

Cooling Fans

Cross Flow Fans

Introduction
Cooling Module
AC Input MRS
AC Input Variable Flow MRS
Axial Flow Fans
AC Input MU
DC Input Long-Life MDE
DC Input MDS/MD
Centrifugal Blowers
AC Input MB
DC Input MBD
Cross Flow Fans
AC Input MF
DC Input MFD
Thermostats
Accessories
Installation

AC Input
MF Series

DC Input
MFD Series

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Introduction	E-122
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Cross flow fans are suitable for cooling circuit boards or other applications requiring wide and uniform air flow such as air curtains.



Features

Cross flow fans deliver wide, uniform air flow.

These fans provide right-angle air flow and a rectangular shape, allowing for installation in corners and space saving.

Types of Cross Flow Fans

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


Series	Features	Power Supply Voltage	Impeller Length [mm (in.)]	
			300 (11.81)	150 (5.91)
AC Cross Flow Fans MF Series → Page E-124~E-127	<ul style="list-style-type: none"> ● AC input cross flow fans ● The MF Series is recognized by UL/CSA Standards. CE Marking is used in accordance with the Low Voltage Directive. (Certification status differs according to the product.) ● RoHS-Compliant The MF Series conforms to the RoHS Directive that prohibits the use of six chemical substances including lead and cadmium.	Single-Phase 100/110/115 VAC	●	●
		Single-Phase 200/220/230 VAC	●	●
DC Cross Flow Fans MFD Series → Page E-128~E-131	<ul style="list-style-type: none"> ● DC input cross flow fans ● RoHS-Compliant The MFD Series conforms to the RoHS Directive that prohibits the use of six chemical substances including lead and cadmium.	24 VDC	●■	●■
		48 VDC	●◆	●◆

● Details of safety standards → Page G-2 ● List of safety standard approved products (Model, Standards, File No., Certification Body) → Page G-11

System Configuration


An example of a system configuration with the **MF** Series.

MF Series




Peripheral Equipment (Sold separately)

① **Thermostats**
→ Page E-133




AC Power Supply
(Main Power Supply)
(Not supplied)



Example of installing the finger guard
(The photo shows two finger guards, **FG915D**.)

Accessories (Sold separately)



② **Finger Guards**
→ Page E-145

No.	Product Name	Overview	Page
①	Thermostats	Contact is ON and OFF in accordance with thermostat's set temperature. Using a fan with a thermostat provides on/off control of the fan.	E-133
②	Finger Guards	This guard prevents fingers and foreign objects from entering the rotating side of the fan.	E-145

● Example of System Configuration



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

Product Number Code

AC Cross Flow Fans

MF 9 30 B - B C

① ② ③ ④ ⑤ ⑥

① Series	MF: MF Series
② Frame Size	9: 90 mm (3.54 in.)
③ Impeller Length	30: 300 mm (11.81 in.) 15: 150 mm (5.91 in.)
④ Letter Designation	Blank: Motor is on left when viewing the mounting holes B: Motor is on right when viewing the mounting holes
⑤ Power Supply Voltage	B: Single-Phase 100/110/115 VAC D: Single-Phase 200/220/230 VAC
⑥	C: Built-in Capacitor

DC Cross Flow Fans

MFD 9 30 B - 24 A

① ② ③ ④ ⑤ ⑥

① Series	MFD: MFD Series
② Frame Size	9: 90 mm (3.54 in.)
③ Impeller Length	30: 300 mm (11.81 in.) 15: 150 mm (5.91 in.)
④ Letter Designation	Blank: Motor is on left when viewing the mounting holes B: Motor is on right when viewing the mounting holes
⑤ Power Supply Voltage	24: 24 VDC 48: 48 VDC
⑥ Additional Functions	A: Low-Speed Alarm, Contact Alarm Type S: Pulse Sensor Type

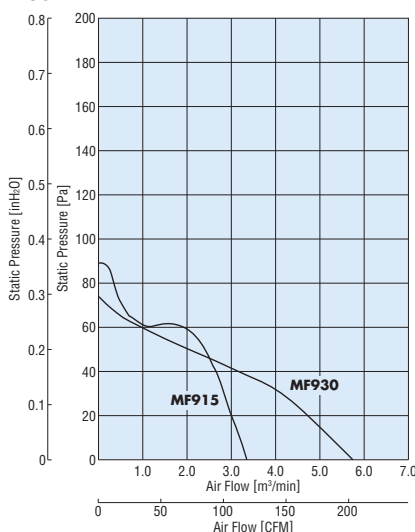
General Specifications

Item	Specifications
Insulation Resistance	100 M Ω or more when 500 VDC megger is applied between the windings and the frame after continuous operation under normal ambient temperature and humidity. (MFD Series: 10 M Ω or more, 250 VDC megger, MFD915-48, 24A, 48S, MFD930-48, 24A, 48S: 10 M Ω or more, 500 VDC megger)
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. (MFD Series: 500 VAC at 50 Hz, 1 minute)
Temperature Rise	45°C (81°F) or less measured by the thermometer method after the temperature of the motor case has stabilized after continuous operation under normal ambient temperature and humidity. (MFD Series: 15°C [27°F] or less)
Operating Voltage Range	MF Series: $\pm 10\%$ of the rated voltage MFD Series: $\pm 10\%$ of the rated voltage
Insulation Class	MF Series: UL, CSA: Class A [105°C (221°F)], Class E [120°C (248°F)] MFD Series: Class E [120°C (248°F)]
Overheat Protection	MF series has built-in thermal protector (automatic return type). Open: 120 $\pm 5^\circ\text{C}$ (248 $\pm 9^\circ\text{F}$), Close: 77 $\pm 15^\circ\text{C}$ (170.6 $\pm 27^\circ\text{F}$) MFD series has an overheat protection circuit.
Ambient Temperature	-10 \sim +60°C (+14 \sim +140°F)
Ambient Humidity	85% or less (non-condensing)
Color	MF Series: Motor: Dark gray, Fan case: Black MFD Series: Motor: Black, Fan case: Black, Flange: Dark gray
Materials	Impeller: Aluminum Casing: Steel Motor case: Die cast aluminum

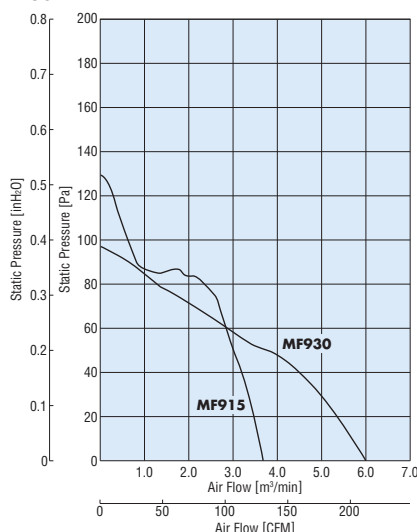
Comparison of Characteristics

MF Series

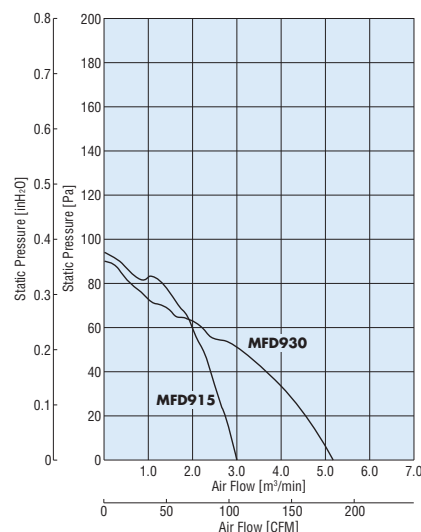
50 Hz



60 Hz



MFD Series



Introduction

Cooling Module

AC Input
MRSAC Input
Variable Flow
MRSAC Input
MUDC Input
Long-Life
MDEDC Input
MDS/MDAC Input
MBDC Input
MBDAC Input
MFDC Input
MFD

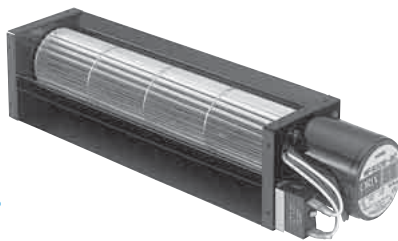
Thermostats

Accessories

Installation

AC Cross Flow Fans MF Series

Impeller Length 300 mm (11.81 in.)



Ambient Temperature: $-10\sim+60^{\circ}\text{C}$ ($+14\sim+140^{\circ}\text{F}$)
 Operating Voltage Range: $\pm 10\%$
 Materials
 Motor Case: Die Cast Aluminum
 Casing: Steel
 Impeller: Aluminum
 Overheat Protection: Built-in Thermal Protector
 Bearings: Ball Bearings

Specifications RoHS



Model	Voltage VAC	Frequency Hz	Current A	Input W	Speed r/min	Max. Air Flow		Max. Static Pressure		Noise Level dB (A)
						m ³ /min	CFM	Pa	inHzO	
MF930-BC MF930B-BC	Single-Phase 100	50	0.40	35	2500	6.0	212	74	0.297	58
	Single-Phase 100	60	0.50	45	2700	6.2	219	103	0.413	60
	Single-Phase 110	60	0.50	48	2950	6.6	233	106	0.425	62
	Single-Phase 115	60	0.50	50	3000	6.8	240	106	0.425	63
MF930-DC MF930B-DC	Single-Phase 200	50	0.20	35	2500	6.0	212	74	0.297	58
	Single-Phase 200	60	0.25	45	2700	6.2	219	103	0.413	60
	Single-Phase 220	60	0.25	48	2950	6.6	233	106	0.425	62
	Single-Phase 230	50	0.20	40	2700	6.2	219	78	0.313	60
	Single-Phase 230	60	0.25	50	3000	6.8	240	106	0.425	63

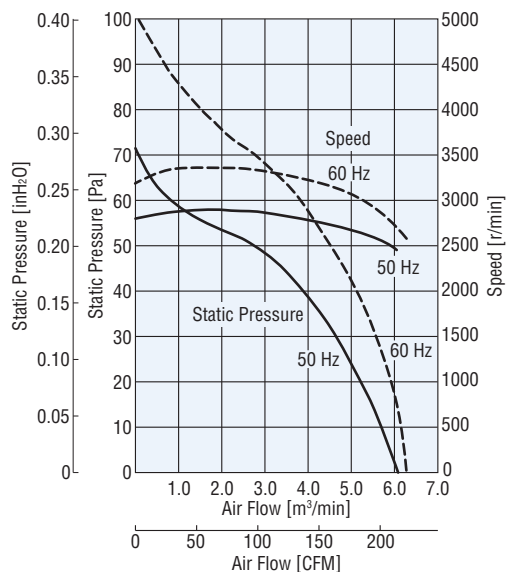
● How to read specifications → Page E-19 ● Details of safety standards → Page G-2 ● Details of RoHS Directive → Page G-38

The following items are included in each product.

Fan, Operating Manual

Air Flow – Static Pressure Characteristics

● How to read air flow – static pressure characteristics → Page E-20

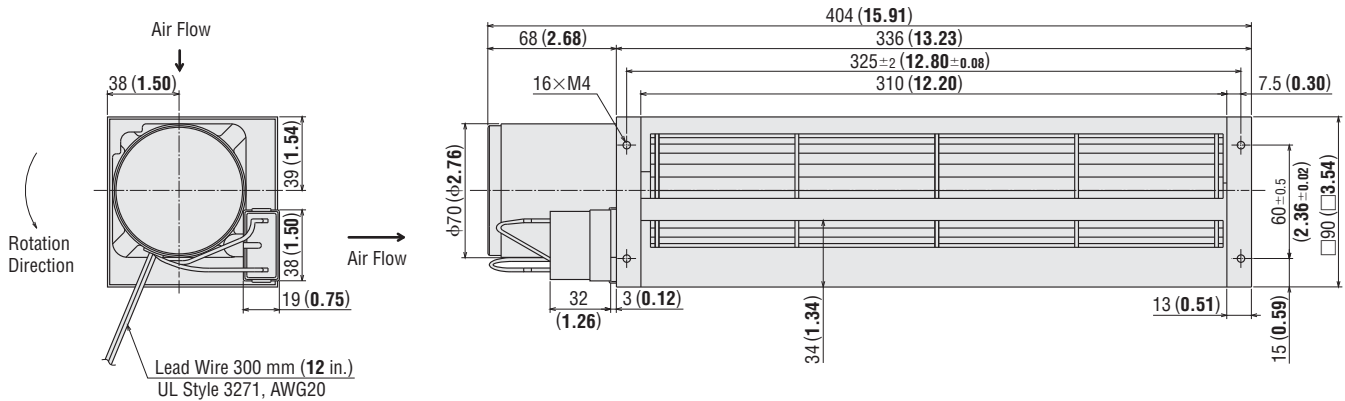


Dimensions Unit = mm (in.)

MF930-BC, MF930-DC

Mass: 1.9 kg (4.2 lb.)

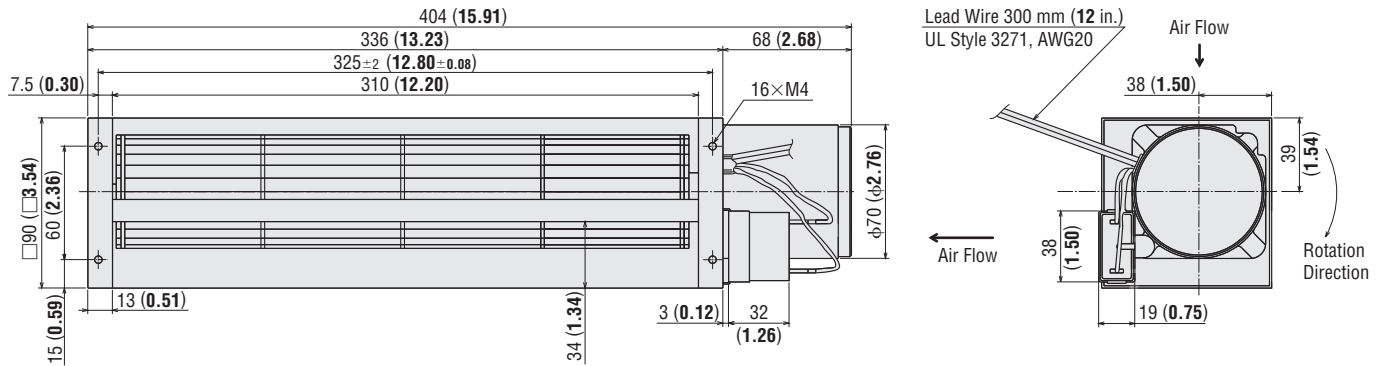
DXF E034



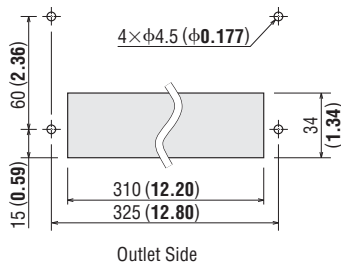
MF930B-BC, MF930B-DC

Mass: 1.9 kg (4.2 lb.)

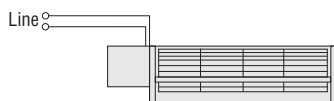
DXF E035



Panel Cut-Out Unit = mm (in.)



Connection Diagram



Accessories

The following product is RoHS-Compliant.

Details → Page E-137

Product	Model	Safety Standards	Page
Finger Guard	FG930D	Conformed component	E-145

Thermostats

A thermostat makes it possible for fans to operate only when cooling is necessary, thereby conserving energy.



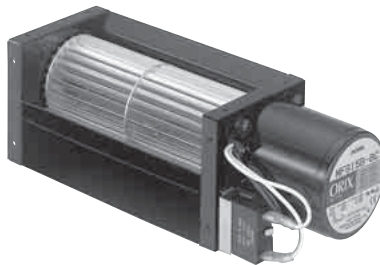
RoHS

Thermostats **AM1-WA1/AM1-XA1**

●Page → E-133

AC Cross Flow Fans MF Series

Impeller Length 150 mm (5.91 in.)



Ambient Temperature: $-10\sim+60^{\circ}\text{C}$ ($+14\sim+140^{\circ}\text{F}$)
 Operating Voltage Range: $\pm 10\%$
 Materials
 Motor Case: Die Cast Aluminum
 Casing: Steel
 Impeller: Aluminum
 Overheat Protection: Built-in Thermal Protector
 Bearings: Ball Bearings

Specifications RoHS



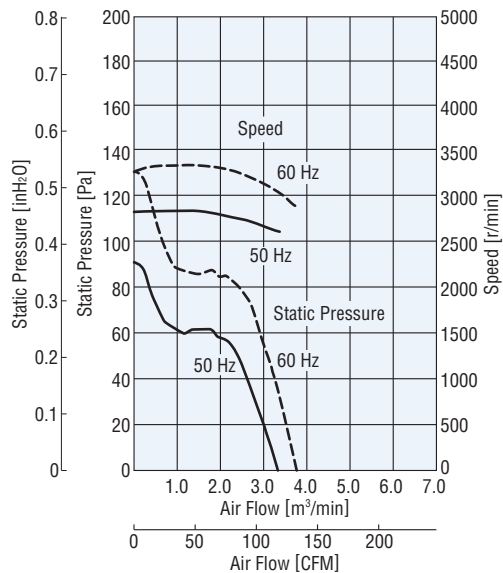
Model	Voltage VAC	Frequency Hz	Current A	Input W	Speed r/min	Max. Air Flow		Max. Static Pressure		Noise Level dB (A)
						m ³ /min	CFM	Pa	inHzO	
MF915-BC MF915B-BC	Single-Phase 100	50	0.35	30	2650	3.4	120	88	0.353	60
	Single-Phase 100	60	0.45	40	2950	3.7	131	127	0.509	63
	Single-Phase 110	60	0.45	42	3200	4.0	141	132	0.529	64
	Single-Phase 115	60	0.45	43	3250	4.1	145	132	0.529	64
MF915-DC MF915B-DC	Single-Phase 200	50	0.20	30	2650	3.4	120	88	0.353	60
	Single-Phase 200	60	0.25	40	2950	3.7	131	127	0.509	63
	Single-Phase 220	60	0.25	42	3200	4.0	141	132	0.529	64
	Single-Phase 230	50	0.20	33	2800	3.6	127	92	0.369	61
	Single-Phase 230	60	0.25	43	3250	4.1	145	132	0.529	64

● How to read specifications → Page E-19 ● Details of safety standards → Page G-2 ● Details of RoHS Directive → Page G-38

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 Fan, Operating Manual

Air Flow – Static Pressure Characteristics

● How to read air flow – static pressure characteristics → Page E-20

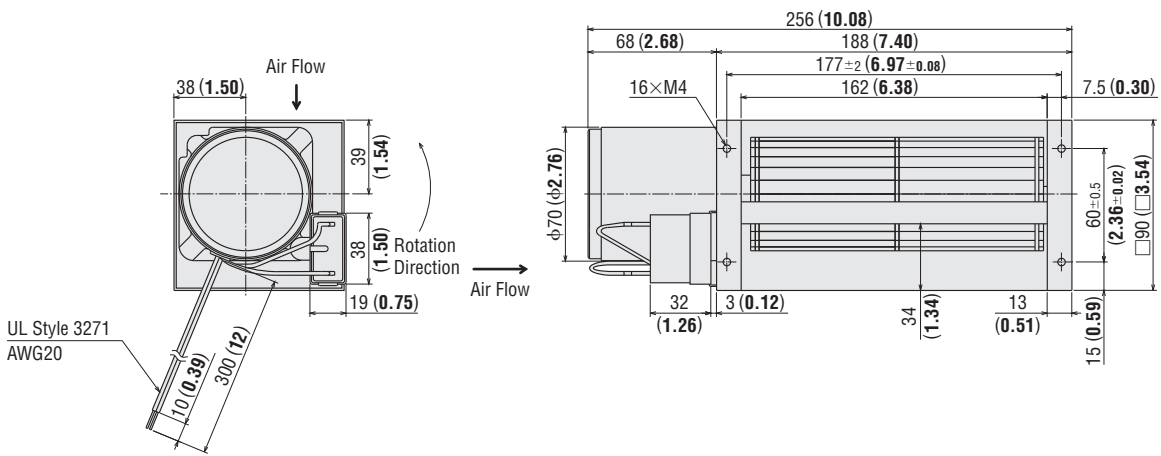


Dimensions Unit = mm (in.)

MF915-BC, MF915-DC

Mass: 1.7 kg (3.7 lb.)

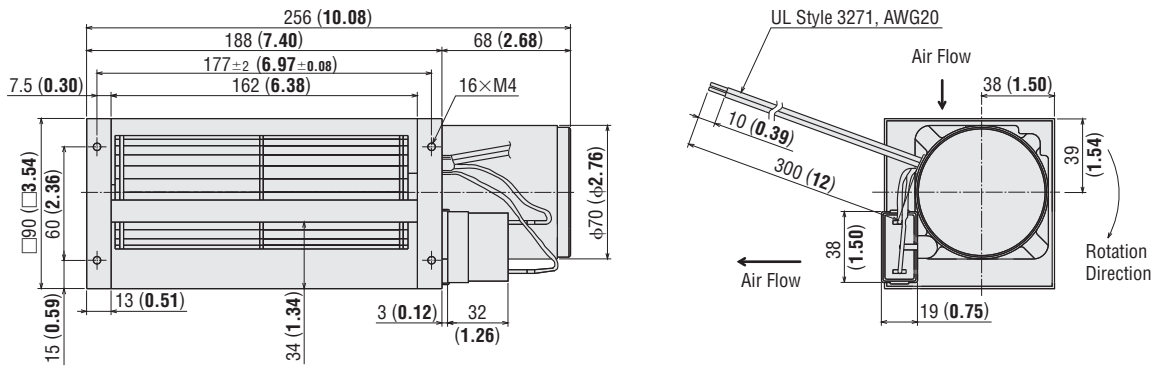
DXF E036



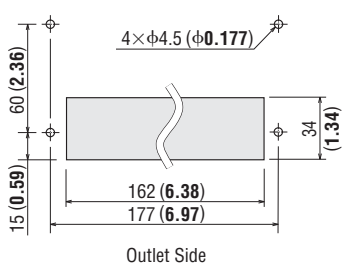
MF915B-BC, MF915B-DC

Mass: 1.7 kg (3.7 lb.)

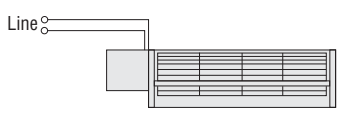
DXF E037



Panel Cut-Out Unit = mm (in.)



Connection Diagram



Accessories

The following product is RoHS-Compliant.
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Product	Model	Safety Standards	Page
Finger Guard	FG915D	Conformed component	E-145

Thermostats

A thermostat makes it possible for fans to operate only when cooling is necessary, thereby conserving energy.



RoHS

Thermostats **AM1-WA1/AM1-XA1**

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Introduction	FM	AC Input MRS	AC Input Variable Flow MRS	AC Input MU	DC Input Long-Life MDE	DC Input MDS/MD	AC Input MB	DC Input MBD	AC Input MF	DC Input MFD	Thermostats	Accessories	Installation
	Cooling Module			Axial Flow Fans			Centrifugal Blowers		Cross Flow Fans				

DC Cross Flow Fans MFD Series

Impeller Length 300 mm (11.81 in.)



Ambient Temperature: $-10\sim+60^{\circ}\text{C}$ ($+14\sim+140^{\circ}\text{F}$)
 Operating Voltage Range: $\pm 10\%$
 Materials
 Motor Case: Die Cast Aluminum
 Casing: Steel
 Impeller: Aluminum
 Overheat Protection: Built-in Overheat Protection
 Circuit
 Bearings: Ball Bearings

Specifications RoHS

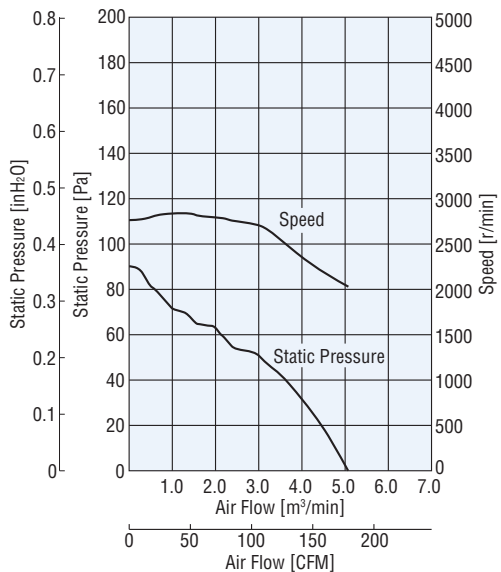
Model	Voltage VDC	Current A	Speed r/min	Max. Air Flow		Max. Static Pressure		Noise Level dB (A)
				m ³ /min	CFM	Pa	inH ₂ O	
Low-Speed Alarm, Contact Alarm Type (Alarm specifications: ㉚)	24	1.0	2100	5.2	184	83	0.333	60
Pulse Sensor Type (Alarm specifications: ㉛)	48	0.7	2100	5.2	184	83	0.333	60
Standard Type	24	1.0	2100	5.2	184	83	0.333	60
	48	0.7	2100	5.2	184	83	0.333	60

● How to read specifications → Page E-19 ● Alarm specifications ㉚, ㉛ → Page E-21 ● Details of RoHS Directive → Page G-38

The following items are included in each product.
 Fan, Operating Manual

Air Flow – Static Pressure Characteristics

● How to read air flow – static pressure characteristics → Page E-20

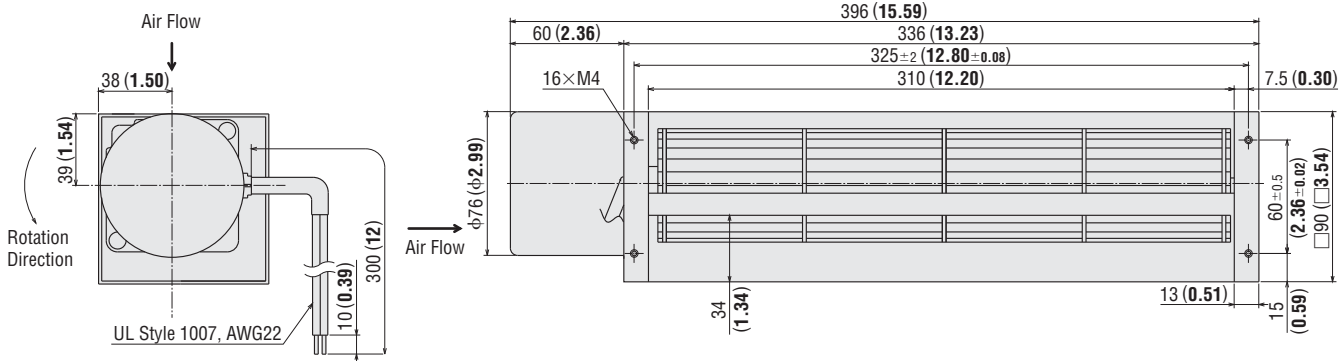


Dimensions Unit = mm (in.)

MFD930

Mass: 1.6 kg (3.5 lb.)

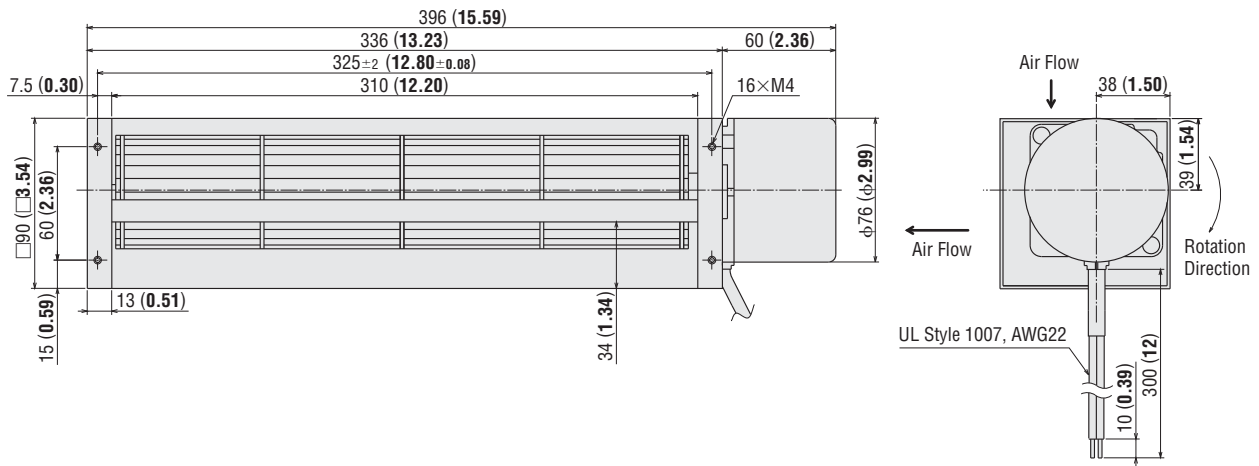
DXF E038



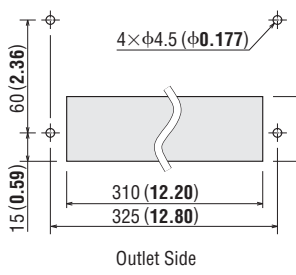
MFD930B

Mass: 1.6 kg (3.5 lb.)

DXF E039



Panel Cut-Out Unit = mm (in.)



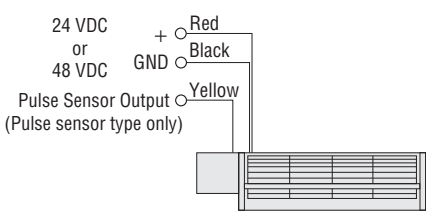
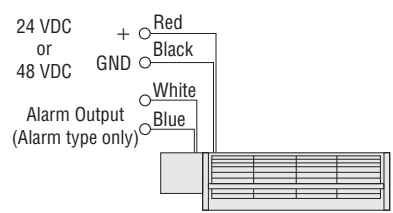
Accessories

The following product is RoHS-Compliant.

Details → Page E-137

Product	Model	Safety Standards	Page
Finger Guard	FG930D	Conformed component	E-145

Connection Diagrams



- Introduction
- Cooling Module
 - FM
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 - AC Input Variable Flow MRS
 - AC Input MU
 - DC Input Long-Life MDE
 - DC Input MDS/MD
- Axial Flow Fans
 - AC Input MB
 - DC Input MBD
- Centrifugal Blowers
 - AC Input MF
 - DC Input MFD
- Cross Flow Fans
 - Thermostats
 - Accessories
 - Installation

DC Cross Flow Fans MFD Series

Impeller Length 150 mm (5.91 in.)



Ambient Temperature: $-10\sim+60^{\circ}\text{C}$ ($+14\sim+140^{\circ}\text{F}$)
 Operating Voltage Range: $\pm 10\%$
 Materials
 Motor Case: Die Cast Aluminum
 Casing: Steel
 Impeller: Aluminum
 Overheat Protection: Built-in Overheat Protection
 Circuit
 Bearings: Ball Bearings

Specifications RoHS

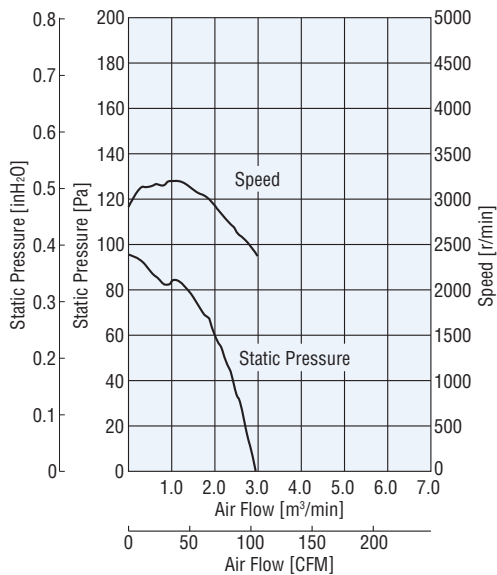
Model	Voltage VDC	Current A	Speed r/min	Max. Air Flow		Max. Static Pressure		Noise Level dB (A)
				m ³ /min	CFM	Pa	inH ₂ O	
Low-Speed Alarm, Contact Alarm Type (Alarm specifications: ㉚)	24	1.0	2500	3.0	106	98	0.393	60
Pulse Sensor Type (Alarm specifications: ㉛)	48	0.7	2500	3.0	106	98	0.393	60
Standard Type	24	1.0	2500	3.0	106	98	0.393	60
	48	0.7	2500	3.0	106	98	0.393	60

● How to read specifications → Page E-19 ● Alarm specifications ㉚, ㉛ → Page E-21 ● Details of RoHS Directive → Page G-38

The following items are included in each product.
 Fan, Operating Manual

Air Flow – Static Pressure Characteristics

● How to read air flow – static pressure characteristics → Page E-20

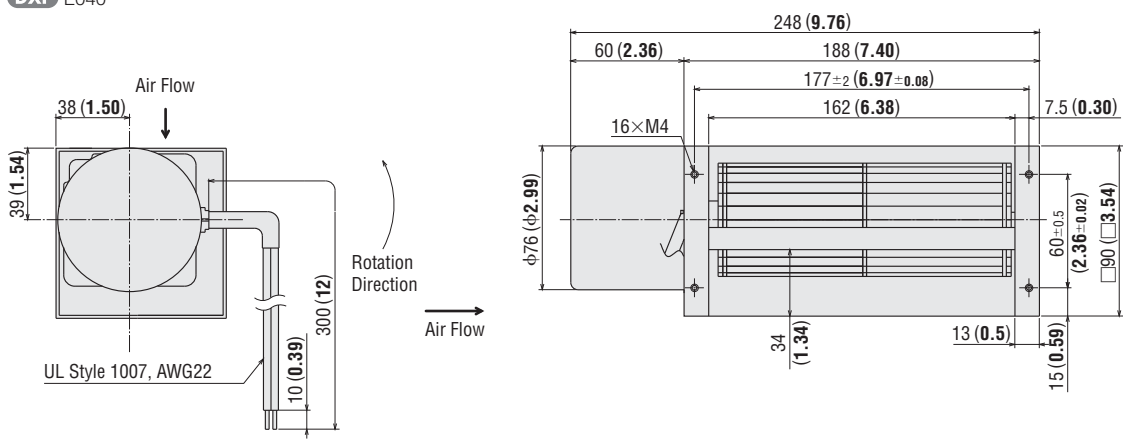


Dimensions Unit = mm (in.)

MFD915

Mass: 1.4 kg (3.1 lb.)

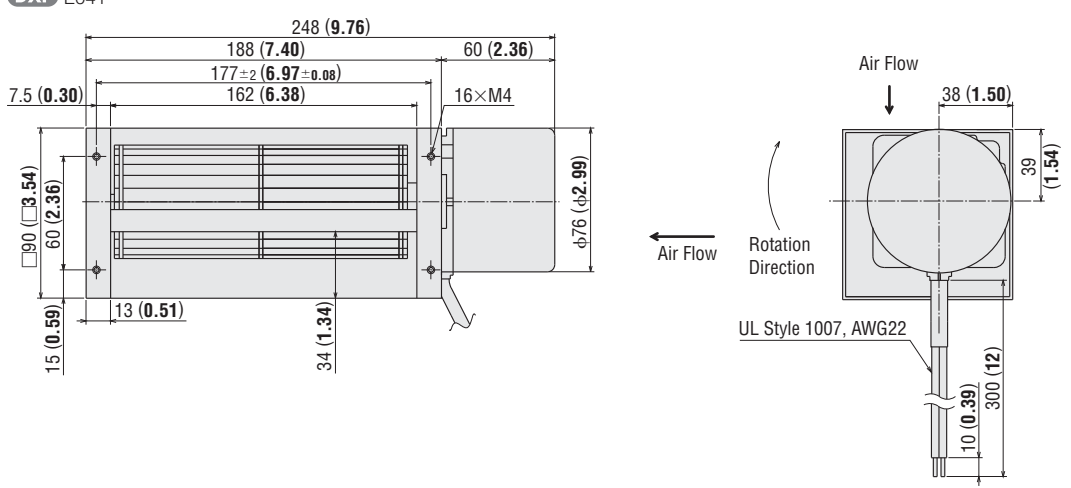
DXF E040



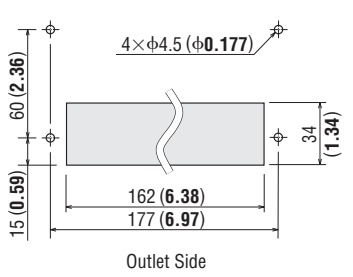
MFD915B

Mass: 1.4 kg (3.1 lb.)

DXF E041



Panel Cut-Out Unit = mm (in.)



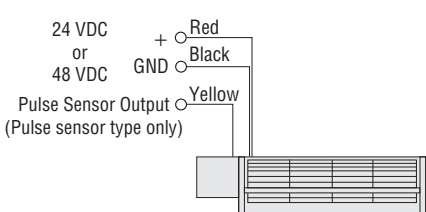
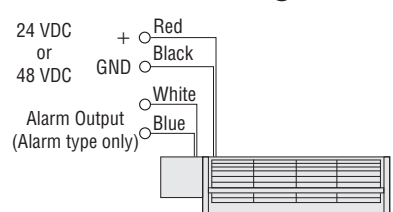
Accessories

The following product is RoHS-Compliant.

Details → Page E-137

Product	Model	Safety Standards	Page
Finger Guard	FG915D	Conformed component	E-145

Connection Diagrams



Introduction	FM	AC Input MRS	AC Input Variable Flow MRS	AC Input MU	DC Input Long-Life MDE	DC Input MDS/MD	AC Input MB	DC Input MBD	AC Input MF	DC Input MFD	Thermostats	Accessories	Installation
	Cooling Module			Axial Flow Fans			Centrifugal Blowers		Cross Flow Fans				

