Filter Fans
Operating Guide

Use the product safely after thoroughly reading the section "Safety precautions."
Read installation methods printed on the reverse side of this paper.

Before use

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.

■ RoHS Directive

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.

- 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.
- Assign qualified personnel the task of installing, wiring, operating/controlling, inspecting and troubleshooting the product. Failure to do so may result in fire, electric shock or injury.
- When using the DC fan type, turn off the power in the event that the overheat protection circuit is activated. Otherwise, the fan will start unexpectedly when released from the locked condition, causing bodily injury or equipment damage.
- Install the product inside equipment. Failure to do so may result in electric shock or injury.
- When installing the AC fan type, be sure to ground. Failure to do so may result in electric shock.
- Keep the input-power voltage within the specified range. Failure to do so may result in fire or electric shock.
- Connect the cables securely according to the wiring diagram. Failure to do so may result in fire or electric shock.
- Do not forcibly bend, pull or pinch the cable. Doing so may result in fire or electric shock.
- 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. Otherwise, the fan will suddenly start when the power is restored and this may cause injury or damage to equipment.
- Do not disassemble or modify the product. Doing so may result in electric shock or injury. Refer all such internal inspections and repairs to the branch or sales office from which you purchased the product.

⚠Caution

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

- Do not use the product beyond the specifications. Doing so may result in electric shock, injury or damage to equipment.
- Keep your fingers and objects out of the openings in the product. Failure to do so may result in injury.
- Do not carry the product by holding the rotating part (blades) or lead wires. Doing so may result in injury.
- Keep the area around the product free of combustible materials. Failure to do so may result in fire or a skin burn(s).
- Do not leave anything around the product that would obstruct ventilation. Doing so may result in damage to equipment.
- Before installing the product, take measures against static electricity. Failure to do so may result in damage to equipment.
- Do not touch the rotating part (blades) while operating. Doing so may result in injury.
- Immediately when trouble has occurred, stop operation and turn off the power supply. Failure to do so may result in fire, electric shock or injury.
- To dispose of the product, disassemble it into parts and components as much as possible and dispose of individual parts/components as industrial waste.
- For the AC fan type, since the motor surface temperature may exceed 70 °C (158 °F) even under normal operating conditions, attach a warning label as shown in the figure in a conspicuous position. Failure to do so may result in a skin burn(s).


Warning label

Note Do not conduct the insulation resistance measurement or dielectric strength test between the primary (coil) and secondary (alarm circuit) sides. Doing so may cause damage to the alarm circuit.

Preparation

Verify the model number of the purchased product against the number shown on the nameplate.

■ 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.

Filter Fan IP2X type, Filter Fan IP55/43 type

- Filter fan.....1 pc
- Cable for power supply connection.....1 pc
- Mounting screw set.....1 set
- Instructions and Precautions for Safe Use ..1 copy

Each 1 set of screws for installing the mounting frame and grille are included in the mounting screw set of the filter fan IP55/43 type.

Filter Fan IP4X type

- Filter fan.....1 pc
- Cable for power supply connection.....1 pc
  2 pieces of cables are supplied with the filter fans in which two fans are installed, and 3 pieces of cables are supplied with the filter fans in which three fans are installed.
- Mounting screw set.....1 set
- Instructions and Precautions for Safe Use ..1 copy

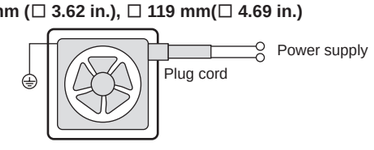
An alarm cable is supplied with the filter fans in which the fans of the frame size 180 mm (7.09 in.) with built-in alarm circuits are installed.

Connection of the power supply

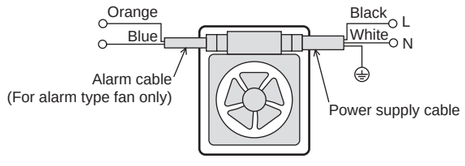
Verify the specification with the nameplate of the product, and input the suitable voltage.

■ AC axial flow fan

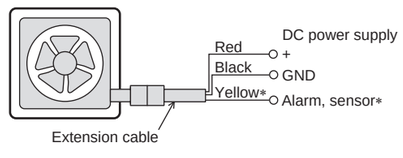
- **Fan size ☐ 92 mm (☐ 3.62 in.), ☐ 119 mm(☐ 4.69 in.)**



- **Fan size ☐ 180 mm (☐ 7.09 in.)**



■ DC axial flow fan



* For alarm type or sensor type fan only

Specification and connection of the alarm/sensor

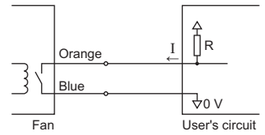
Connect the product to the user's circuit as shown in the figure.

■ AC axial flow fan

Low-speed alarm, contact alarm type [☐ 180 mm (☐ 7.09 in.)]

The alarm signal output is a relay mode.

When the fan speed drops to 1800±300 r/min or lower, an alarm signal is output (H level).
Contact capacity:
Resistive load max. 10 VA
(max. 100 V/max. 0.5 A)



Note The alarm circuit is not equipped with a delay function. External delay circuit is required to prevent alarm detection when starting the fan. The delay time should be at least 10 seconds.

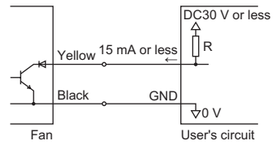
■ DC axial flow fan

Low-speed alarm, electronic alarm type

The alarm signal output is an open collector mode.

[☐ 92 mm (☐ 3.62 in.)]

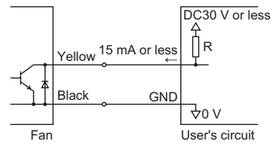
The yellow lead wire is for the alarm signal.
GND is common to the sensor and power supply.
When the fan speed drops to 1900±400 r/min or lower, an alarm signal is output (H level).



Note The alarm circuit is not equipped with a delay function. External delay circuit is required to prevent alarm detection when starting the fan. The delay time should be at least 10 seconds.

[☐ 119 mm (☐ 4.69 in.)]

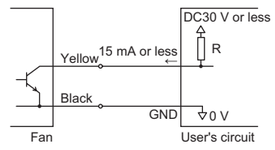
The yellow lead wire is for the alarm signal.
GND is common to the sensor and power supply.
When the fan speed drops to 2100±400 r/min or lower, an alarm signal is output (H level).



Note The alarm circuit is equipped with an internal starting-delay function. The alarm function becomes effective within 10 seconds after the fan starts.

Stall alarm, electronic alarm type

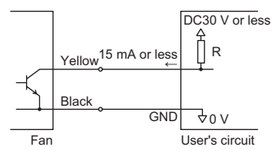
The yellow lead wire is for the alarm signal.
GND is common to the sensor and power supply.
If the fan stops while the power is on, an alarm signal is output (H level).



Note The stall alarm circuit is not equipped with a delay function. External delay circuit is required to prevent alarm detection when starting the fan. The delay time should be at least 1 second.

Pulse sensor type

The yellow lead wire is for the pulse output.
GND is common to the sensor and power supply.
Two cycles of rectangular waves are output per revolution.



Overheat protection

■ AC axial flow fan

- **Impedance protection [☐ 92 mm (☐ 3.62 in.), ☐ 119 mm (☐ 4.69 in.)]**

If an error occurs or the fan is locked, the coil impedance will increase and suppress input to the fan, thereby preventing the fan coil from burning.

- **Thermal protection [☐ 180 mm (☐ 7.09 in.)]**

Once the temperature reaches a specified level, the internal thermal protector that has an automatic-return feature is triggered to stop the fan operation. Because of its automatic-reset mechanism, the fan will resume operation automatically once the fan temperature drops.
Therefore, be sure to turn off the power supply before inspecting the fan.
[Operating temperature of thermal protectors]
Open (Power OFF)..... 120±5 °C (248±9 °F)
Close (Power ON) ..... 77±15 °C (171±27 °F)

■ DC axial flow fan

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 windings. Therefore it prevents the fan blades from locking and burning out. The fan resumes operation automatically as soon as it is released from the locked condition. Turn off the power in the event of inspections.

Maintenance

■ Inspection

Check periodically whether any of screws is loose. Re-tighten if the screw was loose.

■ Cleaning

Clean or replace the filter media regularly because the clogged filter media reduces the cooling capacity.
Clean the filter media by either of the following methods if the filter media has become dirty.

- Hand-wash by pushing it up and down in the water pool.
  Oil stain can be removed by washing with a neutral detergent.
  Do not strongly wash or scrub in order to use for a long period of time. Dry it naturally after cleaning.
- Blow dust away with compressed air. Or suck dust with a vacuum cleaner.

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

ORIENTAL MOTOR U.S.A. CORP.
Technical Support Tel:800-468-3982
8:30am EST to 5:00pm PST (M-F)

ORIENTAL MOTOR (EUROPA) GmbH
Schiessstraße 44, 40549 Düsseldorf, Germany
Technical Support Tel:00 800/22 55 66 22

ORIENTAL MOTOR (UK) LTD.
Blythe Valley Business Park,
Central Blvd Blythe Valley Park,
Solihull B90 8AG, United Kingdom
Tel:+44-1926-671220

ORIENTAL MOTOR (FRANCE) SARL
Tel:+33-1 47 86 97 50

ORIENTAL MOTOR ITALIA s.r.l.
Tel:+39-02-93906347

ORIENTAL MOTOR CO., LTD.
4-8-1Higashiueno,Taito-ku,Tokyo 110-8536
Japan
Tel:+81-3-6744-0361
www.orientalmotor.co.jp/ja

ORIENTAL MOTOR ASIA PACIFIC PTE. LTD.
Singapore
Tel:1800-842-0280

ORIENTAL MOTOR (MALAYSIA) SDN. BHD.
Tel:1800-806-161

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Tel:1800-888-881

ORIENTAL MOTOR (INDIA) PVT. LTD.
Tel:1800-120-1995 (For English)
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TAIWAN ORIENTAL MOTOR CO., LTD.
Tel:0800-060708

SHANGHAI ORIENTAL MOTOR CO., LTD.
Tel:400-820-6516

INA ORIENTAL MOTOR CO., LTD.
Korea
Tel:080-777-2042

Oriental motor

Filter Fans
Installation

Use the product safely after thoroughly reading the section "Safety precautions."
Read safety precautions, connection method and other information printed on the reverse side of this paper.

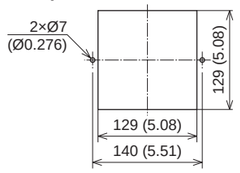
Installation methods vary depending on the filter fan types. Install the filter fan using the supplied mounting screw set.
When purchasing a panel separately, use it by installing in the same way.
Install the product onto an appropriate flat metal plate having excellent vibration resistance and heat conductivity.

Filter Fan IP2X type

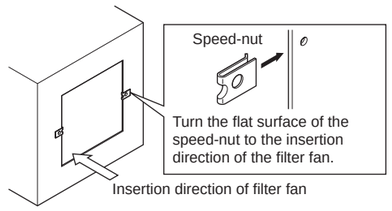
• Machining of mounting hole

1. Drill a mounting hole into the enclosure.
Applicable plate thickness:
1.0 mm to 1.6 mm (0.039 in. to 0.063 in.)

Reference panel cut-out Unit: mm (in.)



2. Attach the supplied speed-nut to the mounting plate and adjust the position to the screw hole.
If it is too tight to attach the speed-nut, drive it with a hammer.

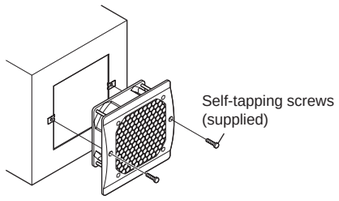


Note Be sure to install the filter fan using the supplied mounting screw set. If the filter fan is installed without speed-nuts, gaps may remain between the filter fan and mounting plate. It may cause the resinous parts to break or the fan to fall, resulting in damage.

• Installation

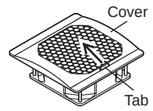
Filter fan without filter

Install the product into a mounting hole and secure it with two self-tapping screws (supplied).
Tightening torque: 0.88 N·m (124 oz-in)

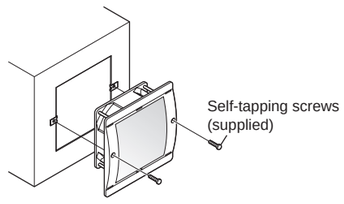


Filter fan with filter

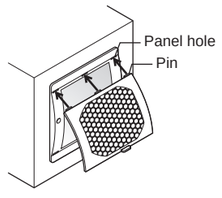
1. Place the product on a flat stand and remove the cover while pushing the tab of the cover in the direction of an arrow.



2. Install the product that was removed the cover into the mounting hole, and secure it with the supplied self-tapping screws.
Tightening torque: 0.88 N·m (124 oz-in)



3. Insert the pins of the cover that is opposite the tab of the cover into the panel holes (3 locations).



4. Lift the tab lightly and push the pin of the tab side into the panel hole while bending the cover.

5. Check that the cover is firmly secured by pushing the both sides of the tab side.

■ 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 (provide vent holes)
- Operating ambient temperature
  −10 to +60 °C (+14 to +140 °F) (non-freezing)
  −45 to +85 °C [−49 to +185 °F] for the panels of the filter fan IP55/43 type (non-freezing)
- Operating ambient humidity 85% or less (non-condensing)
  65% or less for the panels of the filter fan IP55/43 type (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.

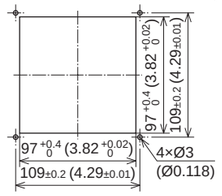
Filter Fan IP55/43 type

• Machining of mounting hole

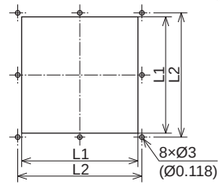
Drill a mounting hole into the enclosure.

Reference panel cut-out Unit: mm (in.)

• Fan size ☐ 92 mm (☐ 3.62 in.)



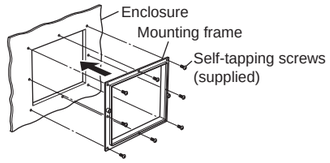
• Fan size ☐ 119 mm (☐ 4.69 in.)



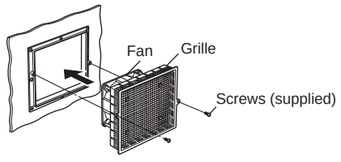
Panel size	Dimensions	
	L1	L2
Large size	176 +0.4 0 (6.93 +0.02 0)	188±0.2 (7.40±0.01)
Medium size	125 +0.4 0 (4.92 +0.02 0)	137±0.2 (5.39±0.01)

• Installation

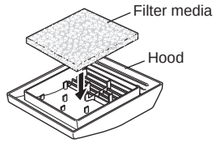
1. Install the mounting frame into the mounting hole and secure it with the supplied self-tapping screws.
Tightening the screws excessively may damage the mounting frame.



2. Install the fan and grille assembly into the mounting frame and secure the assembly with the supplied screws at two locations.
The tightening torque: 0.57 N·m (80 oz-in).



3. Install the filter media into the hood. Do not install the media on the grille side, as it may reduce the air volume.
The filter media must be installed in such a way that air will flow from the coarse-mesh side to the fine-mesh side. Wrong orientation will cause the media to clog easily.



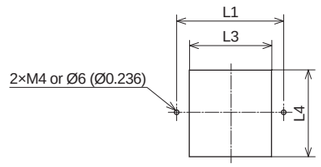
4. Install the hood on the grille.

Filter Fan IP4X type

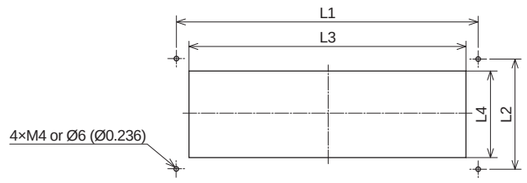
• Machining of mounting hole

Drill a mounting hole into the enclosure.

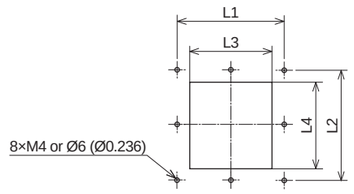
Reference panel cut-out A



Reference panel cut-out B



Reference panel cut-out C



Unit: mm (in.)

Fan size, unit	Reference panel cut-out	Dimensions			
		L1	L2	L3	L4
☐ 92 mm (☐ 3.62 in.) 1 pc	A	145 (5.71)	–	135 (5.31)	135 (5.31)
☐ 119 mm (☐ 4.69 in.) 1 pc		170 (6.69)	–	160 (6.30)	160 (6.30)
☐ 119 mm (☐ 4.69 in.) 2 pcs	B	295 (11.61)	170 (6.69)	285 (11.22)	160 (6.30)
☐ 119 mm (☐ 4.69 in.) 3 pcs		420 (16.54)	170 (6.69)	410 (16.14)	160 (6.30)
☐ 180 mm (☐ 7.09 in.) 1 pc	C	263 (10.35)	263 (10.35)	250 (9.84)	250 (9.84)

• Installation

Install the product into the mounting hole and secure with the supplied mounting screws.

■ How to identify the product model

C - Fan model - G ☐

- Filter Fans
- G: Filter Fan IP2X type
  P: Filter Fan IP55/43 type
  S: Filter Fan IP4X type

The code followed after the fan model name indicates the type of the filter fans.