SPECIFICATION FOR APPROVAL

Customer : STD

Description : DC FAN

Customer Part No. _____ REV. : _____

Delta Model No. : GFB0912ES-E REV. : 04

Sample Issue No. : _____

Sample Issue Date : OCT.13 2020

PLEASE SEND ONE COPY OF THIS SPECIFICAITON BACK AFTER YOU SIGNED APPROVAL FOR PRODUCTION PRE-ARRANGMENT.

APPROVED BY:

DATE :

DELTA ELECTRONICS, INC.
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STATEMENT OF DEVIATION

■ NONE

□ DESCRIPTION:

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Specification For Approval

Customer : STD

Description : DC FAN

Customer P/N : rev. :

Delta model no. : GFB0912ES-E Delta Safety Model No.: GFB0912ES-E

Sample revision. : Issue no.:

Sample issue date : OCT.13 2020 Quantity :

1. SCOPE:
THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE DC BRUSHLESS AXIAL FLOW FAN.

2. CHARACTERS:

ITEM	DESCRIPTION
RATED VOLTAGE	12 VDC
OPERATION VOLTAGE	10.8 - 13.2 VDC
INPUT CURRENT (AVG.)★ (TEST UNDER FREE AIR)	3.95 (MAX. 4.74) A CURRENT ON LABEL : 7.20A
INPUT POWER(AVG.)★ (TEST UNDER FREE AIR)	47.40 (MAX.56.88) W
SPEED	FRONT：11200 ±10% / REAR：11400 ±10% R.P.M.
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	4.685 (MIN. 4.216) M^3/MIN. 165.44 (MIN. 148.90) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	118.62 (MIN. 96.08) mmH2O 4.67 (MIN. 3.783) inchH2O
ACOUSTICAL NOISE (AVG.)	78.50 (MAX. 82.5) dB-A
INSULATION TYPE	UL: CLASS A
INSULATION STRENGTH	10 MEG OHM MIN. AT 500 VDC (BETWEEN FRAME AND (+) TERMINAL)
DIELECTRIC STRENGTH	5 mA MAX. AT 500 VAC 50/60 Hz ONE MINUTE, (BETWEEN FRAME AND (+) TERMINAL)

★AVG. IS THE AVERAGE VALUE DURING STEADY OPERATION, AND MAX. IS MAXIMUM AVERAGE VALUE INCLUDED PRODUCTION TOLERANCE. ABOUT THE PEAK VALUE, NEED TO USE OSCILLOSCOPE TO MEASURE.

(continued)

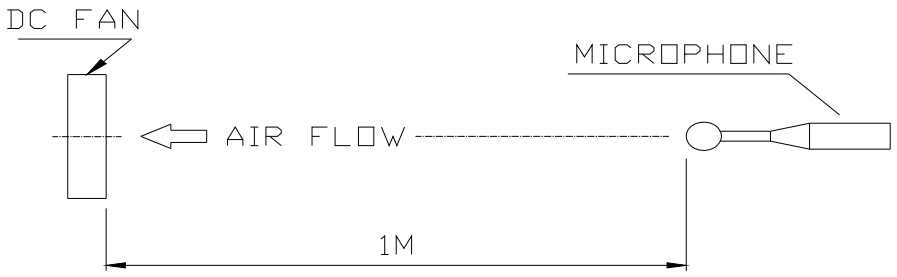
PART NO:

DELTA MODEL: GFB0912ES-E

LIFE EXPECTANCE (L10) (AT LABEL VOLTAGE)	70,000 HOURS CONTINOUS OPERATION AT 40 °C WITH 15 ~ 65 %RH.
ROTATION	TWO FANS ROTATE IN COUNTER DIRECTIONS.
LOCK ROTOR SHUT DOWN	THE CURRENT WILL SHUT DOWN, WHEN ROTOR LOCKED AND FIXED.

NOTES:

1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 10 MINUTES.
2. STANDARD AIR PROPERTY IS AIR AT (Td) 25°C TEMPERATURE, (RH) 65% RELATIVE HUMIDITY , AND (Pb) 760 mmHg BAROMETRIC PRESSURE.
3. THE VALUES WRITTEN IN PARENS , ( ), ARE LIMITED SPEC.
4. THE CHARACTERS SHOWED IN PAGE 1 IS THE CONDITION OF BOTH FANS RUN.
5. ACOUSTICAL NOISE MEASURING CONDITION:



NOISE IS MEASURED AT RATED VOLTAGE IN FREE AIR IN SEMI-ANECHOIC CHAMBER WITH MICROPHONE AT A DISTANCE OF ONE METER FROM THE FAN INTAKE.

PART NO:

DELTA MODEL: GFB0912ES-E

3.MECHANICAL:

3-1. DIMENSIONS---------- SEE DIMENSIONS DRAWING
3-2. FRAME---------- PLASTIC UL: 94V-0
3-3. IMPELLER---------- PLASTIC UL: 94V-0
3-4. BEARING SYSTEM---------- TWO BALL BEARINGS
3-5. WEIGHT---------- 410 GRAMS(REF.)

4. ENVIRONMENTAL:

4-1. OPERATING TEMPERATURE---------- -10 TO +70 DEGREE C
4-2. STORAGE TEMPERATURE---------- -40 TO +75 DEGREE C
4-3. OPERATING HUMIDITY---------- 5 TO 90 % RH
4-4. STORAGE HUMIDITY---------- 5 TO 95 % RH

5. PROTECTION:

5-1. LOCKED ROTOR PROTECTION
IMPEDANCE OF MOTOR WINDING PROTECTS MOTOR FROM FIRE IN 96 HOURS OF LOCKED ROTOR CONDITION AT THE RATED VOLTAGE.

5-2. POLARITY PROTECTION
BE CAPABLE OF WITHSTANDING IF REVERSE CONNECTION FOR POSITIVE AND NEGATIVE LEADS.

6. RE OZONE DEPLETING SUBSTANCES:

6-1. NO CONTAINING PBBs, PBBOs, CFCs, PBBEs, PBDPEs AND HCFCs.

7. PRODUCTION LOCATION

7-1. PRODUCTS WILL BE PRODUCED IN CHINA OR THAILAND.

8. TURBO FUNCTION

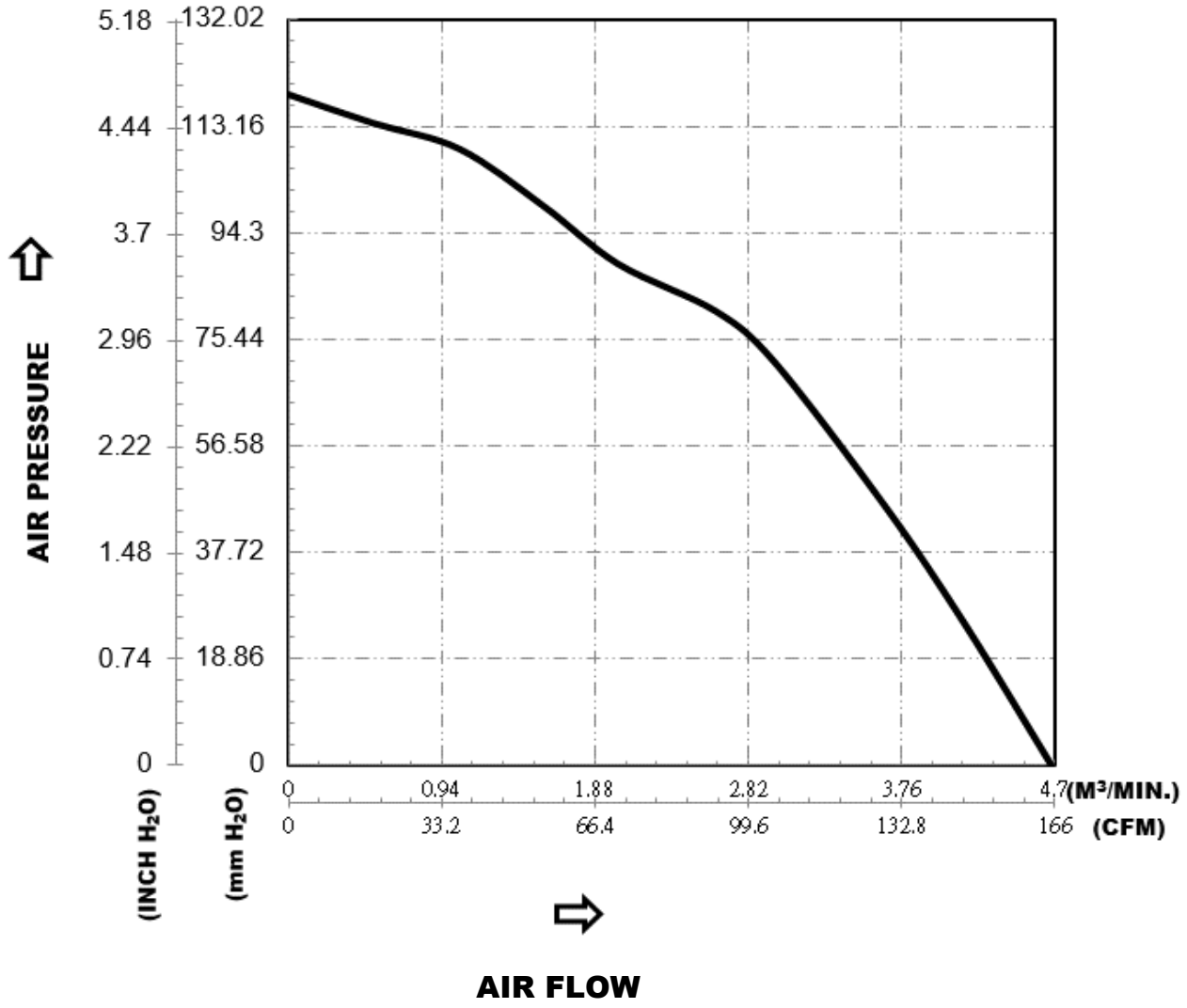
8-1. THERE WILL BE A TURBO FUNCTION(REAR ROTOR ACCELERATE) WHEN THE FRONT ROTOR OF FAN IS FAILURED.
(IT IS RECOMMENDED TO REPLACE THE FAN AFTER THE TURBO FUNCTION START UP.)

8-2. WHEN THE FRONT ROTOR OF FAN IS FAILURED,THE REAR FAN WILL RUN AT 13500+/-15%RPM IN FREE AIR CONDITION.
(IT IS NOT RECOMMENDED TO USE ONLY THE REAR FAN AS THE FREQUENCY GENERATOR (FG) SIGNAL OF THE WHOLE FAN.)

PART NO:

DELTA MODEL: GFB0912ES-E

9. P & Q CURVE:



*TEST CONDITION: INPUT VOLTAGE-----OPERATION VOLTAGE
TEMPERATURE-----ROOM TEMPERATURE
HUMIDITY-----65%RH

PART NO:

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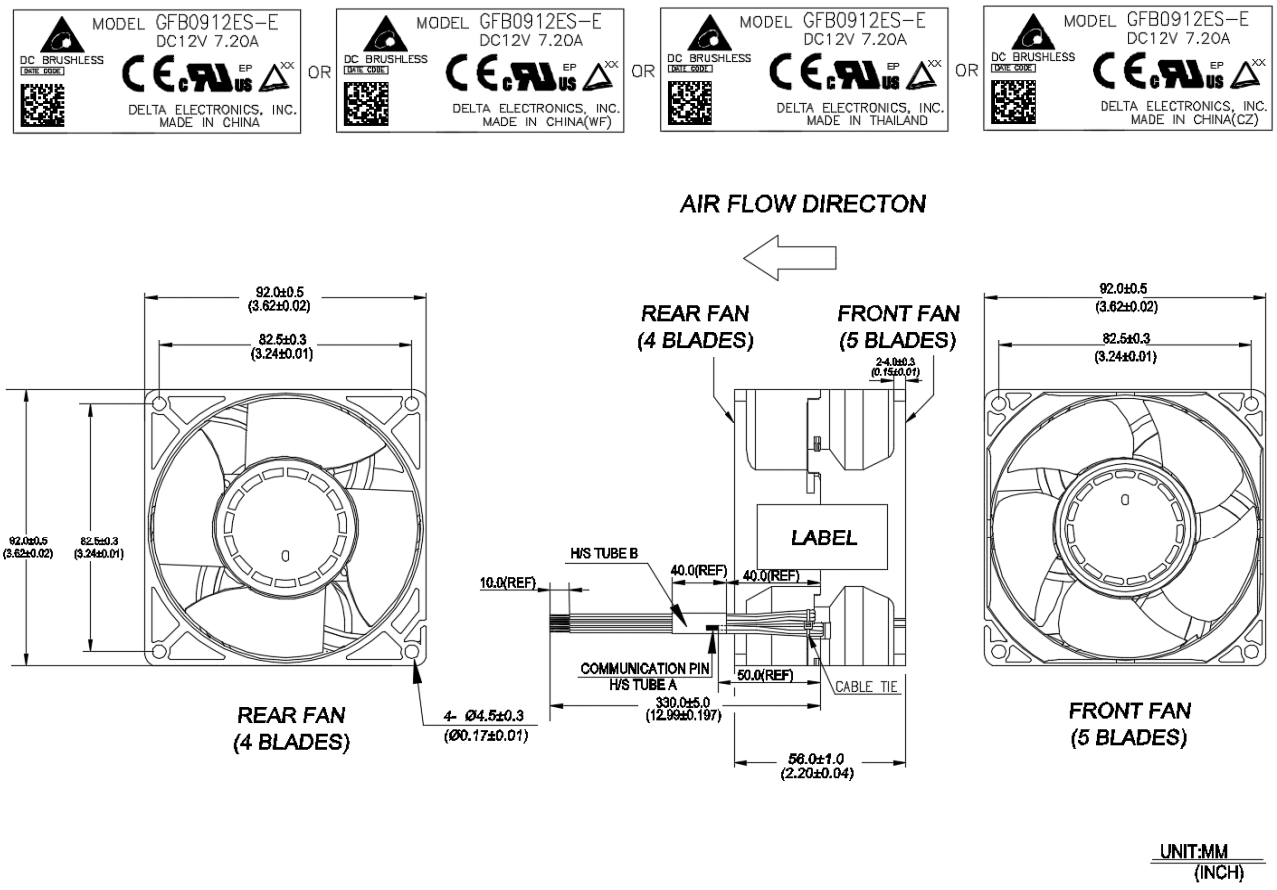
10. DIMENSION DRAWING:



NOTES:

1.LEAD WIRE:

UL10368 AWG24, BLACK WIRE, FRONT FAN -------- (-)
UL10368 AWG24, RED WIRE, FRONT FAN -------- (+)
UL10368 AWG26, BLUE WIRE, FRONT FAN -------- (PWM)
UL10368 AWG26, YELLOW WIRE, FRONT FAN -------- (FOO)
UL10368 AWG24, GRAY WIRE, REAR FAN -------- (-)
UL10368 AWG24, ORANGE WIRE, REAR FAN -------- (+)
UL10368 AWG26, WHITE WIRE, REAR FAN -------- (PWM)
UL10368 AWG26, GREEN WIRE, REAR FAN -------- (FOO)
UL10368 AWG26, BROWN WIRE, FRONT FAN ---- COMMUNICATION WIRE
UL10368 AWG26, BROWN WITH WHITE WIRE, REAR FAN - COMMUNICATION WIRE

2.H/S TUBE A: 2.0*Ø0.25 , 120°C , 600V, BLACK
3.H/S TUBE B: 5.0*Ø0.25 , 120°C , 600V, BLACK
4.THIS PRODUCT IS ROHS COMPLAINT

PART NO:

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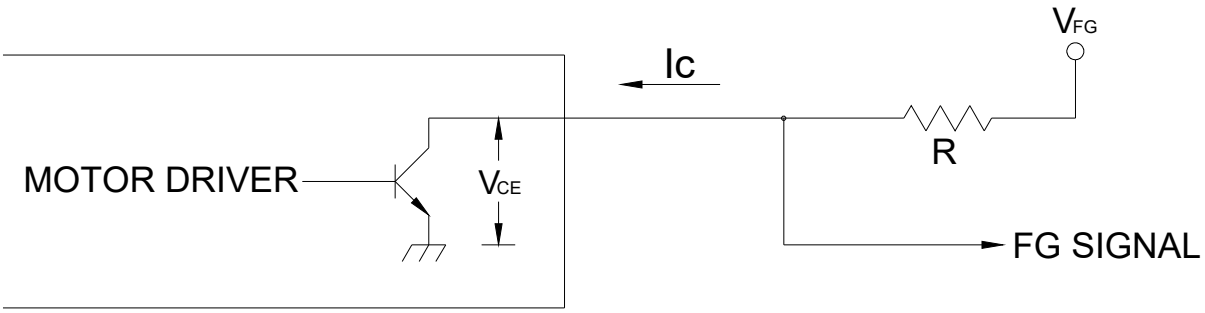
11. FREQUENCY GENERATOR (FG) SIGNAL:

11-1. INTERFACE CIRCUIT



CAUTION:

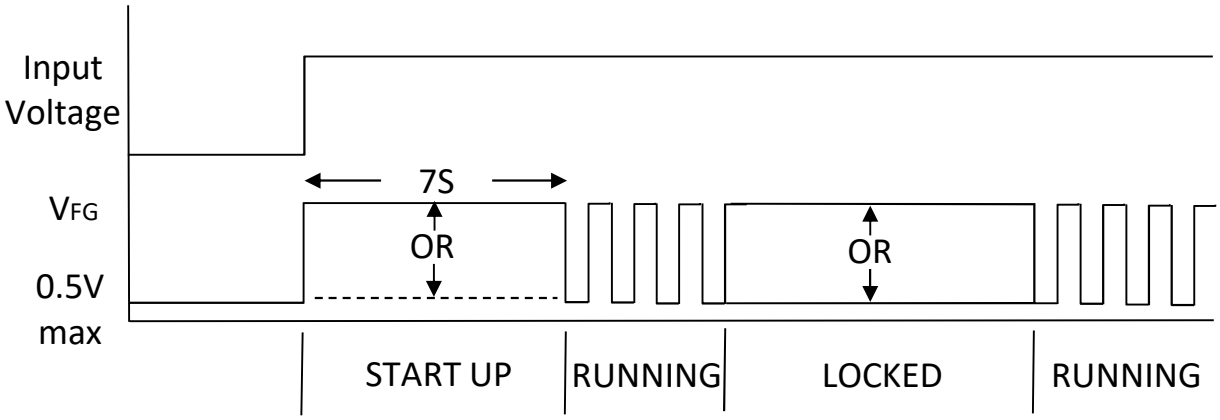
THE LEAD WIRE OF FG SIGNAL CAN NOT TOUCH
THE LEAD WIRE OF POSITIVE OR NEGATIVE.

11-2. SPECIFICATION:

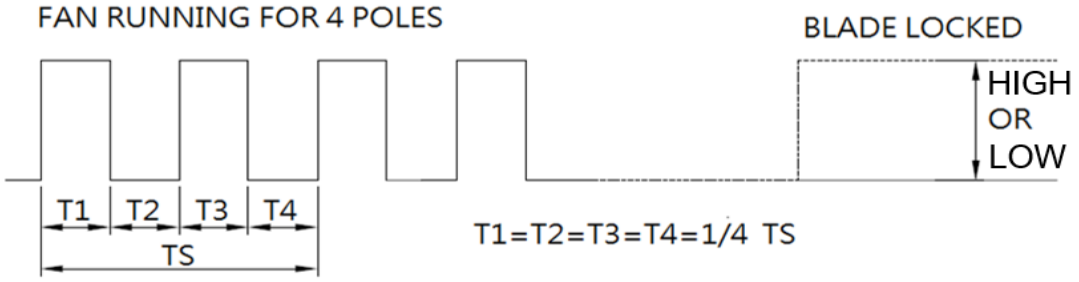
V_{FG}= 13.2V MAX. Ic = 5mA MAX.

V_{CE}= 0.5V MAX. $R \geqq V_{FG}/Ic$

11-3. FREQUENCY GENERATOR WAVEFORM:



SINCE THIS FAN HAS 4.0 SEC BRAKE FUNCTION AND 3-PHASE SENSORLESS TECHNOLOGY, THE FG SIGNAL WILL APPEAR AFTER POWER ON 7.0 SEC .



N=R.P.M

TS=60/N(SEC)

*V_{FG} IS ALWAYS HIGH OR LOW LEVEL AFTER BLADE LOCKED

*4 POLES

PART NO:

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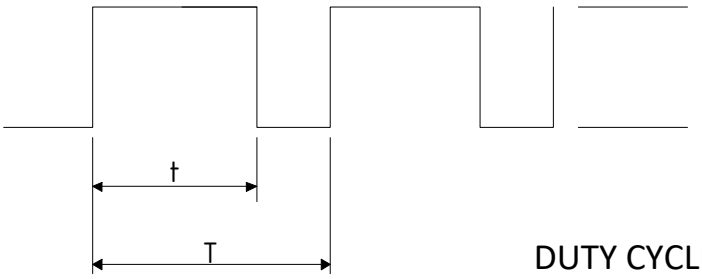
12. PWM CONTROL SIGNAL:

SIGNAL VOLTAGE RANGE: 0 ~ 16.0 VDC



HIGH SIGNAL: 16 VDC MAX. / 3.3 VDC MIN.

LOW SIGNAL: 0.8 VDC MAX. / 0 VDC MIN.

DUTY CYCLE= $\frac{t}{T}$ *100(%)

*THE PREFERRED OPERATING POINT FOR THE FAN IS 25.0K HZ.
*AT 100% DUTY CYCLE,THE ROTOR WILL SPIN AT MAXIMUM SPEED.
*AT 0% DUTY CYCLE,THE ROTOR WILL SPIN AT MINIMUM SPEED.
*WITH CONTROL SIGNAL LEAD DISCONNECTED,THE FAN WILL SPIN AT MAXIMUM SPEED.

13. SPEED VS PWM CONTROL SIGNAL:

(AT RATED 12V & PWM FREQUENCY = 25KHZ & TEMPERATURE AT 25 DEGREE C)

DUTY CYCLE (%)	SPEED R.P.M		CURRENT (A) TYP.(AVG.)★ TOTAL
	FRONT	REAR	
100	11200 ± 10%	11400 ± 10%	3.95
50	6400 ± 10%	6500 ± 10%	0.8
0	1150 ± 350	1200 ± 350	0.05

★AVG. IS THE AVERAGE VALUE DURING STEADY OPERATION, AND MAX. IS MAXIMUM AVERAGE VALUE INCLUDED PRODUCTION TOLERANCE. ABOUT THE PEAK VALUE, NEED TO USE OSCILLOSCOPE TO MEASURE.

14. PWM CONTROL LEAD WIRE INPUT IMPEDANCE