Cooling Fans

Cross Flow Fans

Page
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MF Series ................................................. E-124
MFD Series .............................................. E-128

AC Input
MF Series

DC Input
MFD Series
Cooling Fans

RoHS-Compliant

Cross Flow Fans

Cross flow fans are suitable for cooling circuit boards or other applications requiring wide and uniform air flow such as air curtains.

Features

Cross flow fans deliver wide, uniform air flow. These fans provide right-angle air flow and a rectangular shape, allowing for installation in corners and space saving.

Types of Cross Flow Fans

- Standard Type
- Alarm Type
- Pulse Sensor Type

<table>
<thead>
<tr>
<th>Series</th>
<th>Features</th>
<th>Power Supply Voltage</th>
<th>Impeller Length [mm (in.)]</th>
</tr>
</thead>
</table>
| AC Cross Flow Fans | - AC input cross flow fans  
                  | - The MF Series is recognized by UL/CSA Standards. CE Marking is used in accordance with the Low  
                  | - RoHS-Compliant                                                      | Single-Phase         | 300 (11.81) | 150 (5.91) |
| MF Series   | - The MF Series conforms to the RoHS Directive that prohibits the use of six chemical substances  
                  |                      | Single-Phase 200/220/230 VAC                                           | ●                      | ●          |
|             | including lead and cadmium.                                                                          |                      |                           | ●                      | ●          |
| DC Cross Flow Fans | - DC input cross flow fans  
                  | - RoHS-Compliant                                                      | 24 VDC                                                            | ●                      | ●          |
| MFD Series  | - The MFD Series conforms to the RoHS Directive that prohibits the use of six chemical substances  
                  |                      | 48 VDC                                                            | ●                      | ●          |


System Configuration

An example of a system configuration with the MF Series.

MF Series

Peripheral Equipment (Sold separately)

Thermostats

AC Power Supply (Main Power Supply)

(Not supplied)

Example of installing the finger guard
(The photo shows two finger guards, FG915D.)

Accessories (Sold separately)

Thermostats

Finger Guards

No. | Product Name | Overview | Page |
---|--------------|----------|------|
1  | Thermostats  | Contact is ON and OFF in accordance with thermostat’s set temperature. Using a fan with a thermostat provides on/off control of the fan. | E-133 |
2  | Finger Guards| This guard prevents fingers and foreign objects from entering the rotating side of the fan. | E-145 |

Example of System Configuration

- The system configuration shown above is an example. Other combinations are available.
### Product Number Code

**AC Cross Flow Fans**

**MF 9 30 B - B C**

1. **Series**  
   MF: MF Series
2. **Frame Size**  
   9: 90 mm (3.54 in.)
3. **Impeller Length**  
   30: 300 mm (11.81 in.)  
   15: 150 mm (5.91 in.)
4. **Letter Designation**  
   Blank: Motor is on left when viewing the mounting holes  
   B: Motor is on right when viewing the mounting holes
5. **Power Supply Voltage**  
   B: Single-Phase 100/110/115 VAC  
   D: Single-Phase 200/220/230 VAC
6. **C: Built-in Capacitor**

**DC Cross Flow Fans**

**MFD 9 30 B - 24 A**

1. **Series**  
   MFD: MFD Series
2. **Frame Size**  
   9: 90 mm (3.54 in.)
3. **Impeller Length**  
   30: 300 mm (11.81 in.)  
   15: 150 mm (5.91 in.)
4. **Letter Designation**  
   Blank: Motor is on left when viewing the mounting holes  
   B: Motor is on right when viewing the mounting holes
5. **Power Supply Voltage**  
   24: 24 VDC  
   48: 48 VDC
6. **Additional Functions**  
   A: Low-Speed Alarm, Contact Alarm Type  
   S: Pulse Sensor Type

### General Specifications

**Item** | **Specifications**
---|---
Insulation Resistance | 100 MΩ or more when 500 VDC megger is applied between the windings and the frame after continuous operation under normal ambient temperature and humidity.  
(MFD Series: 10 MΩ or more, 250 VDC megger, MFD915, 48, 24A, 48S, MFD930-48, 24A, 48S: 10 MΩ or more, 500 VDC megger)
Dielectric Strength | Sufficient to withstand 1.5 kVAC at 50 Hz applied between the windings and the frame for 1 minute after continuous operation under normal ambient temperature and humidity.  
(MFD Series: 500 VAC at 50 Hz, 1 minute)
Temperature Rise | 45ºC (81ºF) or less measured by the thermometer method after the temperature of the motor case has stabilized after continuous operation under normal ambient temperature and humidity.  
(MFD Series: 15ºC [27ºF] or less)
Operating Voltage Range | MF Series: ±10% of the rated voltage  
MFD Series: ±10% of the rated voltage
Insulation Class | MF Series: UL, CSA: Class A [105˚C (221˚F)], Class E [120˚C (248˚F)]  
MFD Series: Class E [120˚C (248˚F)]
Overheat Protection | MF series has built-in thermal protector (automatic return type).  
Open: 120 ± 5ºC (248 ± 9ºF), Close: 77 ± 15ºC (170.6 ± 27ºF)  
MFD series has an overheat protection circuit.
Ambient Temperature | −10 ~ +60ºC (+14 ~ +140ºF)
Ambient Humidity | 85% or less (non-condensing)
Color | MF Series: Motor: Dark gray, Fan case: Black  
MFD Series: Motor: Black, Fan case: Black, Flange: Dark gray
Materials | Impeller: Aluminum  
Casing: Steel  
Motor case: Die cast aluminum

### Comparison of Characteristics

#### MF Series

**50 Hz**

![Comparison of Characteristics 50 Hz](image)

**60 Hz**

![Comparison of Characteristics 60 Hz](image)

#### MFD Series

![Comparison of Characteristics MFD Series](image)
AC Cross Flow Fans
MF Series
Impeller Length
300 mm (11.81 in.)

Specifications (RoHS)

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage VAC</th>
<th>Frequency Hz</th>
<th>Current A</th>
<th>Input W</th>
<th>Speed r/min</th>
<th>Max. Air Flow m³/min</th>
<th>Max. Air Flow CFM</th>
<th>Max. Static Pressure Pa</th>
<th>InH₂O</th>
<th>Noise Level dB (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF930-BC</td>
<td>Single-Phase 100</td>
<td>50</td>
<td>0.40</td>
<td>35</td>
<td>2500</td>
<td>6.0</td>
<td>212</td>
<td>74</td>
<td>0.297</td>
<td>58</td>
</tr>
<tr>
<td>MF930B-BC</td>
<td>Single-Phase 100</td>
<td>60</td>
<td>0.50</td>
<td>45</td>
<td>2700</td>
<td>6.2</td>
<td>219</td>
<td>103</td>
<td>0.413</td>
<td>60</td>
</tr>
<tr>
<td>MF930-BC</td>
<td>Single-Phase 110</td>
<td>60</td>
<td>0.50</td>
<td>48</td>
<td>2950</td>
<td>6.6</td>
<td>233</td>
<td>106</td>
<td>0.425</td>
<td>62</td>
</tr>
<tr>
<td>MF930B-BC</td>
<td>Single-Phase 110</td>
<td>60</td>
<td>0.50</td>
<td>50</td>
<td>3000</td>
<td>6.8</td>
<td>240</td>
<td>106</td>
<td>0.425</td>
<td>63</td>
</tr>
</tbody>
</table>

How to read specifications ➜ Page E-19
Details of safety standards ➜ Page G-2
Details of RoHS Directive ➜ Page G-38
The following items are included in each product.
Fan, Operating Manual

Air Flow – Static Pressure Characteristics

<table>
<thead>
<tr>
<th>Speed [r/min]</th>
<th>Static Pressure [Pa]</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Hz</td>
<td>0.05</td>
</tr>
<tr>
<td>60 Hz</td>
<td>0.15</td>
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<th>Static Pressure [inH₂O]</th>
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<tr>
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<td>0.15</td>
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</table>

Features E-122 / System Configuration E-122 / General Specifications E-123
**Dimensions**  Unit = mm (in.)

- **MF930-BC, MF930-DC**
  Mass: 1.9 kg (4.2 lb.)

- **MF930B-BC, MF930B-DC**
  Mass: 1.9 kg (4.2 lb.)

**Panel Cut-Out**  Unit = mm (in.)

<table>
<thead>
<tr>
<th>Product</th>
<th>Model</th>
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<th>Page</th>
</tr>
</thead>
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<td>Finger Guard</td>
<td>FG930D</td>
<td>Conformed component</td>
<td>E-145</td>
</tr>
</tbody>
</table>

**Connection Diagram**

**Accessories**

The following product is RoHS-Compliant.
Details ➜ Page E-137

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<td>Conformed component</td>
<td>E-145</td>
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</tbody>
</table>

**Thermostats**

A thermostat makes it possible for fans to operate only when cooling is necessary, thereby conserving energy.

RoHS Thermostats AM1-WA1/AM1-XA1

Page ➜ E-133
AC Cross Flow Fans
MF Series
Impeller Length 150 mm (5.91 in.)

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Frequency</th>
<th>Current</th>
<th>Input</th>
<th>Speed (r/min)</th>
<th>Max. Air Flow (m³/min)</th>
<th>Max. Air Flow (CFM)</th>
<th>Max. Static Pressure (Pa)</th>
<th>Max. Static Pressure (inH₂O)</th>
<th>Noise Level (dB (A))</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF915-BC</td>
<td>Single-Phase 100</td>
<td>50</td>
<td>0.35</td>
<td>30</td>
<td>2650</td>
<td>3.4</td>
<td>120</td>
<td>88</td>
<td>0.353</td>
<td>60</td>
</tr>
<tr>
<td>MF915B-BC</td>
<td>Single-Phase 100</td>
<td>60</td>
<td>0.45</td>
<td>40</td>
<td>2950</td>
<td>3.7</td>
<td>131</td>
<td>127</td>
<td>0.509</td>
<td>63</td>
</tr>
<tr>
<td>MF915-BC</td>
<td>Single-Phase 110</td>
<td>60</td>
<td>0.45</td>
<td>42</td>
<td>3200</td>
<td>4.0</td>
<td>141</td>
<td>132</td>
<td>0.529</td>
<td>64</td>
</tr>
<tr>
<td>MF915B-BC</td>
<td>Single-Phase 115</td>
<td>60</td>
<td>0.45</td>
<td>43</td>
<td>3250</td>
<td>4.1</td>
<td>145</td>
<td>132</td>
<td>0.529</td>
<td>64</td>
</tr>
<tr>
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<td>Single-Phase 200</td>
<td>50</td>
<td>0.20</td>
<td>30</td>
<td>2650</td>
<td>3.4</td>
<td>120</td>
<td>88</td>
<td>0.353</td>
<td>60</td>
</tr>
<tr>
<td>MF915B-DC</td>
<td>Single-Phase 200</td>
<td>60</td>
<td>0.25</td>
<td>40</td>
<td>2950</td>
<td>3.7</td>
<td>131</td>
<td>127</td>
<td>0.509</td>
<td>63</td>
</tr>
<tr>
<td>MF915-DC</td>
<td>Single-Phase 220</td>
<td>60</td>
<td>0.25</td>
<td>42</td>
<td>3200</td>
<td>4.0</td>
<td>141</td>
<td>132</td>
<td>0.529</td>
<td>64</td>
</tr>
<tr>
<td>MF915B-DC</td>
<td>Single-Phase 230</td>
<td>50</td>
<td>0.20</td>
<td>33</td>
<td>2800</td>
<td>3.6</td>
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<td>92</td>
<td>0.369</td>
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<tr>
<td>MF915-DC</td>
<td>Single-Phase 230</td>
<td>60</td>
<td>0.25</td>
<td>43</td>
<td>3250</td>
<td>4.1</td>
<td>145</td>
<td>132</td>
<td>0.529</td>
<td>64</td>
</tr>
</tbody>
</table>

Air Flow – Static Pressure Characteristics

- How to read air flow – static pressure characteristics: Page E-20

The following items are included in each product:
- Fan, Operating Manual
- Ambient Temperature: −10°C to +60°C (+14°F to +140°F)
- Operating Voltage Range: ±10%
- Materials:
  - Motor Case: Die Cast Aluminum
  - Casing: Steel
  - Impeller: Aluminum
- Overheat Protection: Built-in Thermal Protector
- Bearings: Ball Bearings

Features E-122 / System Configuration E-122 / General Specifications E-123
■ Dimensions
Unit = mm (in.)

○ MF915-BC, MF915-DC
Mass: 1.7 kg (3.7 lb.)

○ MF915B-BC, MF915B-DC
Mass: 1.7 kg (3.7 lb.)

■ Panel Cut-Out
Unit = mm (in.)

■ Connection Diagram

■ Accessories
The following product is RoHS-Compliant.
Details → Page E-137

<table>
<thead>
<tr>
<th>Product</th>
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<td>E-145</td>
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</table>

■ Thermostats
A thermostat makes it possible for fans to operate only when cooling is necessary, thereby conserving energy.
## Specifications (RoHS)

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage VDC</th>
<th>Current A</th>
<th>Speed r/min</th>
<th>Max. Air Flow m³/min</th>
<th>Max. Air Flow CFM</th>
<th>Max. Static Pressure Pa</th>
<th>Max. Static Pressure inH₂O</th>
<th>Noise Level dB (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Speed Alarm, Contact Alarm Type (Alarm specifications: ⑦)</td>
<td>MFD930-24A</td>
<td>24</td>
<td>1.0</td>
<td>2100</td>
<td>5.2</td>
<td>184</td>
<td>83</td>
<td>0.333</td>
</tr>
<tr>
<td></td>
<td>MFD930-24A</td>
<td>24</td>
<td>1.0</td>
<td>2100</td>
<td>5.2</td>
<td>184</td>
<td>83</td>
<td>0.333</td>
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<tr>
<td>Pulse Sensor Type</td>
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<td>184</td>
<td>83</td>
<td>0.333</td>
</tr>
<tr>
<td>(Alarm specifications: ⑨)</td>
<td>MFD930-48S</td>
<td>48</td>
<td>0.7</td>
<td>2100</td>
<td>5.2</td>
<td>184</td>
<td>83</td>
<td>0.333</td>
</tr>
<tr>
<td>Standard Type</td>
<td>MFD930-24</td>
<td>24</td>
<td>1.0</td>
<td>2100</td>
<td>5.2</td>
<td>184</td>
<td>83</td>
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<tr>
<td></td>
<td>MFD930-48</td>
<td>48</td>
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<td>2100</td>
<td>5.2</td>
<td>184</td>
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- How to read specifications ➔ Page E-19
- Alarm specifications ⑦, ⑨ ➔ Page E-21
- Details of RoHS Directive ➔ Page G-38

The following items are included in each product:

- Fan, Operating Manual

## Air Flow – Static Pressure Characteristics

- How to read air flow – static pressure characteristics ➔ Page E-20
Dimensions  Unit = mm (in.)

- **MFD930**
  Mass: 1.6 kg (3.5 lb.)

- **MFD930B**
  Mass: 1.6 kg (3.5 lb.)

**Accessories**

The following product is RoHS-Compliant.
Details ➜ Page E-137

<table>
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<td>E-145</td>
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</table>
DC Cross Flow Fans
MFD Series
Impeller Length
150 mm (5.91 in.)

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Current</th>
<th>Speed</th>
<th>Max. Air Flow</th>
<th>Max. Static Pressure</th>
<th>Noise Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Speed Alarm, Contact Alarm Type (Alarm specifications: ⑦)</td>
<td>MFD915-24A</td>
<td>24</td>
<td>1.0</td>
<td>2500</td>
<td>3.0</td>
<td>106</td>
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<td>MFD915B-24A</td>
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<td>2500</td>
<td>3.0</td>
<td>106</td>
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<td>Pulse Sensor Type (Alarm specifications: ⑨)</td>
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<td>MFD915B-48S</td>
<td>48</td>
<td>0.7</td>
<td>2500</td>
<td>3.0</td>
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<td>Standard Type</td>
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Air Flow – Static Pressure Characteristics

Ambient Temperature: −10°C to +60°C (−14°F to +140°F)
Operating Voltage Range: ±10%
Materials:
- Motor Case: Die Cast Aluminum
- Casing: Steel
- Impeller: Aluminum
- Overheat Protection: Built-in Overheat Protection Circuit
- Bearings: Ball Bearings

The following items are included in each product:
- Fan, Operating Manual
- Alarm specifications ⑦, ⑨
- Details of RoHS Directive

How to read specifications → Page E-19
How to read air flow – static pressure characteristics → Page E-20
**Dimensions**  Unit = mm (in.)

- **MFD915**
  Mass: 1.4 kg (3.1 lb.)
  - UL Style 1007, AWG22

- **MFD915B**
  Mass: 1.4 kg (3.1 lb.)
  - UL Style 1007, AWG22

**Panel Cut-Out**  Unit = mm (in.)

<p>| | |</p>
<table>
<thead>
<tr>
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<td></td>
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</table>

**Connection Diagrams**

- 24 VDC or 48 VDC
- Alarm Output (Alarm type only)
- Pulse Sensor Output (Pulse sensor type only)

**Accessories**

- The following product is RoHS-Compliant.
- Details → Page E-137

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