# SPECIFICATION FOR APPROVAL

Customer DPC
Description. DC FAN
Part No. REV.
Delta Model No. AHB1348GHE-CZ41 REV. 00
Sample Issue No.
Sample Issue Date. FEB-26-2013

**PLEASE SEND ONE COPY OF THIS SPECIFICATION BACK AFTER YOU SIGNED APPROVAL FOR PRODUCTION PRE-ARRANGEMENT.**

**APPROVED BY :**

**DATE:**

**Delta Electronics, Inc.**
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# STATEMENT OF DEVIATION

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☑ NONE

☐ DESCRIPTION :

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# SPECIFICATION FOR APPROVAL

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Customer: DPC

Description: DC FAN

Customer P/N: REV:

Delta Model NO.: AHB1348GHE-CZ41 Safety Delta Model NO.: AHB1348GHE

Sample Rev: 00 Issue NO:

Sample Issue Date: FEB-26-2013 Quantity:

## 1. SCOPE:

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

## 2. CHARACTERS:

| ITEM | DESCRIPTION |
|---|---|
| RATED VOLTAGE | 48VDC |
| OPERATION VOLTAGE | 34 - 80VDC |
| INPUT CURRENT | 0.75 (MAX. 0.90) A<br>(SAFETY CURRENT 0.90A) |
| INPUT POWER | 36.00 MAX. 43.20 W |
| SPEED | 5500 R.P.M. (REF.) |
| MAX. AIR FLOW<br>(AT ZERO STATIC PRESSURE) | 7.243 (MIN. 6.519 ) $M^3$/MIN.<br>255.77 (MIN.230.19 ) CFM |
| MAX.AIR PRESSURE<br>(AT ZERO AIRFLOW) | 36.77 (MIN. 29.78 ) mm$H_2O$<br>1.448 (MIN. 1.173 ) inch$H_2O$ |
| ACOUSTICAL NOISE (AVG.) | 67.0(MAX.71.0) dB-A |
| INSULATION TYPE | UL: CLASS A |

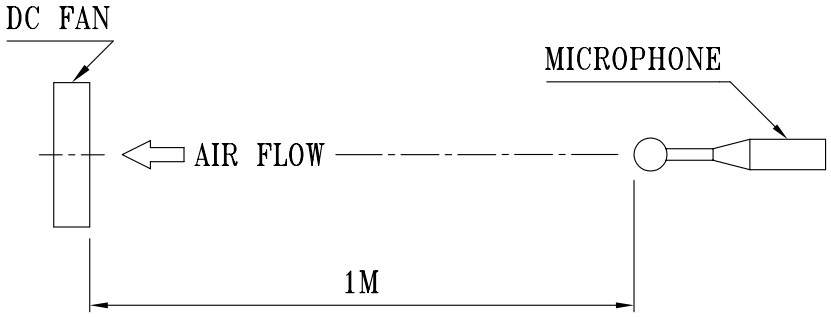
(continued)

PART NO:

DELTA MODEL: AHB1348GHE-CZ41

| | |
|---|---|
| INSULATION STRENGTH | 10 MEG OHM MIN. AT 500 VDC (BETWEEN FRAME AND (+) TERMINAL) |
| DIELECTRIC STRENGTH | 5 mA MAX. AT 1000 VAC 50/60 Hz ONE MINUTE, (BETWEEN FRAME AND (+) TERMINAL) |
| EXTERNAL COVER | OPEN TYPE |
| LIFE EXPECTANCE (AT LABEL VOLTAGE) | 100,000 HOURS CONTINUOUS OPERATION AT 40 °C WITH 15 ~ 65 %RH. |
| ROTATION | CLOCKWISE VIEW FROM NAME PLATE SIDE |
| LOCKED ROTOR SHUT DOWN | THE CURRENT WILL SHUT DOWN WHEN LOCKING ROTOR |
| STARTING PROTECTION | START AT LOW SPEED , AFTER 15 SEC RUNNING AT FULL SPEED |
| LEAD WIRE | UL 1007 -F- AWG #24<br>BLACK WIRE NEGATIVE(-)<br>RED WIRE POSITIVE(+)<br>UL 1061 -F- AWG #24<br>BLUE WIRE FREQUENCY(-F00)<br>YELLOW WIRE (PWM) |

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. 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.

PART NO:

DELTA MODEL: AHB1348GHE-CZ41

3. MECHANICAL:

3-1. DIMENSIONS ---------- SEE DIMENSIONS DRAWING

3-2. FRAME ---------- DIE-CASTING UL: 94V-0

3-3. IMPELLER ---------- PLASTIC UL: 94V-0

3-4. BEARING SYSTEM ---------- TWO BALL BEARINGS

3-5. WEIGHT ---------- 490 GRAMS

4. ENVIRONMENTAL:

4-1. OPERATING TEMPERATURE ---------- -40 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.

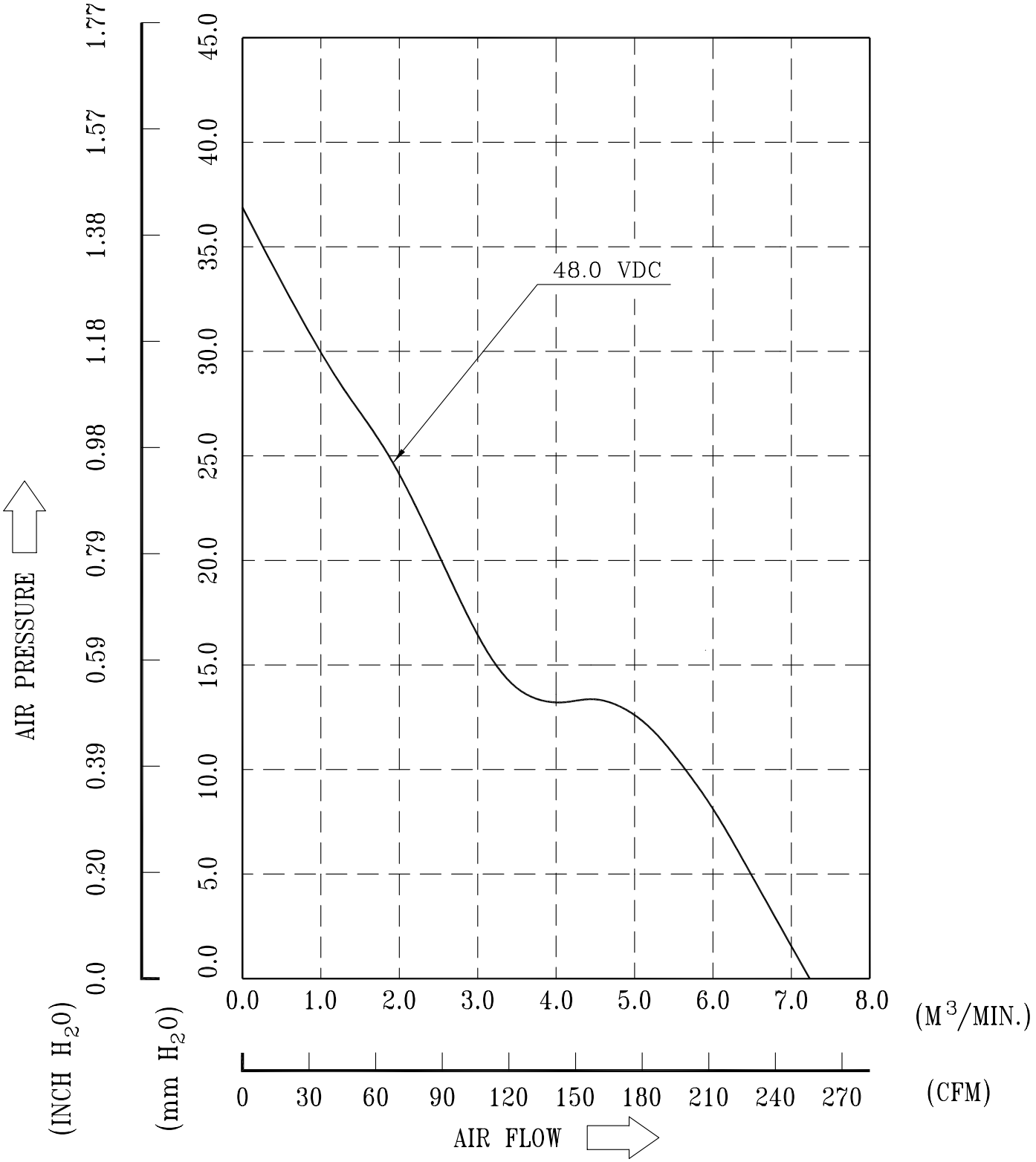
7. PRODUCTION LOCATION

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

PART NO:

DELTA MODEL: AHB1348GHE-CZ41

8. P & Q CURVE:




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



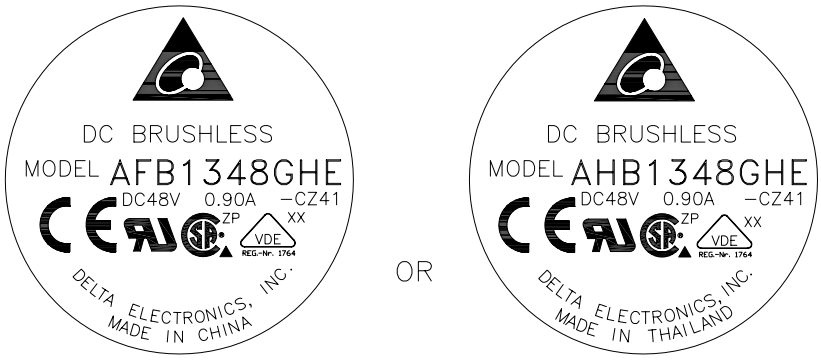
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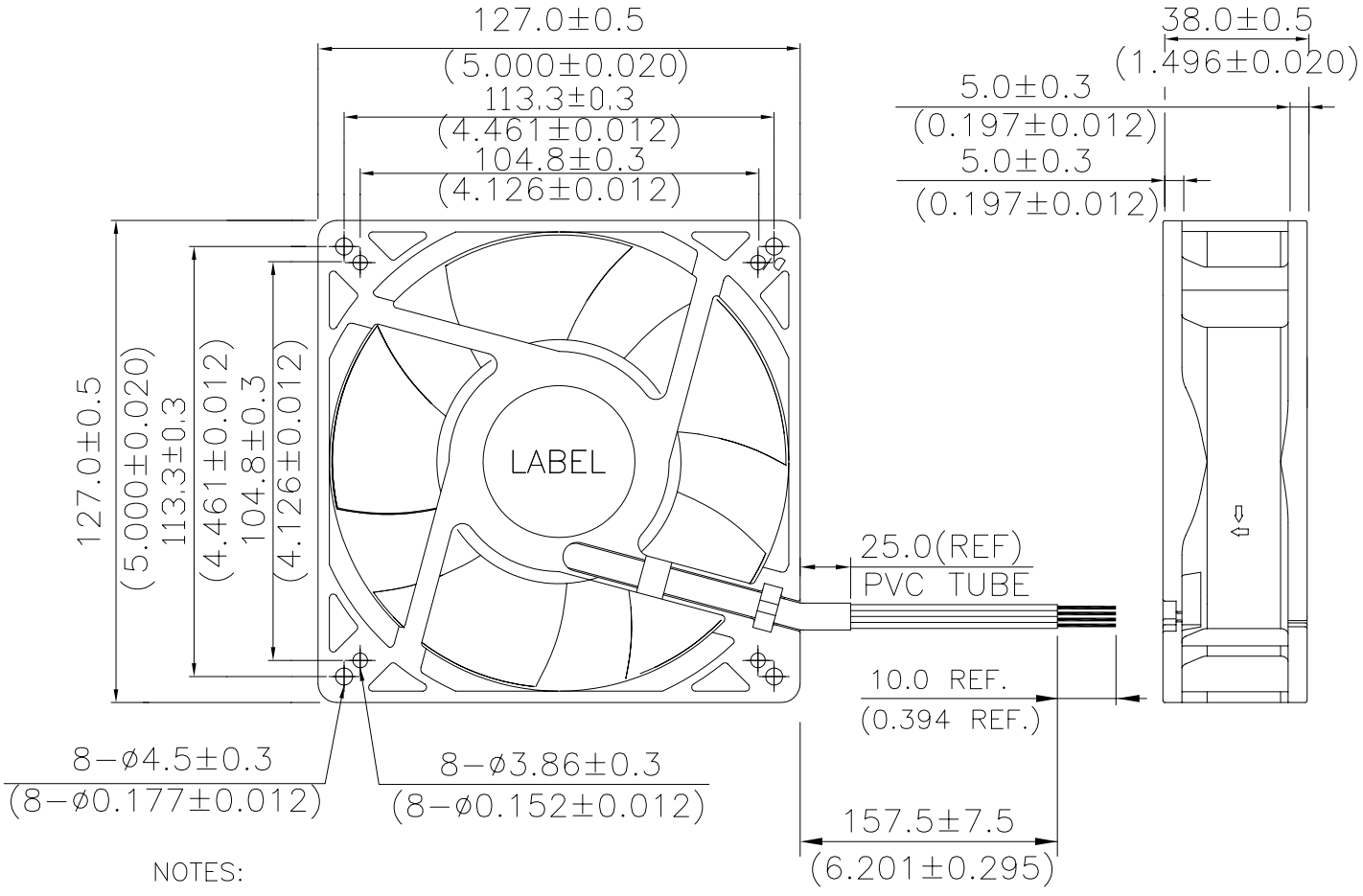
PART NO:

DELTA MODEL: AHB1348GHE-CZ41

9. DIMENSION DRAWING:

LABEL:




NOTES:

1. LEAD WIRE UL:1007 AWG#24
   BLACK WIRE------(-)
   RED WIRE------(+)
   CABLE WIRE 1061#24
   BLUE WIRE-------(FOO)
   YELLOW WIRE------(PWM)
2. THIS PRODUCT IS RoHS COMPLIANT.

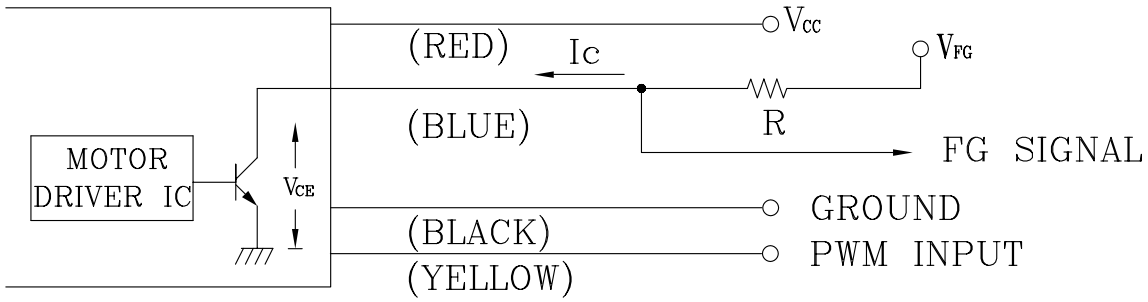
UNIT: mm(INCH)

PART NO:

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10. FREQUENCY GENERATOR (FG) SIGNAL:

1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



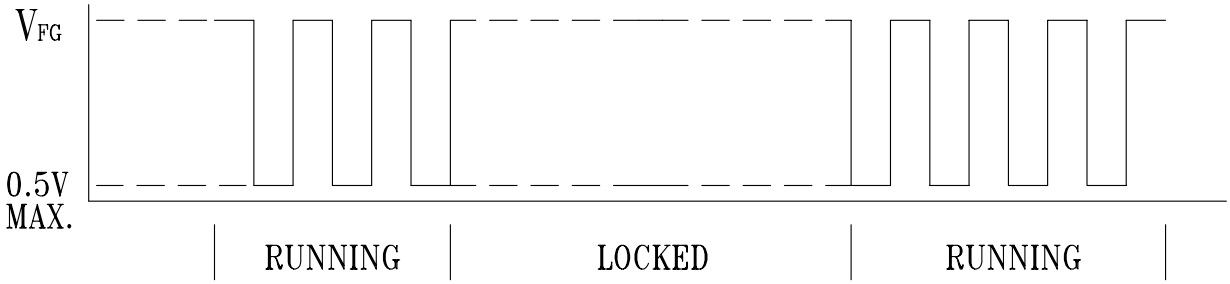

CAUTION: THE FG SIGNAL LEAD WIRE MUST BE KEPT AWAY FROM "+" LEAD WIRE & "−" LEAD WIRE.

2. SPECIFICATION:

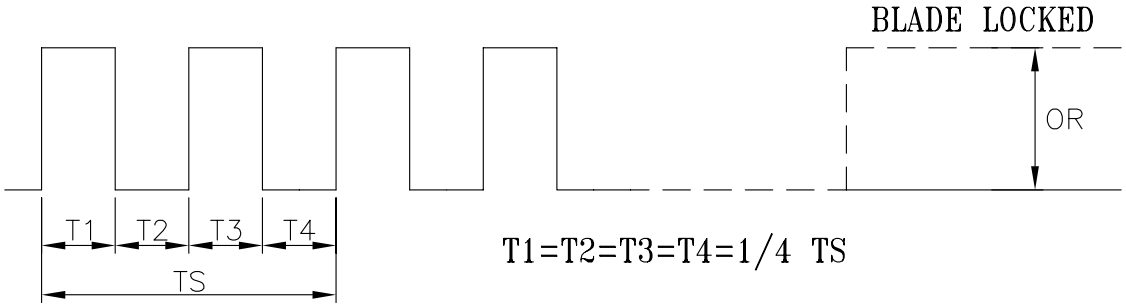
$V_{CE(sat)}$=0.5V MAX $V_{FG}$=80.0V MAX

$I_C$ =10mA MAX. $R \geq V_{FG}/I_C$

3. FREQUENCY GENERATOR WAVEFORM:




FAN RUNNING FOR 8 POLES




T1=T2=T3=T4=1/4 TS

N=R.P.M

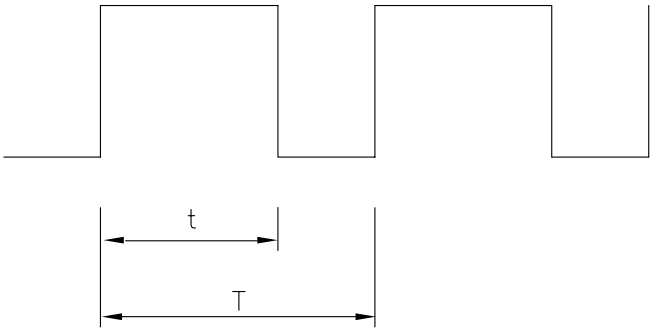
TS=60/N(SEC)

*VOLTAGE LEVEL AFTER BLADE LOCKED

*8 POLES

11. PWM CONTROL SIGNAL:

SIGNAL VOLTAGE RANGE: 0~10VDC




— — — — HIGH SIGNAL: 3.3 VDC MIN.

— — — — LOW SIGNAL: 0.8 VDC MAX.

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

- THE FREQUENCY FOR CONTROL SIGNAL OF THE FAN SHALL BE ABLE TO ACCEPT A 20KHZ~25KHZ.
- THE PREFERRED OPERATING POINT FOR THE FAN IS 20K HZ.
- AT 100% DUTY CYCLE,THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- AT 0%-15% DUTY CYCLE,THE ROTOR WILL STOP SPIN .
- WITH CONTROL SIGNAL LEAD DISCONNECTED,THE FAN WILL SPIN AT MAXIMUM SPEED.
- AT 20KHZ 20% DUTY CYCLE ,THE FAN WILL BE ABLE TO START FROM A DEAD STOP .

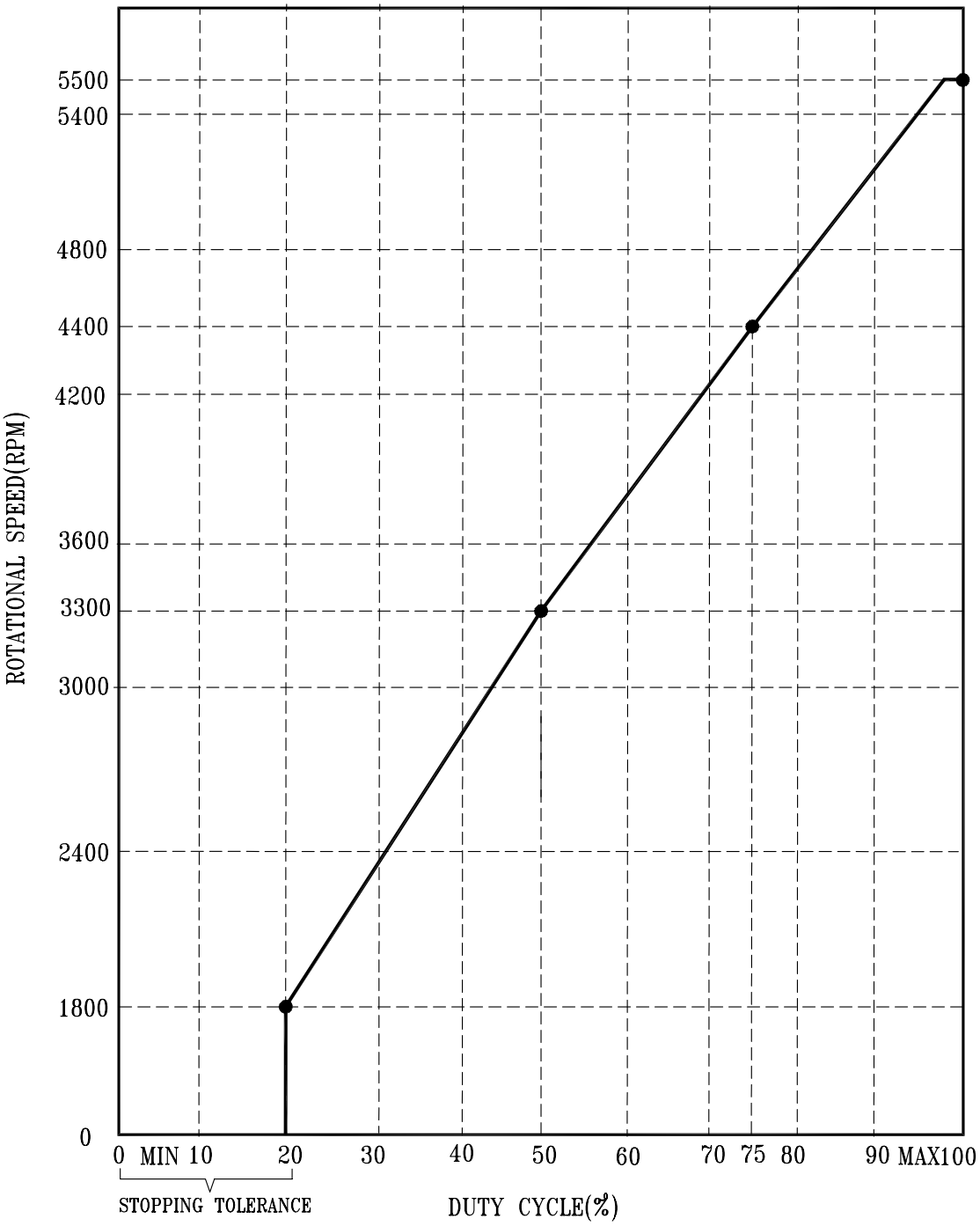
12. SPEED VS PWM CONTROL SIGNAL: (PWM FREQUENCY=20KHZ)

| DUTY CYCLE (%) | SPEED R.P.M. (REF.) | CURRENT (A) TYP. |
|---|---|---|
| 100 | 5500 ± 10% | 0.75A |
| 75 | 4400 ± 10% | 0.50A |
| 50 | 3300 ± 10% | 0.30A |
| 0 | 0 | 0 |

PART NO:

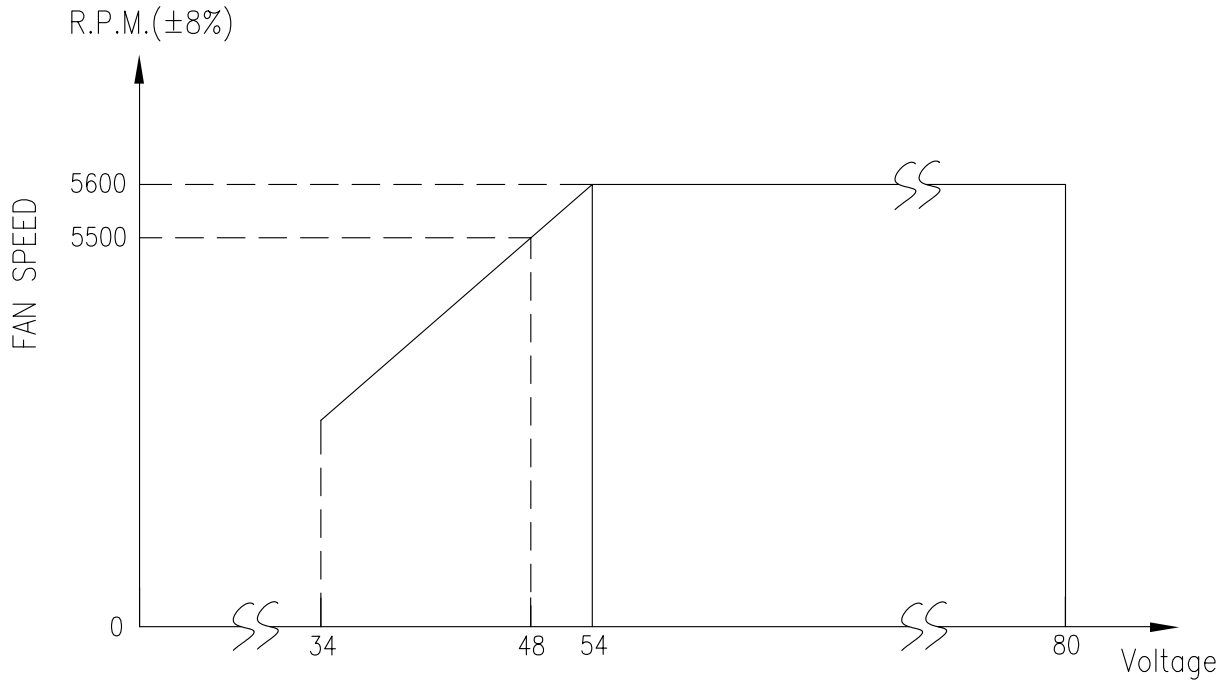
DELTA MODEL: AHB1348GHE-CZ41

13. DUTY CYCLE & SPEED CURVE:



14. HIGH VOLTAGE SPEED LIMIT FUNCTION

54~80V FAN SPEED KEEP IN 5600 R.P.M




NOTE: 1. NEED TO TEST 48V AND 80V FAN SPEED,
AND 48V MUST MEET 5500 R.P.M(±8%).
80V MUST MEET 5600 R.P.M(±8%).

2. BESIDES 48V CPK OF THE FAN SPEED MUST EXCEED 1.33,
80V CPK OF THE FAN SPPED MUST NOT MEET,
BUT THE SPEED MUST MEET SPEC INSIDE THE TOLERANCE.

# 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.