SPECIFICATION FOR APPROVAL

Customer : NVIDIA
Description : DC FAN
Customer Part No. : REV. :
Delta Model No. : AFB0405MA-AFGE REV. : 01
Sample Issue No. :
Sample Issue Date : JUN.10.2019

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

APPROVED BY:

DATE :

DELTA ELECTRONICS, INC.
TAOYUAN PLANT
252, SHANGYING ROAD, GUISHAN INDUSTRIAL ZONE,
TAOYUAN CITY 33341, TAIWAN
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Delta Electronics, Inc.
252, SHANGYING ROAD, GUISHAN INDUSTRIAL ZONE, TEL : 886-(0)3-3591968
TAOYUAN CITY 33341, TAIWAN FAX : 886-(0)3-3591991

STATEMENT OF DEVIATION

■ NONE

□ DESCRIPTION:

Delta Electronics, Inc.
252, SHANGYING ROAD, GUISHAN INDUSTRIAL ZONE, TEL : 886-(0)3-3591968
TAOYUAN CITY 33341, TAIWAN FAX : 886-(0)3-3591991

Specification For Approval

Customer : NVIDIA

Description : DC FAN

Customer P/N : rev. :

Delta model no. : AFB0405MA-AFGE Delta Safety Model No.: AFB0405MA-A

Sample revision. : 01 Issue no.:

Sample issue date : JUN.10.2019 Quantity :

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

ITEM	DESCRIPTION
RATED VOLTAGE	5 V
OPERATION VOLTAGE	4.5 - 5.5 VDC
INPUT CURRENT(AVG.) # (AT FREE AIR)	0.05 (MAX. 0.10) A SAFETY CURRENT ON LABEL : 0.10A
INPUT POWER(AVG.) (AT FREE AIR)	0.25 (MAX. 0.50) W
SPEED (AT 5 MIN. RUNNING) (AT FREE AIR)	5000±10% R.P.M.
MAX. AIR FLOW (AT ZERO STATIC PRESSURE)	0.161 (MIN. 0.136) M^3/MIN. 5.675 (MIN.4.823) CFM
MAX. AIR PRESSURE (AT ZERO AIRFLOW)	2.652 (MIN. 1.916) mmH_2O 0.104 (MIN. 0.075) inH_2O
ACOUSTICAL NOISE (AVG.)	21.5 (MAX. 25.5) 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)

: THE MAX VALUE OF CONSUMING CURRENT DOES NOT REPRESENT THE PEAK VALUE, THE PEAK VALUE NEED MEASURE BY OSCILLOSCOPE.

(continued)

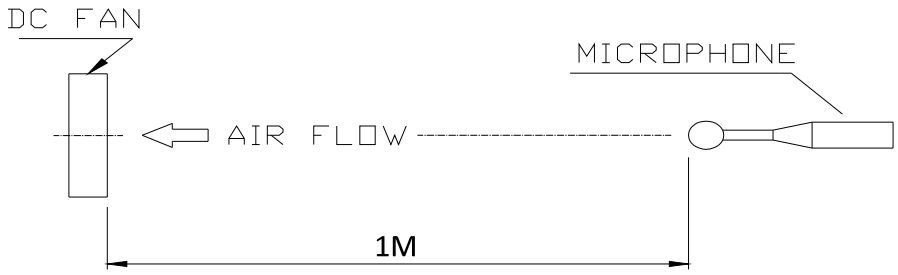
PART NO:

DELTA MODEL: AFB0405MA-AFGE

LIFE EXPECTANCE (L10) (AT LABEL VOLTAGE)	70,000 HOURS CONTINUOUS OPERATION AT 40 °C WITH 15 ~ 65 %RH.
ROTATION	CLOCKWISE VIEW FROM NAME PLATE SIDE.
OVER CURRENT 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℃ TEMPER ATURE, (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.

3.MECHANICAL:

3-1. DIMENSIONS---------- SEE DIMENSIONS DRAWING
3-2. FRAME---------- PLASTIC UL: 94V-0
3-3. IMPELLER---------- PLASTIC UL: 94V-0
3-6. BEARING SYSTEM----------TWO BALL BEARINGS
3-7. WEIGHT---------- 14.0 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.

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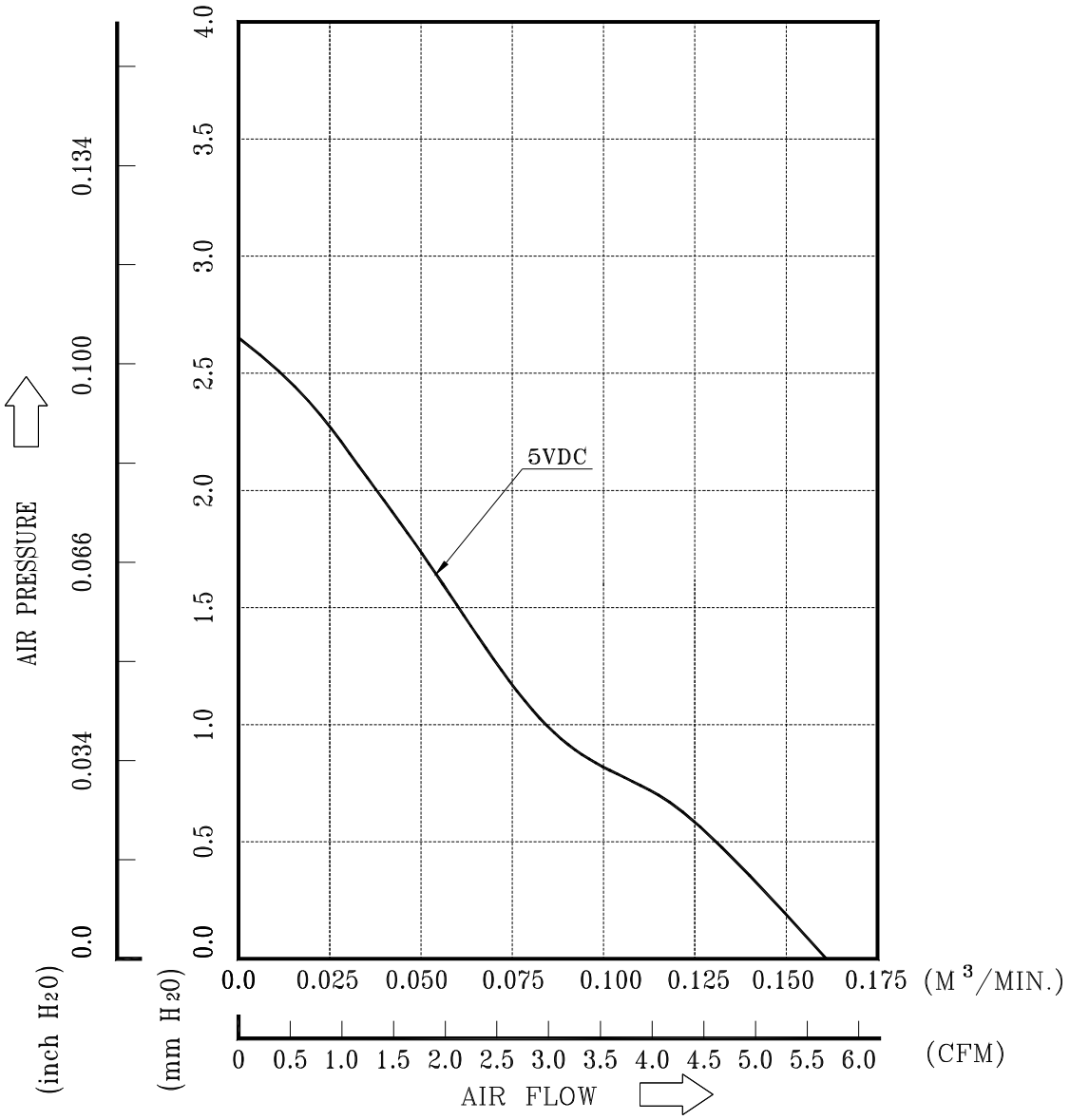
8. P & Q CURVE:



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

PART NO:

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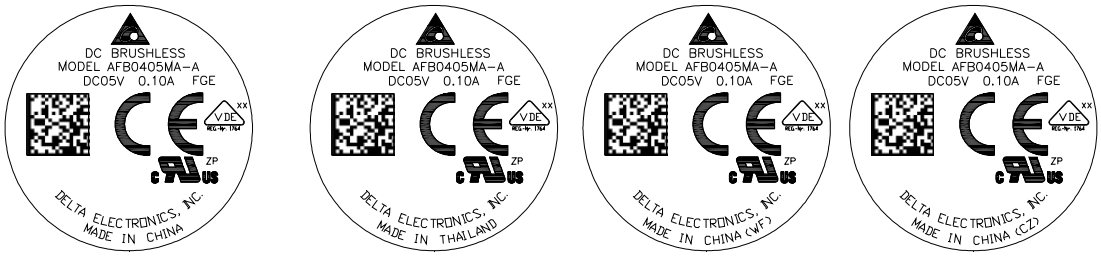
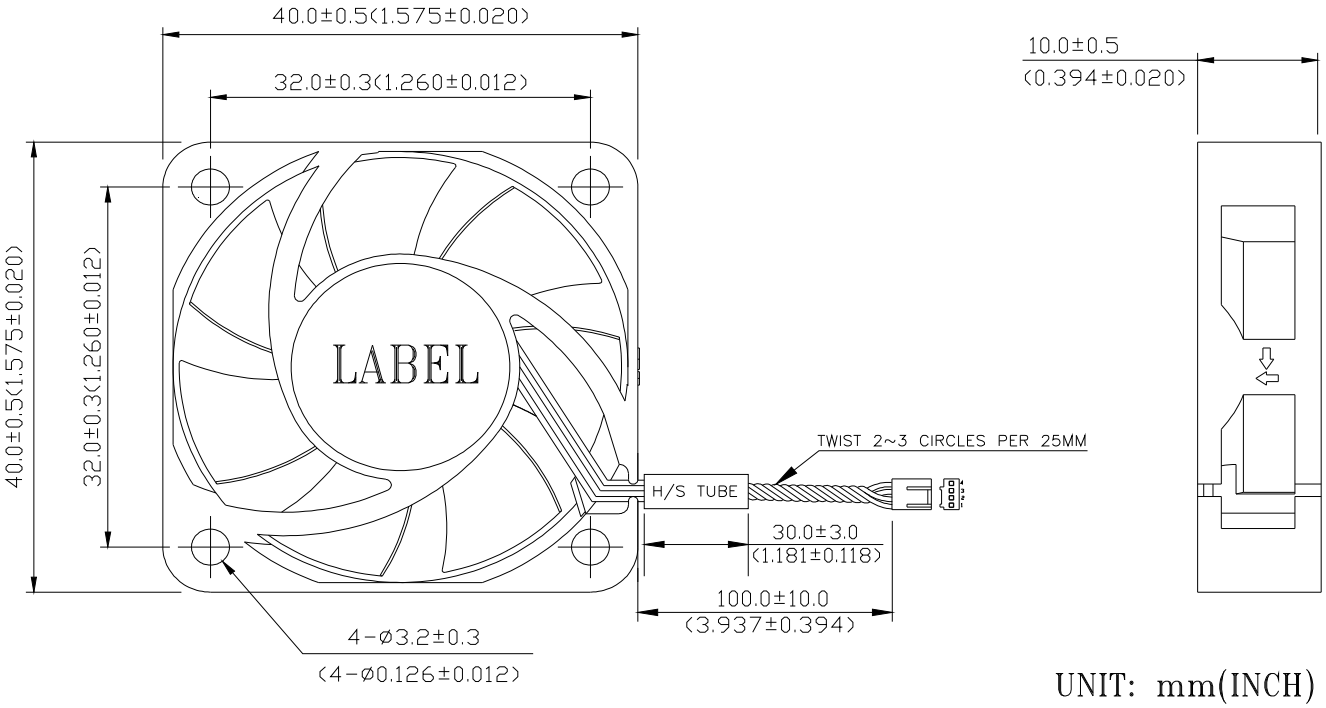
9. DIMENSION DRAWING:

LABEL:





NOTES:

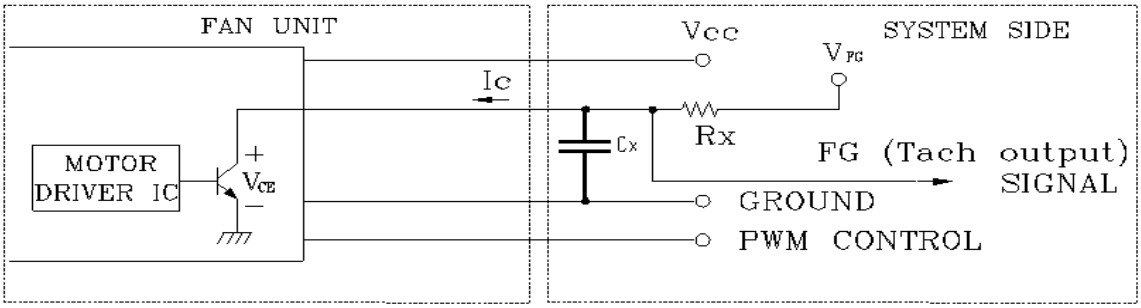
1. LEAD WIRE: UL1061AWG#28
   PIN 1: BLACK WIRE-----(-)
   PIN 2: RED WIRE-----(+)
   PIN 3: YELLOW WIRE-----(F00)
   PIN 4: BLUE WIRE-----(PWM)
2. HOUSING: LOTES ABB-WAF-057-P08 OR JWT A2543H00-4P-DL OR EQUIVALENT
3. TERMINAL: LOTES ABB-WAF-055-K01 OR JWT A2543TOB-2 OR EQUIVALENT
4. THIS PRODUCT IS ROHS COMPLIANT.

PART NO:

DELTA MODEL: AFB0405MA-AFGE

10. FREQUENCY GENERATOR (FG) SIGNAL:

10-1. OUTPUT CIRCUIT - OPEN COLLECTOR MODE:



GENERAL CONDITION: VFG is 3.3V, Rx is 8.2Kohm, and Cx is 4nF.

CAUTION:

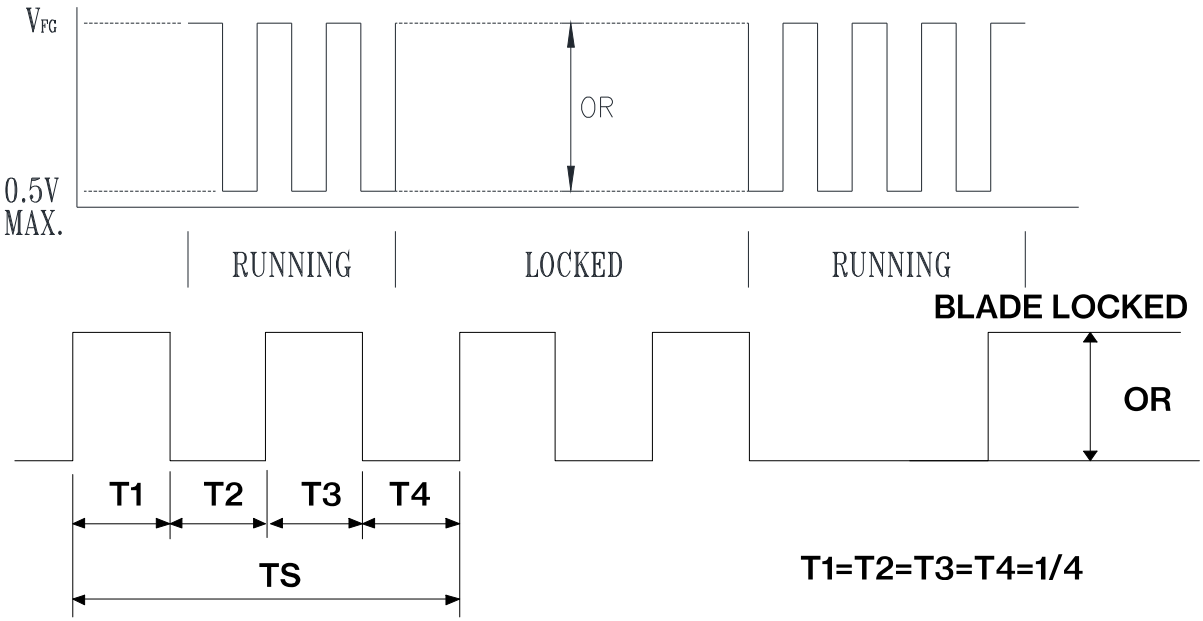
THE LEAD WIRE OF FG SIGNAL CAN NOT TOUCH
THE LEAD WIRE OF POSITIVE OR NEGATIVE.

10-2. SPECIFICATION:

V_{FG}= 5.5V MAX. Ic = 5mA MAX.

V_{CE}= 0.5V MAX. Rx ≧ V_{FG} /Ic

10-3. FREQUENCY GENERATOR WAVEFORM:



N=R.P.M

TS=60/N(SEC)

*VOLTAGE LEVEL AFTER BLADE LOCKED

*4 POLES

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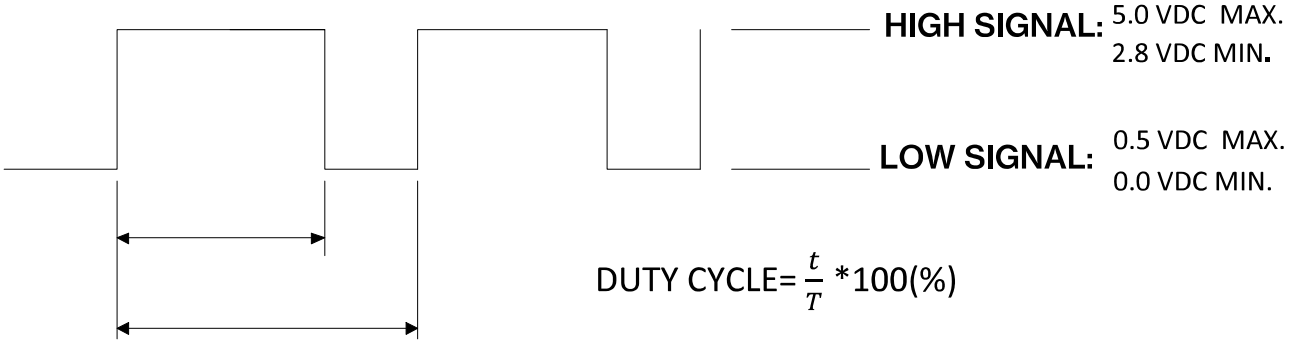
11. PWM CONTROL SIGNAL:
SIGNAL VOLTAGE RANGE: 0~5 VDC

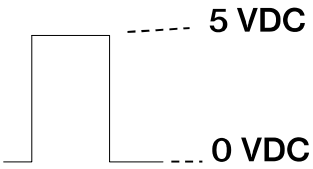


*THE PREFERRED OPERATING POINT FOR THE FAN IS 25K HZ.
*AT 100% DUTY CYCLE, THE ROTOR WILL SPIN AT MAXIMUM SPEED.
*AT 0% DUTY CYCLE, THE ROTOR WILL SPIN STOP.
*WITH CONTROL SIGNAL LEAD DISCONNECTED, THE FAN WILL SPIN AT MAXIMUM SPEED.
*AT 25K HZ, RATED VOLTAGE 5V, 20% DUTY CYCLE, THE FAN WILL BE ABLE TO START FROM A DEAD STOP.

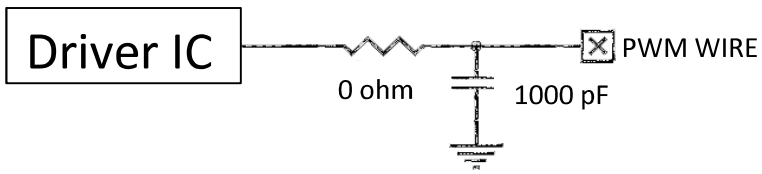
12. SPEED VS PWM CONTROL SIGNAL:
(AT 25℃, RATED VOLTAGE 5V & PWM FREQUENCY=25K Hz)

DUTY CYCLE (%	SPEED R.P.M.	CURRENT (A) TYP.	CURRENT (A) MAX.
100	5000±10%	0.05	0.10
0	0	0.01	0.02

*PWM SIGNAL
PWM FREQUENCY = 25K HZ



13. PWM CONTROL LEAD WIRE INPUT IMPEDANCE:



PART NO:

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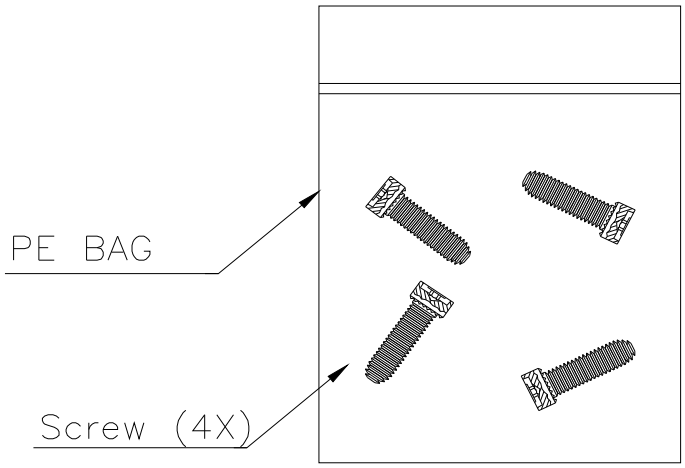
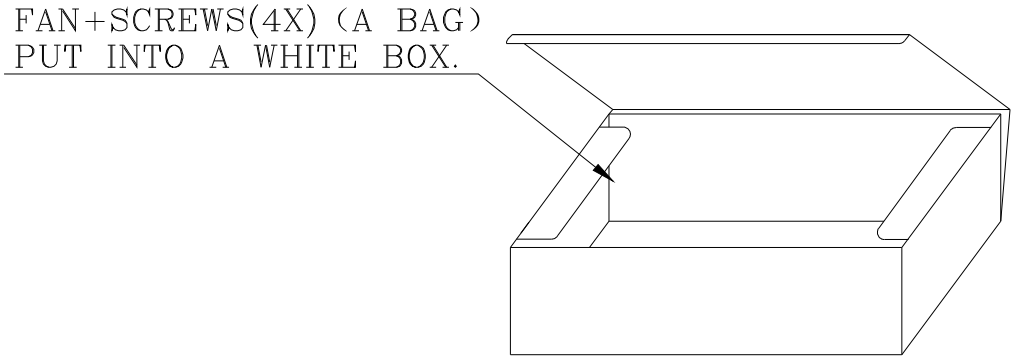
14. PACKING SPEC

14-1. SCREW PACKING

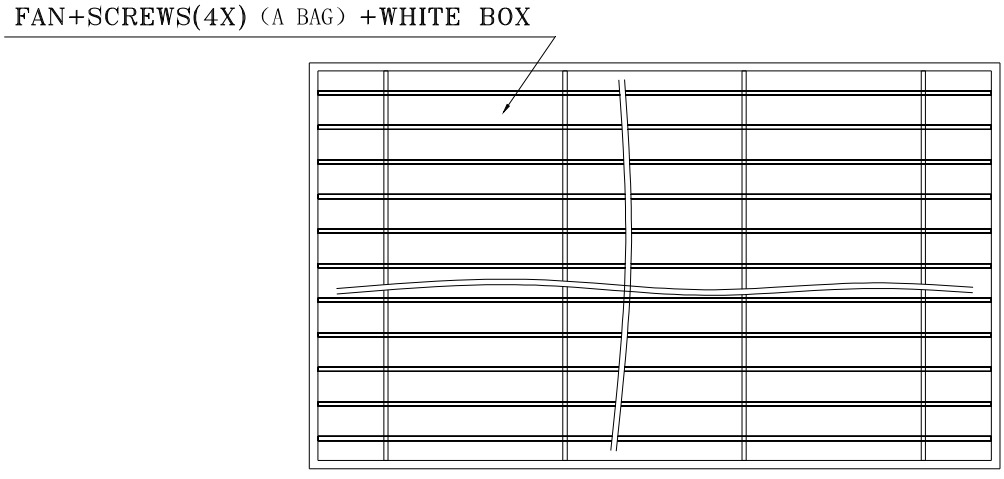
PUT SCREW(4X) INTO A BAG.



14-2. FAN AND BAG WITH SCREW (4X) PACKING:



14-3. WHITE BOX PACKING:



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.