Air Cooling Fan
Telecommunication Application
Introduction

More than 17 years Delta has gained industry's recognition, confidence and commendation by continuously offering innovative quality brushless DC air cooling products. Broad product range covers axial fan from 25mm-200mm, blowers from 30mm-175mm, cross-flow fans and slim blowers. In combine with patented distinctive blade design, innovative structure design and "Sensflow" control not only greatly increase cooling performance but also reduce system noise with temperature sensor control when the fan is in low load operation. Fans with hot-swap construction, fan trays and modules with strong pan and first-rate efficiency are also produced.

Product Research & Development
Innovations are everywhere in our products. Engineering expertise backed by sophisticated test instruments and equipment gives Delta very strong design capability. Advanced engineering equipment such as Star-LT simulation software, computerized CNC machines, semi-anechoic chambers and wind tunnels are used to develop high performance, low noise and cost effective products.

Quality Assurance
Delta is an ISO-9001 and TS-16949 certified manufacturer for brushless DC air cooling products. We implement strict reliability tests in the design stage and have put into place Statistical Process Controls at each production process.

Manufacturing
Delta's automation department is highly specialized in computerized state-of-the-art equipment. We build our own fully automated production lines in-house. This allows us to provide large production capacity and high quality, cost effective products to our customers.

Global Operations
A worldwide network of sales and technical support teams is available to our customers in Asia, USA and Europe. These teams are assisted by local design-engineering centers. Delta Group is utilizing a SAP R/3 system to facilitate and optimize its linkage with customers and suppliers, allowing it to effectively monitor and maintain its world-wide logistics operations.
### Evaluation Facilities

**ISO 3745 Anechoic Chamber**

#### Noise Chamber:
- Residual background noise level: 10.0 dB(A)
- Lowest cutoff frequency: 80 Hz
- Room Volume: 5.2m x 5.0m x 3.2m
- Instrument: HEAD acoustics
- System impedance noise measurement: ISO 10302 International standard

#### Static Pressure Range: 0 ~ 100 & 127 mmH₂O

#### Air Flow Rate Range: 10 CFM, 20 CFM, 200 CFM, 250 CFM, 1000 CFM, & 3000 CFM.

### Waterproof fan

Currently, many customer system applications in telecom and other industries are for outdoor or relatively harsh environments. Waterproof and dustproof fans are required under these conditions.

In accordance with IEC60529 and the development and design for fan motor assembly protection, Delta has the capability to produce IP55 level fans. Delta production has already installed equipment to meet IEC & NEBS conditions as well as additional functional testing for other customer requirements.
### Telecommunication Fans

#### Axial Fan

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimension</th>
<th>Rated Voltage</th>
<th>Operating Voltage Range</th>
<th>Max. RPM</th>
<th>Rated Input Power</th>
<th>Max. Air Flow</th>
<th>Max. Air Pressure</th>
<th>Noise</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFB12X2-M</td>
<td>120 x 120 x 38</td>
<td>24 / 48</td>
<td>14 to 26.4 / 28 to 54</td>
<td>6300</td>
<td>78.00 / 79.20</td>
<td>204.62</td>
<td>1.705</td>
<td>73.5</td>
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<tr>
<td>FFB14X-M</td>
<td>120 x 120 x 38</td>
<td>24 / 48</td>
<td>14 to 26.4 / 28 to 54</td>
<td>6300</td>
<td>80.40 / 86.36</td>
<td>297.52</td>
<td>1.624</td>
<td>74.0</td>
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<tr>
<td>AFB15X</td>
<td>172 x 150 x 25.4</td>
<td>24 / 48</td>
<td>12 to 30 / 24 to 60</td>
<td>3200</td>
<td>14.88 / 14.88</td>
<td>214.85</td>
<td>0.524</td>
<td>53.5</td>
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<tr>
<td>AFB17X</td>
<td>172 x 25.4</td>
<td>24 / 48</td>
<td>12 to 30 / 24 to 60</td>
<td>3200</td>
<td>14.88 / 14.88</td>
<td>214.85</td>
<td>0.524</td>
<td>53.5</td>
</tr>
<tr>
<td>EFB15XG</td>
<td>172 x 150 x 25.4</td>
<td>24 / 48</td>
<td>12 to 28 / 24 to 60</td>
<td>4300 / 4000</td>
<td>208.00 / 23.52</td>
<td>325.00 / 302.29</td>
<td>1.083 / 0.937</td>
<td>63.0 / 60.0</td>
</tr>
<tr>
<td>EFB17XG</td>
<td>172 x 25.4</td>
<td>24 / 48</td>
<td>12 to 28 / 24 to 60</td>
<td>4300 / 4000</td>
<td>208.00 / 23.52</td>
<td>325.00 / 302.29</td>
<td>1.083 / 0.937</td>
<td>59.0 / 57.0</td>
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<tr>
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<td>26 to 54</td>
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<td>120.00</td>
<td>450.98</td>
<td>1.837</td>
<td>74.0</td>
</tr>
<tr>
<td>FHB12X-M</td>
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<td>48</td>
<td>32 to 80</td>
<td>5800</td>
<td>61.44</td>
<td>245.83</td>
<td>1.502</td>
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<tr>
<td>AHB13X</td>
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<tr>
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<td>48</td>
<td>32 to 80</td>
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<td>65.28</td>
<td>346.34</td>
<td>1.434</td>
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<tr>
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<td>172 x 150 x 25.4</td>
<td>48</td>
<td>32 to 80</td>
<td>4000</td>
<td>24.96</td>
<td>271.05</td>
<td>0.736</td>
<td>61.0</td>
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<tr>
<td>AHB17X</td>
<td>172 x 25.4</td>
<td>48</td>
<td>32 to 80</td>
<td>4000</td>
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<td>271.05</td>
<td>0.736</td>
<td>61.0</td>
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<tr>
<td>AHB15XG</td>
<td>172 x 150 x 25.4</td>
<td>48</td>
<td>32 to 80</td>
<td>5200</td>
<td>72.96</td>
<td>402.72</td>
<td>1.964</td>
<td>68.5</td>
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<tr>
<td>EHB15XG</td>
<td>172 x 150 x 25.4</td>
<td>48</td>
<td>32 to 80</td>
<td>5200</td>
<td>57.60</td>
<td>374.82</td>
<td>1.703</td>
<td>68.5</td>
</tr>
<tr>
<td>AHB17X</td>
<td>172 x 50.8</td>
<td>48</td>
<td>32 to 80</td>
<td>5200</td>
<td>72.96</td>
<td>408.39</td>
<td>2.048</td>
<td>66.5</td>
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<tr>
<td>EHB17XG</td>
<td>172 x 50.8</td>
<td>48</td>
<td>32 to 80</td>
<td>5200</td>
<td>57.60</td>
<td>394.22</td>
<td>1.781</td>
<td>66.0</td>
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<tr>
<td>FHB17XG</td>
<td>172 x 50.8</td>
<td>48</td>
<td>32 to 80</td>
<td>4400</td>
<td>76.80</td>
<td>388.25</td>
<td>1.395</td>
<td>71.5</td>
</tr>
</tbody>
</table>

* The model name “X” letter means rotation speed that will be different for various models.
* The max. air flow and the speed are measured in free air; max. air pressure is measured at zero air flow.

### Impeller: Plastic

- Plastic
- Metal
Open blower

| Model   | Dimension Rated Voltage Operating Voltage Range Max. Speed Rated Input Power Max. Air flow Max. Air pressure Noise |
|---------|-------------------------------------------------|---------------------------------------------------|------------------|-------------------|------------------|------------------|
| KFB10XS | 100 x 55 24 / 48 14 to 26.4 / 28 to 53 5700 20.88 / 20.64 | 111.60 | 1.393 | 62.0 |
| KFB17XS | 175 x 54 24 / 48 14 to 30 / 28 to 60 4200 55.20 / 55.20 | 297.39 | 2.361 | 73.5 |
| KFB17XT| 175 x 69 24 / 48 14 to 26.4 / 36 to 53 3300 69.12 / 69.60 | 334.79 | 1.884 | 67.5 |
| KFB17XT-A | 175 x 69 24 / 48 14 to 27.6 / 28 to 53 4000 75.36 / 69.60 | 412.78 | 2.403 | 73.0 |
| KHB10XS | 100 x 55 48 32 to 80 6200 21.22 | 94.96 | 1.630 | 66.0 |
| KHB17XS | 175 x 54 48 32 to 80 3500 31.20 | 247.47 | 1.601 | 69.0 |
| KHB17XT | 175 x 69 48 32 to 80 2700 35.04 | 251.87 | 1.209 | 62.5 |
| KHB17XT-A | 175 x 69 48 32 to 80 3100 35.04 | 335.50 | 1.448 | 66.0 |

The model name "X" letter means rotation speed that will be different for various models.

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Specifications are subject to change without notice.

**FREQUENCY GENERATOR O/P (F00)**

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

**APPLICATION:**

- TIMER
- COUNTER
- CALCULATOR
- ENABLE
- F.G.
- I.P.M.
- C.B.
- P.S.
- Vcc.
- Ic = 5 mA max.
- R = V/I (Output "R" value calculation)

**FUNCTIONS:**

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

**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 10 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 3V to ±30V. The preferred operating point for the fan is 0% to 100% of duty cycle.
**Delta STD 6 Fan tray Character:**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Rated Voltage VDC</th>
<th>Operating Temperature °C</th>
<th>Speed RPM</th>
<th>Input Current Amp</th>
<th>Input Power Watt</th>
<th>Maximum Air Flow CFM</th>
<th>Maximum Air Pressure IN H2O</th>
<th>Noise dB-A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta STD 6 fan tray</td>
<td>48</td>
<td>-10 to +55</td>
<td>4000</td>
<td>2.33</td>
<td>112</td>
<td>1070</td>
<td>0.708</td>
<td>74.5</td>
</tr>
</tbody>
</table>

- The max. air flow and the speed are measured in free air; max. air pressure is measured at zero air flow.

Fan Type: 6pcs axial fan
Communication: I^C

**Delta STD 9 Fan tray Character:**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Rated Voltage VDC</th>
<th>Operating Temperature °C</th>
<th>Speed RPM</th>
<th>Input Current Amp</th>
<th>Input Power Watt</th>
<th>Maximum Air Flow CFM</th>
<th>Maximum Air Pressure IN H2O</th>
<th>Noise dB-A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta STD 9 fan tray</td>
<td>48</td>
<td>-10 to +55</td>
<td>4000</td>
<td>4.68</td>
<td>225</td>
<td>1600</td>
<td>0.669</td>
<td>75</td>
</tr>
</tbody>
</table>

- The max. air flow and the speed are measured in free air; max. air pressure is measured at zero air flow.

Fan Type: 9pcs axial fan
Communication: I^C

**Specifications:***
- **Wide Input Voltage Range:** 10VDC~75VDC
- **Widely Applicative Fan:** 12V/24V/48VDC
- **Optimal cooling design of heat dissipation**
- **Flexible Manufacture**
- **100% Auto Function Testing**
- **100% Burn In Testing & Monitor Equipment**
- **Industry & Telecom (Indoor & outdoor) & Networking and other application ODM & OEM Design**
- **Communication:** I^C, RS232, RS485
- **DC/DC Converter**
- **Safety Compliance:** UL/CUL/TUV/VDE/CE

*Specifications are subject to change without notice.*
Advanced TCA Fan & Blower Available

ATCA 13U (14 Slot) System

3D View

Controller Boards
Delta’s fan controllers are designed for the telecom industry. This system cooling solution provides an interface with fan speed control.

Features
- Wide Input Range: 10VDC ~ 75VDC
- Widely Applicative Fan: 12V/24V/48VDC
- Soft Start Function at Start Up
- Reverse Polarity Protection
- Hot-Swap Inrush Current Protection
- Function Fail Alarm Indication
- Redundancy Function
- Over Voltage and Over Current Protection
- Thermal Detect and Fan Speed Control
- PWM or Voltage Control Speed
- Communication Function: I²C, RS232...etc
- Custom Design is Accepted

Control Functions
- Fan Speed Alarm Settings
- Fan Fail Alarm
- Multiple Fans Fail Alarm
- Over Temperature or Thermal Fail Alarm
- Warning for Insufficient Input Power.
- RPM VS Temperature: Two Modes of Speed Control are Applied.

Step Mode.

Linear Mode.

Fan Tray Production Auto Test Equipment

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