

OPERATING MANUAL

Brushless DC Fan

MDS Series, MD Series, MDE 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, 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.

Regulations and standards

The applicable standards and certification body vary according to the product. Check on the Oriental Motor Website for details about standards.

■ UL Standards, CSA Standards

This product is recognized by UL under the UL and CSA Standards.

■ CE Marking / UKCA Marking

This product is affixed with the marks under the following directives/regulations.

● EU EMC Directive/UK EMC Regulation

The conformance of your mechanical equipment to EMC will vary depending on such factors as the control system equipment used with this product, configuration of electrical parts, wiring, and layout. It therefore must be verified through conducting EMC measures in a state where all parts including this product have been installed in the equipment.

⚠ CAUTION This equipment is not intended for use in residential environments nor for use on a low-voltage public network supplied in residential premises, and it may not provide adequate protection to radio reception interference in such environments.

■ EU RoHS Directive/UK RoHS Regulation

This products do not contain the substances exceeding the restriction values.

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.

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.

⚠ 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.
- 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.
 - Dispose of the product correctly in accordance with laws and regulations, or instructions of local governments.

Preparation

Verify the model number of the purchased product against the number shown on the package label. The fan model name is listed on the fan nameplate.

● Standard type

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

● Pulse sensor type

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

● Stall alarm, electronic alarm type

MDS410-12L, MDS410-24L, MDS510-12L, MDS510-24L, MD625B-12L, MD625B-24L, MD825B-12L, MD825B-24L, MD925A-12L, MD925A-24L, MDS1238-24L

● Long life models (Stall alarm, electronic alarm type)

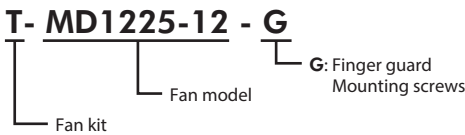
MDE1225-12L

■ Checking the product

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.

<input type="checkbox"/> Fan <input type="checkbox"/> OPERATING MANUAL (this document)	<input type="checkbox"/> Fan <input type="checkbox"/> OPERATING MANUAL (this document) <input type="checkbox"/> Finger guard <input type="checkbox"/> Mounting screws
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How to identify the fan kit model



Installation

■ Location for installation

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

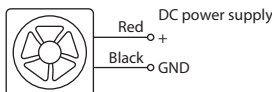
Install the fan onto an appropriate flat metal plate having excellent vibration resistance and heat conductivity. Drill holes on the mounting plate and fix the fan on the plate using screws (not supplied). For air orientation and rotational direction, see the indications shown on the fan's side frame.

Model	Screw size	Tightening torque
MDS825, MD825, MD925, MD1225, MDS1225, MDE1225, MDS1238	M4	0.6 N·m (5.3 lb-in)
MDS410, MDS510, MD625	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.

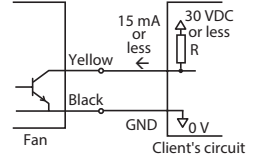


Connection and specifications of the alarm

■ Pulse sensor type

The yellow wire is lead wire for the pulse output. GND is common to the sensor and power supply.

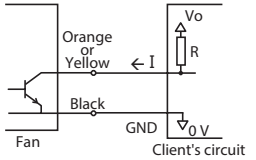
Two cycles of rectangular waves are output per rotation.



■ Stall alarm, electronic alarm type

The orange or yellow wire is lead wire for the alarm circuit. GND is common to the sensor and power supply.

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



Model	Vo: Maximum applied voltage	I: Maximum current
MDS series	30 VDC or less*	5 mA or less
MDE series		
MD series		15 mA or less

* MDS1238-24L = 27.6 VDC or less



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.

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.

Product warranty

Check on the Oriental Motor Website for the product warranty.

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* Please contact your nearest Oriental Motor office for further information.

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