

PSC-360

Hall-Effect End-of-Shaft Rotary Position Sensor



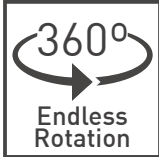
Available with
CAN

KEY FEATURES



True, contactless operation

Without any gears or mechanical interfaces the sensor is easily assembled and calibrated and subject to limited wear and tear over lifetime.



360 degree absolute position feedback

Endless mechanical rotational angle without dead band, keeps the position on power loss with programmable electrical angles from 15 to 360 degrees.



Made for harsh environments

The rugged package protects the sensor from dust, moisture, vibration and extreme temperatures for usage in the most demanding environments.



Durable and robust design

The non-contacting design allows for an extra-long product lifetime of up to 50 million cycles.



Integrated shaft

The magnet is securely fastened to the shaft and acts as only moving component in the sensor.



Adaptable to your requirements

Programmable transfer function and switch outputs as well as different output protocols and redundancy levels available.

DESCRIPTION

The robust PSC-360 is a cost-effective non-contacting rotary position sensor that provides high performance in harsh environments such as transportation, industrial and medical applications.

This compact sensor of Piher Sensing Systems is truly non-contacting with a permanent magnet that is securely fastened to the shaft and acts as the only moving component in the sensor. Redundant versions provide independent voltage outputs with fully customizable characteristics. Additionally a switch output can optionally be configured.

The endless rotation sensor is highly configurable with a programmable angular range between 15 and 360 degrees, different signal output options and support for low and high-voltage power supply. Sealed, flange mounted for easy positioning and with fly leads, it can be customized to fit any desired connector configuration.

Multi-turn configurations are available on request.

APPLICATIONS

Industrial

- ▶ Autonomous warehouse robotics
- ▶ Robotics and automation feedback
- ▶ Robot arm position
- ▶ Valve monitoring
- ▶ Conveyor operation

Transportation

- ▶ Steering wheel angle
- ▶ Pedal Position
- ▶ Suspension/height detection
- ▶ Fork height and mast tilt
- ▶ Bucket position
- ▶ Hitch position
- ▶ Transmission gear shift

Marine

- ▶ Steering and shifter sensor

Home and Building Automation

- ▶ HVAC systems

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MECHANICAL SPECIFICATIONS

| | PSC-360 | PSC-360U |
|------------------|-------------------------|----------|
| Rotational life | Up to 50.000.000 cycles | |
| Mechanical range | 360° (endless rotation) | |
| Shaft diameter | 6mm | 6,35mm |

ELECTRICAL SPECIFICATIONS

| | PSC-360 | PSC-360U |
|-----------------------------|--|--|
| Linearity ¹ | ±1% absolute (±0.5% on request) | |
| Electrical angular range | Programmable from 15° to 360° | |
| Output protocols | Analog (Ratiometric), PWM Serial Protocol (SPI) upon request CAN SAE J1939 CAN OPEN | Analog (Ratiometric), PWM Serial Protocol (SPI) |
| Output | Simple Redundant Full-redundant | |
| Switch output | On request | Configurable |
| Resolution | CAN, Analog, PWM SPI | Up to 12 bit Up to 14 bit |
| Supply voltage ² | 5V ±10% 7V to 15V | 5V ±10% 12V ±10% 15V ±10% |
| Supply current | Single version Redundant version CAN version | Typ 8.5 mA Typ 17 mA Typ 47 mA |
| Voltage protection | ±10V | |
| Self-diagnostic features | yes | |

¹ Ferromagnetic materials close to the sensor (i.e. shaft, mounting surface) may affect the sensor's linearity.

² Voltages up to 25V possible on request.

ENVIRONMENTAL SPECIFICATIONS

| | |
|--|------------------------------|
| Operating and storage temperature ¹ | -40° to +125°C |
| Shock | 50g |
| Vibration | 5-2000 Hz; 20g; Amax 0,75 mm |

¹ Other specifications available

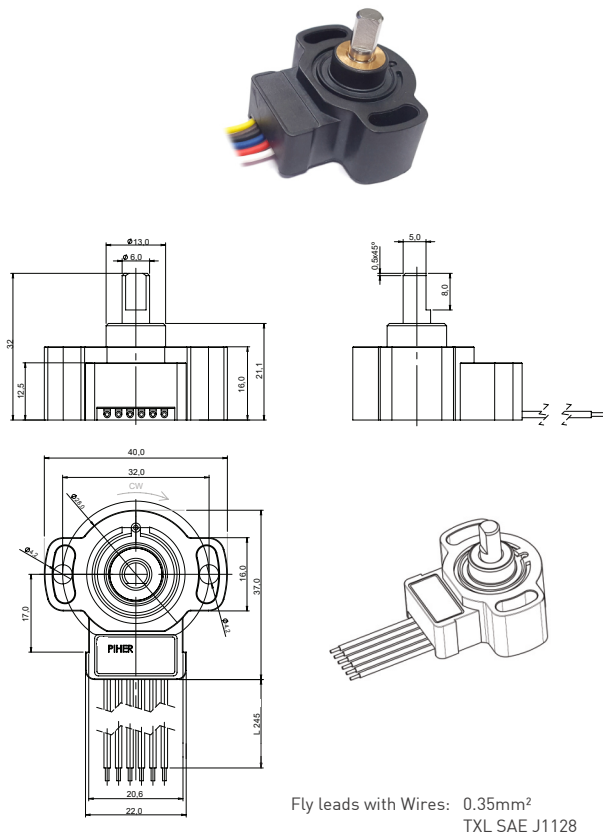
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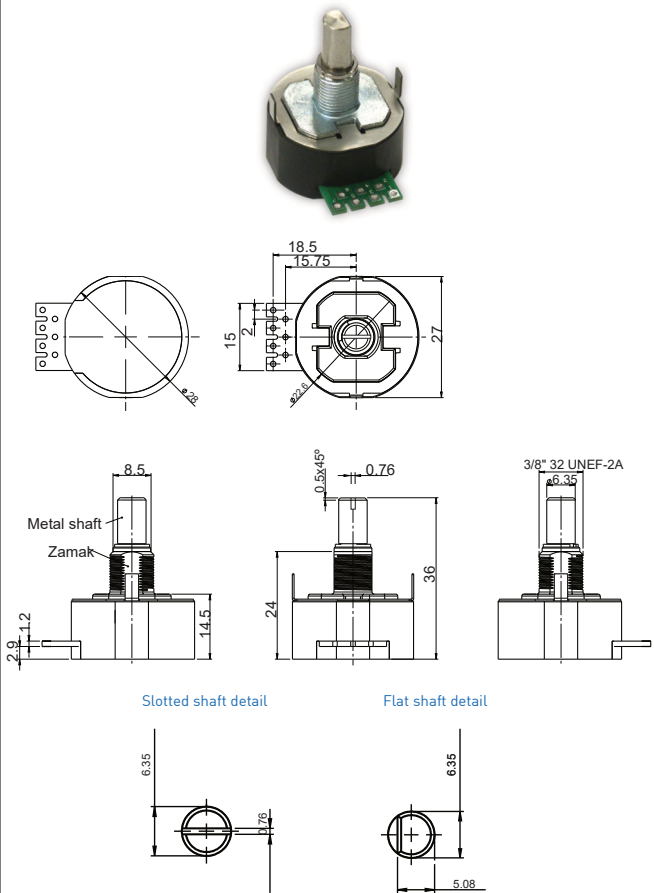
DIMENSIONS (MM)

PSC-360G2

PSC-360U - panel mount version



Sensor shown with the shaft at zero position.



Sensor shown with the shaft at 0° position. Nut and washer included.



Download the STEP's file here:
www.pihernet.net

Sensor delivered at random position. Assembly of any type of connector on request.

MOUNTING INSTRUCTIONS

1. Place the component on a flat surface.
2. Fit the actuator onto the shaft avoiding any mechanical play/wobble.
3. Fasten the two M4 screws (M4 washers are recommended).

CONNECTION SCHEME

| Color | Simple | | Redundant | | Full-redundant | CAN | SPI |
|--------|---------------|---------------|-----------------|-----------------|-----------------|--------------|--------------|
| | 5V | 7V to 15V | 5V | 7V to 15V | | | |
| Brown | Power supply | Power supply | Power supply | Power supply | Power supply 1 | Power supply | Power supply |
| Blue | Ground | Ground | Ground | Ground | Ground 1 | Ground | Ground |
| Black | Signal output | Signal output | Signal output 1 | Signal output 1 | Ground 2 | CAN High | MOSI |
| White | n/a | n/a | Signal output 2 | Signal output 2 | Signal output 2 | CAN Low | /SS |
| Red | n/a | n/a | n/a | n/a | Power supply 2 | n/a | n/a |
| Yellow | n/a | n/a | n/a | n/a | Signal output 1 | n/a | n/a |
| Grey | n/a | Not used | n/a | Not used | n/a | n/a | SCLK |

More instructions of use on www.pihernet.net. Connector assembly available on request.

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HOW TO ORDER (Example: PSC360G2-F1A-C0001-ERA360-05K)

Simple Output - Analogic, PWM and CAN

| PSC360G2 | - | F | 1 | - | - | C_____ | - | ERA_____ | - | ___ | K | - | _____ |
|----------|----------|------------|--|------------------------------|--|-----------------------------|---------------------|--|---|-----|---|---|-------|
| Series | Shaft | Type | Output ¹ | Output function ² | Electric rotational angle ³ | Voltage supply ⁴ | Temp. range | PWM Frequency Hz ⁵ | | | | | |
| | F = flat | 1 = simple | A = analogic P = PWM J = CAN SAE J1939 O = CAN OPEN | C0000 C0001 | ERA040 ERA041 ... ERA360 | 05 = 5V ±10% RE = 7V-15V | K = -40°C to +125°C | [empty] = 200Hz F100 = 100Hz F101 = 101Hz ... F999 = 999Hz | | | | | |

Redundant output - Analogic, PWM and CAN

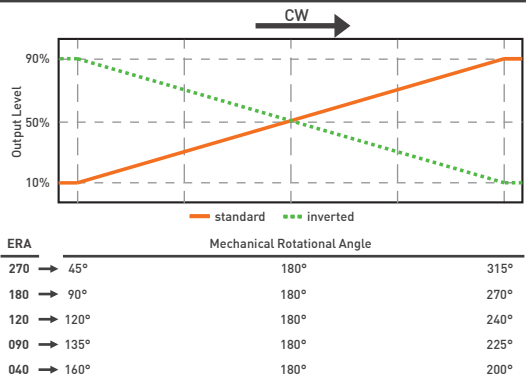
| PSC360G2 | - | F | 2 | - | - | C_____ | - | ERA_____ | - | ___ | K | - | _____ | _____ |
|----------|----------|---------------|---|------------------------------|--|-----------------------------|---------------------|------------------------------------|------------------------------------|-----|---|---|-------|-------|
| Series | Shaft | Type | Output ¹ | Output function ² | Electric rotational angle ³ | Voltage supply ⁴ | Temp. range | PWM Frequency Hz. (1) ⁵ | PWM Frequency Hz. (2) ⁵ | | | | | |
| | F = flat | 2 = redundant | AA= analogic PP = PWM JJ = CAN SAE J1939 OO = CAN OPEN | C0002 | ERA040 ERA041 ... ERA360 | 05 = 5V ±10% RE = 7V-15V | K = -40°C to +125°C | F100 F101 ... F999 | F100 F101 ... F999 | | | | | |

Full-redundant output - Analogic and PWM

| PSC360G2 | - | F | 3 | - | - | C_____ | - | ERA_____ | - | 05 | K | - | _____ | _____ |
|----------|----------|--------------------|--------------------------|------------------------------|--|-----------------------------|---------------------|------------------------------------|------------------------------------|----|---|---|-------|-------|
| Series | Shaft | Type | Output ¹ | Output function ² | Electric rotational angle ³ | Voltage supply ⁴ | Temp. range | PWM Frequency Hz. (1) ⁴ | PWM Frequency Hz. (2) ⁴ | | | | | |
| | F = flat | 3 = full-redundant | AA= analogic PP = PWM | C0002 | ERA040 ERA041 ... ERA360 | 05 = 5V ±10% | K = -40°C to +125°C | F100 F101 ... F999 | F100 F101 ... F999 | | | | | |

1 The analog output is ratiometric, proportional:
 - for supply voltage "5V" to input voltage;
 - for supply voltage "RE" to 5V.
 2 Other output functions available, please check availability. Enter CXXXX as long as the new output function is not defined.
 3 Models with ERA < 40° available on request
 4 Voltages up to 25V possible on request.
 5 Leave empty if not applicable. Default frequency is 200 Hz

OUTPUT FUNCTIONS



| ERA | Standard | Inverted | Redundant |
|------|----------|------------|-----------|
| 360° | C0000 | C0001 | C0002 |
| 270° | C0208 | C0158 | C0031 |
| 180° | C0007 | C0072 | C0036 |
| 120° | C0024 | On request | C0032 |
| 90° | C0011 | | C0025 |
| 70° | C0150 | | C0149 |
| 60° | C0006 | | C0020 |
| 40° | C0026 | | C0123 |

Custom output functions on request.

PSC-360U Panel Mount Version



HOW TO ORDER - PANEL MOUNT VERSION (Example: PSC360U-F1A-C0000-ERA360-05E)

Simple Output - Analogic and PWM

| PSC360U | - | - | 1 | - | - | - | - | C | ERA | - | - | - | - |
|---------|----------------------------------|------------|-------------------------|------------------------------|-------------------------------------|------------------------------|--|---------------------------------|---|--|---|---|---|
| Series | Shaft | Type | Output ¹ | Switch | Switch position ² | Output function ³ | Electric rotational angle ⁴ | Voltage supply | Temp. range | PWM Frequency Hz ⁵ | | | |
| | F = flat shaft L = slot shaft | 1 = simple | A = analogic P = PWM | [empty] = none W = switch | [empty] 000 016 ... 360 | C0000 C0001 | ERA040 ERA041 ... ERA360 | 05 = 5V 12 = 12V 15 = 15V | E = -40°C to +85°C K = -40°C to +125°C | [empty] = 200Hz F100 = 100Hz F101 = 101Hz ... F999 = 999Hz | | | |

Simple output - SPI

| PSC360U | - | - | 1 | S | C | ERA | - | - | - |
|---------|----------------------------------|------------|---------|------------------------------|--|---------------------------------|---|---|---|
| Series | Shaft | Type | Output | Output function ³ | Electric rotational angle ⁴ | Voltage supply | Temp. range | | |
| | F = flat shaft L = slot shaft | 1 = simple | S = SPI | C0000 C0001 | ERA040 ERA041 ... ERA360 | 05 = 5V 12 = 12V 15 = 15V | E = -40°C to +85°C K = -40°C to +125°C | | |

Annotations:

- The analog output is ratiometric, proportional:
 - For supply voltage 5V: to input supply voltage.
 - For supply voltage 12V and 15V: to 5V.
- Leave empty if not applicable. Switch function diagram: see next page.
- Other output functions available, please check availability. Enter CXXX as long as the new output function is not defined.
- Models with ERA < 40° available on request
- Leave empty if not applicable. Default frequency is 200 Hz

Redundant output - Analogic and PWM

| PSC360U | - | - | 2 | - | - | - | - | - | C | ERA | - | - | - | - |
|---------|----------------------------------|---------------|--------------------------|------------------------------|-------------------------------------|------------------------------|-------------------------------------|------------------------------|--|---------------------------------|---|------------------------------------|------------------------------------|---|
| Series | Shaft | Type | Output ¹ | Switch1 | Switch1 position ² | Switch2 | Switch2 position ² | Output function ³ | Electric rotational angle ⁴ | Voltage supply | Temp. range | PWM Frequency Hz. (1) ⁵ | PWM Frequency Hz. (2) ⁵ | |
| | F = flat shaft L = slot shaft | 2 = redundant | AA= analogic PP = PWM | [empty] = none W = switch | [empty] 000 016 ... 360 | [empty] = none W = switch | [empty] 000 016 ... 360 | C0002 C0003 | ERA040 ERA041 ... ERA360 | 05 = 5V 12 = 12V 15 = 15V | E = -40°C to +85°C K = -40°C to +125°C | F100 F101 ... F999 | F100 F101 ... F999 | |

Full-redundant output - Analogic and PWM

| PSC360U | - | - | 3 | - | - | - | - | - | C | ERA | - | - | - | - |
|---------|----------------------------------|---------------|--------------------------|------------------------------|-------------------------------------|------------------------------|-------------------------------------|------------------------------|--|----------------|---|------------------------------------|------------------------------------|---|
| Series | Shaft | Type | Output ¹ | Switch1 | Switch1 position ² | Switch2 | Switch2 position ² | Output function ³ | Electric rotational angle ⁴ | Voltage supply | Temp. range | PWM Frequency Hz. (1) ⁵ | PWM Frequency Hz. (2) ⁵ | |
| | F = flat shaft L = slot shaft | 3 = redundant | AA= analogic PP = PWM | [empty] = none W = switch | [empty] 000 016 ... 360 | [empty] = none W = switch | [empty] 000 016 ... 360 | C0002 C0003 | ERA040 ERA041 ... ERA360 | 05 = 5V | E = -40°C to +85°C K = -40°C to +125°C | F100 F101 ... F999 | F100 F101 ... F999 | |