

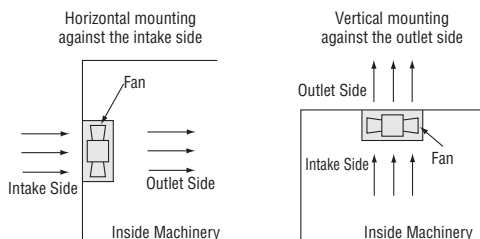
Cooling Fans

Installation

Installation

Mounting Direction of Fans

Fans can be mounted such that air is blown either horizontally or vertically. In addition, they can be mounted against either the outlet side or the intake side of the intake side.

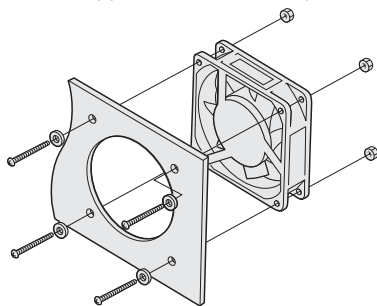


Mounting Fans to Machinery

● Axial Flow Fans

To mount the fan to machinery, drill the mounting holes, referring to the panel cut-out in each page where product is listed (for some fans, the shape of the mounting holes is different for the intake side and the outlet side).

To prevent vibration, mount the fan securely to a strong metal plate. Mounting screws are not included with the fan. Use screws of suitable size, referring to the dimensions and the panel cut-out. (Mounting screws are supplied with the fan kit.)



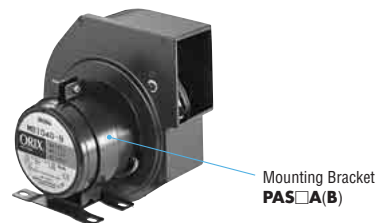
Recommended Tightening Torque

Series/Model	Screw Size	Recommended Tightening Torque
MRS Series (Except for MRS14)	M5	1.2 N·m (170 oz-in)
MRS14 Type	M4	0.6 N·m (85 oz-in)
MU Series (Except for MU925)	M4	0.6 N·m (85 oz-in)
MU925 Type	M3	0.4 N·m (56 oz-in)
MDE Series, MDS Series, MD Series (Except for MD625 , MDS510 and MDS410)	M4	0.6 N·m (85 oz-in)
MD625 , MDS510 , MDS410 Type	M3	0.4 N·m (56 oz-in)

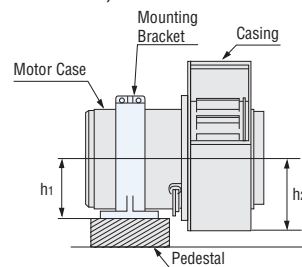
● Centrifugal Blowers

◇ Using a Dedicated Mounting Bracket (Sold separately)

Install a centrifugal blower using the mounting bracket matched to the diameter of the motor case.

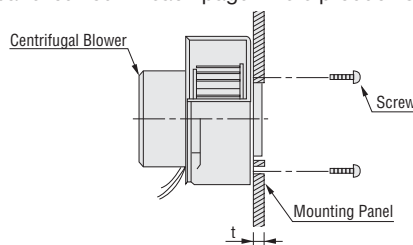


For all the centrifugal blowers except for **MB520** and **MB630**, h_2 is longer than h_1 , therefore, a pedestal must be used when mounting the centrifugal blower so that the casing does not touch the mounting surface. (For exact dimensions, refer to dimensions in each page where product is listed.)



◇ Attaching Centrifugal Blowers Directly to Machinery Using Screws (for **MB520** and **MB630** only)

Mounting holes are provided in three spots on the casing of the **MB520** and **MB630**, so, the centrifugal blowers can be fixed to the machinery without the mounting bracket. To drill the mounting holes, refer to the panel cut-out in each page where product is listed.



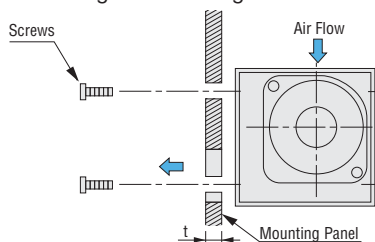
Recommended Tightening Torque

Model	Screw Size	Recommended Tightening Torque
MB630 Type	M3 P0.5 Length = $t + 3.5$ mm (0.14 in.)	0.6 N·m (85 oz-in)
MB520 Type	M3 P0.5 Length = $t + 2.5$ mm (0.10 in.)	

● t : Thickness of mounting plate

● Cross Flow Fans

The cross flow fan casing has mounting holes on all sides.



Recommended Tightening Torque

Series	Screw Size	Recommended Tightening Torque
MF Series, MFD Series	M4 P0.7 Length = t+5 mm (0.20 in.)	1.4 N·m (198 oz·in)

● t : Thickness of mounting plate

When the fan is mounted on the intake side or the outlet side, drill the mounting holes referring to the panel cut-out in each page where product is listed.

■ Installation Conditions

Install the fan in a location that meets the following conditions. Use in a location that does not satisfy these conditions could damage the products.

- Indoors (This product is designed and manufactured to be installed within another device.)
- Ambient temperature: $-10 \sim +60^{\circ}\text{C}$ ($+14 \sim +140^{\circ}\text{F}$)
[**MB Series**: $-10 \sim +50^{\circ}\text{C}$ ($+14 \sim +122^{\circ}\text{F}$) (non-freezing)]
- Ambient humidity: 85% or less (non-condensing)
- Not exposed to explosive, flammable or corrosive gases
- Not exposed to direct sunlight
- Not exposed to water
- No oil or grease, organic solvents, acid or alkaline chemicals
- Not exposed to continuous vibration or excessive impact

■ Installing Accessories

Dust or objects entering the machinery through the fan opening can affect the life of the machinery and cause accidents. To ensure safety and maintain performance, it is recommended that accessories such as finger guards, filters and screens be installed on fans.

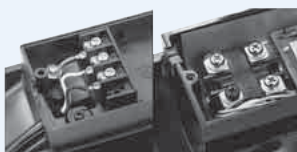
For installing of accessories below, refer to the following page.

Finger guards	Page E-145
Filters	Page E-147
Screens	Page E-150

■ Connection to Power Supply

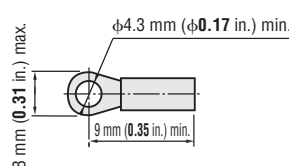
● MRS Series Terminal Box

MRS series (except for **MRS20** and **MRS25**) fans use a terminal box for the power supply connection, allowing the power supply cord to be fastened securely. It is recommended to use a crimp terminal to connect the cord to the terminal box.

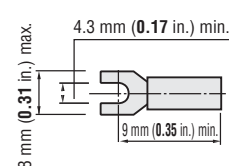


Recommended Crimp Terminal

● Round Terminal Type with Insulation

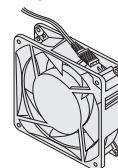


● Fork Terminal Type with Insulation



● MU Series

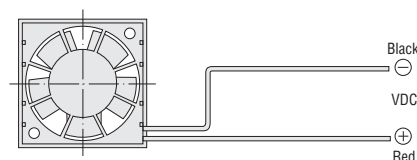
Terminals for connection to the power supply are located in the fan frame. Using the plug cord (accessory) makes connection easily. (The **MU825** has lead wire output, so no plug cord is required.)



● MDE Series, MDS Series, MD Series, MBD Series and MFD Series

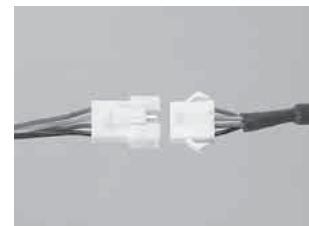
Use the black and red lead wires extending from the fan, connecting the red wire to the plus (+) terminal and the black wire to the minus (−) terminal. (Common to all DC axial flow fans.)

Even if connection is reversed by mistake, the fan is equipped with a protection circuit to keep current from flowing in the wrong direction. For the **MD**, **MDS** and **MDE** products to confirm with safety standards, use a DC power supply with reinforced insulation on the primary side.



● MDS and MD Series Connector Type

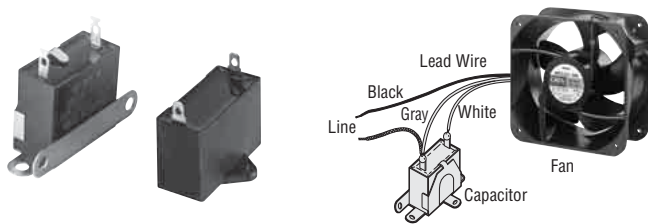
Cable with connector (included) provides for quick connect/disconnect to fan.



● How to Connect a Capacitor

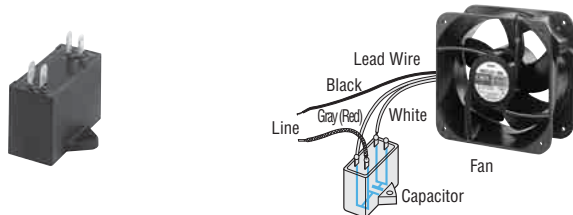
◇ For 2-Terminal Capacitor

● How to Connect Fan and Capacitor



◇ For 4-Terminal Capacitor

● How to Connect Fan and Capacitor

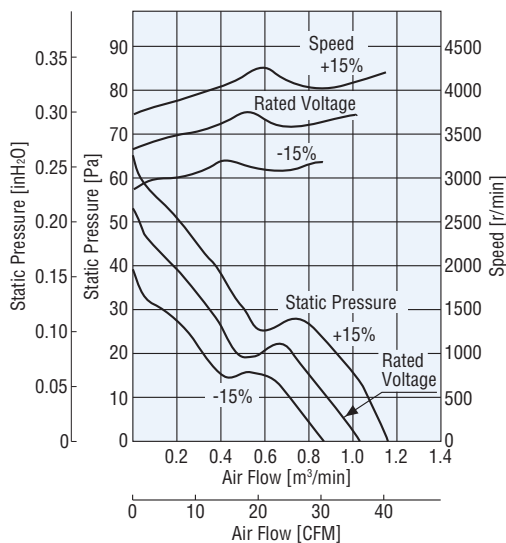


- Terminals of the capacitor are connected inside as shown in the figure above.
- For lead wire connection with 4-terminal capacitor, use one lead wire per terminal.
- Crimp Terminals are available (except for **MR516-□□A**) for easy connection. Use AMP Fasten Terminal 187 series (Tyco Electronics AMP).

■ Speed Adjustment

The DC fan can be operated within the operating voltage range. When the input voltage is varied within this operating voltage range, the fan speed varies proportionally to the voltage and the fan air flow characteristics also vary.

MD825B-24

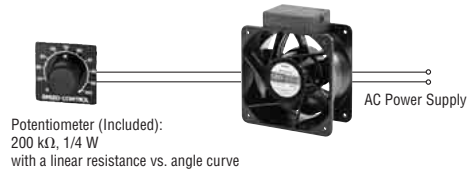


■ Use of Variable Flow Fans VARIOFLOW

● Axial Flow Fan (MRS18V2)

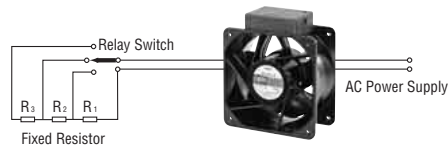
◇ When Adjusting the Speed with a Potentiometer

Connect the provided External Speed Potentiometer to the lead wire coming out of the fan terminal box.



◇ When Setting the Speed with Multiple External Fixed Resistors

Relays can be used to switch between fixed resistors (1/4 W min).



● External Speed Potentiometer

A high voltage can be applied across the terminals of the potentiometer. Be sure to insulate with tubing or tape.

If the potentiometer is used in an area with high electrical noise, the speed may fluctuate. Should this occur, try any of the following solutions:

- Put a noise filter on the power source line.
- Use twisted pair wire for the wiring.
- Route the wire as far as possible from lines generating noise (lines with large current flows).

