

# Global Operations



	Greater China	Asia (Except Greater China)	Americas	Europe
Sales Offices	8	4	9	21
Manufacturing Plants	11	3	1	2
R&D/Engineering Labs	5	5	4	4
Logistics Hubs	8	8	37	33

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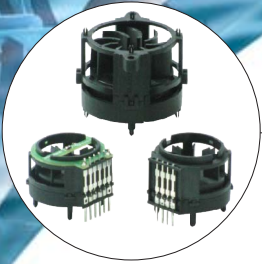
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## Introduction



Delta is a leading global electronics company offering a broad spectrum of electronic components and equipment including switching power supplies, color monitors, EMI/RFI filters, magnetics, networking components, chip and power inductors, motors, resistor networks, and DC fans. Our strong capabilities in product design, manufacturing, automation and quality assurance make us the preferred supplier to OEM customers and distributors around the world.

For brushless DC fans, Delta's highly experienced design engineers have in-depth knowledge of customer applications and cooling requirements. Advanced engineering equipment such as computerized CNC machines, anechoic chambers and wind tunnels are used to develop high performance, low noise, and cost effective DC fans.

Delta is an ISO-9001 & TS16949 certified manufacturer for brushless DC fans, with ROHS compliance beginning in Q2 2005. We implement strict reliability tests in the design stage and have put into place Statistical Process Controls at each step of the production process. Because of our outstanding performance in quality and reliability, Delta has earned vendor awards from major customers such as Asus, Cisco, Dell, HP, IBM, NCR, NEC, Nortel, Philips, Xerox and others.



*Anechoic Chamber for Noise Test*



*Wind Tunnel*



*Computerized CNC Machine*



*Automated Balance Test*

Our automation department is highly specialized with computerized state-of-the-art equipment. We build computer integrated automated production lines in-house for the assembly and testing of our DC fans. This allows us to provide large production capacity plus high quality and cost effective products to our customers.

Delta's DC fan manufacturing plants are located in Dongguan, Wujiang (China), Bangkok (Thailand) and Taiwan, with sales offices located globally. Delta maintains a stock of standard models in Taiwan, the U.S.A., Japan, and Europe through our extensive distribution network. Our worldwide manufacturing and customer service enables us to meet customer requirements flexibly and effectively as well as serve domestic companies with international affiliations.



*Manufacturing Plant 2 in Taoyuan, Taiwan*



*Manufacturing Plant in Wujiang, China*



*Manufacturing Plant in Dongguan, China*



*Manufacturing Plant in Bangkok, Thailand*



# 2003 National Invention Award



## QS 9000 accredited ISO/TS 16949 certified manufacturer for Air Cooling Fan products



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# DC Fan With Minimum Noise

## Introductions

- Every model undergoes rigorous aerodynamic analysis and anechoic chamber test to achieve minimum noise under high airflow and air pressure conditions.
- High precision maintenance-free ball bearing system provides superb reliability.
- Frame and fan blade meet UL 94V-0 flammability rating.
- Every model features locked rotor protection and polarity protection, and offers optional frequency generator or rotation detector function.
- All DC fans are 100% balanced to guarantee low vibration and excellent durability.
- Automatic multi-axes winding, surface-mount machine and highly automated assembly lines enable mass production and consistent quality.
- UL, CSA, VDE approved.

## Part Number Definition

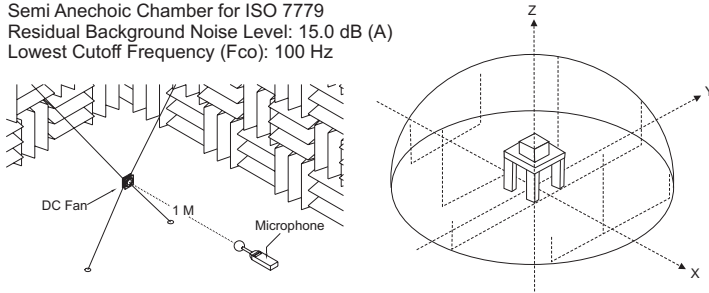
AFB	12	12	H	E	-	B	F	00
1	2	3	4	5		6	7	8
1. SERIES CODE : AFB,AHB,EFB,EHB,FFB,FHB,GFB, LFB,NFB,TFB,BFB, KFB,KHB,SFB,	2. FRAME DIMENSION: 02 : 125 x 38 x 45 mm 03 : 30 mm SQUARE or 180 x 38 x 45 mm 032 : Ø32 x 9 mm 035 : 35 mm SQUARE 04 : 40 mm SQUARE or 42 x 45 x 19 mm 045 : 45 mm SQUARE 05 : 50 mm SQUARE or 51 x 51 x 15 mm 06 : 60 mm SQUARE 07 : 70 mm SQUARE or 75 x 75 x 30 mm 08 : 80 mm SQUARE 09 : 92 mm SQUARE 10 : 97 x 94 x 33 or Ø100 x 46.8 mm 12 : 120 mm SQUARE or 125 x 126 x 34 mm or 120 x 120 x 32 mm 13 : 127 mm SQUARE or Ø133 x 61.5 mm 14 : 140 mm SQUARE 15 : 172 x 150 mm 16 : 159 x 165 x 40 mm 17 : Ø172 mm or Ø175 x 69.0 mm	3. OPERATION VOLTAGE : 05 : DC 5V 12 : DC 12V 24 : DC 24V 48 : DC 48V	4. SPEED (RPM) : L : LOW M : MEDIUM H : HIGH HH : EXTRA HIGH VH : VERY HIGH SH : SUPER HIGH EH : EXTERNAL HIGH GH : GRAND HIGH SPEED UH : ULTRA HIGH SPEED DH : DRASTIC HIGH SPEED XH : EXTREME HIGH SPEED	5. FRAME THICKNESS: A : 10 mm C : 13 mm B : 15 mm D : 20 mm (BLANK) : 25.4 mm N : 28 mm F : 32 mm E : 38 mm or RIGHT SIDE EXHAUST (INTAKE VIEW FOR BFB SERIES) G : 50.8 mm OR 48mm S : 55 mm T : 69.0 mm W : 76.2 mm	6. FRAME TYPE: (BLANK) : FLANGE TYPE B : RIB TYPE (10mm, 13mm, 15mm, 20mm THICKNESS) M : METAL FRAME	7. SIGNAL OUTPUT : F : FREQUENCY GENERATOR OUTPUT (SPEED SENSOR) OR TACH OUTPUT R : ROTATION DETECTOR OUTPUT (FAILURE DETECTOR)	8. SIGNAL OUTPUT VOLTAGE : 00 : VCC (OPEN COLLECTOR)	



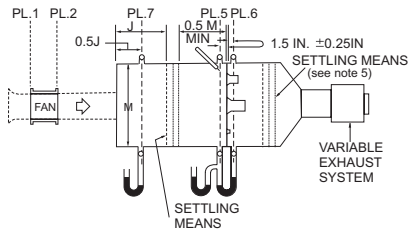
## Note

1. NOISE IS MEASURED AT RATED VOLTAGE IN ANECHOIC CHAMBER IN FREE AIR WITH LARSON DAVIS AND WITH MICROPHONE AT A DISTANCE OF ONE METER FROM THE FAN INTAKE. REFER TO ANSI-S12.10 AS SHOWN BELOW:

SEMI ANECHOIC CHAMBER LEVEL  
Semi Anechoic Chamber for ISO 7779  
Residual Background Noise Level: 15.0 dB (A)  
Lowest Cutoff Frequency (Fco): 100 Hz



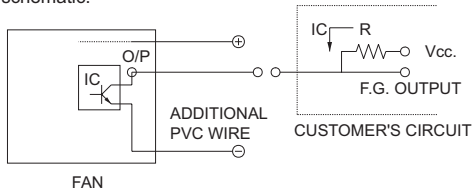
2. THE PERFORMANCE INCLUDING AIR FLOW AND AIR PRESSURE MEASURED AT RATED VOLTAGE IN DOUBLE CHAMBER IS MEASURED ACCORDING TO AMCA 210 STANDARD AS SHOWN BELOW:



3. FREQUENCY GENERATOR O/P: (F00)

Frequency generator function is activated by an internal IC for customer's application.

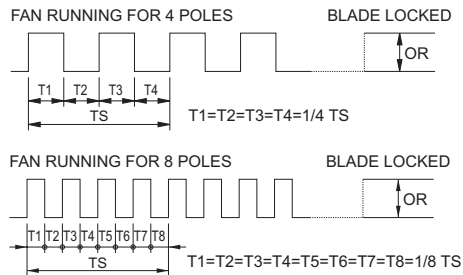
Electrical schematic:



### CUSTOMER'S CIRCUIT

Vcc = From +5 To +28 VDC (Generally using +12 or +24 VDC)  
Ic = 5 mA max.  
R = V/I (Output "R" value calculation)

### SUPPLY A WAVEFORM:



N=R.P.M. (Rotation speed will be different for various models L/M/H/HH/VH/SH)

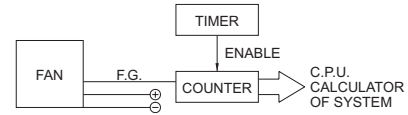
TS=60/N (Sec)

\* Voltage level after blade locked  
\* 4 POLES OR 8 POLES

### OUTPUT LEVEL:

High = Vcc±10%  
Low = 0~0.5V  
Ic = 5 mA max.

### APPLICATION:



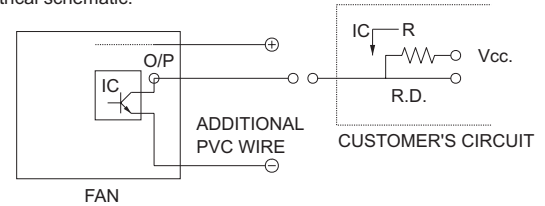
### FUNCTIONS:

- By means of waveform & customer's design, schematic can reach alarm function, either in the form of buzzing or LED flashing. Adjust rotation speed.
- When power supply output voltage level decreases, it will result in the lowering of fan rotation speed. The irregular situation will be controlled by using F.G. O/P through P/S circuit to increase the output voltage and result in a stable rotation speed.

4. ROTATION DETECTOR O/P (R00)

Rotation detector function is activated by an internal IC for customer's application.

Electrical schematic:



### CUSTOMER'S CIRCUIT

Vcc = From +5 To +28 VDC (Generally use +12 or +24 VDC)  
Ic = 5 mA max.  
R = V/I (Output "R" value calculation)

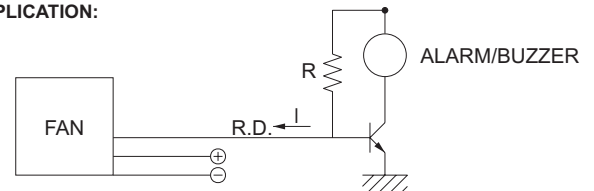
### SUPPLY A WAVEFORM:



### OUTPUT LEVEL:

High = Vcc±10%  
Low = 0~0.5V  
Ic = 5 mA max.

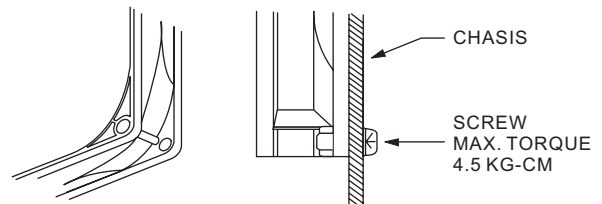
### APPLICATION:



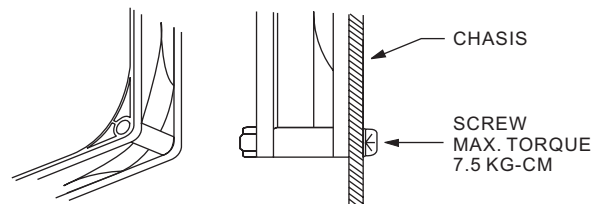
### FUNCTION:

By means of waveform & customer's design, schematic can reach alarm function: either in the form of buzzing or LED flashing.

5. FRAME TYPE:



#### • FLANGE TYPE

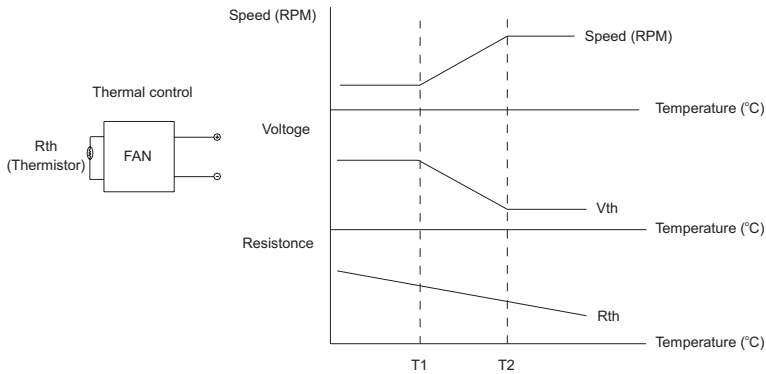


#### • RIB TYPE

## Note

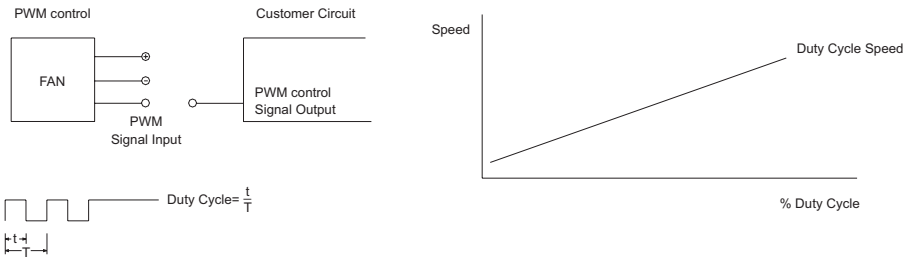
### 6. TEMPERATURE CONTROL : "SENSFLOW"

With temperature controlled fan, the RPM can be controlled by on board or off board thermistor. The RPM and temperature range is subject to custom request.



### 7. PWM CONTROL

In PWM speed control, a fixed frequency square wave is applied to the speed control lead wire of the fan. The ratio of the on time vs. the PWM period is proportional to the RPM.



#### ■ PWM INPUT VOLTAGE RANGE:

High level= 2.8 to 20 VDC  
Low level= 0 to 0.4 VDC

#### ■ PWM INPUT CURRENT (IPWM) RANGE:

40uA to 20mA

To control signal line of the fan shall be able to accept a 30Hz to 30kHz.  
The preferred operating point for the fan is 0%~100% of duty cycle.