AC Axial-flow Fans
R87F/R87T

Optimum Cooling with a Comprehensive Lineup of Axial-flow Fans

- Low noise level, long service life, and resistance to the environment.
- Shaft supported by ball bearings for highly-reliable operation.
- Plastic-bladed models (48 type) and metal-bladed models (24 type) included in series.
- R87F-A□A16H-WR Water-resistant AC Axial-flow Fans (IP65 degree of protection) added to series.
- A wide range of models with CSA, VDE, and EN/IEC approval also available.

Model Number Structure

■ Model Number Legend

R87□-□□ □□□□□□-□

1 2 3 4 5 6 7 8

1. Basic series

R87F: Plastic blade
R87T: Metal blade

2. Rated voltage

A1: 100 VAC
A3: 115 VAC
A4: 200 VAC
A6: 230 VAC

3. Frame material

A: Die-cast aluminum

4. Frame size

0: 150 dia.
1: 120×120
9: 92×92
8: 80×80

5. Frame thickness

3: 25
5: 38
6: 40
7: 55

6. Rotational speed

H: High
M: Medium
L: Low

7. Terminal type

No marking: Lead wires
P: Terminals (See note 1.)

8. Type

No marking: Standard
WR: Water-resistant

Note: 1. A Plug Cord (R87F-PC) is available as an option for models with terminals.

2. These tables show only how to read product markings. They do not indicate which products are available. Refer to product ratings when ordering.

Ordering Information

■ Available Models

AC Axial-flow Fans

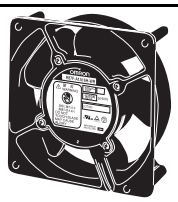
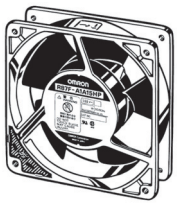
Series	Size (mm)	Model	Page number
R87F (plastic blades)	120×120×t40	R87F-A□A16H-WR	Refer to page 4.
	120×120×t38	R87F-A□A15	Refer to page 7.
	120×120×t25	R87F-A□A13	Refer to page 9.
	92×92×t25	R87F-A□A93	Refer to page 11.
	80×80×t38	R87F-A□A85	Refer to page 13.
	80×80×t25	R87F-A□A83	Refer to page 15.
R87T (metal blades)	150-dia.×t55	R87T-A□A07	Refer to page 17.
	150-dia.×t38	R87T-A□A05	Refer to page 19.
	120×120×t38	R87T-A□A15	Refer to page 21.
	80×80×t38	R87T-A□A85	Refer to page 23.
	80×80×t25	R87T-A□A83	Refer to page 25.

Note: Mounting screws are not provided.

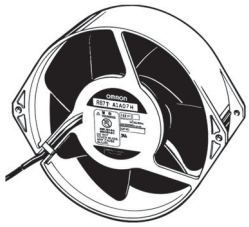
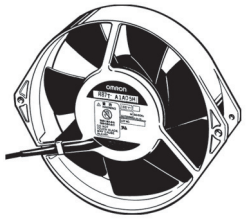
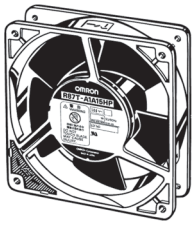
Options

Product name	Model	Page number
Plug Cord	R87F-PC	Refer to page 27.
Finger Guard	R87F-FG□	Refer to page 27.
Filter	R87F-FL□(S)	Refer to page 28.

■ AC Axial-flow Fan Series

Series	Size (mm)	Model	Rated voltage	Speed	Safety standards				Electrical connection	Page number
					UL	CSA	EN/IEC			
							VDE	TÜV		
R87F (plastic blades)	 120 × 120 × 40	R87F-A1A16H-WR	100 VAC	High	Yes	Yes	---	Yes	Lead wires	Refer to page 4.
		R87F-A3A16H-WR	115 VAC		Yes	Yes	---	Yes		
		R87F-A4A16H-WR	200 VAC		Yes	Yes	---	Yes		
		R87F-A6A16H-WR	230 VAC		Yes	Yes	---	Yes		
	 120 × 120 × 38	R87F-A1A15HP	100 VAC	High	Yes	Yes	---	Yes	Tab terminals	Refer to page 7.
		R87F-A3A15HP	115 VAC		Yes	Yes	Yes	Yes		
		R87F-A4A15HP	200 VAC		Yes	Yes	---	Yes		
		R87F-A6A15HP	230 VAC		Yes	Yes	Yes	Yes		
		R87F-A1A15MP	100 VAC	Medium	Yes	Yes	---	---		
		R87F-A3A15MP	115 VAC		Yes	Yes	Yes	---		
		R87F-A4A15MP	200 VAC		Yes	Yes	---	---		
		R87F-A6A15MP	230 VAC		Yes	Yes	Yes	---		
		R87F-A1A15LP	100 VAC	Low	Yes	Yes	---	---		
		R87F-A3A15LP	115 VAC		Yes	Yes	Yes	---		
		R87F-A4A15LP	200 VAC		Yes	Yes	---	---		
		R87F-A6A15LP	230 VAC		Yes	Yes	Yes	---		
	 120 × 120 × 25	R87F-A1A13HP	100 VAC	High	Yes	Yes	---	Yes		Refer to page 9.
		R87F-A3A13HP	115 VAC		Yes	Yes	Yes	Yes		
		R87F-A4A13HP	200 VAC		Yes	Yes	---	Yes		
		R87F-A6A13HP	230 VAC		Yes	Yes	Yes	Yes		
		R87F-A1A13LP	100 VAC	Low	Yes	Yes	---	---		
		R87F-A3A13LP	115 VAC		Yes	Yes	Yes	---		
		R87F-A4A13LP	200 VAC		Yes	Yes	---	---		
		R87F-A6A13LP	230 VAC		Yes	Yes	Yes	---		
	 92 × 92 × 25	R87F-A1A93HP	100 VAC	High	Yes	Yes	---	---		Refer to page 11.
		R87F-A3A93HP	115 VAC		Yes	Yes	Yes	---		
		R87F-A4A93HP	200 VAC		Yes	Yes	---	---		
		R87F-A6A93HP	230 VAC		Yes	Yes	Yes	---		
		R87F-A1A93LP	100 VAC	Low	Yes	Yes	---	---		
		R87F-A3A93LP	115 VAC		Yes	Yes	Yes	---		
		R87F-A4A93LP	200 VAC		Yes	Yes	---	---		
		R87F-A6A93LP	230 VAC		Yes	Yes	Yes	---		
	 80 × 80 × 38	R87F-A1A85HP	100 VAC	High	Yes	Yes	---	---		Refer to page 13.
		R87F-A3A85HP	115 VAC		Yes	Yes	Yes	---		
		R87F-A4A85HP	200 VAC		Yes	Yes	---	---		
		R87F-A6A85HP	230 VAC		Yes	Yes	Yes	---		
		R87F-A1A85LP	100 VAC	Low	Yes	Yes	---	---		
		R87F-A3A85LP	115 VAC		Yes	Yes	Yes	---		
		R87F-A4A85LP	200 VAC		Yes	Yes	---	---		
		R87F-A6A85LP	230 VAC		Yes	Yes	Yes	---		
	 80 × 80 × 25	R87F-A1A83H	100 VAC	High	Yes	Yes	---	---	Lead wires	Refer to page 15.
		R87F-A3A83H	115 VAC		Yes	Yes	Yes	---		
		R87F-A4A83H	200 VAC		Yes	Yes	---	---		
		R87F-A6A83H	230 VAC		Yes	Yes	Yes	---		
		R87F-A1A83L	100 VAC	Low	Yes	Yes	---	---		
		R87F-A3A83L	115 VAC		Yes	Yes	Yes	---		
		R87F-A4A83L	200 VAC		Yes	Yes	---	---		
		R87F-A6A83L	230 VAC		Yes	Yes	Yes	---		

Note: The products approved by standard organizations satisfied the following tests.
UL approval number: UL507 (UL519, UL547)
CSA approval number: C22.2 (No. 0, No. 113)
VDE approval number: DIN/EN60950 (VDE0805), EN60950, IEC950
TÜV approval number: VDE0700 Teil 1, VDE0700 Teil 234, EN60355-1, IEC335-1

Series	Size (mm)	Model	Rated voltage	Speed	Safety standards				Electrical connection	Page number
					UL	CSA	EN/IEC			
							VDE	TÜV		
R87T (metal blades)	 150 dia. × t55	R87T-A1A07H	100 VAC	High	Yes	---	---	Yes	Lead wires	Refer to page 17.
		R87T-A3A07H	115 VAC		Yes	---	---	Yes		
		R87T-A4A07H	200 VAC		Yes	---	---	Yes		
		R87T-A6A07H	230 VAC		Yes	---	---	Yes		
	 150 dia. × t38	R87T-A1A05H	100 VAC		Yes	---	---	Yes		Refer to page 19.
		R87T-A3A05H	115 VAC		Yes	---	---	Yes		
		R87T-A4A05H	200 VAC		Yes	---	---	Yes		
		R87T-A6A05H	230 VAC		Yes	---	---	Yes		
	 120 × 120 × 38	R87T-A1A15HP	100 VAC	High	Yes	---	---	Yes	Tab terminals	Refer to page 21.
		R87T-A3A15HP	115 VAC		Yes	---	---	Yes		
		R87T-A4A15HP	200 VAC		Yes	---	---	Yes		
		R87T-A6A15HP	230 VAC		Yes	---	---	Yes		
		R87T-A1A15MP	100 VAC	Medium	Yes	---	---	---		
		R87T-A3A15MP	115 VAC		Yes	---	---	---		
		R87T-A4A15MP	200 VAC		Yes	---	---	---		
		R87T-A6A15MP	230 VAC		Yes	---	---	---		
	 80 × 80 × 38	R87T-A1A85H	100 VAC	High	Yes	---	---	---	Lead wires	Refer to page 23.
		R87T-A3A85H	115 VAC		Yes	---	---	Yes		
		R87T-A4A85H	200 VAC		Yes	---	---	---		
		R87T-A6A85H	230 VAC		Yes	---	---	Yes		
	 80 × 80 × 25	R87T-A1A83H	100 VAC		Yes	---	---	---		Refer to page 25.
		R87T-A3A83H	115 VAC		Yes	---	---	---		
		R87T-A4A83H	200 VAC		Yes	---	---	---		
		R87T-A6A83H	230 VAC		Yes	---	---	---		
Plug Cord		R87F-PC	---	---	Yes	Con-forms	---	---	---	Refer to page 27.
Finger Guard		R87F-FG□	---	---	---	---	---	---	---	Refer to page 27.
Filter		R87F-FL□	---	---	---	---	---	---	---	Refer to page 28.
		R87F-FL□S			---	---	---	---	---	

Note: The products approved by standard organizations satisfied the following tests.
UL approval number: UL507 (UL519, UL547)
CSA approval number: C22.2 (No. 0, No. 113)
VDE approval number: DIN/EN60950 (VDE0805), EN60950, IEC950
TÜV approval number: VDE0700 Teil 1, VDE0700 Teil 234, EN60355-1, IEC335-1

Water-resistant AC Axial-flow Fans

R87F-A□A16H-WR

Axial-flow Fans Designed for Environments Subject to High Humidity

- Size: 120 × 120 × t40 mm, with lead wires.
- Degree of protection: IP65 (sealed construction)
- Airtight construction in a slim design (40-mm depth).
- Highly environment-resistive, flame-resistant PBT used for blade material.
- Low noise level, long service life, and resistance to environment.
- Highly reliable ball bearings used for bearings.
- Range of models that comply with the Electrical Appliance and Material Safety Law and IEC60335. UL and CSA approval also available.

NEW

International Protection (IP)

These fans comply with IP65 degree of protection (for internal parts), demonstrating outstanding strength under high humidity.

- Labyrinthine construction provides protection against dust and water entering between the blades and motor casing.
- Silicon rubber used to seal the section where lead wires exit the motor protects against dust and water entering the motor.
- Fan motor is hermetically sealed by an O-ring, preventing dust and water from entering the motor.

Ideal for Harsh Environments

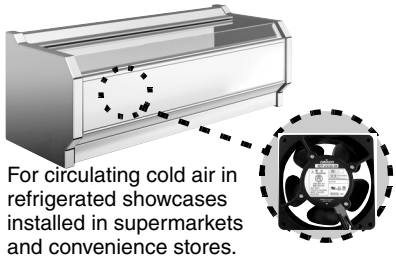
IP Degree of Protection (International Protection)

Degree of protection against international of foreign objects in fan motor: IP65

First digit of IP Code: Protection against International of Solids		Second digit of IP Code: Protection against International of Liquids	
Class	Degree of protection	Class	Degree of protection
6	Totally protected from dust.	5	Protected from low pressure jets of water from all directions.

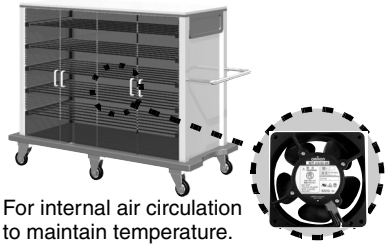
Applications (Ideal for High-temperature Environments and Outdoor Installation)

Refrigerated Showcases



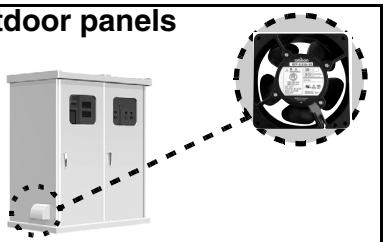
For circulating cold air in refrigerated showcases installed in supermarkets and convenience stores.

Meal-serving Trolleys



For internal air circulation to maintain temperature.

Outdoor panels



As an inlet or exhaust fan in various control panels installed outdoors.

Note: Other applications include discharging air in outdoor devices (small-size outdoor devices), and cooling internal components of machine tools and switchboards in industrial devices.

Specifications

■ Ratings

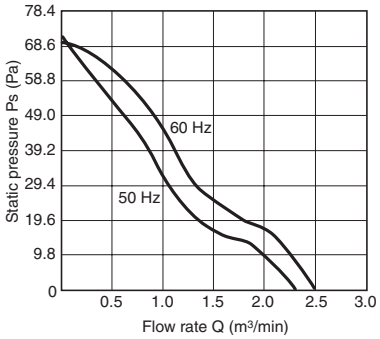
Note: *indicates a nominal value.

Model	Rated voltage (V)	Permitted voltage fluctuation range (%)	Frequency (Hz)	Rated current (A)*		Rated input (W)*		Rated rotational speed (r/min)*		Maximum flow rate (m^3/min)*		Max. static pressure (Pa)*		Noise (dB)*	
				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
R87F-A1A16H-WR	100	85 to 110% rated voltage	50/60	0.217	0.197	16	15	2690	3040	2.3	2.5	70.9	69.6	43	46
R87F-A3A16H-WR	115			0.194	0.175										
R87F-A4A16H-WR	200			0.109	0.098										
R87F-A6A16H-WR	230			0.098	0.088										

■ Characteristics

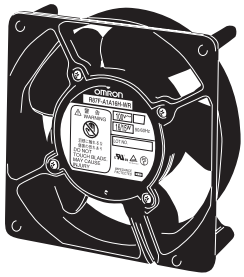
Motor type	Single-phase, shading coil induction motor (2-pole, sealed type)	**Ambient operating temperature**		-30 to 70°C (no icing)
		Ambient storage temperature		-40 to 85°C (no icing)
Size	120 × 120 × t40 mm	**Ambient humidity**		98% RH max.
Lead terminal	Lead-wire type	**Protection**		Impedance protection
Insulation class	IEC class E (120°C) UL class A (105°C) CSA class A (105°C)	**Materials**	**Frame**	Die-cast aluminum Melamine resin, mat black baked coating
			Blades	PBT/glass, black (UL94V-0)
Insulation resistance	100 MΩ min. (at 500 VDC) between all power supply connections and uncharged metal parts.	**Bearings**		Ball bearings
Insulation withstand voltage	2000 VAC (1 minute) between all power supply connections and uncharged metal parts.	**Weight**		650 g max.
Degree of protection	IP65 (conforming to EN/IEC60529)	**Standards**		Conforms to Electrical Appliance and Material Safety Law, UL/CSA, and IEC60335

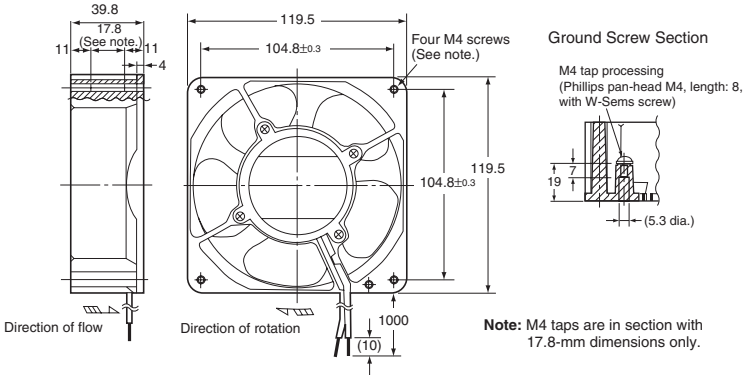
■ Flow Rate and Static Pressure Characteristics (Reference Values)



Note: For details on measurement conditions, refer to "Flow Rate and Static Pressure" on page 31.

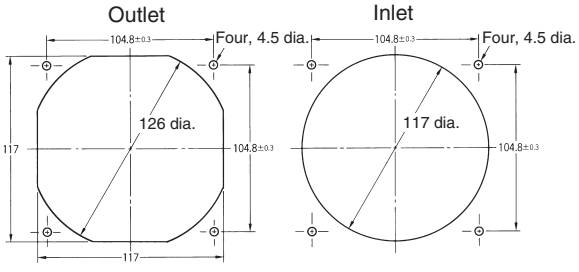
Dimensions





Note: M4 taps are in section with 17.8-mm dimensions only.

Panel Cut-outs



Options

Name	Model	Page number
Finger Guard	R87F-FG120	Refer to page 27.
Filter	R87F-FL120(S)	Refer to page 28.

AC Axial-flow Fans with Terminals (120 x 120 x t38 mm)
R87F-A□A15

Specifications

■ Ratings

Note: *indicates a nominal value.

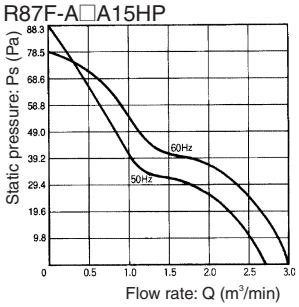
Model	Rated voltage (V)	Permitted voltage fluctuation range (%)	Frequency (Hz)	Rated current (A)*		Rated input (W)*		Rated rotational speed (r/min)*		Maximum flow rate (m^3/min)*		Max. static pressure (Pa)*		Noise (dB)*	
				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
R87F-A1A15HP R87F-A3A15HP R87F-A4A15HP R87F-A6A15HP	100 115 200 230	85 to 110% rated voltage	50/60	0.232 0.195 0.105 0.095	0.210 0.180 0.098 0.090	16	15	2700	3000	2.7	3.0	88.3	78.5	47	50
R87F-A1A15MP R87F-A3A15MP R87F-A4A15MP R87F-A6A15MP	100 115 200 230	85 to 110% rated voltage	50/60	0.220 0.185 0.100 0.090	0.195 0.165 0.090 0.082	15	14	2350	2550	2.3	2.6	61.8	63.7	42	44
R87F-A1A15LP R87F-A3A15LP R87F-A4A15LP R87F-A6A15LP	100 115 200 230	85 to 110% rated voltage	50/60	0.175 0.155 0.085 0.076	0.155 0.138 0.075 0.068	13	12	2000	2100	1.9	2.0	39.2	39.2	38	41

■ Characteristics

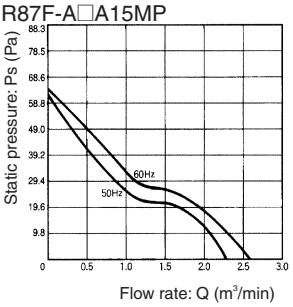
Ambient operating temperature	-30 to 70°C (no icing)
Ambient storage temperature	-40 to 85°C (no icing)
Ambient humidity	25 to 85% RH
Insulation class	VDE class E (120°C) UL class A (105°C) CSA class B (130°C)
Insulation resistance	100 MΩ min. (at 500 VDC) between all power supply connections and uncharged metal parts.
Insulation withstand voltage	2000 VAC (1 minute) between all power supply connections and uncharged metal parts.
Protection	Impedance protection
Materials	Frame: Die-cast aluminum Blades: Glass polycarbonate
Bearings	Ball bearings
Weight	550 g

■ Flow Rate and Static Pressure Characteristics (Reference Values)

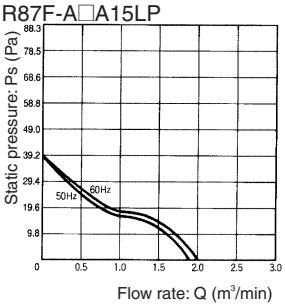
R87F-A□A15HP



R87F-A□A15MP

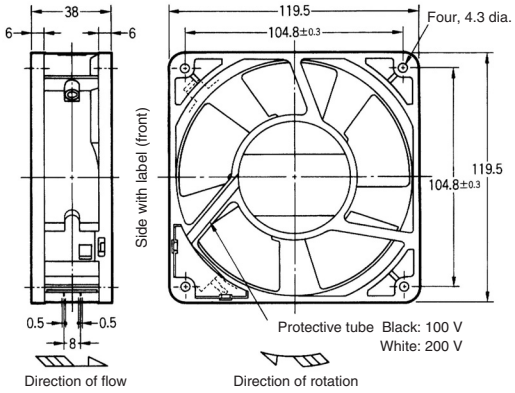


R87F-A□A15LP



Note: For details on measurement conditions, refer to “Flow Rate and Static Pressure” on page 31.

Dimensions



Screw hole for grounding

M4 screw: 0.7 pitch

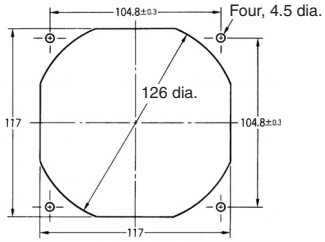
Terminal shape

Faston #110 terminals (or equivalent)

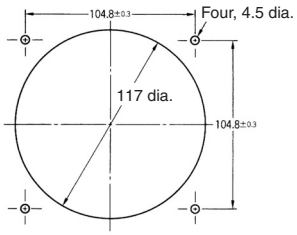
Panel Cut-outs

For reference purposes.

Outlet



Inlet



Options

Name	Model	Page number
Plug Cord	R87F-PC	Refer to page 27.
Finger Guard	R87F-FG120	Refer to page 27.
Filter	R87F-FL120(S)	Refer to page 28.

AC Axial-flow Fans with Terminals (120 x 120 x t25 mm)
R87F-A□A13

Specifications

■ Ratings

Note: * indicates a nominal value.

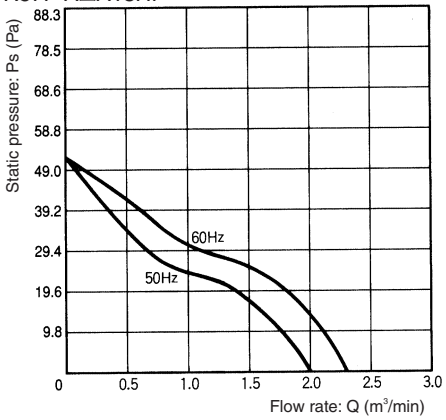
Model	Rated voltage (V)	Permitted voltage fluctuation range (%)	Frequency (Hz)	Rated current (A)*		Rated input (W)*		Rated rotational speed (r/min)*		Maximum flow rate (m^3/min)*		Max. static pressure (Pa)*		Noise (dB)*	
				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
R87F-A1A13HP R87F-A3A13HP R87F-A4A13HP R87F-A6A13HP	100 115 200 230	85 to 110% rated voltage	50/60	0.170 0.148 0.085 0.074	0.145 0.125 0.072 0.063	14	12	2500	2850	2.0	2.3	52.0	52.0	40	44
R87F-A1A13LP R87F-A3A13LP R87F-A4A13LP R87F-A6A13LP	100 115 200 230	85 to 110% rated voltage	50/60	0.110 0.096 0.058 0.051	0.096 0.084 0.050 0.043	9	8	1800	2000	1.5	1.7	25.5	25.5	30	33

■ Characteristics

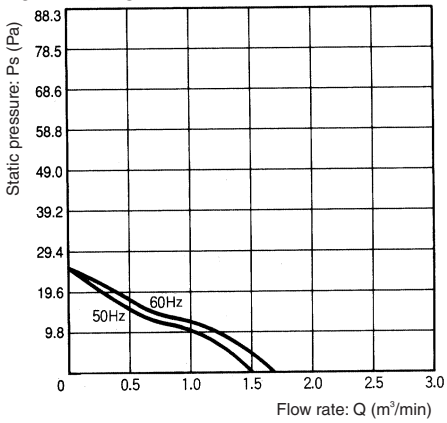
Ambient operating temperature	–30 to 70°C (no icing)
Ambient storage temperature	–40 to 85°C (no icing)
Ambient humidity	25 to 85% RH
Insulation class	VDE class E (120°C) UL class A (105°C) CSA class B (130°C)
Insulation resistance	100 MΩ min. (at 500 VDC) between all power supply connections and uncharged metal parts.
Insulation withstand voltage	2000 VAC (1 minute) between all power supply connections and uncharged metal parts.
Protection	Impedance protection
Materials	Frame: Die-cast aluminum Blades: Glass polycarbonate
Bearings	Ball bearings
Weight	330 g

■ Flow Rate and Static Pressure Characteristics (Reference Values)

R87F-A□A13HP

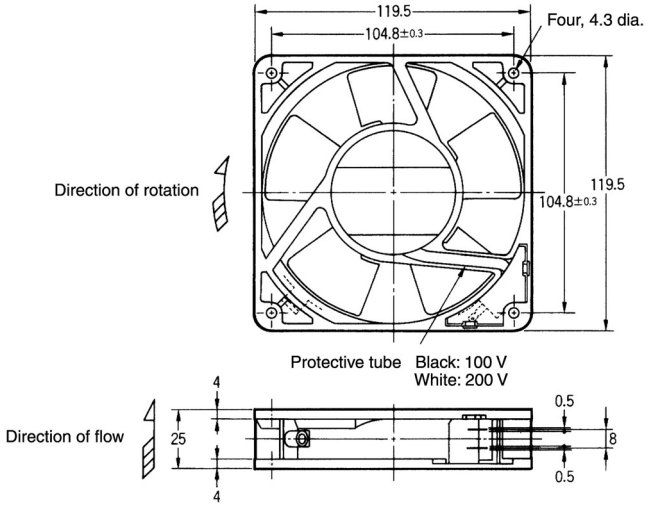


R87F-A□A13LP



Note: For details on measurement conditions, refer to “Flow Rate and Static Pressure” on page 31.

Dimensions



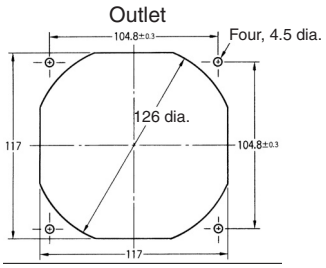
Screw hole for grounding

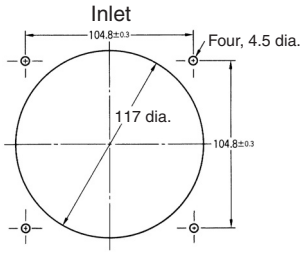
Terminal shape

Faston #110 terminal (or equivalent)

Panel Cut-outs

For reference purposes.





Options

Name	Model	Page number
Plug Cord	R87F-PC	Refer to page 27.
Finger Guard	R87F-FG120	Refer to page 27.
Filter	R87F-FL120(S)	Refer to page 28.

AC Axial-flow Fans with Terminals (92 x 92 x t25 mm)
R87F-A□A93

Specifications

■ Ratings

Note: * indicates a nominal value.

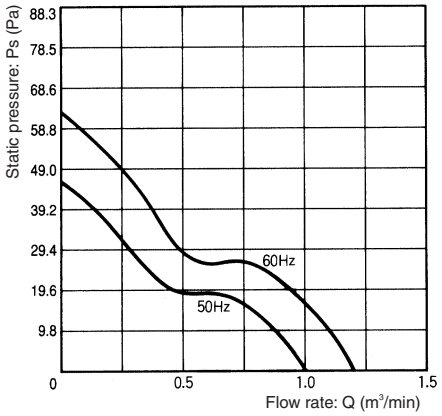
Model	Rated voltage (V)	Permitted voltage fluctuation range (%)	Frequency (Hz)	Rated current (A)*		Rated input (W)*		Rated rotational speed (r/min)*		Maximum flow rate (m^3/min)*		Max. static pressure (Pa)*		Noise (dB)*	
				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
R87F-A1A93HP R87F-A3A93HP R87F-A4A93HP R87F-A6A93HP	100 115 200 230	85 to 110% rated voltage	50/60	0.130 0.116 0.061 0.056	0.110 0.098 0.052 0.048	10	9	2600	3050	1.0	1.2	46.1	62.8	34	38
R87F-A1A93LP R87F-A3A93LP R87F-A4A93LP R87F-A6A93LP	100 115 200 230	85 to 110% rated voltage	50/60	0.084 0.075 0.043 0.035	0.073 0.065 0.038 0.032	7	6	2000	2300	0.70	0.85	24.5	31.4	28	31

■ Characteristics

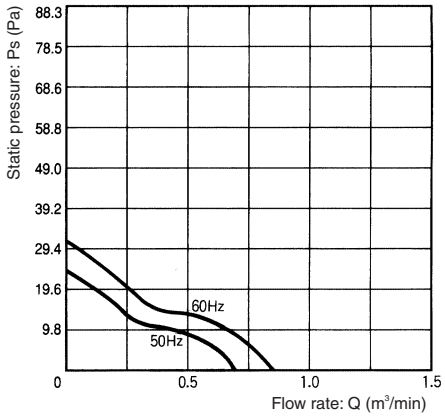
Ambient operating temperature	-30 to 70°C (no icing)
Ambient storage temperature	-40 to 85°C (no icing)
Ambient humidity	25 to 85% RH
Insulation class	VDE class E (120°C) UL class A (105°C) CSA class B (130°C)
Insulation resistance	100 MΩ min. (at 500 VDC) between all power supply connections and uncharged metal parts.
Insulation withstand voltage	2000 VAC (1 minute) between all power supply connections and uncharged metal parts.
Protection	Impedance protection
Materials	Frame: Die-cast aluminum Blades: Glass polycarbonate
Bearings	Ball bearings
Weight	330 g

■ Flow Rate and Static Pressure Characteristics (Reference Values)

R87F-A□A93HP

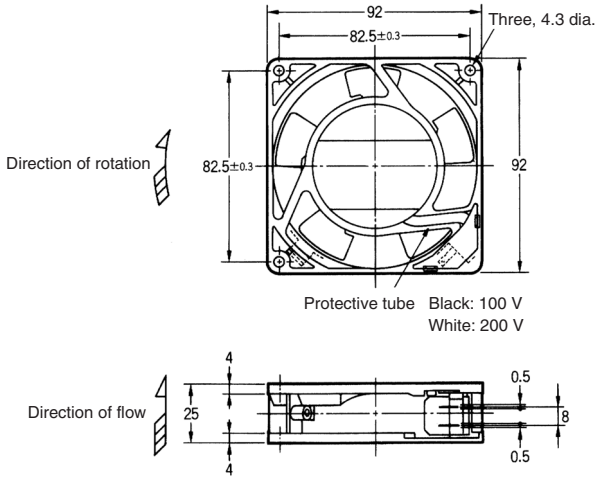


R87F-A□A93LP



Note: For details on measurement conditions, refer to “Flow Rate and Static Pressure” on page 31.

Dimensions



Screw hole for grounding

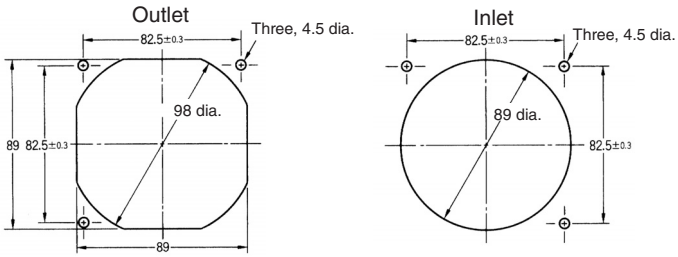
M4 screw: 0.7 pitch

Terminal shape

Faston #110 terminal (or equivalent)

Panel Cut-outs

For reference purposes. Panel cutting reference dimensions (note 3 mounting holes)



Options

Name	Model	Page number
Plug Cord	R87F-PC	Refer to page 27.
Finger Guard	R87F-FG90	Refer to page 27.
Filter	R87F-FL90	Refer to page 28.

AC Axial-flow Fans with Terminals (80 x 80 x t38 mm)
R87F-A□A85

Specifications

■ Ratings

Note: * indicates a nominal value.

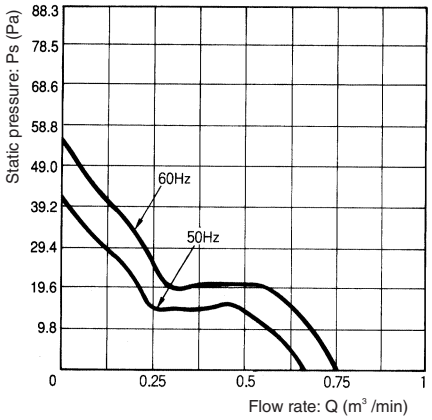
Model	Rated voltage (V)	Permitted voltage fluctuation range (%)	Frequency (Hz)	Rated current (A)*		Rated input (W)*		Rated rotational speed (r/min)*		Maximum flow rate (m^3/min)*		Max. static pressure (Pa)*		Noise (dB)*	
				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
R87F-A1A85HP R87F-A3A85HP R87F-A4A85HP R87F-A6A85HP	100 115 200 230	85 to 110% rated voltage	50/60	0.121 0.106 0.061 0.052	0.111 0.097 0.055 0.049	9	8	2800	3250	0.66	0.76	41.2	54.9	38	43
R87F-A1A85LP R87F-A3A85LP R87F-A4A85LP R87F-A6A85LP	100 115 200 230	85 to 110% rated voltage	50/60	0.064 0.055 0.032 0.028	0.057 0.050 0.029 0.025	5.5	5	2050	2050	0.46	0.46	24.5	25.5	28	30

■ Characteristics

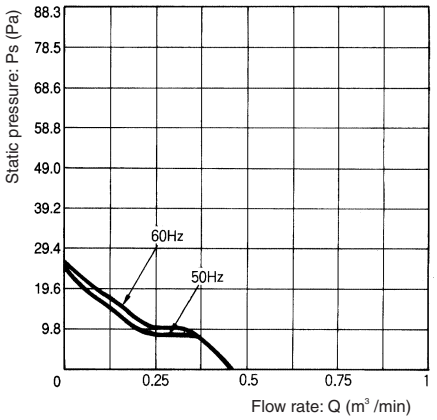
Ambient operating temperature	-30 to 70°C (no icing)
Ambient storage temperature	-40 to 85°C (no icing)
Ambient humidity	25 to 85% RH
Insulation class	VDE class E (120°C) UL class A (105°C) CSA class B (130°C)
Insulation resistance	100 MΩ min. (at 500 VDC) between all power supply connections and uncharged metal parts.
Insulation withstand voltage	2000 VAC (1 minute) between all power supply connections and uncharged metal parts.
Protection	Impedance protection
Materials	Frame: Die-cast aluminum Blades: Glass polycarbonate
Bearings	Ball bearings
Weight	460 g

■ Flow Rate and Static Pressure Characteristics (Reference Values)

R87F-A□A85HP

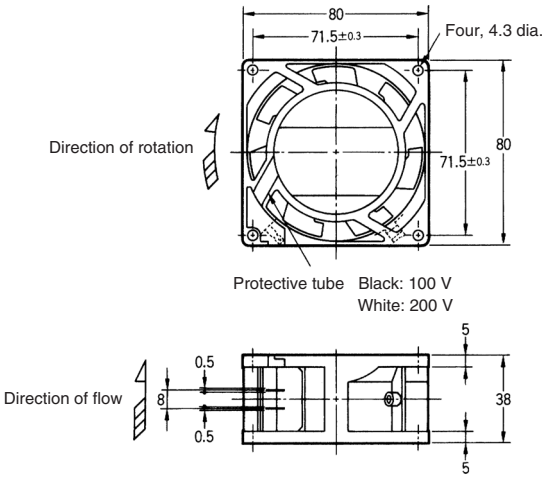


R87F-A□A85LP



Note: For details on measurement conditions, refer to “Flow Rate and Static Pressure” on page 31.

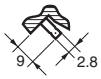
Dimensions



Screw hole for grounding

M4 screw: 0.7 pitch

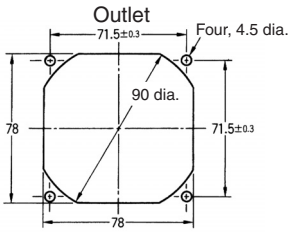
Terminal shape

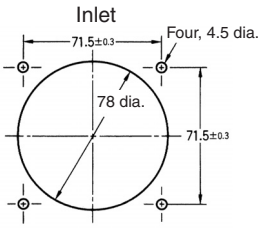


Faston #110 terminal (or equivalent)

Panel Cut-outs

For reference purposes.





Options

Name	Model	Page number
Plug Cord	R87F-PC	Refer to page 27.
Finger Guard	R87F-FG80	Refer to page 27.
Filter	R87F-FL80	Refer to page 28.

AC Axial-flow Fans with Lead Wires (80 x 80 x t25 mm)
R87F-A□A83

Specifications

■ Ratings

Note: * indicates a nominal value.

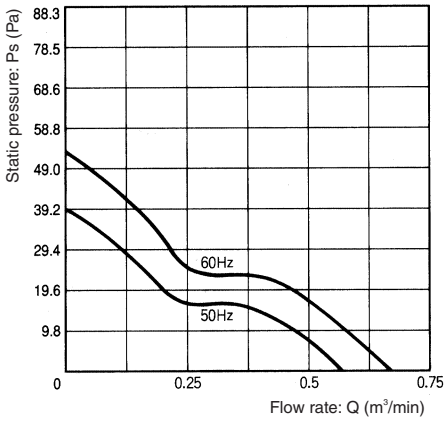
Model	Rated voltage (V)	Permitted voltage fluctuation range (%)	Frequency (Hz)	Rated current (A)*		Rated input (W)*		Rated rotational speed (r/min)*		Maximum flow rate (m^3/min)*		Max. static pressure (Pa)*		Noise (dB)*	
				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
R87F-A1A83H R87F-A3A83H R87F-A4A83H R87F-A6A83H	100 115 200 230	85 to 110% rated voltage	50/60	0.091 0.082 0.040 0.038	0.080 0.071 0.036 0.034	7	6	2600	3000	0.57	0.67	39.2	53.0	34	38
R87F-A1A83L R87F-A3A83L R87F-A4A83L R87F-A6A83L	100 115 200 230	85 to 110% rated voltage	50/60	0.070 0.059 0.032 0.029	0.061 0.052 0.029 0.025	5	4.5	1800	2050	0.39	0.43	19.6	23.5	26	28

■ Characteristics

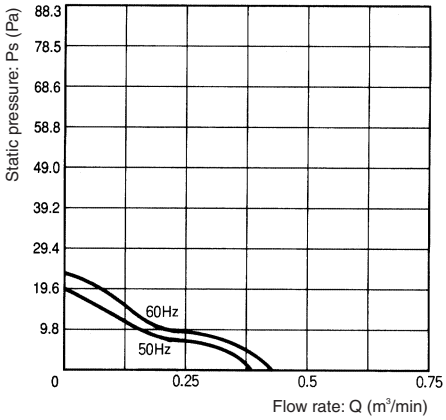
Ambient operating temperature	-30 to 70°C (no icing)
Ambient storage temperature	-40 to 85°C (no icing)
Ambient humidity	25 to 85% RH
Insulation class	UL A (105°C) CSA B (130°C) VDE E (120°C)
Insulation resistance	100 MΩ min. (at 500 VDC) between all power supply connections and uncharged metal parts.
Insulation withstand voltage	2000 VAC (1 minute) between all power supply connections and uncharged metal parts.
Protection	Impedance protection
Materials	Frame: Die-cast aluminum Blades: Glass polycarbonate
Bearings	Ball bearings
Weight	240 g

■ Flow Rate and Static Pressure Characteristics (Reference Values)

R87F-A□A83H

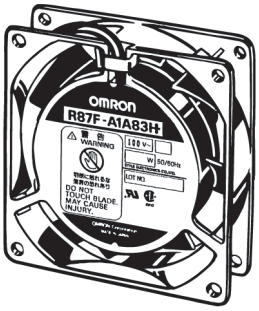


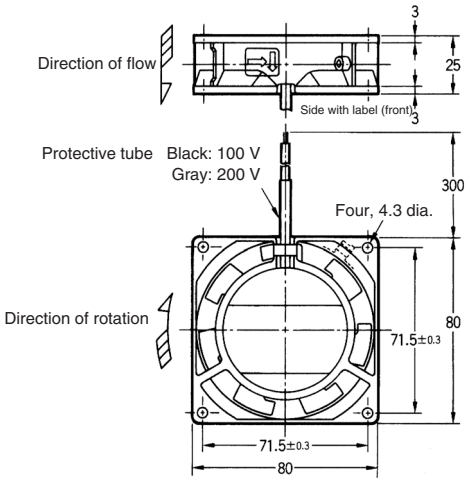
R87F-A□A83L

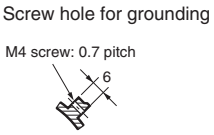


Note: For details on measurement conditions, refer to “Flow Rate and Static Pressure” on page 31.

Dimensions

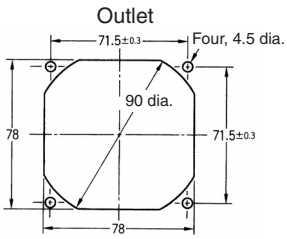


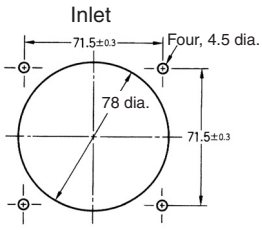




Panel Cut-outs

For reference purposes.





Options

Names	Model	Page number
Finger Guard	R87F-FG80	Refer to page 27.
Filter	R87F-FL80	Refer to page 28.

AC Axial-flow Fans with Lead Wires (150-dia. x t55 mm)
R87T-A□A07

Specifications

■ Ratings

Note: * indicates a nominal value.

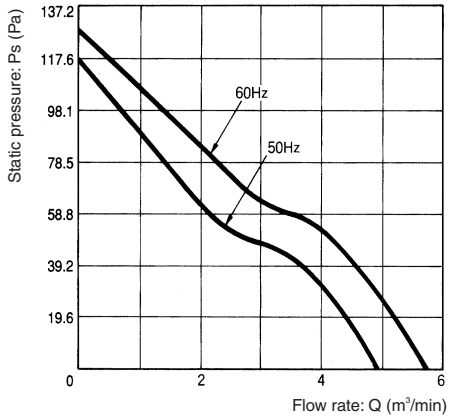
Model	Rated voltage (V)	Permitted voltage fluctuation range (%)	Frequency (Hz)	Rated current (A)*		Rated input (W)*		Rated rotational speed (r/min)*		Maximum flow rate (m^3/min)*		Max. static pressure (Pa)*		Noise (dB)*	
				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
R87T-A1A07H	100	85 to 110% rated voltage	50/60	0.660	0.560	37	34	2750	3050	5.0	5.8	111.7	127.5	55	59
R87T-A3A07H	115			0.450	0.400										
R87T-A4A07H	200			0.330	0.280										
R87T-A6A07H	230			0.210	0.190										

■ Characteristics

Ambient operating temperature	-20 to 70°C (no icing)
Ambient storage temperature	-40 to 85°C (no icing)
Ambient humidity	25 to 85% RH
Insulation class	UL A (105°C)
Insulation resistance	100 MΩ min. (at 500 VDC) between all power supply connections and uncharged metal parts.
Insulation withstand voltage	2000 VAC (1 minute) between all power supply connections and uncharged metal parts.
Protection	Thermal protection
Materials	Frame: Die-cast aluminum Blades: Steel plate (mat black baked coating)
Bearings	Ball bearings
Weight	1200 g

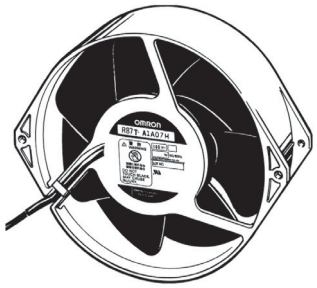
■ Flow Rate and Static Pressure Characteristics (Reference Value)

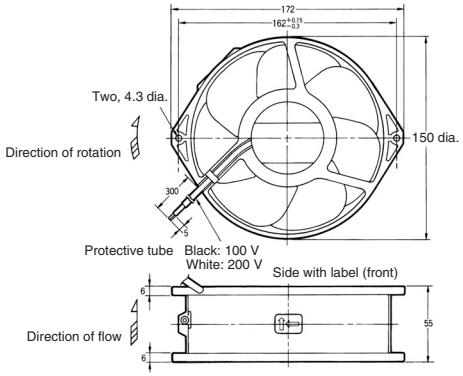
R87T-A□A07H

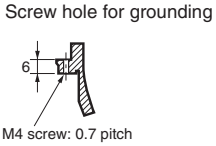


Note: For details on measurement conditions, refer to “Flow Rate and Static Pressure” on page 31.

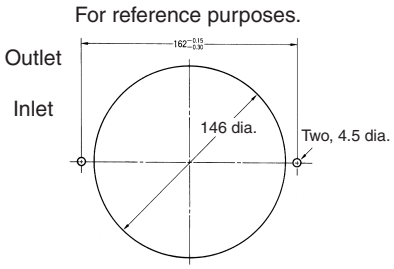
Dimensions







Panel Cut-outs



Options

Name	Model	Page number
Finger Guard	R87F-FG150	Refer to page 27.

AC Axial-flow Fans with Lead Wires (150-dia. x t38 mm)
R87T-A□A05

Specifications

■ Ratings

Note: * indicates a nominal value.

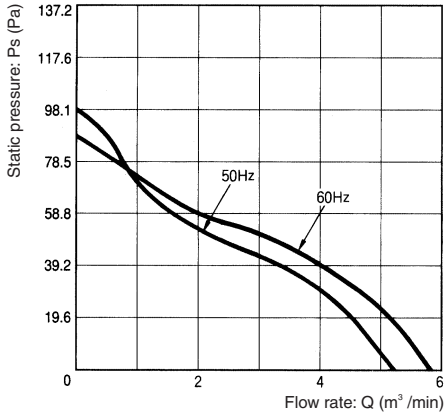
Model	Rated voltage (V)	Permitted voltage fluctuation range (%)	Frequency (Hz)	Rated current (A)*		Rated input (W)*		Rated rotational speed (r/min)*		Maximum flow rate (m^3/min)*		Max. static pressure (Pa)*		Noise (dB)*	
				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
R87T-A1A05H	100	85 to 110% rated voltage	50/60	0.540	0.470	35	33	2600	2950	5.2	5.8	98.1	88.3	54	56
R87T-A3A05H	115			0.430	0.380										
R87T-A4A05H	200			0.240	0.210										
R87T-A6A05H	230			0.220	0.200										

■ Characteristics

Ambient operating temperature	-20 to 70°C (no icing)
Ambient storage temperature	-40 to 85°C (no icing)
Ambient humidity	25 to 85% RH
Insulation class	UL class A (105°C)
Insulation resistance	100 MΩ min. (at 500 VDC) between all power supply connections and uncharged metal parts.
Insulation withstand voltage	2000 VAC (1 minute) between all power supply connections and uncharged metal parts.
Protection	Thermal protection
Materials	Frame: Die-cast aluminum Blades: Steel plate (mat black baked coating)
Bearings	Ball bearings
Weight	830 g

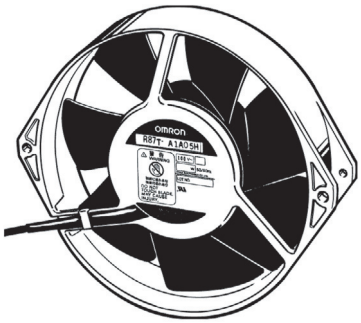
■ Flow Rate and Static Pressure Characteristics (Reference Value)

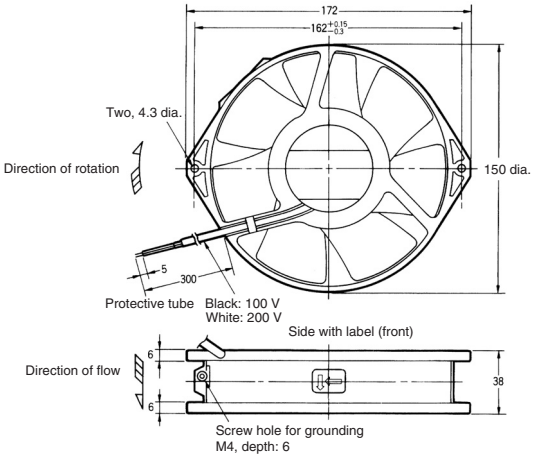
R87T-A□A05H

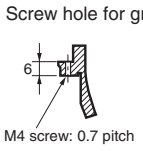


Note: For details on measurement conditions, refer to “Flow Rate and Static Pressure” on page 31.

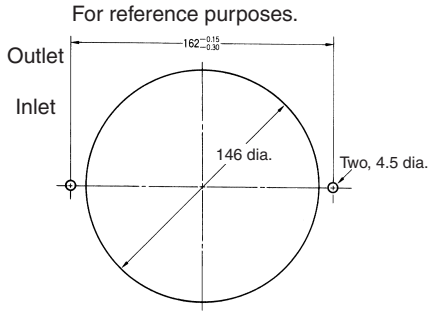
Dimensions







Panel Cut-outs



Options

Name	Model	Page number
Finger Guard	R87F-FG150	Refer to page 27.

AC Axial-flow Fans with Terminals (120 x 120 x t38 mm)
R87T-A□A15

Specifications

■ Ratings

Note: * indicates a nominal value.

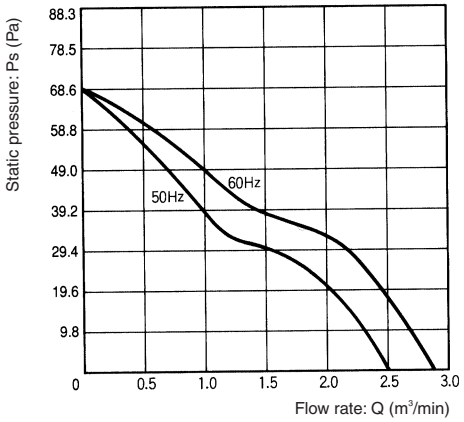
Model	Rated voltage (V)	Permitted voltage fluctuation range (%)	Frequency (Hz)	Rated current (A)*		Rated input (W)*		Rated rotational speed (r/min)*		Maximum flow rate (m^3/min)*		Max. static pressure (Pa)*		Noise (dB)*	
				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
R87T-A1A15HP R87T-A3A15HP R87T-A4A15HP R87T-A6A15HP	100 115 200 230	85 to 110% rated voltage	50/60	0.230 0.190 0.110 0.100	0.210 0.170 0.100 0.091	16	15	2700	3050	2.5	2.9	68.6	68.6	43	47
R87T-A1A15MP R87T-A3A15MP R87T-A4A15MP R87T-A6A15MP	100 115 200 230	85 to 110% rated voltage	50/60	0.220 0.180 0.102 0.096	0.200 0.162 0.092 0.086	15	14	2250	2500	2.0	2.2	40.2	38.2	38	42

■ Characteristics

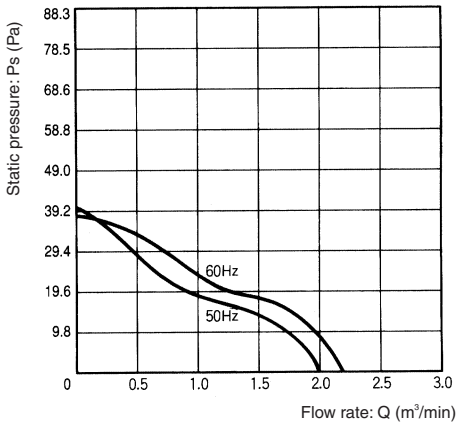
Ambient operating temperature	-20 to 70° C (no icing)
Ambient storage temperature	-40 to 85° C (no icing)
Ambient humidity	25 to 85% RH
Insulation class	UL class A (105° C)
Insulation resistance	100 MΩ min. (at 500 VDC) between all power supply connections and uncharged metal parts.
Insulation withstand voltage	2000 VAC (1 minute) between all power supply connections and uncharged metal parts.
Protection	Impedance protection
Materials	Frame: Die-cast aluminum Blades: Steel plate (mat black baked coating)
Bearings	Ball bearings
Weight	580 g

■ Flow Rate and Static Pressure Characteristics (Reference Values)

R87T-A□A15HP

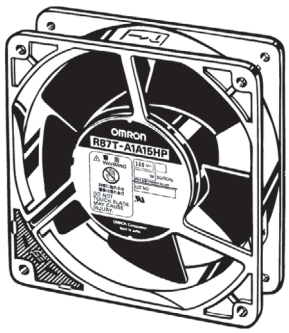


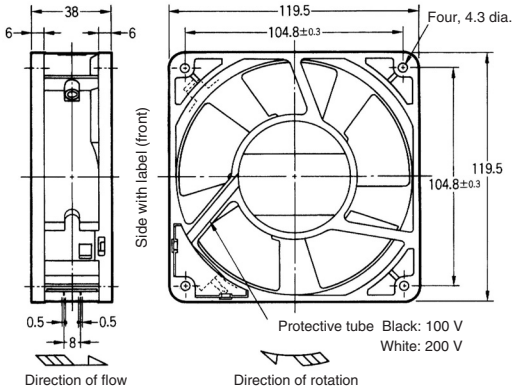
R87T-A□A15MP



Note: For details on measurement conditions, refer to “Flow Rate and Static Pressure” on page 31.

Dimensions





Screw hole for grounding

M4 screw: 0.7 pitch

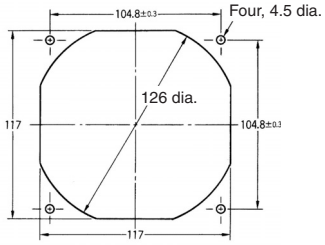
Terminal shape

Faston #110 terminal (or equivalent)

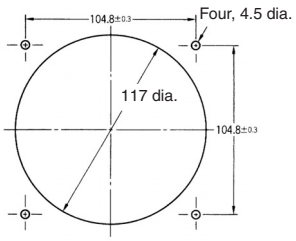
Panel Cut-outs

For reference purposes.

Outlet



Inlet



Options

Name	Model	Page number
Plug Cord	R87F-PC	Refer to page 27.
Finger Guard	R87F-FG120	Refer to page 27.
Filter	R87F-FL120(S)	Refer to page 28.

AC Axial-flow Fans with Lead Wires (80 x 80 x t38 mm)
R87T-A□A85

Specifications

■ Ratings

Note: * indicates a nominal value.

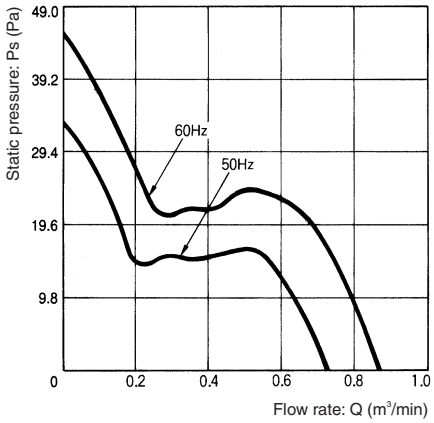
Model	Rated voltage (V)	Permitted voltage fluctuation range (%)	Frequency (Hz)	Rated current (A)*		Rated input (W)*		Rated rotational speed (r/min)*		Maximum flow rate (m^3/min)*		Max. static pressure (Pa)*		Noise (dB)*	
				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
R87T-A1A85H	100	85 to 110% rated voltage	50/60	0.170	0.150	11	10	2700	3150	0.73	0.87	33.3	46.1	35	40
R87T-A3A85H	115			0.140	0.120										
R87T-A4A85H	200			0.081	0.069										
R87T-A6A85H	230			0.069	0.060										

■ Characteristics

Ambient operating temperature	-20 to 70° C (no icing)
Ambient storage temperature	-40 to 85° C (no icing)
Ambient humidity	25 to 85% RH
Insulation class	UL class A (105° C)
Insulation resistance	100 MΩ min. (at 500 VDC) between all power supply connections and uncharged metal parts.
Insulation withstand voltage	2000 VAC (1 minute) between all power supply connections and uncharged metal parts.
Protection	Impedance protection
Materials	Frame: Die-cast aluminum Blades: Steel plate (mat black baked coating)
Bearings	Ball bearings
Weight	440 g

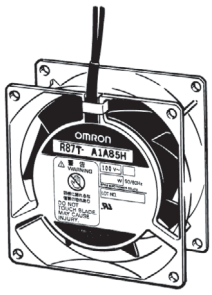
■ Flow Rate and Static Pressure Characteristics (Reference Value)

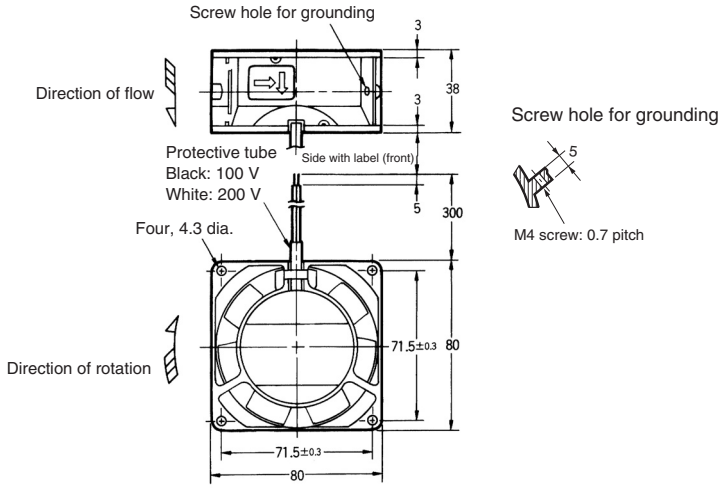
R87T-A□A85H



Note: For details on measurement conditions, refer to “Flow Rate and Static Pressure” on page 31.

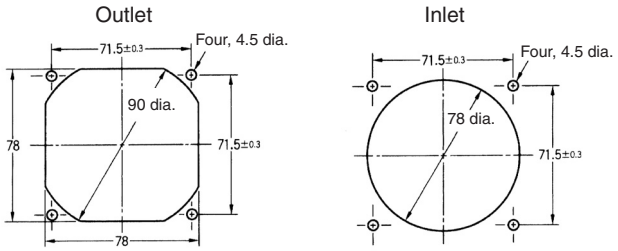
Dimensions





Panel Cut-outs

For reference purposes.



Options

Name	Model	Page number
Finger Guard	R87F-FG80	Refer to page 27.
Filter	R87F-FL80	Refer to page 28.

AC Axial-flow Fans with Lead Wires (80 x 80 x t25 mm)
R87T-A□A83

Specifications

■ Ratings

Note: * indicates a nominal value.

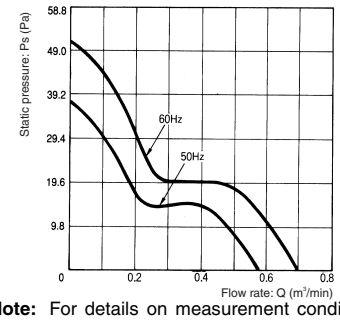
Model	Rated voltage (V)	Permitted voltage fluctuation range (%)	Frequency (Hz)	Rated current (A)*		Rated input (W)*		Rated rotational speed (r/min)*		Maximum flow rate (m^3/min)*		Max. static pressure (Pa)*		Noise (dB)*	
				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
R87T-A1A83H R87T-A3A83H R87T-A4A83H R87T-A6A83H	100 115 200 230	85 to 110% rated voltage	50/60	0.150 0.140 0.079 0.065	0.130 0.120 0.067 0.056	11	10	2550	3100	0.58	0.70	37.3	51.0	37	40

■ Characteristics

Ambient operating temperature	-20 to 70° C (no icing)
Ambient storage temperature	-40 to 85° C (no icing)
Ambient humidity	25 to 85% RH
Insulation class	UL class A (105° C)
Insulation resistance	100 MΩ min. (at 500 VDC) between all power supply connections and uncharged metal parts.
Insulation withstand voltage	2000 VAC (1 minute) between all power supply connections and uncharged metal parts.
Protection	Impedance protection
Materials	Frame: Die-cast aluminum Blades: Steel plate (mat black baked coating)
Bearings	Ball bearings
Weight	320 g

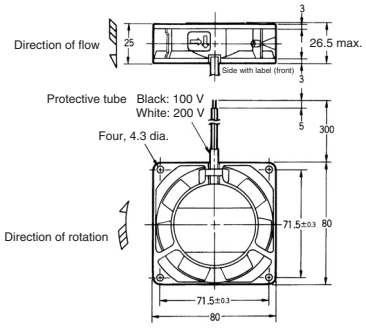
■ Flow Rate and Static Pressure Characteristics (Reference Value)

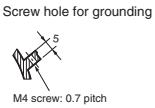
R87T-A□A83H



Note: For details on measurement conditions, refer to "Flow Rate and Static Pressure" on page 31.

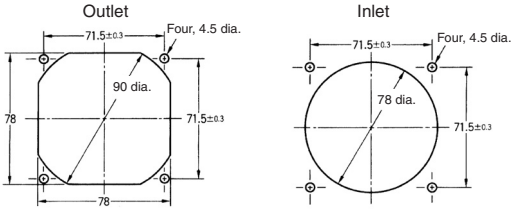
Dimensions





Panel Cut-outs

For reference purposes.



Options

Name	Model	Page number
Finger Guard	R87F-FG80	Refer to page 27.
Filter	R87F-FL80	Refer to page 28.

Common to all AC Axial-flow Fans

Accessories (Order Separately)

■ Plug Cord

R87F-PC Rating: 250 VAC, 3 A
UL approved/conforms to CSA

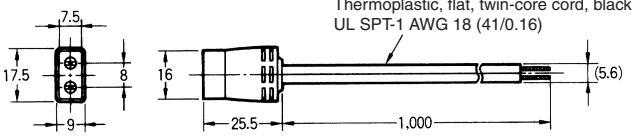
Note: UL File No. E175022

Available Models

Cord length	Model number
1 m	R87F-PC
2 m	R87F-PC-20

Dimensions

R87F-PC



Connectable to Faston #110 terminals (or equivalent).
Note: This Plug Cord is used for Axial-flow Fans with terminals.

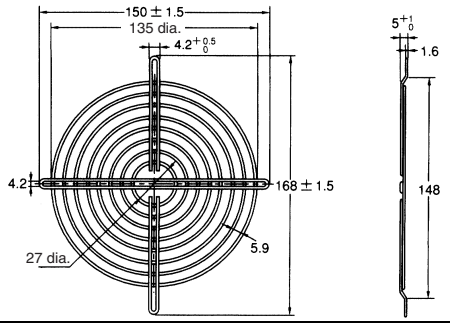
■ Finger Guards

R87F-FG

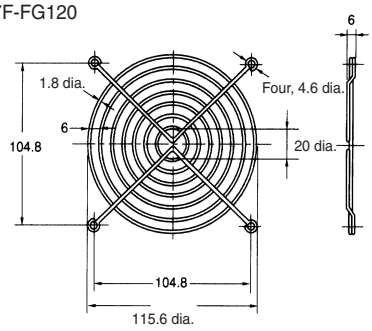
Dimensions

Material: steel, Joints: spot welded, Surface: nickel-chrome plated

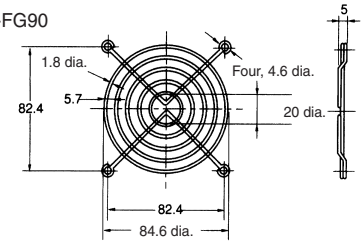
R87F-FG150



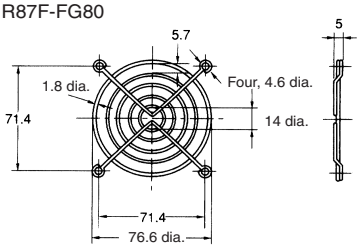
R87F-FG120



R87F-FG90



R87F-FG80



Applicable Axial-flow Fans

AC Axial-flow Fan		Finger Guard
Size	Model	
150 dia.	R87T-A□A0 Series	R87F-FG150
120×120	R87F-A□A1 Series R87T-A□A1 Series	R87F-FG120
92×92	R87F-A□A9 Series	R87F-FG90
80×80	R87F-A□A8 Series R87T-A□A8 Series	R87F-FG80

Note: Finger Guards reduce the flow rate by approximately 2% to 5%.

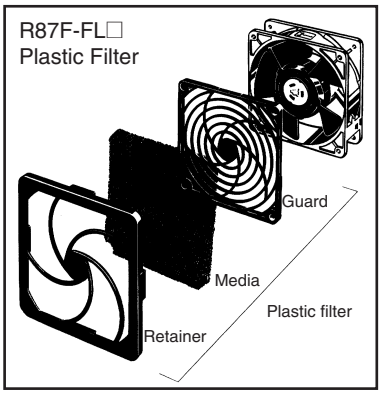
Available Models

Size	Rated voltage
150 dia.	R87F-FG150
120×120	R87F-FG120
92×92	R87F-FG90
80×80	R87F-FG80

■ Filters

R87F-FL

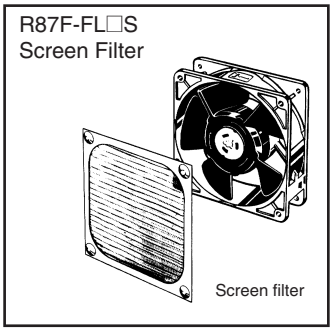
R87F-FL□
Plastic Filter



Mounting Method

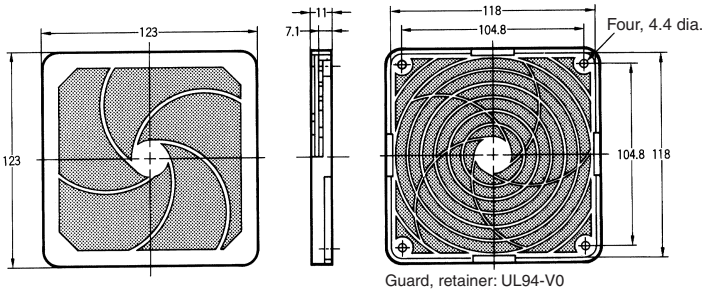
1. Attach the guard to the Fan using the mounting bolts. (There are no mounting bolts provided with the Plastic Filter.)
2. With the media held between the retainer and the guard, hook the retainer to the guard. (The media and retainer can be one-touch mounted/dismounted.)
3. Use the following model number to order media only.
   R87F-FL□-M□ (□: 120, 90, or 80)
   (One package contains five media.)

R87F-FL□S
Screen Filter



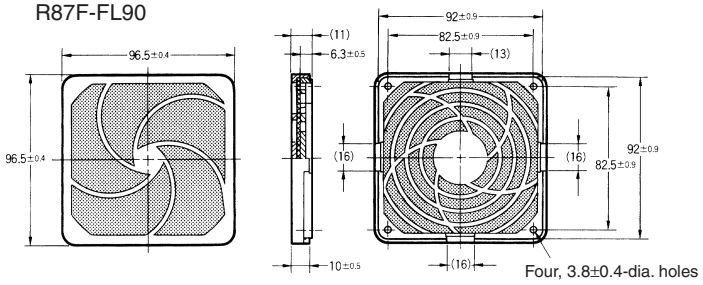
Dimensions

R87F-FL120

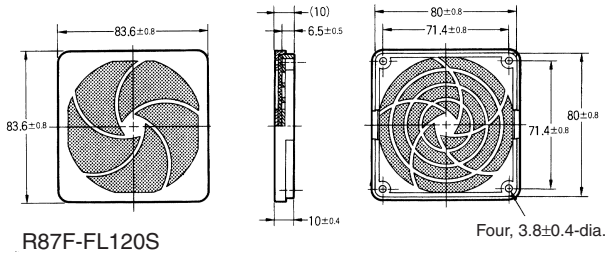


Guard, retainer: UL94-V0
Media: UL900, 30 ppi (30 pores per inch)

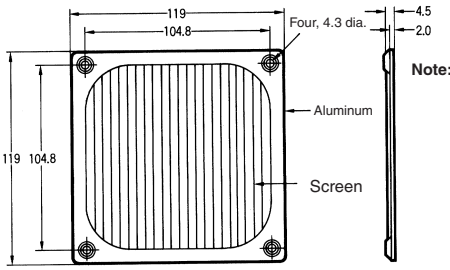
R87F-FL90



R87F-FL80



R87F-FL120S



Note: **1.** The Screen Filter is made using aluminium and has an EMI/RFI shielding effect.
2. When mounting the Screen Filter, make sure that it does not come in contact with the fan blades.
3. The screen is a 30×30 aluminum mesh.

Applicable Axial-flow Fans

AC Axial-flow Fan		Filter	
Size	Model	Plastic Filter	Screen Filter
150 dia.	R87T-A□A0 Series	---	---
120×120	R87F-A□A1 Series R87T-A□A1 Series	R87F-FL120	R87F-FL120S
92×92	R87F-A□A9 Series	R87F-FL90	---
80×80	R87F-A□A8 Series R87T-A□A8 Series	R87F-FL80	---

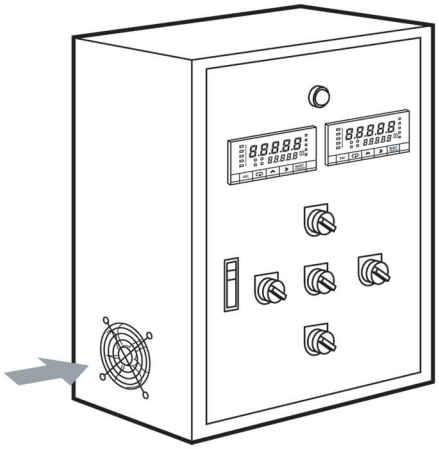
Note: Filters reduce the flow rate by approximately 20% to 40%. Ensure that there is no clogging.

Available Models

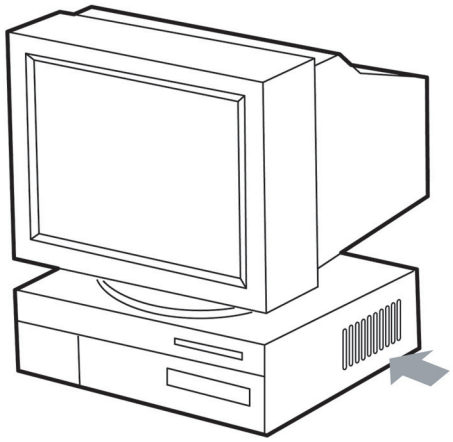
Size	Model number
120×120	R87F-FL120
92×92	R87F-FL90
80×80	R87F-FL80
120×120	R87F-FL120

Application Examples

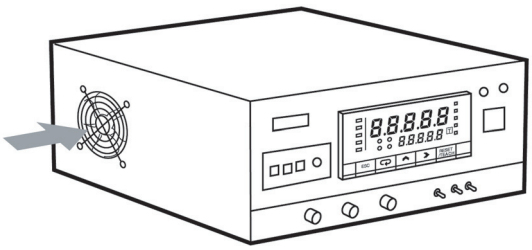
1. Control Panels



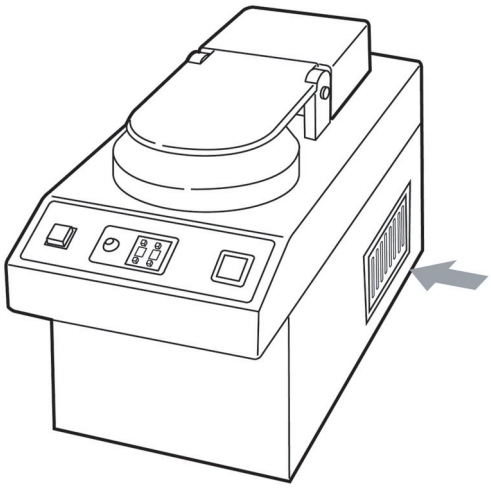
2. Computer



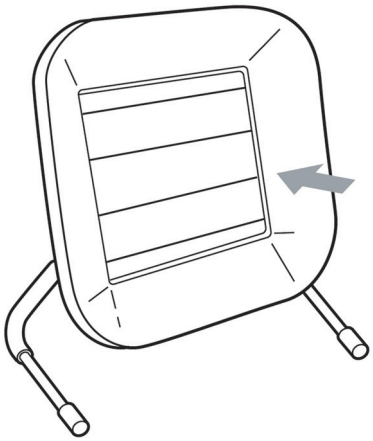
3. Measurement Devices



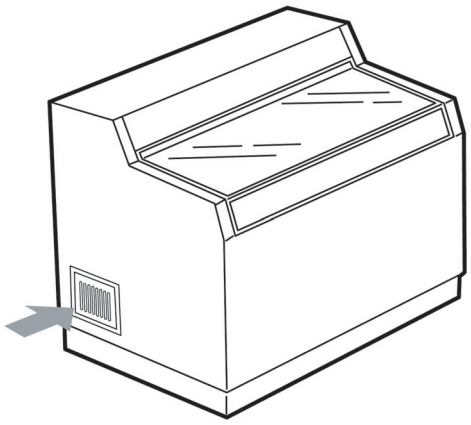
4. Medical Equipment



5. Soldering Fume Extractor



6. Automatic Vending Machines and Display Cases



Precautions

⚠ WARNING

Assembly

Be sure to attach a Finger Guard if there is a danger of the user touching the Fan.

Attach a guard, protective net, or a Finger Guard (available as an option) to the Axial Fan's mounting section.

A variety of Finger Guards are available as options (R87F-FG). Select a Finger Guard of a size appropriate for the Fan used. For details of the available Finger Guards, refer to page 27.

Be sure to turn OFF the power supply and confirm that the blades have stopped before performing inspections or replacing Filters. Not doing so may result in injury due to contact with the blades.

⚠ WARNING

Application

Do not touch the blades. Doing so may result in injury.

Ensure that no part of your body and no objects come in contact with the blades while they are moving, otherwise injury may result due to contact with the blades or due to scattering of object fragments.

Handling

Do not use the Fan in locations subject to explosive, flammable, or corrosive gases, or in locations subject to drops of water. Doing so may result in fire, electric shock, or injury.

Do not use the Fan outside the rated temperature range or above the rated voltage. Doing so will cause the temperature of the coil (at the center of the Fan) to increase, and may result in deformation or scorching of the blades.

Operate the Fan using a sine-wave power supply.

Do not hold the Fan by its power lines, or pull the power lines with excessive force. Doing so may cause damage to the wire insulation or break the wire, resulting in injury due to electric shock or the Fan falling.

Mounting

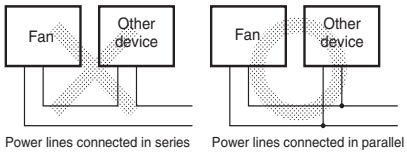
Be sure to secure the Fan with the mounting bolts. Not doing so may result in injury due to the Fan falling.

A precision-type ball bearing is used to hold the shaft of the Fan. The structure of the ball bearing is prone to damage if the Fan is subjected to shock (e.g., dropped). Ensure that the Fan is not subjected to shock, otherwise the service life and performance characteristics of the Fan will be adversely affected.

Wiring

Prevent short-circuiting of the Fan from adversely affecting other devices by installing circuit-breakers in the Fan's power lines.

Do not wire the power lines of the Fan in series with those of other Fans or devices. Doing so may cause a voltage above the Fan's rated voltage to be applied, and this may result in malfunction or burning. Be sure to wire devices in parallel.



Cleaning

Ensure that drops of water do no come in contact with the Fan.

Ensure that no organic solvents or alkaline chemicals are in contact with plastic parts of the Fan, otherwise cracks, swelling, or dissolution may result.

When performing any action that requires touching the blades, such as inspections, ensure that power is turned OFF. Unexpected operation of the Fan after, for example, the Fan has stopped due to contact failure or due to the operation of the overheating protection function (thermal protection), may result in injury.

Do not apply grease to the Fan or attempt to remodel it. Doing so may result in malfunction or injury.

Correct Use

(1) Leakage Flux

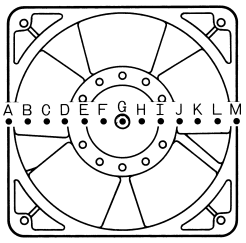
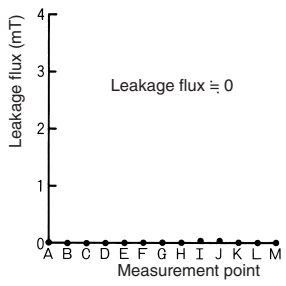
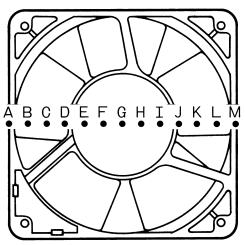
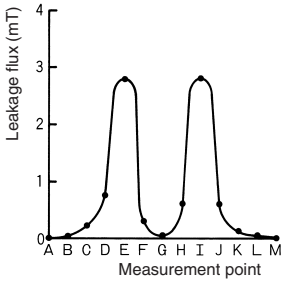
Leakage flux from a Axial-flow Fan may distort the image on nearby CRT screens. Measures to prevent this problem include:

1. Keeping CRT's at least 30 cm away from the Axial-flow Fan
2. Shielding the Axial-flow Fan side with metal mesh.

The leakage flux from a Fan with metal blades is less than with plastic blades. Note, however, that the leakage flux differs between the inlet and outlet sides.

Leakage Flux Distribution Curves

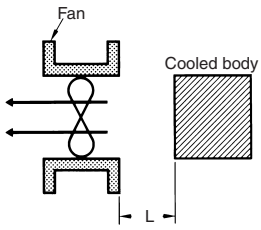
The leakage flux distribution curves for inlet and outlet sides of the R87T Axial-flow Fans are shown below as examples.

Inlet		Outlet	
Dimensions	**Leakage flux distribution**	**Dimensions**	**Leakage flux distribution**
			

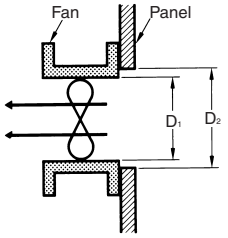
(2) Noise Countermeasures

The cooling effect and noise levels of Axial-flow Fans are greatly affected by the mounting conditions. Take the points listed below into account when installing the Fans.

Maintain as much clearance as possible (L) between the Fan inlet and the cooled object.
(If the cooled object occupies about the same surface area as the Fan on a flat surface, a distance of approximately 10 cm is appropriate.)



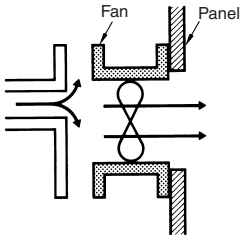
The diameter of the Fan installation hole (D_2) should be larger than the diameter of the Fan (D_1).



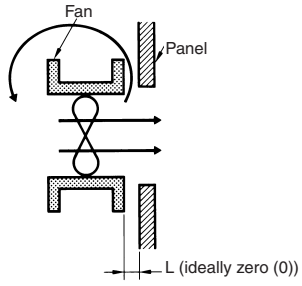
D_1: Fan installation hole diameter
D_2: Fan diameter
$D_1 > D_2$

(3) Cooling Effect

Avoid rapid changes in air flow direction or air-flow cross-section which reduce the cooling effect.



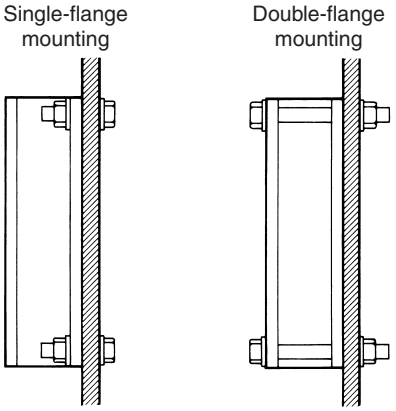
When installing the Fan, keep the clearance at the outlet side as small as possible. (If there is a large clearance at the outlet side, it may not be possible to obtain a sufficient cooling effect.)



(4) Installation

The Fan can be mounted with bolts through only one flange (single-flange mounting) or with through-bolts through both flanges (double-flange mounting). Take care not to distort the frame when using double-flange mounting.

Tighten the bolts to a torque of approximately 0.44 N·m when installing the Fan.



Flow Rate and Static Pressure

The characteristic graphs provided for each of the models represent the average of actual measurement data obtained under the measurement conditions given below. They are provided as reference for determining the Fan most suitable for the type of cooling required; the actual characteristics may differ from the values represented in the graphs.

A simple explanation of the flow rate/static pressure characteristics and the methods of measuring them is given below.

Maximum Static Pressure, Ps max (flow rate = 0):
Fully close the damper. Take the pressure difference between chamber B and ambient pressure (Ps). The maximum value of the pressure difference (Ps) is the maximum static pressure (Ps max).

Intermediate Region, (Q, Ps):
Adjust the auxiliary blower to change the static pressure (Ps). Measure the pressure difference between chamber A and chamber B (Pd). Calculate the flow rate (Q).

Maximum Flow Rate, Q max (static pressure = 0):
Fully open the damper and adjust the auxiliary blower to set the static pressure to zero (0). Measure the pressure difference between chamber A and chamber B (Pd). Take the flow rate (Q) calculated at this point as the maximum flow rate (Q max).

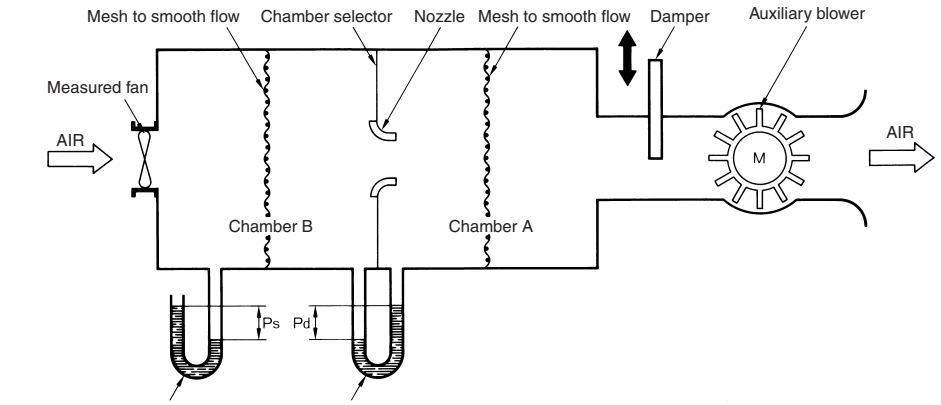
Fan Operating Point:
A Fan installed in equipment operates near the point where the Fan characteristic curve crosses the system impedance curve.

Note: The maximum flow rate and maximum static pressure do not indicate the Fan operating point when it is installed in equipment. However, these characteristics are important for comparing Fan performances and for selecting Fans.

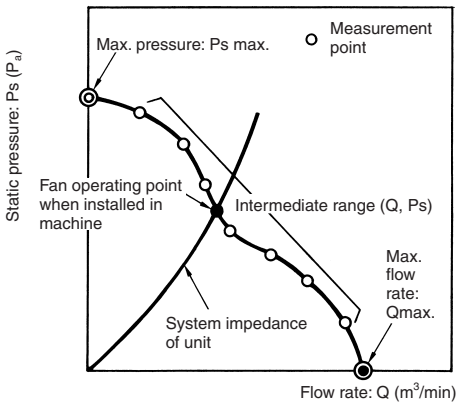
Measurement Conditions

Number of Fans tested	Ambient conditions	Measurement device
5	Temperature: 23±2°C Humidity: 65±5%	Measurement was performed using the multi-nozzle double chamber method based on AMCA (Air Moving Condition Association, U.S.A.) standards 270 to 274.

Flow Rate Measurement Device



Sample Flow Rate/Static Pressure Characteristic



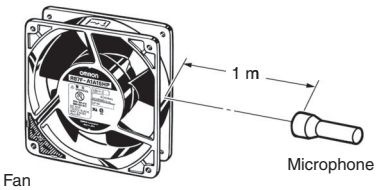
Noise Measurements

The following two methods are available for measuring Fan noise. These are used interchangeably by Fan manufacturers so that the measurement method is not standardized.

JIS B 8330: Testing and Inspection Methods for Fans

JIS C 9603: Extractor Fans

OMRON conducts testing according to JIS (Japan Industrial Standard) C 9603 because of the small size and low noise levels of the Fans and because of their similarity in shape to extractor fans. This standard prescribes that the noise be measured at a distance of 1 m from the side of the Fan.



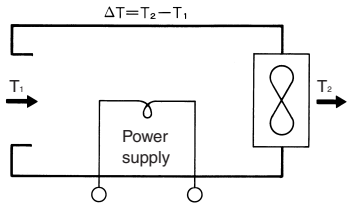
Selecting a Fan

Follow the steps below to select Fans.

1. Procedure

(1) Estimate the amount of heat generated inside the Unit.

(2) Set the maximum permitted temperature rise limit inside the Unit.



T_1: Temperature of the inlet air (°C).

T_2: Temperature of the outlet air (°C).

(3) Calculate the required flow rate.

$Q = 50W/\Delta T$ (m^3/min)

Q = flow rate (m^3/min.)

ΔT = permitted temperature rise limit (°C)
(Normally between 8 to 10°C.)

W = amount of heat generated (kW)

(4) Estimate the system impedance from the air flow through the Unit or from previous data.

$\Delta P = KQ^n$

ΔP: Pressure drop (Pa)

K: Unit constant

n: Coefficient determined by air flow
n=1: laminar flow
n=2: turbulent flow
(n=2 is the normal value.)

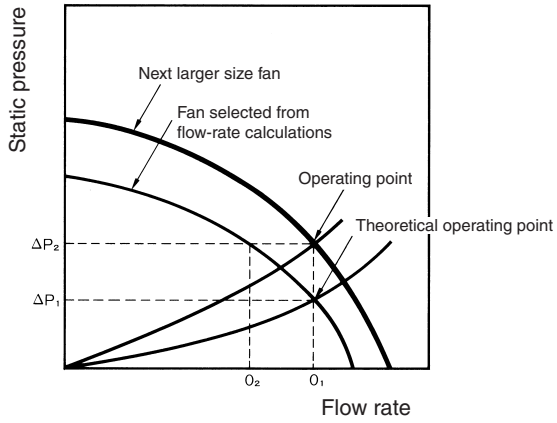
(5) Select the Fan according to the P - Q characteristics.

(6) Measure the temperature rise in an installed Unit.

(7) Reappraise the Fan if the measured cooling effect is insufficient.

2. Recheck the Selected Fan

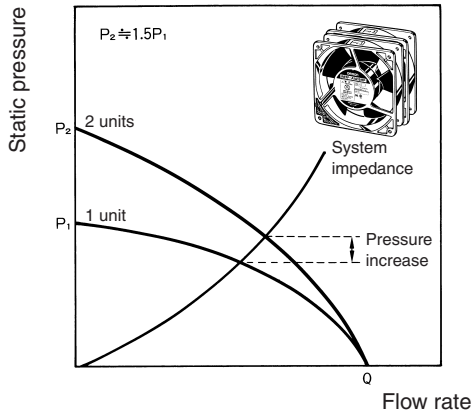
In the following diagram, the value for the system impedance ΔP_1 is unknown. It is assumed that a flow rate of Q_1 is required but measurements of the cooling effect show a reduced flow rate of Q2, for example. This result indicates that the system impedance was ΔP_1, so the Fan one size larger is necessary to produce the flow rate Q_1 to obtain the prescribed cooling effect.



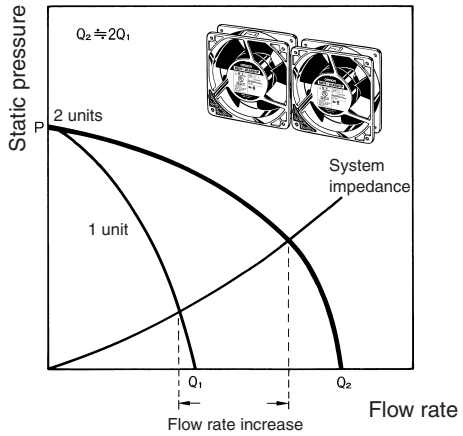
3. Serial and Parallel Fan Operation

The characteristics of two identical Fans operated in series or parallel are determined as shown in the following diagrams.

Serial Operation:



Parallel Operation:



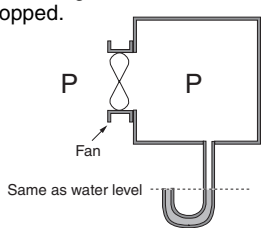
Terminology

Nominal Value:
The average value of data based on actual measurements.
Nominal values cannot be treated as rated values. Enquire separately for details on rated values.

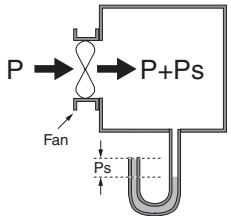
Flow Rate: Q (m^3/min.)
The volume of air discharged by the Fan in a unit of time.

Static Pressure: Ps (Pa)
The pressure difference across the front to the back of the Fan generated by the discharged air, which is unaffected by air flow speed.

1. The air pressure across the front to the back of the fan does not change when the fan is stopped.

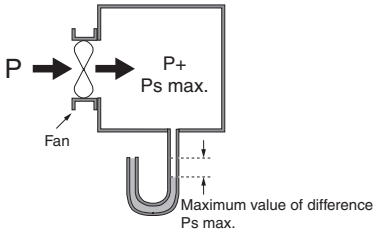


2. Static pressure (Ps) is generated at the front of the fan when it rotates.



Maximum Flow Rate: Q max (m^3/min.)
The volume of air discharged by the Fan when the static pressure is adjusted to zero (Pa) at the flow measurement unit.

Maximum Static Pressure: Ps max (Pa)
The pressure difference inside and outside the Unit when the flow rate is adjusted to zero (0 m^3/min.) at the flow measurement unit.



System Impedance:
The flow resistance inside a mounted Axial-flow Fan caused by the density of parts and shape of the flow path.

Impedance Protection:
A method of preventing burning damage when the motor is restricted from rotating by setting the motor winding impedance (AC resistance) to a value giving a temperature rise in the windings below the temperature at which burning occurs.

Thermal Protection:
A method of preventing burning damage when the motor is restricted from rotating by setting a thermal element to interrupt (the restricting) operation before the motor reaches a temperature at which burning occurs.

Warranty and Application Considerations

Read and Understand this Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Disclaimers

PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON *Warranty and Limitations of Liability.*

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased product.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. J122-E1-04

In the interest of product improvement, specifications are subject to change without notice.