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## STATEMENT OF DEVIATION

NONE

DESCRIPTION:

## Specification For Approval

Customer : STD

Description : DC FAN

Customer P/N :

rev. :

Delta model no. : TGD0412HS-00EA8

Delta Safety Model No.: TGD0412HS-00

Sample revision. : 01

Issue no.:

Sample issue date : JAN.21 2018

Quantity :

### 1. SCOPE:

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

### 2. CHARACTERS:

ITEM	DESCRIPTION
RATED VOLTAGE	12.0 VDC
OPERATION VOLTAGE	10.8 - 12.6 VDC
INPUT CURRENT (AVG.) <sup>NOTE5.</sup>	3.50 (MAX. 4.20) A (SAFETY CURRENT ON LABEL : 6.00A)
INPUT POWER (AVG.)	42.0 (MAX. 50.4) W
SPEED	FRONT 27000±10% RPM REAR 23000±10% RPM
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	1.107 (MIN. 0.996) M <sup>3</sup> /MIN. 39.30 (MIN. 35.37) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	147.32(MIN. 119.33) mmH <sub>2</sub> O 5.80 (MIN. 4.698) inchH <sub>2</sub> O
ACOUSTICAL NOISE (AVG.)	73.0 (MAX. 77.0) dB-A
INSULATION TYPE	UL: CLASS A
INSULATION STRENGT	10 MEG OHM MIN. AT 500 VDC (BETWEEN FRAME AND LEAD WIRES.)
DIELECTRIC STRENGTH	5 mA MAX. AT 500 VAC 50/60 Hz ONE MINUTE, (BETWEEN FRAME AND LEAD WIRES.)

(continued)

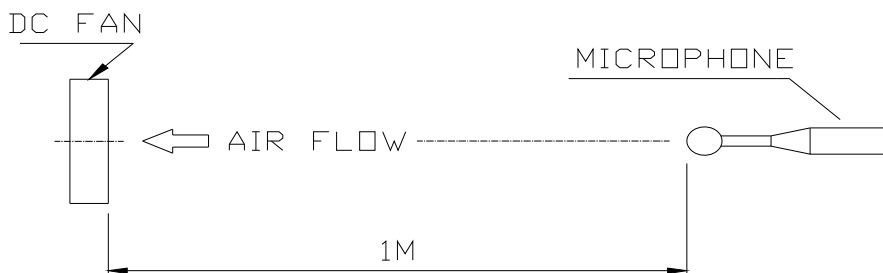
PART NO:

DELTA MODEL: TGD0412HS-00EA8

LIFE EXPECTANCE (L10) (AT LABEL VOLTAGE)	70,000 HOURS CONTINUOUS OPERATION AT 40 ° C WITH 15 ~ 65 %RH.
ROTATION	TWO FANS ROTATE IN COUNTER DIRECTIONS SHOWED IN THE NAME PLATE SIDE
LOCKED ROTOR PROTECTION	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. THE MAX VALUE OF CONSUMING CURRENT DOES NOT REPRESENT THE PEAK VALUE, THE PEAK VALUE NEED MEASURE BY OSCILLOSCOPE.
6. ACOUSTICAL NOISE MEASURING CONDITION:



NOISE IS MEASURED AT RATED VOLTAGE IN FREE AIR IN ANECHOIC CHAMBER WITH B & K SOUND LEVEL METER WITH MICROPHONE AT A DISTANCE OF ONE METER FROM THE FAN INTAKE.

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PART NO:

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DELTA MODEL: TGD0412HS-00EA8

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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. TOTAL WEIGHT----- 91 GRAMS(REF.)
- 3-6. FRONT ROTOR WEIGHT----- 17 GRAMS(REF.)
- 3-7. REAR ROTOR WEIGHT----- 17 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.

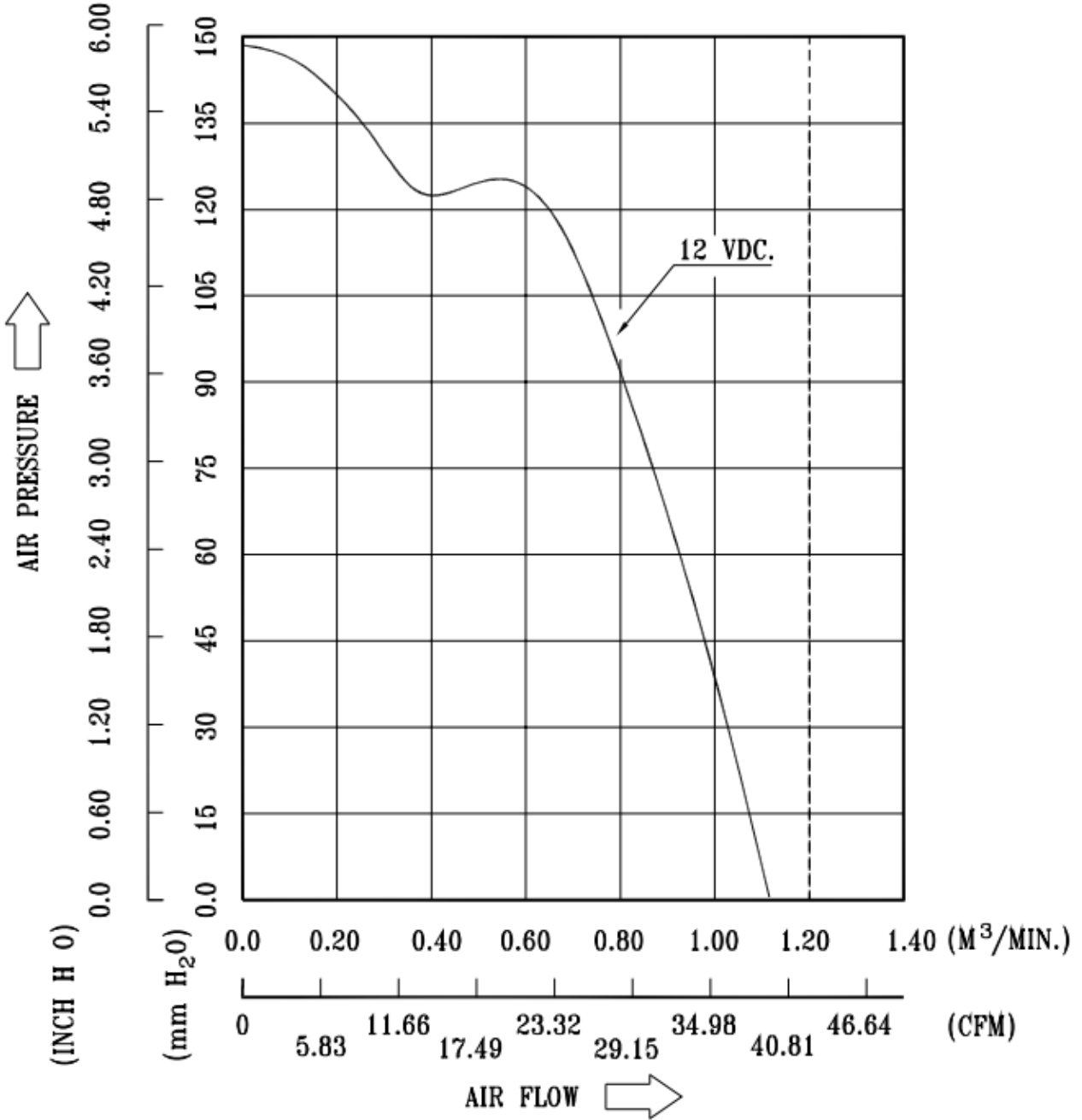
7. PRODUCTION LOCATION

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

PART NO:

DELTA MODEL: TGD0412HS-00EA8

8. P & Q CURVE:



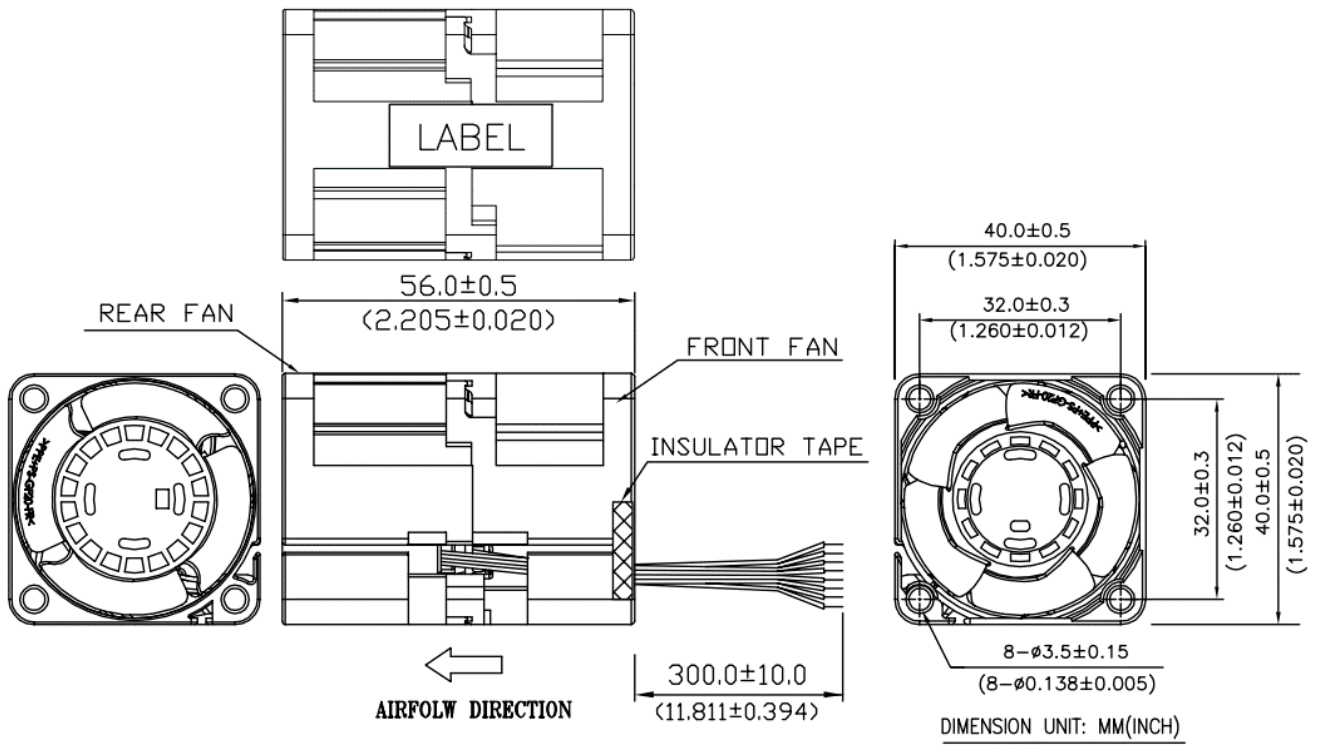
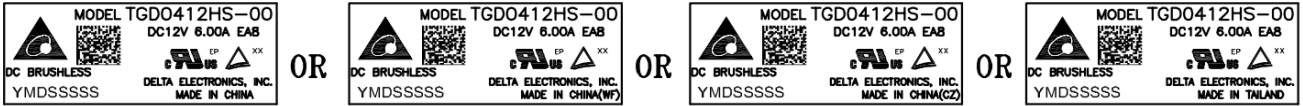
\*TEST CONDITION: INPUT VOLTAGE-----OPERATION VOLTAGE  
TEMPERATURE-----ROOM TEMPERATURE  
HUMIDITY-----65%RH

PART NO:

DELTA MODEL: TGD0412HS-00EA8

9. DIMENSION DRAWING:

LABEL:



NOTES:

1. LEAD WIRE:

FRONT FAN (5BLADES)	[	BLACK WIRE -----(-)-----UL1061 AWG#26
		RED WIRE -----(+)------UL1061 AWG#26
		YELLOW WIRE -----(FOO)----UL1061 AWG#30
		BLUE WIRE -----(PWM)-----UL1061 AWG#30
REAR FAN (4BLADES)	[	WHITE WIRE -----(-)-----UL1061 AWG#26
		ORANGE WIRE -----(+)------UL1061 AWG#26
		BROWN WIRE -----(FOO)----UL1061 AWG#30
		GREEN WIRE -----(PWM)----UL1061 AWG#30

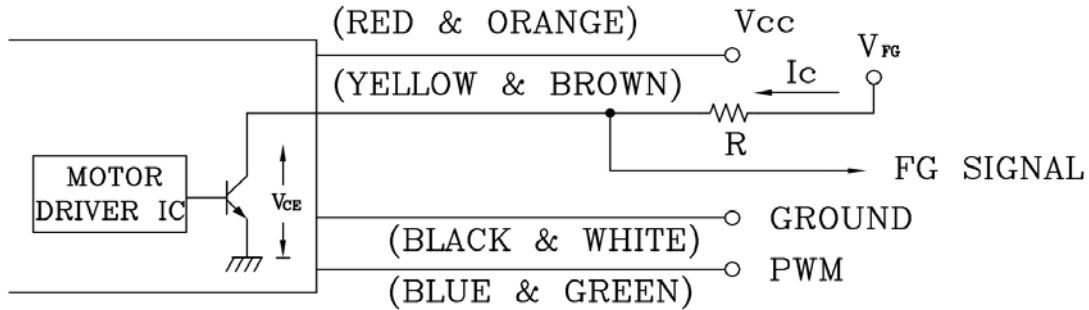
2. THIS PRODUCT IS RoHS COMPLIANT.

PART NO:

DELTA MODEL: TGD0412HS-00EA8

10. FREQUENCY GENERATOR (FG) SIGNAL:

10-1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



CAUTION:

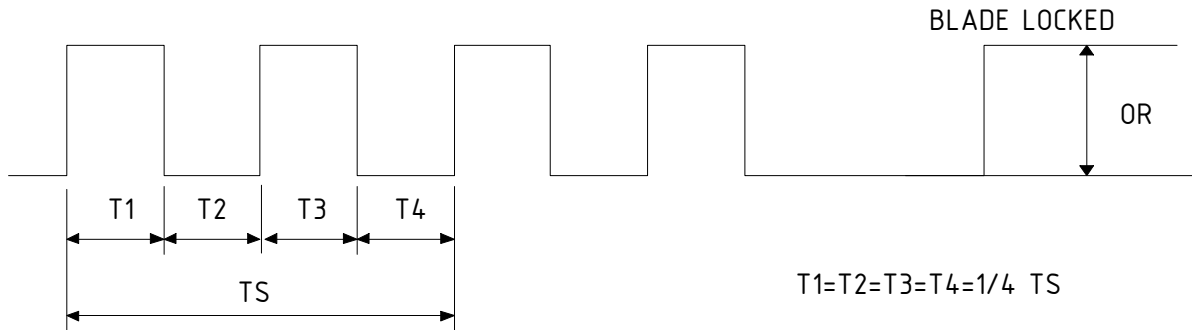
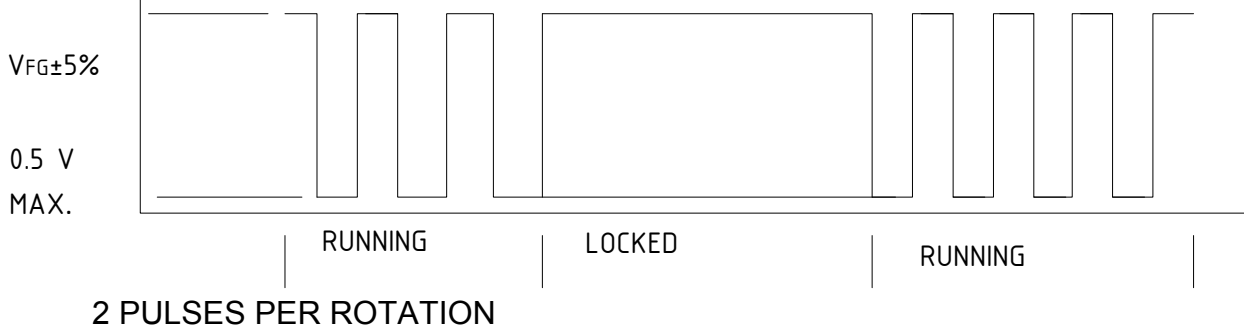
THE LEAD WIRE OF FG SIGNAL CAN NOT TOUCH THE LEAD WIRE OF POSITIVE OR NEGATIVE.

10-2. SPECIFICATION:

$V_{FG} = 5.0 \text{ VDC TYP} (V_{CC} \text{ MAX.})$   
 $V_{CE} (\text{sat}) = 0.5 \text{ V MAX.}$

$I_c = 5 \text{ mA MAX.}$   
 $R \geq V_{FG} / I_c$

10-3. FREQUENCY GENERATOR WAVEFORM:



$N = \text{RPM}$

$TS = 60/N (\text{SEC})$

\*VOLTAGE LEVEL AFTER BLADE LOCKED

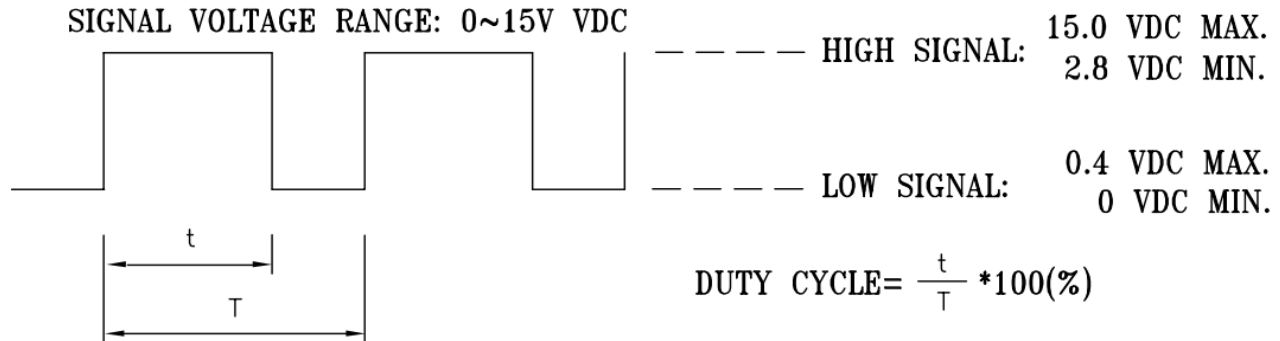
\*2 PULSES



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11. PWM CONTROL SIGNAL: (AT RATED VOLTAGE 12VDC ; 25 DEGREE C)



\*THE FREQUENCY FOR CONTROL SIGNAL OF THE FAN SHALL BE ABLE TO ACCEPT 600HZ~30KHZ WITH DIFFERENT SPEED PERFORMANCE.

\*PWM SIGNAL WITH 5VDC TTL OR CMOS LEVELS. THE PREFERRED OPERATING POINT FOR THE FAN IS 25KHZ.

\*AT 12V & 100% DUTY CYCLE, THE ROTOR WILL SPIN AT MAXIMUM SPEED.

\*AT 12V & 0% DUTY CYCLE, THE ROTOR WILL BE STOP .

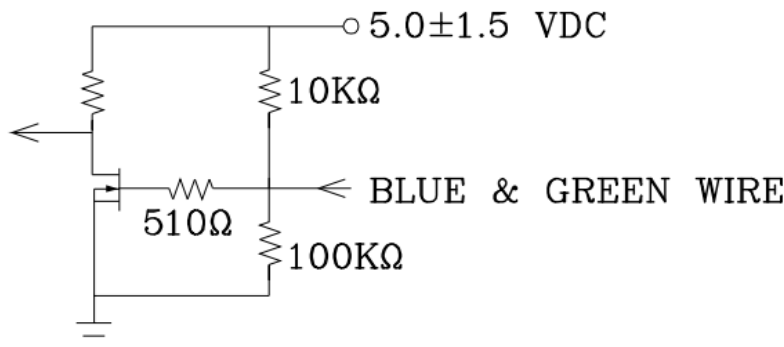
\*WITH CONTROL SIGNAL LEAD DISCONNECTED, THE FAN WILL SPIN AT MAXIMUM SPEED.

\*AT RATED VOLTAGE & 25KHZ & 20% DUTY CYCLE ,THE FAN WILL BE ABLE TO START FROM A DEAD STOP.

12. SPEED VS PWM CONTROL SIGNAL: (TEST AT RATED ; 25 DEGREE C ; PWM SIGNAL WITH 5 VDC TTL OR CMOS LEVELS & 25 KH.

DUTY CYCLE (%)	SPEED RPM (REF.)		CURRENT (A) TYP. TOTAL
	FRONT	REAR	
100	27000 ± 10%	23000 ± 10%	3.50 (MAX. 4.20) A
50	11000 ± 10%	9600 ± 10%	0.40 (MAX. 0.45) A
0	0	0	0.05 (MAX. 0.07) A

13. PWM CONTROL LEAD WIRE INPUT IMPEDANCE:





## ***Application Notice***

- 1. Delta will not guarantee the performance of the products if the application condition falls outside the parameters set forth in the specification.**
- 2. A written request should be submitted to Delta prior to approval if deviation from this specification is required.**
- 3. Please exercise caution when handling fans. Damage may be caused when pressure is applied to the impeller, if the fans are handled by the lead wires, or if the fan was hard-dropped to the production floor.**
- 4. Except as pertains to some special designs, there is no guarantee that the products will be free from any such safety problems or failures as caused by the introduction of powder, droplets of water or encroachment of insect into the hub.**
- 5. The above-mentioned conditions are representative of some unique examples and viewed as the first point of reference prior to all other information.**
- 6. It is very important to establish the correct polarity before connecting the fan to the power source. Positive (+) and Negative (-). Damage may be caused to the fans if connection is with reverse polarity, if there is no foolproof method to protect against such error specifically mentioned in this spec.**
- 7. Delta fans without special protection are not suitable where any corrosive fluids are introduced to their environment.**
- 8. Please ensure all fans are stored according to the storage temperature limits specified. Do not store fans in a high humidity environment. We highly recommend performance testing is conducted before shipping, if the fans have been stored over 6 months.**
- 9. Not all fans are provided with the Lock Rotor Protection feature. If you impair the rotation of the impeller for the fans that do not have this function, the performance of those fans will lead to failure.**
- 10. Please be cautious when mounting the fan. Incorrect mounting of fans may cause excess resonance, vibration and subsequent noise.**
- 11. It is important to consider safety when testing the fans. A suitable fan guard should be fitted to the fan to guard against any potential for personal injury.**
- 12. Except where specifically stated, all tests are carried out at room (ambient) temperature and relative humidity conditions of 25°C, 65% RH. The test value is only for fan performance itself.**
- 13. Be certain to connect an “ 4.7μF or greater” capacitor to the fan externally when the application calls for using multiple fans in parallel, to avoid any unstable power.**