

# 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 Without a sensor		H With a low-speed sensor			
Frame form	Nil Plastic frame: Ribbed frame			1 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 <sub>min.</sub>					
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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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.



# 92x92x38 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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 LeadTime Service applicable models. See p. 654 for details.

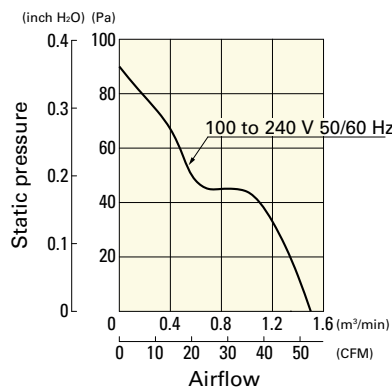
## Set Models

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

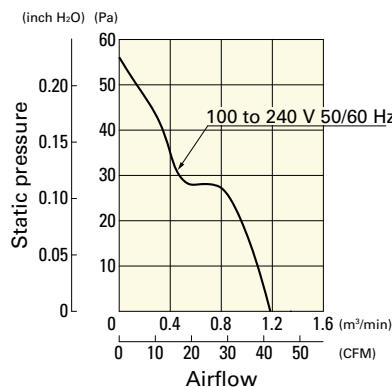
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord	Finger guards	Mounting screws
ST1-9AD0901H12	9AD0901H12	100 to 240 V		489-1635-L10	109-099E	M4×55 mm (4 screws)
ST1-9AD0901M12	9AD0901M12			489-1635-L10	109-099E	
ST1-9AD0901H1H	9AD0901H1H		○	489-1635-L10	109-099E	
ST1-9AD0901M1H	9AD0901M1H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

## Airflow - Static Pressure Characteristics

9AD0901H12, 9AD0901H1H

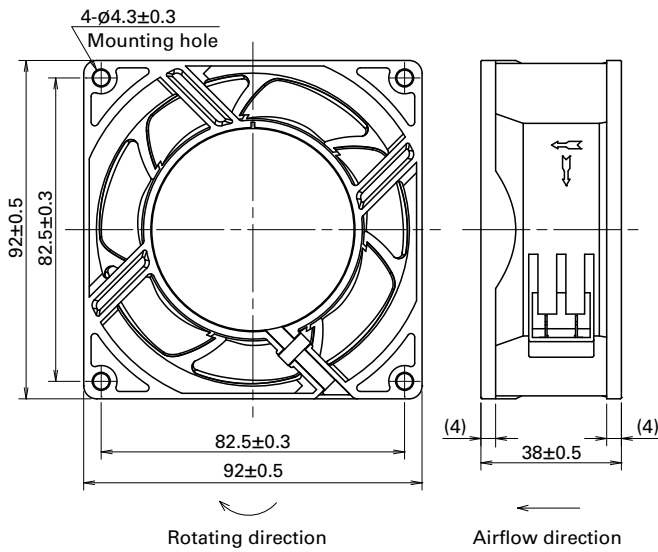


9AD0901M12, 9AD0901M1H

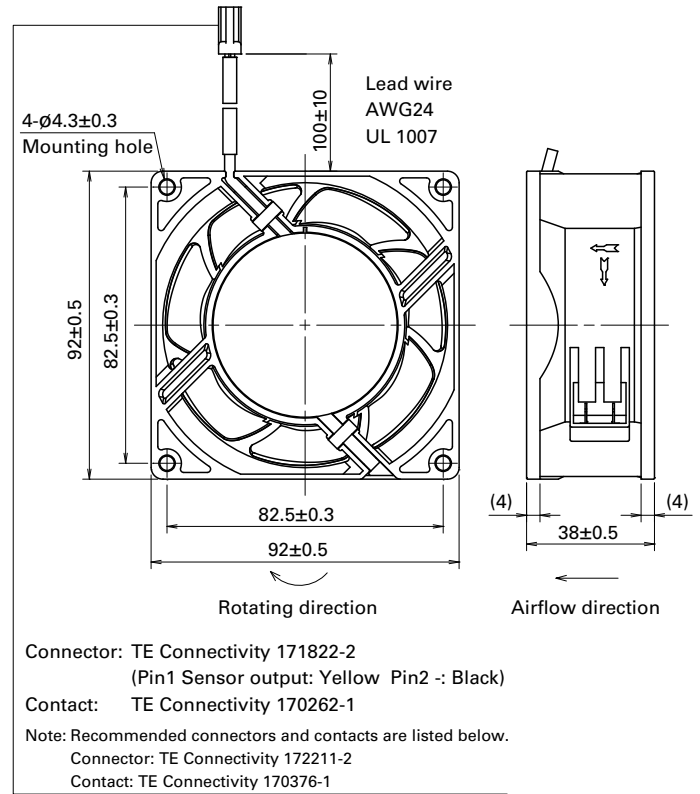


**Dimensions (unit: mm)** (With ribs)

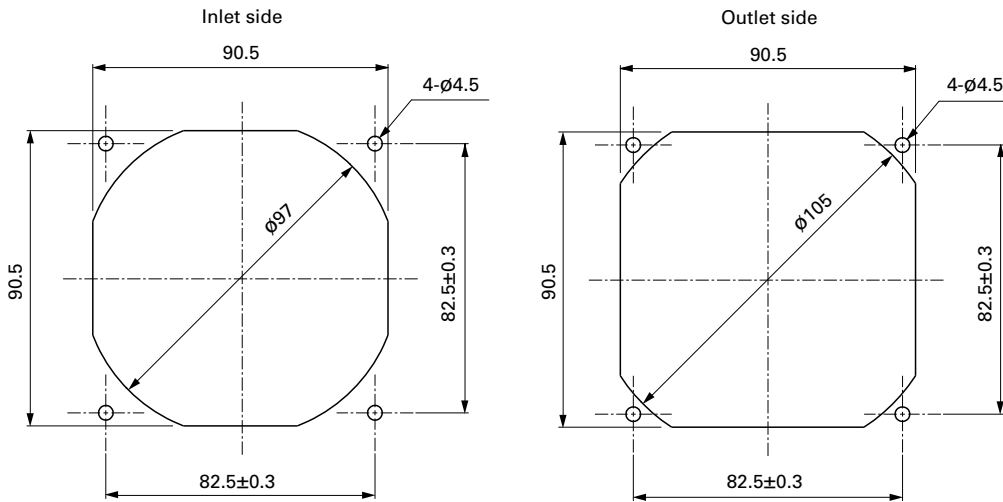
**without Sensor**



**with Low-speed sensor**

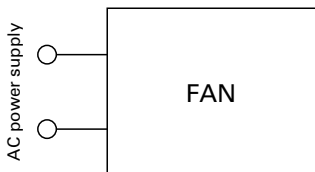


**Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)**

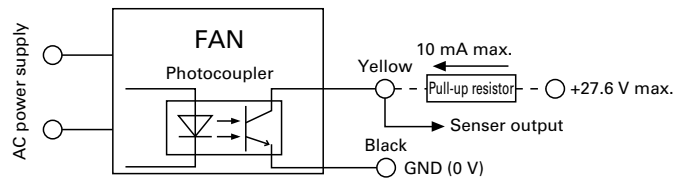


**Wiring Diagram**

**without Sensor**



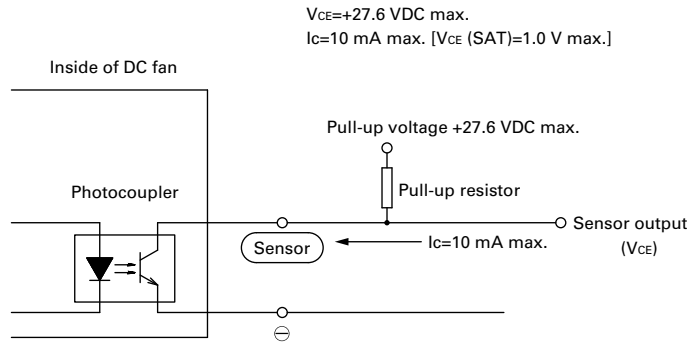
**with Low-speed sensor**



## Specifications for Low-speed Sensors

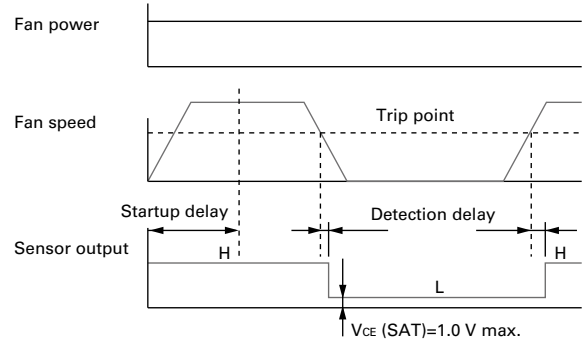
Typical standard model: 9AD0901H1H

Output circuit: Open collector

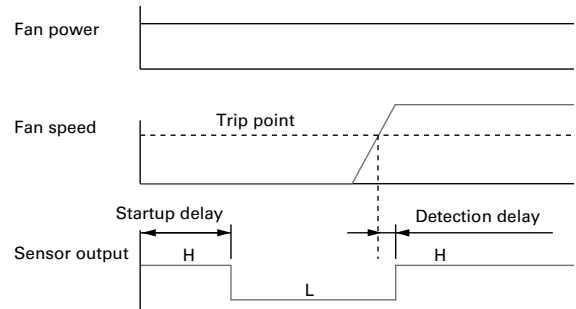


### Sensor scheme

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±3 s  
 Detection delay: 3 s max.  
 Trip point: 1700 min<sup>-1</sup>

#### 9AD0901M1H

Startup delay: 36±3 s  
 Detection delay: 3 s max.  
 Trip point: 850 min<sup>-1</sup>

## 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

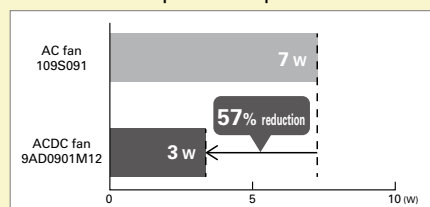
Model no.: 489-1636

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

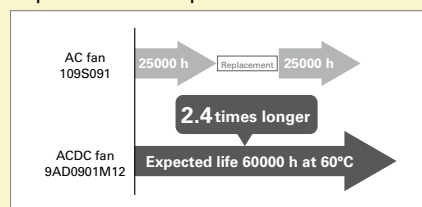
**Low power consumption** **Long life** **Wide voltage range** (Compared with our existing AC fan with equal size.)

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





# 120x120x38 mm

San Ace 120AD 9AD<sub>type</sub>

## 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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.

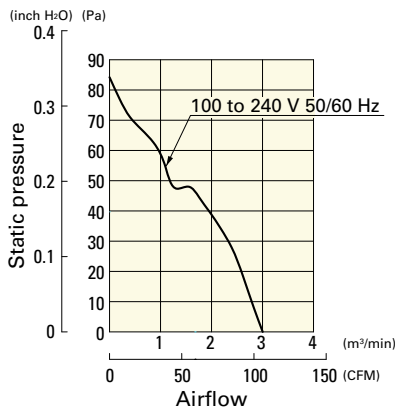
## Set Models

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	M4x55 mm (4 screws)
ST1-9AD1201H1H	9AD1201H1H		○	489-1635-L10	109-019E	

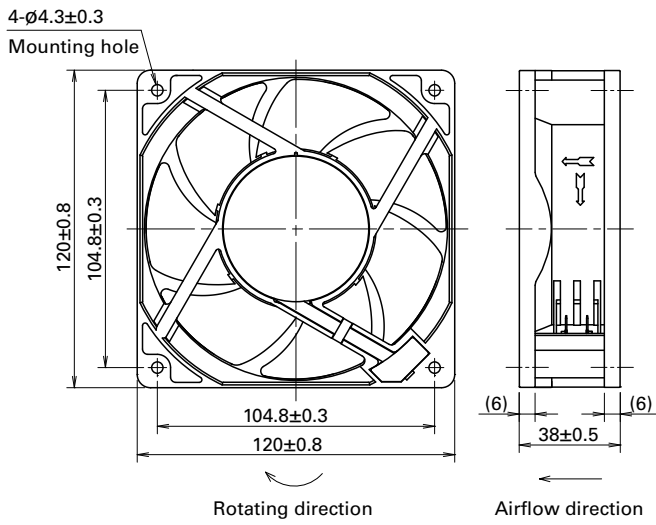
## Airflow - Static Pressure Characteristics

### 9AD1201H12, 9AD1201H1H

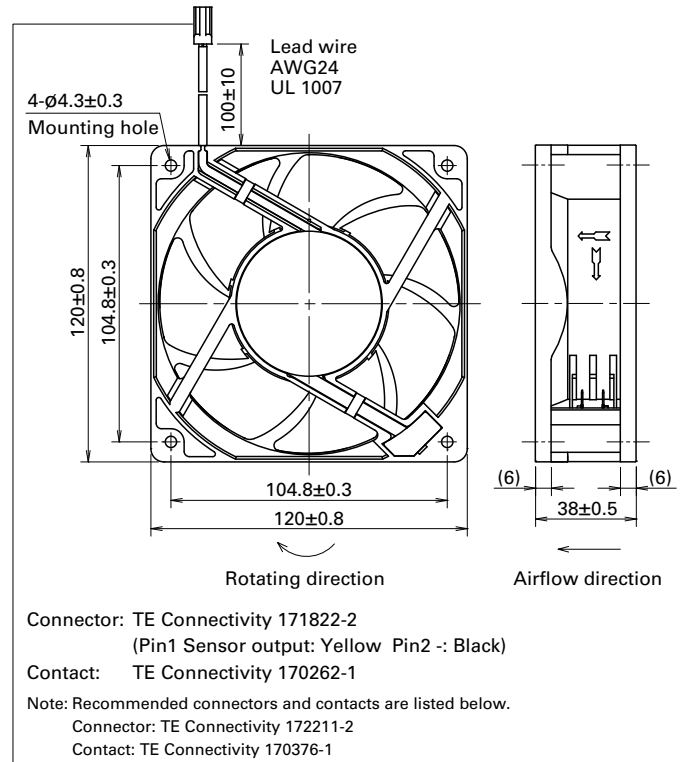


**Dimensions (unit: mm)** (With ribs)

**without Sensor**

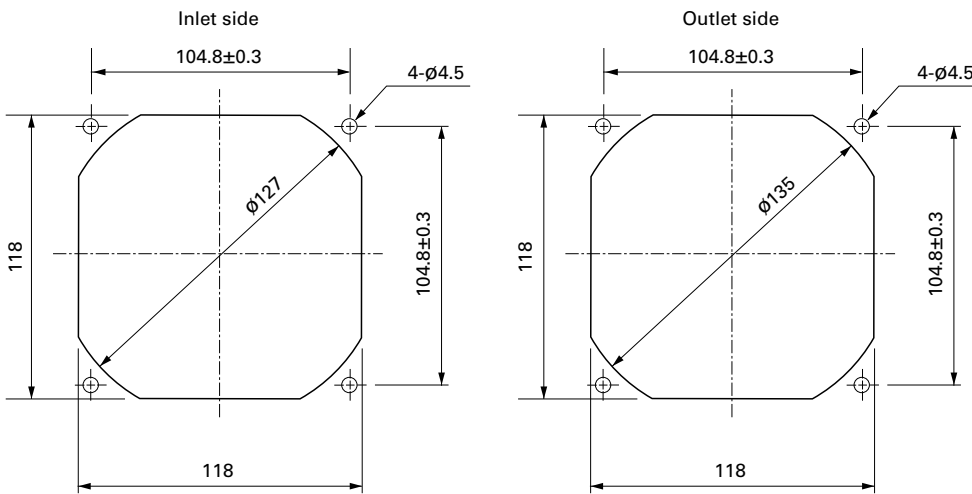


**with Low-speed sensor**



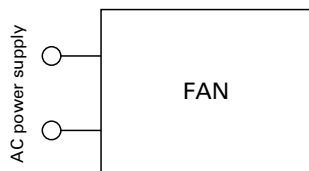
**Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)**

ACDC Fan 120 mm sq.

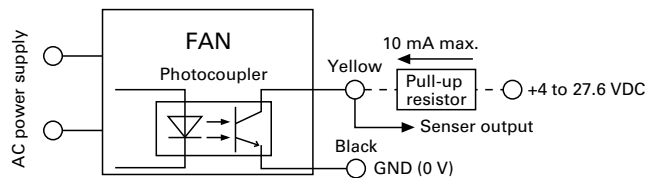


**Wiring Diagram**

**without Sensor**



**with Low-speed sensor**

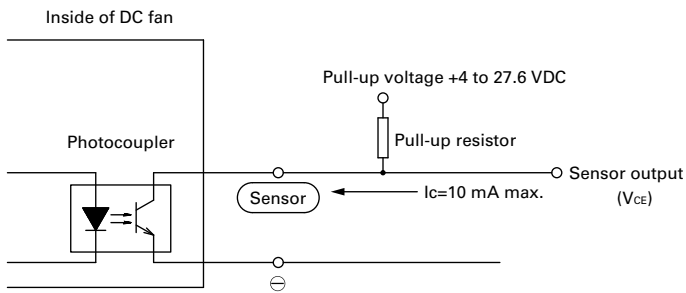


## Specifications for Low-speed Sensors

Model No.: 9AD1201H1H

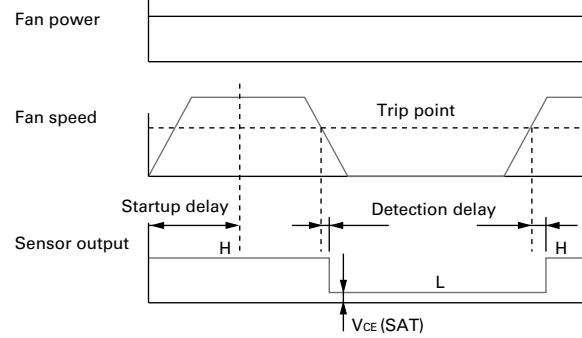
Output circuit: Open collector

$V_{CE} = +27.6$  VDC max.  
 $I_C = 10$  mA max. [ $V_{CE} (SAT) = 1.0$  V max.]

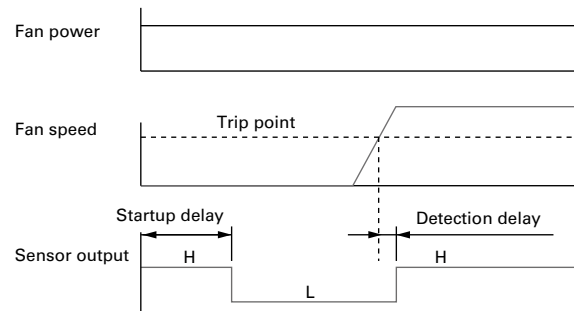


Sensor scheme

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

## Options

Finger guards page: p. 585

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

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: p. 595

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

Wiring harness for sensor page: p. 595

Model no.: 489-1636

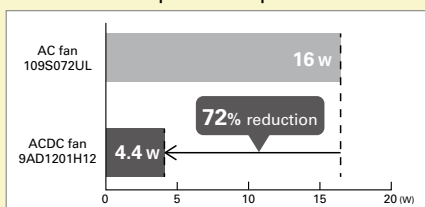
ACDC  
 ACDC Fan 120 mm sq.

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

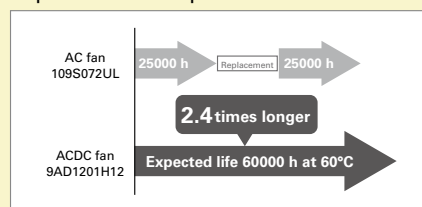
**Low power consumption** **Long life** **Wide voltage range** (Compared with our existing AC fan with equal size.)

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

## ACDC Fan

9AD type

### Features

#### High Airflow and High Static Pressure

These fans deliver a maximum airflow of 6.7 m<sup>3</sup>/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 172AC Fan (Model 109S301)



∅172 × 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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%.

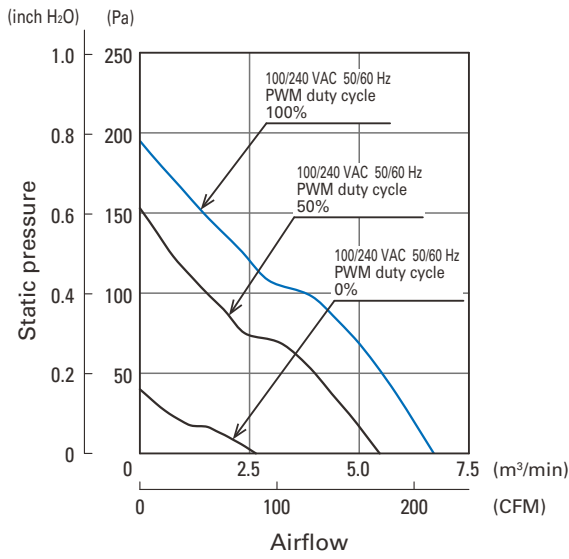
Models with the following sensor specifications are also available as options: Without sensor Lock sensor Low-speed sensor

### 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

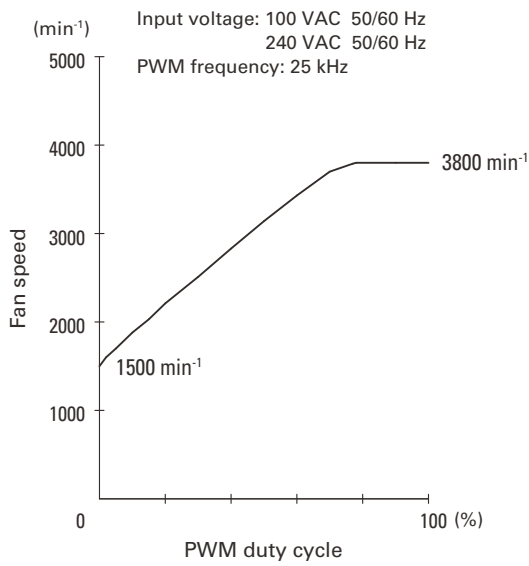


## Airflow - Static Pressure Characteristics



**9AD5701P5H003**  
**9AD5701P5HT03**

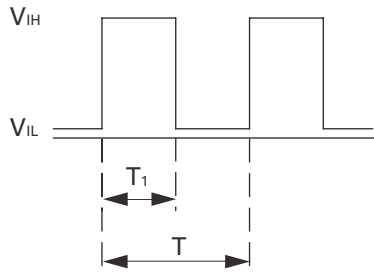
## PWM Duty - Speed Characteristics Example



**9AD5701P5H003**  
**9AD5701P5HT03**

### PWM Input Signal Example

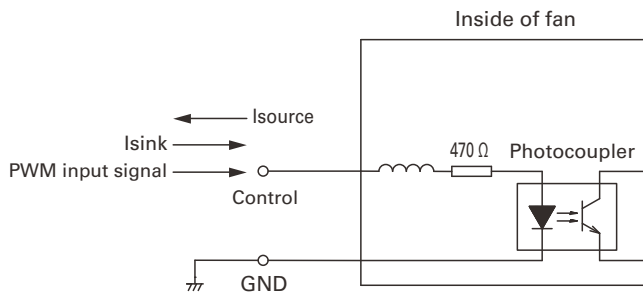
Input signal waveform



$V_{IH} = 4.75 \text{ to } 5.25 \text{ V}$     $V_{IL} = 0 \text{ to } 0.4 \text{ V}$   
 PWM duty cycle (%) =  $\frac{T_1}{T} \times 100$    PWM frequency 25 (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)

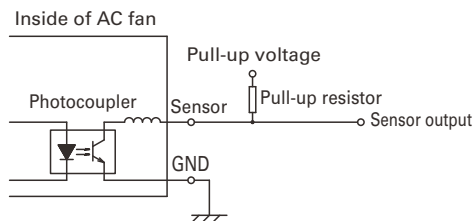
When the PWM control terminal is open, the fan speed is the same as the speed at 0% PWM duty cycle. A TTL input can be used for the PWM input signal.

### Example of Connection Schematic



### Specifications for Pulse Sensors

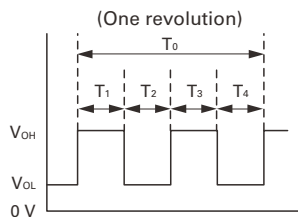
Output circuit: Open collector



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

Output waveform (Need pull-up resistor)

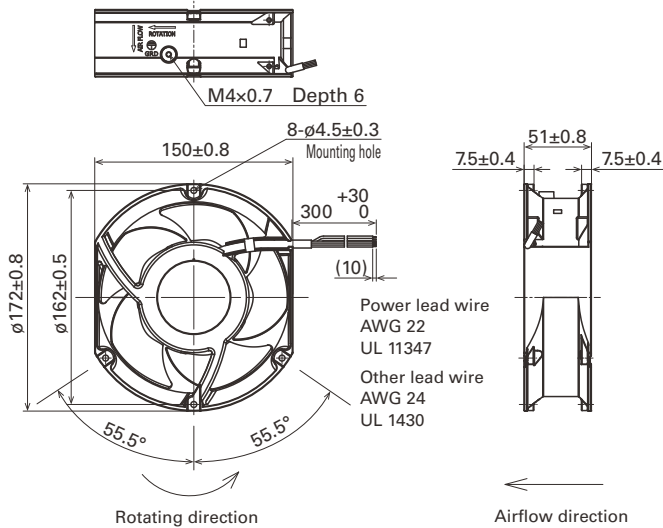
In case of steady running



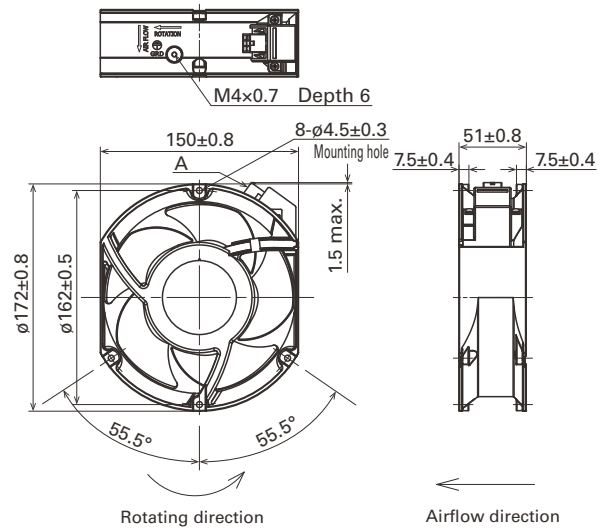
$T_{1 \text{ to } 4} \approx (1/4) T_0$   
 $T_{1 \text{ to } 4} \approx (1/4) T_0 = 60/4N \text{ (s)}$   
 $N = \text{Fan speed (min}^{-1}\text{)}$

## Dimensions (unit: mm)

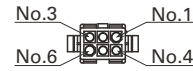
### Lead wire model



### Terminal model



#### A Connector contact



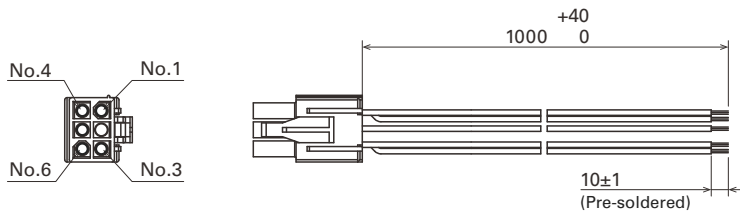
#### Pin arrangement

Connector (Model no.: TE Connectivity: 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

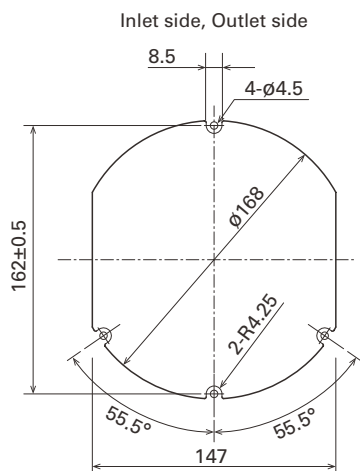


Connector Model no.: TE Connectivity: 1-172168-9

Power lead wire  
AWG22 UL11347

Other lead wire  
AWG24 UL3385

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



## Notice

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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 m<sup>3</sup>/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.<sup>(1)</sup>

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<sup>(2)</sup> 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.



∅172 × 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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		

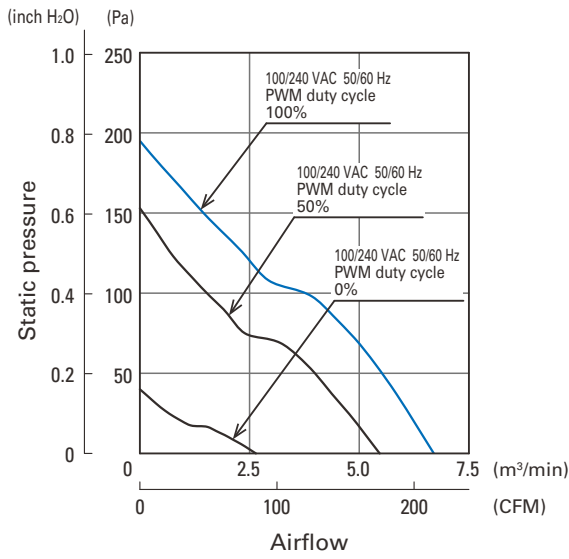
\* PWM input frequency is 25 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

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

### Common Specifications

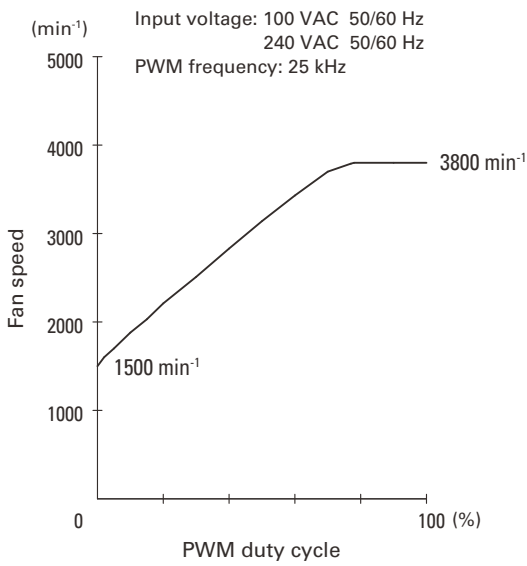
- Material ..... Frame: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life ..... Refer to specifications  
(L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)  
Expected life at 40°C is for reference only.
- Motor protection 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



**9ADW5701P5H003**  
**9ADW5701P5HT03**

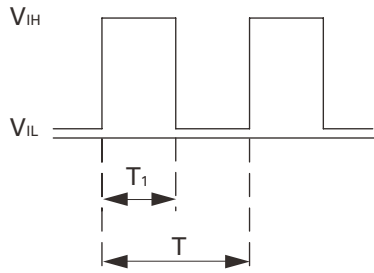
## PWM Duty - Speed Characteristics Example



**9ADW5701P5H003**  
**9ADW5701P5HT03**

### PWM Input Signal Example

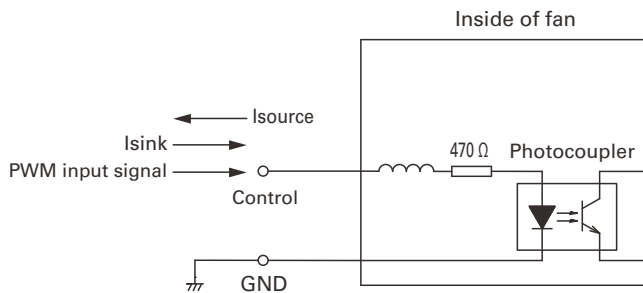
Input signal waveform



$V_{IH} = 4.75 \text{ to } 5.25 \text{ V}$     $V_{IL} = 0 \text{ to } 0.4 \text{ V}$   
 PWM duty cycle (%) =  $\frac{T_1}{T} \times 100$    PWM frequency 25 (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)

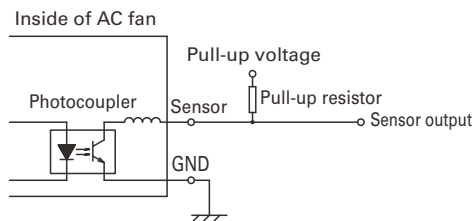
When the PWM control terminal is open, the fan speed is the same as the speed at 0% PWM duty cycle. A TTL input can be used for the PWM input signal.

### Example of Connection Schematic



### Specifications for Pulse Sensors

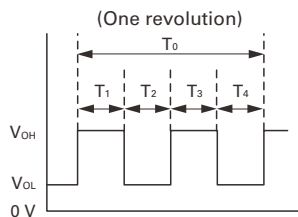
Output circuit: Open collector



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

Output waveform (Need pull-up resistor)

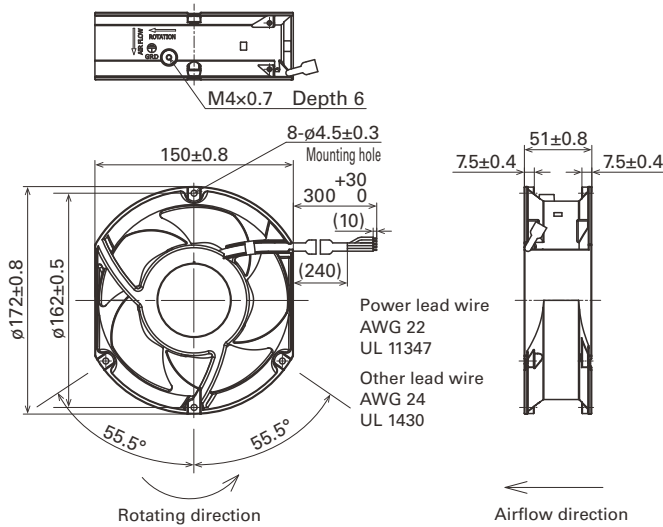
In case of steady running



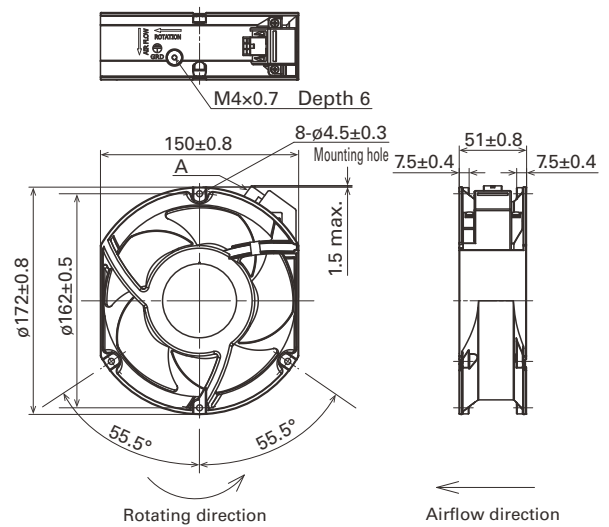
$T_{1 \text{ to } 4} \doteq (1/4) T_0$   
 $T_{1 \text{ to } 4} \doteq (1/4) T_0 = 60/4N \text{ (s)}$   
 $N = \text{Fan speed (min}^{-1}\text{)}$

## Dimensions (unit: mm)

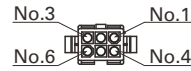
### Lead wire model



### Terminal model



#### A Connector contact



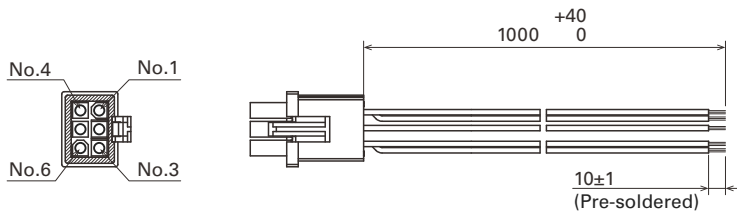
#### Pin arrangement

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

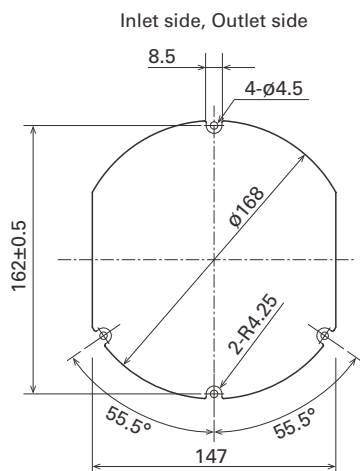


Connector Model no.: TE Connectivity: 794895-1

Power lead wire  
AWG22 UL11347

Other lead wire  
AWG24 UL3385

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



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CATALOG No. C1119B002 '21.7

# San Ace 190AD

9ADTU type

## ACDC Fan

### 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.



∅190 × 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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		

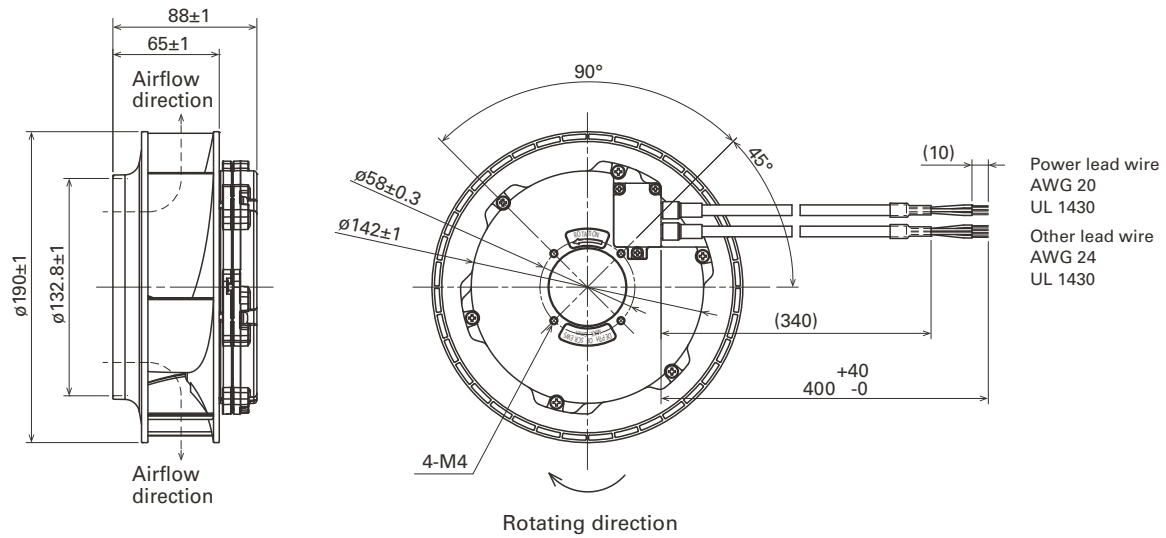
\* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

### Common Specifications

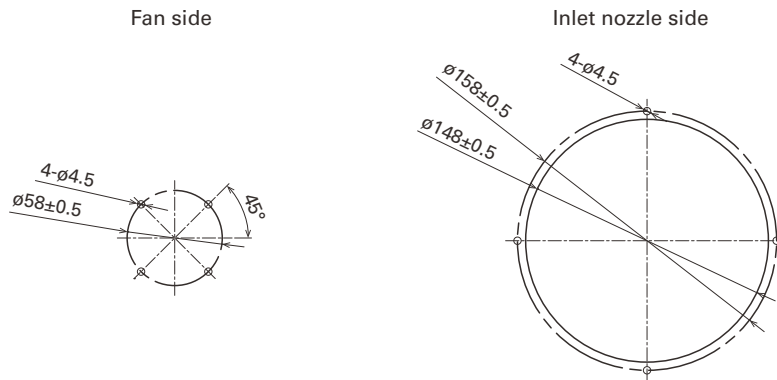
- Material ..... Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life ..... Refer to specifications  
(L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)  
Expected life at 40°C is for reference only.
- Motor protection 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



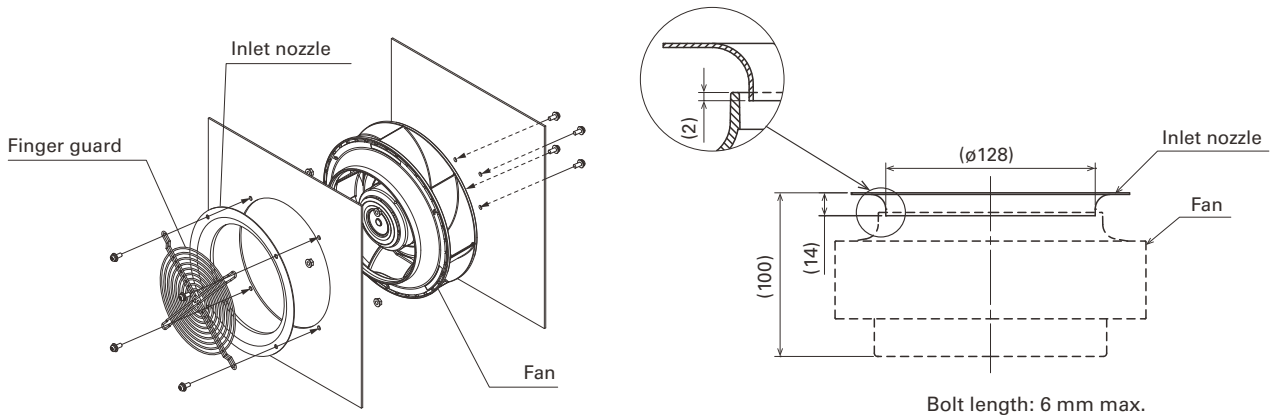
## Dimensions (unit: mm)



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



## Reference Diagram for Mounting



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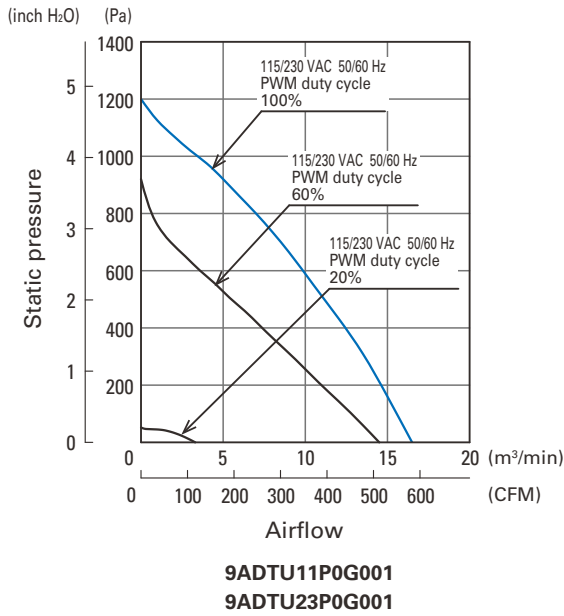
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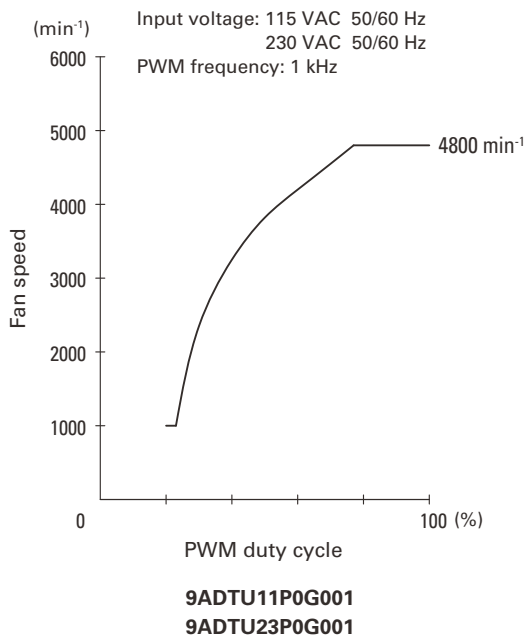
Specifications are subject to change without notice.

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

∅190 x 88 mm

### Specifications

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

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

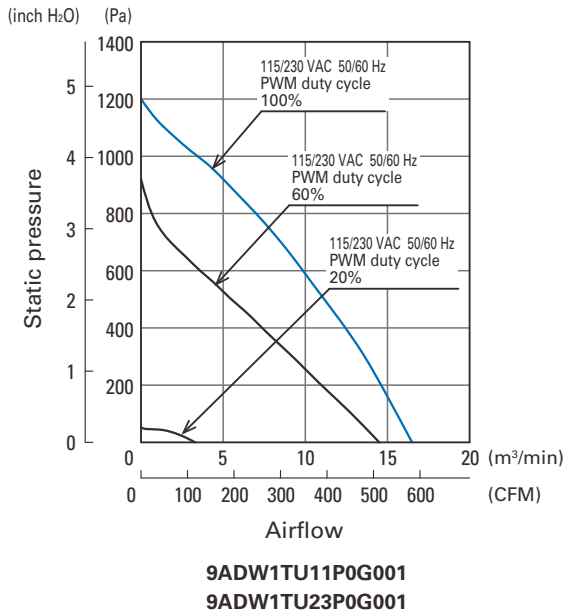
Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> O]	SPL [dB(A)]	Operating temperature [°C]	Expected life [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%.

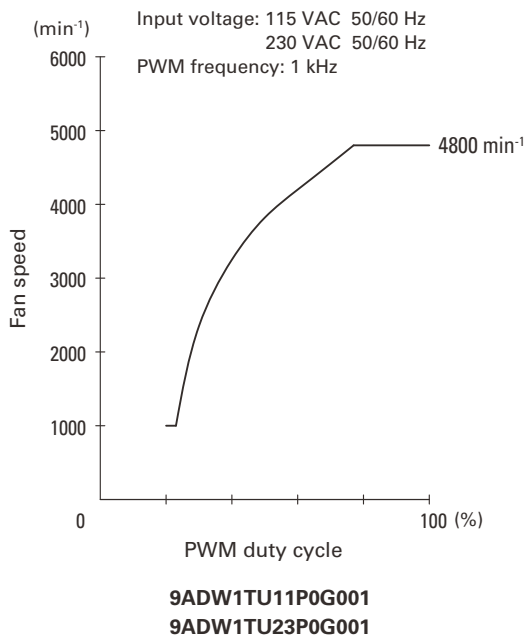
### Common Specifications

- 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 SensorYellow Control Brown
- Mass ..... 1700 g
- Ingress protection ..... IP56

## Airflow - Static Pressure Characteristics

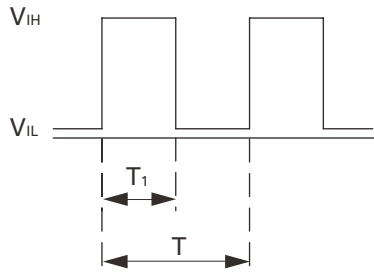


## PWM Duty - Speed Characteristics Example



### PWM Input Signal Example

Input signal waveform



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

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

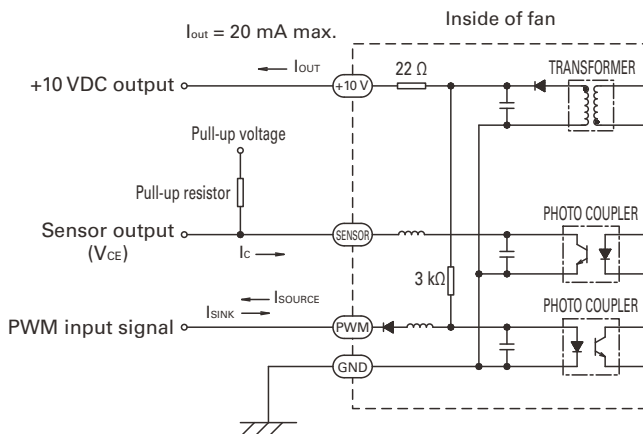
Current source ( $I_{source}$ ) = 5 mA max. (when control voltage is 0 V)

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



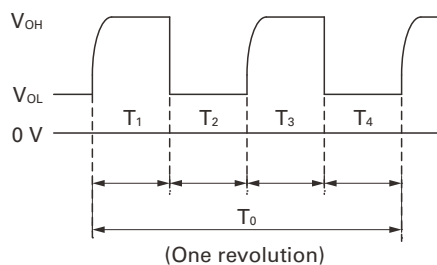
$V_{CE} = +27.6 \text{ V max.}$   
 $I_C = 10 \text{ mA max.}$  [ $V_{OL} = V_{CE} \text{ (SAT)} = 1 \text{ V max.}$ ]  
Pull-up resistor = 5 kΩ max.

### Specifications for Pulse Sensors

Output circuit: Open collector

Output waveform

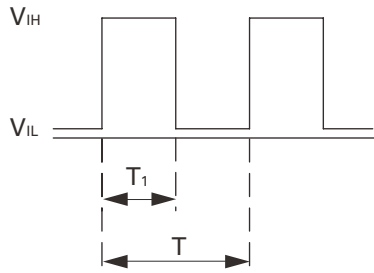
In case of steady running



$T_{1 \text{ to } 4} \cong (1/4) T_0$   
 $T_0 = 60/4N \text{ (s)}$   
 $N = \text{Fan speed (min}^{-1}\text{)}$

### PWM Input Signal Example

Input signal waveform



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

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

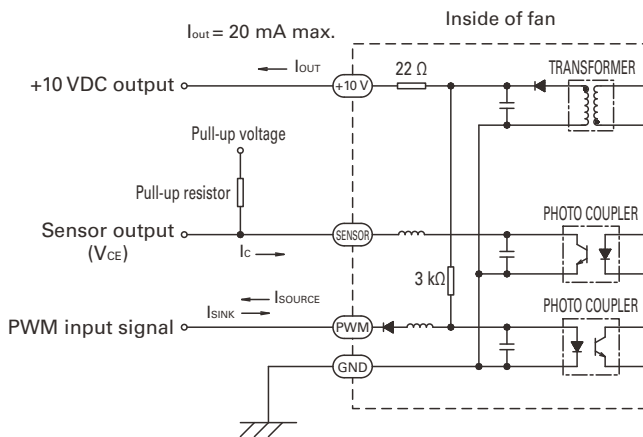
Current source ( $I_{source}$ ) = 5 mA max. (when control voltage is 0 V)

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



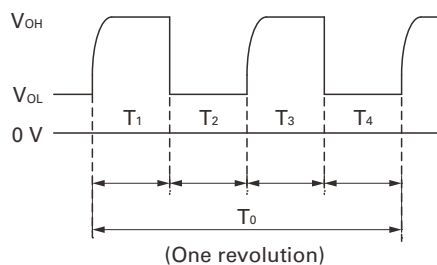
$V_{CE} = +27.6 \text{ V max.}$   
 $I_c = 10 \text{ mA max.}$  [ $V_{OL} = V_{CE} \text{ (SAT)} = 1 \text{ V max.}$ ]  
Pull-up resistor = 5 kΩ max.

### Specifications for Pulse Sensors

Output circuit: Open collector

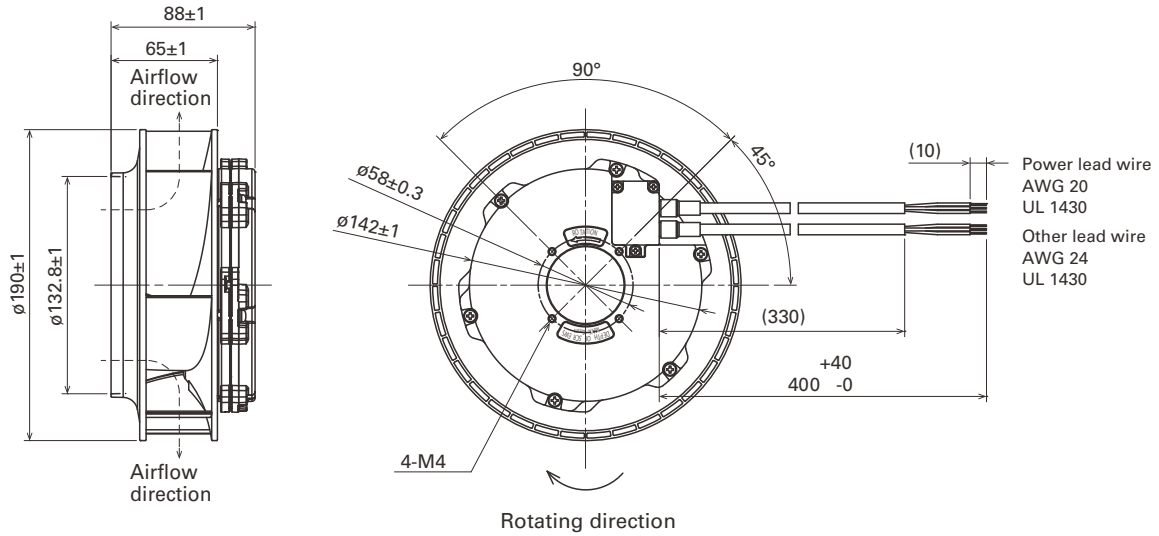
Output waveform

In case of steady running

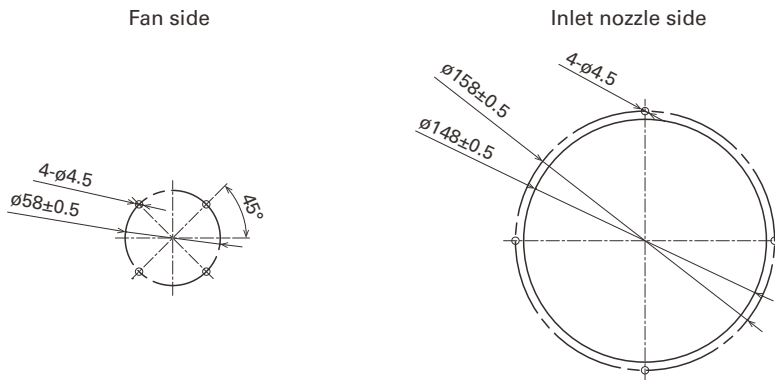


$T_{1 \text{ to } 4} \approx (1/4) T_0$   
 $T_0 = 60/4N \text{ (s)}$   
 $N = \text{Fan speed (min}^{-1}\text{)}$

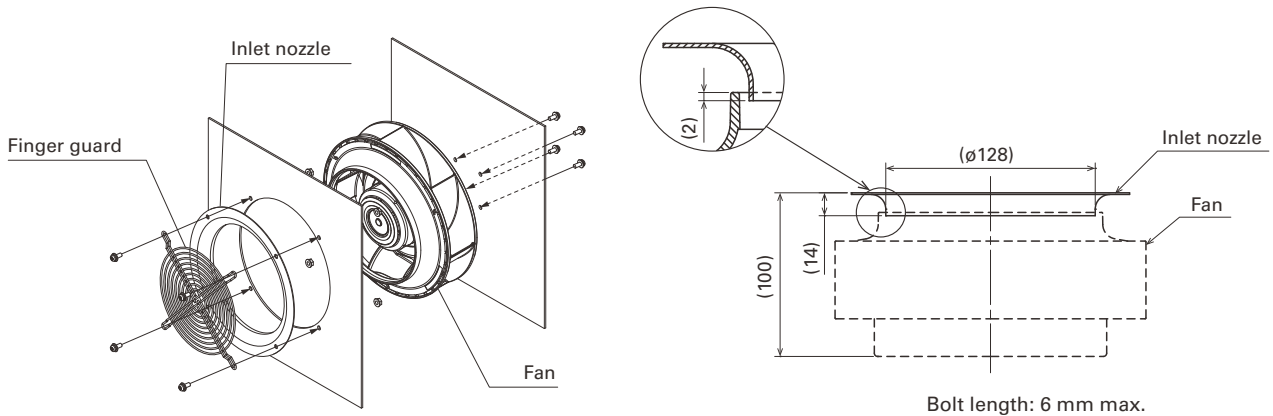
## Dimensions (unit: mm)



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



## Reference Diagram for Mounting



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CATALOG No. C1112B001 '20.12



# Ø 225x99 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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				

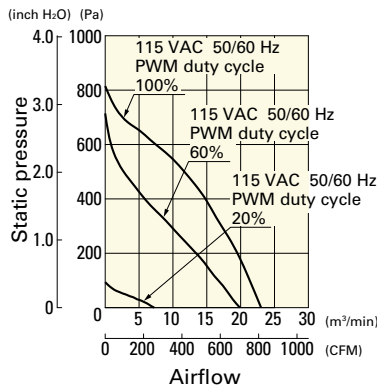
\* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

• AC power frequency: 50/60 Hz

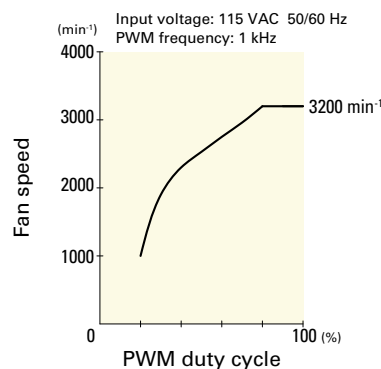
## Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

**9ADTS11P0G001** With pulse sensor with PWM control function

PWM duty cycle



PWM duty - Speed characteristics example



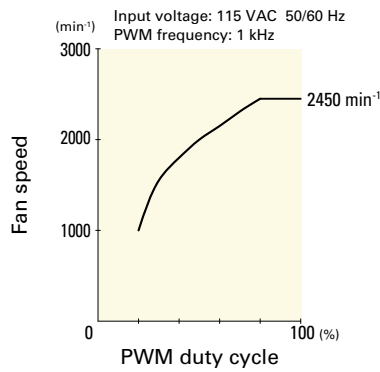
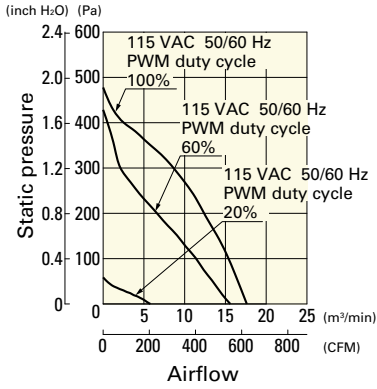


## Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

**9ADTS11P0F001** With pulse sensor with PWM control function

PWM duty cycle

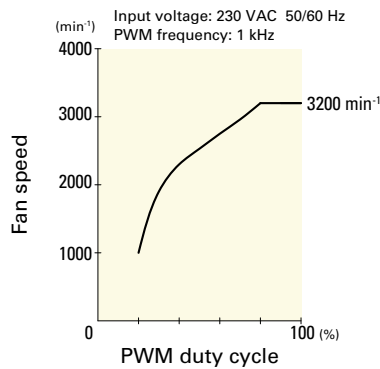
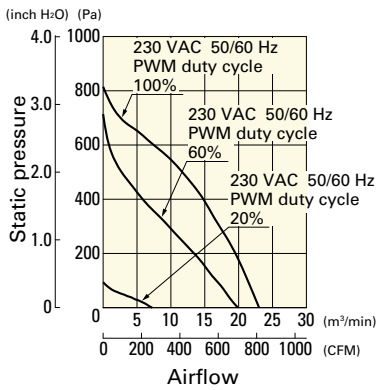
PWM duty - Speed characteristics example



**9ADTS23P0G001** With pulse sensor with PWM control function

PWM duty cycle

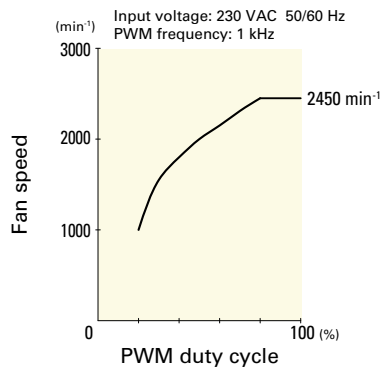
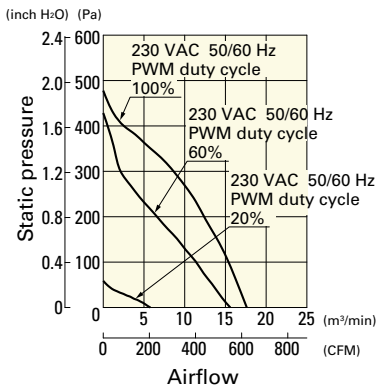
PWM duty - Speed characteristics example



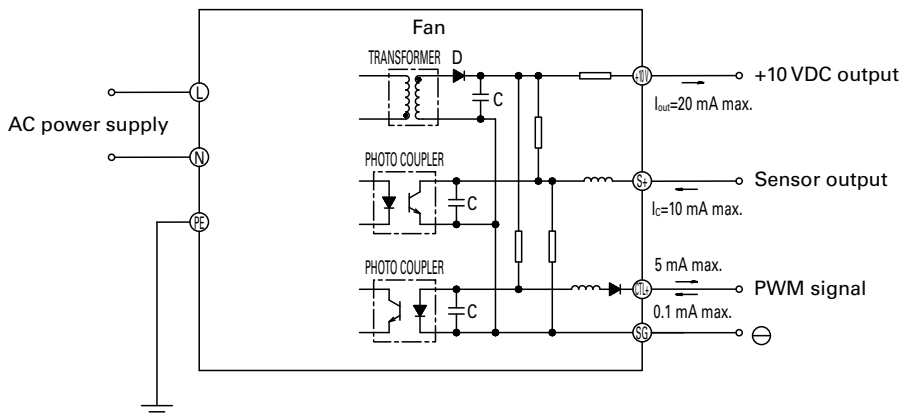
**9ADTS23P0F001** With pulse sensor with PWM control function

PWM duty cycle

PWM duty - Speed characteristics example

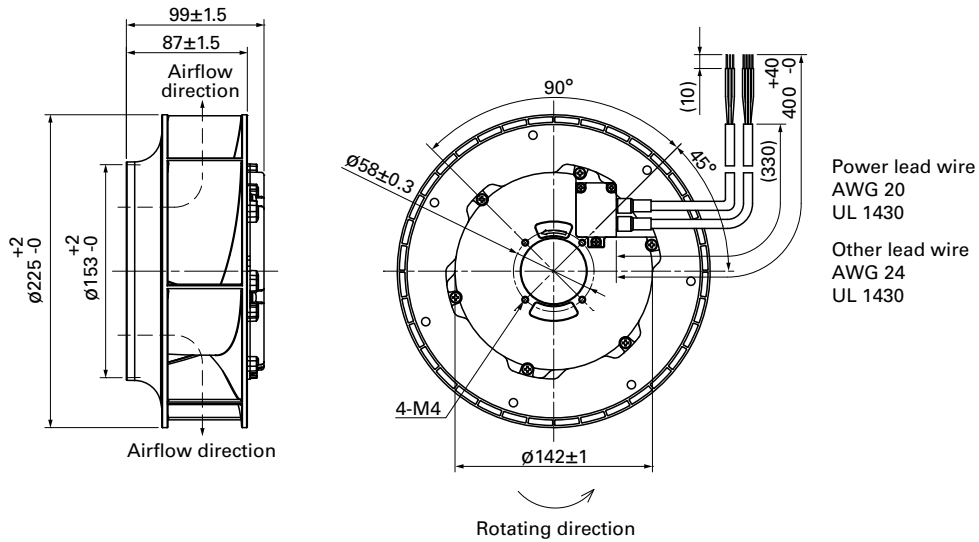


## Wiring Diagram

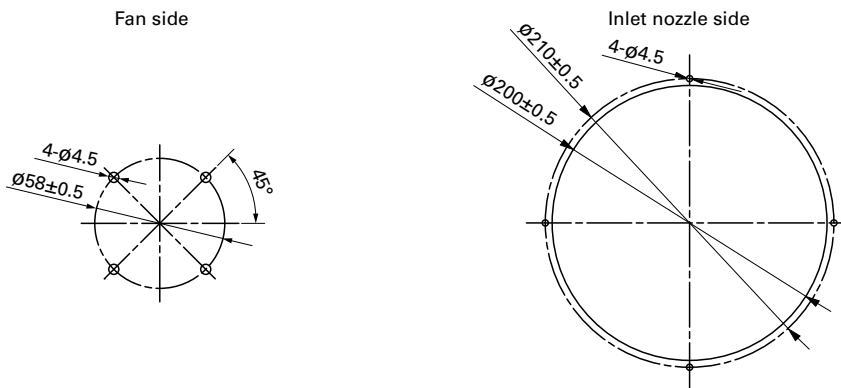


ACDC Fan φ225 mm

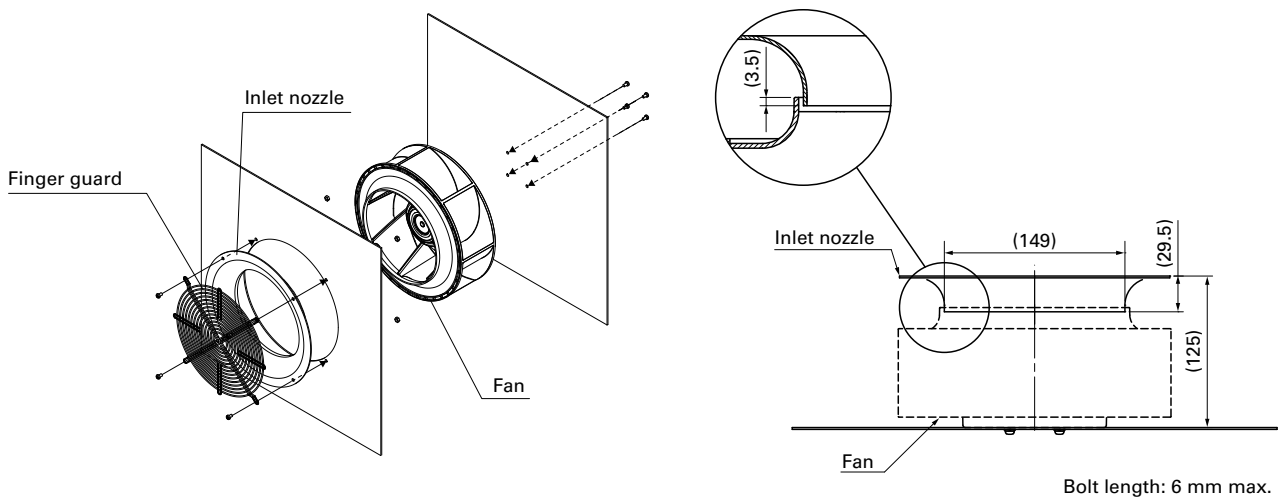
## Dimensions (unit: mm)



## 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



Ø **225x99** 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
<b>9ADW1TS11P0H001</b>	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		
<b>9ADW1TS11P0M001</b>			100	1.08	61	2350	16.9 597	440 1.77	67		
			20	0.3	11	1000	7.1 252	80 0.32	50		
<b>9ADW1TS23P0H001</b>	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		
<b>9ADW1TS23P0M001</b>			100	0.57	61	2350	16.9 597	440 1.77	67		
			20	0.2	11	1000	7.1 252	80 0.32	50		

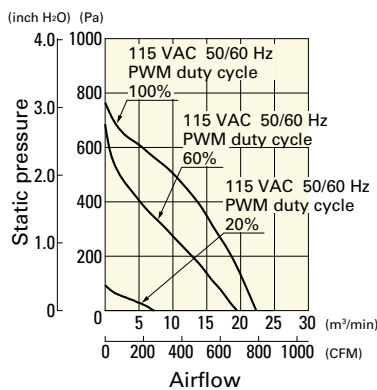
\* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

· AC power frequency: 50/60 Hz

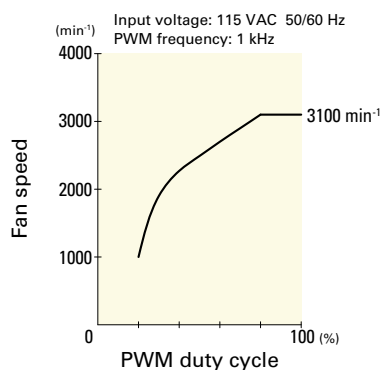
**Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example**

**9ADW1TS11P0H001** With pulse sensor with PWM control function

PWM duty cycle



PWM duty - Speed characteristics example

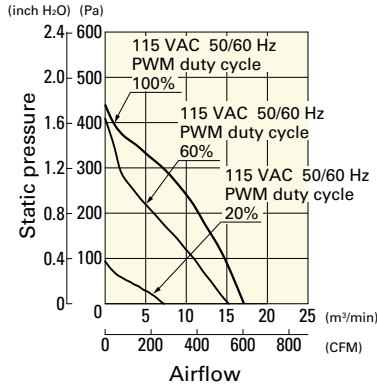


ACDC Fan Ø225 mm

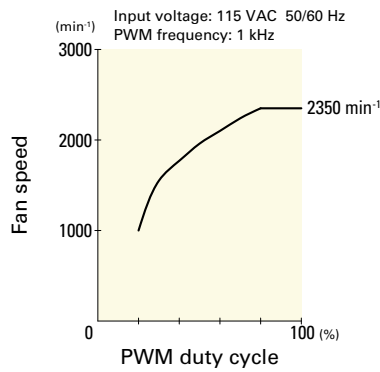
## Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

**9ADW1TS11P0M001** With pulse sensor with PWM control function

PWM duty cycle

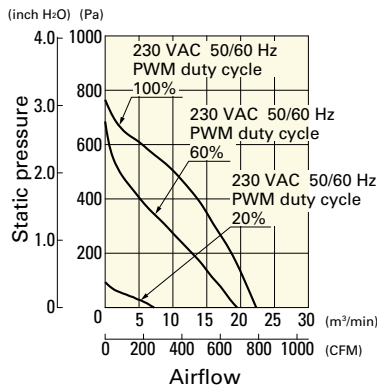


PWM duty - Speed characteristics example

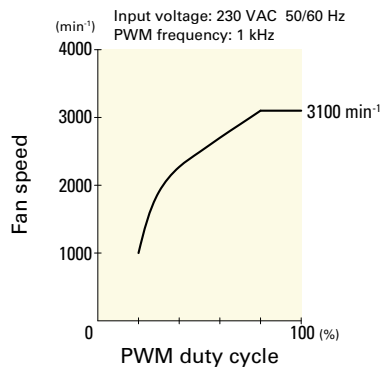


**9ADW1TS23P0H001** With pulse sensor with PWM control function

PWM duty cycle

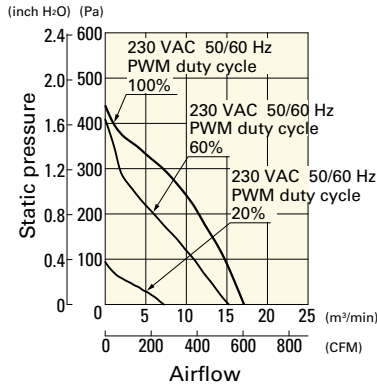


PWM duty - Speed characteristics example

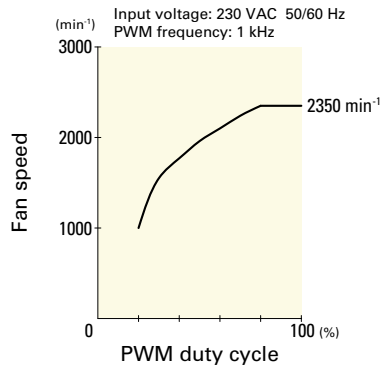


**9ADW1TS23P0M001** With pulse sensor with PWM control function

PWM duty cycle

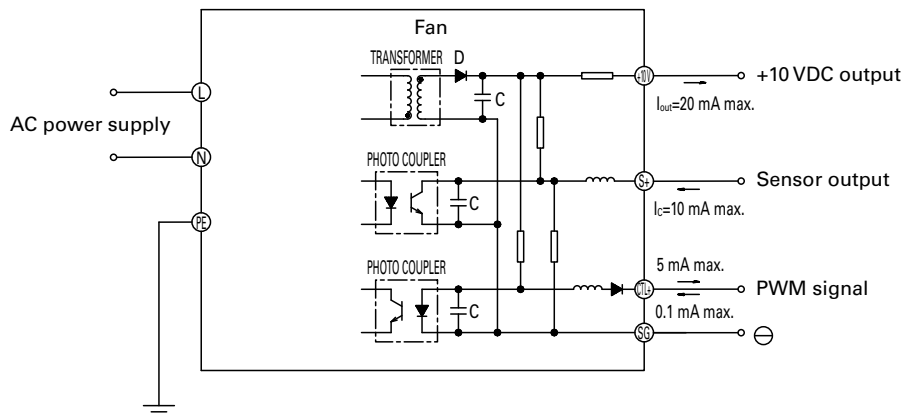


PWM duty - Speed characteristics example

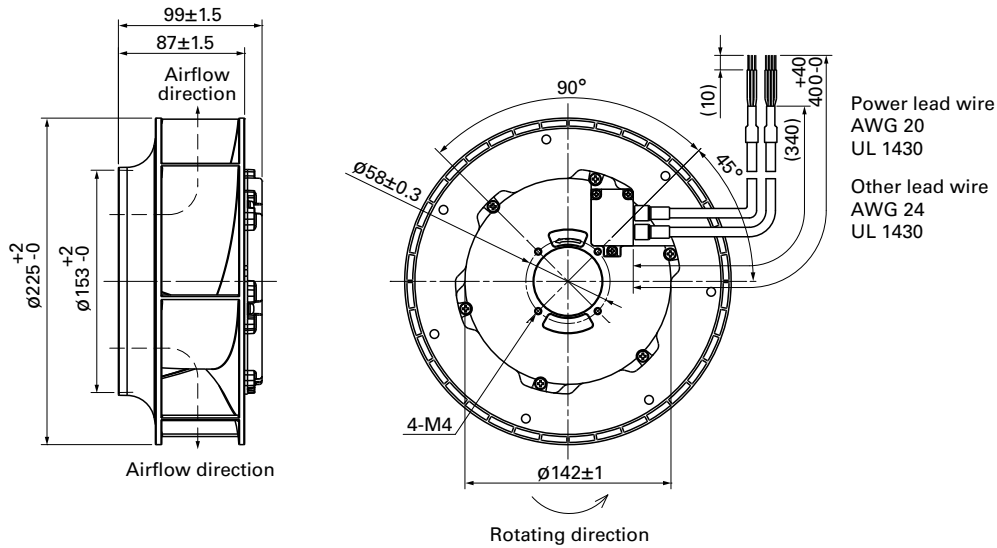


ACDC Fan φ225 mm

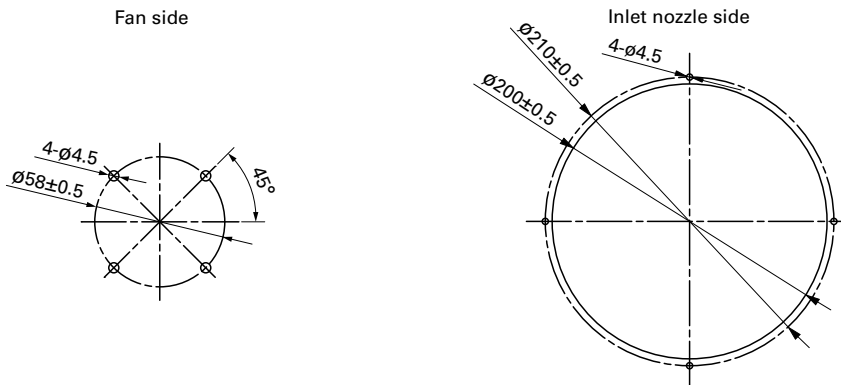
## Wiring Diagram



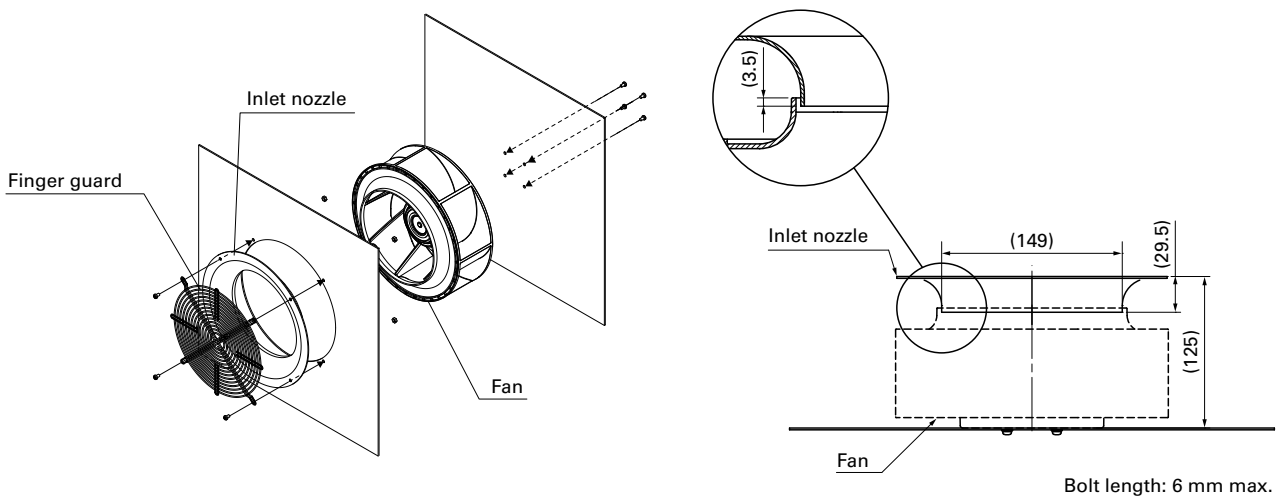
## Dimensions (unit: mm)



## 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 m<sup>3</sup>/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.

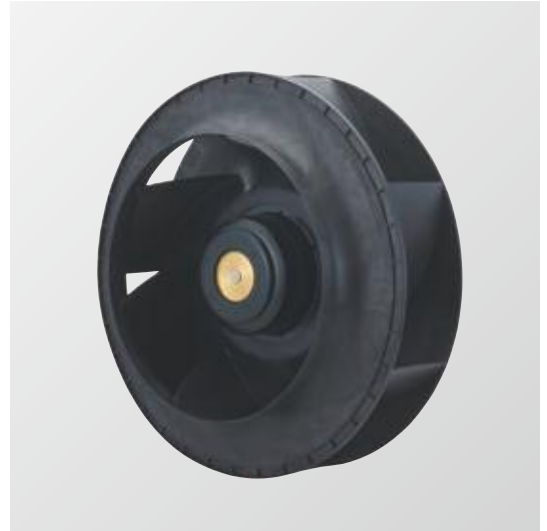
#### No DC Power Supply Required

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.



∅250 x 99 mm

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

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

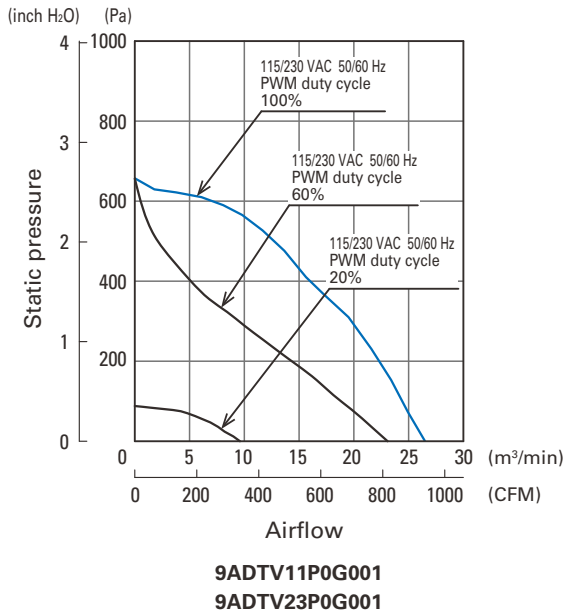
Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> O]	SPL [dB(A)]	Operating temperature [°C]	Expected life [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%.

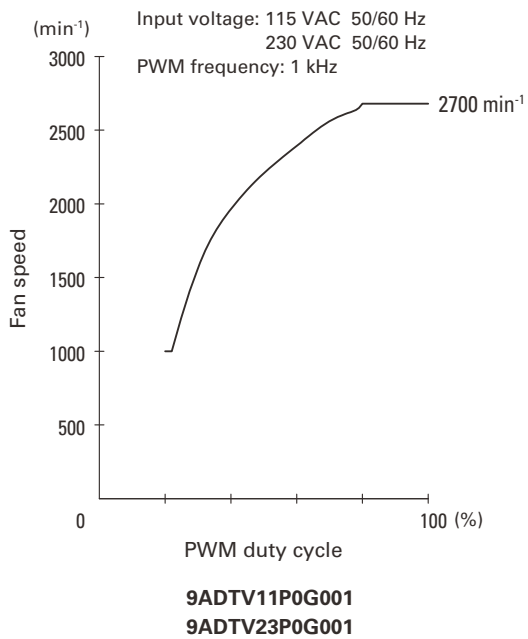
### Common Specifications

- 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

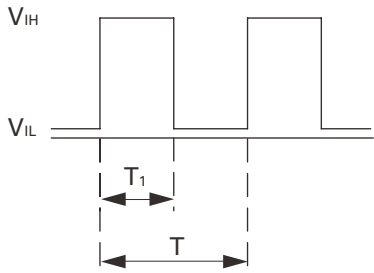


## PWM Duty - Speed Characteristics Example



**PWM Input Signal Example**

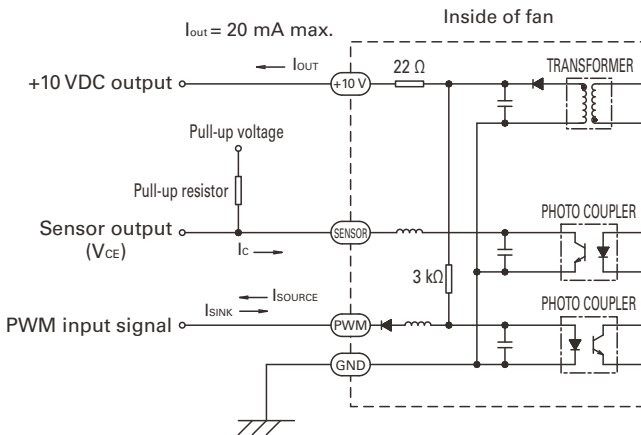
Input signal waveform



$V_{IH} = 2.8 \text{ to } 10.5 \text{ V}$     $V_{IL} = 0 \text{ to } 0.5 \text{ V}$   
 PWM duty cycle (%) =  $\frac{T_1}{T} \times 100$    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**



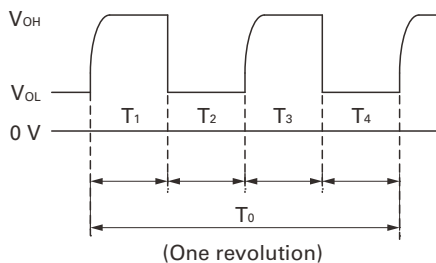
$V_{CE} = +27.6 \text{ V max.}$   
 $I_C = 10 \text{ mA max. [} V_{OL} = V_{CE} \text{ (SAT)} = 1 \text{ V max.]}$   
 Pull-up resistor = 5 kΩ max.

**Specifications for Pulse Sensors**

Output circuit: Open collector

Output waveform

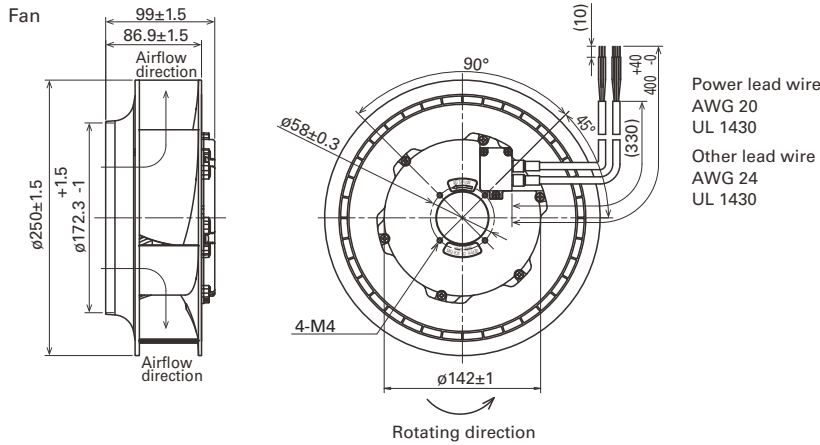
In case of steady running



$T_{1 \text{ to } 4} \approx (1/4) T_0$   
 $T_0 = 60/4N \text{ (s)}$   
 $N = \text{Fan speed (min}^{-1}\text{)}$

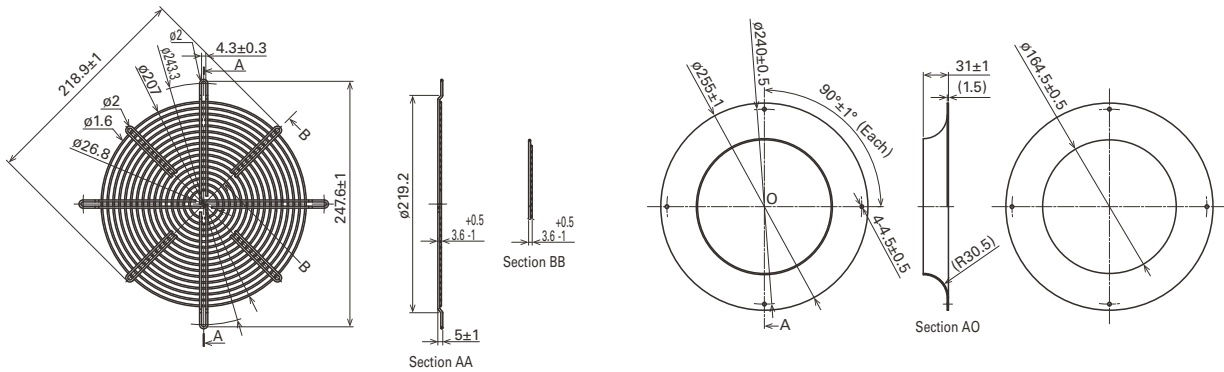


## Dimensions (unit: mm)

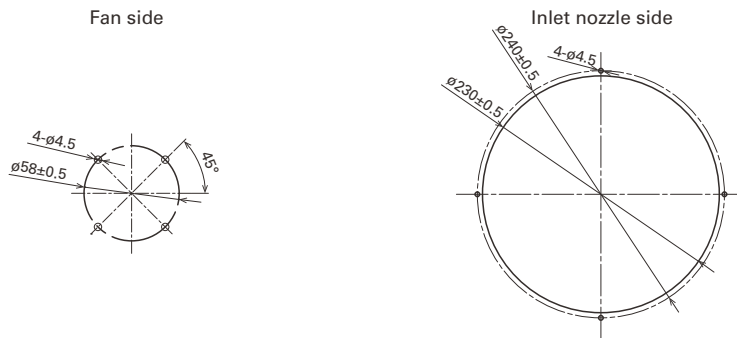


**Finger guards**  
 Model no.: 109-1152  
 Surface treatment: Nickel-chrome plating (silver) Mass: g  
 Model no.: 109-1152H  
 Surface treatment: Cation electropainting (black) Mass: g

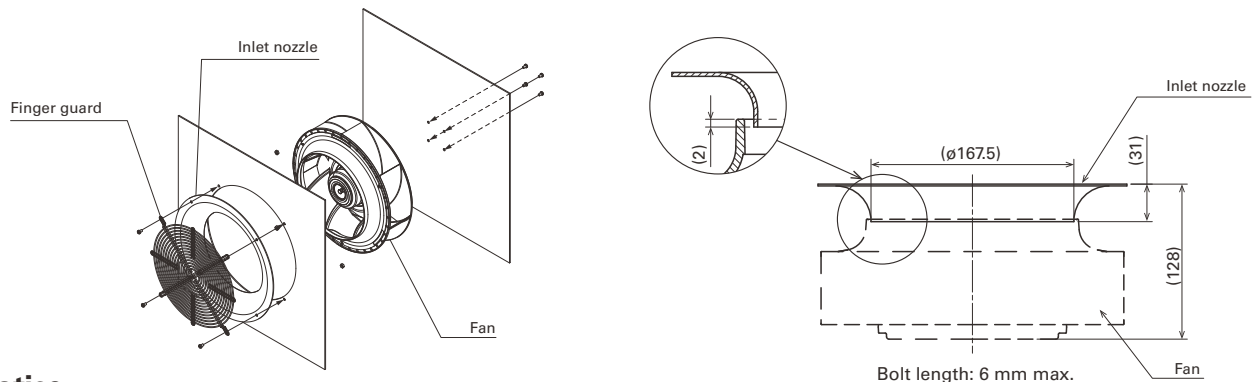
**Inlet nozzle**  
 Model no.: 109-1151  
 Material: Steel sheet Surface treatment: Nickel-chrome plating (silver) Mass: 440 g  
 Model no.: 109-1151H  
 Material: Steel sheet Surface treatment: Cation electropainting (black) Mass: 440 g



## 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 m<sup>3</sup>/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.

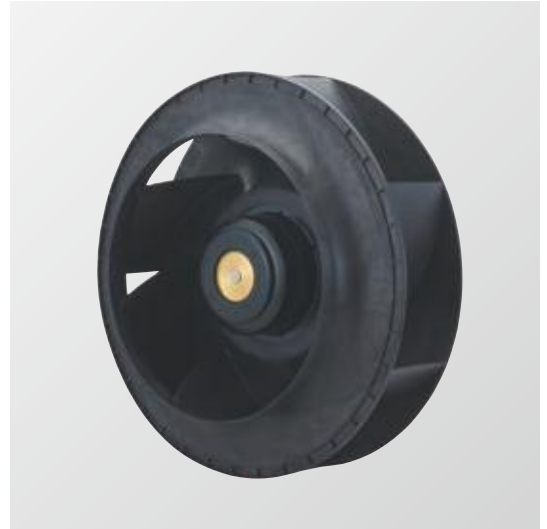
#### Low Noise and High Energy Efficiency

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



∅250 x 99 mm

### Specifications

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

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

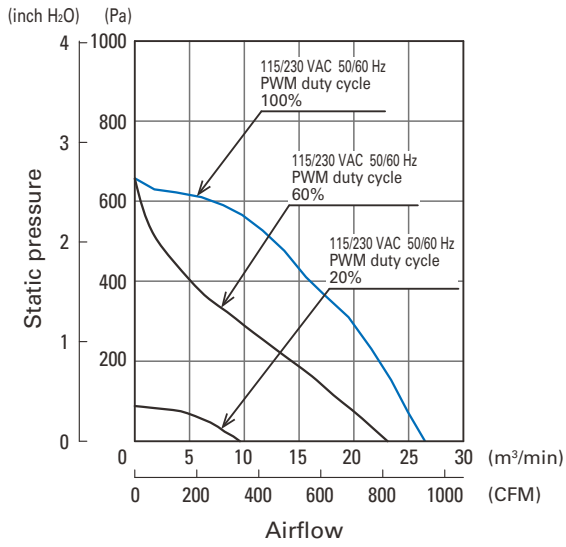
Model no.	Rated voltage [V]	Operating voltage range [V]	Frequency [Hz]	PWM duty cycle* [%]	Rated current [A]	Rated input [W]	Rated speed [min <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> O]	SPL [dB(A)]	Operating temperature [°C]	Expected life [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

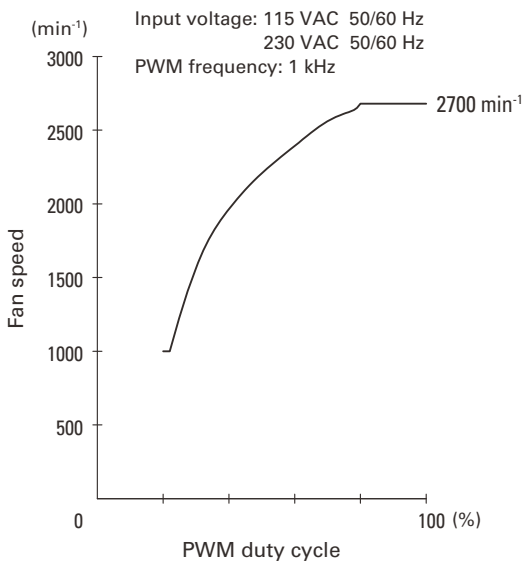
- Material ..... Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life ..... Refer to specifications  
(L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)  
Expected life at 40°C is for reference only.
- Motor protection 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



**9ADW1TV11P0G001**  
**9ADW1TV23P0G001**

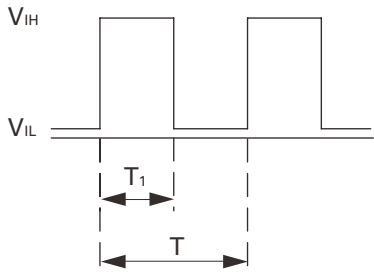
## PWM Duty - Speed Characteristics Example



**9ADW1TV11P0G001**  
**9ADW1TV23P0G001**

**PWM Input Signal Example**

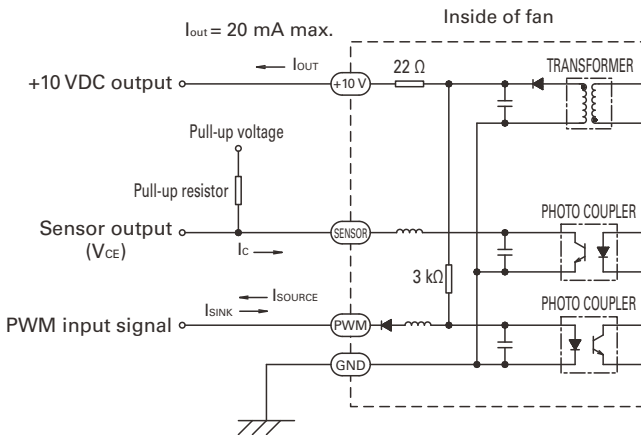
Input signal waveform



$V_{IH} = 2.8 \text{ to } 10.5 \text{ V}$     $V_{IL} = 0 \text{ to } 0.5 \text{ V}$   
 PWM duty cycle (%) =  $\frac{T_1}{T} \times 100$    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**



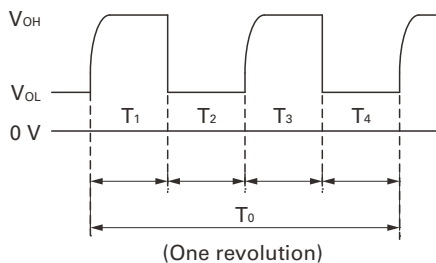
$V_{CE} = +27.6 \text{ V max.}$   
 $I_c = 10 \text{ mA max. [V}_{OL}=V_{CE} \text{ (SAT)}=1 \text{ V max.}]$   
 Pull-up resistor = 5 kΩ max.

**Specifications for Pulse Sensors**

Output circuit: Open collector

Output waveform

In case of steady running



$T_{1 \text{ to } 4} \approx (1/4) T_0$   
 $T_0 = 60/4N \text{ (s)}$   
 $N = \text{Fan speed (min}^{-1}\text{)}$





# 270x270x119 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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%.

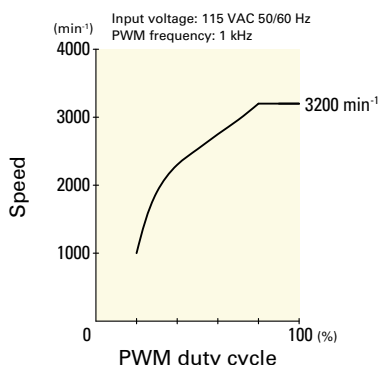
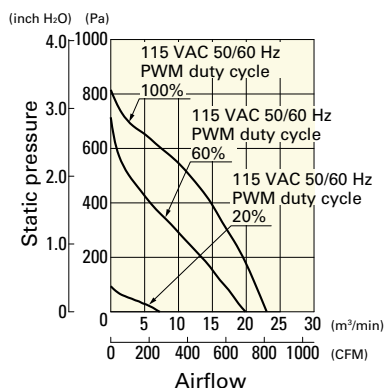
• AC power frequency: 50/60 Hz

## 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

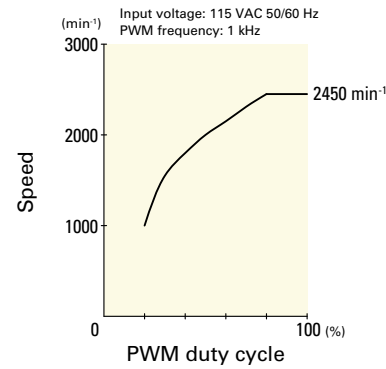
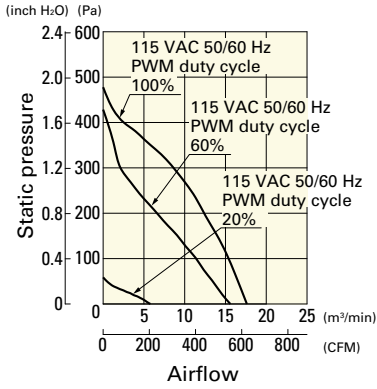


## Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

**9ADB1TS11P0F001** With pulse sensor with PWM control function

PWM duty cycle

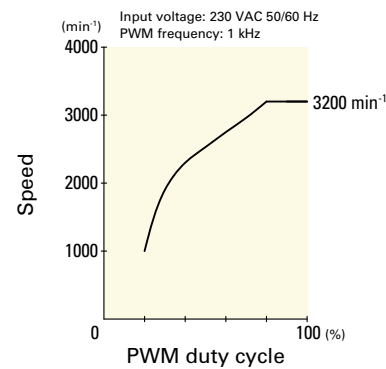
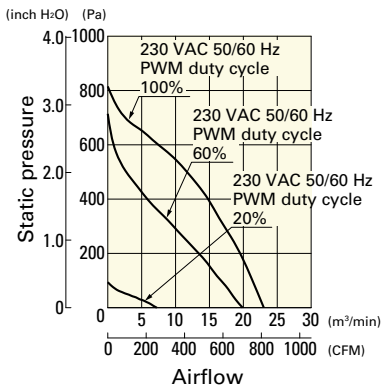
PWM duty - Speed characteristics example



**9ADB1TS23P0G001** With pulse sensor with PWM control function

PWM duty cycle

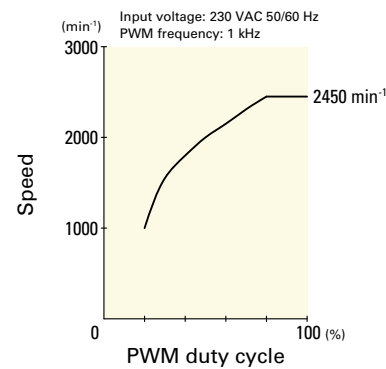
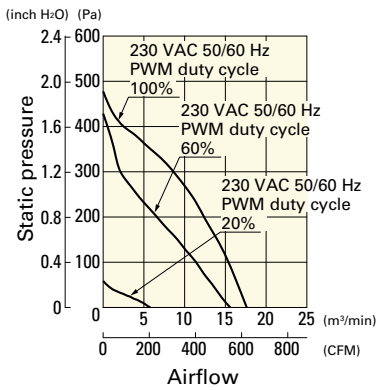
PWM duty - Speed characteristics example



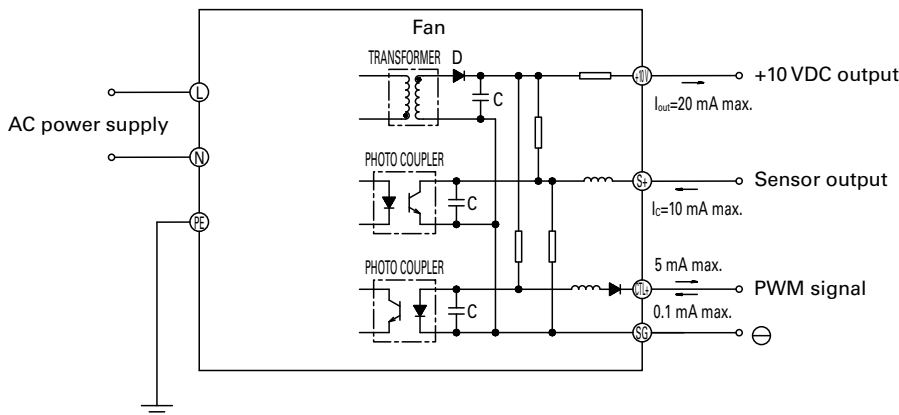
**9ADB1TS23P0F001** With pulse sensor with PWM control function

PWM duty cycle

PWM duty - Speed characteristics example

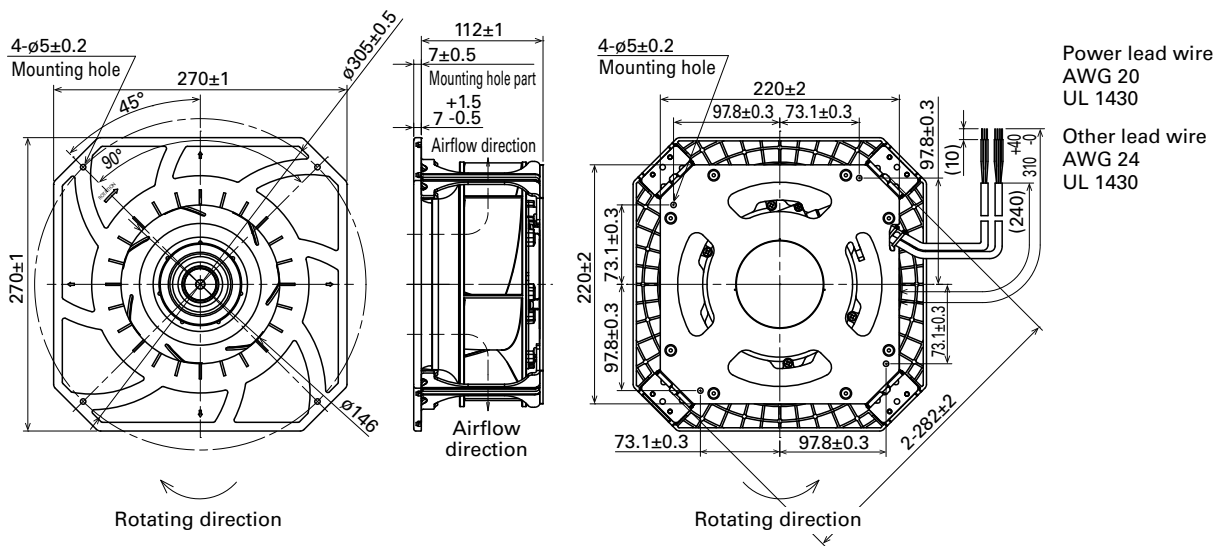


## Wiring Diagram

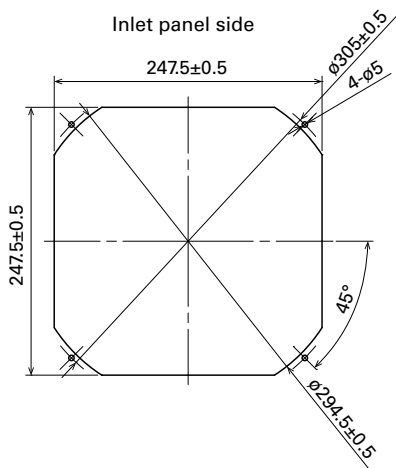


ACDC ACDC Fan 270 mm sq.

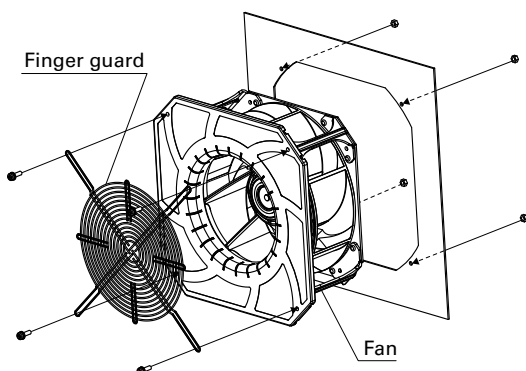
## Dimensions (unit: mm)



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



## Reference Diagram for Mounting



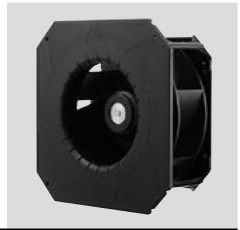
## Options

Finger guards

page: p. 588

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





# 270x270x119 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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	115	90 to 132	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	230	180 to 264	100	0.57	61	2350	16.9 597	440 1.77	67		
			20	0.2	11	1000	7.1 252	80 0.32	50		

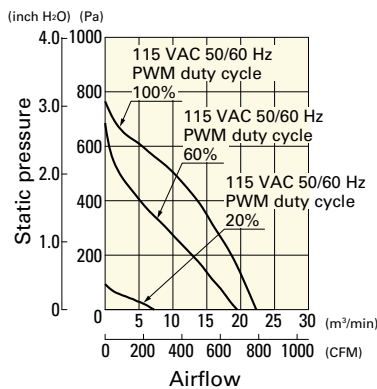
\* PWM input frequency is 1 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

- AC power frequency: 50/60 Hz

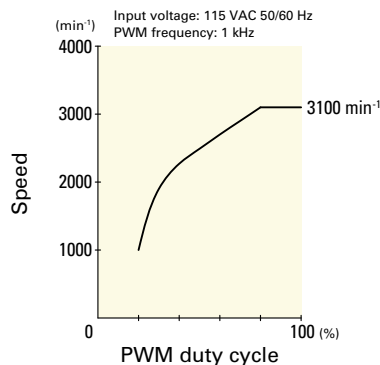
## Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

**9ADB1W1TS11P0H001** With pulse sensor with PWM control function

PWM duty cycle



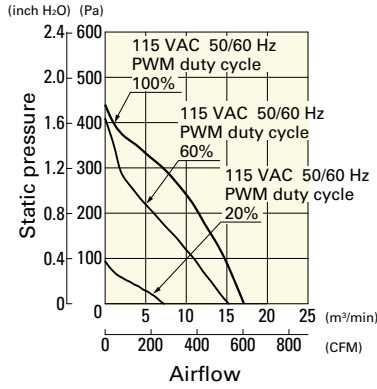
PWM duty - Speed characteristics example



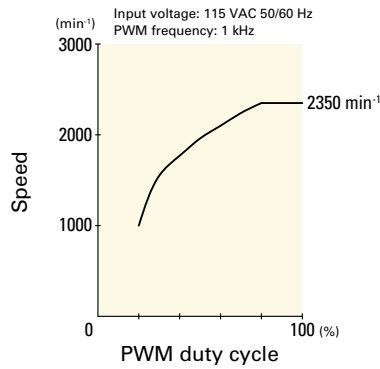
## Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

**9ADB1W1TS11P0M001** With pulse sensor with PWM control function

PWM duty cycle

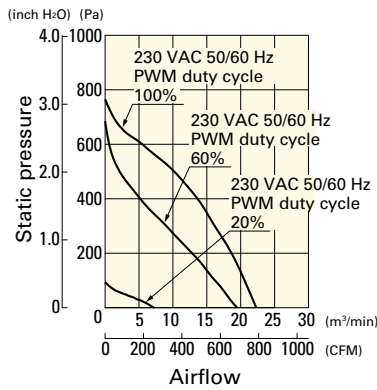


PWM duty - Speed characteristics example

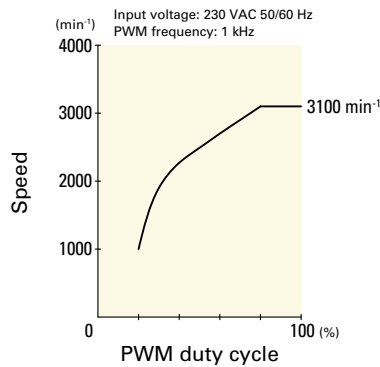


**9ADB1W1TS23P0H001** With pulse sensor with PWM control function

PWM duty cycle

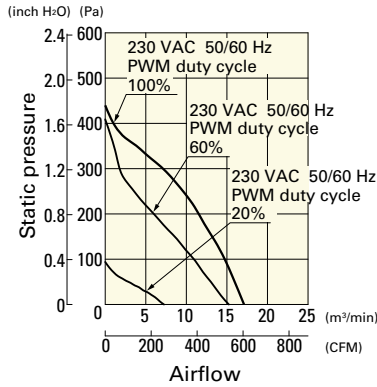


PWM duty - Speed characteristics example

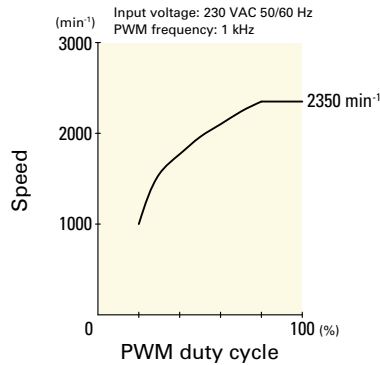


**9ADB1W1TS23P0M001** With pulse sensor with PWM control function

PWM duty cycle

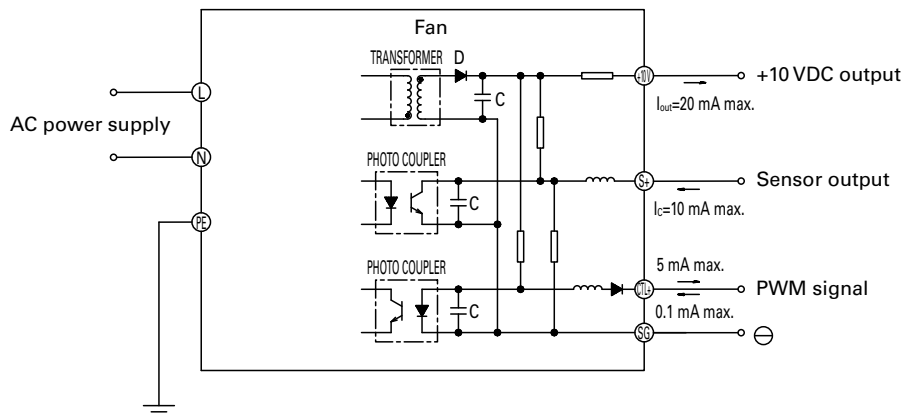


PWM duty - Speed characteristics example

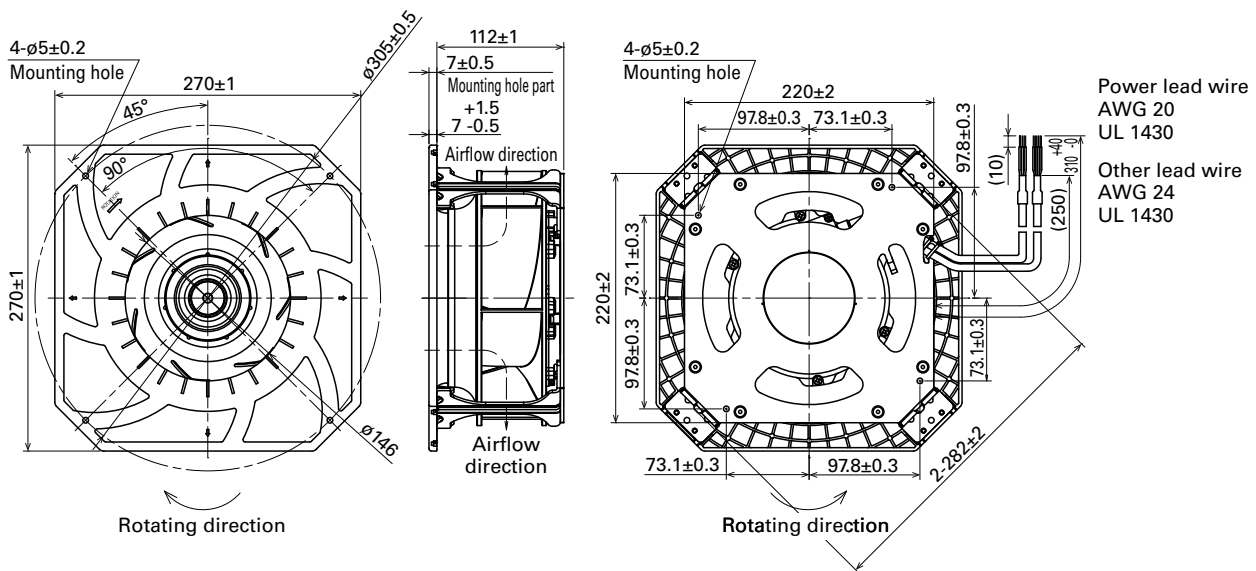


ACDC Fan 270 mm sq.

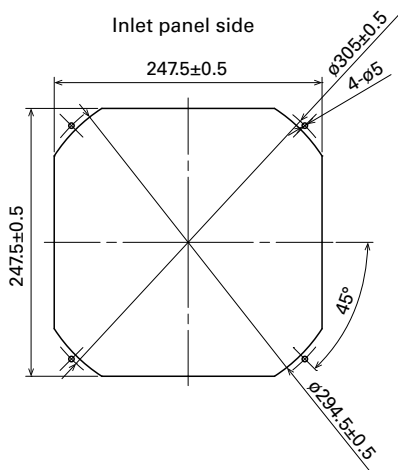
## Wiring Diagram



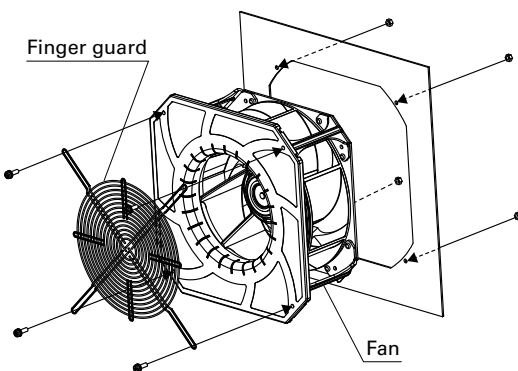
## Dimensions (unit: mm)



## 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
<b>109-180</b>	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)
<b>109-183</b>	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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
<b>109-180</b>	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)
<b>109-183</b>	115				0.06/0.05						

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.

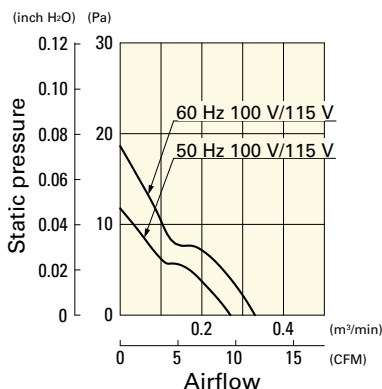
## Set Models

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

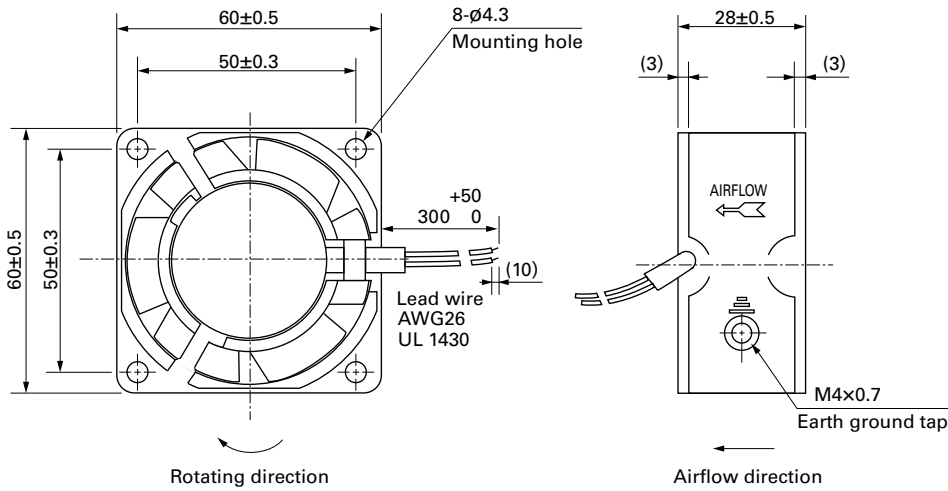
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord	Finger guards	Mounting screws
<b>ST1-109-180</b>	109-180	100 V		Plug cord is not included because of the exposed-lead structure.	109-139E	M4×40 mm (4 screws)
<b>ST1-109-183</b>	109-183	115 V			109-139E	

## Airflow - Static Pressure Characteristics

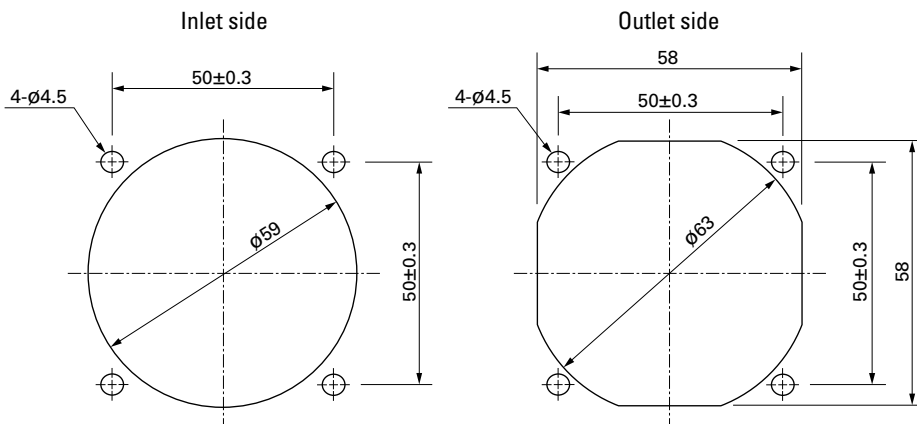
### 109-180, 109-183



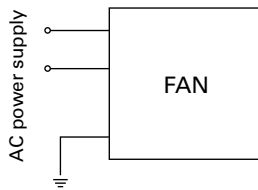
## Dimensions (unit: mm)



## 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
<b>109-130</b>	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)
<b>109-133</b>	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.

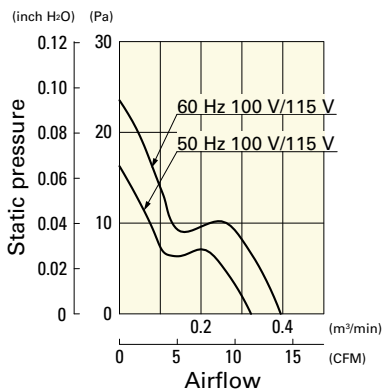
## Set Models

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
<b>ST1-109-130</b>	109-130	100 V		Plug cord is not included because of the exposed-lead structure.	109-139E	M4×55 mm (4 screws)
<b>ST1-109-133</b>	109-133	115 V			109-139E	

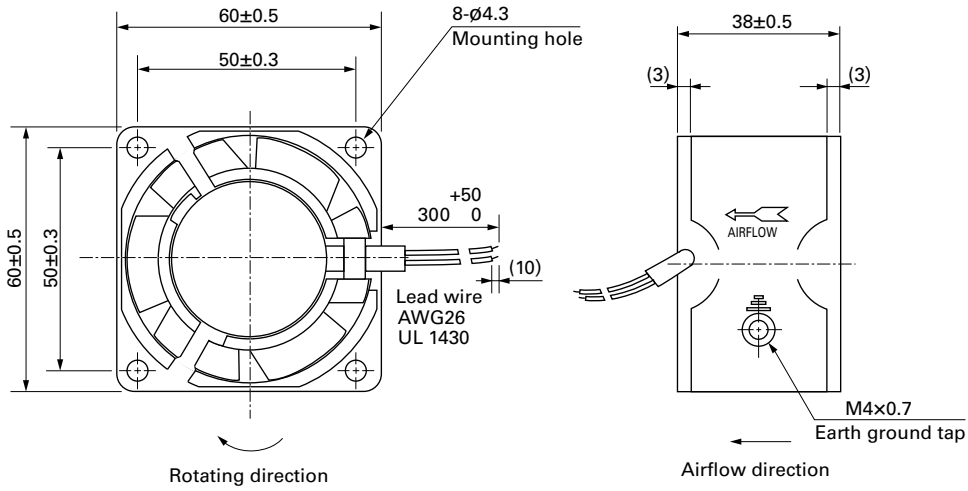
## Airflow - Static Pressure Characteristics

### 109-130, 109-133

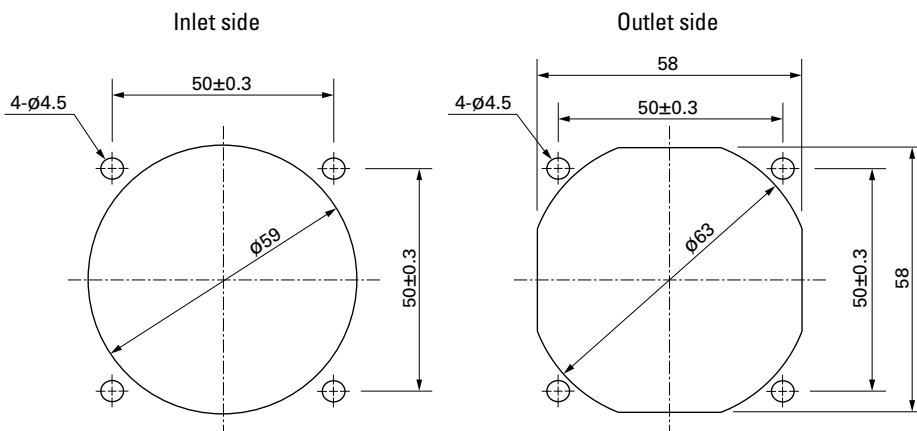




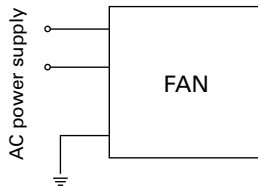
## Dimensions (unit: mm)



## 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
<b>109-210</b>	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)
<b>109-213</b>	115			0.06/0.05	0.06/0.05						

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.

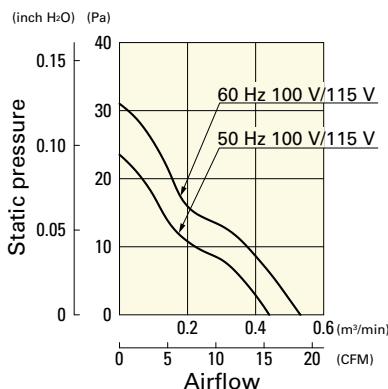
## Set Models

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

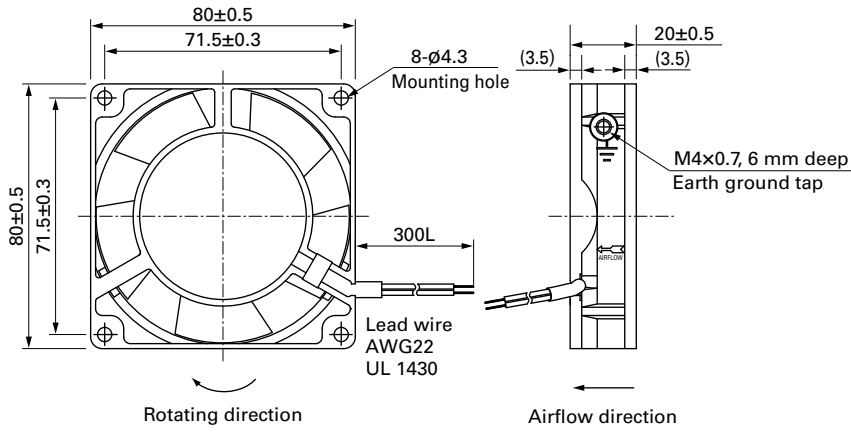
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord	Finger guards	Mounting screws
<b>ST1-109-210</b>	109-210	100 V		Plug cord is not included because of the exposed-lead structure.	109-049E	M4×40 mm (4 screws)
<b>ST1-109-213</b>	109-213	115 V			109-049E	

## Airflow - Static Pressure Characteristics

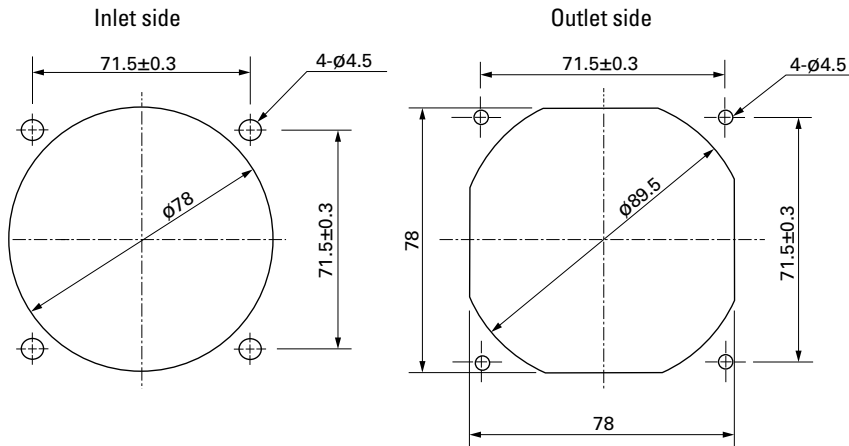
**109-210, 109-213**



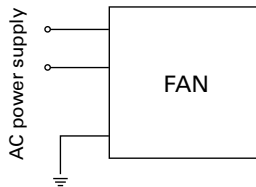
## Dimensions (unit: mm)



## 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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						
109S030	100			0.12/0.1	0.13/0.11	2350/2700	0.55/0.63 19.4/22.3	21.6/28.4 0.087/0.114	28/30		
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 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.

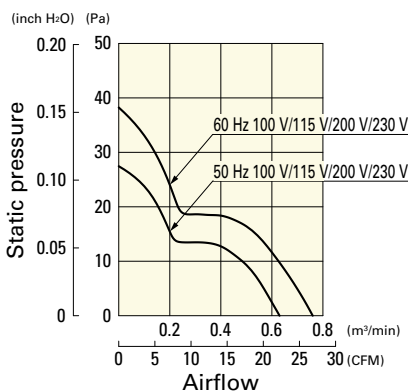
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord <sup>(1)</sup>	Finger guards	Mounting screws
ST1-109S050	109S050	100 V		489-016-L10	109-049E	M4×40 mm (4 screws) <sup>(2)</sup>
ST1-109S053	109S053	115 V		489-016-L10	109-049E	
ST1-109S051	109S051	200 V		489-016-L10	109-049E	
ST1-109S054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

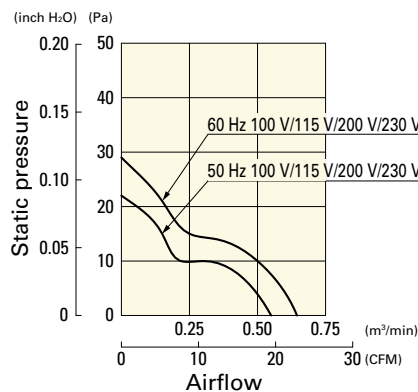
(2) Though these are 2-hole or 3-hole frame mount types, 4 screws are included for extra.

## Airflow - Static Pressure Characteristics

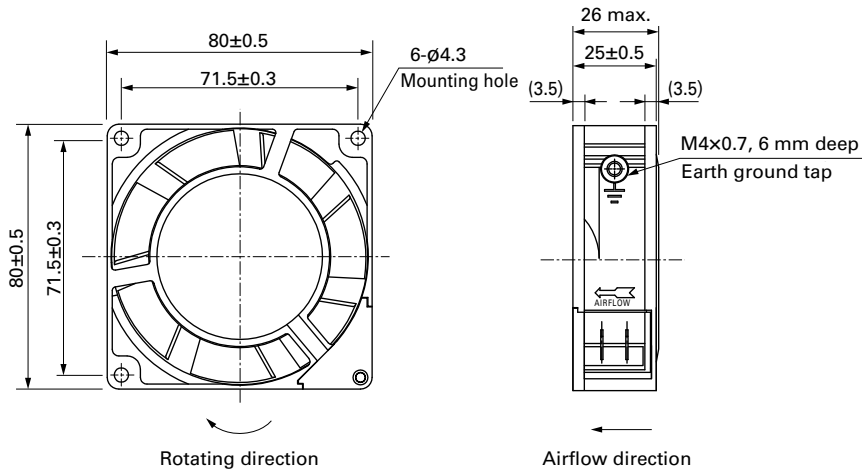
109S050, 109S053, 109S051, 109S054



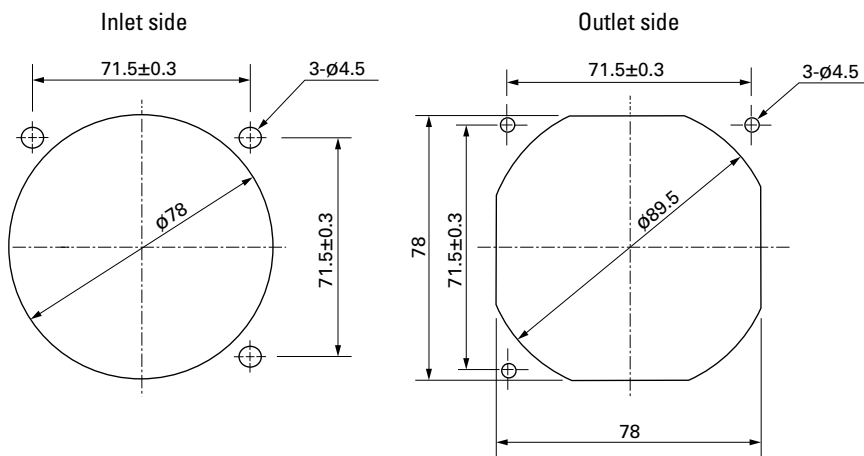
109S030, 109S033, 109S031, 109S034



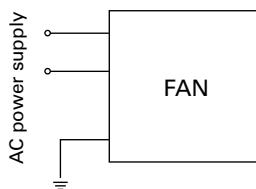
## Dimensions (unit: mm)



## 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



# 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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.

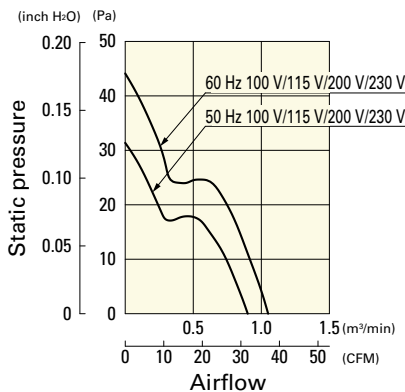
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord <sup>(1)</sup>	Finger guards	Mounting screws
ST1-109-150	109-150	100 V		489-016-L10	109-049E	M4×55 mm (4 screws) <sup>(2)</sup>
ST1-109-153	109-153	115 V		489-016-L10	109-049E	
ST1-109-151	109-151	200 V		489-016-L10	109-049E	
ST1-109-154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

(1) PSE compatible.

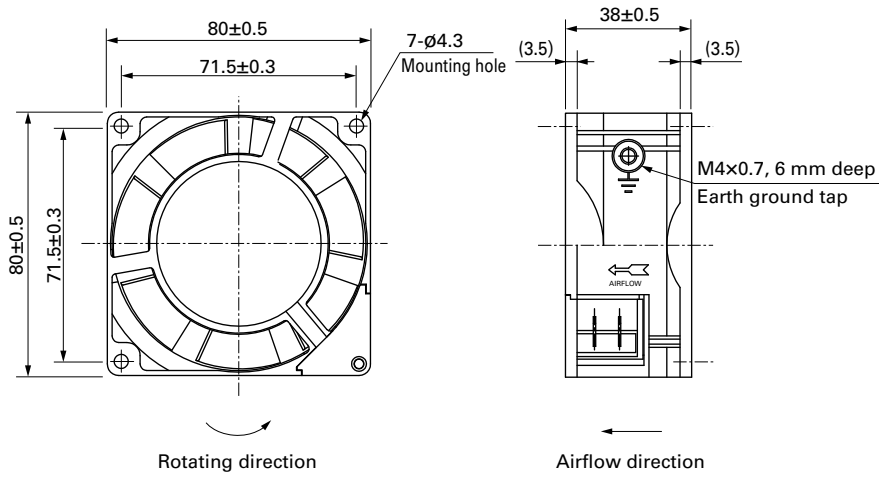
(2) Though these are 2-hole or 3-hole frame mount types, 4 screws are included for extra.

## Airflow - Static Pressure Characteristics

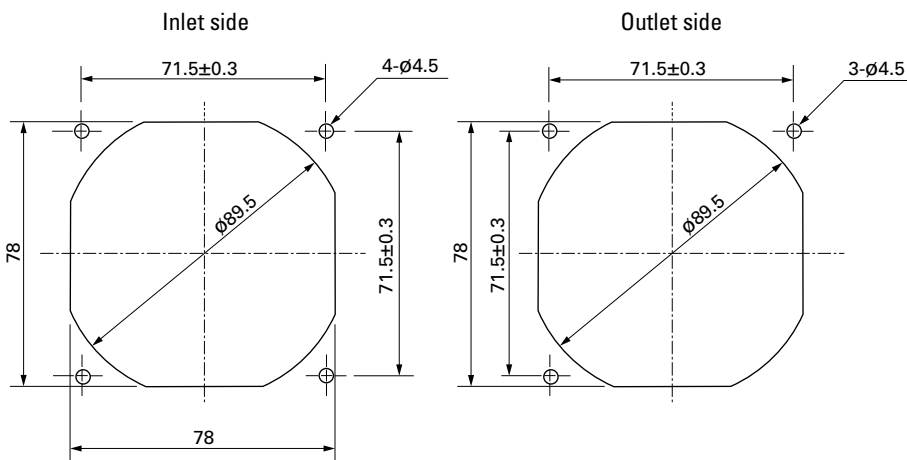
### 109-150, 109-153, 109-151, 109-154



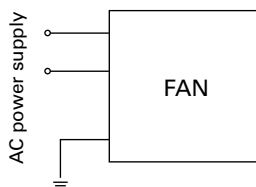
## Dimensions (unit: mm)



## 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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			4/3.5	0.05/0.05							0.05/0.05	1500/1500	0.43/0.43 15.2/15.2	8.8/ 8.8 0.035/0.035	24/24
109-033UL*	115			0.04/0.04	0.04/0.04											

\* 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.

AC Fan 80 mm sq.

## Set Models

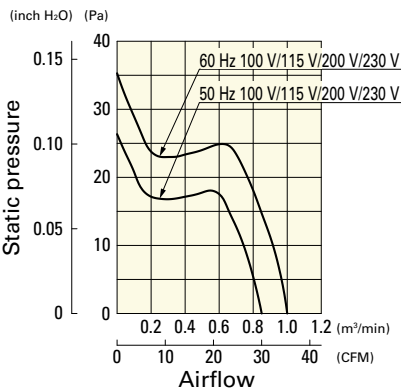
Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 655.

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	

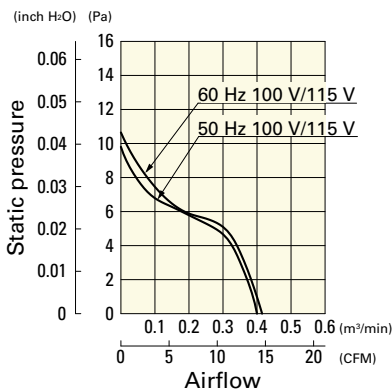
\* PSE compatible.

## Airflow - Static Pressure Characteristics

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

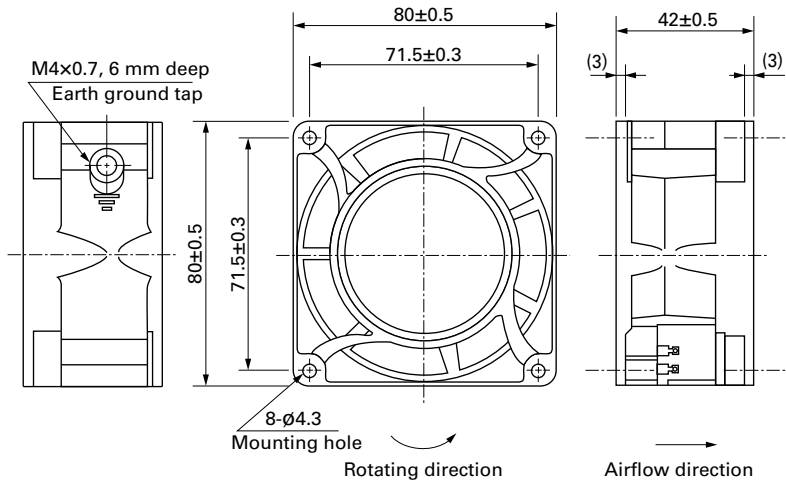


109-047UL, 109-033UL

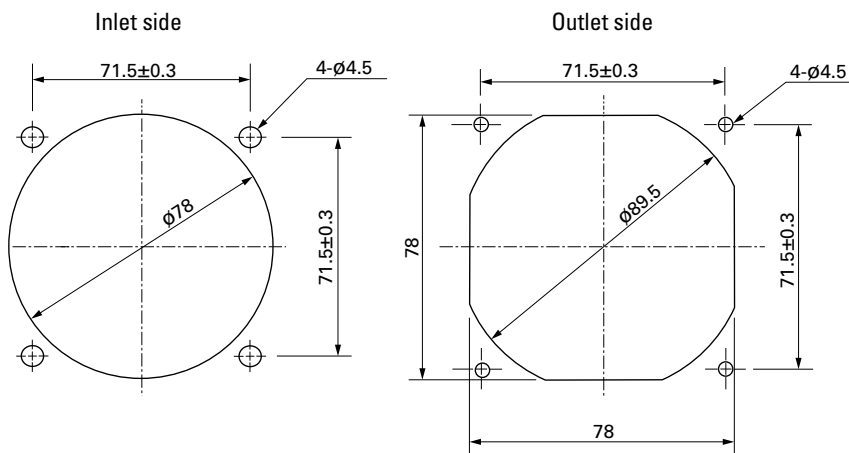




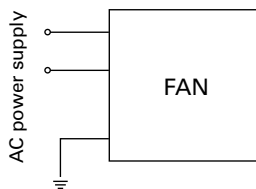
## Dimensions (unit: mm)



## 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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						
109S094	230		10/9	0.06/0.05	0.07/0.07						
109S095	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		
109S096*	100		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		
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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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 <sup>(1)</sup>	Finger guards	Mounting screws
ST1-109S091	109S091	100 V		489-016-L10	109-099E	M3×40 mm (4 screws) <sup>(2)</sup>
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	

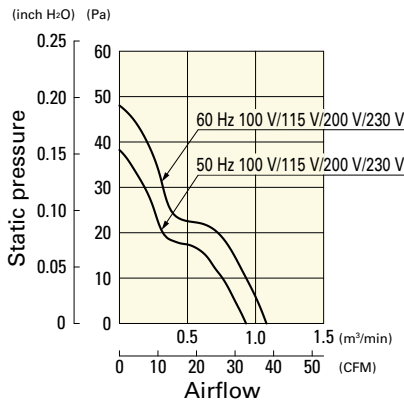
(1) PSE compatible.

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

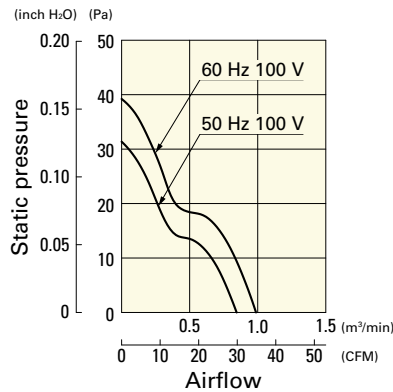
## Airflow - Static Pressure Characteristics

### Standard

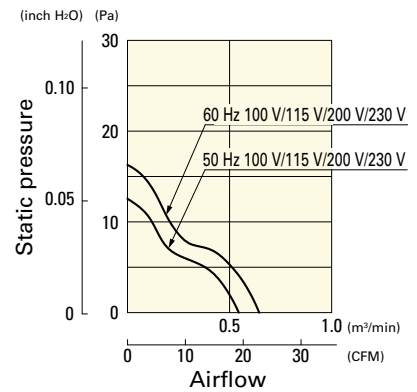
#### 109S091, 109S093, 109S092, 109S094



#### 109S095

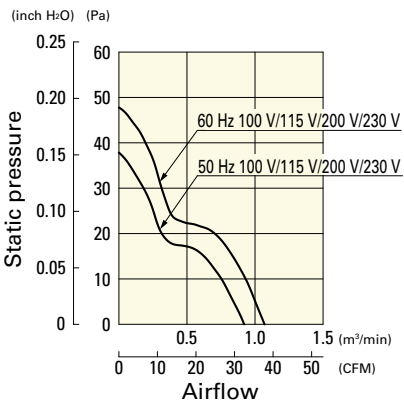


#### 109S096, 109S193, 109S192, 109S194

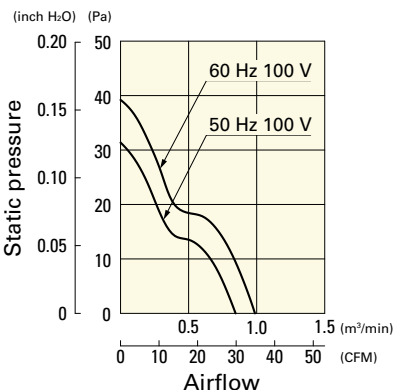


### with Sensor

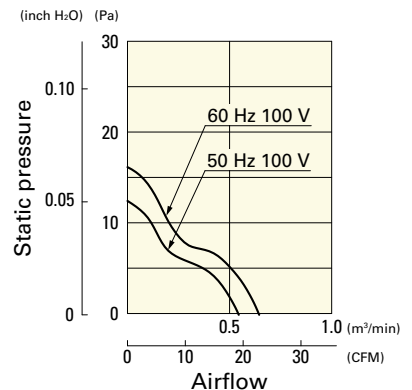
#### 109S491, 109S493, 109S492, 109S494



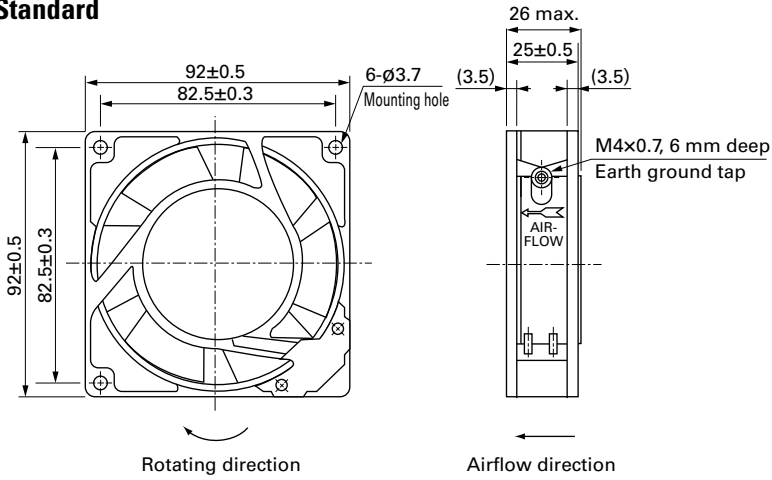
#### 109S495



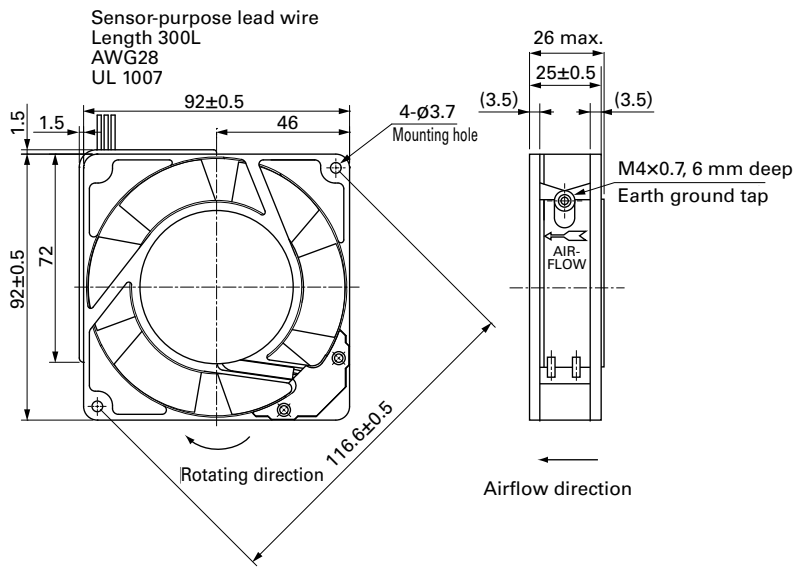
#### 109S496



**Standard**



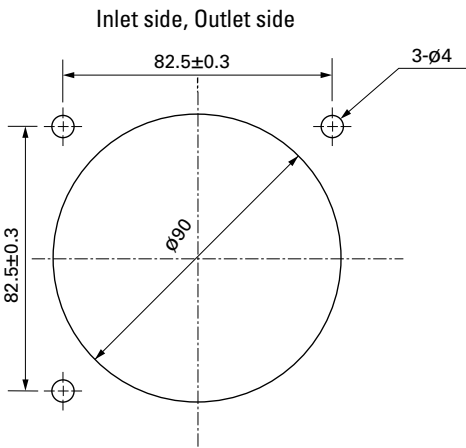
**with Sensor**



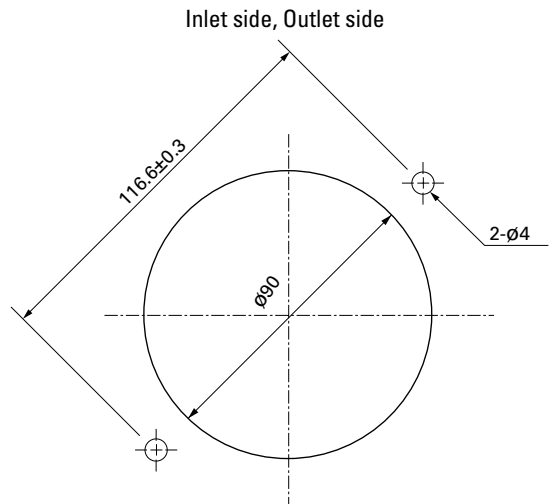
AC Fan 92 mm sq.

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

**Standard**

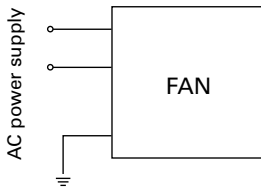


**with Sensor**



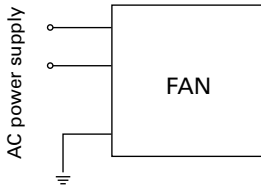
## Wiring Diagram

### Standard

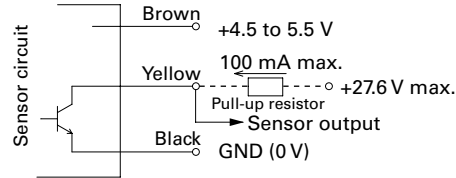


### with Sensor

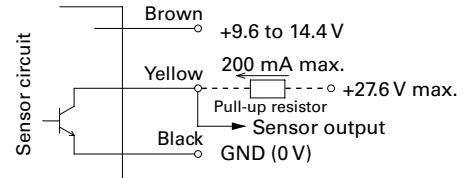
For fan power supply



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



# 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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	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			
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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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 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.

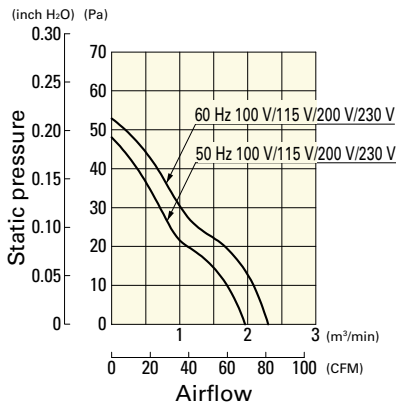
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord*	Finger guards	Mounting screws
ST1-109S085	109S085	100 V		489-016-L10	109-019E	M3×40 mm (4 screws)
ST1-109S084	109S084	115 V		489-016-L10	109-019E	
ST1-109S088	109S088	200 V		489-016-L10	109-019E	
ST1-109S087	109S087	230 V		489-016-L10	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.

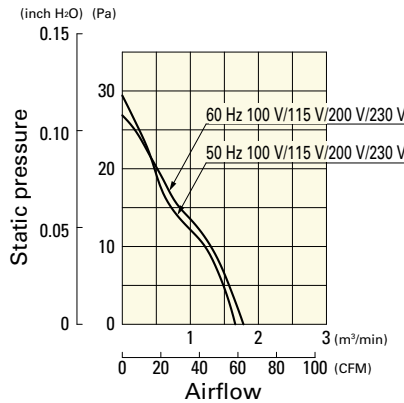
## Airflow - Static Pressure Characteristics

### Standard

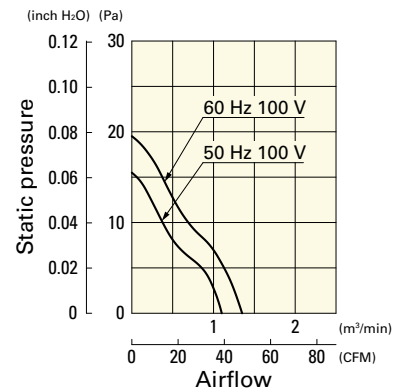
#### 109S085, 109S084, 109S088, 109S087



#### 109S081, 109S083, 109S082, 109S089

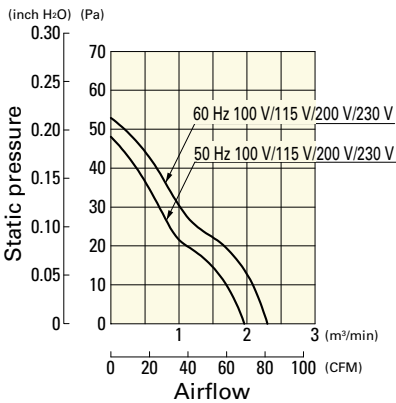


#### 109S086

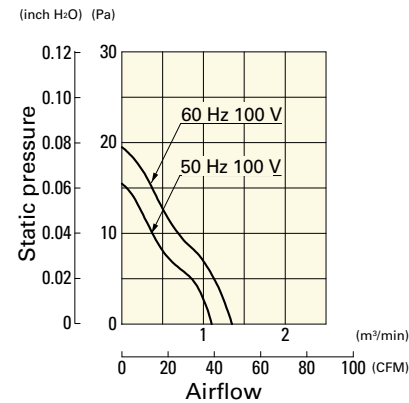


### with Sensor

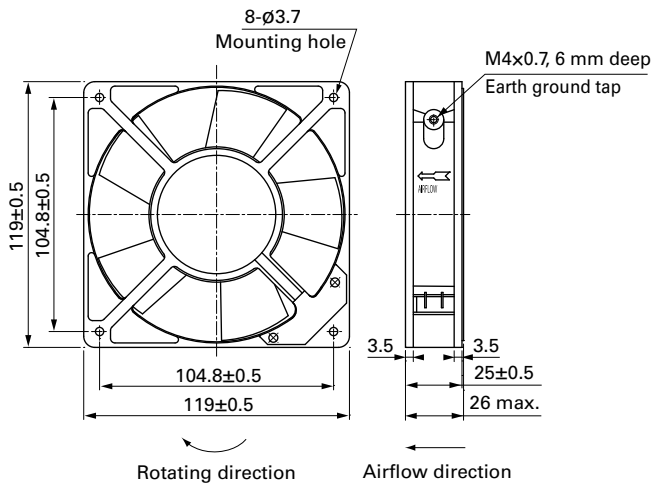
#### 109S485, 109S484, 109S488, 109S487



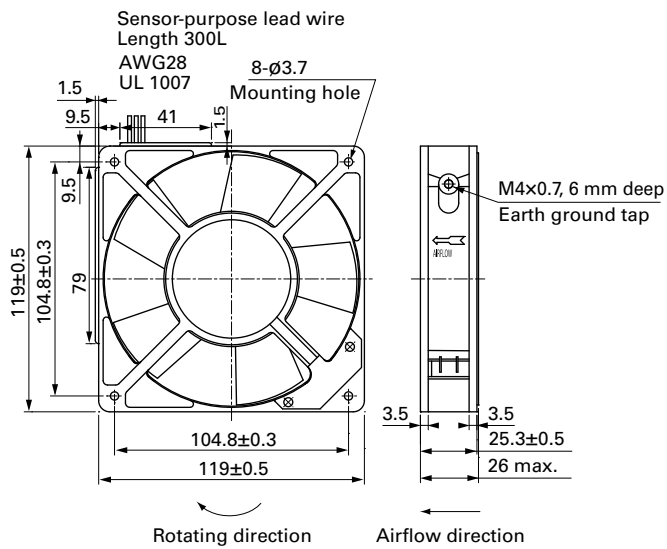
#### 109S486



Standard

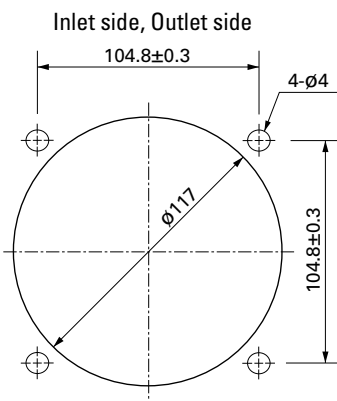


**with Sensor** When mounting the model with a sensor, please screw-mount through both flanges as it has a sensor box.



AC Fan 120 mm sq.

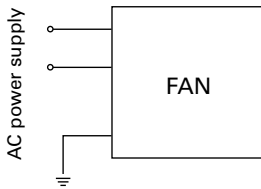
Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)





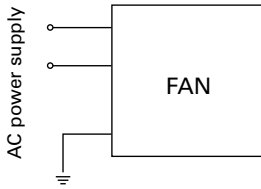
## Wiring Diagram

### Standard

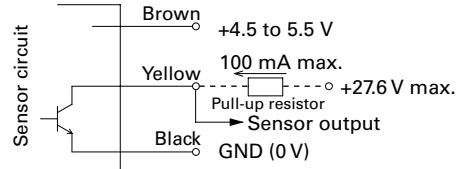


### with Sensor

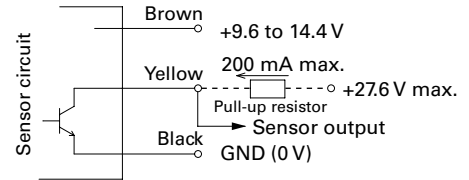
For fan power supply



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



# 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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				120	0.09/0.08							0.13/0.11
109S024UL				115	0.08/0.07							0.11/0.09
109S008	200		14/12	0.09/0.08	0.13/0.11	2450/2700	2.15/2.35 76 / 83	44.1/49.0 0.177/0.197	38/40			
109S008UL												230
109S025	100		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												200
109S029UL	115		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			
109S013												200
109S013UL	240		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			
109S006*												200
109S006UL*	240	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			
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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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	7/6	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 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 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.

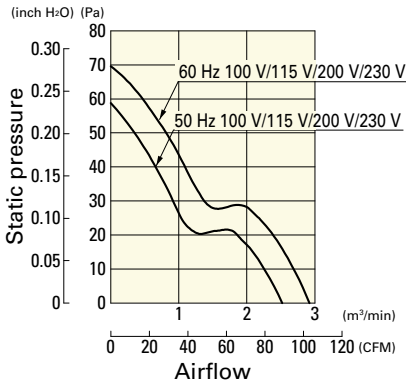
Order no.	Set items						Mounting screws
	Fan	Voltage	Low-speed sensor	Plug cord*	Finger guards		
ST1-109S075UL	109S075UL	100 V		489-037-L10	109-019E	M3×55 mm (4 screws)	
ST1-109S074UL	109S074UL	115 V		489-037-L10	109-019E		
ST1-109S078UL	109S078UL	200 V		489-037-L10	109-019E		
ST1-109S072UL	109S072UL	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.

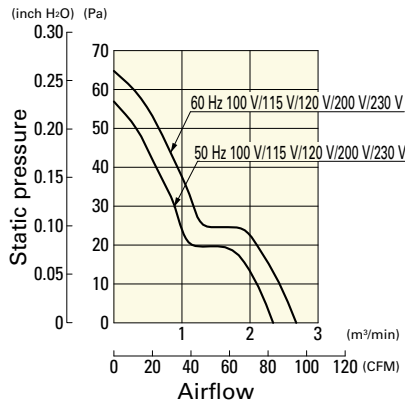
# Airflow - Static Pressure Characteristics

## Standard

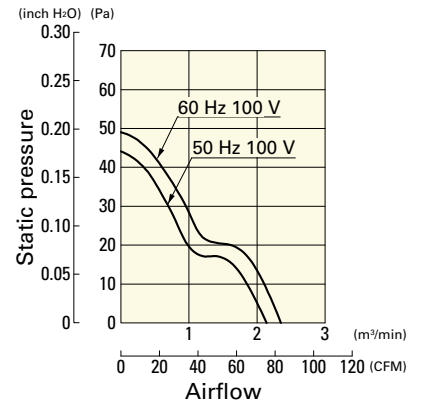
**109S075UL, 109S074UL, 109S078UL, 109S072UL**



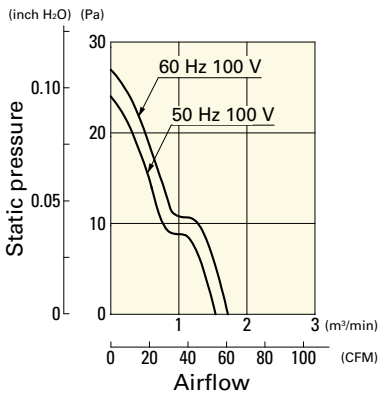
**109S005, 109S005UL, 109S024, 109S024UL, 109S008, 109S008UL, 109S025, 109S025UL**



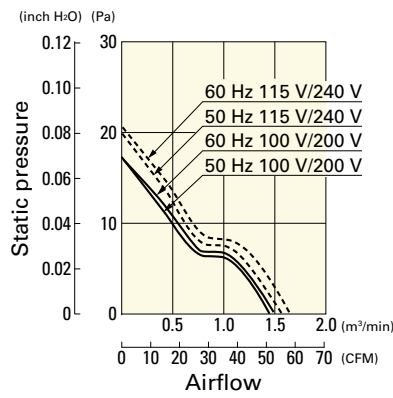
**109S029UL**



**109S013, 109S013UL**



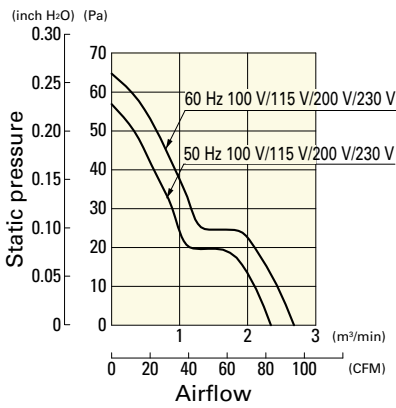
**109S006, 109S006UL, 109S010, 109S010UL**



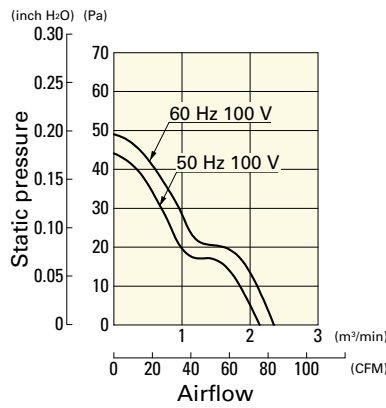
AC Fan 120 mm sq.

## with Sensor

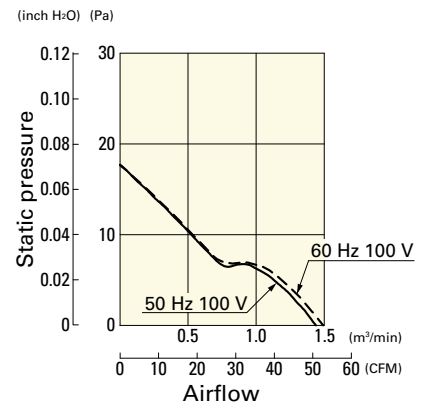
**109S405UL, 109S424UL, 109S408UL, 109S425UL**



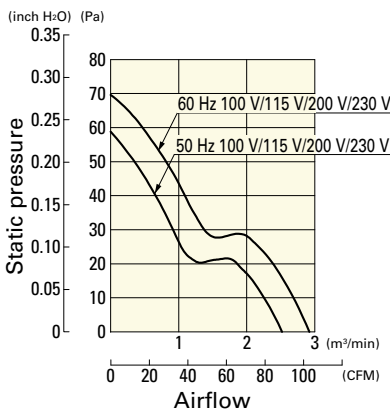
**109S429UL**



**109S406UL**

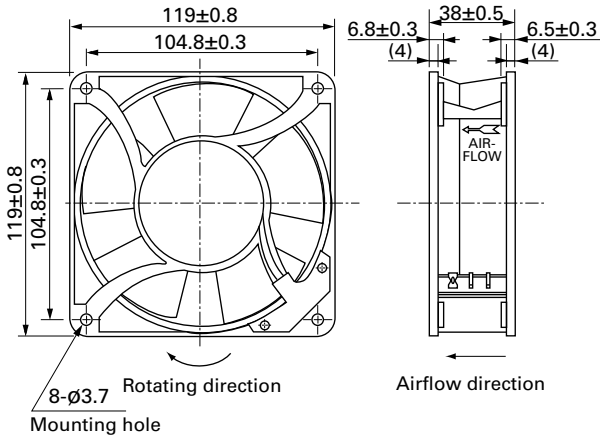


**109S475UL, 109S474UL, 109S478UL, 109S472UL**

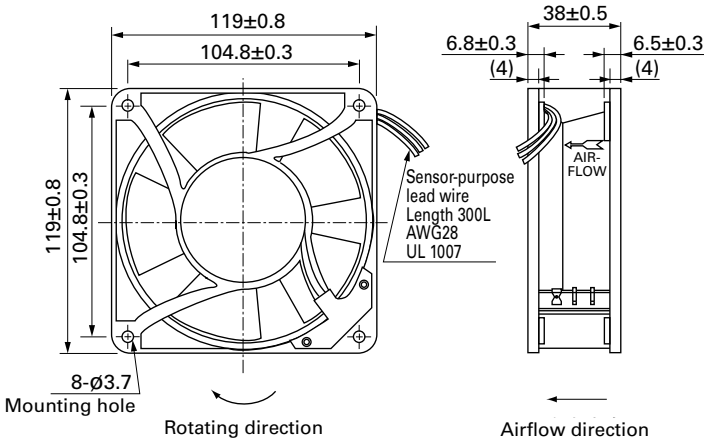


■ Dimensions (unit: mm)

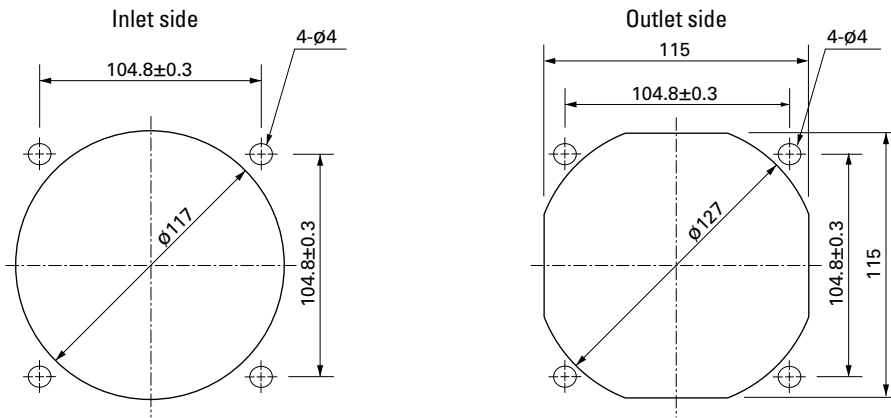
Standard



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

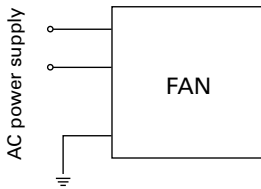


■ Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



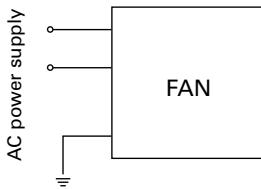
## Wiring Diagram

### Standard

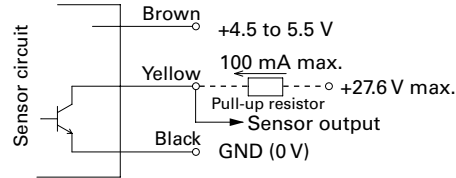


### with Sensor

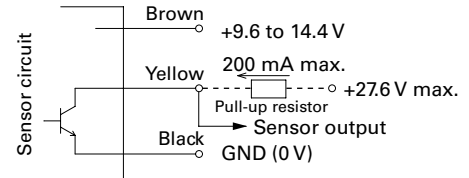
For fan power supply



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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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.

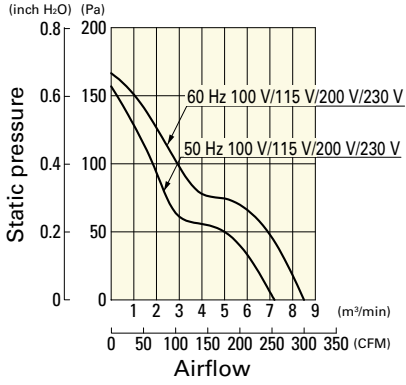
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord*	Finger guards	Mounting screws
ST1-109-601	109-601	100 V		489-1618-L10	109-619E	M5×20 mm (4 screws)
ST1-109-604	109-604	115 V		489-1618-L10	109-619E	
ST1-109-602	109-602	200 V		489-1618-L10	109-619E	
ST1-109-603	109-603	230 V		489-1618-L10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

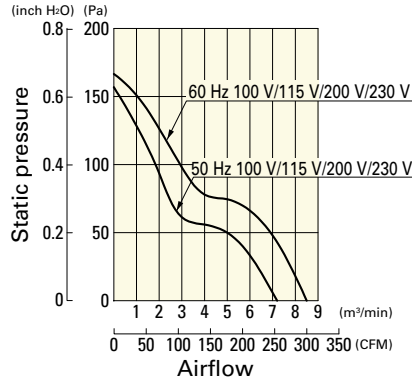
### Standard

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



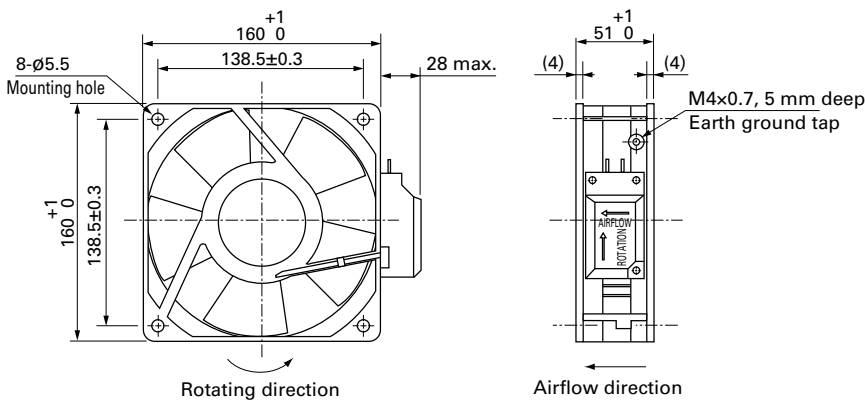
### with Sensor

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

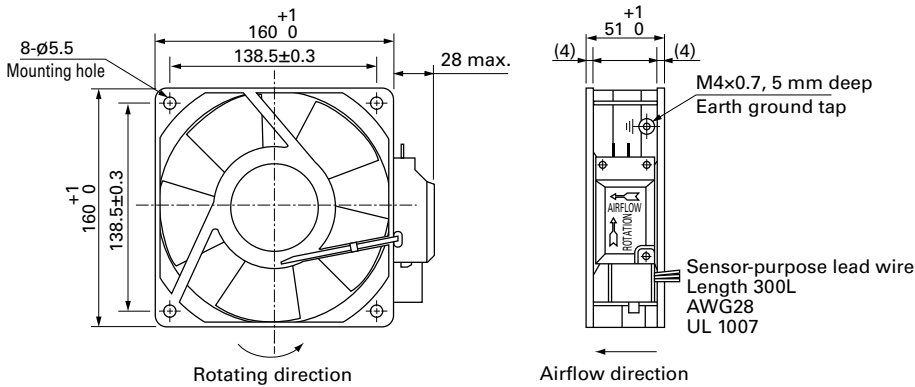


## Dimensions (unit: mm)

### Standard



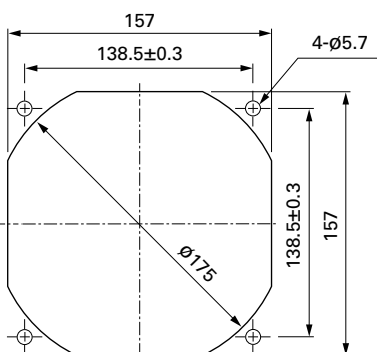
### with Sensor



AC Fan 160 mm sq.

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

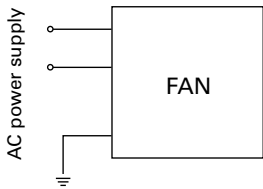
Inlet side, Outlet side





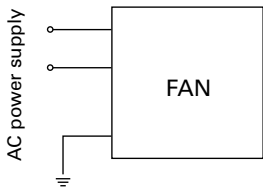
## Wiring Diagram

### Standard

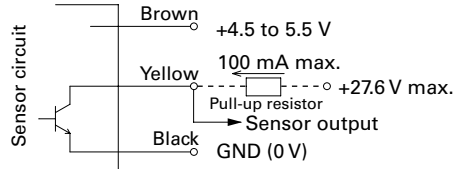


### with Sensor

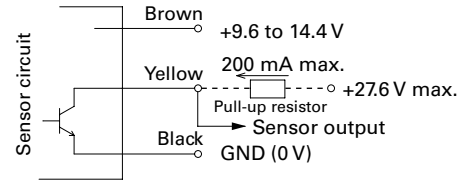
For fan power supply



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



# ∅ 172×150×51 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> 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.

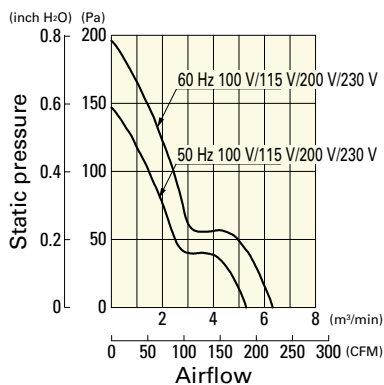
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord <sup>(1)</sup>	Finger guards	Mounting screws
ST1-109S301	109S301	100 V		489-1619-L10	109-319E	M4×25 mm (4 screws) <sup>(2)</sup>
ST1-109S304	109S304	115 V		489-1619-L10	109-319E	
ST1-109S302	109S302	200 V		489-1619-L10	109-319E	
ST1-109S303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

(1) PSE compatible.

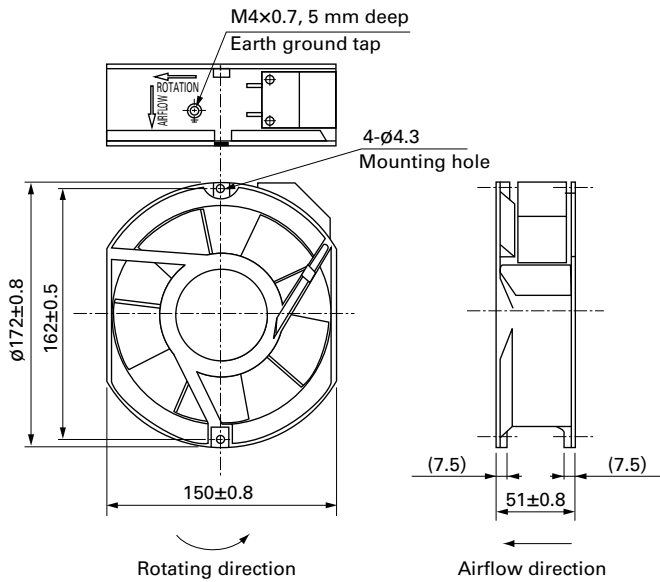
(2) Though these are 2-hole or 3-hole frame mount types, 4 screws are included for extra.

## Airflow - Static Pressure Characteristics

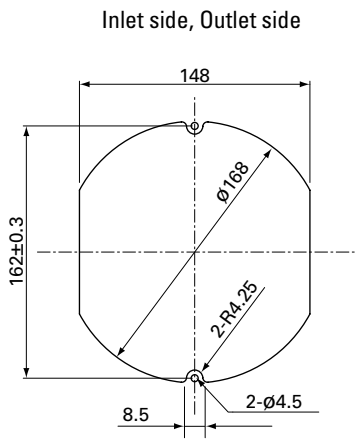
### 109S301, 109S304, 109S302, 109S303



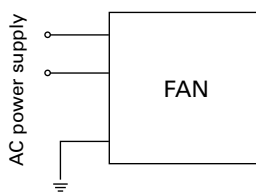
## Dimensions (unit: mm)



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



## 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

# ∅172x51 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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
<b>109-311</b>	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)
<b>109-314</b>	115			0.29/0.22	0.55/0.54						
<b>109-312</b>	200			0.16/0.13	0.33/0.32						
<b>109-313</b>	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 <sup>-1</sup> ]	Max. airflow [m <sup>3</sup> /min] [CFM]	Max. static pressure [Pa] [inchH <sub>2</sub> O]	SPL [dB (A)]	Operating temperature [°C]	Expected life [h]
<b>109-371</b>	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)
<b>109-374</b>	115			0.29/0.22	0.55/0.54						
<b>109-372</b>	200			0.16/0.13	0.33/0.32						
<b>109-373</b>	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.

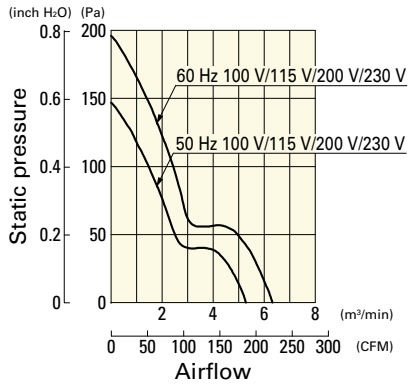
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord*	Finger guards	Mounting screws
<b>ST1-109-311</b>	109-311	100 V		489-1619-L10	109-319E	M4×25 mm (4 screws)
<b>ST1-109-314</b>	109-314	115 V		489-1619-L10	109-319E	
<b>ST1-109-312</b>	109-312	200 V		489-1619-L10	109-319E	
<b>ST1-109-313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

\* PSE compatible.

## Airflow - Static Pressure Characteristics

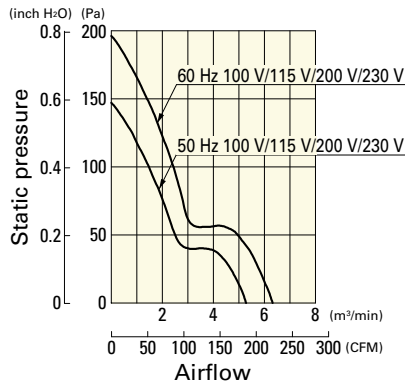
### Standard

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



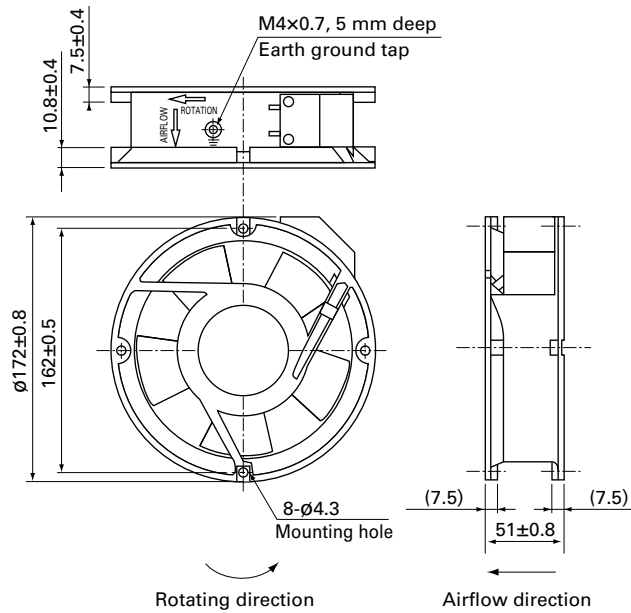
### with Sensor

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

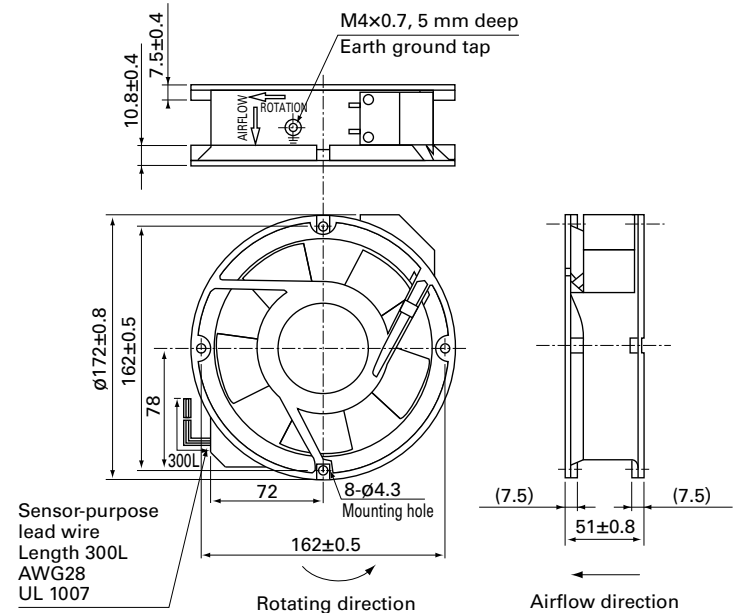


## Dimensions (unit: mm)

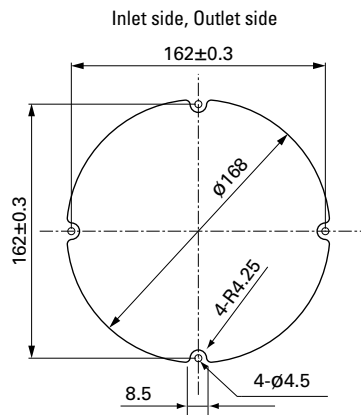
### Standard



### with Sensor



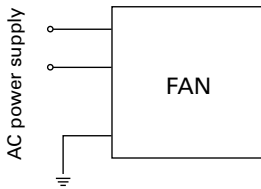
## Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)



AC  
AC Fan  $\varnothing$ 172 mm

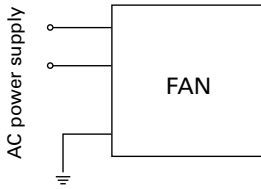
## Wiring Diagram

### Standard

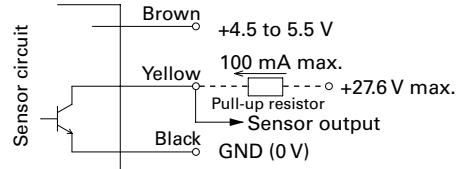


### with Sensor

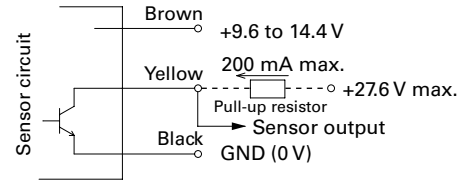
For fan power supply



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

AC

AC Fan  $\varnothing$ 172 mm



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