

# 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 airflow at 0 Pa static pressure when the fan is operating at rated voltage. (Measured using the double chamber method)
- Max. static pressure ..... The static pressure at 0 m<sup>3</sup>/min airflow when the fan is operating at rated voltage. (Measured using the double chamber method)
- SPL ..... A-weighted sound pressure level (SPL) when the fan operates at the rated speed.  
For the measurement method, see the Technical Materials section in the catalog.
- 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. 580.
- 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 min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) ..... A-weighted 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. 621.

Note 2: The ▶▶ mark indicates Short LeadTime Service applicable models. See p. 630 for details.

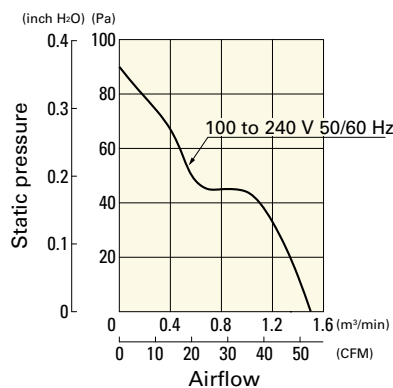
## Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 631.

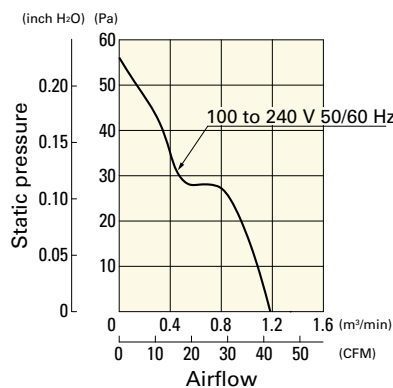
Order no.	Set items					
	Fan	Voltage	Low-speed sensor	Plug cord	Finger guards	Mounting screws
ST1-9AD0901H12	9AD0901H12	100 to 240 V		489-1635-L10	109-099E	M4x55 mm (4 screws)
ST1-9AD0901M12	9AD0901M12			489-1635-L10	109-099E	
ST1-9AD0901H1H	9AD0901H1H		○	489-1635-L10	109-099E	
ST1-9AD0901M1H	9AD0901M1H		○	489-1635-L10	109-099E	

## Airflow - Static Pressure Characteristics

9AD0901H12, 9AD0901H1H

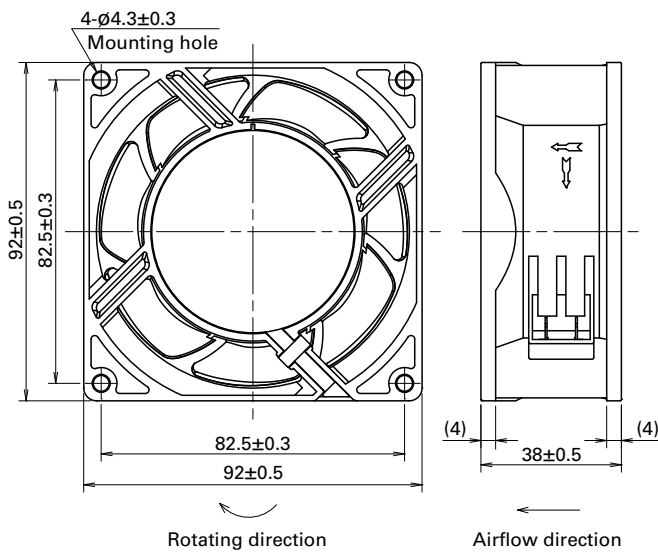


9AD0901M12, 9AD0901M1H

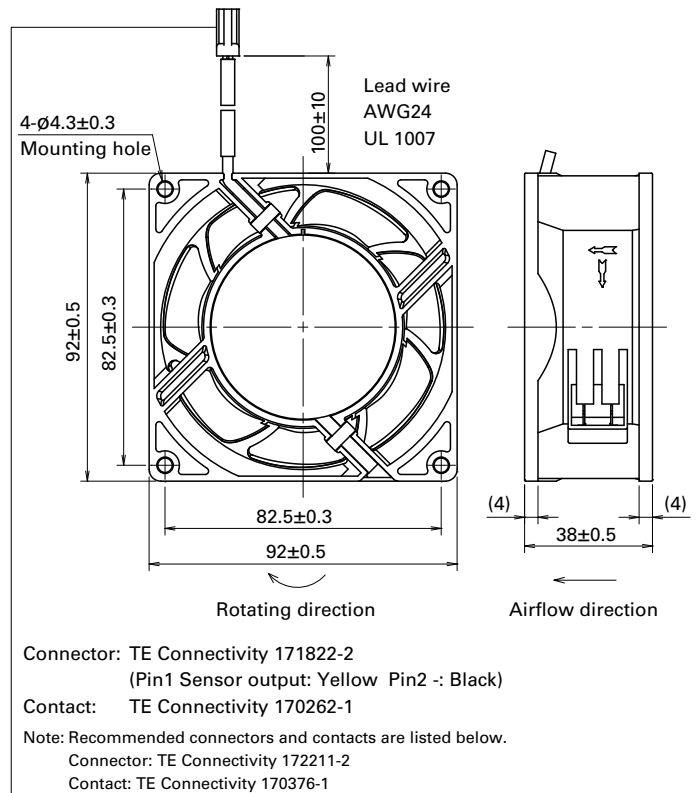


## Dimensions (unit: mm) (With ribs)

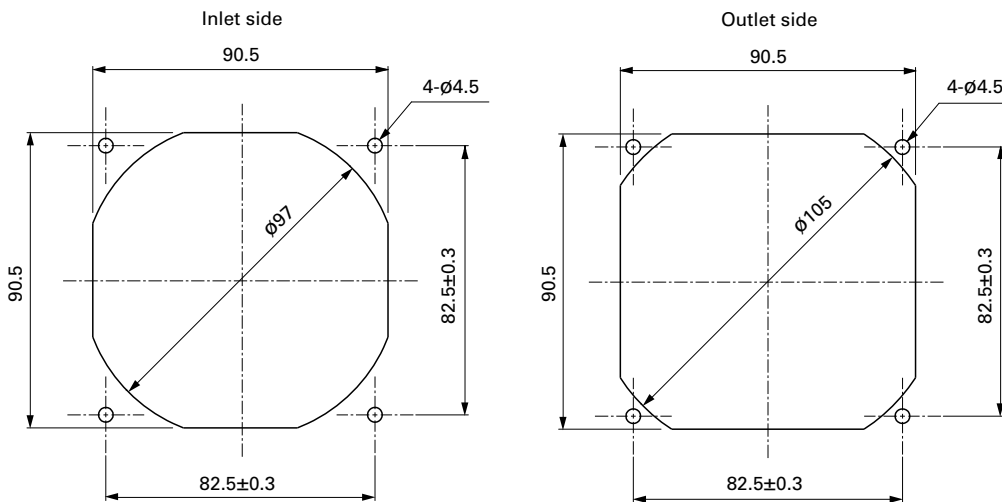
### without Sensor



### with Low-speed sensor

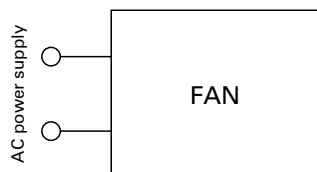


## Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

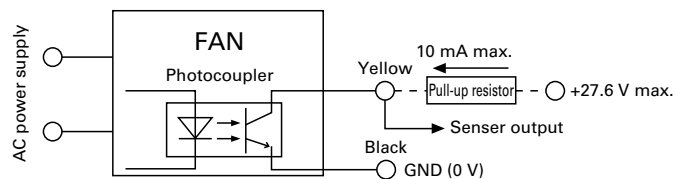


## Connection Schematic

### without Sensor



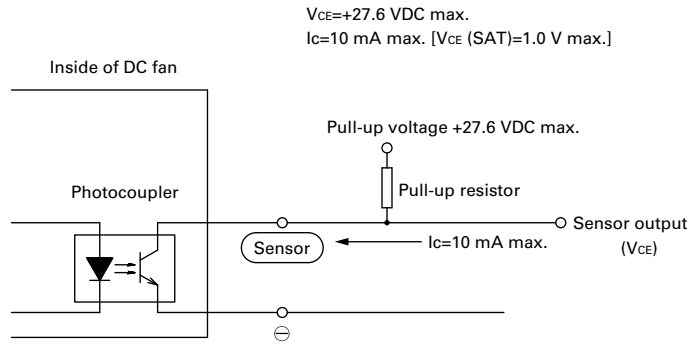
### with Low-speed sensor



## Specifications for Low-speed Sensors

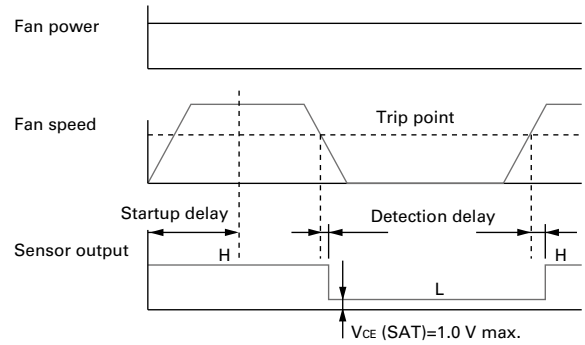
Typical standard model: 9AD0901H1H

Output circuit: Open collector

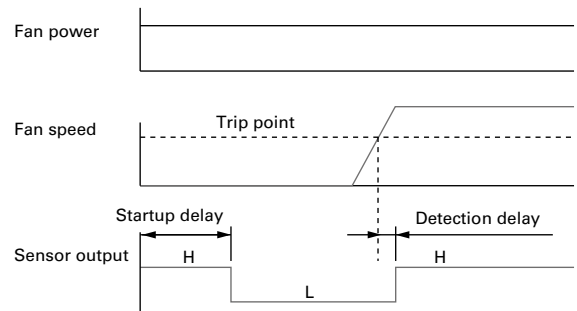


### Sensor scheme

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. 564

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

Resin finger guards page: p. 571

Model no.: 109-1001G

Resin filter kits page: p. 572

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

Plug cord page: p. 575

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

Sensor extension wiring harness page: p. 575

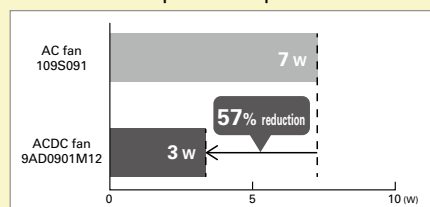
Model no.: 489-1636

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

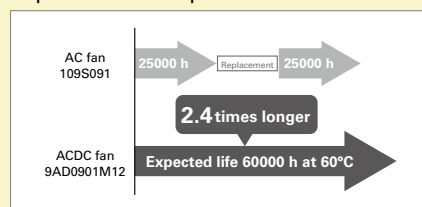
**Low power consumption** **Long life** **Wide voltage range** (Compared with our existing AC fan with equal size.)

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** type

## General Specifications

- Material ..... Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life ..... See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor structure ..... Brushless DC motor
- Motor protection function ..... Locked rotor burnout protection For details, please refer to p. 580.
- 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 min. at 500 VDC (between lead wire conductors and frame)
- Sound pressure level (SPL) ..... A-weighted 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. 621.

Note 2: The ☞ mark indicates Short Lead Time Service applicable models. See p. 630 for details.

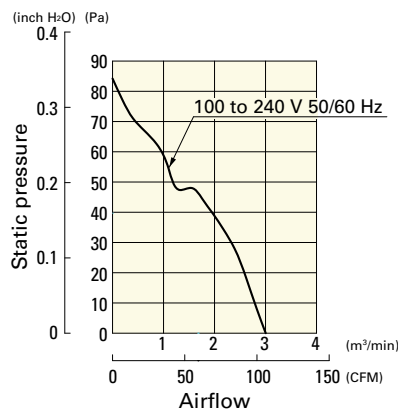
## Set Models

Fan, finger guard, plug cord, screws, etc. can be purchased in one package. For details, please refer to p. 631.

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	

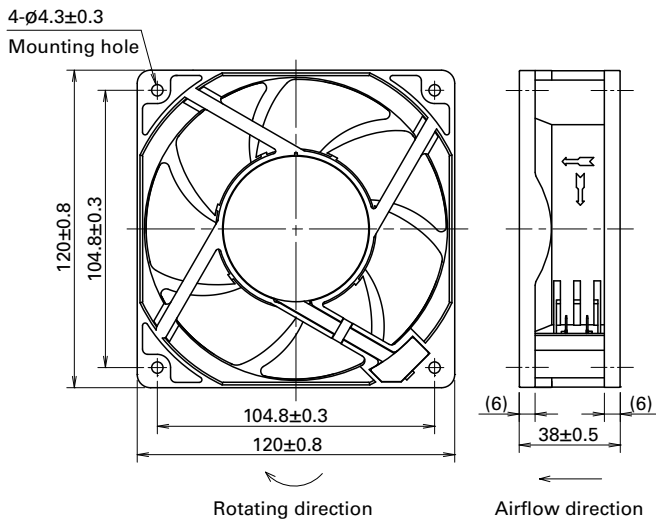
## Airflow - Static Pressure Characteristics

9AD1201H12, 9AD1201H1H

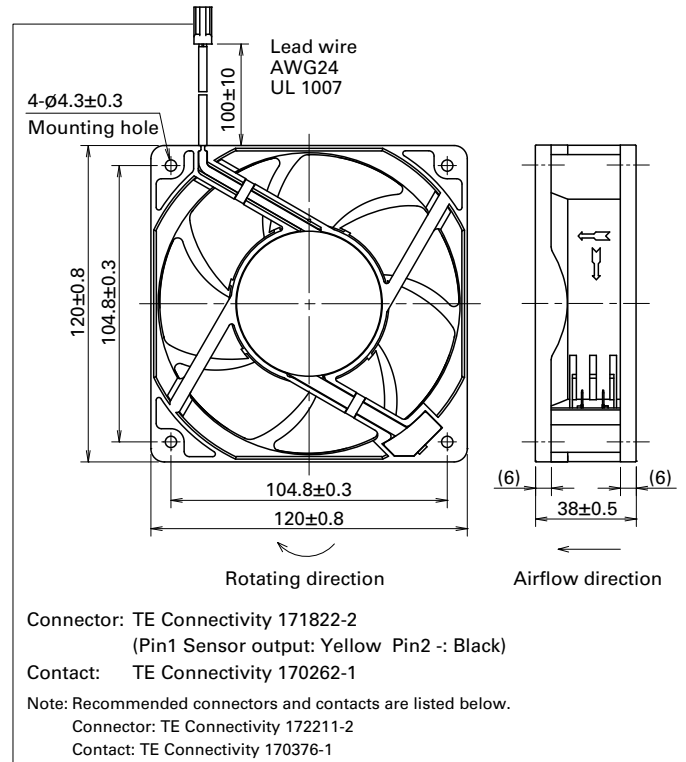


## Dimensions (unit: mm) (With ribs)

### without Sensor

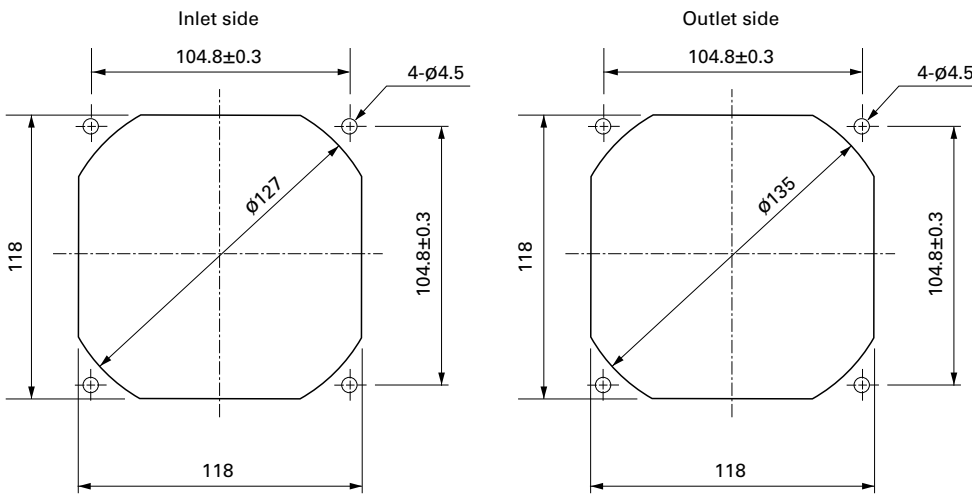


### with Low-speed sensor



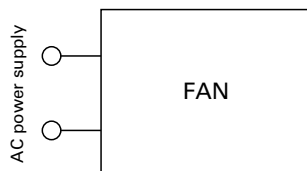
## Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

ACDC Fan 120 mm sq.

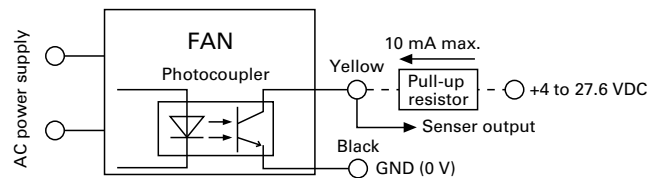


## Connection Schematic

### without Sensor



### with Low-speed sensor

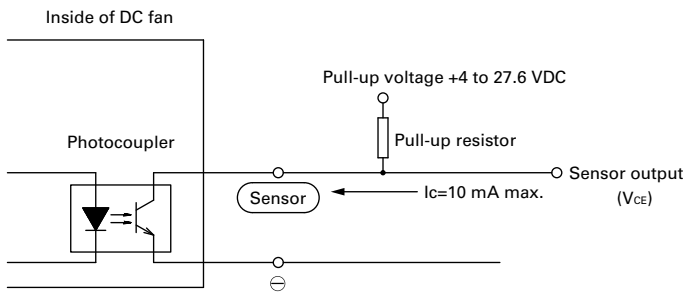


## Specifications for Low-speed Sensors

Model No.: 9AD1201H1H

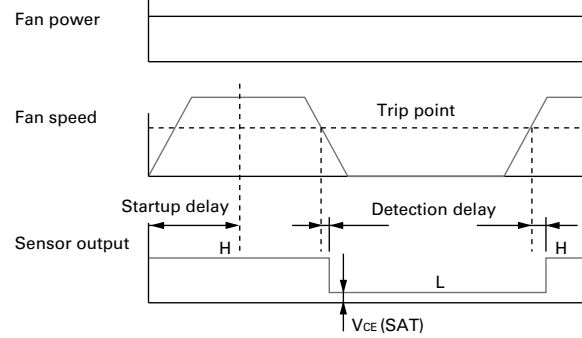
Output circuit: Open collector

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

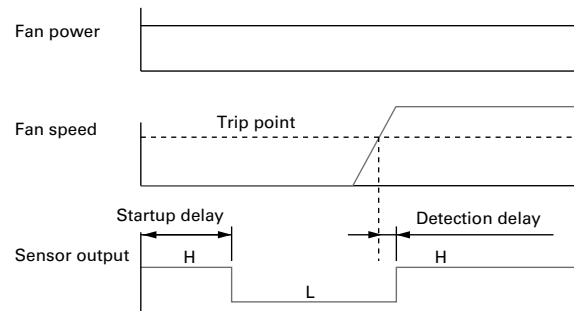


### Sensor scheme

#### 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. 565

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

Resin finger guards page: p. 571

Model no.: 109-1000G

Resin filter kits page: p. 572

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

Plug cord page: p. 575

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

Sensor extension wiring harness page: p. 575

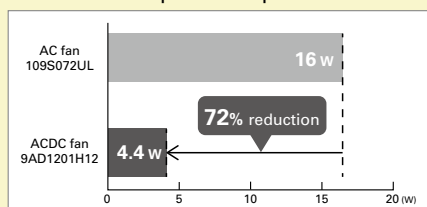
Model no.: 489-1636

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

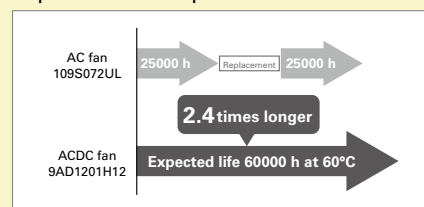
**Low power consumption** **Long life** **Wide voltage range** (Compared with our existing AC fan with equal size.)

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

### Power consumption comparison



### Expected life comparison





# Ø 172x150x51 mm

**San Ace 172AD 9AD** type

Sidecut type

## General Specifications

- Material ..... Frame: 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. 580.
- Dielectric strength ..... 50/60 Hz, 1500 VAC, for 1 minute (Lead wire model: between lead wire conductors and frame, terminal model: between terminals and frame)
- Insulation resistance ..... 10 MΩ min. at 500 VDC (Lead wire model: between lead wire conductors and frame, terminal model: between terminals and frame)
- Sound pressure level (SPL) ..... A-weighted 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
Sensor	Yellow	Control
	Brown	GND
		Black
- Mass ..... 750 g

## 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 frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 0% duty cycle.

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		

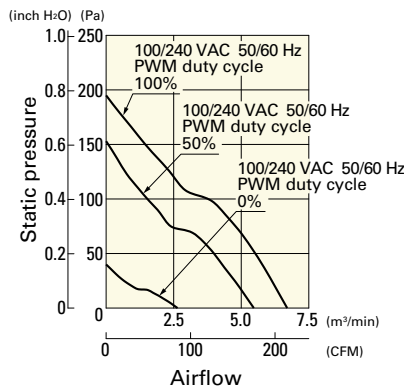
\* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 0% duty cycle.

Note: Sensor and control options are available for selection. Refer to the table on p. 621.

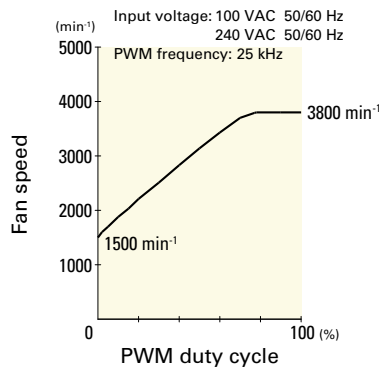
## Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

**9AD5701P5H003** With pulse sensor with PWM control function

PWM duty cycle



PWM duty - Speed characteristics example

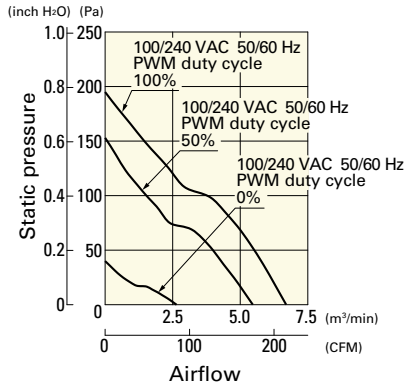




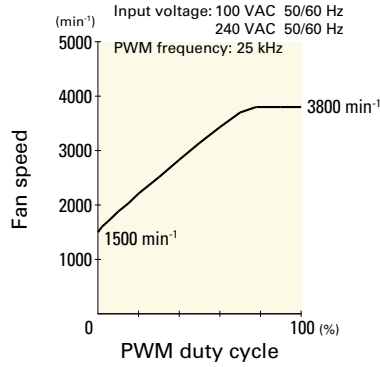
## Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

9AD5701P5HT03 With pulse sensor with PWM control function

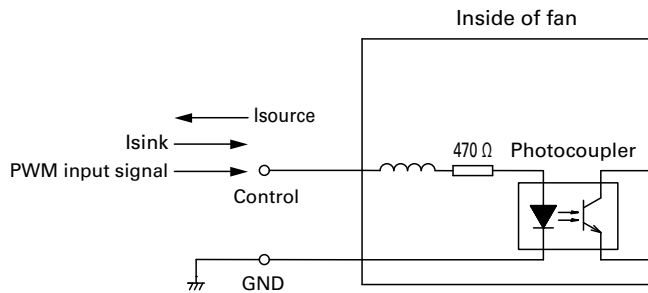
PWM duty cycle



PWM duty - Speed characteristics example

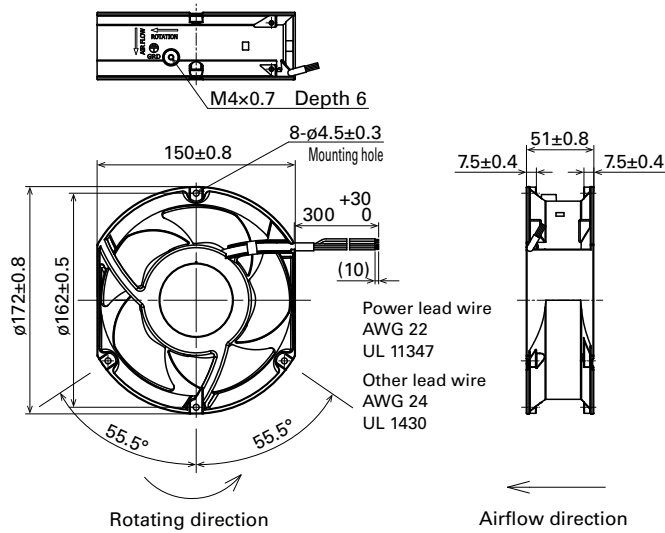


## Connection Schematic

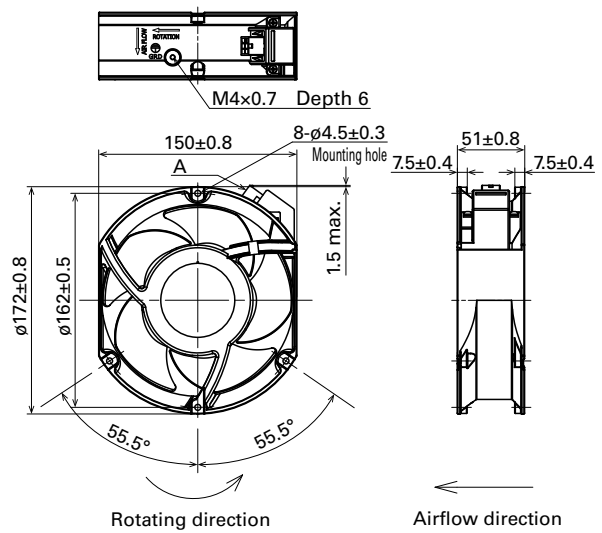


## Dimensions (unit: mm)

Lead wire model



Terminal model



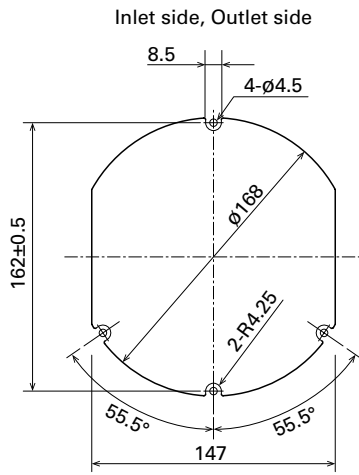
A Connector contact

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

ACDC Fan φ172 mm

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



## Options

Finger guards

page: p. 566

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

Terminal model wiring harness

page: p. 576

Model no.: 489-1647