

ACDC Fan

This fan works while internally converting AC power into DC power, providing the superior performance of a DC fan with the flexibility of AC input.

Model Numbering System Not every combination of the following codes or characters is available. Contact us for an available combination.

9AD	09	01	H	1	2	
Type name	Frame size	Voltage	Speed code	Frame thickness	Sensor specifications	Frame form
Type name	9AD					
Frame size (mm)	09 12 92×92 120×120					
Voltage (V)	01 100 to 240					
Speed code	H M etc.					
Frame thickness (mm)	1 38					
Sensor specifications	2 H Without a sensor With a low-speed sensor					
Frame form	Nil 1 Plastic frame: Ribbed frame Plastic frame: Ribless frame					

Centrifugal Fan

9ADT	S	11	P	0	G	001
Type name	Impeller size	Voltage	PWM control function	Thickness	Speed code	Individual customer's spec

Bracket-mounted Splash Proof Centrifugal Fan

9ADB1T	S	11	P	0	G	001
Type name	Impeller size	Voltage	PWM control function	Thickness	Speed code	Individual customer's spec

Type name	9ADT 9ADW1T 9ADB1T 9ADB1W1T					
Impeller size (mm)	S ø225					
Voltage (V)	11 23 115 230					
Thickness (mm)	0 69 min.					
Speed code	G H etc.					

How to Read Specifications (ACDC fan) The following is a sample. See respective product pages for detailed information.

Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
9AD0901H12	100 to 240	90 to 264	50/60	0.08	4.5	3850	1.5 53.0	90 0.36	40	-20 to +75	60000/60°C (90000/40°C)
9AD0901M12				0.06	3.0	3100	1.18 41.7	56 0.22	33		

Rated voltage	.....	This is the necessary voltage to drive the fan. Single-phase 100 to 240 VAC are also available.
Operating voltage range	.....	The voltage range over which fan operation is guaranteed.
Frequency	.....	This is a frequency of alternating current (AC). The frequencies of 50 Hz and 60 Hz are existing in Japan.
Rated current	.....	The current when the fan is operating at rated voltage (at free air).
Rated input	.....	The power value when the fan is operating at rated voltage (at free air).
Rated speed	.....	The speed when the fan is operating at rated voltage (at free air).
Max. airflow	.....	The maximum airflow that the fan can generate during rated operation (measured with our double chamber measuring device). Airflow is the volume of air generated by the fan per unit of time.
Max. static pressure	.....	The maximum static pressure value that the fan can produce during rated operation (measured with our double chamber measuring device). Static pressure indicates a fan's ability to move air against resistance due to the internal structure of the device to which the fan is installed.
SPL	.....	SPL stands for Sound Pressure Level. The noise level during the fan's rated operation. Please refer to the technical material section for the measurement method.
Operating temperature	.....	The temperature range over which fan operation is guaranteed (Non- condensing).
Expected life	.....	Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only. For more information, please refer to the technical material section.

92×92×38 mm

San Ace 92AD 9AD type     

General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Brushless DC motor
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame, and between sensor output and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger (between lead wire conductors and frame)
- Sound pressure level (SPL) At 1 m away from the air inlet
- Storage temperature -30 to +75°C (Non-condensing)
- Mass 250 g

Do not solder wires directly to AC input terminals.

Specifications

The models listed below **have ribs and no sensors**. For models without ribs, append "1" to the end of model numbers.

Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
➤ 9AD0901H12	100 to 240	90 to 264	50/60	0.08	4.5	3850	1.5 53.0	90 0.36	40	-20 to +75	60000/60°C (90000/40°C)
➤ 9AD0901M12				0.06	3.0	3100	1.18 41.7	56 0.22	33		

The models listed below **have ribs and low-speed sensors**. For models without ribs, append "1" to the end of model numbers.

Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
➤ 9AD0901H1H	100 to 240	90 to 264	50/60	0.08	4.5	3850	1.5 53.0	90 0.36	40	-20 to +75	60000/60°C (90000/40°C)
➤ 9AD0901M1H				0.06	3.0	3100	1.18 41.7	56 0.22	33		

Note 1: Sensor and control options are available for selection. Refer to the table on p. 641.

Note 2: The ➤ mark indicates Short Lead Time Service applicable models. See p. 654 for details.

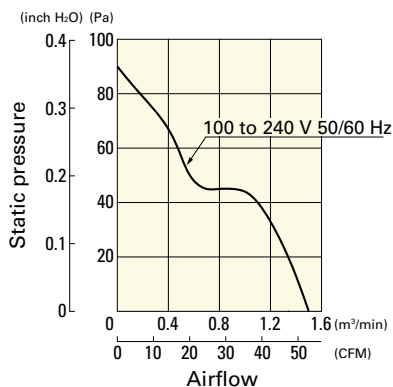
Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

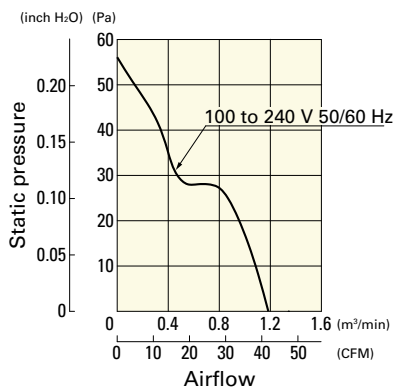
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord	Finger guards	Mounting screws
ST1-9AD0901H12	9AD0901H12	100 to 240 V		489-1635-L10	109-099E	M4×55 mm (4 screws)
ST1-9AD0901M12	9AD0901M12			489-1635-L10	109-099E	
ST1-9AD0901H1H	9AD0901H1H		○	489-1635-L10	109-099E	
ST1-9AD0901M1H	9AD0901M1H		○	489-1635-L10	109-099E	

Airflow - Static Pressure Characteristics

9AD0901H12, 9AD0901H1H

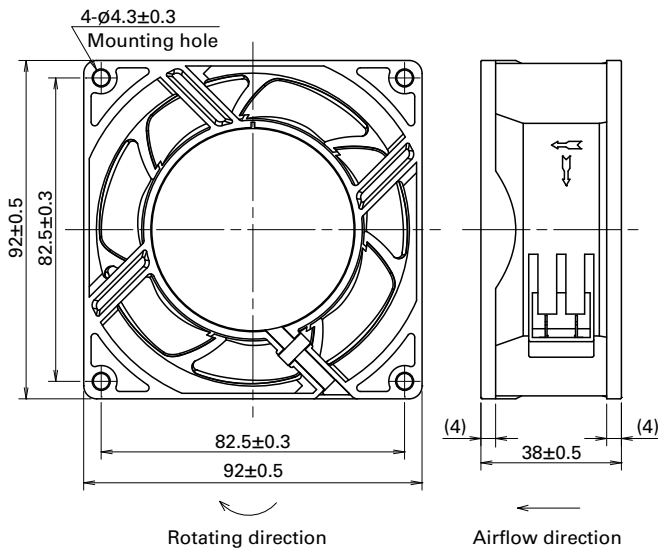


9AD0901M12, 9AD0901M1H

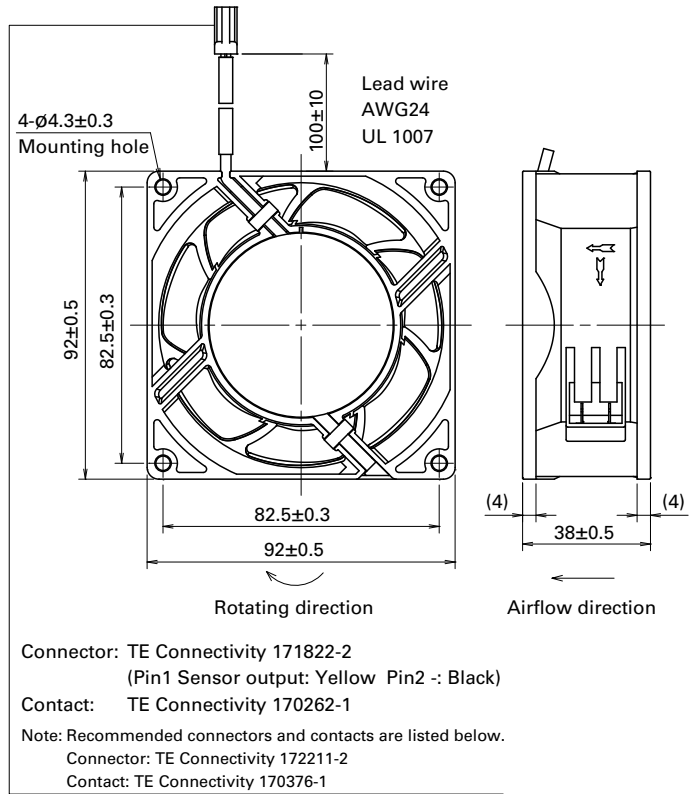


Dimensions (unit: mm) (With ribs)

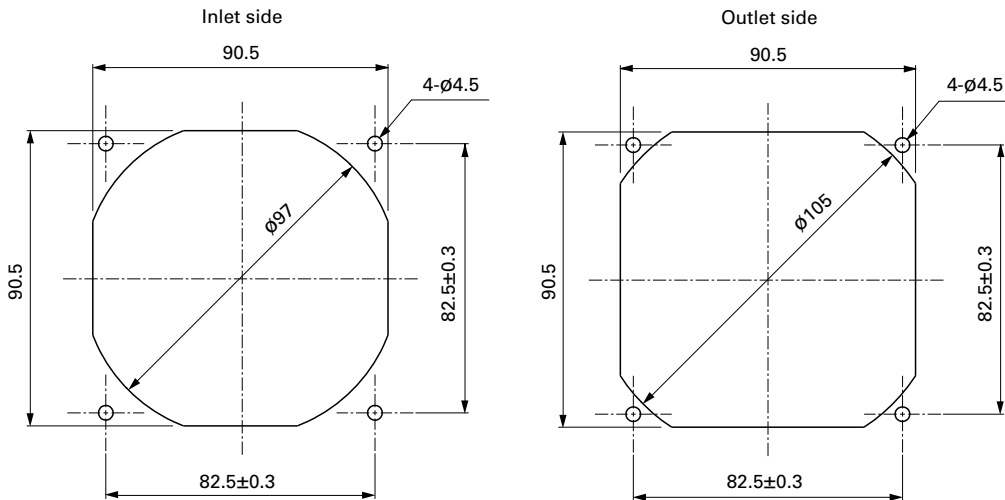
without Sensor



with Low-speed sensor

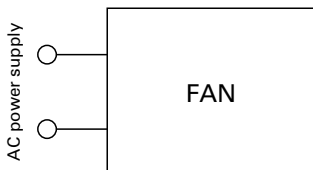


Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

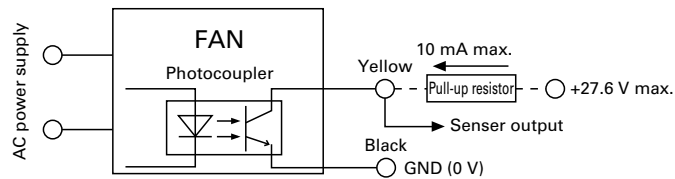


Wiring Diagram

without Sensor



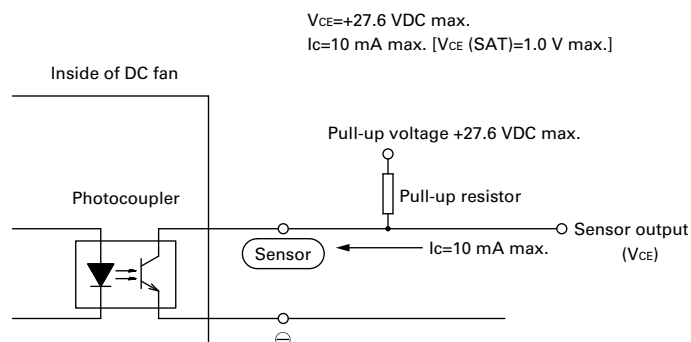
with Low-speed sensor



Specifications for Low-speed Sensors

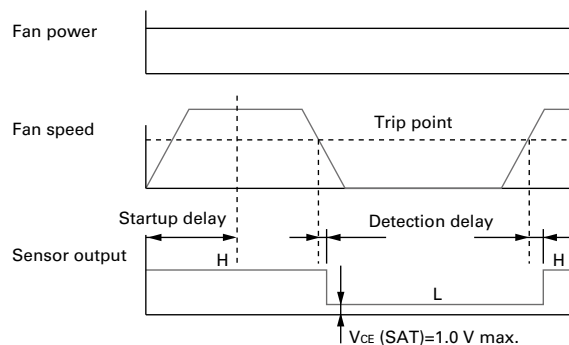
Typical standard model: 9AD0901H1H

Output circuit: Open collector

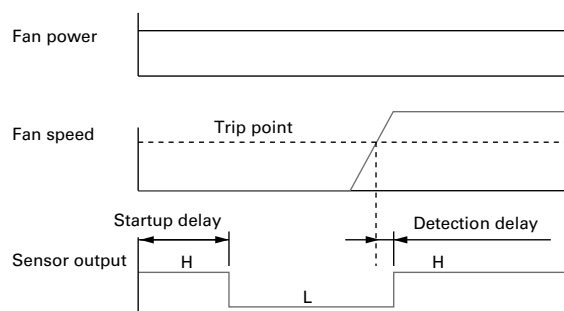


Sensor scheme

Example 1: when steady running



Example 2: when the rotor is locked when the fan motor is turned on and released after the start-up delay time.



9AD0901H1H

Startup delay: $18 \pm 3 \text{ s}$
 Detection delay: 3 s max.
 Trip point: 1700 min^{-1}

9AD0901M1H

Startup delay: $36 \pm 3 \text{ s}$
 Detection delay: 3 s max.
 Trip point: 850 min^{-1}

Options

Finger guards

page: p. 584

Model no.: 109-099C, 109-099E, 109-099H

Resin finger guards

page: p. 591

Model no.: 109-1001G

Resin filter kits

page: p. 592

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
 109-1001F30 (30PPI), 109-1001F40 (40PPI)

Plug cord

page: p. 595

Model no.: 489-1635-L10, 489-1635-L21

Wiring harness for sensor

page: p. 595

Model no.: 489-1636

Features of the San Ace 92AD 9AD type ACDC Fan

Low power consumption

Long life

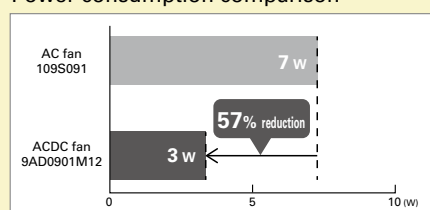
Wide voltage range

(Compared with our existing AC fan with equal size.)

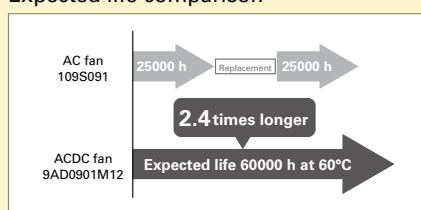
With AC input, the same level of energy saving and long life as a DC fan can be achieved.

The maintenance effort can be reduced too.

Power consumption comparison



Expected life comparison



120×120×38 mm

San Ace 120AD 9AD type     


General Specifications

- Material Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Brushless DC motor
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame, and between sensor output and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger (between lead wire conductors and frame)
- Sound pressure level (SPL) At 1 m away from the air inlet
- Storage temperature -30 to +75°C (Non-condensing)
- Mass 290 g

Do not solder wires directly to AC input terminals.

Specifications

The models listed below **have ribs and no sensors**. For models without ribs, append "1" to the end of model numbers.

Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
» 9AD1201H12	100 to 240	90 to 264	50/60	0.08	4.4	3250	3.0 106	84 0.34	42	-20 to +75	60000/60°C (90000/40°C)

The models listed below **have ribs and low-speed sensors**. For models without ribs, append "1" to the end of model numbers.

Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
» 9AD1201H1H	100 to 240	90 to 264	50/60	0.08	4.4	3250	3.0 106	84 0.34	42	-20 to +75	60000/60°C (90000/40°C)

Note 1: Sensor and control options are available for selection. Refer to the table on p. 641.

Note 2: The » mark indicates Short LeadTime Service applicable models. See p. 654 for details.

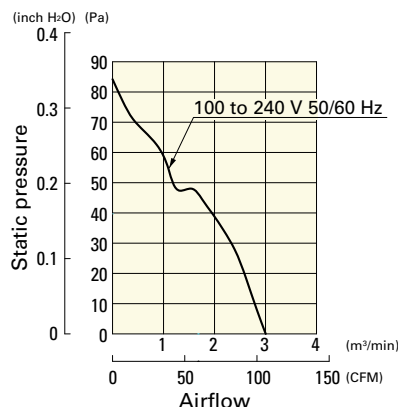
Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord	Finger guards	Mounting screws
ST1-9AD1201H12	9AD1201H12	100 to 240 V		489-1635-L10	109-019E	M4×55 mm (4 screws)
ST1-9AD1201H1H	9AD1201H1H		○	489-1635-L10	109-019E	

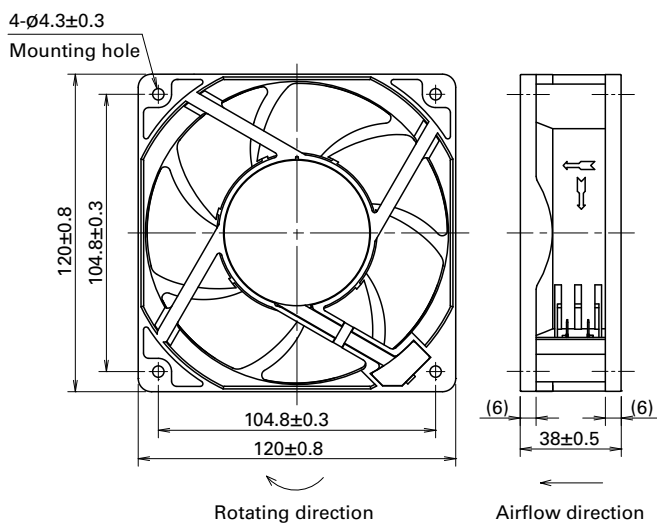
Airflow - Static Pressure Characteristics

9AD1201H12, 9AD1201H1H

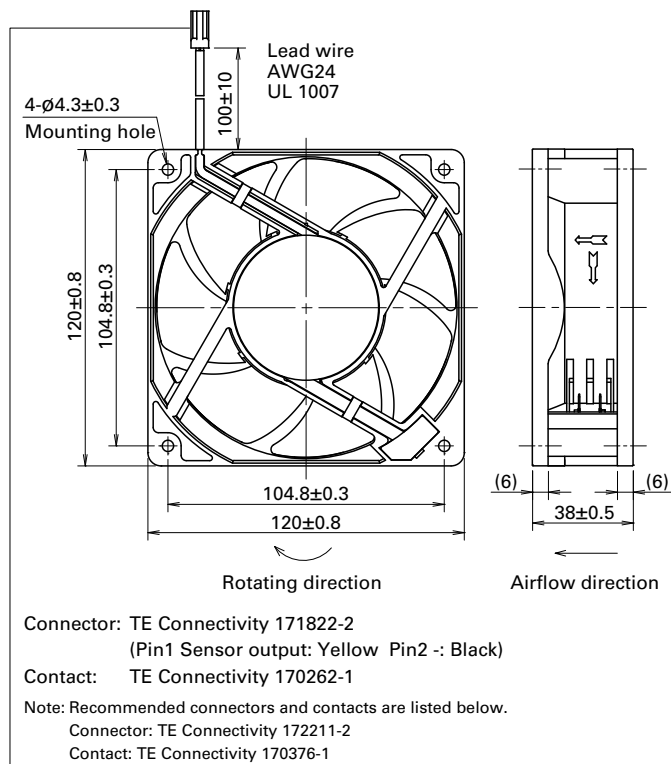


Dimensions (unit: mm) (With ribs)

without Sensor

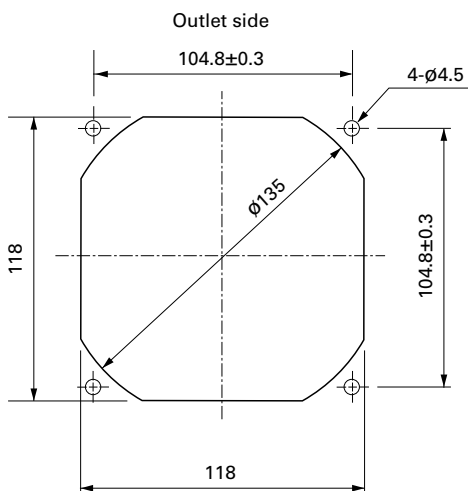
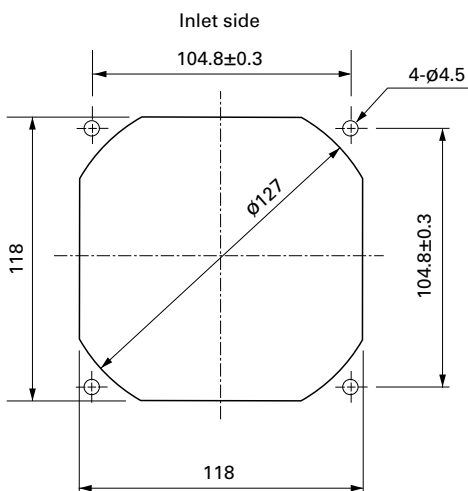


with Low-speed sensor



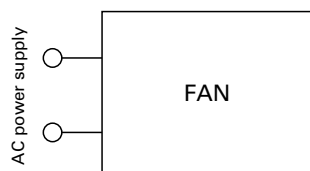
Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

ACDC Fan 120 mm sq.

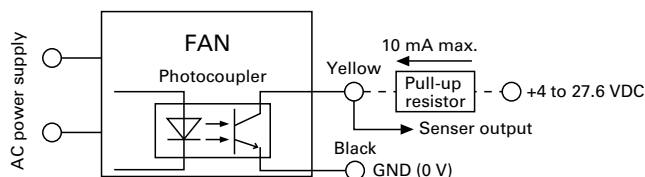


Wiring Diagram

without Sensor



with Low-speed sensor



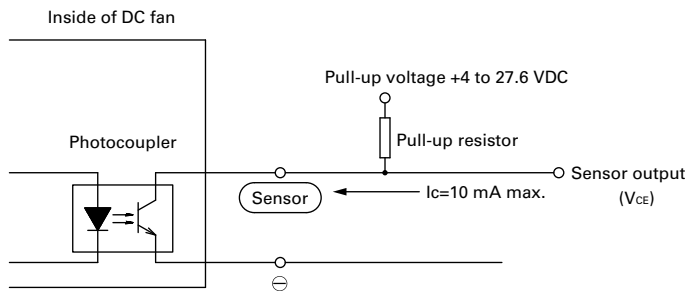
Specifications for Low-speed Sensors

Model No.: 9AD1201H1H

Output circuit: Open collector

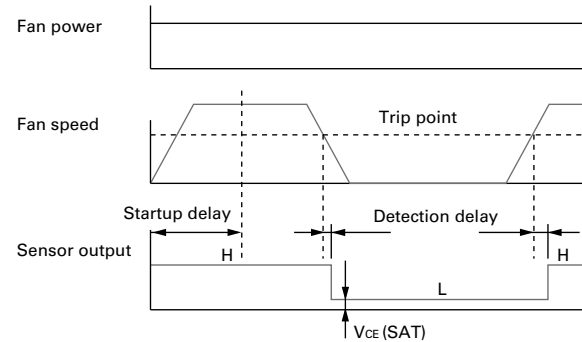
$V_{CE} = +27.6$ VDC max.

$I_C = 10$ mA max. [$V_{CE(SAT)} = 1.0$ V max.]

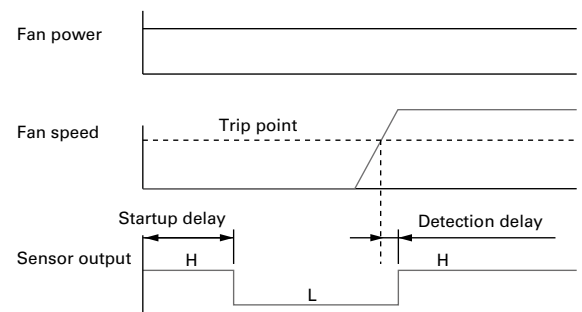


Sensor scheme

Example 1: when steady running



Example 2: when the rotor is locked when the fan motor is turned on and released after the start-up delay time.



Startup delay: 18 ± 3 s
Detection delay: 3 s max.
Trip point: 1700 min^{-1}

Options

Finger guards

page: p. 585

Model no.: 109-019C, 109-019H, 109-019E, 109-019K

Resin filter kits

page: p. 592

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)

Resin finger guards

page: p. 591

Model no.: 109-1000G

Plug cord

page: p. 595

Model no.: 489-1635-L10, 489-1635-L21

Wiring harness for sensor

page: p. 595

Model no.: 489-1636

Features of the San Ace 120AD 9AD type ACDC Fan

Low power consumption

Long life

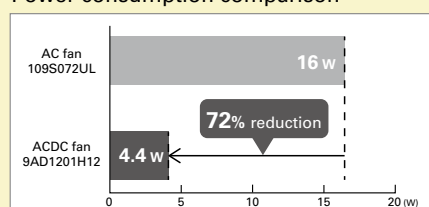
Wide voltage range

(Compared with our existing AC fan with equal size.)

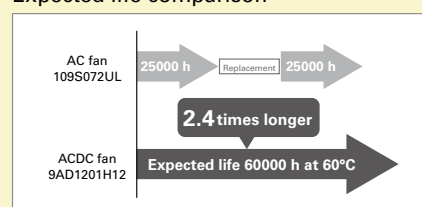
With AC input, the same level of energy saving and long life as a DC fan can be achieved.

The maintenance effort can be reduced too.

Power consumption comparison



Expected life comparison



San Ace 172AD

9AD type

ACDC Fan

Features

High Airflow and High Static Pressure

These fans deliver a maximum airflow of 6.7 m³/min and a maximum static pressure of 195 Pa.

Low Power Consumption

Power consumption has been reduced by approximately 32% compared with the current model.*

Also, the PWM control function enables the control of fan speed, contributing to lowering noise and improving energy efficiency of devices.

Wide Operating Voltage Range

These fans have an input voltage range of 100 to 240 VAC, supporting both 100 and 200 VAC systems.

* For San Ace 172 AC Fan (Model 109S301)



Ø172 × 150 × 51 mm

Specifications

Lead wire model

The models listed below have pulse sensors with PWM control function.

Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB(A)]	Operating temperature [°C]	Expected life [h]
9AD5701P5H003	100 to 240	90 to 264	50/60	100	0.3	17	3800	6.7 236	195 0.78	54	-20 to +70	40000/60°C (70000/40°C)
				0	0.08	3.2	1500	2.64 93	40 0.16	31		

* PWM input frequency is 25 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

Terminal model

The models listed below have pulse sensors with PWM control function.

Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB(A)]	Operating temperature [°C]	Expected life [h]
9AD5701P5HT03	100 to 240	90 to 264	50/60	100	0.3	17	3800	6.7 236	195 0.78	54	-20 to +70	40000/60°C (70000/40°C)
				0	0.08	3.2	1500	2.64 93	40 0.16	31		

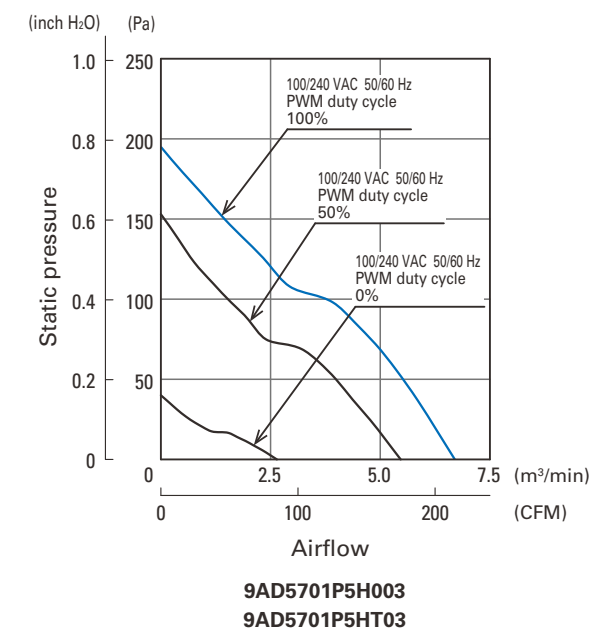
* PWM input frequency is 25 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

Models with the following sensor specifications are also available as options: Without sensor Lock sensor Low-speed sensor

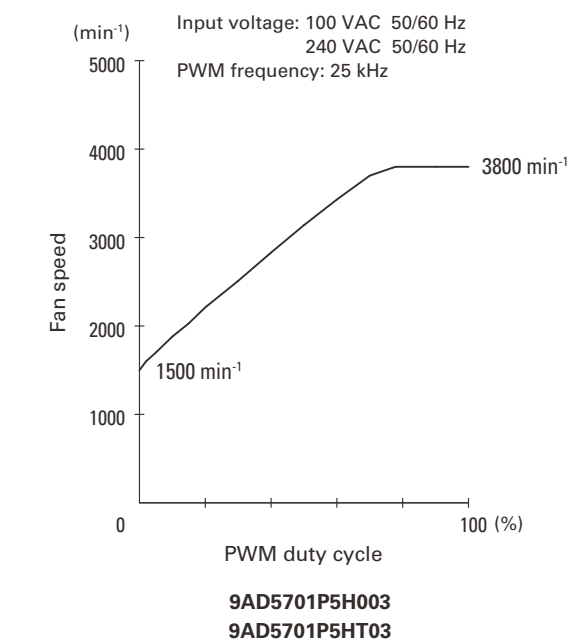
Common Specifications

- ☐ Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- ☐ Expected life Refer to specifications
(L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- ☐ Motor protection function Locked rotor burnout protection
- ☐ Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute
(Lead wire model: between lead wire conductors and frame, Terminal model: between terminal and frame)
- ☐ Insulation resistance 10 MΩ or more with a 500 VDC megger
(Lead wire model: between lead wire conductors and frame, Terminal model: between terminal and frame)
- ☐ Sound pressure level (SPL) At 1 m away from the air inlet
- ☐ Operating temperature Refer to specifications (Non-condensing)
- ☐ Storage temperature -30 to +70°C (Non-condensing)
- ☐ Lead wire AC power input L: Orange N: Gray
Sensor Yellow Control Brown GND Black
- ☐ Mass 750 g

Airflow - Static Pressure Characteristics

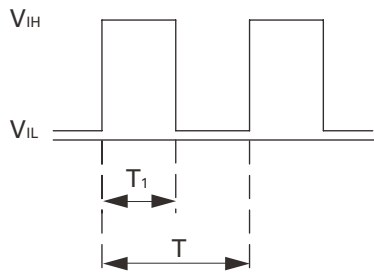


PWM Duty - Speed Characteristics Example



PWM Input Signal Example

Input signal waveform



$$V_{IH} = 4.75 \text{ to } 5.25 \text{ V} \quad V_{IL} = 0 \text{ to } 0.4 \text{ V}$$

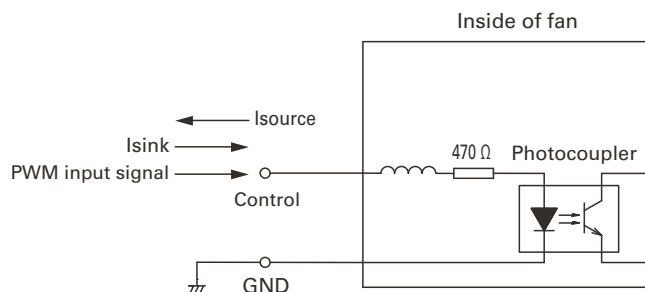
$$\text{PWM duty cycle (\%)} = \frac{T_1}{T} \times 100 \quad \text{PWM frequency } 25 \text{ (kHz)} = \frac{1}{T}$$

Current source (I_{source}) = 1.0 mA max. (when control voltage is 0 V)

Current sink (I_{sink}) = 10 mA max. (when control voltage is 5.25 V)

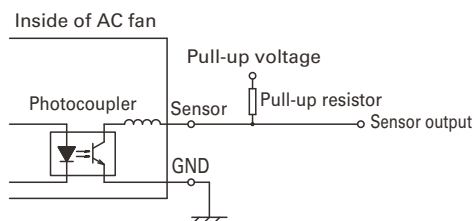
When the PWM control terminal is open,
the fan speed is the same as the speed at 0% PWM duty cycle.
A TTL input can be used for the PWM input signal.

Example of Connection Schematic



Specifications for Pulse Sensors

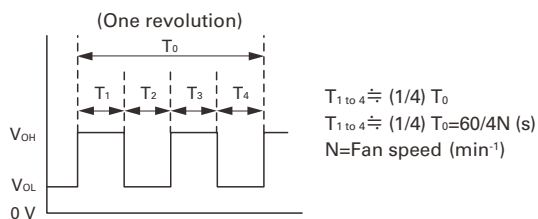
Output circuit: Open collector



$V_{CE} = +60 \text{ V max.}$
 $I_C = 10 \text{ mA max.}$ [$V_{OL} = V_{CE}(\text{SAT}) = 1.2 \text{ V max.}$]

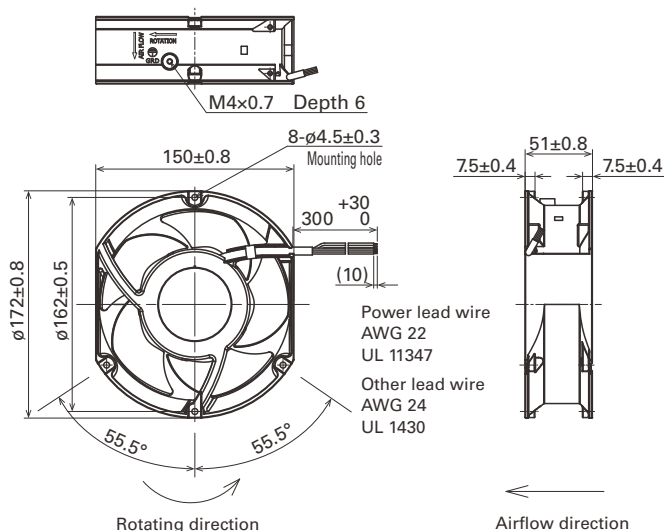
Output waveform (Need pull-up resistor)

In case of steady running

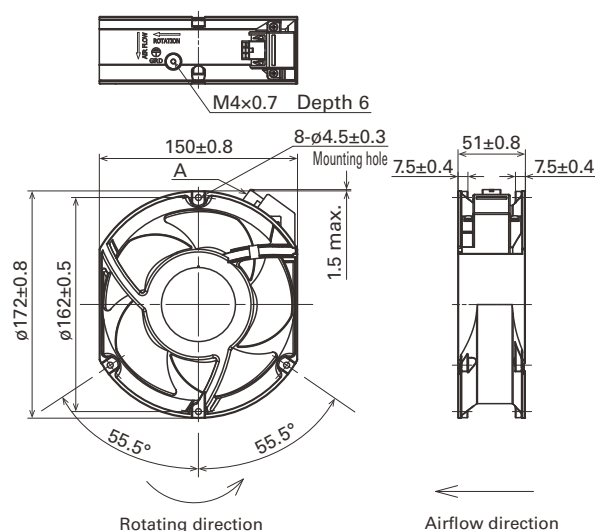


Dimensions (unit: mm)

Lead wire model



Terminal model



A Connector contact



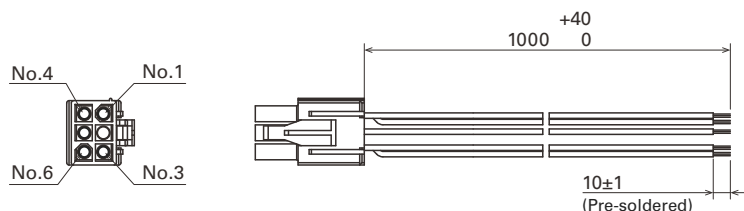
Pin arrangement

Connector (Model no.: TE Connectivity: 1-172160-9)

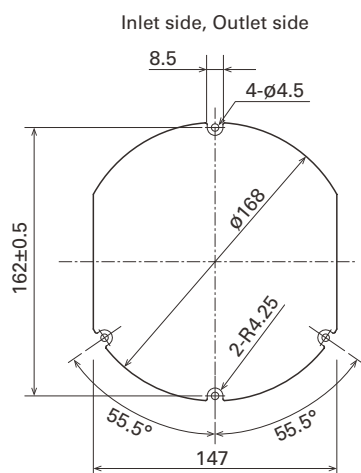
Pin No.	Function	Input
1	L	AC
2	No connection	-
3	N	AC
4	PWM	DC
5	GND	DC
6	Sensor	DC

Wiring harness

Model no.: 489-1647 Mass: 27 g



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Notice

- Please read the "Safety Precautions" on our website before using the product.
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SANYO DENKI CO., LTD. 3-33-1 Minami-Otsuka, Toshima-ku, Tokyo 170-8451, Japan TEL: +81 3 5927 1020

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CATALOG No. C1118B002 '21.7

San Ace 172AD

ACDC Fan

9ADW type

Features

High Airflow and High Static Pressure

These fans deliver a maximum airflow of 6.7 m³/min and a maximum static pressure of 195 Pa.

Low Power Consumption

Power consumption has been reduced by approximately 32% compared with the current model.⁽¹⁾

Also, the PWM control function enables the control of fan speed, contributing to lowering noise and improving energy efficiency of devices.

Wide Operating Voltage Range

These fans have an input voltage range of 100 to 240 VAC, supporting both 100 and 200 VAC systems.

Water and Dust Protection

IP56-rated⁽²⁾ water and dust protection ensures stable fan operation even in harsh environments.

(1) For San Ace 172 AC Fan (Model 109S301)

(2) The degree of protection (IP code) is defined by IEC 60529 (International Electrotechnical Commission) as follows.



Ø172 × 150 × 51 mm

Specifications

Lead wire model

The models listed below have pulse sensors with PWM control function.

Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB(A)]	Operating temperature [°C]	Expected life [h]
9ADW5701P5H003	100 to 240	90 to 264	50/60	100	0.3	17	3800	6.7 236	195 0.78	54	-20 to +70	40000/60°C (70000/40°C)
				0	0.08	3.2	1500	2.64 93	40 0.16	31		

* PWM input frequency is 25 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

Terminal model

The models listed below have pulse sensors with PWM control function.

Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB(A)]	Operating temperature [°C]	Expected life [h]
9ADW5701P5HT03	100 to 240	90 to 264	50/60	100	0.3	17	3800	6.7 236	195 0.78	54	-20 to +70	40000/60°C (70000/40°C)
				0	0.08	3.2	1500	2.64 93	40 0.16	31		

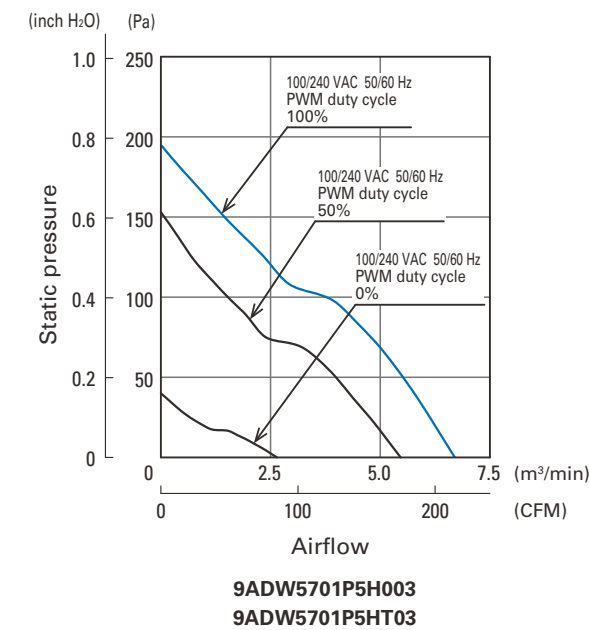
* PWM input frequency is 25 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

Models with the following sensor specifications are also available as options: Without sensor Lock sensor Low-speed sensor

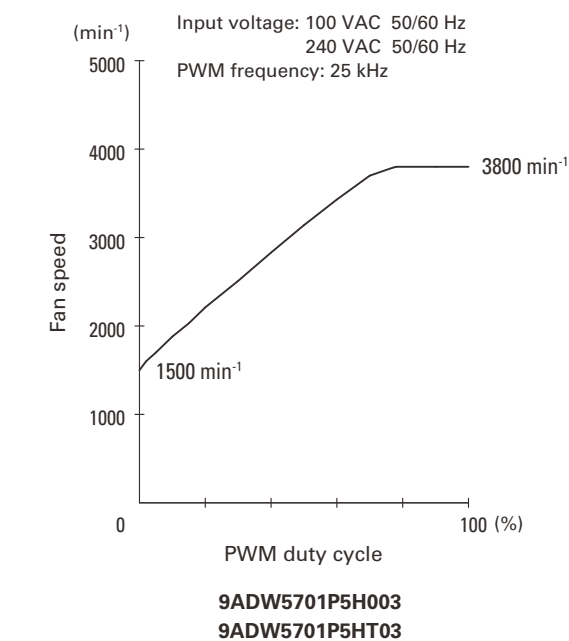
Common Specifications

- ☐ Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- ☐ Expected life Refer to specifications
(L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- ☐ Motor protection function Locked rotor burnout protection
- ☐ Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute
(Lead wire model: between lead wire conductors and frame, Terminal model: between terminal and frame)
- ☐ Insulation resistance 10 MΩ or more with a 500 VDC megger
(Lead wire model: between lead wire conductors and frame, Terminal model: between terminal and frame)
- ☐ Sound pressure level (SPL) At 1 m away from the air inlet
- ☐ Operating temperature Refer to specifications (Non-condensing)
- ☐ Storage temperature -30 to +70°C (Non-condensing)
- ☐ Lead wire AC power input L: Orange N: Gray
Sensor Yellow Control Brown GND Black
- ☐ Mass 810 g
- ☐ Ingress protection IP56

Airflow - Static Pressure Characteristics

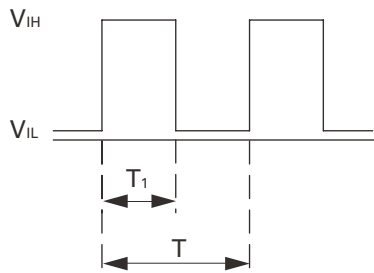


PWM Duty - Speed Characteristics Example



PWM Input Signal Example

Input signal waveform



$$V_{IH} = 4.75 \text{ to } 5.25 \text{ V} \quad V_{IL} = 0 \text{ to } 0.4 \text{ V}$$

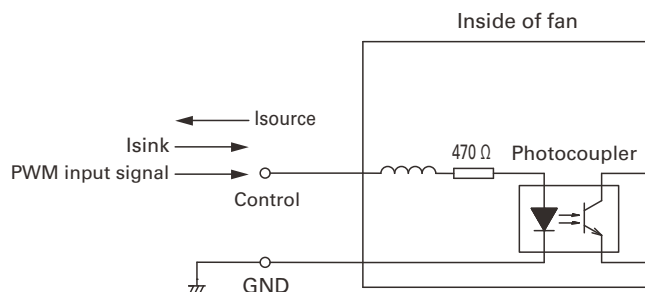
$$\text{PWM duty cycle (\%)} = \frac{T_1}{T} \times 100 \quad \text{PWM frequency } 25 \text{ (kHz)} = \frac{1}{T}$$

Current source (I_{source}) = 1.0 mA max. (when control voltage is 0 V)

Current sink (I_{sink}) = 10 mA max. (when control voltage is 5.25 V)

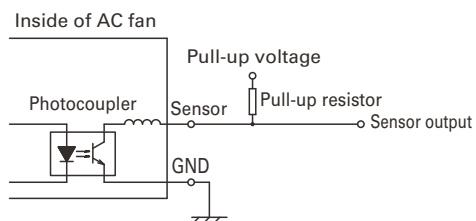
When the PWM control terminal is open,
the fan speed is the same as the speed at 0% PWM duty cycle.
A TTL input can be used for the PWM input signal.

Example of Connection Schematic



Specifications for Pulse Sensors

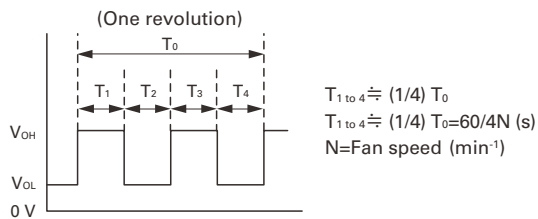
Output circuit: Open collector



$V_{CE} = +60 \text{ V max.}$
 $I_C = 10 \text{ mA max.}$ [$V_{OL} = V_{CE}(\text{SAT}) = 1.2 \text{ V max.}$]

Output waveform (Need pull-up resistor)

In case of steady running



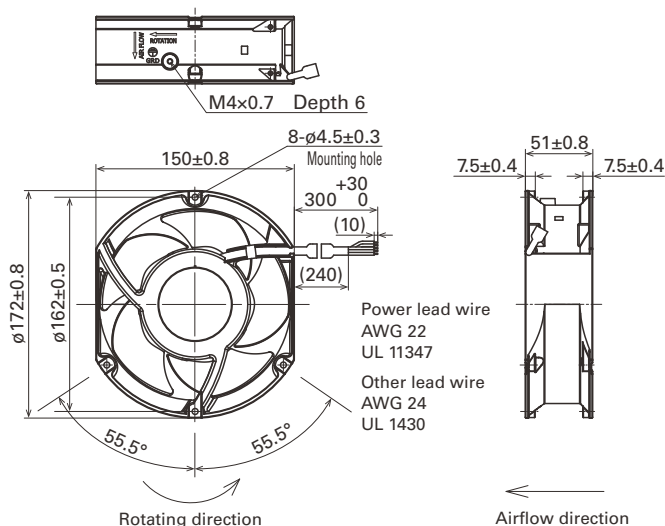
$$T_1 \text{ to } T_4 \approx (1/4) T_0$$

$$T_1 \text{ to } T_4 \approx (1/4) T_0 = 60/4N \text{ (s)}$$

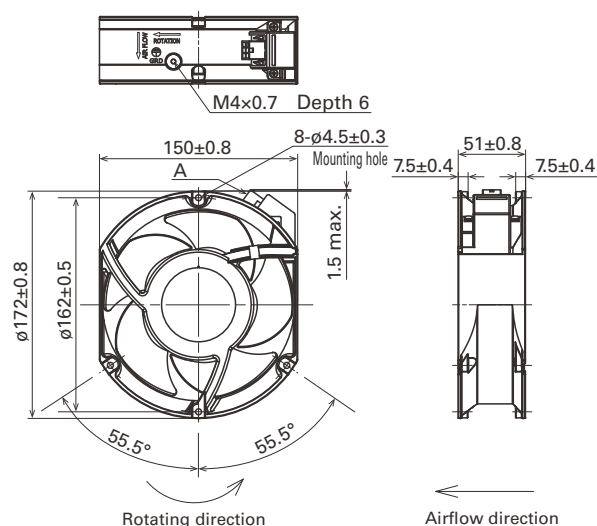
$$N = \text{Fan speed (min}^{-1}\text{)}$$

Dimensions (unit: mm)

Lead wire model



Terminal model



A Connector contact

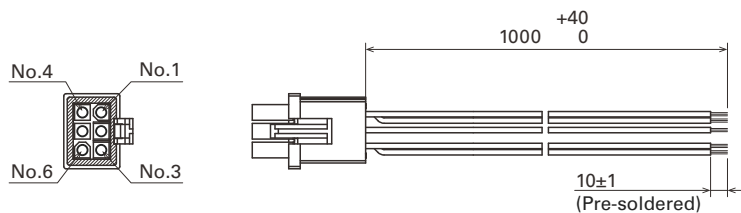


Pin arrangement
Connector (Model no.: TE Connectivity: 794940-1)

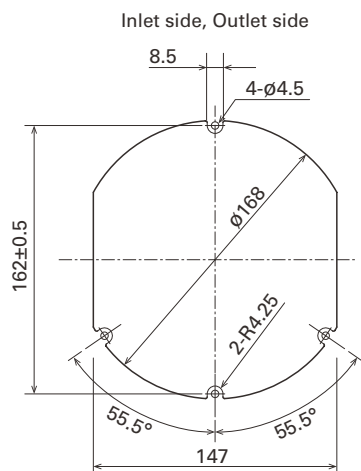
Pin No.	Function	Input
1	L	AC
2	No connection	-
3	N	AC
4	PWM	DC
5	GND	DC
6	Sensor	DC

Wiring harness

Model no.: 489-1645 Mass: 27 g



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



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CATALOG No. C1119B002 '21.7

San Ace 190AD

ACDC Fan

9ADTU type

Features

High Static Pressure

This fan delivers a maximum static pressure of 1200 Pa. They are ideal for blowing applications in air conditioning systems such as FFU (fan filter units) and air purifiers, which require high static pressure performance, and for cooling inverters and the housings of communication systems, which have high mounting density.

No DC Power Supply Required

With an embedded AC-DC converter, these fans can be driven by an AC power supply. This eliminates the need for a high-capacity DC power supply, reducing overall costs.

Low Noise and High Energy Efficiency

The PWM control function enables the control of fan speed, contributing to lowering noise and improving energy efficiency of devices.



Ø190 × 88 mm

Specifications

When the optional inlet nozzle (109-1073) is mounted.

The models listed below **have pulse sensors with PWM control function.**

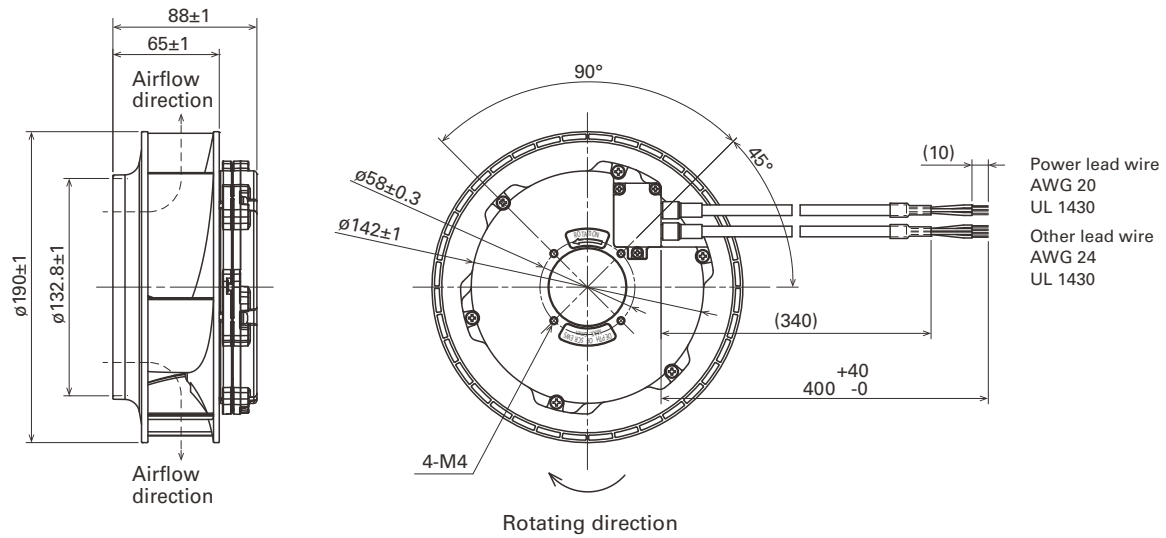
Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB(A)]	Operating temperature [°C]	Expected life [h]
9ADTU11P0G001	115	90 to 132	50/60	100	2.5	150	4800	16.5 583	1200 4.82	72	-25 ~ +60	40000/60°C (70000/40°C)
				20	0.3	10	1000	3.3 116	52 0.21	43		
9ADTU23P0G001	230	180 to 264		100	1.3	150	4800	16.5 583	1200 4.82	72		
				20	0.2	10	1000	3.3 116	52 0.21	43		

* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

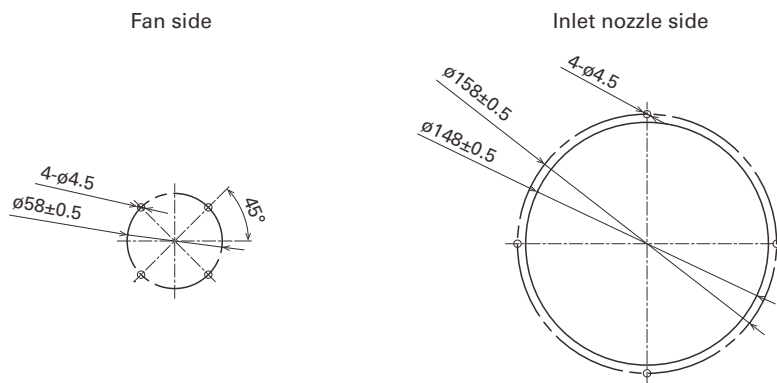
Common Specifications

- ☐ Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- ☐ Expected life Refer to specifications
(L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- ☐ Motor protection function Locked rotor burnout protection
- ☐ Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- ☐ Insulation resistance 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- ☐ Sound pressure level (SPL) At 1 m away from the air inlet
- ☐ Operating temperature Refer to specifications (Non-condensing)
- ☐ Storage temperature -30 to +70°C (Non-condensing)
- ☐ Lead wire AC power input L: Orange N: Gray Ground Yellow / Green
+10 VDC output Red ⊖ Black Sensor Yellow Control Brown
- ☐ Mass 1600 g

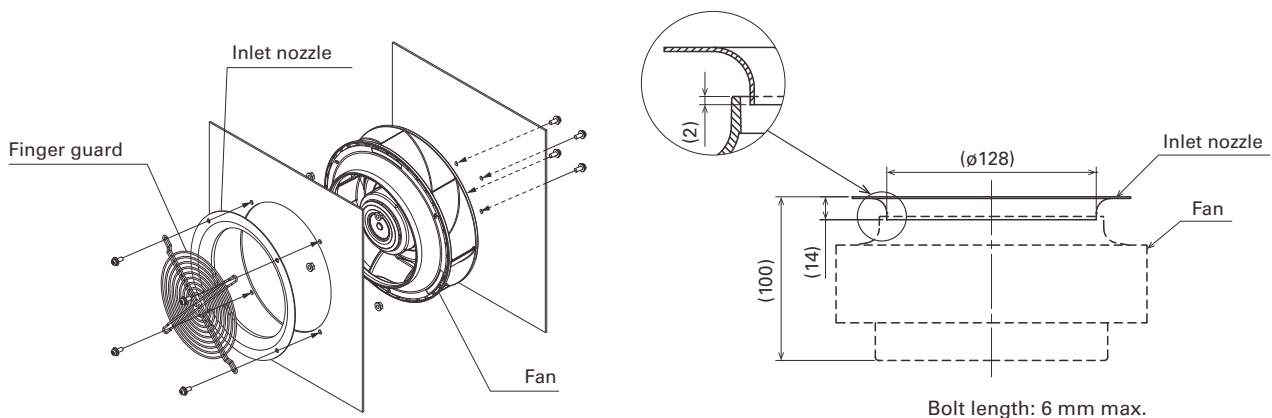
■ Dimensions (unit: mm)



■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



■ Reference Diagram for Mounting



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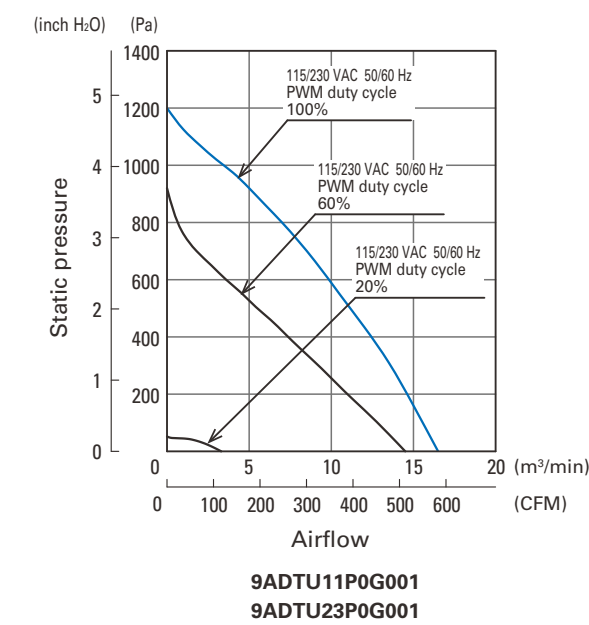
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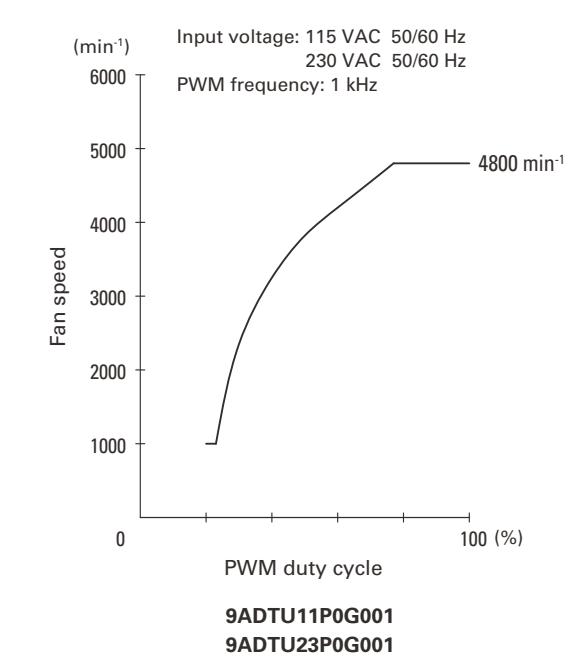
Specifications are subject to change without notice.

CATALOG No. C1113B001 '20.12

Airflow - Static Pressure Characteristics



PWM Duty - Speed Characteristics Example



San Ace 190AD

ACDC Fan

9ADW1TU type

Features

High Static Pressure

This fan delivers a maximum static pressure of 1200 Pa. They are ideal for blowing applications in air conditioning systems such as FFU (fan filter units) and air purifiers, which require high static pressure performance, and for cooling inverters and the housings of communication systems, which have high mounting density.

No DC Power Supply Required

With an embedded AC-DC converter, these fans can be driven by an AC power supply. This eliminates the need for a high-capacity DC power supply, reducing overall costs.

Low Noise and High Energy Efficiency

The PWM control function enables the control of fan speed, contributing to lowering noise and improving energy efficiency of devices.

Water and Dust Resistance

This fan has IP56-rated* water and dust protection. It maintains stable operation even in harsh environments.

* The degree of protection (IP code) is defined by IEC 60529 (International Electrotechnical Commission).

IP56:

- Protection against a level of dust that could hinder operation or impair safety
- Protection against powerful water jets



Ø190 × 88 mm

Specifications When the optional inlet nozzle (109-1073H) is mounted.

The models listed below **have pulse sensors with PWM control function.**

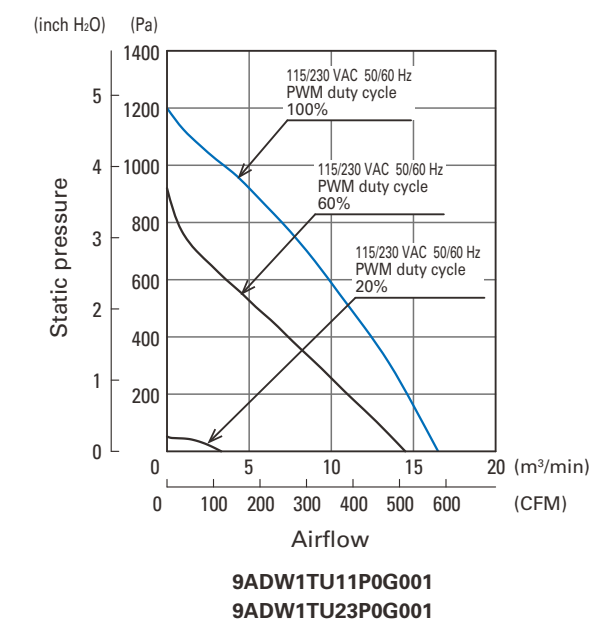
Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB(A)]	Operating temperature [°C]	Expected life [h]
9ADW1TU11P0G001	115	90 to 132	50/60	100	2.5	150	4800	16.5 583	1200 4.82	72	-25 ~ +60	40000/60°C (70000/40°C)
				20	0.3	10	1000	3.3 116	52 0.21	43		
9ADW1TU23P0G001	230	180 to 264		100	1.3	150	4800	16.5 583	1200 4.82	72		
				20	0.2	10	1000	3.3 116	52 0.21	43		

* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

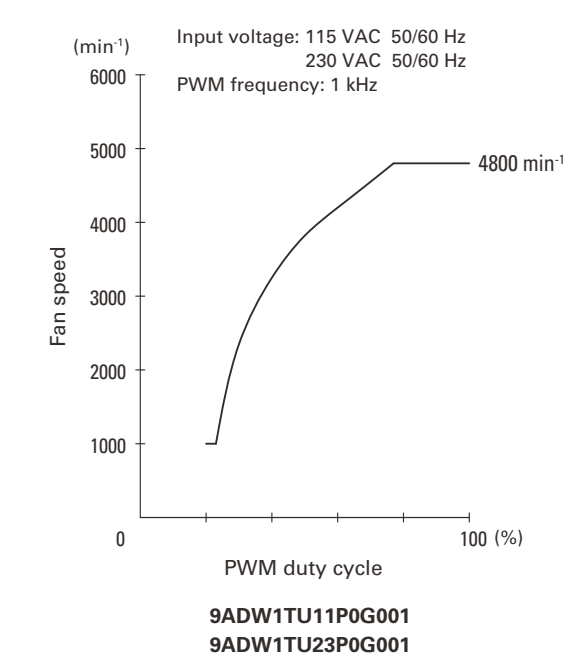
Common Specifications

- ☐ Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- ☐ Expected life Refer to specifications
(L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- ☐ Motor protection function Locked rotor burnout protection
- ☐ Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- ☐ Insulation resistance 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- ☐ Sound pressure level (SPL) At 1 m away from the air inlet
- ☐ Operating temperature Refer to specifications (Non-condensing)
- ☐ Storage temperature -30 to +70°C (Non-condensing)
- ☐ Lead wire AC power input L: Orange N: Gray Ground Yellow / Green
+10 VDC output Red ⊖ Black Sensor Yellow Control Brown
- ☐ Mass 1700 g
- ☐ Ingress protection IP56

Airflow - Static Pressure Characteristics

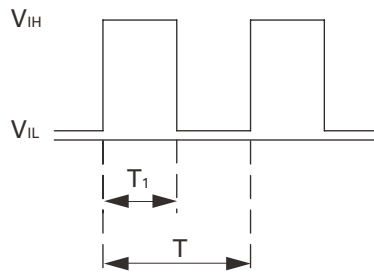


PWM Duty - Speed Characteristics Example



PWM Input Signal Example

Input signal waveform



$$V_{IH} = 2.8 \text{ to } 10.5 \text{ V} \quad V_{IL} = 0 \text{ to } 0.5 \text{ V}$$

$$\text{PWM duty cycle (\%)} = \frac{T_1}{T} \times 100 \quad \text{PWM frequency 1 (kHz)} = \frac{1}{T}$$

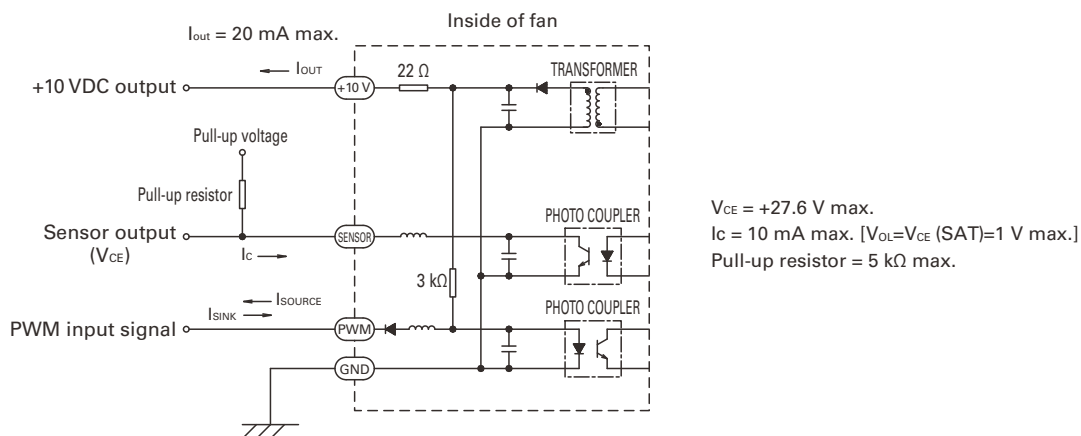
Current source (I_{source}) = 5 mA max. (when control voltage is 0 V)

Current sink (I_{sink}) = 0.1 mA max. (when control voltage is 10 V)

Control terminal voltage = 11.5 V max. (when control terminal is open)

When the control terminal is open,
fan speed is the same as when PWM duty cycle is 100%.
Either TTL input, open collector or open drain can be used for
PWM control input signal.

Example of Connection Schematic

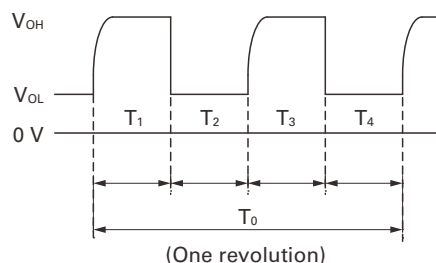


Specifications for Pulse Sensors

Output circuit: Open collector

Output waveform

In case of steady running



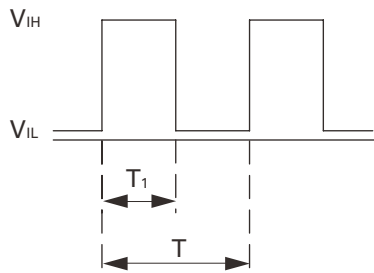
$$T_{1 \text{ to } 4} \approx (1/4) T_0$$

$$T_0 = 60/4N \text{ (s)}$$

$$N = \text{Fan speed (min}^{-1}\text{)}$$

PWM Input Signal Example

Input signal waveform



$$V_{IH} = 2.8 \text{ to } 10.5 \text{ V} \quad V_{IL} = 0 \text{ to } 0.5 \text{ V}$$

$$\text{PWM duty cycle (\%)} = \frac{T_1}{T} \times 100 \quad \text{PWM frequency 1 (kHz)} = \frac{1}{T}$$

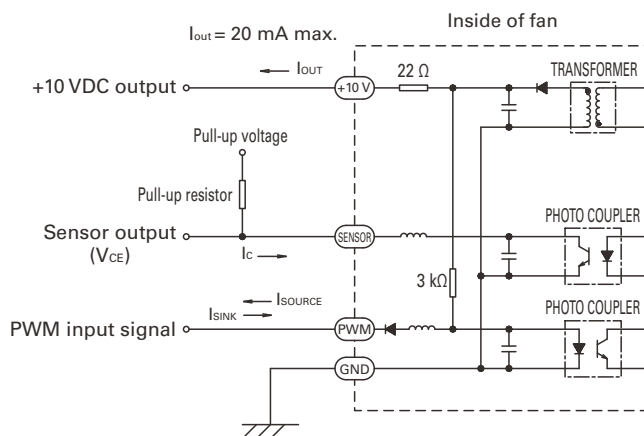
Current source (I_{source}) = 5 mA max. (when control voltage is 0 V)

Current sink (I_{sink}) = 0.1 mA max. (when control voltage is 10 V)

Control terminal voltage = 11.5 V max. (when control terminal is open)

When the control terminal is open,
fan speed is the same as when PWM duty cycle is 100%.
Either TTL input, open collector or open drain can be used for
PWM control input signal.

Example of Connection Schematic



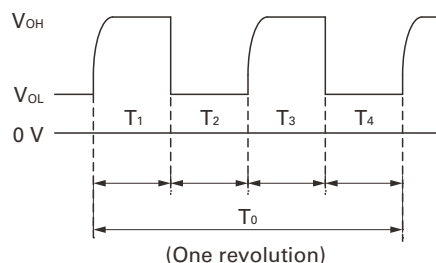
$V_{CE} = +27.6 \text{ V max.}$
 $I_c = 10 \text{ mA max.}$ [$V_{OL} = V_{CE} (\text{SAT}) = 1 \text{ V max.}$]
Pull-up resistor = 5 kΩ max.

Specifications for Pulse Sensors

Output circuit: Open collector

Output waveform

In case of steady running



$$T_1 \text{ to } 4 \approx (1/4) T_0$$

$$T_0 = 60/4N \text{ (s)}$$

$$N = \text{Fan speed (min}^{-1}\text{)}$$

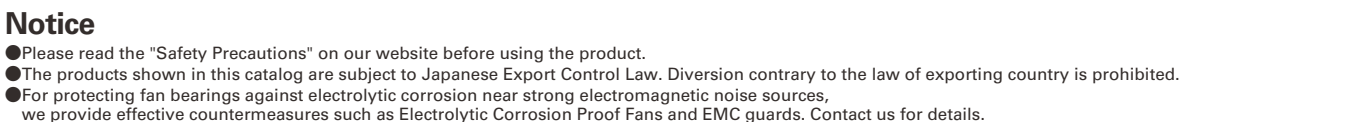
Dimensions (unit: mm)



■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting



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Ø225x99 mm


San Ace 225AD 9ADTS type

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- Sound pressure level (SPL) At 1 m away from the air inlet
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

AC power input	L: Orange N: Gray	Ground	Yellow / Green
+10 VDC output	Red ⊖Black	Sensor	Yellow
		Control	Brown
- Mass 1800 g

Specifications When the optional inlet nozzle (109-1134) is mounted.

The models listed below **have pulse sensors with PWM control function.**

Model no.	Rated voltage [V]	Operating voltage range [V]	PWM duty cycle [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
9ADTS11P0G001	115	90 to 132	100	2.23	155	3200	23.0 812	815 3.27	74	-20 to +60	40000/60°C (70000/40°C)
			20	0.3	10	1000	7.1 252	80 0.32	50		
9ADTS11P0F001			100	1.11	70	2450	17.6 621	480 1.93	68		
			20	0.3	10	1000	7.1 252	80 0.32	50		
9ADTS23P0G001	230	180 to 264	100	1.17	155	3200	23.0 812	815 3.27	74		
			20	0.2	10	1000	7.1 252	80 0.32	50		
9ADTS23P0F001			100	0.64	70	2450	17.6 621	480 1.93	68		
			20	0.2	10	1000	7.1 252	80 0.32	50		

* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

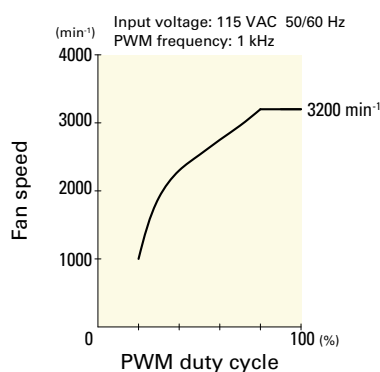
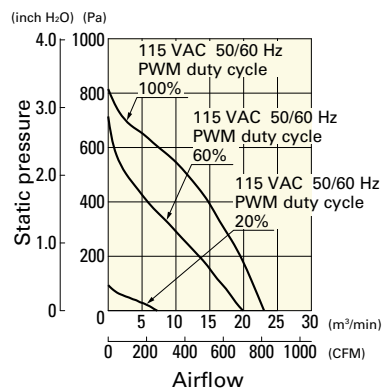
• AC power frequency: 50/60 Hz

Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADTS11P0G001 With pulse sensor with PWM control function

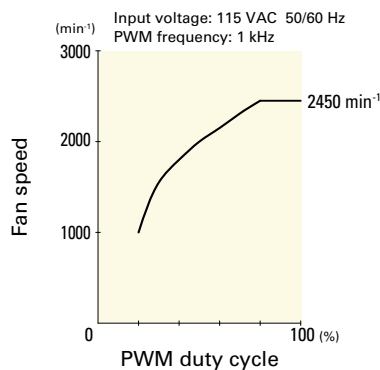
PWM duty cycle

PWM duty - Speed characteristics example



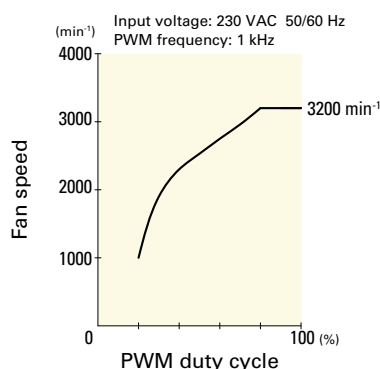
9ADTS11P0F001 With pulse sensor with PWM control function

PWM duty - Speed characteristics example



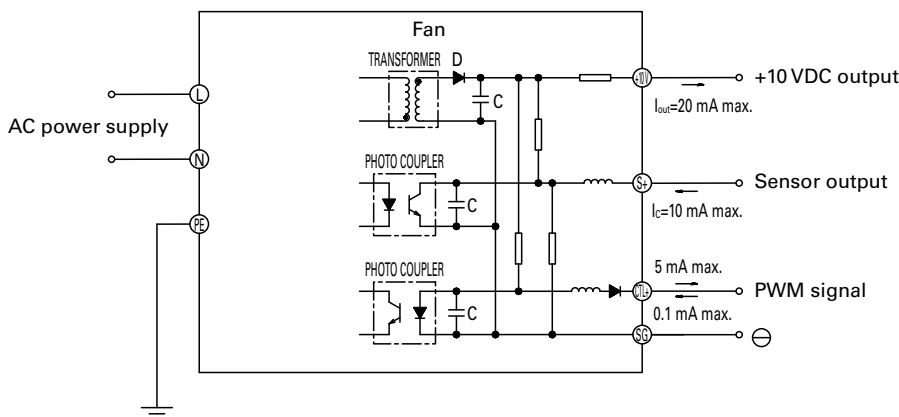
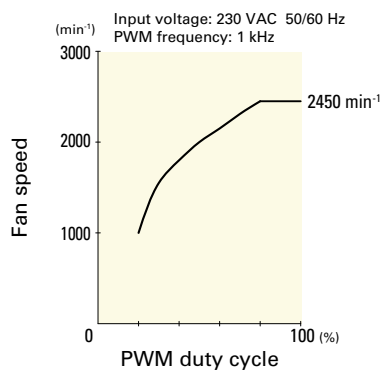
9ADTS23P0G001 With pulse sensor with PWM control function

PWM duty - Speed characteristics example

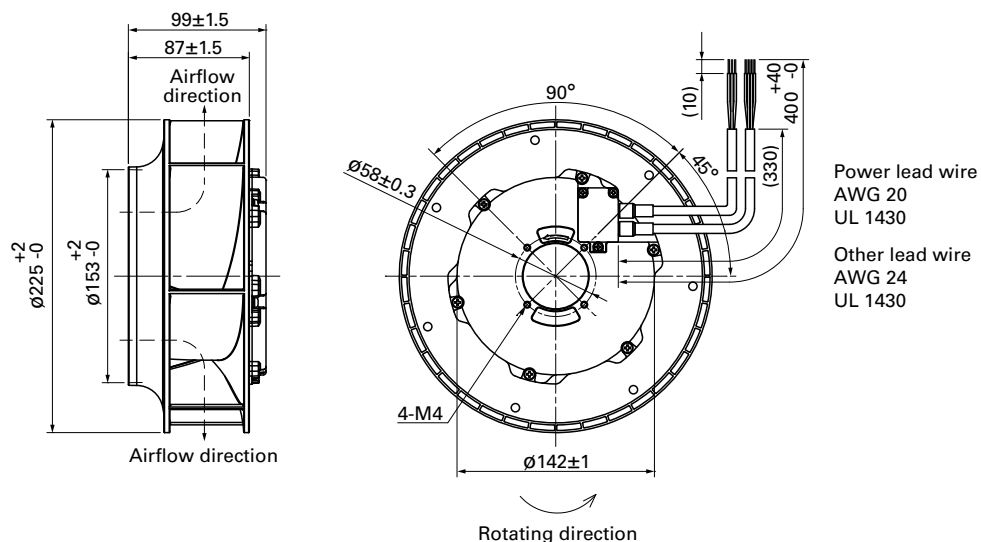


9ADTS23P0F001 With pulse sensor with PWM control function

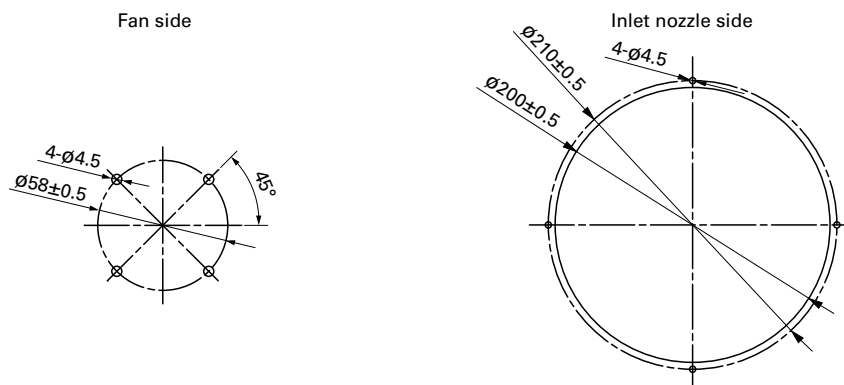
PWM duty - Speed characteristics example



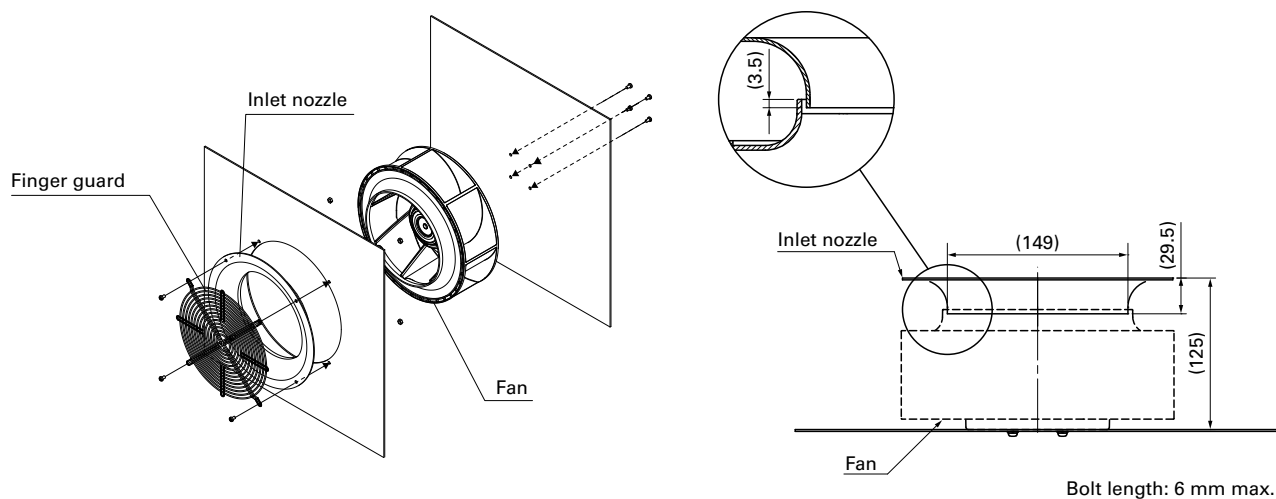
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting



Options

Finger guards

page: p. 587

Model no.: 109-1137, 109-1137H

Inlet nozzle

page: p. 589

Model no.: 109-1134, 109-1134H

Ø225×99 mm

San Ace 225AD 9ADW1TS type



General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- Sound pressure level (SPL) At 1 m away from the air inlet
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

AC power input	L: Orange N: Gray	Ground	Yellow / Green
+10 VDC output	Red ⊖Black	Sensor	Yellow
		Control	Brown
- Mass 1900 g
- Ingress protection IP56

Specifications When the optional inlet nozzle (109-1134H) is mounted.

The models listed below **have pulse sensors with PWM control function.**

Model no.	Rated voltage [V]	Operating voltage range [V]	PWM duty cycle [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
9ADW1TS11P0H001	115	90 to 132	100	2.06	140	3100	22.3 787	760 3.05	73	-20 to +60	40000/60°C (70000/40°C)
			20	0.3	11	1000	7.1 252	80 0.32	50		
9ADW1TS11P0M001			100	1.08	61	2350	16.9 597	440 1.77	67		
			20	0.3	11	1000	7.1 252	80 0.32	50		
9ADW1TS23P0H001	230	180 to 264	100	1.06	140	3100	22.3 787	760 3.05	73		
			20	0.2	11	1000	7.1 252	80 0.32	50		
9ADW1TS23P0M001			100	0.57	61	2350	16.9 597	440 1.77	67		
			20	0.2	11	1000	7.1 252	80 0.32	50		

* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

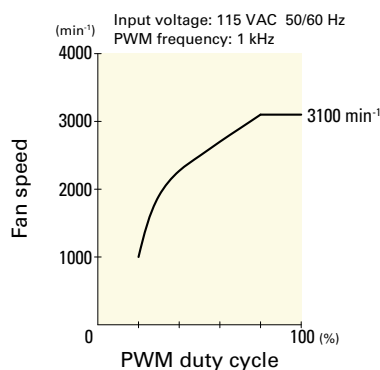
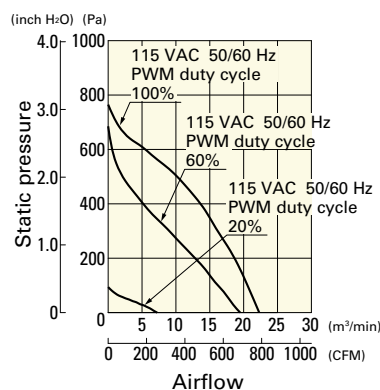
• AC power frequency: 50/60 Hz

Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADW1TS11P0H001 With pulse sensor with PWM control function

PWM duty cycle

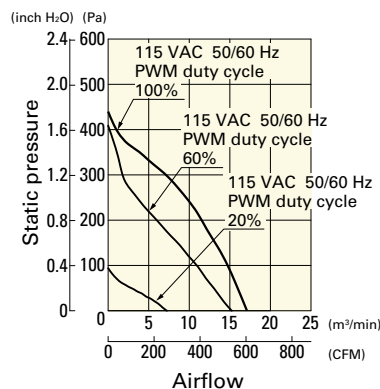
PWM duty - Speed characteristics example



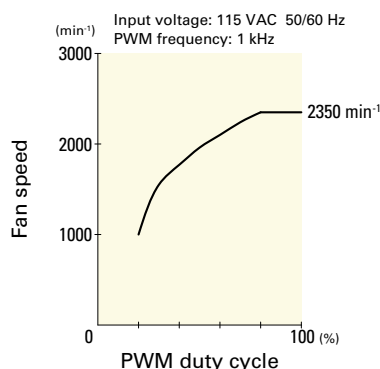
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADW1TS11P0M001 With pulse sensor with PWM control function

PWM duty cycle

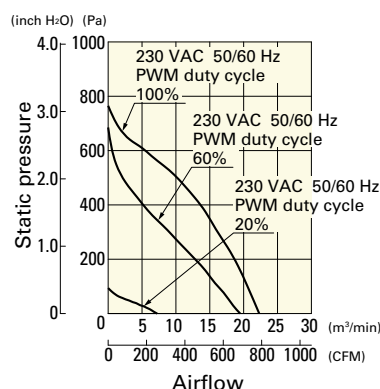


PWM duty - Speed characteristics example

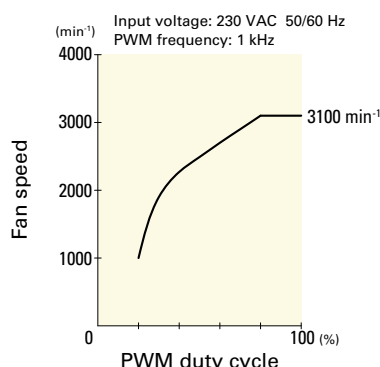


9ADW1TS23P0H001 With pulse sensor with PWM control function

PWM duty cycle

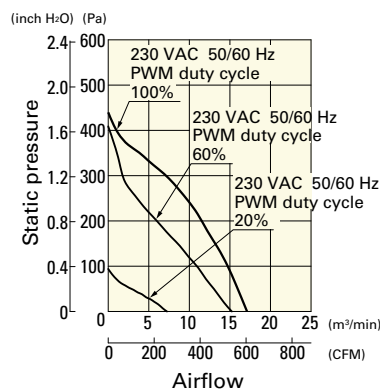


PWM duty - Speed characteristics example

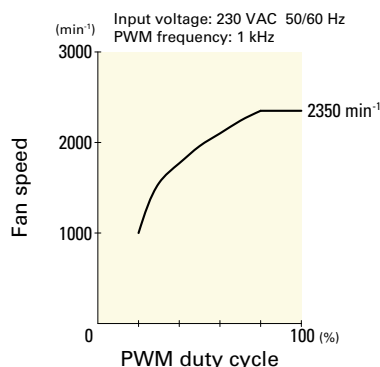


9ADW1TS23P0M001 With pulse sensor with PWM control function

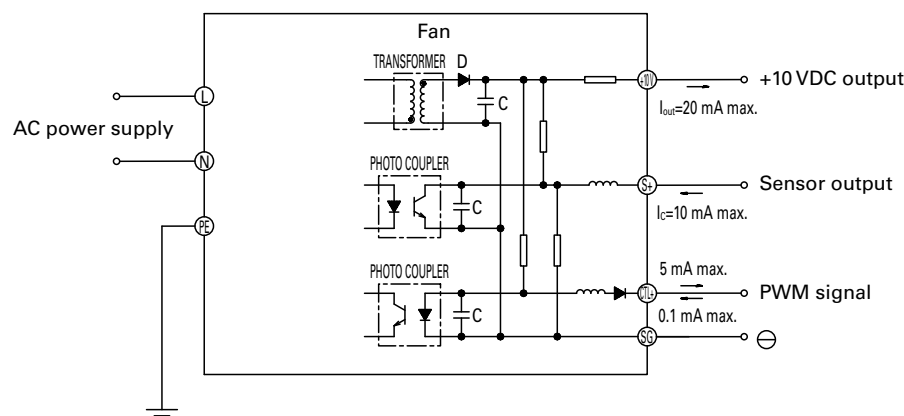
PWM duty cycle



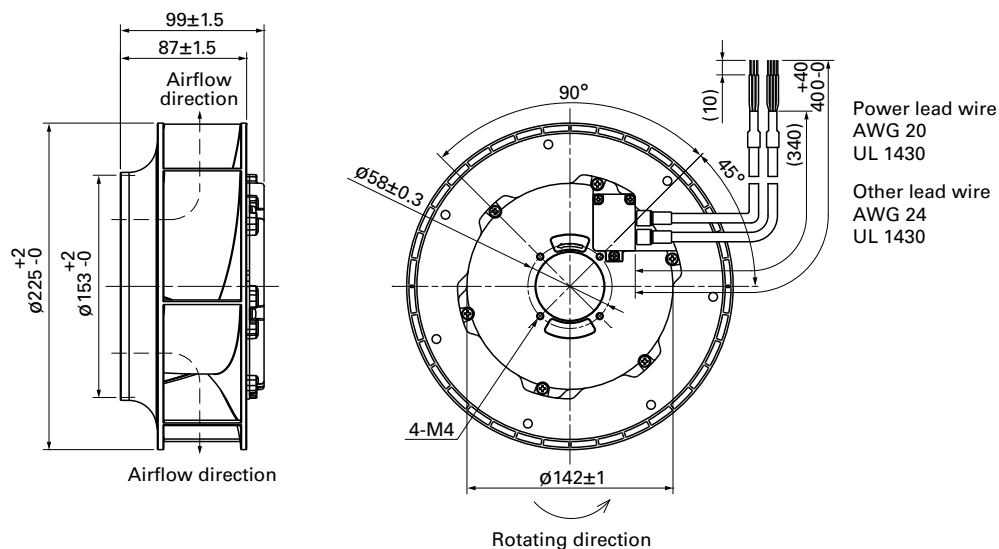
PWM duty - Speed characteristics example



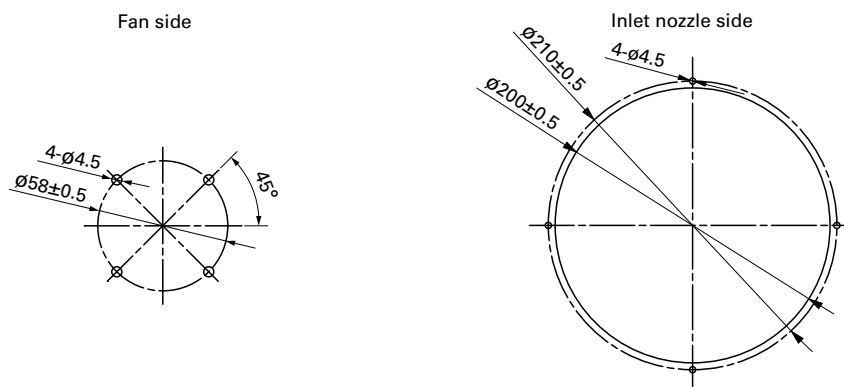
Wiring Diagram



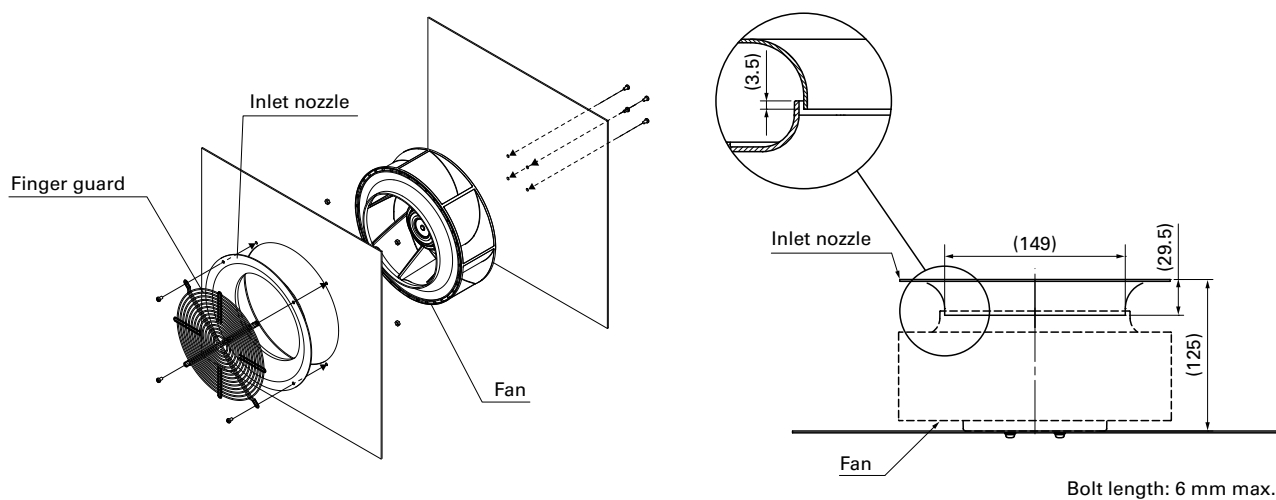
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting



Options

Finger guards

page: p. 587

Model no.: 109-1137, 109-1137H

Inlet nozzle

page: p. 589

Model no.: 109-1134, 109-1134H

San Ace 250AD

ACDC Fan

9ADTV type

Features

High Airflow and High Static Pressure

These fans deliver a maximum airflow of 26.5 m³/min and a maximum static pressure of 650 Pa.

They are ideal for air conditioning systems such as heat exchangers and fan filter units (FFU), which require high cooling performance, and for cooling inverters and telecom equipment cabinets, which have high mounting density so air flows with difficulty.

No DC Power Supply Required

With an embedded AC-DC converter, these fans can be driven by an AC power supply.

This eliminates the need for a high-capacity DC power supply, reducing the overall costs.

Low Noise and High Energy Efficiency

The PWM control function enables the control of fan speed, contributing to lowering noise and improving energy efficiency of devices.



Ø250 × 99 mm

Specifications

When the optional inlet nozzle (109-1151) is mounted.

The models listed below **have pulse sensors with PWM control function.**

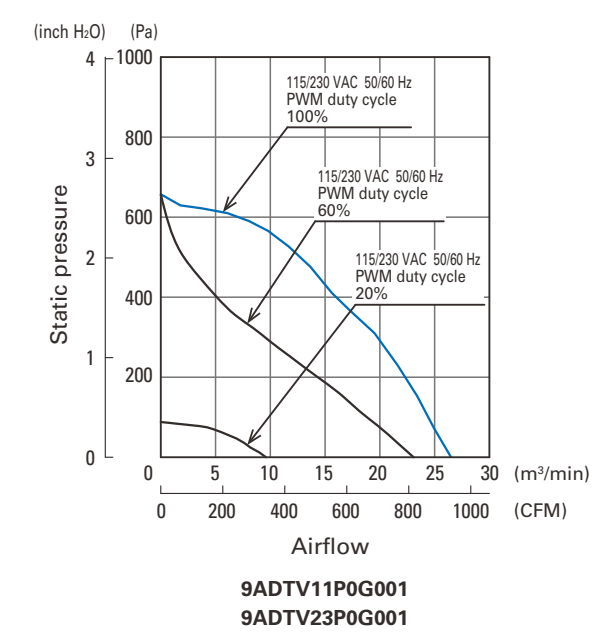
Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB(A)]	Operating temperature [°C]	Expected life [h]
9ADTV11P0G001	115	90 to 132	50/60	100	2.3	140	2700	26.5 936	650 2.61	71	-25 to +60	40000/60°C (70000/40°C)
				20	0.3	10	1000	9.6 339	88 0.35	57		
9ADTV23P0G001	230	180 to 264		100	1.2	140	2700	26.5 936	650 2.61	71		
				20	0.2	10	1000	9.6 339	88 0.35	57		

* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

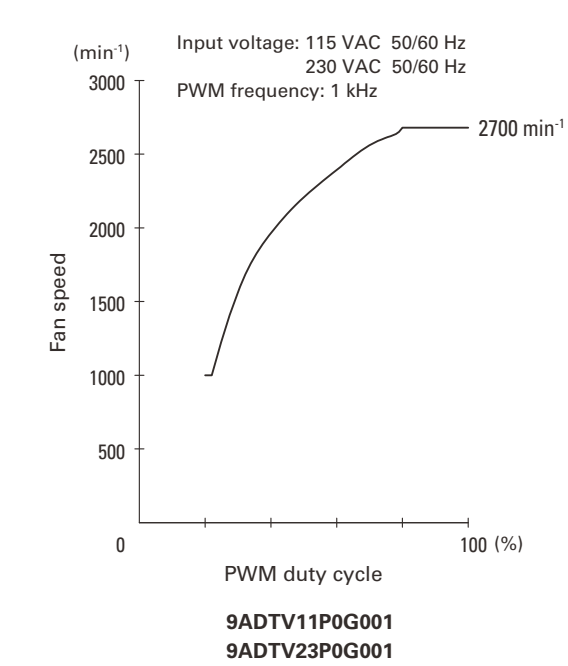
Common Specifications

- ☐ Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- ☐ Expected life Refer to specifications
(L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- ☐ Motor protection function Locked rotor burnout protection
- ☐ Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- ☐ Insulation resistance 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- ☐ Sound pressure level (SPL) At 1 m away from the air inlet
- ☐ Operating temperature Refer to specifications (Non-condensing)
- ☐ Storage temperature -30 to +70°C (Non-condensing)
- ☐ Lead wire AC power input L: Orange N: Gray Ground Yellow / Green
+10 VDC output Red ⊖ Black Sensor Yellow Control Brown
- ☐ Mass 1920 g

Airflow - Static Pressure Characteristics

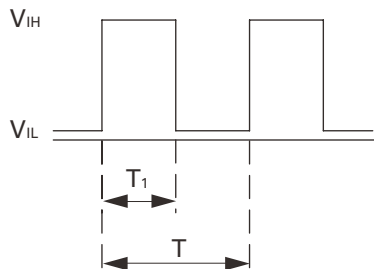


PWM Duty - Speed Characteristics Example



PWM Input Signal Example

Input signal waveform



$$V_{IH} = 2.8 \text{ to } 10.5 \text{ V} \quad V_{IL} = 0 \text{ to } 0.5 \text{ V}$$

$$\text{PWM duty cycle (\%)} = \frac{T_1}{T} \times 100 \quad \text{PWM frequency 1 (kHz)} = \frac{1}{T}$$

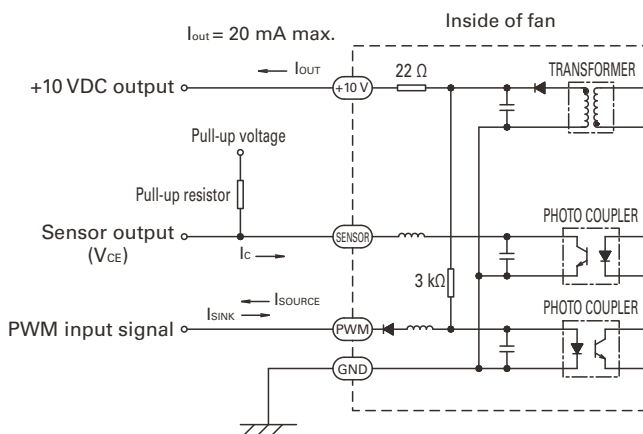
Current source (I_{source}) = 5 mA max. (when control voltage is 0 V)

Current sink (I_{sink}) = 0.1 mA max. (when control voltage is 10 V)

Control terminal voltage = 11.5 V max. (when control terminal is open)

When the control terminal is open,
fan speed is the same as when PWM duty cycle is 100%.
Either TTL input, open collector or open drain can be used for
PWM control input signal.

Example of Connection Schematic



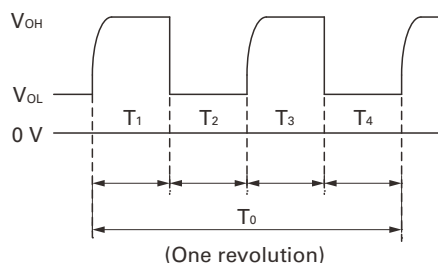
$V_{CE} = +27.6 \text{ V max.}$
 $I_C = 10 \text{ mA max.}$ [$V_{OL} = V_{CE} (\text{SAT}) = 1 \text{ V max.}$]
Pull-up resistor = 5 kΩ max.

Specifications for Pulse Sensors

Output circuit: Open collector

Output waveform

In case of steady running

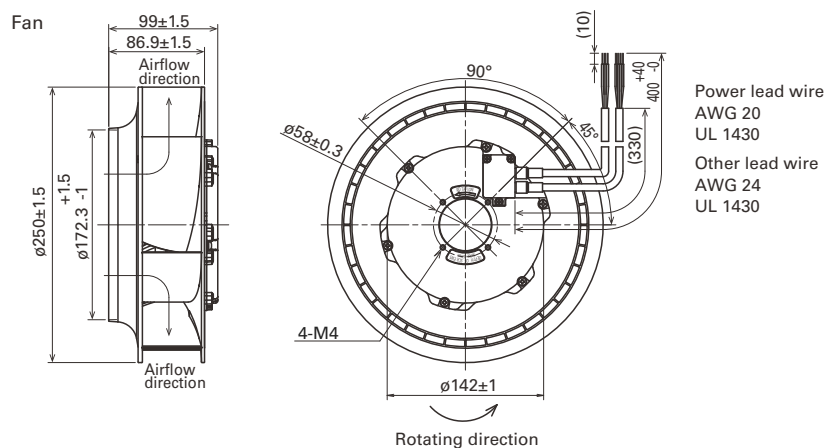


$$T_1 \text{ to } 4 \approx (1/4) T_0$$

$$T_0 = 60/4N \text{ (s)}$$

$$N = \text{Fan speed (min}^{-1}\text{)}$$

Dimensions (unit: mm)



Finger guards

Model no.: 109-1152

Surface treatment: Nickel-chrome plating (silver) Mass: g

Model no.: 109-1152H

Surface treatment: Cation electropainting (black) Mass: g

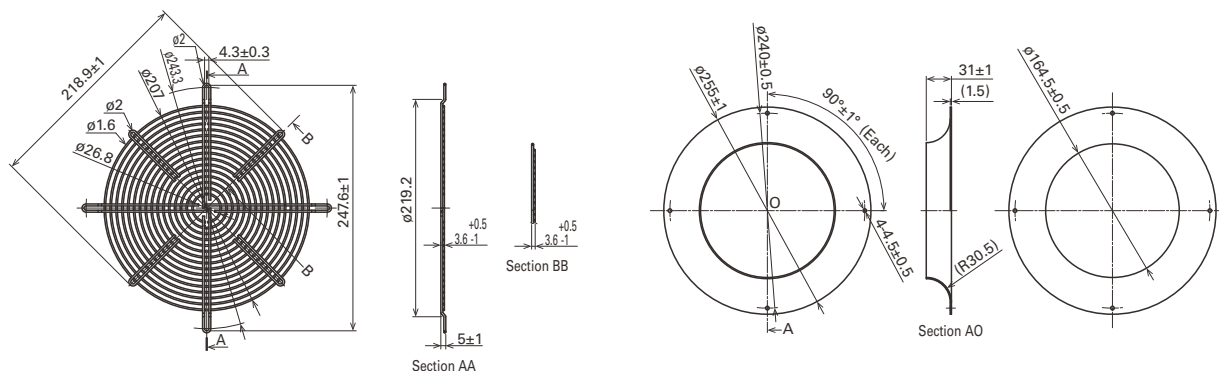
Inlet nozzle

Model no.: 109-1151

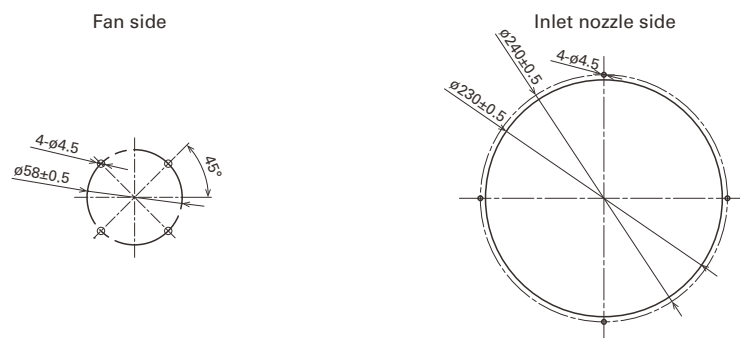
Material: Steel sheet Surface treatment: Nickel-chrome plating (silver) Mass: 440 g

Model no.: 109-1151H

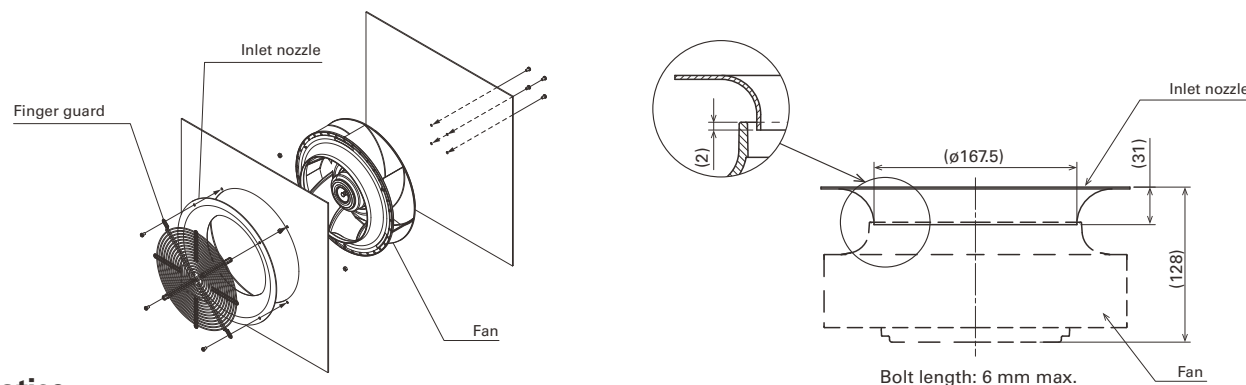
Material: Steel sheet Surface treatment: Cation electropainting (black) Mass: 440 g



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting



Notice

- Please read the "Safety Precautions" on our website before using the product.
- The products shown in this catalog are subject to Japanese Export Control Law. Diversion contrary to the law of exporting country is prohibited.
- For protecting fan bearings against electrolytic corrosion near strong electromagnetic noise sources, we provide effective countermeasures such as Electrolytic Corrosion Proof Fans and EMC guards. Contact us for details.

SANYO DENKI CO., LTD. 3-33-1 Minami-Otsuka, Toshima-ku, Tokyo 170-8451, Japan TEL: +81 3 5927 1020

<https://www.sanyodenki.com>

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Specifications are subject to change without notice.

CATALOG No. C1115B001 '21.4

San Ace 250AD

ACDC Fan

9ADW1TV type

Features

High Airflow and High Static Pressure

These fans deliver a maximum airflow of 26.5 m³/min and a maximum static pressure of 650 Pa. They are ideal for air conditioning systems such as heat exchangers and fan filter units (FFU), which require high cooling performance, and for cooling inverters and telecom equipment cabinets, which have high mounting density so air flows with difficulty.

No DC Power Supply Required

With an embedded AC-DC converter, these fans can be driven by an AC power supply. This eliminates the need for a high-capacity DC power supply, reducing the overall costs.

Low Noise and High Energy Efficiency

The PWM control function enables the control of fan speed, contributing to lowering noise and improving energy efficiency of devices.

Water and Dust Resistance

This fan has IP56-rated* water and dust protection. It maintains stable operation even in harsh environments.

* The degree of protection (IP code) is defined by IEC 60529 (International Electrotechnical Commission).

IP56:

- Protection against a level of dust that could hinder operation or impair safety
- Protection against powerful water jets



Ø250 × 99 mm

Specifications When the optional inlet nozzle (109-1151H) is mounted.

The models listed below **have pulse sensors with PWM control function.**

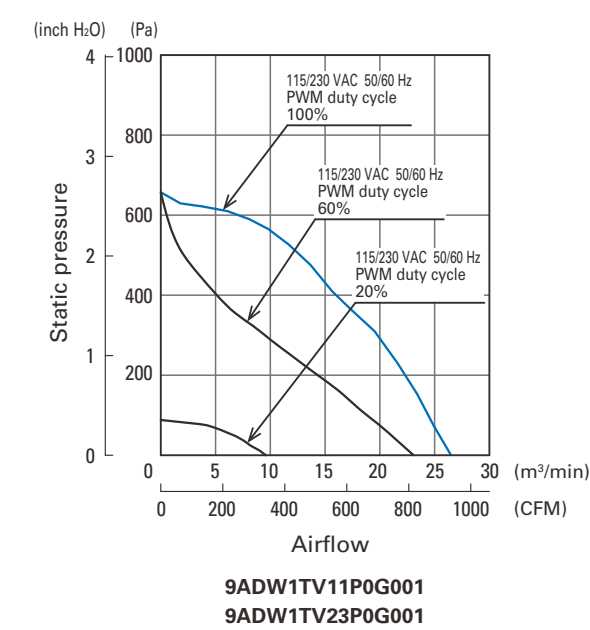
Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB(A)]	Operating temperature [°C]	Expected life [h]
9ADW1TV11P0G001	115	90 to 132	50/60	100	2.3	140	2700	26.5 936	650 2.61	71	-25 to +60	40000/60°C (70000/40°C)
				20	0.3	10	1000	9.6 339	88 0.35	57		
9ADW1TV23P0G001	230	180 to 264		100	1.2	140	2700	26.5 936	650 2.61	71		
				20	0.2	10	1000	9.6 339	88 0.35	57		

* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

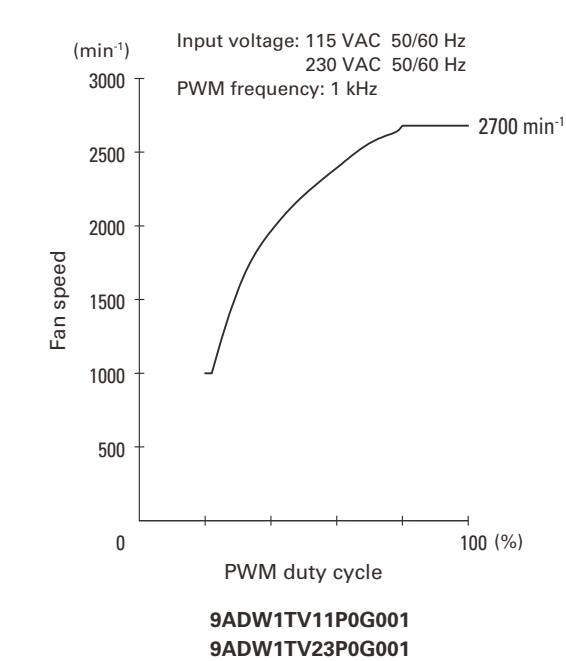
Common Specifications

- ☐ Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- ☐ Expected life Refer to specifications
(L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- ☐ Motor protection function Locked rotor burnout protection
- ☐ Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and motor case)
- ☐ Insulation resistance 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- ☐ Sound pressure level (SPL) At 1 m away from the air inlet
- ☐ Operating temperature Refer to specifications (Non-condensing)
- ☐ Storage temperature -30 to +70°C (Non-condensing)
- ☐ Lead wire AC power input L: Orange N: Gray Ground Yellow / Green
+10 VDC output Red ⊖ Black Sensor Yellow Control Brown
- ☐ Mass 2020 g
- ☐ Ingress protection IP56

Airflow - Static Pressure Characteristics

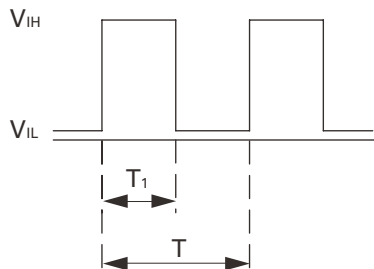


PWM Duty - Speed Characteristics Example



PWM Input Signal Example

Input signal waveform



$$V_{IH} = 2.8 \text{ to } 10.5 \text{ V} \quad V_{IL} = 0 \text{ to } 0.5 \text{ V}$$

$$\text{PWM duty cycle (\%)} = \frac{T_1}{T} \times 100 \quad \text{PWM frequency } 1 \text{ (kHz)} = \frac{1}{T}$$

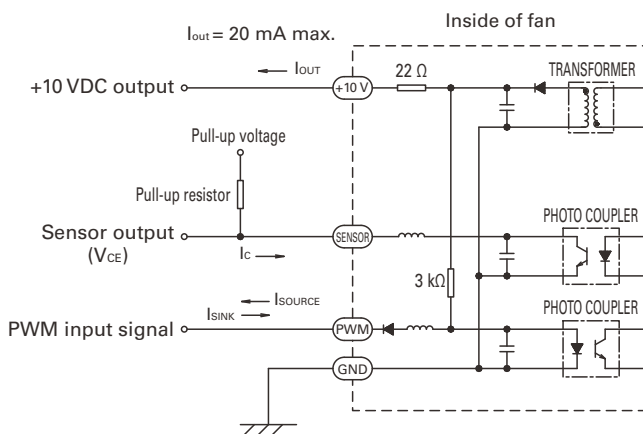
Current source (I_{source}) = 5 mA max. (when control voltage is 0 V)

Current sink (I_{sink}) = 0.1 mA max. (when control voltage is 10 V)

Control terminal voltage = 11.5 V max. (when control terminal is open)

When the control terminal is open,
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Either TTL input, open collector or open drain can be used for
PWM control input signal.

Example of Connection Schematic



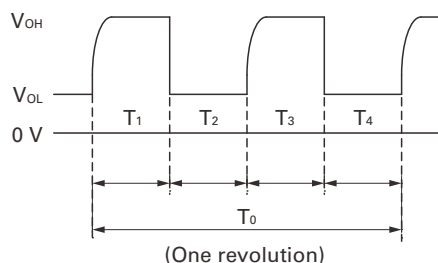
$V_{CE} = +27.6 \text{ V max.}$
 $I_C = 10 \text{ mA max.}$ [$V_{OL} = V_{CE} \text{ (SAT)} = 1 \text{ V max.}$]
Pull-up resistor = 5 kΩ max.

Specifications for Pulse Sensors

Output circuit: Open collector

Output waveform

In case of steady running

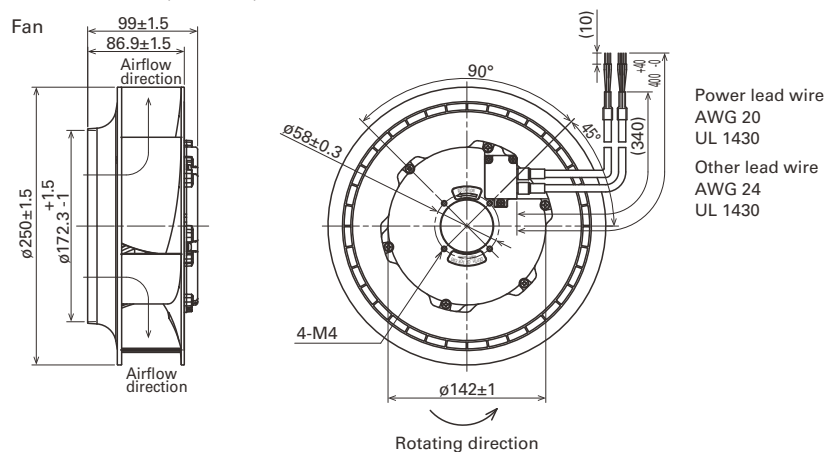


$$T_1 \text{ to } 4 \approx (1/4) T_0$$

$$T_0 = 60/4N \text{ (s)}$$

$$N = \text{Fan speed (min}^{-1}\text{)}$$

Dimensions (unit: mm)



Finger guards

Model no.: 109-1152

Surface treatment: Nickel-chrome plating (silver) Mass: 140 g

Model no.: 109-1152H

Surface treatment: Cation electropainting (black) Mass: 140 g

For use in environments subject to water splashes, cation electroplating models are recommended.

Inlet nozzle

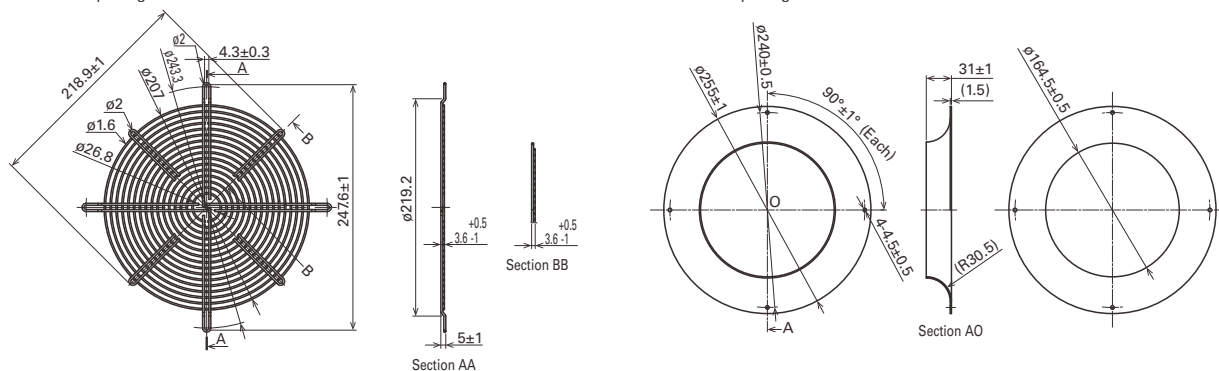
Model no.: 109-1151

Material: Steel sheet Surface treatment: Nickel-chrome plating (silver) Mass: 440 g

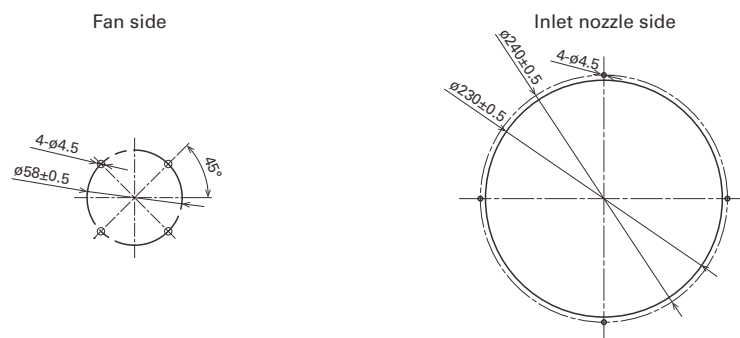
Model no.: 109-1151H

Material: Steel sheet Surface treatment: Cation electropainting (black) Mass: 440 g

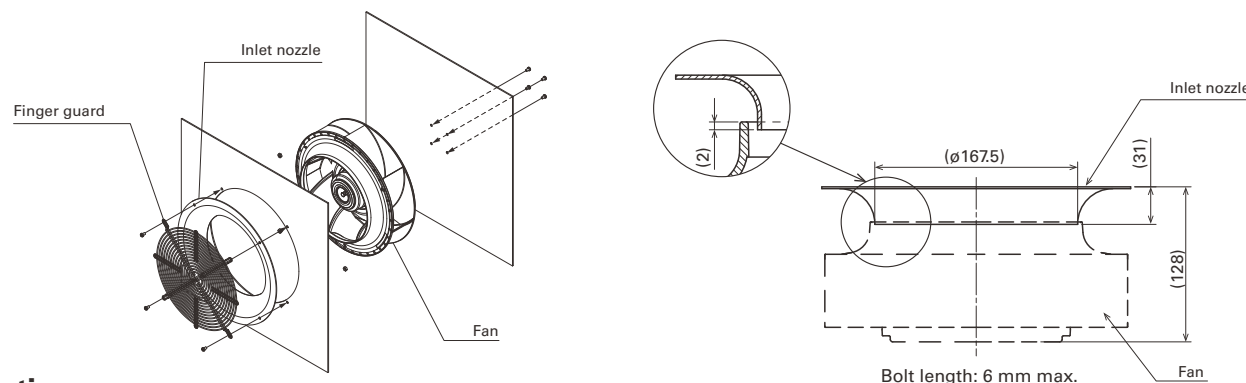
For use in environments subject to water splashes, cation electroplating models are recommended.



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting



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SANYO DENKI CO.,LTD.

3-33-1 Minami-Otsuka, Toshima-ku, Tokyo 170-8451, Japan TEL: +81 3 5927 1020

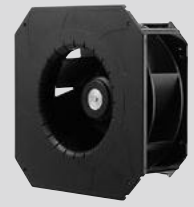
<https://www.sanyodenki.com>

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CATALOG No. C1116B001 '21.4

270×270×119 mm**San Ace 225AD 9ADB1TS** type    

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
Bracket: Aluminum (Black coating), Plastic (Flammability: UL94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and bracket)
- Insulation resistance 10 MΩ or more with a 500 VDC megger (between lead wire conductors and bracket)
- Sound pressure level (SPL) At 1 m away from the air inlet
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

AC power input	L: Orange	N: Gray	Ground	Yellow / Green
+10 VDC output	Red	Black	Sensor	Yellow
			Control	Brown
- Mass 2500 g

Specifications

The models listed below **have pulse sensors with PWM control function.**

Model no.	Rated voltage [V]	Operating voltage range [V]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
9ADB1TS11P0G001	115	90 to 132	100	2.23	155	3200	23.0 812	815 3.27	74	-20 to +60	40000/60°C (70000/40°C)
			20	0.3	10	1000	7.1 252	80 0.32	50		
9ADB1TS11P0F001			100	1.11	70	2450	17.6 621	480 1.93	68		
			20	0.3	10	1000	7.1 252	80 0.32	50		
9ADB1TS23P0G001	230	180 to 264	100	1.17	155	3200	23.0 812	815 3.27	74		
			20	0.2	10	1000	7.1 252	80 0.32	50		
9ADB1TS23P0F001			100	0.64	70	2450	17.6 621	480 1.93	68		
			20	0.2	10	1000	7.1 252	80 0.32	50		

* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

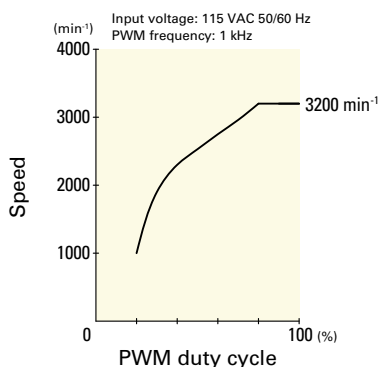
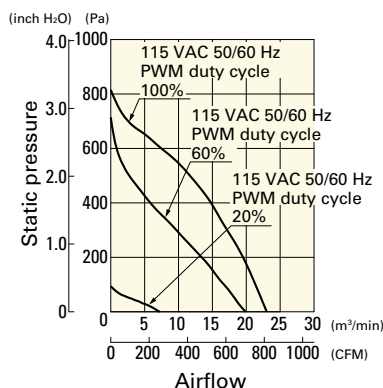
- AC power frequency: 50/60 Hz

Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADB1TS11P0G001 With pulse sensor with PWM control function

PWM duty cycle

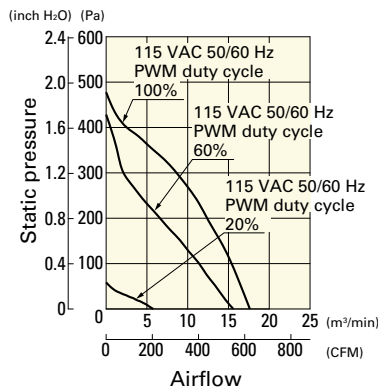
PWM duty - Speed characteristics example



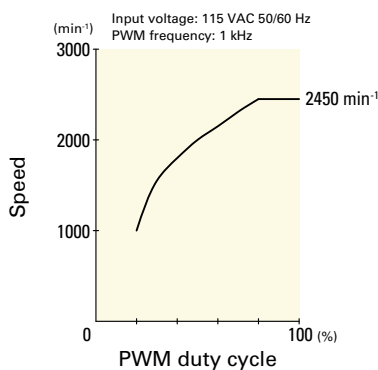
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADB1TS11P0F001 With pulse sensor with PWM control function

PWM duty cycle

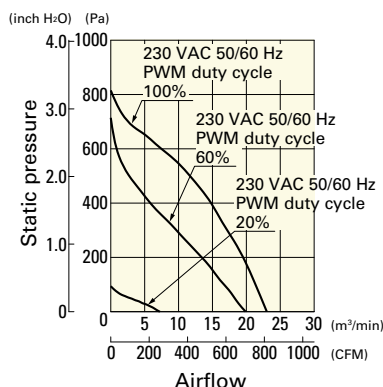


PWM duty - Speed characteristics example

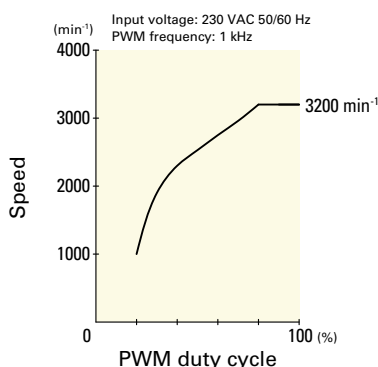


9ADB1TS23P0G001 With pulse sensor with PWM control function

PWM duty cycle

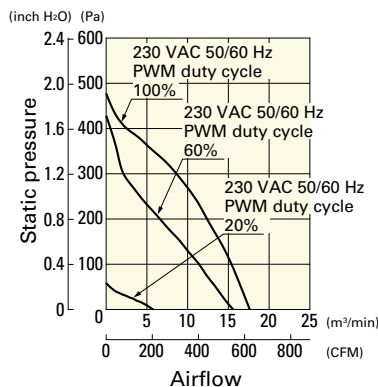


PWM duty - Speed characteristics example

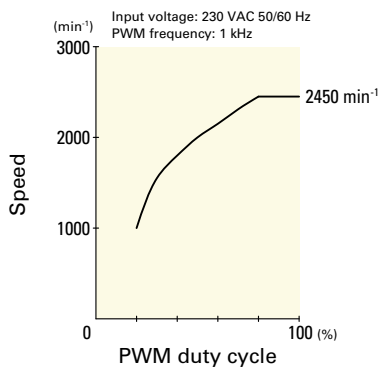


9ADB1TS23P0F001 With pulse sensor with PWM control function

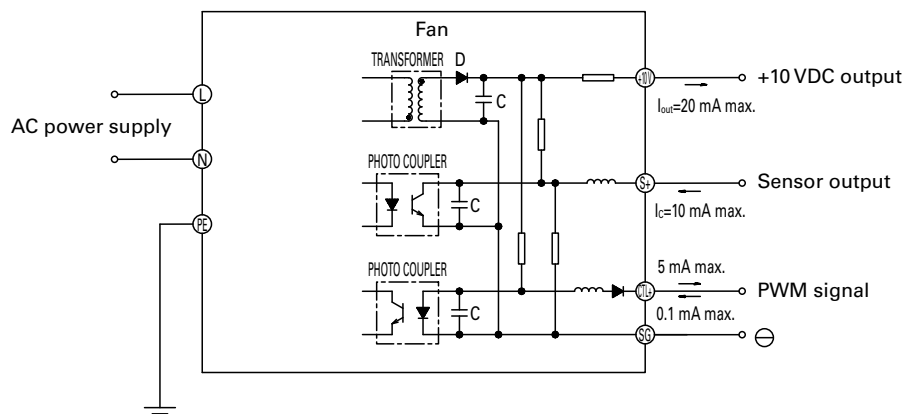
PWM duty cycle



PWM duty - Speed characteristics example



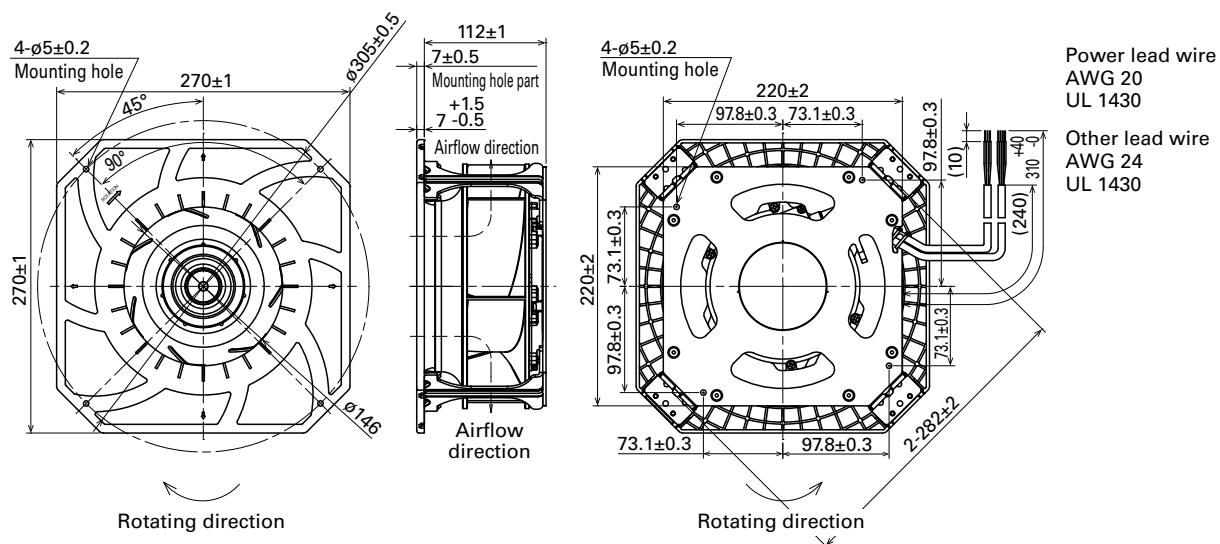
Wiring Diagram



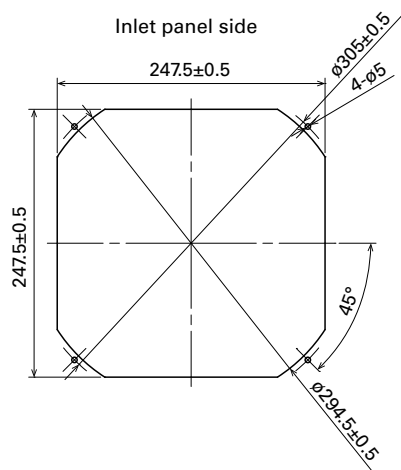
ACDC

ACDC Fan 270 mm sq.

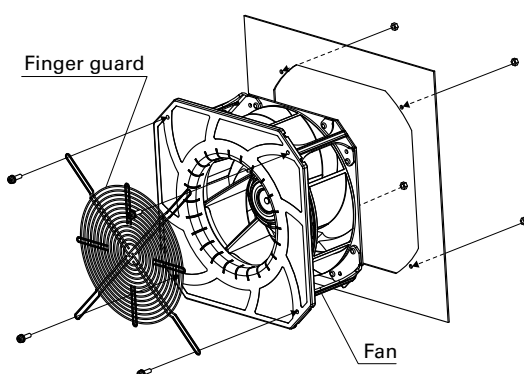
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting



Options

Finger guards

page: p. 588

Model no.: 109-1146, 109-1146H

270×270×119 mm

San Ace 225AD 9ADB1W1TS type    

General Specifications

- Material Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
Bracket: Aluminum (Black coating), Plastic (Flammability: UL94V-0)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor protection function Locked rotor burnout protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and bracket)
- Insulation resistance 10 MΩ or more with a 500 VDC megger (between lead wire conductors and bracket)
- Sound pressure level (SPL) At 1 m away from the air inlet
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire

AC power input	L: Orange N: Gray	Ground	Yellow / Green
+10 VDC output	Red ⊖Black	Sensor	Yellow
		Control	Brown
- Mass 2600 g
- Ingress protection IP56

Specifications

The models listed below **have pulse sensors with PWM control function.**

Model no.	Rated voltage [V]	Operating voltage range [V]	PWM duty cycle [%]	Rated current [A]	Rated input [W]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
9ADB1W1TS11P0H001	115	90 to 132	100	2.06	140	3100	22.3 787	760 3.05	73	-20 to +60	40000/60°C (70000/40°C)
			20	0.3	11	1000	7.1 252	80 0.32	50		
9ADB1W1TS11P0M001			100	1.08	61	2350	16.9 597	440 1.77	67		
			20	0.3	11	1000	7.1 252	80 0.32	50		
9ADB1W1TS23P0H001	230	180 to 264	100	1.06	140	3100	22.3 787	760 3.05	73		
			20	0.2	11	1000	7.1 252	80 0.32	50		
9ADB1W1TS23P0M001			100	0.57	61	2350	16.9 597	440 1.77	67		
			20	0.2	11	1000	7.1 252	80 0.32	50		

* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

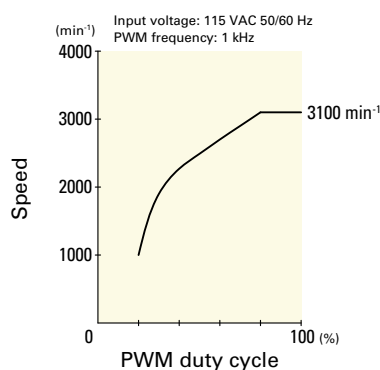
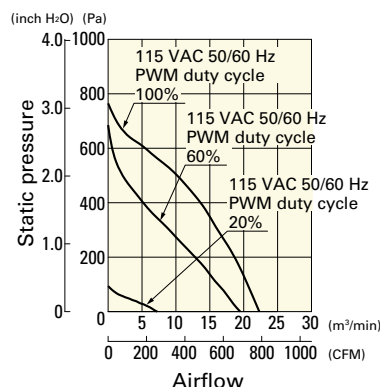
• AC power frequency: 50/60 Hz

Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADB1W1TS11P0H001 With pulse sensor with PWM control function

PWM duty cycle

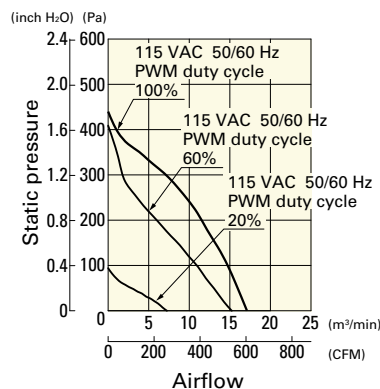
PWM duty - Speed characteristics example



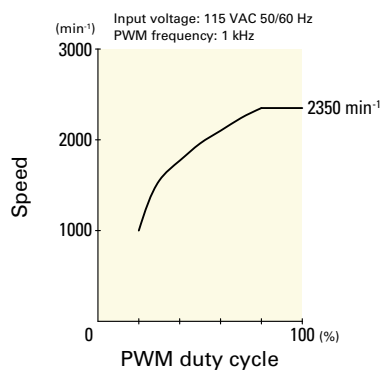
Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9ADB1W1TS11P0M001 With pulse sensor with PWM control function

PWM duty cycle

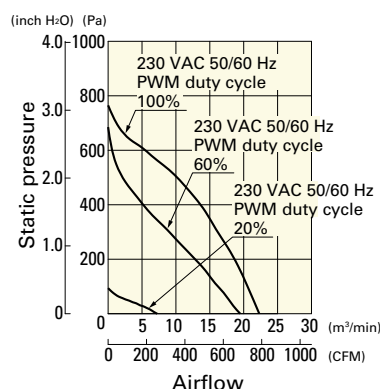


PWM duty - Speed characteristics example

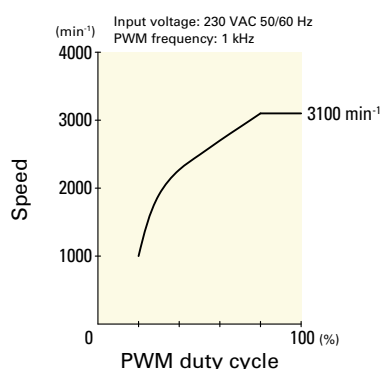


9ADB1W1TS23P0H001 With pulse sensor with PWM control function

PWM duty cycle

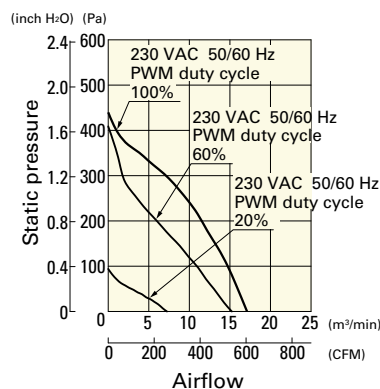


PWM duty - Speed characteristics example

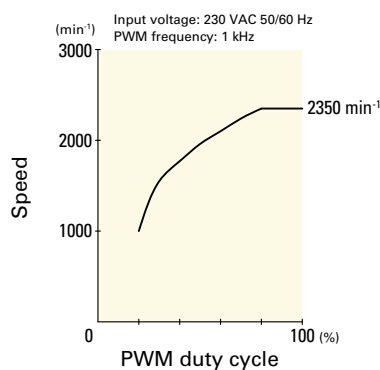


9ADB1W1TS23P0M001 With pulse sensor with PWM control function

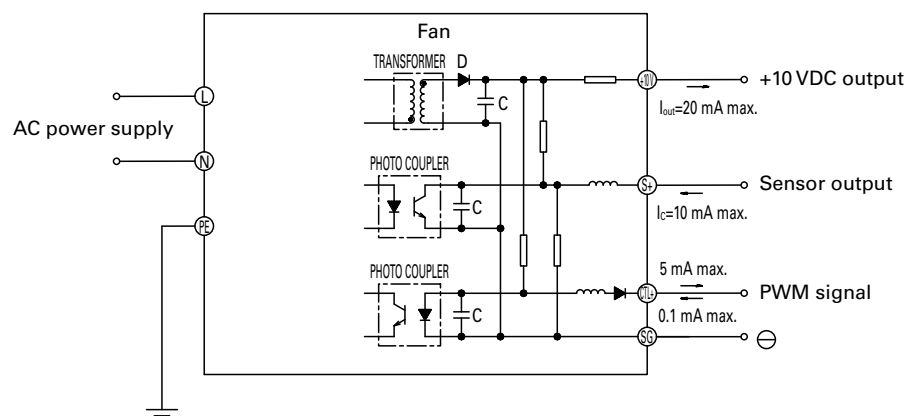
PWM duty cycle



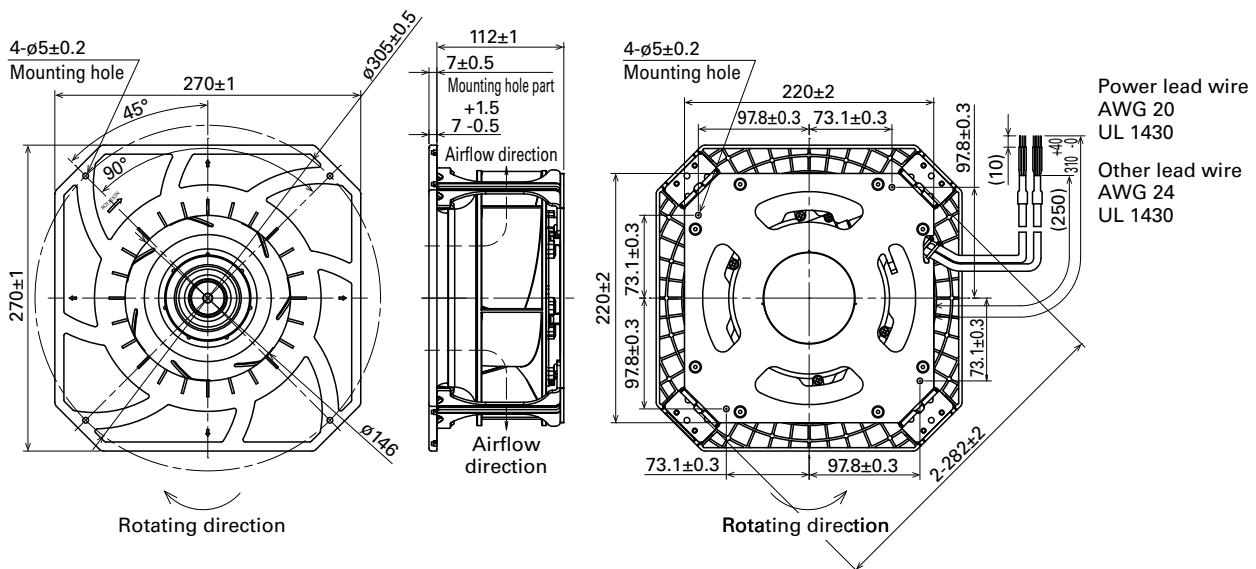
PWM duty - Speed characteristics example



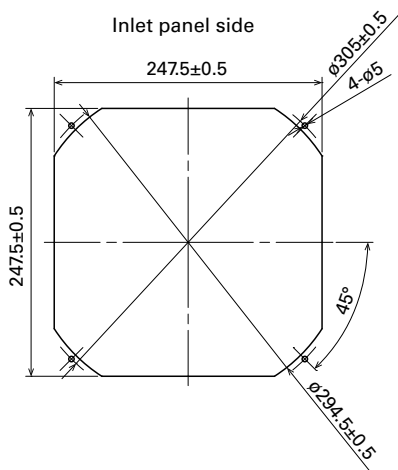
Wiring Diagram



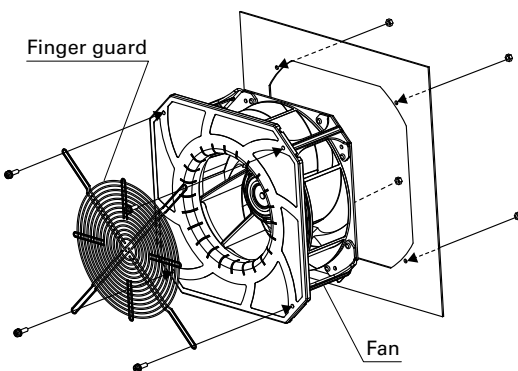
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Reference Diagram for Mounting



Options

Finger guards

page: p. 588

Model no.: 109-1146, 109-1146H

AC Fan

The cooling fan operates at 100 to 230 VAC.

■ **How to Read Specifications** (AC fan) The following is a sample. See respective product pages for detailed information.

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109-180	100	50/60	5/4	0.06/0.05	0.07/0.06	2250/2700	0.27/0.33 9.5/11.7	11.8/18.6 0.047/0.075	24/26	-30 to +70	25000/60°C (56000/40°C)
109-183	115				0.06/0.05						

Rated voltage	This is the necessary voltage to drive the fan. Single-phase 100, 115, 200 and 230 VAC are also available.
Frequency	This is a frequency of alternating current (AC). The frequencies of 50 Hz and 60 Hz are existing in Japan. Performance of AC fan varies depending on the frequency. Example: Rated speed 2250/2700 = 50 Hz → 2250, 60 Hz → 2700
Input	The power value when the fan is operating at rated voltage (at free air).
Current	The current when the fan is operating at rated voltage (at free air).
Locked rotor current	This is a current when rotor of motor that applies rated voltage is locked.
Rated speed	The speed when the fan is operating at rated voltage (at free air).
Max. airflow	The maximum airflow that the fan can generate during rated operation (measured with our double chamber measuring device). Airflow is the volume of air generated by the fan per unit of time.
Max. static pressure	The maximum static pressure value that the fan can produce during rated operation (measured with our double chamber measuring device). Static pressure indicates a fan's ability to move air against resistance due to the internal structure of the device to which the fan is installed.
SPL	SPL stands for Sound Pressure Level. The noise level during the fan's rated operation. Please refer to the technical material section for the measurement method.
Operating temperature	The temperature range over which fan operation is guaranteed (Non- condensing).
Expected life	Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only. For more information, please refer to the technical material section.

60×60×28 mm

San Ace 60



General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Black, 2 pcs
- Mass 120 g

Specifications

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109-180	100	50/60	5/4	0.06/0.05	0.07/0.06	2250/2700	0.27/0.33 9.5/11.7	11.8/18.6 0.047/0.075	24/26	-30 to +70	25000/60°C (56000/40°C)
109-183	115				0.06/0.05						

Note: These are Short LeadTime Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

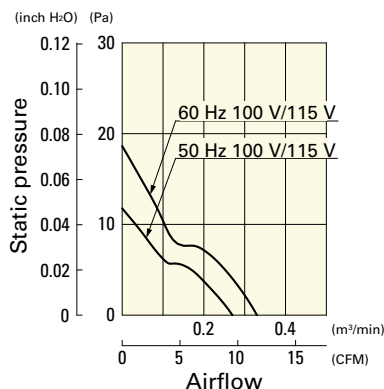
Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

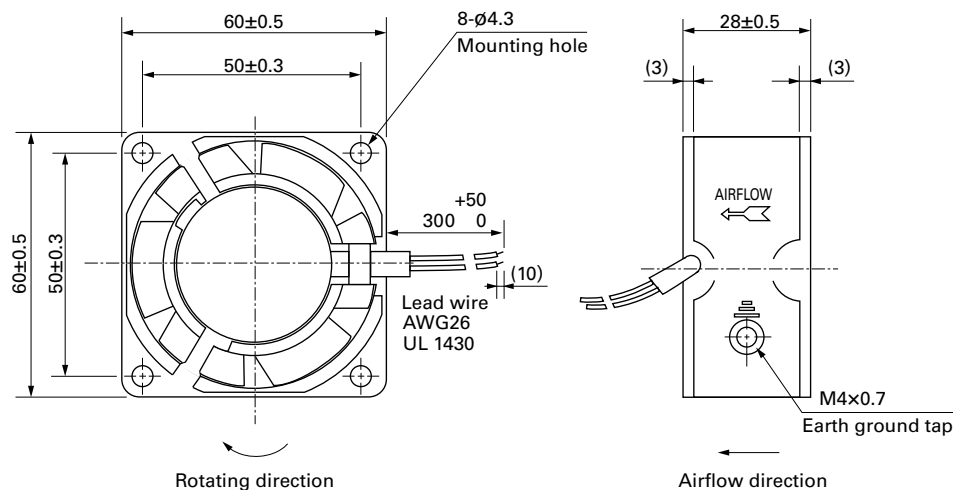
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord	Finger guards	Mounting screws
ST1-109-180	109-180	100 V		Plug cord is not included because of the exposed-lead structure.	109-139E	M4×40 mm (4 screws)
ST1-109-183	109-183	115 V			109-139E	

Airflow - Static Pressure Characteristics

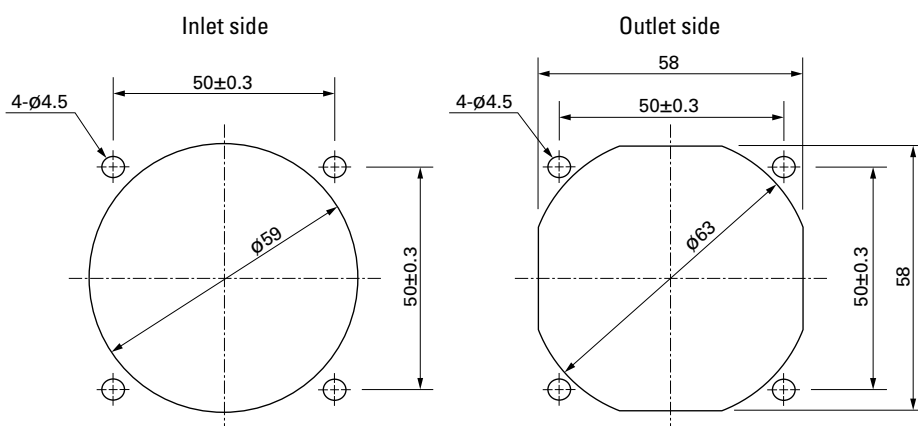
109-180, 109-183



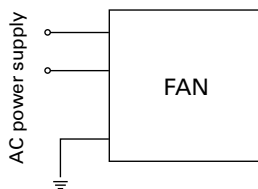
■ Dimensions (unit: mm)



■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



■ Wiring Diagram



■ Options

Finger guards

page: p. 584

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 591

Model no.: 109-1003G

Resin filter kits

page: p. 592

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)

60×60×38 mm

San Ace 60  


General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Black, 2 pcs
- Mass 170 g

Specifications

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109-130	100	50/60	6/5	0.08/0.07	0.08/0.07	2600/3150	0.33/0.4 11.7/14.1	16.3/23.3 0.065/0.094	28/30	-30 to +60	25000/60°C (56000/40°C)
109-133	115			0.07/0.06	0.07/0.06						

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

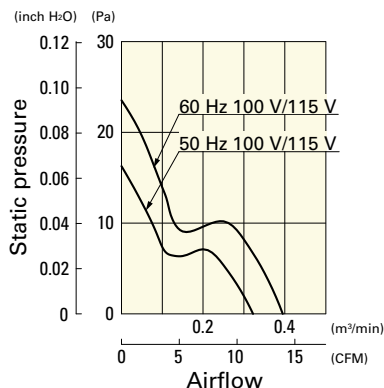
Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

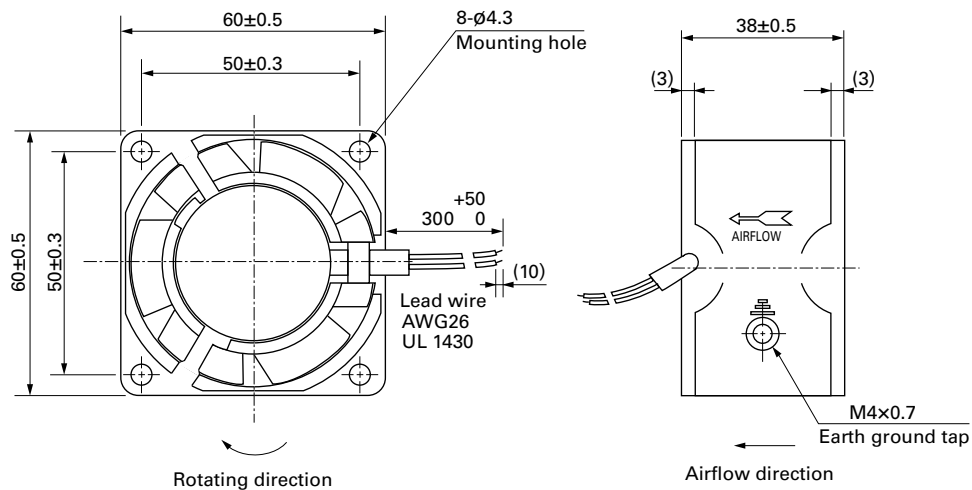
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord	Finger guards	Mounting screws
ST1-109-130	109-130	100 V		Plug cord is not included because of the exposed-lead structure.	109-139E	M4×55 mm (4 screws)
ST1-109-133	109-133	115 V			109-139E	

Airflow - Static Pressure Characteristics

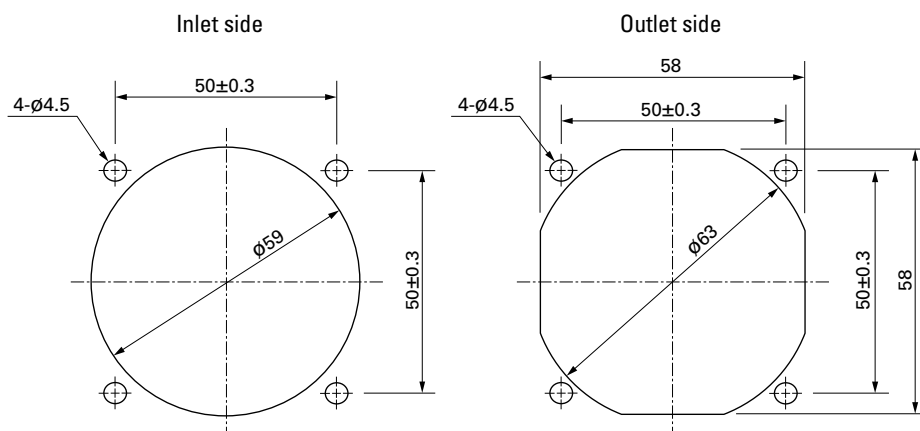
109-130, 109-133



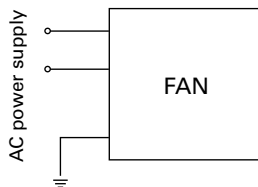
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Wiring Diagram



Options

Finger guards

page: p. 584

Model no.: 109-139E, 109-139H

Resin finger guards

page: p. 591

Model no.: 109-1003G

Resin filter kits

page: p. 592

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),
109-1003F30 (30PPI), 109-1003F40 (40PPI)

80×80×20 mm

San Ace 80


General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Lead wire Black, 2 pcs
- Mass 180 g

Specifications

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109-210	100	50/60	6/5	0.07/0.06	0.07/0.06	2500/3000	0.44/0.53 15.5/18.7	23.5/31.4 0.094/0.126	26/31	-30 to +60	25000/60°C (56000/40°C)
109-213	115			0.06/0.05	0.06/0.05						

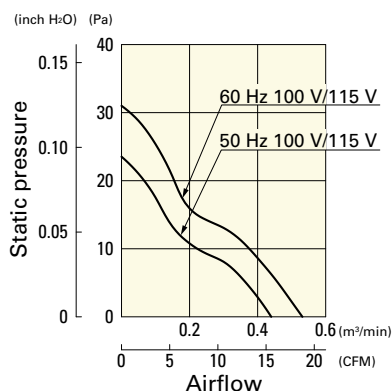
Note: These are Short LeadTime Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

Set Models

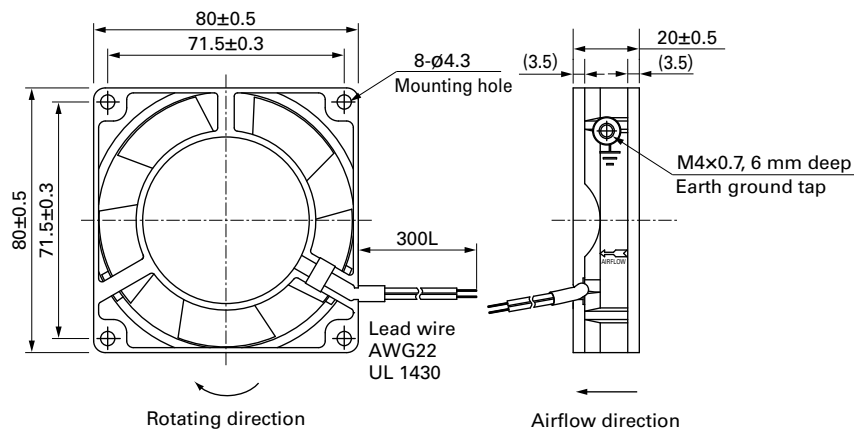
Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord	Finger guards	Mounting screws
ST1-109-210	109-210	100 V		Plug cord is not included because of the exposed-lead structure.	109-049E	M4×40 mm (4 screws)
ST1-109-213	109-213	115 V			109-049E	

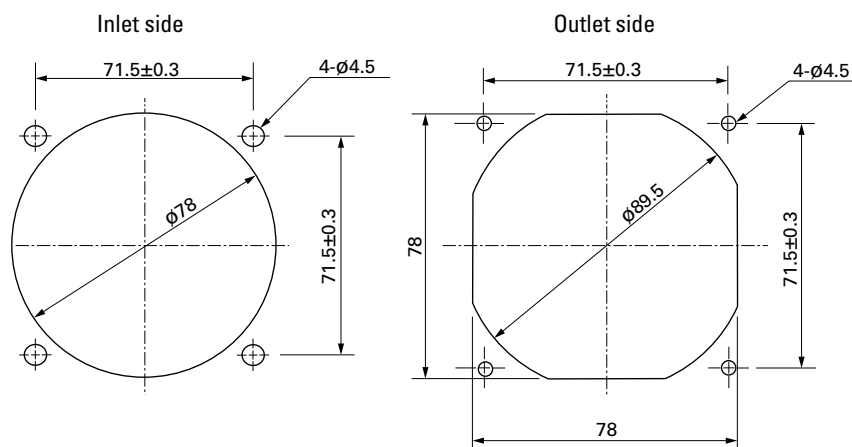
Airflow - Static Pressure Characteristics

109-210, 109-213


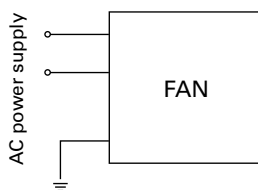
■ Dimensions (unit: mm)



■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



■ Wiring Diagram



■ Options

Finger guards

page: p. 584

Model no.: 109-049E, 109-049H, 109-049C

Resin finger guards

page: p. 591

Model no.: 109-1002G

Resin filter kits

page: p. 592

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)

80×80×25 mm

San Ace 80


General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Mass 270 g

Specifications

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m³/min] [CFM]		Max. static pressure [Pa] [inchH ₂ O]		SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109S050	100	50/60	9/7	0.12/0.1	0.13/0.11	2650/3100	0.63/0.76	22.3/26.9	27.5/38.3	0.11 /0.154	30/33	-30 to +60	25000/60°C (56000/40°C)
109S053	115			0.1 /0.08	0.11/0.09								
109S051	200			0.06/0.05	0.06/0.05								
109S054	230			0.05/0.04	0.05/0.04	2350/2700	0.55/0.63	19.4/22.3	21.6/28.4	0.087/0.114	28/30		
109S030	100			0.12/0.1	0.13/0.11								
109S033	115			0.1 /0.08	0.11/0.09								
109S031	200			0.06/0.05	0.06/0.05								
109S034	230			0.05/0.04	0.05/0.04								

Note: These are Short LeadTime Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

Set Models

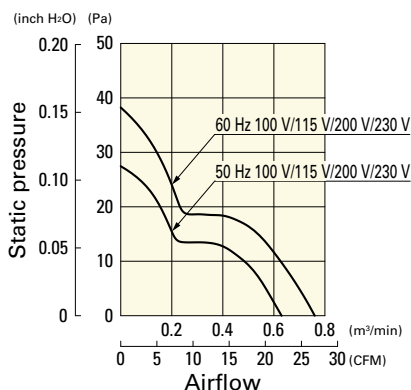
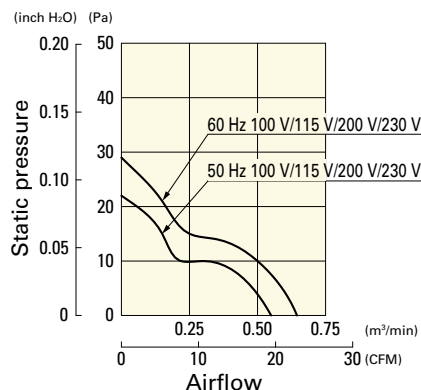
Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord ⁽¹⁾	Finger guards	Mounting screws
ST1-109S050	109S050	100 V		489-016-L10	109-049E	M4×40 mm (4 screws) ⁽²⁾
ST1-109S053	109S053	115 V		489-016-L10	109-049E	
ST1-109S051	109S051	200 V		489-016-L10	109-049E	
ST1-109S054	109S054	230 V		489-016-L10	109-049E	
ST1-109S030	109S030	100 V		489-016-L10	109-049E	
ST1-109S033	109S033	115 V		489-016-L10	109-049E	
ST1-109S031	109S031	200 V		489-016-L10	109-049E	
ST1-109S034	109S034	230 V		489-016-L10	109-049E	

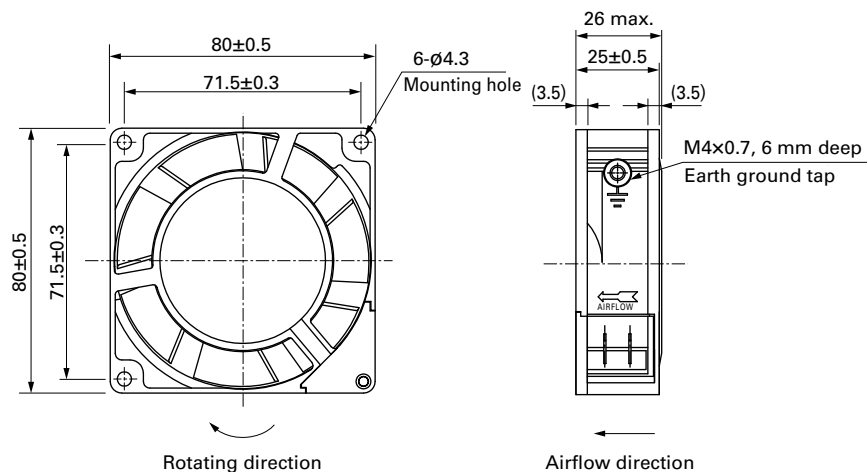
(1) PSE compatible.

(2) Though these are 2-hole or 3-hole frame mount types, 4 screws are included for extra.

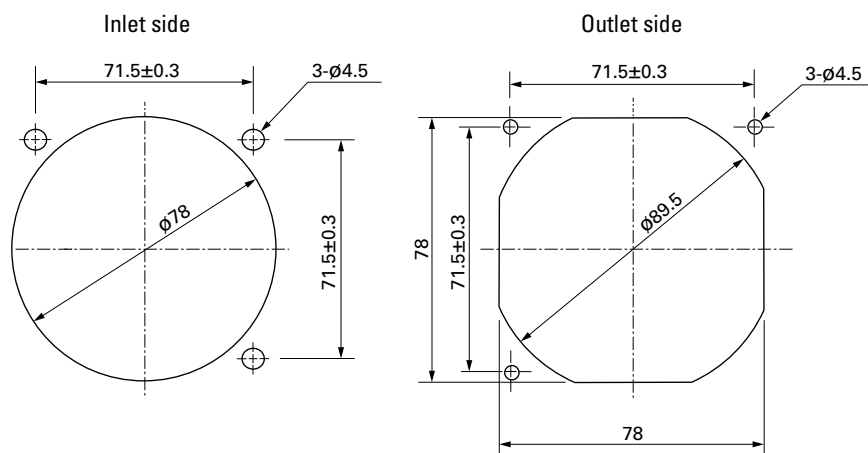
Airflow - Static Pressure Characteristics

109S050, 109S053, 109S051, 109S054

109S030, 109S033, 109S031, 109S034


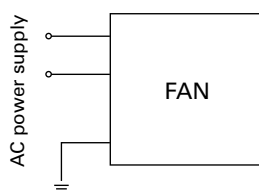
■ Dimensions (unit: mm)



■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



■ Wiring Diagram



■ Options

Finger guards

page: p. 584

Model no.: 109-049E, 109-049H, 109-049C

Resin finger guards

page: p. 591

Model no.: 109-1002G

Resin filter kits

page: p. 592

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)

Plug cord

page: pp. 594 to 595

Model no.: 489-016-L10, 489-016-L21, 489-047-L10,
489-047-L21

AC

AC Fan 80 mm sq.

80×80×38 mm

San Ace 80


General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Mass 400 g

Specifications

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109-150	100	50/60	9/8	0.13/0.11	0.17/0.15	2700/3150	0.9/1.05 31.8/37.1	31.4/44.1 0.126/0.177	35/39	-30 to +60	25000/60°C (56000/40°C)
109-153	115			0.11/0.1	0.14/0.12						
109-151	200			0.07/0.06	0.09/0.08						
109-154	230			0.06/0.05	0.08/0.07						

Note: These are Short LeadTime Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

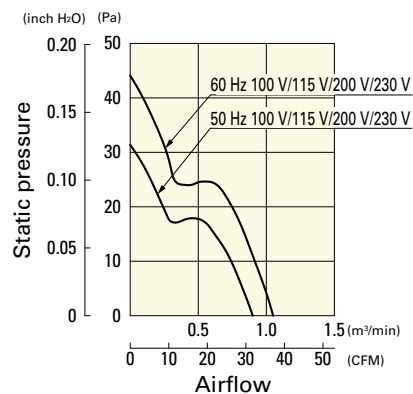
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord ⁽¹⁾	Finger guards	Mounting screws
ST1-109-150	109-150	100 V		489-016-L10	109-049E	M4×55 mm (4 screws) ⁽²⁾
ST1-109-153	109-153	115 V		489-016-L10	109-049E	
ST1-109-151	109-151	200 V		489-016-L10	109-049E	
ST1-109-154	109-154	230 V		489-016-L10	109-049E	

(1) PSE compatible.

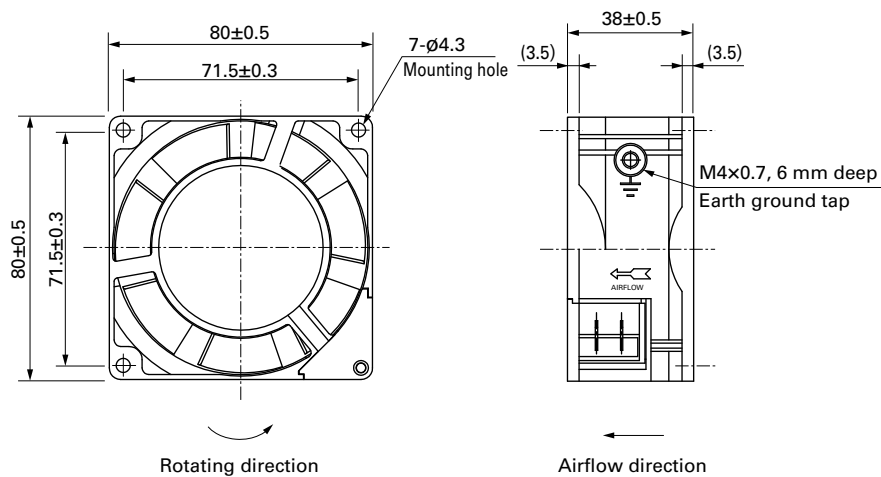
(2) Though these are 2-hole or 3-hole frame mount types, 4 screws are included for extra.

Airflow - Static Pressure Characteristics

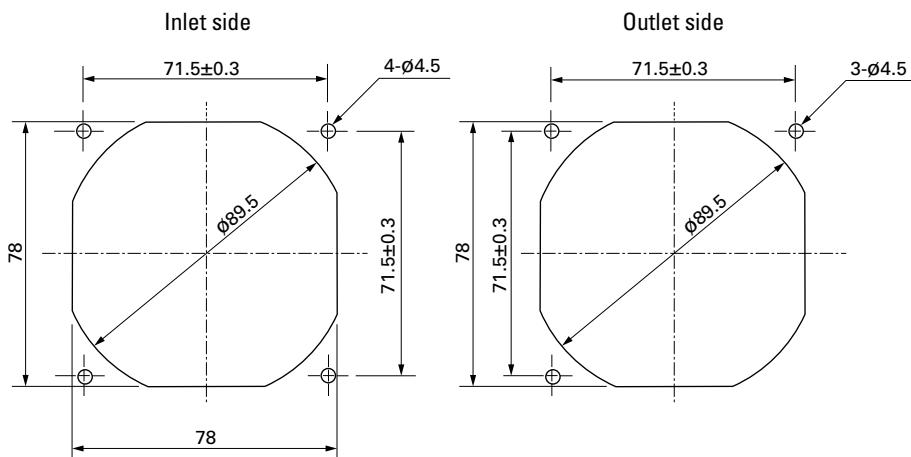
109-150, 109-153, 109-151, 109-154



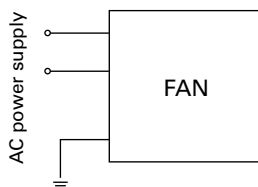
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Wiring Diagram



Options

Finger guards

page: p. 584

Model no.: 109-049E, 109-049H, 109-049C

Resin finger guards

page: p. 591

Model no.: 109-1002G

Resin filter kits

page: p. 592

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI),
109-1002F30 (30PPI), 109-1002F40 (40PPI)

Plug cord

page: pp. 594 to 595

Model no.: 489-016-L10, 489-016-L21, 489-047-L10,
489-047-L21

80×80×42 mm

San Ace 80


General Specifications

- Material Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Mass 410 g

Specifications

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109-040UL	100	50/60	10/9	0.13/0.11	0.16/0.14	2650/3100	0.85/1.0 30.0/35.3	24.5/35.3 0.098/0.142	40/44	-30 to +60	25000/60°C (56000/40°C)
109-043UL	115			0.11/0.1	0.14/0.12						
109-041UL	200			0.07/0.06	0.08/0.07						
109-044UL	230			0.06/0.05	0.07/0.06						
109-047UL*	100			0.05/0.05	0.05/0.05						
109-033UL*	115	50/60	4/3.5	0.04/0.04	0.04/0.04	1500/1500	0.43/0.43 15.2/15.2	8.8/ 8.8 0.035/0.035	24/24	-30 to +60	25000/60°C (56000/40°C)
109-043UL	115			0.04/0.04	0.04/0.04						
109-041UL	200			0.04/0.04	0.04/0.04						
109-044UL	230			0.04/0.04	0.04/0.04						
109-047UL*	100			0.04/0.04	0.04/0.04						

* These are low-speed models.

Note: These are Short LeadTime Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

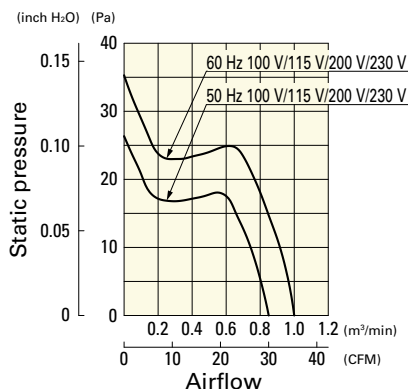
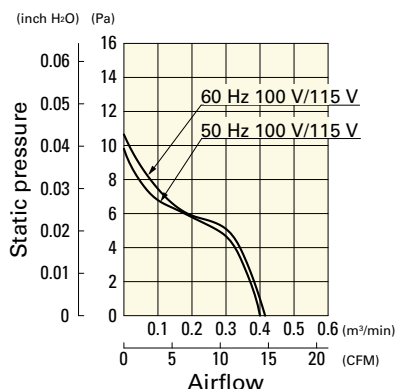
Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

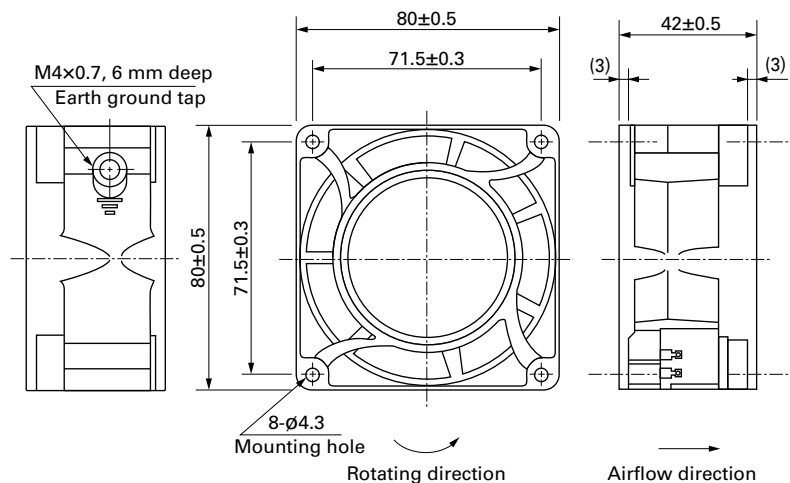
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord*	Finger guards	Mounting screws
ST1-109-040UL	109-040UL	100 V		489-008-L10	109-049E	M4×55 mm (4 screws)
ST1-109-043UL	109-043UL	115 V		489-008-L10	109-049E	
ST1-109-041UL	109-041UL	200 V		489-008-L10	109-049E	
ST1-109-044UL	109-044UL	230 V		489-008-L10	109-049E	
ST1-109-047UL	109-047UL	100 V		489-008-L10	109-049E	
ST1-109-033UL	109-033UL	115 V		489-008-L10	109-049E	

* PSE compatible.

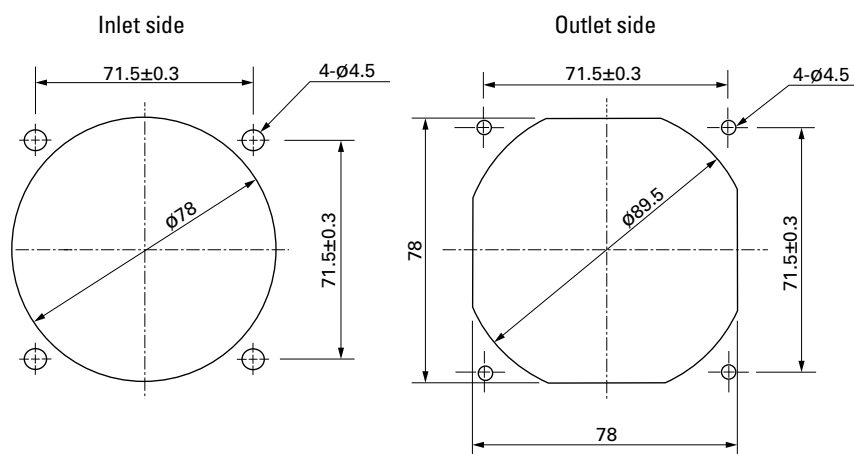
Airflow - Static Pressure Characteristics

109-040UL, 109-043UL, 109-041UL, 109-044UL

109-047UL, 109-033UL


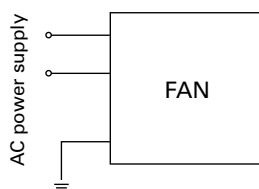
Dimensions (unit: mm)



Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



Wiring Diagram



Options

Finger guards

page: p. 584

Model no.: 109-049E, 109-049H, 109-049C

Resin finger guards

page: p. 591

Model no.: 109-1002G

Resin filter kits

page: p. 592

Model no.: 109-1002F13 (13PPI), 109-1002F20 (20PPI), 109-1002F30 (30PPI), 109-1002F40 (40PPI)

Plug cord

page: p. 594

Model no.: 489-008-L10, 489-008-L21, 489-008-L35

92×92×25 mm

San Ace 92



Only standard fans (without sensors) have acquired CSA certification.



General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Dielectric strength (with sensor) 50/60 Hz 1500 VAC 1 minute (between AC input terminal and frame)
50/60 Hz 1000 VAC 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Sensor-Purpose lead wire ⊕Brown ⊖Black (Sensor) Yellow
- Mass 290 g/310 g (with Sensor)

Specifications

Standard

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m³/min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109S091	100	50/60	8/7	0.1 /0.09	0.13/0.12	2700/3100	0.95/1.1 33.6/38.9	39.2/49.0 0.157/0.197	35/38	-30 to +60	25000/60°C (56000/40°C)
109S093	115			0.09/0.08	0.11/0.1						
109S092	200		11/10	0.07/0.06	0.08/0.08	2400/2800	0.84/0.98 29.7/34.6	31.4/40.2 0.126/0.161	32/35		
109S094	230		10/9	0.06/0.05	0.07/0.07						
109S095	100		8/7	0.1 /0.09	0.11/0.1	1500/1700	0.55/0.65 19.4/23	12.5/16.3 0.05 /0.065	24/27		
109S096*	100		7/6	0.09/0.08	0.09/0.08						
109S193*	115			0.08/0.07	0.08/0.07						
109S192*	200		8/7	0.06/0.05	0.06/0.05						
109S194*	230			0.05/0.04	0.05/0.04						

*These are low-speed models.

with Sensor

For sensor specifications, please refer to p. 602. Sensor specification differs depending on the fan's speed specification.

For a 5 V sensor power supply (ITEM-20), please append "-20" to the end of model number. E.g. 109S491-20

For a 12 V sensor power supply (ITEM-30), please append "-30" to the end of model number. E.g. 109S491-30

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m³/min] [CFM]		Max. static pressure [Pa] [inchH ₂ O]		SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109S491	100	50/60	8/7	0.1 /0.09	0.13/0.12	2700/3100	0.95/1.1	33.6/38.9	39.2/49.0	0.157/0.197	35/38	-10 to +60	25000/60°C (56000/40°C)
109S493	115				0.09/0.08									0.11/0.1
109S492	200		11/10	0.07/0.06	0.08/0.08								
109S494	230		10/9	0.06/0.05	0.07/0.07								
109S495	100		8/7	0.1 /0.09	0.11/0.1	2400/2800	0.84/0.98	29.7/34.6	31.4/40.2	0.126/0.161	32/35		
109S496*			7/6	0.09/0.08	0.09/0.08	1500/1700	0.55/0.65	19.4/23	12.5/16.3	0.05 /0.065	24/27		

*These are low-speed models.

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

For the San Ace 92AD 9AD type 92×92×38 mm fan, please refer to p. 516.

This fan works while internally converting AC power into DC power, providing the superior performance of a DC fan with the flexibility of AC input.

Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord ⁽¹⁾	Finger guards	Mounting screws
ST1-109S091	109S091	100 V		489-016-L10	109-099E	M3×40 mm (4 screws) ⁽²⁾
ST1-109S093	109S093	115 V		489-016-L10	109-099E	
ST1-109S092	109S092	200 V		489-016-L10	109-099E	
ST1-109S094	109S094	230 V		489-016-L10	109-099E	
ST1-109S095	109S095	100 V		489-016-L10	109-099E	
ST1-109S096	109S096	100 V		489-016-L10	109-099E	
ST1-109S193	109S193	115 V		489-016-L10	109-099E	
ST1-109S192	109S192	200 V		489-016-L10	109-099E	
ST1-109S194	109S194	230 V		489-016-L10	109-099E	
ST1-109S491-20	109S491-20	100 V	○ (5 V)	489-016-L10	109-099E	
ST1-109S491-30	109S491-30		○ (12 V)	489-016-L10	109-099E	
ST1-109S493-20	109S493-20	115 V	○ (5 V)	489-016-L10	109-099E	
ST1-109S493-30	109S493-30		○ (12 V)	489-016-L10	109-099E	
ST1-109S492-20	109S492-20	200 V	○ (5 V)	489-016-L10	109-099E	
ST1-109S492-30	109S492-30		○ (12 V)	489-016-L10	109-099E	
ST1-109S494-20	109S494-20	230 V	○ (5 V)	489-016-L10	109-099E	
ST1-109S494-30	109S494-30		○ (12 V)	489-016-L10	109-099E	
ST1-109S495-20	109S495-20	100 V	○ (5 V)	489-016-L10	109-099E	
ST1-109S495-30	109S495-30		○ (12 V)	489-016-L10	109-099E	
ST1-109S496-20	109S496-20		○ (5 V)	489-016-L10	109-099E	
ST1-109S496-30	109S496-30		○ (12 V)	489-016-L10	109-099E	

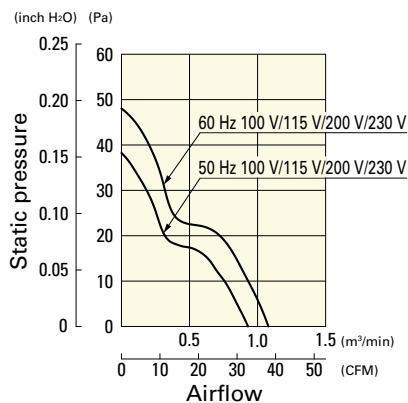
(1) PSE compatible.

(2) Though these are 2-hole or 3-hole frame mount types, 4 screws are included for extra.

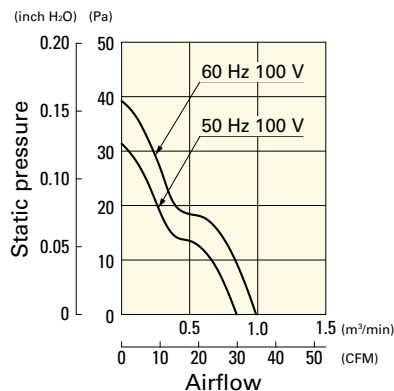
Airflow - Static Pressure Characteristics

Standard

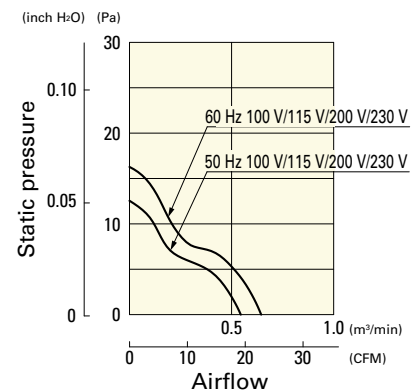
109S091, 109S093, 109S092, 109S094



109S095

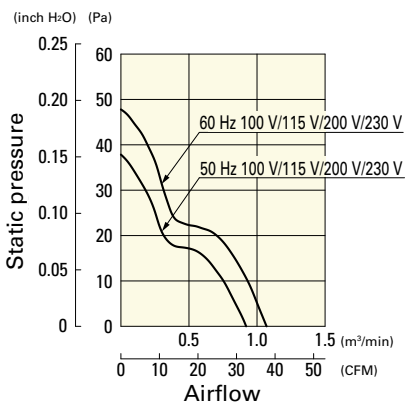


109S096, 109S193, 109S192, 109S194

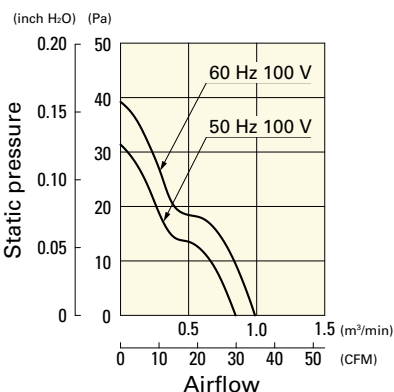


with Sensor

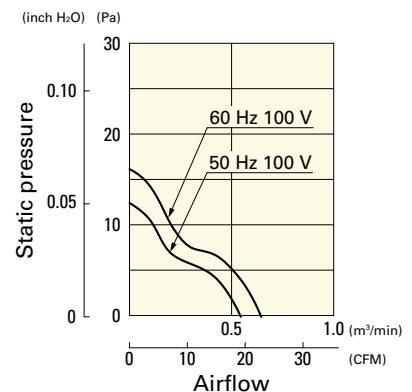
109S491, 109S493, 109S492, 109S494



109S495

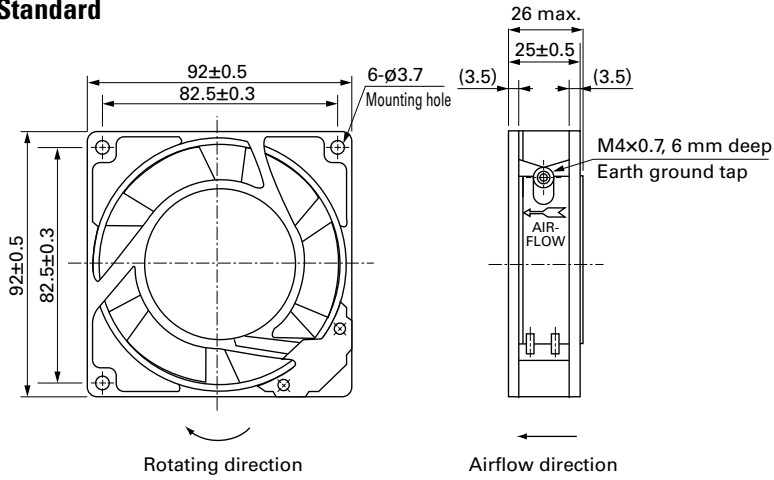


109S496

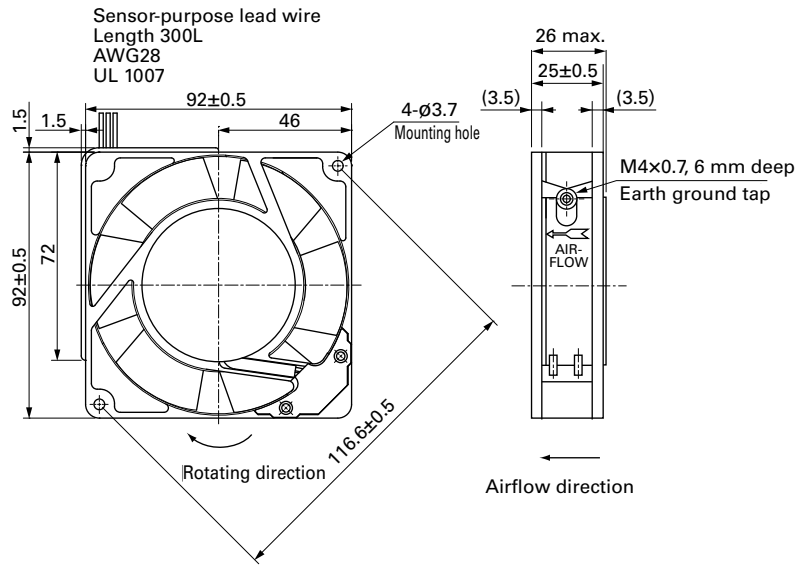


Dimensions (unit: mm)

Standard

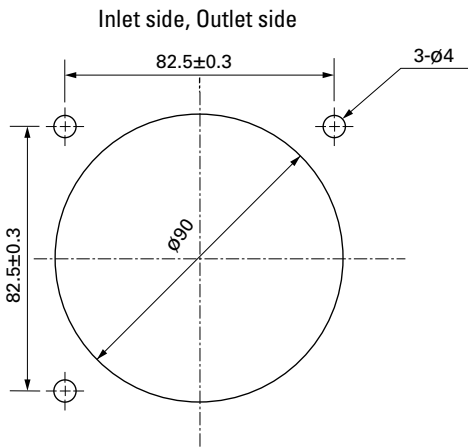


with Sensor

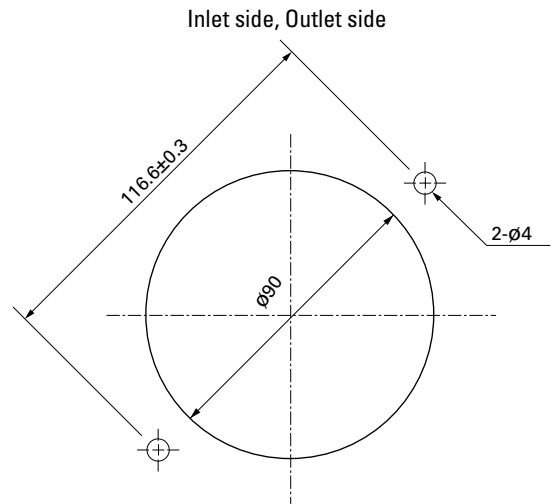


Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Standard

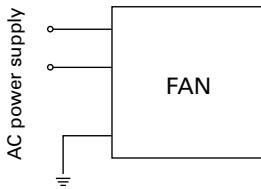


with Sensor



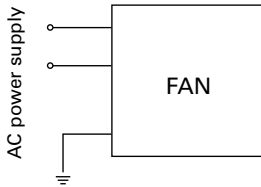
Wiring Diagram

Standard

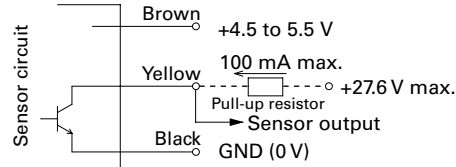


with Sensor

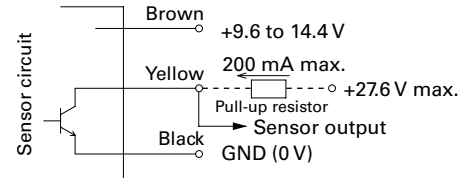
For fan power supply



For sensor circuit
5 V (ITEM-20)



12 V (ITEM-30)



GND (Black) should be shared in case that power supply for sensor circuit (Brown) and that for sensor pull-up (Yellow) are separated.

Options

Finger guards

page: p. 584

Model no.: 109-099E, 109-099H, 109-099C

Resin finger guards

page: p. 591

Model no.: 109-1001G

Resin filter kits

page: p. 592

Model no.: 109-1001F13 (13PPI), 109-1001F20 (20PPI),
109-1001F30 (30PPI), 109-1001F40 (40PPI)

Plug cord

page: pp. 594 to 595

Model no.: 489-016-L10, 489-016-L21, 489-047-L10,
489-047-L21

AC

AC Fan 92 mm sq.



120×120×25 mm

San Ace 120       Only standard fans (without sensors) have acquired CSA certification.

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Dielectric strength (with sensor) 50/60 Hz 1500 VAC 1 minute (between AC input terminal and frame)
50/60 Hz 1000 VAC 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Sensor-Purpose lead wire ⊕Brown ⊖Black (Sensor) Yellow
- Mass 370 g/390 g (with Sensor)

Specifications

Standard

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m³/min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109S085	100	50/60	13.5/12	0.16/0.14	0.19/0.17	2500/2900	1.95/2.3 68.9/81.3	48 /51.9 0.193/0.216	38/41	-30 to +60	25000/60°C (56000/40°C)
109S084	115			0.14/0.12	0.16/0.15						
109S088	200			0.08/0.07	0.1 /0.09						
109S087	230			0.07/0.06	0.08/0.07						
109S081	100		9.5/8.5	0.11	0.11/0.1	2200/2350	1.7 /1.8 60.1/63.6	29.4/26.5 0.118/0.106	34/35		
109S083	115			0.1	0.1 /0.09						
109S082	200			0.07	0.07/0.06						
109S089	230			0.06	0.06/0.05						
109S086*	100			12/10	0.14/0.12	0.15/0.13	1400/1600	1.1 /1.25 38.9/44.2	14.7/18.6 0.059/0.075			24/27

* These are low-speed models.

with Sensor

For sensor specifications, please refer to p. 602. Sensor specification differs depending on the fan's speed specification.

For a 5 V sensor power supply (ITEM-20), please append "-20" to the end of model number. E.g. 109S485-20

For a 12 V sensor power supply (ITEM-30), please append "-30" to the end of model number. E.g. 109S485-30

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109S485	100	50/60	13.5/12	0.16/0.14	0.19/0.17	2500/2900	1.95/2.3 68.9/81.3	48 /51.9 0.193/0.216	38/41	-10 to +60	25000/60°C (56000/40°C)
109S484	115			0.14/0.12	0.16/0.15						
109S488	200			0.08/0.07	0.1 /0.09						
109S487	230			0.07/0.06	0.08/0.07						
109S486*	100		12/10	0.14/0.12	0.15/0.13	1400/1600	1.1 /1.25 38.9/44.2	14.7/18.6 0.059/0.075	24/27		

* These are low-speed models.

Note: These are Short LeadTime Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

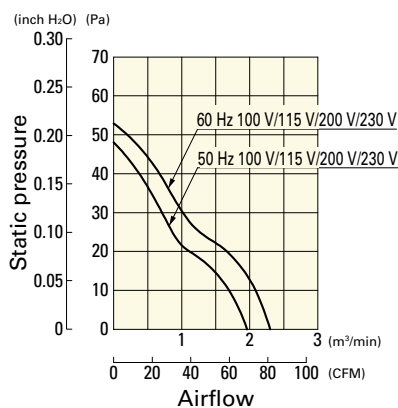
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord*	Finger guards	Mounting screws
ST1-109S085	109S085	100 V		489-016-L10	109-019E	M3×40 mm (4 screws)
ST1-109S084	109S084	115 V		489-016-L10	109-019E	
ST1-109S088	109S088	200 V		489-016-L10	109-019E	
ST1-109S087	109S087	230 V		489-016-L10	109-019E	
ST1-109S081	109S081	100 V		489-016-L10	109-019E	
ST1-109S083	109S083	115 V		489-016-L10	109-019E	
ST1-109S082	109S082	200 V		489-016-L10	109-019E	
ST1-109S089	109S089	230 V		489-016-L10	109-019E	
ST1-109S086	109S086			489-016-L10	109-019E	
ST1-109S485-20	109S485-20	100 V	○ (5 V)	489-016-L10	109-019E	
ST1-109S485-30	109S485-30		○ (12 V)	489-016-L10	109-019E	
ST1-109S484-20	109S484-20	115 V	○ (5 V)	489-016-L10	109-019E	
ST1-109S484-30	109S484-30		○ (12 V)	489-016-L10	109-019E	
ST1-109S488-20	109S488-20	200 V	○ (5 V)	489-016-L10	109-019E	
ST1-109S488-30	109S488-30		○ (12 V)	489-016-L10	109-019E	
ST1-109S487-20	109S487-20	230 V	○ (5 V)	489-016-L10	109-019E	
ST1-109S487-30	109S487-30		○ (12 V)	489-016-L10	109-019E	
ST1-109S486-20	109S486-20	100 V	○ (5 V)	489-016-L10	109-019E	
ST1-109S486-30	109S486-30		○ (12 V)	489-016-L10	109-019E	

* PSE compatible.

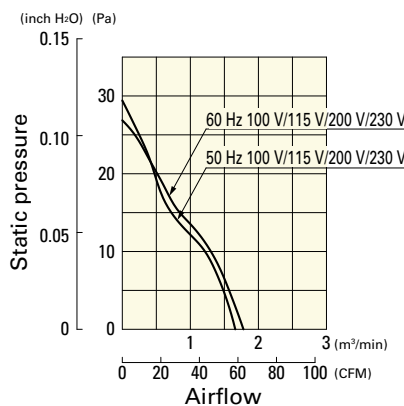
Airflow - Static Pressure Characteristics

Standard

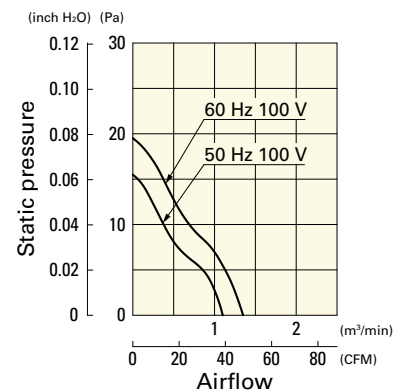
109S085, 109S084, 109S088, 109S087



109S081, 109S083, 109S082, 109S089

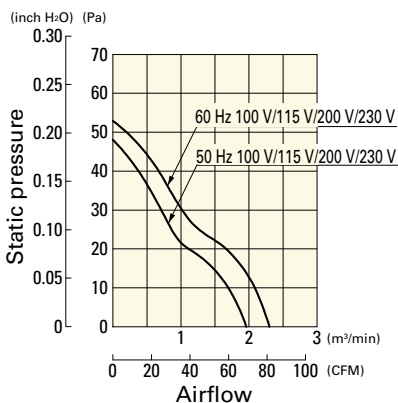


109S086

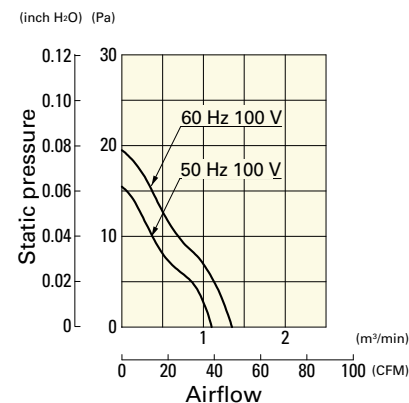


with Sensor

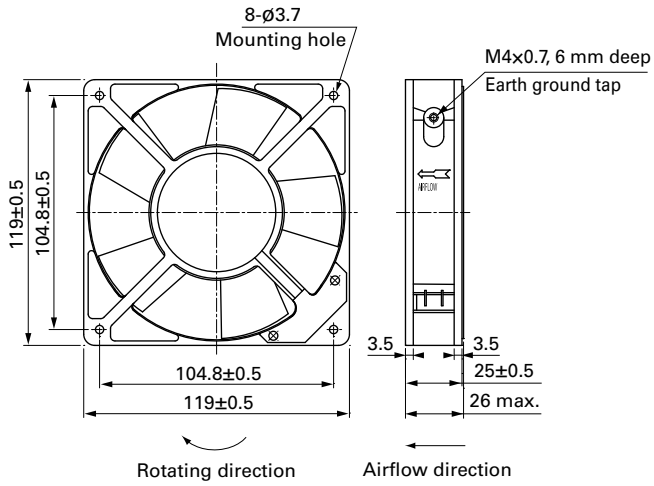
109S485, 109S484, 109S488, 109S487



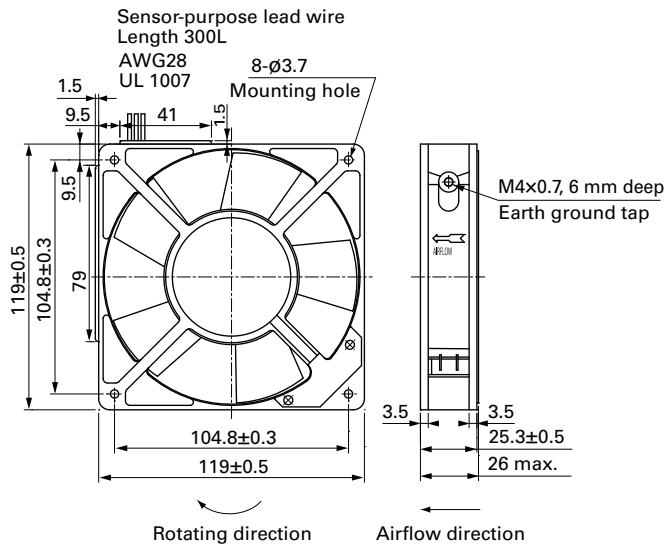
109S486



Standard



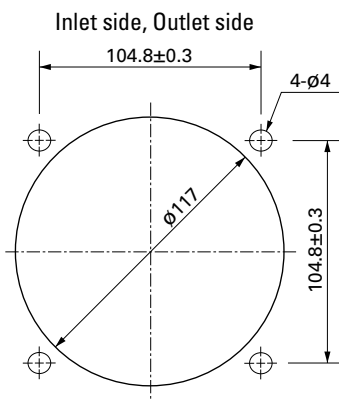
with Sensor When mounting the model with a sensor, please screw-mount through both flanges as it has a sensor box.



AC

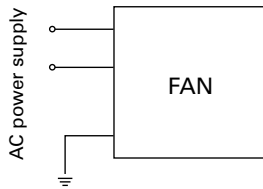
AC Fan 120 mm sq.

■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



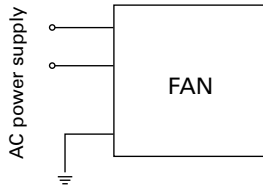
Wiring Diagram

Standard

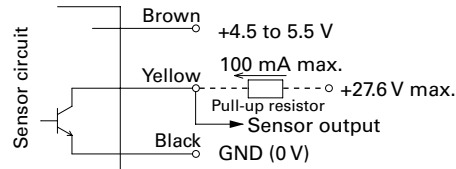


with Sensor

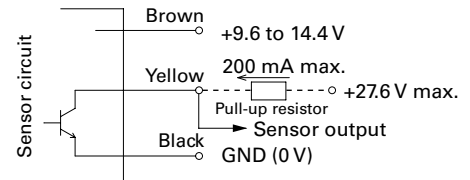
For fan power supply



For sensor circuit
5 V (ITEM-20)



12 V (ITEM-30)



GND (Black) should be shared in case that power supply for sensor circuit (Brown) and that for sensor pull-up (Yellow) are separated.

Options

Finger guards

page: p. 585

Model no.: 109-019E, 109-019K, 109-019C, 109-019H

Resin finger guards

page: p. 591

Model no.: 109-1000G

Resin filter kits

page: p. 592

Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)

Plug cord

page: pp. 594 to 595

Model no.: 489-016-L10, 489-016-L21, 489-047-L10,
489-047-L21

AC

AC Fan 120 mm sq.



120×120×38 mm

San Ace 120


Certifications vary by model no. Please refer to pp. 614 to 615.

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Shaded coil motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and G terminal)
- Dielectric strength (with sensor) 50/60 Hz 1500 VAC 1 minute (between AC input terminal and G terminal)
50/60 Hz 1000 VAC 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Sensor-Purpose lead wire ⊕Brown ⊖Black (Sensor) Yellow
- Mass 550 g/580 g (with Sensor)

Specifications

Standard

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m³/min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]	
109S075UL	100	50/60	18/16	0.24/0.21	0.32/0.28	2700/3100	2.5 /2.9 88.3/102.5	57.9/68.7 0.233/0.276	42/45	-30 to +60	25000/60°C (56000/40°C)	
109S074UL	115			0.21/0.18	0.27/0.24							
109S078UL	200			0.12/0.1	0.16/0.14							
109S072UL	230			0.11/0.09	0.14/0.13							
109S005	100		14/12	0.18/0.16	0.25/0.22	2700/3100	2.35/2.7 83 / 95.4	55.9/65.7 0.224/0.264	40/43			
109S005UL				0.16/0.14	0.21/0.18							
109S024				0.09/0.08	0.13/0.11							
109S008	200			0.08/0.07	0.11/0.09							
109S008UL				14/12	0.18/0.16	0.23/0.21	2450/2700	2.15/2.35 76 / 83	44.1/49.0 0.177/0.197			38/40
109S025	230			13/11	0.16/0.14	0.16/0.15	1800/2000	1.55/1.75 54.8/ 60.8	23.5/26.4 0.094/0.106			30/32
109S025UL				7/7	0.1 /0.09	0.1 /0.09	1650/1700	1.45/1.5 51.2/ 53	17.6/17.6 0.071/0.071			28/28
109S029UL				10/10	0.13/0.11	0.13/0.11	1800/1900	1.56/1.64 55 / 57.9	20 /20.6 0.08 /0.083			30/31
109S013	100			7/7	0.05/0.04	0.05/0.04	1650/1700	1.45/1.5 51.2/ 53	17.6/17.6 0.071/0.071			28/28
109S013UL				11/11	0.06/0.05	0.06/0.05	1800/1950	1.58/1.68 55.8/ 59.3	20.6/21.6 0.083/0.087			30/32
109S006*				10/10	0.13/0.11	0.13/0.11	1800/1900	1.56/1.64 55 / 57.9	20 /20.6 0.08 /0.083			30/31
109S006UL*	115			7/7	0.05/0.04	0.05/0.04	1650/1700	1.45/1.5 51.2/ 53	17.6/17.6 0.071/0.071			28/28
109S010*	200		11/11	0.06/0.05	0.06/0.05	1800/1950	1.58/1.68 55.8/ 59.3	20.6/21.6 0.083/0.087	30/32			
109S010UL*	240		11/11	0.06/0.05	0.06/0.05	1800/1950	1.58/1.68 55.8/ 59.3	20.6/21.6 0.083/0.087	30/32			

*These are low-speed models.

with Sensor

For sensor specifications, please refer to p. 602. Sensor specification differs depending on the fan's speed specification.

For a 5 V sensor power supply (ITEM-20), please append "-20" to the end of model number. E.g. 109S405UL-20

For a 12 V sensor power supply (ITEM-30), please append "-30" to the end of model number. E.g. 109S405UL-30

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m³/min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109S405UL	100	50/60	14/12	0.18/0.16	0.25/0.22	2700/3100	2.35/2.7 83 / 95.4	55.9/65.7 0.224/0.264	40/43	-10 to +60	25000/60°C (56000/40°C)
109S424UL	115			0.16/0.14	0.21/0.18						
109S408UL	200			0.09/0.08	0.13/0.11						
109S425UL	230			0.08/0.07	0.11/0.09						
109S429UL	100		7/6	0.18/0.16	0.23/0.21	2450/2700	2.15/2.35 76 / 83	44.1/49.0 0.177/0.197	38/40		
109S406UL *				0.09/0.08	0.1 /0.09	1650/1700	1.45/1.5 51 / 53	17.7/17.7 0.071/0.071	28/28		
109S475UL	100		18/16	0.24/0.21	0.32/0.28	2700/3100	2.5 /2.9 88.3/102.4	57.9/68.7 0.233/0.276	42/45		
109S474UL	115			0.21/0.18	0.27/0.24						
109S478UL	200			0.12/0.1	0.16/0.14						
109S472UL	230			0.11/0.09	0.14/0.13						

*These are low-speed models.

Note: These are Short LeadTime Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

For the San Ace 120AD 9AD type 120×120×38 mm fan, please refer to p. 519.

This fan works while internally converting AC power into DC power, providing the superior performance of a DC fan with the flexibility of AC input.

Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord*	Finger guards	Mounting screws
ST1-109S075UL	109S075UL	100 V		489-037-L10	109-019E	M3×55 mm (4 screws)
ST1-109S074UL	109S074UL	115 V		489-037-L10	109-019E	
ST1-109S078UL	109S078UL	200 V		489-037-L10	109-019E	
ST1-109S072UL	109S072UL	230 V		489-037-L10	109-019E	
ST1-109S005	109S005	100 V		489-006-L10	109-019E	
ST1-109S005UL	109S005UL			489-037-L10	109-019E	
ST1-109S024	109S024	120 V		489-006-L10	109-019E	
ST1-109S024UL	109S024UL	115 V		489-037-L10	109-019E	
ST1-109S008	109S008	200 V		489-006-L10	109-019E	
ST1-109S008UL	109S008UL			489-037-L10	109-019E	
ST1-109S025	109S025	230 V		489-006-L10	109-019E	
ST1-109S025UL	109S025UL			489-037-L10	109-019E	
ST1-109S029UL	109S029UL	100 V		489-037-L10	109-019E	
ST1-109S013	109S013			489-006-L10	109-019E	
ST1-109S013UL	109S013UL			489-037-L10	109-019E	
ST1-109S006	109S006			489-006-L10	109-019E	
ST1-109S006UL	109S006UL	100 V 115 V		489-037-L10	109-019E	
ST1-109S010	109S010	200 V		489-006-L10	109-019E	
ST1-109S010UL	109S010UL	200 V 240 V		489-037-L10	109-019E	
ST1-109S405UL-20	109S405UL-20	100 V	○ (5 V)	489-037-L10	109-019E	
ST1-109S405UL-30	109S405UL-30		○ (12 V)	489-037-L10	109-019E	
ST1-109S424UL-20	109S424UL-20	115 V	○ (5 V)	489-037-L10	109-019E	
ST1-109S424UL-30	109S424UL-30		○ (12 V)	489-037-L10	109-019E	
ST1-109S408UL-20	109S408UL-20	200 V	○ (5 V)	489-037-L10	109-019E	
ST1-109S408UL-30	109S408UL-30		○ (12 V)	489-037-L10	109-019E	
ST1-109S425UL-20	109S425UL-20	230 V	○ (5 V)	489-037-L10	109-019E	
ST1-109S425UL-30	109S425UL-30		○ (12 V)	489-037-L10	109-019E	
ST1-109S429UL-20	109S429UL-20	100 V	○ (5 V)	489-037-L10	109-019E	
ST1-109S429UL-30	109S429UL-30		○ (12 V)	489-037-L10	109-019E	
ST1-109S406UL-20	109S406UL-20	100 V	○ (5 V)	489-037-L10	109-019E	
ST1-109S406UL-30	109S406UL-30		○ (12 V)	489-037-L10	109-019E	
ST1-109S475UL-20	109S475UL-20	100 V	○ (5 V)	489-037-L10	109-019E	
ST1-109S475UL-30	109S475UL-30		○ (12 V)	489-037-L10	109-019E	
ST1-109S474UL-20	109S474UL-20	115 V	○ (5 V)	489-037-L10	109-019E	
ST1-109S474UL-30	109S474UL-30		○ (12 V)	489-037-L10	109-019E	
ST1-109S478UL-20	109S478UL-20	200 V	○ (5 V)	489-037-L10	109-019E	
ST1-109S478UL-30	109S478UL-30		○ (12 V)	489-037-L10	109-019E	
ST1-109S472UL-20	109S472UL-20	230 V	○ (5 V)	489-037-L10	109-019E	
ST1-109S472UL-30	109S472UL-30		○ (12 V)	489-037-L10	109-019E	

* PSE compatible.

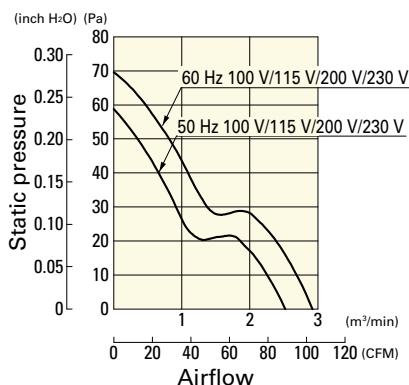
AC

AC Fan 120 mm sq.

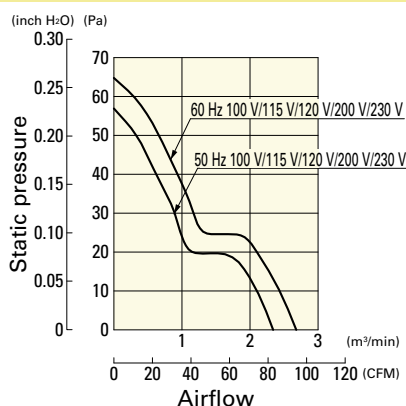
Airflow - Static Pressure Characteristics

Standard

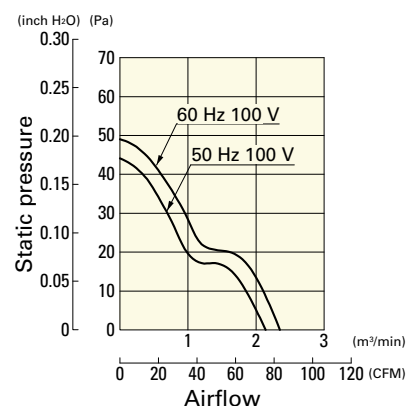
109S075UL, 109S074UL, 109S078UL, 109S072UL



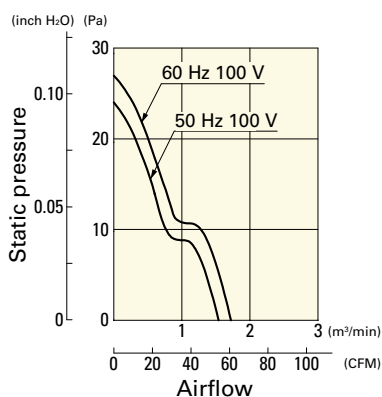
109S005, 109S005UL, 109S024, 109S024UL, 109S008, 109S008UL, 109S025, 109S025UL



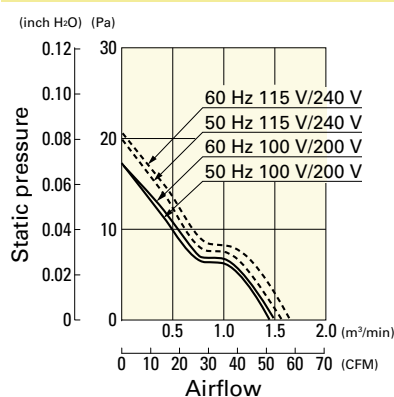
109S029UL



109S013, 109S013UL

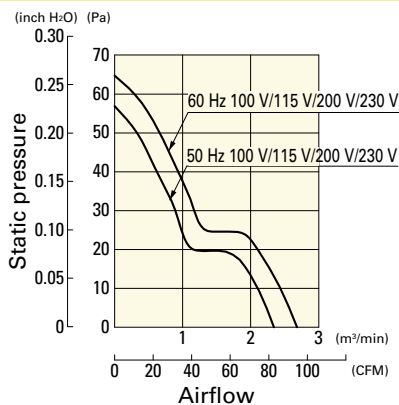


109S006, 109S006UL, 109S010, 109S010UL

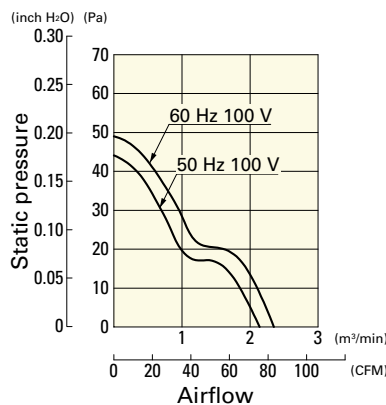


with Sensor

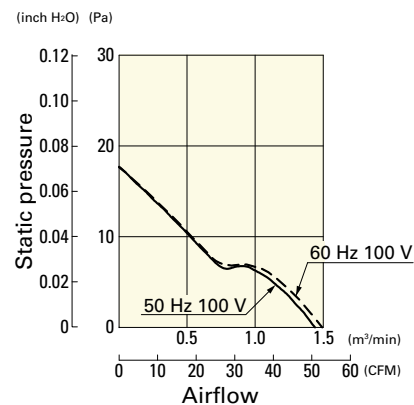
109S405UL, 109S424UL, 109S408UL, 109S425UL



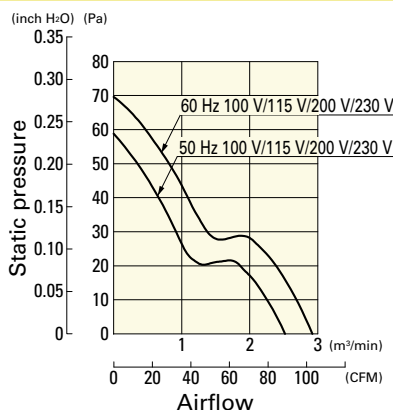
109S429UL



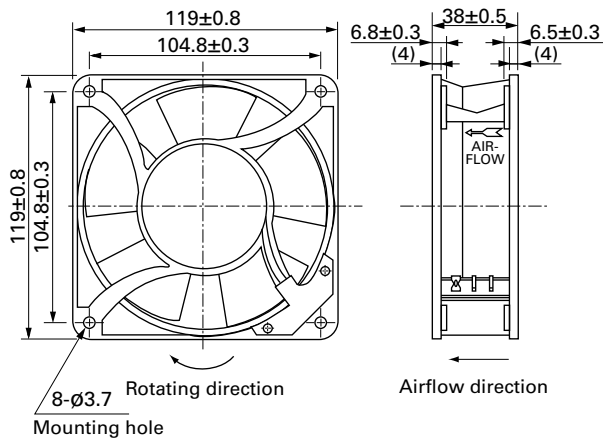
109S406UL



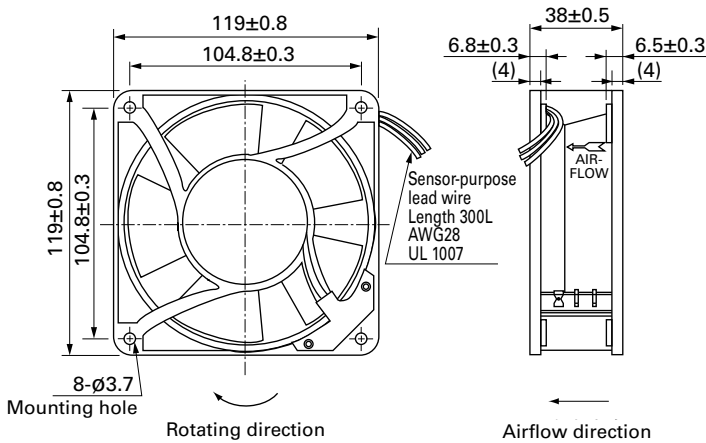
109S475UL, 109S474UL, 109S478UL, 109S472UL



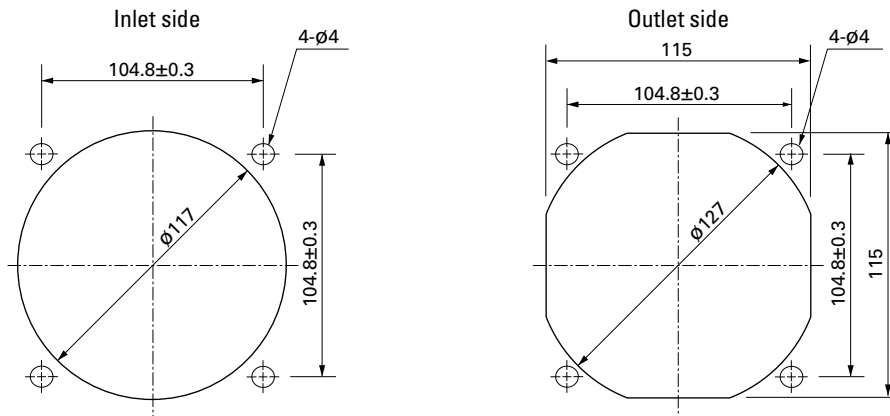
Standard



with Sensor When mounting the model with a sensor, please screw-mount through both flanges as it has a sensor box.

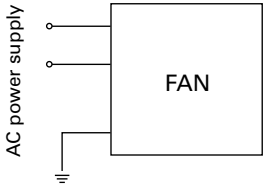


■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



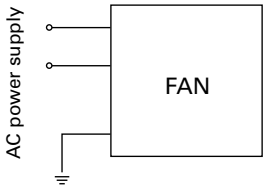
Wiring Diagram

Standard

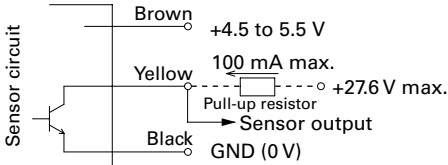


with Sensor

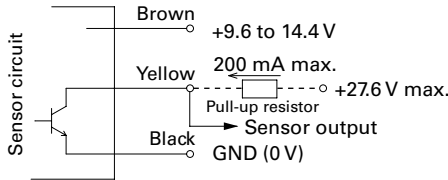
For fan power supply



For sensor circuit
5 V (ITEM-20)



12 V (ITEM-30)



GND (Black) should be shared in case that power supply for sensor circuit (Brown) and that for sensor pull-up (Yellow) are separated.

Options

Finger guards page: p. 585
Model no.: 109-019E, 109-019K, 109-019C, 109-019H

Resin finger guards page: p. 591
Model no.: 109-1000G

Resin filter kits page: p. 592
Model no.: 109-1000F13 (13PPI), 109-1000F20 (20PPI),
109-1000F30 (30PPI), 109-1000F40 (40PPI)

Filter kits page: p. 593
Model no.: 109-018

Screen kits page: p. 593
Model no.: 109-020

Plug cord page: pp. 594 to 595
Exclusive for fans without UL at the end of the model number.
Model no.: 489-006-L10, 489-006-L21, 489-006-L35
Exclusive for fans with UL at the end of the model number.
Model no.: 489-037-L10, 489-037-L21, 489-037-L35,
489-007-L10, 489-007-L21



160×160×51 mm

San Ace 160    Only standard fans (without sensors) have acquired CSA certification.

General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Capacitor motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Dielectric strength (with sensor) 50/60 Hz 1500 VAC 1 minute (between AC input terminal and frame)
50/60 Hz 1000 VAC 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Sensor-Purpose lead wire ⊕Brown ⊖Black (Sensor) Yellow
- Mass 1100 g

Specifications

Standard

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109-601	100	50/60	37.5/33	0.43/0.35	0.72/0.7	2850/3350	7.2/8.5 254.4/300.4	156.8/166.6 0.63/0.669	56/60	-30 to +60	25000/60°C (56000/40°C)
109-604	115			0.39/0.31	0.62/0.61						
109-602	200			0.23/0.18	0.36/0.35						
109-603	230			0.21/0.16	0.32/0.31						

with Sensor

For sensor specifications, please refer to p. 602. Sensor specification differs depending on the fan's speed specification.

For a 5 V sensor power supply (ITEM-20), please append "-20" to the end of model number. E.g. 109-641-20

For a 12 V sensor power supply (ITEM-30), please append "-30" to the end of model number. E.g. 109-641-30

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109-641	100	50/60	37.5/33	0.43/0.35	0.72/0.7	2850/3350	7.2/8.5 254.4/300.4	156.8/166.6 0.63/0.669	56/60	-10 to +60	25000/60°C (56000/40°C)
109-644	115			0.39/0.31	0.62/0.61						
109-642	200			0.23/0.18	0.36/0.35						
109-643	230			0.21/0.16	0.32/0.31						

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

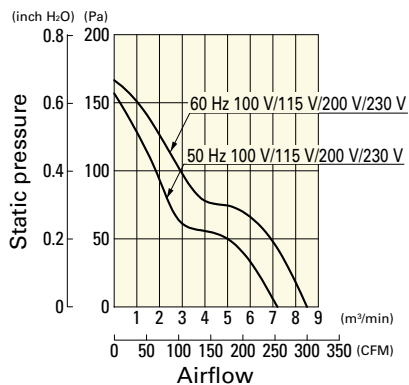
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord*	Finger guards	Mounting screws
ST1-109-601	109-601	100 V		489-1618-L10	109-619E	M5×20 mm (4 screws)
ST1-109-604	109-604	115 V		489-1618-L10	109-619E	
ST1-109-602	109-602	200 V		489-1618-L10	109-619E	
ST1-109-603	109-603	230 V		489-1618-L10	109-619E	
ST1-109-641-20	109-641-20	100 V	○ (5 V)	489-1618-L10	109-619E	
ST1-109-641-30	109-641-30		○ (12 V)	489-1618-L10	109-619E	
ST1-109-644-20	109-644-20	115 V	○ (5 V)	489-1618-L10	109-619E	
ST1-109-644-30	109-644-30		○ (12 V)	489-1618-L10	109-619E	
ST1-109-642-20	109-642-20	200 V	○ (5 V)	489-1618-L10	109-619E	
ST1-109-642-30	109-642-30		○ (12 V)	489-1618-L10	109-619E	
ST1-109-643-20	109-643-20	230 V	○ (5 V)	489-1618-L10	109-619E	
ST1-109-643-30	109-643-30		○ (12 V)	489-1618-L10	109-619E	

* PSE compatible.

Airflow - Static Pressure Characteristics

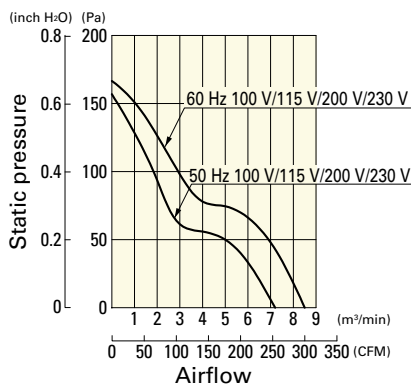
Standard

109-601, 109-604, 109-602, 109-603



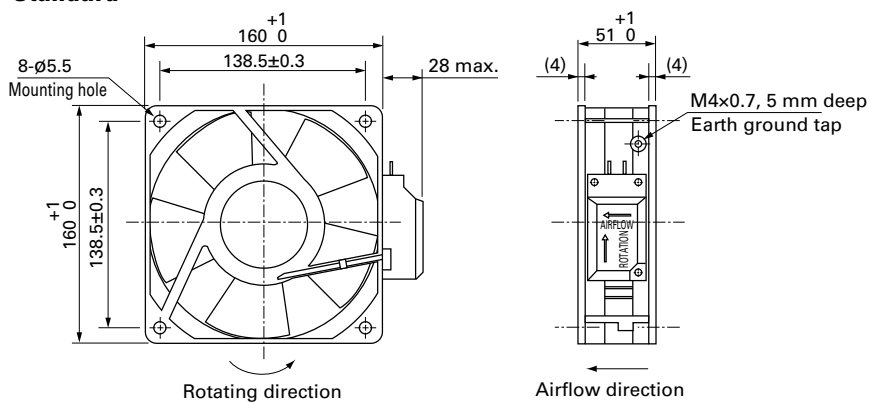
with Sensor

109-641, 109-644, 109-642, 109-643

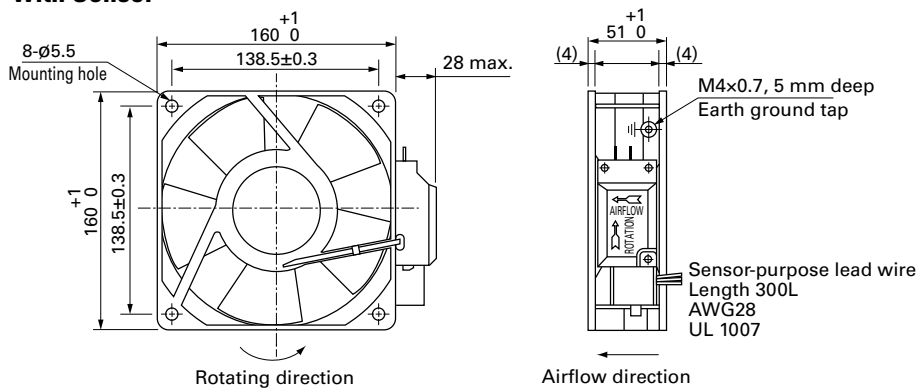


Dimensions (unit: mm)

Standard

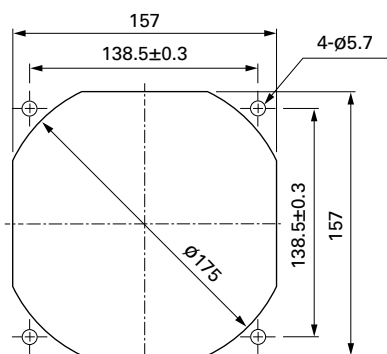


with Sensor



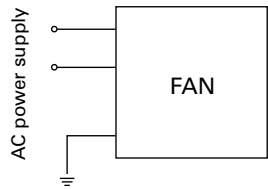
Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Inlet side, Outlet side



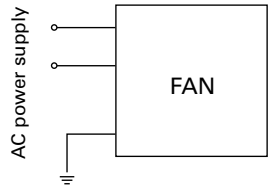
■ **Wiring Diagram**

Standard

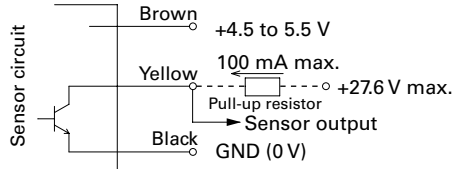


with Sensor

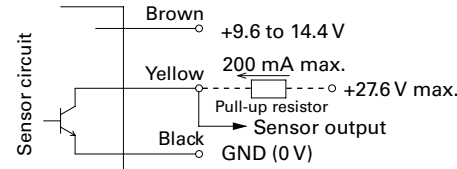
For fan power supply



For sensor circuit
5 V (ITEM-20)



12 V (ITEM-30)



GND (Black) should be shared in case that power supply for sensor circuit (Brown) and that for sensor pull-up (Yellow) are separated.

■ **Options**

Finger guards

page: p. 585

Model no.: 109-619E, 109-619H, 109-620

Plug cord

page: pp. 594 to 595

Model no.: 489-084-L10, 489-084-L21, 489-086-L10,
489-086-L21, 489-1618-L10, 489-1618-L21,
489-1618-L28, 489-1619-L10, 489-1619-L21

AC

AC Fan 160 mm sq.

Ø172×150×51 mm

San Ace 172   

Sidecut type



General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Capacitor motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Mass 1000 g

Specifications

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109S301	100	50/60	27/25	0.33/0.25	0.65/0.64	2900/3500	5.3/6.4 187.3/226.1	147/196 0.59/0.787	51/56	-30 to +60	25000/60°C (56000/40°C)
109S304	115			0.29/0.22	0.55/0.54						
109S302	200			0.16/0.13	0.33/0.32						
109S303	230			0.14/0.11	0.28/0.27						

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

Set Models

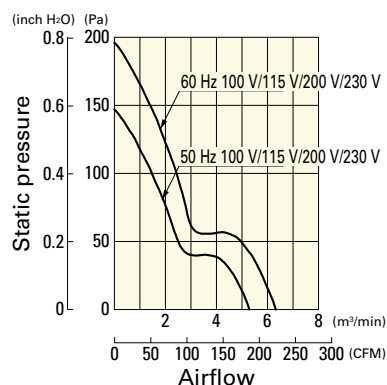
Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord ⁽¹⁾	Finger guards	Mounting screws
ST1-109S301	109S301	100 V		489-1619-L10	109-319E	M4×25 mm (4 screws) ⁽²⁾
ST1-109S304	109S304	115 V		489-1619-L10	109-319E	
ST1-109S302	109S302	200 V		489-1619-L10	109-319E	
ST1-109S303	109S303	230 V		489-1619-L10	109-319E	

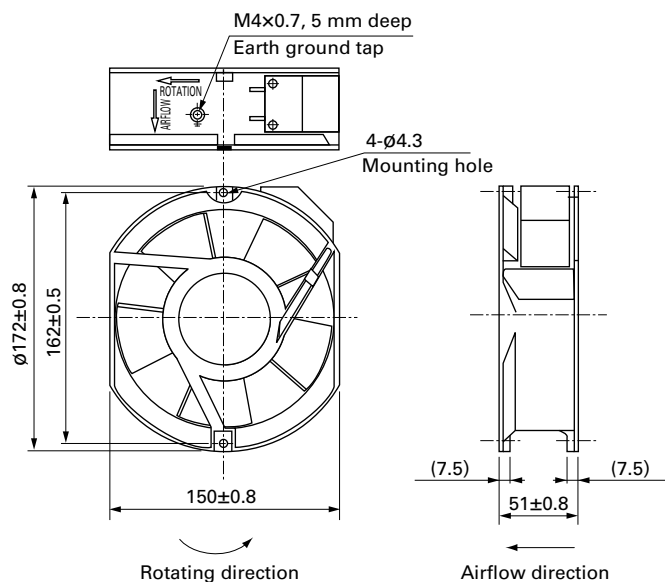
(1) PSE compatible.

(2) Though these are 2-hole or 3-hole frame mount types, 4 screws are included for extra.

Airflow - Static Pressure Characteristics

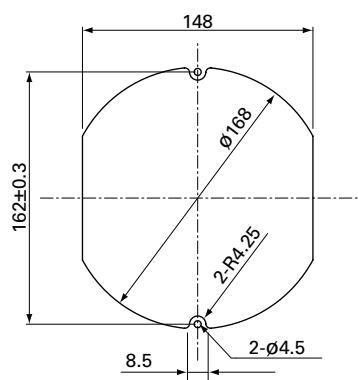
109S301, 109S304, 109S302, 109S303


■ Dimensions (unit: mm)

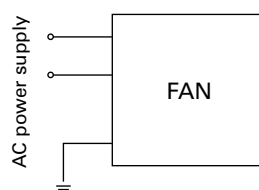


■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Inlet side, Outlet side



■ Wiring Diagram



■ Options

Finger guards

page: p. 586

Model no.: 109-319E, 109-319H, 109-320

Plug cord

page: pp. 594 to 595

Model no.: 489-1619-L10, 489-1619-L21, 489-084-L10, 489-084-L21

AC

AC Fan $\varnothing 172 \text{ mm}$

Ø172x51 mm

San Ace 172



Only standard fans (without sensors) have acquired CSA certification.

Round type



General Specifications

- Material Frame: Aluminum, Impeller: Plastic (Flammability: UL 94V-1)
- Expected life See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
Expected life at 40°C is for reference only.
- Motor structure Capacitor motor
- Motor protection function Locked rotor burnout protection, Reverse polarity protection
For details, please refer to p. 599.
- Dielectric strength 50/60 Hz, 1500 VAC, for 1 minute (between input terminal and frame)
- Dielectric strength (with sensor) 50/60 Hz 1500 VAC 1 minute (between AC input terminal and frame)
50/60 Hz 1000 VAC 1 minute (between lead wire conductors and frame)
- Insulation resistance 10 MΩ or more with a 500 VDC megger
- Sound pressure level (SPL) At 1 m away from the air inlet
- Operating voltage range Voltage of each model ±10%
- Storage temperature -30 to +70°C (Non-condensing)
- Sensor-Purpose lead wire ⊕Brown ⊖Black (Sensor) Yellow
- Mass 1000 g

Specifications

Standard

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109-311	100	50/60	27/25	0.33/0.25	0.65/0.64	2900/3500	5.3/6.4 187.3/226.1	147/196 0.59/0.787	47/51	-30 to +60	25000/60°C (56000/40°C)
109-314	115			0.29/0.22	0.55/0.54						
109-312	200			0.16/0.13	0.33/0.32						
109-313	230			0.14/0.11	0.28/0.27						

with Sensor

For sensor specifications, please refer to p. 602. Sensor specification differs depending on the fan's speed specification.

For a 5 V sensor power supply (ITEM-20), please append "-20" to the end of model number. E.g. 109-371-20

For a 12 V sensor power supply (ITEM-30), please append "-30" to the end of model number. E.g. 109-371-30

Model no.	Rated voltage [V]	Frequency [Hz]	Input [W]	Current [A]	Locked rotor current [A]	Rated speed [min ⁻¹]	Max. airflow [m ³ /min] [CFM]	Max. static pressure [Pa] [inchH ₂ O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
109-371	100	50/60	27/25	0.33/0.25	0.65/0.64	2900/3500	5.3/6.4 187.3/226.1	147/196 0.59/0.787	47/51	-10 to +60	25000/60°C (56000/40°C)
109-374	115			0.29/0.22	0.55/0.54						
109-372	200			0.16/0.13	0.33/0.32						
109-373	230			0.14/0.11	0.28/0.27						

Note: These are Short Lead Time Service applicable models. Contact your point of sale for stock availability. For more information on the service, see p. 654.

Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

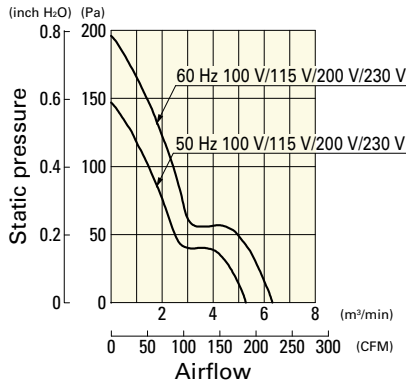
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord*	Finger guards	Mounting screws
ST1-109-311	109-311	100 V		489-1619-L10	109-319E	M4×25 mm (4 screws)
ST1-109-314	109-314	115 V		489-1619-L10	109-319E	
ST1-109-312	109-312	200 V		489-1619-L10	109-319E	
ST1-109-313	109-313	230 V		489-1619-L10	109-319E	
ST1-109-371-20	109-371-20	100 V	○ (5 V)	489-1619-L10	109-319E	
ST1-109-371-30	109-371-30		○ (12 V)	489-1619-L10	109-319E	
ST1-109-374-20	109-374-20	115 V	○ (5 V)	489-1619-L10	109-319E	
ST1-109-374-30	109-374-30		○ (12 V)	489-1619-L10	109-319E	
ST1-109-372-20	109-372-20	200 V	○ (5 V)	489-1619-L10	109-319E	
ST1-109-372-30	109-372-30		○ (12 V)	489-1619-L10	109-319E	
ST1-109-373-20	109-373-20	230 V	○ (5 V)	489-1619-L10	109-319E	
ST1-109-373-30	109-373-30		○ (12 V)	489-1619-L10	109-319E	

* PSE compatible.

Airflow - Static Pressure Characteristics

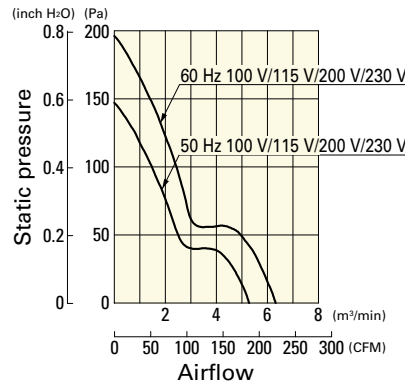
Standard

109-311, 109-314, 109-312, 109-313



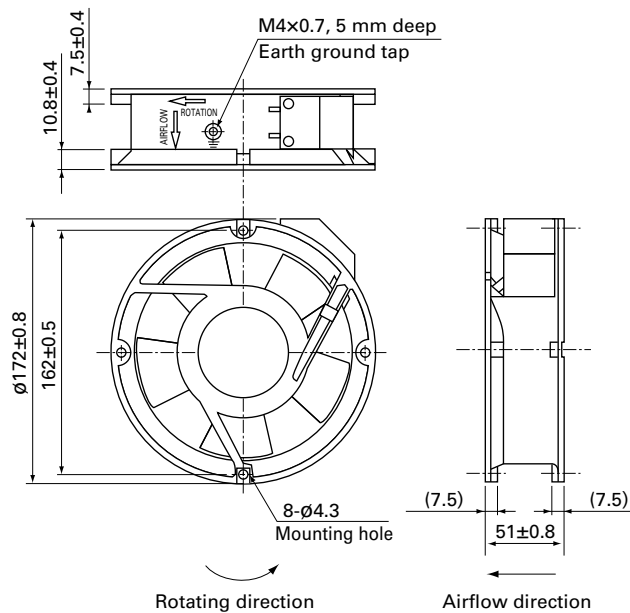
with Sensor

109-371, 109-374, 109-372, 109-373

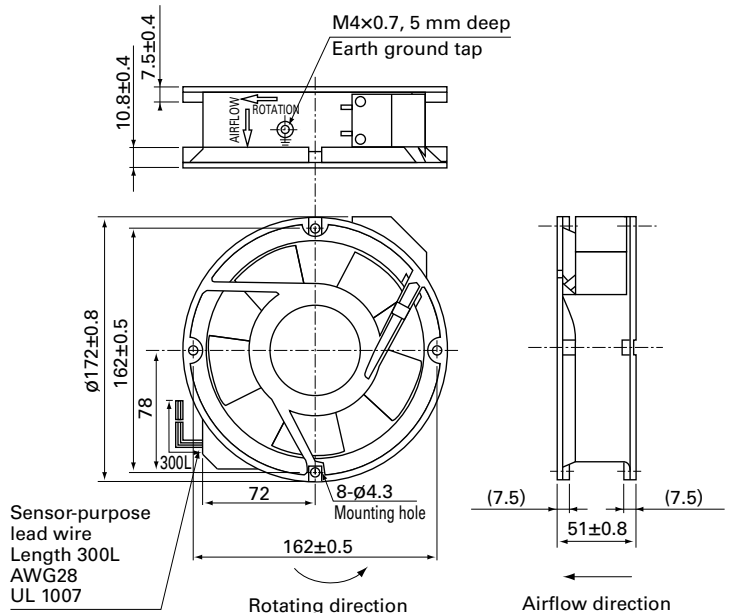


Dimensions (unit: mm)

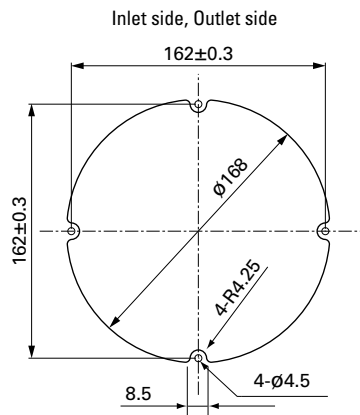
Standard



with Sensor



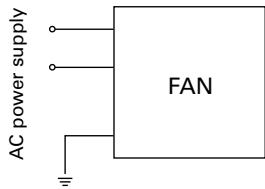
Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



AC
AC Fan ø172 mm

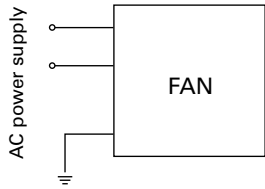
Wiring Diagram

Standard

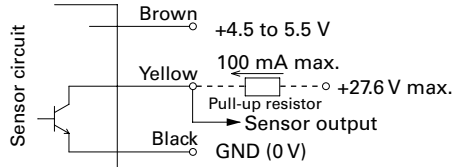


with Sensor

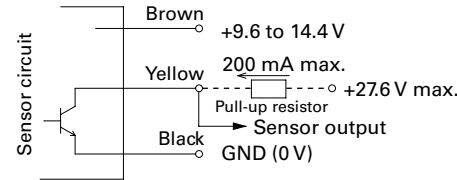
For fan power supply



For sensor circuit
5 V (ITEM-20)



12 V (ITEM-30)



GND (Black) should be shared in case that power supply for sensor circuit (Brown) and that for sensor pull-up (Yellow) are separated.

Options

Finger guards

page: p. 586

Model no.: 109-319E, 109-319H, 109-320, 109-1066,
109-1068

Plug cord

page: pp. 594 to 595

Model no.: 489-1619-L10, 489-1619-L21, 489-084-L10,
489-084-L21

Mouser Electronics

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