

OPERATING MANUAL

Brushless DC Fan



MDE Series
MDS Series
MD Series

Introduction

■ Before using the fan

Only qualified 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 for use in general industrial machinery, and must not be used for any other purpose. For the power supply use a DC power supply with reinforced insulation on its primary and secondary sides. Oriental Motor Co., Ltd. is not responsible for any damage caused through failure to observe this warning.

■ Standard • CE marking

The product is recognized by UL and certified by DEMKO.

◆ Standards

Standards	Certification body	Standards File No.
UL 507 CSA C22.2 No.113	UL	UL File No.E58377
EN 60950-1 IEC 60950-1	DEMKO	DEMKO Certificate No.135713

• Pulse sensor type is not certified by DEMKO.

◆ Installation conditions (For EN/IEC Standards)

Overvoltage category I, Pollution degree 2, Class III equipment

◆ Applicable standards

EMI EN 55011 Group 1, Class A
EMS EN 61000-6-2

■ Hazardous substances

RoHS (Directive 2002/95/EC 27Jan.2003) compliant

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.

⚠ Warning Handling the product without observing the instructions that accompany a "Warning" symbol may result in serious injury or death.

⚠ Caution Handling the product without observing the instructions that accompany a "Caution" symbol may result in injury or property damage.

Note The items under this heading contain important handling instructions that the user should observe to ensure safe use of the product.

⚠ 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 or injury.

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.

- Assign qualified personnel the task of installing, wiring, operating/controlling, inspecting and troubleshooting the product. Failure to do so may result in fire or injury.
- Shut off the power to the fan in the event the lock-protection circuit is activated. Otherwise, the fan will start unexpectedly when released from the locked condition, causing bodily injury or equipment damage.
- Install the fan in an enclosure in order to prevent injury.
- Keep the input-power voltage within the specified range to avoid fire.
- Connect the cables securely according to the wiring diagram in order to prevent fire.
- Do not forcibly bend, pull or pinch the cable. Doing so may fire.
- For the power supply use a DC power supply with reinforced insulation on its primary and secondary sides. Failure to do so may result in electric shock.
- 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 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 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 hold the rotating parts (blades) of the fan or 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.
- Provide anti-static measures before installing the fan. Failure to do so may result in equipment damage.
- Do not touch the rotating parts (blades) when the fan is in operation. This may cause injury. The use of the optional fingerguard is recommended to ensure protection. *Wegen der Verletzungsgefahr dürfen die Lüfterflügel bei Ventilatorbetrieb nicht berührt werden. Der Gebrauch des als Sonderzubehör erhältlichen Fingerschutzes ist empfehlenswert, um erhöhte Sicherheit zu gewährleisten.*
- When an abnormality is noted, stop the operation immediately, or fire or injury may occur.
- To dispose of the fan, disassemble it into parts and components as much as possible and dispose of individual parts/components as industrial waste.

Preparation

■ Checking the product

To verify that the unit you've purchased is the correct one, check the model number shown on the identification plate. Report any incorrect or damaged item to the branch or sales office from which you purchased the product.

◆ Long life models (Stall alarm, electronic alarm type)
MDE1225-12L, MDE1225-24L

◆ Pulse sensor type

MD925A-12S, MD925A-24S, MD825B-12S,
MD825B-24S, MD625B-12S, MD625B-24S

◆ **Stall alarm, electronic alarm type**

MD925A-12L, MD925A-24L, MD825B-12L, MD825B-24L, MD625B-12L, MD625B-24L, MDS510-12L, MDS510-24L, MDS410-12L, MDS410-24L

◆ **Low-speed alarm, electronic alarm type**
MDS1225-12M, MDS1225-24M

◆ **Standard type**

MDS1225-12, MDS1225-24, MD1225-12, MD1225-24, MD925A-12, MD925A-24, MD925AM-12, MD925AM-24, MD925AL-12, MD925AL-24, MD825B-12, MD825B-24, MD825BM-12, MD825BM-24, MD825BL-12, MD825BL-24, MD625B-12, MD625B-24, MD625BM-12, MD625BM-24, MDS510-12, MDS510-24, MDS510M-12, MDS510M-24, MDS510M-5, MDS410-12, MDS410-24, MDS410M-5

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 (provide vent holes)
- Operating ambient temperature
-10 to +60 °C (+14 to +140 °F) (non-freezing)
- Operating ambient humidity 85%, maximum (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 free of excessive salt
- Area not subject to continuous vibration or excessive shocks
- Area free of excessive electromagnetic noise (from welders, power machinery, etc.)
- Area free of radioactive materials, magnetic fields or vacuum

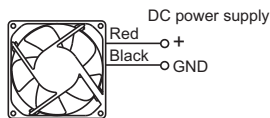
■ **How to install the fan**

Install the fan onto an appropriate flat metal plate having excellent vibration resistance and heat conductivity. See the panel cut-out, mounting-hall reference drawing for information on how to provide mounting holes on the equipment used and secure the fan with screws (not supplied). For air orientation and rotational direction, see the outline drawings in the catalogue.

Model	Screw size	Tightening torque
MDE1225 type, MDS1225 type, MD1225 type, MD925A type, MD825B type	M4	0.6 N·m (5.3 lb-in)
MD625B type, MDS510 type, MDS410 type	M3	0.4 N·m (3.5 lb-in)

Connecting the power supply

Connect the red wire to the positive (+) power supply and the black wire to the ground connection.

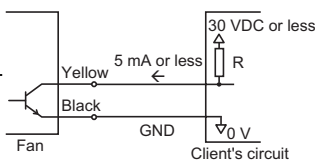


Check the voltage specification on the product identification plate and input the correct voltage.

Connection and specifications of the alarm/sensor

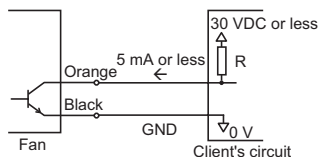
■ **Pulse sensor type**

The yellow wire is lead wire for the pulse output. GND is common to the sensor and power supply. Connect these wires to the client's circuit as shown in the figure below. Two cycles of rectangular waves are output per rotation.



■ **Stall alarm, electronic alarm type**

The orange wire is lead wire for the alarm circuit. GND is common to the sensor and power supply. Connect these wires to the client's circuit as shown in the figure below.



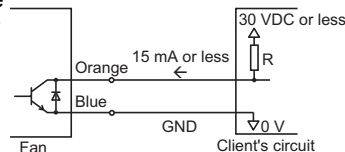
If the fan stalls while the power is on, an alarm signal (H level) is output.

Note

The stall alarm type of fan is not equipped with a delayed trip-point alarm circuit. Therefore, an external delay function is necessary to avoid the detection of fan start. The set time of the delay function should be at least one second.

■ **Low-speed alarm, electronic alarm type**

The orange and blue wires are lead wires for the alarm circuit. Connect these wires to the client's as shown in the figure below.



An alarm (H level) signal is output when the fan's rotation speed falls below 2'100±400 r/min.

Note

The low-speed alarm type of fan is equipped with an internal delayed-start alarm circuit. The alarm function becomes effective within 10 seconds of the fan start.

Overheat protection

The fan is equipped with an internal protective circuit against overheating. In the event a lock-up condition is detected, this function automatically controls the current flow to the fan motor's windings, thus preventing the fan blades from locking and burning out. The fan resumes operation automatically as soon as it is released from the locked condition. Be sure to shut off the power to the fan before performing an inspection.

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