Cooling Fans

Axial Flow Fans

Axial Flow Fans

●Additional Information●
Technical reference ➜ Page G-1

Axial flow fans use a propeller to generate air flow in the direction of the axis of rotation. Capable of generating a large air flow, axial flow fans are suited for applications requiring ventilation cooling.

Features

●Extensive Lineup

Axial flow fans are available in a large number of sizes and voltage characteristics, from large air flow AC axial flow fans to extraordinarily compact DC axial flow fans.

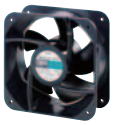
●Connector Types are Available.

Connector Types are available for □180 mm (□7.09 in.) **MRS** Series, **MDS** Series and **MD** Series.
By terminating the leads with a connector, the wiring process is simplified and maintenance replacement is easy.

●Built-in Alarm Circuit

In addition to the standard type, built-in alarm types are also available which detect and signal fan rotation abnormalities.

Types of Axial Flow Fans

Series	Features
AC Axial Flow Fans **MRS** Series ➜ Pages F-32～F-45 	●AC Axial Flow Fans ●Large axial flow fans with large air flow, high static pressure and high efficiency. ●The **MRS** Series is recognized by UL/CSA Standards and conforms to EN Standards. (Certification status differs according to the product.) CE Marking is used in accordance with the Low Voltage Directive. ●RoHS-Compliant The **MRS** Series conforms to the RoHS Directive.
AC Axial Flow Fans **MRS** Series Variable Flow Type ➜ Pages F-46～F-47 	●AC Axial Flow Fans ●An internal power control device allows adjustment of airflow.
AC Axial Flow Fans **MU** Series ➜ Pages F-48～F-55 	●Compact AC axial flow fans ●The **MU** Series is recognized by UL/CSA Standards and the Electrical Appliance and Material Safety Law (Japan), and conforms to EN Standards. (Certification status differs according to the product.) CE Marking is used in accordance with the Low Voltage Directive. ●RoHS-Compliant The **MU** Series conforms to the RoHS Directive.
DC Axial Flow Fans **MDS** Series **MD** Series ➜ Pages F-56～F-73 	●DC axial flow fans ●The **MDS** and **MD** Series is recognized by UL/CSA Standards and conforms to EN Standards. CE Marking is used in accordance with the EMC Directive. (Certification status differs according to the product.) ●RoHS-Compliant The **MDS** and **MD** Series conform to the RoHS Directive.
DC Long-Life Fans **MDE** Series ➜ Pages F-74～F-77 	●Compact DC axial flow fans ●The **MDE** Series is recognized by UL/CSA Standards and conforms to EN Standards. (Except **MDE1451** type.) CE Marking is used in accordance with the EMC Directive. (Certification status differs according to the product.) ●RoHS-Compliant The **MDE** Series conforms to the RoHS Directive.

●Details of safety standards ➜ Page H-2 ●For detailed product safety standard information including standards, file number and certification body, please visit www.orientalmotor.com.

Lineup

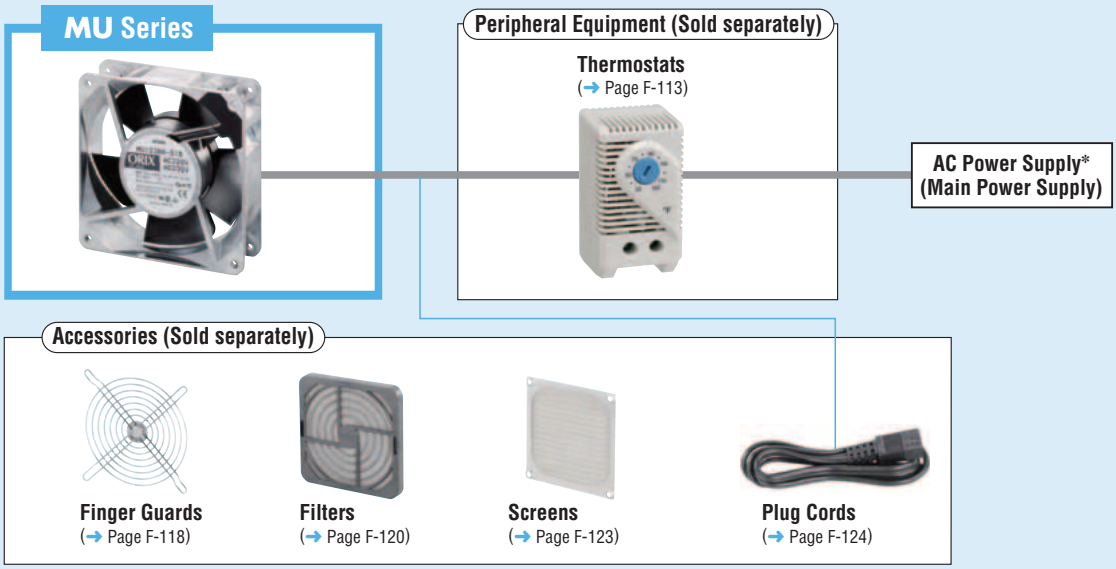
●: Standard Type ■: Alarm Type ◆: Pulse Sensor Type

Series	Power Supply Voltage	Frame Size [mm (in.)]											
		□250 (□9.84)	□200 (□7.87)	□180 (□7.09)	ϕ172 (ϕ6.77)	□160 (□6.30)	□140 (□5.51)	□119 (□4.69)	□92 (□3.62)	□80 (□3.15)	□62 (□2.44)	□52 (□2.05)	□42 (□1.65)
AC Axial Flow Fans **MRS** Series → Pages F-32～F-45	Single-Phase 100/110/115 VAC	●■	●■	●■		●■							
	Single-Phase 200/220/230 VAC	●■	●■*	●■*		●■*							
	Three-Phase 200/220/230 VAC	●■	●■	●■		●■	●■						
AC Axial Flow Fans **MRS** Series Variable Flow Type → Pages F-46～F-47	Single-Phase 100/115 VAC			●									
	Single-Phase 220/230 VAC			●									
AC Axial Flow Fans **MU** Series → Pages F-48～F-55	Single-Phase 115 VAC							●	●	●			
	Single-Phase 220/230 VAC							●	●	●			
DC Axial Flow Fans **MDS** Series **MD** Series → Pages F-56～F-73	5 VDC											●	●
	12 VDC							●■	●■◆	●■◆	●■◆	●■	●■
	24 VDC				●■◆		●■◆	●■	●■◆	●■◆	●■◆	●■	●■
	48 VDC						●■◆						
DC Long-Life Fans **MDE** Series → Pages F-74～F-77	12 VDC							■					
	24 VDC						■	■					
	48 VDC						■						

*The product for single-phase 220 VAC is not available.

System Configuration

An example of a system configuration with the **MU** Series. A thermostat, finger guard and plug cord are used.



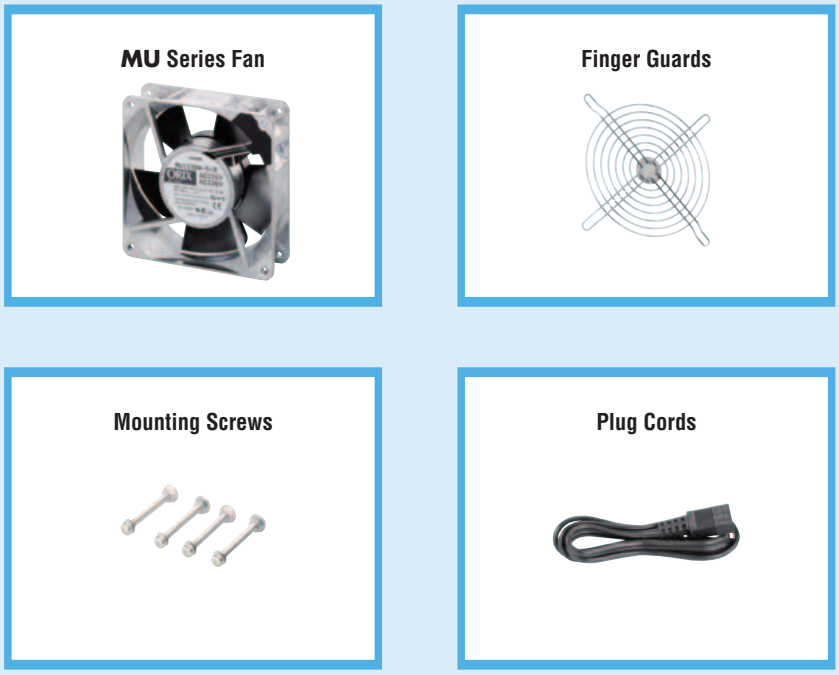
●**Example of System Configuration**

Fan		Sold Separately		
		Thermostat	Finger Guard	Plug Cord [1 m (3.3 ft.)]
MU1238A-21B	+	**AM1-WA1**	**FG12D**	**PCA2B**

●The system configuration shown above is an example. Other combinations are available.

✻Not supplied

A fan kit containing all necessary accessories in one package is available.



Fan Kit	Package Contents			
	Fan	Finger Guard	Plug Cord [1 m (3.3 ft.)]	Mounting Screws
T-MU1238A-21-GP	**MU1238A-21B**	**FG12D**	**PCA2B**	M4×55 mm (2.17 in.)

General Specifications

AC Axial Flow Fans

Item	Specifications
Insulation Resistance	100 MΩ or more when 500 VDC megger is applied between the windings and the frame after continuous operation under normal ambient temperature and humidity.
Dielectric Strength	Sufficient to withstand 1.5 kVAC at 50 Hz applied between the windings and the frame for 1 minute after continuous operation under normal ambient temperature and humidity.
Temperature Rise	30˚C (54°F) or less measured by the thermometer method after the temperature of the case has stabilized after continuous operation under normal ambient temperature and humidity.
Operating Voltage Range	±10% of the rated voltage
Thermal Class	UL/CSA standards: 105 (A), EN standards: 120 (E)
Overheat Protection	**MRS** Series has built-in thermal protector. (automatic return type) Open: 120±5˚C (248±9°F), Close: 77±15˚C (170.6±27°F) **MU** Series is impedance protected.
Operating Environment	Provided in a separate box.
Storage Condition	Provided in a separate box.
Color	**MRS** Series Frame: Dark Gray Blades: Black **MU** Series Frame: Unpainted (Aluminum) Blades: Black
Materials	Frame: Die cast aluminum Blades: Polycarbonate (Flammability grade: V-0)

◇Operating Environment and Storage Condition

Series	Operating Environment*1		Storage Condition*1 *2		Environmental Standards
	Ambient Temperature	Ambient Humidity	Ambient Temperature	Ambient Humidity	
MU, **MRS** Series	−30～+60˚C (−22～+140°F)	85% or less (non-condensing)	−40～+70˚C (−40～+158°F)	85% or less (non-condensing)	Compliant with ETSI standards*3
MRS Series Low-Speed Alarm Type	−20～+60˚C (−4～+140°F)		−20～+70˚C (−4～+158°F)		
MRS Series Variable Flow Type	−10～+60˚C (+14～+140°F)	85% or less (non-condensing)	–	–	–

*1 The operating environment and storage conditions require no condensation, no freezing and no vibration or external force other from the fan.
*2 The storage condition applies to a short period such as a period during transportation.
*3 The operating environment and storage condition are compliant with the following environmental standards:
ETSI EN 300 019-2-1 V2.1.2 (2000-09) Class 1.3E Storage
ETSI EN 300 019-2-2 V2.1.2 (1999-09) Class 2.3 Transportation
ETSI EN 300 019-2-3 V2.2.2 (2003-04) Class 3.4 Stationary use

Test Name	Environmental Standards	Conditions and Test Details
Heat Cycle Test	ETSI EN 300 019-2-1 ETSI EN 300 019-2-2 ETSI EN 300 019-2-3	5 cycles at −40～+30˚C (−40～+86°F), temperature gradient: 1.0˚C (1.8°F)/min. Low temperature: [−40˚C (−40°F)], High temperature: [+30˚C (+86°F)]. Shelf time: 3 hours No abnormality after the test.
Low-Temperature Shelf Test		−45˚C (−49°F). Shelf time: 72 hours. No abnormality after the test.

● Environmental Standards: ETSI
ETSI is the abbreviation for the European Telecommunications Standards Institute, and is a standardization organization established to formulate standard models for telecommunications in Europe. The ETSI EN 300 019 series are standards based on IEC 60721, established for environmental conditions for devices, and provide specific definitions of environmental conditions along with test conditions.

DC Axial Flow Fans

Item	Specifications
Insulation Resistance	10 MΩ or more when 250 VDC megger (For **MDS1751-24B**, **-24S**, **MDS1451**: 500 VDC megger) is applied between the windings and the frame after continuous operation under normal ambient temperature and humidity.
Dielectric Strength	Sufficient to withstand 500 V at 50 Hz applied between the windings and the frame for 1 minute after continuous operation under normal ambient temperature and humidity.
Temperature Rise	10ºC (18°F) or less measured by the thermometer method after the temperature of the case has stabilized after continuous operation under normal ambient temperature and humidity. (**MDS1751**: 5˚C [9˚F] or less, **MDS1451**: 15˚C [27°F] or less)
Operating Voltage Range	±15% of the rated voltage **MDS510**, **MDS410**, **MDS1225-12M**, **-24M**: ±10% of the rated voltage
Thermal Class	UL/CSA standards: 105 (A), EN standards: 120 (E)
Overheat Protection	Built-in overheat protection circuit
Ambient Temperature	−10～+60˚C (+14～+140°F)
Ambient Humidity	85% or less (non-condensing)
Color	Frame: Black: **MD925**, **MD825**, **MD625**, **MDS510**, **MDS410** Dark Gray: **MDE1451**, **MDE1225** Unpainted (Aluminum): **MDS1751**, **MDS1451**, **MDS1225**, **MD1225** Blades: Black
Materials	Fan Frame: Die cast aluminum: **MDS1751**, **MDS1451**, **MDS1225**, **MD1225**, **MDE1451**, **MDE1225** Polycarbonate (Flammability grade V-0): **MD925**, **MD825**, **MD625**, **MDS510**, **MDS410** Blades: Polycarbonate (Flammability grade V-0): **MDS1751**, **MDS1451**, **MDS1225**, **MD1225**, **MD925**, **MD825**, **MD625**, **MDE1451**, **MDE1225** PBT (Flammability grade: V-0): **MDS510**, **MDS410**

Product Number Code

AC Axial Flow Fans

◇MRS Series

MRS 18 □ - B M H
① ② ③ ④ ⑤ ⑥

①	Series	**MRS**: **MRS** Series
②	Frame Size	**14**: 140 mm (5.51 in.) **16**: 160 mm (6.30 in.) **18**: 180 mm (7.09 in.) **20**: 200 mm (7.87 in.) **25**: 250 mm (9.84 in.)
③		**V2**: Variable Flow
④	Power Supply Voltage	**B**: Single-Phase 100/110/115 VAC **D**: Single-Phase 200/220/230 VAC **T**: Three-phase 200/220/230 VAC
⑤	Additional Functions	**M**: Low-Speed Alarm, Electronic Alarm Type **B**: Low-Speed Alarm, Contact Alarm Type **TM**: Low-Speed Alarm, Electronic Alarm Type **TA**: Low-Speed Alarm, Contact Alarm Type **UL**: Standard Type
⑥	Connection Type	Blank: Connection with lead wire type or terminal box type **H**: Connector Type

◇MU Series

MU 12 38 A - 2 1 B
① ② ③ ④ ⑤ ⑥ ⑦

①	Series	**MU**: **MU** Series
②	Frame Size	**8**: 80 mm (3.15 in.) **9**: 92 mm (3.62 in.) **12**: 119 mm (4.69 in.)
③	Frame Thickness	**25**: 25 mm (0.98 in.) **38**: 38 mm (1.50 in.)
④	Speed Type	**A**, **S**: Standard Speed **M**, **B**: Middle Speed **L**: Low Speed
⑤	Power Supply Voltage	**2**: Single-Phase 115 VAC **5**: Single-Phase 220/230 VAC
⑥	Power Connection	**1**: 2-Terminal **3**: Lead Wire Type
⑦	Reference Number	

Fan Kit

T- MRS18-BMH G
① ② ③

①	Fan Kit Order Code
②	Fan Model Name
③	**G**: With finger guard and mounting screws **GP**: With finger guard, plug cord and mounting screws **F**: With filter and mounting screws

DC Axial Flow Fans

◇MDS, MD and MDE Series

MD 9 25 A - 12 L H □
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

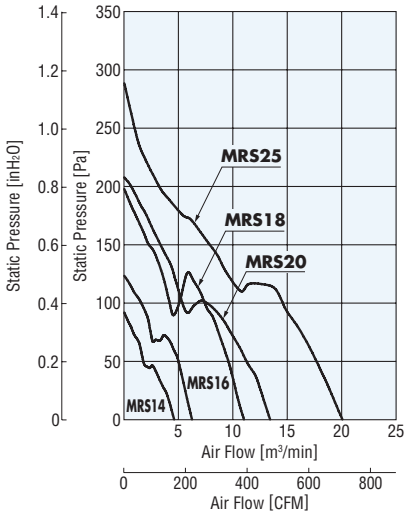
①	Series	**MDS**: **MDS** Series **MD**: **MD** Series **MDE**: **MDE** Series
②	Frame Size	**4**: 42 mm (1.65 in.) **5**: 52 mm (2.05 in.) **6**: 62 mm (2.44 in.) **8**: 80 mm (3.15 in.) **9**: 92 mm (3.62 in.) **12**: 119 mm (4.69 in.) **14**: 140 mm (5.51 in.) **17**: ϕ172 mm (ϕ6.77 in.)
③	Frame Thickness	**10**: 10 mm (0.39 in.) **25**: 25.4 mm (1.00 in.) **51**: 51 mm (2.01 in.)
④	Speed Type	Blank, **A**, **B**: Standard Speed **AM**, **BM**: Middle Speed **AL**, **BL**: Low Speed
⑤	Power Supply Voltage	**5**: 5 VDC **12**: 12 VDC **24**: 24 VDC **48**: 48 VDC
⑥	Additional Functions	**B**: Low-Speed Alarm, Contact Alarm Type **M**: Low-Speed Alarm, Electronic Alarm Type **L**: Stall Alarm, Electronic Alarm Type **S**: Pulse Sensor Type
⑦	Connection Type	Blank: Lead wire type **H**: Connector Type
⑧	Reference Number	

Comparison of Characteristics

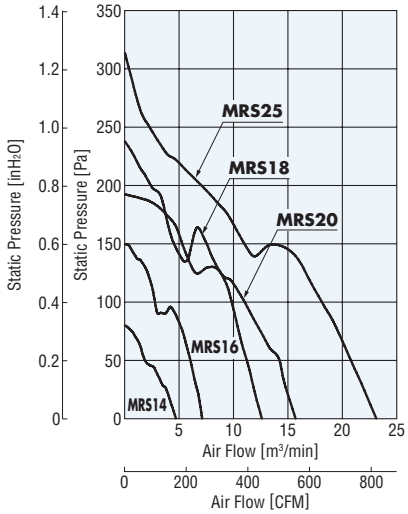
AC Axial Flow Fans

◇**MRS** Series

• 50 Hz



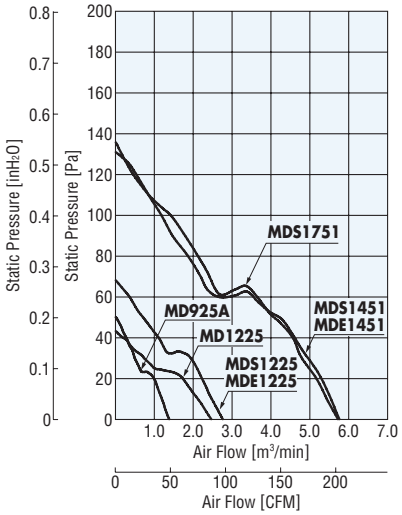
• 60 Hz



DC Axial Flow Fans

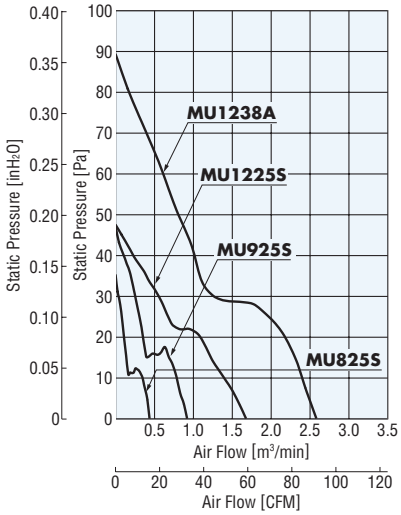
◇**MDS**, **MD** and **MDE** Series

• **MDS1751**, **MDS1451**, **MDS1225**, **MD1225**, **MD925A**, **MDE1451**, **MDE1225**

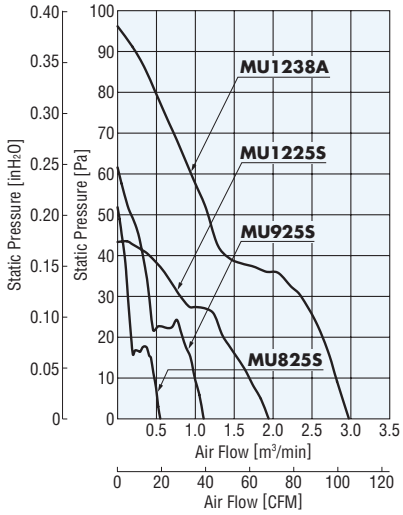


◇**MU** Series

• 50 Hz



• 60 Hz



◇**MDS**, **MD** Series

• **MD825B**, **MD625B**, **MDS510**, **MDS410**