SPECIFICATION FOR APPROVAL

Customer			
Description	DC FAN		
Part No.		**Rev.**	
Delta Model No.	KFB2348HHU-EP	**Rev.**	01
Sample Issue No.			
Sample Issue Date.	Apr 22, 2013		

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

APPROVED BY : _____

DATE : _____

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SPECIFICATION FOR APPROVAL
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Customer:			
Description:	DC BLOWER		
Customer P/N:	KFB2348HHU-EP	REV:	
Delta Model NO.:			
Sample Rev:	01	Issue NO:	
Sample Issue Date:	Apr 22, 2013	Quantity:	

1. SCOPE:

THIS SPECIFICATION DEFINES THE ELECTRICAL AND MECHANICAL CHARACTERISTICS OF THE DC BRUSHLESS CENTRIFUGAL BLOWER.

2. CHARACTERS:

ALL CHARACTERS ARE MEASURED UNDER THE STANDARD ENVIRONMENTAL CONDITION (25°C AND 1 ATM).

ITEM	DESCRIPTION
RATED VOLTAGE	48.0 VDC
OPERATION VOLTAGE	36.0-60.0 VDC
INPUT CURRENT	2.20 (MAX. 2.64) A (CURRENT ON SAFETY LABEL : 2.76A)
INPUT POWER	105.60 (MAX. 126.72) W
SPEED	2600 ± 10% R.P.M.
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	20.853 (MIN. 18.768) M^3/MIN. 735.08 (MIN. 661.57) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	50.54 (MIN. 40.94) mmH_2O 1.990 (MIN. 1.612) $inchH_2O$
ACOUSTICAL NOISE (AVG.)	71.0 (MAX. 75.0) dB-A
INSULATION TYPE	UL:CLASS A
INGRESS PROTECTION	IP56(IEC60529 STANDARD)
SALT FOG PROTECTION	30 DAYS (GR-487)

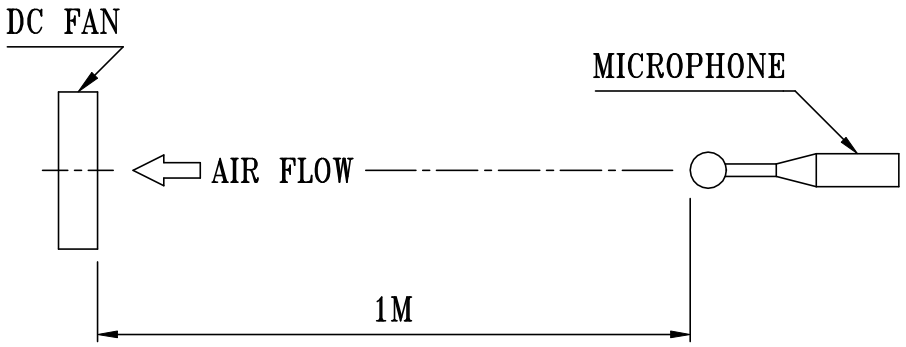
(continued)

PART NO:

DELTA MODEL: KFB2348HHU-EP

INSULATION STRENGTH	10 MEG OHM MIN. AT 500 VDC (BETWEEN PILLOW AND (+) TERMINAL)
DIELECTRIC STRENGTH	5 mA MAX. AT 500 VAC 50/60 Hz ONE MINUTE, (BETWEEN PILLOW AND (+) TERMINAL)
EXTERNAL COVER	OPEN TYPE
LIFE EXPECTANCE (AT LABEL VOLTAGE)	L10, 70,000 HOURS AT 40 °C WITH 15 ~ 65 %RH.
ROTATION	COUNTER CLOCKWISE VIEW FROM NAME PLATE SIDE
STARTING PROTECTION	START AT LOW SPEED , AFTER 5 SEC RUNNING AT FULL SPEED
LEAD WIRE	UL 1430 AWG #22 BLACK WIRE NEGATIVE(-) RED WIRE POSITIVE(+) BLUE WIRE FREQUENCY(F00) YELLOW WIRE SPEED CONTROL(PWM)

NOTES:
1. ALL READINGS ARE MEASURED AFTER STABLY WARMING UP THROUGH 10 MINUTES.
2. THE VALUES WRITTEN IN PARENS , ( ), ARE LIMITED SPEC.
3. 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:

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3. MECHANICAL:

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

3-2. PILLOW ---------- ALUMINUM

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

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

3-5. WEIGHT ---------- 1200 GRAMS

4. ENVIRONMENTAL:

4-1. OPERATING TEMPERATURE ---------- -25 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

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 OR TAIWAN.

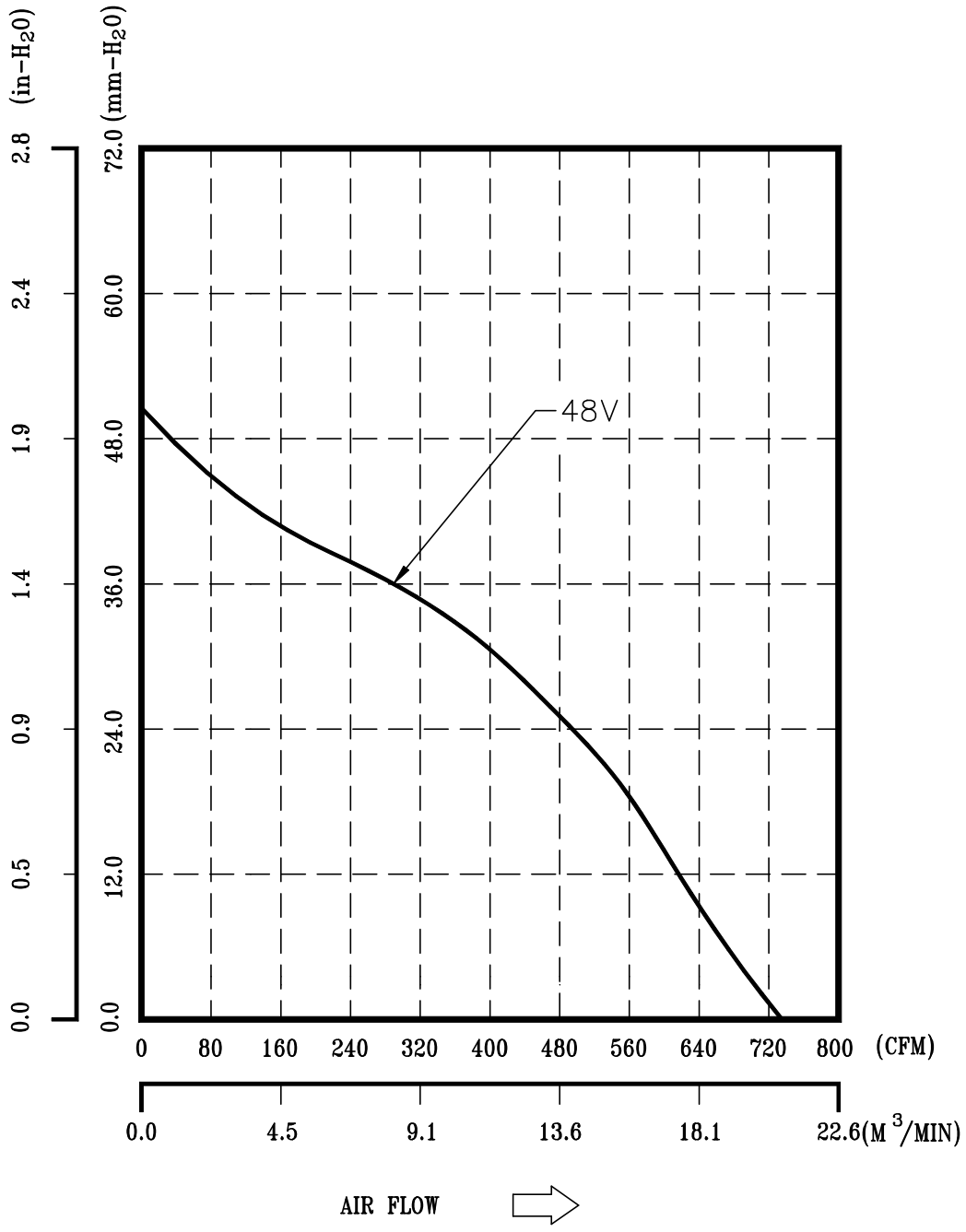
8. RESTRICTION OF THE USE CERTAIN OF HAZARDOUS SUBSTANCES IN ELECTRICAL AND ELECTRIC EQUIPMENT.

8-1 NO CONTAINING PB , CD , HG , CR 6+ , PBB , PBDE.

PART NO:

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9. P & Q CURVE:



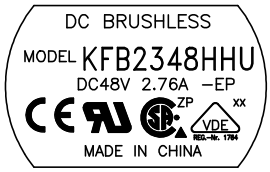
* TEST CONDITION: INPUT VOLTAGE ----- RATED VOLTAGE
TEMPERATURE ------ ROOM TEMPERATURE
HUMIDITY --------- 65%RH

PART NO:

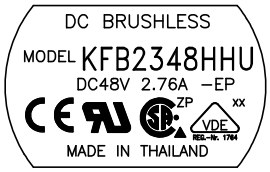
DELTA MODEL: KFB2348HHU-EP

10. DIMENSION DRAWING:

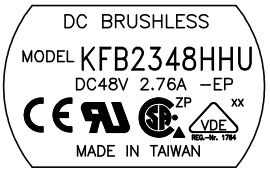
LABEL:

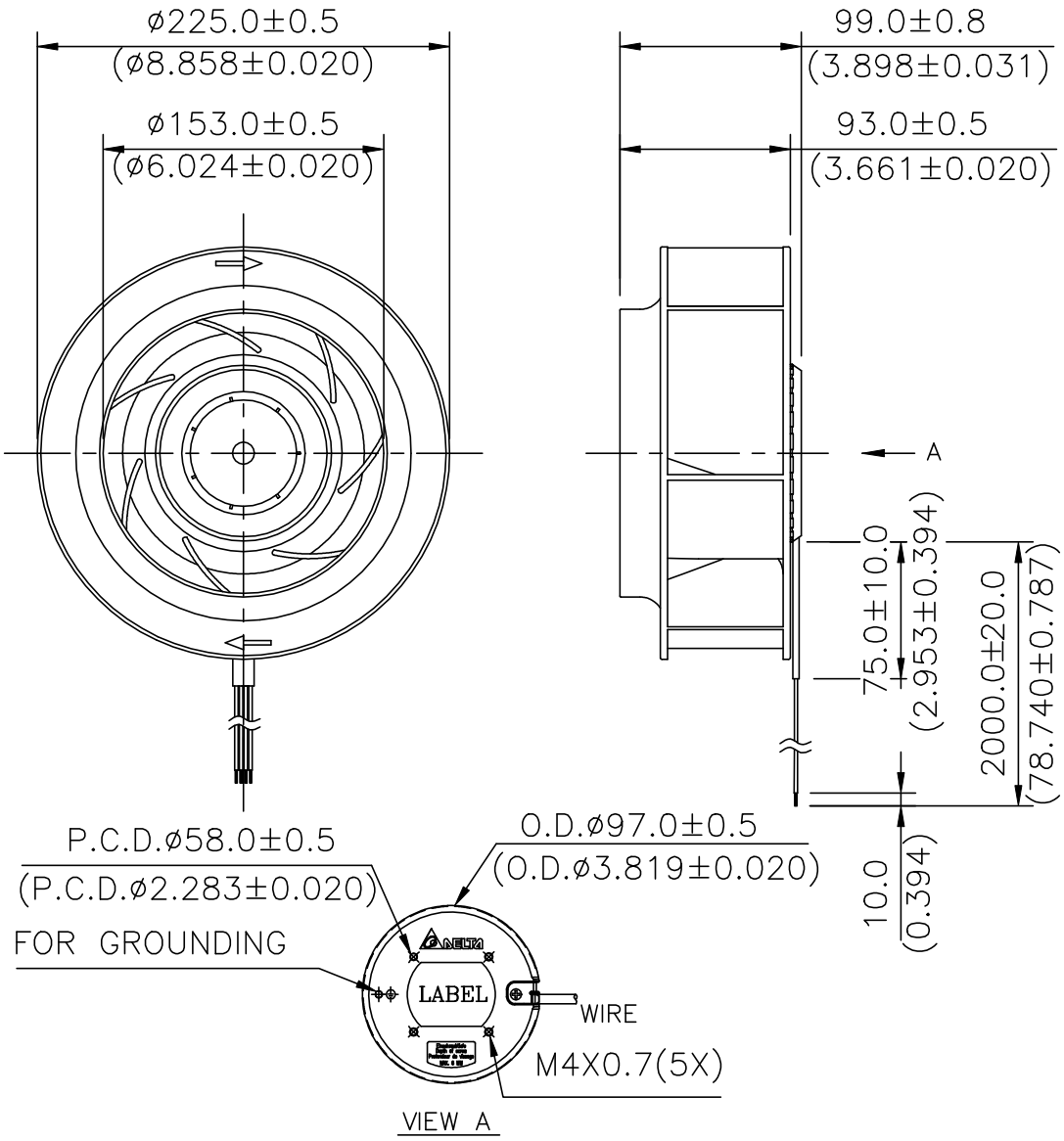


OR



OR





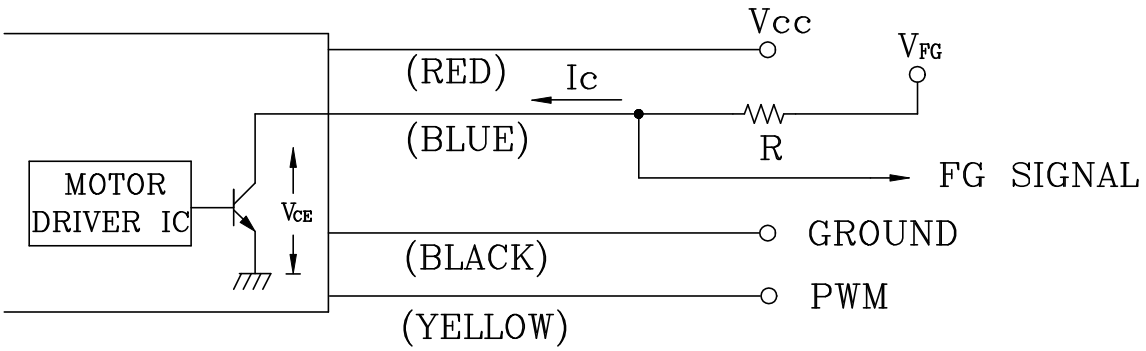
UNIT: mm(INCH)

NOTES :

1. WIRE: UL 1430 AWG #22
   - RED WIRE (+)
   - BLUE WIRE (F00)
   - BLACK WIRE (-)
   - YELLOW WIRE (PWM)
2. H/S TUBE : BLACK ø4.0*0.55 105°C 600V
3. THIS PRODUCT IS RoHS COMPLIANT.

11. FREQUENCY GENERATOR (FG) SIGNAL:

A. OUTPUT CIRCUIT – OPEN COLLECTOR MODE:



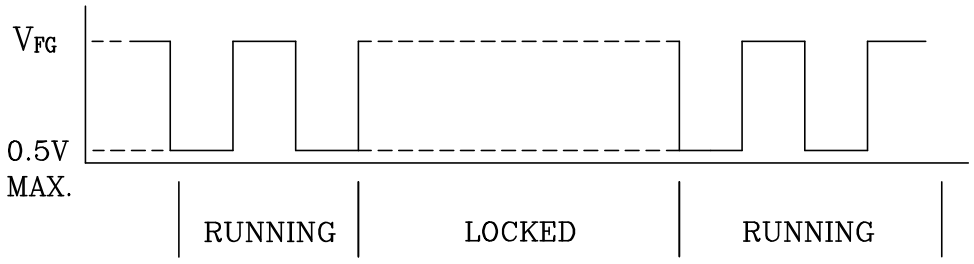
CAUTION: THE FG SIGNAL LEAD WIRE MUST BE KEPT AWAY FROM "+" LEAD WIRE & "–" LEAD WIRE.

B. SPECIFICATION:

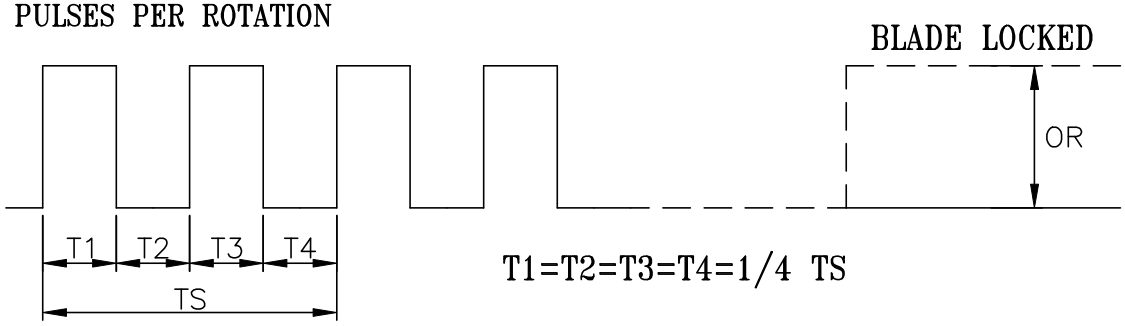
V_{FG} = 60V MAX. I_C = 10mA MAX.

$V_{CE(SAT)}$ = 0.5V MAX. $R \geq V_{FG}/I_C$

C. FREQUENCY GENERATOR WAVEFORM:



2 PULSES PER ROTATION



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

N=R.P.M

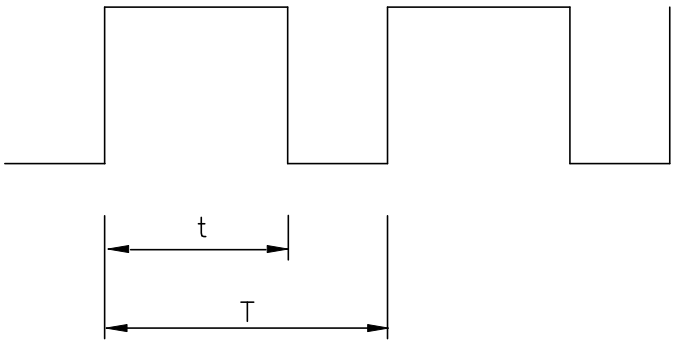
TS=60/N(SEC)

*VOLTAGE LEVEL AFTER BLADE LOCKED

*4 POLES

12. PWM CONTROL SIGNAL:

SIGNAL VOLTAGE RANGE: -0.8VDC~20VDC



HIGH SIGNAL: 20 VDC MAX. 2.8 VDC MIN.

LOW SIGNAL: 0.4 VDC MAX. -0.8 VDC MIN.

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

- THE PREFERRED OPERATING POINT FOR THE FAN IS 1K HZ.
- AT 100% DUTY CYCLE 48VDC,THE ROTOR WILL SPIN AT MAXIMUM SPEED.
- AT 0% DUTY CYCLE 48VDC,THE ROTOR WILL STOP.
- WITH CONTROL SIGNAL LEAD DISCONNECTED,THE FAN WILL SPIN AT MAXIMUM SPEED.
- WHEN THE ROTOR IS HALTED , IT WILL SPIN BY MORE THAN 20% DUTY CYCLE.

13. SPEED VS PWM CONTROL SIGNAL: (DC48V F:1KHZ TEMP:25 DEGREE C)

DUTY CYCLE (%)	SPEED R.P.M. (REF.)	CURRENT (A) TYP.
100	2600±10%	2.20
50	1400±200	0.41
20	750±200	0.10
0	0	0.02

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.