

San Ace Cooling Fan

DC Fan / ACDC Fan / AC Fan

2023

English



San Ace

New/Recommended Products

NEW

DC DC Fan

The 60 × 60 × 38 mm San Ace 60 9HVA type fan can efficiently cool high-density equipment that is hard to ventilate, making it suitable for cooling servers and storage. Also, the 9RA type lineup has been expanded. (80 × 80 × 38 mm, 120 × 120 × 38 mm, 140 × 140 × 38 mm)

This fan is ideal for cooling medical equipment, AV-equipment, measuring instruments, and other applications that require low noise and low power consumption.

The product lineup is available in a wide variety in 12/24/48 voltage, cooling performance, noise level, and PWM control. This allows users to choose the most suitable one for their applications.



San Ace 60 9HVA type
60 × 60 × 38 mm
pp. 75 to 76



San Ace 80 9RA type
80 × 80 × 38 mm
pp. 122 to 125



San Ace 120 9RA type
120 × 120 × 38 mm
pp. 173 to 176



San Ace 140 9RA type
140 × 140 × 38 mm
pp. 184 to 187

NEW

DC Splash Proof Fan 9WPA type

The Splash Proof Fan lineup has been expanded.

Superior IP68-rated* water and dust protection ensures stable fan operation even in harsh environments. This fan is suitable for cooling base stations, quick EV chargers, and surveillance cameras.

* The degree of protection (IP code) is defined by the IEC (International Electrotechnical Commission) 60529 standard. The protection ratings of our fans only apply to electrical components (motor coils and electronic components) and do not cover mechanical components.



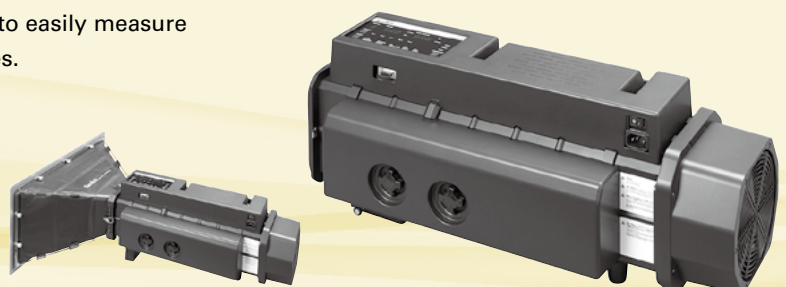
40 × 40 × 20 mm
pp. 258 to 260



40 × 40 × 28 mm
pp. 263 to 265

Airflow Tester pp. 592 to 595

This is a portable measuring device that enables you to easily measure the system impedance and operating airflow of devices.



We offer more products with various features available. See the rest of the catalog for more.

NEW

ACDC ACDC Fan

The ACDC Fan lineup has been expanded.

With an embedded AC-DC converter, this fan runs on AC power without needing a DC power supply. DC fan advantages such as low power consumption and long life can be enjoyed while being AC-powered, making it ideal for control panels, food manufacturing equipment, and plant factories.



San Ace 120AD
9ADA type
120×120×38 mm
pp. 499 to 501



San Ace 120AD
9ADAW type
120×120×38 mm
pp. 502 to 504



San Ace 160AD
9AD type
160×160×51 mm
pp. 508 to 511



San Ace 160AD
9ADW type
160×160×51 mm
pp. 512 to 515

San Ace Controller pp. 584 to 587

This controller can perform control and remote monitoring of PWM fans.

It can optimize the airflow and static pressure of fans by controlling individual fan speeds from a computer or smartphone.

Combined with option sensors, the controller can measure air temperature and pressure for automatic fan speed control.

It can monitor and control fans in remote locations via a cloud server, adding new value to customers' equipment such as failure detection and preventive maintenance capabilities.

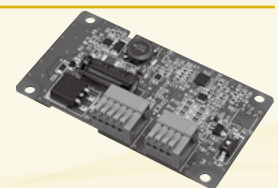


PWM Controller pp. 588 to 591

This device provides external speed control of PWM fans. By using this product, PWM fans can be fully utilized without the need for preparing new circuits, contributing to reducing the system power consumption and the fan noise. By using this product, PWM fans can be fully utilized without preparing a new circuit, contributing to reducing the system power consumption and noise level.



Box type



PCB type

Why are San Ace fans chosen?

High Quality and High Reliability

Our products are made of high-quality materials and undergo rigorous quality assurance testing. They are designed and manufactured by experienced engineers and professionals to achieve high reliability.

Rich Lineup

They are available in a wide range of size, shape, and performance to meet various needs. Also, we specialize in customization tailored to customer needs.

DC Fan

DC Fan



The lineup offers a number of products with features such as low power consumption, high airflow, and low noise. They are suitable for a variety of applications including air blowing, ventilation, and cooling.

Counter Rotating Fan



This fan features high static pressure and can blow straight air, and therefore is suitable for cooling high-density devices and for cooling by blowing air directly.

Reversible Flow Fan



This fan can switch forward/reverse air directions, delivering nearly the same airflow and static pressure for both. It is ideal for home ventilation systems and other applications where two intake and exhaust fans are used.

Splash Proof Fan



Fans with excellent water and dust protection. They can be used outdoors and in environments with water splashes and dust.

Splash Proof Centrifugal Fan



Centrifugal fans with excellent water and dust resistance. They are used in high-density equipment and outdoor equipment.

Splash Proof Blower



These blowers send out air in a 90° direction from the intake direction, changing the direction of air without an external duct. Featuring superb water and dust protection, they can be used outdoors and in environments with water splashes and dust.

ACDC Fan

This fan internally converts AC power to DC power. DC fan advantages such as low power consumption and long life can be enjoyed while being AC-powered. Unlike AC fans, whose performance depends on the power source conditions, this fan runs at a constant speed regardless of the input voltage and frequency.



Used everywhere in society

In addition to cooling, we offer a variety of fans suitable not only for cooling but also for air ventilation and circulation, air blowing, and suction applications.

In convenience stores...

ATM

For cooling the housing and paper currency detector.

San Ace 80 / San Ace 60T



Refrigerated showcase

For circulating cool air through a showcase.

San Ace 120W



Coffee maker

For removing humidity inside the device through ventilation.

San Ace B52



Copier

For cooling inside a copier and holding paper by air suction.

San Ace B97 / San Ace 80



Surveillance camera

For exhausting the heat generated from PCB.

San Ace 40



Environmentally Friendly

Our fans are eco-designed and offer energy savings. They are compliant with RoHS Directive and made environmentally friendly.

Short Lead Time Service

Short Lead Time Service is available for the prompt delivery of our products. Please contact your point of sale for details.

Oil Proof Fan



The windings and electronic components are protected by oil-resistant materials, which ensures stable operation in oil mist environments. This fan is ideal for factory automation applications, such as industrial equipment, machine tools, and industrial robots.

Long Life Fan



This fan features a long life expectancy of up to 180,000 hours and is suitable for telecom equipment, servers, and industrial equipment that needs to operate without maintenance for extended periods of time.

Wide Temperature Range Fan



This fan features a wide operating temperature range of -40 to +85°C. This makes it suitable for many applications, from low temperature refrigerators and freezers to high temperature lighting equipment.

G Proof Fan



This fan is designed to withstand G-forces of up to 735 m/s² (75 G) for 1,000 hours. It is suitable for such devices as CT scanners, which are subjected to high levels of G-force.

Centrifugal Fan



These fans blow air in a centrifugal course. Featuring excellent airflow and static pressure, they are suitable for cooling compact, high-density devices, such as servers.

Blower



These blowers send out air in a 90° direction from the intake direction, changing the direction of air without an external duct. Featuring high static pressure, Blowers are ideal for spot cooling applications and cooling high-density equipment.

AC Fan

These fans run on AC power of 100 to 230 V. They are suitable for a various applications including ICT equipment, control panels, and general facilities.



In hospitals...

CT scanner

For preventing image distortion caused by high temperatures within the gantry.
San Ace 120L



Air mattress

For removing moisture in an air mattress through ventilation.
San Ace B76



Powder packing machine

For suctioning the powder in the air when filling pharmaceutical powder.
San Ace B76



Medical ultrasound equipment

Cooling control boards.
San Ace 120



In food factories...

Air showers

For blowing filtered clean air.
San Ace C175



Inspection equipment

For exhausting heat generated by an x-ray generator.
San Ace 60



Palletizing robot

For exhausting heat from control panels.
San Ace 120AD



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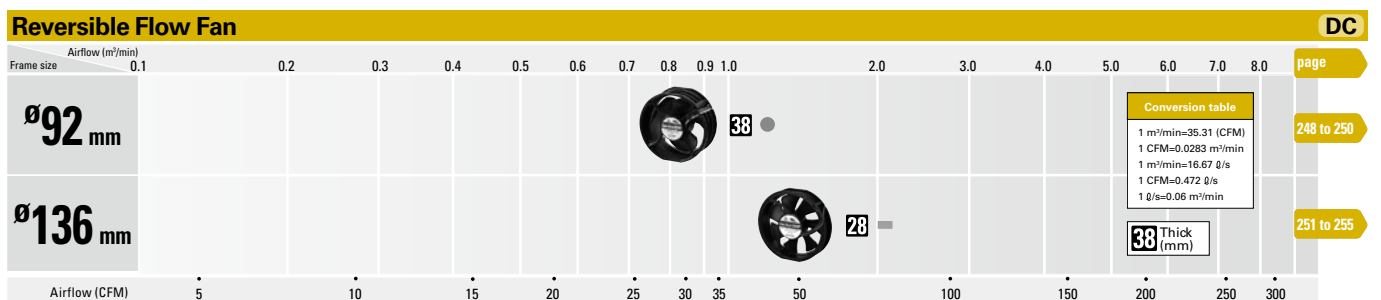
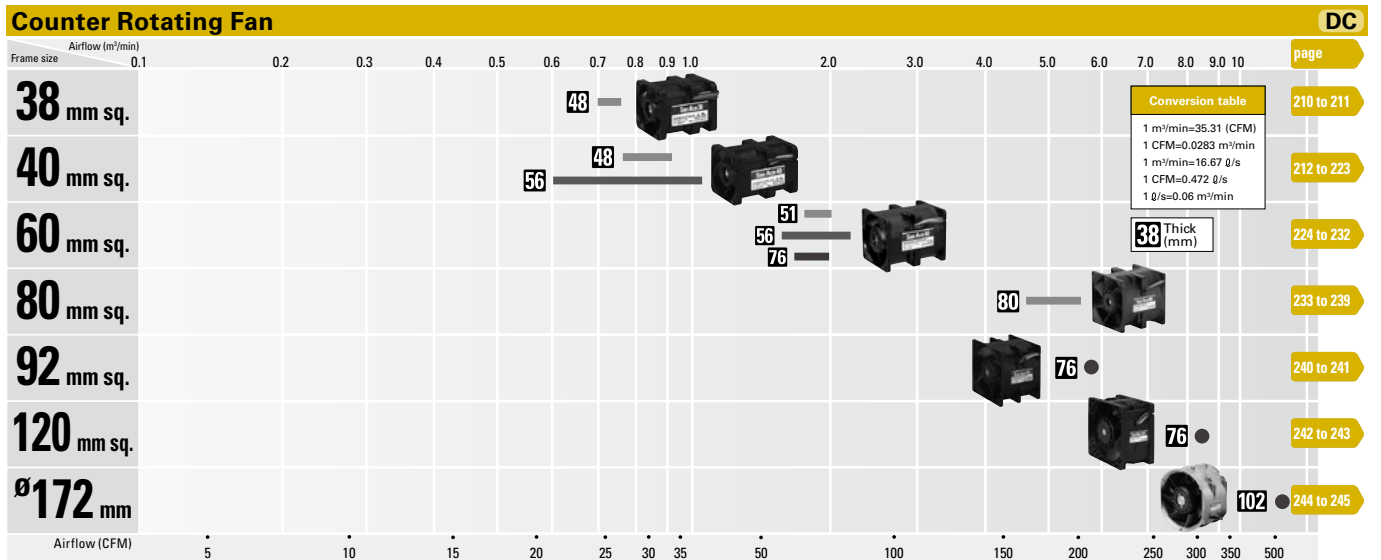
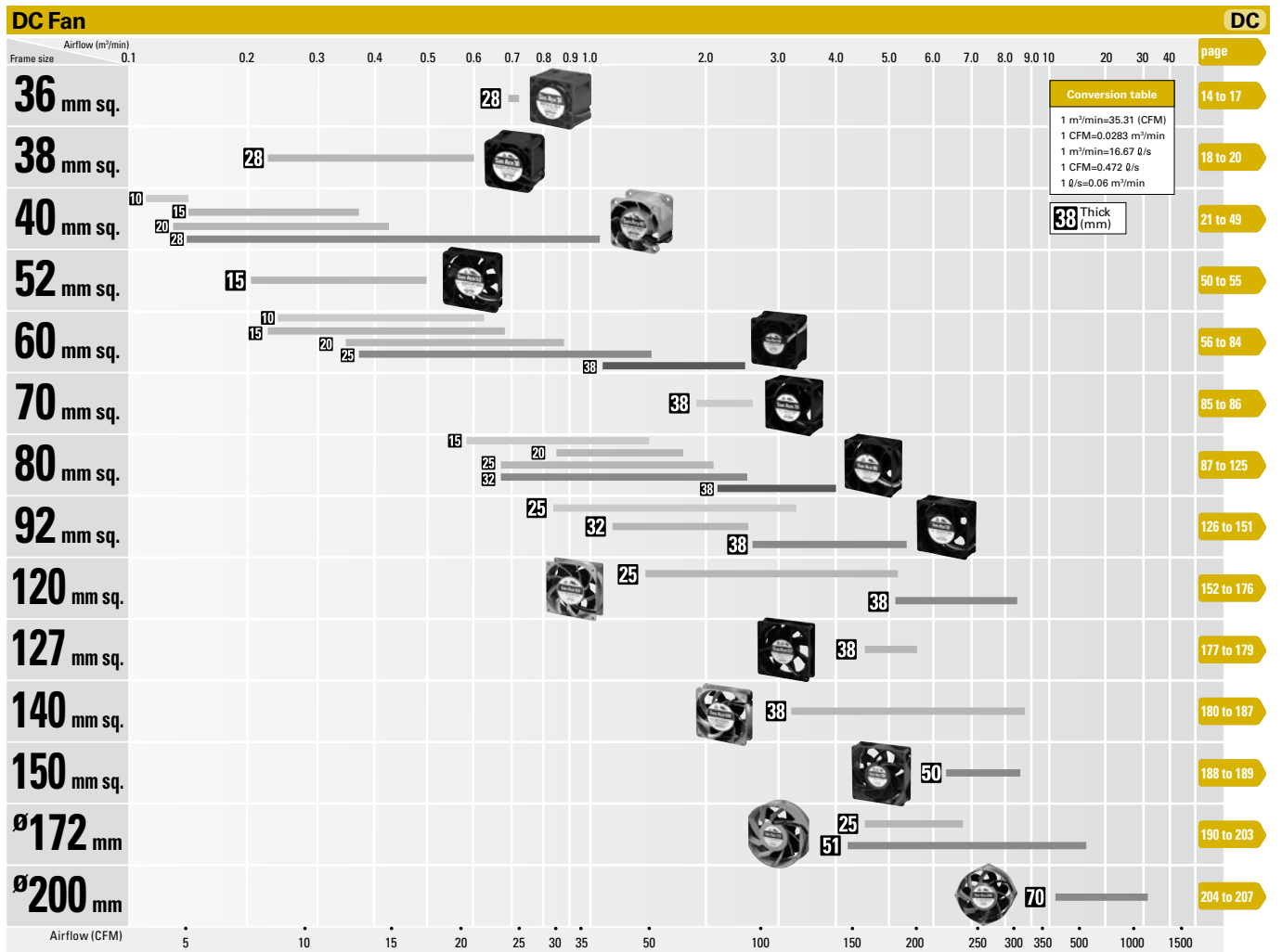
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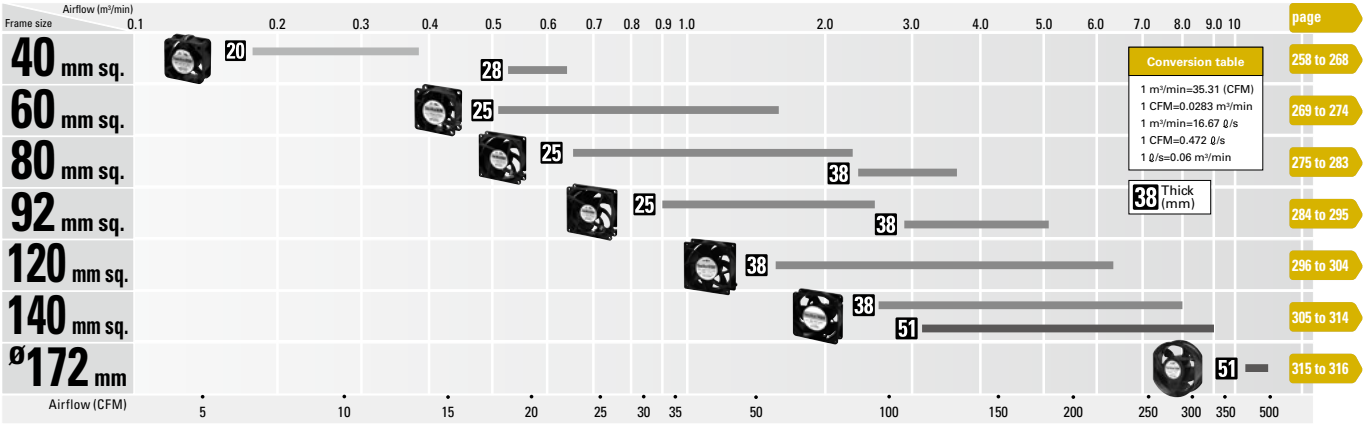
Short Lead Time Service 668

| | |
|--|--|
| DC Fan | |
| Counter Rotating Fan | |
| Reversible Flow Fan | |
| Splash Proof Fan | |
| Splash Proof Centrifugal Fan | |
| Splash Proof Blower | |
| Oil Proof Fan | |
| Long Life Fan | |
| Wide Temperature Range Fan | |
| G Proof Fan | |
| Centrifugal Fan | |
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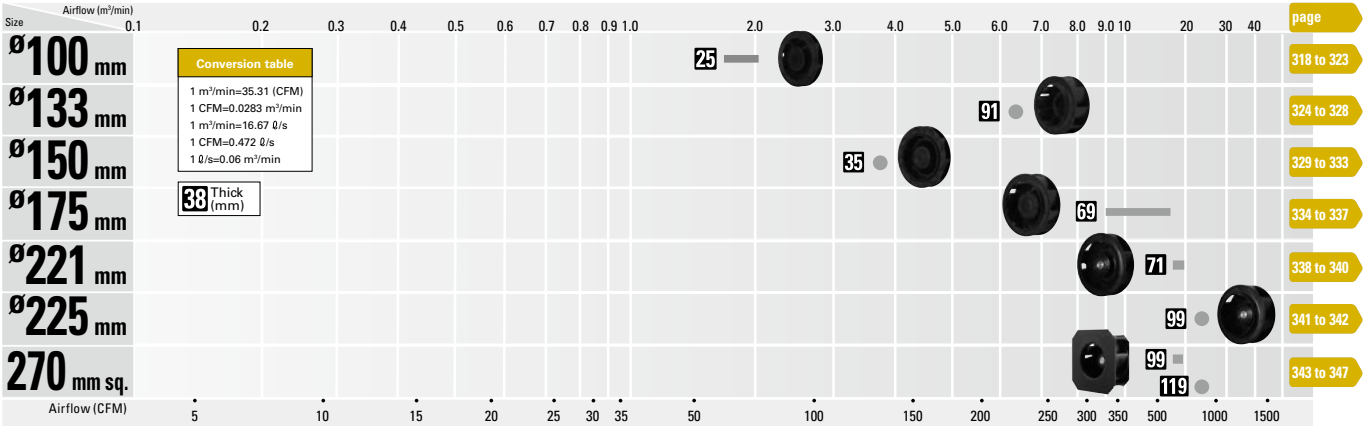
Splash Proof Fan

DC



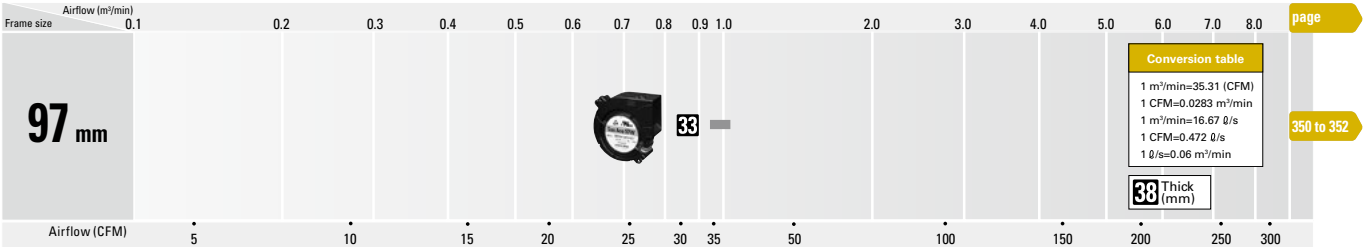
Splash Proof Centrifugal Fan

DC



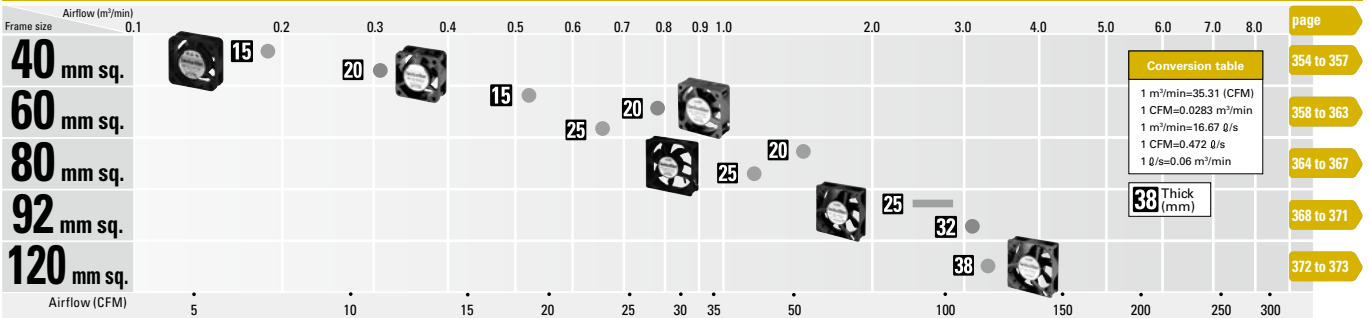
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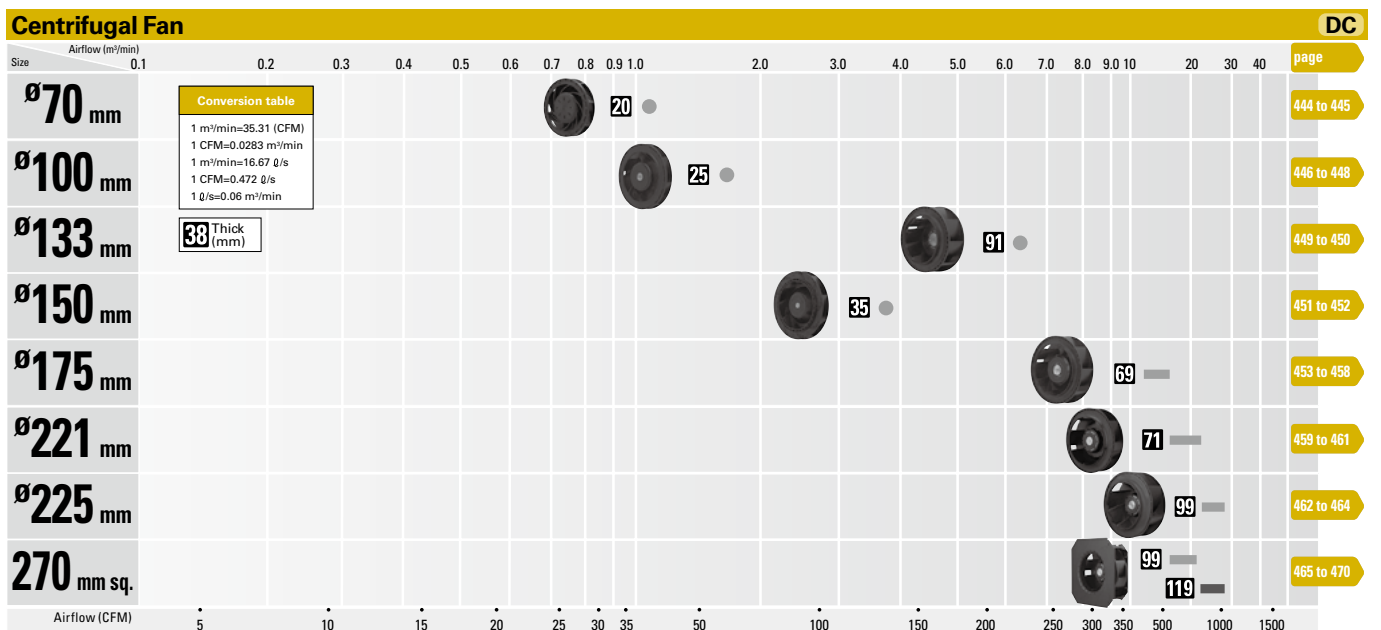
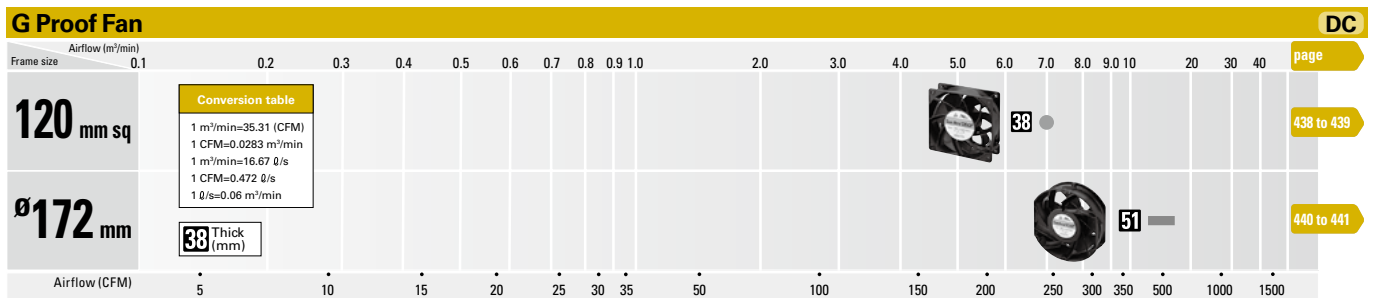
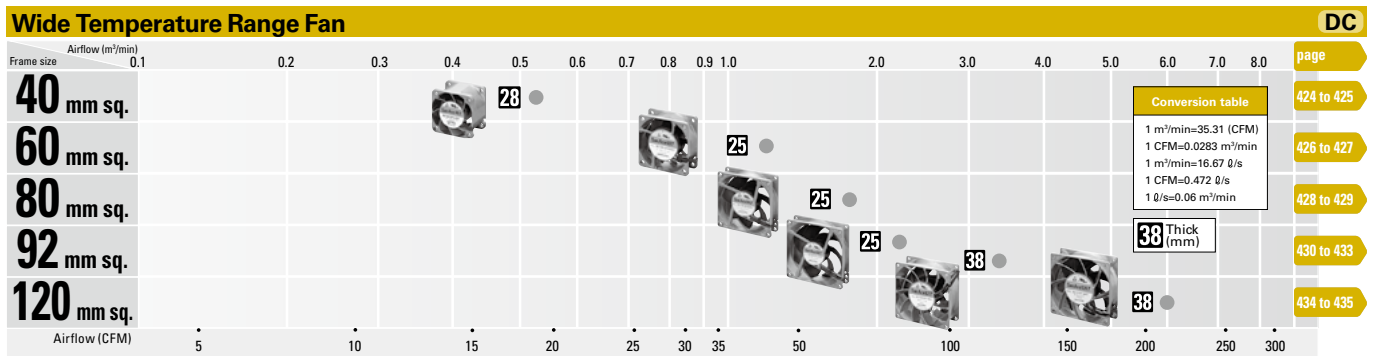
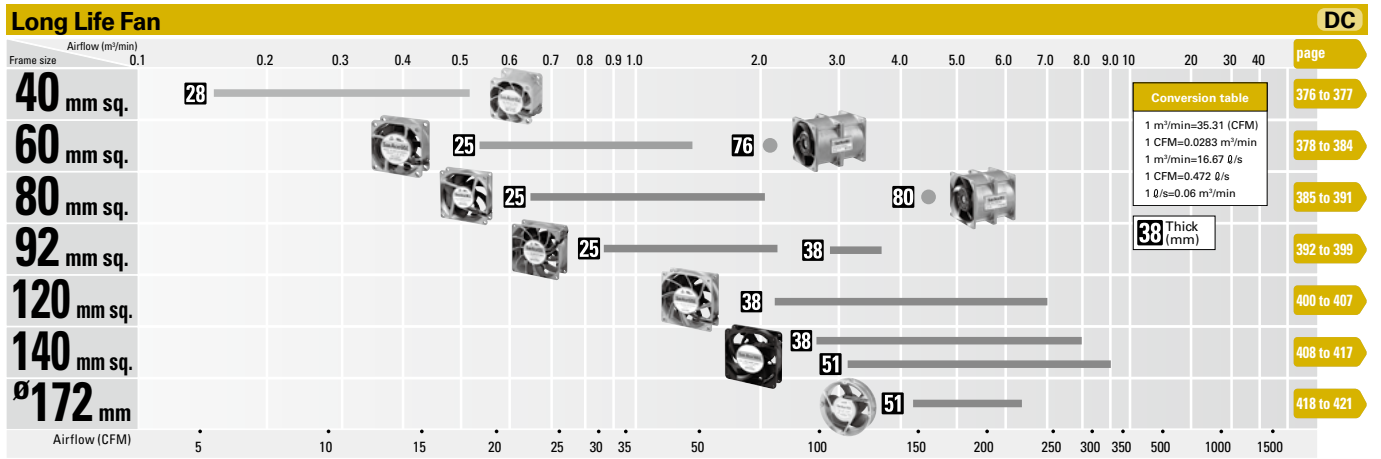
DC



Oil Proof Fan

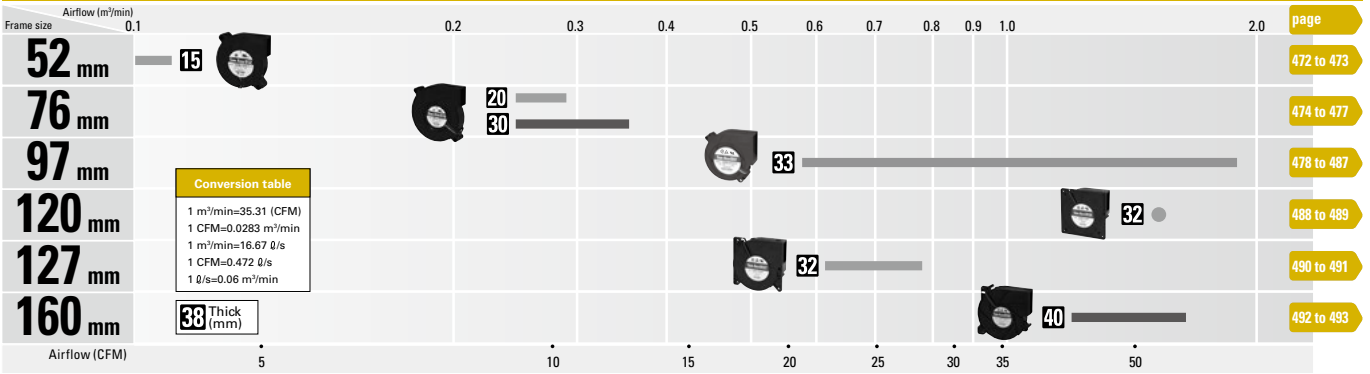
DC





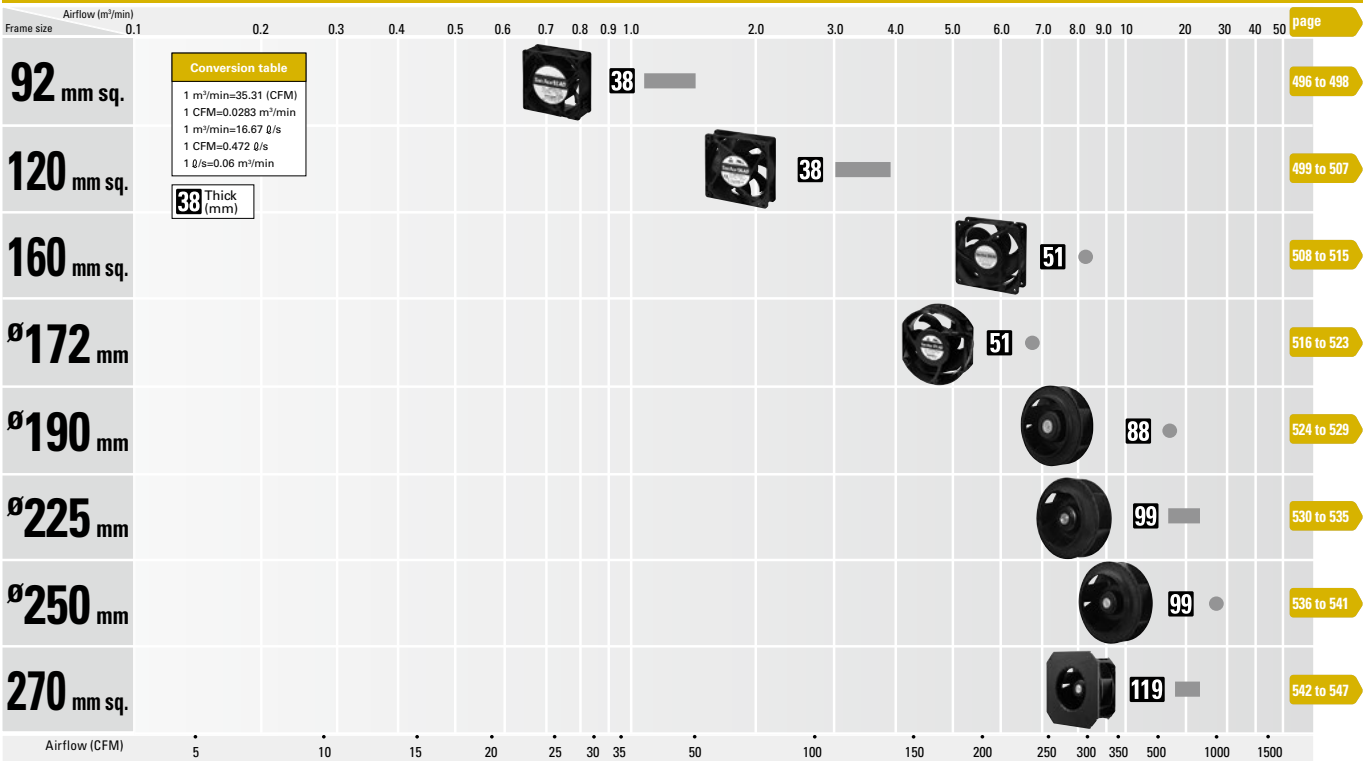
Blower

DC



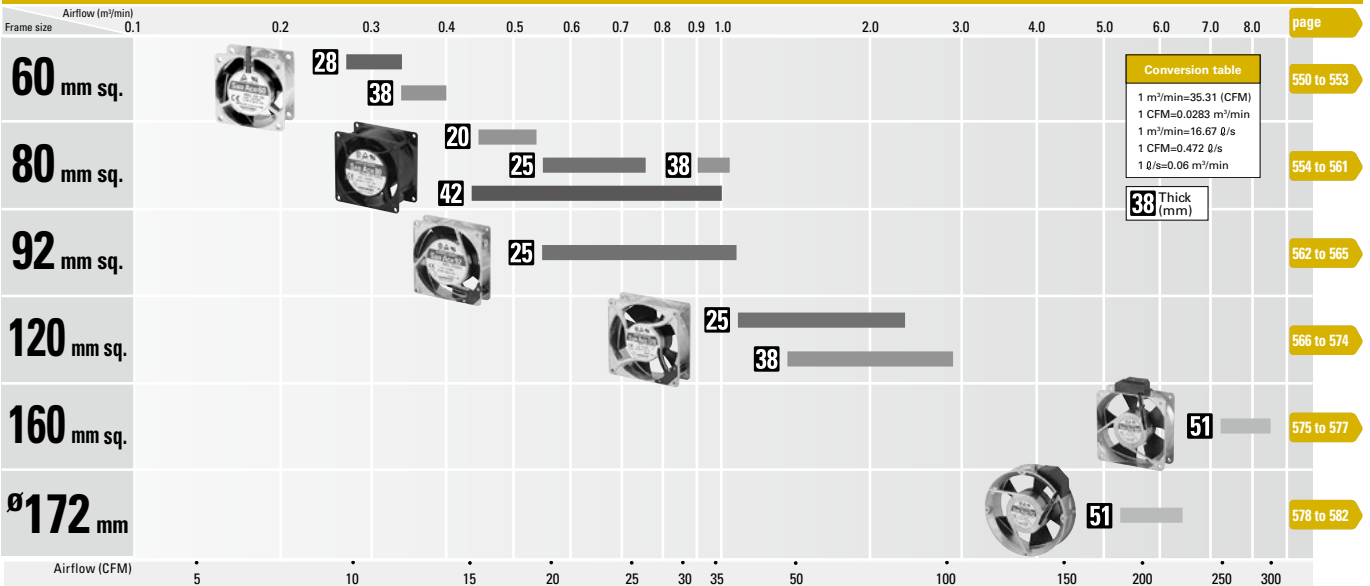
ACDC Fan

AC



AC Fan

AC



Eco-products

Efforts for designing Eco-products

As for product design, we are carrying out R&D to incorporate the latest energy-saving technologies into our new products. At the same time, we carry out product assessments to evaluate the environmental impact of products at each stage, such as component and material procurement, manufacture, distribution, use, recycling, and disposal.

Newly developed products are compared with commercially available and existing products and are certified as Eco-products (Eco-design products) if they satisfy the specified evaluation standards. Eco-products are presented in catalogues and other materials with a LEAF symbol.



ECO PRODUCTS

Life cycle assessment (LCA)

LCA is one of the techniques used to provide a general quantitative measure of levels of environmental impact including global warming that products have through their life cycles. We evaluate the environmental compatibility of a product using this method. Our rate of implementing LCA in our Eco-products was 90%.

DC Fan

Wide lineup including low power consumption fans (9GA type), silent fans (9S type), and high airflow and high static pressure fans.

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | | |
|------------|------------|-----------|------------|-----------------|-----------------------|------------|
| 9GV | 12 | 12 | J | 1 | 01 | 1 |
| Type name | Frame size | Voltage | Speed code | Frame thickness | Sensor specifications | Frame form |

Fans with PWM control

| | | | | | | | |
|------------|------------|-----------|-------------|-----------------|------------|--|------------|
| 9GV | 12 | 12 | P | 4 | G | 01 | |
| Type name | Frame size | Voltage | PWM control | Frame thickness | Speed code | Individual customer's spec (2 to 4 digits) | Frame form |

| | | | | | | | | | | | | | | | |
|-----------------------|--|-------|-------|-------|-------------------------------|--------|---------|---------|-----------------------------------|---------|------|-------|--|--------------------|------|
| Type name | 9GA 9GV 9HV etc. | | | | | | | | | | | | | | |
| Frame size (mm) | 03 | 04 | 05 | 06 | 08 | 09 | 12 | 13 | 14 | 15 | 17 | 36 | 47 | 57 | 20 |
| | 38×38 | 40×40 | 52×52 | 60×60 | 80×80 | 92×92 | 120×120 | 127×127 | 140×140 | 150×150 | ∅172 | 36×36 | ∅172×147 (sidecut) | ∅172×150 (sidecut) | ∅200 |
| Voltage (V) | 05 | 12 | 24 | 48 | | | | | | | | | | | |
| | 5 | 12 | 24 | 48 | etc. | | | | | | | | | | |
| Speed code | A | B | C | D | E | F | G | H | J | K | L | M | S | W | etc. |
| Frame thickness (mm) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | | | | | | |
| | 70 | 38 | 32 | 28 | 25 | 50, 51 | 20 | 15 | 10 | | | | | | |
| Sensor specifications | 01 or 001 With a pulse sensor | | | | 02 or 002 Without a sensor | | | | D01 or D001 With a lock sensor | | | | | | |
| Frame form | Nil | | | | 1 | | | | 3 | | | | 40 × 40 × 28 mm for 1U applications Plastic frame: Ribbed frame | | |
| | Plastic frame: Ribbed frame Aluminum frame: Ribless frame | | | | Plastic frame: Ribless frame | | | | | | | | | | |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

- Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
For more information, please refer to the technical material section.



36×36×28 mm

San Ace 36 9HV type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 53 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9HV3612P3K001 | 12 | 10.8 to 13.2 | 100 | 1.75 | 21.0 | 32500 | 0.72 25.4 | 1400 5.62 | 67 | -20 to +60 | 30000/60°C (53000/40°C) |
| | | | 20 | 0.05 | 0.6 | 6000 | 0.12 4.2 | 47.2 0.19 | 26 | | |

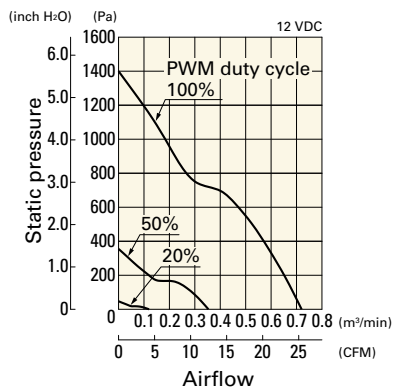
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

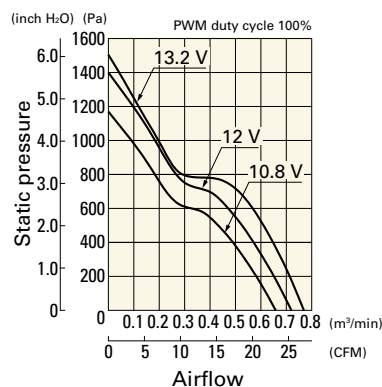
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV3612P3K001 With pulse sensor with PWM control

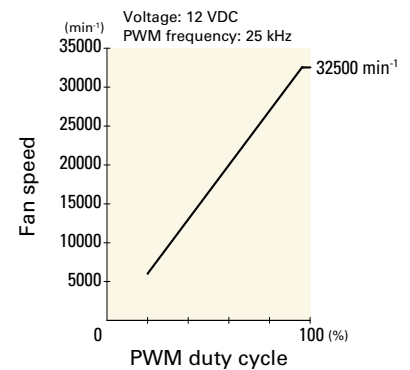
PWM duty cycle



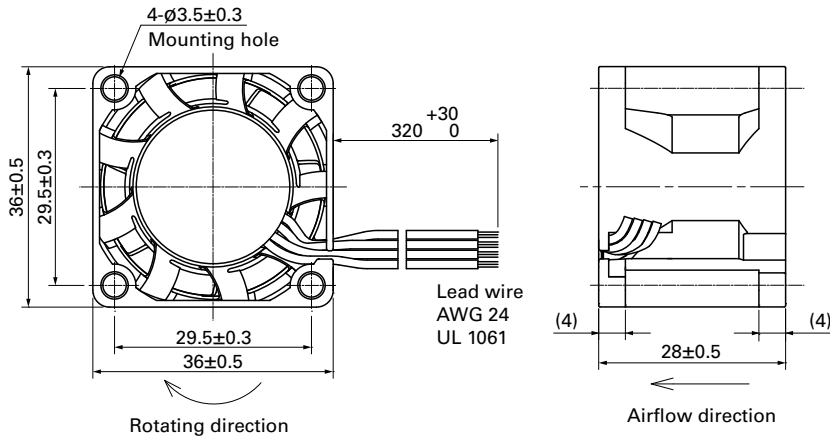
Operating voltage range



PWM duty - Speed characteristics example

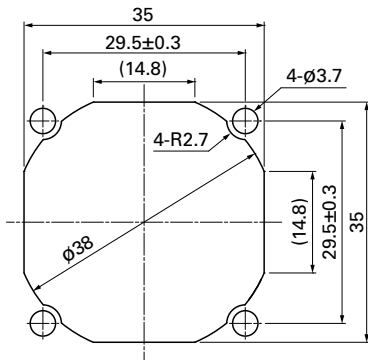


Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Inlet side, Outlet side



Options

Finger guards

page: p. 598

Model no.: 109-1050

DC Fan

36×36×28 mm

San Ace 36 9GX type



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 46 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GX3612P3K001 | 12 | 10.8 to 13.2 | 100 | 1.3 | 15.6 | 24000 | 0.69 24.4 | 838 3.367 | 66 | -10 to +60 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.07 | 0.84 | 3200 | 0.09 3.2 | 14.0 0.056 | 16 | | |

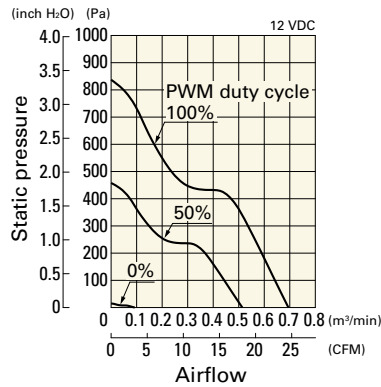
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 647.

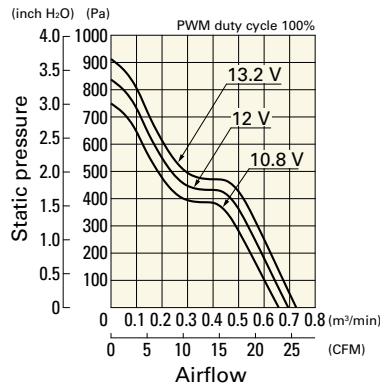
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GX3612P3K001 With pulse sensor with PWM control

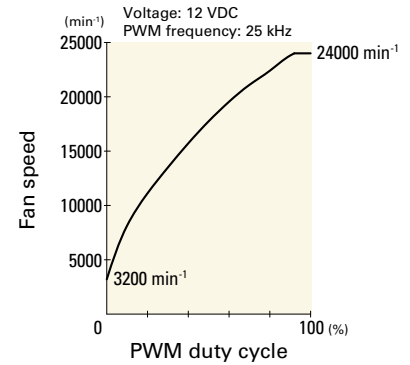
PWM duty cycle



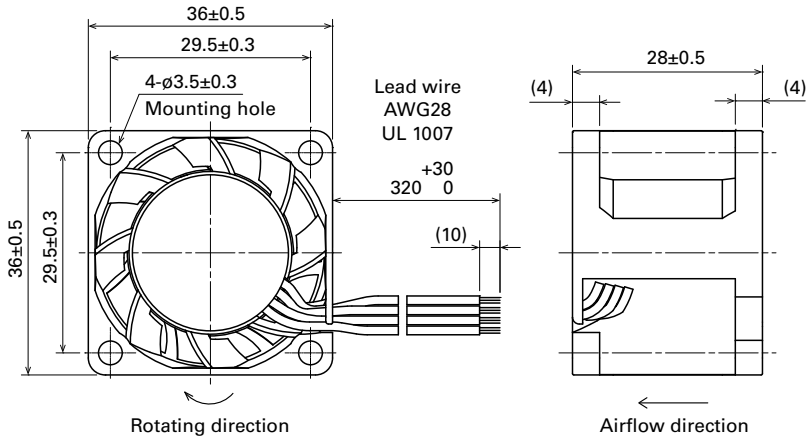
Operating voltage range



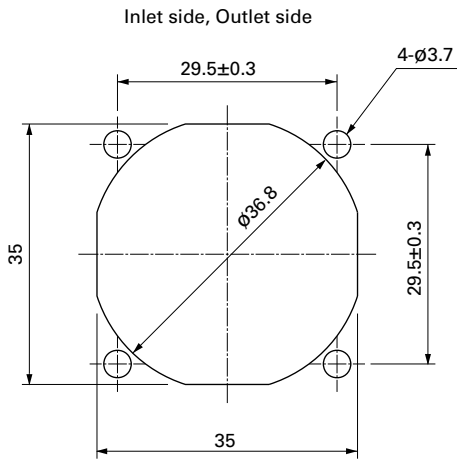
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-1050



38x38x28 mm

San Ace 38 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 52 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9GA0312P3K001 | 12 | 10.8 to 13.2 | 100 | 0.62 | 7.4 | 25000 | 0.6 21.2 | 800 3.21 | 59.0 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.06 | 0.7 | 3000 | 0.07 2.5 | 11 0.04 | 15.0 | | |
| ▶▶ 9GA0312P3J001 | | | 100 | 0.52 | 6.2 | 23500 | 0.57 20.1 | 720 2.89 | 57.5 | | |
| | | | 0 | 0.06 | 0.7 | 3000 | 0.07 2.5 | 11 0.04 | 15.0 | | |
| ▶▶ 9GA0312P3G001 | | | 100 | 0.33 | 4.0 | 19000 | 0.45 15.9 | 460 1.85 | 53.0 | | |
| | | | 0 | 0.06 | 0.7 | 3000 | 0.07 2.5 | 11 0.04 | 15.0 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0312E3001 | 12 | 10.8 to 13.2 | 0.18 | 2.16 | 14000 | 0.34 12.0 | 250 1.0 | 47 | -20 to +70 | 60000/60°C (90000/40°C) |
| 9GA0312H3001 | | | 0.09 | 1.08 | 9200 | 0.22 7.77 | 108 0.43 | 37 | | |

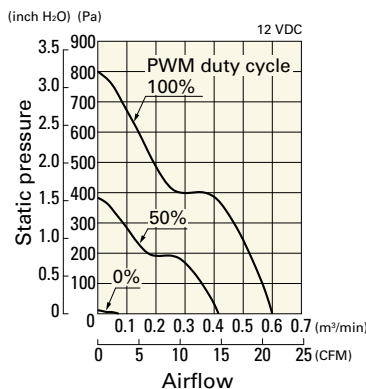
Note 1: Sensor and control options are available for selection. Refer to the table on p. 642.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

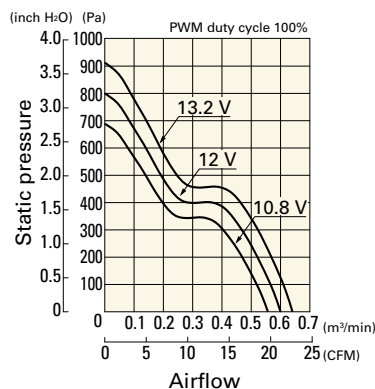
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0312P3K001 With pulse sensor with PWM control

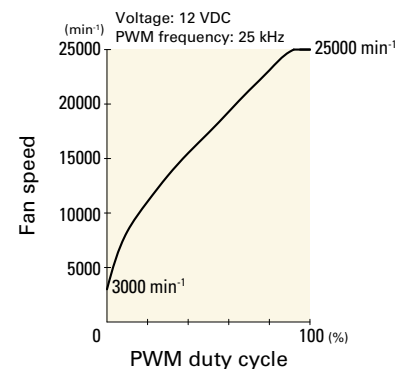
PWM duty cycle



Operating voltage range



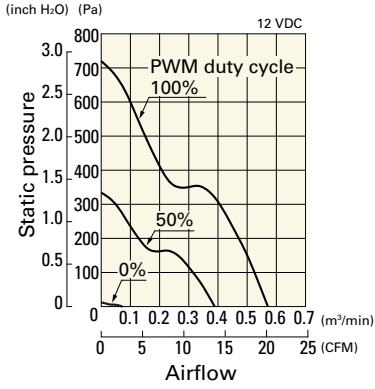
PWM duty - Speed characteristics example



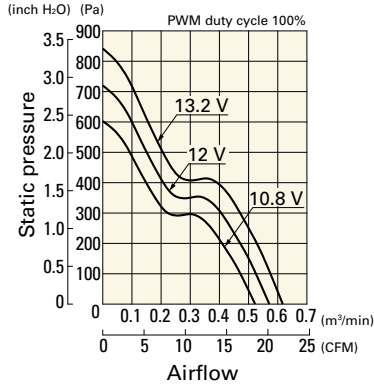
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0312P3J001 With pulse sensor with PWM control

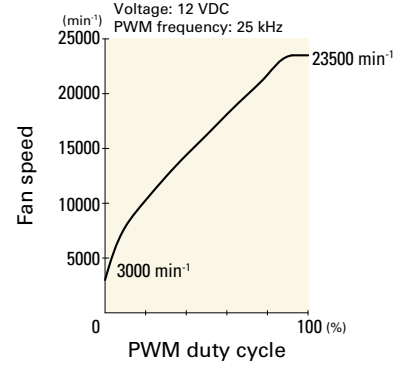
PWM duty cycle



Operating voltage range

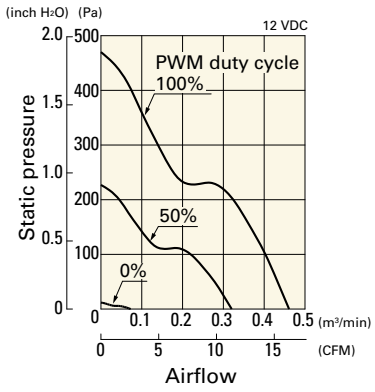


PWM duty - Speed characteristics example

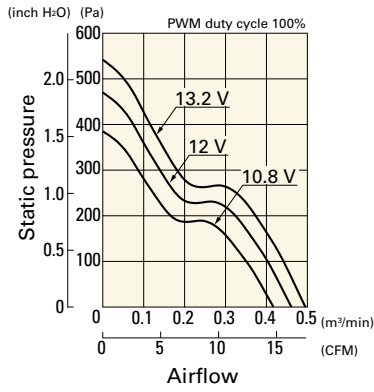


9GA0312P3G001 With pulse sensor with PWM control

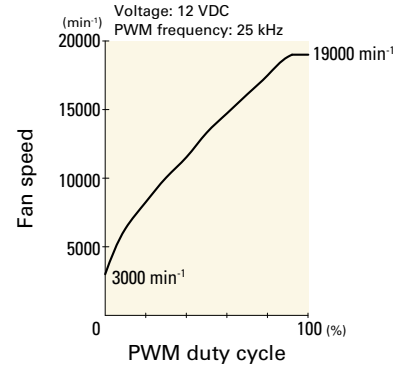
PWM duty cycle



Operating voltage range



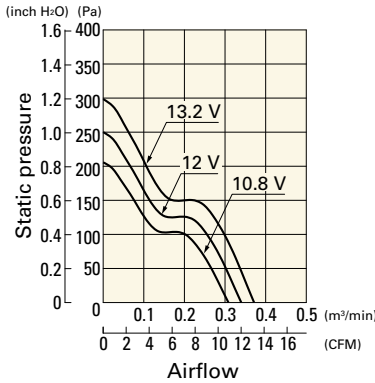
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

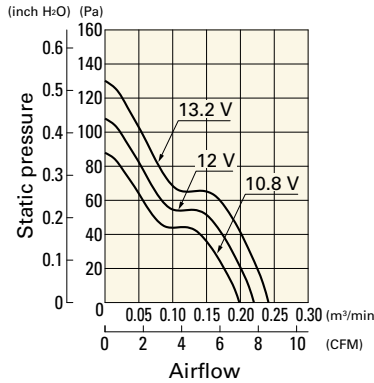
9GA0312E3001 With pulse sensor

Operating voltage range

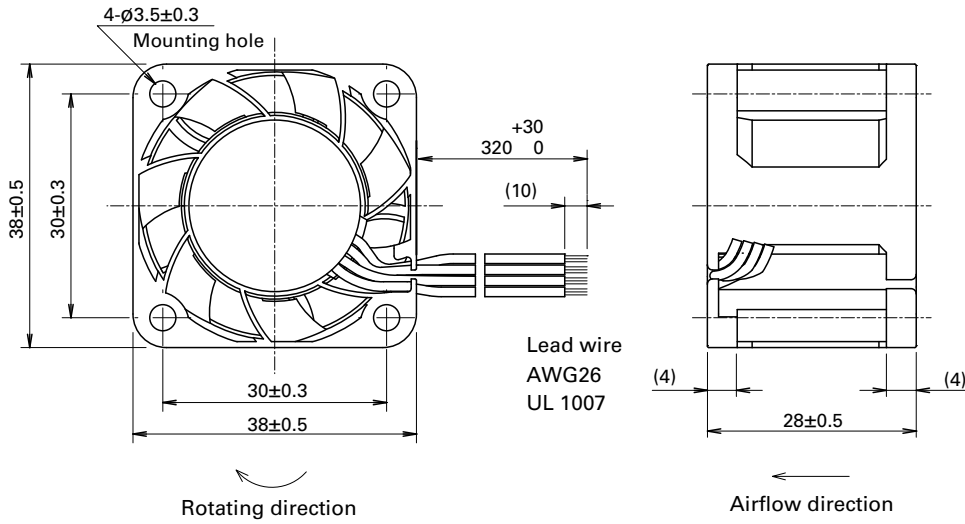


9GA0312H3001 With pulse sensor

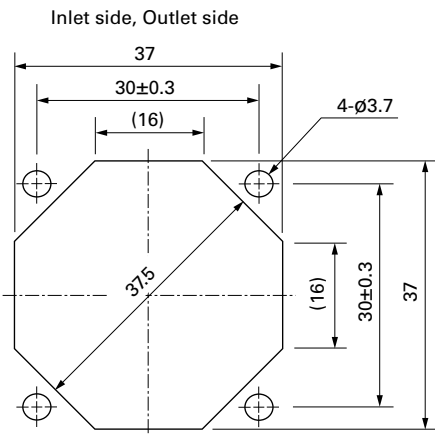
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-1065



40x40x10 mm

San Ace 40 9P_{type}

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 19 g

Specifications

The models listed below **have ribs and a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 109P0405H901 | 5 | 4.5 to 5.5 | 0.16 | 0.8 | 6200 | 0.15 5.3 | 41.2 0.165 | 25 | -10 to +60 | 40000/60°C (70000/40°C) |
| ▶▶ 109P0405M901 | | | 0.11 | 0.55 | 5000 | 0.12 4.2 | 27 0.108 | 21 | | |
| ▶▶ 109P0412H901 | 12 | 7 to 13.2 | 0.07 | 0.84 | 6200 | 0.15 5.3 | 41.2 0.165 | 25 | | |
| ▶▶ 109P0412M901 | | | 0.06 | 0.72 | 5000 | 0.12 4.2 | 27 0.108 | 21 | | |
| ▶▶ 109P0424H901 | 24 | 20.4 to 27.6 | 0.04 | 0.96 | 6200 | 0.15 5.3 | 41.2 0.165 | 25 | | |

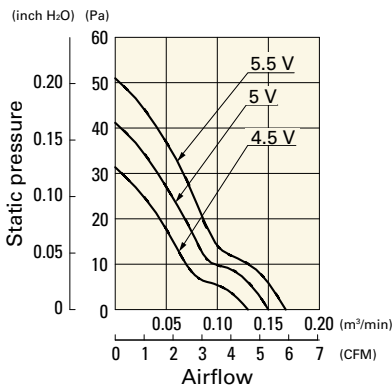
Note 1: Sensor and control options are available for selection. Refer to the table on p. 639.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

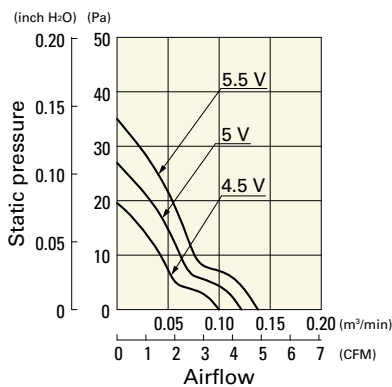
109P0405H901 With pulse sensor

Operating voltage range



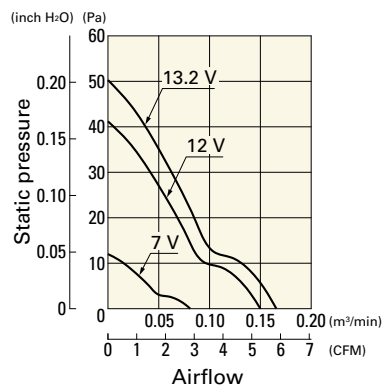
109P0405M901 With pulse sensor

Operating voltage range



109P0412H901 With pulse sensor

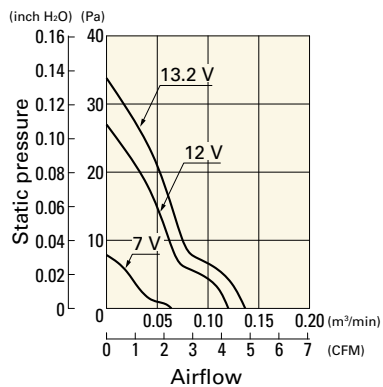
Operating voltage range



Airflow - Static Pressure Characteristics

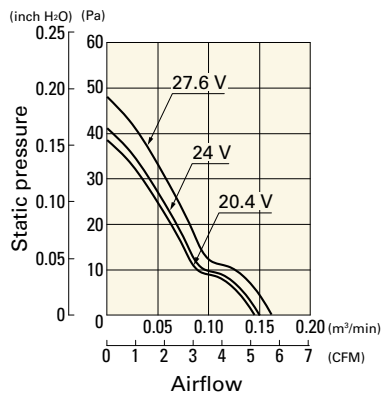
109P0412M901 With pulse sensor

Operating voltage range

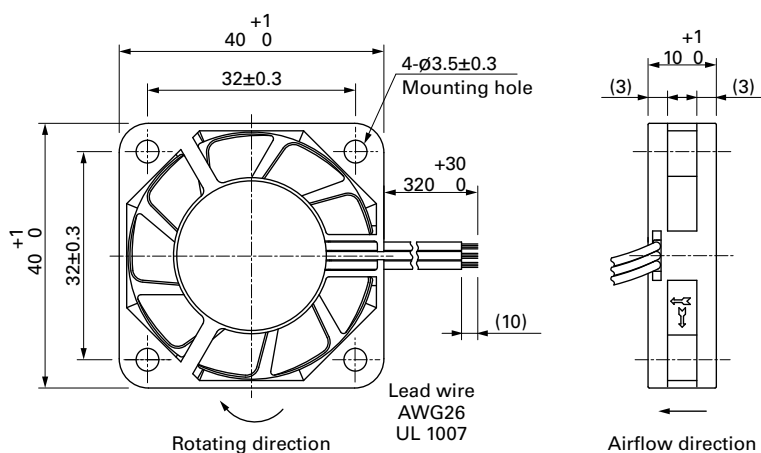


109P0424H901 With pulse sensor

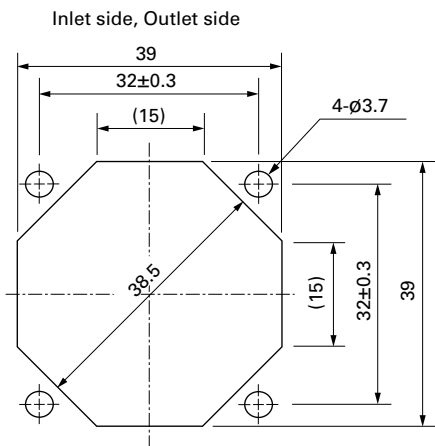
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x15 mm

San Ace 40 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 28 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ² /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0412P7G001 | 12 | 10.2 to 13.8 | 100 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ² /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9GA0412H7001 | | | 0.06 | 0.72 | 7300 | 0.2 7.1 | 59.6 0.24 | 28 | | |

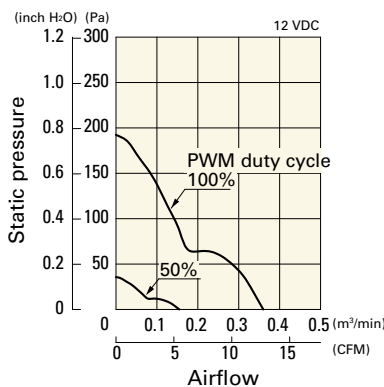
Note 1: Sensor and control options are available for selection. Refer to the table on p. 642.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

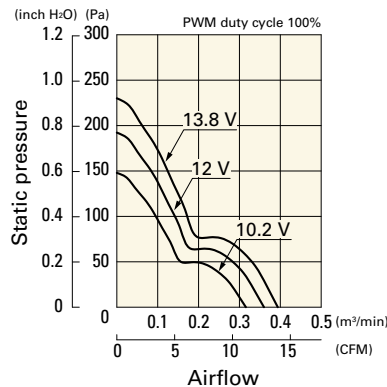
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0412P7G001 With pulse sensor with PWM control

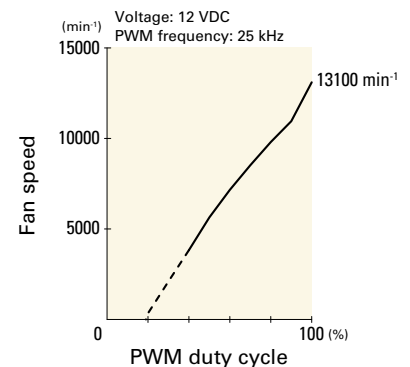
PWM duty cycle



Operating voltage range



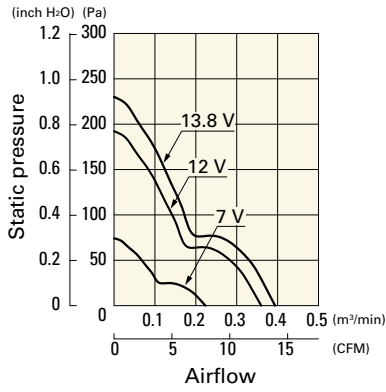
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

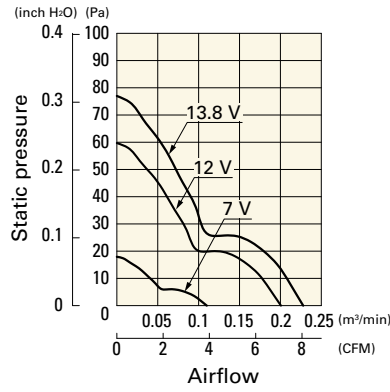
9GA0412G7001 With pulse sensor

Operating voltage range

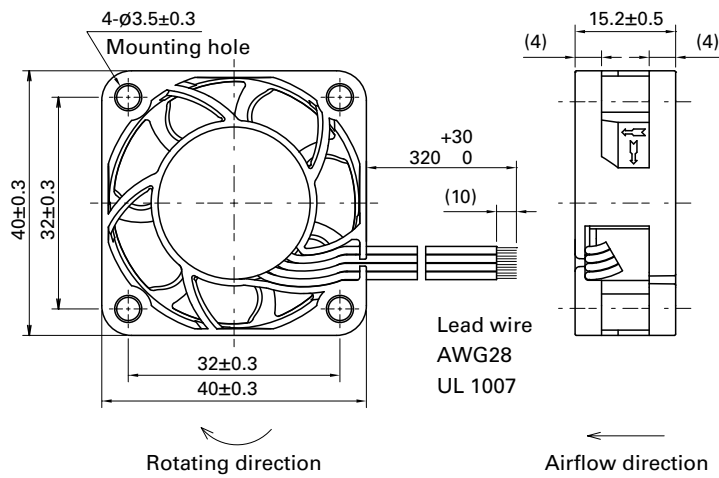


9GA0412H7001 With pulse sensor

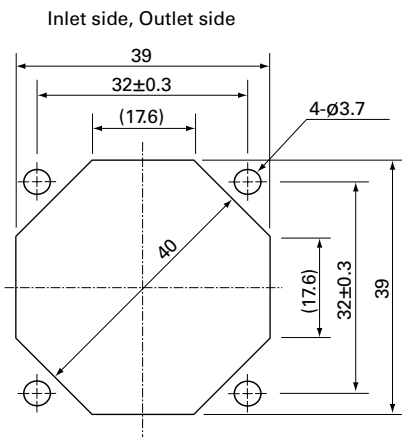
Operating voltage range



Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x15 mm

San Ace 40 9P_{type}

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 32 g

Specifications

The models listed below **have ribs and a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 109P0405H701 | 5 | 4.5 to 5.5 | 0.28 | 1.4 | 7700 | 0.18 6.4 | 75.5 0.303 | 28 | -20 to +60 | 60000/60°C (90000/40°C) |
| ▶▶ 109P0405M701 | | | 0.21 | 1.05 | 6500 | 0.15 5.3 | 52.9 0.213 | 24 | | |
| ▶▶ 109P0412H701 | 12 | 10.2 to 13.8 | 0.13 | 1.56 | 7700 | 0.18 6.4 | 75.5 0.303 | 28 | -20 to +70 | |
| ▶▶ 109P0412M701 | | | 0.095 | 1.14 | 6500 | 0.15 5.3 | 52.9 0.213 | 24 | | |
| ▶▶ 109P0424H701 | | | 0.08 | 1.92 | 7700 | 0.18 6.4 | 75.5 0.303 | 28 | | |

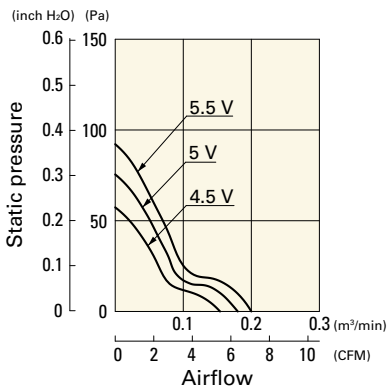
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 639 to 640.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

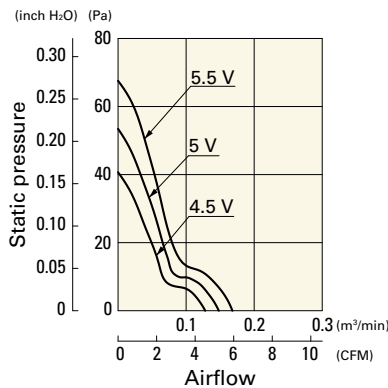
109P0405H701 With pulse sensor

Operating voltage range



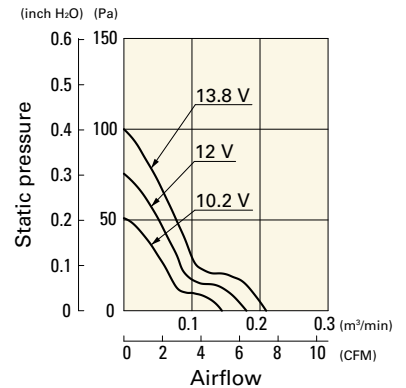
109P0405M701 With pulse sensor

Operating voltage range



109P0412H701 With pulse sensor

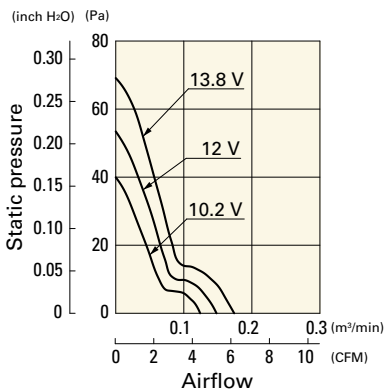
Operating voltage range



Airflow - Static Pressure Characteristics

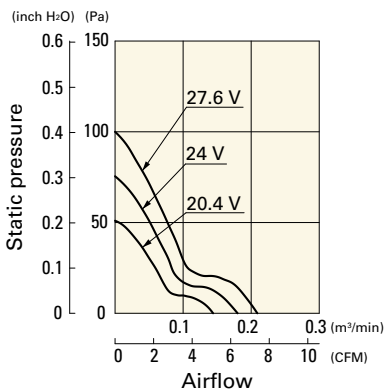
109P0412M701 With pulse sensor

Operating voltage range

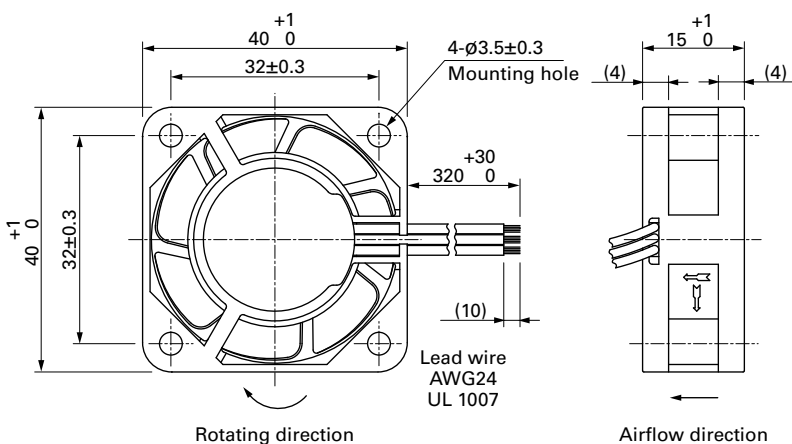


109P0424H701 With pulse sensor

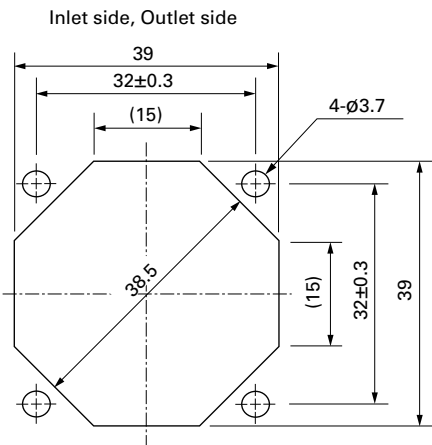
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x20 mm

San Ace 40 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow Control Brown
- Mass 35 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0405P6H001 | 5 | 4.5 to 5.5 | 100 | 0.35 | 1.75 | 12400 | 0.33 11.7 | 191 0.77 | 40 | -20 to +70 | 60000/60°C (90000/40°C) |
| 9GA0405P6F001 | | | 100 | 0.18 | 0.9 | 8000 | 0.21 7.4 | 79.5 0.32 | 28 | | |
| 9GA0412P6G001 | 12 | 10.2 to 13.8 | 100 | 0.23 | 2.76 | 16000 | 0.42 14.8 | 318 1.28 | 47 | | 40000/60°C (70000/40°C) |
| | | | 0 | 0.04 | 0.48 | 3800 | 0.1 3.5 | 17.9 0.07 | 14 | | |
| 9GA0412P6H001 | | | 100 | 0.14 | 1.68 | 12400 | 0.33 11.7 | 191 0.77 | 40 | | 60000/60°C (90000/40°C) |
| | | | 0 | 0.04 | 0.48 | 3800 | 0.1 3.5 | 17.9 0.07 | 14 | | |
| 9GA0412P6F001 | | | 100 | 0.08 | 0.96 | 8000 | 0.21 7.4 | 79.5 0.32 | 28 | | 40000/60°C (70000/40°C) |
| | | | 0 | 0.03 | 0.36 | 2200 | 0.06 2.1 | 6.0 0.02 | 10 | | |
| 9GA0424P6G001 | 24 | 20.4 to 27.6 | 100 | 0.13 | 3.12 | 16000 | 0.42 14.8 | 318 1.28 | 47 | | 40000/60°C (70000/40°C) |
| 9GA0424P6H001 | | | 100 | 0.08 | 1.92 | 12400 | 0.33 11.7 | 191 0.77 | 40 | | |
| 9GA0424P6F001 | | | 100 | 0.04 | 0.96 | 8000 | 0.21 7.4 | 79.5 0.32 | 28 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

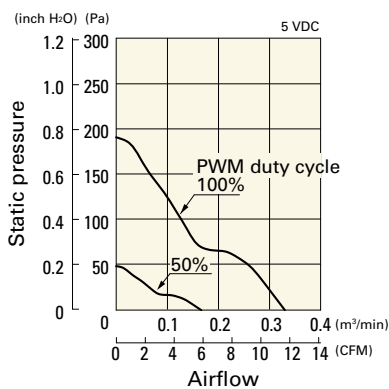
Note 1: Sensor and control options are available for selection. Refer to the table on p. 642.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

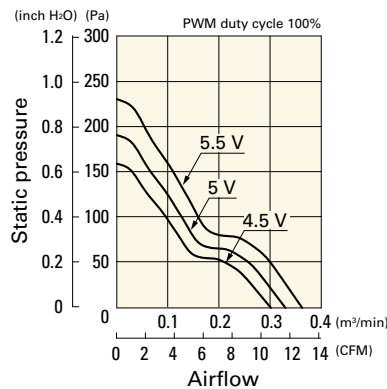
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0405P6H001 With pulse sensor with PWM control

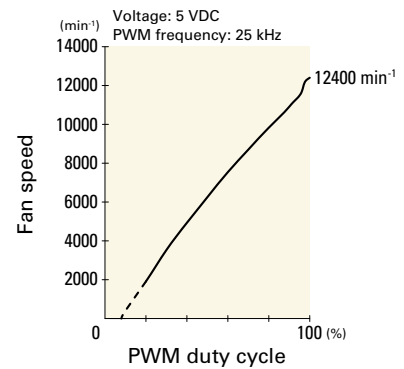
PWM duty cycle



Operating voltage range



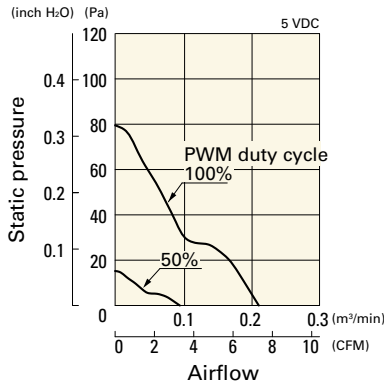
PWM duty - Speed characteristics example



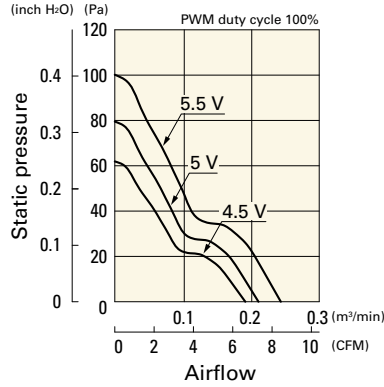
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0405P6F001 With pulse sensor with PWM control

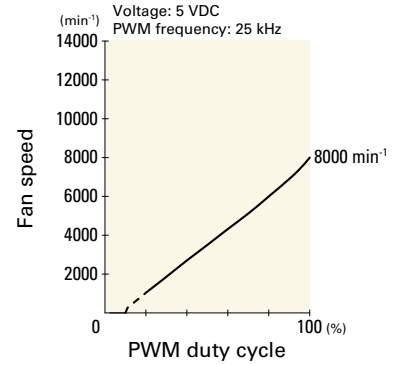
PWM duty cycle



Operating voltage range

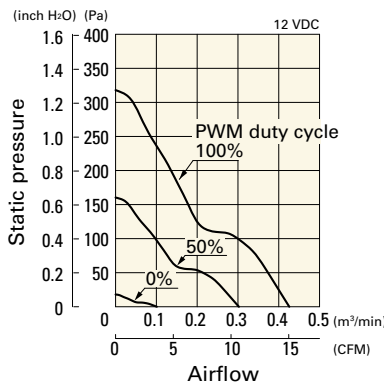


PWM duty - Speed characteristics example

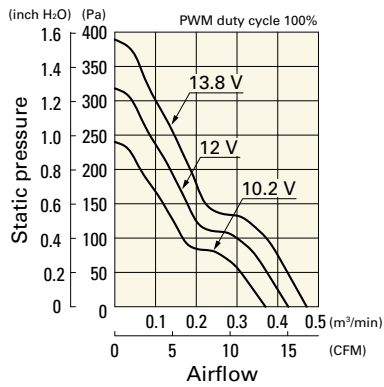


9GA0412P6G001 With pulse sensor with PWM control

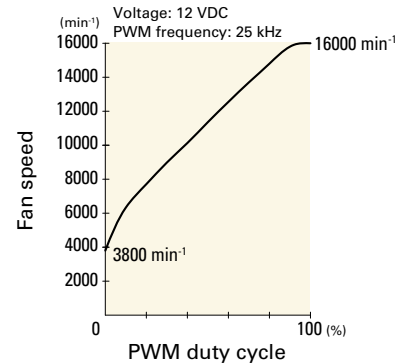
PWM duty cycle



Operating voltage range

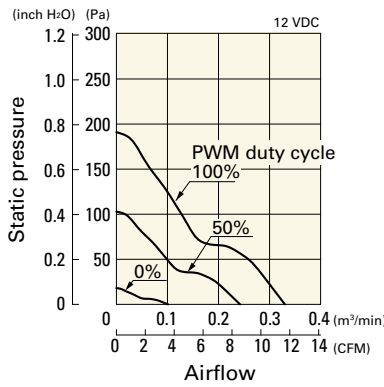


PWM duty - Speed characteristics example

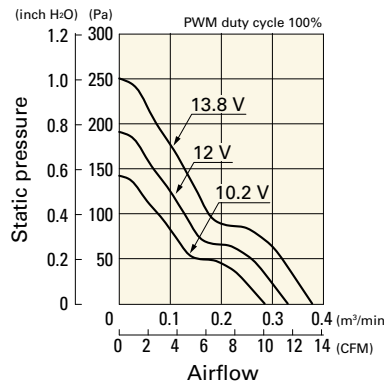


9GA0412P6H001 With pulse sensor with PWM control

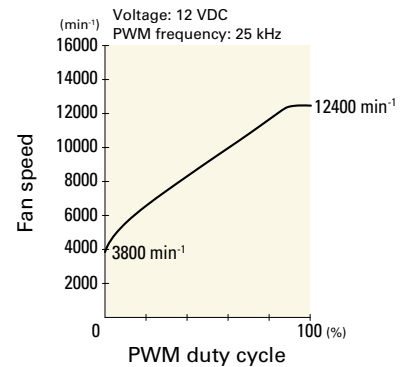
PWM duty cycle



Operating voltage range

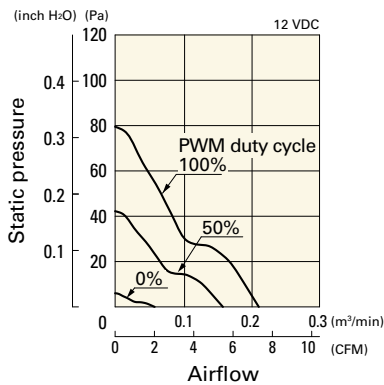


PWM duty - Speed characteristics example

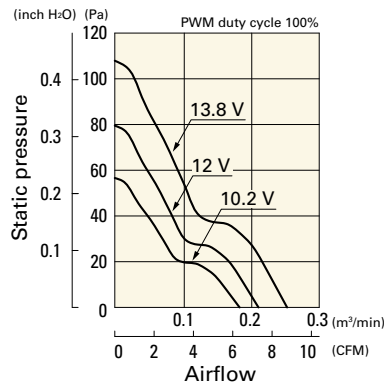


9GA0412P6F001 With pulse sensor with PWM control

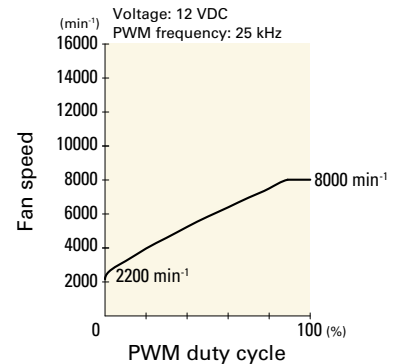
PWM duty cycle



Operating voltage range

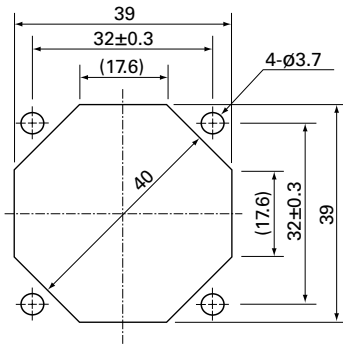


PWM duty - Speed characteristics example



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Inlet side, Outlet side

**Options**

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x20 mm

San Ace 40 9P_{type}

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 45 g

Specifications

The models listed below **have ribs and a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 109P0405F601 | 5 | 4.5 to 5.5 | 0.25 | 1.25 | 6500 | 0.183 6.5 | 45.1 0.181 | 28 | -20 to +70 | 60000/60°C (90000/40°C) |
| ▶▶ 109P0405M601 | | | 0.12 | 0.6 | 5000 | 0.136 4.8 | 26.5 0.106 | 24 | | |
| ▶▶ 109P0412F601 | 12 | 7 to 13.8 | 0.09 | 1.08 | 6500 | 0.183 6.5 | 45.1 0.181 | 28 | | |
| ▶▶ 109P0412M601 | | | 0.06 | 0.72 | 5000 | 0.136 4.8 | 26.5 0.106 | 24 | | |
| ▶▶ 109P0424F601 | 24 | 14 to 27.6 | 0.06 | 1.44 | 6500 | 0.183 6.5 | 45.1 0.181 | 28 | | |
| ▶▶ 109P0424B601 | | | 0.06 | 1.44 | 5200 | 0.14 4.9 | 28.3 0.114 | 25 | | |

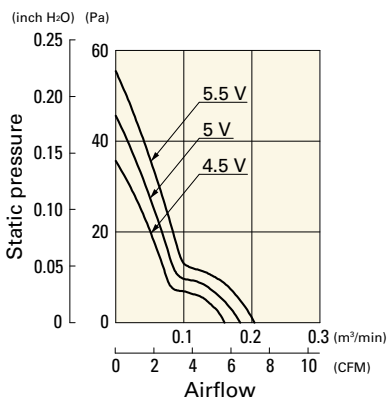
Note 1: Sensor and control options are available for selection. Refer to the table on p. 639.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

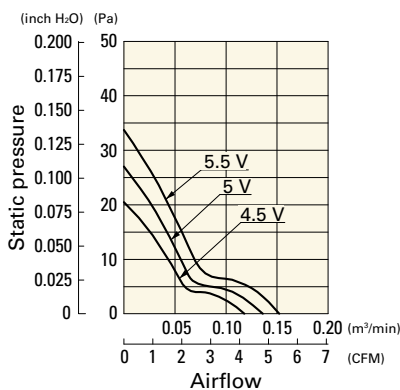
109P0405F601 With pulse sensor

Operating voltage range



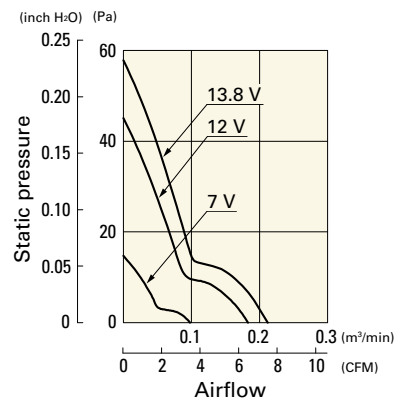
109P0405M601 With pulse sensor

Operating voltage range



109P0412F601 With pulse sensor

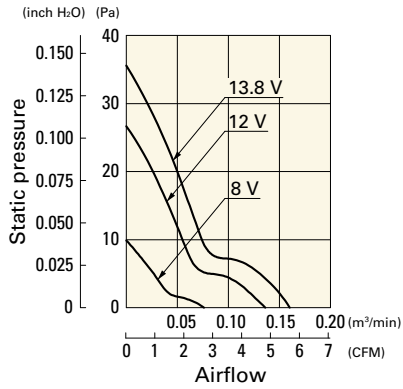
Operating voltage range



Airflow - Static Pressure Characteristics

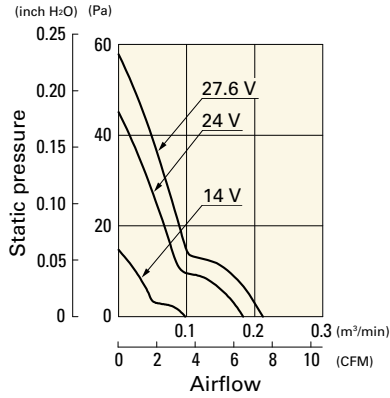
109P0412M601 With pulse sensor

Operating voltage range



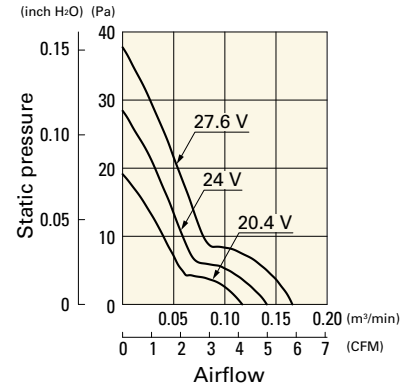
109P0424F601 With pulse sensor

Operating voltage range

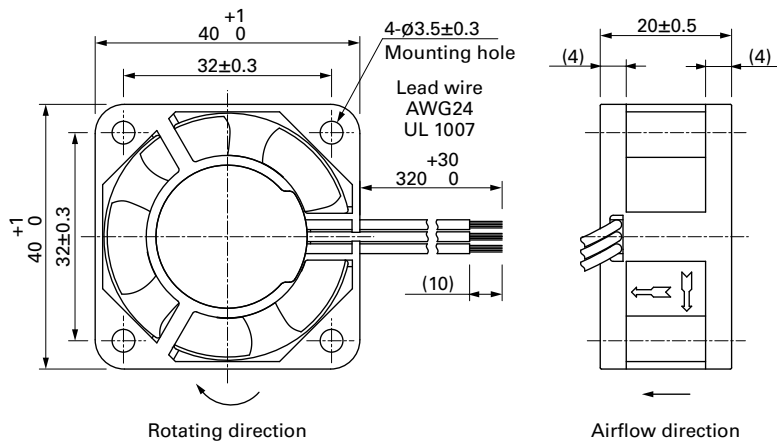


109P0424B601 With pulse sensor

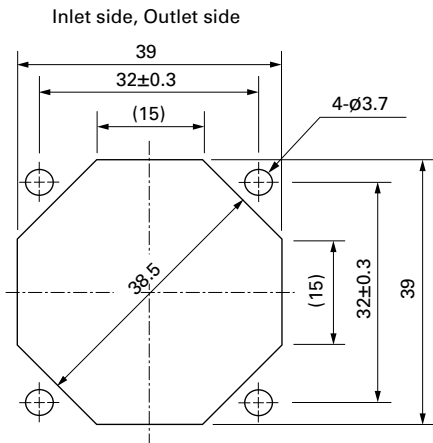
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x28 mm

San Ace 40 9HVA type US

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 57 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9HVA0412P3J001 | 12 | 10.2 to 13.8 | 100 | 2.6 | 31.2 | 38000 | 1.05 37.1 | 2300 9.24 | 71 | -20 to +70 | 30000/60°C (53000/40°C) |
| | | | 20 | 0.12 | 1.4 | 8000 | 0.22 7.8 | 101 0.41 | 34 | | |
| 9HVA0424P3G001 | 24 | 21.6 to 26.4 | 100 | 0.88 | 21.1 | 33000 | 0.92 32.5 | 1650 6.63 | 68 | | |
| | | | 20 | 0.05 | 1.2 | 6750 | 0.18 6.4 | 74 0.30 | 31 | | |

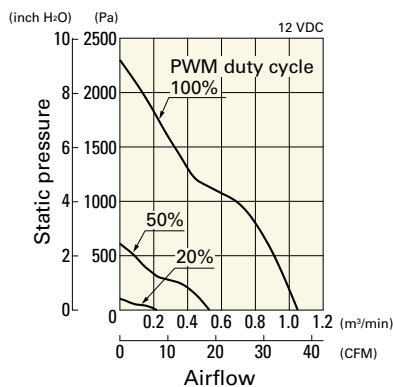
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

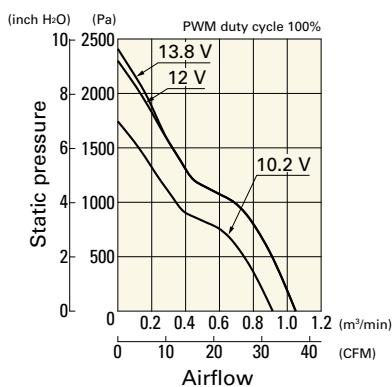
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HVA0412P3J001 With pulse sensor with PWM control

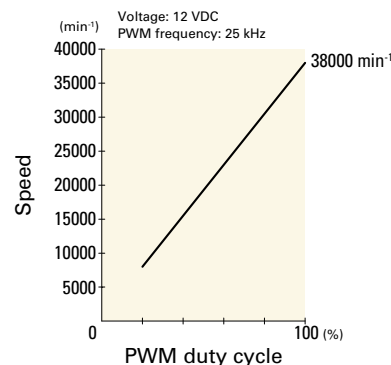
PWM duty cycle



Operating voltage range



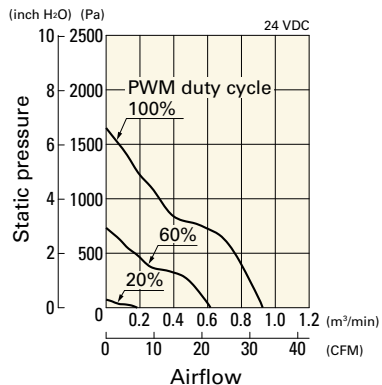
PWM duty - Speed characteristics example



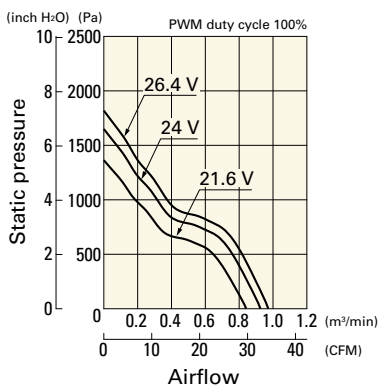
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HVA0424P3G001 With pulse sensor with PWM control

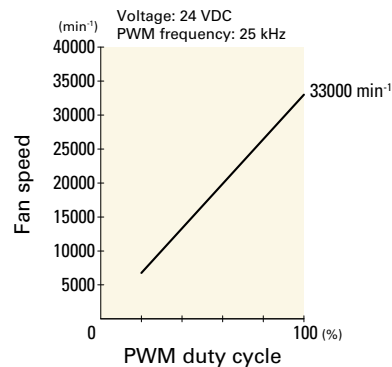
PWM duty cycle



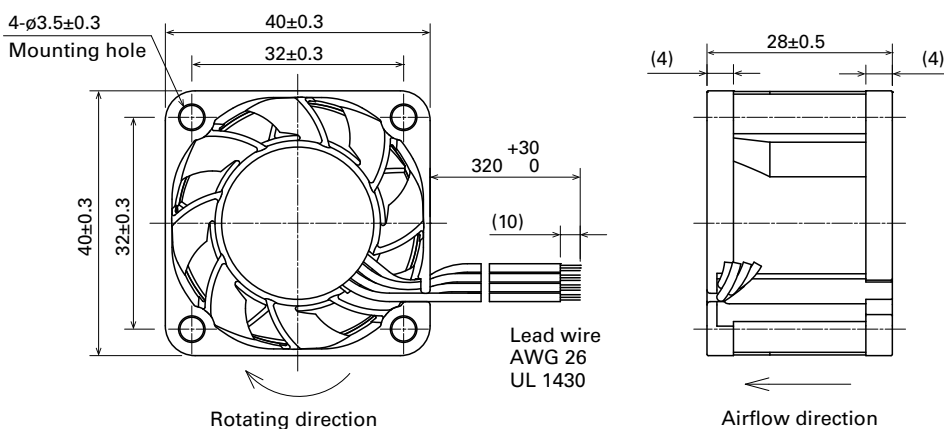
Operating voltage range



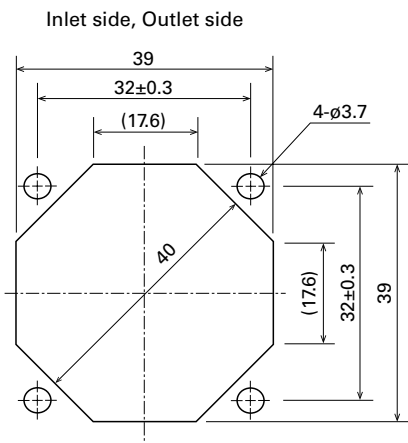
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H

40x40x28 mm



San Ace 40 9GAX type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 53 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GAX0412P3S001 | 12 | 10.8 to 12.6 | 100 | 1.3 | 15.6 | 25000 | 0.9 31.8 | 1000 4.02 | 64 | -20 to +60 | 30000/60°C (53000/40°C) |
| | | | 20 | 0.07 | 0.84 | 4400 | 0.155 5.5 | 32 0.125 | 21.5 | | |
| 9GAX0412P3S003 | | | 100 | 1.3 | 15.6 | 25000 | 0.9 31.8 | 1000 4.02 | 64 | | |
| 10.8 to 13.2 | | 0 | 0.11 | 1.32 | 7800 | 0.26 9.2 | 87 0.35 | 38 | | | |
| | | 9GAX0412P3K001 | 100 | 0.92 | 11.04 | 22000 | 0.81 28.6 | 800 3.21 | 61 | | |
| | | 20 | 0.07 | 0.84 | 4200 | 0.15 5.3 | 28 0.11 | 21 | | | |
| 9GAX0412P3K003 | 100 | 0.92 | 11.04 | 22000 | 0.81 28.6 | 800 3.21 | 61 | | | | |
| 0 | 0.1 | 1.2 | 6500 | 0.24 8.5 | 70 0.28 | 32 | | | | | |

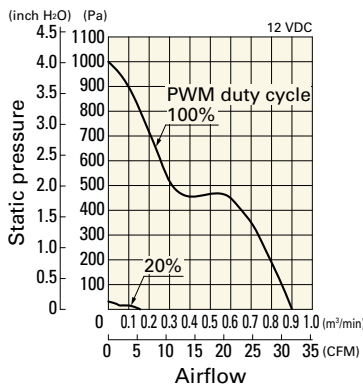
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

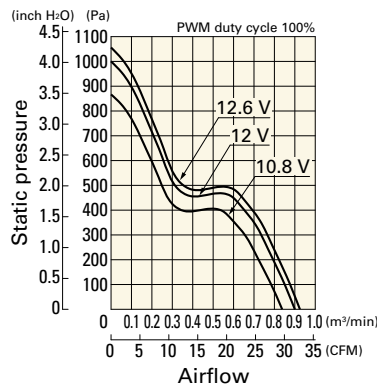
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GAX0412P3S001 With pulse sensor with PWM control

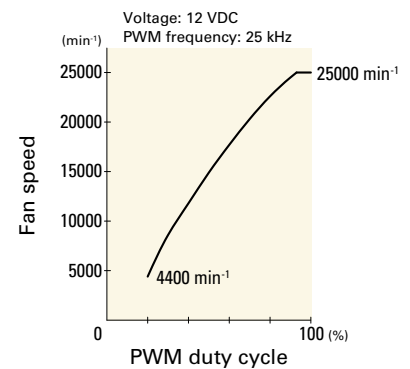
PWM duty cycle



Operating voltage range



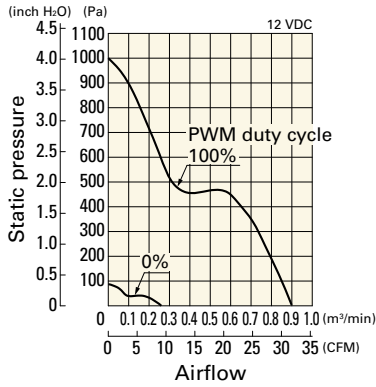
PWM duty - Speed characteristics example



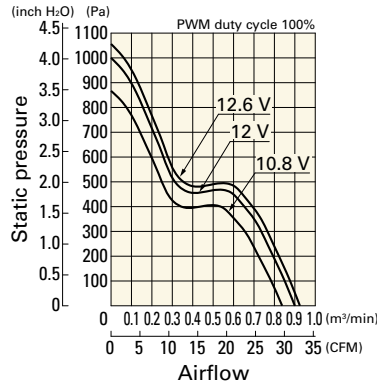
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GAX0412P3S003 With pulse sensor with PWM control

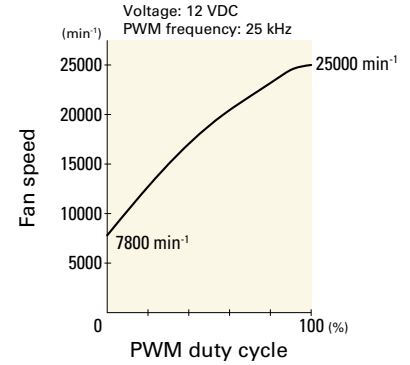
PWM duty cycle



Operating voltage range

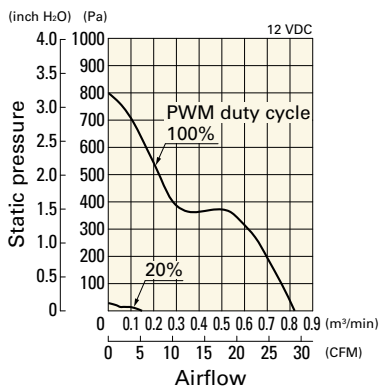


PWM duty - Speed characteristics example

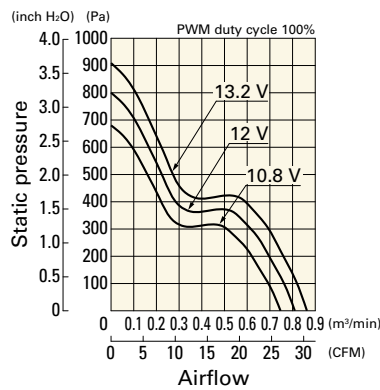


9GAX0412P3K001 With pulse sensor with PWM control

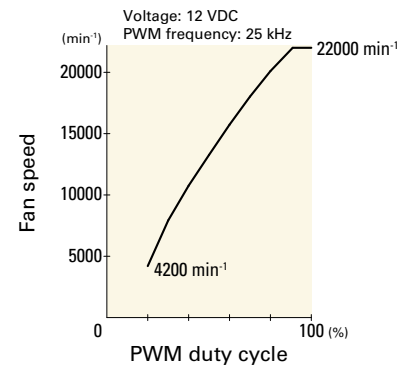
PWM duty cycle



Operating voltage range

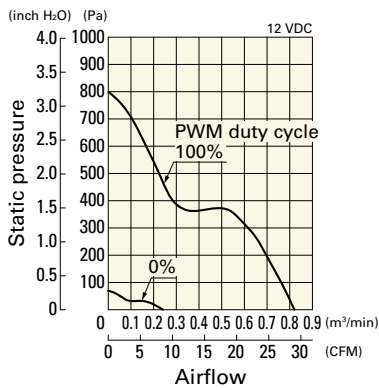


PWM duty - Speed characteristics example

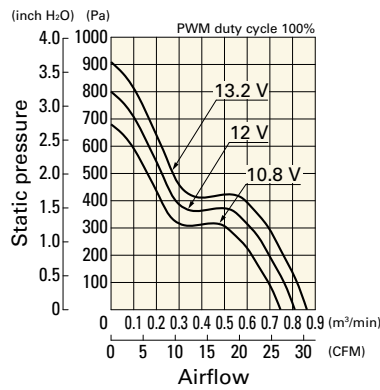


9GAX0412P3K003 With pulse sensor with PWM control

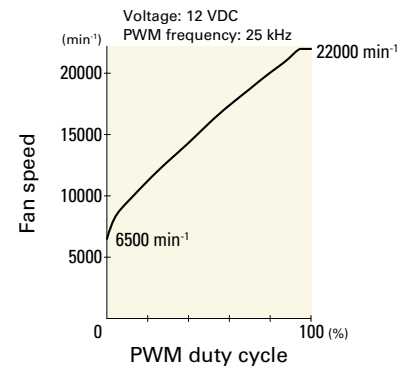
PWM duty cycle



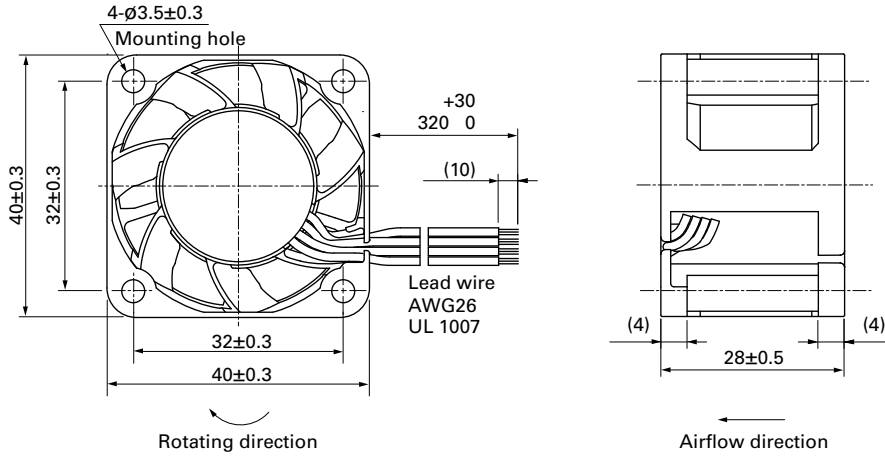
Operating voltage range



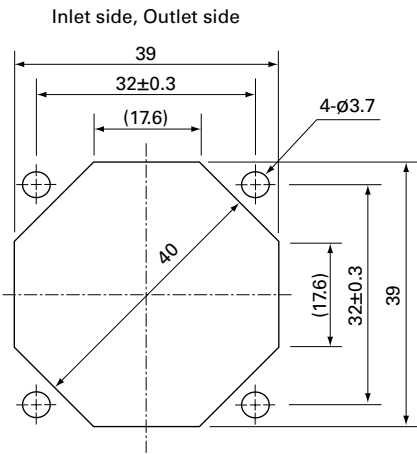
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x28 mm

San Ace 40 9HV type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 60 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9HV0412P3K001 | 12 | 10.8 to 12.6 | 100 | 1.52 | 18.3 | 25000 | 0.83 29.3 | 1100 4.42 | 65 | -20 to +60 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.2 | 2.4 | 7500 | 0.25 8.8 | 99 0.4 | 37 | | |

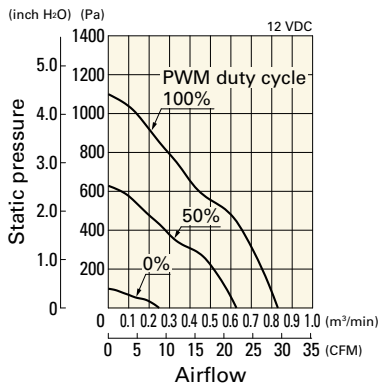
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

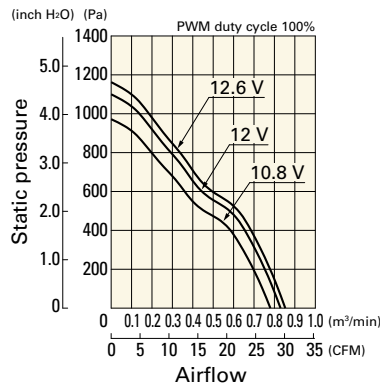
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV0412P3K001 With pulse sensor with PWM control

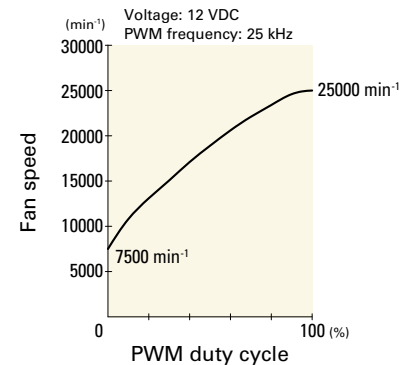
PWM duty cycle



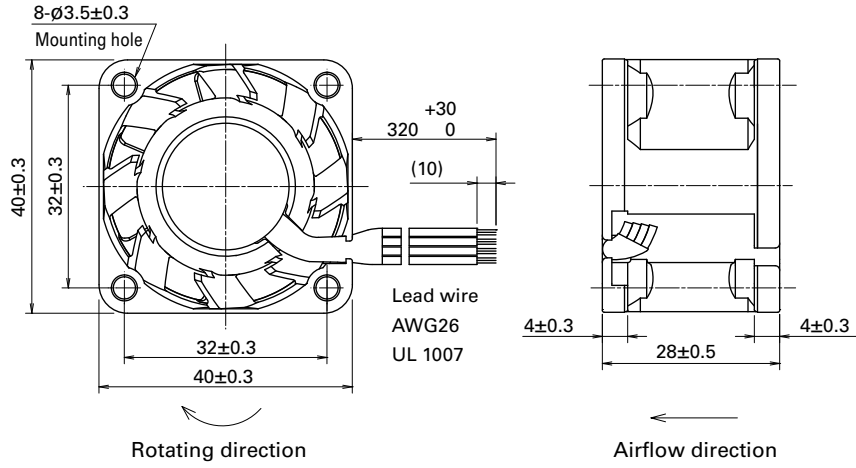
Operating voltage range



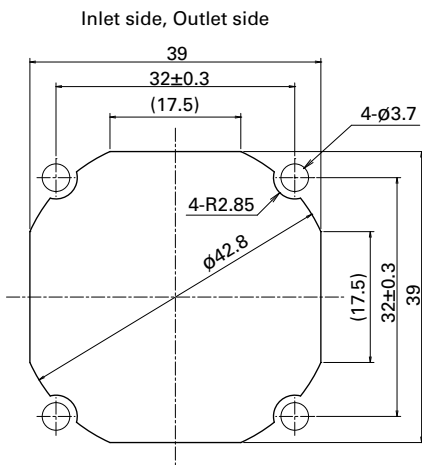
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H

DC Fan



40x40x28 mm

San Ace 40 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 53 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | | | | |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|----------|----|------------|----------------------------|
| 9GA0412P3J01 | 12 | 10.8 to 13.2 | 100 | 0.49 | 5.88 | 18000 | 0.67 23.7 | 535 2.15 | 54 | -20 to +70 | 40000/60°C (70000/40°C) | | | | |
| | | | 0 | 0.05 | 0.6 | 4500 | 0.16 5.7 | 33 0.13 | 22 | | | | | | |
| 9GA0412P3G01 | | | 100 | 0.39 | 4.68 | 16500 | 0.61 21.5 | 450 1.81 | 53 | | | | | | |
| | | | 0 | 0.05 | 0.6 | 4500 | 0.16 5.7 | 33 0.13 | 22 | | | | | | |
| 9GA0412P3H01 | | | 100 | 0.28 | 3.36 | 14500 | 0.54 19.1 | 347 1.39 | 50 | | | | | | |
| | | | 0 | 0.04 | 0.48 | 3500 | 0.13 4.6 | 20 0.08 | 17 | | | | | | |
| 9GA0412P3M01 | | | 100 | 0.21 | 2.52 | 12500 | 0.46 16.2 | 258 1.04 | 47 | | | | | | |
| | | | 0 | 0.04 | 0.48 | 3500 | 0.13 4.6 | 20 0.08 | 17 | | | | | | |
| 9GA0424P3J001 | | | 24 | 21.6 to 26.4 | 100 | 0.27 | 6.48 | 18000 | 0.67 23.7 | | | 535 2.15 | 54 | -20 to +70 | 40000/60°C (70000/40°C) |
| 0 | | | | | 0.04 | 0.48 | 3500 | 0.13 4.6 | 20 0.08 | | | 17 | | | |
| 9GA0424P3G001 | 100 | 0.22 | | | 5.28 | 16500 | 0.61 21.5 | 450 1.81 | 53 | | | | | | |
| 9GA0424P3H001 | 100 | 0.16 | | | 3.84 | 14500 | 0.54 19.1 | 347 1.39 | 50 | | | | | | |
| 9GA0424P3M001 | 100 | 0.11 | | | 2.64 | 12500 | 0.46 16.2 | 258 1.04 | 47 | | | | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0412A301 | 12 | 10.8 to 13.2 | 0.13 | 1.56 | 10500 | 0.38 13.4 | 182 0.73 | 43 | -10 to +70 | 40000/60°C (70000/40°C) |

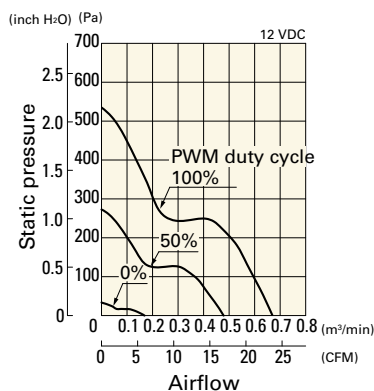
Note 1: Sensor and control options are available for selection. Refer to the table on p. 642.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

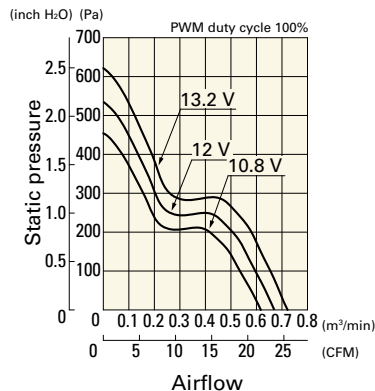
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0412P3J01 With pulse sensor with PWM control

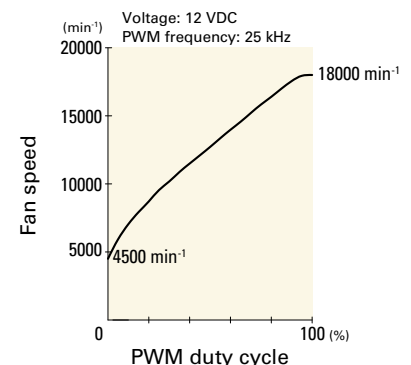
PWM duty cycle



Operating voltage range



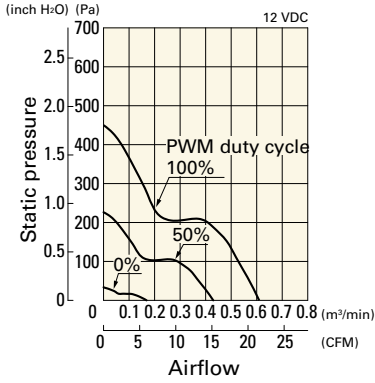
PWM duty - Speed characteristics example



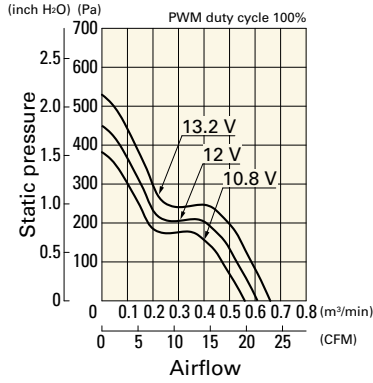
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0412P3G01 With pulse sensor with PWM control

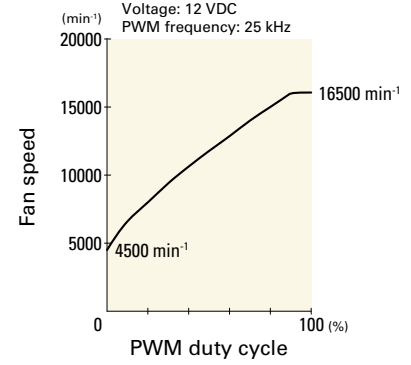
PWM duty cycle



Operating voltage range

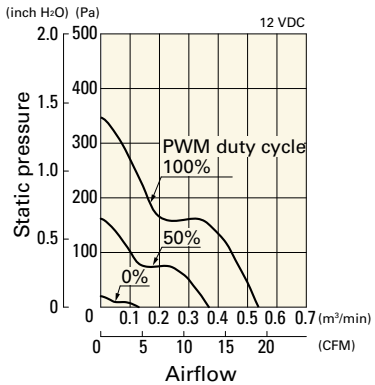


PWM duty - Speed characteristics example

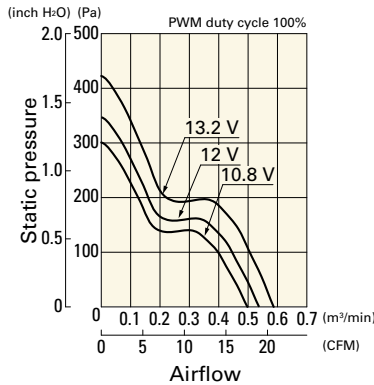


9GA0412P3H01 With pulse sensor with PWM control

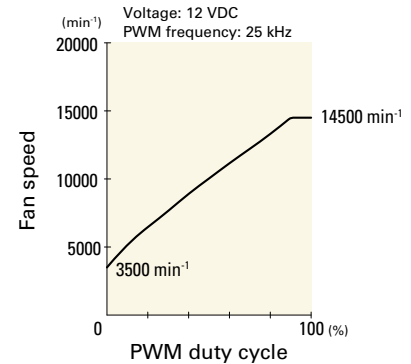
PWM duty cycle



Operating voltage range

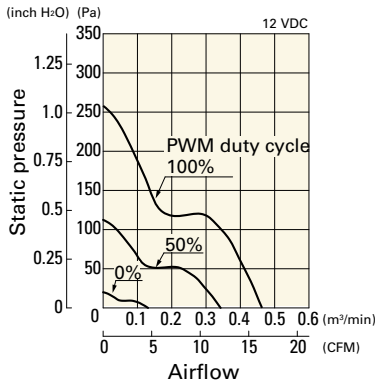


PWM duty - Speed characteristics example

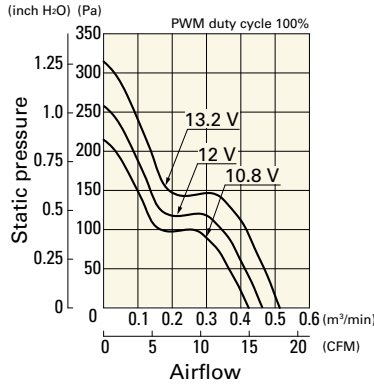


9GA0412P3M01 With pulse sensor with PWM control

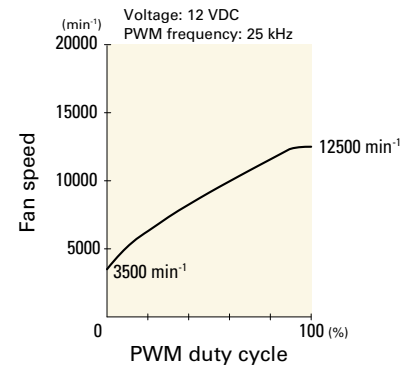
PWM duty cycle



Operating voltage range

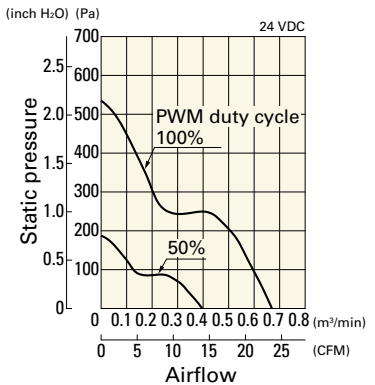


PWM duty - Speed characteristics example

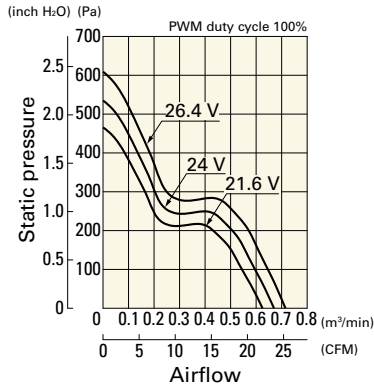


9GA0424P3J001 With pulse sensor with PWM control

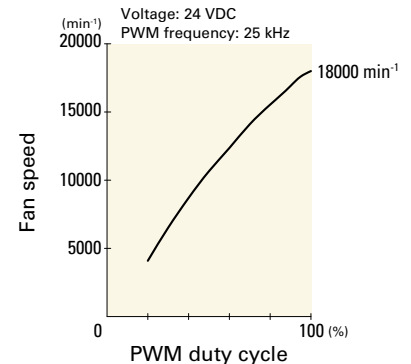
PWM duty cycle



Operating voltage range



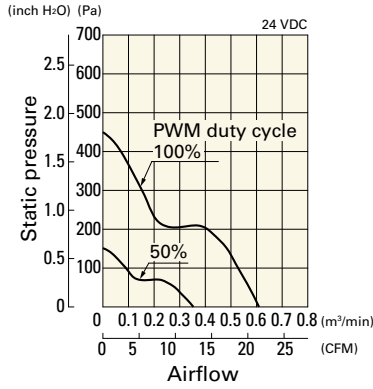
PWM duty - Speed characteristics example



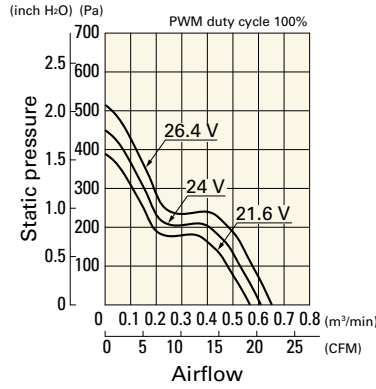
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0424P3G001 With pulse sensor with PWM control

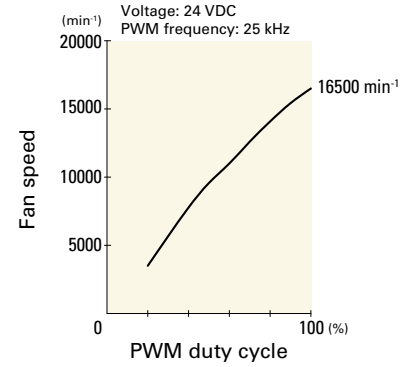
PWM duty cycle



Operating voltage range

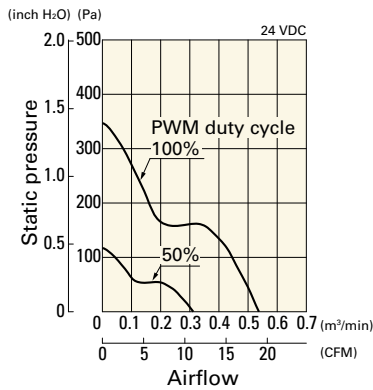


PWM duty - Speed characteristics example

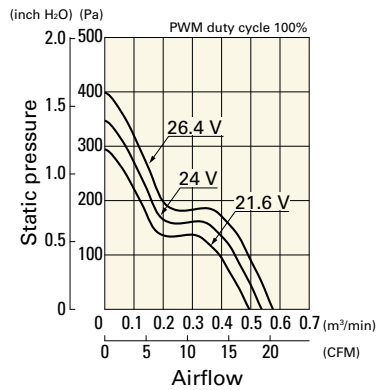


9GA0424P3H001 With pulse sensor with PWM control

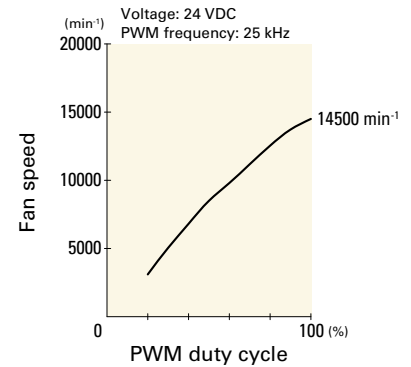
PWM duty cycle



Operating voltage range

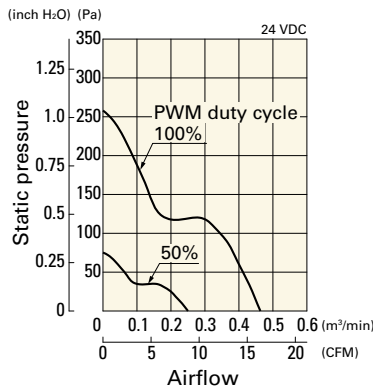


PWM duty - Speed characteristics example

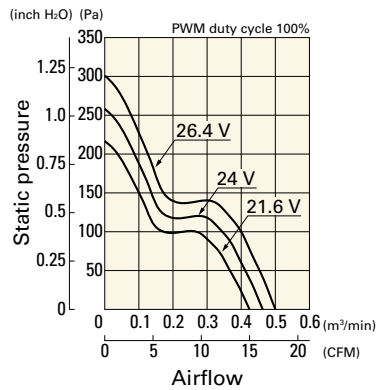


9GA0424P3M001 With pulse sensor with PWM control

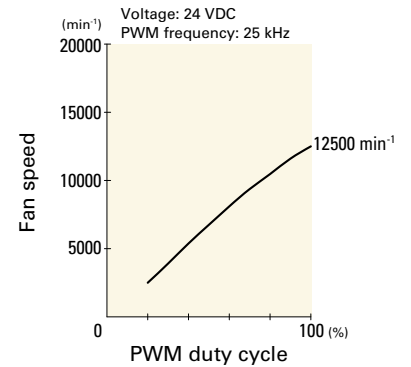
PWM duty cycle



Operating voltage range



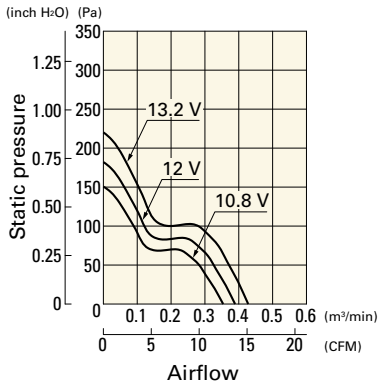
PWM duty - Speed characteristics example



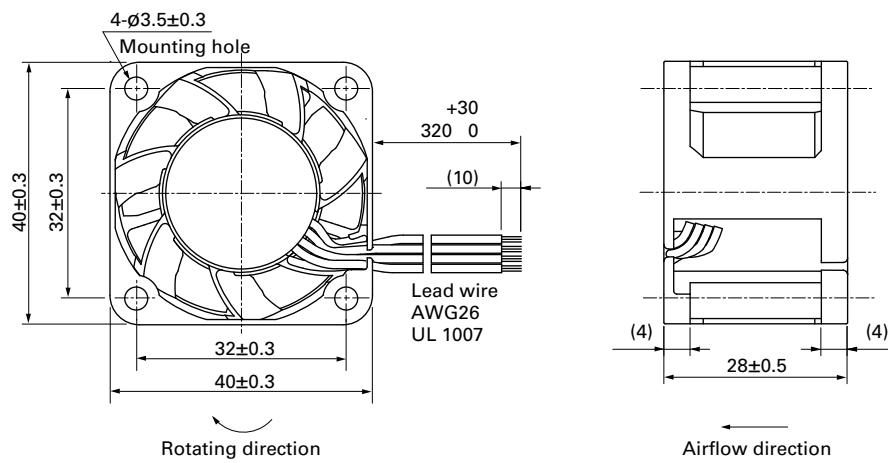
Airflow - Static Pressure Characteristics

9GA0412A301 With pulse sensor

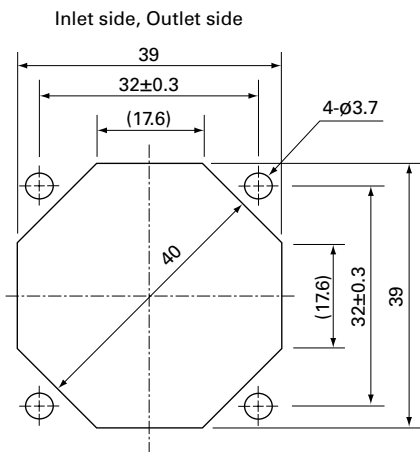
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H

40x40x28 mm



San Ace 40 9GE type Low Vibration Fan

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 55 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GE0412P3K03 | 12 | 10.8 to 13.2 | 100 | 0.84 | 10.08 | 16500 | 0.76 26.8 | 415 1.666 | 58 | -20 to +60 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.07 | 0.84 | 3000 | 0.13 4.6 | 13 0.052 | 17 | | |
| 9GE0412P3J03 | | | 100 | 0.65 | 7.8 | 15000 | 0.69 24.4 | 343.0 1.378 | 56 | | |
| | | | 0 | 0.05 | 0.6 | 2650 | 0.12 4.2 | 10.7 0.042 | 14 | | |
| 9GE0412P3G03 | | | 100 | 0.47 | 5.64 | 13000 | 0.6 21.2 | 260 1.044 | 52 | | |
| | | | 0 | 0.05 | 0.6 | 2400 | 0.11 3.9 | 8.2 0.033 | 13 | | |

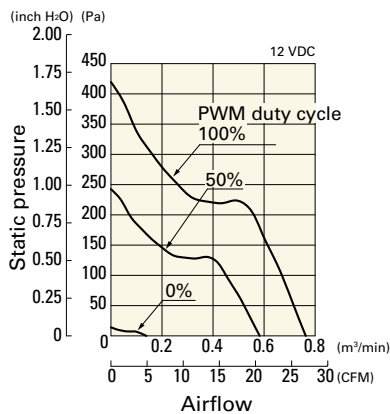
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 645.

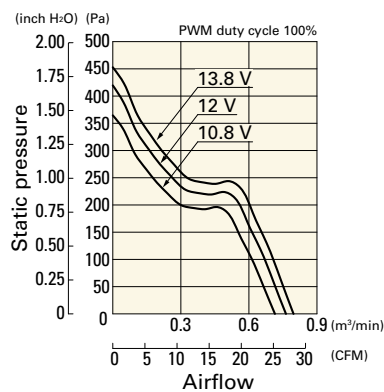
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GE0412P3K03 With pulse sensor with PWM control

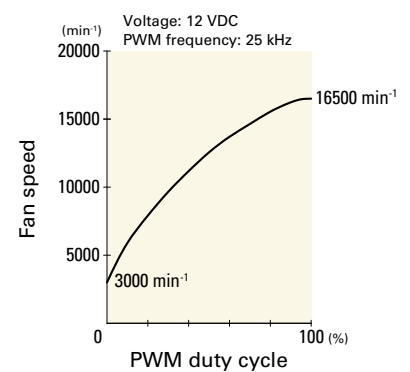
PWM duty cycle



Operating voltage range



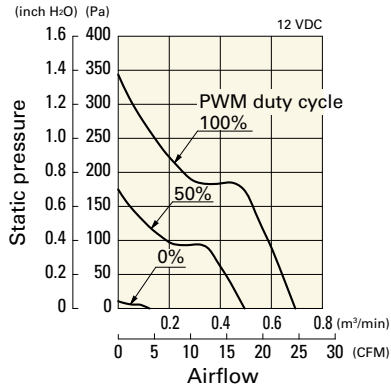
PWM duty - Speed characteristics example



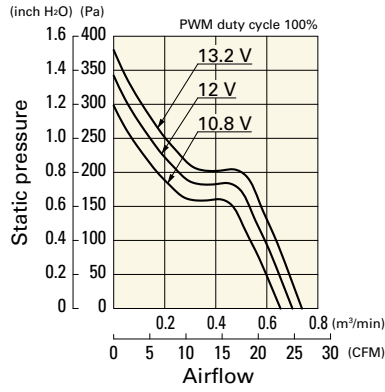
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GE0412P3J03 With pulse sensor with PWM control

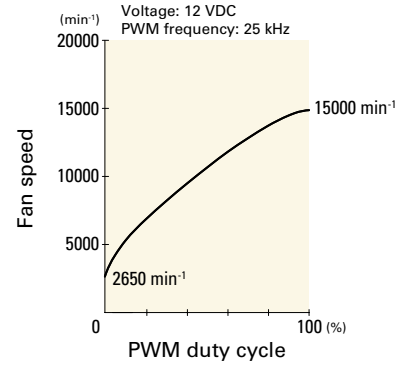
PWM duty cycle



Operating voltage range

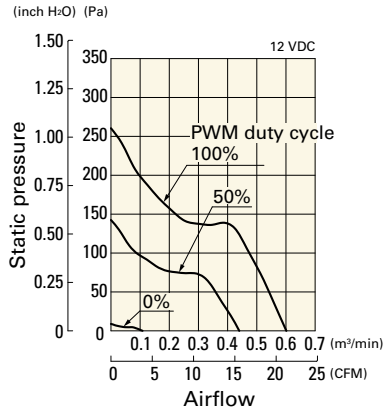


PWM duty - Speed characteristics example

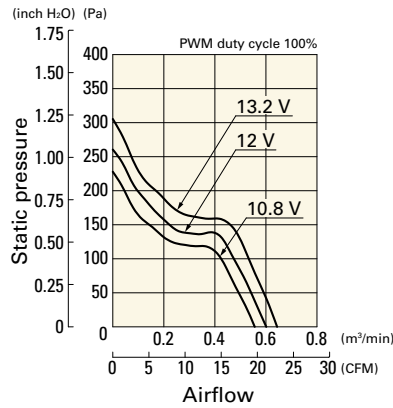


9GE0412P3G03 With pulse sensor with PWM control

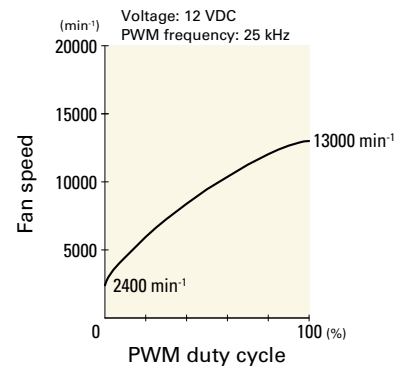
PWM duty cycle



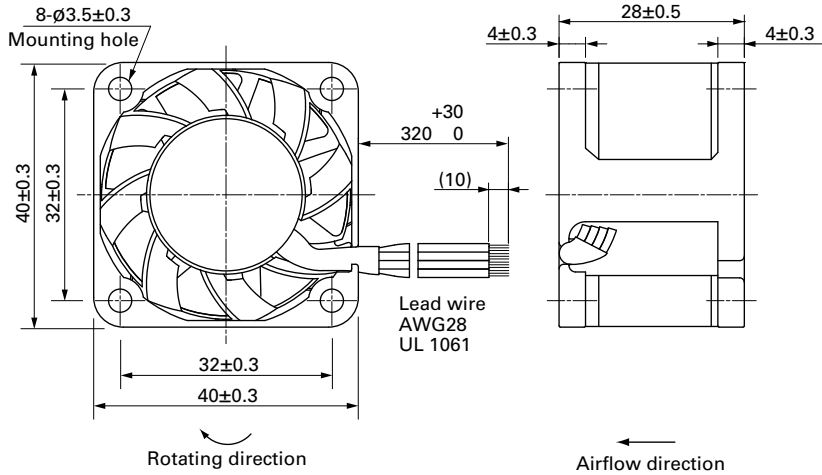
Operating voltage range

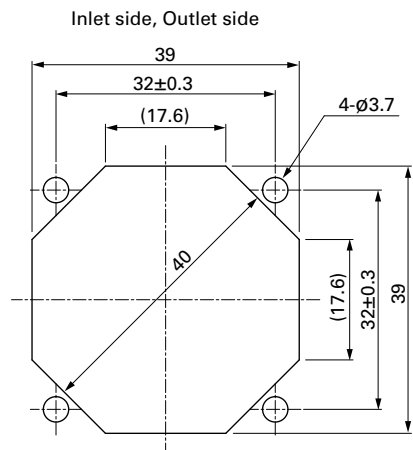


PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)**Options**

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x28 mm

San Ace 40 9P_{type}

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue (Sensor) Yellow
- Mass 52 g

Specifications

The models listed below **have ribs and a pulse sensor.**

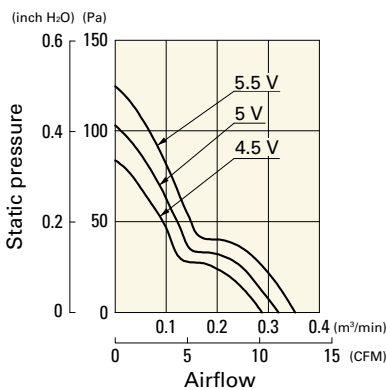
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | |
|------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|----------------------------|
| ▶▶ 109P0405H3013 | 5 | 4.5 to 5.5 | 0.68 | 3.4 | 8700 | 0.32 11.3 | 102.9 0.414 | 37 | -20 to +70 | 40000/60°C (70000/40°C) | |
| ▶▶ 109P0405F3013 | | | 0.28 | 1.4 | 6700 | 0.244 8.6 | 58.8 0.236 | 30 | | 60000/60°C (90000/40°C) | |
| ▶▶ 109P0412G3013 | 12 | 7 to 13.2 | 0.31 | 3.72 | 11500 | 0.42 14.8 | 179 0.719 | 42 | -20 to +60 | 40000/60°C (70000/40°C) | |
| ▶▶ 109P0412B3013 | | | 0.28 | 3.36 | 10300 | 0.38 13.4 | 143 0.574 | 40 | | -20 to +70 | 60000/60°C (90000/40°C) |
| ▶▶ 109P0412H3013 | | 7 to 13.8 | 0.195 | 2.34 | 8700 | 0.32 11.3 | 102.9 0.414 | 37 | -20 to +70 | | 60000/60°C (90000/40°C) |
| ▶▶ 109P0412F3013 | | | 0.105 | 1.26 | 6700 | 0.244 8.6 | 58.8 0.236 | 30 | | | |
| ▶▶ 109P0412M3013 | | 10.2 to 13.8 | 0.045 | 0.54 | 4100 | 0.15 5.3 | 21.6 0.087 | 20 | -20 to +60 | | 40000/60°C (70000/40°C) |
| ▶▶ 109P0424G3013 | | | 12 to 26.4 | 0.19 | 4.56 | 11500 | 0.42 14.8 | 179 0.719 | | 42 | |
| ▶▶ 109P0424B3013 | 0.13 | 3.12 | | 10300 | 0.38 13.4 | 143 0.574 | 40 | -20 to +70 | 60000/60°C (90000/40°C) | | |
| ▶▶ 109P0424H3013 | 12 to 27.6 | 0.095 | 2.28 | 8700 | 0.32 11.3 | 102.9 0.414 | 37 | | | | |
| ▶▶ 109P0424F3013 | | 14 to 27.6 | 0.055 | 1.32 | 6700 | 0.244 8.6 | 58.8 0.236 | 30 | | | |

Note 1: Sensor and control options are available for selection. Refer to the table on p. 639.
 Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

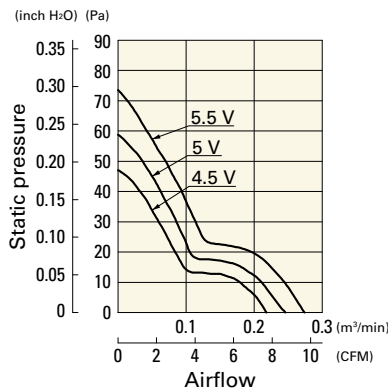
109P0405H3013 With pulse sensor

Operating voltage range



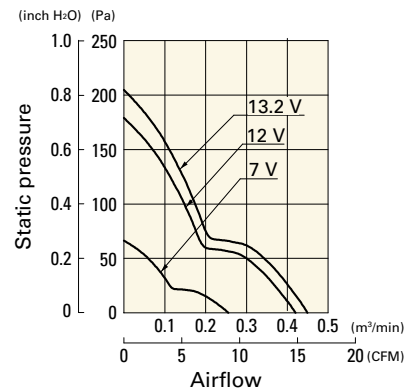
109P0405F3013 With pulse sensor

Operating voltage range



109P0412G3013 With pulse sensor

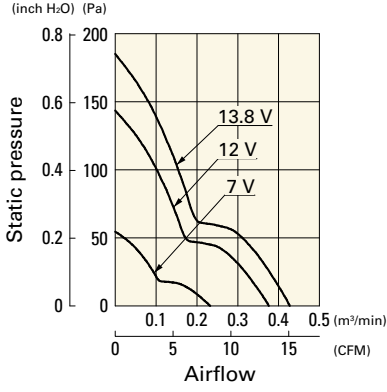
Operating voltage range



Airflow - Static Pressure Characteristics

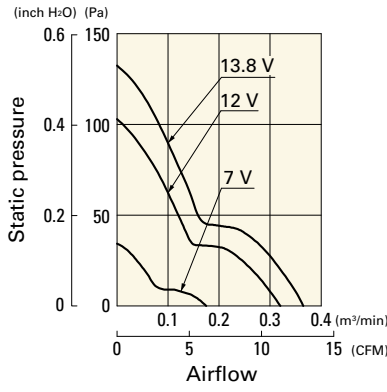
109P0412B3013 With pulse sensor

Operating voltage range



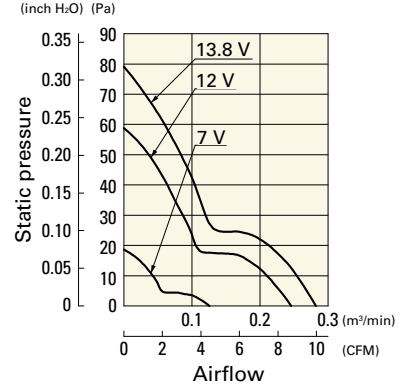
109P0412H3013 With pulse sensor

Operating voltage range



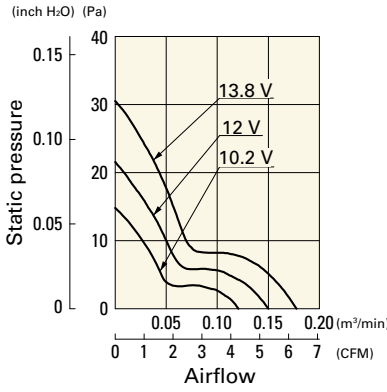
109P0412F3013 With pulse sensor

Operating voltage range



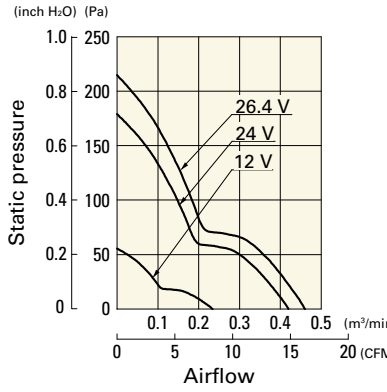
109P0412M3013 With pulse sensor

Operating voltage range



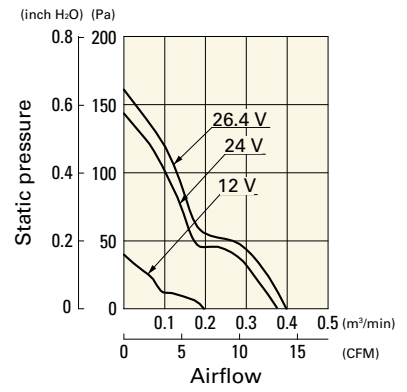
109P0424G3013 With pulse sensor

Operating voltage range



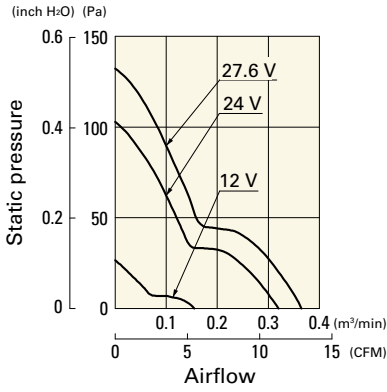
109P0424B3013 With pulse sensor

Operating voltage range



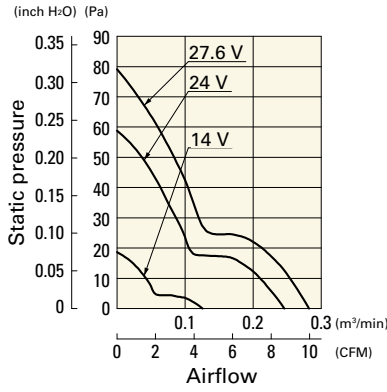
109P0424H3013 With pulse sensor

Operating voltage range

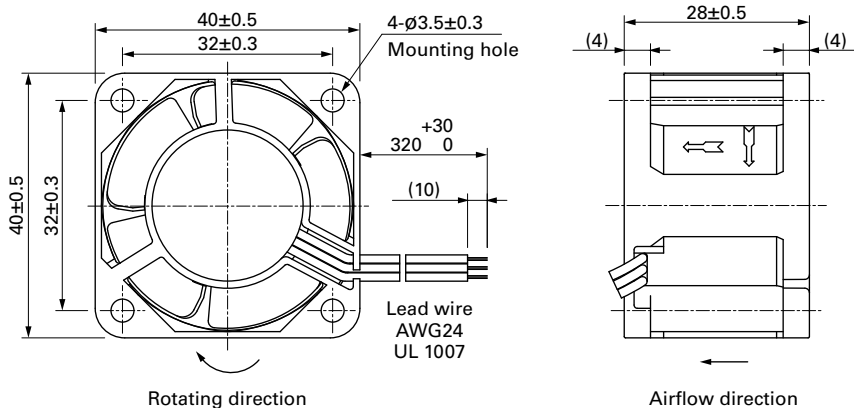


109P0424F3013 With pulse sensor

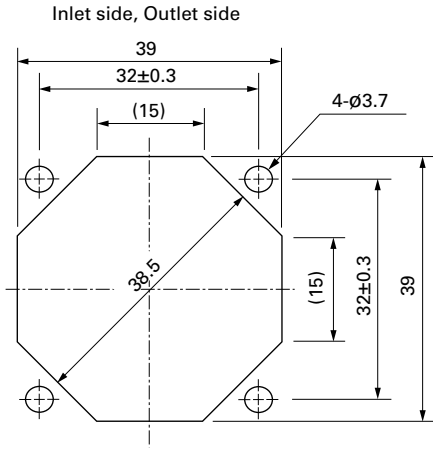
Operating voltage range



Dimensions (unit: mm)



■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



■ Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H

DC Fan



52x52x15 mm

San Ace 52 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 40 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9GA0512P7G001 | 12 | 10.2 to 13.8 | 100 | 0.13 | 1.56 | 7800 | 0.5 17.7 | 91.5 0.367 | 38 | -20 to +70 | 40000/60°C (70000/40°C) |
| ▶▶ 9GA0512P7A001 | | | 100 | 0.08 | 0.96 | 6300 | 0.4 14.1 | 59 0.237 | 32 | | |
| ▶▶ 9GA0512P7H001 | | | 100 | 0.05 | 0.6 | 4300 | 0.275 9.7 | 27.5 0.11 | 22 | | |
| ▶▶ 9GA0512P7M001 | | | 100 | 0.04 | 0.48 | 3400 | 0.215 7.6 | 17 0.068 | 16 | | |
| ▶▶ 9GA0524P7G001 | 24 | 20.4 to 27.6 | 100 | 0.07 | 1.68 | 7800 | 0.5 17.7 | 91.5 0.367 | 38 | | |
| ▶▶ 9GA0524P7A001 | | | 100 | 0.05 | 1.2 | 6300 | 0.4 14.1 | 59.0 0.237 | 32 | | |
| ▶▶ 9GA0524P7H001 | | | 100 | 0.03 | 0.72 | 4300 | 0.275 9.7 | 27.5 0.11 | 22 | | |
| ▶▶ 9GA0524P7M001 | | | 100 | 0.02 | 0.48 | 3400 | 0.215 7.6 | 17.0 0.068 | 16 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

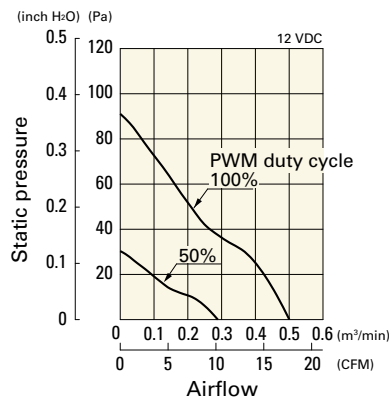
Note 1: Sensor and control options are available for selection. Refer to the table on p. 642.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

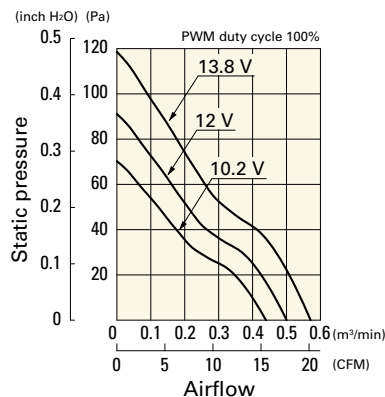
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0512P7G001 With pulse sensor with PWM control

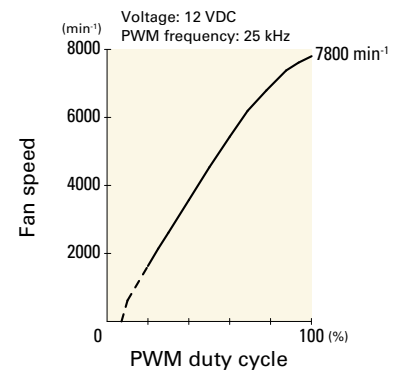
PWM duty cycle



Operating voltage range



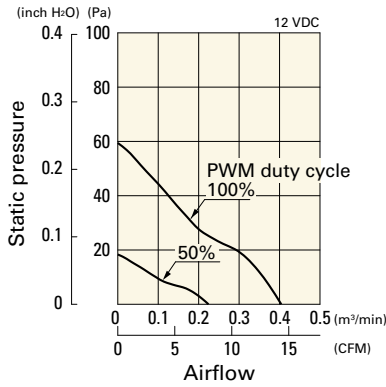
PWM duty - Speed characteristics example



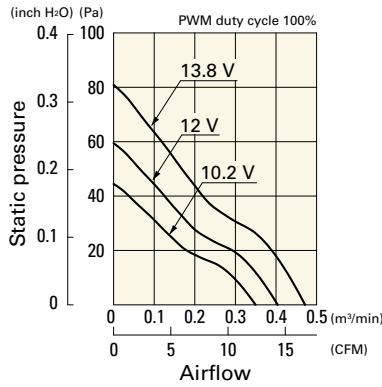
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0512P7A001 With pulse sensor with PWM control

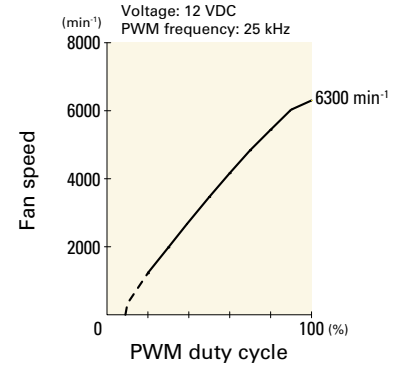
PWM duty cycle



Operating voltage range

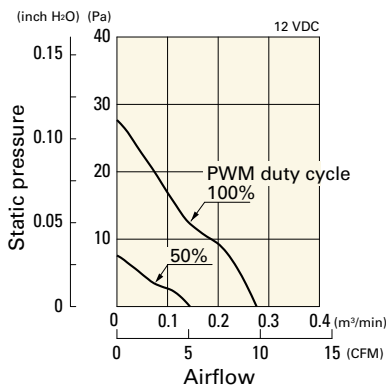


PWM duty - Speed characteristics example

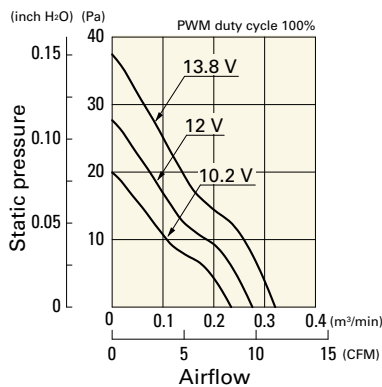


9GA0512P7H001 With pulse sensor with PWM control

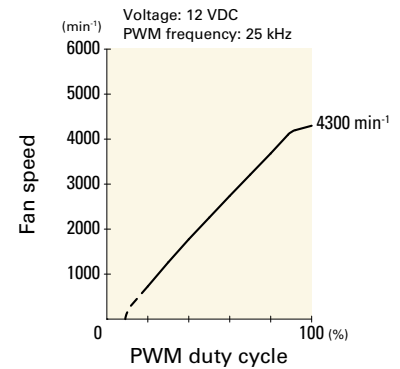
PWM duty cycle



Operating voltage range

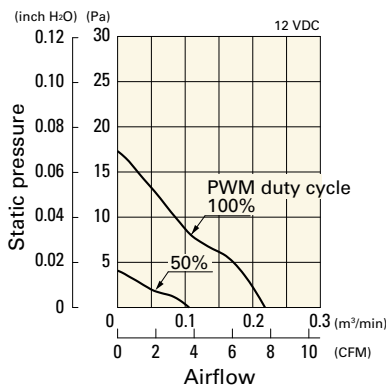


PWM duty - Speed characteristics example

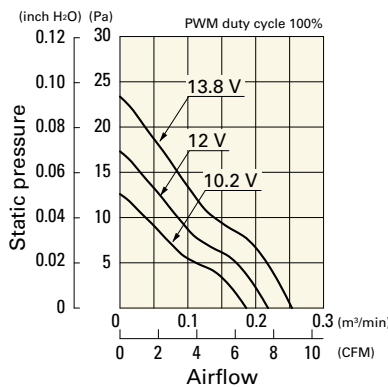


9GA0512P7M001 With pulse sensor with PWM control

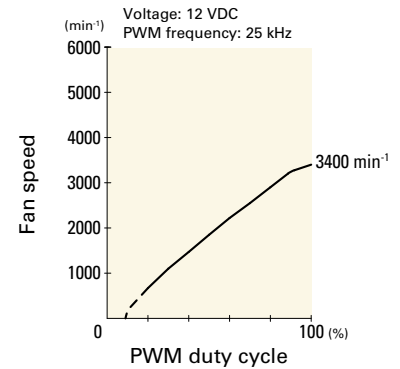
PWM duty cycle



Operating voltage range

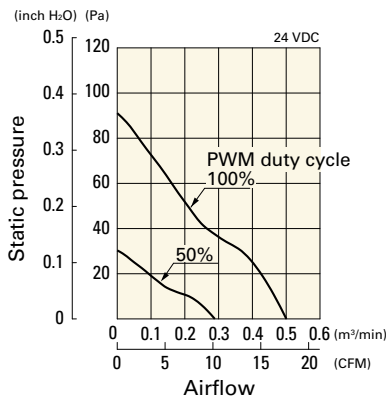


PWM duty - Speed characteristics example

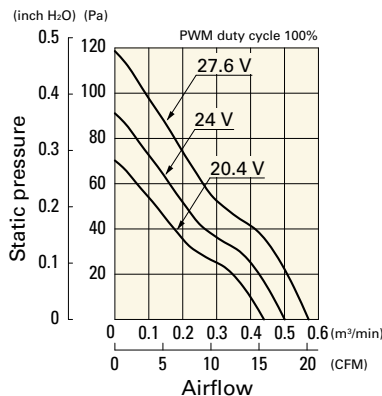


9GA0524P7G001 With pulse sensor with PWM control

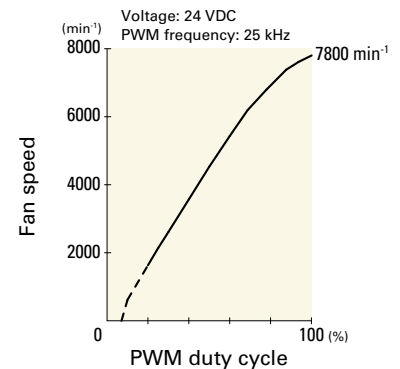
PWM duty cycle



Operating voltage range



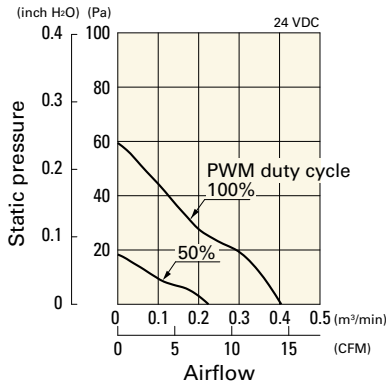
PWM duty - Speed characteristics example



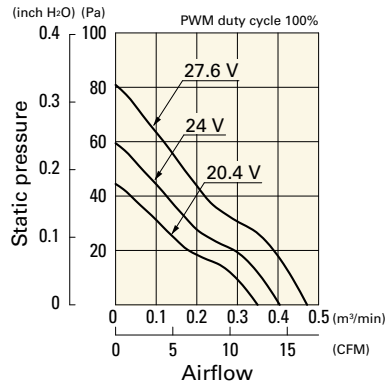
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0524P7A001 With pulse sensor with PWM control

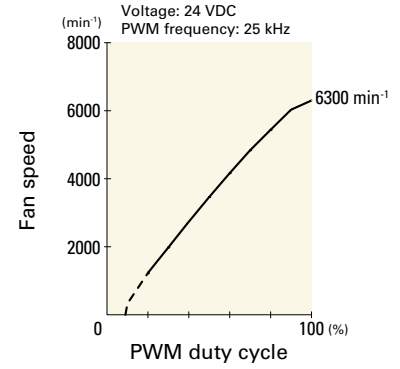
PWM duty cycle



Operating voltage range

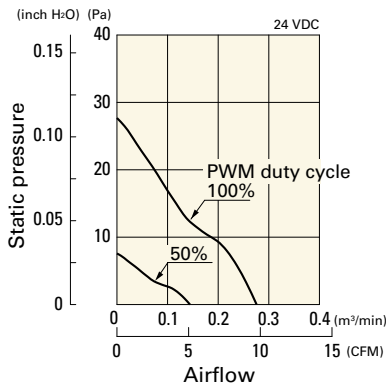


PWM duty - Speed characteristics example

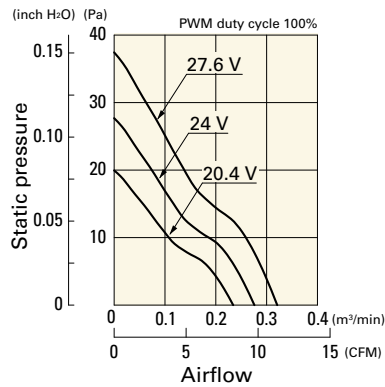


9GA0524P7H001 With pulse sensor with PWM control

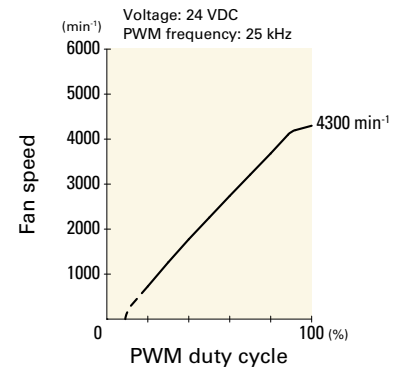
PWM duty cycle



Operating voltage range

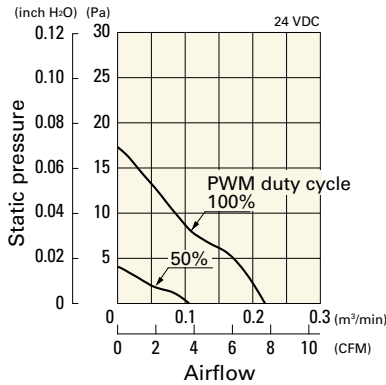


PWM duty - Speed characteristics example

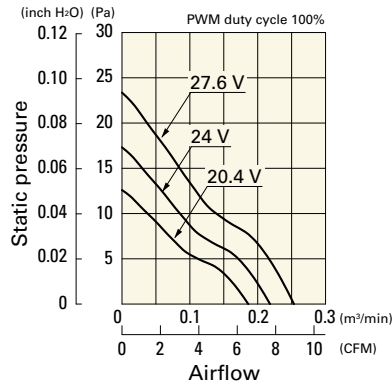


9GA0524P7M001 With pulse sensor with PWM control

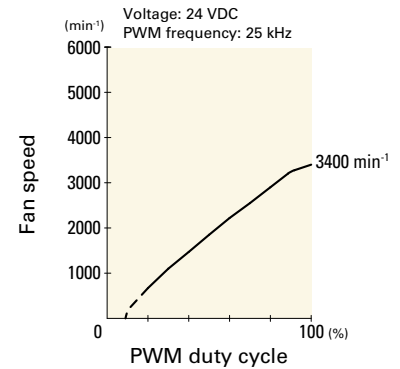
PWM duty cycle



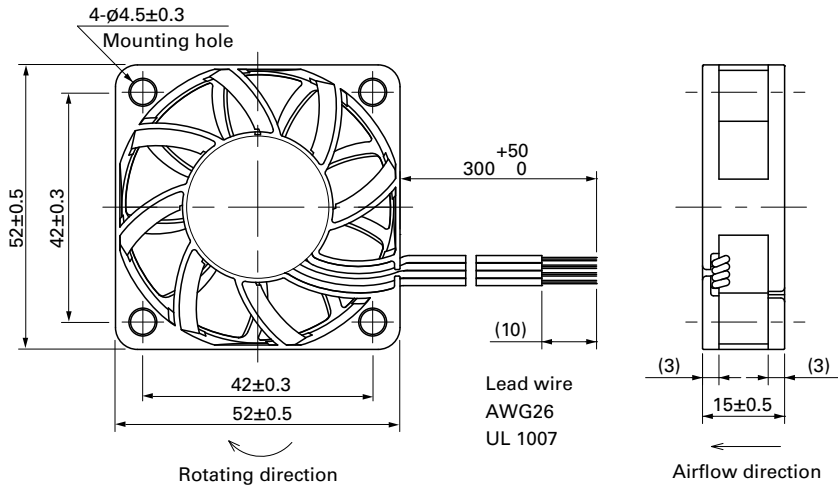
Operating voltage range



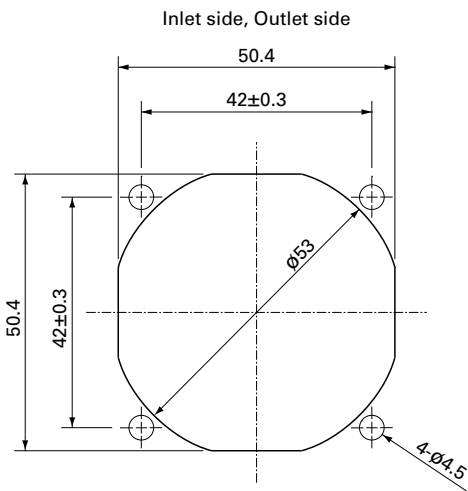
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-149E

DC Fan

52x52x15 mm

San Ace 52 9P type   



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 55 g

Specifications

The models listed below **have ribs and a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ☞ 109P0505M701 | 5 | 4.5 to 5.5 | 0.15 | 0.75 | 3700 | 0.205 7.24 | 21.4 0.086 | 22 | -20 to +70 | 60000/60°C (90000/40°C) |

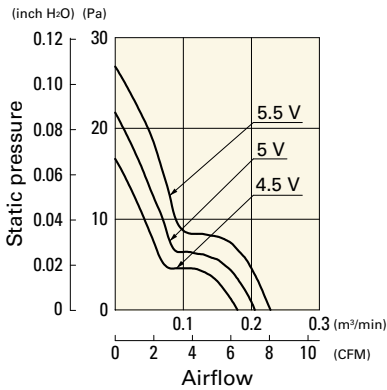
Note 1: Sensor and control options are available for selection. Refer to the table on p. 640.

Note 2: The ☞ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

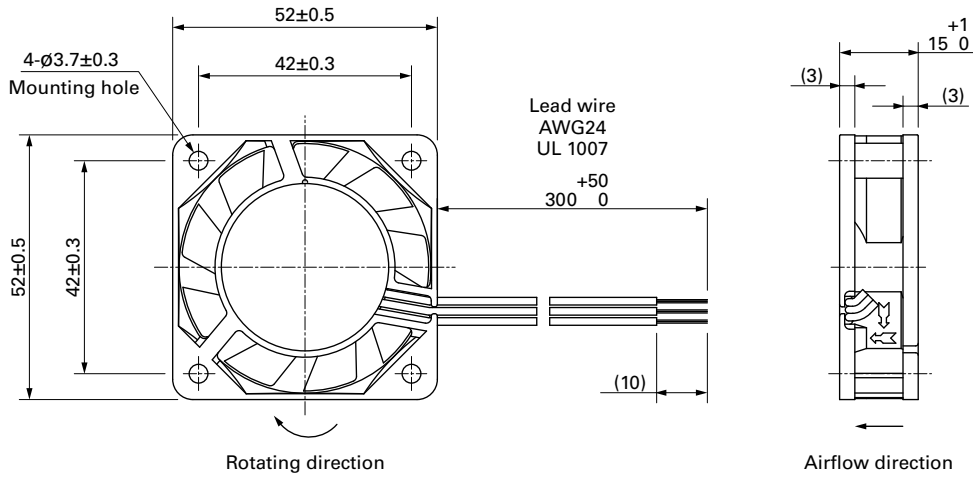
Airflow - Static Pressure Characteristics

109P0505M701 With pulse sensor

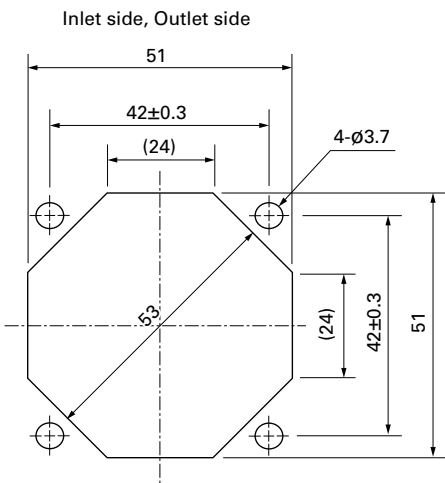
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-149E



60×60×10 mm

San Ace 60 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 35 g

Specifications

The models listed below **have ribs and a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| » 9GA0612G9001 | 12 | 7.0 to 13.2 | 0.27 | 3.24 | 6200 | 0.62 21.9 | 66 0.26 | 43 | -20 to +60 | 40000/60°C (70000/40°C) |
| » 9GA0612H9001 | | | 0.14 | 1.68 | 5000 | 0.5 17.6 | 42.9 0.17 | 37 | -20 to +70 | |
| » 9GA0612L9001 | | 7.0 to 13.8 | 0.03 | 0.36 | 2300 | 0.23 8.1 | 9.1 0.037 | 17 | -10 to +70 | |

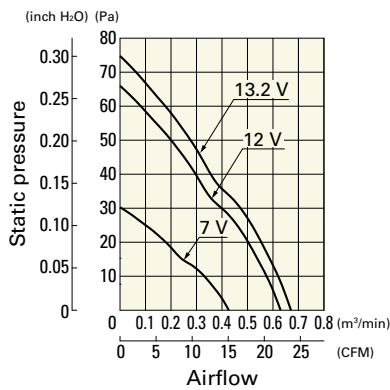
Note 1: Sensor and control options are available for selection. Refer to the table on p. 643.

Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

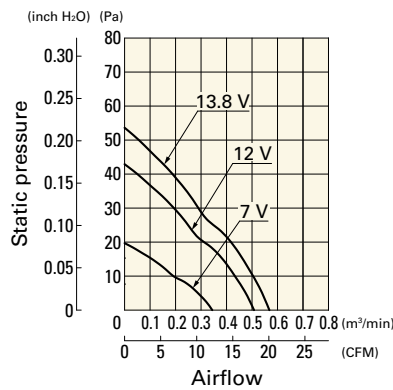
9GA0612G9001 With pulse sensor

Operating voltage range



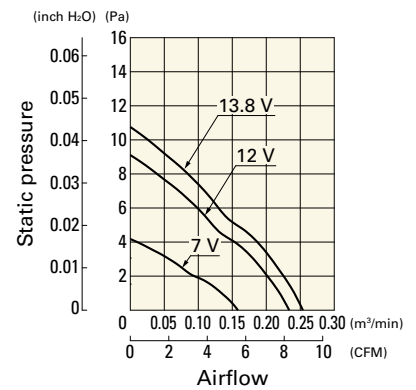
9GA0612H9001 With pulse sensor

Operating voltage range

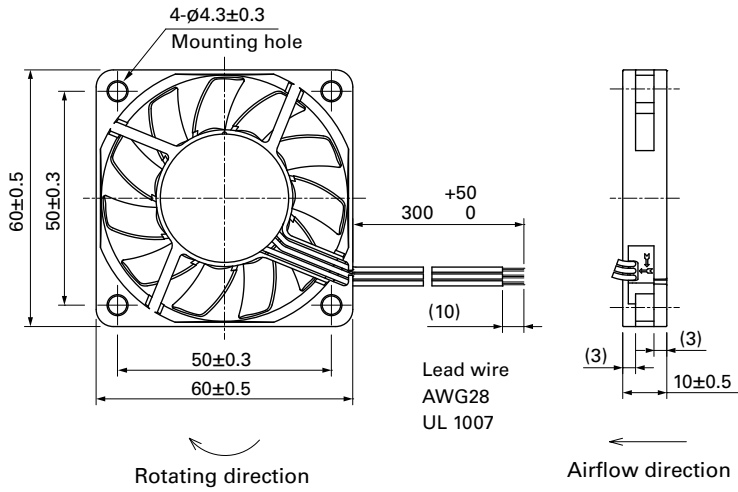


9GA0612L9001 With pulse sensor

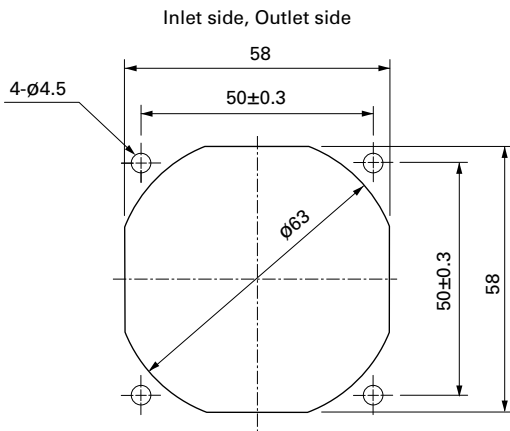
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)

DC Fan



60x60x15 mm

San Ace 60 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 50 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ² /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0612P7G01 | 12 | 10.2 to 13.8 | 100 | 0.16 | 1.92 | 5900 | 0.68 24 | 80 0.32 | 38 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.05 | 0.6 | 1500 | 0.17 6.0 | 5.2 0.02 | 10 | | |
| 9GA0612P7H01 | | | 100 | 0.1 | 1.2 | 4900 | 0.56 19.7 | 55.6 0.223 | 34 | | |
| | | | 0 | 0.03 | 0.36 | 1300 | 0.15 5.3 | 3.9 0.015 | 8 | | |
| 9GA0624P7G01 | 24 | 20.4 to 27.6 | 100 | 0.08 | 1.92 | 5900 | 0.68 24.0 | 80 0.32 | 38 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ² /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0612G701 | 12 | 6 to 13.8 | 0.16 | 1.92 | 5900 | 0.68 24 | 80 0.32 | 38 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9GA0612H701 | | | 0.1 | 1.2 | 4900 | 0.56 19.7 | 55.6 0.223 | 34 | | |
| 9GA0612M701 | | | 0.08 | 0.96 | 3900 | 0.45 15.9 | 35.3 0.142 | 28 | | |
| 9GA0612L701 | | | 0.03 | 0.36 | 2800 | 0.31 10.9 | 18 0.072 | 17 | | |
| 9GA0612B701 | | 10.2 to 13.8 | 0.025 | 0.3 | 2000 | 0.22 7.8 | 9.8 0.039 | 10 | | 40000/60°C (70000/40°C) |
| 9GA0624M701 | 24 | 12 to 27.6 | 0.05 | 1.2 | 3900 | 0.45 15.9 | 35.3 0.142 | 28 | | |
| 9GA0624L701 | | | 20.4 to 27.6 | 0.02 | 0.48 | 2800 | 0.31 10.9 | 18 0.072 | 17 | |

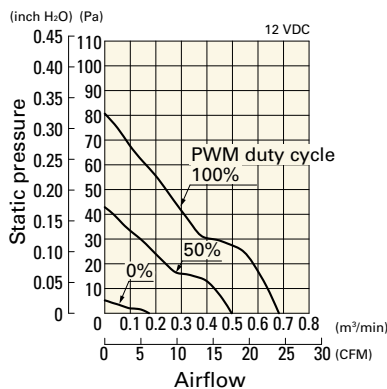
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 642 to 643.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

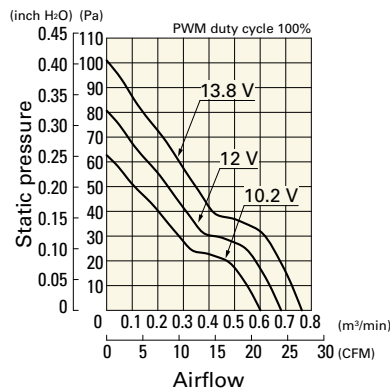
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0612P7G01 With pulse sensor with PWM control

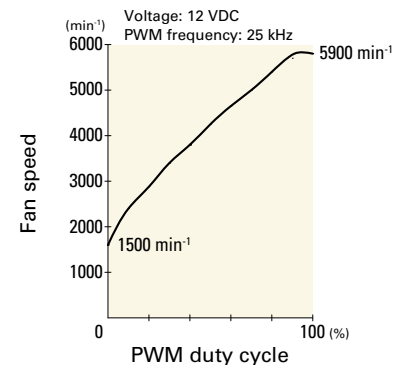
PWM duty cycle



Operating voltage range



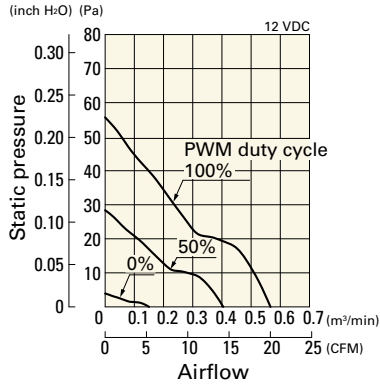
PWM duty - Speed characteristics example



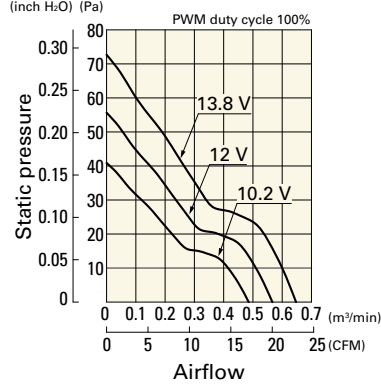
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0612P7H01 With pulse sensor with PWM control

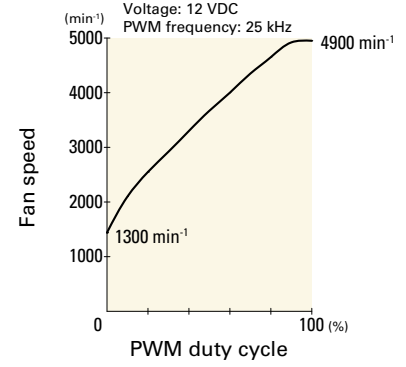
PWM duty cycle



Operating voltage range

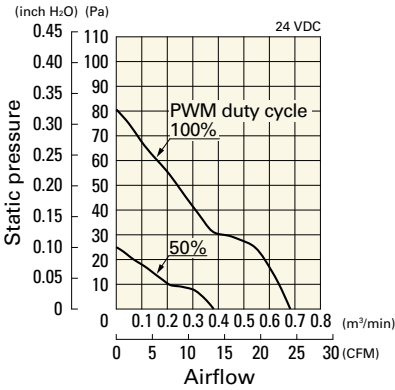


PWM duty - Speed characteristics example

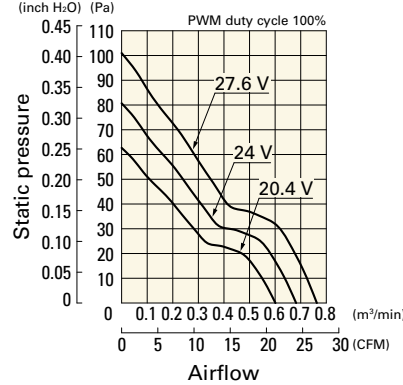


9GA0624P7G01 With pulse sensor with PWM control

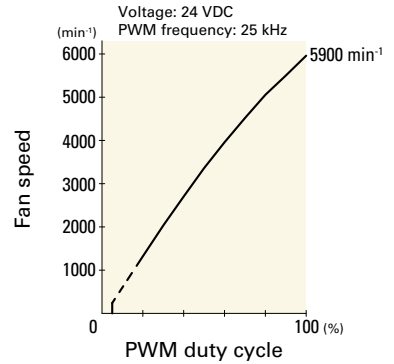
PWM duty cycle



Operating voltage range



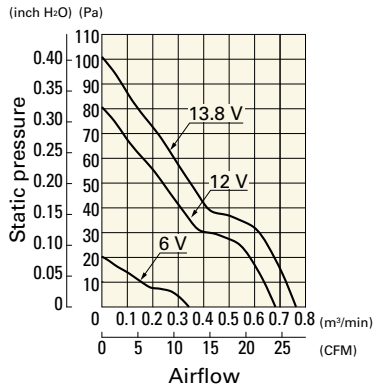
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

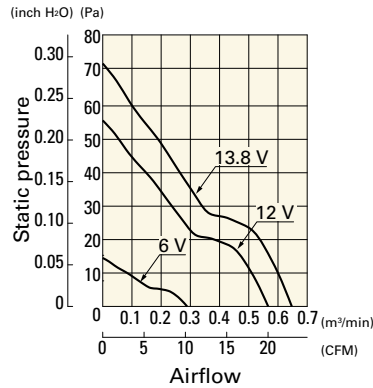
9GA0612G701 With pulse sensor

Operating voltage range



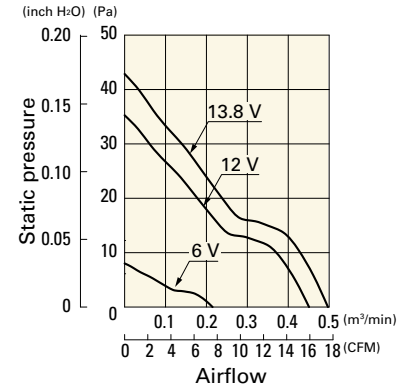
9GA0612H701 With pulse sensor

Operating voltage range



9GA0612M701 With pulse sensor

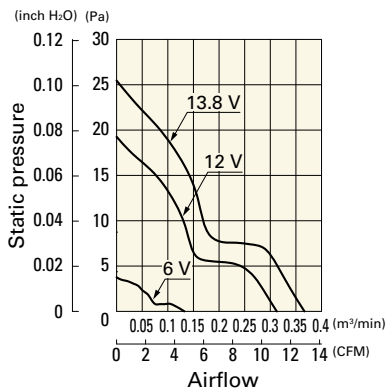
Operating voltage range



Airflow - Static Pressure Characteristics

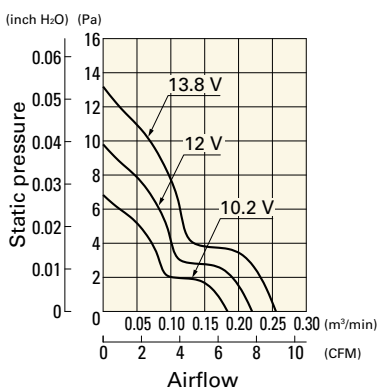
9GA0612L701 With pulse sensor

Operating voltage range



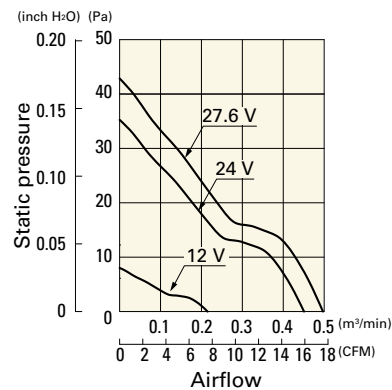
9GA0612B701 With pulse sensor

Operating voltage range



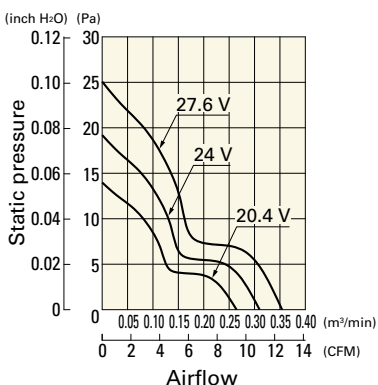
9GA0624M701 With pulse sensor

Operating voltage range

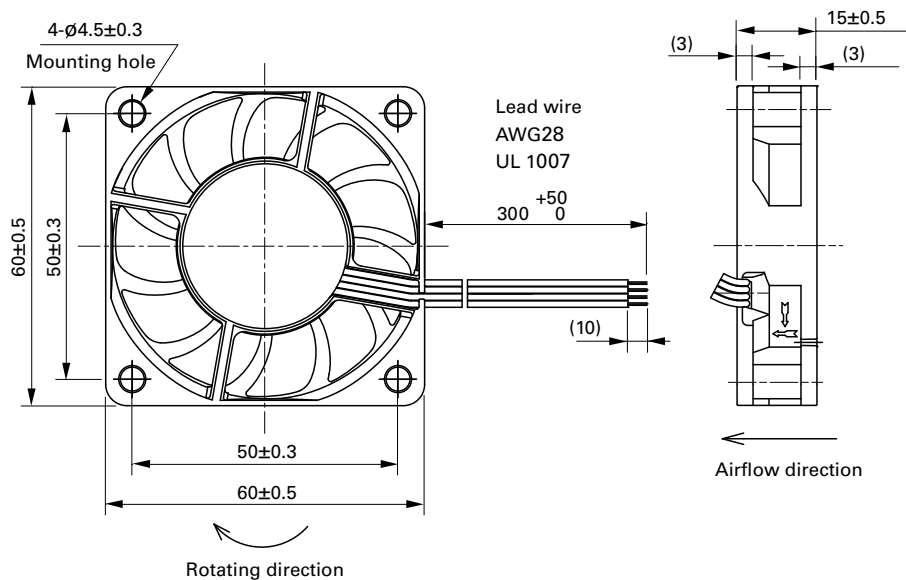


9GA0624L701 With pulse sensor

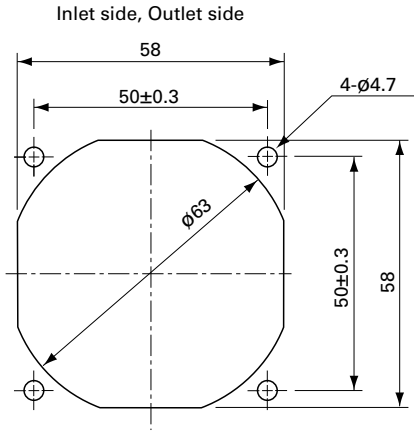
Operating voltage range



Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards page: p. 605

Model no.: 109-1003G

Resin filter kits page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



60×60×20 mm

San Ace 60 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 70 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0612P6G001 | 12 | 10.8 to 13.2 | 100 | 0.26 | 3.12 | 6850 | 0.88 31.1 | 125 0.5 | 43 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9GA0612P6S001 | | | 100 | 0.15 | 1.8 | 5500 | 0.7 24.7 | 81 0.33 | 36 | | |
| 9GA0624P6G001 | 24 | 21.6 to 26.4 | 100 | 0.12 | 2.88 | 6850 | 0.88 31.1 | 125 0.5 | 43 | | |
| 9GA0624P6S001 | | | 100 | 0.07 | 1.68 | 5500 | 0.7 24.7 | 81 0.33 | 36 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0612H6001 | 12 | 10.8 to 13.2 | 0.09 | 1.08 | 4100 | 0.52 18.4 | 45 0.18 | 29 | -20 to +70 | 60000/60°C (90000/40°C) |
| 9GA0612M6001 | | | 0.05 | 0.6 | 2700 | 0.34 12.0 | 20 0.08 | 18 | | |
| 9GA0624H6001 | 24 | 21.6 to 26.4 | 0.04 | 0.96 | 4100 | 0.52 18.4 | 45 0.18 | 29 | | |
| 9GA0624M6001 | | | 0.03 | 0.72 | 2700 | 0.34 12.0 | 20 0.08 | 18 | | |

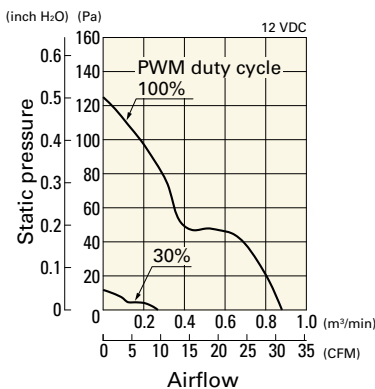
Note 1: Sensor and control options are available for selection. Refer to the table on p. 643.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

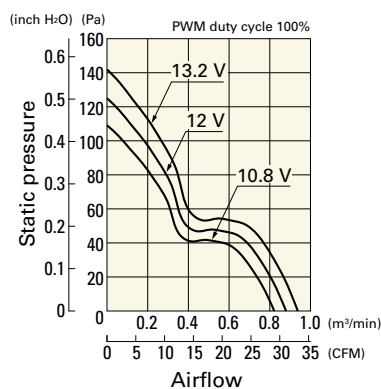
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0612P6G001 With pulse sensor with PWM control

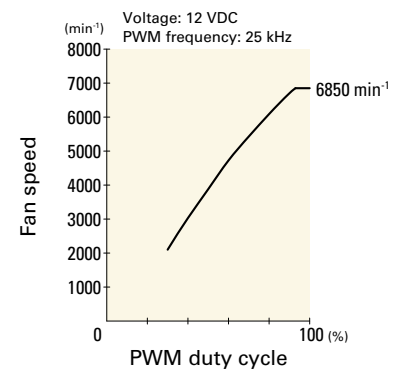
PWM duty cycle



Operating voltage range



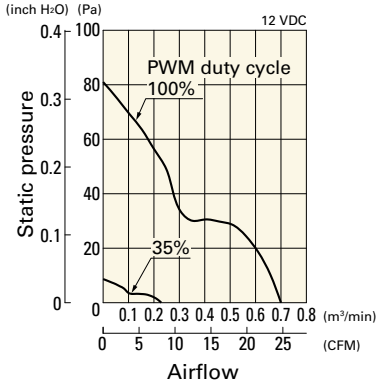
PWM duty - Speed characteristics example



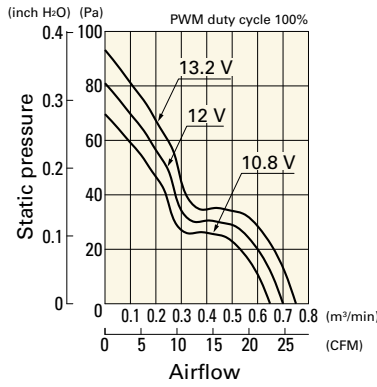
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0612P6S001 With pulse sensor with PWM control

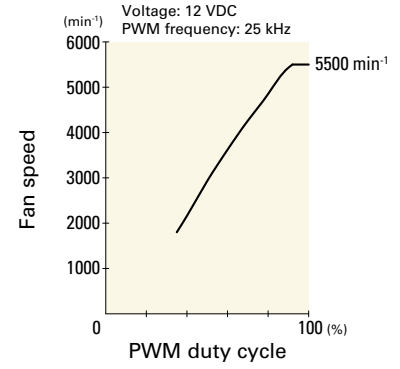
PWM duty cycle



Operating voltage range

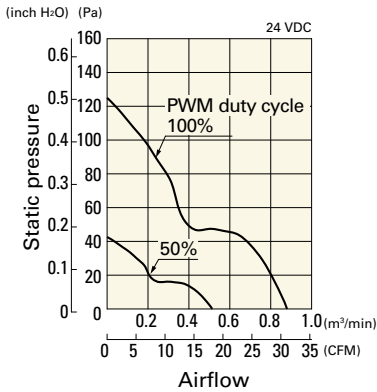


PWM duty - Speed characteristics example

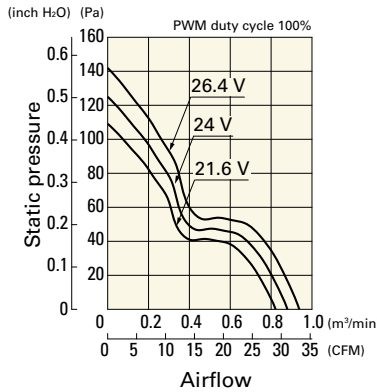


9GA0624P6G001 With pulse sensor with PWM control

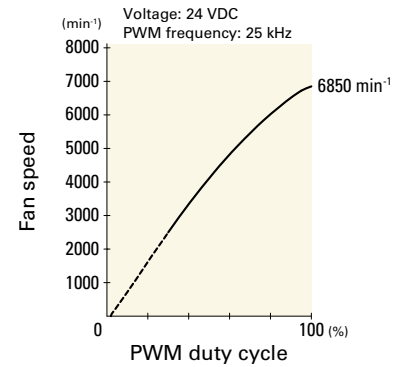
PWM duty cycle



Operating voltage range

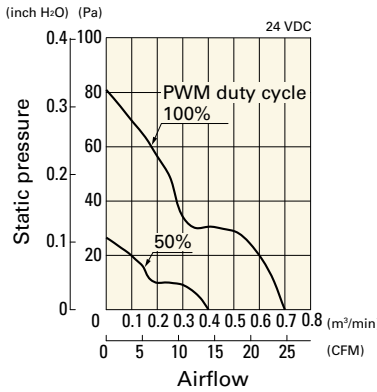


PWM duty - Speed characteristics example

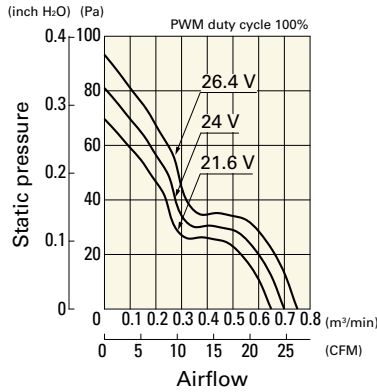


9GA0624P6S001 With pulse sensor with PWM control

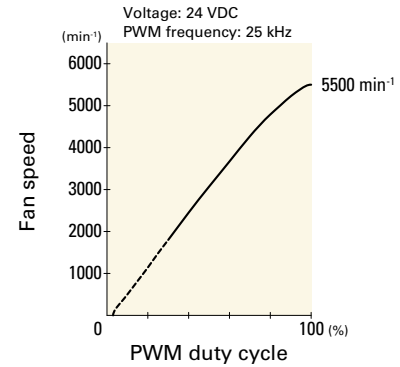
PWM duty cycle



Operating voltage range



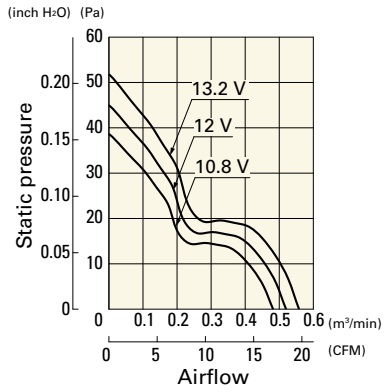
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

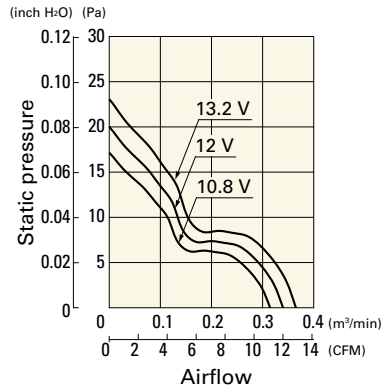
9GA0612H6001 With pulse sensor

Operating voltage range



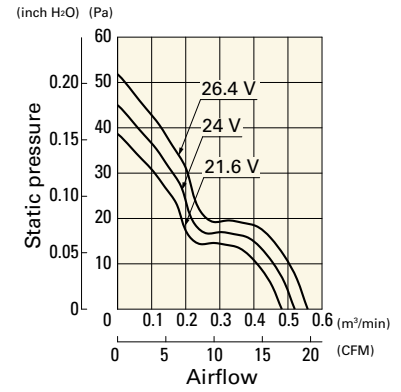
9GA0612M6001 With pulse sensor

Operating voltage range



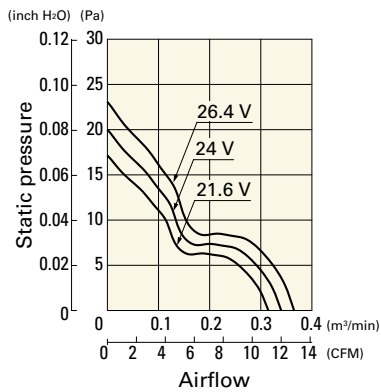
9GA0624H6001 With pulse sensor

Operating voltage range

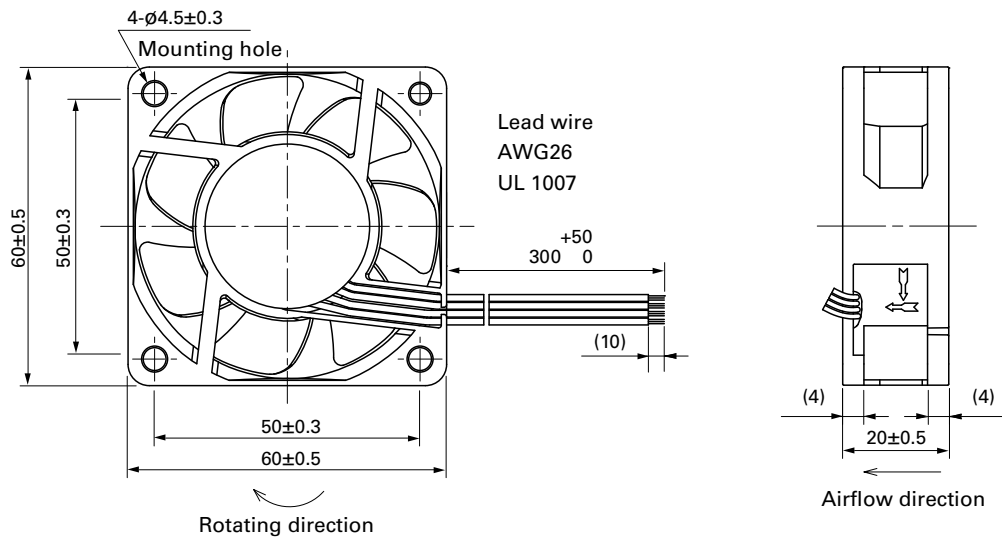


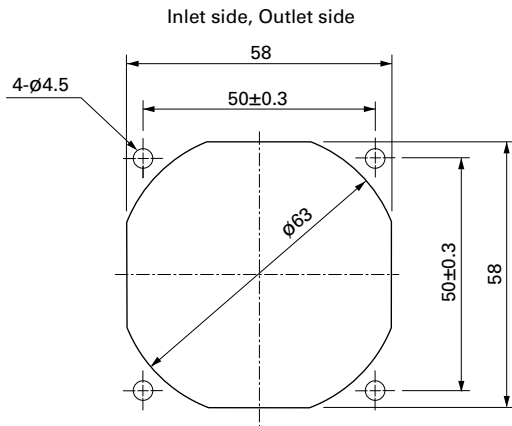
9GA0624M6001 With pulse sensor

Operating voltage range



Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)**Options****Finger guards**

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)

DC Fan



60x60x25 mm

San Ace 60 9G type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 90 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9G0612P4S001 | 12 | 10.2 to 13.8 | 100 | 0.67 | 8.04 | 11000 | 1.4 49.4 | 300 1.2 | 53 | -20 to +70 | 40000/60°C (70000/40°C) |
| ▶▶ 9G0612P4H001 | | | 0 | 0.07 | 0.84 | 3300 | 0.42 14.8 | 27 0.11 | 19 | | |
| ▶▶ 9G0624P4S001 | 24 | 20.4 to 27.6 | 100 | 0.5 | 6.0 | 9500 | 1.21 42.7 | 224 0.9 | 49 | | |
| ▶▶ 9G0624P4H001 | | | 0 | 0.06 | 0.72 | 2850 | 0.36 12.7 | 20.2 0.08 | 18 | | |
| ▶▶ 9G0648P4S001 | 48 | 36 to 72 | 100 | 0.34 | 8.16 | 11000 | 1.4 49.4 | 300 1.2 | 53 | | |
| ▶▶ 9G0648P4H001 | | | 0 | 0.04 | 0.96 | 3300 | 0.42 14.8 | 27 0.11 | 19 | | |
| ▶▶ 9G0648P4S001 | 48 | 36 to 72 | 100 | 0.18 | 8.64 | 11000 | 1.4 49.4 | 305 1.22 | 53 | | |
| ▶▶ 9G0648P4H001 | | | 0 | 0.02 | 0.96 | 3300 | 0.42 14.8 | 27.4 0.11 | 19 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

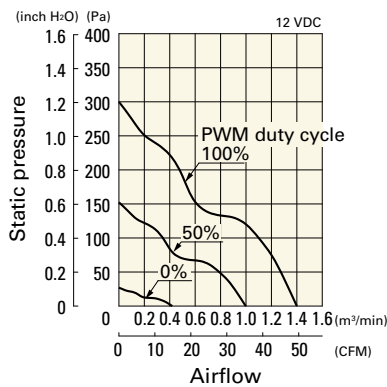
Note 1: Sensor and control options are available for selection. Refer to the table on p. 641.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

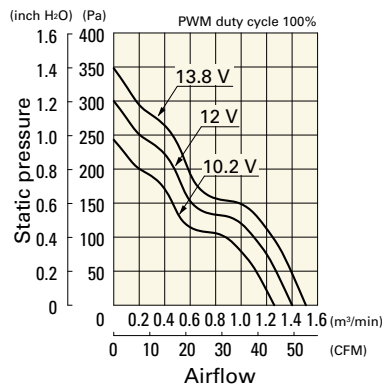
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9G0612P4S001 With pulse sensor with PWM control

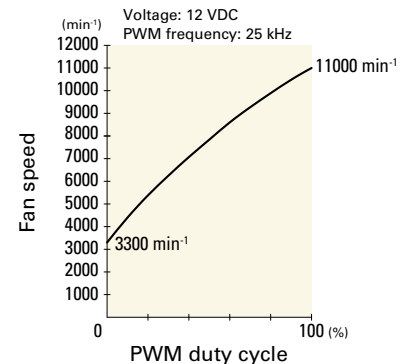
PWM duty cycle



Operating voltage range



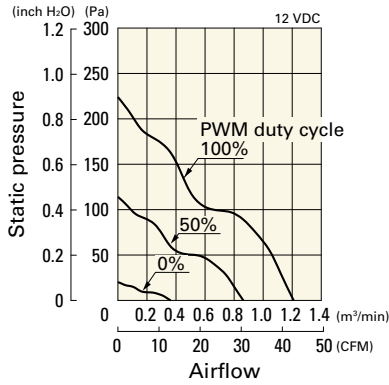
PWM duty - Speed characteristics example



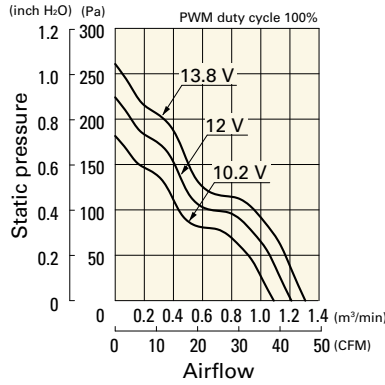
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9G0612P4H001 With pulse sensor with PWM control

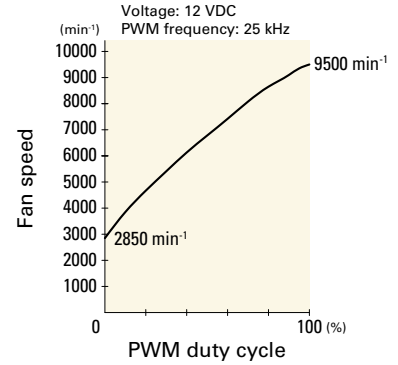
PWM duty cycle



Operating voltage range

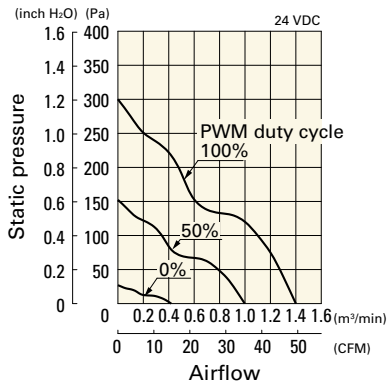


PWM duty - Speed characteristics example

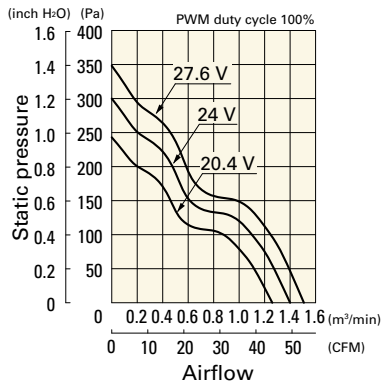


9G0624P4S001 With pulse sensor with PWM control

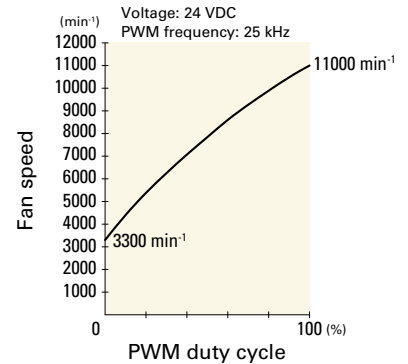
PWM duty cycle



Operating voltage range

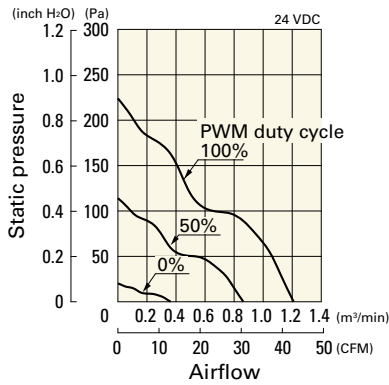


PWM duty - Speed characteristics example

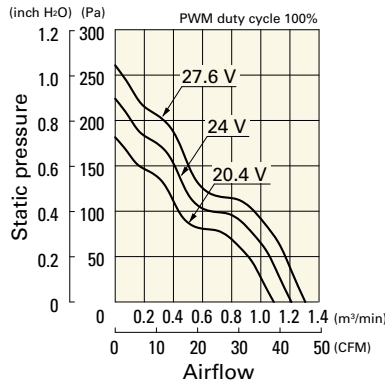


9G0624P4H001 With pulse sensor with PWM control

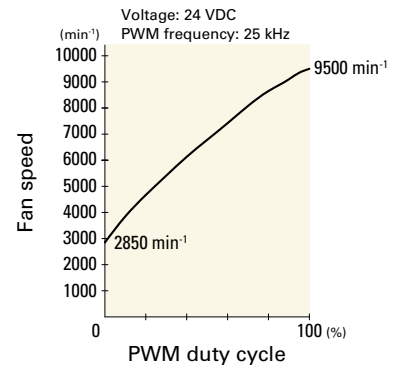
PWM duty cycle



Operating voltage range

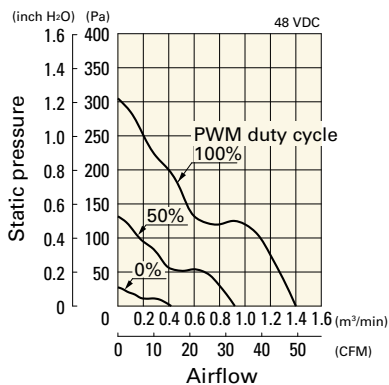


PWM duty - Speed characteristics example

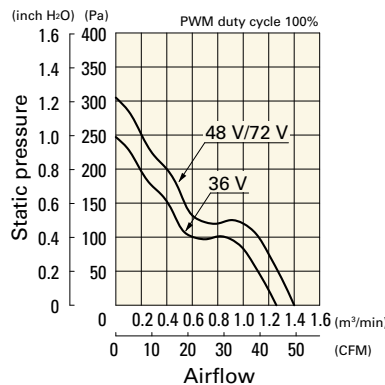


9G0648P4S001 With pulse sensor with PWM control

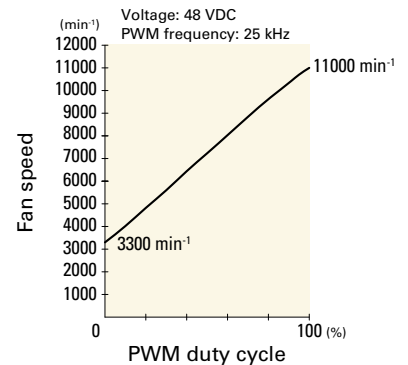
PWM duty cycle



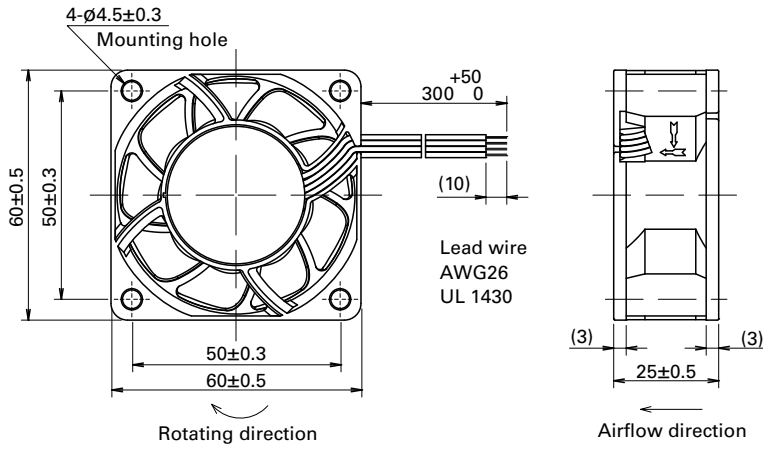
Operating voltage range



PWM duty - Speed characteristics example

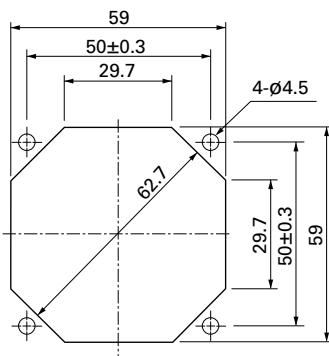


Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Inlet side, Outlet side



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

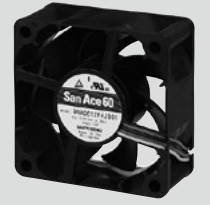
page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



60×60×25 mm

San Ace 60 9RA type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 70 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| » 9RA0612P4J001 | 12 | 10.8 to 13.2 | 100 | 0.35 | 4.2 | 7700 | 1.1 38.8 | 130 0.52 | 41 | -20 to +70 | 60000/60°C (90000/40°C) |
| | | | 30 | 0.05 | 0.6 | 1900 | 0.27 9.5 | 8.1 0.03 | 13 | | |
| » 9RA0624P4J001 | 24 | 21.6 to 26.4 | 100 | 0.18 | 4.32 | 7700 | 1.1 38.8 | 130 0.52 | 41 | | |
| | | | 20 | 0.03 | 0.72 | 1700 | 0.24 8.5 | 6.5 0.02 | 11 | | |
| » 9RA0648P4J001 | 48 | 43.2 to 52.8 | 100 | 0.1 | 4.8 | 7700 | 1.1 38.8 | 130 0.52 | 41 | | |
| | | | 20 | 0.03 | 1.44 | 1800 | 0.25 8.8 | 7.1 0.03 | 12 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| » 9RA0612J4001 | 12 | 7 to 13.8 | 0.35 | 4.2 | 7700 | 1.1 38.8 | 130 0.52 | 41 | -20 to +70 | 60000/60°C (90000/40°C) |
| » 9RA0612G4001 | | | 0.15 | 1.8 | 5600 | 0.8 28.2 | 69 0.28 | 36 | | |
| » 9RA0612S4001 | | | 0.1 | 1.2 | 4600 | 0.66 23.3 | 46 0.18 | 30 | | |
| » 9RA0612H4001 | | 6 to 13.8 | 0.07 | 0.84 | 3800 | 0.54 19.1 | 32 0.13 | 26 | | |
| » 9RA0612F4001 | | | 0.05 | 0.6 | 3200 | 0.46 16.2 | 22 0.09 | 21 | | |
| » 9RA0612M4001 | | | 0.04 | 0.48 | 2600 | 0.37 13 | 14.8 0.06 | 17 | | |
| » 9RA0624J4001 | 24 | 14 to 27.6 | 0.18 | 4.32 | 7700 | 1.1 38.8 | 130 0.52 | 41 | | |
| » 9RA0624G4001 | | | 0.08 | 1.92 | 5600 | 0.8 28.2 | 69 0.28 | 36 | | |
| » 9RA0624S4001 | | | 0.06 | 1.44 | 4600 | 0.66 23.3 | 46 0.18 | 30 | | |
| » 9RA0624H4001 | | 12 to 27.6 | 0.05 | 1.2 | 3800 | 0.54 19.1 | 32 0.13 | 26 | | |
| » 9RA0624F4001 | | | 0.04 | 0.96 | 3200 | 0.46 16.2 | 22 0.09 | 21 | | |
| » 9RA0624M4001 | | | 0.03 | 0.72 | 2600 | 0.37 13 | 14.8 0.06 | 17 | | |
| » 9RA0648J4001 | 48 | 36 to 55.2 | 0.1 | 4.8 | 7700 | 1.1 38.8 | 130 0.52 | 41 | | |
| » 9RA0648G4001 | | | 0.06 | 2.88 | 5600 | 0.8 28.2 | 69 0.28 | 36 | | |

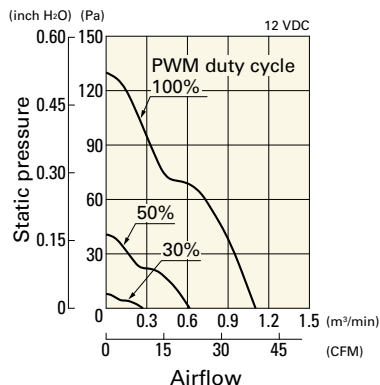
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 649 to 650.

Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 668 for details.

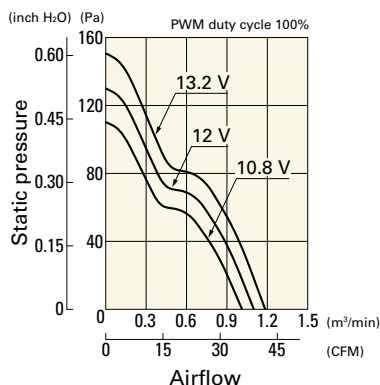
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RA0612P4J001 With pulse sensor with PWM control

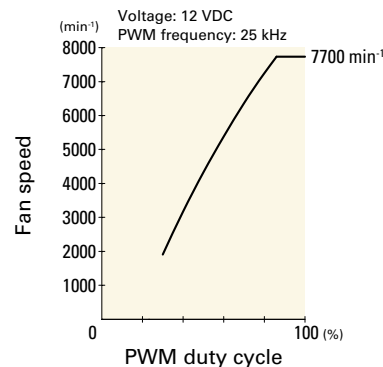
PWM duty cycle



Operating voltage range

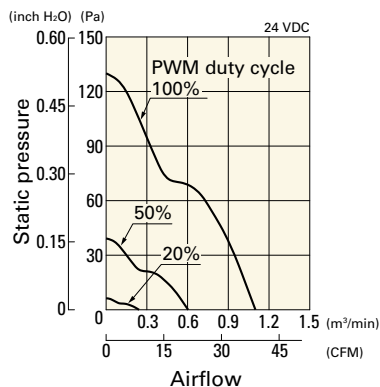


PWM duty - Speed characteristics example

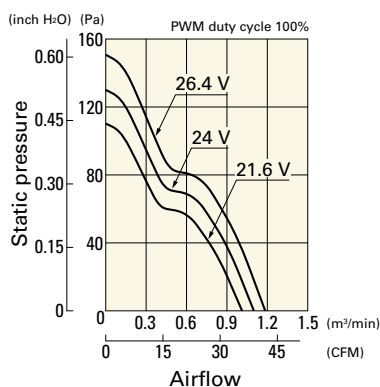


9RA0624P4J001 With pulse sensor with PWM control

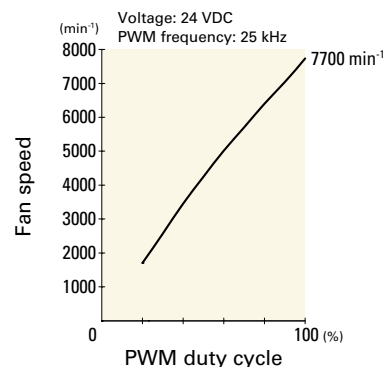
PWM duty cycle



Operating voltage range

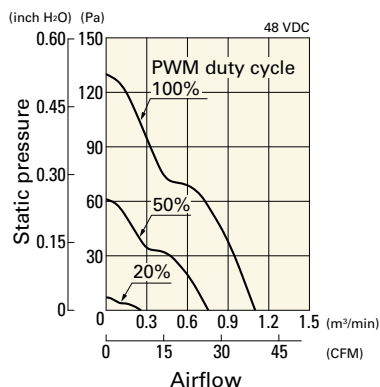


PWM duty - Speed characteristics example

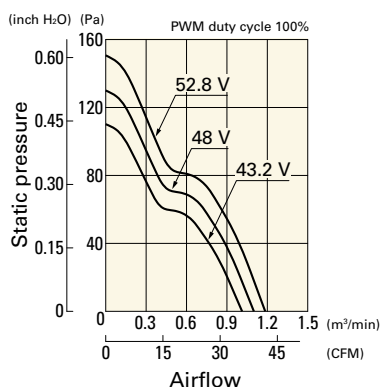


9RA0648P4J001 With pulse sensor with PWM control

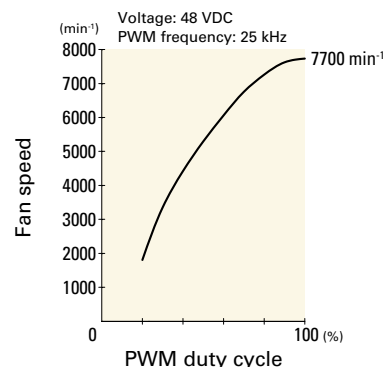
PWM duty cycle



Operating voltage range



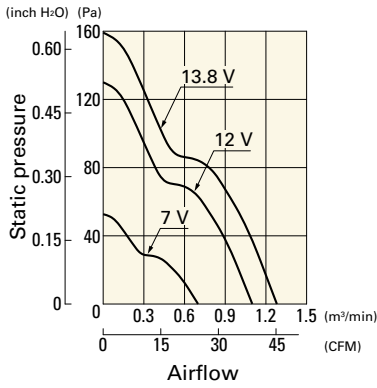
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

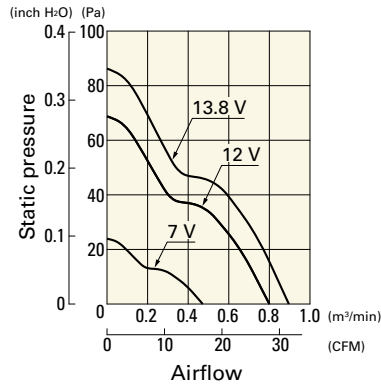
9RA0612J4001 With pulse sensor

Operating voltage range



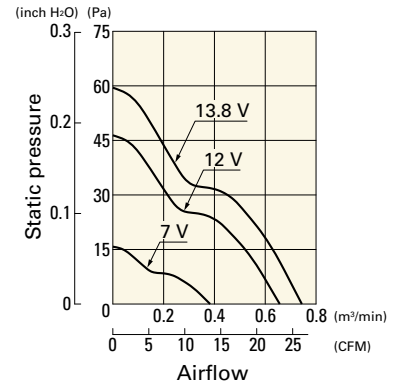
9RA0612G4001 With pulse sensor

Operating voltage range



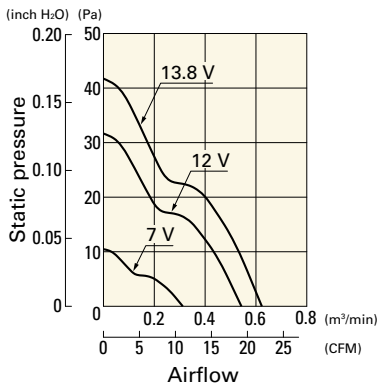
9RA0612S4001 With pulse sensor

Operating voltage range



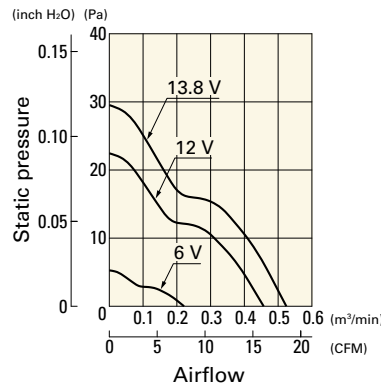
9RA0612H4001 With pulse sensor

Operating voltage range



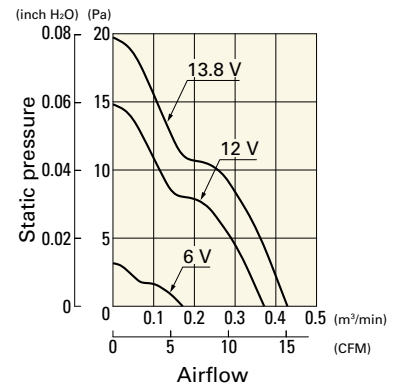
9RA0612F4001 With pulse sensor

Operating voltage range



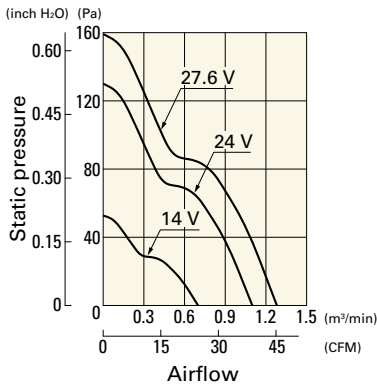
9RA0612M4001 With pulse sensor

Operating voltage range



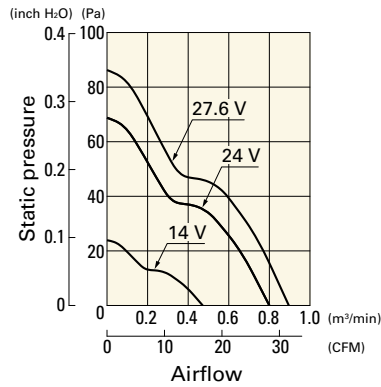
9RA0624J4001 With pulse sensor

Operating voltage range



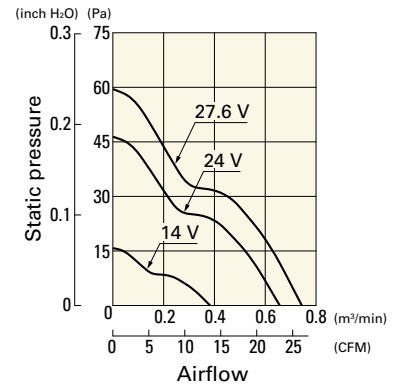
9RA0624G4001 With pulse sensor

Operating voltage range



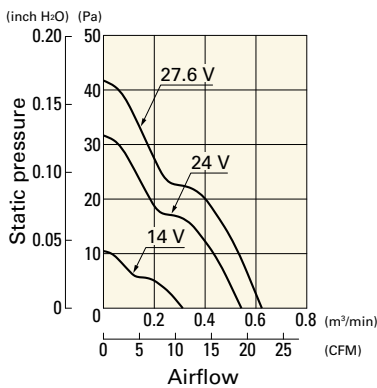
9RA0624S4001 With pulse sensor

Operating voltage range



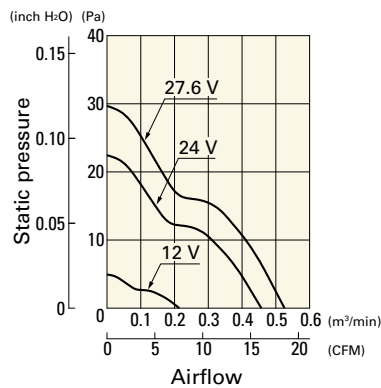
9RA0624H4001 With pulse sensor

Operating voltage range



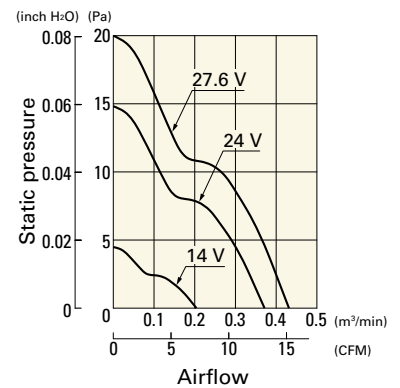
9RA0624F4001 With pulse sensor

Operating voltage range



9RA0624M4001 With pulse sensor

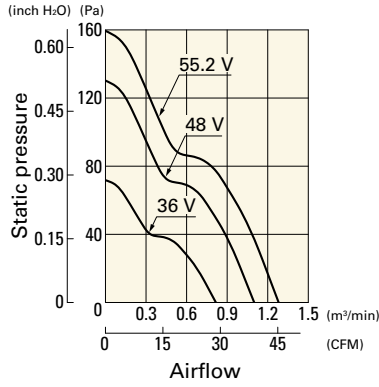
Operating voltage range



Airflow - Static Pressure Characteristics

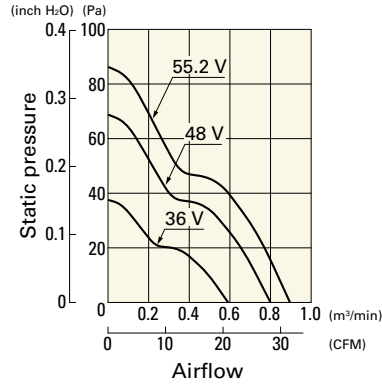
9RA0648J4001 With pulse sensor

Operating voltage range

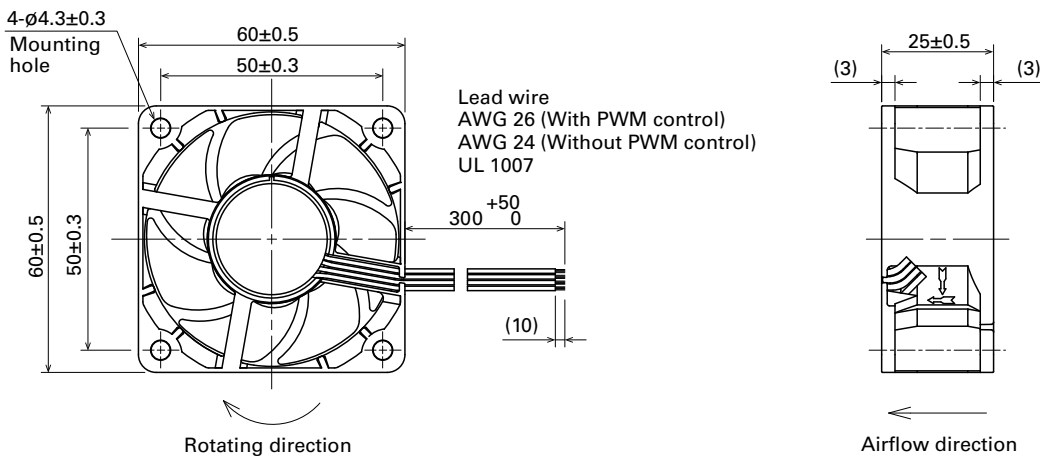


9RA0648G4001 With pulse sensor

Operating voltage range

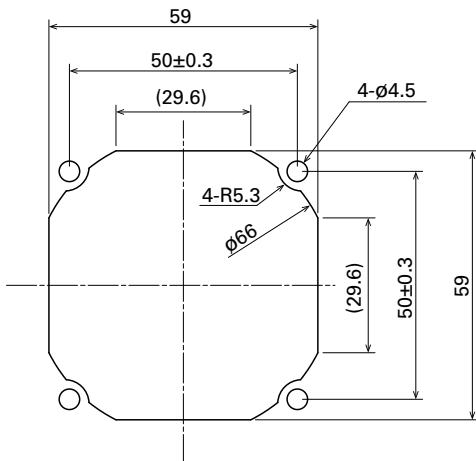


Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Inlet side, Outlet side



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



60×60×25 mm

San Ace 60 9S type Silent Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 55 g

Specifications

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9S0612S401 | 12 | 8 to 13.8 | 0.2 | 2.4 | 5000 | 0.74 26.1 | 65.7 0.26 | 31 | -10 to +70 | 40000/60°C (70000/40°C) |
| 9S0612H401 | | | 0.11 | 1.32 | 3900 | 0.58 20.5 | 40.0 0.16 | 24 | | |
| 9S0612F401 | | | 0.08 | 0.96 | 3300 | 0.49 17.3 | 29.3 0.12 | 20 | | |
| 9S0612M401 | | | 0.07 | 0.84 | 2700 | 0.4 14.1 | 19.7 0.08 | 16 | | |

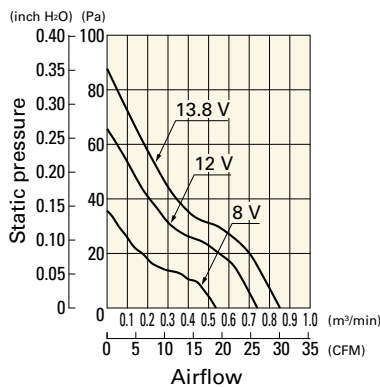
Note 1: Sensor and control options are available for selection. Refer to the table on p. 653.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

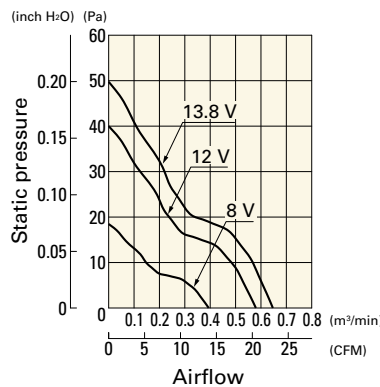
9S0612S401 With pulse sensor

Operating voltage range



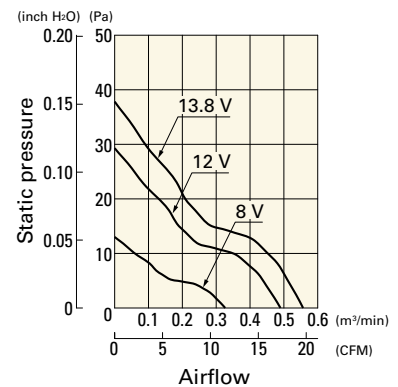
9S0612H401 With pulse sensor

Operating voltage range



9S0612F401 With pulse sensor

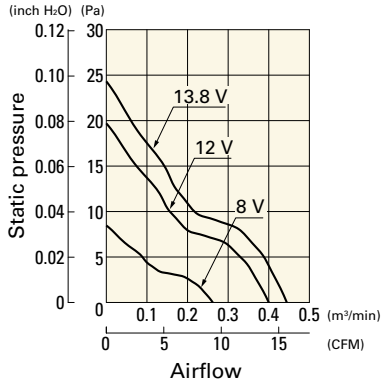
Operating voltage range



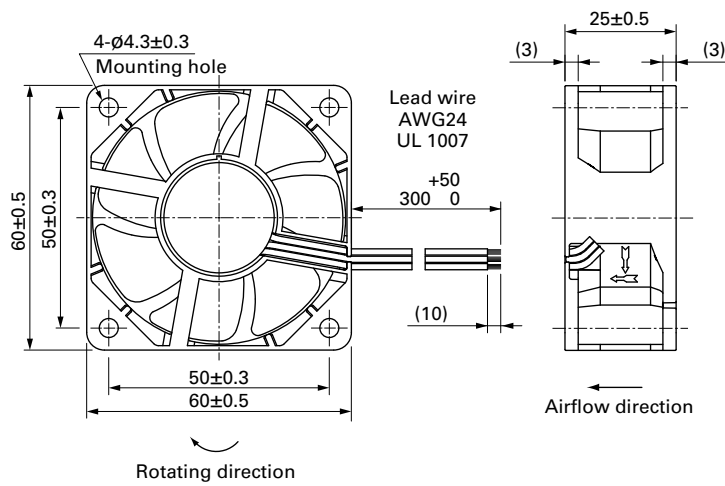
Airflow - Static Pressure Characteristics

9S0612M401 With pulse sensor

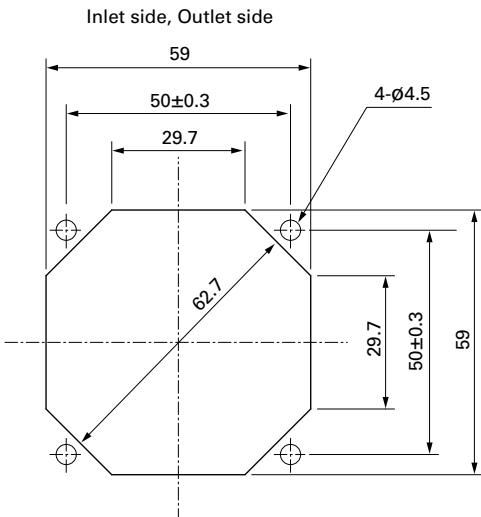
Operating voltage range



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



60×60×38 mm

San Ace 60 9HVA type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 130 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9HVA0612P1J001 | 12 | 10.8 to 13.2 | 100 | 2.8 | 33.6 | 24800 | 2.39 84.3 | 2000 8.0 | 68 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.11 | 1.32 | 5200 | 0.48 16.9 | 91 0.36 | 34 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

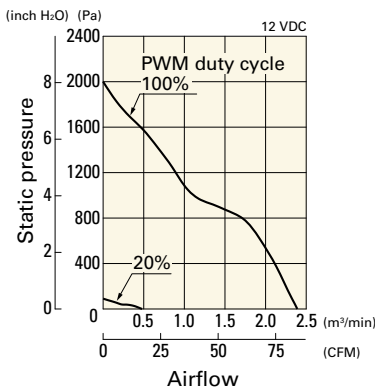
Note 1: Sensor and control options are available for selection. Refer to the table on p. 647.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

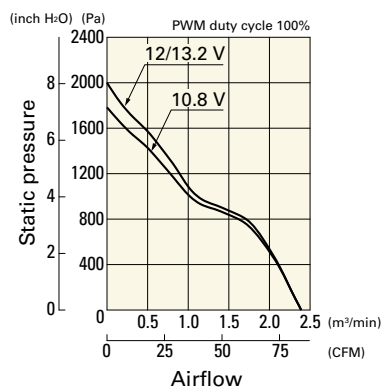
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HVA0612P1J001 With pulse sensor with PWM control

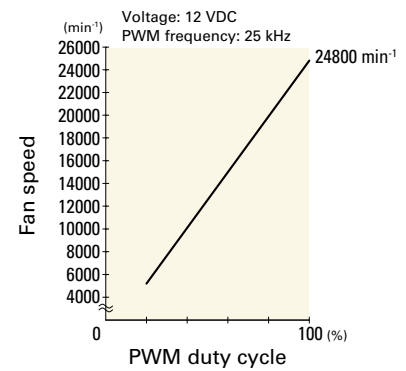
PWM duty cycle



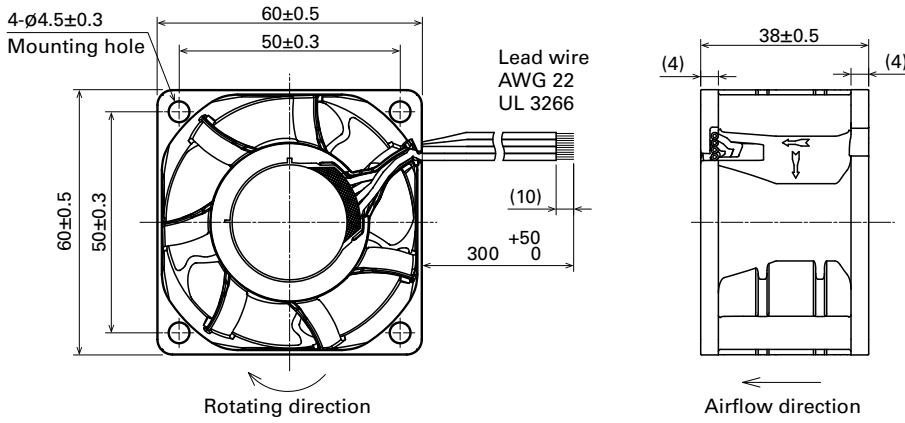
Operating voltage range



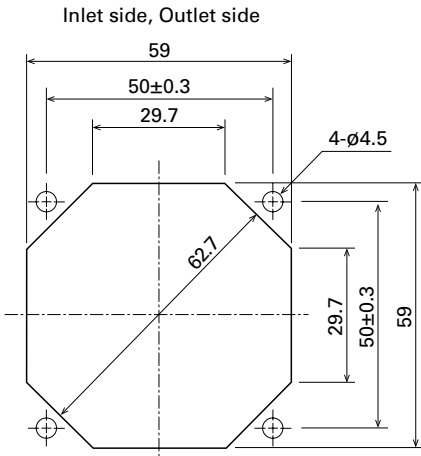
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards page: p. 598
 Model no.: 109-139E, 109-139H

Resin finger guards page: p. 605
 Model no.: 109-1003G

Resin filter kits page: p. 606
 Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
 109-1003F30 (30PPI), 109-1003F40 (40PPI)



60×60×38 mm

San Ace 60 9HV type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 135 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9HV0612P1J001 | 12 | 10.8 to 12.6 | 100 | 2.7 | 32.4 | 21700 | 1.88 66.4 | 1750 7.0 | 68 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.17 | 2.04 | 5300 | 0.43 15.2 | 102 0.41 | 34 | | |

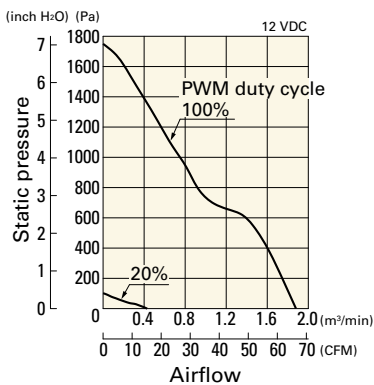
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

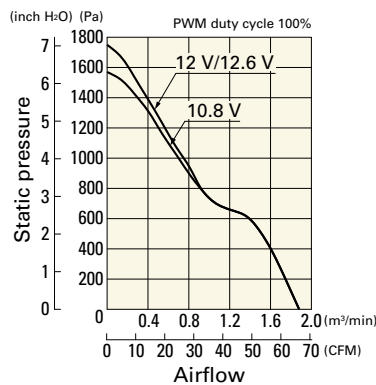
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV0612P1J001 With pulse sensor with PWM control

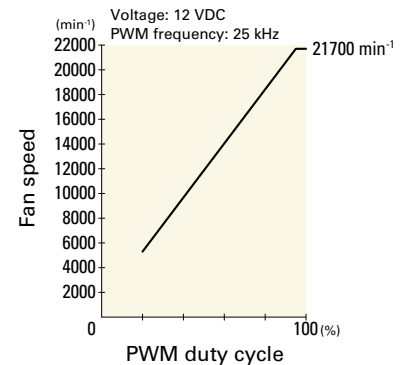
PWM duty cycle



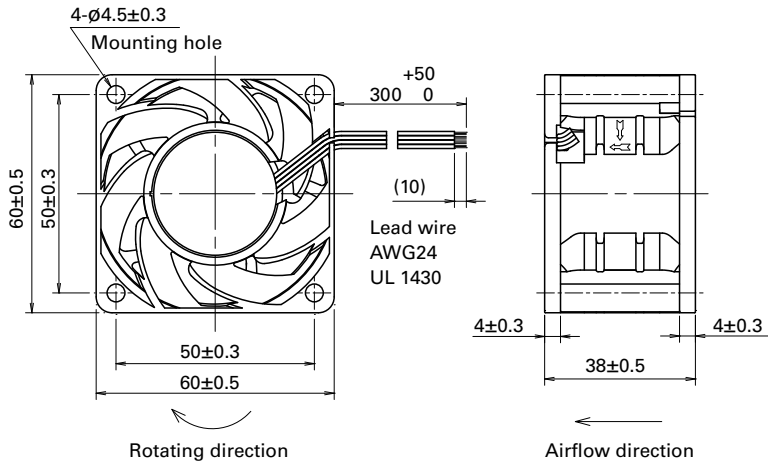
Operating voltage range



PWM duty - Speed characteristics example

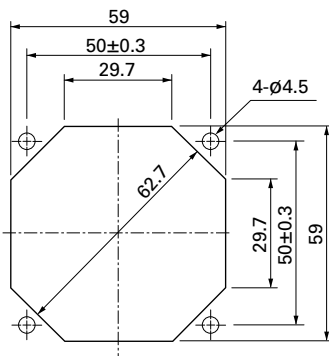


Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Inlet side, Outlet side



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



60x60x38 mm

San Ace 60 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 130 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | |
|--------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|------------|
| 9GA0612P1J03 | 12 | 10.8 to 12.6 | 100 | 1.5 | 18.0 | 17500 | 1.75 62 | 820 3.3 | 63 | -20 to +60 | 40000/60°C (70000/40°C) | |
| | | | 20 | 0.1 | 1.2 | 4000 | 0.4 14 | 43 0.17 | 24 | | | |
| 9GA0612P1K03 | | 10.8 to 13.2 | 100 | 0.95 | 11.4 | 14800 | 1.5 53 | 600 2.4 | 59 | -20 to +70 | | |
| | | | 20 | 0.1 | 1.2 | 4000 | 0.4 14 | 43 0.17 | 24 | | | |
| 9GA0612P1K60 | | 10.8 to 13.2 | 100 | 0.95 | 11.4 | 14800 | 1.5 53 | 675 2.7 | 59 | -20 to +60 | | |
| | | | 0 | 0.05 | 0.6 | 1480 | 0.134 4.7 | 8.3 0.03 | 16 | | | |
| 9GA0612P1H03 | | 10.8 to 13.2 | 100 | 0.55 | 6.6 | 11500 | 1.15 40 | 375 1.5 | 52 | -20 to +70 | | |
| | | | 20 | 0.06 | 0.72 | 2600 | 0.27 9.5 | 20 0.08 | 19 | | | |
| 9GA0624P1J03 | | 24 | 21.6 to 25.2 | 100 | 0.75 | 18.0 | 17500 | 1.75 62 | 820 3.3 | 63 | | -20 to +60 |
| | | | | 20 | 0.1 | 2.4 | 6200 | 0.63 22 | 104 0.42 | 35 | | |
| 9GA0624P1K03 | | | 21.6 to 26.4 | 100 | 0.5 | 12 | 14800 | 1.5 53.0 | 600 2.4 | 59 | | -20 to +70 |
| | | | | 20 | 0.06 | 1.44 | 5000 | 0.5 17.7 | 70 0.28 | 28 | | |
| 9GA0648P1K03 | 48 | 43.2 to 52.8 | 100 | 0.24 | 11.52 | 14800 | 1.5 53 | 600 2.4 | 59 | -10 to +70 | | |
| | 20 | 0.03 | 1.44 | 4000 | 0.4 14 | 43 0.17 | 24 | | | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

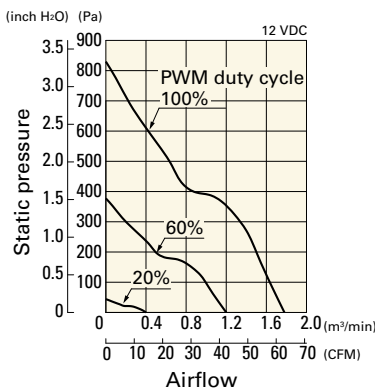
Note 1: Sensor and control options are available for selection. Refer to the table on p. 643.

Note 2: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

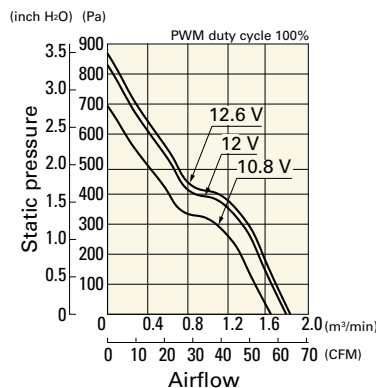
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0612P1J03 With pulse sensor with PWM control

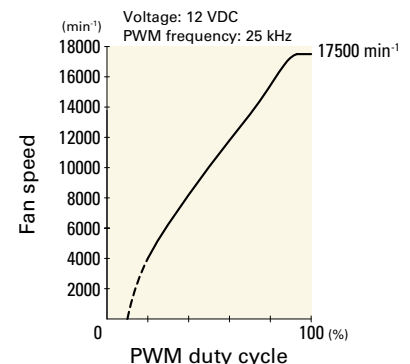
PWM duty cycle



Operating voltage range



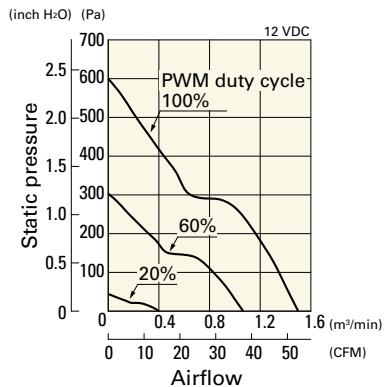
PWM duty - Speed characteristics example



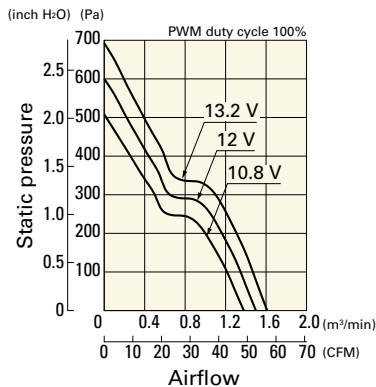
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0612P1K03 With pulse sensor with PWM control

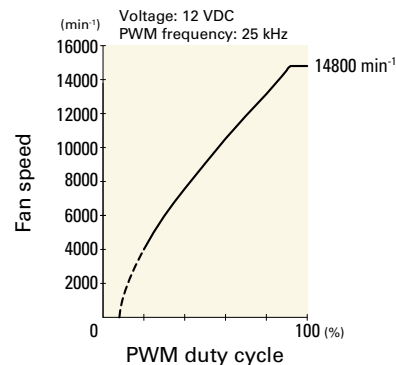
PWM duty cycle



Operating voltage range

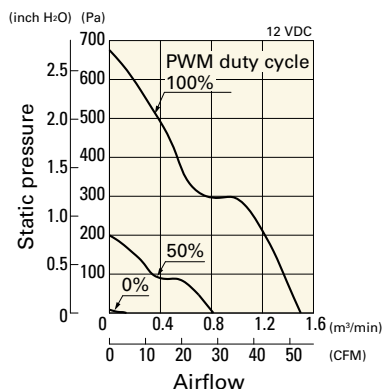


PWM duty - Speed characteristics example

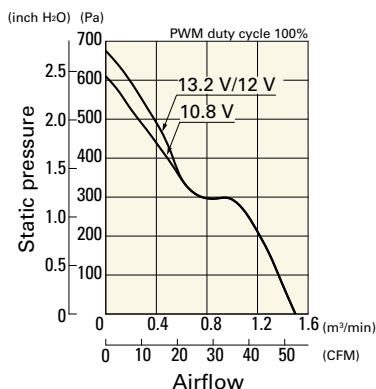


9GA0612P1K60 With pulse sensor with PWM control

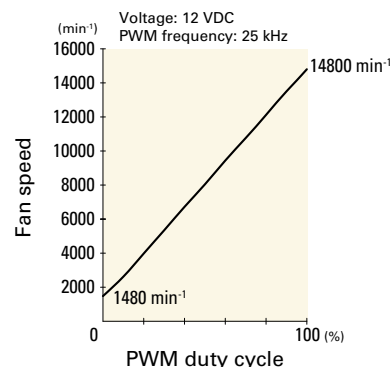
PWM duty cycle



Operating voltage range

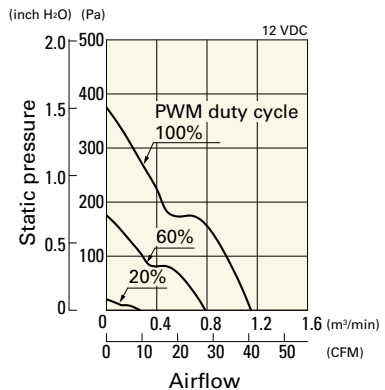


PWM duty - Speed characteristics example

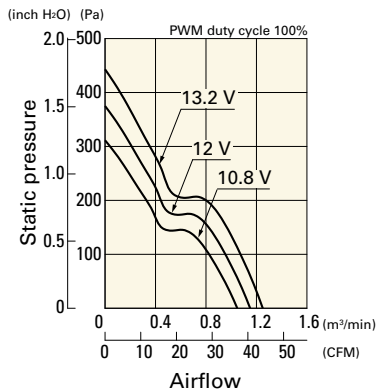


9GA0612P1H03 With pulse sensor with PWM control

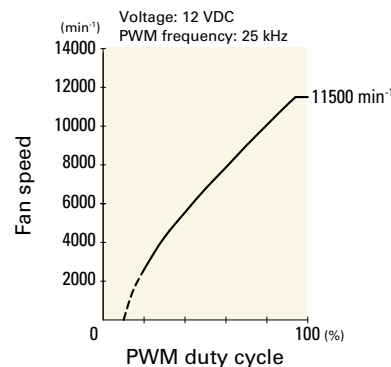
PWM duty cycle



Operating voltage range

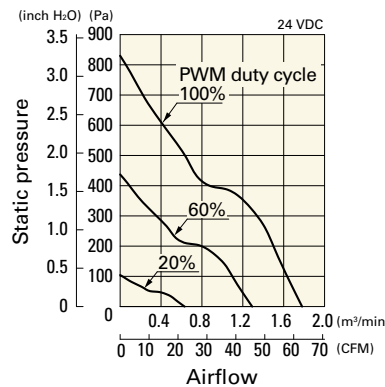


PWM duty - Speed characteristics example

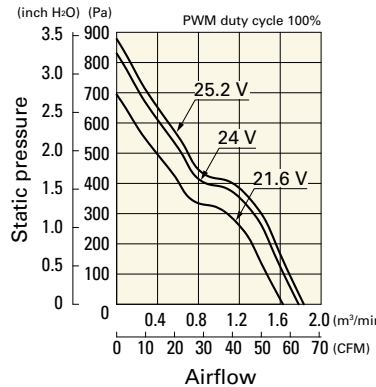


9GA0624P1J03 With pulse sensor with PWM control

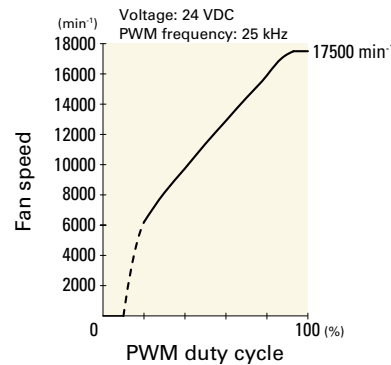
PWM duty cycle



Operating voltage range



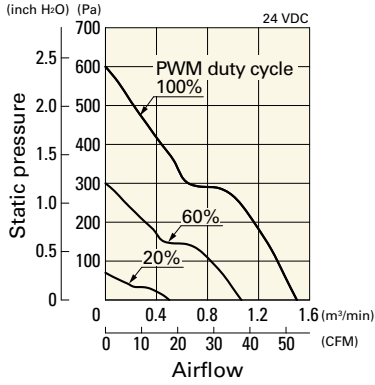
PWM duty - Speed characteristics example



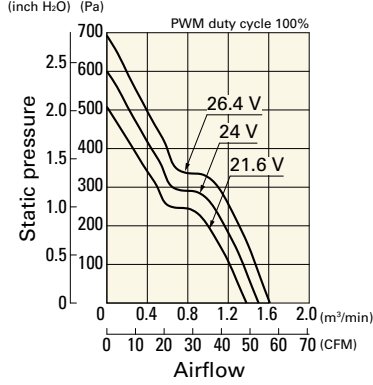
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0624P1K03 With pulse sensor with PWM control

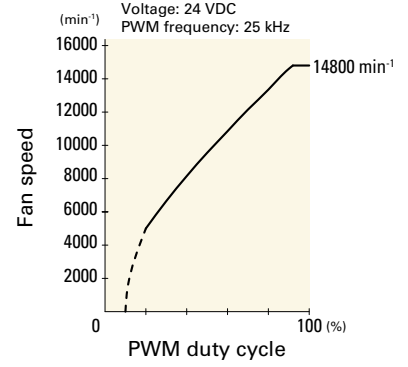
PWM duty cycle



Operating voltage range

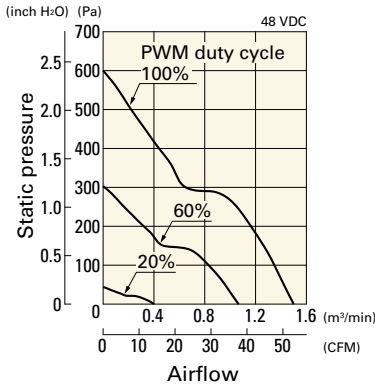


PWM duty - Speed characteristics example

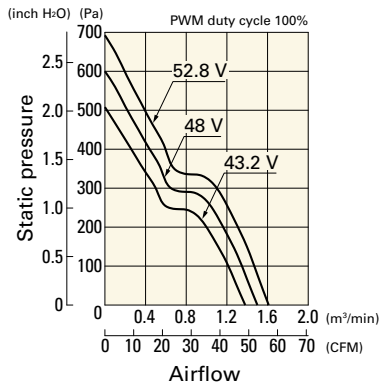


9GA0648P1K03 With pulse sensor with PWM control

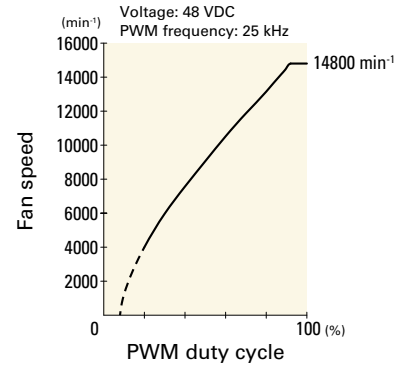
PWM duty cycle



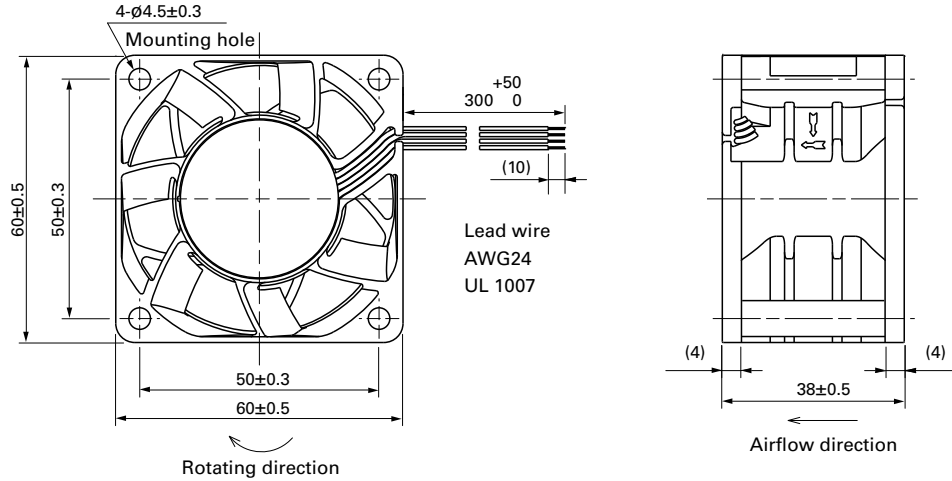
Operating voltage range



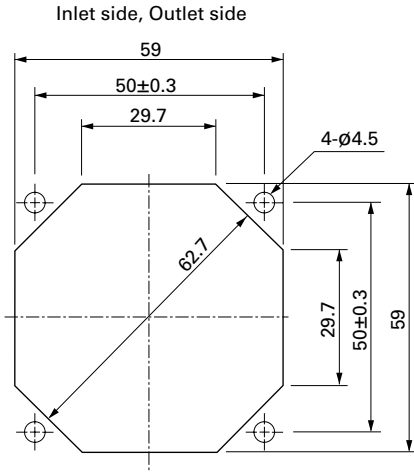
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



60×60×38 mm

San Ace 60 9GV type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 130 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

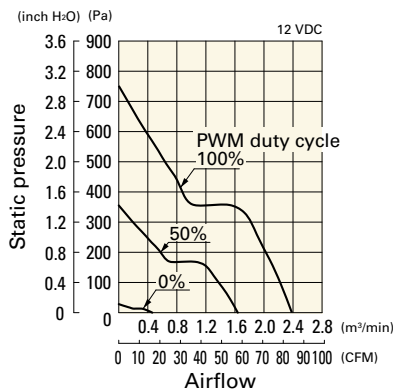
| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GV0612P1G03 | 12 | 8.0 to 13.8 | 100 | 2.8 | 33.6 | 16000 | 2.37 84 | 751 3.02 | 66 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.12 | 1.5 | 3100 | 0.44 15 | 26 0.10 | 25 | | |
| 9GV0624P1G03 | 24 | 20.4 to 27.6 | 100 | 1.4 | 33.6 | 16000 | 2.37 84 | 751 3.02 | 66 | | |
| | | | 0 | 0.12 | 2.88 | 6000 | 0.89 31 | 105 0.42 | 38 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

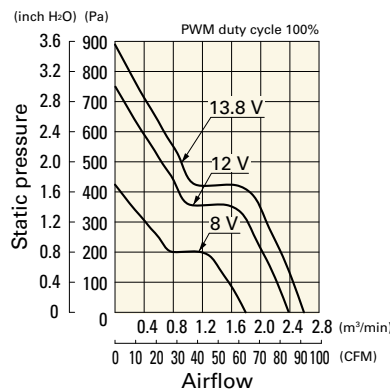
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV0612P1G03 With pulse sensor with PWM control

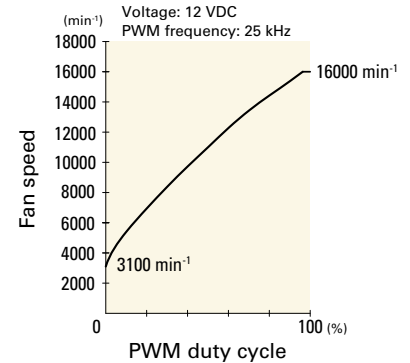
PWM duty cycle



Operating voltage range

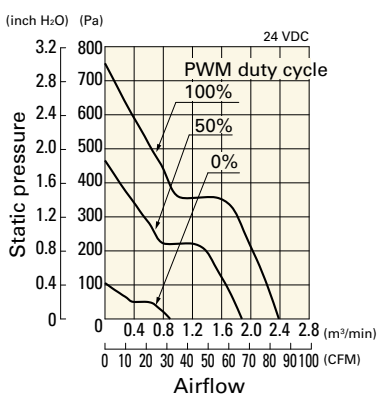


PWM duty - Speed characteristics example

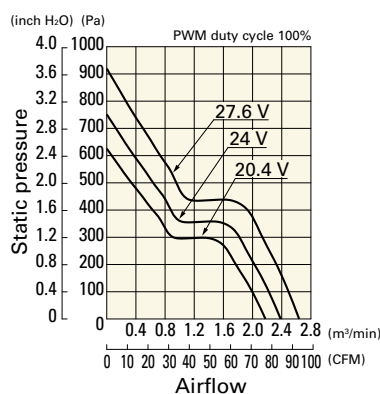


9GV0624P1G03 With pulse sensor with PWM control

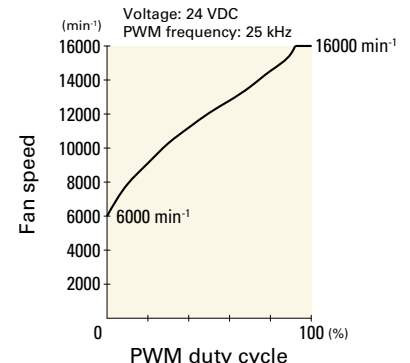
PWM duty cycle



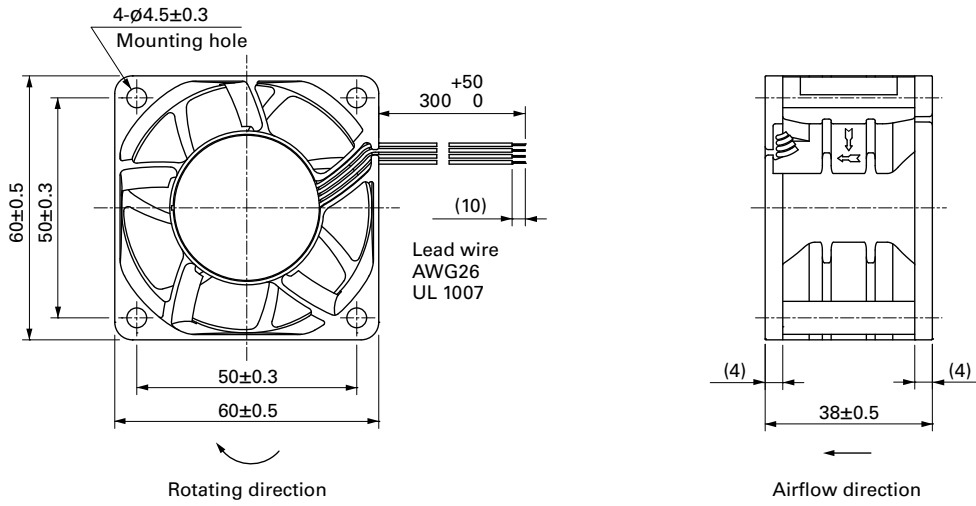
Operating voltage range



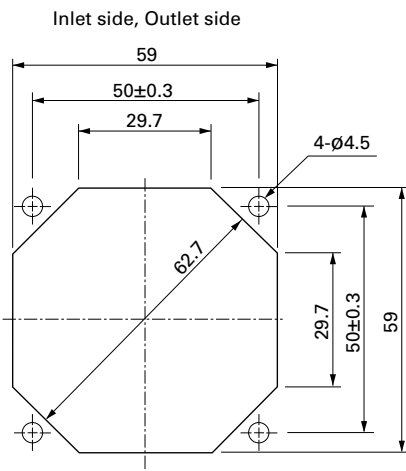
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



70x70x38 mm

San Ace 70 9GA type Low Power Consumption Fan **US**

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 170 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9GA0712P1G001 | 12 | 10.8 to 13.2 | 100 | 2.6 | 31.2 | 16500 | 2.65 93.6 | 860 3.45 | 65 | -20 to +70 | 40000/60°C (70000/40°C) |
| 0 | | | 0.16 | 1.92 | 4400 | 0.7 24.7 | 61 0.24 | 30 | | | |
| ▶▶ 9GA0712P1H001 | | | 100 | 1.1 | 13.2 | 12000 | 1.92 67.8 | 455 1.83 | 57 | | |
| 0 | | | 0.07 | 0.84 | 2500 | 0.4 14.1 | 20 0.08 | 19 | | | |

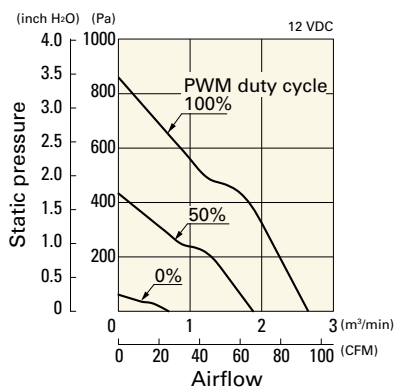
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

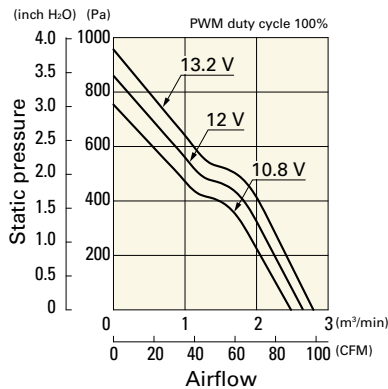
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0712P1G001 With pulse sensor with PWM control

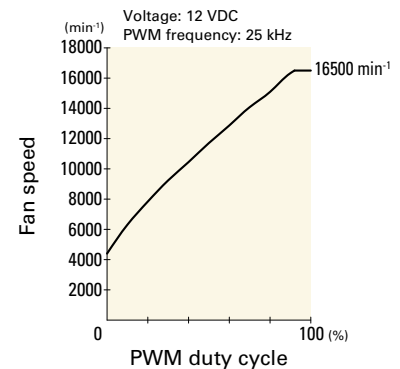
PWM duty cycle



Operating voltage range



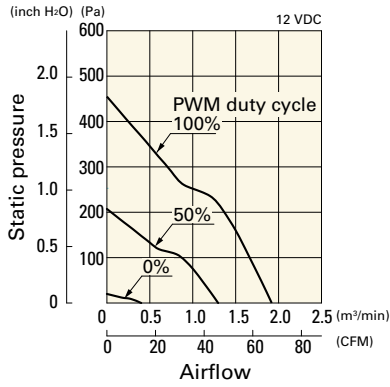
PWM duty - Speed characteristics example



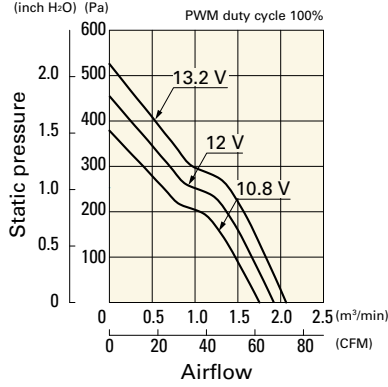
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0712P1H001 With pulse sensor with PWM control

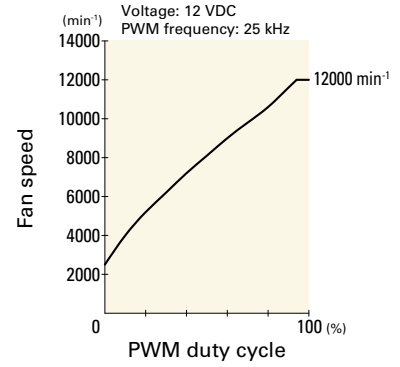
PWM duty cycle



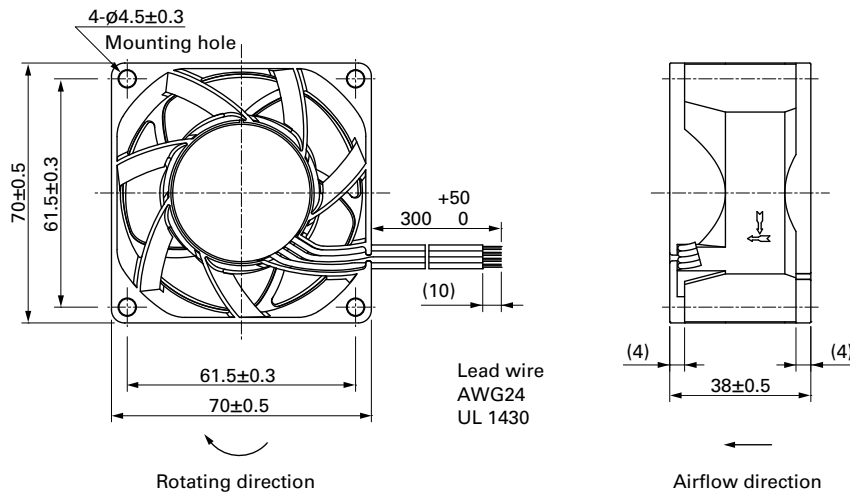
Operating voltage range



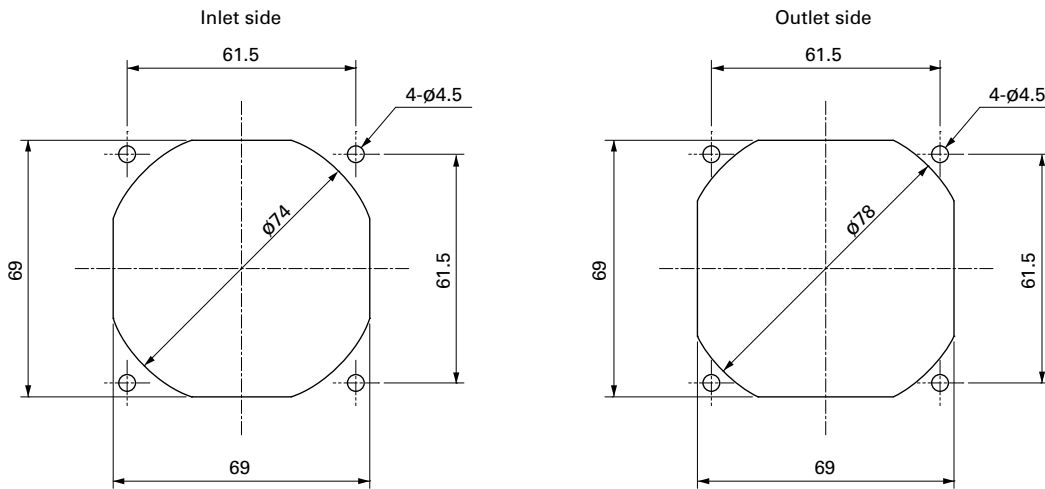
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)




Options

Finger guards

page: p. 598

Model no.: 109-1128

80x80x15 mm

San Ace 80 9GA type Low Power Consumption Fan 



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 65 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0812P7G001 | 12 | 10.2 to 13.8 | 100 | 0.29 | 3.48 | 6100 | 1.44 50.9 | 84.0 0.34 | 41 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9GA0812P7S001 | | | 100 | 0.17 | 2.04 | 5000 | 1.18 41.7 | 56.4 0.23 | 37 | | |
| 9GA0824P7G001 | 24 | 20.4 to 27.6 | 100 | 0.13 | 3.12 | 6100 | 1.44 50.9 | 84.0 0.34 | 41 | | |
| 9GA0824P7S001 | | | 100 | 0.08 | 1.92 | 5000 | 1.18 41.7 | 56.4 0.23 | 37 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0812H7001 | 12 | 6 to 13.2 | 0.09 | 1.08 | 3800 | 0.89 31.4 | 32.6 0.13 | 29 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9GA0812M7001 | | 7 to 13.2 | 0.025 | 0.3 | 2500 | 0.58 20.5 | 14 0.056 | 20 | | |
| 9GA0824H7001 | 24 | 12 to 26.4 | 0.05 | 1.2 | 3800 | 0.89 31.4 | 32.6 0.13 | 29 | | |
| 9GA0824M7001 | | | 0.02 | 0.48 | 2500 | 0.58 20.5 | 14 0.056 | 20 | | |

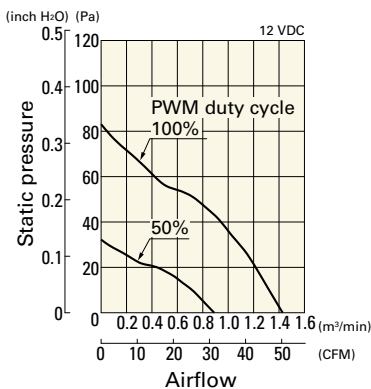
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 643 to 644.

Note 2: The  mark indicates Short LeadTime Service applicable models. See p. 668 for details.

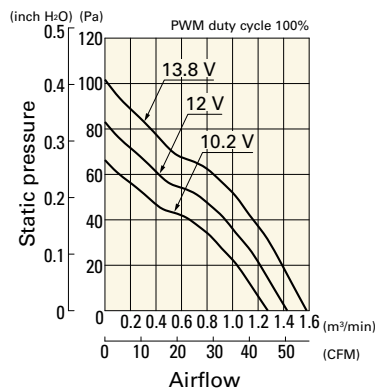
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0812P7G001 With pulse sensor with PWM control

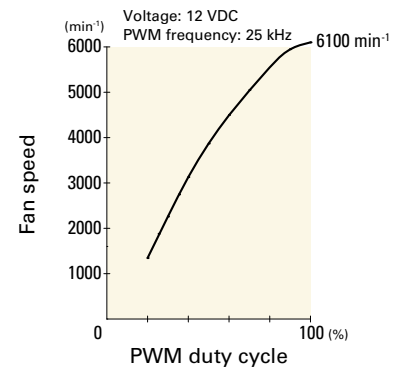
PWM duty cycle



Operating voltage range



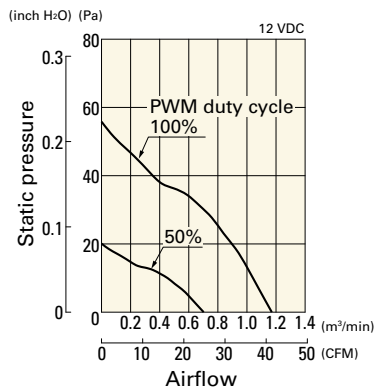
PWM duty - Speed characteristics example



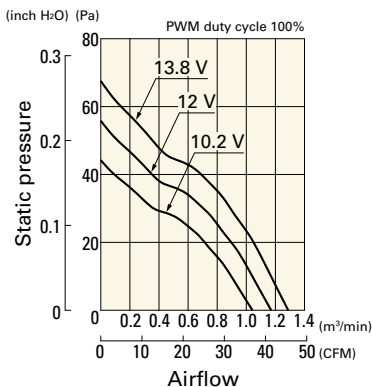
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0812P7S001 With pulse sensor with PWM control

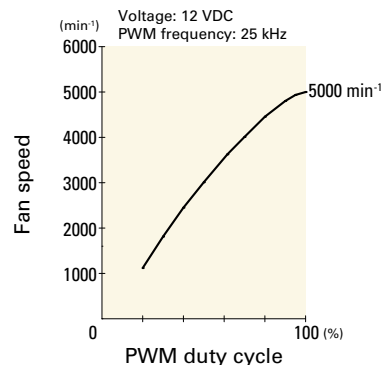
PWM duty cycle



Operating voltage range

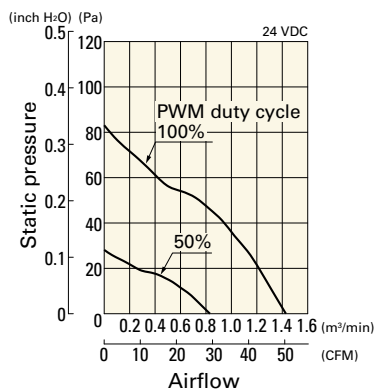


PWM duty - Speed characteristics example

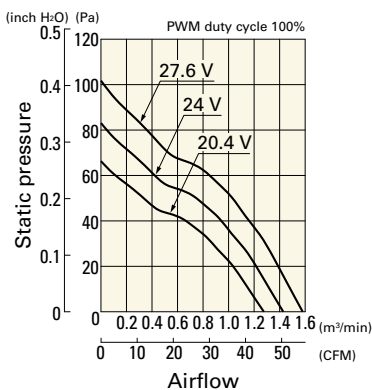


9GA0824P7G001 With pulse sensor with PWM control

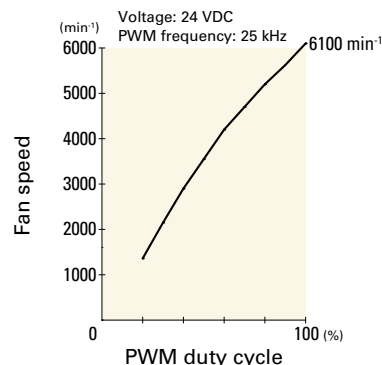
PWM duty cycle



Operating voltage range

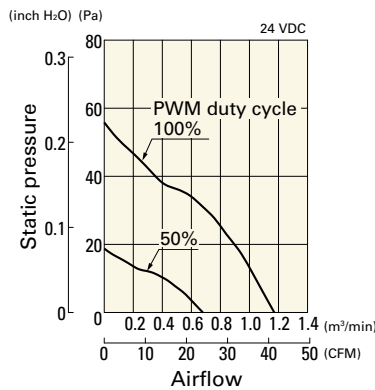


PWM duty - Speed characteristics example

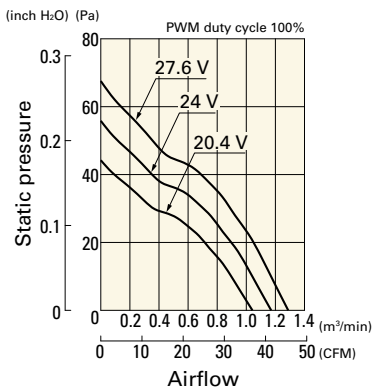


9GA0824P7S001 With pulse sensor with PWM control

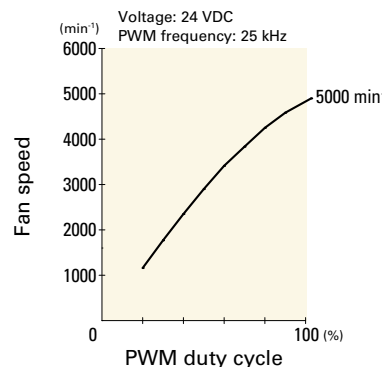
PWM duty cycle



Operating voltage range



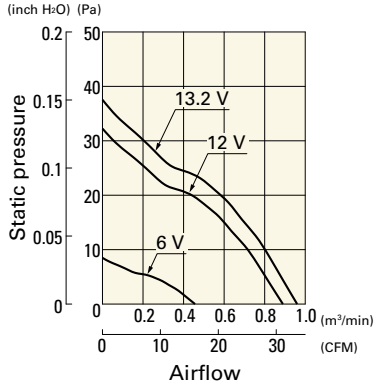
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

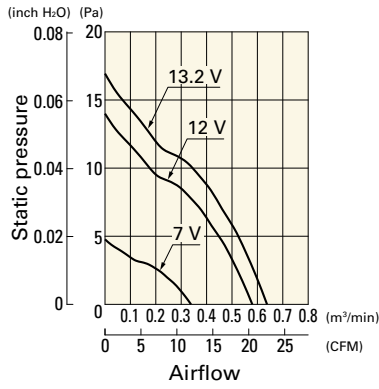
9GA0812H7001 With pulse sensor

Operating voltage range



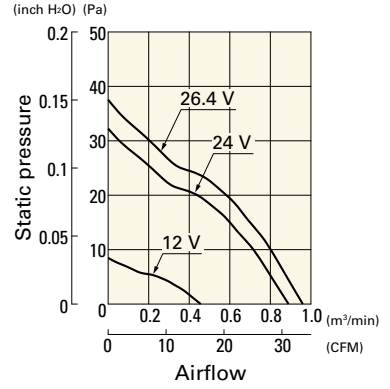
9GA0812M7001 With pulse sensor

Operating voltage range



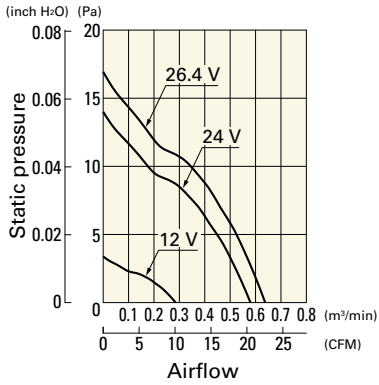
9GA0824H7001 With pulse sensor

Operating voltage range

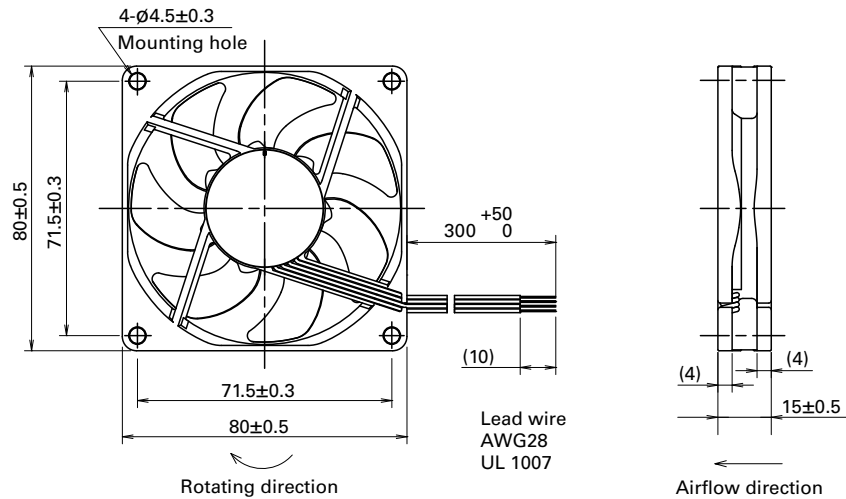


9GA0824M7001 With pulse sensor

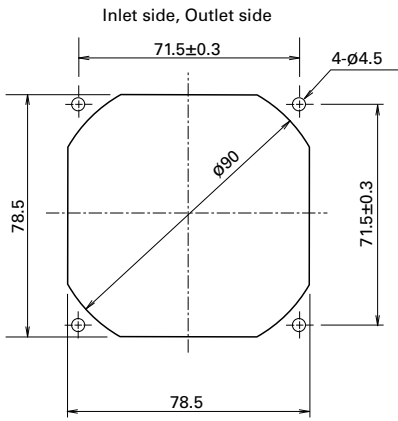
Operating voltage range



Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)



80x80x20 mm

San Ace 80 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow Control Brown
- Mass 80 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0812P6G001 | 12 | 10.2 to 13.8 | 100 | 0.3 | 3.6 | 5850 | 1.72 60.78 | 110 0.44 | 45 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9GA0812P6M001 | | | 100 | 0.06 | 0.72 | 2900 | 0.84 29.68 | 27 0.11 | 26.5 | | 60000/60°C (90000/40°C) |
| 9GA0824P6G001 | 24 | 20.4 to 27.6 | 100 | 0.15 | 3.6 | 5850 | 1.72 60.78 | 110 0.44 | 45 | | 40000/60°C (70000/40°C) |
| 9GA0824P6M001 | | | 100 | 0.03 | 0.72 | 2900 | 0.84 29.68 | 27 0.11 | 26.5 | | 60000/60°C (90000/40°C) |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

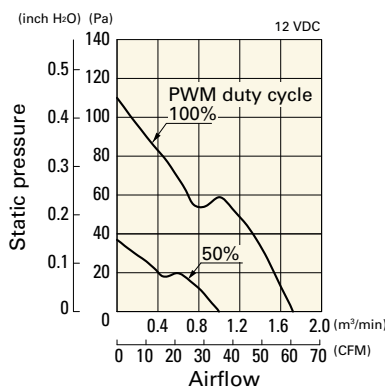
Note 1: Sensor and control options are available for selection. Refer to the table on p. 644.

Note 2: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

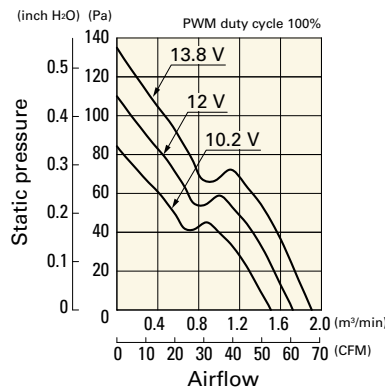
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0812P6G001 With pulse sensor with PWM control

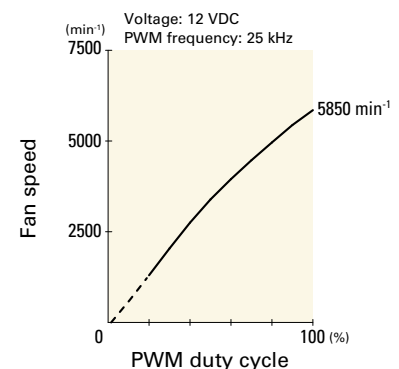
PWM duty cycle



Operating voltage range



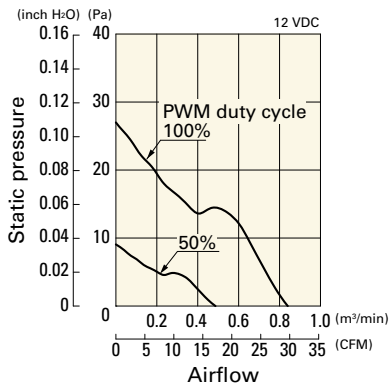
PWM duty - Speed characteristics example



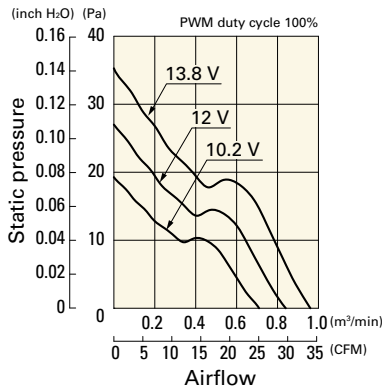
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0812P6M001 With pulse sensor with PWM control

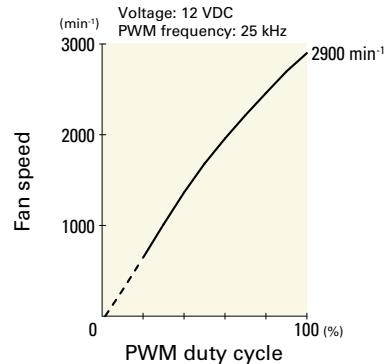
PWM duty cycle



Operating voltage range

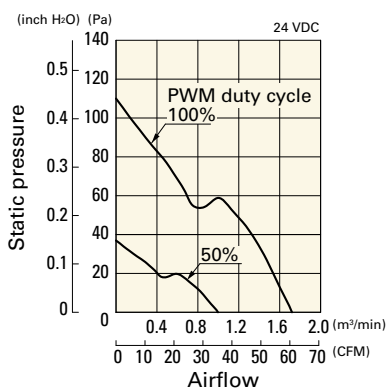


PWM duty - Speed characteristics example

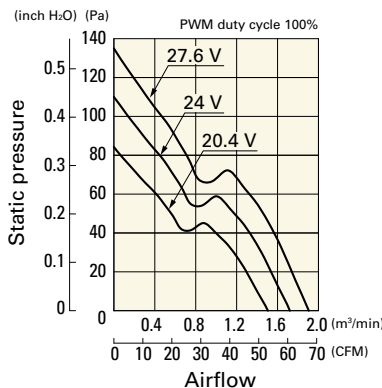


9GA0824P6G001 With pulse sensor with PWM control

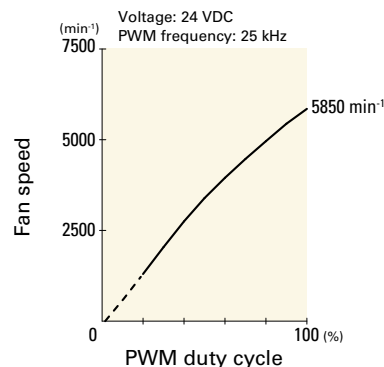
PWM duty cycle



Operating voltage range

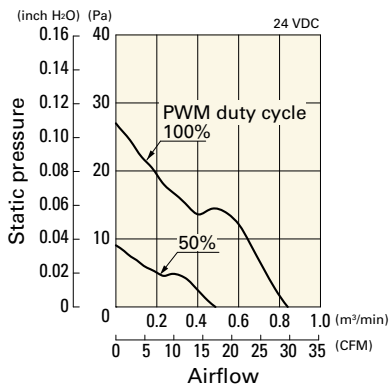


PWM duty - Speed characteristics example

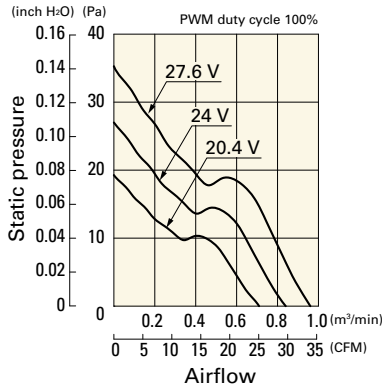


9GA0824P6M001 With pulse sensor with PWM control

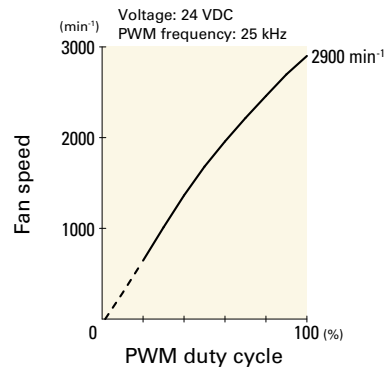
PWM duty cycle



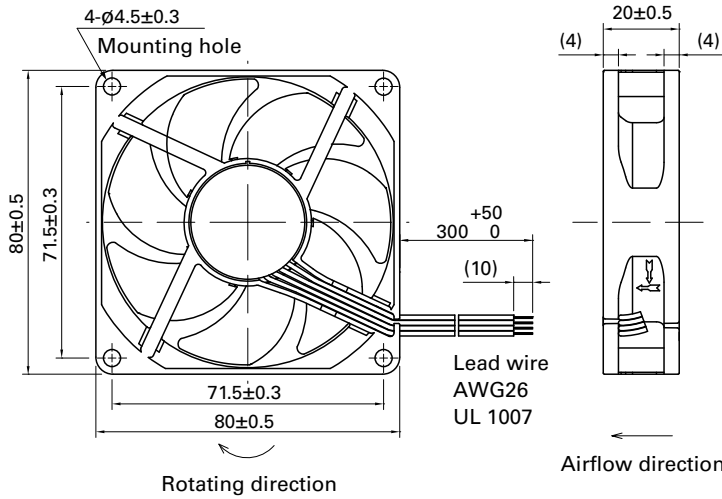
Operating voltage range



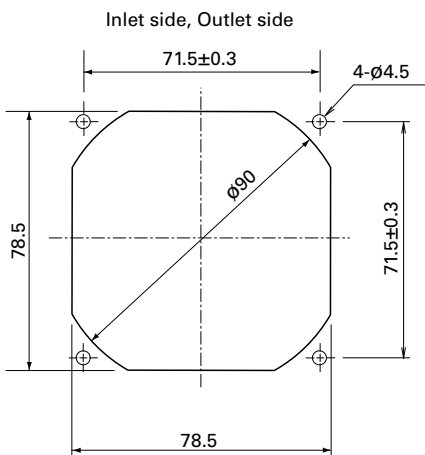
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)

DC Fan

80×80×20 mm

San Ace 80 9P_{type}   



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 100 g

Specifications

The models listed below **have ribs and a pulse sensor**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109P0848C601 | 48 | 38 to 57.6 | 0.08 | 3.84 | 3700 | 1.07 37.8 | 46 0.185 | 39 | -20 to +70 | 40000/60°C (70000/40°C) |
| 109P0848H601 | | | 0.05 | 2.4 | 2900 | 0.84 29.7 | 29.4 0.118 | 31 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 640.

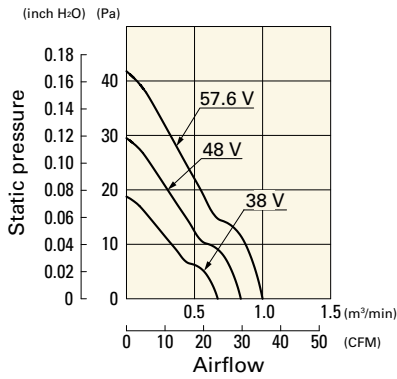
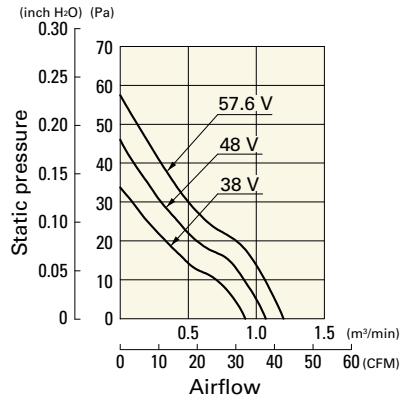
Airflow - Static Pressure Characteristics

109P0848C601 With pulse sensor

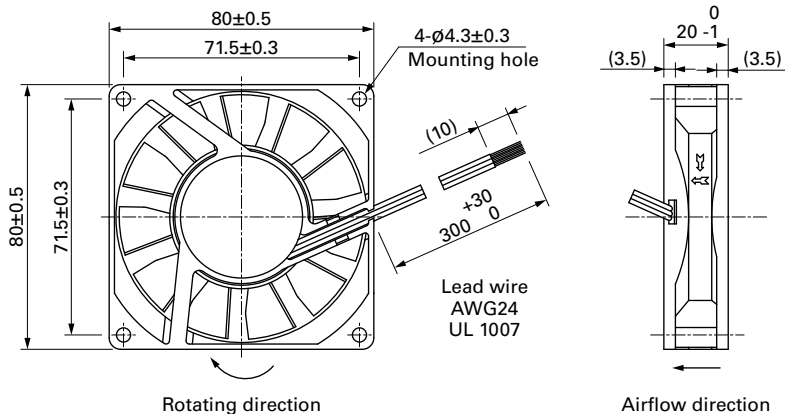
109P0848H601 With pulse sensor

Operating voltage range

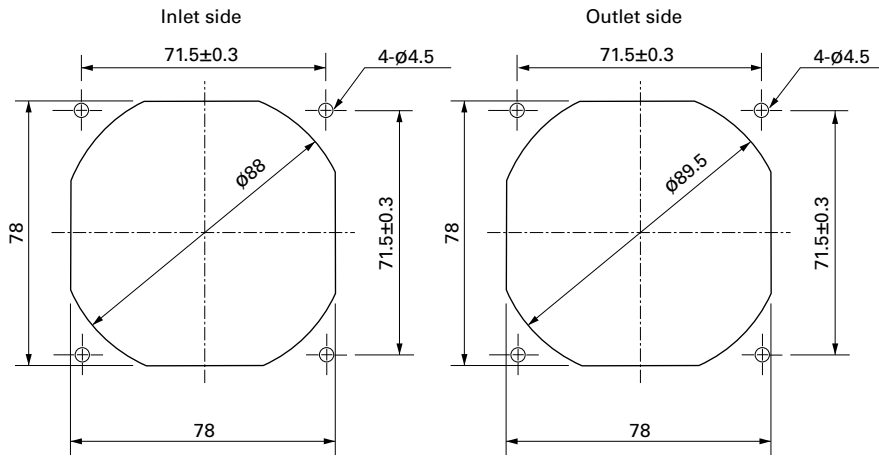
Operating voltage range



Dimensions (unit: mm)



■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



■ Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)

DC Fan



80x80x25 mm

San Ace 80 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 110 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9GA0812P4J001 | 12 | 10.8 to 13.2 | 100 | 0.6 | 7.2 | 7400 | 2.07 73.0 | 177.6 0.7 | 48 | -20 to +70 | 60000/60°C (90000/40°C) |
| | | | 25 | 0.08 | 0.96 | 2500 | 0.69 24.3 | 20.2 0.08 | 21 | | |
| ▶▶ 9GA0812P4G001 | | | 100 | 0.48 | 5.76 | 6800 | 1.91 67.4 | 150 0.6 | 45 | | |
| | | | 25 | 0.06 | 0.72 | 1500 | 0.42 14.8 | 7.2 0.02 | 17 | | |
| ▶▶ 9GA0812P4H001 | | | 100 | 0.22 | 2.64 | 5200 | 1.46 51.5 | 87.7 0.35 | 37 | | |
| | | | 25 | 0.06 | 0.72 | 1600 | 0.44 15.5 | 8.3 0.03 | 17 | | |
| ▶▶ 9GA0824P4J001 | 24 | 21.6 to 26.4 | 100 | 0.28 | 6.72 | 7400 | 2.07 73.0 | 177.6 0.7 | 48 | | |
| | | | 25 | 0.06 | 1.44 | 2800 | 0.78 27.5 | 25.4 0.1 | 23 | | |
| ▶▶ 9GA0824P4G001 | | | 100 | 0.21 | 5.04 | 6800 | 1.91 67.4 | 150 0.6 | 45 | | |
| | | | 25 | 0.04 | 0.96 | 2100 | 0.58 20.4 | 14.3 0.05 | 19 | | |
| ▶▶ 9GA0824P4H001 | | | 100 | 0.1 | 2.4 | 5200 | 1.46 51.5 | 87.7 0.35 | 37 | | |
| | | | 25 | 0.02 | 0.48 | 1500 | 0.42 14.8 | 7.2 0.02 | 17 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

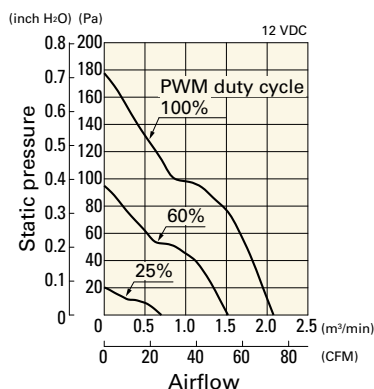
Note 1: Sensor and control options are available for selection. Refer to the table on p. 644.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

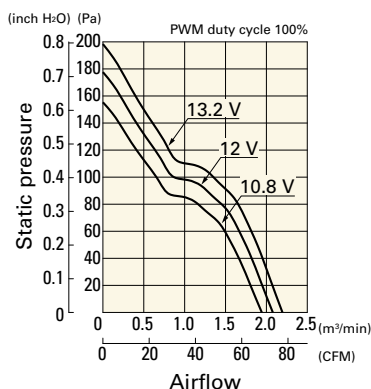
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0812P4J001 With pulse sensor with PWM control

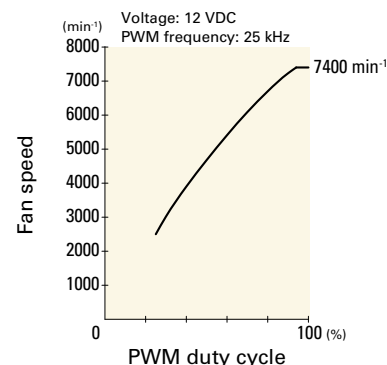
PWM duty cycle



Operating voltage range



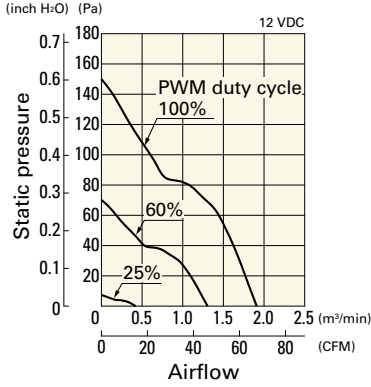
PWM duty - Speed characteristics example



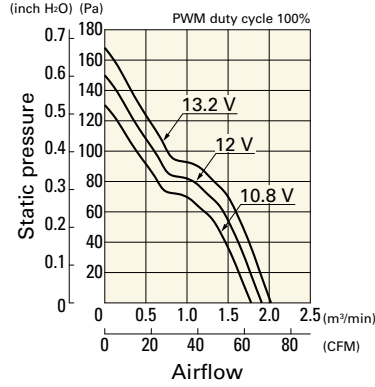
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0812P4G001 With pulse sensor with PWM control

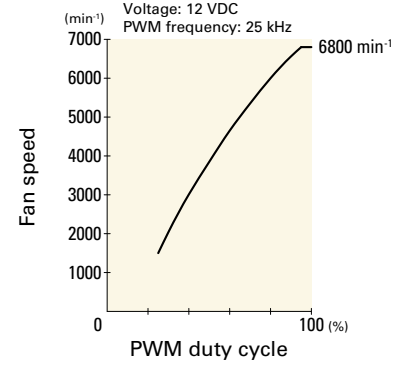
PWM duty cycle



Operating voltage range

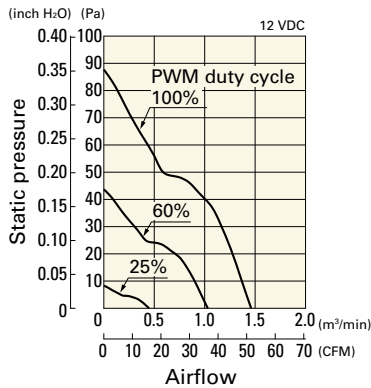


PWM duty - Speed characteristics example

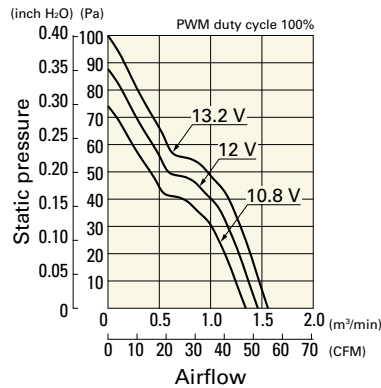


9GA0812P4H001 With pulse sensor with PWM control

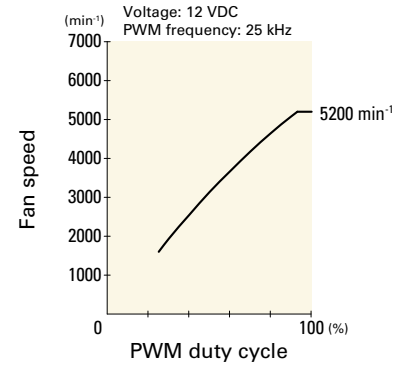
PWM duty cycle



Operating voltage range

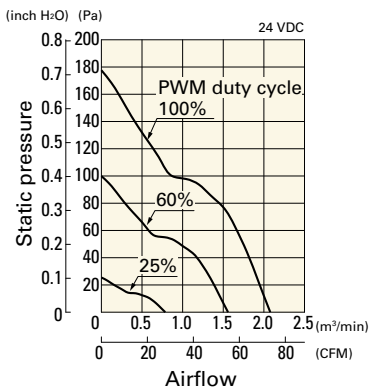


PWM duty - Speed characteristics example

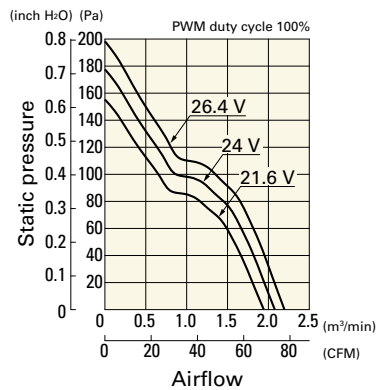


9GA0824P4J001 With pulse sensor with PWM control

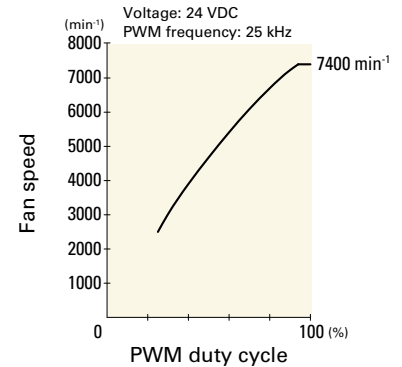
PWM duty cycle



Operating voltage range

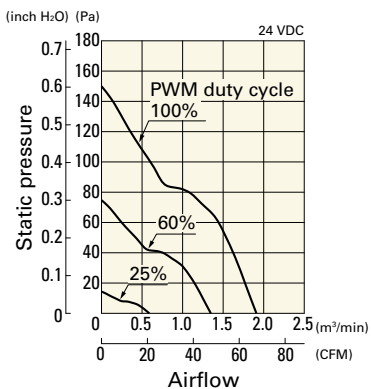


PWM duty - Speed characteristics example

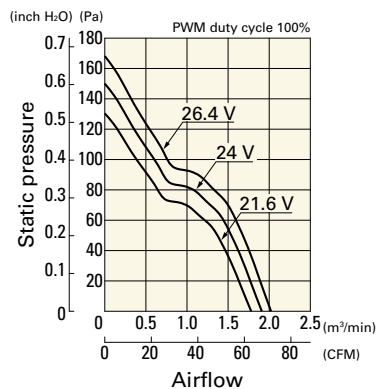


9GA0824P4G001 With pulse sensor with PWM control

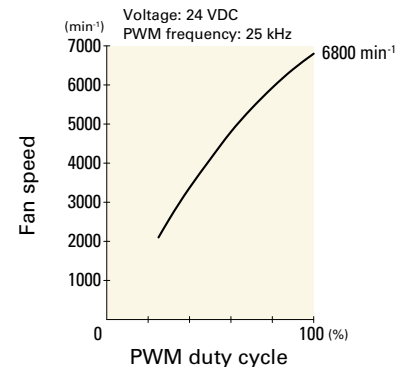
PWM duty cycle



Operating voltage range



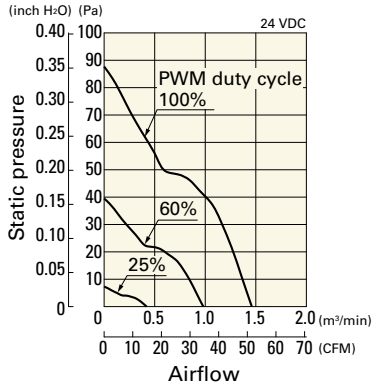
PWM duty - Speed characteristics example



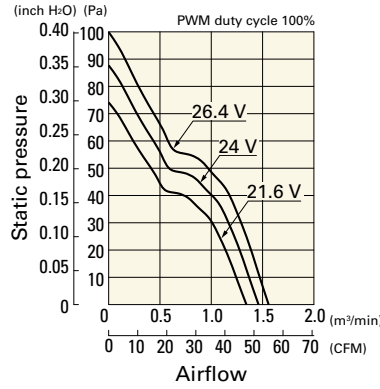
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0824P4H001 With pulse sensor with PWM control

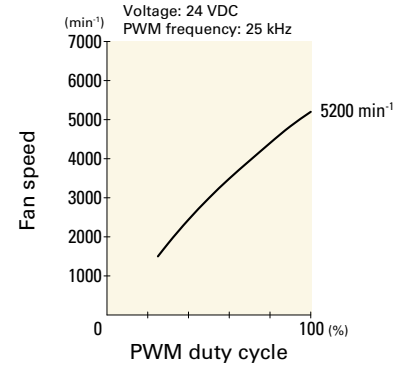
PWM duty cycle



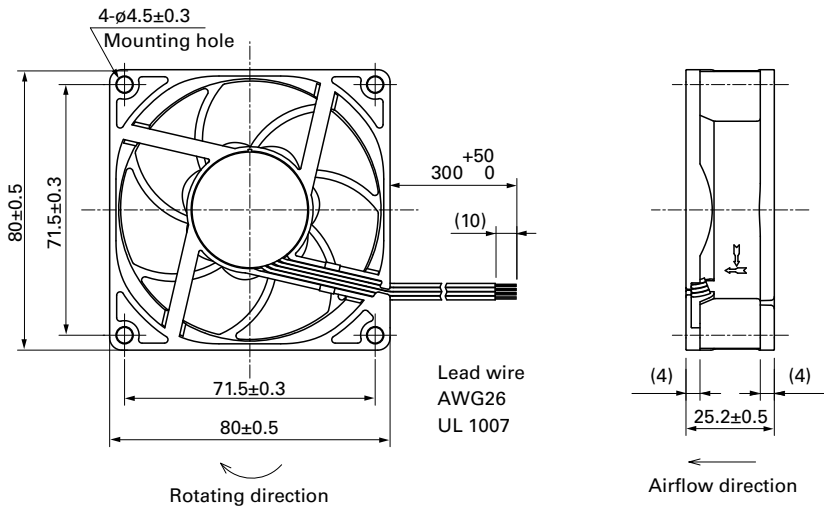
Operating voltage range



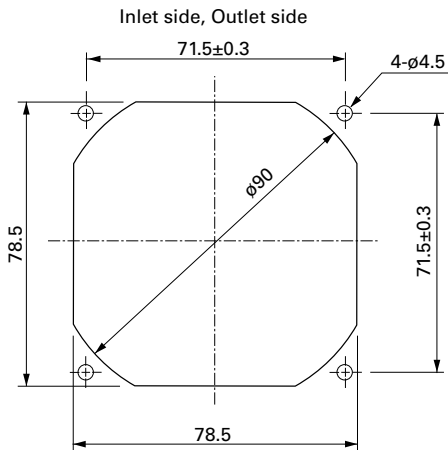
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards page: p. 605

Model no.: 109-1002G

Resin filter kits page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI), 109-1002F30 (30PPI), 109-1002F40 (40PPI)



80×80×25 mm

San Ace 80 9RA type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 110 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|------|--|------|--------------|----------------------------|----------------------------|
| » 9RA0812P4G001 | 12 | 10.8 to 13.2 | 100 | 0.22 | 2.64 | 5000 | 1.4 | 49.4 | 83 | 0.33 | 37 | -20 to +70 | 60000/60°C (90000/40°C) |
| | | | 30 | 0.03 | 0.36 | 1100 | 0.3 | 10.6 | 4 | 0.01 | 11 | | |
| » 9RA0824P4G001 | 24 | 21.6 to 26.4 | 100 | 0.11 | 2.64 | 5000 | 1.4 | 49.4 | 83 | 0.33 | 37 | | |
| | | | 20 | 0.02 | 0.48 | 1000 | 0.28 | 9.8 | 3.3 | 0.01 | 10 | | |
| » 9RA0848P4G001 | 48 | 43.2 to 52.8 | 100 | 0.07 | 3.36 | 5000 | 1.4 | 49.4 | 83 | 0.33 | 37 | | |
| | | | 20 | 0.02 | 0.96 | 1700 | 0.47 | 16.5 | 9.6 | 0.04 | 14 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|------|--|------|--------------|----------------------------|----------------------------|
| » 9RA0812G4001 | 12 | 7 to 13.8 | 0.22 | 2.64 | 5000 | 1.4 | 49.4 | 83 | 0.33 | 37 | -20 to +70 | 60000/60°C (90000/40°C) |
| » 9RA0812S4001 | | | 0.12 | 1.44 | 3900 | 1.09 | 38.5 | 50 | 0.21 | 31 | | |
| » 9RA0812H4001 | | | 0.08 | 0.96 | 3300 | 0.92 | 32.5 | 36 | 0.14 | 27 | | |
| » 9RA0812M4001 | | | 0.06 | 0.72 | 2650 | 0.74 | 26.1 | 23 | 0.09 | 22 | | |
| » 9RA0824G4001 | 24 | 14 to 27.6 | 0.11 | 2.64 | 5000 | 1.4 | 49.4 | 83 | 0.33 | 37 | | |
| » 9RA0824S4001 | | | 0.06 | 1.44 | 3900 | 1.09 | 38.5 | 50 | 0.21 | 31 | | |
| » 9RA0824H4001 | | | 0.05 | 1.2 | 3300 | 0.92 | 32.5 | 36 | 0.14 | 27 | | |
| » 9RA0824M4001 | | | 0.04 | 0.96 | 2650 | 0.74 | 26.1 | 23 | 0.09 | 22 | | |
| » 9RA0848G4001 | 48 | 36 to 55.2 | 0.07 | 3.36 | 5000 | 1.4 | 49.4 | 83 | 0.33 | 37 | | |
| » 9RA0848S4001 | | | 0.05 | 2.4 | 3900 | 1.09 | 38.5 | 50 | 0.21 | 31 | | |

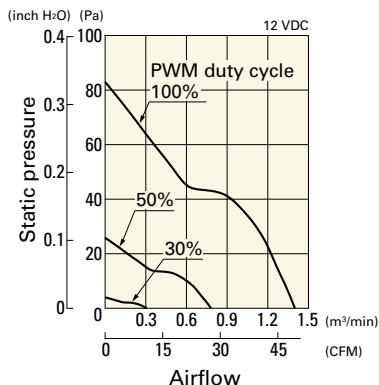
Note 1: Sensor and control options are available for selection. Refer to the table on p. 650.

Note 2: The » mark indicates Short Lead Time Service applicable models. See p. 668 for details.

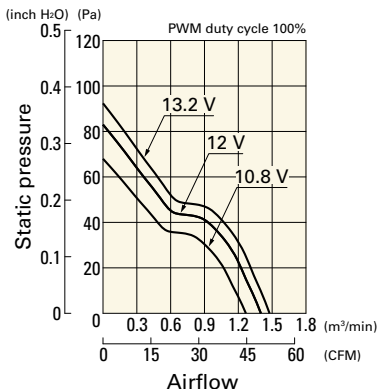
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RA0812P4G001 With pulse sensor with PWM control

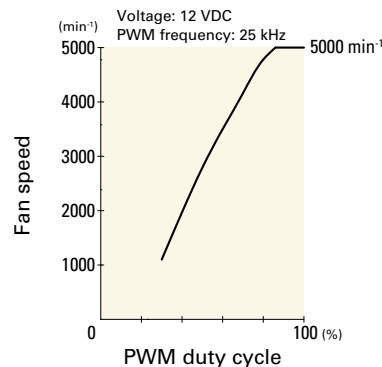
PWM duty cycle



Operating voltage range

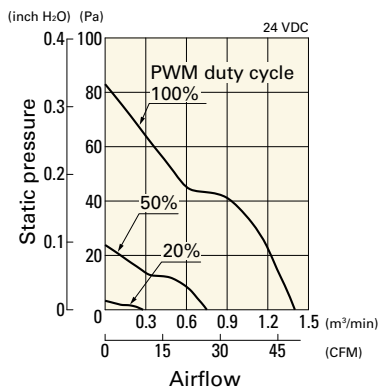


PWM duty - Speed characteristics example

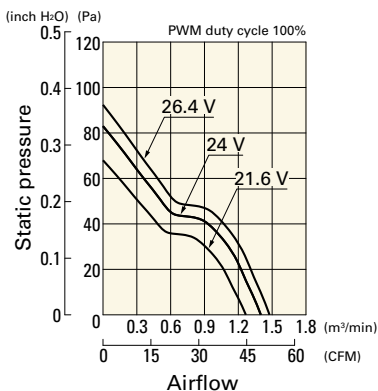


9RA0824P4G001 With pulse sensor with PWM control

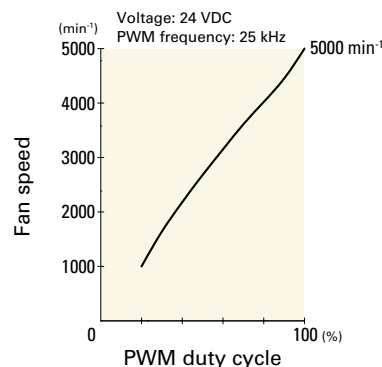
PWM duty cycle



Operating voltage range

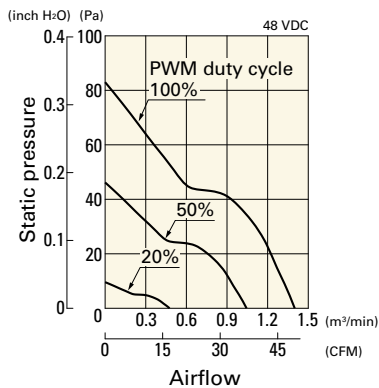


PWM duty - Speed characteristics example

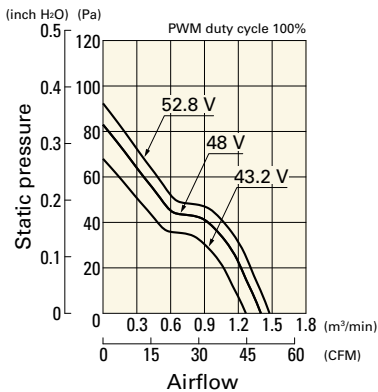


9RA0848P4G001 With pulse sensor with PWM control

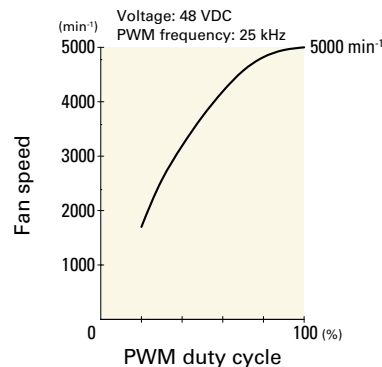
PWM duty cycle



Operating voltage range



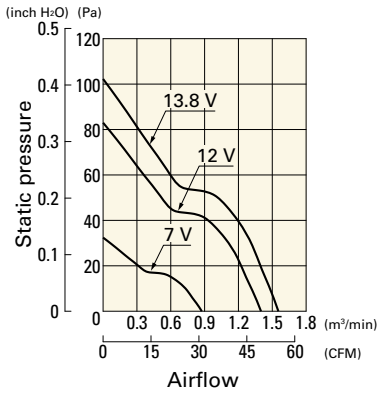
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

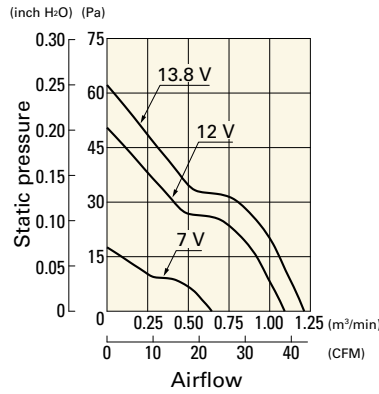
9RA0812G4001 With pulse sensor

Operating voltage range



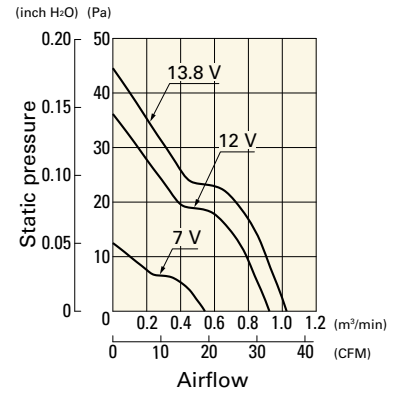
9RA0812S4001 With pulse sensor

Operating voltage range



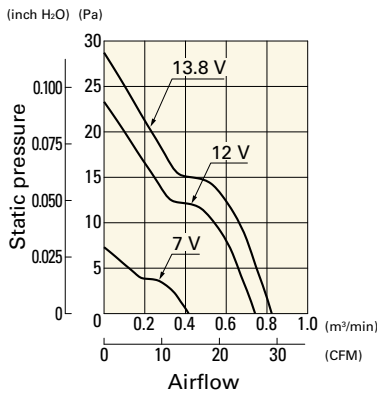
9RA0812H4001 With pulse sensor

Operating voltage range



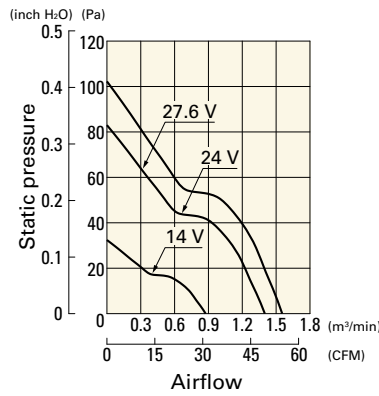
9RA0812M4001 With pulse sensor

Operating voltage range



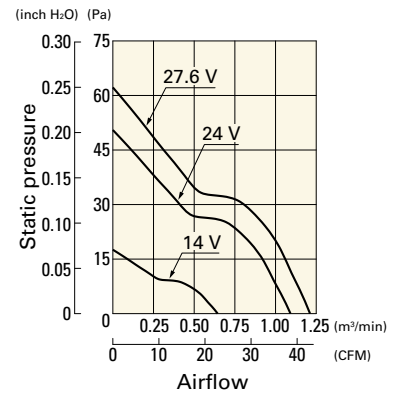
9RA0824G4001 With pulse sensor

Operating voltage range



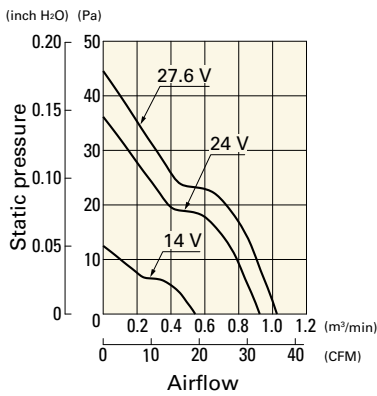
9RA0824S4001 With pulse sensor

Operating voltage range



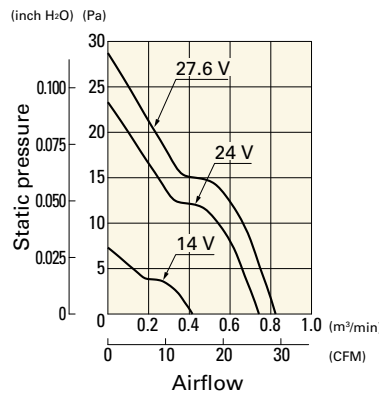
9RA0824H4001 With pulse sensor

Operating voltage range



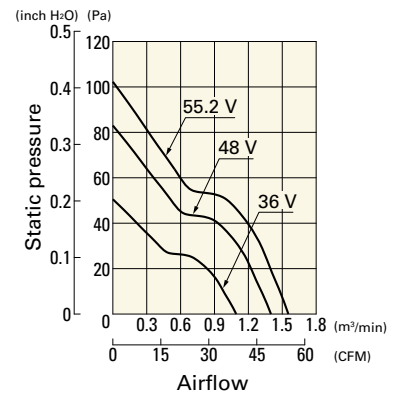
9RA0824M4001 With pulse sensor

Operating voltage range



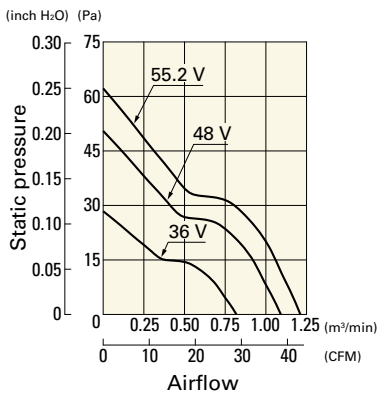
9RA0848G4001 With pulse sensor

Operating voltage range

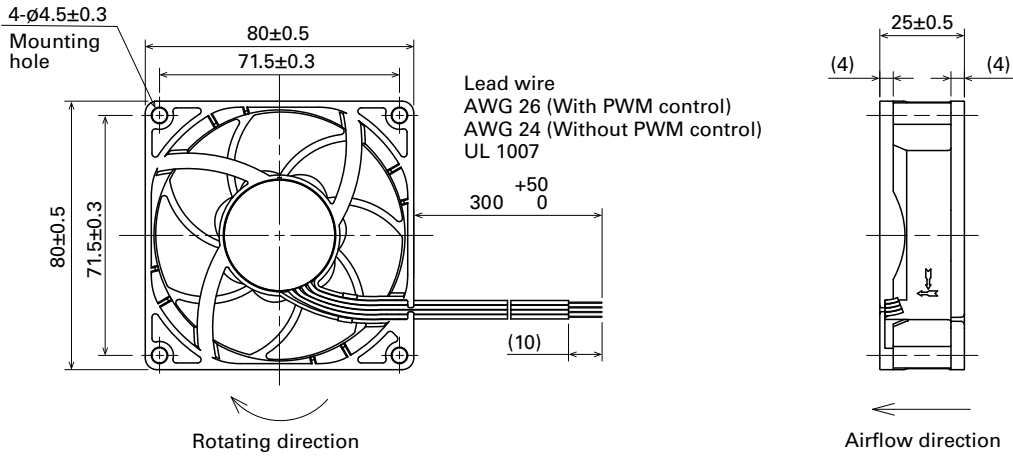


9RA0848S4001 With pulse sensor

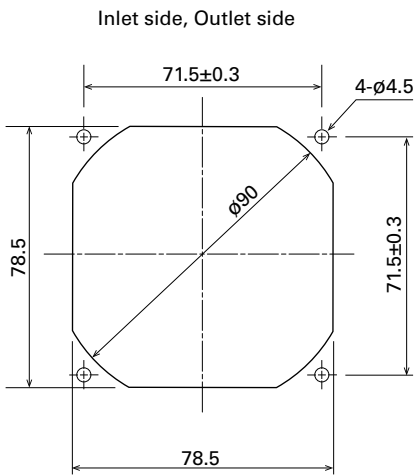
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605



Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)

80x80x25 mm

San Ace 80 9S type Silent Fan   US Model 9S0812H401 is not TÜV certified.



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 75 g

Specifications

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| » 9S0812H401 | 12 | 6 to 13.2 | 0.23 | 2.76 | 3400 | 1.12 39.5 | 52.15 0.2 | 31 | -10 to +70 | 40000/60°C (70000/40°C) |
| » 9S0812F401 | | 6 to 13.8 | 0.11 | 1.32 | 2800 | 0.93 32.8 | 35.5 0.143 | 24 | | |
| » 9S0812M401 | | 7 to 13.8 | 0.08 | 0.96 | 2500 | 0.83 29.3 | 27.5 0.11 | 22 | | |
| » 9S0812L401 | | | 0.05 | 0.6 | 2000 | 0.66 23.3 | 18.1 0.073 | 16 | | |
| » 9S0824M401 | 24 | 10 to 26.4 | 0.06 | 1.44 | 2500 | 0.83 29.3 | 27.5 0.11 | 22 | | |
| » 9S0824L401 | | | 0.04 | 0.96 | 2000 | 0.66 23.3 | 18.1 0.073 | 16 | | |

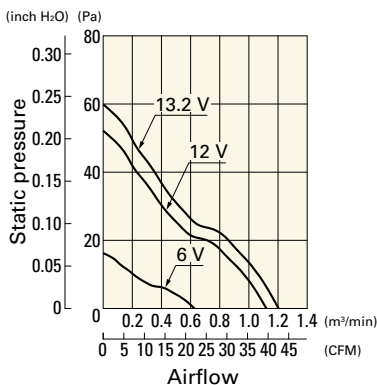
Note 1: Sensor and control options are available for selection. Refer to the table on p. 653.

Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

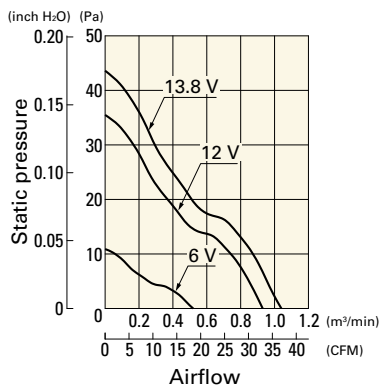
9S0812H401 With pulse sensor

Operating voltage range



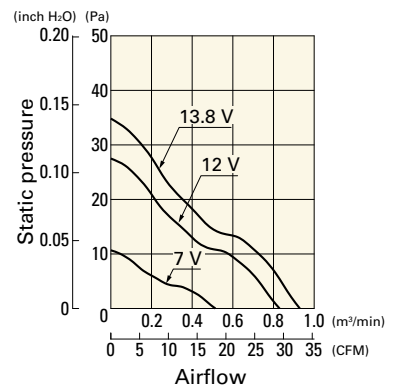
9S0812F401 With pulse sensor

Operating voltage range



9S0812M401 With pulse sensor

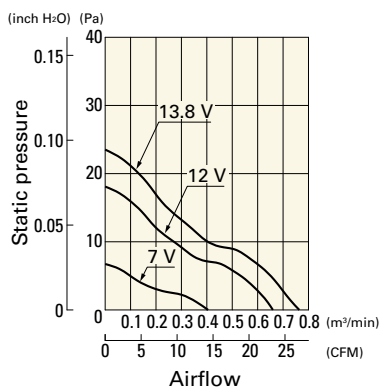
Operating voltage range



Airflow - Static Pressure Characteristics

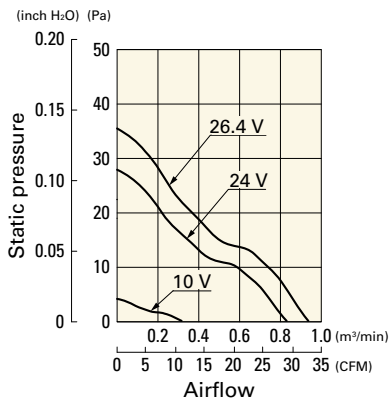
9S0812L401 With pulse sensor

Operating voltage range



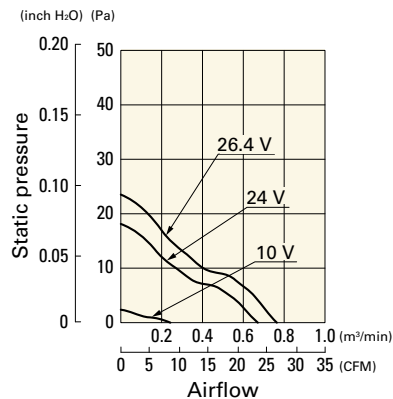
9S0824M401 With pulse sensor

Operating voltage range

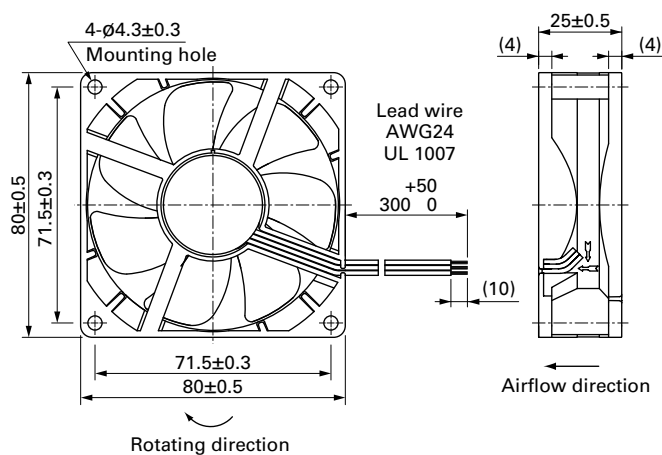


9S0824L401 With pulse sensor

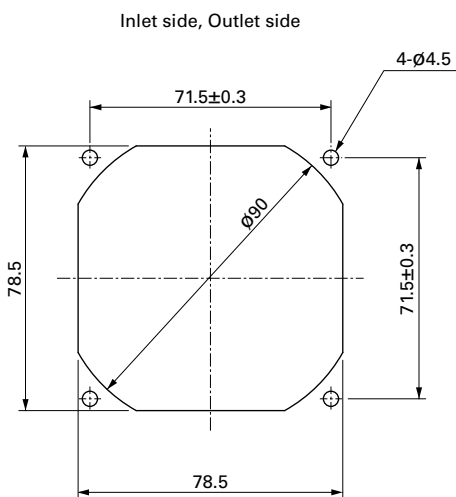
Operating voltage range



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI), 109-1002F30 (30PPI), 109-1002F40 (40PPI)



80×80×32 mm

San Ace 80 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 130 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|------|--|------|--------------|----------------------------|----------------------------|------------|
| » 9GA0812P2S001 | 12 | 10.2 to 13.8 | 100 | 0.83 | 9.96 | 9700 | 2.45 | 86.5 | 360 | 1.45 | 57 | -20 to +70 | 40000/60°C (70000/40°C) | |
| » 9GA0812P2H001 | | | 0 | 0.08 | 0.96 | 2800 | 0.71 | 25.1 | 30 | 0.12 | 24 | | | |
| » 9GA0812P2M001 | | | 100 | 0.59 | 7.08 | 8700 | 2.2 | 77.7 | 294 | 1.18 | 54 | | | |
| » 9GA0824P2S001 | | 24 | 20.4 to 27.6 | 100 | 0.35 | 4.2 | 6700 | 1.69 | 59.6 | 171 | 0.68 | 47 | | -20 to +55 |
| | | | | 0 | 0.04 | 0.48 | 1400 | 0.35 | 12.3 | 7.5 | 0.03 | 10 | | |
| | | | | 100 | 0.42 | 10.1 | 9700 | 2.45 | 86.5 | 360 | 1.45 | 57 | | |
| » 9GA0848P2S001 | 48 | 40.8 to 55.2 | 100 | 0.22 | 10.56 | 9700 | 2.45 | 86.5 | 360 | 1.45 | 57 | -10 to +70 | | |
| | | | 0 | 0.04 | 1.92 | 2800 | 0.71 | 25.1 | 30 | 0.12 | 24 | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|------|--|------|--------------|----------------------------|----------------------------|
| » 9GA0812A2001 | 12 | 6 to 13.2 | 0.31 | 3.72 | 6000 | 1.51 | 53.4 | 137.7 | 0.55 | 44 | -20 to +70 | 40000/60°C (70000/40°C) |
| » 9GA0812B2001 | | 6 to 13.8 | 0.13 | 1.56 | 4000 | 1.01 | 35.7 | 61.2 | 0.25 | 33 | | |
| » 9GA0812L2001 | | 7 to 13.8 | 0.08 | 0.96 | 2600 | 0.66 | 23.3 | 26 | 0.1 | 21 | | |
| » 9GA0824A2001 | 24 | 12 to 26.4 | 0.15 | 3.6 | 6000 | 1.51 | 53.4 | 137.7 | 0.55 | 44 | -20 to +70 | |
| » 9GA0824B2001 | | 12 to 27.6 | 0.08 | 1.92 | 4000 | 1.01 | 35.7 | 61.2 | 0.25 | 33 | | |
| » 9GA0824L2001 | | 14 to 27.6 | 0.05 | 1.2 | 2600 | 0.66 | 23.3 | 26 | 0.1 | 21 | | |

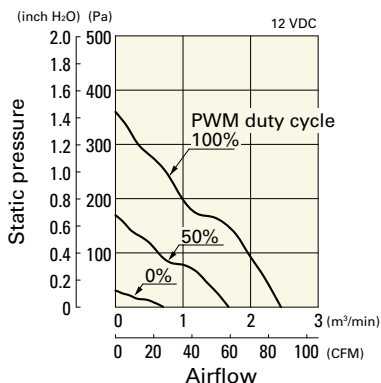
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 643 to 644.

Note 2: The » mark indicates Short Lead Time Service applicable models. See p. 668 for details.

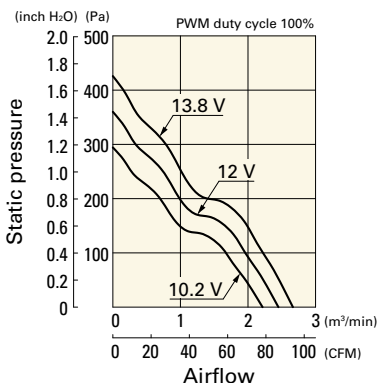
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0812P2S001 With pulse sensor with PWM control

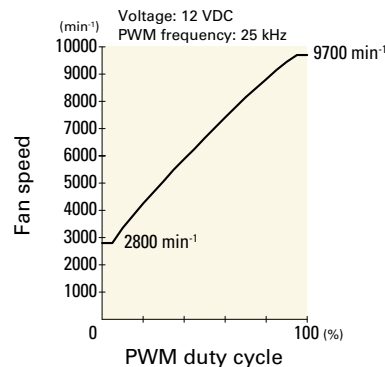
PWM duty cycle



Operating voltage range

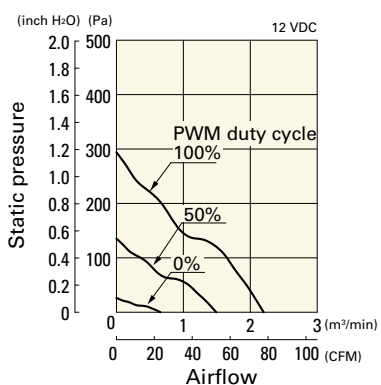


PWM duty - Speed characteristics example

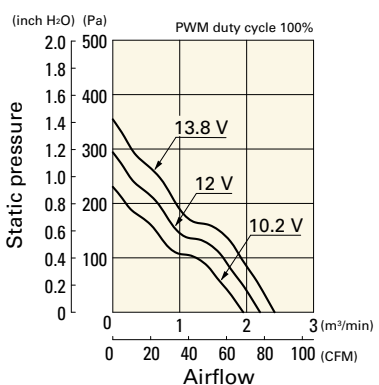


9GA0812P2H001 With pulse sensor with PWM control

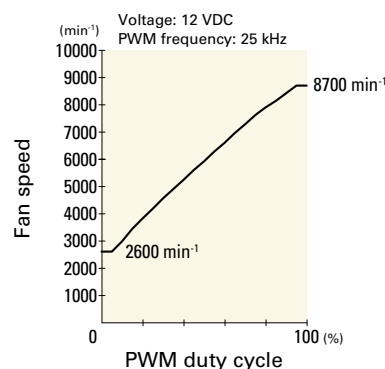
PWM duty cycle



Operating voltage range

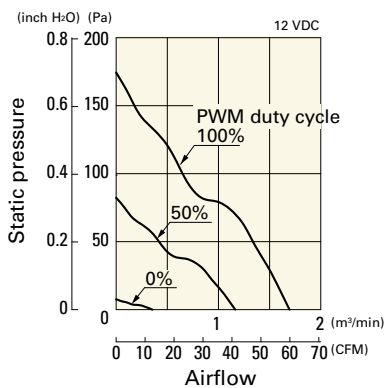


PWM duty - Speed characteristics example

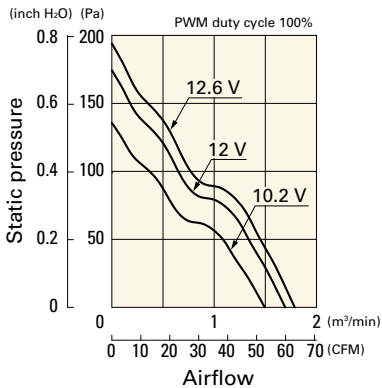


9GA0812P2M001 With pulse sensor with PWM control

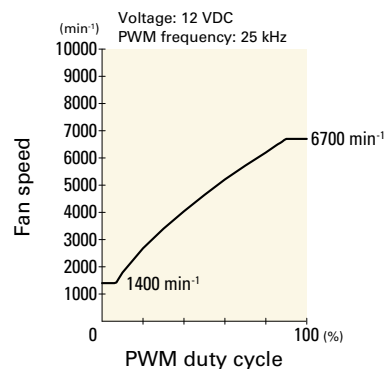
PWM duty cycle



Operating voltage range

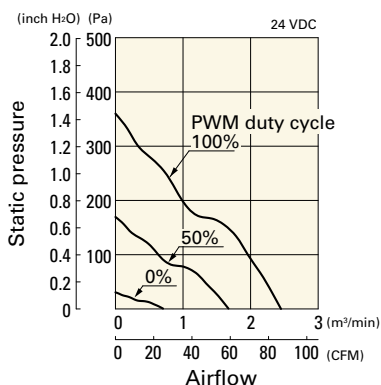


PWM duty - Speed characteristics example

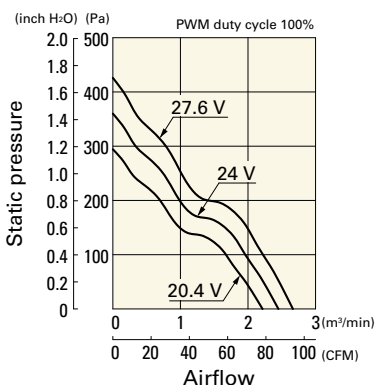


9GA0824P2S001 With pulse sensor with PWM control

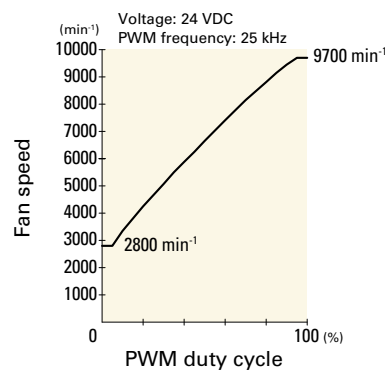
PWM duty cycle



Operating voltage range



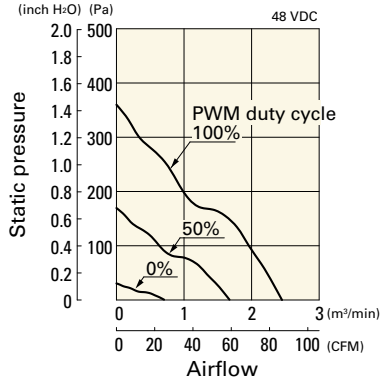
PWM duty - Speed characteristics example



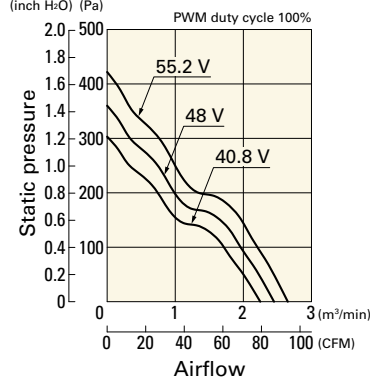
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0848P2S001 With pulse sensor with PWM control

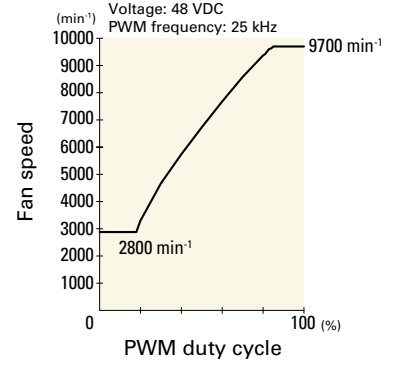
PWM duty cycle



Operating voltage range



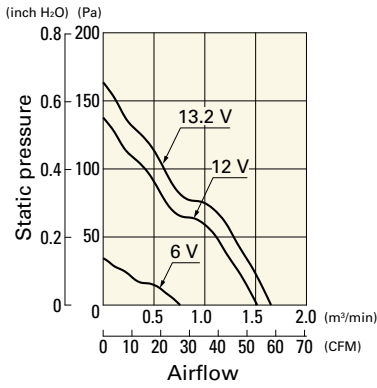
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

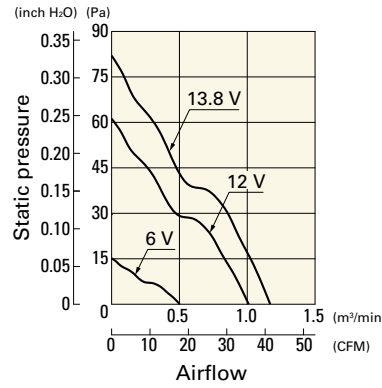
9GA0812A2001 With pulse sensor

Operating voltage range



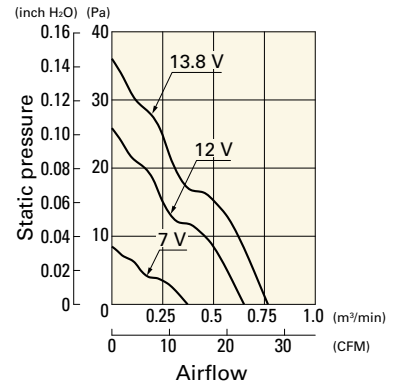
9GA0812B2001 With pulse sensor

Operating voltage range



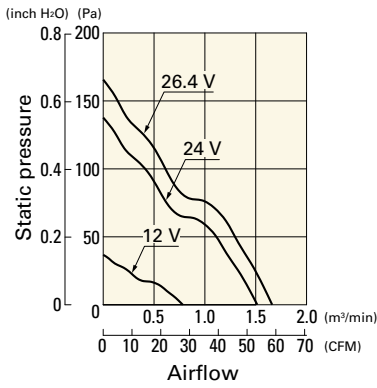
9GA0812L2001 With pulse sensor

Operating voltage range



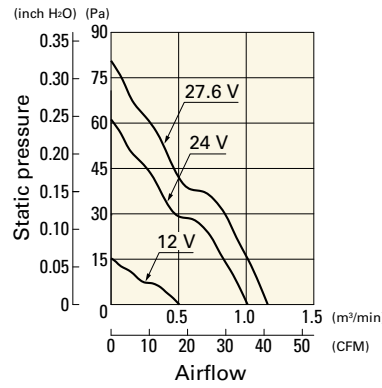
9GA0824A2001 With pulse sensor

Operating voltage range



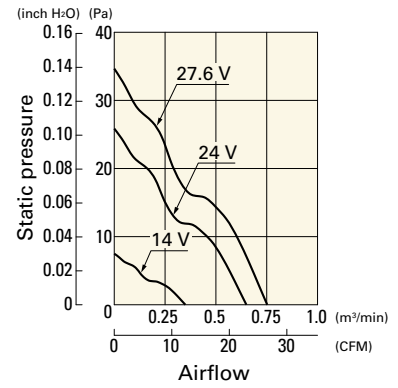
9GA0824B2001 With pulse sensor

Operating voltage range

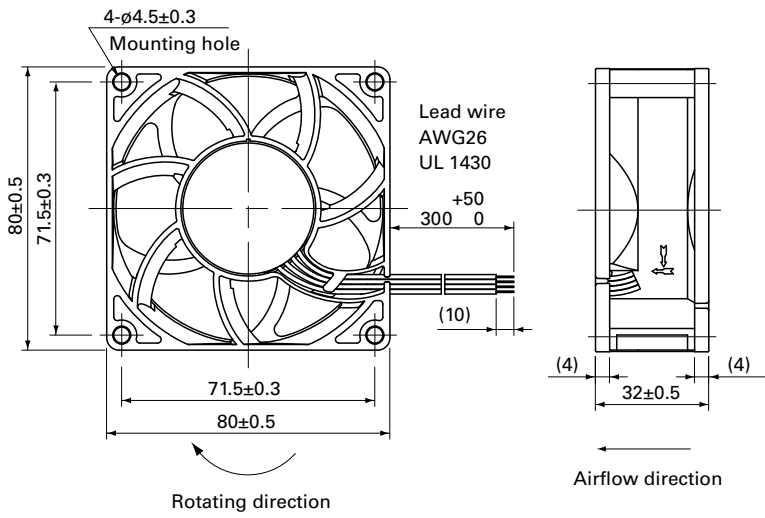


9GA0824L2001 With pulse sensor

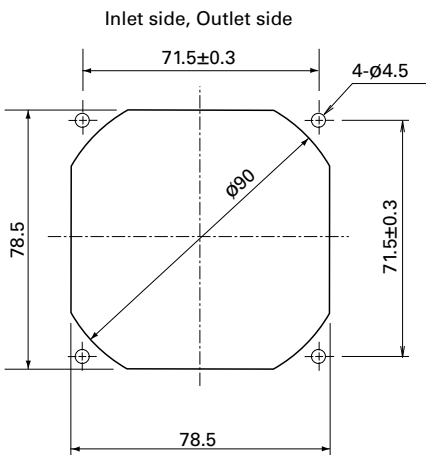
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)



80x80x38 mm

San Ace 80 9HVB type US

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 230 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9HVB0812P1G001 | 12 | 10.8 to 12.6 | 100 | 4.8 | 57.6 | 18300 | 4.0 141.3 | 1600 6.42 | 75 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.17 | 2.0 | 4300 | 0.94 33.2 | 105 0.42 | 40 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

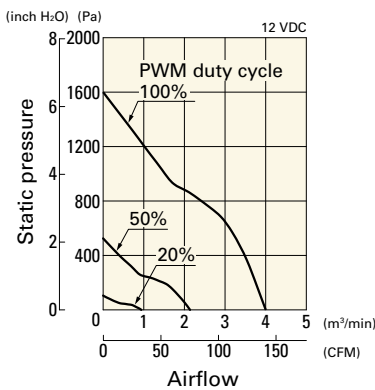
Note 1: Sensor and control options are available for selection. Refer to the table on p. 647.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

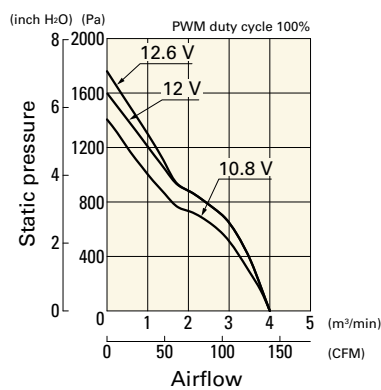
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HVB0812P1G001 With pulse sensor with PWM control

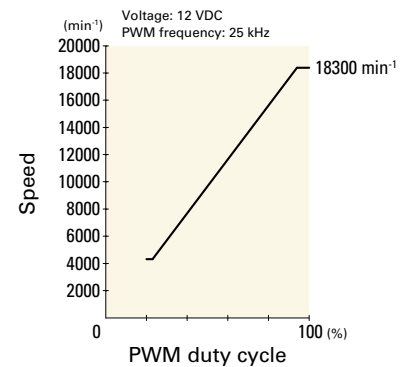
PWM duty cycle



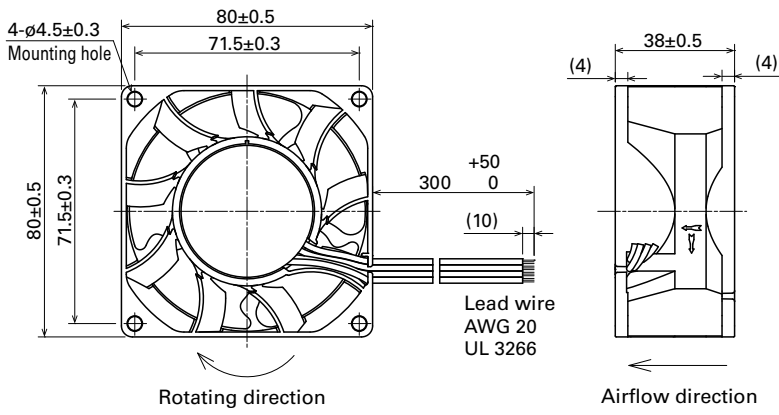
Operating voltage range



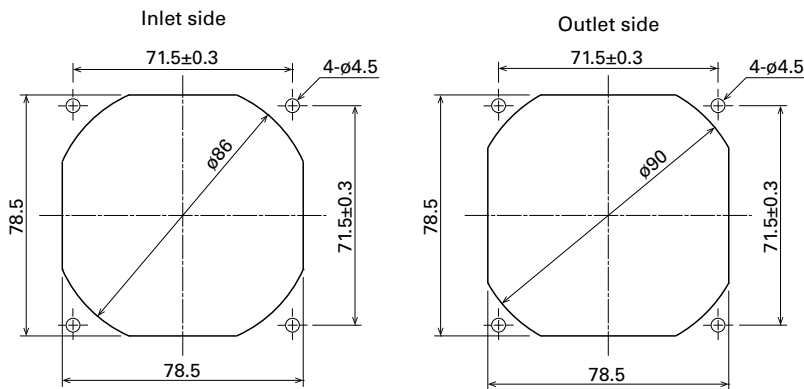
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)



80x80x38 mm

San Ace 80 9HVA type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 220 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

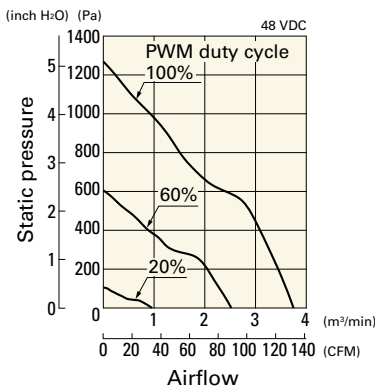
| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9HVA0848P1G601 | 48 | 36 to 57 | 100 | 0.9 | 43.2 | 16100 | 3.75 132 | 1250 5.0 | 73 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.07 | 3.36 | 4200 | 0.96 33.9 | 105 0.42 | 44 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

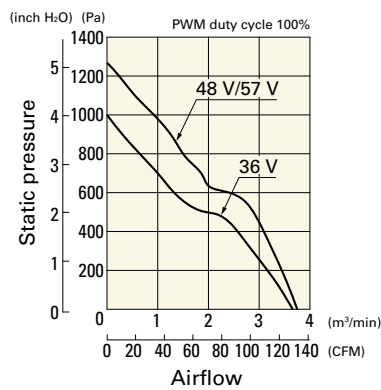
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HVA0848P1G601 With pulse sensor with PWM control

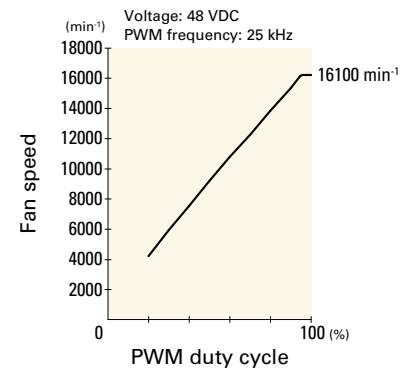
PWM duty cycle



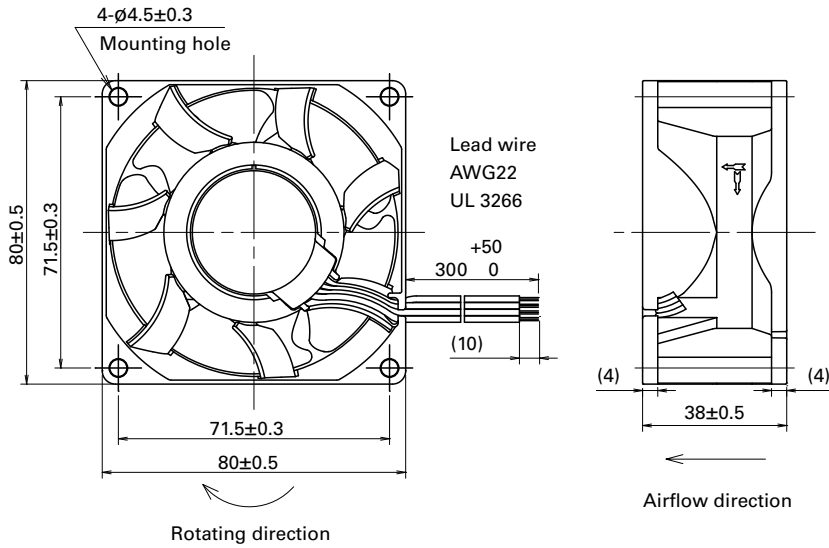
Operating voltage range



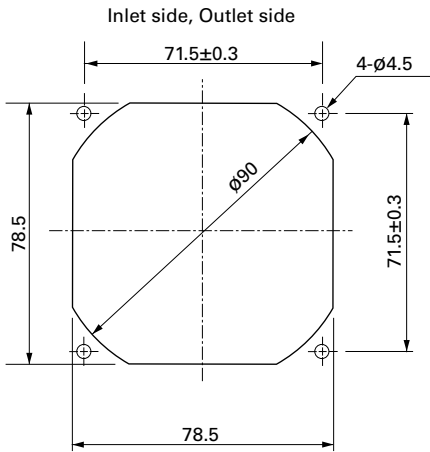
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards page: p. 605

Model no.: 109-1002G

Resin filter kits page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)



80×80×38 mm

San Ace 80 9HV type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 230 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9HV0812P1G601 | 12 | 10.8 to 13.2 | 100 | 3.4 | 40.8 | 14900 | 3.7 130.7 | 1000 4.0 | 69 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.25 | 3 | 4400 | 1.06 37.5 | 87.2 0.35 | 40 | | |
| ▶▶ 9HV0824P1G003 | 24 | 21.6 to 26.4 | 100 | 1.7 | 40.8 | 14900 | 3.7 130.7 | 1000 4.0 | 69 | | |
| | | | 100 | 0.85 | 40.8 | 14900 | 3.7 130.7 | 1000 4.0 | 69 | | |
| ▶▶ 9HV0848P1G001 | 48 | 36 to 57 | 0 | 0.13 | 6.24 | 4400 | 1.06 37.5 | 87.2 0.35 | 40 | -10 to +70 | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note 1: The model number of the ribless model for 9HV0824P1G003 is 9HV0824P1G0011.

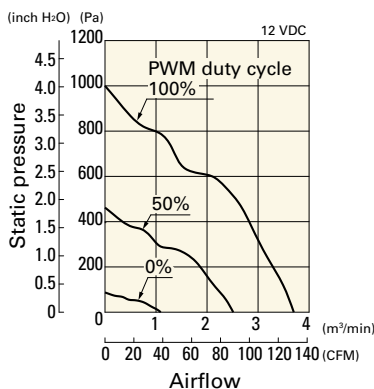
Note 2: Sensor and control options are available for selection. Refer to the table on p. 647.

Note 3: The ▶▶ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

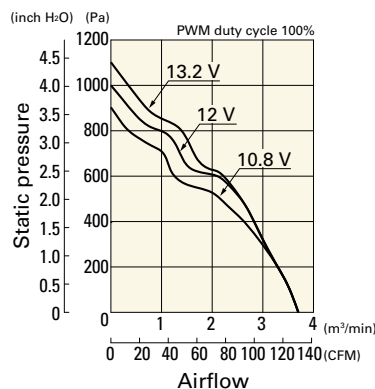
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV0812P1G601 With pulse sensor with PWM control

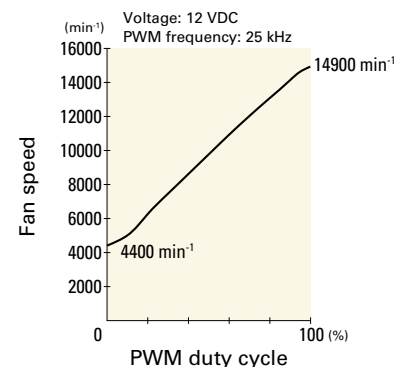
PWM duty cycle



Operating voltage range



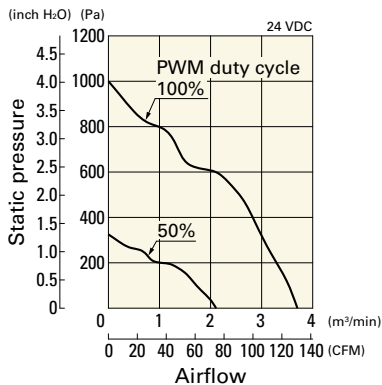
PWM duty - Speed characteristics example



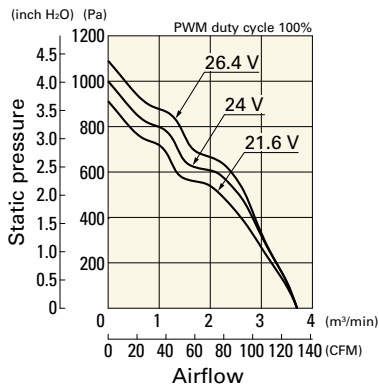
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV0824P1G003 With pulse sensor with PWM control

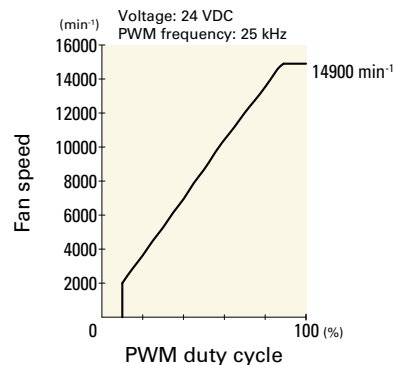
PWM duty cycle



Operating voltage range

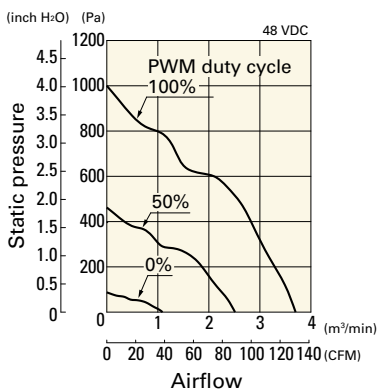


PWM duty - Speed characteristics example

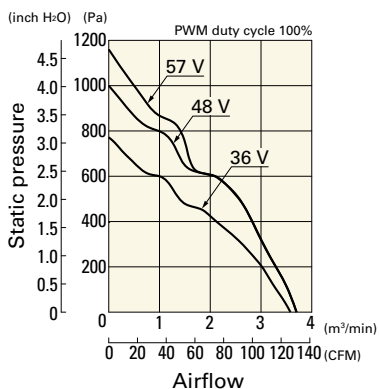


9HV0848P1G001 With pulse sensor with PWM control

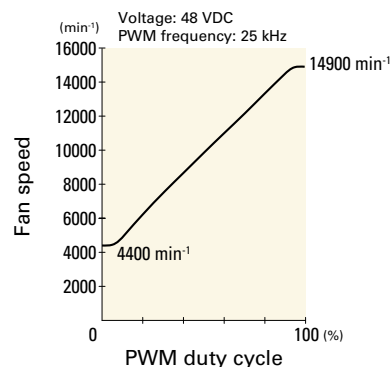
PWM duty cycle



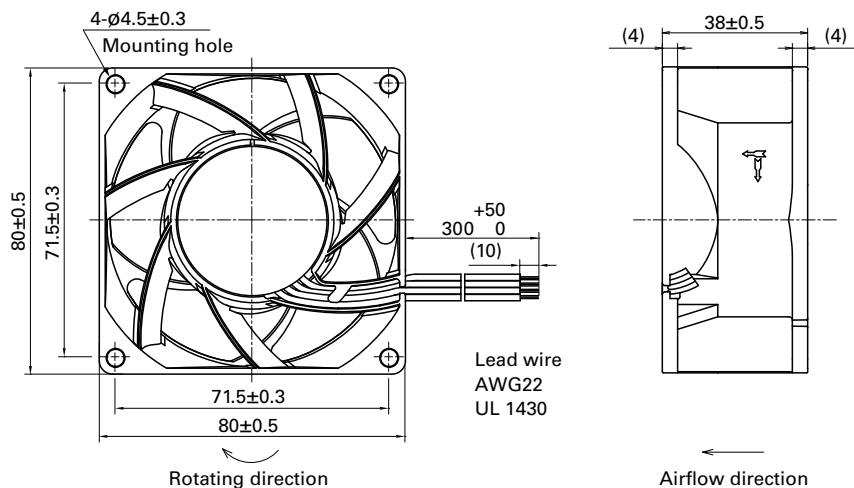
Operating voltage range



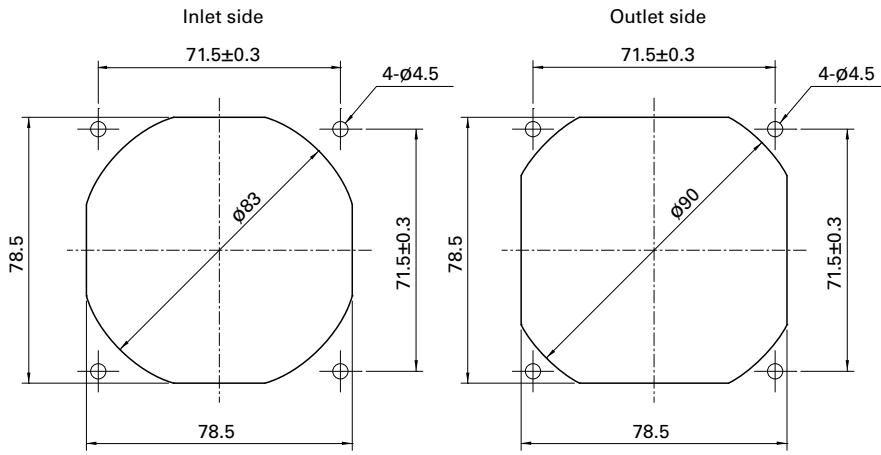
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)



80×80×38 mm

San Ace 80 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 160 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0812P1G61 | 12 | 10.8 to 13.2 | 100 | 1.2 | 14.4 | 10500 | 2.85 100.6 | 480 1.93 | 60 | -20 to +70 | 40000/60°C (70000/40°C) |
| 0 | | | 0.07 | 0.48 | 2000 | 0.51 18.0 | 28.7 0.11 | 21 | | | |
| 9GA0812P1S61 | | | 100 | 0.94 | 11.28 | 9550 | 2.6 91.8 | 480 1.93 | 59 | | |
| 0 | | | 0.1 | 1.2 | 2900 | 0.74 26.1 | 60 0.24 | 27 | | | |
| 9GA0812P1H61 | 24 | 20.4 to 27.6 | 100 | 0.6 | 7.2 | 8250 | 2.25 79.4 | 380 1.53 | 55 | | |
| 0 | | | 0.08 | 0.96 | 2500 | 0.64 22.6 | 45 0.18 | 24 | | | |
| 9GA0824P1S61 | 24 | 20.4 to 27.6 | 100 | 0.47 | 11.28 | 9550 | 2.6 91.8 | 480 1.93 | 59 | | |
| 0 | | | 0.06 | 1.44 | 2900 | 0.74 26.1 | 60 0.24 | 27 | | | |
| 9GA0824P1H61 | | | 100 | 0.3 | 7.2 | 8250 | 2.25 79.4 | 380 1.53 | 55 | | |
| 0 | | | 0.05 | 1.2 | 2500 | 0.64 22.6 | 45 0.18 | 24 | | | |
| 9GA0848P1S61 | 48 | 40.8 to 55.2 | 100 | 0.25 | 12 | 9550 | 2.6 91.8 | 480 1.93 | 59 | | |
| 0 | | | 0.04 | 1.92 | 2900 | 0.74 26.1 | 60 0.24 | 27 | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

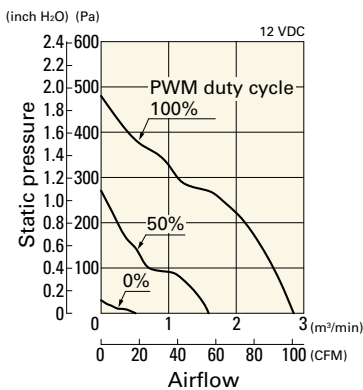
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 643 to 644.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

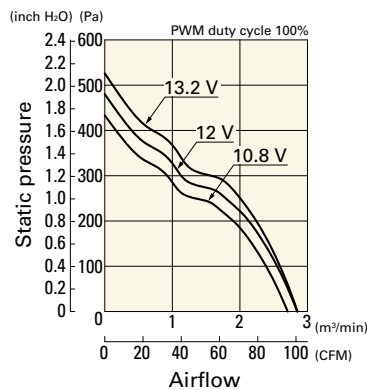
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0812P1G61 With pulse sensor with PWM control

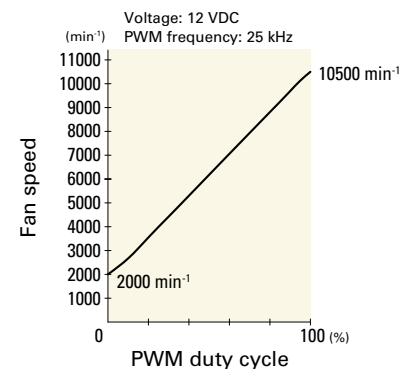
PWM duty cycle



Operating voltage range



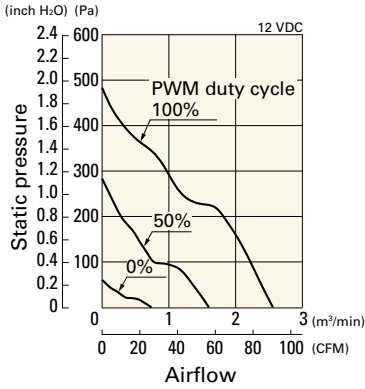
PWM duty - Speed characteristics example



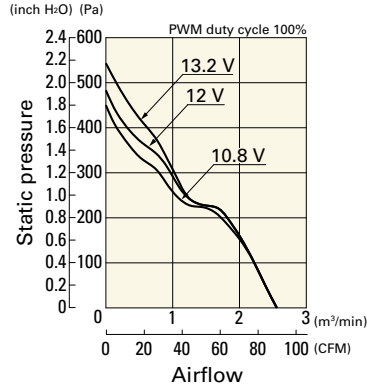
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0812P1S61 With pulse sensor with PWM control

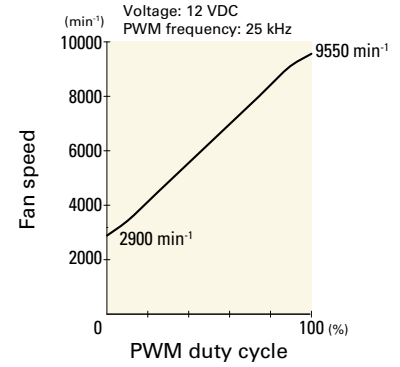
PWM duty cycle



Operating voltage range

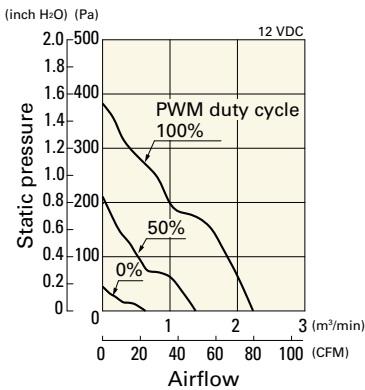


PWM duty - Speed characteristics example

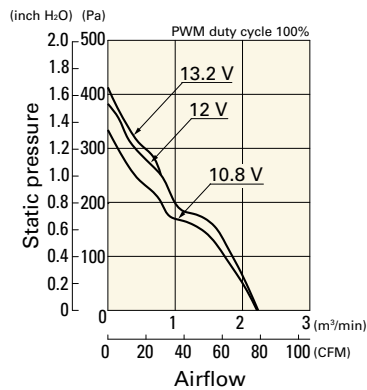


9GA0812P1H61 With pulse sensor with PWM control

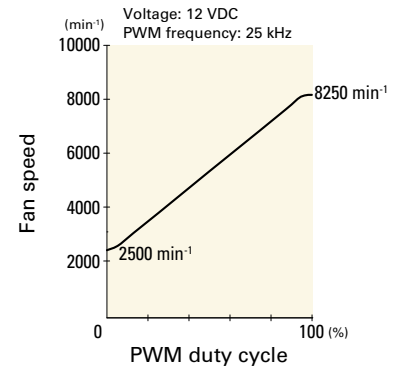
PWM duty cycle



Operating voltage range

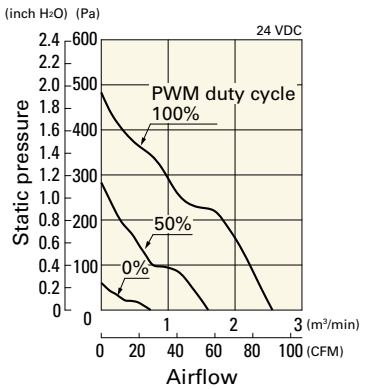


PWM duty - Speed characteristics example

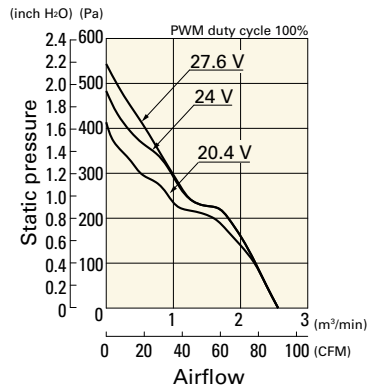


9GA0824P1S61 With pulse sensor with PWM control

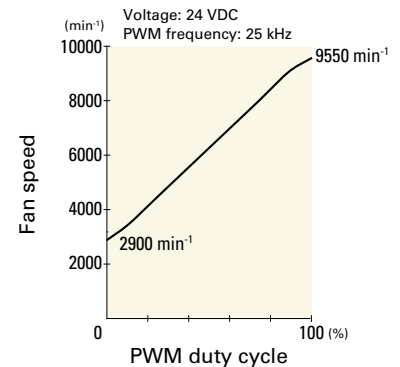
PWM duty cycle



Operating voltage range

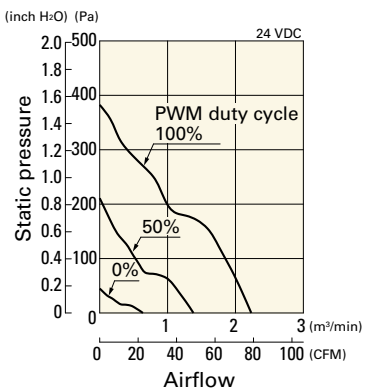


PWM duty - Speed characteristics example

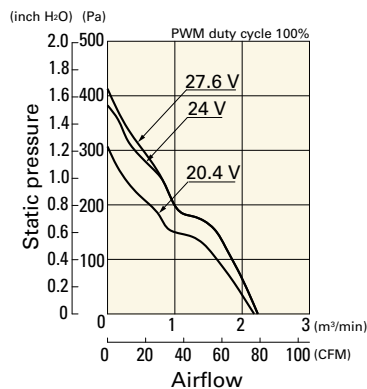


9GA0824P1H61 With pulse sensor with PWM control

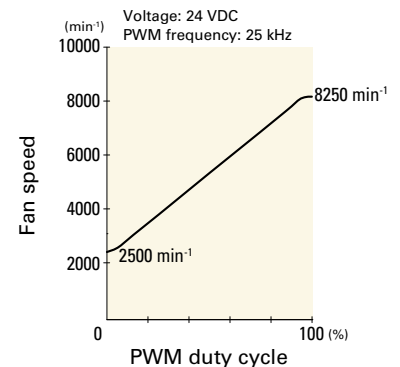
PWM duty cycle



Operating voltage range



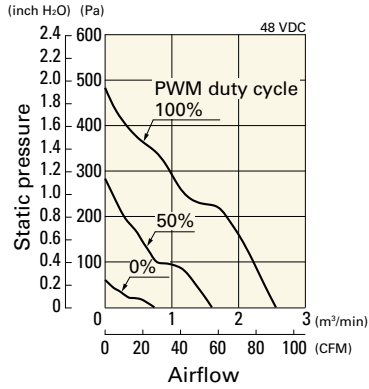
PWM duty - Speed characteristics example



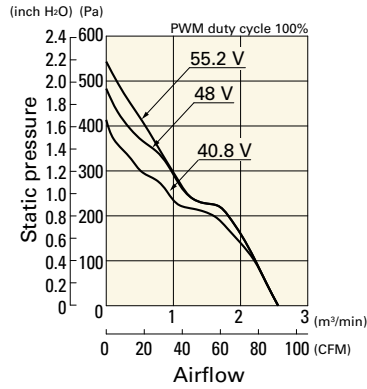
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0848P1S61 With pulse sensor with PWM control

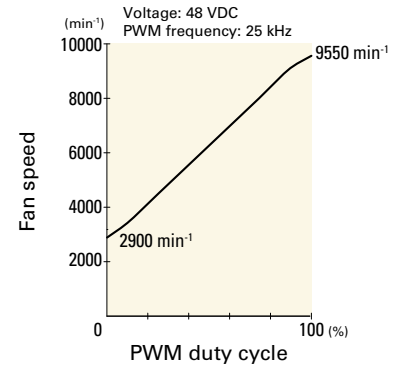
PWM duty cycle



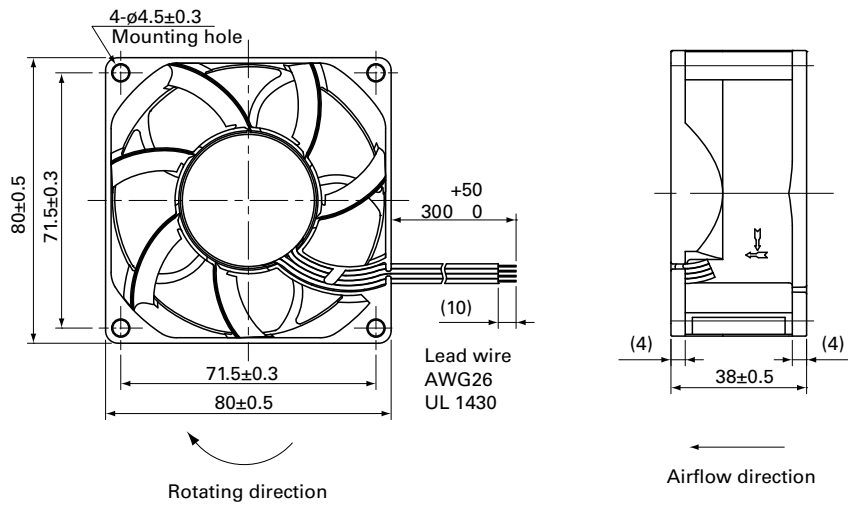
Operating voltage range



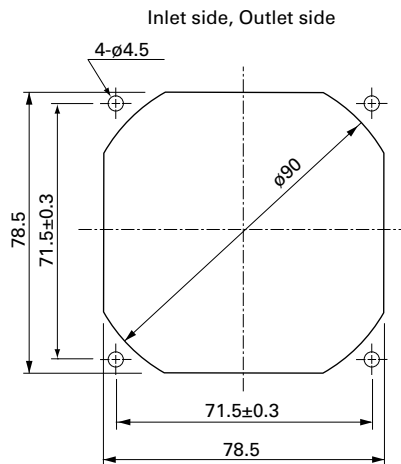
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)



80x80x38 mm

San Ace 80 9GV type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 220 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GV0812P1G03 | 12 | 10.8 to 13.2 | 100 | 3.8 | 45.6 | 10200 | 3.9 138.0 | 490.0 1.97 | 65 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.32 | 3.84 | 3000 | 1.15 40.6 | 42.4 0.17 | 34 | | |
| 9GV0812P1H03 | 12 | 10.8 to 13.2 | 100 | 3.0 | 36.0 | 9700 | 3.7 131.0 | 440.0 1.77 | 63 | | |
| | | | 0 | 0.2 | 2.4 | 2900 | 1.11 39.2 | 39.0 0.16 | 34 | | |
| 9GV0812P1F03 | 12 | 10.2 to 13.8 | 100 | 1.5 | 18 | 8000 | 3.05 108.0 | 301.0 1.21 | 58 | | |
| | | | 0 | 0.12 | 1.44 | 2400 | 0.92 32.0 | 27.1 0.11 | 26 | | |
| 9GV0812P1M03 | 12 | 10.2 to 13.8 | 100 | 0.75 | 9 | 6000 | 2.29 81.0 | 169.0 0.68 | 51 | | |
| | | | 0 | 0.09 | 1.08 | 1700 | 0.65 23.0 | 13.6 0.05 | 19 | | |
| 9GV0824P1G03 | 24 | 20.4 to 27.6 | 100 | 1.6 | 38.4 | 10200 | 3.9 138.0 | 490.0 1.97 | 65 | | |
| | | | 0 | 0.3 | 7.2 | 4700 | 1.79 63.2 | 104.0 0.41 | 44 | | |
| 9GV0848P1G03 | 48 | 40.8 to 55.2 | 100 | 0.84 | 40.32 | 10200 | 3.9 138.0 | 490.0 1.97 | 65 | | |
| | | | 0 | 0.15 | 7.2 | 4700 | 1.79 63.2 | 104.0 0.41 | 44 | | |

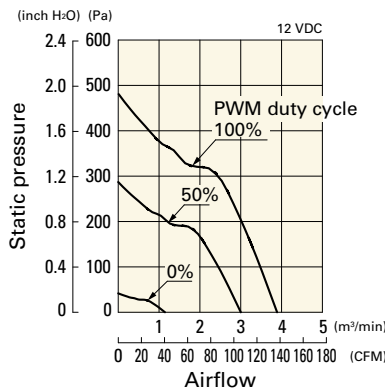
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 646.

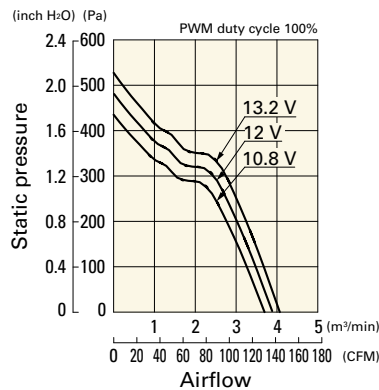
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV0812P1G03 With pulse sensor with PWM control

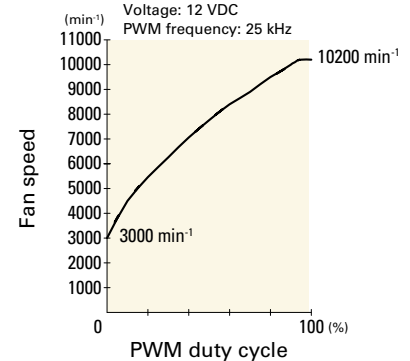
PWM duty cycle



Operating voltage range



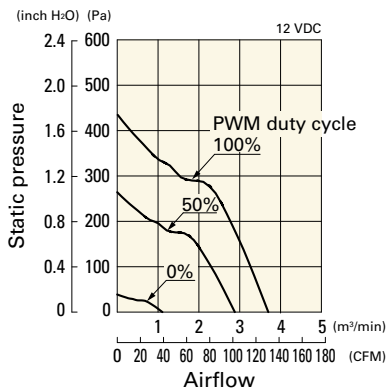
PWM duty - Speed characteristics example



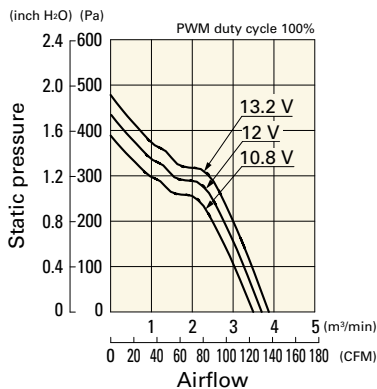
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV0812P1H03 With pulse sensor with PWM control

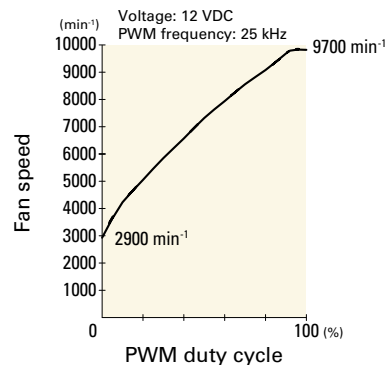
PWM duty cycle



Operating voltage range

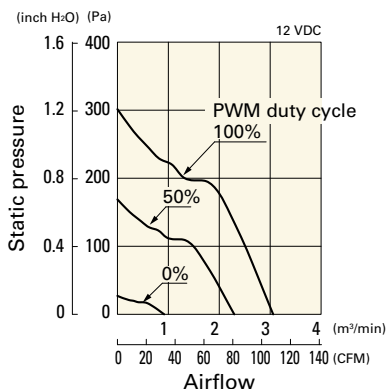


PWM duty - Speed characteristics example

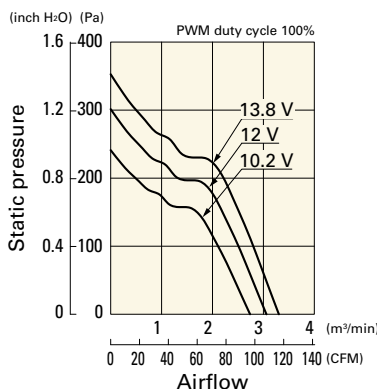


9GV0812P1F03 With pulse sensor with PWM control

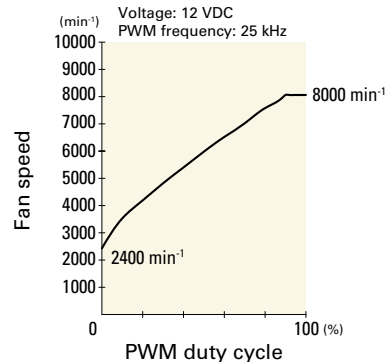
PWM duty cycle



Operating voltage range

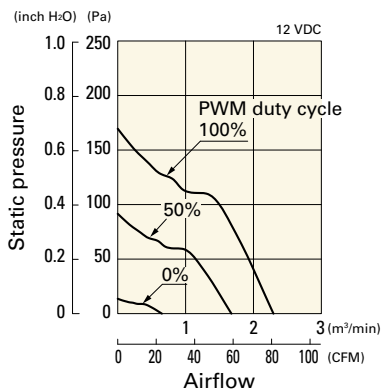


PWM duty - Speed characteristics example

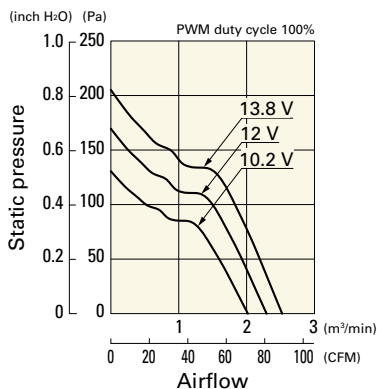


9GV0812P1M03 With pulse sensor with PWM control

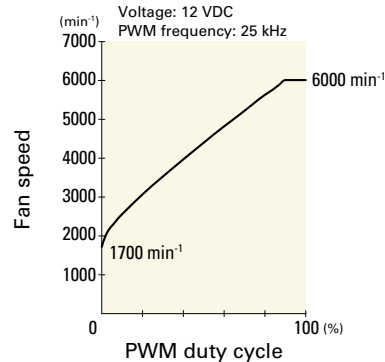
PWM duty cycle



Operating voltage range

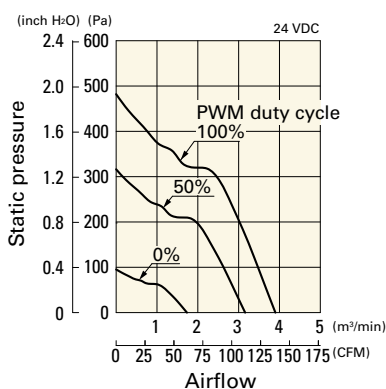


PWM duty - Speed characteristics example

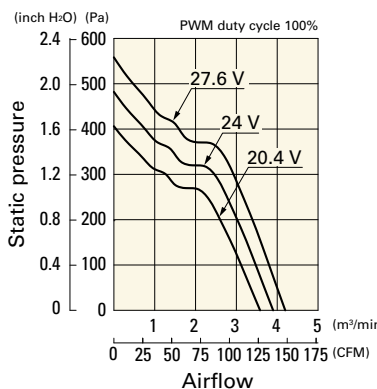


9GV0824P1G03 With pulse sensor with PWM control

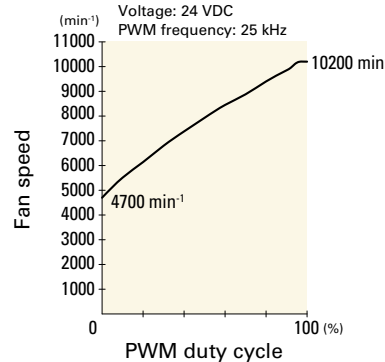
PWM duty cycle



Operating voltage range



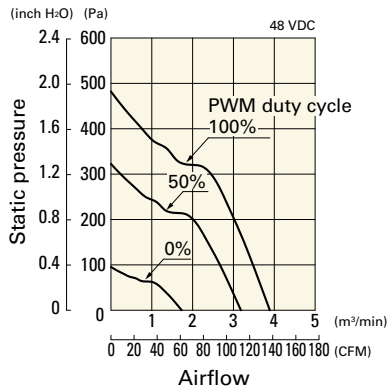
PWM duty - Speed characteristics example



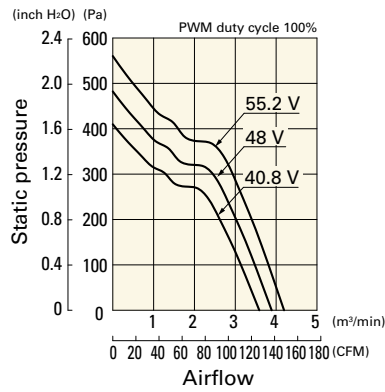
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV0848P1G03 With pulse sensor with PWM control

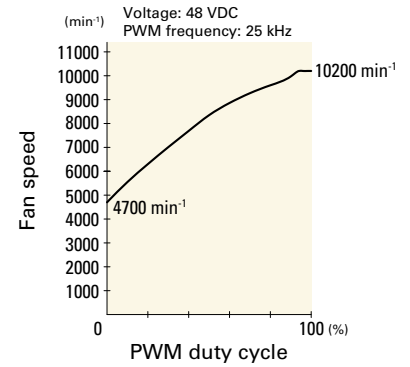
PWM duty cycle



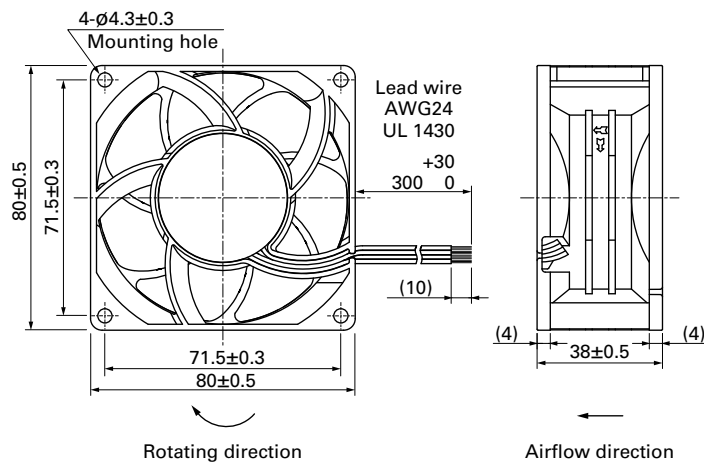
Operating voltage range



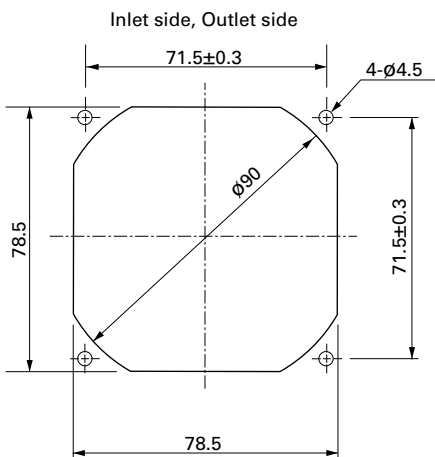
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)

DC Fan



80×80×38 mm

San Ace 80 9RA type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 170 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.** For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|-------|--|------|--------------|----------------------------|----------------------------|
| ➤ 9RA0812P1K001 | 12 | 10.8 to 13.2 | 100 | 1.52 | 18.24 | 8250 | 2.96 | 104.5 | 307 | 1.23 | 53 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.13 | 1.56 | 2500 | 0.90 | 31.8 | 27.7 | 0.11 | 21 | | |
| ➤ 9RA0812P1G001 | | | 100 | 0.82 | 9.84 | 6750 | 2.42 | 85.5 | 206 | 0.83 | 48 | | |
| | | | 20 | 0.08 | 0.96 | 1800 | 0.65 | 22.9 | 14.6 | 0.06 | 15 | | |
| ➤ 9RA0812P1H001 | | | 100 | 0.66 | 7.92 | 6100 | 2.19 | 77.3 | 168 | 0.67 | 46 | | |
| | | | 20 | 0.08 | 0.96 | 1500 | 0.54 | 19.0 | 10.2 | 0.04 | 13 | | |
| ➤ 9RA0824P1G001 | 24 | 21.6 to 26.4 | 100 | 0.41 | 9.84 | 6750 | 2.42 | 85.5 | 206 | 0.83 | 48 | | |
| | | | 20 | 0.08 | 1.92 | 2800 | 1.00 | 35.3 | 35.4 | 0.14 | 24 | | |
| ➤ 9RA0848P1G001 | 48 | 43.2 to 52.8 | 100 | 0.22 | 10.56 | 6750 | 2.42 | 85.5 | 206 | 0.83 | 48 | | |
| | | | 20 | 0.05 | 2.40 | 3000 | 1.07 | 37.8 | 40.7 | 0.16 | 26 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor.** For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|-------|--|------|--------------|----------------------------|----------------------------|
| ➤ 9RA0812K1001 | 12 | 7 to 13.2 | 1.52 | 18.24 | 8250 | 2.96 | 104.5 | 307 | 1.23 | 53 | -20 to +70 | 40000/60°C (70000/40°C) |
| ➤ 9RA0812G1001 | | 7 to 13.8 | 0.82 | 9.84 | 6750 | 2.42 | 85.5 | 206 | 0.83 | 48 | | |
| ➤ 9RA0812H1001 | | 0.66 | 7.92 | 6100 | 2.19 | 77.3 | 168 | 0.67 | 46 | | | |
| ➤ 9RA0824G1001 | 24 | 14 to 27.6 | 0.41 | 9.84 | 6750 | 2.42 | 85.5 | 206 | 0.83 | 48 | | |
| ➤ 9RA0824H1001 | | | 0.33 | 7.92 | 6100 | 2.19 | 77.3 | 168 | 0.67 | 46 | | |
| ➤ 9RA0848G1001 | 48 | 36 to 55.2 | 0.22 | 10.56 | 6750 | 2.42 | 85.5 | 206 | 0.83 | 48 | | |
| ➤ 9RA0848H1001 | | | 0.18 | 8.64 | 6100 | 2.19 | 77.3 | 168 | 0.67 | 46 | | |

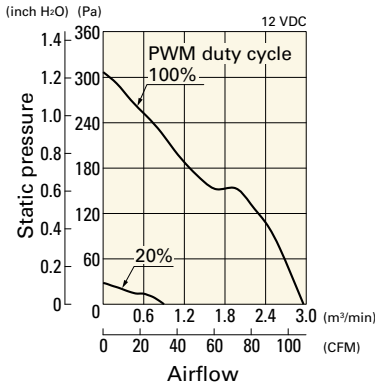
Note 1: Sensor and control options are available for selection. Refer to the table on p. 650.

Note 2: The ➤ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

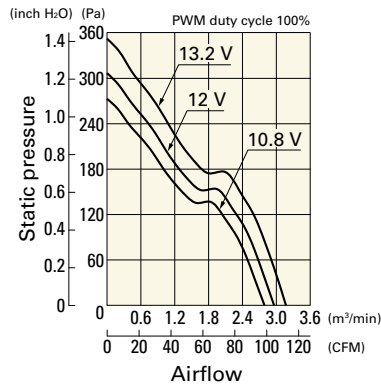
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RA0812P1K001 With pulse sensor with PWM control

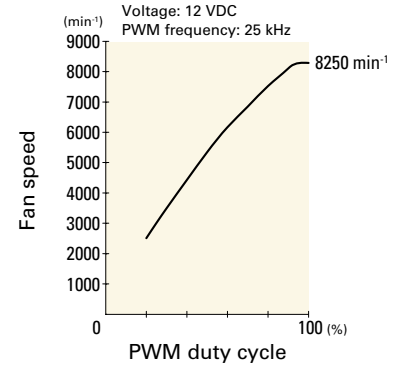
PWM duty cycle



Operating voltage range

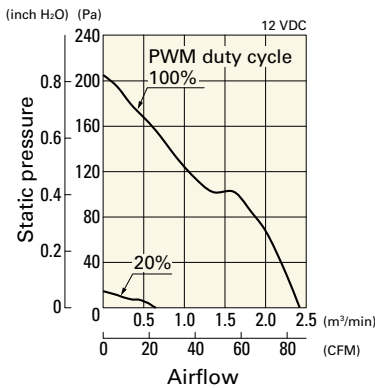


PWM duty - Speed characteristics example

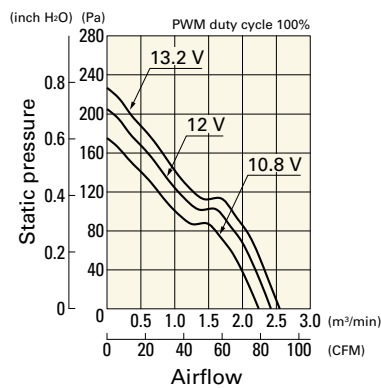


9RA0812P1G001 With pulse sensor with PWM control

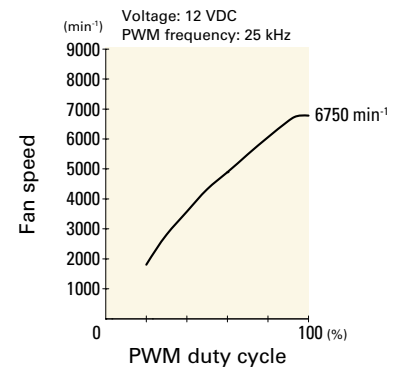
PWM duty cycle



Operating voltage range

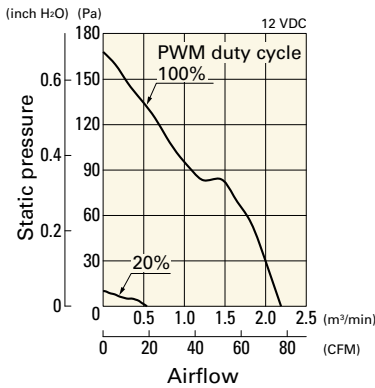


PWM duty - Speed characteristics example

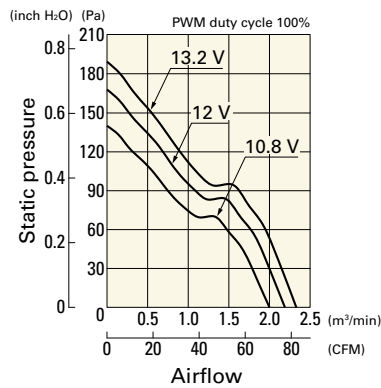


9RA0812P1H001 With pulse sensor with PWM control

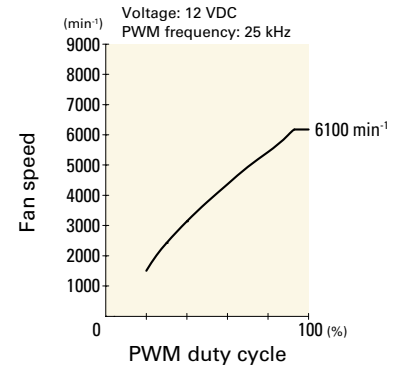
PWM duty cycle



Operating voltage range

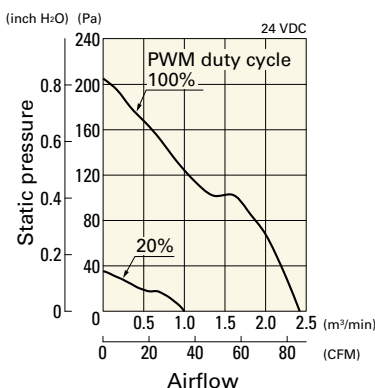


PWM duty - Speed characteristics example

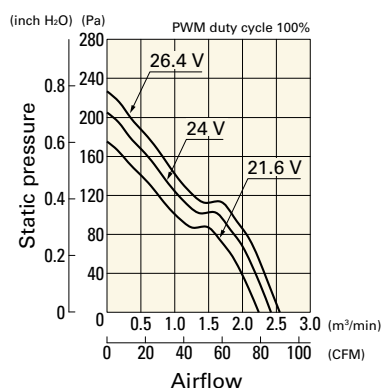


9RA0824P1G001 With pulse sensor with PWM control

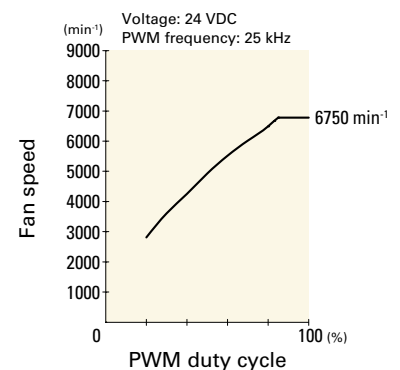
PWM duty cycle



Operating voltage range



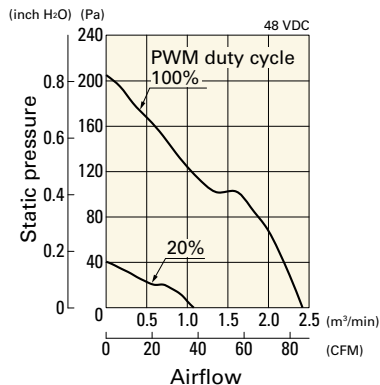
PWM duty - Speed characteristics example



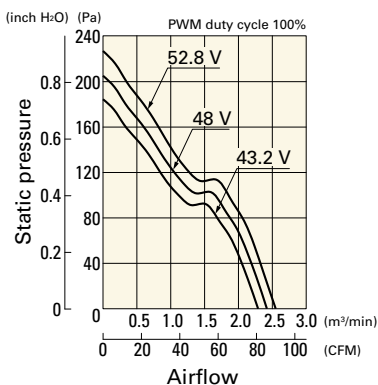
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RA0848P1G001 With pulse sensor with PWM control

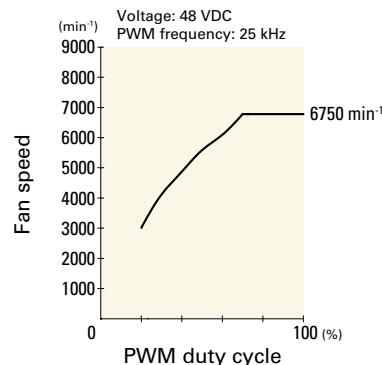
PWM duty cycle



Operating voltage range



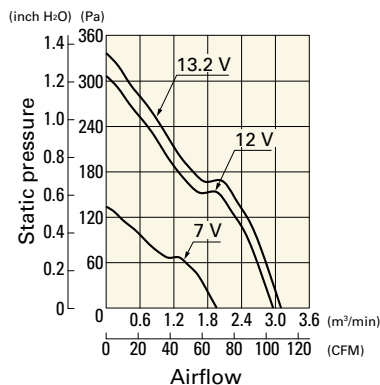
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

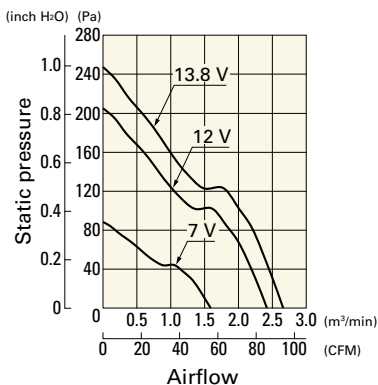
9RA0812K1001 With pulse sensor

Operating voltage range



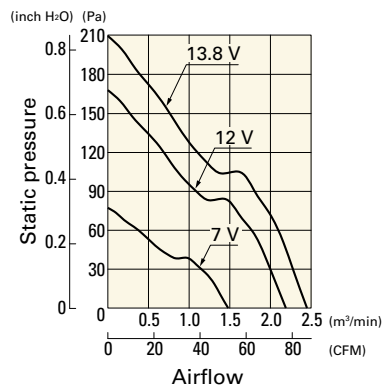
9RA0812G1001 With pulse sensor

Operating voltage range



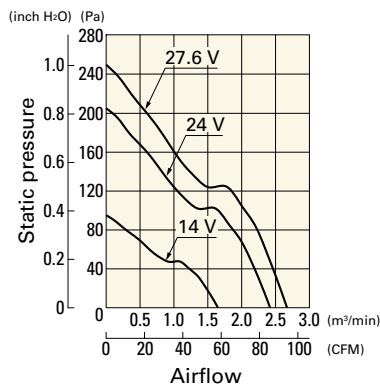
9RA0812H1001 With pulse sensor

Operating voltage range



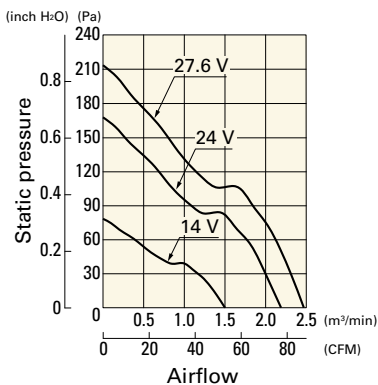
9RA0824G1001 With pulse sensor

Operating voltage range



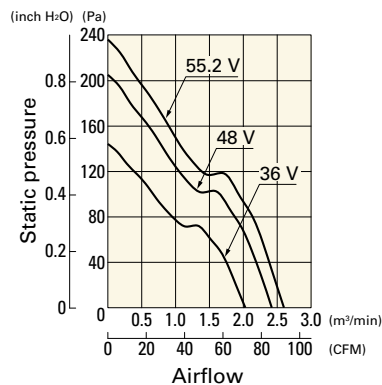
9RA0824H1001 With pulse sensor

Operating voltage range



9RA0848G1001 With pulse sensor

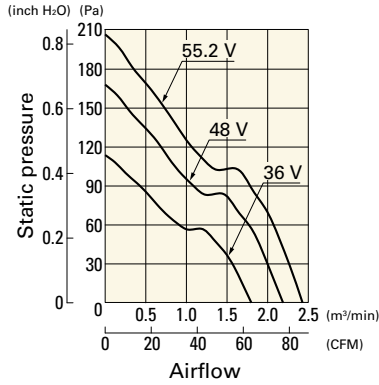
Operating voltage range



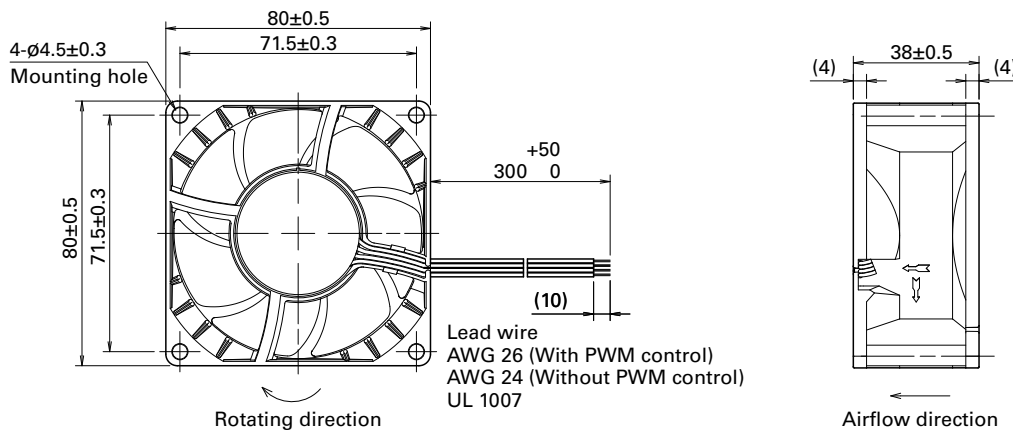
Airflow - Static Pressure Characteristics

9RA0848H1001 With pulse sensor

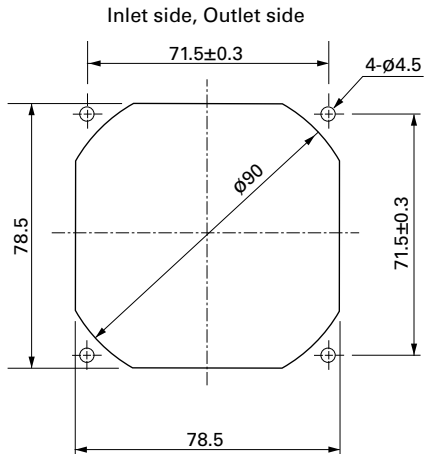
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
 109-1002F30 (30PPI), 109-1002F40 (40PPI)

DC Fan

92x92x25 mm

San Ace 92 9HV type



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 150 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9HV0912P4G001 | 12 | 10.2 to 13.8 | 100 | 1.23 | 14.76 | 7350 | 3.35 118 | 280 1.12 | 56 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.12 | 1.44 | 2200 | 1.0 35.3 | 25 0.1 | 26 | | |
| ▶▶ 9HV0912P4H001 | 12 | 10.2 to 13.8 | 100 | 0.71 | 8.52 | 6050 | 2.75 97.1 | 190 0.76 | 52 | | |
| | | | 20 | 0.07 | 0.84 | 1700 | 0.77 27.2 | 15 0.06 | 20 | | |
| ▶▶ 9HV0924P4G001 | 24 | 20.4 to 27.6 | 100 | 0.61 | 14.64 | 7350 | 3.35 118 | 280 1.12 | 56 | | |
| | | | 20 | 0.06 | 1.44 | 2200 | 1.0 35.3 | 25 0.1 | 26 | | |
| ▶▶ 9HV0924P4H001 | 24 | 20.4 to 27.6 | 100 | 0.38 | 9.12 | 6050 | 2.75 97.1 | 190 0.76 | 52 | | |
| | | | 20 | 0.05 | 1.2 | 1700 | 0.77 27.2 | 15 0.06 | 20 | | |

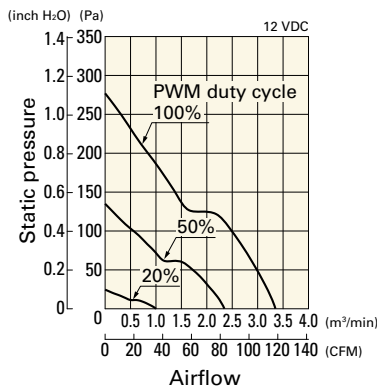
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note 1: Sensor and control options are available for selection. Refer to the table on p. 647.
 Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

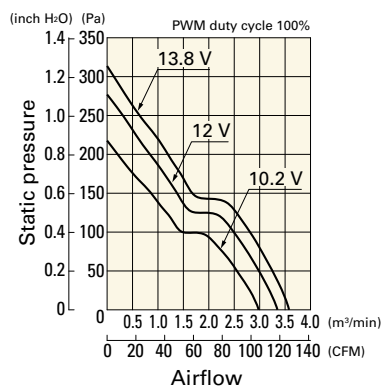
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV0912P4G001 With pulse sensor with PWM control

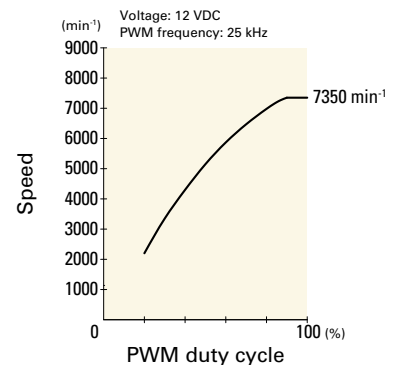
PWM duty cycle



Operating voltage range



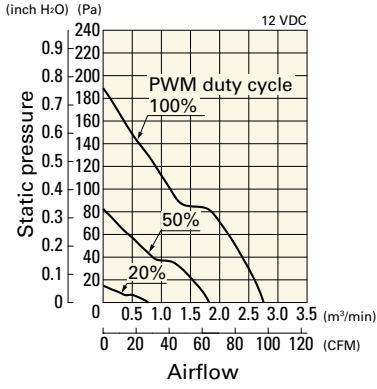
PWM duty - Speed characteristics example



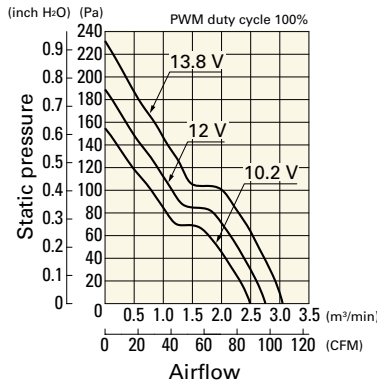
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV0912P4H001 With pulse sensor with PWM control

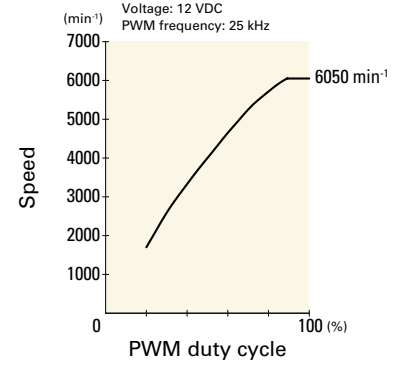
PWM duty cycle



Operating voltage range

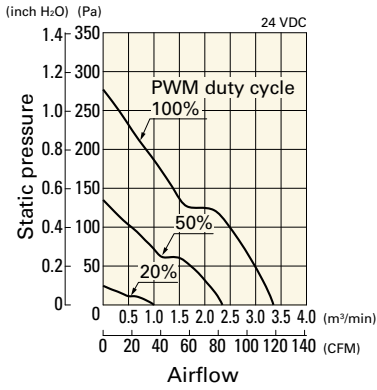


PWM duty - Speed characteristics example

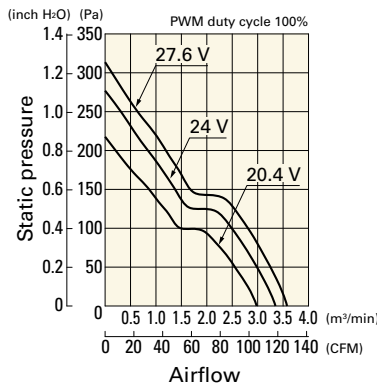


9HV0924P4G001 With pulse sensor with PWM control

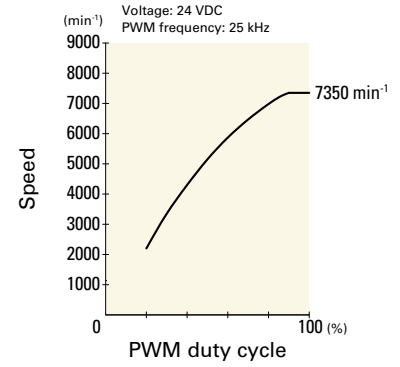
PWM duty cycle



Operating voltage range

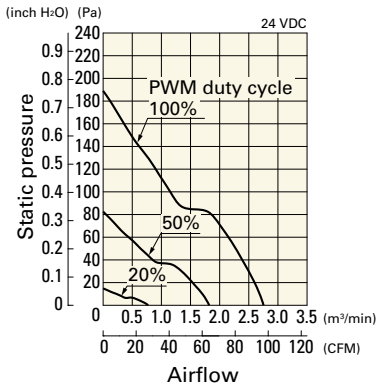


PWM duty - Speed characteristics example

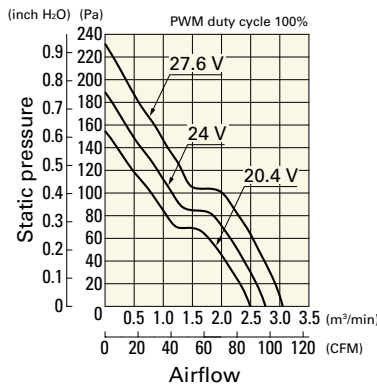


9HV0924P4H001 With pulse sensor with PWM control

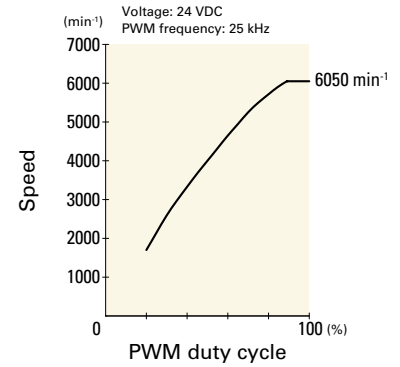
PWM duty cycle



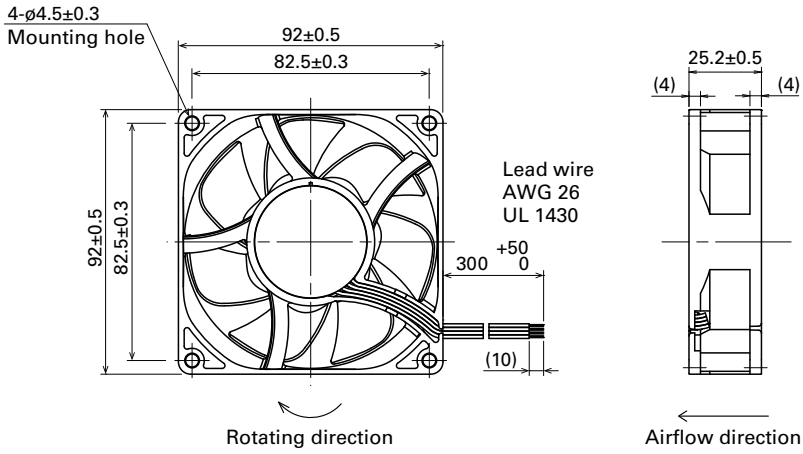
Operating voltage range



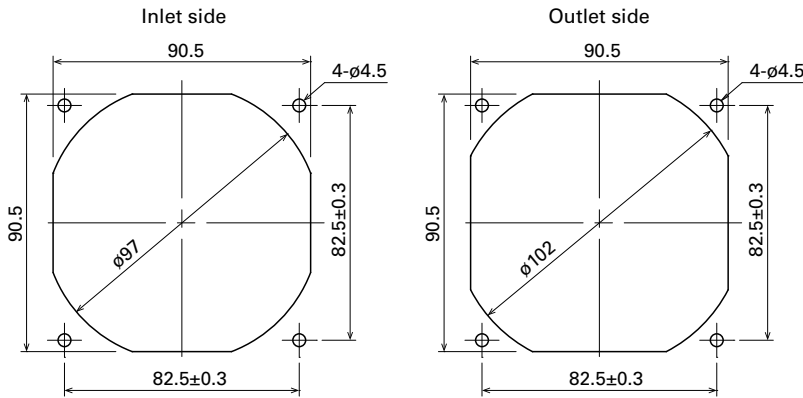
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)



92x92x25 mm

San Ace 92 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 125 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0912P4J03 | 12 | 10.2 to 13.8 | 100 | 0.39 | 4.68 | 5000 | 2.2 77.7 | 105 0.42 | 43 | -20 to +70 | 60000/60°C (90000/40°C) |
| | | | 0 | 0.06 | 0.72 | 1500 | 0.65 23.3 | 9.4 0.04 | 14 | | |
| 9GA0912P4G03 | | | 100 | 0.28 | 3.36 | 4400 | 1.93 68.2 | 81 0.33 | 39 | | |
| | | | 0 | 0.06 | 0.72 | 1500 | 0.65 23.3 | 9.4 0.04 | 14 | | |
| 9GA0924P4J03 | 24 | 20.4 to 27.6 | 100 | 0.2 | 4.8 | 5000 | 2.2 77.7 | 105 0.42 | 43 | | |
| | | | 0 | 0.04 | 0.96 | 1500 | 0.65 23.3 | 9.4 0.04 | 14 | | |
| 9GA0924P4G03 | | | 100 | 0.15 | 3.6 | 4400 | 1.93 68.2 | 81 0.33 | 39 | | |
| | | | 0 | 0.04 | 0.96 | 1500 | 0.65 23.3 | 9.4 0.04 | 14 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

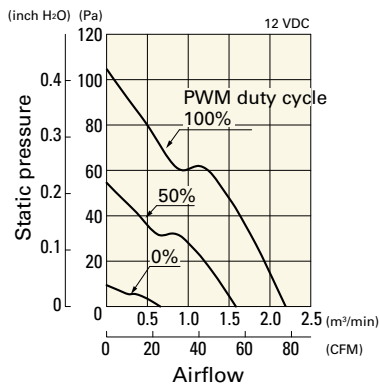
Note 1: Sensor and control options are available for selection. Refer to the table on p. 644.

Note 2: The Ⓢ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

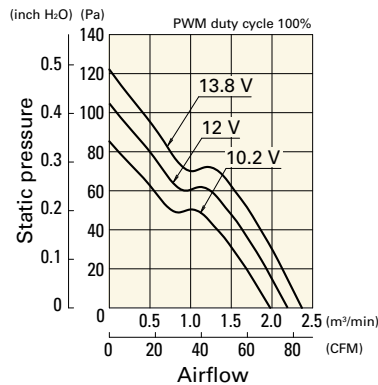
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0912P4J03 With pulse sensor with PWM control

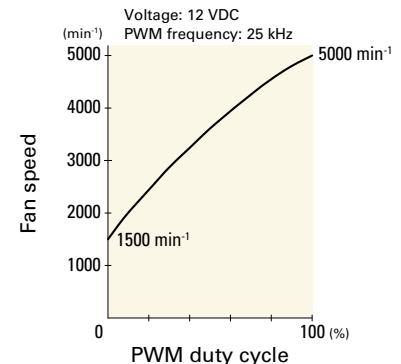
PWM duty cycle



Operating voltage range



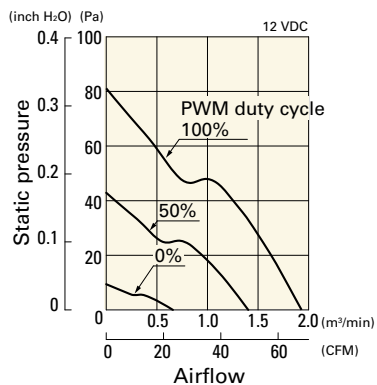
PWM duty - Speed characteristics example



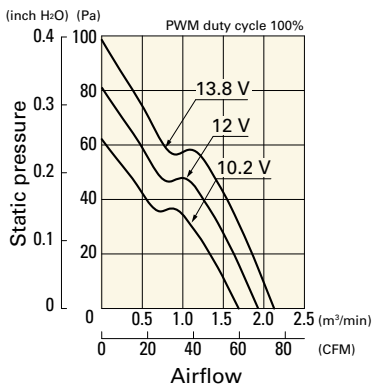
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0912P4G03 With pulse sensor with PWM control

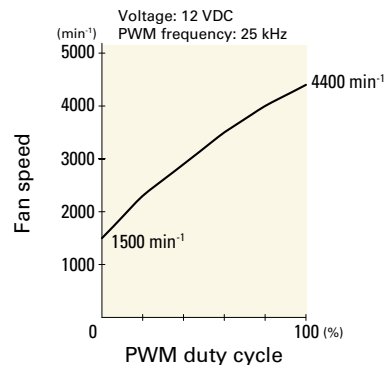
PWM duty cycle



Operating voltage range

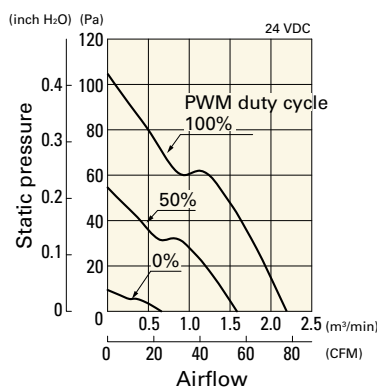


PWM duty - Speed characteristics example

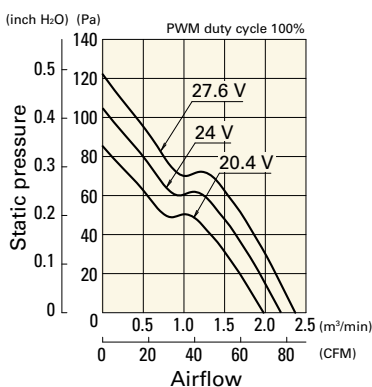


9GA0924P4J03 With pulse sensor with PWM control

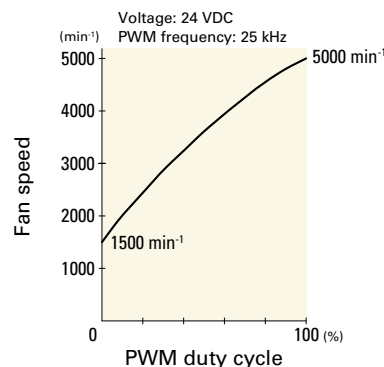
PWM duty cycle



Operating voltage range

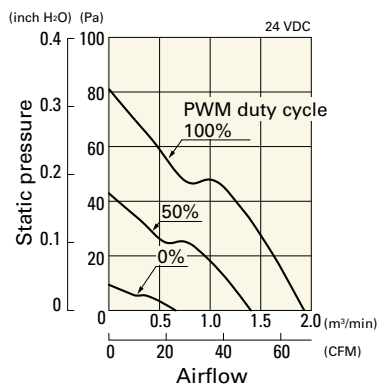


PWM duty - Speed characteristics example

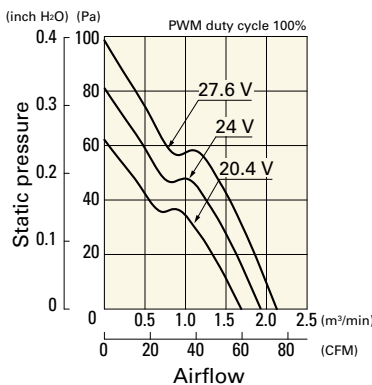


9GA0924P4G03 With pulse sensor with PWM control

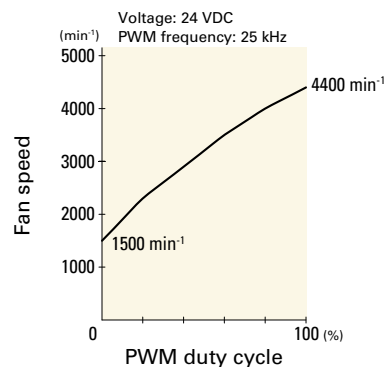
PWM duty cycle



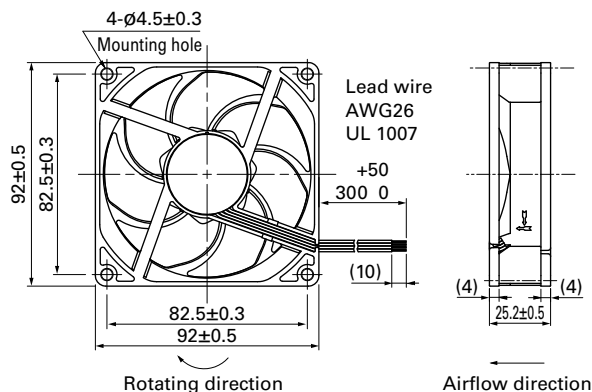
Operating voltage range



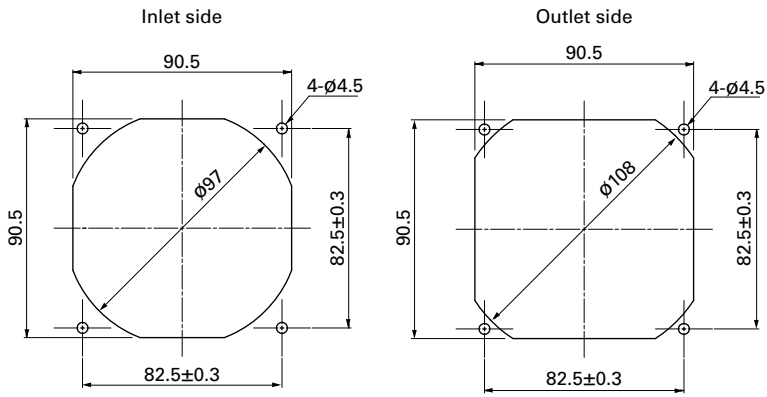
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)

DC Fan



92x92x25 mm

San Ace 92 9RA type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 130 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.** For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|------|--|-------|--------------|----------------------------|----------------------------|
| » 9RA0912P4G001 | 12 | 10.8 to 13.2 | 100 | 0.22 | 2.64 | 4200 | 1.8 | 63.5 | 73.5 | 0.29 | 37 | -20 to +70 | 60000/60°C (90000/40°C) |
| | | | 30 | 0.03 | 0.36 | 1000 | 0.42 | 14.8 | 4.1 | 0.016 | 11 | | |
| » 9RA0924P4G001 | 24 | 21.6 to 26.4 | 100 | 0.13 | 3.12 | 4200 | 1.8 | 63.5 | 73.5 | 0.29 | 37 | | |
| | | | 20 | 0.03 | 0.72 | 1000 | 0.42 | 14.8 | 4.1 | 0.016 | 11 | | |
| » 9RA0948P4G001 | 48 | 43.2 to 52.8 | 100 | 0.07 | 3.36 | 4200 | 1.8 | 63.5 | 73.5 | 0.29 | 37 | | |
| | | | 20 | 0.03 | 1.44 | 1400 | 0.6 | 21.2 | 8.1 | 0.033 | 14 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor.** For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|------|--|------|--------------|----------------------------|----------------------------|
| » 9RA0912G4001 | 12 | 7 to 13.8 | 0.22 | 2.64 | 4200 | 1.8 | 63.5 | 73.5 | 0.29 | 37 | -20 to +70 | 60000/60°C (90000/40°C) |
| » 9RA0912S4001 | | | 0.2 | 2.4 | 3850 | 1.65 | 58.3 | 61.7 | 0.25 | 35 | | |
| » 9RA0912H4001 | | | 0.14 | 1.68 | 3400 | 1.46 | 51.6 | 48.1 | 0.19 | 31 | | |
| » 9RA0912F4001 | | | 0.1 | 1.2 | 2850 | 1.22 | 43.1 | 33.8 | 0.14 | 27 | | |
| » 9RA0912M4001 | | | 0.07 | 0.84 | 2450 | 1.05 | 37.1 | 25 | 0.1 | 23 | | |
| » 9RA0924G4001 | 24 | 14 to 27.6 | 0.13 | 3.12 | 4200 | 1.8 | 63.5 | 73.5 | 0.29 | 37 | | |
| » 9RA0924S4001 | | | 0.1 | 2.4 | 3850 | 1.65 | 58.3 | 61.7 | 0.25 | 35 | | |
| » 9RA0924H4001 | | | 0.08 | 1.92 | 3400 | 1.46 | 51.6 | 48.1 | 0.19 | 31 | | |
| » 9RA0924F4001 | | | 0.06 | 1.44 | 2850 | 1.22 | 43.1 | 33.8 | 0.14 | 27 | | |
| » 9RA0924M4001 | | | 0.04 | 0.96 | 2450 | 1.05 | 37.1 | 25 | 0.1 | 23 | | |
| » 9RA0948G4001 | 48 | 36 to 55.2 | 0.07 | 3.36 | 4200 | 1.8 | 63.5 | 73.5 | 0.29 | 37 | | |
| » 9RA0948S4001 | | | 0.06 | 2.88 | 3850 | 1.65 | 58.3 | 61.7 | 0.25 | 35 | | |
| » 9RA0948H4001 | | | 0.05 | 2.4 | 3400 | 1.46 | 51.6 | 48.1 | 0.19 | 31 | | |
| » 9RA0948F4001 | | | 0.05 | 2.4 | 3400 | 1.46 | 51.6 | 48.1 | 0.19 | 31 | | |

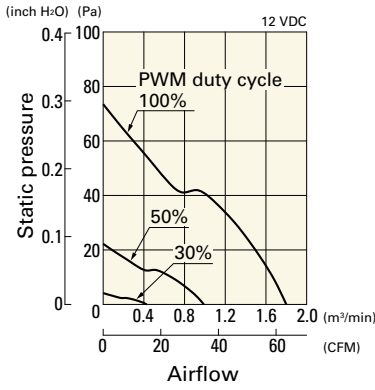
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 650 to 651.

Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 668 for details.

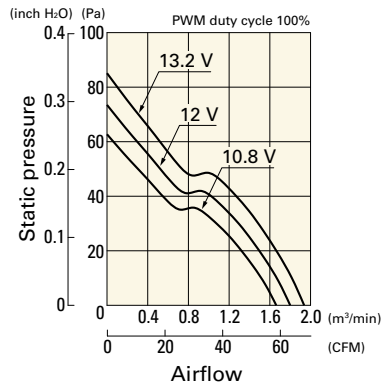
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RA0912P4G001 With pulse sensor with PWM control

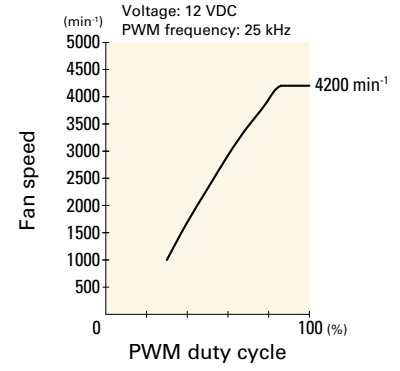
PWM duty cycle



Operating voltage range

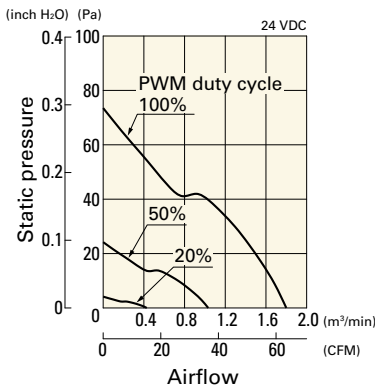


PWM duty - Speed characteristics example

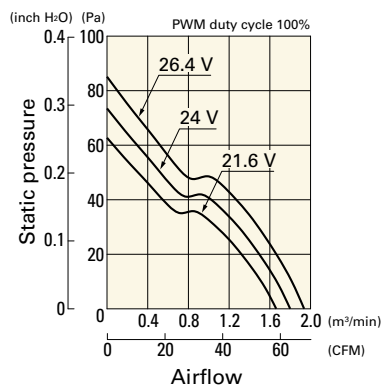


9RA0924P4G001 With pulse sensor with PWM control

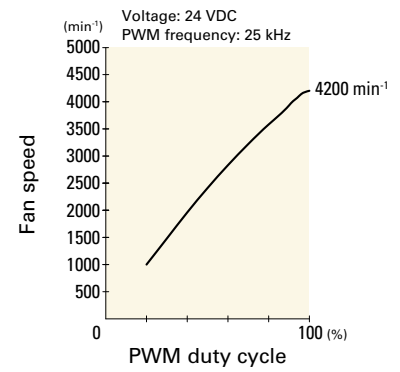
PWM duty cycle



Operating voltage range

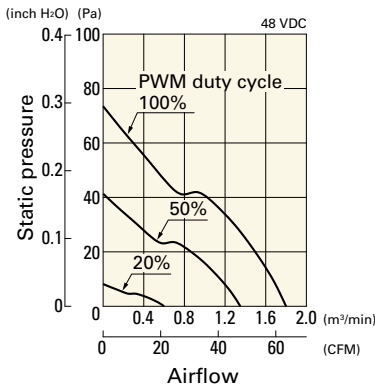


PWM duty - Speed characteristics example

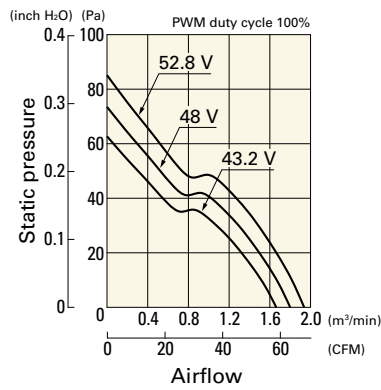


9RA0948P4G001 With pulse sensor with PWM control

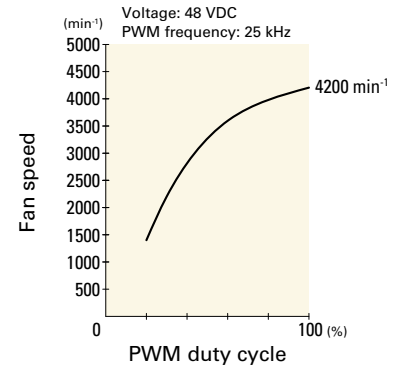
PWM duty cycle



Operating voltage range



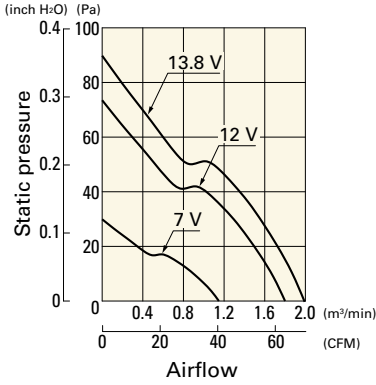
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

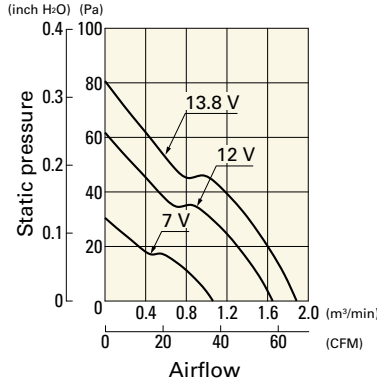
9RA0912G4001 With pulse sensor

Operating voltage range



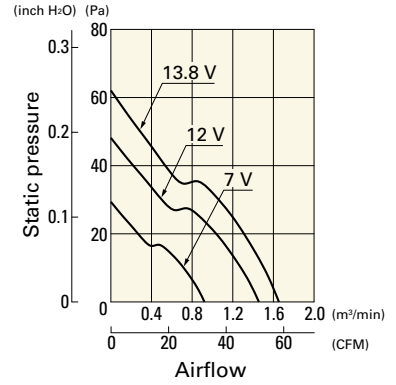
9RA0912S4001 With pulse sensor

Operating voltage range



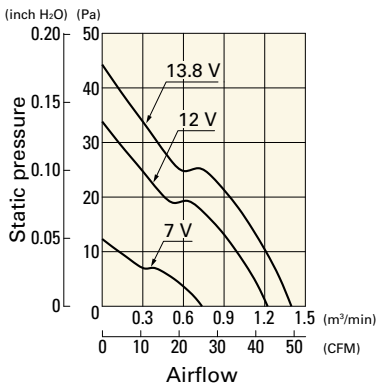
9RA0912H4001 With pulse sensor

Operating voltage range



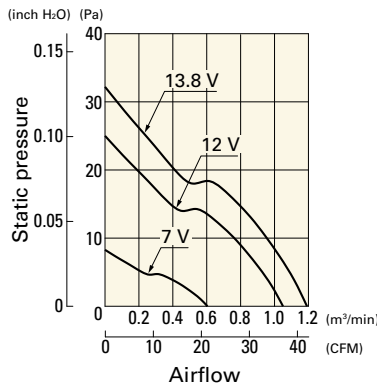
9RA0912F4001 With pulse sensor

Operating voltage range



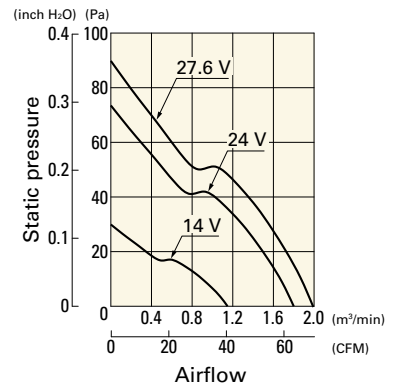
9RA0912M4001 With pulse sensor

Operating voltage range



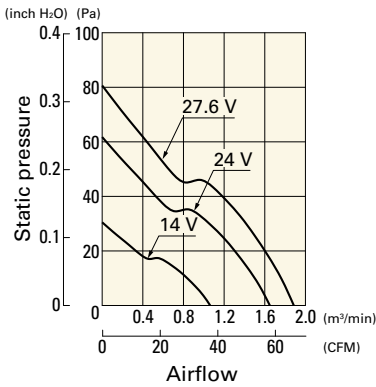
9RA0924G4001 With pulse sensor

Operating voltage range



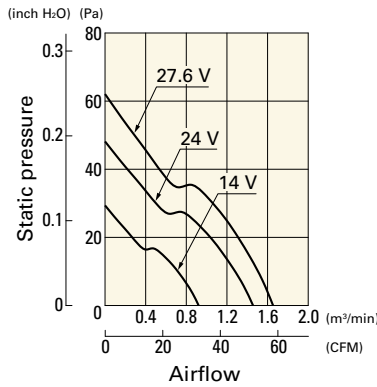
9RA0924S4001 With pulse sensor

Operating voltage range



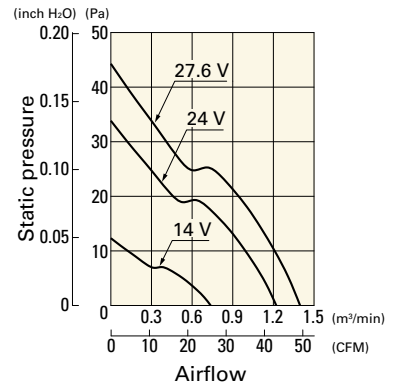
9RA0924H4001 With pulse sensor

Operating voltage range



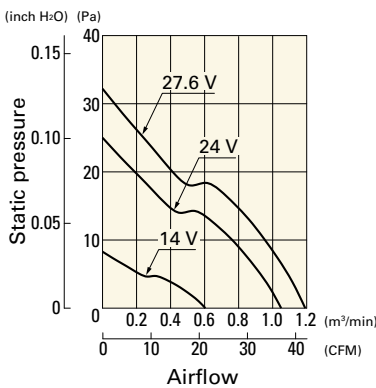
9RA0924F4001 With pulse sensor

Operating voltage range



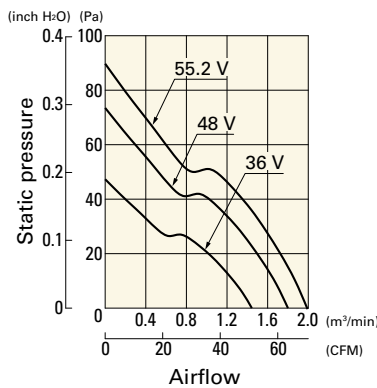
9RA0924M4001 With pulse sensor

Operating voltage range



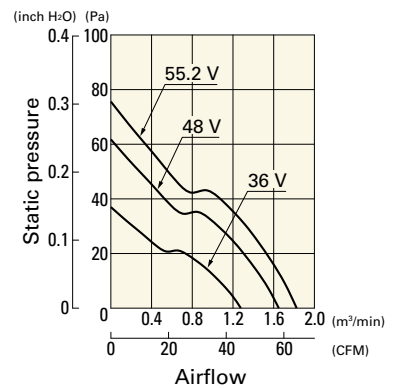
9RA0948G4001 With pulse sensor

Operating voltage range



9RA0948S4001 With pulse sensor

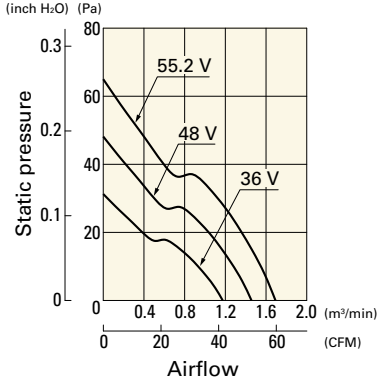
Operating voltage range



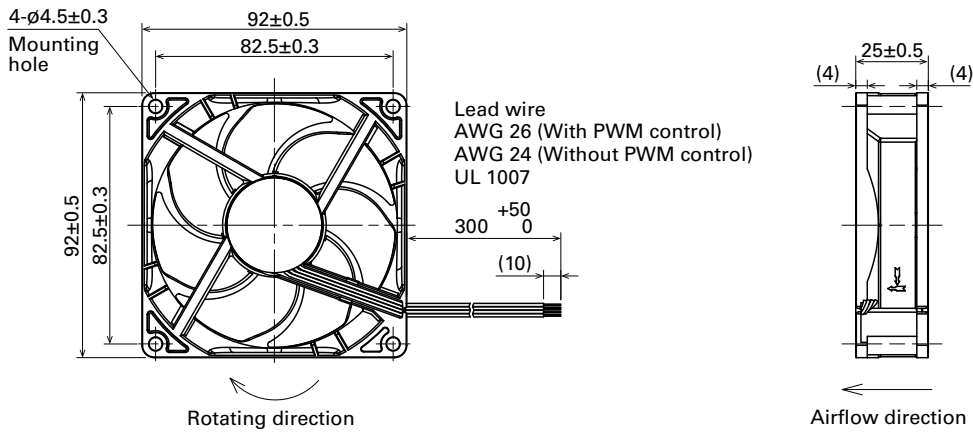
Airflow - Static Pressure Characteristics

9RA0948H4001 With pulse sensor

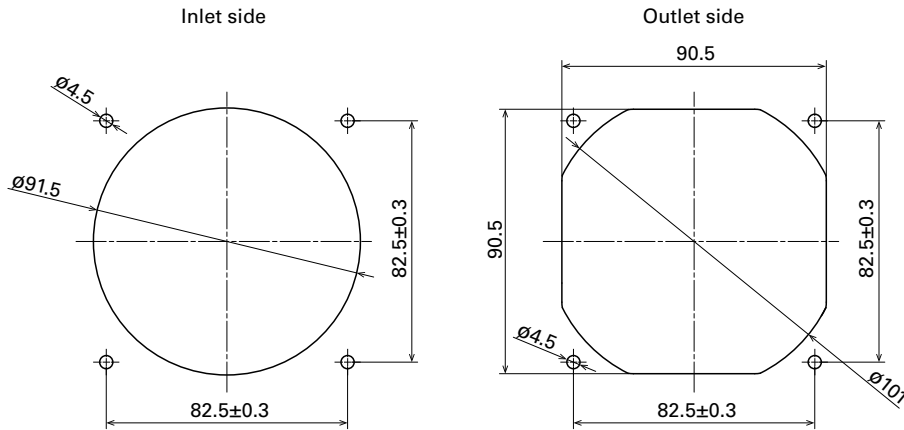
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)

DC Fan

92x92x25 mm

San Ace 92 9S type Silent Fan 



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 100 g

Specifications

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| » 9S0912F401 | 12 | 6 to 13.8 | 0.14 | 1.68 | 2650 | 1.26 44.5 | 30.0 0.12 | 27 | -10 to +70 | 40000/60°C (70000/40°C) |
| » 9S0912M401 | | | 0.11 | 1.32 | 2250 | 1.07 37.8 | 21.6 0.087 | 22 | | |
| » 9S0912L401 | | 0.07 | 0.84 | 1750 | 0.83 29.3 | 13.1 0.053 | 17 | | | |
| » 9S0924F401 | 24 | 14 to 26.4 | 0.09 | 2.16 | 2650 | 1.26 44.5 | 30.0 0.12 | 27 | | |
| » 9S0924M401 | | | 0.07 | 1.68 | 2250 | 1.07 37.8 | 21.6 0.087 | 22 | | |
| » 9S0924L401 | | | 0.04 | 0.96 | 1750 | 0.83 29.3 | 13.1 0.053 | 17 | | |

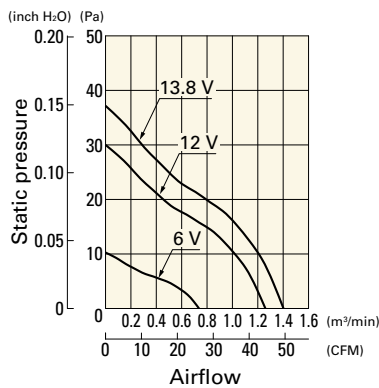
Note 1: Sensor and control options are available for selection. Refer to the table on p. 653.

Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

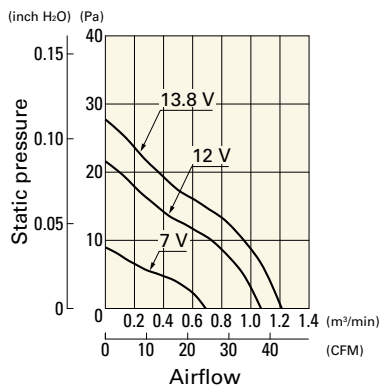
9S0912F401 With pulse sensor

Operating voltage range



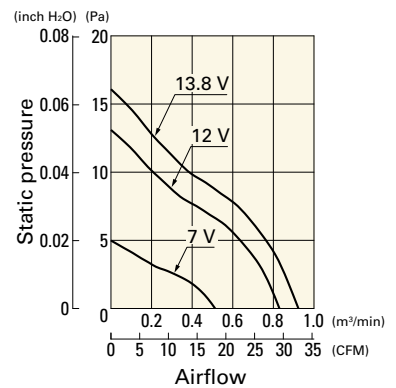
9S0912M401 With pulse sensor

Operating voltage range



9S0912L401 With pulse sensor

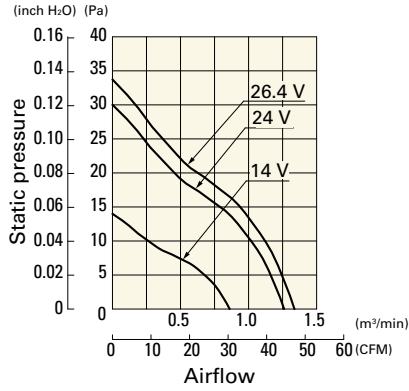
Operating voltage range



Airflow - Static Pressure Characteristics

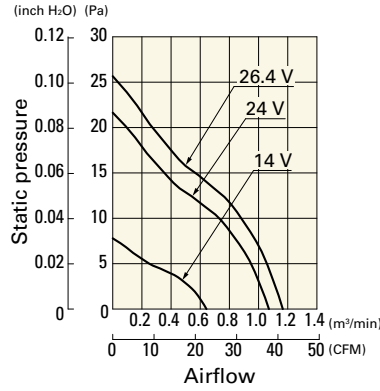
9S0924F401 With pulse sensor

Operating voltage range



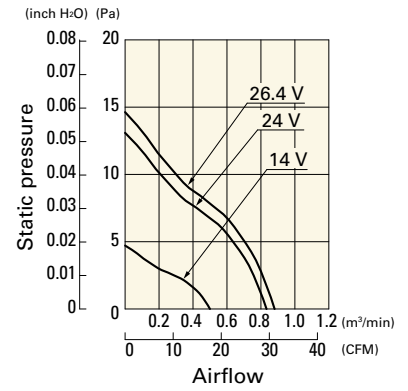
9S0924M401 With pulse sensor

Operating voltage range

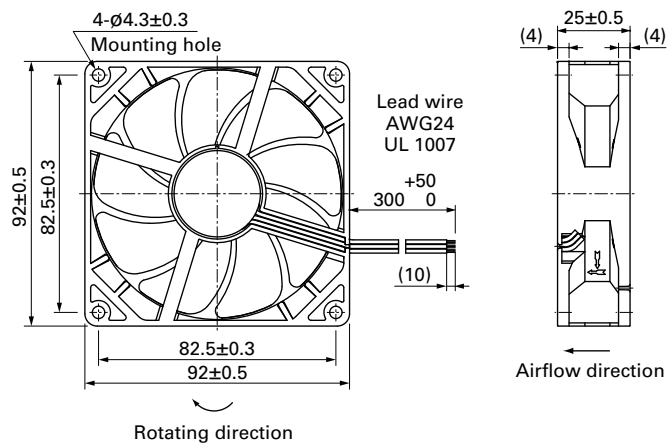


9S0924L401 With pulse sensor

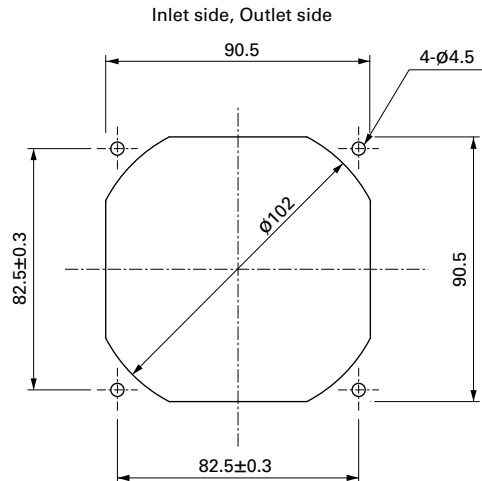
Operating voltage range



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)

DC Fan



92x92x32 mm

San Ace 92 9G type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 170 g

Specifications

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9G0912A201 | 12 | 10.2 to 13.8 | 0.58 | 6.96 | 4300 | 2.5 88.3 | 115 0.462 | 44 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9G0912S201 | | | 0.38 | 4.56 | 3500 | 2.0 70.7 | 77 0.309 | 38 | | |
| 9G0912H201 | | | 0.23 | 2.76 | 2850 | 1.59 56.2 | 51 0.205 | 32 | | |
| 9G0912M201 | | | 0.13 | 1.56 | 2100 | 1.2 42.4 | 27 0.108 | 25 | | |
| 9G0924A201 | 24 | 20.4 to 27.6 | 0.3 | 7.2 | 4300 | 2.5 88.3 | 115 0.462 | 44 | -20 to +60 | |
| 9G0924S201 | | | 0.19 | 4.56 | 3500 | 2.0 70.7 | 77 0.309 | 38 | | |
| 9G0924H201 | | | 0.12 | 2.88 | 2850 | 1.59 56.2 | 51 0.205 | 32 | | |
| 9G0924M201 | | | 0.08 | 1.92 | 2100 | 1.2 42.4 | 27 0.108 | 25 | | |
| 9G0948A201 | 48 | 40.8 to 55.2 | 0.16 | 7.68 | 4300 | 2.5 88.3 | 115 0.462 | 44 | -20 to +70 | |
| 9G0948S201 | | | 0.11 | 5.28 | 3500 | 2.0 70.7 | 77 0.309 | 38 | | |
| 9G0948H201 | | | 0.08 | 3.84 | 2850 | 1.59 56.2 | 51 0.205 | 32 | | |
| 9G0948M201 | | | 0.05 | 2.4 | 2100 | 1.2 42.4 | 27 0.108 | 25 | | |

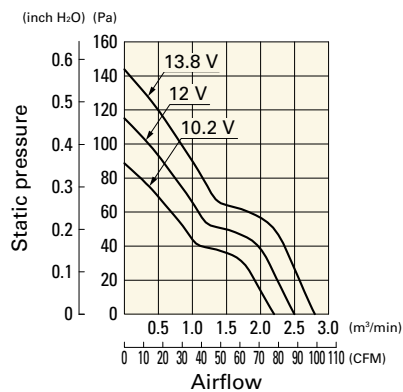
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 641 to 642.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

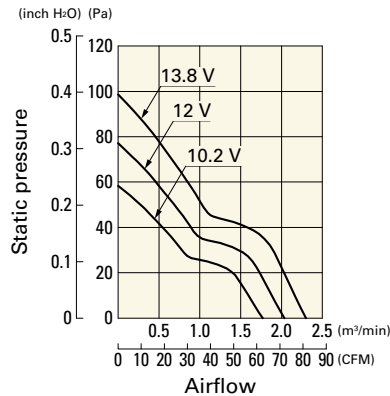
9G0912A201 With pulse sensor

Operating voltage range



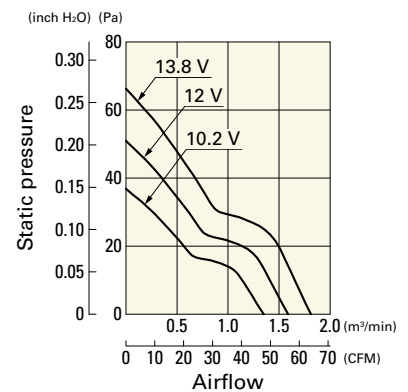
9G0912S201 With pulse sensor

Operating voltage range



9G0912H201 With pulse sensor

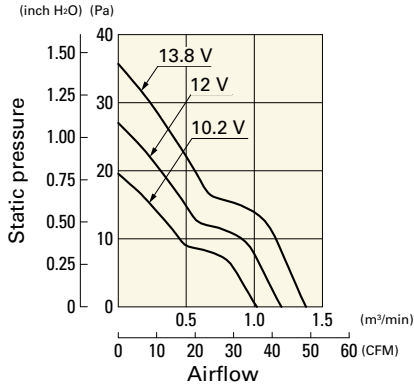
Operating voltage range



Airflow - Static Pressure Characteristics

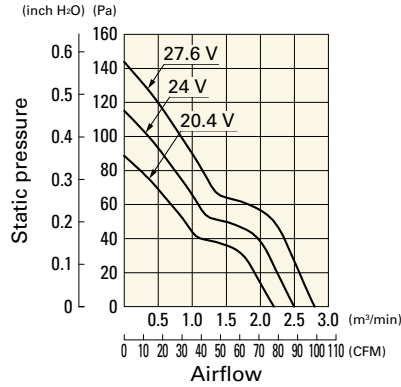
9G0912M201 With pulse sensor

Operating voltage range



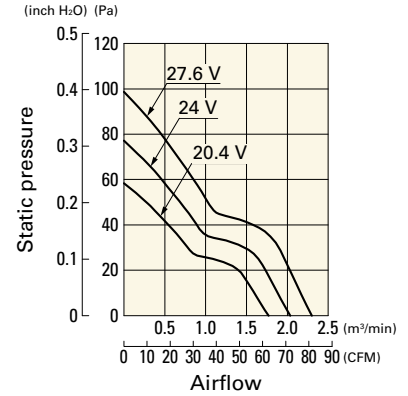
9G0924A201 With pulse sensor

Operating voltage range



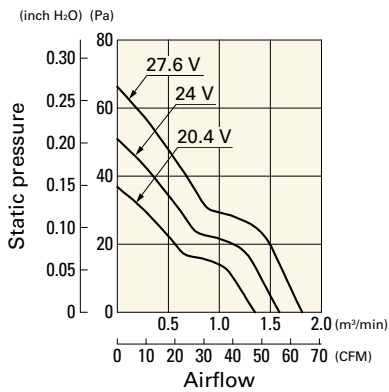
9G0924S201 With pulse sensor

Operating voltage range



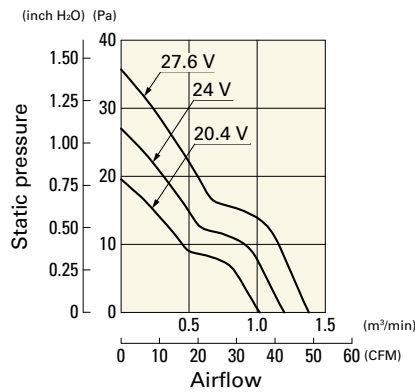
9G0924H201 With pulse sensor

Operating voltage range



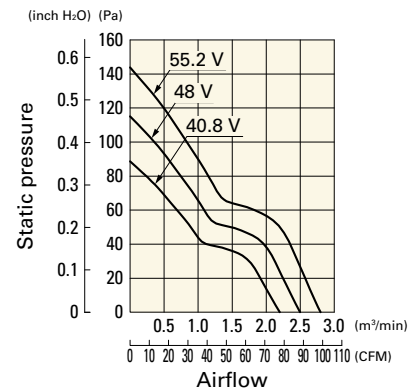
9G0924M201 With pulse sensor

Operating voltage range



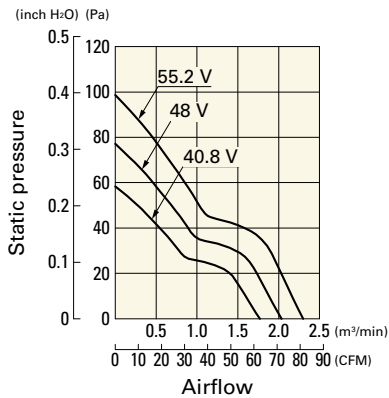
9G0948A201 With pulse sensor

Operating voltage range



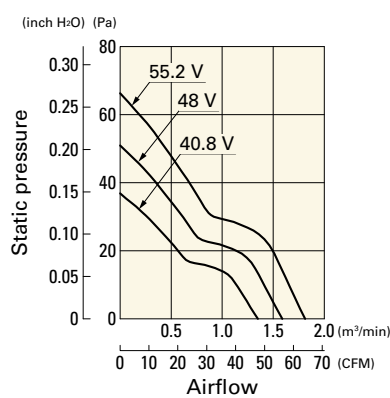
9G0948S201 With pulse sensor

Operating voltage range



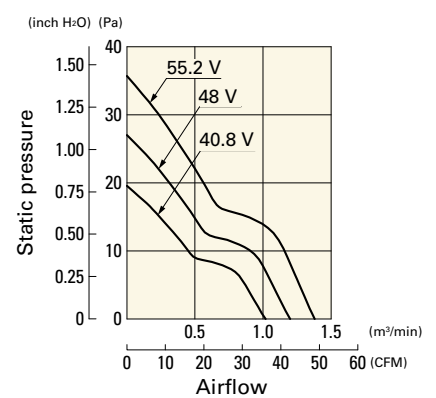
9G0948H201 With pulse sensor

Operating voltage range

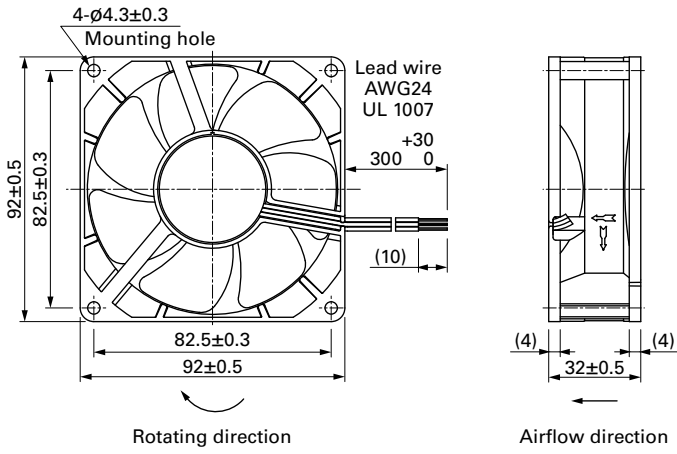


9G0948M201 With pulse sensor

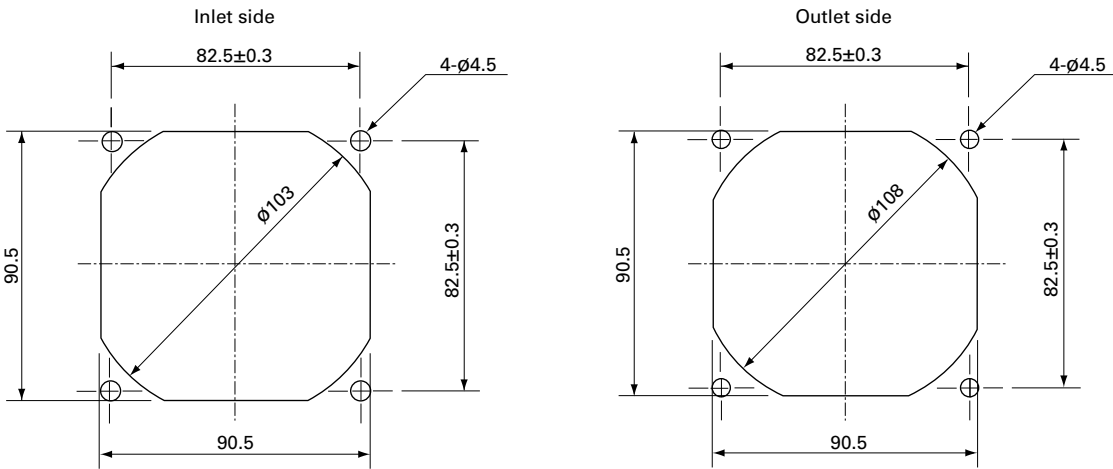
Operating voltage range



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards page: p. 598
 Model no.: 109-099E, 109-099H

Resin finger guards page: p. 605
 Model no.: 109-1001G

Resin filter kits page: p. 606
 Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
 109-1001F30 (30PPI), 109-1001F40 (40PPI)



92x92x38 mm

San Ace 92 9HV type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 250 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9HV0912P1G001 | 12 | 8 to 12.6 | 100 | 5.2 | 62.4 | 14900 | 5.1 180 | 1100 4.42 | 72 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.8 | 9.6 | 4500 | 1.54 54.4 | 160 0.64 | 44 | | |
| ▶▶ 9HV0924P1G001 | 24 | 20.4 to 27.6 | 100 | 2.50 | 60.0 | 14900 | 5.1 180 | 1100 4.42 | 72 | | |
| | | | 0 | 0.34 | 8.16 | 4500 | 1.54 54.4 | 160 0.64 | 44 | | |
| ▶▶ 9HV0948P1G001 | 48 | 36 to 60 | 100 | 1.2 | 57.6 | 14900 | 5.1 180 | 1100 4.42 | 72 | | |
| | | | 0 | 0.15 | 7.2 | 4500 | 1.54 54.4 | 160 0.64 | 44 | | |

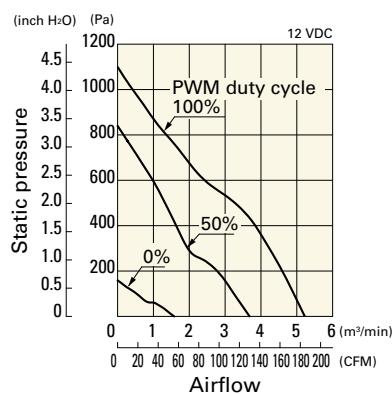
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The ▶▶ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

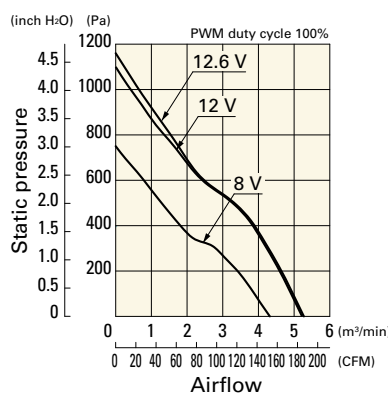
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV0912P1G001 With pulse sensor with PWM control

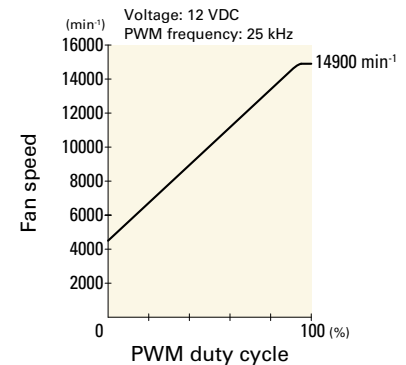
PWM duty cycle



Operating voltage range



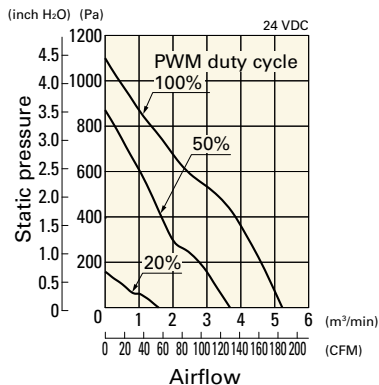
PWM duty - Speed characteristics example



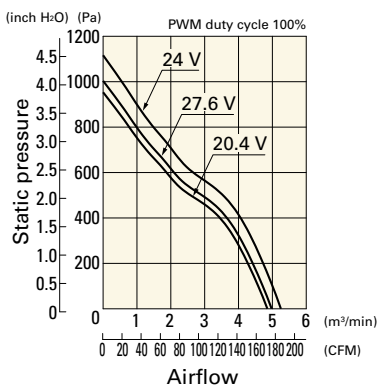
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV0924P1G001 With pulse sensor with PWM control

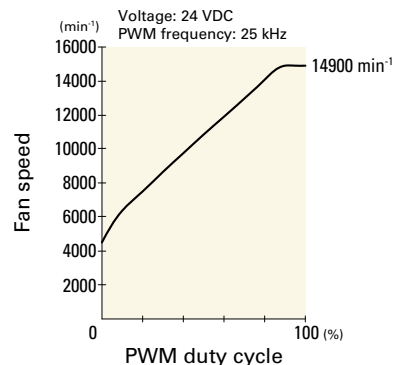
PWM duty cycle



Operating voltage range

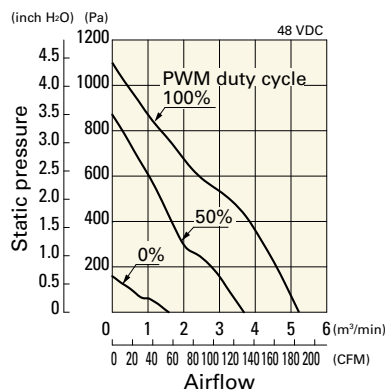


PWM duty - Speed characteristics example

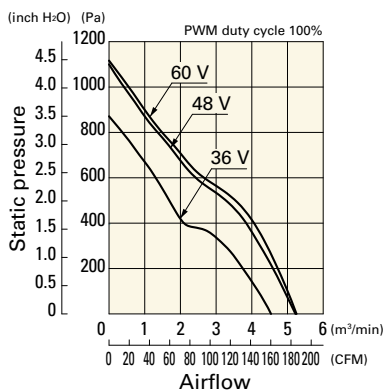


9HV0948P1G001 With pulse sensor with PWM control

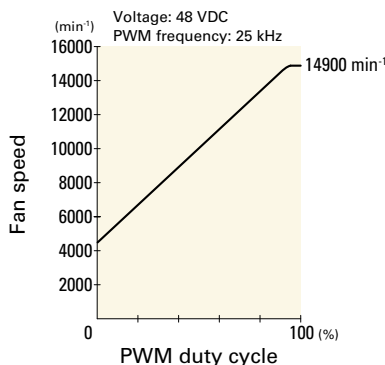
PWM duty cycle



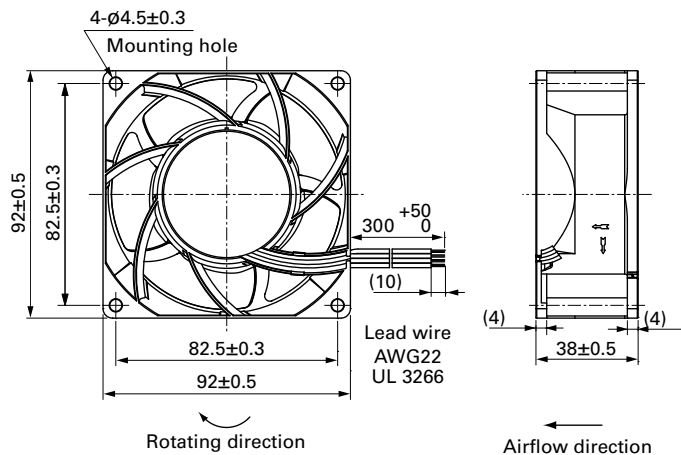
Operating voltage range



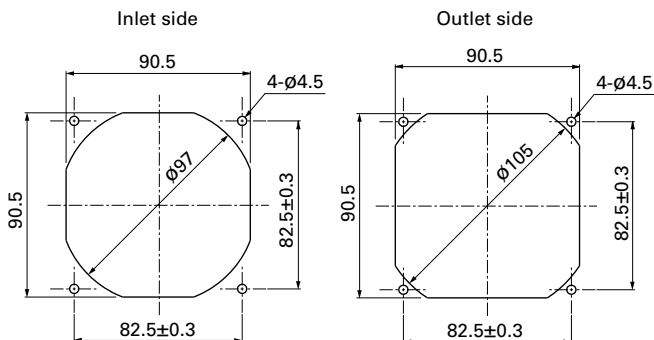
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)

DC Fan



92x92x38 mm

San Ace 92 9GA type Low Power Consumption Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 240 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0912P1H03 | 12 | 10.2 to 13.8 | 100 | 2.1 | 25.2 | 9700 | 4.0 141 | 500 2.01 | 63 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.16 | 1.92 | 2500 | 0.97 34.3 | 33 0.13 | 29 | | |
| 9GA0924P1H01 | 24 | 20.4 to 27.6 | 100 | 1.1 | 26.4 | 9700 | 4.0 141 | 500 2.01 | 63 | -10 to +70 | |
| | | | 0 | 0.07 | 1.68 | 2500 | 0.97 34.3 | 33 0.13 | 29 | | |
| 9GA0948P1H03 | 48 | 40.8 to 55.2 | 100 | 0.55 | 26.4 | 9700 | 4.0 141 | 500 2.01 | 63 | -20 to +70 | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

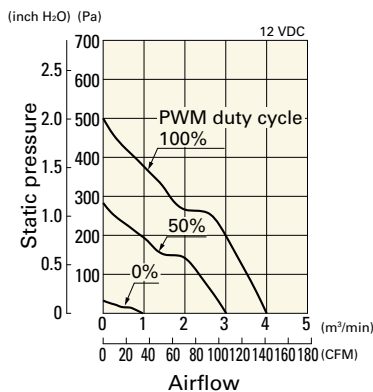
Note 1: Sensor and control options are available for selection. Refer to the table on p. 644.

Note 2: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

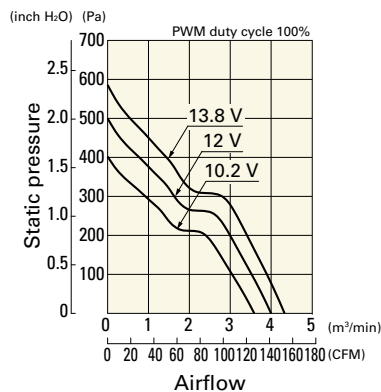
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0912P1H03 With pulse sensor with PWM control

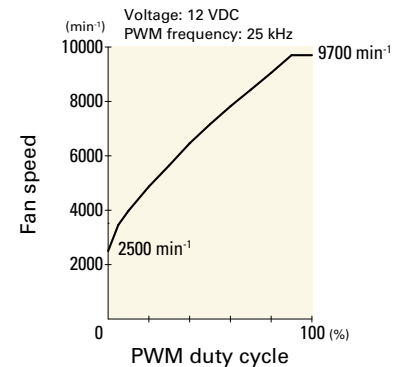
PWM duty cycle



Operating voltage range



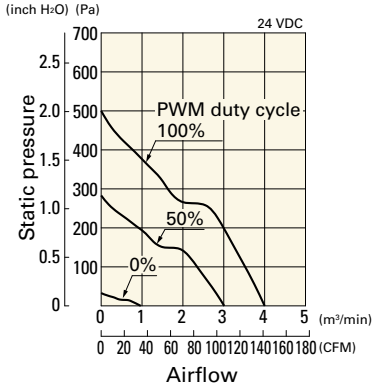
PWM duty - Speed characteristics example



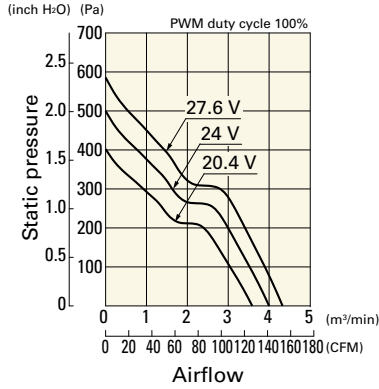
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA0924P1H01 With pulse sensor with PWM control

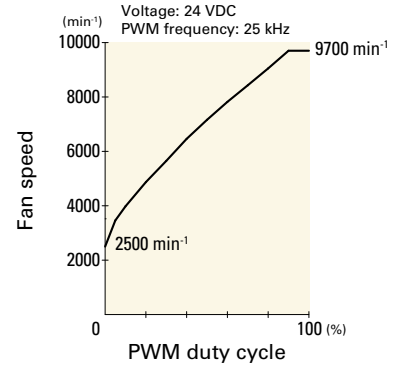
PWM duty cycle



Operating voltage range

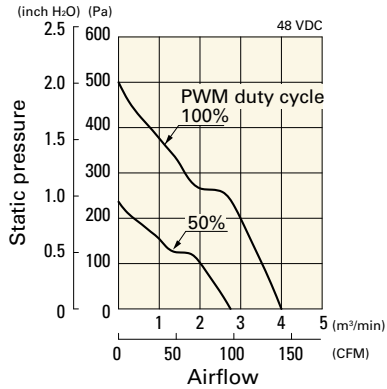


PWM duty - Speed characteristics example

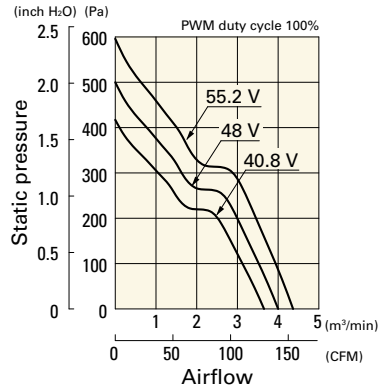


9GA0948P1H03 With pulse sensor with PWM control

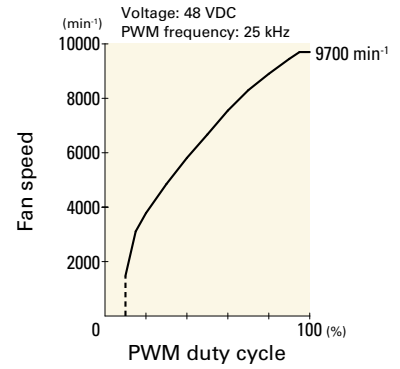
PWM duty cycle



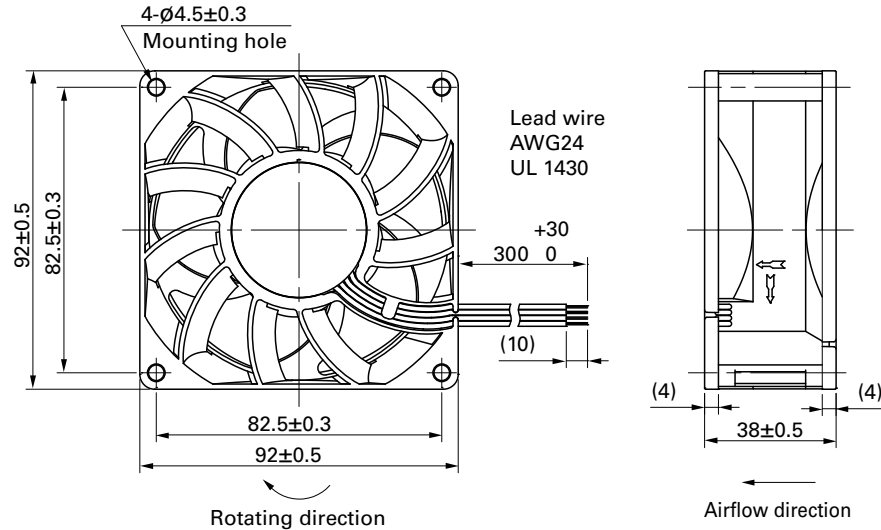
Operating voltage range



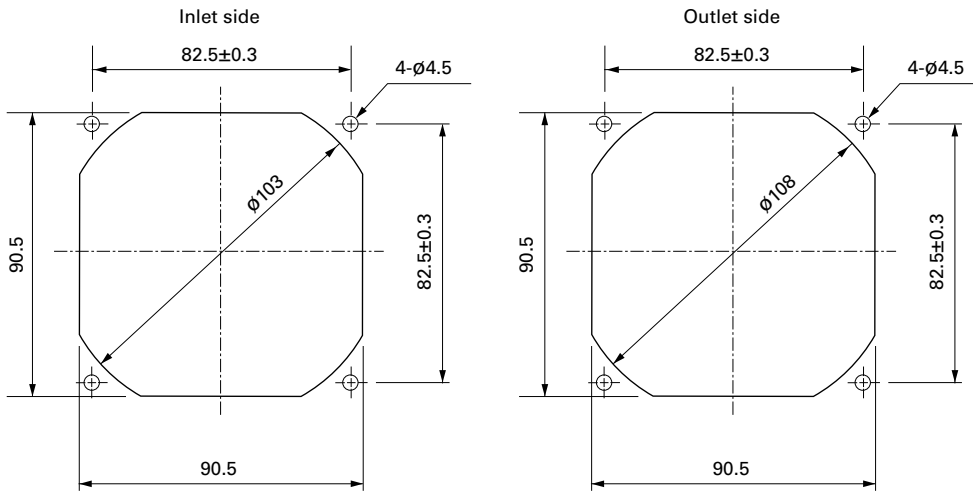
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)



92x92x38 mm

San Ace 92 9GV type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 250 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | | |
|--------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|----|------------|
| 9GV0912P1G03 | 12 | 10.8 to 13.2 | 100 | 4.1 | 49.2 | 9000 | 5.35 189.0 | 430.0 1.73 | 68 | -20 to +70 | 40000/60°C (70000/40°C) | | |
| | | | 0 | 0.33 | 4.0 | 2900 | 1.72 60.8 | 44.6 0.18 | 37 | | | | |
| 9GV0912P1H03 | | 10.2 to 13.8 | 100 | 3.5 | 42.0 | 8500 | 5.05 178.0 | 385.0 1.55 | 64 | | | | |
| | | | 0 | 0.29 | 3.5 | 2700 | 1.6 56.5 | 38.8 0.16 | 34 | | | | |
| 9GV0912P1F03 | | 48 | 40.8 to 55.2 | 100 | 1.9 | 22.8 | 7000 | 4.15 146.6 | 261 1.05 | | | 59 | -10 to +70 |
| | | | | 0 | 0.16 | 1.92 | 2200 | 1.3 45.9 | 25.7 0.1 | | | 31 | |
| 9GV0948P1H03 | 100 | | 0.82 | 39.4 | 8500 | 5.05 178.0 | 385.0 1.55 | 64 | -20 to +70 | | | | |
| | | | 0 | 0.14 | 6.7 | 4000 | 2.37 83.7 | 85.2 0.34 | | 45 | | | |
| 9GV0948P1F03 | 100 | | 0.48 | 23.04 | 7000 | 4.15 146.6 | 261 1.05 | 59 | -10 to +70 | | | | |
| | | | 0 | 0.12 | 5.76 | 3500 | 2.07 73.1 | 65.2 0.26 | | 42 | | | |

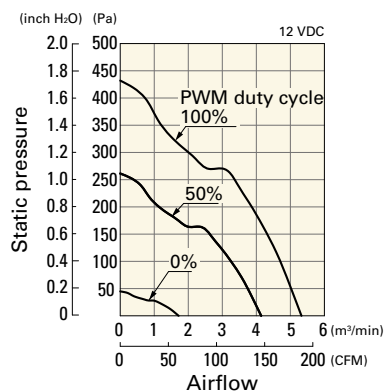
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 646.

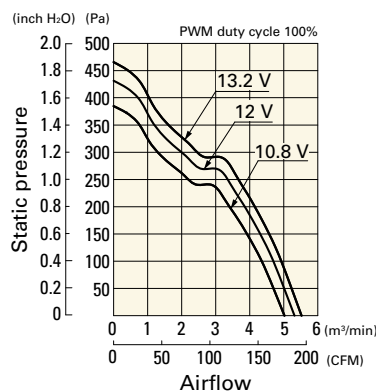
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV0912P1G03 With pulse sensor with PWM control

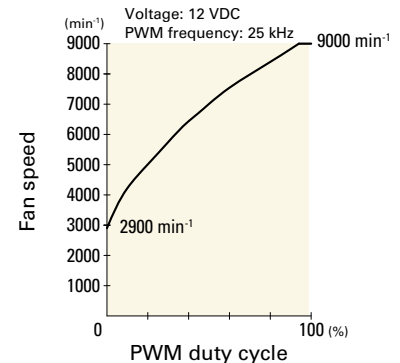
PWM duty cycle



Operating voltage range



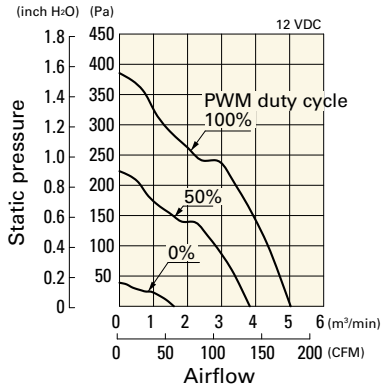
PWM duty - Speed characteristics example



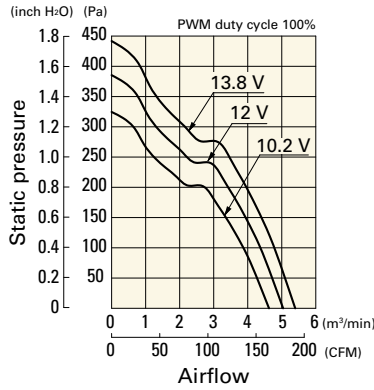
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV0912P1H03 With pulse sensor with PWM control

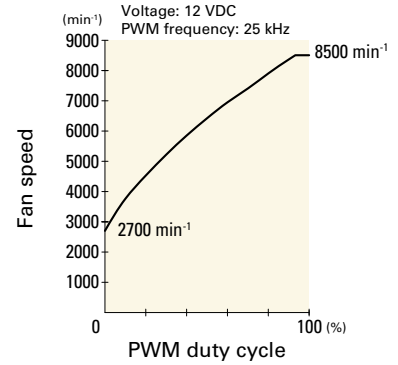
PWM duty cycle



Operating voltage range

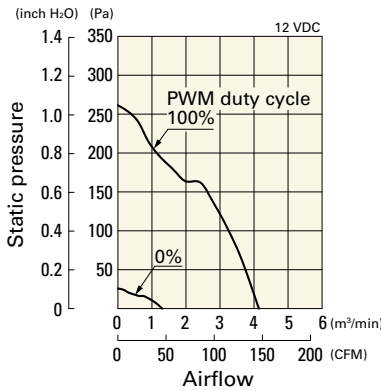


PWM duty - Speed characteristics example

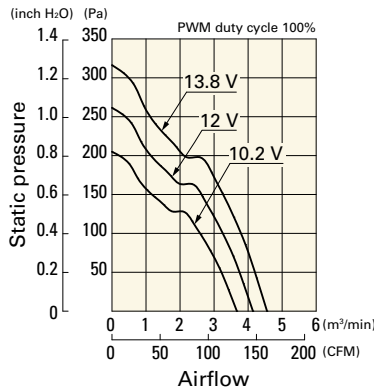


9GV0912P1F03 With pulse sensor with PWM control

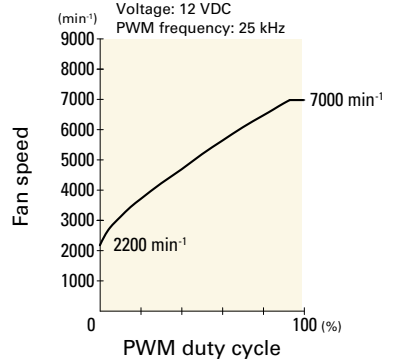
PWM duty cycle



Operating voltage range

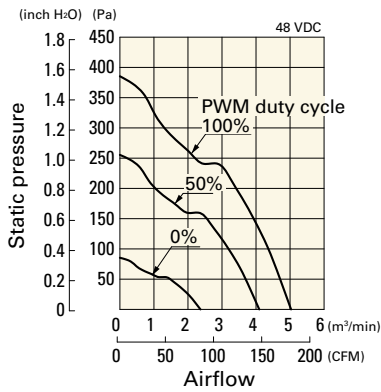


PWM duty - Speed characteristics example

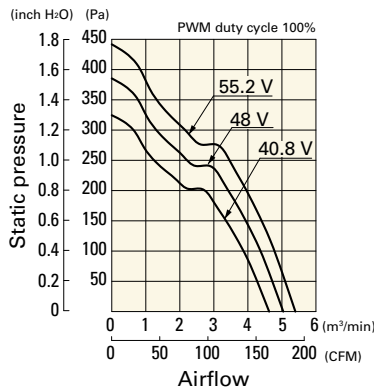


9GV0948P1H03 With pulse sensor with PWM control

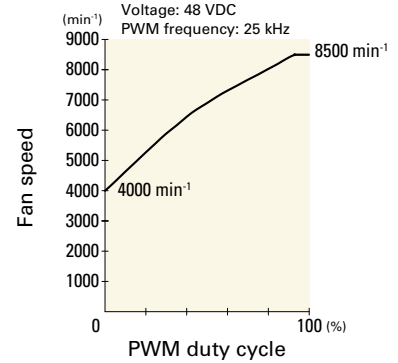
PWM duty cycle



Operating voltage range

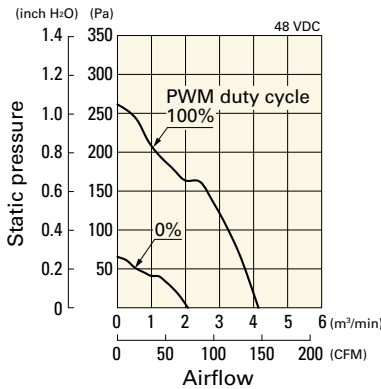


PWM duty - Speed characteristics example

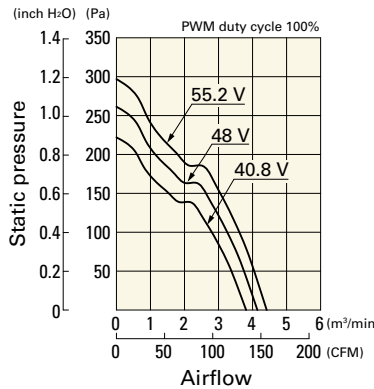


9GV0948P1F03 With pulse sensor with PWM control

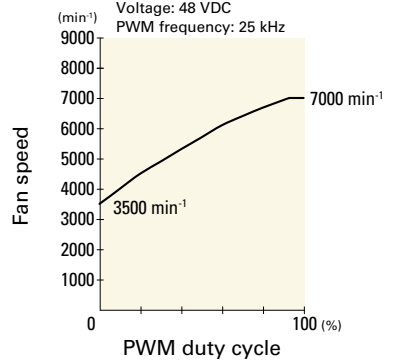
PWM duty cycle



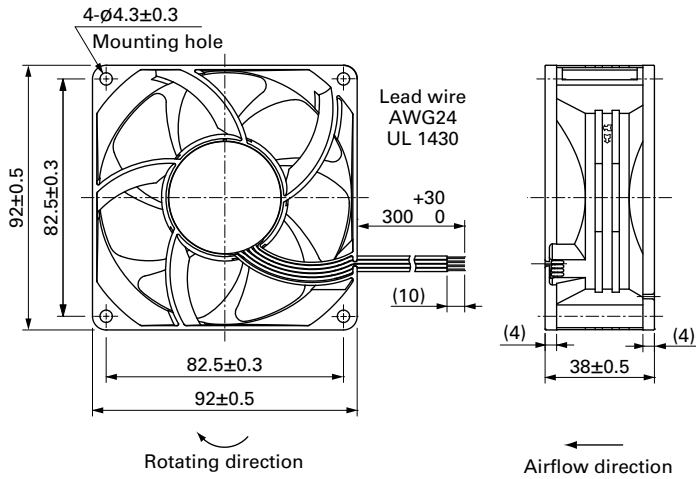
Operating voltage range



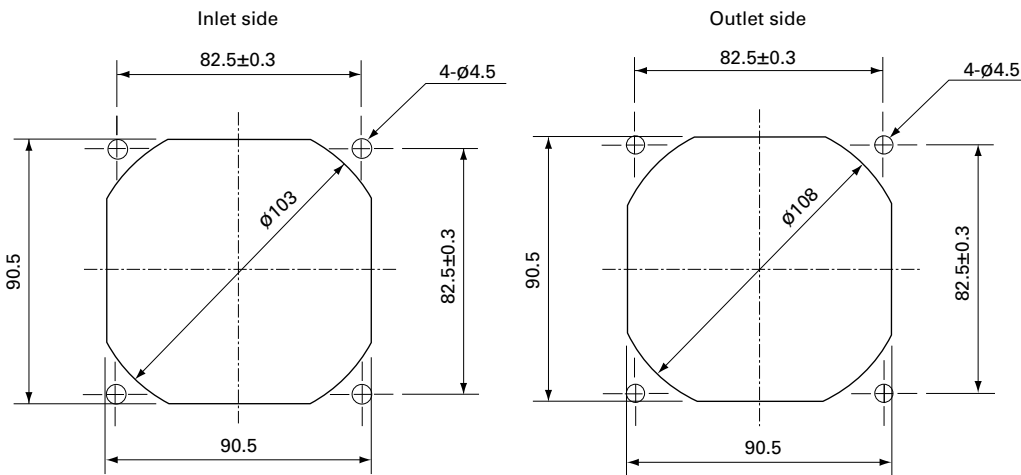
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)

DC Fan



92x92x38 mm

San Ace 92 9G type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 180 g

Specifications

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

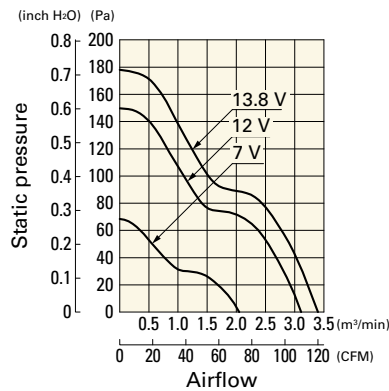
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9G0912G101 | 12 | 7.0 to 13.8 | 1.1 | 13.2 | 5000 | 3.1 110 | 150 0.602 | 50 | -20 to +60 | 40000/60°C (70000/40°C) |
| 9G0912H101 | | | 0.58 | 6.96 | 4000 | 2.54 90 | 100 0.402 | 43 | | |
| 9G0924G101 | 24 | 20.4 to 27.6 | 0.55 | 13.2 | 5000 | 3.1 110 | 150 0.602 | 50 | | |
| 9G0924H101 | | | 0.3 | 7.2 | 4000 | 2.54 90 | 100 0.402 | 43 | | |
| 9G0948G101 | 48 | 40.8 to 55.2 | 0.27 | 12.96 | 5000 | 3.1 110 | 150 0.602 | 50 | | |
| 9G0948H101 | | | 0.16 | 7.68 | 4000 | 2.54 90 | 100 0.402 | 43 | | |

Note: Sensor and control options are available for selection. Refer to the table on pp. 641 to 642.

Airflow - Static Pressure Characteristics

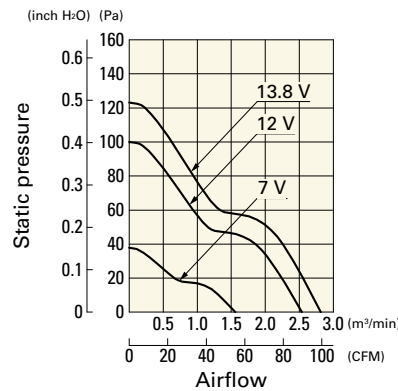
9G0912G101 With pulse sensor

Operating voltage range



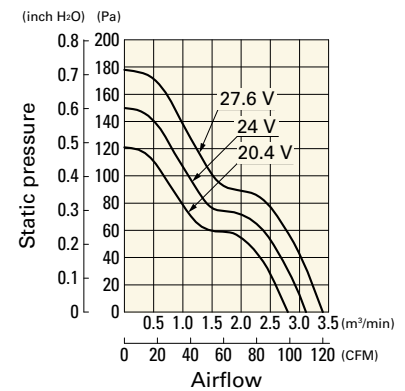
9G0912H101 With pulse sensor

Operating voltage range



9G0924G101 With pulse sensor

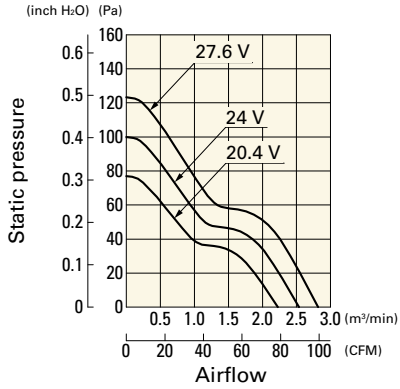
Operating voltage range



Airflow - Static Pressure Characteristics

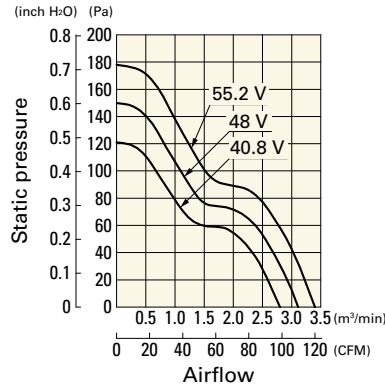
9G0924H101 With pulse sensor

Operating voltage range



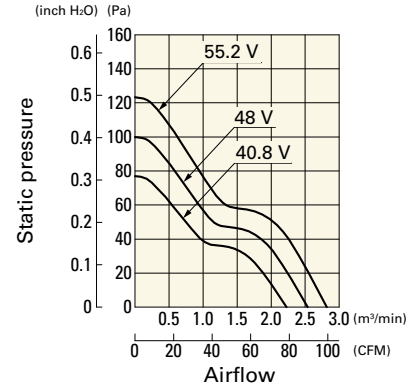
9G0948G101 With pulse sensor

Operating voltage range

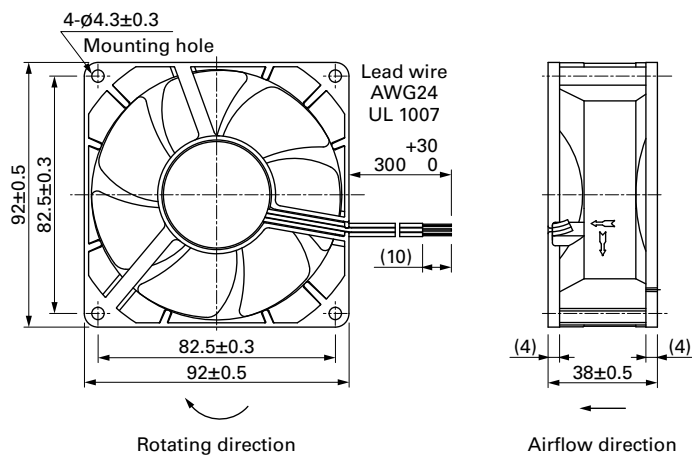


9G0948H101 With pulse sensor

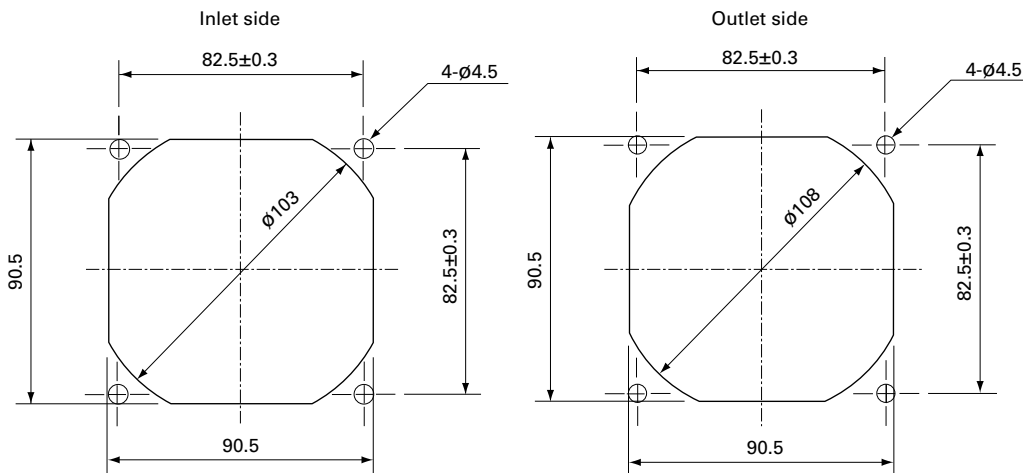
Operating voltage range



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G


Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)

DC Fan

120x120x25 mm

San Ace 120 9GA type Low Power Consumption Fan 



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 280 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.** For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | | |
|-------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|--|--|
| ▶▶▶ 9GA1212P4G001 | 12 | 10.2 to 13.8 | 100 | 0.93 | 11.16 | 6400 | 3.8 134 | 365 1.47 | 57 | -20 to +70 | 40000/60°C (70000/40°C) | | |
| ▶▶▶ 9GA1212P4S001 | | | 25 | 0.16 | 1.92 | 2550 | 1.5 53 | 60 0.24 | 34 | | | | |
| ▶▶▶ 9GA1224P4G001 | 24 | 20.4 to 27.6 | 100 | 0.47 | 11.28 | 6400 | 3.8 134 | 365 1.47 | 57 | | | | |
| ▶▶▶ 9GA1224P4S001 | | | 25 | 0.1 | 2.4 | 2550 | 1.5 53 | 60 0.24 | 34 | | | | |
| ▶▶▶ 9GA1248P4G001 | | | 100 | 0.31 | 7.44 | 5400 | 3.2 113 | 260 1.04 | 54 | | | | |
| ▶▶▶ 9GA1248P4S001 | 48 | 40.8 to 53 | 25 | 0.1 | 2.4 | 2550 | 1.5 53 | 60 0.24 | 34 | | | | |
| ▶▶▶ 9GA1248P4G001 | | | 100 | 0.24 | 11.52 | 6400 | 3.8 134 | 365 1.47 | 57 | | | | |
| ▶▶▶ 9GA1248P4S001 | | | 25 | 0.08 | 3.84 | 2550 | 1.5 53 | 60 0.24 | 34 | | | | |
| ▶▶▶ 9GA1248P4G001 | | | 100 | 0.16 | 7.68 | 5400 | 3.2 113 | 260 1.04 | 54 | | | | |
| ▶▶▶ 9GA1248P4S001 | | | 25 | 0.08 | 3.84 | 2550 | 1.5 53 | 60 0.24 | 34 | | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor.** For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶▶ 9GA1212G4001 | 12 | 7 to 13.8 | 0.93 | 11.16 | 6400 | 3.8 134 | 365 1.47 | 57 | -20 to +70 | 40000/60°C (70000/40°C) |
| ▶▶▶ 9GA1212S4001 | | | 0.61 | 7.32 | 5400 | 3.2 113 | 260 1.04 | 54 | | |
| ▶▶▶ 9GA1224G4001 | 24 | 14 to 27.6 | 0.47 | 11.28 | 6400 | 3.8 134 | 365 1.47 | 57 | | |
| ▶▶▶ 9GA1224S4001 | | | 0.31 | 7.44 | 5400 | 3.2 113 | 260 1.04 | 54 | | |
| ▶▶▶ 9GA1248G4001 | 48 | 36 to 53 | 0.24 | 11.52 | 6400 | 3.8 134 | 365 1.47 | 57 | | |
| ▶▶▶ 9GA1248S4001 | | | 0.16 | 7.68 | 5400 | 3.2 113 | 260 1.04 | 54 | | |

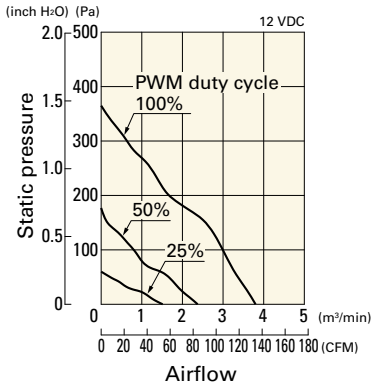
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 644 to 645.

Note 2: The ▶▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

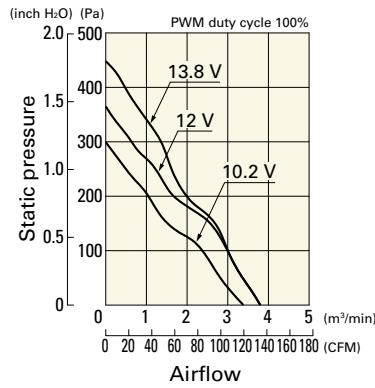
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA1212P4G001 With pulse sensor with PWM control

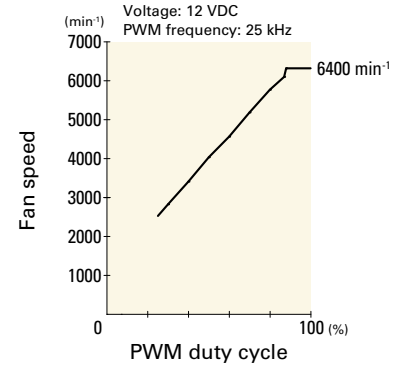
PWM duty cycle



Operating voltage range

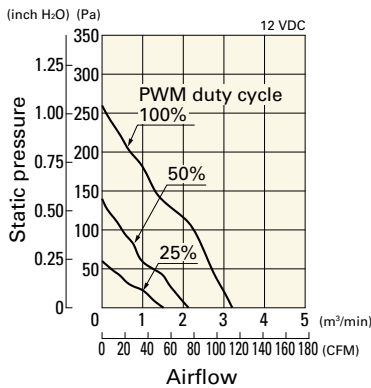


PWM duty - Speed characteristics example

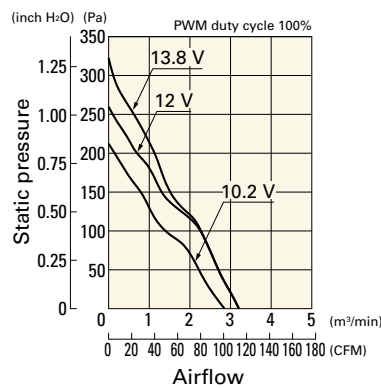


9GA1212P4S001 With pulse sensor with PWM control

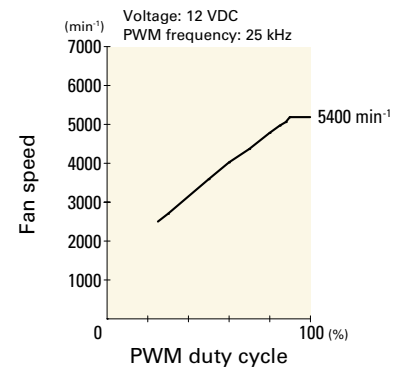
PWM duty cycle



Operating voltage range

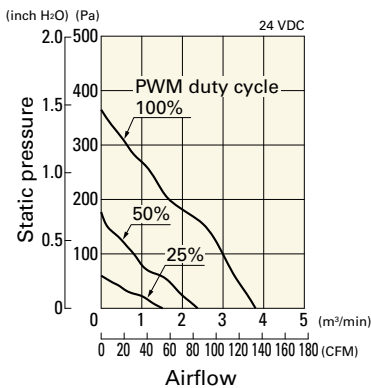


PWM duty - Speed characteristics example

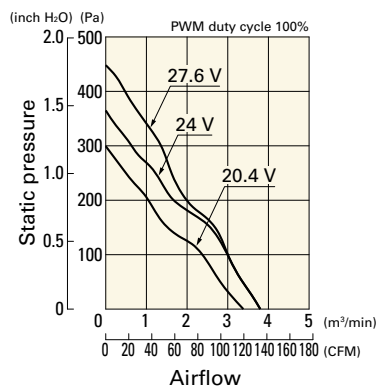


9GA1224P4G001 With pulse sensor with PWM control

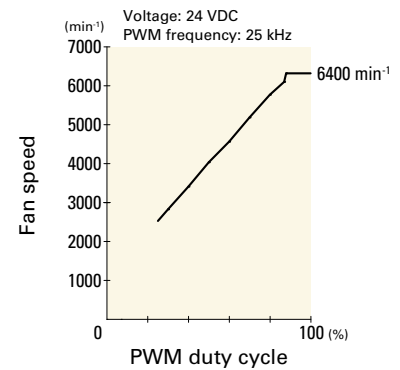
PWM duty cycle



Operating voltage range

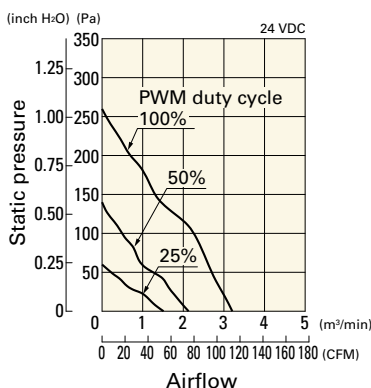


PWM duty - Speed characteristics example

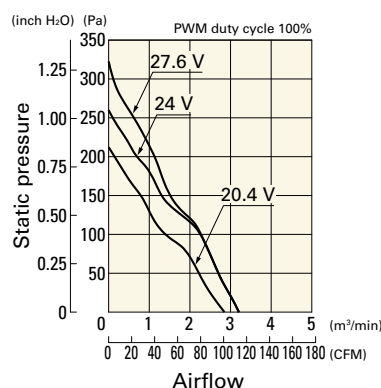


9GA1224P4S001 With pulse sensor with PWM control

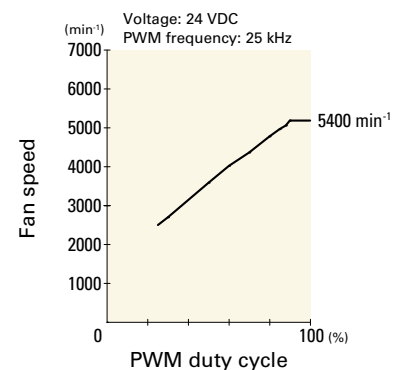
PWM duty cycle



Operating voltage range



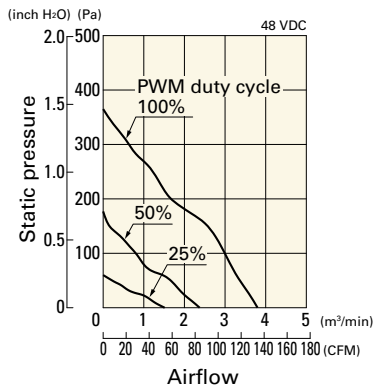
PWM duty - Speed characteristics example



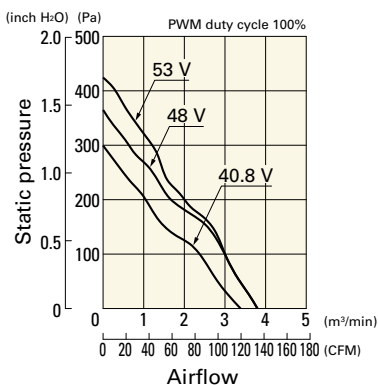
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GA1248P4G001 With pulse sensor with PWM control

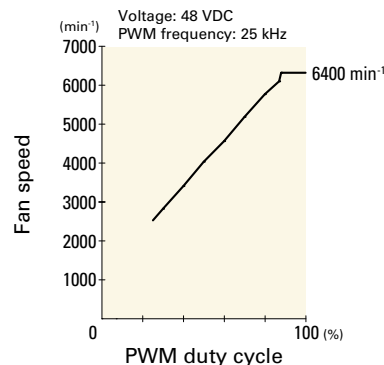
PWM duty cycle



Operating voltage range

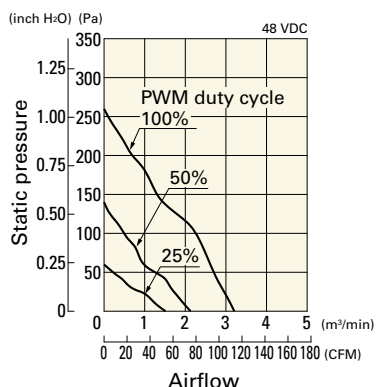


PWM duty - Speed characteristics example

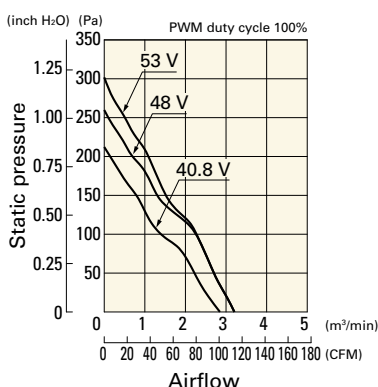


9GA1248P4S001 With pulse sensor with PWM control

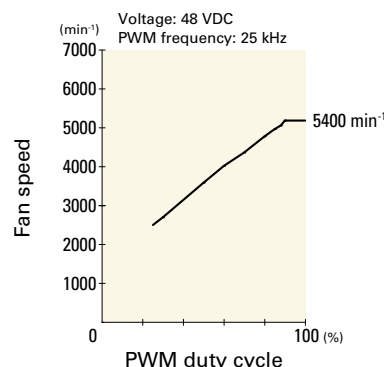
PWM duty cycle



Operating voltage range



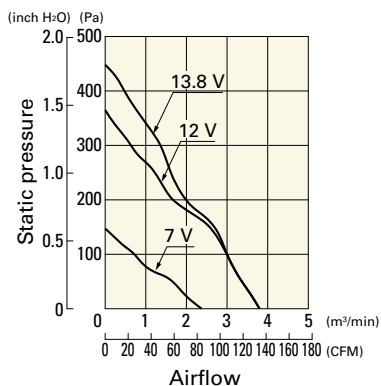
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

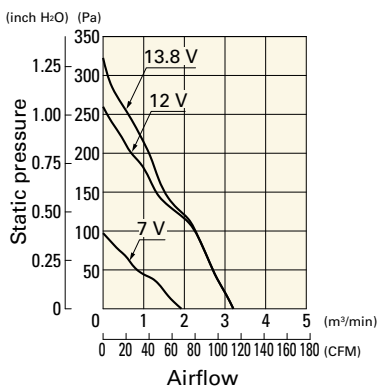
9GA1212G4001 With pulse sensor

Operating voltage range



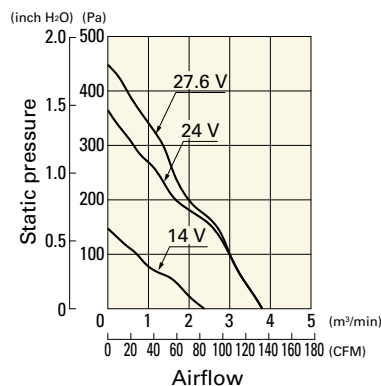
9GA1212S4001 With pulse sensor

Operating voltage range



9GA1224G4001 With pulse sensor

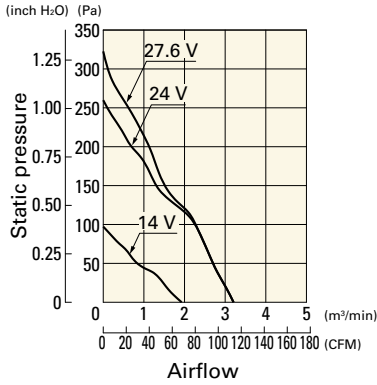
Operating voltage range



Airflow - Static Pressure Characteristics

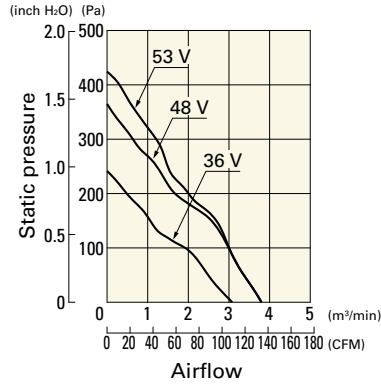
9GA1224S4001 With pulse sensor

Operating voltage range



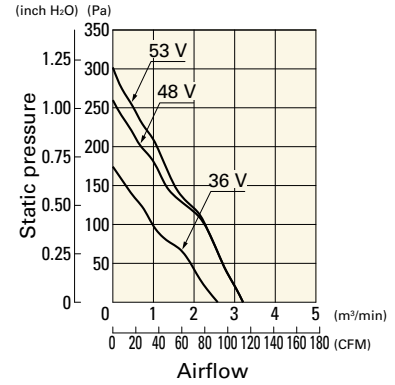
9GA1248G4001 With pulse sensor

Operating voltage range

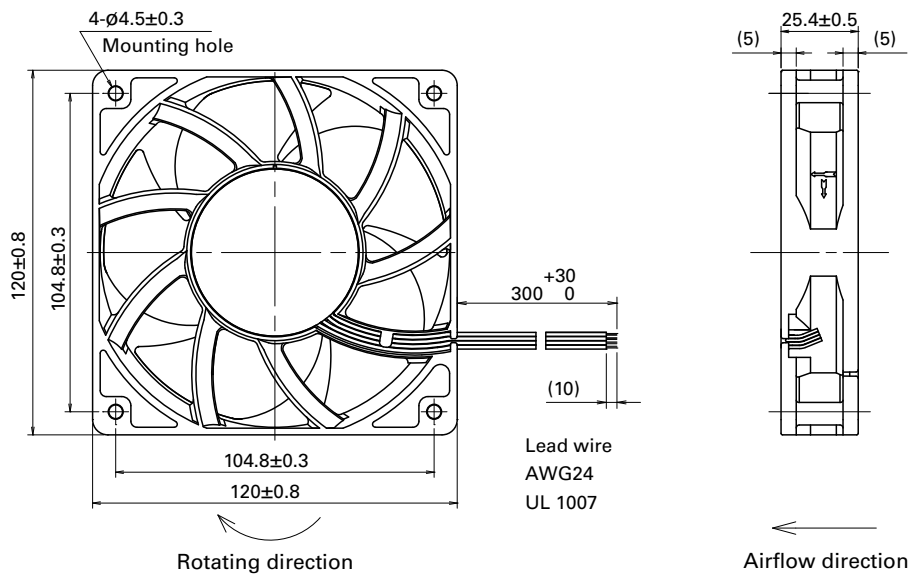


9GA1248S4001 With pulse sensor

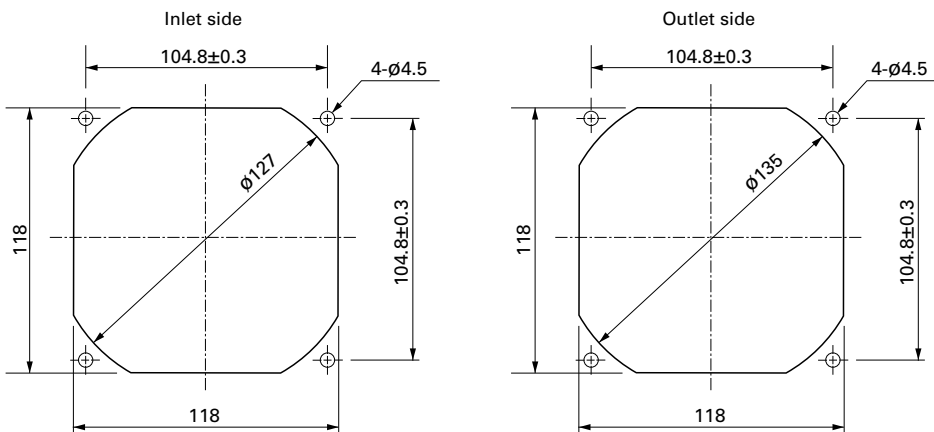
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

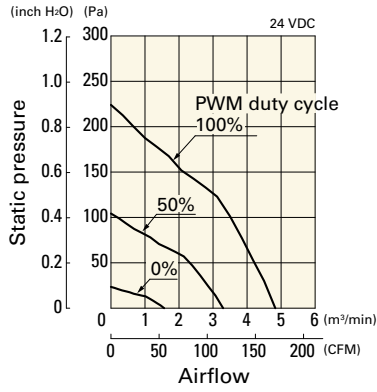
page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)

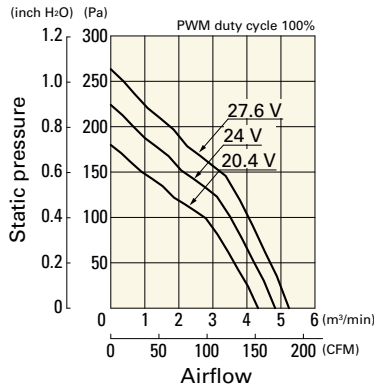
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV1224P4G01 With pulse sensor with PWM control

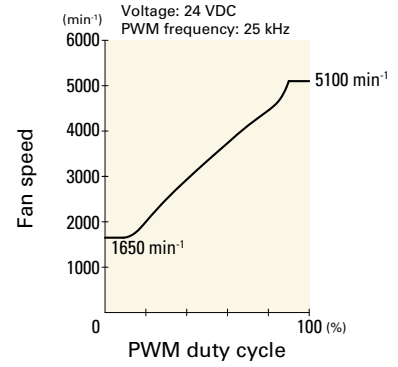
PWM duty cycle



Operating voltage range

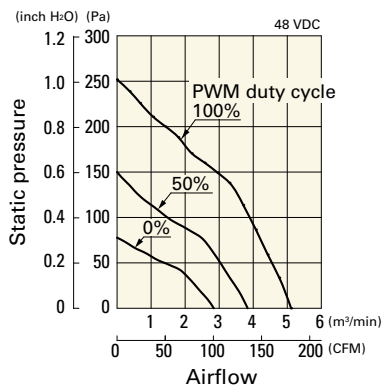


PWM duty - Speed characteristics example

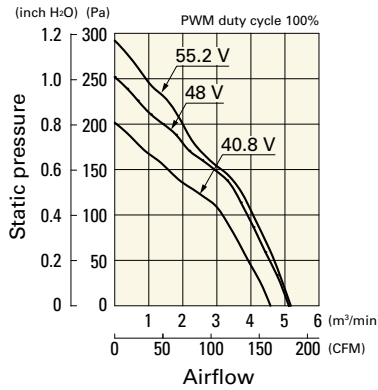


9GV1248P4J01 With pulse sensor with PWM control

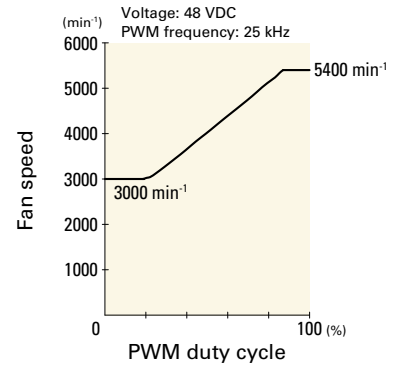
PWM duty cycle



Operating voltage range

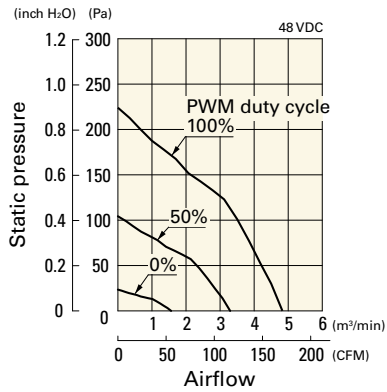


PWM duty - Speed characteristics example

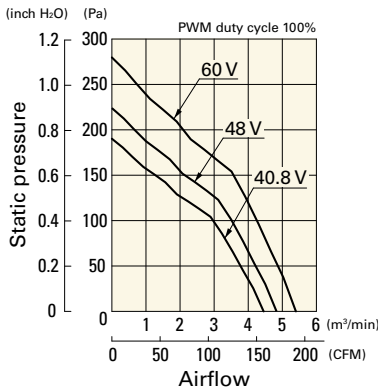


9GV1248P4G01 With pulse sensor with PWM control

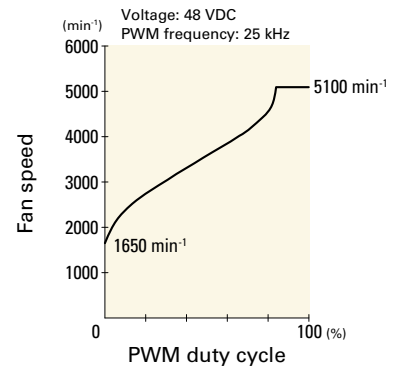
PWM duty cycle



Operating voltage range

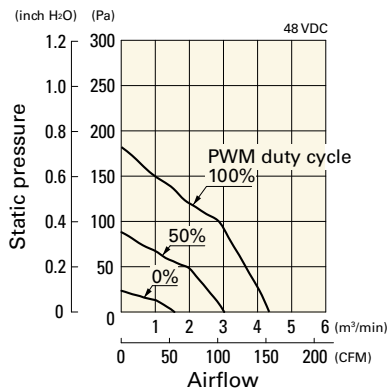


PWM duty - Speed characteristics example

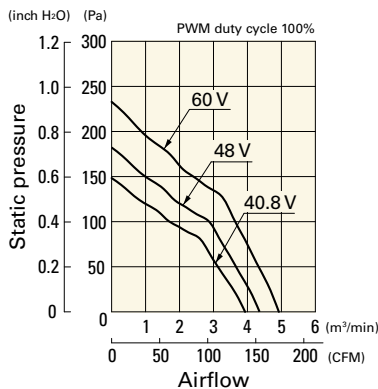


9GV1248P4H01 With pulse sensor with PWM control

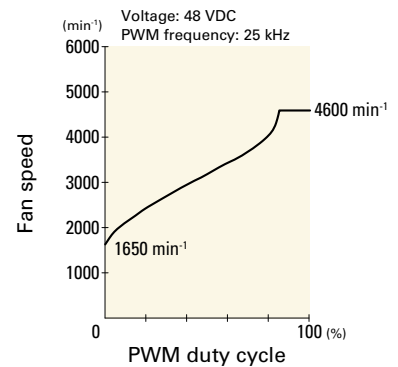
PWM duty cycle



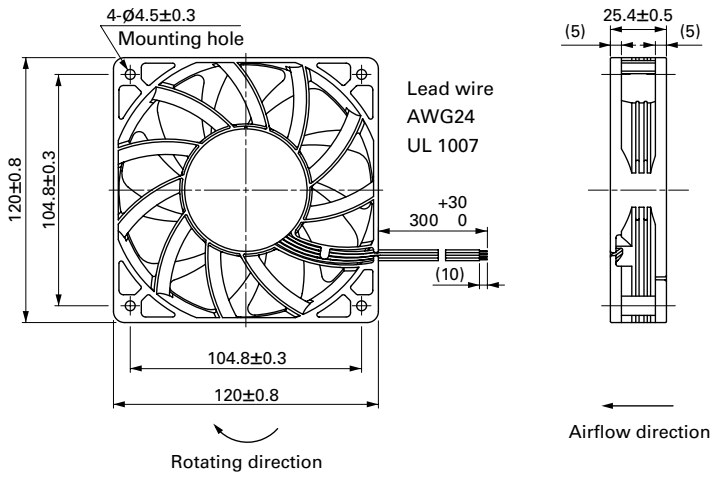
Operating voltage range



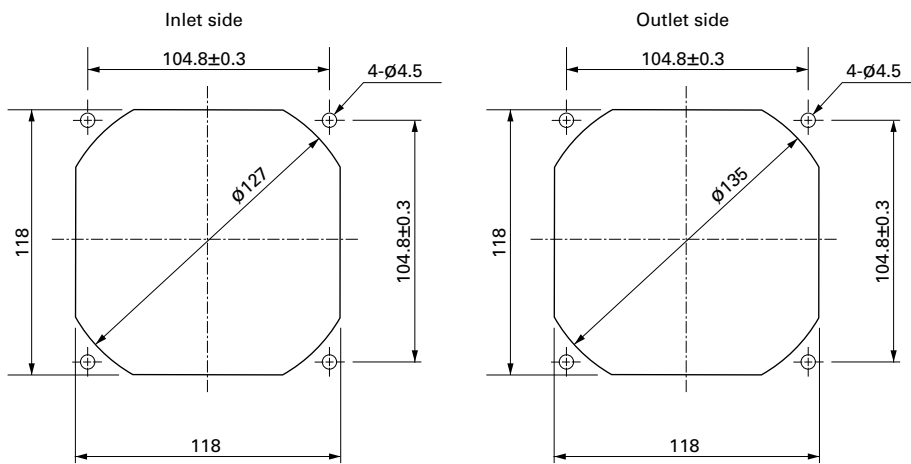
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards page: p. 605

Model no.: 109-1000G

Resin filter kits page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)



120×120×25 mm

San Ace 120 9RA type   

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 210 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|------|--|-------|--------------|----------------------------|----------------------------|
| » 9RA1212P4G001 | 12 | 10.8 to 13.2 | 100 | 0.55 | 6.6 | 4500 | 3.68 | 130 | 120 | 0.48 | 47 | -20 to +70 | 60000/60°C (90000/40°C) |
| | | | 20 | 0.06 | 0.72 | 1250 | 1.02 | 36 | 9.2 | 0.037 | 15 | | |
| » 9RA1224P4G001 | 24 | 21.6 to 26.4 | 100 | 0.28 | 6.72 | 4500 | 3.68 | 130 | 120 | 0.48 | 47 | | |
| | | | 20 | 0.05 | 1.2 | 1750 | 1.43 | 50.5 | 18.1 | 0.073 | 22 | | |
| » 9RA1248P4G001 | 48 | 43.2 to 52.8 | 100 | 0.15 | 7.2 | 4500 | 3.68 | 130 | 120 | 0.48 | 47 | | |
| | | | 20 | 0.03 | 1.44 | 1650 | 1.34 | 47.3 | 16.1 | 0.065 | 21 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|-------|--|-------|--------------|----------------------------|----------------------------|
| » 9RA1212G4001 | 12 | 7 to 13.8 | 0.55 | 6.6 | 4500 | 3.68 | 130 | 120 | 0.48 | 47 | -20 to +70 | 60000/60°C (90000/40°C) |
| » 9RA1212E4001 | | | 0.41 | 4.92 | 4000 | 3.3 | 116.5 | 96 | 0.386 | 45 | | |
| » 9RA1212A4001 | | | 0.3 | 3.6 | 3500 | 2.86 | 101.1 | 73 | 0.293 | 42 | | |
| » 9RA1212H4001 | | | 0.26 | 3.12 | 3200 | 2.62 | 92.4 | 61 | 0.245 | 39 | | |
| » 9RA1212F4001 | | | 0.17 | 2.04 | 2700 | 2.2 | 77.6 | 43 | 0.172 | 35 | | |
| » 9RA1212M4001 | | | 0.12 | 1.44 | 2200 | 1.8 | 63.5 | 29 | 0.116 | 28 | | |
| » 9RA1224G4001 | 24 | 14 to 27.6 | 0.28 | 6.72 | 4500 | 3.68 | 130 | 120 | 0.48 | 47 | | |
| » 9RA1224E4001 | | | 0.22 | 5.28 | 4000 | 3.3 | 116.5 | 96 | 0.386 | 45 | | |
| » 9RA1224A4001 | | | 0.16 | 3.84 | 3500 | 2.86 | 101.1 | 73 | 0.293 | 42 | | |
| » 9RA1224H4001 | | | 0.13 | 3.12 | 3200 | 2.62 | 92.4 | 61 | 0.245 | 39 | | |
| » 9RA1224M4001 | | | 0.07 | 1.68 | 2200 | 1.8 | 63.5 | 29 | 0.116 | 28 | | |
| » 9RA1248G4001 | | | 48 | 36 to 55.2 | 0.15 | 7.2 | 4500 | 3.68 | 130 | 120 | | |
| » 9RA1248E4001 | 0.11 | 5.28 | | | 4000 | 3.3 | 116.5 | 96 | 0.386 | 45 | | |
| » 9RA1248A4001 | 0.09 | 4.32 | | | 3500 | 2.86 | 101.1 | 73 | 0.293 | 42 | | |

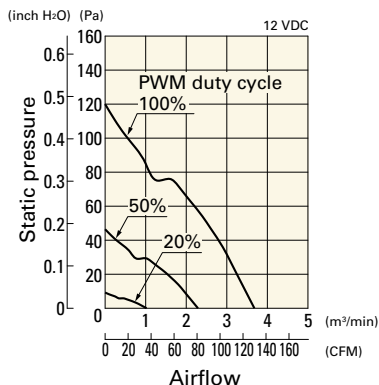
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 651 to 652.

Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 668 for details.

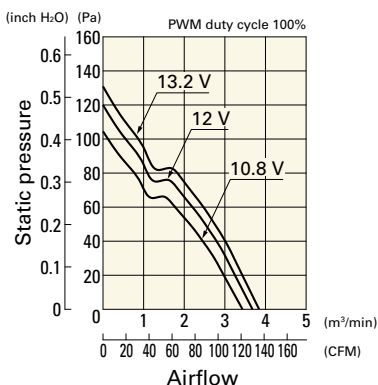
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RA1212P4G001 With pulse sensor with PWM control

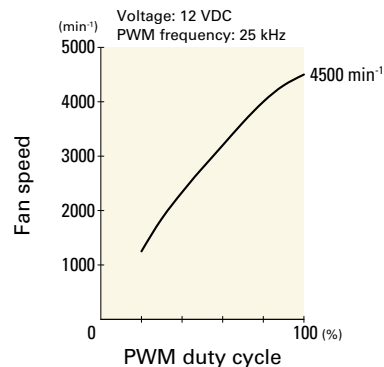
PWM duty cycle



Operating voltage range

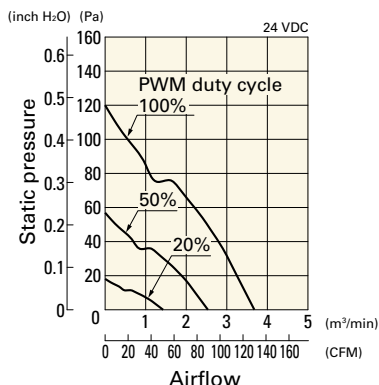


PWM duty - Speed characteristics example

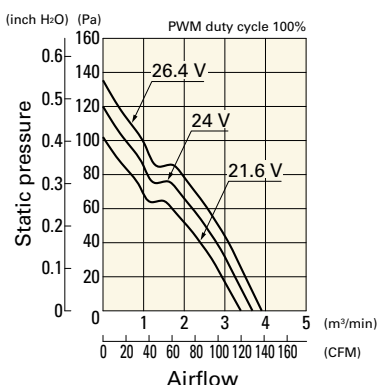


9RA1224P4G001 With pulse sensor with PWM control

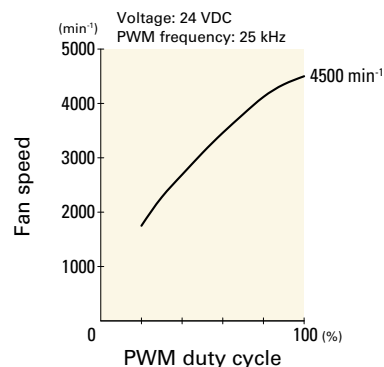
PWM duty cycle



Operating voltage range

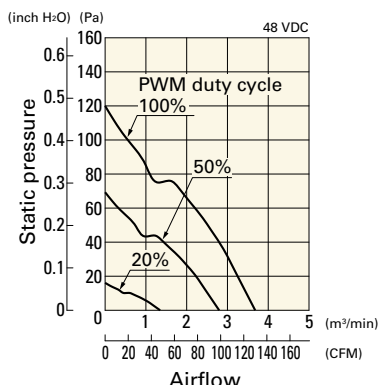


PWM duty - Speed characteristics example

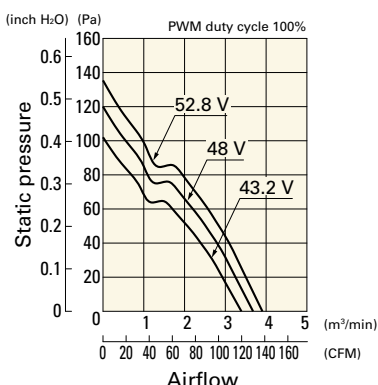


9RA1248P4G001 With pulse sensor with PWM control

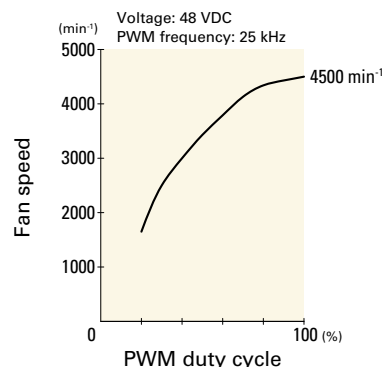
PWM duty cycle



Operating voltage range



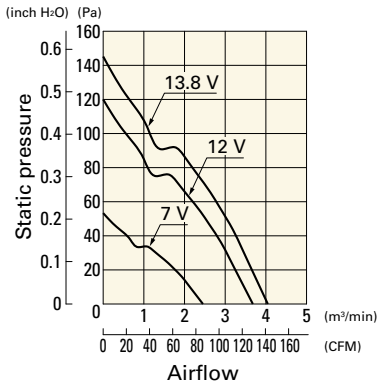
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

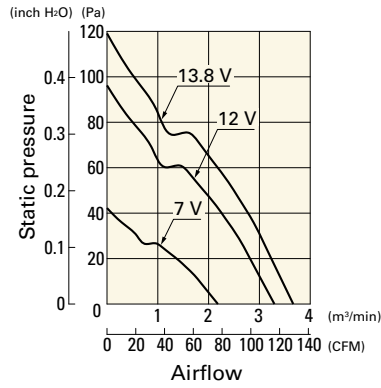
9RA1212G4001 With pulse sensor

Operating voltage range



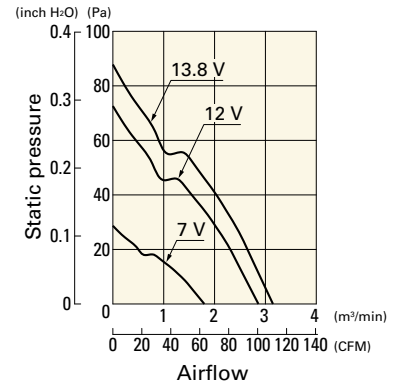
9RA1212E4001 With pulse sensor

Operating voltage range



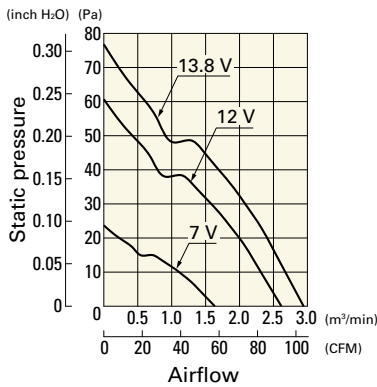
9RA1212A4001 With pulse sensor

Operating voltage range



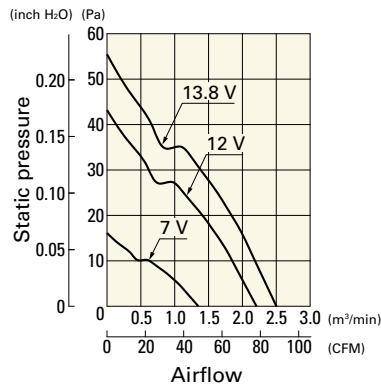
9RA1212H4001 With pulse sensor

Operating voltage range



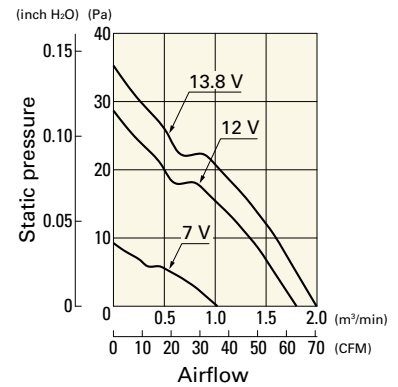
9RA1212F4001 With pulse sensor

Operating voltage range



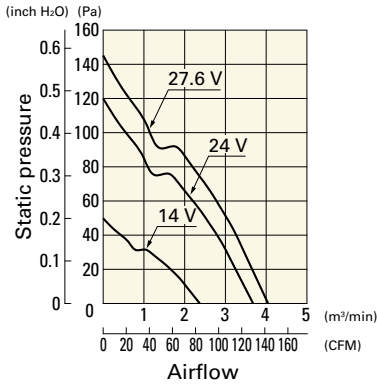
9RA1212M4001 With pulse sensor

Operating voltage range



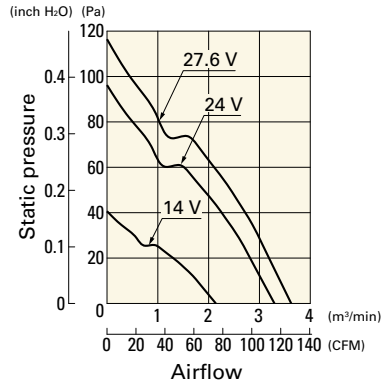
9RA1224G4001 With pulse sensor

Operating voltage range



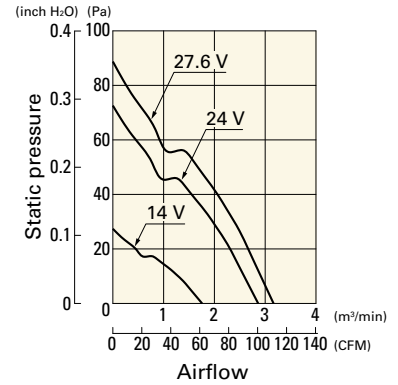
9RA1224E4001 With pulse sensor

Operating voltage range



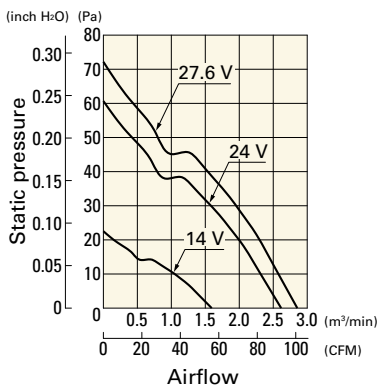
9RA1224A4001 With pulse sensor

Operating voltage range



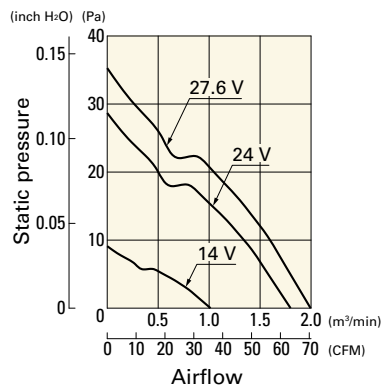
9RA1224H4001 With pulse sensor

Operating voltage range



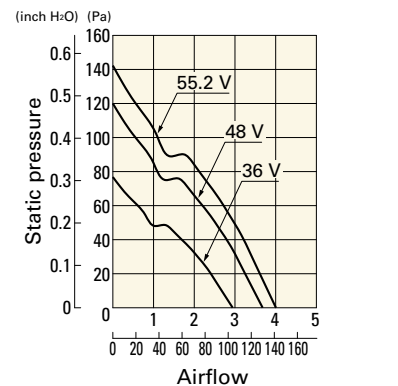
9RA1224M4001 With pulse sensor

Operating voltage range



9RA1248G4001 With pulse sensor

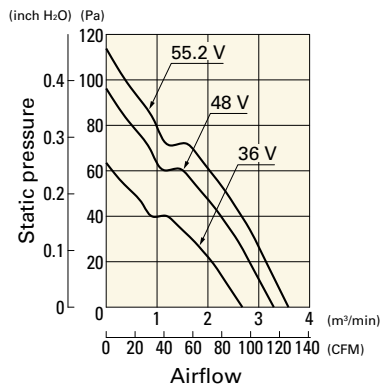
Operating voltage range



Airflow - Static Pressure Characteristics

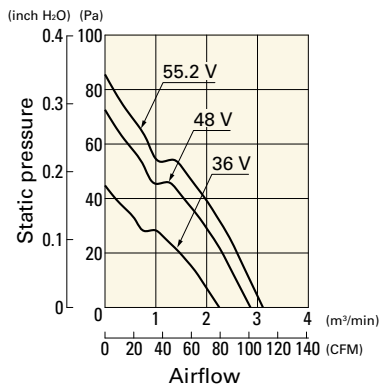
9RA1248E4001 With pulse sensor

Operating voltage range

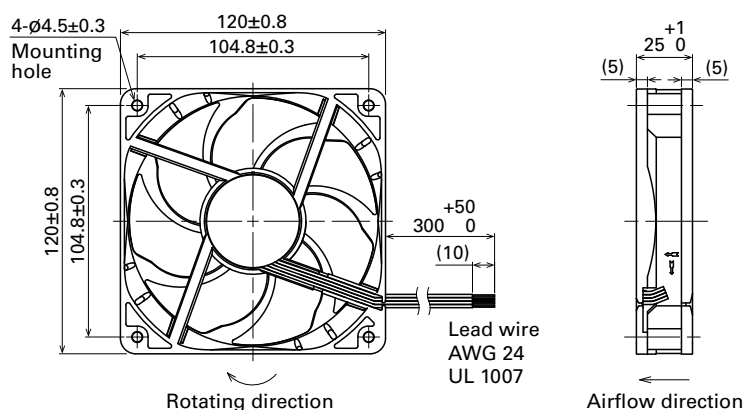


9RA1248A4001 With pulse sensor

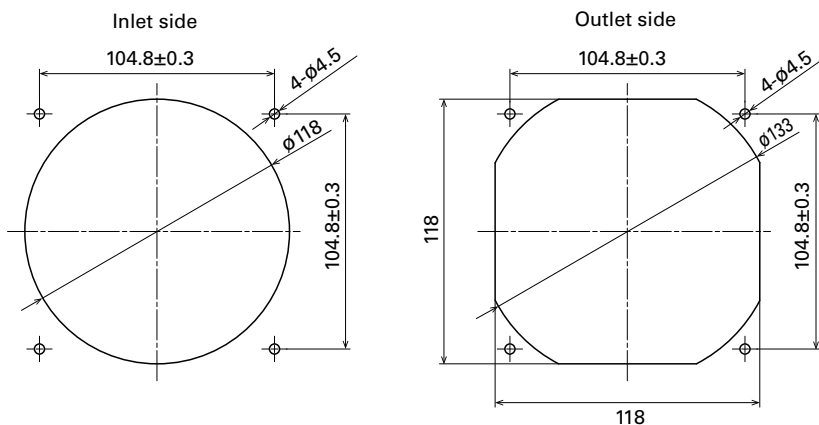
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)

120×120×25 mm



San Ace 120 9S type Silent Fan

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 140 g

Specifications

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| » 9S1212H401 | 12 | 8 to 13.2 | 0.39 | 4.68 | 2700 | 2.45 86.5 | 45.2 0.18 | 36 | -10 to +60 | 40000/60°C (70000/40°C) |
| » 9S1212F401 | | | 0.19 | 2.28 | 2200 | 2.0 70.6 | 30.0 0.12 | 30 | | |
| » 9S1212M401 | | 8 to 13.8 | 0.13 | 1.56 | 1850 | 1.66 58.6 | 22.7 0.09 | 24 | | |
| » 9S1212L401 | | | 0.08 | 0.96 | 1500 | 1.36 48.1 | 14.9 0.06 | 17 | | |
| » 9S1224M401 | | | 24 | 14 to 26.4 | 0.06 | 1.44 | 1850 | 1.66 58.6 | | |

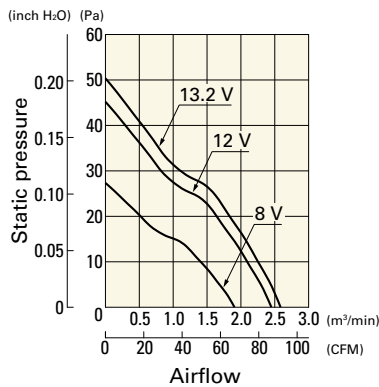
Note 1: Sensor and control options are available for selection. Refer to the table on p. 653.

Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

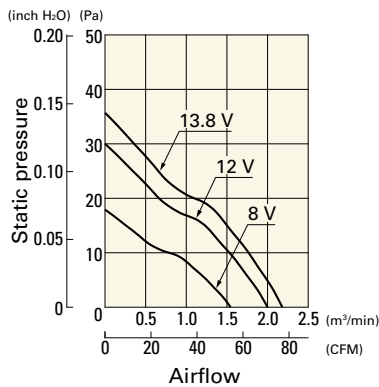
9S1212H401 With pulse sensor

Operating voltage range



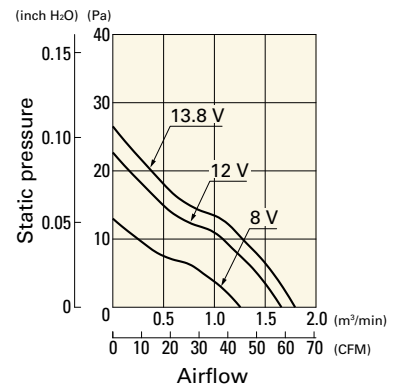
9S1212F401 With pulse sensor

Operating voltage range



9S1212M401 With pulse sensor

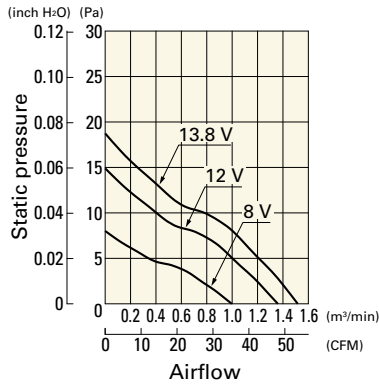
Operating voltage range



Airflow - Static Pressure Characteristics

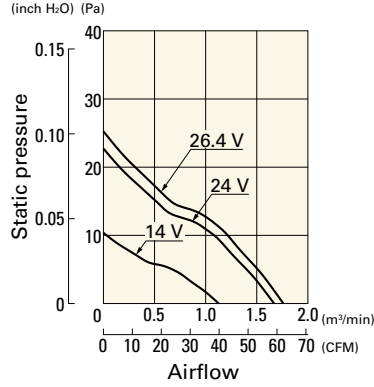
9S1212L401 With pulse sensor

Operating voltage range

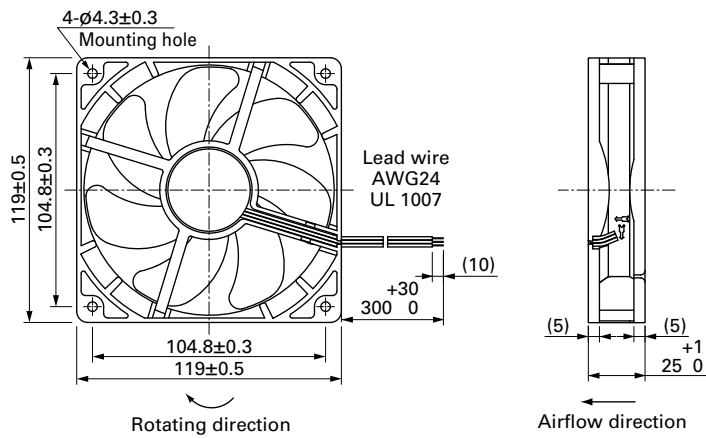


9S1224M401 With pulse sensor

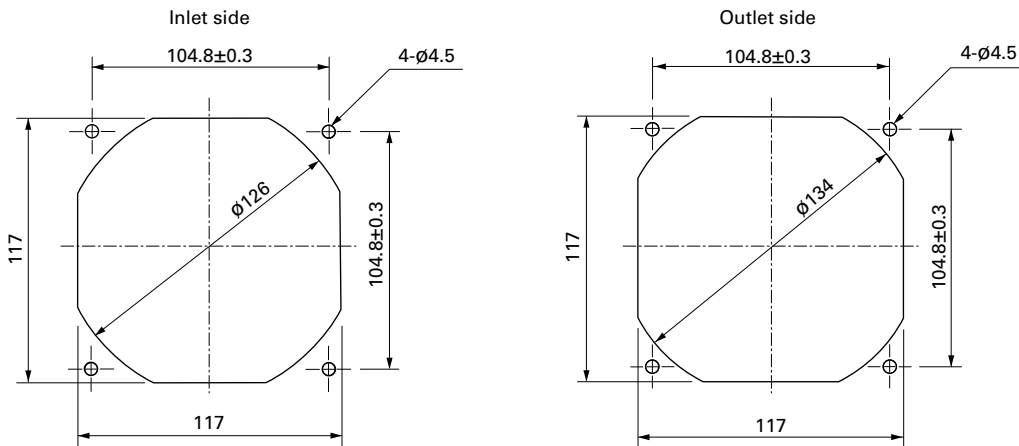
Operating voltage range



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
 109-1000F30 (30PPI), 109-1000F40 (40PPI)



120x120x38 mm

San Ace 120 9HV type US

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 460 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9HV1224P1A001 | 24 | 21.6 to 26.4 | 100 | 2.4 | 57.6 | 9600 | 7.0 247 | 950 3.82 | 71 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.37 | 8.88 | 3800 | 2.7 95 | 161 0.65 | 46 | | |
| 9HV1248P1G001 | 48 | 36 to 60 | 100 | 2.0 | 96 | 11500 | 8.3 293 | 1300 5.22 | 75 | | |
| | | | 0 | 0.23 | 11 | 3800 | 2.7 95 | 161 0.65 | 46 | | |
| 9HV1248P1H001 | | | 100 | 1.4 | 67 | 10000 | 7.2 254 | 1050 4.22 | 72 | | |
| | | | 0 | 0.23 | 11 | 3800 | 2.7 95 | 161 0.65 | 46 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

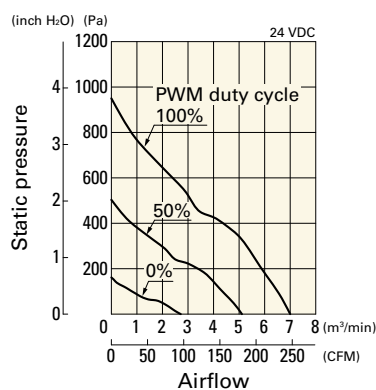
Note 1: Sensor and control options are available for selection. Refer to the table on p. 647.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

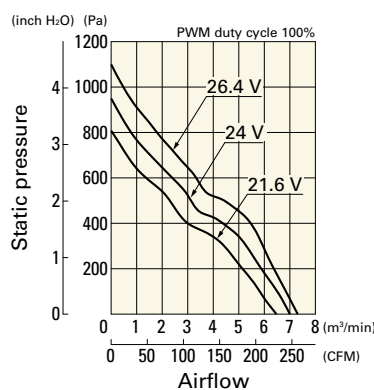
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV1224P1A001 With pulse sensor with PWM control

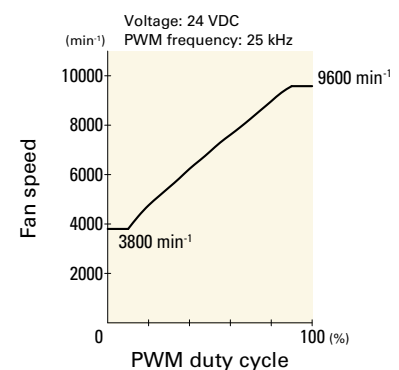
PWM duty cycle



Operating voltage range



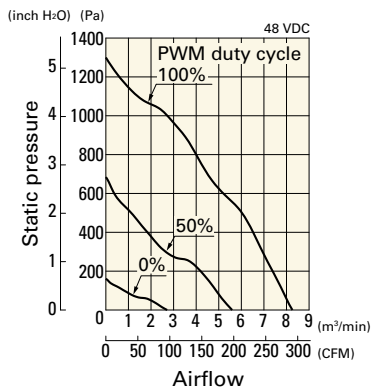
PWM duty - Speed characteristics example



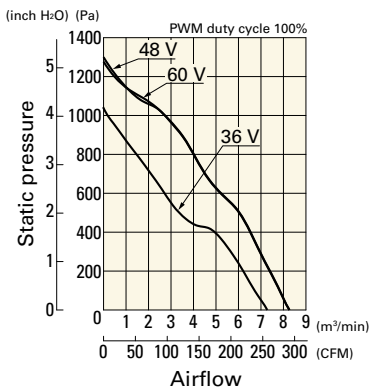
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV1248P1G001 With pulse sensor with PWM control

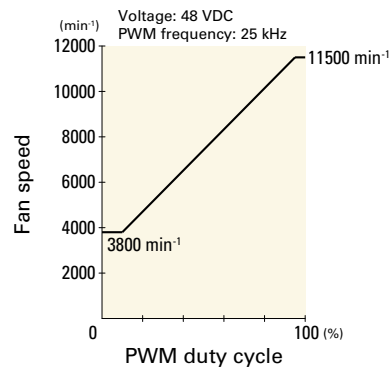
PWM duty cycle



Operating voltage range

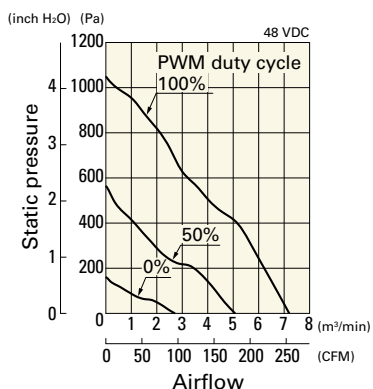


PWM duty - Speed characteristics example

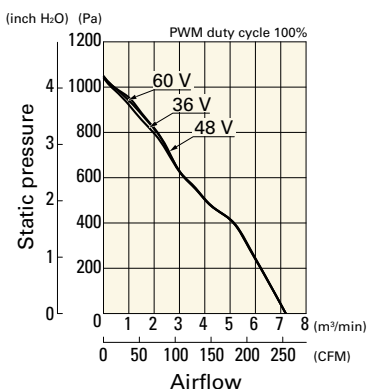


9HV1248P1H001 With pulse sensor with PWM control

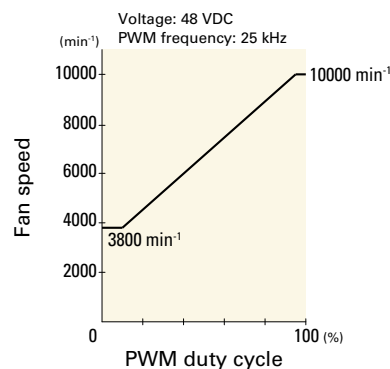
PWM duty cycle



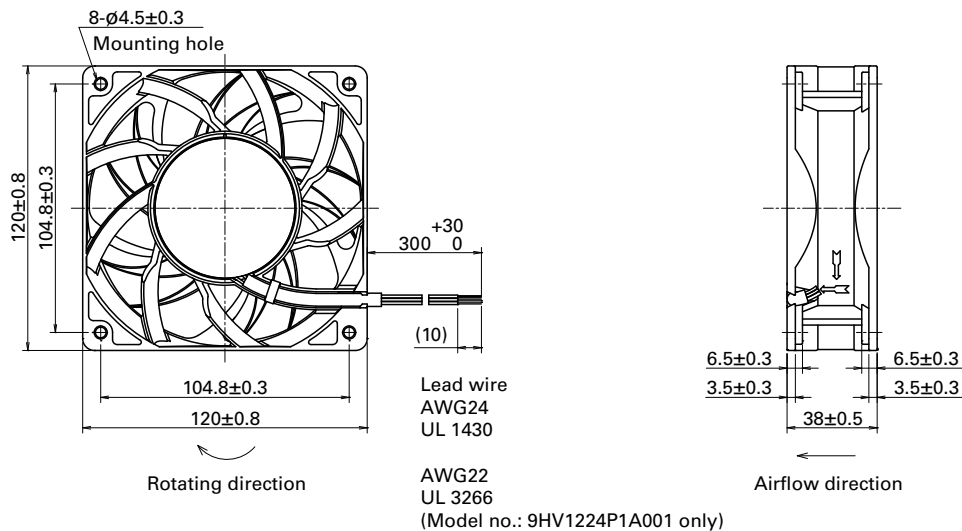
Operating voltage range

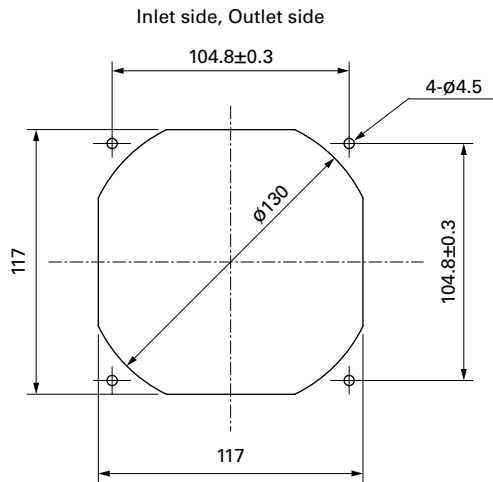


PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)**Options****Finger guards**

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)

120×120×38 mm



San Ace 120 9SX type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 390 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

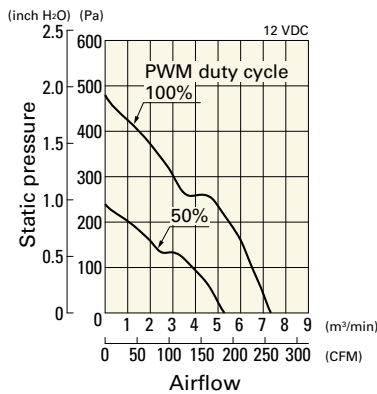
| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9SX1212P1K001 | 12 | 10.8 to 13.2 | 100 | 4.4 | 52.8 | 7400 | 7.3 258 | 480 1.93 | 66 | -10 to +60 | 40000/60°C (70000/40°C) |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

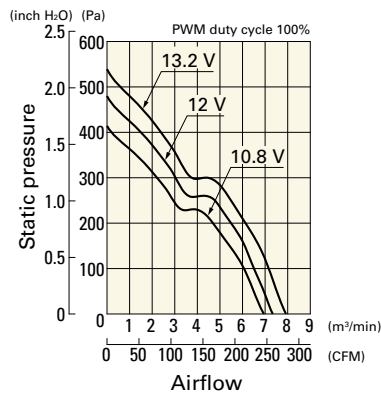
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9SX1212P1K001 With pulse sensor with PWM control

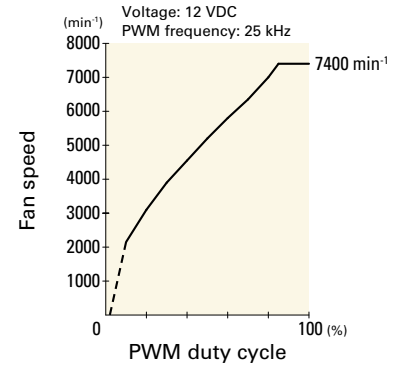
PWM duty cycle



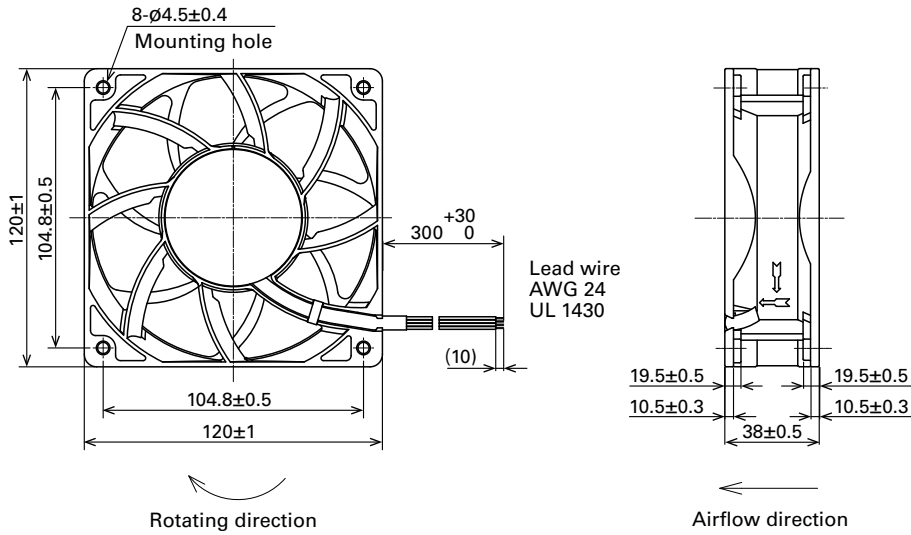
Operating voltage range



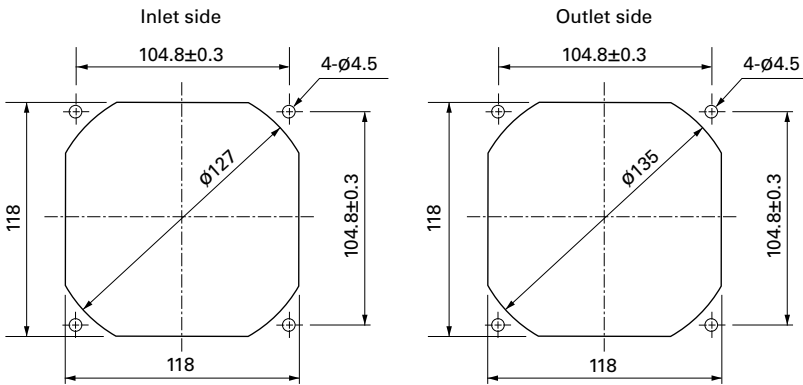
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)

DC Fan



120x120x38 mm

San Ace 120 9GV type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 360 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GV1212P1J01 | 12 | 10.2 to 13.8 | 100 | 3.0 | 36.0 | 6400 | 6.35 224.0 | 360.0 1.45 | 64 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.19 | 2.28 | 1500 | 1.49 52.6 | 19.8 0.08 | 33 | | |
| 9GV1212P1G01 | 12 | 10.2 to 13.8 | 100 | 2.1 | 25.2 | 5500 | 5.45 192.6 | 265 1.06 | 60 | | |
| | | | 0 | 0.19 | 2.28 | 1500 | 1.49 52.6 | 19.8 0.08 | 33 | | |
| 9GV1224P1J01 | 24 | 20.4 to 27.6 | 100 | 1.5 | 36.0 | 6400 | 6.35 224.0 | 360 1.45 | 64 | | |
| 9GV1224P1H01 | | | 100 | 0.8 | 19.2 | 5200 | 5.16 182.3 | 237 0.95 | 58 | | |
| 9GV1248P1J01 | 48 | 40.8 to 55.2 | 100 | 0.75 | 36.0 | 6400 | 6.35 224.0 | 360.0 1.45 | 64 | | |
| | | | 0 | 0.06 | 2.88 | 1500 | 1.49 52.6 | 26.1 0.106 | 33 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

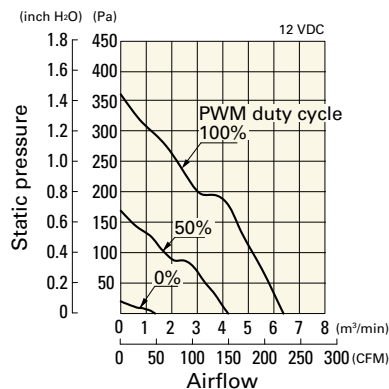
Note 1: Sensor and control options are available for selection. Refer to the table on p. 646.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

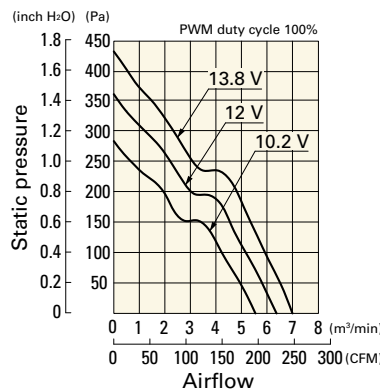
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV1212P1J01 With pulse sensor with PWM control

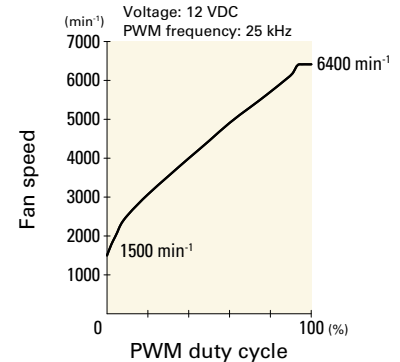
PWM duty cycle



Operating voltage range



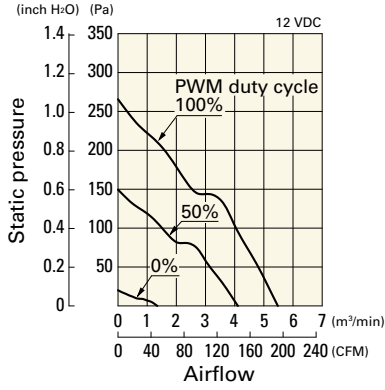
PWM duty - Speed characteristics example



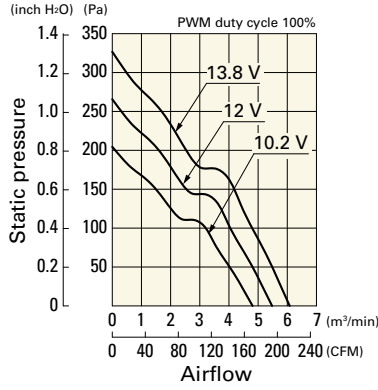
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV1212P1G01 With pulse sensor with PWM control

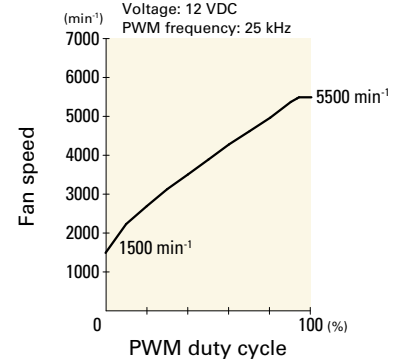
PWM duty cycle



Operating voltage range

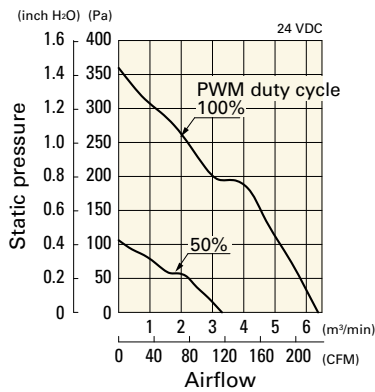


PWM duty - Speed characteristics example

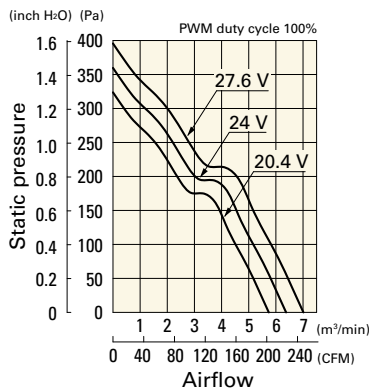


9GV1224P1J01 With pulse sensor with PWM control

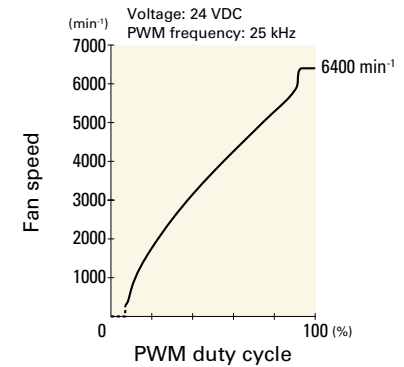
PWM duty cycle



Operating voltage range

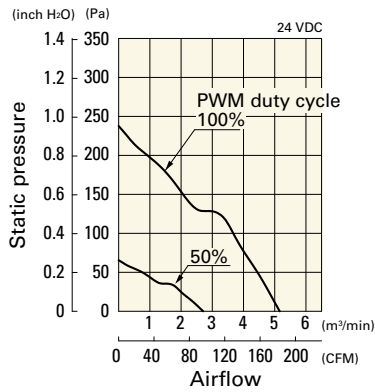


PWM duty - Speed characteristics example

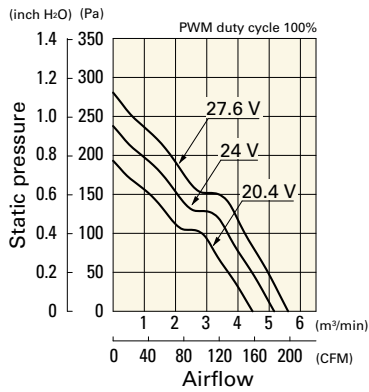


9GV1224P1H01 With pulse sensor with PWM control

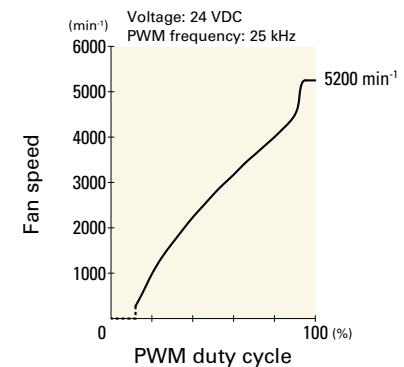
PWM duty cycle



Operating voltage range

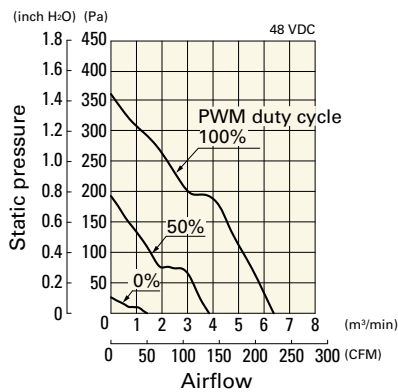


PWM duty - Speed characteristics example

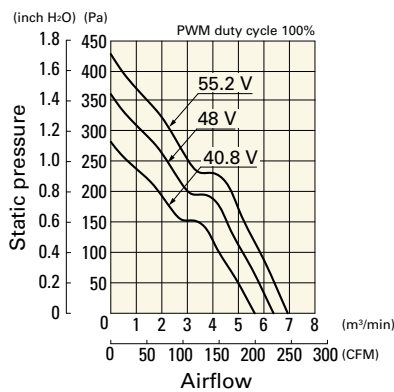


9GV1248P1J01 With pulse sensor with PWM control

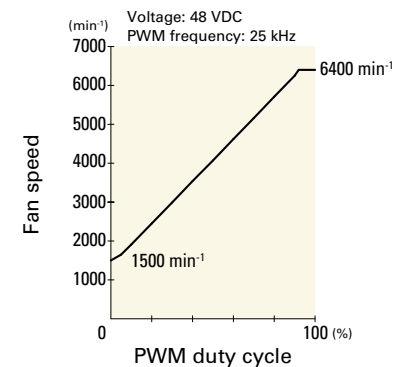
PWM duty cycle



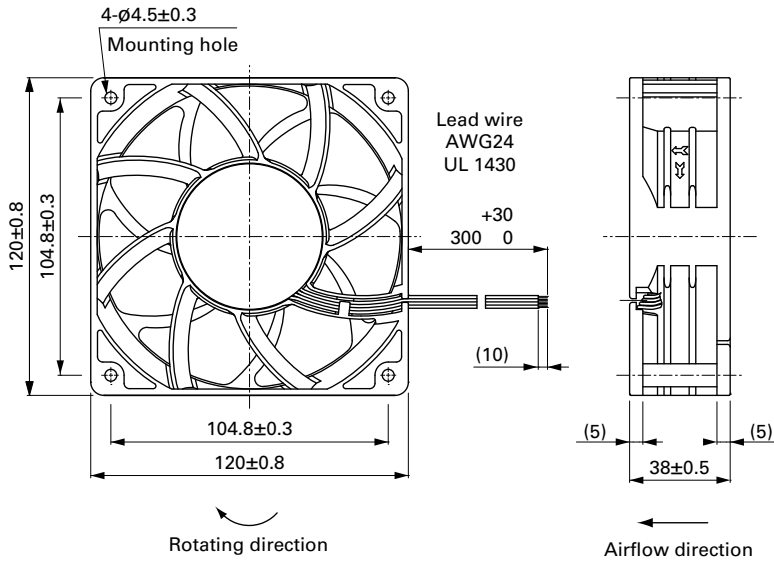
Operating voltage range



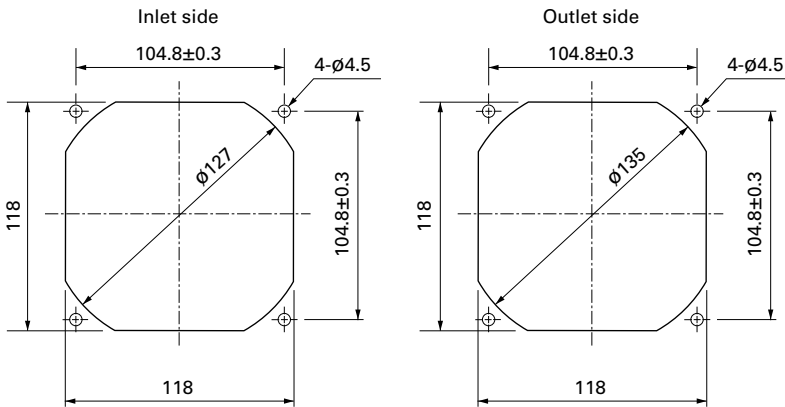
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)



120×120×38 mm

San Ace 120 9RA type   

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 320 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶▶ 9RA1212P1K001 | 12 | 10.8 to 13.2 | 100 | 0.96 | 11.5 | 4700 | 4.5 158 | 170 0.683 | 50 | -20 to +70 | 30000/60°C (53000/40°C) |
| | | | 25 | 0.12 | 1.4 | 1800 | 1.7 60 | 24 0.096 | 25 | | |
| ▶▶▶ 9RA1224P1K001 | 24 | 21.6 to 26.4 | 100 | 0.48 | 11.5 | 4700 | 4.5 158 | 170 0.683 | 50 | | |
| | | | 25 | 0.06 | 1.4 | 1800 | 1.7 60 | 24 0.096 | 25 | | |
| ▶▶▶ 9RA1248P1K001 | 48 | 43.2 to 52.8 | 100 | 0.25 | 12.0 | 4700 | 4.5 158 | 170 0.683 | 50 | | |
| | | | 25 | 0.04 | 1.9 | 1500 | 1.4 50 | 17 0.069 | 21 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶▶ 9RA1212G1001 | 12 | 7 to 13.8 | 0.70 | 8.4 | 4200 | 4.0 141 | 135 0.542 | 46 | -20 to +70 | 40000/60°C (70000/40°C) |
| ▶▶▶ 9RA1212E1001 | | | 0.47 | 5.6 | 3600 | 3.4 120 | 100 0.402 | 43 | | |
| ▶▶▶ 9RA1212H1001 | | | 0.25 | 3.0 | 3000 | 2.8 99 | 70 0.281 | 37 | | |
| ▶▶▶ 9RA1224G1001 | 24 | 14 to 27.6 | 0.35 | 8.4 | 4200 | 4.0 141 | 135 0.542 | 46 | | |
| ▶▶▶ 9RA1224E1001 | | | 0.24 | 5.8 | 3600 | 3.4 120 | 100 0.402 | 43 | | |
| ▶▶▶ 9RA1224H1001 | | | 0.13 | 3.1 | 3000 | 2.8 99 | 70 0.281 | 37 | | |
| ▶▶▶ 9RA1248G1001 | 48 | 40.8 to 55.2 | 0.18 | 8.6 | 4200 | 4.0 141 | 135 0.542 | 46 | | |
| ▶▶▶ 9RA1248E1001 | | | 0.12 | 5.8 | 3600 | 3.4 120 | 100 0.402 | 43 | | |
| ▶▶▶ 9RA1248H1001 | | | 0.07 | 3.4 | 3000 | 2.8 99 | 70 0.281 | 37 | | |

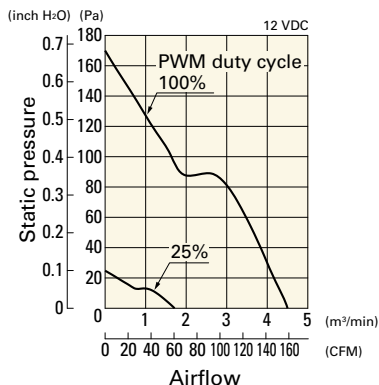
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 651 to 652.

Note 2: The ▶▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

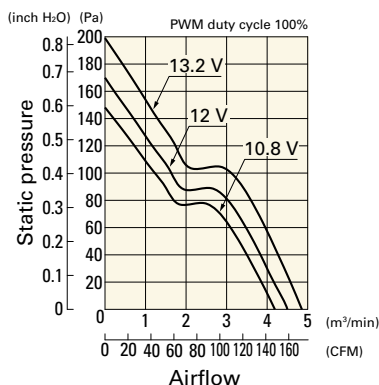
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RA1212P1K001 With pulse sensor with PWM control

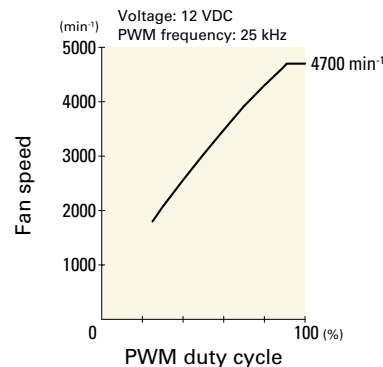
PWM duty cycle



Operating voltage range

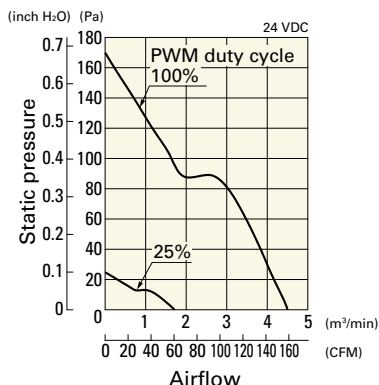


PWM duty - Speed characteristics example

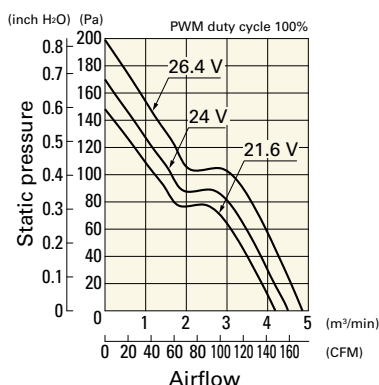


9RA1224P1K001 With pulse sensor with PWM control

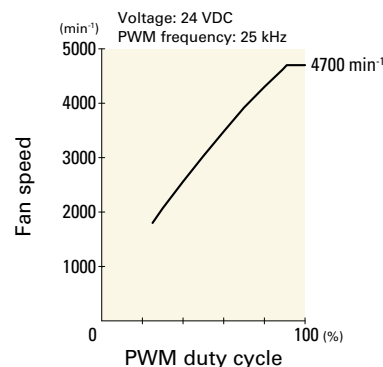
PWM duty cycle



Operating voltage range

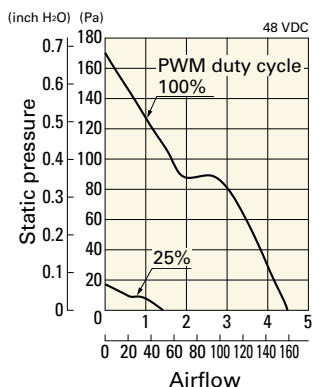


PWM duty - Speed characteristics example

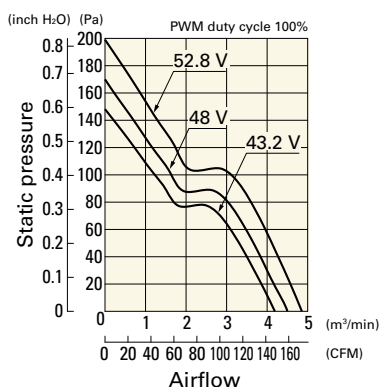


9RA1248P1K001 With pulse sensor with PWM control

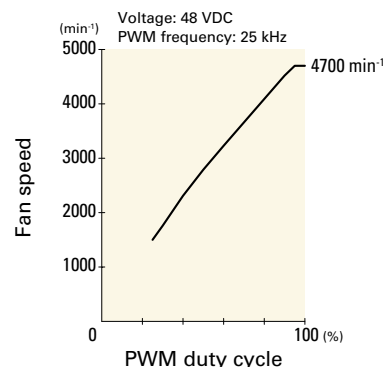
PWM duty cycle



Operating voltage range



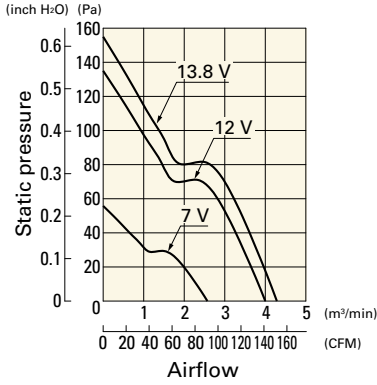
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

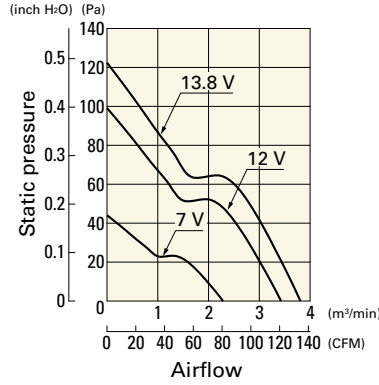
9RA1212G1001 With pulse sensor

Operating voltage range



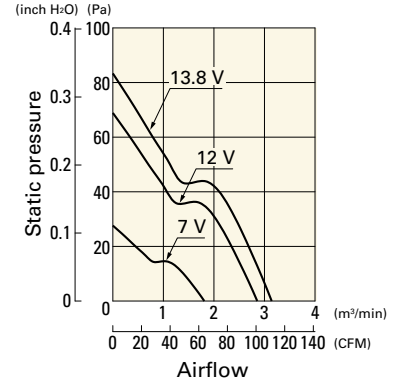
9RA1212E1001 With pulse sensor

Operating voltage range



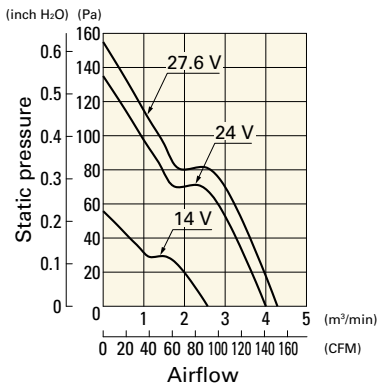
9RA1212H1001 With pulse sensor

Operating voltage range



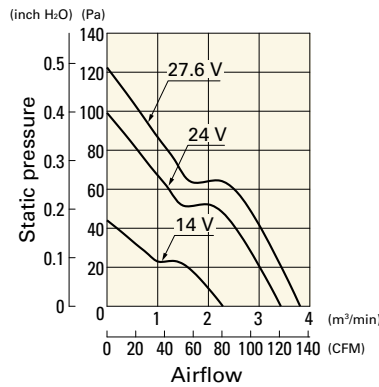
9RA1224G1001 With pulse sensor

Operating voltage range



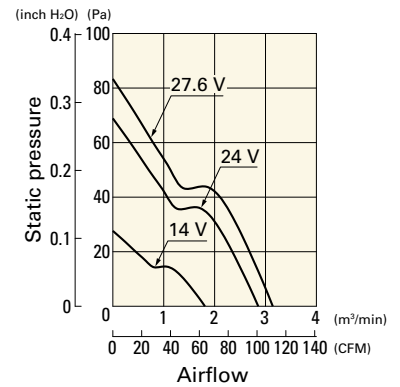
9RA1224E1001 With pulse sensor

Operating voltage range



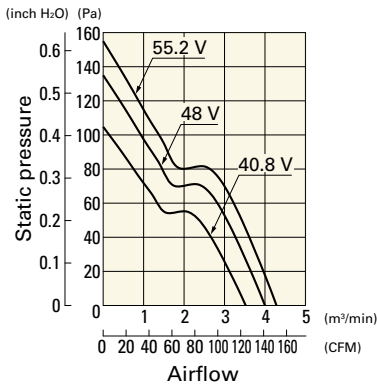
9RA1224H1001 With pulse sensor

Operating voltage range



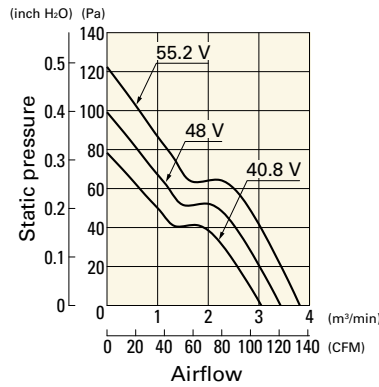
9RA1248G1001 With pulse sensor

Operating voltage range



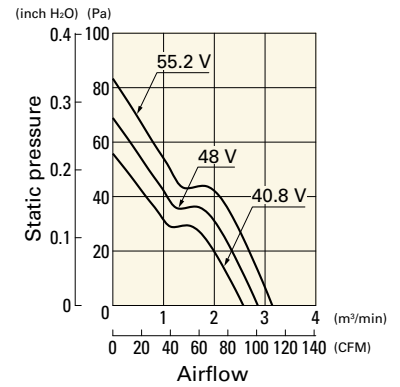
9RA1248E1001 With pulse sensor

Operating voltage range

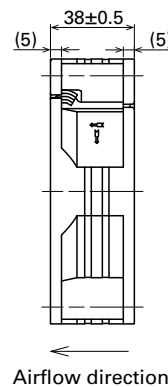
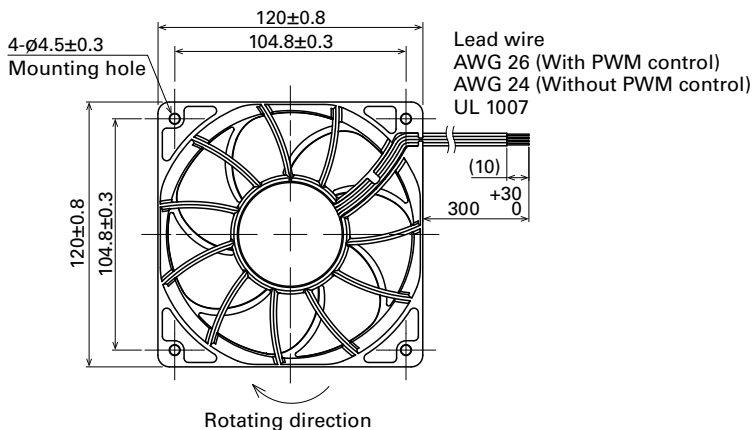


9RA1248H1001 With pulse sensor

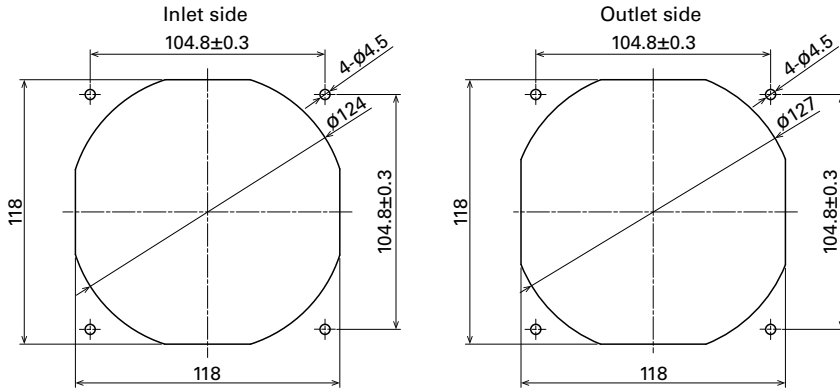
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G




Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)

127×127×38 mm



San Ace 127 9E type   

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 400 g

Specifications

The models listed below **have a pulse sensor.**

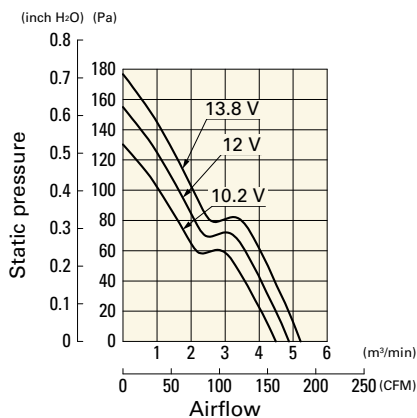
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109E1312A101 | 12 | 10.2 to 13.8 | 1.4 | 16.8 | 3850 | 4.81 170 | 155 0.622 | 52 | -20 to +70 | 60000/60°C (90000/40°C) |
| 109E1312S101 | | | 1.2 | 14.4 | 3450 | 4.37 154 | 125 0.502 | 49 | | |
| 109E1324G101 | 24 | 20.4 to 27.6 | 1.1 | 26.4 | 4550 | 5.66 200 | 216 0.867 | 57 | -20 to +60 | 40000/60°C (70000/40°C) |
| 109E1324A101 | | | 0.7 | 16.8 | 3850 | 4.81 170 | 155 0.622 | 52 | | |
| 109E1324S101 | | | 0.53 | 12.7 | 3450 | 4.37 154 | 125 0.502 | 49 | -20 to +70 | 60000/60°C (90000/40°C) |
| 109E1348G101 | 48 | 40.8 to 55.2 | 0.54 | 25.9 | 4550 | 5.66 200 | 216 0.867 | 57 | -20 to +60 | 40000/60°C (70000/40°C) |
| 109E1348A101 | | | 0.36 | 17.3 | 3850 | 4.81 170 | 155 0.622 | 52 | | |
| 109E1348S101 | | | 0.28 | 13.4 | 3450 | 4.37 154 | 125 0.502 | 49 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 638.

Airflow - Static Pressure Characteristics

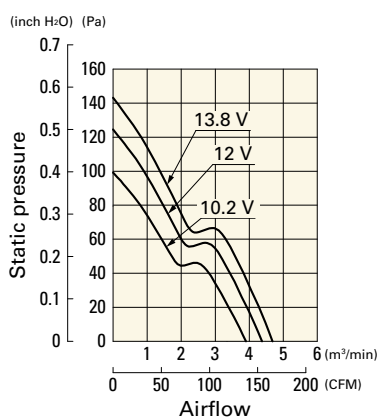
109E1312A101 With pulse sensor

Operating voltage range



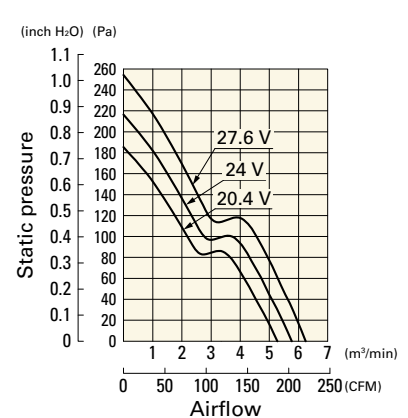
109E1312S101 With pulse sensor

Operating voltage range



109E1324G101 With pulse sensor

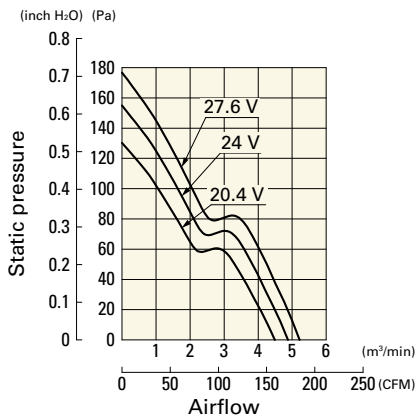
Operating voltage range



Airflow - Static Pressure Characteristics

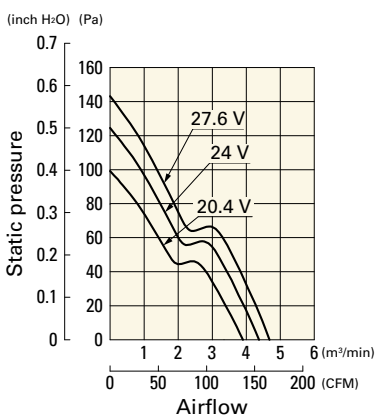
109E1324A101 With pulse sensor

Operating voltage range



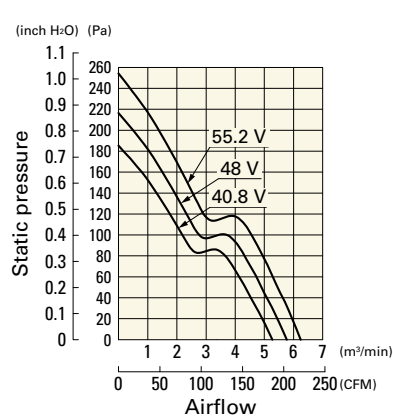
109E1324S101 With pulse sensor

Operating voltage range



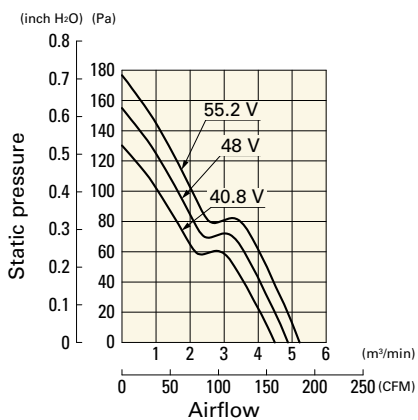
109E1348G101 With pulse sensor

Operating voltage range



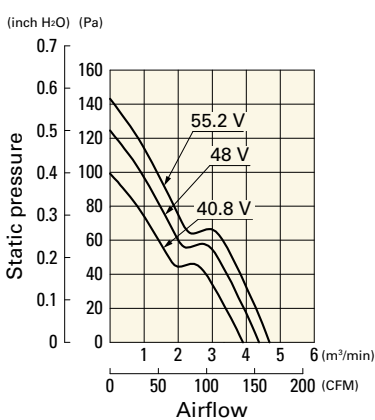
109E1348A101 With pulse sensor

Operating voltage range

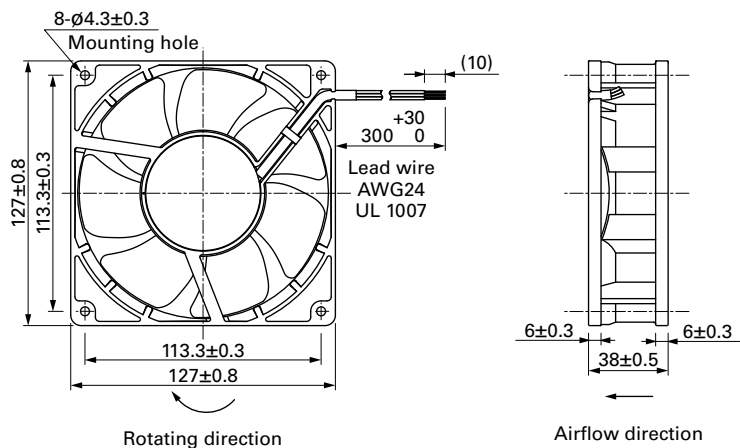


109E1348S101 With pulse sensor

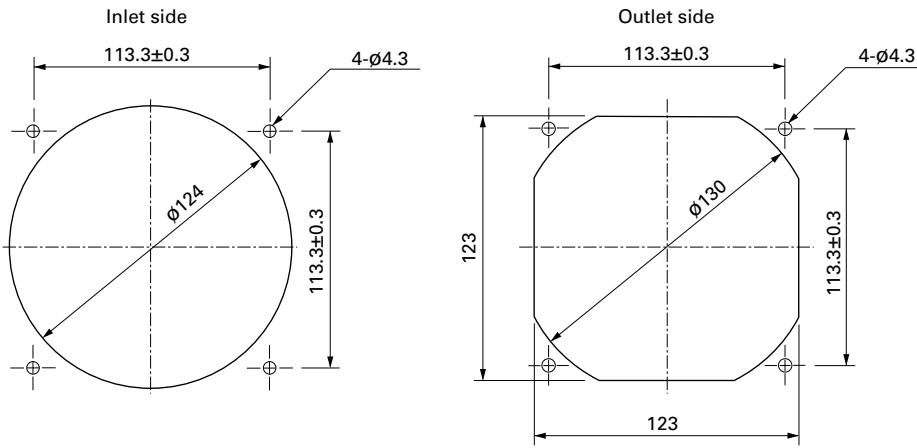
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-722, 109-722H

140x140x38 mm

San Ace 140 9GV type   



General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 630 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|----|
| 9GV1412P1G001 | 12 | 10.8 to 13.2 | 100 | 4.6 | 55.2 | 7600 | 8.8 310 | 640 2.57 | 70 | -20 to +70 | 40000/60°C (70000/40°C) | |
| | | | 20 | 0.26 | 3.12 | 2300 | 2.66 93 | 80 0.32 | 39 | | | |
| 9GV1412P1S001 | | | 100 | 3.1 | 37.2 | 6650 | 7.7 272 | 480 1.93 | 67 | | | |
| | | | 20 | 0.26 | 3.12 | 2300 | 2.66 93 | 80 0.32 | 39 | | | |
| 9GV1412P1H001 | | | 100 | 1.7 | 20.4 | 5200 | 6.0 212 | 300 1.2 | 62 | | | |
| | | | 20 | 0.26 | 3.12 | 2300 | 2.66 93 | 80 0.32 | 39 | | | |
| 9GV1424P1G001 | | 24 | 21.6 to 26.4 | 100 | 2.3 | 55.2 | 7600 | 8.8 310 | 640 2.57 | | | 70 |
| | | | | 20 | 0.13 | 3.12 | 2300 | 2.66 93 | 80 0.32 | | | 39 |
| 9GV1424P1S001 | | | | 100 | 1.55 | 37.2 | 6650 | 7.7 272 | 480 1.93 | | | 67 |
| | | | | 20 | 0.13 | 3.12 | 2300 | 2.66 93 | 80 0.32 | | | 39 |
| 9GV1424P1H001 | | | | 100 | 0.85 | 20.4 | 5200 | 6.0 212 | 300 1.2 | | | 62 |
| | | | | 20 | 0.13 | 3.12 | 2300 | 2.66 93 | 80 0.32 | | | 39 |
| 9GV1448P1G001 | 48 | 36 to 60 | 100 | 1.15 | 55.2 | 7600 | 8.8 310 | 640 2.57 | 70 | | | |
| | | | 20 | 0.11 | 5.28 | 2300 | 2.66 93 | 80 0.32 | 39 | | | |
| 9GV1448P1S001 | | | 100 | 0.78 | 37.44 | 6650 | 7.7 272 | 480 1.93 | 67 | | | |
| | | | 20 | 0.11 | 5.28 | 2300 | 2.66 93 | 80 0.32 | 39 | | | |
| 9GV1448P1H001 | | | 100 | 0.42 | 20.16 | 5200 | 6.0 212 | 300 1.2 | 62 | | | |
| | | | 20 | 0.11 | 5.28 | 2300 | 2.66 93 | 80 0.32 | 39 | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

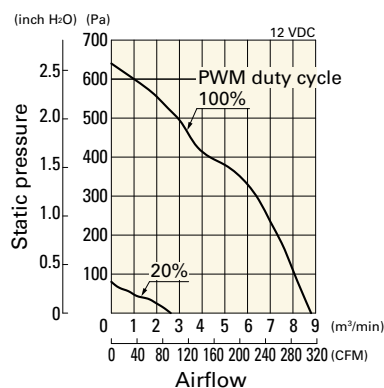
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 646 to 647.

Note 2: The  mark indicates Short LeadTime Service applicable models. See p. 668 for details.

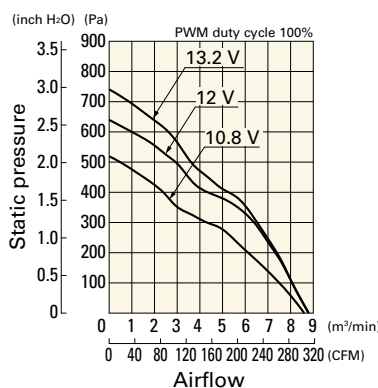
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV1412P1G001 With pulse sensor with PWM control

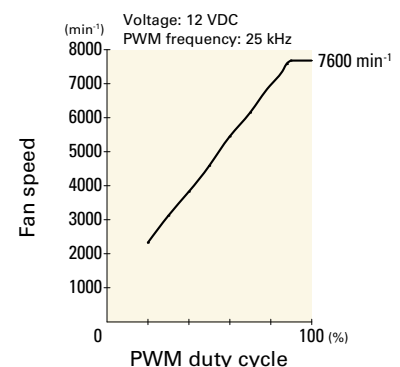
PWM duty cycle



Operating voltage range



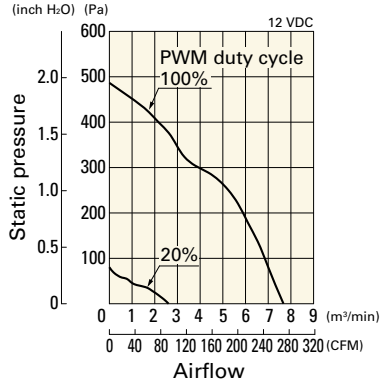
PWM duty - Speed characteristics example



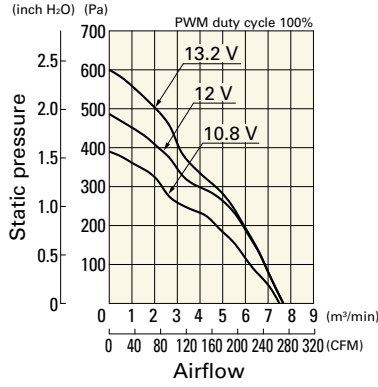
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV1412P1S001 With pulse sensor with PWM control

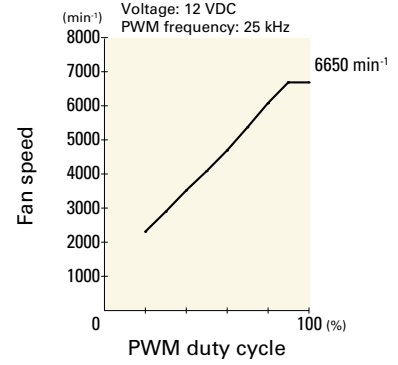
PWM duty cycle



Operating voltage range

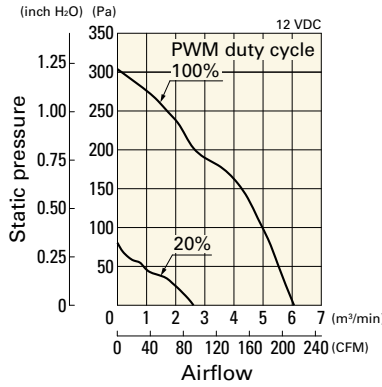


PWM duty - Speed characteristics example

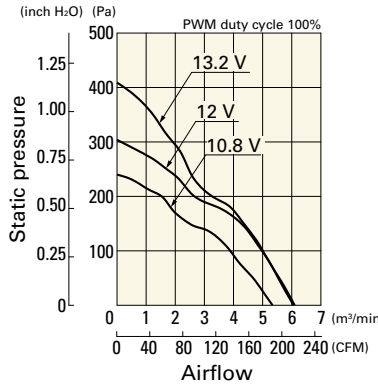


9GV1412P1H001 With pulse sensor with PWM control

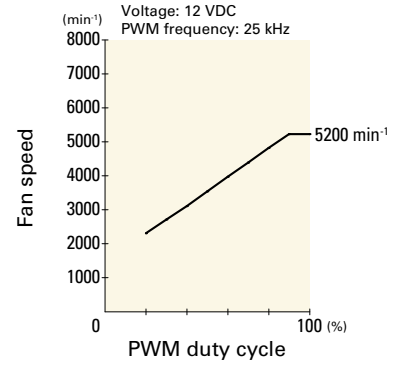
PWM duty cycle



Operating voltage range

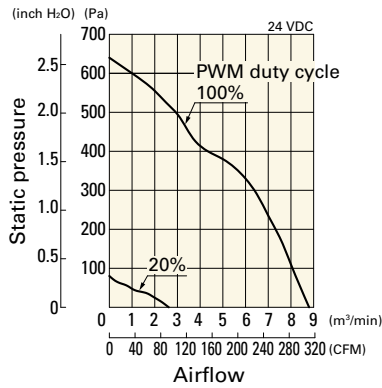


PWM duty - Speed characteristics example

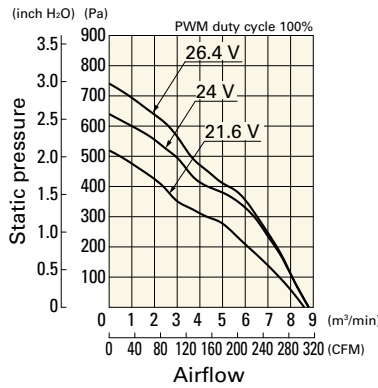


9GV1424P1G001 With pulse sensor with PWM control

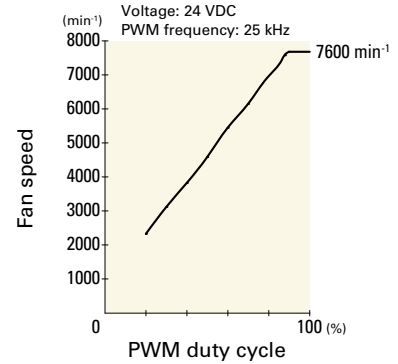
PWM duty cycle



Operating voltage range

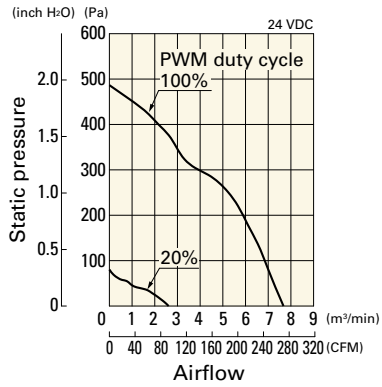


PWM duty - Speed characteristics example

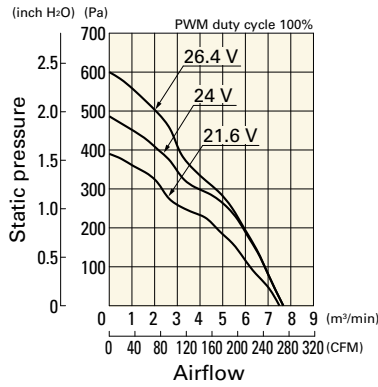


9GV1424P1S001 With pulse sensor with PWM control

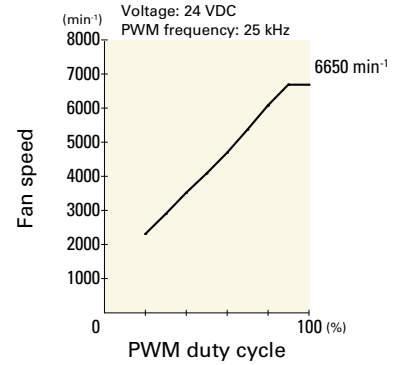
PWM duty cycle



Operating voltage range



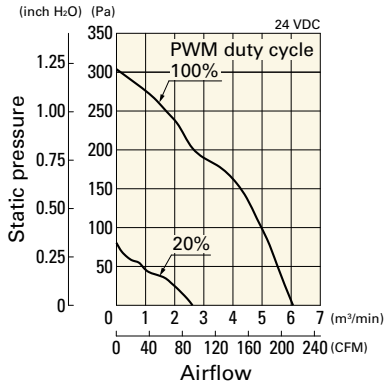
PWM duty - Speed characteristics example



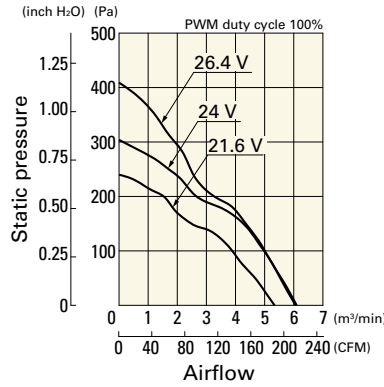
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV1424P1H001 With pulse sensor with PWM control

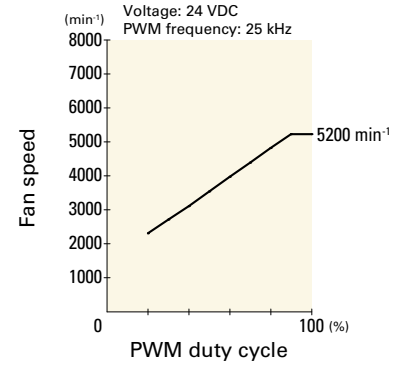
PWM duty cycle



Operating voltage range

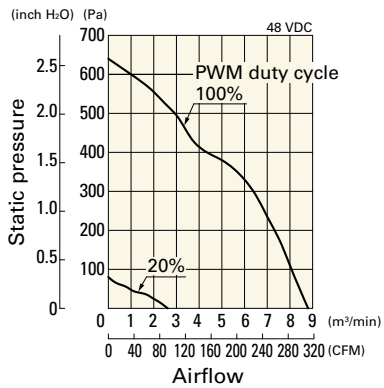


PWM duty - Speed characteristics example

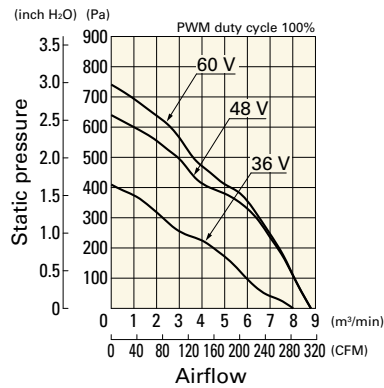


9GV1448P1G001 With pulse sensor with PWM control

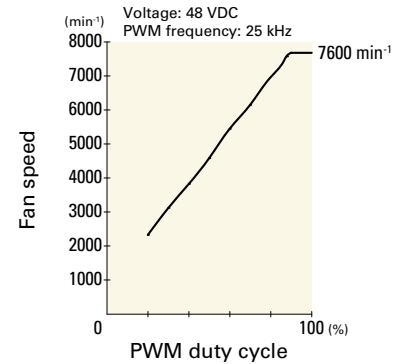
PWM duty cycle



Operating voltage range

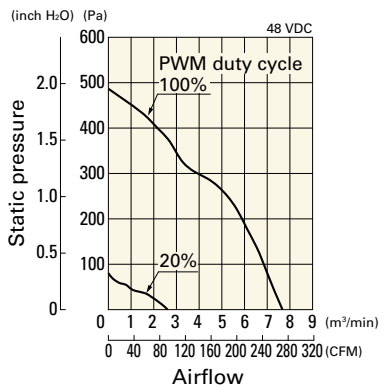


PWM duty - Speed characteristics example

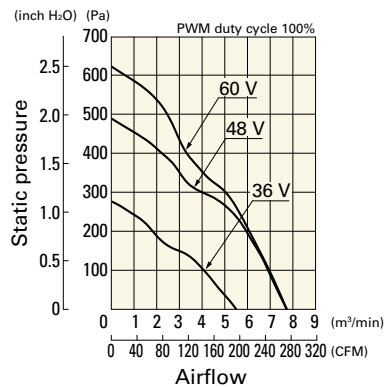


9GV1448P1S001 With pulse sensor with PWM control

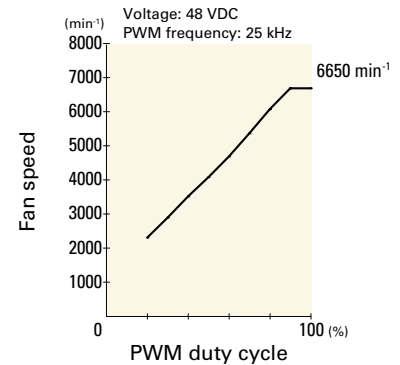
PWM duty cycle



Operating voltage range

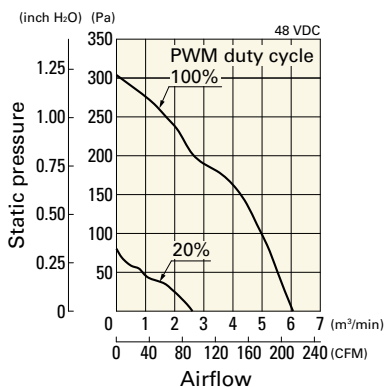


PWM duty - Speed characteristics example

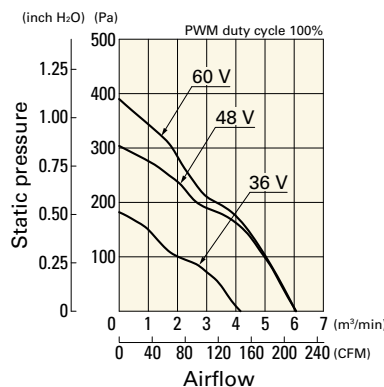


9GV1448P1H001 With pulse sensor with PWM control

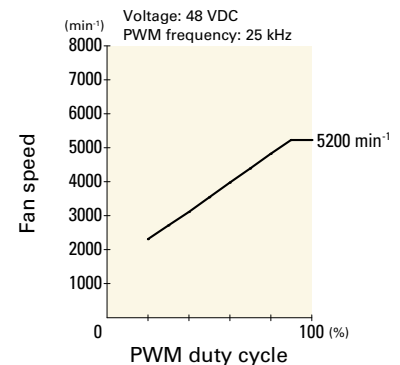
PWM duty cycle



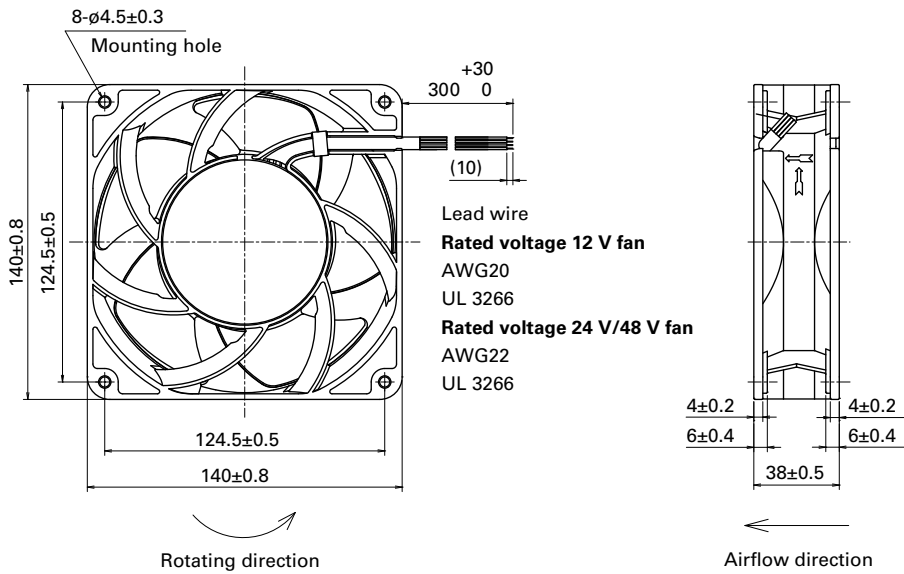
Operating voltage range



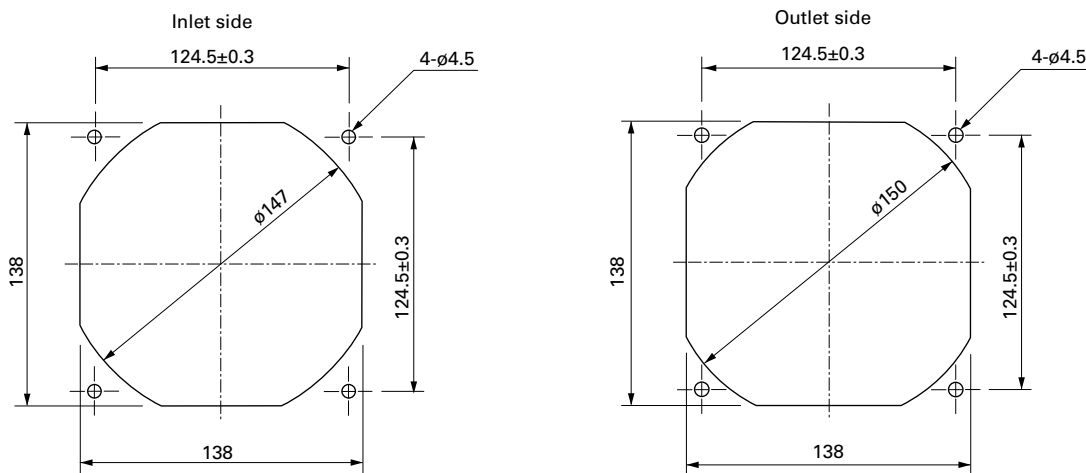
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-719, 109-719H

DC Fan



140x140x38 mm

San Ace 140 9RA type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 360 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|------|--|-------|--------------|----------------------------|----------------------------|
| » 9RA1412P1G001 | 12 | 10.8 to 13.2 | 100 | 1.10 | 13.2 | 4250 | 6.0 | 212 | 160 | 0.64 | 52 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.09 | 1.1 | 1250 | 1.81 | 64.0 | 16.3 | 0.065 | 19 | | |
| » 9RA1424P1G001 | 24 | 21.6 to 26.4 | 100 | 0.53 | 12.7 | 4250 | 6.0 | 212 | 160 | 0.64 | 52 | | |
| | | | 20 | 0.05 | 1.2 | 1400 | 2.17 | 76.7 | 21.5 | 0.086 | 22 | | |
| » 9RA1448P1G001 | 48 | 43.2 to 52.8 | 100 | 0.28 | 13.4 | 4250 | 6.0 | 212 | 160 | 0.64 | 52 | | |
| | | | 30 | 0.04 | 1.9 | 1600 | 2.32 | 82.0 | 29.5 | 0.118 | 25 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|-----|--|------|--------------|----------------------------|----------------------------|
| » 9RA1412S1001 | 12 | 7 to 13.8 | 0.75 | 9.0 | 3750 | 5.3 | 187 | 130 | 0.52 | 49 | -20 to +70 | 40000/60°C (70000/40°C) |
| » 9RA1412H1001 | | | 0.43 | 5.2 | 3050 | 4.3 | 152 | 92 | 0.37 | 43 | | |
| » 9RA1412M1001 | | | 0.19 | 2.3 | 2250 | 3.2 | 113 | 54 | 0.22 | 35 | | |
| » 9RA1424S1001 | 24 | 14 to 27.6 | 0.37 | 8.9 | 3750 | 5.3 | 187 | 130 | 0.52 | 49 | | |
| » 9RA1424H1001 | | | 0.22 | 5.3 | 3050 | 4.3 | 152 | 92 | 0.37 | 43 | | |
| » 9RA1424M1001 | | | 0.10 | 2.4 | 2250 | 3.2 | 113 | 54 | 0.22 | 35 | | |
| » 9RA1448S1001 | 48 | 40.8 to 55.2 | 0.21 | 10.1 | 3750 | 5.3 | 187 | 130 | 0.52 | 49 | | |
| » 9RA1448H1001 | | | 0.13 | 6.2 | 3050 | 4.3 | 152 | 92 | 0.37 | 43 | | |
| » 9RA1448M1001 | | | 0.06 | 2.9 | 2250 | 3.2 | 113 | 54 | 0.22 | 35 | | |

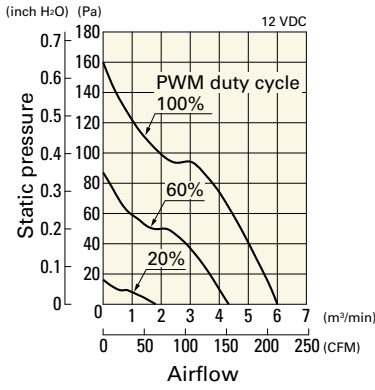
Note 1: Sensor and control options are available for selection. Refer to the table on p. 652.

Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 668 for details.

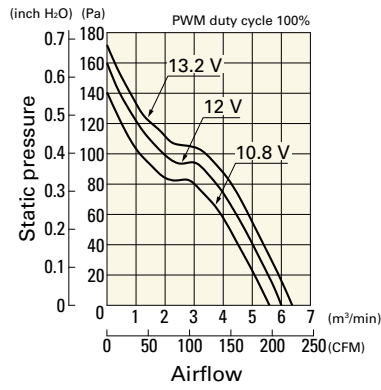
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RA1412P1G001 With pulse sensor with PWM control

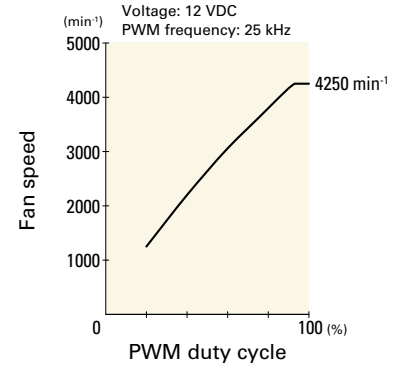
PWM duty cycle



Operating voltage range

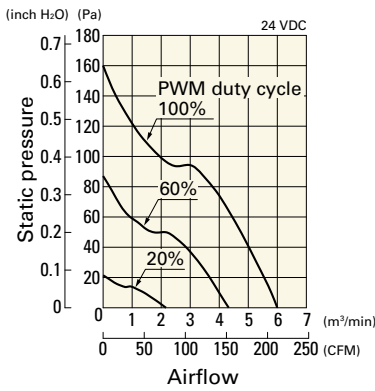


PWM duty - Speed characteristics example

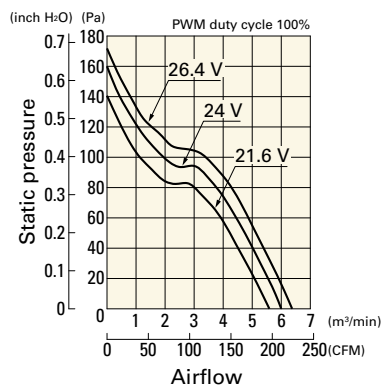


9RA1424P1G001 With pulse sensor with PWM control

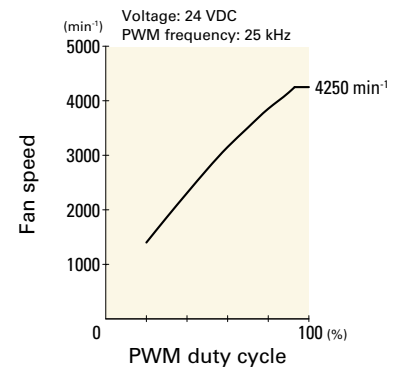
PWM duty cycle



Operating voltage range

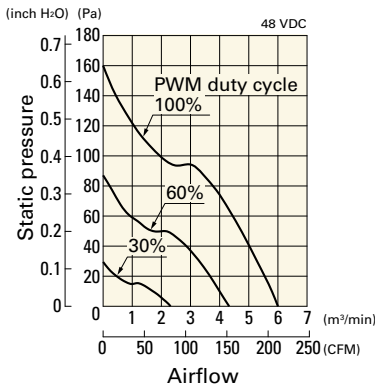


PWM duty - Speed characteristics example

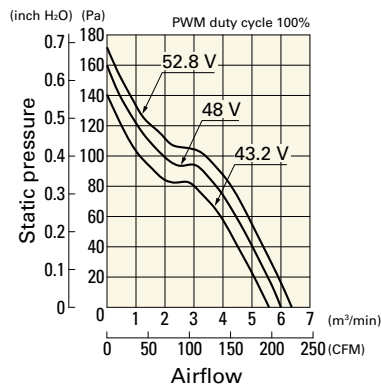


9RA1448P1G001 With pulse sensor with PWM control

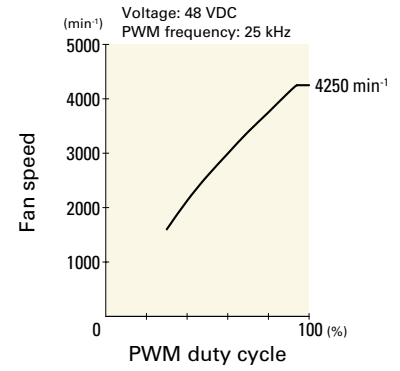
PWM duty cycle



Operating voltage range



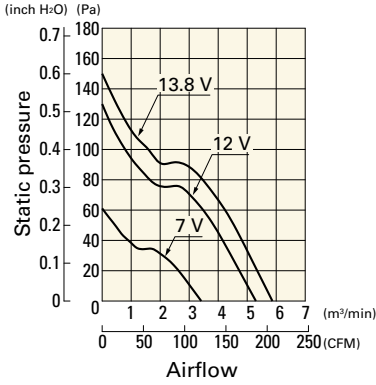
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

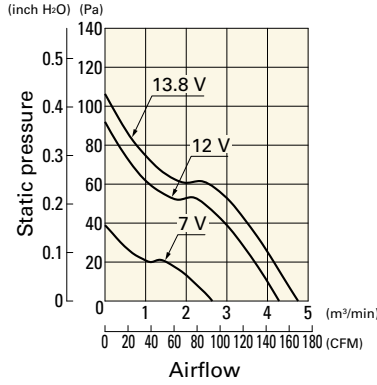
9RA1412S1001 With pulse sensor

Operating voltage range



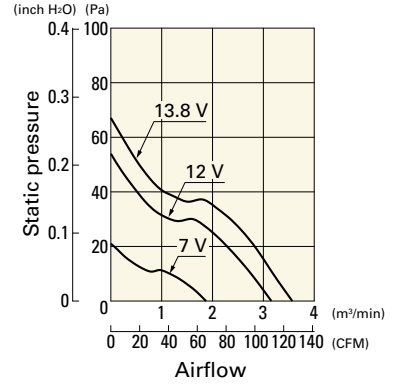
9RA1412H1001 With pulse sensor

Operating voltage range



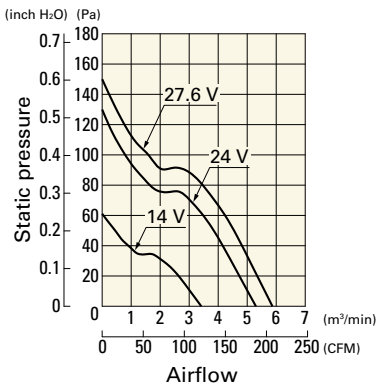
9RA1412M1001 With pulse sensor

Operating voltage range



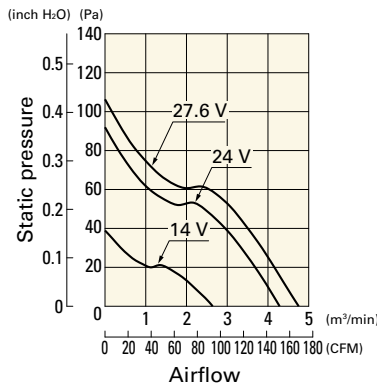
9RA1424S1001 With pulse sensor

Operating voltage range



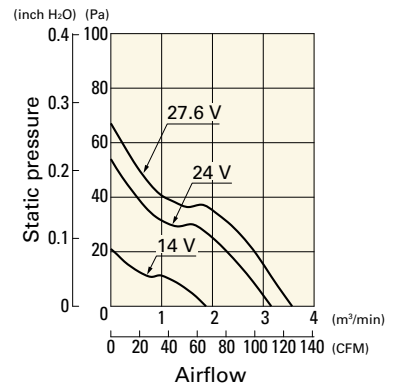
9RA1424H1001 With pulse sensor

Operating voltage range



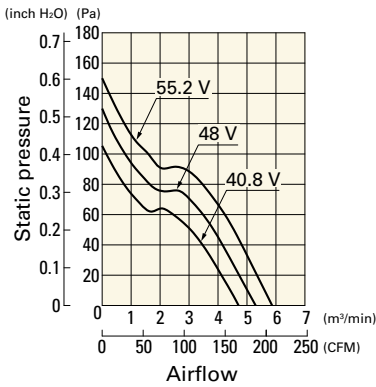
9RA1424M1001 With pulse sensor

Operating voltage range



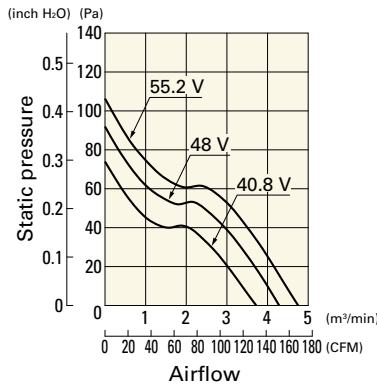
9RA1448S1001 With pulse sensor

Operating voltage range



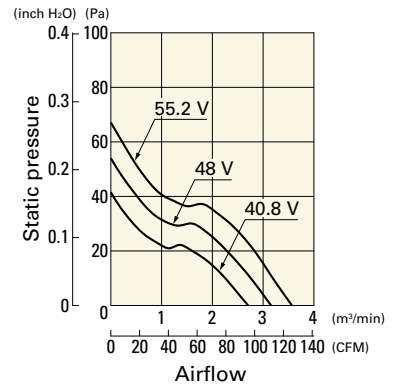
9RA1448H1001 With pulse sensor

Operating voltage range

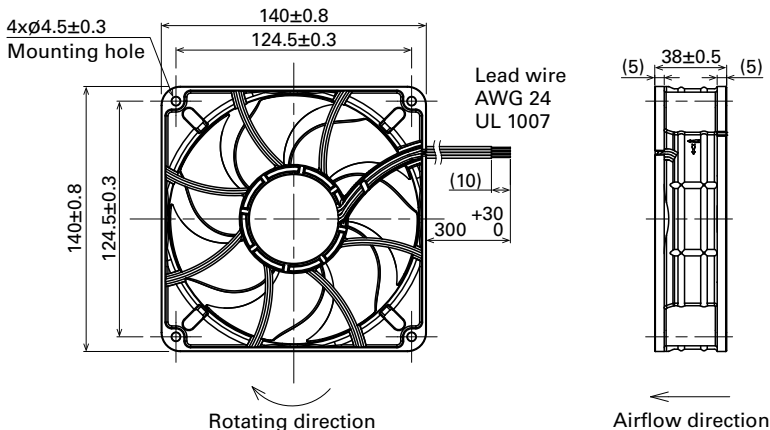


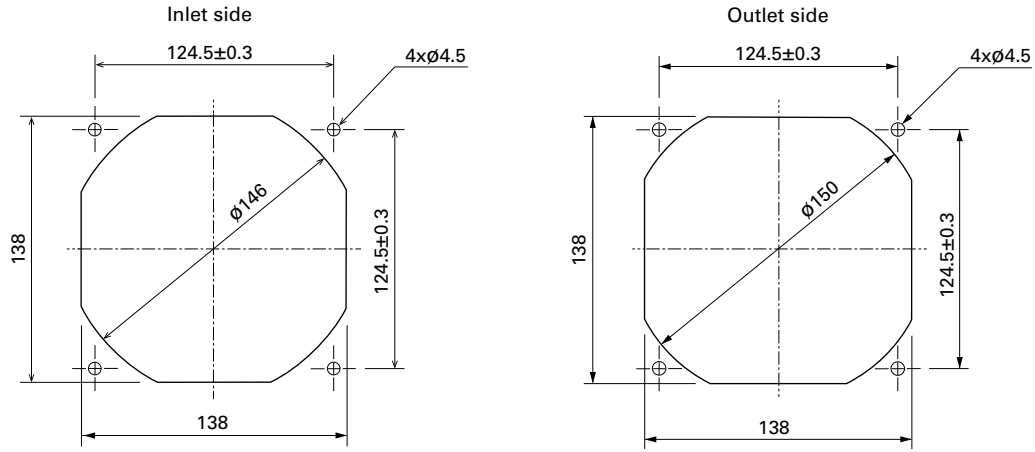
9RA1448M1001 With pulse sensor

Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)**Options**

Finger guards

page: p. 599

Model no.: 109-719, 109-719H



150×150×50 mm

San Ace 150 9GV type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 450 g

Specifications

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

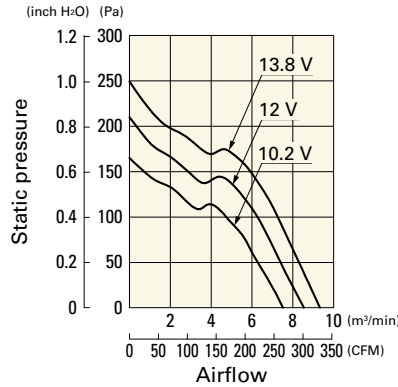
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GV1512H501 | 12 | 10.2 to 13.8 | 2.9 | 34.8 | 3900 | 8.54 300 | 210 0.84 | 61 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9GV1512M501 | | | 1.2 | 14.4 | 3000 | 6.35 224 | 132 0.53 | 53 | | |
| 9GV1524M501 | 24 | 20.4 to 27.6 | 0.6 | 14.4 | 3000 | 6.35 224 | 132 0.53 | 53 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 647.

Airflow - Static Pressure Characteristics

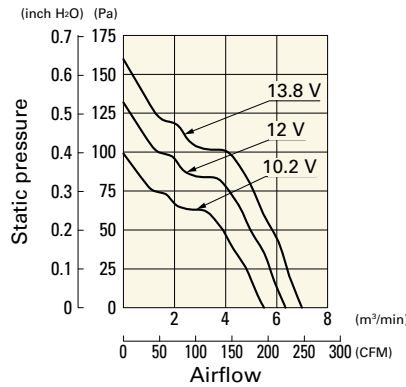
9GV1512H501 With pulse sensor

Operating voltage range



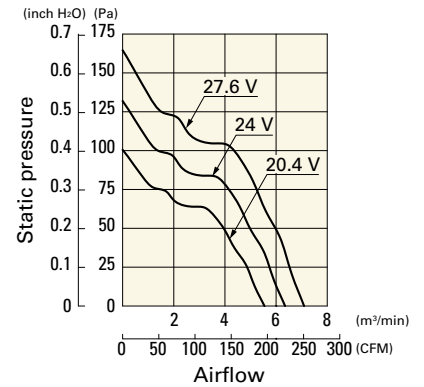
9GV1512M501 With pulse sensor

Operating voltage range

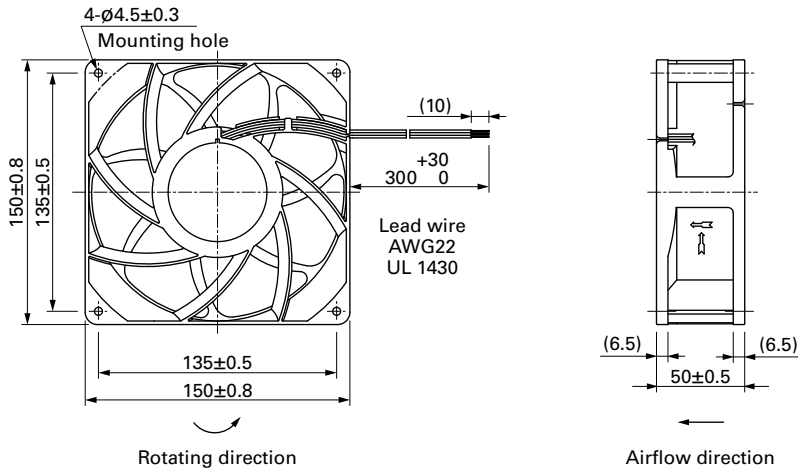


9GV1524M501 With pulse sensor

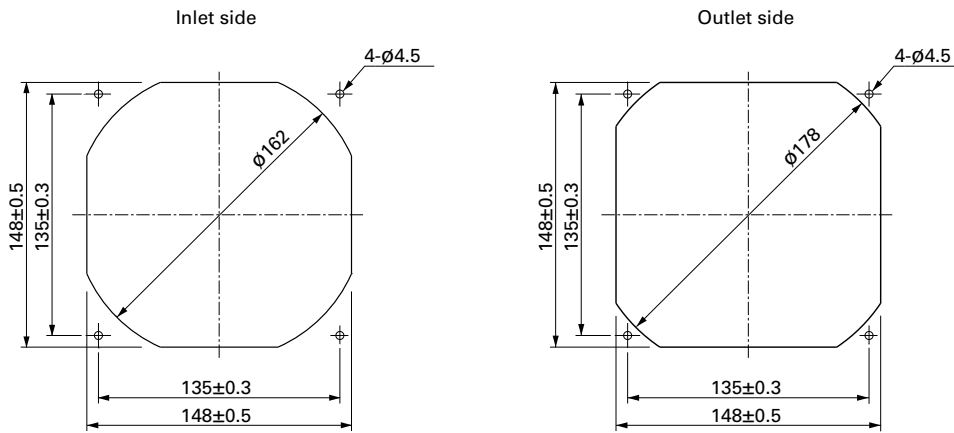
Operating voltage range



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-1051

Ø172x147x25 mm

San Ace 172 9E type   

Sidecut type



General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 500 g

Specifications

The models listed below **have a pulse sensor**.

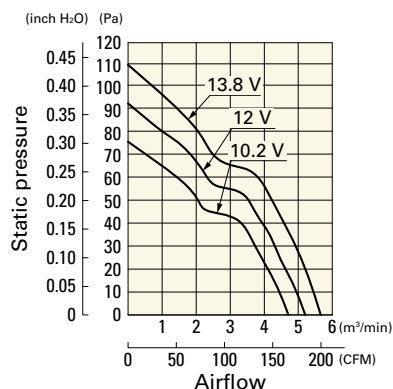
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109E4712M401 | 12 | 10.2 to 13.8 | 1.3 | 15.6 | 2800 | 5.2 183 | 92 0.369 | 51 | -20 to +60 | 40000/60°C (70000/40°C) |
| 109E4712L401 | | | 1.0 | 12.0 | 2500 | 4.6 162 | 73 0.293 | 48 | | |
| 109E4724H401 | 24 | 20.4 to 27.6 | 1.0 | 24.0 | 3400 | 6.4 226 | 135 0.542 | 57 | | |
| 109E4724F401 | | | 0.79 | 19.0 | 3100 | 5.8 204 | 112 0.45 | 54 | | |
| 109E4724M401 | | | 0.58 | 13.9 | 2800 | 5.2 183 | 92 0.369 | 51 | | |
| 109E4724L401 | | | 0.44 | 10.6 | 2500 | 4.6 162 | 73 0.293 | 48 | | |
| 109E4748S401 | 48 | 40.8 to 55.2 | 0.62 | 29.8 | 3650 | 6.8 240 | 156 0.627 | 58 | | |
| 109E4748H401 | | | 0.52 | 25.0 | 3400 | 6.4 226 | 135 0.542 | 57 | | |
| 109E4748F401 | | | 0.4 | 19.2 | 3100 | 5.8 204 | 112 0.45 | 54 | | |
| 109E4748M401 | | | 0.32 | 15.4 | 2800 | 5.2 183 | 92 0.369 | 51 | | |
| 109E4748L401 | | | 0.25 | 12.0 | 2500 | 4.6 162 | 73 0.293 | 48 | | |

Note: Sensor and control options are available for selection. Refer to the table on pp. 638 to 639.

Airflow - Static Pressure Characteristics

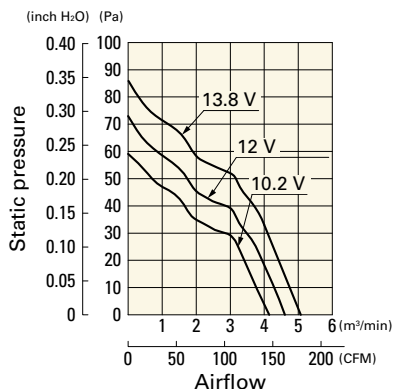
109E4712M401 With pulse sensor

Operating voltage range



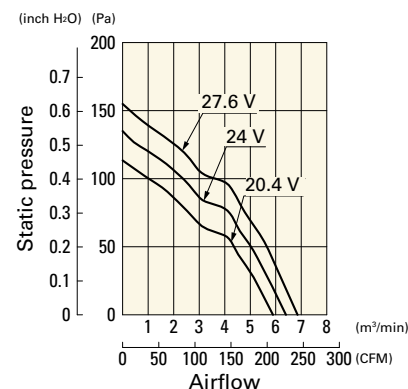
109E4712L401 With pulse sensor

Operating voltage range



109E4724H401 With pulse sensor

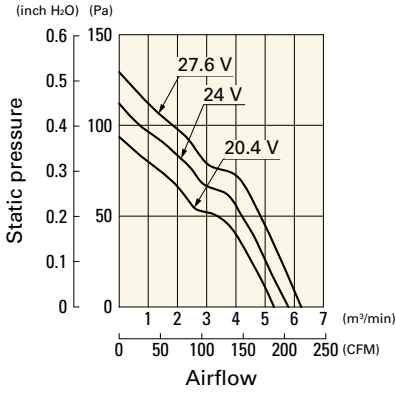
Operating voltage range



Airflow - Static Pressure Characteristics

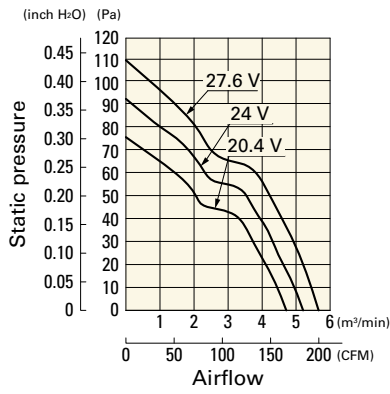
109E4724F401 With pulse sensor

Operating voltage range



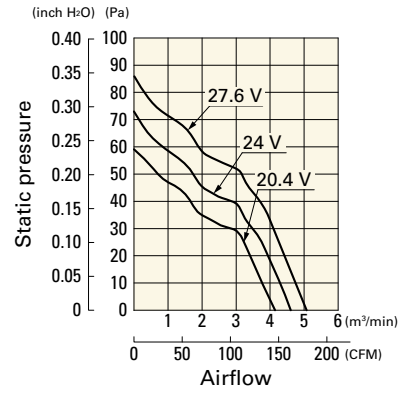
109E4724M401 With pulse sensor

Operating voltage range



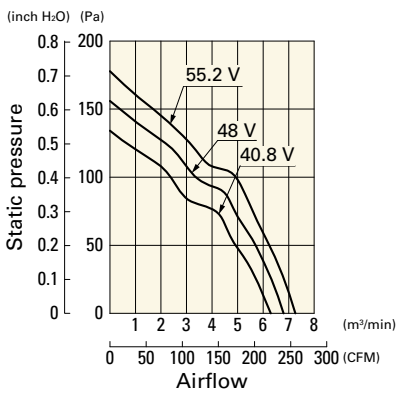
109E4724L401 With pulse sensor

Operating voltage range



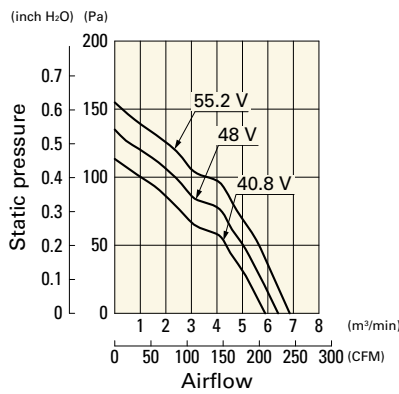
109E4748S401 With pulse sensor

Operating voltage range



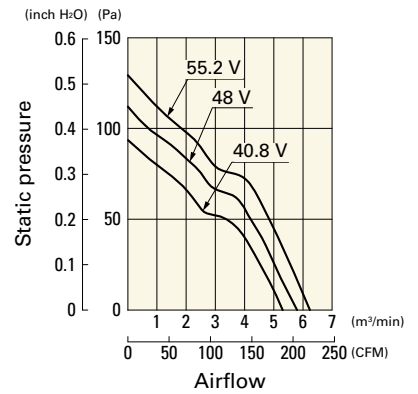
109E4748H401 With pulse sensor

Operating voltage range



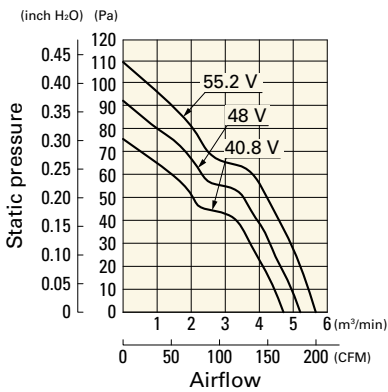
109E4748F401 With pulse sensor

Operating voltage range



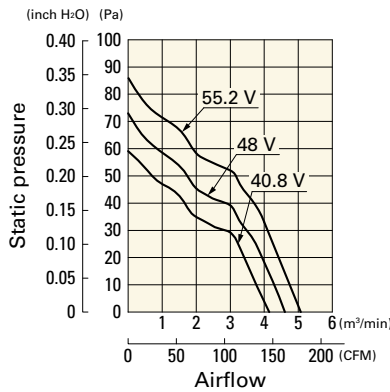
109E4748M401 With pulse sensor

Operating voltage range

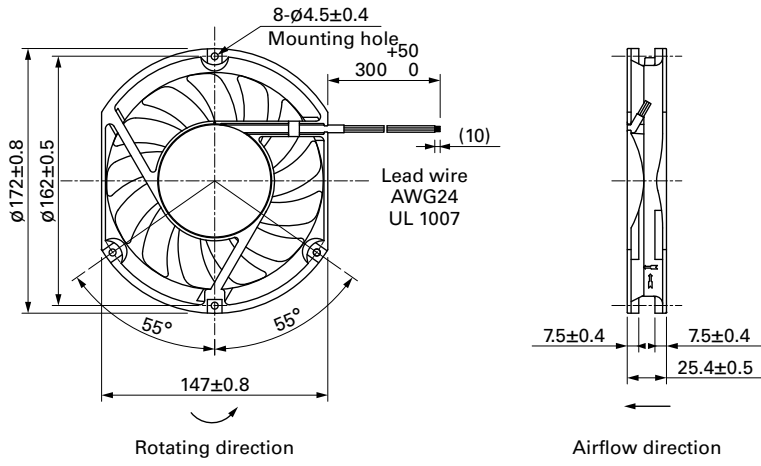


109E4748L401 With pulse sensor

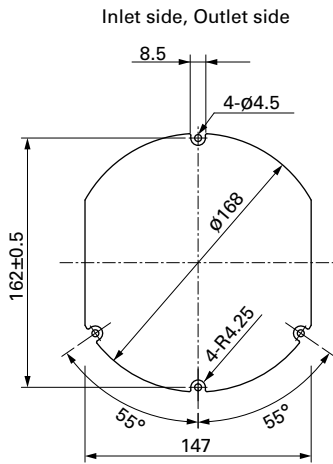
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 600

Model no.: 109-319J, 109-319E, 109-319H



∅172x150x51 mm

San Ace 172 9HV type

Sidecut type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 800 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9HV5724P5H001 | 24 | 16 to 30 | 100 | 5.0 | 120 | 8000 | 12.3 434 | 1000 4.02 | 77 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.5 | 12.0 | 3000 | 4.6 162 | 175 0.7 | 51 | | |
| ▶▶ 9HV5748P5G001 | 48 | 36 to 72 | 100 | 5.0 | 240 | 10500 | 16.1 568 | 1600 6.43 | 83 | | |
| | | | 20 | 0.41 | 19.7 | 3700 | 5.6 198 | 250 1.01 | 57 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

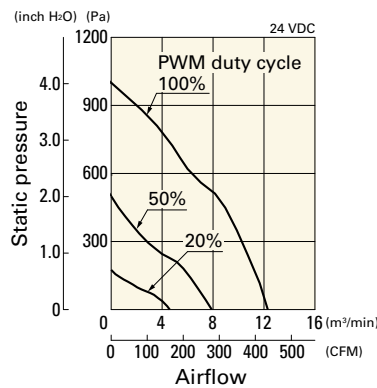
Note 1: Sensor and control options are available for selection. Refer to the table on p. 647.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

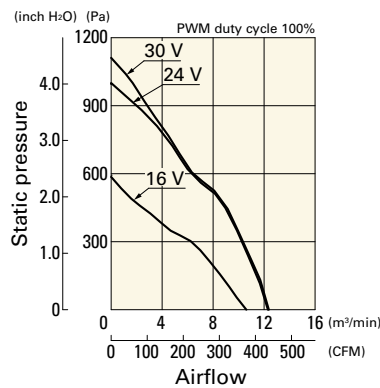
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV5724P5H001 With pulse sensor with PWM control

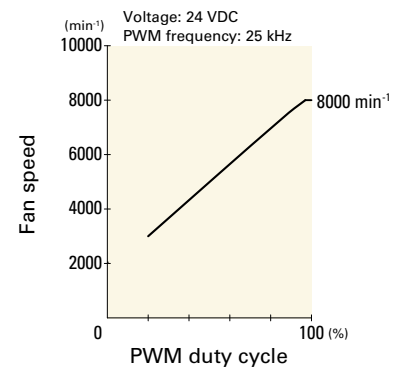
PWM duty cycle



Operating voltage range



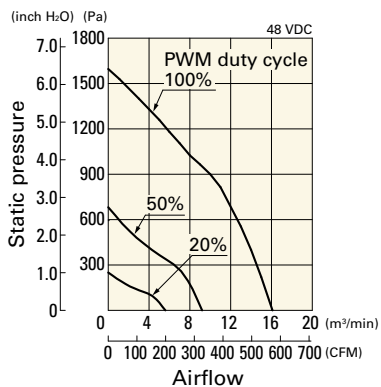
PWM duty - Speed characteristics example



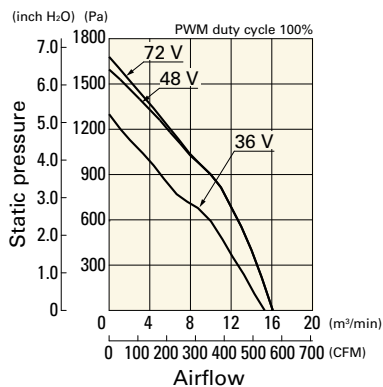
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9HV5748P5G001 With pulse sensor with PWM control

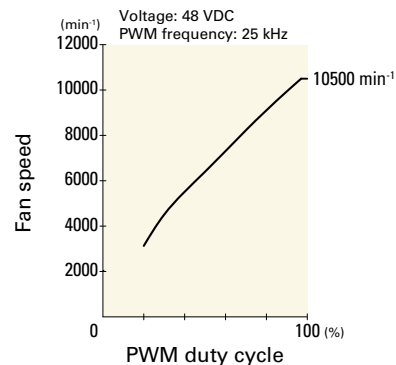
PWM duty cycle



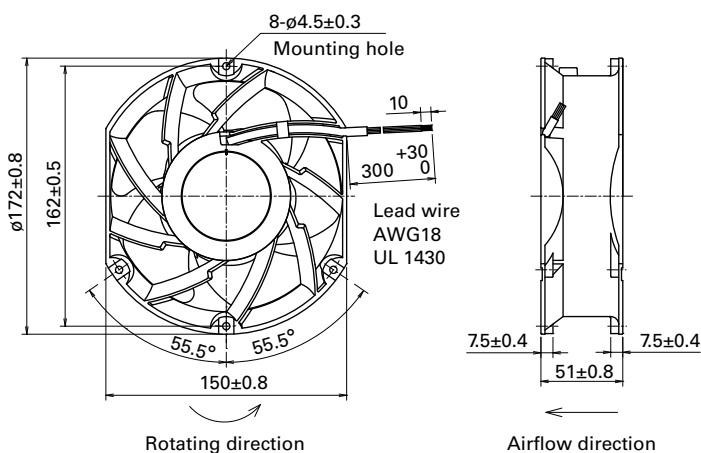
Operating voltage range



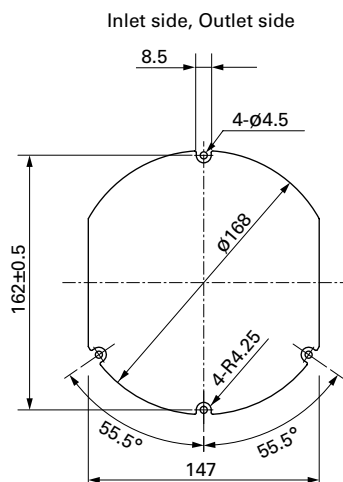
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 600

Model no.: 109-319J, 109-319E, 109-319H



∅172x150x51 mm

San Ace 172 9SG type US

Sidecut type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow Control Brown
- Mass 760 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9SG5724P5H61 | 24 | 20.4 to 27.6 | 100 | 2.8 | 67.2 | 6500 | 11.6 410 | 540 2.16 | 71 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.18 | 4.32 | 1300 | 2.32 81.9 | 30 0.12 | 28 | | |
| 9SG5748P5G01 | 48 | 36 to 72 | 100 | 2.91 | 140 | 8600 | 15.46 546 | 1000 4.02 | 78 | -20 to +60 | |
| | | | 0 | 0.21 | 10.1 | 2000 | 3.59 127 | 75.1 0.3 | 40 | | |
| 9SG5748P5H01 | 48 | 36 to 72 | 100 | 1.62 | 78 | 6500 | 11.6 410 | 770 3.09 | 71 | -20 to +60 | |
| | | | 0 | 0.21 | 10.1 | 2000 | 3.59 127 | 75.1 0.3 | 40 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

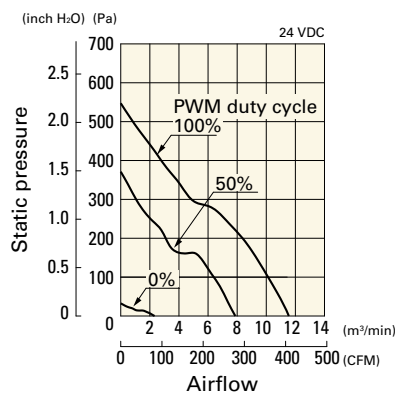
Note 1: Sensor and control options are available for selection. Refer to the table on p. 653.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

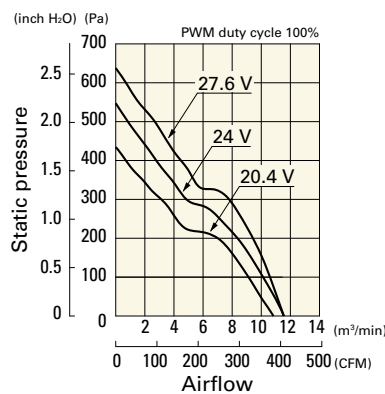
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9SG5724P5H61 With pulse sensor with PWM control

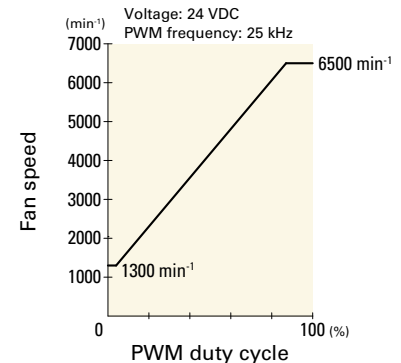
PWM duty cycle



Operating voltage range



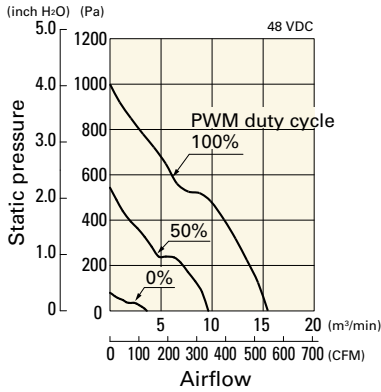
PWM duty - Speed characteristics example



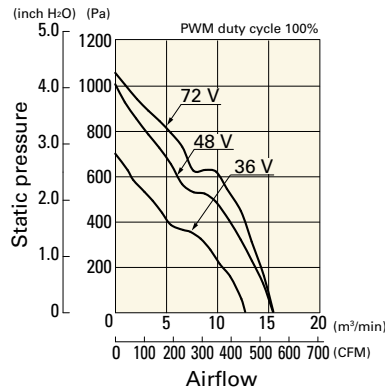
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9SG5748P5G01 With pulse sensor with PWM control

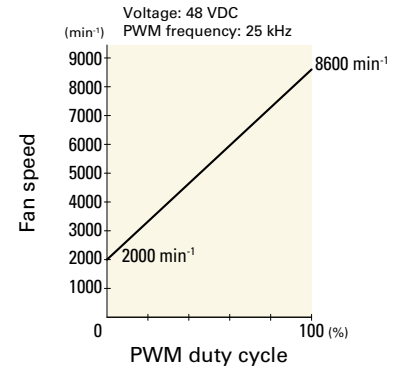
PWM duty cycle



Operating voltage range

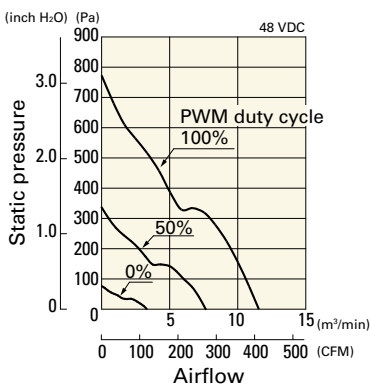


PWM duty - Speed characteristics example

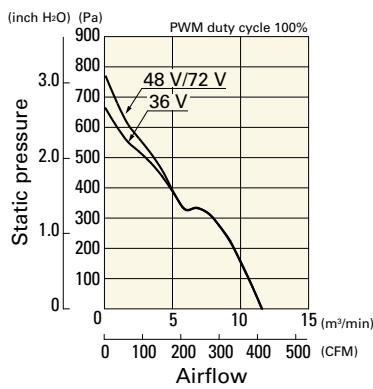


9SG5748P5H01 With pulse sensor with PWM control

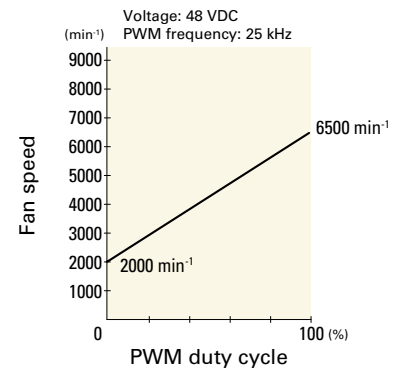
PWM duty cycle



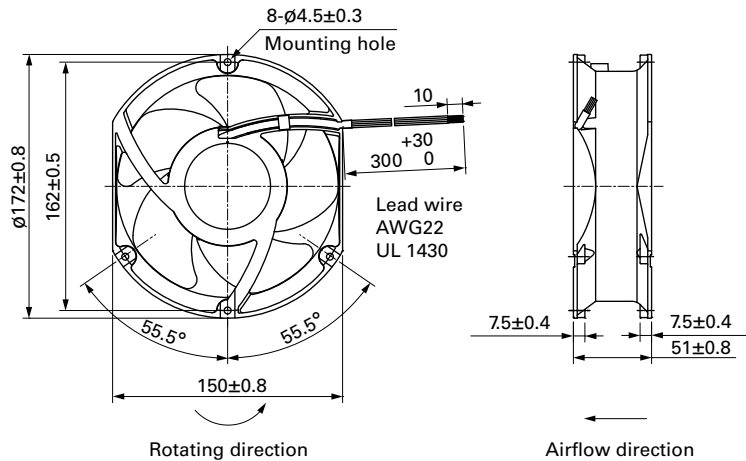
Operating voltage range



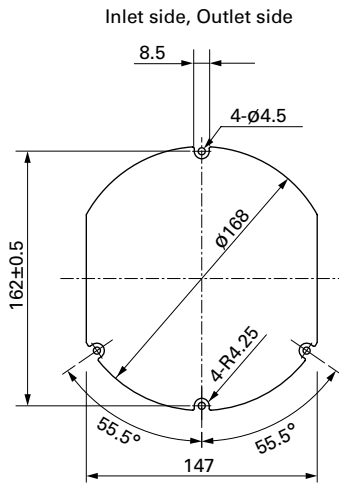
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards


page: p. 600

Model no.: 109-319J, 109-319E, 109-319H

DC Fan

Ø 172x150x51 mm



San Ace 172 9E type   

Sidecut type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 760 g

Specifications

The models listed below **have a pulse sensor**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 109E5712K501 | 12 | 10.2 to 13.8 | 2.9 | 34.8 | 4100 | 8.5 300 | 243.0 0.976 | 60 | -20 to +60 | 40000/60°C (70000/40°C) |
| ▶▶ 109E5712Y501 | | | 2.3 | 27.6 | 3800 | 8 282 | 210 0.84 | 60 | | |
| ▶▶ 109E5712H501 | | | 1.2 | 14.4 | 3050 | 6.4 226 | 137.2 0.551 | 52 | | |
| ▶▶ 109E5712F501 | | | 0.68 | 8.16 | 2500 | 5.1 180 | 95 0.38 | 47 | | |
| ▶▶ 109E5712M501 | | | 0.48 | 5.76 | 2000 | 4.2 148 | 67.6 0.271 | 41 | | |
| ▶▶ 109E5724C501 | 24 | 20.4 to 27.6 | 2.3 | 55.2 | 4800 | 9.9 350 | 308.0 1.237 | 66 | -20 to +70 | |
| ▶▶ 109E5724K501 | | | 1.3 | 31.2 | 4100 | 8.5 300 | 243.0 0.976 | 60 | | |
| ▶▶ 109E5724H501 | | | 0.58 | 13.92 | 3050 | 6.4 226 | 137.2 0.551 | 52 | | |
| ▶▶ 109E5724F501 | | | 0.35 | 8.4 | 2500 | 5.1 180 | 95 0.38 | 47 | | |
| ▶▶ 109E5724M501 | | | 0.2 | 4.8 | 2000 | 4.2 148 | 67.6 0.271 | 41 | | |
| ▶▶ 109E5748C501 | 48 | 40.8 to 55.2 | 1.2 | 57.6 | 4800 | 9.9 350 | 308.0 1.237 | 66 | -20 to +60 | |
| ▶▶ 109E5748K501 | | | 0.7 | 33.6 | 4100 | 8.5 300 | 243.0 0.976 | 60 | | |
| ▶▶ 109E5748H501 | | | 0.28 | 13.44 | 3050 | 6.4 226 | 137.2 0.551 | 52 | | |
| ▶▶ 109E5748F501 | | | 0.19 | 9.12 | 2500 | 5.1 180 | 95 0.38 | 47 | | |
| ▶▶ 109E5748M501 | | | 0.11 | 5.28 | 2000 | 4.2 148 | 67.6 0.271 | 41 | | |

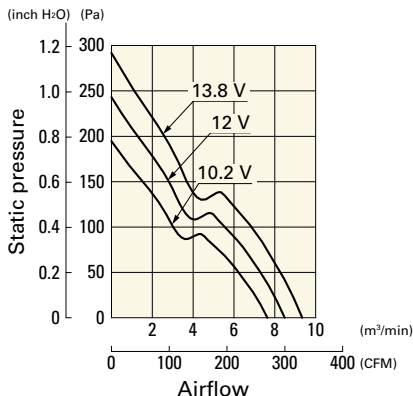
Note 1: Sensor and control options are available for selection. Refer to the table on p. 639.

Note 2: The ▶▶ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

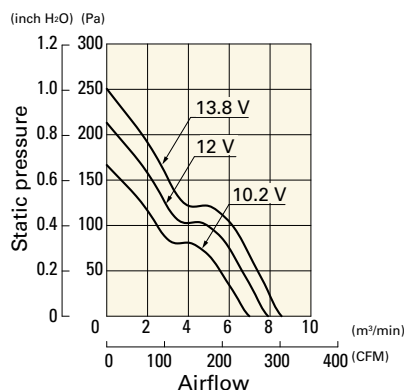
109E5712K501 With pulse sensor

Operating voltage range



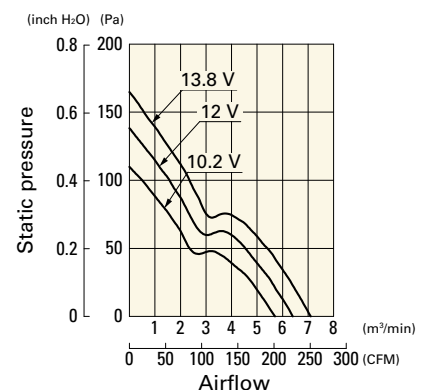
109E5712Y501 With pulse sensor

Operating voltage range



109E5712H501 With pulse sensor

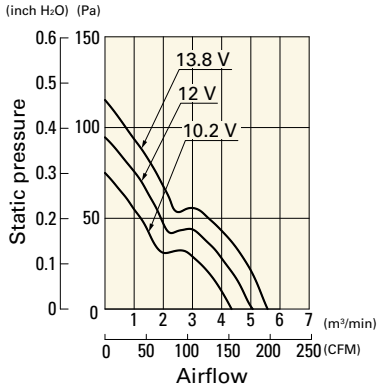
Operating voltage range



Airflow - Static Pressure Characteristics

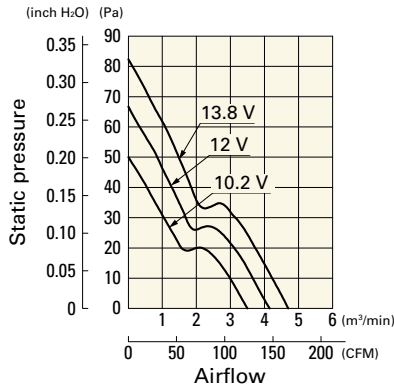
109E5712F501 With pulse sensor

Operating voltage range



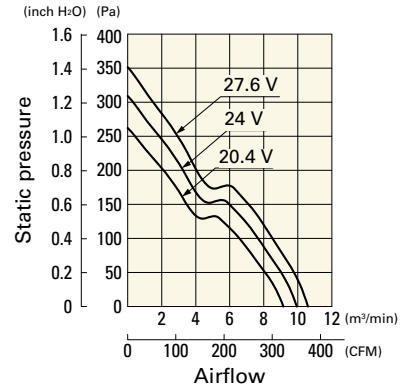
109E5712M501 With pulse sensor

Operating voltage range



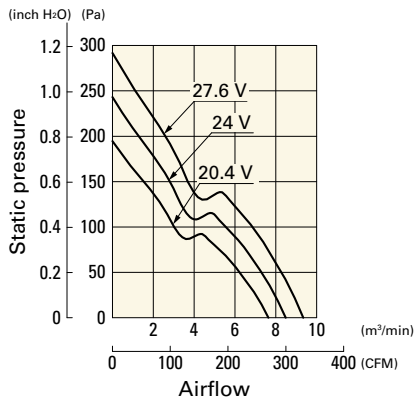
109E5724C501 With pulse sensor

Operating voltage range



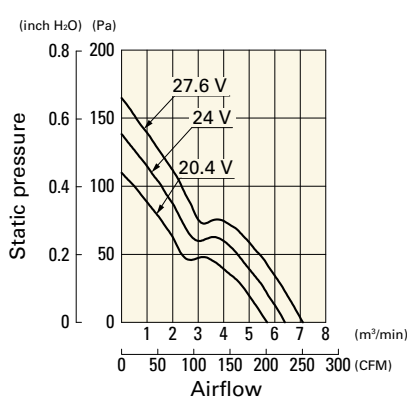
109E5724K501 With pulse sensor

Operating voltage range



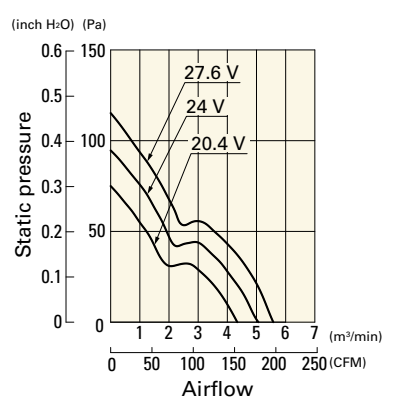
109E5724H501 With pulse sensor

Operating voltage range



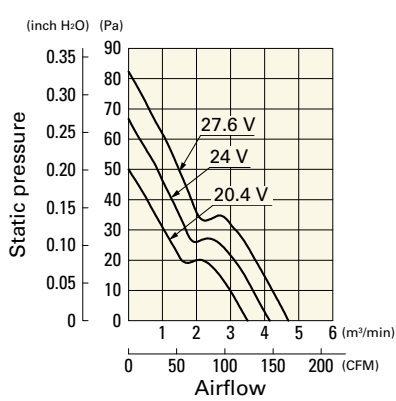
109E5724F501 With pulse sensor

Operating voltage range



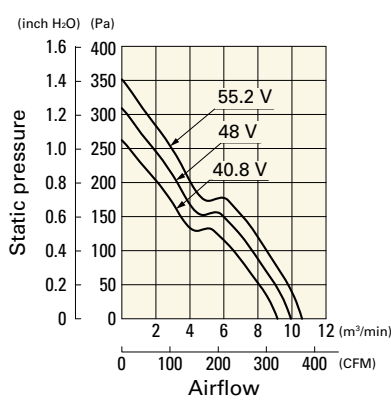
109E5724M501 With pulse sensor

Operating voltage range



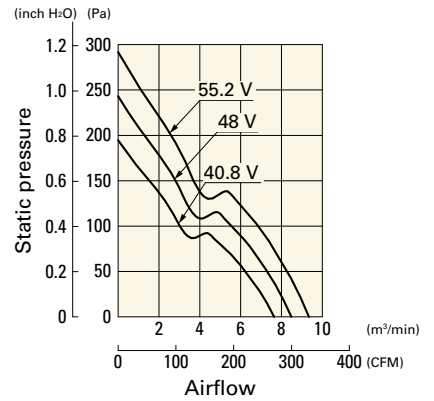
109E5748C501 With pulse sensor

Operating voltage range



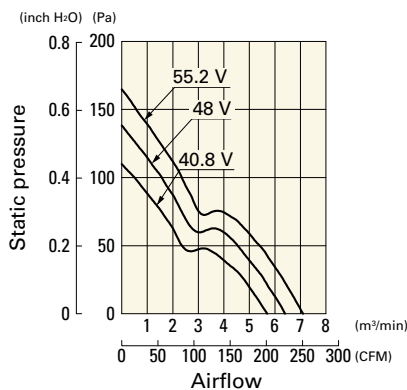
109E5748K501 With pulse sensor

Operating voltage range



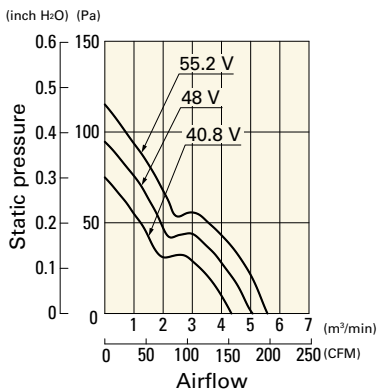
109E5748H501 With pulse sensor

Operating voltage range



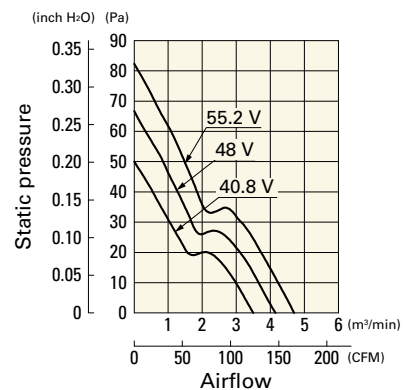
109E5748F501 With pulse sensor

Operating voltage range

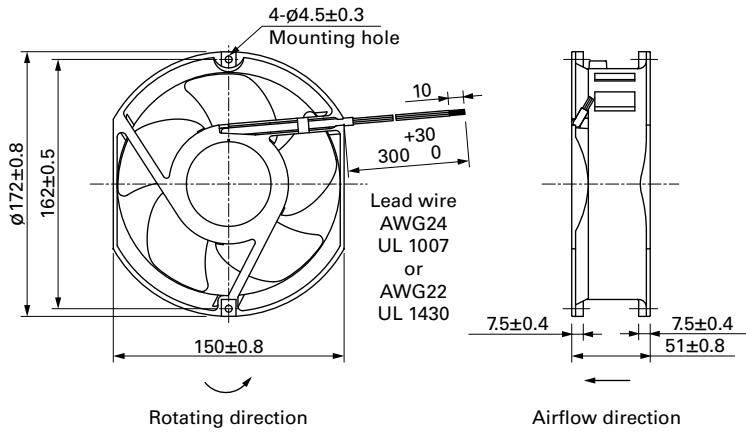


109E5748M501 With pulse sensor

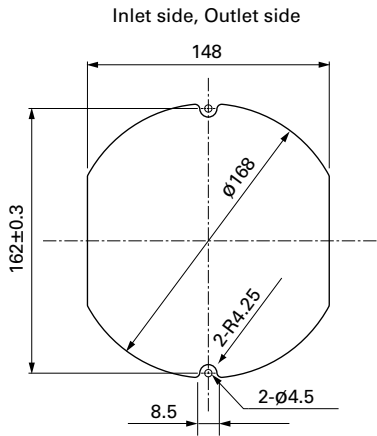
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 600

Model no.: 109-319J, 109-319E, 109-319H

∅ **172x51** mm

San Ace 172 9E type   

Round type



General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 780 g

Specifications

The models listed below **have a pulse sensor**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| » 109E1712K501 | 12 | 10.2 to 13.8 | 2.9 | 34.8 | 4100 | 8.5 300 | 243.0 0.976 | 55 | -20 to +60 | 40000/60°C (70000/40°C) |
| » 109E1712Y501 | | | 2.3 | 27.6 | 3800 | 7.8 276 | 210.0 0.843 | 53 | | |
| » 109E1712H501 | | | 1.2 | 14.4 | 3050 | 6.4 226 | 137.2 0.551 | 47 | | |
| » 109E1712F501 | | | 0.68 | 10.8 | 2500 | 5.1 180 | 95.0 0.382 | 42 | | |
| » 109E1712M501 | | | 0.48 | 5.76 | 2000 | 4.2 148 | 67.6 0.271 | 36 | | |
| » 109E1724C501 | 24 | 20.4 to 27.6 | 2.3 | 55.2 | 4800 | 9.9 350 | 308.0 1.237 | 60 | -20 to +70 | |
| » 109E1724K501 | | | 1.3 | 31.2 | 4100 | 8.5 300 | 243.0 0.976 | 55 | | |
| » 109E1724H501 | | | 0.58 | 13.92 | 3050 | 6.4 226 | 137.2 0.551 | 47 | | |
| » 109E1724F501 | | | 0.35 | 8.4 | 2500 | 5.1 180 | 95 0.382 | 42 | | |
| » 109E1724M501 | | | 0.2 | 4.8 | 2000 | 4.2 148 | 67.6 0.271 | 36 | | |
| » 109E1748C501 | 48 | 40.8 to 55.2 | 1.2 | 57.6 | 4800 | 9.9 350 | 308.0 1.237 | 60 | -20 to +60 | |
| » 109E1748K501 | | | 0.7 | 33.6 | 4100 | 8.5 300 | 243.0 0.976 | 55 | | |
| » 109E1748H501 | | | 0.28 | 13.44 | 3050 | 6.4 226 | 137.2 0.551 | 47 | | |
| » 109E1748F501 | | | 0.19 | 9.12 | 2500 | 5.1 180 | 95 0.382 | 42 | | |
| » 109E1748M501 | | | 0.11 | 5.28 | 2000 | 4.2 148 | 67.6 0.271 | 36 | | |

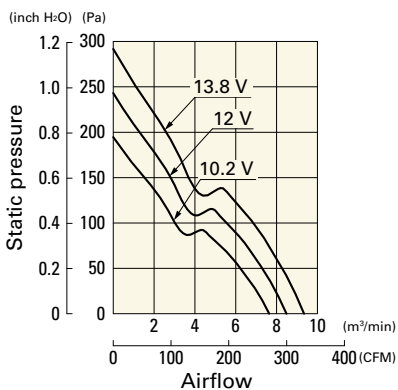
Note 1: Sensor and control options are available for selection. Refer to the table on p. 638.

Note 2: The » mark indicates Short Lead Time Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

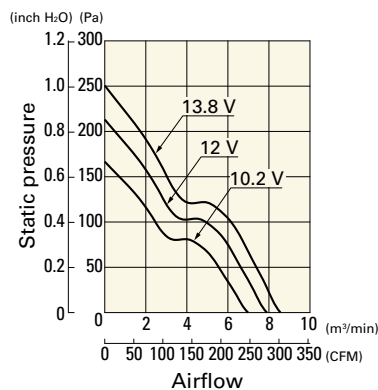
109E1712K501 With pulse sensor

Operating voltage range



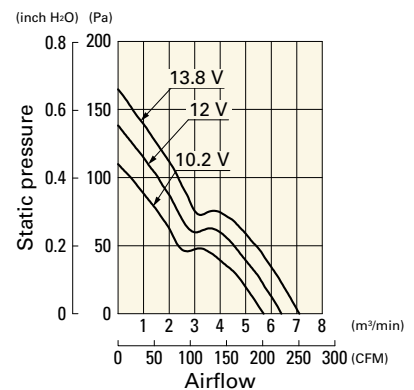
109E1712Y501 With pulse sensor

Operating voltage range



109E1712H501 With pulse sensor

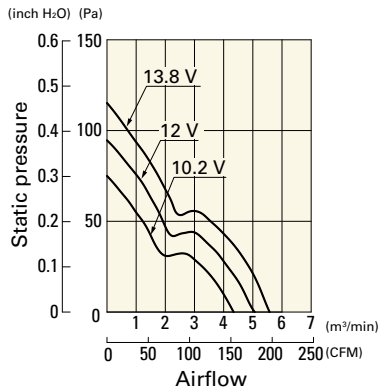
Operating voltage range



Airflow - Static Pressure Characteristics

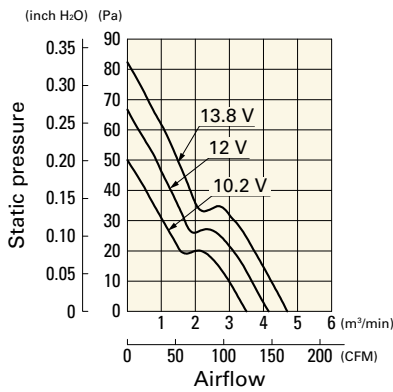
109E1712F501 With pulse sensor

Operating voltage range



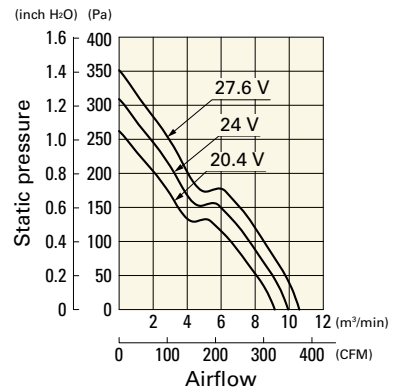
109E1712M501 With pulse sensor

Operating voltage range



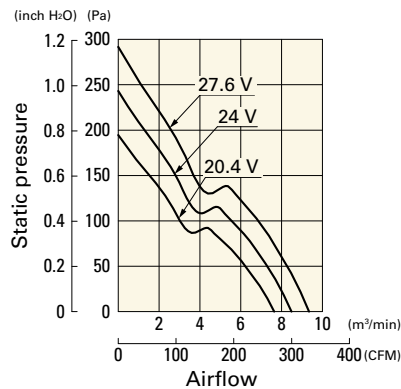
109E1724C501 With pulse sensor

Operating voltage range



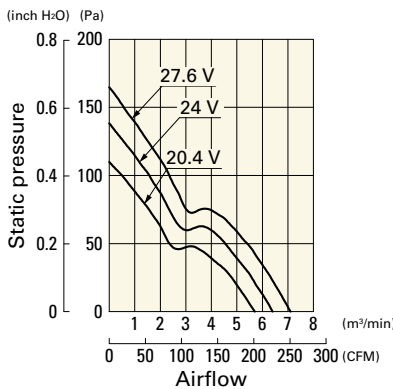
109E1724K501 With pulse sensor

Operating voltage range



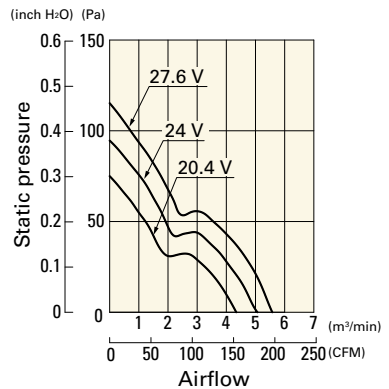
109E1724H501 With pulse sensor

Operating voltage range



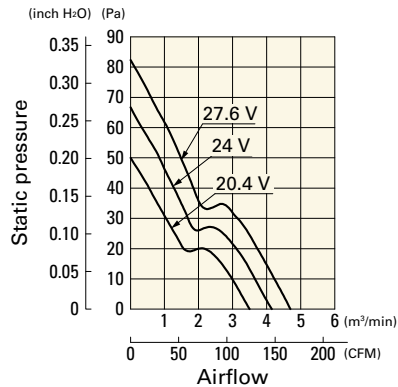
109E1724F501 With pulse sensor

Operating voltage range



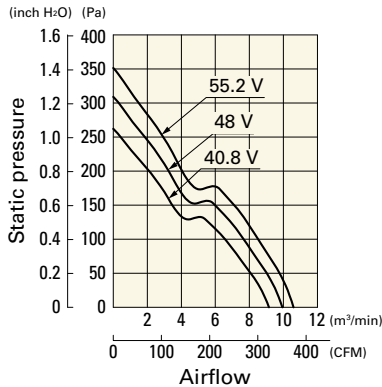
109E1724M501 With pulse sensor

Operating voltage range



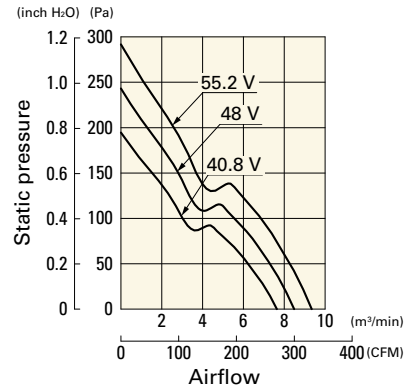
109E1748C501 With pulse sensor

Operating voltage range



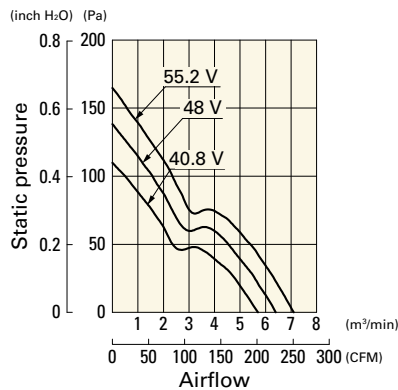
109E1748K501 With pulse sensor

Operating voltage range



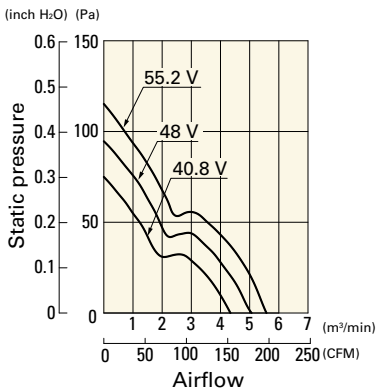
109E1748H501 With pulse sensor

Operating voltage range



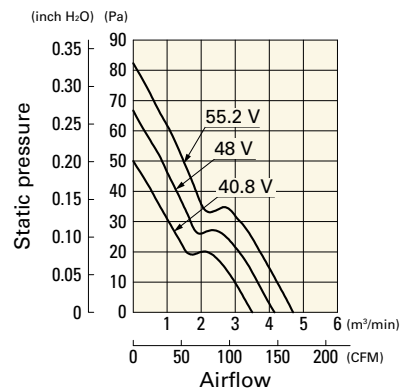
109E1748F501 With pulse sensor

Operating voltage range

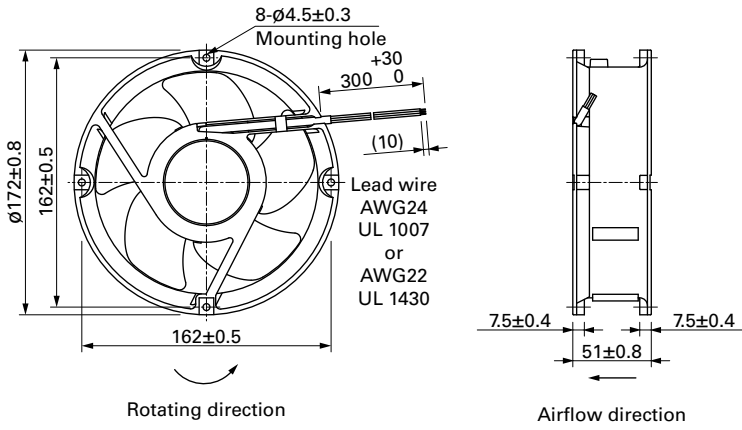


109E1748M501 With pulse sensor

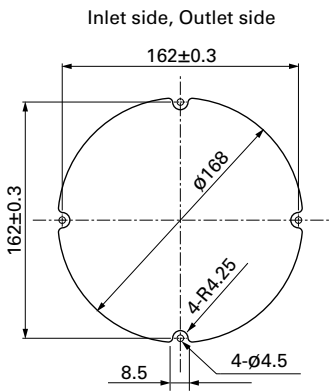
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 600

Model no.: 109-319E, 109-319H, 109-1066



Ø200x70 mm

San Ace 200 9GV type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 1800 g

Once the fan stops, wait for at least 15 seconds before restarting the fan.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GV2048P0G201 | 48 | 36 to 72 | 100 | 12.5 | 600 | 8000 | 31.5 1112 | 1400 5.62 | 81 | -20 to +70 | 40000/60°C (70000/40°C) |

* PWM frequency is 1 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

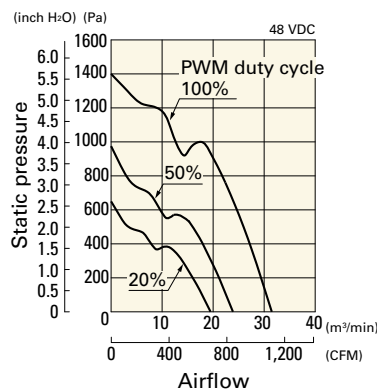
Note 1: Sensor and control options are available for selection. Refer to the table on p. 647.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

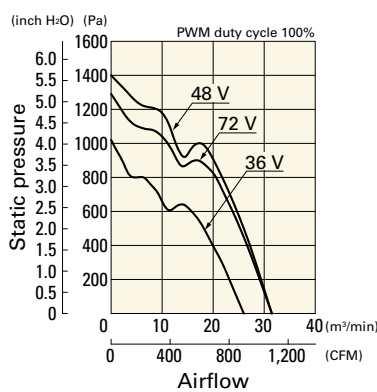
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GV2048P0G201 With pulse sensor with PWM control

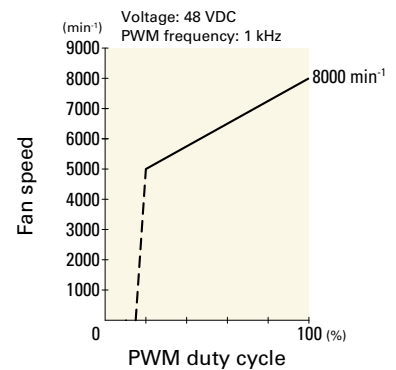
PWM duty cycle



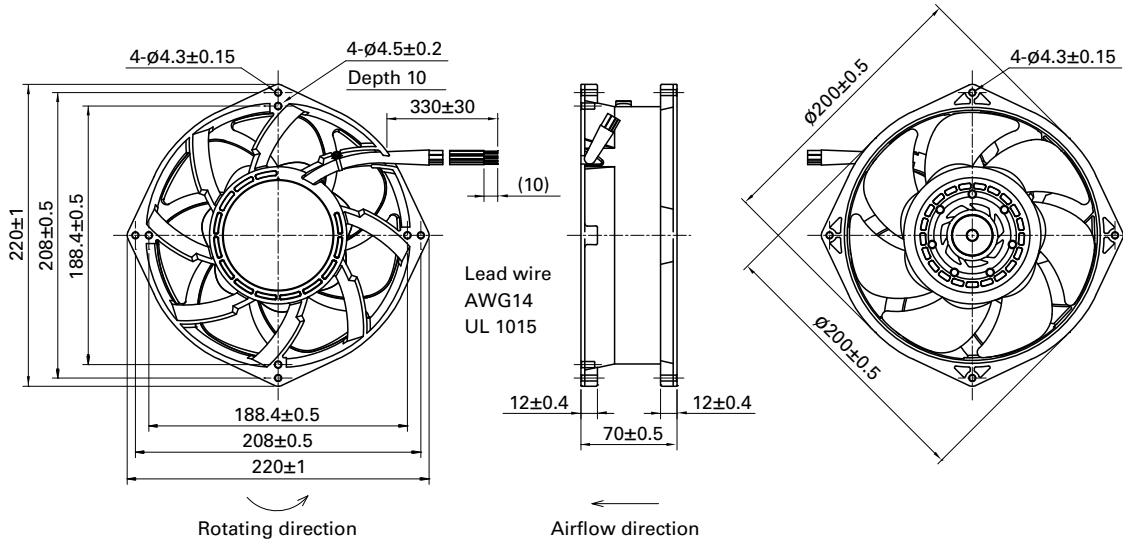
Operating voltage range



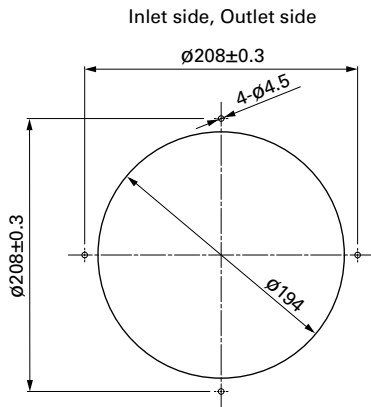
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

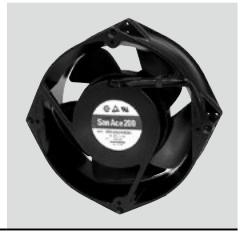
page: p. 601

Model no.: 109-1102, 109-1102H

DC Fan

Ø200x70 mm

San Ace 200 9EC type   



General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 1800 g

Once the fan stops, wait for at least 10 seconds before restarting the fan.

Specifications

The models listed below **have a pulse sensor**.

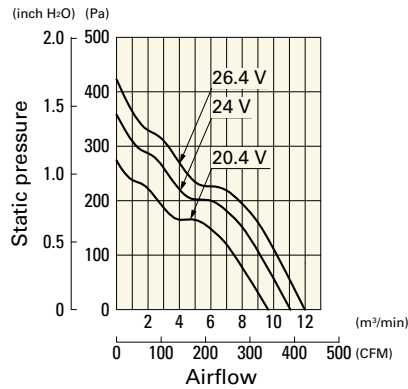
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9EC2024H001 | 24 | 20.4 to 26.4 | 2.0 | 48.0 | 3600 | 11.0 388 | 360 1.446 | 60 | -20 to +60 | 40000/60°C (70000/40°C) |
| 9EC2048A001 | 48 | 43.0 to 51.0 | 2.2 | 105.6 | 4800 | 14.7 519 | 640 2.57 | 68 | | |
| 9EC2048H001 | | 40.8 to 52.8 | 1.2 | 57.6 | 3600 | 11.0 388 | 360 1.446 | 60 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 641.

Airflow - Static Pressure Characteristics

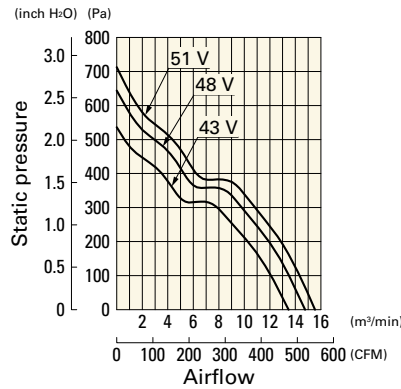
9EC2024H001 With pulse sensor

Operating voltage range



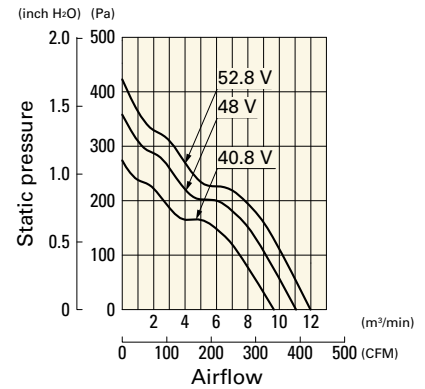
9EC2048A001 With pulse sensor

Operating voltage range

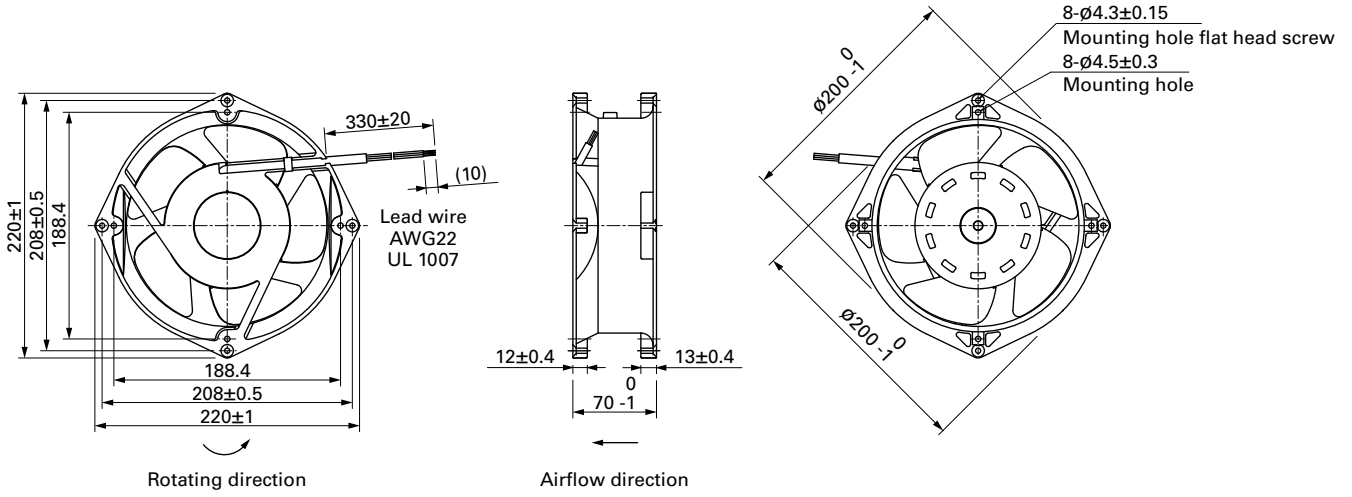


9EC2048H001 With pulse sensor

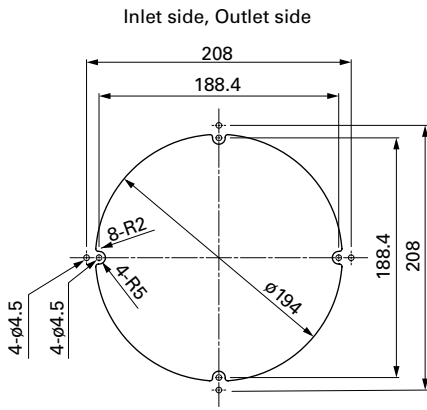
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 601

Model no.: 109-720, 109-720H

Counter Rotating Fan

Counter rotating fans feature high airflow and high static pressure.
Related product: Long Life Fan pp. 383, 390

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | |
|-------------|------------|-----------|------------|-----------------|-----------------------|
| 9CRA | 04 | 12 | K | 4 | 01 |
| Type name | Frame size | Voltage | Speed code | Frame thickness | Sensor specifications |

Fans with PWM control

| | | | | | | |
|-------------|------------|-----------|-------------|-----------------|------------|--|
| 9CRA | 03 | 12 | P | 4 | K | 03 |
| Type name | Frame size | Voltage | PWM control | Frame thickness | Speed code | Individual customer's spec (2 to 3 digits) |

| | | | | | | |
|-----------------------|---------------------|-------|------------------|-------|---------|--------------------|
| Type name | 9CRA 9CRH etc. | | | | | |
| Frame size (mm) | 03 | 04 | 06 | 08 | 12 | 57 |
| | 38×38 | 40×40 | 60×60 | 80×80 | 120×120 | ∅172×150 (sidecut) |
| Voltage (V) | 12 | 48 | | | | |
| | 12 | 48 | | | | |
| Speed code | G H J K S etc. | | | | | |
| Frame thickness (mm) | 0 | 4 | 5 | 6 | 8 | 9 |
| | 76 | 48 | 51, 56 | 56 | 80 | 102 |
| Sensor specifications | 01, 001 | | 02, 002 | | | D01, D001 |
| | With a pulse sensor | | Without a sensor | | | With a lock sensor |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

- Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
For more information, please refer to the technical material section.

38x38x48 mm

San Ace 38 9CRA type   US



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 80 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CRA0312P4K03 | 12 | 10.8 to 13.2 | 100 | 1.5 | 18.0 | 17600 | 14520 | 0.77 | 27.2 | 700.0 | 2.81 | 64 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.2 | 2.4 | 5280 | 4200 | 0.22 | 7.8 | 54.9 | 0.22 | 33 | | |
| 100 | | | 1.1 | 13.2 | 16000 | 13200 | 0.7 | 24.7 | 560.0 | 2.25 | 62 | | | |
| 0 | | | 0.18 | 2.2 | 4800 | 3960 | 0.21 | 7.4 | 50.4 | 0.2 | 31 | | | |
| 9CRA0312P4J03 | | | | | | | | | | | | | | |

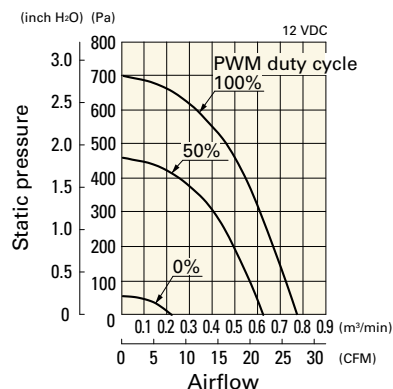
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 640.

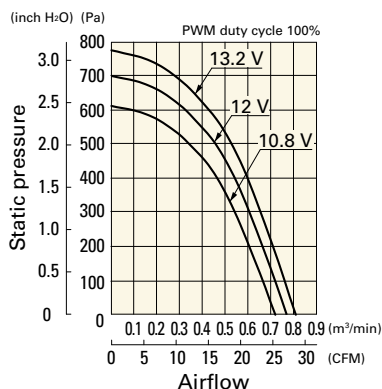
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0312P4K03 With pulse sensor with PWM control

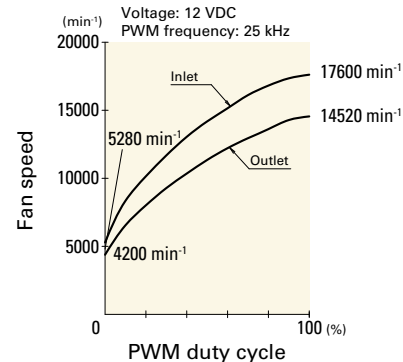
PWM duty cycle



Operating voltage range



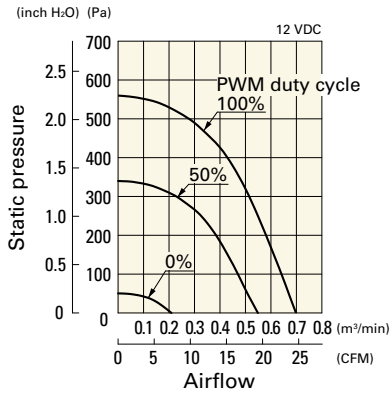
PWM duty - Speed characteristics example



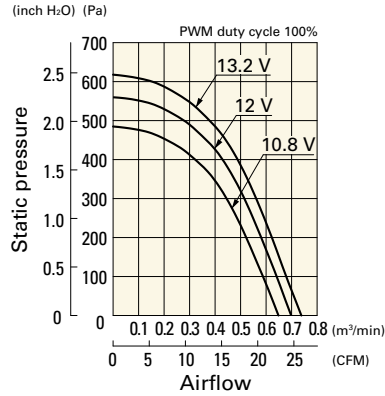
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0312P4J03 With pulse sensor with PWM control

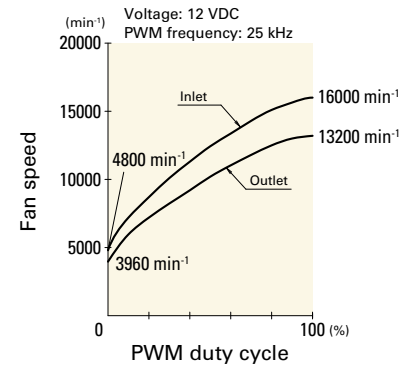
PWM duty cycle



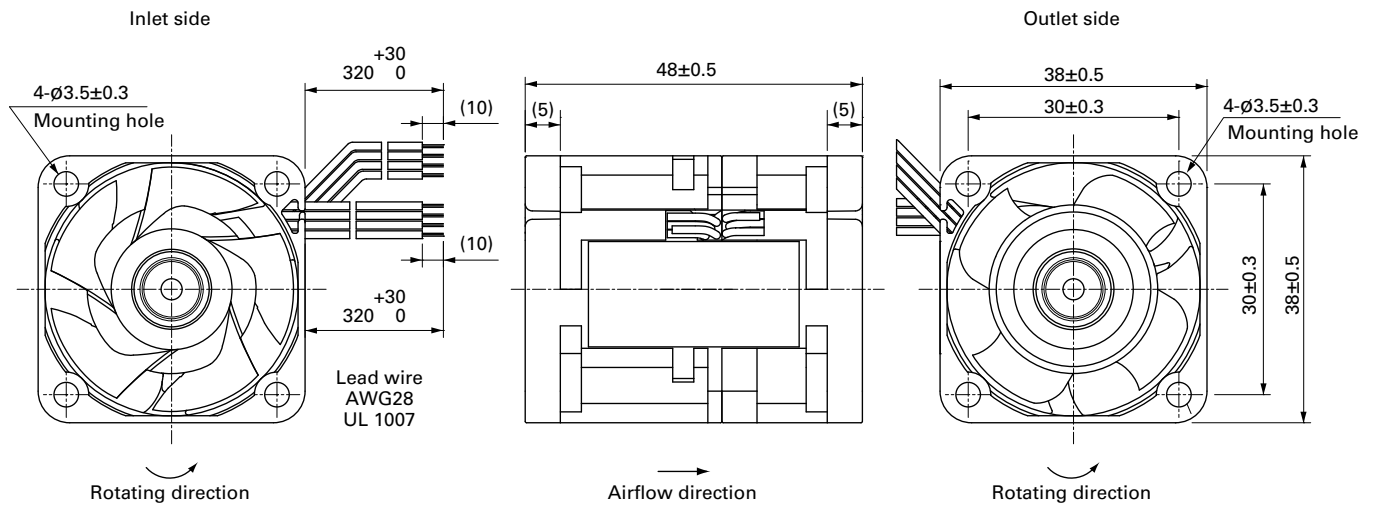
Operating voltage range



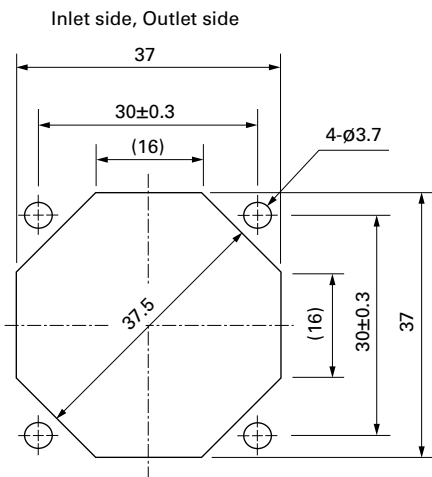
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-1065

40x40x48 mm



San Ace 40 9CRA type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 80 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CRA0412P4K03 | 12 | 10.8 to 13.2 | 100 | 1.6 | 19.2 | 17500 | 11700 | 0.92 | 32.5 | 650.0 | 2.61 | 64 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.19 | 2.28 | 5250 | 3510 | 0.276 | 9.75 | 58.5 | 0.235 | 33 | | |
| 9CRA0412P4J03 | | | 100 | 1.2 | 14.4 | 16200 | 10800 | 0.85 | 30.0 | 560.0 | 2.25 | 62 | | |
| | | | 0 | 0.15 | 1.8 | 4500 | 3000 | 0.236 | 8.33 | 43.2 | 0.173 | 28 | | |
| 9CRA0412P4G03 | | | 100 | 1.0 | 12.0 | 14700 | 9800 | 0.77 | 27.2 | 460.0 | 1.85 | 59 | | |
| | | | 0 | 0.15 | 1.8 | 4410 | 2940 | 0.231 | 8.16 | 41.4 | 0.166 | 28 | | |

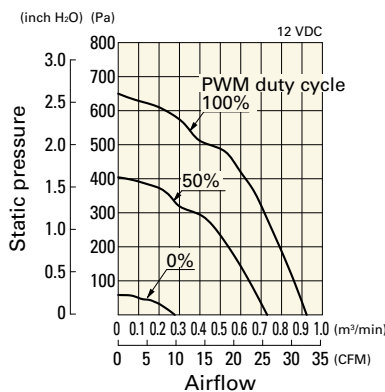
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 640.

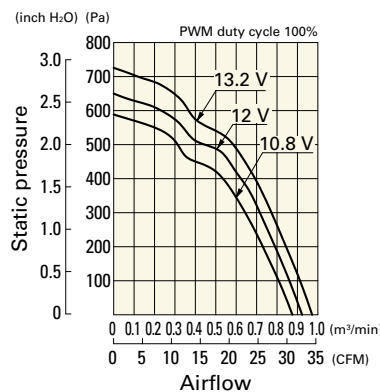
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0412P4K03 With pulse sensor with PWM control

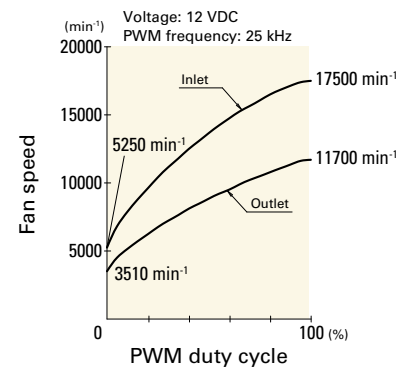
PWM duty cycle



Operating voltage range



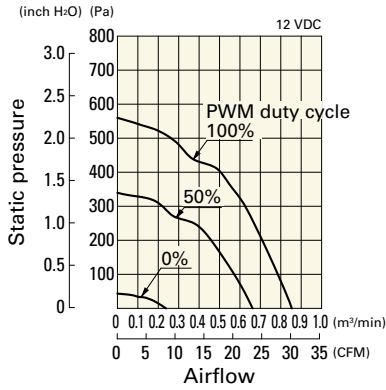
PWM duty - Speed characteristics example



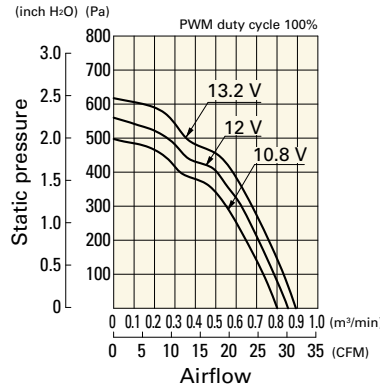
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0412P4J03 With pulse sensor with PWM control

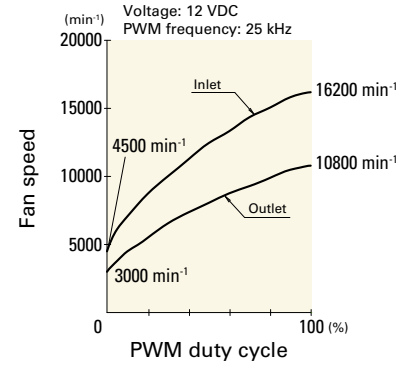
PWM duty cycle



Operating voltage range

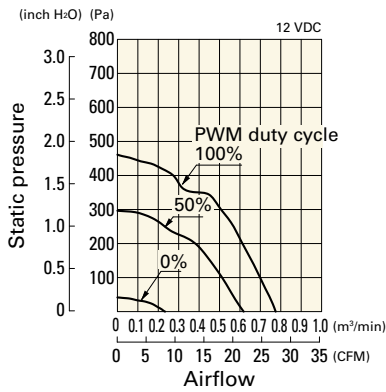


PWM duty - Speed characteristics example

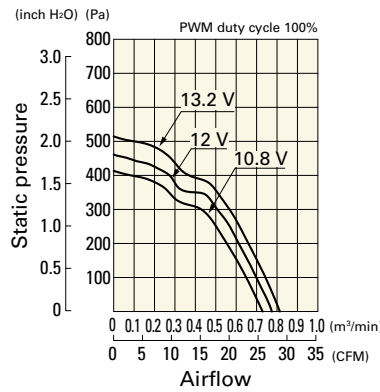


9CRA0412P4G03 With pulse sensor with PWM control

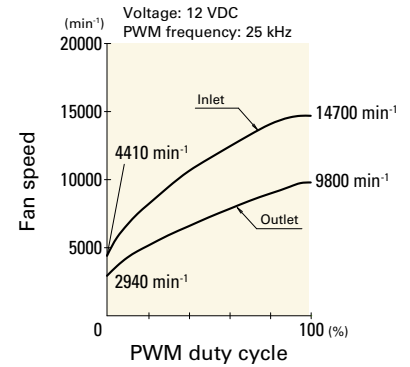
PWM duty cycle



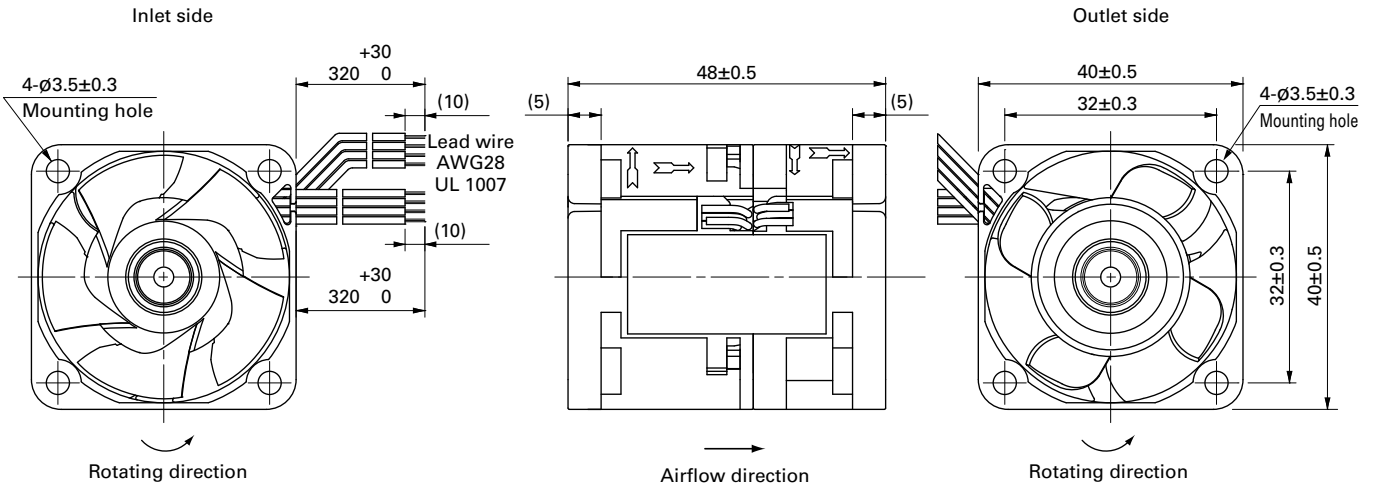
Operating voltage range



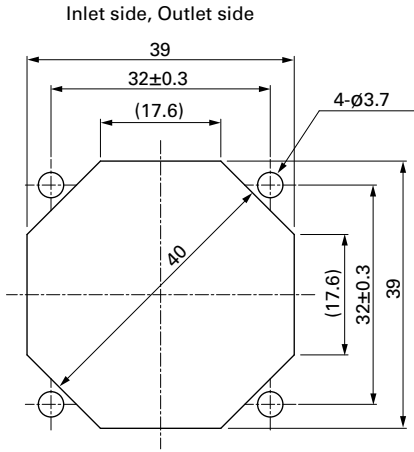
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x56 mm

San Ace 40 9CRJ type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 110 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CRJ0412P5J001 | 12 | 10.8 to 12.6 | 100 | 3.1 | 37.2 | 36200 | 32000 | 1.06 | 37.4 | 2400 | 9.64 | 72 | -20 to +70 | 30000/60°C (53000/40°C) |
| | | | 20 | 0.1 | 1.2 | 4500 | 4000 | 0.11 | 3.9 | 40 | 0.16 | 28 | | |

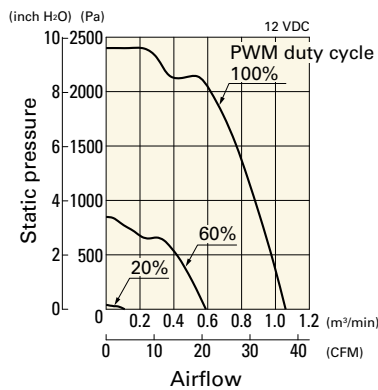
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

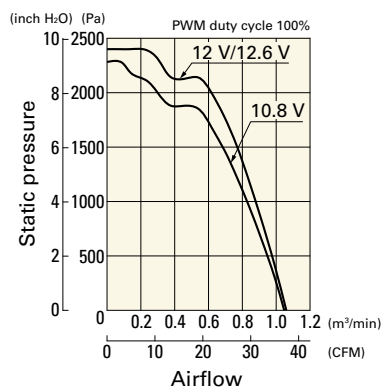
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRJ0412P5J001 With pulse sensor with PWM control

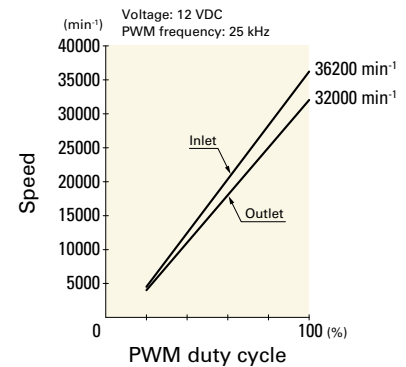
PWM duty cycle



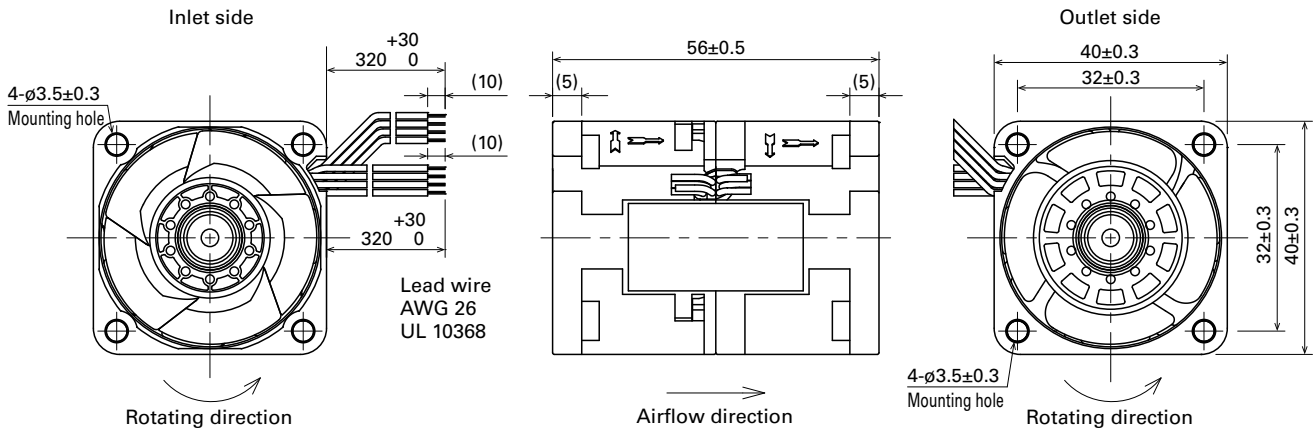
Operating voltage range



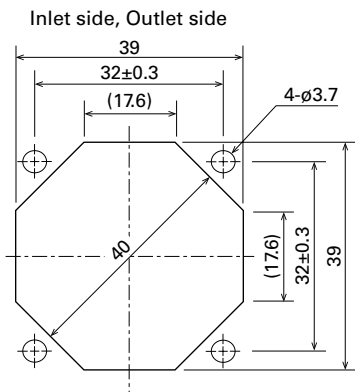
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x56 mm

San Ace 40 9CRH type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 110 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CRH0412P5J001 | 12 | 10.8 to 12.6 | 100 | 2.52 | 30.24 | 29500 | 25500 | 0.93 | 32.9 | 1700 | 6.83 | 70 | -20 to +70 | 30000/60°C (53000/40°C) |
| | | | 20 | 0.06 | 0.72 | 3000 | 2600 | 0.08 | 2.8 | 17 | 0.07 | 20 | | |

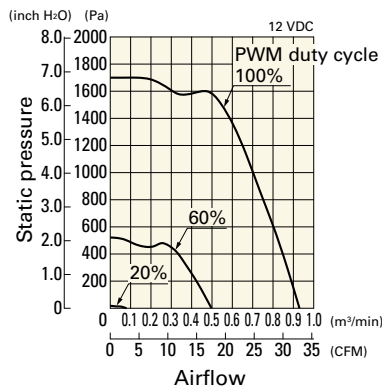
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

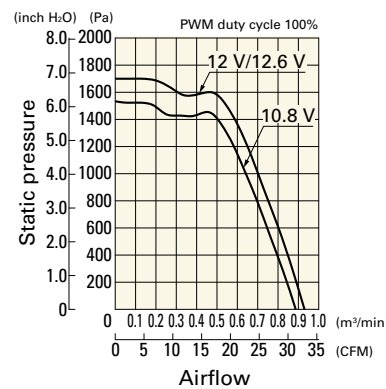
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRH0412P5J001 With pulse sensor with PWM control

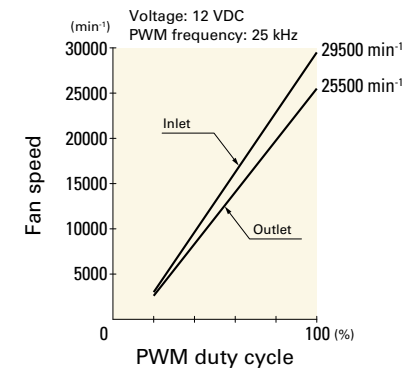
PWM duty cycle



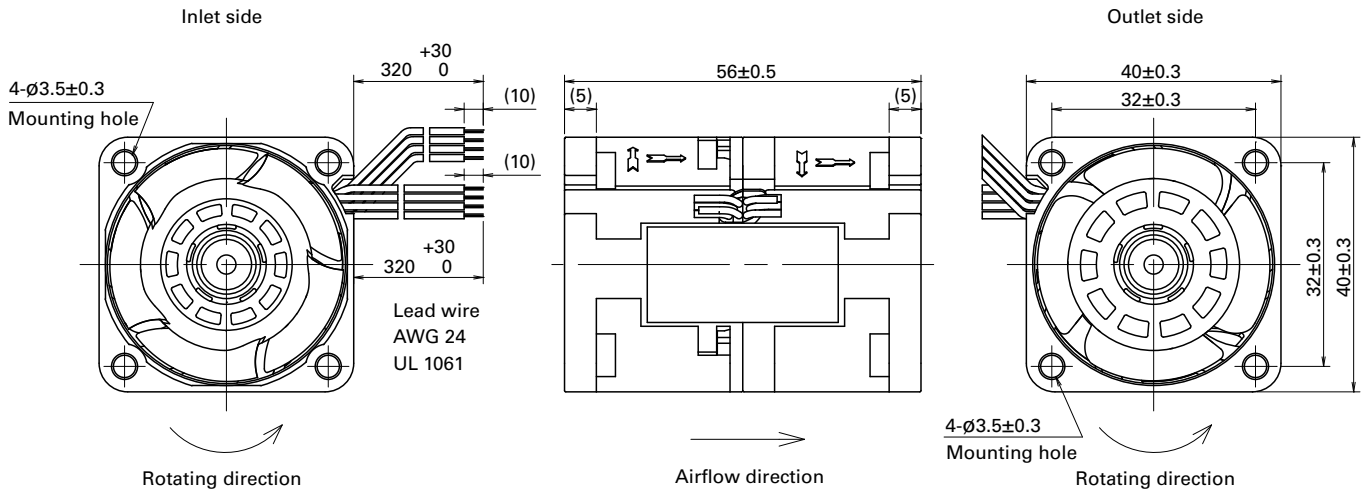
Operating voltage range



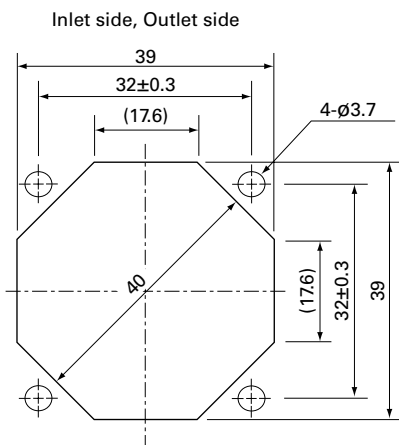
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x56 mm

San Ace 40 9CRV type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 100 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|----------------------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Pa | inchH ₂ O | | | |
| 9CRV0412P5J201 | 12 | 10.8 to 13.2 | 100 | 1.8 | 21.6 | 22500 | 20000 | 0.9 | 31.8 | 1050 | 4.22 | 68 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.11 | 1.32 | 3800 | 3500 | 0.14 | 4.9 | 30 | 0.12 | 26 | | |
| 9CRV0412P5G201 | | | 100 | 1.1 | 13.2 | 19000 | 16900 | 0.76 | 26.8 | 748 | 3.0 | 62 | | |
| | | | 0 | 0.11 | 1.32 | 3800 | 3500 | 0.14 | 4.9 | 30 | 0.12 | 26 | | |
| 9CRV0412P5S201 | | | 100 | 0.8 | 9.6 | 17000 | 15100 | 0.68 | 24 | 590 | 2.37 | 59 | | |
| | | | 0 | 0.11 | 1.32 | 3800 | 3500 | 0.14 | 4.9 | 30 | 0.12 | 26 | | |
| 9CRV0412P5H201 | | | 100 | 0.55 | 6.6 | 15000 | 13300 | 0.6 | 21.2 | 451 | 1.81 | 56 | | |
| | | | 0 | 0.11 | 1.32 | 3800 | 3500 | 0.14 | 4.9 | 30 | 0.12 | 26 | | |

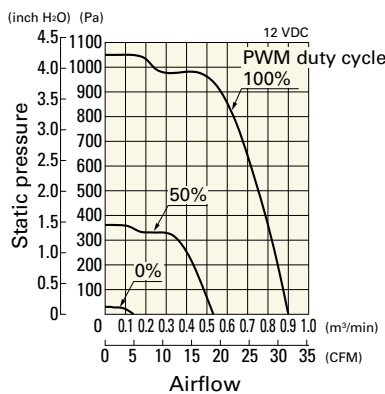
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

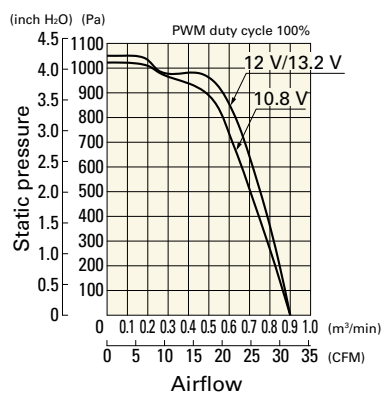
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRV0412P5J201 With pulse sensor with PWM control

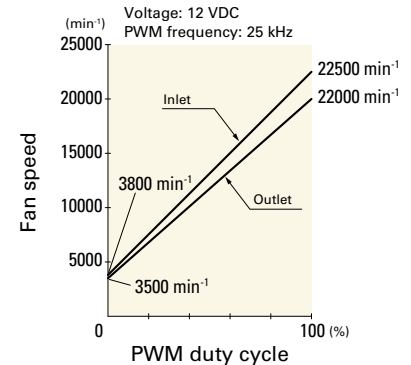
PWM duty cycle



Operating voltage range



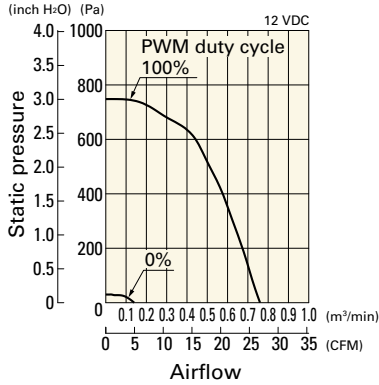
PWM duty - Speed characteristics example



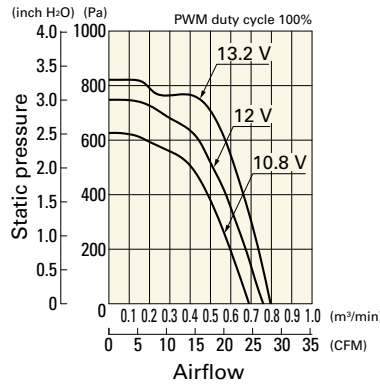
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRV0412P5G201 With pulse sensor with PWM control

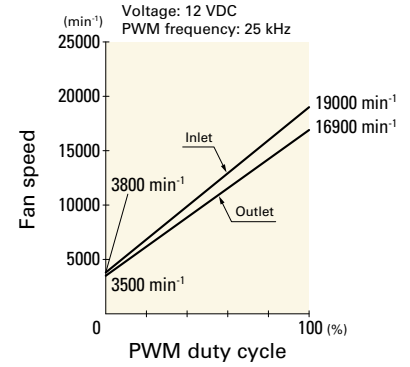
PWM duty cycle



Operating voltage range

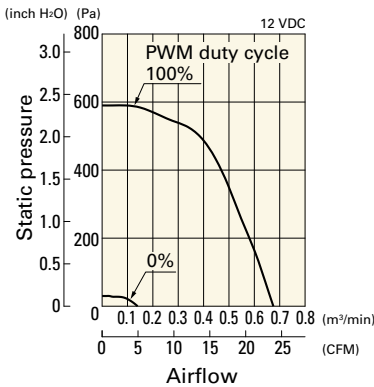


PWM duty - Speed characteristics example

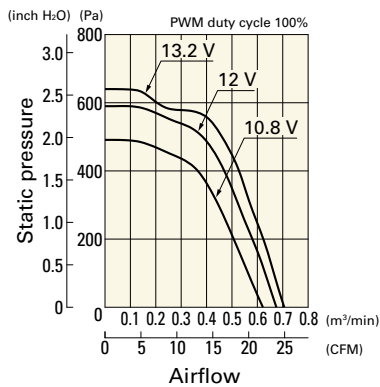


9CRV0412P5S201 With pulse sensor with PWM control

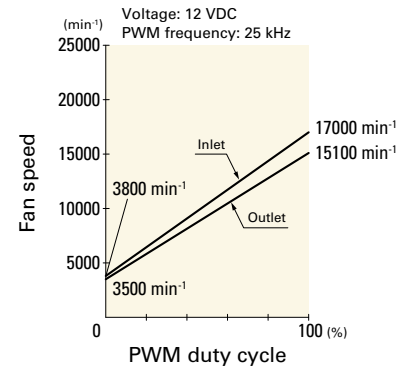
PWM duty cycle



Operating voltage range

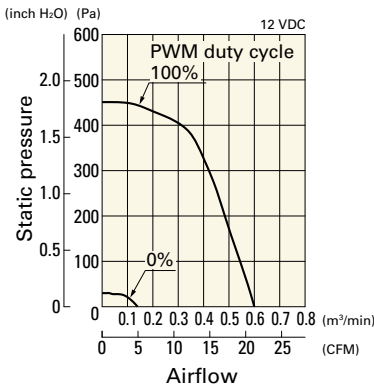


PWM duty - Speed characteristics example

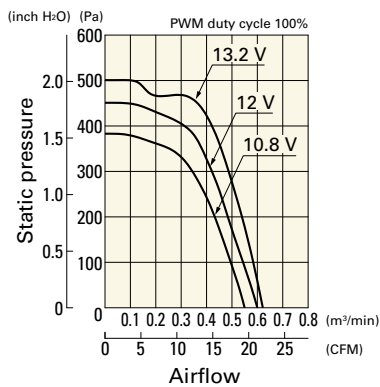


9CRV0412P5H201 With pulse sensor with PWM control

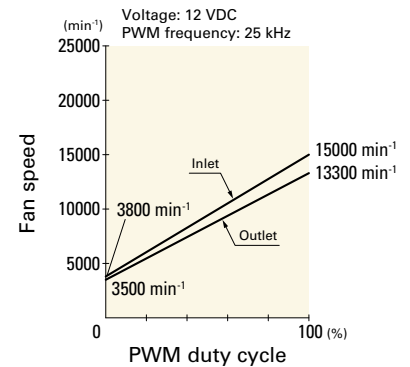
PWM duty cycle



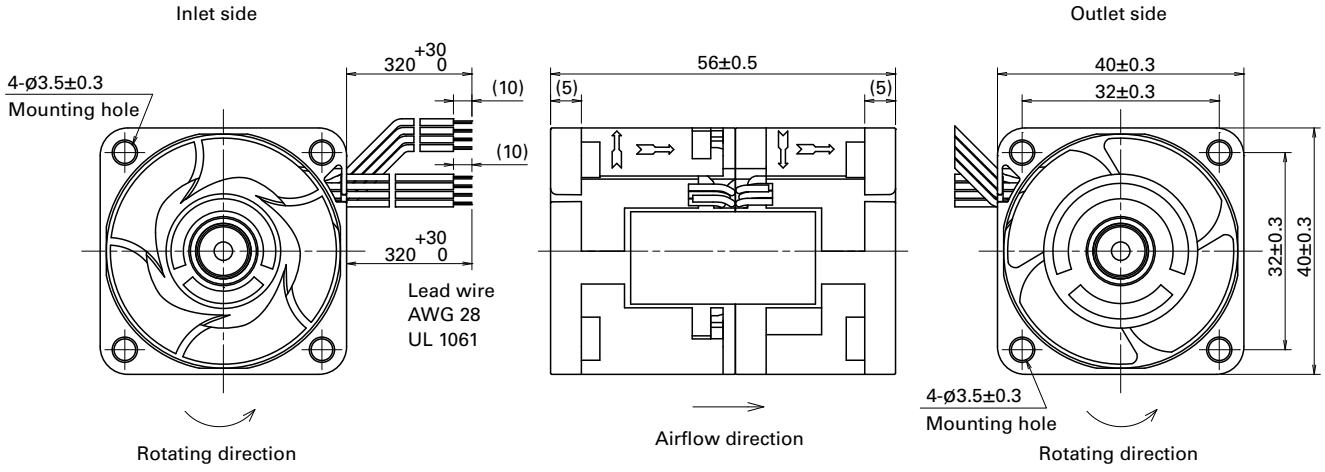
Operating voltage range



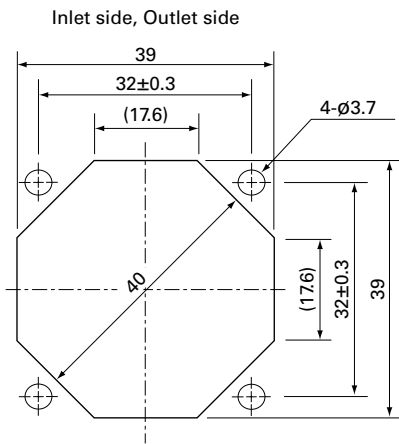
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x56 mm

San Ace 40 9CRE type Low Vibration Fan

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 110 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|------|--|-------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | | | | | | | |
| 9CRE0412P5J03 | 12 | 10.8 to 13.2 | 100 | 1.4 | 16.8 | 15800 | 12200 | 0.9 | 31.8 | 570.0 | 2.29 | 62 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.1 | 1.2 | 2850 | 2250 | 0.12 | 4.2 | 13.7 | 0.055 | 20.5 | | |

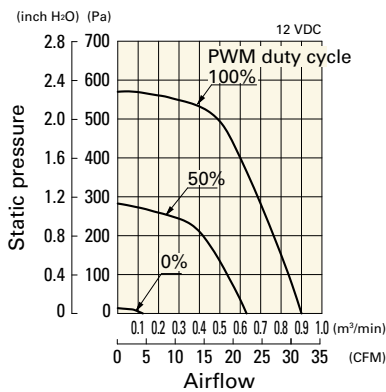
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 641.

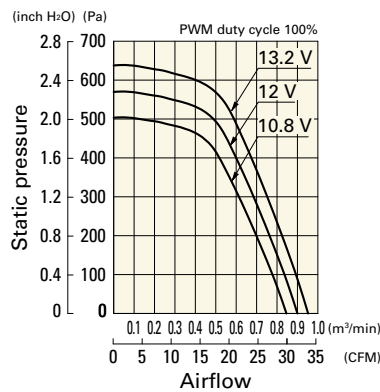
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRE0412P5J03 With pulse sensor with PWM control

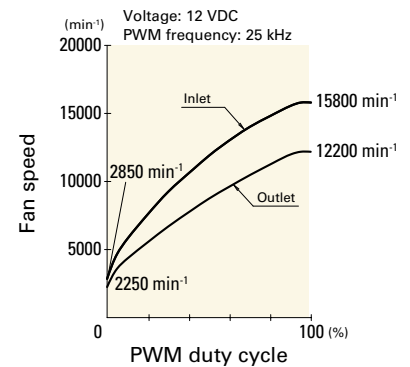
PWM duty cycle



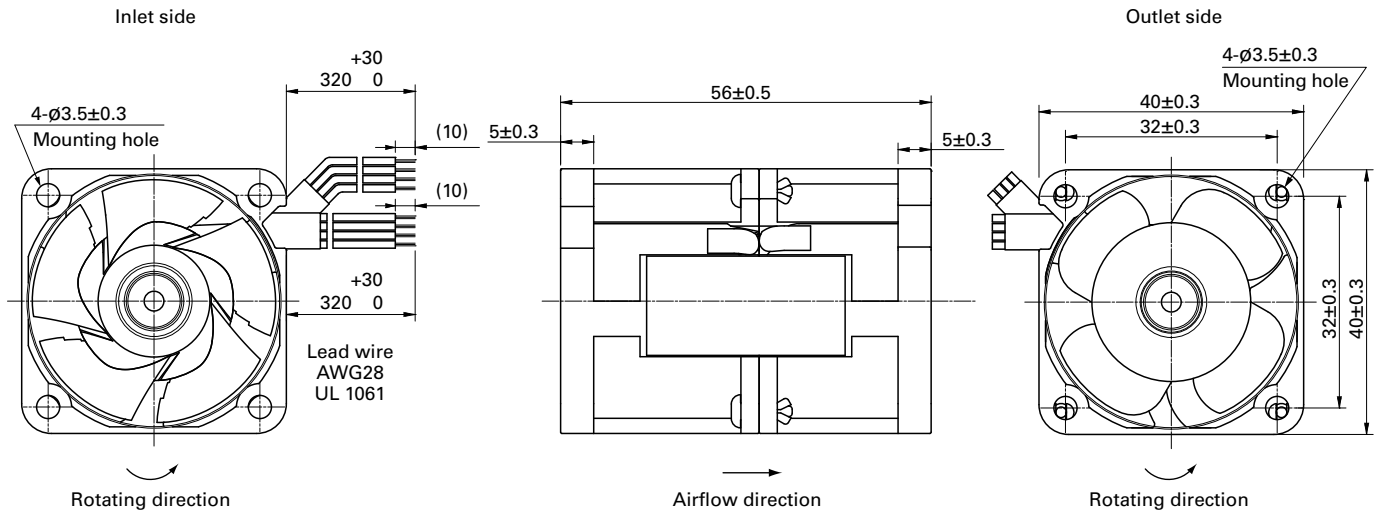
Operating voltage range



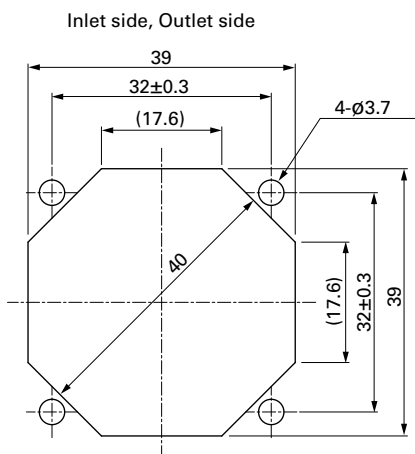
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



60×60×51 mm

San Ace 60 9CR type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 180 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CR0612P5G03 | 12 | 10.8 to 13.2 | 100 | 2.7 | 32.4 | 11500 | 9000 | 2.03 | 71.7 | 600 | 2.41 | 68 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.22 | 2.64 | 3000 | 2300 | 0.48 | 16.9 | 40 | 0.16 | 34 | | |
| 9CR0612P5H03 | | | 100 | 2.0 | 24.0 | 10500 | 8200 | 1.85 | 65.4 | 500 | 2.01 | 65 | | |
| | | | 0 | 0.22 | 2.64 | 3000 | 2300 | 0.48 | 16.9 | 40 | 0.16 | 34 | | |

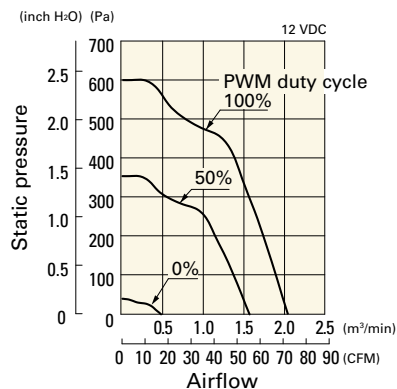
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 640.

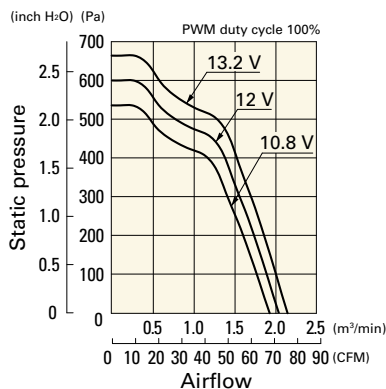
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CR0612P5G03 With pulse sensor with PWM control

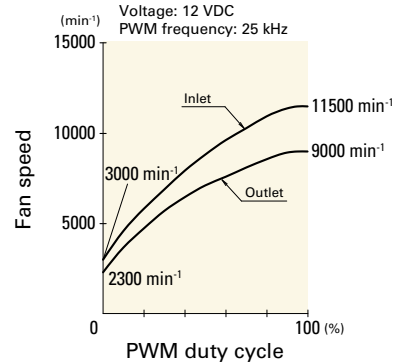
PWM duty cycle



Operating voltage range



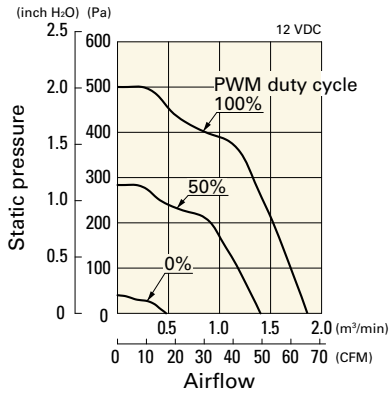
PWM duty - Speed characteristics example



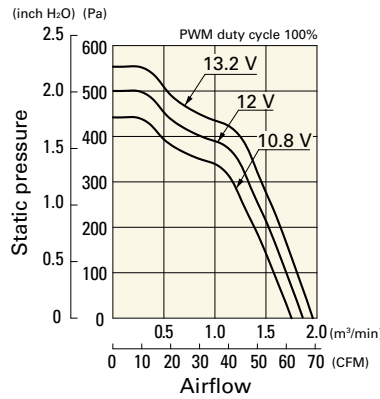
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CR0612P5H03 With pulse sensor with PWM control

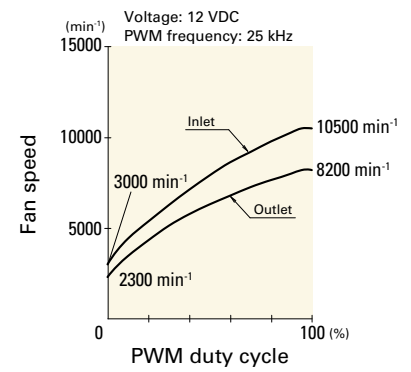
PWM duty cycle



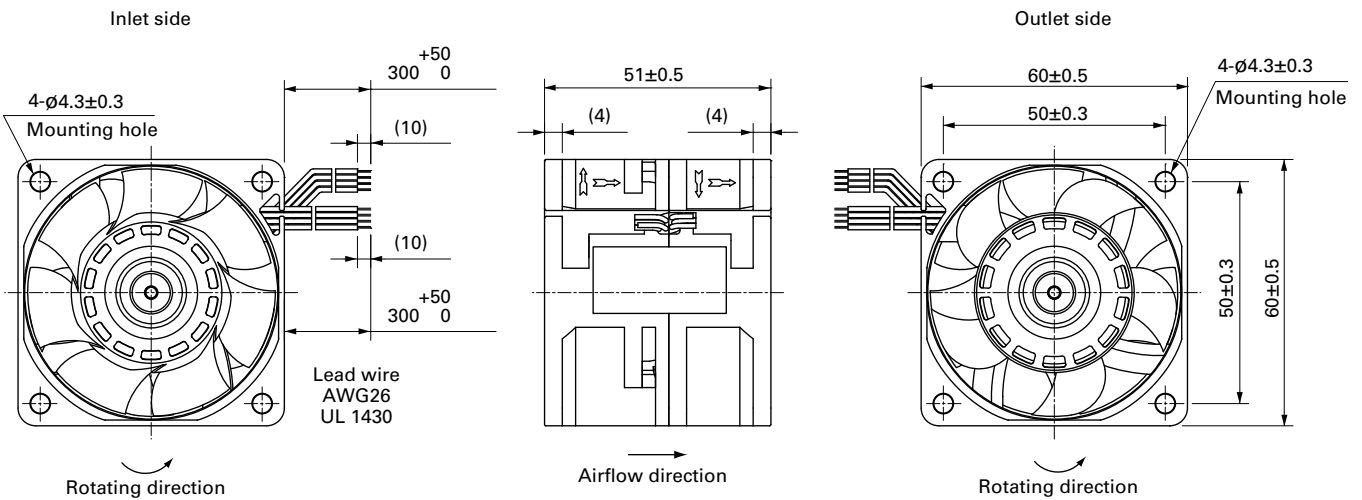
Operating voltage range



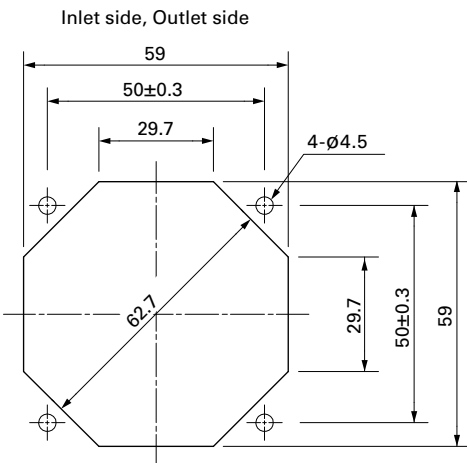
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



60x60x56 mm

San Ace 60 9CRA type US

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 200 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CRA0612P6K001 | 12 | 10.8 to 13.2 | 100 | 3.1 | 37.2 | 18300 | 15800 | 2.28 | 80.5 | 1130 | 4.54 | 73 | -20 to +70 | 30000/60°C (53000/40°C) |
| | | | 0 | 0.17 | 2.0 | 3800 | 3300 | 0.47 | 16.6 | 49 | 0.2 | 35 | | |
| 9CRA0612P6J001 | | | 100 | 2.3 | 27.6 | 16800 | 14500 | 2.1 | 74.2 | 950 | 3.82 | 70 | | |
| | | | 0 | 0.15 | 1.8 | 3800 | 3300 | 0.47 | 16.6 | 49 | 0.2 | 35 | | |
| 9CRA0612P6G001 | | | 100 | 1.3 | 15.6 | 13500 | 11400 | 1.65 | 58.3 | 620 | 2.49 | 65 | | 40000/60°C (70000/40°C) |
| | | | 0 | 0.1 | 1.2 | 3000 | 2500 | 0.36 | 12.7 | 31 | 0.12 | 29 | | |

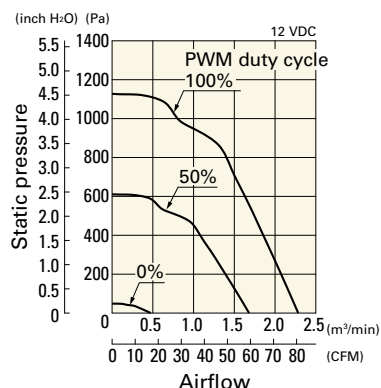
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

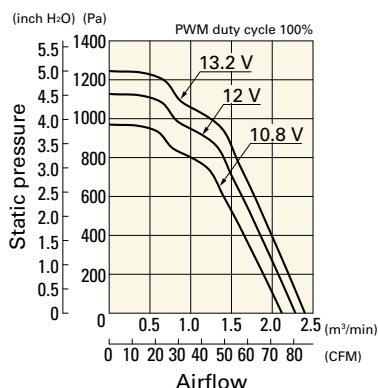
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0612P6K001 With pulse sensor with PWM control

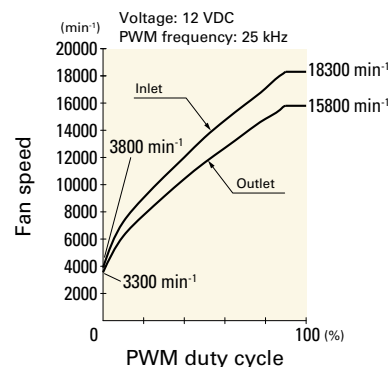
PWM duty cycle



Operating voltage range



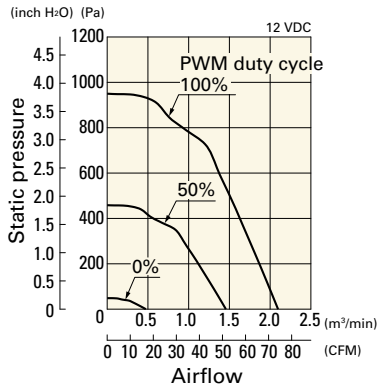
PWM duty - Speed characteristics example



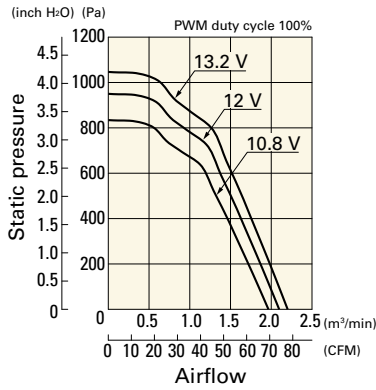
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0612P6J001 With pulse sensor with PWM control

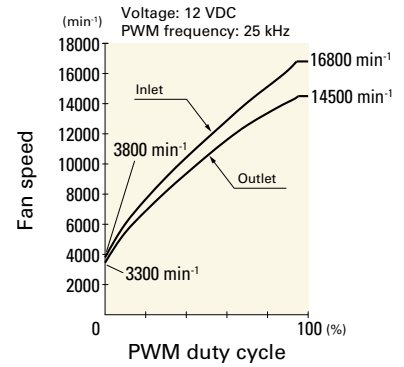
PWM duty cycle



Operating voltage range

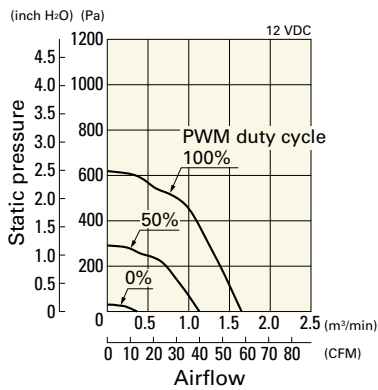


PWM duty - Speed characteristics example

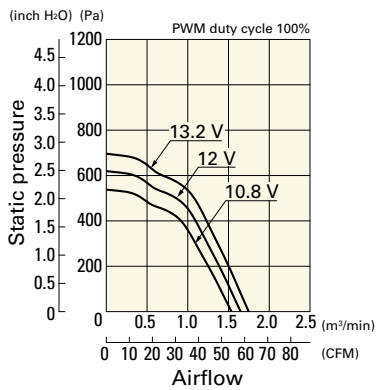


9CRA0612P6G001 With pulse sensor with PWM control

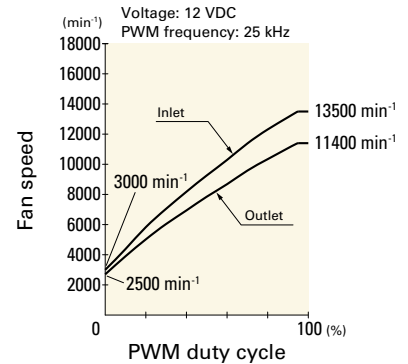
PWM duty cycle



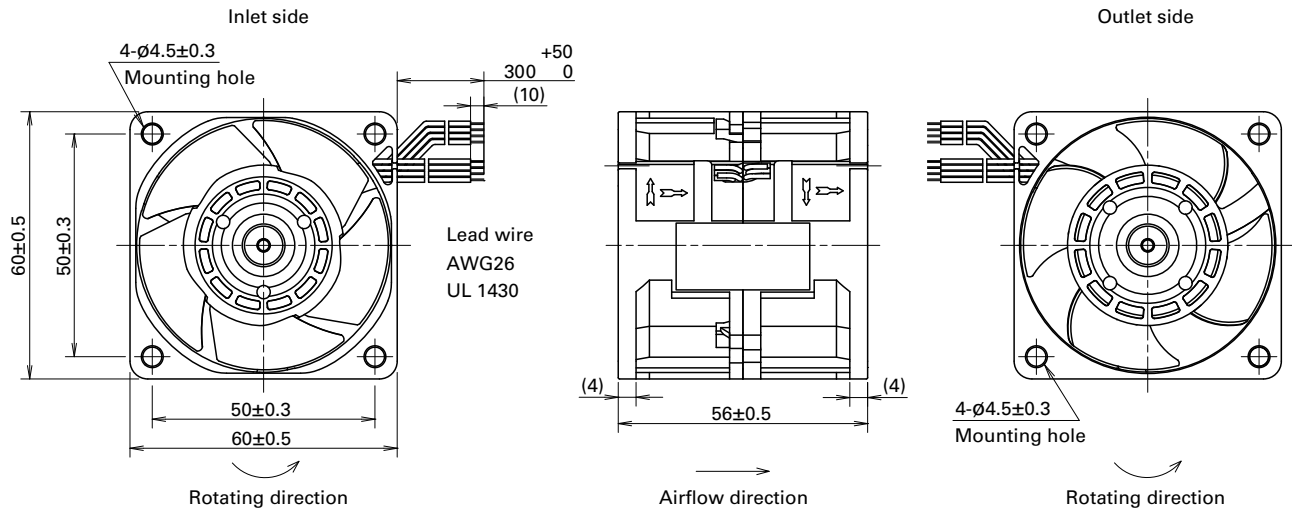
Operating voltage range



PWM duty - Speed characteristics example




Dimensions (unit: mm)



60×60×76 mm



San Ace 60 9CRE type Low Vibration Fan 

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 300 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

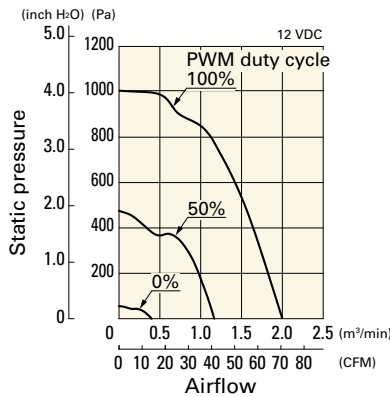
| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|------|--|------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | | | | | | | |
| 9CRE0612P0G001 | 12 | 10.8 to 13.2 | 100 | 2.3 | 27.6 | 16500 | 13000 | 2.0 | 70.6 | 1000 | 4.0 | 66 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.22 | 2.7 | 3600 | 2800 | 0.43 | 15.1 | 47.6 | 0.19 | 32 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

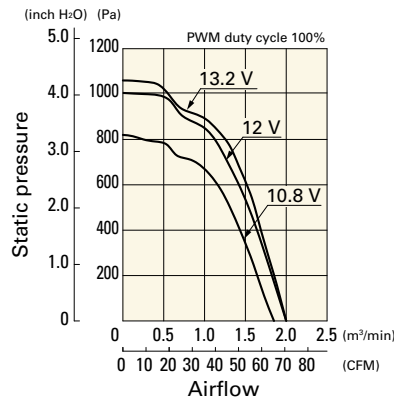
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRE0612P0G001 With pulse sensor with PWM control

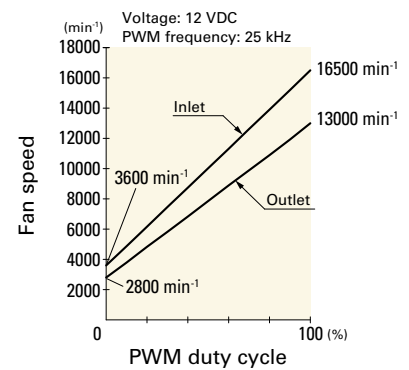
PWM duty cycle



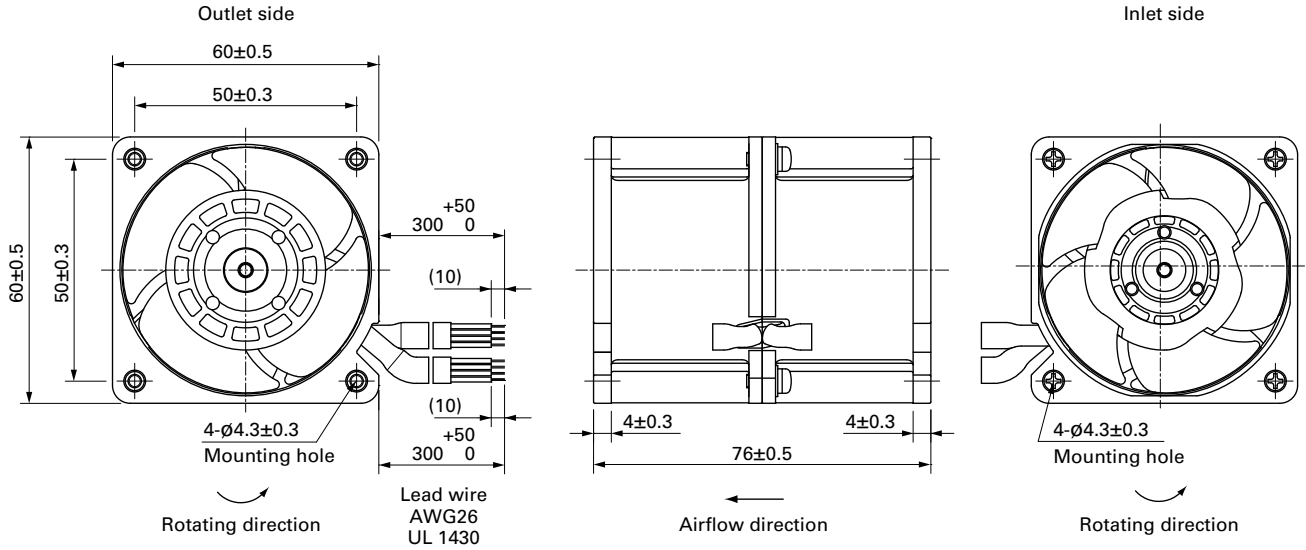
Operating voltage range



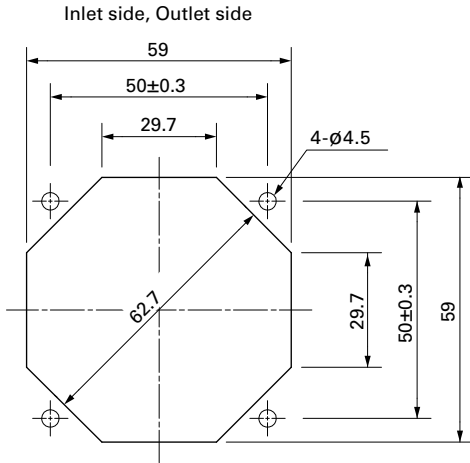
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards page: p. 598
Model no.: 109-139E, 109-139H

Resin finger guards page: p. 605
Model no.: 109-1003G

Resin filter kits page: p. 606
Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



60x60x76 mm

San Ace 60 9CRA type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 270 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CRA0612P0G001 | 12 | 10.8 to 13.2 | 100 | 2.3 | 27.6 | 16500 | 13000 | 2.0 | 70.6 | 1000 | 4.0 | 66 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.22 | 2.7 | 3600 | 2800 | 0.43 | 15.1 | 47.6 | 0.19 | 32 | | |
| 9CRA0612P0S001 | 12 | 10.8 to 13.2 | 100 | 1.5 | 18.0 | 14000 | 11000 | 1.7 | 60.0 | 720 | 2.89 | 63 | | |
| | | | 0 | 0.17 | 2.1 | 3200 | 2500 | 0.38 | 13.4 | 37.6 | 0.15 | 29 | | |

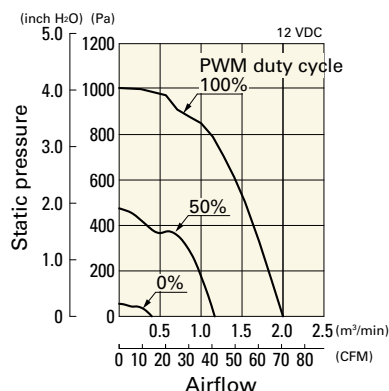
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

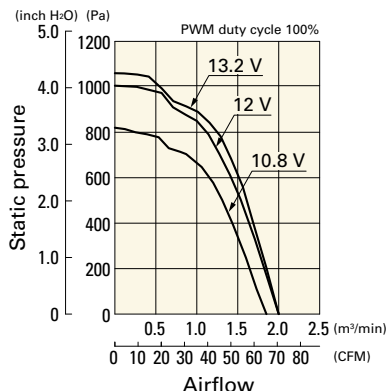
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0612P0G001 With pulse sensor with PWM control

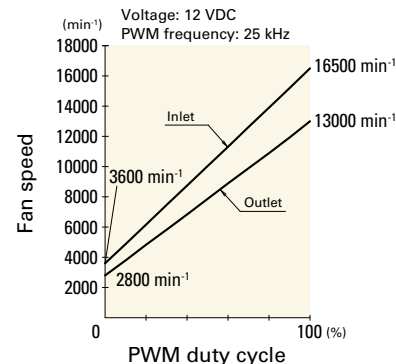
PWM duty cycle



Operating voltage range



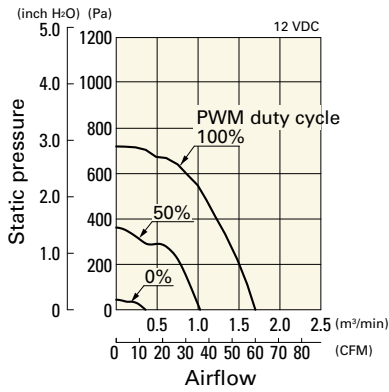
PWM duty - Speed characteristics example



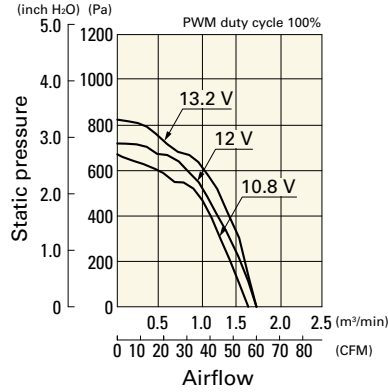
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0612P0S001 With pulse sensor with PWM control

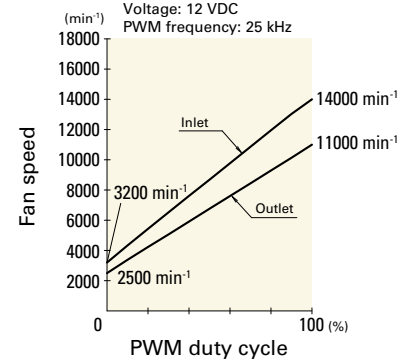
PWM duty cycle



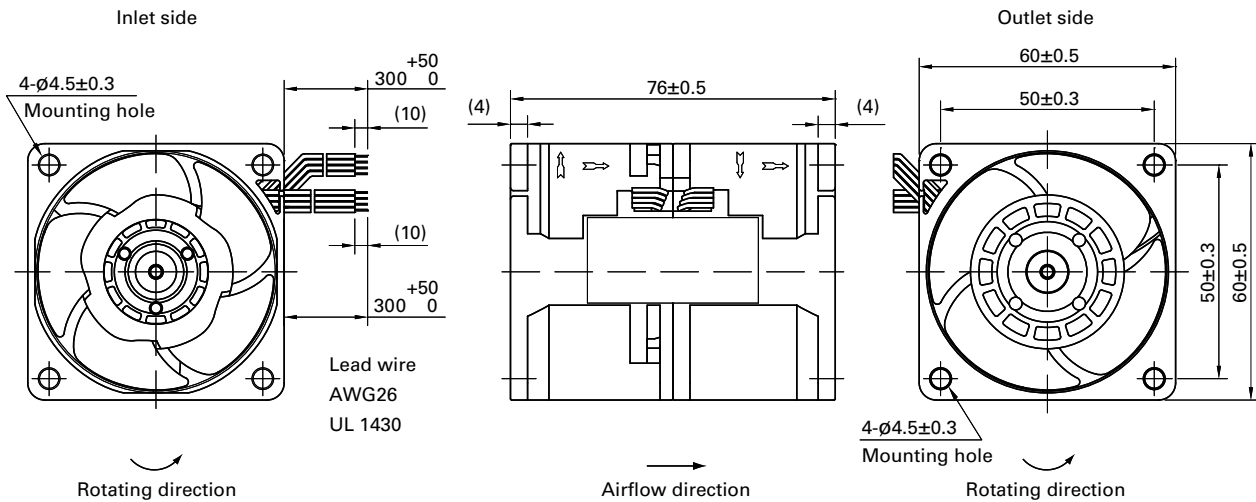
Operating voltage range



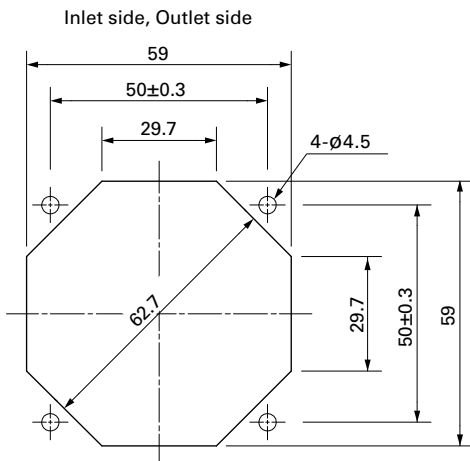
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



80x80x80 mm

San Ace 80 9CRB type US

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 430 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CRB0812P8G001 | 12 | 10.8 to 13.2 | 100 | 9.2 | 110.4 | 14600 | 12200 | 5.5 | 194 | 1150 | 4.6 | 80 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.17 | 2.04 | 2000 | 1670 | 0.7 | 24.7 | 21.6 | 0.09 | 24 | | |

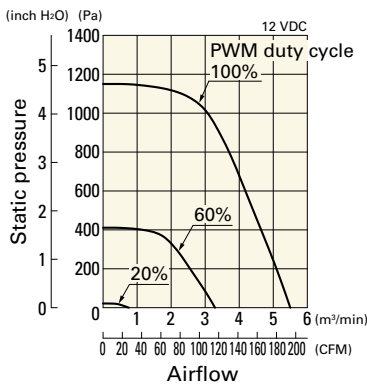
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

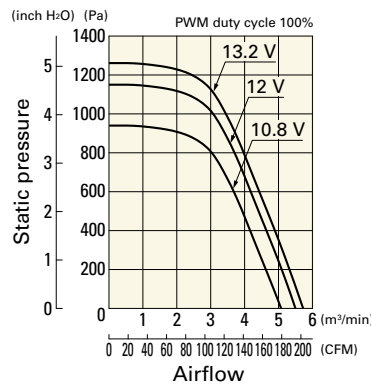
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRB0812P8G001 With pulse sensor with PWM control

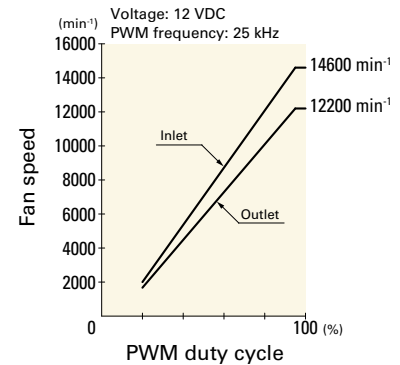
PWM duty cycle



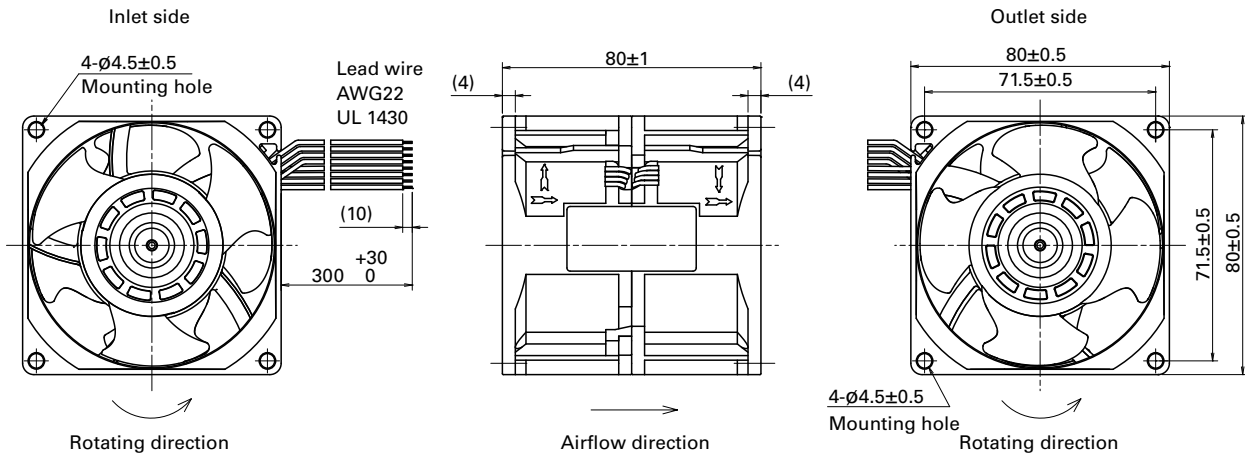
Operating voltage range



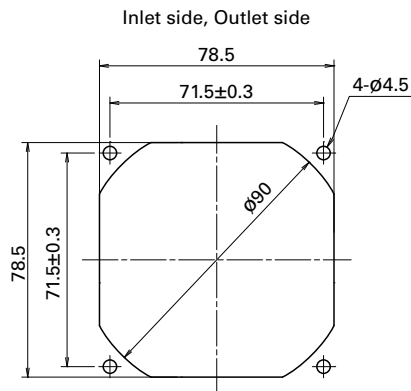
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)

80x80x80 mm



DC

Counter Rotating Fan 80 mm sq.

San Ace 80 9CRE type Low Vibration Fan

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 490 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

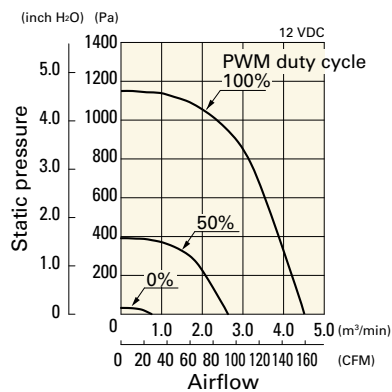
| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CRE0812P8G001 | 12 | 10.8 to 13.2 | 100 | 5.3 | 63.6 | 12000 | 11300 | 4.5 | 158.9 | 1150 | 4.62 | 76 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.2 | 2.4 | 2000 | 1900 | 0.74 | 26.1 | 31.9 | 0.13 | 30 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

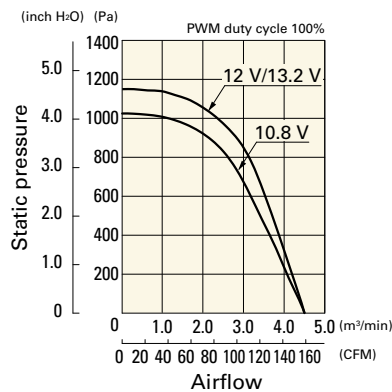
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRE0812P8G001 With pulse sensor with PWM control

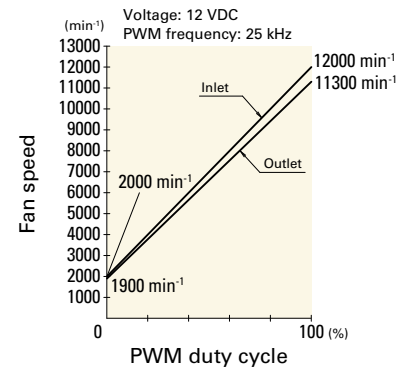
PWM duty cycle



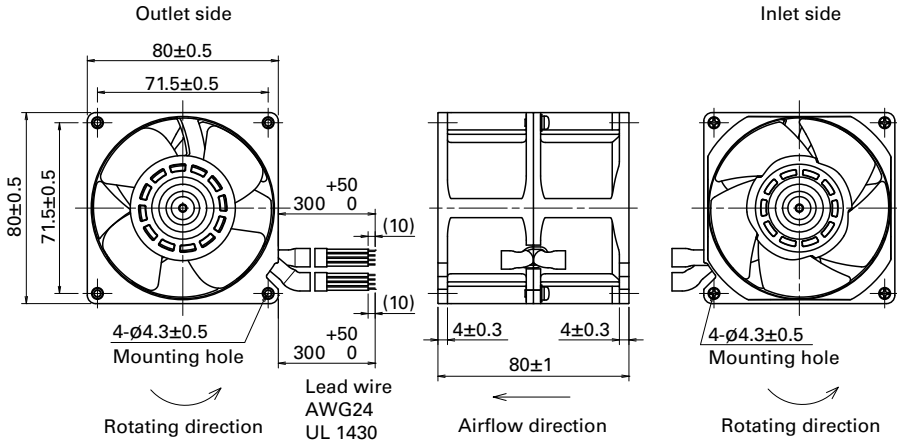
Operating voltage range



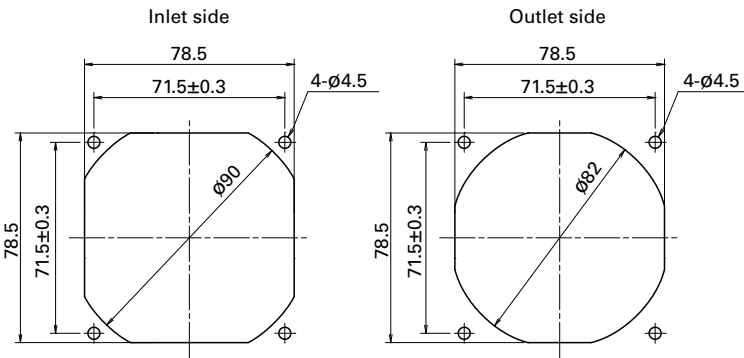
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)



80x80x80 mm

San Ace 80 9CRA type US

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 450 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CRA0812P8G001 | 12 | 10.8 to 13.2 | 100 | 5.3 | 63.6 | 12000 | 11300 | 4.5 | 158.9 | 1150 | 4.62 | 76 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.2 | 2.4 | 2000 | 1900 | 0.74 | 26.1 | 31.9 | 0.13 | 30 | | |
| 9CRA0812P8H001 | 12 | 10.8 to 13.2 | 100 | 3.3 | 39.6 | 10000 | 9400 | 3.75 | 133.9 | 798 | 3.21 | 72 | | |
| | | | 0 | 0.2 | 2.4 | 2000 | 1900 | 0.74 | 26.1 | 31.9 | 0.13 | 30 | | |
| 9CRA0824P8G001 | 24 | 21.6 to 26.4 | 100 | 2.65 | 63.6 | 12000 | 11300 | 4.5 | 158.9 | 1150 | 4.62 | 76 | | |
| | | | 0 | 0.09 | 2.16 | 2000 | 1900 | 0.74 | 26.1 | 31.9 | 0.13 | 30 | | |
| 9CRA0848P8G001 | 48 | 40.8 to 55.2 | 100 | 1.32 | 63.4 | 12000 | 11300 | 4.5 | 158.9 | 1150 | 4.62 | 76 | | |
| | | | 0 | 0.29 | 13.9 | 5000 | 4700 | 1.88 | 66.2 | 200 | 0.8 | 52 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

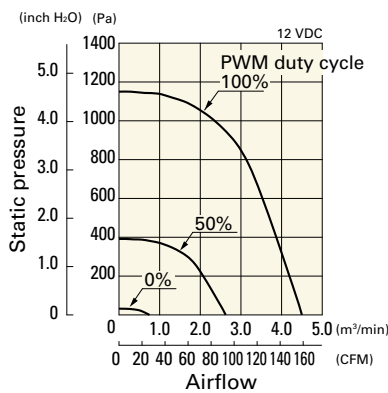
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 640 to 641.

Note 2: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

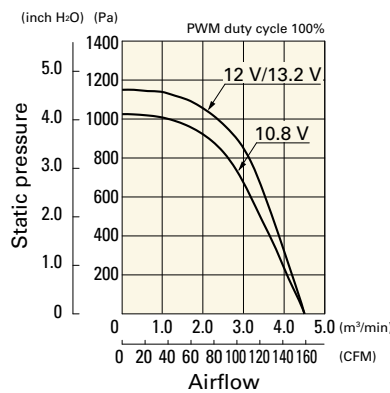
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0812P8G001 With pulse sensor with PWM control

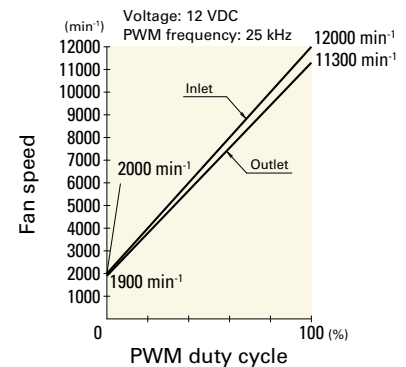
PWM duty cycle



Operating voltage range



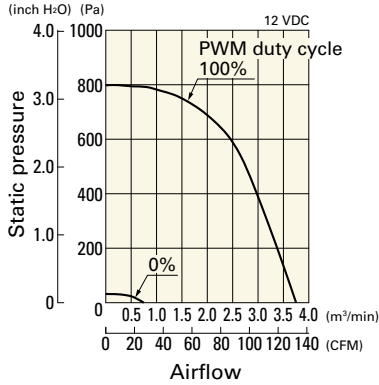
PWM duty - Speed characteristics example



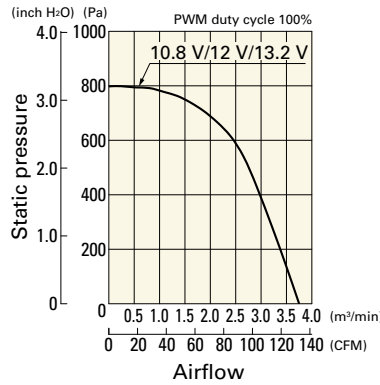
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0812P8H001 With pulse sensor with PWM control

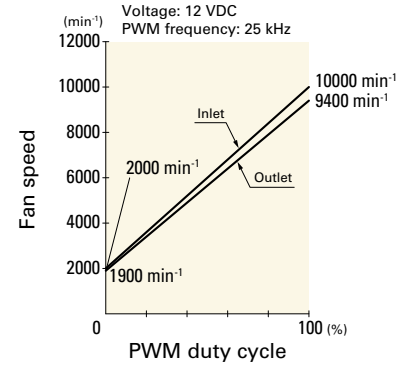
PWM duty cycle



Operating voltage range

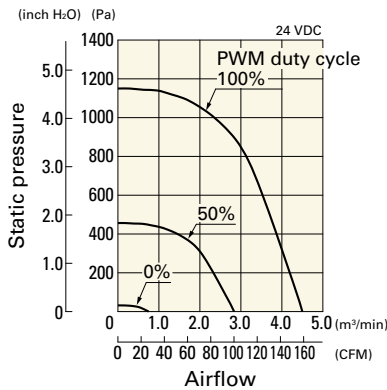


PWM duty - Speed characteristics example

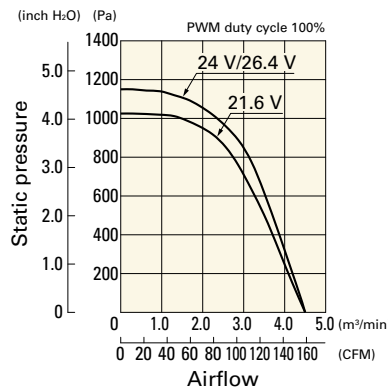


9CRA0824P8G001 With pulse sensor with PWM control

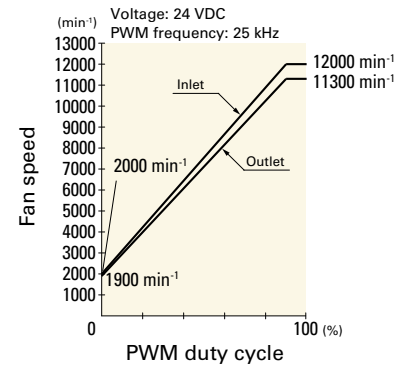
PWM duty cycle



Operating voltage range

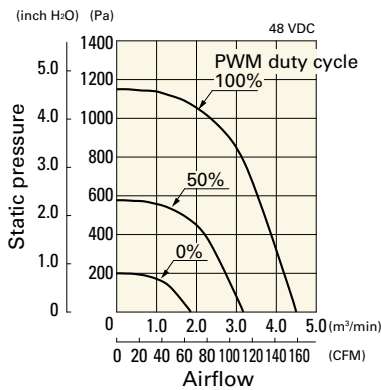


PWM duty - Speed characteristics example

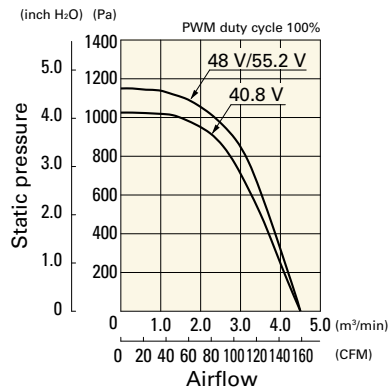


9CRA0848P8G001 With pulse sensor with PWM control

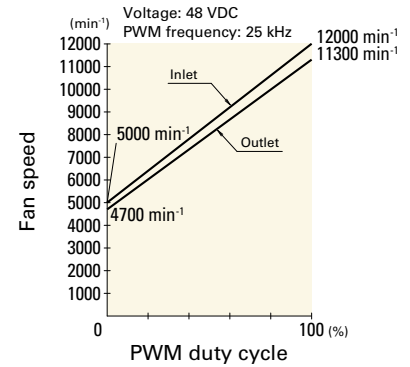
PWM duty cycle



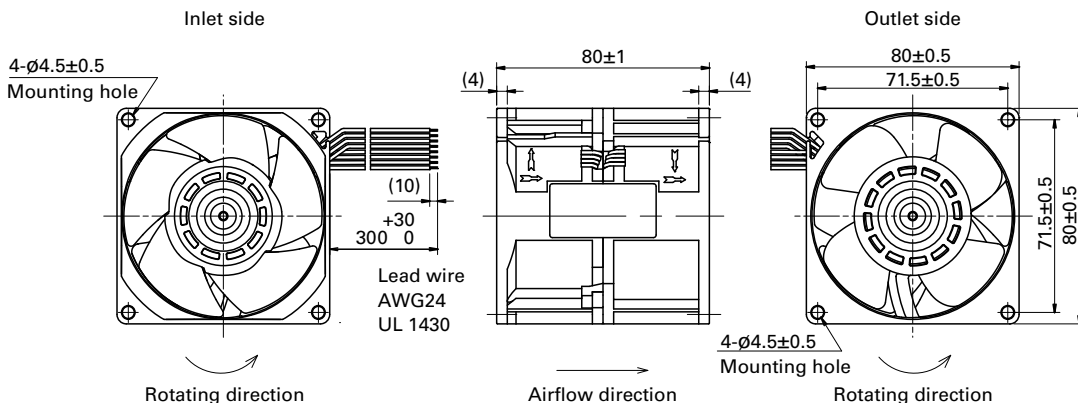
Operating voltage range



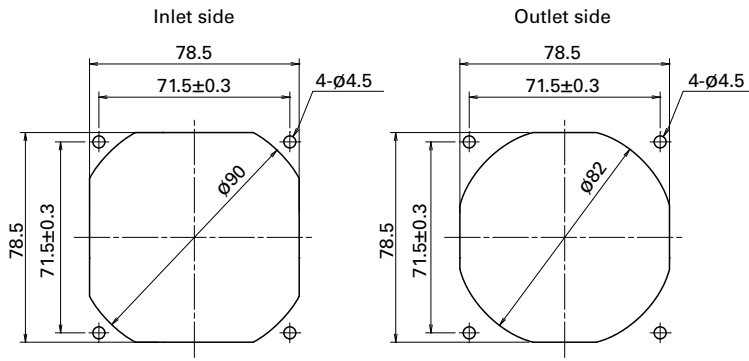
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)



92x92x76 mm

San Ace 92 9CRA type US

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 510 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CRA0912P0G001 | 12 | 10.2 to 13.2 | 100 | 9.0 | 108.0 | 13300 | 12200 | 5.8 | 205 | 1650 | 6.63 | 81 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.42 | 5.04 | 3500 | 3200 | 1.48 | 52.3 | 140 | 0.56 | | | |
| 9CRA0948P0G601 | 48 | 36 to 60 | 100 | 2.2 | 105.6 | 13300 | 12200 | 5.8 | 205 | 1650 | 6.63 | 81 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.15 | 7.2 | 3500 | 3200 | 1.48 | 52.3 | 140 | 0.56 | | | |

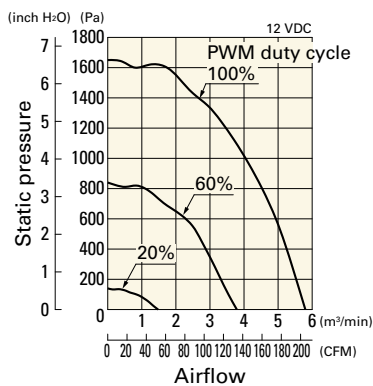
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

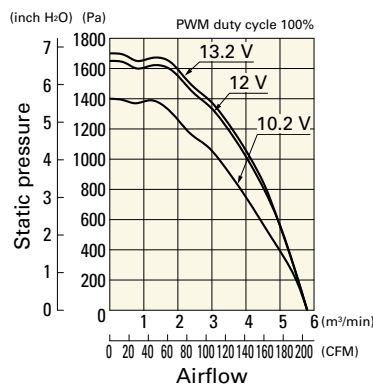
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0912P0G001 With pulse sensor with PWM control

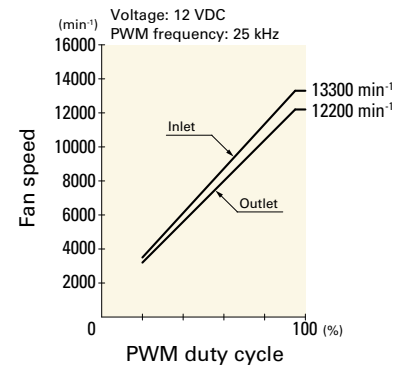
PWM duty cycle



Operating voltage range



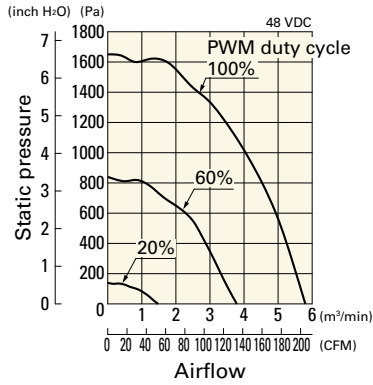
PWM duty - Speed characteristics example



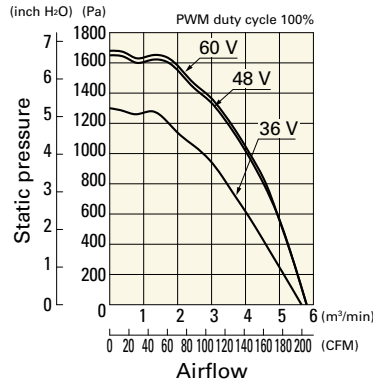
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRA0948P0G601 With pulse sensor with PWM control

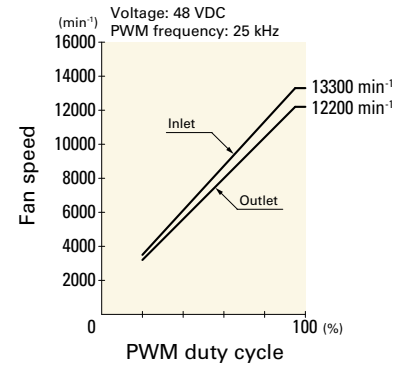
PWM duty cycle



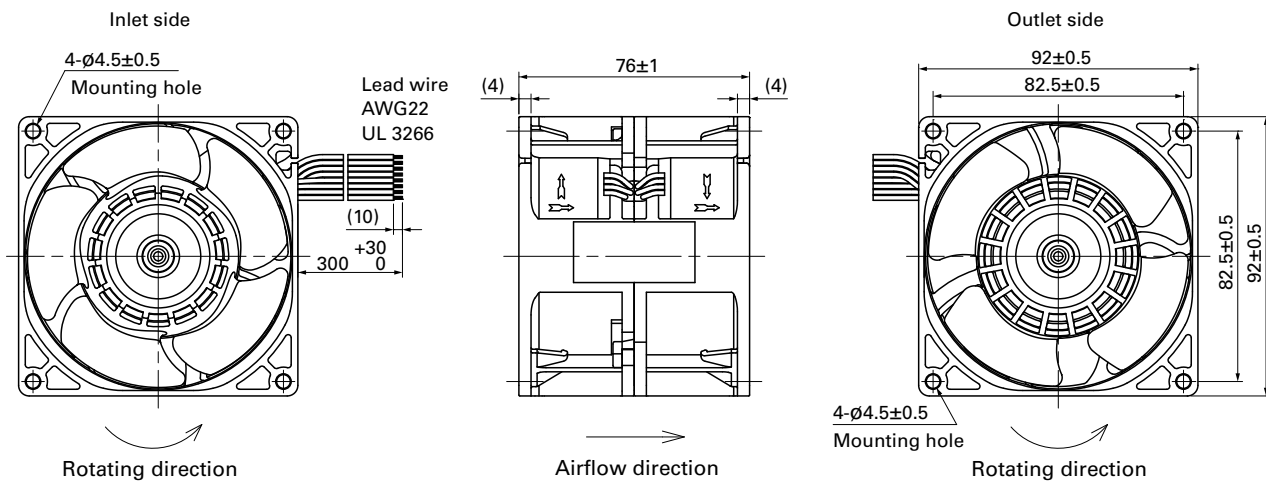
Operating voltage range



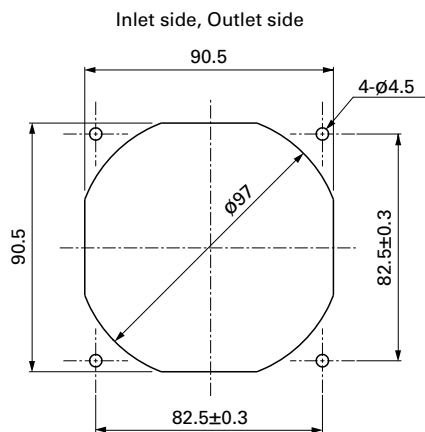
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)



120×120×76 mm

San Ace 120 9CR type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 670 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|-----|--|------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | | | | | | | |
| 9CR1212P0G03 | 12 | 10.8 to 13.2 | 100 | 7.2 | 86.4 | 6200 | 3800 | 8.5 | 300 | 480 | 1.93 | 70 | -20 to +60 | 40000/60°C (70000/40°C) |
| | | | 0 | 1.1 | 13.2 | 2700 | 1800 | 3.8 | 134 | 95 | 0.38 | 51 | | |

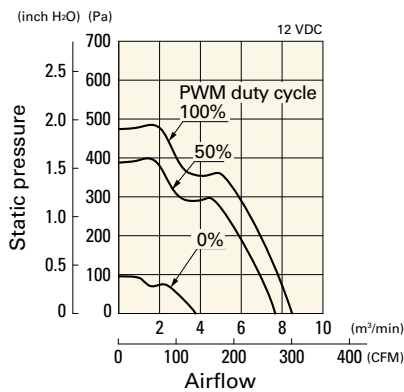
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 640.

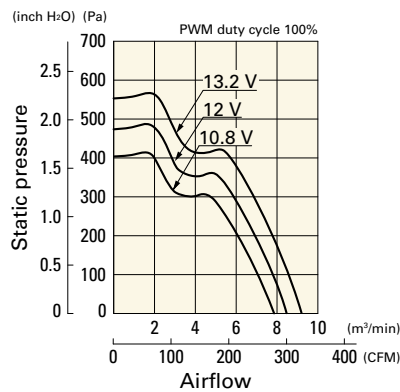
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CR1212P0G03 With pulse sensor with PWM control

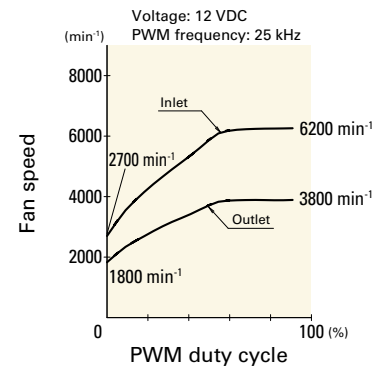
PWM duty cycle



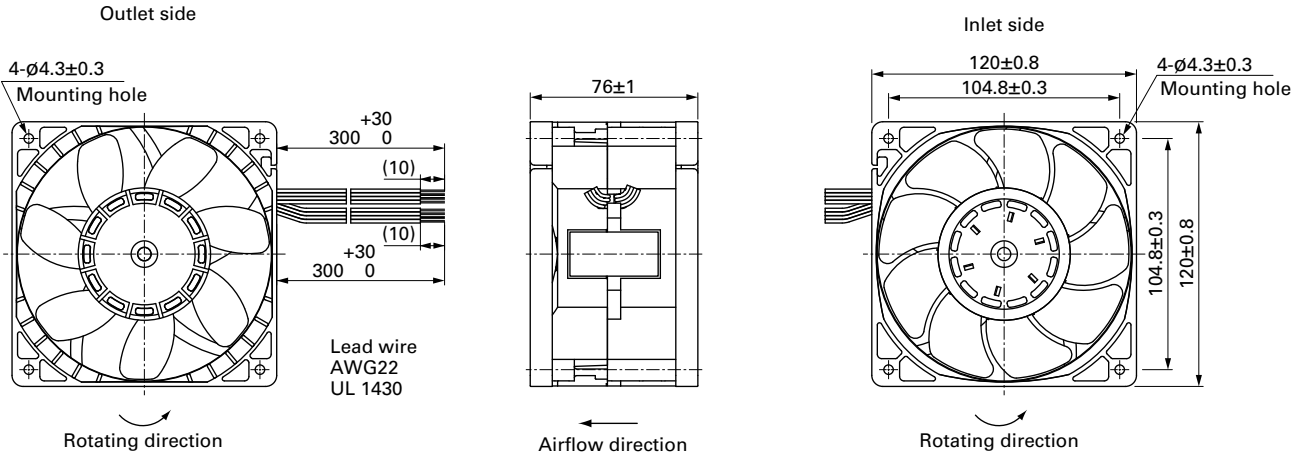
Operating voltage range



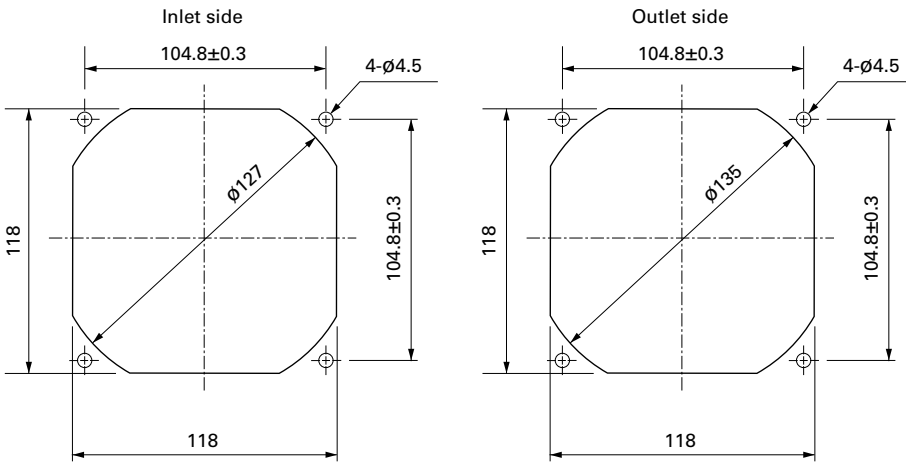
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards page: p. 599
Model no.: 109-019E, 109-019K

Resin finger guards page: p. 605
Model no.: 109-1000G

Resin filter kits page: p. 606
Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)



Ø 172x150x102 mm

San Ace 172 9CR type us

Sidecut type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 1600 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|--------|--|--------|--------------|----------------------------|----------------------------|
| | | | | | | Inlet | Outlet | Inlet | Outlet | Inlet | Outlet | | | |
| 9CR5748P9G001 | 48 | 36 to 72 | 100 | 5.5 | 264 | 7300 | 6400 | 18 | 636 | 1400 | 5.62 | 83 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.5 | 24 | 2400 | 1900 | 5.5 | 194.3 | 152 | 0.61 | 54 | | |

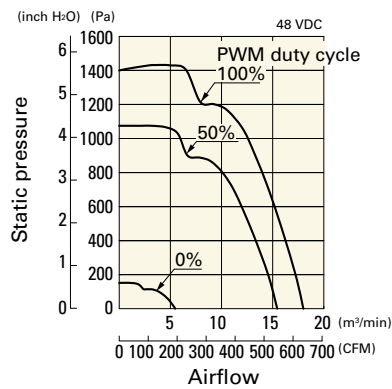
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

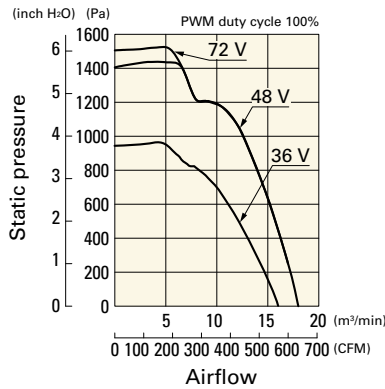
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CR5748P9G001 With pulse sensor with PWM control

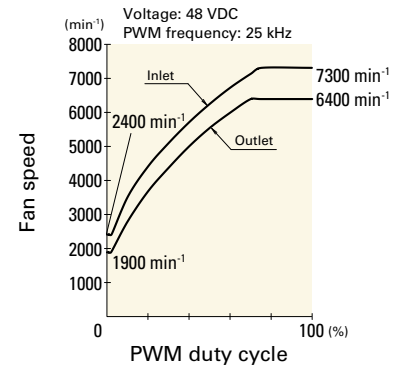
PWM duty cycle



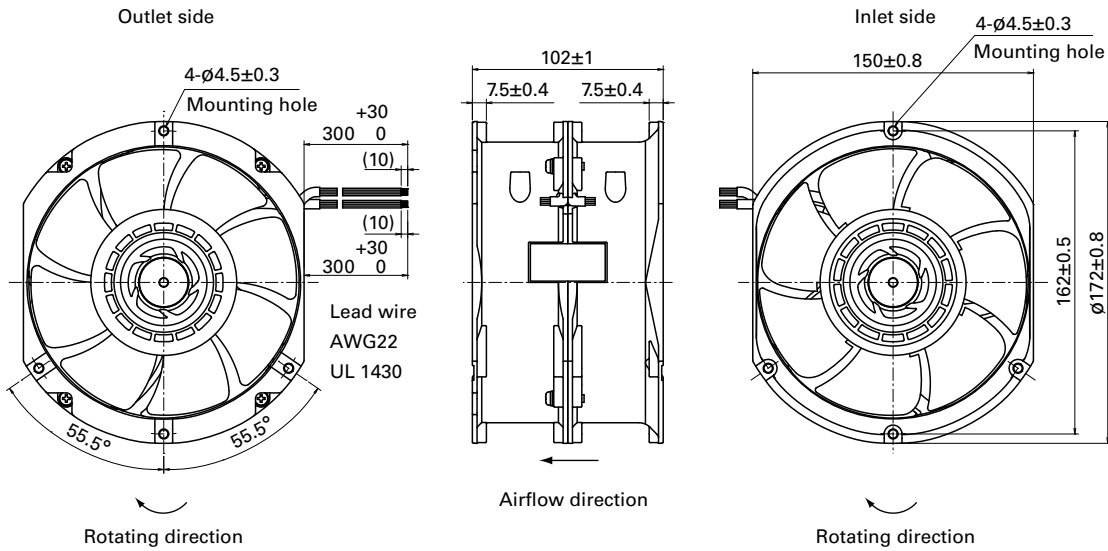
Operating voltage range



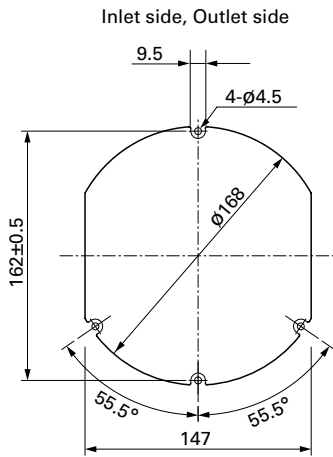
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 600

Model no.: 109-319J, 109-319E, 109-319H

Reversible Flow Fan

The wind directions can be switched with these fans. Equivalent cooling performance can be obtained in both directions.

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | | |
|------------|------------|-----------|-------------|-----------------|------------|----------------------------|
| 9RF | 13 | 12 | P | 3 | H | 001 |
| Type name | Frame size | Voltage | PWM control | Frame thickness | Speed code | Individual customer's spec |

| | | |
|----------------------|-----|------|
| Type name | 9RF | |
| Frame size (mm) | 09 | 13 |
| | ∅92 | ∅136 |
| Voltage (V) | 12 | 24 |
| | 12 | 24 |
| Frame thickness (mm) | 1 | 3 |
| | 38 | 28 |
| Speed code | H | |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

- Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
For more information, please refer to the technical material section.



∅92x38 mm

San Ace 92RF 9RF type

DC

Reversible Flow Fan ∅92 mm

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 150 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Airflow direction | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9RF0912P1H001 | Forward | 12 | 10.2 to 13.8 | 100 | 0.17 | 2.0 | 5500 | 1.2 42.4 | 156 0.63 | 39 | -20 to +70 | 40000/60°C (70000/40°C) |
| | Reverse | | | 0 | | | | | | | | |
| 9RF0924P1H001 | Forward | 24 | 20.4 to 27.6 | 100 | 0.09 | 2.2 | 5500 | 1.2 42.4 | 156 0.63 | 39 | | |
| | Reverse | | | 0 | | | | | | | | |

* PWM frequency is 25 kHz. When control terminal is open, speed is the same as at 100% PWM duty cycle.

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

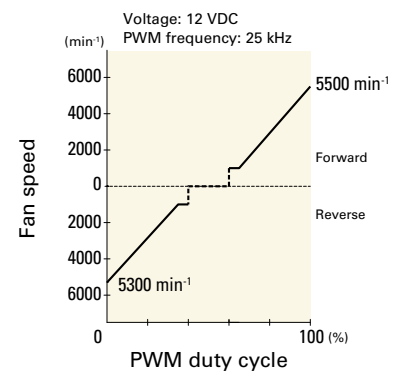
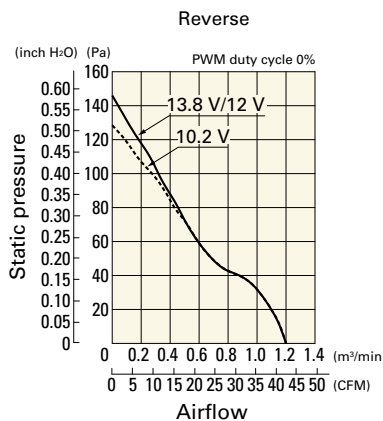
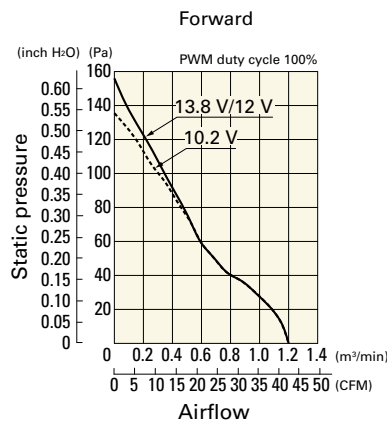
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RF0912P1H001 With pulse sensor with PWM control

Operating voltage range

Operating voltage range

PWM duty - Speed characteristics example



Options

Finger guards

page: p. 598

Model no.: 109-1147

DC

Reversible Flow Fan 92 mm



∅136x28 mm

San Ace 136RF 9RFA type

DC

Reversible Flow Fan ∅136 mm

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 204 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Airflow direction | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9RFA1312P3G001 | Forward | 12 | 10.2 to 13.8 | 100 | 0.25 | 3.00 | 5450 | 2.10 74.2 | 285 1.14 | 49 | -25 to +70 | 40000/60°C (70000/40°C) |
| | Reverse | | | 0 | 0.25 | 3.00 | 5450 | 2.05 72.4 | 280 1.12 | 52 | | |
| 9RFA1312P3H001 | Forward | | | 100 | 0.16 | 1.92 | 4350 | 1.67 59.2 | 185 0.74 | 44 | | |
| | Reverse | | | 0 | 0.16 | 1.92 | 4350 | 1.63 57.8 | 180 0.72 | 47 | | |
| 9RFA1324P3G001 | Forward | 24 | 20.4 to 27.6 | 100 | 0.13 | 3.12 | 5450 | 2.10 74.2 | 285 1.14 | 49 | | |
| | Reverse | | | 0 | 0.13 | 3.12 | 5450 | 2.05 72.4 | 280 1.12 | 52 | | |
| 9RFA1324P3H001 | Forward | | | 100 | 0.08 | 1.92 | 4350 | 1.67 59.2 | 185 0.74 | 44 | | |
| | Reverse | | | 0 | 0.08 | 1.92 | 4350 | 1.63 57.8 | 180 0.72 | 47 | | |

* PWM frequency is 25 kHz. When control terminal is open, speed is the same as at 100% PWM duty cycle.

Note: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

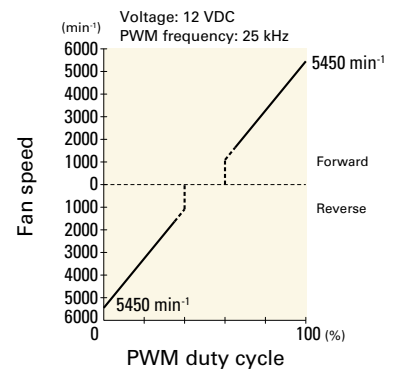
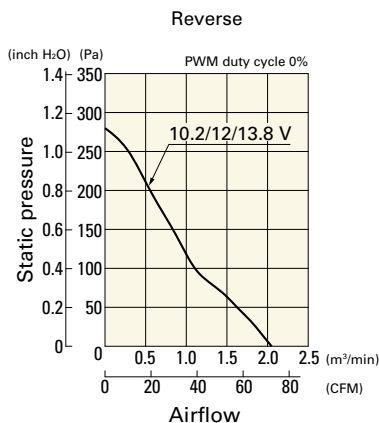
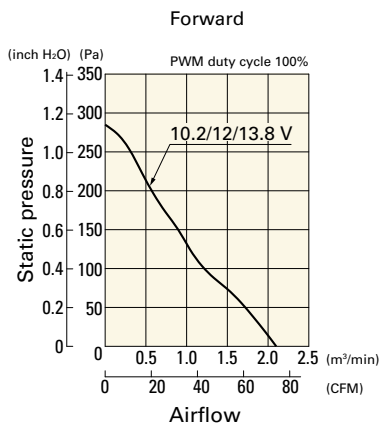
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RFA1312P3G001 With pulse sensor with PWM control

Operating voltage range

Operating voltage range

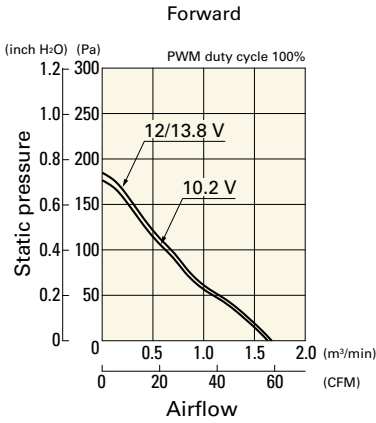
PWM duty - Speed characteristics example



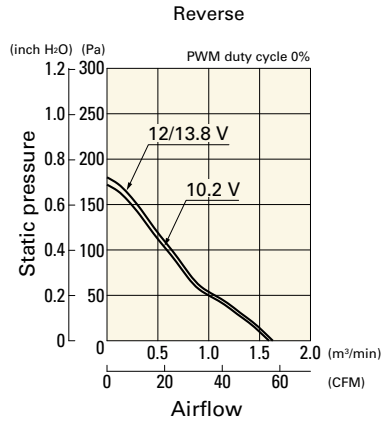
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RFA1312P3H001 With pulse sensor with PWM control

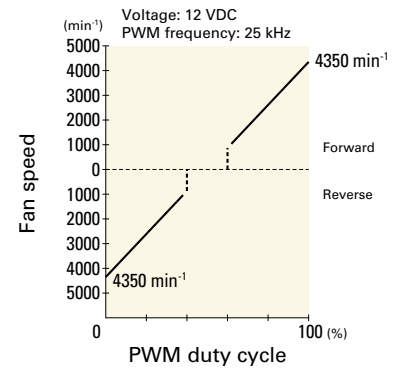
Operating voltage range



Operating voltage range



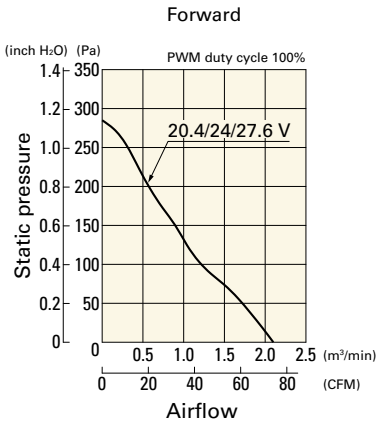
PWM duty - Speed characteristics example



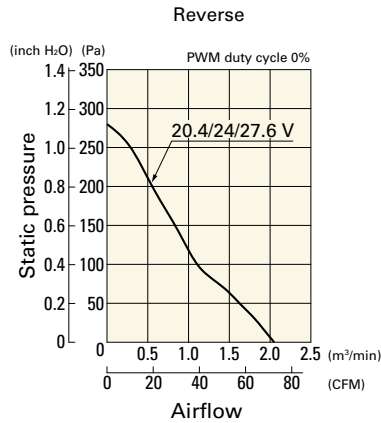
Reversible Flow Fan Ø136 mm DC

9RFA1324P3G001 With pulse sensor with PWM control

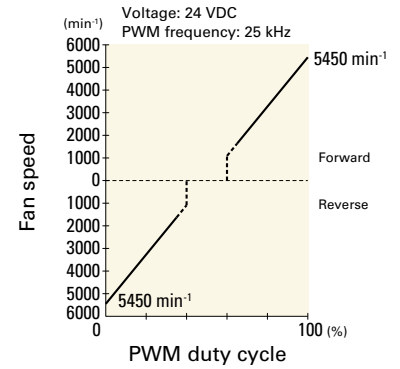
Operating voltage range



Operating voltage range

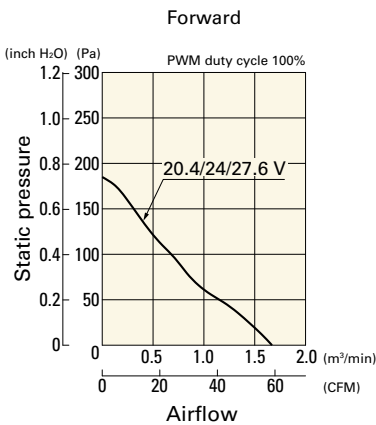


PWM duty - Speed characteristics example

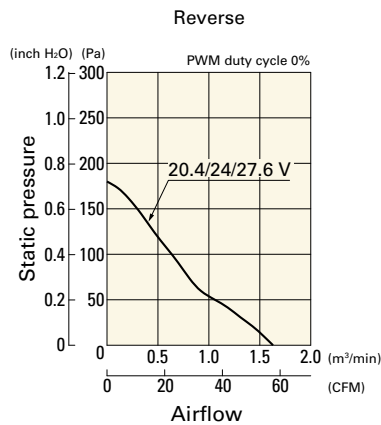


9RFA1324P3H001 With pulse sensor with PWM control

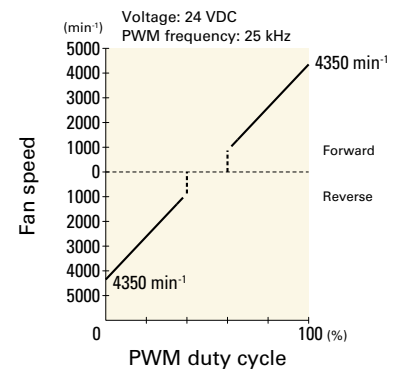
Operating voltage range



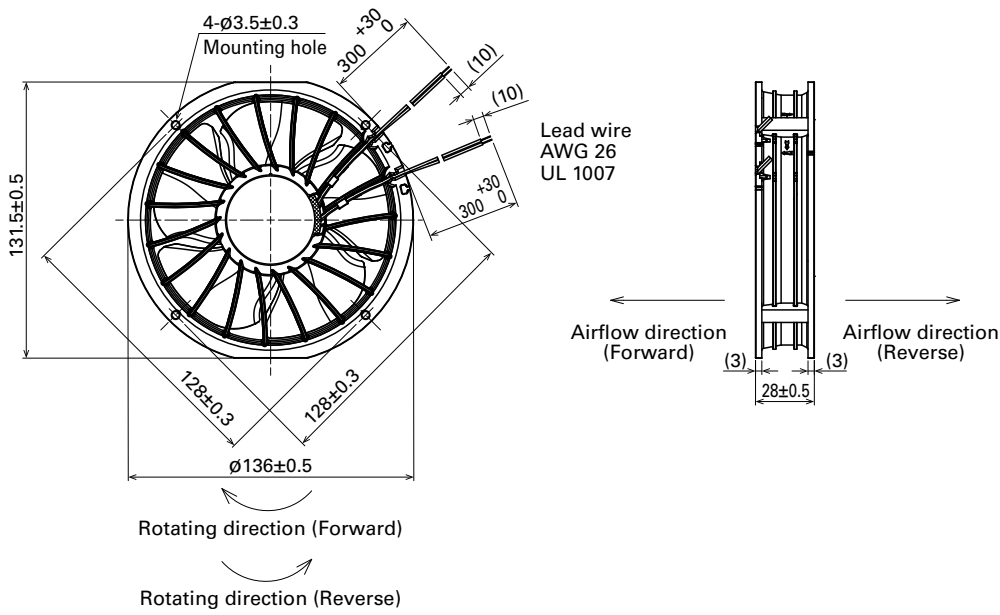
Operating voltage range



PWM duty - Speed characteristics example

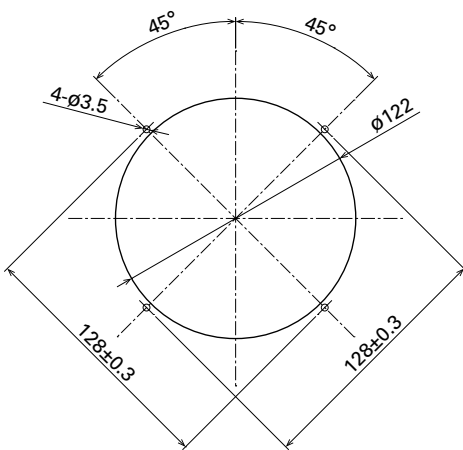


Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Impeller side, Nameplate side



Options

Finger guards

page: p. 599

Model no.: 109-1139



∅136x28 mm

San Ace 136RF 9RF type

Reversible Flow Fan ∅136 mm

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 220 g

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Airflow direction | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9RF1312P3H601 | Forward | 12 | 10.2 to 13.8 | 100 | 0.15 | 1.8 | 3100 | 2.0 70.7 | 102 0.41 | 35 | -20 to +70 | 40000/60°C (70000/40°C) |
| | Reverse | | | 0 | | | | | | | | |

* PWM frequency is 25 kHz. When control terminal is open, speed is the same as at 100% PWM duty cycle.

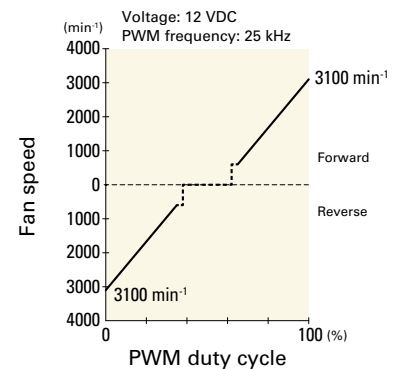
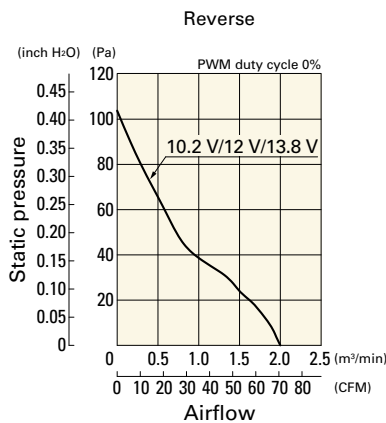
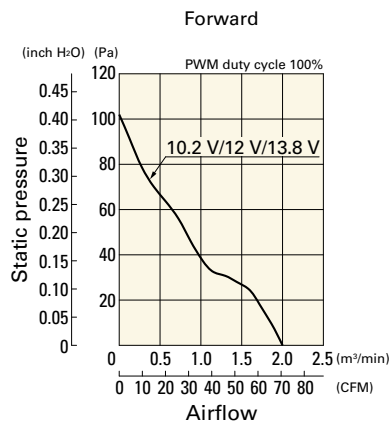
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9RF1312P3H601 With pulse sensor with PWM control

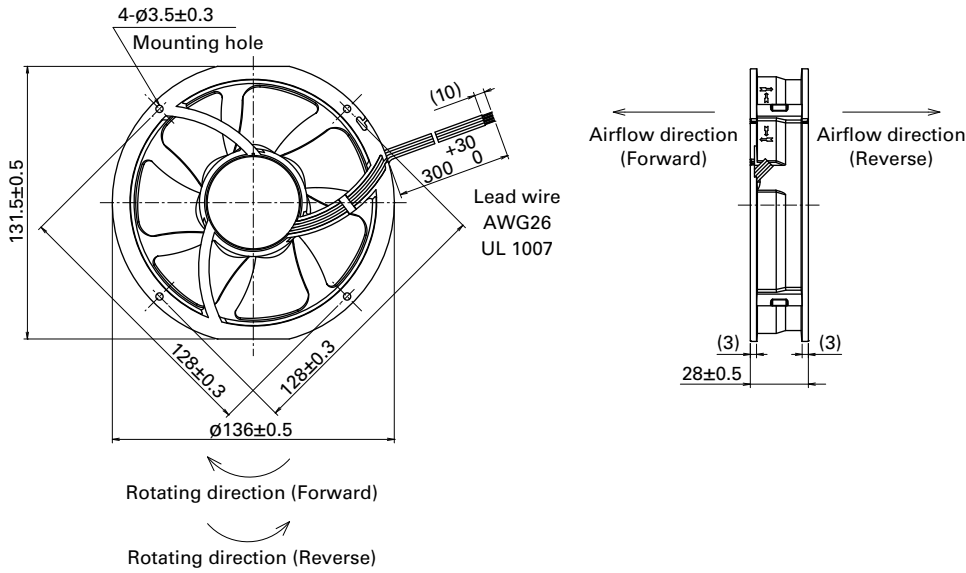
Operating voltage range

Operating voltage range

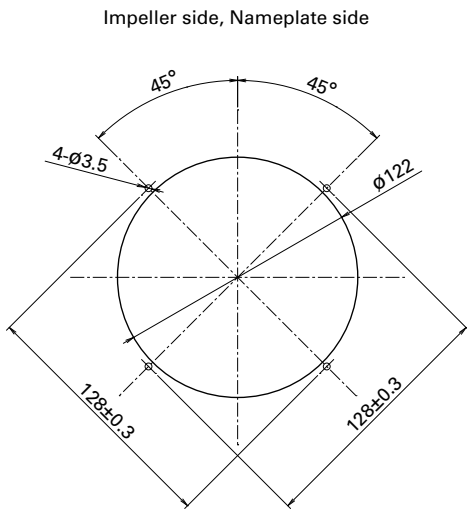
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-1139

Splash Proof Fan

Cooling fan of IP54, IP55 and IP68 waterproof capability. For more information on IP rating, refer to p. 621.
 Related product: Splash Proof Centrifugal Fan p. 317, Splash Proof Blower p. 349, Oil Proof Fan p. 353

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | | |
|------------|------------|-----------|------------|-----------------|-----------------------|------------|
| 9WL | 14 | 48 | L | 1 | 001 | |
| Type name | Frame size | Voltage | Speed code | Frame thickness | Sensor specifications | Frame form |

Fans with PWM control

| | | | | | | | |
|------------|------------|-----------|-------------|-----------------|------------|--|------------|
| 9WV | 08 | 48 | P | 1 | H | 001 | |
| Type name | Frame size | Voltage | PWM control | Frame thickness | Speed code | Individual customer's spec (2 to 3 digits) | Frame form |

| | | | | | | | | |
|-----------------------|-------------------------------|-------|-------|------------------|------------------------------|---------|--------------------|--------------------|
| Type name | 9WL 9WP 9WV etc. | | | | | | | |
| Frame size (mm) | 04 | 06 | 08 | 09 | 12 | 14 | 17 | 57 |
| | 40×40 | 60×60 | 80×80 | 92×92 | 120×120 | 140×140 | ∅172 | ∅172×150 (sidecut) |
| Voltage (V) | 12 | 24 | 48 | | | | | |
| | 12 | 24 | 48 | etc. | | | | |
| Speed code | A | D | E | F | G | H | J | L M S etc. |
| Frame thickness (mm) | 1 | 4 | 5 | 6 | | | | |
| | 38 | 25 | 51 | 20 | | | | |
| Sensor specifications | 01, 001 | | | 02, 002 | | | D01, D001 | |
| | With a pulse sensor | | | Without a sensor | | | With a lock sensor | |
| Frame form | Nil | | | | 1 | | | |
| | Plastic frame: Ribbed frame | | | | Plastic frame: Ribless frame | | | |
| | Aluminum frame: Ribless frame | | | | | | | |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

- Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
 For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
 For more information, please refer to the technical material section.



40x40x20 mm

San Ace 40W 9WPA type   

DC
Splash Proof Fan 40 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 47 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have ribs and a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WPA0412P6G001 | 12 | 10.8 to 13.2 | 100 | 0.17 | 2.0 | 13700 | 0.38 13.4 | 210 0.84 | 44 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 25 | 0.03 | 0.36 | 3000 | 0.07 2.5 | 9.8 0.04 | 12 | | |
| 9WPA0424P6G001 | 24 | 21.6 to 26.4 | 100 | 0.09 | 2.0 | 13700 | 0.38 13.4 | 210 0.84 | 44 | | |
| | | | 25 | 0.03 | 0.72 | 3600 | 0.09 3.2 | 15 0.06 | 14 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor.**

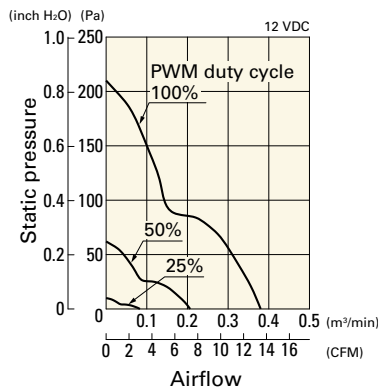
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WPA0412H6001 | 12 | 7 to 13.8 | 0.075 | 0.9 | 8800 | 0.24 8.5 | 81 0.33 | 34 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9WPA0424H6001 | 24 | 14 to 27.6 | 0.038 | 0.9 | 8800 | 0.24 8.5 | 81 0.33 | 34 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 656.

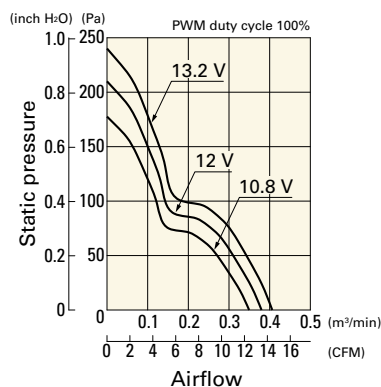
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WPA0412P6G001 With pulse sensor with PWM control

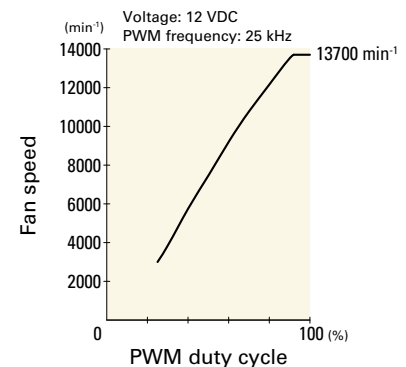
PWM duty cycle



Operating voltage range



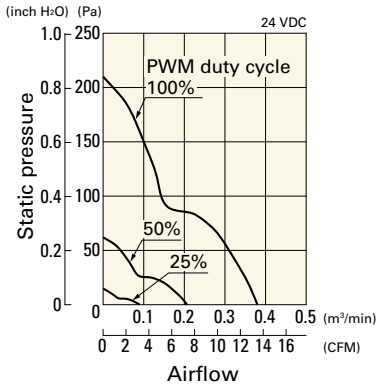
PWM duty - Speed characteristics example



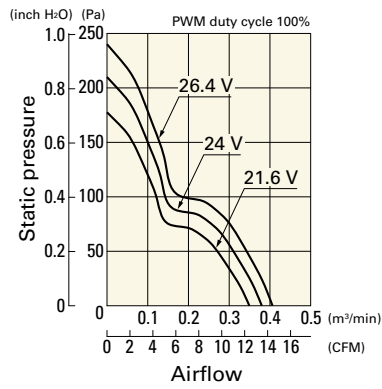
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WPA0424P6G001 With pulse sensor with PWM control

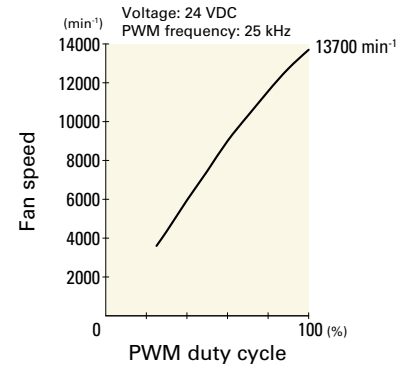
PWM duty cycle



Operating voltage range



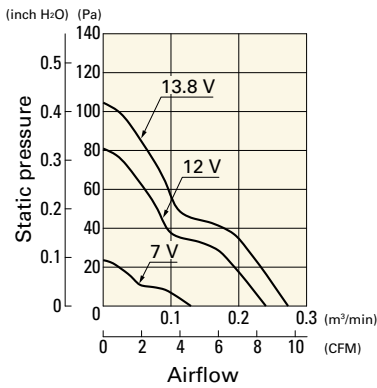
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

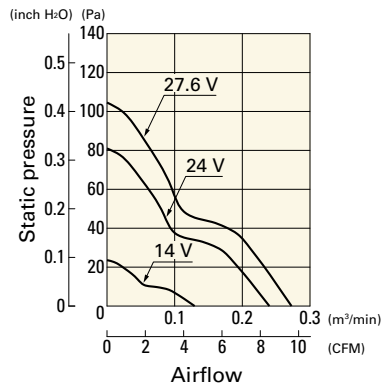
9WPA0412H6001 With pulse sensor

Operating voltage range

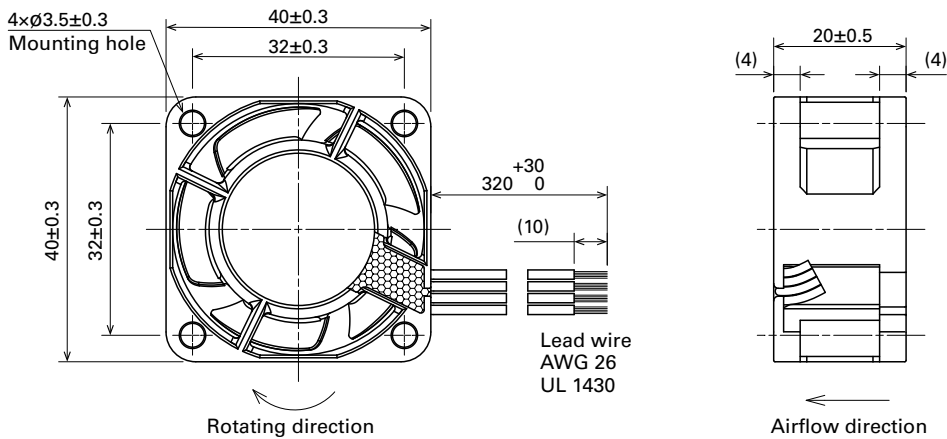


9WPA0424H6001 With pulse sensor

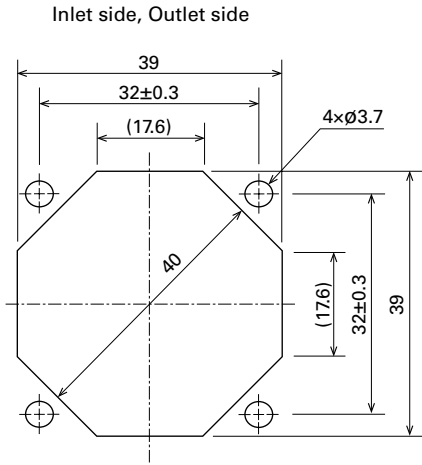
Operating voltage range



Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x20 mm

San Ace 40W 9WP type US

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 50 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have ribs and a pulse sensor**.

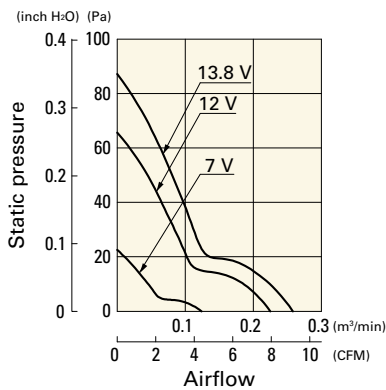
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WP0412H6001 | 12 | 7 to 13.8 | 0.1 | 1.2 | 8000 | 0.225 8.0 | 65.7 0.264 | 33 | -10 to +60 | 40000/60°C (70000/40°C) |
| 9WP0412F6001 | | | 0.06 | 0.72 | 6500 | 0.183 6.5 | 45.1 0.181 | 28 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 656.

Airflow - Static Pressure Characteristics

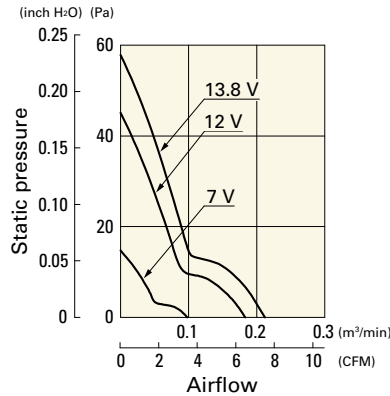
9WP0412H6001 With pulse sensor

Operating voltage range

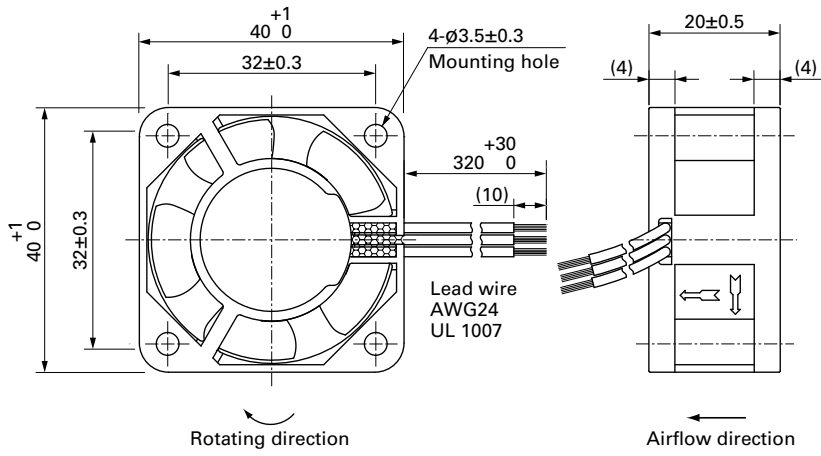


9WP0412F6001 With pulse sensor

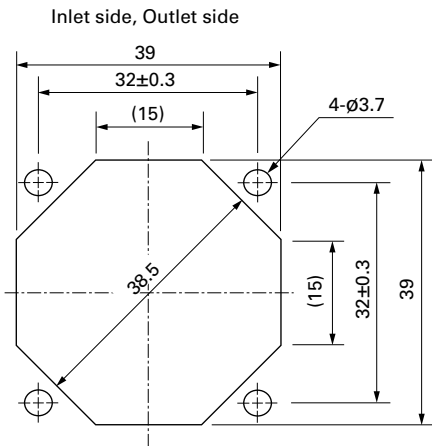
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x28 mm

San Ace 40W 9WPA type   

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 60 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WPA0412P3G001 | 12 | 10.8 to 13.2 | 100 | 0.50 | 6.0 | 22200 | 0.63 22.2 | 555 2.22 | 53 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.06 | 0.72 | 5000 | 0.14 4.9 | 28.1 0.11 | 21 | | |
| 9WPA0424P3G001 | 24 | 21.6 to 26.4 | 100 | 0.25 | 6.0 | 22200 | 0.63 22.2 | 555 2.22 | 53 | | |
| | | | 20 | 0.06 | 1.44 | 9200 | 0.26 9.1 | 95 0.38 | 34 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

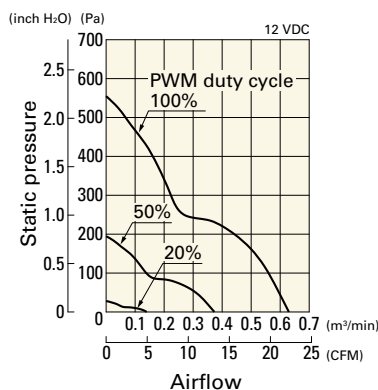
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WPA0412H3001 | 12 | 7 to 13.8 | 0.34 | 4.1 | 18500 | 0.52 18.3 | 375 1.51 | 48 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9WPA0424H3001 | 24 | 14 to 27.6 | 0.17 | 4.1 | 18500 | 0.52 18.3 | 375 1.51 | 48 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 656.

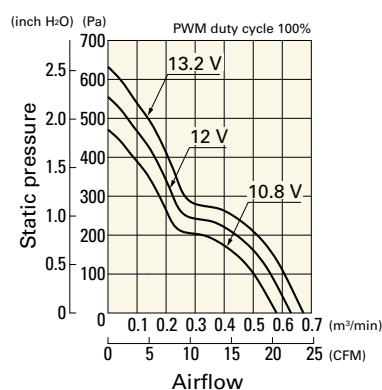
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WPA0412P3G001 With pulse sensor with PWM control

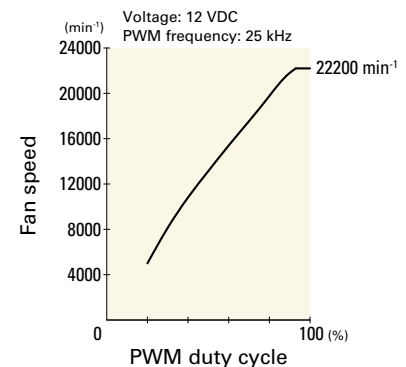
PWM duty cycle



Operating voltage range



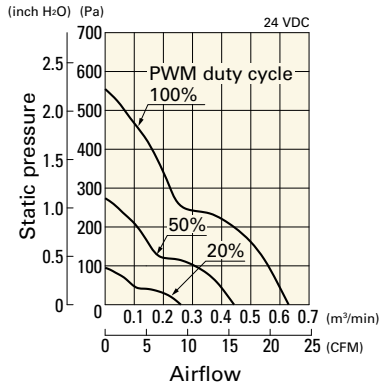
PWM duty - Speed characteristics example



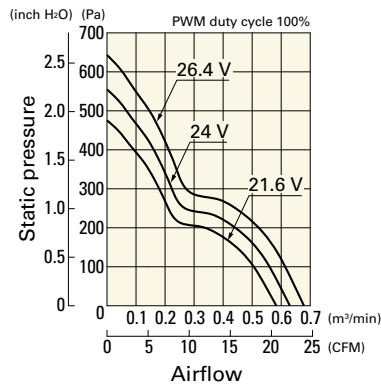
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WPA0424P3G001 With pulse sensor with PWM control

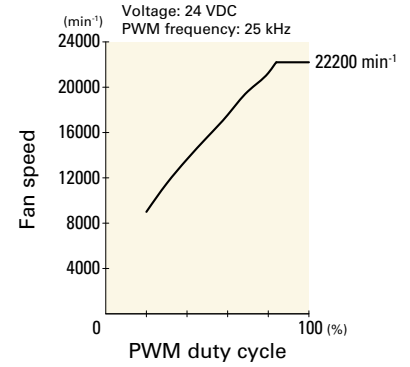
PWM duty cycle



Operating voltage range



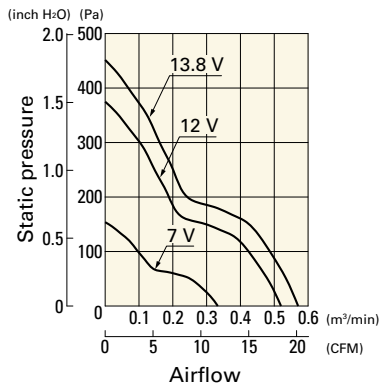
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

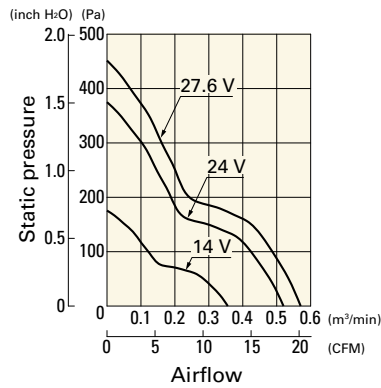
9WPA0412H3001 With pulse sensor

Operating voltage range

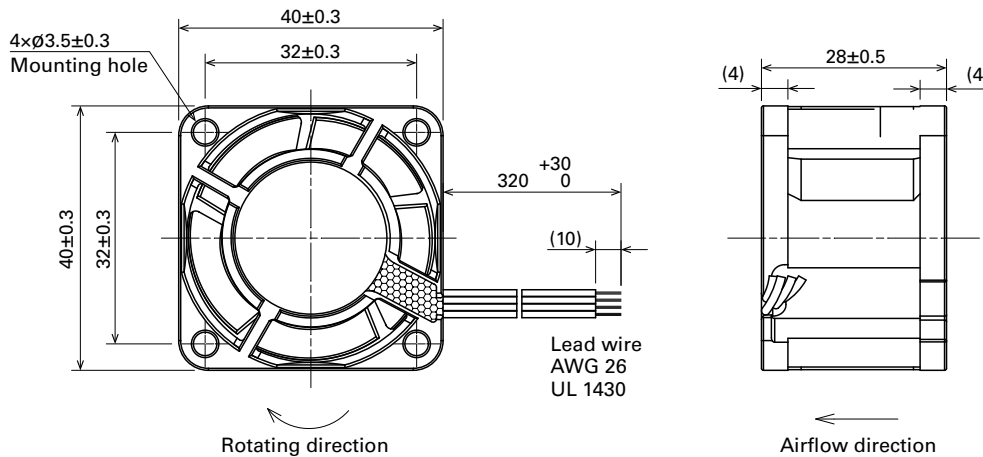


9WPA0424H3001 With pulse sensor

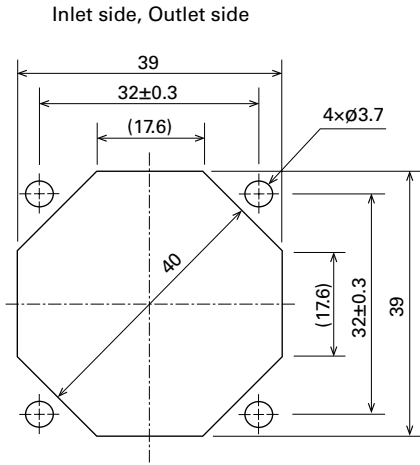
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x28 mm

San Ace 40W 9WL type   

DC
Splash Proof Fan 40 mm sq.

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 70 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| 9WL0412P3J001 | 12 | 10.8 to 13.2 | 100 | 0.52 | 6.24 | 17500 | 0.63 22.2 | 400 1.61 | 51 | -20 to +70 | 150000/60°C (185000/40°C) |
| | | | 20 | 0.06 | 0.72 | 3600 | 0.13 4.6 | 16.9 0.07 | 20 | | |
| 9WL0412P3G001 | 12 | 10.8 to 13.2 | 100 | 0.4 | 4.8 | 15500 | 0.56 19.7 | 310 1.24 | 47 | | |
| | | | 20 | 0.06 | 0.72 | 3300 | 0.12 4.2 | 14.0 0.06 | 18 | | |
| 9WL0424P3J001 | 24 | 21.6 to 26.4 | 100 | 0.26 | 6.24 | 17500 | 0.63 22.2 | 400 1.61 | 51 | | |
| | | | 20 | 0.04 | 0.96 | 4000 | 0.14 5.1 | 20.9 0.08 | 22 | | |
| 9WL0424P3G001 | 24 | 21.6 to 26.4 | 100 | 0.2 | 4.8 | 15500 | 0.56 19.7 | 310 1.24 | 47 | | |
| | | | 20 | 0.04 | 0.96 | 3000 | 0.11 3.8 | 11.6 0.05 | 16 | | |

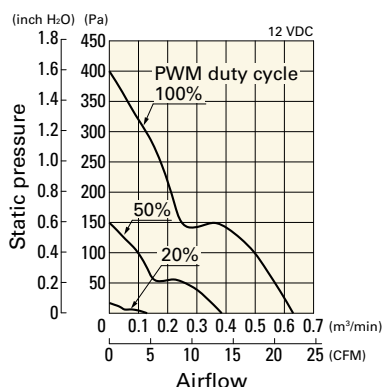
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 655.

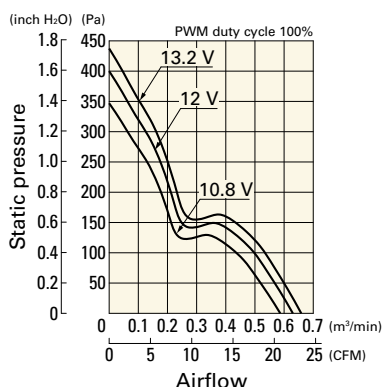
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0412P3J001 With pulse sensor with PWM control

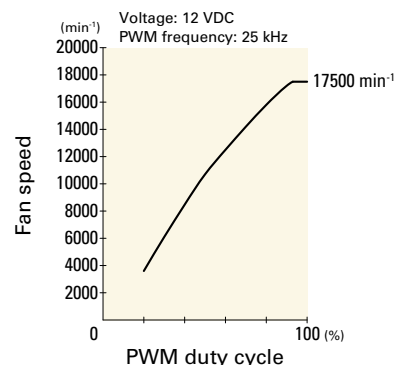
PWM duty cycle



Operating voltage range



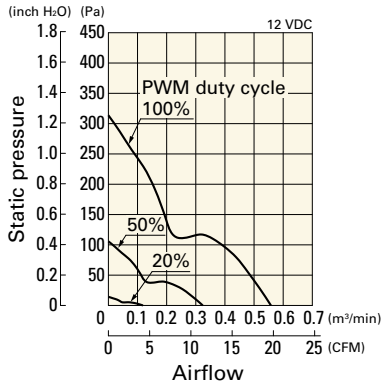
PWM duty - Speed characteristics example



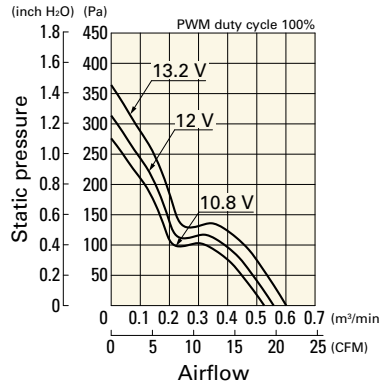
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0412P3G001 With pulse sensor with PWM control

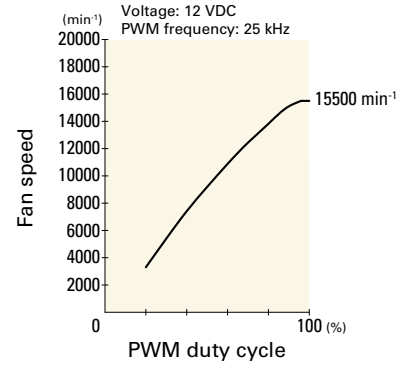
PWM duty cycle



Operating voltage range

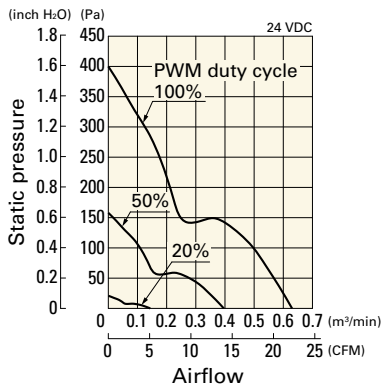


PWM duty - Speed characteristics example

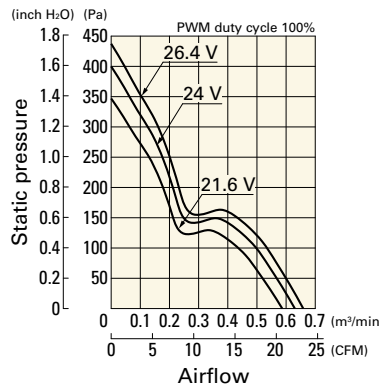


9WL0424P3J001 With pulse sensor with PWM control

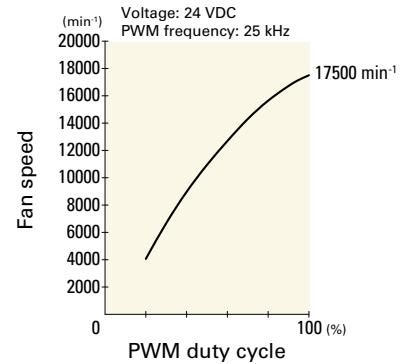
PWM duty cycle



Operating voltage range

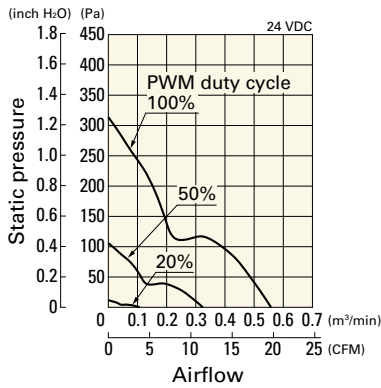


PWM duty - Speed characteristics example

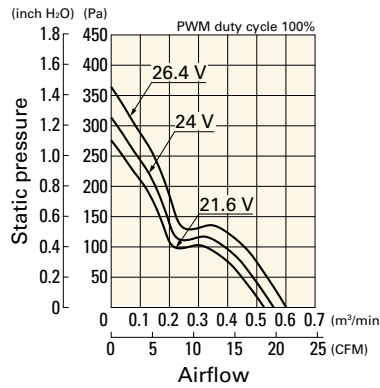


9WL0424P3G001 With pulse sensor with PWM control

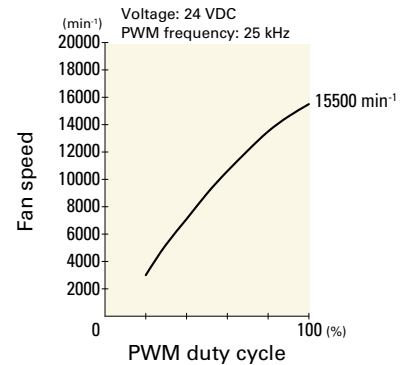
PWM duty cycle



Operating voltage range

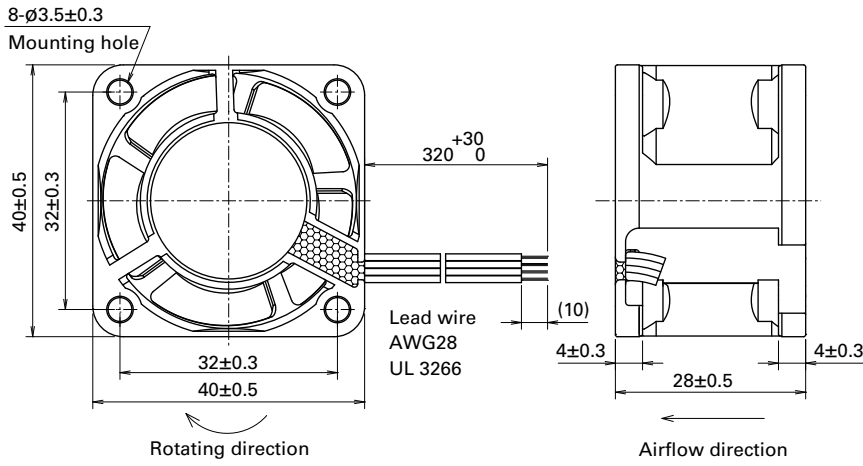


PWM duty - Speed characteristics example

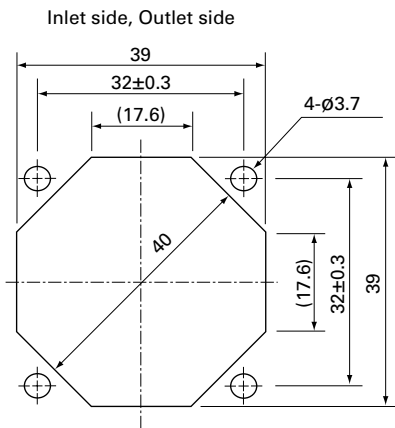


DC
Splash Proof Fan 40 mm sq.

Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



60x60x25 mm

San Ace 60W 9WPA type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown (For models without PWM control, there is no speed control wiring.)
- Mass 110 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9WPA0612P4G001 | 12 | 10.8 to 13.2 | 100 | 0.93 | 11.16 | 12000 | 1.52 53.7 | 357 1.44 | 56 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.09 | 1.08 | 3500 | 0.43 15.1 | 30 0.12 | 22 | | |
| 9WPA0612P4H001 | 12 | 10.2 to 13.8 | 100 | 0.17 | 2.04 | 5800 | 0.73 25.8 | 83 0.33 | 36 | | |
| | | | 20 | 0.04 | 0.48 | 1600 | 0.2 7 | 6.3 0.02 | 10 | | |
| 9WPA0624P4G001 | 24 | 21.6 to 26.4 | 100 | 0.46 | 11.04 | 12000 | 1.52 53.7 | 357 1.44 | 56 | | |
| | | | 20 | 0.05 | 1.2 | 3500 | 0.43 15.1 | 30 0.12 | 22 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

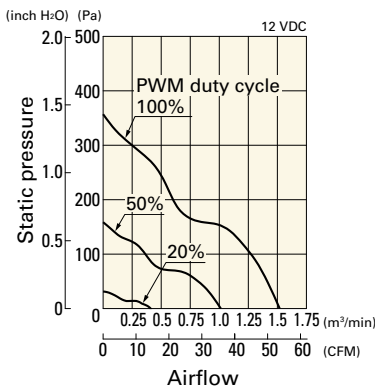
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9WPA0612M4001 | 12 | 10.2 to 13.8 | 0.11 | 1.32 | 4000 | 0.51 18 | 39.7 0.16 | 26 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9WPA0624S4001 | 24 | 21.6 to 26.4 | 0.17 | 4.08 | 7800 | 0.99 35 | 151 0.6 | 43 | | |
| 9WPA0624M4001 | | 20.4 to 27.6 | 0.06 | 1.44 | 4000 | 0.51 18 | 39.7 0.16 | 26 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 656.

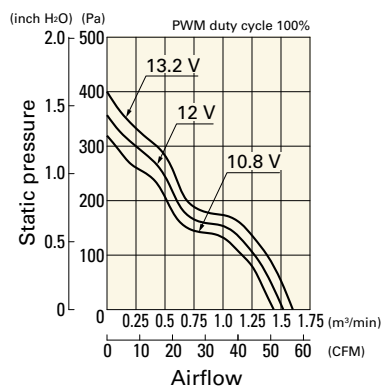
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WPA0612P4G001 With pulse sensor with PWM control

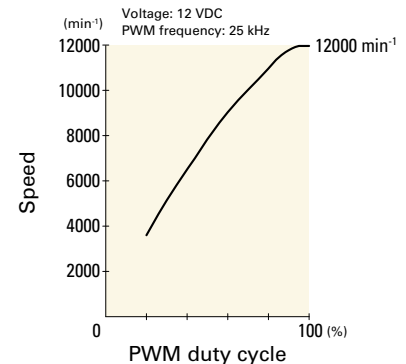
PWM duty cycle



Operating voltage range



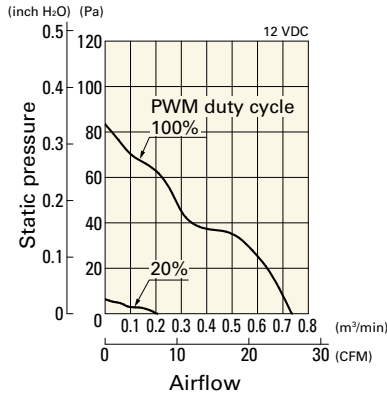
PWM duty - Speed characteristics example



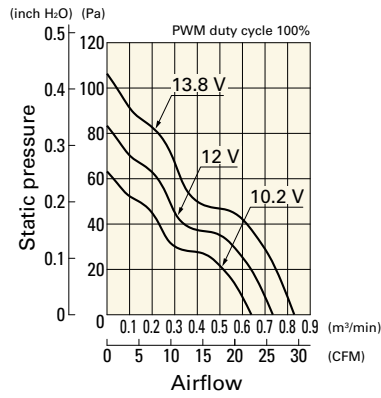
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WPA0612P4H001 With pulse sensor with PWM control

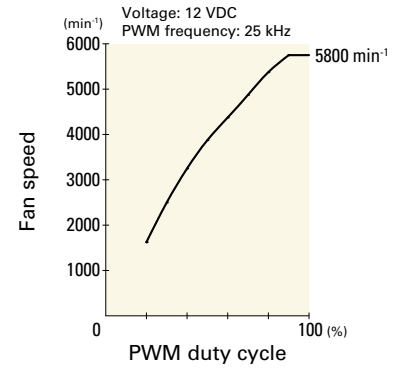
PWM duty cycle



Operating voltage range

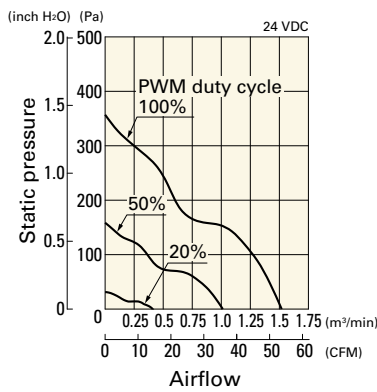


PWM duty - Speed characteristics example

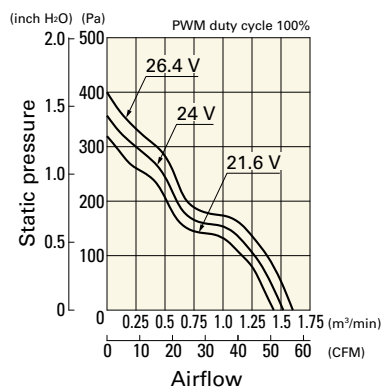


9WPA0624P4G001 With pulse sensor with PWM control

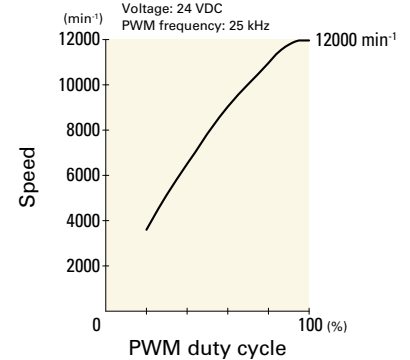
PWM duty cycle



Operating voltage range



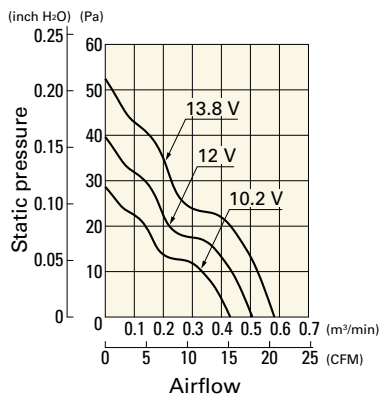
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

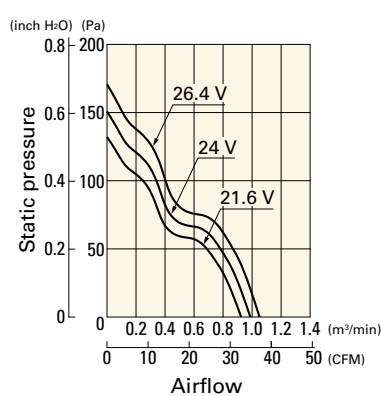
9WPA0612M4001 With pulse sensor

Operating voltage range



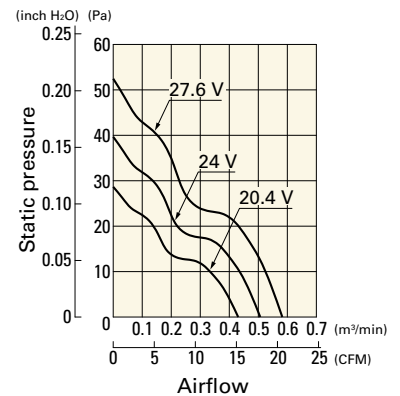
9WPA0624S4001 With pulse sensor

Operating voltage range

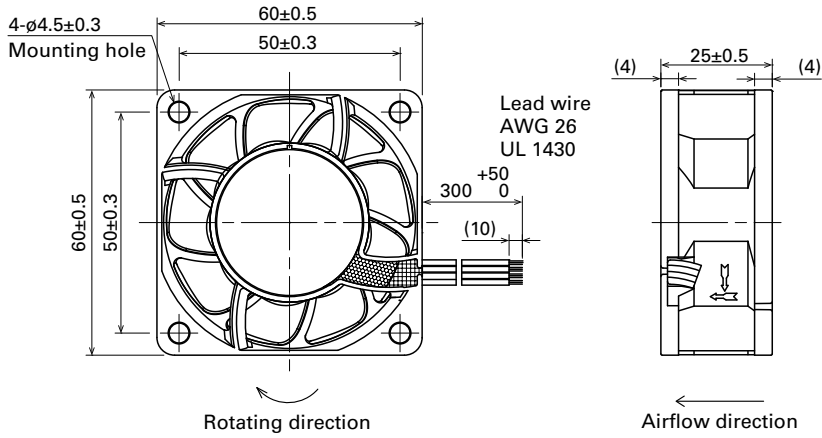


9WPA0624M4001 With pulse sensor

Operating voltage range

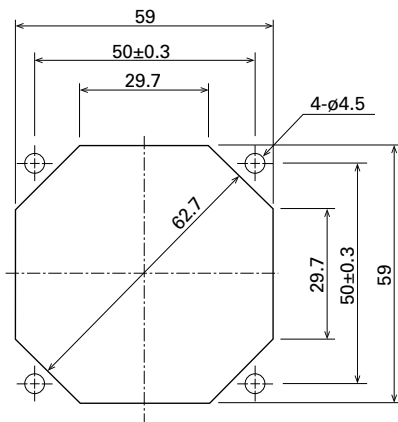


Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Inlet side, Outlet side



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G



60×60×25 mm

San Ace 60W 9WL type   US

DC
Splash Proof Fan 60 mm sq.

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 120 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | | |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|------------|----|
| 9WL0612P4S001 | 12 | 10.8 to 13.2 | 100 | 0.67 | 8.04 | 11000 | 1.4 49.4 | 300 1.204 | 53 | -20 to +70 | 180000/60°C (215000/40°C) | | |
| | | | 20 | 0.06 | 0.72 | 2900 | 0.36 12.7 | 20.8 0.083 | 20 | | | | |
| 9WL0612P4J001 | | | 100 | 0.39 | 4.68 | 8650 | 1.1 38.8 | 182 0.73 | 47 | | | | |
| | | | 25 | 0.04 | 0.48 | 2100 | 0.27 9.5 | 10.7 0.043 | 17 | | | | |
| 9WL0612P4H001 | | | 100 | 0.17 | 2.04 | 6150 | 0.78 27.5 | 97 0.389 | 36 | | | | |
| | | | 25 | 0.03 | 0.36 | 1350 | 0.17 6.0 | 4.7 0.018 | 14 | | | | |
| 9WL0624P4S001 | | 24 | 21.6 to 26.4 | 100 | 0.34 | 8.16 | 11000 | 1.4 49.4 | 300 1.204 | | | 53 | |
| | | | | 20 | 0.03 | 0.72 | 2900 | 0.36 12.7 | 20.8 0.083 | | | 20 | |
| | | | | 9WL0624P4J001 | 100 | 0.19 | 4.56 | 8650 | 1.1 38.8 | | | 182 0.73 | 47 |
| | | | | | 20 | 0.02 | 0.48 | 2200 | 0.28 9.8 | | | 12.0 0.048 | 17 |
| | | | | 9WL0624P4H001 | 100 | 0.08 | 1.92 | 6150 | 0.78 27.5 | | | 97 0.389 | 36 |
| | | | | | 20 | 0.02 | 0.48 | 1300 | 0.16 5.6 | | | 4.3 0.017 | 14 |

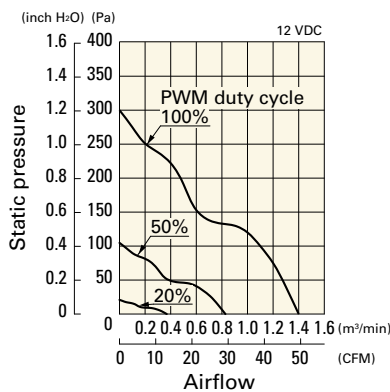
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 655.

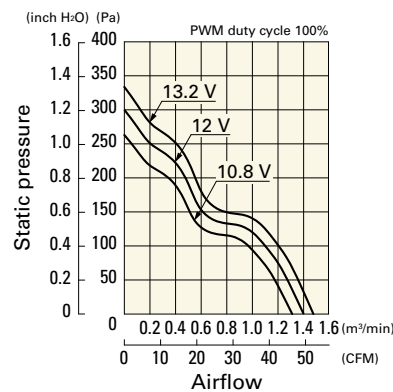
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0612P4S001 With pulse sensor with PWM control

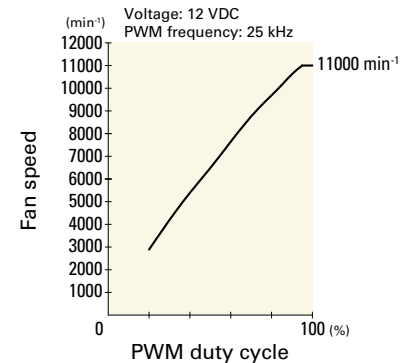
PWM duty cycle



Operating voltage range



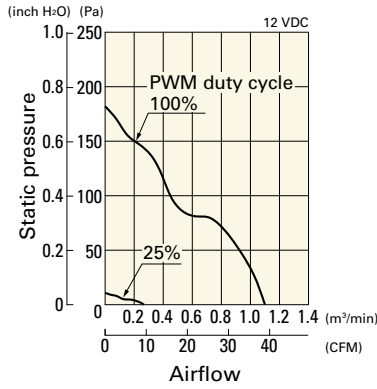
PWM duty - Speed characteristics example



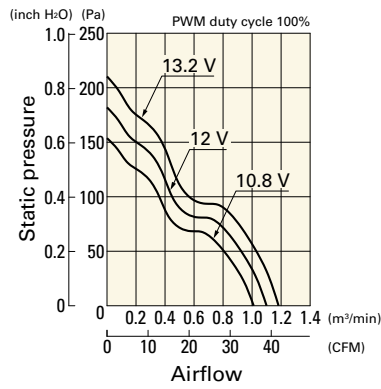
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0612P4J001 With pulse sensor with PWM control

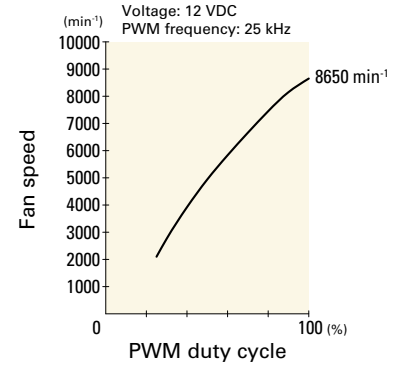
PWM duty cycle



Operating voltage range

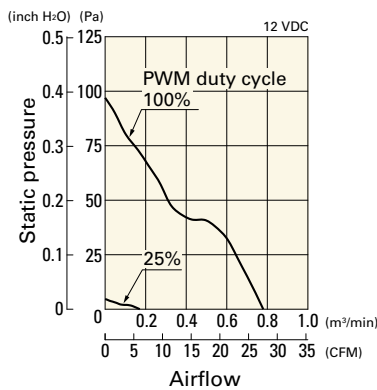


PWM duty - Speed characteristics example

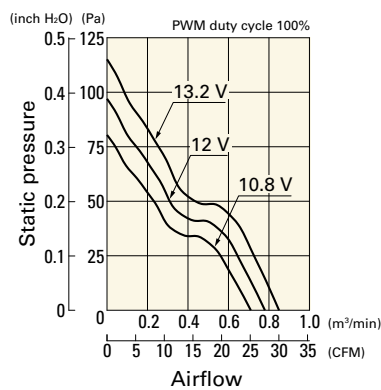


9WL0612P4H001 With pulse sensor with PWM control

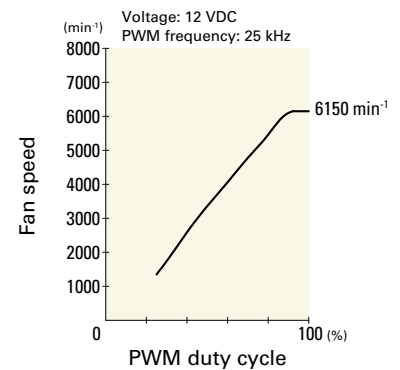
PWM duty cycle



Operating voltage range

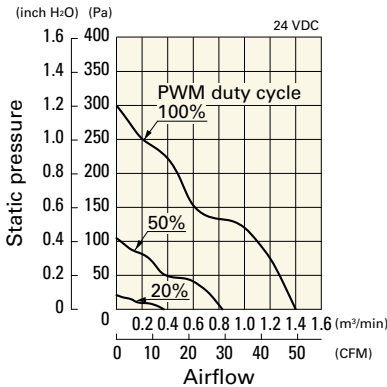


PWM duty - Speed characteristics example

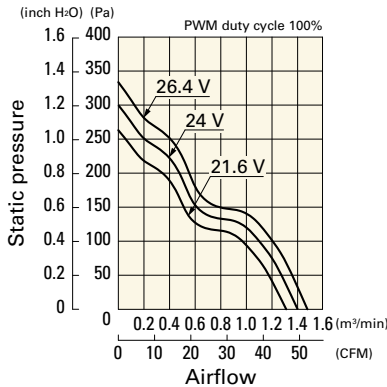


9WL0624P4S001 With pulse sensor with PWM control

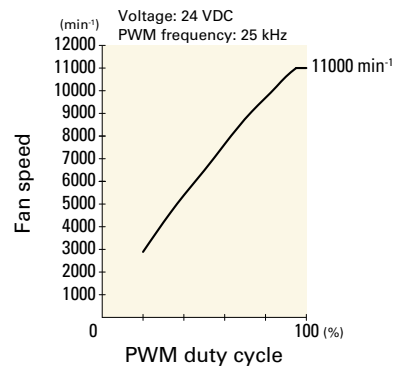
PWM duty cycle



Operating voltage range

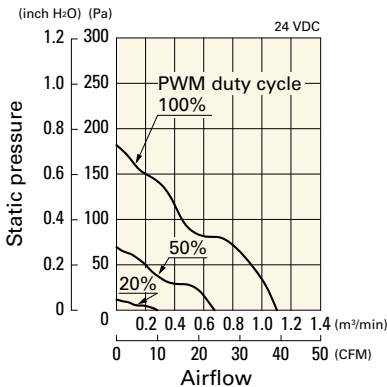


PWM duty - Speed characteristics example

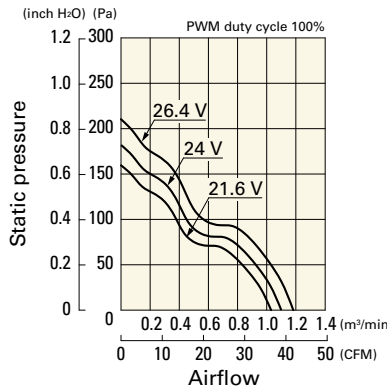


9WL0624P4J001 With pulse sensor with PWM control

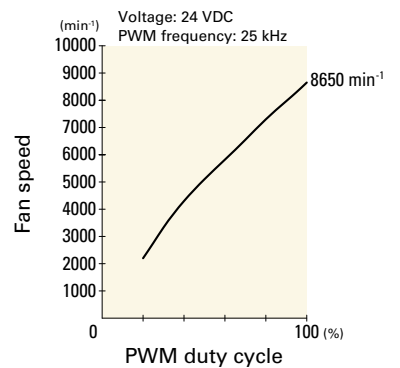
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

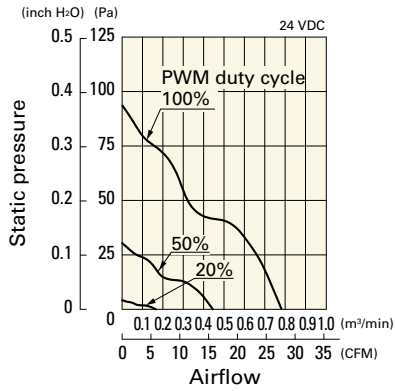


DC
Splash Proof Fan 60 mm sq.

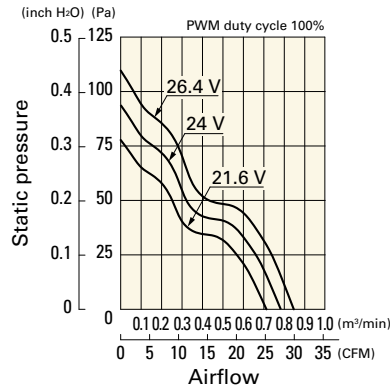
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0624P4H001 With pulse sensor with PWM control

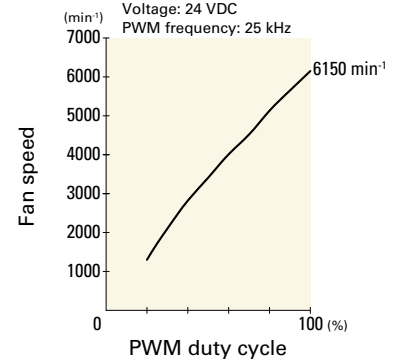
PWM duty cycle



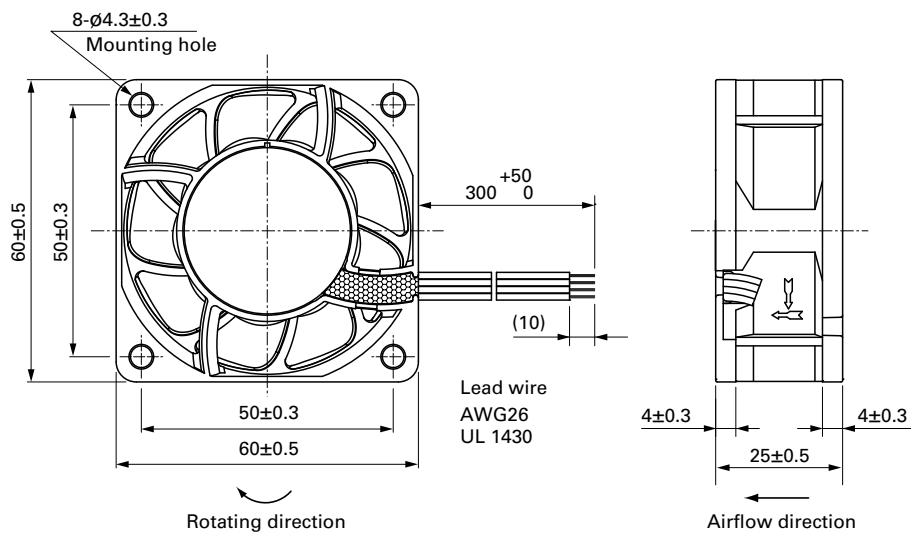
Operating voltage range



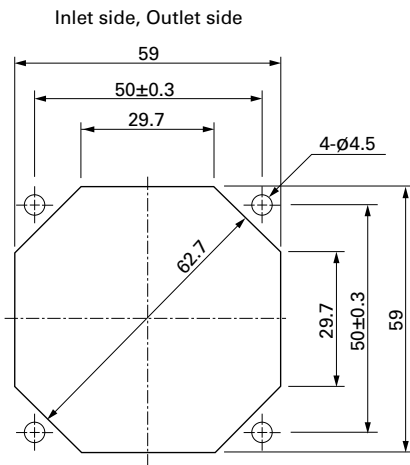
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G



80x80x25 mm

San Ace 80W 9WPA type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 130 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WPA0812P4G001 | 12 | 10.8 to 13.2 | 100 | 0.71 | 8.52 | 8250 | 2.32 81.9 | 210 0.84 | 54 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.07 | 0.84 | 2400 | 0.67 23.6 | 18.2 0.073 | 21 | | |
| 9WPA0812P4S001 | | | 100 | 0.26 | 3.12 | 5300 | 1.49 52.6 | 86.7 0.35 | 40 | | |
| | | | 20 | 0.04 | 0.48 | 1250 | 0.35 12.4 | 4.8 0.019 | 10 | | |
| 9WPA0824P4G001 | 24 | 21.6 to 26.4 | 100 | 0.36 | 8.64 | 8250 | 2.32 81.9 | 210 0.84 | 54 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.05 | 1.2 | 2400 | 0.67 23.6 | 18.2 0.073 | 21 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

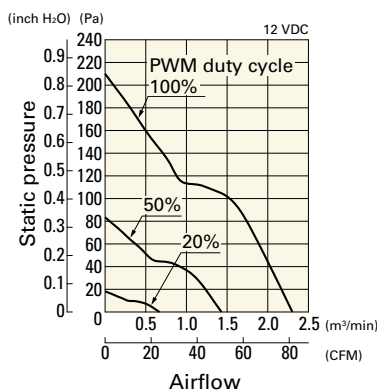
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WPA0824H4001 | 24 | 20.4 to 27.6 | 0.07 | 1.68 | 3500 | 0.98 34.6 | 37.8 0.15 | 29 | -20 to +70 | 40000/60°C (70000/40°C) |

Note: Sensor and control options are available for selection. Refer to the table on p. 656.

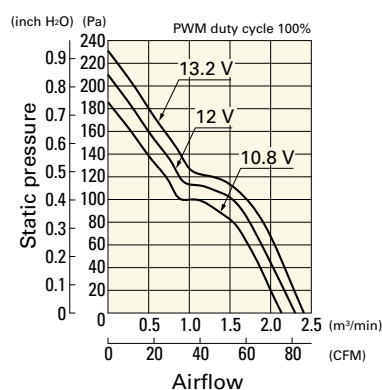
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WPA0812P4G001 With pulse sensor with PWM control

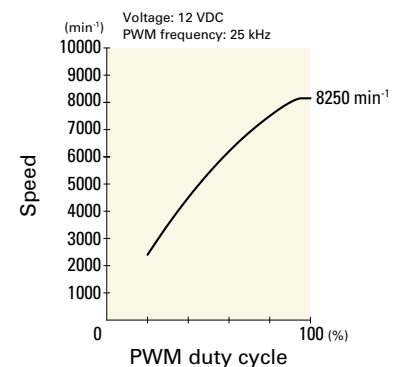
PWM duty cycle



Operating voltage range



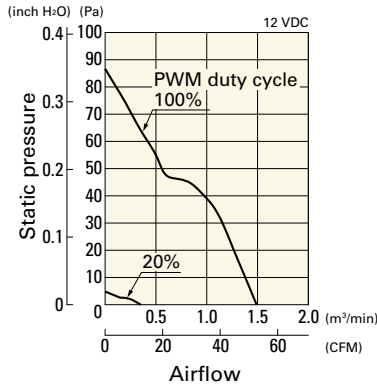
PWM duty - Speed characteristics example



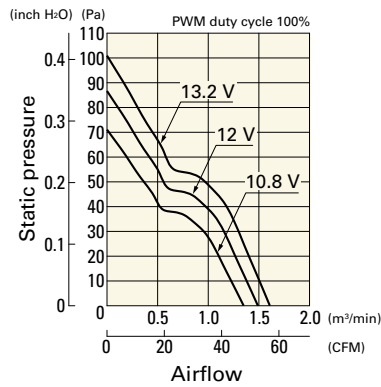
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WPA0812P4S001 With pulse sensor with PWM control

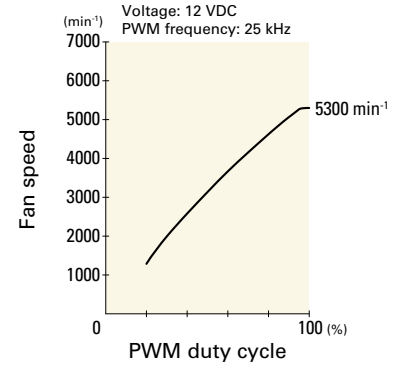
PWM duty cycle



Operating voltage range

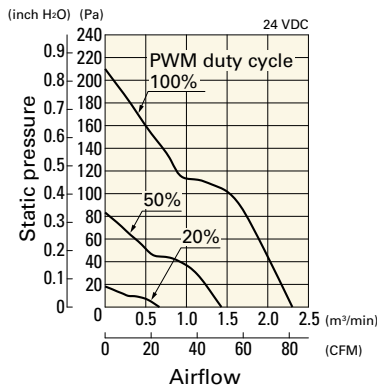


PWM duty - Speed characteristics example

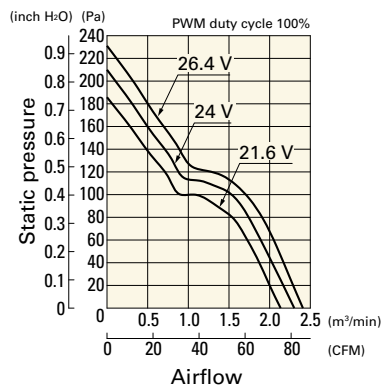


9WPA0824P4G001 With pulse sensor with PWM control

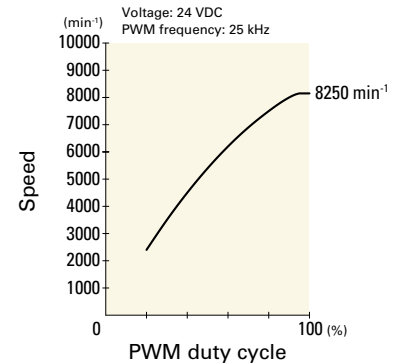
PWM duty cycle



Operating voltage range



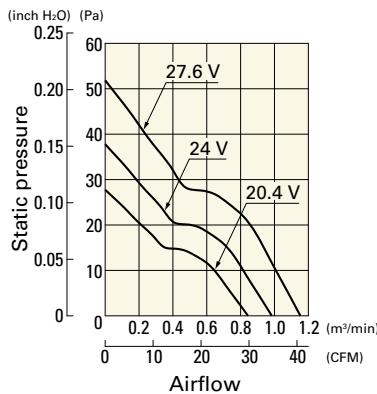
PWM duty - Speed characteristics example



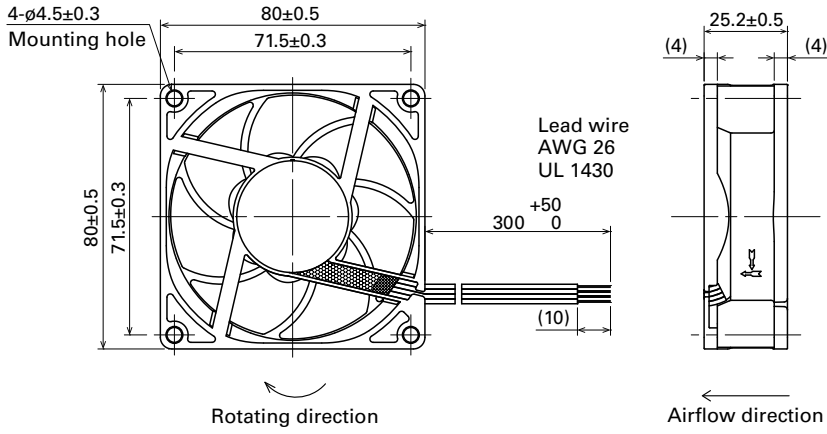
Airflow - Static Pressure Characteristics

9WPA0824H4001 With pulse sensor

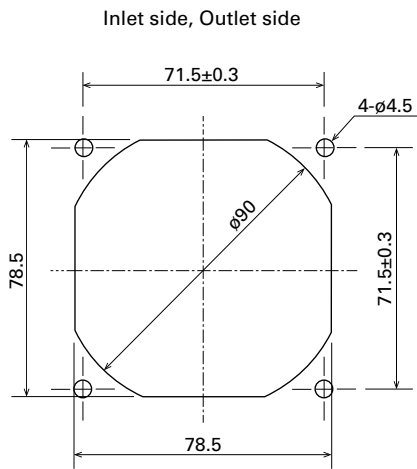
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G



80x80x25 mm

San Ace 80W 9WL type   

DC
Splash Proof Fan 80 mm sq.

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 150 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | | |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|-----------|----|
| 9WL0812P4J001 | 12 | 10.8 to 13.2 | 100 | 0.6 | 7.2 | 7400 | 2.07 73.0 | 177 0.71 | 49 | -20 to +70 | 180000/60°C (215000/40°C) | | |
| | | | 20 | 0.06 | 0.72 | 1800 | 0.5 17.6 | 10.4 0.04 | 16 | | | | |
| 9WL0812P4G001 | | | 100 | 0.3 | 3.6 | 5500 | 1.54 54.3 | 98 0.39 | 43 | | | | |
| | | | 25 | 0.05 | 0.6 | 1400 | 0.39 13.7 | 6.3 0.02 | 14 | | | | |
| 9WL0812P4H001 | | | 100 | 0.12 | 1.44 | 3700 | 1.03 36.3 | 44 0.17 | 31 | | | | |
| | | | 30 | 0.04 | 0.48 | 1100 | 0.3 10.5 | 3.9 0.01 | 13 | | | | |
| 9WL0824P4J001 | | | 24 | 21.6 to 26.4 | 100 | 0.28 | 6.72 | 7400 | 2.07 73.0 | | | 177 0.71 | 49 |
| | | | | | 20 | 0.05 | 1.2 | 2400 | 0.67 23.6 | | | 18.6 0.07 | 22 |
| 9WL0824P4G001 | | | | | 100 | 0.14 | 3.36 | 5500 | 1.54 54.3 | | | 98 0.39 | 43 |
| | | | | | 20 | 0.02 | 0.48 | 1200 | 0.33 11.6 | | | 4.6 0.01 | 13 |
| 9WL0824P4H001 | 100 | 0.05 | | | 1.2 | 3700 | 1.03 36.3 | 44 0.17 | 31 | | | | |
| | 30 | 0.02 | | | 0.48 | 1100 | 0.3 10.5 | 3.9 0.01 | 13 | | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have a pulse sensor.**

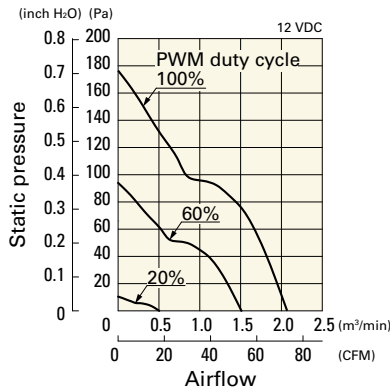
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| 9WL0812L4001 | 12 | 8 to 13.2 | 0.06 | 0.72 | 2300 | 0.64 22.6 | 17 0.068 | 22 | -20 to +70 | 180000/60°C (215000/40°C) |
| 9WL0824F4001 | 24 | 12 to 26.4 | 0.045 | 1.08 | 3300 | 0.92 32.5 | 35 0.14 | 29 | | |
| 9WL0824L4001 | | 14 to 26.4 | 0.03 | 0.72 | 2300 | 0.64 22.6 | 17 0.068 | 22 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 655.

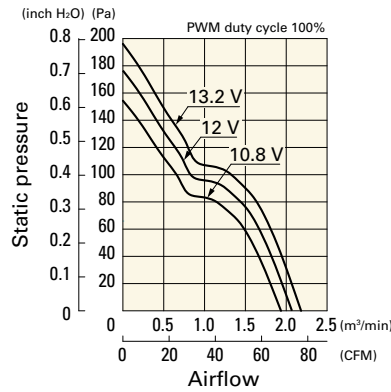
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0812P4J001 With pulse sensor with PWM control

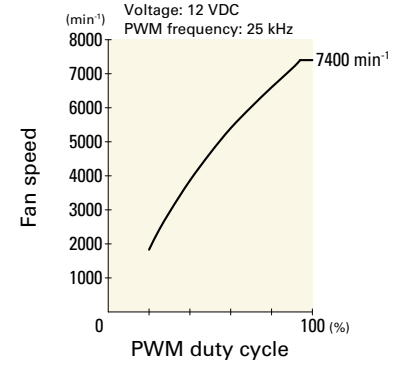
PWM duty cycle



Operating voltage range

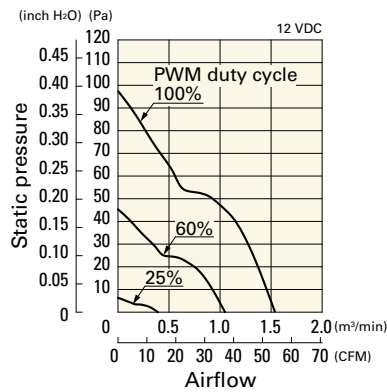


PWM duty - Speed characteristics example

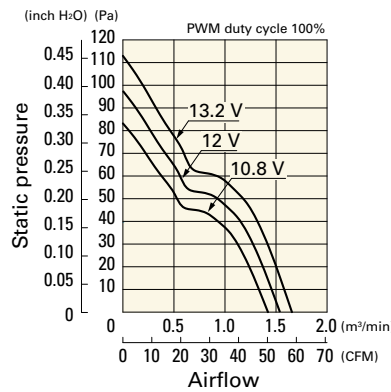


9WL0812P4G001 With pulse sensor with PWM control

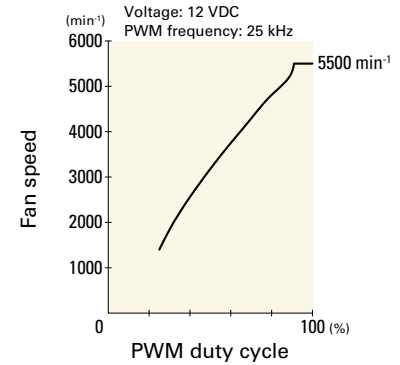
PWM duty cycle



Operating voltage range

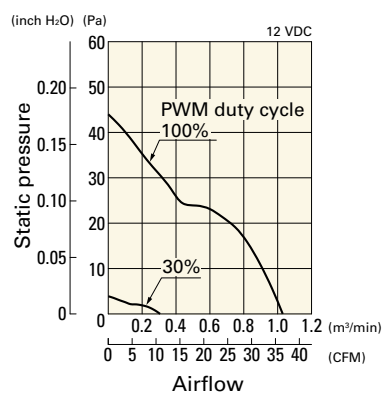


PWM duty - Speed characteristics example

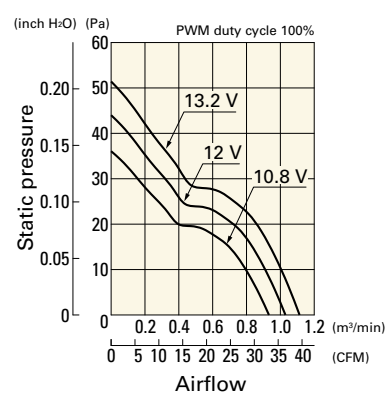


9WL0812P4H001 With pulse sensor with PWM control

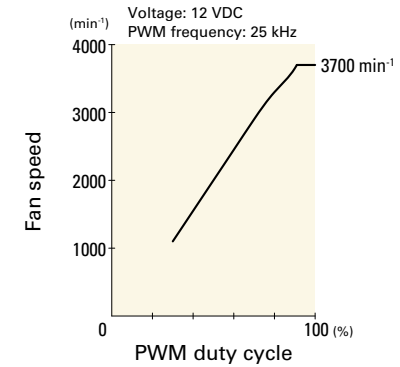
PWM duty cycle



Operating voltage range

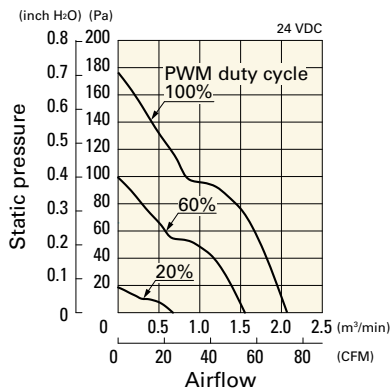


PWM duty - Speed characteristics example

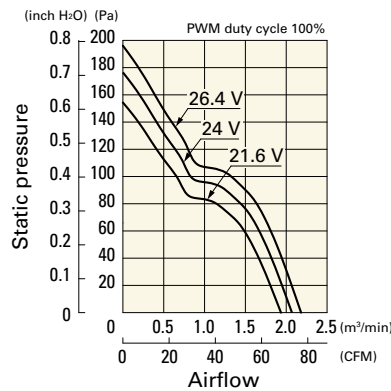


9WL0824P4J001 With pulse sensor with PWM control

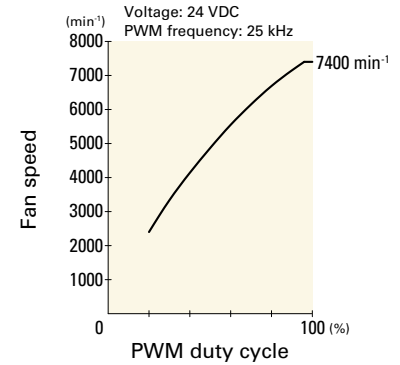
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

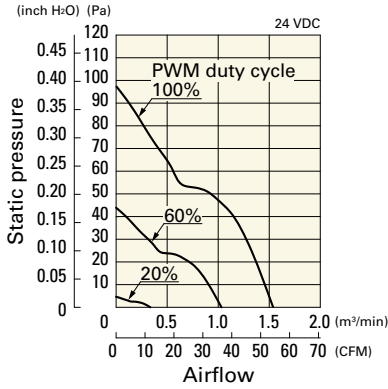


DC
Splash Proof Fan 80 mm sq.

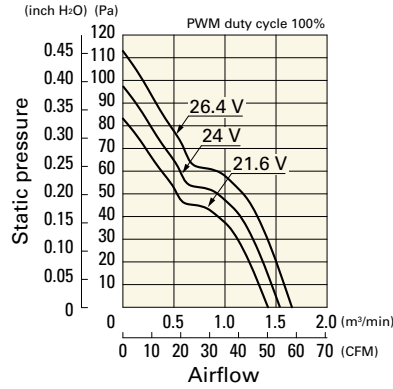
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0824P4G001 With pulse sensor with PWM control

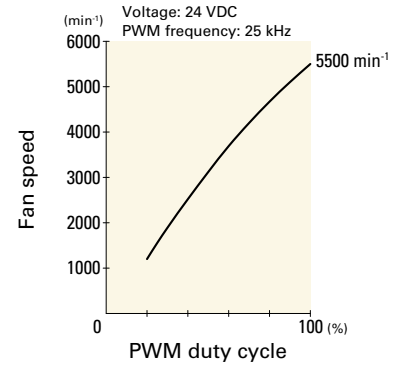
PWM duty cycle



Operating voltage range

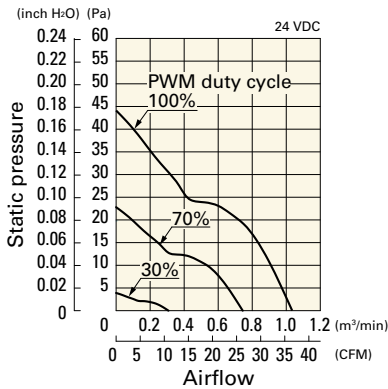


PWM duty - Speed characteristics example

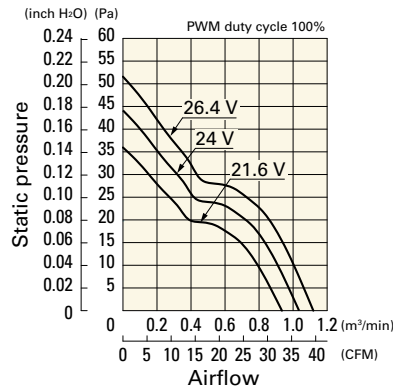


9WL0824P4H001 With pulse sensor with PWM control

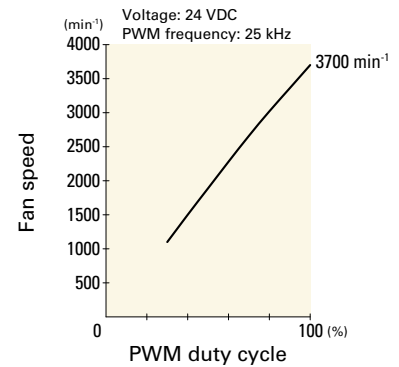
PWM duty cycle



Operating voltage range



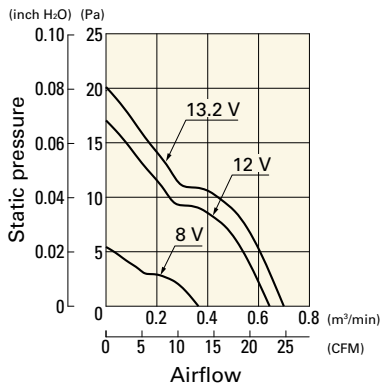
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

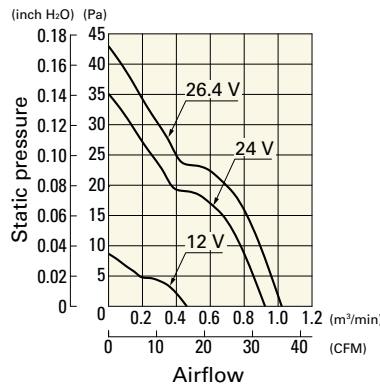
9WL0812L4001 With pulse sensor

Operating voltage range



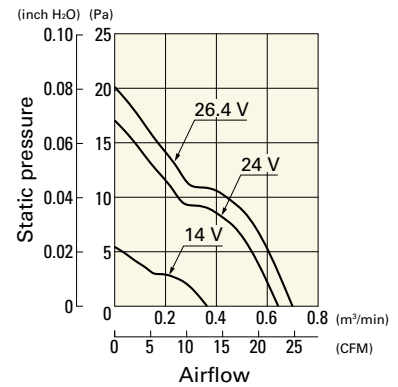
9WL0824F4001 With pulse sensor

Operating voltage range

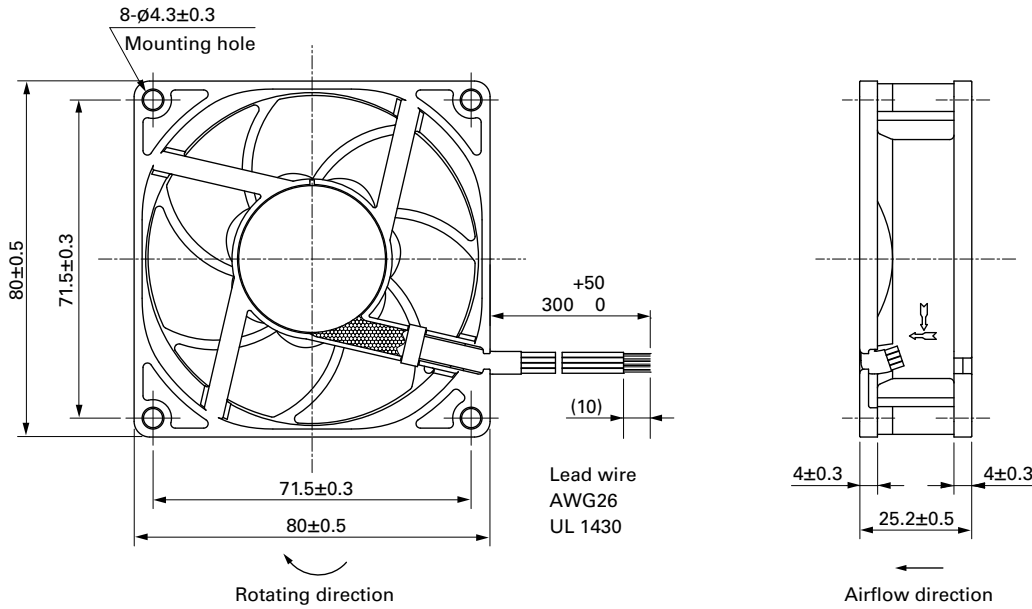


9WL0824L4001 With pulse sensor

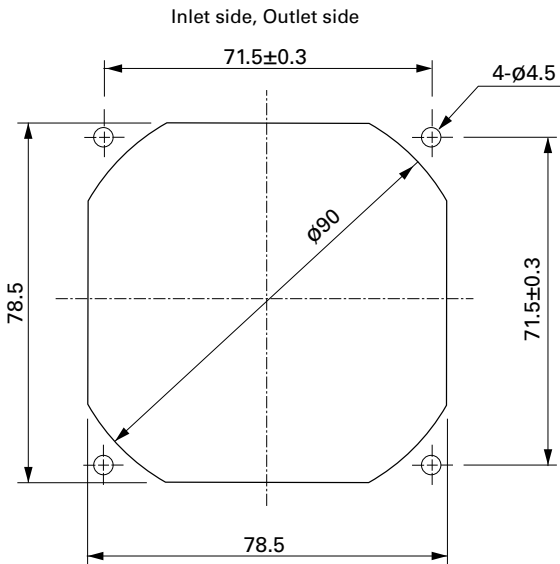
Operating voltage range



Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

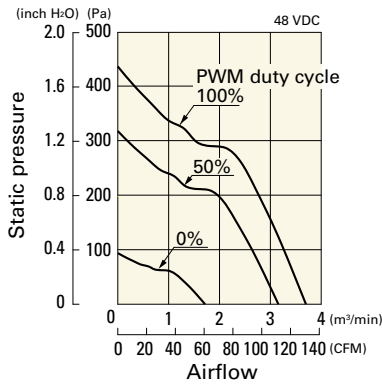
page: p. 605

Model no.: 109-1002G

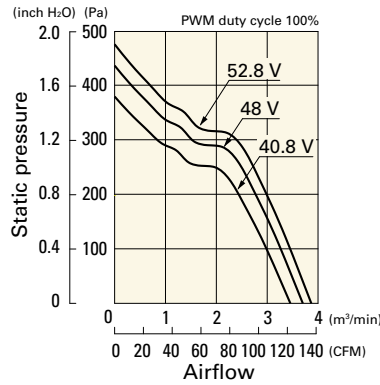
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WV0848P1H001 With pulse sensor with PWM control

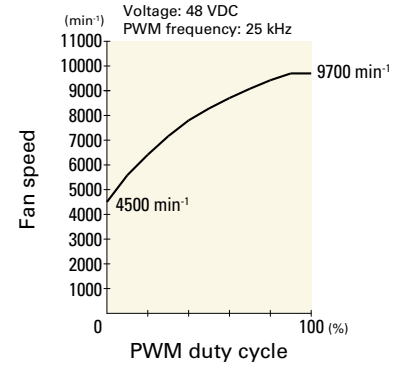
PWM duty cycle



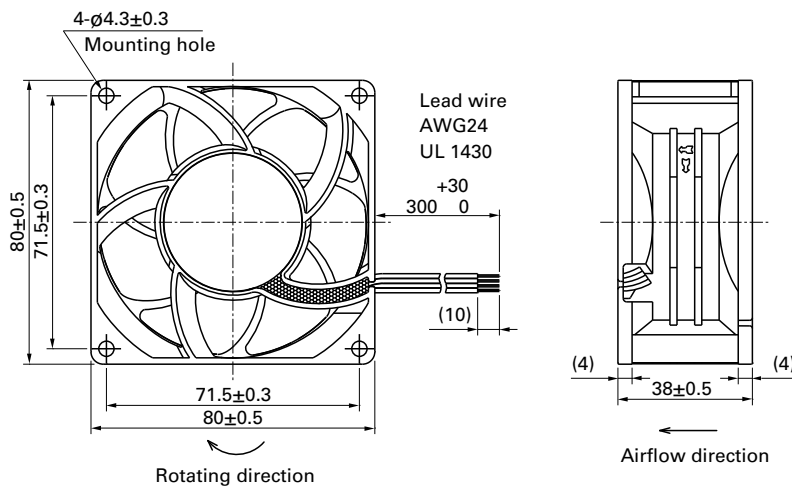
Operating voltage range



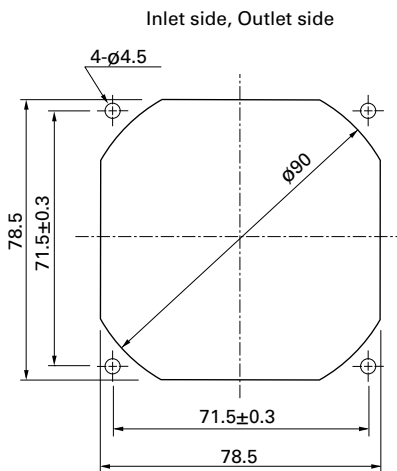
PWM duty - Speed characteristics example



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

DC
Splash Proof Fan 80 mm sq.



92x92x25 mm

San Ace 92W 9WPA type

DC
Splash Proof Fan 92 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 135 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WPA0912P4G001 | 12 | 10.8 to 13.2 | 100 | 0.5 | 6 | 5700 | 2.45 86.5 | 126 0.51 | 47 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.04 | 0.5 | 1200 | 0.52 18.4 | 6 0.02 | 11 | | |
| 9WPA0924P4G001 | 24 | 21.6 to 26.4 | 100 | 0.25 | 6 | 5700 | 2.45 86.5 | 126 0.51 | 47 | | |
| | | | 20 | 0.03 | 0.7 | 1200 | 0.52 18.4 | 6 0.02 | 11 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

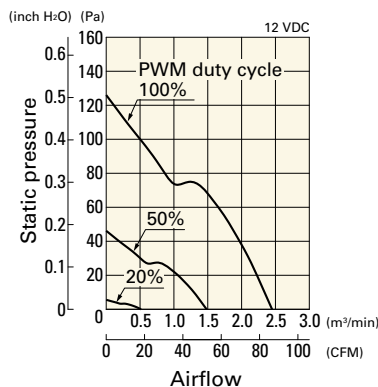
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WPA0924S4001 | 24 | 12 to 27.6 | 0.1 | 2.4 | 3900 | 1.67 59 | 59 0.24 | 37 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9WPA0924H4001 | | | 0.08 | 1.92 | 3400 | 1.46 51.5 | 44.8 0.18 | 33 | | |
| 9WPA0924F4001 | | | 0.06 | 1.44 | 2900 | 1.24 43.8 | 32.6 0.13 | 28 | | |
| 9WPA0924B4001 | | | 0.04 | 0.96 | 2100 | 0.9 31.7 | 17.1 0.07 | 18 | | |

Note: Sensor and control options are available for selection. Refer to the table on pp. 656 to 657.

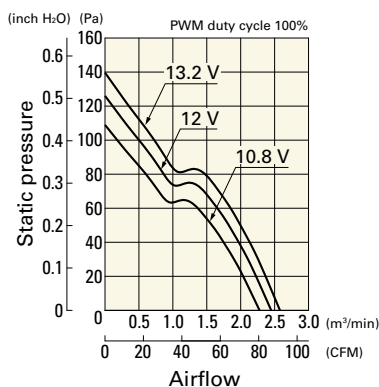
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WPA0912P4G001 With pulse sensor with PWM control

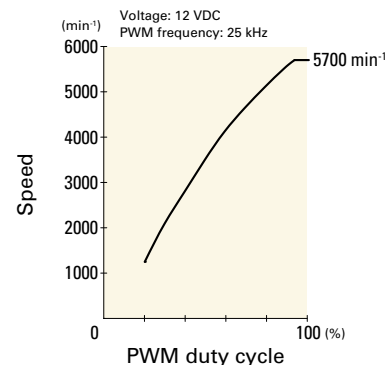
PWM duty cycle



Operating voltage range



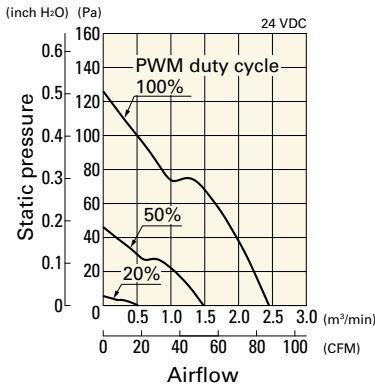
PWM duty - Speed characteristics example



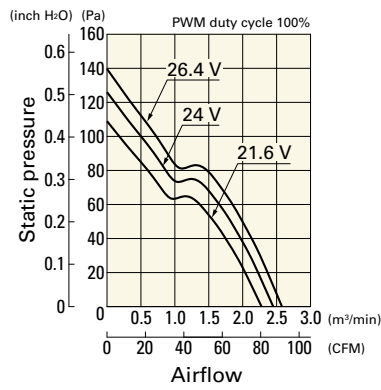
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WPA0924P4G001 With pulse sensor with PWM control

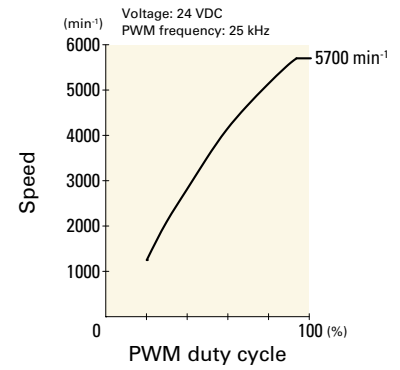
PWM duty cycle



Operating voltage range



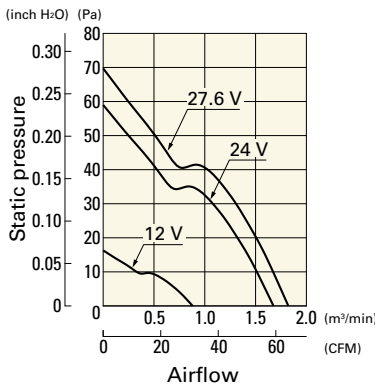
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

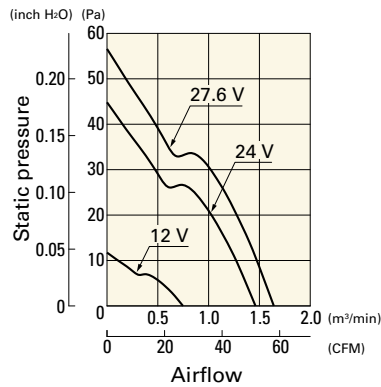
9WPA0924S4001 With pulse sensor

Operating voltage range



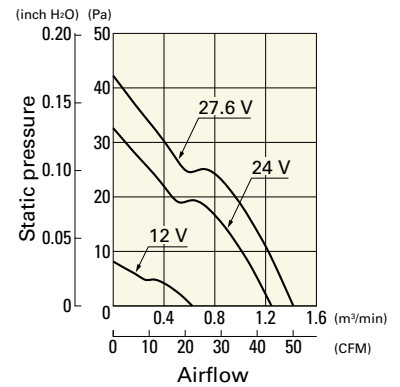
9WPA0924H4001 With pulse sensor

Operating voltage range



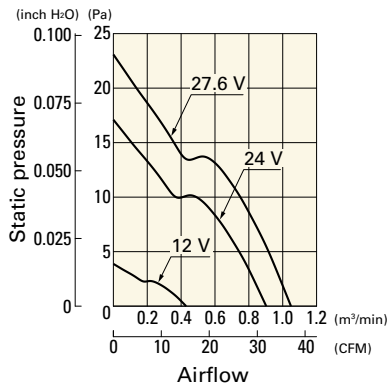
9WPA0924F4001 With pulse sensor

Operating voltage range

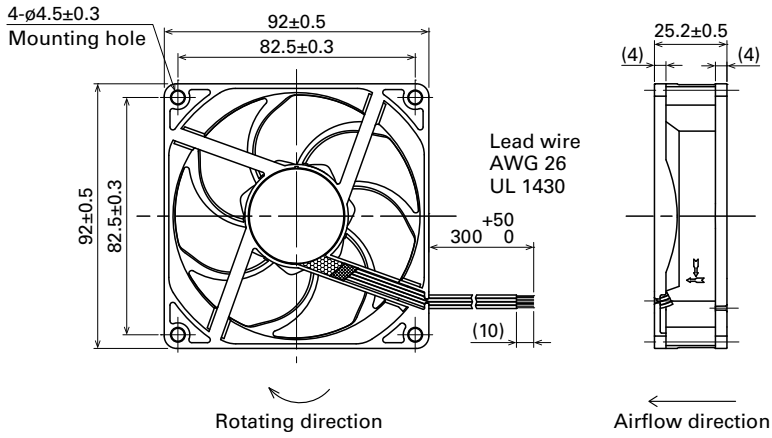


9WPA0924B4001 With pulse sensor

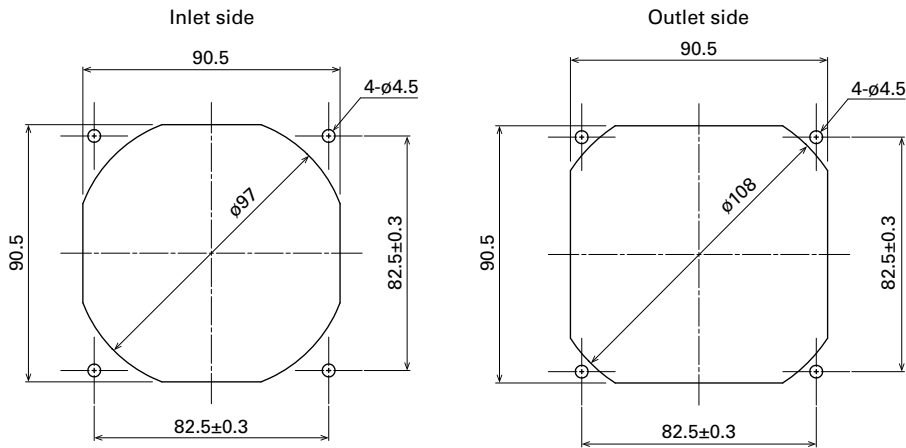
Operating voltage range



Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H


Resin finger guards

page: p. 605

Model no.: 109-1001G



92x92x25 mm

San Ace 92W 9WL type   

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 170 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|----|
| 9WL0912P4J001 | 12 | 10.8 to 13.2 | 100 | 0.42 | 5.04 | 5000 | 2.2 77.7 | 105 0.42 | 44 | -20 to +70 | 180000/60°C (215000/40°C) | |
| | | | 20 | 0.04 | 0.48 | 1200 | 0.52 18.4 | 6.04 0.024 | 11 | | | |
| 9WL0912P4G001 | | | 100 | 0.3 | 3.6 | 4400 | 1.93 68.2 | 81 0.33 | 40 | | | |
| | | | 20 | 0.04 | 0.48 | 1000 | 0.43 15.1 | 4.18 0.016 | 8 | | | |
| 9WL0912P4S001 | | | 100 | 0.22 | 2.64 | 3850 | 1.69 59.7 | 62.1 0.25 | 37 | | | |
| | | | 30 | 0.04 | 0.48 | 1400 | 0.61 21.5 | 8.21 0.032 | 13 | | | |
| 9WL0912P4H001 | | 100 | 0.15 | 1.8 | 3150 | 1.38 48.7 | 41.6 0.17 | 32 | | | | |
| | | 35 | 0.04 | 0.48 | 1100 | 0.48 16.9 | 5.07 0.02 | 9 | | | | |
| 9WL0924P4J001 | | 24 | 21.6 to 26.4 | 100 | 0.21 | 5.04 | 5000 | 2.2 77.7 | 105 0.42 | | | 44 |
| | | | | 20 | 0.02 | 0.48 | 1100 | 0.48 16.9 | 5.07 0.02 | | | 9 |
| 9WL0924P4S001 | | | | 100 | 0.11 | 2.64 | 3850 | 1.69 59.7 | 62.1 0.25 | | | 37 |
| | | | | 30 | 0.02 | 0.48 | 1300 | 0.57 20.1 | 7.08 0.028 | | | 12 |
| 9WL0924P4H001 | 100 | | | 0.07 | 1.68 | 3150 | 1.38 48.7 | 41.6 0.17 | 32 | | | |
| | 30 | | | 0.02 | 0.48 | 1000 | 0.43 15.1 | 4.18 0.016 | 8 | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have a pulse sensor.**

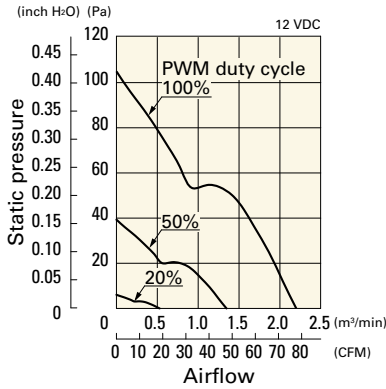
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| 9WL0912M4001 | 12 | 10.2 to 13.8 | 0.08 | 0.96 | 2400 | 1.05 37.1 | 24.1 0.097 | 24 | -20 to +70 | 180000/60°C (215000/40°C) |
| 9WL0924F4001 | 24 | 20.4 to 27.6 | 0.05 | 1.2 | 2800 | 1.22 43.1 | 32.8 0.13 | 29 | | |
| 9WL0924M4001 | | | 0.04 | 0.96 | 2400 | 1.05 37.1 | 24.1 0.097 | 24 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 655.

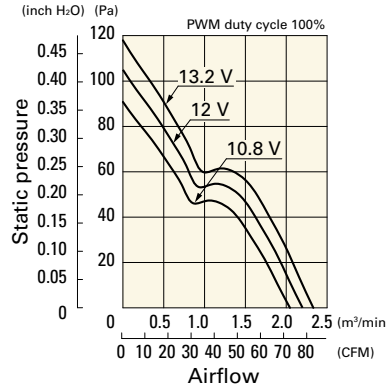
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0912P4J001 With pulse sensor with PWM control

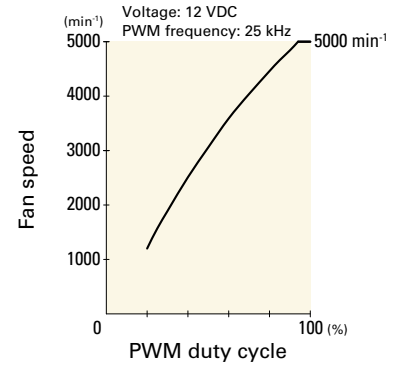
PWM duty cycle



Operating voltage range

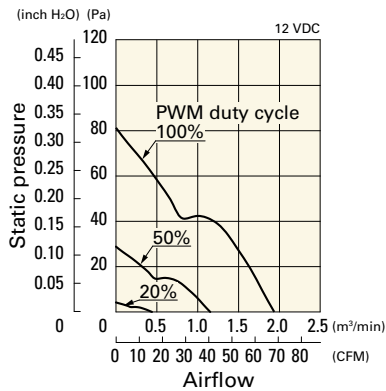


PWM duty - Speed characteristics example

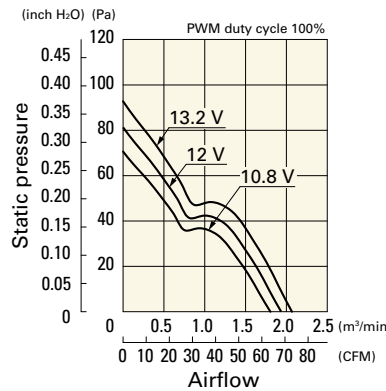


9WL0912P4G001 With pulse sensor with PWM control

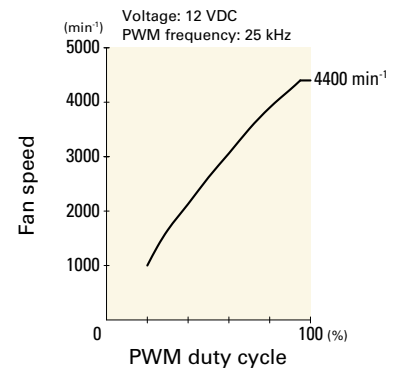
PWM duty cycle



Operating voltage range

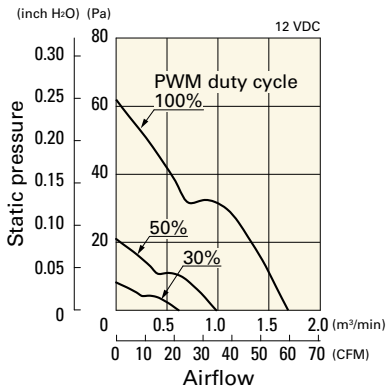


PWM duty - Speed characteristics example

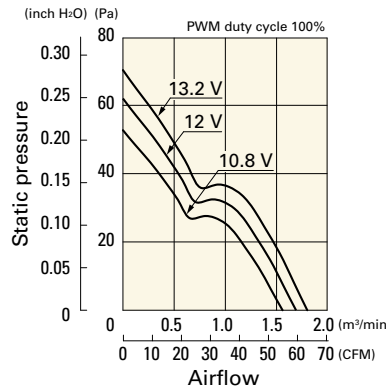


9WL0912P4S001 With pulse sensor with PWM control

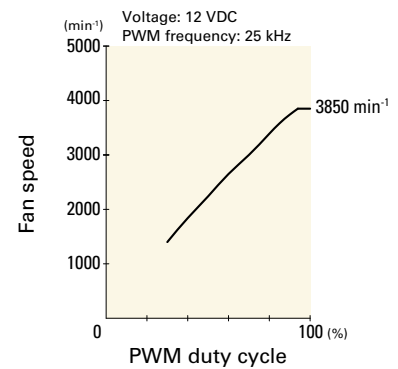
PWM duty cycle



Operating voltage range

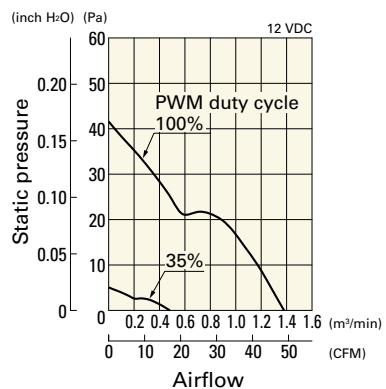


PWM duty - Speed characteristics example

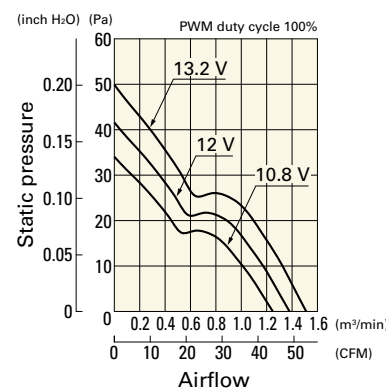


9WL0912P4H001 With pulse sensor with PWM control

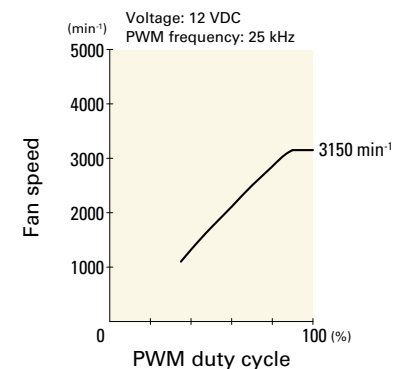
PWM duty cycle



Operating voltage range



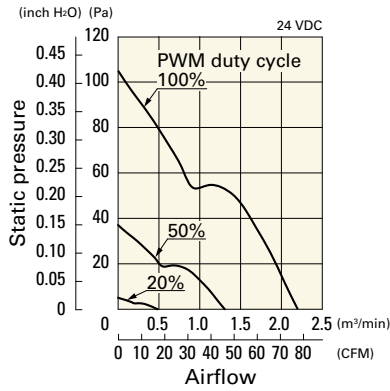
PWM duty - Speed characteristics example



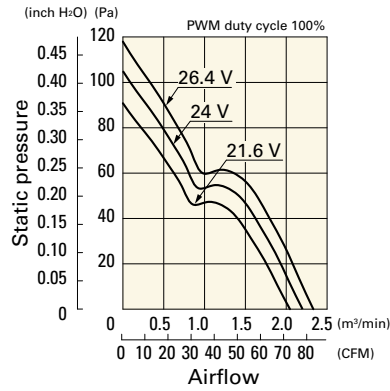
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0924P4J001 With pulse sensor with PWM control

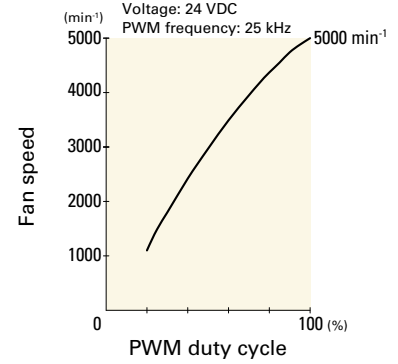
PWM duty cycle



Operating voltage range

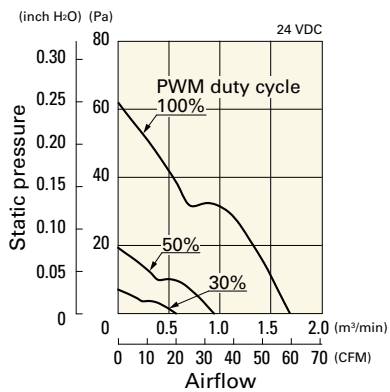


PWM duty - Speed characteristics example

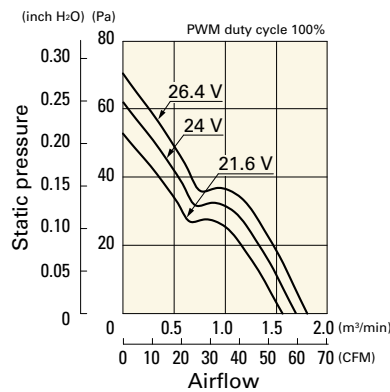


9WL0924P4S001 With pulse sensor with PWM control

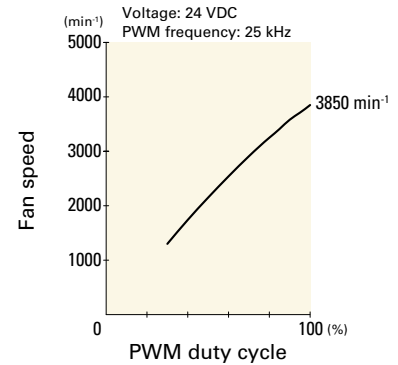
PWM duty cycle



Operating voltage range

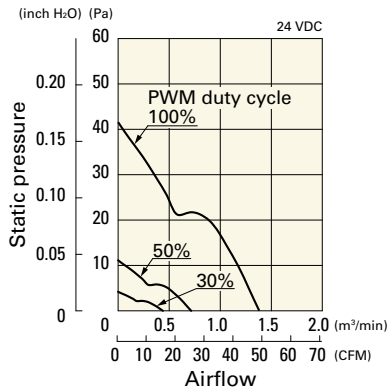


PWM duty - Speed characteristics example

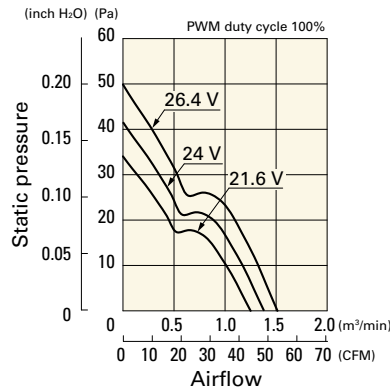


9WL0924P4H001 With pulse sensor with PWM control

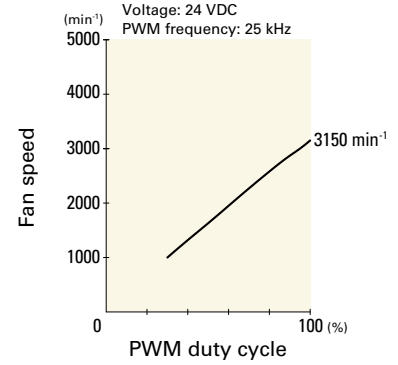
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

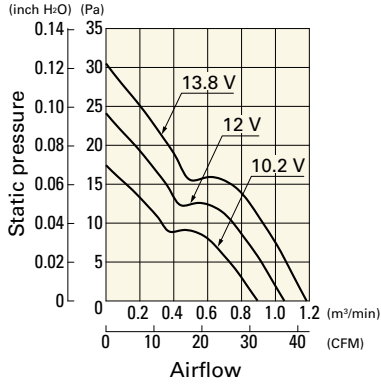


DC
Splash Proof Fan 92 mm sq.

Airflow - Static Pressure Characteristics

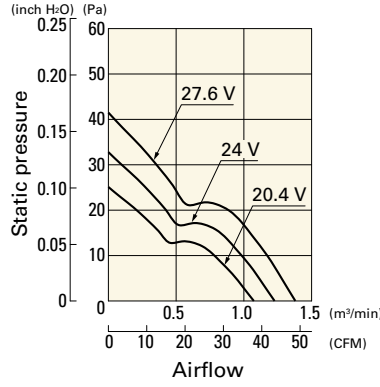
9WL0912M4001 With pulse sensor

Operating voltage range



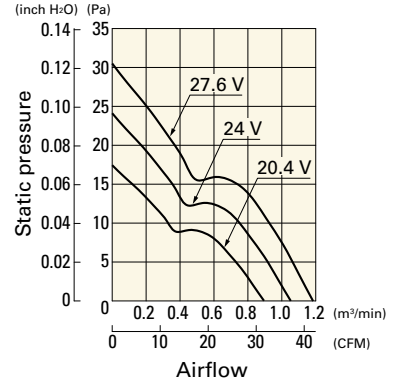
9WL0924F4001 With pulse sensor

Operating voltage range

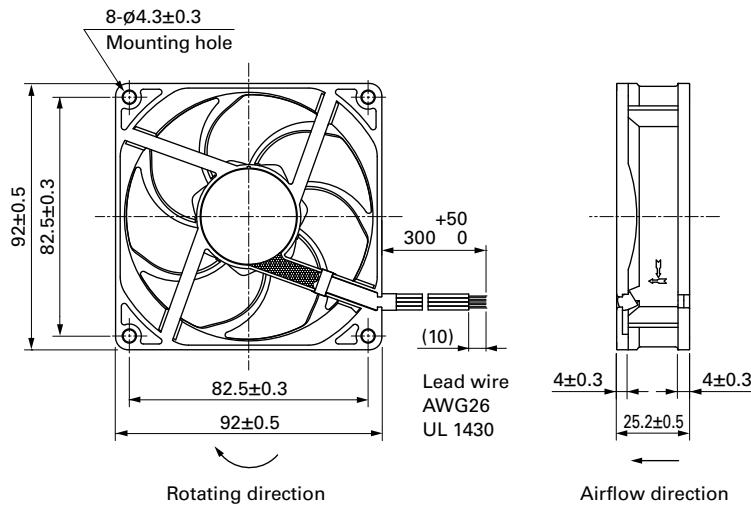


9WL0924M4001 With pulse sensor

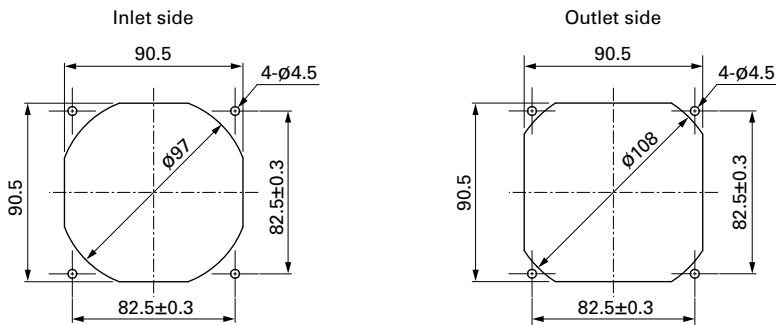
Operating voltage range



Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-101G



92x92x38 mm

San Ace 92W 9WL type

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 300 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|---------------------------|
| 9WL0912P1H001 | 12 | 10.2 to 13.2 | 100 | 1.9 | 22.8 | 9000 | 3.7 130.6 | 430 1.72 | 61 | -20 to +70 | 100000/60°C (135000/40°C) |
| | | | 20 | 0.13 | 1.56 | 2700 | 1.11 39.1 | 48.0 0.19 | 30 | | |
| 9WL0912P1F001 | 12 | 10.2 to 13.2 | 100 | 0.95 | 11.4 | 7000 | 2.9 102.4 | 263 1.05 | 55 | | |
| | | | 20 | 0.1 | 1.2 | 2000 | 0.83 29.3 | 26.3 0.1 | 22 | | |
| 9WL0924P1H001 | 24 | 20.4 to 26.4 | 100 | 0.95 | 22.8 | 9000 | 3.7 130.6 | 430 1.72 | 61 | | |
| | | | 20 | 0.07 | 1.68 | 2700 | 1.11 39.1 | 48.0 0.19 | 30 | | |
| 9WL0924P1F001 | 24 | 20.4 to 26.4 | 100 | 0.5 | 12 | 7000 | 2.9 102.4 | 263 1.05 | 55 | | |
| | | | 20 | 0.06 | 1.44 | 2000 | 0.83 29.3 | 26.3 0.1 | 22 | | |
| 9WL0948P1H601 | 48 | 40.8 to 52.8 | 100 | 0.48 | 23.04 | 9000 | 3.7 130.6 | 430 1.72 | 61 | | |
| | | | 20 | 0.05 | 2.4 | 2700 | 1.11 39.1 | 48.0 0.19 | 30 | | |
| 9WL0948P1F601 | 48 | 40.8 to 52.8 | 100 | 0.24 | 11.52 | 7000 | 2.9 102.4 | 263 1.05 | 55 | | |
| | | | 20 | 0.05 | 2.4 | 2000 | 0.83 29.3 | 26.3 0.1 | 22 | | |

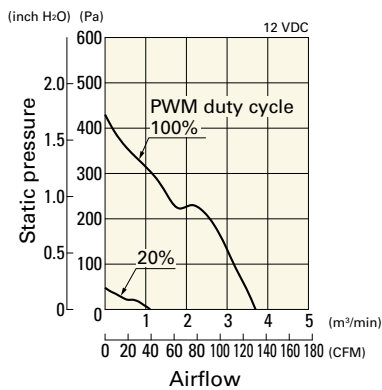
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 655.

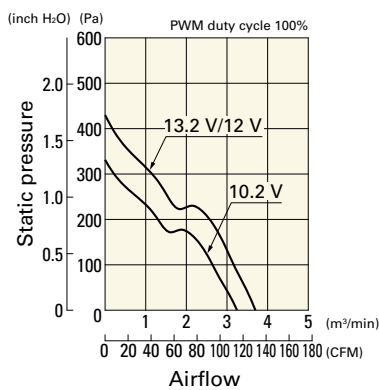
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0912P1H001 With pulse sensor with PWM control

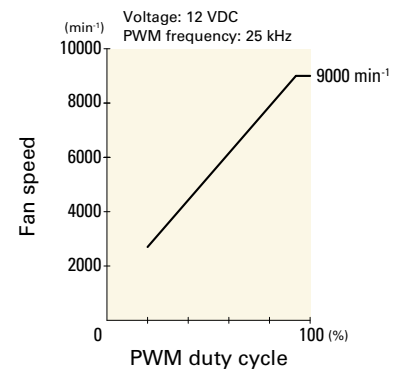
PWM duty cycle



Operating voltage range



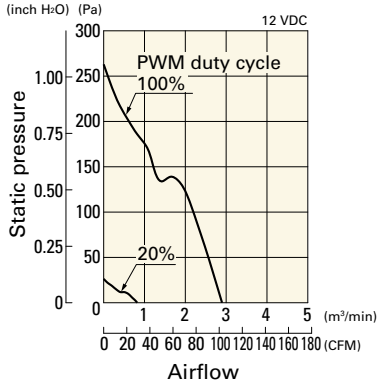
PWM duty - Speed characteristics example



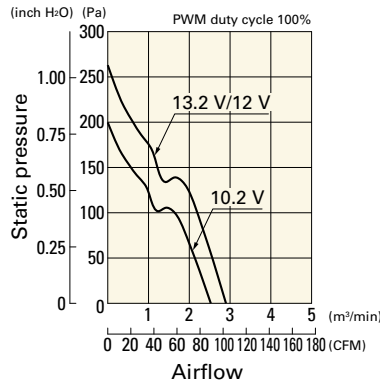
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0912P1F001 With pulse sensor with PWM control

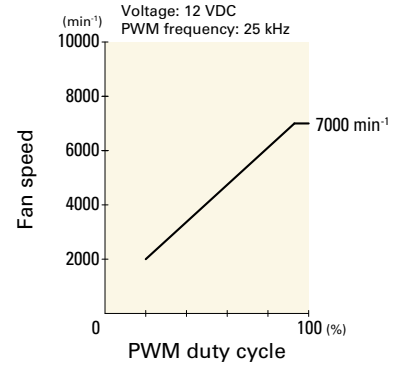
PWM duty cycle



Operating voltage range

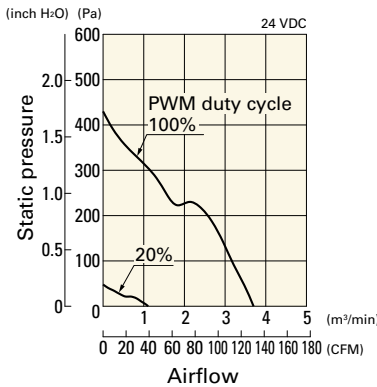


PWM duty - Speed characteristics example

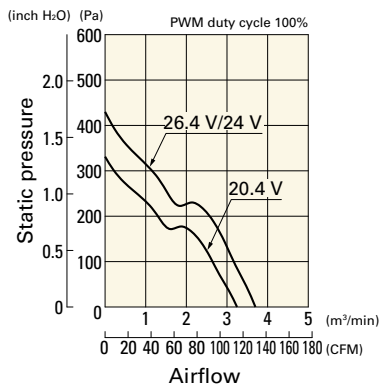


9WL0924P1H001 With pulse sensor with PWM control

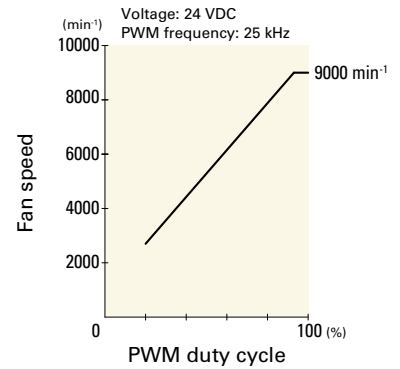
PWM duty cycle



Operating voltage range

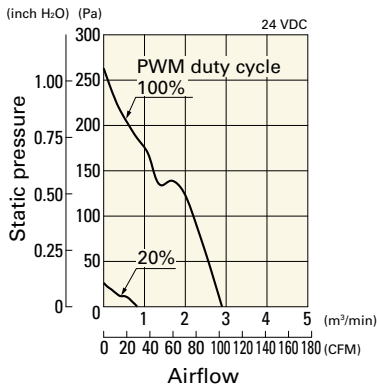


PWM duty - Speed characteristics example

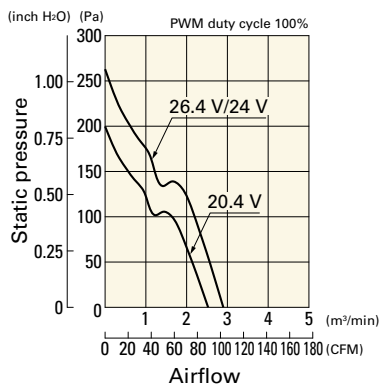


9WL0924P1F001 With pulse sensor with PWM control

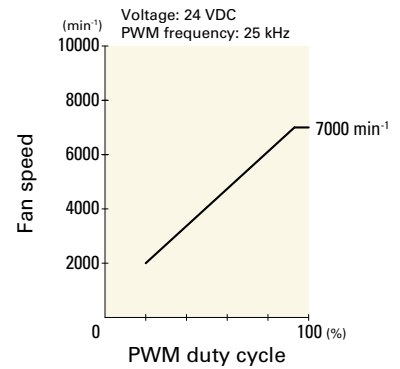
PWM duty cycle



Operating voltage range

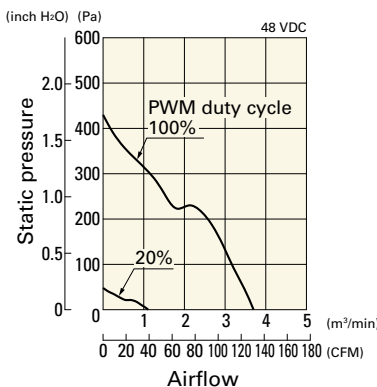


PWM duty - Speed characteristics example

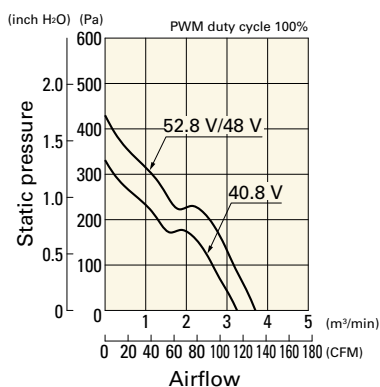


9WL0948P1H601 With pulse sensor with PWM control

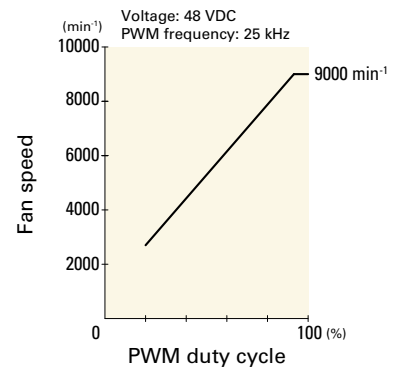
PWM duty cycle



Operating voltage range



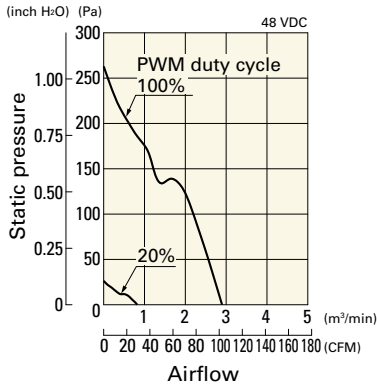
PWM duty - Speed characteristics example



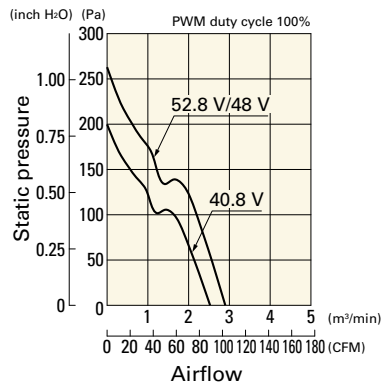
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL0948P1F601 With pulse sensor with PWM control

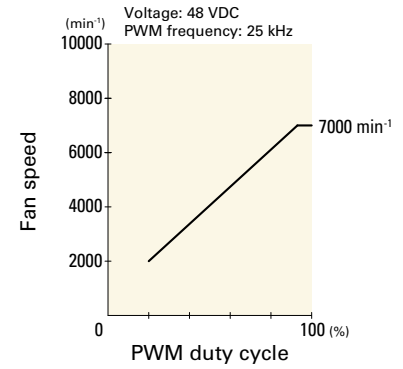
PWM duty cycle



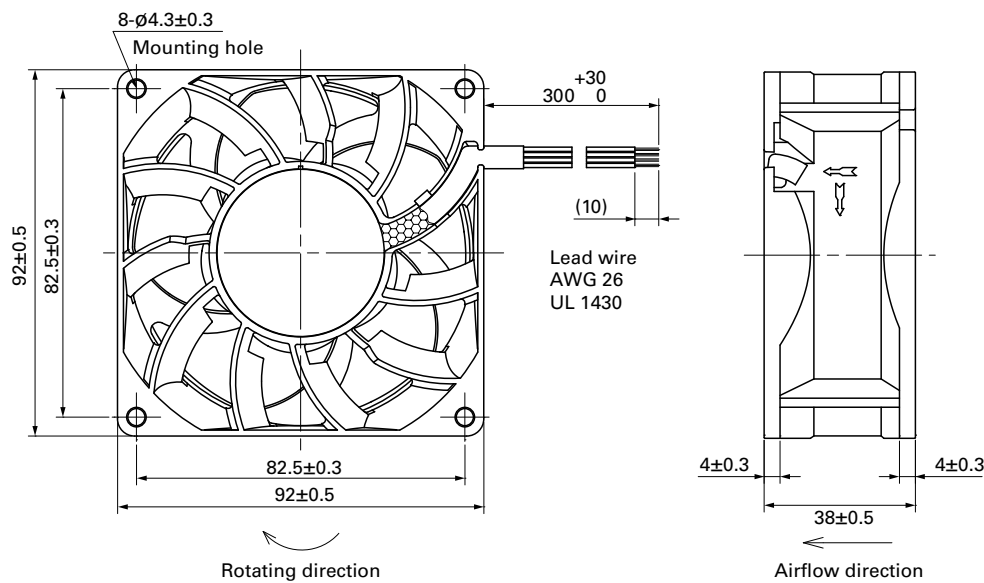
Operating voltage range



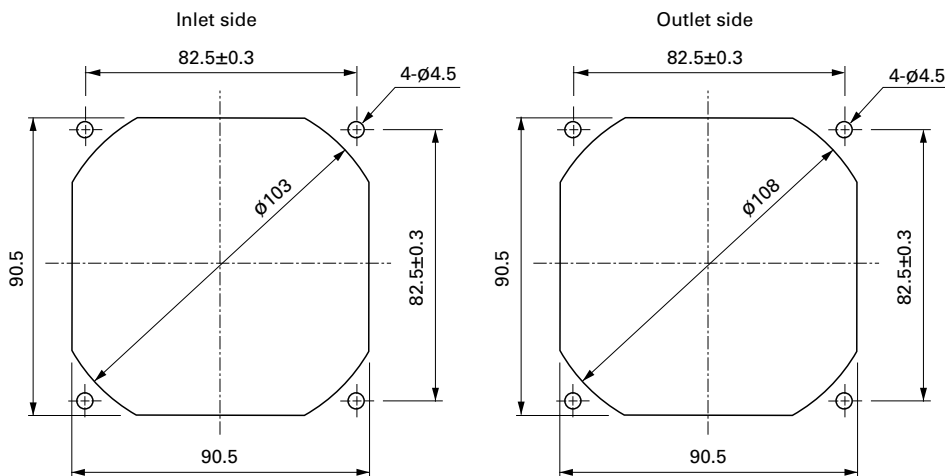
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

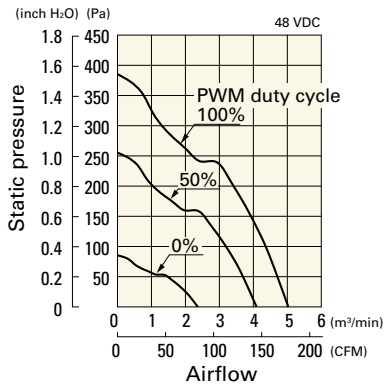
Model no.: 109-1001G

DC
Splash Proof Fan 92 mm sq.

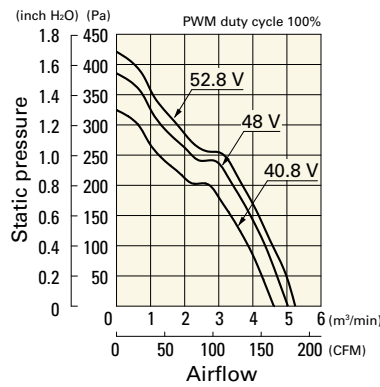
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WV0948P1H001 With pulse sensor with PWM control

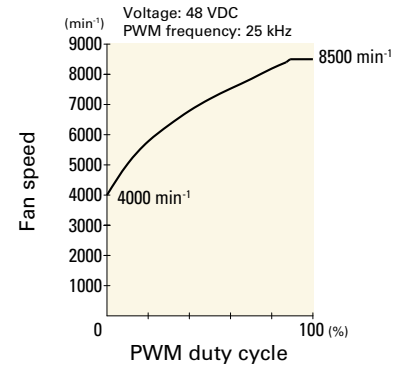
PWM duty cycle



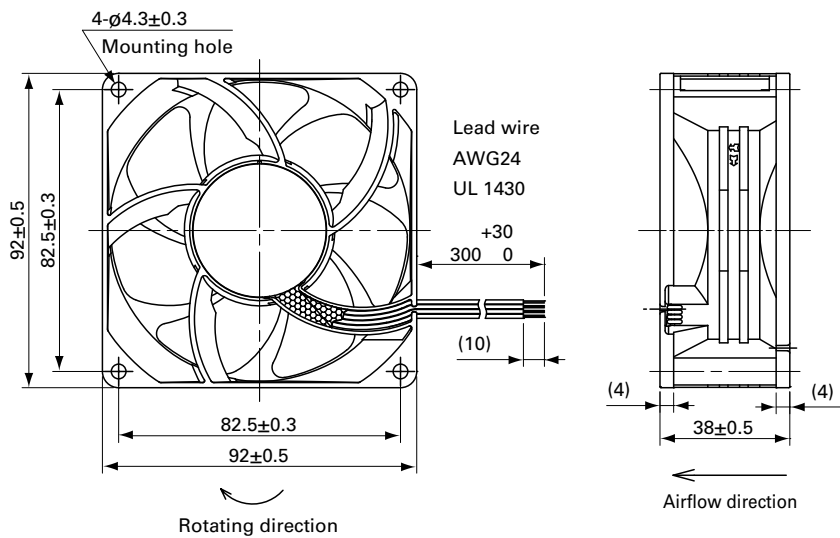
Operating voltage range



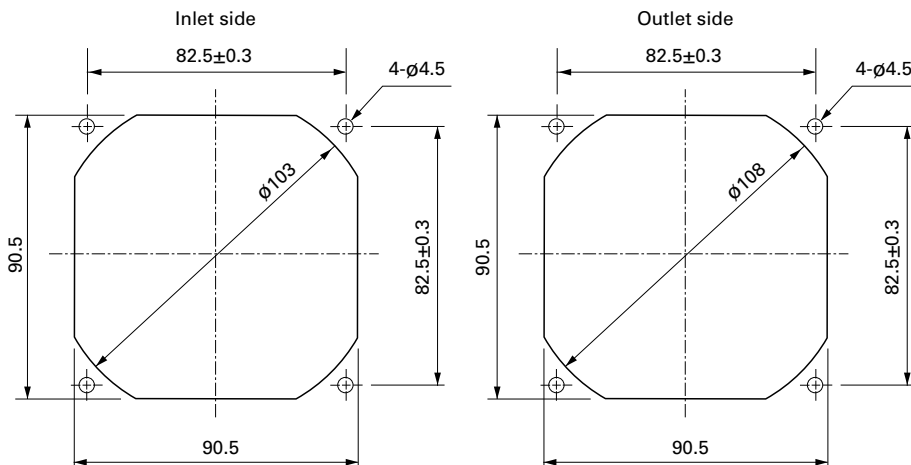
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H




Resin finger guards

page: p. 605

Model no.: 109-1001G



120x120x38 mm

San Ace 120W 9WV type   

DC
Splash Proof Fan 120 mm sq.

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 440 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WV1212P1J001 | 12 | 10.2 to 13.8 | 100 | 3 | 36 | 6400 | 6.35 224.0 | 360 1.45 | 64 | -20 to +70 | 60000/60°C (90000/40°C) |
| | | | 0 | 0.2 | 2.4 | 1500 | 1.49 52.6 | 19.8 0.08 | 33 | | |
| 9WV1224P1J601 | 24 | 20.4 to 27.6 | 100 | 1.5 | 36 | 6400 | 6.35 224.0 | 360 1.45 | 64 | | |
| | | | 0 | 0.12 | 2.88 | 1500 | 1.49 52.6 | 26.1 0.105 | 33 | | |
| 9WV1224P1H001 | 24 | 20.4 to 27.6 | 100 | 0.8 | 19.2 | 5200 | 5.16 182 | 237 0.95 | 58 | | |
| 0 | | | 0.65 | 31.2 | 6400 | 6.35 224.0 | 360 1.45 | 64 | | | |
| 9WV1248P1J001 | 48 | 40.8 to 55.2 | 100 | 0.65 | 31.2 | 6400 | 6.35 224.0 | 360 1.45 | 64 | | |
| | | | 0 | 0.06 | 2.88 | 1500 | 1.49 52.6 | 26.1 0.105 | 33 | | |

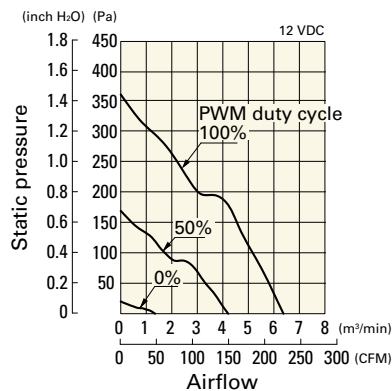
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 657.

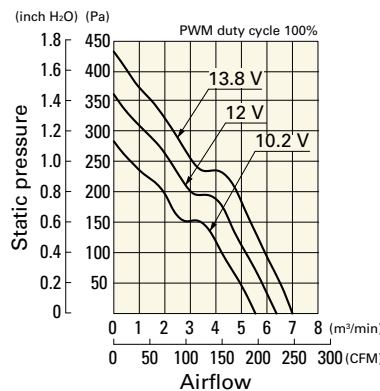
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WV1212P1J001 With pulse sensor with PWM control

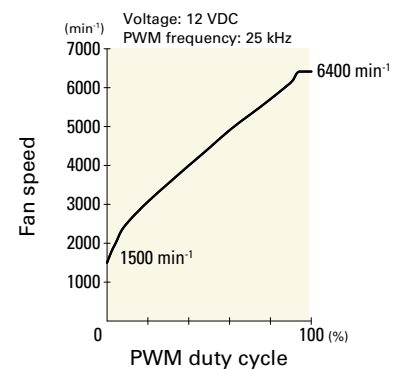
PWM duty cycle



Operating voltage range



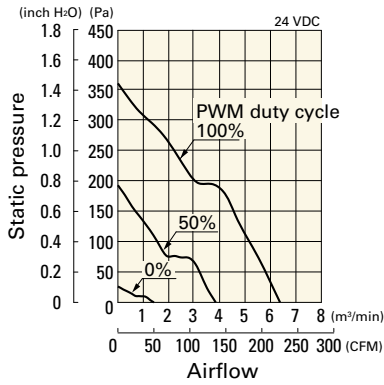
PWM duty - Speed characteristics example



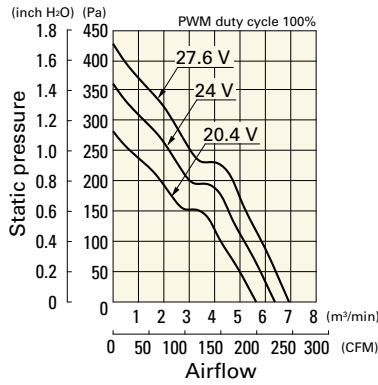
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WV1224P1J601 With pulse sensor with PWM control

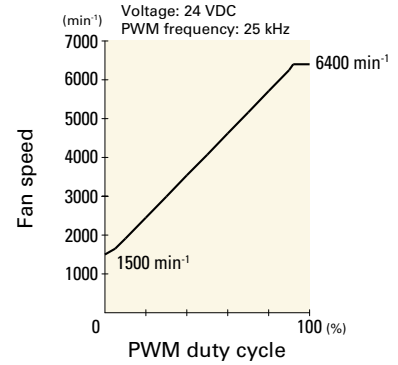
PWM duty cycle



Operating voltage range

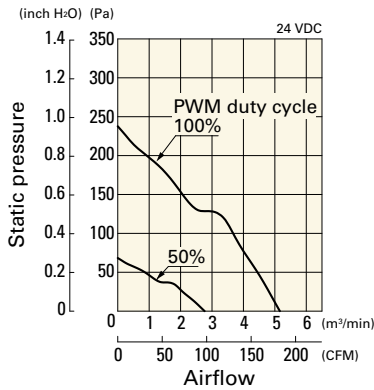


PWM duty - Speed characteristics example

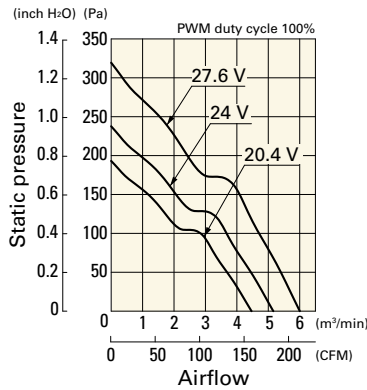


9WV1224P1H001 With pulse sensor with PWM control

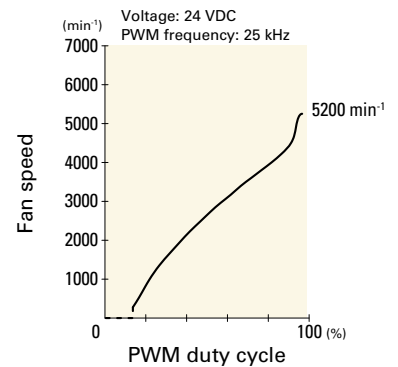
PWM duty cycle



Operating voltage range

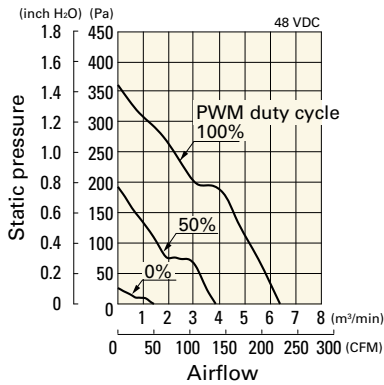


PWM duty - Speed characteristics example

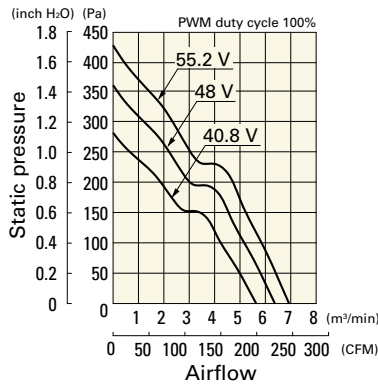


9WV1248P1J001 With pulse sensor with PWM control

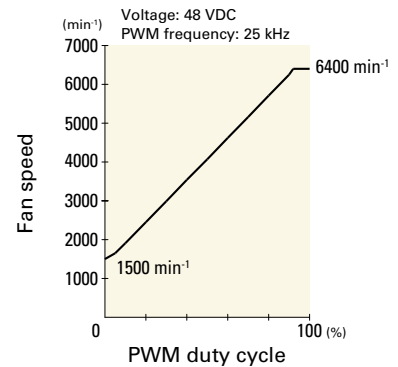
PWM duty cycle



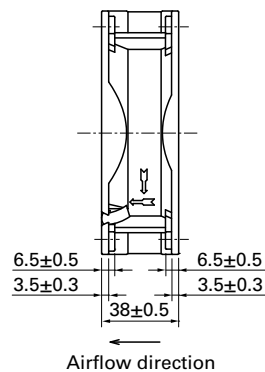
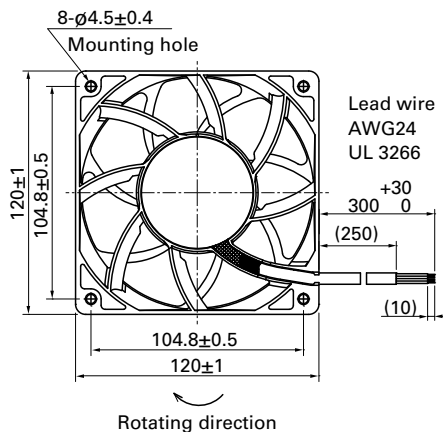
Operating voltage range



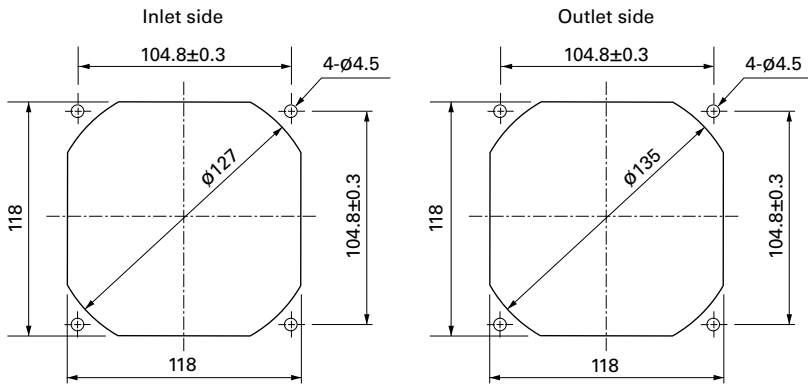
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G



120×120×38 mm

San Ace 120W 9WG type

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue (Sensor) Yellow
- Mass 410 g
- Ingress protection IP55 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor**.

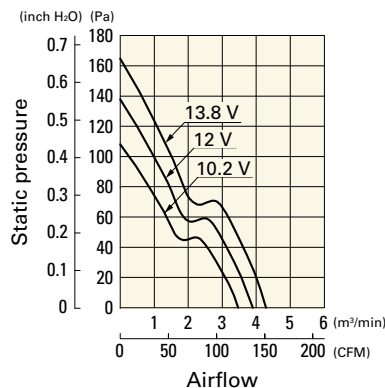
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| 9WG1212G101-E | 12 | 10.2 to 13.8 | 0.98 | 11.76 | 3600 | 3.88 137 | 135 0.542 | 49 | -20 to +70 | 80000/60°C (115000/40°C) |
| 9WG1212E101-E | | | 0.61 | 7.32 | 3100 | 3.34 118 | 100 0.402 | 46 | | |
| 9WG1212H101-E | | 7 to 13.8 | 0.38 | 4.56 | 2600 | 2.8 99 | 70.4 0.283 | 39 | | 100000/60°C (135000/40°C) |
| 9WG1212F101-E | | | 0.28 | 3.36 | 2280 | 2.45 87 | 54.2 0.218 | 36 | | |
| 9WG1212M101-E | | | 0.21 | 2.52 | 1950 | 2.1 74 | 39.6 0.159 | 32 | | |
| 9WG1224G101-E | 24 | 20.4 to 27.6 | 0.5 | 12 | 3600 | 3.88 137 | 135 0.542 | 49 | | 80000/60°C (115000/40°C) |
| 9WG1224E101-E | | | 0.34 | 8.16 | 3100 | 3.34 118 | 100 0.402 | 46 | | |
| 9WG1224H101-E | | 14 to 27.6 | 0.22 | 5.28 | 2600 | 2.8 99 | 70.4 0.283 | 39 | | 100000/60°C (135000/40°C) |
| 9WG1224F101-E | | | 0.16 | 3.84 | 2280 | 2.45 87 | 54.2 0.218 | 36 | | |
| 9WG1224M101-E | | | 0.11 | 2.64 | 1950 | 2.1 74 | 39.6 0.159 | 32 | | |
| 9WG1248G101-E | 48 | 40.8 to 55.2 | 0.25 | 12 | 3600 | 3.88 137 | 135 0.542 | 49 | | 80000/60°C (115000/40°C) |
| 9WG1248E101-E | | | 0.17 | 8.16 | 3100 | 3.34 118 | 100 0.402 | 46 | | |
| 9WG1248H101-E | | | 0.11 | 5.28 | 2600 | 2.8 99 | 70.4 0.283 | 39 | | 100000/60°C (135000/40°C) |
| 9WG1248F101-E | | | 0.09 | 4.32 | 2280 | 2.45 87 | 54.2 0.218 | 36 | | |
| 9WG1248M101-E | | | 0.07 | 3.36 | 1950 | 2.1 74 | 39.6 0.159 | 32 | | |

Note: Sensor and control options are available for selection. Refer to the table on pp. 654 to 655.

Airflow - Static Pressure Characteristics

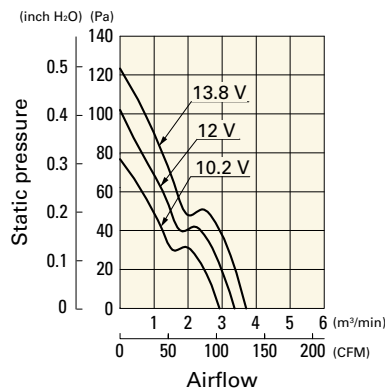
9WG1212G101-E With pulse sensor

Operating voltage range



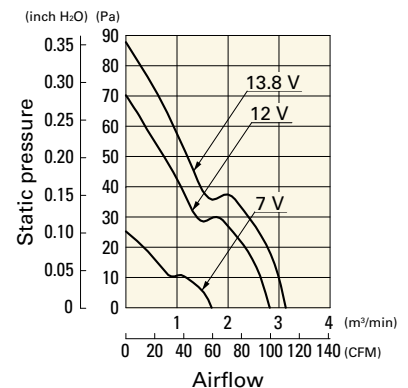
9WG1212E101-E With pulse sensor

Operating voltage range



9WG1212H101-E With pulse sensor

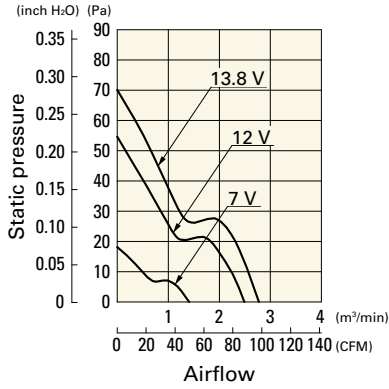
Operating voltage range



Airflow - Static Pressure Characteristics

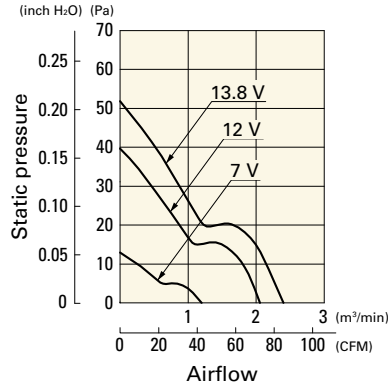
9WG1212F101-E With pulse sensor

Operating voltage range



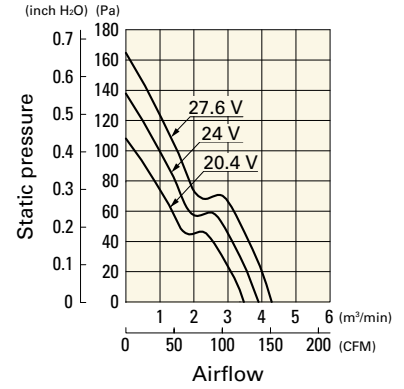
9WG1212M101-E With pulse sensor

Operating voltage range



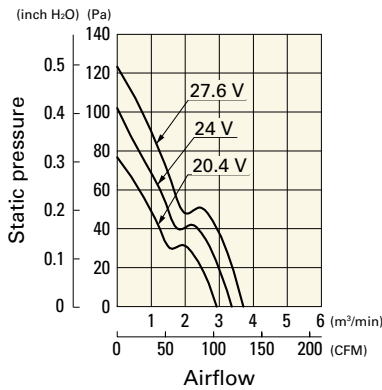
9WG1224G101-E With pulse sensor

Operating voltage range



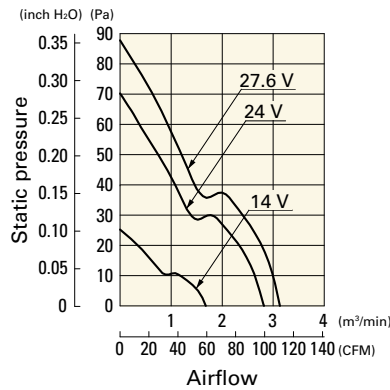
9WG1224E101-E With pulse sensor

Operating voltage range



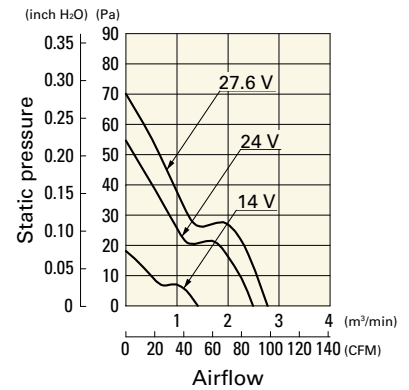
9WG1224H101-E With pulse sensor

Operating voltage range



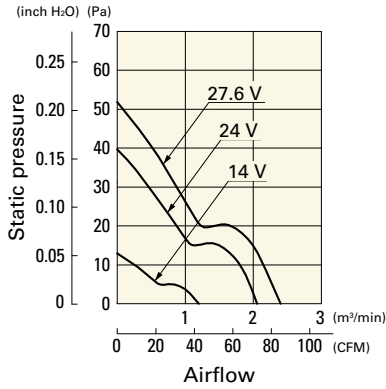
9WG1224F101-E With pulse sensor

Operating voltage range



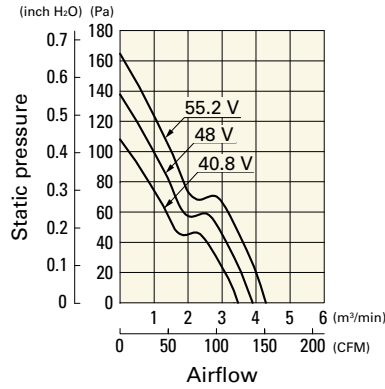
9WG1224M101-E With pulse sensor

Operating voltage range



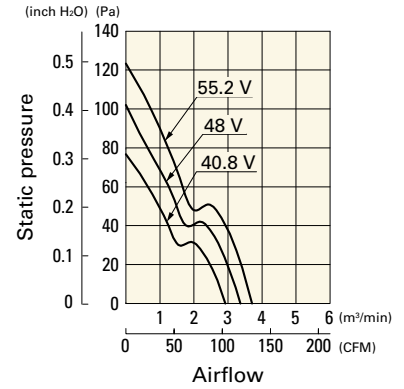
9WG1248G101-E With pulse sensor

Operating voltage range



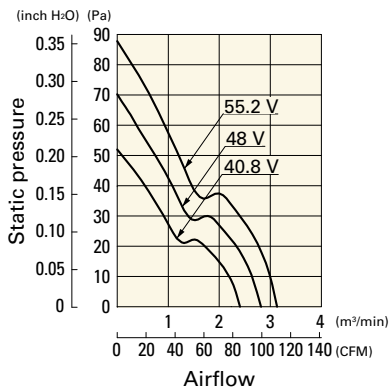
9WG1248E101-E With pulse sensor

Operating voltage range



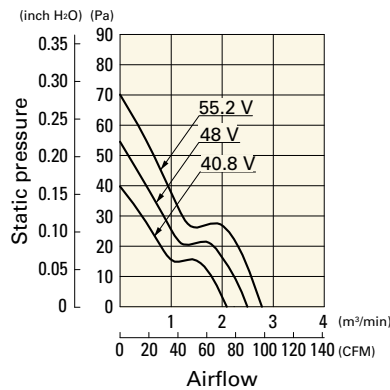
9WG1248H101-E With pulse sensor

Operating voltage range



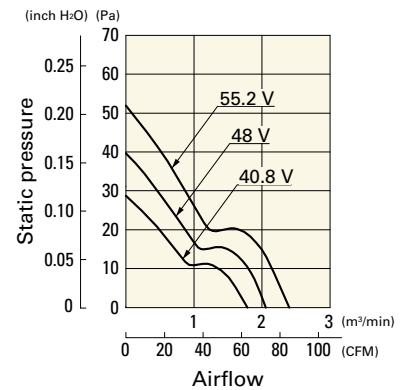
9WG1248F101-E With pulse sensor

Operating voltage range

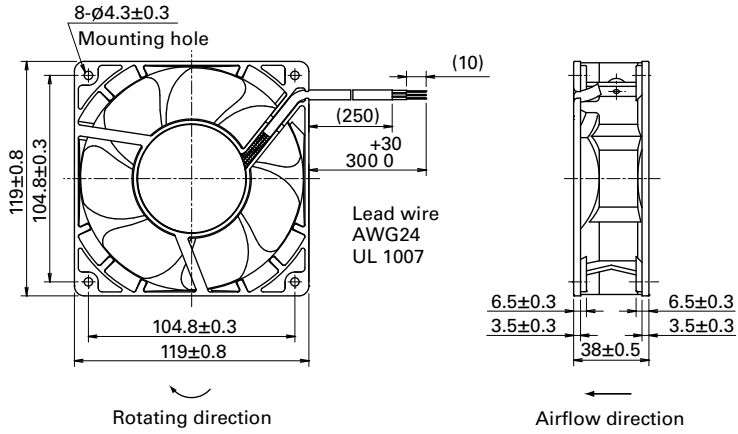


9WG1248M101-E With pulse sensor

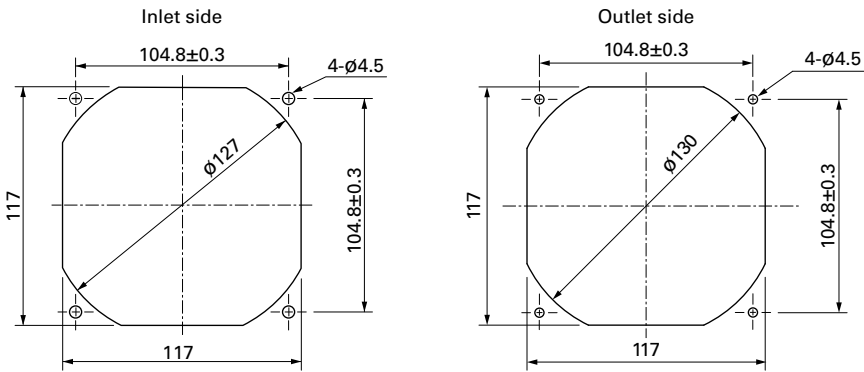
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G



120x120x38 mm

San Ace 120W 9WP_{type}

DC
Splash Proof Fan 120 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 360 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

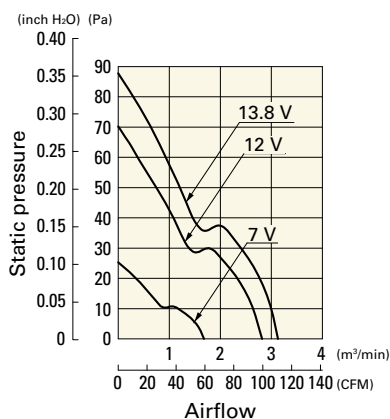
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WP1212H101 | 12 | 7 to 13.8 | 0.38 | 4.56 | 2600 | 2.8 99 | 70.4 0.283 | 39 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9WP1212M101 | | | 0.21 | 2.52 | 1950 | 2.1 74.2 | 39.6 0.159 | 32 | | |
| 9WP1212L101 | | 10.2 to 13.8 | 0.14 | 1.68 | 1500 | 1.62 57.2 | 23.4 0.094 | 26 | | |
| 9WP1224H101 | 24 | 14 to 27.6 | 0.22 | 5.28 | 2600 | 2.8 99 | 70.4 0.283 | 39 | | |
| 9WP1224M101 | | | 0.11 | 2.64 | 1950 | 2.1 74.2 | 39.6 0.159 | 32 | | |
| 9WP1248H101 | 48 | 40.8 to 55.2 | 0.11 | 5.28 | 2600 | 2.8 99 | 70.4 0.283 | 39 | | |
| 9WP1248M101 | | | 0.07 | 3.36 | 1950 | 2.1 74.2 | 39.6 0.159 | 32 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 656.

Airflow - Static Pressure Characteristics

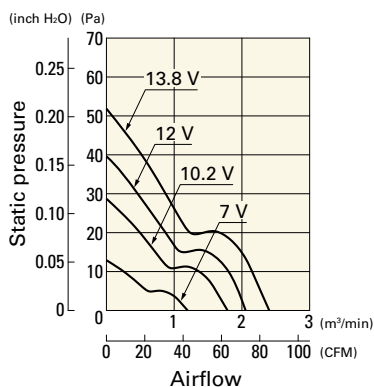
9WP1212H101 With pulse sensor

Operating voltage range



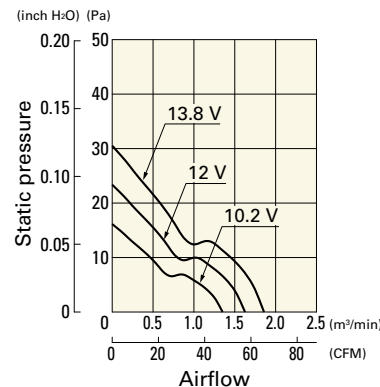
9WP1212M101 With pulse sensor

Operating voltage range



9WP1212L101 With pulse sensor

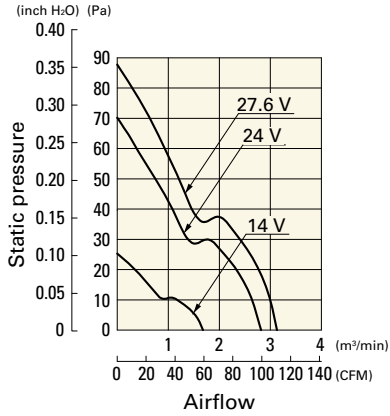
Operating voltage range



Airflow - Static Pressure Characteristics

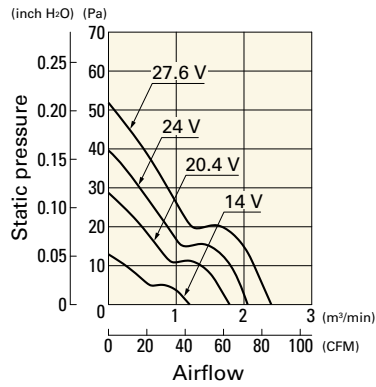
9WP1224H101 With pulse sensor

Operating voltage range



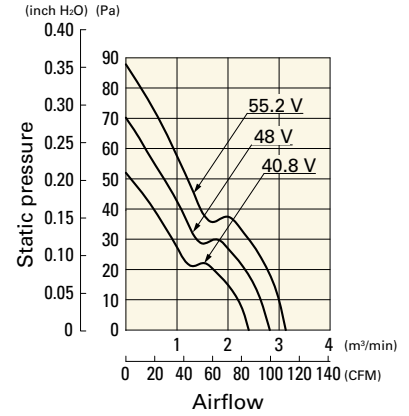
9WP1224M101 With pulse sensor

Operating voltage range



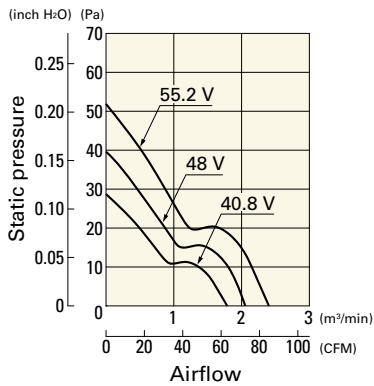
9WP1248H101 With pulse sensor

Operating voltage range

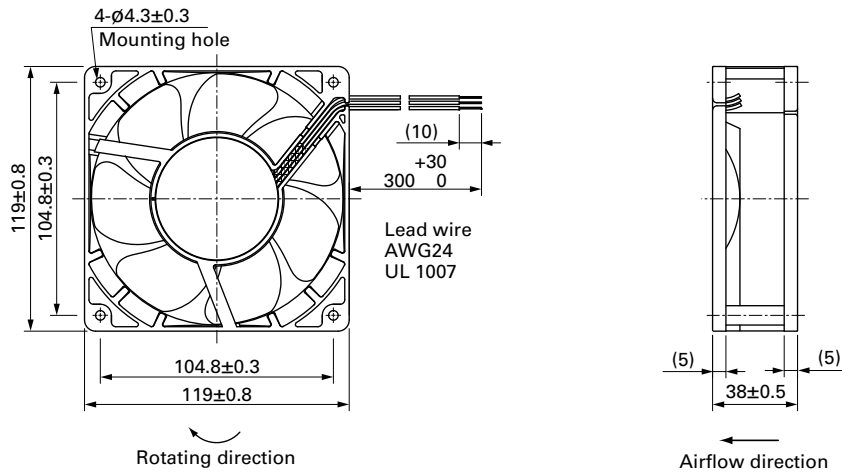


9WP1248M101 With pulse sensor

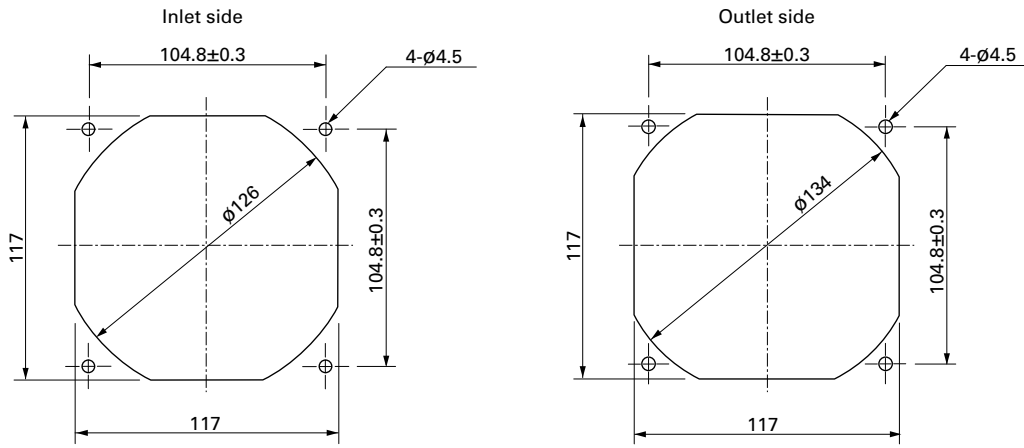
Operating voltage range



Dimensions (unit: mm) (With ribs)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K




Resin finger guards

page: p. 605

Model no.: 109-1000G



140x140x38 mm

San Ace 140W 9WL type   

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 740 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|----|
| 9WL1412P1A001 | 12 | 10.2 to 13.8 | 100 | 3.72 | 44.64 | 6900 | 8.0 282 | 516 2.07 | 68 | -20 to +70 | 100000/60°C (135000/40°C) | |
| | | | 20 | 0.27 | 3.24 | 2300 | 2.66 93 | 80 0.32 | 39 | | | |
| 9WL1412P1H001 | | | 100 | 1.7 | 20.4 | 5200 | 6.0 212 | 300 1.2 | 62 | | | |
| | | | 20 | 0.27 | 3.24 | 2300 | 2.66 93 | 80 0.32 | 39 | | | |
| 9WL1412P1M001 | | | 100 | 0.6 | 7.2 | 3300 | 3.7 130 | 170 0.68 | 46 | | | |
| | | | 20 | 0.16 | 1.92 | 1300 | 1.45 51 | 26 0.1 | 29 | | | |
| 9WL1424P1A001 | | 24 | 20.4 to 27.6 | 100 | 1.86 | 44.64 | 6900 | 8.0 282 | 516 2.07 | | | 68 |
| | | | | 20 | 0.17 | 4.08 | 2300 | 2.66 93 | 80 0.32 | | | 39 |
| 9WL1424P1H001 | | | | 100 | 0.85 | 20.4 | 5200 | 6.0 212 | 300 1.2 | | | 62 |
| | | | | 20 | 0.16 | 3.84 | 2300 | 2.66 93 | 80 0.32 | | | 39 |
| 9WL1424P1M001 | | | | 100 | 0.3 | 7.2 | 3300 | 3.7 130 | 170 0.68 | | | 46 |
| | | | | 20 | 0.11 | 2.64 | 1300 | 1.45 51 | 26 0.1 | | | 29 |
| 9WL1448P1A001 | 48 | 40.8 to 55.2 | 100 | 0.92 | 44.16 | 6900 | 8.0 282 | 516 2.07 | 68 | | | |
| | | | 20 | 0.11 | 5.28 | 2300 | 2.66 93 | 80 0.32 | 39 | | | |
| 9WL1448P1H001 | | | 100 | 0.42 | 20.16 | 5200 | 6.0 212 | 300 1.2 | 62 | | | |
| | | | 20 | 0.11 | 5.28 | 2300 | 2.66 93 | 80 0.32 | 39 | | | |
| 9WL1448P1M001 | | | 100 | 0.15 | 7.2 | 3300 | 3.7 130 | 170 0.68 | 46 | | | |
| | | | 20 | 0.09 | 4.32 | 1300 | 1.45 51 | 26 0.1 | 29 | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have a pulse sensor.**

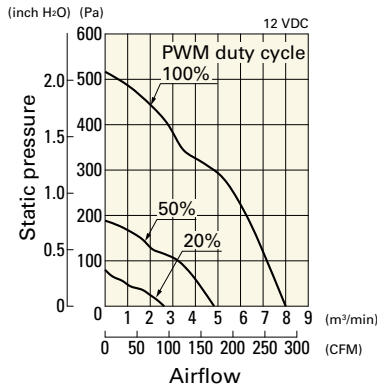
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| 9WL1448L1001 | 48 | 40.8 to 55.2 | 0.11 | 5.3 | 2300 | 2.6 91.9 | 80 0.32 | 39 | -20 to +70 | 100000/60°C (135000/40°C) |

Note: Sensor and control options are available for selection. Refer to the table on pp. 655 to 656.

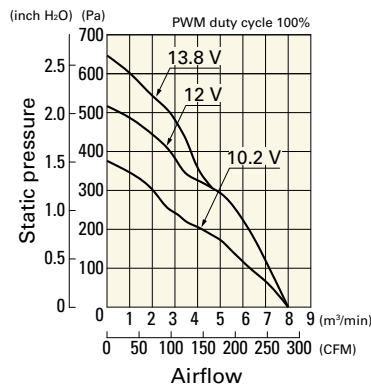
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL1412P1A001 With pulse sensor with PWM control

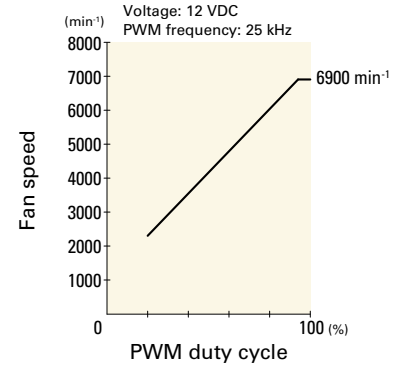
PWM duty cycle



Operating voltage range

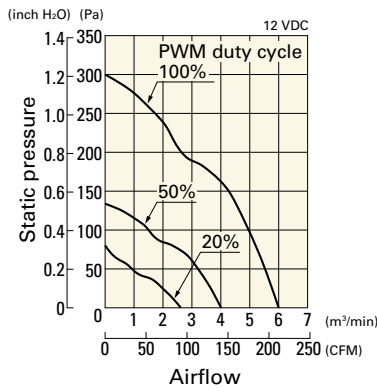


PWM duty - Speed characteristics example

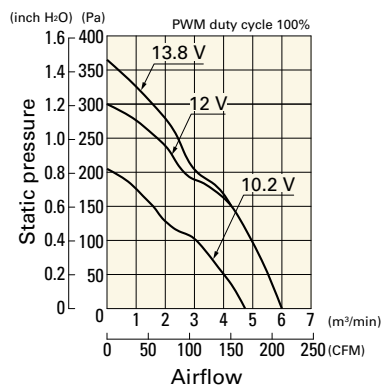


9WL1412P1H001 With pulse sensor with PWM control

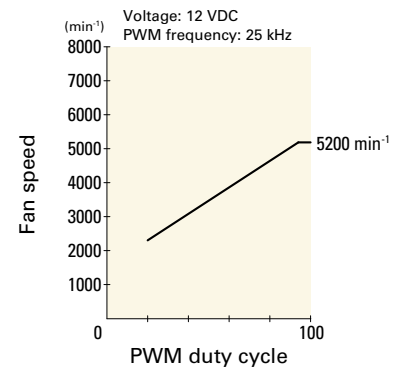
PWM duty cycle



Operating voltage range

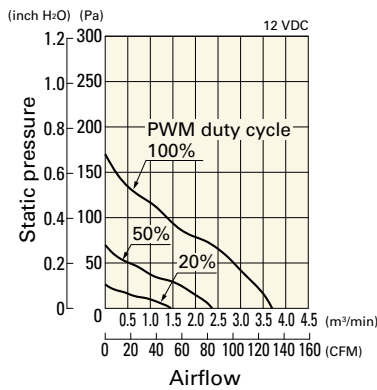


PWM duty - Speed characteristics example

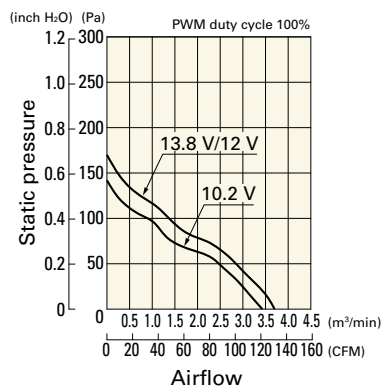


9WL1412P1M001 With pulse sensor with PWM control

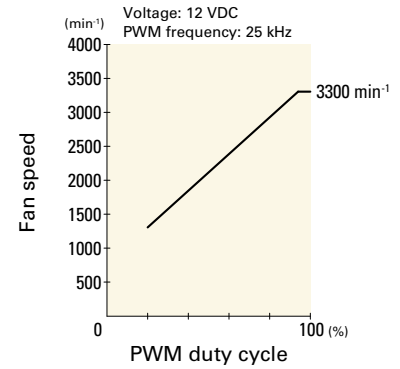
PWM duty cycle



Operating voltage range

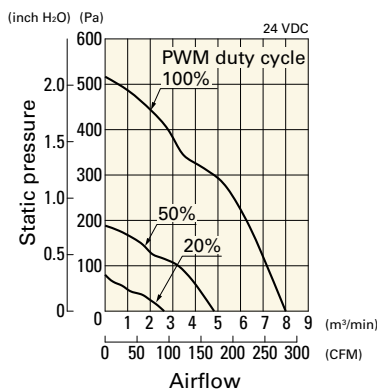


PWM duty - Speed characteristics example

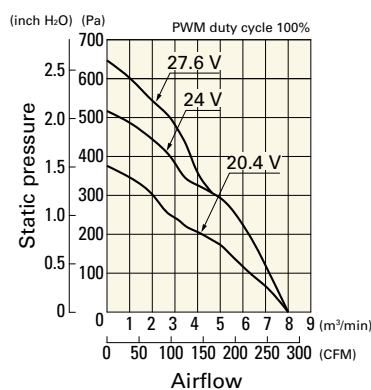


9WL1424P1A001 With pulse sensor with PWM control

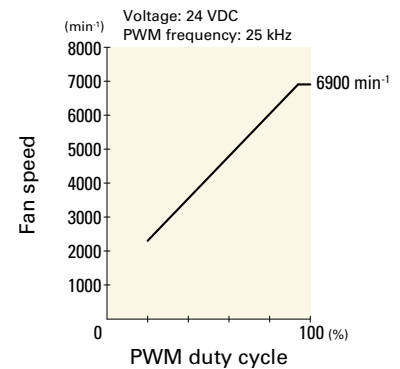
PWM duty cycle



Operating voltage range



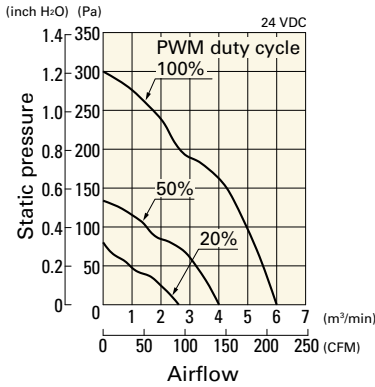
PWM duty - Speed characteristics example



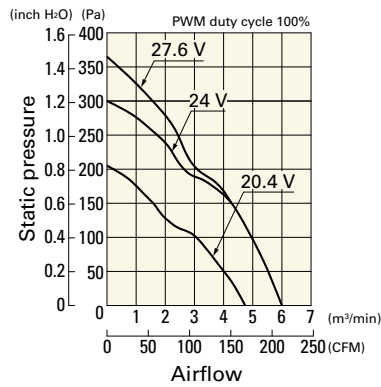
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL1424P1H001 With pulse sensor with PWM control

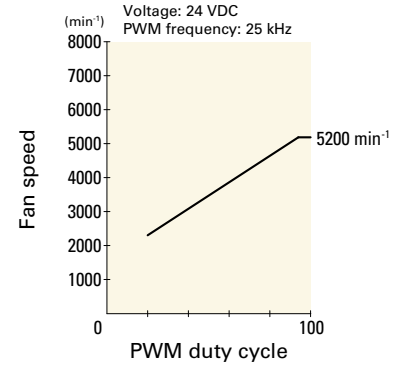
PWM duty cycle



Operating voltage range

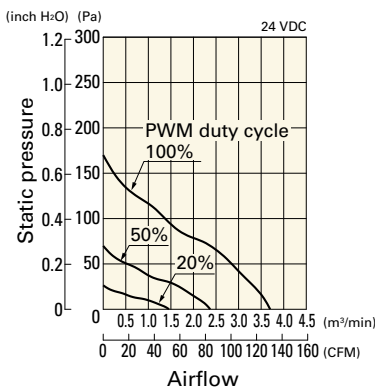


PWM duty - Speed characteristics example

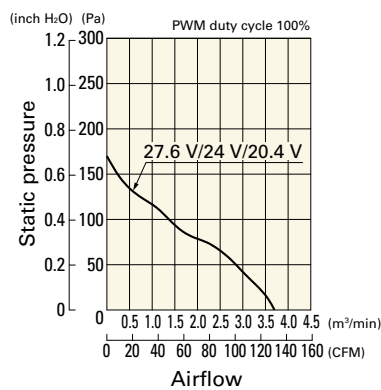


9WL1424P1M001 With pulse sensor with PWM control

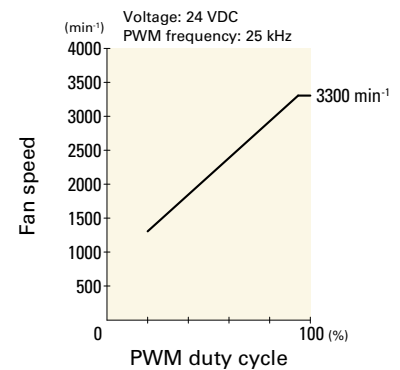
PWM duty cycle



Operating voltage range

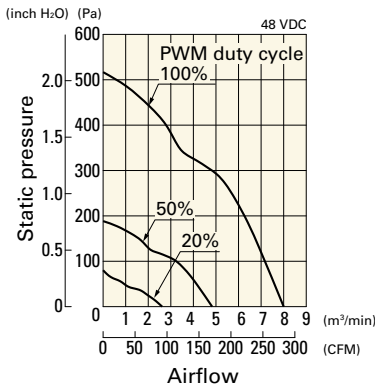


PWM duty - Speed characteristics example

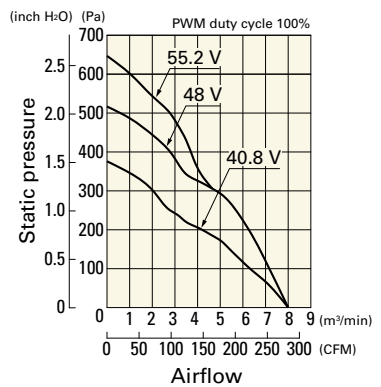


9WL1448P1A001 With pulse sensor with PWM control

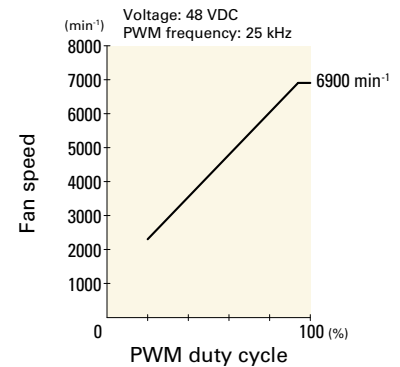
PWM duty cycle



Operating voltage range

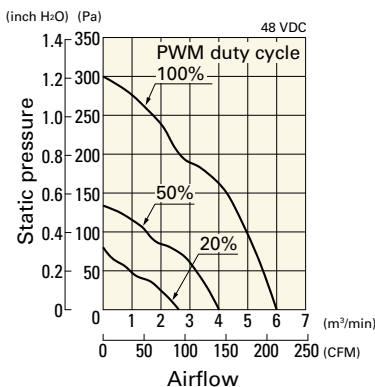


PWM duty - Speed characteristics example

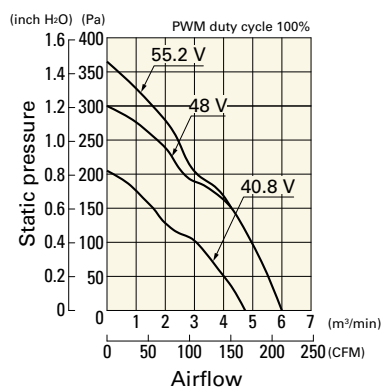


9WL1448P1H001 With pulse sensor with PWM control

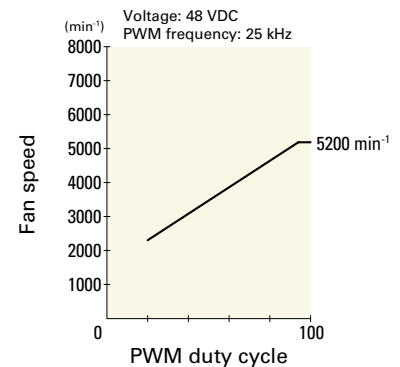
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

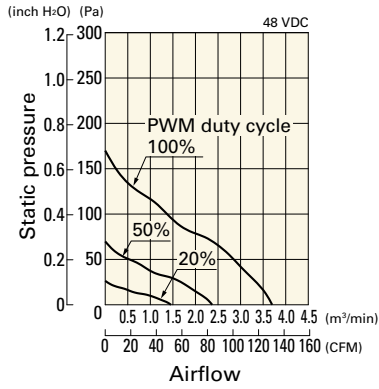


DC
Splash Proof Fan 140 mm sq.

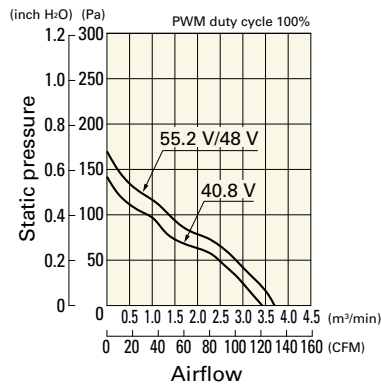
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL1448P1M001 With pulse sensor with PWM control

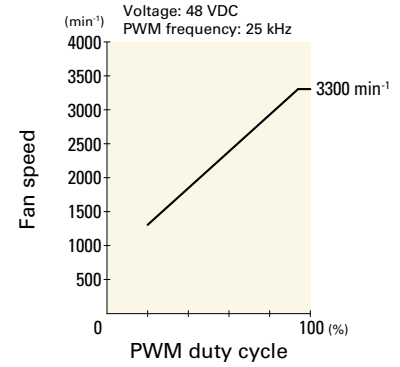
PWM duty cycle



Operating voltage range



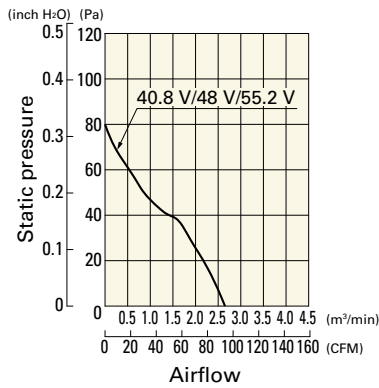
PWM duty - Speed characteristics example



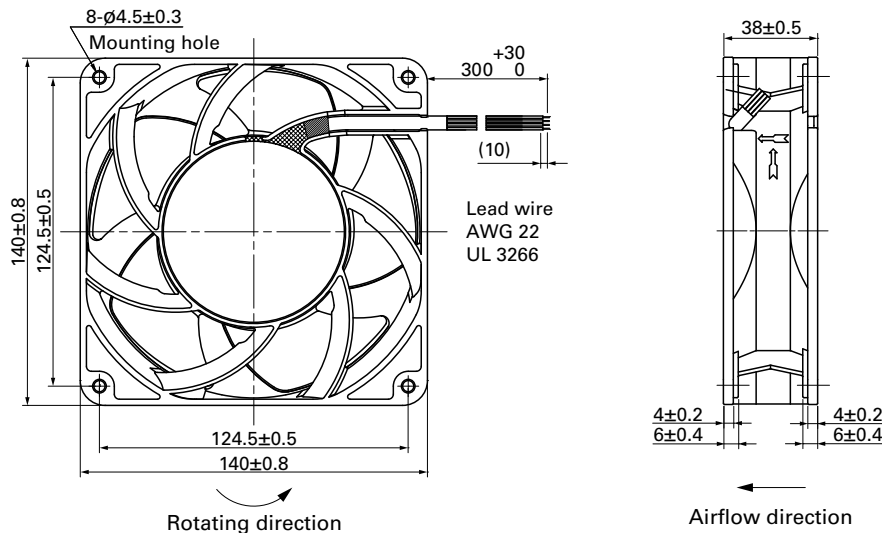
Airflow - Static Pressure Characteristics

9WL1448L1001 With pulse sensor

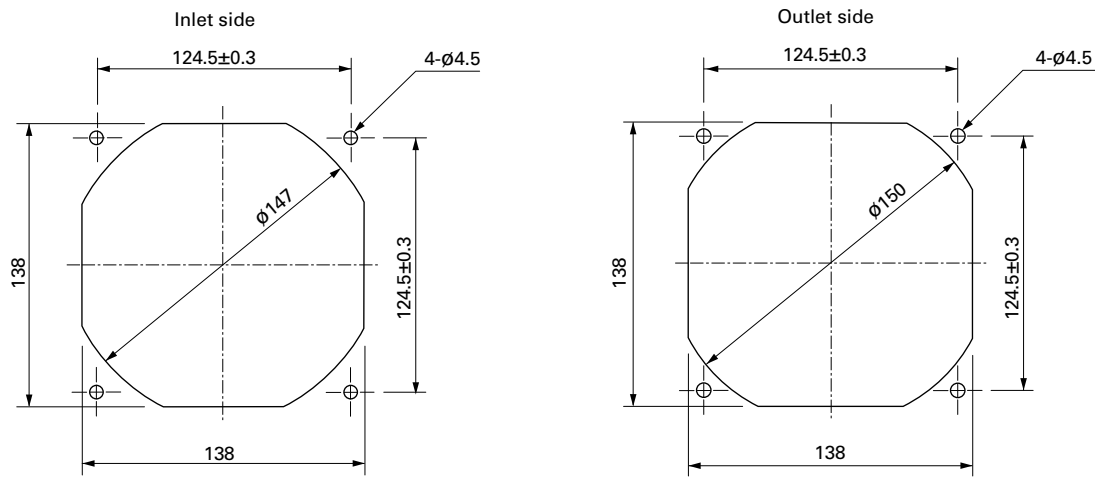
Operating voltage range



Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options




Finger guards

page: p. 599

Model no.: 109-719, 109-719H



140x140x51 mm

San Ace 140W 9WL type   

DC
Splash Proof Fan 140 mm sq.

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 930 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| 9WL1412P5G001 | 12 | 10.2 to 13.8 | 100 | 5.16 | 62 | 7500 | 9.0 318 | 655 2.63 | 69 | -20 to +70 | 100000/60°C (135000/40°C) |
| | | | 20 | 0.31 | 3.72 | 2300 | 2.75 97 | 80 0.32 | 38 | | |
| 9WL1412P5S001 | 12 | 10.2 to 13.8 | 100 | 1.83 | 22 | 5000 | 6.0 212 | 295 1.18 | 57 | | |
| | | | 20 | 0.31 | 3.72 | 2300 | 2.75 97 | 80 0.32 | 38 | | |
| 9WL1424P5G001 | 24 | 20.4 to 27.6 | 100 | 2.58 | 62 | 7500 | 9.0 318 | 655 2.63 | 69 | | |
| | | | 20 | 0.16 | 3.84 | 2300 | 2.75 97 | 80 0.32 | 38 | | |
| 9WL1424P5S001 | 24 | 20.4 to 27.6 | 100 | 0.91 | 22 | 5000 | 6.0 212 | 295 1.18 | 57 | | |
| | | | 20 | 0.16 | 3.84 | 2300 | 2.75 97 | 80 0.32 | 38 | | |
| 9WL1448P5G001 | 48 | 40.8 to 55.2 | 100 | 1.29 | 62 | 7500 | 9.0 318 | 655 2.63 | 69 | | |
| | | | 20 | 0.12 | 5.76 | 2300 | 2.75 97 | 80 0.32 | 38 | | |
| 9WL1448P5S001 | 48 | 40.8 to 55.2 | 100 | 0.45 | 22 | 5000 | 6.0 212 | 295 1.18 | 57 | | |
| | | | 20 | 0.12 | 5.76 | 2300 | 2.75 97 | 80 0.32 | 38 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have a pulse sensor.**

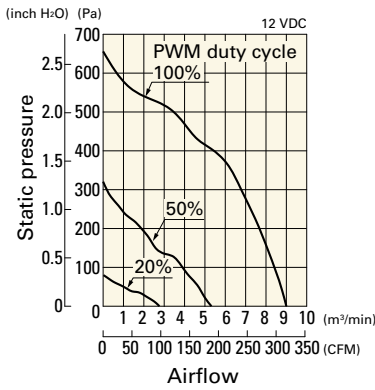
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| 9WL1412A5001 | 12 | 10.2 to 13.8 | 2.61 | 31.4 | 5700 | 6.9 243.8 | 500 2 | 61 | -20 to +70 | 100000/60°C (135000/40°C) |
| 9WL1412H5001 | | | 1 | 12 | 4100 | 4.9 173.1 | 260 1.04 | 52 | | |
| 9WL1412M5001 | | | 0.43 | 5.16 | 2600 | 3.1 109.5 | 100 0.4 | 40 | | |
| 9WL1424A5001 | 24 | 20.4 to 27.6 | 1.21 | 29.10 | 5700 | 6.9 243.8 | 540 2.17 | 61 | | |
| 9WL1424H5001 | | | 0.55 | 13.2 | 4100 | 4.9 173.1 | 260 1.04 | 52 | | |
| 9WL1424M5001 | | | 0.23 | 5.52 | 2600 | 3.1 109.5 | 100 0.4 | 40 | | |
| 9WL1448A5001 | 48 | 40.8 to 55.2 | 0.66 | 31.7 | 5700 | 6.9 243.8 | 540 2.17 | 61 | | |
| 9WL1448H5001 | | | 0.31 | 14.9 | 4100 | 4.9 173.1 | 260 1.04 | 52 | | |
| 9WL1448M5001 | | | 0.15 | 7.2 | 2600 | 3.1 109.5 | 100 0.4 | 40 | | |

Note: Sensor and control options are available for selection. Refer to the table on pp. 655 to 656.

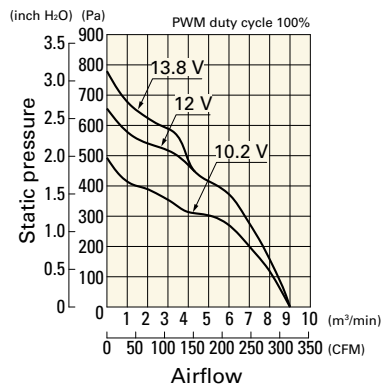
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL1412P5G001 With pulse sensor with PWM control

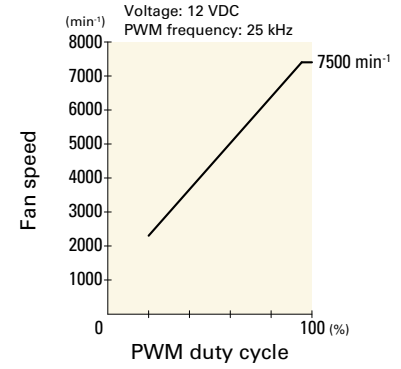
PWM duty cycle



Operating voltage range

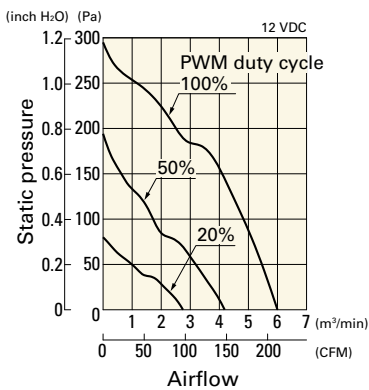


PWM duty - Speed characteristics example

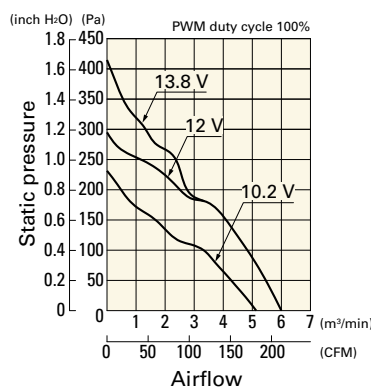


9WL1412P5S001 With pulse sensor with PWM control

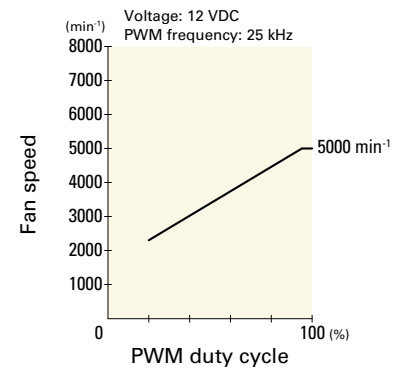
PWM duty cycle



Operating voltage range

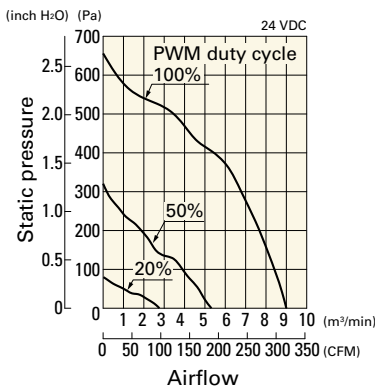


PWM duty - Speed characteristics example

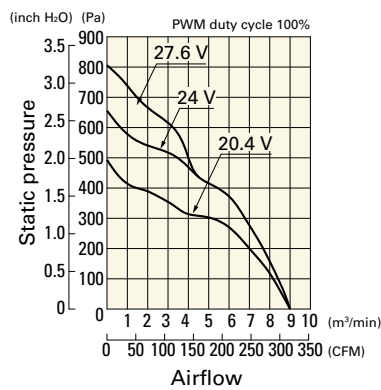


9WL1424P5G001 With pulse sensor with PWM control

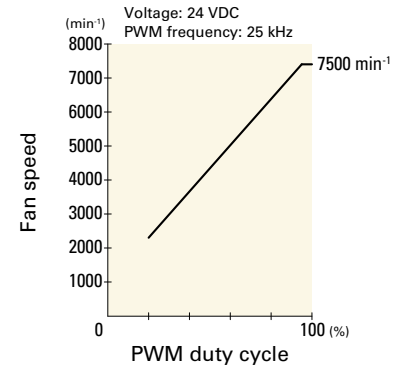
PWM duty cycle



Operating voltage range

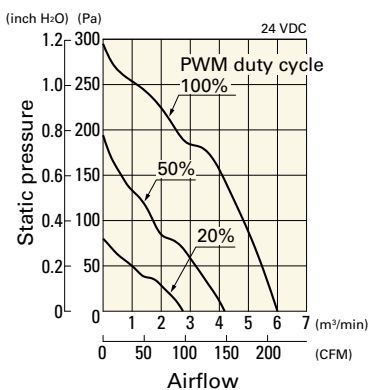


PWM duty - Speed characteristics example

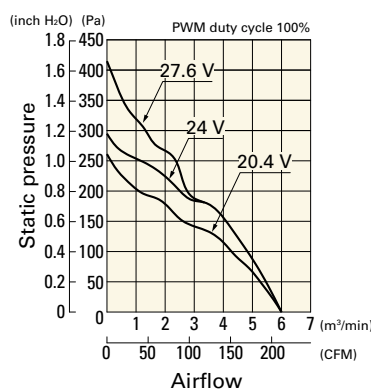


9WL1424P5S001 With pulse sensor with PWM control

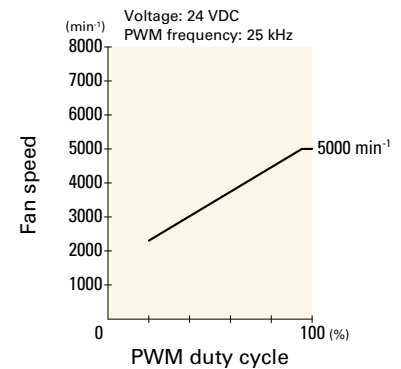
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

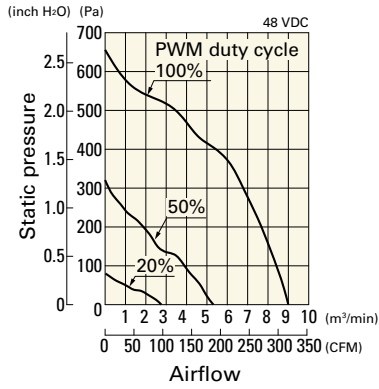


DC
Splash Proof Fan 140 mm sq.

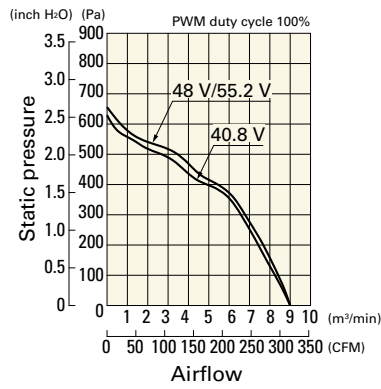
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WL1448P5G001 With pulse sensor with PWM control

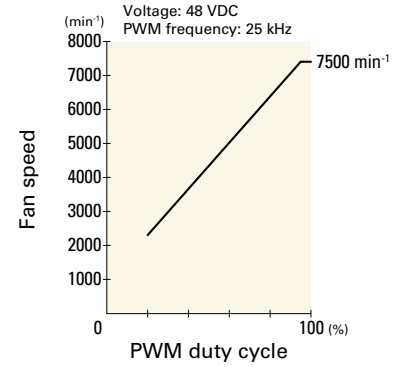
PWM duty cycle



Operating voltage range

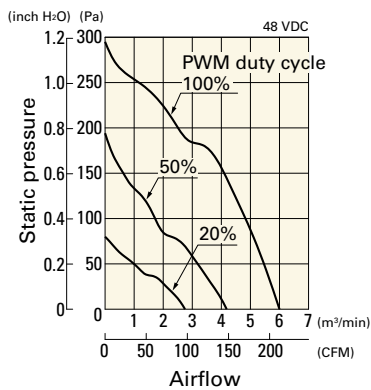


PWM duty - Speed characteristics example

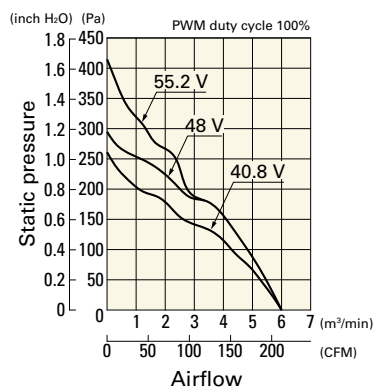


9WL1448P5S001 With pulse sensor with PWM control

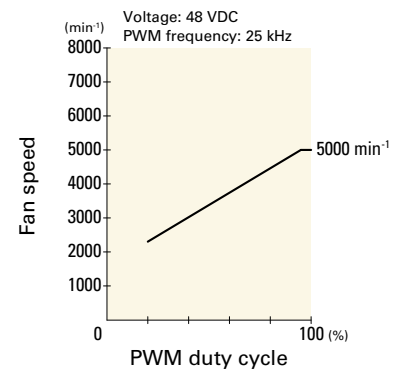
PWM duty cycle



Operating voltage range



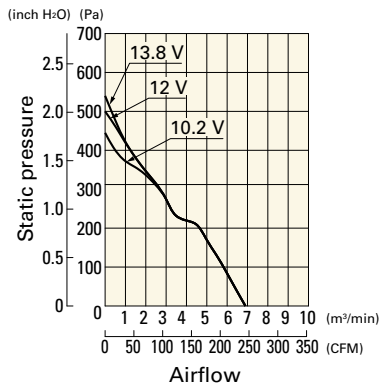
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

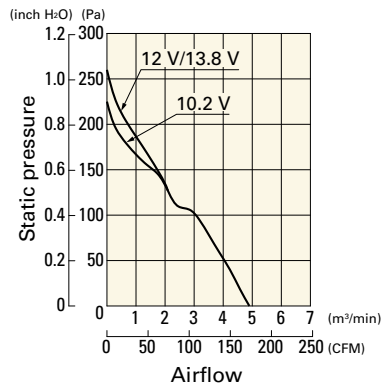
9WL1412A5001 With pulse sensor

Operating voltage range



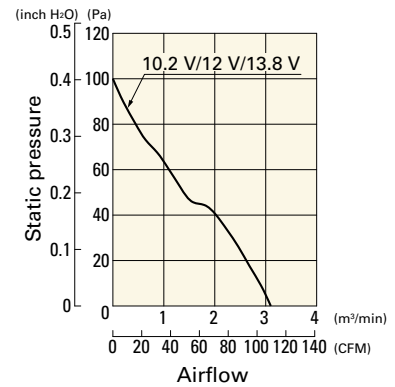
9WL1412H5001 With pulse sensor

Operating voltage range



9WL1412M5001 With pulse sensor

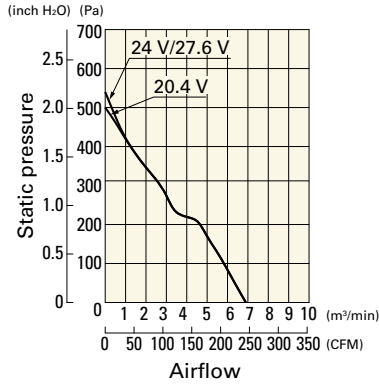
Operating voltage range



Airflow - Static Pressure Characteristics

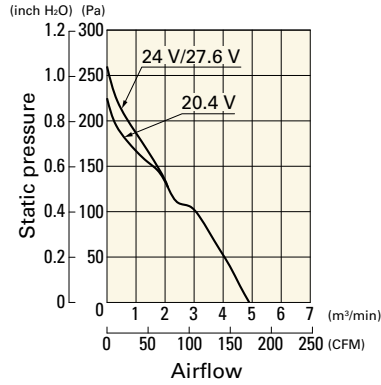
9WL1424A5001 With pulse sensor

Operating voltage range



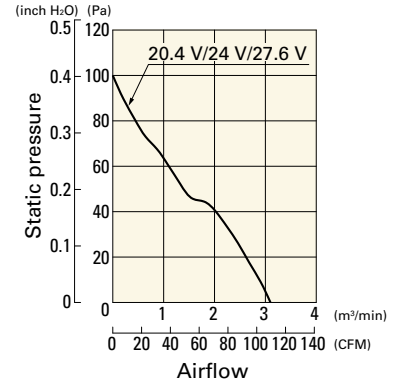
9WL1424H5001 With pulse sensor

Operating voltage range



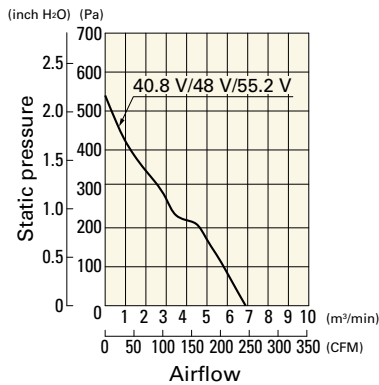
9WL1424M5001 With pulse sensor

Operating voltage range



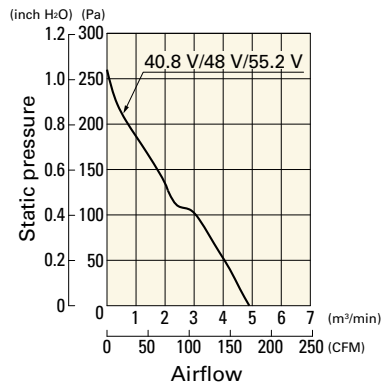
9WL1448A5001 With pulse sensor

Operating voltage range



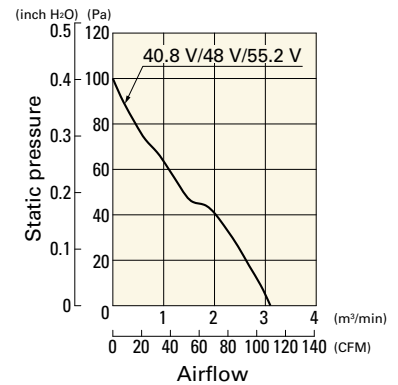
9WL1448H5001 With pulse sensor

Operating voltage range

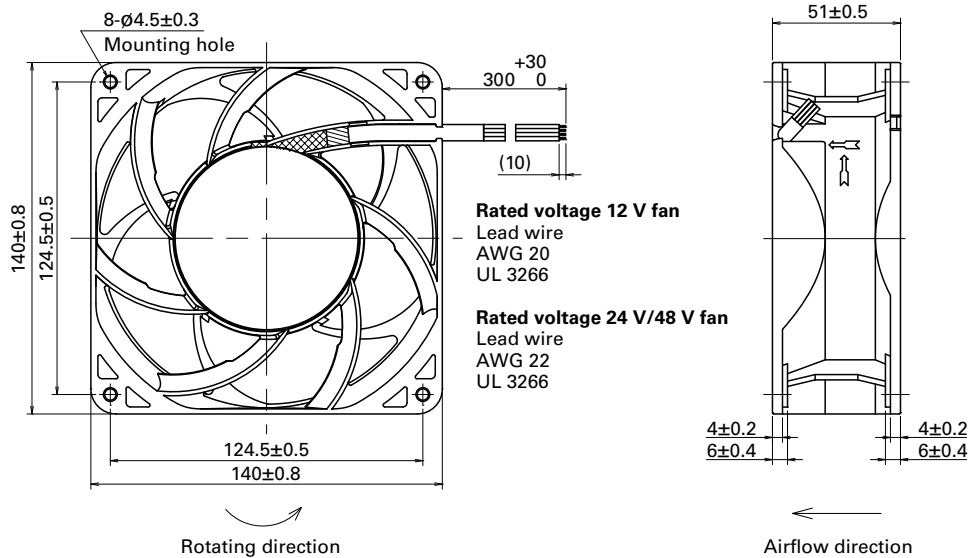


9WL1448M5001 With pulse sensor

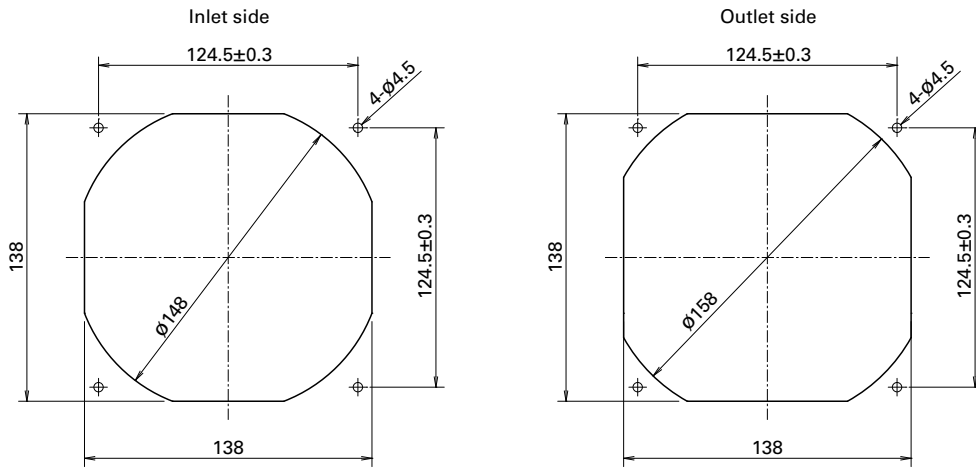
Operating voltage range



Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-719, 109-719H



Ø 172x150x51 mm

San Ace 172W 9WG type US

Sidecut type

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 860 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9WG5748P5G001 | 48 | 40.8 to 55.2 | 100 | 2.91 | 140.0 | 8600 | 15.46 546 | 1000 4.02 | 78 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.21 | 10.1 | 2000 | 3.59 127 | 75.1 0.3 | 40 | | |
| 9WG5748P5H001 | | | 100 | 1.62 | 78.0 | 6500 | 11.6 410 | 770 3.09 | 71 | | |
| | | | 0 | 0.21 | 10.1 | 2000 | 3.59 127 | 75.1 0.3 | 40 | | |

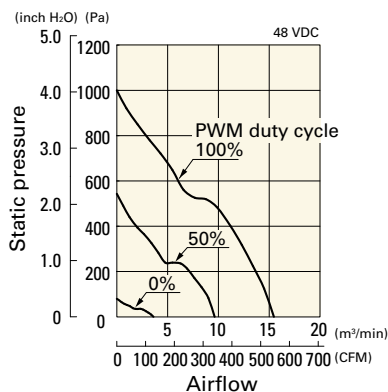
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 655.

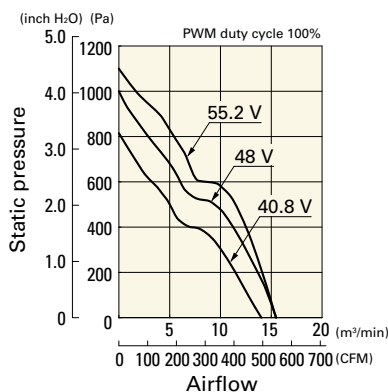
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WG5748P5G001 With pulse sensor with PWM control

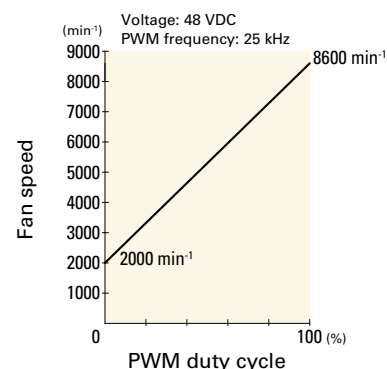
PWM duty cycle



Operating voltage range



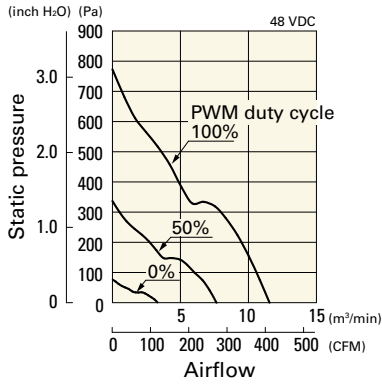
PWM duty - Speed characteristics example



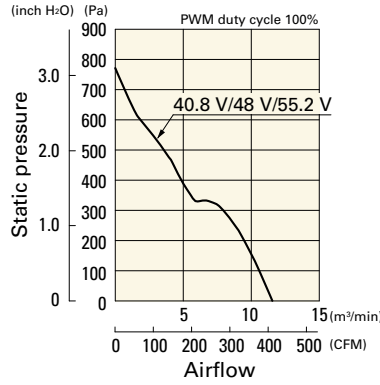
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9WG5748P5H001 With pulse sensor with PWM control

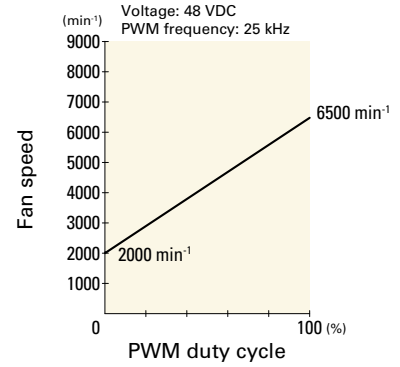
PWM duty cycle



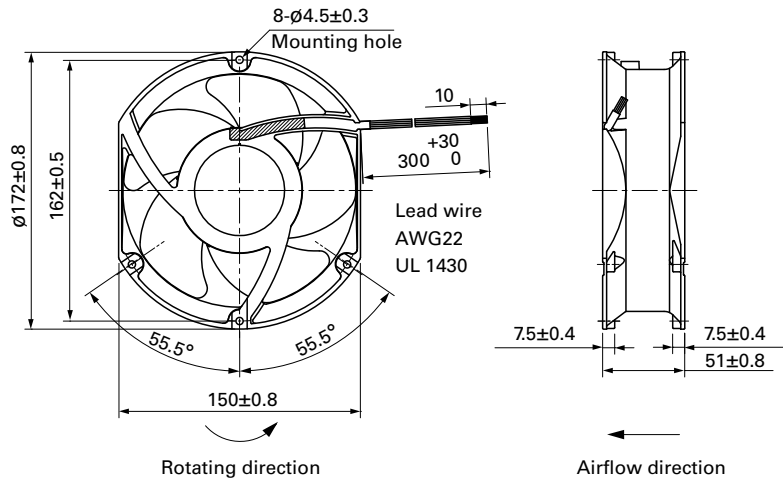
Operating voltage range



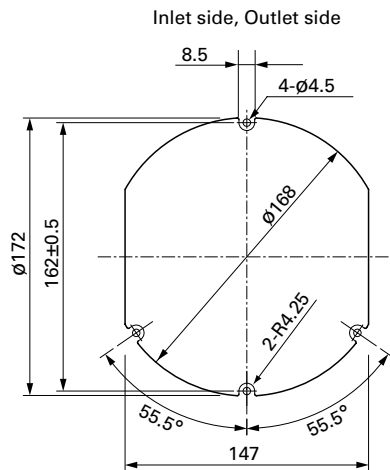
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 600

Model no.: 109-319J, 109-319E, 109-319H

Splash Proof Centrifugal Fan

Centrifugal fans of IP54 and IP56 waterproof capability. For more information on IP rating, refer to p. 621.
 Related product: Splash Proof Fan p. 257, Centrifugal Fan p. 443, Splash Proof Blower p. 349,
 Oil Proof Fan p. 353

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | | |
|-------------|---------------|-----------|-------------|-----------|------------|--|
| 9W1T | M | 48 | P | 4 | H | 01 |
| Type name | Impeller size | Voltage | PWM control | Thickness | Speed code | Individual customer's spec (2 to 3 digits) |

Bracket-mounted Splash Proof Centrifugal Fan

| | | | | | | |
|---------------|---------------|-----------|-------------|-----------|------------|---------------------------------------|
| 9B1W2T | P | 24 | P | 0 | H | 001 |
| Type name | Impeller size | Voltage | PWM control | Thickness | Speed code | Individual customer's spec (3 digits) |

| | | | | | | |
|--------------------|---------|------|--------|------|------|------|
| Type name | 9W1T | 9W2T | 9B1W2T | | | |
| Impeller size (mm) | G | J | M | N | P | S |
| | ∅175 | ∅133 | ∅100 | ∅150 | ∅221 | ∅225 |
| Voltage (V) | 24 | 48 | | | | |
| | 24 | 48 | | | | |
| Thickness (mm) | 0 | 1 | 4 | | | |
| | 69 min. | 35 | 25 | | | |
| Speed code | H | G | S | etc. | | |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

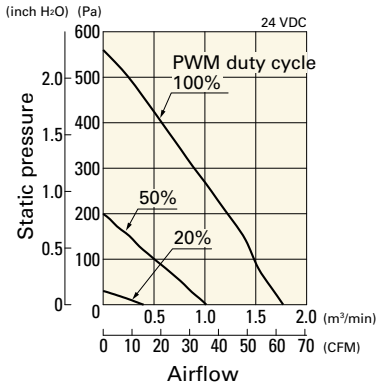
- Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
 For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
 For more information, please refer to the technical material section.

DC
Splash Proof Centrifugal Fan

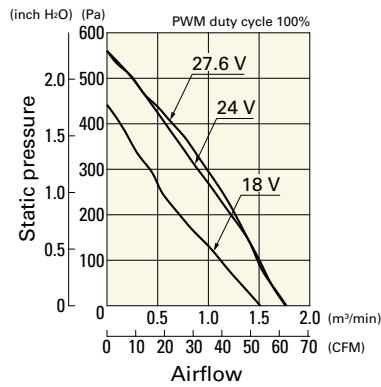
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W2TM24P4H001 With pulse sensor with PWM control

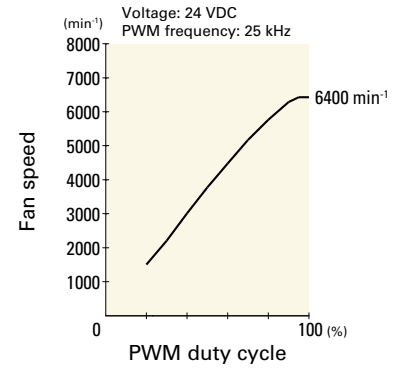
PWM duty cycle



Operating voltage range

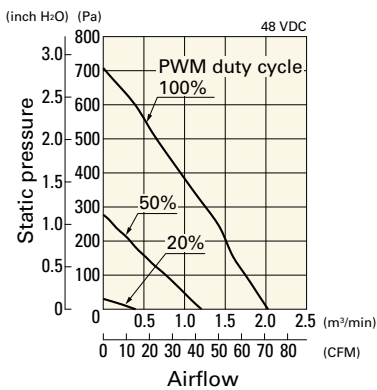


PWM duty - Speed characteristics example

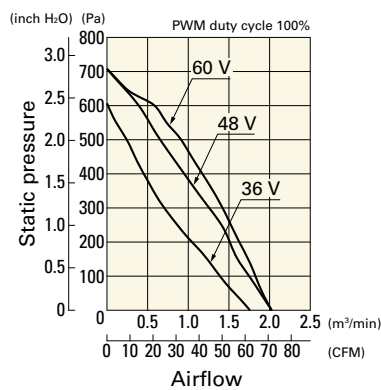


9W2TM48P4G001 With pulse sensor with PWM control

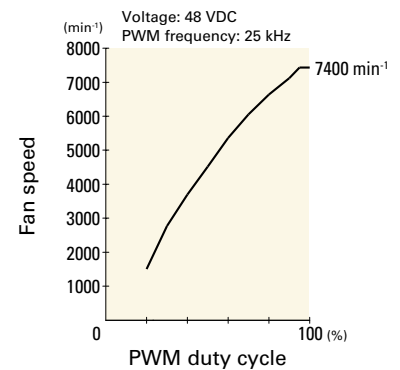
PWM duty cycle



Operating voltage range

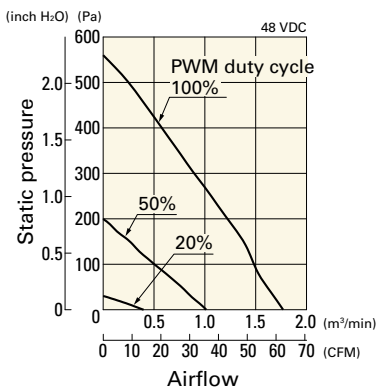


PWM duty - Speed characteristics example

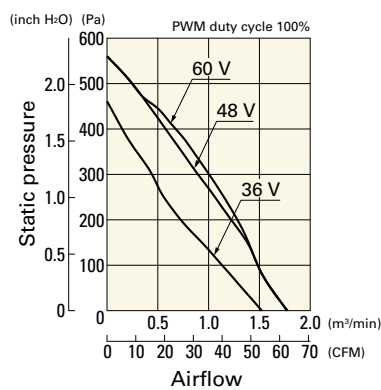


9W2TM48P4H001 With pulse sensor with PWM control

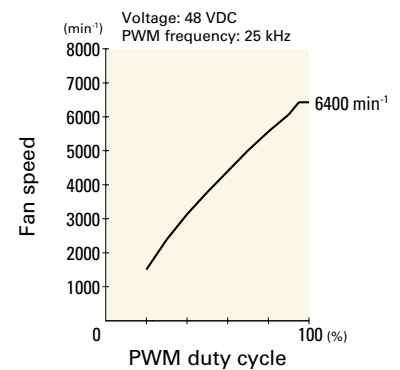
PWM duty cycle



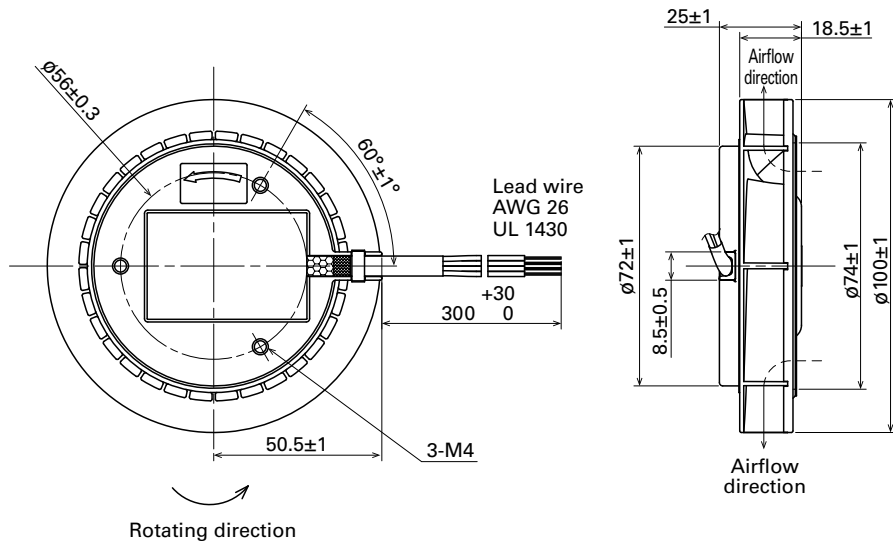
Operating voltage range



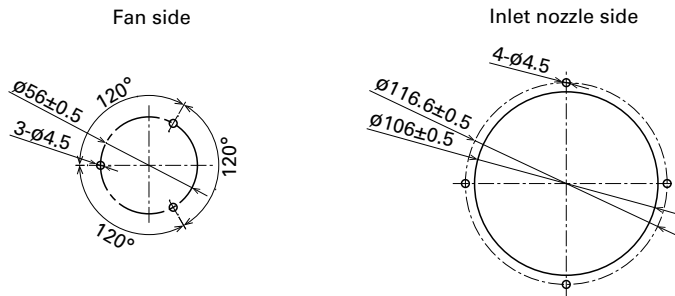
PWM duty - Speed characteristics example



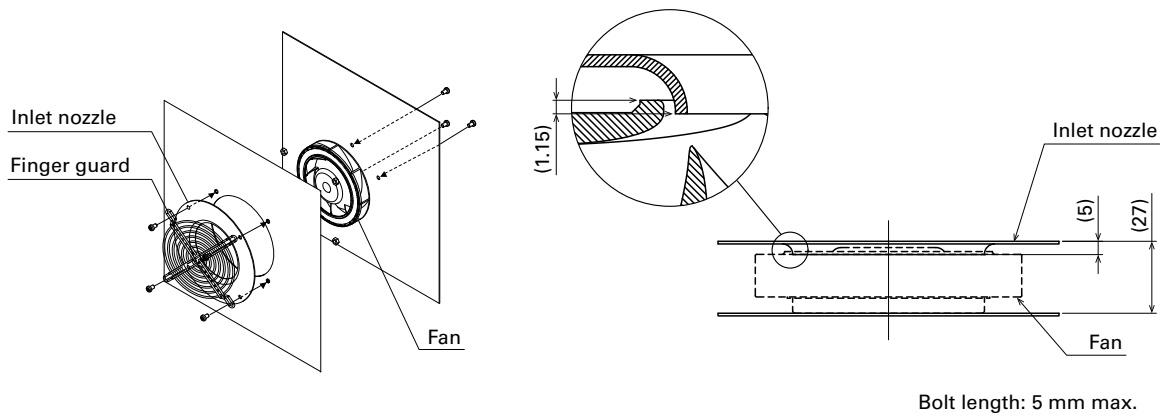
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

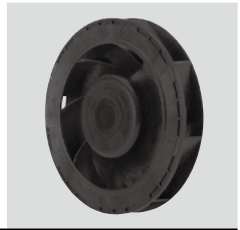
page: p. 598

Model no.: 109-099E, 109-099H

Inlet nozzle

page: p. 603

Model no.: 109-1080, 109-1080H



∅ 100x25 mm

San Ace 100W 9W1TM_{type}

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 160 g
- Ingress protection IP54 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1080) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9W1TM48P4G01 | 48 | 36 to 60 | 100 | 0.36 | 17.28 | 7400 | 2.03 71.7 | 708 2.84 | 65 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9W1TM48P4H01 | | | 100 | 0.22 | 10.56 | 6400 | 1.77 62.5 | 560 2.25 | 60 | | |
| | | | 0 | 0.04 | 1.92 | 2000 | 0.51 18.0 | 48 0.19 | 34 | | |

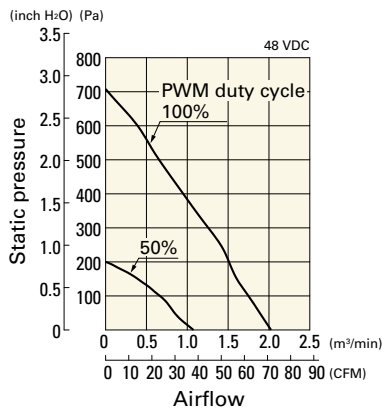
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input of 9W1TM48P4G01: 22 W, 9W1TM48P4H01: 14 W at rated voltage.

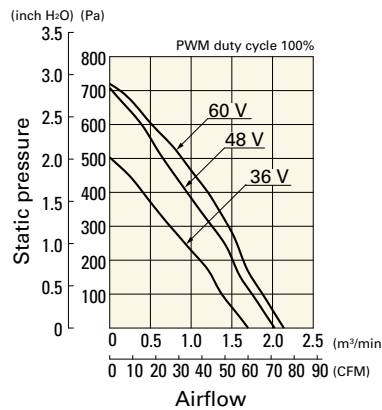
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W1TM48P4G01 With pulse sensor with PWM control

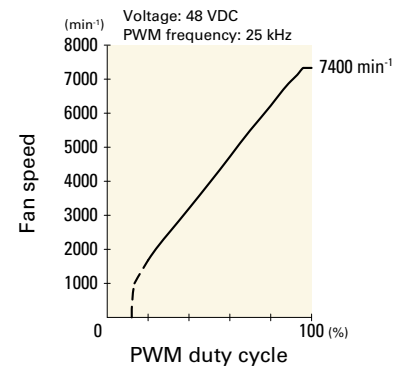
PWM duty cycle



Operating voltage range



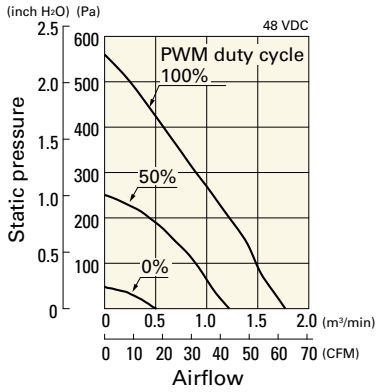
PWM duty - Speed characteristics example



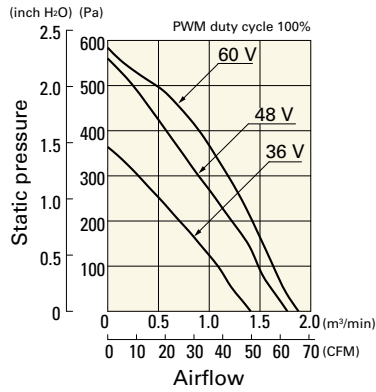
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W1TM48P4H01 With pulse sensor with PWM control

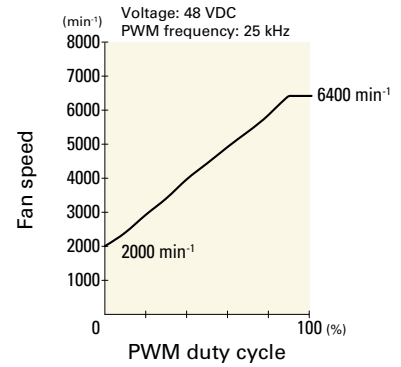
PWM duty cycle



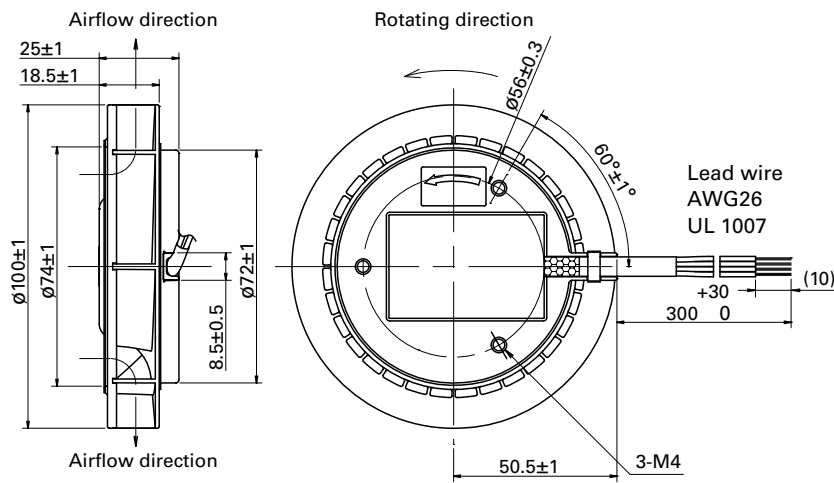
Operating voltage range



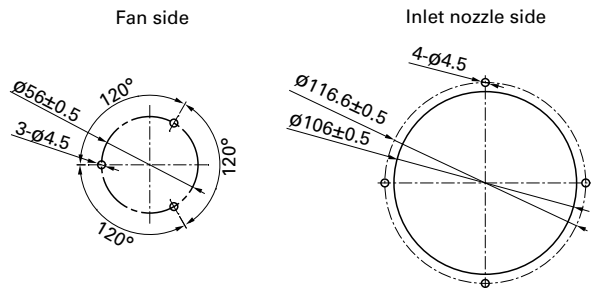
PWM duty - Speed characteristics example



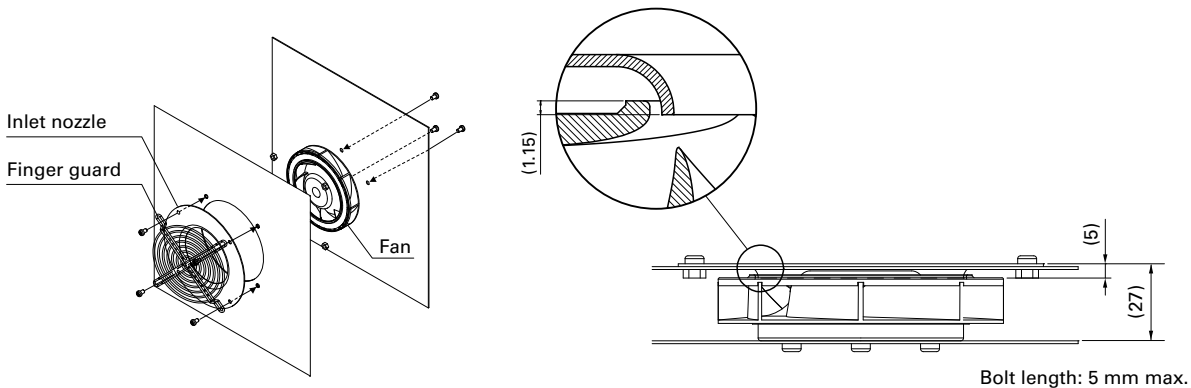
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Inlet nozzle

page: p. 603

Model no.: 109-1080, 109-1080H

DC

Splash Proof Centrifugal Fan ø100 mm



Ø133x91 mm

San Ace 133W 9W2TJ type 

Splash Proof Centrifugal Fan Ø133 mm DC

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 800 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1069H) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9W2TJ24P0H001 | 24 | 20.4 to 27.6 | 100 | 1.2 | 28.8 | 4150 | 6.39 225 | 395 1.59 | 61 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.09 | 2.16 | 1150 | 1.7 60 | 32 0.13 | 35 | | |
| 9W2TJ48P0H001 | 48 | 36 to 60 | 100 | 0.55 | 26.4 | 4150 | 6.39 225 | 395 1.59 | 61 | | |
| | | | 20 | 0.08 | 3.84 | 1150 | 1.7 60 | 32 0.13 | 35 | | |

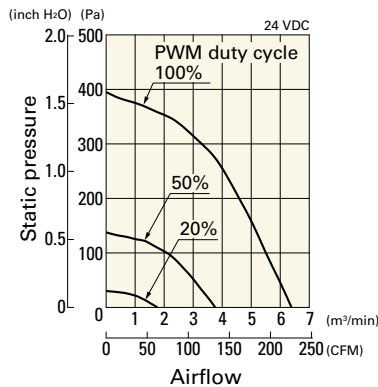
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input is 45 W at rated voltage.

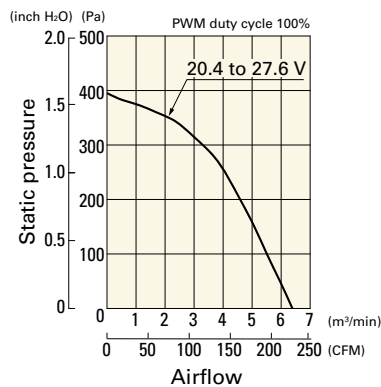
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W2TJ24P0H001 With pulse sensor with PWM control

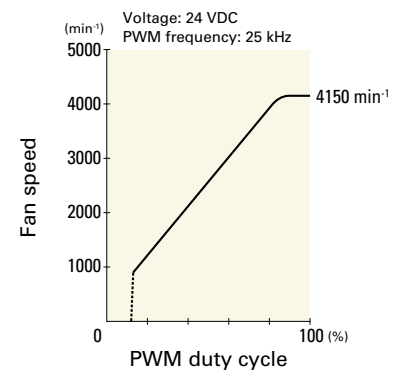
PWM duty cycle



Operating voltage range



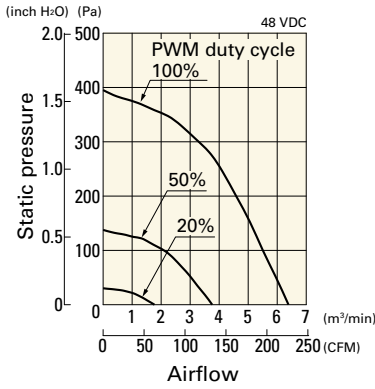
PWM duty - Speed characteristics example



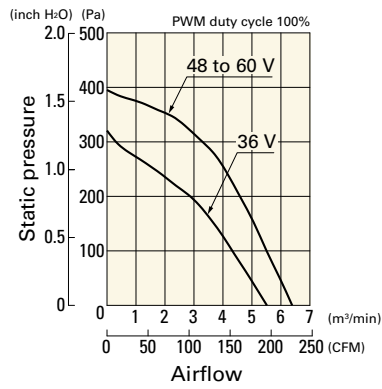
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W2TJ48P0H001 With pulse sensor with PWM control

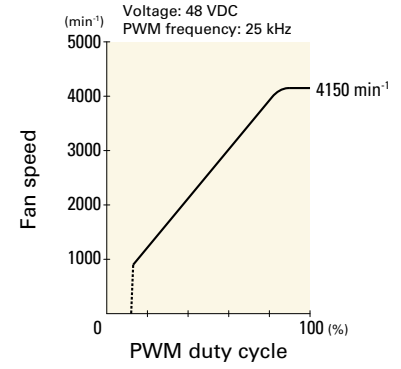
PWM duty cycle



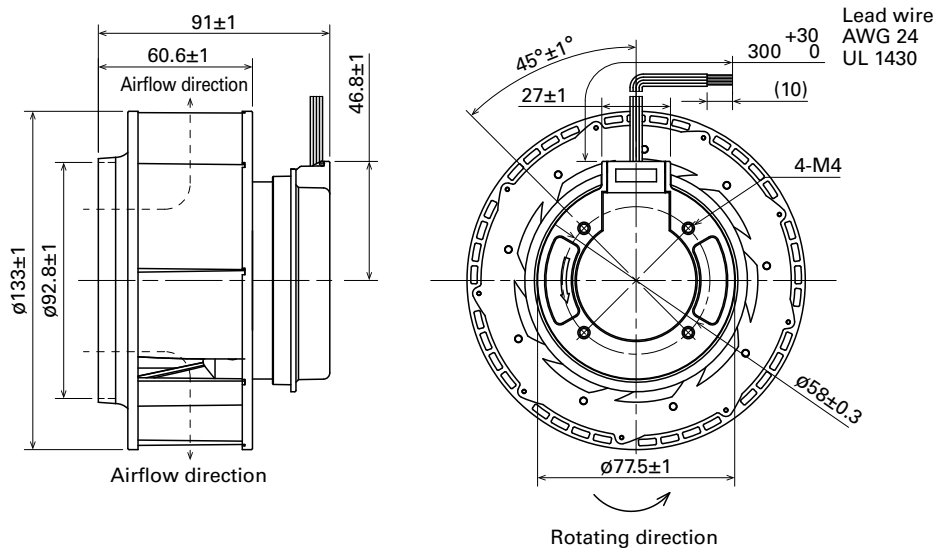
Operating voltage range



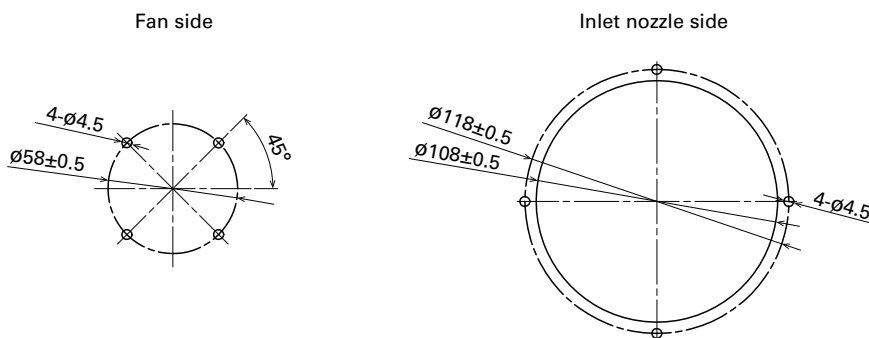
PWM duty - Speed characteristics example



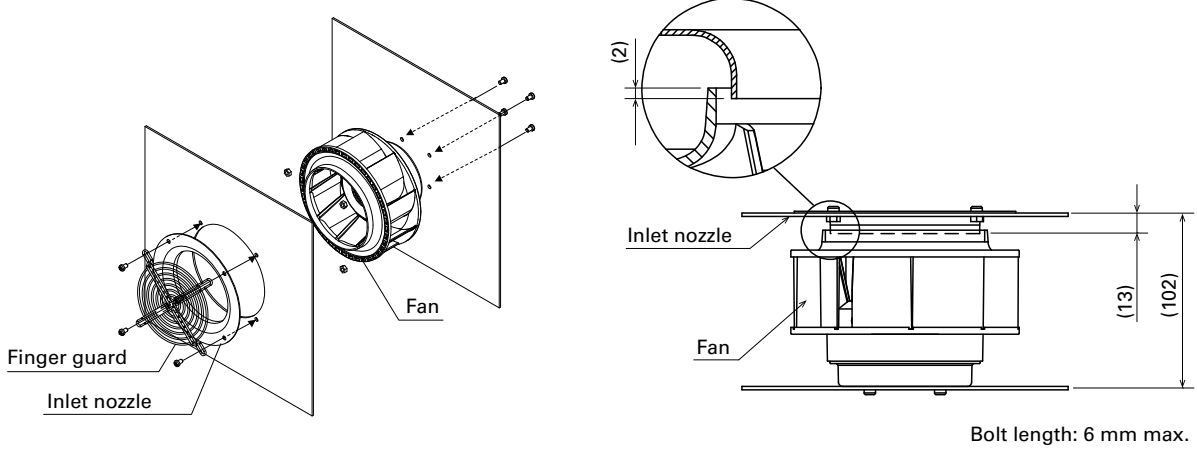
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

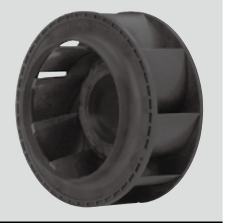
page: p. 599

Model no.: 109-1112

Inlet nozzle

page: p. 603

Model no.: 109-1069, 109-1069H



Ø 133x91 mm

San Ace 133W 9W1TJ type US

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 720 g
- Ingress protection IP54 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1069) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9W1TJ24P0H61 | 24 | 20.4 to 27.6 | 100 | 1.2 | 28.8 | 4150 | 6.39 225 | 395 1.59 | 61 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9W1TJ48P0H61 | 48 | 36 to 60 | 100 | 0.55 | 26.4 | 4150 | 6.39 225 | 395 1.59 | 61 | | |

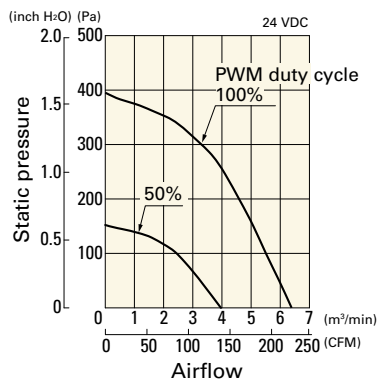
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input is 45W at rated voltage.

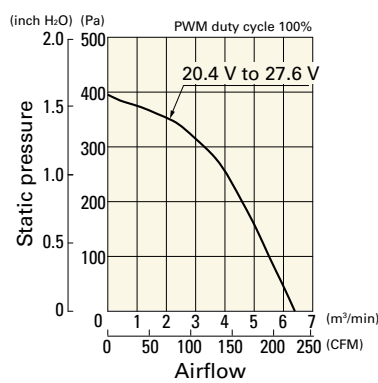
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W1TJ24P0H61 With pulse sensor with PWM control

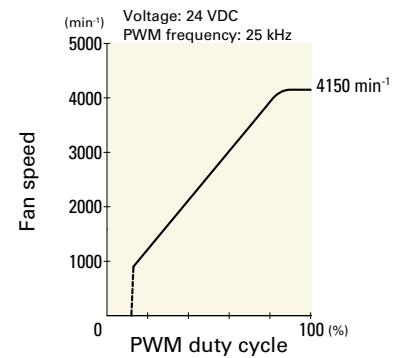
PWM duty cycle



Operating voltage range

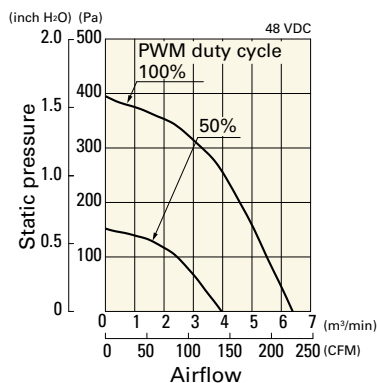


PWM duty - Speed characteristics example

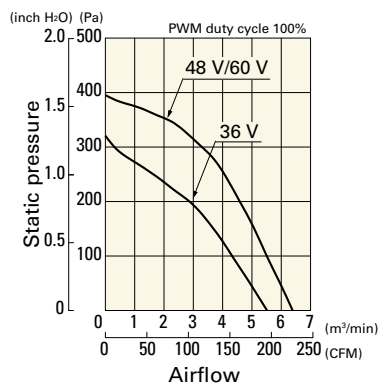


9W1TJ48P0H61 With pulse sensor with PWM control

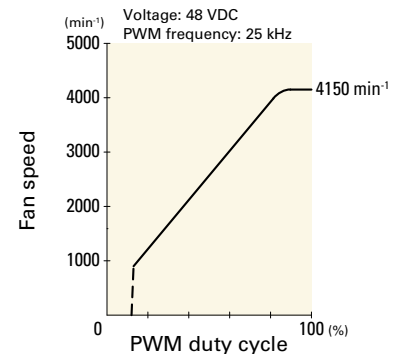
PWM duty cycle



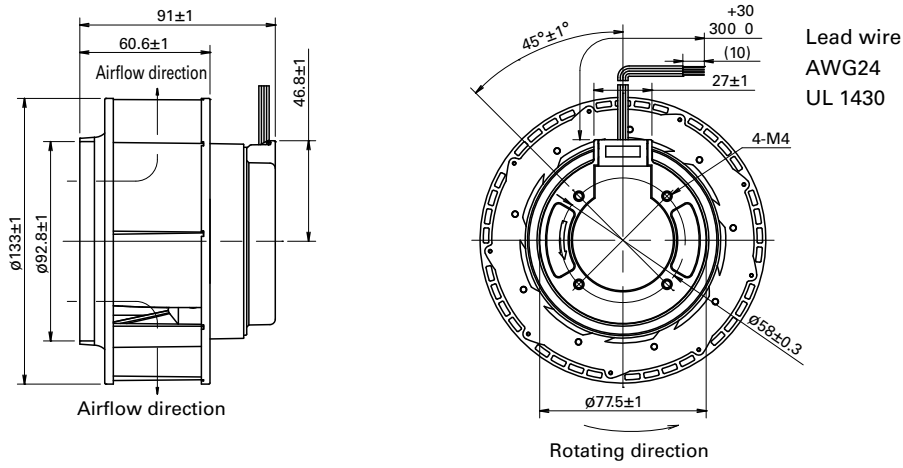
Operating voltage range



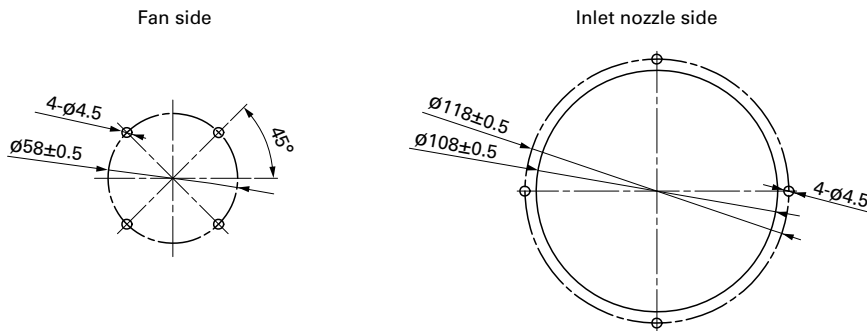
PWM duty - Speed characteristics example



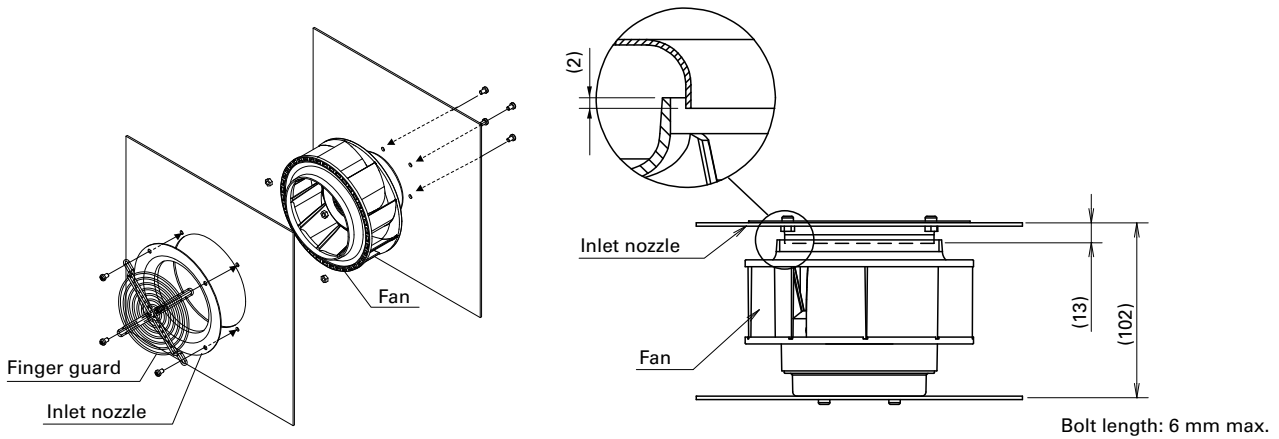
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

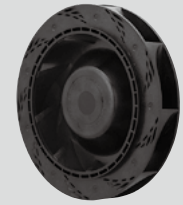
page: p. 599

Model no.: 109-1112

Inlet nozzle

page: p. 603

Model no.: 109-1069, 109-1069H



Ø 150x35 mm

San Ace 150W 9W2TN type 

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 360 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1081H) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9W2TN24P1H001 | 24 | 20.4 to 27.6 | 100 | 0.64 | 15.4 | 3800 | 3.83 135 | 390 1.57 | 59 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.16 | 3.84 | 1500 | 1.51 53 | 60.7 0.24 | 38 | | |
| 9W2TN48P1H001 | 48 | 36 to 55.2 | 100 | 0.32 | 15.4 | 3800 | 3.83 135 | 390 1.57 | 59 | | |
| | | | 20 | 0.08 | 3.84 | 1500 | 1.51 53 | 60.7 0.24 | 38 | | |

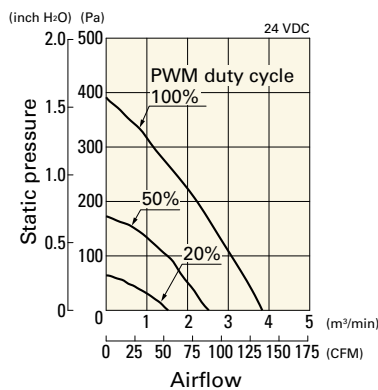
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input is 22 W at rated voltage.

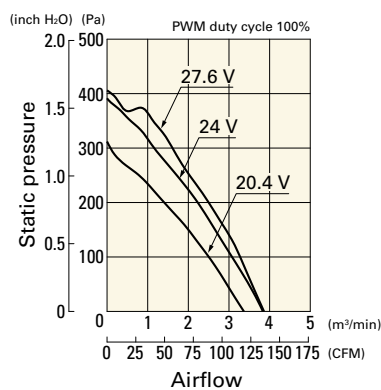
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W2TN24P1H001 With pulse sensor with PWM control

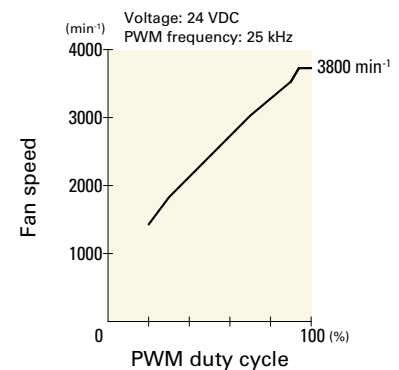
PWM duty cycle



Operating voltage range



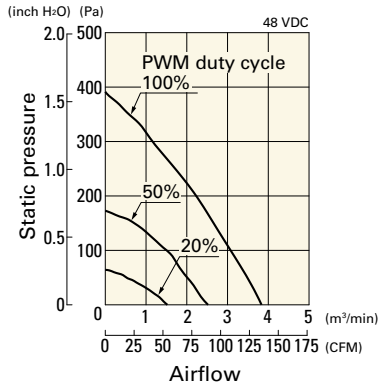
PWM duty - Speed characteristics example



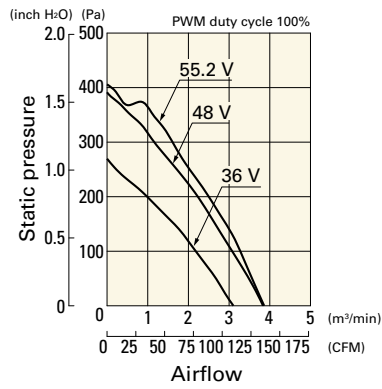
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W2TN48P1H001 With pulse sensor with PWM control

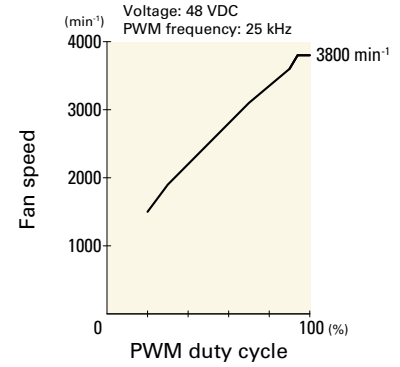
PWM duty cycle



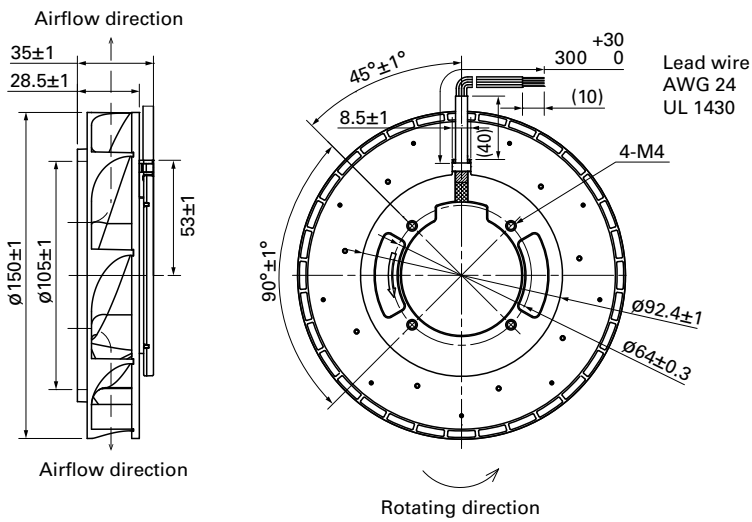
Operating voltage range



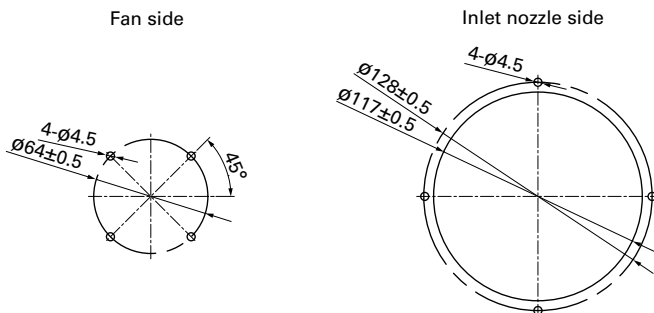
PWM duty - Speed characteristics example



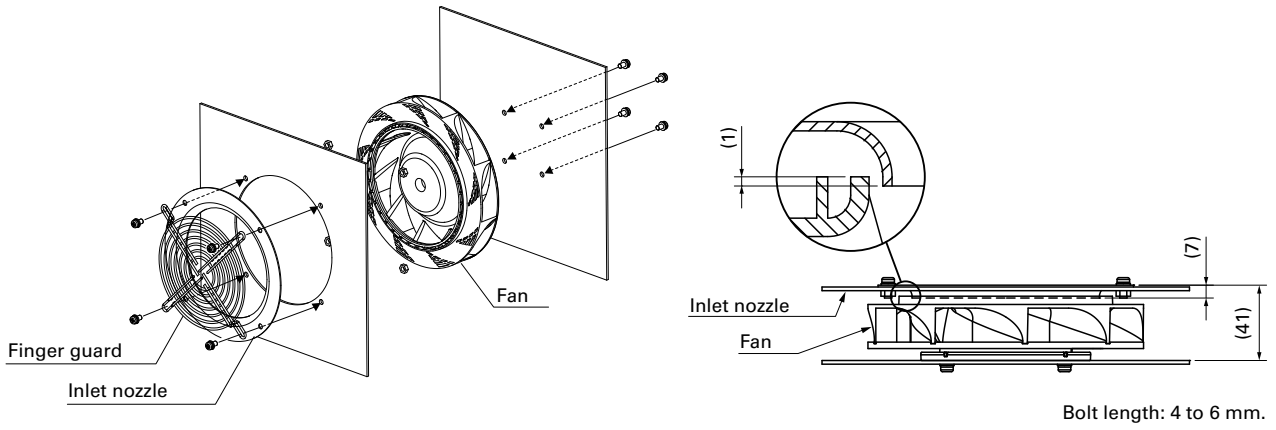
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-1104, 109-1104H

Inlet nozzle

page: p. 603

Model no.: 109-1081, 109-1081H



Ø 150x35 mm

San Ace 150W 9W1TN type

DC
Splash Proof Centrifugal Fan Ø150 mm

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 330 g
- Ingress protection IP54 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1081) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9W1TN48P1H01 | 48 | 36.0 to 55.2 | 100 | 0.32 | 15.4 | 3800 | 3.83 135 | 390 1.57 | 59 | -20 to +70 | 40000/60°C (70000/40°C) |

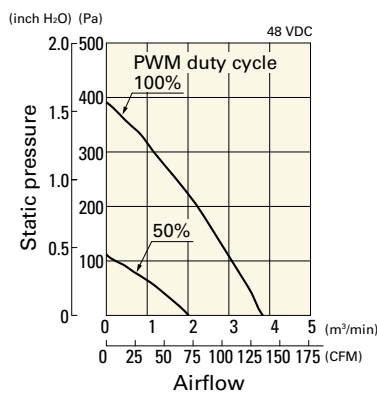
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input is 22 W at rated voltage.

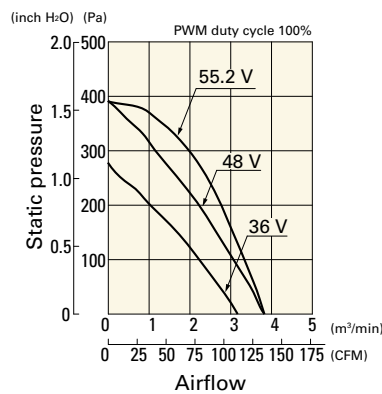
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W1TN48P1H01 With pulse sensor with PWM control

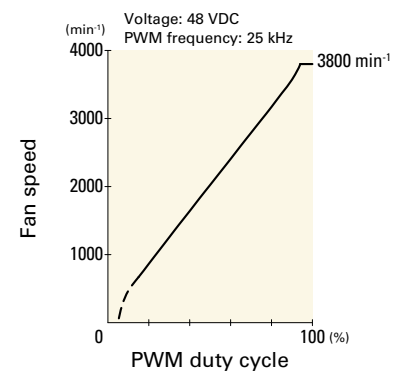
PWM duty cycle



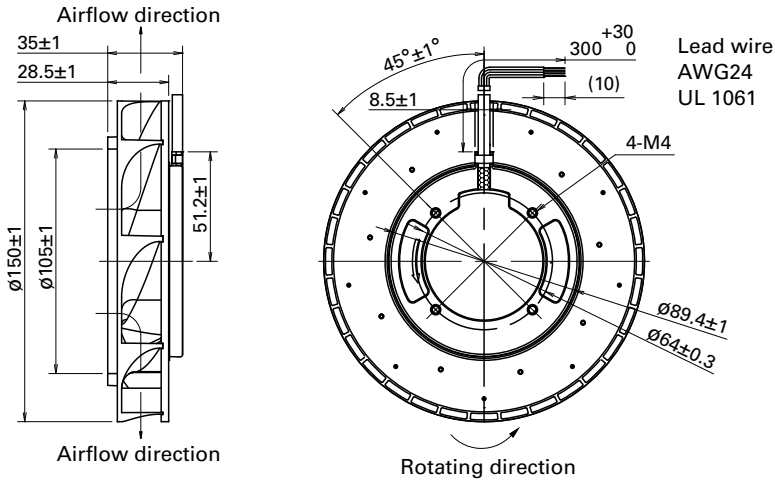
Operating voltage range



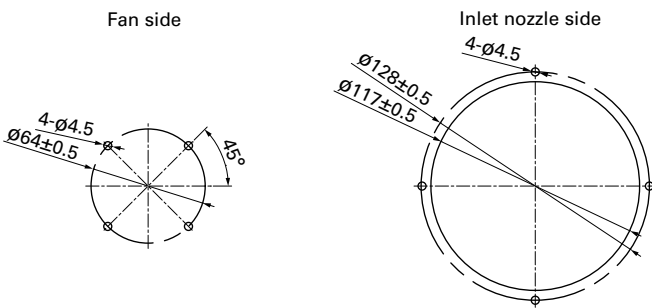
PWM duty - Speed characteristics example



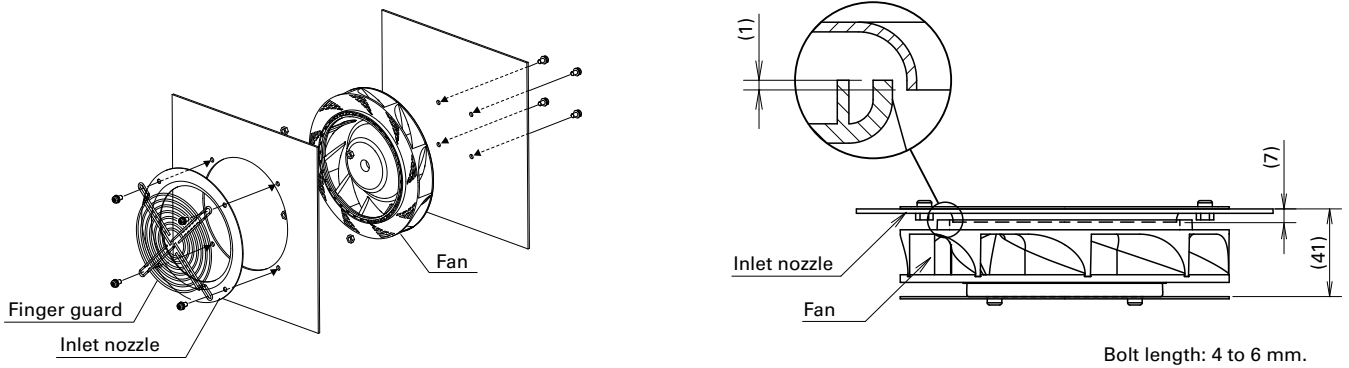
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

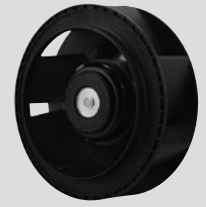
page: p. 599

Model no.: 109-1104, 109-1104H

Inlet nozzle

page: p. 603

Model no.: 109-1081, 109-1081H



Ø 175x69 mm

San Ace 175W 9W2TGA type   

Splash Proof Centrifugal Fan Ø175 mm DC

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 980 g
- Ingress protection IP56 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1073H) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9W2TGA48P0G001 | 48 | 36 to 72 | 100 | 3.85 | 184.8 | 5700 | 17.3 611 | 1100 4.42 | 80 | -30 to +60 | 40000/60°C (70000/40°C) |
| | | | 15 | 0.08 | 3.84 | 800 | 2.4 84.7 | 21.7 0.087 | 38 | | |

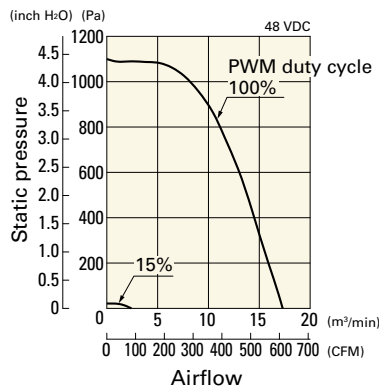
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input is 330 W at rated voltage.

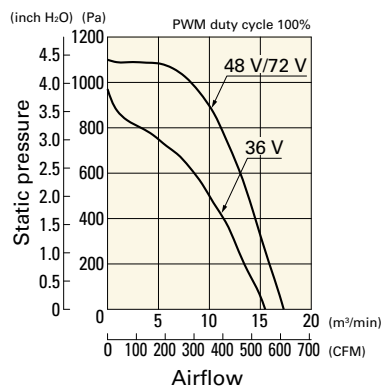
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W2TGA48P0G001 With pulse sensor with PWM control

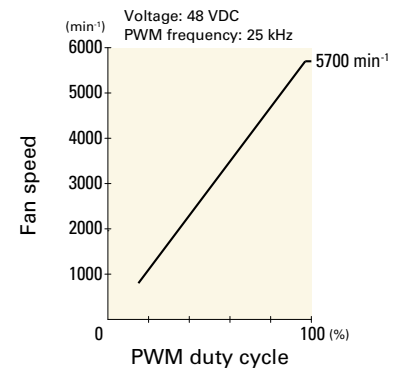
PWM duty cycle



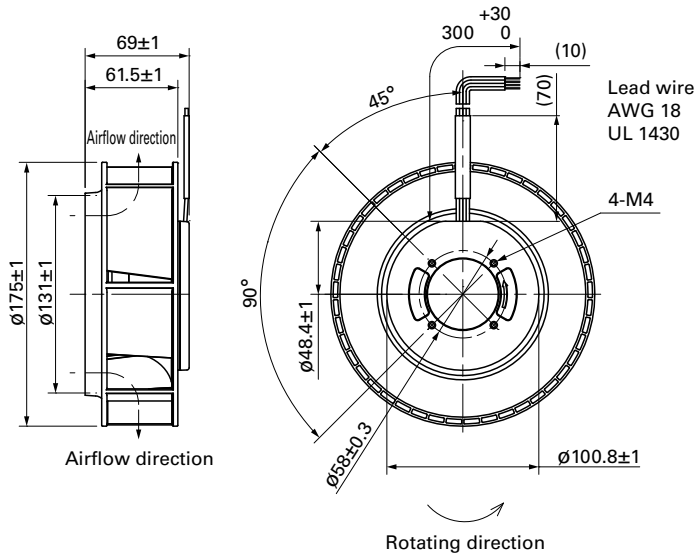
Operating voltage range



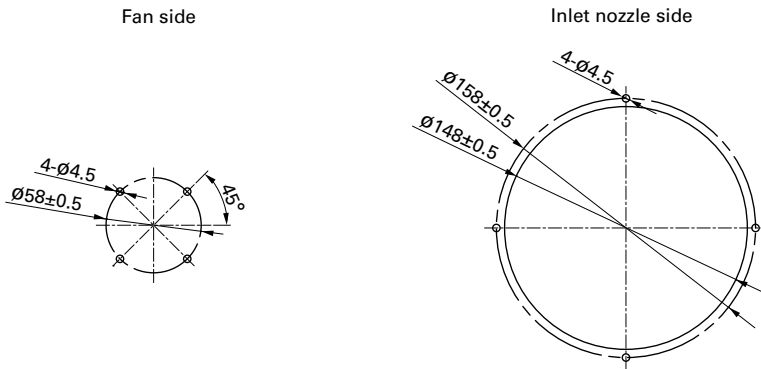
PWM duty - Speed characteristics example



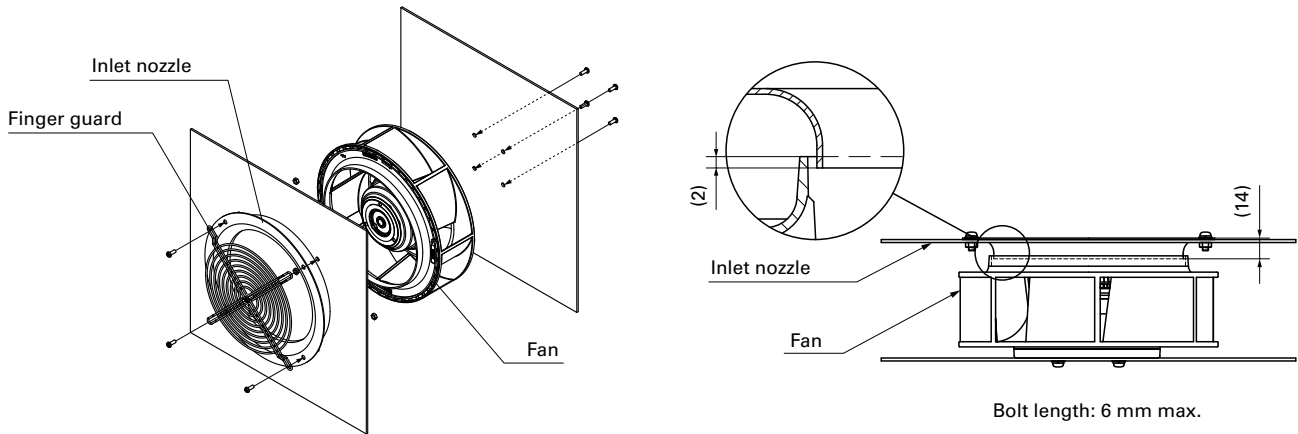
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-722, 109-722H

Inlet nozzle

page: p. 603

Model no.: 109-1073, 109-1073H



Ø 175x69 mm

San Ace 175W 9W1TG type

DC Splash Proof Centrifugal Fan Ø175 mm

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 760 g
- Ingress protection IP54 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1073) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9W1TG48P0H61 | 48 | 36 to 60 | 100 | 0.65 | 31.2 | 3100 | 9.0 318 | 360 1.44 | 64 | -20 to +70 | 40000/60°C (70000/40°C) |

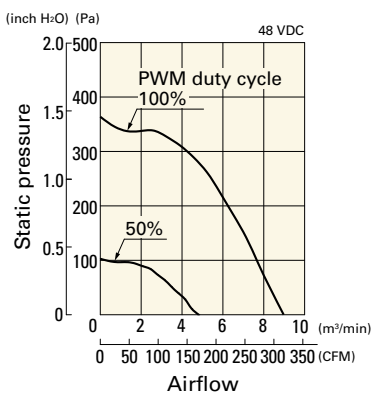
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input is 60 W at rated voltage.

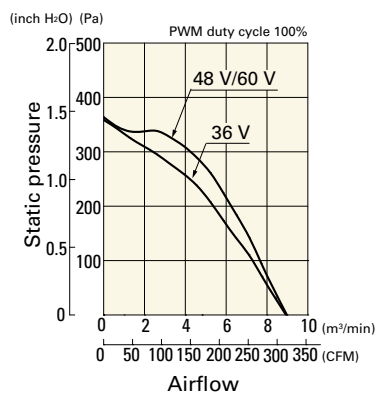
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W1TG48P0H61 With pulse sensor with PWM control

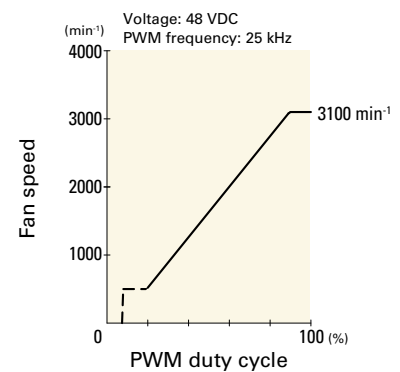
PWM duty cycle



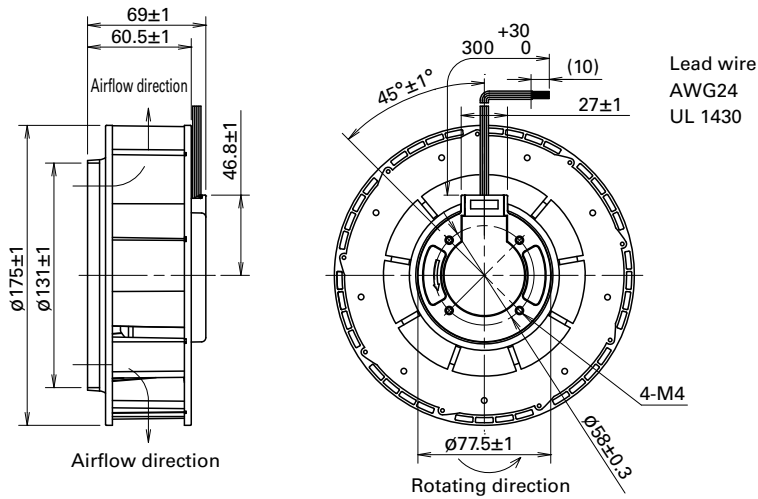
Operating voltage range



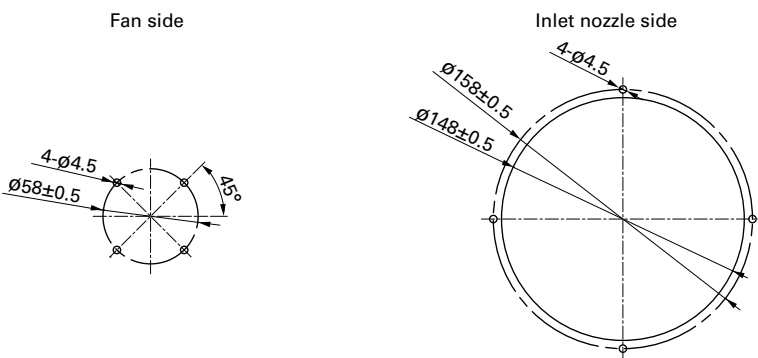
PWM duty - Speed characteristics example



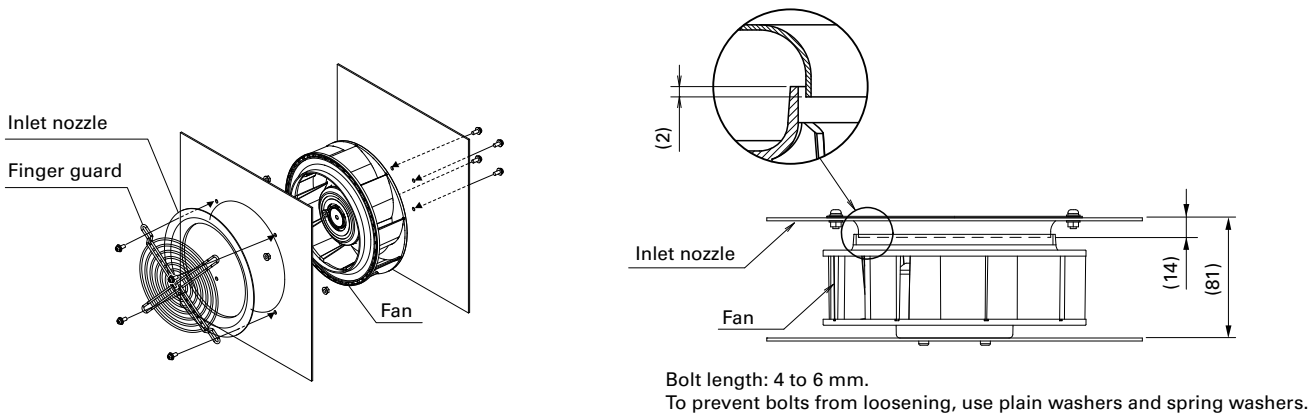
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-722, 109-722H

Inlet nozzle

page: p. 603

Model no.: 109-1073, 109-1073H



∅221×71 mm

San Ace 221W 9W2TP type   

DC Splash Proof Centrifugal Fan ∅221 mm

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 1250 g
- Ingress protection IP56 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1135H) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9W2TP24P0H001 | 24 | 16 to 36 | 100 | 3.35 | 80.4 | 3050 | 17.6 621 | 530 2.13 | 71.5 | -25 to +70 | 40000/60°C (70000/40°C) |
| | | | 15 | 0.4 | 9.6 | 1000 | 5.75 203 | 57.0 0.23 | 53.5 | | |
| 9W2TP48P0S001 | 48 | 36 to 72 | 100 | 2.3 | 110.4 | 3400 | 19.6 692 | 659 2.65 | 73.5 | | |
| | | | 15 | 0.2 | 9.6 | 1000 | 5.75 203 | 57.0 0.23 | 53.5 | | |

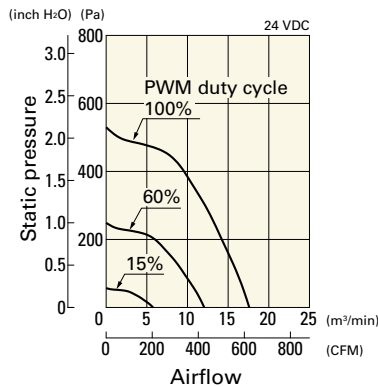
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input of 9W2TP24P0H001: 150 W, 9W2TP48P0S001: 210 W at rated voltage.

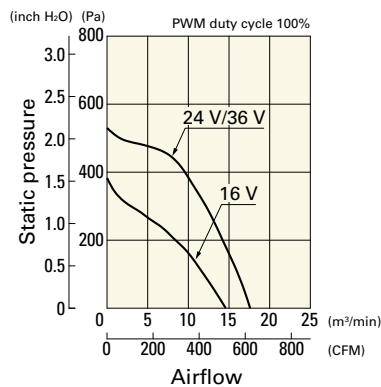
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W2TP24P0H001 With pulse sensor with PWM control

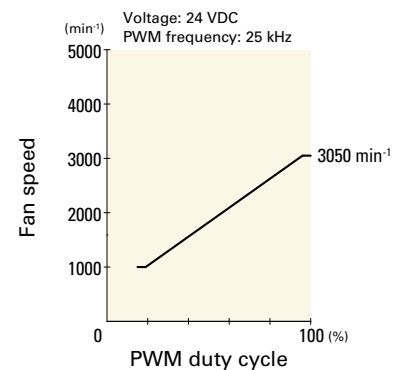
PWM duty cycle



Operating voltage range



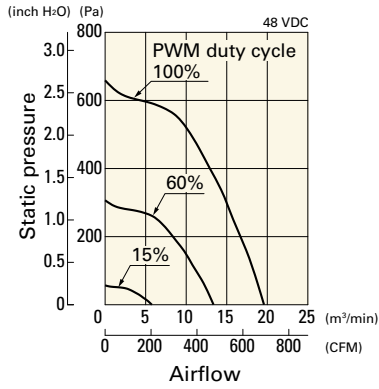
PWM duty - Speed characteristics example



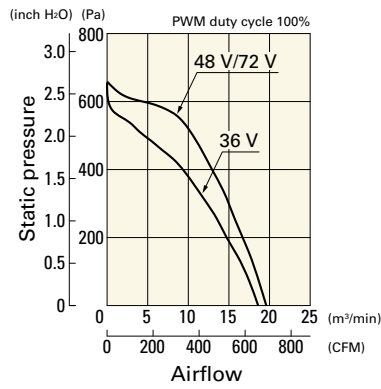
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W2TP48P0S001 With pulse sensor with PWM control

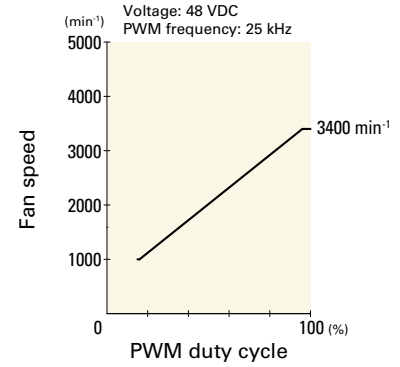
PWM duty cycle



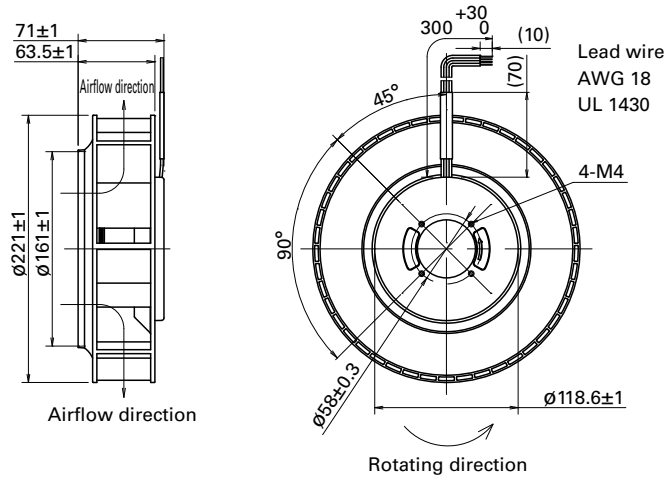
Operating voltage range



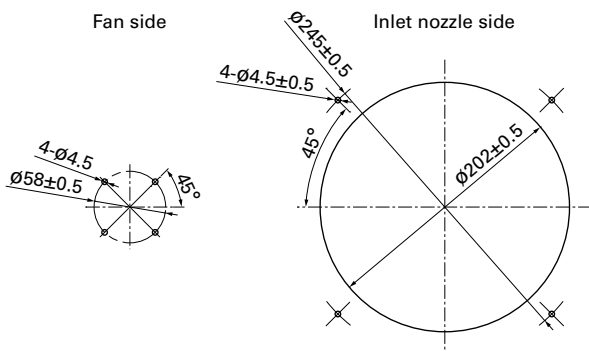
PWM duty - Speed characteristics example



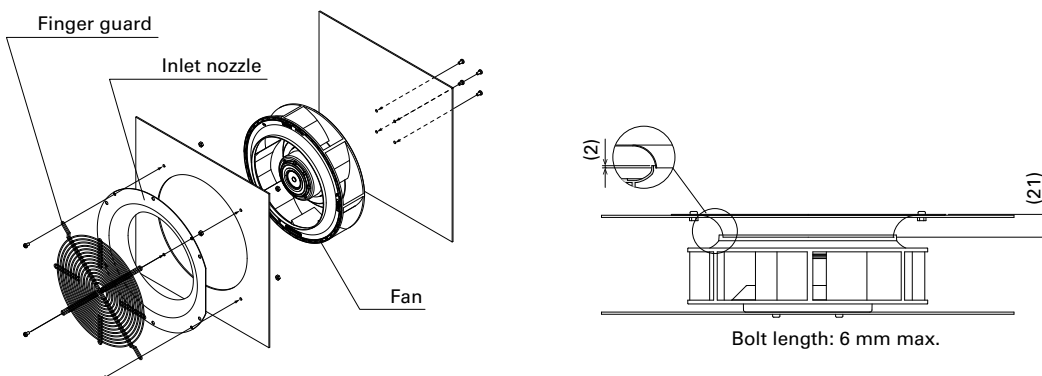
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm) Bracket-mounted model of this fan is available. For details, refer to pp. 343 to 345.



Options

Finger guards

page: p. 601

Model no.: 109-1138, 109-1138H

Inlet nozzle

page: p. 603

Model no.: 109-1135, 109-1135H

DC

Splash Proof Centrifugal Fan Ø221 mm



Ø225x99 mm

San Ace 225W 9W2TS type   

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 1500 g
- Ingress protection IP56 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1134H) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9W2TS48P0S001 | 48 | 36 to 72 | 100 | 2.45 | 117.6 | 3000 | 23.5 830 | 635 2.55 | 72.0 | -25 to +70 | 40000/60°C (70000/40°C) |
| | | | 15 | 0.24 | 11.5 | 1000 | 7.83 276 | 70.6 0.28 | 52.5 | | |

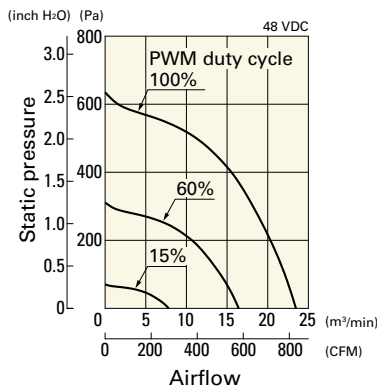
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input is 220 W at rated voltage.

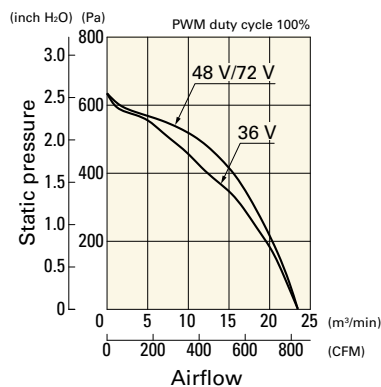
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W2TS48P0S001 With pulse sensor with PWM control

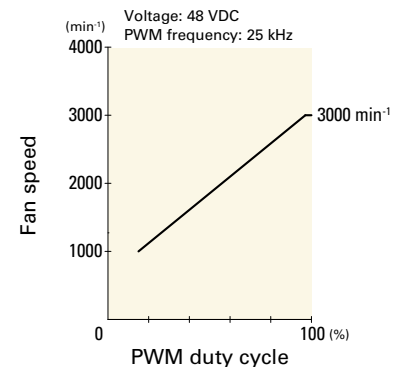
PWM duty cycle



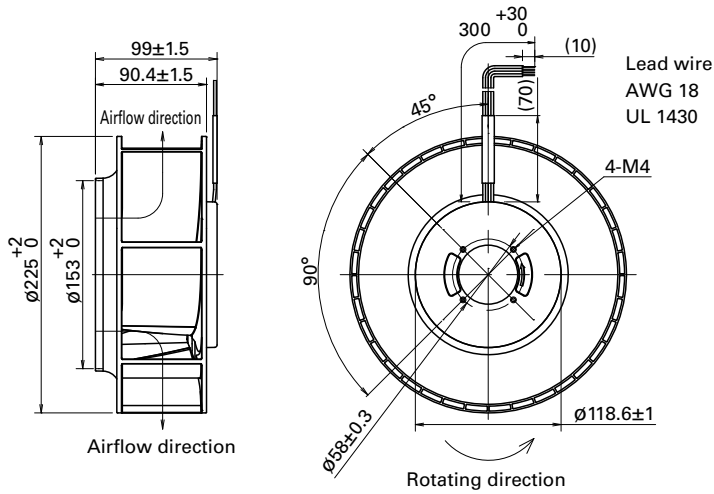
Operating voltage range



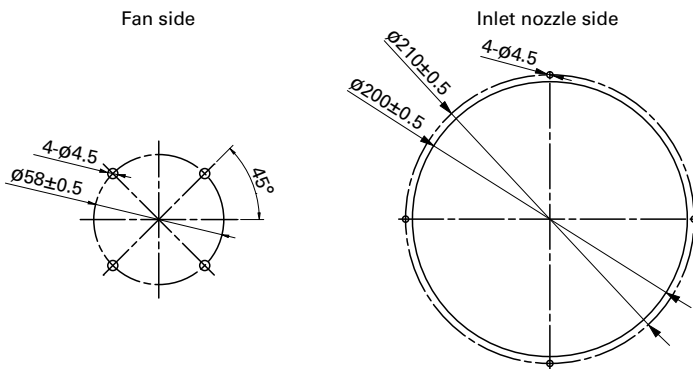
PWM duty - Speed characteristics example



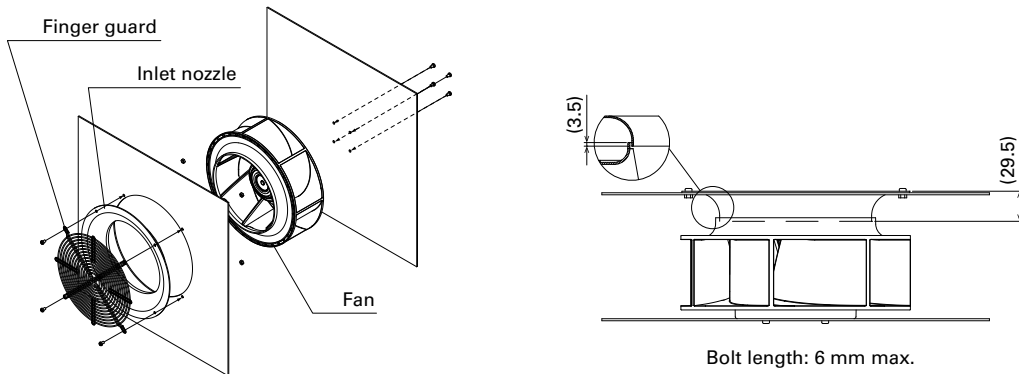
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm) Bracket-mounted model of this fan is available. For details, refer to pp. 346 to 347.



Options

Finger guards

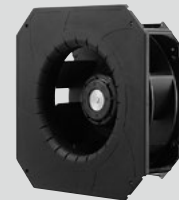
page: p. 601

Model no.: 109-1137, 109-1137H

Inlet nozzle

page: p. 603

Model no.: 109-1134, 109-1134H



270x270x99 mm

San Ace 221W 9B1W2TP type

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
Bracket: Aluminum (Black coating), Plastic (Flammability: UL94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and bracket)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and bracket)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow Control Brown
- Mass 1900 g
- Ingress protection IP56 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9B1W2TP24P0H001 | 24 | 16 to 36 | 100 | 3.35 | 80.4 | 3050 | 17.6 621 | 530 2.13 | 71.5 | -25 to +70 | 40000/60°C (70000/40°C) |
| | | | 15 | 0.4 | 9.6 | 1000 | 5.75 203 | 57.0 0.23 | 53.5 | | |
| 9B1W2TP48P0S001 | 48 | 36 to 72 | 100 | 2.3 | 110.4 | 3400 | 19.6 692 | 659 2.65 | 73.5 | | |
| | | | 15 | 0.2 | 9.6 | 1000 | 5.75 203 | 57.0 0.23 | 53.5 | | |

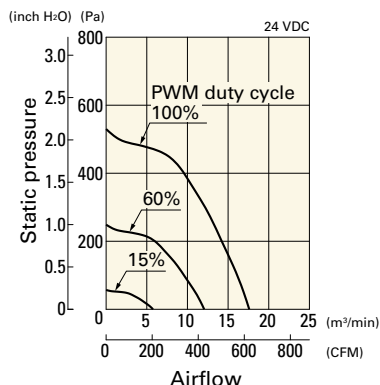
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input of 9B1W2TP24P0H001: 150 W, 9B1W2TP48P0S001: 210 W at rated voltage.

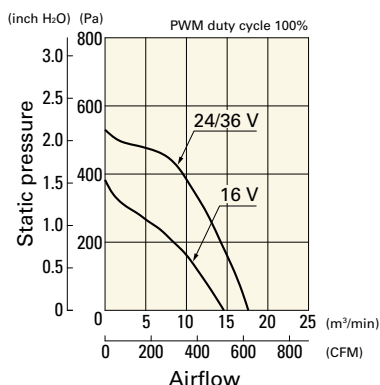
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9B1W2TP24P0H001 With pulse sensor with PWM control

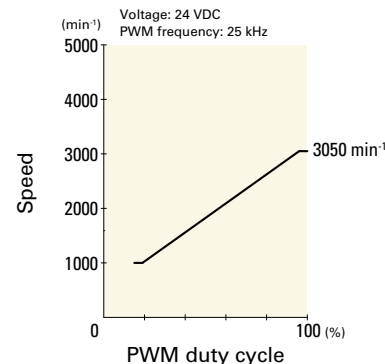
PWM duty cycle



Operating voltage range



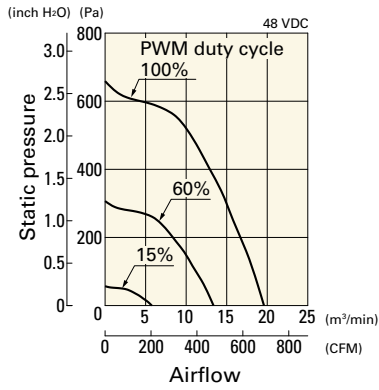
PWM duty - Speed characteristics example



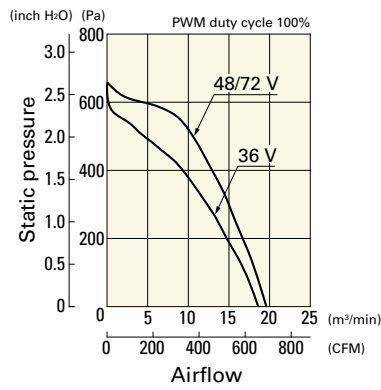
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9B1W2TP48P0S001 With pulse sensor with PWM control

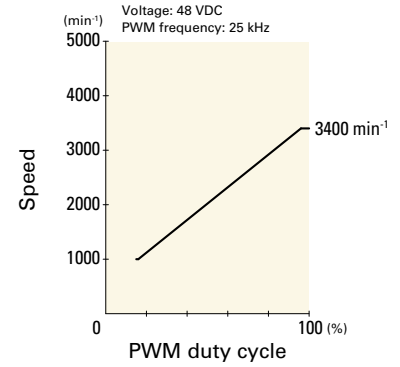
PWM duty cycle



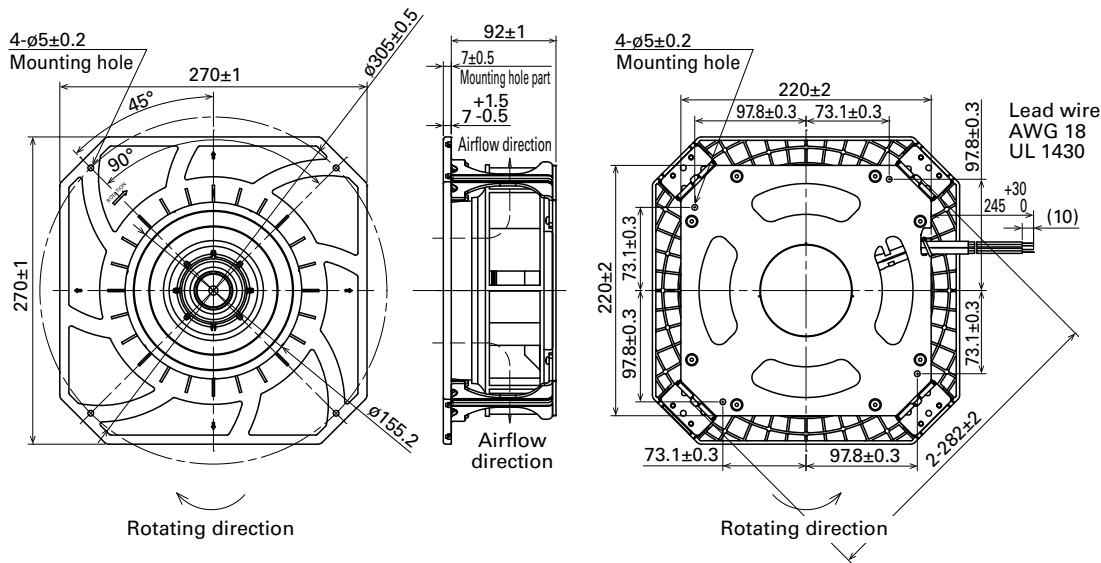
Operating voltage range



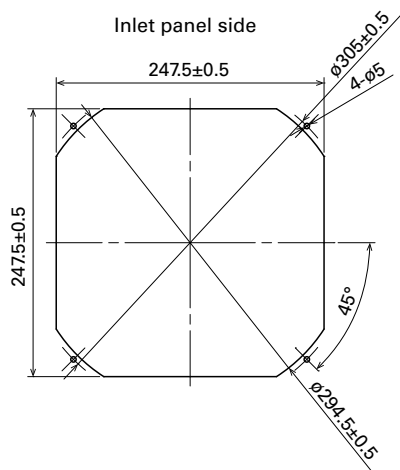
PWM duty - Speed characteristics example



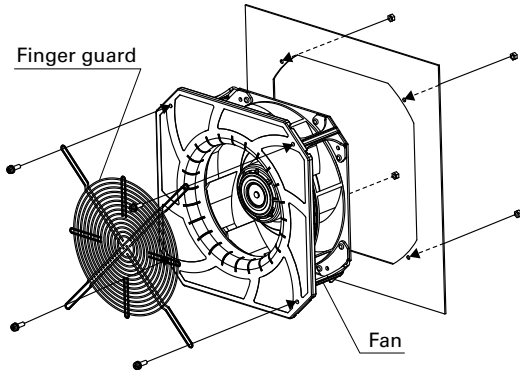
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting

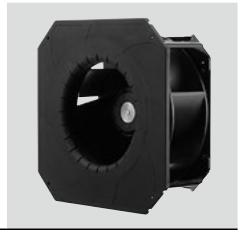


Options

Finger guards

page: p. 602

Model no.: 109-1146, 109-1146H



270x270x119 mm

San Ace 225W 9B1W2TS type

DC Splash Proof Centrifugal Fan 270 mm sq.

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
Bracket: Aluminum (Black coating), Plastic (Flammability: UL94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and bracket)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and bracket)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow Control Brown
- Mass 2200 g
- Ingress protection IP56 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9B1W2TS48P0S001 | 48 | 36 to 72 | 100 | 2.45 | 117.6 | 3000 | 23.5 830 | 635 2.55 | 72.0 | -25 to +70 | 40000/60°C (70000/40°C) |
| | | | 15 | 0.24 | 11.5 | 1000 | 7.83 276 | 70.6 0.28 | 52.5 | | |

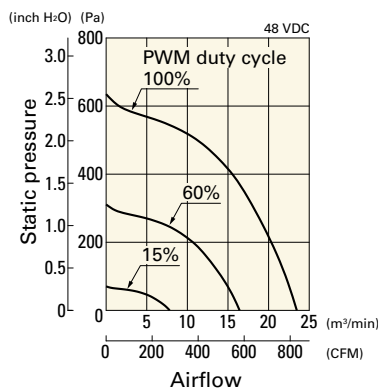
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input is 220 W at rated voltage.

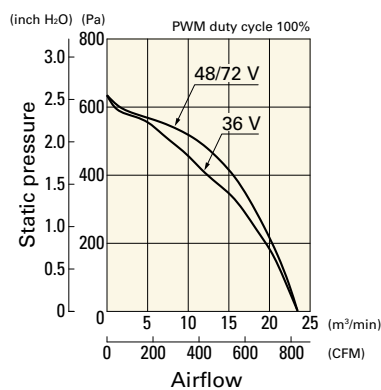
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9B1W2TS48P0S001 With pulse sensor with PWM control

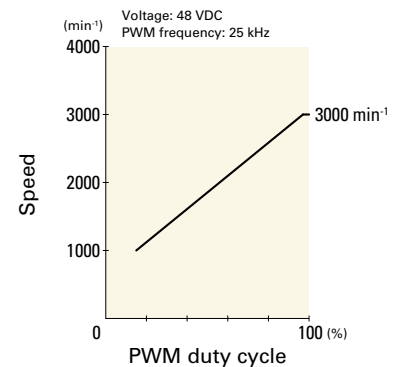
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example



Splash Proof Blower

This fan specializes in high static pressure and has IP68-rated water resistance. For more information on IP rating, refer to p. 621.

Related product: Splash Proof Fan p. 257, Splash Proof Centrifugal Fan p. 317, Blower p. 471

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | | |
|-------------|------------|-----------|-------------|-----------------|------------|---------------------------------------|
| 9W1B | M | 12 | P | 2 | H | 001 |
| Type name | Frame size | Voltage | PWM control | Frame thickness | Speed code | Individual customer's spec (3 digits) |

| | |
|----------------------|----------------|
| Type name | 9W1B |
| Frame size (mm) | M 97 |
| Voltage (V) | 12 24 12 24 |
| Frame thickness (mm) | 2 33 |
| Speed code | H M |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

- Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
For more information, please refer to the technical material section.



97x33 mm

San Ace 97W 9W1BM type 

DC
Splash Proof Blower 97 mm

General Specifications

- Material Frame: Aluminum (Black coating), Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 240 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

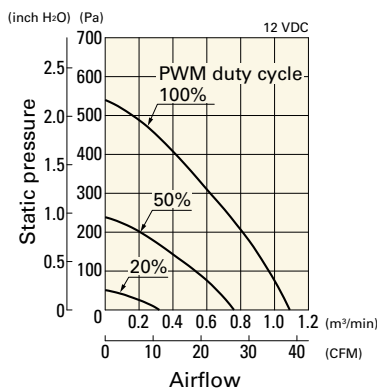
| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9W1BM12P2H001 | 12 | 10.2 to 13.8 | 100 | 1.3 | 15.6 | 4800 | 1.09 38.5 | 540 2.17 | 58 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.14 | 1.68 | 1500 | 0.32 11.3 | 51 0.2 | 30 | | |
| 9W1BM12P2M001 | 12 | 10.2 to 13.8 | 100 | 0.9 | 10.8 | 4100 | 0.93 32.8 | 380 1.53 | 55 | | |
| | | | 20 | 0.14 | 1.68 | 1500 | 0.32 11.3 | 51 0.2 | 30 | | |
| 9W1BM24P2H001 | 24 | 20.4 to 27.6 | 100 | 0.65 | 15.6 | 4800 | 1.09 38.5 | 540 2.17 | 58 | | |
| | | | 20 | 0.07 | 1.68 | 1500 | 0.32 11.3 | 51 0.2 | 30 | | |
| 9W1BM24P2M001 | 24 | 20.4 to 27.6 | 100 | 0.45 | 10.8 | 4100 | 0.93 32.8 | 380 1.53 | 55 | | |
| | | | 20 | 0.07 | 1.68 | 1500 | 0.32 11.3 | 51 0.2 | 30 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

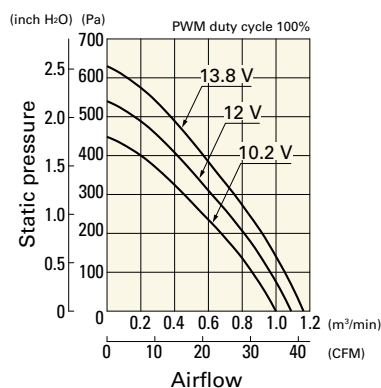
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W1BM12P2H001 With pulse sensor with PWM control

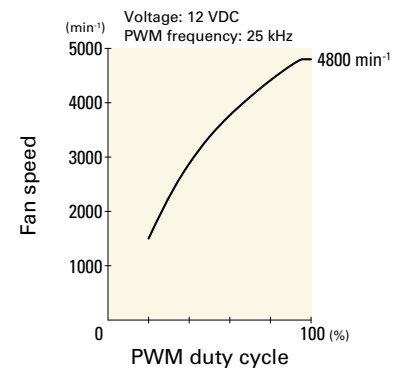
PWM duty cycle



Operating voltage range



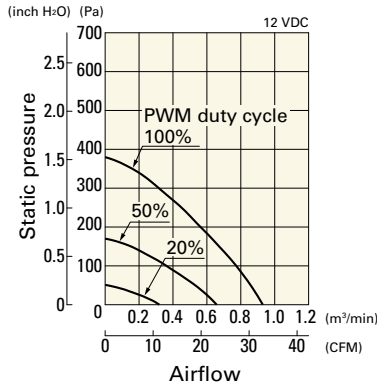
PWM duty - Speed characteristics example



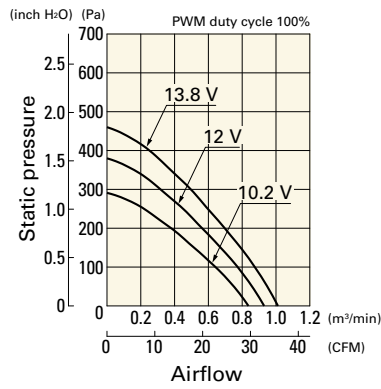
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9W1BM12P2M001 With pulse sensor with PWM control

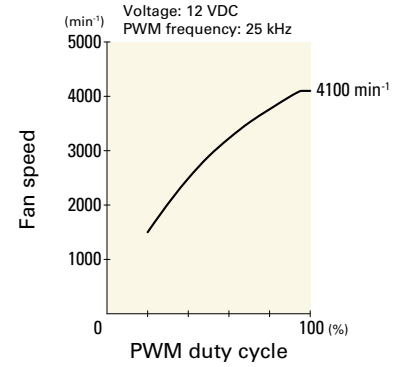
PWM duty cycle



Operating voltage range

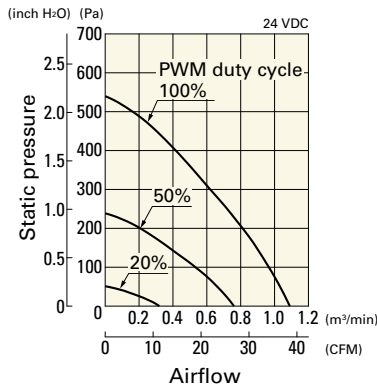


PWM duty - Speed characteristics example

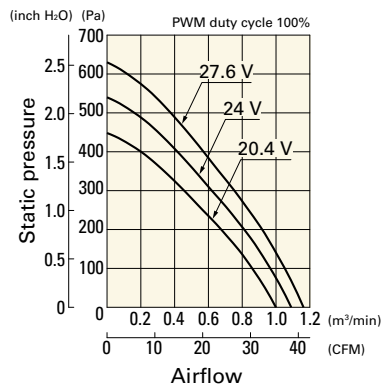


9W1BM24P2H001 With pulse sensor with PWM control

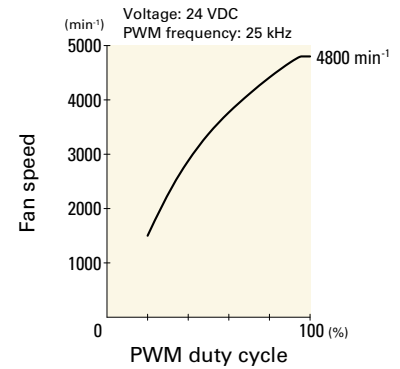
PWM duty cycle



Operating voltage range

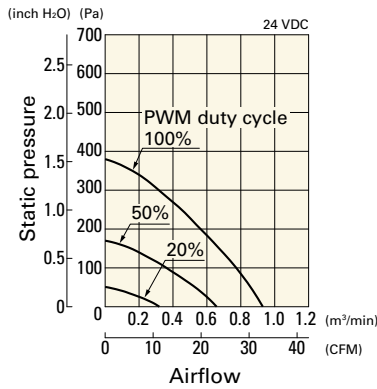


PWM duty - Speed characteristics example

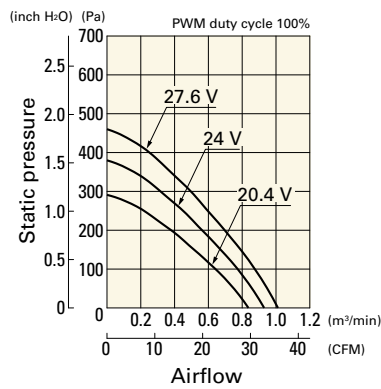


9W1BM24P2M001 With pulse sensor with PWM control

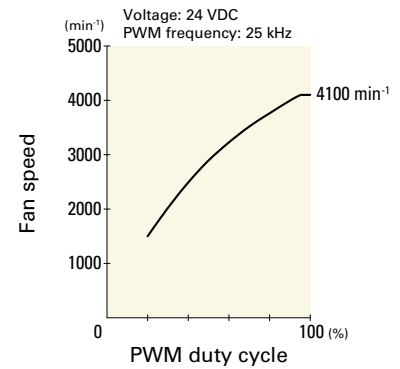
PWM duty cycle



Operating voltage range



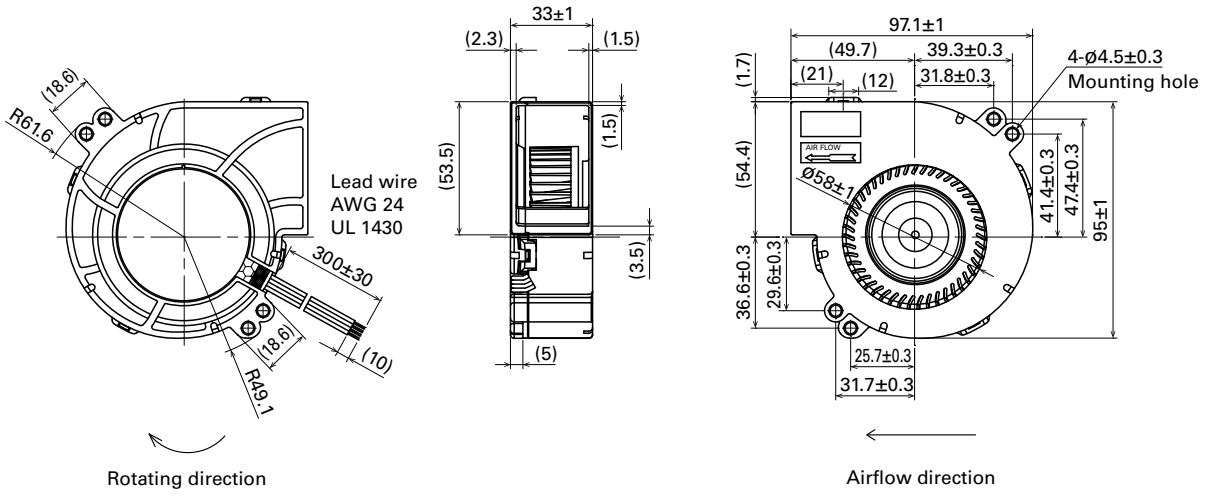
PWM duty - Speed characteristics example



DC

Splash Proof Blower 97 mm

Dimensions (unit: mm)



DC
Splash Proof Blower 97 mm

Oil Proof Fan

Cooling fan capable of operating in an oil-mist environment.

Related product: Splash Proof Fan p. 257, Splash Proof Centrifugal Fan p. 317, Splash Proof Blower p. 349

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | | |
|------------|------------|-----------|------------|-----------------|-----------------------|------------|
| 9WF | 12 | 24 | H | 1 | 01 | |
| Type name | Frame size | Voltage | Speed code | Frame thickness | Sensor specifications | Frame form |

| | | | | | | |
|-----------------------|---------------------|-------|------------------|-------|--------------------|--|
| Type name | 9WF 9WFA | | | | | |
| Frame size (mm) | 04 | 06 | 08 | 09 | 12 | |
| | 40×40 | 60×60 | 80×80 | 92×92 | 120×120 | |
| Voltage (V) | 24 | | | | | |
| Speed code | H | | | | | |
| Frame thickness (mm) | 1 | 2 | 4 | 6 | 7 | |
| | 38 | 32 | 25 | 20 | 15 | |
| Sensor specifications | 01, 001 | | 02, 002 | | D01, D001 | |
| | With a pulse sensor | | Without a sensor | | With a lock sensor | |
| Frame form | Nil | | | | | |
| | Ribbed frame | | | | | |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

- Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
For more information, please refer to the technical material section.

40x40x15 mm

San Ace 40WF 9WF_{type}   



Oil Proof Fan 40 mm sq. DC

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 35 g

This fan can be used in environments with oil mist.*

* Environment where cutting oil creates oil mist. Conduct a product evaluation with the type of oil to be used.

Specifications

The models listed below **have ribs and a pulse sensor.**

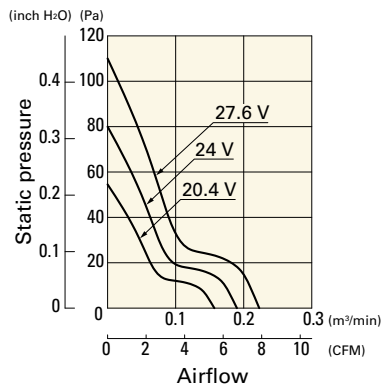
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow | | Max. static pressure | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|-----------------------|-------|----------------------|------------------------|--------------|----------------------------|----------------------------|
| | | | | | | [m ³ /min] | [CFM] | [Pa] | [inchH ₂ O] | | | |
| 9WF0424H701 | 24 | 20.4 to 27.6 | 0.085 | 2.04 | 11300 | 0.195 | 6.9 | 80 | 0.32 | 38 | -20 to +70 | 40000/60°C (70000/40°C) |

Note: Sensor and control options are available for selection. Refer to the table on p. 654.

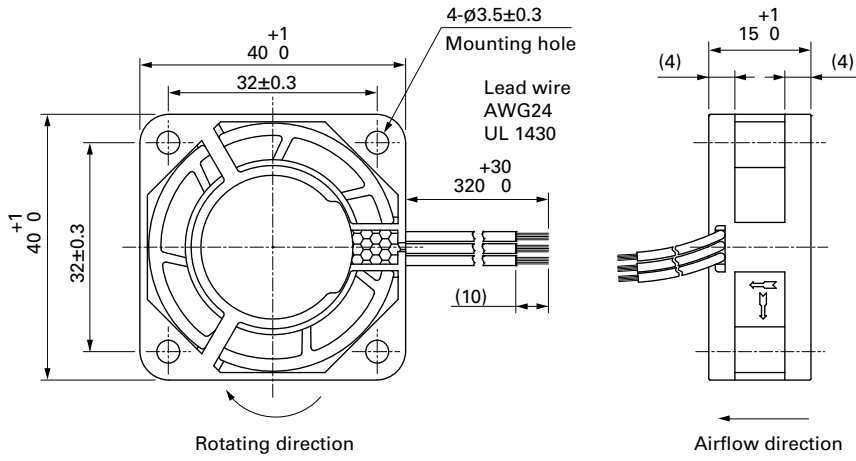
Airflow - Static Pressure Characteristics

9WF0424H701 With pulse sensor

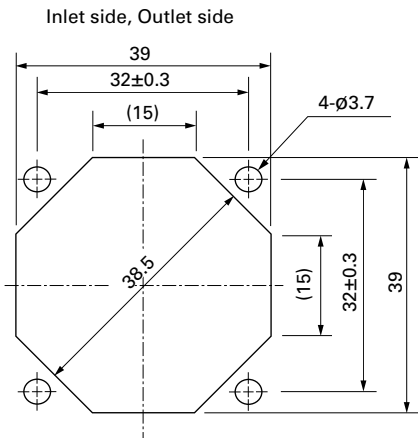
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



40x40x20 mm

San Ace 40WF 9WFA type US

DC Oil Proof Fan 40 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow
- Mass 45 g

This fan can be used in environments with oil mist.*

* Environment where cutting oil creates oil mist. Conduct a product evaluation with the type of oil to be used.

Specifications

The models listed below **have ribs and a pulse sensor.**

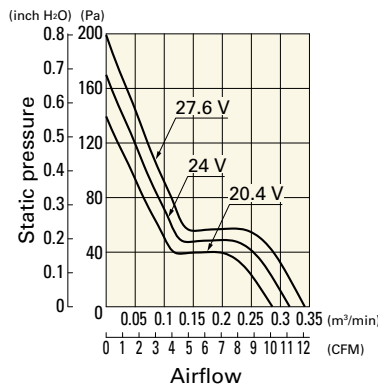
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WFA0424G6001 | 24 | 20.4 to 27.6 | 0.11 | 2.6 | 17000 | 0.31 10.9 | 170 0.68 | 48 | -20 to +70 | 40000/60°C (70000/40°C) |

Note: Sensor and control options are available for selection. Refer to the table on p. 654.

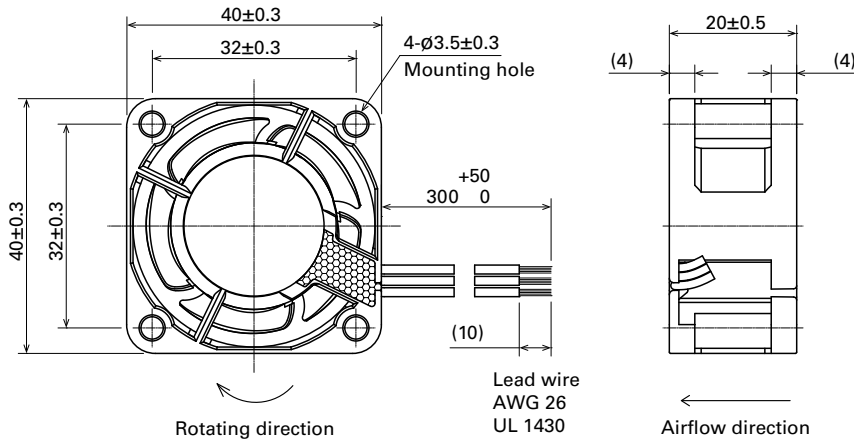
Airflow - Static Pressure Characteristics

9WFA0424G6001 With pulse sensor

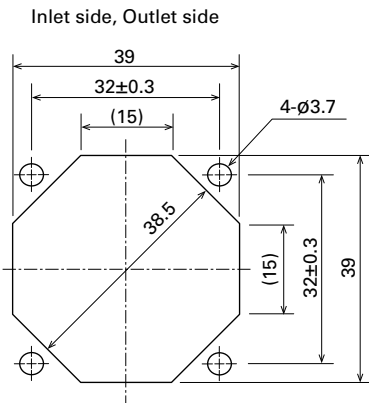
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



60x60x15 mm

San Ace 60WF 9WF_{type}

DC Oil Proof Fan 60 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow
- Mass 62 g

This fan can be used in environments with oil mist.*

* Environment where cutting oil creates oil mist. Conduct a product evaluation with the type of oil to be used.

Specifications

The models listed below **have ribs and a pulse sensor.**

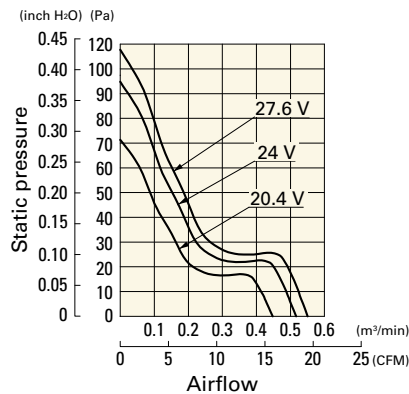
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow | | Max. static pressure | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|-----------------------|-------|----------------------|------------------------|--------------|----------------------------|----------------------------|
| | | | | | | [m ³ /min] | [CFM] | [Pa] | [inchH ₂ O] | | | |
| 9WF0624H701 | 24 | 20.4 to 27.6 | 0.12 | 2.88 | 6800 | 0.52 | 18.3 | 95 | 0.38 | 44 | -20 to +70 | 40000/60°C (70000/40°C) |

Note: Sensor and control options are available for selection. Refer to the table on p. 654.

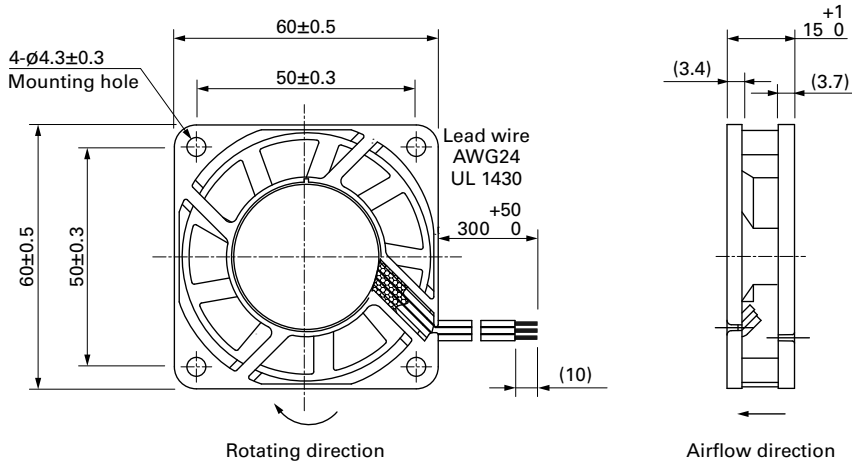
Airflow - Static Pressure Characteristics

9WF0624H701 With pulse sensor

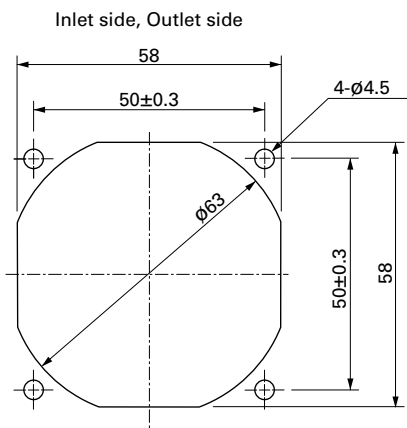
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H



60x60x20 mm

San Ace 60WF 9WFA type US

DC Oil Proof Fan 60 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow
- Mass 85 g

This fan can be used in environments with oil mist.*

* Environment where cutting oil creates oil mist. Conduct a product evaluation with the type of oil to be used.

Specifications

The models listed below **have ribs and a pulse sensor.**

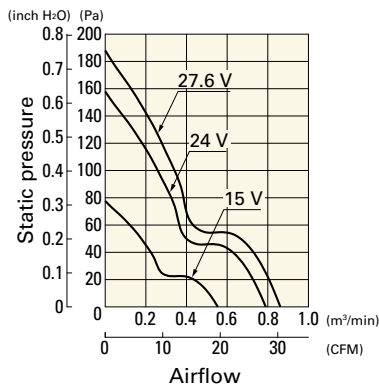
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WFA0624G6001 | 24 | 15 to 27.6 | 0.16 | 3.8 | 7700 | 0.79 27.9 | 158 0.63 | 48 | -20 to +70 | 40000/60°C (70000/40°C) |

Note: Sensor and control options are available for selection. Refer to the table on p. 654.

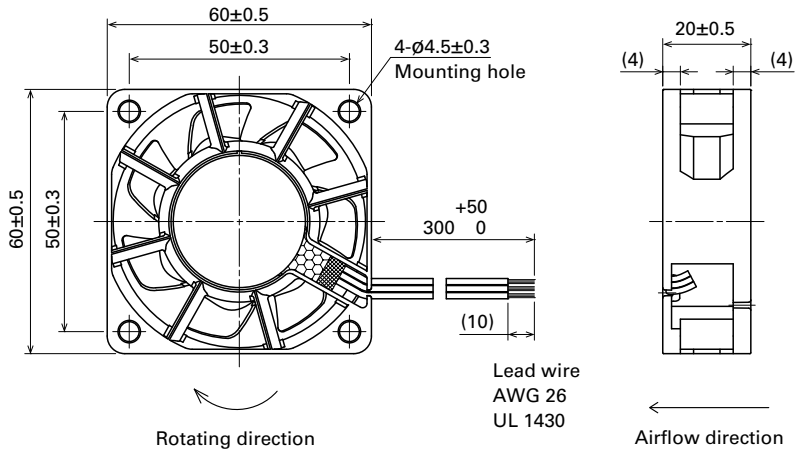
Airflow - Static Pressure Characteristics

9WFA0624G6001 With pulse sensor

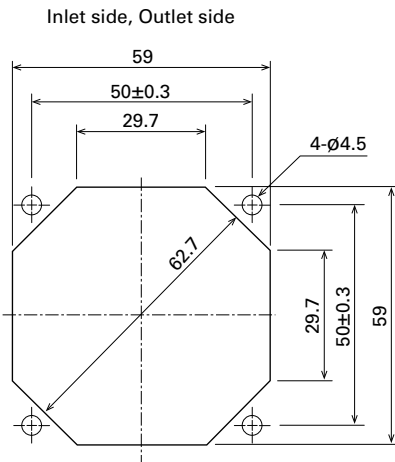
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H



60x60x25 mm

San Ace 60WF 9WF_{type}

DC Oil Proof Fan 60 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow
- Mass 110 g

This fan can be used in environments with oil mist.*

* Environment where cutting oil creates oil mist. Conduct a product evaluation with the type of oil to be used.

Specifications

The models listed below **have ribs and a pulse sensor.**

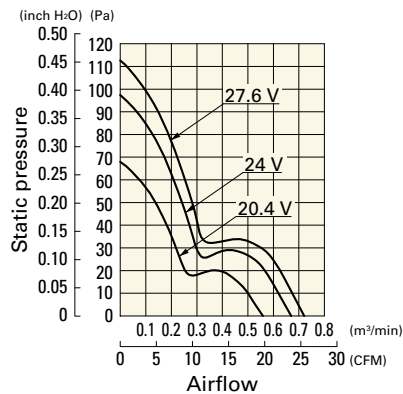
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow | | Max. static pressure | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|-----------------------|-------|----------------------|------------------------|--------------|----------------------------|----------------------------|
| | | | | | | [m ³ /min] | [CFM] | [Pa] | [inchH ₂ O] | | | |
| 9WF0624H401 | 24 | 20.4 to 27.6 | 0.15 | 3.6 | 6500 | 0.67 | 23.6 | 97 | 0.38 | 41 | -20 to +70 | 40000/60°C (70000/40°C) |

Note: Sensor and control options are available for selection. Refer to the table on p. 654.

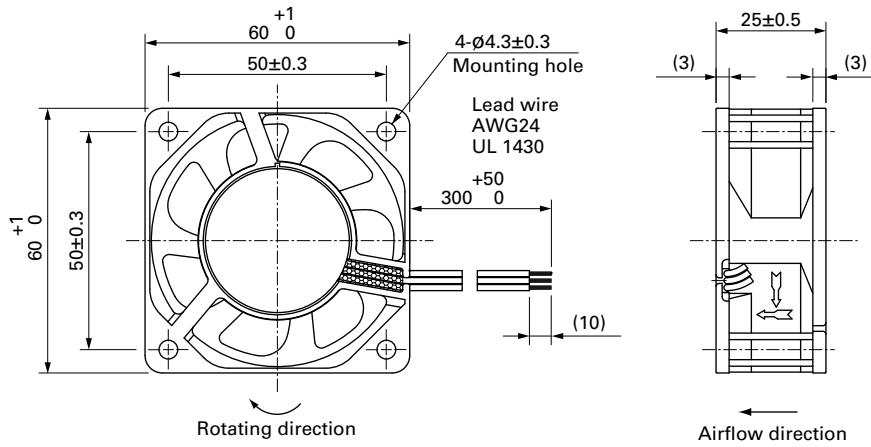
Airflow - Static Pressure Characteristics

9WF0624H401 With pulse sensor

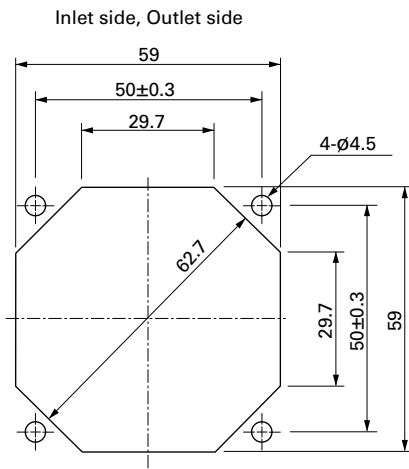
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H



80x80x20 mm

San Ace 80WF 9WFA type

DC Oil Proof Fan 80 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow
- Mass 105 g

This fan can be used in environments with oil mist.*

* Environment where cutting oil creates oil mist. Conduct a product evaluation with the type of oil to be used.

Specifications

The models listed below **have ribs and a pulse sensor.**

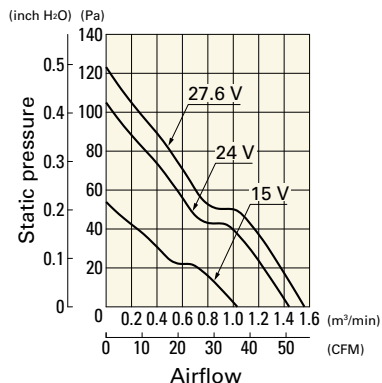
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WFA0824G6001 | 24 | 15 to 27.6 | 0.15 | 3.6 | 6000 | 1.44 50.8 | 105 0.42 | 48 | -20 to +70 | 40000/60°C (70000/40°C) |

Note: Sensor and control options are available for selection. Refer to the table on p. 654.

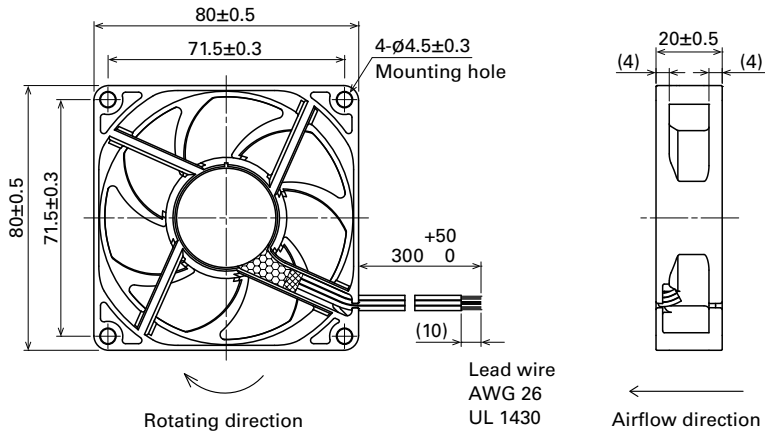
Airflow - Static Pressure Characteristics

9WFA0824G6001 With pulse sensor

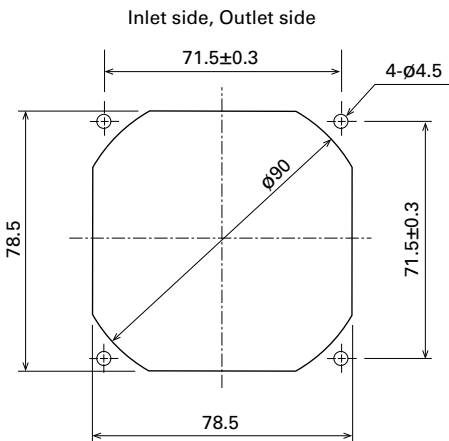
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H



80x80x25 mm

San Ace 80WF 9WF_{type}

DC Oil Proof Fan 80 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 130 g

This fan can be used in environments with oil mist.*

* Environment where cutting oil creates oil mist. Conduct a product evaluation with the type of oil to be used.

Specifications

The models listed below **have ribs and a pulse sensor.**

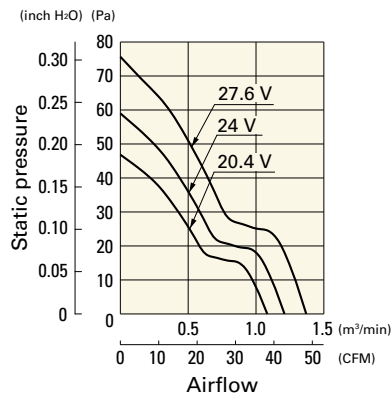
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow | | Max. static pressure | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|-----------------------|-------|----------------------|------------------------|--------------|----------------------------|----------------------------|
| | | | | | | [m ³ /min] | [CFM] | [Pa] | [inchH ₂ O] | | | |
| 9WF0824S401 | 24 | 20.4 to 27.6 | 0.16 | 3.84 | 4000 | 1.2 | 42.4 | 58 | 0.23 | 38 | -20 to +70 | 40000/60°C (70000/40°C) |

Note: Sensor and control options are available for selection. Refer to the table on p. 654.

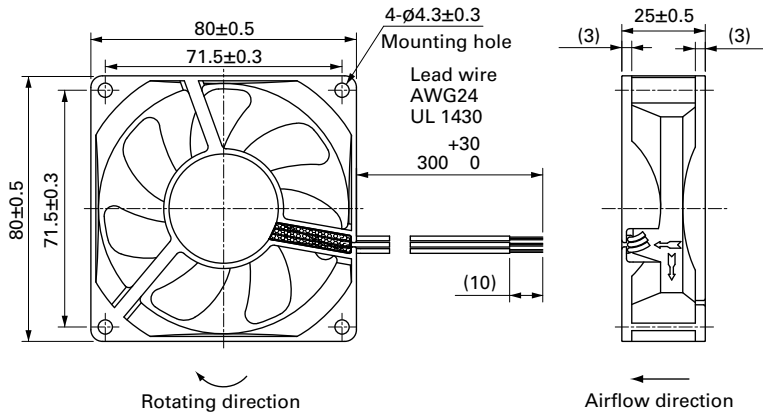
Airflow - Static Pressure Characteristics

9WF0824S401 With pulse sensor

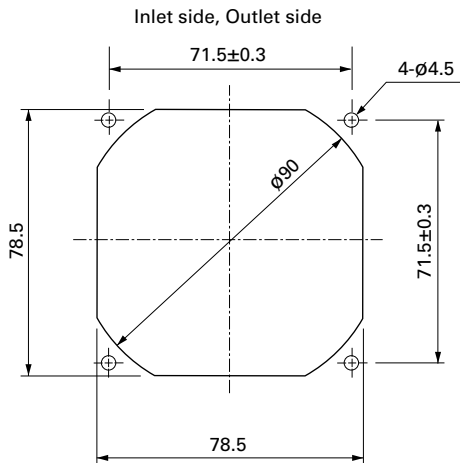
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H



92x92x25 mm

San Ace 92WF 9WFA type

DC Oil Proof Fan 92 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow
- Mass 170 g

This fan can be used in environments with oil mist.*

* Environment where cutting oil creates oil mist. Conduct a product evaluation with the type of oil to be used.

Specifications

The models listed below **have ribs and a pulse sensor**. For models without ribs, append "1" to the end of model numbers.

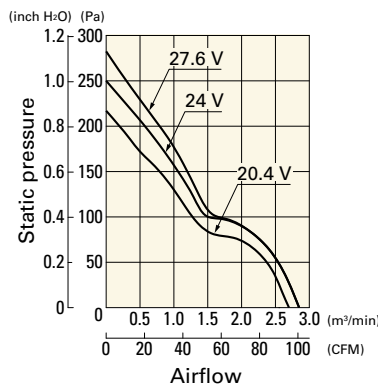
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WFA0924G4001 | 24 | 20.4 to 27.6 | 0.45 | 10.8 | 7350 | 2.85 100.6 | 250 1.0 | 56 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9WFA0924H4001 | | | 0.28 | 6.72 | 6100 | 2.35 83.0 | 171 0.69 | 52 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 654.

Airflow - Static Pressure Characteristics

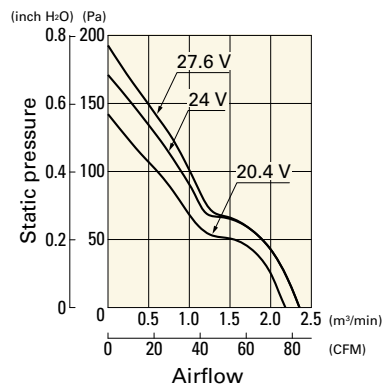
9WFA0924G4001 With pulse sensor

Operating voltage range

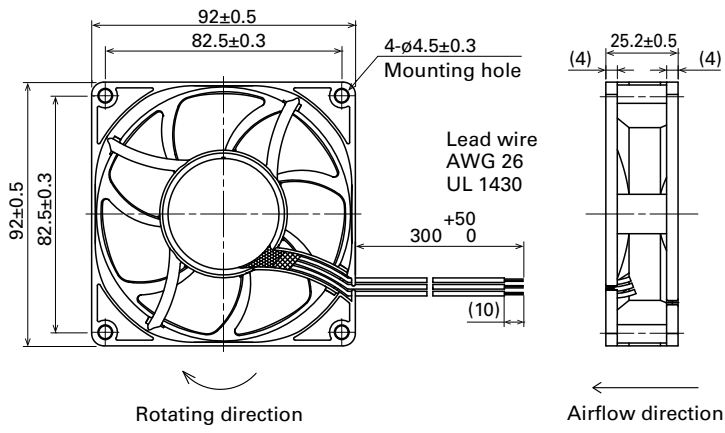


9WFA0924H4001 With pulse sensor

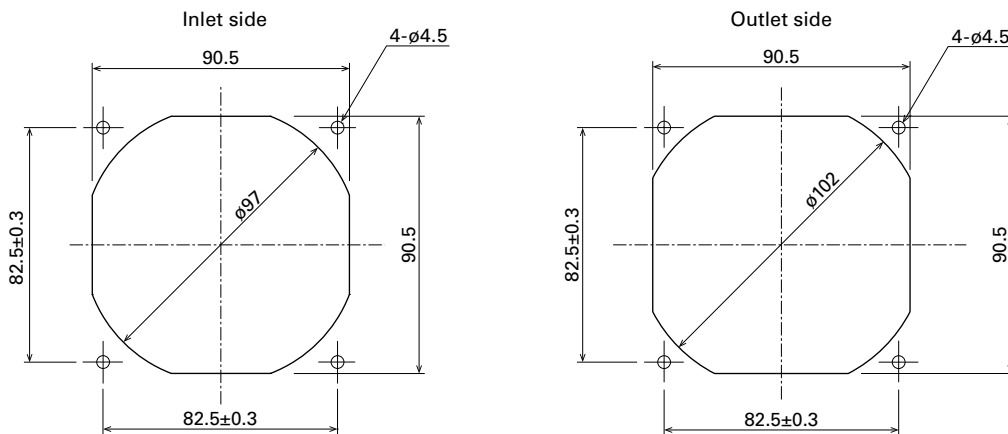
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H



92x92x32 mm

San Ace 92WF 9WFA type

DC Oil Proof Fan 92 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow
- Mass 205 g

This fan can be used in environments with oil mist.*

* Environment where cutting oil creates oil mist. Conduct a product evaluation with the type of oil to be used.

Specifications

The models listed below **have ribs and a pulse sensor.**

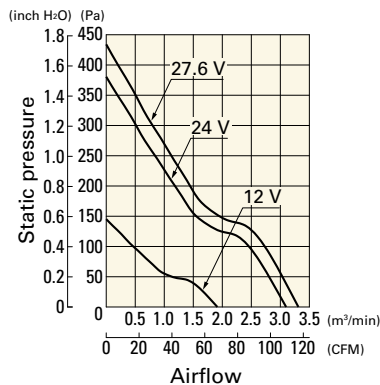
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WFA0924G2001 | 24 | 12 to 27.6 | 0.58 | 13.9 | 9600 | 3.1 109.5 | 380 1.53 | 63 | -20 to +70 | 40000/60°C (70000/40°C) |

Note: Sensor and control options are available for selection. Refer to the table on p. 654.

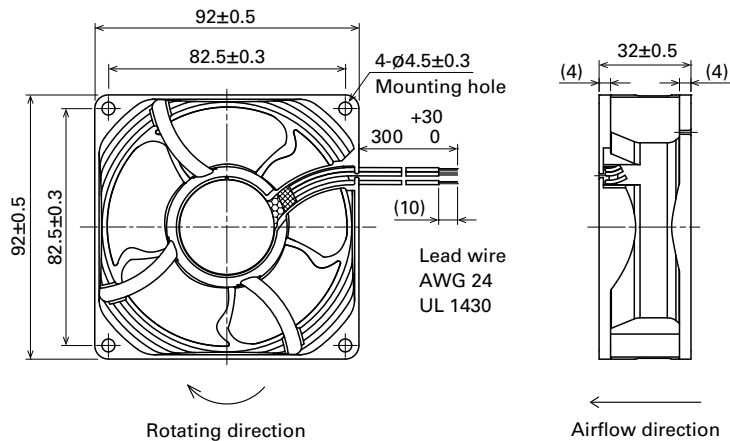
Airflow - Static Pressure Characteristics

9WFA0924G2001 With pulse sensor

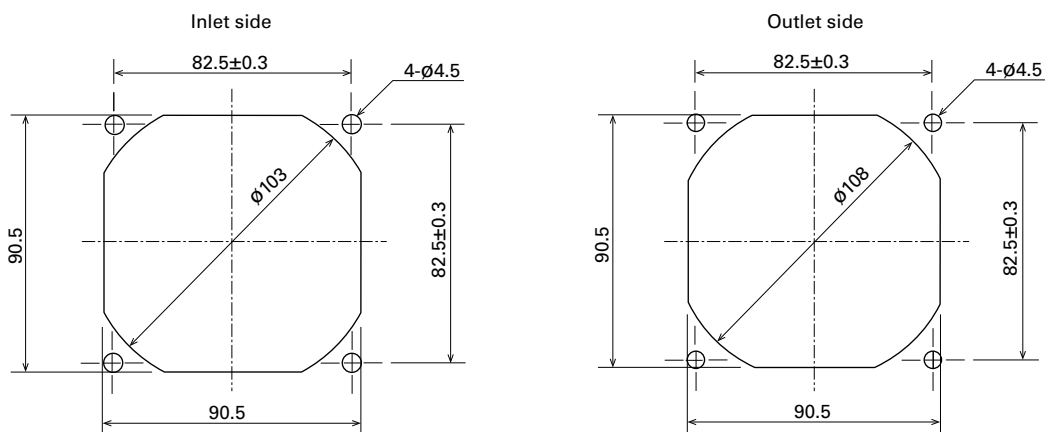
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598




Model no.: 109-099E, 109-099H

DC

Oil Proof Fan 92 mm sq.



120×120×38 mm

San Ace 120WF 9WF type   

DC Oil Proof Fan 120 mm sq.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 355 g

This fan can be used in environments with oil mist.*

* Environment where cutting oil creates oil mist. Conduct a product evaluation with the type of oil to be used.

Specifications

The models listed below **have ribs and a pulse sensor.**

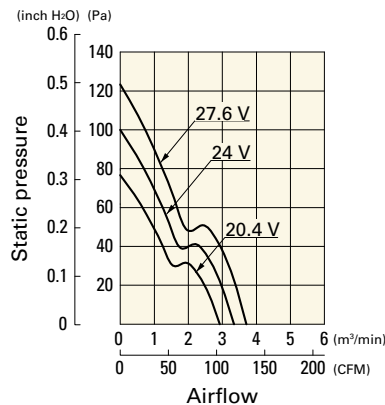
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9WF1224H101 | 24 | 20.4 to 27.6 | 0.32 | 7.68 | 3100 | 3.34 118 | 100 0.4 | 46 | -20 to +70 | 40000/60°C (70000/40°C) |

Note: Sensor and control options are available for selection. Refer to the table on p. 654.

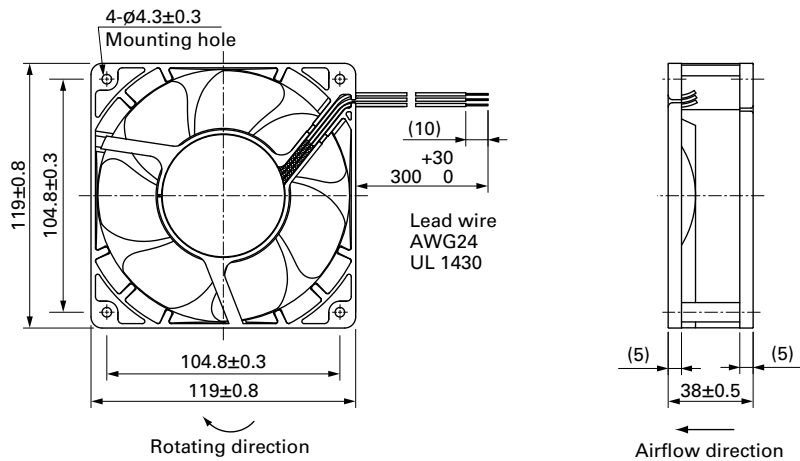
Airflow - Static Pressure Characteristics

9WF1224H101 With pulse sensor

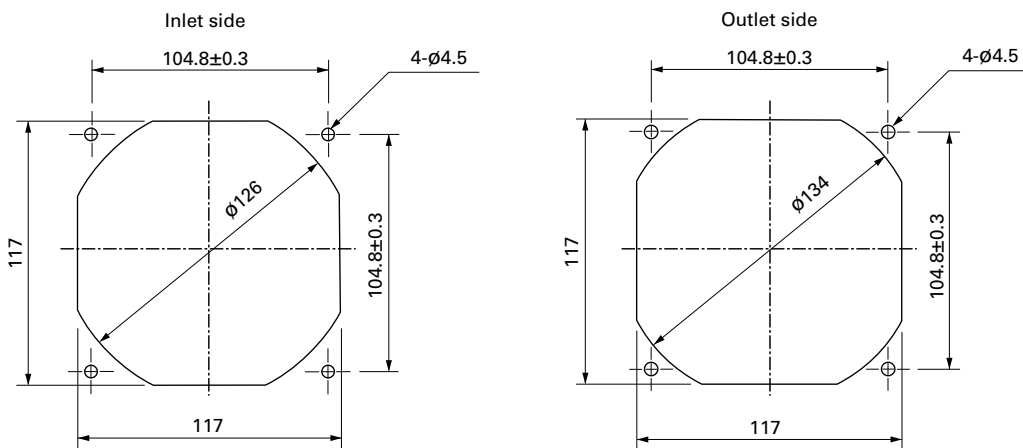
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Long Life Fan

Cooling fan with Max. 180,000 hours of expected life.

Related product: Splash Proof Fan pp. 266, 272, 278, 287, 291

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | |
|-----------|------------|-----------|------------|-----------------|-----------------------|
| 9L | 04 | 12 | J | 3 | 01 |
| Type name | Frame size | Voltage | Speed code | Frame thickness | Sensor specifications |

Fans with PWM control

| | | | | | | |
|------------|------------|-----------|-------------|-----------------|------------|--|
| 9LG | 06 | 12 | P | 4 | S | 001 |
| Type name | Frame size | Voltage | PWM control | Frame thickness | Speed code | Individual customer's spec (2 to 3 digits) |

| | | | | | | | | | |
|-----------------------|----------------------|-------|-------|------------------|---------|---------|--------------------|--------------------|--|
| Type name | 9CRL 9L 9LG etc. | | | | | | | | |
| Frame size (mm) | 04 | 06 | 08 | 09 | 12 | 14 | 17 | 57 | |
| | 40×40 | 60×60 | 80×80 | 92×92 | 120×120 | 140×140 | ∅172 | ∅172×150 (sidecut) | |
| Voltage (V) | 12 | 24 | 48 | | | | | | |
| | 12 | 24 | 48 | etc. | | | | | |
| Speed code | E F G H J L M S etc. | | | | | | | | |
| Frame thickness (mm) | 0 | 1 | 3 | 4 | 5 | 8 | | | |
| | 76 | 38 | 28 | 25 | 51 | 80 | | | |
| Sensor specifications | 01, 001 | | | 02, 002 | | | D01, D001 | | |
| | With a pulse sensor | | | Without a sensor | | | With a lock sensor | | |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC

Operating voltage range The voltage range over which fan operation is guaranteed.

Rated current The current when the fan is operating at rated voltage (at free air).

Rated input The power value when the fan is operating at rated voltage (at free air).

Rated speed The speed when the fan is operating at rated voltage (at free air).

Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)

Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)

SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.

For the measurement method, see the Technical Materials section in the catalog.

Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).

Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.

For more information, please refer to the technical material section.



40x40x28 mm

San Ace 40L 9L type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 55 g

Specifications

The models listed below **have a pulse sensor**.

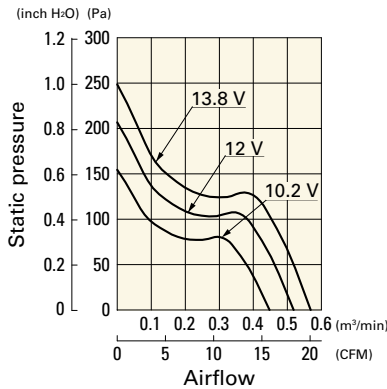
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| 9L0412J301 | 12 | 10.2 to 13.8 | 0.31 | 3.72 | 11700 | 0.52 18.4 | 206 0.827 | 48 | -20 to +70 | 100000/60°C (135000/40°C) |
| 9L0412H301 | | | 0.15 | 1.8 | 8400 | 0.37 13.1 | 106 0.426 | 40 | | |
| 9L0412M301 | | | 0.045 | 0.54 | 4000 | 0.16 5.65 | 24 0.096 | 19 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 647.

Airflow - Static Pressure Characteristics

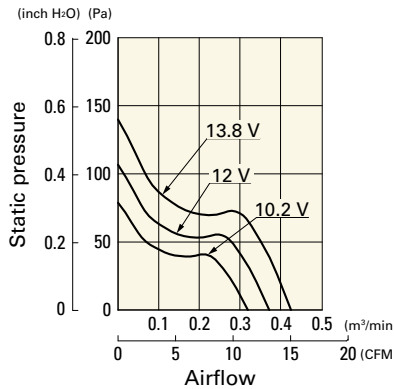
9L0412J301 With pulse sensor

Operating voltage range



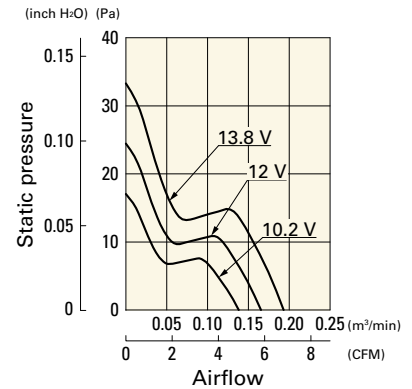
9L0412H301 With pulse sensor

Operating voltage range

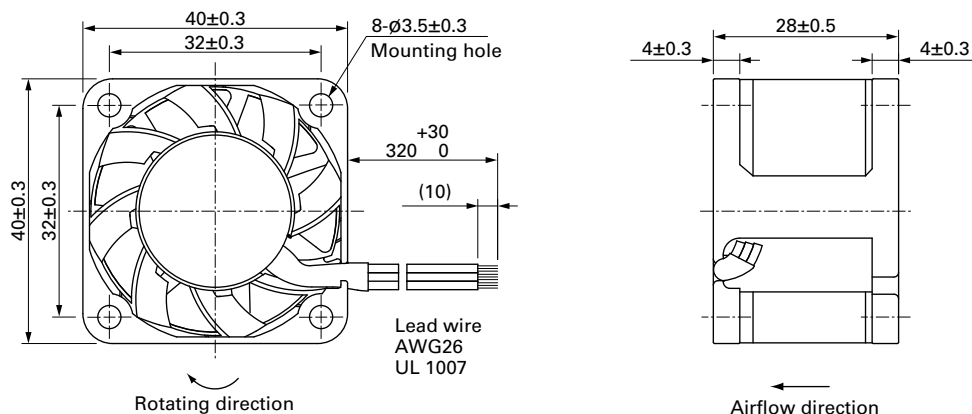


9L0412M301 With pulse sensor

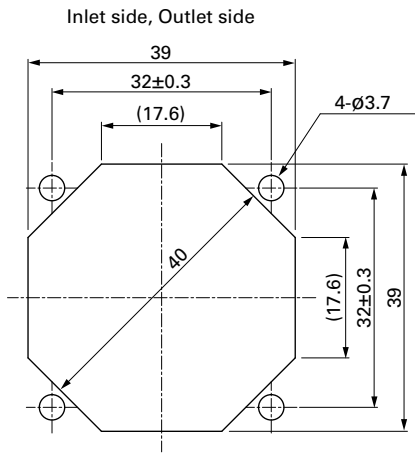
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H



60x60x25 mm

San Ace 60L 9LG type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 100 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| 9LG0612P4S001 | 12 | 10.8 to 13.2 | 100 | 0.67 | 8.04 | 11000 | 1.4 49.4 | 300 1.204 | 53 | -20 to +70 | 180000/60°C (215000/40°C) |
| | | | 20 | 0.06 | 0.72 | 2900 | 0.36 12.7 | 20.8 0.083 | 20 | | |
| 9LG0612P4J001 | | | 100 | 0.39 | 4.68 | 8650 | 1.1 38.8 | 182 0.73 | 47 | | |
| | | | 25 | 0.04 | 0.48 | 2100 | 0.26 9.1 | 10.7 0.042 | 17 | | |
| 9LG0612P4H001 | | | 100 | 0.17 | 2.04 | 6150 | 0.78 27.5 | 97 0.389 | 35 | | |
| | | | 25 | 0.03 | 0.36 | 1350 | 0.17 6.0 | 4.7 0.018 | 14 | | |
| 9LG0612P4M001 | 100 | 0.09 | 1.08 | 4200 | 0.53 18.7 | 45 0.18 | 24 | | | | |
| | 25 | 0.03 | 0.36 | 900 | 0.11 3.8 | 2.0 0.008 | 14 | | | | |
| 9LG0624P4S001 | 24 | 21.6 to 26.4 | 100 | 0.34 | 8.16 | 11000 | 1.4 49.4 | 300 1.204 | 53 | | |
| | | | 20 | 0.03 | 0.72 | 2900 | 0.36 12.7 | 20.8 0.083 | 20 | | |
| 9LG0624P4J001 | | | 100 | 0.19 | 4.56 | 8650 | 1.1 38.8 | 182 0.73 | 47 | | |
| | | | 20 | 0.02 | 0.48 | 2200 | 0.28 9.8 | 12.0 0.048 | 17 | | |
| 9LG0624P4H001 | | | 100 | 0.08 | 1.92 | 6150 | 0.78 27.5 | 97 0.389 | 35 | | |
| | | | 20 | 0.02 | 0.48 | 1300 | 0.16 5.6 | 4.3 0.017 | 14 | | |
| 9LG0624P4M001 | 100 | 0.04 | 0.96 | 4200 | 0.53 18.7 | 45 0.18 | 24 | | | | |
| | 20 | 0.01 | 0.24 | 800 | 0.1 3.5 | 1.6 0.006 | 14 | | | | |
| 9LG0648P4S001 | 48 | 36 to 72 | 100 | 0.18 | 8.64 | 11000 | 1.4 49.4 | 305 1.224 | 53 | | |
| | | | 20 | 0.02 | 0.96 | 2900 | 0.36 12.7 | 20.8 0.083 | 20 | | |
| 9LG0648P4J001 | | | 100 | 0.1 | 4.8 | 8650 | 1.1 38.8 | 182 0.73 | 47 | | |
| | | | 20 | 0.02 | 0.96 | 2100 | 0.26 9.1 | 10.7 0.042 | 17 | | |
| 9LG0648P4H001 | | | 100 | 0.06 | 2.88 | 6150 | 0.78 27.5 | 97 0.389 | 35 | | |
| | | | 20 | 0.02 | 0.96 | 1000 | 0.12 4.2 | 2.5 0.01 | 14 | | |
| 9LG0648P4M001 | 100 | 0.04 | 1.92 | 4200 | 0.53 18.7 | 45 0.18 | 24 | | | | |
| | 20 | 0.02 | 0.96 | 650 | 0.08 2.8 | 1.0 0.004 | 14 | | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note 1: Sensor and control options are available for selection. Refer to the table on pp. 647 to 648.

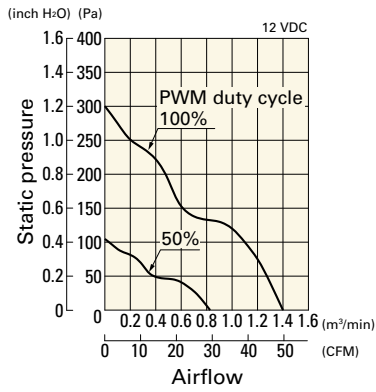
Note 2: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

DC Long Life Fan 60 mm sq.

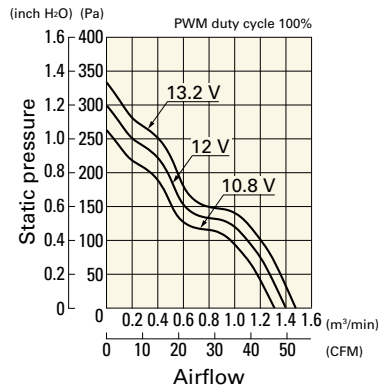
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG0612P4S001 With pulse sensor with PWM control

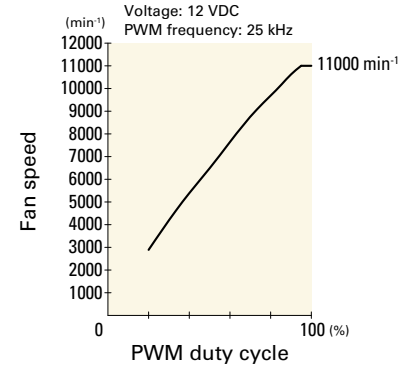
PWM duty cycle



Operating voltage range

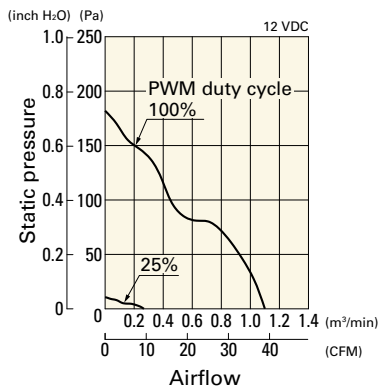


PWM duty - Speed characteristics example

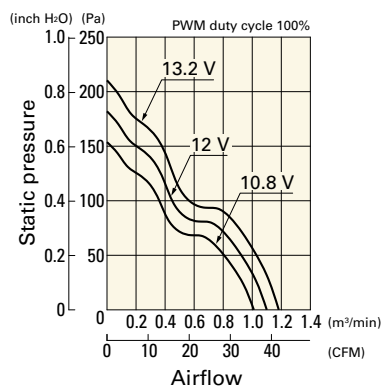


9LG0612P4J001 With pulse sensor with PWM control

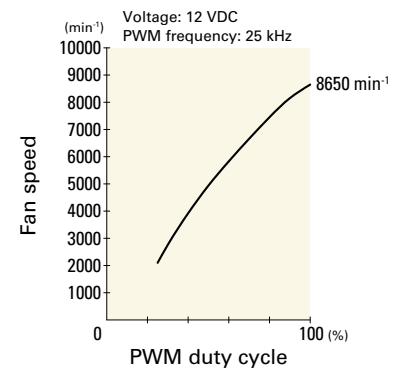
PWM duty cycle



Operating voltage range

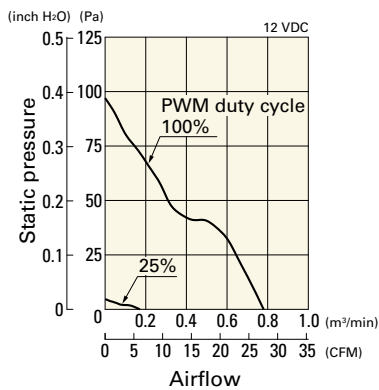


PWM duty - Speed characteristics example

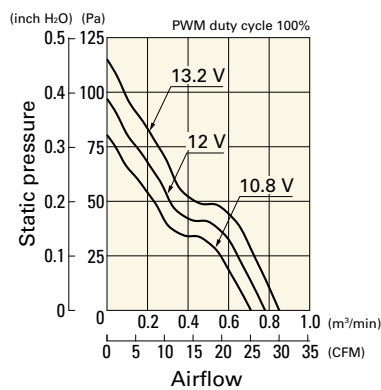


9LG0612P4H001 With pulse sensor with PWM control

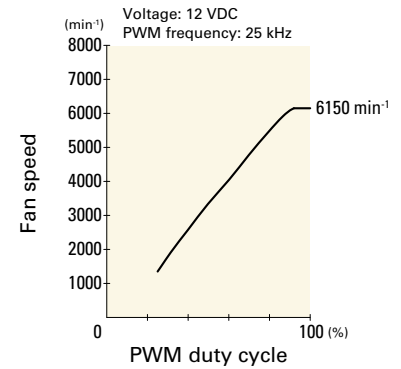
PWM duty cycle



Operating voltage range

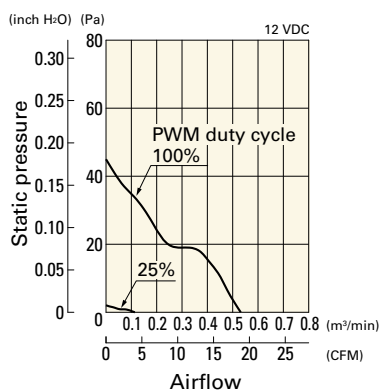


PWM duty - Speed characteristics example

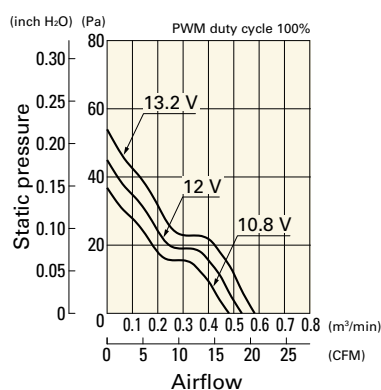


9LG0612P4M001 With pulse sensor with PWM control

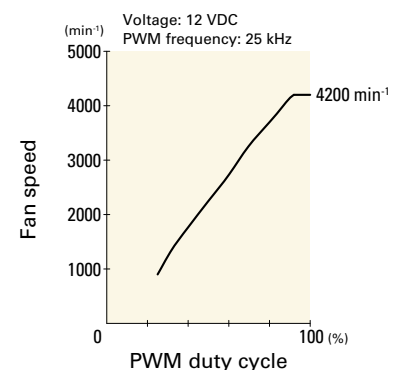
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

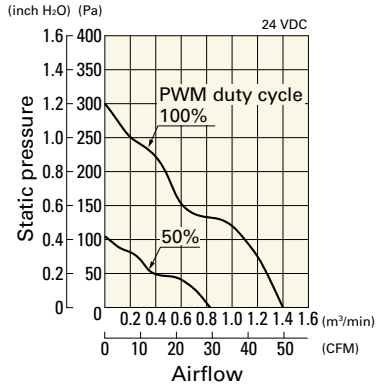


DC
Long Life Fan 60 mm sq.

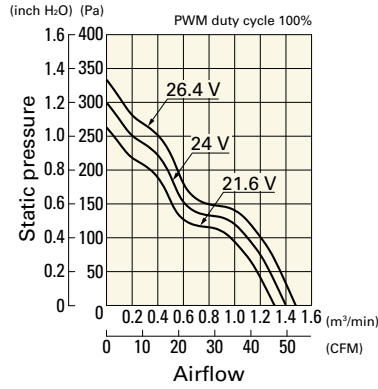
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG0624P4S001 With pulse sensor with PWM control

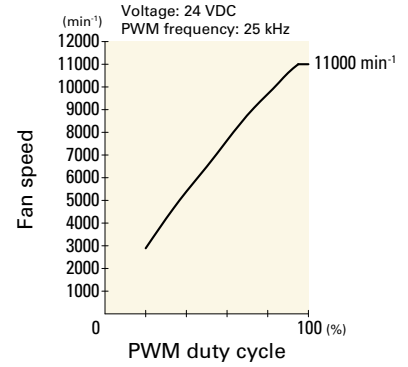
PWM duty cycle



Operating voltage range

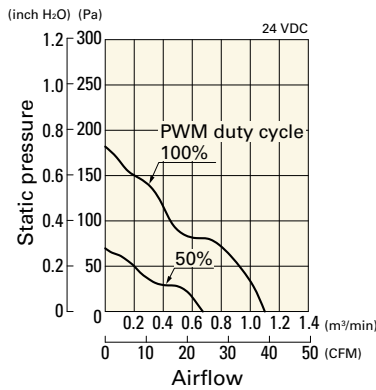


PWM duty - Speed characteristics example

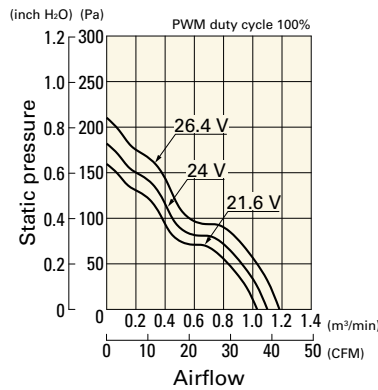


9LG0624P4J001 With pulse sensor with PWM control

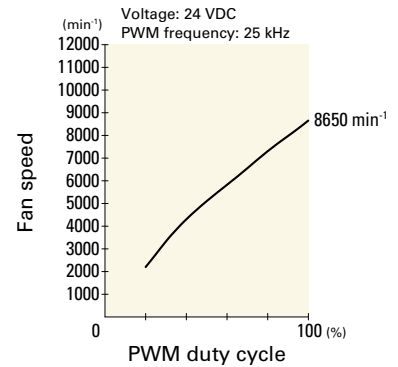
PWM duty cycle



Operating voltage range

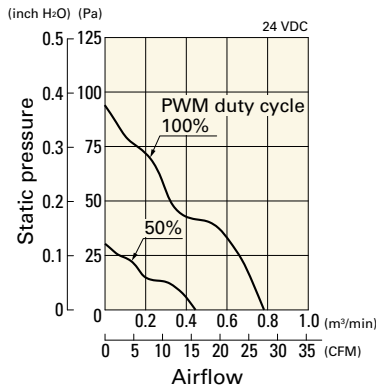


PWM duty - Speed characteristics example

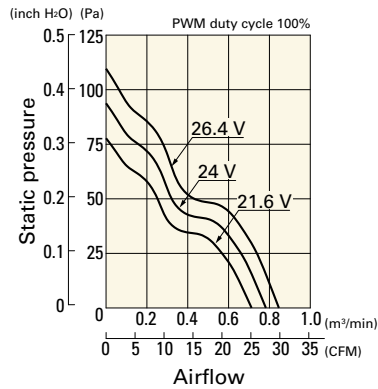


9LG0624P4H001 With pulse sensor with PWM control

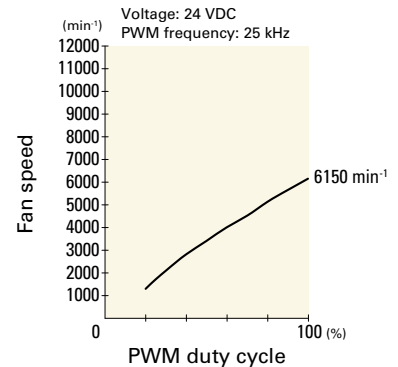
PWM duty cycle



Operating voltage range

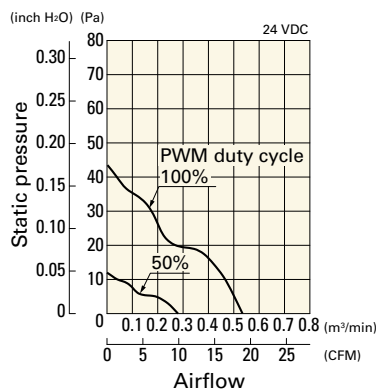


PWM duty - Speed characteristics example

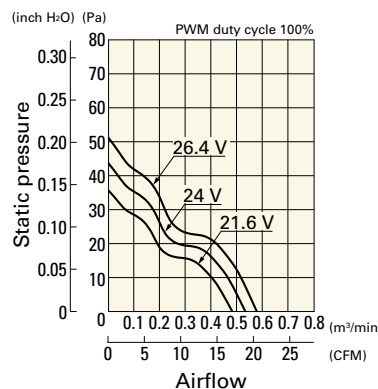


9LG0624P4M001 With pulse sensor with PWM control

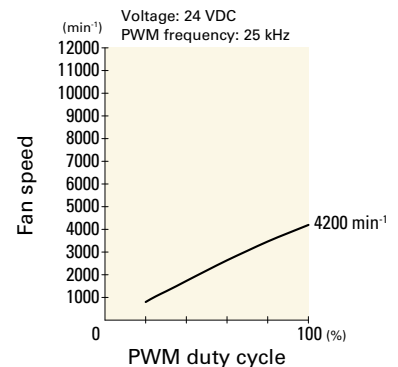
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

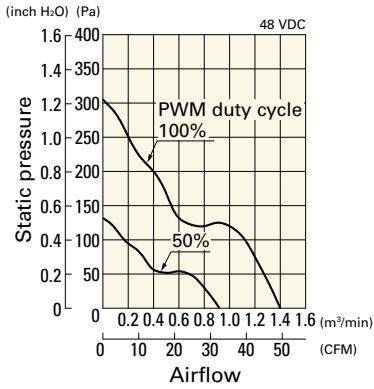


DC Long Life Fan 60 mm sq.

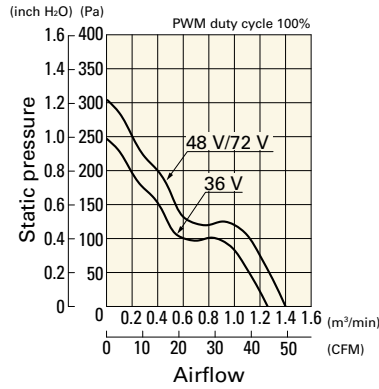
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG0648P4S001 With pulse sensor with PWM control

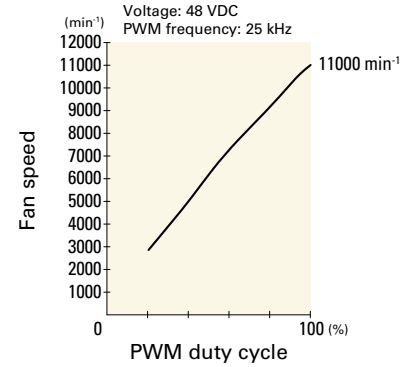
PWM duty cycle



Operating voltage range

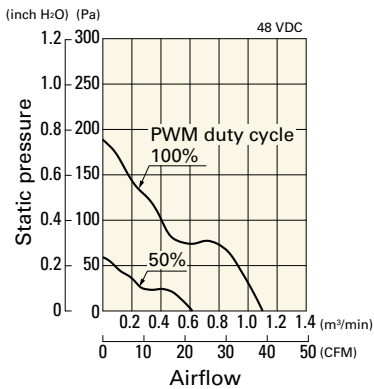


PWM duty - Speed characteristics example

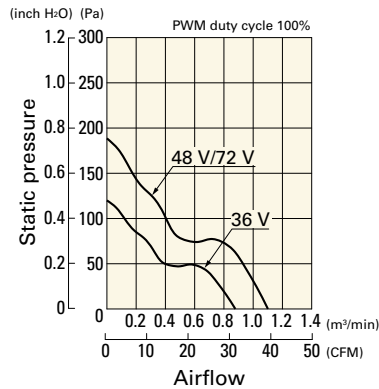


9LG0648P4J001 With pulse sensor with PWM control

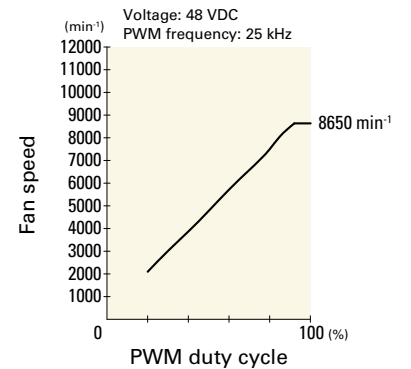
PWM duty cycle



Operating voltage range

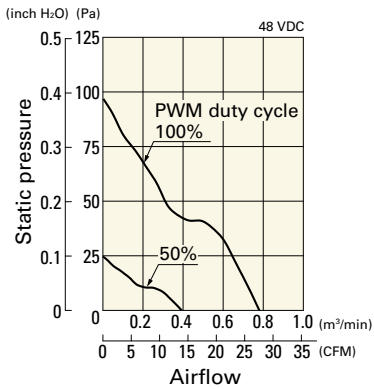


PWM duty - Speed characteristics example

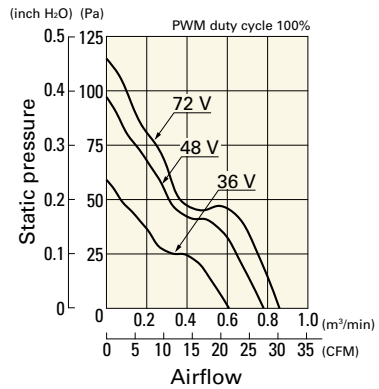


9LG0648P4H001 With pulse sensor with PWM control

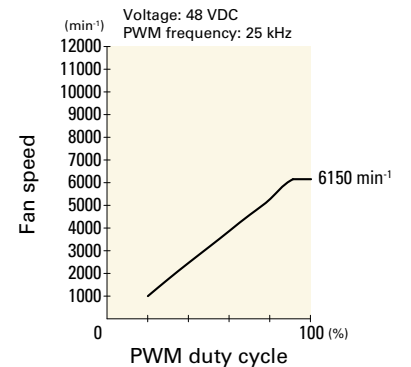
PWM duty cycle



Operating voltage range

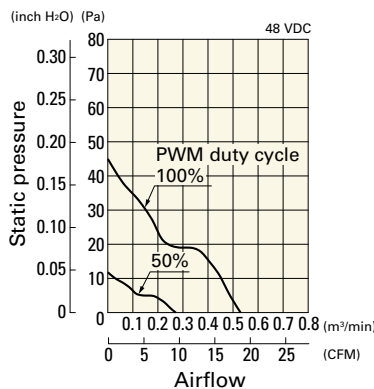


PWM duty - Speed characteristics example

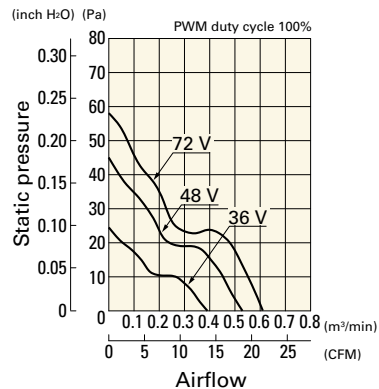


9LG0648P4M001 With pulse sensor with PWM control

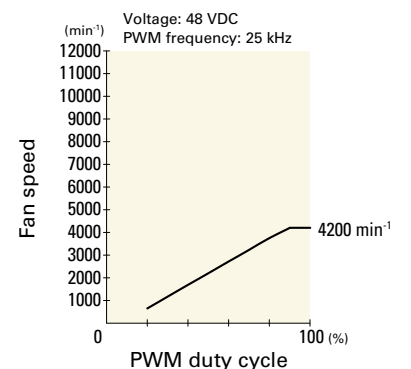
PWM duty cycle



Operating voltage range

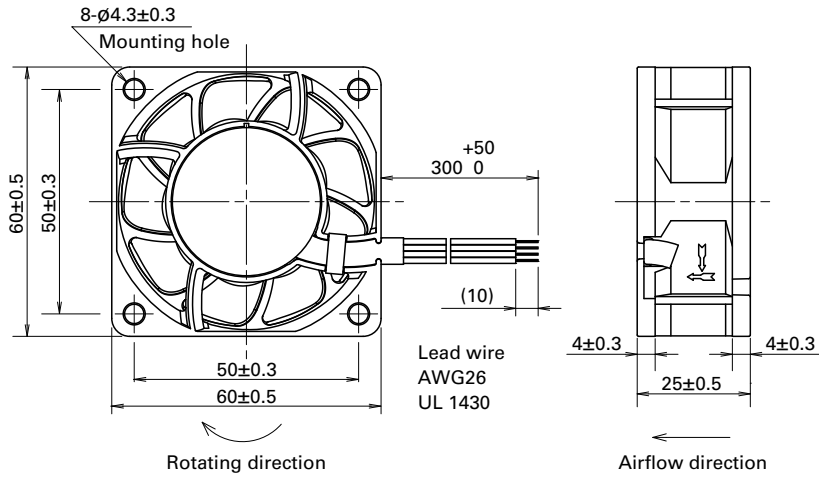


PWM duty - Speed characteristics example

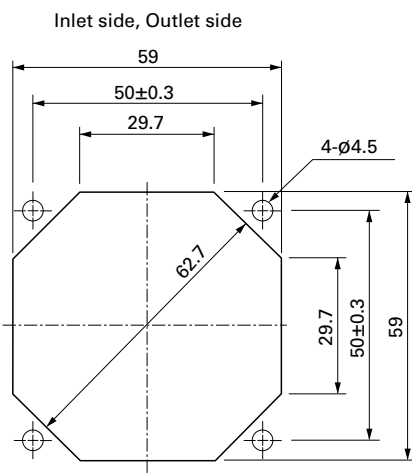


DC
Long Life Fan 60 mm sq.

Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



60x60x76 mm

San Ace 60L 9CRLA type US

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 310 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|------|--|------|--------------|----------------------------|------------------------------|
| | | | | | | Inlet | Outlet | | | | | | | |
| 9CRLA0612P0G001 | 12 | 10.8 to 13.2 | 100 | 3.0 | 36.0 | 16500 | 17800 | 2.1 | 74.1 | 1400 | 5.62 | 70 | -20 to +70 | 100000/60°C (135000/40°C) |
| | | | 20 | 0.4 | 4.8 | 5000 | 5400 | 0.64 | 22.6 | 128 | 0.51 | 43 | | |

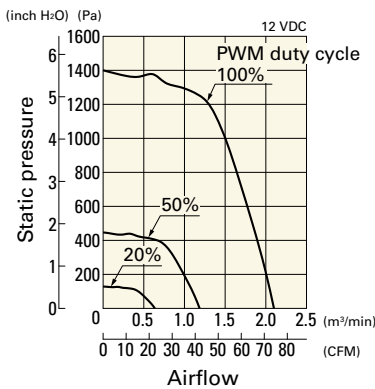
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

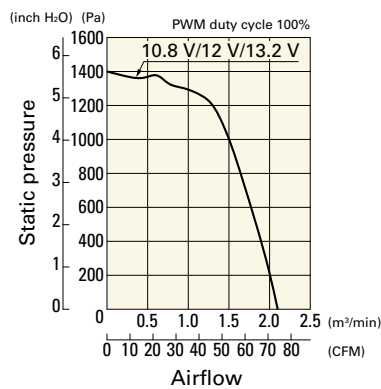
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRLA0612P0G001 With pulse sensor with PWM control

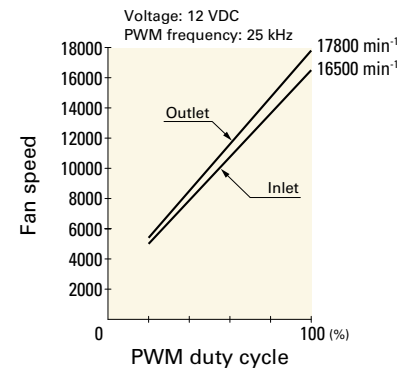
PWM duty cycle



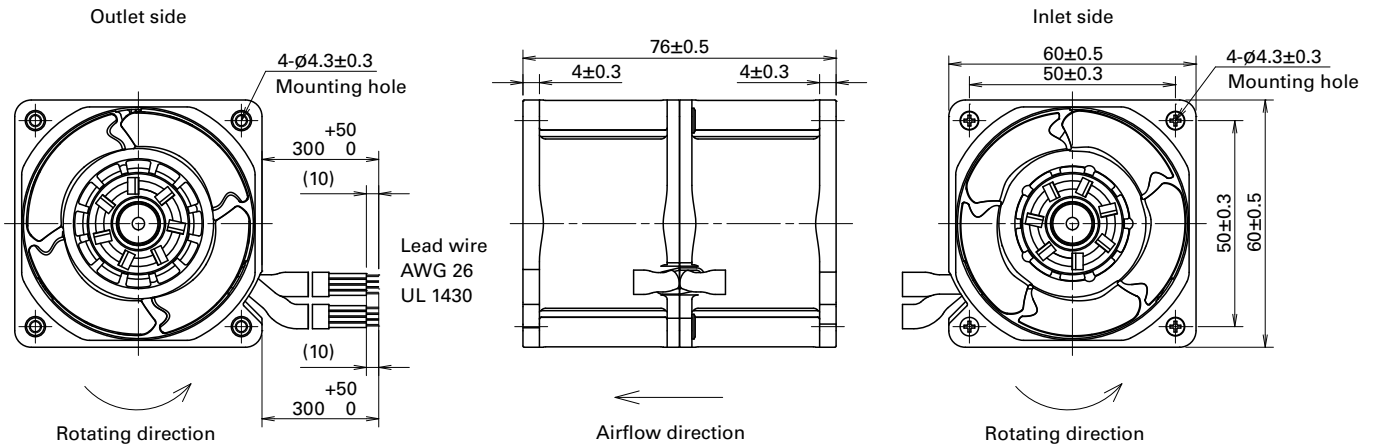
Operating voltage range



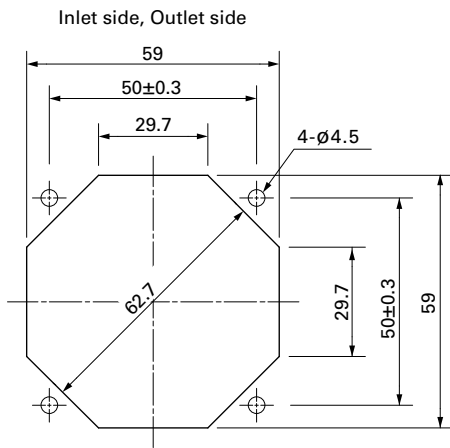
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



80x80x25 mm

San Ace 80L 9LG type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 130 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | | |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|----------|----|
| » 9LG0812P4J001 | 12 | 10.8 to 13.2 | 100 | 0.6 | 7.2 | 7400 | 2.07 73.0 | 177 0.71 | 49 | -20 to +70 | 180000/60°C (215000/40°C) | | |
| » 9LG0812P4G001 | | | 20 | 0.06 | 0.72 | 1800 | 0.5 17.6 | 10.4 0.04 | 16 | | | | |
| » 9LG0812P4H001 | | | 100 | 0.3 | 3.6 | 5500 | 1.54 54.3 | 98 0.39 | 43 | | | | |
| | | | 25 | 0.05 | 0.6 | 1400 | 0.39 13.7 | 6.3 0.02 | 14 | | | | |
| » 9LG0824P4J001 | | | 24 | 21.6 to 26.4 | 100 | 0.12 | 1.44 | 3700 | 1.03 36.3 | | | 44 0.17 | 31 |
| | | | | | 25 | 0.04 | 0.48 | 1100 | 0.3 10.5 | | | 3.9 0.01 | 13 |
| » 9LG0824P4G001 | 100 | 0.28 | | | 6.72 | 7400 | 2.07 73.0 | 177 0.71 | 49 | | | | |
| | 20 | 0.05 | | | 1.2 | 2400 | 0.67 23.6 | 18.6 0.07 | 22 | | | | |
| » 9LG0824P4H001 | 100 | 0.14 | | | 3.36 | 5500 | 1.54 54.3 | 98 0.39 | 43 | | | | |
| | 20 | 0.02 | | | 0.48 | 1200 | 0.33 11.6 | 4.6 0.01 | 13 | | | | |
| » 9LG0824P4H001 | | | 100 | 0.05 | 1.2 | 3700 | 1.03 36.3 | 44 0.17 | 31 | | | | |
| | | | 30 | 0.02 | 0.48 | 1100 | 0.3 10.5 | 3.9 0.01 | 13 | | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|----|
| » 9LG0812S4001 | 12 | 6 to 13.2 | 0.17 | 2.04 | 4200 | 1.17 41.3 | 56 0.22 | 35 | -20 to +70 | 180000/60°C (215000/40°C) | |
| » 9LG0812F4001 | | | 0.1 | 1.2 | 3300 | 0.92 32.5 | 35 0.14 | 29 | | | |
| » 9LG0812M4001 | | | 0.08 | 0.96 | 2900 | 0.8 28.3 | 27 0.11 | 25 | | | |
| » 9LG0812L4001 | 24 | 8 to 13.2 | 0.06 | 0.72 | 2300 | 0.64 22.6 | 17 0.068 | 22 | | | |
| » 9LG0824S4001 | | | 12 to 26.4 | 0.07 | 1.68 | 4200 | 1.17 41.3 | 56 0.22 | | | 35 |
| » 9LG0824F4001 | | | | 0.045 | 1.08 | 3300 | 0.92 32.5 | 35 0.14 | | | 29 |
| » 9LG0824M4001 | | 0.04 | | 0.96 | 2900 | 0.8 28.3 | 27 0.11 | 25 | | | |
| » 9LG0824L4001 | | 14 to 26.4 | 0.03 | 0.72 | 2300 | 0.64 22.6 | 17 0.068 | 22 | | | |

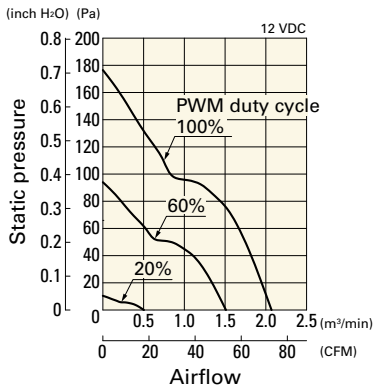
Note 1: Sensor and control options are available for selection. Refer to the table on p. 648.

Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 668 for details.

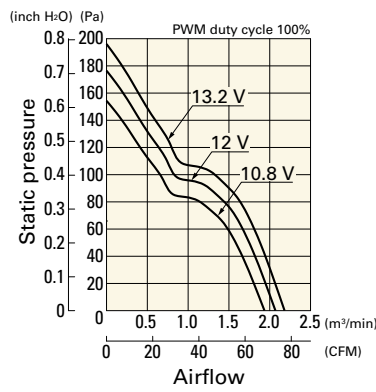
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG0812P4J001 With pulse sensor with PWM control

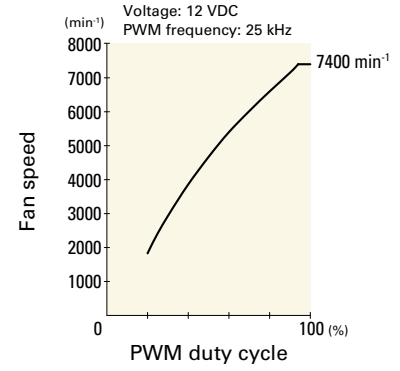
PWM duty cycle



Operating voltage range

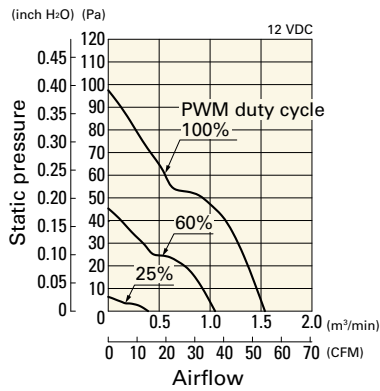


PWM duty - Speed characteristics example

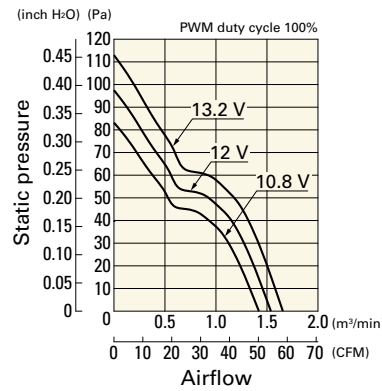


9LG0812P4G001 With pulse sensor with PWM control

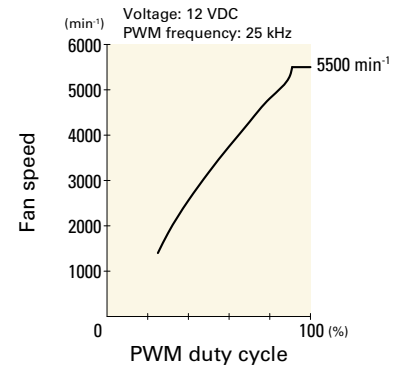
PWM duty cycle



Operating voltage range

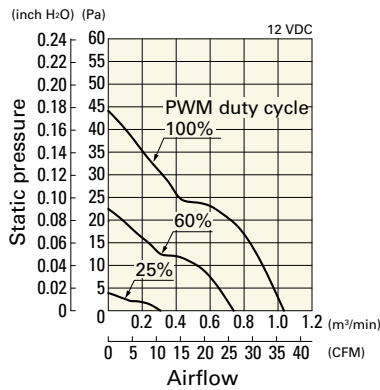


PWM duty - Speed characteristics example

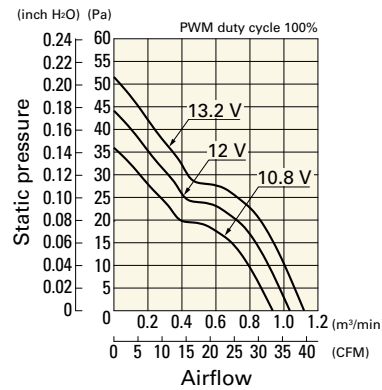


9LG0812P4H001 With pulse sensor with PWM control

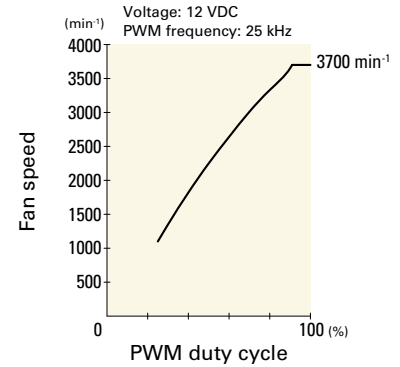
PWM duty cycle



Operating voltage range

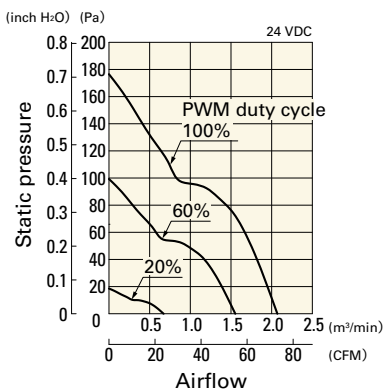


PWM duty - Speed characteristics example

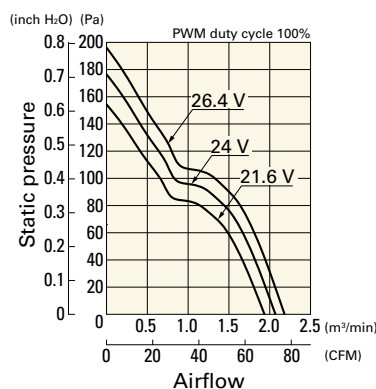


9LG0824P4J001 With pulse sensor with PWM control

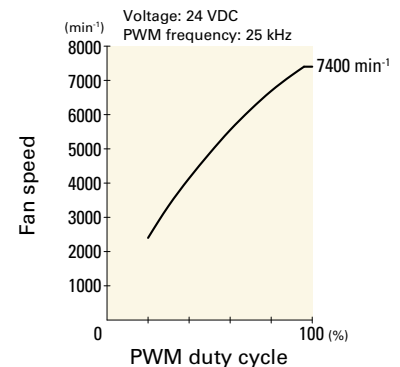
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

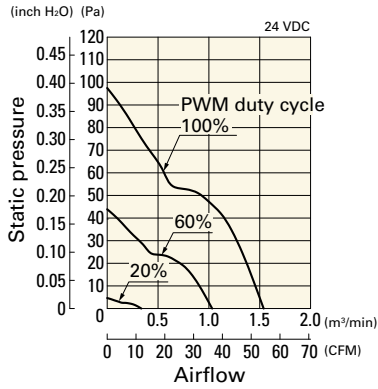


DC Long Life Fan 80 mm sq.

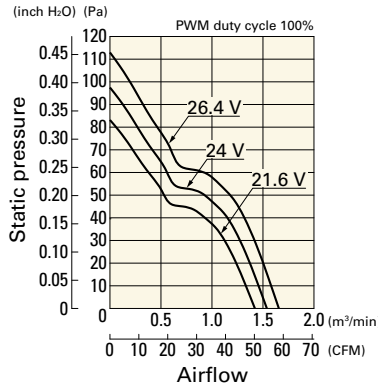
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG0824P4G001 With pulse sensor with PWM control

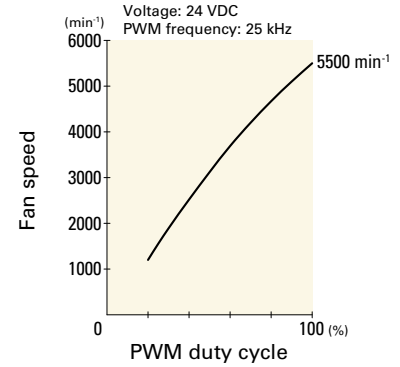
PWM duty cycle



Operating voltage range

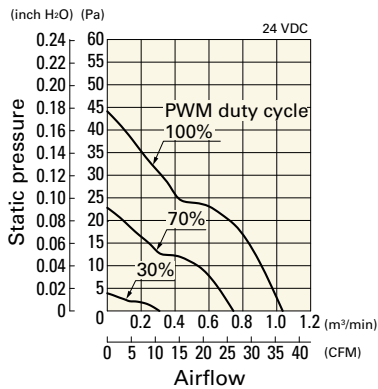


PWM duty - Speed characteristics example

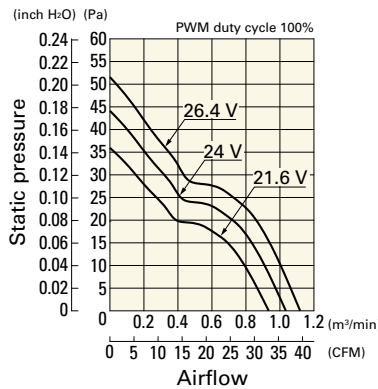


9LG0824P4H001 With pulse sensor with PWM control

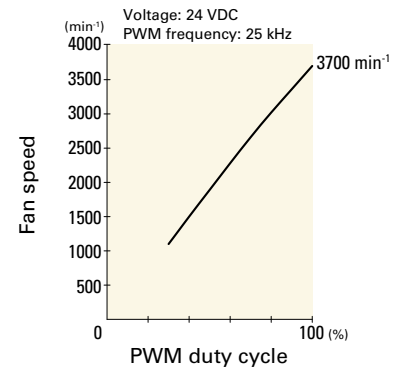
PWM duty cycle



Operating voltage range



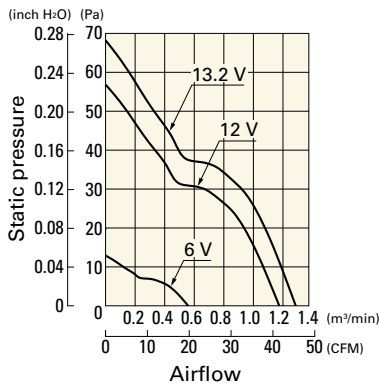
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

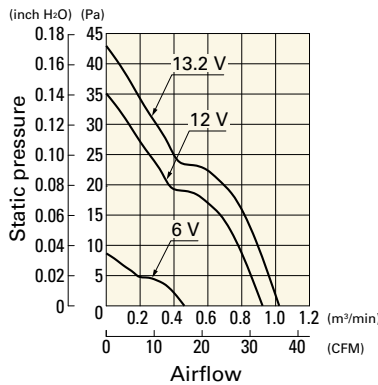
9LG0812S4001 With pulse sensor

Operating voltage range



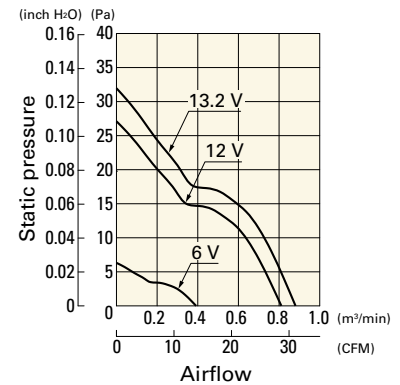
9LG0812F4001 With pulse sensor

Operating voltage range



9LG0812M4001 With pulse sensor

Operating voltage range



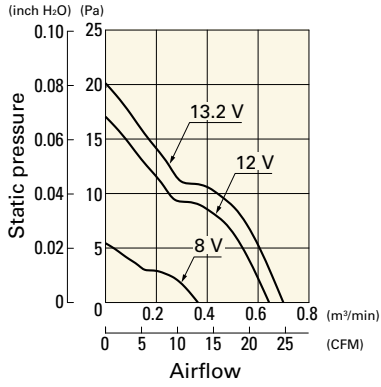
DC

Long Life Fan 80 mm sq.

Airflow - Static Pressure Characteristics

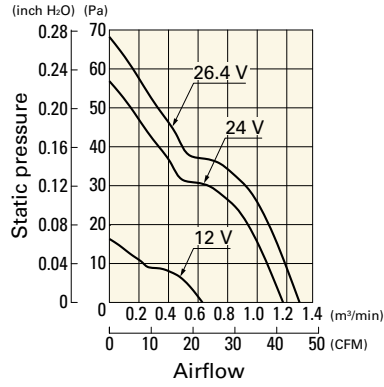
9LG0812L4001 With pulse sensor

Operating voltage range



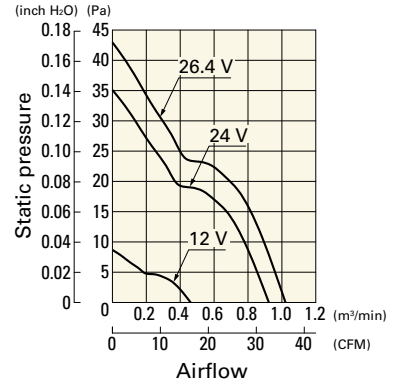
9LG0824S4001 With pulse sensor

Operating voltage range



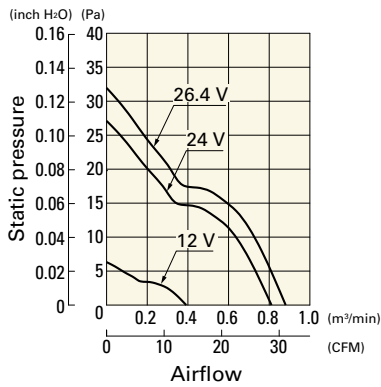
9LG0824F4001 With pulse sensor

Operating voltage range



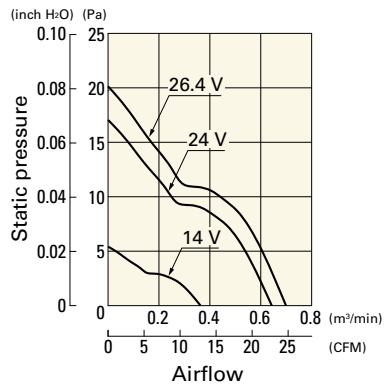
9LG0824M4001 With pulse sensor

Operating voltage range



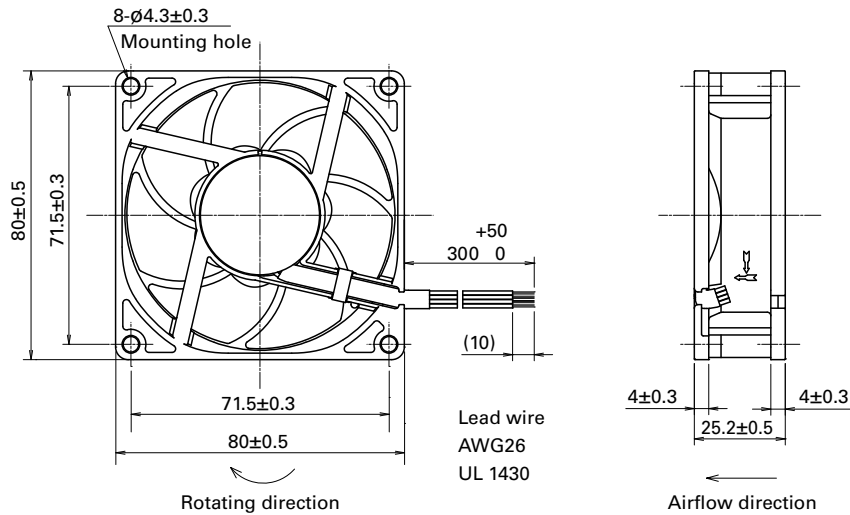
9LG0824L4001 With pulse sensor

Operating voltage range

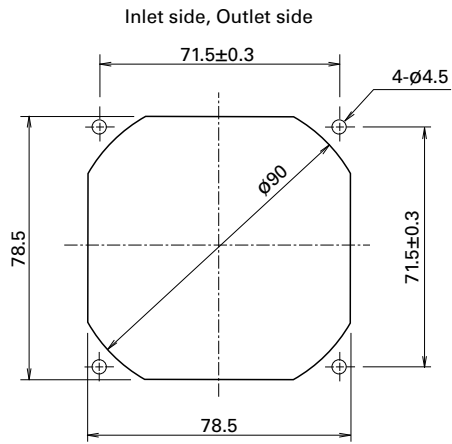


DC Long Life Fan 80 mm sq.

Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)



80x80x80 mm

San Ace 80L 9CRL type

DC Long Life Fan 80 mm sq.

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass 490 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--------|--|-------|--|------|--------------|----------------------------|------------------------------|
| | | | | | | Inlet | Outlet | | | | | | | |
| 9CRL0812P8G001 | 12 | 10.8 to 13.2 | 100 | 5.3 | 63.6 | 12000 | 11300 | 4.5 | 158.9 | 1150 | 4.62 | 76 | -20 to +70 | 130000/60°C (165000/40°C) |
| | | | 0 | 0.2 | 2.4 | 2000 | 1900 | 0.74 | 26.1 | 31.9 | 0.13 | 30 | | |

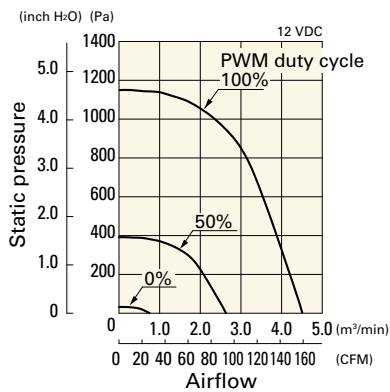
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

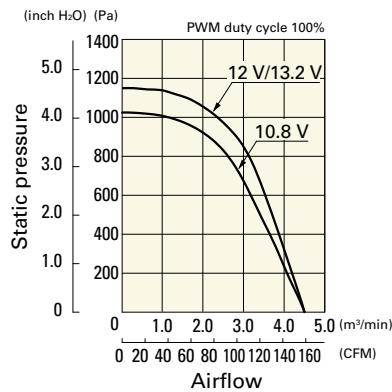
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9CRL0812P8G001 With pulse sensor with PWM control

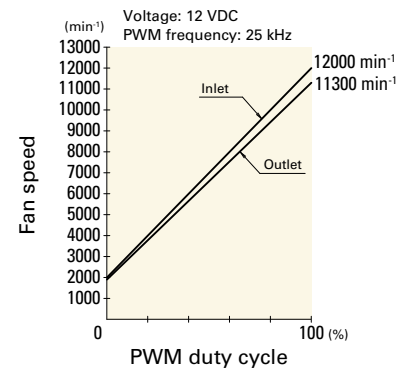
PWM duty cycle



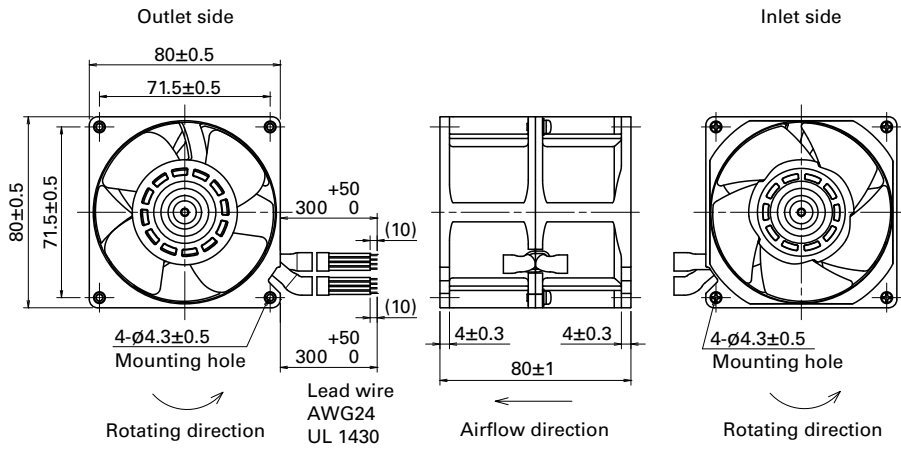
Operating voltage range



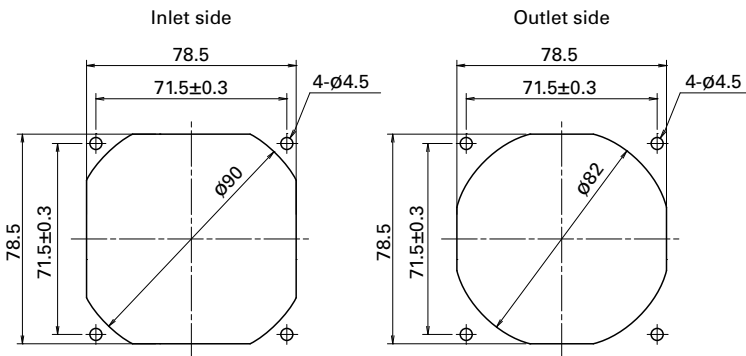
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)



92x92x25 mm

San Ace 92L 9LG type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 150 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ² /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|------|--|------|--------------|----------------------------|------------------------------|
| 9LG0912P4J001 | 12 | 10.8 to 13.2 | 100 | 0.42 | 5.04 | 5000 | 2.2 | 77.7 | 105 | 0.42 | 44 | -20 to +70 | 180000/60°C (215000/40°C) |
| 9LG0912P4G001 | | | 100 | 0.3 | 3.6 | 4400 | 1.93 | 68.2 | 81 | 0.33 | 40 | | |
| 9LG0912P4S001 | | | 100 | 0.22 | 2.64 | 3850 | 1.69 | 59.7 | 62.1 | 0.25 | 37 | | |
| 9LG0912P4H001 | | | 100 | 0.15 | 1.8 | 3150 | 1.38 | 48.7 | 41.6 | 0.17 | 32 | | |
| 9LG0924P4J001 | 24 | 21.6 to 26.4 | 100 | 0.21 | 5.04 | 5000 | 2.2 | 77.7 | 105 | 0.42 | 44 | | |
| 9LG0924P4G001 | | | 100 | 0.15 | 3.6 | 4400 | 1.93 | 68.2 | 81 | 0.33 | 40 | | |
| 9LG0924P4S001 | | | 100 | 0.11 | 2.64 | 3850 | 1.69 | 59.7 | 62.1 | 0.25 | 37 | | |
| 9LG0924P4H001 | | | 100 | 0.07 | 1.68 | 3150 | 1.38 | 48.7 | 41.6 | 0.17 | 32 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ² /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|------|--|-------|--------------|----------------------------|------------------------------|
| 9LG0912F4001 | 12 | 10.2 to 13.8 | 0.1 | 1.2 | 2800 | 1.22 | 43.1 | 32.8 | 0.13 | 29 | -20 to +70 | 180000/60°C (215000/40°C) |
| 9LG0912M4001 | | | 0.08 | 0.96 | 2400 | 1.05 | 37.1 | 24.1 | 0.097 | 24 | | |
| 9LG0912L4001 | | | 0.07 | 0.84 | 2000 | 0.87 | 30.7 | 16.7 | 0.067 | 19 | | |
| 9LG0924F4001 | 24 | 20.4 to 27.6 | 0.05 | 1.2 | 2800 | 1.22 | 43.1 | 32.8 | 0.13 | 29 | | |
| 9LG0924M4001 | | | 0.04 | 0.96 | 2400 | 1.05 | 37.1 | 24.1 | 0.097 | 24 | | |
| 9LG0924L4001 | | | 0.03 | 0.72 | 2000 | 0.87 | 30.7 | 16.7 | 0.067 | 19 | | |
| 9LG0948H4001 | | | 48 | 40.8 to 55.2 | 0.04 | 1.92 | 3150 | 1.38 | 48.7 | 41.6 | | |

Note 1: Sensor and control options are available for selection. Refer to the table on p. 648.

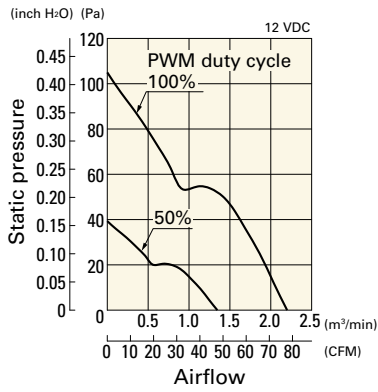
Note 2: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

DC Long Life Fan 92 mm sq.

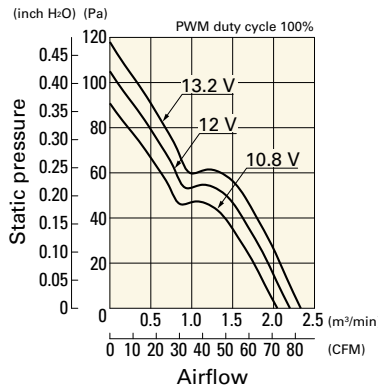
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG0912P4J001 With pulse sensor with PWM control

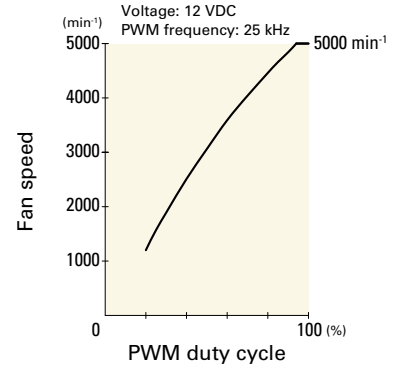
PWM duty cycle



Operating voltage range

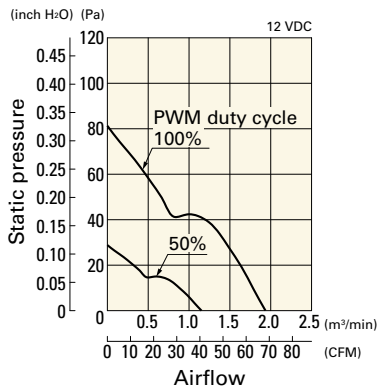


PWM duty - Speed characteristics example

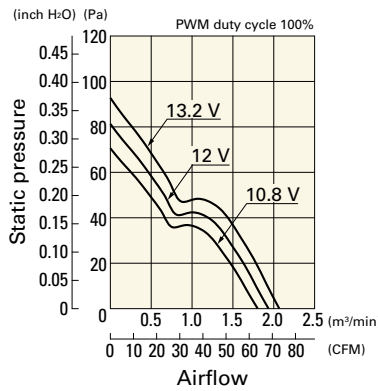


9LG0912P4G001 With pulse sensor with PWM control

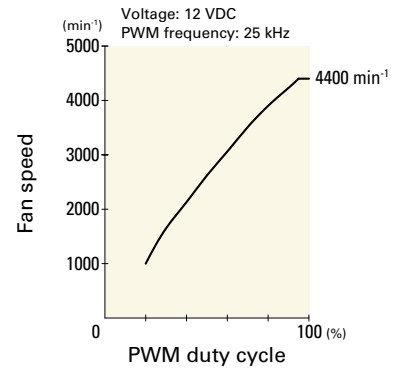
PWM duty cycle



Operating voltage range

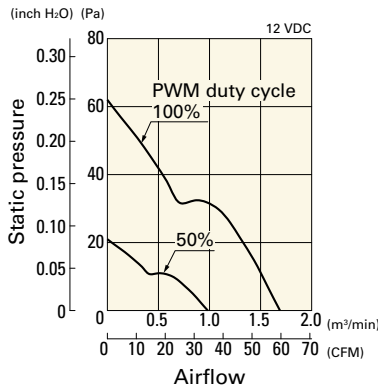


PWM duty - Speed characteristics example

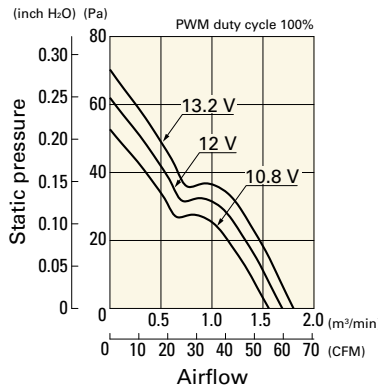


9LG0912P4S001 With pulse sensor with PWM control

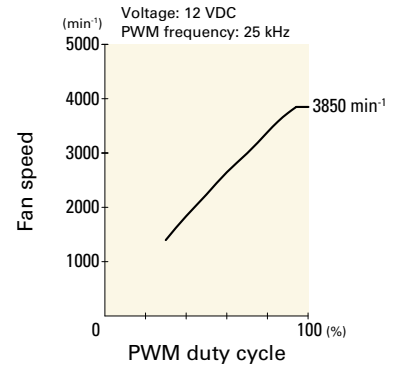
PWM duty cycle



Operating voltage range

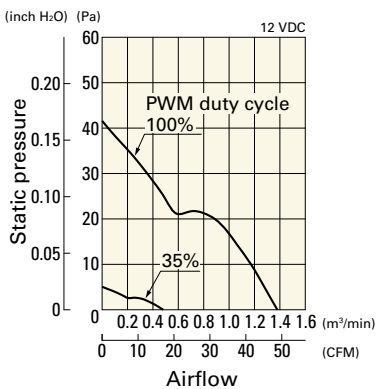


PWM duty - Speed characteristics example

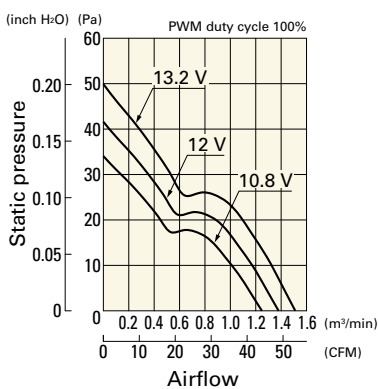


9LG0912P4H001 With pulse sensor with PWM control

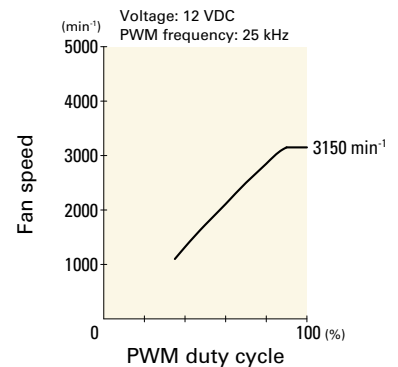
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

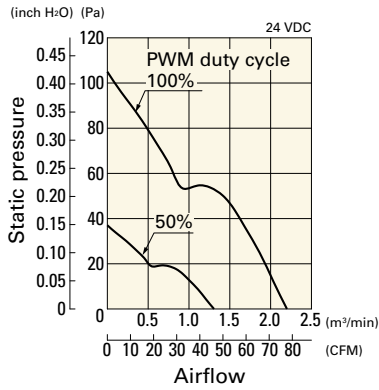


DC
Long Life Fan 92 mm sq.

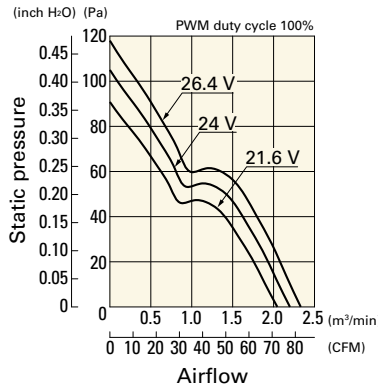
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG0924P4J001 With pulse sensor with PWM control

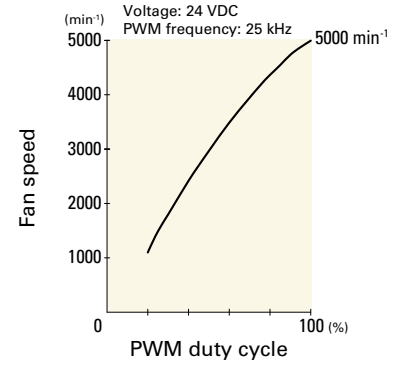
PWM duty cycle



Operating voltage range

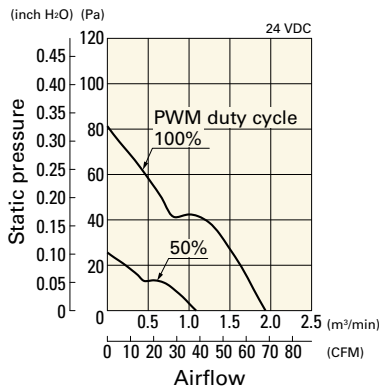


PWM duty - Speed characteristics example

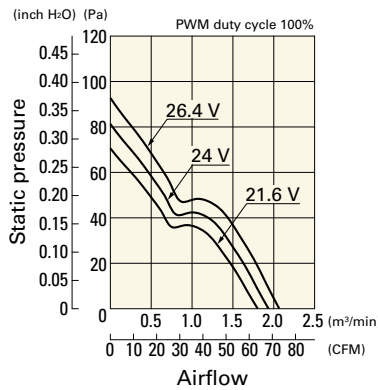


9LG0924P4G001 With pulse sensor with PWM control

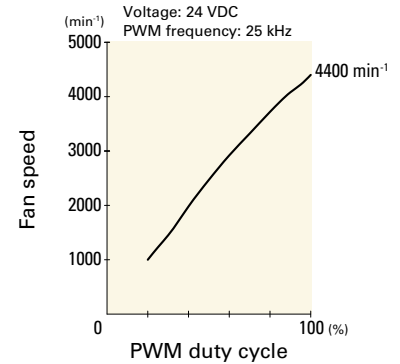
PWM duty cycle



Operating voltage range

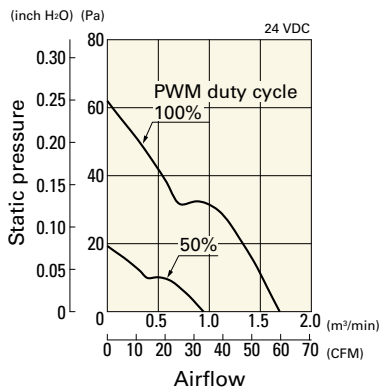


PWM duty - Speed characteristics example

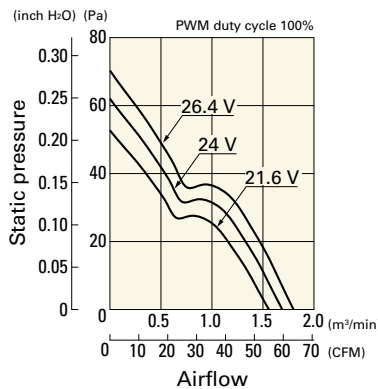


9LG0924P4S001 With pulse sensor with PWM control

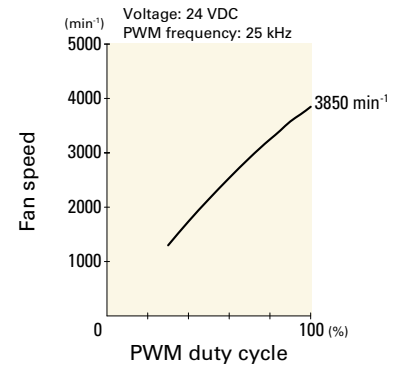
PWM duty cycle



Operating voltage range

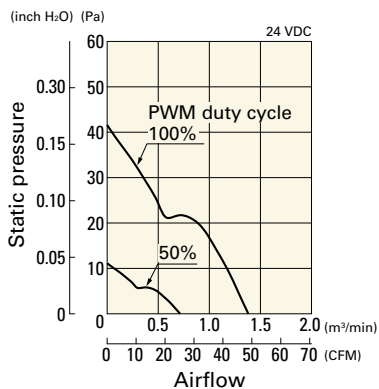


PWM duty - Speed characteristics example

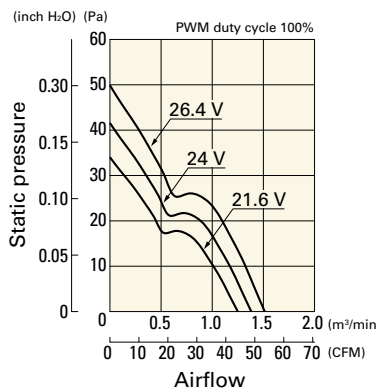


9LG0924P4H001 With pulse sensor with PWM control

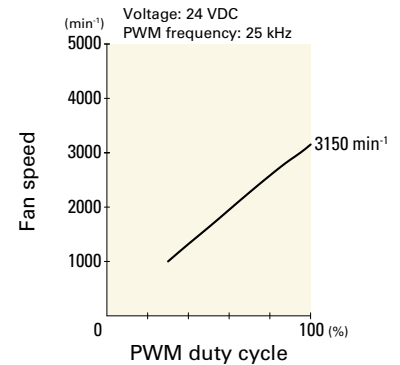
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

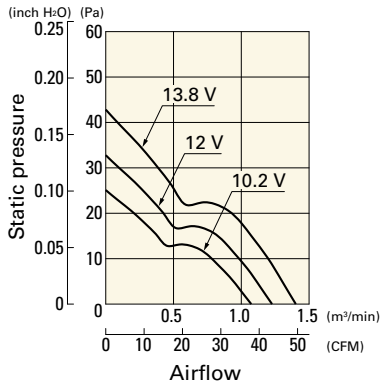


DC Long Life Fan 92 mm sq.

Airflow - Static Pressure Characteristics

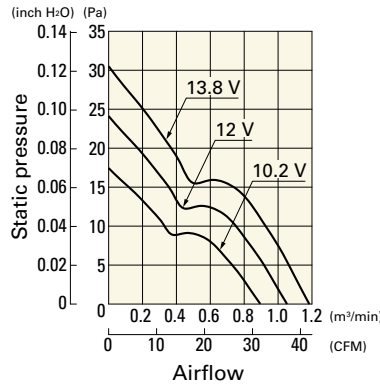
9LG0912F4001 With pulse sensor

Operating voltage range



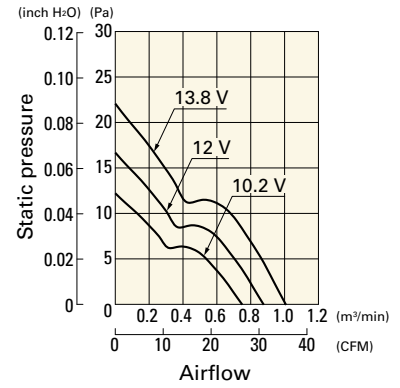
9LG0912M4001 With pulse sensor

Operating voltage range



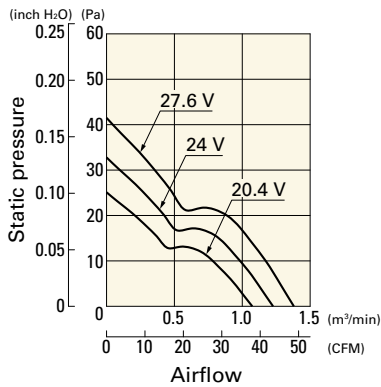
9LG0912L4001 With pulse sensor

Operating voltage range



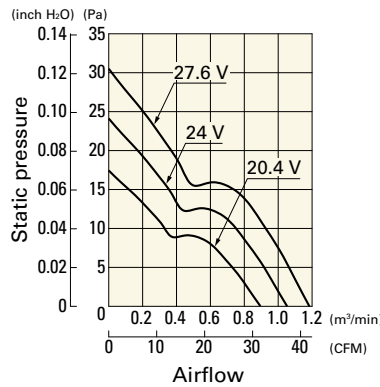
9LG0924F4001 With pulse sensor

Operating voltage range



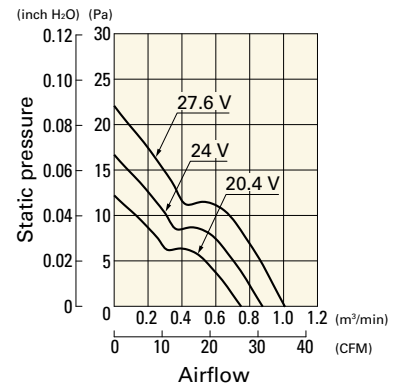
9LG0924M4001 With pulse sensor

Operating voltage range



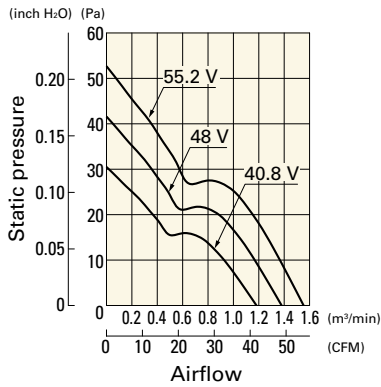
9LG0924L4001 With pulse sensor

Operating voltage range

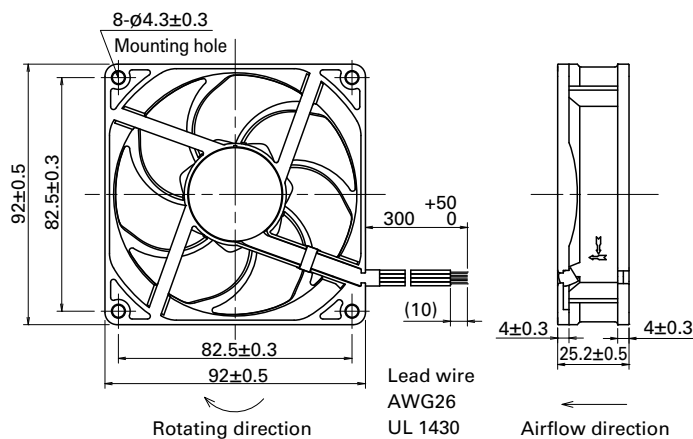


9LG0948H4001 With pulse sensor

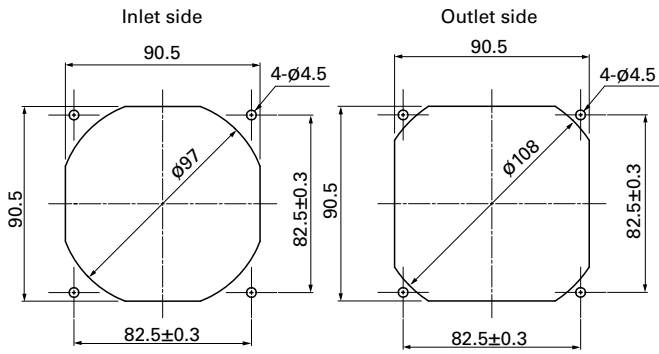
Operating voltage range



Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)



92x92x38 mm

San Ace 92L 9LG type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 270 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| ▶▶ 9LG0912P1H001 | 12 | 10.2 to 13.8 | 100 | 2.0 | 24.0 | 9000 | 3.7 130.6 | 430 1.72 | 61 | -20 to +70 | 180000/60°C (215000/40°C) |
| | | | 20 | 0.18 | 2.16 | 2700 | 1.11 39.1 | 38.7 0.15 | 30 | | |
| ▶▶ 9LG0912P1F001 | 12 | 10.2 to 13.8 | 100 | 1.0 | 12.0 | 7000 | 2.9 102.4 | 263 1.05 | 55 | | |
| | | | 20 | 0.11 | 1.32 | 2000 | 0.83 29.3 | 21.5 0.08 | 22 | | |
| ▶▶ 9LG0924P1H001 | 24 | 20.4 to 27.6 | 100 | 0.9 | 21.6 | 9000 | 3.7 130.6 | 430 1.72 | 61 | | |
| | | | 20 | 0.08 | 1.92 | 2700 | 1.11 39.1 | 38.7 0.15 | 30 | | |
| ▶▶ 9LG0924P1F001 | 24 | 20.4 to 27.6 | 100 | 0.5 | 12.0 | 7000 | 2.9 102.4 | 263 1.05 | 55 | | |
| | | | 20 | 0.06 | 1.44 | 2000 | 0.83 29.3 | 21.5 0.08 | 22 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

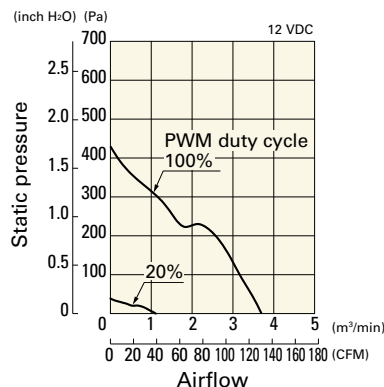
Note 1: Sensor and control options are available for selection. Refer to the table on p. 648.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

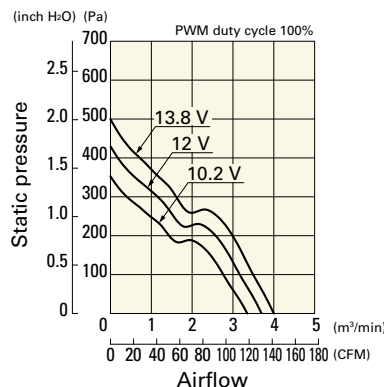
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG0912P1H001 With pulse sensor with PWM control

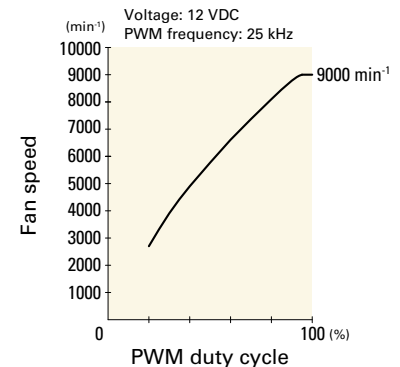
PWM duty cycle



Operating voltage range



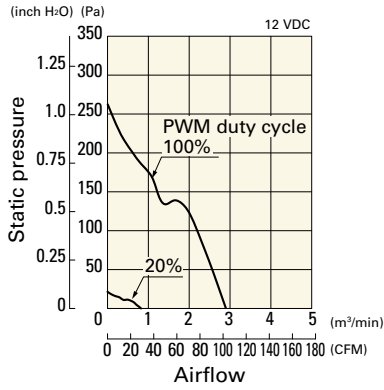
PWM duty - Speed characteristics example



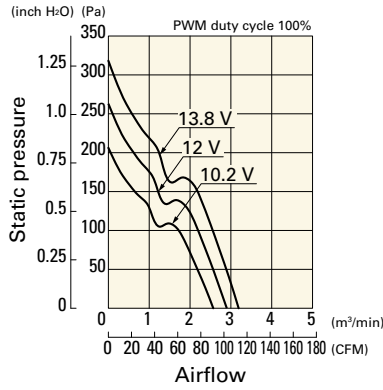
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG0912P1F001 With pulse sensor with PWM control

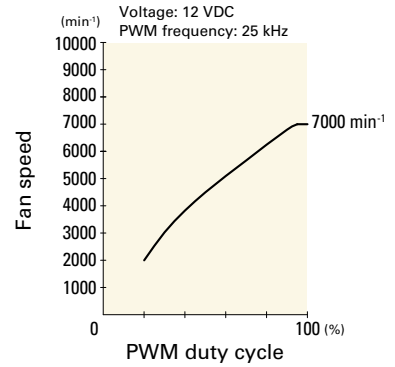
PWM duty cycle



Operating voltage range

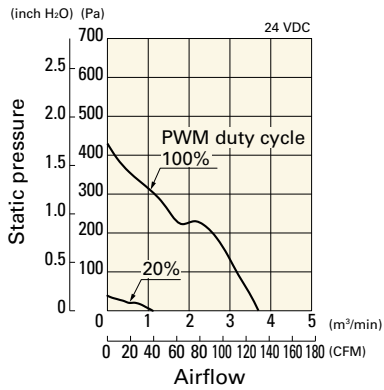


PWM duty - Speed characteristics example

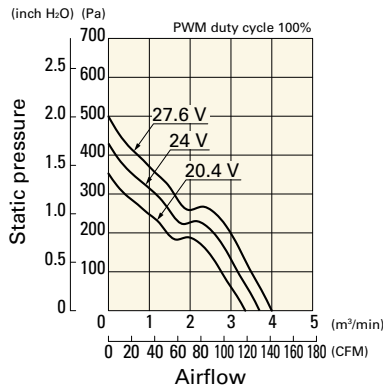


9LG0924P1H001 With pulse sensor with PWM control

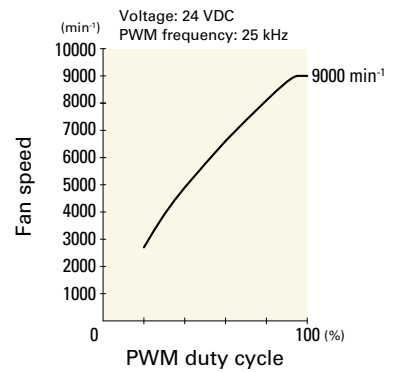
PWM duty cycle



Operating voltage range

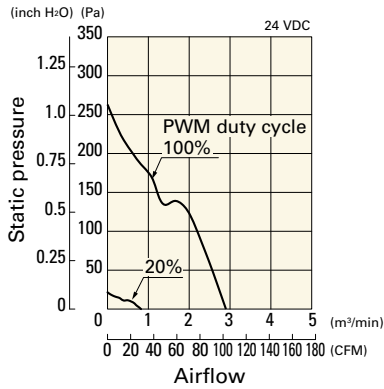


PWM duty - Speed characteristics example

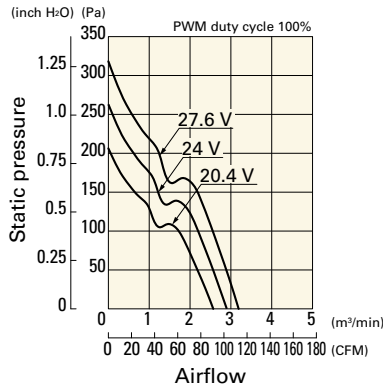


9LG0924P1F001 With pulse sensor with PWM control

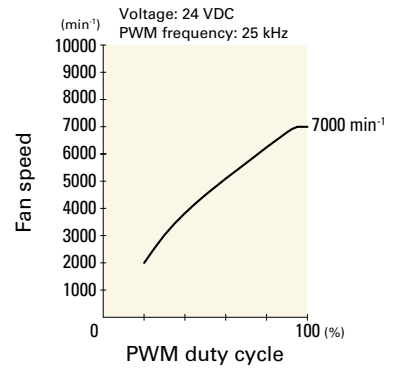
PWM duty cycle



Operating voltage range

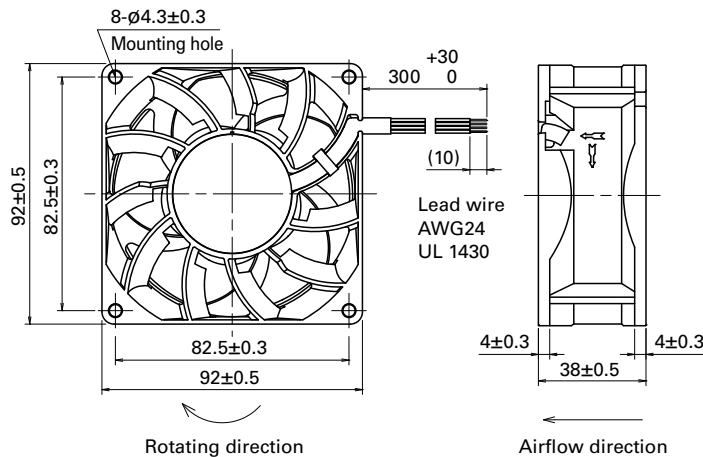


PWM duty - Speed characteristics example

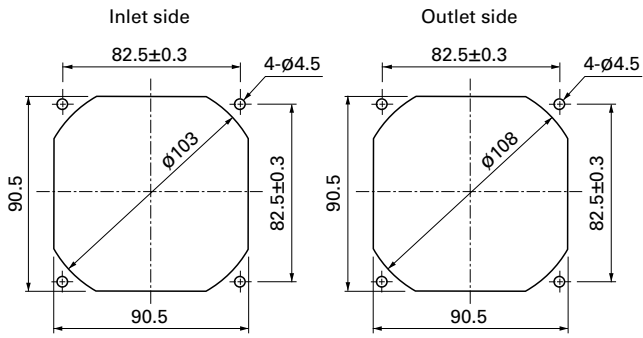


DC Long Life Fan 92 mm sq.

Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)



120x120x38 mm

San Ace 120L 9LG type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 420 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|----|
| » 9LG1212P1G001 | 12 | 8.0 to 13.8 | 100 | 3.2 | 38.4 | 6550 | 7.0 247.1 | 370 1.48 | 62 | -20 to +70 | 180000/60°C (215000/40°C) | |
| | | | 20 | 0.24 | 2.88 | 2000 | 2.13 75.2 | 34.4 0.13 | 36 | | | |
| » 9LG1212P1S001 | | | 100 | 2.2 | 26.4 | 5600 | 6.0 211.8 | 270 1.08 | 58 | | | |
| | | | 20 | 0.24 | 2.88 | 2000 | 2.13 75.2 | 34.4 0.13 | 36 | | | |
| » 9LG1212P1H001 | | | 100 | 1.4 | 16.8 | 4700 | 5.0 176.5 | 190 0.76 | 54 | | | |
| | | | 20 | 0.24 | 2.88 | 2000 | 2.13 75.2 | 34.4 0.13 | 36 | | | |
| » 9LG1224P1G001 | | 24 | 15 to 30 | 100 | 1.6 | 38.4 | 6550 | 7.0 247.1 | 370 1.48 | | | 62 |
| | | | | 20 | 0.12 | 2.88 | 2000 | 2.13 75.2 | 34.4 0.13 | | | 36 |
| » 9LG1224P1S001 | | | | 100 | 1.1 | 26.4 | 5600 | 6.0 211.8 | 270 1.08 | | | 58 |
| | | | 20 | 0.12 | 2.88 | 2000 | 2.13 75.2 | 34.4 0.13 | 36 | | | |
| » 9LG1224P1H001 | | | 100 | 0.7 | 16.8 | 4700 | 5.0 176.5 | 190 0.76 | 54 | | | |
| | | | 20 | 0.12 | 2.88 | 2000 | 2.13 75.2 | 34.4 0.13 | 36 | | | |
| » 9LG1248P1G001 | 48 | 36 to 60 | 100 | 0.8 | 38.4 | 6550 | 7.0 247.1 | 370 1.48 | 62 | | | |
| | | | 20 | 0.08 | 3.84 | 2000 | 2.13 75.2 | 34.4 0.13 | 36 | | | |
| » 9LG1248P1S001 | | | 100 | 0.55 | 26.4 | 5600 | 6.0 211.8 | 270 1.08 | 58 | | | |
| | | 20 | 0.08 | 3.84 | 2000 | 2.13 75.2 | 34.4 0.13 | 36 | | | | |
| » 9LG1248P1H001 | | 100 | 0.35 | 16.8 | 4700 | 5.0 176.5 | 190 0.76 | 54 | | | | |
| | | 20 | 0.08 | 3.84 | 2000 | 2.13 75.2 | 34.4 0.13 | 36 | | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| » 9LG1212F1001 | 12 | 8 to 13.8 | 0.39 | 4.68 | 2800 | 3 106 | 67.6 0.27 | 39 | -20 to +70 | 180000/60°C (215000/40°C) |
| » 9LG1212M1001 | | | 0.22 | 2.64 | 2100 | 2.2 77.7 | 37.9 0.15 | 33 | | |
| » 9LG1224A1001 | 24 | 15 to 30 | 0.37 | 8.88 | 3700 | 3.9 137.8 | 117.8 0.47 | 48 | | |
| » 9LG1224F1001 | | | 0.19 | 4.56 | 2800 | 3 106 | 67.6 0.27 | 39 | | |
| » 9LG1224M1001 | | | 0.11 | 2.64 | 2100 | 2.2 77.7 | 37.9 0.15 | 33 | | |
| » 9LG1248F1001 | 48 | 36 to 60 | 0.11 | 5.28 | 2800 | 3 106 | 67.6 0.27 | 39 | | |
| » 9LG1248M1001 | | | 0.07 | 3.36 | 2100 | 2.2 77.7 | 37.9 0.15 | 33 | | |

Note 1: Sensor and control options are available for selection. Refer to the table on p. 648.

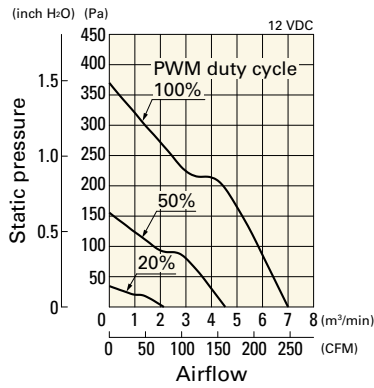
Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Long Life Fan 120 mm sq. DC

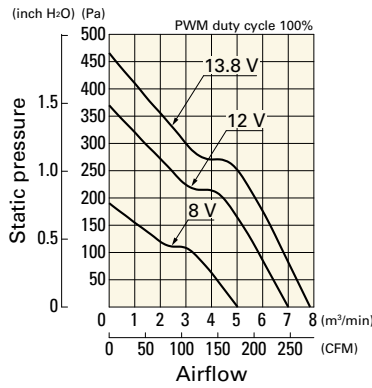
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG1212P1G001 With pulse sensor with PWM control

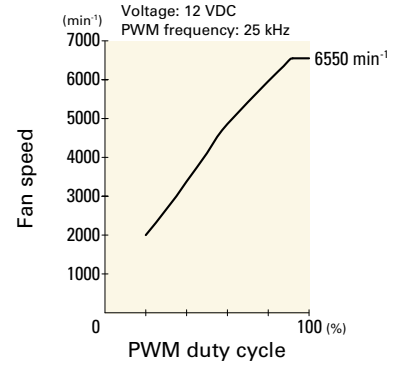
PWM duty cycle



Operating voltage range

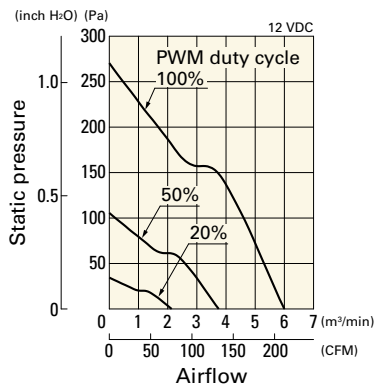


PWM duty - Speed characteristics example

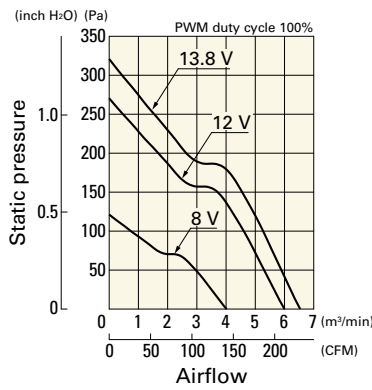


9LG1212P1S001 With pulse sensor with PWM control

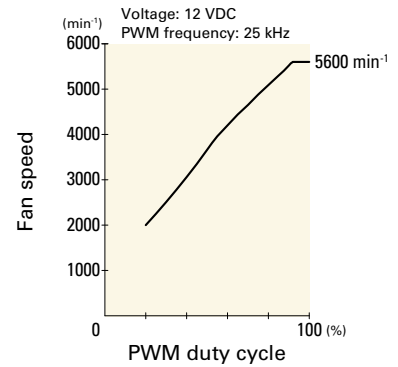
PWM duty cycle



Operating voltage range

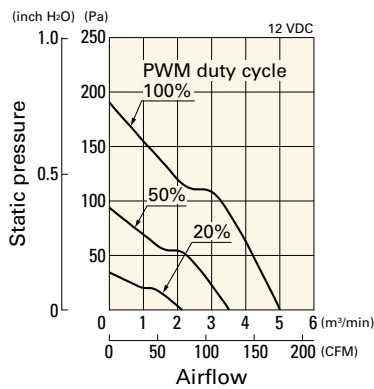


PWM duty - Speed characteristics example

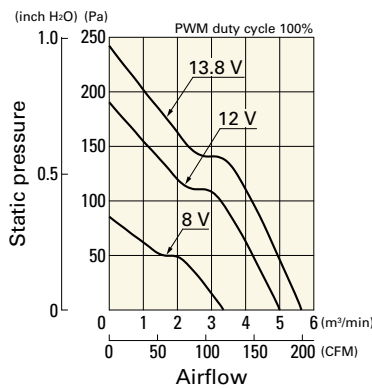


9LG1212P1H001 With pulse sensor with PWM control

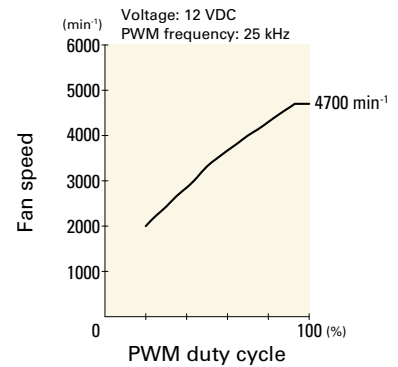
PWM duty cycle



Operating voltage range

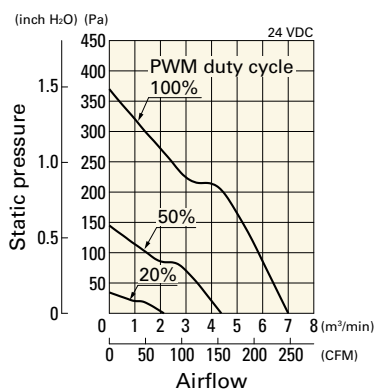


PWM duty - Speed characteristics example

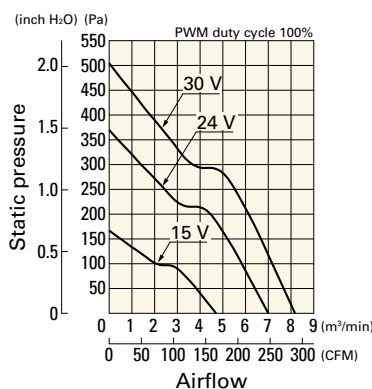


9LG1224P1G001 With pulse sensor with PWM control

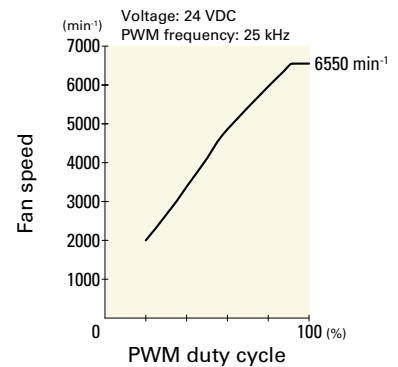
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

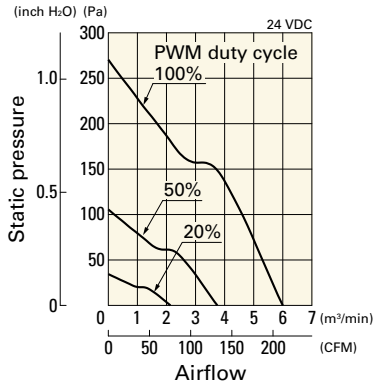


DC
Long Life Fan 120 mm sq.

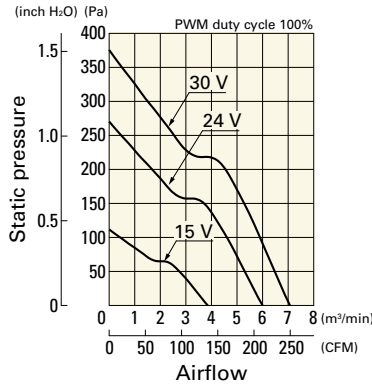
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG1224P1S001 With pulse sensor with PWM control

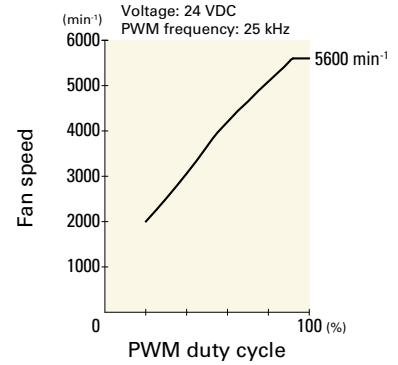
PWM duty cycle



Operating voltage range

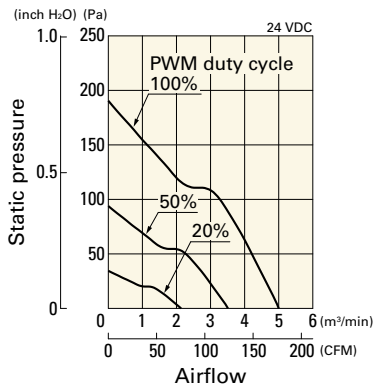


PWM duty - Speed characteristics example

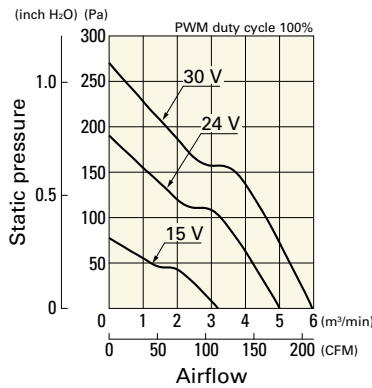


9LG1224P1H001 With pulse sensor with PWM control

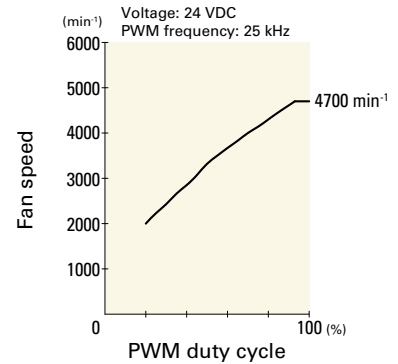
PWM duty cycle



Operating voltage range

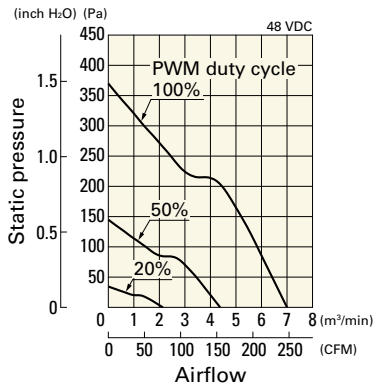


PWM duty - Speed characteristics example

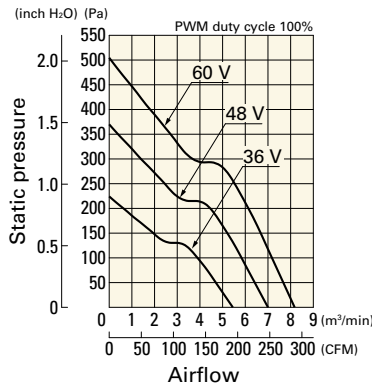


9LG1248P1G001 With pulse sensor with PWM control

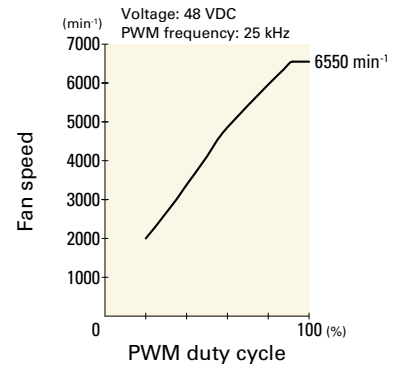
PWM duty cycle



Operating voltage range

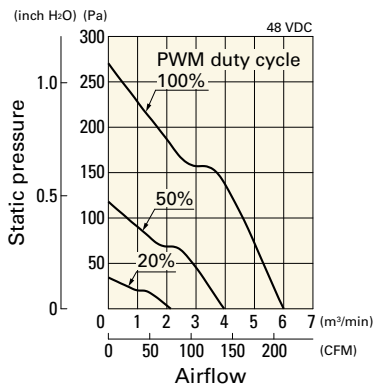


PWM duty - Speed characteristics example

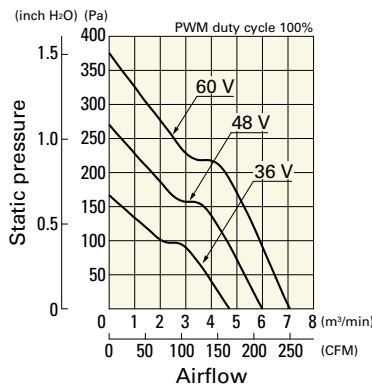


9LG1248P1S001 With pulse sensor with PWM control

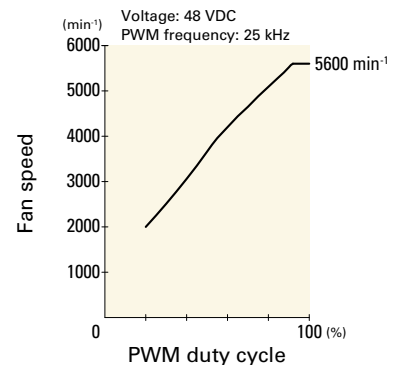
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

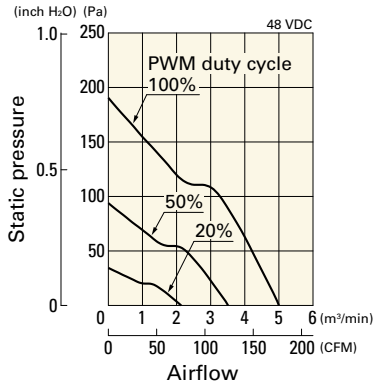


DC Long Life Fan 120 mm sq.

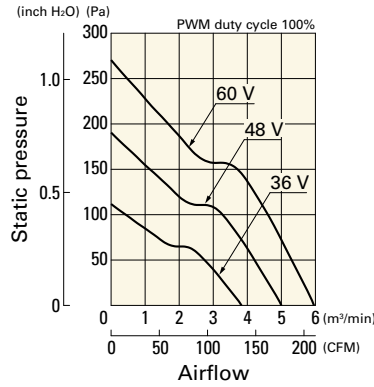
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG1248P1H001 With pulse sensor with PWM control

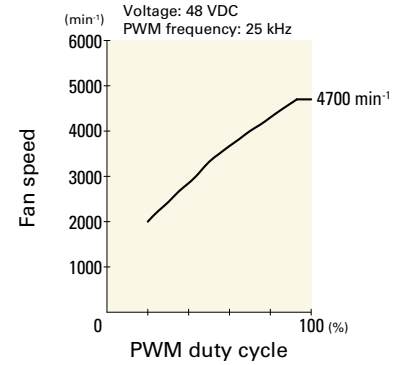
PWM duty cycle



Operating voltage range



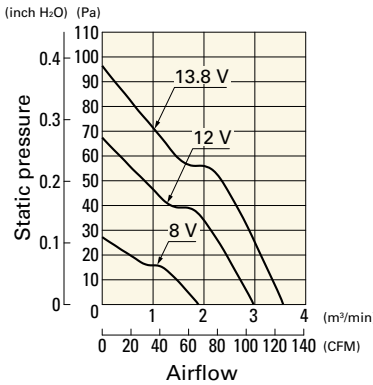
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

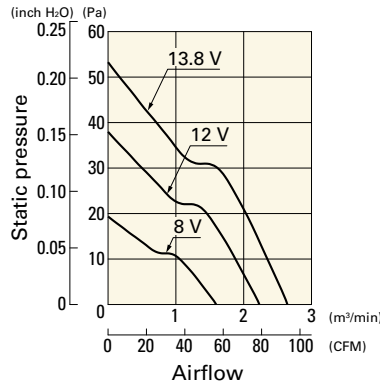
9LG1212F1001 With pulse sensor

Operating voltage range



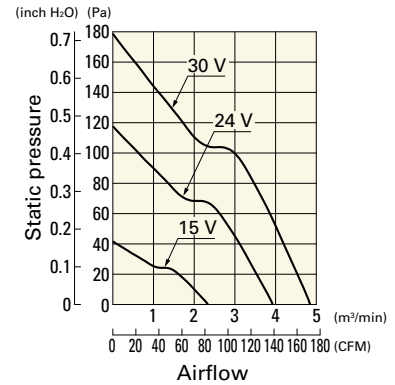
9LG1212M1001 With pulse sensor

Operating voltage range



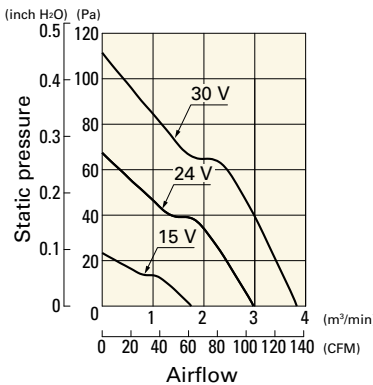
9LG1224A1001 With pulse sensor

Operating voltage range



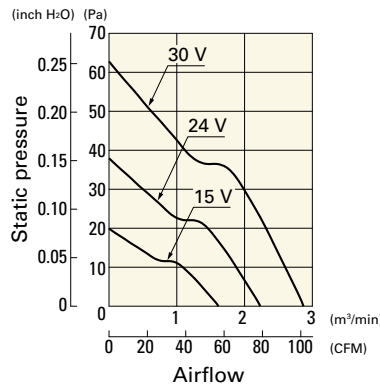
9LG1224F1001 With pulse sensor

Operating voltage range



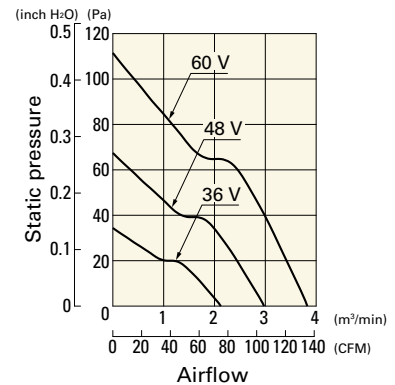
9LG1224M1001 With pulse sensor

Operating voltage range



9LG1248F1001 With pulse sensor

Operating voltage range

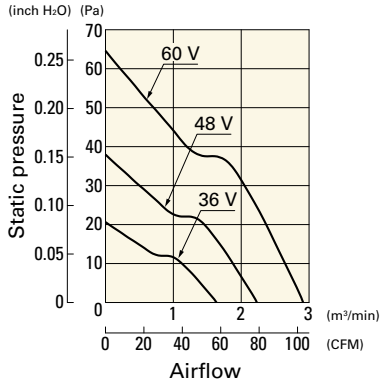


DC
Long Life Fan 120 mm sq.

Airflow - Static Pressure Characteristics

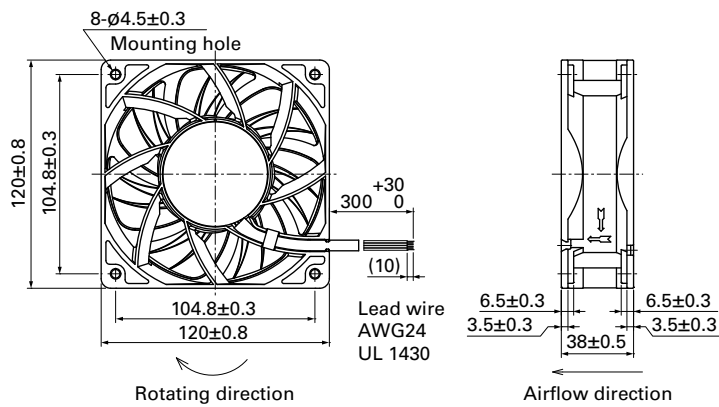
9LG1248M1001 With pulse sensor

Operating voltage range

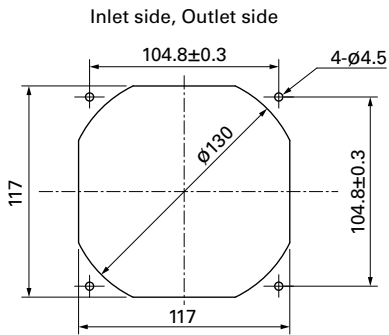


DC
Long Life Fan 120 mm sq.

Dimensions (unit: mm) (With pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)



120×120×38 mm

San Ace 120L 9GL type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue (Sensor) Yellow
- Mass 370 g

Specifications

The models listed below **have a pulse sensor**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|------------------------------|------------------------------|
| 9GL1212G101 | 12 | 10.2 to 13.8 | 0.98 | 11.8 | 3600 | 3.88 137 | 135 0.542 | 49 | -20 to +70 | 80000/60°C (115000/40°C) |
| 9GL1212E101 | | | 0.61 | 7.32 | 3100 | 3.34 118 | 100 0.402 | 46 | | |
| 9GL1212H101 | | 7 to 13.8 | 0.38 | 4.56 | 2600 | 2.8 99 | 70.4 0.283 | 39 | | 100000/60°C (135000/40°C) |
| 9GL1212F101 | | | 0.28 | 3.36 | 2280 | 2.45 87 | 54.2 0.218 | 36 | | |
| 9GL1212M101 | | | 0.21 | 2.52 | 1950 | 2.1 74 | 39.6 0.159 | 32 | | |
| 9GL1224G101 | | | 24 | 20.4 to 27.6 | 0.5 | 12.0 | 3600 | 3.88 137 | | |
| 9GL1224E101 | 0.34 | 8.16 | | | 3100 | 3.34 118 | 100 0.402 | 46 | | |
| 9GL1224H101 | 14 to 27.6 | 0.22 | | 5.28 | 2600 | 2.8 99 | 70.4 0.283 | 39 | | 100000/60°C (135000/40°C) |
| 9GL1224F101 | | 0.16 | | 3.84 | 2280 | 2.45 87 | 54.2 0.218 | 36 | | |
| 9GL1224M101 | | 0.11 | | 2.64 | 1950 | 2.1 74 | 39.6 0.159 | 32 | | |
| 9GL1248G101 | | 48 | | 40.8 to 55.2 | 0.25 | 12.0 | 3600 | 3.88 137 | | |
| 9GL1248E101 | 0.17 | | 8.16 | | 3100 | 3.34 118 | 100 0.402 | 46 | | |
| 9GL1248H101 | 0.11 | | 5.28 | | 2600 | 2.8 99 | 70.4 0.283 | 39 | 100000/60°C (135000/40°C) | |
| 9GL1248F101 | 0.09 | | 4.32 | | 2280 | 2.45 87 | 54.2 0.218 | 36 | | |
| 9GL1248M101 | 0.07 | | 3.36 | | 1950 | 2.1 74 | 39.6 0.159 | 32 | | |

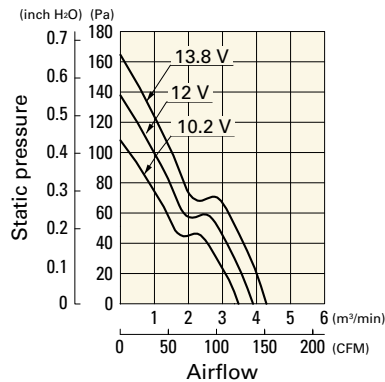
Note 1: Sensor and control options are available for selection. Refer to the table on p. 645.

Note 2: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

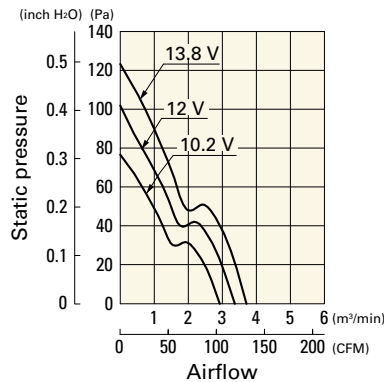
9GL1212G101 With pulse sensor

Operating voltage range



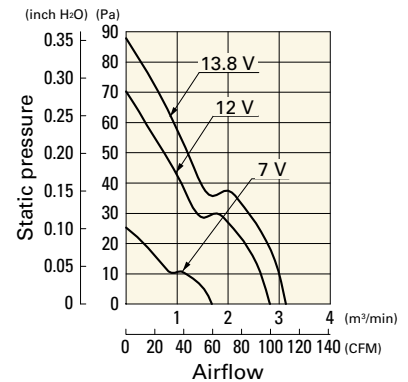
9GL1212E101 With pulse sensor

Operating voltage range



9GL1212H101 With pulse sensor

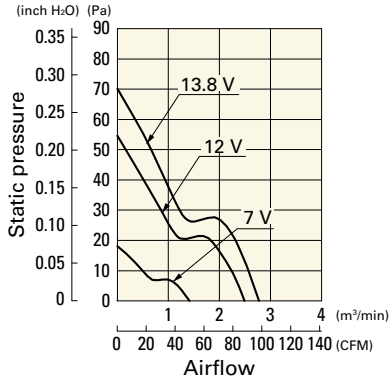
Operating voltage range



Airflow - Static Pressure Characteristics

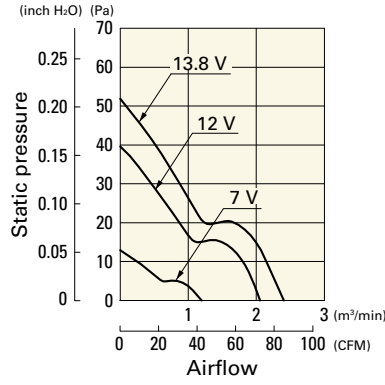
9GL1212F101 With pulse sensor

Operating voltage range



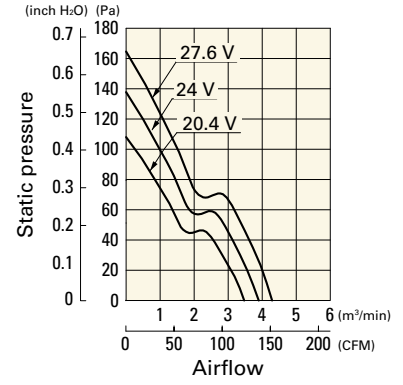
9GL1212M101 With pulse sensor

Operating voltage range



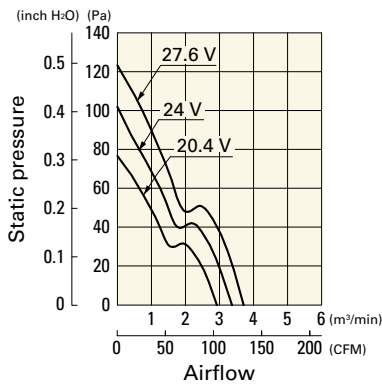
9GL1224G101 With pulse sensor

Operating voltage range



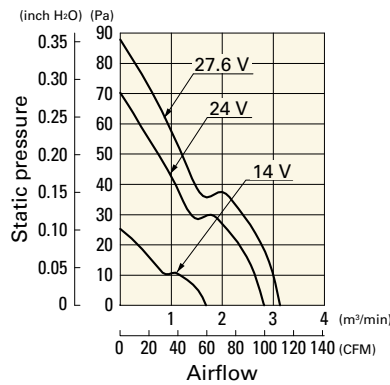
9GL1224E101 With pulse sensor

Operating voltage range



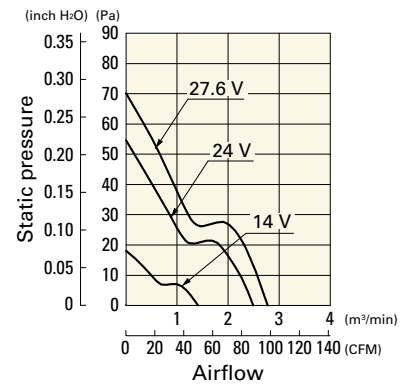
9GL1224H101 With pulse sensor

Operating voltage range



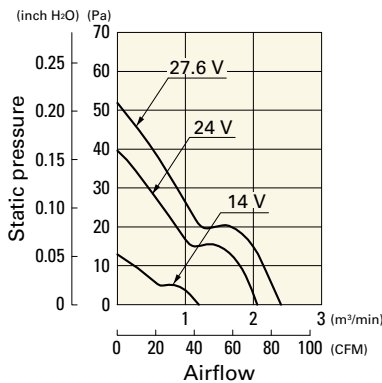
9GL1224F101 With pulse sensor

Operating voltage range



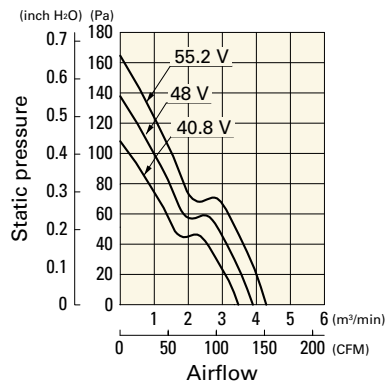
9GL1224M101 With pulse sensor

Operating voltage range



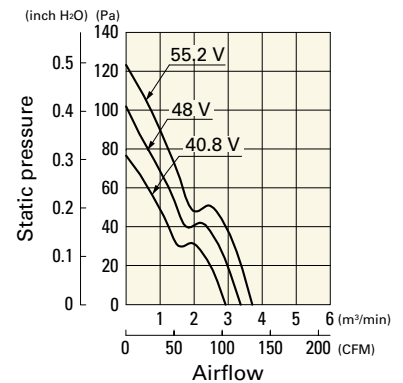
9GL1248G101 With pulse sensor

Operating voltage range



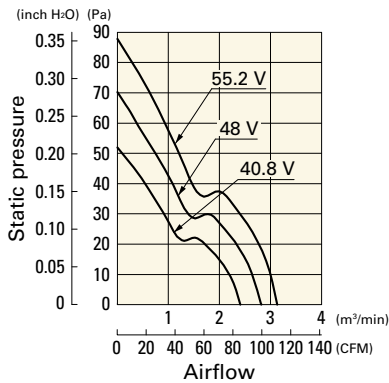
9GL1248E101 With pulse sensor

Operating voltage range



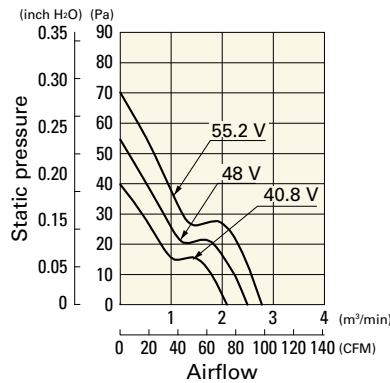
9GL1248H101 With pulse sensor

Operating voltage range



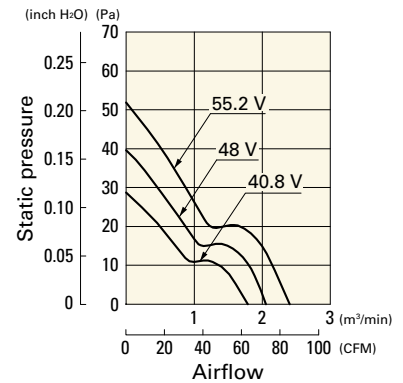
9GL1248F101 With pulse sensor

Operating voltage range



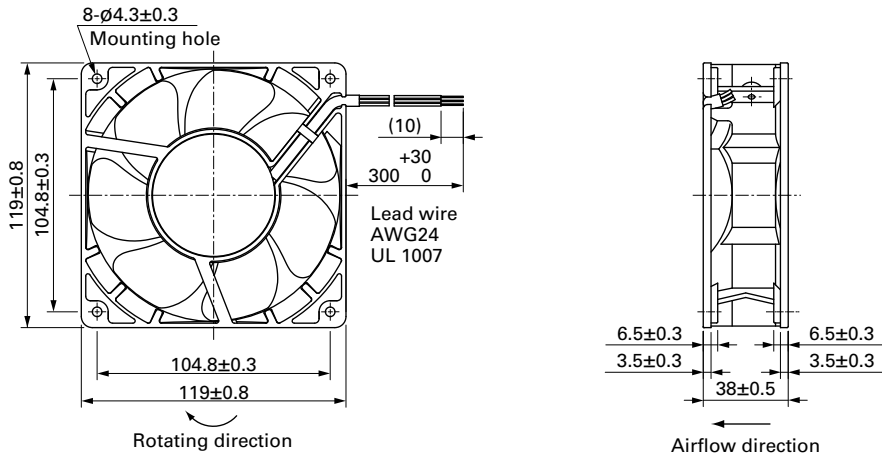
9GL1248M101 With pulse sensor

Operating voltage range

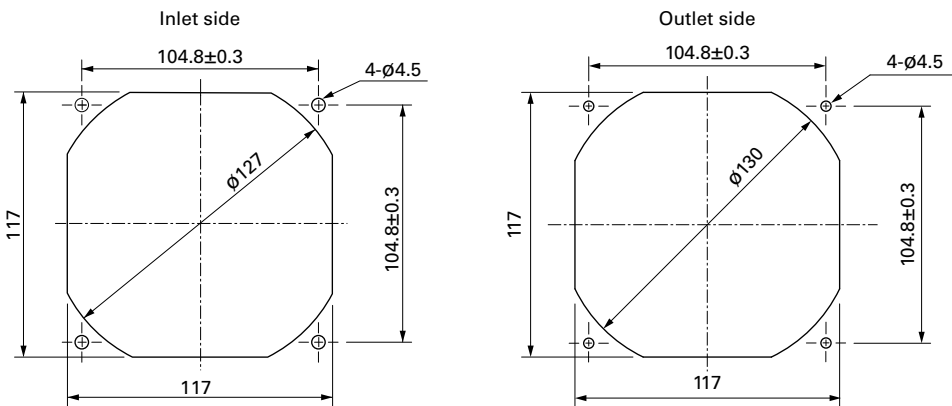


DC Long Life Fan 120 mm sq.

Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)



140x140x38 mm

San Ace 140L 9LG type

DC Long Life Fan 140 mm sq.

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 640 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | | |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|----------|----|
| » 9LG1412P1A001 | 12 | 10.2 to 13.8 | 100 | 3.72 | 44.64 | 6900 | 8.0 282 | 516 2.07 | 68 | -20 to +70 | 180000/60°C (215000/40°C) | | |
| » 9LG1412P1H001 | | | 20 | 0.27 | 3.24 | 2300 | 2.66 93 | 80 0.32 | 39 | | | | |
| » 9LG1412P1M001 | | | 100 | 1.7 | 20.4 | 5200 | 6.0 212 | 300 1.2 | 62 | | | | |
| | | | 20 | 0.27 | 3.24 | 2300 | 2.66 93 | 80 0.32 | 39 | | | | |
| » 9LG1424P1A001 | | | 24 | 20.4 to 27.6 | 100 | 1.86 | 44.64 | 6900 | 8.0 282 | | | 516 2.07 | 68 |
| | | | | | 20 | 0.17 | 4.08 | 2300 | 2.66 93 | | | 80 0.32 | 39 |
| | » 9LG1424P1H001 | 100 | | | 0.85 | 20.4 | 5200 | 6.0 212 | 300 1.2 | | | 62 | |
| | | 20 | | | 0.16 | 3.84 | 2300 | 2.66 93 | 80 0.32 | | | 39 | |
| » 9LG1424P1M001 | 24 | 20.4 to 27.6 | 100 | 0.3 | 7.2 | 3300 | 3.7 130 | 170 0.68 | 46 | | | | |
| | | | 20 | 0.11 | 2.64 | 1300 | 1.45 51 | 26 0.1 | 29 | | | | |
| » 9LG1448P1A001 | 48 | 40.8 to 55.2 | 100 | 0.92 | 44.16 | 6900 | 8.0 282 | 516 2.07 | 68 | | | | |
| | | | 20 | 0.11 | 5.28 | 2300 | 2.66 93 | 80 0.32 | 39 | | | | |
| | | | » 9LG1448P1H001 | 100 | 0.42 | 20.16 | 5200 | 6.0 212 | 300 1.2 | | | 62 | |
| | | | | 20 | 0.11 | 5.28 | 2300 | 2.66 93 | 80 0.32 | | | 39 | |
| » 9LG1448P1M001 | 48 | 40.8 to 55.2 | 100 | 0.15 | 7.2 | 3300 | 3.7 130 | 170 0.68 | 46 | | | | |
| | | | 20 | 0.09 | 4.32 | 1300 | 1.45 51 | 26 0.1 | 29 | | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| » 9LG1412L1001 | 12 | 10.2 to 13.8 | 0.27 | 3.3 | 2300 | 2.6 91.9 | 80 0.32 | 39 | -20 to +70 | 180000/60°C (215000/40°C) |
| » 9LG1424L1001 | 24 | 20.4 to 27.6 | 0.17 | 4.1 | 2300 | 2.6 91.9 | 80 0.32 | 39 | | |
| » 9LG1448L1001 | 48 | 40.8 to 55.2 | 0.11 | 5.3 | 2300 | 2.6 91.9 | 80 0.32 | 39 | | |

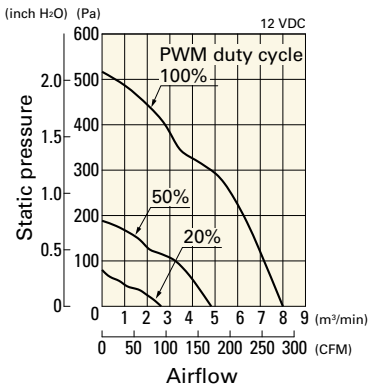
Note 1: Sensor and control options are available for selection. Refer to the table on p. 649.

Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 668 for details.

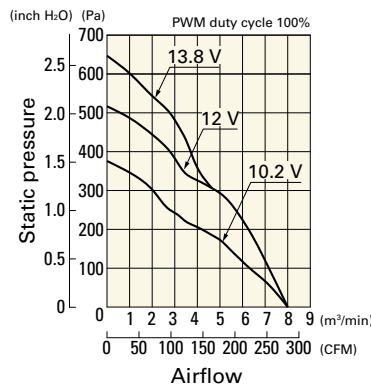
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG1412P1A001 With pulse sensor with PWM control

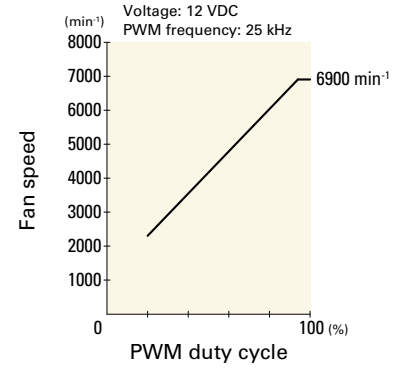
PWM duty cycle



Operating voltage range

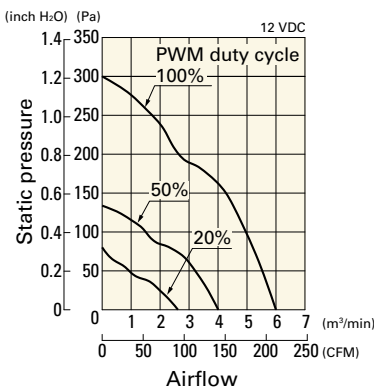


PWM duty - Speed characteristics example

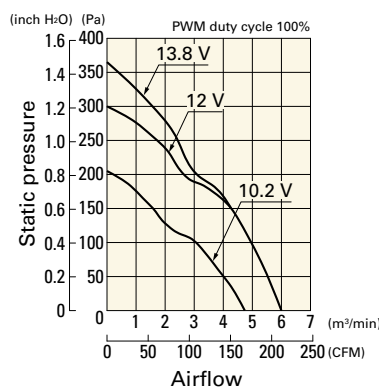


9LG1412P1H001 With pulse sensor with PWM control

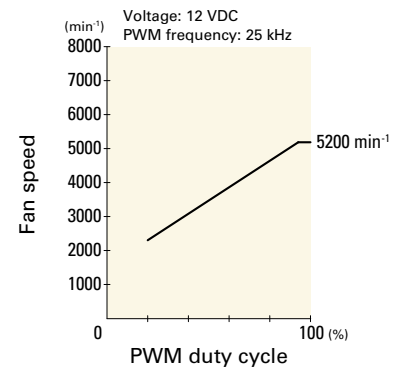
PWM duty cycle



Operating voltage range

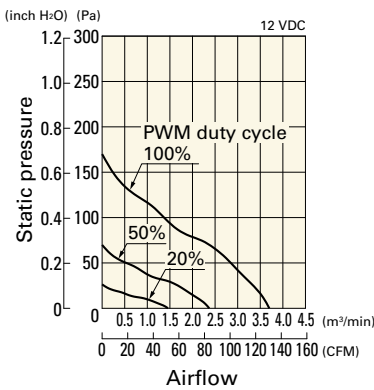


PWM duty - Speed characteristics example

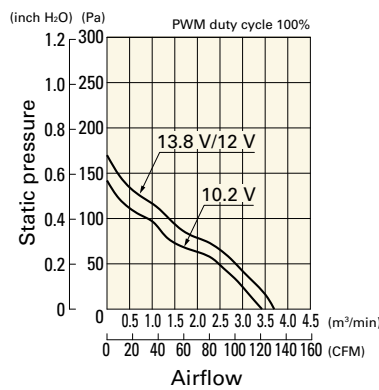


9LG1412P1M001 With pulse sensor with PWM control

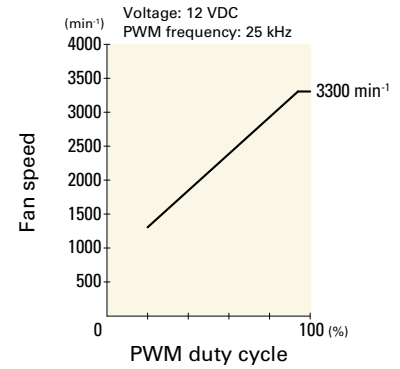
PWM duty cycle



Operating voltage range

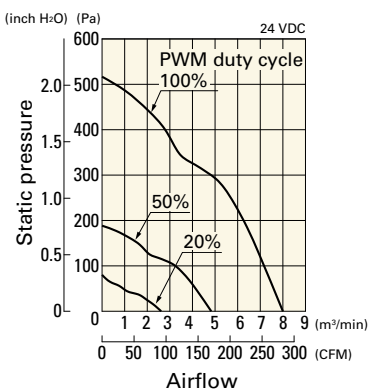


PWM duty - Speed characteristics example

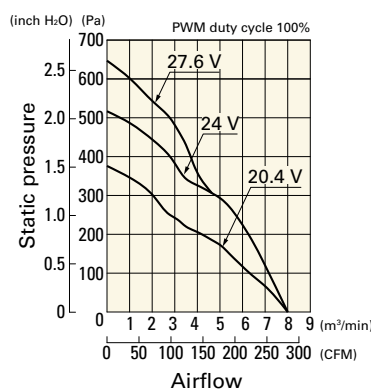


9LG1424P1A001 With pulse sensor with PWM control

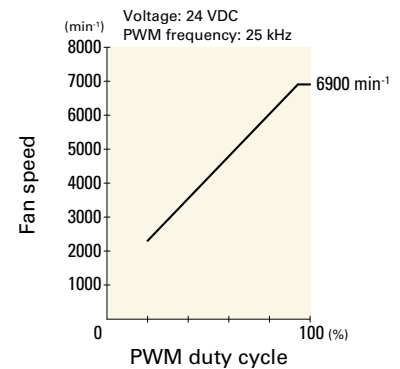
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

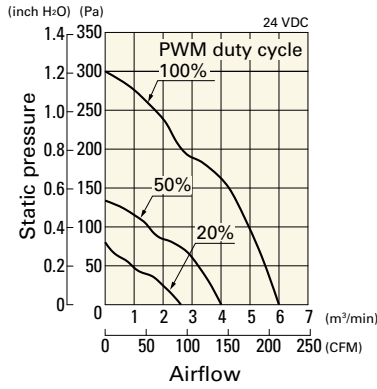


DC
Long Life Fan 140 mm sq.

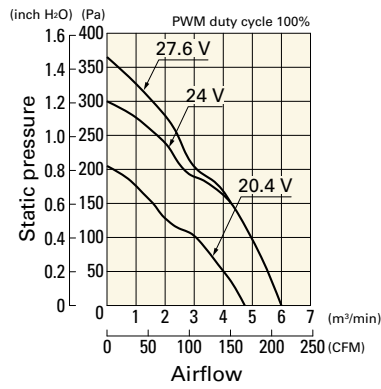
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG1424P1H001 With pulse sensor with PWM control

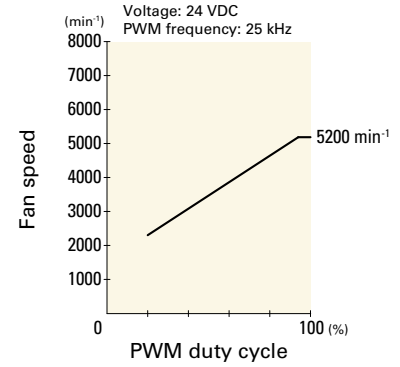
PWM duty cycle



Operating voltage range

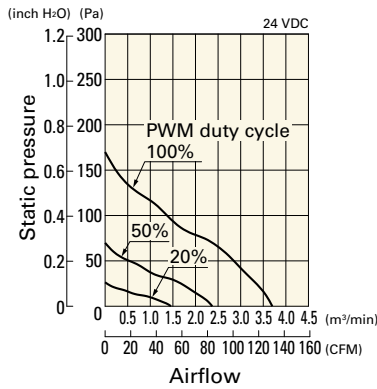


PWM duty - Speed characteristics example

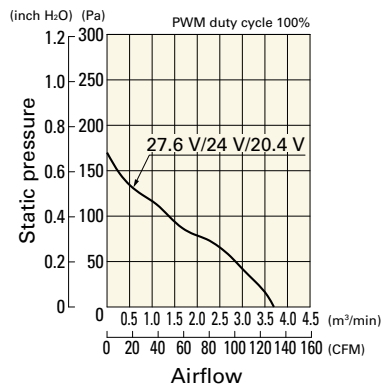


9LG1424P1M001 With pulse sensor with PWM control

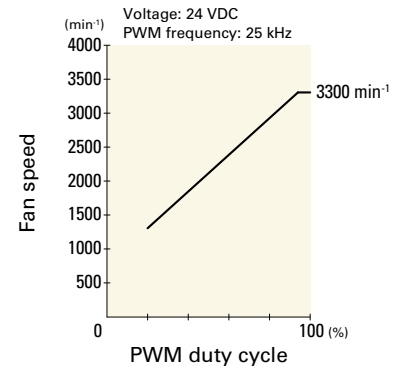
PWM duty cycle



Operating voltage range

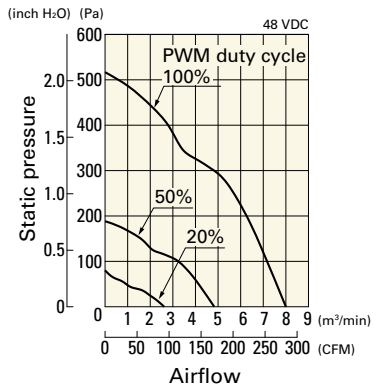


PWM duty - Speed characteristics example

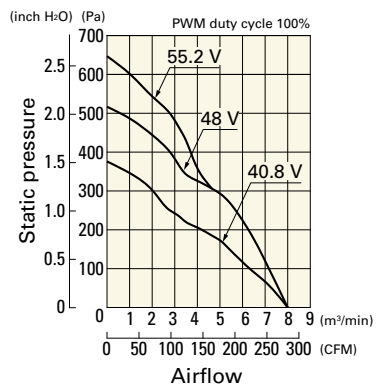


9LG1448P1A001 With pulse sensor with PWM control

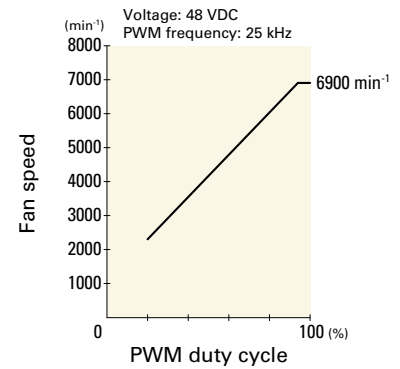
PWM duty cycle



Operating voltage range

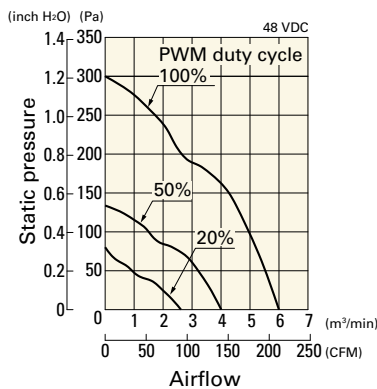


PWM duty - Speed characteristics example

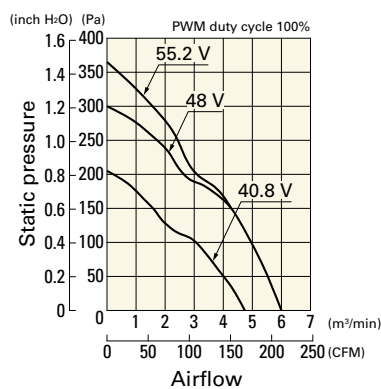


9LG1448P1H001 With pulse sensor with PWM control

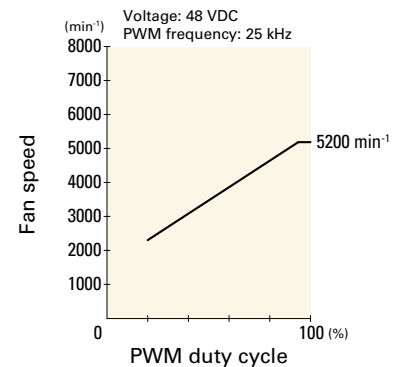
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

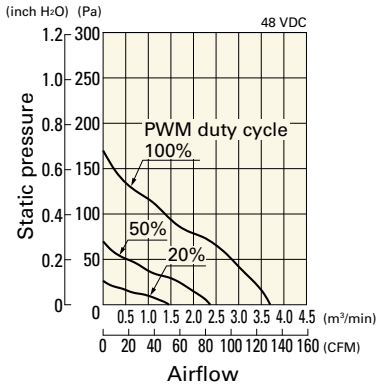


DC Long Life Fan 140 mm sq.

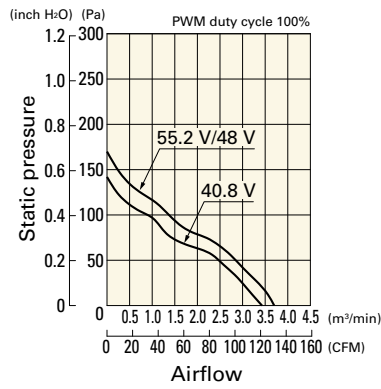
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG1448P1M001 With pulse sensor with PWM control

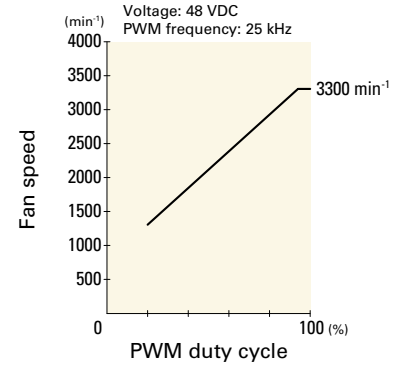
PWM duty cycle



Operating voltage range



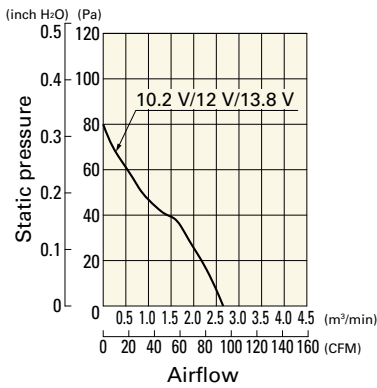
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

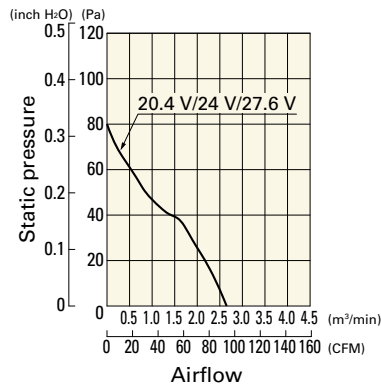
9LG1412L1001 With pulse sensor

Operating voltage range



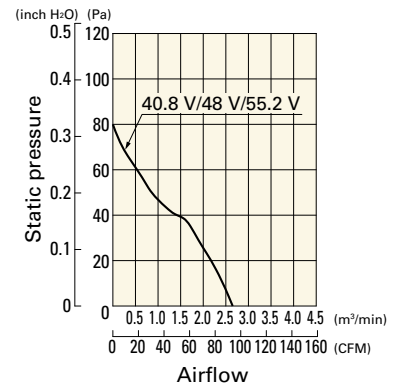
9LG1424L1001 With pulse sensor

Operating voltage range

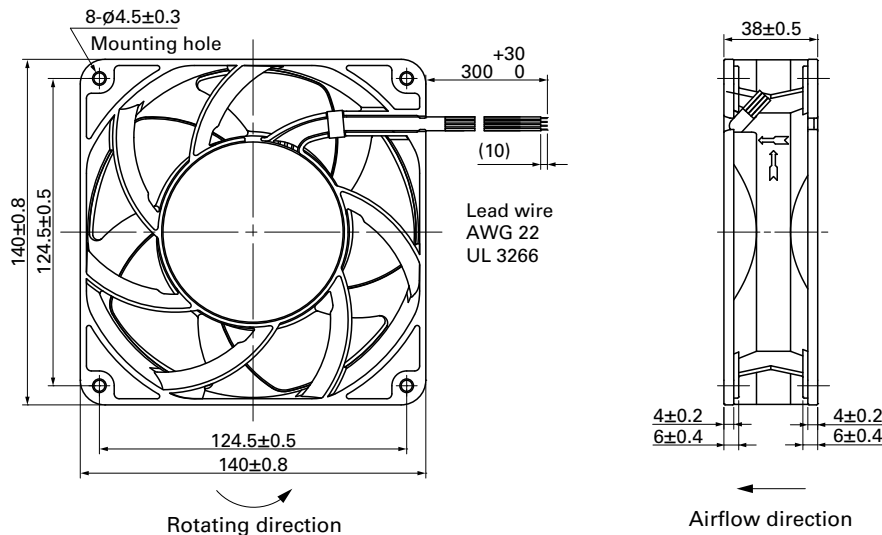


9LG1448L1001 With pulse sensor

Operating voltage range



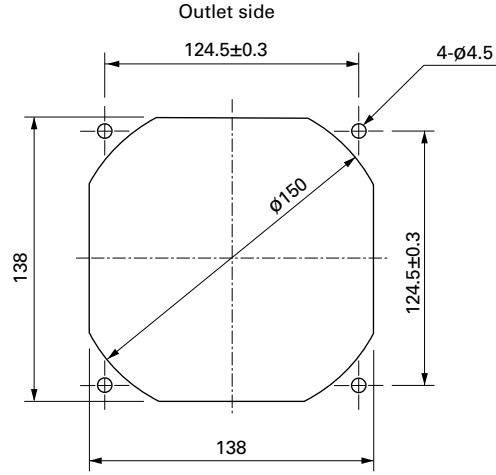
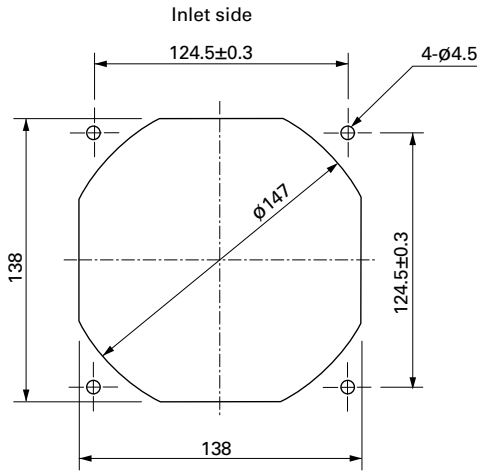
Dimensions (unit: mm) (With pulse sensor with PWM control)



DC

Long Life Fan 140 mm sq.

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-719, 109-719H

DC

Long Life Fan 140 mm sq.



140x140x51 mm

San Ace 140L 9LG type

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 790 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| ▶▶▶ 9LG1412P5G001 | 12 | 10.2 to 13.8 | 100 | 5.16 | 62 | 7500 | 9.0 318 | 655 2.63 | 69 | -20 to +70 | 180000/60°C (215000/40°C) |
| ▶▶▶ 9LG1412P5S001 | | | 20 | 0.31 | 3.72 | 2300 | 2.75 97 | 80 0.32 | 38 | | |
| ▶▶▶ 9LG1424P5G001 | 24 | 20.4 to 27.6 | 100 | 1.83 | 22 | 5000 | 6.0 212 | 295 1.18 | 57 | | |
| | | | ▶▶▶ 9LG1424P5S001 | 20 | 0.31 | 3.72 | 2300 | 2.75 97 | 80 0.32 | | |
| ▶▶▶ 9LG1448P5G001 | 48 | 40.8 to 55.2 | 100 | 2.58 | 62 | 7500 | 9.0 318 | 655 2.63 | 69 | | |
| | | | ▶▶▶ 9LG1448P5S001 | 20 | 0.16 | 3.84 | 2300 | 2.75 97 | 80 0.32 | | |
| ▶▶▶ 9LG1448P5G001 | 48 | 40.8 to 55.2 | 100 | 0.91 | 22 | 5000 | 6.0 212 | 295 1.18 | 57 | | |
| | | | ▶▶▶ 9LG1448P5S001 | 20 | 0.16 | 3.84 | 2300 | 2.75 97 | 80 0.32 | | |
| ▶▶▶ 9LG1448P5G001 | 48 | 40.8 to 55.2 | 100 | 1.29 | 62 | 7500 | 9.0 318 | 655 2.63 | 69 | | |
| | | | ▶▶▶ 9LG1448P5S001 | 20 | 0.12 | 5.76 | 2300 | 2.75 97 | 80 0.32 | | |
| ▶▶▶ 9LG1448P5G001 | 48 | 40.8 to 55.2 | 100 | 0.45 | 22 | 5000 | 6.0 212 | 295 1.18 | 57 | | |
| | | | ▶▶▶ 9LG1448P5S001 | 20 | 0.12 | 5.76 | 2300 | 2.75 97 | 80 0.32 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| ▶▶▶ 9LG1412A5001 | 12 | 10.2 to 13.8 | 2.61 | 31.4 | 5700 | 6.9 243.8 | 500 2 | 61 | -20 to +70 | 180000/60°C (215000/40°C) |
| ▶▶▶ 9LG1412H5001 | | | 1 | 12 | 4100 | 4.9 173.1 | 260 1.04 | 52 | | |
| ▶▶▶ 9LG1412M5001 | | | 0.43 | 5.16 | 2600 | 3.1 109.5 | 100 0.4 | 40 | | |
| ▶▶▶ 9LG1424A5001 | 24 | 20.4 to 27.6 | 1.21 | 29.1 | 5700 | 6.9 243.8 | 540 2.17 | 61 | | |
| ▶▶▶ 9LG1424H5001 | | | 0.55 | 13.2 | 4100 | 4.9 173.1 | 260 1.04 | 52 | | |
| ▶▶▶ 9LG1424M5001 | | | 0.23 | 5.52 | 2600 | 3.1 109.5 | 100 0.4 | 40 | | |
| ▶▶▶ 9LG1448A5001 | 48 | 40.8 to 55.2 | 0.66 | 31.7 | 5700 | 6.9 243.8 | 540 2.17 | 61 | | |
| ▶▶▶ 9LG1448H5001 | | | 0.31 | 14.9 | 4100 | 4.9 173.1 | 260 1.04 | 52 | | |
| ▶▶▶ 9LG1448M5001 | | | 0.15 | 7.2 | 2600 | 3.1 109.5 | 100 0.4 | 40 | | |

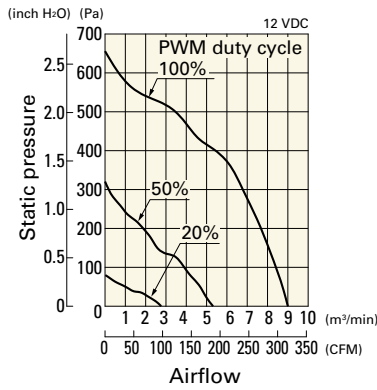
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 648 to 649.

Note 2: The ▶▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

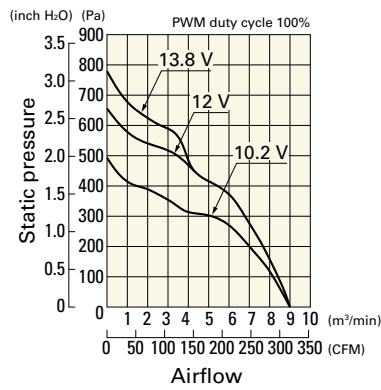
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG1412P5G001 With pulse sensor with PWM control

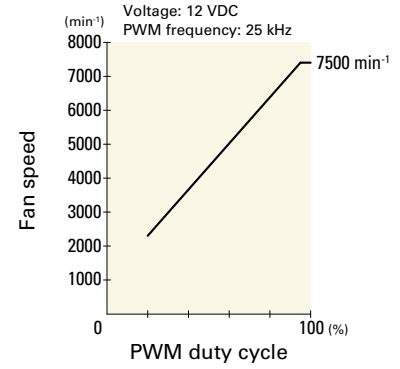
PWM duty cycle



Operating voltage range

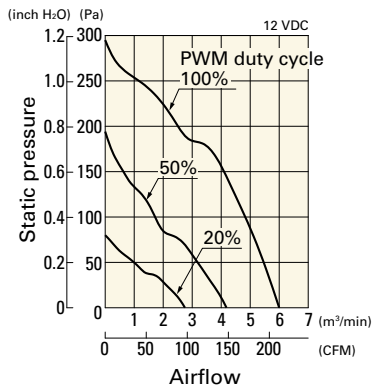


PWM duty - Speed characteristics example

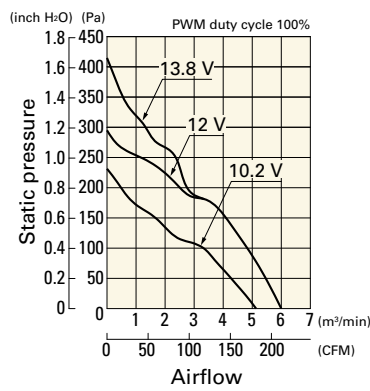


9LG1412P5S001 With pulse sensor with PWM control

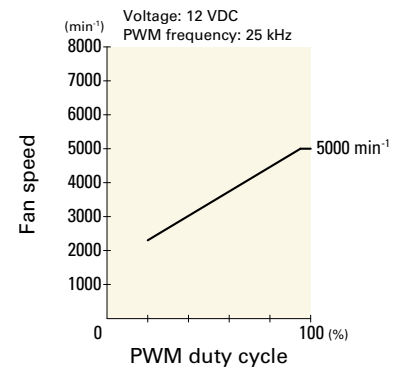
PWM duty cycle



Operating voltage range

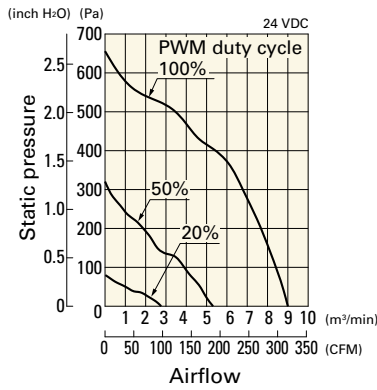


PWM duty - Speed characteristics example

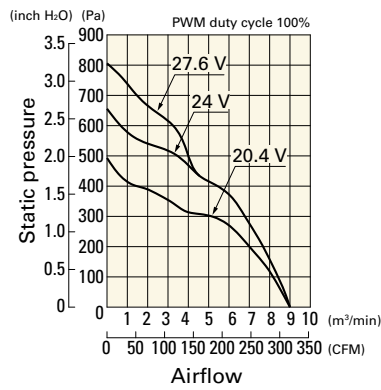


9LG1424P5G001 With pulse sensor with PWM control

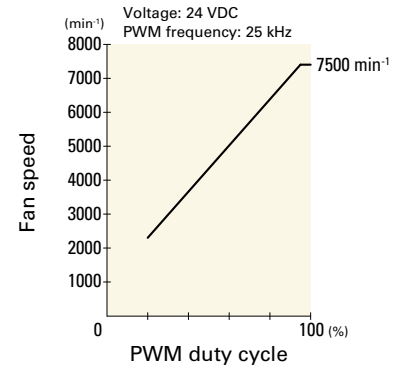
PWM duty cycle



Operating voltage range

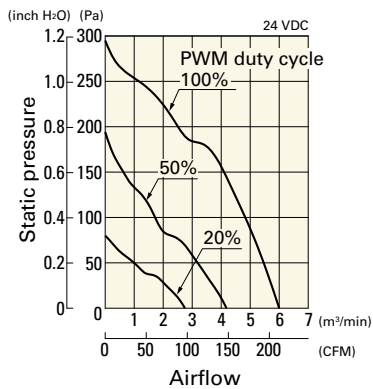


PWM duty - Speed characteristics example

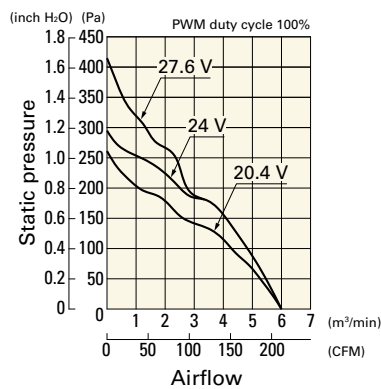


9LG1424P5S001 With pulse sensor with PWM control

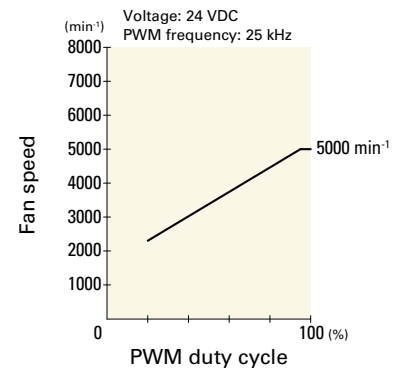
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

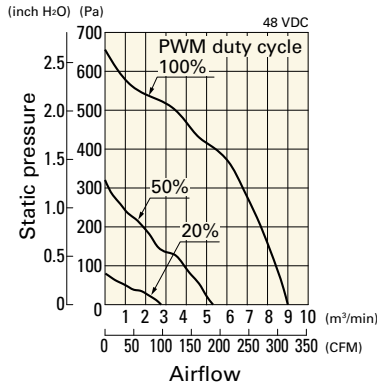


DC Long Life Fan 140 mm sq.

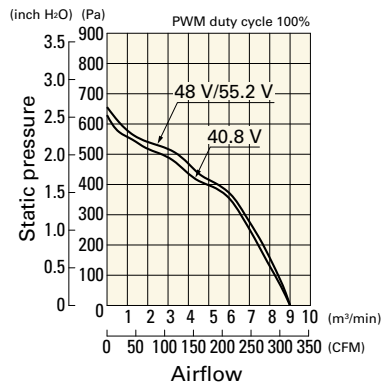
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9LG1448P5G001 With pulse sensor with PWM control

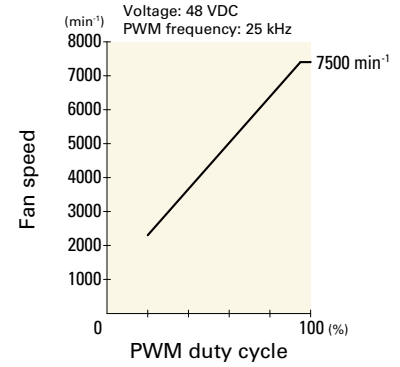
PWM duty cycle



Operating voltage range

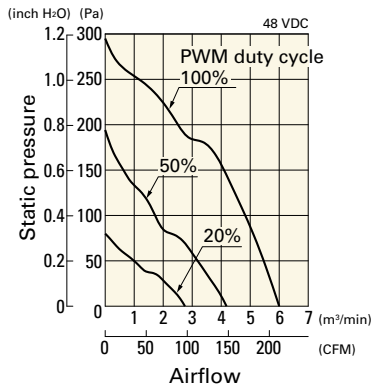


PWM duty - Speed characteristics example

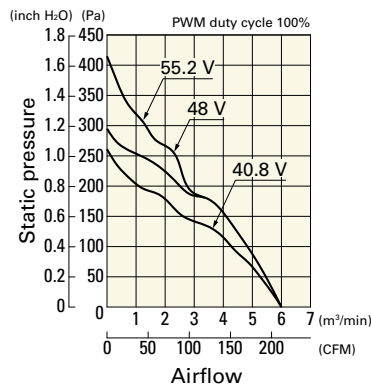


9LG1448P5S001 With pulse sensor with PWM control

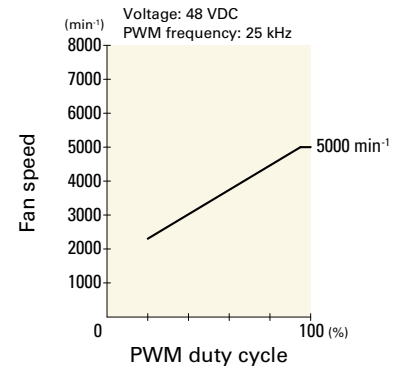
PWM duty cycle



Operating voltage range



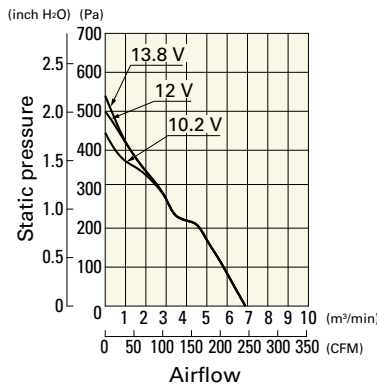
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

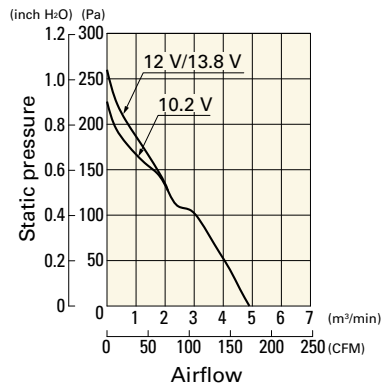
9LG1412A5001 With pulse sensor

Operating voltage range



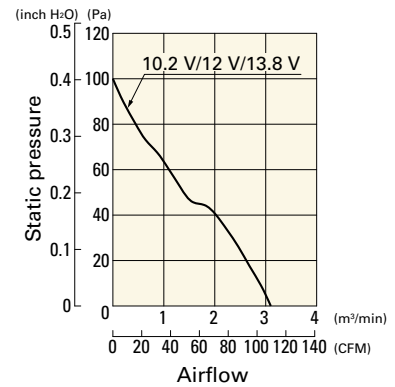
9LG1412H5001 With pulse sensor

Operating voltage range



9LG1412M5001 With pulse sensor

Operating voltage range

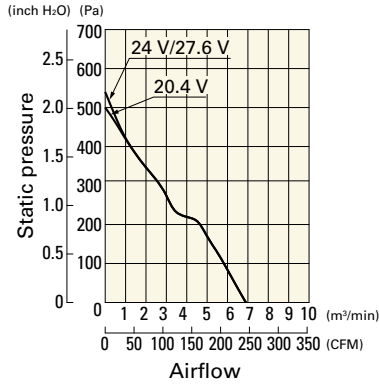


DC
Long Life Fan 140 mm sq.

Airflow - Static Pressure Characteristics

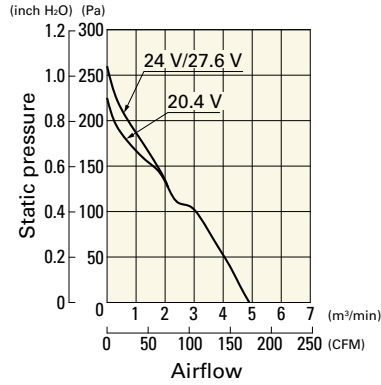
9LG1424A5001 With pulse sensor

Operating voltage range



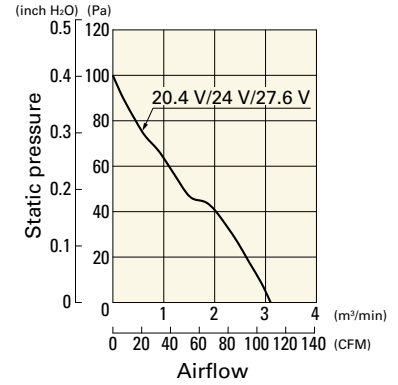
9LG1424H5001 With pulse sensor

Operating voltage range



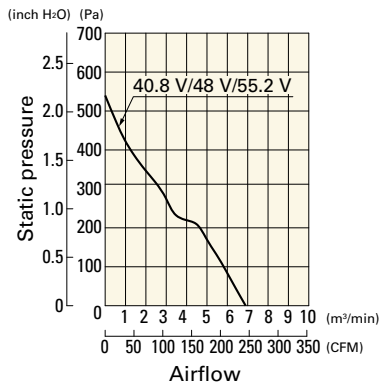
9LG1424M5001 With pulse sensor

Operating voltage range



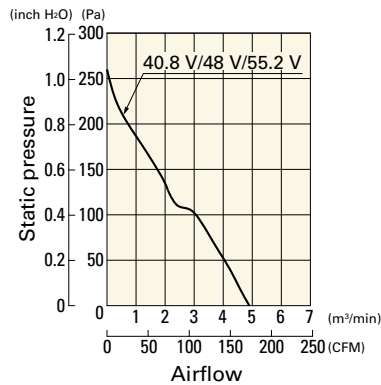
9LG1448A5001 With pulse sensor

Operating voltage range



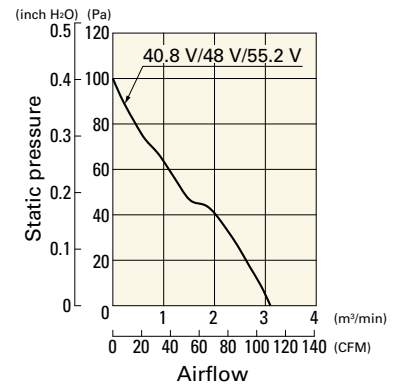
9LG1448H5001 With pulse sensor

Operating voltage range



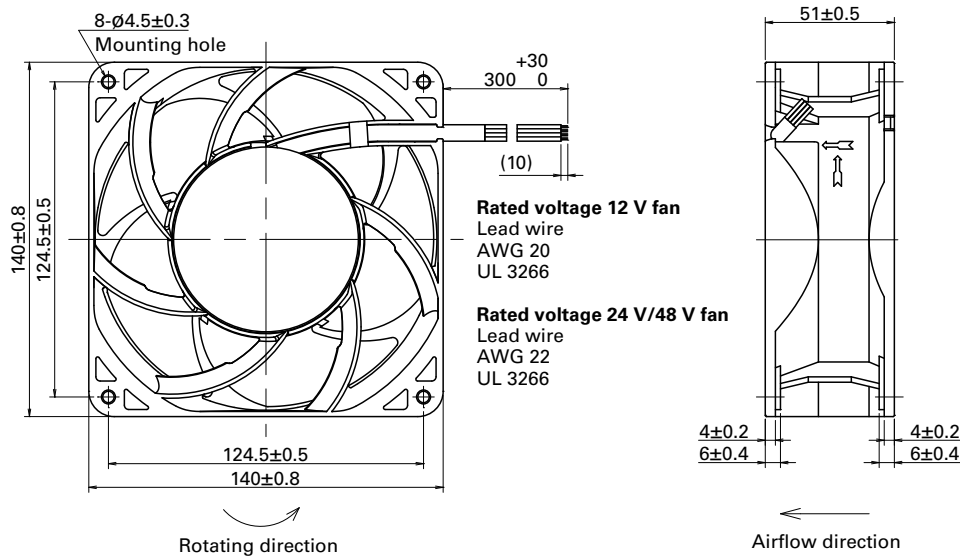
9LG1448M5001 With pulse sensor

Operating voltage range

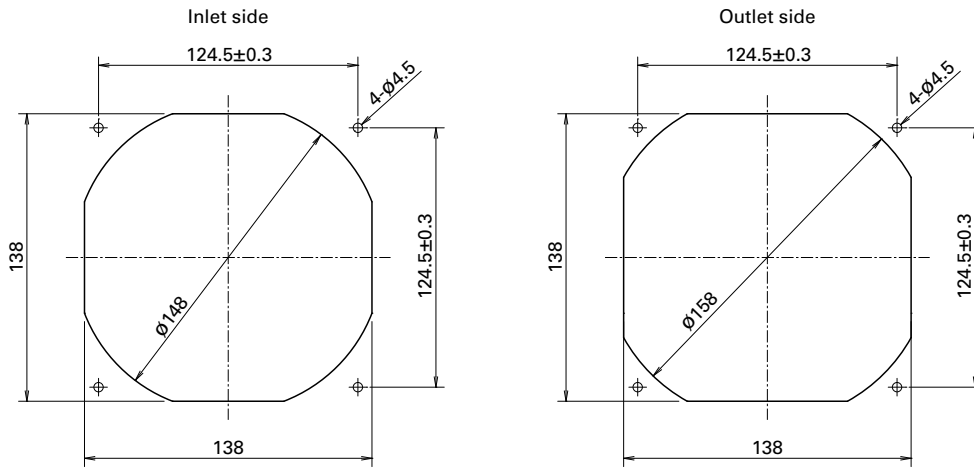


DC Long Life Fan 140 mm sq.

Dimensions (unit: mm) (With pulse sensor with PWM control)



■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



■ Options




Finger guards

page: p. 599

Model no.: 109-719, 109-719H



∅172×150×51 mm

San Ace 172L 9L type   

Sidecut type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 760 g

Specifications

The models listed below **have a pulse sensor**.

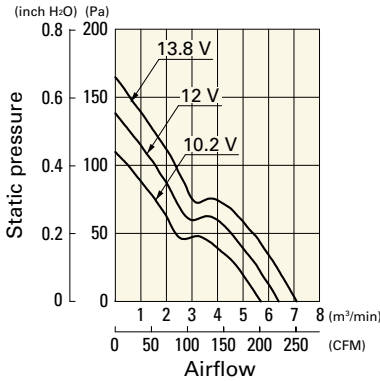
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| 109L5712H501 | 12 | 10.2 to 13.8 | 1.2 | 14.4 | 3050 | 6.4 226 | 137.2 0.551 | 52 | -20 to +70 | 100000/60°C (135000/40°C) |
| 109L5712M501 | | | 0.48 | 5.76 | 2000 | 4.2 148 | 67.6 0.271 | 41 | | |
| 109L5724H501 | 24 | 20.4 to 27.6 | 0.58 | 13.92 | 3050 | 6.4 226 | 137.2 0.551 | 52 | | |
| 109L5724M501 | | | 0.2 | 4.8 | 2000 | 4.2 148 | 67.6 0.271 | 41 | | |
| 109L5748H501 | 48 | 40.8 to 55.2 | 0.28 | 13.44 | 3050 | 6.4 226 | 137.2 0.551 | 52 | | |
| 109L5748M501 | | | 0.11 | 5.28 | 2000 | 4.2 148 | 67.6 0.271 | 41 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 639.

Airflow - Static Pressure Characteristics

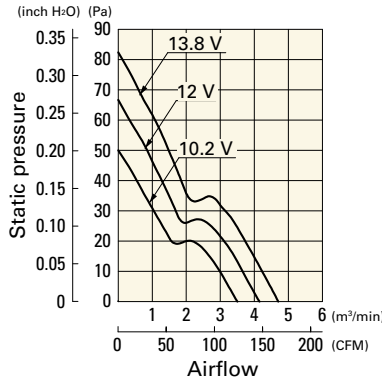
109L5712H501 With pulse sensor

Operating voltage range



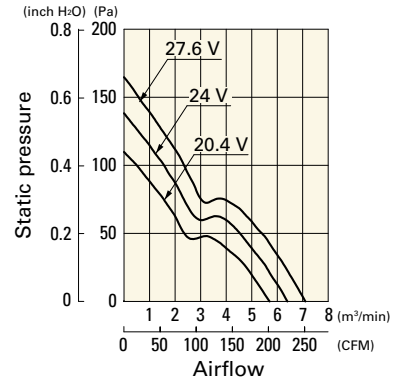
109L5712M501 With pulse sensor

Operating voltage range



109L5724H501 With pulse sensor

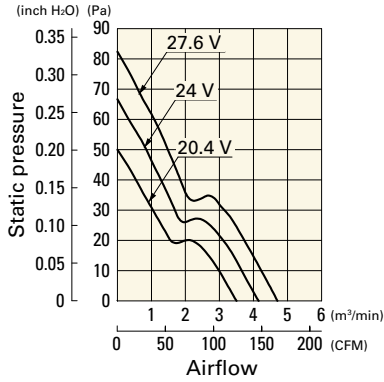
Operating voltage range



Airflow - Static Pressure Characteristics

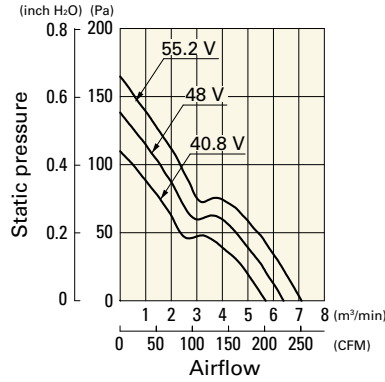
109L5724M501 With pulse sensor

Operating voltage range



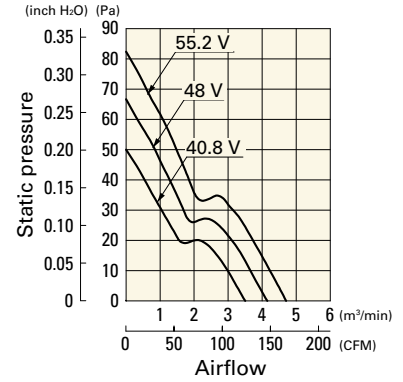
109L5748H501 With pulse sensor

Operating voltage range

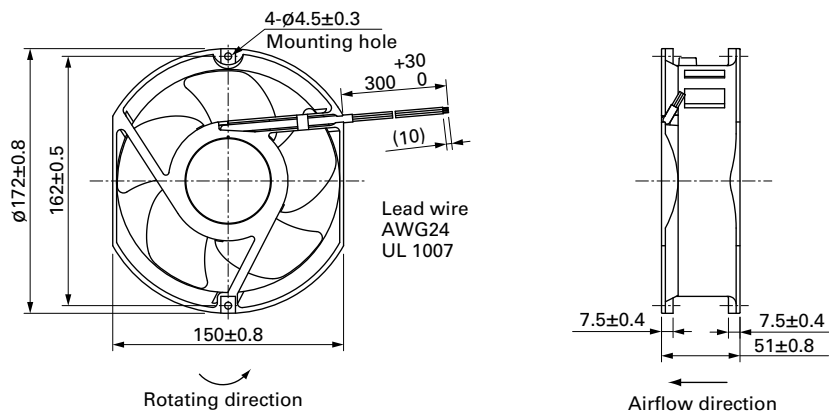


109L5748M501 With pulse sensor

Operating voltage range



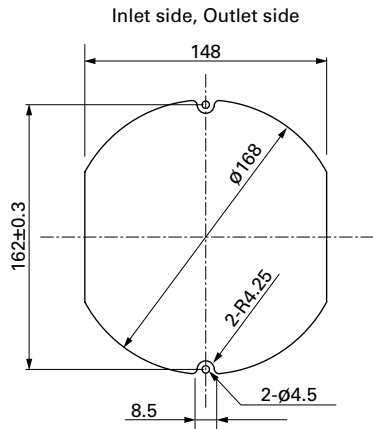
Dimensions (unit: mm)



DC

Long Life Fan $\phi 172$ mm

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 600

Model no.: 109-319J, 109-319E, 109-319H



∅172x51 mm

San Ace 172L 9L type

Round type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 780 g

Specifications

The models listed below **have a pulse sensor**.

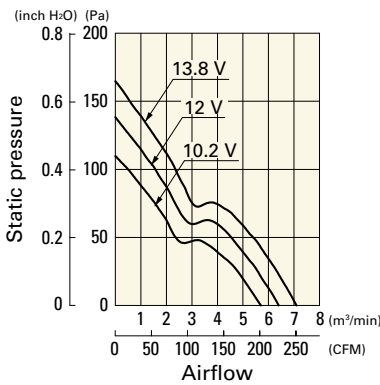
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|------------------------------|
| 109L1712H501 | 12 | 10.2 to 13.8 | 1.2 | 14.4 | 3050 | 6.4 226 | 137.2 0.551 | 47 | -20 to +70 | 100000/60°C (135000/40°C) |
| 109L1712M501 | | | 0.48 | 5.76 | 2000 | 4.2 148 | 67.6 0.271 | 36 | | |
| 109L1724H501 | 24 | 20.4 to 27.6 | 0.58 | 13.92 | 3050 | 6.4 226 | 137.2 0.551 | 47 | | |
| 109L1724M501 | | | 0.2 | 4.8 | 2000 | 4.2 148 | 67.6 0.271 | 36 | | |
| 109L1748H501 | 48 | 40.8 to 55.2 | 0.28 | 13.44 | 3050 | 6.4 226 | 137.2 0.551 | 47 | | |
| 109L1748M501 | | | 0.11 | 5.28 | 2000 | 4.2 148 | 67.6 0.271 | 36 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 639.

Airflow - Static Pressure Characteristics

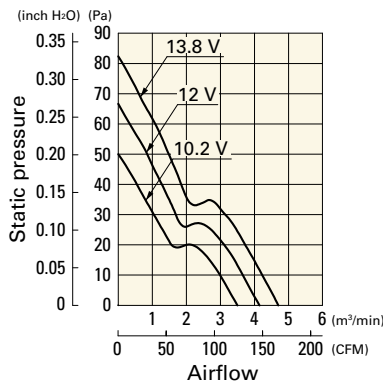
109L1712H501 With pulse sensor

Operating voltage range



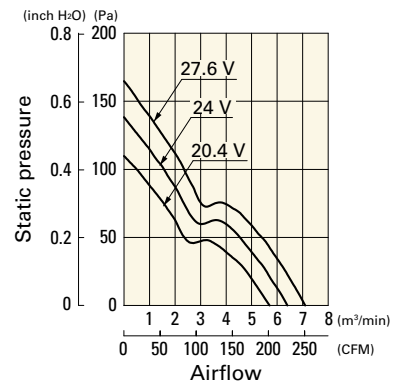
109L1712M501 With pulse sensor

Operating voltage range



109L1724H501 With pulse sensor

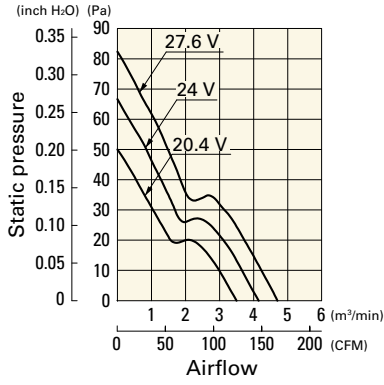
Operating voltage range



Airflow - Static Pressure Characteristics

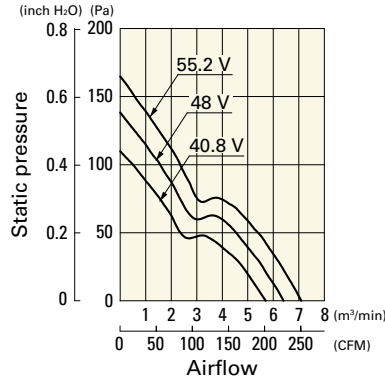
109L1724M501 With pulse sensor

Operating voltage range



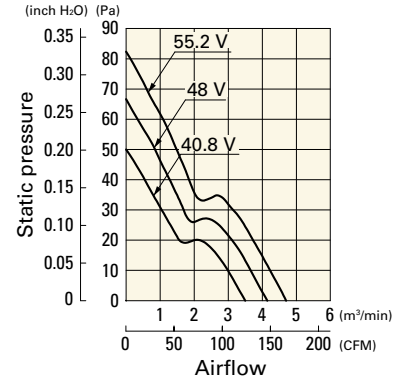
109L1748H501 With pulse sensor

Operating voltage range

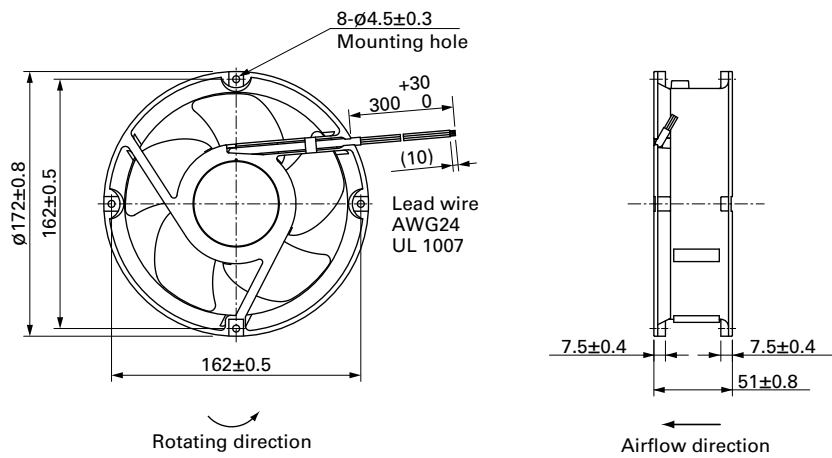


109L1748M501 With pulse sensor

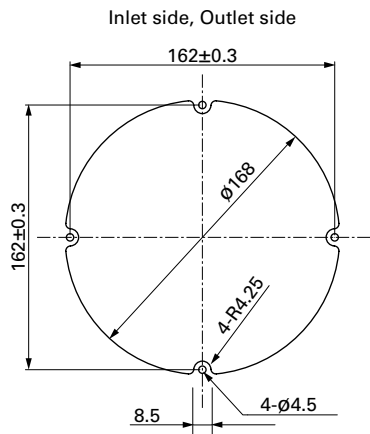
Operating voltage range



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 600

Model no.: 109-319E, 109-319H, 109-1066

DC
Long Life Fan $\phi 172$ mm

Wide Temperature Range Fan

These fans can be used in a wide temperature range from -40 to +85°C.

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | | |
|------------|------------|-----------|-------------|-----------------|------------|----------------------------|
| 9GT | 04 | 12 | P | 3 | J | 001 |
| Type name | Frame size | Voltage | PWM control | Frame thickness | Speed code | Individual customer's spec |

| | | | | | | |
|----------------------|-------|-------|-------|-------|---------|--|
| Type name | 9GT | | | | | |
| Frame size (mm) | 04 | 06 | 08 | 09 | 12 | |
| | 40×40 | 60×60 | 80×80 | 92×92 | 120×120 | |
| Voltage (V) | 12 | 24 | | | | |
| | 12 | 24 | | | | |
| Frame thickness (mm) | 1 | 3 | 4 | | | |
| | 38 | 28 | 25 | | | |
| Speed code | J | | | | | |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

- Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life
(Wide Temperature Range Fan)..... Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 85°C temperature. Expected life at 40°C is for reference only.
For more information, please refer to the technical material section.



40x40x28 mm

San Ace 40T 9GT type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 85°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -40 to +85°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 55 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-----------------------------|
| ▶▶ 9GT0412P3J001 | 12 | 10.2 to 13.8 | 100 | 0.31 | 3.72 | 11700 | 0.52 18.4 | 206 0.827 | 48 | -40 to +85 | 40000/85°C (162000/40°C) |
| | | | 30 | 0.08 | 0.96 | 4100 | 0.18 6.36 | 25.2 0.1 | 21 | | |
| ▶▶ 9GT0424P3J001 | 24 | 20.4 to 27.6 | 100 | 0.15 | 3.6 | 11700 | 0.52 18.4 | 206 0.827 | 48 | | |
| | | | 30 | 0.07 | 1.68 | 5700 | 0.25 8.83 | 48.9 0.196 | 29 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

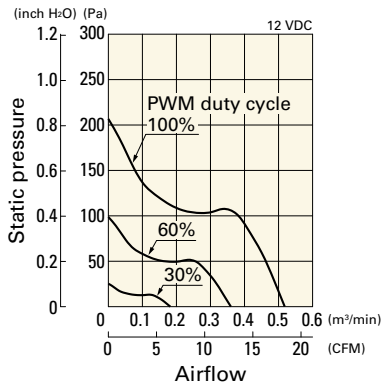
Note 1: Sensor and control options are available for selection. Refer to the table on p. 645.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

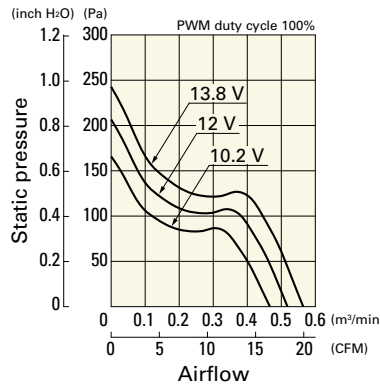
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT0412P3J001 With pulse sensor with PWM control

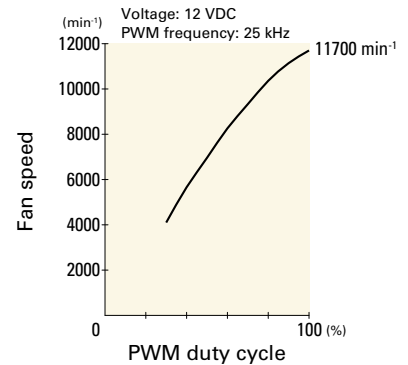
PWM duty cycle



Operating voltage range



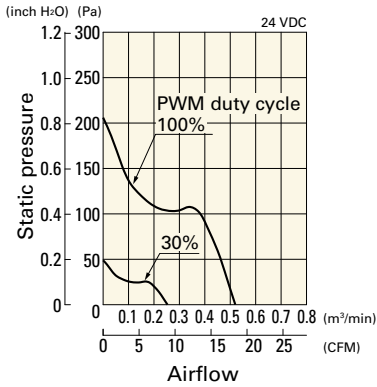
PWM duty - Speed characteristics example



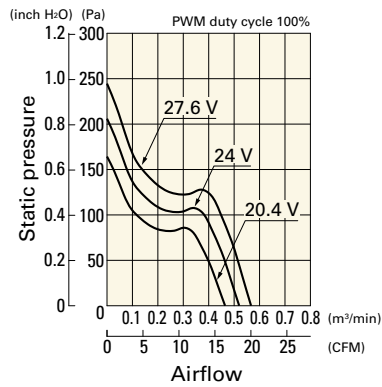
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT0424P3J001 With pulse sensor with PWM control

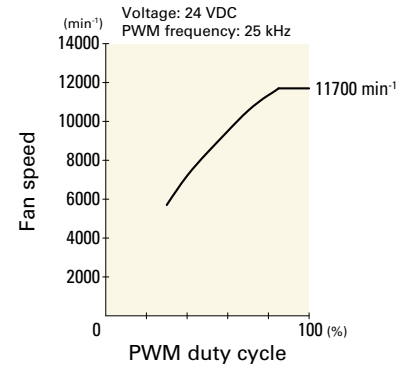
PWM duty cycle



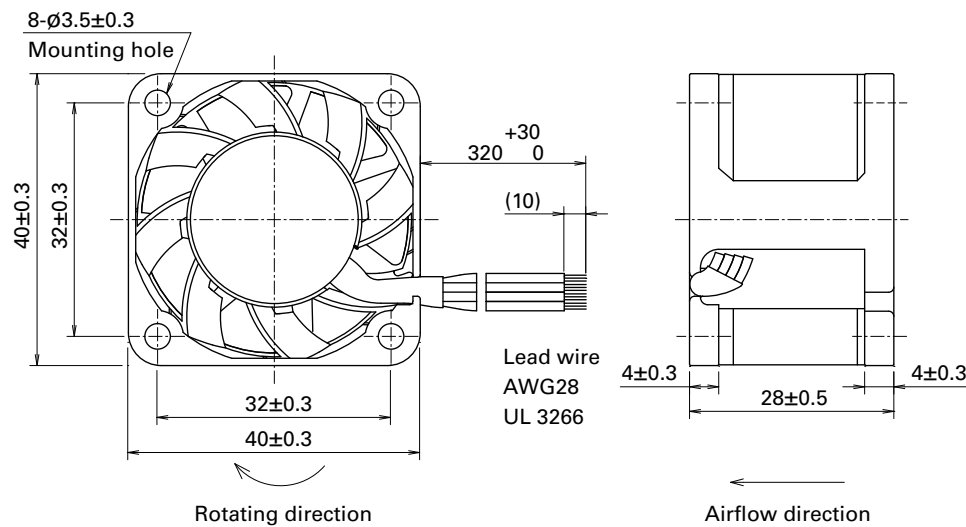
Operating voltage range



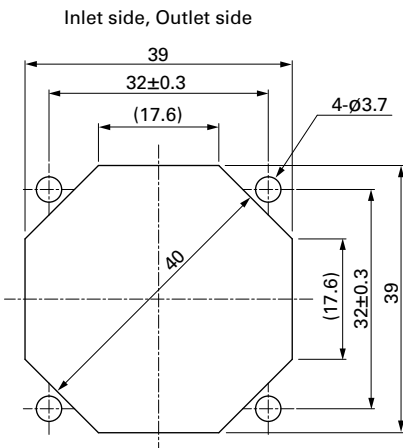
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-059, 109-059H

DC
Wide Temperature Range Fan 40 mm sq.

60×60×25 mm

San Ace 60T 9GT type  



General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 85°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -40 to +85°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow Control Brown
- Mass 100 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-----------------------------|
| 9GT0612P4G001 | 12 | 10.2 to 13.8 | 100 | 0.56 | 6.72 | 10000 | 1.26 44.5 | 243 0.97 | 52 | -40 to +85 | 40000/85°C (162000/40°C) |
| | | | 30 | 0.11 | 1.32 | 4100 | 0.52 18.3 | 42.8 0.17 | 25 | | |
| 9GT0624P4G001 | 24 | 20.4 to 27.6 | 100 | 0.28 | 6.72 | 10000 | 1.26 44.5 | 243 0.97 | 52 | | |
| | | | 30 | 0.06 | 1.44 | 4100 | 0.52 18.3 | 42.8 0.17 | 25 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

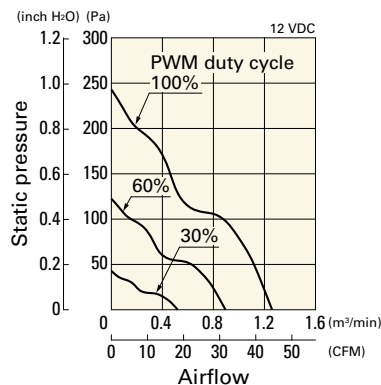
Note 1: Sensor and control options are available for selection. Refer to the table on p. 645.

Note 2: The  mark indicates Short LeadTime Service applicable models. See p. 668 for details.

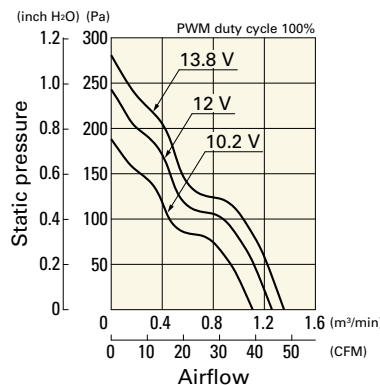
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT0612P4G001 With pulse sensor with PWM control

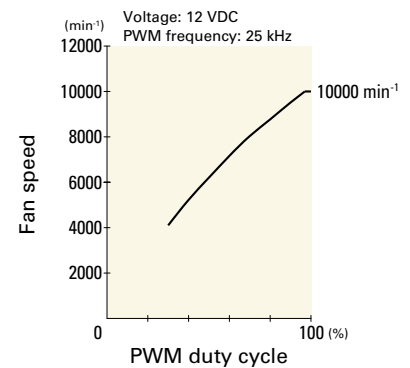
PWM duty cycle



Operating voltage range



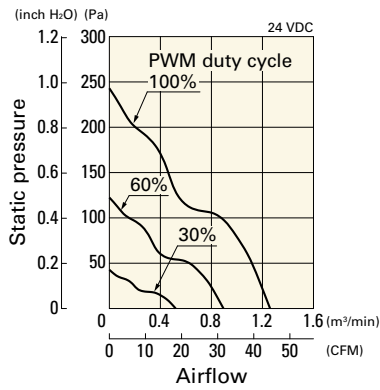
PWM duty - Speed characteristics example



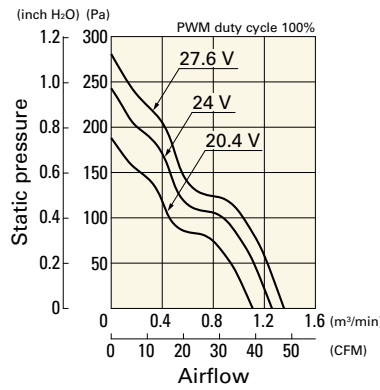
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT0624P4G001 With pulse sensor with PWM control

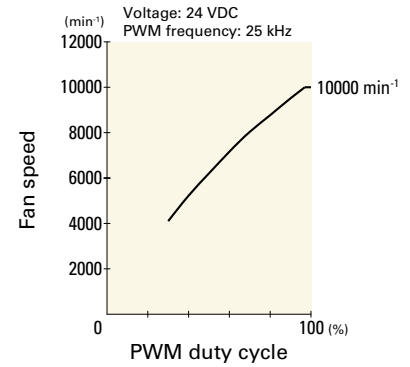
PWM duty cycle



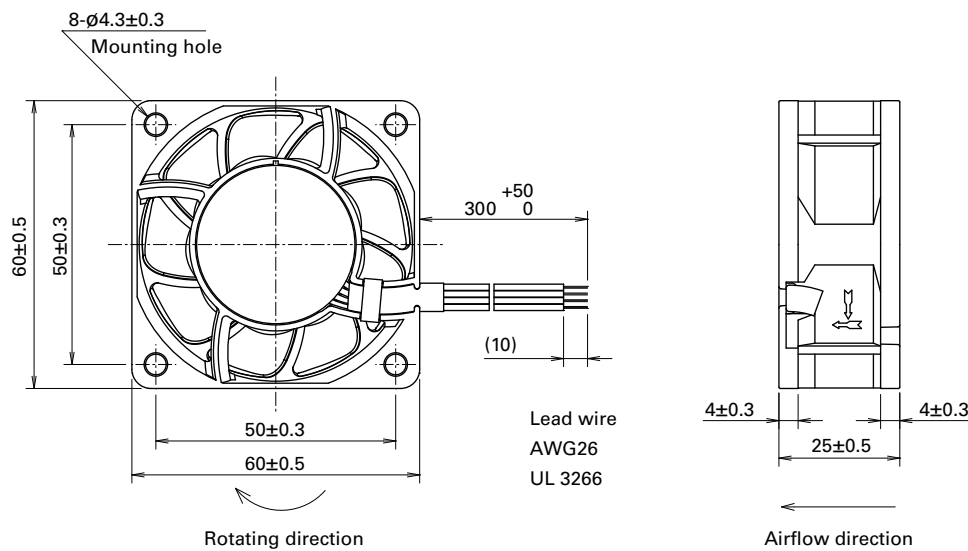
Operating voltage range



PWM duty - Speed characteristics example

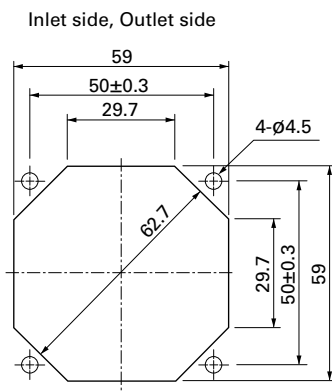


Dimensions (unit: mm)



DC
Wide Temperature Range Fan 60 mm sq.

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

80×80×25 mm

San Ace 80T 9GT type   



General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 85°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -40 to +85°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 130 g


Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-----------------------------|
| 9GT0812P4S001 | 12 | 10.2 to 13.8 | 100 | 0.46 | 5.52 | 6700 | 1.86 65.7 | 143 0.57 | 46 | -40 to +85 | 40000/85°C (162000/40°C) |
| | | | 30 | 0.09 | 1.08 | 2650 | 0.73 25.7 | 22.3 0.08 | 26 | | |
| 9GT0824P4S001 | 24 | 20.4 to 27.6 | 100 | 0.22 | 5.28 | 6700 | 1.86 65.7 | 143 0.57 | 46 | | |
| | | | 30 | 0.05 | 1.2 | 2650 | 0.73 25.7 | 22.3 0.08 | 26 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

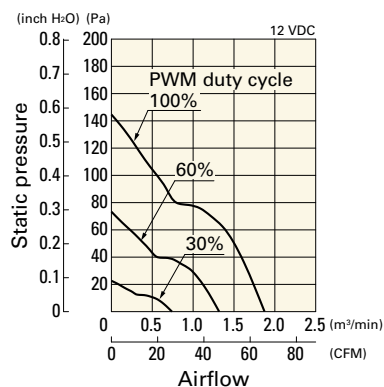
Note 1: Sensor and control options are available for selection. Refer to the table on p. 645.

Note 2: The  mark indicates Short LeadTime Service applicable models. See p. 668 for details.

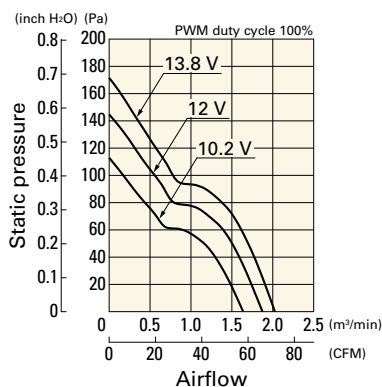
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT0812P4S001 With pulse sensor with PWM control

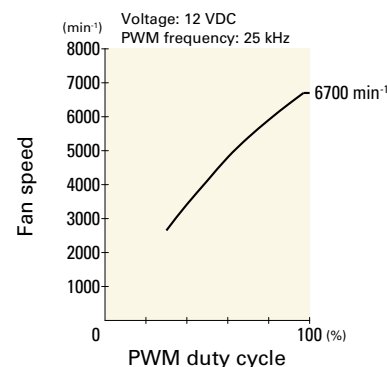
PWM duty cycle



Operating voltage range



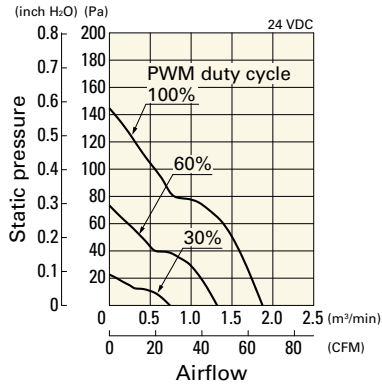
PWM duty - Speed characteristics example



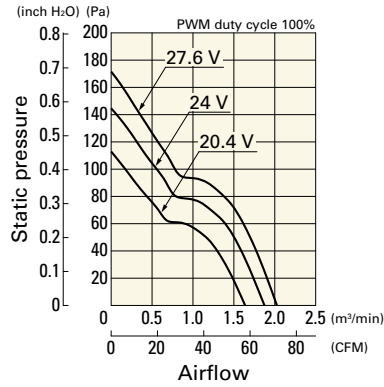
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT0824P4S001 With pulse sensor with PWM control

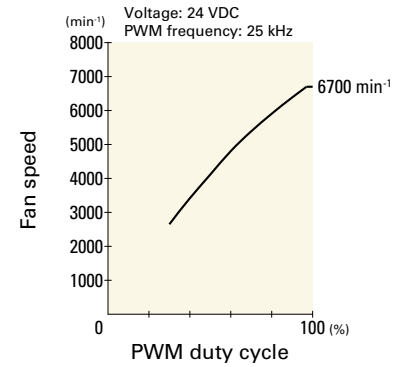
PWM duty cycle



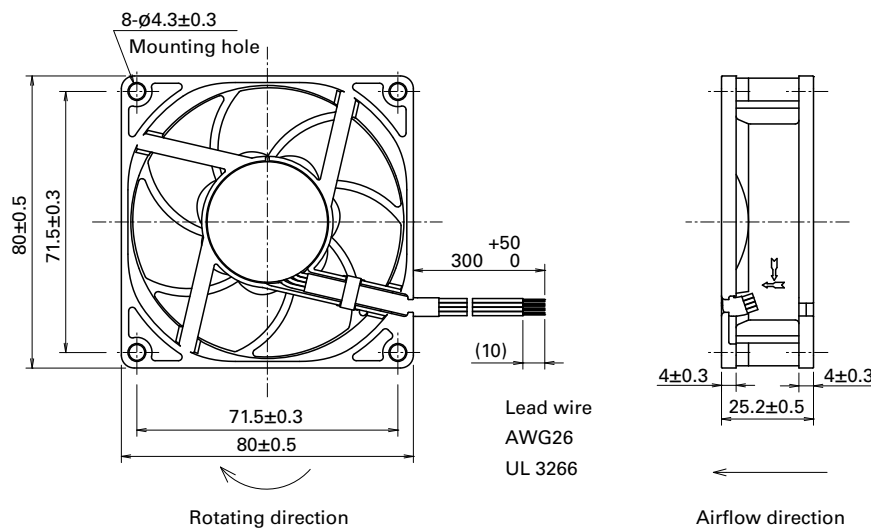
Operating voltage range



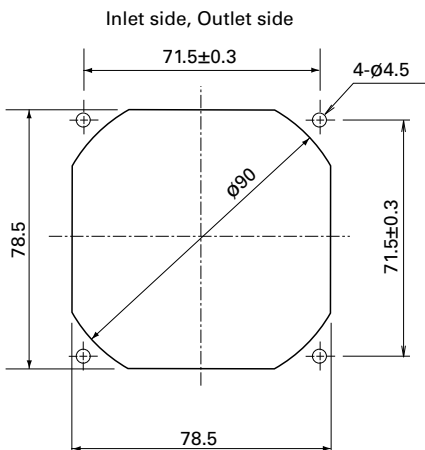
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

DC
Wide Temperature Range Fan 80 mm sq.



92x92x25 mm

San Ace 92T 9GT type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 85°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -40 to +85°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow Control Brown
- Mass 150 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-----------------------------|
| ▶▶ 9GT0912P4J001 | 12 | 10.2 to 13.8 | 100 | 0.42 | 5.04 | 5000 | 2.2 77.7 | 105 0.42 | 44 | -40 to +85 | 40000/85°C (162000/40°C) |
| | | | 30 | 0.07 | 0.84 | 1850 | 0.81 28.7 | 14.3 0.05 | 18 | | |
| ▶▶ 9GT0924P4J001 | 24 | 20.4 to 27.6 | 100 | 0.21 | 5.04 | 5000 | 2.2 77.7 | 105 0.42 | 44 | | |
| | | | 30 | 0.05 | 1.2 | 1850 | 0.81 28.7 | 14.3 0.05 | 18 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

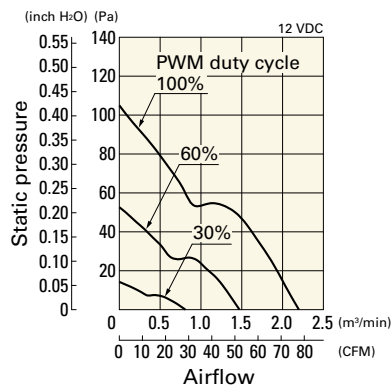
Note 1: Sensor and control options are available for selection. Refer to the table on p. 646.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

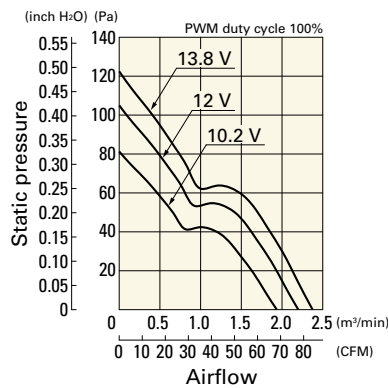
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT0912P4J001 With pulse sensor with PWM control

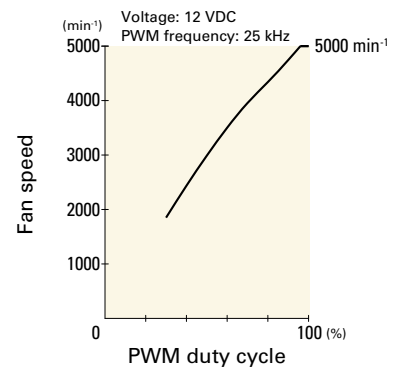
PWM duty cycle



Operating voltage range



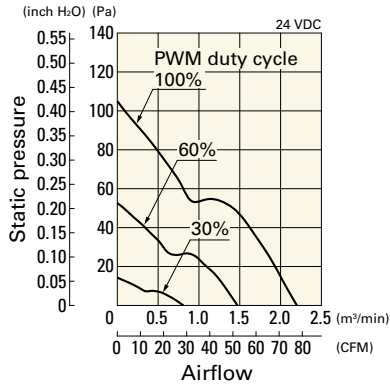
PWM duty - Speed characteristics example



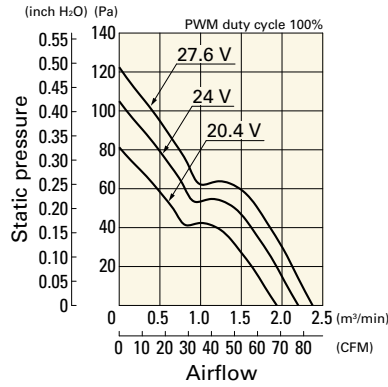
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT0924P4J001 With pulse sensor with PWM control

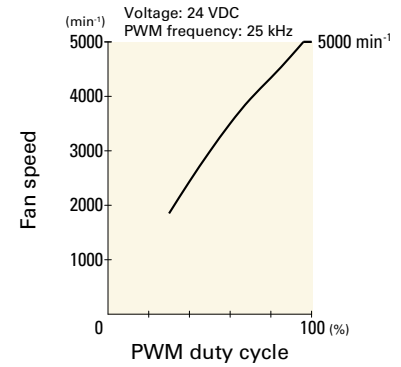
PWM duty cycle



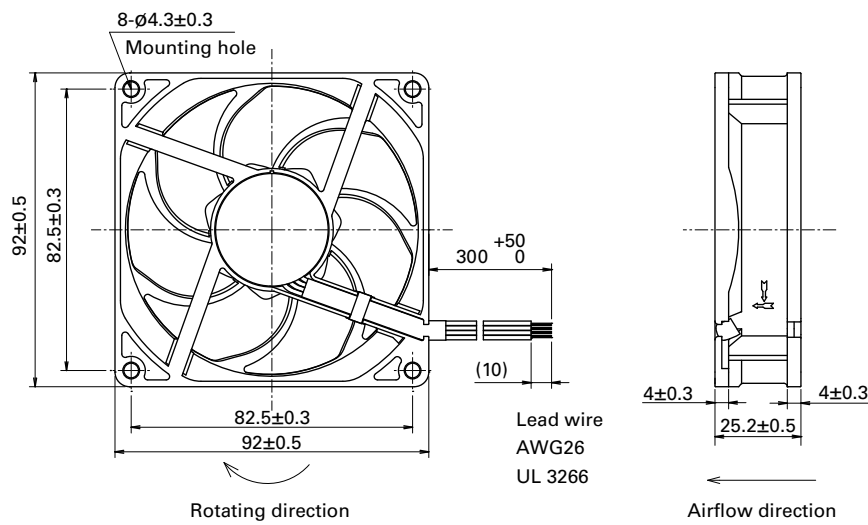
Operating voltage range



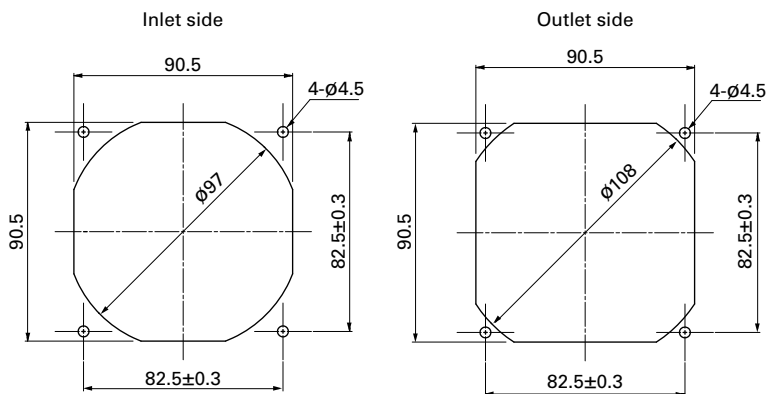
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

DC
Wide Temperature Range Fan 92 mm sq.



92x92x38 mm

San Ace 92T 9GT type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 85°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -40 to +85°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 270 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-----------------------------|
| 9GT0912P1M001 | 12 | 10.2 to 13.8 | 100 | 1.5 | 18.0 | 8100 | 3.3 116.6 | 315 1.26 | 58 | -40 to +85 | 40000/85°C (162000/40°C) |
| | | | 30 | 0.3 | 3.6 | 3750 | 1.5 53.0 | 72.0 0.29 | 37 | | |
| 9GT0924P1M001 | 24 | 20.4 to 27.6 | 100 | 0.75 | 18.0 | 8100 | 3.3 116.6 | 315 1.26 | 58 | | |
| | | | 30 | 0.15 | 3.6 | 3750 | 1.5 53.0 | 72.0 0.29 | 37 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

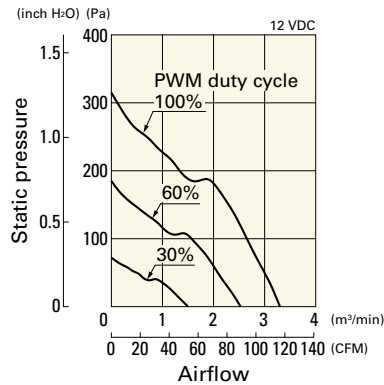
Note 1: Sensor and control options are available for selection. Refer to the table on pp. 645 to 646.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

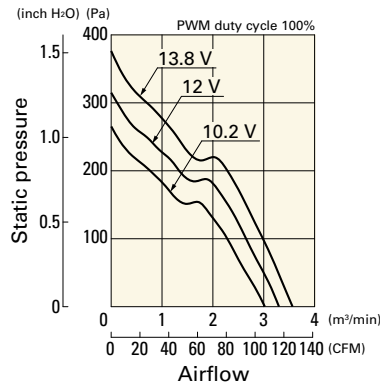
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT0912P1M001 With pulse sensor with PWM control

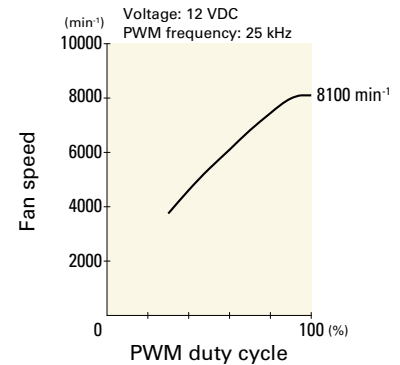
PWM duty cycle



Operating voltage range



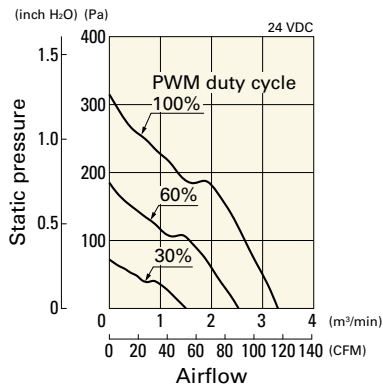
PWM duty - Speed characteristics example



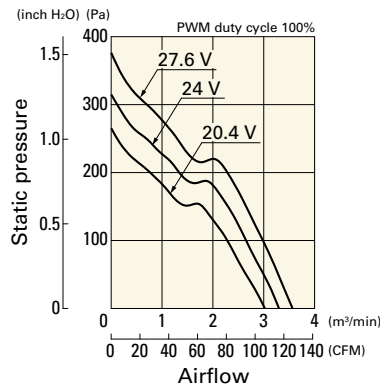
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT0924P1M001 With pulse sensor with PWM control

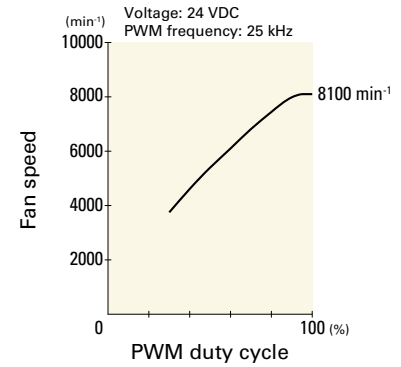
PWM duty cycle



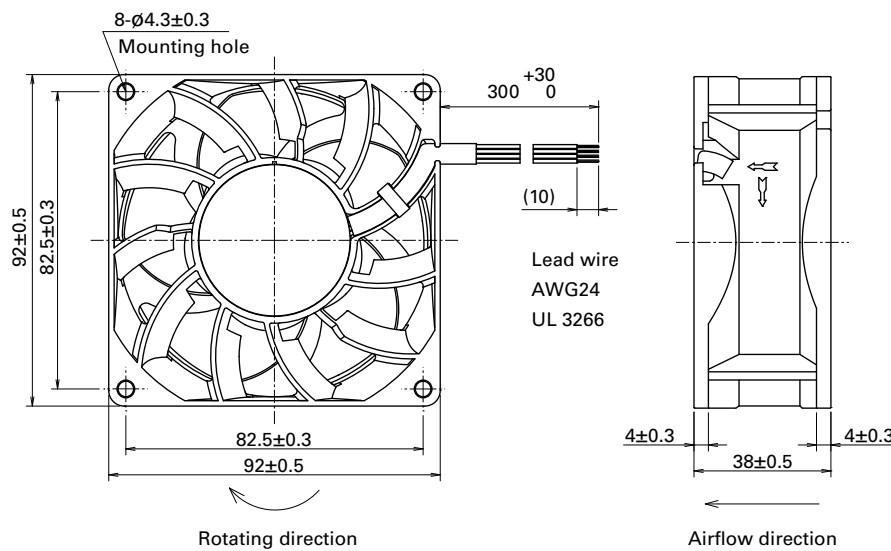
Operating voltage range



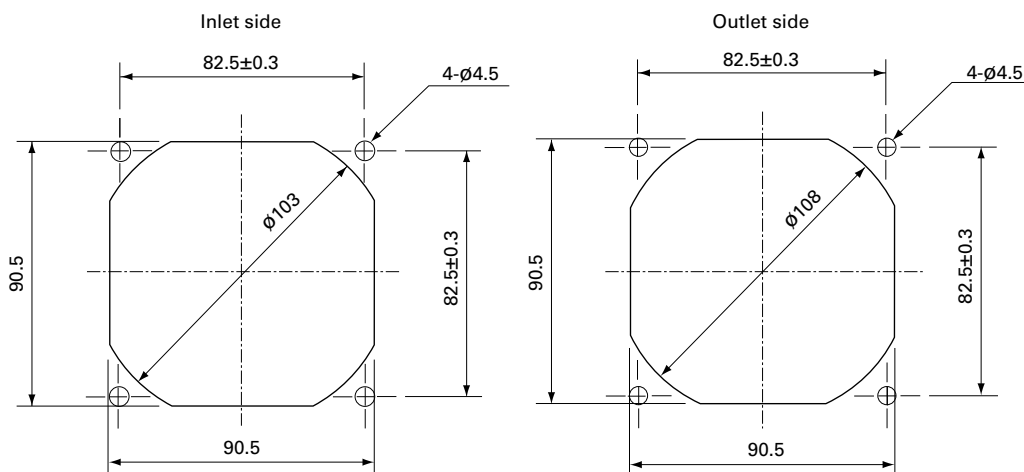
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

DC
Wide Temperature Range Fan 92 mm sq.



120×120×38 mm

San Ace 120T 9GT type US

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 85°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -40 to +85°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow Control Brown
- Mass 420 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-----------------------------|
| 9GT1212P1S001 | 12 | 9.0 to 13.8 | 100 | 2.2 | 26.4 | 5600 | 6.0 211.8 | 270 1.08 | 58 | -40 to +85 | 40000/85°C (162000/40°C) |
| | | | 35 | 0.48 | 5.76 | 2900 | 3.0 106.0 | 85.6 0.34 | 41 | | |
| 9GT1224P1S001 | 24 | 18.0 to 27.6 | 100 | 1.1 | 26.4 | 5600 | 6.0 211.8 | 270 1.08 | 58 | | |
| | | | 35 | 0.24 | 5.76 | 2900 | 3.0 106.0 | 85.6 0.34 | 41 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

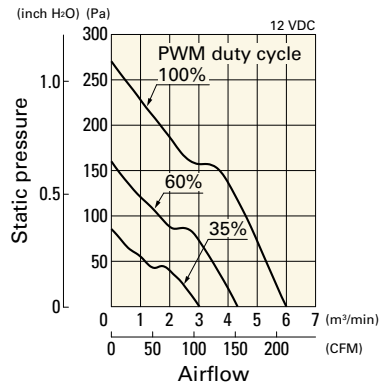
Note 1: Sensor and control options are available for selection. Refer to the table on p. 646.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

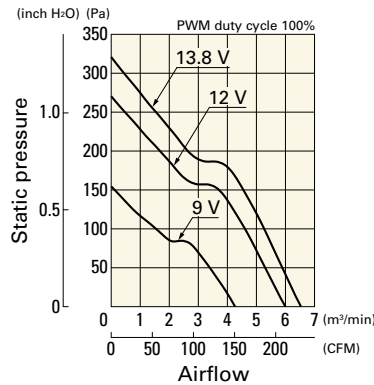
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT1212P1S001 With pulse sensor with PWM control

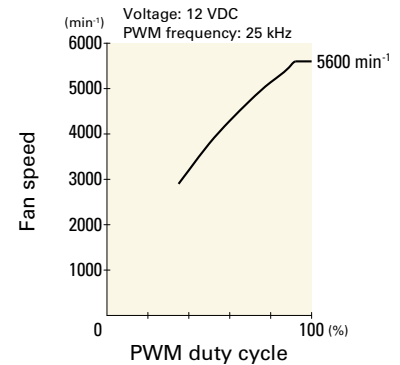
PWM duty cycle



Operating voltage range



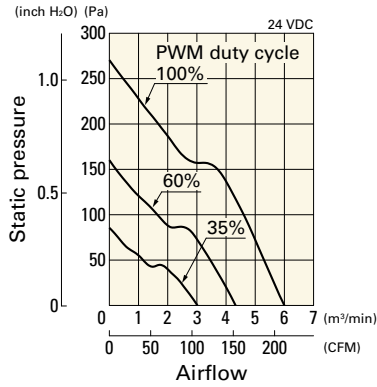
PWM duty - Speed characteristics example



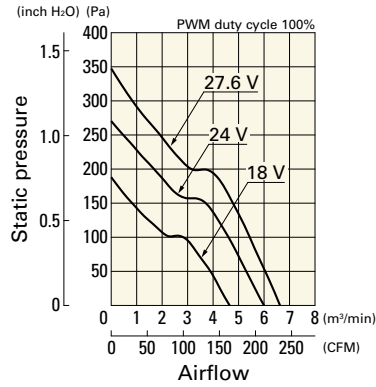
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GT1224P1S001 With pulse sensor with PWM control

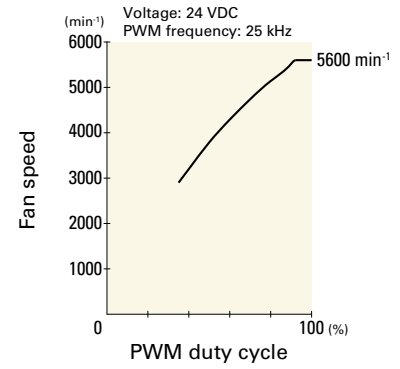
PWM duty cycle



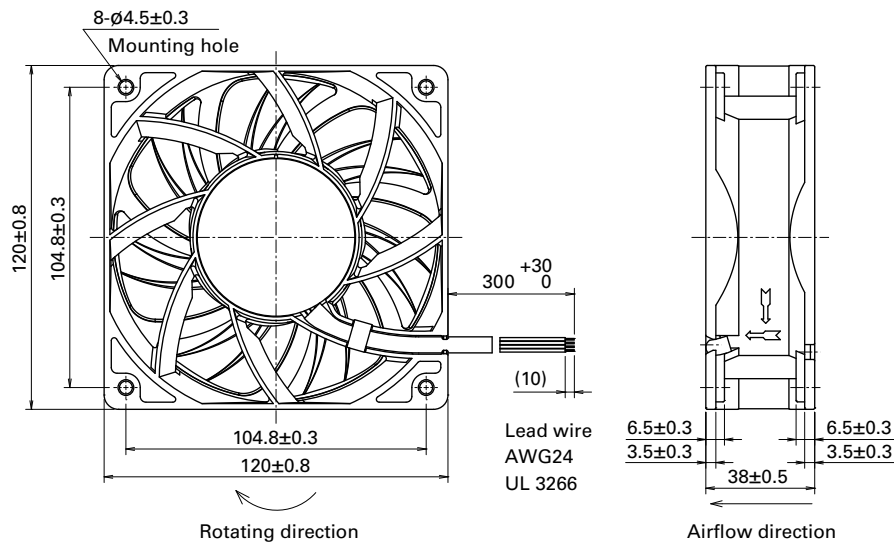
Operating voltage range



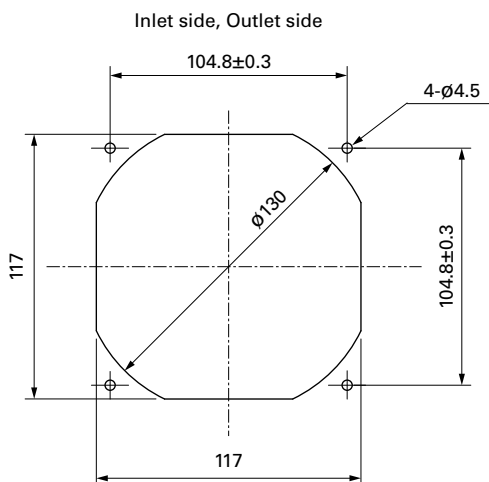
PWM duty - Speed characteristics example



Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

DC
Wide Temperature Range Fan 120 mm sq.

G Proof Fan

These fans are suitable for cooling CT scanners and other devices subject to high G-force or vibration.

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | | |
|------------|------------|-----------|-------------|-----------------|------------|---------------------------------------|
| 9GP | 12 | 24 | P | 1 | G | 001 |
| Type name | Frame size | Voltage | PWM control | Frame thickness | Speed code | Individual customer's spec (3 digits) |

| | | |
|----------------------|----------------------------------|----|
| Type name | 9GP | |
| Frame size (mm) | 12 | 57 |
| | 120×120 ϕ 172×150 (sidecut) | |
| Voltage (V) | 24 | 48 |
| | 24 | 48 |
| Frame thickness (mm) | 1 | 5 |
| | 38 | 51 |
| Speed code | G | H |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

- Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
For more information, please refer to the technical material section.



120x120x38 mm

San Ace 120GP 9GP type

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 440 g
- G-force tolerance 735 m/s² (75 G) for 1,000 h (Measured with our G-force testing machine.)

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GP1224P1G001 | 24 | 15 to 30 | 100 | 1.6 | 38.4 | 6550 | 7.0 247 | 370 1.48 | 62 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.12 | 2.88 | 2000 | 2.13 75.2 | 34.4 0.13 | 36 | | |
| 9GP1248P1G001 | 48 | 36 to 60 | 100 | 0.8 | 38.4 | 6550 | 7.0 247 | 370 1.48 | 62 | | |
| | | | 20 | 0.08 | 3.84 | 2000 | 2.13 75.2 | 34.4 0.13 | 36 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

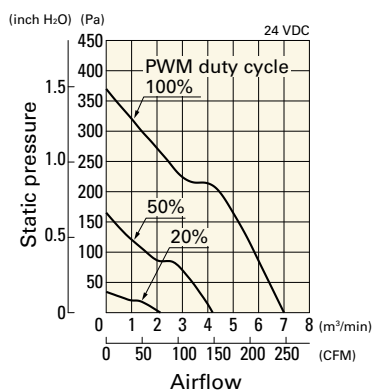
Note 1: Sensor and control options are available for selection. Refer to the table on p. 645.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

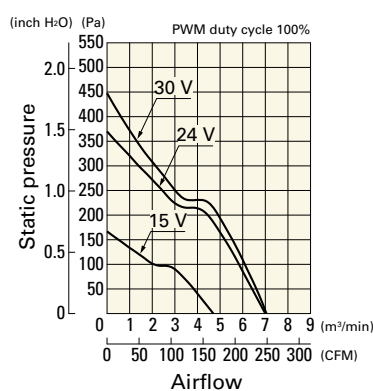
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GP1224P1G001 With pulse sensor with PWM control

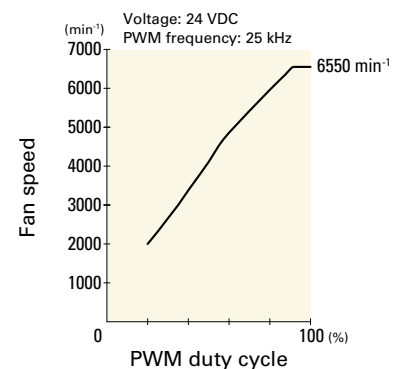
PWM duty cycle



Operating voltage range



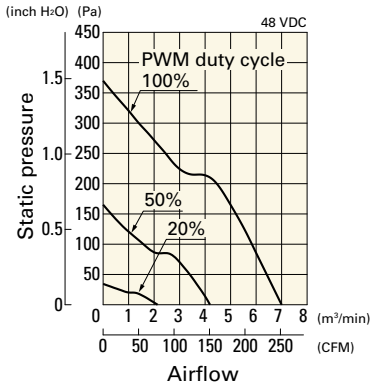
PWM duty - Speed characteristics example



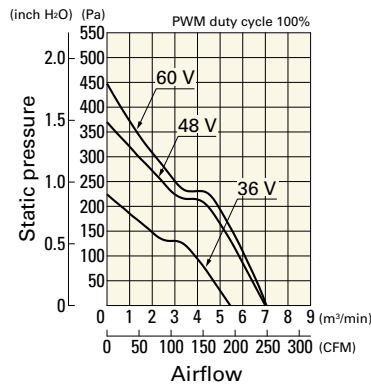
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GP1248P1G001 With pulse sensor with PWM control

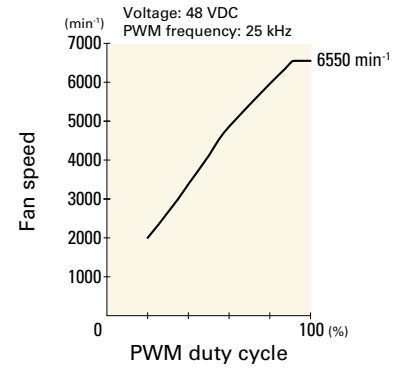
PWM duty cycle



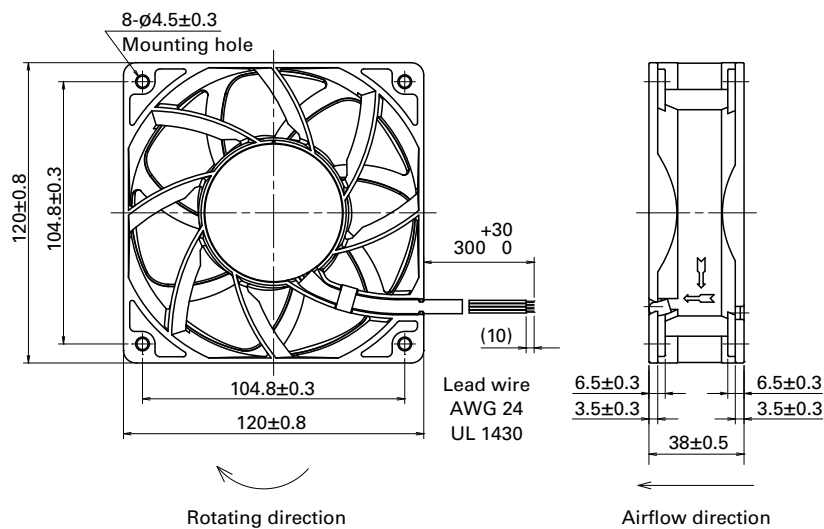
Operating voltage range



PWM duty - Speed characteristics example

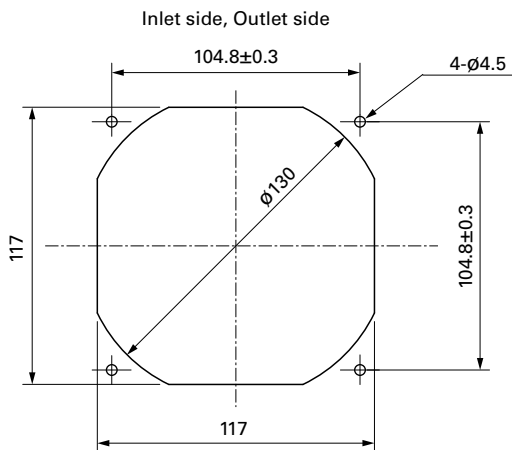


Dimensions (unit: mm)



DC
G Proof Fan 120 mm sq.

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)



Ø 172x150x51 mm

San Ace 172GP 9GP type

Sidecut type

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 880 g
- G-force tolerance 735 m/s² (75 G) for 1,000 h (Measured with our G-force testing machine.)

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9GP5724P5H001 | 24 | 16 to 30 | 100 | 5.0 | 120 | 8000 | 12.3 434 | 1000 4.02 | 77 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.5 | 12.0 | 3000 | 4.6 162 | 175 0.7 | 51 | | |
| 9GP5748P5G001 | 48 | 36 to 72 | 100 | 5.0 | 240 | 10500 | 16.1 568 | 1600 6.43 | 83 | | |
| | | | 20 | 0.41 | 19.7 | 3700 | 5.6 198 | 250 1.01 | 57 | | |

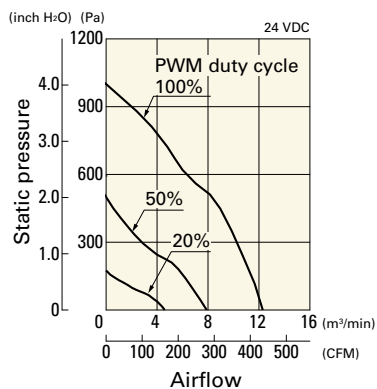
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

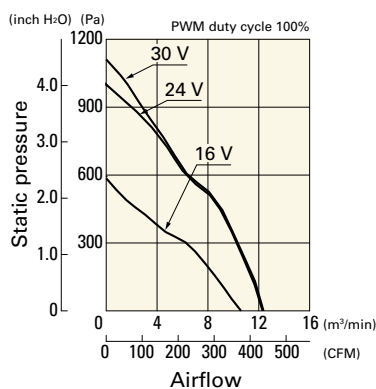
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GP5724P5H001 With pulse sensor with PWM control

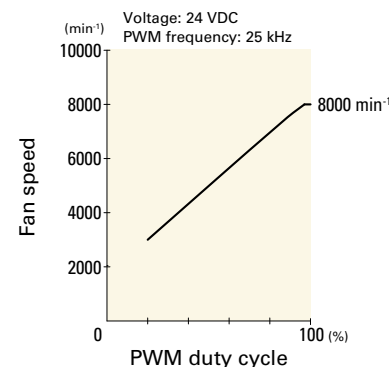
PWM duty cycle



Operating voltage range



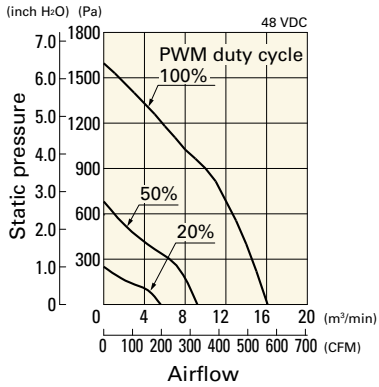
PWM duty - Speed characteristics example



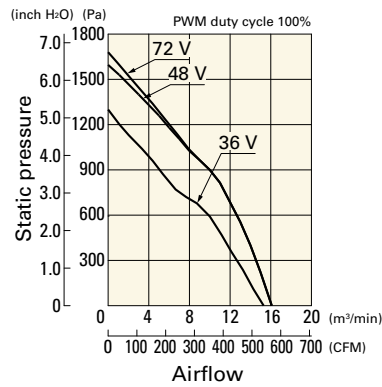
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9GP5748P5G001 With pulse sensor with PWM control

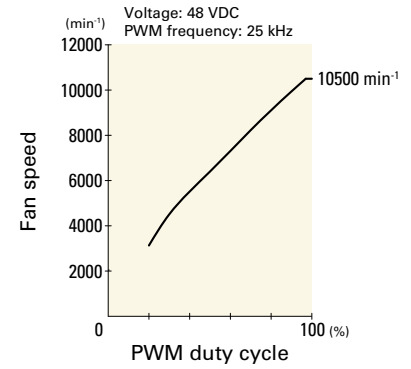
PWM duty cycle



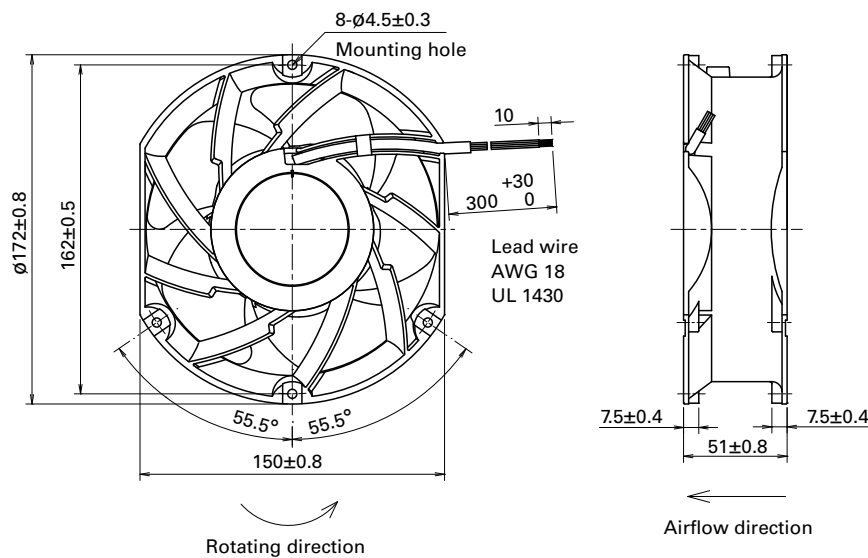
Operating voltage range



PWM duty - Speed characteristics example

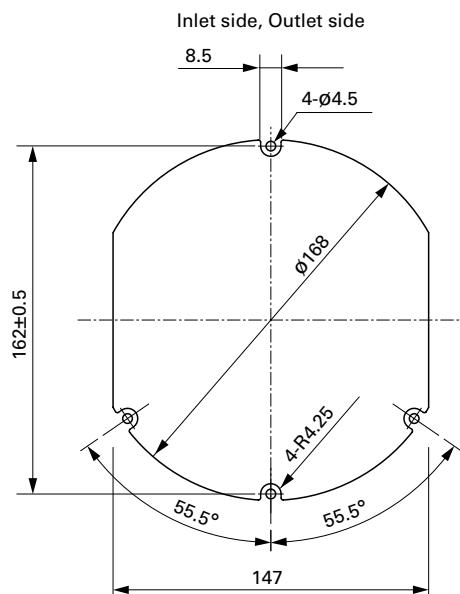


Dimensions (unit: mm)



DC
G Proof Fan ø172 mm

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 600

Model no.: 109-319J, 109-319E, 109-319H

Centrifugal Fan

Cooling fan blows air in a centrifugal course. It features high static pressure.

Related product: Splash Proof Centrifugal Fan p. 317

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | | |
|-----------|---------------|-----------|-------------|-----------|------------|--|
| 9T | M | 48 | P | 4 | H | 01 |
| Type name | Impeller size | Voltage | PWM control | Thickness | Speed code | Individual customer's spec. (2 to 3 digits) |

Bracket-mounted Centrifugal Fan

| | | | | | | |
|-------------|---------------|-----------|-------------|-----------|------------|---|
| 9B1T | P | 48 | P | 0 | H | 001 |
| Type name | Impeller size | Voltage | PWM control | Thickness | Speed code | Individual customer's spec. (3 digits) |

| | | | | | | | | | | | | | | | |
|--------------------|---|------|-------|------|------|------------------|----|----|-----|------|------|------|------|------|------|
| Type name | 9B1T 9T | | | | | | | | | | | | | | |
| Impeller size (mm) | <table border="1"> <tr> <td>D</td> <td>G, GA</td> <td>J</td> <td>M</td> <td>N</td> <td>P</td> <td>S</td> </tr> <tr> <td>∅70</td> <td>∅175</td> <td>∅133</td> <td>∅100</td> <td>∅150</td> <td>∅221</td> <td>∅225</td> </tr> </table> | D | G, GA | J | M | N | P | S | ∅70 | ∅175 | ∅133 | ∅100 | ∅150 | ∅221 | ∅225 |
| D | G, GA | J | M | N | P | S | | | | | | | | | |
| ∅70 | ∅175 | ∅133 | ∅100 | ∅150 | ∅221 | ∅225 | | | | | | | | | |
| Voltage (V) | <table border="1"> <tr> <td>12</td> <td>24</td> <td>48</td> </tr> <tr> <td>12</td> <td>24</td> <td>48</td> </tr> </table> | 12 | 24 | 48 | 12 | 24 | 48 | | | | | | | | |
| 12 | 24 | 48 | | | | | | | | | | | | | |
| 12 | 24 | 48 | | | | | | | | | | | | | |
| Thickness (mm) | <table border="1"> <tr> <td>0</td> <td>1</td> <td>4</td> <td>6</td> </tr> <tr> <td>69 min., 99, 119</td> <td>35</td> <td>25</td> <td>20</td> </tr> </table> | 0 | 1 | 4 | 6 | 69 min., 99, 119 | 35 | 25 | 20 | | | | | | |
| 0 | 1 | 4 | 6 | | | | | | | | | | | | |
| 69 min., 99, 119 | 35 | 25 | 20 | | | | | | | | | | | | |
| Speed code | H G etc. | | | | | | | | | | | | | | |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

- Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
For more information, please refer to the technical material section.



Ø70x20 mm

San Ace C70 9TD type

General Specifications

- Material Motor case: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 90 g

Specifications When the optional inlet nozzle (109-1106) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9TD12P6G001 | 12 | 10.8 to 13.2 | 100 | 1.0 | 12 | 9200 | 1.13 39.9 | 560 2.24 | 61 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.1 | 1.2 | 2000 | 0.23 8.1 | 25 0.10 | 30 | | |

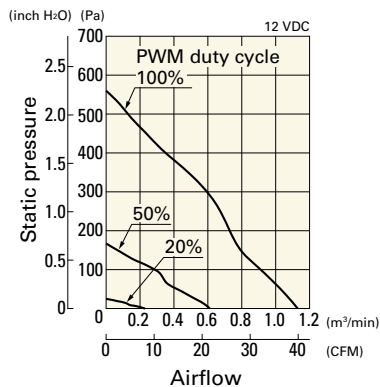
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input is 12.6W at rated voltage.

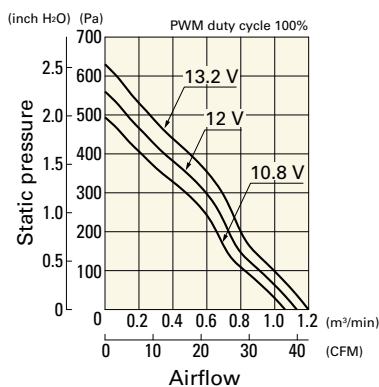
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TD12P6G001 With pulse sensor with PWM control

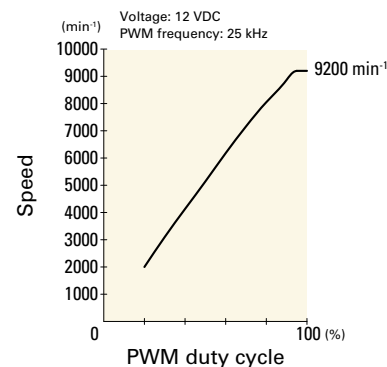
PWM duty cycle



Operating voltage range

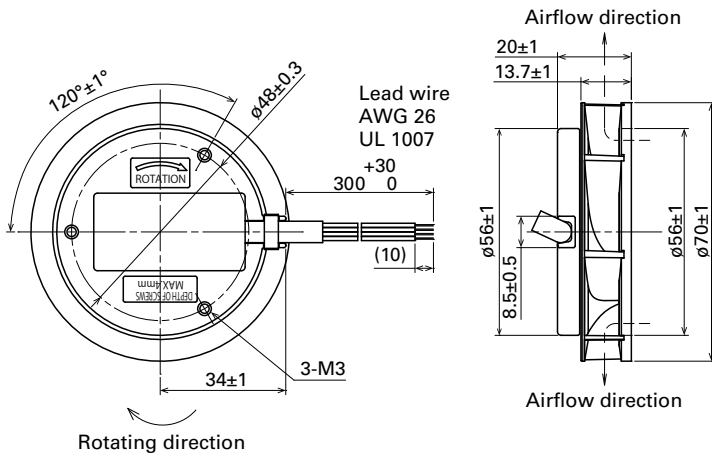


PWM duty - Speed characteristics example

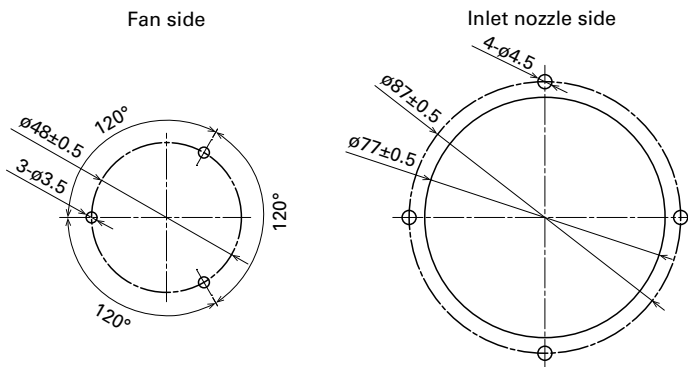


DC Centrifugal Fan Ø70 mm

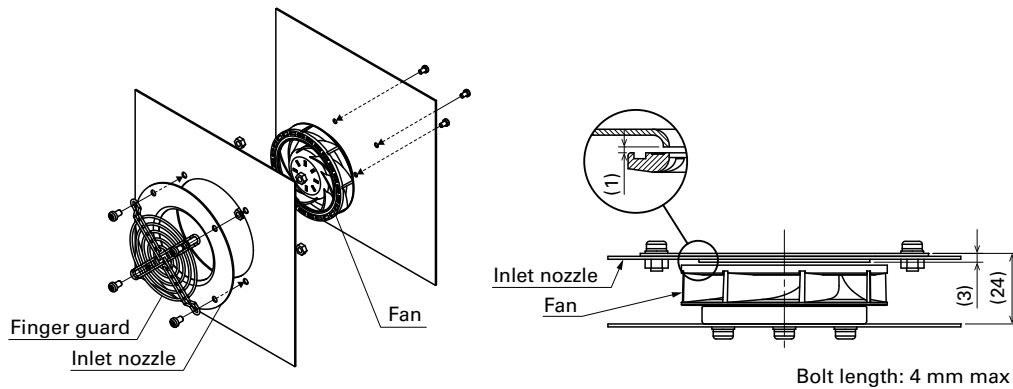
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-1128

Inlet nozzle

page: p. 603

Model no.: 109-1106



∅ 100x25 mm

San Ace C100 9TM type

General Specifications

- Material Motor case: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 150 g

Specifications When the optional inlet nozzle (109-1080) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9TM24P4H01 | 24 | 21.6 to 26.4 | 100 | 0.44 | 10.56 | 6400 | 1.77 62.5 | 560 2.25 | 60 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 0 | 0.05 | 1.2 | 2000 | 0.51 18.0 | 48 0.19 | 34 | | |
| 9TM48P4H01 | 48 | 36 to 60 | 100 | 0.22 | 10.56 | 6400 | 1.77 62.5 | 560 2.25 | 60 | | |
| | | | 0 | 0.04 | 1.92 | 2000 | 0.51 18.0 | 48 0.19 | 34 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

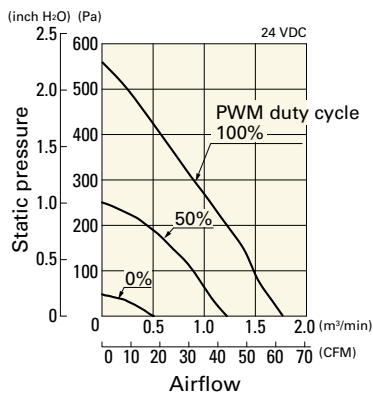
Note 1: Max input is 14W at rated voltage.

Note 2: Sensor and control options are available for selection. Refer to the table on pp. 653 to 654.

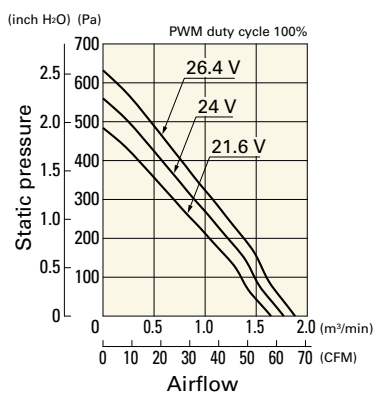
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TM24P4H01 With pulse sensor with PWM control

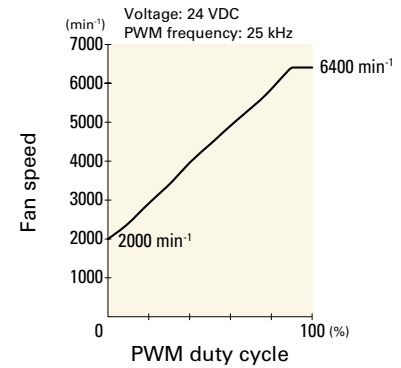
PWM duty cycle



Operating voltage range



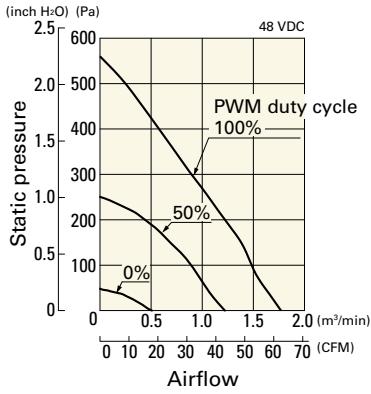
PWM duty - Speed characteristics example



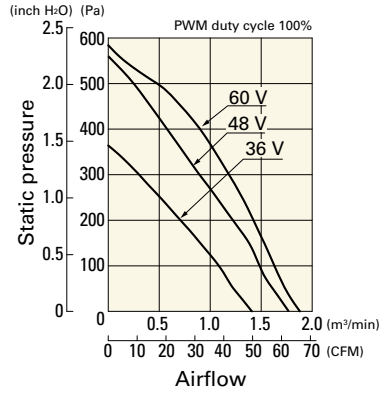
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TM48P4H01 With pulse sensor with PWM control

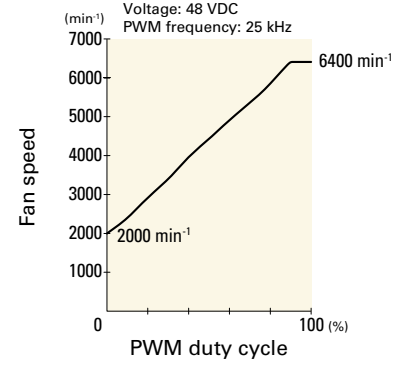
PWM duty cycle



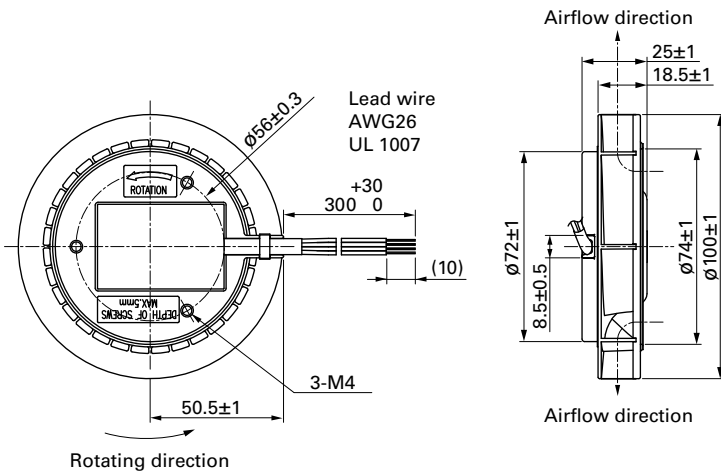
Operating voltage range



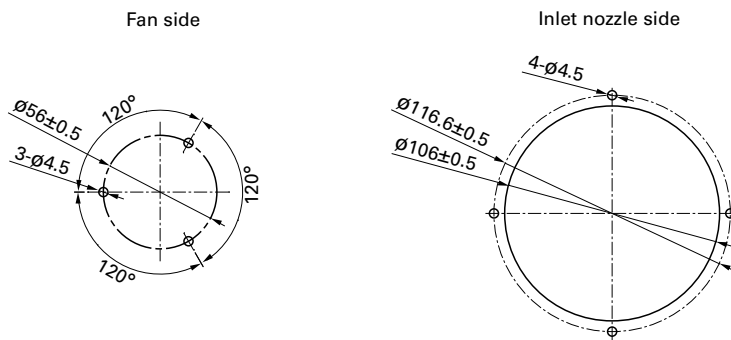
PWM duty - Speed characteristics example



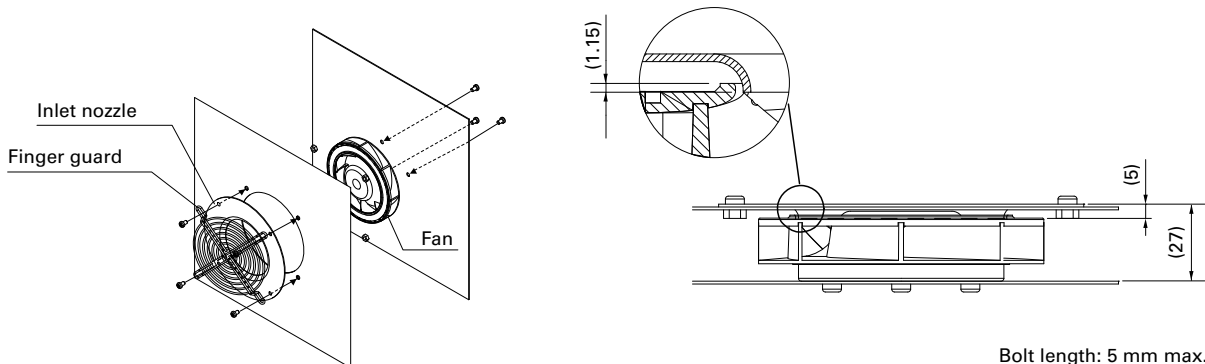
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Bolt length: 5 mm max.

DC
Centrifugal Fan $\phi 100$ mm

Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Inlet nozzle

page: p. 603

Model no.: 109-1080, 109-1080H



Ø133x91 mm

San Ace C133 9TJ type

General Specifications

- Material Motor case: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 660 g

Specifications When the optional inlet nozzle (109-1069) is mounted.

The models listed below **have a pulse sensor with PWM control.**

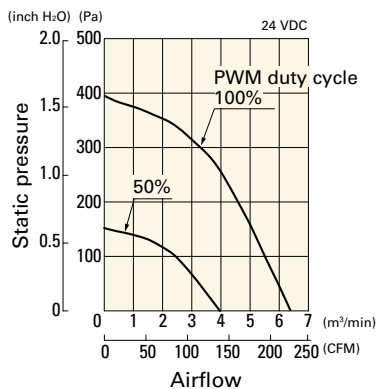
| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9TJ24P0H61 | 24 | 20.4 to 27.6 | 100 | 1.2 | 28.8 | 4150 | 6.39 226 | 395 1.59 | 61 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9TJ48P0H01 | 48 | 36 to 72 | 100 | 0.55 | 26.4 | 4150 | 6.39 226 | 395 1.59 | 61 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

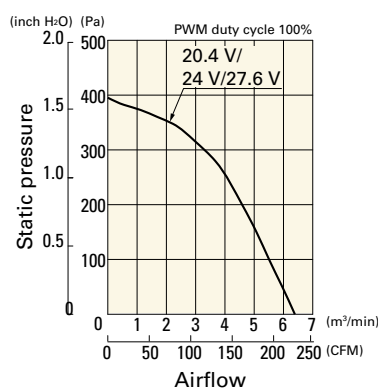
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TJ24P0H61 With pulse sensor with PWM control

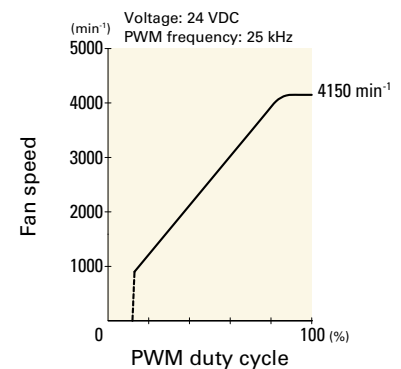
PWM duty cycle



Operating voltage range

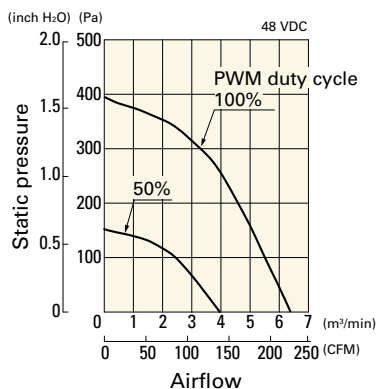


PWM duty - Speed characteristics example

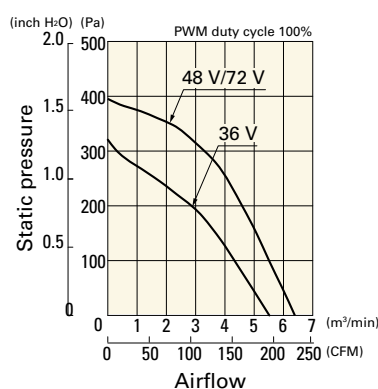


9TJ48P0H01 With pulse sensor with PWM control

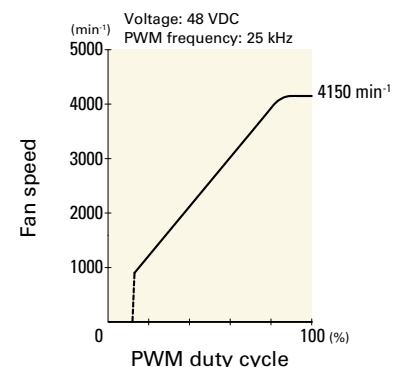
PWM duty cycle



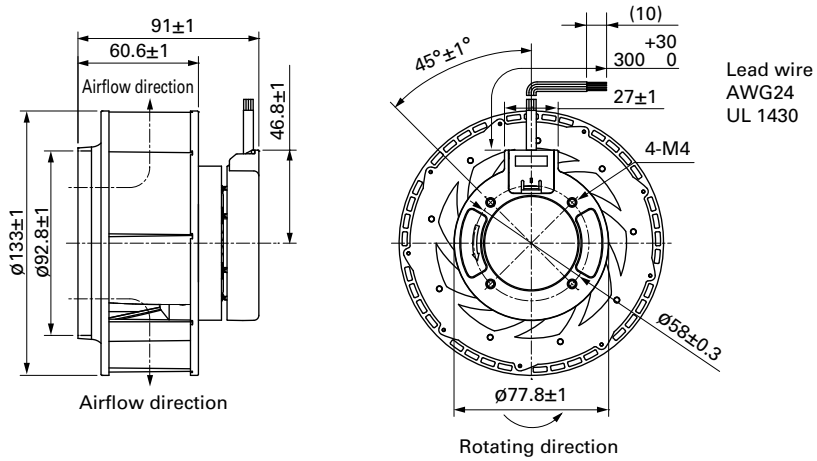
Operating voltage range



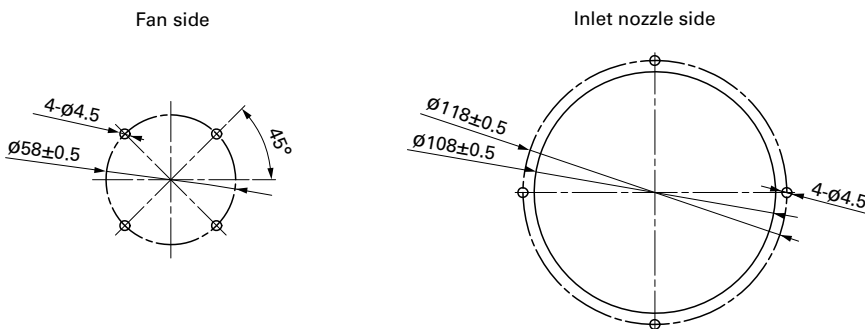
PWM duty - Speed characteristics example



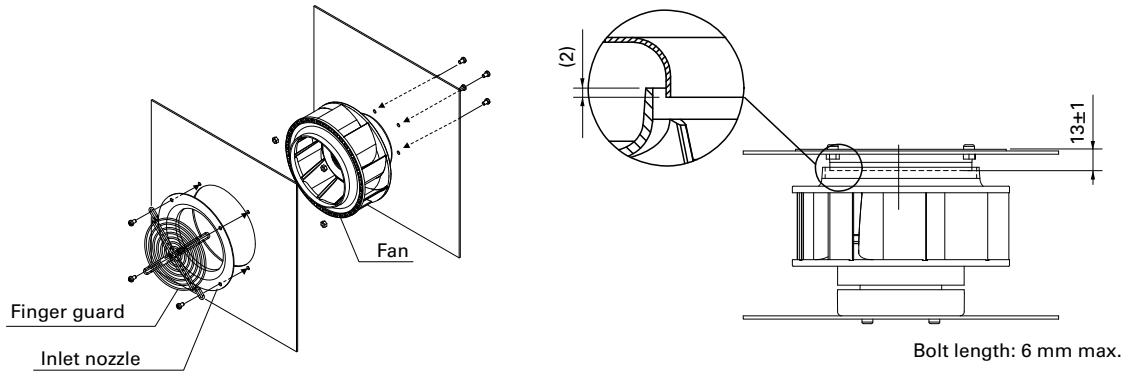
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-1112

Inlet nozzle

page: p. 603

Model no.: 109-1069, 109-1069H



∅150x35 mm

San Ace C150 9TN type US

General Specifications

- Material Motor case: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 330 g

Specifications When the optional inlet nozzle (109-1081) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9TN24P1H01 | 24 | 20.4 to 27.6 | 100 | 0.62 | 14.9 | 3800 | 3.83 135 | 410 1.65 | 59 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9TN48P1H01 | 48 | 36.0 to 55.2 | 100 | 0.32 | 15.4 | 3800 | 3.83 135 | 390 1.57 | 59 | | |

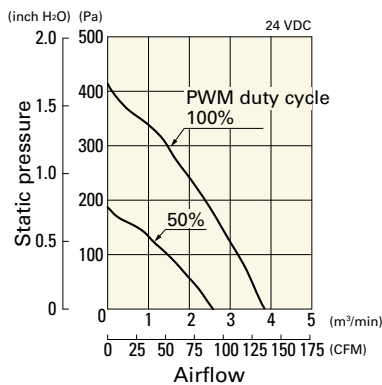
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input of 9TN24P1H01: 21.4 W, 9TN48P1H01: 22 W.

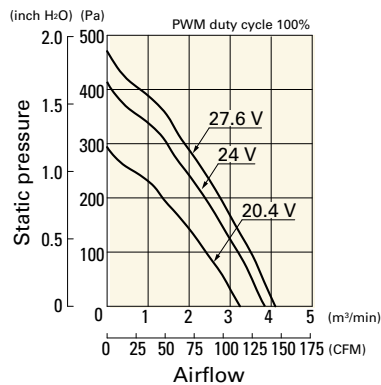
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TN24P1H01 With pulse sensor with PWM control

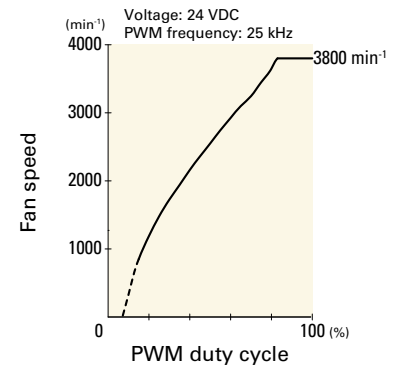
PWM duty cycle



Operating voltage range

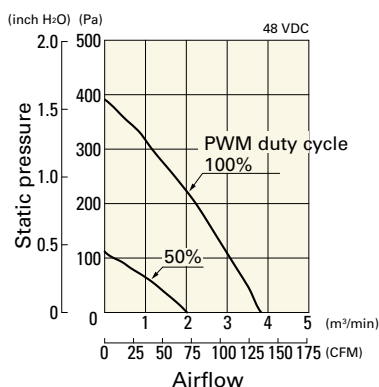


PWM duty - Speed characteristics example

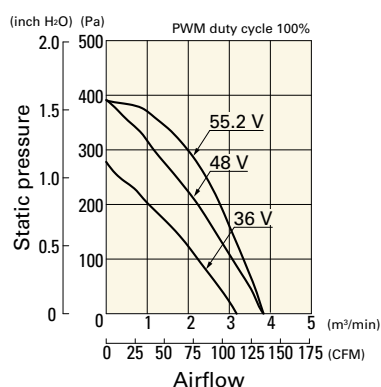


9TN48P1H01 With pulse sensor with PWM control

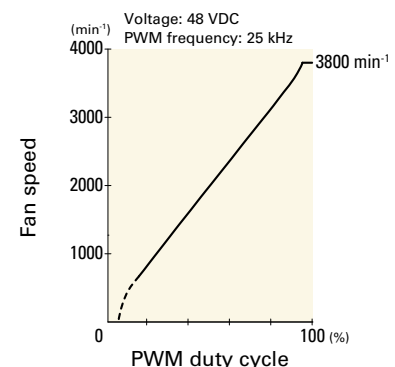
PWM duty cycle



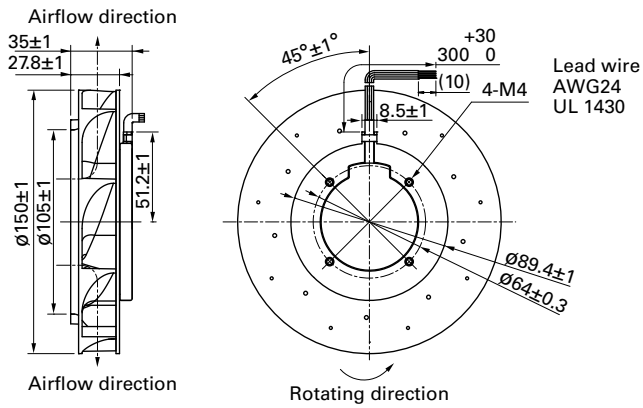
Operating voltage range



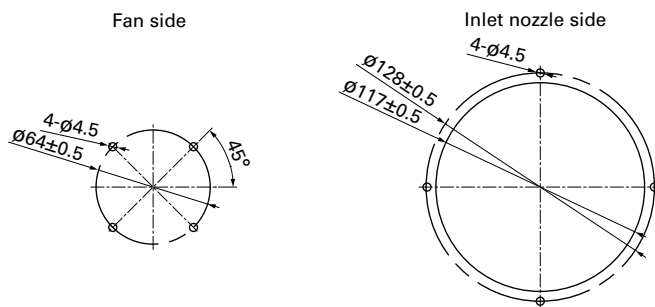
PWM duty - Speed characteristics example



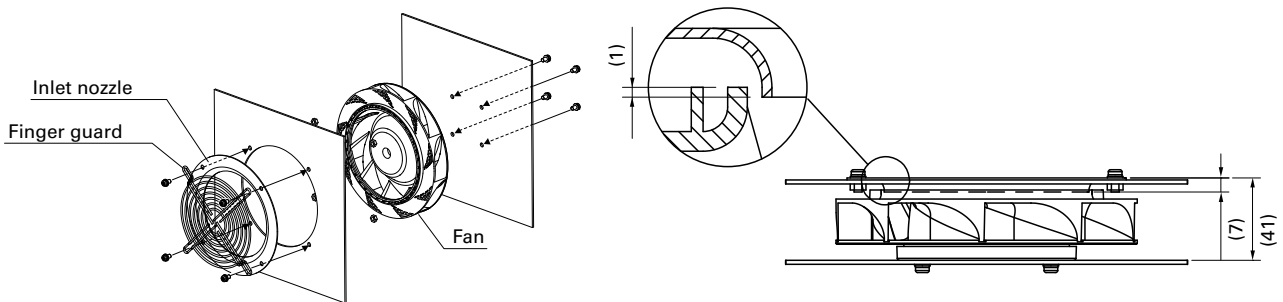
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Bolt length: 4 to 6 mm.

Options

Finger guards

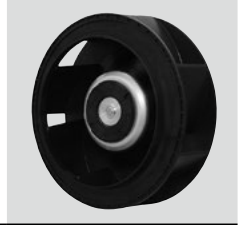
page: p. 599

Model no.: 109-1104, 109-1104H

Inlet nozzle

page: p. 603

Model no.: 109-1081, 109-1081H



Ø 175x69 mm

San Ace C175 9TGA type

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 720 g

Specifications When the optional inlet nozzle (109-1073) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9TGA24P0H001 | 24 | 16 to 36 | 100 | 4.8 | 115 | 4950 | 15.3 541 | 830 3.33 | 77 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 15 | 0.14 | 3.36 | 800 | 2.5 88.3 | 21.8 0.088 | 38 | | |
| ▶▶ 9TGA48P0G001 | 48 | 36 to 72 | 100 | 3.5 | 168 | 5700 | 17.6 622 | 1100 4.42 | 80 | | |
| | | | 15 | 0.07 | 3.36 | 800 | 2.5 88.3 | 21.8 0.088 | 38 | | |

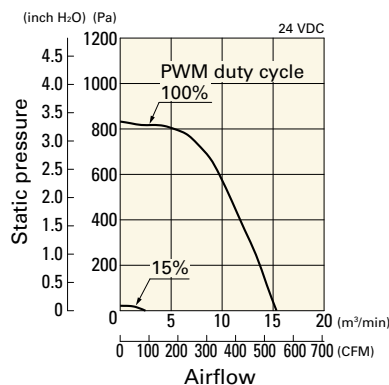
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note 1: Max input of 9TGA24P0H001: 210 W, 9TGA48P0G001: 325 W at rated voltage.
Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

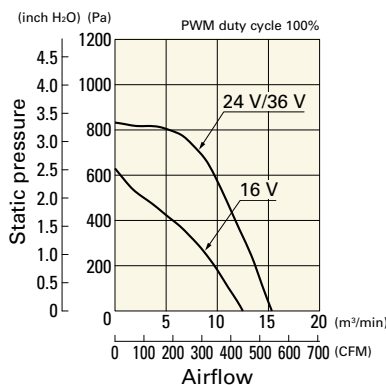
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TGA24P0H001 With pulse sensor with PWM control

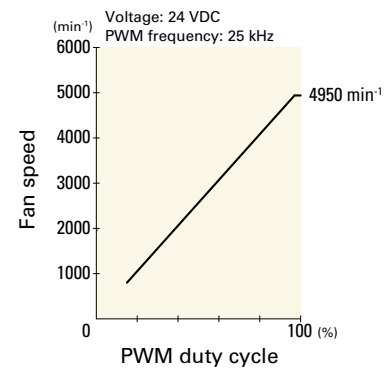
PWM duty cycle



Operating voltage range



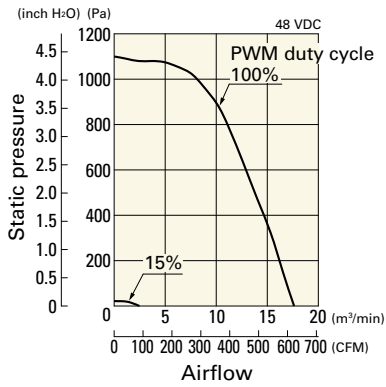
PWM duty - Speed characteristics example



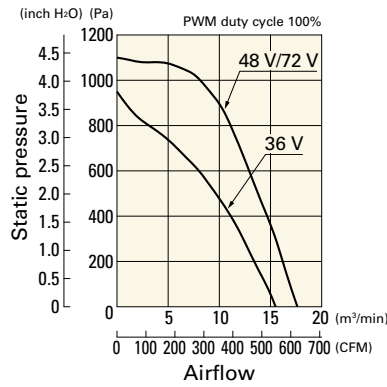
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TGA48P0G001 With pulse sensor with PWM control

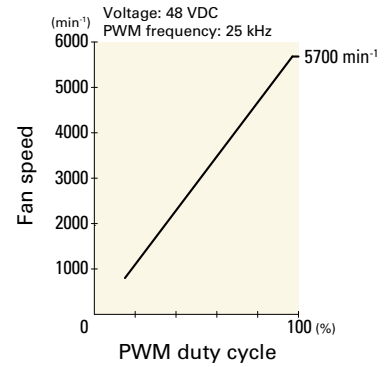
PWM duty cycle



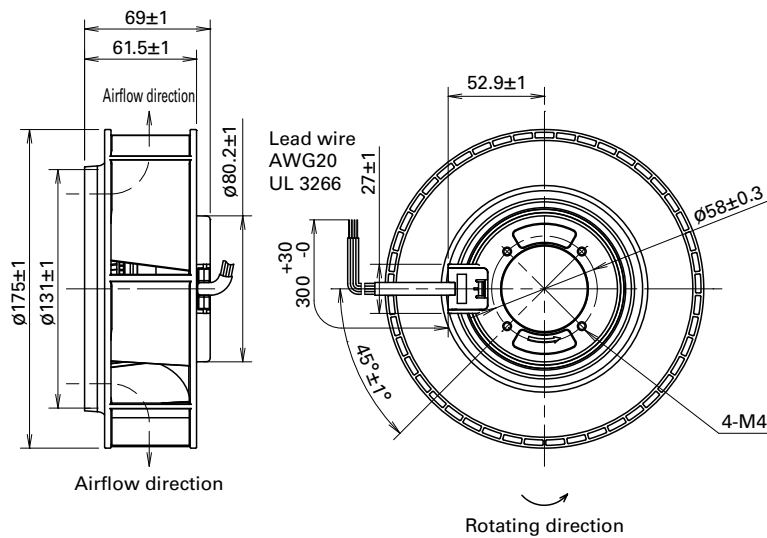
Operating voltage range



PWM duty - Speed characteristics example

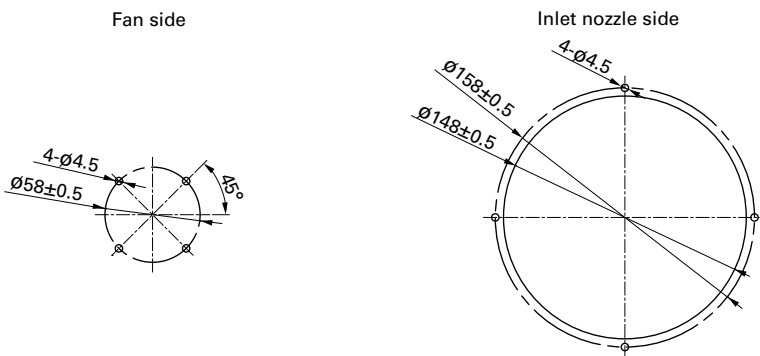


Dimensions (unit: mm)

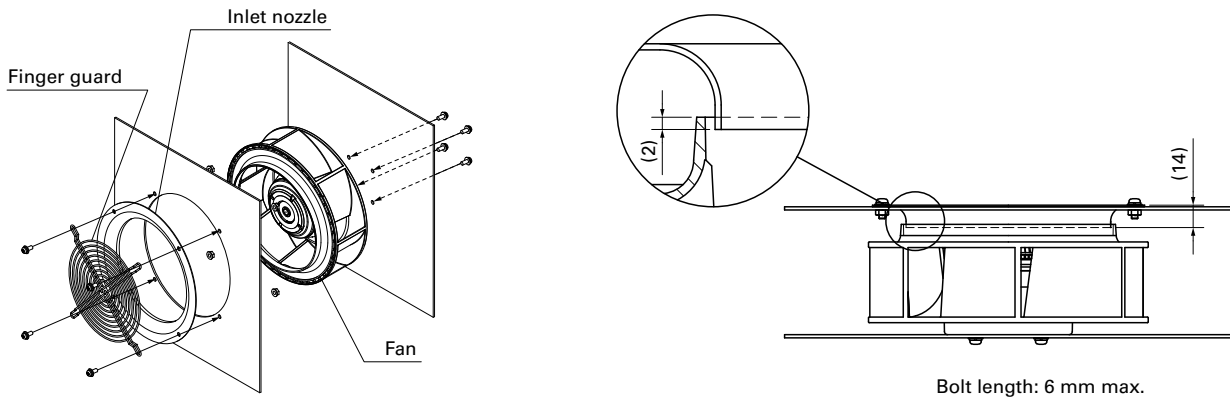


DC Centrifugal Fan \varnothing 175 mm

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

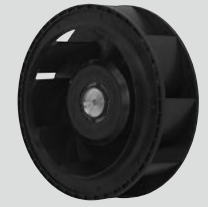
page: p. 599

Model no.: 109-722, 109-722H

Inlet nozzle

page: p. 603

Model no.: 109-1073, 109-1073H



Ø 175x69 mm

San Ace C175 9TG type US

General Specifications

- Material Motor case: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 750 g

Specifications When the optional inlet nozzle (109-1073) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9TG24P0G01 | 24 | 20.4 to 27.6 | 100 | 3.9 | 93.6 | 4700 | 14.0 494.7 | 885 3.55 | 73 | -20 to +60 | 40000/60°C (70000/40°C) |
| 9TG24P0S01 | | | 100 | 2.35 | 56.4 | 3900 | 11.6 409.8 | 609 2.45 | 69 | | |
| 9TG48P0G01 | 48 | 36 to 55.2 | 100 | 1.95 | 93.6 | 4700 | 14.0 494.7 | 885 3.55 | 73 | -20 to +70 | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

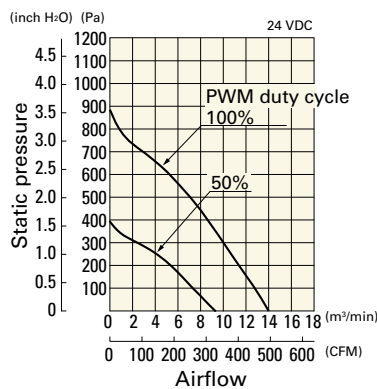
Note 1: Max input is 130 W at rated voltage.

Note 2: Sensor and control options are available for selection. Refer to the table on p. 653.

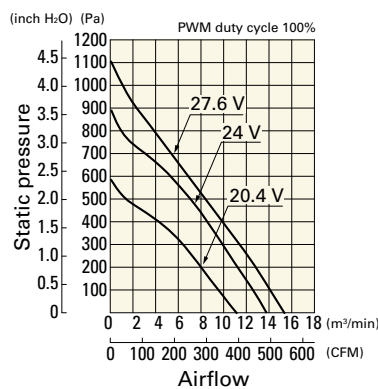
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TG24P0G01 With pulse sensor with PWM control

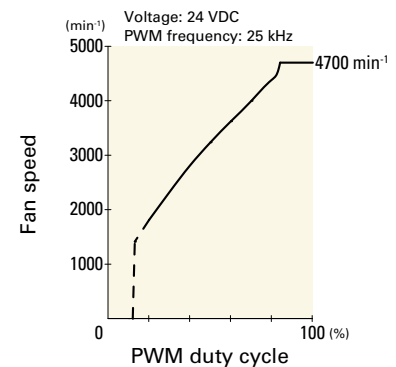
PWM duty cycle



Operating voltage range



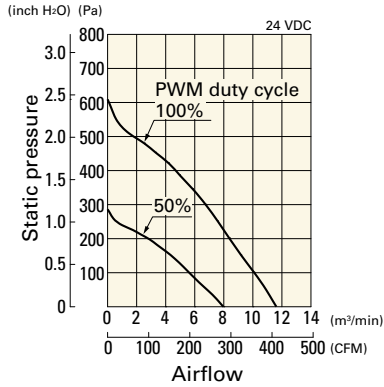
PWM duty - Speed characteristics example



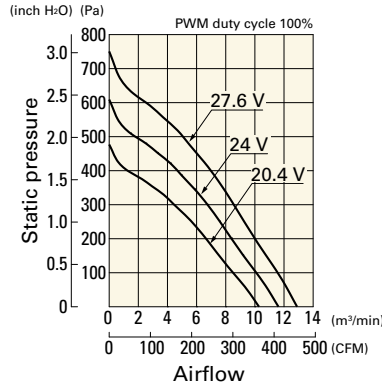
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TG24P0S01 With pulse sensor with PWM control

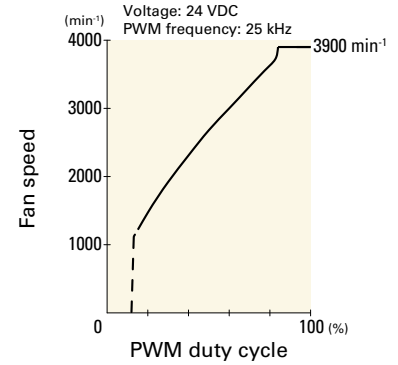
PWM duty cycle



Operating voltage range

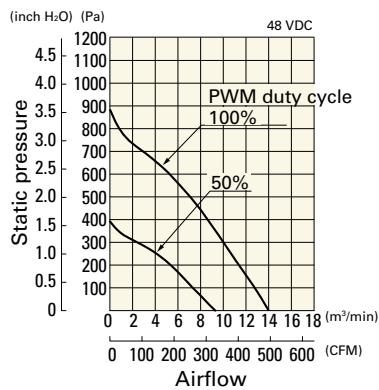


PWM duty - Speed characteristics example

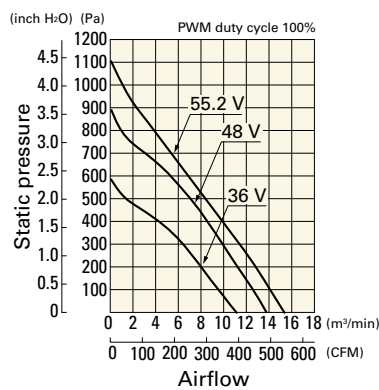


9TG48P0G01 With pulse sensor with PWM control

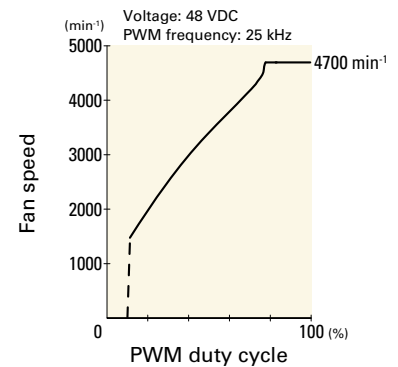
PWM duty cycle



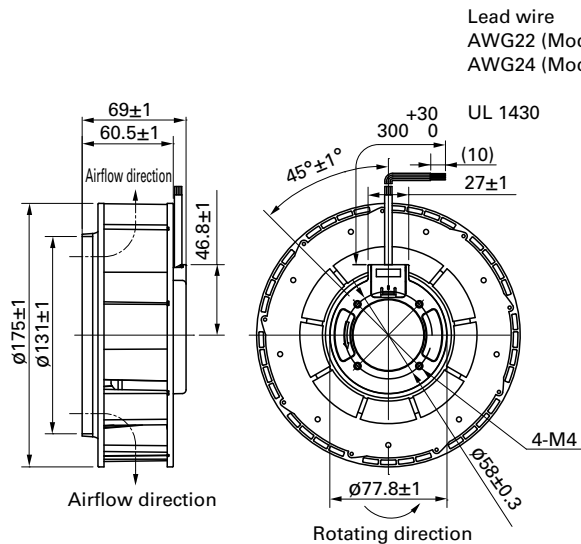
Operating voltage range



PWM duty - Speed characteristics example

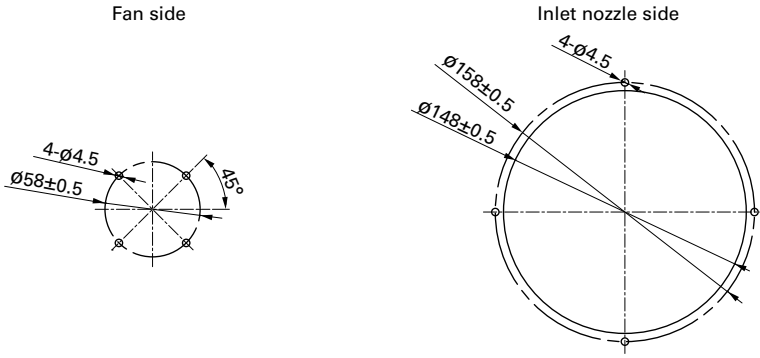


Dimensions (unit: mm)

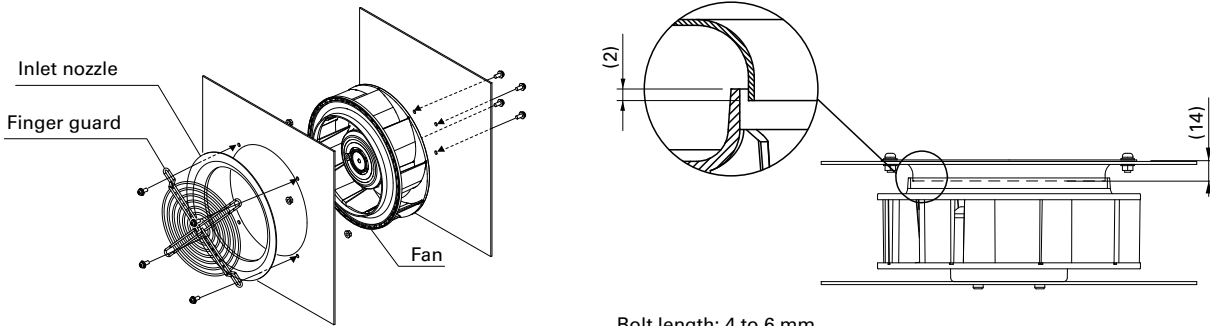


DC
Centrifugal Fan Ø175 mm

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Bolt length: 4 to 6 mm.
To prevent bolts from loosening, use plain washers and spring washers.

Options

Finger guards

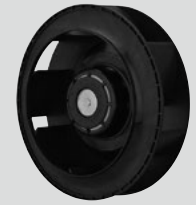
page: p. 599

Model no.: 109-722, 109-722H

Inlet nozzle

page: p. 603

Model no.: 109-1073, 109-1073H



Ø **221x71** mm

San Ace C221 9TP type **US**

General Specifications

- Material Motor case: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 1050 g

Specifications When the optional inlet nozzle (109-1135) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] | | |
|-----------------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|----------|------------|
| ▶▶ 9TP24P0H001 | 24 | 16 to 36 | 100 | 3.2 | 76.8 | 3050 | 17.6 622 | 530 2.13 | 71 | -20 to +70 | 40000/60°C (70000/40°C) | | |
| | | | 15 | 0.4 | 9.6 | 1000 | 5.75 203 | 57.4 0.23 | 53 | | | | |
| ▶▶ 9TP48P0G001 | 48 | 36 to 72 | 100 | 2.75 | 132 | 3650 | 21 742 | 760 3.05 | 74 | -20 to +60 | | | |
| | | | 15 | 0.2 | 9.6 | 1000 | 5.75 203 | 57.4 0.23 | 53 | | | | |
| ▶▶ 9TP48P0H001 | | | | | 100 | 1.6 | 76.8 | 3050 | 17.6 622 | 530 2.13 | | 71 | -20 to +70 |
| | | | | | | | 15 | 0.2 | 9.6 | 1000 | | 5.75 203 | |

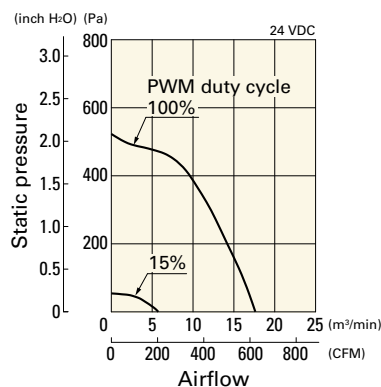
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

- Note 1: Max input of 9TP48P0G001: 280 W, 9TP24P0H001/9TP48P0H001: 160 W at rated voltage.
- Note 2: Sensor and control options are available for selection. Refer to the table on p. 654.
- Note 3: The ▶▶ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

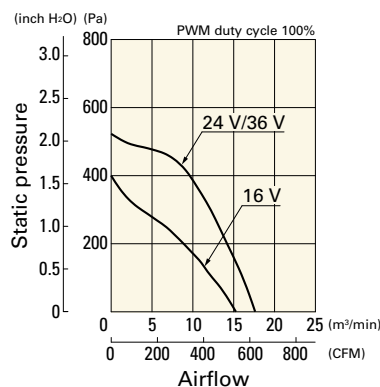
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TP24P0H001 With pulse sensor with PWM control

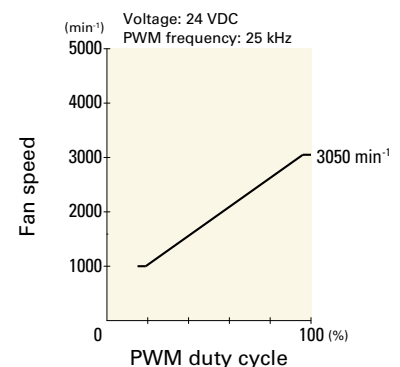
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

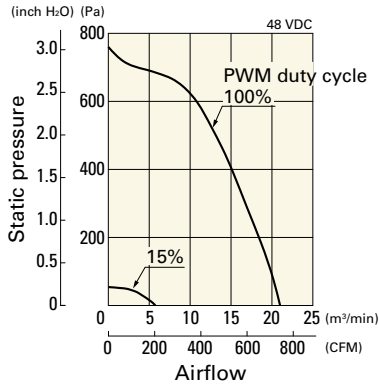


DC Centrifugal Fan Ø221 mm

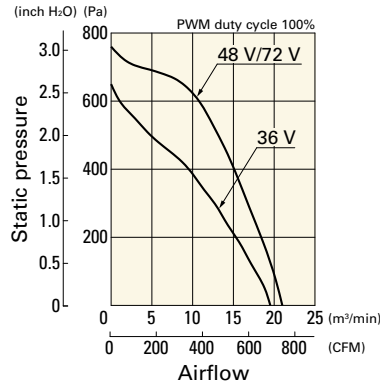
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TP48P0G001 With pulse sensor with PWM control

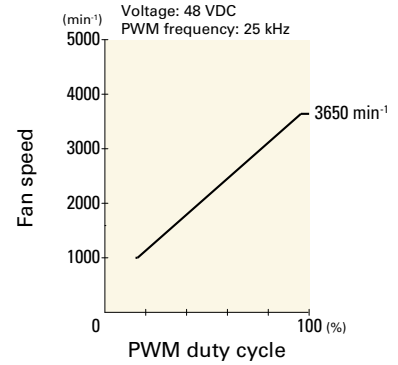
PWM duty cycle



Operating voltage range

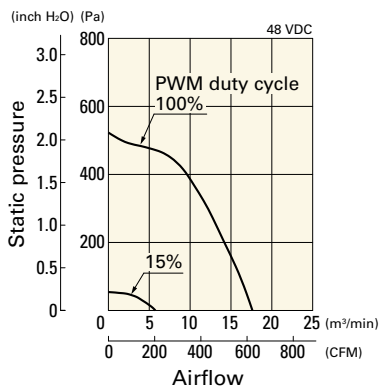


PWM duty - Speed characteristics example

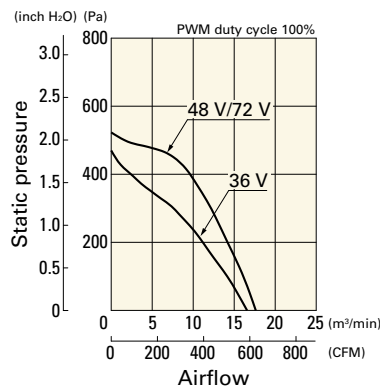


9TP48P0H001 With pulse sensor with PWM control

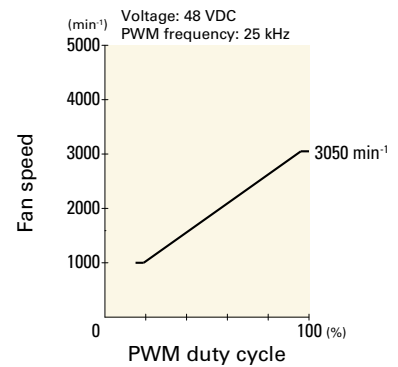
PWM duty cycle



Operating voltage range

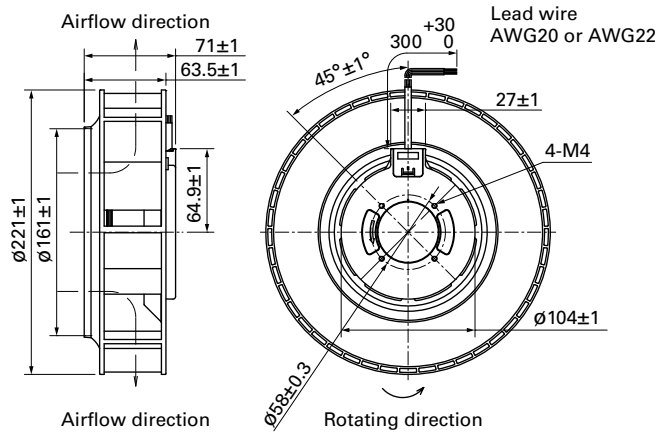


PWM duty - Speed characteristics example

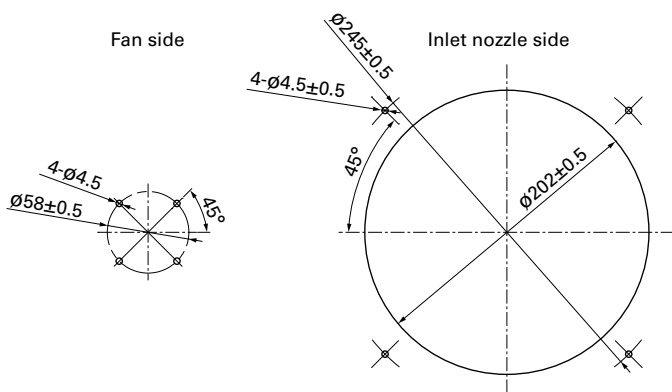


DC Centrifugal Fan $\varnothing 221$ mm

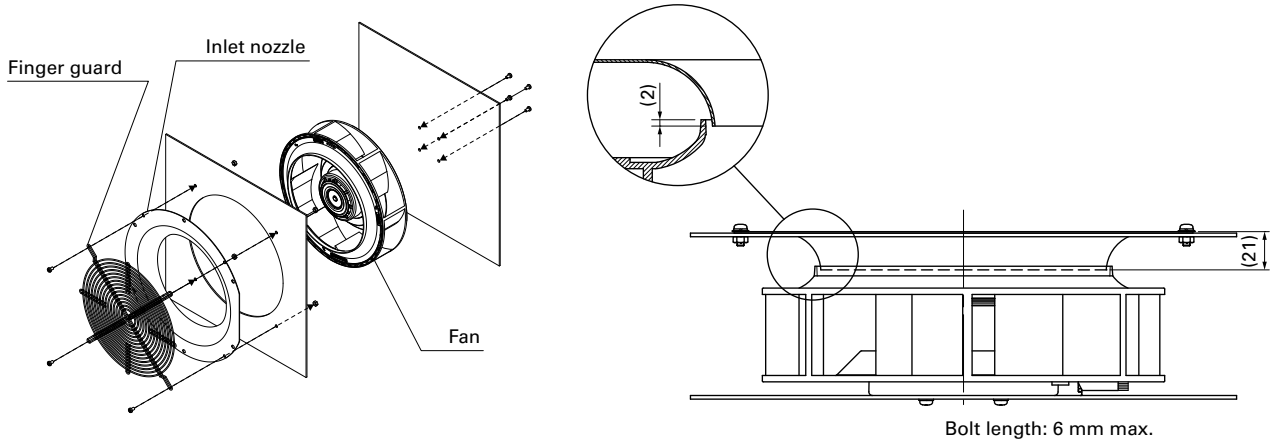
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm) Bracket-mounted model of this fan is available. For details, refer to pp. 465 to 467.



Options

Finger guards

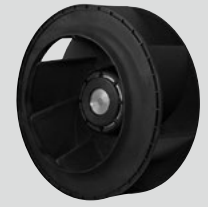
page: p. 601

Model no.: 109-1138, 109-1138H

Inlet nozzle

page: p. 603

Model no.: 109-1135, 109-1135H



Ø225x99 mm

San Ace C225 9TS type

General Specifications

- Material Motor case: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 1220 g

Specifications When the optional inlet nozzle (109-1134) is mounted.

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9TS48P0G001 | 48 | 36 to 72 | 100 | 3.65 | 175.2 | 3550 | 28.1 992 | 861 3.46 | 74.5 | -20 to +60 | 40000/60°C (70000/40°C) |
| | | | 15 | 0.24 | 11.5 | 1000 | 7.85 277 | 68.5 0.28 | 52.0 | | |
| 9TS48P0H001 | | | 100 | 2.08 | 99.8 | 2900 | 22.7 802 | 590 2.37 | 70.5 | -20 to +70 | |
| | | | 15 | 0.24 | 11.5 | 1000 | 7.85 277 | 68.5 0.28 | 52.0 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

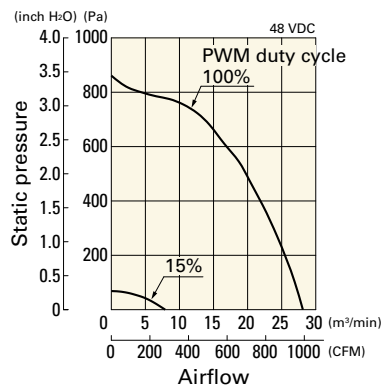
Note 1: Max input of 9TS48P0G001: 380 W, 9TS48P0H001: 200 W at rated voltage.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

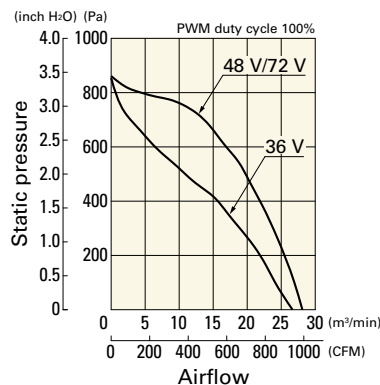
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TS48P0G001 With pulse sensor with PWM control

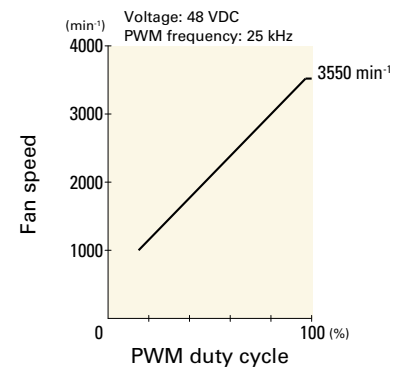
PWM duty cycle



Operating voltage range



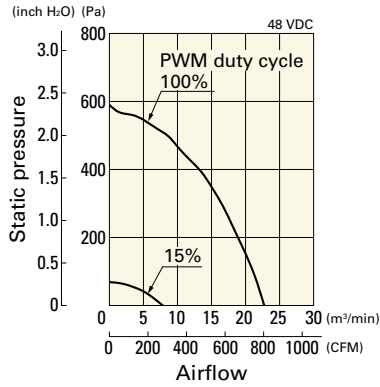
PWM duty - Speed characteristics example



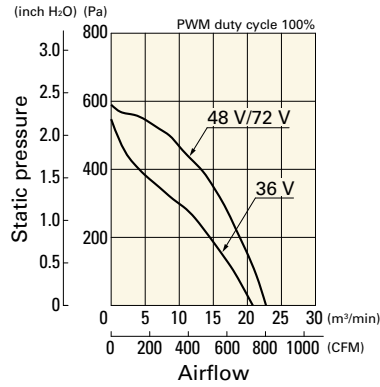
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9TS48P0H001 With pulse sensor with PWM control

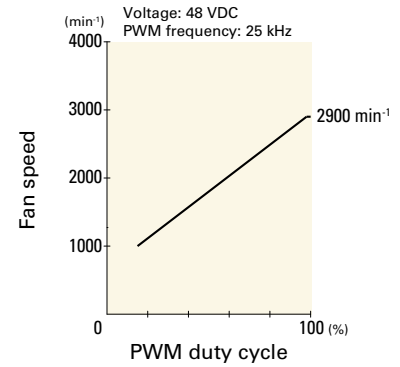
PWM duty cycle



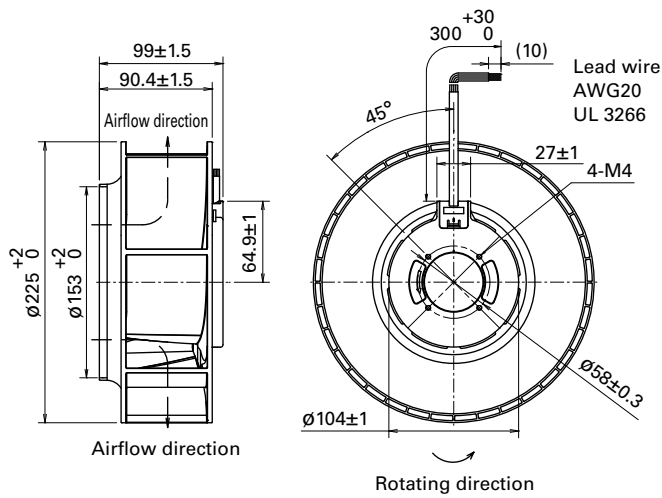
Operating voltage range



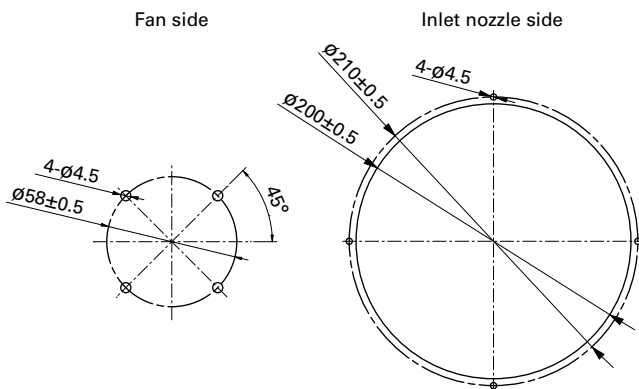
PWM duty - Speed characteristics example



Dimensions (unit: mm)

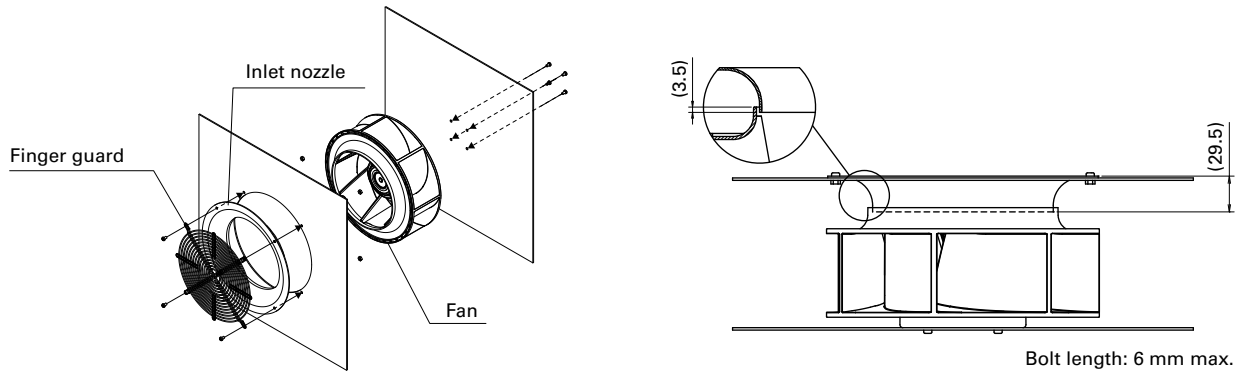


Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



DC
Centrifugal Fan Ø225 mm

Reference Diagram for Mounting (unit: mm) Bracket-mounted model of this fan is available. For details, refer to pp. 468 to 470.



Options

Finger guards

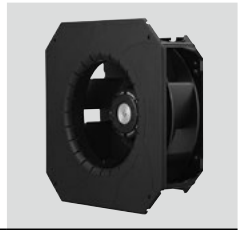
page: p. 601

Model no.: 109-1137, 109-1137H

Inlet nozzle

page: p. 603

Model no.: 109-1134, 109-1134H



270x270x99 mm

San Ace C221 9B1TP type

General Specifications

- Material Motor case: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
Bracket: Aluminum (Black coating), Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and bracket)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and bracket)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow Control Brown
- Mass 1700 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9B1TP24P0H001 | 24 | 16 to 36 | 100 | 3.2 | 76.8 | 3050 | 17.6 622 | 530 2.13 | 71 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 15 | 0.4 | 9.6 | 1000 | 5.75 203 | 57.4 0.23 | 53 | | |
| 9B1TP48P0G001 | 48 | 36 to 72 | 100 | 2.75 | 132 | 3650 | 21.0 742 | 760 3.05 | 74 | -20 to +60 | |
| | | | 15 | 0.2 | 9.6 | 1000 | 5.75 203 | 57.4 0.23 | 53 | | |
| 9B1TP48P0H001 | 48 | 36 to 72 | 100 | 1.6 | 76.8 | 3050 | 17.6 622 | 530 2.13 | 71 | -20 to +70 | |
| | | | 15 | 0.2 | 9.6 | 1000 | 5.75 203 | 57.4 0.23 | 53 | | |

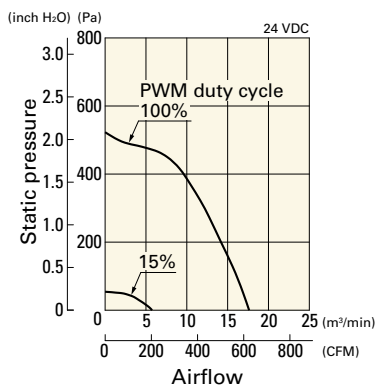
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input of 9B1TP24P0H001/9B1TP48P0H001: 160 W, 9B1TP48P0G001: 280 W at rated voltage.

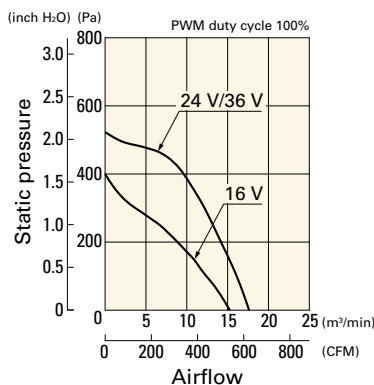
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9B1TP24P0H001 With pulse sensor with PWM control

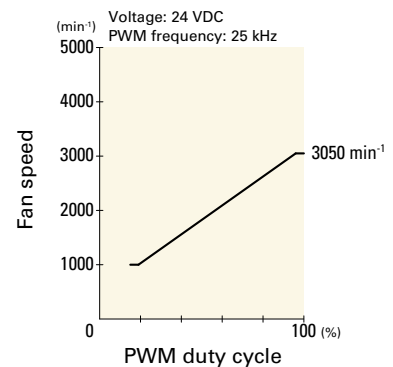
PWM duty cycle



Operating voltage range



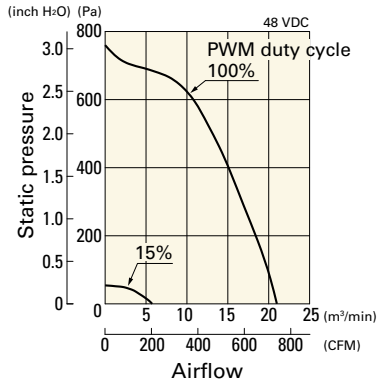
PWM duty - Speed characteristics example



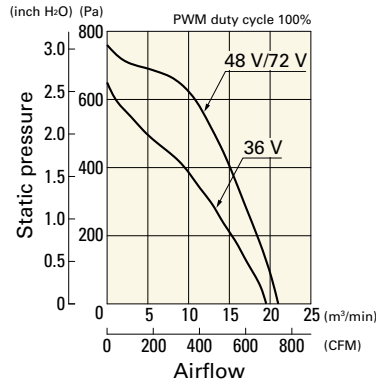
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9B1TP48P0G001 With pulse sensor with PWM control

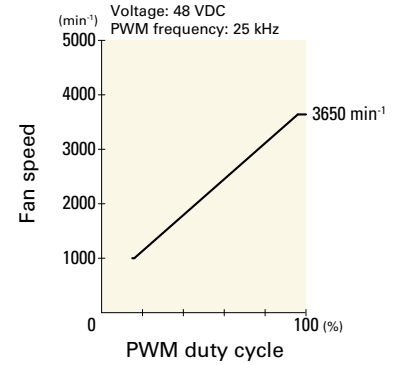
PWM duty cycle



Operating voltage range

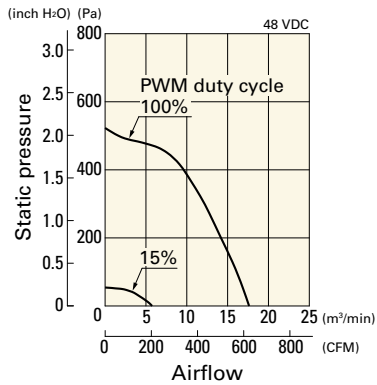


PWM duty - Speed characteristics example

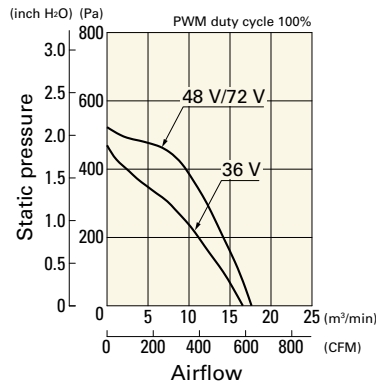


9B1TP48P0H001 With pulse sensor with PWM control

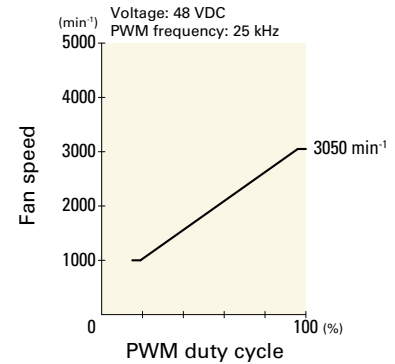
PWM duty cycle



Operating voltage range

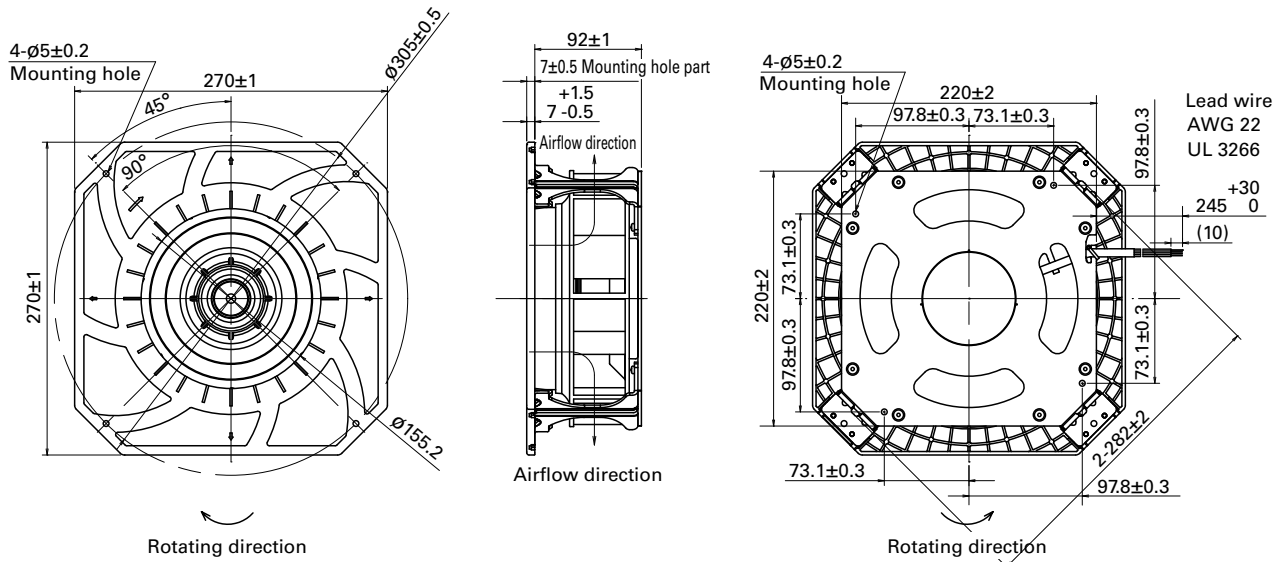


PWM duty - Speed characteristics example

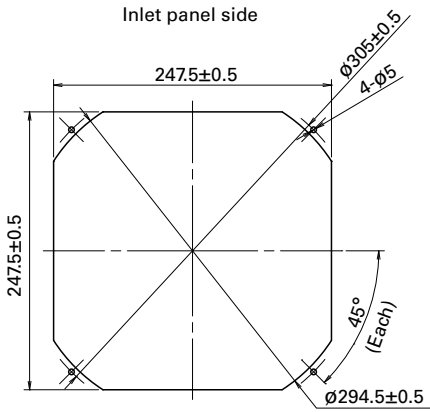


DC Centrifugal Fan 270 mm sq.

Dimensions (unit: mm)

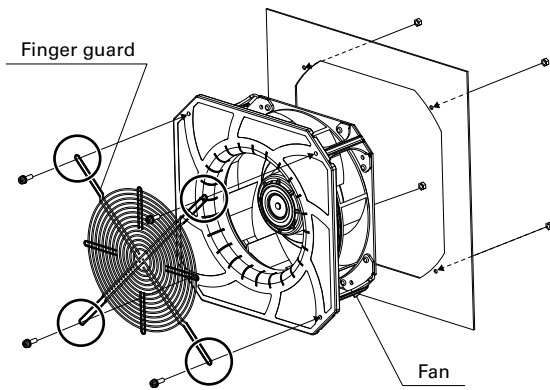


Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting

Finger guard 109-1146 and 109-1146H should be mounted with four holes as in the drawing.

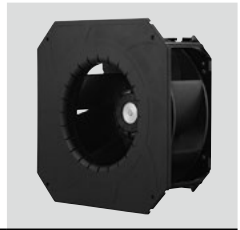


Options

Finger guards

page: p. 602

Model no.: 109-1146, 109-1146H



270x270x119 mm

San Ace C225 9B1TS type

General Specifications

- Material Motor case: Aluminum, Impeller: Plastic (Flammability: UL 94V-0)
Bracket: Aluminum (Black coating), Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and bracket)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and bracket)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow Control Brown
- Mass 1920 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ² /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9B1TS48P0G001 | 48 | 36 to 72 | 100 | 3.65 | 175.2 | 3550 | 28.1 992 | 861 3.46 | 74.5 | -20 to +60 | 40000/60°C (70000/40°C) |
| | | | 15 | 0.24 | 11.5 | 1000 | 7.85 277 | 68.5 0.28 | 52.0 | | |
| 9B1TS48P0H001 | | | 100 | 2.08 | 99.8 | 2900 | 22.7 802 | 590 2.37 | 70.5 | -20 to +70 | |
| | | | 15 | 0.24 | 11.5 | 1000 | 7.85 277 | 68.5 0.28 | 52.0 | | |

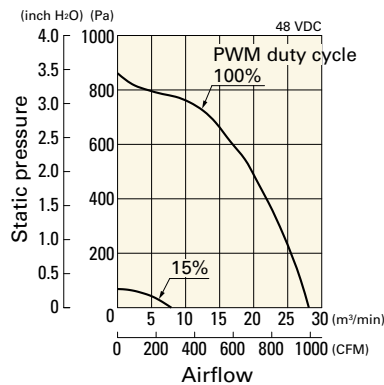
* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

Note: Max input of 9B1TS48P0G001: 380 W, 9B1TS48P0H001: 200 W at rated voltage.

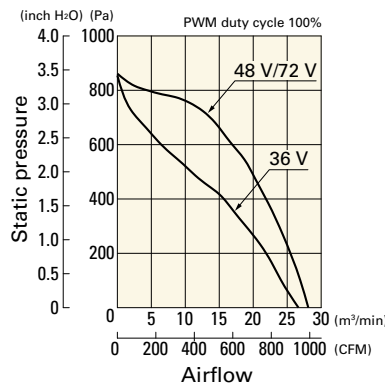
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9B1TS48P0G001 With pulse sensor with PWM control

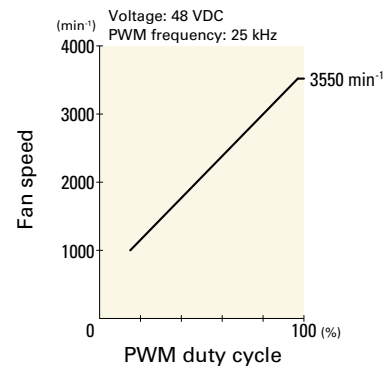
PWM duty cycle



Operating voltage range



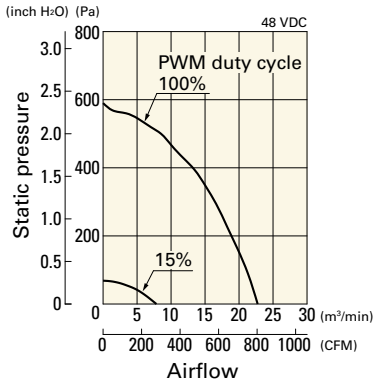
PWM duty - Speed characteristics example



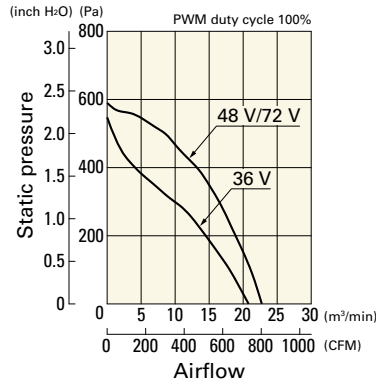
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9B1TS48P0H001 With pulse sensor with PWM control

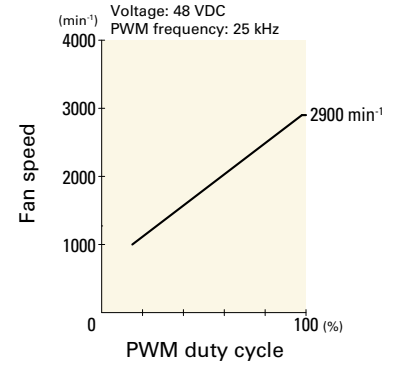
PWM duty cycle



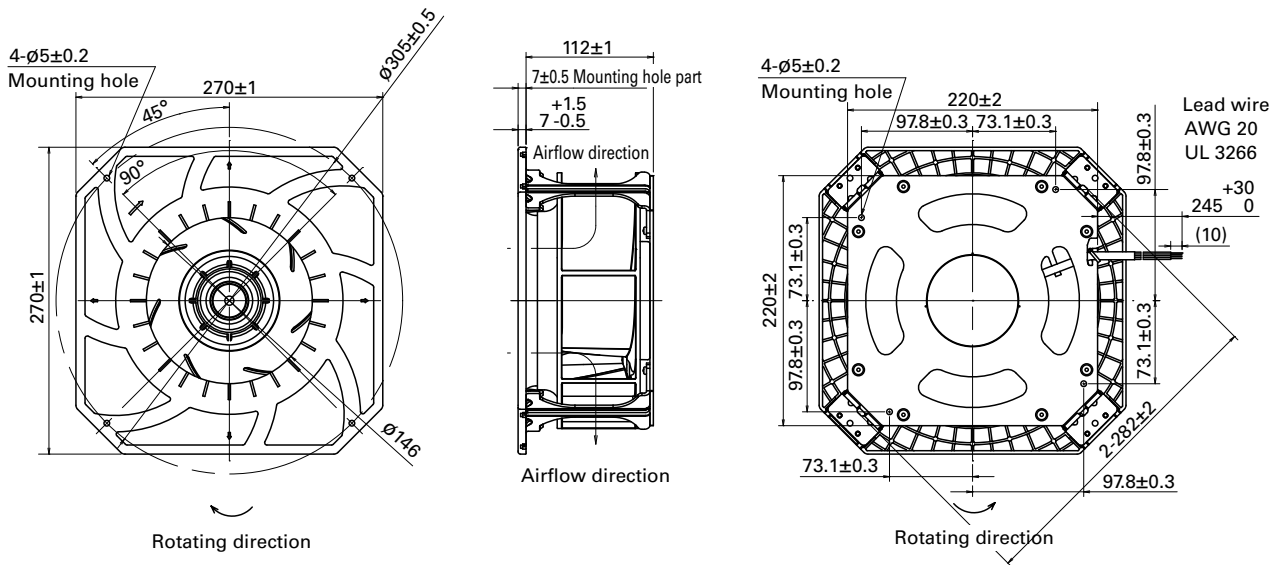
Operating voltage range



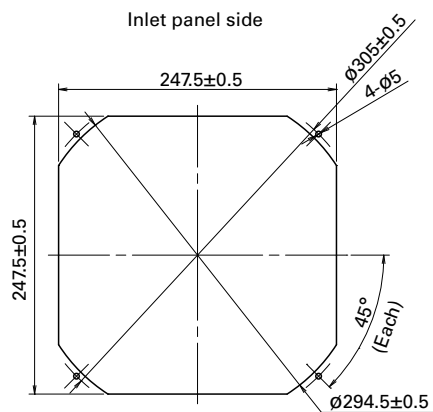
PWM duty - Speed characteristics example



Dimensions (unit: mm)



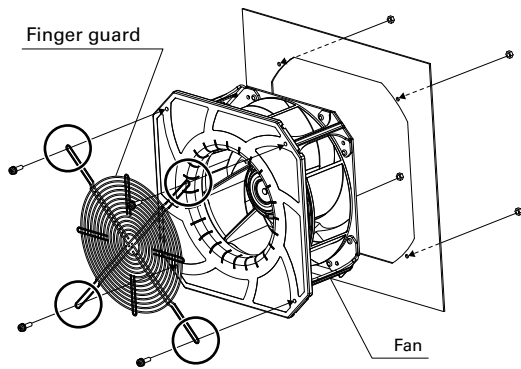
Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



DC
Centrifugal Fan 270 mm sq.

Reference Diagram for Mounting

Finger guard 109-1146 and 109-1146H should be mounted with four holes as in the drawing.



Options

Finger guards

page: p. 602

Model no.: 109-1146, 109-1146H

Blower

Cooling fan specialized for high static pressure.
 Related product: Splash Proof Blower p. 349

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| | | | | | | |
|-------------|------------|-----------|------------|-----------------------|-----------------------|----------------------------|
| 109B | C | 12 | G | C | 7 | -1 |
| Type name | Frame size | Voltage | Speed code | Sensor specifications | Frame thickness | Individual customer's spec |
| 9B | MB | 12 | G | 2 | 01 | -1 |
| Type name | Frame size | Voltage | Speed code | Frame thickness | Sensor specifications | Individual customer's spec |

Fans with PWM control

| | | | | | | |
|-----------|------------|-----------|-------------|-----------------|------------|--|
| 9B | MB | 12 | P | 2 | G | 01 |
| Type name | Frame size | Voltage | PWM control | Frame thickness | Speed code | Individual customer's spec (2 to 3 digits) |

| | | | | | | | |
|-----------------------|------------------|------------|---------------------|-----|--------------------|-----------|------|
| Type name | 109B | 9B | | | | | |
| Frame size (mm) | C | D | F, FB | G | J | M, MB, MC | |
| | 52 | 76 | 120 | 160 | 127 | 97 | |
| Voltage (V) | 12 | 24 | | | | | |
| | 12 | 24 | | | | | |
| Speed code | F | G | H | K | M | S | etc. |
| Sensor specifications | A, 02, 002 | | C, 01, 001 | | D | | |
| | Without a sensor | | With a pulse sensor | | With a lock sensor | | |
| Frame thickness (mm) | 1 | 2 | 7 | 6 | | | |
| | 40 | 30, 32, 33 | 15 | 20 | | | |

How to Read Specifications (DC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9GA0412G7001 | 12 | 7 to 13.8 | 0.17 | 2.04 | 13100 | 0.36 12.7 | 192 0.77 | 42 | -20 to +70 | 40000/60°C (70000/40°C) |

- Rated voltage This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
 For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
 For more information, please refer to the technical material section.

52x15 mm

San Ace B52 9BC type



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 33 g

Specifications

The models listed below **have a pulse sensor**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 109BC12GC7-1 | 12 | 6 to 13.8 | 0.12 | 1.44 | 6200 | 0.125 4.4 | 215 0.86 | 43 | -20 to +70 | 40000/60°C (70000/40°C) |
| ▶▶ 109BC12HC7-1 | | | 0.1 | 1.2 | 5600 | 0.112 4.0 | 165 0.66 | 40 | | |
| ▶▶ 109BC12FC7-1 | | | 0.08 | 0.96 | 5100 | 0.101 3.6 | 130 0.52 | 38 | | |
| ▶▶ 109BC12MC7-1 | | | 0.06 | 0.72 | 4600 | 0.091 3.2 | 100 0.4 | 35 | | |
| ▶▶ 109BC24GC7-1 | 24 | 12 to 27.6 | 0.07 | 1.68 | 6200 | 0.125 4.4 | 215 0.86 | 43 | | |
| ▶▶ 109BC24HC7-1 | | | 0.05 | 1.2 | 5600 | 0.112 4.0 | 165 0.66 | 40 | | |
| ▶▶ 109BC24MC7-1 | | | 0.04 | 0.96 | 5100 | 0.101 3.6 | 130 0.52 | 38 | | |
| ▶▶ 109BC24FC7-1 | | | | | | | | | | |

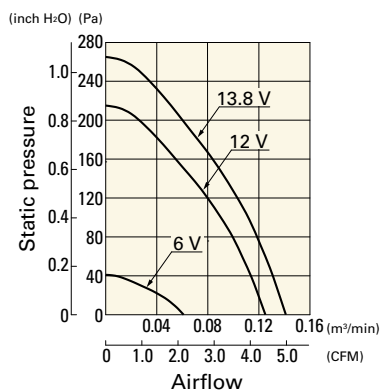
Note 1: Sensor and control options are available for selection. Refer to the table on p. 638.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

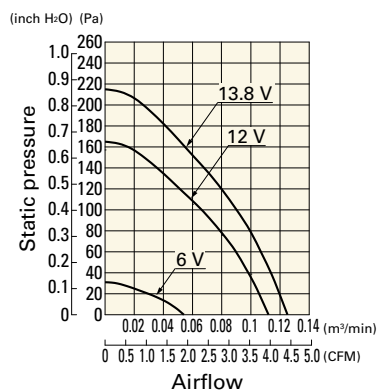
109BC12GC7-1 With pulse sensor

Operating voltage range



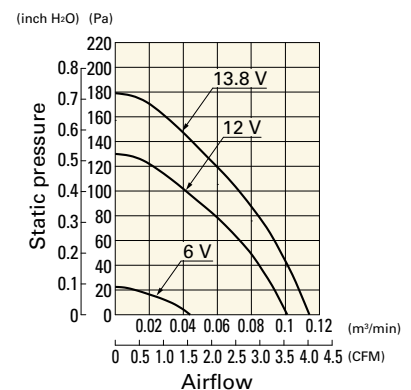
109BC12HC7-1 With pulse sensor

Operating voltage range



109BC12FC7-1 With pulse sensor

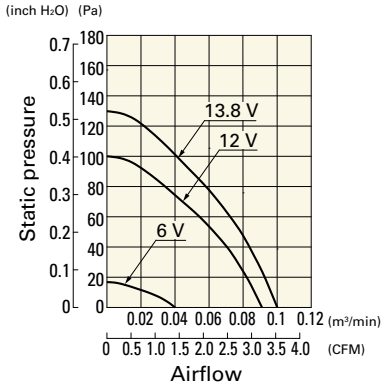
Operating voltage range



Airflow - Static Pressure Characteristics

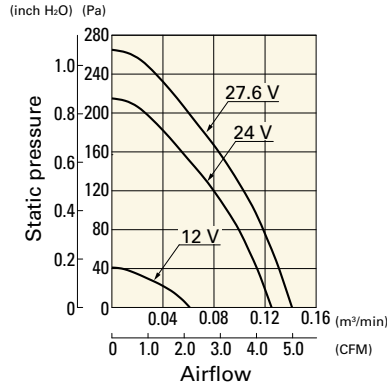
109BC12MC7-1 With pulse sensor

Operating voltage range



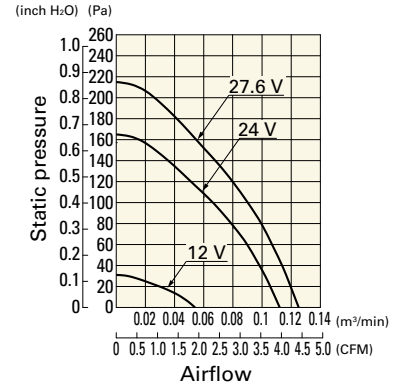
109BC24GC7-1 With pulse sensor

Operating voltage range



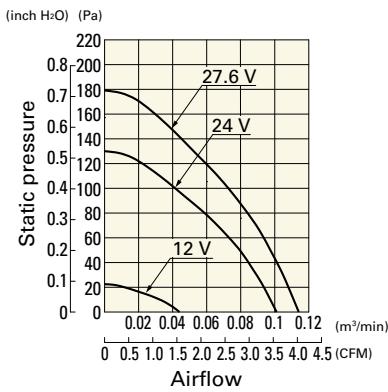
109BC24HC7-1 With pulse sensor

Operating voltage range

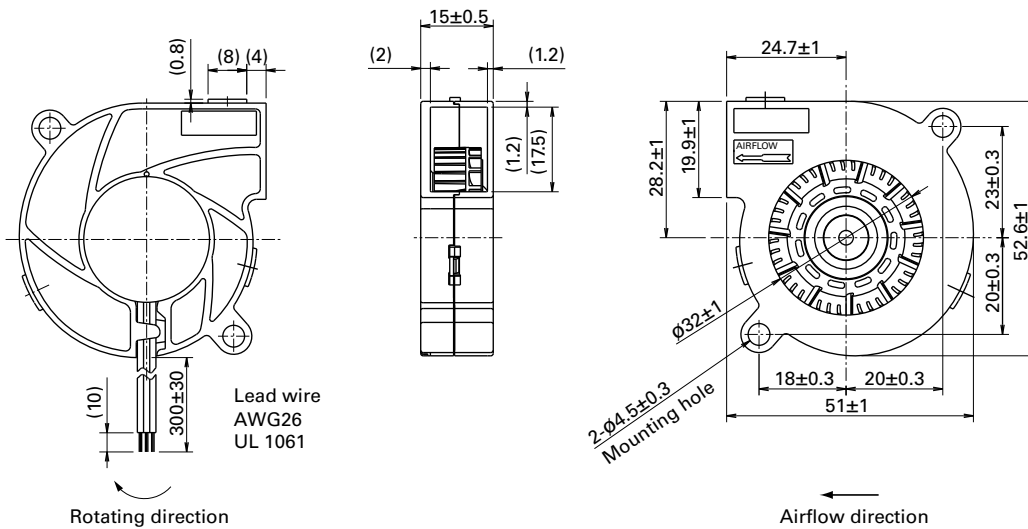


109BC24FC7-1 With pulse sensor



Operating voltage range



Dimensions (unit: mm)



76x20 mm


San Ace B76 9BD type   

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 58 g

Specifications

The models listed below **have a pulse sensor**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9BD12SC6-1 | 12 | 7 to 13.8 | 0.28 | 3.36 | 4500 | 0.29 10.2 | 300 1.2 | 43 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9BD12HC6-1 | | | 0.21 | 2.52 | 4200 | 0.27 9.5 | 230 0.92 | 41 | | |
| 9BD12FC6-1 | | | 0.18 | 2.16 | 3900 | 0.25 8.8 | 200 0.8 | 39 | | |
| 9BD24SC6-40 | 24 | 10 to 27.6 | 0.16 | 3.84 | 4500 | 0.29 10.2 | 300 1.2 | 43 | | |
| 9BD24HC6-1 | | | 0.12 | 2.88 | 4200 | 0.27 9.5 | 230 0.92 | 41 | | |
| 9BD24FC6-1 | | | 0.1 | 2.4 | 3900 | 0.25 8.8 | 200 0.8 | 39 | | |

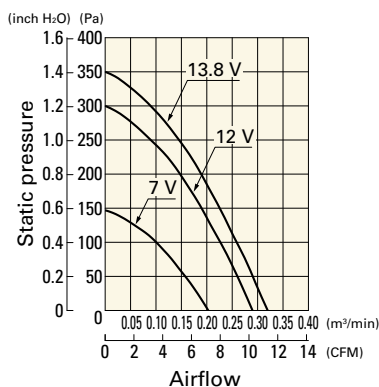
Note 1: Sensor and control options are available for selection. Refer to the table on p. 640.

Note 2: The  mark indicates Short LeadTime Service applicable models. See p. 668 for details.

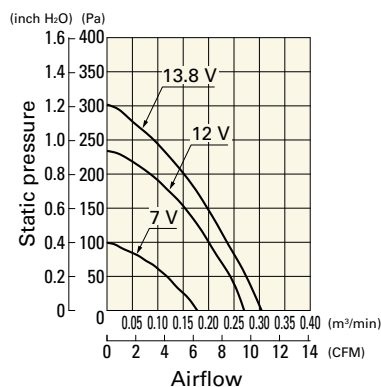
Airflow - Static Pressure Characteristics

9BD12SC6-1 With pulse sensor

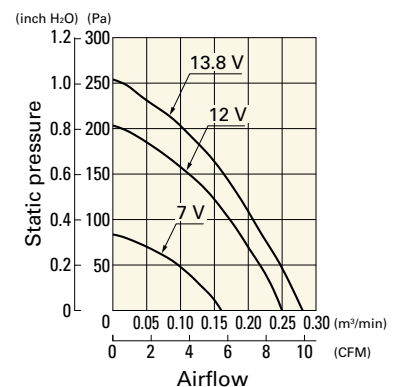
Operating voltage range


9BD12HC6-1 With pulse sensor

Operating voltage range


9BD12FC6-1 With pulse sensor

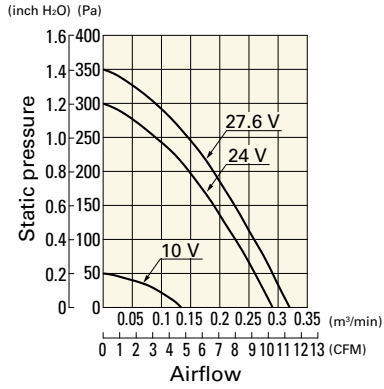
Operating voltage range



Airflow - Static Pressure Characteristics

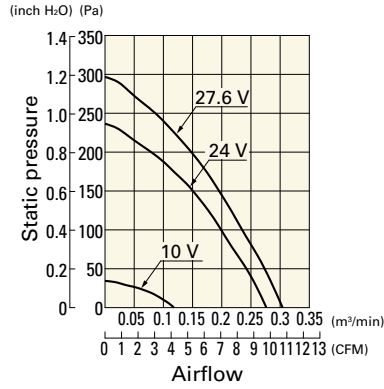
9BD24SC6-40 With pulse sensor

Operating voltage range



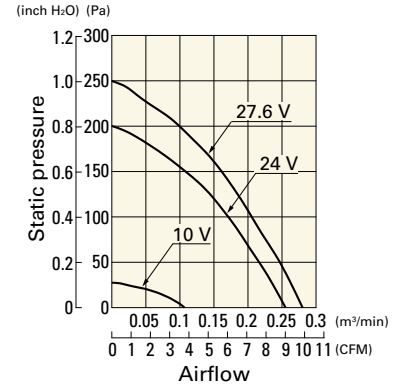
9BD24HC6-1 With pulse sensor

Operating voltage range

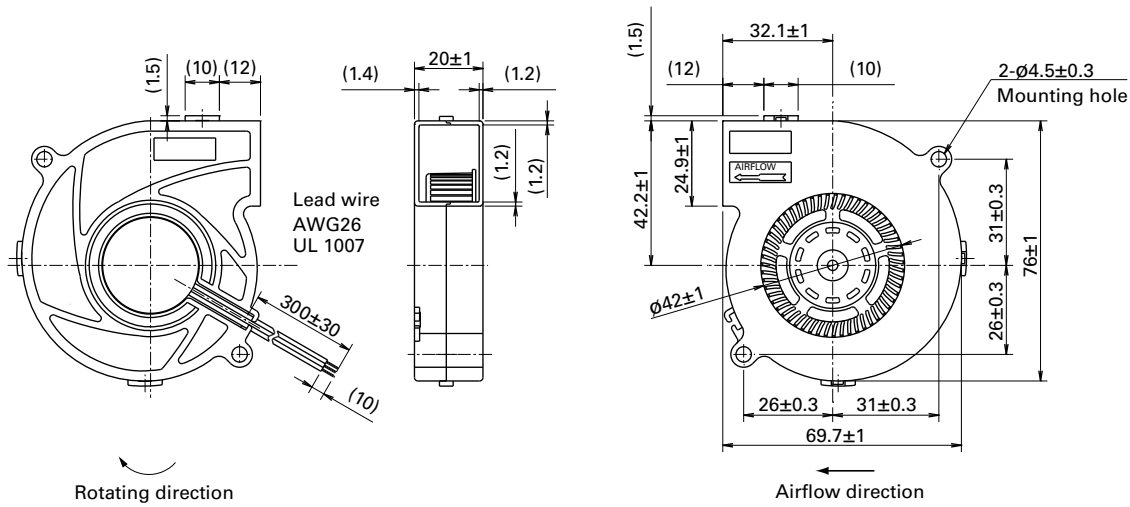


9BD24FC6-1 With pulse sensor

Operating voltage range



Dimensions (unit: mm)



Blower 76 mm DC

76x30 mm

San Ace B76 9BD type   



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 100 g

Specifications

The models listed below **have a pulse sensor**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 109BD12HC2 | 12 | 10.2 to 13.8 | 0.37 | 4.44 | 3000 | 0.36 12.7 | 151.9 0.61 | 41.5 | -20 to +60 | 40000/60°C (70000/40°C) |
| ▶▶ 109BD12FC2 | | | 0.27 | 3.24 | 2600 | 0.31 10.9 | 98 0.394 | 37 | | |
| ▶▶ 109BD12MC2 | | | 0.14 | 1.68 | 2100 | 0.25 8.8 | 58.8 0.236 | 32.5 | | |
| ▶▶ 109BD24HC2 | 24 | 20.4 to 27.6 | 0.17 | 4.08 | 3000 | 0.36 12.7 | 151.9 0.61 | 41.5 | -20 to +60 | |
| ▶▶ 109BD24FC2 | | | 0.14 | 3.36 | 2600 | 0.31 10.9 | 98 0.394 | 37 | -20 to +70 | |
| ▶▶ 109BD24MC2 | | | 0.1 | 2.4 | 2100 | 0.25 8.8 | 58.8 0.236 | 32.5 | -20 to +70 | |

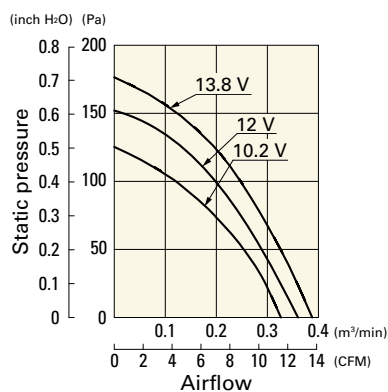
Note 1: Sensor and control options are available for selection. Refer to the table on p. 638.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

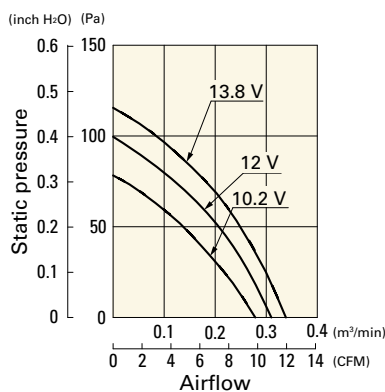
109BD12HC2 With pulse sensor

Operating voltage range



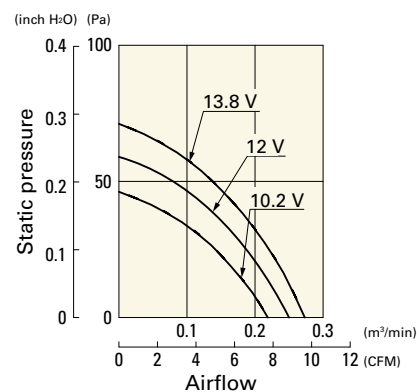
109BD12FC2 With pulse sensor

Operating voltage range



109BD12MC2 With pulse sensor

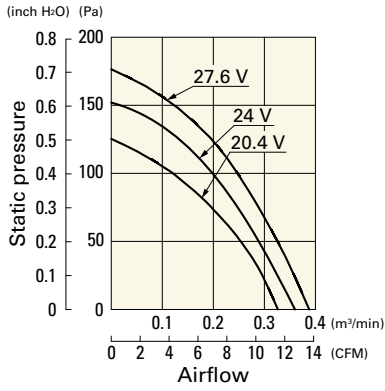
Operating voltage range



Airflow - Static Pressure Characteristics

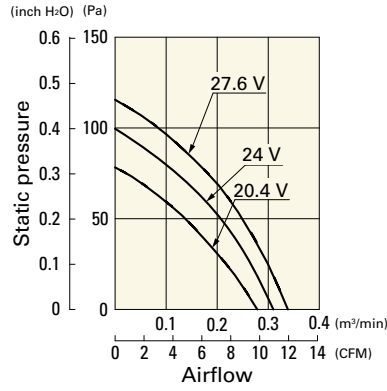
109BD24HC2 With pulse sensor

Operating voltage range



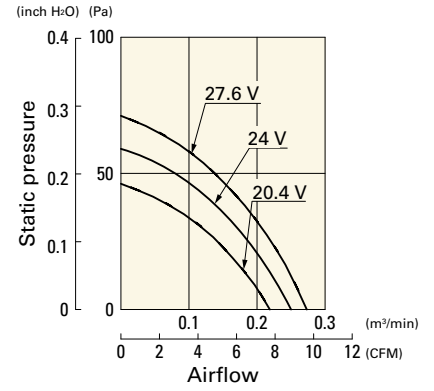
109BD24FC2 With pulse sensor

Operating voltage range

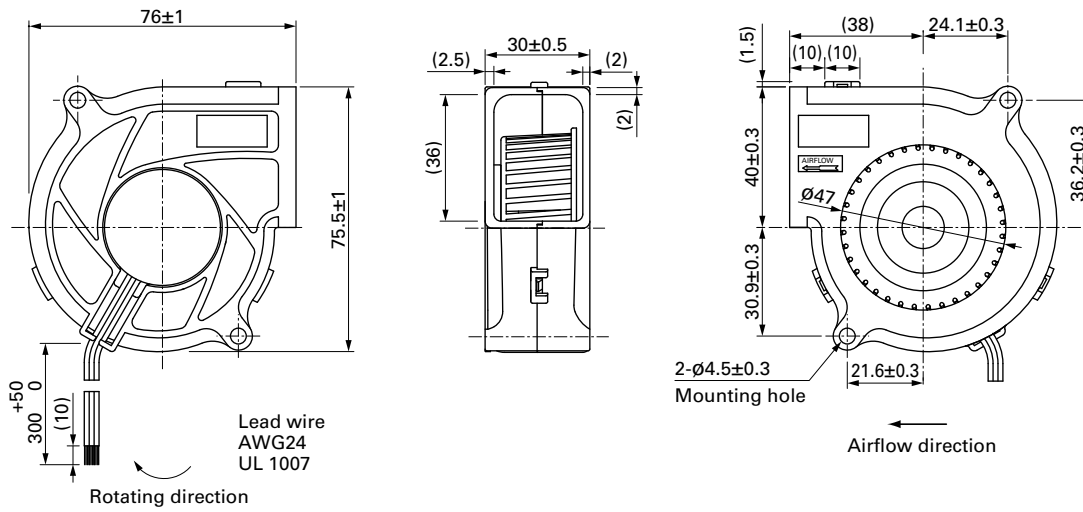


109BD24MC2 With pulse sensor

Operating voltage range



Dimensions (unit: mm)



Blower 76 mm DC



97×33 mm

San Ace B97 9BMC type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 200 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9BMC12P2G001 | 12 | 10.8 to 13.2 | 100 | 6.2 | 74.4 | 8200 | 1.85 65.3 | 1950 7.83 | 69 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | 20 | 0.38 | 4.56 | 2800 | 0.58 20.4 | 121.0 0.48 | 44 | | |
| 9BMC24P2G001 | 24 | 21.6 to 26.4 | 100 | 3.1 | 74.4 | 8200 | 1.85 65.3 | 1950 7.83 | 69 | | |
| | | | 20 | 0.19 | 4.56 | 2800 | 0.58 20.4 | 121.0 0.48 | 44 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

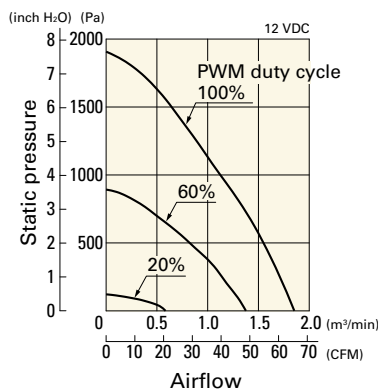
Note 1: Sensor and control options are available for selection. Refer to the table on p. 640.

Note 2: The mark indicates Short LeadTime Service applicable models. See p. 668 for details.

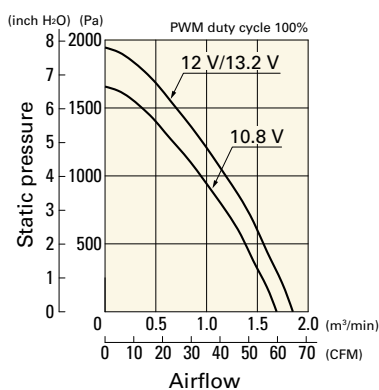
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9BMC12P2G001 With pulse sensor with PWM control

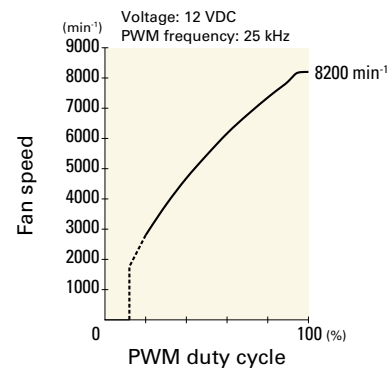
PWM duty cycle



Operating voltage range



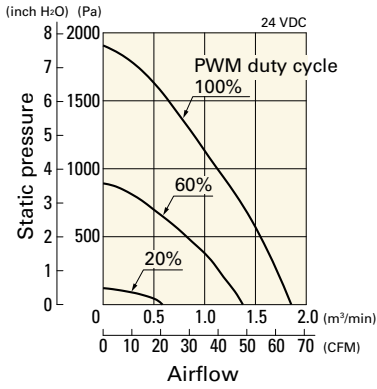
PWM duty - Speed characteristics example



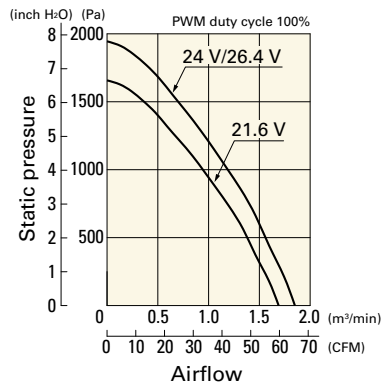
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9BMC24P2G001 With pulse sensor with PWM control

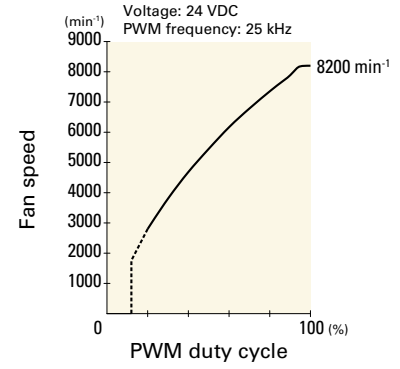
PWM duty cycle



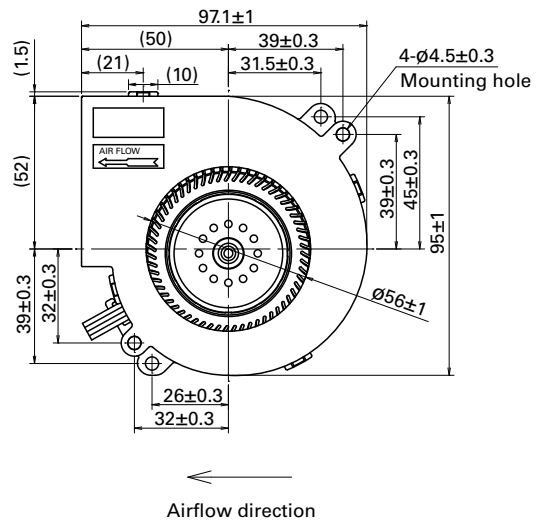
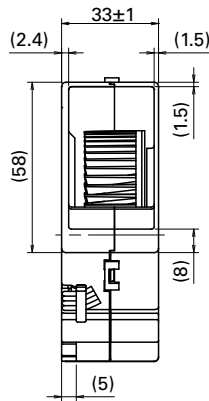
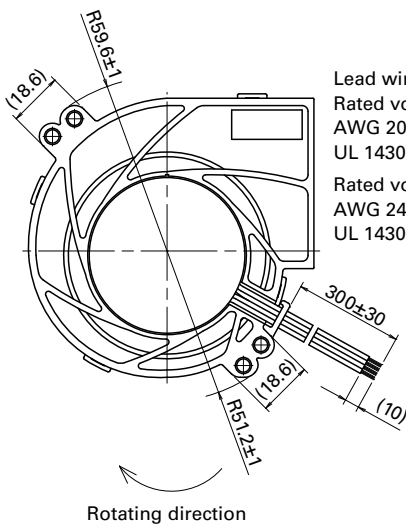
Operating voltage range



PWM duty - Speed characteristics example



Dimensions (unit: mm)



Blower 97 mm DC

97×33 mm



San Ace B97 9BMB type US

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
(For models without PWM control, there is no speed control wiring.)
- Mass 190 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9BMB12P2K01 | 12 | 10.8 to 13.2 | 100 | 3.4 | 40.8 | 6850 | 1.61 56.8 | 1280 5.14 | 66 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9BMB12P2G01 | | | 100 | 1.8 | 21.6 | 5750 | 1.34 47.3 | 760 3.05 | 61 | | |
| 9BMB12P2S01 | | 10.2 to 13.8 | 100 | 1.4 | 16.8 | 5250 | 1.22 43.1 | 610 2.45 | 59 | | |
| 9BMB12P2H01 | | | 100 | 1.1 | 13.2 | 4850 | 1.11 39.2 | 490 1.968 | 57 | | |
| 9BMB12P2F01 | | | 100 | 0.9 | 10.8 | 4500 | 1.04 36.7 | 410 1.64 | 56 | | |
| 9BMB24P2K01 | 24 | 21.6 to 26.4 | 100 | 1.62 | 38.88 | 6850 | 1.61 56.8 | 1280 5.14 | 66 | | |
| 9BMB24P2G01 | | | 100 | 0.83 | 19.92 | 5750 | 1.34 47.3 | 760 3.05 | 61 | | |
| 9BMB24P2S01 | | 10.2 to 13.8 | 100 | 0.7 | 16.8 | 5250 | 1.22 43.1 | 610 2.45 | 59 | | |
| 9BMB24P2H01 | | | 100 | 0.55 | 13.2 | 4850 | 1.11 39.2 | 490 1.968 | 57 | | |
| 9BMB24P2F01 | | | 100 | 0.45 | 10.8 | 4500 | 1.04 36.7 | 410 1.64 | 56 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have a pulse sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9BMB12K201 | 12 | 7 to 13.2 | 3.4 | 40.8 | 6850 | 1.61 56.8 | 1280 5.14 | 66 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9BMB12G201 | | | 1.8 | 21.6 | 5750 | 1.34 47.3 | 760 3.052 | 61 | | |
| 9BMB12S201 | | 7 to 13.8 | 1.4 | 16.8 | 5250 | 1.22 43.1 | 610 2.45 | 59 | | |
| 9BMB12H201 | | | 1.1 | 13.2 | 4850 | 1.11 39.2 | 490 1.968 | 57 | | |
| 9BMB12F201 | | | 0.9 | 10.8 | 4500 | 1.04 36.7 | 410 1.647 | 56 | | |
| 9BMB24K201 | 24 | 21.6 to 26.4 | 1.62 | 38.88 | 6850 | 1.61 56.8 | 1280 5.14 | 66 | | |
| 9BMB24G201 | | | 0.83 | 19.9 | 5750 | 1.34 47.3 | 760 3.052 | 61 | | |
| 9BMB24S201 | | 12 to 26.4 | 0.7 | 16.8 | 5250 | 1.22 43.1 | 610 2.45 | 59 | | |
| 9BMB24H201 | | | 0.55 | 13.2 | 4850 | 1.11 39.2 | 490 1.968 | 57 | | |
| 9BMB24F201 | | | 0.45 | 10.8 | 4500 | 1.04 36.7 | 410 1.647 | 56 | | |

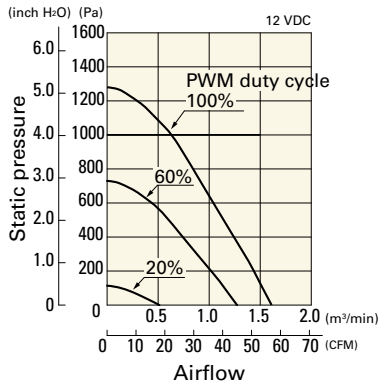
Note 1: Sensor and control options are available for selection. Refer to the table on p. 640.

Note 2: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

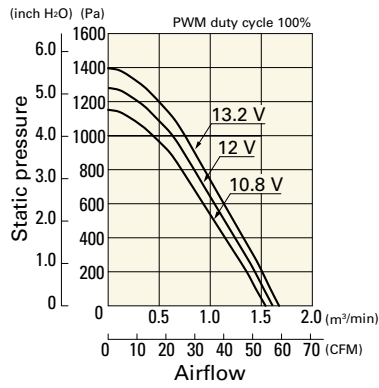
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9BMB12P2K01 With pulse sensor with PWM control

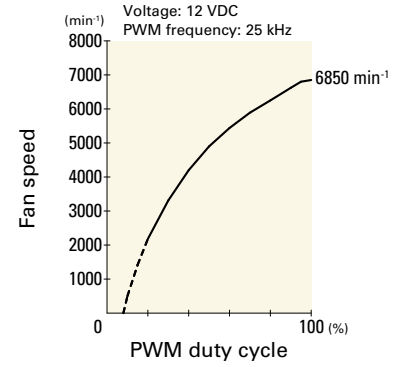
PWM duty cycle



Operating voltage range

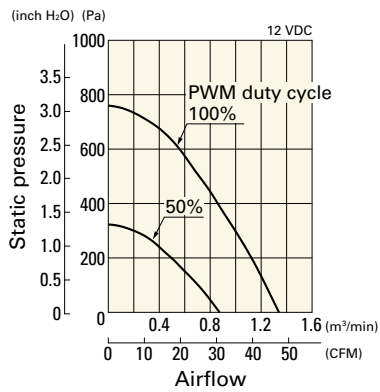


PWM duty - Speed characteristics example

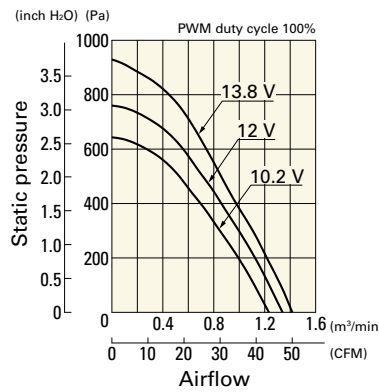


9BMB12P2G01 With pulse sensor with PWM control

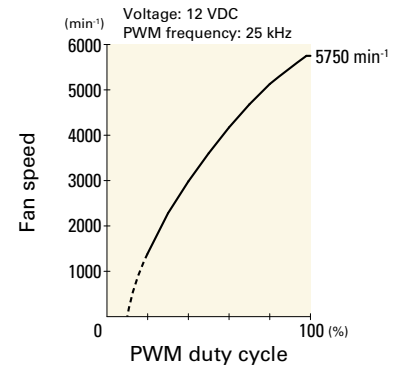
PWM duty cycle



Operating voltage range

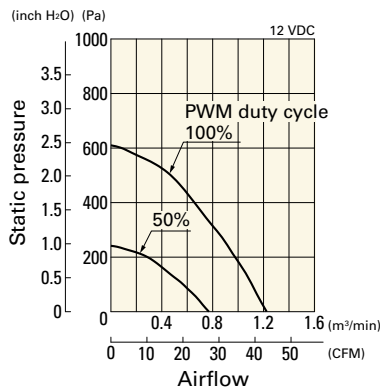


PWM duty - Speed characteristics example

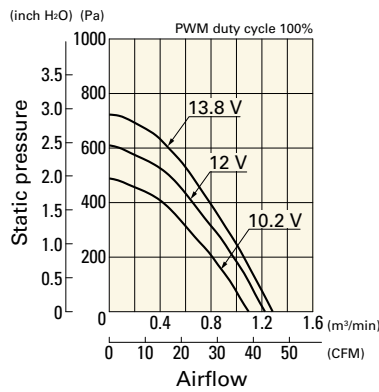


9BMB12P2S01 With pulse sensor with PWM control

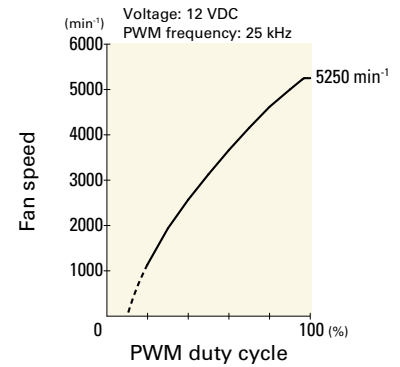
PWM duty cycle



Operating voltage range

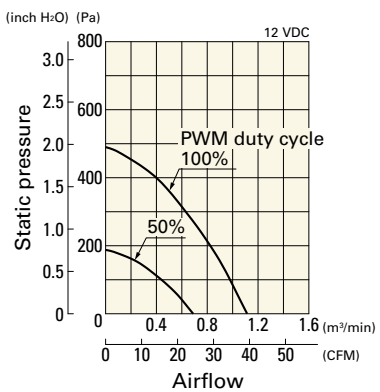


PWM duty - Speed characteristics example

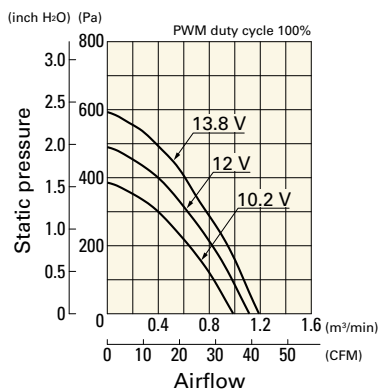


9BMB12P2H01 With pulse sensor with PWM control

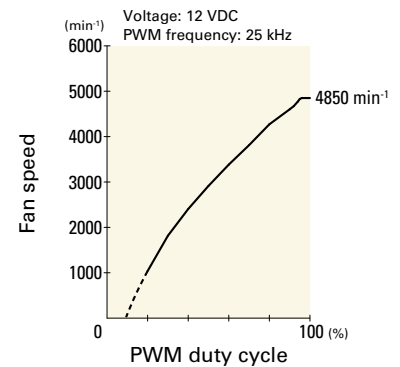
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

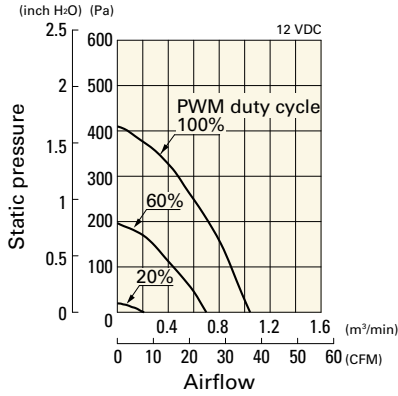


Blower 97 mm DC

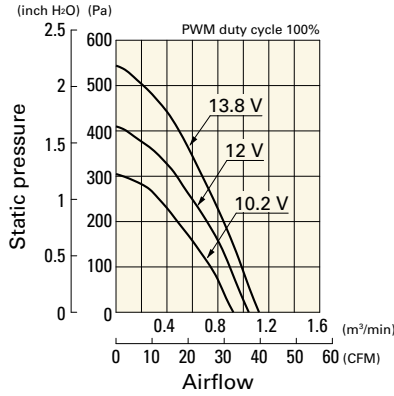
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9BMB12P2F01 With pulse sensor with PWM control

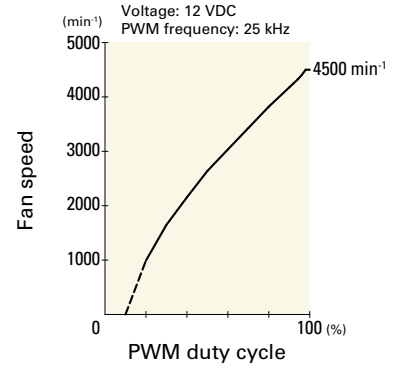
PWM duty cycle



Operating voltage range

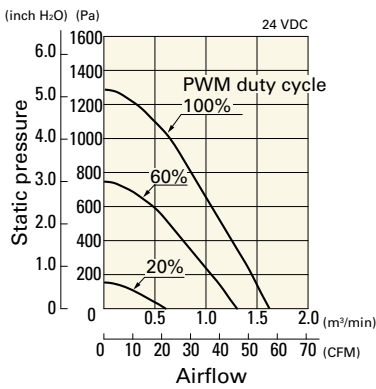


PWM duty - Speed characteristics example

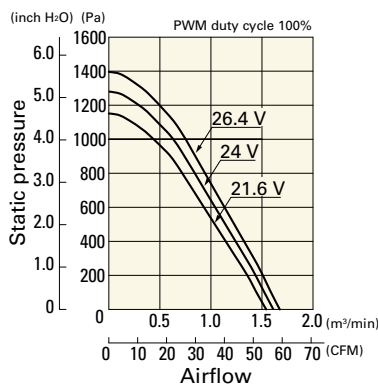


9BMB24P2K01 With pulse sensor with PWM control

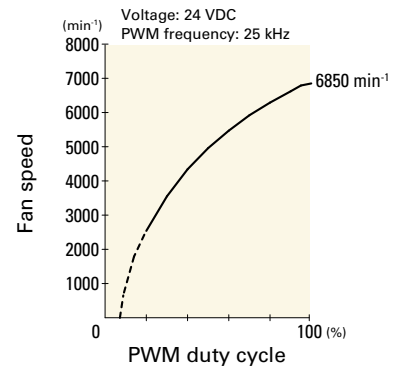
PWM duty cycle



Operating voltage range

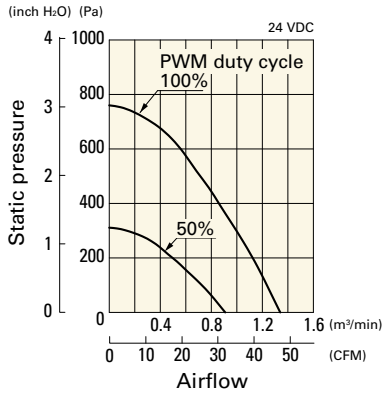


PWM duty - Speed characteristics example

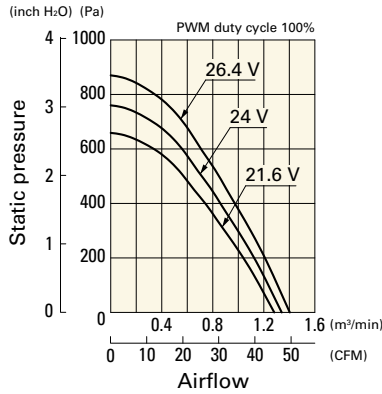


9BMB24P2G01 With pulse sensor with PWM control

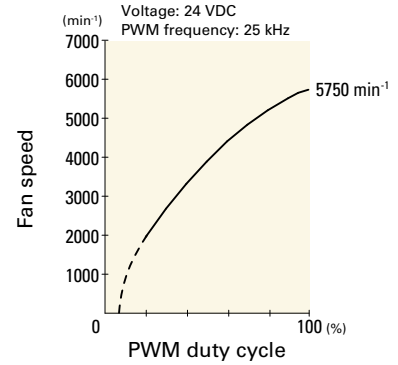
PWM duty cycle



Operating voltage range

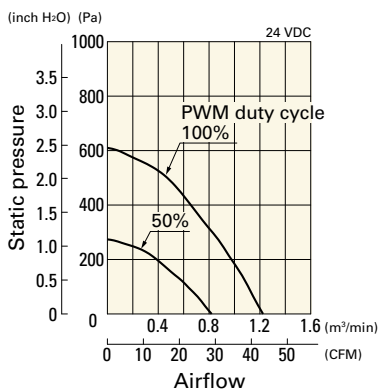


PWM duty - Speed characteristics example

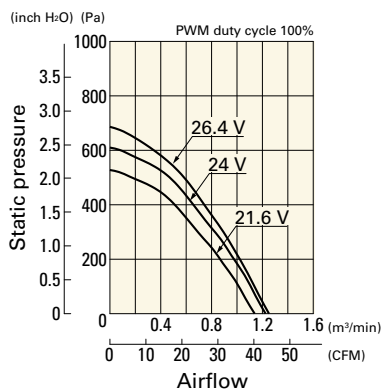


9BMB24P2S01 With pulse sensor with PWM control

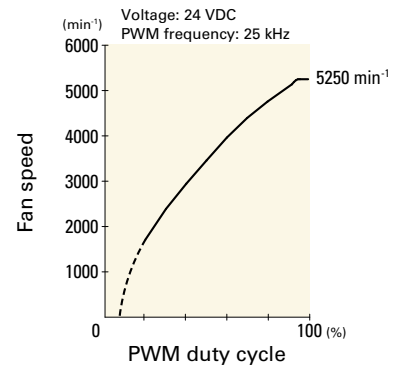
PWM duty cycle



Operating voltage range



PWM duty - Speed characteristics example

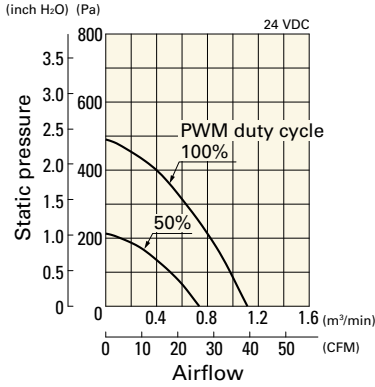


Blower 97 mm DC

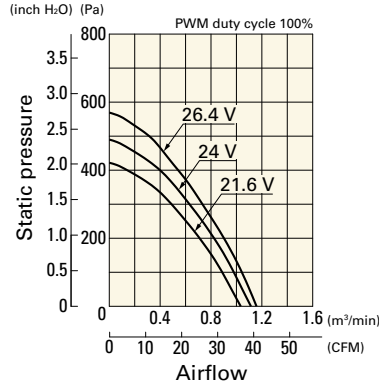
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9BMB24P2H01 With pulse sensor with PWM control

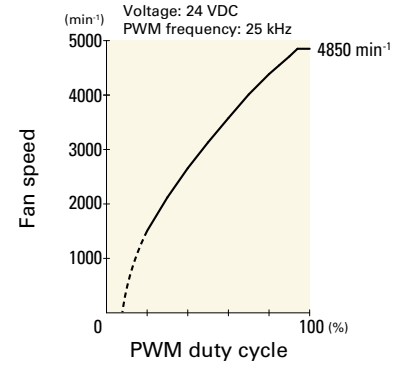
PWM duty cycle



Operating voltage range

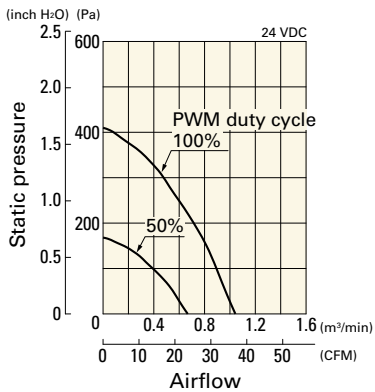


PWM duty - Speed characteristics example

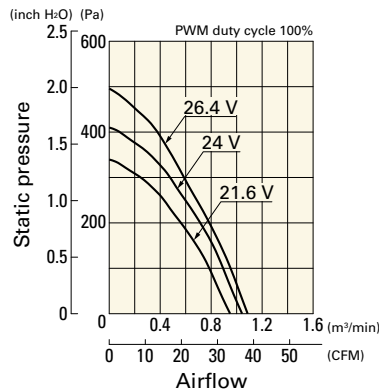


9BMB24P2F01 With pulse sensor with PWM control

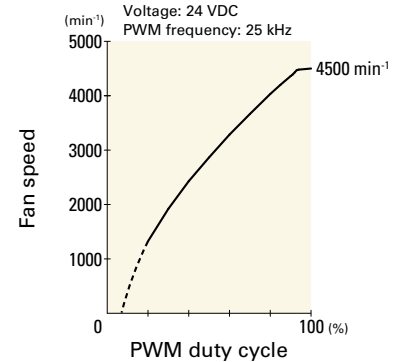
PWM duty cycle



Operating voltage range



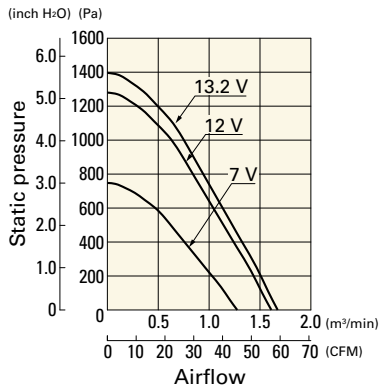
PWM duty - Speed characteristics example



Airflow - Static Pressure Characteristics

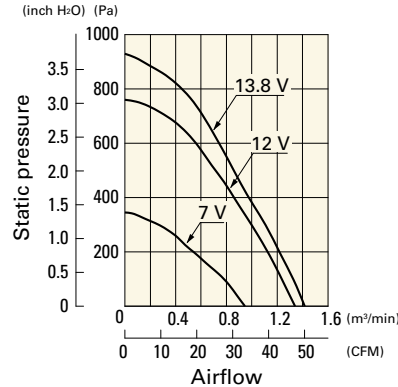
9BMB12K201 With pulse sensor

Operating voltage range



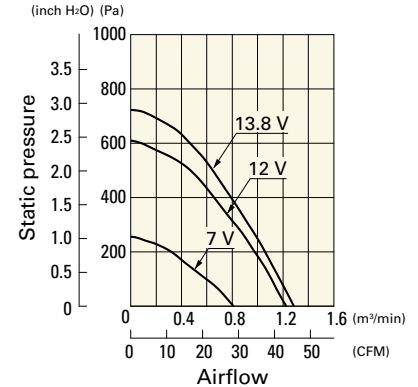
9BMB12G201 With pulse sensor

Operating voltage range



9BMB12S201 With pulse sensor

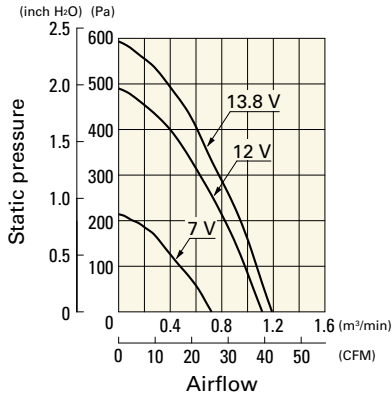
Operating voltage range



Airflow - Static Pressure Characteristics

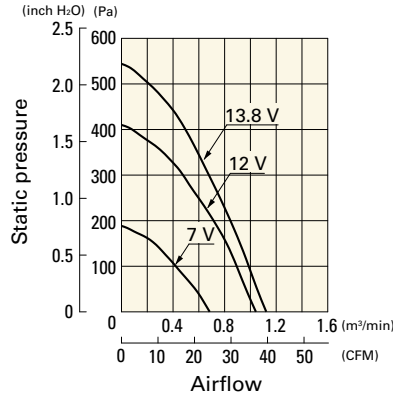
9BMB12H201 With pulse sensor

Operating voltage range



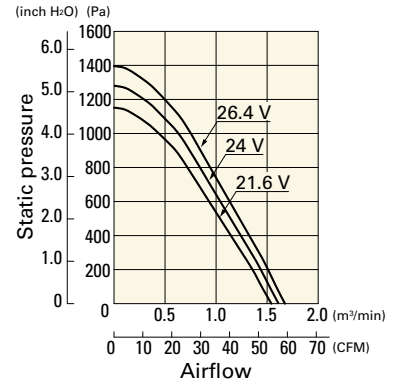
9BMB12F201 With pulse sensor

Operating voltage range



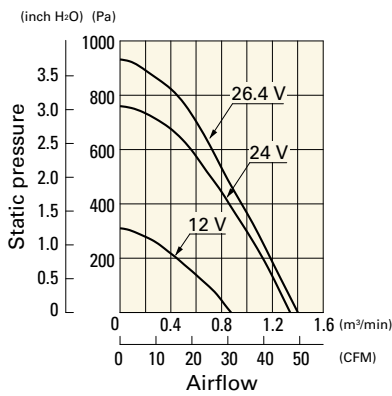
9BMB24K201 With pulse sensor

Operating voltage range



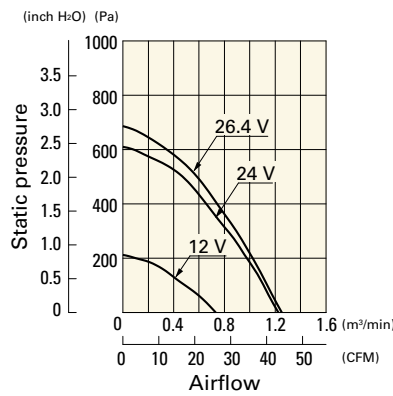
9BMB24G201 With pulse sensor

Operating voltage range



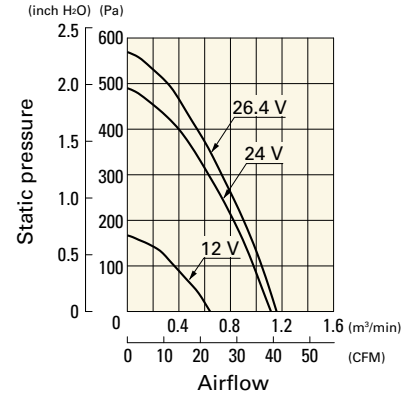
9BMB24S201 With pulse sensor

Operating voltage range



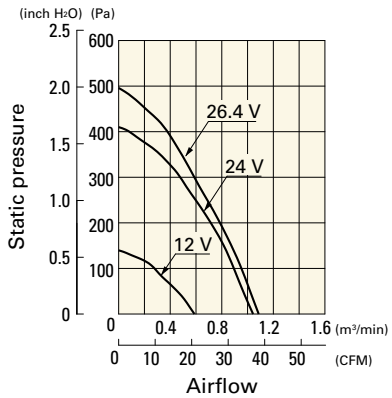
9BMB24H201 With pulse sensor

Operating voltage range



9BMB24F201 With pulse sensor

Operating voltage range



Blower 97 mm DC

97×33 mm

San Ace B97 9BM type   



General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black Sensor Yellow
- Mass 175 g

Specifications

The models listed below **have a pulse sensor**.

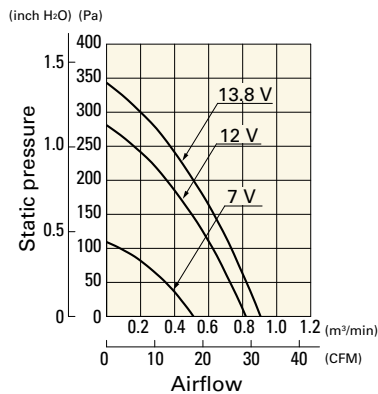
| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109BM12GC2-1 | 12 | 7 to 13.8 | 0.6 | 7.2 | 3800 | 0.82 28.9 | 281 1.129 | 51.5 | -20 to +70 | 40000/60°C (70000/40°C) |
| 109BM12HC2-1 | | | 0.4 | 4.8 | 3300 | 0.71 25.1 | 204 0.819 | 48.5 | | |
| 109BM12MC2-1 | | | 0.26 | 3.12 | 2700 | 0.58 20.5 | 119 0.478 | 43.5 | | |
| 109BM24GC2-1 | 24 | 12 to 27.6 | 0.31 | 7.44 | 3800 | 0.82 28.9 | 281 1.129 | 51.5 | | |
| 109BM24HC2-1 | | | 0.26 | 6.24 | 3300 | 0.71 25.1 | 204 0.819 | 48.5 | | |
| 109BM24MC2-1 | | | 0.15 | 3.6 | 2700 | 0.58 20.5 | 119 0.478 | 43.5 | | |

Note: Sensor and control options are available for selection. Refer to the table on p. 638.

Airflow - Static Pressure Characteristics

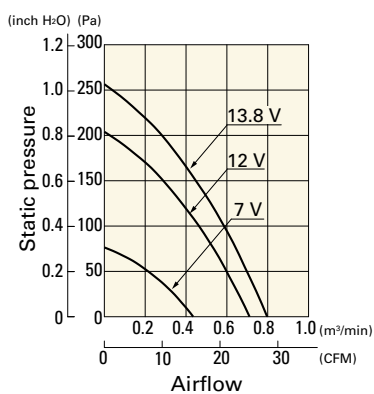
109BM12GC2-1 With pulse sensor

Operating voltage range



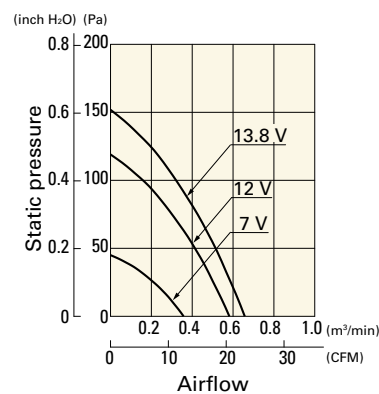
109BM12HC2-1 With pulse sensor

Operating voltage range



109BM12MC2-1 With pulse sensor

Operating voltage range





120x32 mm

San Ace B120 9BFB type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black (Sensor) Yellow (Control) Brown
- Mass 340 g

Specifications

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 9BFB12P2H003 | 12 | 10.8 to 13.2 | 100 | 2.3 | 27.6 | 3750 | 1.6 56.5 | 1250 5.02 | 62 | -20 to +70 | 40000/60°C (70000/40°C) |
| ▶▶ 9BFB24P2H003 | 24 | 21.6 to 26.4 | 100 | 1.1 | 26.4 | 3750 | 1.6 56.5 | 1250 5.02 | 62 | | |
| 0 | | | 0.12 | 2.88 | 1300 | 0.46 16.2 | 43 0.17 | 41 | | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

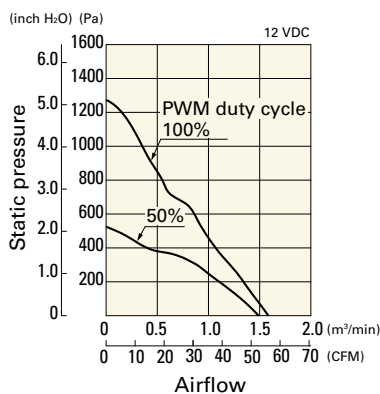
Note 1: Sensor and control options are available for selection. Refer to the table on p. 640.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

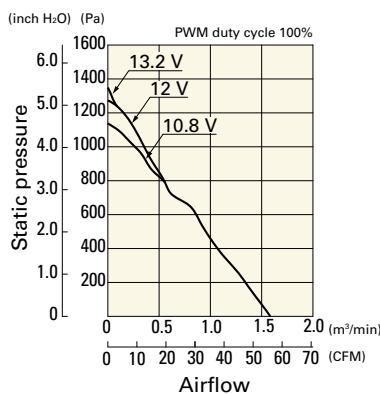
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9BFB12P2H003 With pulse sensor with PWM control

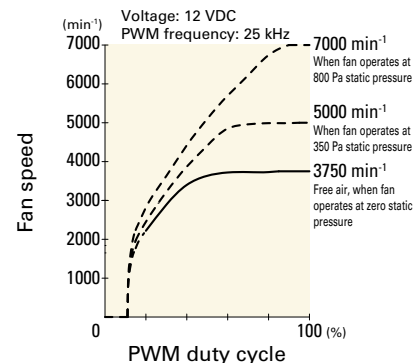
PWM duty cycle



Operating voltage range



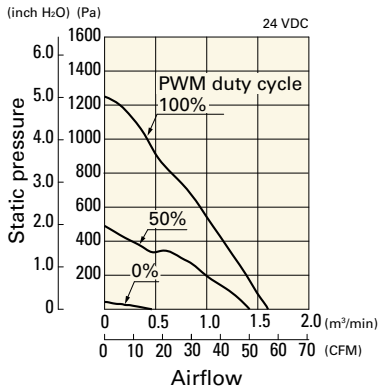
PWM duty - Speed characteristics example



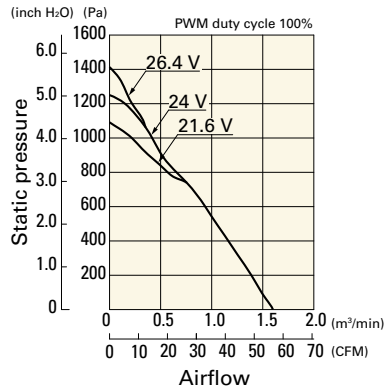
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9BFB24P2H003 With pulse sensor with PWM control

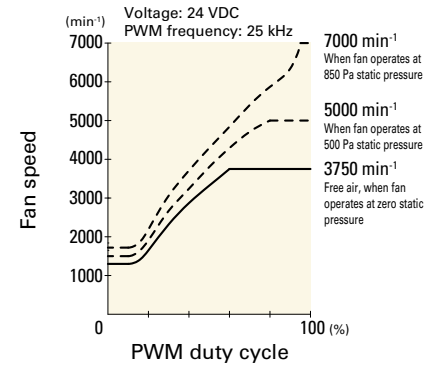
PWM duty cycle



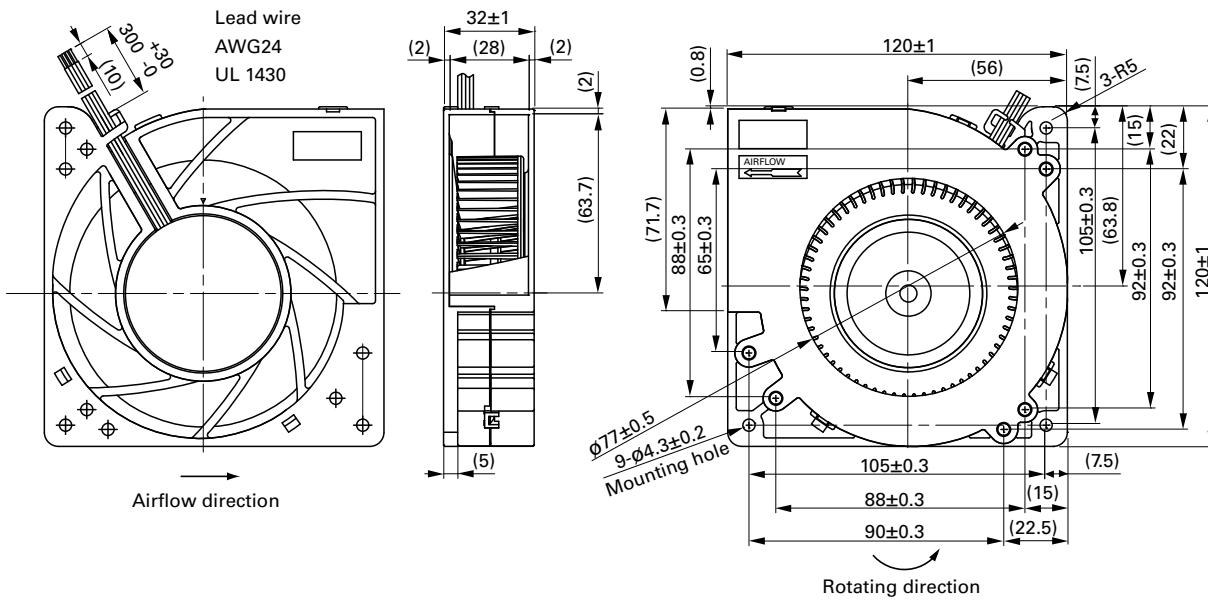
Operating voltage range



PWM duty - Speed characteristics example



Dimensions (unit: mm)



Blower 120 mm DC

127×32 mm


San Ace B127 9BJ type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 290 g

Specifications

The models listed below **have a pulse sensor**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 109BJ12HC2 | 12 | 10.2 to 13.8 | 0.52 | 6.24 | 2400 | 0.78 27.5 | 205.8 0.826 | 46 | -20 to +70 | 40000/60°C (70000/40°C) |
| ▶▶ 109BJ12MC2 | | | 0.29 | 3.48 | 1900 | 0.61 21.5 | 109.8 0.441 | 40 | | |
| ▶▶ 109BJ24HC2 | 24 | 20.4 to 27.6 | 0.26 | 6.24 | 2400 | 0.78 27.5 | 205.8 0.826 | 46 | -20 to +60 | |
| ▶▶ 109BJ24MC2 | | | 0.15 | 3.6 | 1900 | 0.61 21.5 | 109.8 0.441 | 40 | | |

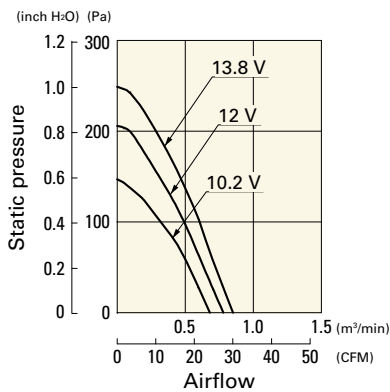
Note 1: Sensor and control options are available for selection. Refer to the table on p. 638.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

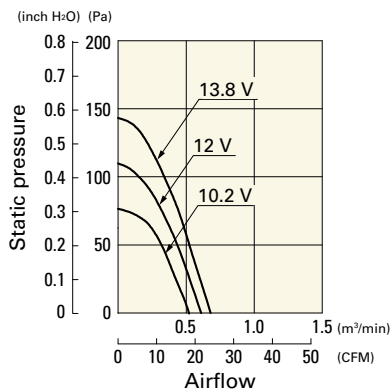
109BJ12HC2 With pulse sensor

Operating voltage range



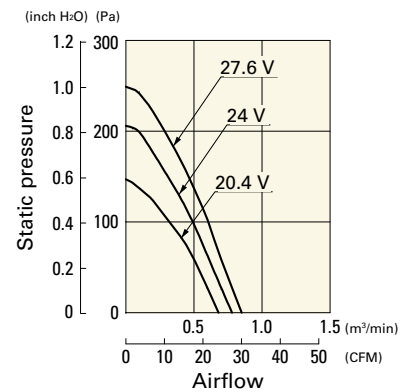
109BJ12MC2 With pulse sensor

Operating voltage range



109BJ24HC2 With pulse sensor

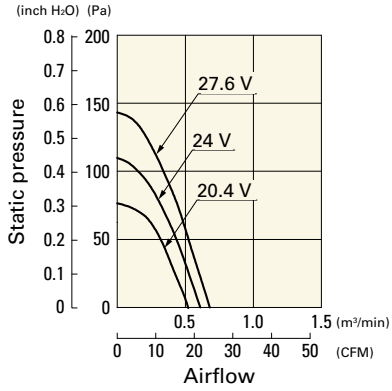
Operating voltage range



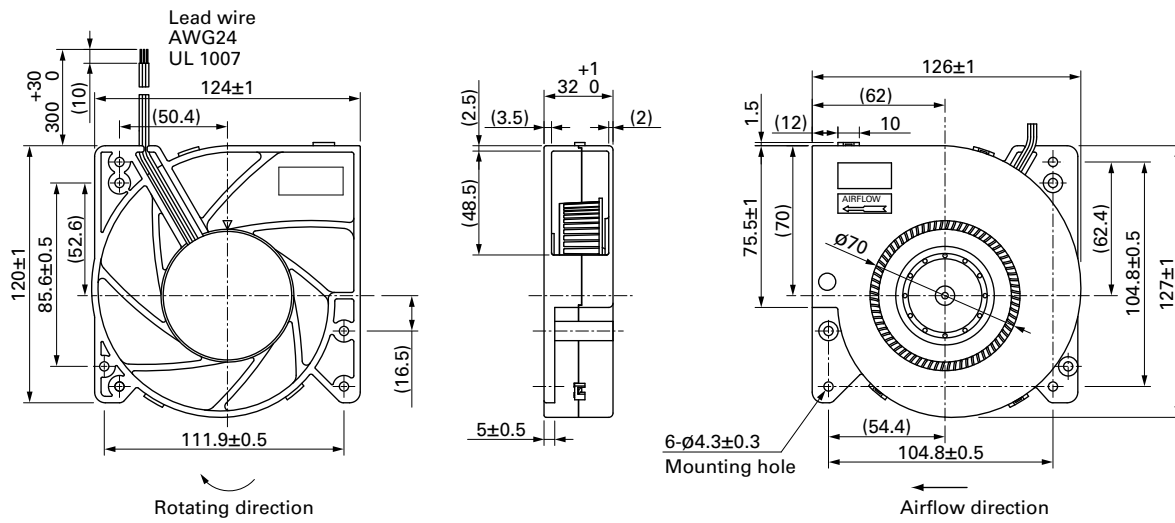
Airflow - Static Pressure Characteristics

109BJ24MC2 With pulse sensor

Operating voltage range






Dimensions (unit: mm)



Blower 127 mm DC

160x40 mm



San Ace B160 9BG type   

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire ⊕Red ⊖Black or Blue Sensor Yellow
- Mass 580 g

Specifications

The models listed below **have a pulse sensor**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ▶▶ 109BG12HC1 | 12 | 10.2 to 13.8 | 1.3 | 15.6 | 2300 | 1.62 57.2 | 313.6 1.259 | 55 | -20 to +60 | 40000/60°C (70000/40°C) |
| ▶▶ 109BG12MC1 | | | 0.64 | 7.68 | 1800 | 1.26 44.5 | 156.8 0.629 | 50 | | |
| ▶▶ 109BG24HC1 | 24 | 20.4 to 27.6 | 0.62 | 14.88 | 2300 | 1.62 57.2 | 313.6 1.259 | 55 | | |
| ▶▶ 109BG24MC1 | | | 0.31 | 7.44 | 1800 | 1.26 44.5 | 156.8 0.629 | 50 | | |

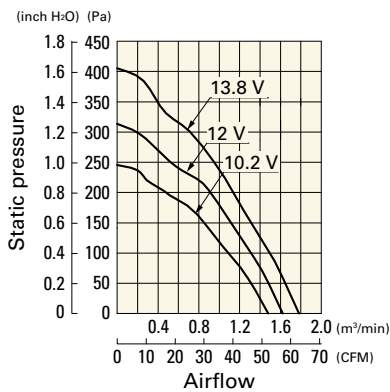
Note 1: Sensor and control options are available for selection. Refer to the table on p. 638.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

Airflow - Static Pressure Characteristics

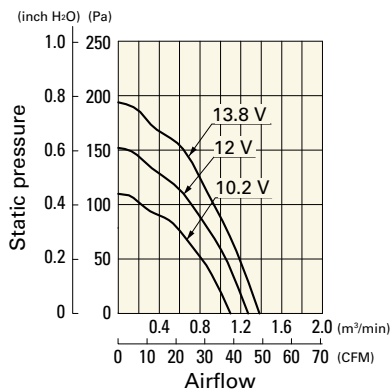
109BG12HC1 With pulse sensor

Operating voltage range



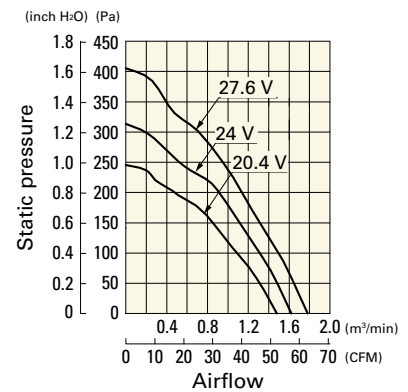
109BG12MC1 With pulse sensor

Operating voltage range



109BG24HC1 With pulse sensor

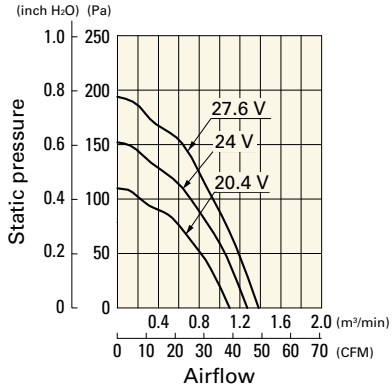
Operating voltage range



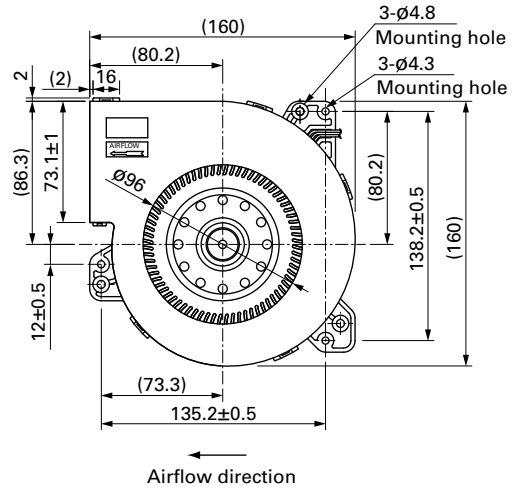
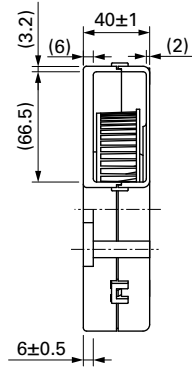
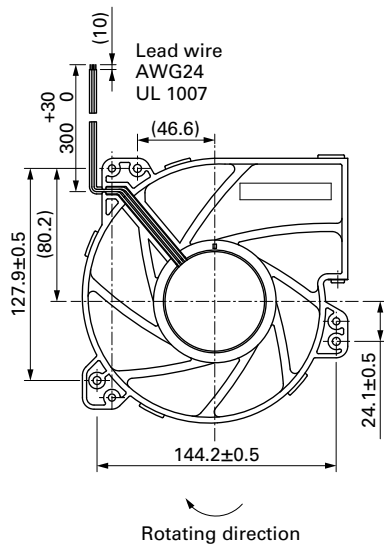
Airflow - Static Pressure Characteristics

109BG24MC1 With pulse sensor

Operating voltage range



Dimensions (unit: mm)



Blower 160 mm DC

ACDC Fan

This fan works while internally converting AC power into DC power, providing the superior performance of a DC fan with the flexibility of AC input.

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

| 9AD | 09 | 01 | H | 1 | 2 | |
|-----------------------|------------------------------------|---------|------------------------------|-----------------------------------|-----------------------|------------|
| Type name | Frame size | Voltage | Speed code | Frame thickness | Sensor specifications | Frame form |
| Type name | 9AD | | | | | |
| Frame size (mm) | 09 12 92×92 120×120 | | | | | |
| Voltage (V) | 01 100 to 240 | | | | | |
| Speed code | H M etc. | | | | | |
| Frame thickness (mm) | 1 38 | | | | | |
| Sensor specifications | 2 Without a sensor | | H With a low-speed sensor | | | |
| Frame form | Nil Plastic frame: Ribbed frame | | | 1 Plastic frame: Ribless frame | | |

Centrifugal Fan

| 9ADT | S | 11 | P | 0 | G | 001 |
|-----------|---------------|---------|-------------|-----------|------------|----------------------------|
| Type name | Impeller size | Voltage | PWM control | Thickness | Speed code | Individual customer's spec |

Bracket-mounted Splash Proof Centrifugal Fan

| 9ADB1T | S | 11 | P | 0 | G | 001 |
|-----------|---------------|---------|-------------|-----------|------------|----------------------------|
| Type name | Impeller size | Voltage | PWM control | Thickness | Speed code | Individual customer's spec |

| | | | | | | |
|--------------------|-----------------------------|--|--|--|--|--|
| Type name | 9ADT 9ADW1T 9ADB1T 9ADB1W1T | | | | | |
| Impeller size (mm) | S ø225 | | | | | |
| Voltage (V) | 11 23 115 230 | | | | | |
| Thickness (mm) | 0 69 _{min.} | | | | | |
| Speed code | G H etc. | | | | | |

How to Read Specifications (ACDC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9AD0901H12 | 100 to 240 | 90 to 264 | 50/60 | 0.08 | 4.5 | 3850 | 1.5 53.0 | 90 0.36 | 40 | -20 to +75 | 60000/60°C (90000/40°C) |
| 9AD0901M12 | | | | 0.06 | 3.0 | 3100 | 1.18 41.7 | 56 0.22 | 33 | | |

- Rated voltage This is the necessary voltage to drive the fan. Single-phase 100 to 240 VAC are also available.
- Operating voltage range The voltage range over which fan operation is guaranteed.
- Frequency This is a frequency of alternating current (AC). The frequencies of 50 Hz and 60 Hz are existing in Japan.
- Rated current The current when the fan is operating at rated voltage (at free air).
- Rated input The power value when the fan is operating at rated voltage (at free air).
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
For more information, please refer to the technical material section.



92x92x38 mm

San Ace 92AD 9AD type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Brushless DC motor
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 4000 VAC, for 1 minute (between input terminal and frame)
50/60 Hz, 2500 VAC, for 1 second (between input terminal and sensor output)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +75°C (Non-condensing)
- Mass 250 g

Do not solder wires directly to AC input terminals.

Specifications

The models listed below **have ribs and no sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9AD0901H12 | 100 to 240 | 90 to 264 | 50/60 | 0.08 | 4.5 | 3850 | 1.5 53.0 | 90 0.36 | 40 | -20 to +75 | 60000/60°C (90000/40°C) |
| 9AD0901M12 | | | | 0.06 | 3.0 | 3100 | 1.18 41.7 | 56 0.22 | 33 | | |

The models listed below **have ribs and a low-speed sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9AD0901H1H | 100 to 240 | 90 to 264 | 50/60 | 0.08 | 4.5 | 3850 | 1.5 53.0 | 90 0.36 | 40 | -20 to +75 | 60000/60°C (90000/40°C) |
| 9AD0901M1H | | | | 0.06 | 3.0 | 3100 | 1.18 41.7 | 56 0.22 | 33 | | |

Note: The mark indicates Short Lead Time Service applicable models. See p. 668 for details.

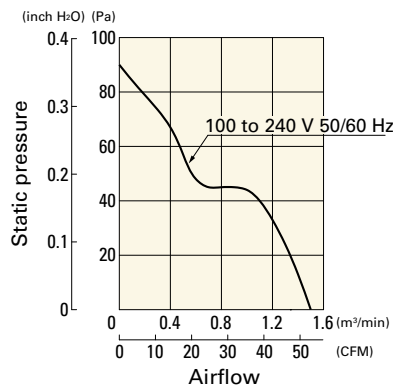
Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 669.

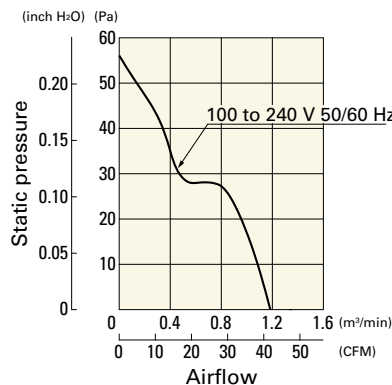
| Order no. | Set items | | | | | |
|----------------|------------|--------------|------------------|--------------|---------------|---------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-9AD0901H12 | 9AD0901H12 | 100 to 240 V | | 489-1635-L10 | 109-099E | M4x55 mm (4 screws) |
| ST1-9AD0901M12 | 9AD0901M12 | | | 489-1635-L10 | 109-099E | |
| ST1-9AD0901H1H | 9AD0901H1H | | | 489-1635-L10 | 109-099E | |
| ST1-9AD0901M1H | 9AD0901M1H | | | 489-1635-L10 | 109-099E | |

Airflow - Static Pressure Characteristics

9AD0901H12, 9AD0901H1H

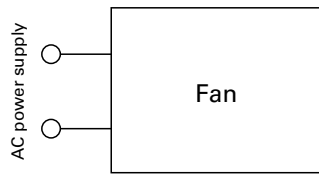


9AD0901M12, 9AD0901M1H

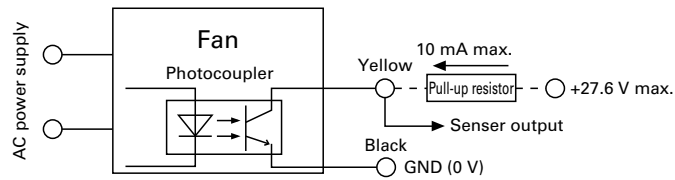


Connection Schematic

without Sensor



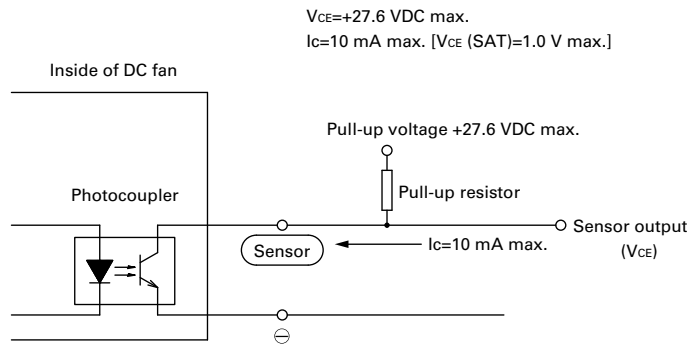
with Low-speed sensor



Specifications for Low-speed Sensors

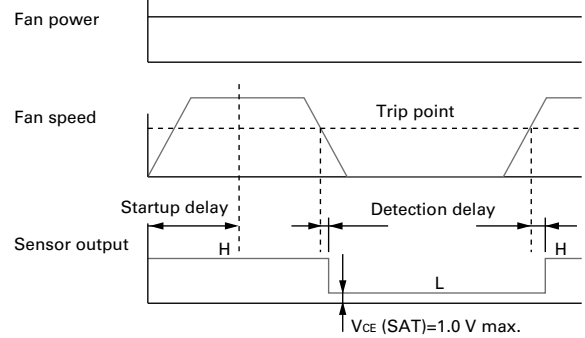
Typical standard model: 9AD0901H1H

Output circuit: Open collector

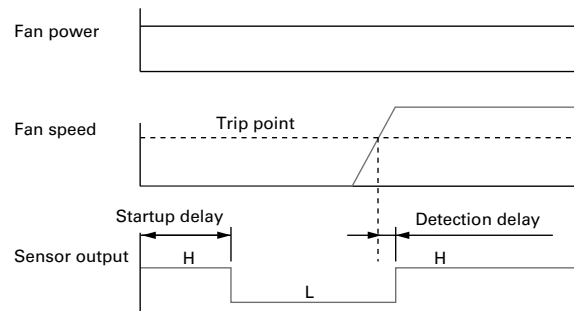


Sensor scheme

Example 1: when steady running



Example 2: when the rotor is locked when the fan motor is turned on and released after the start-up delay time.



9AD0901H1H

Startup delay: 18±3 s

Detection delay: 3 s max.

Trip point: 1700 min⁻¹

9AD0901M1H

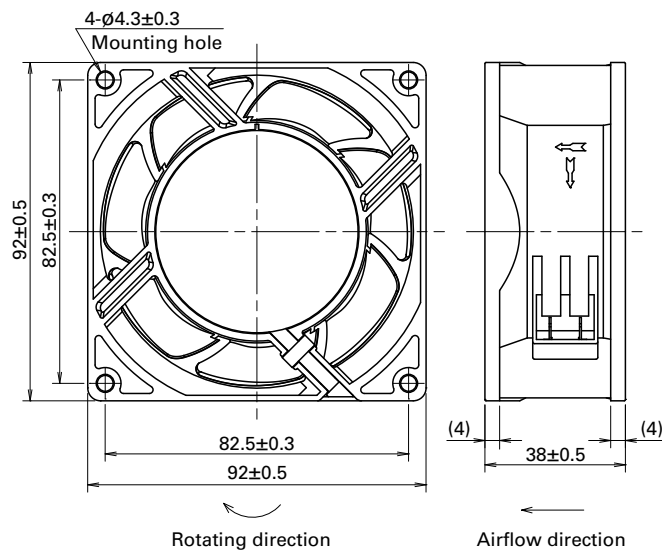
Startup delay: 36±3 s

Detection delay: 3 s max.

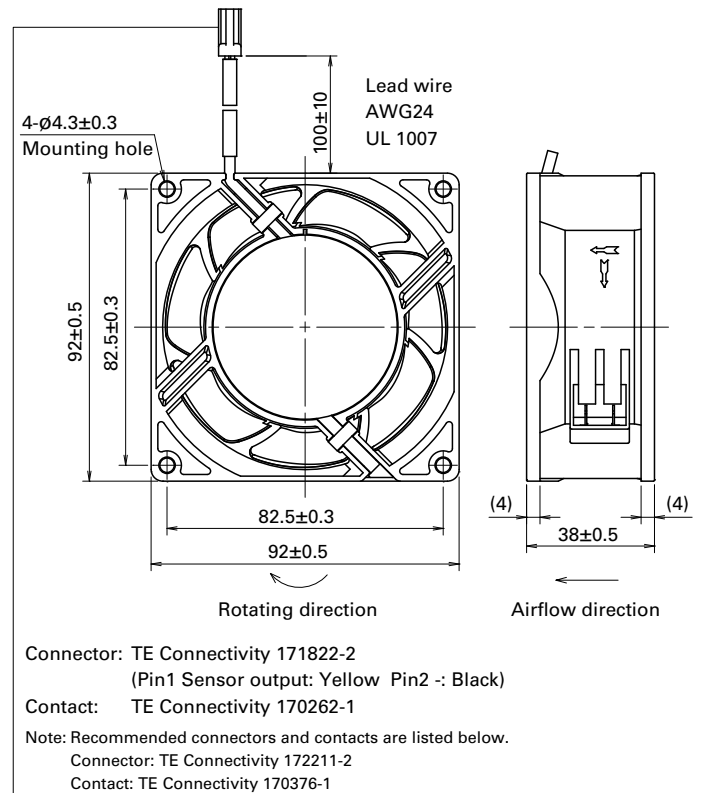
Trip point: 850 min⁻¹

Dimensions (unit: mm) (With ribs)

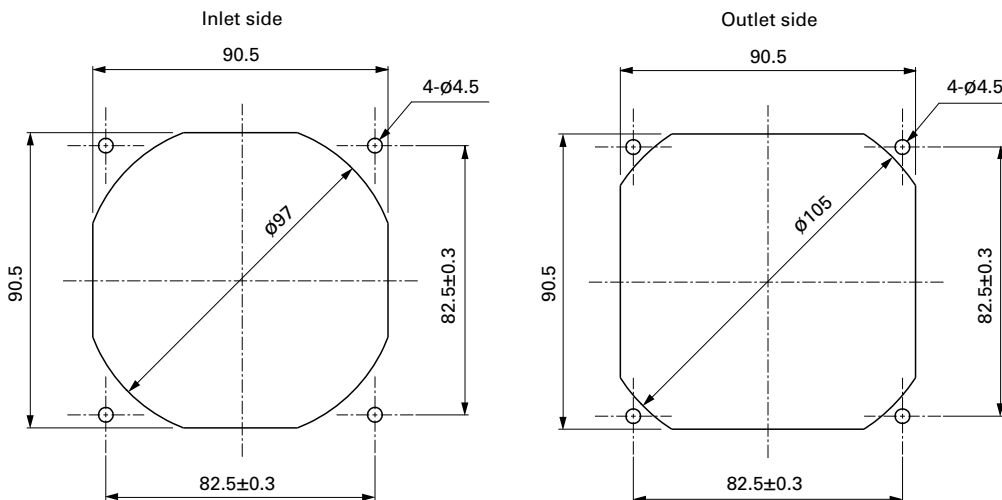
without Sensor



with Low-speed sensor



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)

Plug cord

page: p. 610

Model no.: 489-1635-L10, 489-1635-L21

Sensor extension wiring harness

page: p. 610

Model no.: 489-1636



120x120x38 mm

San Ace 120AD 9ADA type Certification of safety standards being processed.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame, and between sensor output and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

| | | |
|----------------|-----------|---------|
| AC power input | L: Orange | N: Gray |
| Sensor | Yellow | Control |
| | Brown | GND |
| | | Black |
- Mass 340 g

Specifications

The models listed below **have ribs and no sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADA1201G1002 | 100 to 240 | 90 to 264 | 50/60 | 0.17 | 9.0 | 4400 | 3.9 138 | 170 0.683 | 52 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9ADA1201H1002 | | | | 0.13 | 6.6 | 3800 | 3.36 119 | 128 0.514 | 48 | | 60000/60°C (90000/40°C) |

The models listed below **have ribs and a low-speed sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADA1201G1H001 | 100 to 240 | 90 to 264 | 50/60 | 0.17 | 9.0 | 4400 | 3.9 138 | 170 0.683 | 52 | -20 to +70 | 40000/60°C (70000/40°C) |

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

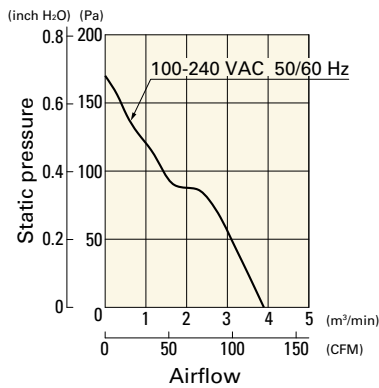
| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------------|-------------------|-----------------------------|----------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADA1201P1G001 | 100 to 240 | 90 to 264 | 50/60 | 100 | 0.17 | 9.0 | 4400 | 3.9 138 | 170 0.683 | 52 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | | 20 | 0.04 | 1.4 | 1050 | 0.93 32.8 | 15 0.06 | 25 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 0% duty cycle.

Airflow - Static Pressure Characteristics

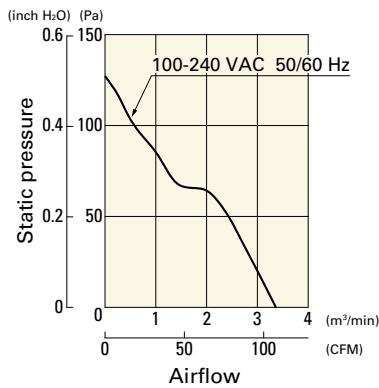
9ADA1201G1002 No sensor

Operating voltage range



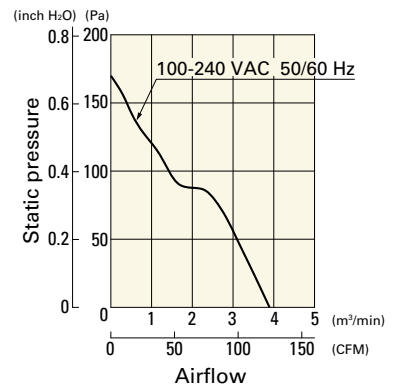
9ADA1201H1002 No sensor

Operating voltage range



9ADA1201G1H001 With low-speed sensor

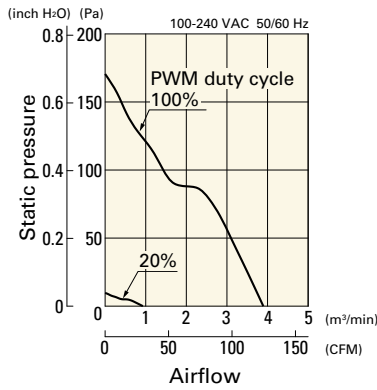
Operating voltage range



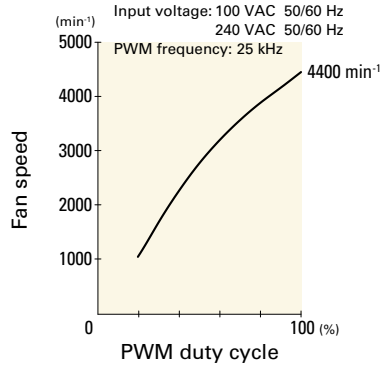
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADA1201P1G001 With pulse sensor with PWM control

PWM duty cycle

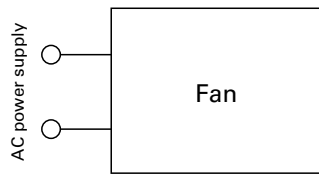


PWM duty - Speed characteristics example

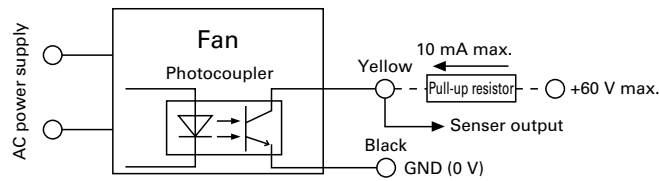


Connection Schematic

without Sensor

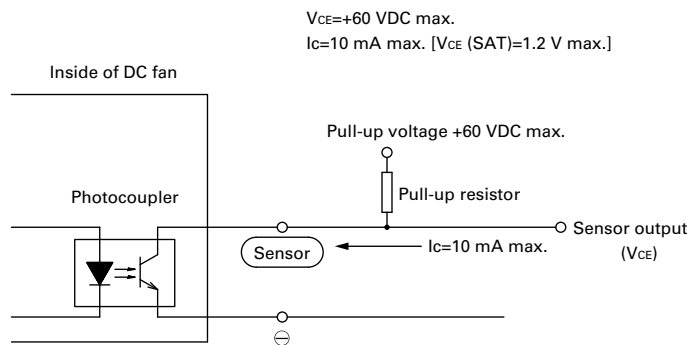


with Low-speed sensor



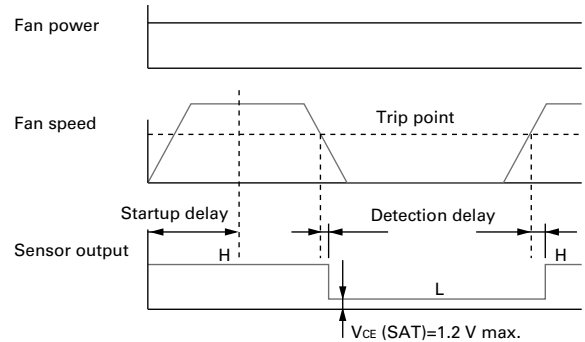
Specifications for Low-speed Sensors

Output circuit: Open collector

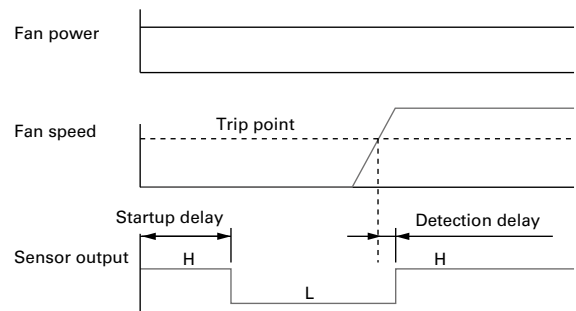


Sensor scheme

Example 1: when steady running



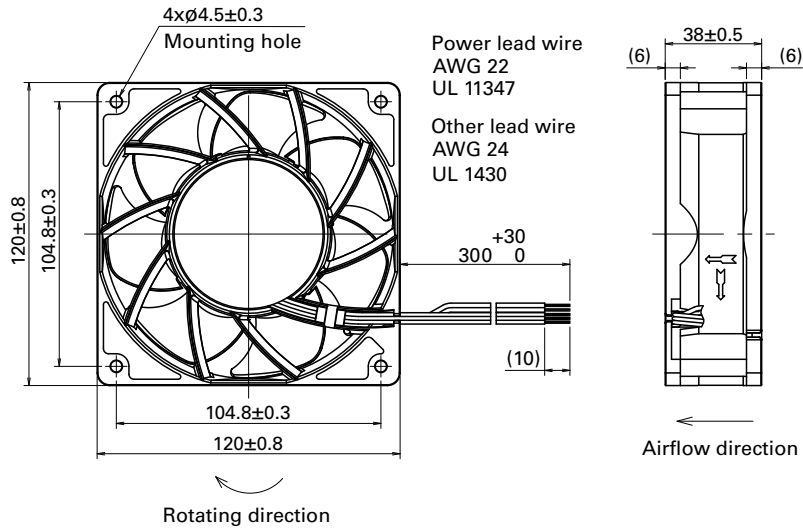
Example 2: when the rotor is locked when the fan motor is turned on and released after the start-up delay time.



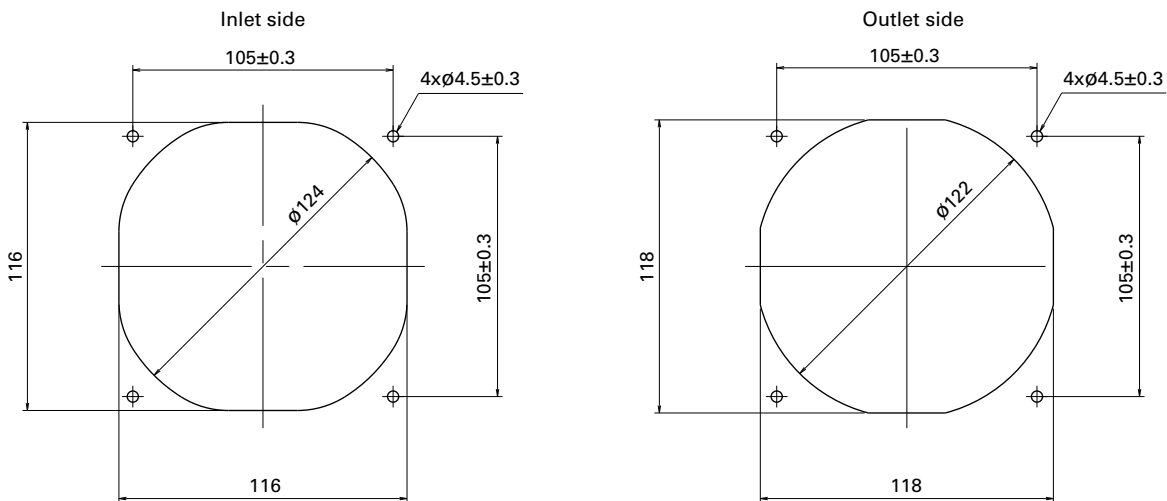
Startup delay: 18 ± 3 s
 Detection delay: 3 s max.
 Trip point: 1700 min^{-1}

ACDC Fan 120 mm sq. ACDC

Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards page: p. 599
 Model no.: 109-019E, 109-019K

Resin finger guards page: p. 605
 Model no.: 109-1000G

Resin filter kits page: p. 606
 Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
 109-1000F30 (30PPI), 109-1000F40 (40PPI)



120×120×38 mm

San Ace 120AD 9ADAW type Certification of safety standards being processed.

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame, and between sensor output and frame)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

| | | |
|----------------|-----------|---------|
| AC power input | L: Orange | N: Gray |
| Sensor | Yellow | Control |
| | Brown | GND |
| | | Black |
- Mass 420 g
- Ingress protection IP68 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have ribs and no sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADAW1201H1002 | 100 to 240 | 90 to 264 | 50/60 | 0.13 | 6.6 | 3800 | 3.36 119 | 128 0.514 | 48 | -20 to +70 | 60000/60°C (90000/40°C) |

The models listed below **have ribs and a low-speed sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADAW1201H1H001 | 100 to 240 | 90 to 264 | 50/60 | 0.13 | 6.6 | 3800 | 3.36 119 | 128 0.514 | 48 | -20 to +70 | 60000/60°C (90000/40°C) |

The models listed below **have ribs and a pulse sensor with PWM control**. For models without ribs, append "1" to the end of model numbers.

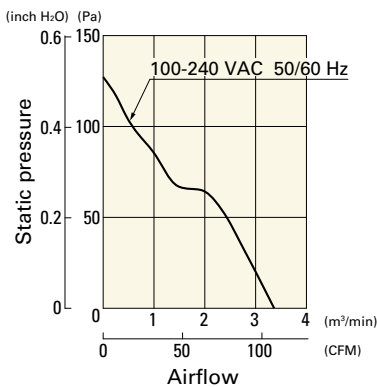
| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------------|-------------------|-----------------------------|----------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADAW1201P1H001 | 100 to 240 | 90 to 264 | 50/60 | 100 | 0.13 | 6.6 | 3800 | 3.36 119 | 128 0.514 | 48 | -20 to +70 | 60000/60°C (90000/40°C) |
| | | | | 25 | 0.04 | 1.4 | 1050 | 0.93 32.8 | 15 0.06 | 25 | | |

* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 0% duty cycle.

Airflow - Static Pressure Characteristics

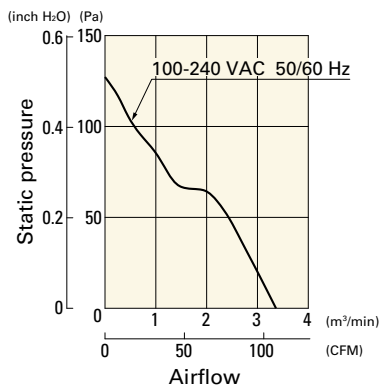
9ADAW1201H1002 No sensor

Operating voltage range



9ADAW1201H1H001 With low-speed sensor

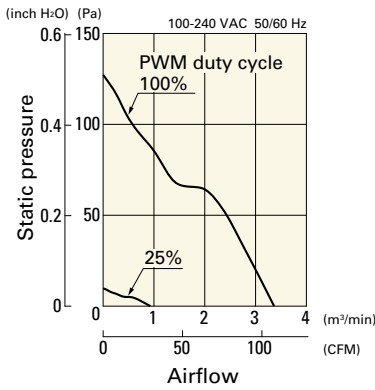
Operating voltage range



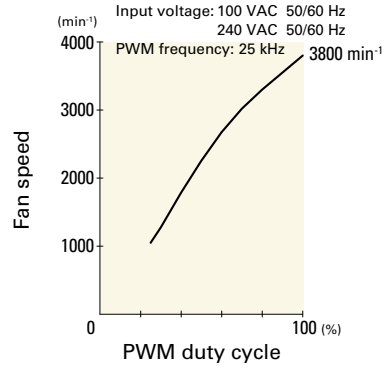
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADAW1201P1H001 With pulse sensor with PWM control

PWM duty cycle

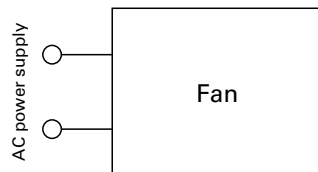


PWM duty - Speed characteristics example

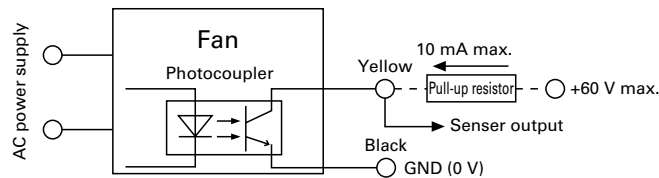


Connection Schematic

without Sensor

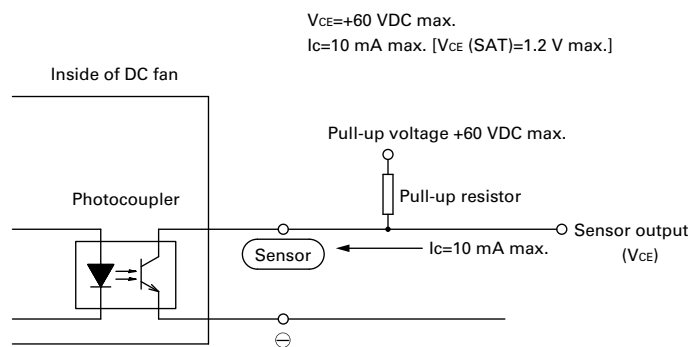


with Low-speed sensor



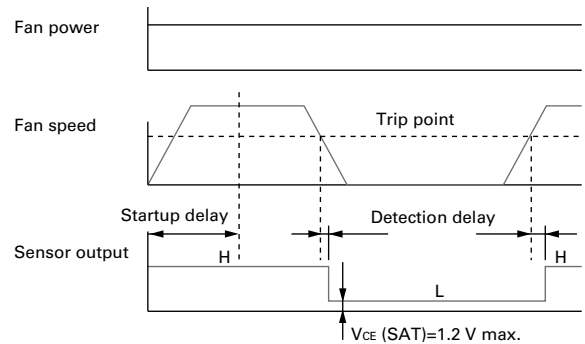
Specifications for Low-speed Sensors

Output circuit: Open collector

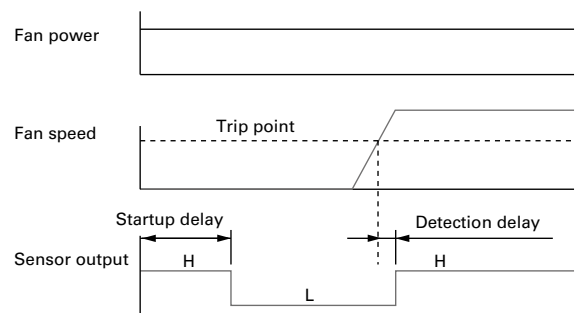


Sensor scheme

Example 1: when steady running



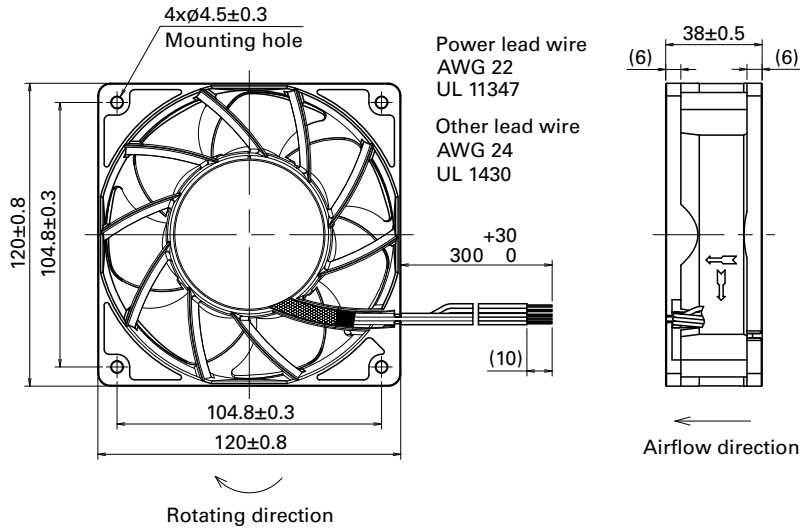
Example 2: when the rotor is locked when the fan motor is turned on and released after the start-up delay time.



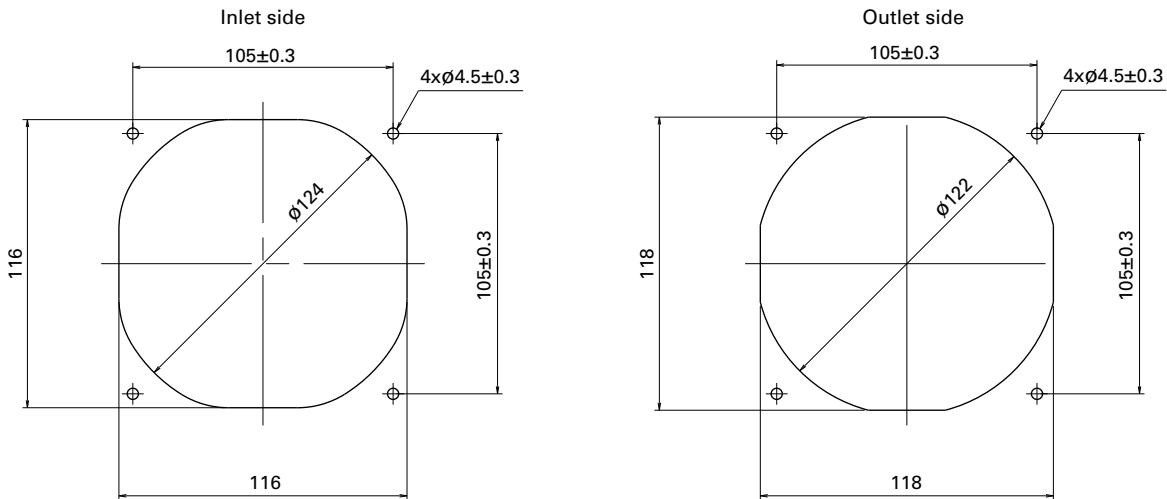
Startup delay: 18 ± 3 s
 Detection delay: 3 s max.
 Trip point: 1700 min^{-1}

ACDC Fan 120 mm sq. ACDC

Dimensions (unit: mm) (Ribbed frame with pulse sensor with PWM control)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)



120x120x38 mm

San Ace 120AD 9AD type

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Brushless DC motor
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 4000 VAC, for 1 minute (between input terminal and frame)
50/60 Hz, 2500 VAC, for 1 second (between input terminal and sensor output)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +75°C (Non-condensing)
- Mass 290 g

Do not solder wires directly to AC input terminals.

Specifications

The models listed below **have ribs and no sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ☞ 9AD1201H12 | 100 to 240 | 90 to 264 | 50/60 | 0.08 | 4.4 | 3250 | 3.0 106 | 84 0.34 | 42 | -20 to +75 | 60000/60°C (90000/40°C) |

The models listed below **have ribs and a low-speed sensor**. For models without ribs, append "1" to the end of model numbers.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| ☞ 9AD1201H1H | 100 to 240 | 90 to 264 | 50/60 | 0.08 | 4.4 | 3250 | 3.0 106 | 84 0.34 | 42 | -20 to +75 | 60000/60°C (90000/40°C) |

Note: The ☞ mark indicates Short LeadTime Service applicable models. See p. 668 for details.

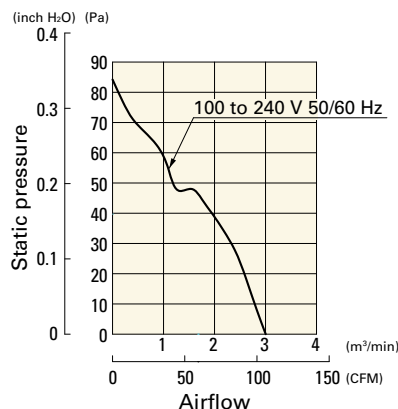
Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 669.

| Order no. | Set items | | | | | |
|----------------|------------|--------------|------------------|--------------|---------------|---------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-9AD1201H12 | 9AD1201H12 | 100 to 240 V | | 489-1635-L10 | 109-019E | M4x55 mm (4 screws) |
| ST1-9AD1201H1H | 9AD1201H1H | | ○ | 489-1635-L10 | 109-019E | |

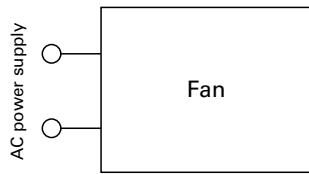
Airflow - Static Pressure Characteristics

9AD1201H12, 9AD1201H1H

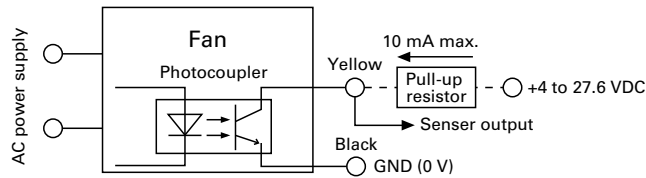


Connection Schematic

without Sensor



with Low-speed sensor

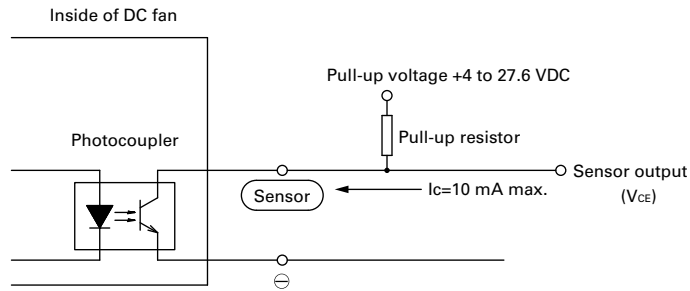


Specifications for Low-speed Sensors

Model No.: 9AD1201H1H

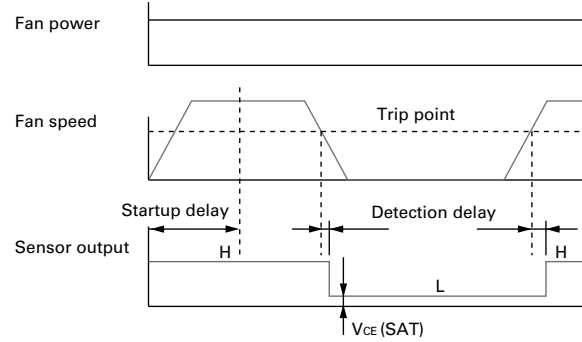
Output circuit: Open collector

$V_{CE} = +27.6$ VDC max.
 $I_C = 10$ mA max. [$V_{CE(SAT)} = 1.0$ V max.]

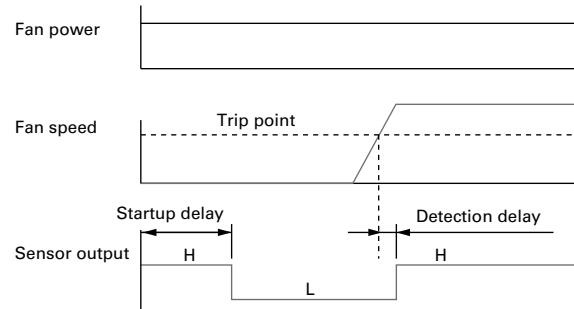


Sensor scheme

Example 1: when steady running



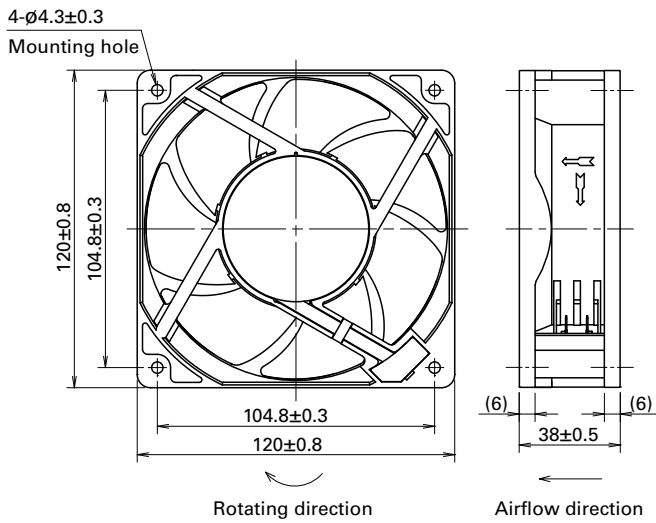
Example 2: when the rotor is locked when the fan motor is turned on and released after the start-up delay time.



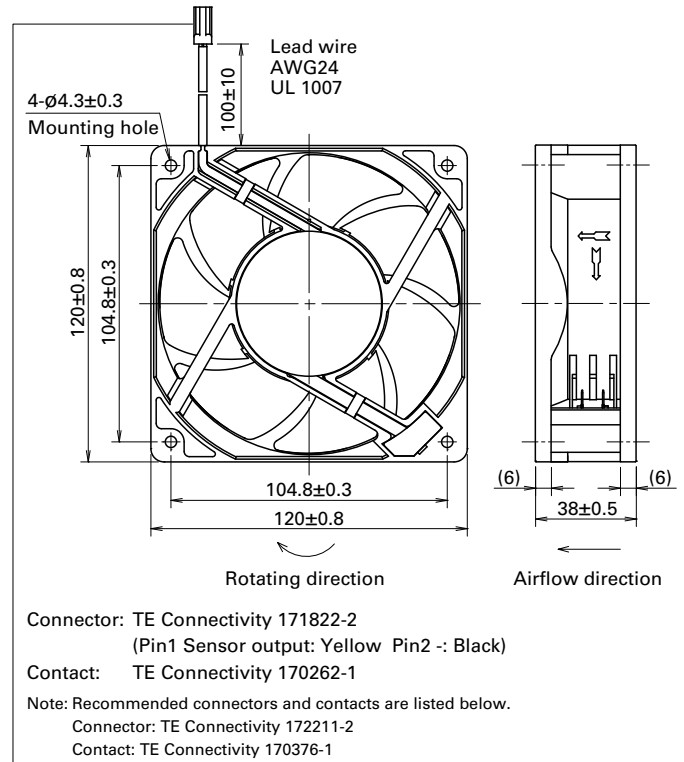
Startup delay: 18 ± 3 s
 Detection delay: 3 s max.
 Trip point: 1700 min^{-1}

Dimensions (unit: mm) (With ribs)

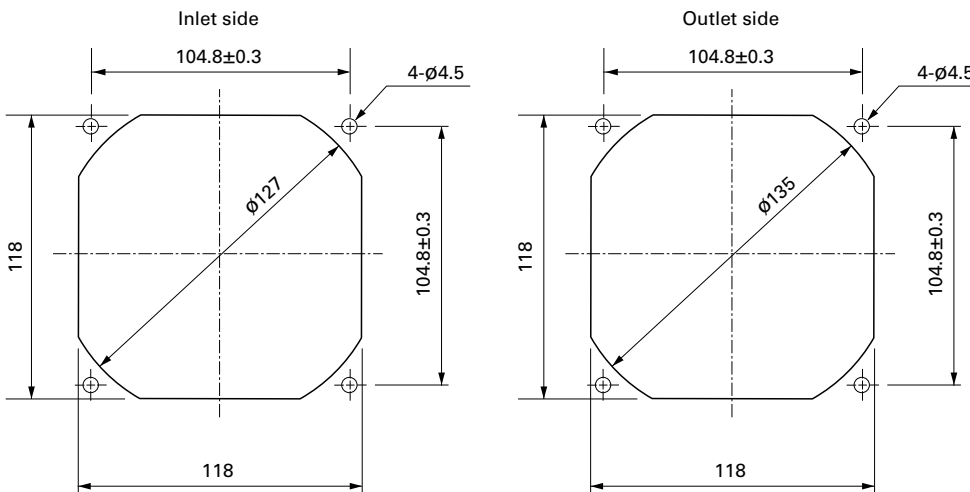
without Sensor



with Low-speed sensor



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)

Plug cord

page: p. 610

Model no.: 489-1635-L10, 489-1635-L21

Sensor extension wiring harness

page: p. 610

Model no.: 489-1636



160×160×51 mm

San Ace 160AD 9AD type   Certification of UL standards being processed.

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute
(Lead wire model: between lead wire conductors and frame, terminal model: between terminals and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
(Lead wire model: between lead wire conductors and frame, terminal model: between terminals and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

| | | | | | |
|----------------|---|---------|-------|-----|-------|
| AC power input | L: Orange N: Gray | | | | |
| Sensor | Yellow <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="border: 1px solid black; padding: 2px;">Control</td> <td style="padding: 2px;">Brown</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">GND</td> <td style="padding: 2px;">Black</td> </tr> </table> | Control | Brown | GND | Black |
| Control | Brown | | | | |
| GND | Black | | | | |
- Mass 880 g

Specifications

The models listed below **have no sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------------------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|-----|--|------|--------------|----------------------------|----------------------------|
| 9AD1601H5002 ^{*1} | 100 to 240 | 90 to 264 | 50/60 | 0.46 | 22 | 4150 | 8.2 | 290 | 167 | 0.66 | 58 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9AD1601H5T02 ^{*2} | | | | 0.46 | 22 | 4150 | 8.2 | 290 | 167 | 0.66 | 58 | | |

*1 Lead wire model *2 Terminal model

The models listed below **have a low-speed sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------------------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|-----|--|------|--------------|----------------------------|----------------------------|
| 9AD1601H5H001 ^{*1} | 100 to 240 | 90 to 264 | 50/60 | 0.46 | 22 | 4150 | 8.2 | 290 | 167 | 0.66 | 58 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9AD1601H5HT01 ^{*2} | | | | 0.46 | 22 | 4150 | 8.2 | 290 | 167 | 0.66 | 58 | | |

*1 Lead wire model *2 Terminal model

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle ^{*3} [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | | Max. static pressure [Pa] [inchH ₂ O] | | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------------------------|-------------------|-----------------------------|----------------|----------------------------------|-------------------|-----------------|----------------------------------|--|-----|--|------|--------------|----------------------------|----------------------------|
| 9AD1601P5H003 ^{*1} | 100 to 240 | 90 to 264 | 50/60 | 100 | 0.46 | 22 | 4150 | 8.2 | 290 | 167 | 0.66 | 58 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | | 0 | 0.10 | 4.0 | 1500 | 3.07 | 108 | 44 | 0.17 | 31 | | |
| 9AD1601P5HT03 ^{*2} | | | | 100 | 0.46 | 22 | 4150 | 8.2 | 290 | 167 | 0.66 | 58 | | |
| | | | | 0 | 0.10 | 4.0 | 1500 | 3.07 | 108 | 44 | 0.17 | 31 | | |

*1 Lead wire model *2 Terminal model

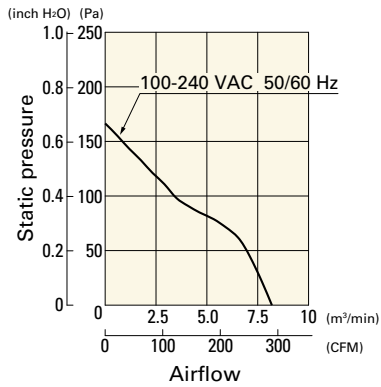
*3 PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 0% duty cycle.

Airflow - Static Pressure Characteristics

9AD1601H5002, 9AD1601H5T02

No sensor

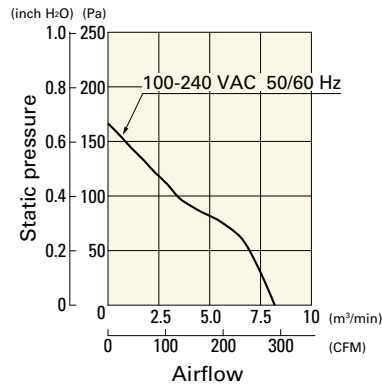
Operating voltage range



9AD1601H5H001, 9AD1601H5HT01

With low-speed sensor

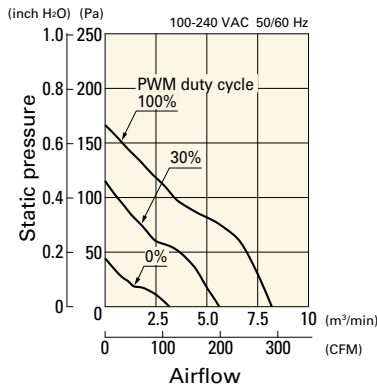
Operating voltage range



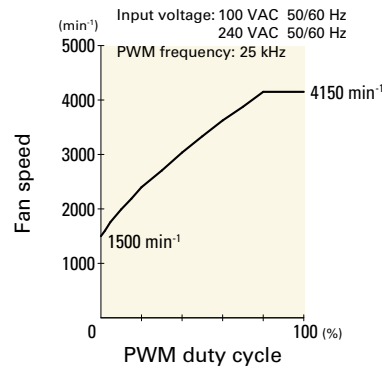
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9AD1601P5H003, 9AD1601P5HT03 With pulse sensor with PWM control

PWM duty cycle

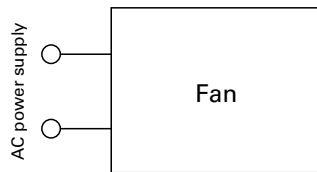


PWM duty - Speed characteristics example

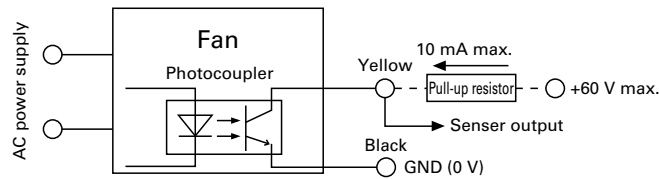


Connection Schematic

without Sensor

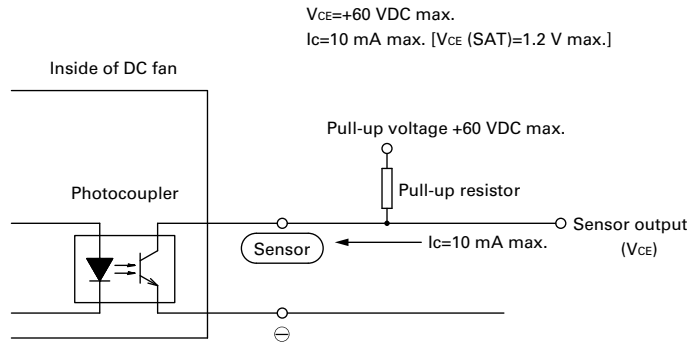


with Low-speed sensor



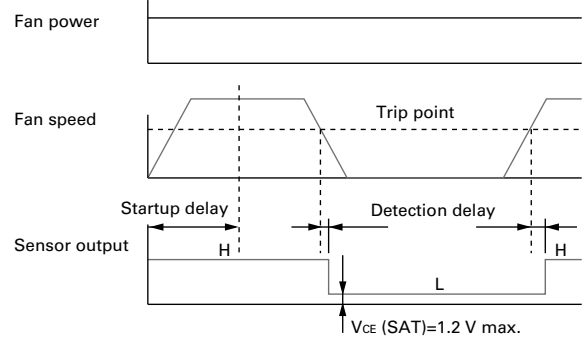
Specifications for Low-speed Sensors

Output circuit: Open collector

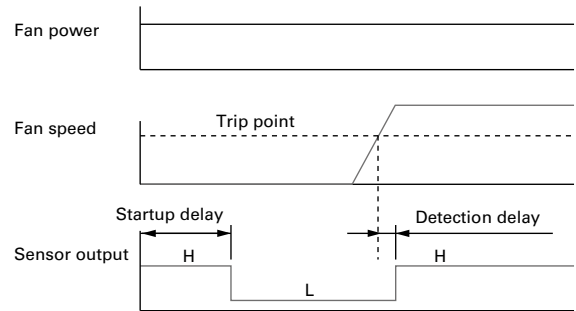


Sensor scheme

Example 1: when steady running



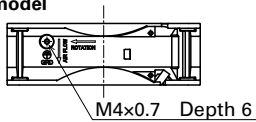
Example 2: when the rotor is locked when the fan motor is turned on and released after the start-up delay time.



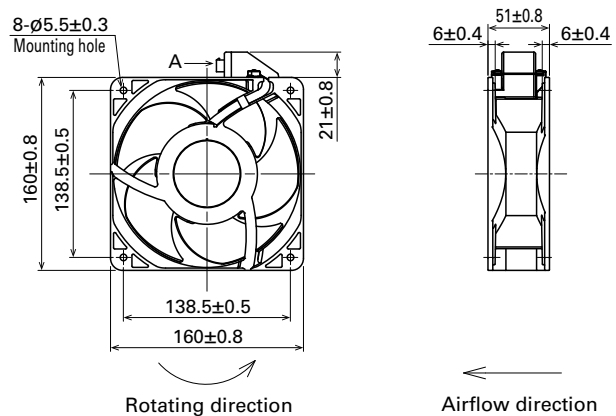
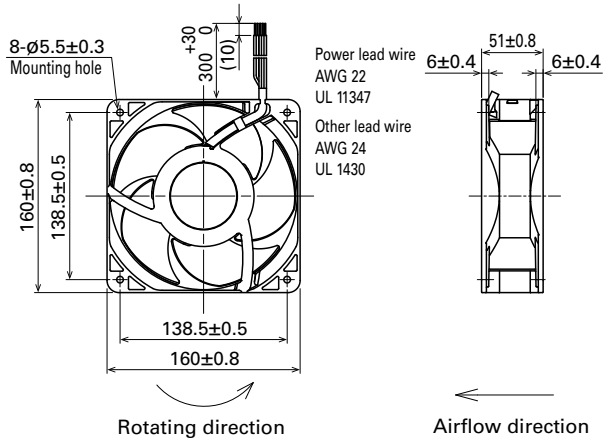
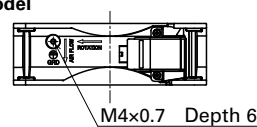
Startup delay: $18 \pm 3 \text{ s}$
Detection delay: 3 s max.
Trip point: 1700 min^{-1}

Dimensions (unit: mm) (With pulse sensor with PWM control)

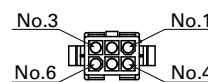
Lead wire model



Terminal model



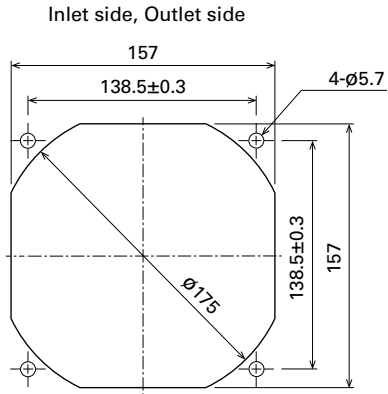
A Connector contact



Pin arrangement
Connector (Model no.: TE Connectivity: 1-172160-9)

| Pin No. | Function | Input |
|---------|---------------|-------|
| 1 | L | AC |
| 2 | No connection | - |
| 3 | N | AC |
| 4 | PWM | DC |
| 5 | GND | DC |
| 6 | Sensor | DC |

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-619E, 109-619H

Terminal model wiring harness

page: p. 610

Model no.: 489-1647



160×160×51 mm

San Ace 160AD 9ADW type    Certification of UL standards being processed.

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute
(Lead wire model: between lead wire conductors and frame, terminal model: between terminals and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
(Lead wire model: between lead wire conductors and frame, terminal model: between terminals and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

| |
|----------------|
| AC power input |
| Sensor |

 L: Orange N: Gray

| |
|---------|
| Control |
|---------|

 Brown

| |
|-----|
| GND |
|-----|

 Black
- Mass 940 g
- Ingress protection IP56 (Excluding the connectors of terminal models)
For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have no sensor**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADW1601H5002 ^{*1} | 100 to 240 | 90 to 264 | 50/60 | 0.46 | 22 | 4150 | 8.2 290 | 167 0.66 | 58 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9ADW1601H5T02 ^{*2} | | | | 0.46 | 22 | 4150 | 8.2 290 | 167 0.66 | 58 | | |

*1 Lead wire model *2 Terminal model

The models listed below **have a low-speed sensor**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADW1601H5H001 ^{*1} | 100 to 240 | 90 to 264 | 50/60 | 0.46 | 22 | 4150 | 8.2 290 | 167 0.66 | 58 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9ADW1601H5HT01 ^{*2} | | | | 0.46 | 22 | 4150 | 8.2 290 | 167 0.66 | 58 | | |

*1 Lead wire model *2 Terminal model

The models listed below **have a pulse sensor with PWM control**.

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle ³ [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------------------|-------------------|-----------------------------|----------------|---------------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADW1601P5H003 ^{*1} | 100 to 240 | 90 to 264 | 50/60 | 100 | 0.46 | 22 | 4150 | 8.2 290 | 167 0.66 | 58 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | | 0 | 0.10 | 4.0 | 1500 | 3.07 108 | 44 0.17 | 31 | | |
| 9ADW1601P5HT03 ^{*2} | | | | 100 | 0.46 | 22 | 4150 | 8.2 290 | 167 0.66 | 58 | | |
| | | | | 0 | 0.10 | 4.0 | 1500 | 3.07 108 | 44 0.17 | 31 | | |

*1 Lead wire model *2 Terminal model

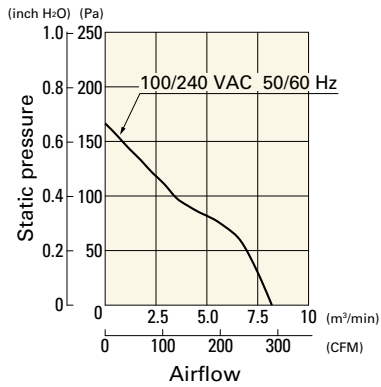
*3 PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 0% duty cycle.

Airflow - Static Pressure Characteristics

9ADW1601H5002, 9ADW1601H5T02

No sensor

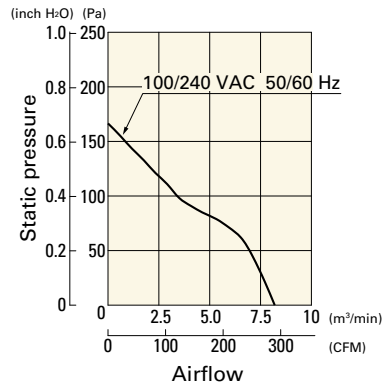
Operating voltage range



9ADW1601H5H001, 9ADW1601H5HT01

With low-speed sensor

Operating voltage range

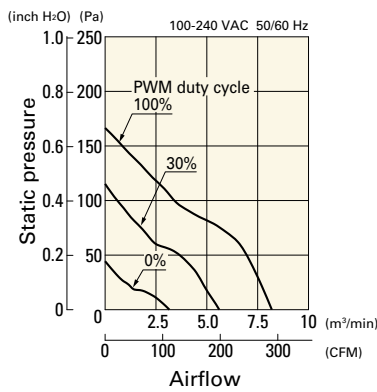


Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

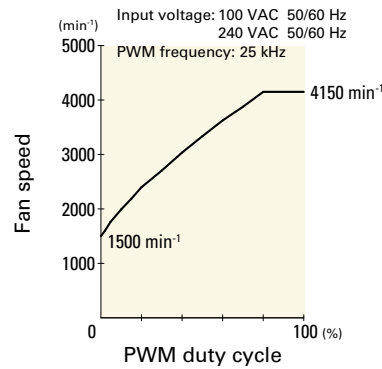
9ADW1601P5H003, 9ADW1601P5HT03

With pulse sensor with PWM control

PWM duty cycle

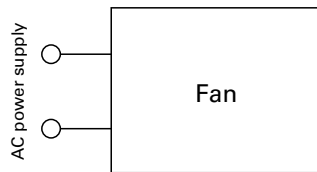


PWM duty - Speed characteristics example

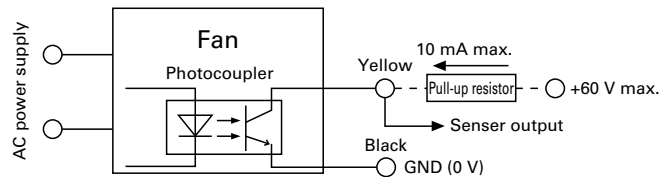


Connection Schematic

without Sensor

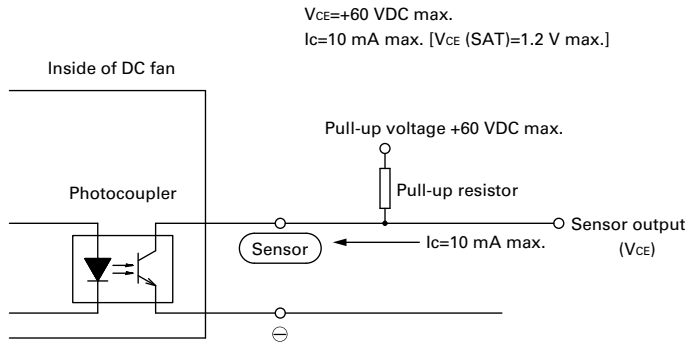


with Low-speed sensor



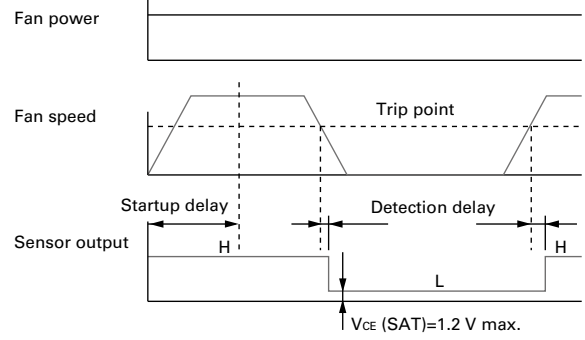
Specifications for Low-speed Sensors

Output circuit: Open collector

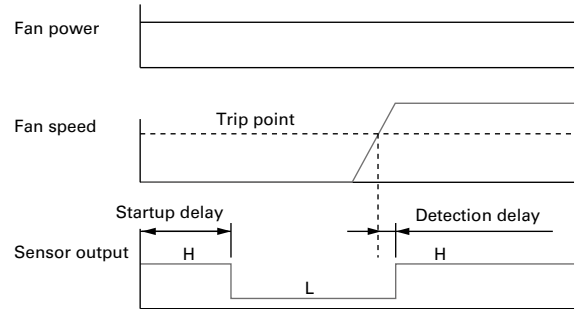


Sensor scheme

Example 1: when steady running



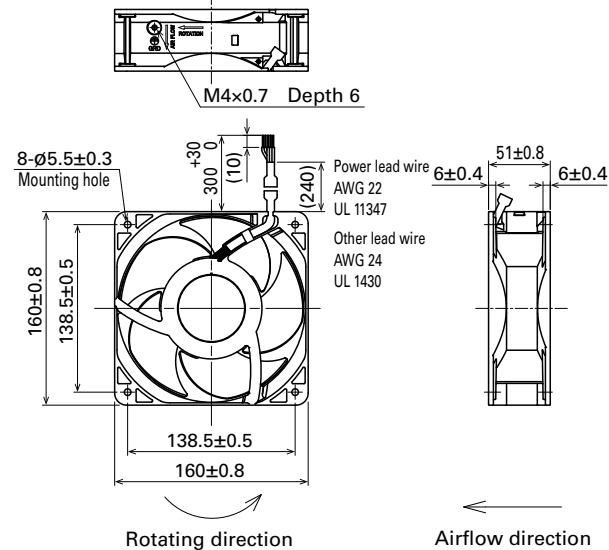
Example 2: when the rotor is locked when the fan motor is turned on and released after the start-up delay time.



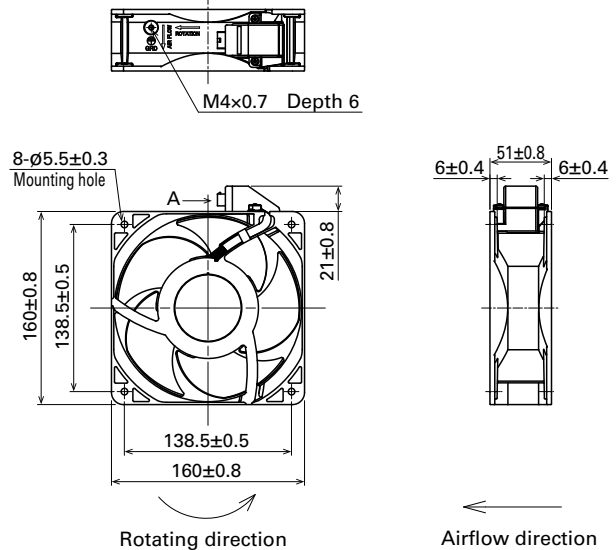
Startup delay: 18 ± 3 s
 Detection delay: 3 s max.
 Trip point: 1700 min^{-1}

Dimensions (unit: mm) (With pulse sensor with PWM control)

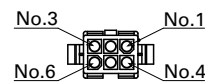
Lead wire model



Terminal model



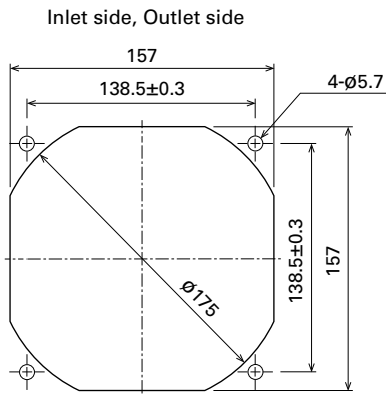
A Connector contact



Pin arrangement
 Connector (Model no.: TE Connectivity: 1-172160-9)

| Pin No. | Function | Input |
|---------|---------------|-------|
| 1 | L | AC |
| 2 | No connection | - |
| 3 | N | AC |
| 4 | PWM | DC |
| 5 | GND | DC |
| 6 | Sensor | DC |

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

page: p. 599

Model no.: 109-619E, 109-619H

Terminal model wiring harness

page: p. 610

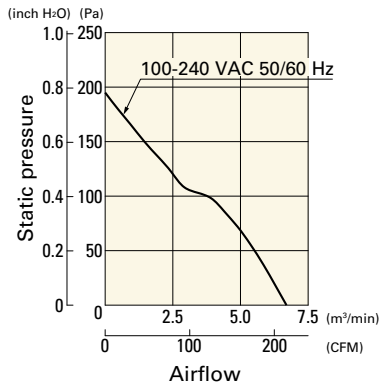
Model no.: 489-1647

Airflow - Static Pressure Characteristics

9AD5701H5002, 9AD5701H5T02

No sensor

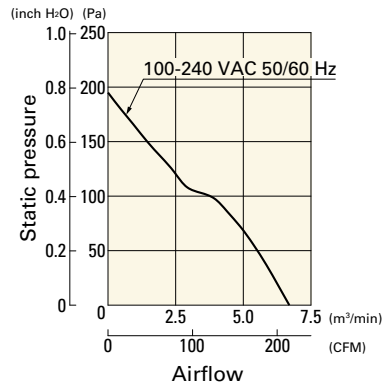
Operating voltage range



9AD5701H5H001, 9AD5701H5HT01

With low-speed sensor

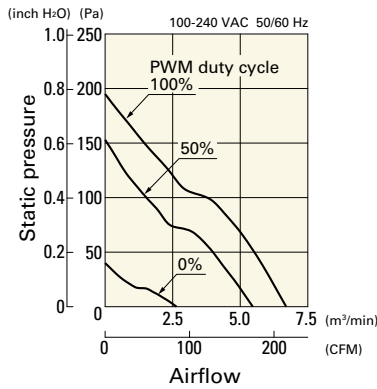
Operating voltage range



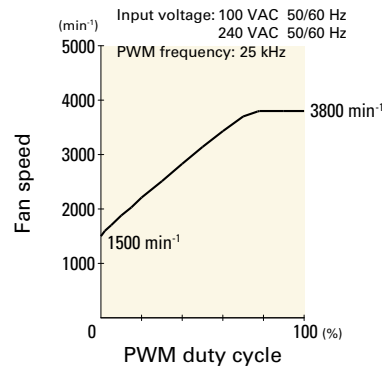
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9AD5701P5H003, 9AD5701P5HT03 With pulse sensor with PWM control

PWM duty cycle

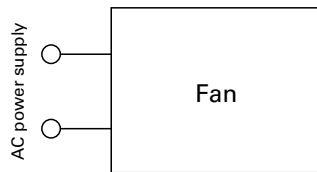


PWM duty - Speed characteristics example

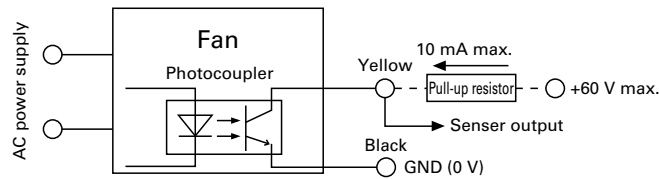


Connection Schematic

without Sensor

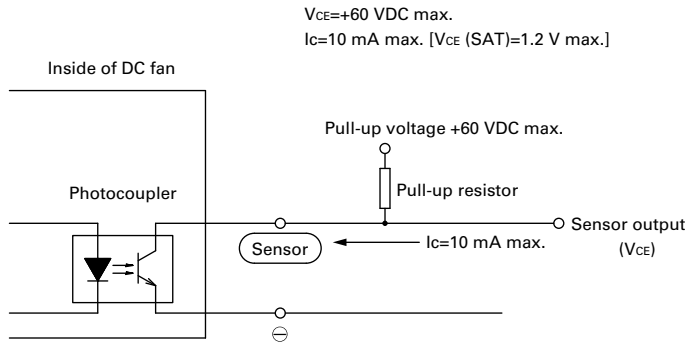


with Low-speed sensor



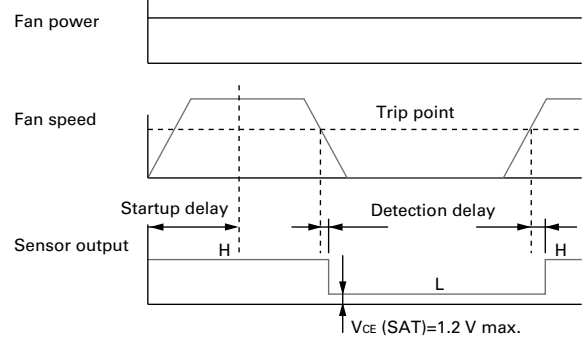
Specifications for Low-speed Sensors

Output circuit: Open collector

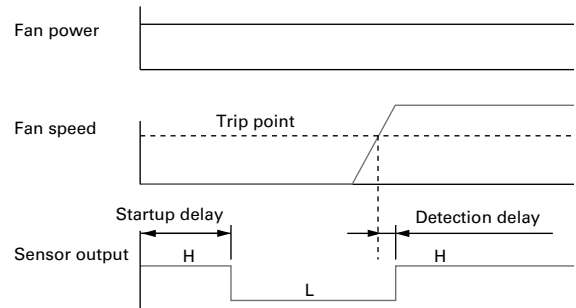


Sensor scheme

Example 1: when steady running



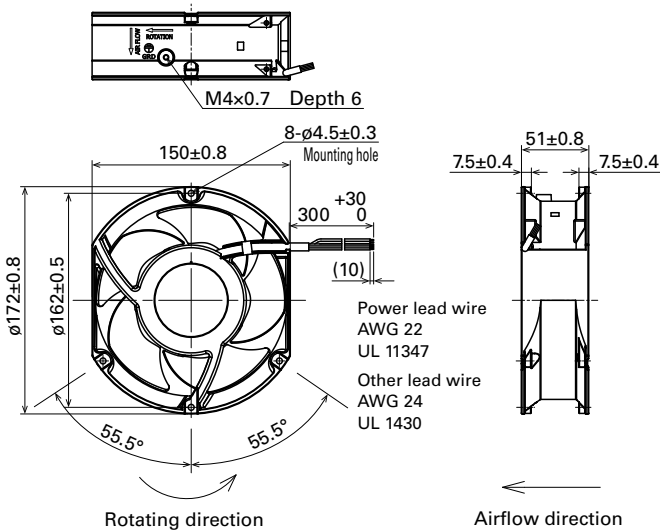
Example 2: when the rotor is locked when the fan motor is turned on and released after the start-up delay time.



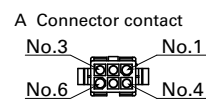
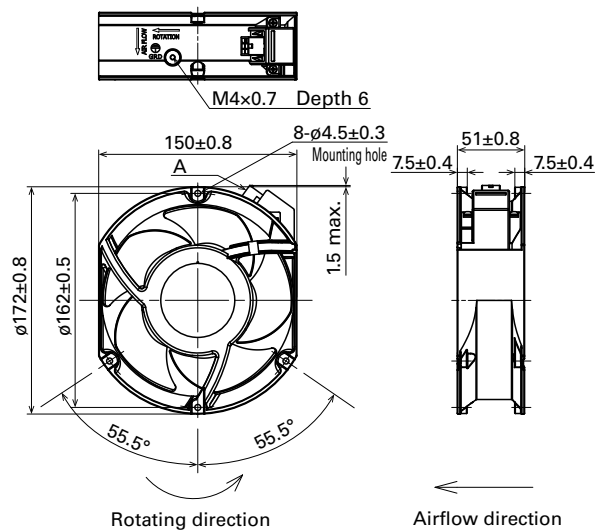
Startup delay: 18 ± 3 s
 Detection delay: 3 s max.
 Trip point: 1700 min^{-1}

Dimensions (unit: mm) (With pulse sensor with PWM control)

Lead wire model



Terminal model



Pin arrangement
Connector (Model no.: TE Connectivity: 1-172160-9)

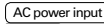



| Pin No. | Function | Input |
|---------|---------------|-------|
| 1 | L | AC |
| 2 | No connection | - |
| 3 | N | AC |
| 4 | PWM | DC |
| 5 | GND | DC |
| 6 | Sensor | DC |

Ø 172x150x51 mm


San Ace 172AD 9ADW type    

Sidecut type

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute
(Lead wire model: between lead wire conductors and frame, terminal model: between terminals and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
(Lead wire model: between lead wire conductors and frame, terminal model: between terminals and frame)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire  L: Orange N: Gray
 Yellow  Brown  Black
- Mass 810 g
- Ingress protection IP56 (Excluding the connectors of terminal models)
For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have no sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADW5701H5002 ^{*1} | 100 to 240 | 90 to 264 | 50/60 | 0.3 | 17 | 3800 | 6.7 236 | 195 0.78 | 54 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9ADW5701H5T02 ^{*2} | | | | 0.3 | 17 | 3800 | 6.7 236 | 195 0.78 | 54 | | |

*1 Lead wire model *2 Terminal model

The models listed below **have a low-speed sensor.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------------------|-------------------|-----------------------------|----------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADW5701H5H001 ^{*1} | 100 to 240 | 90 to 264 | 50/60 | 0.3 | 17 | 3800 | 6.7 236 | 195 0.78 | 54 | -20 to +70 | 40000/60°C (70000/40°C) |
| 9ADW5701H5HT01 ^{*2} | | | | 0.3 | 17 | 3800 | 6.7 236 | 195 0.78 | 54 | | |

*1 Lead wire model *2 Terminal model

The models listed below **have a pulse sensor with PWM control.**

| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle ³ [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------------------------|-------------------|-----------------------------|----------------|---------------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADW5701P5H003 ^{*1} | 100 to 240 | 90 to 264 | 50/60 | 100 | 0.3 | 17 | 3800 | 6.7 236 | 195 0.78 | 54 | -20 to +70 | 40000/60°C (70000/40°C) |
| | | | | 0 | 0.08 | 3.2 | 1500 | 2.64 93 | 40 0.16 | 31 | | |
| 9ADW5701P5HT03 ^{*2} | | | | 100 | 0.3 | 17 | 3800 | 6.7 236 | 195 0.78 | 54 | | |
| | | | | 0 | 0.08 | 3.2 | 1500 | 2.64 93 | 40 0.16 | 31 | | |

*1 Lead wire model *2 Terminal model

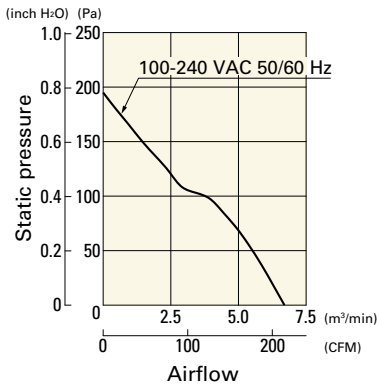
*3 PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 0% duty cycle.

Airflow - Static Pressure Characteristics

9ADW5701H5002, 9ADW5701H5T02

No sensor

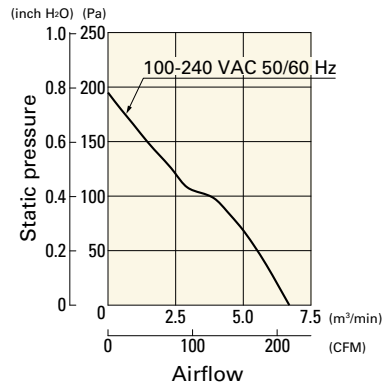
Operating voltage range



9ADW5701H5H001, 9ADW5701H5HT01

With low-speed sensor

Operating voltage range

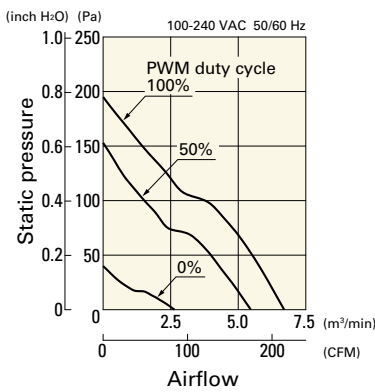


Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

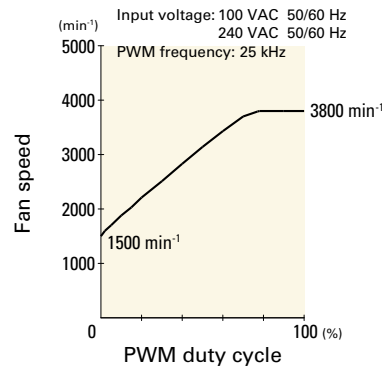
9ADW5701P5H003, 9ADW5701P5HT03

With pulse sensor with PWM control

PWM duty cycle

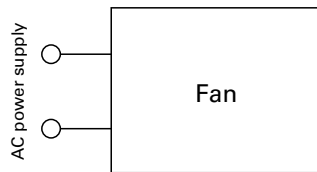


PWM duty - Speed characteristics example

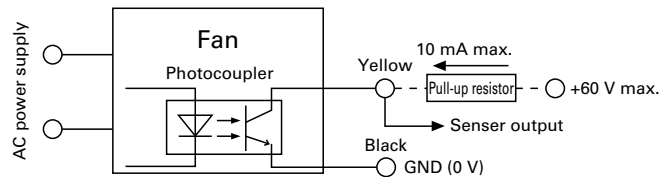


Connection Schematic

without Sensor

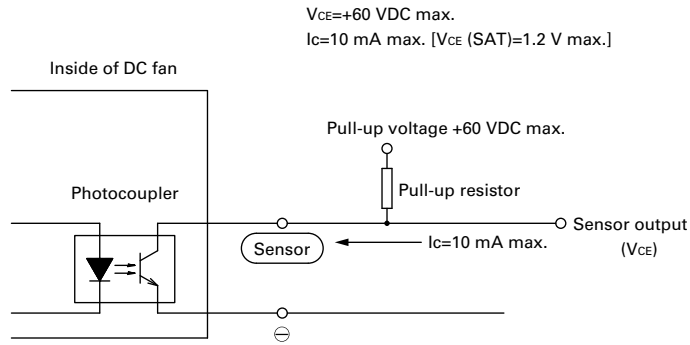


with Low-speed sensor



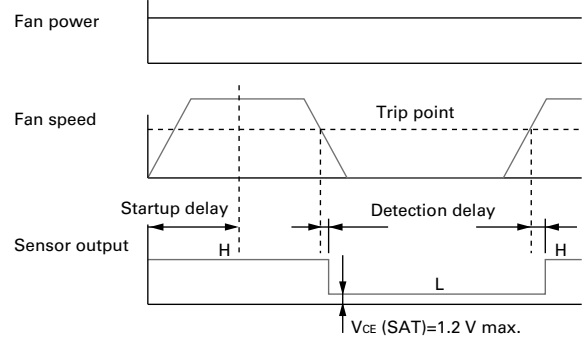
Specifications for Low-speed Sensors

Output circuit: Open collector

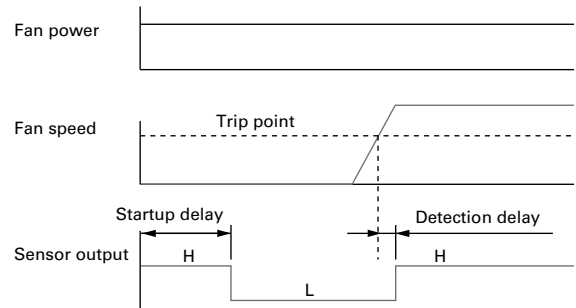


Sensor scheme

Example 1: when steady running



Example 2: when the rotor is locked when the fan motor is turned on and released after the start-up delay time.



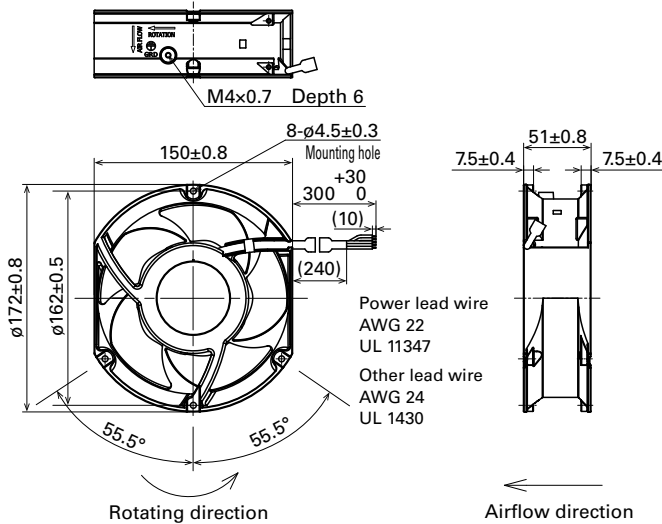
Startup delay: 18±3 s

Detection delay: 3 s max.

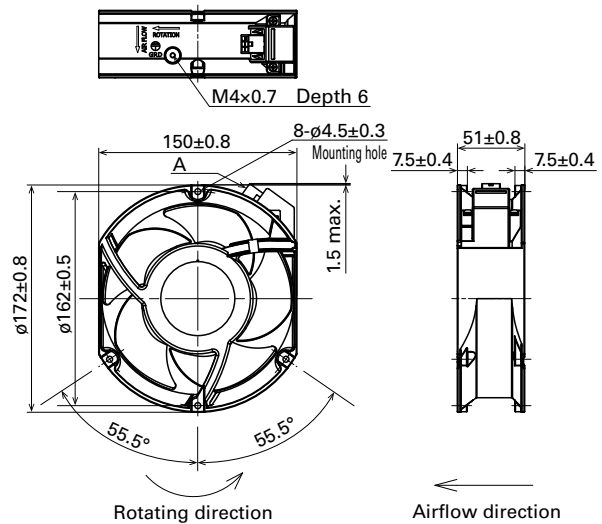
Trip point: 1700 min⁻¹

Dimensions (unit: mm) (With pulse sensor with PWM control)

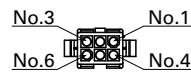
Lead wire model



Terminal model



A Connector contact

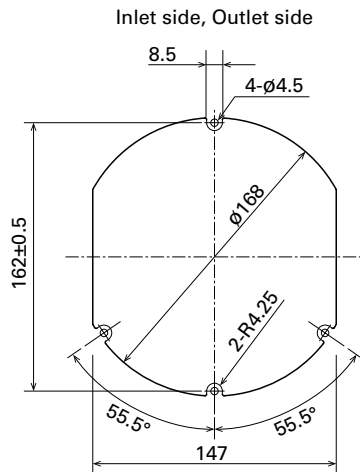


Pin arrangement

Connector (Model no.: TE Connectivity: 1-172160-9)

| Pin No. | Function | Input |
|---------|---------------|-------|
| 1 | L | AC |
| 2 | No connection | - |
| 3 | N | AC |
| 4 | PWM | DC |
| 5 | GND | DC |
| 6 | Sensor | DC |

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Options

Finger guards

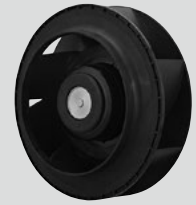
page: p. 600

Terminal model wiring harness

page: p. 610

Model no.: 109-319J, 109-319E, 109-319H

Model no.: 489-1647



Ø 190x88 mm

San Ace 190AD 9ADTU type **type**

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

| | | | | |
|----------------|-----------|---------|---------|----------------|
| AC power input | L: Orange | N: Gray | Ground | Yellow / Green |
| +10 VDC output | Red | Black | Sensor | Yellow |
| | | | Control | Brown |
- Mass 1600 g

Specifications When the optional inlet nozzle (109-1073) is mounted.

The models listed below **have a pulse sensor with PWM control.**

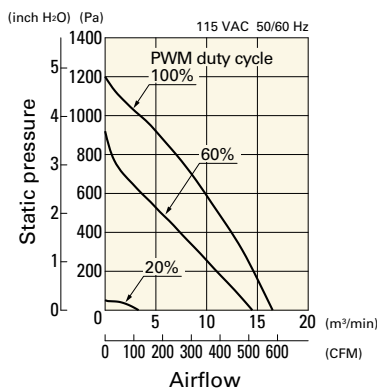
| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------------|-------------------|-----------------------------|----------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADTU11P0G001 | 115 | 90 to 132 | 50/60 | 100 | 2.5 | 150 | 4800 | 16.5 583 | 1200 4.82 | 72 | -25 to +60 | 40000/60°C (70000/40°C) |
| | | | | 20 | 0.3 | 10 | 1000 | 3.3 116 | 52 0.21 | 43 | | |
| 9ADTU23P0G001 | 230 | 180 to 264 | | 100 | 1.3 | 150 | 4800 | 16.5 583 | 1200 4.82 | 72 | | |
| | | | | 20 | 0.2 | 10 | 1000 | 3.3 116 | 52 0.21 | 43 | | |

* PWM frequency is 1 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

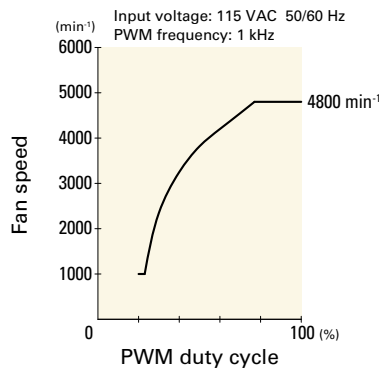
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADTU11P0G001 With pulse sensor with PWM control

PWM duty cycle



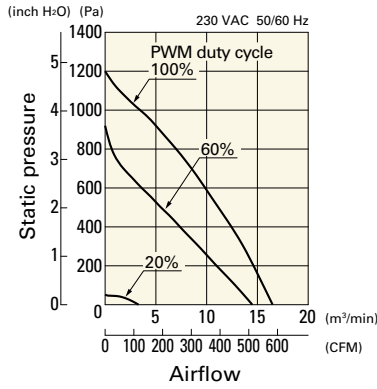
PWM duty - Speed characteristics example



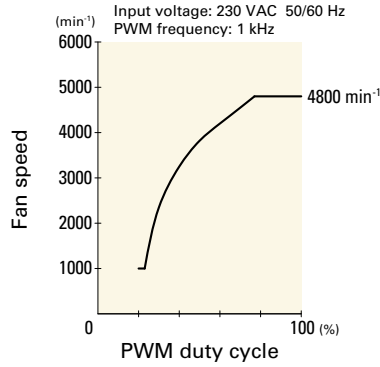
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADTU23P0G001 With pulse sensor with PWM control

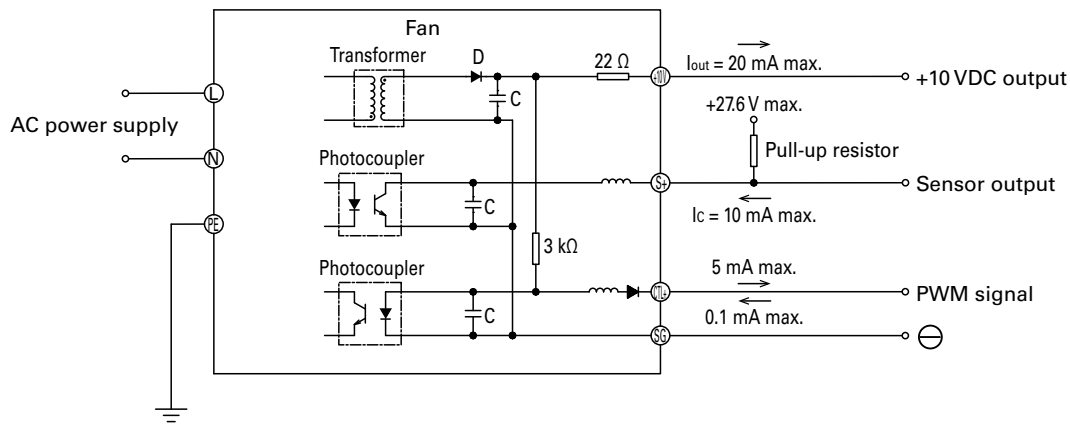
PWM duty cycle



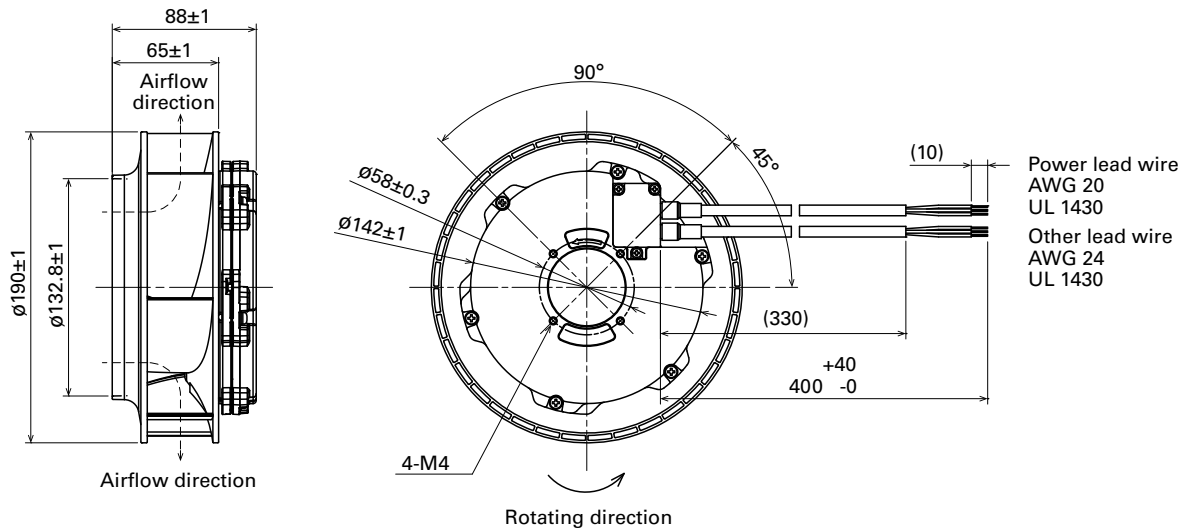
PWM duty - Speed characteristics example



Connection Schematic

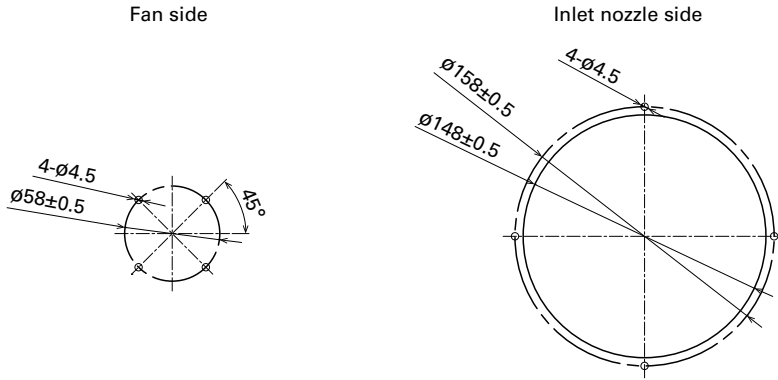


Dimensions (unit: mm)

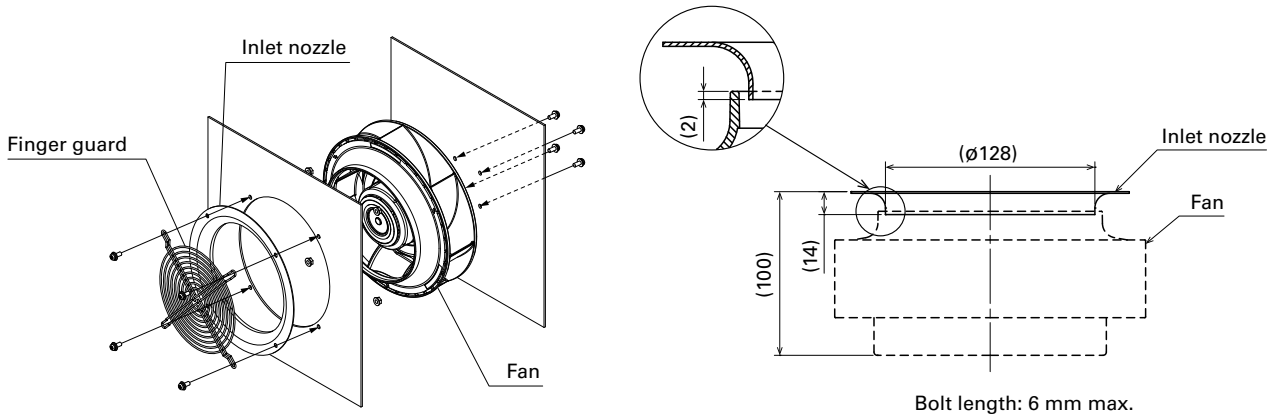


ACDC Fan ø190 mm

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

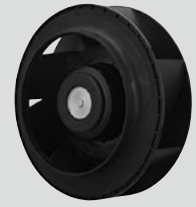
page: p. 599

Model no.: 109-722, 109-722H

Inlet nozzle

page: p. 603

Model no.: 109-1073, 109-1073H



Ø 190x88 mm

San Ace 190AD 9ADW1TU type    

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

| | | | | |
|----------------|-----------|---------|---------|----------------|
| AC power input | L: Orange | N: Gray | Ground | Yellow / Green |
| +10 VDC output | Red | Black | Sensor | Yellow |
| | | | Control | Brown |
- Mass 1700 g
- Ingress protection IP56 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1073H) is mounted.

The models listed below **have a pulse sensor with PWM control.**

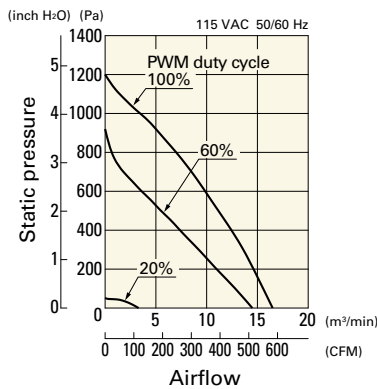
| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|----------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9ADW1TU11P0G001 | 115 | 90 to 132 | 50/60 | 100 | 2.5 | 150 | 4800 | 16.5 583 | 1200 4.82 | 72 | -25 to +60 | 40000/60°C (70000/40°C) |
| | | | | 20 | 0.3 | 10 | 1000 | 3.3 116 | 52 0.21 | 43 | | |
| 9ADW1TU23P0G001 | 230 | 180 to 264 | | 100 | 1.3 | 150 | 4800 | 16.5 583 | 1200 4.82 | 72 | | |
| | | | | 20 | 0.2 | 10 | 1000 | 3.3 116 | 52 0.21 | 43 | | |

* PWM frequency is 1 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

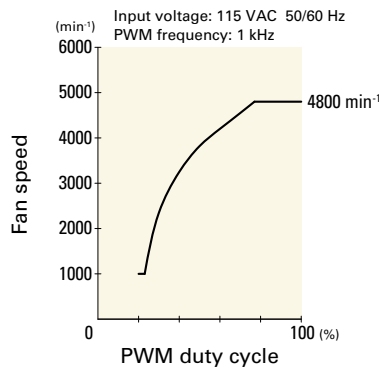
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADW1TU11P0G001 With pulse sensor with PWM control

PWM duty cycle



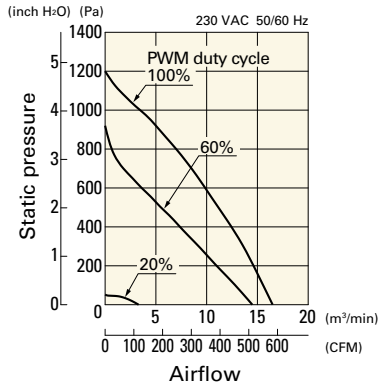
PWM duty - Speed characteristics example



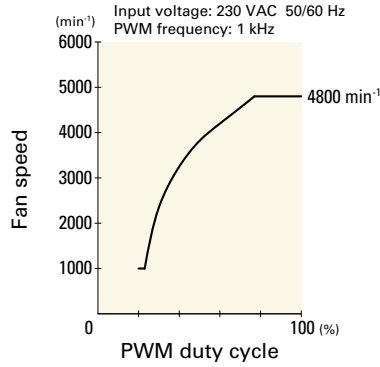
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADW1TU23P0G001 With pulse sensor with PWM control

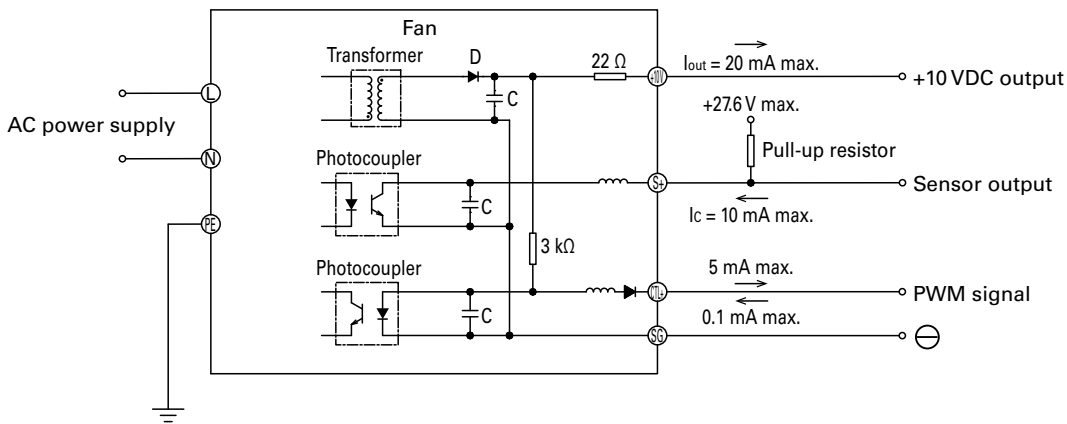
PWM duty cycle



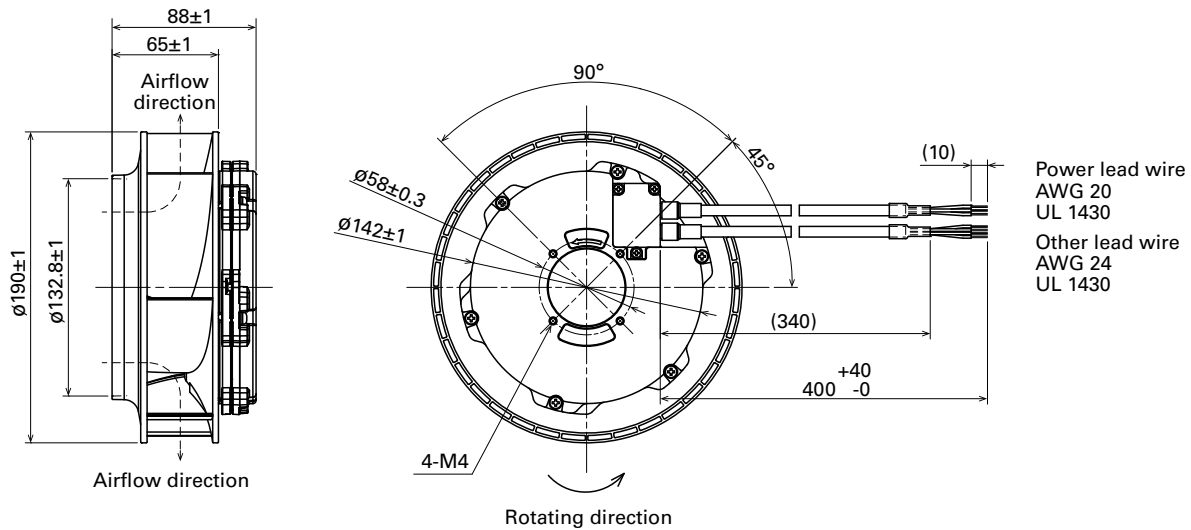
PWM duty - Speed characteristics example



Connection Schematic

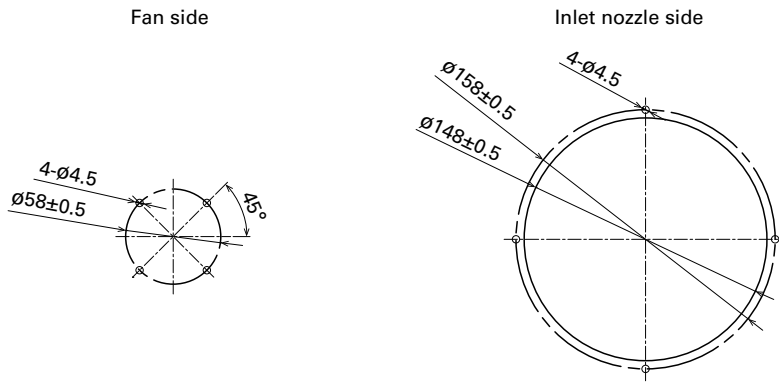


Dimensions (unit: mm)

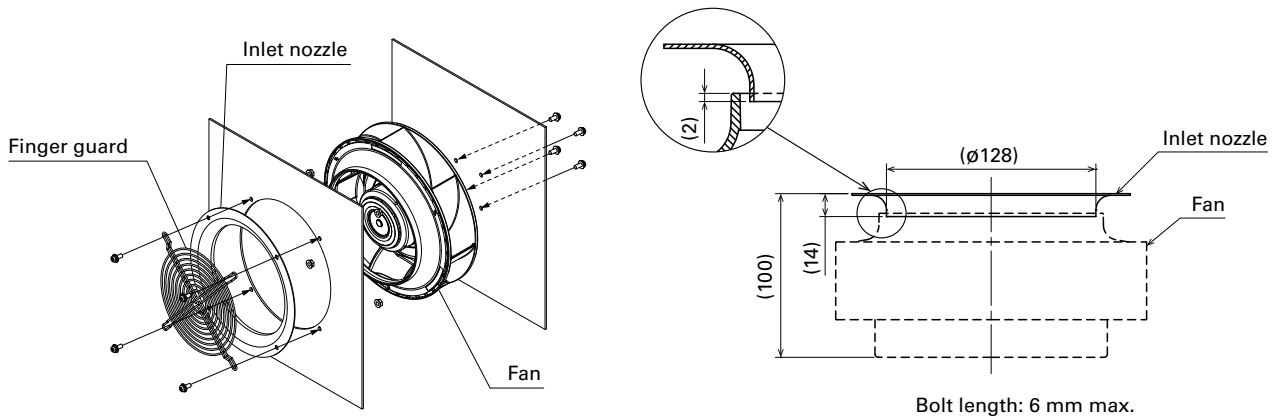


ACDC Fan $\varnothing 190$ mm

■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



■ Reference Diagram for Mounting (unit: mm)



■ Options

Finger guards page: p. 599
Model no.: 109-722, 109-722H

Inlet nozzle page: p. 603
Model no.: 109-1073, 109-1073H



Ø225x99 mm

San Ace 225AD 9ADTS type

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

| | | | | |
|----------------|-----------|---------|---------|----------------|
| AC power input | L: Orange | N: Gray | Ground | Yellow / Green |
| +10 VDC output | Red | Black | Sensor | Yellow |
| | | | Control | Brown |
- Mass 1800 g

Specifications When the optional inlet nozzle (109-1134) is mounted.

The models listed below **have a pulse sensor with PWM control.**

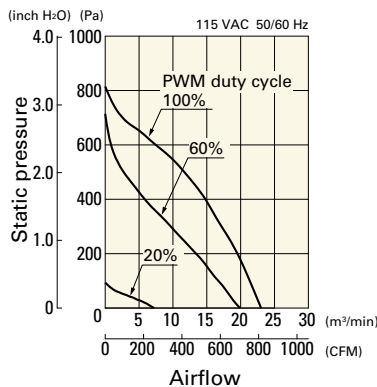
| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|---------------|-------------------|-----------------------------|----------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9ADTS11P0G001 | 115 | 90 to 132 | 50/60 | 100 | 2.23 | 155 | 3200 | 23.0 812 | 815 3.27 | 74 | -20 to +60 | 40000/60°C (70000/40°C) |
| | | | | 20 | 0.3 | 10 | 1000 | 7.1 252 | 80 0.32 | 50 | | |
| 9ADTS11P0F001 | 115 | 90 to 132 | 50/60 | 100 | 1.11 | 70 | 2450 | 17.6 621 | 480 1.93 | 68 | | |
| | | | | 20 | 0.3 | 10 | 1000 | 7.1 252 | 80 0.32 | 50 | | |
| 9ADTS23P0G001 | 230 | 180 to 264 | 50/60 | 100 | 1.17 | 155 | 3200 | 23.0 812 | 815 3.27 | 74 | | |
| | | | | 20 | 0.2 | 10 | 1000 | 7.1 252 | 80 0.32 | 50 | | |
| 9ADTS23P0F001 | 230 | 180 to 264 | 50/60 | 100 | 0.64 | 70 | 2450 | 17.6 621 | 480 1.93 | 68 | | |
| | | | | 20 | 0.2 | 10 | 1000 | 7.1 252 | 80 0.32 | 50 | | |

* PWM frequency is 1 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

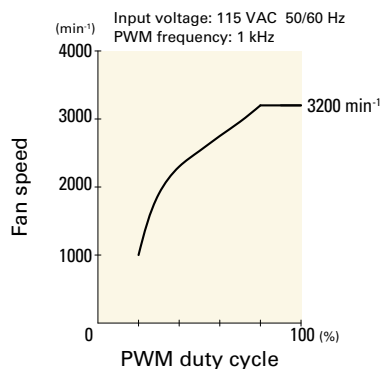
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADTS11P0G001 With pulse sensor with PWM control

PWM duty cycle



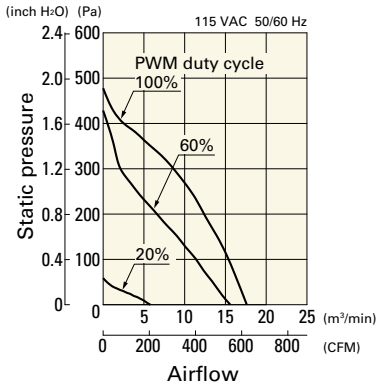
PWM duty - Speed characteristics example



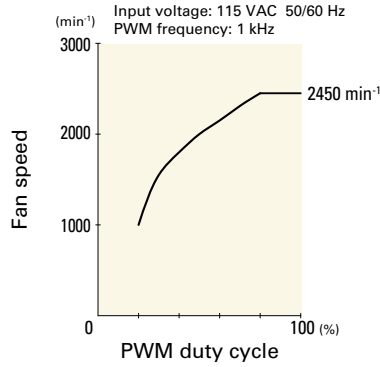
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADTS11P0F001 With pulse sensor with PWM control

PWM duty cycle

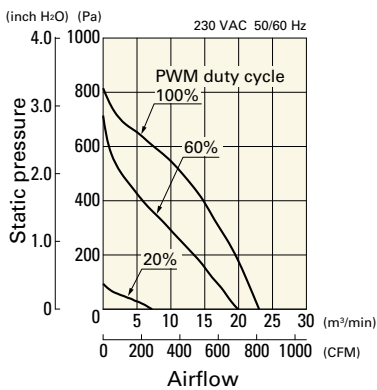


PWM duty - Speed characteristics example

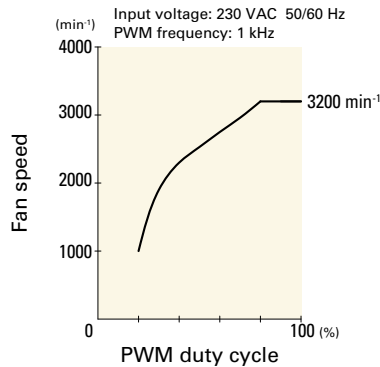


9ADTS23P0G001 With pulse sensor with PWM control

PWM duty cycle

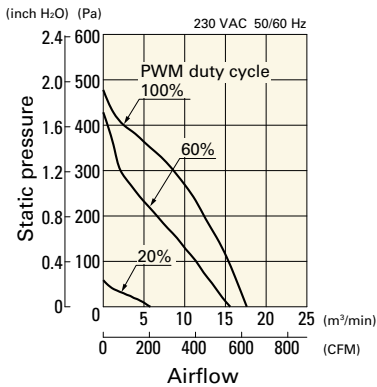


PWM duty - Speed characteristics example

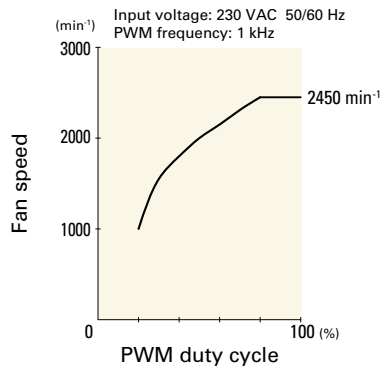


9ADTS23P0F001 With pulse sensor with PWM control

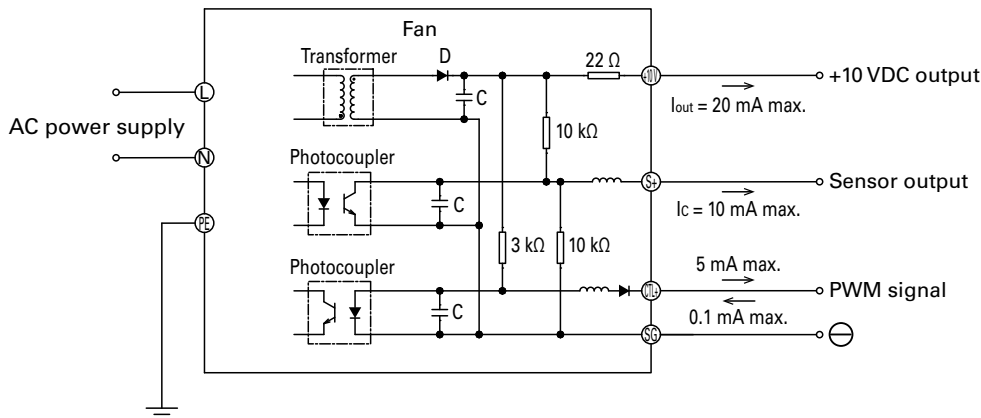
PWM duty cycle



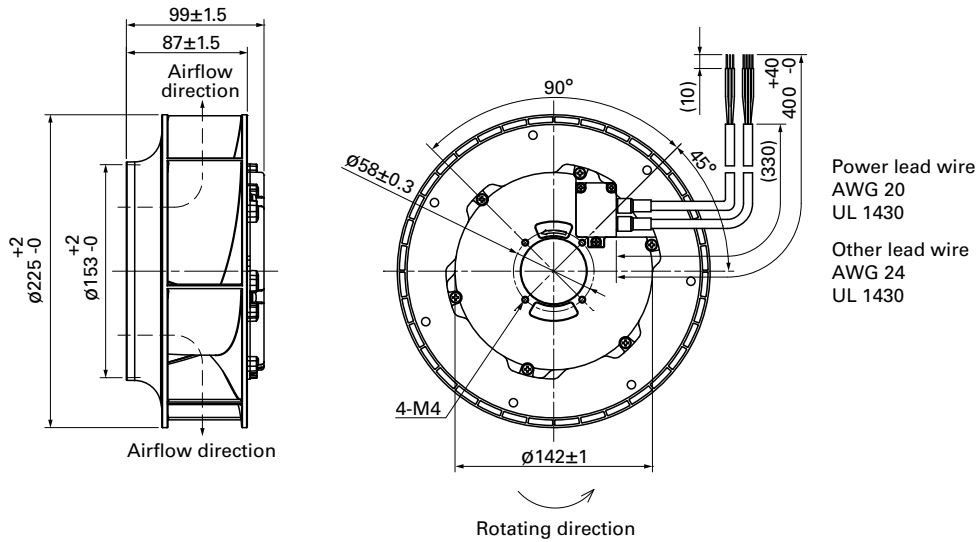
PWM duty - Speed characteristics example



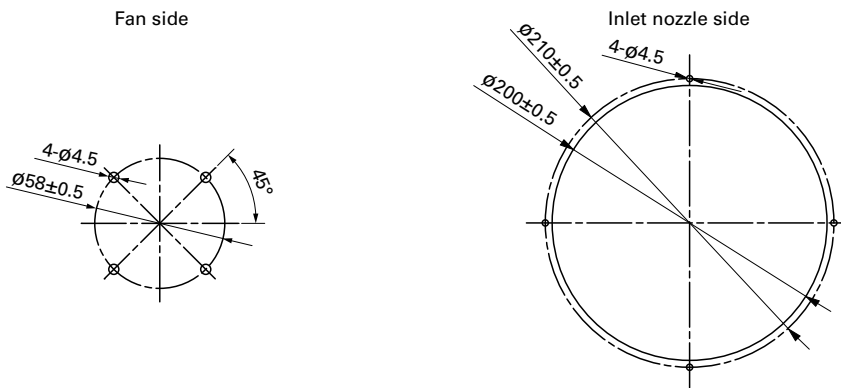
Connection Schematic



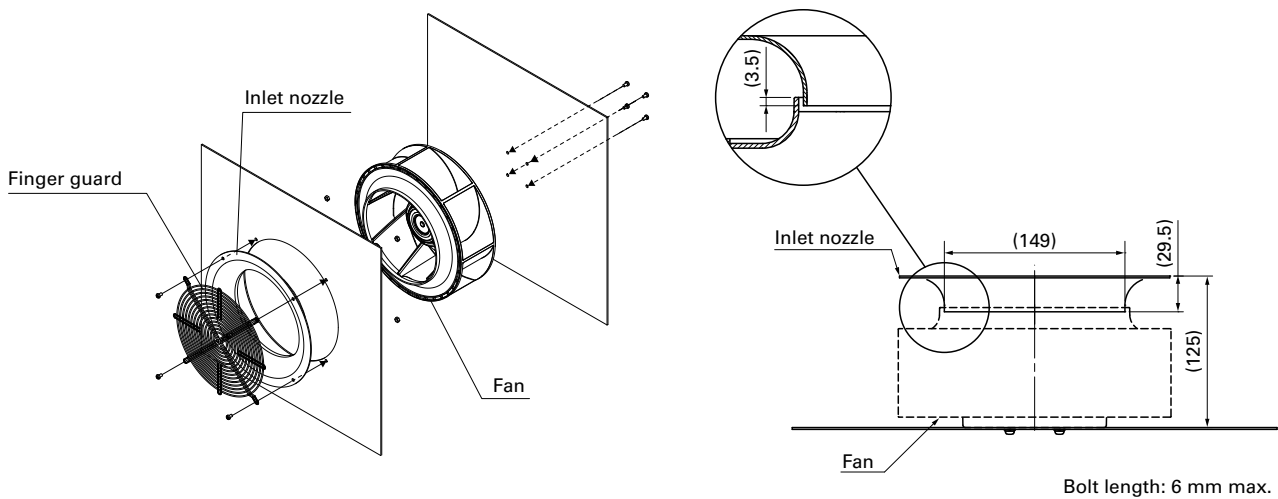
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

page: p. 601

Model no.: 109-1137, 109-1137H

Inlet nozzle

page: p. 603

Model no.: 109-1134, 109-1134H



Ø 225x99 mm

San Ace 225AD 9ADW1TS type  

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

| | | | |
|----------------|-------------------|---------|----------------|
| AC power input | L: Orange N: Gray | Ground | Yellow / Green |
| +10 VDC output | Red ⊖ Black | Sensor | Yellow |
| | | Control | Brown |
- Mass 1900 g
- Ingress protection IP56 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1134H) is mounted.

The models listed below **have a pulse sensor with PWM control.**

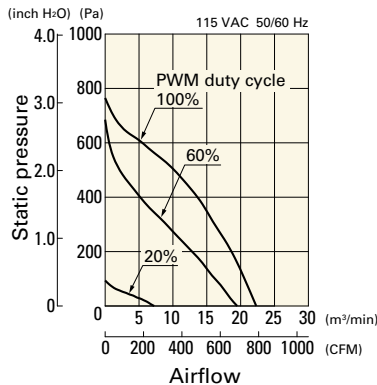
| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|----------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9ADW1TS11P0H001 | 115 | 90 to 132 | 50/60 | 100 | 2.06 | 140 | 3100 | 22.3 787 | 760 3.05 | 73 | -20 to +60 | 40000/60°C (70000/40°C) |
| | | | | 20 | 0.3 | 11 | 1000 | 7.1 252 | 80 0.32 | 50 | | |
| 9ADW1TS11P0M001 | 115 | 90 to 132 | 50/60 | 100 | 1.08 | 61 | 2350 | 16.9 597 | 440 1.77 | 67 | -20 to +60 | 40000/60°C (70000/40°C) |
| | | | | 20 | 0.3 | 11 | 1000 | 7.1 252 | 80 0.32 | 50 | | |
| 9ADW1TS23P0H001 | 230 | 180 to 264 | 50/60 | 100 | 1.06 | 140 | 3100 | 22.3 787 | 760 3.05 | 73 | -20 to +60 | 40000/60°C (70000/40°C) |
| | | | | 20 | 0.2 | 11 | 1000 | 7.1 252 | 80 0.32 | 50 | | |
| 9ADW1TS23P0M001 | 230 | 180 to 264 | 50/60 | 100 | 0.57 | 61 | 2350 | 16.9 597 | 440 1.77 | 67 | -20 to +60 | 40000/60°C (70000/40°C) |
| | | | | 20 | 0.2 | 11 | 1000 | 7.1 252 | 80 0.32 | 50 | | |

* PWM frequency is 1 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

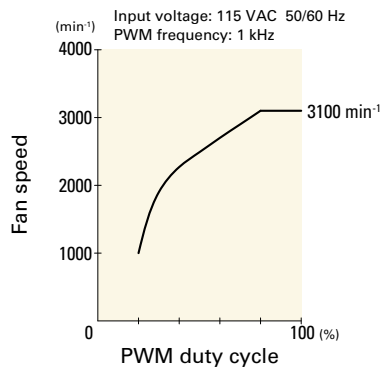
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADW1TS11P0H001 With pulse sensor with PWM control

PWM duty cycle



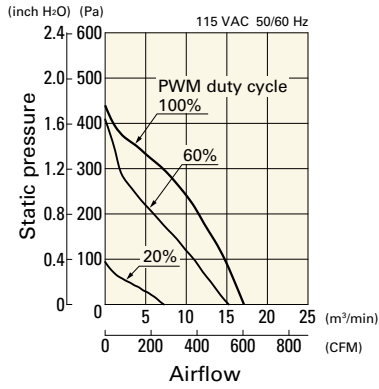
PWM duty - Speed characteristics example



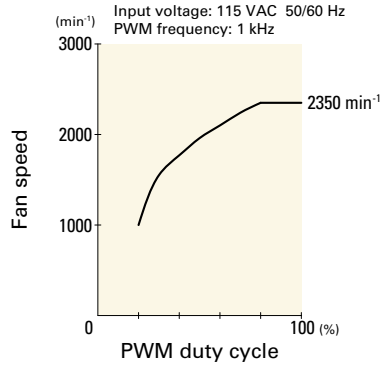
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADW1TS11P0M001 With pulse sensor with PWM control

PWM duty cycle

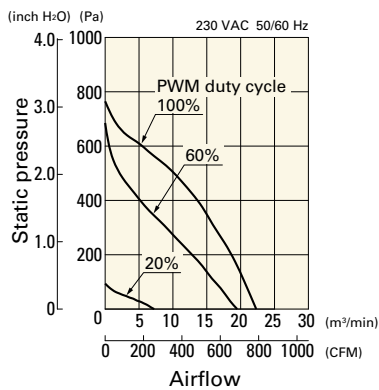


PWM duty - Speed characteristics example

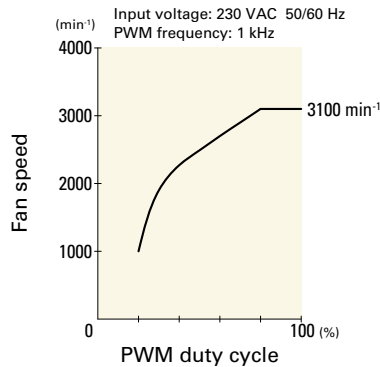


9ADW1TS23P0H001 With pulse sensor with PWM control

PWM duty cycle

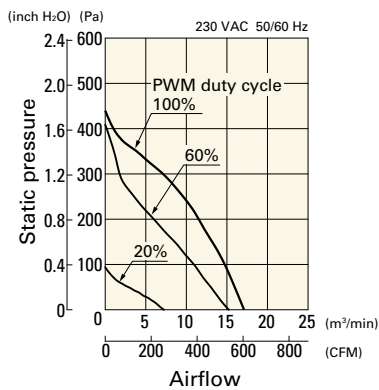


PWM duty - Speed characteristics example

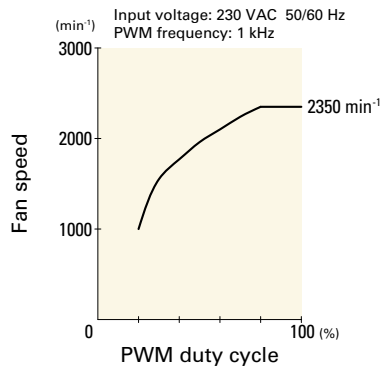


9ADW1TS23P0M001 With pulse sensor with PWM control

PWM duty cycle

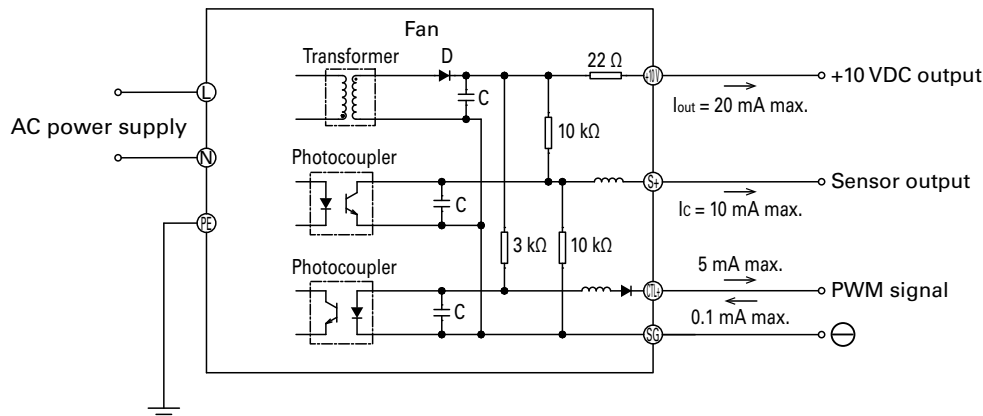


PWM duty - Speed characteristics example

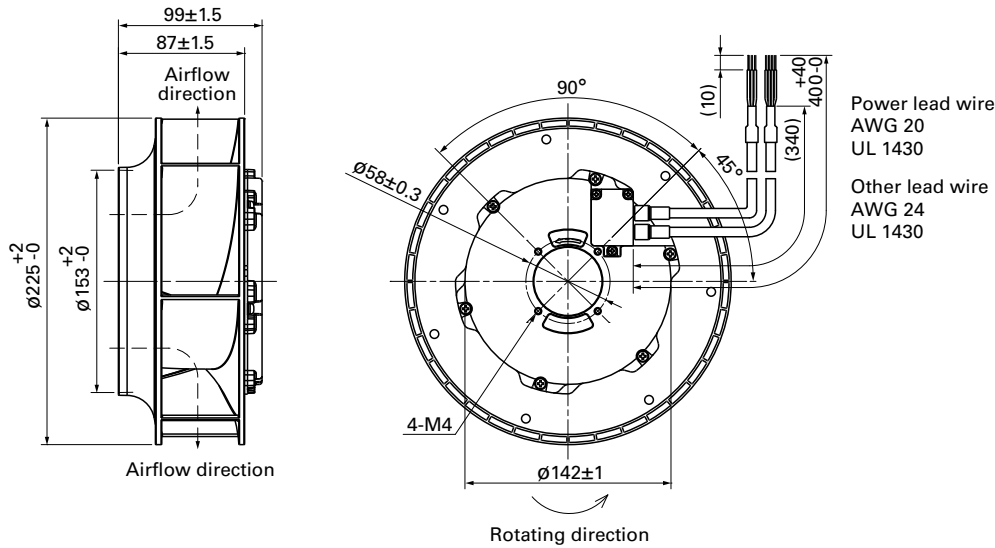


ACDC Fan φ225 mm

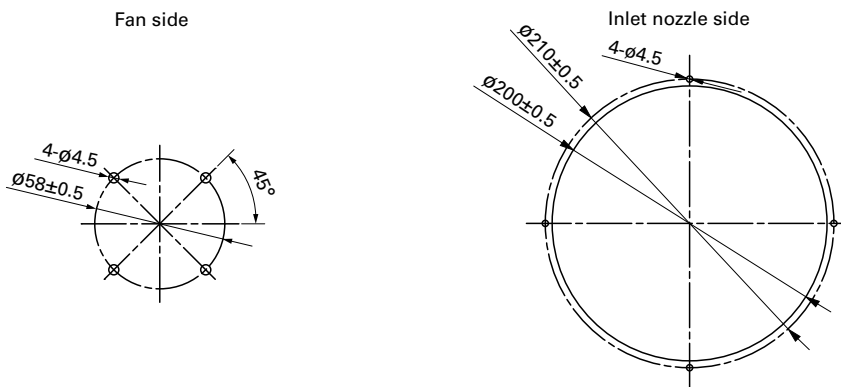
Connection Schematic



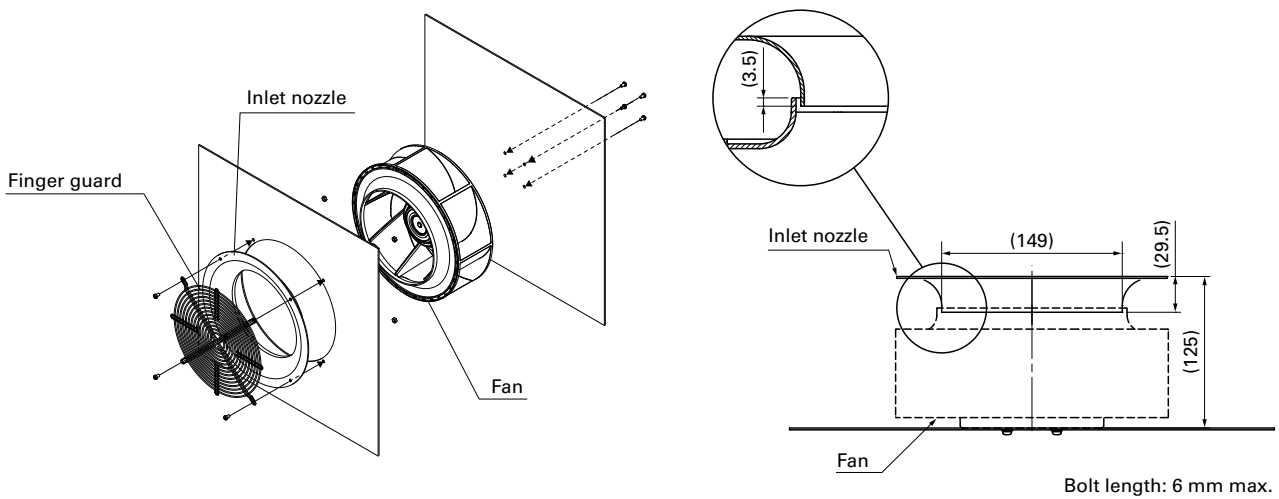
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

page: p. 601

Model no.: 109-1137, 109-1137H

Inlet nozzle

page: p. 603

Model no.: 109-1134, 109-1134H



Ø250x99 mm

San Ace 250AD 9ADTV type

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

| | | | |
|----------------|-------------------|---------|----------------|
| AC power input | L: Orange N: Gray | Ground | Yellow / Green |
| +10 VDC output | Red ⊖Black | Sensor | Yellow |
| | | Control | Brown |
- Mass 1920 g

Specifications When the optional inlet nozzle (109-1151) is mounted.

The models listed below **have a pulse sensor with PWM control.**

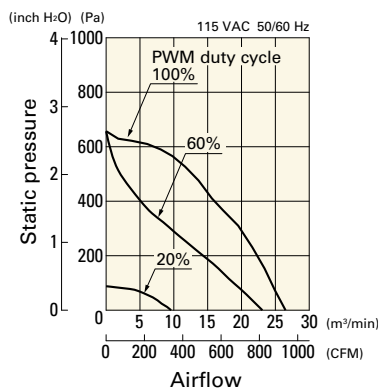
| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------------|-------------------|-----------------------------|----------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 9ADTV11P0G001 | 115 | 90 to 132 | 50/60 | 100 | 2.3 | 140 | 2700 | 26.5 936 | 650 2.61 | 71 | -25 to +60 | 40000/60°C (70000/40°C) |
| | | | | 20 | 0.3 | 10 | 1000 | 9.6 339 | 88 0.35 | 57 | | |
| 9ADTV23P0G001 | 230 | 180 to 264 | | 100 | 1.2 | 140 | 2700 | 26.5 936 | 650 2.61 | 71 | | |
| | | | | 20 | 0.2 | 10 | 1000 | 9.6 339 | 88 0.35 | 57 | | |

* PWM frequency is 1 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

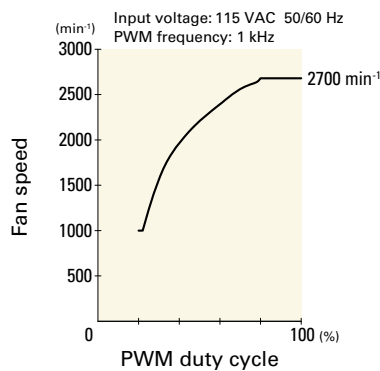
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADTV11P0G001 With pulse sensor with PWM control

PWM duty cycle



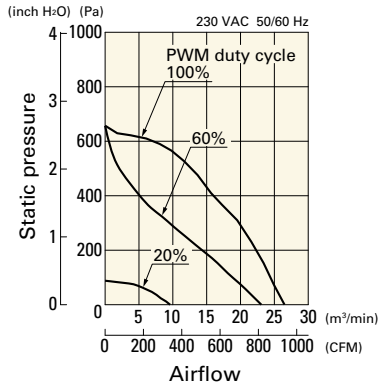
PWM duty - Speed characteristics example



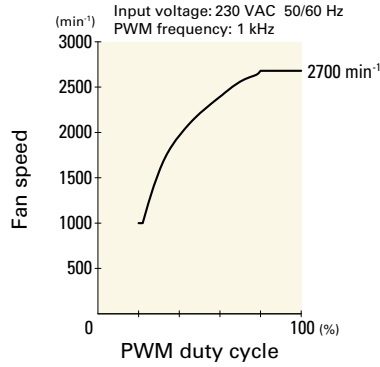
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADTV23P0G001 With pulse sensor with PWM control

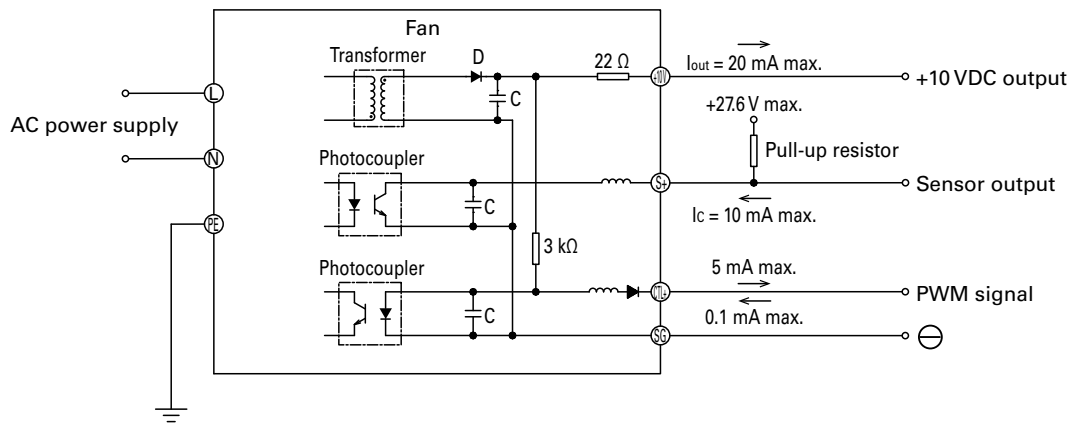
PWM duty cycle



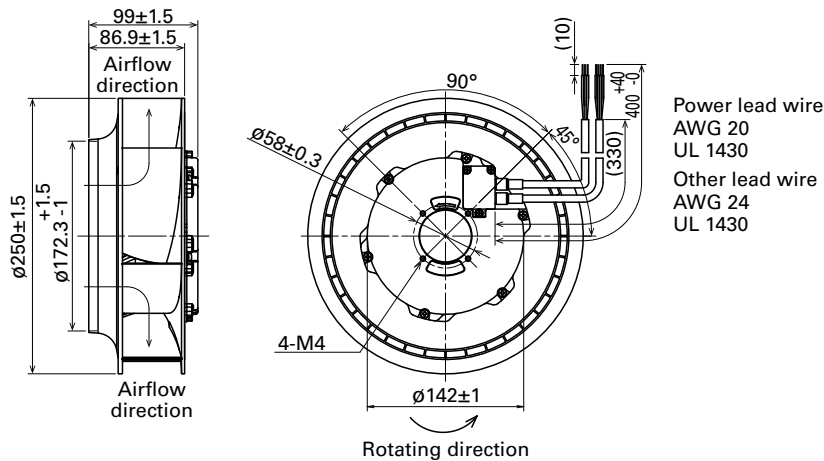
PWM duty - Speed characteristics example



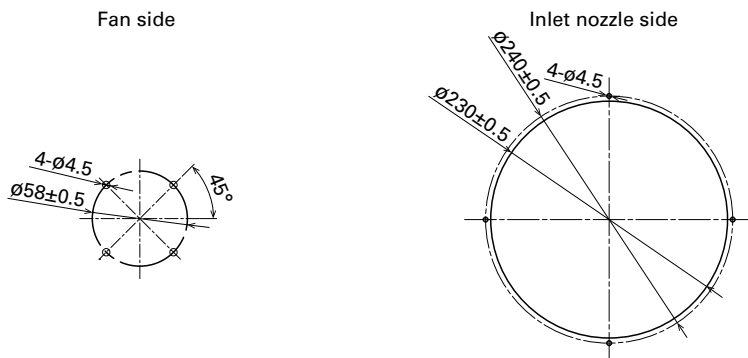
Connection Schematic



Dimensions (unit: mm)

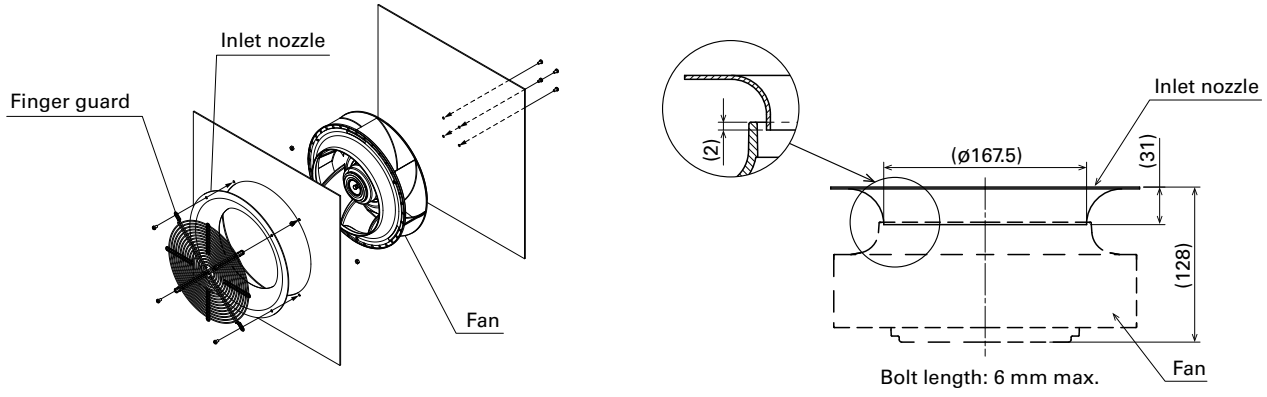


Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



ACDC Fan $\phi 250 \text{ mm}$ ACDC

■ Reference Diagram for Mounting (unit: mm)



■ Options

Finger guards

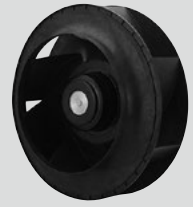
page: p. 602

Model no.: 109-1152, 109-1152H

Inlet nozzle

page: p. 603

Model no.: 109-1151, 109-1151H



∅250×99 mm

San Ace 250AD 9ADW1TV type   

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and motor case)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

| | | | | |
|----------------|-----------|---------|---------|----------------|
| AC power input | L: Orange | N: Gray | Ground | Yellow / Green |
| +10 VDC output | Red | Black | Sensor | Yellow |
| | | | Control | Brown |
- Mass 2020 g
- Ingress protection IP56 For more information on IP rating, refer to p. 621.

Specifications When the optional inlet nozzle (109-1151H) is mounted.

The models listed below **have a pulse sensor with PWM control.**

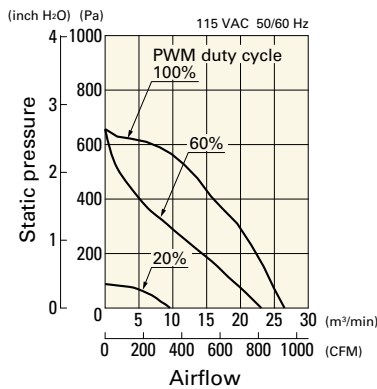
| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------------|-----------------------------|----------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADW1TV11P0G001 | 115 | 90 to 132 | 50/60 | 100 | 2.3 | 140 | 2700 | 26.5 936 | 650 2.61 | 71 | -25 to +60 | 40000/60°C (70000/40°C) |
| | | | | 20 | 0.3 | 10 | 1000 | 9.6 339 | 88 0.35 | 57 | | |
| 9ADW1TV23P0G001 | 230 | 180 to 264 | | 100 | 1.2 | 140 | 2700 | 26.5 936 | 650 2.61 | 71 | | |
| | | | | 20 | 0.2 | 10 | 1000 | 9.6 339 | 88 0.35 | 57 | | |

* PWM frequency is 1 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

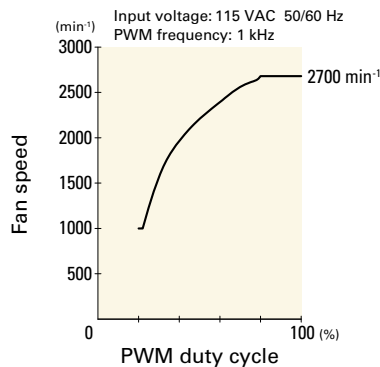
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADW1TV11P0G001 With pulse sensor with PWM control

PWM duty cycle



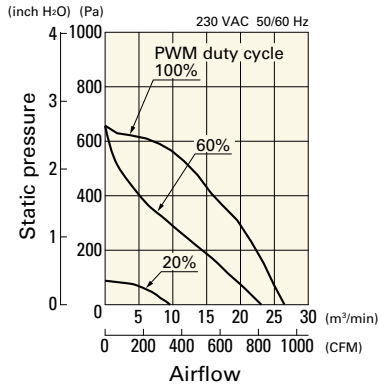
PWM duty - Speed characteristics example



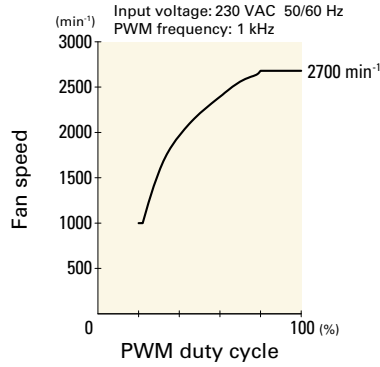
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADW1TV23P0G001 With pulse sensor with PWM control

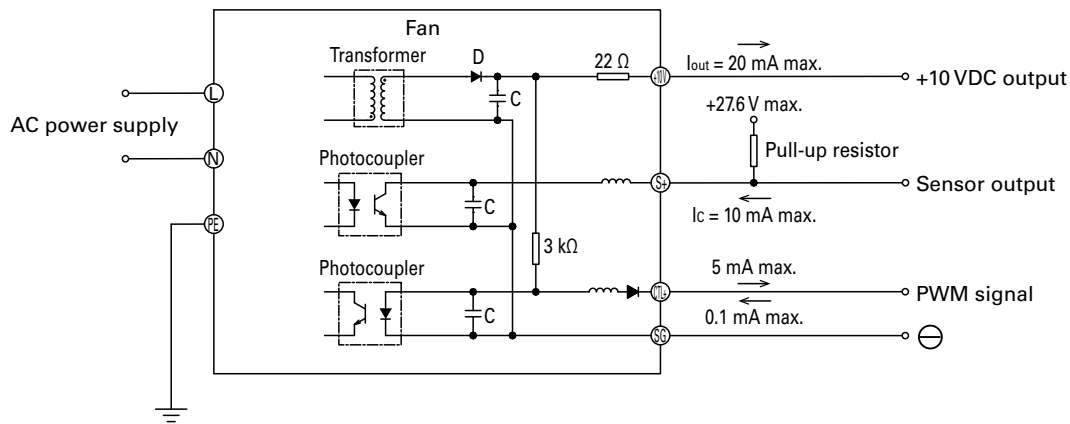
PWM duty cycle



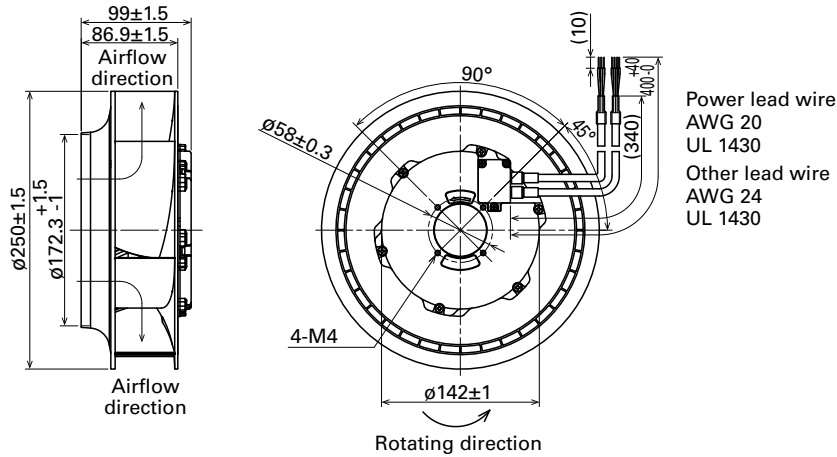
PWM duty - Speed characteristics example



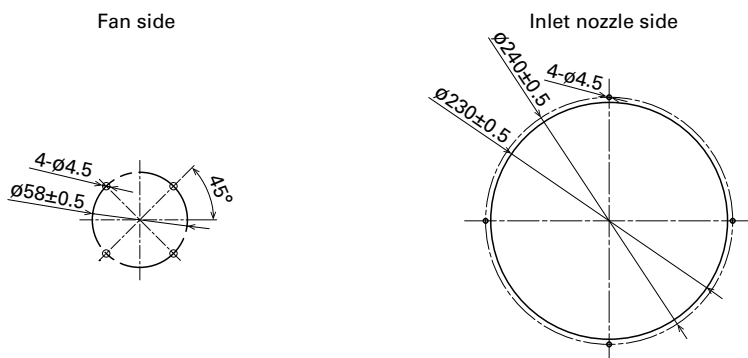
Connection Schematic



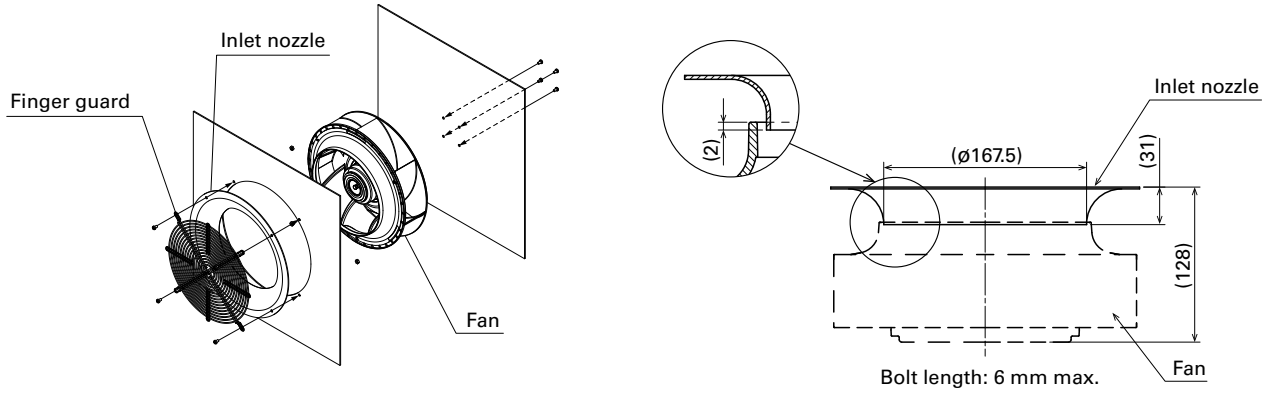
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting (unit: mm)



Options

Finger guards

page: p. 602

Model no.: 109-1152, 109-1152H

Inlet nozzle

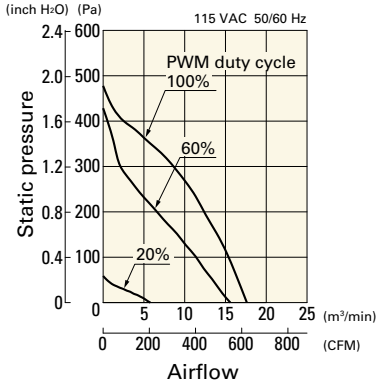
page: p. 603

Model no.: 109-1151, 109-1151H

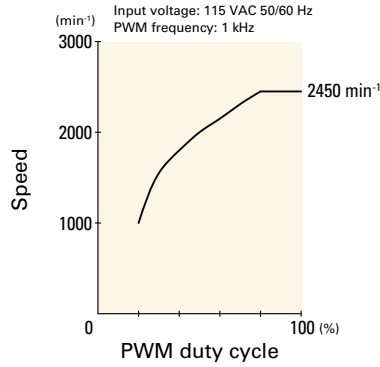
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADB1TS11P0F001 With pulse sensor with PWM control

PWM duty cycle

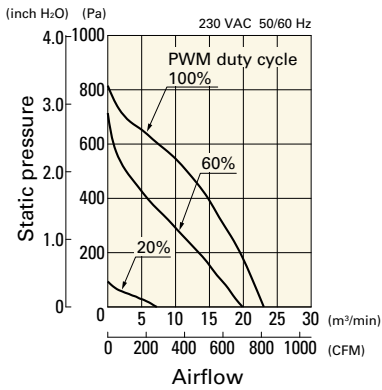


PWM duty - Speed characteristics example

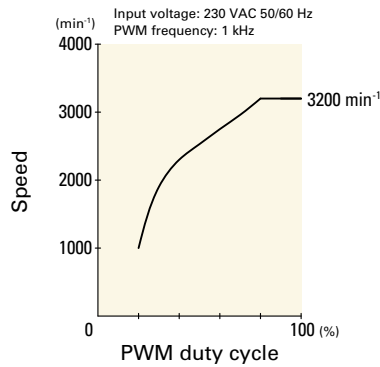


9ADB1TS23P0G001 With pulse sensor with PWM control

PWM duty cycle

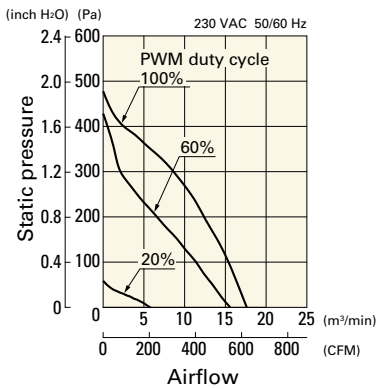


PWM duty - Speed characteristics example

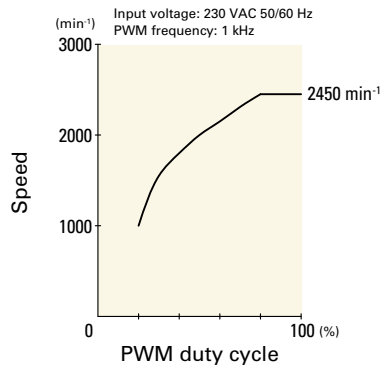


9ADB1TS23P0F001 With pulse sensor with PWM control

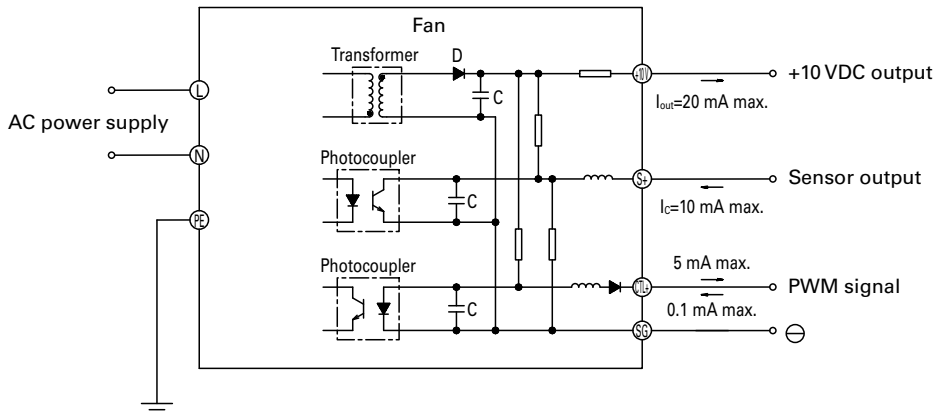
PWM duty cycle



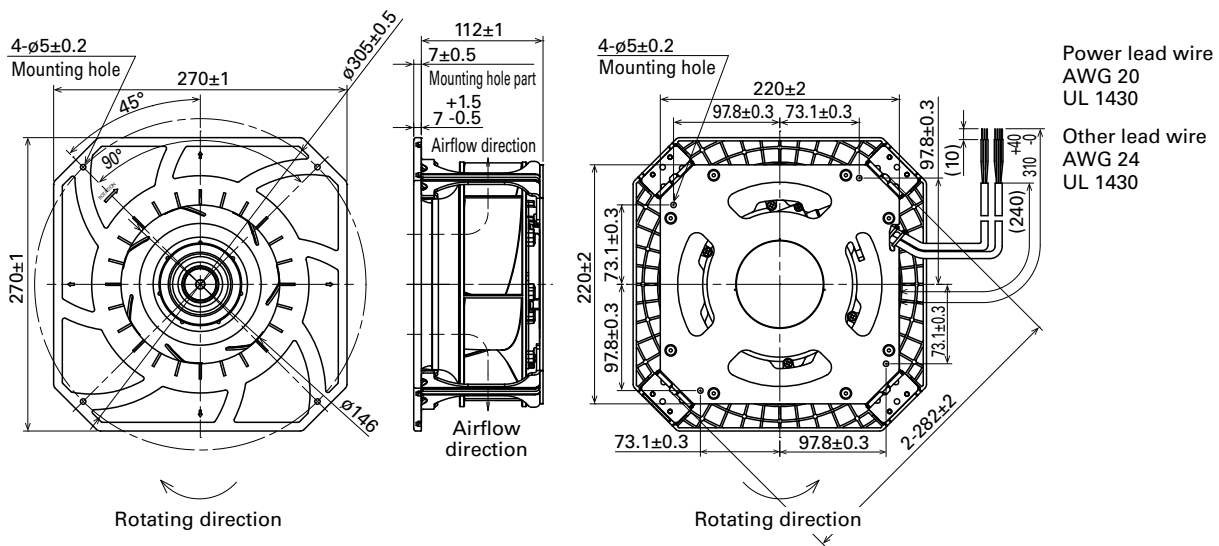
PWM duty - Speed characteristics example



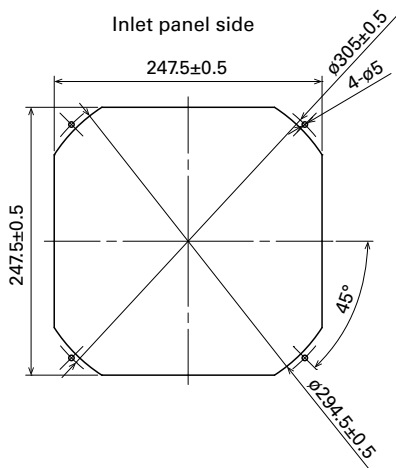
Connection Schematic



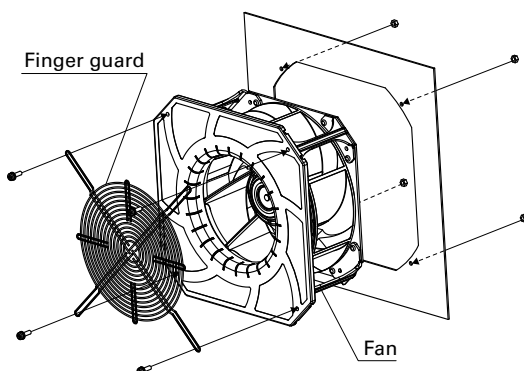
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting

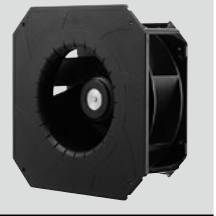


Options

Finger guards

page: p. 602

Model no.: 109-1146, 109-1146H



270x270x119 mm

San Ace 225AD 9ADB1W1TS type

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
Bracket: Aluminum (Black coating), Plastic (Flammability: UL94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and bracket)
- Insulation resistance 10 MΩ min. at 500 VDC (between lead wire conductors and bracket)
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

| | | | | |
|----------------|-----------|---------|---------|----------------|
| AC power input | L: Orange | N: Gray | Ground | Yellow / Green |
| +10 VDC output | Red | Black | Sensor | Yellow |
| | | | Control | Brown |
- Mass 2600 g
- Ingress protection IP56 For more information on IP rating, refer to p. 621.

Specifications

The models listed below **have a pulse sensor with PWM control.**

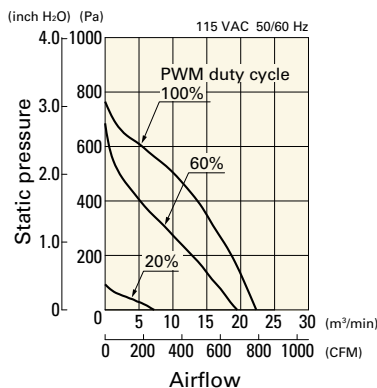
| Model no. | Rated voltage [V] | Operating voltage range [V] | Frequency [Hz] | PWM duty cycle [%] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-------------------|-------------------|-----------------------------|----------------|--------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 9ADB1W1TS11P0H001 | 115 | 90 to 132 | 50/60 | 100 | 2.06 | 140 | 3100 | 22.3 787 | 760 3.05 | 73 | -20 to +60 | 40000/60°C (70000/40°C) |
| | | | | 20 | 0.3 | 11 | 1000 | 7.1 252 | 80 0.32 | 50 | | |
| 9ADB1W1TS11P0M001 | 115 | 90 to 132 | | 100 | 1.08 | 61 | 2350 | 16.9 597 | 440 1.77 | 67 | | |
| | | | | 20 | 0.3 | 11 | 1000 | 7.1 252 | 80 0.32 | 50 | | |
| 9ADB1W1TS23P0H001 | 230 | 180 to 264 | | 100 | 1.06 | 140 | 3100 | 22.3 787 | 760 3.05 | 73 | | |
| | | | | 20 | 0.2 | 11 | 1000 | 7.1 252 | 80 0.32 | 50 | | |
| 9ADB1W1TS23P0M001 | 230 | 180 to 264 | 100 | 0.57 | 61 | 2350 | 16.9 597 | 440 1.77 | 67 | | | |
| | | | 20 | 0.2 | 11 | 1000 | 7.1 252 | 80 0.32 | 50 | | | |

* PWM frequency is 1 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

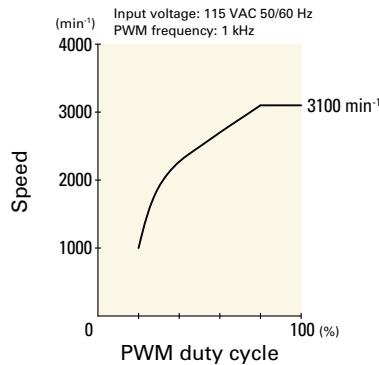
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADB1W1TS11P0H001 With pulse sensor with PWM control

PWM duty cycle



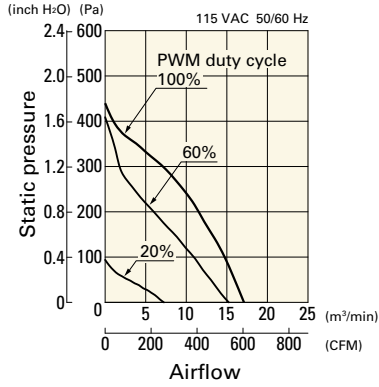
PWM duty - Speed characteristics example



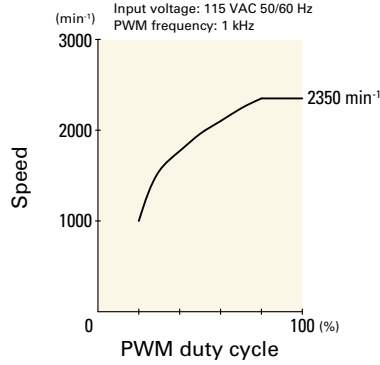
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADB1W1TS11P0M001 With pulse sensor with PWM control

PWM duty cycle

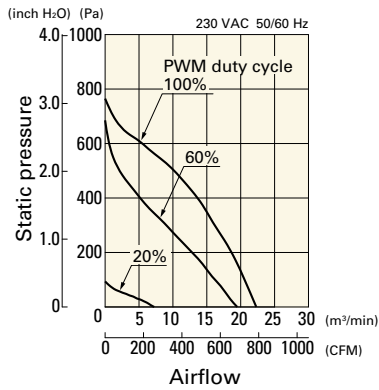


PWM duty - Speed characteristics example

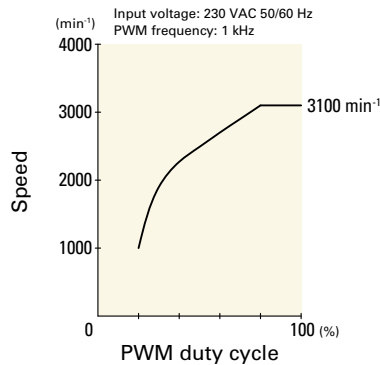


9ADB1W1TS23P0H001 With pulse sensor with PWM control

PWM duty cycle

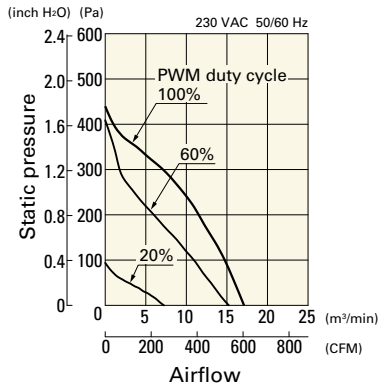


PWM duty - Speed characteristics example

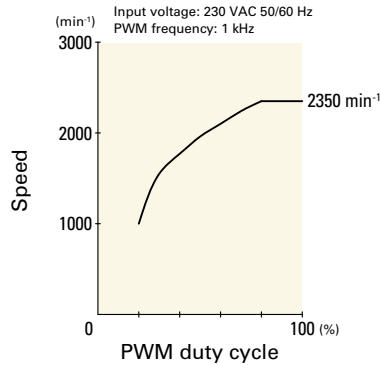


9ADB1W1TS23P0M001 With pulse sensor with PWM control

PWM duty cycle

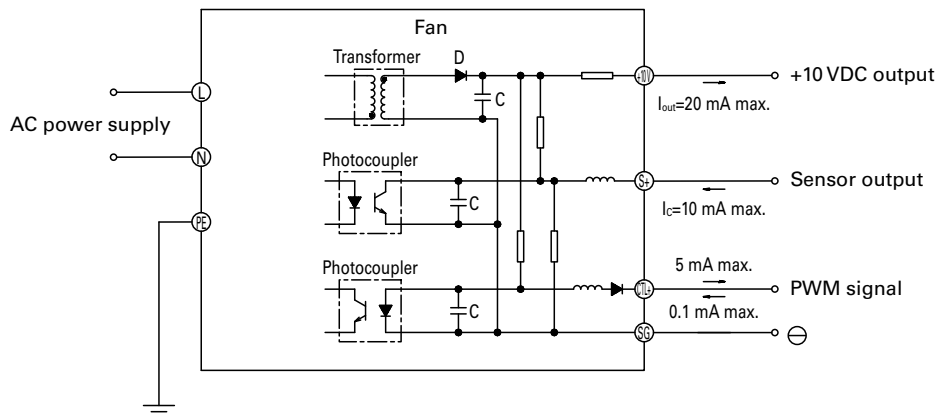


PWM duty - Speed characteristics example

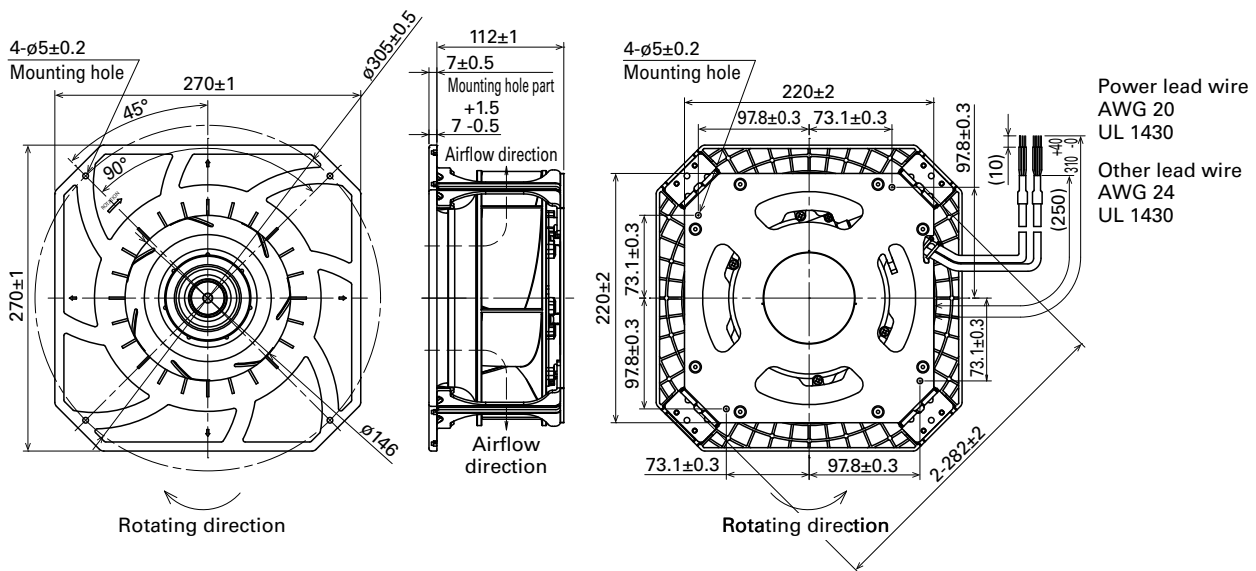


ACDC Fan 270 mm sq.

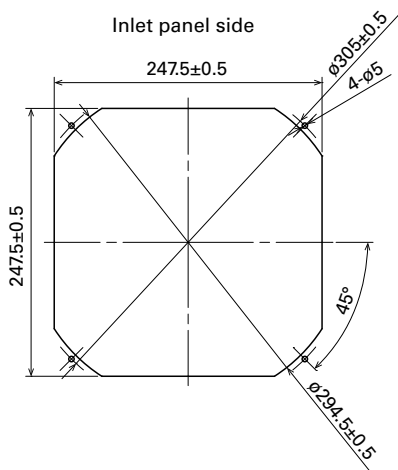
Connection Schematic



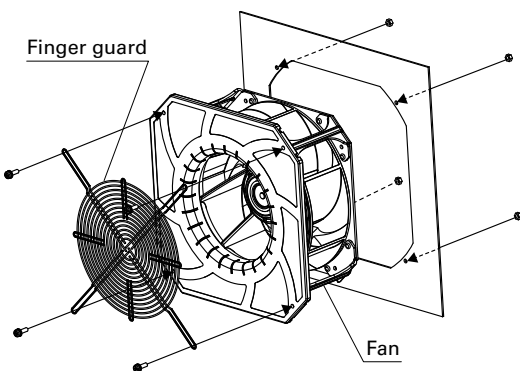
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting



Options

Finger guards

page: p. 602

Model no.: 109-1146, 109-1146H

AC Fan

The cooling fan operates at 100 to 230 VAC.

■ How to Read Specifications (AC fan) The following is a sample. See respective product pages for detailed information.

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109-180 | 100 | 50/60 | 5/4 | 0.06/0.05 | 0.07/0.06 | 2250/2700 | 0.27/0.33 9.5/11.7 | 11.8/18.6 0.047/0.075 | 24/26 | -30 to +70 | 25000/60°C (56000/40°C) |
| 109-183 | 115 | | | | 0.06/0.05 | | | | | | |

- Rated voltage This is the necessary voltage to drive the fan. Single-phase 100, 115, 200 and 230 VAC are also available.
- Frequency This is a frequency of alternating current (AC). The frequencies of 50 Hz and 60 Hz are existing in Japan.
Performance of AC fan varies depending on the frequency. Example: Rated speed 2250/2700 = 50 Hz → 2250, 60 Hz → 2700
- Input The power value when the fan is operating at rated voltage (at free air).
- Current The current when the fan is operating at rated voltage (at free air).
- Locked rotor current This is a current when rotor of motor that applies rated voltage is locked.
- Rated speed The speed when the fan is operating at rated voltage (at free air).
- Max. airflow The airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure The static pressure at 0 m³/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL A-weighted sound pressure level (SPL) when the fan operates at the rated speed.
For the measurement method, see the Technical Materials section in the catalog.
- Operating temperature The temperature range over which fan operation is guaranteed (Non-condensing).
- Expected life Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.
For more information, please refer to the technical material section.



60×60×28 mm

San Ace 60

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Black, 2 pcs
- Mass 120 g

Specifications

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109-180 | 100 | 50/60 | 5/4 | 0.06/0.05 | 0.07/0.06 | 2250/2700 | 0.27/0.33 9.5/11.7 | 11.8/18.6 0.047/0.075 | 24/26 | -30 to +70 | 25000/60°C (56000/40°C) |
| 109-183 | 115 | | | | 0.06/0.05 | | | | | | |

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

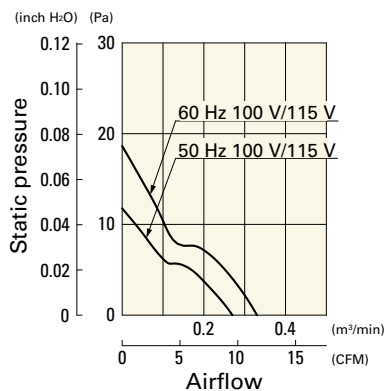
Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 669.

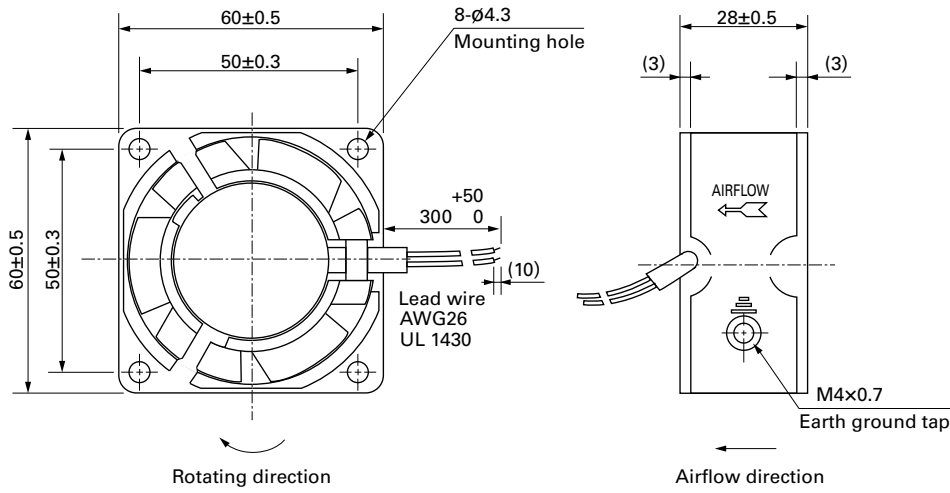
| Order no. | Set items | | | | | |
|-------------|-----------|---------|------------------|--|---------------|---------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-109-180 | 109-180 | 100 V | | Plug cord is not included because of the exposed-lead structure. | 109-139E | M4×40 mm (4 screws) |
| ST1-109-183 | 109-183 | 115 V | | | 109-139E | |

Airflow - Static Pressure Characteristics

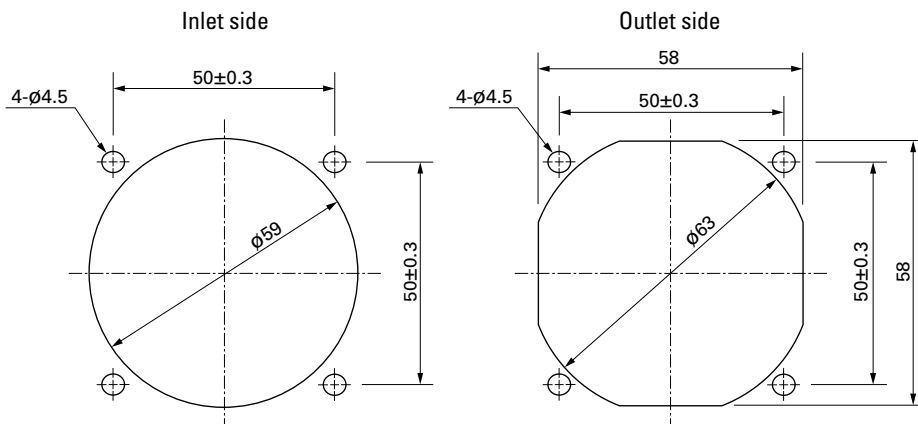
109-180, 109-183



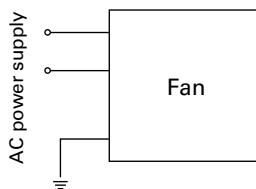
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Connection Schematic



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



60×60×38 mm

San Ace 60

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Black, 2 pcs
- Mass 170 g

Specifications

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|----------------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109-130 | 100 | 50/60 | 6/5 | 0.08/0.07 | 0.08/0.07 | 2600/3150 | 0.33/0.4 11.7/14.1 | 16.3/23.3 0.065/0.094 | 28/30 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109-133 | 115 | | | 0.07/0.06 | 0.07/0.06 | | | | | | |

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

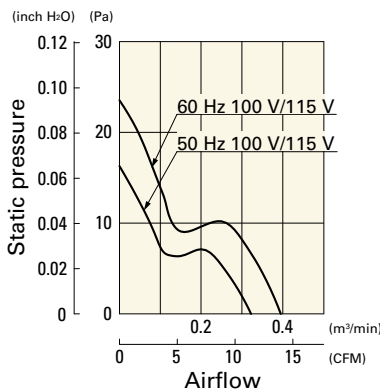
Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 669.

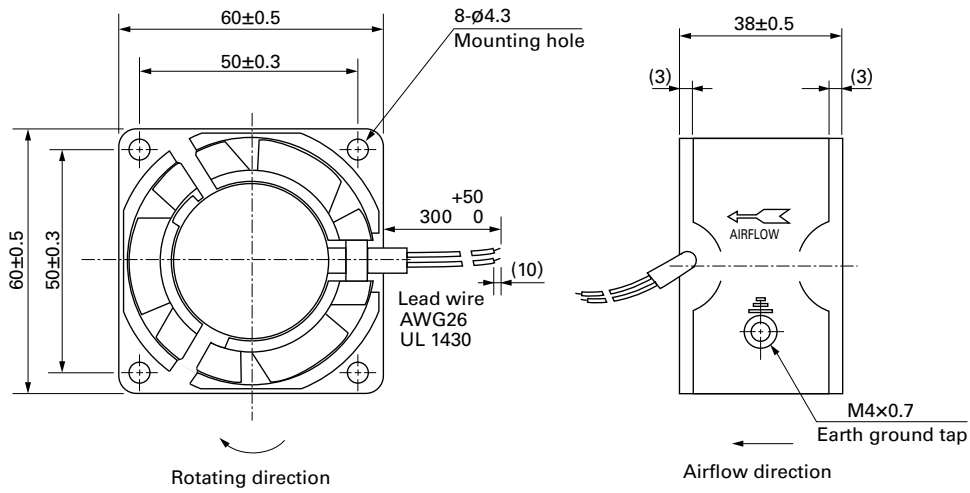
| Order no. | Set items | | | | | |
|--------------------|-----------|---------|------------------|--|---------------|---------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-109-130 | 109-130 | 100 V | | Plug cord is not included because of the exposed-lead structure. | 109-139E | M4×55 mm (4 screws) |
| ST1-109-133 | 109-133 | 115 V | | | 109-139E | |

Airflow - Static Pressure Characteristics

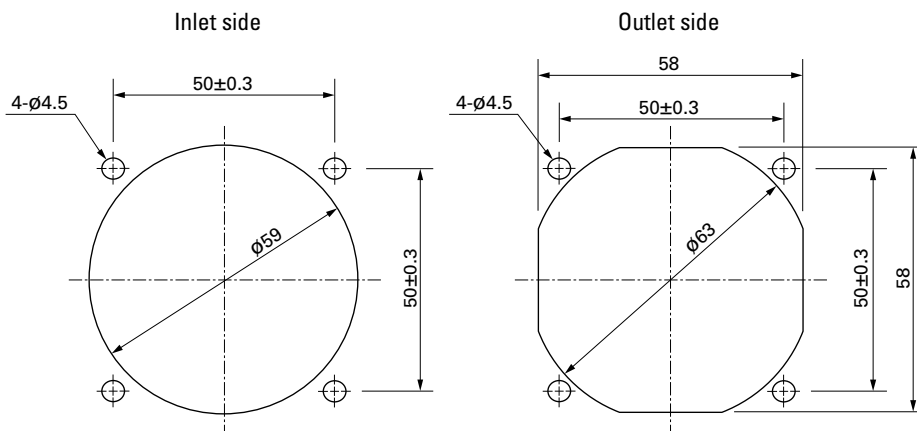
109-130, 109-133



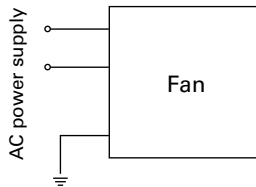
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Connection Schematic



Options

Finger guards

page: p. 598

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 605

Model no.: 109-1003G

Resin filter kits

page: p. 606

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)



80×80×20 mm

San Ace 80

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Black, 2 pcs
- Mass 180 g

Specifications

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 109-210 | 100 | 50/60 | 6/5 | 0.07/0.06 | 0.07/0.06 | 2500/3000 | 0.44/0.53 15.5/18.7 | 23.5/31.4 0.094/0.126 | 26/31 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109-213 | 115 | | | 0.06/0.05 | 0.06/0.05 | | | | | | |

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

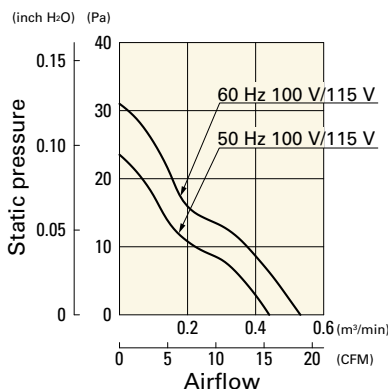
Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 669.

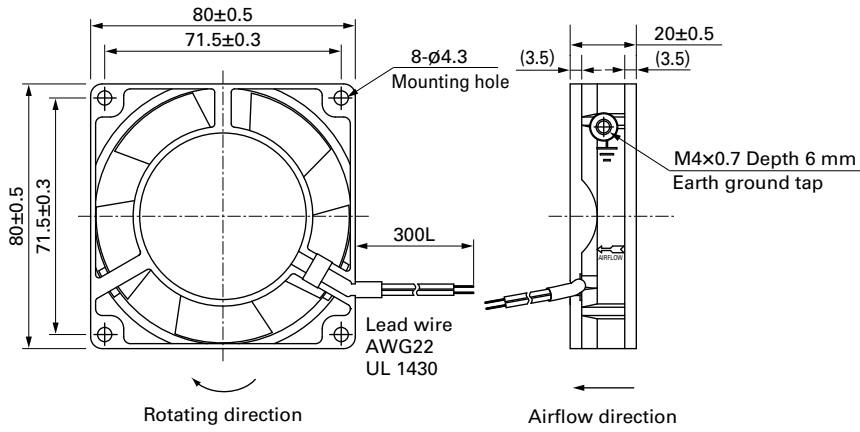
| Order no. | Set items | | | | | |
|-------------|-----------|---------|------------------|--|---------------|---------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-109-210 | 109-210 | 100 V | | Plug cord is not included because of the exposed-lead structure. | 109-049E | M4×40 mm (4 screws) |
| ST1-109-213 | 109-213 | 115 V | | | 109-049E | |

Airflow - Static Pressure Characteristics

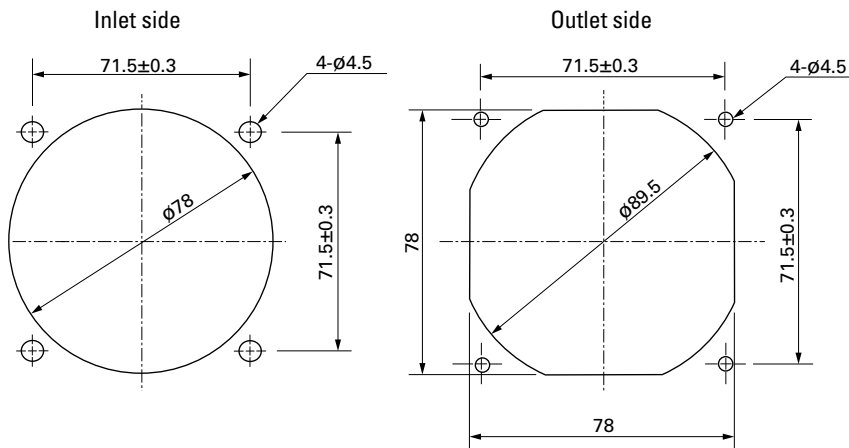
109-210, 109-213



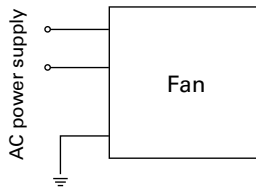
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Connection Schematic



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)



80×80×25 mm

San Ace 80

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Mass 270 g

Specifications

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 109S050 | 100 | 50/60 | 9/7 | 0.12/0.1 | 0.13/0.11 | 2650/3100 | 0.63/0.76 22.3/26.9 | 27.5/38.3 0.11 /0.154 | 30/33 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109S053 | 115 | | | 0.1 /0.08 | 0.11/0.09 | | | | | | |
| 109S051 | 200 | | | 0.06/0.05 | 0.06/0.05 | | | | | | |
| 109S054 | 230 | | | 0.05/0.04 | 0.05/0.04 | | | | | | |
| 109S030 | 100 | | | 0.12/0.1 | 0.13/0.11 | 2350/2700 | 0.55/0.63 19.4/22.3 | 21.6/28.4 0.087/0.114 | 28/30 | | |
| 109S033 | 115 | | | 0.1 /0.08 | 0.11/0.09 | | | | | | |
| 109S031 | 200 | | | 0.06/0.05 | 0.06/0.05 | | | | | | |
| 109S034 | 230 | | | 0.05/0.04 | 0.05/0.04 | | | | | | |

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

Set Models PSE (Japanese safety standard) compatible

A set of a fan, finger guard, plug cord (PSE compatible), and screws. For details, please refer to p. 669.

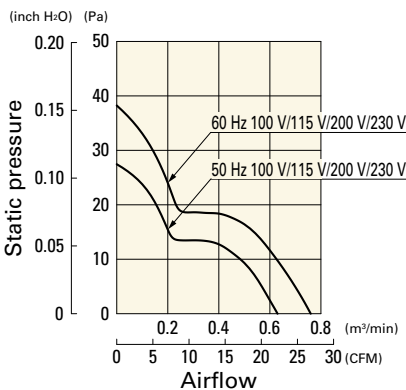
| Order no. | Set items | | | | | |
|-------------|-----------|---------|------------------|----------------------------|---------------|------------------------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-109S050 | 109S050 | 100 V | | 489-016-L10 ⁽¹⁾ | 109-049E | M4×40 mm (4 screws) ⁽²⁾ |
| ST1-109S053 | 109S053 | 115 V | | 489-016-L10 ⁽¹⁾ | 109-049E | |
| ST1-109S051 | 109S051 | 200 V | | 489-016-L10 ⁽¹⁾ | 109-049E | |
| ST1-109S054 | 109S054 | 230 V | | 489-016-L10 ⁽¹⁾ | 109-049E | |
| ST1-109S030 | 109S030 | 100 V | | 489-016-L10 ⁽¹⁾ | 109-049E | |
| ST1-109S033 | 109S033 | 115 V | | 489-016-L10 ⁽¹⁾ | 109-049E | |
| ST1-109S031 | 109S031 | 200 V | | 489-016-L10 ⁽¹⁾ | 109-049E | |
| ST1-109S034 | 109S034 | 230 V | | 489-016-L10 ⁽¹⁾ | 109-049E | |

(1) PSE compatible, but not UL compatible.

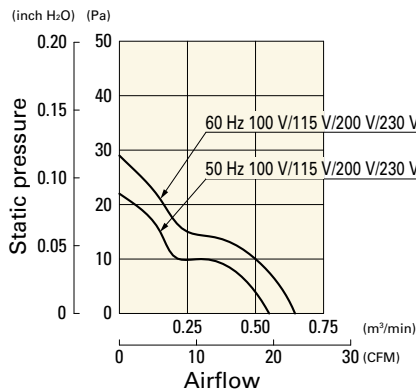
(2) Though these are 2-hole or 3-hole frame mount types, 4 screws are included for extra.

Airflow - Static Pressure Characteristics

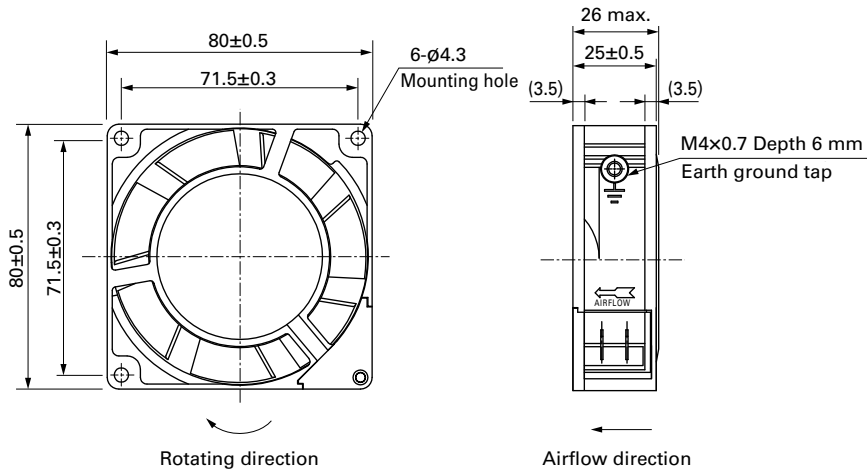
109S050, 109S053, 109S051, 109S054



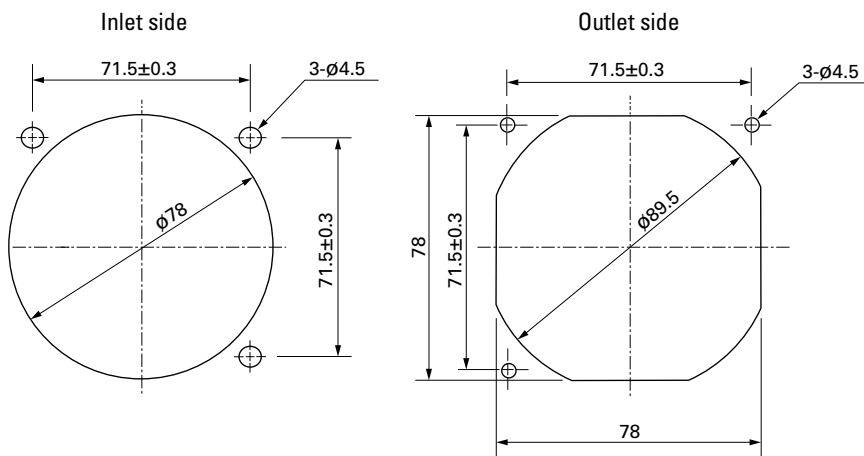
109S030, 109S033, 109S031, 109S034



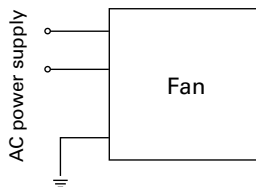
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Connection Schematic



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)

Plug cord

page: pp. 608 to 609

PSE compatible models
Model no.: 489-016-L10, 489-016-L21
UL/CSA certified models
Model no.: 489-047-L10, 489-047-L21



80×80×38 mm

San Ace 80

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Mass 400 g

Specifications

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 109-150 | 100 | 50/60 | 9/8 | 0.13/0.11 | 0.17/0.15 | 2700/3150 | 0.9/1.05 31.8/37.1 | 31.4/44.1 0.126/0.177 | 35/39 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109-153 | 115 | | | 0.11/0.1 | 0.14/0.12 | | | | | | |
| 109-151 | 200 | | | 0.07/0.06 | 0.09/0.08 | | | | | | |
| 109-154 | 230 | | | 0.06/0.05 | 0.08/0.07 | | | | | | |

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

Set Models PSE (Japanese safety standard) compatible

A set of a fan, finger guard, plug cord (PSE compatible), and screws. For details, please refer to p. 669.

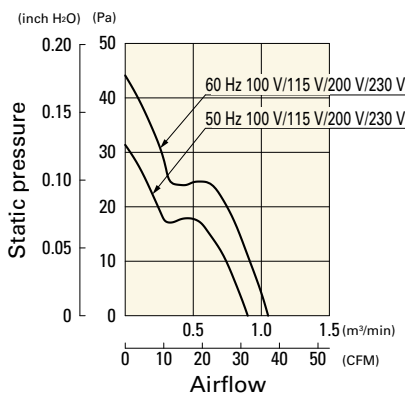
| Order no. | Set items | | | | | |
|-------------|-----------|---------|------------------|----------------------------|---------------|------------------------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-109-150 | 109-150 | 100 V | | 489-016-L10 ⁽¹⁾ | 109-049E | M4×55 mm (4 screws) ⁽²⁾ |
| ST1-109-153 | 109-153 | 115 V | | 489-016-L10 ⁽¹⁾ | 109-049E | |
| ST1-109-151 | 109-151 | 200 V | | 489-016-L10 ⁽¹⁾ | 109-049E | |
| ST1-109-154 | 109-154 | 230 V | | 489-016-L10 ⁽¹⁾ | 109-049E | |

(1) PSE compatible, but not UL compatible.

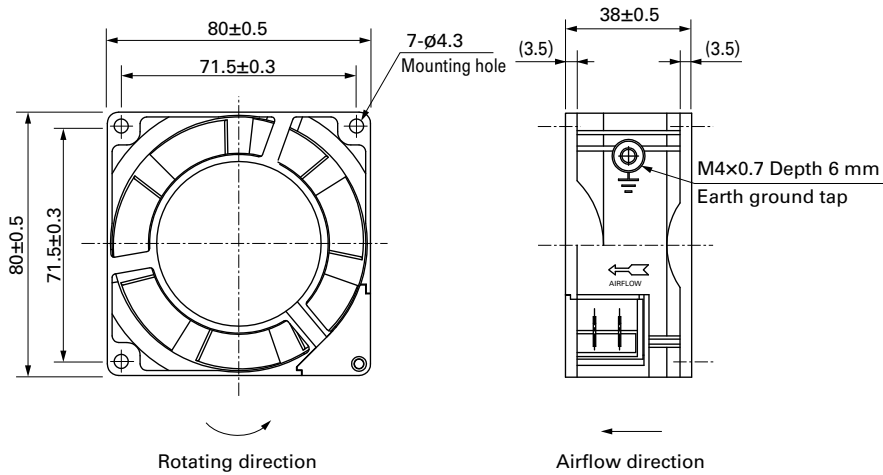
(2) Though these are 2-hole or 3-hole frame mount types, 4 screws are included for extra.

Airflow - Static Pressure Characteristics

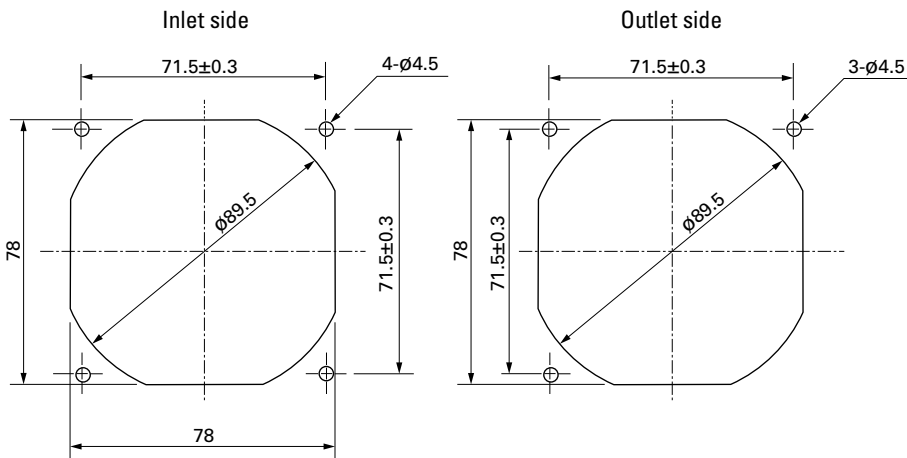
109-150, 109-153, 109-151, 109-154



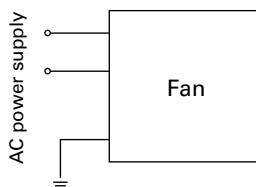
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Connection Schematic



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)

Plug cord

page: pp. 608 to 609

PSE compatible models
Model no.: 489-016-L10, 489-016-L21
UL/CSA certified models
Model no.: 489-047-L10, 489-047-L21



80×80×42 mm

San Ace 80

General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Mass 410 g

Specifications

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 109-040UL | 100 | 50/60 | 10/9 | 0.13/0.11 | 0.16/0.14 | 2650/3100 | 0.85/1.0 30.0/35.3 | 24.5/35.3 0.098/0.142 | 40/44 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109-043UL | 115 | | | 0.11/0.1 | 0.14/0.12 | | | | | | |
| 109-041UL | 200 | | | 0.07/0.06 | 0.08/0.07 | | | | | | |
| 109-044UL | 230 | | | 0.06/0.05 | 0.07/0.06 | | | | | | |
| 109-047UL* | 100 | | | 4/3.5 | 0.05/0.05 | | | | | | |
| 109-033UL* | 115 | 0.04/0.04 | 0.04/0.04 | | | | | | | | |

* These are low-speed models.

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

AC Fan 80 mm sq.

Set Models PSE (Japanese safety standard) compatible

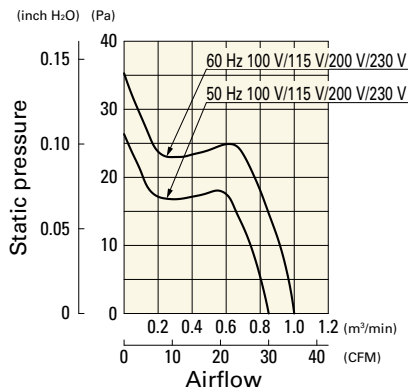
A set of a fan, finger guard, plug cord (PSE compatible), and screws. For details, please refer to p. 669.

| Order no. | Set items | | | | | |
|---------------|-----------|---------|------------------|--------------|---------------|---------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-109-040UL | 109-040UL | 100 V | | 489-008-L10* | 109-049E | M4×55 mm (4 screws) |
| ST1-109-043UL | 109-043UL | 115 V | | 489-008-L10* | 109-049E | |
| ST1-109-041UL | 109-041UL | 200 V | | 489-008-L10* | 109-049E | |
| ST1-109-044UL | 109-044UL | 230 V | | 489-008-L10* | 109-049E | |
| ST1-109-047UL | 109-047UL | 100 V | | 489-008-L10* | 109-049E | |
| ST1-109-033UL | 109-033UL | 115 V | | 489-008-L10* | 109-049E | |

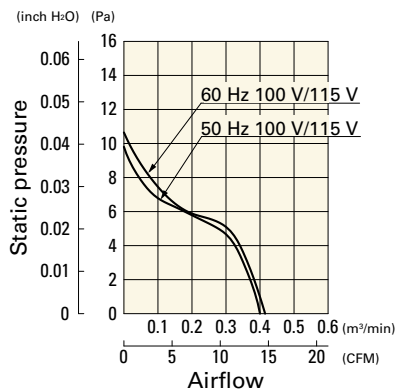
* PSE compatible, but not UL compatible.

Airflow - Static Pressure Characteristics

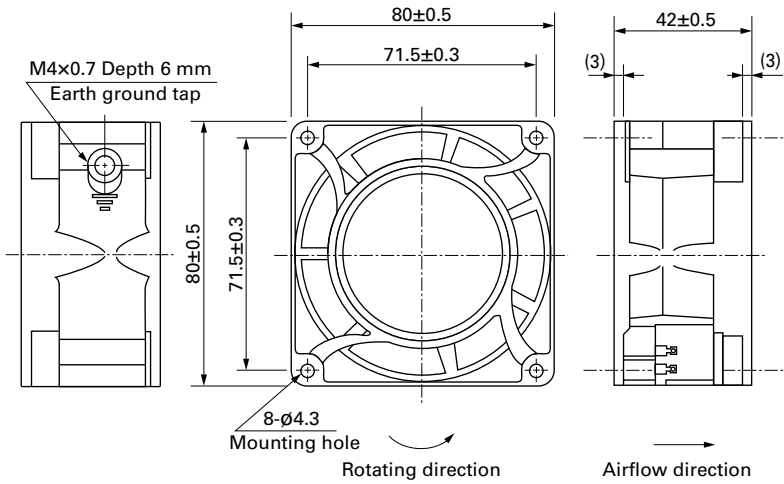
109-040UL, 109-043UL, 109-041UL, 109-044UL



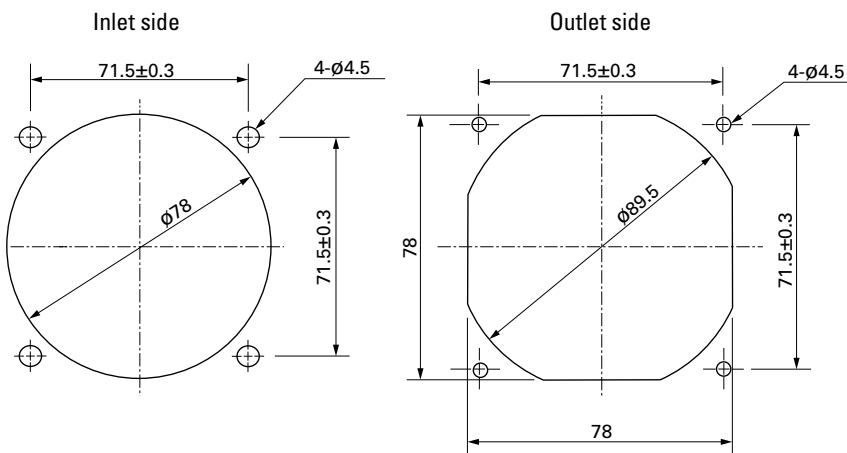
109-047UL, 109-033UL



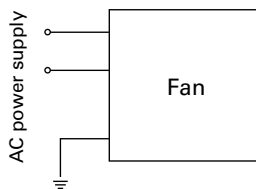
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Connection Schematic



Options

Finger guards

page: p. 598

Model no.: 109-049E, 109-049H

Resin finger guards

page: p. 605

Model no.: 109-1002G

Resin filter kits

page: p. 606

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)

Plug cord

page: pp. 608 to 609

PSE compatible models

Model no.: 489-008-L10, 489-008-L21, 489-008-L35

92×92×25 mm

San Ace 92  Only standard fans (without sensors) have acquired CSA certification.



General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Dielectric strength (with sensor) 50/60 Hz 1500 VAC 1 minute (between AC input terminal and frame)
50/60 Hz 1000 VAC 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Sensor-Purpose lead wire ⊕Brown ⊖Black (Sensor) Yellow
- Mass 290 g/310 g (with Sensor)

Specifications

Standard

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109S091 | 100 | 50/60 | 8/7 | 0.1 /0.09 | 0.13/0.12 | 2700/3100 | 0.95/1.1 33.6/38.9 | 39.2/49.0 0.157/0.197 | 35/38 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109S093 | 115 | | | 0.09/0.08 | 0.11/0.1 | | | | | | |
| 109S092 | 200 | | 11/10 | 0.07/0.06 | 0.08/0.08 | | | | | | |
| 109S094 | 230 | | 10/9 | 0.06/0.05 | 0.07/0.07 | | | | | | |
| 109S095 | 100 | | 8/7 | 0.1 /0.09 | 0.11/0.1 | 2400/2800 | 0.84/0.98 29.7/34.6 | 31.4/40.2 0.126/0.161 | 32/35 | | |
| 109S096* | 100 | | 7/6 | 0.09/0.08 | 0.09/0.08 | 1500/1700 | 0.55/0.65 19.4/23 | 12.5/16.3 0.05 /0.065 | 24/27 | | |
| 109S193* | 115 | | | 0.08/0.07 | 0.08/0.07 | | | | | | |
| 109S192* | 200 | | 8/7 | 0.06/0.05 | 0.06/0.05 | | | | | | |
| 109S194* | 230 | | | 0.05/0.04 | 0.05/0.04 | | | | | | |

*These are low-speed models.

with Sensor

For sensor specifications, please refer to p. 618. Sensor specification differs depending on the fan's speed specification.

For a 5 V sensor power supply (ITEM-20), please append "-20" to the end of model number. E.g. 109S491-20

For a 12 V sensor power supply (ITEM-30), please append "-30" to the end of model number. E.g. 109S491-30

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109S491 | 100 | 50/60 | 8/7 | 0.1 /0.09 | 0.13/0.12 | 2700/3100 | 0.95/1.1 33.6/38.9 | 39.2/49.0 0.157/0.197 | 35/38 | -10 to +60 | 25000/60°C (56000/40°C) |
| 109S493 | 115 | | | 0.09/0.08 | 0.11/0.1 | | | | | | |
| 109S492 | 200 | | 11/10 | 0.07/0.06 | 0.08/0.08 | | | | | | |
| 109S494 | 230 | | 10/9 | 0.06/0.05 | 0.07/0.07 | | | | | | |
| 109S495 | 100 | | 8/7 | 0.1 /0.09 | 0.11/0.1 | 2400/2800 | 0.84/0.98 29.7/34.6 | 31.4/40.2 0.126/0.161 | 32/35 | | |
| 109S496* | | | 7/6 | 0.09/0.08 | 0.09/0.08 | 1500/1700 | 0.55/0.65 19.4/23 | 12.5/16.3 0.05 /0.065 | 24/27 | | |

*These are low-speed models.

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

For the **San Ace 92AD** 9AD type **92×92×38** mm fan, please refer to p. 496.

This fan works while internally converting AC power into DC power, providing the superior performance of a DC fan with the flexibility of AC input.

Set Models PSE (Japanese safety standard) compatible

A set of a fan, finger guard, plug cord (PSE compatible), and screws. For details, please refer to p. 669.

| Order no. | Set items | | | | | |
|----------------|------------|---------|------------------|----------------------------|---------------|------------------------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-109S091 | 109S091 | 100 V | | 489-016-L10 ⁽¹⁾ | 109-099E | M3×40 mm (4 screws) ⁽²⁾ |
| ST1-109S093 | 109S093 | 115 V | | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S092 | 109S092 | 200 V | | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S094 | 109S094 | 230 V | | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S095 | 109S095 | 100 V | | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S096 | 109S096 | 100 V | | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S193 | 109S193 | 115 V | | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S192 | 109S192 | 200 V | | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S194 | 109S194 | 230 V | | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S491-20 | 109S491-20 | 100 V | ○ (5 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S491-30 | 109S491-30 | | ○ (12 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S493-20 | 109S493-20 | 115 V | ○ (5 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S493-30 | 109S493-30 | | ○ (12 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S492-20 | 109S492-20 | 200 V | ○ (5 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S492-30 | 109S492-30 | | ○ (12 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S494-20 | 109S494-20 | 230 V | ○ (5 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S494-30 | 109S494-30 | | ○ (12 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S495-20 | 109S495-20 | 100 V | ○ (5 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S495-30 | 109S495-30 | | ○ (12 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S496-20 | 109S496-20 | | ○ (5 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |
| ST1-109S496-30 | 109S496-30 | | ○ (12 V) | 489-016-L10 ⁽¹⁾ | 109-099E | |

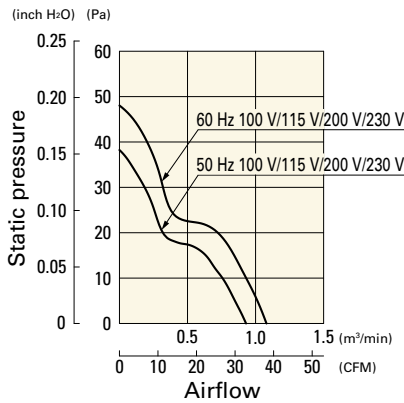
(1) PSE compatible, but not UL compatible.

(2) Though these are 2-hole or 3-hole frame mount types, 4 screws are included for extra.

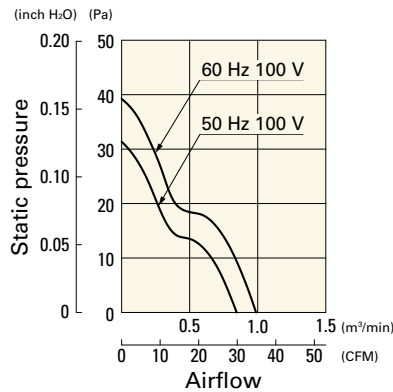
Airflow - Static Pressure Characteristics

Standard

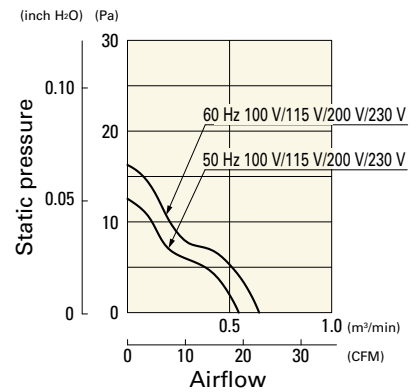
109S091, 109S093, 109S092, 109S094



109S095

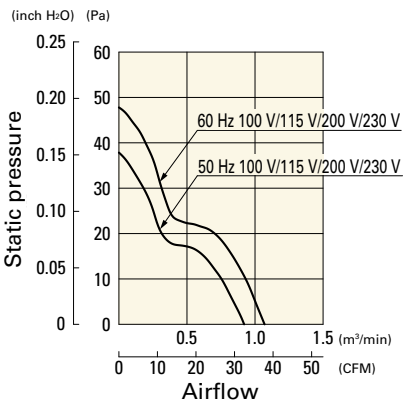


109S096, 109S193, 109S192, 109S194

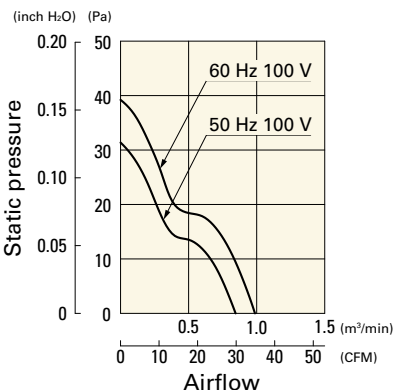


with Sensor

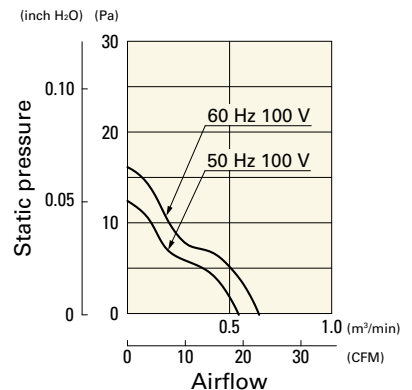
109S491, 109S493, 109S492, 109S494



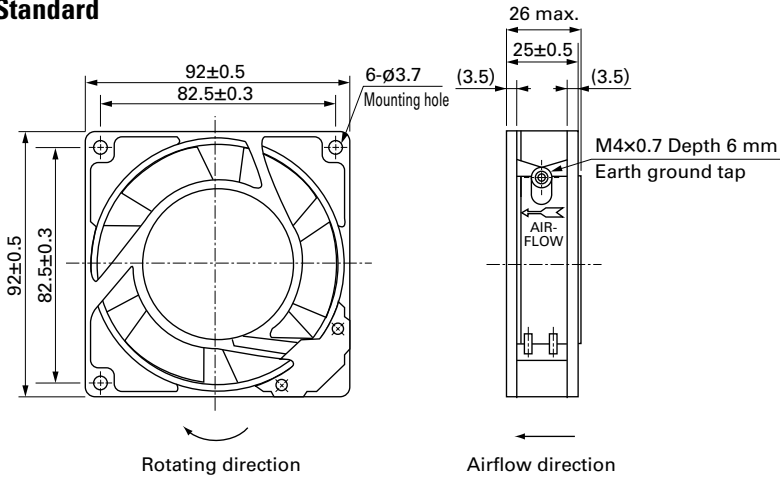
109S495



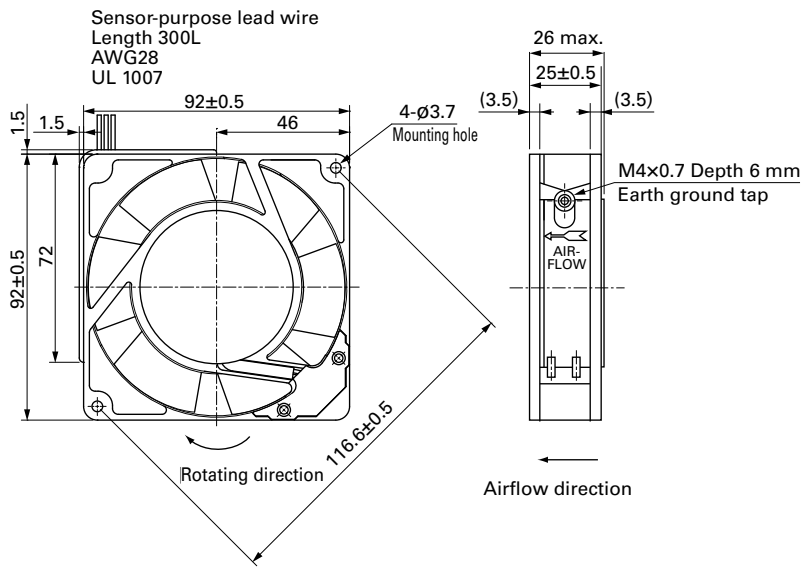
109S496



Standard



with Sensor

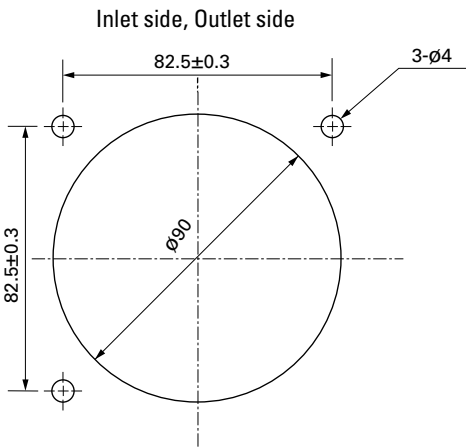


AC

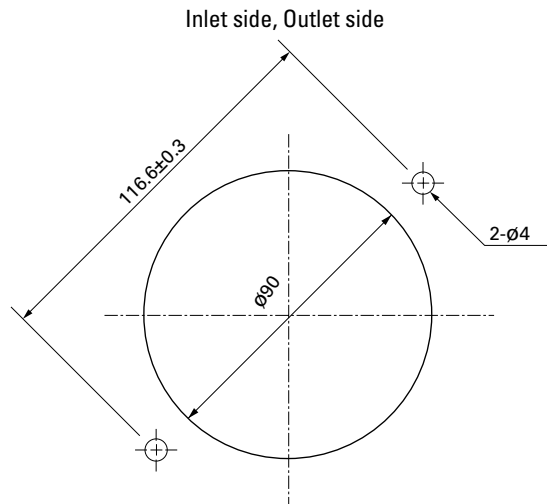
AC Fan 92 mm sq.

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Standard

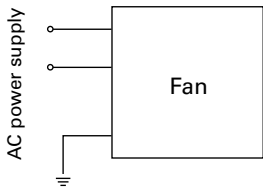


with Sensor



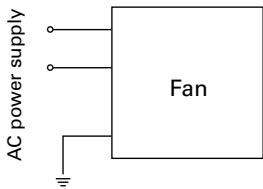
Connection Schematic

Standard

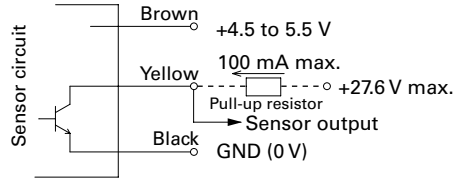


with Sensor

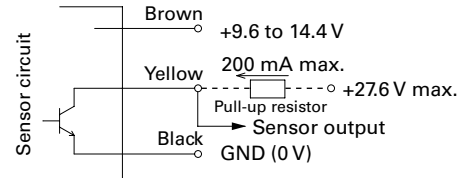
For fan power supply



For sensor circuit
5 V (ITEM-20)



12 V (ITEM-30)



GND (Black) should be shared in case that power supply for sensor circuit (Brown) and that for sensor pull-up (Yellow) are separated.

Options

Finger guards

page: p. 598

Model no.: 109-099E, 109-099H

Resin finger guards

page: p. 605

Model no.: 109-1001G

Resin filter kits

page: p. 606

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)

Plug cord

page: pp. 608 to 609

PSE compatible models
Model no.: 489-016-L10, 489-016-L21
UL/CSA certified models
Model no.: 489-047-L10, 489-047-L21



120×120×25 mm

San Ace 120

Only standard fans (without sensors) have acquired CSA certification.

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Dielectric strength (with sensor) 50/60 Hz 1500 VAC 1 minute (between AC input terminal and frame)
50/60 Hz 1000 VAC 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Sensor-Purpose lead wire ⊕Brown ⊖Black (Sensor) Yellow
- Mass 370 g/390 g (with Sensor)

Specifications

Standard

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109S085 | 100 | 50/60 | 13.5/12 | 0.16/0.14 | 0.19/0.17 | 2500/2900 | 1.95/2.3 68.9/81.3 | 48 /51.9 0.193/0.216 | 38/41 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109S084 | 115 | | | 0.14/0.12 | 0.16/0.15 | | | | | | |
| 109S088 | 200 | | | 0.08/0.07 | 0.1 /0.09 | | | | | | |
| 109S087 | 230 | | | 0.07/0.06 | 0.08/0.07 | | | | | | |
| 109S081 | 100 | 9.5/8.5 | 0.11 | 0.11/0.1 | 2200/2350 | 1.7 /1.8 60.1/63.6 | 29.4/26.5 0.118/0.106 | 34/35 | | | |
| 109S083 | 115 | 0.1 | 0.1 /0.09 | | | | | | | | |
| 109S082 | 200 | 0.07 | 0.07/0.06 | | | | | | | | |
| 109S089 | 230 | 0.06 | 0.06/0.05 | | | | | | | | |
| 109S086* | 100 | 12/10 | 0.14/0.12 | 0.15/0.13 | 1400/1600 | 1.1 /1.25 38.9/44.2 | 14.7/18.6 0.059/0.075 | 24/27 | | | |

*These are low-speed models.

with Sensor

For sensor specifications, please refer to p. 618. Sensor specification differs depending on the fan's speed specification.

For a 5 V sensor power supply (ITEM-20), please append "-20" to the end of model number. E.g. 109S485-20

For a 12 V sensor power supply (ITEM-30), please append "-30" to the end of model number. E.g. 109S485-30

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109S485 | 100 | 50/60 | 13.5/12 | 0.16/0.14 | 0.19/0.17 | 2500/2900 | 1.95/2.3 68.9/81.3 | 48 /51.9 0.193/0.216 | 38/41 | -10 to +60 | 25000/60°C (56000/40°C) |
| 109S484 | 115 | | | 0.14/0.12 | 0.16/0.15 | | | | | | |
| 109S488 | 200 | | | 0.08/0.07 | 0.1 /0.09 | | | | | | |
| 109S487 | 230 | | | 0.07/0.06 | 0.08/0.07 | | | | | | |
| 109S486* | 100 | 12/10 | 0.14/0.12 | 0.15/0.13 | 1400/1600 | 1.1 /1.25 38.9/44.2 | 14.7/18.6 0.059/0.075 | 24/27 | | | |

*These are low-speed models.

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

Set Models PSE (Japanese safety standard) compatible

A set of a fan, finger guard, plug cord (PSE compatible), and screws. For details, please refer to p. 669.

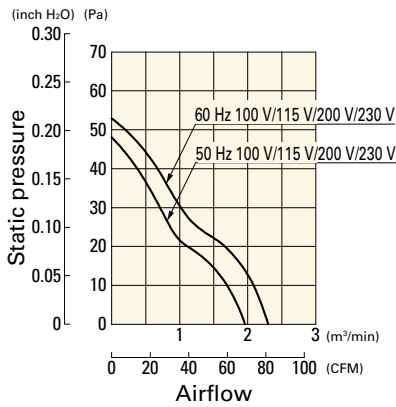
| Order no. | Set items | | | | | |
|----------------|------------|---------|------------------|--------------|---------------|---------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-109S085 | 109S085 | 100 V | | 489-016-L10* | 109-019E | M3×40 mm (4 screws) |
| ST1-109S084 | 109S084 | 115 V | | 489-016-L10* | 109-019E | |
| ST1-109S088 | 109S088 | 200 V | | 489-016-L10* | 109-019E | |
| ST1-109S087 | 109S087 | 230 V | | 489-016-L10* | 109-019E | |
| ST1-109S081 | 109S081 | 100 V | | 489-016-L10* | 109-019E | |
| ST1-109S083 | 109S083 | 115 V | | 489-016-L10* | 109-019E | |
| ST1-109S082 | 109S082 | 200 V | | 489-016-L10* | 109-019E | |
| ST1-109S089 | 109S089 | 230 V | | 489-016-L10* | 109-019E | |
| ST1-109S086 | 109S086 | | | 489-016-L10* | 109-019E | |
| ST1-109S485-20 | 109S485-20 | 100 V | ○ (5 V) | 489-016-L10* | 109-019E | |
| ST1-109S485-30 | 109S485-30 | | ○ (12 V) | 489-016-L10* | 109-019E | |
| ST1-109S484-20 | 109S484-20 | 115 V | ○ (5 V) | 489-016-L10* | 109-019E | |
| ST1-109S484-30 | 109S484-30 | | ○ (12 V) | 489-016-L10* | 109-019E | |
| ST1-109S488-20 | 109S488-20 | 200 V | ○ (5 V) | 489-016-L10* | 109-019E | |
| ST1-109S488-30 | 109S488-30 | | ○ (12 V) | 489-016-L10* | 109-019E | |
| ST1-109S487-20 | 109S487-20 | 230 V | ○ (5 V) | 489-016-L10* | 109-019E | |
| ST1-109S487-30 | 109S487-30 | | ○ (12 V) | 489-016-L10* | 109-019E | |
| ST1-109S486-20 | 109S486-20 | 100 V | ○ (5 V) | 489-016-L10* | 109-019E | |
| ST1-109S486-30 | 109S486-30 | | ○ (12 V) | 489-016-L10* | 109-019E | |

* PSE compatible, but not UL compatible.

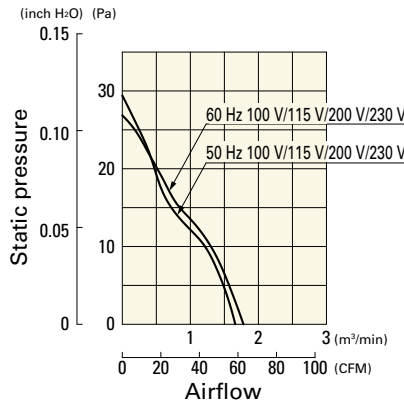
Airflow - Static Pressure Characteristics

Standard

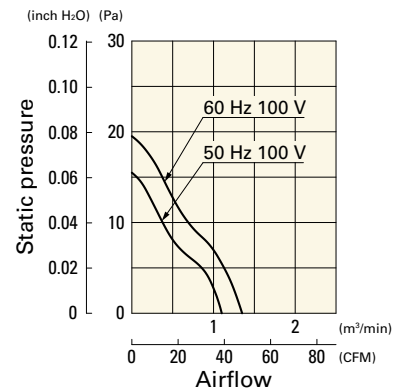
109S085, 109S084, 109S088, 109S087



109S081, 109S083, 109S082, 109S089

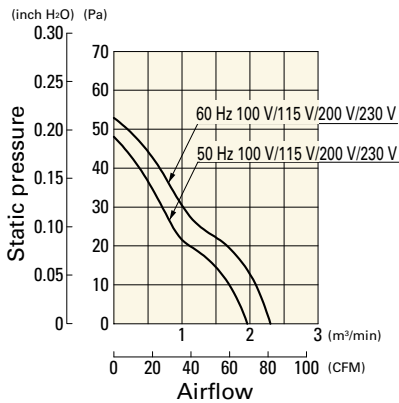


109S086

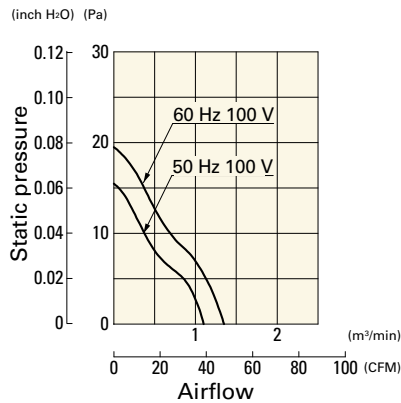


with Sensor

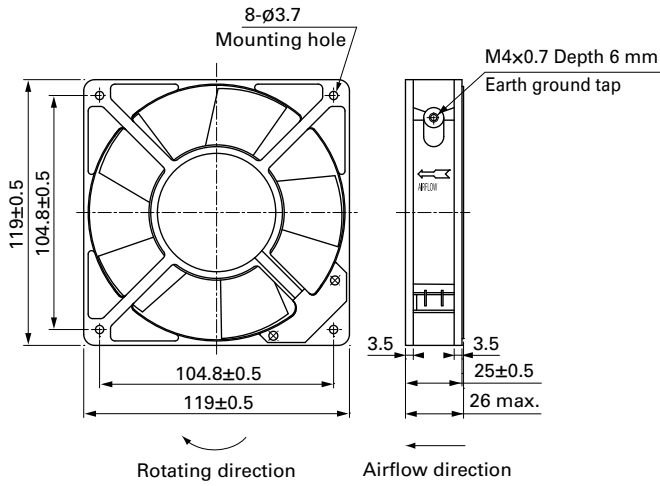
109S485, 109S484, 109S488, 109S487



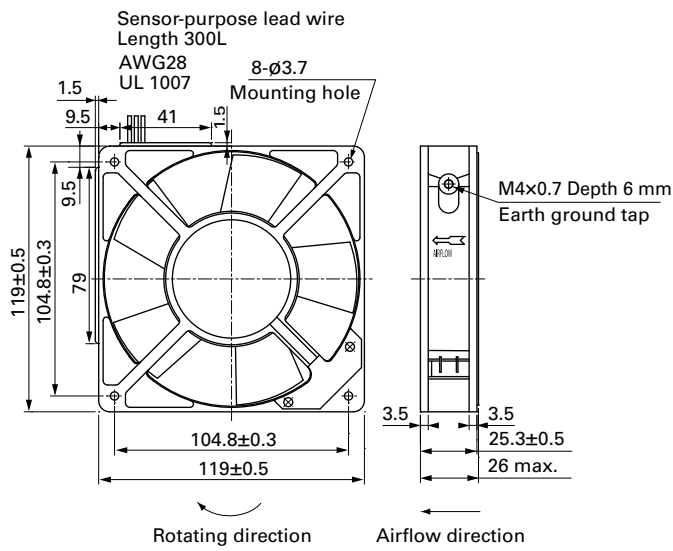
109S486



Standard

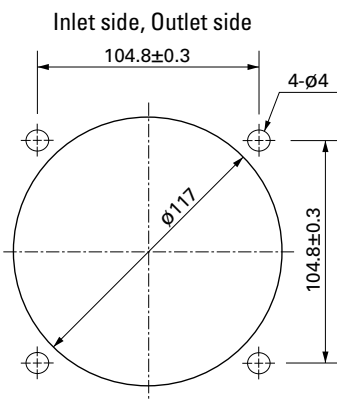


with Sensor When mounting the model with a sensor, please screw-mount through both flanges as it has a sensor box.



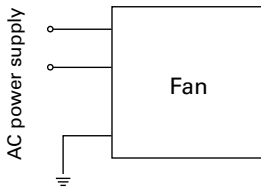
AC Fan 120 mm sq.

Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



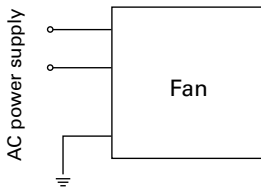
Connection Schematic

Standard

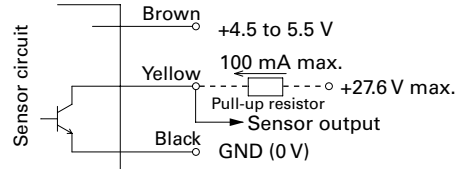


with Sensor

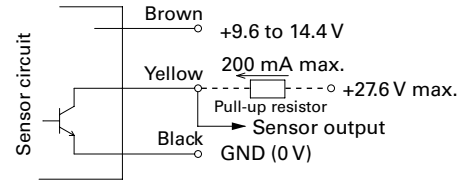
For fan power supply



For sensor circuit
5 V (ITEM-20)



12 V (ITEM-30)



GND (Black) should be shared in case that power supply for sensor circuit (Brown) and that for sensor pull-up (Yellow) are separated.

Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)

Plug cord

page: pp. 608 to 609

PSE compatible models
Model no.: 489-016-L10, 489-016-L21
UL/CSA certified models
Model no.: 489-047-L10, 489-047-L21



120×120×38 mm

San Ace 120 Certifications vary by model no. See the Specifications below.

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and G terminal)
- Dielectric strength (with sensor) 50/60 Hz 1500 VAC 1 minute (between AC input terminal and G terminal)
50/60 Hz 1000 VAC 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Sensor-Purpose lead wire ⊕Brown ⊖Black (Sensor) Yellow
- Mass 550 g/580 g (with Sensor)

Specifications

Standard

Standard conformity: UL, CSA, TÜV, CE, UKCA, and PSE

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109S075UL | 100 | 50/60 | 18/16 | 0.24/0.21 | 0.32/0.28 | 2700/3100 | 2.5 /2.9 88.3/102.5 | 57.9/68.7 0.233/0.276 | 42/45 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109S074UL | 115 | | | 0.21/0.18 | 0.27/0.24 | | | | | | |
| 109S078UL | 200 | | | 0.12/0.1 | 0.16/0.14 | | | | | | |
| 109S072UL | 230 | | | 0.11/0.09 | 0.14/0.13 | | | | | | |
| 109S005UL | 100 | | 14/12 | 0.18/0.16 | 0.25/0.22 | 2700/3100 | 2.35/2.7 83 / 95.4 | 55.9/65.7 0.224/0.264 | 40/43 | | |
| 109S024UL | 115 | | | 0.16/0.14 | 0.21/0.18 | | | | | | |
| 109S008UL | 200 | | | 0.09/0.08 | 0.13/0.11 | | | | | | |
| 109S025UL | 230 | | | 0.08/0.07 | 0.11/0.09 | | | | | | |
| 109S029UL | 100 | | 14/12 | 0.18/0.16 | 0.23/0.21 | 2450/2700 | 2.15/2.35 76 / 83 | 44.1/49.0 0.177/0.197 | 38/40 | | |
| 109S013UL | | | 13/11 | 0.16/0.14 | 0.16/0.15 | 1800/2000 | 1.55/1.75 54.8/ 60.8 | 23.5/26.4 0.094/0.106 | 30/32 | | |
| 109S006UL* | | 115 | 7/7 | 0.1 /0.09 | 0.1 /0.09 | 1650/1700 | 1.45/1.5 51.2/ 53 | 17.6/17.6 0.071/0.071 | 28/28 | | |
| | | | 10/10 | 0.13/0.11 | 0.13/0.11 | 1800/1900 | 1.56/1.64 55 / 57.9 | 20 /20.6 0.08 /0.083 | 30/31 | | |
| 109S010UL* | 200 | 7/7 | 0.05/0.04 | 0.05/0.04 | 1650/1700 | 1.45/1.5 51.2/ 53 | 17.6/17.6 0.071/0.071 | 28/28 | | | |
| | 240 | 11/11 | 0.06/0.05 | 0.06/0.05 | 1800/1950 | 1.58/1.68 55.8/ 59.3 | 20.6/21.6 0.083/0.087 | 30/32 | | | |

*These are low-speed models.

Standard conformity: PSE

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109S005 | 100 | 50/60 | 14/12 | 0.18/0.16 | 0.25/0.22 | 2700/3100 | 2.35/2.7 83 / 95.4 | 55.9/65.7 0.224/0.264 | 40/43 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109S024 | 120 | | | 0.16/0.14 | 0.21/0.18 | | | | | | |
| 109S008 | 200 | | | 0.09/0.08 | 0.13/0.11 | | | | | | |
| 109S025 | 230 | | | 0.08/0.07 | 0.11/0.09 | | | | | | |
| 109S013 | 100 | | 13/11 | 0.16/0.14 | 0.16/0.15 | 1800/2000 | 1.55/1.75 54.8/ 60.8 | 23.5/26.4 0.094/0.106 | 30/32 | | |
| 109S006* | | | 7/7 | 0.1 /0.09 | 0.1 /0.09 | 1650/1700 | 1.45/1.5 51.2/ 53 | 17.6/17.6 0.071/0.071 | 28/28 | | |
| 109S010* | 200 | 7/7 | 0.05/0.04 | 0.05/0.04 | 1650/1700 | 1.45/1.5 51.2/ 53 | 17.6/17.6 0.071/0.071 | 28/28 | | | |

*These are low-speed models.

with Sensor

For sensor specifications, please refer to p. 618. Sensor specification differs depending on the fan's speed specification.

For a 5 V sensor power supply (ITEM-20), please append "-20" to the end of model number. E.g. 109S405UL-20

For a 12 V sensor power supply (ITEM-30), please append "-30" to the end of model number. E.g. 109S405UL-30

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|------------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 109S405UL | 100 | 50/60 | 14/12 | 0.18/0.16 | 0.25/0.22 | 2700/3100 | 2.35/2.7 83 / 95.4 | 55.9/65.7 0.224/0.264 | 40/43 | -10 to +60 | 25000/60°C (56000/40°C) |
| 109S424UL | 115 | | | 0.16/0.14 | 0.21/0.18 | | | | | | |
| 109S408UL | 200 | | | 0.09/0.08 | 0.13/0.11 | | | | | | |
| 109S425UL | 230 | | | 0.08/0.07 | 0.11/0.09 | | | | | | |
| 109S429UL | 100 | | 7/6 | 0.18/0.16 | 0.23/0.21 | 2450/2700 | 2.15/2.35 76 / 83 | 44.1/49.0 0.177/0.197 | 38/40 | | |
| 109S406UL* | | | | 0.09/0.08 | 0.1 /0.09 | 1650/1700 | 1.45/1.5 51 / 53 | 17.7/17.7 0.071/0.071 | 28/28 | | |
| 109S475UL | 100 | | 18/16 | 0.24/0.21 | 0.32/0.28 | 2700/3100 | 2.5 /2.9 88.3/102.4 | 57.9/68.7 0.233/0.276 | 42/45 | | |
| 109S474UL | 115 | | | 0.21/0.18 | 0.27/0.24 | | | | | | |
| 109S478UL | 200 | | | 0.12/0.1 | 0.16/0.14 | | | | | | |
| 109S472UL | 230 | | | 0.11/0.09 | 0.14/0.13 | | | | | | |

*These are low-speed models.

Note:These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

For the San Ace 120AD 9AD type 120×120×38 mm fan, please refer to p. 505.

This fan works while internally converting AC power into DC power, providing the superior performance of a DC fan with the flexibility of AC input.

Set Models PSE (Japanese safety standard) compatible

A set of a fan, finger guard, plug cord (PSE compatible), and screws. For details, please refer to p. 669.

| Order no. | Set items | | | | | | Mounting screws |
|------------------|--------------|----------------|------------------|--------------|---------------|---------------------|-----------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | | |
| ST1-109S075UL | 109S075UL | 100 V | | 489-037-L10* | 109-019E | M3×55 mm (4 screws) | |
| ST1-109S074UL | 109S074UL | 115 V | | 489-037-L10* | 109-019E | | |
| ST1-109S078UL | 109S078UL | 200 V | | 489-037-L10* | 109-019E | | |
| ST1-109S072UL | 109S072UL | 230 V | | 489-037-L10* | 109-019E | | |
| ST1-109S005 | 109S005 | 100 V | | 489-006-L10* | 109-019E | | |
| ST1-109S005UL | 109S005UL | | 489-037-L10* | 109-019E | | | |
| ST1-109S024 | 109S024 | 120 V | | 489-006-L10* | 109-019E | | |
| ST1-109S024UL | 109S024UL | 115 V | | 489-037-L10* | 109-019E | | |
| ST1-109S008 | 109S008 | 200 V | | 489-006-L10* | 109-019E | | |
| ST1-109S008UL | 109S008UL | | 489-037-L10* | 109-019E | | | |
| ST1-109S025 | 109S025 | 230 V | | 489-006-L10* | 109-019E | | |
| ST1-109S025UL | 109S025UL | | 489-037-L10* | 109-019E | | | |
| ST1-109S029UL | 109S029UL | 100 V | | 489-037-L10* | 109-019E | | |
| ST1-109S013 | 109S013 | | 489-006-L10* | 109-019E | | | |
| ST1-109S013UL | 109S013UL | | 489-037-L10* | 109-019E | | | |
| ST1-109S006 | 109S006 | | 489-006-L10* | 109-019E | | | |
| ST1-109S006UL | 109S006UL | 100 V 115 V | | 489-037-L10* | 109-019E | | |
| ST1-109S010 | 109S010 | 200 V | | 489-006-L10* | 109-019E | | |
| ST1-109S010UL | 109S010UL | 200 V 240 V | | 489-037-L10* | 109-019E | | |
| ST1-109S405UL-20 | 109S405UL-20 | 100 V | ○ (5 V) | 489-037-L10* | 109-019E | | |
| ST1-109S405UL-30 | 109S405UL-30 | | ○ (12 V) | 489-037-L10* | 109-019E | | |
| ST1-109S424UL-20 | 109S424UL-20 | 115 V | ○ (5 V) | 489-037-L10* | 109-019E | | |
| ST1-109S424UL-30 | 109S424UL-30 | | ○ (12 V) | 489-037-L10* | 109-019E | | |
| ST1-109S408UL-20 | 109S408UL-20 | 200 V | ○ (5 V) | 489-037-L10* | 109-019E | | |
| ST1-109S408UL-30 | 109S408UL-30 | | ○ (12 V) | 489-037-L10* | 109-019E | | |
| ST1-109S425UL-20 | 109S425UL-20 | 230 V | ○ (5 V) | 489-037-L10* | 109-019E | | |
| ST1-109S425UL-30 | 109S425UL-30 | | ○ (12 V) | 489-037-L10* | 109-019E | | |
| ST1-109S429UL-20 | 109S429UL-20 | 100 V | ○ (5 V) | 489-037-L10* | 109-019E | | |
| ST1-109S429UL-30 | 109S429UL-30 | | ○ (12 V) | 489-037-L10* | 109-019E | | |
| ST1-109S406UL-20 | 109S406UL-20 | 100 V | ○ (5 V) | 489-037-L10* | 109-019E | | |
| ST1-109S406UL-30 | 109S406UL-30 | | ○ (12 V) | 489-037-L10* | 109-019E | | |
| ST1-109S475UL-20 | 109S475UL-20 | 100 V | ○ (5 V) | 489-037-L10* | 109-019E | | |
| ST1-109S475UL-30 | 109S475UL-30 | | ○ (12 V) | 489-037-L10* | 109-019E | | |
| ST1-109S474UL-20 | 109S474UL-20 | 115 V | ○ (5 V) | 489-037-L10* | 109-019E | | |
| ST1-109S474UL-30 | 109S474UL-30 | | ○ (12 V) | 489-037-L10* | 109-019E | | |
| ST1-109S478UL-20 | 109S478UL-20 | 200 V | ○ (5 V) | 489-037-L10* | 109-019E | | |
| ST1-109S478UL-30 | 109S478UL-30 | | ○ (12 V) | 489-037-L10* | 109-019E | | |
| ST1-109S472UL-20 | 109S472UL-20 | 230 V | ○ (5 V) | 489-037-L10* | 109-019E | | |
| ST1-109S472UL-30 | 109S472UL-30 | | ○ (12 V) | 489-037-L10* | 109-019E | | |

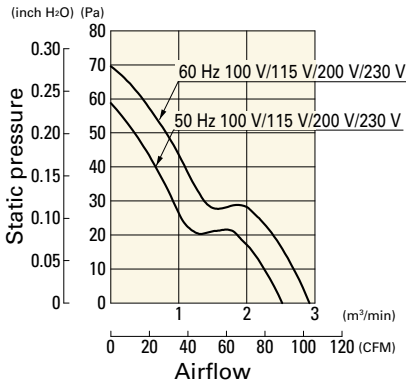
* PSE compatible, but not UL compatible.

AC
AC Fan 120 mm sq.

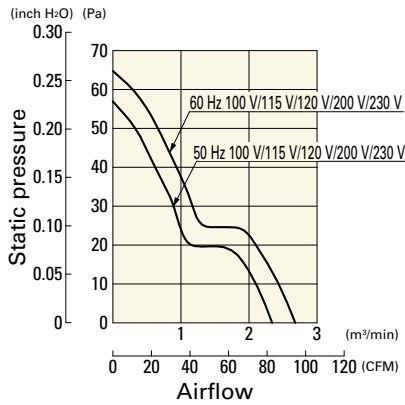
Airflow - Static Pressure Characteristics

Standard

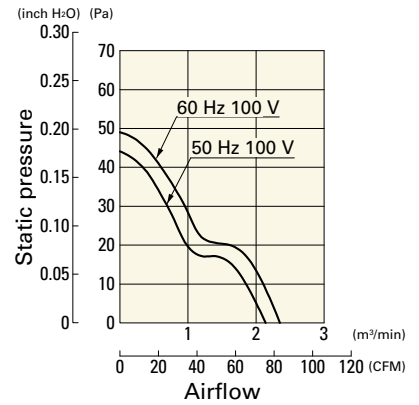
109S075UL, 109S074UL, 109S078UL, 109S072UL



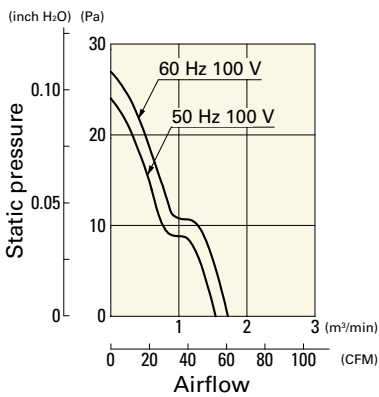
109S005, 109S005UL, 109S024, 109S024UL, 109S008, 109S008UL, 109S025, 109S025UL



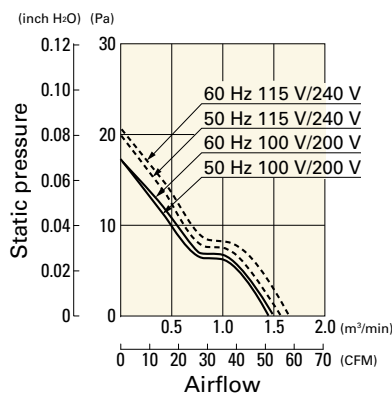
109S029UL



109S013, 109S013UL



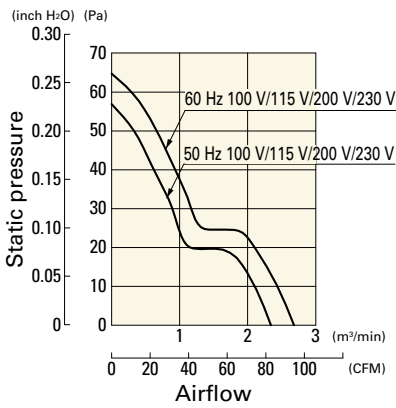
109S006, 109S006UL, 109S010, 109S010UL



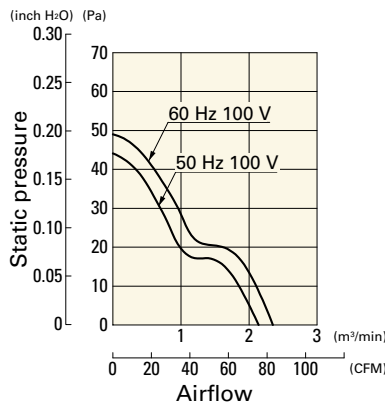
AC Fan 120 mm sq. AC

with Sensor

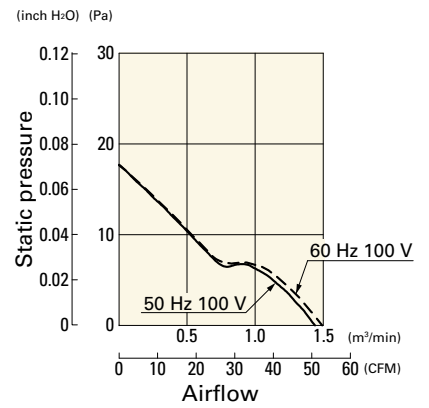
109S405UL, 109S424UL, 109S408UL, 109S425UL



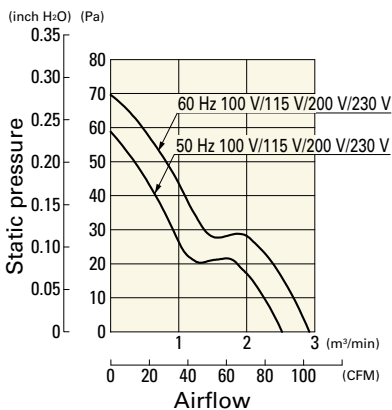
109S429UL



109S406UL

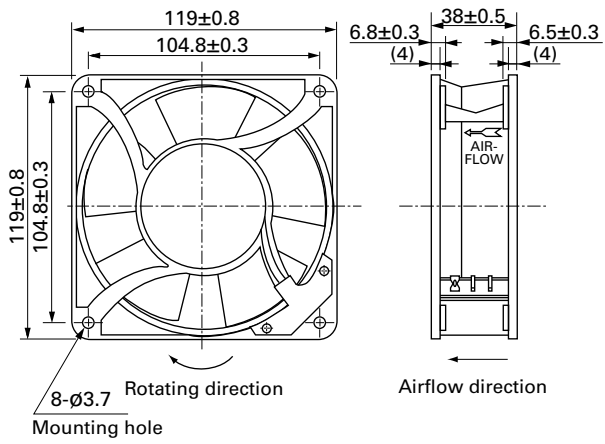


109S475UL, 109S474UL, 109S478UL, 109S472UL



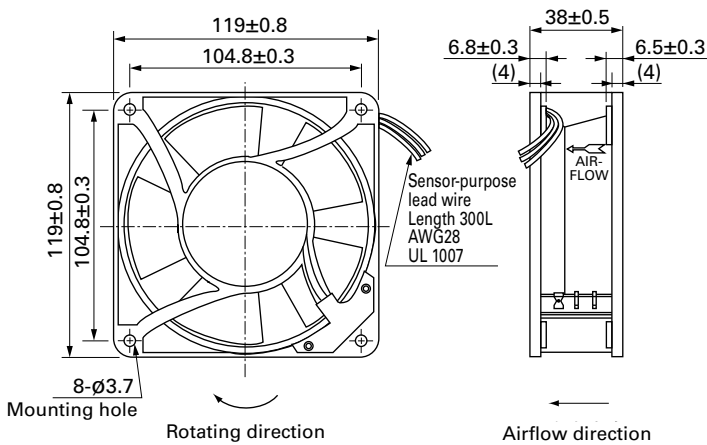
■ Dimensions (unit: mm)

Standard

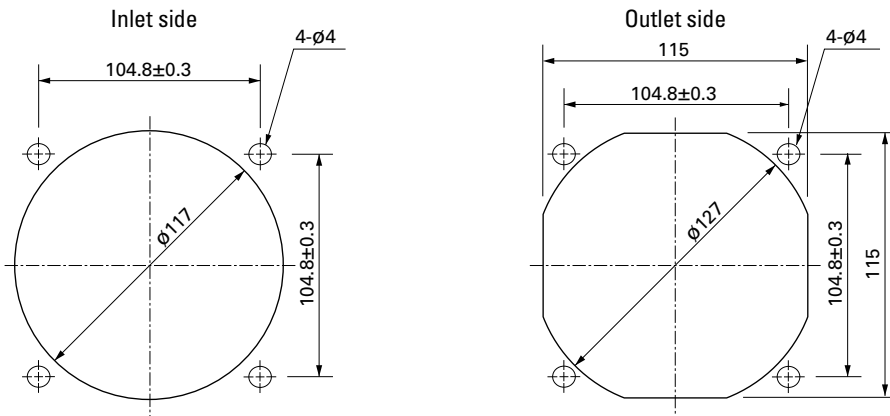


with Sensor

When mounting the model with a sensor, please screw-mount through both flanges as it has a sensor box.

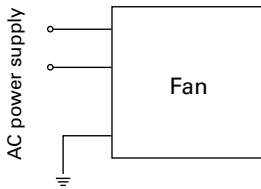


■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



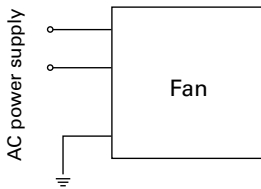
Connection Schematic

Standard

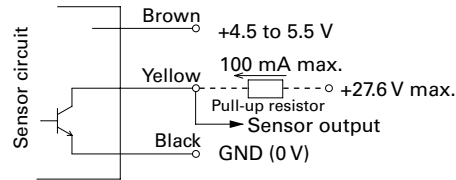


with Sensor

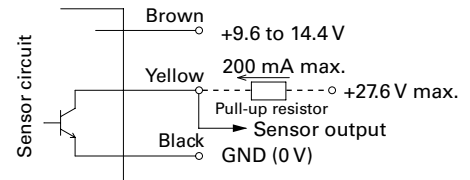
For fan power supply



For sensor circuit
5 V (ITEM-20)



12 V (ITEM-30)



GND (Black) should be shared in case that power supply for sensor circuit (Brown) and that for sensor pull-up (Yellow) are separated.

Options

Finger guards

page: p. 599

Model no.: 109-019E, 109-019K

Resin finger guards

page: p. 605

Model no.: 109-1000G

Resin filter kits

page: p. 606

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)

Filter kits

page: p. 607

Model no.: 109-018

Screen kits

page: p. 607

Model no.: 109-020

Plug cord

page: pp. 608 to 609

PSE compatible models

- Dedicated models for fans whose model numbers not ending with "UL"
Model no.: 489-006-L10, 489-006-L21, 489-006-L35
- Dedicated models for fans whose model numbers ending with "UL"
Model no.: 489-037-L10, 489-037-L21, 489-037-L35

UL/CSA certified models

Model no.: 489-007-L10, 489-007-L21



160×160×51 mm

San Ace 160 Only standard fans (without sensors) have acquired CSA certification.

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor structure Capacitor motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Dielectric strength (with sensor) 50/60 Hz 1500 VAC 1 minute (between AC input terminal and frame)
50/60 Hz 1000 VAC 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Sensor-Purpose lead wire ⊕Brown ⊖Black (Sensor) Yellow
- Mass 1100 g

Specifications

Standard

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 109-601 | 100 | 50/60 | 37.5/33 | 0.43/0.35 | 0.72/0.7 | 2850/3350 | 7.2/8.5 254.4/300.4 | 156.8/166.6 0.63/0.669 | 56/60 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109-604 | 115 | | | 0.39/0.31 | 0.62/0.61 | | | | | | |
| 109-602 | 200 | | | 0.23/0.18 | 0.36/0.35 | | | | | | |
| 109-603 | 230 | | | 0.21/0.16 | 0.32/0.31 | | | | | | |

with Sensor

For sensor specifications, please refer to p. 618. Sensor specification differs depending on the fan's speed specification.

For a 5 V sensor power supply (ITEM-20), please append "-20" to the end of model number. E.g. 109-641-20

For a 12 V sensor power supply (ITEM-30), please append "-30" to the end of model number. E.g. 109-641-30

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 109-641 | 100 | 50/60 | 37.5/33 | 0.43/0.35 | 0.72/0.7 | 2850/3350 | 7.2/8.5 254.4/300.4 | 156.8/166.6 0.63/0.669 | 56/60 | -10 to +60 | 25000/60°C (56000/40°C) |
| 109-644 | 115 | | | 0.39/0.31 | 0.62/0.61 | | | | | | |
| 109-642 | 200 | | | 0.23/0.18 | 0.36/0.35 | | | | | | |
| 109-643 | 230 | | | 0.21/0.16 | 0.32/0.31 | | | | | | |

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

Set Models PSE (Japanese safety standard) compatible

A set of a fan, finger guard, plug cord (PSE compatible), and screws. For details, please refer to p. 669.

| Order no. | Set items | | | | | |
|----------------|------------|---------|------------------|---------------|---------------|---------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-109-601 | 109-601 | 100 V | | 489-1618-L10* | 109-619E | M5×20 mm (4 screws) |
| ST1-109-604 | 109-604 | 115 V | | 489-1618-L10* | 109-619E | |
| ST1-109-602 | 109-602 | 200 V | | 489-1618-L10* | 109-619E | |
| ST1-109-603 | 109-603 | 230 V | | 489-1618-L10* | 109-619E | |
| ST1-109-641-20 | 109-641-20 | 100 V | ○ (5 V) | 489-1618-L10* | 109-619E | |
| ST1-109-641-30 | 109-641-30 | | ○ (12 V) | 489-1618-L10* | 109-619E | |
| ST1-109-644-20 | 109-644-20 | 115 V | ○ (5 V) | 489-1618-L10* | 109-619E | |
| ST1-109-644-30 | 109-644-30 | | ○ (12 V) | 489-1618-L10* | 109-619E | |
| ST1-109-642-20 | 109-642-20 | 200 V | ○ (5 V) | 489-1618-L10* | 109-619E | |
| ST1-109-642-30 | 109-642-30 | | ○ (12 V) | 489-1618-L10* | 109-619E | |
| ST1-109-643-20 | 109-643-20 | 230 V | ○ (5 V) | 489-1618-L10* | 109-619E | |
| ST1-109-643-30 | 109-643-30 | | ○ (12 V) | 489-1618-L10* | 109-619E | |

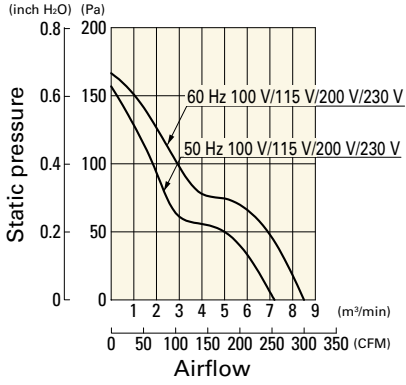
* PSE compatible, but not UL compatible.

AC Fan 160 mm sq.

Airflow - Static Pressure Characteristics

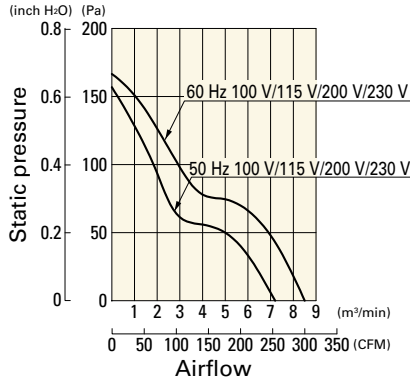
Standard

109-601, 109-604, 109-602, 109-603



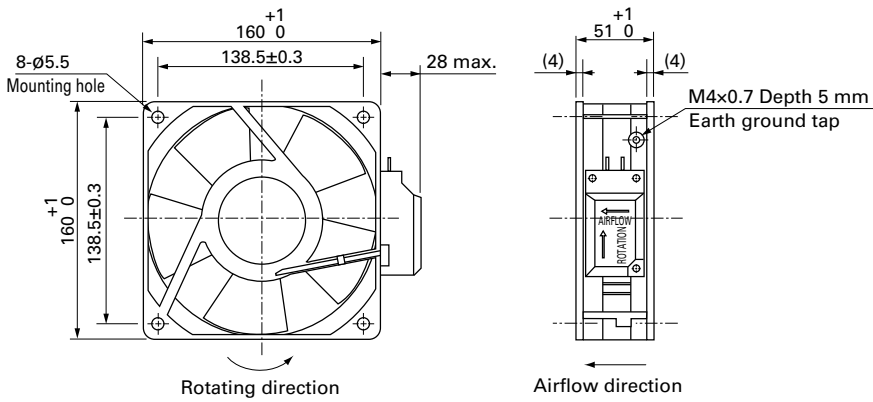
with Sensor

109-641, 109-644, 109-642, 109-643

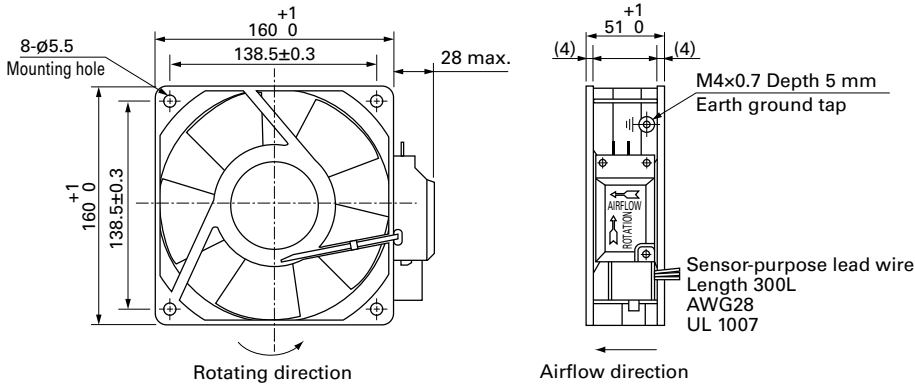


Dimensions (unit: mm)

Standard



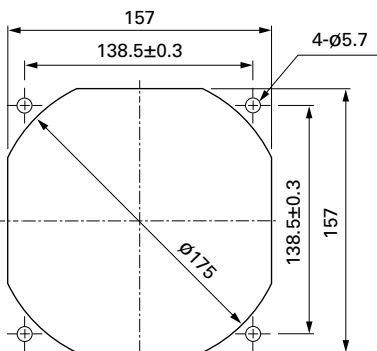
with Sensor



AC Fan 160 mm sq.

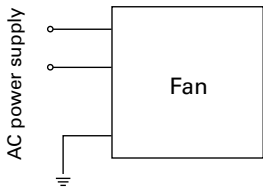
Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Inlet side, Outlet side



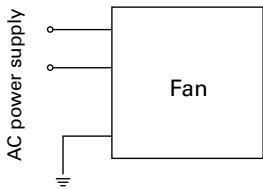
Connection Schematic

Standard

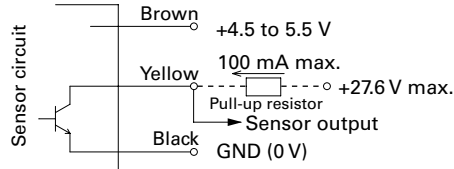


with Sensor

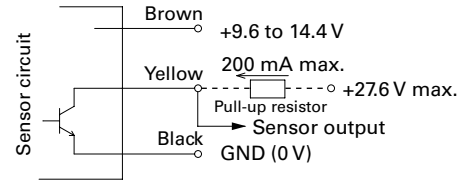
For fan power supply



For sensor circuit
5 V (ITEM-20)



12 V (ITEM-30)



GND (Black) should be shared in case that power supply for sensor circuit (Brown) and that for sensor pull-up (Yellow) are separated.

Options

Finger guards

page: p. 599

Model no.: 109-619E, 109-619H

Plug cord

page: pp. 608 to 609

PSE compatible models

Model no.: 489-1618-L10, 489-1618-L21, 489-1618-L28,
489-1619-L10, 489-1619-L21

UL/CSA certified models

Model no.: 489-084-L10, 489-084-L21,
489-086-L10, 489-086-L21



Ø 172×150×51 mm

San Ace 172

Sidecut type

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor structure Capacitor motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Mass 1000 g

Specifications

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|-------------------------|
| 109S301 | 100 | 50/60 | 27/25 | 0.33/0.25 | 0.65/0.64 | 2900/3500 | 5.3/6.4 187.3/226.1 | 147/196 0.59/0.787 | 51/56 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109S304 | 115 | | | 0.29/0.22 | 0.55/0.54 | | | | | | |
| 109S302 | 200 | | | 0.16/0.13 | 0.33/0.32 | | | | | | |
| 109S303 | 230 | | | 0.14/0.11 | 0.28/0.27 | | | | | | |

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

Set Models PSE (Japanese safety standard) compatible

A set of a fan, finger guard, plug cord (PSE compatible), and screws. For details, please refer to p. 669.

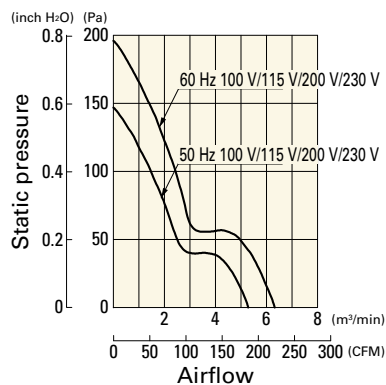
| Order no. | Set items | | | | | |
|-------------|-----------|---------|------------------|-----------------------------|---------------|------------------------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-109S301 | 109S301 | 100 V | | 489-1619-L10 ⁽¹⁾ | 109-319E | M4×25 mm (4 screws) ⁽²⁾ |
| ST1-109S304 | 109S304 | 115 V | | 489-1619-L10 ⁽¹⁾ | 109-319E | |
| ST1-109S302 | 109S302 | 200 V | | 489-1619-L10 ⁽¹⁾ | 109-319E | |
| ST1-109S303 | 109S303 | 230 V | | 489-1619-L10 ⁽¹⁾ | 109-319E | |

(1) PSE compatible, but not UL compatible.

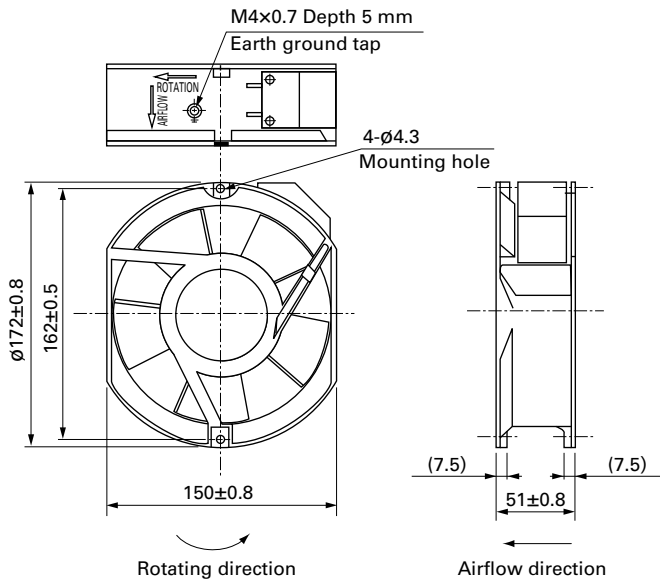
(2) Though these are 2-hole or 3-hole frame mount types, 4 screws are included for extra.

Airflow - Static Pressure Characteristics

109S301, 109S304, 109S302, 109S303

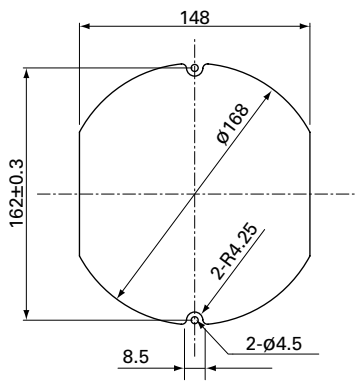


Dimensions (unit: mm)

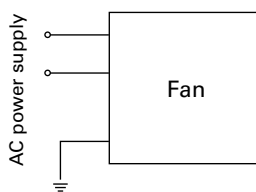


Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Inlet side, Outlet side



Connection Schematic



Options

Finger guards

page: p. 600

Model no.: 109-319J, 109-319E, 109-319H

Plug cord

page: pp. 608 to 609

PSE compatible models

Model no.: 489-1619-L10, 489-1619-L21

UL/CSA certified models

Model no.: 489-084-L10, 489-084-L21

∅172×51 mm

San Ace 172



Only standard fans (without sensors) have acquired CSA certification. Round type



General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Capacitor motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 614.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Dielectric strength (with sensor) 50/60 Hz 1500 VAC 1 minute (between AC input terminal and frame)
50/60 Hz 1000 VAC 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ min. at 500 VDC
- Sound pressure level (SPL) A-weighted sound pressure level (SPL) at 1 m away from the air inlet.
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Sensor-Purpose lead wire ⊕Brown ⊖Black (Sensor) Yellow
- Mass 1000 g

Specifications

Standard

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109-311 | 100 | 50/60 | 27/25 | 0.33/0.25 | 0.65/0.64 | 2900/3500 | 5.3/6.4 187.3/226.1 | 147/196 0.59/0.787 | 47/51 | -30 to +60 | 25000/60°C (56000/40°C) |
| 109-314 | 115 | | | 0.29/0.22 | 0.55/0.54 | | | | | | |
| 109-312 | 200 | | | 0.16/0.13 | 0.33/0.32 | | | | | | |
| 109-313 | 230 | | | 0.14/0.11 | 0.28/0.27 | | | | | | |

with Sensor

For sensor specifications, please refer to p. 618. Sensor specification differs depending on the fan's speed specification.

For a 5 V sensor power supply (ITEM-20), please append "-20" to the end of model number. E.g. 109-371-20

For a 12 V sensor power supply (ITEM-30), please append "-30" to the end of model number. E.g. 109-371-30

| Model no. | Rated voltage [V] | Frequency [Hz] | Input [W] | Current [A] | Locked rotor current [A] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------|-------------------|----------------|-----------|-------------|--------------------------|----------------------------------|--|--|--------------|----------------------------|----------------------------|
| 109-371 | 100 | 50/60 | 27/25 | 0.33/0.25 | 0.65/0.64 | 2900/3500 | 5.3/6.4 187.3/226.1 | 147/196 0.59/0.787 | 47/51 | -10 to +60 | 25000/60°C (56000/40°C) |
| 109-374 | 115 | | | 0.29/0.22 | 0.55/0.54 | | | | | | |
| 109-372 | 200 | | | 0.16/0.13 | 0.33/0.32 | | | | | | |
| 109-373 | 230 | | | 0.14/0.11 | 0.28/0.27 | | | | | | |

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 668.

Set Models PSE (Japanese safety standard) compatible

A set of a fan, finger guard, plug cord (PSE compatible), and screws. For details, please refer to p. 669.

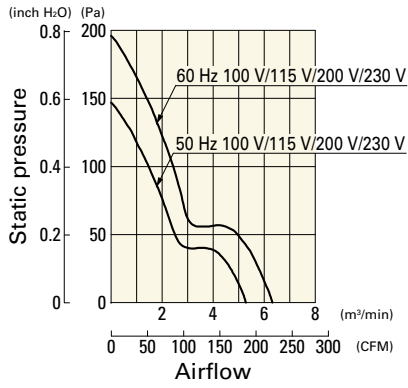
| Order no. | Set items | | | | | |
|----------------|------------|---------|------------------|---------------|---------------|---------------------|
| | Fan | Voltage | Low-speed sensor | Plug cord | Finger guards | Mounting screws |
| ST1-109-311 | 109-311 | 100 V | | 489-1619-L10* | 109-319E | M4×25 mm (4 screws) |
| ST1-109-314 | 109-314 | 115 V | | 489-1619-L10* | 109-319E | |
| ST1-109-312 | 109-312 | 200 V | | 489-1619-L10* | 109-319E | |
| ST1-109-313 | 109-313 | 230 V | | 489-1619-L10* | 109-319E | |
| ST1-109-371-20 | 109-371-20 | 100 V | ○ (5 V) | 489-1619-L10* | 109-319E | |
| ST1-109-371-30 | 109-371-30 | | ○ (12 V) | 489-1619-L10* | 109-319E | |
| ST1-109-374-20 | 109-374-20 | 115 V | ○ (5 V) | 489-1619-L10* | 109-319E | |
| ST1-109-374-30 | 109-374-30 | | ○ (12 V) | 489-1619-L10* | 109-319E | |
| ST1-109-372-20 | 109-372-20 | 200 V | ○ (5 V) | 489-1619-L10* | 109-319E | |
| ST1-109-372-30 | 109-372-30 | | ○ (12 V) | 489-1619-L10* | 109-319E | |
| ST1-109-373-20 | 109-373-20 | 230 V | ○ (5 V) | 489-1619-L10* | 109-319E | |
| ST1-109-373-30 | 109-373-30 | | ○ (12 V) | 489-1619-L10* | 109-319E | |

* PSE compatible, but not UL compatible.

Airflow - Static Pressure Characteristics

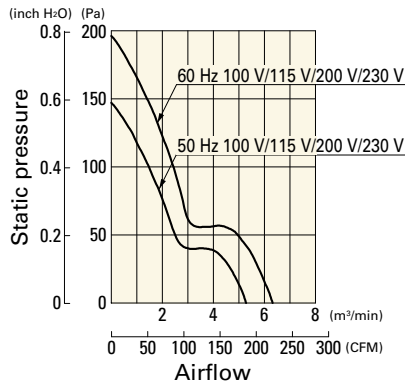
Standard

109-311, 109-314, 109-312, 109-313



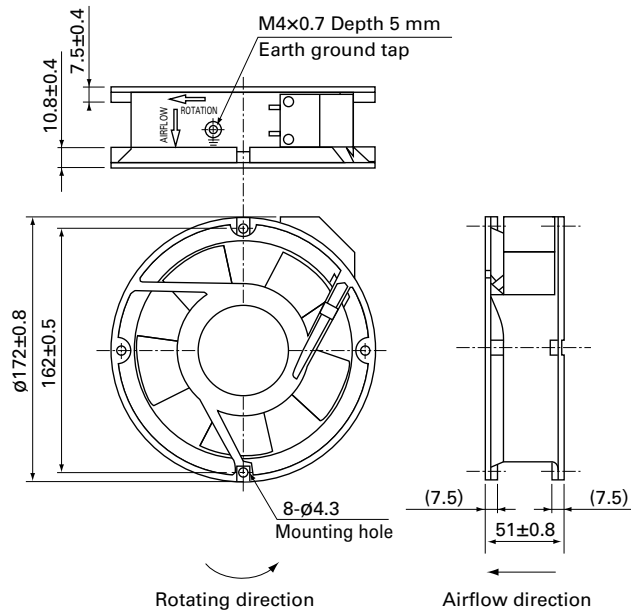
with Sensor

109-371, 109-374, 109-372, 109-373

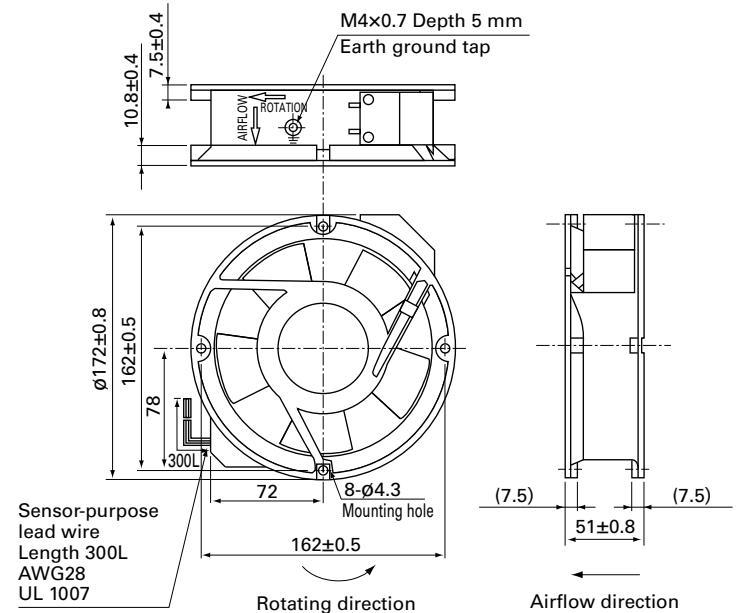


Dimensions (unit: mm)

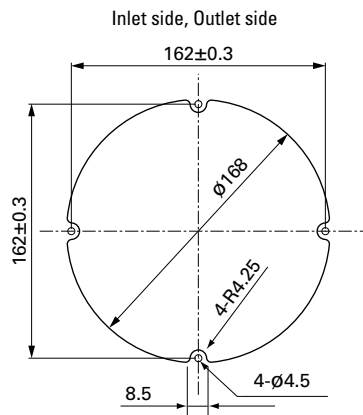
Standard



with Sensor



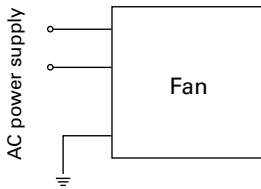
Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



AC Fan ϕ 172 mm

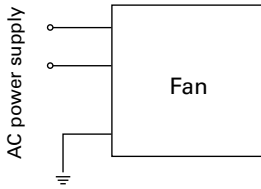
Connection Schematic

Standard

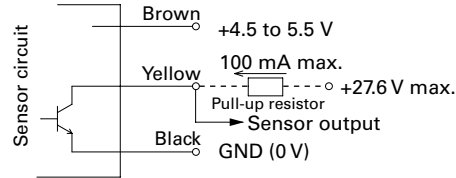


with Sensor

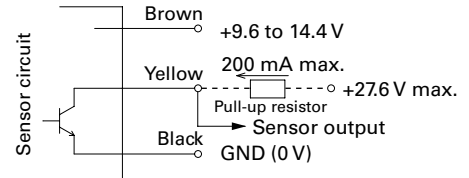
For fan power supply



For sensor circuit
5 V (ITEM-20)



12 V (ITEM-30)



GND (Black) should be shared in case that power supply for sensor circuit (Brown) and that for sensor pull-up (Yellow) are separated.

Options

Finger guards

page: p. 600

Model no.: 109-319E, 109-319H, 109-1066

Plug cord

page: pp. 608 to 609

PSE compatible models

Model no.: 489-1619-L10, 489-1619-L21

UL/CSA certified models

Model no.: 489-084-L10, 489-084-L21

AC

AC Fan \varnothing 172 mm

San Ace Controller

Features

Preventive maintenance of equipment (IoT functionality)

- Easy to connect to user's terminal devices. (Wireless LAN / wired LAN)
- Enables users to monitor the status of fans and sensors from remote terminal devices.
- Enables users to control the fan speed remotely via terminal devices.
- Detects outlier sensor measurements and sends alerts.
- Saves the fan's cumulative operating time and other fan measurement data to the cloud for later use.
- Prevents heat problems with user equipment, contributing to reducing maintenance time and costs.

Low noise and high energy efficiency (Automatic control)

- Stores temperature, humidity, and air pressure measurements for automatic fan speed control based on the setting conditions.
- Makes fan cooling and ventilation more efficient, reducing noise and improving efficiency.

Optimized fan settings (Manual control)

- Can connect and control a maximum of four fans, enabling different speed settings for individual fans.
- Optimizes the airflow and static pressure of individual fans in multi-fan systems.



Only the 9CT1-U001 model is cUL-certified.

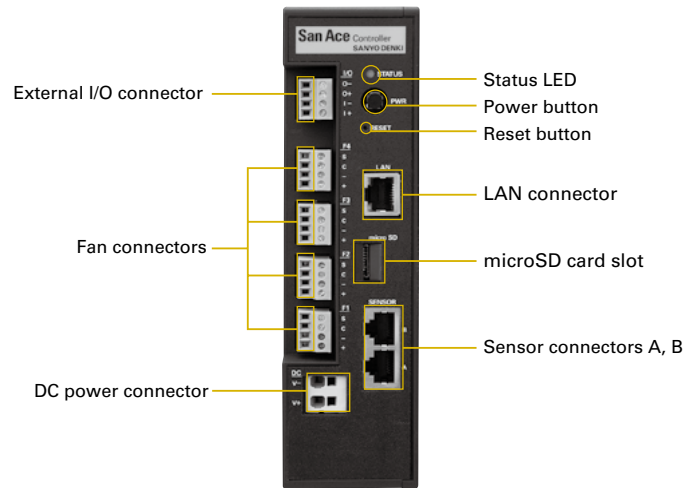
Specifications

| | With wireless LAN | Without wireless LAN | With wireless LAN, cUL certified |
|---|---|--|---|
| Model no. | 9CT1-001 | 9CT1-002 | 9CT1-U001⁽¹⁾ |
| Rated voltage [VDC] | 12/24/48 | | 12/24 |
| Power consumption [W] | 3.1 ⁽²⁾ | | |
| Max. input power | 970 W or less | | 64 W or less (At 12 VDC) 100 W or less (At 24 VDC) |
| Operating voltage range [VDC] | 7 to 60 | | 7 to 27.6 |
| Operating temperature range [°C] | -20 to +70 | | |
| Control functions | Manual / automatic | | |
| Control signal | PWM signal High-level voltage (V _{OH}): 3.3/5 V Frequency: 25 kHz | | |
| Monitoring criteria | Fan speed, fan current, fan operation hours, sensor detection value, external input | | |
| No. of connectable fans | Max. 4 | | |
| Max. fan connection terminal current (per terminal) | 5 A | | 5 A (At 12 VDC) 4 A (At 24 VDC) |
| Max. output current (Total) | 20 A | | 5 A (At 12 VDC) 4 A (At 24 VDC) |
| No. of connectable sensors | Max. 4 | | |
| Compatible sensors ⁽³⁾ | Temperature / humidity, air pressure, acceleration | | |
| External I/O functions | Input | Photocoupler-isolated input, ON: 15 to 28.8 VDC, OFF: 0 to 5 VDC | |
| | Output | Photocoupler-isolated open-collector output, load voltage: 28.8 VDC or less, output current: 0.1 A or less | |
| Communication | Wireless | IEEE 802.11b/g/n, frequency: 2.4 GHz ⁽⁴⁾ | IEEE 802.11b/g/n, frequency: 2.4 GHz ⁽⁴⁾ |
| | Wired | Ethernet 10BASE-T, 100BASE-TX | |
| Size [mm] | 50 (W) × 135 (D) × 180 (H) | | |
| Mass [g] | 450 | | |
| Material | Casing: Plastic | | |

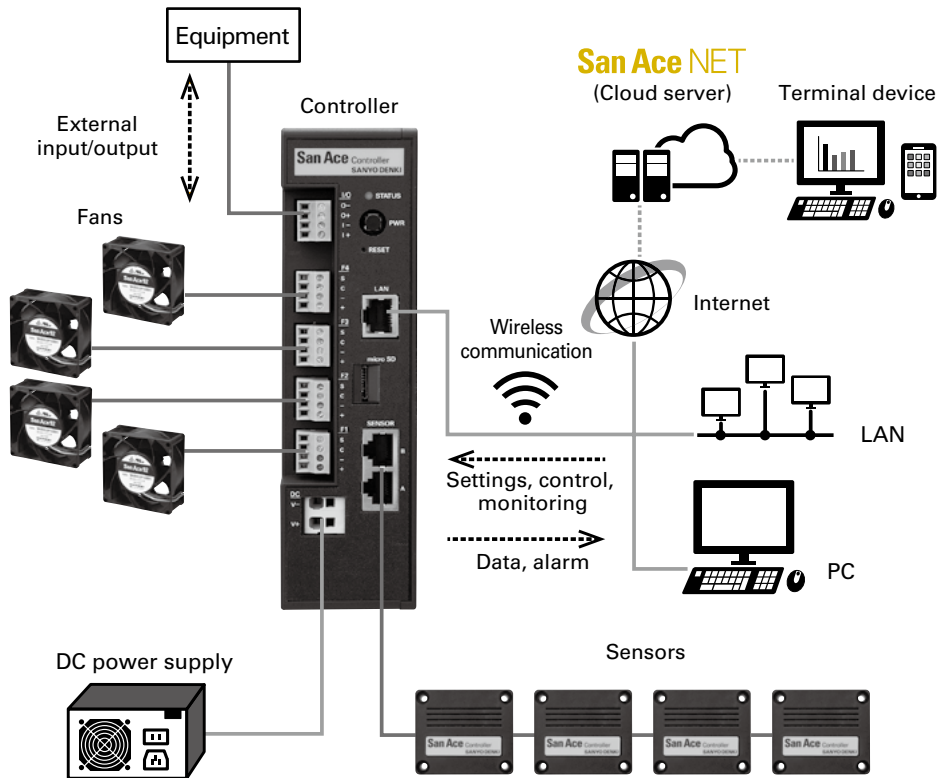
(1) Use a UL Class 2 power supply. (2) For use of this product alone, at 20°C ambient temperature

(3) Use our dedicated sensors (options). (4) Available channels: Ch. 1 to 11

Front View



System Configuration

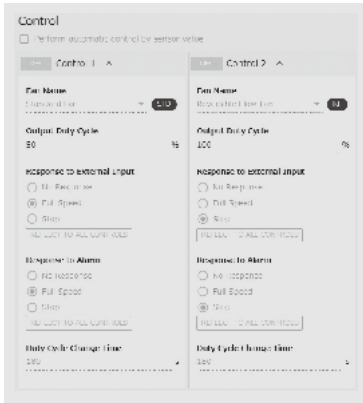


Graphical User Interface (GUI) Screens

Settings, control, monitoring, and data download can be done through web browsers.

Sample screens

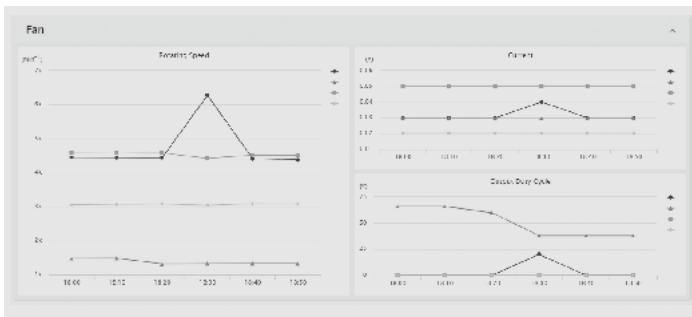
Control settings



Measurement data



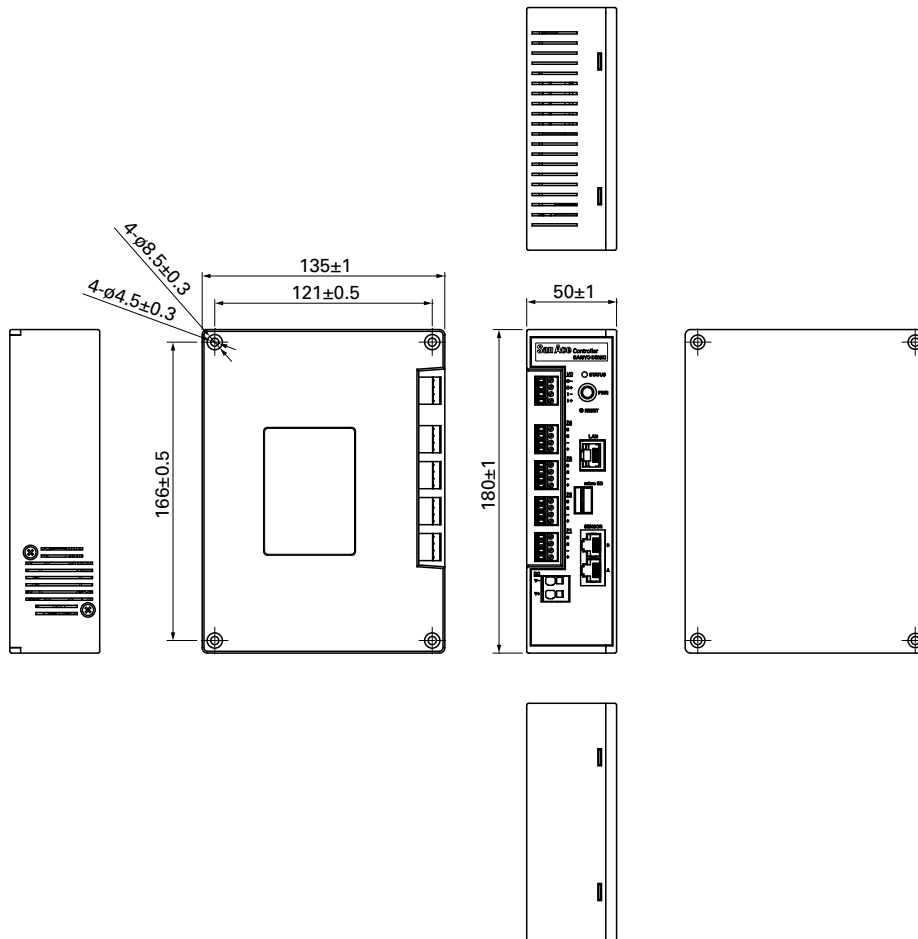
Graphs



Alarms

| Alarm Type | Date | Action |
|-------------------------|---------------------|---------|
| F1 Fan Rotational Speed | 2023/02/10 09:28:06 | RELEASE |
| F2 Fan Rotational Speed | --- | RELEASE |
| F3 Fan Rotational Speed | --- | RELEASE |
| F1 Fan Current | 2023/02/10 09:28:06 | RELEASE |
| F2 Fan Current | --- | RELEASE |
| F3 Fan Current | --- | RELEASE |
| F4 Fan Acceleration | --- | RELEASE |
| F5 Fan Acceleration | --- | RELEASE |
| F6 Fan Acceleration | --- | RELEASE |

Dimensions (unit: mm)



Options

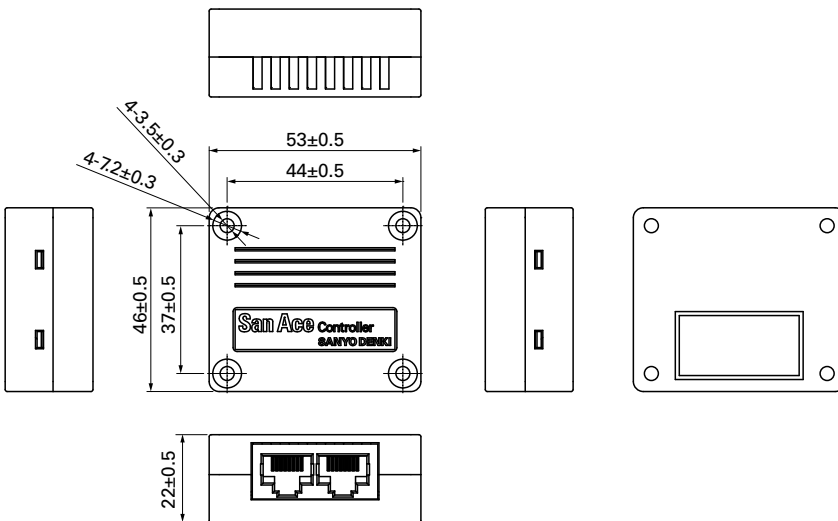
Sensors

| Sensor type | Temperature / Humidity sensor | Air pressure sensor | Accelerometer |
|----------------------------------|--|-------------------------------|---|
| Model no. | 9CT1-T | 9CT1-P | 9CT1-A |
| Measurement range | Temperature: -20 to +70°C Humidity: 20 to 85% RH ⁽¹⁾ | Air pressure: 800 to 1100 hPa | Acceleration: 0 to 60 m/s ² ⁽²⁾ |
| Operating temperature range [°C] | -20 to +70 | | |
| Operating humidity range [% RH] | 20 to 85 ⁽¹⁾ | | |
| Size [mm] | 53 (W) × 46 (D) × 22 (H) | | |
| Mass [g] | 35 | | |
| Material | Casing: Plastic | | |

(1) Non-condensing (2) Total acceleration from three axes



Dimensions (unit: mm)



Din rail adapter

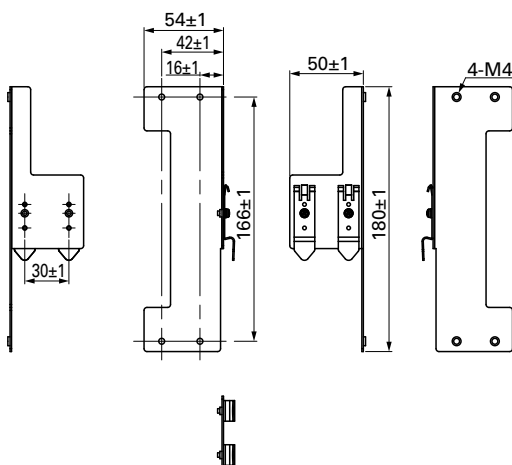
| | |
|----------------|-----------------|
| Model no. | 9CT1-D |
| Mass [g] | 110 |
| Material | Stainless steel |
| Items included | Screw: 2 pcs |



Mounting example



Dimensions (unit: mm)



PWM Controller

Features

Reduces system power consumption and fan noise

For PWM fan speed control, a PWM control circuit needs to be newly designed and configured.

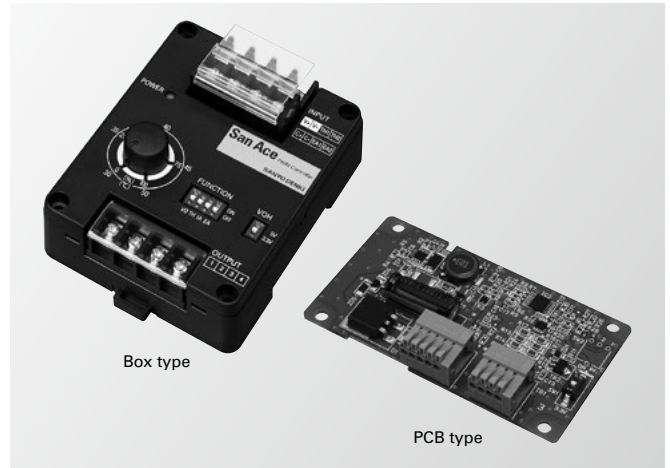
By using this product, however, PWM fans can be fully utilized without the need for preparing new circuits, contributing to reducing the system power consumption and the fan noise.

Can be common-powered by the fan power supply

The controller can be powered by the fan power supply of rated voltage 12, 24, and 48 VDC, and no separate supply is required.

Maximum of four fans connectable

Up to four PWM fans can be connected and controlled.



Specifications

Box type

| Model no. | 9PC8666X-S001 | 9PC8666X-S101 |
|----------------------------------|--|---|
| Size [mm] | 86 (H) × 66 (W) × 38 (D) | |
| Rated voltage [V] | 12/24/48 | |
| Power consumption [W] | 0.2 ⁽¹⁾ | |
| Operating temperature [°C] | -20 to +70 | |
| Input terminal | Input voltage range [V] (V+, V-) | 7 to 60 |
| | Control voltage range [V] | 0 to 5.5 |
| Output terminal | PWM signal output | V _{OH} (high level voltage): 3.3 or 5 VDC selectable |
| | PWM frequency [kHz] | 25 1 |
| | Output current | 20 mA max. (total sum of 4 terminals) |
| | Output breakdown voltage [V] | 6.5 |
| | No. of connectable fans | Up to 4 fans |
| Control functions ⁽²⁾ | Voltage control, Internal adjustment (variable resistor) control, External adjustment (variable resistor) control ⁽³⁾ , Thermistor control ⁽³⁾ | |
| Mounting method | DIN rail mounting or screw mounting | |
| Mass [g] | 110 | |
| Material | Case: Plastic | |

PCB type

| Model no. | 9PC8045D-V001 | 9PC8045D-R001 | 9PC8045D-T001 | 9PC8045D-V101 | 9PC8045D-R101 | 9PC8045D-T101 |
|----------------------------|----------------------------------|---|-----------------------------------|-----------------|--|-----------------------------------|
| Size [mm] | 80 (H) × 45 (W) × 17 (D) | | | | | |
| Rated voltage [V] | 12/24/48 | | | | | |
| Power consumption [W] | 0.2 ⁽¹⁾ | | | | | |
| Operating temperature [°C] | -20 to +70 | | | | | |
| Input terminal | Input voltage range [V] (V+, V-) | 7 to 60 | | | | |
| | Control voltage range [V] | 0 to 5.5 | | | | |
| Output terminal | PWM signal output | V _{OH} (high level voltage): 3.3 or 5 VDC selectable | | | | |
| | PWM frequency [kHz] | 25 | 1 | | | |
| | Output current | 20 mA max. (total sum of 4 terminals) | | | | |
| | Output breakdown voltage [V] | 6.5 | | | | |
| | No. of connectable fans | Up to 4 fans | | | | |
| Control functions | Voltage control | Variable resistor control ⁽³⁾ | Thermistor control ⁽³⁾ | Voltage control | Variable resistor control ⁽³⁾ | Thermistor control ⁽³⁾ |
| Mounting method | Screw mounting | | | | | |
| Mass [g] | 27 | | | | | |
| Material | PCB: FR-4 | | | | | |

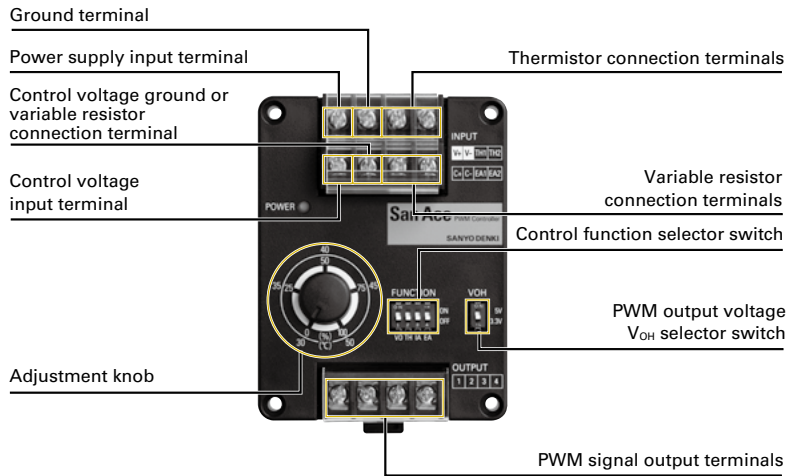
(1) When output terminals are turned on. (2) Control functions are mutually exclusive for Box type.

(3) Variable resistor and thermistor are not supplied with the controller and need to be prepared separately.

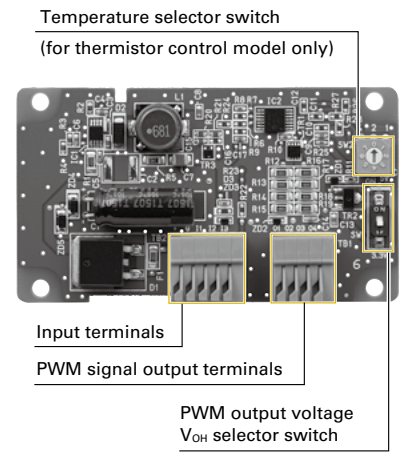
Note: Be noted that if applied input voltage or frequency is out of range of the connected fan, how the fan speed responds to the PWM duty cycle may be altered.

Front View (component names)

- Box type



- PCB type



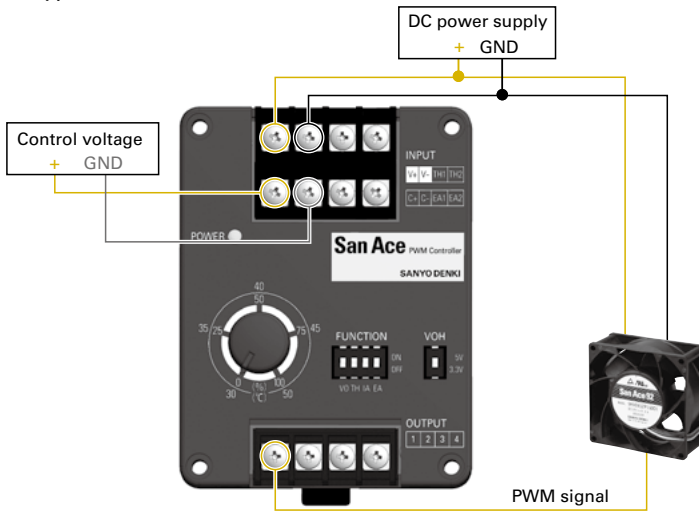
Connection Examples and PWM Signal Output Characteristics

Controller can be common-powered by the power supply for 12, 24, and 48 VDC rated voltage fans. It can also be powered by a separate supply as long as both supplies share the same ground.

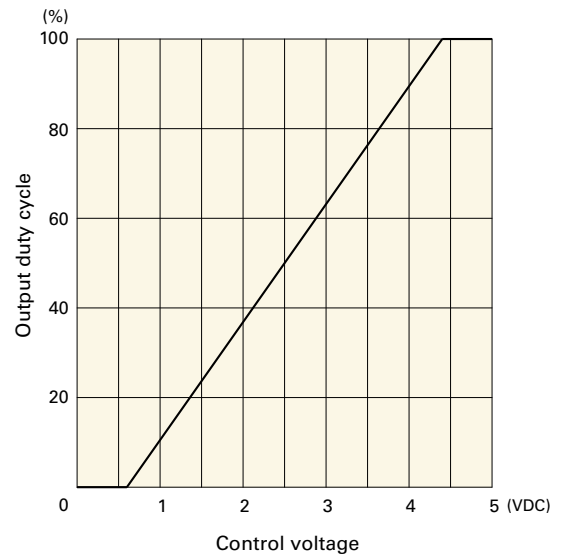
Voltage control

Output duty cycle controlled with input voltage of 0 to 5 VDC. *Ensure that the input voltage does not exceed 5.5 VDC.

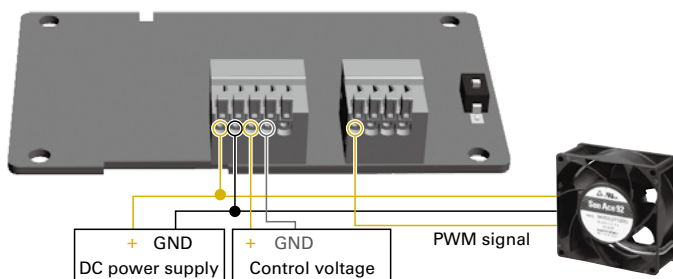
- Box type



Control Voltage - Output Duty Cycle Characteristics



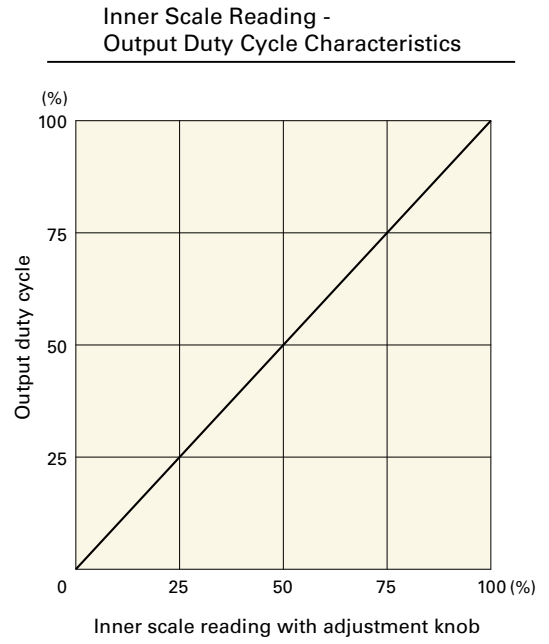
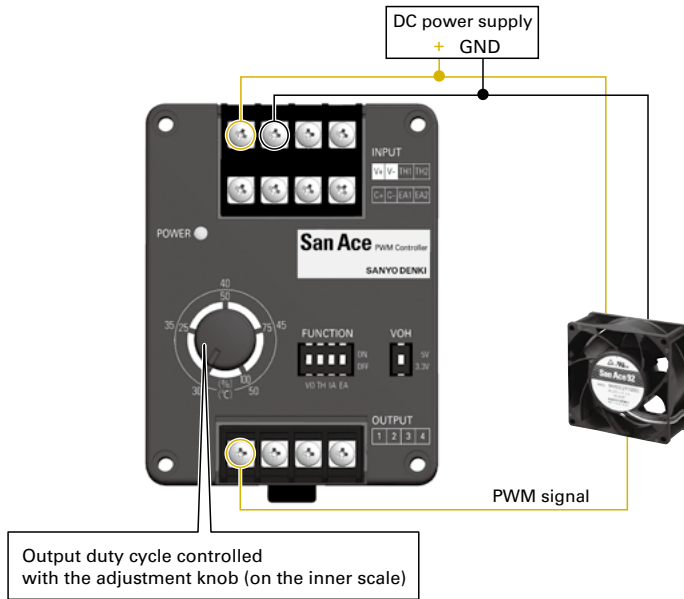
- PCB type (Model no.: 9PC8045D-V001)



Internal adjustment (variable resistor) control

Output duty cycle controlled with the adjustment knob.

- Box type

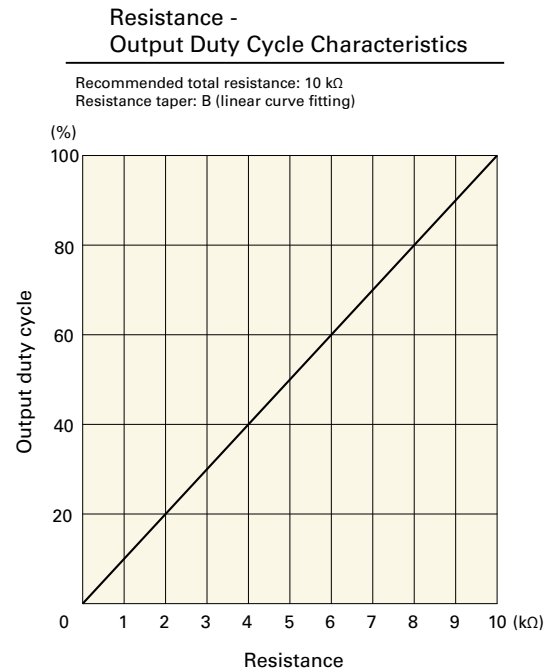
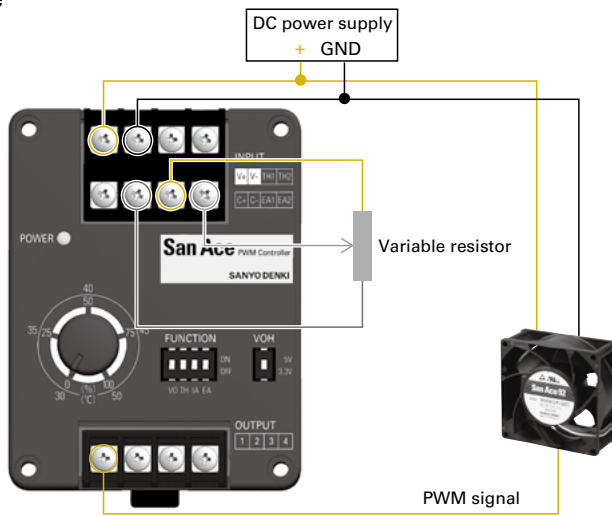


PWM Controller

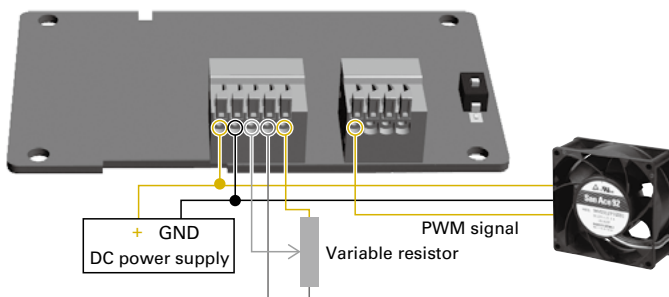
External adjustment (variable resistor) control

Output duty cycle controlled with variable resistor connected to terminals.

- Box type



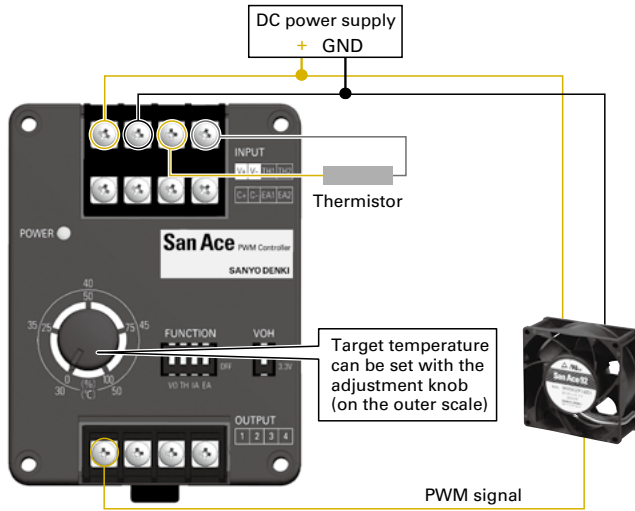
- PCB type (Model no.: 9PC8045D-R001)



Thermistor control

Automation control of output duty cycle in response to the temperature detected with an external thermistor.

- Box type



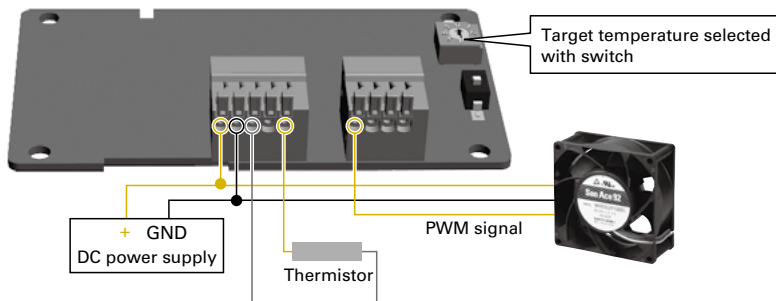
Controlling Conditions

T_{ST} : Temperature set with the adjustment knob (30 to 50°C)
 T_{TH} : Temperature detected with thermistor

Recommended thermistor conditions
 Type: NTC
 R_{25} (Resistance at 25°C): 10 kΩ
 B value: $B_{25/85} = 3435$ K

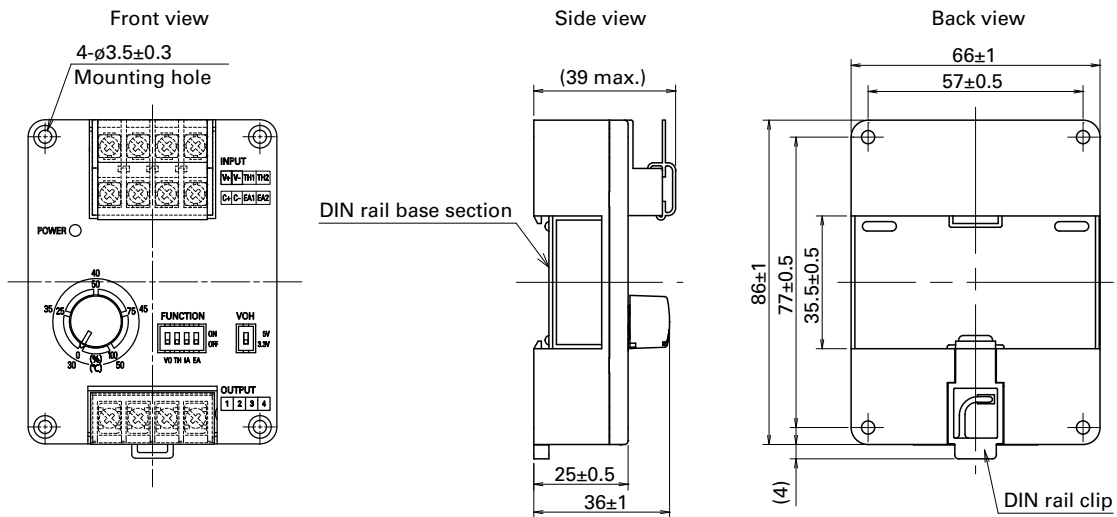
| Temperature conditions | Duty cycle | Fan rotational speed (For reference) |
|-------------------------|------------|--------------------------------------|
| $T_{ST} < T_{TH}$ | Increases | Increases |
| $T_{ST} > T_{TH}$ | Decreases | Decreases |
| $T_{ST} \approx T_{TH}$ | Maintained | Maintained |

- PCB type (Model no.: 9PC8045D-T001)

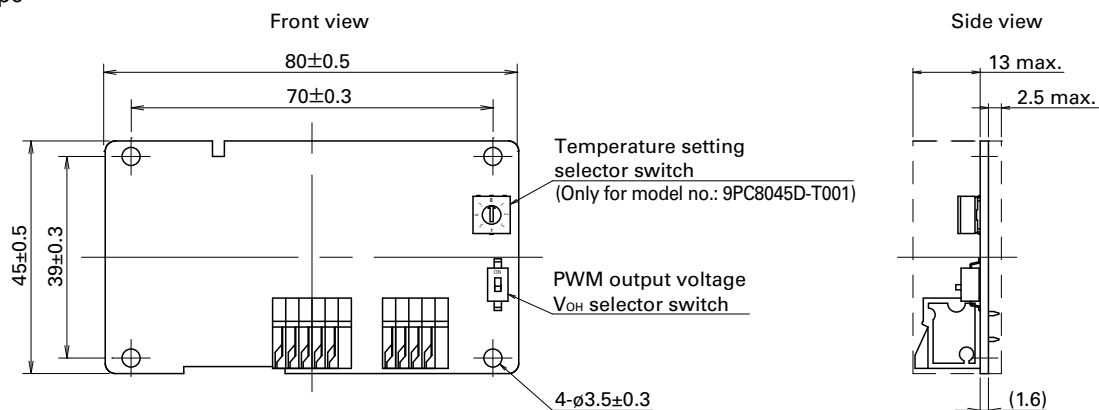


Dimensions (unit: mm)

- Box type



- PCB type



Airflow Tester

■ Features (Patented as a movable measurement device for measuring device airflow and system impedance)

Enables the selection of the optimal fan for a device

An optimal fan for a device can be selected by entering accurate measurement results into thermal design simulation software.

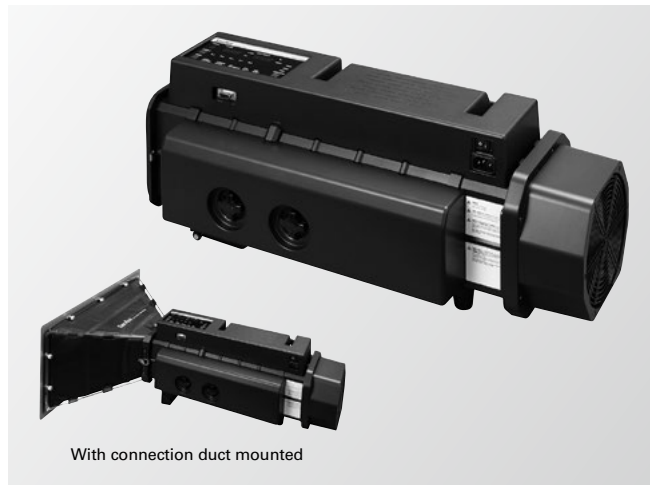
Compact and lightweight

With a compact design and weight of approximately 6 kg, it is portable enough to measure immobile equipment.

■ Measurement Functions

- System Impedance Measurement of the resistance to the flow of air within a device
- Operating Airflow Measurement of the actual airflow that passes through a device when a fan is mounted
- P-Q Performance Measurement of airflow versus static pressure characteristics*

* Performance curve that illustrates the characteristics of a fan for use within a certain system.
It shows the relationship between airflow and static pressure.



With connection duct mounted



■ Specifications

| Model no. | | 9AT2560S-000□ ⁽¹⁾ | 9AT2560A-000□ ⁽¹⁾ | 9AT2560C-000□ ⁽¹⁾ |
|-----------------------|---------------------|--|---|-------------------------------------|
| Measurement units | Airflow | m ³ /min | CFM | CFM |
| | Static pressure | Pa | inchH ₂ O | Pa |
| Measurement range | Airflow | 0.20 to 8.00 m ³ /min (Resolution: 0.01 m ³ /min) | 7 to 282 CFM (Resolution: 1 CFM) | 7 to 282 CFM (Resolution: 1 CFM) |
| | Static pressure | 0 to 999 Pa (Resolution: 1 Pa) | 0 to 4.01 inchH ₂ O (Resolution: 0.01 inchH ₂ O) | 0 to 999 Pa (Resolution: 1 Pa) |
| Measurement accuracy | Airflow | ±7% of maximum measurable airflow with each nozzle | | |
| | Static pressure | ±10 Pa (0.04 inchH ₂ O) for measurement results < 200 Pa, ±50 Pa (0.20 inchH ₂ O) for measurement results ≥ 200 Pa | | |
| Operating environment | Ambient temperature | 0 to 40°C | | |
| | Humidity | 20 to 85% RH (non-condensing) | | |
| Display | | Data no., Measurement values (airflow, static pressure ⁽²⁾), Measurement status, Nozzle selection, Measurement mode selection | | |
| Interface | | Digital output: Included USB serial adapter | | |
| Power supply | Input voltage | 100 to 240 VAC, 50/60 Hz | | |
| | Power consumption | 260 VA max. | | |
| Dimensions | | 600 (W) × 250 (H) × 250 (D) mm | | |
| Mass | | Main unit: Approx. 6 kg, Connection duct (including board holder): Approx. 1.5 kg | | |
| Included peripherals | | 1 Set of measurement nozzles, Plastic mounting board (5 pcs / set), Connection duct, AC power cable (2.5 m), USB serial adapter, Instruction manual, Quick start guide, Data viewer software | | |

(1) The AC power plug shape differs with the number in □ of model numbers.

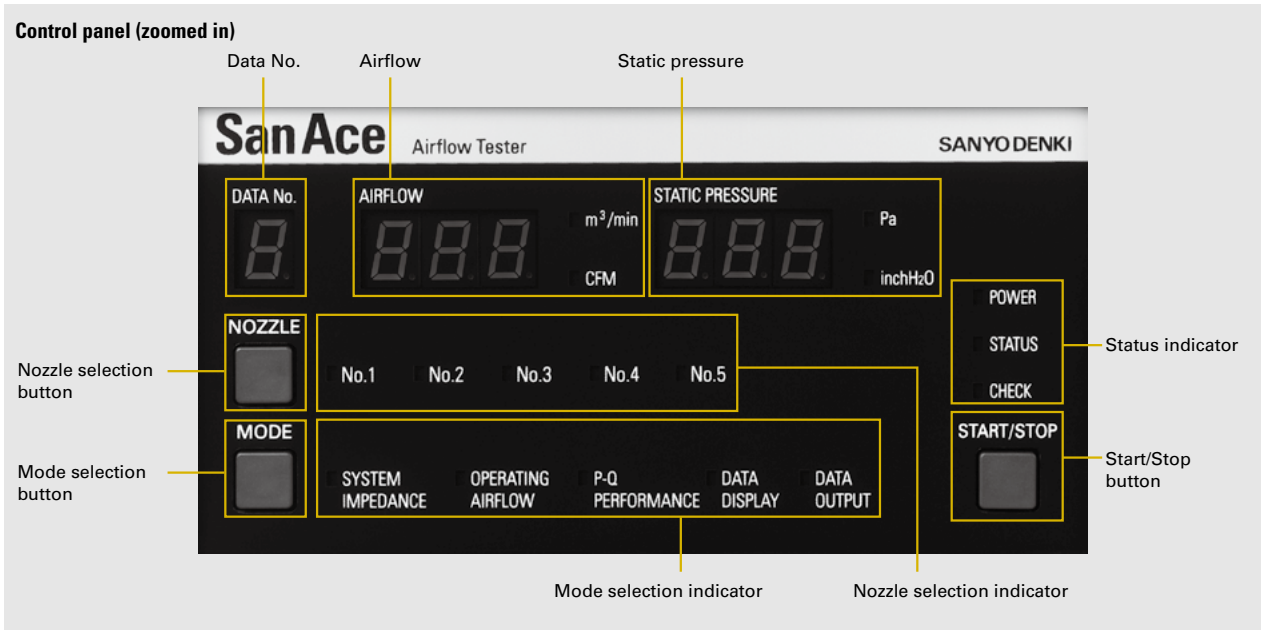
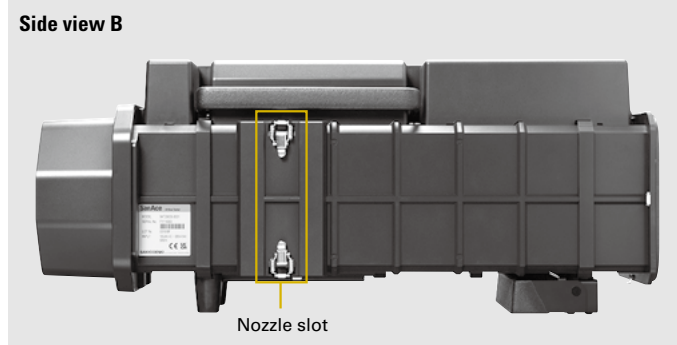
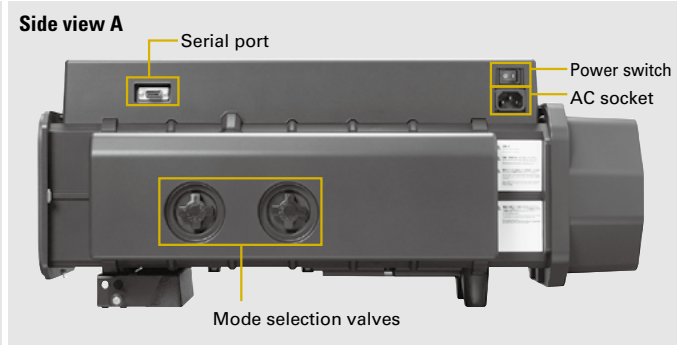
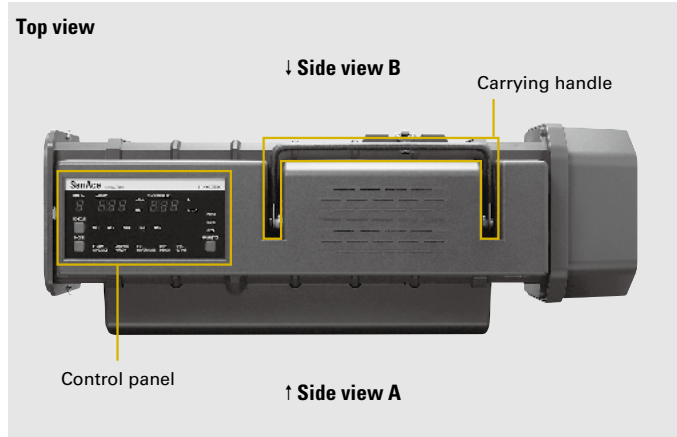
AC power plug included in models with 1 in □ is for Japan and North America regions (2 parallel flat pins + a round grounding pin), Input voltage: 100/120 VAC, 50/60 Hz

AC power plug included in models with 2 in □ is for Europe region (2 round pins + a female grounding contact), Input voltage: 220 VAC, 50 Hz

AC power plug included in models with 3 in □ is for China region (2 angled flat pins + a flat grounding pin), Input voltage: 220 VAC, 50 Hz

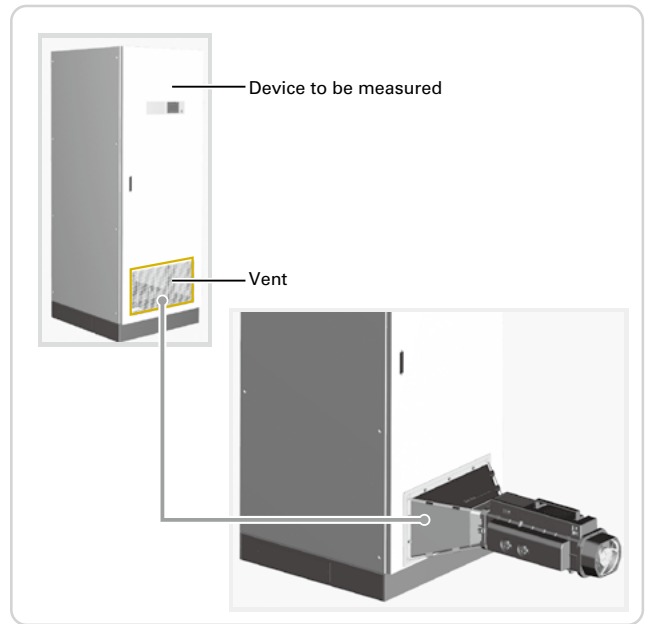
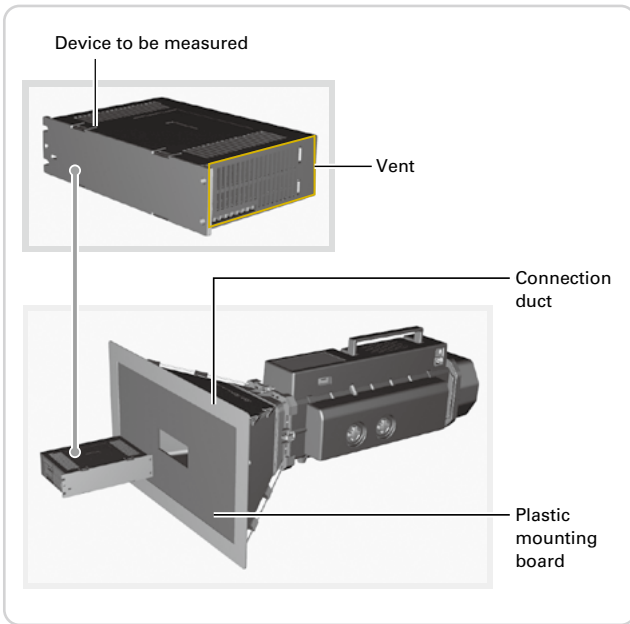
Product also available without an AC power cable. Model no. 9AT2560S-0000, 9AT2560A-0000, 9AT2560C-0000

(2) Static pressure values are calculated with standard atmosphere as 1013 hPa at 20°C.



Usage Examples

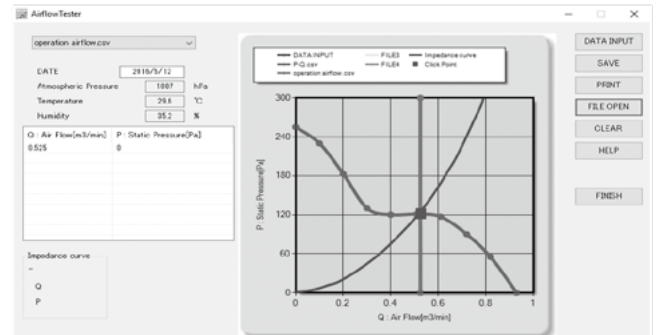
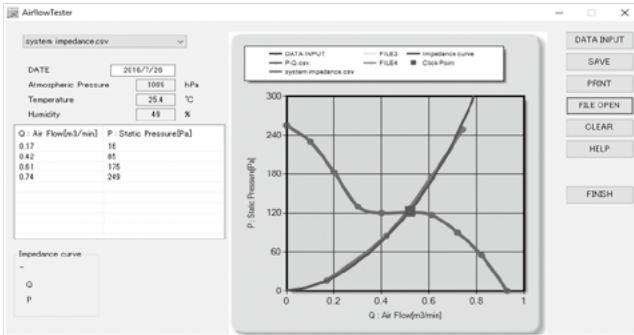
Cut out a hole in the mounting board matching the vent opening of the device to be measured, and place the mounting board firmly against the device to perform measurements.



Data Viewer Software (included)

Obtained measurement data can be represented as a graph and saved on a PC.

Screen examples P-Q performance shown below based on catalog data.



Option

Carrying case Measurement nozzle case included

| | |
|------------|---|
| Model no. | 9AT2560-B001 Please add "CS" to the end of the model no. of Airflow Tester in page 1 when ordering Airflow Tester and carrying case as a set. e.g. 9AT2560S-0001CS |
| Dimensions | 705 (W) × 385 (H) × 415 (D) mm |

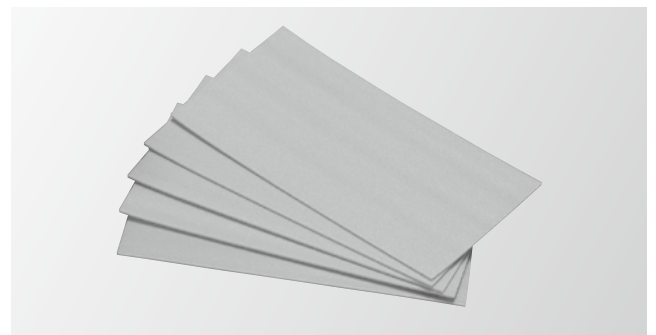


Carrying case, measurement nozzle case

Plastic mounting boards

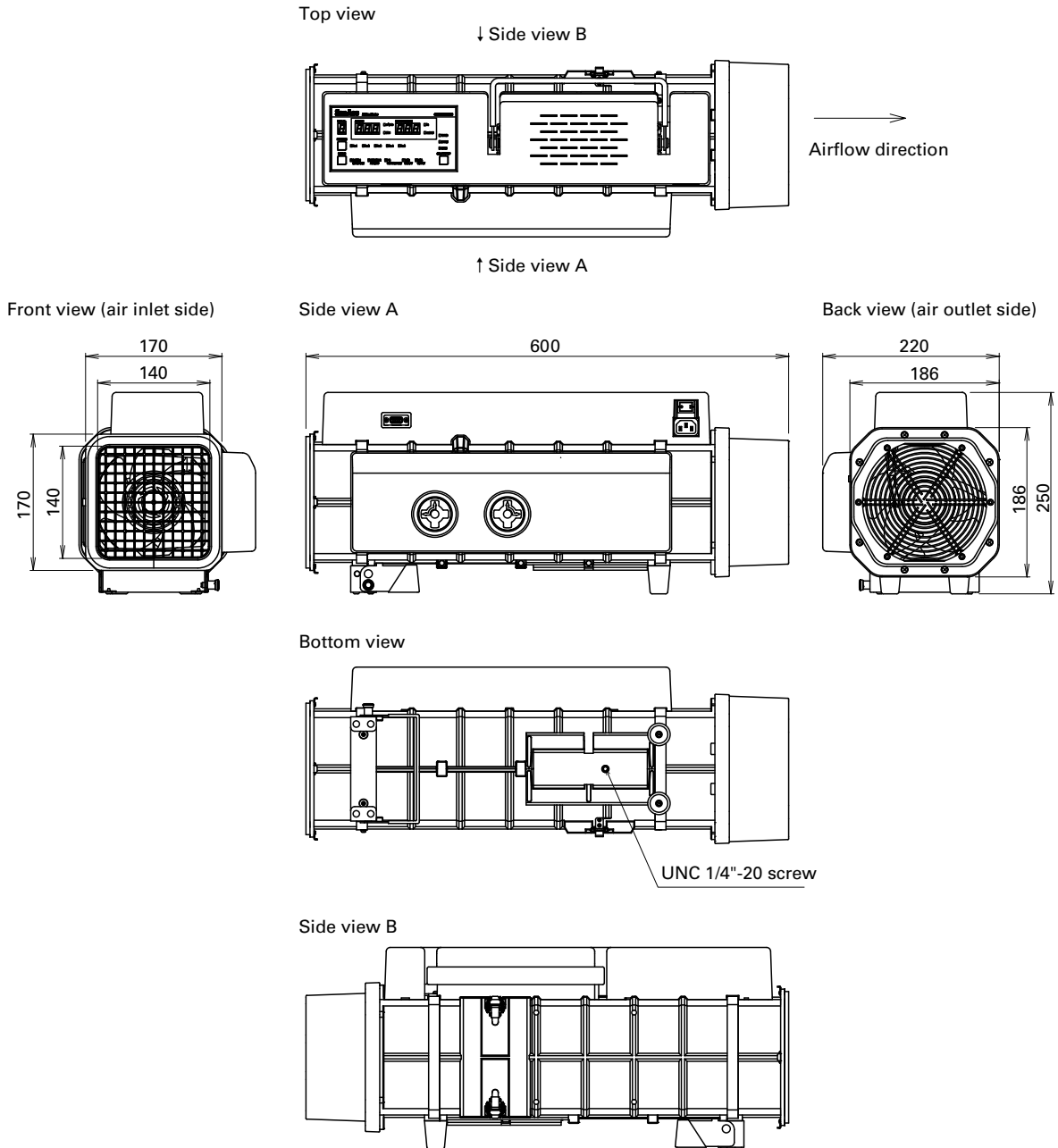
Sized to fit the duct frame. Five boards included with Airflow Tester.

| | |
|------------|------------------------------|
| Model no. | 9AT2560-P001 |
| Quantity | 5 pcs / set |
| Dimensions | 525 (W) × 275 (H) × 4 (D) mm |

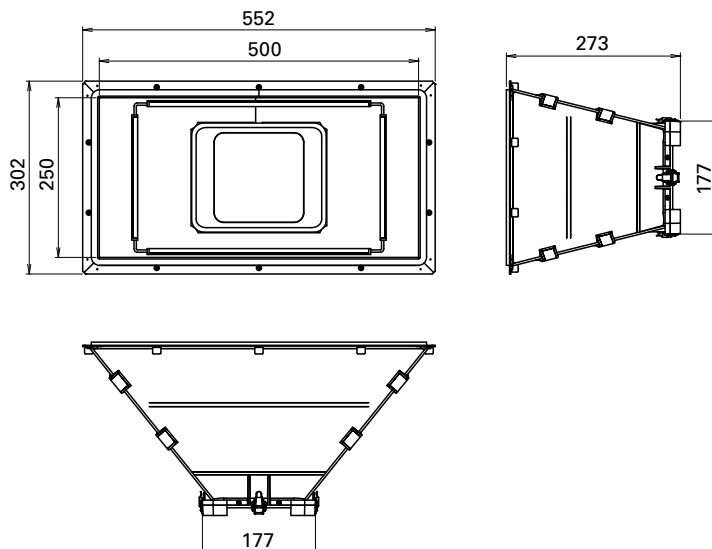


Plastic mounting boards (5 pcs)

● Main unit



● Connection duct



Cooling Fan Units CUSTOMIZED PRODUCTS

Features

We manufacture custom fan units tailored to the specification and requirements of your equipment. For details such as custom conditions, contact us.

■ Example



Electrolytic Corrosion Proof Fans CUSTOMIZED PRODUCTS → p. 622

Features

This cooling fan prevents electrolytic corrosion of bearings even under conditions where electromagnetic noise is generated. Electrolytic corrosion of ball bearings is prevented by using ceramic balls in ball bearings. The ceramic material is an insulating material. Manufacturable to meet specifications of all San Ace series fans.

Finger guards List

Increases safety by preventing foreign objects from entering fans. Fans can be used with little effect on airflow and static pressure.

| Size | Model no. | Mounting side | Surface treatment | |
|--|------------|-------------------------------|--------------------------------|--------------------------------|
| | | | Nickel-chrome plating (silver) | Cation electropainting (black) |
| 36 mm sq. type | 109-1050 | Inlet side, Outlet side | ✓ | – |
| 38 mm sq. type | 109-1065 | Inlet side, Outlet side | ✓ | – |
| 40 mm sq. type | 109-059 | Inlet side, Outlet side | ✓ | – |
| | 109-059H | | – | ✓ |
| 52 mm sq. type | 109-149E | Inlet side, Outlet side | ✓ | – |
| 60 mm sq. type | 109-139E | Inlet side, Outlet side | ✓ | – |
| | 109-139H | | – | ✓ |
| 70 mm sq. type, \varnothing70 mm type | 109-1128 | Inlet side, Outlet side | ✓ | – |
| 80 mm sq. type | 109-049E | Inlet side, Outlet side | ✓ | – |
| | 109-049H | | – | ✓ |
| \varnothing92 mm type | 109-1147 | Impeller side, Nameplate side | ✓ | – |
| 92 mm sq. type, \varnothing100 mm type | 109-099E | Inlet side, Outlet side | ✓ | – |
| | 109-099H | | – | ✓ |
| 120 mm sq. type | 109-019E | Inlet side, Outlet side | ✓ | – |
| | 109-019K | | – | ✓ |
| 127 mm sq. type, \varnothing175 mm type, \varnothing190 mm type | 109-722 | Inlet side, Outlet side | ✓ | – |
| | 109-722H | | – | ✓ |
| \varnothing133 mm type | 109-1112 | Inlet side | ✓ | – |
| \varnothing136 mm type | 109-1139 | Impeller side, Nameplate side | ✓ | – |
| 140 mm sq. type | 109-719 | Inlet side, Outlet side | ✓ | – |
| | 109-719H | | – | ✓ |
| 150 mm sq. type | 109-1051 | Inlet side, Outlet side | ✓ | – |
| \varnothing150 mm type | 109-1104 | Inlet side | ✓ | – |
| | 109-1104H | | – | ✓ |
| 160 mm sq. type | 109-619E | Inlet side, Outlet side | ✓ | – |
| | 109-619H | | – | ✓ |
| \varnothing172 mm Sidecut type | 109-319J | Inlet side, Outlet side | ✓ | – |
| \varnothing172 mm Sidecut, Round type | 109-319E | Inlet side, Outlet side | ✓ | – |
| | 109-319H | | – | ✓ |
| \varnothing172 mm Round type | 109-1066 | Inlet side, Outlet side | ✓ | – |
| \varnothing200 mm type | 109-1102* | Inlet side, Outlet side | ✓ | – |
| | 109-1102H* | | – | ✓ |
| | 109-720 | | ✓ | – |
| | 109-720H | | – | ✓ |
| \varnothing221 mm type | 109-1138 | Inlet side | ✓ | – |
| | 109-1138H | | – | ✓ |
| \varnothing225 mm type | 109-1137 | Inlet side | ✓ | – |
| | 109-1137H | | – | ✓ |
| \varnothing250 mm type | 109-1152 | Inlet side | ✓ | – |
| | 109-1152H | | – | ✓ |
| 270 mm sq. type (for Bracket-mounted Centrifugal Fan) | 109-1146 | Inlet side | ✓ | – |
| | 109-1146H | | – | ✓ |

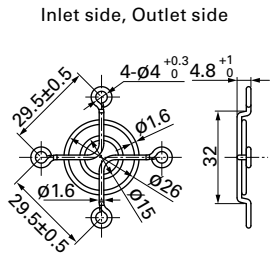
* Applicable model no.: 9GV20*

Finger guards Dimensions (unit: mm)

For use in environments subject to water splashes, cation electroplating models are recommended.

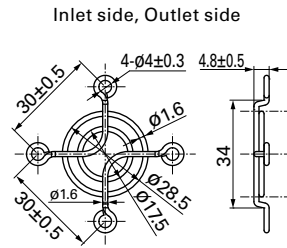
36 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1050 | Nickel-chrome plating (silver) | 4 |



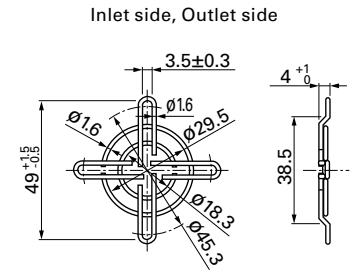
38 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1065 | Nickel-chrome plating (silver) | 5 |



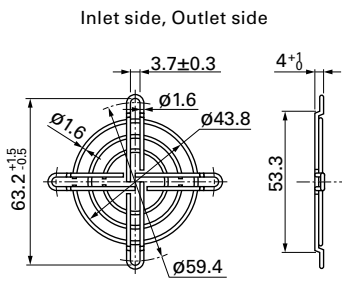
40 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-059 | Nickel-chrome plating (silver) | 7 |
| 109-059H | Cation electroplating (black) | |



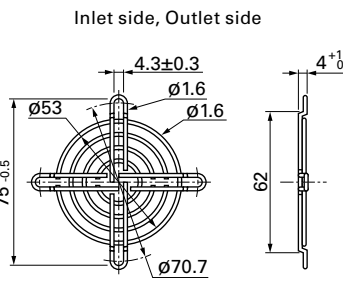
52 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-149E | Nickel-chrome plating (silver) | 9 |



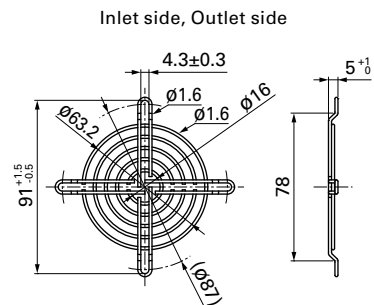
60 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-139E | Nickel-chrome plating (silver) | 14.5 |
| 109-139H | Cation electroplating (black) | |



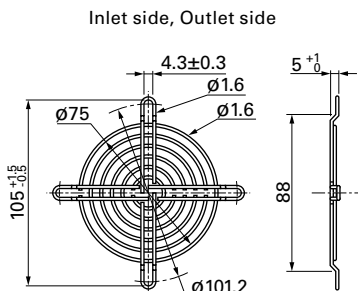
70 mm sq. type, ∅70 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1128 | Nickel-chrome plating (silver) | 17 |



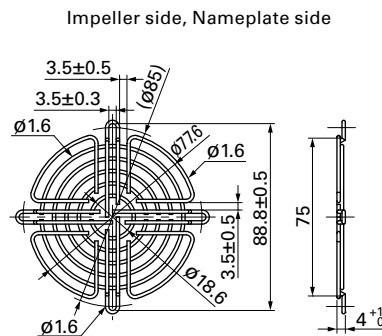
80 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-049E | Nickel-chrome plating (silver) | 21 |
| 109-049H | Cation electroplating (black) | |



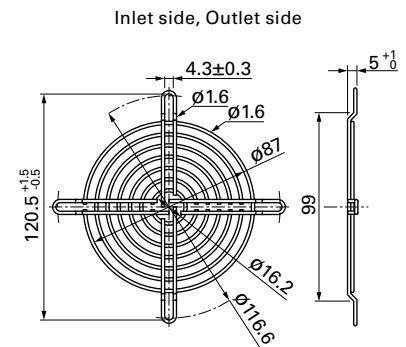
∅92 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1147 | Nickel-chrome plating (silver) | 23 |



92 mm sq., ∅100 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-099E | Nickel-chrome plating (silver) | 29 |
| 109-099H | Cation electroplating (black) | |



Option

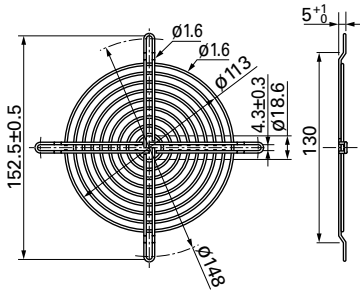
Finger guards Dimensions (unit: mm)

For use in environments subject to water splashes, cation electroplating models are recommended.

120 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-019E | Nickel-chrome plating (silver) | 42 |
| 109-019K | Cation electroplating (black) | |

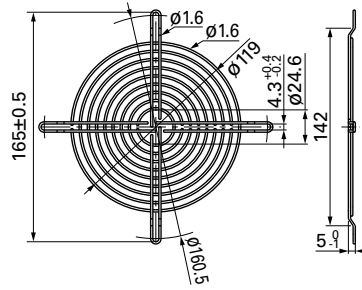
Inlet side, Outlet side



127 mm sq., Ø175 mm, Ø190 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-722 | Nickel-chrome plating (silver) | 43 |
| 109-722H | Cation electroplating (black) | |

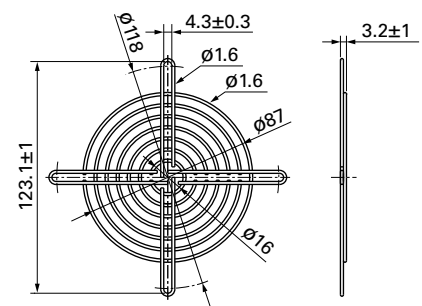
Inlet side, Outlet side



Ø133 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1112 | Nickel-chrome plating (silver) | 65 |

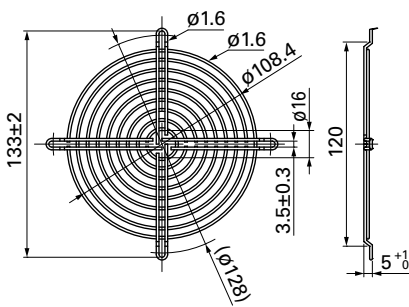
Inlet side



Ø136 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1139 | Nickel-chrome plating (silver) | 41 |

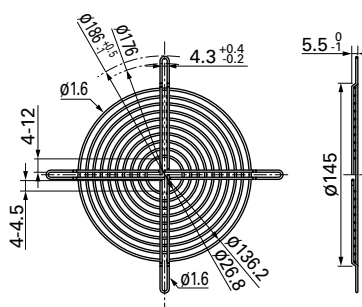
Impeller side, Nameplate side



140 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-719 | Nickel-chrome plating (silver) | 51 |
| 109-719H | Cation electroplating (black) | |

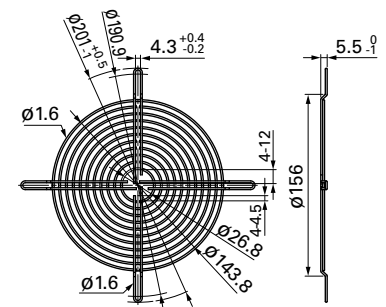
Inlet side, Outlet side



150 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1051 | Nickel-chrome plating (silver) | 63 |

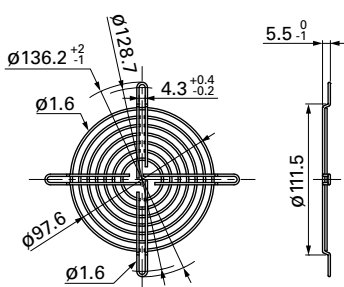
Inlet side, Outlet side



Ø150 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1104 | Nickel-chrome plating (silver) | 31 |
| 109-1104H | Cation electroplating (black) | |

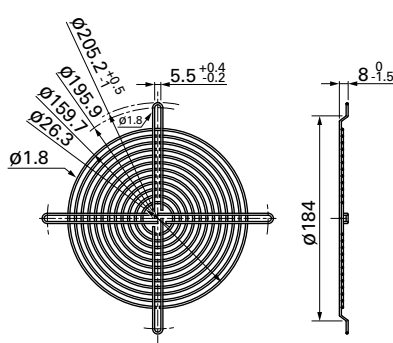
Inlet side



160 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-619E | Nickel-chrome plating (silver) | 85 |
| 109-619H | Cation electroplating (black) | |

Inlet side, Outlet side



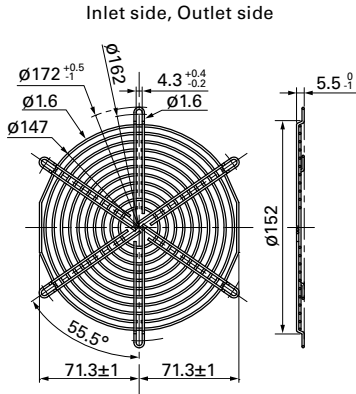
Option

Finger guards Dimensions (unit: mm)

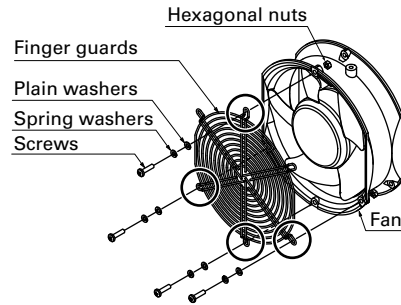
For use in environments subject to water splashes, cation electroplating models are recommended.

Ø172 mm Sidecut type

| Model no. | Surface treatment | Mass (g) |
|--|--------------------------------|----------|
| 109-319J | Nickel-chrome plating (silver) | 65 |
| Applicable model no. | | |
| 9HV57*/9SG57*/9GV57*/9CR57*/9WG57*/9GP57*/9AD57*/9ADW57*/109E47*/109E57*/109L57*/109S30* | | |

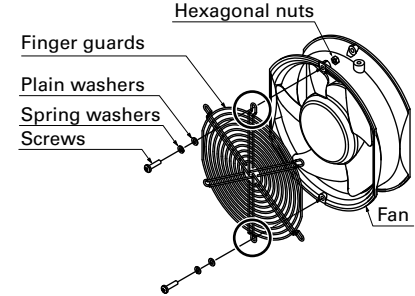


Use four holes as shown below when mounting the finger guard to the following fans: Model no. 9HV57*/9SG57*/9GV57*/9CR57*/9WG57*/9GP57*/9AD57*/9AD57W*



● No nuts or screws for use in attachment included.

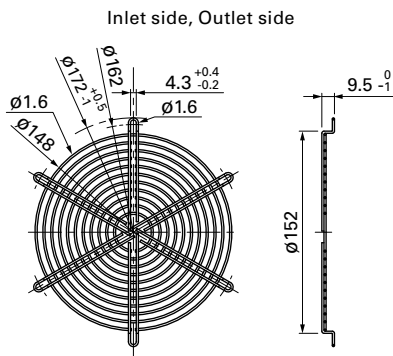
Use two holes as shown below when mounting the finger guard to the following fans: Model no. 109E47*/109E57*/109L57*/109S30*



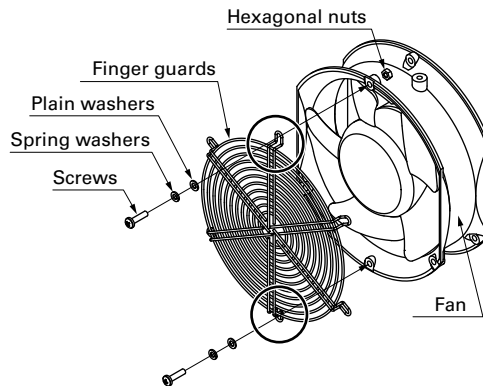
● No nuts or screws for use in attachment included.

Ø172 mm Sidecut, Round type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-319E | Nickel-chrome plating (silver) | 69 |
| 109-319H | Cation electroplating (black) | |



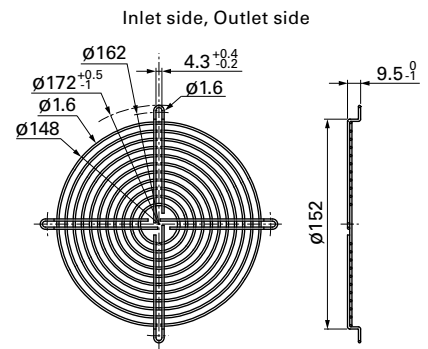
Mount the 109-319E/109-319H finger guard to a fan using two holes as shown below. They cannot be mounted otherwise.



● No nuts or screws for use in attachment included.

Ø172 mm Round type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1066 | Nickel-chrome plating (silver) | 61 |



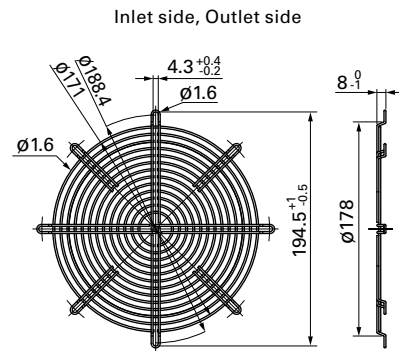
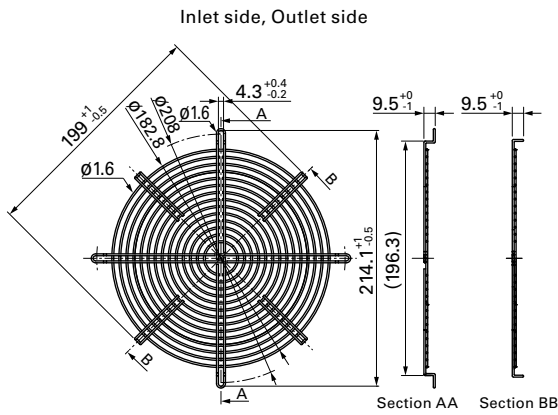
Finger guards Dimensions (unit: mm)

For use in environments subject to water splashes, cation electroplating models are recommended.

ø200 mm type

| Model no. | Surface treatment | Mass (g) | Applicable model no. |
|-----------|--------------------------------|----------|----------------------|
| 109-1102 | Nickel-chrome plating (silver) | 100 | 9GV20* |
| 109-1102H | Cation electroplating (black) | | |

| Model no. | Surface treatment | Mass (g) | Applicable model no. |
|-----------|--------------------------------|----------|----------------------|
| 109-720 | Nickel-chrome plating (silver) | 84 | 9EC20* |
| 109-720H | Cation electroplating (black) | | |

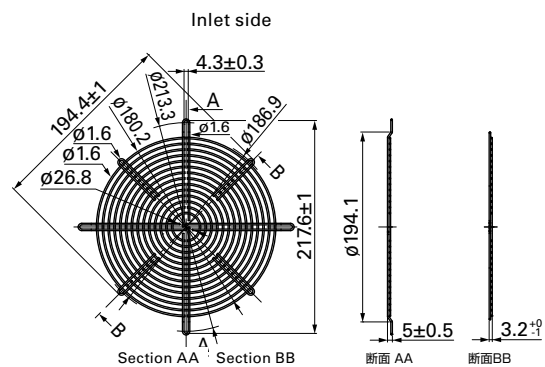
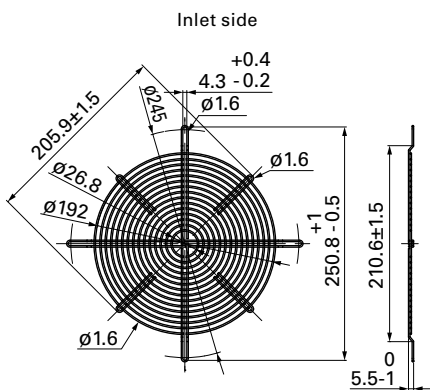


ø221 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1138 | Nickel-chrome plating (silver) | 105 |
| 109-1138H | Cation electroplating (black) | |

ø225 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1137 | Nickel-chrome plating (silver) | 94 |
| 109-1137H | Cation electroplating (black) | |

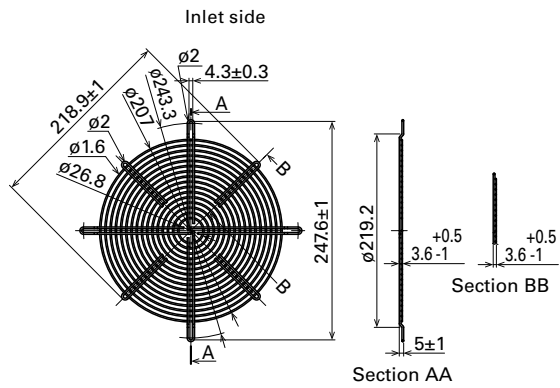


Finger guards Dimensions (unit: mm)

For use in environments subject to water splashes, cation electroplating models are recommended.

ø250 mm type

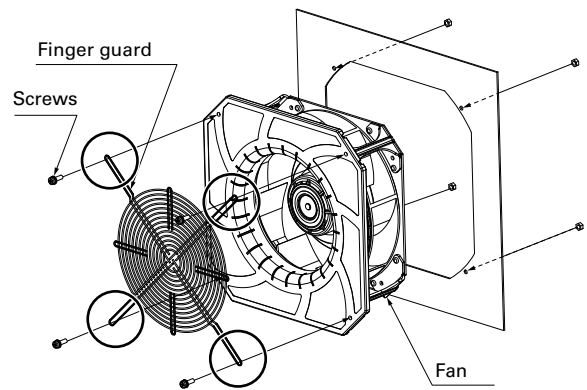
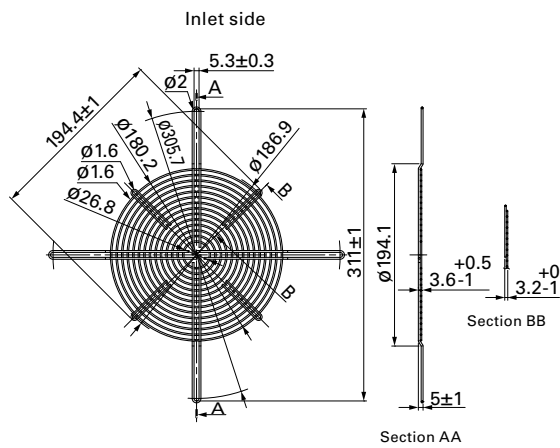
| Model no. | Surface treatment | Mass (g) |
|-----------|---------------------------------|----------|
| 109-1152 | Electro nickel plating (silver) | 140 |
| 109-1152H | Cation electropainting (black) | |



270 mm sq. type (for Bracket-mounted Centrifugal Fan)

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1146 | Nickel-chrome plating (silver) | 106 |
| 109-1146H | Cation electropainting (black) | |

Finger guard 109-1146 and 109-1146H should be mounted with four holes as in the drawing.

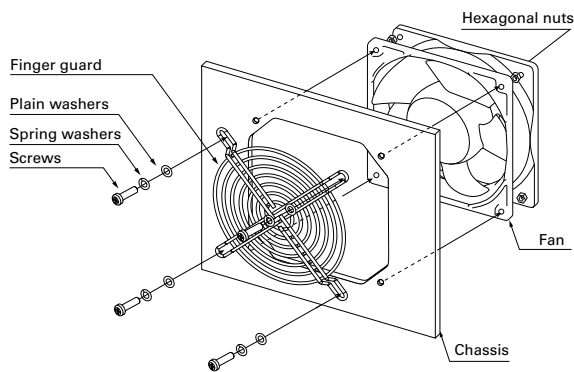


●No nuts or screws for use in attachment included.

Mounting example

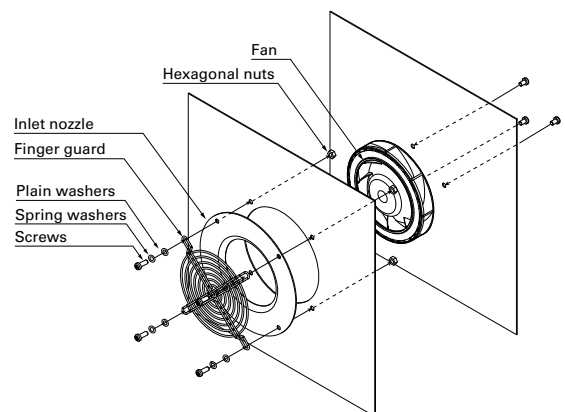
Option

Axial fan



●No nuts or screws for use in attachment included.

Centrifugal fan

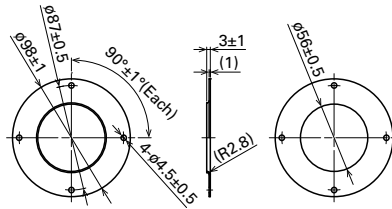


Inlet nozzle for centrifugal fan and splash proof centrifugal fan Dimensions (unit: mm)

Nozzle mounted in fan inlet side to adjust the flow of introduced air. Material: Steel sheet
 For use in environments subject to water splashes, cation electroplating models are recommended.

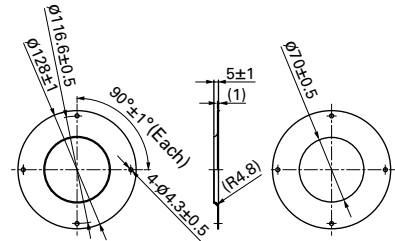
ø70 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|---------------------------------|----------|
| 109-1106 | Electro nickel plating (silver) | 40 |



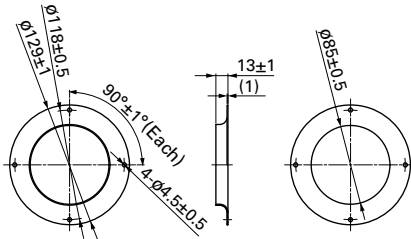
ø100 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|---------------------------------|----------|
| 109-1080 | Electro nickel plating (silver) | 80 |
| 109-1080H | Cation electroplating (black) | |



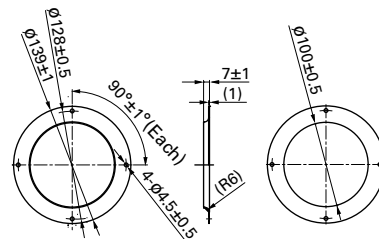
ø133 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|---------------------------------|----------|
| 109-1069 | Electro nickel plating (silver) | 76 |
| 109-1069H | Cation electroplating (black) | |



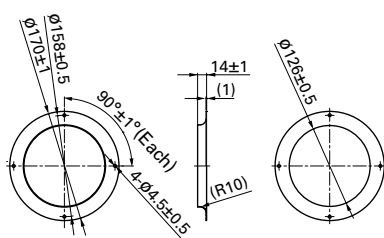
ø150 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|---------------------------------|----------|
| 109-1081 | Electro nickel plating (silver) | 70 |
| 109-1081H | Cation electroplating (black) | |



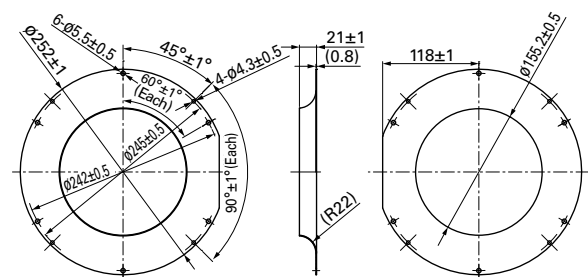
ø175 mm, ø190 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|---------------------------------|----------|
| 109-1073 | Electro nickel plating (silver) | 100 |
| 109-1073H | Cation electroplating (black) | |



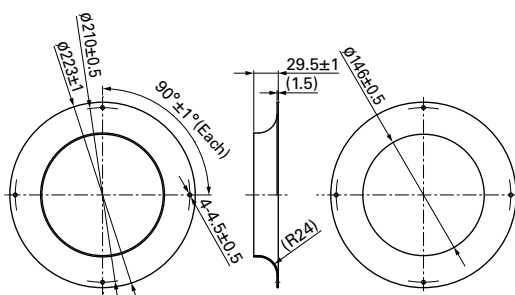
ø221 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|---------------------------------|----------|
| 109-1135 | Electro nickel plating (silver) | 230 |
| 109-1135H | Cation electroplating (black) | |



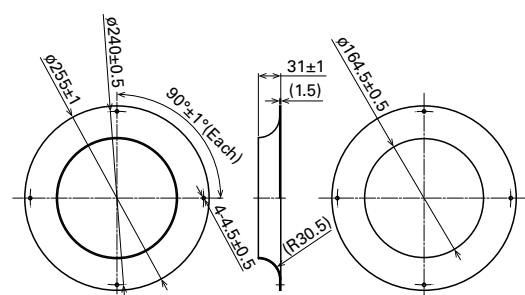
ø225 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|---------------------------------|----------|
| 109-1134 | Electro nickel plating (silver) | 360 |
| 109-1134H | Cation electroplating (black) | |



ø250 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|---------------------------------|----------|
| 109-1151 | Electro nickel plating (silver) | 440 |
| 109-1151H | Cation electroplating (black) | |



Option

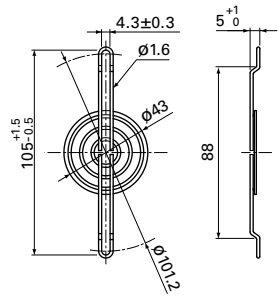
EMC guards Dimensions (unit: mm)

It is a metallic piece that protects materials from the adverse effects of electromagnetic noise sources. It provides electromagnetic shielding. It is attached to the casing of a device by means of the fan fixing screw (s). Ground the devices equipped with an EMC guard. Rust may occur if used in wet environments. Please refer to page 622 for detail.

80 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1038 | Nickel-chrome plating (silver) | 14 |

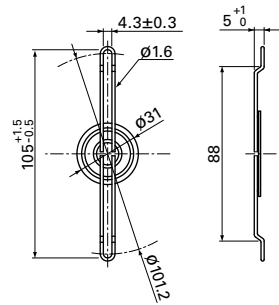
| Representative fans model numbers | Dimensions of fans (mm) |
|-----------------------------------|-------------------------|
| 109P08* | 80×80×20 |
| 9GV08* | 80×80×38 |
| 9HV08* | |
| 9HVA08* | |
| 9HVB08* | |



80 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1039 | Nickel-chrome plating (silver) | 10 |

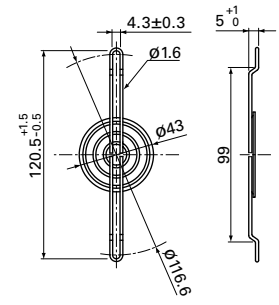
| Representative fans model numbers | Dimensions of fans (mm) |
|-----------------------------------|-------------------------|
| 9GA08* | 80×80×20 |
| 9GA08* | 80×80×25 |
| 9GA08* | 80×80×32 |
| 9G08* | 80×80×38 |
| 9GA08* | |



92 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1040 | Nickel-chrome plating (silver) | 15 |

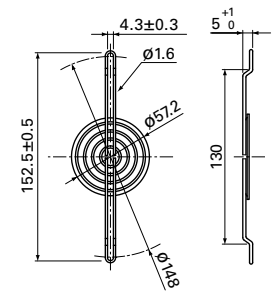
| Representative fans model numbers | Dimensions of fans (mm) |
|-----------------------------------|-------------------------|
| 9G09* | 92×92×32 |
| 9G09* | 92×92×38 |
| 9GV09* | |
| 9GA09* | |
| 9AD09* | |



120 mm sq. type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1037 | Nickel-chrome plating (silver) | 26 |

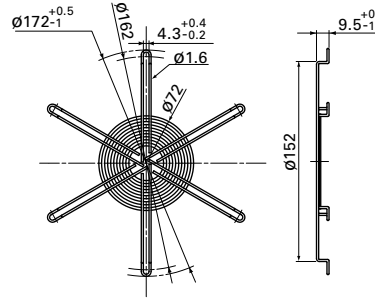
| Representative fans model numbers | Dimensions of fans (mm) |
|-----------------------------------|-------------------------|
| 9GV12* | 120×120×25 |
| 9GL12* | 120×120×38 |
| 9G12* | |
| 9GV12* | |
| 9HV12* | |
| 9LG12* | |
| 9AD12* | |



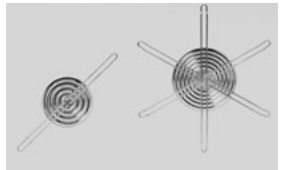
Ø172 mm type

| Model no. | Surface treatment | Mass (g) |
|-----------|--------------------------------|----------|
| 109-1036 | Nickel-chrome plating (silver) | 49 |

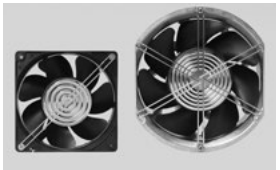
| Representative fans model numbers | Dimensions of fans (mm) |
|-----------------------------------|-------------------------|
| 109E47* | Ø172×25 |
| 109L17* | Ø172×51 |
| 9GV57* | |
| 109E17* | |
| 109E57* | |
| 9SG57* | |



Option



EMC guard



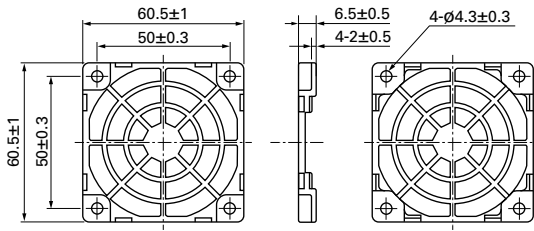
attached to a cooling fan

Resin finger guards Dimensions (unit: mm)

Material Frame: Resin (PPE+PS) UL file no. E82268 94V-0

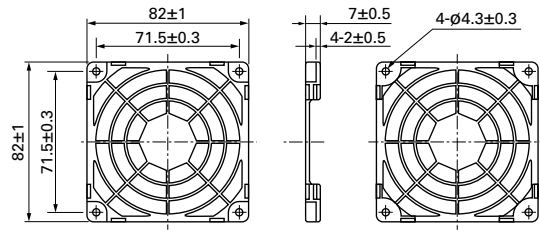
60 mm sq. type

| Model no. | Mass (g) |
|-----------|----------|
| 109-1003G | 7 |



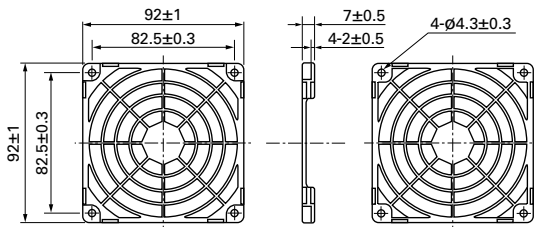
80 mm sq. type

| Model no. | Mass (g) |
|-----------|----------|
| 109-1002G | 10 |



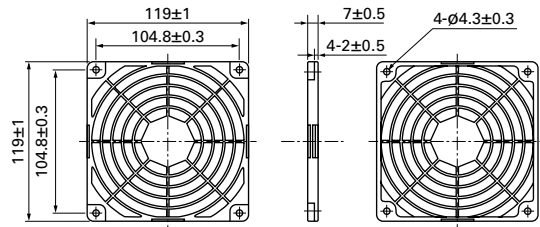
92 mm sq. type

| Model no. | Mass (g) |
|-----------|----------|
| 109-1001G | 12 |



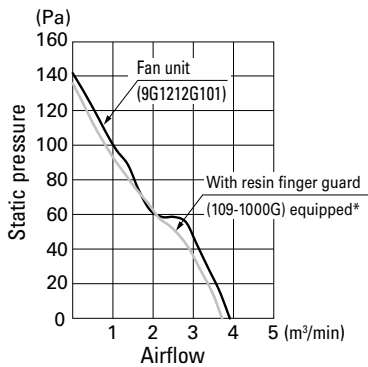
120 mm sq. type

| Model no. | Mass (g) |
|-----------|----------|
| 109-1000G | 23 |



Airflow - Static pressure characteristics

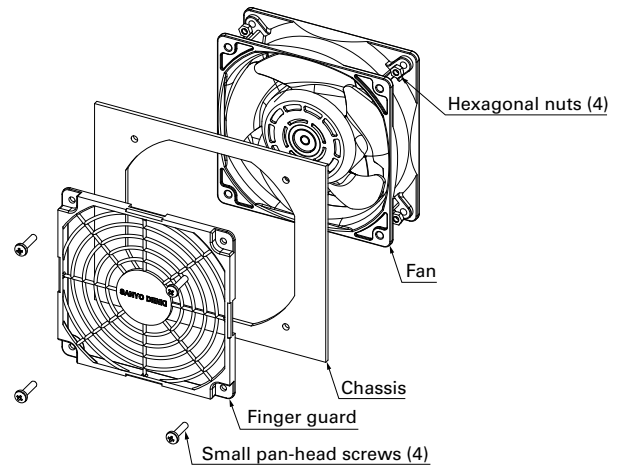
Measured with our double chamber measuring device (120 mm sq. type)



Applied voltage: 12 VDC

* Finger guard is attached on air inlet side of fan.

Mounting example



- Operating temperature limit is between -20 to +70°C. (non-condensing)
- Plastic finger guards are placed on both the intake and exhaust sides of the fan.
- No nuts or screws for use in attachment included.

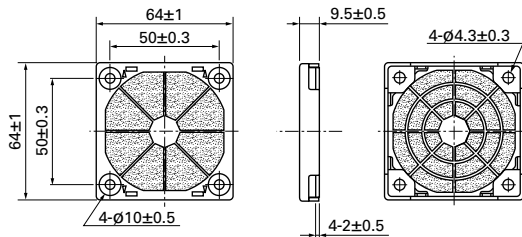
Option

Resin filter kits Dimensions (unit: mm)

Material Guard, cover: Resin (PPE+PS) UL file no. E82268 94V-0 Filter: Polyurethane foam UL file no. E74916 (S) 94HF-1
 PPI: Particles Per Inch Indicates the number of holes per inch. Note that the higher the number, the finer the grain of the sponge.

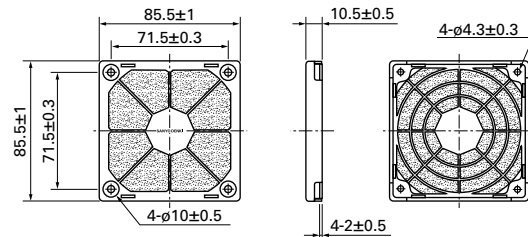
60 mm sq. type

| Model no. | Mass (g) |
|------------------------------|----------|
| 109-1003F13 (13 PPI) | 11 |
| 109-1003F20 (20 PPI) | |
| 109-1003F30 (30 PPI) | |
| 109-1003F40 (40 PPI) | |
| Replacement filter model no. | Quantity |
| 109-1003M13 (13 PPI) | 5 |
| 109-1003M20 (20 PPI) | |
| 109-1003M30 (30 PPI) | |
| 109-1003M40 (40 PPI) | |



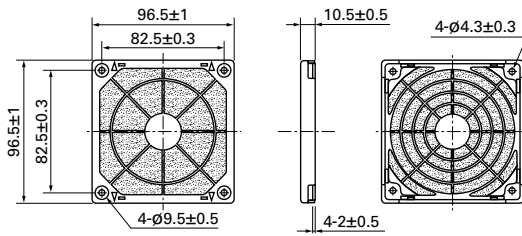
80 mm sq. type

| Model no. | Mass (g) |
|------------------------------|----------|
| 109-1002F13 (13 PPI) | 19 |
| 109-1002F20 (20 PPI) | |
| 109-1002F30 (30 PPI) | |
| 109-1002F40 (40 PPI) | |
| Replacement filter model no. | Quantity |
| 109-1002M13 (13 PPI) | 5 |
| 109-1002M20 (20 PPI) | |
| 109-1002M30 (30 PPI) | |
| 109-1002M40 (40 PPI) | |



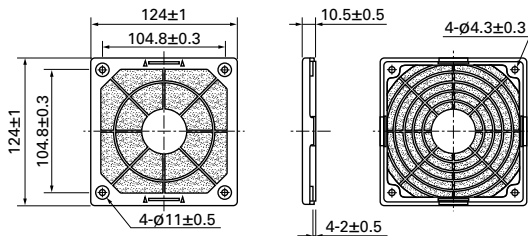
92 mm sq. type

| Model no. | Mass (g) |
|------------------------------|----------|
| 109-1001F13 (13 PPI) | 25 |
| 109-1001F20 (20 PPI) | |
| 109-1001F30 (30 PPI) | |
| 109-1001F40 (40 PPI) | |
| Replacement filter model no. | Quantity |
| 109-1001M13 (13 PPI) | 5 |
| 109-1001M20 (20 PPI) | |
| 109-1001M30 (30 PPI) | |
| 109-1001M40 (40 PPI) | |



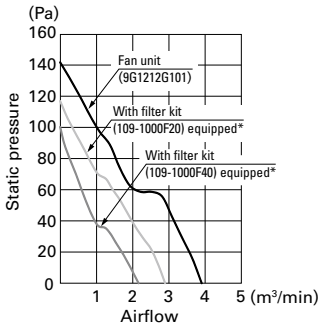
120 mm sq. type

| Model no. | Mass (g) |
|------------------------------|----------|
| 109-1000F13 (13 PPI) | 44 |
| 109-1000F20 (20 PPI) | |
| 109-1000F30 (30 PPI) | |
| 109-1000F40 (40 PPI) | |
| Replacement filter model no. | Quantity |
| 109-1000M13 (13 PPI) | 5 |
| 109-1000M20 (20 PPI) | |
| 109-1000M30 (30 PPI) | |
| 109-1000M40 (40 PPI) | |



Airflow - Static pressure characteristics

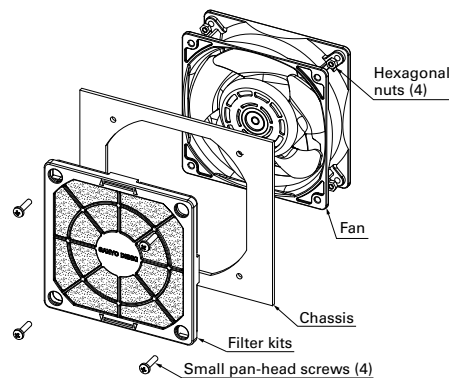
Measured with our double chamber measuring device (120 mm sq. type)



Applied voltage: 12 VDC

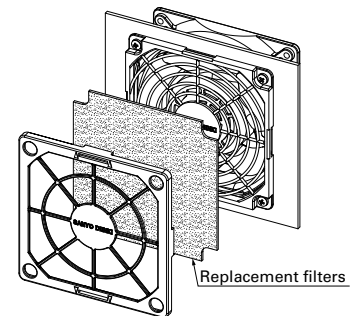
* Filter kit is attached on air inlet side of fan.

Mounting example



Filter replacement (example)

Replacement filters can be replaced by taking off the front part of the filter kit. There is no need to remove the screws.



Option

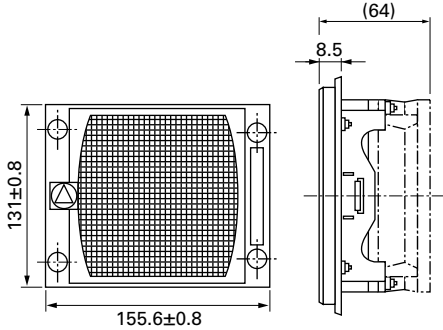
- Filter kit is one of the option to keep air in the chassis clean filtering dust in external atmosphere when pulling-air cooling is implemented. The filter kit is hooked up through mounting hole of fan frame with screw as well as finger guard. Some performances (airflow & static pressure) of the fan motor decreases when filter kit is hooked up.
- This Filter Kit is composed of 3 components, including a guard, a filter and a cover. It is delivered as a finished product at delivery, saving assembly time when mounting. It can be mounted by inserting a screw in the apertures of the cover.
- The filter and cover can be easily removed from the guard with one touch. There is no need for fan removal when undertaking maintenance. ● Operating temperature limit is between -10 to +60°C. (non-condensing)
- The filter will deteriorate with age, and the level of deterioration will vary upon usage conditions. Please be aware that the filter has a greater tendency to deteriorate under high temperature and humidity. For long-term storage, please store under the temperature range of 10 to 30°C, humidity range of 20 to 65%. Usage and storage period is approximately 2 years.
- Cooling ability decreases with filter contamination due to clogging. Filter replacement is recommended approximately every six months of usage. Please replace the filter if deterioration or clogging is seen at inspection.
- When replacing the filter, please use genuine SANYO DENKI filters. ● Do not water-wash the filter.
- Avoid use and storage under high temperature or humidity, direct sunlight or exposure to ultraviolet light, or in corrosive gas. ● No nuts or screws for use in attachment included.

Filter kits Applicable models: AC Fan 120×120×38 mm Dimensions, Reference Dimensions of Mounting Holes (unit: mm)

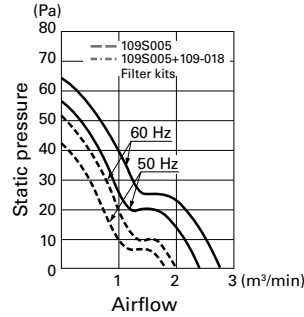
Neither filter kit can be installed on ACDC fans, or AC fans with sensors. Please evaluate it by assembly filter kits on the device.

| Model no. | Material | Mass (g) |
|-----------|--|----------|
| 109-018 | Steel Wire Mesh: Stainless 16-mesh nets in 3 layers Cover: Resin Metal fittings: Steel (chromate-plated) | 182 |

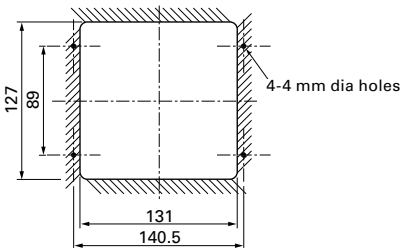
Dimensions



Airflow - Static Pressure Characteristics
(Measured with our double chamber measuring device)

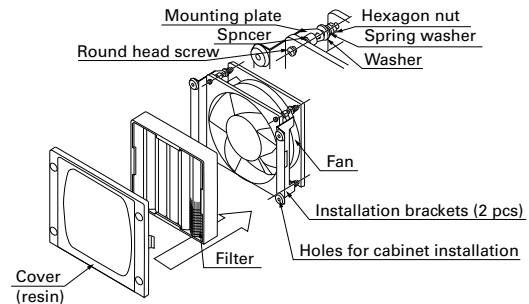


Reference Dimensions of Mounting Holes



●The parts shown in the installation diagram (nuts, washers, and screws) are included.

Mounting Example

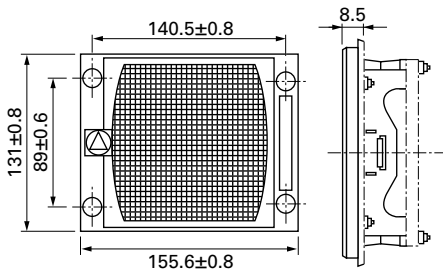


Screen kits Applicable models: AC Fan 120×120×38 mm Dimensions, Reference Dimensions of Mounting Holes (unit: mm)

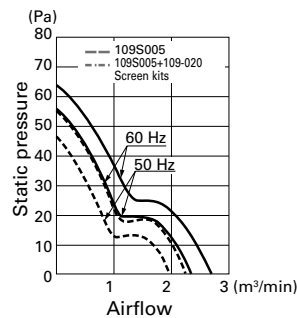
Neither screen kit can be installed on ACDC fans, or AC fans with sensors.

| Model no. | Material | Mass (g) |
|-----------|--|----------|
| 109-020 | Steel Wire Mesh: Stainless 16-mesh nets in 1 layers Cover: Resin Metal fittings: Steel (chromate-plated) | 135 |

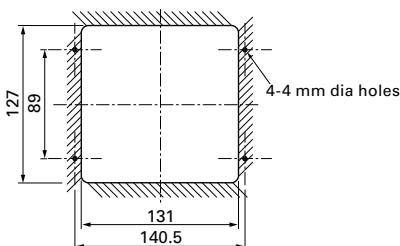
Dimensions



Airflow - Static Pressure Characteristics
(Measured with our double chamber measuring device)

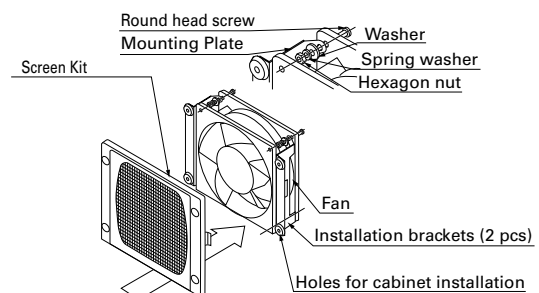


Reference Dimensions of Mounting Holes



●The parts shown in the installation diagram (nuts, washers, and screws) are included.

Mounting Example



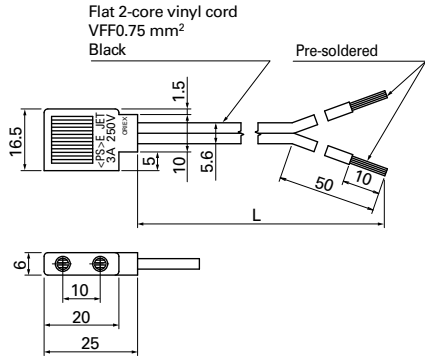
Option

Plug cord for AC fan Dimensions (unit: mm)

■PSE compatible models

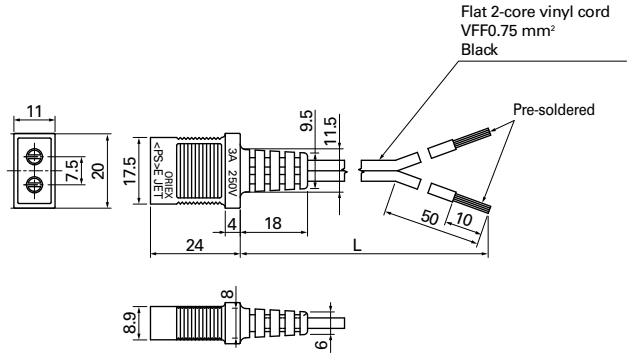
For 80×80×42 mm

| Model no. | Power cord length [L] (mm) | Mass (g) |
|-------------|----------------------------|----------|
| 489-008-L10 | 1000 | 30 |
| 489-008-L21 | 2100 | 61 |
| 489-008-L35 | 3500 | 99 |



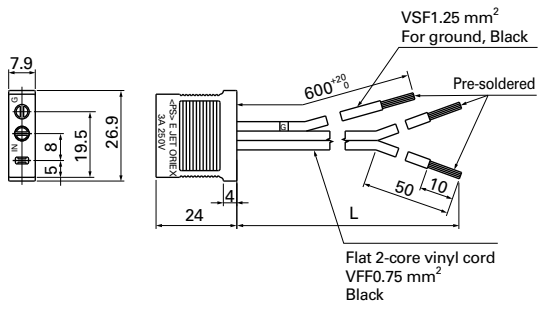
For 80×80×25 mm, 80×80×38 mm, 92×92×25 mm, 120×120×25 mm

| Model no. | Power cord length [L] (mm) | Mass (g) |
|-------------|----------------------------|----------|
| 489-016-L10 | 1000 | 34 |
| 489-016-L21 | 2100 | 64 |



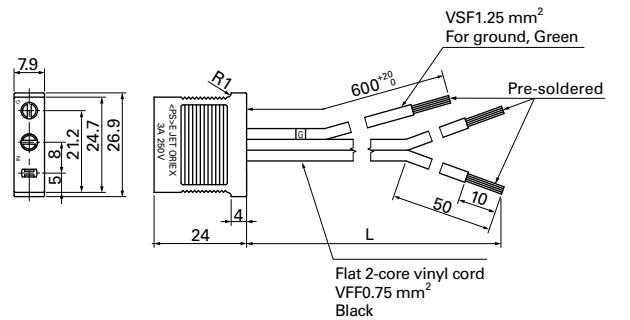
For 120×120×38 mm (not including ACDC fan)
Exclusive for fans without UL at the end of the model number.

| Model no. | Power cord length [L] (mm) | Mass (g) |
|-------------|----------------------------|----------|
| 489-006-L10 | 1000 | 47 |
| 489-006-L21 | 2100 | 76 |
| 489-006-L35 | 3500 | 114 |



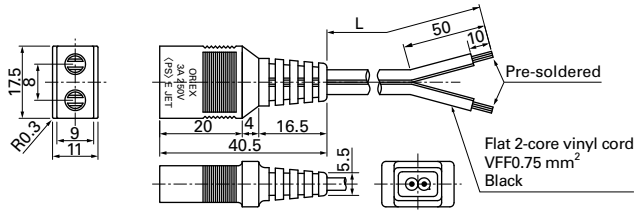
For 120×120×38 mm (not including ACDC fan)
Exclusive for fans with UL at the end of the model number.

| Model no. | Power cord length [L] (mm) | Mass (g) |
|-------------|----------------------------|----------|
| 489-037-L10 | 1000 | 46 |
| 489-037-L21 | 2100 | 76 |
| 489-037-L35 | 3500 | 114 |



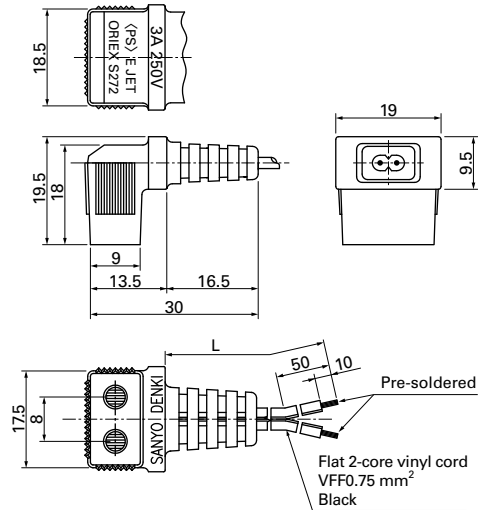
For 160×160×51 mm

| Model no. | Power cord length [L] (mm) | Mass (g) |
|--------------|----------------------------|----------|
| 489-1618-L10 | 1000 | 34 |
| 489-1618-L21 | 2100 | 63 |
| 489-1618-L28 | 2800 | 83 |



For ø172×51 mm, ø172×150×51 mm, 160×160×51 mm

| Model no. | Power cord length [L] (mm) | Mass (g) |
|--------------|----------------------------|----------|
| 489-1619-L10 | 1000 | 34 |
| 489-1619-L21 | 2100 | 64 |



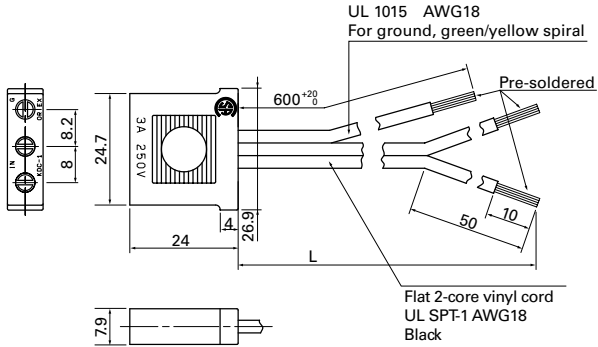
Option

●Be careful not to damage the plug cord when taking them out of the package.

■UL/CSA certified models UL file no.: E50197 CSA file no.: LR67048

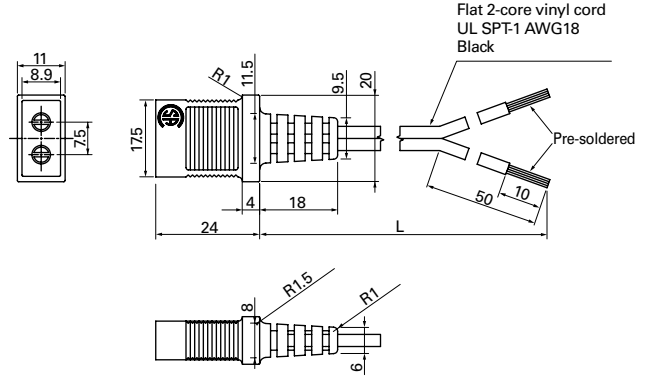
For 120×120×38 mm (not including ACDC fan)
Exclusive for fans with UL at the end of the model number.

| Model no. | Power cord length [L] (mm) | Mass (g) |
|-------------|----------------------------|----------|
| 489-007-L10 | 1000 | 48 |
| 489-007-L21 | 2100 | 80 |



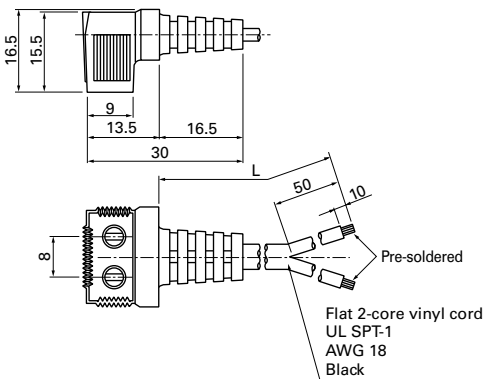
For 80×80×25 mm, 80×80×38 mm, 92×92×25 mm, 120×120×25 mm

| Model no. | Power cord length [L] (mm) | Mass (g) |
|-------------|----------------------------|----------|
| 489-047-L10 | 1000 | 38 |
| 489-047-L21 | 2100 | 71 |



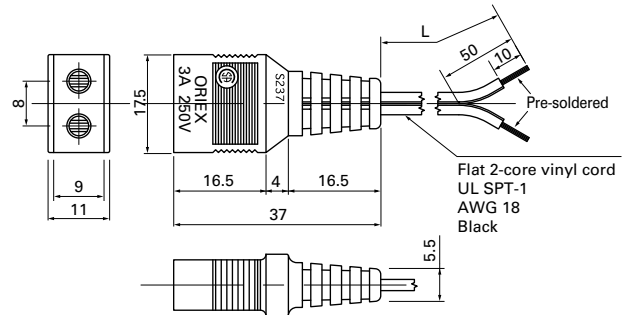
For ∅172×51 mm, ∅172×150×51 mm, 160×160×51 mm

| Model no. | Power cord length [L] (mm) | Mass (g) |
|-------------|----------------------------|----------|
| 489-084-L10 | 1000 | 37 |
| 489-084-L21 | 2100 | 70 |



For 160×160×51 mm

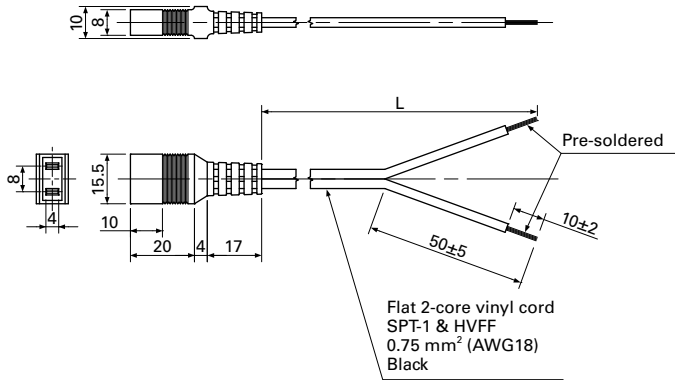
| Model no. | Power cord length [L] (mm) | Mass (g) |
|-------------|----------------------------|----------|
| 489-086-L10 | 1000 | 37 |
| 489-086-L21 | 2100 | 70 |



Plug cord for ACDC fan Dimensions (unit: mm)

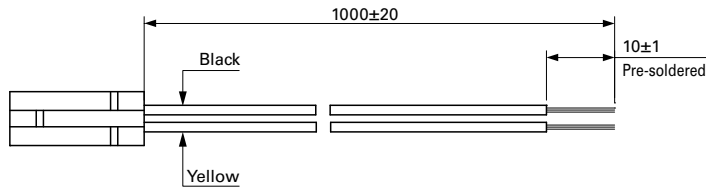
■PSE compatible, UL/CSA [c-UL] certified models UL file no.: E43202

| Model no. | Power cord length [L] (mm) | Mass (g) |
|--------------|----------------------------|----------|
| 489-1635-L10 | 1000 | 38 |
| 489-1635-L21 | 2100 | 74 |



Sensor extension wiring harness

| Model no. | Mass (g) |
|-----------|----------|
| 489-1636 | 9 |

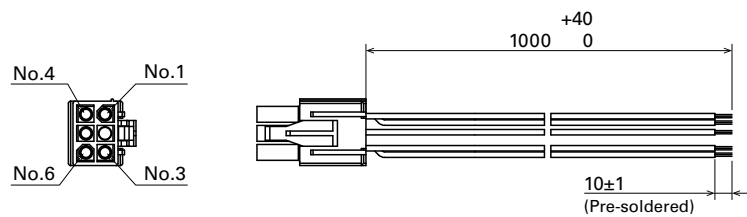


Connector Model no.: TE Connectivity 172211-2
 Contact Model no.: TE Connectivity 170376-1
 Lead wire: AWG24 UL 1007

● Be careful not to damage the plug cord when taking them out of the package.

Terminal model wiring harness Applicable models: ACDC Fan 160 × 160 × 51 mm/^φ172 × 150 × 51 mm Dimensions (unit: mm)

| Model no. | Mass (g) |
|-----------|----------|
| 489-1647 | 27 |



Connector Model no.: TE Connectivity: 1-172168-9
 Power lead wire
 AWG22 UL 11347
 Other lead wire
 AWG24 UL 3385

Typical Connectors for DC Fans

Listed below are the typical contact/housing connectors with a proven track record with our products. For customization details, contact us.

| Manufacturer | 2 pins Housing model number | 3 pins Housing model number | 4 pins Housing model number | 6 pins Housing model number | 8 pins Housing model number | Contact model number |
|-------------------------------|--------------------------------|--|---|--------------------------------------|--------------------------------------|-----------------------------|
| MOLEX | 22-01-1022:P/N 5051-02* | 22-01-1032:P/N 5051-03* 22-01-3037:P/N 2695-03RP* | 22-01-1042:P/N 5051-04* 22-01-3047:P/N 2695-04RP 47054-1000 | — | — | 08-55-0130:P/N 2759-(558)B |
| | | | | | | 08-50-0113:P/N 2759-(P909)B |
| | | | | | | 08-70-0064:P/N 5159T* |
| | | | | | | 08-70-0048:P/N 5159PBT* |
| | | | | | | 39-00-0372:P/N 2759T* |
| | | | | | | 39-00-0374:P/N 2759GS |
| | | | | | | 39-00-0376:P/N 2759G |
| | 39-00-0380:P/N 2759PBG | | | | | |
| | 43025-0200* | — | 43025-0400* | 44133-0600 | — | 43030-0001* |
| | | | | | | 43030-0002* |
| | | | | | | 43030-0003* |
| | | | | | | 43030-0004 |
| | | | | | | 43030-0005 |
| | | | | | | 43030-0006 |
| — | — | 51021-0400 | — | — | 46235-0001 | |
| 51191-0200* | 51191-0300* | 51191-0400* | — | — | 50079-8000 | |
| 50-37-5023:P/N 5264-02* | 50-37-5033:P/N 5264-03* | 50-37-5043:P/N 5264-04* | — | — | 50802-9001* | |
| 39-01-2020:P/N 5557-02R* | — | 39-01-2040:P/N 5557-04R* | — | — | 50802-8000 | |
| 50-37-5023:P/N 5264-02* | 50-37-5033:P/N 5264-03* | 50-37-5043:P/N 5264-04* | — | — | 08-70-1039:P/N 5263PBT* | |
| 39-01-2020:P/N 5557-02R* | — | 39-01-2040:P/N 5557-04R* | — | — | 39-00-0059:P/N 5556PBT* | |
| — | — | — | — | — | 39-00-0038:P/N 5556T* | |
| TE Connectivity | 171822-2* | 171822-3* | 171822-4* | — | — | 170262-1* |
| | 179228-2* | 179228-3* | 179228-4* | — | — | 179227-1* |
| | — | — | — | — | 794617-8 | 1-794607-1 |
| Hirose | DF1B-2EP-2.5RC* | DF1B-3EP-2.5RC* | — | — | — | DF1B-2428PCF* |
| | DF3-2EP-2C* DF3AA-2EP-2C* | DF3-3EP-2C* DF3AA-3EP-2C* | DF3-4EP-2C* DF3AA-4EP-2C* | — | — | DF3-EP2428PCF* |
| Japan Solderless Terminals | EHR-2* | EHR-3* | EHR-4* | — | — | SEH-001TP0.6* |
| | SMP-02V-BC* | SMP-03V-BC* | SMP-04V-BC* | — | — | SHF-001T0.8BS* |
| | SMP-02V-NC* | SMP-03V-NC* | — | — | — | |
| | H2P-SHF-AA* | H3P-SHF-AA* | — | — | — | |
| | PHR-2* | PHR-3* | PHR-4* | — | — | SPH-002TP0.5S* |
| | XAP-02V-1* | XAP-03V-1* | XAP-04V-1* | — | — | SPH-002TP0.5L |
| | XMP-02V* | XMP-03V* | — | — | — | SXA-001TP0.6* |
| | XHP-2* | XHP-3* | XHP-4* | — | — | SXA-01TP0.6 |
| | | | | | | SXH-001GU-P0.6* |
| | | | | | | SXH-001TP0.6* |
| | SMR-02V-B* | SMR-03V-B* | SMR-04V-B* | — | — | SXH-002TP0.6 |
| SMR-02V-N* | SMR-03V-N* | SMR-04V-N* | — | — | SYM-001TP0.6* | |
| — | — | ZHR-4 | — | — | SZH-002TP0.5 | |

* Recommended connectors

Recommended tubes and cable ties for DC fan

| | Manufacturer | Representative model numbers | Specifications | UL file no. |
|--------------------------|--------------------|------------------------------|------------------|-------------|
| PVC tube | YAMAICHI CHEMICAL | YET-300H | 105°C 300 V VW-1 | E55011 |
| | IWASE KAGAKU KOGYO | AH-3 | | E56036 |
| Thermal contraction tube | SUMITOMO ELECTRIC | SUMITUBE® F2 (Z) | 125°C 600 V VW-1 | E48762 |
| | SUMI-PAC | SUMITUBE® F32 | | |
| Cable tie | ABB | TY23M | UL 94V-2 | E49405 |
| | PANDUIT | BT1M | | E56854 |
| | HellermannTyton | T18R | | E64962 |

Note: The specifications in this table are for reference purposes only. When selecting, please check catalogs of each brand.

Overview and Characteristics of Fan

Overview

A cooling fan is widely used to extend life of your system by cooling off heat of the system that many electrical components are mounted in a very high density and dissipating heat. Since we SANYO DENKI developed "San Ace" which is the first AC fan in Japan in 1965, we have increased fan motor lineup until now meeting customer's needs rapidly based on our tremendous career. We SANYO DENKI will continue to develop new fans with high airflow, low noise, low vibration, and energy-saving design.

Characteristics

We can roughly divide fan into two types which are AC and DC.

AC fans

SANYO DENKI succeeded in the mass-production of AC fans in 1965. SANYO DENKI was the first Japanese manufacturer to have succeeded at this.

- High performance
- High reliability
- Safety

DC fans

SANYO DENKI succeeded in the mass-production of DC fans in 1982.

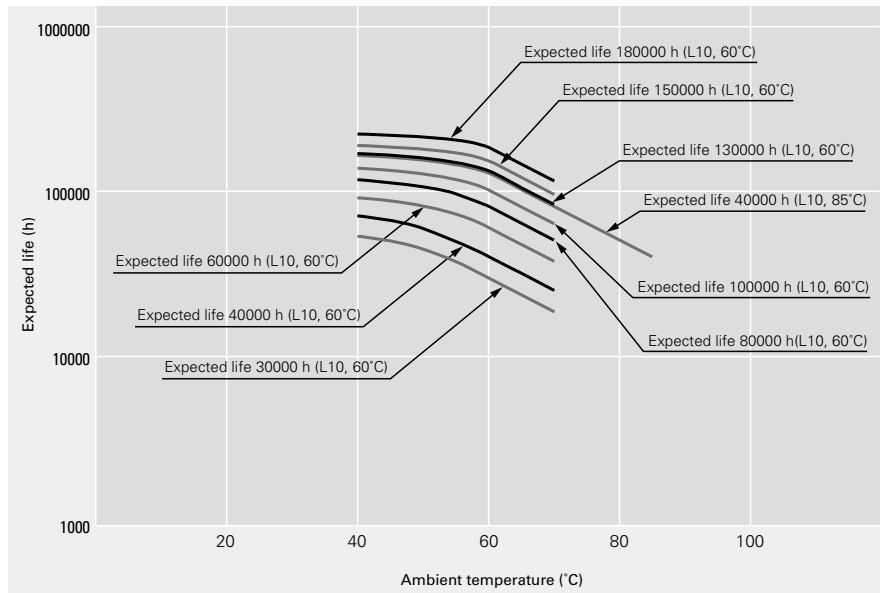
- High performance
- Low power consumption
- Low vibration
- Low leakage of flux
- High reliability

SANYO DENKI currently has a wider variety of products like Long Life Fan, CPU cooler, Splash Proof Fan, and Oil Proof Fan etc to meet all customer needs.

Reliability and expected life

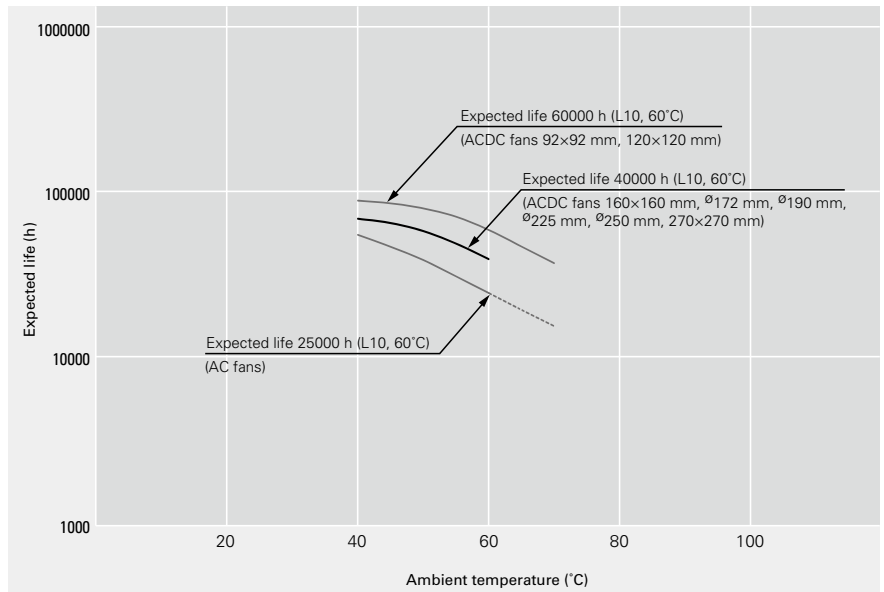
A cooling fan generally cools itself as well. The temperature rise of the motor is relatively low and the temperature rise of the grease in the bearings is also low, so expected life is longer than general some either motors. Since the service life of bearings is a theoretical value that applies when they are ideally lubricated, the life of lubricant can be regarded as expected life of the fan. DC fan consumes less power and its temperature rise of bearing is very low. When the measurement conditions are: L10 (the remaining product life in the lifespan test is 90%), with an ambient temperature of 60°C (85°C for Wide Temperature Range Fans), at the rated voltage, and continuously run in a free air state. The table below indicates the relationship between ambient temperature and expected life estimated on the basis of our life tests and same other tests conducted by SANYO DENKI.

Expected life of DC fans



Rated voltage, continuously run in a free air state, survival rate of 90%

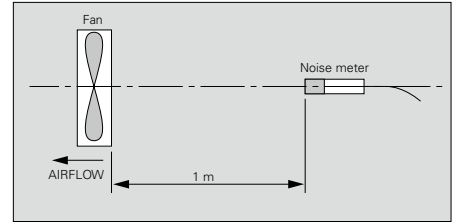
Expected life of AC fans



Rated voltage, continuously run in a free air state, survival rate of 90%

Noise characteristics

Noise is average value that measured at 1 meter away from air intake side of fan that is suspended on special frame in anechoic chamber (as per JIS B 8346).



Acoustic radio wave anechoic chamber



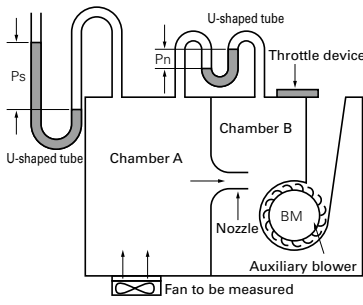
Noise characteristic measurement equipment



Measuring airflow and static pressure

It is very difficult to measure airflow and static pressure. In fact, the performance curve may vary greatly according to the type of measuring equipment.

The commonly-used type of measuring equipment is a wind tunnel using a Pitot tube. SANYO DENKI uses a very precise method using double chamber equipped with many nozzles.



Double chamber measuring equipment

$$Q = 60A\bar{v} \text{ (A)}$$

where

$$Q = \text{airflow (m}^3\text{/min)}$$

$$A = \text{cross sectional area of nozzle} = \frac{\pi}{4}D^2 \text{ (m}^2\text{)}$$

$$D = \text{nozzle diameter}$$

$$\bar{v} = \text{average airflow velocity of nozzle} = \sqrt{2g \frac{P_n}{\gamma}} \text{ (m/s)}$$

$$\gamma = \text{Specific weight of air} = \rho g \text{ (N/m}^3\text{)}$$

(Air density $\rho = 1.2 \text{ kg/m}^3$ at 20°C , 1 atm)

$$g = \text{acceleration of gravity} = 9.8 \text{ (m/s}^2\text{)}$$

$$P_n = \text{differential pressure (Pa)}$$

$$P_s = \text{static pressure (Pa)}$$

The measuring equipment using double chamber is method to be calculated from airflow goes through nozzle and differential pressure between pressure of inside of chamber (P_s) and atmospheric pressure by measuring differential pressure between air intake and exhaust of nozzle (P_n).

Conversion table

Static pressure

$$1 \text{ mm H}_2\text{O} = 0.0394 \text{ inch H}_2\text{O}$$

$$1 \text{ mm H}_2\text{O} = 9.8 \text{ Pa (Pascal)}$$

$$1 \text{ inch H}_2\text{O} = 25.4 \text{ mm H}_2\text{O}$$

$$1 \text{ Pa} = 0.102 \text{ mm H}_2\text{O}$$

$$1 \text{ inch H}_2\text{O} = 249 \text{ Pa}$$

Airflow

$$1 \text{ m}^3\text{/min} = 35.31 \text{ ft}^3\text{/min (CFM)}$$

$$1 \text{ CFM} = 0.0283 \text{ m}^3\text{/min}$$

$$1 \text{ m}^3\text{/min} = 16.67 \text{ l /s}$$

$$1 \text{ CFM} = 0.472 \text{ l /s}$$

$$1 \text{ l /s} = 0.06 \text{ m}^3\text{/min}$$

Motor Protection

If the fan blades are restricted, an overcurrent occurs and leads to a rise in the fan coil temperature. This can result in reduced performance, damage, or a fire. To prevent this from occurring, SANYO DENKI's fans incorporate an overheating protection function.

Reverse polarity protection function (DC fan)

No problem about fan even if positive & negative lead are connected in reverse.

However, when wiring fans with sensors or PWM speed control function, connecting positive and negative leads in reverse may damage the fans.

Burnout protection function at locked rotor condition (DC fan, ACDC fan)

Current cutoff system

If the fan blades are restricted, the coil current is cut off at regular cycles to prevent overheating of the coil. When the hindrance is removed, the fan restarts automatically.

Burnout protection function at locked rotor condition (AC fan)

Impedance protection (60 mm sq., 80 mm sq., 92 mm sq., 120 mm sq.)

This system is used for shading coil-type fans. When the blades are restricted, the current is reduced by the impedance of the coil itself to prevent a temperature rise in the coil. However, if the applied voltage exceeds the specification range, an overcurrent can occur and result in overheating, and so care needs to be taken.

Thermal protection (160 mm sq., \varnothing 172 mm)

This system is used for condenser phase-type fans. A temperature sensor is incorporated in the coil so that if the temperature exceeds the specification temperature, the current is cut off to prevent overheating of the coil.

Guideline in Selecting a Fan

How to select an appropriate fan

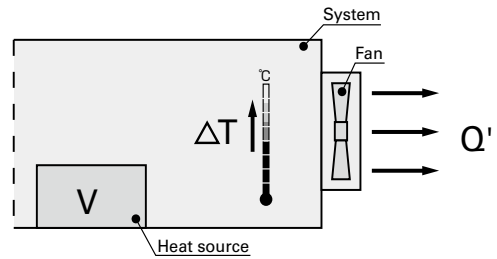
The following example is a guideline regarding how to select an appropriate fan for cooling your system

Determining of your system specifications and conditions

Determine the temperature rise inside your system and obtain the total heating value inside your system on the basis of its inputs and outputs.

Example

- V: Total heating value of your system (W)=100 (W)
- ΔT : Inside temperature rise (K)=15 (K)



Calculating the required airflow for cooling

After the equipment specifications and conditions of your system have been determined, calculate required airflow to meet the conditions. (Note that the formula shown below only applies when the heat radiation is performed only by cooling air from the fan.)

Example

Q' : Motion airflow (m^3/min)

$$Q' = \frac{V}{20\Delta T} = \frac{100 (W)}{20 \times 15 (K)} \approx 0.33 (m^3/min)$$

Selecting the fan

After the motion airflow has been calculated, select an appropriate fan motor based on the value. The motion airflow when the fan motor is actually mounted in your system can be obtained using the airflow-static pressure characteristics curve and system impedance. However, the system impedance cannot be measured without a measuring equipment, so fan with 1.5 to 2 times higher airflow than the actual max airflow should be selected (operating airflow is one-third to two-thirds of maximum airflow).

Example

Q : Maximum airflow (m^3/min)

$$Q' = Q \times 2/3$$

$$Q = Q' \times 3/2 = 0.33 \times 3/2 \approx 0.5 (m^3/min)$$

Next, In case that you select a fan having an airflow of 0.5 (m^3/min) or more and a appropriate size for the space inside your system.

For example, If you need a fan of 60 mm square, 25 mm thickness and 12 V, you should select is 9RA0612H4001 (maximum airflow = 0.54 m^3/min).

Confirming the selected fan

Calculate the temperature rise inside your sysetem when your sysetem having 100 (W) of total heating value is forcefully cooled down by a 9RA0612H4001 fan.

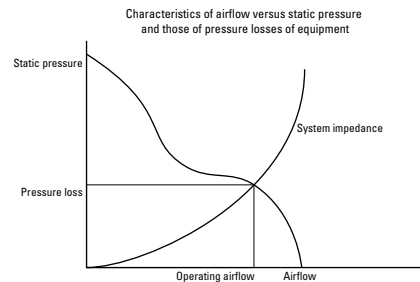
Example

$$Q' = Q \times 2/3 = 0.54 \times 2/3 \approx 0.36 (m^3/min)$$

$$\Delta T = V/20Q' = 100 (W)/20 \times 0.36 (m^3/min) \approx 13.9 (K)$$

From the above, the temperature rise inside your system is calculated as 13.9 (K).

Since the value obtained from the above equation is only a rough target, final fan selection should be based on your actual installation test.



Portable measuring device for measuring airflow and system impedance within equipment

San Ace Airflow Tester

■Features

Enables the selection of the optimal fan for a device

An optimal fan for a device can be selected by entering accurate measurement results into thermal design simulation software.

Compact and lightweight

With a compact design and weight of approximately 6 kg, it is portable enough to measure immobile equipment.

Please refer to page 592 for detail.



Specifications for DC Fan Sensors

Pulse sensor (Tach output type) example

Pulse sensor outputs two pulse waves per revolution of fan, and it is good to detect fan speed. Pulse sensors can be incorporated in all kinds of DC fans.

Noise from inside the fan or from external devices may effect sensor output.

Contact us for more information.

The specifications listed below are for the 9G1212H101 model, and vary with the model number used. Please contact your point of sale for details.

Output circuit

Open collector

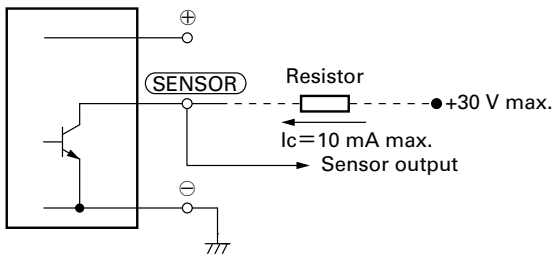
Specifications

$V_{CE} = +30\text{ V max.}$

(For a 48 V-rated fan: $V_{ce} = +60\text{ V max.}$)

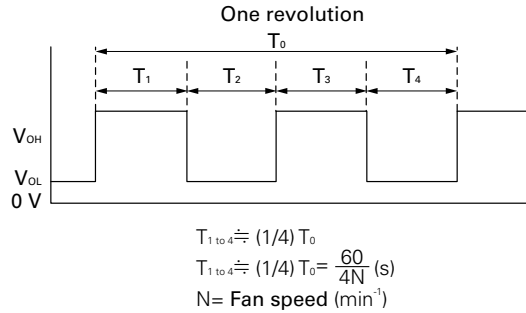
$I_c = 10\text{ mA max.}$ [$V_{OL} = V_{CE}(\text{SAT}) = 0.4\text{ V or less}$]

Inside of DC fan



Output waveform (Need pull-up resistor)

In case of steady running



If you want detailed specifications that apply when the rotor is locked, please contact SANYO DENKI.

Locked rotor sensor (rotation / lock detection type) example

Locked rotor sensor outputs fan status signals. It is good to check whether the fan is running or locked

Noise from inside the fan or from external devices may effect sensor output.

Regarding details of the reverse logic and specifications of lock sensor output signals, please contact SANYO DENKI.

Lock sensor can not be used in some models. Contact us for more information.

The specifications listed below are for the 9G1212H1D01 model, and vary with the model number used. Please contact your point of sale for details.

Output circuit

Open collector

Specifications

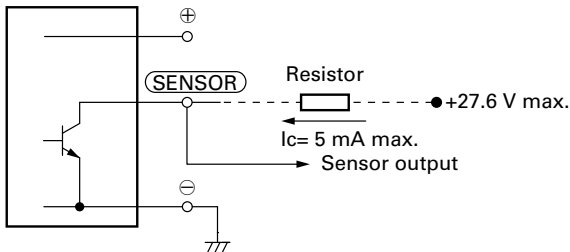
$V_{CE} = +27.6\text{ V max.}$

For a 48 V fan $V_{CE} = +60\text{ V max.}$

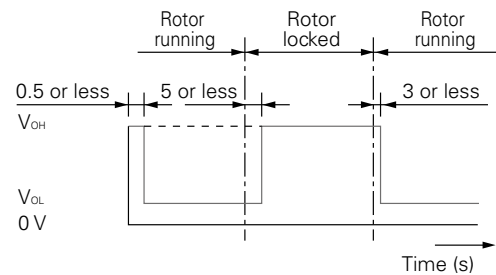
$I_c = 5\text{ mA max.}$ [$V_{OL} = V_{CE}(\text{SAT}) = 0.6\text{ V or less}$]

For a 48 V fan: $V_{CE}(\text{SAT}) = 0.4\text{ V or less}$

Inside of DC fan



Output waveform (Need pull-up resistor)



Note: The output is completely at V_{OL} with 0.5 s or less after power-up.

Low-speed sensor (rotating speed detection type) example

Low-speed sensor outputs a signal when fan speed goes down to trip point or less. It is good to detect cooling degradation of fan. Noise from inside the fan or from external devices may effect sensor output, please. If you want detailed specification and reverse signal output, please contact SANYO DENKI. Low-speed sensors can not be used in some models. Contact us for more information.

The specifications listed below are for the 9G1212H1H01 model, and vary with the model number used. Please contact your point of sale for details.

Output circuit

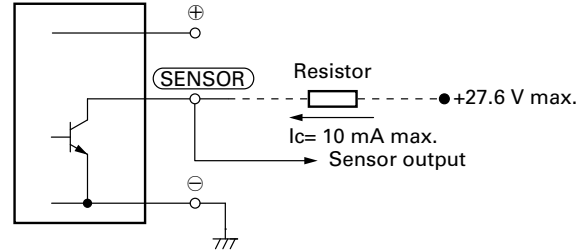
Open collector

Specifications

$V_{CE} = +27.6 \text{ V max.}$

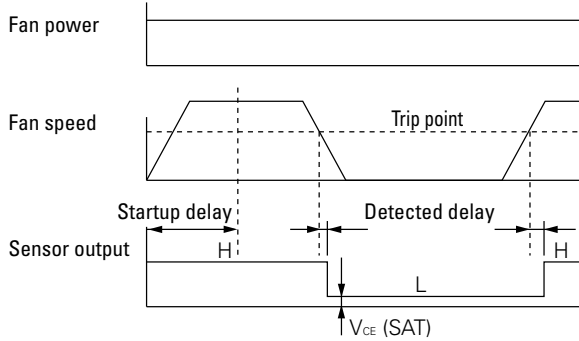
$I_c = 10 \text{ mA max.}$ [$V_{OL} = V_{CE}(\text{SAT}) = 0.5 \text{ V or less}$]

Inside of DC fan

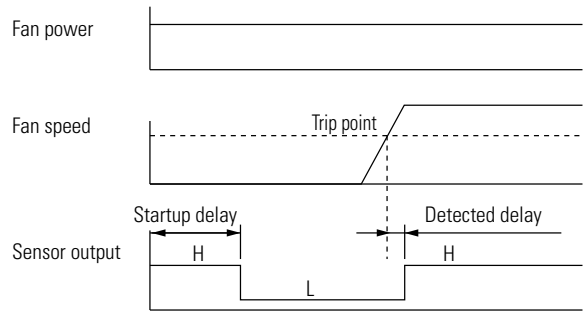


Sensor scheme

Example 1: In case steady running



Example 2: In case that the rotor is locked when the fan motor is turned on and released after the start-up delay time



Specifications for AC Fan Sensor

ACDC fan sensor specifications differ from those below. Please refer to each product page.

Specifications of sensor circuit

| | 5 V (ITEM-20*) | 12 V (ITEM-30*) |
|---------------------------------|---|------------------------------|
| Example of model.no | 109S405UL | |
| System | Speed detection, Auto-restart, Open collector | |
| Power supply | 5 VDC±10% At 5 V, 6 mA | 12 VDC±20% At 12 V, 10 mA |
| Recommend sensor circuit output | At Vp= 5 V, I= 100 mA max. | At Vp= 12 V, I = 200 mA max. |
| Trip point | Standard speed: 1700 min ⁻¹ ±10% Low speed: 850 min ⁻¹ ±10% | |
| Response speed | Standard speed: Startup delay 18 s Detection delay 1 s Low speed: Startup delay 36 s Detection delay 2 s | |
| Insulation resistance | 10 MΩ min. at 500 VDC (Note) | |
| Dielectric strength | 50/60 Hz, 1000 VAC, 1 minute (Note) | |
| Ambient conditions | Temperature: -10 to +70°C , humidity: 90% RH max. (at 40°C) | |

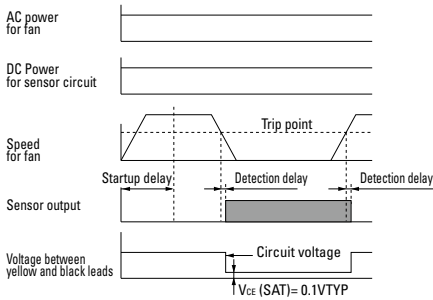


*[ITEM-20] and [ITEM-30] are printed on the fan nameplate.

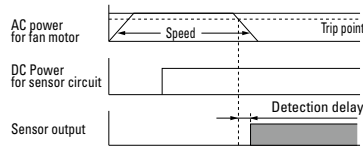
Note: Between one end that all sensor leads consisting of brown, yellow and black are tied together and the G terminal or power terminal of the fan.

Sensor scheme

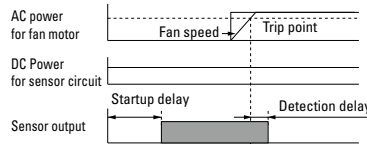
Example 1: When the AC power for the fan and the DC power for the sensor are turned on at the same time



Example 2: When the AC power for the fan is turned on first, then the DC power for sensor is powered on

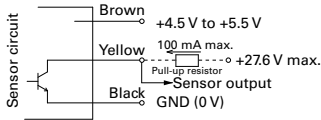


Example 3: When the DC power for sensor is first powered on, then the AC power for the fan is turned on

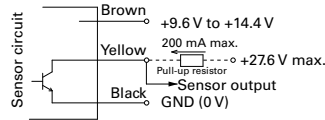


Sensor output circuit

5 V (ITEM-20*)



12 V (ITEM-30*)



GND (Black) should be shared in case that power supply for sensor circuit (Brown) and that for sensor pull-up (Yellow) are separated.

Fans with PWM Control

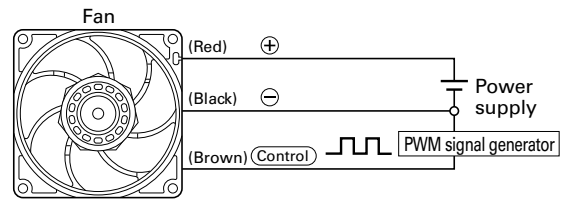
PWM control

1. Overview

Pulse Width Modulation (PWM) control enables you to externally control the speed of the fan by varying the duty cycles of PWM input signals between control and grounding terminals. It allows fans to operate optimally in response to the device's heat level, lowering the noise and power consumption of the system.

PWM control has the following advantages:

- (1) Because the PWM signal is digitally input, precise control is possible.
- (2) Because the PWM signal is digitally input, multiple fans can be controlled.
- (3) Upon users request, how the fan speed responds to PWM signals can be customized. For example, fan can be set to stop or run at low speed at 0% PWM duty cycle.



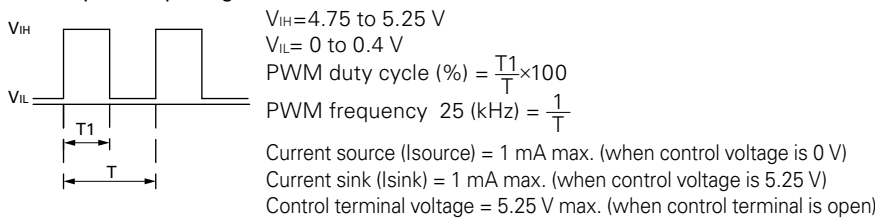
2. PWM duty input signals and wiring diagram

Other than a voltage input, an open collector/drain input can be used for PWM signal input.

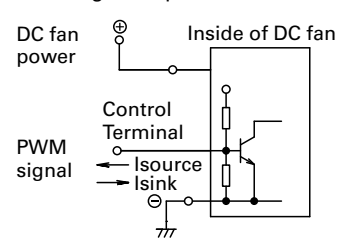
Be noted that if an open collector/drain input is used or applied an input voltage and frequency is out of specified range, how the fan speed responds to the PWM duty cycle may be altered.

The input signal voltage and the frequency differ with models. Please contact us for details.

Example of input signal



Wiring example

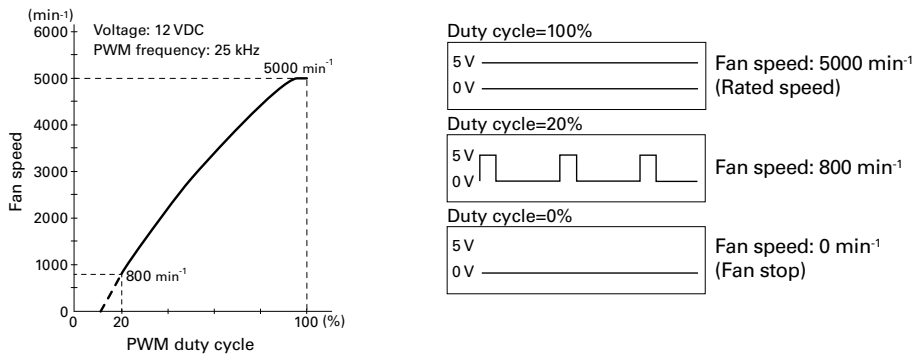


3. PWM duty cycle – Speed characteristics

Fan speed of PWM control fans change, as the below performance curve shows, in response to the PWM duty cycle input.

If necessary, users can do the speed setting by themselves, making the fans operate at the optimum speed.

Also, upon user's request, how fan speed responds to a PWM signal can be customized so that the fan stops or runs at low speed for a certain PWM duty cycle input. The below performance curve is for a fan that stops at 0% PWM duty cycle. Specifications differ with models. Please contact us for details.



The dotted part of the performance curve (area below 20% PWM duty cycle in the above case) indicates the fan speed is unstable in the area.

4. When you wish to obtain a fan performance with 100 or 0% PWM duty cycle without a PWM signal generator for built-in test.

Performance at 100% PWM duty cycle: Leave the control lead wire open and no connection.*

Performance at 0% PWM duty cycle: Connect the control lead wire directly to ⊖ pin.

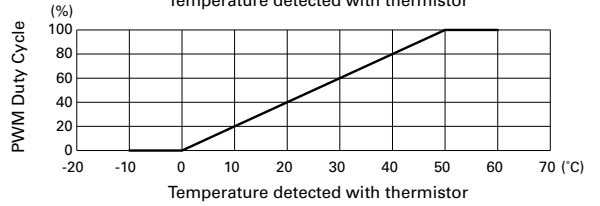
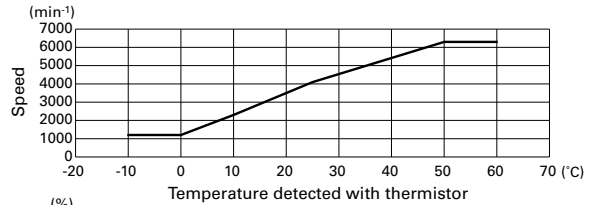
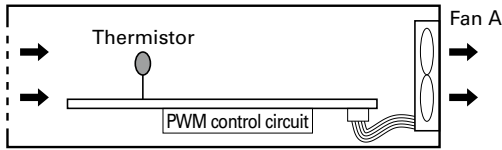
*Exception: San Ace 172AD... When control terminal is open, speed is the same as at 0% duty cycle.

5. Application examples of PWM control fan

Here are a few application examples of PWM control fan.

(1) This system controls the fan speed in response to changing device temperature.

By combining a PWM control circuit and thermistor that detects temperature of device and its parts, it is able to control the fan speed of PWM control fan in response to the changing temperature.

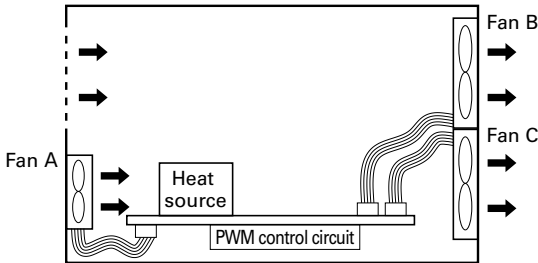


(2) Simultaneous control of multiple fans

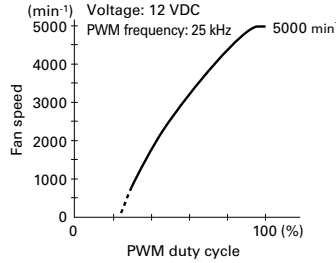
Because PWM control is done with digital signal inputs, regardless of fan types or input voltage, multiple fans can be controlled simultaneously.

Below figure shows a system that can control multiple fans with various PWM characteristics simultaneously. Such systems contribute to the low power consumption and noise.

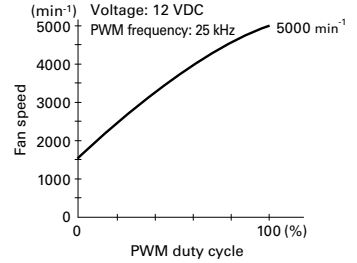
| Operation mode | PWM Duty | Fan A | Fan B, C |
|--------------------|----------|------------------------|------------------------|
| Full-power | 100% | 5000 min ⁻¹ | 5000 min ⁻¹ |
| Normal | 60% | 3500 min ⁻¹ | 4000 min ⁻¹ |
| Standby (eco mode) | 0% | Stop | 1500 min ⁻¹ |



Fan A (model that stops at 0% PWM duty cycle)



Fan B, C (model that runs at low speed at 0% PWM duty cycle)



Controlling device that easily regulates the rotational speed of PWM control fans

San Ace PWM Controller

■Features

Reduces system power consumption and fan noise

For PWM fan speed control, a PWM control circuit needs to be newly designed and configured.

By using this product, however, PWM fans can be fully utilized without the need for preparing new circuits, contributing to reducing the system power consumption and the fan noise.

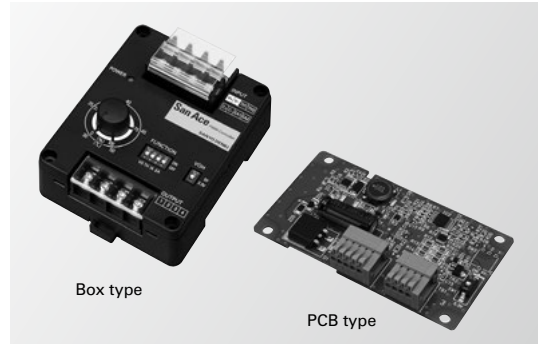
Can be common-powered by the fan power supply

The controller can be powered by the fan power supply of rated voltage 12, 24, and 48 VDC, and no separate supply is required.

Maximum of four fans connectable

Up to four PWM fans can be connected and controlled.

Please refer to page 588 for detail.



Splash Proof Fan

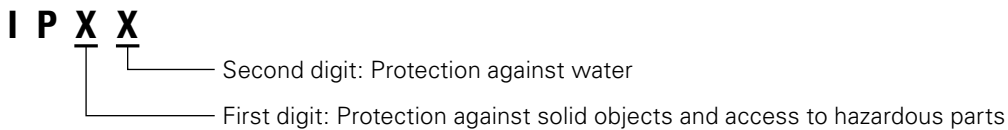
Ingress protection ratings (IP code)

The degree of protection of our products are rated as per IEC (International Electrotechnical Commission) 60529. The protection ratings of our fans only apply to electrical components (motor coils and electronic components) and do not cover mechanical components (blades, frames, and bearings). Please test fans in your environment before purchase as they may not operate properly with water or dust depending on the operating environment.



Protected electrical components and motor coils

■ Definition of Ingress Protection (IP Code)



| First digit | Definition |
|-------------|---|
| 0 | No protection |
| 1 | Protection against solid objects > 50 mm |
| 2 | Protection against solid objects > 12.5 mm |
| 3 | Protection against solid objects > 2.5 mm |
| 4 | Protection against solid objects > 1 mm |
| 5 | Protection against a level of dust that could hinder operation or impair safety |
| 6 | Complete protection against dust |

| Second digit | Definition |
|--------------|---|
| 0 | No protection |
| 1 | Protection against dripping water |
| 2 | Protection against water spray up to 15° |
| 3 | Protection against spraying water |
| 4 | Protection against splashing water |
| 5 | Protection against low pressure water jets |
| 6 | Protection against high pressure water jets |
| 7 | Protection against temporary immersion in water |
| 8 | Protection against submersion in water |

■ IPX8 Requirements

When the power is off, the fan is submerged in water pressurized to the equivalent of 2 meters for 60 minutes. Then it's run for 15 minutes at the rated voltage in free-air. During the test, there shall be no reduction in dielectric strength or fan characteristics.

UPS, inverter, rectifier, high-voltage power supply, etc.

Cautions for Use of a Cooling Fan in the Vicinity of a Power Switching Circuit (prevention of electrolytic corrosion)

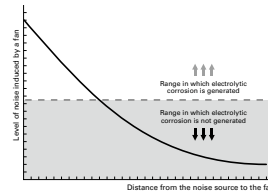
If a fan is installed near a large-power or high-voltage switching circuit, the heavy electromagnetic noise resulting from electromagnetic induction in such circuits or the influence of high-frequency noise imposed through the power line of the fan may induce current through the shaft bearing of the fan. Such current may damage the oil film on the bearing and even the friction surface of the bearing. This adverse effect is known as "electrolytic corrosion of the fan." Electrolytic corrosion affects the smooth revolution of the fan and may reduce its service life. An audible symptom is unusual noise emitted from the fan. This adverse effect is often observed and may partly be explained by the practice of mounting high-density parts, which reduces the gap between the switching circuits and the fan and the use of higher switching frequencies apt to provoke induction. Data processing/communications devices that operate at low voltages are not liable to electrolytic corrosion since they generate less electromagnetic noise.

A Case of electrolytic corrosion

Fans without anti-corrosion features installed near components that generate electromagnetic noise, such as inverter controllers, are liable to experience electrolytic corrosion.

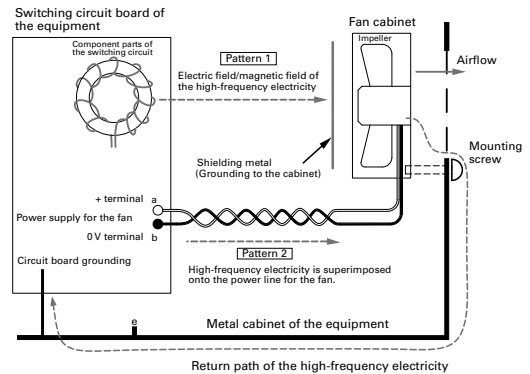
| No. | Use | Period until the occurrence of unusual noise |
|-----|--------------------------|--|
| 1 | Switching power supply | 6 months to 2 years |
| 2 | UPS | 6 months to 2 years |
| 3 | General-purpose inverter | 1 to 1.5 years |
| 4 | Air cleaner | 2 to 3 months |
| 5 | Inverter for LCDs | 6 months |

The curve shown in the graph below represents the relationship between the level of the electromagnetic noise induced by a fan and the distance from the fan to the noise source.



Occurrence of electrolytic corrosion Pattern 1

1. The fan gets charged with high-frequency electricity by high-frequency noise (electric field/magnetic field) generated in the switching circuit.
2. Because of high-frequency electricity charged in the fan, an electric current flows through the bearing of the fan.
3. The electric current breaks the oil membrane on the surface of the bearing and the bearing gets abraded (electrolytically corroded).
4. This symptom often occurs in equipment in which switching circuits are sped up and implemented in high density.
5. Countermeasure 1: To provide a shield plate⁽¹⁾ inside the fan (The plate should be such that does not interfere with airflow).
6. Countermeasure 2: To use a fan with ceramic bearings.



Occurrence of electrolytic corrosion Pattern 2

1. High-frequency electricity flows from the circuit board into the inside of the fan superimposed with the power line for the fan.
2. High-frequency electricity that has entered into the fan flows through the bearing.
3. Oil membrane on the surface of the bearing gets broken and the bearing gets abraded (electrolytically corroded).
4. Countermeasure 1: To remove high-frequency component between terminals "a" and "b", "a" and "e" and "b" and "e" of the power supply for the fan, or to insert a filter⁽²⁾ into the power line for the fan.
5. Countermeasure 2: To use a fan with ceramic bearings
6. Cables should be twisted in order to decrease induction to the power line for the fan.

(1) Shielding metal plate
As an electromagnetic shield metal, "EMC Guard" is available from our company. Certain shielding effect can be expected from mounting a general-purpose finger guard inside the fan. In each case, grounding to the cabinet is required.

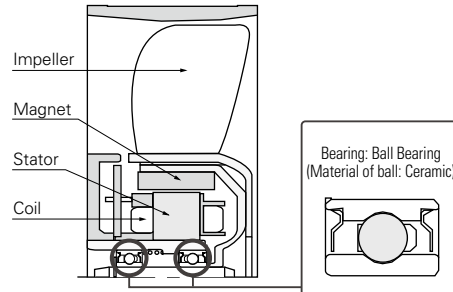
(2) Filter
Insert a common mode filter when the high-frequency electricity is superimposed on both lines "a" and "b" in the same phase and, if not, insert a normal mode filter.

Measures against electrolytic corrosion

- Relocate fans far from all electromagnetic noise sources.
- Attach an EMC guard to ordinary fans. This should have an effect on electromagnetic noise due to radiation.
- As a power supply, the fan is wired from a circuit for which noise is not superimposed.
- Against heavy electromagnetic noise (electromagnetic induction) and conductive noise from the power supply line for a fan, we recommend the use of an "Electrolytic corrosion proof fan" with ceramic bearing.

This cooling fan prevents electrolytic corrosion of bearings even under conditions where electromagnetic noise is generated. Electrolytic corrosion of ball bearings is prevented by using ceramic balls in ball bearings. The ceramic material is an insulating material.

■ Component diagram



Caution

Electrolytic Corrosion Proof Fan has been designed to prevent the electrolytic corrosion of ball bearings in the fan, but this does not guarantee that the fan will operate normally under conditions where there is strong electromagnetic noise.

Please be sure to fully evaluate the value of fan malfunction due to noise in advance.

Safety Standards

Our products conform to these directives and safety standards. For compliance with standards, see individual product pages. Safety standard registration numbers are as follows.

| Standard name | UL | CSA | TÜV |
|----------------------|--------|--------|-----------------|
| Certification number | E46810 | 172248 | Varies by model |

1. UL ratings (USA)



Underwriters Laboratories Inc. was established by the American Union of Fire Insurance Underwriters. The purpose of UL is to ensure safety of machines, equipment, and materials and protect human lives and property from fire and other accidents. To that end, UL has conducted numerous tests and extensive research and, as a result, set up UL ratings. Any seller of products in any of the majority of the states of the USA must produce their products according to the UL ratings, have them pass UL-specified safety inspections, and have them listed in UL's registration book. Therefore, to export and sell any product in the United States, one must in most cases apply for UL-listing. Additionally, UL is accredited by The Standards Council of Canada (SCC) as both a Certification Organization (CO) and a Testing Organization (TO) and is officially recognized in all provinces and territories throughout Canada. Accordingly, our products can be tested by UL for compliance with Canadian safety standards. Certified products are entitled to display the cUL Mark, which authorizes their use and sale in Canada. If products are deemed to be compliant with both U.S. and Canadian standards, then both the UL Mark and cUL Mark can be displayed or a combination U.S. and Canadian mark (bottom left). Our fans are certified as satisfying all UL 507 requirements.

2. CSA standards (Canada)



The Canadian Standards Association (CSA) was set up in response to the advice of the Canadian government. In Canada, the law prohibits the use and sale of any product other than those approved under CSA in terms of safety. CSA has set up CSA standards as inspection procedures and other requirements to ensure product safety. Our products are certified as satisfying the CSA standard C22.2 No. 113.

3. EN standards (EU members)



In the EU territory, the harmonization of industrial standards and safety standards of different countries is under way. The unified standards are called Harmonized Standards. Each of these standards is marked EN above the standard number. EN standards offer the grounds in design and manufacture when one exports a product to the EU territory. In order for a product to receive a safety marking, the product must be found to conform to TÜV, VDE, or other relevant standard. Our products are certified by TÜV Rheinland to meet the requirements of EN 60950-1/EN 62368-1. (San Ace Controller complies with EN 60730-1)

4. Electrical Appliances and Materials Safety Act (Japan)



As of April 1, 2001, the Electrical Appliance and Material Control Law has been revised and reenacted as the Electrical Appliances and Materials Safety Act (Japan). AC fans are classified as 'Blowers' under 'Electric motor-operated appliances'. They are categorized as electrical products other than specific electrical appliances (with the exception of some models) and are required to be labeled to indicate PSE certification.

5. CE marking



To distribute goods in the EU territory, manufacturers are obligated to affix the CE marking to their products as a sign of conformity with EC directives. Manufacturers ensure that their products meet the requirements of individual directives by conforming to EN standards, or IEC standards if there is no applicable EN standards.

6. UKCA marking



It is required to affix the UKCA marking to products sold within the Great Britain market (England, Wales, and Scotland) of the United Kingdom as a sign of conformity to the UK regulations that correspond to EU directives.

7. Technical Standard Conformity Certification



The Technical Standard Conformity Certification mark, set by Japanese Ministry of Internal Affairs and Communications, indicates that the product is certified as either or both of the following: specific radio equipment defined in the Radio Act and terminal equipment defined in the Telecommunications Business Act. Our San Ace Controller has built-in Technical Standard Conformity-certified specific radio equipment defined in the Radio Act in Japan. It is also a certified terminal equipment based on the Telecommunications Business Act in Japan.

8. VCCI



VCCI is a membership organization in Japan that aims to suppress electromagnetic interference generated from information technology equipment by industry self-regulation. It sets standards for noise, which affects other communications equipment, generated from data-processing equipment. VCCI categorizes information technology equipment in two classes: Class A equipment is used in commercial and industrial areas and Class B equipment is used in residential and adjacent areas. Our San Ace Controller is categorized as Class B information technology equipment.

9. FCC



Federal Communications Commission (FCC) is an independent U.S. government agency responsible for implementing and enforcing U.S. communications law and regulations. Obtaining an FCC certification is required to sell communications equipment including radio equipment in the U.S. Our San Ace Controller complies with FCC Part 15 Class B.

RoHS Directive Compliance

All products listed in this catalog conform to the RoHS Directive (2011/65/EU). These Directives restrict the following ten hazardous substances: cadmium, lead, mercury, hexavalent chromium, PBB, PBDE, DEHP, BBP, DBP, and DIBP. Implementation schedule is as follows:

| Products | Implementation date |
|--|--------------------------------------|
| Fans, PWM Controller, San Ace Controller | From January 2019 production onwards |
| Plug cords | From October 2018 shipment onwards |
| Finger guards, filter kits | From January 2018 shipment onwards |
| Airflow Tester | From July 2019 production onwards |

Operating Precautions Fan

Temperature conditions

Operating temperature: Refer to the specifications table for each model.

Storage temperature: -20 to +70°C / -30 to +70°C (Varies for each model / Non-condensing)

Rapid change in temperature may cause condensation. Prevent condensation when storing. Condensation may affect lubrication performance and insulation.

Power specifications

For the specification of rated voltage and voltage range, please check the catalog or drawing for the model number.

Use of voltage exceeding the specified range may lead to performance degradation, device failure, or fire hazards. Do not apply voltage that exceeds specifications to the fan.

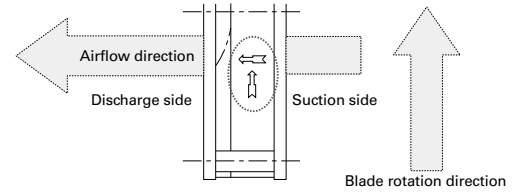
An electronic circuit is used for the DC fan. For power supply, use power with ripple less than 5% with low line noise and surge to prevent electronic circuit trouble.

Handling precautions

The fan motor is equipped with a precision ball bearing. Therefore, please handle the motors carefully in order not to shock the bearings.

Installation tips

There are no limitations on the installation direction of fans or blowers. Fans have symbols on the fan indicating the airflow direction and blade rotation direction. When installing, use these symbols to check the airflow direction.



Symbols indicating the fan airflow direction and blade rotation direction

Recommended screw torque

This shows the recommended values for the screw torque when installing the fans. If the tightening torque is higher than the recommended values, the fan can be deformed or damaged.

Use care when tightening. Also, be sure to always use a fan with a ribbed structure when securing by screws with both flanges.

DC fan

| Fan mounting hole diameter [mm] | Nominal screw diameter | Recommended screw torque |
|---------------------------------|------------------------|---|
| ø3.5, ø3.7 | M3 | 0.44 N·m max. |
| ø4.3, ø4.5 | M4 | 0.78 N·m max. |
| ø4.3, ø4.5 | M4 | 0.98 N·m max. (ø172 mm×51 mm, ø172 mm×150 mm×51 mm, ø200×70 mm) |

AC fan

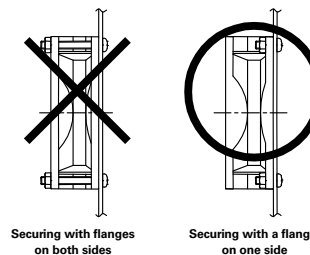
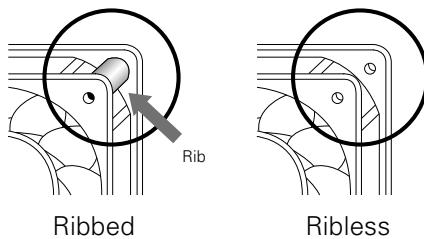
| Fan mounting hole diameter [mm] | Nominal screw diameter | Recommended screw torque |
|---------------------------------|------------------------|------------------------------------|
| ø3.5, ø3.7 | M3 | 0.44 N·m max. |
| ø4.3 | M4 | 0.58 N·m max. (120 mm×120 mm max.) |
| ø4.3 | M4 | 0.78 N·m max. (ACDC fan, ø172 mm) |
| ø5.5 | M4, M5 | 0.78 N·m max. (160 mm×160 mm) |

Comparison of ribbed and ribless structures

Regarding plastic frame, we have a option ribbed and ribless about mounting. Please use preferred type up to your application. Please use ribbed fan in case that you hook fan up clamping either side fan mounting hole target. (According to the model, only models with or without ribs are available.)

*Use a fan with a rib structure when securing by screws with both flanges.

When securing screws to ribless plastic frame models, use a flange to secure on one side.



Fan Mounting Using Self-tapping Screw

Installing self-tapping screws into the plastic frame of the fan may split or deform it.

If using self-tapping screws, use screws that are recommended by our company, and refer to our recommended tightening torques and recommended pilot hole shapes. Pay close attention to the operating precautions and fully understand your equipment before you use it.

Recommended screw torques

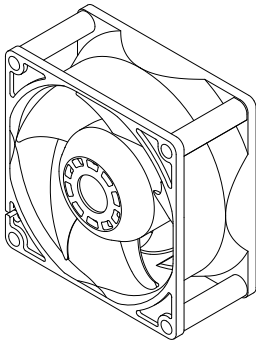


Fig. A: Ribbed fan

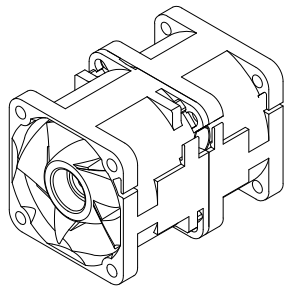


Fig. B: Counter rotating fan

| | Recommended screw torque [N·m] | Fan mounting hole diameter [mm] |
|-------------------------------|--------------------------------|---------------------------------|
| Ribbed fan (Fig. A) | 0.8 max. | ø3.5. ø4.3. ø4.5 |
| Counter rotating fan (Fig. B) | 0.6 max. | |

Do not use self-tapping screws in the following cases:

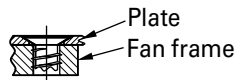
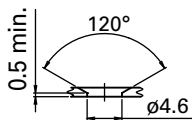
- For ribless fans (except for counter rotating fans)
- When mounting finger guards on fans

Using self-tapping screws could deform or split the frame. Please use regular screws.

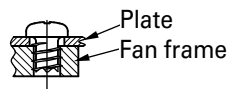
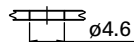
Recommended pilot hole shape

[For nominal diameter 4 mm]

Self-tapping screw model no.
SY-NS020412P11



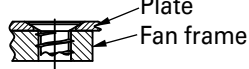
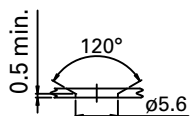
Self-tapping screw model no.
SY-NS010412P11



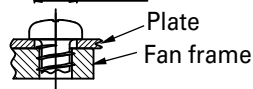
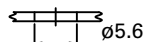
Minimum mounting plate thickness: T=1.2 mm

[For nominal diameters of 4.8 mm and 5 mm]

Self-tapping screw model no.
SY-NS024812P15
SY-NS020512P15



Self-tapping screw model no.
SY-NS014812P15
SY-NS010512P15



Minimum mounting plate thickness: T=1.2 mm

Recommended self-tapping screws

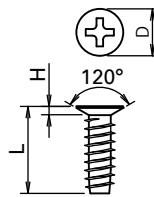
· Material: Steel

· Plating: Trivalent chromating plating

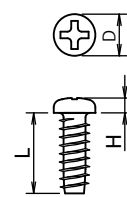
unit: mm

| Fan mounting hole diameter | Self-tapping screw model no. | Nominal screw diameter | Length [L] | Head shape | Flat-head/pan-head dimensions | | |
|----------------------------|------------------------------|------------------------|------------|------------|-------------------------------|--------------------|------------------|
| | | | | | Head diameter [D] | Height of head [H] | Cross recess No. |
| ø3.5 | SY-NS020412P11 | 4 | 12 | Flat | 6.2 | 1.1 max. | 2 |
| | SY-NS010412P11 | 4 | 12 | Pan | 5.5 | 2.0 | 2 |
| ø4.3 | SY-NS024812P15 | 4.8 | 12 | Flat | 6.8 | 1.2 max. | 2 |
| | SY-NS014812P15 | 4.8 | 12 | Pan | 7.0 | 2.6 | 2 |
| ø4.5 | SY-NS020512P15 | 5 | 12 | Flat | 6.8 | 1.2 max. | 2 |
| | SY-NS010512P15 | 5 | 12 | Pan | 7.0 | 2.6 | 2 |

Head shape: Flat

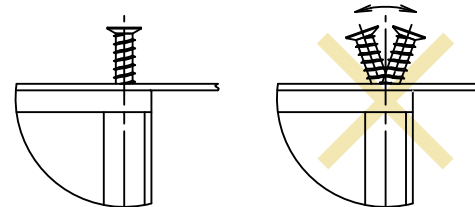


Head shape: Pan



Operating precautions

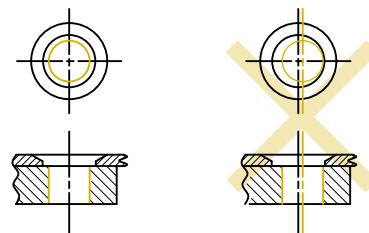
- Place the self-tapping screw so that it is vertical and centered with the frame mounting hole (Fig. A) and then screw it in. The self-tapping screw could deform or split the frame if you screw it into the frame when the screw is not vertical.
- Screw in the self-tapping screw with the center of the mounting hole on the fan and the center of the pilot hole on the mounting plate aligned (Fig. B). Misaligned holes could lead to the frame being deformed or split.



Vertically placed screw

Inclined screw

Fig. A



Aligned and centered holes

Misaligned holes

Fig. B

- Tightening the screw beyond the recommended screw torque could deform or split the frame.
- With flat-head screws, failure to use the recommended pilot hole shape will cause interference between the flat-head screw and fan frame which could split the frame.

Recommended screw manufacturer

To purchase the screws, please contact the screw manufacturer directly.

SAIMA CORPORATION

2-9-17 Tsujido Fujisawa Kanagawa 251-0047 JAPAN



TEL: +81-466-36-3656 FAX: +81-466-36-0009

<https://www.saima.co.jp/en/top.php>

Safety Precautions Fan

- To ensure that this fan is used safely, be sure that you read and understand the following precautions fully and use it only as directed.
- Be sure to read these Safety Precautions carefully before installing, connecting, operating, maintaining, or inspecting the fan. Follow all the precautions and directions given here.
- The fan has been designed and manufactured for built-in use in general industrial machinery, and might not be used otherwise.
- The fan falls into the Category 16 (Class 84, Item 14) of the Appended Table 1 of the Export Trade Control Order. When exporting the fan either as a standalone item or as part of another product, be sure to implement the necessary procedures including the "Informed Cases" and "Objective Cases" based on the "Catch-All Controls" defined by the Ministry of Economy, Trade and Industry of Japan.
- When disposing the fan, treat it as industrial waste. For instructions on proper disposal methods, please contact local government authorities.
- When using the fan in equipment that could affect people's lives or health, that is used on a car, ship, or aircraft, or that could have a major impact on society or on the public, use it at your own discretion only after deploying sufficient safety measures and making prior evaluation.
- Fully understand the Safety Precautions described in this document before using the product. SANYO DENKI will not be liable for any accidents resulting in death, injury, or property damage due to the failure of the fan.

Safety precautions necessary for preventing any possible bodily injury or damage to property or equipment are ranked in two levels:

| | |
|--|--|
|  Warning | Denotes hazards which could cause severe bodily injury or death as a result of incorrect operation. |
|  Caution | Denotes hazards which could cause bodily injury or property damage as a result of incorrect operation. |

Note: Even those items marked "Caution" might also result in serious consequences depending on the situation. Be sure to observe them carefully to the same extent as items marked "Warning."

Descriptions of the precautions to be taken to ensure safety are given below.

Warning

- When using the fan in the following equipment, use it at your own discretion only after deploying sufficient safety measures and making prior evaluation.
- Equipment that could affect people's lives or health
- Equipment that is used on a car, ship, or aircraft
- Equipment that could have a major impact on society or on the public
- SANYO DENKI will not be liable for any accidents involving human casualties (death, injury, etc.) or property damage due to the failure of the fan while use in such equipment.
- Ensure that wiring is done correctly. Failure to do so might result in fire, burns, or electrical shock.
- If there are any grounding taps or wires, ground them securely. Failure to do so might result in electric shock.
- Never use in explosive atmospheres, as doing so might result in fires, burns, or bodily injury.
- Do not operate the fan with live parts exposed. Doing so might result in electric shock.
- Never allow any persons or objects to approach or come into contact with the fan's rotor while in operation, as doing so might result in damage or personal injury.
- Turn off the power and stop using the fan immediately if you notice any sparks, smoke, odd odors or sounds, or anything unusual during operation. Failure to do so might result in fire, bodily injury, or electrical shock.
- Never allow the fan to fall, topple over, or be subjected to excessive shocks when moving it. Doing so might result in product failure or performance deterioration.
- The fan should be handled by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion.
- Never attempt to disassemble, repair, or alter the fan in any way, as doing so might result in electrical shock, fire, or bodily injury.

Caution

Handling

- Installation, mounting, connections, wiring, and relocation of the fan should be done by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion.
- Never perform such work while the product is on, as this might lead to injury, electrical shock, burns, or fire.
- Do not operate the fan if it is not secured, nor while held in hand.
- Never allow yourself to come into contact with the fan when measuring insulation resistance or dielectric strength. There is danger of electric shock.
- Never attempt to disassemble or alter the fan in any way. Doing so might not only result in substandard performance, but also fire, burns, bodily injury, or electrical shock.

Operation

- Take protective measures for the equipment in which the fan is embedded in case the fan stops, malfunctions, or fails during operation.
- Never use the fan at voltages, temperatures, or any other parameters exceeding those given in the product specifications. Otherwise, it might result in substandard performance, failure, fire, bodily injury, or electrical shock.
- Any specifications not listed in this document, such as fan and sensor operation after the fan power is turned off, will not be covered by our warranty. Please contact us in advance if you need to make any special arrangements for the specifications not listed in this document.
- Using a power supply with insufficient capacity might result in faulty fan operation because an inrush current several times larger than the rated current will flow at the moment of fan startup. Be sure to use a power supply with sufficient capacity.
- Start all fans at the same time when two or more fans are positioned in equipment in a way that creates wind interference. If the fan is exposed to wind from other fans at startup, it might result in fan failure or faulty fan startup. Also, evaluate the influence to individual fans in advance and use them at your own discretion.
- Never connect or disconnect lead wires, plug cords, or connectors while the power is on. Be sure to connect or disconnect them while holding the frame only after power-off. Otherwise, it might result in fan damage or electrical shock.
- Do not remove the lead wire of the fan from the frame hook. Doing so might scratch and damage the surface of the lead wire.

- Do not remove the nameplate. Doing so might result in fan failure or electrical shock.
- Do not press down hard on the nameplate of the fan. Otherwise, the nameplate might break or come into contact with the shaft, hindering proper operation.
- The fan might be damaged or burned out if foreign objects or external forces hinder normal fan operation.
- Do not use the power supply's PWM to control the speed of the fan. Doing so might result in fan malfunction.
- Do not turn the power on or off on the negative power line. Doing so might damage the fan.
- Turning the power on and off frequently or turning the power back on before the fan comes to a complete stop might result in fan failure or damage. Before conducting such operations, fully evaluate the equipment in which the fan is embedded.
- The IP ratings of Splash Proof Fans apply only to the live electric parts and motor coils of the fan in accordance with IEC 60529. The protection does not apply to the non-live parts of the fan. If the fan is to be used for a long period of time in an environment subject to dust, water, or condensation, take measures required for the operating environment.
- Do not wash the fan during maintenance of equipment. Doing so might result in failure of the fan.
- For DC fans, even if the positive and negative lead wires of the power supply are connected in reverse, the fan will not be affected by the motor protection function. However, when wiring fans with sensors or PWM speed control function, connecting positive and negative leads in reverse may damage the fans.

Installation (Common to All Fans)

- Install and secure the fan properly with its weight and vibration during operation taken into account. Failure to do so might result in bodily injury or equipment failure due to the fan or its parts falling off.
- Ensure that the fan is installed in the right orientation. Failure to do so might result in bodily injury or equipment failure.
- For the fan to perform to its full capacity, secure air vents and take measures to prevent foreign objects from entering the fan. Failure to do so might result in bodily injury or fan failure.
- Do not subject the fan to excessive shock. Doing so might result in failure or substandard performance of the fan.
- Pulling or pinching lead wires might result in damage and stress to the wire. Also, make connections so that the lead wires do not come into contact with the rotating blades. Failure to do so might result in equipment failure or electrical shock.
- Take proper precautions against static electricity when wiring. Failure to do so might cause failure of the fan or equipment.
- Take safety measures such as installing a finger guard and displaying a warning symbol if there is any danger of fingers or objects coming into contact with the rotating blades. Failure to do so might result in bodily injury or fan failure.
- When installing an inlet nozzle, finger guard, filter, or base plate to the fan, ensure that they are positioned correctly according to this Product Specification and other documents so that they do not come into contact with the rotating blades. Also, use the fan only after checking that the rotating blades do not come into contact with anything. Otherwise, it might result in equipment failure.
- Please use only genuine SANYO DENKI inlet nozzles and finger guards.
- Make connections correctly in accordance with the information of this Product Specification and the nameplate of the fan. Failure to do so might result in equipment failure or the malfunction, failure, or performance degradation of the fan.

Installation (Axial Fan and Blower)

- When mounting the fan with screws, make sure that the screw and base plate will not deform the frame of the fan before mounting. A deformed frame might result in failure or substandard performance of the fan.
- When mounting the fan with screws, ensure that the screw tightening torque is correct. If the tightening torque exceeds the recommended torque, the fan frame might be deformed or damaged. Choose a ribbed frame model if mounting fans with plastic frames through both sides of the frame with through-screws. To prevent loose screws, use plain washers or spring washers. For the screwing torque of each fan type, contact SANYO DENKI or a SANYO DENKI distributor.
- Note that mounting the fan with self-tapping screws might damage the fan frame.
- If using self-tapping screws, be sure to choose the screw that we recommend and conduct evaluations before using it.

Installation (Centrifugal Fan)

- The fan shall be mounted with screws. For the screw size for each fan model, see this Product Specification.
- Choose screws with the right length with information such as the fan mounting depth and base plate thickness taken into account. Failure to do so might result in stripped screw holes and improper fan mounting. For the mounting depth of each fan model, see this Product Specification.
- Ensure that the screw tightening torque is correct. If the tightening torque exceeds the recommended torque, the screw hole might be deformed or damaged. Also, to prevent loose screws, use plain washers or spring washers. For the tightening torque for each fan model, see this Product Specification.
- For the inlet nozzle and base plate installation dimensions for each fan model, see this Product Specification.

Operating Environments

- Avoid using or storing the fan in the following environments. Otherwise, it might result in fire or the failure or performance degradation of the fan.
In environments where flammable or corrosive gas is present, where water or oil splashes, where there is much dust or humidity, where condensation occurs, where exposed to radioactive rays or direct sunlight, where a salty sea breeze blows or seawater splashes, where the fan might be contaminated by such corrosive materials as sulfurous water, sulfurous volcanic ash, organic solvents, acidic and alkali chemicals, or nuclear fuel materials, where subjected to constant vibration, strong shocks, centrifugal force, acceleration, or strong magnetic force, where electromagnetic noise radiation is present, where the electromagnetic noise overlaps into power voltage, or where subjected to rapid environmental fluctuations (temperature, humidity, pressure, etc.).

Storage

- The fan should be stored in packaging.
- Ensure that the fan is stored in the following environments where:
 - the temperature is normal and stable;
 - the relative humidity is 20 to 85% with no sudden changes in humidity and no condensation;
 - not subjected to direct sunlight;
 - not subjected to water, oil, corrosive materials, or other hazardous substances;
 - and not subjected to vibration or shock.

Maintenance



- Maintenance and inspections of the fan should be done by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion. Otherwise, it might result in fire, burns, bodily injury, or electrical shock.
- Never perform any maintenance or inspections while the fan is in operation. Also note that the blades continue to rotate for some time immediately after operation ceases. Always confirm that all rotating parts have come to a stop before beginning work. Failure to do so might result in bodily injury.
- Never use gasoline, paint thinner, benzene, or any other organic solvents to clean the fan. Also, avoid placing excessive stresses on the fan. Otherwise, it might result in product deformation or performance degradation.

Safety Precautions **San Ace Controller**

Please read this instruction manual and its appendix carefully prior to installation, operation, maintenance or inspection and perform all tasks according to the instructions provided here.

A good understanding of this equipment, its safety information as well as all Warnings/Cautions is also necessary prior to operation. Matters that require attention are ranked as "Warning" and "Caution" in this document.

Warning Symbol:

| | |
|--|--|
|  Warning | Denotes hazards which could cause severe bodily injury or death as a result of incorrect operation. |
|  Caution | Denotes hazards which could cause bodily injury or property damage as a result of incorrect operation. |

Note: Even those items marked 'Caution' might also result in serious consequences depending on the situation. Be sure to observe them carefully to the same extent as items marked 'Warning.'

Warning

- When using the product in the following equipment, use it at your own discretion only after deploying sufficient safety measures and making prior evaluation.
 - Equipment that could affect people's lives or health
 - Equipment that is used on a car, ship, or aircraft
 - Equipment that could have a major impact on society or on the public
 - SANYO DENKI will not be liable for any accidents involving human casualties (death, injury, etc.) or property damage due to the failure of the product while use in such equipment.
- Ensure that wiring is done correctly. Failure to do so might result in fire, burns, or electrical shock.
- Never use in explosive atmospheres, as doing so might result in fires, burns, or bodily injury.
- Do not operate the product with live parts exposed. Doing so might result in electric shock.
- Turn off the power and stop using the product immediately if you notice any sparks, smoke, odd odors or sounds, or anything unusual during operation. Failure to do so might result in fire, bodily injury, or electrical shock.
- Never allow the product to fall, topple over, or be subjected to excessive shocks when moving it. Doing so might result in product failure or performance deterioration.
- The product should be handled by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion.
- Never attempt to disassemble, repair, or alter the product in any way, as doing so might result in electrical shock, fire, or bodily injury.

Caution

Handling

- Installation, mounting, connections, wiring, and relocation of the product should be done by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion. Never perform such work while the product is on, as this might lead to injury, electrical shock, burns, or fire.
- Never allow yourself to come into contact with the product when measuring insulation resistance or dielectric strength. There is danger of electric shock.
- Never attempt to disassemble or alter the product in any way. Doing so might not only result in substandard performance, but also fire, burns, bodily injury, or electrical shock.

Operation

- Take protective measures for the equipment in which the product is embedded in case the product stops, malfunctions, or fails during operation.
- Never use the product at voltages, temperatures, or any other parameters exceeding those given in the product specifications. Otherwise, it might result in substandard performance, failure, fire, bodily injury, or electrical shock.
- Do not remove the nameplate. Do not install the product so that the identification cannot be seen after installation.
- Turn the power supply ON/OFF using the power switch on the product. Otherwise, it might result in product failure.
- Do not use the product with a negative power supply. Otherwise, it might result in product failure.
- Do not apply excessive force to the product while it is operating. Otherwise, it might result in product failure.

Installation

- When fixing the product into place, be sure to take into consideration the product's weight and all other relevant factors. Failure to do so might result in the product or its parts falling, resulting in bodily injury or device failure.
- Do not block the airflow openings of the product. Failure to do so might result in device failure, product failure, or product malfunction.
- When fixing the product with screws, ensure correct tightening torque. If the tightening torque is over the recommended values, the product structure might deform or break.
- Take proper precautions against static electricity when wiring. Failure to do so might cause failure of the product or equipment.
- Make connections correctly in accordance with the information of this Instruction Manual and the nameplate of the product. Failure to do so might result in equipment failure or the malfunction, failure, or performance degradation of the product.
- Ensure that wires are fitted with insulation to prevent accidental short circuiting. Failure to do so might result in device failure, product failure, or product malfunction.

Operating environment

- Avoid using or storing the product in the following environments. Otherwise, it might result in fire or the failure or performance degradation of the product.
In environments where flammable or corrosive gas is present, where water or oil splashes, where there is much dust or humidity, where condensation occurs, where exposed to radioactive rays or direct sunlight, where a salty sea breeze blows or seawater splashes, where the product might be contaminated by such corrosive materials as sulfurous water, sulfurous volcanic ash, organic solvents, acidic and alkali chemicals, or nuclear fuel materials, where subjected to constant vibration, strong shocks, centrifugal force, acceleration, or strong magnetic force, where electromagnetic noise radiation is present, where the electromagnetic noise overlaps into power voltage, or where subjected to rapid environmental fluctuations (temperature, humidity, pressure, etc.).

Storage

- The product should be stored in packaging.
- Ensure that the product is stored in the following environments where:
 - the temperature is normal and stable;
 - the relative humidity is 20 to 85% with no sudden changes in humidity and no condensation;
 - not subjected to direct sunlight;
 - not subjected to water, oil, corrosive materials, or other hazardous substances;
 - and not subjected to vibration or shock.

Maintenance

- Maintenance and inspections of the product should be done by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion. Otherwise, it might result in fire, burns, bodily injury, or electrical shock.
- Perform maintenance or inspections while the product is off. Otherwise, it might result in fire, burns, bodily injury, or electrical shock.
- Never use gasoline, paint thinner, benzene, or any other organic solvents to clean the product. Also, avoid placing excessive stresses on the product. Otherwise, it might result in product deformation or performance degradation.

Radio wave

- Disassembling or altering the radio wave circuit of this product might be punishable by law.
- This product uses a frequency band of 2.4 GHz to transmit radio waves. Radio wave interference might occur if this product is used in the vicinity of the following equipment or a radio station.
 - Industrial, scientific, or medical equipment (such as microwave ovens, wireless LAN devices, security devices, or cardiac pacemakers)
 - Radio stations for which no license is required (specific power-saving radio stations)
 - Radio stations for which a license is required (local wave stations used on factory production lines, etc. to identify moving objects, or amateur radio stations)
- If this product affects a cardiac pacemaker or other medical equipment, immediately turn OFF the power to this product.
- Do not use this product in the vicinity of a microwave oven, in a location where static electricity or electromagnetic interference occurs, or in a room shielded by metallic doors. Radio waves might not reach the target device depending on the environment.

Other Precautions



- This product falls into the category of the products specified in the Appended Table 1, Item 16 (Class 90, Item 32) of the Export Trade Control Order. To export the product as an individual part or to export a product into which the product is assembled, the "Informed Condition" and "Objective Condition" that the Ministry of Economy, Trade and Industry of Japan established based on the "Catch-All Controls" must be studied for applicability. Accordingly, appropriate export formalities must be performed.
- When disposing the product, treat it as industrial waste. Please contact your local government office for further details about disposal.

Safety Precautions **PWM Controller**

Box type

- To ensure that this product is used safely, be sure that you read and understand the following precautions fully and use it only as directed.
- Be sure to read these Safety Precautions carefully before installing, connecting, operating, maintaining, or inspecting the product. Follow all the precautions and directions given here.
- The product has been designed and manufactured for built-in use in general industrial machinery, and might not be used otherwise.
- The product falls into the Category 16 (Class 85, Item 43) of the Appended Table 1 of the Export Trade Control Order. When exporting the product either as a standalone item or as part of another product, be sure to implement the necessary procedures including the "Informed Cases" and "Objective Cases" based on the "Catch-All Controls" defined by the Ministry of Economy, Trade and Industry of Japan.
- When disposing the product, treat it as industrial waste. For instructions on proper disposal methods, please contact local government authorities.
- When using the product in equipment that could affect people's lives or health, that is used on a car, ship, or aircraft, or that could have a major impact on society or on the public, use it at your own discretion only after deploying sufficient safety measures and making prior evaluation.
- Fully understand the Safety Precautions described in this document before using the product. SANYO DENKI will not be liable for any accidents resulting in death, injury, or property damage due to the failure of the product.

Safety precautions necessary for preventing any possible bodily injury or damage to property or equipment are ranked in two levels:

| | |
|--|--|
|  Warning | Denotes hazards which could cause severe bodily injury or death as a result of incorrect operation. |
|  Caution | Denotes hazards which could cause bodily injury or property damage as a result of incorrect operation. |

Note: Even those items marked 'Caution' might also result in serious consequences depending on the situation. Be sure to observe them carefully to the same extent as items marked 'Warning.'

Warning

- When using the product in the following equipment, use it at your own discretion only after deploying sufficient safety measures and making prior evaluation.
 - Equipment that could affect people's lives or health
 - Equipment that is used on a car, ship, or aircraft
 - Equipment that could have a major impact on society or on the public
 - SANYO DENKI will not be liable for any accidents involving human casualties (death, injury, etc.) or property damage due to the failure of the product while use in such equipment.
- Ensure that wiring is done correctly. Failure to do so might result in fire, burns, or electrical shock.
- Never use in explosive atmospheres, as doing so might result in fires, burns, or bodily injury.
- Do not operate the product with live parts exposed. Doing so might result in electric shock.
- Turn off the power and stop using the product immediately if you notice any sparks, smoke, odd odors or sounds, or anything unusual during operation. Failure to do so might result in fire, bodily injury, or electrical shock.
- Never allow the product to fall, topple over, or be subjected to excessive shocks when moving it. Doing so might result in product failure or performance deterioration.
- The product should be handled by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion.
- Never attempt to disassemble, repair, or alter the product in any way, as doing so might result in electrical shock, fire, or bodily injury.

Caution

Handling

- Installation, mounting, connections, wiring, and relocation of the product should be done by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion. Never perform such work while the product is on, as this might lead to injury, electrical shock, burns, or fire.
- Never allow yourself to come into contact with the product when measuring insulation resistance or dielectric strength. There is danger of electric shock.
- Never attempt to disassemble or alter the product in any way. Doing so might not only result in substandard performance, but also fire, burns, bodily injury, or electrical shock.

Operation

- Take protective measures for the equipment in which the product is embedded in case the product stops, malfunctions, or fails during operation.
- Never use the product at voltages, temperatures, or any other parameters exceeding those given in the product specifications. Otherwise, it might result in substandard performance, failure, fire, bodily injury, or electrical shock.
- Do not remove the nameplate. Doing so might result in product failure or electrical shock.
- Do not turn the power on or off on the negative power line. Doing so might damage the product.
- Do not apply excessive force to the product while it is operating. Otherwise, it may result in product failure.

Installation

- When fixing the product into place, be sure to take into consideration the product's weight and all other relevant factors. Failure to do so may result in the product or its parts falling, resulting in bodily injury or device failure.
- Never install or remove the product while it is wired.
- When fixing the product with screws, ensure correct tightening torque. If the tightening torque is over the recommended values, the product structure may deform or break.
- Take proper precautions against static electricity when wiring. Failure to do so might cause failure of the product or equipment.
- Make connections correctly in accordance with the information of this Instruction Manual and the nameplate of the product. Failure to do so might result in equipment failure or the malfunction, failure, or performance degradation of the product.
- Ensure that wires are fitted with insulation to prevent accidental short-circuiting. Failure to do so may result in device failure, product failure, or product malfunction.

Operating Environments

- Avoid using or storing the product in the following environments. Otherwise, it might result in fire or the failure or performance degradation of the product.
In environments where flammable or corrosive gas is present, where water or oil splashes, where there is much dust or humidity, where condensation occurs, where exposed to radioactive rays or direct sunlight, where a salty sea breeze blows or seawater splashes, where the product might be contaminated by such corrosive materials as sulfurous water, sulfurous volcanic ash, organic solvents, acidic and alkali chemicals, or nuclear fuel materials, where subjected to constant vibration, strong shocks, centrifugal force, acceleration, or strong magnetic force, where electromagnetic noise radiation is present, where the electromagnetic noise overlaps into power voltage, or where subjected to rapid environmental fluctuations (temperature, humidity, pressure, etc.).

Storage

- The product should be stored in packaging.
- Ensure that the product is stored in the following environments where:
 - the temperature is normal and stable;
 - the relative humidity is 20 to 85% with no sudden changes in humidity and no condensation;
 - not subjected to direct sunlight;
 - not subjected to water, oil, corrosive materials, or other hazardous substances;
 - and not subjected to vibration or shock.

Maintenance



- Maintenance and inspections of the product should be done by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion. Otherwise, it might result in fire, burns, bodily injury, or electrical shock.
- Perform maintenance or inspections while the product is off. Otherwise, it may result in fire, burns, bodily injury, or electrical shock.
- Never use gasoline, paint thinner, benzene, or any other organic solvents to clean the product. Also, avoid placing excessive stresses on the product. Otherwise, it might result in product deformation or performance degradation.

Safety Precautions **PWM Controller**

■ PCB type

- To ensure that this product is used safely, be sure that you read and understand the following precautions fully and use it only as directed.
- Be sure to read these Safety Precautions carefully before installing, connecting, operating, maintaining, or inspecting the product. Follow all the precautions and directions given here.
- The product has been designed and manufactured for built-in use in general industrial machinery, and might not be used otherwise.
- The product falls into the Category 16 (Class 85, Item 43) of the Appended Table 1 of the Export Trade Control Order. When exporting the product either as a standalone item or as part of another product, be sure to implement the necessary procedures including the "Informed Cases" and "Objective Cases" based on the "Catch-All Controls" defined by the Ministry of Economy, Trade and Industry of Japan.
- When disposing the product, treat it as industrial waste. For instructions on proper disposal methods, please contact local government authorities.
- When using the product in equipment that could affect people's lives or health, that is used on a car, ship, or aircraft, or that could have a major impact on society or on the public, use it at your own discretion only after deploying sufficient safety measures and making prior evaluation.
- Fully understand the Safety Precautions described in this document before using the product. SANYO DENKI will not be liable for any accidents resulting in death, injury, or property damage due to the failure of the product.

Safety precautions necessary for preventing any possible bodily injury or damage to property or equipment are ranked in two levels:

| | |
|--|--|
|  Warning | Denotes hazards which could cause severe bodily injury or death as a result of incorrect operation. |
|  Caution | Denotes hazards which could cause bodily injury or property damage as a result of incorrect operation. |

Note: Even those items marked 'Caution' might also result in serious consequences depending on the situation. Be sure to observe them carefully to the same extent as items marked 'Warning.'

Warning

- When using the product in the following equipment, use it at your own discretion only after deploying sufficient safety measures and making prior evaluation.
 - Equipment that could affect people's lives or health
 - Equipment that is used on a car, ship, or aircraft
 - Equipment that could have a major impact on society or on the public
 - SANYO DENKI will not be liable for any accidents involving human casualties (death, injury, etc.) or property damage due to the failure of the product while use in such equipment.
- Ensure that wiring is done correctly. Failure to do so might result in fire, burns, or electrical shock.
- Never use in explosive atmospheres, as doing so might result in fires, burns, or bodily injury.
- Do not operate the product with live parts exposed. Doing so might result in electric shock.
- Only use the product integrated with another device or system. Failure to do so may result in burns or electrical shock.
- Do not touch the product while it is operating. Otherwise, it may result in burns or electrical shock.
- Turn off the power and stop using the product immediately if you notice any sparks, smoke, odd odors or sounds, or anything unusual during operation. Failure to do so might result in fire, bodily injury, or electrical shock.
- Never allow the product to fall, topple over, or be subjected to excessive shocks when moving it. Doing so might result in product failure or performance deterioration.
- The product should be handled by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion.
- Never attempt to disassemble, repair, or alter the product in any way, as doing so might result in electrical shock, fire, or bodily injury.

Caution

Handling

- Discharge static electricity from your body before handling the product. In addition, avoid packaging or covering the product with materials which generate static electricity. Contact with static electricity may result in product failure.
- Do not touch solder joints or pins. Otherwise, it may result in bodily injury.
- Installation, mounting, connections, wiring, and relocation of the product should be done by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion. Never perform such work while the product is on, as this might lead to injury, electrical shock, burns, or fire.
- Never allow yourself to come into contact with the product when measuring insulation resistance or dielectric strength. There is danger of electric shock.
- Never attempt to disassemble or alter the product in any way. Doing so might not only result in substandard performance, but also fire, burns, bodily injury, or electrical shock.

Operation

- Do not touch the product for a period after the power has been turned off as it may still be hot. Otherwise, it may result in burns.
- Take protective measures for the equipment in which the product is embedded in case the product stops, malfunctions, or fails during operation.
- Never use the product at voltages, temperatures, or any other parameters exceeding those given in the product specifications. Otherwise, it might result in substandard performance, failure, fire, bodily injury, or electrical shock.
- Do not remove the nameplate. Doing so might result in product failure or electrical shock.
- Do not turn the power on or off on the negative power line. Doing so might damage the product.
- Do not apply excessive force to the product while it is operating. Otherwise, it may result in product failure.

Installation

- When fixing the product into place, be sure to take into consideration the product's weight and all other relevant factors. Failure to do so may result in the product or its parts falling, resulting in bodily injury or device failure.
- Never install or remove the product while it is wired.
- When fixing the product with screws, ensure correct tightening torque. If the tightening torque is over the recommended values, the product structure may deform or break.
- Install the product carefully without touching conductors or other electrical components. Touching these components may result in device failure, product failure, or product malfunction.
- Take proper precautions against static electricity when wiring. Failure to do so might cause failure of the product or equipment.
- Make connections correctly in accordance with the information of this Instruction Manual and the nameplate of the product. Failure to do so might result in equipment failure or the malfunction, failure, or performance degradation of the product.
- Ensure that wires are fitted with insulation to prevent accidental short-circuiting. Failure to do so may result in device failure, product failure, or product malfunction.

Operating Environments

- Avoid using or storing the product in the following environments. Otherwise, it might result in fire or the failure or performance degradation of the product.

In environments where flammable or corrosive gas is present, where water or oil splashes, where there is much dust or humidity, where condensation occurs, where exposed to radioactive rays or direct sunlight, where a salty sea breeze blows or seawater splashes, where the product might be contaminated by such corrosive materials as sulfurous water, sulfurous volcanic ash, organic solvents, acidic and alkali chemicals, or nuclear fuel materials, where subjected to constant vibration, strong shocks, centrifugal force, acceleration, or strong magnetic force, where electromagnetic noise radiation is present, where the electromagnetic noise overlaps into power voltage, or where subjected to rapid environmental fluctuations (temperature, humidity, pressure, etc.).

Storage

- The product should be stored in packaging.
- Ensure that the product is stored in the following environments where:
 - the temperature is normal and stable;
 - the relative humidity is 20 to 85% with no sudden changes in humidity and no condensation;
 - not subjected to direct sunlight;
 - not subjected to water, oil, corrosive materials, or other hazardous substances;
 - and not subjected to vibration or shock.

Maintenance



- Maintenance and inspections of the product should be done by technically qualified personnel or someone with sufficient expertise; the personnel shall be assigned at your own discretion. Otherwise, it might result in fire, burns, bodily injury, or electrical shock.
- Perform maintenance or inspections while the product is off. Otherwise, it may result in fire, burns, bodily injury, or electrical shock.
- Never use gasoline, paint thinner, benzene, or any other organic solvents to clean the product. Also, avoid placing excessive stresses on the product. Otherwise, it might result in product deformation or performance degradation.


Safety Precautions Airflow Tester

Please read the instruction manual and its appendix carefully prior to installation, operation, maintenance or inspection and perform all tasks according to the instructions provided here.



A good understanding of this equipment, its safety information as well as all Warnings/Cautions is also necessary prior to operation. Matters that require attention are ranked as "Danger", "Warning", and "Caution" in this document.

Warning symbols

| | |
|--|--|
|  Warning | Denotes immediate hazards which could cause severe bodily injury or death as a result of incorrect operation. |
|  Caution | Denotes hazards which could cause bodily injury and product or property damage as a result of incorrect operation. |

 **Caution** Even those hazards denoted by this symbol could lead to a serious accident. Make sure to strictly follow these safety precautions.

Prohibited, mandatory symbols

| | |
|---|---|
|  | Indicates actions that must not be allowed to occur / prohibited actions. |
|  | Indicates actions that must be carried out / mandatory actions. |

Warning

Operating precautions

- Avoid using the product in the presence of flammable, explosive, or corrosive gases, locations subjected to splashing water or oil, or near combustibles. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- Turn off the power before performing any wiring, maintenance, or inspection. Once the power is off, remove the AC power cable, and confirm that the POWER LED is off before performing these tasks. Failure to do so may result in electric shock.
- Operate the product with dry hands. Failure to do so may result in electric shock.
- Never attempt to disassemble or alter the product in any way. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- Do not damage the AC power cable. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- If the product emits unusual noise, odors, or smoke, or if water or other liquids enter the product, immediately turn off the power and disconnect the power cable. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- Read the instruction manual carefully prior to using the product. Failure to do so may result in electric shock, bodily injury, fire, product failure, or damage.
- Always use the supplied AC power cable if included. Using an AC power cable with inappropriate ratings may result in electric shock, bodily injury, fire, product failure, or damage.
- If an AC power cable is not included, please prepare a cable matching the specifications listed in section 9.2 "Specifications" of Instruction Manual. Using an AC power cable with inappropriate ratings may result in electric shock, bodily injury, fire, product failure, or damage.
- Prior to turning on the power, be sure to ground the product by connecting it to a grounded outlet. Insufficient grounding may result in electric shock, bodily injury, fire, product failure, or damage.

Caution

Operating precautions

- Avoid using the product near bodies of salt water or other locations susceptible to salt damage. Otherwise, it may result in product failure or damage caused by salt.
- Due to the internal power supply, certain sections of the product may experience an elevation in temperature that may cause a burn or bodily injury.
- Do not use the product outside its specifications. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- Do not use the product if it is defective, damaged, or burnt out. Otherwise, it may result in electric shock, bodily injury, or fire.
- When not using the product, turn off the power and unplug the AC power cable. Failure to do so may result in electric shock, bodily injury, fire, product failure, or damage.

Transportation

- Excess stacking may cause the load to collapse so follow the directions written on the outside box. Failure to do so may result in bodily injury or damage.
- Handle the product with care during transportation, as it is dangerous if dropped. Failure to do so may result in bodily injury.
- The product is heavy so handle with care. Failure to do so may result in bodily injury.

Handling

- Do not apply excessive stress or place heavy objects on the product. Otherwise, it may result in electric shock, bodily injury, product failure, or damage.
- Transport the product using the carrying handle. Failure to do so may result in bodily injury, product failure, or damage.
- Do not drop the product or subject it to excessive shock of any kind. Otherwise, it may result in product failure or damage.
- If the connection duct or tripod is attached to the main unit, make sure it does not tip over or drop while moving. Otherwise, it may result in bodily injury, product failure, or damage.
- Only use the product as specified in this instruction manual. Failure to do so may result in product failure or damage.
- Make sure that the intake and exhaust vents are free of debris and foreign matter. Otherwise, it may result in bodily injury, product failure, or damage.
- Mount the product on incombustible material below 60°C. Failure to do so may result in fire, product failure, or damage.

Connecting the AC power cable

- Connect the AC power cable as instructed by the instruction manual. Failure to do so may result in electric shock, bodily injury, fire, product failure, or damage.

Operation

- Operate the product within the specified input-power voltage to maintain stability. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- The auxiliary fan rotates during operation. Make sure that the intake and exhaust vents are free of debris and foreign matter.
- Keep hands away from the exhaust vent. Failure to do so may result in bodily injury, fire, product failure, or damage.

Maintenance and inspection

- Some parts of the product (fan motor, gasket, electrolytic condenser, sensor, LED, switches) can deteriorate with long-term use. As preventive maintenance, perform periodic maintenance and inspection to maintain measuring accuracy. For details on maintenance, inspection, and repair, please contact SANYO DENKI. Disassembly is not to be performed by the end-user. Disassembly may result in electric shock, bodily injury, fire, malfunction, product failure, or damage.

Prohibited

Handling

- Do not scratch the connection duct with sharp objects as it may tear or damage the material.

Operation

- Applying voltage outside the input voltage range may result in electric shock, bodily injury, fire, product failure, or damage. Never use voltages outside of specification.
- Keep the USB serial adapter away from static electricity and high voltage. Failure to do so may result in failure or damage.
- Do not use a polarized grounding adapter with the product. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.

Storage

- Do not store the product where it could be exposed to rain, water, toxic gases, or other liquids. Failure to do so may result in product failure or damage.

Maintenance and inspection

- Do not perform disassembly, inspection, or repairs. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- Do not measure the insulation resistance or the pressure resistance. Otherwise, it may result in product failure or damage.
- Never unplug the AC power cable while the power is on as the resulting surge voltage may damage electronic components. Otherwise, it may result in electric shock, bodily injury, or fire.
- Do not remove the nameplate attached to the product. Doing so voids the warranty.
- Do not wipe the product with benzene, paint thinner, or other solvents. Otherwise, it may result in deformation, deterioration, discoloration, product failure, or damage.

Mandatory

Operation

- In the case of any irregular operation, stop the device immediately. Otherwise, it may result in electric shock, bodily injury, fire, product failure, or damage.
- As a provisional measure, ensure that the power can be turned off at any time. Inability to turn off the power may result in electric shock, bodily injury, fire, product failure, or damage.
- If an error occurs, eliminate the cause and ensure safety before resuming.
- Use the product within the specified temperature and humidity range. Failure to do so may result in product failure or damage.
Temperature: 0 to 40°C / Humidity 20 to 85% RH (non-condensing)
- Be sure to use the supplied AC power cable to prevent electric shock, bodily injury, fire, product failure, or damage.
- Be sure to prepare a cable matching the ratings listed in section 9.2 "Specifications" of Instruction Manual to prevent electric shock, bodily injury, fire, product failure, or damage.
- Prior to turning on the power, be sure to ground the product by connecting it to a grounded outlet to prevent electric shock, bodily injury, fire, product failure, or damage.

Storage

- Store the product in a location that is not exposed to direct sunlight, at a temperature and humidity within specifications. Failure to do so may result in product failure.
- If the product has been stored for a long period, contact SANYO DENKI. There is the possibility that components may have deteriorated and require maintenance.

Disposal

- When disposing of the product, treat it as industrial waste.

Model Index in Ascending Order - DC Fans

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|--------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| 109BC12FC7-1 | ➤ 109BC12FA7-1 | ➤ 109BC12FC7-1 | ➤ 109BC12FD7-1 | — | 52 × 15 mm | — | 472 |
| 109BC12GC7-1 | ➤ 109BC12GA7-1 | ➤ 109BC12GC7-1 | ➤ 109BC12GD7-1 | — | 52 × 15 mm | — | 472 |
| 109BC12HC7-1 | ➤ 109BC12HA7-1 | ➤ 109BC12HC7-1 | ➤ 109BC12HD7-1 | — | 52 × 15 mm | — | 472 |
| 109BC12MC7-1 | ➤ 109BC12MA7-1 | ➤ 109BC12MC7-1 | ➤ 109BC12MD7-1 | — | 52 × 15 mm | — | 472 |
| 109BC24FC7-1 | ➤ 109BC24FA7-1 | ➤ 109BC24FC7-1 | ➤ 109BC24FD7-1 | — | 52 × 15 mm | — | 472 |
| 109BC24GC7-1 | ➤ 109BC24GA7-1 | ➤ 109BC24GC7-1 | ➤ 109BC24GD7-1 | — | 52 × 15 mm | — | 472 |
| 109BC24HC7-1 | ➤ 109BC24HA7-1 | ➤ 109BC24HC7-1 | ➤ 109BC24HD7-1 | — | 52 × 15 mm | — | 472 |
| 109BD12FC2 | ➤ 109BD12FA2 | ➤ 109BD12FC2 | ➤ 109BD12FD2 | — | 76 × 30 mm | — | 476 |
| 109BD12HC2 | ➤ 109BD12HA2 | ➤ 109BD12HC2 | ➤ 109BD12HD2 | 109BD12P2H01 | 76 × 30 mm | — | 476 |
| 109BD12MC2 | ➤ 109BD12MA2 | ➤ 109BD12MC2 | 109BD12MD2 | — | 76 × 30 mm | — | 476 |
| 109BD24FC2 | ➤ 109BD24FA2 | ➤ 109BD24FC2 | 109BD24FD2 | — | 76 × 30 mm | — | 476 |
| 109BD24HC2 | ➤ 109BD24HA2 | ➤ 109BD24HC2 | ➤ 109BD24HD2 | — | 76 × 30 mm | — | 476 |
| 109BD24MC2 | ➤ 109BD24MA2 | ➤ 109BD24MC2 | ➤ 109BD24MD2 | — | 76 × 30 mm | — | 476 |
| 109BG12HC1 | ➤ 109BG12HA1 | ➤ 109BG12HC1 | ➤ 109BG12HD1 | — | 160 × 40 mm | — | 492 |
| 109BG12MC1 | ➤ 109BG12MA1 | ➤ 109BG12MC1 | 109BG12MD1 | — | 160 × 40 mm | — | 492 |
| 109BG24HC1 | ➤ 109BG24HA1 | ➤ 109BG24HC1 | ➤ 109BG24HD1 | — | 160 × 40 mm | — | 492 |
| 109BG24MC1 | 109BG24MA1 | ➤ 109BG24MC1 | 109BG24MD1 | — | 160 × 40 mm | — | 492 |
| 109BJ12HC2 | ➤ 109BJ12HA2 | ➤ 109BJ12HC2 | 109BJ12HD2 | — | 127 × 32 mm | — | 490 |
| 109BJ12MC2 | ➤ 109BJ12MA2 | ➤ 109BJ12MC2 | 109BJ12MD2 | — | 127 × 32 mm | — | 490 |
| 109BJ24HC2 | 109BJ24HA2 | ➤ 109BJ24HC2 | ➤ 109BJ24HD2 | — | 127 × 32 mm | — | 490 |
| 109BJ24MC2 | ➤ 109BJ24MA2 | 109BJ24MC2 | 109BJ24MD2 | — | 127 × 32 mm | — | 490 |
| 109BM12GC2-1 | 109BM12GA2-1 | 109BM12GC2-1 | 109BM12GD2-1 | — | 97 × 33 mm | — | 486 |
| 109BM12HC2-1 | 109BM12HA2-1 | 109BM12HC2-1 | 109BM12HD2-1 | — | 97 × 33 mm | — | 486 |
| 109BM12MC2-1 | 109BM12MA2-1 | 109BM12MC2-1 | 109BM12MD2-1 | 109BM12P2M01 | 97 × 33 mm | — | 486 |
| 109BM24GC2-1 | 109BM24GA2-1 | 109BM24GC2-1 | 109BM24GD2-1 | — | 97 × 33 mm | — | 486 |
| 109BM24HC2-1 | 109BM24HA2-1 | 109BM24HC2-1 | 109BM24HD2-1 | — | 97 × 33 mm | — | 486 |
| 109BM24MC2-1 | 109BM24MA2-1 | 109BM24MC2-1 | 109BM24MD2-1 | — | 97 × 33 mm | — | 486 |
| 109E1312A101 | 109E1312A102 | 109E1312A101 | 109E1312A1D01 | — | 127 × 127 × 38 mm | No | 177 |
| 109E1312S101 | 109E1312S102 | 109E1312S101 | 109E1312S1D01 | — | 127 × 127 × 38 mm | No | 177 |
| 109E1324A101 | 109E1324A102 | 109E1324A101 | 109E1324A1D01 | — | 127 × 127 × 38 mm | No | 177 |
| 109E1324G101 | 109E1324G102 | 109E1324G101 | 109E1324G1D01 | — | 127 × 127 × 38 mm | No | 177 |
| 109E1324S101 | 109E1324S102 | 109E1324S101 | 109E1324S1D01 | — | 127 × 127 × 38 mm | No | 177 |
| 109E1348A101 | 109E1348A102 | 109E1348A101 | 109E1348A1D01 | — | 127 × 127 × 38 mm | No | 177 |
| 109E1348G101 | 109E1348G102 | 109E1348G101 | 109E1348G1D01 | — | 127 × 127 × 38 mm | No | 177 |
| 109E1348S101 | 109E1348S102 | 109E1348S101 | 109E1348S1D01 | — | 127 × 127 × 38 mm | No | 177 |
| 109E1712F501 | 109E1712F502 | 109E1712F501 | 109E1712F5D01 | — | ∅172 × 51 mm | No | 201 |
| 109E1712H501 | ➤ 109E1712H502 | ➤ 109E1712H501 | 109E1712H5D01 | — | ∅172 × 51 mm | No | 201 |
| 109E1712K501 | 109E1712K502 | ➤ 109E1712K501 | — | — | ∅172 × 51 mm | No | 201 |
| 109E1712M501 | 109E1712M502 | ➤ 109E1712M501 | — | — | ∅172 × 51 mm | No | 201 |
| 109E1712Y501 | 109E1712Y502 | 109E1712Y501 | — | — | ∅172 × 51 mm | No | 201 |
| 109E1724C501 | 109E1724C502 | ➤ 109E1724C501 | 109E1724C5D01 | 9EH1724P5C01 | ∅172 × 51 mm | No | 201 |
| 109E1724F501 | 109E1724F502 | 109E1724F501 | 109E1724F5D01 | — | ∅172 × 51 mm | No | 201 |
| 109E1724H501 | ➤ 109E1724H502 | ➤ 109E1724H501 | ➤ 109E1724H5D01 | — | ∅172 × 51 mm | No | 201 |
| 109E1724K501 | ➤ 109E1724K502 | ➤ 109E1724K501 | ➤ 109E1724K5D01 | — | ∅172 × 51 mm | No | 201 |
| 109E1724M501 | ➤ 109E1724M502 | ➤ 109E1724M501 | 109E1724M5D01 | — | ∅172 × 51 mm | No | 201 |
| 109E1748C501 | 109E1748C502 | ➤ 109E1748C501 | — | — | ∅172 × 51 mm | No | 201 |
| 109E1748F501 | 109E1748F502 | 109E1748F501 | — | — | ∅172 × 51 mm | No | 201 |
| 109E1748H501 | 109E1748H502 | ➤ 109E1748H501 | 109E1748H5D01 | — | ∅172 × 51 mm | No | 201 |
| 109E1748K501 | 109E1748K502 | 109E1748K501 | — | 109E1748P5K03 | ∅172 × 51 mm | No | 201 |
| 109E1748M501 | 109E1748M502 | 109E1748M501 | — | — | ∅172 × 51 mm | No | 201 |
| 109E4712L401 | 109E4712L402 | 109E4712L401 | 109E4712L4D01 | — | ∅172 × 147 × 25 mm | No | 190 |
| 109E4712M401 | 109E4712M402 | 109E4712M401 | 109E4712M4D01 | — | ∅172 × 147 × 25 mm | No | 190 |
| 109E4724F401 | 109E4724F402 | 109E4724F401 | 109E4724F4D01 | — | ∅172 × 147 × 25 mm | No | 190 |
| 109E4724H401 | 109E4724H402 | 109E4724H401 | 109E4724H4D01 | 109E4724P4H01 | ∅172 × 147 × 25 mm | No | 190 |
| 109E4724L401 | 109E4724L402 | 109E4724L401 | 109E4724L4D01 | — | ∅172 × 147 × 25 mm | No | 190 |
| 109E4724M401 | 109E4724M402 | 109E4724M401 | 109E4724M4D01 | — | ∅172 × 147 × 25 mm | No | 190 |
| 109E4748F401 | 109E4748F402 | 109E4748F401 | 109E4748F4D01 | — | ∅172 × 147 × 25 mm | No | 190 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The ➤ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|--------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 109E4748H401 | 109E4748H402 | 109E4748H401 | 109E4748H4D01 | | | |
| 109E4748L401 | 109E4748L402 | 109E4748L401 | 109E4748L4D01 | — | ∅172 × 147 × 25 mm | No | 190 |
| 109E4748M401 | 109E4748M402 | 109E4748M401 | 109E4748M4D01 | — | ∅172 × 147 × 25 mm | No | 190 |
| 109E4748S401 | 109E4748S402 | 109E4748S401 | 109E4748S4D01 | — | ∅172 × 147 × 25 mm | No | 190 |
| 109E5712F501 | 109E5712F502 | 109E5712F501 | — | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5712H501 | 👉 109E5712H502 | 👉 109E5712H501 | 109E5712H5D01 | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5712K501 | 109E5712K502 | 👉 109E5712K501 | 109E5712K5D01 | 109E5712P5K04 | ∅172 × 150 × 51 mm | No | 198 |
| 109E5712M501 | 109E5712M502 | 109E5712M501 | 109E5712M5D01 | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5712Y501 | 109E5712Y502 | 109E5712Y501 | — | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5724C501 | 👉 109E5724C502 | 👉 109E5724C501 | 👉 109E5724C5D01 | 9EH5724P5C01 | ∅172 × 150 × 51 mm | No | 198 |
| 109E5724F501 | 109E5724F502 | 109E5724F501 | — | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5724H501 | 👉 109E5724H502 | 👉 109E5724H501 | 👉 109E5724H5D01 | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5724K501 | 👉 109E5724K502 | 👉 109E5724K501 | 109E5724K5D01 | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5724M501 | 👉 109E5724M502 | 👉 109E5724M501 | — | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5748C501 | 109E5748C502 | 109E5748C501 | — | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5748F501 | 109E5748F502 | 109E5748F501 | — | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5748H501 | 109E5748H502 | 👉 109E5748H501 | 109E5748H5D01 | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5748K501 | 👉 109E5748K502 | 👉 109E5748K501 | — | — | ∅172 × 150 × 51 mm | No | 198 |
| 109E5748M501 | 109E5748M502 | 109E5748M501 | — | — | ∅172 × 150 × 51 mm | No | 198 |
| 109L1712H501 | 109L1712H502 | 109L1712H501 | 109L1712H5D01 | — | ∅172 × 51 mm | No | 420 |
| 109L1712M501 | 109L1712M502 | 109L1712M501 | 109L1712M5D01 | — | ∅172 × 51 mm | No | 420 |
| 109L1724H501 | 109L1724H502 | 109L1724H501 | 109L1724H5D01 | — | ∅172 × 51 mm | No | 420 |
| 109L1724M501 | 109L1724M502 | 109L1724M501 | 109L1724M5D01 | — | ∅172 × 51 mm | No | 420 |
| 109L1748H501 | 109L1748H502 | 109L1748H501 | 109L1748H5D01 | — | ∅172 × 51 mm | No | 420 |
| 109L1748M501 | 109L1748M502 | 109L1748M501 | 109L1748M5D01 | — | ∅172 × 51 mm | No | 420 |
| 109L5712H501 | 109L5712H502 | 109L5712H501 | 109L5712H5D01 | — | ∅172 × 150 × 51 mm | No | 418 |
| 109L5712M501 | 109L5712M502 | 109L5712M501 | 109L5712M5D01 | — | ∅172 × 150 × 51 mm | No | 418 |
| 109L5724H501 | 109L5724H502 | 109L5724H501 | 109L5724H5D01 | — | ∅172 × 150 × 51 mm | No | 418 |
| 109L5724M501 | 109L5724M502 | 109L5724M501 | 109L5724M5D01 | — | ∅172 × 150 × 51 mm | No | 418 |
| 109L5748H501 | 109L5748H502 | 109L5748H501 | 109L5748H5D01 | — | ∅172 × 150 × 51 mm | No | 418 |
| 109L5748M501 | 109L5748M502 | 109L5748M501 | 109L5748M5D01 | — | ∅172 × 150 × 51 mm | No | 418 |
| 109P0405F3013 | 👉 109P0405F3023 | 👉 109P0405F3013 | 👉 109P0405F3D013 | — | 40 × 40 × 28 mm | Yes | 47 |
| 109P0405F601 | 👉 109P0405F602 | 👉 109P0405F601 | 👉 109P0405F6D01 | — | 40 × 40 × 20 mm | Yes | 31 |
| 109P0405H3013 | 👉 109P0405H3023 | 👉 109P0405H3013 | 👉 109P0405H3D013 | — | 40 × 40 × 28 mm | Yes | 47 |
| 109P0405H701 | 👉 109P0405H702 | 👉 109P0405H701 | 👉 109P0405H7D01 | — | 40 × 40 × 15 mm | Yes | 25 |
| 109P0405H901 | 👉 109P0405H902 | 👉 109P0405H901 | 👉 109P0405H9D01 | — | 40 × 40 × 10 mm | Yes | 21 |
| 109P0405M601 | 👉 109P0405M602 | 👉 109P0405M601 | 👉 109P0405M6D01 | — | 40 × 40 × 20 mm | Yes | 31 |
| 109P0405M701 | 👉 109P0405M702 | 👉 109P0405M701 | 👉 109P0405M7D01 | — | 40 × 40 × 15 mm | Yes | 25 |
| 109P0405M901 | 👉 109P0405M902 | 👉 109P0405M901 | 👉 109P0405M9D01 | — | 40 × 40 × 10 mm | Yes | 21 |
| 109P0412B3013 | 👉 109P0412B3023 | 👉 109P0412B3013 | 👉 109P0412B3D013 | — | 40 × 40 × 28 mm | Yes | 47 |
| 109P0412F3013 | 👉 109P0412F3023 | 👉 109P0412F3013 | 👉 109P0412F3D013 | — | 40 × 40 × 28 mm | Yes | 47 |
| 109P0412F601 | 👉 109P0412F602 | 👉 109P0412F601 | 👉 109P0412F6D01 | — | 40 × 40 × 20 mm | Yes | 31 |
| 109P0412G3013 | 👉 109P0412G3023 | 👉 109P0412G3013 | 👉 109P0412G3D013 | — | 40 × 40 × 28 mm | Yes | 47 |
| 109P0412H3013 | 👉 109P0412H3023 | 👉 109P0412H3013 | 👉 109P0412H3D013 | — | 40 × 40 × 28 mm | Yes | 47 |
| 109P0412H701 | 👉 109P0412H702 | 👉 109P0412H701 | 👉 109P0412H7D01 | — | 40 × 40 × 15 mm | Yes | 25 |
| 109P0412H901 | 👉 109P0412H902 | 👉 109P0412H901 | 👉 109P0412H9D01 | 109P0412P9H01 | 40 × 40 × 10 mm | Yes | 21 |
| 109P0412M3013 | 👉 109P0412M3023 | 👉 109P0412M3013 | 👉 109P0412M3D013 | — | 40 × 40 × 28 mm | Yes | 47 |
| 109P0412M601 | 👉 109P0412M602 | 👉 109P0412M601 | 👉 109P0412M6D01 | — | 40 × 40 × 20 mm | Yes | 31 |
| 109P0412M701 | 👉 109P0412M702 | 👉 109P0412M701 | 👉 109P0412M7D01 | — | 40 × 40 × 15 mm | Yes | 25 |
| 109P0412M901 | 👉 109P0412M902 | 👉 109P0412M901 | 👉 109P0412M9D01 | — | 40 × 40 × 10 mm | Yes | 21 |
| 109P0424B3013 | 👉 109P0424B3023 | 👉 109P0424B3013 | 👉 109P0424B3D013 | — | 40 × 40 × 28 mm | Yes | 47 |
| 109P0424B601 | 👉 109P0424B602 | 👉 109P0424B601 | 👉 109P0424B6D01 | — | 40 × 40 × 20 mm | Yes | 31 |
| 109P0424F3013 | 👉 109P0424F3023 | 👉 109P0424F3013 | 👉 109P0424F3D013 | — | 40 × 40 × 28 mm | Yes | 47 |
| 109P0424F601 | 👉 109P0424F602 | 👉 109P0424F601 | 👉 109P0424F6D01 | — | 40 × 40 × 20 mm | Yes | 31 |
| 109P0424G3013 | 👉 109P0424G3023 | 👉 109P0424G3013 | 👉 109P0424G3D013 | — | 40 × 40 × 28 mm | Yes | 47 |
| 109P0424H3013 | 👉 109P0424H3023 | 👉 109P0424H3013 | 👉 109P0424H3D013 | — | 40 × 40 × 28 mm | Yes | 47 |
| 109P0424H901 | 109P0424H902 | 109P0424H901 | 109P0424H9D01 | — | 40 × 40 × 10 mm | Yes | 21 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The 👉 mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "-" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|---------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| 109P0424H701 | ➤ 109P0424H702 | ➤ 109P0424H701 | ➤ 109P0424H7D01 | — | 40 × 40 × 15 mm | Yes | 25 |
| 109P0505M701 | ➤ 109P0505M702 | ➤ 109P0505M701 | ➤ 109P0505M7D01 | — | 52 × 52 × 15 mm | Yes | 54 |
| 109P0848C601 | 109P0848C602 | 109P0848C601 | 109P0848C6D01 | — | 80 × 80 × 20 mm | Yes | 94 |
| 109P0848H601 | — | 109P0848H601 | 109P0848H6D01 | — | 80 × 80 × 20 mm | Yes | 94 |
| 9B1TP24P0H001 | — | — | — | 9B1TP24P0H001 | 270 × 270 × 99 mm | — | 465 |
| 9B1TP48P0G001 | — | — | — | 9B1TP48P0G001 | 270 × 270 × 99 mm | — | 465 |
| 9B1TP48P0H001 | — | — | — | 9B1TP48P0H001 | 270 × 270 × 99 mm | — | 465 |
| 9B1TS48P0G001 | — | — | — | 9B1TS48P0G001 | 270 × 270 × 119 mm | — | 468 |
| 9B1TS48P0H001 | — | — | — | 9B1TS48P0H001 | 270 × 270 × 119 mm | — | 468 |
| 9B1W2TP24P0H001 | — | — | — | 9B1W2TP24P0H001 | 270 × 270 × 99 mm | — | 343 |
| 9B1W2TP48P0S001 | — | — | — | 9B1W2TP48P0S001 | 270 × 270 × 99 mm | — | 343 |
| 9B1W2TS48P0S001 | — | — | — | 9B1W2TS48P0S001 | 270 × 270 × 119 mm | — | 346 |
| 9BD12FC6-1 | ➤ 9BD12FA6-1 | ➤ 9BD12FC6-1 | ➤ 9BD12FD6-1 | — | 76 × 20 mm | — | 474 |
| 9BD12HC6-1 | ➤ 9BD12HA6-1 | ➤ 9BD12HC6-1 | ➤ 9BD12HD6-1 | — | 76 × 20 mm | — | 474 |
| 9BD12SC6-1 | ➤ 9BD12SA6-1 | ➤ 9BD12SC6-1 | ➤ 9BD12SD6-1 | 9BD12P6S01 | 76 × 20 mm | — | 474 |
| 9BD24FC6-1 | ➤ 9BD24FA6-1 | ➤ 9BD24FC6-1 | ➤ 9BD24FD6-1 | — | 76 × 20 mm | — | 474 |
| 9BD24HC6-1 | ➤ 9BD24HA6-1 | ➤ 9BD24HC6-1 | ➤ 9BD24HD6-1 | — | 76 × 20 mm | — | 474 |
| 9BD24SC6-40 | 9BD24SA6-40 | 9BD24SC6-40 | 9BD24SD6-40 | 9BD24P6S06 | 76 × 20 mm | — | 474 |
| 9BFB12P2H003 | — | — | — | ➤ 9BFB12P2H003 | 120 × 32 mm | — | 488 |
| 9BFB24P2H003 | 9BFB24H2002 | — | 9BFB24H2D001 | ➤ 9BFB24P2H003 | 120 × 32 mm | — | 488 |
| 9BMB12F201 | 9BMB12F202 | ➤ 9BMB12F201 | 9BMB12F2D01 | ➤ 9BMB12P2F01 | 97 × 33 mm | — | 480 |
| 9BMB12G201 | 9BMB12G202 | ➤ 9BMB12G201 | 9BMB12G2D01 | ➤ 9BMB12P2G01 | 97 × 33 mm | — | 480 |
| 9BMB12H201 | ➤ 9BMB12H202 | ➤ 9BMB12H201 | ➤ 9BMB12H2D01 | ➤ 9BMB12P2H01 | 97 × 33 mm | — | 480 |
| 9BMB12K201 | ➤ 9BMB12K202 | ➤ 9BMB12K201 | — | ➤ 9BMB12P2K01 | 97 × 33 mm | — | 480 |
| 9BMB12P2F01 | 9BMB12F202 | ➤ 9BMB12F201 | 9BMB12F2D01 | ➤ 9BMB12P2F01 | 97 × 33 mm | — | 480 |
| 9BMB12P2G01 | 9BMB12G202 | ➤ 9BMB12G201 | 9BMB12G2D01 | ➤ 9BMB12P2G01 | 97 × 33 mm | — | 480 |
| 9BMB12P2H01 | ➤ 9BMB12H202 | ➤ 9BMB12H201 | ➤ 9BMB12H2D01 | ➤ 9BMB12P2H01 | 97 × 33 mm | — | 480 |
| 9BMB12P2K01 | ➤ 9BMB12K202 | ➤ 9BMB12K201 | — | ➤ 9BMB12P2K01 | 97 × 33 mm | — | 480 |
| 9BMB12P2S01 | 9BMB12S202 | ➤ 9BMB12S201 | — | 9BMB12P2S01 | 97 × 33 mm | — | 480 |
| 9BMB12S201 | 9BMB12S202 | ➤ 9BMB12S201 | — | 9BMB12P2S01 | 97 × 33 mm | — | 480 |
| 9BMB24F201 | 9BMB24F202 | ➤ 9BMB24F201 | 9BMB24F2D01 | ➤ 9BMB24P2F01 | 97 × 33 mm | — | 480 |
| 9BMB24G201 | ➤ 9BMB24G202 | ➤ 9BMB24G201 | ➤ 9BMB24G2D01 | ➤ 9BMB24P2G01 | 97 × 33 mm | — | 480 |
| 9BMB24H201 | ➤ 9BMB24H202 | ➤ 9BMB24H201 | ➤ 9BMB24H2D01 | ➤ 9BMB24P2H01 | 97 × 33 mm | — | 480 |
| 9BMB24K201 | 9BMB24K202 | 9BMB24K201 | 9BMB24K2D01 | ➤ 9BMB24P2K01 | 97 × 33 mm | — | 480 |
| 9BMB24P2F01 | 9BMB24F202 | ➤ 9BMB24F201 | 9BMB24F2D01 | ➤ 9BMB24P2F01 | 97 × 33 mm | — | 480 |
| 9BMB24P2G01 | ➤ 9BMB24G202 | ➤ 9BMB24G201 | ➤ 9BMB24G2D01 | ➤ 9BMB24P2G01 | 97 × 33 mm | — | 480 |
| 9BMB24P2H01 | ➤ 9BMB24H202 | ➤ 9BMB24H201 | ➤ 9BMB24H2D01 | ➤ 9BMB24P2H01 | 97 × 33 mm | — | 480 |
| 9BMB24P2K01 | 9BMB24K202 | 9BMB24K201 | 9BMB24K2D01 | ➤ 9BMB24P2K01 | 97 × 33 mm | — | 480 |
| 9BMB24P2S01 | 9BMB24S202 | ➤ 9BMB24S201 | — | 9BMB24P2S01 | 97 × 33 mm | — | 480 |
| 9BMB24S201 | 9BMB24S202 | ➤ 9BMB24S201 | — | 9BMB24P2S01 | 97 × 33 mm | — | 480 |
| 9BMC12P2G001 | 9BMC12G2002 | — | — | ➤ 9BMC12P2G001 | 97 × 33 mm | — | 478 |
| 9BMC24P2G001 | — | — | — | ➤ 9BMC24P2G001 | 97 × 33 mm | — | 478 |
| 9CR0612P5G03 | 9CR0612G502 | 9CR0612G501 | — | 9CR0612P5G03 | 60 × 60 × 51 mm | — | 224 |
| 9CR0612P5H03 | — | 9CR0612H501 | — | 9CR0612P5H03 | 60 × 60 × 51 mm | — | 224 |
| 9CR1212P0G03 | 9CR1212G002 | 9CR1212G001 | — | 9CR1212P0G03 | 120 × 120 × 76 mm | — | 242 |
| 9CR5748P9G001 | — | — | — | ➤ 9CR5748P9G001 | ∅172 × 150 × 102 mm | — | 244 |
| 9CRA0312P4J03 | 9CRA0312K402 | 9CRA0312J401 | — | 9CRA0312P4J03 | 38 × 38 × 48 mm | — | 210 |
| 9CRA0312P4K03 | 9CRA0312K402 | — | — | 9CRA0312P4K03 | 38 × 38 × 48 mm | — | 210 |
| 9CRA0412P4G03 | 9CRA0412G402 | — | — | 9CRA0412P4G03 | 40 × 40 × 48 mm | — | 212 |
| 9CRA0412P4J03 | 9CRA0412J402 | 9CRA0412J401 | — | 9CRA0412P4J03 | 40 × 40 × 48 mm | — | 212 |
| 9CRA0412P4K03 | 9CRA0412K402 | 9CRA0412K401 | — | 9CRA0412P4K03 | 40 × 40 × 48 mm | — | 212 |
| 9CRA0612P0G001 | — | — | — | ➤ 9CRA0612P0G001 | 60 × 60 × 76 mm | — | 231 |
| 9CRA0612P0S001 | — | — | — | ➤ 9CRA0612P0S001 | 60 × 60 × 76 mm | — | 231 |
| 9CRA0612P6G001 | — | — | — | ➤ 9CRA0612P6G001 | 60 × 60 × 56 mm | — | 226 |
| 9CRA0612P6J001 | — | — | — | ➤ 9CRA0612P6J001 | 60 × 60 × 56 mm | — | 226 |
| 9CRA0612P6K001 | — | — | — | ➤ 9CRA0612P6K001 | 60 × 60 × 56 mm | — | 226 |
| 9CRA0812P8G001 | — | 9CRA0812G8001 | — | ➤ 9CRA0812P8G001 | 80 × 80 × 80 mm | — | 237 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.
 Note 2: The ➤ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|-----------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9CRA0812P8H001 | — | 9CRA0812H8001 | — | | | |
| 9CRA0824P8G001 | — | — | 9CRA0824G8D001 | 9CRA0824P8G001 | 80 × 80 × 80 mm | — | 237 |
| 9CRA0848P8G001 | — | — | — | ☛ 9CRA0848P8G001 | 80 × 80 × 80 mm | — | 237 |
| 9CRA0912P0G001 | — | — | — | ☛ 9CRA0912P0G001 | 92 × 92 × 76 mm | — | 240 |
| 9CRA0948P0G601 | — | — | — | ☛ 9CRA0948P0G601 | 92 × 92 × 76 mm | — | 240 |
| 9CRB0812P8G001 | — | — | — | ☛ 9CRB0812P8G001 | 80 × 80 × 80 mm | — | 233 |
| 9CRE0412P5J03 | 9CRE0412J502 | — | — | 9CRE0412P5J03 | 40 × 40 × 56 mm | — | 222 |
| 9CRE0612P0G001 | — | — | — | 9CRE0612P0G001 | 60 × 60 × 76 mm | — | 229 |
| 9CRE0812P8G001 | — | — | — | 9CRE0812P8G001 | 80 × 80 × 80 mm | — | 235 |
| 9CRH0412P5J001 | — | — | — | ☛ 9CRH0412P5J001 | 40 × 40 × 56 mm | — | 217 |
| 9CRJ0412P5J001 | — | — | — | ☛ 9CRJ0412P5J001 | 40 × 40 × 56 mm | — | 215 |
| 9CRL0812P8G001 | — | — | — | ☛ 9CRL0812P8G001 | 80 × 80 × 80 mm | No | 390 |
| 9CRLA0612P0G001 | — | — | — | ☛ 9CRLA0612P0G001 | 60 × 60 × 76 mm | No | 383 |
| 9CRV0412P5G201 | — | — | — | 9CRV0412P5G201 | 40 × 40 × 56 mm | — | 219 |
| 9CRV0412P5H201 | — | — | — | 9CRV0412P5H201 | 40 × 40 × 56 mm | — | 219 |
| 9CRV0412P5J201 | — | — | — | ☛ 9CRV0412P5J201 | 40 × 40 × 56 mm | — | 219 |
| 9CRV0412P5S201 | — | — | — | 9CRV0412P5S201 | 40 × 40 × 56 mm | — | 219 |
| 9EC2024H001 | 9EC2024H002 | 9EC2024H001 | — | — | ∅200 × 70 mm | No | 206 |
| 9EC2048A001 | 9EC2048A002 | 9EC2048A001 | 9EC2048A0D01 | 9EC2048P0A01 | ∅200 × 70 mm | No | 206 |
| 9EC2048H001 | 9EC2048H002 | 9EC2048H001 | — | — | ∅200 × 70 mm | No | 206 |
| 9G0612P4H001 | 9G0612H4002 | — | ☛ 9G0612H4D001 | ☛ 9G0612P4H001 | 60 × 60 × 25 mm | Yes | 66 |
| 9G0612P4H0011 | 9G0612H40021 | 9G0612H40011 | 9G0612H4D0011 | ☛ 9G0612P4H0011 | 60 × 60 × 25 mm | No | 66 |
| 9G0612P4S001 | 9G0612S4002 | 9G0612S4001 | — | ☛ 9G0612P4S001 | 60 × 60 × 25 mm | Yes | 66 |
| 9G0612P4S0011 | 9G0612S40021 | — | — | ☛ 9G0612P4S0011 | 60 × 60 × 25 mm | No | 66 |
| 9G0624P4H001 | ☛ 9G0624H4002 | ☛ 9G0624H4001 | 9G0624H4D001 | ☛ 9G0624P4H001 | 60 × 60 × 25 mm | Yes | 66 |
| 9G0624P4H0011 | 9G0624H40021 | — | — | ☛ 9G0624P4H0011 | 60 × 60 × 25 mm | No | 66 |
| 9G0624P4S001 | ☛ 9G0624S4002 | — | 9G0624S4D001 | ☛ 9G0624P4S001 | 60 × 60 × 25 mm | Yes | 66 |
| 9G0624P4S0011 | 9G0624S40021 | — | — | ☛ 9G0624P4S0011 | 60 × 60 × 25 mm | No | 66 |
| 9G0648P4S001 | 9G0648S4002 | 9G0648S4001 | — | ☛ 9G0648P4S001 | 60 × 60 × 25 mm | Yes | 66 |
| 9G0648P4S0011 | — | — | — | 9G0648P4S0011 | 60 × 60 × 25 mm | No | 66 |
| 9G0912A201 | ☛ 9G0912A202 | ☛ 9G0912A201 | 9G0912A2D01 | 9G0912P2A01 | 92 × 92 × 32 mm | Yes | 138 |
| 9G0912A2011 | 9G0912A2021 | 9G0912A2011 | 9G0912A2D011 | 9G0912P2A011 | 92 × 92 × 32 mm | No | 138 |
| 9G0912G101 | 9G0912G102 | 9G0912G101 | 9G0912G1D01 | 9G0912P1G03 | 92 × 92 × 38 mm | Yes | 150 |
| 9G0912G1011 | 9G0912G1021 | 9G0912G1011 | — | 9G0912P1G031 | 92 × 92 × 38 mm | No | 150 |
| 9G0912H101 | 9G0912H102 | 9G0912H101 | 9G0912H1D01 | 9G0912P1H05 | 92 × 92 × 38 mm | Yes | 150 |
| 9G0912H1011 | 9G0912H1021 | 9G0912H1011 | 9G0912H1D011 | — | 92 × 92 × 38 mm | No | 150 |
| 9G0912H201 | ☛ 9G0912H202 | ☛ 9G0912H201 | ☛ 9G0912H2D01 | 9G0912P2H01 | 92 × 92 × 32 mm | Yes | 138 |
| 9G0912H2011 | 9G0912H2021 | 9G0912H2011 | ☛ 9G0912H2D011 | — | 92 × 92 × 32 mm | No | 138 |
| 9G0912M201 | 9G0912M202 | ☛ 9G0912M201 | 9G0912M2D01 | — | 92 × 92 × 32 mm | Yes | 138 |
| 9G0912M2011 | 9G0912M2021 | 9G0912M2011 | 9G0912M2D011 | — | 92 × 92 × 32 mm | No | 138 |
| 9G0912S201 | ☛ 9G0912S202 | ☛ 9G0912S201 | 9G0912S2D01 | 9G0912P2S01 | 92 × 92 × 32 mm | Yes | 138 |
| 9G0912S2011 | ☛ 9G0912S2021 | 9G0912S2011 | 9G0912S2D011 | — | 92 × 92 × 32 mm | No | 138 |
| 9G0924A201 | ☛ 9G0924A202 | ☛ 9G0924A201 | ☛ 9G0924A2D01 | — | 92 × 92 × 32 mm | Yes | 138 |
| 9G0924A2011 | 9G0924A2021 | 9G0924A2011 | 9G0924A2D011 | — | 92 × 92 × 32 mm | No | 138 |
| 9G0924G101 | 9G0924G102 | 9G0924G101 | 9G0924G1D01 | — | 92 × 92 × 38 mm | Yes | 150 |
| 9G0924G1011 | 9G0924G1021 | 9G0924G1011 | 9G0924G1D011 | — | 92 × 92 × 38 mm | No | 150 |
| 9G0924H101 | 9G0924H102 | 9G0924H101 | 9G0924H1D01 | — | 92 × 92 × 38 mm | Yes | 150 |
| 9G0924H1011 | 9G0924H1021 | 9G0924H1011 | 9G0924H1D011 | — | 92 × 92 × 38 mm | No | 150 |
| 9G0924H201 | ☛ 9G0924H202 | ☛ 9G0924H201 | ☛ 9G0924H2D01 | — | 92 × 92 × 32 mm | Yes | 138 |
| 9G0924H2011 | 9G0924H2021 | 9G0924H2011 | 9G0924H2D011 | — | 92 × 92 × 32 mm | No | 138 |
| 9G0924M201 | ☛ 9G0924M202 | ☛ 9G0924M201 | 9G0924M2D01 | — | 92 × 92 × 32 mm | Yes | 138 |
| 9G0924M2011 | 9G0924M2021 | 9G0924M2011 | 9G0924M2D011 | — | 92 × 92 × 32 mm | No | 138 |
| 9G0924S201 | ☛ 9G0924S202 | ☛ 9G0924S201 | ☛ 9G0924S2D01 | — | 92 × 92 × 32 mm | Yes | 138 |
| 9G0924S2011 | 9G0924S2021 | 9G0924S2011 | 9G0924S2D011 | — | 92 × 92 × 32 mm | No | 138 |
| 9G0948A201 | ☛ 9G0948A202 | ☛ 9G0948A201 | 9G0948A2D01 | — | 92 × 92 × 32 mm | Yes | 138 |
| 9G0948A2011 | 9G0948A2021 | 9G0948A2011 | 9G0948A2D011 | — | 92 × 92 × 32 mm | No | 138 |
| 9G0948G101 | 9G0948G102 | 9G0948G101 | 9G0948G1D01 | — | 92 × 92 × 38 mm | Yes | 150 |


Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.
Note 2: The ☛ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|-----------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| 9G0948G1011 | 9G0948G1021 | 9G0948G1011 | — | — | 92 × 92 × 38 mm | No | 150 |
| 9G0948H101 | 9G0948H102 | 9G0948H101 | 9G0948H1D01 | — | 92 × 92 × 38 mm | Yes | 150 |
| 9G0948H1011 | — | 9G0948H1011 | — | — | 92 × 92 × 38 mm | No | 150 |
| 9G0948H201 | 9G0948H202 | 9G0948H201 | 9G0948H2D01 | — | 92 × 92 × 32 mm | Yes | 138 |
| 9G0948H2011 | 9G0948H2021 | 9G0948H2011 | 9G0948H2D011 | — | 92 × 92 × 32 mm | No | 138 |
| 9G0948M201 | 9G0948M202 | 9G0948M201 | 9G0948M2D01 | — | 92 × 92 × 32 mm | Yes | 138 |
| 9G0948M2011 | 9G0948M2021 | 9G0948M2011 | 9G0948M2D011 | — | 92 × 92 × 32 mm | No | 138 |
| 9G0948S201 | 9G0948S202 | 9G0948S201 | 9G0948S2D01 | — | 92 × 92 × 32 mm | Yes | 138 |
| 9G0948S2011 | 9G0948S2021 | 9G0948S2011 | 9G0948S2D011 | — | 92 × 92 × 32 mm | No | 138 |
| 9GA0312E3001 | — | 9GA0312E3001 | — | — | 38 × 38 × 28 mm | Yes | 18 |
| 9GA0312E30011 | — | 9GA0312E30011 | — | — | 38 × 38 × 28 mm | No | 18 |
| 9GA0312H3001 | — | 9GA0312H3001 | — | — | 38 × 38 × 28 mm | Yes | 18 |
| 9GA0312H30011 | — | 9GA0312H30011 | — | — | 38 × 38 × 28 mm | No | 18 |
| 9GA0312P3G001 | — | ☺ 9GA0312G3001 | 9GA0312G3D001 | ☺ 9GA0312P3G001 | 38 × 38 × 28 mm | Yes | 18 |
| 9GA0312P3G0011 | — | — | — | ☺ 9GA0312P3G0011 | 38 × 38 × 28 mm | No | 18 |
| 9GA0312P3J001 | — | 9GA0312J3001 | 9GA0312J3D001 | ☺ 9GA0312P3J001 | 38 × 38 × 28 mm | Yes | 18 |
| 9GA0312P3J0011 | — | — | — | ☺ 9GA0312P3J0011 | 38 × 38 × 28 mm | No | 18 |
| 9GA0312P3K001 | — | ☺ 9GA0312K3001 | 9GA0312K3D001 | ☺ 9GA0312P3K001 | 38 × 38 × 28 mm | Yes | 18 |
| 9GA0312P3K0011 | — | — | 9GA0312K3D0011 | ☺ 9GA0312P3K0011 | 38 × 38 × 28 mm | No | 18 |
| 9GA0405P6F001 | 9GA0405F6002 | 9GA0405F6001 | — | ☺ 9GA0405P6F001 | 40 × 40 × 20 mm | Yes | 27 |
| 9GA0405P6H001 | 9GA0405H6002 | 9GA0405H6001 | — | ☺ 9GA0405P6H001 | 40 × 40 × 20 mm | Yes | 27 |
| 9GA0412A301 | 9GA0412A302 | 9GA0412A301 | 9GA0412A3D01 | — | 40 × 40 × 28 mm | Yes | 40 |
| 9GA0412A3011 | — | 9GA0412A3011 | — | — | 40 × 40 × 28 mm | No | 40 |
| 9GA0412G7001 | ☺ 9GA0412G7002 | ☺ 9GA0412G7001 | ☺ 9GA0412G7D001 | ☺ 9GA0412P7G001 | 40 × 40 × 15 mm | Yes | 23 |
| 9GA0412H7001 | ☺ 9GA0412H7002 | ☺ 9GA0412H7001 | 9GA0412H7D001 | — | 40 × 40 × 15 mm | Yes | 23 |
| 9GA0412P3G01 | 9GA0412G302 | 9GA0412G301 | — | ☺ 9GA0412P3G01 | 40 × 40 × 28 mm | Yes | 40 |
| 9GA0412P3G011 | 9GA0412G3021 | 9GA0412G3011 | — | ☺ 9GA0412P3G011 | 40 × 40 × 28 mm | No | 40 |
| 9GA0412P3H01 | 9GA0412H302 | 9GA0412H301 | 9GA0412H3D01 | ☺ 9GA0412P3H01 | 40 × 40 × 28 mm | Yes | 40 |
| 9GA0412P3H011 | 9GA0412H3021 | 9GA0412H3011 | 9GA0412H3D011 | ☺ 9GA0412P3H011 | 40 × 40 × 28 mm | No | 40 |
| 9GA0412P3J01 | 9GA0412J302 | ☺ 9GA0412J301 | 9GA0412J3D01 | ☺ 9GA0412P3J01 | 40 × 40 × 28 mm | Yes | 40 |
| 9GA0412P3J011 | 9GA0412J3021 | 9GA0412J3011 | — | ☺ 9GA0412P3J011 | 40 × 40 × 28 mm | No | 40 |
| 9GA0412P3M01 | 9GA0412M302 | 9GA0412M301 | 9GA0412M3D01 | ☺ 9GA0412P3M01 | 40 × 40 × 28 mm | Yes | 40 |
| 9GA0412P3M011 | 9GA0412M3021 | 9GA0412M3011 | — | ☺ 9GA0412P3M011 | 40 × 40 × 28 mm | No | 40 |
| 9GA0412P6F001 | 9GA0412F6002 | 9GA0412F6001 | — | ☺ 9GA0412P6F001 | 40 × 40 × 20 mm | Yes | 27 |
| 9GA0412P6G001 | 9GA0412G6002 | 9GA0412G6001 | — | ☺ 9GA0412P6G001 | 40 × 40 × 20 mm | Yes | 27 |
| 9GA0412P6H001 | 9GA0412H6002 | 9GA0412H6001 | — | ☺ 9GA0412P6H001 | 40 × 40 × 20 mm | Yes | 27 |
| 9GA0412P7G001 | ☺ 9GA0412G7002 | ☺ 9GA0412G7001 | ☺ 9GA0412G7D001 | ☺ 9GA0412P7G001 | 40 × 40 × 15 mm | Yes | 23 |
| 9GA0424P3G001 | 9GA0424G3002 | 9GA0424G3001 | 9GA0424G3D001 | ☺ 9GA0424P3G001 | 40 × 40 × 28 mm | Yes | 40 |
| 9GA0424P3G0011 | 9GA0424G30021 | 9GA0424G30011 | — | ☺ 9GA0424P3G0011 | 40 × 40 × 28 mm | No | 40 |
| 9GA0424P3H001 | 9GA0424H3002 | 9GA0424H3001 | ☺ 9GA0424H3D001 | ☺ 9GA0424P3H001 | 40 × 40 × 28 mm | Yes | 40 |
| 9GA0424P3H0011 | 9GA0424H30021 | 9GA0424H30011 | — | ☺ 9GA0424P3H0011 | 40 × 40 × 28 mm | No | 40 |
| 9GA0424P3J001 | ☺ 9GA0424J3002 | 9GA0424J3001 | 9GA0424J3D001 | ☺ 9GA0424P3J001 | 40 × 40 × 28 mm | Yes | 40 |
| 9GA0424P3J0011 | 9GA0424J30021 | 9GA0424J30011 | — | ☺ 9GA0424P3J0011 | 40 × 40 × 28 mm | No | 40 |
| 9GA0424P3M001 | 9GA0424M3002 | 9GA0424M3001 | 9GA0424M3D001 | ☺ 9GA0424P3M001 | 40 × 40 × 28 mm | Yes | 40 |
| 9GA0424P3M0011 | 9GA0424M30021 | 9GA0424M30011 | — | ☺ 9GA0424P3M0011 | 40 × 40 × 28 mm | No | 40 |
| 9GA0424P6F001 | 9GA0424F6002 | 9GA0424F6001 | 9GA0424F6D001 | ☺ 9GA0424P6F001 | 40 × 40 × 20 mm | Yes | 27 |
| 9GA0424P6G001 | 9GA0424G6002 | 9GA0424G6001 | 9GA0424G6D001 | ☺ 9GA0424P6G001 | 40 × 40 × 20 mm | Yes | 27 |
| 9GA0424P6H001 | ☺ 9GA0424H6002 | 9GA0424H6001 | 9GA0424H6D001 | ☺ 9GA0424P6H001 | 40 × 40 × 20 mm | Yes | 27 |
| 9GA0512P7A001 | 9GA0512A7002 | 9GA0512A7001 | — | ☺ 9GA0512P7A001 | 52 × 52 × 15 mm | Yes | 50 |
| 9GA0512P7G001 | 9GA0512G7002 | 9GA0512G7001 | — | ☺ 9GA0512P7G001 | 52 × 52 × 15 mm | Yes | 50 |
| 9GA0512P7H001 | 9GA0512H7002 | 9GA0512H7001 | 9GA0512H7D001 | ☺ 9GA0512P7H001 | 52 × 52 × 15 mm | Yes | 50 |
| 9GA0512P7M001 | 9GA0512M7002 | 9GA0512M7001 | — | ☺ 9GA0512P7M001 | 52 × 52 × 15 mm | Yes | 50 |
| 9GA0524P7A001 | 9GA0524A7002 | 9GA0524A7001 | 9GA0524A7D001 | ☺ 9GA0524P7A001 | 52 × 52 × 15 mm | Yes | 50 |
| 9GA0524P7G001 | 9GA0524G7002 | 9GA0524G7001 | 9GA0524G7D001 | ☺ 9GA0524P7G001 | 52 × 52 × 15 mm | Yes | 50 |
| 9GA0524P7H001 | 9GA0524H7002 | 9GA0524H7001 | — | ☺ 9GA0524P7H001 | 52 × 52 × 15 mm | Yes | 50 |
| 9GA0524P7M001 | 9GA0524M7002 | 9GA0524M7001 | — | ☺ 9GA0524P7M001 | 52 × 52 × 15 mm | Yes | 50 |
| 9GA0612B701 | — | 9GA0612B701 | — | — | 60 × 60 × 15 mm | Yes | 58 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The ☺ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|-----------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9GA0612G701 | 9GA0612G702 | 9GA0612G701 | 9GA0612G7D01 | | | |
| 9GA0612G9001 | 9GA0612G9002 | 9GA0612G9001 | 9GA0612G9D001 | 9GA0612P9G001 | 60 × 60 × 10 mm | Yes | 56 |
| 9GA0612H6001 | 9GA0612H6002 | 9GA0612H6001 | 9GA0612H6D001 | — | 60 × 60 × 20 mm | Yes | 62 |
| 9GA0612H701 | 9GA0612H702 | 9GA0612H701 | 9GA0612H7D01 | 9GA0612P7H01 | 60 × 60 × 15 mm | Yes | 58 |
| 9GA0612H9001 | 9GA0612H9002 | 9GA0612H9001 | 9GA0612H9D001 | — | 60 × 60 × 10 mm | Yes | 56 |
| 9GA0612L701 | 9GA0612L702 | 9GA0612L701 | 9GA0612L7D01 | — | 60 × 60 × 15 mm | Yes | 58 |
| 9GA0612L9001 | 9GA0612L9002 | 9GA0612L9001 | 9GA0612L9D001 | — | 60 × 60 × 10 mm | Yes | 56 |
| 9GA0612M6001 | 9GA0612M6002 | 9GA0612M6001 | 9GA0612M6D001 | — | 60 × 60 × 20 mm | Yes | 62 |
| 9GA0612M701 | 9GA0612M702 | 9GA0612M701 | — | — | 60 × 60 × 15 mm | Yes | 58 |
| 9GA0612P1H03 | 9GA0612H102 | 9GA0612H101 | — | 9GA0612P1H03 | 60 × 60 × 38 mm | Yes | 79 |
| 9GA0612P1H031 | 9GA0612H1021 | 9GA0612H1011 | — | 9GA0612P1H031 | 60 × 60 × 38 mm | No | 79 |
| 9GA0612P1J03 | 9GA0612J102 | 9GA0612J101 | 9GA0612J1D01 | 9GA0612P1J03 | 60 × 60 × 38 mm | Yes | 79 |
| 9GA0612P1J031 | 9GA0612J1021 | 9GA0612J1011 | — | 9GA0612P1J031 | 60 × 60 × 38 mm | No | 79 |
| 9GA0612P1K03 | 9GA0612K102 | 9GA0612K101 | 9GA0612K1D01 | 9GA0612P1K03 | 60 × 60 × 38 mm | Yes | 79 |
| 9GA0612P1K031 | 9GA0612K1021 | 9GA0612K1011 | 9GA0612K1D011 | 9GA0612P1K031 | 60 × 60 × 38 mm | No | 79 |
| 9GA0612P1K60 | 9GA0612K162 | 9GA0612K161 | — | 9GA0612P1K60 | 60 × 60 × 38 mm | Yes | 79 |
| 9GA0612P1K601 | 9GA0612K1621 | 9GA0612K1611 | — | 9GA0612P1K601 | 60 × 60 × 38 mm | No | 79 |
| 9GA0612P6G001 | 9GA0612G6002 | 9GA0612G6001 | — | 9GA0612P6G001 | 60 × 60 × 20 mm | Yes | 62 |
| 9GA0612P6S001 | 9GA0612S6002 | 9GA0612S6001 | — | 9GA0612P6S001 | 60 × 60 × 20 mm | Yes | 62 |
| 9GA0612P7G01 | 9GA0612G702 | 9GA0612G701 | 9GA0612G7D01 | 9GA0612P7G01 | 60 × 60 × 15 mm | Yes | 58 |
| 9GA0612P7H01 | 9GA0612H702 | 9GA0612H701 | 9GA0612H7D01 | 9GA0612P7H01 | 60 × 60 × 15 mm | Yes | 58 |
| 9GA0624H6001 | 9GA0624H6002 | 9GA0624H6001 | 9GA0624H6D001 | — | 60 × 60 × 20 mm | Yes | 62 |
| 9GA0624L701 | — | 9GA0624L701 | — | — | 60 × 60 × 15 mm | Yes | 58 |
| 9GA0624M6001 | 9GA0624M6002 | 9GA0624M6001 | 9GA0624M6D001 | — | 60 × 60 × 20 mm | Yes | 62 |
| 9GA0624M701 | 9GA0624M702 | 9GA0624M701 | — | — | 60 × 60 × 15 mm | Yes | 58 |
| 9GA0624P1J03 | 9GA0624J102 | 9GA0624J101 | — | 9GA0624P1J03 | 60 × 60 × 38 mm | Yes | 79 |
| 9GA0624P1J031 | 9GA0624J1021 | 9GA0624J1011 | — | 9GA0624P1J031 | 60 × 60 × 38 mm | No | 79 |
| 9GA0624P1K03 | 9GA0624K102 | — | 9GA0624K1D01 | 9GA0624P1K03 | 60 × 60 × 38 mm | Yes | 79 |
| 9GA0624P1K031 | — | — | — | 9GA0624P1K031 | 60 × 60 × 38 mm | No | 79 |
| 9GA0624P6G001 | 9GA0624G6002 | 9GA0624G6001 | 9GA0624G6D001 | 9GA0624P6G001 | 60 × 60 × 20 mm | Yes | 62 |
| 9GA0624P6S001 | 9GA0624S6002 | 9GA0624S6001 | — | 9GA0624P6S001 | 60 × 60 × 20 mm | Yes | 62 |
| 9GA0624P7G01 | 9GA0624G702 | — | — | 9GA0624P7G01 | 60 × 60 × 15 mm | Yes | 58 |
| 9GA0648P1K03 | — | 9GA0648K101 | — | 9GA0648P1K03 | 60 × 60 × 38 mm | Yes | 79 |
| 9GA0648P1K031 | — | — | — | 9GA0648P1K031 | 60 × 60 × 38 mm | No | 79 |
| 9GA0712P1G001 | — | — | — | 9GA0712P1G001 | 70 × 70 × 38 mm | Yes | 85 |
| 9GA0712P1G0011 | — | — | — | 9GA0712P1G0011 | 70 × 70 × 38 mm | No | 85 |
| 9GA0712P1H001 | — | — | 9GA0712H1D001 | 9GA0712P1H001 | 70 × 70 × 38 mm | Yes | 85 |
| 9GA0712P1H0011 | — | — | — | 9GA0712P1H0011 | 70 × 70 × 38 mm | No | 85 |
| 9GA0812A2001 | 9GA0812A2002 | 9GA0812A2001 | 9GA0812A2D001 | — | 80 × 80 × 32 mm | Yes | 105 |
| 9GA0812A20011 | 9GA0812A20021 | 9GA0812A20011 | 9GA0812A2D0011 | — | 80 × 80 × 32 mm | No | 105 |
| 9GA0812B2001 | 9GA0812B2002 | 9GA0812B2001 | 9GA0812B2D001 | — | 80 × 80 × 32 mm | Yes | 105 |
| 9GA0812B20011 | 9GA0812B20021 | 9GA0812B20011 | 9GA0812B2D0011 | — | 80 × 80 × 32 mm | No | 105 |
| 9GA0812H7001 | 9GA0812H7002 | 9GA0812H7001 | 9GA0812H7D001 | — | 80 × 80 × 15 mm | Yes | 87 |
| 9GA0812L2001 | 9GA0812L2002 | 9GA0812L2001 | 9GA0812L2D001 | — | 80 × 80 × 32 mm | Yes | 105 |
| 9GA0812L20011 | 9GA0812L20021 | 9GA0812L20011 | 9GA0812L2D0011 | — | 80 × 80 × 32 mm | No | 105 |
| 9GA0812M7001 | — | 9GA0812M7001 | — | — | 80 × 80 × 15 mm | Yes | 87 |
| 9GA0812P1G61 | — | — | — | 9GA0812P1G61 | 80 × 80 × 38 mm | Yes | 116 |
| 9GA0812P1G611 | — | — | — | 9GA0812P1G611 | 80 × 80 × 38 mm | No | 116 |
| 9GA0812P1H61 | 9GA0812H162 | 9GA0812H161 | 9GA0812H1D61 | 9GA0812P1H61 | 80 × 80 × 38 mm | Yes | 116 |
| 9GA0812P1H611 | 9GA0812H1621 | 9GA0812H1611 | — | 9GA0812P1H611 | 80 × 80 × 38 mm | No | 116 |
| 9GA0812P1S61 | 9GA0812S162 | 9GA0812S161 | 9GA0812S1D61 | 9GA0812P1S61 | 80 × 80 × 38 mm | Yes | 116 |
| 9GA0812P1S611 | 9GA0812S1621 | 9GA0812S1611 | — | 9GA0812P1S611 | 80 × 80 × 38 mm | No | 116 |
| 9GA0812P2H001 | — | — | — | 9GA0812P2H001 | 80 × 80 × 32 mm | Yes | 105 |
| 9GA0812P2H0011 | — | — | — | 9GA0812P2H0011 | 80 × 80 × 32 mm | No | 105 |
| 9GA0812P2M001 | — | — | — | 9GA0812P2M001 | 80 × 80 × 32 mm | Yes | 105 |
| 9GA0812P2M0011 | — | — | — | 9GA0812P2M0011 | 80 × 80 × 32 mm | No | 105 |
| 9GA0812P2S001 | — | 9GA0812S2001 | — | 9GA0812P2S001 | 80 × 80 × 32 mm | Yes | 105 |


Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.
Note 2: The  mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "-" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|-------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9GA0812P2S0011 | — | — | — | | | |
| 9GA0812P4G001 | 9GA0812G4002 | 9GA0812G4001 | 9GA0812G4D001 | ☛ 9GA0812P4G001 | 80 × 80 × 25 mm | Yes | 96 |
| 9GA0812P4G0011 | 9GA0812G40021 | 9GA0812G40011 | — | ☛ 9GA0812P4G0011 | 80 × 80 × 25 mm | No | 96 |
| 9GA0812P4H001 | 9GA0812H4002 | 9GA0812H4001 | 9GA0812H4D001 | ☛ 9GA0812P4H001 | 80 × 80 × 25 mm | Yes | 96 |
| 9GA0812P4H0011 | 9GA0812H40021 | 9GA0812H40011 | — | ☛ 9GA0812P4H0011 | 80 × 80 × 25 mm | No | 96 |
| 9GA0812P4J001 | 9GA0812J4002 | 9GA0812J4001 | 9GA0812J4D001 | ☛ 9GA0812P4J001 | 80 × 80 × 25 mm | Yes | 96 |
| 9GA0812P4J0011 | 9GA0812J40021 | 9GA0812J40011 | — | ☛ 9GA0812P4J0011 | 80 × 80 × 25 mm | No | 96 |
| 9GA0812P6G001 | 9GA0812G6002 | 9GA0812G6001 | — | ☛ 9GA0812P6G001 | 80 × 80 × 20 mm | Yes | 91 |
| 9GA0812P6M001 | 9GA0812M6002 | 9GA0812M6001 | — | ☛ 9GA0812P6M001 | 80 × 80 × 20 mm | Yes | 91 |
| 9GA0812P7G001 | 9GA0812G7002 | 9GA0812G7001 | 9GA0812G7D001 | ☛ 9GA0812P7G001 | 80 × 80 × 15 mm | Yes | 87 |
| 9GA0812P7S001 | — | — | — | ☛ 9GA0812P7S001 | 80 × 80 × 15 mm | Yes | 87 |
| 9GA0824A2001 | ☛ 9GA0824A2002 | ☛ 9GA0824A2001 | ☛ 9GA0824A2D001 | — | 80 × 80 × 32 mm | Yes | 105 |
| 9GA0824A20011 | ☛ 9GA0824A20021 | ☛ 9GA0824A20011 | ☛ 9GA0824A2D0011 | — | 80 × 80 × 32 mm | No | 105 |
| 9GA0824B2001 | ☛ 9GA0824B2002 | ☛ 9GA0824B2001 | ☛ 9GA0824B2D001 | — | 80 × 80 × 32 mm | Yes | 105 |
| 9GA0824B20011 | ☛ 9GA0824B20021 | ☛ 9GA0824B20011 | ☛ 9GA0824B2D0011 | — | 80 × 80 × 32 mm | No | 105 |
| 9GA0824H7001 | 9GA0824H7002 | ☛ 9GA0824H7001 | 9GA0824H7D001 | — | 80 × 80 × 15 mm | Yes | 87 |
| 9GA0824L2001 | ☛ 9GA0824L2002 | ☛ 9GA0824L2001 | ☛ 9GA0824L2D001 | — | 80 × 80 × 32 mm | Yes | 105 |
| 9GA0824L20011 | ☛ 9GA0824L20021 | ☛ 9GA0824L20011 | ☛ 9GA0824L2D0011 | — | 80 × 80 × 32 mm | No | 105 |
| 9GA0824M7001 | 9GA0824M7002 | 9GA0824M7001 | — | — | 80 × 80 × 15 mm | Yes | 87 |
| 9GA0824P1H61 | 9GA0824H162 | 9GA0824H161 | 9GA0824H1D61 | ☛ 9GA0824P1H61 | 80 × 80 × 38 mm | Yes | 116 |
| 9GA0824P1H611 | 9GA0824H1621 | 9GA0824H1611 | — | ☛ 9GA0824P1H611 | 80 × 80 × 38 mm | No | 116 |
| 9GA0824P1S61 | 9GA0824S162 | 9GA0824S161 | — | ☛ 9GA0824P1S61 | 80 × 80 × 38 mm | Yes | 116 |
| 9GA0824P1S611 | 9GA0824S1621 | 9GA0824S1611 | — | ☛ 9GA0824P1S611 | 80 × 80 × 38 mm | No | 116 |
| 9GA0824P2S001 | 9GA0824S2002 | — | 9GA0824S2D001 | ☛ 9GA0824P2S001 | 80 × 80 × 32 mm | Yes | 105 |
| 9GA0824P2S0011 | — | — | — | ☛ 9GA0824P2S0011 | 80 × 80 × 32 mm | No | 105 |
| 9GA0824P4G001 | 9GA0824G4002 | 9GA0824G4001 | 9GA0824G4D001 | ☛ 9GA0824P4G001 | 80 × 80 × 25 mm | Yes | 96 |
| 9GA0824P4G0011 | 9GA0824G40021 | 9GA0824G40011 | — | ☛ 9GA0824P4G0011 | 80 × 80 × 25 mm | No | 96 |
| 9GA0824P4H001 | 9GA0824H4002 | 9GA0824H4001 | 9GA0824H4D001 | ☛ 9GA0824P4H001 | 80 × 80 × 25 mm | Yes | 96 |
| 9GA0824P4H0011 | 9GA0824H40021 | 9GA0824H40011 | — | ☛ 9GA0824P4H0011 | 80 × 80 × 25 mm | No | 96 |
| 9GA0824P4J001 | 9GA0824J4002 | 9GA0824J4001 | 9GA0824J4D001 | ☛ 9GA0824P4J001 | 80 × 80 × 25 mm | Yes | 96 |
| 9GA0824P4J0011 | 9GA0824J40021 | 9GA0824J40011 | 9GA0824J4D0011 | ☛ 9GA0824P4J0011 | 80 × 80 × 25 mm | No | 96 |
| 9GA0824P6G001 | 9GA0824G6002 | 9GA0824G6001 | — | ☛ 9GA0824P6G001 | 80 × 80 × 20 mm | Yes | 91 |
| 9GA0824P6M001 | 9GA0824M6002 | 9GA0824M6001 | — | ☛ 9GA0824P6M001 | 80 × 80 × 20 mm | Yes | 91 |
| 9GA0824P7G001 | 9GA0824G7002 | — | 9GA0824G7D001 | ☛ 9GA0824P7G001 | 80 × 80 × 15 mm | Yes | 87 |
| 9GA0824P7S001 | 9GA0824S7002 | — | 9GA0824S7D001 | ☛ 9GA0824P7S001 | 80 × 80 × 15 mm | Yes | 87 |
| 9GA0848P1S61 | — | — | — | 9GA0848P1S61 | 80 × 80 × 38 mm | Yes | 116 |
| 9GA0848P1S611 | — | — | — | 9GA0848P1S611 | 80 × 80 × 38 mm | No | 116 |
| 9GA0848P2S001 | — | — | — | 9GA0848P2S001 | 80 × 80 × 32 mm | Yes | 105 |
| 9GA0848P2S0011 | — | — | — | 9GA0848P2S0011 | 80 × 80 × 32 mm | No | 105 |
| 9GA0912P1H03 | 9GA0912H102 | 9GA0912H101 | 9GA0912H1D01 | ☛ 9GA0912P1H03 | 92 × 92 × 38 mm | Yes | 144 |
| 9GA0912P1H031 | 9GA0912H1021 | 9GA0912H1011 | — | ☛ 9GA0912P1H031 | 92 × 92 × 38 mm | No | 144 |
| 9GA0912P4G03 | ☛ 9GA0912G402 | 9GA0912G401 | 9GA0912G4D01 | ☛ 9GA0912P4G03 | 92 × 92 × 25 mm | Yes | 129 |
| 9GA0912P4G031 | 9GA0912G4021 | 9GA0912G4011 | — | ☛ 9GA0912P4G031 | 92 × 92 × 25 mm | No | 129 |
| 9GA0912P4J03 | ☛ 9GA0912J402 | ☛ 9GA0912J401 | ☛ 9GA0912J4D01 | ☛ 9GA0912P4J03 | 92 × 92 × 25 mm | Yes | 129 |
| 9GA0912P4J031 | ☛ 9GA0912J4021 | ☛ 9GA0912J4011 | ☛ 9GA0912J4D011 | ☛ 9GA0912P4J031 | 92 × 92 × 25 mm | No | 129 |
| 9GA0924P1H01 | 9GA0924H102 | ☛ 9GA0924H101 | 9GA0924H1D01 | ☛ 9GA0924P1H01 | 92 × 92 × 38 mm | Yes | 144 |
| 9GA0924P1H011 | — | ☛ 9GA0924H1011 | 9GA0924H1D011 | 9GA0924P1H011 | 92 × 92 × 38 mm | No | 144 |
| 9GA0924P4G03 | ☛ 9GA0924G402 | 9GA0924G401 | 9GA0924G4D01 | ☛ 9GA0924P4G03 | 92 × 92 × 25 mm | Yes | 129 |
| 9GA0924P4G031 | 9GA0924G4021 | 9GA0924G4011 | — | ☛ 9GA0924P4G031 | 92 × 92 × 25 mm | No | 129 |
| 9GA0924P4J03 | ☛ 9GA0924J402 | ☛ 9GA0924J401 | ☛ 9GA0924J4D01 | ☛ 9GA0924P4J03 | 92 × 92 × 25 mm | Yes | 129 |
| 9GA0924P4J031 | ☛ 9GA0924J4021 | ☛ 9GA0924J4011 | — | ☛ 9GA0924P4J031 | 92 × 92 × 25 mm | No | 129 |
| 9GA0948P1H03 | 9GA0948H102 | 9GA0948H101 | — | ☛ 9GA0948P1H03 | 92 × 92 × 38 mm | Yes | 144 |
| 9GA0948P1H031 | — | — | — | 9GA0948P1H031 | 92 × 92 × 38 mm | No | 144 |
| 9GA1212G4001 | — | ☛ 9GA1212G4001 | — | ☛ 9GA1212P4G001 | 120 × 120 × 25 mm | Yes | 152 |
| 9GA1212G40011 | — | ☛ 9GA1212G40011 | — | ☛ 9GA1212P4G0011 | 120 × 120 × 25 mm | No | 152 |
| 9GA1212P4G001 | — | ☛ 9GA1212G4001 | — | ☛ 9GA1212P4G001 | 120 × 120 × 25 mm | Yes | 152 |
| 9GA1212P4G0011 | — | ☛ 9GA1212G40011 | — | ☛ 9GA1212P4G0011 | 120 × 120 × 25 mm | No | 152 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The ☛ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|--------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9GA1212P4S001 | 9GA1212S4002 | 9GA1212S4001 | — | | | |
| 9GA1212P4S0011 | — | 9GA1212S40011 | — | 9GA1212P4S0011 | 120 × 120 × 25 mm | No | 152 |
| 9GA1212S4001 | — | 9GA1212S4001 | — | 9GA1212P4S001 | 120 × 120 × 25 mm | Yes | 152 |
| 9GA1212S40011 | — | 9GA1212S40011 | — | 9GA1212P4S0011 | 120 × 120 × 25 mm | No | 152 |
| 9GA1224G4001 | 9GA1224G4002 | 9GA1224G4001 | 9GA1224G4D001 | 9GA1224P4G001 | 120 × 120 × 25 mm | Yes | 152 |
| 9GA1224G40011 | — | 9GA1224G40011 | — | 9GA1224P4G0011 | 120 × 120 × 25 mm | No | 152 |
| 9GA1224P4G001 | 9GA1224G4002 | 9GA1224G4001 | 9GA1224G4D001 | 9GA1224P4G001 | 120 × 120 × 25 mm | Yes | 152 |
| 9GA1224P4G0011 | — | 9GA1224G40011 | — | 9GA1224P4G0011 | 120 × 120 × 25 mm | No | 152 |
| 9GA1224P4S001 | — | 9GA1224S4001 | 9GA1224S4D001 | 9GA1224P4S001 | 120 × 120 × 25 mm | Yes | 152 |
| 9GA1224P4S0011 | — | 9GA1224S40011 | — | 9GA1224P4S0011 | 120 × 120 × 25 mm | No | 152 |
| 9GA1224S4001 | 9GA1224S4002 | 9GA1224S4001 | — | 9GA1224P4S001 | 120 × 120 × 25 mm | Yes | 152 |
| 9GA1224S40011 | — | 9GA1224S40011 | — | 9GA1224P4S0011 | 120 × 120 × 25 mm | No | 152 |
| 9GA1248G4001 | — | 9GA1248G4001 | — | 9GA1248P4G001 | 120 × 120 × 25 mm | Yes | 152 |
| 9GA1248G40011 | — | 9GA1248G40011 | — | 9GA1248P4G0011 | 120 × 120 × 25 mm | No | 152 |
| 9GA1248P4G001 | — | 9GA1248G4001 | — | 9GA1248P4G001 | 120 × 120 × 25 mm | Yes | 152 |
| 9GA1248P4G0011 | — | 9GA1248G40011 | — | 9GA1248P4G0011 | 120 × 120 × 25 mm | No | 152 |
| 9GA1248P4S001 | — | 9GA1248S4001 | — | 9GA1248P4S001 | 120 × 120 × 25 mm | Yes | 152 |
| 9GA1248P4S0011 | — | 9GA1248S40011 | — | 9GA1248P4S0011 | 120 × 120 × 25 mm | No | 152 |
| 9GA1248S4001 | — | 9GA1248S4001 | — | 9GA1248P4S001 | 120 × 120 × 25 mm | Yes | 152 |
| 9GA1248S40011 | — | 9GA1248S40011 | — | 9GA1248P4S0011 | 120 × 120 × 25 mm | No | 152 |
| 9GAX0412P3K001 | — | — | — | 9GAX0412P3K001 | 40 × 40 × 28 mm | Yes | 35 |
| 9GAX0412P3K0011 | — | — | — | 9GAX0412P3K0011 | 40 × 40 × 28 mm | No | 35 |
| 9GAX0412P3K003 | — | — | — | 9GAX0412P3K003 | 40 × 40 × 28 mm | Yes | 35 |
| 9GAX0412P3K0031 | — | — | — | 9GAX0412P3K0031 | 40 × 40 × 28 mm | No | 35 |
| 9GAX0412P3S001 | — | — | — | 9GAX0412P3S001 | 40 × 40 × 28 mm | Yes | 35 |
| 9GAX0412P3S0011 | — | — | — | 9GAX0412P3S0011 | 40 × 40 × 28 mm | No | 35 |
| 9GAX0412P3S003 | — | — | — | 9GAX0412P3S003 | 40 × 40 × 28 mm | Yes | 35 |
| 9GAX0412P3S0031 | — | — | — | 9GAX0412P3S0031 | 40 × 40 × 28 mm | No | 35 |
| 9GE0412P3G03 | — | — | 9GE0412G3D01 | 9GE0412P3G03 | 40 × 40 × 28 mm | No | 44 |
| 9GE0412P3J03 | 9GE0412J302 | 9GE0412J301 | 9GE0412J3D01 | 9GE0412P3J03 | 40 × 40 × 28 mm | No | 44 |
| 9GE0412P3K03 | — | 9GE0412K301 | 9GE0412K3D01 | 9GE0412P3K03 | 40 × 40 × 28 mm | No | 44 |
| 9GL1212E101 | 9GL1212E102 | 9GL1212E101 | 9GL1212E1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1212F101 | 9GL1212F102 | 9GL1212F101 | 9GL1212F1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1212G101 | 9GL1212G102 | 9GL1212G101 | 9GL1212G1D01 | 9GL1212P1G03 | 120 × 120 × 38 mm | No | 405 |
| 9GL1212H101 | 9GL1212H102 | 9GL1212H101 | 9GL1212H1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1212M101 | 9GL1212M102 | 9GL1212M101 | 9GL1212M1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1224E101 | 9GL1224E102 | 9GL1224E101 | 9GL1224E1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1224F101 | 9GL1224F102 | 9GL1224F101 | 9GL1224F1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1224G101 | 9GL1224G102 | 9GL1224G101 | 9GL1224G1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1224H101 | 9GL1224H102 | 9GL1224H101 | 9GL1224H1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1224M101 | 9GL1224M102 | 9GL1224M101 | 9GL1224M1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1248E101 | 9GL1248E102 | 9GL1248E101 | 9GL1248E1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1248F101 | 9GL1248F102 | 9GL1248F101 | 9GL1248F1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1248G101 | 9GL1248G102 | 9GL1248G101 | 9GL1248G1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1248H101 | 9GL1248H102 | 9GL1248H101 | 9GL1248H1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GL1248M101 | 9GL1248M102 | 9GL1248M101 | 9GL1248M1D01 | — | 120 × 120 × 38 mm | No | 405 |
| 9GP1224P1G001 | 9GP1224G1002 | — | — | 9GP1224P1G001 | 120 × 120 × 38 mm | No | 438 |
| 9GP1248P1G001 | — | — | — | 9GP1248P1G001 | 120 × 120 × 38 mm | No | 438 |
| 9GP5724P5H001 | — | — | — | 9GP5724P5H001 | ∅172 × 150 × 51 mm | No | 440 |
| 9GP5748P5G001 | — | — | — | 9GP5748P5G001 | ∅172 × 150 × 51 mm | No | 440 |
| 9GT0412P3J001 | 9GT0412J3002 | 9GT0412J3001 | 9GT0412J3D001 | 9GT0412P3J001 | 40 × 40 × 28 mm | No | 424 |
| 9GT0424P3J001 | 9GT0424J3002 | 9GT0424J3001 | 9GT0424J3D001 | 9GT0424P3J001 | 40 × 40 × 28 mm | No | 424 |
| 9GT0612P4G001 | 9GT0612G4002 | 9GT0612G4001 | 9GT0612G4D001 | 9GT0612P4G001 | 60 × 60 × 25 mm | No | 426 |
| 9GT0624P4G001 | 9GT0624G4002 | 9GT0624G4001 | — | 9GT0624P4G001 | 60 × 60 × 25 mm | No | 426 |
| 9GT0812P4S001 | 9GT0812S4002 | 9GT0812S4001 | 9GT0812S4D001 | 9GT0812P4S001 | 80 × 80 × 25 mm | No | 428 |
| 9GT0824P4S001 | 9GT0824S4002 | 9GT0824S4001 | 9GT0824S4D001 | 9GT0824P4S001 | 80 × 80 × 25 mm | No | 428 |
| 9GT0912P1M001 | 9GT0912M1002 | 9GT0912M1001 | 9GT0912M1D001 | 9GT0912P1M001 | 92 × 92 × 38 mm | No | 432 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.
Note 2: The  mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "-" models.) | | | | Frame size | Rib | page |
|-----------------------------------|---|-------------------|------------------|--------------------------------------|-------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9GT0912P4J001 | 9GT0912J4002 | 9GT0912J4001 | 9GT0912J4D001 | | | |
| 9GT0924P1M001 | 9GT0924M1002 | — | 9GT0924M1D001 | ☛ 9GT0924P1M001 | 92 × 92 × 38 mm | No | 432 |
| 9GT0924P4J001 | 9GT0924J4002 | 9GT0924J4001 | 9GT0924J4D001 | ☛ 9GT0924P4J001 | 92 × 92 × 25 mm | No | 430 |
| 9GT1212P1S001 | — | — | — | ☛ 9GT1212P1S001 | 120 × 120 × 38 mm | No | 434 |
| 9GT1224P1S001 | 9GT1224S1002 | — | 9GT1224S1D001 | ☛ 9GT1224P1S001 | 120 × 120 × 38 mm | No | 434 |
| 9GV0612P1G03 | 9GV0612G102 | 9GV0612G101 | 9GV0612G1D01 | 9GV0612P1G03 | 60 × 60 × 38 mm | Yes | 83 |
| 9GV0612P1G031 | 9GV0612G1021 | 9GV0612G1011 | 9GV0612G1D011 | 9GV0612P1G031 | 60 × 60 × 38 mm | No | 83 |
| 9GV0624P1G03 | 9GV0624G102 | — | 9GV0624G1D01 | 9GV0624P1G03 | 60 × 60 × 38 mm | Yes | 83 |
| 9GV0624P1G031 | 9GV0624G1021 | — | — | 9GV0624P1G031 | 60 × 60 × 38 mm | No | 83 |
| 9GV0812P1F03 | — | — | — | 9GV0812P1F03 | 80 × 80 × 38 mm | Yes | 119 |
| 9GV0812P1F031 | — | — | — | 9GV0812P1F031 | 80 × 80 × 38 mm | No | 119 |
| 9GV0812P1G03 | 9GV0812G102 | 9GV0812G101 | — | 9GV0812P1G03 | 80 × 80 × 38 mm | Yes | 119 |
| 9GV0812P1G031 | 9GV0812G1021 | 9GV0812G1011 | — | 9GV0812P1G031 | 80 × 80 × 38 mm | No | 119 |
| 9GV0812P1H03 | 9GV0812H102 | 9GV0812H101 | — | 9GV0812P1H03 | 80 × 80 × 38 mm | Yes | 119 |
| 9GV0812P1H031 | 9GV0812H1021 | 9GV0812H1011 | — | 9GV0812P1H031 | 80 × 80 × 38 mm | No | 119 |
| 9GV0812P1M03 | — | — | — | 9GV0812P1M03 | 80 × 80 × 38 mm | Yes | 119 |
| 9GV0812P1M031 | — | — | — | 9GV0812P1M031 | 80 × 80 × 38 mm | No | 119 |
| 9GV0824P1G03 | 9GV0824G102 | 9GV0824G101 | 9GV0824G1D01 | 9GV0824P1G03 | 80 × 80 × 38 mm | Yes | 119 |
| 9GV0824P1G031 | — | — | — | 9GV0824P1G031 | 80 × 80 × 38 mm | No | 119 |
| 9GV0848P1G03 | 9GV0848G102 | 9GV0848G101 | — | 9GV0848P1G03 | 80 × 80 × 38 mm | Yes | 119 |
| 9GV0848P1G031 | — | 9GV0848G1011 | — | 9GV0848P1G031 | 80 × 80 × 38 mm | No | 119 |
| 9GV0912P1F03 | — | — | — | 9GV0912P1F03 | 92 × 92 × 38 mm | Yes | 147 |
| 9GV0912P1F031 | — | — | — | 9GV0912P1F031 | 92 × 92 × 38 mm | No | 147 |
| 9GV0912P1G03 | 9GV0912G102 | — | 9GV0912G1D01 | 9GV0912P1G03 | 92 × 92 × 38 mm | Yes | 147 |
| 9GV0912P1G031 | — | — | — | 9GV0912P1G031 | 92 × 92 × 38 mm | No | 147 |
| 9GV0912P1H03 | 9GV0912H102 | 9GV0912H101 | 9GV0912H1D01 | 9GV0912P1H03 | 92 × 92 × 38 mm | Yes | 147 |
| 9GV0912P1H031 | — | — | — | 9GV0912P1H031 | 92 × 92 × 38 mm | No | 147 |
| 9GV0948P1F03 | — | — | — | 9GV0948P1F03 | 92 × 92 × 38 mm | Yes | 147 |
| 9GV0948P1F031 | — | — | — | 9GV0948P1F031 | 92 × 92 × 38 mm | No | 147 |
| 9GV0948P1H03 | 9GV0948H102 | 9GV0948H101 | — | 9GV0948P1H03 | 92 × 92 × 38 mm | Yes | 147 |
| 9GV0948P1H031 | 9GV0948H1021 | — | — | 9GV0948P1H031 | 92 × 92 × 38 mm | No | 147 |
| 9GV1212P1G01 | — | — | — | 9GV1212P1G01 | 120 × 120 × 38 mm | Yes | 170 |
| 9GV1212P1G011 | — | ☛ 9GV1212G1011 | 9GV1212G1D011 | 9GV1212P1G011 | 120 × 120 × 38 mm | No | 170 |
| 9GV1212P1J01 | ☛ 9GV1212J102 | ☛ 9GV1212J101 | 9GV1212J1D01 | ☛ 9GV1212P1J01 | 120 × 120 × 38 mm | Yes | 170 |
| 9GV1212P1J011 | ☛ 9GV1212J1021 | ☛ 9GV1212J1011 | — | ☛ 9GV1212P1J011 | 120 × 120 × 38 mm | No | 170 |
| 9GV1212P4G01 | 9GV1212G402 | 9GV1212G401 | — | 9GV1212P4G01 | 120 × 120 × 25 mm | Yes | 156 |
| 9GV1212P4G011 | 9GV1212G4021 | 9GV1212G4011 | — | 9GV1212P4G011 | 120 × 120 × 25 mm | No | 156 |
| 9GV1224P1H01 | ☛ 9GV1224H102 | ☛ 9GV1224H101 | ☛ 9GV1224H1D01 | ☛ 9GV1224P1H01 | 120 × 120 × 38 mm | Yes | 170 |
| 9GV1224P1H011 | ☛ 9GV1224H1021 | ☛ 9GV1224H1011 | 9GV1224H1D011 | ☛ 9GV1224P1H011 | 120 × 120 × 38 mm | No | 170 |
| 9GV1224P1J01 | ☛ 9GV1224J102 | ☛ 9GV1224J101 | ☛ 9GV1224J1D01 | ☛ 9GV1224P1J01 | 120 × 120 × 38 mm | Yes | 170 |
| 9GV1224P1J011 | ☛ 9GV1224J1021 | ☛ 9GV1224J1011 | 9GV1224J1D011 | ☛ 9GV1224P1J011 | 120 × 120 × 38 mm | No | 170 |
| 9GV1224P4G01 | 9GV1224G402 | 9GV1224G401 | 9GV1224G4D01 | 9GV1224P4G01 | 120 × 120 × 25 mm | Yes | 156 |
| 9GV1224P4G011 | 9GV1224G4021 | — | — | 9GV1224P4G011 | 120 × 120 × 25 mm | No | 156 |
| 9GV1248P1J01 | 9GV1248J102 | 9GV1248J101 | 9GV1248J1D01 | ☛ 9GV1248P1J01 | 120 × 120 × 38 mm | Yes | 170 |
| 9GV1248P1J011 | ☛ 9GV1248J1021 | ☛ 9GV1248J1011 | — | ☛ 9GV1248P1J011 | 120 × 120 × 38 mm | No | 170 |
| 9GV1248P4G01 | 9GV1248G402 | 9GV1248G401 | — | 9GV1248P4G01 | 120 × 120 × 25 mm | Yes | 156 |
| 9GV1248P4G011 | — | 9GV1248G4011 | — | 9GV1248P4G011 | 120 × 120 × 25 mm | No | 156 |
| 9GV1248P4H01 | 9GV1248H402 | 9GV1248H401 | 9GV1248H4D01 | 9GV1248P4H01 | 120 × 120 × 25 mm | Yes | 156 |
| 9GV1248P4H011 | — | — | — | 9GV1248P4H011 | 120 × 120 × 25 mm | No | 156 |
| 9GV1248P4J01 | — | — | — | 9GV1248P4J01 | 120 × 120 × 25 mm | Yes | 156 |
| 9GV1248P4J011 | — | — | — | 9GV1248P4J011 | 120 × 120 × 25 mm | No | 156 |
| 9GV1412P1G001 | — | — | — | ☛ 9GV1412P1G001 | 140 × 140 × 38 mm | No | 180 |
| 9GV1412P1H001 | 9GV1412H1002 | — | — | ☛ 9GV1412P1H001 | 140 × 140 × 38 mm | No | 180 |
| 9GV1412P1S001 | — | — | — | ☛ 9GV1412P1S001 | 140 × 140 × 38 mm | No | 180 |
| 9GV1424P1G001 | — | — | — | ☛ 9GV1424P1G001 | 140 × 140 × 38 mm | No | 180 |
| 9GV1424P1H001 | 9GV1424H1002 | — | 9GV1424H1D001 | ☛ 9GV1424P1H001 | 140 × 140 × 38 mm | No | 180 |
| 9GV1424P1S001 | — | — | — | ☛ 9GV1424P1S001 | 140 × 140 × 38 mm | No | 180 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The ☛ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|--------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9GV1448P1G001 | — | — | — | | | |
| 9GV1448P1H001 | — | — | — | ☛ 9GV1448P1H001 | 140 × 140 × 38 mm | No | 180 |
| 9GV1448P1S001 | — | — | — | ☛ 9GV1448P1S001 | 140 × 140 × 38 mm | No | 180 |
| 9GV1512H501 | 9GV1512H502 | 9GV1512H501 | — | 9GV1512P5H03 | 150 × 150 × 50 mm | Yes | 188 |
| 9GV1512H5011 | 9GV1512H5021 | 9GV1512H5011 | — | — | 150 × 150 × 50 mm | No | 188 |
| 9GV1512M501 | 9GV1512M502 | 9GV1512M501 | — | 9GV1512P5M03 | 150 × 150 × 50 mm | Yes | 188 |
| 9GV1512M5011 | 9GV1512M5021 | 9GV1512M5011 | — | 9GV1512P5M011 | 150 × 150 × 50 mm | No | 188 |
| 9GV1524M501 | 9GV1524M502 | 9GV1524M501 | 9GV1524M5D01 | — | 150 × 150 × 50 mm | Yes | 188 |
| 9GV1524M5011 | — | 9GV1524M5011 | — | — | 150 × 150 × 50 mm | No | 188 |
| 9GV2048P0G201 | 9GV2048G0202 | — | — | ☛ 9GV2048P0G201 | ∅200 × 70 mm | No | 204 |
| 9GX3612P3K001 | 9GX3612K3002 | — | — | 9GX3612P3K001 | 36 × 36 × 28 mm | Yes | 16 |
| 9HV0412P3K001 | — | — | — | ☛ 9HV0412P3K001 | 40 × 40 × 28 mm | No | 38 |
| 9HV0612P1J001 | — | — | — | ☛ 9HV0612P1J001 | 60 × 60 × 38 mm | Yes | 77 |
| 9HV0612P1J0011 | — | — | — | ☛ 9HV0612P1J0011 | 60 × 60 × 38 mm | No | 77 |
| 9HV0812P1G601 | 9HV0812G1002 | 9HV0812G1001 | — | ☛ 9HV0812P1G601 | 80 × 80 × 38 mm | Yes | 113 |
| 9HV0812P1G6011 | 9HV0812G10021 | 9HV0812G10011 | — | 9HV0812P1G6011 | 80 × 80 × 38 mm | No | 113 |
| 9HV0824P1G003 | — | — | 9HV0824G1D001 | 9HV0824P1G003 | 80 × 80 × 38 mm | Yes | 113 |
| 9HV0824P1G0011 | — | — | — | 9HV0824P1G0011 | 80 × 80 × 38 mm | No | 113 |
| 9HV0848P1G001 | 9HV0848G1002 | 9HV0848G1001 | 9HV0848G1D001 | ☛ 9HV0848P1G001 | 80 × 80 × 38 mm | Yes | 113 |
| 9HV0848P1G0011 | 9HV0848G10021 | 9HV0848G10011 | — | ☛ 9HV0848P1G0011 | 80 × 80 × 38 mm | No | 113 |
| 9HV0912P1G001 | — | — | — | ☛ 9HV0912P1G001 | 92 × 92 × 38 mm | Yes | 141 |
| 9HV0912P1G0011 | — | — | — | 9HV0912P1G0011 | 92 × 92 × 38 mm | No | 141 |
| 9HV0924P1G001 | — | — | 9HV0924G1D001 | 9HV0924P1G001 | 92 × 92 × 38 mm | Yes | 141 |
| 9HV0924P1G0011 | — | — | — | 9HV0924P1G0011 | 92 × 92 × 38 mm | No | 141 |
| 9HV0948P1G001 | — | — | — | ☛ 9HV0948P1G001 | 92 × 92 × 38 mm | Yes | 141 |
| 9HV0948P1G0011 | — | — | — | 9HV0948P1G0011 | 92 × 92 × 38 mm | No | 141 |
| 9HV0912P4G001 | — | — | — | ☛ 9HV0912P4G001 | 92 × 92 × 25 mm | Yes | 126 |
| 9HV0912P4G0011 | — | — | — | ☛ 9HV0912P4G0011 | 92 × 92 × 25 mm | No | 126 |
| 9HV0912P4H001 | — | — | 9HV0912H4D001 | ☛ 9HV0912P4H001 | 92 × 92 × 25 mm | Yes | 126 |
| 9HV0912P4H0011 | — | — | — | ☛ 9HV0912P4H0011 | 92 × 92 × 25 mm | No | 126 |
| 9HV0924P4G001 | — | — | — | ☛ 9HV0924P4G001 | 92 × 92 × 25 mm | Yes | 126 |
| 9HV0924P4G0011 | — | — | — | ☛ 9HV0924P4G0011 | 92 × 92 × 25 mm | No | 126 |
| 9HV0924P4H001 | — | — | — | ☛ 9HV0924P4H001 | 92 × 92 × 25 mm | Yes | 126 |
| 9HV0924P4H0011 | — | — | — | ☛ 9HV0924P4H0011 | 92 × 92 × 25 mm | No | 126 |
| 9HV1224P1A001 | — | — | 9HV1224A1D001 | 9HV1224P1A001 | 120 × 120 × 38 mm | No | 165 |
| 9HV1248P1G001 | 9HV1248G1002 | 9HV1248G1001 | 9HV1248G1D001 | ☛ 9HV1248P1G001 | 120 × 120 × 38 mm | No | 165 |
| 9HV1248P1H001 | 9HV1248H1002 | 9HV1248H1001 | — | ☛ 9HV1248P1H001 | 120 × 120 × 38 mm | No | 165 |
| 9HV3612P3K001 | — | — | — | ☛ 9HV3612P3K001 | 36 × 36 × 28 mm | Yes | 14 |
| 9HV5724P5H001 | 9HV5724H5002 | 9HV5724H5001 | 9HV5724H5D001 | ☛ 9HV5724P5H001 | ∅172 × 150 × 51 mm | No | 193 |
| 9HV5748P5G001 | — | — | — | ☛ 9HV5748P5G001 | ∅172 × 150 × 51 mm | No | 193 |
| 9HVA0412P3J001 | — | — | — | ☛ 9HVA0412P3J001 | 40 × 40 × 28 mm | Yes | 33 |
| 9HVA0424P3G001 | — | — | — | 9HVA0424P3G001 | 40 × 40 × 28 mm | Yes | 33 |
| 9HVA0612P1J001 | — | — | — | ☛ 9HVA0612P1J001 | 60 × 60 × 38 mm | Yes | 75 |
| 9HVA0612P1J0011 | — | — | — | ☛ 9HVA0612P1J0011 | 60 × 60 × 38 mm | No | 75 |
| 9HVA0848P1G601 | — | — | — | 9HVA0848P1G601 | 80 × 80 × 38 mm | Yes | 111 |
| 9HVA0848P1G6011 | — | — | — | 9HVA0848P1G6011 | 80 × 80 × 38 mm | No | 111 |
| 9HVB0812P1G001 | — | — | — | ☛ 9HVB0812P1G001 | 80 × 80 × 38 mm | Yes | 109 |
| 9HVB0812P1G0011 | — | — | — | ☛ 9HVB0812P1G0011 | 80 × 80 × 38 mm | No | 109 |
| 9L0412H301 | 9L0412H302 | 9L0412H301 | 9L0412H3D01 | — | 40 × 40 × 28 mm | No | 376 |
| 9L0412J301 | 9L0412J302 | 9L0412J301 | 9L0412J3D01 | 9L0412P3J01 | 40 × 40 × 28 mm | No | 376 |
| 9L0412M301 | 9L0412M302 | 9L0412M301 | 9L0412M3D01 | — | 40 × 40 × 28 mm | No | 376 |
| 9LG0612P4H001 | 9LG0612H4002 | 9LG0612H4001 | 9LG0612H4D001 | ☛ 9LG0612P4H001 | 60 × 60 × 25 mm | No | 378 |
| 9LG0612P4J001 | — | — | 9LG0612J4D001 | ☛ 9LG0612P4J001 | 60 × 60 × 25 mm | No | 378 |
| 9LG0612P4M001 | — | — | 9LG0612M4D001 | ☛ 9LG0612P4M001 | 60 × 60 × 25 mm | No | 378 |
| 9LG0612P4S001 | — | 9LG0612S4001 | 9LG0612S4D001 | ☛ 9LG0612P4S001 | 60 × 60 × 25 mm | No | 378 |
| 9LG0624P4H001 | 9LG0624H4002 | 9LG0624H4001 | 9LG0624H4D001 | ☛ 9LG0624P4H001 | 60 × 60 × 25 mm | No | 378 |
| 9LG0624P4J001 | — | — | — | ☛ 9LG0624P4J001 | 60 × 60 × 25 mm | No | 378 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.
Note 2: The ☛ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|-------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| 9LG0624P4M001 | 9LG0624M4002 | 9LG0624M4001 | 9LG0624M4D001 | ☞ 9LG0624P4M001 | 60 × 60 × 25 mm | No | 378 |
| 9LG0624P4S001 | 9LG0624S4002 | 9LG0624S4001 | — | ☞ 9LG0624P4S001 | 60 × 60 × 25 mm | No | 378 |
| 9LG0648P4H001 | — | — | — | ☞ 9LG0648P4H001 | 60 × 60 × 25 mm | No | 378 |
| 9LG0648P4J001 | — | — | — | ☞ 9LG0648P4J001 | 60 × 60 × 25 mm | No | 378 |
| 9LG0648P4M001 | — | — | — | ☞ 9LG0648P4M001 | 60 × 60 × 25 mm | No | 378 |
| 9LG0648P4S001 | — | — | 9LG0648S4D001 | ☞ 9LG0648P4S001 | 60 × 60 × 25 mm | No | 378 |
| 9LG0812F4001 | ☞ 9LG0812F4002 | ☞ 9LG0812F4001 | ☞ 9LG0812F4D001 | — | 80 × 80 × 25 mm | No | 385 |
| 9LG0812L4001 | ☞ 9LG0812L4002 | ☞ 9LG0812L4001 | ☞ 9LG0812L4D001 | — | 80 × 80 × 25 mm | No | 385 |
| 9LG0812M4001 | ☞ 9LG0812M4002 | ☞ 9LG0812M4001 | ☞ 9LG0812M4D001 | — | 80 × 80 × 25 mm | No | 385 |
| 9LG0812P4G001 | — | 9LG0812G4001 | 9LG0812G4D001 | ☞ 9LG0812P4G001 | 80 × 80 × 25 mm | No | 385 |
| 9LG0812P4H001 | ☞ 9LG0812H4002 | ☞ 9LG0812H4001 | ☞ 9LG0812H4D001 | ☞ 9LG0812P4H001 | 80 × 80 × 25 mm | No | 385 |
| 9LG0812P4J001 | 9LG0812J4002 | — | 9LG0812J4D001 | ☞ 9LG0812P4J001 | 80 × 80 × 25 mm | No | 385 |
| 9LG0812S4001 | ☞ 9LG0812S4002 | ☞ 9LG0812S4001 | ☞ 9LG0812S4D001 | — | 80 × 80 × 25 mm | No | 385 |
| 9LG0824F4001 | ☞ 9LG0824F4002 | ☞ 9LG0824F4001 | ☞ 9LG0824F4D001 | — | 80 × 80 × 25 mm | No | 385 |
| 9LG0824L4001 | ☞ 9LG0824L4002 | ☞ 9LG0824L4001 | ☞ 9LG0824L4D001 | — | 80 × 80 × 25 mm | No | 385 |
| 9LG0824M4001 | ☞ 9LG0824M4002 | ☞ 9LG0824M4001 | ☞ 9LG0824M4D001 | — | 80 × 80 × 25 mm | No | 385 |
| 9LG0824P4G001 | 9LG0824G4002 | 9LG0824G4001 | 9LG0824G4D001 | ☞ 9LG0824P4G001 | 80 × 80 × 25 mm | No | 385 |
| 9LG0824P4H001 | ☞ 9LG0824H4002 | ☞ 9LG0824H4001 | ☞ 9LG0824H4D001 | ☞ 9LG0824P4H001 | 80 × 80 × 25 mm | No | 385 |
| 9LG0824P4J001 | — | — | 9LG0824J4D001 | ☞ 9LG0824P4J001 | 80 × 80 × 25 mm | No | 385 |
| 9LG0824S4001 | ☞ 9LG0824S4002 | ☞ 9LG0824S4001 | ☞ 9LG0824S4D001 | — | 80 × 80 × 25 mm | No | 385 |
| 9LG0912F4001 | ☞ 9LG0912F4002 | ☞ 9LG0912F4001 | ☞ 9LG0912F4D001 | — | 92 × 92 × 25 mm | No | 392 |
| 9LG0912L4001 | ☞ 9LG0912L4002 | ☞ 9LG0912L4001 | ☞ 9LG0912L4D001 | — | 92 × 92 × 25 mm | No | 392 |
| 9LG0912M4001 | ☞ 9LG0912M4002 | ☞ 9LG0912M4001 | ☞ 9LG0912M4D001 | — | 92 × 92 × 25 mm | No | 392 |
| 9LG0912P1F001 | — | — | — | ☞ 9LG0912P1F001 | 92 × 92 × 38 mm | No | 397 |
| 9LG0912P1H001 | — | — | 9LG0912H1D001 | ☞ 9LG0912P1H001 | 92 × 92 × 38 mm | No | 397 |
| 9LG0912P4G001 | 9LG0912G4002 | — | — | ☞ 9LG0912P4G001 | 92 × 92 × 25 mm | No | 392 |
| 9LG0912P4H001 | ☞ 9LG0912H4002 | ☞ 9LG0912H4001 | ☞ 9LG0912H4D001 | ☞ 9LG0912P4H001 | 92 × 92 × 25 mm | No | 392 |
| 9LG0912P4J001 | — | — | 9LG0912J4D001 | ☞ 9LG0912P4J001 | 92 × 92 × 25 mm | No | 392 |
| 9LG0912P4S001 | ☞ 9LG0912S4002 | ☞ 9LG0912S4001 | ☞ 9LG0912S4D001 | ☞ 9LG0912P4S001 | 92 × 92 × 25 mm | No | 392 |
| 9LG0924F4001 | ☞ 9LG0924F4002 | ☞ 9LG0924F4001 | ☞ 9LG0924F4D001 | — | 92 × 92 × 25 mm | No | 392 |
| 9LG0924L4001 | ☞ 9LG0924L4002 | ☞ 9LG0924L4001 | ☞ 9LG0924L4D001 | — | 92 × 92 × 25 mm | No | 392 |
| 9LG0924M4001 | ☞ 9LG0924M4002 | ☞ 9LG0924M4001 | ☞ 9LG0924M4D001 | — | 92 × 92 × 25 mm | No | 392 |
| 9LG0924P1F001 | — | — | — | ☞ 9LG0924P1F001 | 92 × 92 × 38 mm | No | 397 |
| 9LG0924P1H001 | — | — | — | ☞ 9LG0924P1H001 | 92 × 92 × 38 mm | No | 397 |
| 9LG0924P4G001 | — | — | — | ☞ 9LG0924P4G001 | 92 × 92 × 25 mm | No | 392 |
| 9LG0924P4H001 | ☞ 9LG0924H4002 | ☞ 9LG0924H4001 | ☞ 9LG0924H4D001 | ☞ 9LG0924P4H001 | 92 × 92 × 25 mm | No | 392 |
| 9LG0924P4J001 | — | — | 9LG0924J4D001 | ☞ 9LG0924P4J001 | 92 × 92 × 25 mm | No | 392 |
| 9LG0924P4S001 | — | — | 9LG0924S4D001 | ☞ 9LG0924P4S001 | 92 × 92 × 25 mm | No | 392 |
| 9LG0948H4001 | — | 9LG0948H4001 | 9LG0948H4D001 | — | 92 × 92 × 25 mm | No | 392 |
| 9LG1212F1001 | ☞ 9LG1212F1002 | ☞ 9LG1212F1001 | ☞ 9LG1212F1D001 | — | 120 × 120 × 38 mm | No | 400 |
| 9LG1212M1001 | ☞ 9LG1212M1002 | ☞ 9LG1212M1001 | ☞ 9LG1212M1D001 | — | 120 × 120 × 38 mm | No | 400 |
| 9LG1212P1G001 | — | 9LG1212G1001 | 9LG1212G1D001 | ☞ 9LG1212P1G001 | 120 × 120 × 38 mm | No | 400 |
| 9LG1212P1H001 | — | — | 9LG1212H1D001 | ☞ 9LG1212P1H001 | 120 × 120 × 38 mm | No | 400 |
| 9LG1212P1S001 | — | — | — | ☞ 9LG1212P1S001 | 120 × 120 × 38 mm | No | 400 |
| 9LG1224A1001 | ☞ 9LG1224A1002 | ☞ 9LG1224A1001 | ☞ 9LG1224A1D001 | — | 120 × 120 × 38 mm | No | 400 |
| 9LG1224F1001 | ☞ 9LG1224F1002 | ☞ 9LG1224F1001 | ☞ 9LG1224F1D001 | — | 120 × 120 × 38 mm | No | 400 |
| 9LG1224M1001 | ☞ 9LG1224M1002 | ☞ 9LG1224M1001 | ☞ 9LG1224M1D001 | — | 120 × 120 × 38 mm | No | 400 |
| 9LG1224P1G001 | 9LG1224G1002 | 9LG1224G1001 | ☞ 9LG1224G1D001 | ☞ 9LG1224P1G001 | 120 × 120 × 38 mm | No | 400 |
| 9LG1224P1H001 | 9LG1224H1002 | 9LG1224H1001 | 9LG1224H1D001 | ☞ 9LG1224P1H001 | 120 × 120 × 38 mm | No | 400 |
| 9LG1224P1S001 | — | 9LG1224S1001 | 9LG1224S1D001 | ☞ 9LG1224P1S001 | 120 × 120 × 38 mm | No | 400 |
| 9LG1248F1001 | ☞ 9LG1248F1002 | ☞ 9LG1248F1001 | ☞ 9LG1248F1D001 | — | 120 × 120 × 38 mm | No | 400 |
| 9LG1248M1001 | ☞ 9LG1248M1002 | ☞ 9LG1248M1001 | ☞ 9LG1248M1D001 | — | 120 × 120 × 38 mm | No | 400 |
| 9LG1248P1G001 | 9LG1248G1002 | 9LG1248G1001 | — | ☞ 9LG1248P1G001 | 120 × 120 × 38 mm | No | 400 |
| 9LG1248P1H001 | — | — | — | ☞ 9LG1248P1H001 | 120 × 120 × 38 mm | No | 400 |
| 9LG1248P1S001 | — | — | — | ☞ 9LG1248P1S001 | 120 × 120 × 38 mm | No | 400 |
| 9LG1412A5001 | ☞ 9LG1412A5002 | ☞ 9LG1412A5001 | ☞ 9LG1412A5D001 | — | 140 × 140 × 51 mm | No | 413 |
| 9LG1412H5001 | ☞ 9LG1412H5002 | ☞ 9LG1412H5001 | ☞ 9LG1412H5D001 | — | 140 × 140 × 51 mm | No | 413 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The ☞ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|-------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9LG1412L1001 | ➤ 9LG1412L1002 | ➤ 9LG1412L1001 | — | | | |
| 9LG1412M5001 | ➤ 9LG1412M5002 | ➤ 9LG1412M5001 | ➤ 9LG1412M5D001 | — | 140 × 140 × 51 mm | No | 413 |
| 9LG1412P1A001 | — | — | — | ➤ 9LG1412P1A001 | 140 × 140 × 38 mm | No | 408 |
| 9LG1412P1H001 | — | — | — | ➤ 9LG1412P1H001 | 140 × 140 × 38 mm | No | 408 |
| 9LG1412P1M001 | ➤ 9LG1412M1002 | ➤ 9LG1412M1001 | 9LG1412M1D001 | ➤ 9LG1412P1M001 | 140 × 140 × 38 mm | No | 408 |
| 9LG1412P5G001 | — | — | — | ➤ 9LG1412P5G001 | 140 × 140 × 51 mm | No | 413 |
| 9LG1412P5S001 | 9LG1412S5001 | — | — | ➤ 9LG1412P5S001 | 140 × 140 × 51 mm | No | 413 |
| 9LG1424A5001 | ➤ 9LG1424A5002 | ➤ 9LG1424A5001 | ➤ 9LG1424A5D001 | — | 140 × 140 × 51 mm | No | 413 |
| 9LG1424H5001 | ➤ 9LG1424H5002 | ➤ 9LG1424H5001 | ➤ 9LG1424H5D001 | — | 140 × 140 × 51 mm | No | 413 |
| 9LG1424L1001 | ➤ 9LG1424L1002 | ➤ 9LG1424L1001 | ➤ 9LG1424L1D001 | — | 140 × 140 × 38 mm | No | 408 |
| 9LG1424M5001 | ➤ 9LG1424M5002 | ➤ 9LG1424M5001 | ➤ 9LG1424M5D001 | — | 140 × 140 × 51 mm | No | 413 |
| 9LG1424P1A001 | — | — | — | ➤ 9LG1424P1A001 | 140 × 140 × 38 mm | No | 408 |
| 9LG1424P1H001 | — | — | — | ➤ 9LG1424P1H001 | 140 × 140 × 38 mm | No | 408 |
| 9LG1424P1M001 | ➤ 9LG1424M1002 | ➤ 9LG1424M1001 | ➤ 9LG1424M1D001 | ➤ 9LG1424P1M001 | 140 × 140 × 38 mm | No | 408 |
| 9LG1424P5G001 | — | — | — | ➤ 9LG1424P5G001 | 140 × 140 × 51 mm | No | 413 |
| 9LG1424P5S001 | ➤ 9LG1424S5002 | ➤ 9LG1424S5001 | 9LG1424S5D001 | ➤ 9LG1424P5S001 | 140 × 140 × 51 mm | No | 413 |
| 9LG1448A5001 | ➤ 9LG1448A5002 | ➤ 9LG1448A5001 | ➤ 9LG1448A5D001 | — | 140 × 140 × 51 mm | No | 413 |
| 9LG1448H5001 | ➤ 9LG1448H5002 | ➤ 9LG1448H5001 | ➤ 9LG1448H5D001 | — | 140 × 140 × 51 mm | No | 413 |
| 9LG1448L1001 | ➤ 9LG1448L1002 | ➤ 9LG1448L1001 | ➤ 9LG1448L1D001 | — | 140 × 140 × 38 mm | No | 408 |
| 9LG1448M5001 | ➤ 9LG1448M5002 | ➤ 9LG1448M5001 | ➤ 9LG1448M5D001 | — | 140 × 140 × 51 mm | No | 413 |
| 9LG1448P1A001 | — | — | — | ➤ 9LG1448P1A001 | 140 × 140 × 38 mm | No | 408 |
| 9LG1448P1H001 | — | — | — | ➤ 9LG1448P1H001 | 140 × 140 × 38 mm | No | 408 |
| 9LG1448P1M001 | ➤ 9LG1448M1002 | ➤ 9LG1448M1001 | ➤ 9LG1448M1D001 | ➤ 9LG1448P1M001 | 140 × 140 × 38 mm | No | 408 |
| 9LG1448P5G001 | — | — | — | ➤ 9LG1448P5G001 | 140 × 140 × 51 mm | No | 413 |
| 9LG1448P5S001 | — | — | — | ➤ 9LG1448P5S001 | 140 × 140 × 51 mm | No | 413 |
| 9RA0612F4001 | 9RA0612F4002 | 9RA0612F4001 | — | — | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0612F40011 | 9RA0612F40021 | 9RA0612F40011 | — | — | 60 × 60 × 25 mm | No | 69 |
| 9RA0612G4001 | 9RA0612G4002 | ➤ 9RA0612G4001 | 9RA0612G4D001 | 9RA0612P4G001 | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0612G40011 | 9RA0612G40021 | ➤ 9RA0612G40011 | 9RA0612G4D0011 | — | 60 × 60 × 25 mm | No | 69 |
| 9RA0612H4001 | 9RA0612H4002 | ➤ 9RA0612H4001 | 9RA0612H4D001 | 9RA0612P4H001 | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0612H40011 | 9RA0612H40021 | ➤ 9RA0612H40011 | 9RA0612H4D0011 | 9RA0612P4H0011 | 60 × 60 × 25 mm | No | 69 |
| 9RA0612J4001 | 9RA0612J4002 | ➤ 9RA0612J4001 | 9RA0612J4D001 | ➤ 9RA0612P4J001 | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0612J40011 | 9RA0612J40021 | ➤ 9RA0612J40011 | 9RA0612J4D0011 | ➤ 9RA0612P4J0011 | 60 × 60 × 25 mm | No | 69 |
| 9RA0612M4001 | 9RA0612M4002 | 9RA0612M4001 | — | — | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0612M40011 | 9RA0612M40021 | 9RA0612M40011 | — | — | 60 × 60 × 25 mm | No | 69 |
| 9RA0612P4J001 | 9RA0612J4002 | ➤ 9RA0612J4001 | 9RA0612J4D001 | ➤ 9RA0612P4J001 | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0612P4J0011 | 9RA0612J40021 | ➤ 9RA0612J40011 | 9RA0612J4D0011 | ➤ 9RA0612P4J0011 | 60 × 60 × 25 mm | No | 69 |
| 9RA0612S4001 | 9RA0612S4002 | ➤ 9RA0612S4001 | 9RA0612S4D001 | 9RA0612P4S001 | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0612S40011 | 9RA0612S40021 | ➤ 9RA0612S40011 | 9RA0612S4D0011 | 9RA0612P4S0011 | 60 × 60 × 25 mm | No | 69 |
| 9RA0624F4001 | 9RA0624F4002 | 9RA0624F4001 | — | — | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0624F40011 | 9RA0624F40021 | 9RA0624F40011 | — | — | 60 × 60 × 25 mm | No | 69 |
| 9RA0624G4001 | 9RA0624G4002 | ➤ 9RA0624G4001 | 9RA0624G4D001 | — | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0624G40011 | 9RA0624G40021 | ➤ 9RA0624G40011 | 9RA0624G4D0011 | — | 60 × 60 × 25 mm | No | 69 |
| 9RA0624H4001 | 9RA0624H4002 | ➤ 9RA0624H4001 | 9RA0624H4D001 | — | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0624H40011 | 9RA0624H40021 | 9RA0624H40021 | 9RA0624H4D0011 | — | 60 × 60 × 25 mm | No | 69 |
| 9RA0624J4001 | 9RA0624J4002 | ➤ 9RA0624J4001 | 9RA0624J4D001 | ➤ 9RA0624P4J001 | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0624J40011 | 9RA0624J40021 | ➤ 9RA0624J40011 | 9RA0624J4D0011 | ➤ 9RA0624P4J0011 | 60 × 60 × 25 mm | No | 69 |
| 9RA0624M4001 | 9RA0624M4002 | 9RA0624M4001 | — | — | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0624M40011 | 9RA0624M40021 | 9RA0624M40011 | — | — | 60 × 60 × 25 mm | No | 69 |
| 9RA0624P4J001 | 9RA0624J4002 | ➤ 9RA0624J4001 | 9RA0624J4D001 | ➤ 9RA0624P4J001 | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0624P4J0011 | 9RA0624J40021 | ➤ 9RA0624J40011 | 9RA0624J4D0011 | ➤ 9RA0624P4J0011 | 60 × 60 × 25 mm | No | 69 |
| 9RA0624S4001 | 9RA0624S4002 | ➤ 9RA0624S4001 | 9RA0624S4D001 | — | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0624S40011 | 9RA0624S40021 | ➤ 9RA0624S40011 | 9RA0624S4D0011 | — | 60 × 60 × 25 mm | No | 69 |
| 9RA0648G4001 | 9RA0648G4002 | ➤ 9RA0648G4001 | 9RA0648G4D001 | — | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0648G40011 | 9RA0648G40021 | ➤ 9RA0648G40011 | 9RA0648G4D0011 | — | 60 × 60 × 25 mm | No | 69 |
| 9RA0648J4001 | 9RA0648J4002 | ➤ 9RA0648J4001 | 9RA0648J4D001 | ➤ 9RA0648P4J001 | 60 × 60 × 25 mm | Yes | 69 |
| 9RA0648J40011 | 9RA0648J40021 | ➤ 9RA0648J40011 | 9RA0648J4D0011 | ➤ 9RA0648P4J0011 | 60 × 60 × 25 mm | No | 69 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.
 Note 2: The ➤ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|-----------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9RA0648P4J001 | 9RA0648J4002 | ➤ 9RA0648J4001 | 9RA0648J4D001 | | | |
| 9RA0648P4J0011 | 9RA0648J40021 | ➤ 9RA0648J40011 | 9RA0648J4D0011 | ➤ 9RA0648P4J0011 | 60 × 60 × 25 mm | No | 69 |
| 9RA0812G1001 | 9RA0812G1002 | ➤ 9RA0812G1001 | 9RA0812G1D001 | ➤ 9RA0812P1G001 | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0812G10011 | 9RA0812G10021 | ➤ 9RA0812G10011 | 9RA0812G1D0011 | ➤ 9RA0812P1G0011 | 80 × 80 × 38 mm | No | 122 |
| 9RA0812G4001 | 9RA0812G4002 | ➤ 9RA0812G4001 | 9RA0812G4D001 | ➤ 9RA0812P4G001 | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0812G40011 | 9RA0812G40021 | ➤ 9RA0812G40011 | 9RA0812G4D0011 | ➤ 9RA0812P4G0011 | 80 × 80 × 25 mm | No | 99 |
| 9RA0812H1001 | 9RA0812H1002 | ➤ 9RA0812H1001 | 9RA0812H1D001 | ➤ 9RA0812P1H001 | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0812H10011 | 9RA0812H10021 | ➤ 9RA0812H10011 | 9RA0812H1D0011 | ➤ 9RA0812P1H0011 | 80 × 80 × 38 mm | No | 122 |
| 9RA0812H4001 | 9RA0812H4002 | ➤ 9RA0812H4001 | 9RA0812H4D001 | 9RA0812P4H001 | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0812H40011 | 9RA0812H40021 | ➤ 9RA0812H40011 | 9RA0812H4D0011 | — | 80 × 80 × 25 mm | No | 99 |
| 9RA0812K1001 | 9RA0812K1002 | ➤ 9RA0812K1001 | 9RA0812K1D001 | ➤ 9RA0812P1K001 | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0812K10011 | 9RA0812K10021 | ➤ 9RA0812K10011 | 9RA0812K1D0011 | ➤ 9RA0812P1K0011 | 80 × 80 × 38 mm | No | 122 |
| 9RA0812M4001 | 9RA0812M4002 | ➤ 9RA0812M4001 | 9RA0812M4D001 | — | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0812M40011 | 9RA0812M40021 | ➤ 9RA0812M40011 | 9RA0812M4D0011 | — | 80 × 80 × 25 mm | No | 99 |
| 9RA0812P1G001 | 9RA0812G1002 | ➤ 9RA0812G1001 | 9RA0812G1D001 | ➤ 9RA0812P1G001 | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0812P1G0011 | 9RA0812G10021 | ➤ 9RA0812G10011 | 9RA0812G1D0011 | ➤ 9RA0812P1G0011 | 80 × 80 × 38 mm | No | 122 |
| 9RA0812P1H001 | 9RA0812H1002 | ➤ 9RA0812H1001 | 9RA0812H1D001 | ➤ 9RA0812P1H001 | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0812P1H0011 | 9RA0812H10021 | ➤ 9RA0812H10011 | 9RA0812H1D0011 | ➤ 9RA0812P1H0011 | 80 × 80 × 38 mm | No | 122 |
| 9RA0812P1K001 | 9RA0812K1002 | ➤ 9RA0812K1001 | 9RA0812K1D001 | ➤ 9RA0812P1K001 | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0812P1K0011 | 9RA0812K10021 | ➤ 9RA0812K10011 | 9RA0812K1D0011 | ➤ 9RA0812P1K0011 | 80 × 80 × 38 mm | No | 122 |
| 9RA0812P4G001 | 9RA0812G4002 | ➤ 9RA0812G4001 | 9RA0812G4D001 | ➤ 9RA0812P4G001 | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0812P4G0011 | 9RA0812G40021 | ➤ 9RA0812G40011 | 9RA0812G4D0011 | ➤ 9RA0812P4G0011 | 80 × 80 × 25 mm | No | 99 |
| 9RA0812S4001 | 9RA0812S4002 | ➤ 9RA0812S4001 | 9RA0812S4D001 | — | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0812S40011 | 9RA0812S40021 | ➤ 9RA0812S40011 | 9RA0812S4D0011 | — | 80 × 80 × 25 mm | No | 99 |
| 9RA0824G1001 | 9RA0824G1002 | ➤ 9RA0824G1001 | 9RA0824G1D001 | ➤ 9RA0824P1G001 | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0824G10011 | 9RA0824G10021 | ➤ 9RA0824G10011 | 9RA0824G1D0011 | ➤ 9RA0824P1G0011 | 80 × 80 × 38 mm | No | 122 |
| 9RA0824G4001 | 9RA0824G4002 | ➤ 9RA0824G4001 | 9RA0824G4D001 | ➤ 9RA0824P4G001 | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0824G40011 | 9RA0824G40021 | ➤ 9RA0824G40011 | 9RA0824G4D0011 | ➤ 9RA0824P4G0011 | 80 × 80 × 25 mm | No | 99 |
| 9RA0824H1001 | 9RA0824H1002 | ➤ 9RA0824H1001 | 9RA0824H1D001 | — | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0824H10011 | 9RA0824H10021 | ➤ 9RA0824H10011 | 9RA0824H1D0011 | — | 80 × 80 × 38 mm | No | 122 |
| 9RA0824H4001 | 9RA0824H4002 | ➤ 9RA0824H4001 | 9RA0824H4D001 | — | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0824H40011 | 9RA0824H40021 | ➤ 9RA0824H40011 | 9RA0824H4D0011 | — | 80 × 80 × 25 mm | No | 99 |
| 9RA0824M4001 | 9RA0824M4002 | ➤ 9RA0824M4001 | 9RA0824M4D001 | — | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0824M40011 | 9RA0824M40021 | ➤ 9RA0824M40011 | 9RA0824M4D0011 | — | 80 × 80 × 25 mm | No | 99 |
| 9RA0824P1G001 | 9RA0824G1002 | ➤ 9RA0824G1001 | 9RA0824G1D001 | ➤ 9RA0824P1G001 | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0824P1G0011 | 9RA0824G10021 | ➤ 9RA0824G10011 | 9RA0824G1D0011 | ➤ 9RA0824P1G0011 | 80 × 80 × 38 mm | No | 122 |
| 9RA0824P4G001 | 9RA0824G4002 | ➤ 9RA0824G4001 | 9RA0824G4D001 | ➤ 9RA0824P4G001 | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0824P4G0011 | 9RA0824G40021 | ➤ 9RA0824G40011 | 9RA0824G4D0011 | ➤ 9RA0824P4G0011 | 80 × 80 × 25 mm | No | 99 |
| 9RA0824S4001 | 9RA0824S4002 | ➤ 9RA0824S4001 | 9RA0824S4D001 | — | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0824S40011 | 9RA0824S40021 | ➤ 9RA0824S40011 | 9RA0824S4D0011 | — | 80 × 80 × 25 mm | No | 99 |
| 9RA0848G1001 | 9RA0848G1002 | ➤ 9RA0848G1001 | 9RA0848G1D001 | ➤ 9RA0848P1G001 | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0848G10011 | 9RA0848G10021 | ➤ 9RA0848G10011 | 9RA0848G1D0011 | ➤ 9RA0848P1G0011 | 80 × 80 × 38 mm | No | 122 |
| 9RA0848G4001 | 9RA0848G4002 | ➤ 9RA0848G4001 | 9RA0848G4D001 | ➤ 9RA0848P4G001 | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0848G40011 | 9RA0848G40021 | ➤ 9RA0848G40011 | 9RA0848G4D0011 | ➤ 9RA0848P4G0011 | 80 × 80 × 25 mm | No | 99 |
| 9RA0848H1001 | 9RA0848H1002 | ➤ 9RA0848H1001 | 9RA0848H1D001 | — | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0848H10011 | 9RA0848H10021 | ➤ 9RA0848H10011 | 9RA0848H1D0011 | — | 80 × 80 × 38 mm | No | 122 |
| 9RA0848P1G001 | 9RA0848G1002 | ➤ 9RA0848G1001 | 9RA0848G1D001 | ➤ 9RA0848P1G001 | 80 × 80 × 38 mm | Yes | 122 |
| 9RA0848P1G0011 | 9RA0848G10021 | ➤ 9RA0848G10011 | 9RA0848G1D0011 | ➤ 9RA0848P1G0011 | 80 × 80 × 38 mm | No | 122 |
| 9RA0848P4G001 | 9RA0848G4002 | ➤ 9RA0848G4001 | 9RA0848G4D001 | ➤ 9RA0848P4G001 | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0848P4G0011 | 9RA0848G40021 | ➤ 9RA0848G40011 | 9RA0848G4D0011 | ➤ 9RA0848P4G0011 | 80 × 80 × 25 mm | No | 99 |
| 9RA0848S4001 | 9RA0848S4002 | ➤ 9RA0848S4001 | 9RA0848S4D001 | — | 80 × 80 × 25 mm | Yes | 99 |
| 9RA0848S40011 | 9RA0848S40021 | ➤ 9RA0848S40011 | 9RA0848S4D0011 | — | 80 × 80 × 25 mm | No | 99 |
| 9RA0912F4001 | 9RA0912F40021 | ➤ 9RA0912F4001 | 9RA0912F4D001 | — | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0912F40011 | 9RA0912F40021 | ➤ 9RA0912F40011 | 9RA0912F4D0011 | — | 92 × 92 × 25 mm | No | 132 |
| 9RA0912G4001 | 9RA0912G4002 | ➤ 9RA0912G4001 | 9RA0912G4D001 | ➤ 9RA0912P4G001 | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0912G40011 | 9RA0912G40021 | ➤ 9RA0912G40011 | 9RA0912G4D0011 | ➤ 9RA0912P4G0011 | 92 × 92 × 25 mm | No | 132 |
| 9RA0912H4001 | 9RA0912H4002 | ➤ 9RA0912H4001 | 9RA0912H4D001 | — | 92 × 92 × 25 mm | Yes | 132 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The ➤ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|-------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9RA0912H40011 | 9RA0912H40021 | ➤ 9RA0912H40011 | 9RA0912H4D0011 | | | |
| 9RA0912M4001 | 9RA0912M4002 | ➤ 9RA0912M4001 | 9RA0912M4D001 | — | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0912M40011 | 9RA0912M40021 | ➤ 9RA0912M40011 | 9RA0912M4D0011 | — | 92 × 92 × 25 mm | No | 132 |
| 9RA0912P4G001 | 9RA0912G4002 | ➤ 9RA0912G4001 | 9RA0912G4D001 | ➤ 9RA0912P4G001 | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0912P4G0011 | 9RA0912G40021 | ➤ 9RA0912G40011 | 9RA0912G4D0011 | ➤ 9RA0912P4G0011 | 92 × 92 × 25 mm | No | 132 |
| 9RA0912S4001 | 9RA0912S4002 | ➤ 9RA0912S4001 | 9RA0912S4D001 | — | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0912S40011 | 9RA0912S40021 | ➤ 9RA0912S40011 | 9RA0912S4D0011 | — | 92 × 92 × 25 mm | No | 132 |
| 9RA0924F4001 | 9RA0924F4002 | ➤ 9RA0924F4001 | 9RA0924F4D001 | — | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0924F40011 | 9RA0924F40021 | ➤ 9RA0924F40011 | 9RA0924F4D0011 | — | 92 × 92 × 25 mm | No | 132 |
| 9RA0924G4001 | 9RA0924G4002 | ➤ 9RA0924G4001 | 9RA0924G4D001 | ➤ 9RA0924P4G001 | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0924G40011 | 9RA0924G40021 | ➤ 9RA0924G40011 | 9RA0924G4D0011 | ➤ 9RA0924P4G0011 | 92 × 92 × 25 mm | No | 132 |
| 9RA0924H4001 | 9RA0924H4002 | ➤ 9RA0924H4001 | 9RA0924H4D001 | — | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0924H40011 | 9RA0924H40021 | ➤ 9RA0924H40011 | 9RA0924H4D0011 | — | 92 × 92 × 25 mm | No | 132 |
| 9RA0924M4001 | 9RA0924M4002 | ➤ 9RA0924M4001 | 9RA0924M4D001 | — | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0924M40011 | 9RA0924M40021 | ➤ 9RA0924M40011 | 9RA0924M4D0011 | — | 92 × 92 × 25 mm | No | 132 |
| 9RA0924P4G001 | 9RA0924G4002 | ➤ 9RA0924G4001 | 9RA0924G4D001 | ➤ 9RA0924P4G001 | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0924P4G0011 | 9RA0924G40021 | ➤ 9RA0924G40011 | 9RA0924G4D0011 | ➤ 9RA0924P4G0011 | 92 × 92 × 25 mm | No | 132 |
| 9RA0924S4001 | 9RA0924S4002 | ➤ 9RA0924S4001 | 9RA0924S4D001 | — | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0924S40011 | 9RA0924S40021 | ➤ 9RA0924S40011 | 9RA0924S4D0011 | — | 92 × 92 × 25 mm | No | 132 |
| 9RA0948G4001 | 9RA0948G4002 | ➤ 9RA0948G4001 | 9RA0948G4D001 | ➤ 9RA0948P4G001 | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0948G40011 | 9RA0948G40021 | ➤ 9RA0948G40011 | 9RA0948G4D0011 | ➤ 9RA0948P4G0011 | 92 × 92 × 25 mm | No | 132 |
| 9RA0948H4001 | 9RA0948H4002 | ➤ 9RA0948H4001 | 9RA0948H4D001 | — | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0948H40011 | 9RA0948H40021 | ➤ 9RA0948H40011 | 9RA0948H4D0011 | — | 92 × 92 × 25 mm | No | 132 |
| 9RA0948P4G001 | 9RA0948G4002 | ➤ 9RA0948G4001 | 9RA0948G4D001 | ➤ 9RA0948P4G001 | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0948P4G0011 | 9RA0948G40021 | ➤ 9RA0948G40011 | 9RA0948G4D0011 | ➤ 9RA0948P4G0011 | 92 × 92 × 25 mm | No | 132 |
| 9RA0948S4001 | 9RA0948S4002 | ➤ 9RA0948S4001 | 9RA0948S4D001 | — | 92 × 92 × 25 mm | Yes | 132 |
| 9RA0948S40011 | 9RA0948S40021 | ➤ 9RA0948S40011 | 9RA0948S4D0011 | — | 92 × 92 × 25 mm | No | 132 |
| 9RA1212A4001 | 9RA1212A4002 | ➤ 9RA1212A4001 | 9RA1212A4D001 | — | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1212A40011 | 9RA1212A40021 | ➤ 9RA1212A40011 | 9RA1212A4D0011 | — | 120 × 120 × 25 mm | No | 159 |
| 9RA1212E1001 | 9RA1212E1002 | ➤ 9RA1212E1001 | 9RA1212E1D001 | — | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1212E10011 | 9RA1212E10021 | ➤ 9RA1212E10011 | 9RA1212E1D0011 | — | 120 × 120 × 38 mm | No | 173 |
| 9RA1212E4001 | 9RA1212E4002 | ➤ 9RA1212E4001 | 9RA1212E4D001 | 9RA1212P4E001 | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1212E40011 | 9RA1212E40021 | ➤ 9RA1212E40011 | 9RA1212E4D0011 | 9RA1212P4E0011 | 120 × 120 × 25 mm | No | 159 |
| 9RA1212F4001 | — | 9RA1212F4001 | 9RA1212F4D001 | — | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1212F40011 | — | 9RA1212F40011 | — | — | 120 × 120 × 25 mm | No | 159 |
| 9RA1212G1001 | 9RA1212G1002 | ➤ 9RA1212G1001 | 9RA1212G1D001 | — | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1212G10011 | 9RA1212G10021 | ➤ 9RA1212G10011 | 9RA1212G1D0011 | — | 120 × 120 × 38 mm | No | 173 |
| 9RA1212G4001 | 9RA1212G4002 | ➤ 9RA1212G4001 | 9RA1212G4D001 | ➤ 9RA1212P4G001 | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1212G40011 | 9RA1212G40021 | ➤ 9RA1212G40011 | 9RA1212G4D0011 | ➤ 9RA1212P4G0011 | 120 × 120 × 25 mm | No | 159 |
| 9RA1212H1001 | 9RA1212H1002 | ➤ 9RA1212H1001 | 9RA1212H1D001 | 9RA1212P4H003 | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1212H10011 | 9RA1212H10021 | ➤ 9RA1212H10011 | 9RA1212H1D0011 | 9RA1212P4H0031 | 120 × 120 × 38 mm | No | 173 |
| 9RA1212H4001 | 9RA1212H4002 | ➤ 9RA1212H4001 | 9RA1212H4D001 | — | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1212H40011 | 9RA1212H40021 | ➤ 9RA1212H40011 | 9RA1212H4D0011 | — | 120 × 120 × 25 mm | No | 159 |
| 9RA1212M4001 | 9RA1212M4002 | ➤ 9RA1212M4001 | 9RA1212M4D001 | — | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1212M40011 | 9RA1212M40021 | ➤ 9RA1212M40011 | 9RA1212M4D0011 | — | 120 × 120 × 25 mm | No | 159 |
| 9RA1212P1K001 | 9RA1212K1002 | 9RA1212K1001 | 9RA1212K1D001 | ➤ 9RA1212P1K001 | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1212P1K0011 | 9RA1212K10021 | 9RA1212K10011 | 9RA1212K1D0011 | ➤ 9RA1212P1K0011 | 120 × 120 × 38 mm | No | 173 |
| 9RA1212P4G001 | 9RA1212G4002 | ➤ 9RA1212G4001 | 9RA1212G4D001 | ➤ 9RA1212P4G001 | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1212P4G0011 | 9RA1212G40021 | ➤ 9RA1212G40011 | 9RA1212G4D0011 | ➤ 9RA1212P4G0011 | 120 × 120 × 25 mm | No | 159 |
| 9RA1224A4001 | 9RA1224A4002 | ➤ 9RA1224A4001 | 9RA1224A4D001 | — | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1224A40011 | 9RA1224A40021 | ➤ 9RA1224A40011 | 9RA1224A4D0011 | — | 120 × 120 × 25 mm | No | 159 |
| 9RA1224E1001 | 9RA1224E1002 | ➤ 9RA1224E1001 | 9RA1224E1D001 | — | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1224E10011 | 9RA1224E10021 | ➤ 9RA1224E10011 | 9RA1224E1D0011 | — | 120 × 120 × 38 mm | No | 173 |
| 9RA1224E4001 | 9RA1224E4002 | ➤ 9RA1224E4001 | 9RA1224E4D001 | 9RA1224P4E001 | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1224E40011 | 9RA1224E40021 | ➤ 9RA1224E40011 | 9RA1224E4D0011 | 9RA1224P4E0011 | 120 × 120 × 25 mm | No | 159 |
| 9RA1224G1001 | 9RA1224G1002 | ➤ 9RA1224G1001 | 9RA1224G1D001 | — | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1224G10011 | 9RA1224G10021 | ➤ 9RA1224G10011 | 9RA1224G1D0011 | — | 120 × 120 × 38 mm | No | 173 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.
Note 2: The ➤ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|-------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9RA1224G4001 | 9RA1224G4002 | ☛ 9RA1224G4001 | 9RA1224G4D001 | | | |
| 9RA1224G40011 | 9RA1224G40021 | ☛ 9RA1224G40011 | 9RA1224G4D0011 | ☛ 9RA1224P4G0011 | 120 × 120 × 25 mm | No | 159 |
| 9RA1224H1001 | 9RA1224H1002 | ☛ 9RA1224H1001 | 9RA1224H1D001 | — | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1224H10011 | 9RA1224H10021 | ☛ 9RA1224H10011 | 9RA1224H1D0011 | — | 120 × 120 × 38 mm | No | 173 |
| 9RA1224H4001 | 9RA1224H4002 | ☛ 9RA1224H4001 | 9RA1224H4D001 | — | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1224H40011 | 9RA1224H40021 | ☛ 9RA1224H40011 | 9RA1224H4D0011 | — | 120 × 120 × 25 mm | No | 159 |
| 9RA1224M4001 | 9RA1224M4002 | ☛ 9RA1224M4001 | 9RA1224M4D001 | — | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1224M40011 | 9RA1224M40021 | ☛ 9RA1224M40011 | 9RA1224M4D0011 | — | 120 × 120 × 25 mm | No | 159 |
| 9RA1224P1K001 | 9RA1224K1002 | 9RA1224K1001 | 9RA1224K1D001 | ☛ 9RA1224P1K001 | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1224P1K0011 | 9RA1224K10021 | 9RA1224K10011 | 9RA1224K1D0011 | ☛ 9RA1224P1K0011 | 120 × 120 × 38 mm | No | 173 |
| 9RA1224P4G001 | 9RA1224G4002 | ☛ 9RA1224G4001 | 9RA1224G4D001 | ☛ 9RA1224P4G001 | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1224P4G0011 | 9RA1224G40021 | ☛ 9RA1224G40011 | 9RA1224G4D0011 | ☛ 9RA1224P4G0011 | 120 × 120 × 25 mm | No | 159 |
| 9RA1248A4001 | 9RA1248A4002 | ☛ 9RA1248A4001 | 9RA1248A4D001 | — | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1248A40011 | 9RA1248A40021 | ☛ 9RA1248A40011 | 9RA1248A4D0011 | — | 120 × 120 × 25 mm | No | 159 |
| 9RA1248E1001 | 9RA1248E1002 | ☛ 9RA1248E1001 | 9RA1248E1D001 | — | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1248E10011 | 9RA1248E10021 | ☛ 9RA1248E10011 | 9RA1248E1D0011 | — | 120 × 120 × 38 mm | No | 173 |
| 9RA1248E4001 | 9RA1248E4002 | ☛ 9RA1248E4001 | 9RA1248E4D001 | — | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1248E40011 | 9RA1248E40021 | ☛ 9RA1248E40011 | 9RA1248E4D0011 | — | 120 × 120 × 25 mm | No | 159 |
| 9RA1248G1001 | 9RA1248G1002 | ☛ 9RA1248G1001 | 9RA1248G1D001 | — | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1248G10011 | 9RA1248G10021 | ☛ 9RA1248G10011 | 9RA1248G1D0011 | — | 120 × 120 × 38 mm | No | 173 |
| 9RA1248G4001 | 9RA1248G4002 | ☛ 9RA1248G4001 | 9RA1248G4D001 | ☛ 9RA1248P4G001 | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1248G40011 | 9RA1248G40021 | ☛ 9RA1248G40011 | 9RA1248G4D0011 | ☛ 9RA1248P4G0011 | 120 × 120 × 25 mm | No | 159 |
| 9RA1248H1001 | 9RA1248H1002 | ☛ 9RA1248H1001 | 9RA1248H1D001 | — | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1248H10011 | 9RA1248H10021 | ☛ 9RA1248H10011 | 9RA1248H1D0011 | — | 120 × 120 × 38 mm | No | 173 |
| 9RA1248P1K001 | 9RA1248K1002 | 9RA1248K1001 | 9RA1248K1D001 | ☛ 9RA1248P1K001 | 120 × 120 × 38 mm | Yes | 173 |
| 9RA1248P1K0011 | 9RA1248K10021 | 9RA1248K10011 | 9RA1248K1D0011 | ☛ 9RA1248P1K0011 | 120 × 120 × 38 mm | No | 173 |
| 9RA1248P4G001 | 9RA1248G4002 | ☛ 9RA1248G4001 | 9RA1248G4D001 | ☛ 9RA1248P4G001 | 120 × 120 × 25 mm | Yes | 159 |
| 9RA1248P4G0011 | 9RA1248G40021 | ☛ 9RA1248G40011 | 9RA1248G4D0011 | ☛ 9RA1248P4G0011 | 120 × 120 × 25 mm | No | 159 |
| 9RA1412H1001 | — | ☛ 9RA1412H1001 | 9RA1412H1D001 | — | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1412H10011 | — | 9RA1412H10011 | 9RA1412H1D0011 | — | 140 × 140 × 38 mm | No | 184 |
| 9RA1412M1001 | — | ☛ 9RA1412M1001 | 9RA1412M1D001 | — | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1412M10011 | — | 9RA1412M10011 | 9RA1412M1D0011 | — | 140 × 140 × 38 mm | No | 184 |
| 9RA1412S1001 | — | ☛ 9RA1412S1001 | 9RA1412S1D001 | — | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1412S10011 | — | 9RA1412S10011 | 9RA1412S1D0011 | — | 140 × 140 × 38 mm | No | 184 |
| 9RA1412P1G001 | — | — | — | ☛ 9RA1412P1G001 | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1412P1G0011 | — | — | — | 9RA1412P1G0011 | 140 × 140 × 38 mm | No | 184 |
| 9RA1424H1001 | — | ☛ 9RA1424H1001 | 9RA1424H1D001 | — | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1424H10011 | — | 9RA1424H10011 | 9RA1424H1D0011 | — | 140 × 140 × 38 mm | No | 184 |
| 9RA1424M1001 | — | ☛ 9RA1424M1001 | 9RA1424M1D001 | — | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1424M10011 | — | 9RA1424M10011 | 9RA1424M1D0011 | — | 140 × 140 × 38 mm | No | 184 |
| 9RA1424S1001 | — | ☛ 9RA1424S1001 | 9RA1424S1D001 | — | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1424S10011 | — | 9RA1424S10011 | 9RA1424S1D0011 | — | 140 × 140 × 38 mm | No | 184 |
| 9RA1424P1G001 | — | — | — | ☛ 9RA1424P1G001 | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1424P1G0011 | — | — | — | 9RA1424P1G0011 | 140 × 140 × 38 mm | No | 184 |
| 9RA1448H1001 | — | ☛ 9RA1448H1001 | 9RA1448H1D001 | — | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1448H10011 | — | 9RA1448H10011 | 9RA1448H1D0011 | — | 140 × 140 × 38 mm | No | 184 |
| 9RA1448M1001 | — | ☛ 9RA1448M1001 | 9RA1448M1D001 | — | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1448M10011 | — | 9RA1448M10011 | 9RA1448M1D0011 | — | 140 × 140 × 38 mm | No | 184 |
| 9RA1448S1001 | — | ☛ 9RA1448S1001 | 9RA1448S1D001 | — | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1448S10011 | — | 9RA1448S10011 | 9RA1448S1D0011 | — | 140 × 140 × 38 mm | No | 184 |
| 9RA1448P1G001 | — | — | — | ☛ 9RA1448P1G001 | 140 × 140 × 38 mm | Yes | 184 |
| 9RA1448P1G0011 | — | — | — | 9RA1448P1G0011 | 140 × 140 × 38 mm | No | 184 |
| 9RF0912P1H001 | — | — | — | ☛ 9RF0912P1H001 | ∅92 × 38 mm | Yes | 248 |
| 9RF0924P1H001 | — | — | — | ☛ 9RF0924P1H001 | ∅92 × 38 mm | Yes | 248 |
| 9RF1312P3H601 | — | — | — | 9RF1312P3H601 | ∅136 × 28 mm | Yes | 254 |
| 9RFA1312P3G001 | — | — | — | ☛ 9RFA1312P3G001 | ∅136 × 28 mm | Yes | 251 |
| 9RFA1312P3H001 | — | — | — | ☛ 9RFA1312P3H001 | ∅136 × 28 mm | Yes | 251 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The ☛ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|--------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9RFA1324P3G001 | — | — | — | | | |
| 9RFA1324P3H001 | — | — | — | ➤ 9RFA1324P3H001 | ∅136 × 28 mm | Yes | 251 |
| 9S0612F401 | 9S0612F402 | ➤ 9S0612F401 | 9S0612F4D01 | 9S0612P4F01 | 60 × 60 × 25 mm | Yes | 73 |
| 9S0612F4011 | 9S0612F4021 | 9S0612F4011 | 9S0612F4D011 | 9S0612P4F011 | 60 × 60 × 25 mm | No | 73 |
| 9S0612H401 | 9S0612H402 | ➤ 9S0612H401 | 9S0612H4D01 | 9S0612P4H01 | 60 × 60 × 25 mm | Yes | 73 |
| 9S0612H4011 | 9S0612H4021 | 9S0612H4011 | 9S0612H4D011 | 9S0612P4H011 | 60 × 60 × 25 mm | No | 73 |
| 9S0612M401 | 9S0612M402 | ➤ 9S0612M401 | 9S0612M4D01 | 9S0612P4M01 | 60 × 60 × 25 mm | Yes | 73 |
| 9S0612M4011 | 9S0612M4021 | 9S0612M4011 | 9S0612M4D011 | — | 60 × 60 × 25 mm | No | 73 |
| 9S0612S401 | 9S0612S402 | ➤ 9S0612S401 | 9S0612S4D01 | ➤ 9S0612P4S01 | 60 × 60 × 25 mm | Yes | 73 |
| 9S0612S4011 | — | 9S0612S4011 | — | 9S0612P4S011 | 60 × 60 × 25 mm | No | 73 |
| 9S0812F401 | 9S0812F402 | ➤ 9S0812F401 | 9S0812F4D01 | ➤ 9S0812P4F01 | 80 × 80 × 25 mm | Yes | 103 |
| 9S0812F4011 | 9S0812F4021 | 9S0812F4011 | 9S0812F4D011 | 9S0812P4F011 | 80 × 80 × 25 mm | No | 103 |
| 9S0812H401 | 9S0812H402 | ➤ 9S0812H401 | 9S0812H4D01 | — | 80 × 80 × 25 mm | Yes | 103 |
| 9S0812H4011 | — | 9S0812H4011 | 9S0812H4D011 | — | 80 × 80 × 25 mm | No | 103 |
| 9S0812L401 | 9S0812L402 | ➤ 9S0812L401 | 9S0812L4D01 | — | 80 × 80 × 25 mm | Yes | 103 |
| 9S0812L4011 | 9S0812L4021 | 9S0812L4011 | 9S0812L4D011 | — | 80 × 80 × 25 mm | No | 103 |
| 9S0812M401 | 9S0812M402 | ➤ 9S0812M401 | 9S0812M4D01 | 9S0812P4M01 | 80 × 80 × 25 mm | Yes | 103 |
| 9S0812M4011 | 9S0812M4021 | 9S0812M4011 | 9S0812M4D011 | 9S0812P4M011 | 80 × 80 × 25 mm | No | 103 |
| 9S0824L401 | ➤ 9S0824L402 | ➤ 9S0824L401 | 9S0824L4D01 | — | 80 × 80 × 25 mm | Yes | 103 |
| 9S0824L4011 | 9S0824L4021 | 9S0824L4011 | 9S0824L4D011 | — | 80 × 80 × 25 mm | No | 103 |
| 9S0824M401 | 9S0824M402 | ➤ 9S0824M401 | 9S0824M4D01 | — | 80 × 80 × 25 mm | Yes | 103 |
| 9S0824M4011 | 9S0824M4021 | 9S0824M4011 | 9S0824M4D011 | — | 80 × 80 × 25 mm | No | 103 |
| 9S0912F401 | 9S0912F402 | ➤ 9S0912F401 | 9S0912F4D01 | ➤ 9S0912P4F01 | 92 × 92 × 25 mm | Yes | 136 |
| 9S0912F4011 | 9S0912F4021 | 9S0912F4011 | 9S0912F4D011 | 9S0912P4F011 | 92 × 92 × 25 mm | No | 136 |
| 9S0912L401 | 9S0912L402 | ➤ 9S0912L401 | 9S0912L4D01 | — | 92 × 92 × 25 mm | Yes | 136 |
| 9S0912L4011 | 9S0912L4021 | 9S0912L4011 | 9S0912L4D011 | — | 92 × 92 × 25 mm | No | 136 |
| 9S0912M401 | 9S0912M402 | ➤ 9S0912M401 | 9S0912M4D01 | 9S0912P4M01 | 92 × 92 × 25 mm | Yes | 136 |
| 9S0912M4011 | 9S0912M4021 | 9S0912M4011 | 9S0912M4D011 | 9S0912P4M011 | 92 × 92 × 25 mm | No | 136 |
| 9S0924F401 | 9S0924F402 | ➤ 9S0924F401 | 9S0924F4D01 | — | 92 × 92 × 25 mm | Yes | 136 |
| 9S0924F4011 | 9S0924F4021 | 9S0924F4011 | — | — | 92 × 92 × 25 mm | No | 136 |
| 9S0924L401 | 9S0924L402 | ➤ 9S0924L401 | 9S0924L4D01 | — | 92 × 92 × 25 mm | Yes | 136 |
| 9S0924L4011 | 9S0924L4021 | 9S0924L4011 | — | — | 92 × 92 × 25 mm | No | 136 |
| 9S0924M401 | 9S0924M402 | ➤ 9S0924M401 | 9S0924M4D01 | — | 92 × 92 × 25 mm | Yes | 136 |
| 9S0924M4011 | 9S0924M4021 | 9S0924M4011 | — | — | 92 × 92 × 25 mm | No | 136 |
| 9S1212F401 | 9S1212F402 | ➤ 9S1212F401 | 9S1212F4D01 | 9S1212P4F01 | 120 × 120 × 25 mm | Yes | 163 |
| 9S1212F4011 | 9S1212F4021 | 9S1212F4011 | 9S1212F4D011 | 9S1212P4F011 | 120 × 120 × 25 mm | No | 163 |
| 9S1212H401 | 9S1212H402 | ➤ 9S1212H401 | 9S1212H4D01 | ➤ 9S1212P4H01 | 120 × 120 × 25 mm | Yes | 163 |
| 9S1212H4011 | 9S1212H4021 | 9S1212H4011 | — | 9S1212P4H011 | 120 × 120 × 25 mm | No | 163 |
| 9S1212L401 | 9S1212L402 | ➤ 9S1212L401 | 9S1212L4D01 | — | 120 × 120 × 25 mm | Yes | 163 |
| 9S1212L4011 | 9S1212L4021 | 9S1212L4011 | 9S1212L4D011 | 9S1212P4L011 | 120 × 120 × 25 mm | No | 163 |
| 9S1212M401 | 9S1212M402 | ➤ 9S1212M401 | 9S1212M4D01 | 9S1212P4M01 | 120 × 120 × 25 mm | Yes | 163 |
| 9S1212M4011 | 9S1212M4021 | 9S1212M4011 | 9S1212M4D011 | 9S1212P4M011 | 120 × 120 × 25 mm | No | 163 |
| 9S1224M401 | ➤ 9S1224M402 | ➤ 9S1224M401 | 9S1224M4D01 | — | 120 × 120 × 25 mm | Yes | 163 |
| 9S1224M4011 | 9S1224M4021 | 9S1224M4011 | 9S1224M4D011 | — | 120 × 120 × 25 mm | No | 163 |
| 9SG5724P5H61 | 9SG5724H562 | — | — | ➤ 9SG5724P5H61 | ∅172 × 150 × 51 mm | No | 195 |
| 9SG5748P5G01 | — | — | — | ➤ 9SG5748P5G01 | ∅172 × 150 × 51 mm | No | 195 |
| 9SG5748P5H01 | — | 9SG5748H501 | — | ➤ 9SG5748P5H01 | ∅172 × 150 × 51 mm | No | 195 |
| 9SX1212P1K001 | — | — | — | 9SX1212P1K001 | 120 × 120 × 38 mm | No | 168 |
| 9TD12P6G001 | — | — | — | 9TD12P6G001 | ∅70 × 20 mm | No | 444 |
| 9TG24P0G01 | 9TG24G002 | 9TG24G001 | — | 9TG24P0G01 | ∅175 × 69 mm | — | 456 |
| 9TG24P0S01 | 9TG24S002 | 9TG24S001 | — | 9TG24P0S01 | ∅175 × 69 mm | — | 456 |
| 9TG48P0G01 | — | — | — | 9TG48P0G01 | ∅175 × 69 mm | — | 456 |
| 9TGA24P0H001 | — | — | — | ➤ 9TGA24P0H001 | ∅175 × 69 mm | — | 453 |
| 9TGA48P0G001 | — | — | — | ➤ 9TGA48P0G001 | ∅175 × 69 mm | — | 453 |
| 9TJ24P0H61 | — | — | — | 9TJ24P0H61 | ∅133 × 91 mm | — | 449 |
| 9TJ48P0H01 | — | — | — | 9TJ48P0H01 | ∅133 × 91 mm | — | 449 |
| 9TM24P4H01 | — | — | — | 9TM24P4H01 | ∅100 × 25 mm | — | 446 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.
Note 2: The ➤ mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "-" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|-------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| 9TM48P4H01 | 9TM48H402 | — | — | 9TM48P4H01 | ∅100 × 25 mm | — | 446 |
| 9TN24P1H01 | 9TN24H102 | — | — | 9TN24P1H01 | ∅150 × 35 mm | — | 451 |
| 9TN48P1H01 | — | — | — | 9TN48P1H01 | ∅150 × 35 mm | — | 451 |
| 9TP24P0H001 | — | — | — | ☛ 9TP24P0H001 | ∅221 × 71 mm | — | 459 |
| 9TP48P0G001 | 9TP48G0002 | — | — | ☛ 9TP48P0G001 | ∅221 × 71 mm | — | 459 |
| 9TP48P0H001 | — | — | — | ☛ 9TP48P0H001 | ∅221 × 71 mm | — | 459 |
| 9TS48P0G001 | — | — | — | ☛ 9TS48P0G001 | ∅225 × 99 mm | — | 462 |
| 9TS48P0H001 | — | — | — | ☛ 9TS48P0H001 | ∅225 × 99 mm | — | 462 |
| 9W1BM12P2H001 | — | — | — | 9W1BM12P2H001 | 97 × 33 mm | — | 350 |
| 9W1BM12P2M001 | — | — | — | 9W1BM12P2M001 | 97 × 33 mm | — | 350 |
| 9W1BM24P2H001 | — | — | 9W1BM24H2D001 | 9W1BM24P2H001 | 97 × 33 mm | — | 350 |
| 9W1BM24P2M001 | — | — | — | 9W1BM24P2M001 | 97 × 33 mm | — | 350 |
| 9W1TG48P0H61 | — | — | — | 9W1TG48P0H61 | ∅175 × 69 mm | — | 336 |
| 9W1TJ24P0H61 | — | — | — | 9W1TJ24P0H61 | ∅133 × 91 mm | — | 327 |
| 9W1TJ48P0H61 | — | — | — | 9W1TJ48P0H61 | ∅133 × 91 mm | — | 327 |
| 9W1TM48P4G01 | — | — | — | 9W1TM48P4G01 | ∅100 × 25 mm | — | 321 |
| 9W1TM48P4H01 | — | — | — | 9W1TM48P4H01 | ∅100 × 25 mm | — | 321 |
| 9W1TN48P1H01 | — | — | — | 9W1TN48P1H01 | ∅150 × 35 mm | — | 332 |
| 9W2TGA48P0G001 | — | — | — | 9W2TGA48P0G001 | ∅175 × 69 mm | — | 334 |
| 9W2TJ24P0H001 | — | — | — | 9W2TJ24P0H001 | ∅133 × 91 mm | — | 324 |
| 9W2TJ48P0H001 | — | — | — | 9W2TJ48P0H001 | ∅133 × 91 mm | — | 324 |
| 9W2TM24P4G001 | — | 9W2TM24G4001 | — | 9W2TM24P4G001 | ∅100 × 25 mm | — | 318 |
| 9W2TM24P4H001 | — | 9W2TM24H4001 | — | 9W2TM24P4H001 | ∅100 × 25 mm | — | 318 |
| 9W2TM48P4G001 | — | 9W2TM48G4001 | — | 9W2TM48P4G001 | ∅100 × 25 mm | — | 318 |
| 9W2TM48P4H001 | — | 9W2TM48H4001 | — | 9W2TM48P4H001 | ∅100 × 25 mm | — | 318 |
| 9W2TN24P1H001 | — | — | — | 9W2TN24P1H001 | ∅150 × 35 mm | — | 329 |
| 9W2TN48P1H001 | — | — | — | 9W2TN48P1H001 | ∅150 × 35 mm | — | 329 |
| 9W2TP24P0H001 | — | — | — | 9W2TP24P0H001 | ∅221 × 71 mm | — | 338 |
| 9W2TP48P0S001 | — | — | — | 9W2TP48P0S001 | ∅221 × 71 mm | — | 338 |
| 9W2TS48P0S001 | — | — | — | 9W2TS48P0S001 | ∅225 × 99 mm | — | 341 |
| 9WF0424H701 | 9WF0424H702 | 9WF0424H701 | 9WF0424H7D01 | — | 40 × 40 × 15 mm | Yes | 354 |
| 9WF0624H401 | 9WF0624H402 | 9WF0624H401 | 9WF0624H4D01 | — | 60 × 60 × 25 mm | Yes | 362 |
| 9WF0624H701 | 9WF0624H702 | 9WF0624H701 | 9WF0624H7D01 | — | 60 × 60 × 15 mm | Yes | 358 |
| 9WF0824S401 | 9WF0824S402 | 9WF0824S401 | 9WF0824S4D01 | — | 80 × 80 × 25 mm | Yes | 366 |
| 9WF1224H101 | 9WF1224H102 | 9WF1224H101 | 9WF1224H1D01 | — | 120 × 120 × 38 mm | Yes | 372 |
| 9WFA0424G6001 | 9WFA0424G6002 | 9WFA0424G6001 | 9WFA0424G6D001 | 9WFA0424P6G001 | 40 × 40 × 20 mm | Yes | 356 |
| 9WFA0624G6001 | 9WFA0624G6002 | 9WFA0624G6001 | 9WFA0624G6D001 | 9WFA0624P6G001 | 60 × 60 × 20 mm | Yes | 360 |
| 9WFA0824G6001 | 9WFA0824G6002 | 9WFA0824G6001 | 9WFA0824G6D001 | 9WFA0824P6G001 | 80 × 80 × 20 mm | Yes | 364 |
| 9WFA0924G2001 | 9WFA0924G2002 | 9WFA0924G2001 | 9WFA0924G2D001 | 9WFA0924P2G001 | 92 × 92 × 32 mm | Yes | 370 |
| 9WFA0924G4001 | — | 9WFA0924G4001 | — | 9WFA0924P4G001 | 92 × 92 × 25 mm | Yes | 368 |
| 9WFA0924G40011 | — | 9WFA0924G40011 | — | 9WFA0924P4G0011 | 92 × 92 × 25 mm | No | 368 |
| 9WFA0924H4001 | — | 9WFA0924H4001 | — | 9WFA0924P4H001 | 92 × 92 × 25 mm | Yes | 368 |
| 9WFA0924H40011 | — | 9WFA0924H40011 | — | 9WFA0924P4H0011 | 92 × 92 × 25 mm | No | 368 |
| 9WG1212E101-E | 9WG1212E102-E | 9WG1212E101-E | 9WG1212E1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1212F101-E | 9WG1212F102-E | 9WG1212F101-E | 9WG1212F1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1212G101-E | 9WG1212G102-E | 9WG1212G101-E | 9WG1212G1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1212H101-E | 9WG1212H102-E | 9WG1212H101-E | 9WG1212H1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1212M101-E | 9WG1212M102-E | 9WG1212M101-E | 9WG1212M1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1224E101-E | 9WG1224E102-E | 9WG1224E101-E | 9WG1224E1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1224F101-E | 9WG1224F102-E | 9WG1224F101-E | 9WG1224F1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1224G101-E | 9WG1224G102-E | 9WG1224G101-E | 9WG1224G1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1224H101-E | 9WG1224H102-E | 9WG1224H101-E | 9WG1224H1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1224M101-E | 9WG1224M102-E | 9WG1224M101-E | 9WG1224M1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1248E101-E | 9WG1248E102-E | 9WG1248E101-E | 9WG1248E1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1248F101-E | 9WG1248F102-E | 9WG1248F101-E | 9WG1248F1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1248G101-E | 9WG1248G102-E | 9WG1248G101-E | 9WG1248G1D01-E | — | 120 × 120 × 38 mm | No | 299 |
| 9WG1248H101-E | 9WG1248H102-E | 9WG1248H101-E | 9WG1248H1D01-E | — | 120 × 120 × 38 mm | No | 299 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The ☛ mark indicates Short Lead Time Service applicable models. See p. 668 for details.


| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|--------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9WG1248M101-E | 9WG1248M102-E | 9WG1248M101-E | 9WG1248M1D01-E | | | |
| 9WG5748P5G001 | 9WG5748G5002 | — | — | 9WG5748P5G001 | Ø172 × 150 × 51 mm | No | 315 |
| 9WG5748P5H001 | 9WG5748H5002 | 9WG5748H5001 | 9WG5748H5D001 | 9WG5748P5H001 | Ø172 × 150 × 51 mm | No | 315 |
| 9WL0412P3G001 | 9WL0412G3002 | 9WL0412G3001 | 9WL0412G3D001 | 9WL0412P3G001 | 40 × 40 × 28 mm | No | 266 |
| 9WL0412P3J001 | 9WL0412J3002 | 9WL0412J3001 | — | 9WL0412P3J001 | 40 × 40 × 28 mm | No | 266 |
| 9WL0424P3G001 | 9WL0424G3002 | 9WL0424G3001 | — | 9WL0424P3G001 | 40 × 40 × 28 mm | No | 266 |
| 9WL0424P3J001 | 9WL0424J3002 | 9WL0424J3001 | — | 9WL0424P3J001 | 40 × 40 × 28 mm | No | 266 |
| 9WL0612P4H001 | 9WL0612H4002 | — | 9WL0612H4D001 | 9WL0612P4H001 | 60 × 60 × 25 mm | No | 272 |
| 9WL0612P4J001 | 9WL0612J4002 | — | 9WL0612J4D001 | 9WL0612P4J001 | 60 × 60 × 25 mm | No | 272 |
| 9WL0612P4S001 | 9WL0612S4002 | — | 9WL0612S4D001 | 9WL0612P4S001 | 60 × 60 × 25 mm | No | 272 |
| 9WL0624P4H001 | — | 9WL0624H4001 | — | 9WL0624P4H001 | 60 × 60 × 25 mm | No | 272 |
| 9WL0624P4J001 | — | — | 9WL0624J4D001 | 9WL0624P4J001 | 60 × 60 × 25 mm | No | 272 |
| 9WL0624P4S001 | 9WL0624S4002 | 9WL0624S4001 | — | 9WL0624P4S001 | 60 × 60 × 25 mm | No | 272 |
| 9WL0812L4001 | 9WL0812L4002 | 9WL0812L4001 | — | — | 80 × 80 × 25 mm | No | 278 |
| 9WL0812P4G001 | — | — | 9WL0812G4D001 | 9WL0812P4G001 | 80 × 80 × 25 mm | No | 278 |
| 9WL0812P4H001 | 9WL0812H4002 | 9WL0812H4001 | 9WL0812H4D001 | 9WL0812P4H001 | 80 × 80 × 25 mm | No | 278 |
| 9WL0812P4J001 | — | — | — | 9WL0812P4J001 | 80 × 80 × 25 mm | No | 278 |
| 9WL0824F4001 | 9WL0824F4002 | 9WL0824F4001 | — | — | 80 × 80 × 25 mm | No | 278 |
| 9WL0824L4001 | 9WL0824L4002 | 9WL0824L4001 | — | — | 80 × 80 × 25 mm | No | 278 |
| 9WL0824P4G001 | — | — | — | 9WL0824P4G001 | 80 × 80 × 25 mm | No | 278 |
| 9WL0824P4H001 | 9WL0824H4002 | 9WL0824H4001 | 9WL0824H4D001 | 9WL0824P4H001 | 80 × 80 × 25 mm | No | 278 |
| 9WL0824P4J001 | 9WL0824J4002 | — | — | 9WL0824P4J001 | 80 × 80 × 25 mm | No | 278 |
| 9WL0912M4001 | 9WL0912M4002 | 9WL0912M4001 | — | — | 92 × 92 × 25 mm | No | 287 |
| 9WL0912P1F001 | — | — | — | 9WL0912P1F001 | 92 × 92 × 38 mm | No | 291 |
| 9WL0912P1H001 | — | — | — | 9WL0912P1H001 | 92 × 92 × 38 mm | No | 291 |
| 9WL0912P4G001 | — | — | — | 9WL0912P4G001 | 92 × 92 × 25 mm | No | 287 |
| 9WL0912P4H001 | 9WL0912H4002 | 9WL0912H4001 | 9WL0912H4D001 | 9WL0912P4H001 | 92 × 92 × 25 mm | No | 287 |
| 9WL0912P4J001 | 9WL0912J4002 | — | — | 9WL0912P4J001 | 92 × 92 × 25 mm | No | 287 |
| 9WL0912P4S001 | — | — | — | 9WL0912P4S001 | 92 × 92 × 25 mm | No | 287 |
| 9WL0924F4001 | 9WL0924F4002 | 9WL0924F4001 | — | — | 92 × 92 × 25 mm | No | 287 |
| 9WL0924M4001 | 9WL0924M4002 | 9WL0924M4001 | 9WL0924M4D001 | — | 92 × 92 × 25 mm | No | 287 |
| 9WL0924P1F001 | 9WL0924F1002 | — | — | 9WL0924P1F001 | 92 × 92 × 38 mm | No | 291 |
| 9WL0924P1H001 | — | — | 9WL0924H1D001 | 9WL0924P1H001 | 92 × 92 × 38 mm | No | 291 |
| 9WL0924P4H001 | 9WL0924H4002 | 9WL0924H4001 | 9WL0924H4D001 | 9WL0924P4H001 | 92 × 92 × 25 mm | No | 287 |
| 9WL0924P4J001 | — | — | 9WL0924J4D001 | 9WL0924P4J001 | 92 × 92 × 25 mm | No | 287 |
| 9WL0924P4S001 | — | — | — | 9WL0924P4S001 | 92 × 92 × 25 mm | No | 287 |
| 9WL0948P1F601 | — | — | — | 9WL0948P1F601 | 92 × 92 × 38 mm | No | 291 |
| 9WL0948P1H601 | — | — | — | 9WL0948P1H601 | 92 × 92 × 38 mm | No | 291 |
| 9WL1412P1A001 | — | — | — | 9WL1412P1A001 | 140 × 140 × 38 mm | No | 305 |
| 9WL1412P1H001 | — | — | — | 9WL1412P1H001 | 140 × 140 × 38 mm | No | 305 |
| 9WL1412P1M001 | 9WL1412M1002 | 9WL1412M1001 | 9WL1412M1D001 | 9WL1412P1M001 | 140 × 140 × 38 mm | No | 305 |
| 9WL1412A5001 | 9WL1412A5002 | 9WL1412A5001 | 9WL1412A5D001 | — | 140 × 140 × 51 mm | No | 310 |
| 9WL1412H5001 | 9WL1412H5002 | 9WL1412H5001 | 9WL1412H5D001 | — | 140 × 140 × 51 mm | No | 310 |
| 9WL1412M5001 | 9WL1412M5002 | 9WL1412M5001 | 9WL1412M5D001 | — | 140 × 140 × 51 mm | No | 310 |
| 9WL1412P5G001 | — | — | 9WL1412G5D001 | 9WL1412P5G001 | 140 × 140 × 51 mm | No | 310 |
| 9WL1412P5S001 | — | — | — | 9WL1412P5S001 | 140 × 140 × 51 mm | No | 310 |
| 9WL1424P1A001 | — | — | — | 9WL1424P1A001 | 140 × 140 × 38 mm | No | 305 |
| 9WL1424P1H001 | — | — | — | 9WL1424P1H001 | 140 × 140 × 38 mm | No | 305 |
| 9WL1424P1M001 | 9WL1424M1002 | 9WL1424M1001 | 9WL1424M1D001 | 9WL1424P1M001 | 140 × 140 × 38 mm | No | 305 |
| 9WL1424A5001 | 9WL1424A5002 | 9WL1424A5001 | 9WL1424A5D001 | — | 140 × 140 × 51 mm | No | 310 |
| 9WL1424H5001 | 9WL1424H5002 | 9WL1424H5001 | 9WL1424H5D001 | — | 140 × 140 × 51 mm | No | 310 |
| 9WL1424M5001 | 9WL1424M5002 | 9WL1424M5001 | 9WL1424M5D001 | — | 140 × 140 × 51 mm | No | 310 |
| 9WL1424P5G001 | — | 9WL1424G5001 | 9WL1424G5D001 | 9WL1424P5G001 | 140 × 140 × 51 mm | No | 310 |
| 9WL1424P5S001 | — | — | — | 9WL1424P5S001 | 140 × 140 × 51 mm | No | 310 |
| 9WL1448A5001 | 9WL1448A5002 | 9WL1448A5001 | 9WL1448A5D001 | — | 140 × 140 × 51 mm | No | 310 |
| 9WL1448H5001 | 9WL1448H5002 | 9WL1448H5001 | 9WL1448H5D001 | — | 140 × 140 × 51 mm | No | 310 |
| 9WL1448L1001 | 9WL1448L1002 | 9WL1448L1001 | 9WL1448L1D001 | — | 140 × 140 × 38 mm | No | 305 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The 🚚 mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | | Frame size | Rib | page |
|--------------------------------|---|-------------------|------------------|-----------------------------------|-------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| 9WL1448M5001 | 9WL1448M5002 | 9WL1448M5001 | 9WL1448M5D001 | — | 140 × 140 × 51 mm | No | 310 |
| 9WL1448P1A001 | — | — | — | 9WL1448P1A001 | 140 × 140 × 38 mm | No | 305 |
| 9WL1448P1H001 | — | — | — | 9WL1448P1H001 | 140 × 140 × 38 mm | No | 305 |
| 9WL1448P1M001 | 9WL1448M1002 | 9WL1448M1001 | 9WL1448M1D001 | 9WL1448P1M001 | 140 × 140 × 38 mm | No | 305 |
| 9WL1448P5G001 | — | — | — | 9WL1448P5G001 | 140 × 140 × 51 mm | No | 310 |
| 9WL1448P5S001 | — | — | — | 9WL1448P5S001 | 140 × 140 × 51 mm | No | 310 |
| 9WP0412F6001 | 9WP0412F6002 | 9WP0412F6001 | 9WP0412F6D001 | — | 40 × 40 × 20 mm | Yes | 261 |
| 9WP0412H6001 | 9WP0412H6002 | 9WP0412H6001 | — | — | 40 × 40 × 20 mm | Yes | 261 |
| 9WP1212H101 | 9WP1212H102 | 9WP1212H101 | 9WP1212H1D01 | — | 120 × 120 × 38 mm | Yes | 302 |
| 9WP1212H1011 | 9WP1212H1021 | 9WP1212H1011 | 9WP1212H1D011 | — | 120 × 120 × 38 mm | No | 302 |
| 9WP1212L101 | 9WP1212L102 | 9WP1212L101 | — | — | 120 × 120 × 38 mm | Yes | 302 |
| 9WP1212L1011 | — | 9WP1212L1011 | — | — | 120 × 120 × 38 mm | No | 302 |
| 9WP1212M101 | 9WP1212M102 | 9WP1212M101 | — | — | 120 × 120 × 38 mm | Yes | 302 |
| 9WP1212M1011 | 9WP1212M1021 | 9WP1212M1011 | — | — | 120 × 120 × 38 mm | No | 302 |
| 9WP1224H101 | 9WP1224H102 | 9WP1224H101 | 9WP1224H1D01 | — | 120 × 120 × 38 mm | Yes | 302 |
| 9WP1224H1011 | 9WP1224H1021 | 9WP1224H1011 | 9WP1224H1D011 | — | 120 × 120 × 38 mm | No | 302 |
| 9WP1224M101 | 9WP1224M102 | 9WP1224M101 | — | — | 120 × 120 × 38 mm | Yes | 302 |
| 9WP1224M1011 | 9WP1224M1021 | 9WP1224M1011 | — | — | 120 × 120 × 38 mm | No | 302 |
| 9WP1248H101 | 9WP1248H102 | 9WP1248H101 | 9WP1248H1D01 | — | 120 × 120 × 38 mm | Yes | 302 |
| 9WP1248H1011 | 9WP1248H1021 | 9WP1248H1011 | 9WP1248H1D011 | — | 120 × 120 × 38 mm | No | 302 |
| 9WP1248M101 | 9WP1248M102 | 9WP1248M101 | 9WP1248M1D01 | — | 120 × 120 × 38 mm | Yes | 302 |
| 9WP1248M1011 | 9WP1248M1021 | 9WP1248M1011 | 9WP1248M1D011 | — | 120 × 120 × 38 mm | No | 302 |
| 9WPA0412H3001 | 9WPA0412H3002 | 9WPA0412H3001 | — | — | 40 × 40 × 28 mm | Yes | 263 |
| 9WPA0412H30011 | 9WPA0412H30021 | 9WPA0412H30011 | — | — | 40 × 40 × 28 mm | No | 263 |
| 9WPA0412H6001 | 9WPA0412H6002 | 9WPA0412H6001 | — | — | 40 × 40 × 20 mm | Yes | 258 |
| 9WPA0412P3G001 | — | — | — | 9WPA0412P3G001 | 40 × 40 × 28 mm | Yes | 263 |
| 9WPA0412P3G0011 | — | — | — | 9WPA0412P3G0011 | 40 × 40 × 28 mm | No | 263 |
| 9WPA0412P6G001 | — | — | — | 9WPA0412P6G001 | 40 × 40 × 20 mm | Yes | 258 |
| 9WPA0424H3001 | 9WPA0424H3002 | 9WPA0424H3001 | — | — | 40 × 40 × 28 mm | Yes | 263 |
| 9WPA0424H30011 | 9WPA0424H30021 | 9WPA0424H30011 | — | — | 40 × 40 × 28 mm | No | 263 |
| 9WPA0424H6001 | 9WPA0424H6002 | 9WPA0424H6001 | — | — | 40 × 40 × 20 mm | Yes | 258 |
| 9WPA0424P3G001 | — | — | — | 9WPA0424P3G001 | 40 × 40 × 28 mm | Yes | 263 |
| 9WPA0424P3G0011 | — | — | — | 9WPA0424P3G0011 | 40 × 40 × 28 mm | No | 263 |
| 9WPA0424P6G001 | — | — | — | 9WPA0424P6G001 | 40 × 40 × 20 mm | Yes | 258 |
| 9WPA0612M4001 | 9WPA0612M4002 | 9WPA0612M4001 | — | — | 60 × 60 × 25 mm | Yes | 269 |
| 9WPA0612M40011 | 9WPA0612M40021 | 9WPA0612M40011 | — | — | 60 × 60 × 25 mm | No | 269 |
| 9WPA0612P4G001 | 9WPA0612G4002 | 9WPA0612G4001 | 9WPA0612G4D001 | 9WPA0612P4G001 | 60 × 60 × 25 mm | Yes | 269 |
| 9WPA0612P4G0011 | — | — | — | 9WPA0612P4G0011 | 60 × 60 × 25 mm | No | 269 |
| 9WPA0612P4H001 | 9WPA0612H4002 | 9WPA0612H4001 | — | 9WPA0612P4H001 | 60 × 60 × 25 mm | Yes | 269 |
| 9WPA0612P4H0011 | — | 9WPA0612H40011 | — | 9WPA0612P4H0011 | 60 × 60 × 25 mm | No | 269 |
| 9WPA0624M4001 | 9WPA0624M4002 | 9WPA0624M4001 | 9WPA0624M4D001 | — | 60 × 60 × 25 mm | Yes | 269 |
| 9WPA0624M40011 | 9WPA0624M40021 | 9WPA0624M40011 | 9WPA0624M4D0011 | — | 60 × 60 × 25 mm | No | 269 |
| 9WPA0624P4G001 | 9WPA0624G4002 | 9WPA0624G4001 | 9WPA0624G4D001 | 9WPA0624P4G001 | 60 × 60 × 25 mm | Yes | 269 |
| 9WPA0624P4G0011 | — | — | — | 9WPA0624P4G0011 | 60 × 60 × 25 mm | No | 269 |
| 9WPA0624S4001 | 9WPA0624S4002 | 9WPA0624S4001 | — | — | 60 × 60 × 25 mm | Yes | 269 |
| 9WPA0624S40011 | — | 9WPA0624S40011 | — | — | 60 × 60 × 25 mm | No | 269 |
| 9WPA0812P4G001 | 9WPA0812G4002 | 9WPA0812G4001 | 9WPA0812G4D001 | 9WPA0812P4G001 | 80 × 80 × 25 mm | Yes | 275 |
| 9WPA0812P4G0011 | — | — | — | 9WPA0812P4G0011 | 80 × 80 × 25 mm | No | 275 |
| 9WPA0812P4S001 | 9WPA0812S4002 | 9WPA0812S4001 | — | 9WPA0812P4S001 | 80 × 80 × 25 mm | Yes | 275 |
| 9WPA0812P4S0011 | 9WPA0812S40021 | 9WPA0812S40011 | — | 9WPA0812P4S0011 | 80 × 80 × 25 mm | No | 275 |
| 9WPA0824H4001 | 9WPA0824H4002 | 9WPA0824H4001 | — | — | 80 × 80 × 25 mm | Yes | 275 |
| 9WPA0824H40011 | 9WPA0824H40021 | 9WPA0824H40011 | — | — | 80 × 80 × 25 mm | No | 275 |
| 9WPA0824P4G001 | 9WPA0824G4002 | 9WPA0824G4001 | 9WPA0824G4D001 | 9WPA0824P4G001 | 80 × 80 × 25 mm | Yes | 275 |
| 9WPA0824P4G0011 | — | — | — | 9WPA0824P4G0011 | 80 × 80 × 25 mm | No | 275 |
| 9WPA0912P4G001 | 9WPA0912G4002 | 9WPA0912G4001 | 9WPA0912G4D001 | 9WPA0912P4G001 | 92 × 92 × 25 mm | Yes | 284 |
| 9WPA0912P4G0011 | — | — | — | 9WPA0912P4G0011 | 92 × 92 × 25 mm | No | 284 |
| 9WPA0924B4001 | 9WPA0924B4002 | 9WPA0924B4001 | 9WPA0924B4D001 | — | 92 × 92 × 25 mm | Yes | 284 |

Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The  mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "-" models.) | | | | Frame size | Rib | page |
|-----------------------------------|---|-------------------|------------------|--------------------------------------|-------------------|-----|------|
| | Without sensor | With pulse sensor | With lock sensor | With PWM control and pulse sensor | | | |
| | 9WPA0924B40011 | 9WPA0924B40021 | 9WPA0924B40011 | 9WPA0924B4D0011 | | | |
| 9WPA0924F4001 | 9WPA0924F4002 | 9WPA0924F4001 | 9WPA0924F4D001 | — | 92 × 92 × 25 mm | Yes | 284 |
| 9WPA0924F40011 | 9WPA0924F40021 | 9WPA0924F40011 | 9WPA0924F4D0011 | — | 92 × 92 × 25 mm | No | 284 |
| 9WPA0924H4001 | 9WPA0924H4002 | 9WPA0924H4001 | 9WPA0924H4D001 | — | 92 × 92 × 25 mm | Yes | 284 |
| 9WPA0924H40011 | | 9WPA0924H40011 | — | — | 92 × 92 × 25 mm | No | 284 |
| 9WPA0924P4G001 | 9WPA0924G4002 | 9WPA0924G4001 | 9WPA0924G4D001 | 9WPA0924P4G001 | 92 × 92 × 25 mm | Yes | 284 |
| 9WPA0924P4G0011 | — | — | — | 9WPA0924P4G0011 | 92 × 92 × 25 mm | No | 284 |
| 9WPA0924S4001 | 9WPA0924S4002 | 9WPA0924S4001 | 9WPA0924S4D001 | — | 92 × 92 × 25 mm | Yes | 284 |
| 9WPA0924S40011 | — | 9WPA0924S40011 | — | — | 92 × 92 × 25 mm | No | 284 |
| 9WV0812P1M001 | — | 9WV0812M1001 | 9WV0812M1D001 | 9WV0812P1M001 | 80 × 80 × 38 mm | Yes | 282 |
| 9WV0812P1M0011 | — | — | — | 9WV0812P1M0011 | 80 × 80 × 38 mm | No | 282 |
| 9WV0848P1H001 | — | — | — | 9WV0848P1H001 | 80 × 80 × 38 mm | Yes | 282 |
| 9WV0848P1H0011 | — | — | — | 9WV0848P1H0011 | 80 × 80 × 38 mm | No | 282 |
| 9WV0924P1H001 | 9WV0924H1002 | — | 9WV0924H1D001 | 9WV0924P1H001 | 92 × 92 × 38 mm | Yes | 294 |
| 9WV0948P1H001 | — | — | — | 9WV0948P1H001 | 92 × 92 × 38 mm | Yes | 294 |
| 9WV1212P1J001 | 9WV1212J1002 | — | 9WV1212J1D001 | 9WV1212P1J001 | 120 × 120 × 38 mm | No | 296 |
| 9WV1224P1H001 | 9WV1224H102 | 9WV1224H101 | 9WV1224H1D001 | 9WV1224P1H001 | 120 × 120 × 38 mm | No | 296 |
| 9WV1224P1J601 | 9WV1224J1002 | 9WV1224J1001 | — | 9WV1224P1J601 | 120 × 120 × 38 mm | No | 296 |
| 9WV1248P1J001 | 9WV1248J1002 | 9WV1248J1001 | 9WV1248J1D001 | 9WV1248P1J001 | 120 × 120 × 38 mm | No | 296 |


Note 1: For compliance with standards, see individual product pages. Please contact your point of sale regarding low-speed sensors.

Note 2: The 📦 mark indicates Short Lead Time Service applicable models. See p. 668 for details.

Model Index in Ascending Order - ACDC Fans

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "—" models.) | | | Frame size | Rib | Set model no. | page |
|--------------------------------|---|-----------------------|-----------------------------------|--------------------|-----|----------------|------|
| | Without sensor | With low-speed sensor | With PWM control and pulse sensor | | | | |
| 9AD0901H12 | 9AD0901H12 | 9AD0901H1H | — | 92 × 92 × 38 mm | Yes | ST1-9AD0901H12 | 496 |
| 9AD0901H121 | 9AD0901H121 | 9AD0901H1H1 | — | 92 × 92 × 38 mm | No | — | 496 |
| 9AD0901H1H | 9AD0901H12 | 9AD0901H1H | — | 92 × 92 × 38 mm | Yes | ST1-9AD0901H1H | 496 |
| 9AD0901H1H1 | 9AD0901H121 | 9AD0901H1H1 | — | 92 × 92 × 38 mm | No | — | 496 |
| 9AD0901M12 | 9AD0901M12 | 9AD0901M1H | — | 92 × 92 × 38 mm | Yes | ST1-9AD0901M12 | 496 |
| 9AD0901M121 | 9AD0901M121 | 9AD0901M1H1 | — | 92 × 92 × 38 mm | No | — | 496 |
| 9AD0901M1H | 9AD0901M12 | 9AD0901M1H | — | 92 × 92 × 38 mm | Yes | ST1-9AD0901M1H | 496 |
| 9AD0901M1H1 | 9AD0901M121 | 9AD0901M1H1 | — | 92 × 92 × 38 mm | No | — | 496 |
| 9AD1201H12 | 9AD1201H12 | 9AD1201H1H | — | 120 × 120 × 38 mm | Yes | ST1-9AD1201H12 | 505 |
| 9AD1201H121 | 9AD1201H121 | 9AD1201H1H1 | — | 120 × 120 × 38 mm | No | — | 505 |
| 9AD1201H1H | 9AD1201H12 | 9AD1201H1H | — | 120 × 120 × 38 mm | Yes | ST1-9AD1201H1H | 505 |
| 9AD1201H1H1 | 9AD1201H121 | 9AD1201H1H1 | — | 120 × 120 × 38 mm | No | — | 505 |
| 9AD1601H5002 | 9AD1601H5002 | — | — | 160 × 160 × 51 mm | No | — | 508 |
| 9AD1601H5H001 | — | 9AD1601H5H001 | — | 160 × 160 × 51 mm | No | — | 508 |
| 9AD1601H5HT01 | — | 9AD1601H5HT01 | — | 160 × 160 × 51 mm | No | — | 508 |
| 9AD1601H5T02 | 9AD1601H5T02 | — | — | 160 × 160 × 51 mm | No | — | 508 |
| 9AD1601P5H003 | — | — | 9AD1601P5H003 | 160 × 160 × 51 mm | No | — | 508 |
| 9AD1601P5HT03 | — | — | 9AD1601P5HT03 | 160 × 160 × 51 mm | No | — | 508 |
| 9AD5701H5002 | 9AD5701H5002 | — | — | ∅172 × 150 × 51 mm | No | — | 516 |
| 9AD5701H5H001 | — | 9AD5701H5H001 | — | ∅172 × 150 × 51 mm | No | — | 516 |
| 9AD5701H5HT01 | — | 9AD5701H5HT01 | — | ∅172 × 150 × 51 mm | No | — | 516 |
| 9AD5701H5T02 | 9AD5701H5T02 | — | — | ∅172 × 150 × 51 mm | No | — | 516 |
| 9AD5701P5H003 | 9AD5701H5002 | 9AD5701H5H001 | 9AD5701P5H003 | ∅172 × 150 × 51 mm | No | — | 516 |
| 9AD5701P5HT03 | 9AD5701H5T02 | 9AD5701H5HT01 | 9AD5701P5HT03 | ∅172 × 150 × 51 mm | No | — | 516 |
| 9ADA1201G1002 | 9ADA1201G1002 | 9ADA1201G1H001 | — | 120 × 120 × 38 mm | Yes | — | 499 |
| 9ADA1201G10021 | 9ADA1201G10021 | 9ADA1201G1H0011 | — | 120 × 120 × 38 mm | No | — | 499 |
| 9ADA1201G1H001 | 9ADA1201G1002 | 9ADA1201G1H001 | — | 120 × 120 × 38 mm | Yes | — | 499 |
| 9ADA1201G1H0011 | 9ADA1201G10021 | 9ADA1201G1H0011 | — | 120 × 120 × 38 mm | No | — | 499 |
| 9ADA1201H1002 | 9ADA1201H1002 | 9ADA1201H1H001 | — | 120 × 120 × 38 mm | Yes | — | 499 |
| 9ADA1201H10021 | 9ADA1201H10021 | 9ADA1201H0011 | — | 120 × 120 × 38 mm | No | — | 499 |
| 9ADA1201P1G001 | — | — | 9ADA1201P1G001 | 120 × 120 × 38 mm | Yes | — | 499 |
| 9ADA1201P1G0011 | — | — | 9ADA1201P1G0011 | 120 × 120 × 38 mm | No | — | 499 |
| 9ADAW1201H1002 | 9ADAW1201H1002 | — | — | 120 × 120 × 38 mm | Yes | — | 502 |
| 9ADAW1201H10021 | 9ADAW1201H10021 | — | — | 120 × 120 × 38 mm | No | — | 502 |
| 9ADAW1201H1H001 | — | 9ADAW1201H1H001 | — | 120 × 120 × 38 mm | Yes | — | 502 |
| 9ADAW1201H1H0011 | — | 9ADAW1201H1H0011 | — | 120 × 120 × 38 mm | No | — | 502 |
| 9ADAW1201P1H001 | — | — | 9ADAW1201P1H001 | 120 × 120 × 38 mm | Yes | — | 502 |
| 9ADAW1201P1H0011 | — | — | 9ADAW1201P1H0011 | 120 × 120 × 38 mm | No | — | 502 |
| 9ADB1TS11P0F001 | — | — | 9ADB1TS11P0F001 | 270 × 270 × 119 mm | — | — | 542 |
| 9ADB1TS11P0G001 | — | — | 9ADB1TS11P0G001 | 270 × 270 × 119 mm | — | — | 542 |
| 9ADB1TS23P0F001 | — | — | 9ADB1TS23P0F001 | 270 × 270 × 119 mm | — | — | 542 |
| 9ADB1TS23P0G001 | — | — | 9ADB1TS23P0G001 | 270 × 270 × 119 mm | — | — | 542 |
| 9ADB1W1TS11P0H001 | — | — | 9ADB1W1TS11P0H001 | 270 × 270 × 119 mm | — | — | 545 |
| 9ADB1W1TS11P0M001 | — | — | 9ADB1W1TS11P0M001 | 270 × 270 × 119 mm | — | — | 545 |
| 9ADB1W1TS23P0H001 | — | — | 9ADB1W1TS23P0H001 | 270 × 270 × 119 mm | — | — | 545 |
| 9ADB1W1TS23P0M001 | — | — | 9ADB1W1TS23P0M001 | 270 × 270 × 119 mm | — | — | 545 |
| 9ADTS11P0F001 | — | — | 9ADTS11P0F001 | ∅225 × 99 mm | — | — | 530 |
| 9ADTS11P0G001 | — | — | 9ADTS11P0G001 | ∅225 × 99 mm | — | — | 530 |
| 9ADTS23P0F001 | — | — | 9ADTS23P0F001 | ∅225 × 99 mm | — | — | 530 |
| 9ADTS23P0G001 | — | — | 9ADTS23P0G001 | ∅225 × 99 mm | — | — | 530 |
| 9ADTU11P0G001 | — | — | 9ADTU11P0G001 | ∅190 × 88 mm | — | — | 524 |
| 9ADTU23P0G001 | — | — | 9ADTU23P0G001 | ∅190 × 88 mm | — | — | 524 |
| 9ADTV11P0G001 | — | — | 9ADTV11P0G001 | ∅250 × 99 mm | — | — | 536 |
| 9ADTV23P0G001 | — | — | 9ADTV23P0G001 | ∅250 × 99 mm | — | — | 536 |
| 9ADW1601H5002 | 9ADW1601H5002 | 9ADW1601H5H001 | 9ADW1601P5H003 | 160 × 160 × 51 mm | No | — | 512 |
| 9ADW1601H5H001 | 9ADW1601H5002 | 9ADW1601H5H001 | 9ADW1601P5H003 | 160 × 160 × 51 mm | No | — | 512 |
| 9ADW1601H5HT01 | 9ADW1601H5T02 | 9ADW1601H5HT01 | 9ADW1601P5HT03 | 160 × 160 × 51 mm | No | — | 512 |

Note 1: For compliance with standards, see individual product pages.

Note 2: The  mark indicates Short Lead Time Service applicable models. See p. 668 for details.

| Models listed in product pages | List of models (The models listed on the right of the models listed in product pages are option models. Option models may not necessarily comply with the same standards as the models listed in product pages. Contact us for details of the "-" models.) | | | Frame size | Rib | Set model no. | page |
|--------------------------------|---|-----------------------|-----------------------------------|--------------------|-----|---------------|------|
| | Without sensor | With low-speed sensor | With PWM control and pulse sensor | | | | |
| 9ADW1601H5T02 | 9ADW1601H5T02 | 9ADW1601H5HT01 | 9ADW1601P5HT03 | 160 × 160 × 51 mm | No | — | 512 |
| 9ADW1601P5H003 | 9ADW1601H5002 | 9ADW1601H5H001 | 9ADW1601P5H003 | 160 × 160 × 51 mm | No | — | 512 |
| 9ADW1601P5HT03 | 9ADW1601H5T02 | 9ADW1601H5HT01 | 9ADW1601P5HT03 | 160 × 160 × 51 mm | No | — | 512 |
| 9ADW1TS11P0H001 | — | — | 9ADW1TS11P0H001 | ∅225 × 99 mm | — | — | 533 |
| 9ADW1TS11P0M001 | — | — | 9ADW1TS11P0M001 | ∅225 × 99 mm | — | — | 533 |
| 9ADW1TS23P0H001 | — | — | 9ADW1TS23P0H001 | ∅225 × 99 mm | — | — | 533 |
| 9ADW1TS23P0M001 | — | — | 9ADW1TS23P0M001 | ∅225 × 99 mm | — | — | 533 |
| 9ADW1TU11P0G001 | — | — | 9ADW1TU11P0G001 | ∅190 × 88 mm | — | — | 527 |
| 9ADW1TU23P0G001 | — | — | 9ADW1TU23P0G001 | ∅190 × 88 mm | — | — | 527 |
| 9ADW1TV11P0G001 | — | — | 9ADW1TV11P0G001 | ∅250 × 99 mm | — | — | 539 |
| 9ADW1TV23P0G001 | — | — | 9ADW1TV23P0G001 | ∅250 × 99 mm | — | — | 539 |
| 9ADW5701H5002 | 9ADW5701H5002 | 9ADW5701H5H001 | 9ADW5701P5H003 | ∅172 × 150 × 51 mm | No | — | 520 |
| 9ADW5701H5H001 | 9ADW5701H5002 | 9ADW5701H5H001 | 9ADW5701P5H003 | ∅172 × 150 × 51 mm | No | — | 520 |
| 9ADW5701H5HT01 | 9ADW5701H5T02 | 9ADW5701H5HT01 | 9ADW5701P5HT03 | ∅172 × 150 × 51 mm | No | — | 520 |
| 9ADW5701H5T02 | 9ADW5701H5T02 | 9ADW5701H5HT01 | 9ADW5701P5HT03 | ∅172 × 150 × 51 mm | No | — | 520 |
| 9ADW5701P5H003 | 9ADW5701H5002 | 9ADW5701H5H001 | 9ADW5701P5H003 | ∅172 × 150 × 51 mm | No | — | 520 |
| 9ADW5701P5HT03 | 9ADW5701H5T02 | 9ADW5701H5HT01 | 9ADW5701P5HT03 | ∅172 × 150 × 51 mm | No | — | 520 |

Note 1: For compliance with standards, see individual product pages.

Note 2: The 🚚 mark indicates Short Lead Time Service applicable models. See p. 668 for details.

Model Index in Ascending Order/Safety Standards List - AC Fans

| Models listed in product pages | Frame size | Model | Rated voltage [V] | UL | CSA | TÜV | CE | PSE | UKCA | Set model no. | page |
|--------------------------------|---------------------------------|-------------|-------------------|----|-----|-----|----|-----|------|----------------------------------|------|
| 109-033UL | 80 × 80 × 42 mm | San Ace 80 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-033UL | 560 |
| 109-040UL | 80 × 80 × 42 mm | San Ace 80 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-040UL | 560 |
| 109-041UL | 80 × 80 × 42 mm | San Ace 80 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-041UL | 560 |
| 109-043UL | 80 × 80 × 42 mm | San Ace 80 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-043UL | 560 |
| 109-044UL | 80 × 80 × 42 mm | San Ace 80 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-044UL | 560 |
| 109-047UL | 80 × 80 × 42 mm | San Ace 80 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-047UL | 560 |
| 109-130 | 60 × 60 × 38 mm | San Ace 60 | 100 | ✓ | — | ✓ | ✓ | — | ✓ | ST1-109-130 | 552 |
| 109-133 | 60 × 60 × 38 mm | San Ace 60 | 115 | ✓ | — | ✓ | ✓ | — | ✓ | ST1-109-133 | 552 |
| 109-150 | 80 × 80 × 38 mm | San Ace 80 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-150 | 558 |
| 109-151 | 80 × 80 × 38 mm | San Ace 80 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-151 | 558 |
| 109-153 | 80 × 80 × 38 mm | San Ace 80 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-153 | 558 |
| 109-154 | 80 × 80 × 38 mm | San Ace 80 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-154 | 558 |
| 109-180 | 60 × 60 × 28 mm | San Ace 60 | 100 | ✓ | — | ✓ | ✓ | — | ✓ | ST1-109-180 | 550 |
| 109-183 | 60 × 60 × 28 mm | San Ace 60 | 115 | ✓ | — | ✓ | ✓ | — | ✓ | ST1-109-183 | 550 |
| 109-210 | 80 × 80 × 20 mm | San Ace 80 | 100 | ✓ | ✓ | ✓ | ✓ | — | ✓ | ST1-109-210 | 554 |
| 109-213 | 80 × 80 × 20 mm | San Ace 80 | 115 | ✓ | ✓ | ✓ | ✓ | — | ✓ | ST1-109-213 | 554 |
| 109-311 | ∅172 × 51 mm (Round type) | San Ace 172 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-311 | 580 |
| 109-312 | ∅172 × 51 mm (Round type) | San Ace 172 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-312 | 580 |
| 109-313 | ∅172 × 51 mm (Round type) | San Ace 172 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-313 | 580 |
| 109-314 | ∅172 × 51 mm (Round type) | San Ace 172 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-314 | 580 |
| 109-371 | ∅172 × 51 mm (with sensor) | San Ace 172 | 100 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109-371-20 ST1-109-371-30 | 580 |
| 109-372 | ∅172 × 51 mm (with sensor) | San Ace 172 | 200 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109-372-20 ST1-109-372-30 | 580 |
| 109-373 | ∅172 × 51 mm (with sensor) | San Ace 172 | 230 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109-373-20 ST1-109-373-30 | 580 |
| 109-374 | ∅172 × 51 mm (with sensor) | San Ace 172 | 115 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109-374-20 ST1-109-374-30 | 580 |
| 109-601 | 160 × 160 × 51 mm | San Ace 160 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-601 | 575 |
| 109-602 | 160 × 160 × 51 mm | San Ace 160 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-602 | 575 |
| 109-603 | 160 × 160 × 51 mm | San Ace 160 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-603 | 575 |
| 109-604 | 160 × 160 × 51 mm | San Ace 160 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109-604 | 575 |
| 109-641 | 160 × 160 × 51 mm (with sensor) | San Ace 160 | 100 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109-641-20 ST1-109-641-30 | 575 |
| 109-642 | 160 × 160 × 51 mm (with sensor) | San Ace 160 | 200 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109-642-20 ST1-109-642-30 | 575 |
| 109-643 | 160 × 160 × 51 mm (with sensor) | San Ace 160 | 230 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109-643-20 ST1-109-643-30 | 575 |
| 109-644 | 160 × 160 × 51 mm (with sensor) | San Ace 160 | 115 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109-644-20 ST1-109-644-30 | 575 |
| 109S005 | 120 × 120 × 38 mm | San Ace 120 | 100 | — | — | — | — | ✓ | ✓ | ST1-109S005 | 570 |
| 109S005UL | 120 × 120 × 38 mm | San Ace 120 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S005UL | 570 |
| 109S006 | 120 × 120 × 38 mm | San Ace 120 | 100 | — | — | — | — | ✓ | ✓ | ST1-109S006 | 570 |
| 109S006UL | 120 × 120 × 38 mm | San Ace 120 | 100/115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S006UL | 570 |
| 109S008 | 120 × 120 × 38 mm | San Ace 120 | 200 | — | — | — | — | ✓ | ✓ | ST1-109S008 | 570 |
| 109S008UL | 120 × 120 × 38 mm | San Ace 120 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S008UL | 570 |
| 109S010 | 120 × 120 × 38 mm | San Ace 120 | 200 | — | — | — | — | ✓ | ✓ | ST1-109S010 | 570 |
| 109S010UL | 120 × 120 × 38 mm | San Ace 120 | 200/240 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S010UL | 570 |
| 109S013 | 120 × 120 × 38 mm | San Ace 120 | 100 | — | — | — | — | ✓ | ✓ | ST1-109S013 | 570 |
| 109S013UL | 120 × 120 × 38 mm | San Ace 120 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S013UL | 570 |
| 109S024 | 120 × 120 × 38 mm | San Ace 120 | 120 | — | — | — | — | ✓ | ✓ | ST1-109S024 | 570 |
| 109S024UL | 120 × 120 × 38 mm | San Ace 120 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S024UL | 570 |
| 109S025 | 120 × 120 × 38 mm | San Ace 120 | 230 | — | — | — | — | ✓ | ✓ | ST1-109S025 | 570 |
| 109S025UL | 120 × 120 × 38 mm | San Ace 120 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S025UL | 570 |
| 109S029UL | 120 × 120 × 38 mm | San Ace 120 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S029UL | 570 |
| 109S030 | 80 × 80 × 25 mm | San Ace 80 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S030 | 556 |
| 109S031 | 80 × 80 × 25 mm | San Ace 80 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S031 | 556 |
| 109S033 | 80 × 80 × 25 mm | San Ace 80 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S033 | 556 |
| 109S034 | 80 × 80 × 25 mm | San Ace 80 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S034 | 556 |
| 109S050 | 80 × 80 × 25 mm | San Ace 80 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S050 | 556 |
| 109S051 | 80 × 80 × 25 mm | San Ace 80 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S051 | 556 |
| 109S053 | 80 × 80 × 25 mm | San Ace 80 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S053 | 556 |
| 109S054 | 80 × 80 × 25 mm | San Ace 80 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S054 | 556 |
| 109S072UL | 120 × 120 × 38 mm | San Ace 120 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S072UL | 570 |
| 109S074UL | 120 × 120 × 38 mm | San Ace 120 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S074UL | 570 |

| Models listed in product pages | Frame size | Model | Rated voltage [V] | UL | CSA | TÜV | CE | PSE | UKCA | Set model no. | page |
|--------------------------------|-----------------------------------|-------------|-------------------|----|-----|-----|----|-----|------|--------------------------------------|------|
| 109S075UL | 120 × 120 × 38 mm | San Ace 120 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S075UL | 570 |
| 109S078UL | 120 × 120 × 38 mm | San Ace 120 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S078UL | 570 |
| 109S081 | 120 × 120 × 25 mm | San Ace 120 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S081 | 566 |
| 109S082 | 120 × 120 × 25 mm | San Ace 120 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S082 | 566 |
| 109S083 | 120 × 120 × 25 mm | San Ace 120 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S083 | 566 |
| 109S084 | 120 × 120 × 25 mm | San Ace 120 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S084 | 566 |
| 109S085 | 120 × 120 × 25 mm | San Ace 120 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S085 | 566 |
| 109S086 | 120 × 120 × 25 mm | San Ace 120 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S086 | 566 |
| 109S087 | 120 × 120 × 25 mm | San Ace 120 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S087 | 566 |
| 109S088 | 120 × 120 × 25 mm | San Ace 120 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S088 | 566 |
| 109S089 | 120 × 120 × 25 mm | San Ace 120 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S089 | 566 |
| 109S091 | 92 × 92 × 25 mm | San Ace 92 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S091 | 562 |
| 109S092 | 92 × 92 × 25 mm | San Ace 92 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S092 | 562 |
| 109S093 | 92 × 92 × 25 mm | San Ace 92 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S093 | 562 |
| 109S094 | 92 × 92 × 25 mm | San Ace 92 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S094 | 562 |
| 109S095 | 92 × 92 × 25 mm | San Ace 92 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S095 | 562 |
| 109S096 | 92 × 92 × 25 mm | San Ace 92 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S096 | 562 |
| 109S192 | 92 × 92 × 25 mm | San Ace 92 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S192 | 562 |
| 109S193 | 92 × 92 × 25 mm | San Ace 92 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S193 | 562 |
| 109S194 | 92 × 92 × 25 mm | San Ace 92 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S194 | 562 |
| 109S301 | ∅172 × 150 × 51 mm (Sidecut type) | San Ace 172 | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S301 | 578 |
| 109S302 | ∅172 × 150 × 51 mm (Sidecut type) | San Ace 172 | 200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S302 | 578 |
| 109S303 | ∅172 × 150 × 51 mm (Sidecut type) | San Ace 172 | 230 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S303 | 578 |
| 109S304 | ∅172 × 150 × 51 mm (Sidecut type) | San Ace 172 | 115 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ST1-109S304 | 578 |
| 109S405UL | 120 × 120 × 38 mm (with sensor) | San Ace 120 | 100 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S405UL-20 ST1-109S405UL-30 | 571 |
| 109S406UL | 120 × 120 × 38 mm (with sensor) | San Ace 120 | 100 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S406UL-20 ST1-109S406UL-30 | 571 |
| 109S408UL | 120 × 120 × 38 mm (with sensor) | San Ace 120 | 200 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S408UL-20 ST1-109S408UL-30 | 571 |
| 109S424UL | 120 × 120 × 38 mm (with sensor) | San Ace 120 | 115 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S424UL-20 ST1-109S424UL-30 | 571 |
| 109S425UL | 120 × 120 × 38 mm (with sensor) | San Ace 120 | 230 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S425UL-20 ST1-109S425UL-30 | 571 |
| 109S429UL | 120 × 120 × 38 mm (with sensor) | San Ace 120 | 100 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S429UL-20 ST1-109S429UL-30 | 571 |
| 109S472UL | 120 × 120 × 38 mm (with sensor) | San Ace 120 | 230 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S472UL-20 ST1-109S472UL-30 | 571 |
| 109S474UL | 120 × 120 × 38 mm (with sensor) | San Ace 120 | 115 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S474UL-20 ST1-109S474UL-30 | 571 |
| 109S475UL | 120 × 120 × 38 mm (with sensor) | San Ace 120 | 100 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S475UL-20 ST1-109S475UL-30 | 571 |
| 109S478UL | 120 × 120 × 38 mm (with sensor) | San Ace 120 | 200 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S478UL-20 ST1-109S478UL-30 | 571 |
| 109S484 | 120 × 120 × 25 mm (with sensor) | San Ace 120 | 115 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S484-20 ST1-109S484-30 | 566 |
| 109S485 | 120 × 120 × 25 mm (with sensor) | San Ace 120 | 100 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S485-20 ST1-109S485-30 | 566 |
| 109S486 | 120 × 120 × 25 mm (with sensor) | San Ace 120 | 100 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S486-20 ST1-109S486-30 | 566 |
| 109S487 | 120 × 120 × 25 mm (with sensor) | San Ace 120 | 230 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S487-20 ST1-109S487-30 | 566 |
| 109S488 | 120 × 120 × 25 mm (with sensor) | San Ace 120 | 200 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S488-20 ST1-109S488-30 | 566 |
| 109S491 | 92 × 92 × 25 mm (with sensor) | San Ace 92 | 100 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S491-20 ST1-109S491-30 | 562 |
| 109S492 | 92 × 92 × 25 mm (with sensor) | San Ace 92 | 200 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S492-20 ST1-109S492-30 | 562 |
| 109S493 | 92 × 92 × 25 mm (with sensor) | San Ace 92 | 115 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S493-20 ST1-109S493-30 | 562 |
| 109S494 | 92 × 92 × 25 mm (with sensor) | San Ace 92 | 230 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S494-20 ST1-109S494-30 | 562 |
| 109S495 | 92 × 92 × 25 mm (with sensor) | San Ace 92 | 100 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S495-20 ST1-109S495-30 | 562 |
| 109S496 | 92 × 92 × 25 mm (with sensor) | San Ace 92 | 100 | ✓ | — | ✓ | ✓ | ✓ | ✓ | ST1-109S496-20 ST1-109S496-30 | 562 |

Model Index in Ascending Order - Options

■ San Ace Controller

| Model no. | Note | page |
|-----------|----------------------------------|------|
| 9CT1-001 | With wireless LAN | 584 |
| 9CT1-002 | Without wireless LAN | |
| 9CT1-U001 | With wireless LAN, cUL certified | |

■ PWM Controller

| Model no. | Note | page |
|---------------|----------|------|
| 9PC8666X-S001 | Box type | 588 |
| 9PC8666X-S101 | | |
| 9PC8045D-V001 | PCB type | |
| 9PC8045D-R001 | | |
| 9PC8045D-T001 | | |
| 9PC8045D-V101 | | |
| 9PC8045D-R101 | | |
| 9PC8045D-T101 | | |

■ Airflow Tester

| Model no. | page |
|----------------|------|
| 9AT2560S-000□* | 592 |
| 9AT2560A-000□* | |
| 9AT2560C-000□* | |

* The AC power plug shape differs with the number in □ of model numbers. AC power plug included in models with 1 in □ is for Japan and North America regions (2 parallel flat pins + a round grounding pin), Input voltage: 100/120 VAC, 50/60 Hz
 AC power plug included in models with 2 in □ is for Europe region (2 round pins + a female grounding contact), Input voltage: 220 VAC, 50 Hz
 AC power plug included in models with 3 in □ is for China region (2 angled flat pins + a flat grounding pin), Input voltage: 220 VAC, 50 Hz
 Product also available without an AC power cable. Model no. 9AT2560S-0000, 9AT2560A-0000, 9AT2560C-0000

■ Finger Guards

| Model no. | Category | Matching fan size | page |
|-----------|---------------|---|------|
| 109-019E | Finger Guards | 120 mm sq. type | 599 |
| 109-019K | Finger Guards | 120 mm sq. type | 599 |
| 109-049E | Finger Guards | 80 mm sq. type | 598 |
| 109-049H | Finger Guards | 80 mm sq. type | 598 |
| 109-059 | Finger Guards | 40 mm sq. type | 598 |
| 109-059H | Finger Guards | 40 mm sq. type | 598 |
| 109-099E | Finger Guards | 92 mm sq., \varnothing 100 mm type | 598 |
| 109-099H | Finger Guards | 92 mm sq., \varnothing 100 mm type | 598 |
| 109-1050 | Finger Guards | 36 mm sq. type | 598 |
| 109-1051 | Finger Guards | 150 mm sq. type | 599 |
| 109-1065 | Finger Guards | 38 mm sq. type | 598 |
| 109-1066 | Finger Guards | \varnothing 172 mm type | 600 |
| 109-1102 | Finger Guards | \varnothing 200 mm type | 601 |
| 109-1102H | Finger Guards | \varnothing 200 mm type | 601 |
| 109-1104 | Finger Guards | \varnothing 150 mm type | 599 |
| 109-1104H | Finger Guards | \varnothing 150 mm type | 599 |
| 109-1112 | Finger Guards | \varnothing 133 mm type | 599 |
| 109-1128 | Finger Guards | 70 mm sq., \varnothing 70 mm type | 598 |
| 109-1137 | Finger Guards | \varnothing 225 mm type | 601 |
| 109-1137H | Finger Guards | \varnothing 225 mm type | 601 |
| 109-1138 | Finger Guards | \varnothing 221 mm type | 601 |
| 109-1138H | Finger Guards | \varnothing 221 mm type | 601 |
| 109-1139 | Finger Guards | \varnothing 136 mm type | 599 |
| 109-1146 | Finger Guards | 270 mm sq. type | 602 |
| 109-1146H | Finger Guards | 270 mm sq. type | 602 |
| 109-1147 | Finger Guards | \varnothing 92 mm type | 598 |
| 109-1152 | Finger Guards | \varnothing 250 mm type | 602 |
| 109-1152H | Finger Guards | \varnothing 250 mm type | 602 |
| 109-139E | Finger Guards | 60 mm sq. type | 598 |
| 109-139H | Finger Guards | 60 mm sq. type | 598 |
| 109-149E | Finger Guards | 52 mm sq. type | 598 |
| 109-319E | Finger Guards | \varnothing 172 mm type | 600 |
| 109-319H | Finger Guards | \varnothing 172 mm type | 600 |
| 109-319J | Finger Guards | \varnothing 172 mm type | 600 |
| 109-619E | Finger Guards | 160 mm sq. type | 599 |
| 109-619H | Finger Guards | 160 mm sq. type | 599 |
| 109-719 | Finger Guards | 140 mm sq. type | 599 |
| 109-719H | Finger Guards | 140 mm sq. type | 599 |
| 109-720 | Finger Guards | \varnothing 200 mm type | 601 |
| 109-720H | Finger Guards | \varnothing 200 mm type | 601 |
| 109-722 | Finger Guards | 127 mm sq., \varnothing 175 mm, \varnothing 190 mm type | 599 |
| 109-722H | Finger Guards | 127 mm sq., \varnothing 175 mm, \varnothing 190 mm type | 599 |

■ Resin Finger Guards/Resin Filter Kits

| Model no. | Category | Matching fan size | page |
|-------------|---------------------|-------------------|------|
| 109-1000F13 | Resin Filter Kits | 120 mm sq. type | 606 |
| 109-1000F20 | Resin Filter Kits | 120 mm sq. type | 606 |
| 109-1000F30 | Resin Filter Kits | 120 mm sq. type | 606 |
| 109-1000F40 | Resin Filter Kits | 120 mm sq. type | 606 |
| 109-1001F13 | Resin Filter Kits | 92 mm sq. type | 606 |
| 109-1001F20 | Resin Filter Kits | 92 mm sq. type | 606 |
| 109-1001F30 | Resin Filter Kits | 92 mm sq. type | 606 |
| 109-1001F40 | Resin Filter Kits | 92 mm sq. type | 606 |
| 109-1002F13 | Resin Filter Kits | 80 mm sq. type | 606 |
| 109-1002F20 | Resin Filter Kits | 80 mm sq. type | 606 |
| 109-1002F30 | Resin Filter Kits | 80 mm sq. type | 606 |
| 109-1002F40 | Resin Filter Kits | 80 mm sq. type | 606 |
| 109-1003F13 | Resin Filter Kits | 60 mm sq. type | 606 |
| 109-1003F20 | Resin Filter Kits | 60 mm sq. type | 606 |
| 109-1003F30 | Resin Filter Kits | 60 mm sq. type | 606 |
| 109-1003F40 | Resin Filter Kits | 60 mm sq. type | 606 |
| 109-1000G | Resin Finger Guards | 120 mm sq. type | 605 |
| 109-1001G | Resin Finger Guards | 92 mm sq. type | 605 |
| 109-1002G | Resin Finger Guards | 80 mm sq. type | 605 |
| 109-1003G | Resin Finger Guards | 60 mm sq. type | 605 |

■ Replacement filter

| Model no. | Category | Matching fan size | page |
|-------------|--------------------|-------------------|------|
| 109-1000M13 | Replacement filter | 120 mm sq. type | 606 |
| 109-1000M20 | Replacement filter | 120 mm sq. type | 606 |
| 109-1000M30 | Replacement filter | 120 mm sq. type | 606 |
| 109-1000M40 | Replacement filter | 120 mm sq. type | 606 |
| 109-1001M13 | Replacement filter | 92 mm sq. type | 606 |
| 109-1001M20 | Replacement filter | 92 mm sq. type | 606 |
| 109-1001M30 | Replacement filter | 92 mm sq. type | 606 |
| 109-1001M40 | Replacement filter | 92 mm sq. type | 606 |
| 109-1002M13 | Replacement filter | 80 mm sq. type | 606 |
| 109-1002M20 | Replacement filter | 80 mm sq. type | 606 |
| 109-1002M30 | Replacement filter | 80 mm sq. type | 606 |
| 109-1002M40 | Replacement filter | 80 mm sq. type | 606 |
| 109-1003M13 | Replacement filter | 60 mm sq. type | 606 |
| 109-1003M20 | Replacement filter | 60 mm sq. type | 606 |
| 109-1003M30 | Replacement filter | 60 mm sq. type | 606 |
| 109-1003M40 | Replacement filter | 60 mm sq. type | 606 |

■ EMC guards/Inlet nozzle for centrifugal fan and splash proof centrifugal fan

| Model no. | Category | Matching fan size | page |
|-----------|---|-----------------------|------|
| 109-1036 | EMC guards | ∅172 mm type | 604 |
| 109-1037 | EMC guards | 120 mm sq. type | 604 |
| 109-1038 | EMC guards | 80 mm sq. type | 604 |
| 109-1039 | EMC guards | 80 mm sq. type | 604 |
| 109-1040 | EMC guards | 92 mm sq. type | 604 |
| 109-1069 | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅133 mm type | 603 |
| 109-1069H | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅133 mm type | 603 |
| 109-1073 | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅175 mm, ∅190 mm type | 603 |
| 109-1073H | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅175 mm, ∅190 mm type | 603 |
| 109-1080 | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅100 mm type | 603 |
| 109-1080H | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅100 mm type | 603 |
| 109-1081 | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅150 mm type | 603 |
| 109-1081H | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅150 mm type | 603 |
| 109-1106 | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅70 mm type | 603 |
| 109-1134 | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅225 mm type | 603 |
| 109-1134H | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅225 mm type | 603 |
| 109-1135 | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅221 mm type | 603 |
| 109-1135H | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅221 mm type | 603 |
| 109-1151 | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅250 mm type | 603 |
| 109-1151H | Inlet nozzle for centrifugal fan and splash proof centrifugal fan | ∅250 mm type | 603 |

■ Filter kits/Screen kits

| Model no. | Category | Matching fan size | Note | page |
|-----------|-------------|-------------------|--|------|
| 109-018 | Filter kits | 120 × 120 × 38 mm | Not mountable on AC fans with a sensor or ACDC fans. | 607 |
| 109-020 | Screen kits | 120 × 120 × 38 mm | | 607 |

■ Plug Cord

| Model no. | UL | CSA | PSE | Applicable model | page |
|--------------|----|-----|-----|--|------|
| 489-006-L10 | | | ✓ | 120 × 120 × 38 mm | 608 |
| 489-006-L21 | | | ✓ | 120 × 120 × 38 mm | 608 |
| 489-006-L35 | | | ✓ | 120 × 120 × 38 mm | 608 |
| 489-007-L10 | ✓ | ✓ | | 120 × 120 × 38 mm | 609 |
| 489-007-L21 | ✓ | ✓ | | 120 × 120 × 38 mm | 609 |
| 489-008-L10 | | | ✓ | 80 × 80 × 42 mm | 608 |
| 489-008-L21 | | | ✓ | 80 × 80 × 42 mm | 608 |
| 489-008-L35 | | | ✓ | 80 × 80 × 42 mm | 608 |
| 489-016-L10 | | | ✓ | 120 × 120 × 25 mm 92 × 92 × 25 mm 80 × 80 × 25 mm 80 × 80 × 38 mm | 608 |
| 489-016-L21 | | | ✓ | 120 × 120 × 25 mm 92 × 92 × 25 mm 80 × 80 × 25 mm 80 × 80 × 38 mm | 608 |
| 489-037-L10 | | | ✓ | 120 × 120 × 38 mm | 608 |
| 489-037-L21 | | | ✓ | 120 × 120 × 38 mm | 608 |
| 489-037-L35 | | | ✓ | 120 × 120 × 38 mm | 608 |
| 489-047-L10 | ✓ | ✓ | | 120 × 120 × 25 mm 92 × 92 × 25 mm 80 × 80 × 25 mm 80 × 80 × 38 mm | 609 |
| 489-047-L21 | ✓ | ✓ | | 120 × 120 × 25 mm 92 × 92 × 25 mm 80 × 80 × 25 mm 80 × 80 × 38 mm | 609 |
| 489-084-L10 | ✓ | ✓ | | ∅172 × 51 mm ∅172 × 150 × 51 mm 160 × 160 × 51 mm | 609 |
| 489-084-L21 | ✓ | ✓ | | ∅172 × 51 mm ∅172 × 150 × 51 mm 160 × 160 × 51 mm | 609 |
| 489-086-L10 | ✓ | ✓ | | 160 × 160 × 51 mm | 609 |
| 489-086-L21 | ✓ | ✓ | | 160 × 160 × 51 mm | 609 |
| 489-1618-L10 | | | ✓ | 160 × 160 × 51 mm | 608 |
| 489-1618-L21 | | | ✓ | 160 × 160 × 51 mm | 608 |
| 489-1618-L28 | | | ✓ | 160 × 160 × 51 mm | 608 |
| 489-1619-L10 | | | ✓ | ∅172 × 51 mm ∅172 × 150 × 51 mm 160 × 160 × 51 mm | 608 |
| 489-1619-L21 | | | ✓ | ∅172 × 51 mm ∅172 × 150 × 51 mm 160 × 160 × 51 mm | 608 |
| 489-1635-L10 | ✓ | ✓ | ✓ | ACDC Fan (92 × 92 × 38 mm) | 609 |
| 489-1635-L21 | ✓ | ✓ | ✓ | ACDC Fan (120 × 120 × 38 mm) | 609 |

Typical Connectors for DC Fans page 611

■ Sensor extension wiring harness

| Model no. | Note | page |
|-----------|--|------|
| 489-1636 | Compatible with San Ace 92AD 9AD type (with sensor) and San Ace 120AD 9AD type (with sensor) | 609 |

■ Terminal model wiring harness

| Model no. | Note | page |
|-----------|---|------|
| 489-1647 | Compatible with San Ace 160AD 9AD type (terminal type), San Ace 160AD 9ADW type (terminal type), San Ace 172AD 9AD type (terminal type) and San Ace 172AD 9ADW type (terminal type) | 610 |

Deleted Models in this Catalog

Following models were deleted in this latest version of catalog. However, these models are not discontinued product. Please contact us for further assistance if necessary.

DC Fan

| Size | Model no. | Frame material | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|--------------------|---------------|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------|
| 92 × 92 × 25 mm | 9GA0912W401 | Plastics | 12 | 7 to 16 | 0.19 | 2.28 | 3300 | 1.45 51.2 | 45.6 0.18 | 31 | -20 to +70 | 60000/60°C |
| 92 × 92 × 25 mm | 9GA0912L401 | Plastics | 12 | 10.2 to 13.8 | 0.09 | 1.08 | 2000 | 0.87 30.7 | 16.7 0.067 | 21 | -20 to +70 | 60000/60°C |
| 92 × 92 × 25 mm | 9GA0924W401 | Plastics | 24 | 12 to 28.8 | 0.09 | 2.16 | 3300 | 1.45 51.2 | 45.6 0.18 | 31 | -20 to +70 | 60000/60°C |
| 92 × 92 × 25 mm | 9GA0924L401 | Plastics | 24 | 14 to 27.6 | 0.03 | 0.72 | 2000 | 0.87 30.7 | 16.7 0.067 | 21 | -20 to +70 | 60000/60°C |
| 127 × 127 × 38 mm | 109P1312S101 | Plastics | 12 | 10.2 to 13.8 | 1.3 | 15.6 | 3300 | 4.2 148 | 117.6 0.472 | 47 | -20 to +60 | 40000/60°C |
| 127 × 127 × 38 mm | 109P1312H101 | Plastics | 12 | 10.2 to 13.8 | 0.82 | 9.84 | 2950 | 3.8 134 | 98 0.394 | 45 | -20 to +60 | 40000/60°C |
| 127 × 127 × 38 mm | 109P1324S101 | Plastics | 24 | 20.4 to 27.6 | 0.55 | 13.2 | 3300 | 4.2 148 | 117.6 0.472 | 47 | -20 to +60 | 40000/60°C |
| 127 × 127 × 38 mm | 109P1324H101 | Plastics | 24 | 20.4 to 27.6 | 0.41 | 9.84 | 2950 | 3.8 134 | 98 0.394 | 45 | -20 to +60 | 40000/60°C |
| 127 × 127 × 38 mm | 109P1348S101 | Plastics | 48 | 40.8 to 55.2 | 0.3 | 14.4 | 3300 | 4.2 148 | 117.6 0.472 | 47 | -20 to +60 | 40000/60°C |
| 127 × 127 × 38 mm | 109P1348H101 | Plastics | 48 | 40.8 to 55.2 | 0.2 | 9.6 | 2950 | 3.8 134 | 98 0.394 | 45 | -20 to +60 | 40000/60°C |
| Ø172 × 150 × 51 mm | 9GV5724H501 | Aluminum | 24 | 20.4 to 27.6 | 4.0 | 96 | 6300 | 11.32 400 | 690 2.77 | 74 | -20 to +70 | 40000/60°C |
| Ø172 × 150 × 51 mm | 9GV5748H501 | Aluminum | 48 | 40.8 to 55.2 | 2.0 | 96 | 6300 | 11.32 400 | 690 2.77 | 74 | -20 to +70 | 40000/60°C |
| Ø200 × 70 mm | 109E2024S001 | Aluminum | 24 | 21.6 to 26.4 | 1.9 | 45.6 | 3200 | 10.45 369 | 287.1 1.153 | 57 | -10 to +70 | 40000 |
| Ø200 × 70 mm | 109E2024H001 | Aluminum | 24 | 20.4 to 27.6 | 1.0 | 24 | 2600 | 8.2 289.5 | 192 0.771 | 51 | -10 to +70 | 40000 |
| Ø200 × 70 mm | 109E2024AS001 | Aluminum | 24 | 21.6 to 26.4 | 1.9 | 45.6 | 3200 | 10.45 369 | 287.1 1.153 | 57 | -10 to +70 | 40000 |
| | | | | | 1.45 | 34.8 | 2800 | 9 317.8 | 215.6 0.865 | 54 | | |
| Ø200 × 70 mm | 109E2024MH001 | Aluminum | 24 | 20.4 to 27.6 | 0.63 | 15.12 | 2100 | 6.7 236.6 | 115.4 0.463 | 45 | -10 to +70 | 40000 |

Splash Proof Fan

| Size | Model no. | Frame material | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min ⁻¹] | Max. airflow [m ³ /min] [CFM] | Max. static pressure [Pa] [inchH ₂ O] | SPL [dB (A)] | Operating temperature [°C] | Expected life [h] |
|-----------------|-------------|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--|--|--------------|----------------------------|-------------------|
| 80 × 80 × 25 mm | 9WS0812H401 | Plastics | 12 | 10.2 to 13.8 | 0.16 | 1.92 | 3100 | 0.94 33.2 | 45.1 0.181 | 32 | -20 to +70 | 40000/60°C |
| 80 × 80 × 25 mm | 9WS0812F401 | Plastics | 12 | 10.2 to 13.8 | 0.13 | 1.56 | 2700 | 0.83 29.3 | 34.3 0.138 | 28 | -20 to +70 | 40000/60°C |
| 80 × 80 × 25 mm | 9WS0812M401 | Plastics | 12 | 10.2 to 13.8 | 0.1 | 1.2 | 2200 | 0.65 23.0 | 23.5 0.094 | 23 | -20 to +70 | 40000/60°C |
| 80 × 80 × 25 mm | 9WS0824H401 | Plastics | 24 | 20.4 to 27.6 | 0.09 | 2.16 | 3100 | 0.94 33.2 | 45.1 0.181 | 32 | -20 to +70 | 40000/60°C |
| 80 × 80 × 25 mm | 9WS0824F401 | Plastics | 24 | 20.4 to 27.6 | 0.07 | 1.68 | 2700 | 0.83 29.3 | 34.3 0.138 | 28 | -20 to +70 | 40000/60°C |
| 80 × 80 × 25 mm | 9WS0824M401 | Plastics | 24 | 20.4 to 27.6 | 0.05 | 1.2 | 2200 | 0.65 23.0 | 23.5 0.094 | 23 | -20 to +70 | 40000/60°C |
| 92 × 92 × 25 mm | 9WS0912H401 | Plastics | 12 | 10.2 to 13.8 | 0.17 | 2.04 | 2850 | 1.38 48.7 | 45.1 0.181 | 33 | -20 to +70 | 40000/60°C |
| 92 × 92 × 25 mm | 9WS0912F401 | Plastics | 12 | 10.2 to 13.8 | 0.13 | 1.56 | 2450 | 1.18 41.7 | 32.3 0.13 | 30 | -20 to +70 | 40000/60°C |
| 92 × 92 × 25 mm | 9WS0912M401 | Plastics | 12 | 10.2 to 13.8 | 0.1 | 1.2 | 2100 | 1.01 35.7 | 23.5 0.094 | 27 | -20 to +70 | 40000/60°C |
| 92 × 92 × 25 mm | 9WS0912L401 | Plastics | 12 | 10.2 to 13.8 | 0.06 | 0.72 | 1700 | 0.8 28.2 | 16.7 0.067 | 23 | -20 to +70 | 40000/60°C |
| 92 × 92 × 25 mm | 9WS0924H401 | Plastics | 24 | 20.4 to 27.6 | 0.1 | 2.4 | 2850 | 1.38 48.7 | 45.1 0.181 | 33 | -20 to +70 | 40000/60°C |
| 92 × 92 × 25 mm | 9WS0924F401 | Plastics | 24 | 20.4 to 27.6 | 0.07 | 1.68 | 2450 | 1.18 41.7 | 32.3 0.13 | 30 | -20 to +70 | 40000/60°C |
| 92 × 92 × 25 mm | 9WS0924M401 | Plastics | 24 | 20.4 to 27.6 | 0.06 | 1.44 | 2100 | 1.01 35.7 | 23.5 0.094 | 27 | -20 to +70 | 40000/60°C |
| 92 × 92 × 25 mm | 9WS0924L401 | Plastics | 24 | 20.4 to 27.6 | 0.05 | 1.2 | 1700 | 0.8 28.2 | 16.7 0.067 | 23 | -20 to +70 | 40000/60°C |

Finger Guard

| Size | Mounting side | Model no. | Surface treatment | Mass (g) |
|-----------------------------|---------------|-----------|--------------------------------|----------|
| 52 mm sq. type | Outlet side | 109-149 | Nickel-chrome plating (silver) | 7 |
| 80 mm sq. type | Outlet side | 109-049C | Nickel-chrome plating (silver) | 17 |
| 92 mm sq. type | Outlet side | 109-099C | Nickel-chrome plating (silver) | 22 |
| 120 mm sq. type | Outlet side | 109-019C | Nickel-chrome plating (silver) | 32 |
| | | 109-019H | Cation electropainting (black) | |
| 127 mm sq. type | Outlet side | 109-723 | Nickel-chrome plating (silver) | 34 |
| 150 mm sq. type | Outlet side | 109-1052 | Nickel-chrome plating (silver) | 53 |
| 160 mm sq. type | Outlet side | 109-620 | Nickel-chrome plating (silver) | 74 |
| Ø172 mm Sidecut, Round type | Outlet side | 109-320 | Nickel-chrome plating (silver) | 53 |
| Ø172 mm Round type | Outlet side | 109-1068 | Nickel-chrome plating (silver) | 54 |
| Ø200 mm type | Outlet side | 109-1103 | Nickel-chrome plating (silver) | 80 |
| | | 109-1103H | Cation electropainting (black) | |
| | | 109-721 | Nickel-chrome plating (silver) | 66 |
| | | 109-721H | Cation electropainting (black) | |

Note: Storage temperature is -30 to +70°C.

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