

## OPERATING MANUAL

### AC Centrifugal Blowers MBS Series



## Introduction

### ■ Before using the fan

Only qualified and educated personnel should work with the product. Use the product correctly after thoroughly reading the section "Safety precautions." The product described in this manual has been designed and manufactured to be incorporated in general industrial equipment. Do not use for any other purpose. Oriental Motor Co., Ltd. is not responsible for any damage caused through failure to observe this warning.

### ■ Standard and CE Marking

This product is recognized by UL and certified by CSA, and bears the CE Marking (Low Voltage Directive) in compliance with the EN Standards.

#### Standards

Applicable Standards	Certification body
UL 507 CSA C22.2 No. 113	UL

#### Installation conditions (For EN Standards)

Overvoltage category II, Pollution degree 2, Class I equipment  
When connecting to a power supply of overvoltage category III, supply power via the insulation transformer.

### ■ RoHS Directive

The products do not contain the substances exceeding the restriction values of RoHS Directive (2011/65/EU).

## Safety precautions

The precautions described below are intended to prevent danger or injury to the user and other personnel through safe, correct use of the product. Use the product only after carefully reading and fully understanding these instructions.

<b>Warning</b>	Handling the product without observing the instructions that accompany a "Warning" symbol may result in serious injury or death.
<b>Caution</b>	Handling the product without observing the instructions that accompany a "Caution" symbol may result in injury or property damage.

### Warning

- Do not use the product in explosive or corrosive environments, in the presence of flammable gases, locations subjected to splashing water, or near combustibles. Doing so may result in fire, electric shock or injury.
- Only qualified and educated personnel should be allowed to perform installation, connection, operation and inspection/troubleshooting of the product. Handling by unqualified and uneducated personnel may result in fire, electric shock or injury.
- Do not transport, install the product, perform connections or inspections when the power is on. Always turn the power off before carrying out these operations. Failure to do so may result in electric shock.

Thank you for purchasing an Oriental Motor product. This Operating Manual describes product handling procedures and safety precautions.

- Please read it thoroughly to ensure safe operation.
- Always keep the manual where it is readily available.

- Turn off the power in the event the overheat protection device (thermal protector) is triggered. Failure to do so may result in injury or damage to equipment, since the fan will start abruptly when the overheat protection device (thermal protector) is automatically reset.
- The fan for class I equipment. Be sure to ground the protective earth conductor when installing the fan. Failure to do so may result in electric shock.
- Install the fan in an enclosure in order to prevent electric shock or injury.
- Keep the input-power voltage within the specified range to avoid fire and electric shock.
- Connect the cables securely according to the wiring diagram in order to prevent fire and electric shock.
- Do not forcibly bend, pull or pinch the cable. Doing so may result in fire.
- Turn off the power in the event of a power failure, or the fan will suddenly start when the power is restored and may cause injury or damage to equipment.
- Do not disassemble or modify the fan. This may cause electric shock or injury. Refer all such internal inspections and repairs to the branch or sales office from which you purchased the product.

### Caution

- Do not use the fan beyond its specifications, or electric shock, injury or damage to equipment may result.
- Keep your fingers and objects out of the openings in the fan. This may cause injury.
- Do not touch the motor during operation or immediately after stopping. The surface is hot and may cause a burn.
- Do not hold the lead wire. This may cause injury.
- Keep the area around the fan free of combustible materials in order to prevent fire or a burn.
- To prevent the risk of damage to equipment, leave nothing around the fan that would obstruct ventilation.
- Do not touch the rotating parts (runner) when the fan is in operation. This may cause injury.
- When an abnormality is noted, stop the operation immediately, or fire, electric shock or injury may occur.
- The motor's surface temperature may exceed 70 °C (158 °F), even under normal operating conditions. If a fan is accessible during operation, post the warning label shown in the figure in a conspicuous position to prevent the risk of burns.
- Dispose the product correctly in accordance with laws and regulations, or instructions of local governments.



## Preparation

### ■ Checking the product

Upon opening the package, verify that the items listed below are included. Report any missing or damaged items to the branch or sales office from which you purchased the product.

- Fan ..... 1 pc.
- Power cable ..... 1 pc.
- Air Control Louver ..... 1 pc.
- Set of mounting screws for fan mounting ..... 1 set  
(M5 Hexagonal socket head screws with captive washer, Hexagonal nuts with flange 4 pcs. each)
- Mounting screws for Air Control Louver (M5 Cross-recessed pan head screws with captive washer) ..... 4 pcs.
- Operating manual (this manual) ..... 1 copy

### ■ Checking the model name

To verify that the unit you've purchased is the correct one, check the model number shown on the identification plate.

**MBS18-BH, MBS18-BWH, MBS18-DH, MBS18-DWH, MBS18-TH, MBS18-TWH, MBS20-BH, MBS20-BWH, MBS20-DH, MBS20-DWH, MBS20-TH, MBS20-TWH**

## Installation

### ■ Location for installation

The fan is designed and manufactured for installation in equipment. Install it in a well-ventilated location that provides easy access for inspection. The location must also satisfy the following conditions:

- Inside an enclosure that is installed indoors
- Operating ambient temperature  $-10$  to  $+60$  °C ( $+14$  to  $+140$  °F) (non-freezing)
- Operating ambient humidity 85% or less (non-condensing)
- Area that is free of explosive atmosphere or toxic gas (such as sulfuric gas) or liquid
- Area not exposed to direct sun
- Area free of excessive amount of dust, iron particles or the like
- Area not subject to splashing water (rains, water droplets), oil (oil droplets) or other liquids
- Area not subject to continuous vibration or excessive shocks
- Area free of radioactive materials, magnetic fields or vacuum
- Area free of excessive electromagnetic noise (from welders, power machinery, etc.)

When using near a switching circuit or high-frequency power supply, the induced current may flow inside the fan due to electromagnetic noise (conductive noise, radiative noise). If the induced current flows, the electric corrosion is caused in the bearings of the fan. As a result, it may generate the noise or shorten the service life of the products. Use the fan in the environment that the electromagnetic noise does not cause.

### ■ How to install the fan

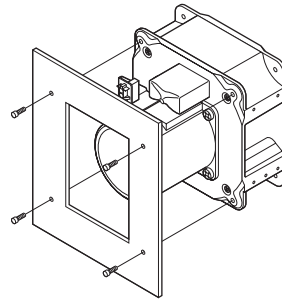
Install the fan onto an appropriate flat metal plate having excellent vibration resistance and heat conductivity. Consider the weight of the fan and install the fan in a location where sufficient strength can be ensured.

Drill mounting holes in your equipment and affix the fan using the supplied screws and the four mounting holes provided in the fan casing.

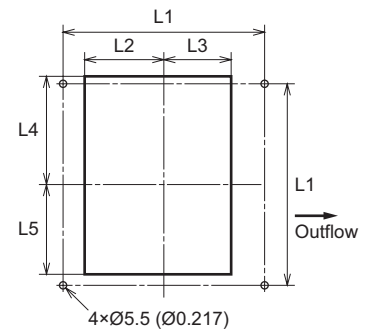
Tightening torque: 1.2 N·m

## ● Installing method and installation dimensions

Motor side installation

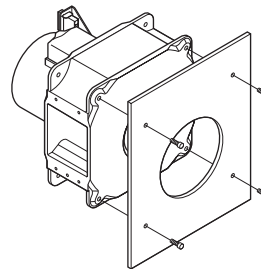


Installation dimensions  
[Unit: mm (in.)]

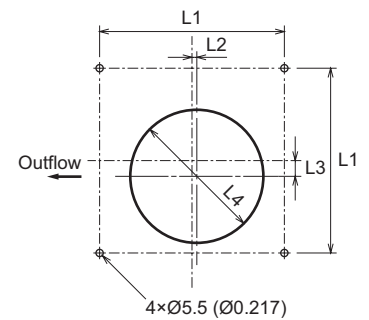


Model	L1	L2	L3	L4	L5
MBS18-□	152.7 (6.012)	60 (2.36)	51 (2.01)	82 (3.23)	68 (2.68)
MBS20-□	166.9 (6.571)	59 (2.32)	52 (2.05)	92 (3.62)	68 (2.68)

Suction side installation

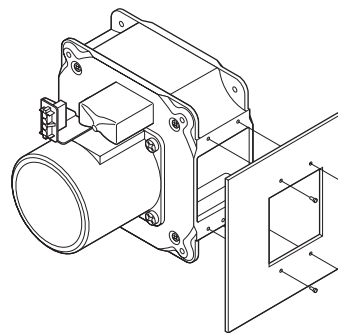


Installation dimensions  
[Unit: mm (in.)]

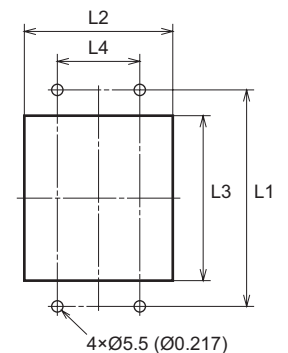


Model	L1	L2	L3	L4
MBS18-□	152.7 (6.012)	4 (0.17)	13 (0.52)	107 (4.21)
MBS20-□	166.9 (6.571)	3.5 (0.14)	12.5 (0.49)	122 (4.8)

Exhaust side installation



Installation dimensions  
[Unit: mm (in.)]



Model	L1	L2	L3	L4
MBS18-□	105 (4.13)	72 (2.83)	80 (3.15)	40 (1.57)
MBS20-□	120 (4.72)	72 (2.83)	92 (3.62)	40 (1.57)

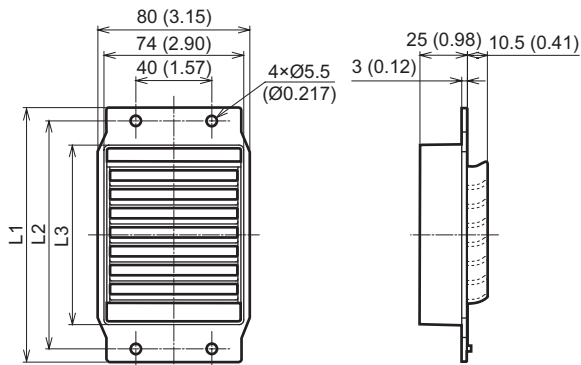
Select mounting screws that are no more than 8 mm (0.315 in.) longer than the thickness.

**● Installation method for Air Control Louver**

Use the louver if airflow must be controlled in a certain direction, such as spot cooling.

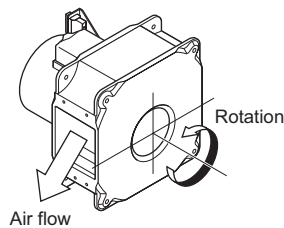
The louver must be installed in the specified direction. Align the projections on the louver with the holes in the blower outlet, and affix the louver using the supplied screws.

Installation dimensions [Unit: mm (in.)]



Applicable model	L1	L2	L3
MBS18-□	118 (4.65)	105 (4.13)	83 (3.27)
MBS20-□	134 (5.28)	120 (4.72)	95 (3.74)

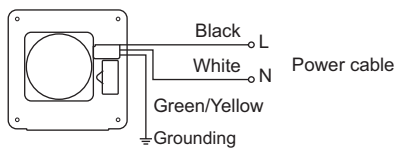
**● Rotational direction and air orientation**



**Wiring**

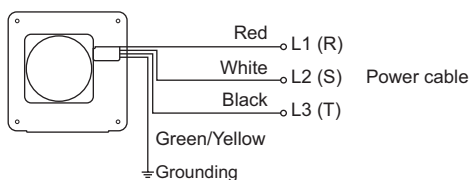
**■ Single-phase**

**● MBS□-BH, MBS□-BWH, MBS□-DH, MBS□-DWH**

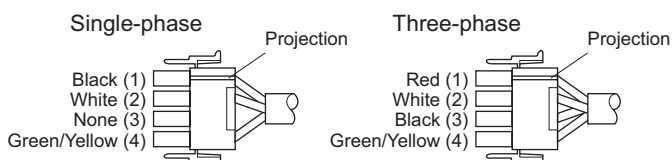


**■ Three-phase**

**● MBS□-TH, MBS□-TWH**



**● Power supply connector pin assignments**



**● Power cable connector housings/contacts**

Manufacturer: TE Connectivity

Housing model number: 350779-1

Contact model number: 350536-1

Poles: 4

Applicable minimum lead wire size: AWG18 (0.75 mm<sup>2</sup>)

**Overheat protection**

The fan uses a thermal protector for overheat protection. Once the temperature reaches a specified level, the internal thermal protector that has an automatic-return feature is triggered to stop the fan operation.

Be sure to turn off the power when checking the thermal protector.

Operating temperature of thermal protectors

Open (Power OFF)..... 130±5 °C (266±9 °F)

Close (Power ON)..... 82±15 °C (179.6±27 °F)

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