

COOLING SYSTEM

# San Ace

Products Information

2006  
ver.2

SANYO DENKI



# C O N T E N T S

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**Technical Material** ..... p.3

---

**Product Guide**

**Instruction Manual for Fan** ..... p.20

**Part Numbering System** ..... p.22

---

**DC Fans** ..... p.35

---

**Thermal Speed Controlled Fans** ..... p.97

---

**Splash Proof Fans** ..... p.111

---

**Oil Proof Fans** ..... p.137

---

**Long Life Fans** ..... p.145

---

**Blowers** ..... p.165

---

**Centrifugal Fans** ..... p.187

---

**CPU Coolers • Liquid Cooling Solution Systems** · · p.191

---

**AC Fans** ..... p.223

---

**Option** ..... p.249

---

**Model No. index** ..... p.261

---

**Overseas Sales Network** ..... p.268

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# **TECHNICAL MATERIAL**

# Overview and characteristics of fan

## Overview

Fan motor is widely used to extend life of your system by cooling off heat of the system that many electrical components are mounted in a very high density and dissipating heat. Since we Sanyo Denki developed "San Ace" which is the first AC fan in Japan in 1965, we have increased fan motor lineup until now meeting customer's needs rapidly based on our tremendous career. We Sanyo Denki will continue to develop new fans with lower noise, downsizing, low profile and higher efficiency.

## Characteristics

We can roughly divide fan into two types which are AC and DC.

### AC fans

Sanyo Denki succeeded in the mass-production of AC fans in 1965. Sanyo Denki was the first Japanese manufacturer to have succeeded at this.

- High performance
- High reliability
- Safety

### DC fans

Sanyo Denki succeeded in the mass-production of DC fans in 1982.

- High performance
- Low power consumption
- Low vibration
- Low leakage of flux
- High reliability

Sanyo Denki currently has a wider variety of products like Long Life Fan, CPU cooler, Splash Proof Fan, and Oil Proof Fan etc to meet all customer needs.

# Guideline in selecting a fan

## How to select an appropriate fan

The following example is a guideline regarding how to select an appropriate fan for cooling your system

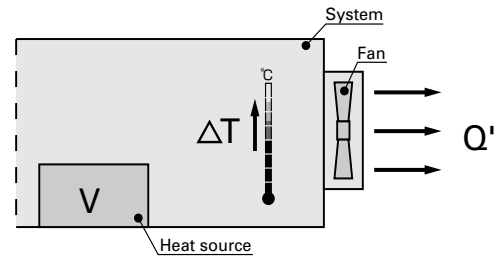
### 1. Determining of your system specifications and conditions

Determine the temperature rise inside your system and obtain the total heating value inside your system on the basis of its inputs and outputs.

Example

V : Total heating value of your system (W) =100 (W)

$\Delta T$  : Inside temperature rise (K) =15 (K)



### 2. Calculating the Required Air flow for Cooling

After the equipment specifications and conditions of your system have been determined, calculate required air flow to meet the conditions.

(Note that the formula shown below only applies when the heat radiation is performed only by cooling air from the fan.)

Example

Q': Motion air flow (m<sup>3</sup>/min.)

$$Q' = \frac{V}{20\Delta T} = \frac{100 \text{ (W)}}{20 \times 15 \text{ (K)}} \approx 0.33 \text{ (m}^3/\text{min)}$$

### 3. Selecting the Fan

After the motion air flow has been calculated, select an appropriate fan motor based on the value.

The motion air flow when the fan motor is actually mounted in your system can be obtained using the air flow-static pressure characteristics curve and system impedance.

However, the system impedance cannot be measured without a measuring equipment, so fan with 1.5 to 2 times higher air flow than the actual Max air flow should be selected (operating air flow is one-third to two-thirds of maximum air flow).

Example

Q: Maximum air flow (m<sup>3</sup>/min.)

$$Q' = Q \times 2/3$$

$$Q = Q' \times 3/2 = 0.33 \times 3/2 \approx 0.5 \text{ (m}^3/\text{min)}$$

Next, In case that you select a fan having an air flow of 0.5 (m<sup>3</sup>/min.) or more and a appropriate size for the space inside your system.

For example, If you need a fan of 60mm square, 25mm thickness and 12V, you should select is 109R0612H402 (maximum air flow = 0.53m<sup>3</sup>/min.).

### 4. Confirming the Selected Fan

Calculate the temperature rise inside your sysetem when your sysetem having 100 (W) of total heating value is forcefully cooled down by a 109R0612H402 fan.

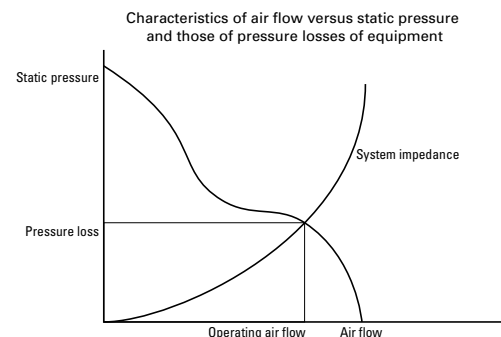
Example

$$Q' = Q \times 2/3 = 0.53 \times 2/3 \approx 0.353 \text{ (m}^3/\text{min)}$$

$$\Delta T = V/20Q' = 100 \text{ (W)} / 20 \times 0.353 \text{ (m}^3/\text{min)} \approx 14.2 \text{ (K)}$$

From the above, the temperature rise inside your system is calculated as 14.2(K)

Since the value obtained from the above equation is only a rough target, final fan selection should be based on your actual installation test.



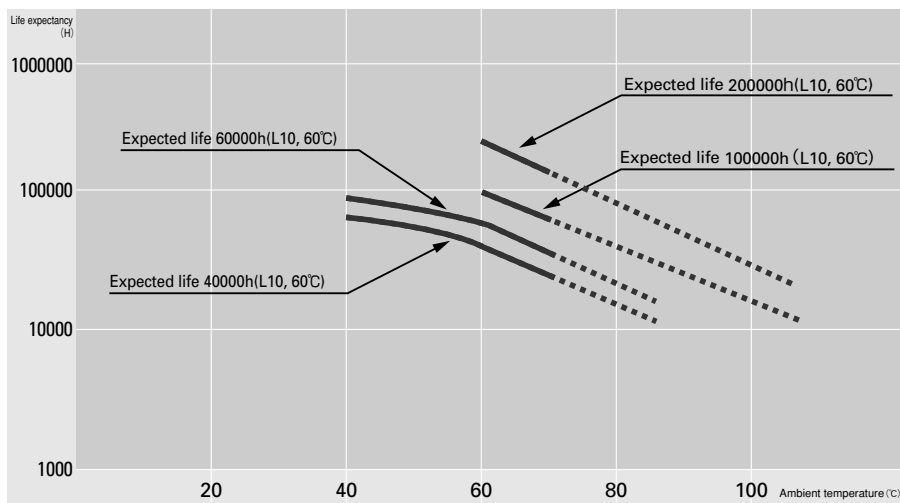
# Characteristics calculation method and description

## Reliability and life

A fan motor generally cools itself as well. The temperature rise of the motor is relatively low and the temperature rise of the grease in the bearings is also low, so expected life is longer than general some either motors. Since the service life of bearings is a theoretical value that applies when they are ideally lubricated, the life of lubricant can be regarded as expected life of the fan. The expected life of an AC fan used at an ambient temperature 60°C is 25,000 hours. The BLDC fan consumes less power and its temperature rise of bearing is very low, thus its expected life is 40,000 hours at an ambient temperature of 60°C. Sanyo Denki also has a line-up of Long Life Fans that has

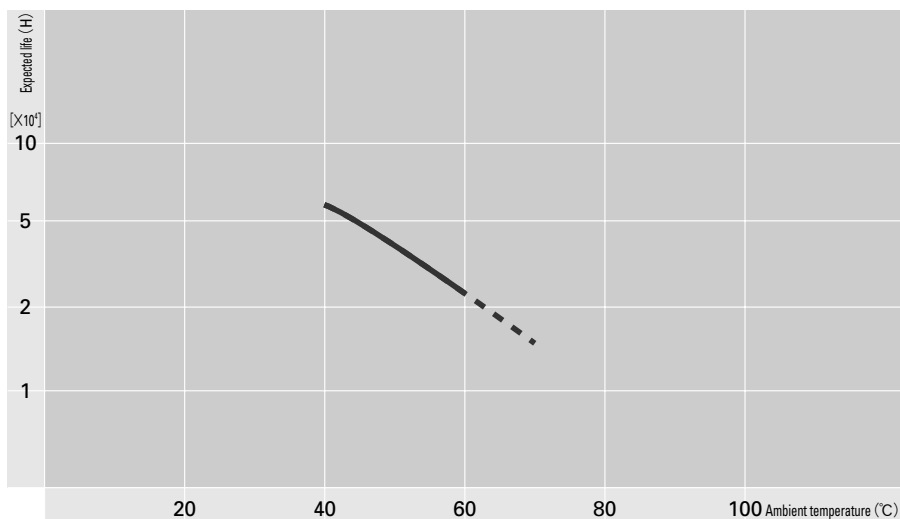
200,000 hours life and 100,000 hours life at an ambient temperature 60°C with an even more enhanced structure and material. The table below indicates the relationship between ambient temperature and expected life estimated on the basis of our life tests and same other tests conducted by Sanyo Denki. (The survival rate is 90%.) An accelerated life test is conducted on the basis of the concept that the expected life halves as the ambient temperature rises by about 15°C (within the operating temperature range of lubricant.)

### Expected life of DC fans



Rated voltage, continuous operation, free air, survival rate of 90%

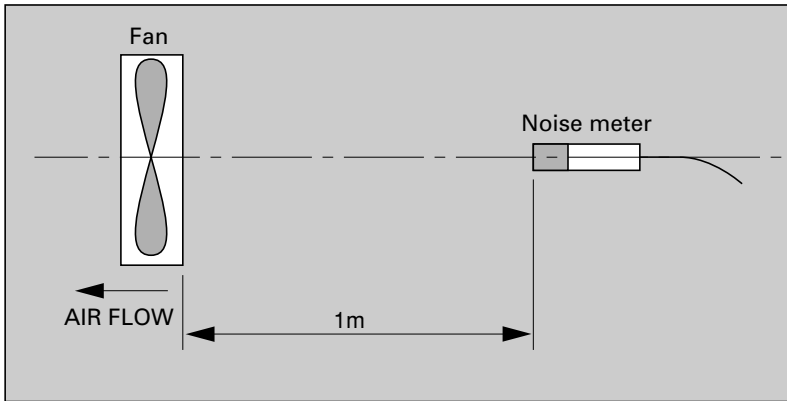
### Expected life of AC fans



Rated voltage, continuous running, free air, survival rate of 90%

## Noise characteristics

Noise is average value that measured at 1 meter away from air intake side of fan that is suspended on special frame in anechoic chamber (as per JIS B 8330).



## General specifications

### Insulation resistance

10M $\Omega$  or more at 500 VDC megger (between the lead conductor and frame).

### Storage temperature range

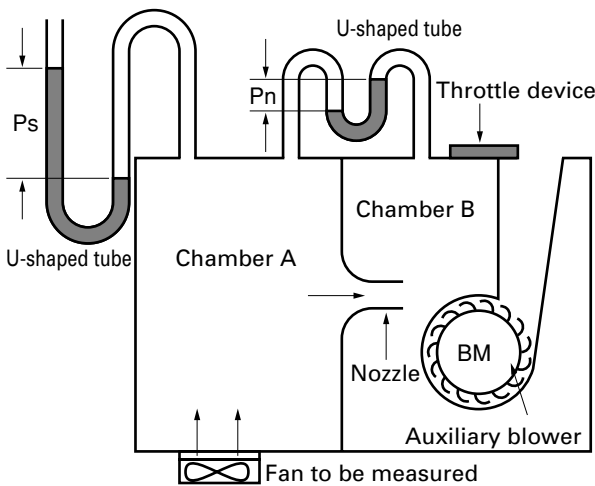
-30°C to +70°C (Non-condensing).

# Characteristics calculation procedure and description

## Measuring air flow and static pressure

It is very difficult to measure air flow and static pressure. In fact, the performance curve may vary greatly according to the type of measuring equipment.

The commonly-used type of measuring equipment is a wind tunnel using a Pitot tube. Sanyo Denki uses a very precise method using double chamber equipped with many nozzles.



Double chamber measuring equipment

$$Q = 60A\bar{v} \text{ (A)}$$

where

Q = air flow (m<sup>3</sup>/min)

A = cross sectional area of nozzle =  $\frac{\pi}{4}D^2$  (m<sup>2</sup>)

D = nozzle diameter

$\bar{v}$  = average air flow velocity of nozzle =  $\sqrt{2g \frac{P_n}{\gamma}}$  (m/sec)

$\gamma$  : Air specific gravity (kg/m<sup>3</sup>)

( $\gamma = 1.2 \text{ kg/m}^3$  at 20°C, 1 atmospheric pressure)

g = acceleration of gravity = 9.8 (m/sec<sup>2</sup>)

P<sub>n</sub> = differential pressure (mm H<sub>2</sub>O)

P<sub>s</sub> = static pressure (mm H<sub>2</sub>O)

The measuring equipment using double chamber is method to be calculated from air flow goes through nozzle and differential pressure between pressure of inside of chamber (P<sub>s</sub>) and atmospheric pressure by measuring differential pressure between air intake and exhaust of nozzle (P<sub>n</sub>).

## Conversion Table

### Static pressure

1mm H<sub>2</sub>O = 0.0394inch H<sub>2</sub>O

1mm H<sub>2</sub>O = 9.8Pa (Pascal)

1inch H<sub>2</sub>O = 25.4mm H<sub>2</sub>O

1Pa = 0.102mm H<sub>2</sub>O

1inch H<sub>2</sub>O = 249Pa

### Air flow

1m<sup>3</sup>/min = 35.31ft<sup>3</sup>/min (CFM)

1CFM = 0.0283m<sup>3</sup>/min

1m<sup>3</sup>/min = 16.67 l /sec

1CFM = 0.472 l /sec

1 l /sec = 0.06m<sup>3</sup>/min

# Operating precautions

## Operating precautions

### Storage temperature

There is no performance problem when the system is used at between  $-30^{\circ}\text{C}$  and  $+70^{\circ}\text{C}$ . There is a possibility that same problem of lubricant and insulation inside motor might occur by condensing due to rapid surrounding temperature change. Therefore, please take care of non-condensing using desiccant or something during fan is in storage.

### Tightening Torque

This shows the recommended values for the tightening torque when installing the fans. If the tightening torque is higher than the recommended values, the fan can be deformed or damaged.

Use care when tightening. Also, be sure to always use a fan with a ribbed structure when using screws to pass through and secure the fan.

Recommended screw torques

AC fans :  $0.44\text{N}\cdot\text{m}$  (4.5kgf $\cdot\text{cm}$ ) or less (with M3 screws)

AC fans :  $0.78\text{N}\cdot\text{m}$  (8kgf $\cdot\text{cm}$ ) or less (with M4 screws)  
(160mm $\times$ 160mm、 $\phi$  172mm)

DC fans :  $0.44\text{N}\cdot\text{m}$  (4.5kgf $\cdot\text{cm}$ ) or less (with M3 screws)  
(Applies to fan motors of 52mm $\times$ 52mm or smaller)

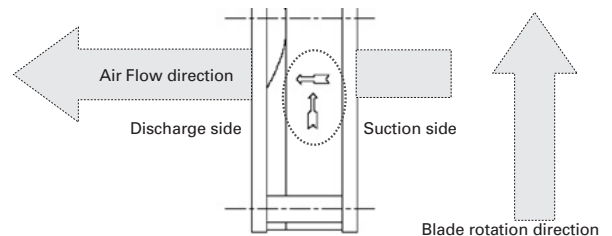
DC fans :  $0.78\text{N}\cdot\text{m}$  (8kgf $\cdot\text{cm}$ ) or less (with M4 screws)  
(Applies to fan motors of 60mm $\times$ 60mm or bigger)

DC fans :  $0.98\text{N}\cdot\text{m}$  (10kgf $\cdot\text{cm}$ ) or less (with M4 screws)  
( $\phi$  200mm)

DC fans :  $0.75\text{N}\cdot\text{m}$  (7.35kgf $\cdot\text{cm}$ ) or less (with M4 screws)  
( $\phi$  220mm)

### Installation

There are no limitations on the installation direction of AC fans, DC fans, or blowers. AC/DC fans have symbols on the fan motor indicating the airflow direction and blade rotation direction. When installing, use these symbols to check the airflow direction.



Symbols indicating the fan airflow direction and blade rotation direction

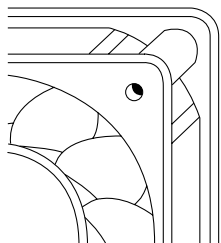
### Comparison of ribbed and ribless structures (in the case of plastic frame BLDC fan)

Regarding plastic frame, we have a option ribbed and ribless about mounting. Please use preferred type up to your application. Please use ribbed fan in case that you hook fan up clamping either side fan mounting hole target. (Ribless type of some models aren't available.)

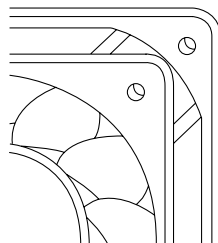
\*Use a fan with a rib structure when using a screw for piercing.

\*The plastic frame models of DC fans are classified into ribbed models and ribless models based on the shape of the installation section of the frame.

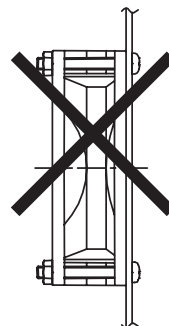
- When securing screws to ribless plastic frame models, use a flange to secure on one side.



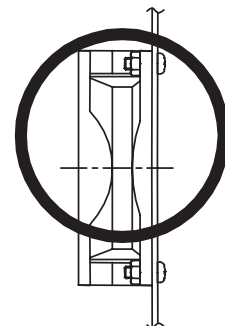
Ribbed



Ribless



Securing with flanges on both sides



Securing with a flange on one side

### Handling precautions

Sanyo Denki's fans incorporate precise bearings. Therefore, please handle the motors carefully in order not to shock the bearings.

# Specifications for DC fan sensors

## Pulse sensor (Tach output type)

Pulse sensor outputs two pulse waves per revolution of fan, and it is good to detect fan speed. Pulse sensors can be incorporated in all kinds of BLDC fans.

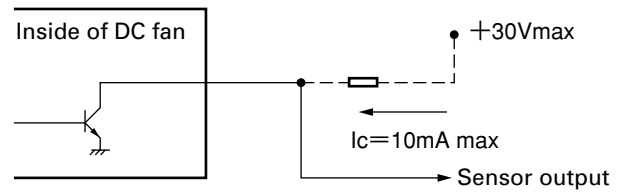
\* Noise from inside the fan or from external devices may effect sensor output, please contact Sanyo Denki.  
(Typical standard model: 109R1212H101).

### Output circuit

Open collector

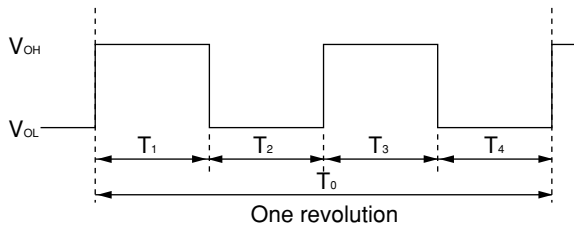
### Specifications

$V_{CE} = +30V$  max  
(For a 48V-rated fan:  $V_{CE} = +60V$  max)  
 $I_c = 10mA$  max [ $V_{OL} = V_{CE} (SAT) = 0.4V$  or less]



### Output waveform (Need pull-up resistor)

In case of steady running



$$T_{1to4} \doteq (1/4) T_0$$

$$T_{1to4} \doteq (1/4) T_0 = 60/4N \text{ (sec)}$$

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

\* If you want detailed specifications that apply when the rotor is locked, please contact Sanyo Denki.

## Locked rotor sensor (rotation/lock detection type)

Locked rotor sensor outputs fan status signals. It is good to check whether the fan is running or locked

\* Noise from inside the fan or from external devices may effect sensor output, please contact Sanyo Denki.

\* Regarding details of the reverse logic and specifications of lock sensor output signals, please contact Sanyo Denki.  
(typical standard model: 109R1212H1D01).

### Output circuit

Open collector

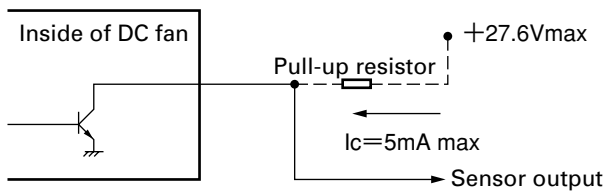
### Specifications

$V_{CE} = +27.6V$  max

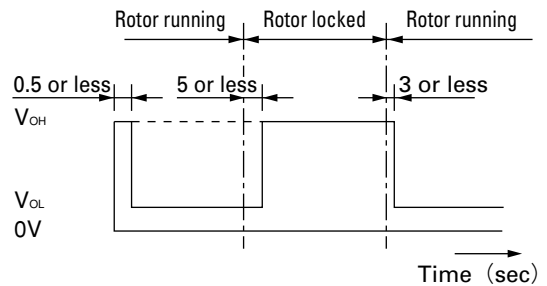
For a 48V fan  $V_{CE} = +60V$  max.

$I_c = 5mA$  max [ $V_{OL} = V_{CE} (SAT) = 0.6V$  or less]

For a 48V fan:  $V_{CE} (SAT) = 0.4V$  or less



### Output waveform



Note: The output is completely at  $V_{OL}$  with 0.5 seconds or less after power-up.

If you are using a thermal speed controlled fan or a two-speed fan, the output waveform is different from above.

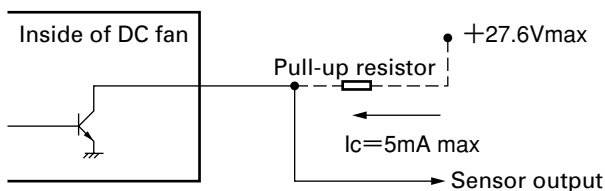
### Output circuit:

Open collector

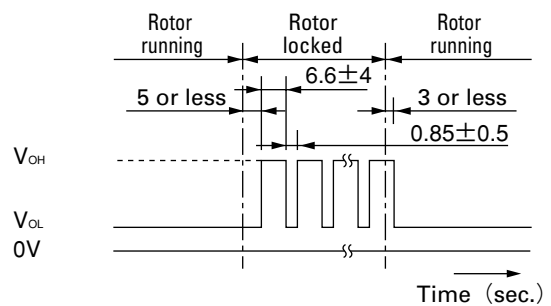
### Specifications:

$V_{CE} = 27.6V$  max

$I_c = 5mA$  max [ $V_{CE} (SAT) = 0.5V$  max.]



### Output waveform



Note: The output is completely at  $V_{OL}$  with 0.5 seconds or less after power-up.

# Specifications for DC fan sensors

## Low-speed sensor (rotating speed detection type)

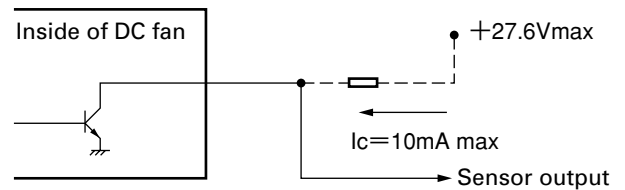
Low-speed sensor outputs a signal when fan speed goes down to trip point or less. It is good to detect cooling degradation of fan.  
 \*Noise from inside the fan or from external devices may effect sensor output, please contact Sanyo Denki.  
 (typical standard model: 109R1212H1H01).

### Output circuit

Open collector

### Specifications

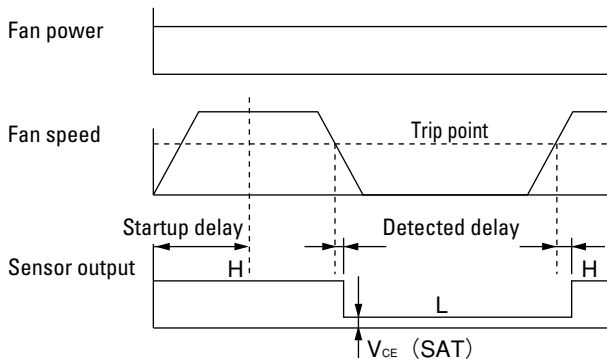
$V_{CE} = 27.6V$  max.  
 $I_c = 10mA$  max. [ $V_{OL} = V_{CE} (SAT) = 0.5V$  or less]



### Sensor scheme

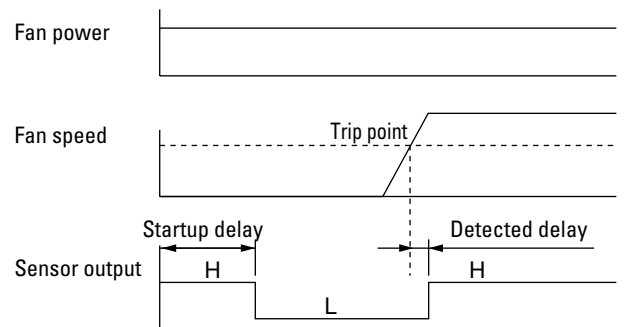
Example 1:

In case steady running



Example 2:

In case that the rotor is locked when the fan motor is turned on and released after the start-up delay time.



\* If you want detailed specification and reverse signal output, please contact Sanyo Denki.

# Specifications for AC fan sensor

## Specifications of sensor circuit

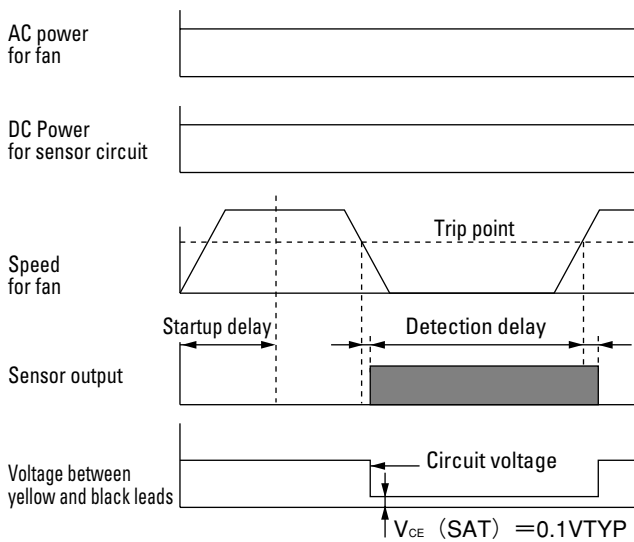
|                       |  |                                    |                                  |
|-----------------------|--|------------------------------------|----------------------------------|
| System                | Speed detection, auto-restart.                               |                                    |                                  |
| Power supply          | 4 to 14 VDC  | ( At 2mA, 5V )<br>( At 5mA, 12V )  | See Note 2.                      |
| Sensor circuit        | I=100mAmax   | P <sub>T</sub> =200mWmax (at 25°C) |                                  |
| Output performance    | V <sub>c</sub> =27.6Vmax                                     |                                    |                                  |
|                       |  | Standard speed                     | Low speed                        |
| Trip point            |  | Within 1,700min <sup>-1</sup> ±10% | Within 850min <sup>-1</sup> ±10% |
| Response speed        | Startup delay  | 18sec                              | 36sec                            |
|                       | Detection delay  | 1sec                               | 2sec                             |
| Insulation resistance | 10 MΩ or more at a 500 VDC megger                            |                                    |                                  |
| Dielectric strength   | 50/60 Hz, 1,000 VAC, 1 minute; see Note 1                    |                                    |                                  |
| Ambient conditions    | Temperature: -10 to +60°C, humidity: 90%RH or less (at 40°C) |                                    |                                  |

Note 1: Between one end that all sensor leads consisting of brown, yellow and black are tied together and the G terminal or power terminal of the fan.

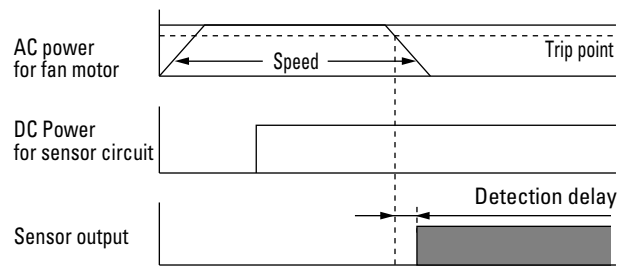
Note 2: Keep the power fluctuations within ±20% of applied power.

## Sensor scheme

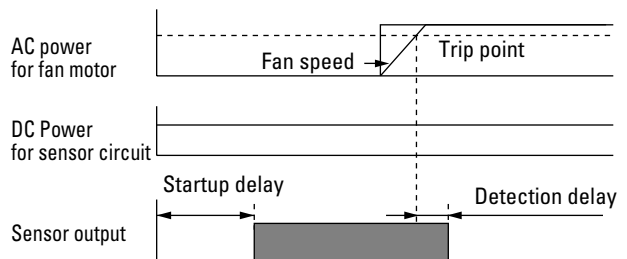
Example 1: When the AC power for the fan and the DC power for the sensor are turned on at the same time



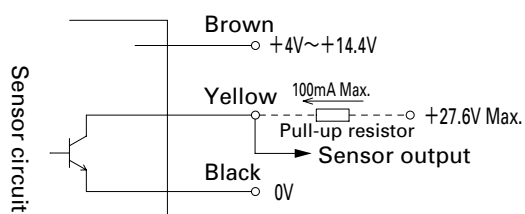
Example 2: When the AC power for the fan is turned on first, then the DC power for sensor is powered on



Example 3: When the DC power for sensor is first powered on, then the AC power for the fan is turned on



## Sensor Output Circuit



# Common Specifications

## Overheating protection function

### Protection Functions:

If the fan blades are restricted, an overcurrent occurs and leads to a rise in the fan coil temperature. This can result in reduced performance, damage, or a fire. To prevent this from occurring, Sony Denki's fans incorporate an overheating protection function. Refer to the catalog for the types of protection functions.

### 1) AC fan overheating protection functions

#### ● Impedance protection

This system is used for shading coil-type fans. When the blades are restricted, the current is reduced by the impedance of the coil itself to prevent a temperature rise in the coil. However, if the applied voltage exceeds the specification range, an overcurrent can occur and result in overheating, and so care needs to be taken.

#### ● Thermal protection

This system is used for condenser phase-type fans. A temperature sensor is incorporated in the coil so that if the temperature exceeds the specification temperature, the current is cut off to prevent overheating of the coil.

### 2) DC and blower overheating protection function

#### ● Current cutoff system

If the fan blades are restricted, the coil current is cut off at regular cycles to prevent overheating of the coil. When the hindrance is removed, the fan restarts automatically. (For the San Ace 200 E Type, however, the power needs to be turned off and on again to restart.).

## Eco Products



Sanyo Denki's ECO PRODUCTS are designed with the concept of lessening impact on the environment in the process from product development to waste. The product units and packaging materials are designed for reduced environmental impact. We have established our own assessment criteria on the environmental impacts applicable to all processes, ranging from design to manufacture. Those products that satisfy the criteria are accredited as ECO PRODUCTS.

# Safety standards

## ■ Description of safety standards

### 1. UL ratings (USA)



Underwriters Laboratories Inc. was established by the American Union of Fire Insurance Underwriters. The purpose of UL is to ensure safety of machines, equipment, and materials and protect human lives and property from fire and other accidents. To that end, UL has conducted numerous tests and extensive research and, as a result, set up UL ratings. Any seller of products in any of the majority of the states of the USA must produce their products according to the UL ratings, have them pass UL-specified safety inspections, and have them listed in UL's registration book. Therefore, to export and sell any product in the United States, one must in most cases apply for UL-listing.

Additionally, UL is accredited by The Standards Council of Canada (SCC) as both a Certification Organization (CO) and a Testing Organization (TO) and is officially recognized in all provinces and territories throughout Canada. Accordingly, our products can be tested by UL for compliance with Canadian safety standards. Certified products are entitled to display the C-UL Mark, which authorizes their use and sale in Canada. If products are deemed to be compliant with both U.S. and Canadian standards, then both the UL Mark and C-UL Mark can be displayed or a combination U.S. and Canadian mark (bottom left).

Our products are certified as satisfying all UL507 requirements.

### 2. CSA standards (Canada)



The Canadian Standards Association (CSA) was set up in response to the advice of the Canadian government. In Canada, the law prohibits the use and sale of any product other than those approved under CSA in terms of safety. CSA has set up CSA standards as inspection procedures and other requirements to ensure product safety.

Our products are certified as satisfying the CSA standard C22.2 No. 113.

### 3. EN standards (EU members)



In the EU territory, the harmonization of industrial standards and safety standards of different countries is under way. The unified standards are called Harmonized Standards. Each of these standards is marked EN above the standard number. EN standards offer the grounds in design and manufacture when one exports a product to the EU territory. In order for a product to receive a safety marking, the product must be found to conform to TÜV, VDE, or other relevant standard.

Our products are certified as satisfying all TÜV Rheinland EN60950 requirements.

4. Electrical Appliance and Material Safety Law

As of April 1, 2001, the Electrical Appliance and Material Control Law has been revised and reenacted as the Electrical Appliance and Material Safety Law.

AC fans are classified as 'Blowers' under 'Electric motor-operated appliances'. They are categorized as electrical products other than specific electrical appliances (with the exception of some models) and are required to be labeled to indicate PSE certification.

■ CE marking

To distribute their equipment in the EU territory, manufacturers are obligated to give a CE marking as proof that the equipment conforms to related EU directives. Manufacturers use EN standards as criteria of judgment as to whether the equipment satisfies the requirements of specific directives or, in the absence of applicable EN standards, they use IEC standards. Manufacturers then prepare a self-declaration to indicate that the equipment conforms to related directives and apply a CE marking. (Depending on the degree of risk of the equipment, some kinds of equipment are required to receive type tests conducted by certified authorities and, after a type test certificate is obtained, manufacturers make a self-declaration.)

Scope of application and compulsory timing of major EC directives

**Machine directives** (89/392/EEC, 91/368/EEC, and 93/44/EEC)

These directives apply to equipment that has a moving part that may injure humans. The directives generally apply to a wide range of machine tools and other industrial machines (became compulsory on January 1, 1995).

**EMC directives** (89/326/EEC and 92/31/EEC)

They apply to equipment which may be affected by electromagnetic interference (EMI) or has electromagnetic susceptibility (EMS) (became compulsory on January 1, 1996).

**Low-voltage directive** (73/23/EEC)

This directive applies to equipment that is used in an AC range between 50 and 1,000V and in a DC range between 75 and 1,500V (became compulsory on January 1, 1997).



CE marking

**JIS: Japanese Industrial Standards**

Japan's national standards related to mining and manufacturing industries

**IEC : International Electrotechnical Commission**

This is an international commission on electrical standardization. This commission promotes the unification and cooperation of international standards related to electric and electronics engineering and issues IEC standards in order eventually to allow different countries to conform to the international standards.

**DIN : Deutsches Institut für Normung e.V.**

This is a German standards institute. The institute uses a wide-range set of standards covering many industrial sectors. The set of standards includes basic standards.

**VDE : Verband Deutscher Elektrotechniker e.V.**

It is a German association of electric engineers. VDE establishes safety standards related to electrical engineering and issues them as DIN-VDE standards.

# Safety standard list

## ■ AC Fan

✓...UL·CSA·and TÜV acquired

| Flame size | Thickness | Model.No  | Rated voltage | UL | CSA | TÜV | CE |
|------------|-----------|-----------|---------------|----|-----|-----|----|
| 60×60mm    | 28mm      | 109-180   | 100           | ✓  |     | ✓   | ✓  |
|            |           | 109-183   | 115           | ✓  |     | ✓   | ✓  |
|            | 38mm      | 109-130   | 100           | ✓  |     | ✓   | ✓  |
|            |           | 109-133   | 115           | ✓  |     | ✓   | ✓  |
| 80×80mm    | 20mm      | 109-210   | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109-213   | 115           | ✓  | ✓   | ✓   | ✓  |
|            | 25mm      | 109S050   | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S053   | 115           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S051   | 200           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S054   | 230           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S030   | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S033   | 115           | ✓  | ✓   | ✓   | ✓  |
|            | 38mm      | 109S031   | 200           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S034   | 230           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109-150   | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109-153   | 115           | ✓  | ✓   | ✓   | ✓  |
|            | 42mm      | 109-151   | 200           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109-154   | 230           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109-040UL | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109-043UL | 115           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109-041UL | 200           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109-044UL | 230           | ✓  | ✓   | ✓   | ✓  |
| 92×92mm    | 25mm      | 109-047UL | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109-033UL | 115           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S091   | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S093   | 115           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S092   | 200           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S094   | 230           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S095   | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S096   | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S193   | 115           | ✓  | ✓   | ✓   | ✓  |
| 120×120mm  | 25mm      | 109S192   | 200           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S194   | 230           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S085   | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S084   | 115           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S088   | 200           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S087   | 230           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S081   | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S083   | 115           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S082   | 200           | ✓  | ✓   | ✓   | ✓  |
|            | 38mm      | 109S089   | 230           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S086   | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S075UL | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S074UL | 115           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S078UL | 200           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S072UL | 230           | ✓  | ✓   | ✓   | ✓  |
| 120×120mm  | 38mm      | 109S029UL | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S013   | 100           |    |     |     |    |
|            |           | 109S013UL | 100           | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S006   | 100           |    |     |     |    |
|            |           | 109S006UL | 100/115       | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S010   | 200           |    |     |     |    |
|            |           | 109S010UL | 200/240       | ✓  | ✓   | ✓   | ✓  |
|            |           | 109S005   | 100           |    |     |     |    |

| Flame size                   | Thickness | Model.No  | Rated voltage | UL | CSA | TÜV | CE |
|------------------------------|-----------|-----------|---------------|----|-----|-----|----|
| 120×120mm                    | 38mm      | 109S005UL | 100           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109S024   | 120           |    |     |     |    |
|                              |           | 109S024UL | 115           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109S008   | 200           |    |     |     |    |
|                              |           | 109S008UL | 200           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109S025   | 230           |    |     |     |    |
|                              |           | 109S025UL | 230           | ✓  | ✓   | ✓   | ✓  |
| 160×160mm                    | 51mm      | 109-601   | 100           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109-604   | 115           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109-602   | 200           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109-603   | 230           | ✓  | ✓   | ✓   | ✓  |
| φ172mm×150mm<br>Sidecut type | 51mm      | 109S301   | 100           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109S304   | 115           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109S302   | 200           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109S303   | 230           | ✓  | ✓   | ✓   | ✓  |
| φ172mm<br>Round type         | 51mm      | 109-311   | 100           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109-314   | 115           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109-312   | 200           | ✓  | ✓   | ✓   | ✓  |
|                              |           | 109-313   | 230           | ✓  | ✓   | ✓   | ✓  |

## ■ AC Fan with Sensor

✓...UL·CSA·and TÜV acquired

| Flame size | Thickness | Model.No  | Rated voltage | UL      | CSA | TÜV | CE |
|------------|-----------|-----------|---------------|---------|-----|-----|----|
| 92×92mm    | 25mm      | 109S491   | 100           | ✓       |     | ✓   | ✓  |
|            |           | 109S493   | 115           | ✓       |     | ✓   | ✓  |
|            |           | 109S492   | 200           | ✓       |     | ✓   | ✓  |
|            |           | 109S494   | 230           | ✓       |     | ✓   | ✓  |
|            |           | 109S495   | 100           | ✓       |     | ✓   | ✓  |
|            |           | 109S496   | 100           | ✓       |     | ✓   | ✓  |
|            |           | 120×120mm | 25mm          | 109S485 | 100 | ✓   |    |
| 109S484    | 115       |           |               | ✓       |     | ✓   | ✓  |
| 109S488    | 200       |           |               | ✓       |     | ✓   | ✓  |
| 109S487    | 230       |           |               | ✓       |     | ✓   | ✓  |
| 38mm       | 109S486   |           | 100           | ✓       |     | ✓   | ✓  |
|            | 109S475UL |           | 100           | ✓       | ✓   | ✓   | ✓  |
|            | 109S474UL |           | 115           | ✓       | ✓   | ✓   | ✓  |
|            | 109S478UL |           | 200           | ✓       | ✓   | ✓   | ✓  |
|            | 109S472UL |           | 230           | ✓       | ✓   | ✓   | ✓  |
|            | 109S405UL |           | 100           | ✓       |     | ✓   | ✓  |
|            | 109S424UL |           | 115           | ✓       |     | ✓   | ✓  |
|            | 109S408UL |           | 200           | ✓       |     | ✓   | ✓  |
| 160×160mm  | 51mm      | 109S425UL | 230           | ✓       |     | ✓   | ✓  |
|            |           | 109S429UL | 100           | ✓       |     | ✓   | ✓  |
|            |           | 109S406UL | 100           | ✓       |     | ✓   | ✓  |
|            |           | 109-641   | 100           | ✓       |     | ✓   | ✓  |
| φ172mm     | 51mm      | 109-644   | 115           | ✓       |     | ✓   | ✓  |
|            |           | 109-642   | 200           | ✓       |     | ✓   | ✓  |
|            |           | 109-643   | 230           | ✓       |     | ✓   | ✓  |
| φ172mm     | 51mm      | 109-371   | 100           | ✓       |     | ✓   | ✓  |
|            |           | 109-374   | 115           | ✓       |     | ✓   | ✓  |
|            |           | 109-372   | 200           | ✓       |     | ✓   | ✓  |
|            |           | 109-373   | 230           | ✓       |     | ✓   | ✓  |

# Safety standard list

## DC Fan

All of the San Ace DC cooling fans acquires UL, CSA and TÜV standards except for the following products.

\*...UL·CSA·and TÜV Pending

| Flame size | Thickness | Model.No          | Rated voltage | UL | CSA | TÜV |
|------------|-----------|-------------------|---------------|----|-----|-----|
| 40×40mm    | 28mm      | 9L0412J302        | 12            | *  | *   | *   |
|            |           | 9L0412H302        | 12            | *  | *   | *   |
|            |           | 9L0412M302        | 12            | *  | *   | *   |
| 40×40mm    | 20mm      | 9WF0424H602       | 24            | *  | *   | *   |
| 60×60mm    | 25mm      | 9WF0624H402       | 24            | *  | *   | *   |
| 120×120mm  | 38mm      | 9WF1224H102       | 24            | *  | *   | *   |
| 60×60mm    | 25mm      | 9WP0612H402       | 12            | *  | *   | *   |
|            |           | 9WP0612H4021      | 12            | *  | *   | *   |
|            |           | 9WP0624H402       | 24            | *  | *   | *   |
|            |           | 9WP0624H4021      | 24            | *  | *   | *   |
| 120×120mm  | 38mm      | 9WP1212H102       | 12            | *  | *   | *   |
|            |           | 9WP1212H1021      | 12            | *  | *   | *   |
|            |           | 9WP1224H102       | 24            | *  | *   | *   |
|            |           | 9WP1224H1021      | 24            | *  | *   | *   |
|            |           | 9WP1248H102       | 48            | *  | *   | *   |
|            |           | 9WP1248H1021      | 48            | *  | *   | *   |
| 150×150mm  | 50mm      | 9GV1512H502(5021) | 12            | *  | *   | *   |
|            |           | 9GV1512M502(5021) | 12            | *  | *   | *   |
| φ220mm     | 71mm      | 9TR48HA0          | 48            | *  | *   | *   |

※The contents of this catalog is as of March 2006.

Please ask us about new products that we released after March 2006 if you want.

| Standard name | Certification number |
|---------------|----------------------|
| UL            | E46810               |
| CSA           | 172248               |

※TÜV certification numbers differ by model.

## CPU Cooler

✓...UL·CSA·and TÜV acquired

| Socket               | Rated current | Model.No        | UL | CSA | TÜV |
|----------------------|---------------|-----------------|----|-----|-----|
| Socket370 (FC-PGA)   | 12            | 109X6512A2016   |    |     |     |
| Socket370 (FC-PGA2)  | 12            | 109X7612H1176   | ✓  |     |     |
| Socket370 (FC-PGA2)  | 12            | 109X7412S4016   | ✓  |     |     |
| Socket423            | 12            | 109X9612S5016   | ✓  |     |     |
| Socket423            | 12            | 9H9912G5016     |    |     |     |
| Socket478            | 12            | 109X9812H0016   | ✓  |     |     |
| Socket478            | 12            | 109X9812T0H016  | ✓  |     |     |
| Socket478            | 12            | 109X9912S0016   | ✓  |     |     |
| Socket478            | 12            | 109X9912T0S016  | ✓  |     |     |
| Socket478            | 12            | 109X9912T0D516  | ✓  |     |     |
| Socket478            | 12            | 109X9412S1016   |    |     |     |
| Socket478            | 12            | 109X9412G4016   | ✓  |     |     |
| Socket478            | 12            | 9H9912G5516     |    |     |     |
| 775-land LGA Package | 12            | 109X9212PT0H016 | ✓  |     |     |
| 775-land LGA Package | 12            | 109X9112PT0H016 | ✓  |     |     |
| 775-land LGA Package | 12            | 9G0912P2E012    | ✓  |     |     |
| 775-land LGA Package | 12            | 9G0912PT2E012   | ✓  |     |     |

## Liquid Cooling Solution System

✓...UL·CSA·and TÜV acquired

| Socket    | Rated current | Model.No    | UL | CSA | TÜV |
|-----------|---------------|-------------|----|-----|-----|
| Socket478 | 12            | 109-LC1-001 | ✓  |     |     |

## Plug Code

✓...UL·CSA·and TÜV acquired

| Model.No    | UL | CSA | TÜV | CE | Applicable model                                 |
|-------------|----|-----|-----|----|--|
| 489-008-L10 |    |     |     |    | 80×80×42mm                                       |
| 489-008-L21 |    |     |     |    | 80×80×42mm                                       |
| 489-008-L35 |    |     |     |    | 80×80×42mm                                       |
| 489-016-L10 |    |     |     |    | 120×120×25mm 92×92×25mm<br>80×80×25mm 80×80×38mm |
| 489-016-L21 |    |     |     |    | 120×120×25mm 92×92×25mm<br>80×80×25mm 80×80×38mm |
| 489-006-L10 |    |     |     |    | 120×120×38mm                                     |
| 489-006-L21 |    |     |     |    | 120×120×38mm                                     |
| 489-007-L10 | ✓  | ✓   |     |    | 120×120×38mm                                     |
| 489-007-L21 | ✓  | ✓   |     |    | 120×120×38mm                                     |
| 489-047-L10 | ✓  | ✓   |     |    | 120×120×25mm 92×92×25mm<br>80×80×25mm 80×80×38mm |
| 489-047-L21 | ✓  | ✓   |     |    | 120×120×25mm 92×92×25mm<br>80×80×25mm 80×80×38mm |
| 489-084-L10 | ✓  | ✓   |     |    | φ172mm×51mm 160×160×51mm<br>L-Shaped             |
| 489-084-L21 | ✓  | ✓   |     |    | φ172mm×51mm 160×160×51mm<br>L-Shaped             |
| 489-086-L10 | ✓  | ✓   |     |    | φ172mm×51mm 160×160×51mm<br>Straight             |
| 489-086-L21 | ✓  | ✓   |     |    | φ172mm×51mm 160×160×51mm<br>Straight             |

# COOLING SYSTEMS

## San Ace

## Product Guide

### DC Fans

Long life, low noise axial cooling fans optimized for mostly server or communication devices.

### Thermal Speed Controlled Fans

Two types: external and internal thermistor.

### Splash Proof Fans

Axial cooling fans optimized for outdoor devices or devices that are used in high-humidity environment.

### Oil Fans

The axial fan that can use under tough condition like oil mist.

### Long Life Fans

The expected life is 100,000 hours (□120mm : 200,000 hours), optimized for maintenance-free devices required.

### Blowers

High static pressure centrifugal cooling fans optimized for draft-resistant, high heat release devices.

### Centrifugal Fans

The high air flow centrifugal fan that is ideal for telecommunication equipments, large server and network storage system.

### CPU Coolers · Liquid Cooling Solution Systems

CPU cooler with low noise, low vibration and high heat dissipation that consists of fan motor and heatsink can effectively cool PC down.

### AC Fans

Long life, low noise axial cooling fans optimized for devices with high system impedance and high heat generation.

### Option

Option guide optimized for various fans.

DC Fans

Thermal Speed  
Controlled Fans

Splash Proof Fans

Oil Proof Fans

Long Life Fans

Blowers

Centrifugal Fans

CPU Coolers  
Liquid Cooling  
Solution System



AC Fans

Option

## Safety Precautions

- In order to ensure that this product is used safely, be sure that you read and understand the following precautions fully and use the product only as directed.
- Be sure to read these Safety Precautions carefully before installing, connecting, operating, maintaining, or inspecting this product. Follow all the precautions and directions given here.
- This product has been designed and manufactured for use as a device to be used in general industrial machinery, and may not be used as a standalone product.
- The product of our company (hereafter called the product) falls into the category of the products specified in the Attached List 1, Item 16 (Class 85, Item 01) of the Export Trade Control Ordinance. To export the product as an individual part or to export a product into which the product is assembled, the "Information Requirements" and "Objective Requirements" that the Ministry of Economy, Trade and Industry established based on the "Catchall Controls" must be studied for applicability. Based on information on applicability and specified requirements, appropriate export formalities must be performed.

In order to prevent any possible bodily injury or damage to property or equipment, the following precautions for ensuring safety are displayed according to the following two ranks of importance:

|  |  |
|--|--|
|  <b>Danger</b>  | Handling or using the product improperly and in disregard of the instructions with this mark might result in serious bodily injury or death.   |
|  <b>Warning</b> | Handling or using the product improperly and in disregard of the instructions with this mark might result in bodily injury or physical damage. |

※ Note: Items marked 'Warning' might also result in serious bodily injury or death in some circumstances. Always follow the instructions for items marked 'Danger'.

Descriptions of the precautions to be taken to ensure safety are given below.

### **Danger**

- If the product is used in medical appliances or other types of equipment that affect people's lives, sufficient safety-related evaluations and preparations must be made in advance, and the product or the type of equipment into which the product is assembled must be used on the user's own responsibility.
- If the product is used in types of equipment that have a strong social and public impact, sufficient prior evaluations and safety-related evaluations and preparations must be made, and the product or the type of equipment into which the product is assembled must be used on the user's own responsibility.
- If the product is used in an environment where there are vibrations, for example, in a car or aboard a ship, sufficient prior evaluations and safety-related evaluations and preparations must be made, and the product or the piece of equipment into which the product is assembled must be used on the user's own responsibility.
- Connect all wires properly and securely. Failure to do so might result in burns, fire, or exposure to electrical shock.
- If there are any grounding taps or wires, attach all grounds securely. Failure to do so might result in exposure to electrical shock.
- Never use in explosive atmosphere, as doing so might result in fires, burns, or bodily injury.
- Never operate with any live wires exposed, as doing so might result in electrical shock.
- Never allow any persons or objects to approach or come into contact with the rotor while in operation, as doing so might result in damage or personal injury.
- Turn off the power and stop using the product immediately if you notice any sparks, smoke, odd odors, sounds, or anything unusual during operation. Failure to do so might result in fire, burns, or electrical shock.
- Never allow the product to fall, topple over, or otherwise be subjected to excessive shocks when moving it, as doing so might result in product breakdown or substandard operation.
- The product should be handled only by personnel with sufficient training and knowledge and under the responsibility of the end user.
- Never attempt to disassemble, repair, or alter this product in any way, as doing so might result in fire, burns, or electrical shock.

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## Warning

- If the fan stops during operation, give proper consideration to the device for its protection.
- Installation, placement, connections, wiring, or relocation of the product should be performed by knowledgeable or correctly licensed personnel. Never perform such work while the product is live as this might lead to injury, electrical shock, burns, or fire.
- When fixing this product into place, be sure to take into consideration the product's weight, the vibrations generated during operation, and all other relevant factors. Failure to do so might cause the product or parts of it to fall out of position, resulting in bodily injury or malfunction of the product.
- Be sure to check the direction of installation (i.e., the fan), as failing to do so might result in bodily injury or mechanical breakdown.
- In order to ensure that the product operates properly, allow spaces for ventilation and take whatever steps necessary to prevent the entry of foreign objects. Failure to do so might result in bodily injury or mechanical breakdown.
- The product might become damaged if foreign objects or external forces are allowed to interfere with normal fan operation.
- Install a finger guard or other cover if there is any danger of fingers, hands or objects coming into contact with the rotor or blades. Failure to do so might result in bodily injury or mechanical breakdown.
- Pulling or pinching the lead wires could result in damage to the wire, and you should avoid placing excessive stresses on these wires. The device should also be installed so that the lead wires are not allowed to come into contact with the rotor or blades. Failure to do so might result in damage or exposure to electrical shock.
- Never insert or remove any plug cords or connectors while the power is turned on. When inserting or removing plugs or connections, always be sure to first check that the power has been turned off and hold the housing of the plug or connector when doing so. Failure to do so might result in damage or exposure to electrical shock.
- Never attempt to disassemble or alter this product in any way. Doing so might invalidate any warranties concerning the functions or performance of the product, and might also result in fire, burns, bodily injury, or electrical shock.
- Take proper precautions against static electricity when making electrical connections. Failure to do so might cause the breakdown of the fan or device.
- The fan may fail to operate properly if there is insufficient power capacity, because the starting current's amperage is several times larger than the rated amperage and the current will flow at the very instant the voltage is supplied to the fan. Be sure to inquire about startup current levels for individual models.
- Never remove the product identification plate or install the product so that the identification cannot be seen after installation. This could result in the product being improperly used, and subsequently result in fires.
- The product must not be used or stored in a flammable or corrosive gas atmosphere, in a place where water or oil splashes (not applicable to Splash Proof or Oil Proof Fans), in a place where there is much dust or humidity, in a place where condensation occurs, in a place where the product is exposed to radioactive rays or is in direct sunlight, in a place where a salty sea breeze blows or seawater splashes, or in an environment where the product may be contaminated by such corrosive materials as sulfurous water, sulfurous volcanic ash, organic solvents, acidic chemicals, alkali chemicals, etc., such hazardous substances as nuclear fuel materials, etc. If it is used or stored in such places or environments, there is the possibility that a fire may occur, the product may malfunction or its performance may deteriorate.
- Never use the product at voltages, temperatures, or any other settings which exceed those given in the product specifications. This might result in breakdown, fire, bodily injury, or electrical shock.
- Avoid using or storing the product in locations where it could be constantly exposed to vibrations, strong shocks, magnetic or electromagnetic noise. This might result in product breakdown or substandard operation.
- Maintenance and inspections should always be performed by personnel with sufficient training and knowledge. Failure to do so might result in fire, burns, bodily injury, or electrical shock.
- Never perform any maintenance or inspections while the product is in operation. Also note that the blades continue to rotate for some time immediately after operation ceases. You should always be sure to check to see that all rotating parts have come to a stop before beginning work.
- Never allow yourself to come into contact with the ends of wires or plugs when measuring the insulation resistance or maximum voltage. This might result in electrical shock.
- Never use gasoline, paint thinner, benzene, or any other organic solvents to clean the product as this could result in the deformation or substandard operation.
- When disposing the product, always dispose of it as industrial waste. For instructions on proper disposal methods, please contact local government authorities.

## Part Numbering System

### DC Fans

|   |   |  |   |  |   |  |
|---|---|--|---|--|---|--|
| <b>9G</b>   | <b>12</b>   | <b>12</b>  | <b>G</b>  | <b>1</b>   | <b>02</b>   | <b>1</b>   |
| <b>Series name / frame material</b><br>109P / Plastics<br>109R / Plastics<br>9GV / Plastics<br>Aluminum<br>9G / Plastics<br>9A / Plastics<br>9CR / Plastics<br>9CRA / Plastics<br>9SG / Aluminum<br>109E / Aluminum<br>9EC / Aluminum | <b>Frame dimensions</b><br>04 : 40×40mm<br>05 : 52×52mm<br>06 : 60×60mm<br>08 : 80×80mm<br>09 : 92×92mm<br>12 : 120×120mm<br>13 : 127×127mm<br>15 : 150×150mm<br>17 : φ172<br>47 : φ172×147 (side cut)<br>57 : φ172×150 (side cut)<br>20 : φ200 | <b>Voltage</b><br>05 : 5V<br>12 : 12V<br>24 : 24V<br>48 : 48V<br>etc | <b>Speed code</b><br>A,B,C,D,E,F,G,H,<br>J,K,L,M,S,W etc<br>Two speed : MH,<br>LM,HD,HE etc | <b>Frame thickness</b><br>0 : 70mm thick<br>1 : 38mm thick<br>2 : 32mm thick<br>3 : 28mm thick<br>4 : 25mm thick<br>5 : 50mm thick<br>51mm thick<br>56mm thick<br>6 : 20mm thick<br>7 : 15mm thick<br>9 : 10mm thick | <b>Sensor specifications</b><br>01 : With a pulse sensor<br>02 : Without a sensor<br>D01 : With a lock sensor | <b>Frame type</b><br>Nil : Ribbed Plastics frame<br>Nil : Ribless aluminum frame<br>1 : Ribless Plastics frame<br>3 : Plastics frame<br>40×40×28mm for 1U applications |

### Splash Proof Fans

|  |   |   |  |  |   |  |
|--|---|---|--|--|---|--|
| <b>109W</b>  | <b>12</b>   | <b>12</b>   | <b>H</b>   | <b>1</b>   | <b>02</b>   | <b>1</b>   |
| <b>Series name / frame material</b><br>109W / Aluminum<br>9WS / Plastics<br>9WG / Aluminum<br>9WB / Aluminum<br>9WP / Plastics | <b>Frame dimensions</b><br>06 : 60×60mm<br>08 : 80×80mm<br>09 : 92×92mm<br>12 : 120×120mm<br>14 : 140×140mm | <b>Voltage</b><br>12 : 12V<br>24 : 24V<br>48 : 48V<br>etc | <b>Speed code</b><br>A,D,E,F,G,H,J,L,<br>M,S etc | <b>Frame thickness</b><br>1 : 38mm thick<br>4 : 25mm thick<br>5 : 51mm thick | <b>Sensor specifications</b><br>01 : With a pulse sensor<br>02 : Without a sensor<br>D01 : With a lock sensor | <b>Frame form</b><br>Nil : Ribbed Plastics frame<br>Nil : Ribless aluminum frame<br>1 : Ribless Plastics frame |

### Oil Proof Fans

|   |   |                            |                        |  |   |  |
|---|---|----------------------------|------------------------|--|---|--|
| <b>9WF</b>  | <b>12</b>   | <b>24</b>                  | <b>H</b>               | <b>1</b>   | <b>02</b>   |  |
| <b>Series name / frame material</b><br>9WF / Plastics | <b>Frame dimensions</b><br>04 : 40×40mm<br>06 : 60×60mm<br>12 : 120×120mm | <b>Voltage</b><br>24 : 24V | <b>Speed code</b><br>H | <b>Frame thickness</b><br>1 : 38mm thick<br>4 : 25mm thick<br>6 : 20mm thick | <b>Sensor specifications</b><br>01 : With a pulse sensor<br>02 : Without a sensor<br>D01 : With a lock sensor | <b>Frame form</b><br>Nil : Ribbed Plastics frame |

### Long Life Fans

|   |   |   |   |  |   |                                    |
|---|---|---|---|--|---|------------------------------------|
| <b>109L</b>   | <b>12</b>   | <b>12</b>   | <b>H</b>                                    | <b>1</b>   | <b>02</b>   |                                    |
| <b>Series name / frame material</b><br>109L / Aluminum<br>9LB / Aluminum<br>9GL / Aluminum<br>9L / Aluminum | <b>Frame dimensions</b><br>04 : 40×40mm<br>06 : 60×60mm<br>08 : 80×80mm<br>09 : 92×92mm<br>12 : 120×120mm<br>14 : 140×140mm<br>17 : φ172<br>57 : φ172×150(side cut) | <b>Voltage</b><br>12 : 12V<br>24 : 24V<br>48 : 48V<br>etc | <b>Speed code</b><br>E,F,G,H,J,L,M,S<br>etc | <b>Frame thickness</b><br>1 : 38mm thick<br>3 : 28mm thick<br>4 : 25mm thick<br>5 : 51mm thick | <b>Sensor specifications</b><br>01 : With a pulse sensor<br>02 : Without a sensor<br>D01 : With a lock sensor | <b>Frame form</b><br>Nil : Ribless |

## Thermally Speed Controlled Fans

|   |   |                                   |  |  |                            |  |   |
|---|---|-----------------------------------|--|--|----------------------------|--|---|
| <b>109R</b>   | <b>12</b>   | <b>12</b>                         | <b>T</b>                                       | <b>1</b>   | <b>H</b>                   | <b>11</b>  | <b>2</b>  |
| <b>Series name / frame material</b><br>109P / Plastics<br>109R / Plastics | <b>Frame dimensions</b><br>05 : 52×52mm<br>06 : 60×60mm<br>08 : 80×80mm<br>09 : 92×92mm<br>12 : 120×120mm | <b>Voltage</b><br>12 : 12V<br>etc | <b>Speed code</b><br>T : Thermal speed control | <b>Frame thickness</b><br>1 : 38mm thick<br>4 : 25mm thick<br>6 : 20mm thick<br>7 : 15mm thick | <b>Speed type</b><br>H etc | <b>Sensor specifications</b><br>10 : With a lock sensor<br>11 : With a pulse sensor<br>12 : Without a sensor | <b>External view code</b><br>Nil : Ribbed frame product with an external thermistor<br>1 : Ribless frame product with an external thermistor<br>2 : Ribbed frame product with a built-in thermistor<br>3 : Ribless frame product with a built-in thermistor |

## Blowers

|   |   |   |                                    |   |  |
|---|---|---|------------------------------------|---|--|
| <b>109B</b>   | <b>F</b>  | <b>12</b>                                     | <b>H</b>                           | <b>A</b>  | <b>2</b>   |
| <b>Series name / frame material</b><br>109B / Plastics<br>9B / Plastics | <b>Frame dimensions</b><br>C : 52×52mm<br>D : 76×76mm<br>E : 94×94mm<br>M : 97×97mm<br>AM : 97×97mm<br>F : 120×120mm<br>J : 127×127mm<br>N : 150×150mm<br>G : 160×160mm | <b>Voltage</b><br>12 : 12V<br>24 : 24V<br>etc | <b>Speed code</b><br>F,G,H,M,S etc | <b>Sensor specifications</b><br>A : Without a sensor<br>C : With a pulse sensor<br>D : With a lock sensor | <b>Frame thickness</b><br>1 : 40mm thick<br>2 : 30mm thick, 32mm thick, 33mm thick<br>4 : 25mm thick<br>6 : 20mm thick<br>7 : 15mm thick |

## Centrifugal Fans

|  |                            |                        |   |  |
|--|----------------------------|------------------------|---|--|
| <b>9TR</b>   | <b>48</b>                  | <b>H</b>               | <b>A</b>  | <b>O</b>                                 |
| <b>Series name / Attachment base</b><br>9TR / Aluminum | <b>Voltage</b><br>48 : 48V | <b>Speed code</b><br>H | <b>Sensor specifications</b><br>A : Without a sensor<br>C : With a pulse sensor | <b>Frame thickness</b><br>0 : 71mm thick |

## CPU Coolers

|   |   |                                   |                                    |  |   |  |
|---|---|-----------------------------------|------------------------------------|--|---|--|
| <b>109X</b>   | <b>99</b>   | <b>12</b>                         | <b>S</b>                           | <b>0</b>                               | <b>01</b>   | <b>6</b>   |
| <b>Series name / frame material</b><br>109X / Plastics<br>9H / Plastics | <b>Product dimensions</b><br>For model numbers starting with 109X<br>65 : 64×50.8mm<br>76 : 68×67.3mm<br>74 : 79×67.3mm<br>94 : 83.3×68.5mm<br>87.2×68.5mm<br>96 : 88.9×67.3mm<br>98 : 91.6×71.3mm<br>99 : 95×67.5mm<br>For model numbers starting with 9H<br>99 : 83.3×70mm<br>88.9×70mm | <b>Voltage</b><br>12 : 12V<br>etc | <b>Speed code</b><br>A,D,G,H,S etc | <b>Thickness code</b><br>0,1,2,4,5 etc | <b>Sensor specifications</b><br>01 : With a pulse sensor<br>02 : Without a sensor | <b>Heat sink specification</b><br>6 : With a heat sink |

## CPU Coolers with Speed Control

|   |   |                                   |  |                                |                                    |   |   |
|---|---|-----------------------------------|--|--------------------------------|------------------------------------|---|---|
| <b>109X</b>   | <b>99</b>   | <b>12</b>                         | <b>T</b>   | <b>0</b>                       | <b>S</b>                           | <b>01</b>   | <b>6</b>  |
| <b>Series name / frame material</b><br>109X / Plastics<br>9G / Plastics | <b>Product dimensions</b><br>For model numbers starting with 109X<br>92 : φ90mm<br>98 : 91.6×71.3mm<br>99 : 95×67.5mm<br>For model numbers starting with 9G<br>09 : 92×92mm | <b>Voltage</b><br>12 : 12V<br>etc | <b>Speed code</b><br>T : Thermal speed control<br>PT : PWM control with thermal speed control<br>P : PWM control | <b>Thickness code</b><br>0 etc | <b>Speed code</b><br>A,D,G,H,S etc | <b>Sensor specifications</b><br>01 : With pulse sensor<br>02 : Without sensor | <b>External view code</b><br>2 : Duct+Heatsink<br>[For BTX Thermalmodule]<br>6 : With a heat sink |

## Liquid Cooling Solution Systems

|  |   |            |   |            |
|--|---|------------|---|------------|
| <b>109</b>   | - | <b>LC1</b> | - | <b>001</b> |
| <b>Represents a liquid cooling solution system.</b><br>LC1 |   |            |   |            |

\*For inquiries concerning frame sizes, voltage, speed types, sensors (including lock sensors and low-speed sensors), speed control systems (including the two-speed system, the thermal speed control system, the PWM control function and the microprocessor control system) that are not covered in the catalog or on connectors, please contact us.

## Cooling Fan Units



Example of application  
Cooling Fan Unit



Example of application  
Cooling Fan Unit for 1U Server

- We build cooling systems that are most suitable for the client's application. The unit includes a range of cooling fans that are optimally adjusted according to the environment and a custom-made fan unit.
- In addition, we design and develop fan tray that are optimally suited to the client's requirements.

## Lineup

Our rich lineup of cooling fans includes tray that are designed for telecommunication equipment, such as servers, routers and storage devices, as well as some other equipments.



**DC Cooling Fan DC San Ace**  
40mm~200mm square.  
10mm~70mm thickness.



**DC Cooling Fan DC San Ace**  
172mm square (140mm wide)  
25mm thickness.



**Splash-proof Fan San Ace W/ WS**  
80mm~140mm square.  
25mm~51mm thickness.



**Blower San Ace B**  
52mm~160mm square.  
25mm~40mm thickness.



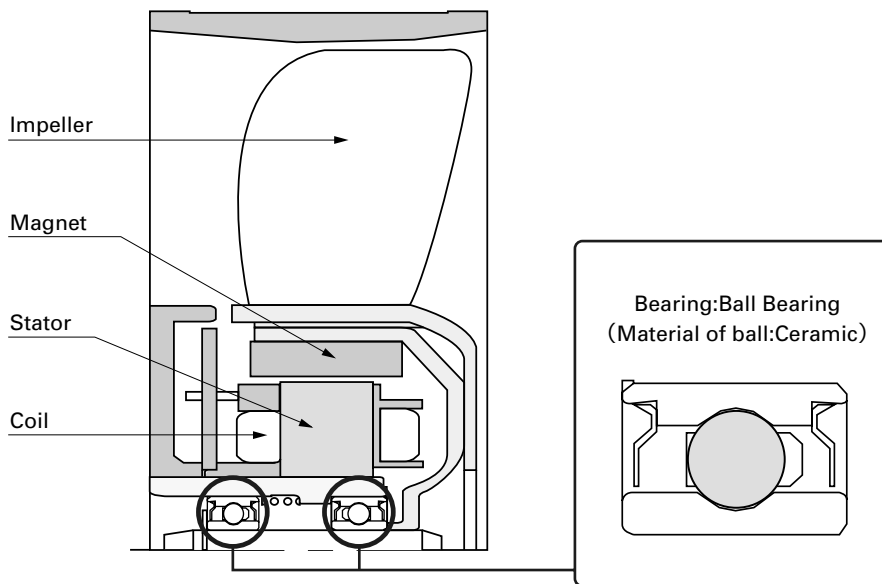
**Long Life Fan San Ace L**  
60mm~172mm square.  
25mm~51mm thickness.

- In addition to the product lineup above, we can offer a programmable control fans and thermal speed control fans.

## Electrolytic Corrosion Proof Fans

- This cooling fan prevents electrolytic corrosion of bearings even under conditions where electromagnetic noise is generated.
- Electrolytic corrosion of ball bearings is prevented by using ceramic balls in ball bearings.  
The ceramic material is an insulating material.

### ■ Structure



### Caution

Electrolytic Corrosion Proof Fan has been designed to prevent the electrolytic corrosion of ball bearings in the fan, but this does not guarantee that the fan will operate normally under conditions where there is strong electromagnetic noise.

Please be sure to fully evaluate the value of fan malfunction due to noise in advance.

## Lineup

- Electrolytic corrosion proof specification can be applied to our entire San Ace.



### DC Cooling Fan

40mm to 140mm sq. /  $\phi$  172mm to  $\phi$  200mm  
10mm to 70mm thickness.



### AC Cooling Fan

60mm to 160mm sq. /  $\phi$  172mm  
20mm to 42mm thickness.



### Long Life Fan

40mm to 140mm sq. /  $\phi$  172mm  
25mm to 51mm thickness.



### Splash-proof Fan

60mm to 140mm sq.  
25mm to 51mm thickness.

## Fans with the PWM control function



This picture shows 120×120×38mm fan.

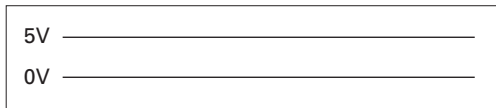
## Pulse Width Modulation Speed Control

### Features

PWM speed control is the feature that fan speed is externally controlled by a constant input frequency with a varying duty cycle. It is good for efficient cooling, power saving and noise reduction for system because fan speed is appropriately adjusted when needed.

### ■ PWM Speed Control Scheme

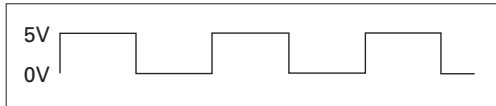
Duty cycle = 100%



Fan speed

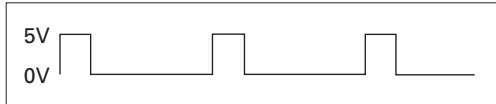
Full speed (6000min<sup>-1</sup>)

Duty cycle = 50%



66% speed (4000min<sup>-1</sup>) of Full speed

Duty cycle = 20%



25% speed (1500min<sup>-1</sup>) of Full speed

## Fans with the PWM control function

### Available size and example of characteristics

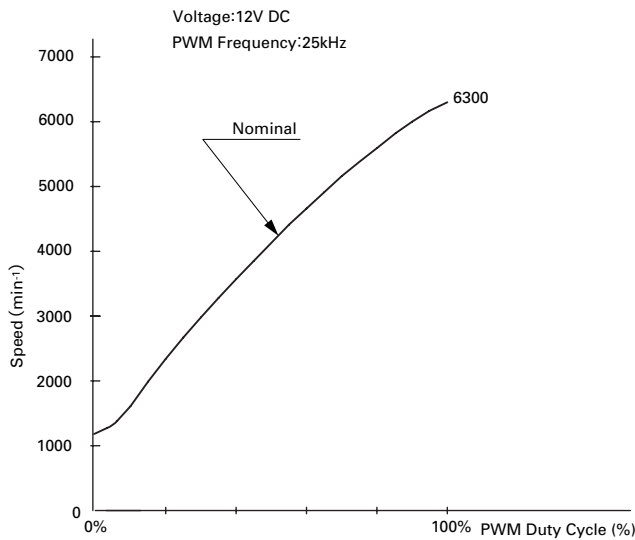
| Size (mm)  | Model No.     | Voltage (V) | Rated Speed (min <sup>-1</sup> ) | Frequency (KHz) | Duty Cycle (%) | Current (A) | Airflow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB[A]) |      |    |
|------------|---------------|-------------|----------------------------------|-----------------|----------------|-------------|-------------------------------------|---|---------------|------|----|
| 40×40×28   | 9GV0412P3J**  | 12          | 14,700                           | 25              | 100            | 0.60        | 0.68                                | 24  | 331           | 1.33 | 55 |
|            |               |             | 0~4,410②                         |                 | 0              | —           | —                                   | —   | —             | —    | —  |
| 60×60×38   | 9G0612P1G**   | 12          | 11,800                           | 25              | 100            | 1.54        | 1.84                                | 65  | 436           | 1.75 | 58 |
|            |               |             | 0~3,540②                         |                 | 0              | —           | —                                   | —   | —             | —    | —  |
| 80×80×38   | 9G0812P1G**   | 12          | 6,300                            | 25              | 100            | 1.10        | 2.55                                | 90  | 212           | 0.85 | 51 |
|            |               |             | 0~1,890②                         |                 | 0              | —           | —                                   | —   | —             | —    | —  |
| 92×92×32   | 9G0912P2G**   | 12          | 5,000                            | 25              | 100            | 0.88        | 2.83                                | 100   | 147           | 0.59 | 50 |
|            |               |             | 0~1,500②                         |                 | 0              | —           | —                                   | —   | —             | —    | —  |
| 120×120×38 | 9SG1212P1G**  | 12          | 6,000                            | 16              | 100            | 4.00        | 7.35                                | 260   | 340           | 1.37 | 64 |
|            |               |             | 0~1,800②                         |                 | 0              | —           | —                                   | —   | —             | —    | —  |
| 172×150×51 | 109E5712P5K** | 12          | 4,100                            | 25              | 100            | 2.90        | 8.49                                | 300   | 244           | 0.98 | 60 |
|            |               |             | 0~1,230②                         |                 | 0              | —           | —                                   | —   | —             | —    | —  |

The numerals on \*marking depend on each fan spec. Please ask us if you need those details.  
 Please ask us about speed at 0% duty cycle .  
 It should be 0 to 30% speed of rated speed as a rough target.  
 Tach outout is embedded for all the standard part numbers.

## Fan example with the PWM control function : 9G0812P1G04

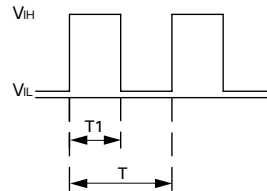
### PWM Duty - Speed Characteristics Example

[Example]



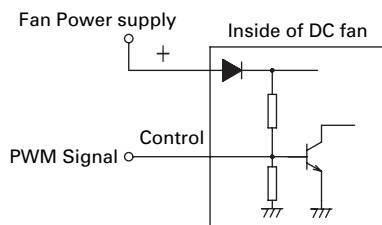
### PWM Input Signal Example

Input Signal Wave Form : TTL Totem-pole

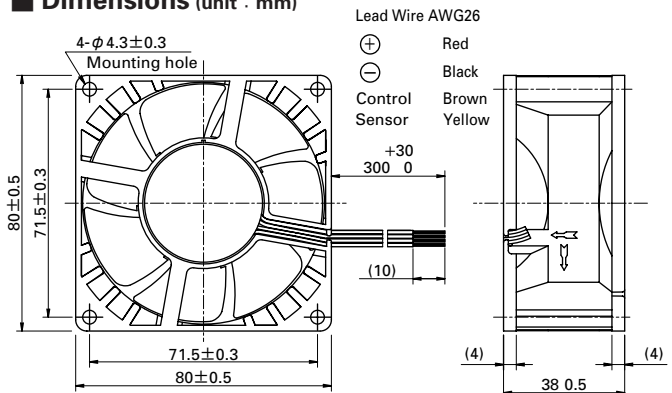


$V_{IH} = 4.75 \text{ V} \sim 5.25 \text{ V}$   
 $V_{IL} = 0 \text{ V} \sim 0.4 \text{ V}$   
 $\text{PWM Duty Cycle}(\%) = \frac{T_1}{T} \times 100$   
 $\text{PWM Frequency } 25 \text{ (kHz)} = \frac{1}{T}$   
 Source Current : 1mA Max. at control voltage 0Vt  
 Sink Current : 1mA Max. at control voltage 5.25Vt  
 Control Terminal Voltage : 5.25V Max. ( Open Circuit )t

### Application



### Dimensions (unit : mm)



## Endurance Fan Series

SANYO DENKI's Cooling Fans enjoy wide acceptance by many customers thanks to their high performance and reliability, proven over many years. Within the company's line of Cooling Fan products, the " Endurance Fan Series " has been developed as a product suitable for a wide range of harsh environments.

The cooling fan motors in SANYO DENKI's " Endurance Fan Series " product line have been developed to perform in various demanding environments, and these motors are durable enough to withstand oil splashes, be installed in outdoor environments exposed to water, and operate non-stop for up to 200,000 hours.

The " Endurance Fan Series" products are capable of cooling the components of a variety of equipment, such as general industrial machinery, equipment installed in outdoor locations, and equipment that is operated for long durations with little or no maintenance.





## Oil Proof Fans

DC Fan  
San Ace WF Series

|                            |
|----------------------------|
| 40mm sq. × 20mm thickness  |
| 60mm sq. × 25mm thickness  |
| 120mm sq. × 38mm thickness |

Oil resistant materials protect coils and electronic parts.

Therefore, even in a severe environment with oil mist, the product maintains stable operation.

Life expectancy : 40,000 hours.

Applications : All kinds of industrial machines

Usage of this product requires an evaluation with the oil that will be used.

### "IP XX" Protection Grade

- IP code is laid down in "Degrees of protection provided by enclosures (IP Code)" on JIS C 0920 and IEC 60529.
- IP code is defined as "A coding system to indicate the degree of protection provided by an enclosure against access to hazardous parts, ingress of solid foreign objects, ingress of water and to give additional information in connection with such a protection"
- Regarding IP code, the first numeral indicates the degree of protection against access to hazardous parts and ingress of solid foreign objects. The second numeral indicates the degree of protection against the ingress of water.

IP X X

**4: Protected against splashing water**

(Water splashed against the enclosure from any direction shall have no harmful effects)

**5: Protected against water jets**

(Water projected in jets against the enclosure from any direction shall have no harmful effects)

**5: Dust-Protected**

(Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety.)

## Lineup of Endurance Fan Series

### Splash Proof Fans



DC Fan  
San Ace W Series

|                          |
|--------------------------|
| 60mm sq.×25mm thickness  |
| 80mm sq.×25mm thickness  |
| 92mm sq.×25mm thickness  |
| 120mm sq.×38mm thickness |
| 140mm sq.×38mm thickness |
| 140mm sq.×51mm thickness |

#### For IP55\*

This cooling fan operates with dependability even in the most severe environments, and is capable of resisting direct jets of water from multiple directions.

Life expectancy : 40,000 to 100,000 hours.

Applications : Outdoor equipment, and all kinds of general manufacturing equipment.

### Splash Proof Fans



DC Fan  
San Ace WS Series

|                          |
|--------------------------|
| 80mm sq.×25mm thickness  |
| 92mm sq.×25mm thickness  |
| 120mm sq.×38mm thickness |

#### For IP54\*

It also offers reliable performance in environments where it is subject to water splash or spray from multiple directions.

Life expectancy : 40,000 hours.

Applications : Communications base station, Outdoor equipment, and all kinds of general manufacturing equipment.

## Long Life Fan

DC Fan  
San Ace L Series



|   |
|---|
| 40mm sq. × 28mm thickness                               |
| 60mm sq. × 25mm thickness                               |
| 80mm sq. × 25mm thickness                               |
| 92mm sq. × 25mm thickness                               |
| 120mm sq. × 38mm thickness                              |
| 140mm sq. × 38mm thickness                              |
| 140mm sq. × 51mm thickness                              |
| φ 172mm × 51mm thickness<br>(sidecut type) (round type) |

The Long-Life Fan Series for cooling equipment that must be in operation and maintenance-free for long periods of time.

Life expectancy : 60,000~200,000 hours

Applications : Communications equipment etc

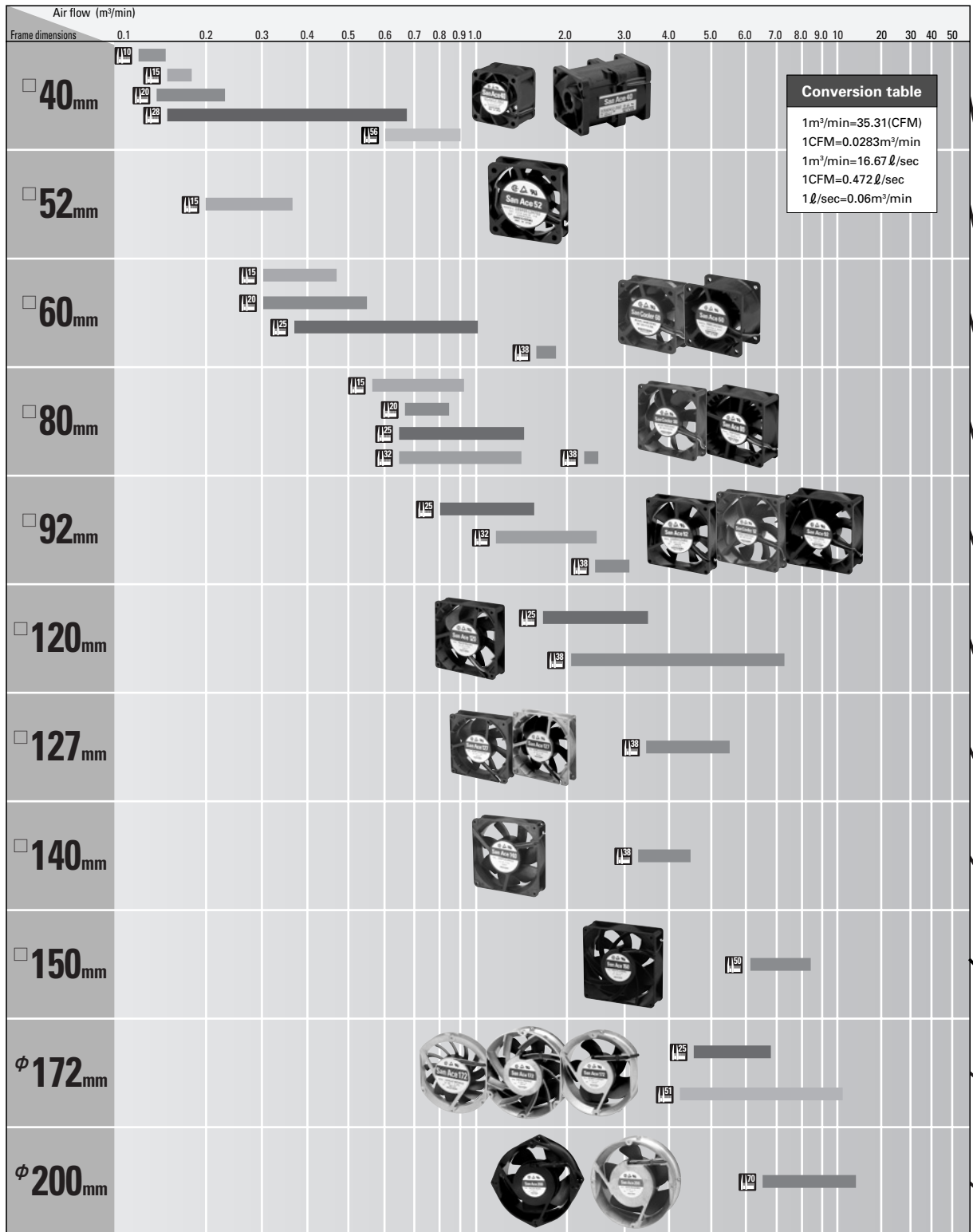


# COOLING SYSTEMS

## DC FAN

## DC Fan

### Domain diagram



- 40mm
- 52mm
- 60mm
- 80mm
- 92mm
- 120mm
- 127mm
- 140mm
- 150mm
- 172mm
- 200mm

# DC Fan

## 40mm San Ace 40



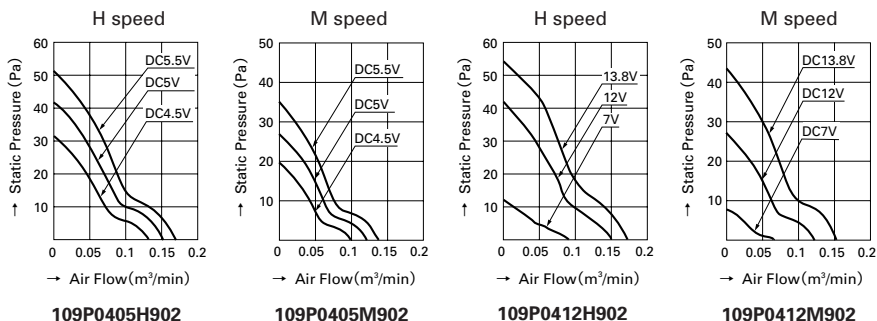
### General specifications

- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....S, H speeds ⊕red, ⊖black  
M speed ⊕red, ⊖black or blue
- Mass .....19g (10mm thick) 32g (15mm thick)

### 10mm thick Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P0405H902</b> | 5                 | 4.5~ 5.5                    | 0.16              | 0.8             | 6,200                            | 0.15 5.3                             | 41.16 0.165                                 | 25             | -10 ~ +60                        | 40,000              |
| <b>109P0405M902</b> |                   |                             | 0.11              | 0.55            | 5,000                            | 0.12 4.2                             | 26.95 0.108                                 | 21             |                                  |                     |
| <b>109P0412H902</b> | 12                | 7 ~13.8                     | 0.07              | 0.84            | 6,200                            | 0.15 5.3                             | 41.16 0.165                                 | 25             |                                  |                     |
| <b>109P0412M902</b> |                   |                             | 0.06              | 0.72            | 5,000                            | 0.12 4.2                             | 26.95 0.108                                 | 21             |                                  |                     |

### Air Flow and Static Pressure Characteristics

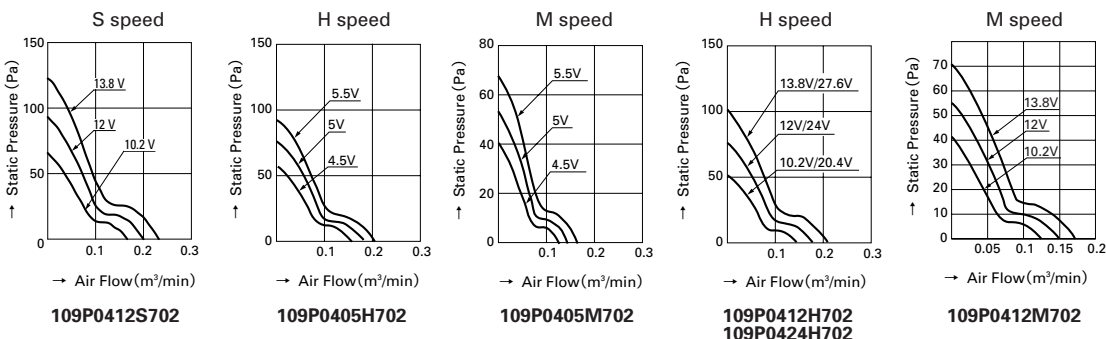


40mm

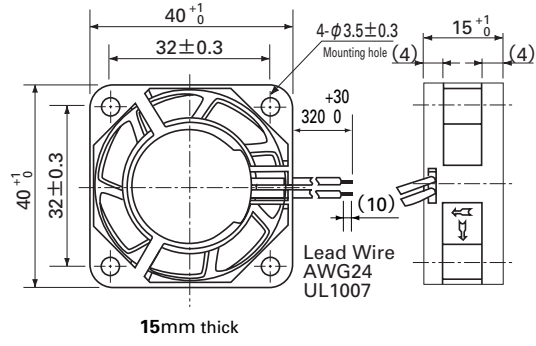
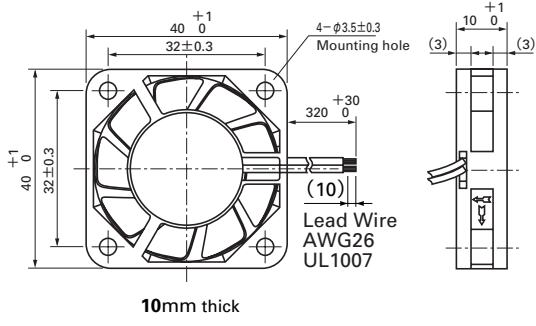
### 15mm thick Specifications

| Model No.           | Rated Voltage (V) | Operating voltage range (V) | Rated current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P0405H702</b> | 5                 | 4.5~ 5.5                    | 0.28              | 1.4             | 7,700                            | 0.18 6.4                             | 75.5 0.303                                  | 28             | -10 ~ +60                        | 60,000              |
| <b>109P0405M702</b> |                   |                             | 0.21              | 1.05            | 6,500                            | 0.15 5.3                             | 53 0.213                                    | 24             |                                  |                     |
| <b>109P0412S702</b> | 12                | 10.2~13.8                   | 0.18              | 2.16            | 8,600                            | 0.2 7.06                             | 92.1 0.369                                  | 32             |                                  |                     |
| <b>109P0412H702</b> |                   |                             | 0.13              | 1.56            | 7,700                            | 0.18 6.4                             | 75.5 0.303                                  | 28             |                                  |                     |
| <b>109P0412M702</b> |                   |                             | 0.095             | 1.14            | 6,500                            | 0.15 5.3                             | 53 0.213                                    | 24             |                                  |                     |
| <b>109P0424H702</b> |                   |                             | 24                | 20.4~27.6       | 0.08                             | 1.92                                 | 7,700                                       | 0.18 6.4       | 75.5 0.303                       |                     |

### Air Flow and Static Pressure Characteristics

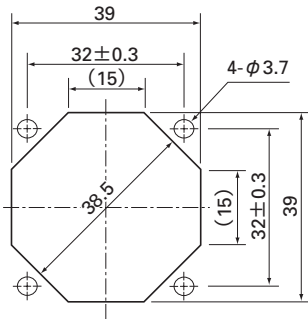


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# DC Fan

# 40mm

## San Ace 40



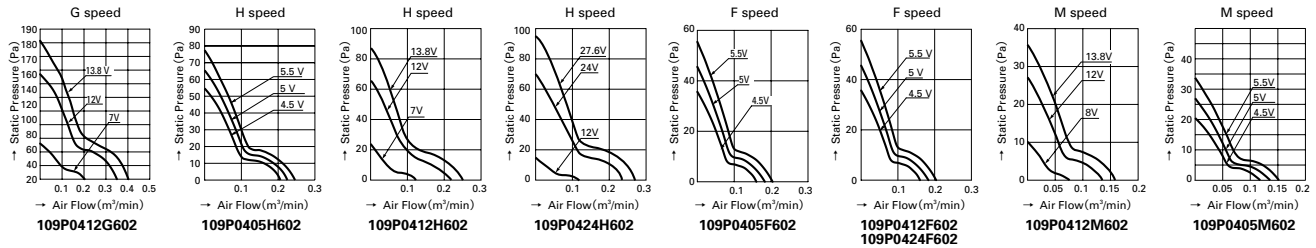
### General specifications

- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....H, F, G, B speeds ⊕red, ⊖black  
M speed ⊕red, ⊖black or blue
- Mass .....45g (20mm thick) 52g (28mm thick)

## 20mm thick Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P0405H602</b> | 5                 | 4.5 ~ 5.5                   | 0.32              | 1.6             | 8,000                            | 0.225 8.0                            | 65.7 0.264                                  | 33             | -10 ~ +70                        | 40,000              |
| <b>109P0405F602</b> |                   |                             | 0.25              | 1.25            | 6,500                            | 0.183 6.5                            | 45.1 0.181                                  | 28             |                                  |                     |
| <b>109P0405M602</b> |                   |                             | 0.12              | 0.60            | 5,000                            | 0.136 4.8                            | 26.5 0.106                                  | 24             |                                  |                     |
| <b>109P0412G602</b> | 12                | 7 ~ 13.8                    | 0.28              | 3.36            | 12,500                           | 0.35 12.4                            | 153.8 0.618                                 | 44             | -10 ~ +60                        | 40,000              |
| <b>109P0412H602</b> |                   |                             | 0.11              | 1.32            | 8,000                            | 0.225 8.0                            | 65.7 0.264                                  | 33             |                                  |                     |
| <b>109P0412F602</b> |                   |                             | 0.09              | 1.08            | 6,500                            | 0.183 6.5                            | 45.1 0.181                                  | 28             |                                  |                     |
| <b>109P0412M602</b> | 8 ~ 13.8          | 0.06                        | 0.72              | 5,000           | 0.136 4.8                        | 26.5 0.106                           | 24  | -10 ~ +70      | 60,000                           |                     |
| <b>109P0424H602</b> | 24                | 12 ~ 27.6                   | 0.07              | 1.68            | 8,300                            | 0.233 8.2                            | 69.6 0.280                                  |                |                                  | 35                  |
| <b>109P0424F602</b> |                   | 14 ~ 27.6                   | 0.06              | 1.44            | 6,500                            | 0.183 6.5                            | 45.1 0.181                                  |                |                                  | 28                  |

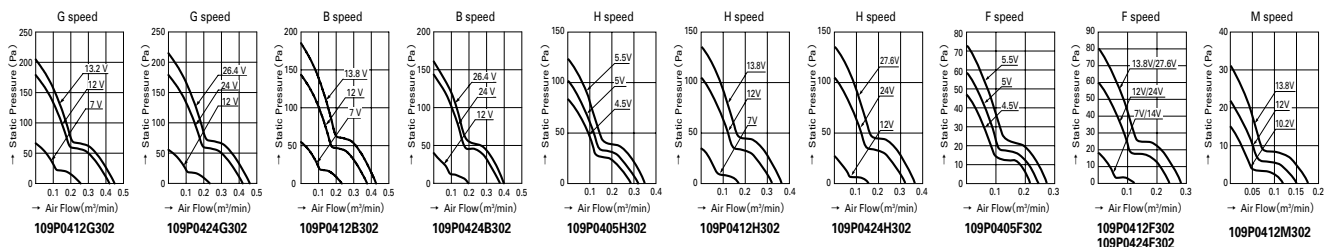
### Air Flow and Static Pressure Characteristics



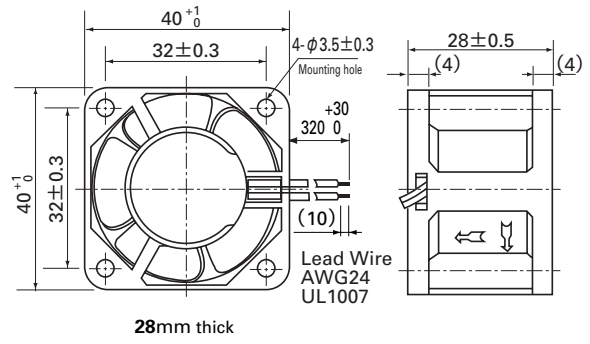
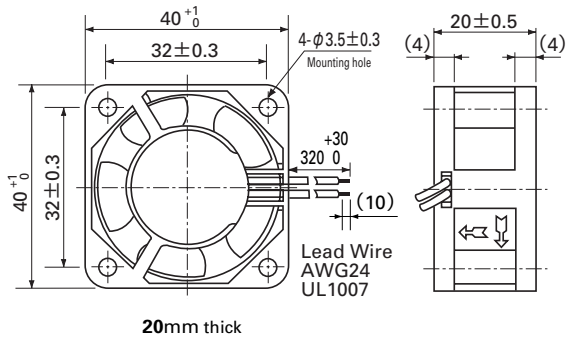
## 28mm thick Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P0405H302</b> | 5                 | 4.5~5.5                     | 0.68              | 3.4             | 8,700                            | 0.32 11.3                            | 103 0.414                                   | 37             | -10 ~ +70                        | 40,000              |
| <b>109P0405F302</b> |                   |                             | 0.28              | 1.4             | 6,700                            | 0.244 8.6                            | 58.8 0.236                                  | 30             |                                  |                     |
| <b>109P0412G302</b> | 12                | 7~13.2                      | 0.31              | 3.72            | 11,500                           | 0.42 14.8                            | 179 0.719                                   | 42             | -10 ~ +60                        | 40,000              |
| <b>109P0412B302</b> |                   |                             | 0.28              | 3.36            | 10,300                           | 0.38 13.4                            | 143 0.574                                   | 40             |                                  |                     |
| <b>109P0412H302</b> |                   |                             | 0.195             | 2.34            | 8,700                            | 0.32 11.3                            | 103 0.414                                   | 37             |                                  |                     |
| <b>109P0412F302</b> | 0.105             | 1.26                        | 6,700             | 0.244 8.6       | 58.8 0.236                       | 30                                   | -10 ~ +70                                   | 60,000         |                                  |                     |
| <b>109P0412M302</b> | 10.2~13.8         | 0.045                       | 0.54              | 4,100           | 0.15 5.3                         | 21.6 0.087                           |   |                | 20                               |                     |
| <b>109P0424G302</b> | 24                | 12~26.4                     | 0.19              | 4.56            | 11,500                           | 0.42 14.8                            | 179 0.719                                   | 42             | -10 ~ +60                        | 40,000              |
| <b>109P0424B302</b> |                   | 0.13                        | 3.12              | 10,300          | 0.38 13.4                        | 143 0.574                            | 40  |                |                                  |                     |
| <b>109P0424H302</b> |                   | 12~27.6                     | 0.095             | 2.28            | 8,700                            | 0.32 11.3                            | 103 0.414                                   | 37             |                                  |                     |
| <b>109P0424F302</b> | 14~27.6           | 0.055                       | 1.32              | 6,700           | 0.244 8.6                        | 58.8 0.236                           | 30  | -10 ~ +70      | 60,000                           |                     |

### Air Flow and Static Pressure Characteristics

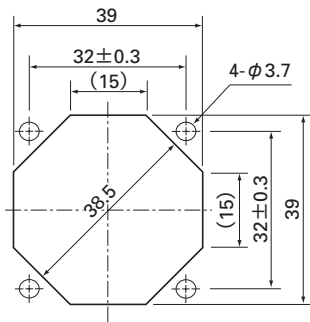


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



## DC Fan

□ **40mm**  
San Ace 40



"San Ace 40" GV type

### General specifications

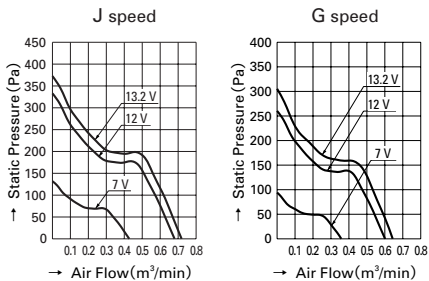
- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....50g

### 28mm thick Specifications

| Model No.                | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9GV0412J302(3021)</b> | 12                | 7~13.2                      | 0.60              | 7.20            | 14,700                           | 0.68 24.0                            | 330 1.325                                   | 55             | -10 ~ +60                        | 40,000              |
| <b>9GV0412G302(3021)</b> |                   |                             | 0.47              | 5.64            | 13,000                           | 0.60 21.1                            | 260 1.044                                   | 52             |                                  |                     |

The numbers in ( ) represent ribless models.

### Air Flow and Static Pressure Characteristics

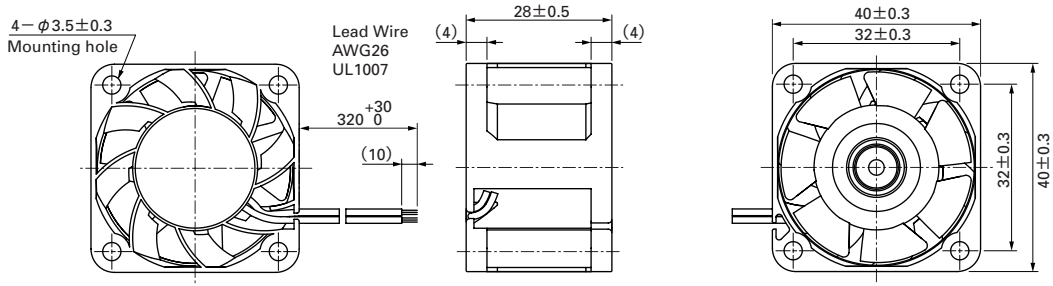


**9GV0412J302(3021)**

**9GV0412G302(3021)**

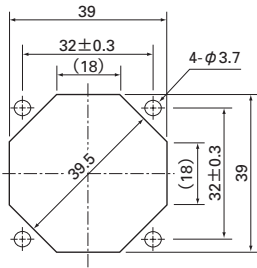
40mm

**Dimensions (unit : mm)**



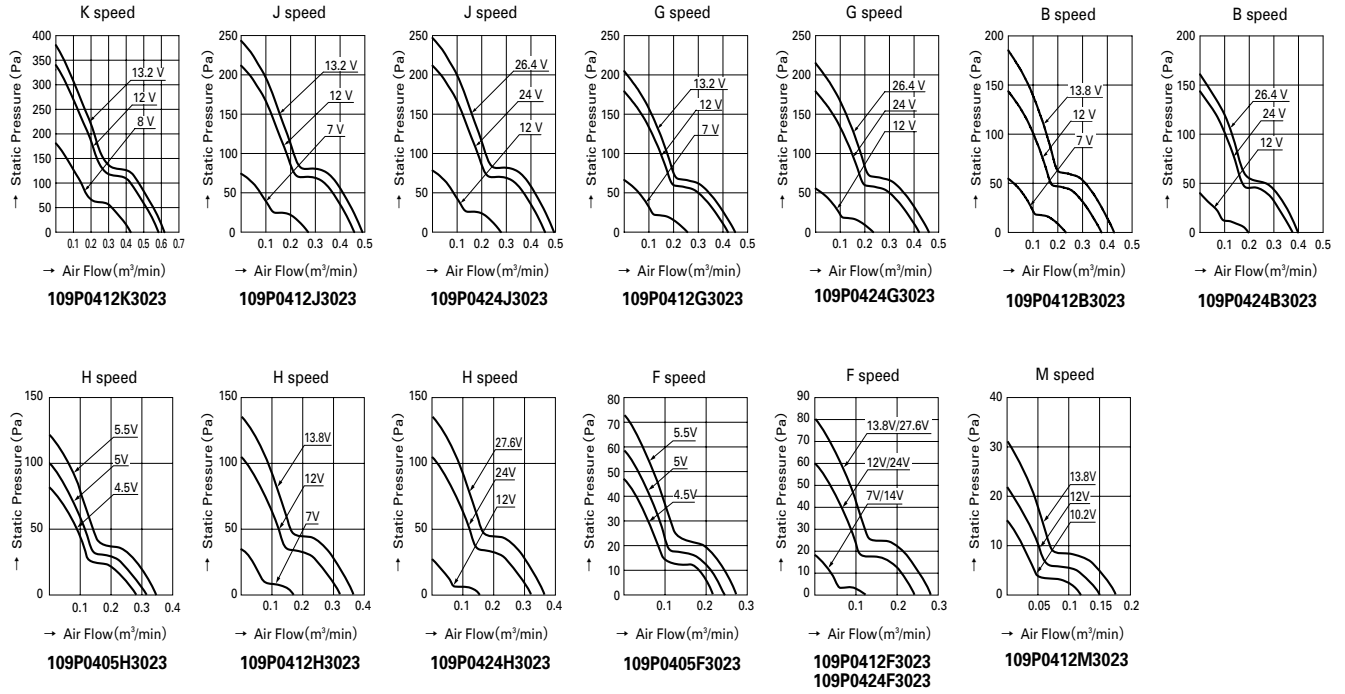
**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side

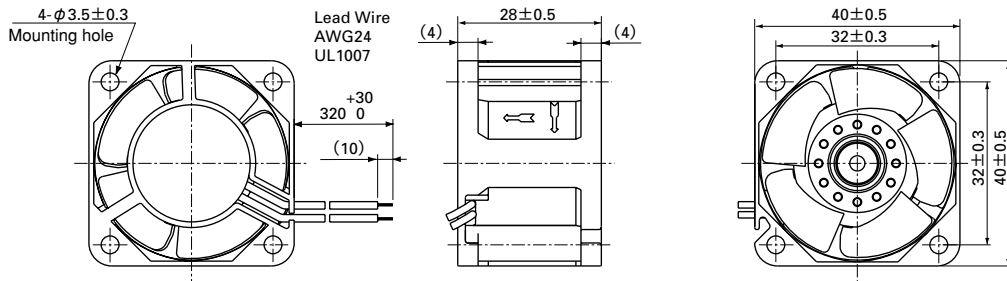




### Air Flow and Static Pressure Characteristics



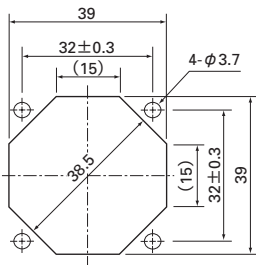
### Dimensions (unit : mm)



40mm

### Reference dimension of mounting holes and vent opening (unit : mm)

Air inlet side · Air outlet side



## DC Fan

□ **40mm**  
San Ace 40



"San Ace 40" CRA type, Counter Rotating Fan



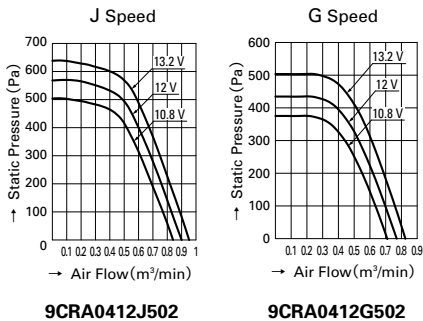
### General Specifications

- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....Inlet ⊕red, ⊖black  
.....Outlet ⊕orange, ⊖gray
- Mass .....90g

### 56mm thick Specifications

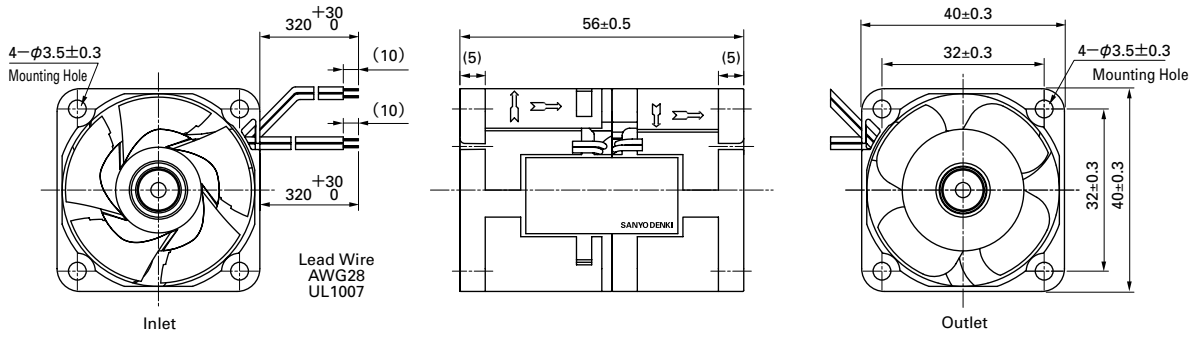
| Model No            | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) |        | Air Flow (m <sup>3</sup> /min) (CFM) |      | Static Pressure (Pa) (inchH <sub>2</sub> O) |      | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------|--------------------------------------|------|---|------|----------------|----------------------------------|---------------------|
|                     |                   |                             |                   |                 | Inlet                            | Outlet |                                      |      |   |      |                |                                  |                     |
| <b>9CRA0412J502</b> | 12                | 10.8~13.2                   | 1.4               | 16.8            | 15,800                           | 12,200 | 0.90                                 | 31.8 | 570   | 2.29 | 62             | -10 ~ +70                        | 40,000              |
| <b>9CRA0412G502</b> |                   |                             | 1.0               | 12.0            | 14,000                           | 10,400 | 0.77                                 | 27.2 | 435   | 1.75 | 59             |                                  |                     |

### Air Flow and Static Pressure Characteristics



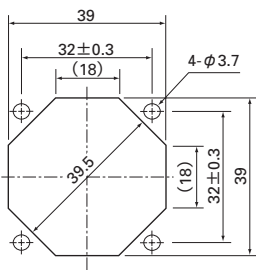
40mm

**Dimensions (unit : mm)**



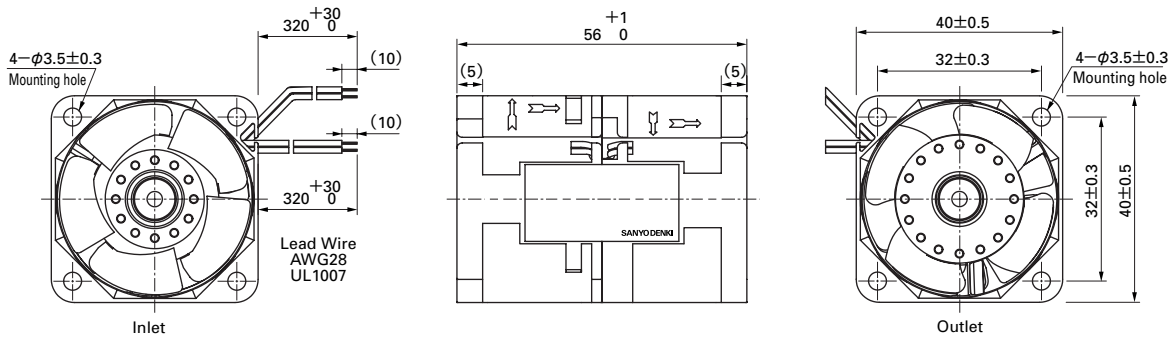
**Reference Dimension of Mounting Holes and Vent Opening (unit : mm)**

Air Inlet Side · Air Outlet Side



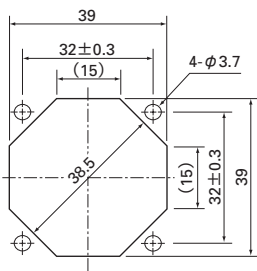


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# DC Fan

52mm  
San Ace 52



## General specifications

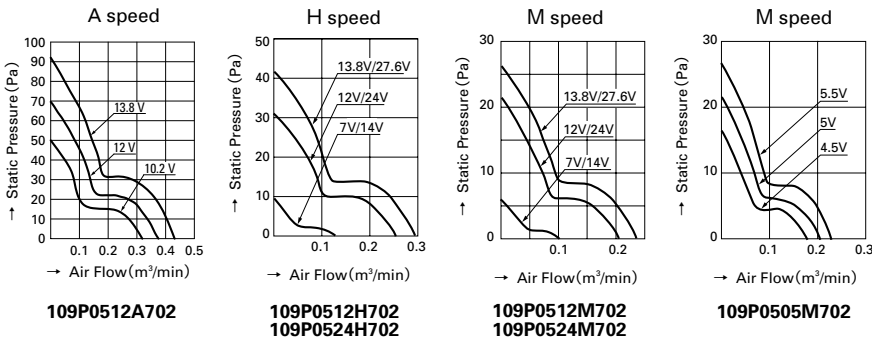
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ...Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....A, H speeds   ⊕red, ⊖black  
  M speed       ⊕red, ⊖black or blue
- Mass .....55g

## 15mm thick Specifications

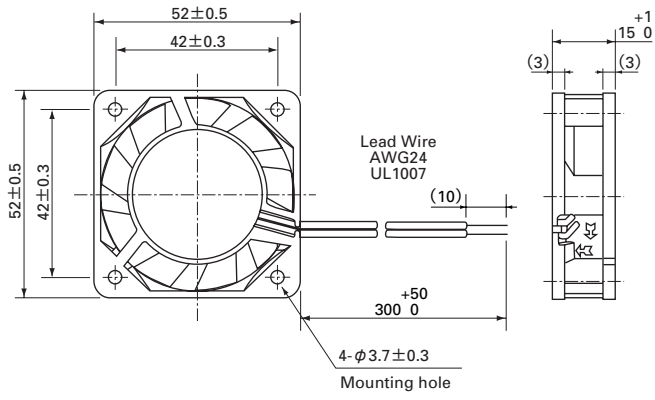
| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P0505M702</b> | 5                 | 4.5~ 5.5                    | 0.15              | 0.75            | 3,700                            | 0.205 7.24                           | 21.4 0.086                                  | 22             | -10 ~ +70                        | 60,000              |
| <b>109P0512A702</b> | 12                | 10.2~13.8                   | 0.21              | 2.52            | 6,800                            | 0.375 13.25                          | 69.7 0.280                                  | 36             |                                  | 40,000              |
| <b>109P0512H702</b> |                   | 7 ~ 13.8                    | 0.10              | 1.20            | 4,600                            | 0.255 9.00                           | 31.9 0.128                                  | 27             |                                  |                     |
| <b>109P0512M702</b> |                   |                             | 0.07              | 0.84            | 3,700                            | 0.205 7.24                           | 21.4 0.086                                  | 22             |                                  |                     |
| <b>109P0524H702</b> | 24                | 14 ~ 27.6                   | 0.05              | 1.20            | 4,600                            | 0.255 9.00                           | 31.9 0.128                                  | 27             |                                  | 60,000              |
| <b>109P0524M702</b> |                   |                             | 0.04              | 0.96            | 3,700                            | 0.205 7.24                           | 21.4 0.086                                  | 22             |                                  |                     |

## Air Flow and Static Pressure Characteristics

52mm

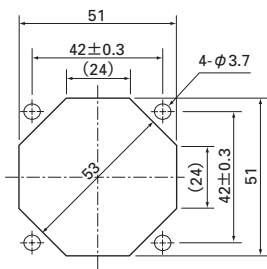


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# DC Fan

# 60mm San Ace 60



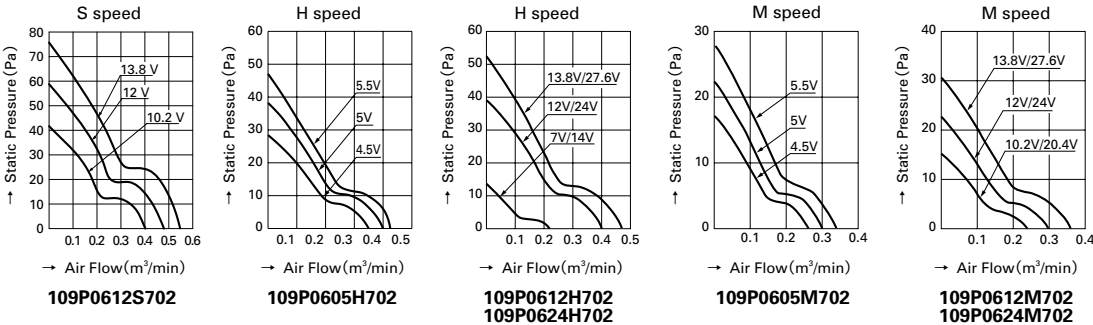
## General specifications

- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....J, G, D, S, H, F, W speeds ⊕red,⊖black  
M speed ⊕red,⊖black or blue
- Mass .....60g (15mm thick) 90g (20mm thick · 25mm thick)

## 15mm thick Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P0605H702</b> | 5                 | 4.5 ~ 5.5                   | 0.26              | 1.30            | 4,100                            | 0.40 14.1                            | 38.2 0.153                                  | 32             | -10 ~ +70                        | 60,000              |
| <b>109P0605M702</b> |                   |                             | 0.15              | 0.75            | 3,100                            | 0.30 10.6                            | 22.6 0.091                                  | 25             |                                  |                     |
| <b>109P0612S702</b> | 12                | 10.2 ~ 13.8                 | 0.15              | 1.80            | 5,000                            | 0.48 17.0                            | 58.8 0.236                                  | 36             |                                  | 40,000              |
| <b>109P0612H702</b> |                   |                             | 0.09              | 1.08            | 4,100                            | 0.40 14.1                            | 38.2 0.153                                  | 32             |                                  |                     |
| <b>109P0612M702</b> |                   |                             | 0.07              | 0.84            | 3,100                            | 0.3 10.6                             | 22.6 0.091                                  | 25             |                                  | 60,000              |
| <b>109P0624H702</b> |                   |                             | 24                | 14 ~ 27.6       | 0.06                             | 1.44                                 | 4,100                                       | 0.4 14.1       |                                  |                     |
| <b>109P0624M702</b> | 0.04              | 0.96                        |                   |                 | 3,100                            | 0.3 10.6                             | 22.6 0.091                                  | 25             |                                  |                     |

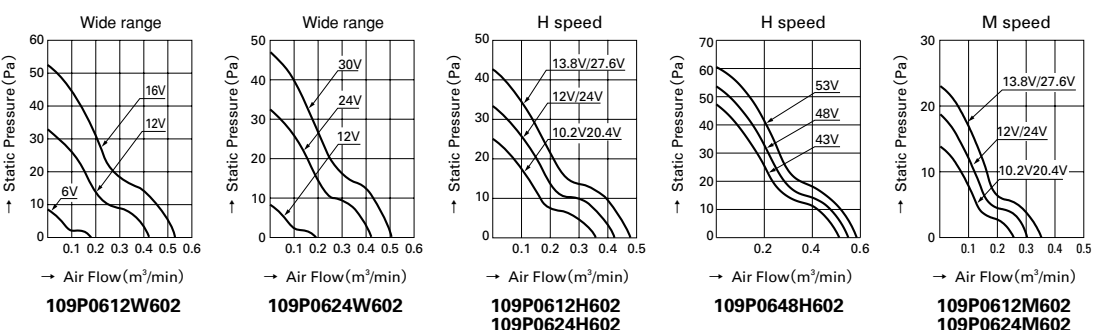
## Air Flow and Static Pressure Characteristics



## 20mm thick Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P0612W602</b> | 12                | 6 ~ 16                      | 0.13              | 1.56            | 4,200                            | 0.42 14.8                            | 31.9 0.128                                  | 31             | -10 ~ +70                        | 60,000              |
| <b>109P0612H602</b> |                   |                             | 0.13              | 1.56            | 4,200                            | 0.42 14.8                            | 31.9 0.128                                  | 31             |                                  |                     |
| <b>109P0612M602</b> |                   |                             | 0.09              | 1.08            | 3,200                            | 0.30 10.6                            | 18.8 0.076                                  | 25             |                                  |                     |
| <b>109P0624W602</b> | 24                | 12 ~ 30                     | 0.07              | 1.68            | 4,200                            | 0.42 14.8                            | 31.9 0.128                                  | 31             |                                  | 40,000              |
| <b>109P0624H602</b> |                   |                             | 0.07              | 1.68            | 4,200                            | 0.42 14.8                            | 31.9 0.128                                  | 31             |                                  |                     |
| <b>109P0624M602</b> |                   |                             | 0.05              | 1.20            | 3,200                            | 0.30 10.6                            | 18.8 0.076                                  | 25             |                                  |                     |
| <b>109P0648H602</b> | 48                | 43 ~ 53                     | 0.07              | 3.36            | 5,600                            | 0.55 19.4                            | 52.9 0.212                                  | 41             |                                  |                     |

## Air Flow and Static Pressure Characteristics

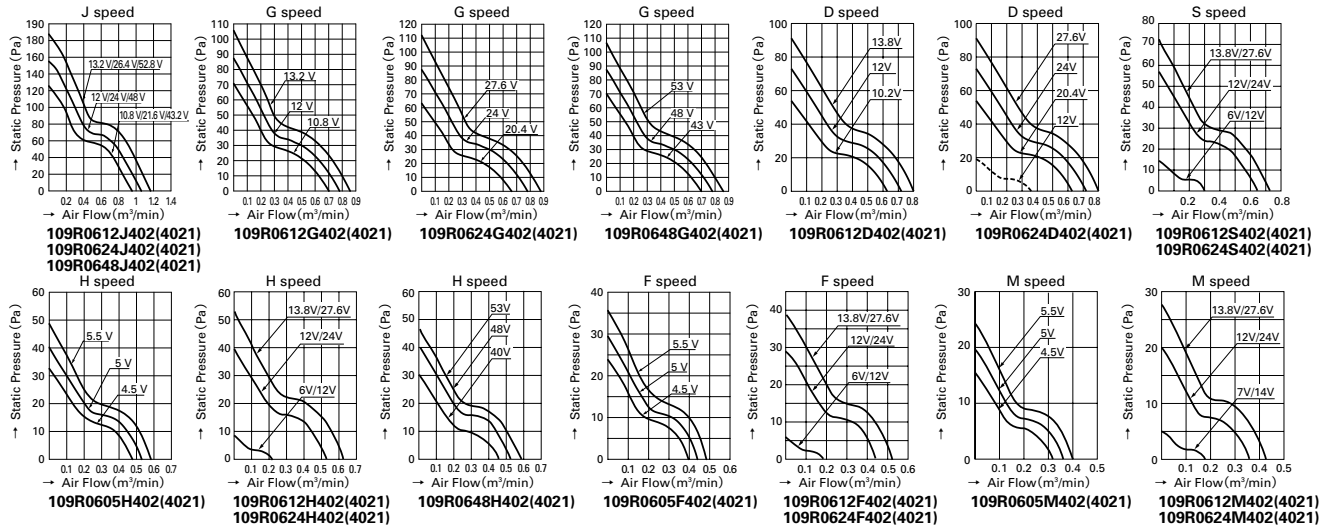


# 25mm thick Specifications

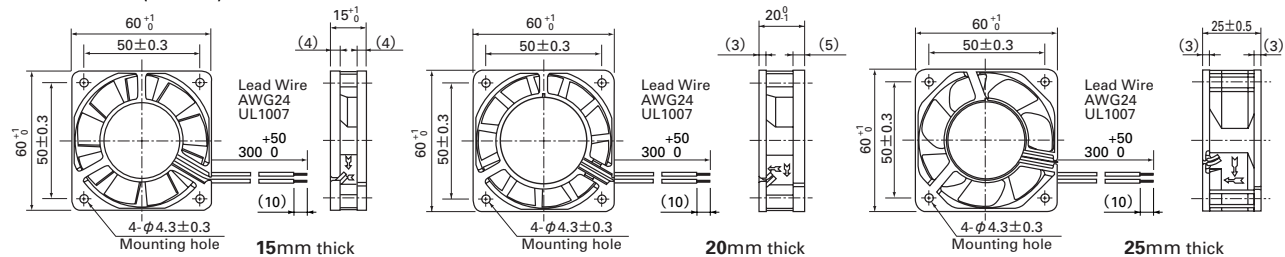
| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109R0605H402(4021) | 5                 | 4.5~ 5.5                    | 0.34              | 1.70            | 3,800                            | 0.53 20.5                            | 40.2 0.161                                  | 28             | -10 ~ +70                        | 60,000              |
| 109R0605F402(4021) |                   |                             | 0.20              | 1.00            | 3,200                            | 0.44 15.5                            | 29.4 0.118                                  | 24             | -10 ~ +60                        |                     |
| 109R0605M402(4021) |                   |                             | 0.13              | 0.65            | 2,600                            | 0.36 12.7                            | 19.6 0.079                                  | 20             | -10 ~ +70                        |                     |
| 109R0612J402(4021) | 12                | 10.8~13.2                   | 0.47              | 5.64            | 7,600                            | 1.05 37.1                            | 155.0 0.622                                 | 44             | -10 ~ +60                        | 40,000              |
| 109R0612G402(4021) |                   | 0.24                        | 2.88              | 5,600           | 0.78 27.5                        | 88.0 0.353                           | 39  | -10 ~ +70      |                                  |                     |
| 109R0612D402(4021) |                   | 10.2~13.8                   | 0.21              | 2.52            | 5,150                            | 0.72 25.4                            | 73.5 0.295                                  |                | 37                               |                     |
| 109R0612S402(4021) |                   | 0.17                        | 2.04              | 4,600           | 0.65 23.0                        | 56.8 0.228                           | 33  |                |                                  |                     |
| 109R0612H402(4021) |                   | 6 ~13.8                     | 0.11              | 1.32            | 3,800                            | 0.53 18.7                            | 40.2 0.161                                  |                | 28                               |                     |
| 109R0612F402(4021) |                   | 0.09                        | 1.08              | 3,200           | 0.44 15.5                        | 29.4 0.118                           | 24  |                |                                  |                     |
| 109R0612M402(4021) |                   | 0.06                        | 0.72              | 2,600           | 0.36 12.7                        | 19.6 0.079                           | 20  |                |                                  |                     |
| 109R0624J402(4021) |                   | 21.6~26.4                   | 0.24              | 5.76            | 7,600                            | 1.05 37.1                            | 155.0 0.622                                 |                | 44                               |                     |
| 109R0624G402(4021) | 20.4~27.6         | 0.13                        | 3.12              | 5,600           | 0.78 27.5                        | 88.0 0.353                           | 39  | -10 ~ +70      |                                  |                     |
| 109R0624D402(4021) | 0.12              | 2.88                        | 5,150             | 0.72 25.4       | 73.5 0.295                       | 37                                   |   |                |                                  |                     |
| 109R0624S402(4021) | 12 ~27.6          | 0.08                        | 1.92              | 4,600           | 0.65 23.0                        | 56.8 0.228                           | 33  |                |                                  |                     |
| 109R0624H402(4021) | 0.06              | 1.44                        | 3,800             | 0.53 18.7       | 40.2 0.161                       | 28                                   |   |                |                                  |                     |
| 109R0624F402(4021) | 0.05              | 1.20                        | 3,200             | 0.44 15.5       | 29.4 0.118                       | 24                                   |   |                |                                  |                     |
| 109R0624M402(4021) | 14 ~27.6          | 0.04                        | 0.96              | 2,600           | 0.36 12.7                        | 19.6 0.079                           | 20  |                |                                  |                     |
| 109R0648J402(4021) | 48                | 43.2~52.8                   | 0.12              | 5.76            | 7,600                            | 1.05 37.1                            | 155.0 0.622                                 |                | 44                               | -10 ~ +60           |
| 109R0648G402(4021) |                   | 43 ~53                      | 0.07              | 3.36            | 5,600                            | 0.78 27.5                            | 88.0 0.353                                  | 39             |                                  |                     |
| 109R0648H402(4021) |                   | 40 ~53                      | 0.04              | 1.92            | 3,800                            | 0.53 18.7                            | 40.2 0.161                                  | 28             | -10 ~ +70                        | 60,000              |

The numbers in ( ) represent ribless models.

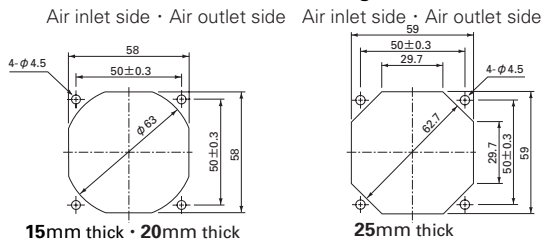
## Air Flow and Static Pressure Characteristics



## Dimensions (unit : mm)



## Reference dimension of mounting holes and vent opening (unit : mm)



## DC Fan

□ **60mm**  
San Ace 60



### General specifications

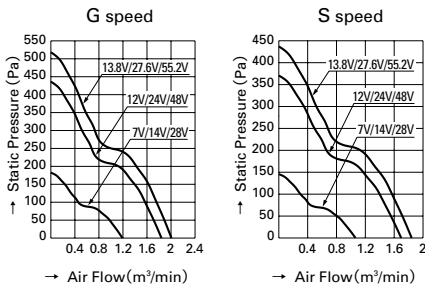
- Material ······Frame, impeller : Plastics
- Life Expectancy ······Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ······Current blocking function (with reverse polarity protection)
- Dielectric Strength ······50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ······Measured at 1m from the air inlet
- Operating Temperature Range ······Varies for each model (Non-condensing)
- Lead Wire ········⊕red, ⊖black
- Mass ············110g

### 38mm thick Specifications

| Model No.               | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9G0612G102(1021)</b> | 12                | 7.0~13.8                    | 1.54              | 18.5            | 11,800                           | 1.84 65                              | 435 1.747                                   | 58             | -10 ~ +70                        | 40,000              |
| <b>9G0612S102(1021)</b> |                   |                             | 1.36              | 16.3            | 10,800                           | 1.70 60                              | 370 1.486                                   | 56             |                                  |                     |
| <b>9G0624G102(1021)</b> | 24                | 14.0~27.6                   | 0.85              | 20.4            | 11,800                           | 1.84 65                              | 435 1.747                                   | 58             |                                  |                     |
| <b>9G0624S102(1021)</b> |                   |                             | 0.70              | 16.8            | 10,800                           | 1.70 60                              | 370 1.486                                   | 56             |                                  |                     |
| <b>9G0648G102(1021)</b> | 48                | 28 ~55.2                    | 0.35              | 16.8            | 11,800                           | 1.84 65                              | 435 1.747                                   | 58             |                                  |                     |
| <b>9G0648S102(1021)</b> |                   |                             | 0.29              | 13.9            | 10,800                           | 1.70 60                              | 370 1.486                                   | 56             |                                  |                     |

The numbers in ( ) represent ribless models.

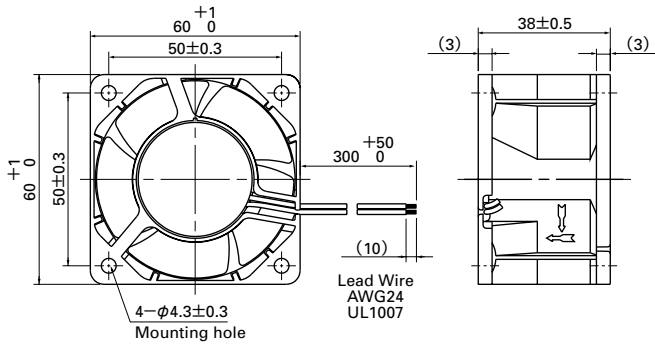
### Air Flow and Static Pressure Characteristics



- 9G0612G102(1021)**
- 9G0612S102(1021)**
- 9G0624G102(1021)**
- 9G0624S102(1021)**
- 9G0648G102(1021)**
- 9G0648S102(1021)**

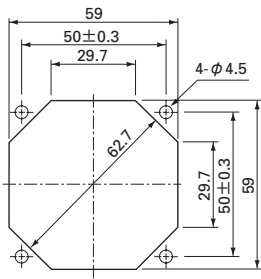
60mm

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# DC Fan

## 80mm San Ace 80



### General specifications

Material ..... Frame, Impeller: Plastics  
 Life Expectancy ..... Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)  
 Motor Protection System ..... Current blocking function (with reverse polarity protection)  
 Dielectric Strength ..... 50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)  
 Noise Measurement Method ..... Measured at 1m from the air inlet  
 Operating Temperature Range ..... Varies for each model (Non-condensing)  
 Lead Wire ..... K, G, A, S, H, F, W speeds ⊕red, ⊖black  
 M, L speeds ⊕red, ⊖black or blue  
 Mass ..... 68g (15mm thick) 100g (20mm thick)  
 110g (25mm thick) 150g (32mm thick)

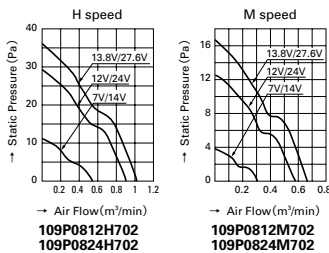
### 15mm thick Specifications

| Model No.    | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P0812H702 | 12                | 7~13.8                      | 0.2               | 2.4             | 3,100                            | 0.91 32.1                            | 29.4 0.118                                  | 31             | -10 ~ +70                        | 40,000              |
| 109P0812M702 |                   |                             | 0.09              | 1.08            | 2,000                            | 0.57 20.1                            | 12.6 0.051                                  | 21             |                                  | 60,000              |
| 109P0824H702 | 24                | 14~27.6                     | 0.1               | 2.4             | 3,100                            | 0.91 32.1                            | 29.4 0.118                                  | 31             |                                  | 40,000              |
| 109P0824M702 |                   |                             | 0.05              | 1.2             | 2,000                            | 0.57 20.1                            | 12.6 0.051                                  | 21             |                                  | 60,000              |

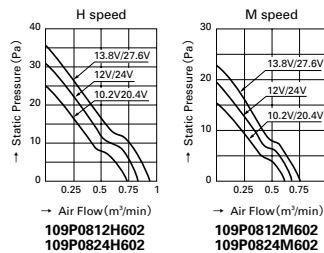
### 20mm thick Specifications

| Model No.    | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P0812H602 | 12                | 10.2~13.8                   | 0.21              | 2.52            | 2,900                            | 0.84 29.7                            | 29.4 0.118                                  | 31             | -10 ~ +70                        | 60,000              |
| 109P0812M602 |                   |                             | 0.13              | 1.56            | 2,300                            | 0.67 23.7                            | 18.6 0.075                                  | 25             |                                  |                     |
| 109P0824H602 | 24                | 20.4~27.6                   | 0.12              | 2.88            | 2,900                            | 0.84 29.7                            | 29.4 0.118                                  | 31             |                                  |                     |
| 109P0824M602 |                   |                             | 0.07              | 1.68            | 2,300                            | 0.67 23.7                            | 18.6 0.075                                  | 25             |                                  |                     |

#### Air Flow and Static Pressure Characteristics (15mm thick)



#### Air Flow and Static Pressure Characteristics (20mm thick)



### 25mm thick Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109R0805F402(4021) | 5                 | 4.5~ 5.5                    | 0.25              | 1.25            | 2,600                            | 0.92 32.5                            | 28.4 0.114                                  | 26             | -10 ~ +70                        | 60,000              |
| 109R0805M402(4021) |                   |                             | 0.17              | 0.85            | 2,350                            | 0.83 29.3                            | 22.5 0.090                                  | 23             |                                  |                     |
| 109R0812G402(4021) | 12                | 10.8~13.2                   | 0.37              | 4.44            | 4,500                            | 1.50 53.0                            | 80.4 0.323                                  | 40             | -10 ~ +60                        | 40,000              |
| 109R0812S402(4021) |                   |                             | 0.18              | 2.16            | 3,400                            | 1.20 42.4                            | 48.0 0.193                                  | 34             |                                  |                     |
| 109R0812H402(4021) |                   |                             | 6 ~13.8           | 0.13            | 1.56                             | 2,900                                | 1.03 36.4                                   | 35.3 0.142     |                                  |                     |
| 109R0812F402(4021) |                   | 0.11                        |                   | 1.32            | 2,600                            | 0.92 32.5                            | 28.4 0.114                                  | 26             |                                  |                     |
| 109R0812M402(4021) |                   | 0.09                        |                   | 1.08            | 2,350                            | 0.83 29.3                            | 22.5 0.090                                  | 23             |                                  |                     |
| 109R0812L402(4021) |                   | 7 ~13.8                     | 0.06              | 0.72            | 1,850                            | 0.65 23.0                            | 14.7 0.059                                  | 20             |                                  |                     |
| 109R0824G402(4021) | 24                | 20.4~26.4                   | 0.20              | 4.80            | 4,500                            | 1.50 53.0                            | 80.4 0.323                                  | 40             | -10 ~ +60                        | 40,000              |
| 109R0824S402(4021) |                   |                             | 0.10              | 2.40            | 3,400                            | 1.20 42.4                            | 48.0 0.193                                  | 34             |                                  |                     |
| 109R0824H402(4021) |                   |                             | 12 ~27.6          | 0.07            | 1.68                             | 2,900                                | 1.03 36.4                                   | 35.3 0.142     |                                  |                     |
| 109R0824F402(4021) |                   | 0.06                        |                   | 1.44            | 2,600                            | 0.92 32.5                            | 28.4 0.114                                  | 26             |                                  |                     |
| 109R0824M402(4021) |                   | 0.05                        |                   | 1.20            | 2,350                            | 0.83 29.3                            | 22.5 0.090                                  | 23             |                                  |                     |
| 109R0824L402(4021) |                   | 14 ~27.6                    | 0.04              | 0.96            | 1,850                            | 0.65 23.0                            | 14.7 0.059                                  | 20             |                                  |                     |
| 109R0848K402(4021) | 48                | 40.8~55.2                   | 0.10              | 4.80            | 4,600                            | 1.56 55.1                            | 88.4 0.355                                  | 41             | -10 ~ +60                        | 40,000              |
| 109R0848S402(4021) |                   |                             | 0.06              | 2.88            | 3,400                            | 1.20 42.4                            | 48.0 0.193                                  | 34             |                                  |                     |

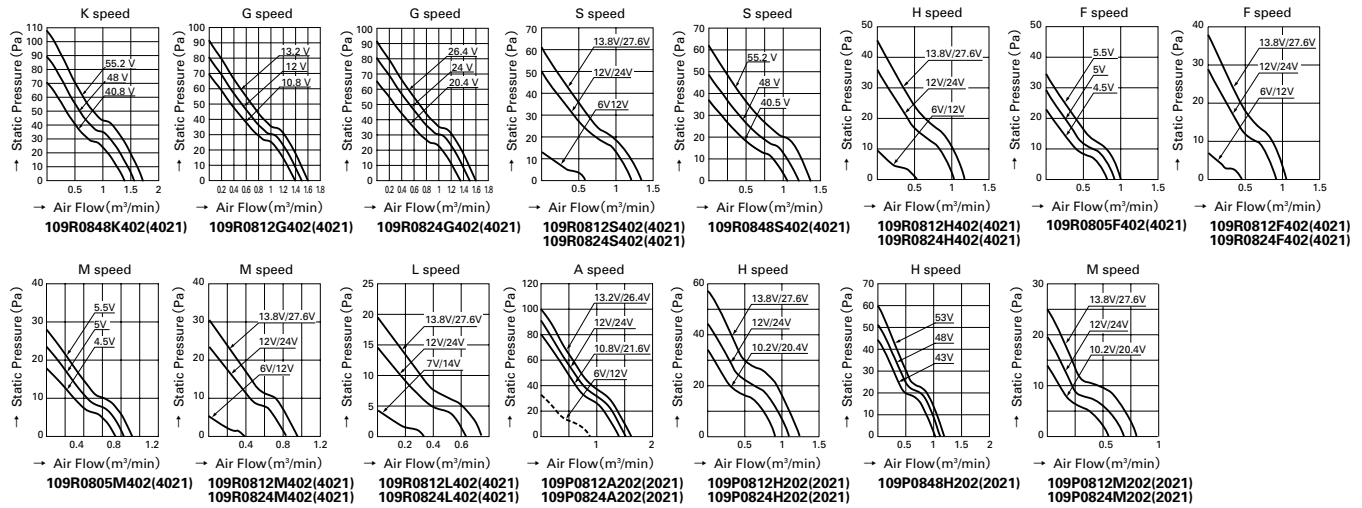
The numbers in ( ) represent ribless models.

# 32mm thick Specifications

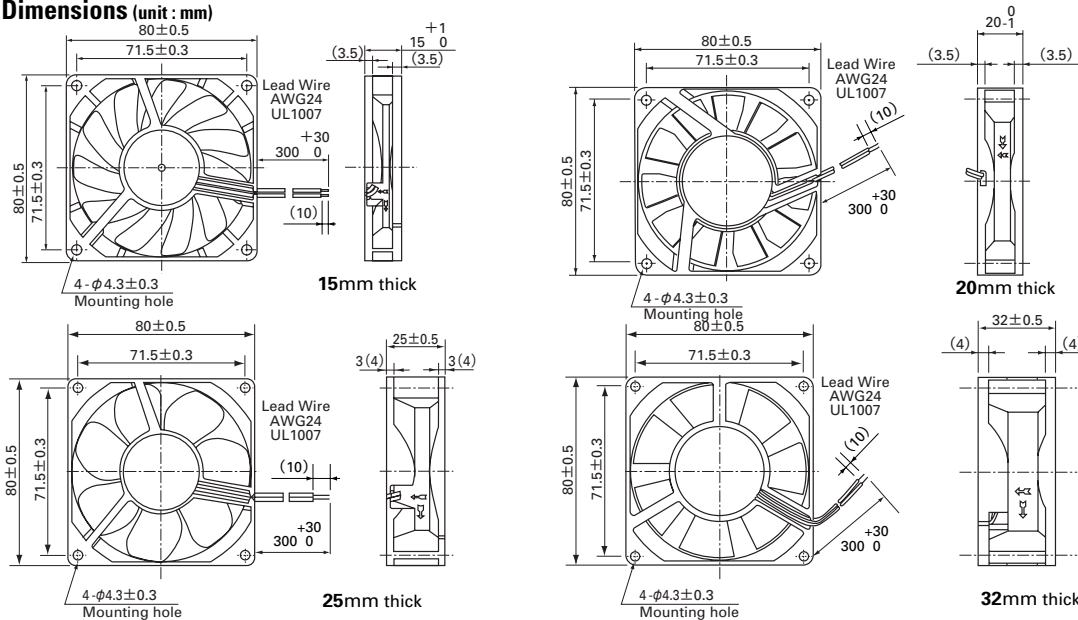
| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P0812A202(2021) | 12                | 6 ~13.2                     | 0.56              | 6.72            | 4,600                            | 1.52 53.7                            | 91.1 0.366                                  | 45             | -10 ~ +55                        | 40,000(+55°C)       |
| 109P0812H202(2021) |                   | 10.2~13.8                   | 0.16              | 1.92            | 3,150                            | 1.05 37.1                            | 43.1 0.173                                  | 33             | -10 ~ +70                        | 40,000              |
| 109P0812M202(2021) |                   |                             | 0.07              | 0.84            | 2,000                            | 0.65 23.0                            | 18.5 0.074                                  | 21             |                                  | 60,000              |
| 109P0824A202(2021) | 24                | 12 ~26.4                    | 0.29              | 6.96            | 4,600                            | 1.52 53.7                            | 91.1 0.366                                  | 45             | -10 ~ +60                        | 40,000              |
| 109P0824H202(2021) |                   | 20.4~27.6                   | 0.09              | 2.16            | 3,150                            | 1.05 37.1                            | 43.1 0.173                                  | 33             | -10 ~ +70                        | 60,000              |
| 109P0824M202(2021) |                   |                             | 0.04              | 0.96            | 2,000                            | 0.65 23.0                            | 18.6 0.075                                  | 21             |                                  | 60,000              |
| 109P0848H202(2021) | 48                | 43 ~53                      | 0.06              | 2.88            | 3,350                            | 1.10 38.9                            | 50.9 0.204                                  | 35             |                                  | 40,000              |

The numbers in ( ) represent ribless models.

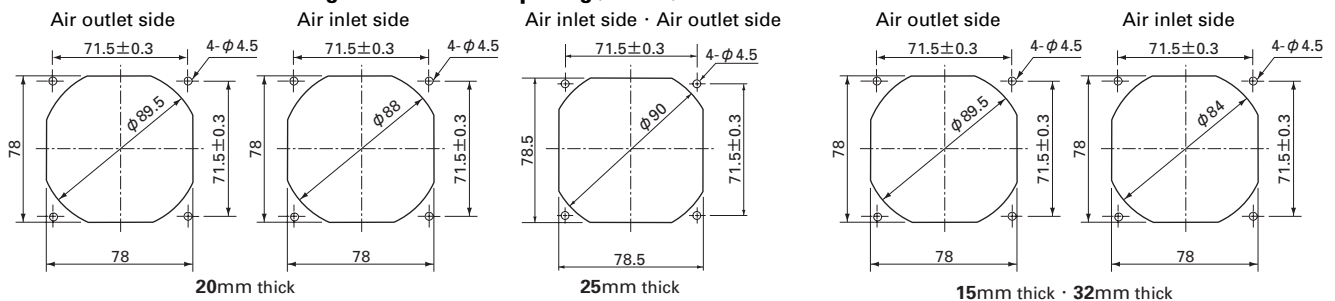
## Air Flow and Static Pressure Characteristics (25mm thick · 32mm thick)



## Dimensions (unit : mm)



## Reference dimension of mounting holes and vent opening (unit : mm)



## DC Fan

□ **80mm**  
San Ace 80



ECO PRODUCTS



### "San Ace 80" G Type

#### General specifications

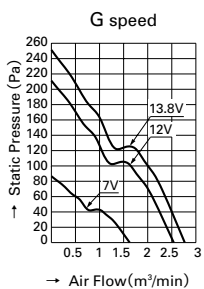
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ...Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....170g

### 38mm thick Specifications

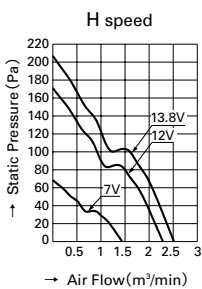
| Model No.               | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9G0812G102(1021)</b> | 12                | 7 ~ 13.8                    | 1.1               | 13.2            | 6,300                            | 2.55 90                              | 211 0.847                                   | 51             | -10 ~ +70                        | 40,000              |
| <b>9G0812H102(1021)</b> |                   |                             | 0.9               | 10.8            | 5,700                            | 2.28 80                              | 171 0.687                                   | 49             |                                  |                     |
| <b>9G0824G102(1021)</b> | 24                | 20.4~27.6                   | 0.56              | 13.4            | 6,300                            | 2.55 90                              | 211 0.847                                   | 51             |                                  |                     |
| <b>9G0824H102(1021)</b> |                   |                             | 0.42              | 10.1            | 5,700                            | 2.28 80                              | 171 0.687                                   | 49             |                                  |                     |
| <b>9G0848G102(1021)</b> | 48                | 40.8~55.2                   | 0.27              | 13.0            | 6,300                            | 2.55 90                              | 211 0.847                                   | 51             |                                  |                     |
| <b>9G0848H102(1021)</b> |                   |                             | 0.20              | 9.6             | 5,700                            | 2.28 80                              | 171 0.687                                   | 49             |                                  |                     |

The numbers in ( ) represent ribless models.

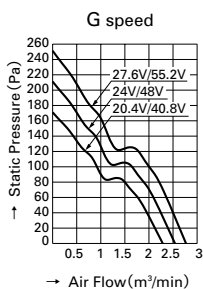
#### Air Flow and Static Pressure Characteristics



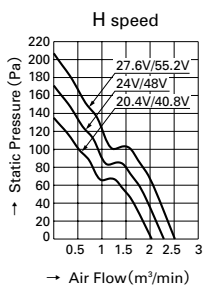
**9G0812G102(1021)**



**9G0812H102(1021)**



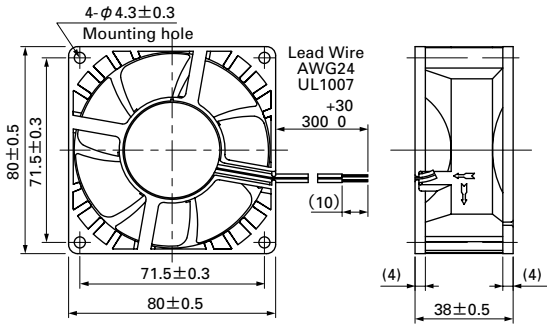
**9G0824G102(1021)**  
**9G0848G102(1021)**



**9G0824H102(1021)**  
**9G0848H102(1021)**

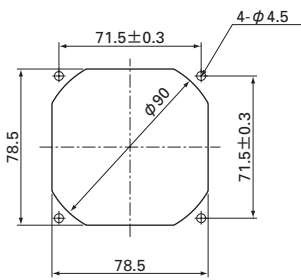
80mm

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# DC Fan

## 92mm San Ace 92



### General specifications

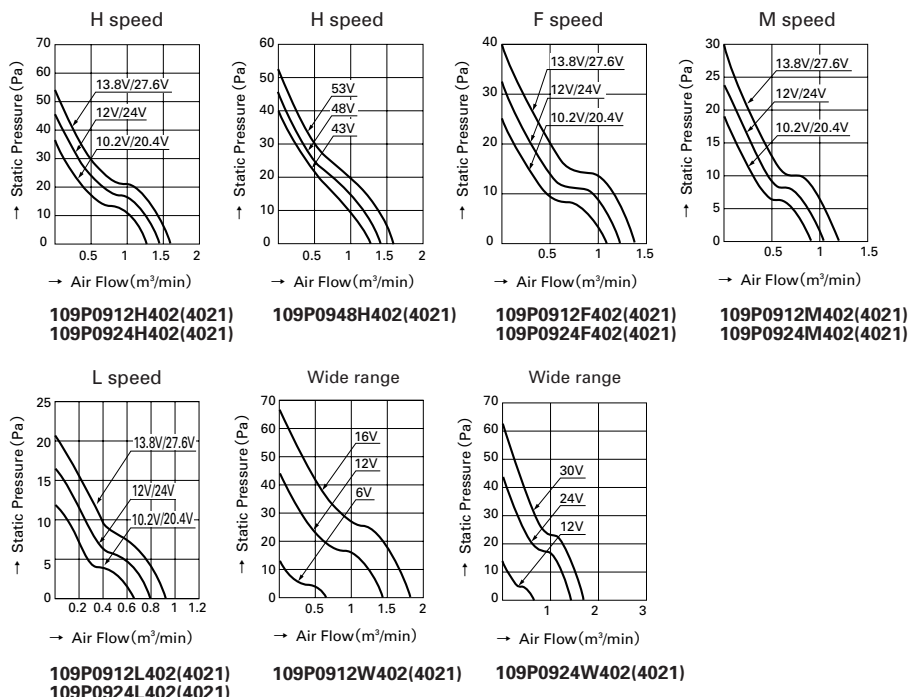
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System .....PTC protection system (25mm thick)  
Current cut system (32mm thick)  
(with reverse-connection protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....A, S, H, F, W speeds      ⊕red, ⊖black  
M, L speeds                                    ⊕red, ⊖black or blue
- Mass .....150g (25mm thick)    170g (32mm thick)

### 25mm thick Specifications

| Model No.                 | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P0912H402(4021)</b> | 12                | 10.2~13.8                   | 0.21              | 2.52            | 2,850                            | 1.45 51.2                            | 45.1 0.181                                  | 33             | -10 ~ +70                        | 40,000              |
| <b>109P0912F402(4021)</b> |                   |                             | 0.14              | 1.68            | 2,450                            | 1.24 43.8                            | 32.3 0.130                                  | 30             |                                  |                     |
| <b>109P0912M402(4021)</b> |                   |                             | 0.1               | 1.2             | 2,100                            | 1.04 36.7                            | 23.5 0.094                                  | 27             |                                  |                     |
| <b>109P0912L402(4021)</b> |                   |                             | 0.07              | 0.84            | 1,700                            | 0.8 28.3                             | 16.7 0.067                                  | 23             |                                  |                     |
| <b>109P0912W402(4021)</b> |                   |                             | 0.21              | 2.52            | 2,850                            | 1.45 51.2                            | 45.1 0.181                                  | 33             |                                  |                     |
| <b>109P0924H402(4021)</b> | 24                | 20.4~27.6                   | 0.12              | 2.88            | 2,850                            | 1.45 51.2                            | 45.1 0.181                                  | 33             |                                  |                     |
| <b>109P0924F402(4021)</b> |                   |                             | 0.08              | 1.92            | 2,450                            | 1.24 43.8                            | 32.3 0.130                                  | 30             |                                  |                     |
| <b>109P0924M402(4021)</b> |                   |                             | 0.06              | 1.44            | 2,100                            | 1.04 36.7                            | 23.5 0.094                                  | 27             |                                  |                     |
| <b>109P0924L402(4021)</b> |                   |                             | 0.05              | 1.2             | 1,700                            | 0.8 28.3                             | 16.7 0.067                                  | 23             |                                  |                     |
| <b>109P0924W402(4021)</b> |                   |                             | 0.12              | 2.88            | 2,850                            | 1.45 51.2                            | 45.1 0.181                                  | 33             |                                  |                     |
| <b>109P0948H402(4021)</b> | 48                | 43 ~53                      | 0.06              | 2.88            | 2,850                            | 1.45 51.2                            | 45.1 0.181                                  | 33             |                                  |                     |

The numbers in ( ) represent ribless models. W represents wide range.

### Air Flow and Static Pressure Characteristics



92mm

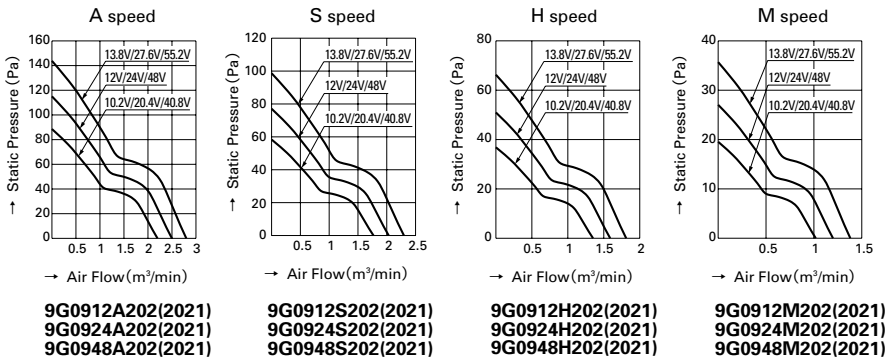
# 32mm thick

## Specifications

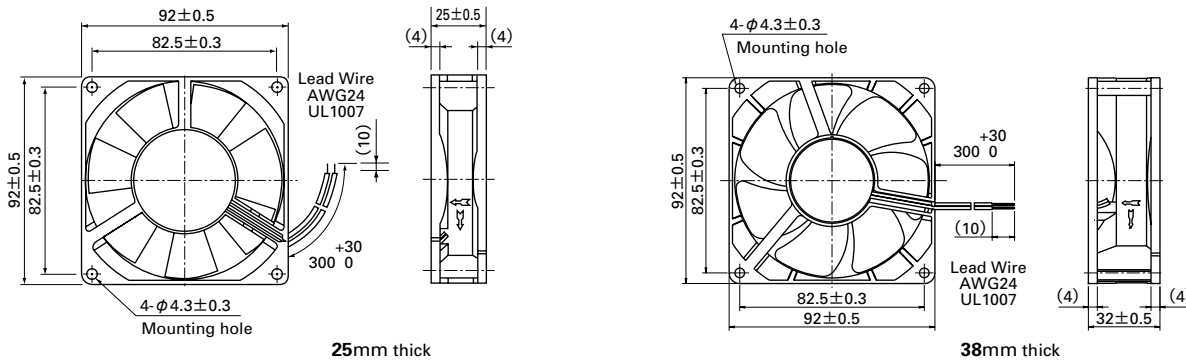
| Model No.        | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 9G0912A202(2021) | 12                | 10.2~13.8                   | 0.58              | 6.96            | 4,300                            | 2.50 88.3                            | 115 0.462                                   | 44             | -10 ~ +70                        | 40,000              |
| 9G0912S202(2021) |                   |                             | 0.38              | 4.56            | 3,500                            | 2.00 70.7                            | 77 0.309                                    | 38             |                                  |                     |
| 9G0912H202(2021) |                   |                             | 0.23              | 2.76            | 2,850                            | 1.59 56.2                            | 51 0.205                                    | 32             |                                  |                     |
| 9G0912M202(2021) |                   |                             | 0.13              | 1.56            | 2,100                            | 1.20 42.4                            | 27 0.108                                    | 25             |                                  |                     |
| 9G0924A202(2021) | 24                | 20.4~27.6                   | 0.30              | 7.20            | 4,300                            | 2.50 88.3                            | 115 0.462                                   | 44             | -10 ~ +60                        |                     |
| 9G0924S202(2021) |                   |                             | 0.19              | 4.56            | 3,500                            | 2.00 70.7                            | 77 0.309                                    | 38             |                                  |                     |
| 9G0924H202(2021) |                   |                             | 0.12              | 2.88            | 2,850                            | 1.59 56.2                            | 51 0.205                                    | 32             |                                  |                     |
| 9G0924M202(2021) |                   |                             | 0.08              | 1.92            | 2,100                            | 1.20 42.4                            | 27 0.108                                    | 25             |                                  |                     |
| 9G0948A202(2021) | 48                | 40.8~55.2                   | 0.16              | 7.68            | 4,300                            | 2.50 88.3                            | 115 0.462                                   | 44             | -10 ~ +70                        |                     |
| 9G0948S202(2021) |                   |                             | 0.11              | 5.28            | 3,500                            | 2.00 70.7                            | 77 0.309                                    | 38             |                                  |                     |
| 9G0948H202(2021) |                   |                             | 0.08              | 3.84            | 2,850                            | 1.59 56.2                            | 51 0.205                                    | 32             |                                  |                     |
| 9G0948M202(2021) |                   |                             | 0.05              | 2.40            | 2,100                            | 1.20 42.4                            | 27 0.108                                    | 25             |                                  |                     |

The numbers in ( ) represent ribless models.

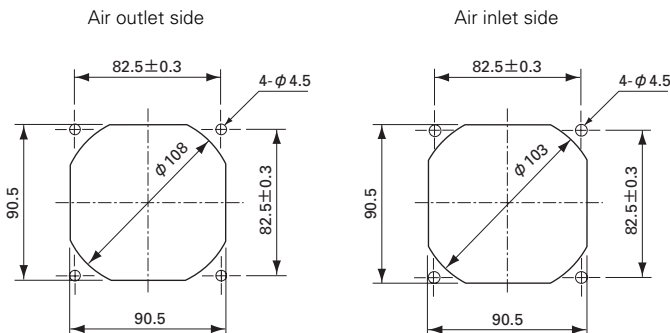
### Air Flow and Static Pressure Characteristics



### Dimensions (unit : mm)



### Reference dimension of mounting holes and vent opening (unit : mm)



# DC Fan

## 92mm San Ace 92



### "San Ace 92" G Type

#### General specifications

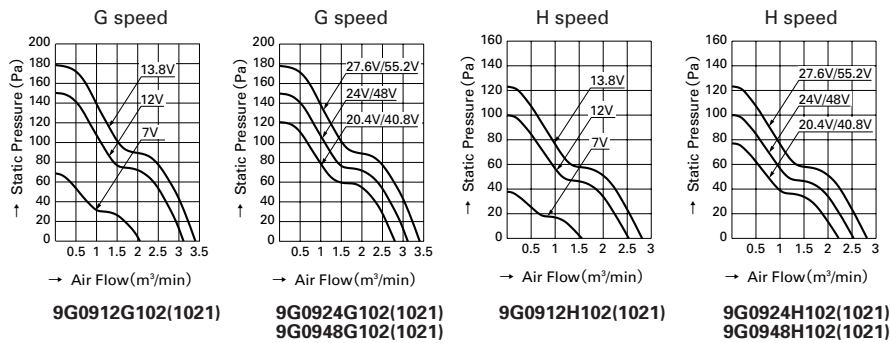
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....180g

### 38mm thick Specifications

| Model No.               | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9G0912G102(1021)</b> | 12                | 7.0~13.8                    | 1.1               | 13.2            | 5,000                            | 3.10 110                             | 150 0.602                                   | 50             | -10 ~ +60                        | 40,000              |
| <b>9G0912H102(1021)</b> |                   |                             | 0.58              | 6.96            | 4,000                            | 2.54 90                              | 100 0.402                                   | 43             |                                  |                     |
| <b>9G0924G102(1021)</b> | 24                | 20.4~27.6                   | 0.55              | 13.2            | 5,000                            | 3.10 110                             | 150 0.602                                   | 50             |                                  |                     |
| <b>9G0924H102(1021)</b> |                   |                             | 0.3               | 7.2             | 4,000                            | 2.54 90                              | 100 0.402                                   | 43             |                                  |                     |
| <b>9G0948G102(1021)</b> | 48                | 40.8~55.2                   | 0.27              | 12.96           | 5,000                            | 3.10 110                             | 150 0.602                                   | 50             |                                  |                     |
| <b>9G0948H102(1021)</b> |                   |                             | 0.16              | 7.68            | 4,000                            | 2.54 90                              | 100 0.402                                   | 43             |                                  |                     |

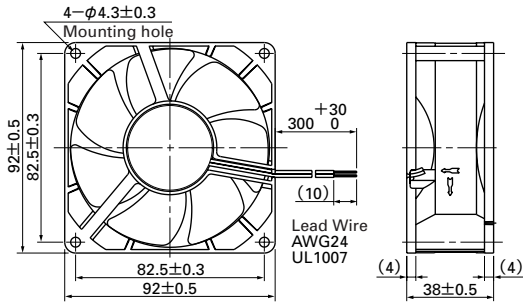
The numbers in ( ) represent ribless models.

### Air Flow and Static Pressure Characteristics

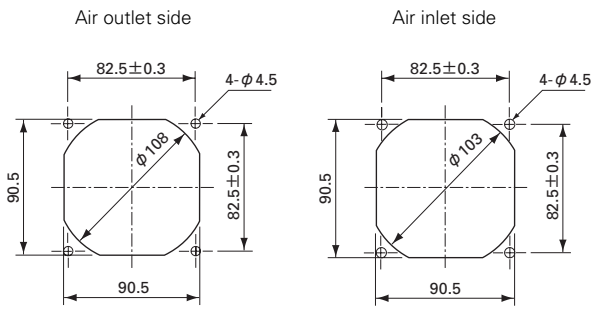


92mm

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



# DC Fan

## 120mm San Ace 120



### General specifications

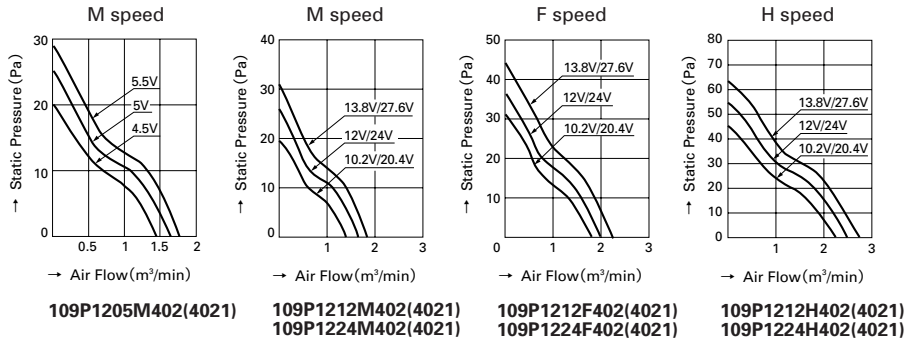
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....H, F, MH speeds ⊕red,⊖black  
 M speed ⊕red,⊖black or blue  
 Control lead , brown
- Mass .....210g (25mm thick) 260g (38mm thick)

### 25mm thick Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P1205M402(4021) | 5                 | 4.5~ 5.5                    | 0.42              | 2.1             | 1,850                            | 1.66 58.6                            | 25.5 0.102                                  | 29             | -10 ~ +70                        | 40,000              |
| 109P1212H402(4021) |                   |                             | 0.45              | 5.4             | 2,800                            | 2.5 88.2                             | 53.9 0.216                                  | 40             |                                  |                     |
| 109P1212F402(4021) | 12                | 10.2~13.8                   | 0.25              | 3               | 2,300                            | 1.98 70                              | 36.3 0.146                                  | 35             | -10 ~ +70                        |                     |
| 109P1212M402(4021) |                   |                             | 0.14              | 1.68            | 1,850                            | 1.66 58.6                            | 25.5 0.102                                  | 29             | -10 ~ +70                        |                     |
| 109P1224H402(4021) | 24                | 20.4~27.6                   | 0.24              | 5.76            | 2,800                            | 2.5 88.2                             | 53.9 0.216                                  | 40             | -10 ~ +60                        |                     |
| 109P1224F402(4021) |                   |                             | 0.12              | 2.88            | 2,300                            | 1.98 70                              | 36.3 0.146                                  | 35             | -10 ~ +70                        |                     |
| 109P1224M402(4021) |                   |                             | 0.09              | 2.16            | 1,850                            | 1.66 58.6                            | 25.5 0.102                                  | 29             | -10 ~ +70                        |                     |

The numbers in ( ) represent ribless models.

### Air Flow and Static Pressure Characteristics

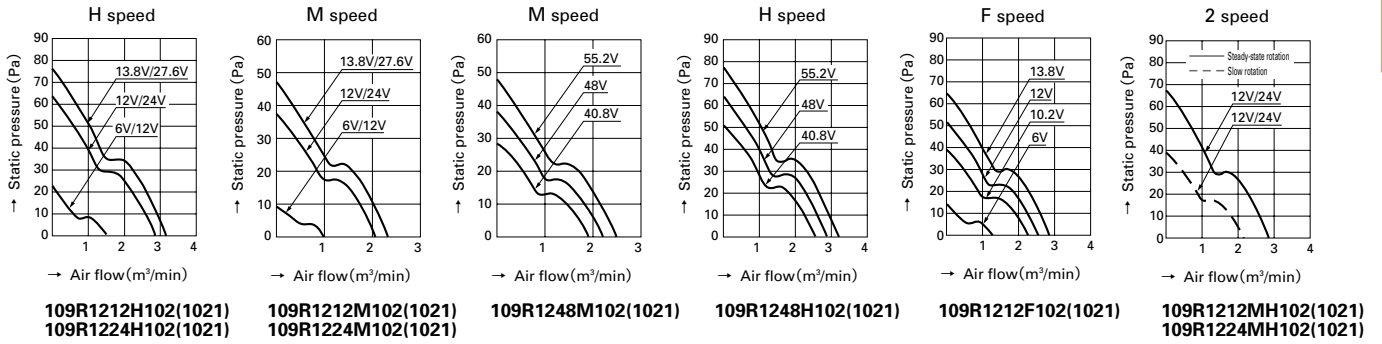


### 38mm thick Specifications

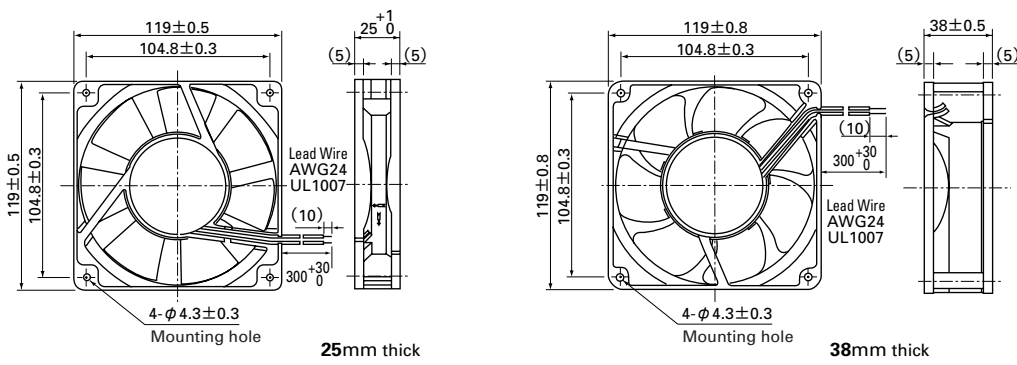
| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109R1212H102(1021)  | 12                | 6 ~ 13.8                    | 0.52              | 6.24            | 2,600                            | 2.9 102.3                            | 64.7 0.260                                  | 39             | -10 ~ +60                        | 40,000              |
| 109R1212F102(1021)  |                   |                             | 0.32              | 3.84            | 2,280                            | 2.56 90.4                            | 51.0 0.205                                  | 37             |                                  |                     |
| 109R1212M102(1021)  |                   |                             | 0.24              | 2.88            | 1,950                            | 2.2 77.6                             | 38.2 0.153                                  | 32             | -10 ~ +70                        |                     |
| 109R1212MH102(1021) |                   |                             | Slow:10.2~13.8    | 0.32            | 3.84                             | 1,950                                | 2.2 77.6                                    | 38.2 0.153     |                                  |                     |
| 109R1224H102(1021)  | 24                | 12 ~ 27.6                   | 0.25              | 6.0             | 2,600                            | 2.9 102.3                            | 64.7 0.260                                  | 39             | -10 ~ +60                        |                     |
| 109R1224M102(1021)  |                   |                             | 0.12              | 2.88            | 1,950                            | 2.2 77.6                             | 38.2 0.153                                  | 32             |                                  |                     |
| 109R1224MH102(1021) |                   |                             | Slow:20.4~27.6    | 0.20            | 4.8                              | 1,950                                | 2.2 77.6                                    | 38.2 0.153     | 32                               |                     |
|                     |                   |                             | Fast:20.4~27.6    | 0.28            | 6.72                             | 2,600                                | 2.9 102.3                                   | 64.7 0.260     | 39                               |                     |
| 109R1248H102(1021)  | 48                | 40.8~55.2                   | 0.15              | 7.2             | 2,600                            | 2.9 102.3                            | 64.7 0.260                                  | 39             | -10 ~ +60                        |                     |
| 109R1248M102(1021)  |                   |                             | 0.08              | 3.84            | 1,950                            | 2.2 77.6                             | 38.2 0.153                                  | 32             |                                  |                     |

The numbers in ( ) represent ribless models.MH represent two-speed.

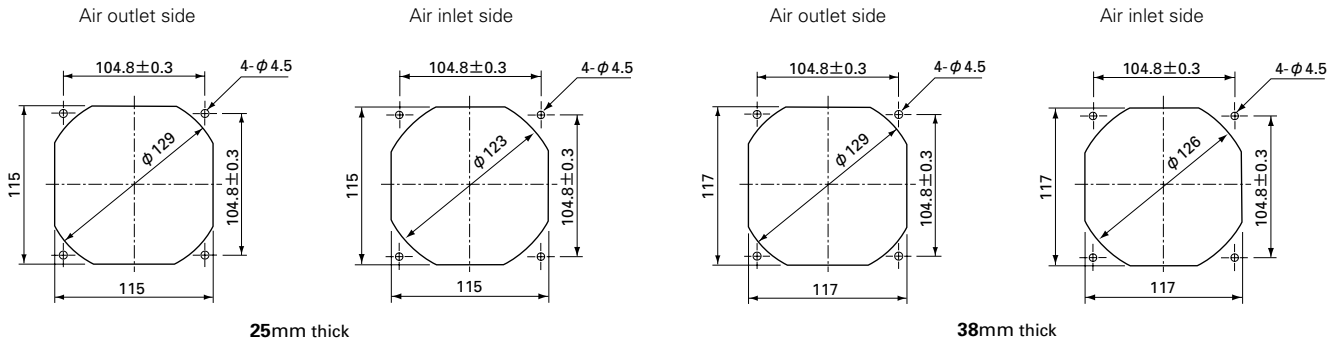
### Air Flow and Static Pressure Characteristics



### Dimensions (unit : mm)



### Reference dimension of mounting holes and vent opening (unit : mm)



## DC Fan

# 120mm

## San Ace 120



### "San Ace 120" G type

#### General specifications

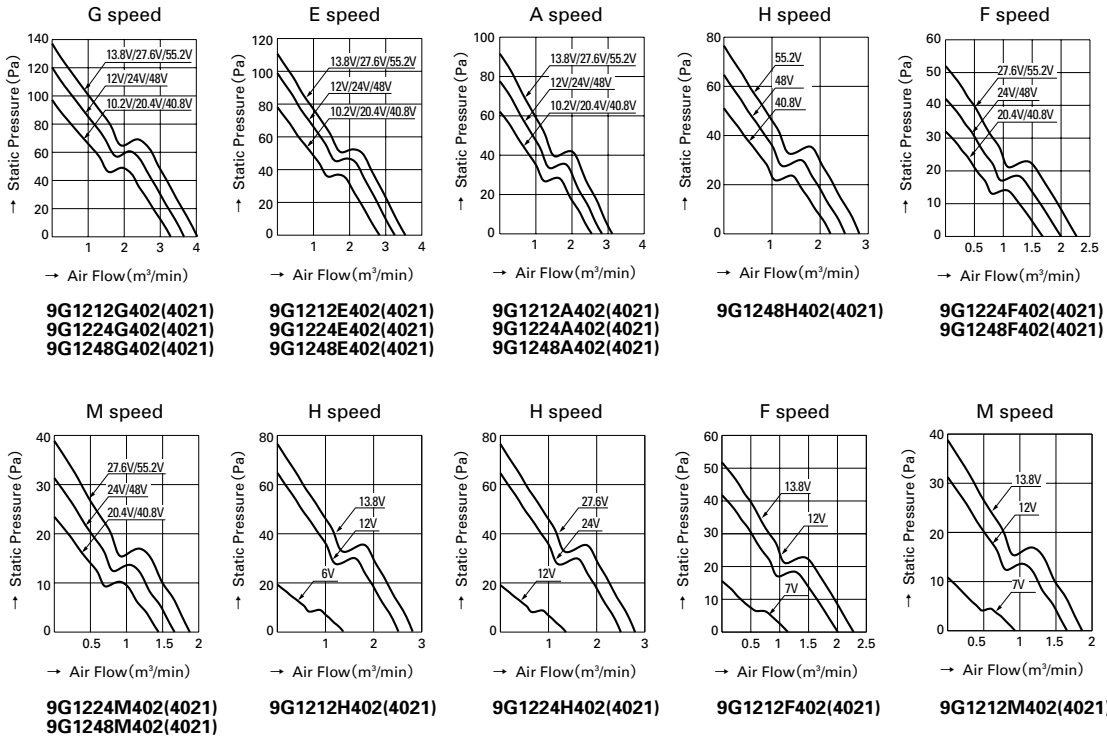
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....G, E, A, H, F speeds ⊕red,⊖black  
M speed ⊕red,⊖black or blue
- Mass .....240g

### 25mm thick Specifications

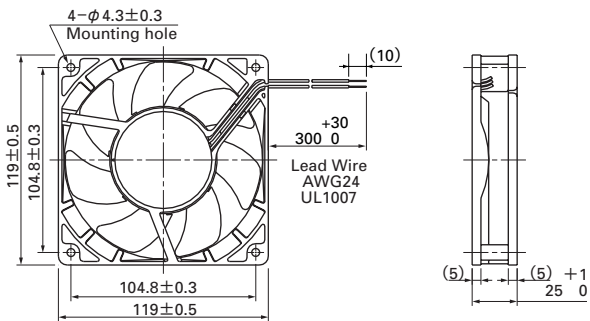
| Model No.               | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9G1212G402(4021)</b> | 12                | 10.2~13.8                   | 0.90              | 10.8            | 4,100                            | 3.68 130                             | 120 0.482                                   | 51             | -10 ~ +70                        | 40,000              |
| <b>9G1212E402(4021)</b> |                   |                             | 0.58              | 6.96            | 3,650                            | 3.25 115                             | 98 0.394                                    | 48             |                                  |                     |
| <b>9G1212A402(4021)</b> |                   |                             | 0.40              | 4.80            | 3,150                            | 2.83 100                             | 77 0.309                                    | 44             |                                  |                     |
| <b>9G1212H402(4021)</b> |                   | 6 ~13.8                     | 0.31              | 3.72            | 2,850                            | 2.50 88                              | 64 0.257                                    | 40             |                                  |                     |
| <b>9G1212F402(4021)</b> |                   | 7 ~13.8                     | 0.19              | 2.28            | 2,250                            | 1.98 70                              | 42 0.169                                    | 35             |                                  |                     |
| <b>9G1212M402(4021)</b> |                   |                             | 0.14              | 1.68            | 1,950                            | 1.66 58                              | 31 0.124                                    | 29             |                                  |                     |
| <b>9G1224G402(4021)</b> | 24                | 20.4~27.6                   | 0.47              | 11.28           | 4,100                            | 3.68 130                             | 120 0.482                                   | 51             |                                  |                     |
| <b>9G1224E402(4021)</b> |                   |                             | 0.37              | 8.88            | 3,650                            | 3.25 115                             | 98 0.394                                    | 48             |                                  |                     |
| <b>9G1224A402(4021)</b> |                   |                             | 0.21              | 5.04            | 3,150                            | 2.83 100                             | 77 0.309                                    | 44             |                                  |                     |
| <b>9G1224H402(4021)</b> |                   | 12 ~27.6                    | 0.17              | 4.08            | 2,850                            | 2.50 88                              | 64 0.257                                    | 40             |                                  |                     |
| <b>9G1224F402(4021)</b> |                   | 20.4~27.6                   | 0.10              | 2.40            | 2,250                            | 1.98 70                              | 42 0.169                                    | 35             |                                  |                     |
| <b>9G1224M402(4021)</b> |                   |                             | 0.08              | 1.92            | 1,950                            | 1.66 58                              | 31 0.124                                    | 29             |                                  |                     |
| <b>9G1248G402(4021)</b> | 48                | 40.8~55.2                   | 0.23              | 11.04           | 4,100                            | 3.68 130                             | 120 0.482                                   | 51             |                                  |                     |
| <b>9G1248E402(4021)</b> |                   |                             | 0.16              | 7.68            | 3,650                            | 3.25 115                             | 98 0.394                                    | 48             |                                  |                     |
| <b>9G1248A402(4021)</b> |                   |                             | 0.13              | 6.24            | 3,150                            | 2.83 100                             | 77 0.309                                    | 44             |                                  |                     |
| <b>9G1248H402(4021)</b> |                   |                             | 0.10              | 4.80            | 2,850                            | 2.50 88                              | 64 0.257                                    | 40             |                                  |                     |
| <b>9G1248F402(4021)</b> |                   |                             | 0.06              | 2.88            | 2,250                            | 1.98 70                              | 42 0.169                                    | 35             |                                  |                     |
| <b>9G1248M402(4021)</b> |                   |                             | 0.05              | 2.40            | 1,950                            | 1.66 58                              | 31 0.124                                    | 29             |                                  |                     |

The numbers in ( ) represent ribless models.

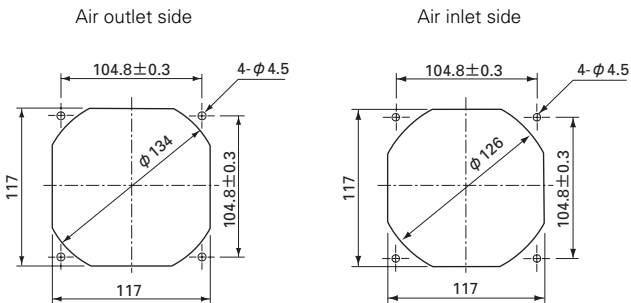
### Air Flow and Static Pressure Characteristics



### Dimensions (unit : mm)



### Reference dimension of mounting holes and vent opening (unit : mm)



## DC Fan

# 120mm

## San Ace 120



## "San Ace 120" G type

## General specifications

|                             |   |
|-----------------------------|---|
| Material                    | Frame, Impeller:Plastics  |
| Life Expectancy             | Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state) |
| Motor Protection System     | Current blocking function (with reverse polarity protection)  |
| Dielectric Strength         | 50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)   |
| Noise Measurement Method    | Measured at 1m from the air inlet   |
| Operating Temperature Range | Varies for each model (Non-condensing)  |
| Lead Wire                   | G, E, H, F speeds ⊕red, ⊖black<br>M speed ⊕red, ⊖black or blue  |
| Mass                        | 330g  |

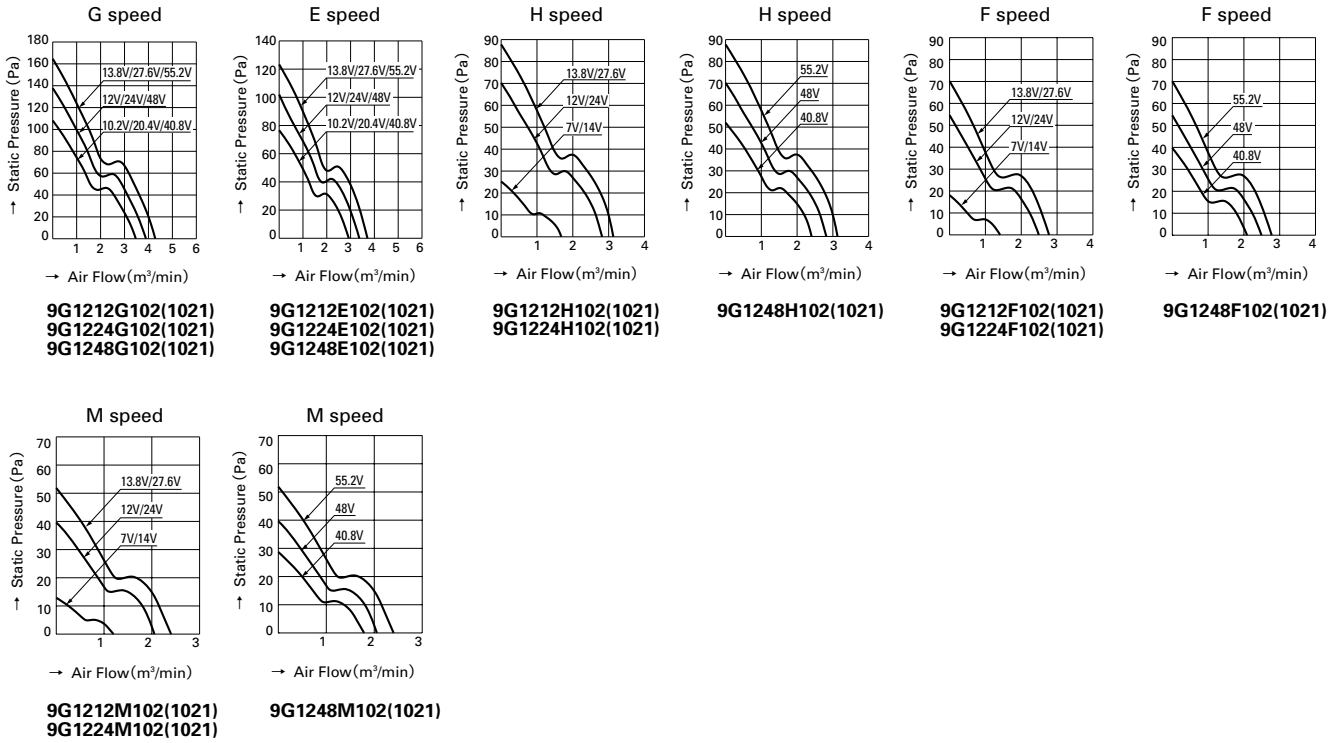
## 38mm thick

### Specifications

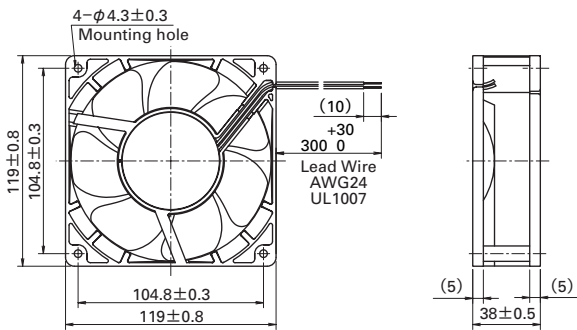
| Model No.               | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) |     | Static Pressure (Pa) (inchH <sub>2</sub> O) |       | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|-----|---|-------|----------------|----------------------------------|---------------------|
| <b>9G1212G102(1021)</b> | 12                | 10.2~13.8                   | 0.98              | 11.76           | 3,600                            | 3.88                                 | 137 | 135   | 0.542 | 49             | -10 ~ +70                        | 40,000              |
| <b>9G1212E102(1021)</b> |                   |                             | 0.61              | 7.32            | 3,100                            | 3.34                                 | 118 | 100   | 0.402 | 46             |                                  |                     |
| <b>9G1212H102(1021)</b> |                   | 7 ~13.8                     | 0.38              | 4.56            | 2,600                            | 2.80                                 | 99  | 70.4  | 0.283 | 39             |                                  |                     |
| <b>9G1212F102(1021)</b> |                   |                             | 0.28              | 3.36            | 2,280                            | 2.45                                 | 87  | 54.2  | 0.218 | 36             |                                  |                     |
| <b>9G1212M102(1021)</b> |                   |                             | 0.21              | 2.52            | 1,950                            | 2.10                                 | 74  | 39.6  | 0.159 | 32             |                                  |                     |
| <b>9G1224G102(1021)</b> | 24                | 20.4~27.6                   | 0.50              | 12              | 3,600                            | 3.88                                 | 137 | 135   | 0.542 | 49             |                                  |                     |
| <b>9G1224E102(1021)</b> |                   |                             | 0.34              | 8.16            | 3,100                            | 3.34                                 | 118 | 100   | 0.402 | 46             |                                  |                     |
| <b>9G1224H102(1021)</b> |                   | 14 ~27.6                    | 0.22              | 5.28            | 2,600                            | 2.80                                 | 99  | 70.4  | 0.283 | 39             |                                  |                     |
| <b>9G1224F102(1021)</b> |                   |                             | 0.16              | 3.84            | 2,280                            | 2.45                                 | 87  | 54.2  | 0.218 | 36             |                                  |                     |
| <b>9G1224M102(1021)</b> |                   |                             | 0.11              | 2.64            | 1,950                            | 2.10                                 | 74  | 39.6  | 0.159 | 32             |                                  |                     |
| <b>9G1248G102(1021)</b> | 48                | 40.8~55.2                   | 0.25              | 12              | 3,600                            | 3.88                                 | 137 | 135   | 0.542 | 49             |                                  |                     |
| <b>9G1248E102(1021)</b> |                   |                             | 0.17              | 8.16            | 3,100                            | 3.34                                 | 118 | 100   | 0.402 | 46             |                                  |                     |
| <b>9G1248H102(1021)</b> |                   |                             | 0.11              | 5.28            | 2,600                            | 2.80                                 | 99  | 70.4  | 0.283 | 39             |                                  |                     |
| <b>9G1248F102(1021)</b> |                   |                             | 0.09              | 4.32            | 2,280                            | 2.45                                 | 87  | 54.2  | 0.218 | 36             |                                  |                     |
| <b>9G1248M102(1021)</b> |                   |                             | 0.07              | 3.36            | 1,950                            | 2.10                                 | 74  | 39.6  | 0.159 | 32             |                                  |                     |

The numbers in ( ) represent ribless models.

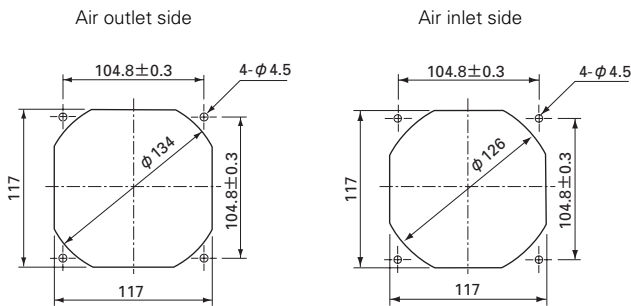
### Air Flow and Static Pressure Characteristics



### Dimensions (unit : mm)



### Reference dimension of mounting holes and vent opening (unit : mm)



## DC Fan

□ **120mm**  
San Ace 120



"San Ace 120" SG type

### General specifications

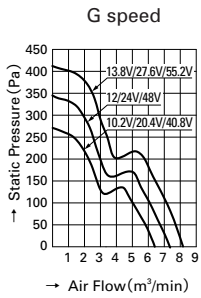


Material .....Frame : Aluminum, Impeller : Plastics  
 Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
 rated voltage, and continuously run in a free air state)  
 Motor Protection System ....Current blocking function (with reverse polarity protection)  
 Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)  
 Noise Measurement Method ...Measured at 1m from the air inlet  
 Operating Temperature Range ....Varies for each model (Non-condensing)  
 Lead Wire .....⊕red, ⊖black  
 Mass .....400g

### 38mm thick Specifications

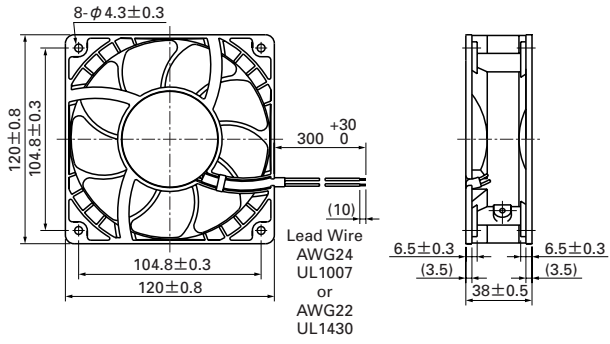
| Model No.          | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9SG1212G102</b> | 12                | 10.2~13.8                   | 4.0               | 48.0            | 6,000                            | 7.35 260                             | 340 1.37                                    | 64             | -10 ~ +70                        | 40,000              |
| <b>9SG1224G102</b> | 24                | 20.4~27.6                   | 2.0               | 48.0            | 6,000                            | 7.35 260                             | 340 1.37                                    | 64             |                                  |                     |
| <b>9SG1248G102</b> | 48                | 40.8~55.2                   | 1.0               | 48.0            | 6,000                            | 7.35 260                             | 340 1.37                                    | 64             |                                  |                     |

### Air Flow and Static Pressure Characteristics

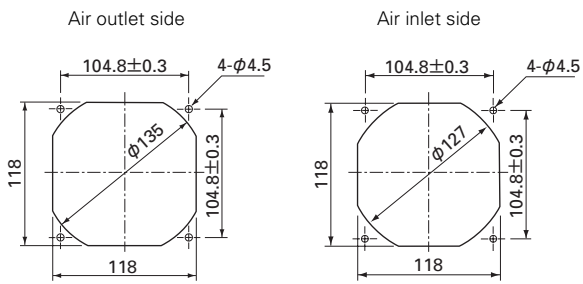


**9SG1212G102**  
**9SG1224G102**  
**9SG1248G102**

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



## DC Fan

# 127mm

### San Ace 127



### General specifications

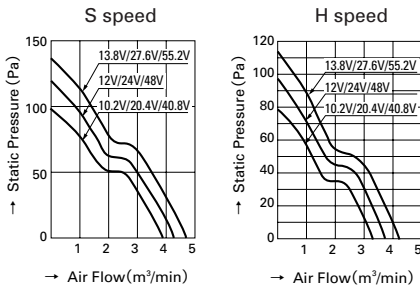
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ...Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....350g

### 38mm thick Specifications

| Model No.                 | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P1312S102(1021)</b> | 12                | 10.2~13.8                   | 1.3               | 15.6            | 3,300                            | 4.2 148                              | 117.6 0.472                                 | 47             | -10 ~ +60                        | 40,000              |
| <b>109P1312H102(1021)</b> |                   |                             | 0.82              | 9.84            | 2,950                            | 3.8 134                              | 98 0.394                                    | 45             |                                  |                     |
| <b>109P1324S102(1021)</b> | 24                | 20.4~27.6                   | 0.55              | 13.2            | 3,300                            | 4.2 148                              | 117.6 0.472                                 | 47             |                                  |                     |
| <b>109P1324H102(1021)</b> |                   |                             | 0.41              | 9.84            | 2,950                            | 3.8 134                              | 98 0.394                                    | 45             |                                  |                     |
| <b>109P1348S102(1021)</b> | 48                | 40.8~55.2                   | 0.3               | 14.4            | 3,300                            | 4.2 148                              | 117.6 0.472                                 | 47             |                                  |                     |
| <b>109P1348H102(1021)</b> |                   |                             | 0.2               | 9.6             | 2,950                            | 3.8 134                              | 98 0.394                                    | 45             |                                  |                     |

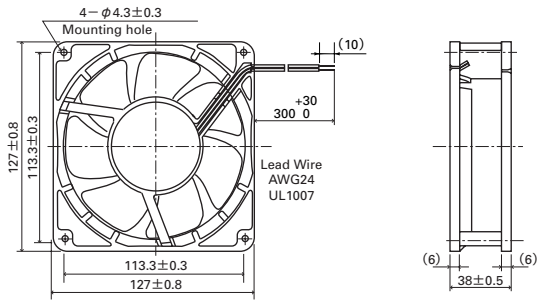
The numbers in ( ) represent ribless models.

### Air Flow and Static Pressure Characteristics

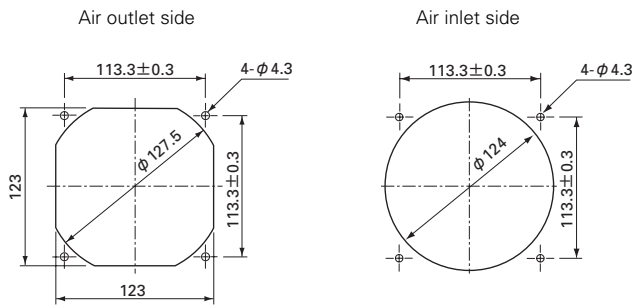


- |                            |                            |
|----------------------------|----------------------------|
| <b>109P1312S102 (1021)</b> | <b>109P1312H102 (1021)</b> |
| <b>109P1324S102 (1021)</b> | <b>109P1324H102 (1021)</b> |
| <b>109P1348S102 (1021)</b> | <b>109P1348H102 (1021)</b> |

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



# DC Fan

# 127mm San Ace 127



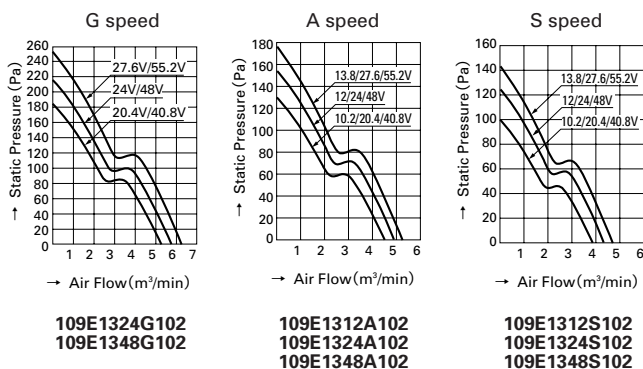
### General specifications

- Material ······Frame, Aluminum, impeller:Plastics
- Life Expectancy ······Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ····Current blocking function (with reverse polarity protection)
- Dielectric Strength ······50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ···Measured at 1m from the air inlet
- Operating Temperature Range ····Varies for each model (Non-condensing)
- Lead Wire ··········⊕red,⊖black
- Mass ············400g

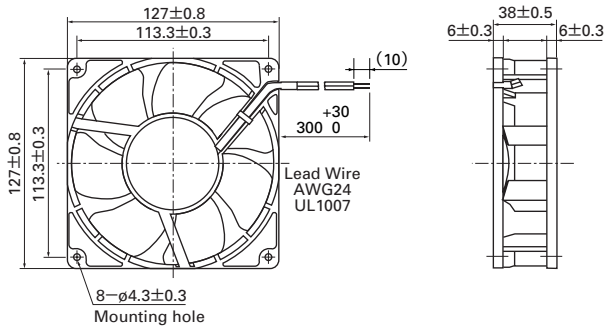
### 38mm thick Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109E1312A102</b> | 12                | 10.2~13.8                   | 1.4               | 16.8            | 3,850                            | 4.81 170                             | 155 0.622                                   | 52             | -10 ~ +70                        | 40,000              |
| <b>109E1312S102</b> |                   |                             | 1.2               | 14.4            | 3,450                            | 4.37 154                             | 125 0.502                                   | 49             |                                  |                     |
| <b>109E1324G102</b> | 24                | 20.4~27.6                   | 1.1               | 25.1            | 4,550                            | 5.66 200                             | 216 0.867                                   | 57             | -10 ~ +60                        |                     |
| <b>109E1324A102</b> |                   |                             | 0.7               | 16.8            | 3,850                            | 4.81 170                             | 155 0.622                                   | 52             |                                  |                     |
| <b>109E1324S102</b> |                   |                             | 0.53              | 12.7            | 3,450                            | 4.37 154                             | 125 0.502                                   | 49             |                                  |                     |
| <b>109E1348G102</b> | 48                | 40.8~55.2                   | 0.54              | 25.9            | 4,550                            | 5.66 200                             | 216 0.867                                   | 57             | -10 ~ +60                        |                     |
| <b>109E1348A102</b> |                   |                             | 0.36              | 17.3            | 3,850                            | 4.81 170                             | 155 0.622                                   | 52             |                                  |                     |
| <b>109E1348S102</b> |                   |                             | 0.28              | 13.4            | 3,450                            | 4.37 154                             | 125 0.502                                   | 49             |                                  |                     |

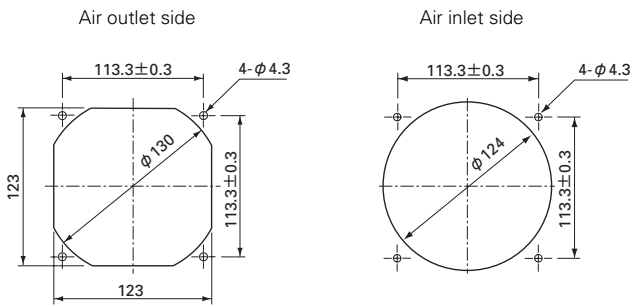
### Air Flow and Static Pressure Characteristics



**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



# DC Fan

# 140mm

## San Ace 140



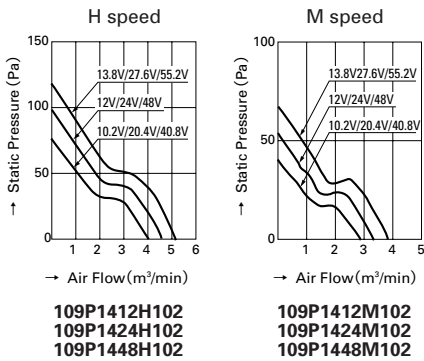
### General specifications

- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ...Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....H speed ⊕red,⊖black  
M speed ⊕red,⊖black or blue
- Mass .....450g

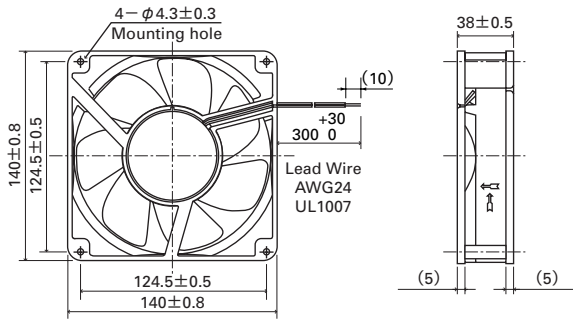
### 38mm thick Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P1412H102</b> | 12                | 10.2~13.8                   | 0.73              | 8.76            | 2,600                            | 4.5 159                              | 94 0.378                                    | 46             | -10~+70                          | 40,000              |
| <b>109P1412M102</b> |                   |                             | 0.33              | 3.96            | 1,900                            | 3.3 117                              | 52 0.209                                    | 38             |                                  |                     |
| <b>109P1424H102</b> | 24                | 20.4~27.6                   | 0.37              | 8.88            | 2,600                            | 4.5 159                              | 94 0.378                                    | 46             |                                  |                     |
| <b>109P1424M102</b> |                   |                             | 0.16              | 3.84            | 1,900                            | 3.3 117                              | 52 0.209                                    | 38             |                                  |                     |
| <b>109P1448H102</b> | 48                | 40.8~55.2                   | 0.2               | 9.6             | 2,600                            | 4.5 159                              | 94 0.378                                    | 46             |                                  |                     |
| <b>109P1448M102</b> |                   |                             | 0.09              | 4.32            | 1,900                            | 3.3 117                              | 52 0.209                                    | 38             |                                  |                     |

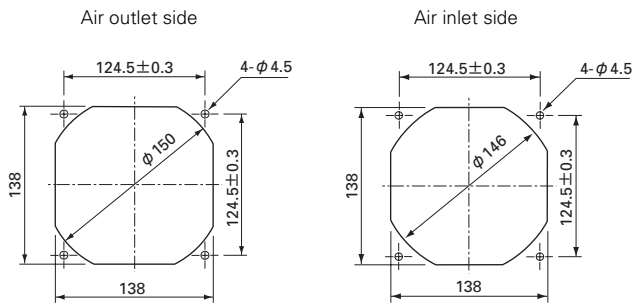
### Air Flow and Static Pressure Characteristics



**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



## DC Fan

# 150mm

## San Ace 150



### "San Ace 150" GV Type

#### General specifications

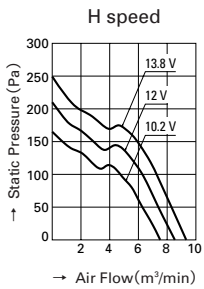
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ...Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red,⊖black
- Mass .....450g

### 50mm thick Specifications

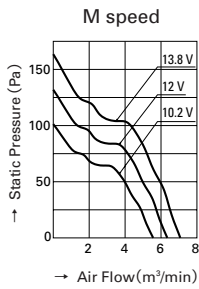
| Model No.                | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9GV1512H502(5021)</b> | 12                | 10.2~13.8                   | 2.9               | 34.8            | 3,900                            | 8.54 300                             | 210 0.84                                    | 61             | -10~+70                          | 40,000              |
| <b>9GV1512M502(5021)</b> |                   |                             | 1.2               | 14.4            | 3,000                            | 6.35 224                             | 132 0.53                                    | 53             |                                  |                     |

The numbers in ( ) represent ribless models.

#### Air Flow and Static Pressure Characteristics

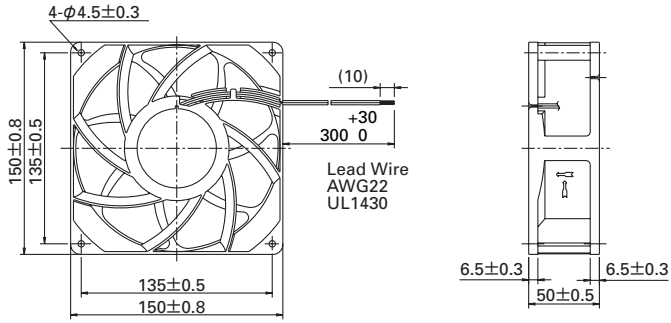


9GV1512H502(5021)

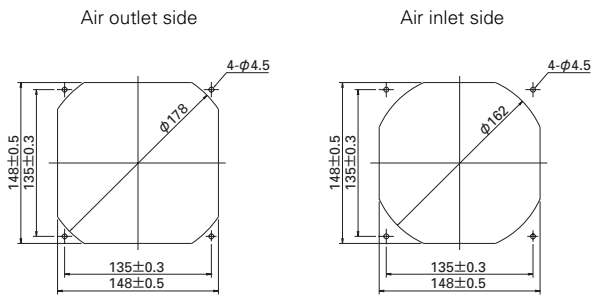


9GV1512M502(5021)

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



# DC Fan

∅172mm  
San Ace 172



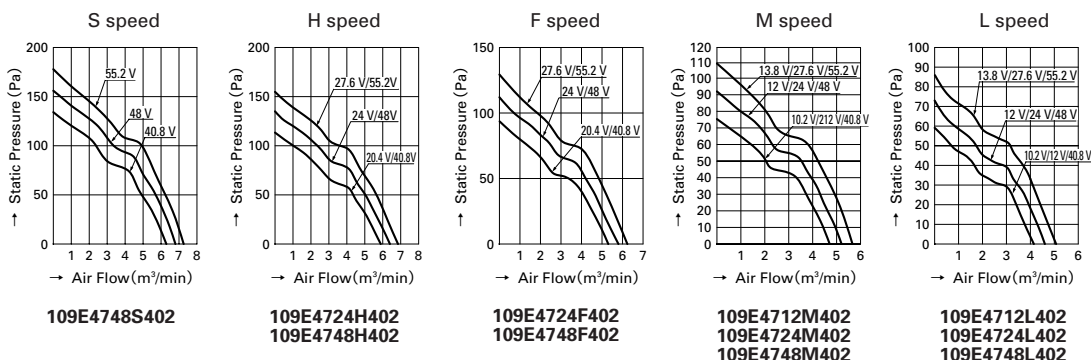
## General specifications

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....S, H, F speeds ⊕red,⊖black  
M, L speeds ⊕red,⊖black or blue
- Mass .....500g

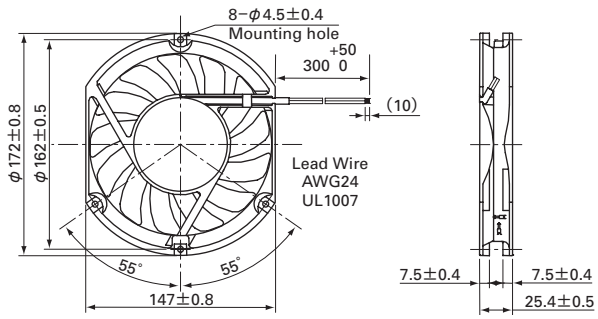
## 25mm thick (Sidecut type) Specifications

| Model No.    | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109E4712M402 | 12                | 10.2~13.8                   | 1.3               | 15.6            | 2,800                            | 5.2 183                              | 92 0.369                                    | 51             | -10 ~ +60                        | 40,000              |
| 109E4712L402 |                   |                             | 1.0               | 12.0            | 2,500                            | 4.6 162                              | 73 0.293                                    | 48             |                                  |                     |
| 109E4724H402 | 24                | 20.4~27.6                   | 1.0               | 24.0            | 3,400                            | 6.4 226                              | 135 0.542                                   | 57             |                                  |                     |
| 109E4724F402 |                   |                             | 0.79              | 19.0            | 3,100                            | 5.8 204                              | 112 0.450                                   | 54             |                                  |                     |
| 109E4724M402 |                   |                             | 0.58              | 13.9            | 2,800                            | 5.2 183                              | 92 0.369                                    | 51             |                                  |                     |
| 109E4724L402 |                   |                             | 0.44              | 10.6            | 2,500                            | 4.6 162                              | 73 0.293                                    | 48             |                                  |                     |
| 109E4748S402 | 48                | 40.8~55.2                   | 0.62              | 29.8            | 3,650                            | 6.8 240                              | 156 0.627                                   | 58             |                                  |                     |
| 109E4748H402 |                   |                             | 0.52              | 25.0            | 3,400                            | 6.4 226                              | 135 0.542                                   | 57             |                                  |                     |
| 109E4748F402 |                   |                             | 0.40              | 19.2            | 3,100                            | 5.8 204                              | 112 0.450                                   | 54             |                                  |                     |
| 109E4748M402 |                   |                             | 0.32              | 15.4            | 2,800                            | 5.2 183                              | 92 0.369                                    | 51             |                                  |                     |
| 109E4748L402 |                   |                             | 0.25              | 12.0            | 2,500                            | 4.6 162                              | 73 0.293                                    | 48             |                                  |                     |

## Air Flow and Static Pressure Characteristics

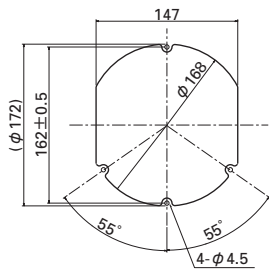


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



## DC Fan

∅**172mm**  
San Ace 172



### "San Ace 172" GV type



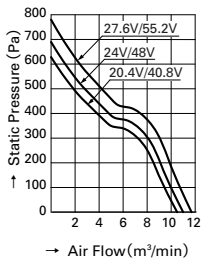
#### General specifications

- Material .....Frame : Aluminum , Impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....800g

## 51mm thick (Sidecut type) Specifications

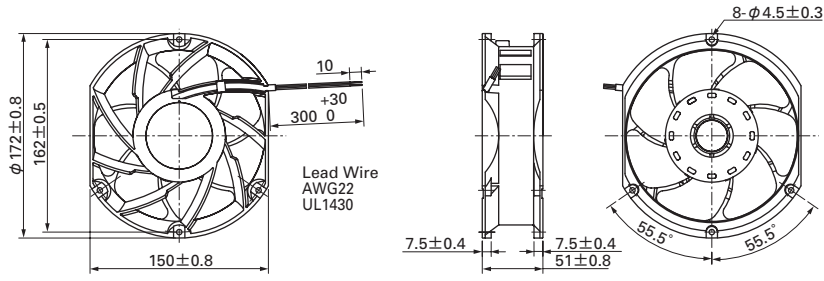
| Model No.          | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9GV5724H502</b> | 24                | 20.4~27.6                   | 4.0               | 96              | 6,300                            | 11.32 400                            | 690 2.530                                   | 74             | -10 ~ +70                        | 40,000              |
| <b>9GV5748H502</b> | 48                | 40.8~55.2                   | 2.0               | 96              |                                  |                                      |   |                |                                  |                     |

### Air Flow and Static Pressure Characteristics



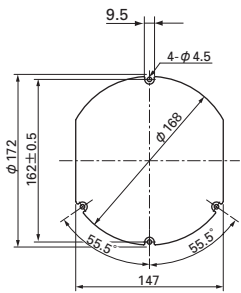
→ Air Flow(m<sup>3</sup>/min)  
**9GV5724H502**  
**9GV5748H502**

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# DC Fan

Ø172mm  
San Ace 172



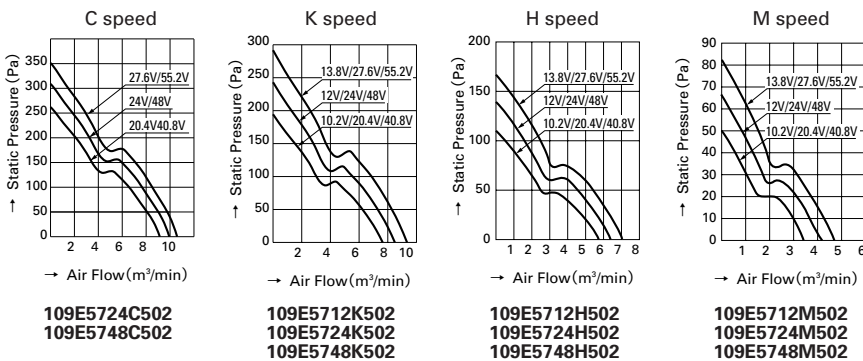
## General specifications

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....C, K, H speeds ⊕red,⊖black  
M speed ⊕red,⊖black or blue
- Mass .....760g

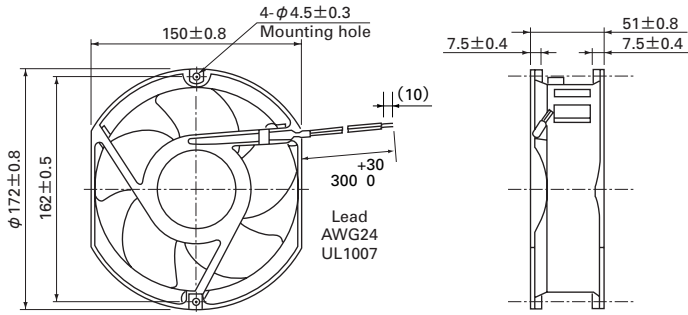
## 51 mm thick (Sidecut type) Specifications

| Model No.    | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109E5712K502 | 12                | 10.2~13.8                   | 2.9               | 34.8            | 4,100                            | 8.5 300                              | 243.0 0.976                                 | 60             | -10 ~ +60                        | 40,000              |
| 109E5712H502 |                   |                             | 1.2               | 14.4            | 3,050                            | 6.4 226                              | 137.2 0.551                                 | 52             |                                  |                     |
| 109E5712M502 |                   |                             | 0.48              | 5.76            | 2,000                            | 4.2 148                              | 67.6 0.271                                  | 41             |                                  |                     |
| 109E5724C502 | 24                | 20.4~27.6                   | 2.3               | 55.2            | 4,800                            | 9.9 350                              | 308.0 1.237                                 | 66             |                                  |                     |
| 109E5724K502 |                   |                             | 1.3               | 31.2            | 4,100                            | 8.5 300                              | 243.0 0.976                                 | 60             |                                  |                     |
| 109E5724H502 |                   |                             | 0.58              | 13.92           | 3,050                            | 6.4 226                              | 137.2 0.551                                 | 52             |                                  |                     |
| 109E5724M502 | 48                | 40.8~55.2                   | 0.2               | 4.8             | 2,000                            | 4.2 148                              | 67.6 0.271                                  | 41             |                                  |                     |
| 109E5748C502 |                   |                             | 1.2               | 57.6            | 4,800                            | 9.9 350                              | 308.0 1.237                                 | 66             |                                  |                     |
| 109E5748K502 |                   |                             | 0.7               | 33.6            | 4,100                            | 8.5 300                              | 243.0 0.976                                 | 60             |                                  |                     |
| 109E5748H502 | -10 ~ +70         | 0.28                        | 13.44             | 3,050           | 6.4 226                          | 137.2 0.551                          | 52  |                |                                  |                     |
| 109E5748M502 |                   | 0.11                        | 5.28              | 2,000           | 4.2 148                          | 67.6 0.271                           | 41  |                |                                  |                     |

## Air Flow and Static Pressure Characteristics

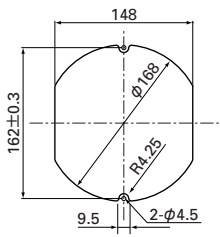


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# DC Fan

∅172mm  
San Ace 172



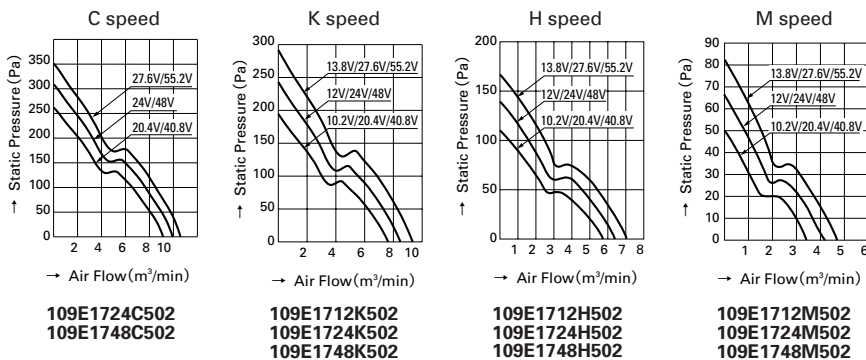
## General specifications

- Material ······Frame:Aluminum, Impeller:Plastics
- Life Expectancy ······Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ······Current blocking function (with reverse polarity protection)
- Dielectric Strength ······50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ···Measured at 1m from the air inlet
- Operating Temperature Range ···Varies for each model (Non-condensing)
- Lead Wire ············C, K, H speeds ⊕red,⊖black  
M speed ⊕red,⊖black or blue
- Mass ················780g

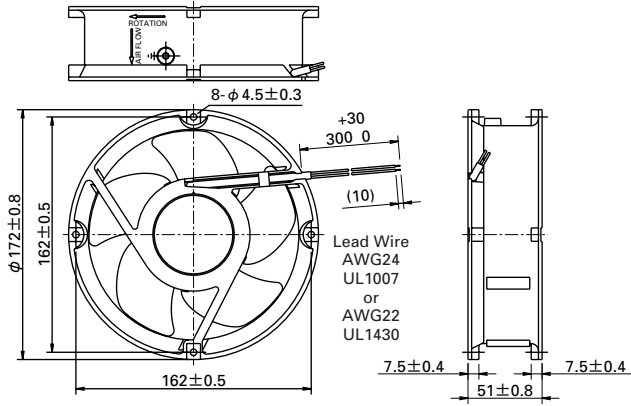
## 51mm thick (Round type) Specifications

| Model No.    | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109E1712K502 | 12                | 10.2~13.8                   | 2.9               | 34.8            | 4,100                            | 8.5 300                              | 243.0 0.976                                 | 55             | -10 ~ +60                        | 40,000              |
| 109E1712H502 |                   |                             | 1.2               | 14.4            | 3,050                            | 6.4 226                              | 137.2 0.551                                 | 47             |                                  |                     |
| 109E1712M502 |                   |                             | 0.48              | 5.76            | 2,000                            | 4.2 148                              | 67.6 0.271                                  | 36             |                                  |                     |
| 109E1724C502 | 24                | 20.4~27.6                   | 2.3               | 55.2            | 4,800                            | 9.9 350                              | 308.0 1.237                                 | 60             |                                  |                     |
| 109E1724K502 |                   |                             | 1.3               | 31.2            | 4,100                            | 8.5 300                              | 243.0 0.976                                 | 55             |                                  |                     |
| 109E1724H502 |                   |                             | 0.58              | 13.92           | 3,050                            | 6.4 226                              | 137.2 0.551                                 | 47             |                                  |                     |
| 109E1724M502 | 48                | 40.8~55.2                   | 0.2               | 4.8             | 2,000                            | 4.2 148                              | 67.6 0.271                                  | 36             |                                  |                     |
| 109E1748C502 |                   |                             | 1.2               | 57.6            | 4,800                            | 9.9 350                              | 308.0 1.237                                 | 60             |                                  |                     |
| 109E1748K502 |                   |                             | 0.7               | 33.6            | 4,100                            | 8.5 300                              | 243.0 0.976                                 | 55             |                                  |                     |
| 109E1748H502 | -10 ~ +70         | 0.28                        | 13.44             | 3,050           | 6.4                              | 226                                  | 137.2                                       | 0.551          | 47                               |                     |
| 109E1748M502 |                   |                             |                   |                 |                                  |                                      |   |                |                                  |                     |

## Air Flow and Static Pressure Characteristics

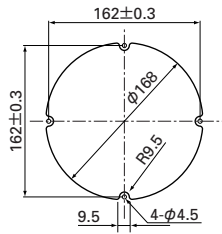


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# DC Fan

Ø **200mm**  
San Ace 200



## General specifications

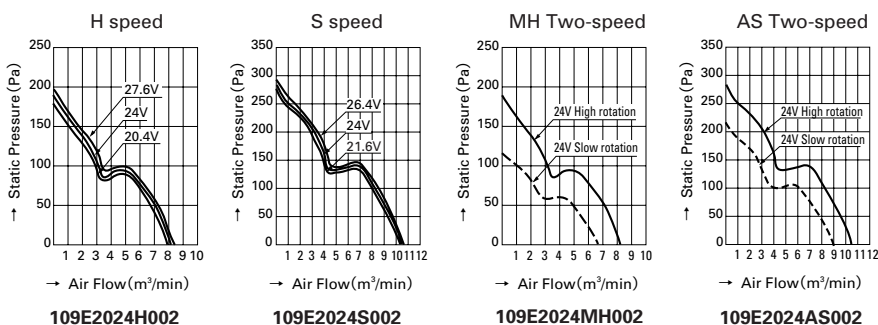
- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black, (Control) brown
- Mass .....1800g

## 70mm thick Specifications

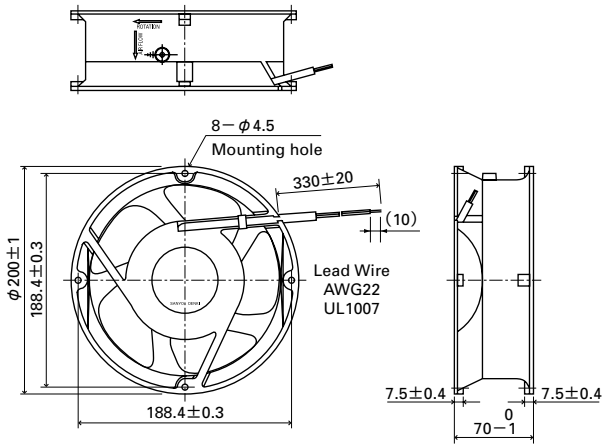
| Model No.            | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109E2024H002</b>  | 24                | 20.4~27.6                   | 1.0               | 24              | 2,600                            | 8.2 289.5                            | 192 0.771                                   | 51             | -10 ~ +70                        | 40,000              |
| <b>109E2024S002</b>  |                   | 21.6~26.4                   | 1.9               | 45.6            | 3,200                            | 10.45 369                            | 287.1 1.153                                 | 57             |                                  |                     |
| <b>109E2024MH002</b> |                   | 20.4~27.6                   | 1.0               | 24              | 2,600                            | 8.2 289.5                            | 192 0.771                                   | 51             |                                  |                     |
|                      |                   |                             | 0.63              | 15.12           | 2,100                            | 6.7 236.6                            | 115.4 0.463                                 | 45             |                                  |                     |
| <b>109E2024AS002</b> |                   | 21.6~26.4                   | 1.9               | 45.6            | 3,200                            | 10.45 369                            | 287.1 1.153                                 | 57             |                                  |                     |
|                      |                   |                             | 1.4               | 33.6            | 2,800                            | 9 317.8                              | 217.5 0.873                                 | 54             |                                  |                     |

The MH speed and AS speed are two speeds.

## Air Flow and Static Pressure Characteristics

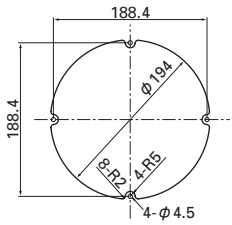


**Dimensions (unit : mm)**

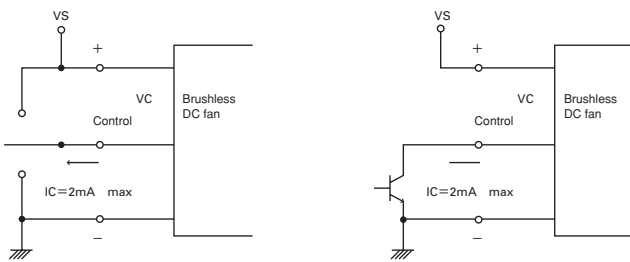


**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



**Signal connection type**



## DC Fan

∅ **200mm**  
San Ace 200



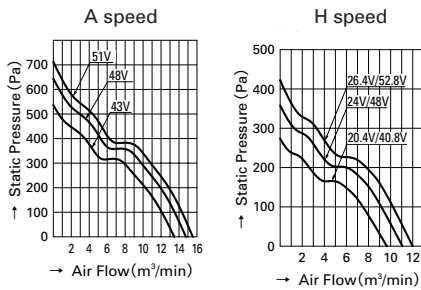
### General specifications

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....1800g

### 70mm thick Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9EC2024H002</b> | 24                | 20.4~26.4                   | 2.0               | 48.0            | 3,600                            | 11.0 388                             | 360 1.446                                   | 60             | -10 ~ +60                        | 40,000              |
| <b>9EC2048A002</b> | 48                | 43 ~ 51                     | 2.2               | 105.6           | 4,800                            | 14.7 519                             | 640 2.570                                   | 68             |                                  |                     |
| <b>9EC2048H002</b> |                   | 40.8~52.8                   | 1.2               | 57.6            | 3,600                            | 11.0 388                             | 360 1.446                                   | 60             |                                  |                     |

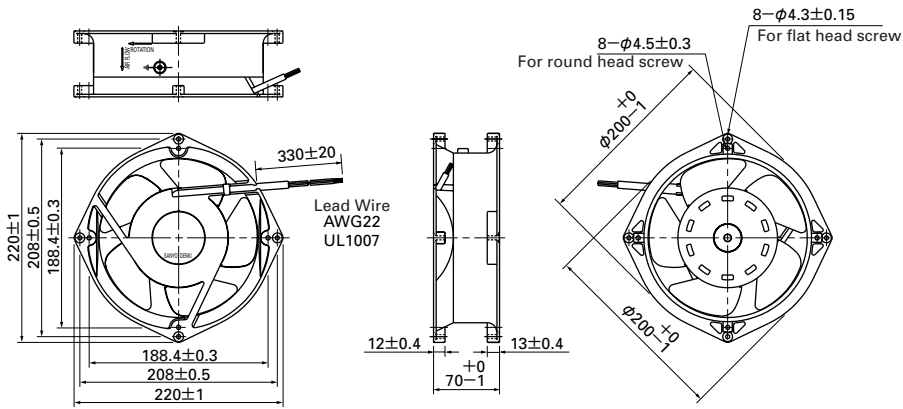
### Air Flow and Static Pressure Characteristics



**9EC2048A002**

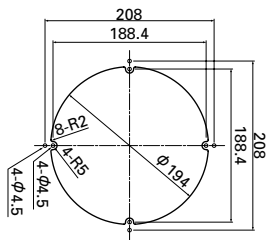
**9EC2024H002**  
**9EC2048H002**

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# DC Fan

# 60mm San Cooler 60



## General specifications

- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....G,S,H,F speeds ⊕red,⊖black  
M speed ⊕red,⊖black or blue
- Mass .....80g

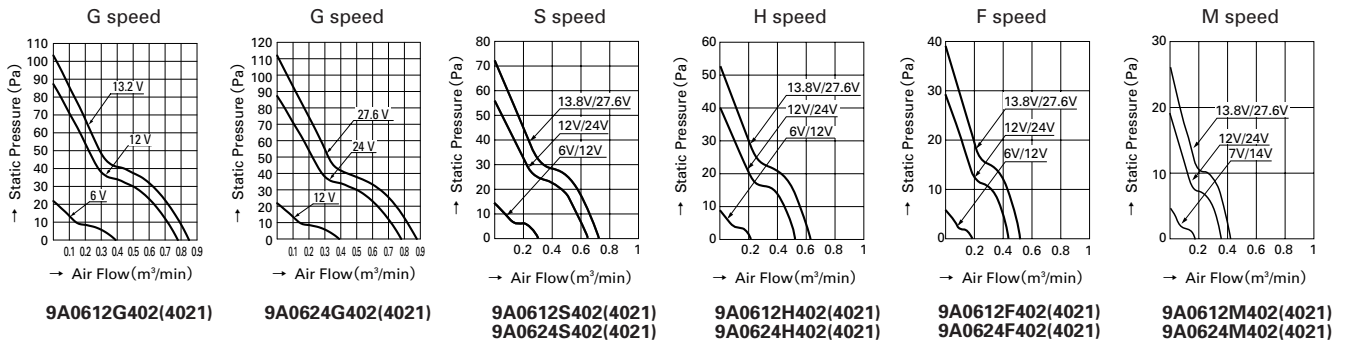
## 25mm thick Specifications

| Model No.               | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9A0612G402(4021)</b> | 12                | 6~13.2                      | 0.24              | 2.88            | 5,600                            | 0.78 27.6                            | 87.3 0.351                                  | 39             | -10 ~ +60                        | 30,000              |
| <b>9A0612S402(4021)</b> |                   |                             | 0.17              | 2.04            | 4,600                            | 0.65 23.0                            | 56.8 0.228                                  | 33             |                                  |                     |
| <b>9A0612H402(4021)</b> |                   | 6~13.8                      | 0.11              | 1.32            | 3,800                            | 0.53 18.7                            | 40.2 0.161                                  | 28             |                                  |                     |
| <b>9A0612F402(4021)</b> |                   |                             | 0.09              | 1.08            | 3,200                            | 0.44 15.5                            | 29.4 0.118                                  | 24             |                                  |                     |
| <b>9A0612M402(4021)</b> |                   |                             | 0.06              | 0.72            | 2,600                            | 0.36 12.7                            | 19.6 0.079                                  | 20             |                                  |                     |
| <b>9A0624G402(4021)</b> | 24                | 12~27.6                     | 0.13              | 3.12            | 5,600                            | 0.78 27.6                            | 87.3 0.351                                  | 39             | -10 ~ +60                        | 30,000              |
| <b>9A0624S402(4021)</b> |                   |                             | 0.08              | 1.92            | 4,600                            | 0.65 23.0                            | 56.8 0.228                                  | 33             |                                  |                     |
| <b>9A0624H402(4021)</b> |                   | 12~27.6                     | 0.06              | 1.44            | 3,800                            | 0.53 18.7                            | 40.2 0.161                                  | 28             |                                  |                     |
| <b>9A0624F402(4021)</b> |                   |                             | 0.05              | 1.2             | 3,200                            | 0.44 15.5                            | 29.4 0.118                                  | 24             |                                  |                     |
| <b>9A0624M402(4021)</b> |                   |                             | 0.04              | 0.96            | 2,600                            | 0.36 12.7                            | 19.6 0.079                                  | 20             |                                  |                     |

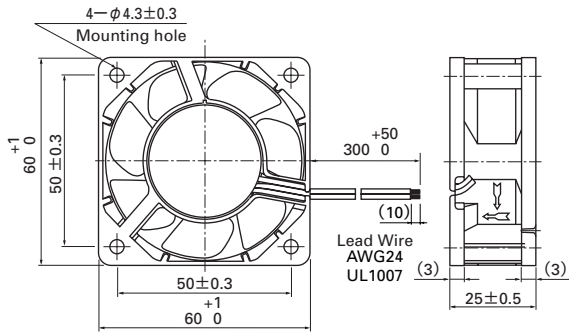
The numbers in ( ) represent ribless models.

## Air Flow and Static Pressure Characteristics

60mm

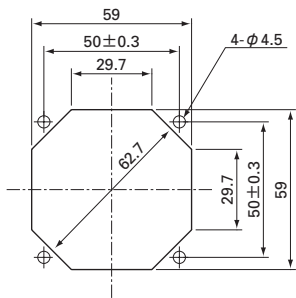


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# DC Fan

## 80mm San Cooler 80



### General specifications

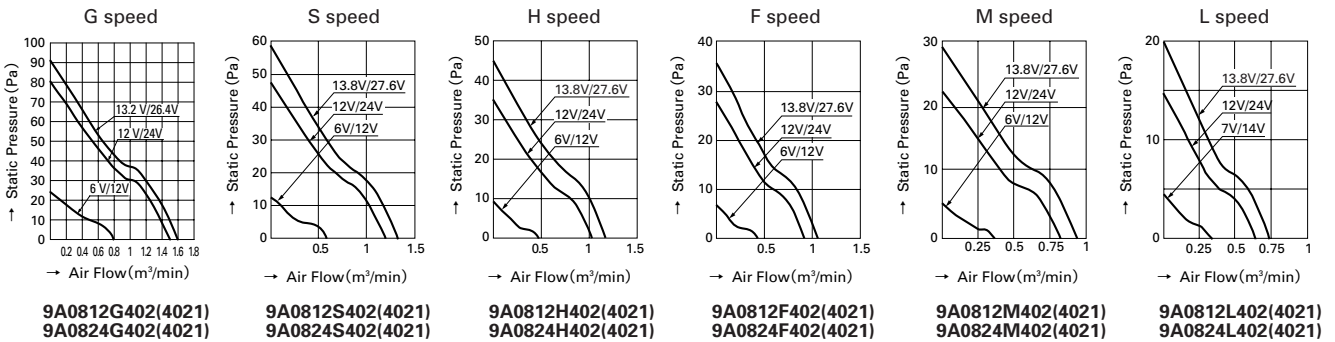
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ...Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....G,S,H,F speeds ⊕red,⊖black  
M speed ⊕red,⊖black or blue
- Mass .....90g

### 25mm thick Specifications

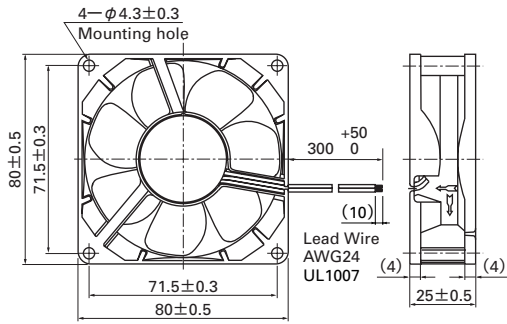
| Model No.               | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9A0812G402(4021)</b> | 12                | 6~13.2                      | 0.38              | 4.56            | 4,500                            | 1.5 53.0                             | 80.3 0.323                                  | 40             | -10 ~ +60                        | 30,000              |
| <b>9A0812S402(4021)</b> |                   |                             | 0.18              | 2.16            | 3,400                            | 1.2 42.4                             | 48 0.193                                    | 34             |                                  |                     |
| <b>9A0812H402(4021)</b> |                   |                             | 0.13              | 1.56            | 2,900                            | 1.03 36.4                            | 35.3 0.142                                  | 29             |                                  |                     |
| <b>9A0812F402(4021)</b> |                   | 6~13.8                      | 0.11              | 1.32            | 2,600                            | 0.92 32.5                            | 28.4 0.114                                  | 26             |                                  |                     |
| <b>9A0812M402(4021)</b> |                   |                             | 0.09              | 1.08            | 2,350                            | 0.83 29.3                            | 22.5 0.090                                  | 23             |                                  |                     |
| <b>9A0812L402(4021)</b> |                   |                             | 0.06              | 0.72            | 1,850                            | 0.65 23.0                            | 14.7 0.059                                  | 20             |                                  |                     |
| <b>9A0824G402(4021)</b> | 24                | 12~26.4                     | 0.21              | 5.04            | 4,500                            | 1.5 53.0                             | 80.3 0.323                                  | 40             | -10 ~ +60                        | 30,000              |
| <b>9A0824S402(4021)</b> |                   |                             | 0.1               | 2.4             | 3,400                            | 1.2 42.4                             | 48 0.193                                    | 34             |                                  |                     |
| <b>9A0824H402(4021)</b> |                   |                             | 0.07              | 1.68            | 2,900                            | 1.03 36.4                            | 35.3 0.142                                  | 29             |                                  |                     |
| <b>9A0824F402(4021)</b> |                   | 12~27.6                     | 0.06              | 1.44            | 2,600                            | 0.92 32.5                            | 28.4 0.114                                  | 26             |                                  |                     |
| <b>9A0824M402(4021)</b> |                   |                             | 0.05              | 1.2             | 2,350                            | 0.83 29.3                            | 22.5 0.090                                  | 23             |                                  |                     |
| <b>9A0824L402(4021)</b> |                   |                             | 0.04              | 0.96            | 1,850                            | 0.65 23.0                            | 14.7 0.059                                  | 20             |                                  |                     |

The numbers in ( ) represent ribless models.

### Air Flow and Static Pressure Characteristics

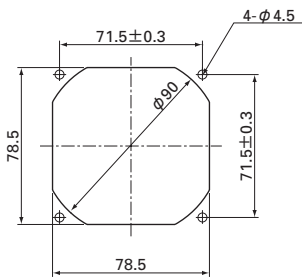


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# DC Fan

## 92mm San Cooler 92



### General specifications

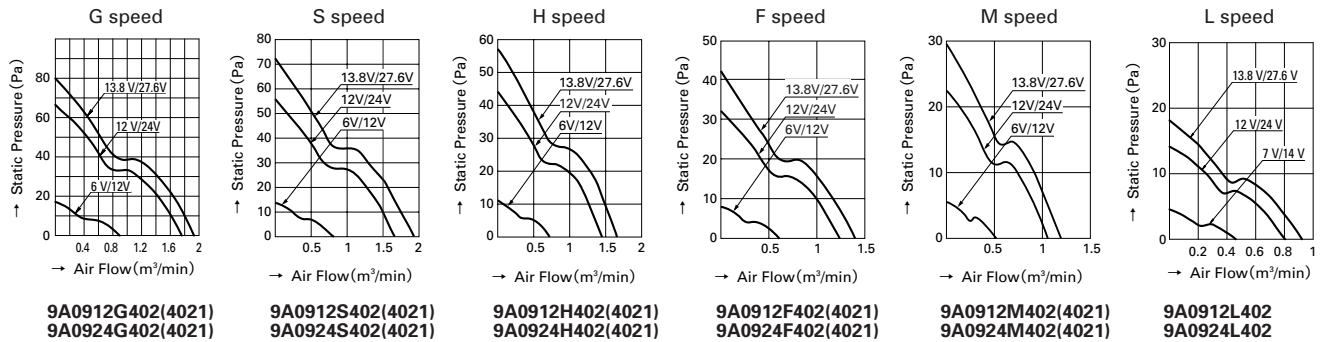
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....G, S, H, F speeds ⊕red, ⊖black  
M speed ⊕red, ⊖black or blue
- Mass .....100g

### 25mm thick Specifications

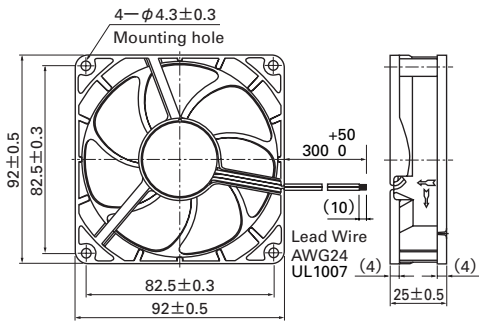
| Model No.               | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9A0912G402(4021)</b> | 12                | 6 ~ 13.8                    | 0.39              | 4.68            | 3,900                            | 1.76 62.1                            | 66.5 0.267                                  | 43             | -10 ~ +60                        | 30,000              |
| <b>9A0912S402(4021)</b> |                   |                             | 0.27              | 3.24            | 3,550                            | 1.66 58.6                            | 56.1 0.225                                  | 39             |                                  |                     |
| <b>9A0912H402(4021)</b> |                   |                             | 0.21              | 2.52            | 3,150                            | 1.45 51.2                            | 44 0.177                                    | 33             |                                  |                     |
| <b>9A0912F402(4021)</b> |                   |                             | 0.14              | 1.68            | 2,650                            | 1.24 43.8                            | 32.2 0.129                                  | 30             |                                  |                     |
| <b>9A0912M402(4021)</b> |                   |                             | 0.12              | 1.44            | 2,250                            | 1.04 36.7                            | 22.6 0.091                                  | 27             |                                  |                     |
| <b>9A0912L402(4021)</b> |                   |                             | 0.07              | 0.84            | 1,750                            | 0.8 28.2                             | 13.4 0.054                                  | 23             |                                  |                     |
| <b>9A0924G402(4021)</b> | 24                | 12 ~ 27.6                   | 0.19              | 4.56            | 3,900                            | 1.76 62.1                            | 66.5 0.267                                  | 43             | -10 ~ +60                        | 30,000              |
| <b>9A0924S402(4021)</b> |                   |                             | 0.15              | 3.6             | 3,550                            | 1.66 58.6                            | 56.1 0.225                                  | 39             |                                  |                     |
| <b>9A0924H402(4021)</b> |                   |                             | 0.1               | 2.4             | 3,150                            | 1.45 51.2                            | 44 0.177                                    | 33             |                                  |                     |
| <b>9A0924F402(4021)</b> |                   |                             | 0.08              | 1.92            | 2,650                            | 1.24 43.8                            | 32.2 0.129                                  | 30             |                                  |                     |
| <b>9A0924M402(4021)</b> |                   |                             | 0.05              | 1.2             | 2,250                            | 1.04 36.7                            | 22.6 0.091                                  | 27             |                                  |                     |
| <b>9A0924L402(4021)</b> |                   |                             | 0.04              | 0.96            | 1,750                            | 0.8 28.2                             | 13.4 0.054                                  | 23             |                                  |                     |

The numbers in ( ) represent ribless models.

### Air Flow and Static Pressure Characteristics

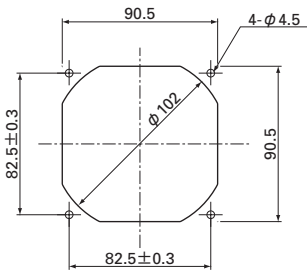


**Dimensions (unit : mm)**

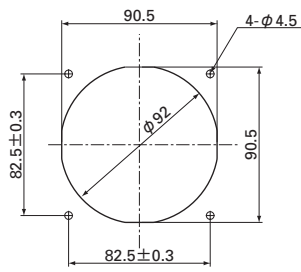


**Reference dimension of mounting holes and vent opening (unit : mm)**

Air outlet side



Air inlet side

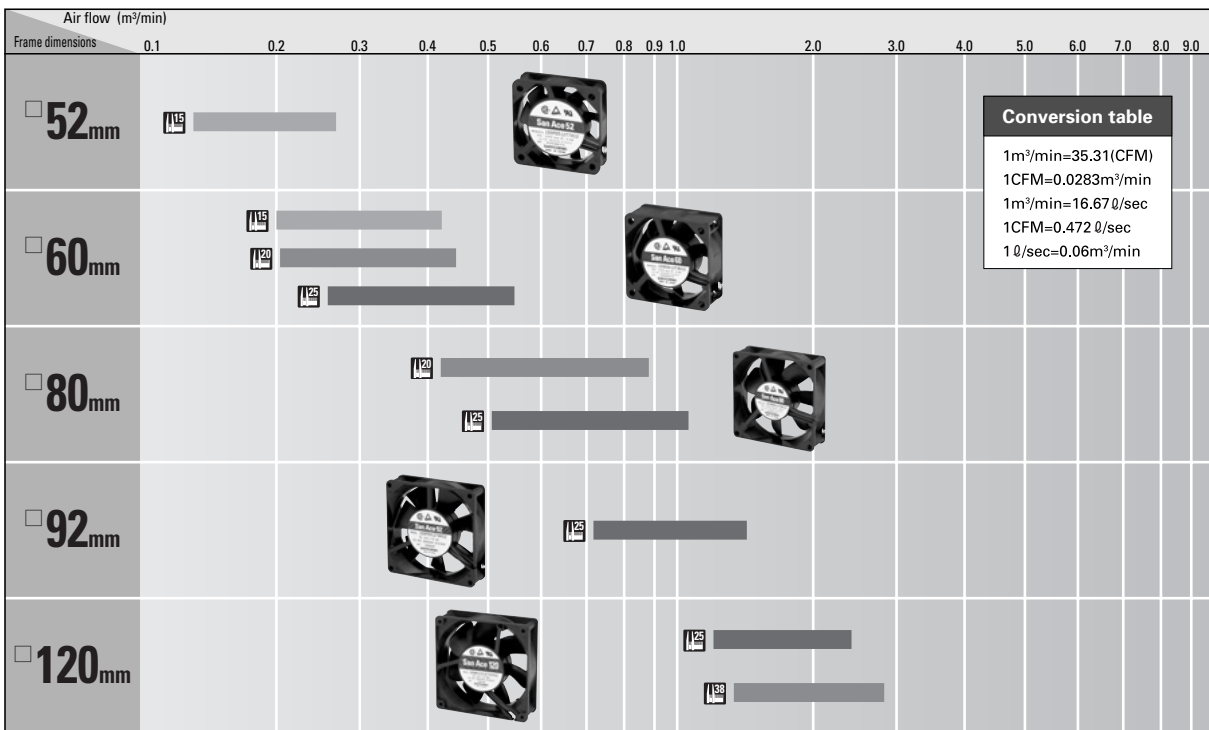




# DC FAN

# Thermal Speed Controlled Fans

## Domain diagram



- 52mm
- 60mm
- 80mm
- 92mm
- 120mm

# Thermal speed controlled fans with an external or built-in thermistor

## External thermistor type

### 1. Overview

For thermal speed controlled fans with an external thermistor, just connect a specified thermistor (or a specified thermistor and a resistor) between the control wire and the negative wire indicated in Fig. 1, it will enable the fan speed to change automatically according to a predetermined temperature speed specification and according to temperature changes in an environment where the thermistor is equipped. (Please refer to Fig. 2)

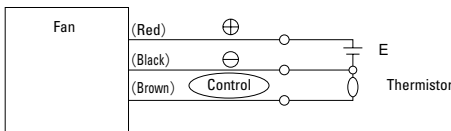


Fig. 1

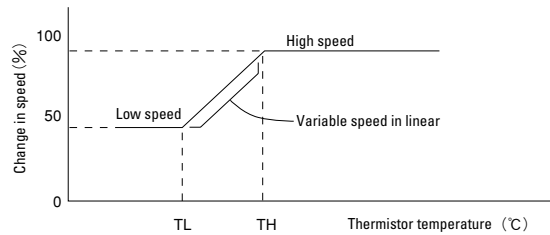


Fig. 2

A thermistor can therefore be installed at an appropriate position inside your equipment to monitor the internal temperature changes due to changes in ambient temperature and heatup status (load status) of the equipment. Automatic monitoring can then specify low speed when the thermistor detects a temperature below TL, high speed when it detects a temperature above TH, and a speed according to the temperature when it detects a temperature between TL and TH.

Thus, the fan motor detects its own operational status and determines the operating conditions.

As a result, the thermal speed controlled fan with an external thermistor is designed that temperature changes according to the ambient temperature and operational status of the equipment are detected by the thermistor to control the fan's air flow (speed), and is near-ideal particularly in designing silent equipment. The fan motor thus meets the three requirements: silence, energy-saving, and long life.

### 2. Setting temperatures (TL and TH) in low and high speed

The standard products listed in this catalog are designed to run at a low speed at 28°C or below and run at a high speed at 35°C or more when a recommended thermistor is connected between the control wire and the negative wire.

These temperatures (TL and TH) can be changed (as indicated in Table 1) by inserting a resistor in series with the thermistor.

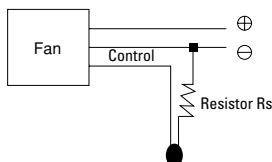


Fig. 3 Recommended thermistor

Table 1

| Resistance Rs (Ω) | Temperature setting (°C) |    |
|-------------------|--------------------------|----|
|                   | TL                       | TH |
| 0                 | 28                       | 35 |
| 0.8K              | 31.5                     | 40 |
| 1.5K              | 35                       | 45 |
| 2.0K              | 38                       | 50 |
| 2.4K              | 40.5                     | 55 |
| 2.75K             | 43                       | 60 |

\* For the resistor Rs, use a resistor rated at no less than 1/8W.  
\* For the thermistor, use a 159-682-86\*\* which are manufactured

### 3. If you wish to obtain low or high speed in a process of testing by using a larger equipment regardless of the thermistor temperature:

Low speed : Instead of the thermistor, connect a 10 KΩ resistor between the control wire and the negative wire.

High speed : Connect the control wire directly to the negative wire.

### 4. Connecting the fan to the thermistor

Sanyo Denki recommends to use connectors, including the power lead of the fan.

Example of Typical connections : place a thermistor on the printed circuit board and connect the fan's power lead and control lead to the circuit pattern by means of connectors.

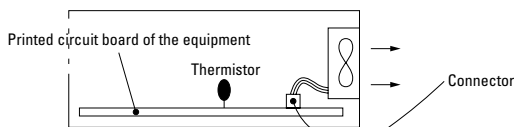


Fig. 4

| Recommended connectors              |                 |
|-------------------------------------|-----------------|
| Manufacturer                        | Model (3-pole)  |
| Japan Solderless Terminals          | XHP-3, SMR-3V-N |
| Japan Aviation Electronics Industry | IL-G-3S-S3C2-SA |
| Japan AMP                           | 171822-3        |
| Molex Japan                         | 5102-3          |

### 5. Typical applications of thermal speed controlled fans with an external thermistor

Here are typical applications of a thermal speed controlled fan with a power supply where two 109P1212H402 fans are used (Fig. 5).

- (1) The fan selected was a 109P1212T4H12 thermal speed controlled fan having a performance equal to that of conventional fans at high speed.
- (2) The relationship between the temperatures of important components and those of the cooling fin can be measured with varied loads on the equipment and varied air flows of the fan. Since a correlation was determined, the thermistor can then be placed on the cooling fin, one of the important components.
- (3) Next, in view of the thermal design conditions of the equipment, the fan is set to high speed at an ambient temperature of 30°C and an equipment load of 100%.

(4) At an ambient temperature of 30°C and an equipment load of 100%, the temperature of the cooling fin was 48°C and the surface temperature of the thermistor placed on the cooling fin was 45°C when the fan was running at high speed. It was therefore decided to add a 1.5 KΩ resistor in series with the thermistor according to Table 1. In this case, the thermistor temperature is 35°C and the fan runs at low (see Table 1 and Fig. 6).

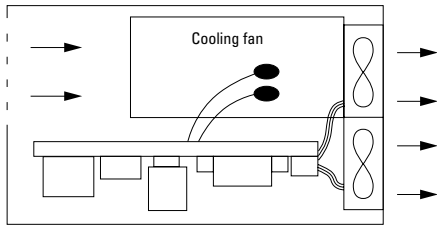
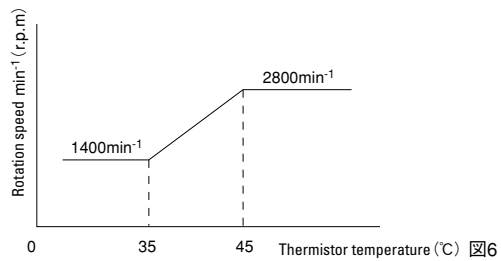


Fig. 5



(5) Test results as installed on equipment: The thermal speed controlled fan displayed its full effect, thus being greatly advantageous in noise reduction. The ambient temperature during the test was 29°C.

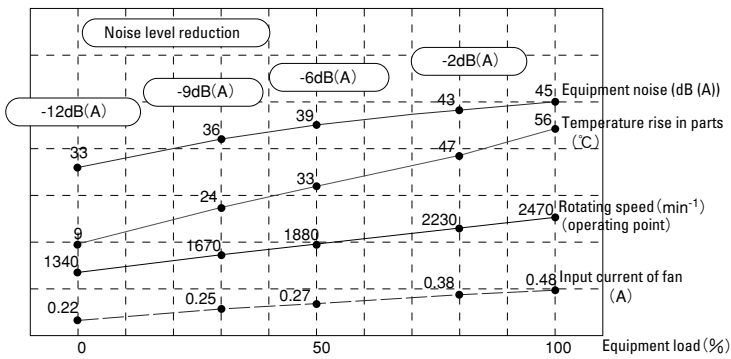


Fig. 7

- \* An ideal drop in the fan noise level was achieved according to the equipment load. When the equipment load was 0, the noise was 12dB (A) lower than in the case of conventional models.
- \* The current consumption of the fan was 54% lower than in the case of conventional models when the equipment load was 0.
- \* The noise level is expected to decline further at lower ambient temperatures.

## built-in thermistor type

### 1. Overview

Thermal speed controlled fans with a built-in thermistor are designed that the fan itself contains a thermistor as indicated in Fig. 8. As illustrated in Fig. 9, the temperature of the air flowing through the fan motor is detected and the fan's speed changes automatically according to changes in that temperature.



Fig. 8

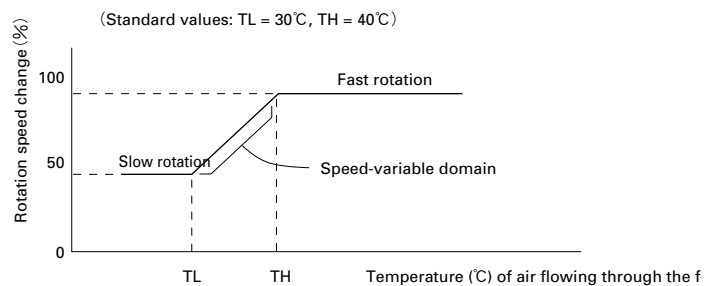
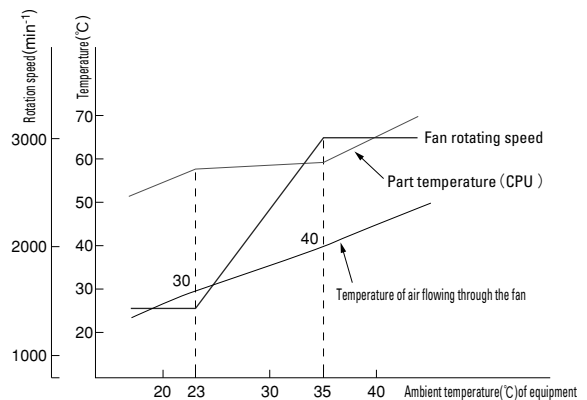
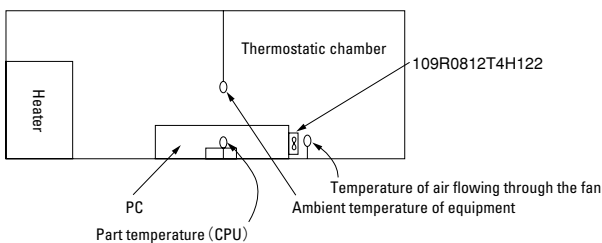


Fig. 9

### 2. Typical applications of thermal speed controlled fans with a built-in thermistor

Fig. 11 indicates measurements taken when a 109R0812T4H122 fan is mounted on equipment (a PC) is tested in the state as illustrated in Fig. 10.



# Thermal Speed Controlled Fan

52mm  
San Ace 52



Photo: externally-mounted thermistor

## General specifications

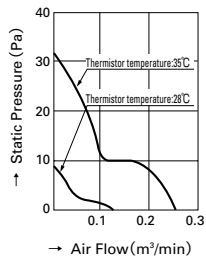
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black, (Control) brown (Only for external thermistor type)
- Fail-safe .....The motor becomes high speed when the thermistor is unable to detect the temperature in cases of open circuit or short-circuit.
- Mass .....55g

## 15mm thick with an external thermistor Specifications

| Model No.     | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P0512T7H12 | 12                | 10.2~13.8                   | 0.13              | 1.56            | 4,600                            | 0.255 9.0                            | 31.9 0.128                                  | 27             | -10 ~ +70                        | 60,000              |
|               |                   |                             | 0.09              | 1.08            | 2,300                            | 0.13 4.6                             | 8.8 0.035                                   | 17             |                                  |                     |

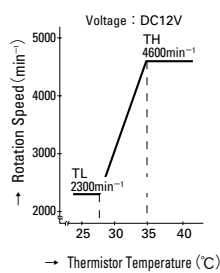
Notes: The top row gives characteristics shown when the thermistor temperature is 35°C, while the bottom row gives characteristics shown when the thermistor temperature is 28°C.

### Air Flow and Static Pressure Characteristics



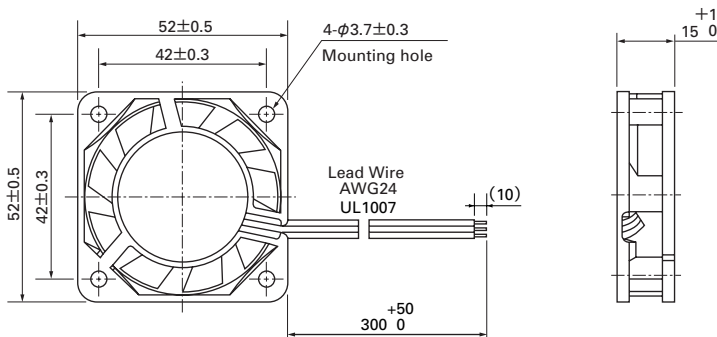
109P0512T7H12

### Characteristics of Thermistor-detected Temperature vs Speed



52mm

### Dimensions (unit : mm)



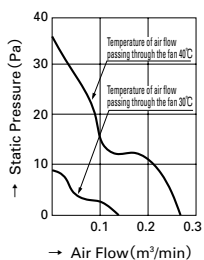
# 15mm thick with an external thermistor

## Specifications

| Model No.      | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P0512T7H122 | 12                | 10.2~13.8                   | 0.13              | 1.56            | 4,900                            | 0.27 9.5                             | 36.2 0.145                                  | 28             | -10 ~ +70                        | 60,000              |
|                |                   |                             | 0.09              | 1.08            | 2,400                            | 0.14 4.9                             | 9.6 0.039                                   | 17             |                                  |                     |

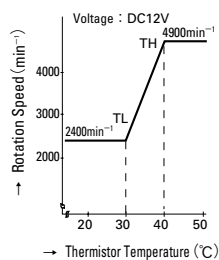
Notes: The top row gives characteristics shown when the thermistor temperature is 35°C, while the bottom row gives characteristics shown when the thermistor temperature is 28°C.

### Air Flow and Static Pressure Characteristics

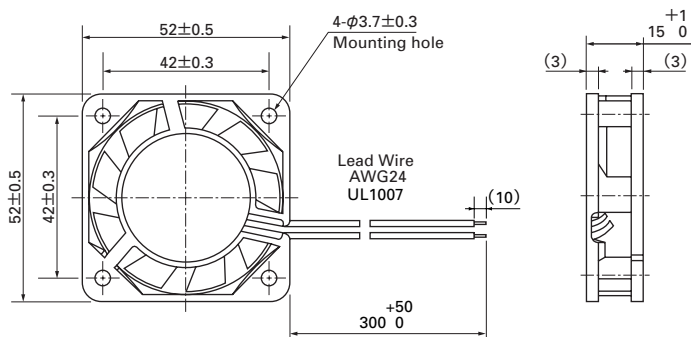


109P0512T7H122

### Typical characteristics of temperature of air flowing through the fan versus rotation speed



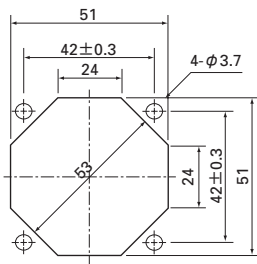
### Dimensions (unit : mm)



52mm

### Reference dimension of mounting holes and vent opening (unit : mm)

Air inlet side · Air outlet side



# Thermal Speed Controlled Fan

□ **60mm**  
San Ace 60



Photo: externally-mounted thermistor

## General specifications

- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black, (Control) brown (Only for external thermistor type)
- Fail-safe .....The motor becomes high speed when the thermistor is unable to detect the temperature in cases of open or short circuit etc.
- Mass .....60g(15mm thick) 90g(20mm thick) 25mm thick)

## 15mm thick with an external thermistor Specifications

| Model No.     | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) |      | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) |       | Air Flow (m <sup>3</sup> /min (CFM)) |       | Static Pressure (Pa) (inchH <sub>2</sub> O) |       | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------|-------------------|-----------------------------|-------------------|------|-----------------|----------------------------------|-------|--------------------------------------|-------|---|-------|----------------|----------------------------------|---------------------|
|               |                   |                             | 0.12              | 0.08 |                 | 4,100                            | 2,050 | 0.4                                  | 14.1  | 38.2  | 0.153 |                |                                  |                     |
| 109P0612T7H12 | 12                | 10.2~13.8                   | 0.12              | 0.08 | 1.44            | 4,100                            | 0.4   | 14.1                                 | 38.2  | 0.153                                       | 32    | -10 ~ +70      | 60,000                           |                     |
|               |                   |                             | 0.08              | 0.96 | 2,050           | 0.2                              | 7.1   | 9.3                                  | 0.037 | 18  |       |                |                                  |                     |

Notes: The top row gives characteristics shown when the thermistor temperature is 35°C, while the bottom row gives characteristics shown when the thermistor temperature is 28°C.

## 20mm thick with an external thermistor Specifications

| Model No.     | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) |     | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) |       | Air Flow (m <sup>3</sup> /min (CFM)) |       | Static Pressure (Pa) (inchH <sub>2</sub> O) |       | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------|-------------------|-----------------------------|-------------------|-----|-----------------|----------------------------------|-------|--------------------------------------|-------|---|-------|----------------|----------------------------------|---------------------|
|               |                   |                             | 0.15              | 0.1 |                 | 4,200                            | 2,100 | 0.42                                 | 14.8  | 31.9  | 0.128 |                |                                  |                     |
| 109P0612T6H12 | 12                | 10.2~13.8                   | 0.15              | 0.1 | 1.8             | 4,200                            | 0.42  | 14.8                                 | 31.9  | 0.128                                       | 31    | -10 ~ +70      | 60,000                           |                     |
|               |                   |                             | 0.1               | 1.2 | 2,100           | 0.21                             | 7.4   | 8.8                                  | 0.035 | 21  |       |                |                                  |                     |

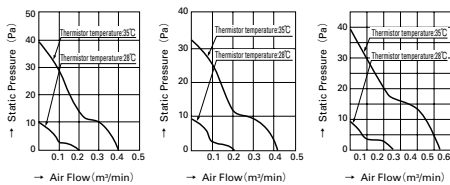
Notes: The top row gives characteristics shown when the thermistor temperature is 35°C, while the bottom row gives characteristics shown when the thermistor temperature is 28°C.

## 25mm thick with an external thermistor Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) |     | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) |       | Air Flow (m <sup>3</sup> /min (CFM)) |       | Static Pressure (Pa) (inchH <sub>2</sub> O) |       | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----|-----------------|----------------------------------|-------|--------------------------------------|-------|---|-------|----------------|----------------------------------|---------------------|
|                    |                   |                             | 0.13              | 0.1 |                 | 3,800                            | 1,900 | 0.53                                 | 18.7  | 40.2  | 0.161 |                |                                  |                     |
| 109R0612T4H12(121) | 12                | 10.2~13.8                   | 0.13              | 0.1 | 1.56            | 3,800                            | 0.53  | 18.7                                 | 40.2  | 0.161                                       | 28    | -10 ~ +60      | 60,000                           |                     |
|                    |                   |                             | 0.1               | 1.2 | 1,900           | 0.26                             | 9.2   | 9.8                                  | 0.039 | 15  |       |                |                                  |                     |

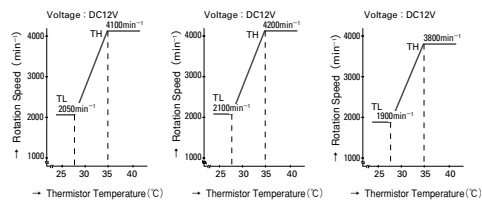
The numbers in ( ) represent ribless models.  
Notes: The top row gives characteristics shown when the thermistor temperature is 35°C, while the bottom row gives characteristics shown when the thermistor temperature is 28°C.

## Air Flow and Static Pressure Characteristics



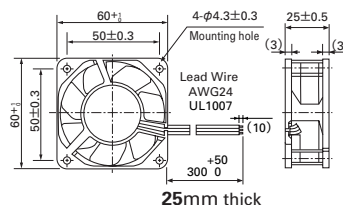
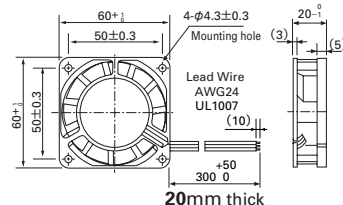
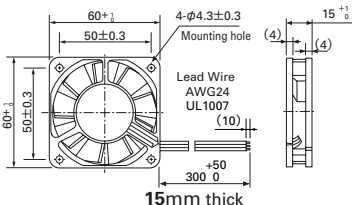
109P0612T7H12 109P0612T6H12 109R0612T4H12(121)

## Characteristics of Thermistor-detected Temperature vs Speed



109P0612T7H12 109P0612T6H12 109R0612T4H12(121)

## Dimensions (unit : mm)



# 15mm thick with a built-in thermistor

## Specifications

| Model No.      | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P0612T7H122 | 12                | 10.2~13.8                   | 0.12              | 1.44            | 4,300                            | 0.42 14.8                            | 42.0 0.169                                  | 32             | -10 ~ +70                        | 60,000              |
|                |                   |                             | 0.08              | 0.96            | 2,100                            | 0.2 7.0                              | 9.7 0.039                                   | 18             |                                  |                     |

Note 1: The top row gives characteristics shown when the emperature is 40°C, while the bottom row gives characteristics shown when the temperature is 30°C.  
 Note 2: The noise levels are calculated by converting measurements taken at 30cm to those measured at 1m.

# 20mm thick with a built-in thermistor

## Specifications

| Model No.      | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P0612T6H122 | 12                | 10.2~13.8                   | 0.15              | 1.8             | 4,400                            | 0.44 15.5                            | 35.0 0.141                                  | 33             | -10 ~ +70                        | 60,000              |
|                |                   |                             | 0.1               | 1.2             | 2,150                            | 0.22 7.8                             | 9.2 0.037                                   | 21             |                                  |                     |

Note 1: The top row gives characteristics shown when the emperature is 40°C, while the bottom row gives characteristics shown when the temperature is 30°C.  
 Note 2: The noise levels are calculated by converting measurements taken at 30cm to those measured at 1m.

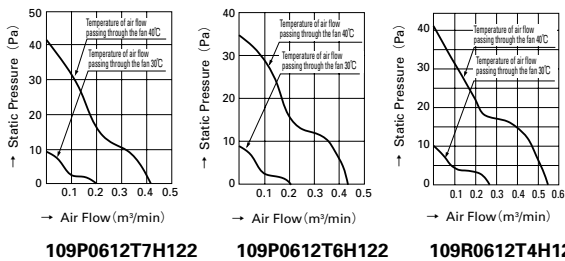
# 25mm thick with a built-in thermistor

## Specifications

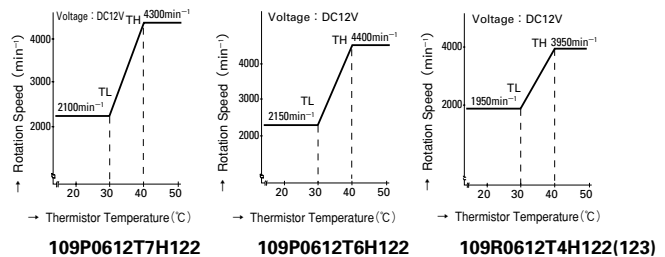
| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109R0612T4H122(123) | 12                | 10.2~13.8                   | 0.13              | 1.56            | 3,950                            | 0.55 19.4                            | 41.8 0.168                                  | 28             | -10 ~ +60                        | 60,000              |
|                     |                   |                             | 0.1               | 1.2             | 1,950                            | 0.27 9.5                             | 10.3 0.041                                  | 15             |                                  |                     |

The numbers in ( ) represent ribless models.  
 Note 1: The top row gives characteristics shown when the emperature is 40°C, while the bottom row gives characteristics shown when the temperature is 30°C.  
 Note 2: The noise levels are calculated by converting measurements taken at 30cm to those measured at 1m.

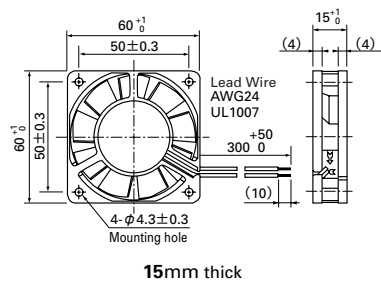
### Air Flow and Static Pressure Characteristics



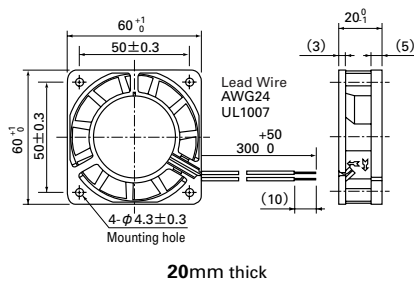
### Typical characteristics of temperature of air flowing through the fan versus rotation speed



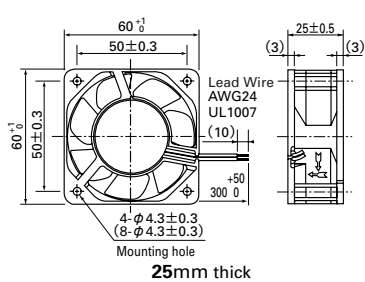
### Dimensions (unit : mm)



15mm thick

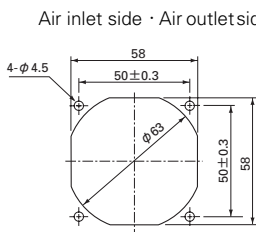


20mm thick

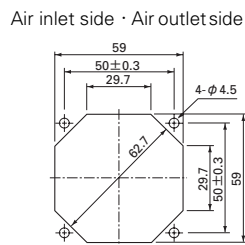


25mm thick

### Reference dimension of mounting holes and vent opening (unit : mm)



15mm thick  
20mm thick



25mm thick

# Thermal Speed Controlled Fan

80mm  
San Ace 80



Photo: externally-mounted thermistor

## General specifications

- Material ..... Frame, Impeller:Plastics
- Life Expectancy ..... Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ..... Current blocking function (with reverse polarity protection)
- Dielectric Strength ..... 50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..... Measured at 1m from the air inlet
- Operating Temperature Range ..... Varies for each model (Non-condensing)
- Lead Wire ..... ⊕red, ⊖black, (Control) brown (Only for external thermistor type)
- Fail-safe ..... The motor becomes high speed when the thermistor is unable to detect the temperature in cases of open or short circuit etc.
- Mass ..... 100g(20mm thick) 110g(25mm thick)

## 20mm thick with an external thermistor Specifications

| Model No.     | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P0812T6H12 | 12                | 10.2~13.8                   | 0.18              | 2.16            | 2,900                            | 0.84 29.7                            | 29.4 0.118                                  | 31             | -10 ~ +60                        | 60,000              |
|               |                   |                             | 0.1               | 1.2             | 1,450                            | 0.42 14.8                            | 7.4 0.030                                   | 18             |                                  |                     |

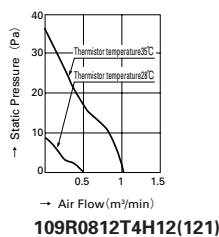
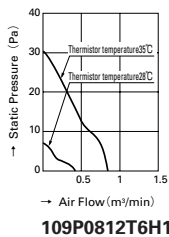
Notes: The top row gives characteristics shown when the thermistor temperature is 35°C, while the bottom row gives characteristics shown when the thermistor temperature is 28°C.

## 25mm thick with an external thermistor Specifications

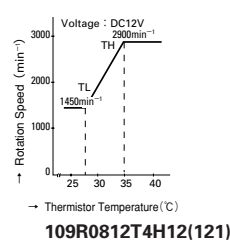
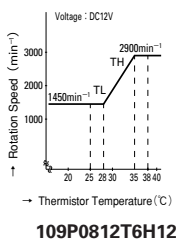
| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109R0812T4H12(121) | 12                | 10.2~13.8                   | 0.14              | 1.68            | 2,900                            | 1.03 36.4                            | 35.3 0.142                                  | 29             | -10 ~ +60                        | 60,000              |
|                    |                   |                             | 0.09              | 1.08            | 1,450                            | 0.51 18.0                            | 8.8 0.035                                   | 14             |                                  |                     |

The numbers in ( ) represent ribless models.  
Notes: The top row gives characteristics shown when the thermistor temperature is 35°C, while the bottom row gives characteristics shown when the thermistor temperature is 28°C.

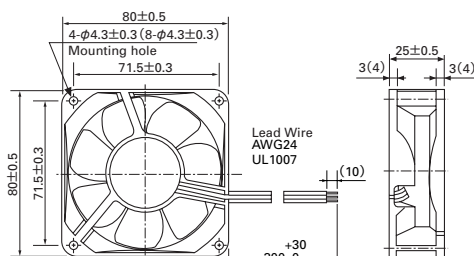
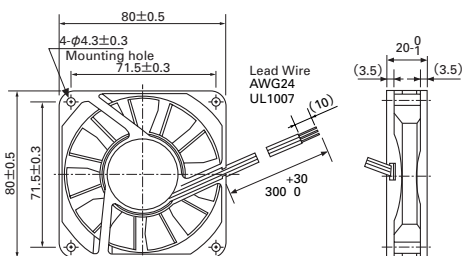
## Air Flow and Static Pressure Characteristics



## Characteristics of Thermistor-detected Temperature vs Speed



## Dimensions (unit : mm)



# 20mm thick with a built-in thermistor

## Specifications

| Model No.             | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P0812T6H122</b> | 12                | 10.2~13.8                   | 0.18              | 2.16            | 3,050                            | 0.88 31.0                            | 32.5 0.131                                  | 32             | -10 ~ +60                        | 60,000              |
|                       |                   |                             | 0.1               | 1.2             | 1,450                            | 0.42 14.8                            | 7.4 0.030                                   | 20             |                                  |                     |

Note 1: The top row gives characteristics shown when the emperature is 40°C, while the bottom row gives characteristics shown when the temperature is 30°C.  
 Note 2: The noise levels are calculated by converting measurements taken at 30cm to those measured at 1m.

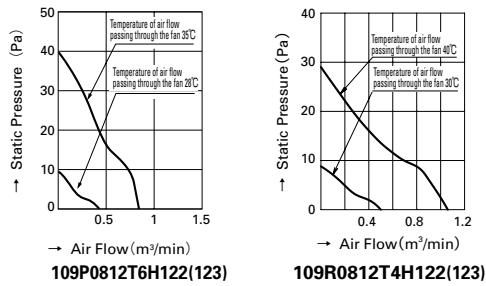
# 25mm thick with a built-in thermistor

## Specifications

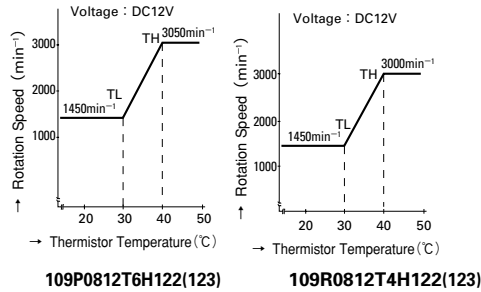
| Model No.                  | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109R0812T4H122(123)</b> | 12                | 10.2~13.8                   | 0.14              | 1.68            | 3,000                            | 1.07 37.8                            | 37.7 0.151                                  | 29             | -10 ~ +60                        | 60,000              |
|                            |                   |                             | 0.09              | 1.08            | 1,450                            | 0.51 18.0                            | 8.8 0.035                                   | 14             |                                  |                     |

The numbers in ( ) represent ribless models.  
 Note 1: The top row gives characteristics shown when the emperature is 40°C, while the bottom row gives characteristics shown when the temperature is 30°C.  
 Note 2: The noise levels are calculated by converting measurements taken at 30cm to those measured at 1m.

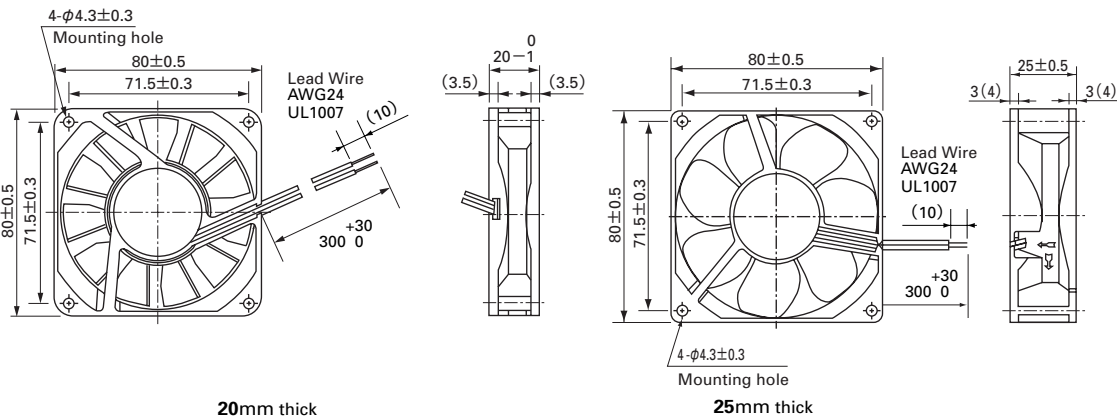
### Air Flow and Static Pressure Characteristics



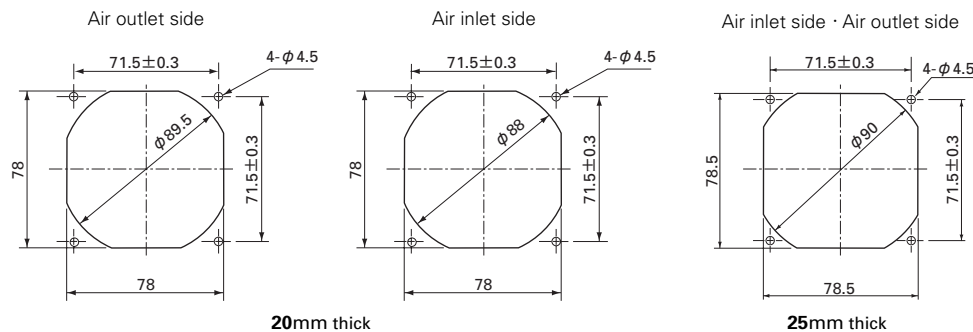
### Typical characteristics of temperature of air flowing through the fan versus rotation speed



### Dimensions (unit : mm)



### Reference dimension of mounting holes and vent opening (unit : mm)



# Thermal Speed Controlled Fan

92mm  
San Ace 92



Photo: externally-mounted thermistor

## General specifications

- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black, (Control) brown (Only for external thermistor type)
- Fail-safe .....The motor becomes high speed when the thermistor is unable to detect the temperature in cases of open or short circuit etc.
- Mass .....150g

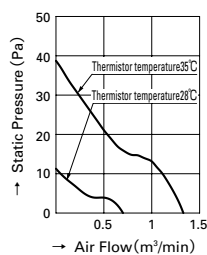
## 25mm thick with an external thermistor Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P0912T4H12(121) | 12                | 10.2~13.8                   | 0.2               | 2.4             | 2,850                            | 1.45 51.2                            | 45.1 0.181                                  | 33             | -10 ~ +60                        | 40,000              |
|                    |                   |                             | 0.1               | 1.2             | 1,400                            | 0.71 25.0                            | 11.3 0.045                                  | 18             |                                  |                     |

The numbers in ( ) represent ribless models.

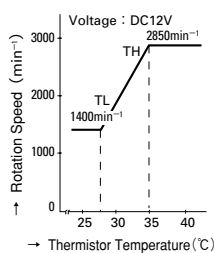
Notes: The top row gives characteristics shown when the thermistor temperature is 35°C, while the bottom row gives characteristics shown when the thermistor temperature is 28°C.

### Air Flow and Static Pressure Characteristics



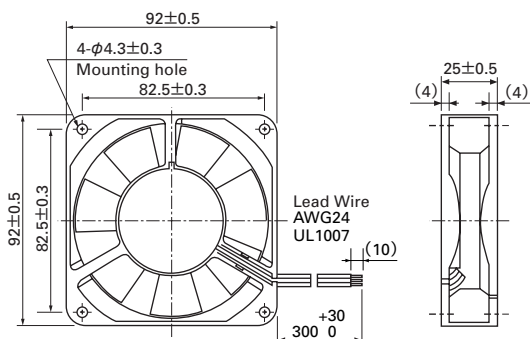
109P0912T4H12(121)

### Characteristics of Thermistor-detected Temperature vs Speed



109P0912T4H12(121)

### Dimensions (unit : mm)



# 25mm thick with a built-in thermistor

## Specifications

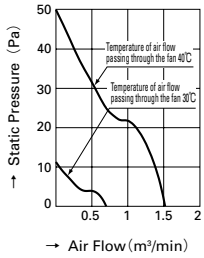
| Model No.                  | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109P0912T4H122(123)</b> | 12                | 10.2~13.8                   | 0.2               | 2.4             | 3,000                            | 1.52 53.7                            | 50.0 0.201                                  | 35             | -10 ~ +60                        | 40,000              |
|                            |                   |                             | 0.1               | 1.2             | 1,400                            | 0.71 25.0                            | 11.3 0.045                                  | 18             |                                  |                     |

The numbers in ( ) represent ribless models.

Note 1: The top row gives characteristics shown when the emperature is 40°C, while the bottom row gives characteristics shown when the temperature is 30°C.

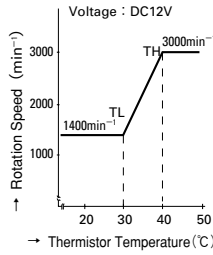
Note 2: The noise levels are calculated by converting measurements taken at 30cm to those measured at 1m.

### Air Flow and Static Pressure Characteristics



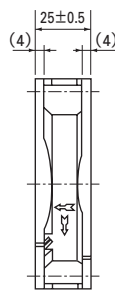
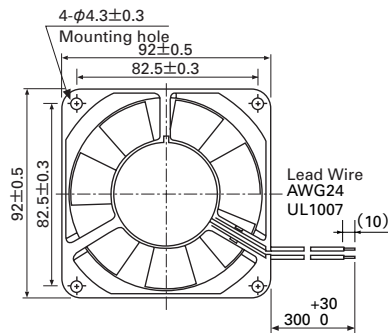
**109P0912T4H122(123)**

### Typical characteristics of temperature of air flowing through the fan versus rotation speed

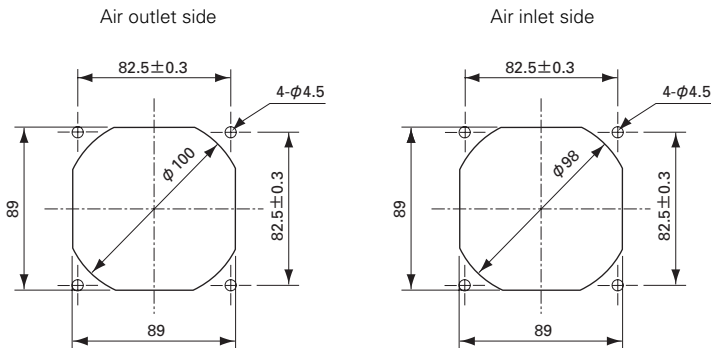


**109P0912T4H122(123)**

### Dimensions (unit : mm)



### Reference dimension of mounting holes and vent opening (unit : mm)



# Thermal Speed Controlled Fan

## 120mm San Ace 120



Photo: externally-mounted thermistor

### General specifications

- Material ..... Frame, Impeller:Plastics
- Life Expectancy ..... Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ..... Current blocking function (with reverse polarity protection)
- Dielectric Strength ..... 50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..... Measured at 1m from the air inlet
- Operating Temperature Range ..... Varies for each model (Non-condensing)
- Lead Wire ..... ⊕red, ⊖black, (Control) brown (Only for external thermistor type)
- Fail-safe ..... The motor becomes high speed when the thermistor is unable to detect the temperature in cases of open or short circuit etc.
- Mass ..... 210g(25mm thick) 260g(38mm thick)

### 25mm thick with an external thermistor Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P1212T4H12(121) | 12                | 10.2~13.8                   | 0.55              | 6.6             | 2,800                            | 2.5 88.3                             | 53.9 0.216                                  | 40             | -10 ~ +60                        | 40,000              |
|                    |                   |                             | 0.22              | 2.64            | 1,400                            | 1.25 44.1                            | 13.7 0.055                                  | 25             |                                  |                     |

The numbers in ( ) represent ribless models.

Notes: The top row gives characteristics shown when the thermistor temperature is 35°C, while the bottom row gives characteristics shown when the thermistor temperature is 28°C.

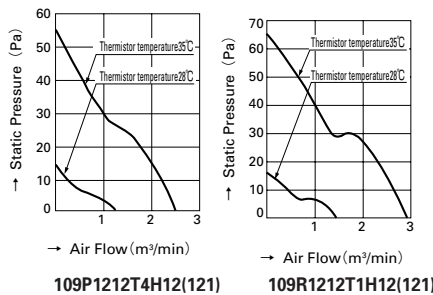
### 38mm thick with an external thermistor Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109R1212T1H12(121) | 12                | 10.2~13.8                   | 0.48              | 5.75            | 2,600                            | 2.9 102.4                            | 64.7 0.260                                  | 39             | -10 ~ +60                        | 40,000              |
|                    |                   |                             | 0.23              | 2.76            | 1,300                            | 1.4 49.4                             | 16.2 0.065                                  | 24             |                                  |                     |

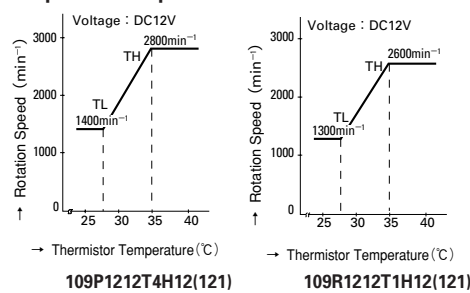
The numbers in ( ) represent ribless models.

Notes: The top row gives characteristics shown when the thermistor temperature is 35°C, while the bottom row gives characteristics shown when the thermistor temperature is 28°C.

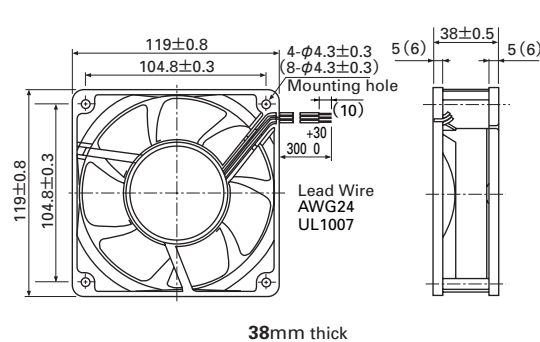
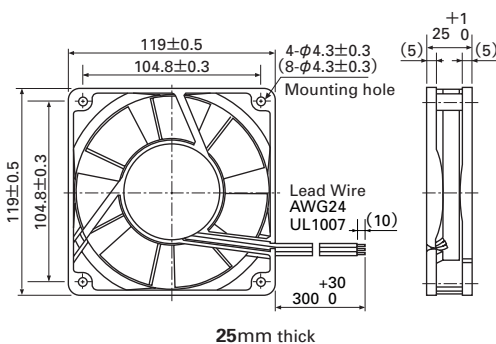
### Air Flow and Static Pressure Characteristics



### Characteristics of Thermistor-detected Temperature vs Speed



### Dimensions (unit : mm)



120mm

# 25mm thick with a built-in thermistor

## Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109P1212T4H122(123) | 12                | 10.2~13.8                   | 0.55              | 6.6             | 2,800                            | 2.5 88.3                             | 53.9 0.216                                  | 40             | -10 ~ +60                        | 40,000              |
|                     |                   |                             | 0.22              | 2.64            | 1,400                            | 1.25 44.1                            | 13.7 0.055                                  | 25             |                                  |                     |

The numbers in ( ) represent ribless models.

Note 1: The top row gives characteristics shown when the emperature is 40°C, while the bottom row gives characteristics shown when the temperature is 30°C.

Note 2: The noise levels are calculated by converting measurements taken at 30cm to those measured at 1m.

# 38mm thick with a built-in thermistor

## Specifications

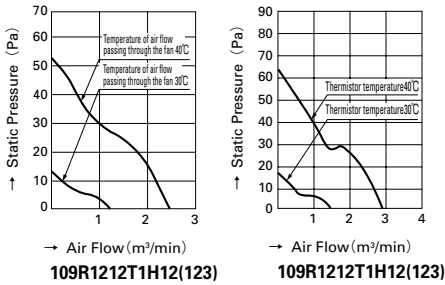
| Model No.           | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109R1212T1H122(123) | 12                | 10.2~13.8                   | 0.48              | 5.75            | 2,600                            | 2.9 102.4                            | 64.7 0.260                                  | 39             | -10 ~ +60                        | 40,000              |
|                     |                   |                             | 0.23              | 2.76            | 1,300                            | 1.4 49.4                             | 16.2 0.065                                  | 24             |                                  |                     |

The numbers in ( ) represent ribless models.

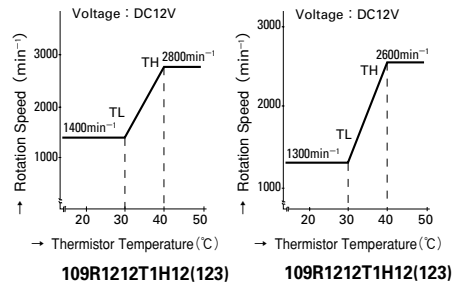
Note 1: The top row gives characteristics shown when the emperature is 40°C, while the bottom row gives characteristics shown when the temperature is 30°C.

Note 2: The noise levels are calculated by converting measurements taken at 30cm to those measured at 1m.

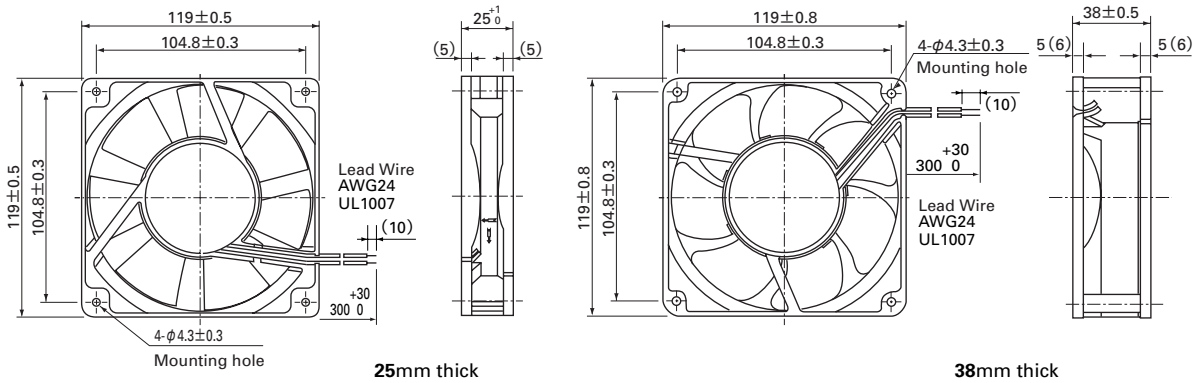
### Air Flow and Static Pressure Characteristics



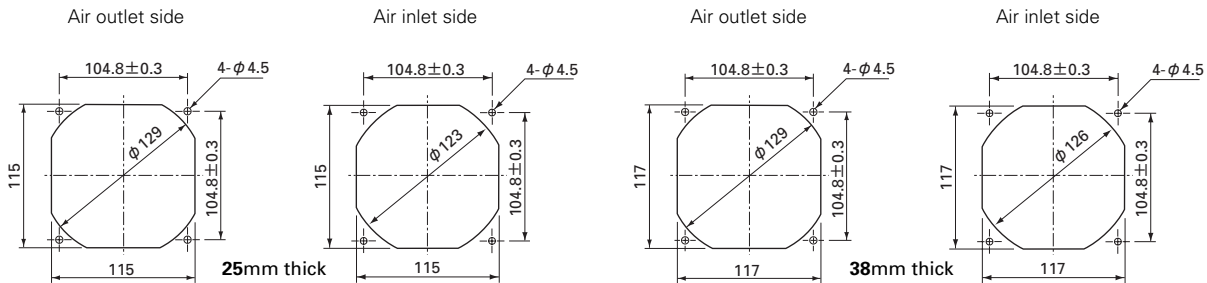
### Typical characteristics of temperature of air flowing through the fan versus rotation speed



### Dimensions (unit : mm)



### Reference dimension of mounting holes and vent opening (unit : mm)

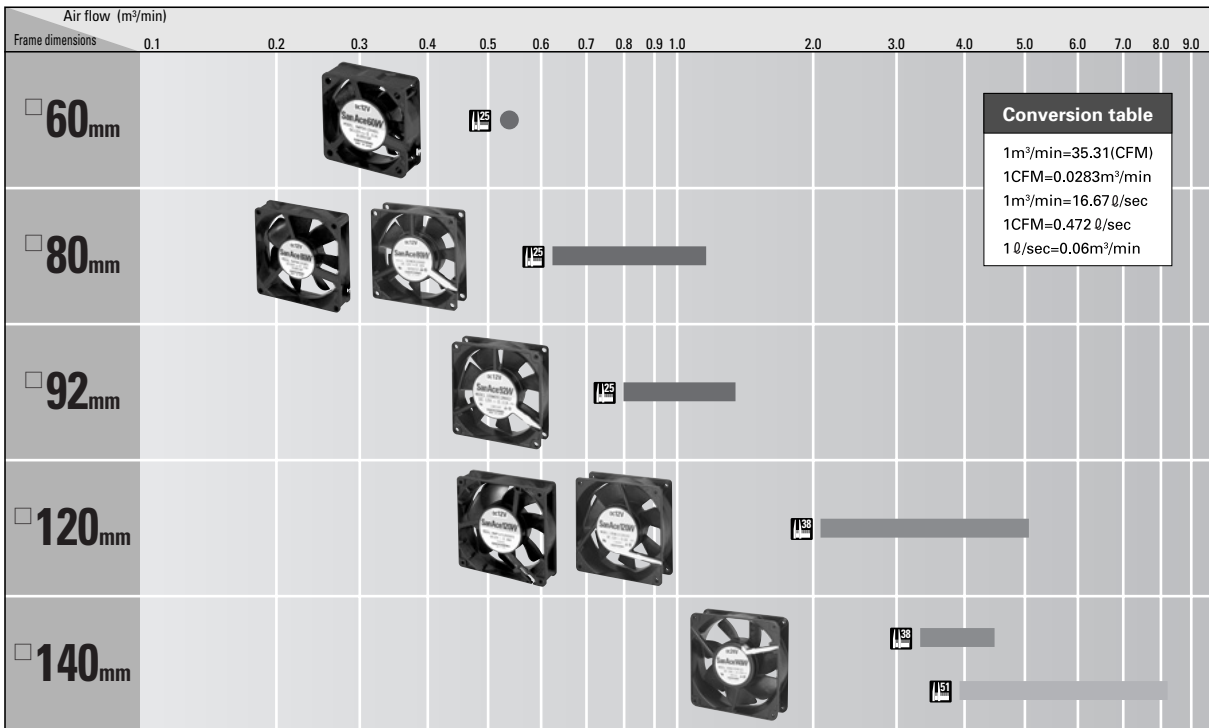




# DC FAN

# Splash Proof Fans

## Domain diagram



- 60mm
- 80mm
- 92mm
- 120mm
- 140mm

## "IP XX" Protection Grade

- IP code is laid down in "Degrees of protection provided by enclosures (IP Code) " on JIS C 0920 and IEC 60529.
- IP code is defined as "A coding system to indicate the degree of protection provided by an enclosure against access to hazardous parts, ingress of solid foreign objects, ingress of water and to give additional information in connection with such a protection"
- Regarding IP code, the first numeral indicates the degree of protection against access to hazardous parts and ingress of solid foreign objects. The second numeral indicates the degree of protection against the ingress of water.

# IP X X

### 4: Protected against splashing water

(Water splashed against the enclosure from any direction shall have no harmful effects)

### 5: Protected against water jets

(Water projected in jets against the enclosure from any direction shall have no harmful effects)

### 5: Dust-Protected

(Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety.)

#### First characteristics

| Degree | Type                    | Description   |
|--------|-------------------------|---|
| 0      | No protected device     | Rotating device without special protection.                                   |
| 1      | Semi-protected device   | Rotating device with protection against solid objects of 50mm or larger       |
| 2      | Protected device        | Rotating device with protection against solid objects of 12mm or larger       |
| 3      | Shielded device         | Rotating device with protection against solid objects of 2.5mm or larger      |
| 4      | Totally shielded device | Rotating device with protection against solid objects of 1mm or larger        |
| 5      | Dust resistant device   | Rotating device with protection against harmful dust ingress (dust protected) |
| 6      | Dust-proof device       | Rotating device with totally protection against any dust ingress (dust tight) |

#### Second characteristics

| Degree | Type                         | Description   |
|--------|------------------------------|---|
| 0      | No protected device          | Rotating device without special protection.   |
| 1      | Drip-proof device (Grade I)  | Rotating device with protection against falling water from the vertical   |
| 2      | Drip-proof device (Grade II) | Rotating device with protection against falling water to a maximum of 15° from the vertical                               |
| 3      | Rain-proof device            | Rotating device with protection against rain to a maximum of 60° from the vertical  |
| 4      | Splash-proof device          | Rotating device with protection against water sprays from any direction.  |
| 5      | Jet-proof device             | Rotating device with protection against water jets from any direction.  |
| 6      | Water resistant device       | Rotating device with protection against powerful water jets from any direction and no water ingress inside of the device. |
| 7      | Water immersion-proof device | Rotating device with protection against the effects of temporary immersion in water under specific test condition.        |
| 8      | Submergence-proof device     | Rotating device with protection against the effects of permanent immersion in water of specific water pressure.           |



# Splash Proof Fan □ 60mm

## San Ace 60W



“San Ace 60W” WP type

**General specifications IP55 (Dust resistant device with protection against water jets)**

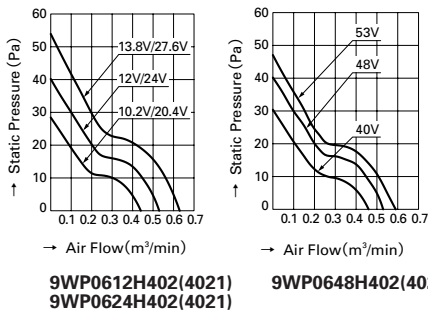
- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....110g

## 25mm thick Specifications

| Model No.                | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9WP0612H402(4021)</b> | 12                | 10.2~13.8                   | 0.11              | 1.32            | 3,800                            | 0.53 18.7                            | 40.2 0.161                                  | 28             | -10 ~ +70                        | 60,000              |
| <b>9WP0624H402(4021)</b> | 24                | 20.4~27.6                   | 0.06              | 1.44            | 3,800                            | 0.53 18.7                            | 40.2 0.161                                  | 28             |                                  |                     |
| <b>9WP0648H402(4021)</b> | 48                | 40 ~53                      | 0.04              | 1.92            | 3,800                            | 0.53 18.7                            | 40.2 0.161                                  | 28             |                                  |                     |

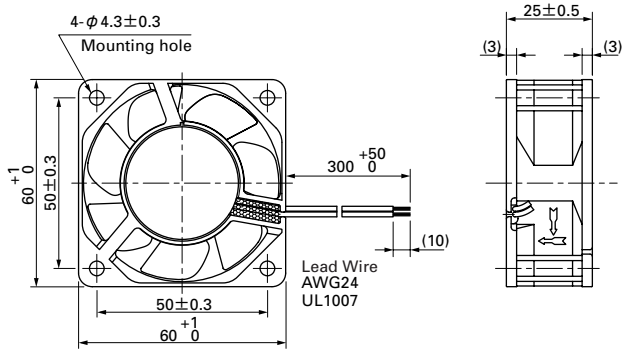
The numbers in ( ) represent ribless models.

### Air Flow and Static Pressure Characteristics

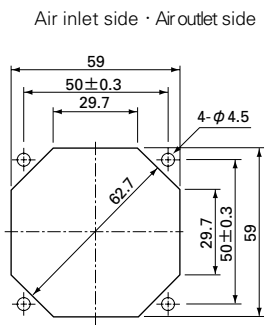


60mm

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



# Splash Proof Fan

□ **80mm**  
San Ace 80W



"San Ace 80W" W type

### General specifications

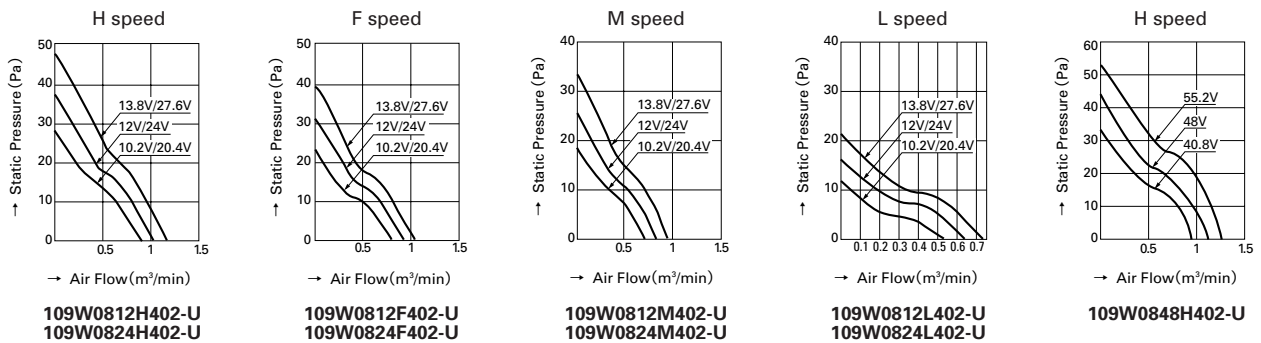
**IP55 (Dust resistant device with protection against water jets)**

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....H, F speeds ⊕red, ⊖black  
M, L speeds ⊕red, ⊖black or blue
- Mass .....170g

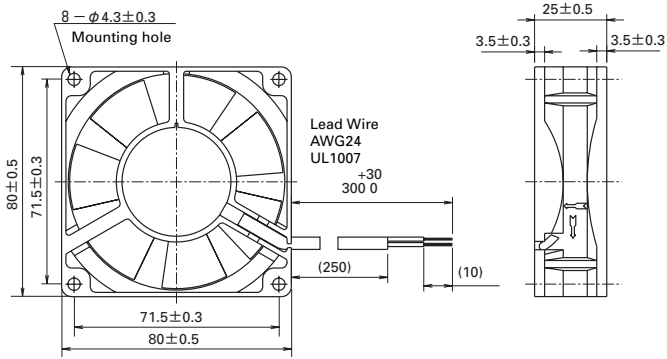
## 25mm thick Specifications

| Model No.             | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |  |  |
|-----------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|--|--|
| <b>109W0812H402-U</b> | 12                | 10.2~13.8                   | 0.18              | 2.16            | 3,000                            | 1.06 37.4                            | 39.2 0.157                                  | 32             | -10 ~ +70                        | 100,000             |  |  |
| <b>109W0812F402-U</b> |                   |                             | 0.14              | 1.68            | 2,700                            | 0.93 32.8                            | 32.3 0.130                                  | 29             |                                  |                     |  |  |
| <b>109W0812M402-U</b> |                   |                             | 0.10              | 1.20            | 2,400                            | 0.83 29.3                            | 26.5 0.106                                  | 26             |                                  |                     |  |  |
| <b>109W0812L402-U</b> |                   |                             | 0.08              | 0.96            | 1,900                            | 0.63 22.2                            | 16.7 0.067                                  | 22             |                                  |                     |  |  |
| <b>109W0824H402-U</b> | 24                | 20.4~27.6                   | 0.09              | 2.16            | 3,000                            | 1.06 37.4                            | 39.2 0.157                                  | 32             |                                  |                     |  |  |
| <b>109W0824F402-U</b> |                   |                             | 0.08              | 1.92            | 2,700                            | 0.93 32.8                            | 32.3 0.130                                  | 29             |                                  |                     |  |  |
| <b>109W0824M402-U</b> |                   |                             | 0.07              | 1.68            | 2,400                            | 0.83 29.3                            | 26.5 0.106                                  | 26             |                                  |                     |  |  |
| <b>109W0824L402-U</b> |                   |                             | 0.05              | 1.20            | 1,900                            | 0.63 22.2                            | 16.7 0.067                                  | 22             |                                  |                     |  |  |
| <b>109W0848H402-U</b> | 48                | 40.8~55.2                   | 0.06              | 2.88            | 3,150                            | 1.1 38.8                             | 43.1 0.173                                  | 34             |                                  |                     |  |  |

### Air Flow and Static Pressure Characteristics

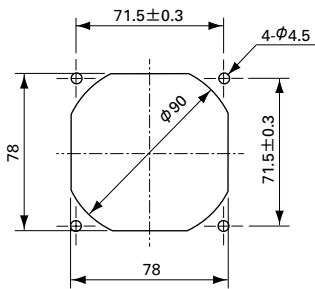


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# Splash Proof Fan □ 80mm

## San Ace 80W



"San Ace 80W" WP type

**General specifications** IP55 (Dust resistant device with protection against water jets)

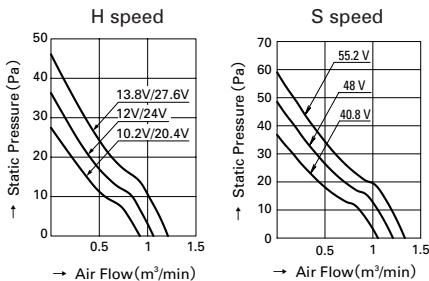
- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....130g

## 25mm thick Specifications

| Model No.                 | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9WP0812H402 (4021)</b> | 12                | 10.2~13.8                   | 0.13              | 1.56            | 2,900                            | 1.03 36.4                            | 35.3 0.142                                  | 29             | -10 ~ +70                        | 60,000              |
| <b>9WP0824H402 (4021)</b> | 24                | 20.4~27.6                   | 0.07              | 1.68            | 2,900                            | 1.03 36.4                            | 35.3 0.142                                  | 29             |                                  | 40,000              |
| <b>9WP0848S402 (4021)</b> | 48                | 40.8~55.2                   | 0.06              | 2.88            | 3,400                            | 1.20 42.4                            | 48.0 0.193                                  | 34             |                                  | 40,000              |

The numbers in ( ) represent ribless models.

### Air Flow and Static Pressure Characteristics

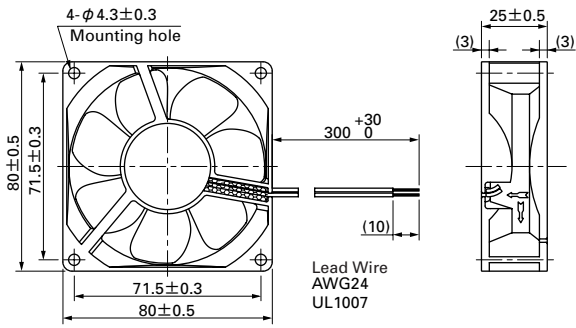


**9WP0812H402(4021)**  
**9WP0824H402(4021)**

**9WP0848S402(4021)**

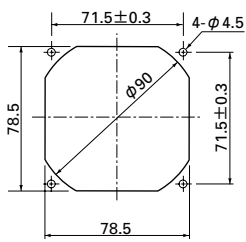
80mm

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



## Splash Proof Fan

□ **80mm**  
San Ace 80WS



### General specifications

#### IP54 (Dust resistant device with protection against water spray)

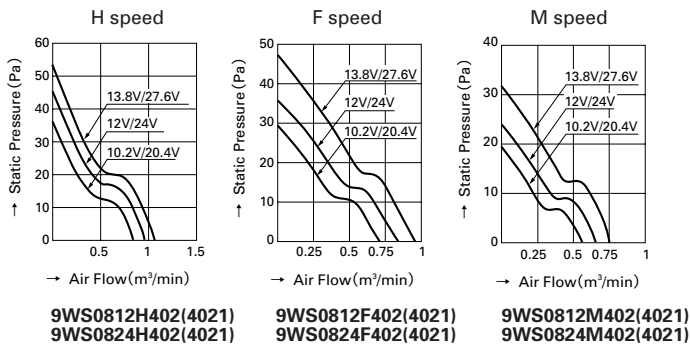
- Material .....Frame, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....H, F speeds ⊕red,⊖black  
M speed ⊕red,⊖black or blue
- Mass .....120g

### 25mm thick Specifications

| Model No.                | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9WS0812H402(4021)</b> | 12                | 10.2~13.8                   | 0.16              | 1.92            | 3,100                            | 0.94 33.2                            | 45.1 0.181                                  | 32             | -10 ~ +70                        | 40,000              |
| <b>9WS0812F402(4021)</b> |                   |                             | 0.13              | 1.56            | 2,700                            | 0.83 29.3                            | 34.3 0.138                                  | 28             |                                  |                     |
| <b>9WS0812M402(4021)</b> |                   |                             | 0.1               | 1.2             | 2,200                            | 0.65 23.0                            | 23.5 0.094                                  | 23             |                                  |                     |
| <b>9WS0824H402(4021)</b> | 24                | 20.4~27.6                   | 0.09              | 2.16            | 3,100                            | 0.94 33.2                            | 45.1 0.181                                  | 32             |                                  |                     |
| <b>9WS0824F402(4021)</b> |                   |                             | 0.07              | 1.68            | 2,700                            | 0.83 29.3                            | 34.3 0.138                                  | 28             |                                  |                     |
| <b>9WS0824M402(4021)</b> |                   |                             | 0.05              | 1.2             | 2,200                            | 0.65 23.0                            | 23.5 0.094                                  | 23             |                                  |                     |

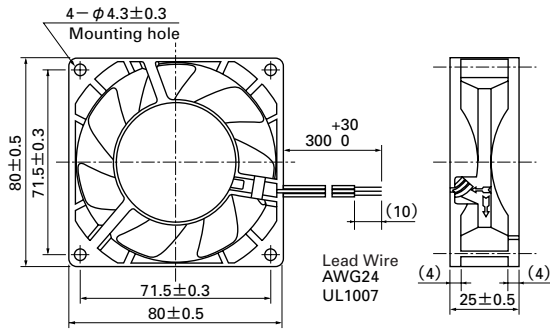
The numbers in ( ) represent ribless models.

### Air Flow and Static Pressure Characteristics



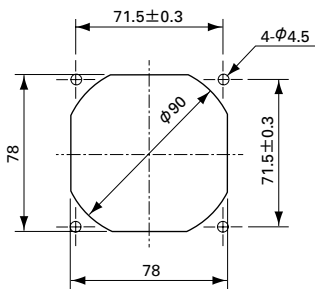
80mm

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# Splash Proof Fan

92mm  
San Ace 92W



“San Ace 92W” W type

## General specifications

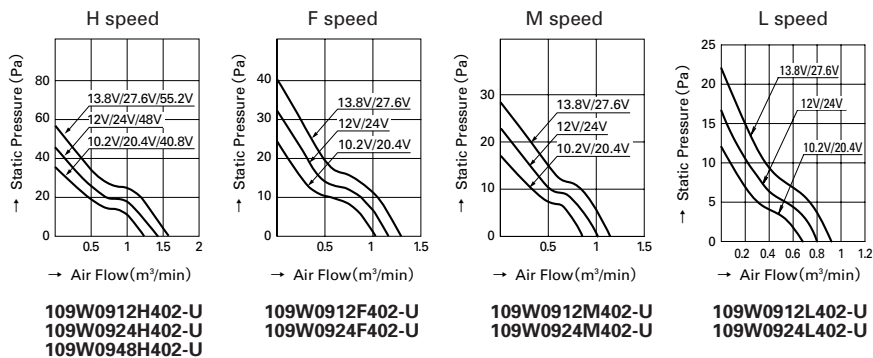
### IP55 (Dust resistant device with protection against water jets)

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....H, F speeds ⊕red, ⊖black  
M, L speeds ⊕red, ⊖black or blue
- Mass .....190g

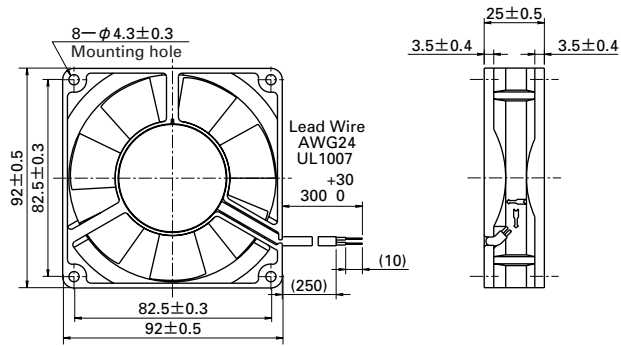
## 25mm thick Specifications

| Model No.      | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |  |  |
|----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|--|--|
| 109W0912H402-U | 12                | 10.2~13.8                   | 0.21              | 2.52            | 2,850                            | 1.38 48.7                            | 45.1 0.181                                  | 33             | -10 ~ +70                        | 100,000             |  |  |
| 109W0912F402-U |                   |                             | 0.14              | 1.68            | 2,450                            | 1.18 41.7                            | 32.3 0.130                                  | 30             |                                  |                     |  |  |
| 109W0912M402-U |                   |                             | 0.11              | 1.32            | 2,100                            | 1.01 35.7                            | 23.5 0.094                                  | 27             |                                  |                     |  |  |
| 109W0912L402-U |                   |                             | 0.08              | 0.96            | 1,700                            | 0.80 28.2                            | 16.7 0.067                                  | 23             |                                  |                     |  |  |
| 109W0924H402-U | 24                | 20.4~27.6                   | 0.12              | 2.88            | 2,850                            | 1.38 48.7                            | 45.1 0.181                                  | 33             |                                  |                     |  |  |
| 109W0924F402-U |                   |                             | 0.08              | 1.92            | 2,450                            | 1.18 41.7                            | 32.3 0.130                                  | 30             |                                  |                     |  |  |
| 109W0924M402-U |                   |                             | 0.06              | 1.44            | 2,100                            | 1.01 35.7                            | 23.5 0.094                                  | 27             |                                  |                     |  |  |
| 109W0924L402-U |                   |                             | 0.05              | 1.2             | 1,700                            | 0.80 28.2                            | 16.7 0.067                                  | 23             |                                  |                     |  |  |
| 109W0948H402-U | 48                | 40.8~55.2                   | 0.06              | 2.88            | 2,850                            | 1.38 48.7                            | 45.1 0.181                                  | 33             |                                  |                     |  |  |

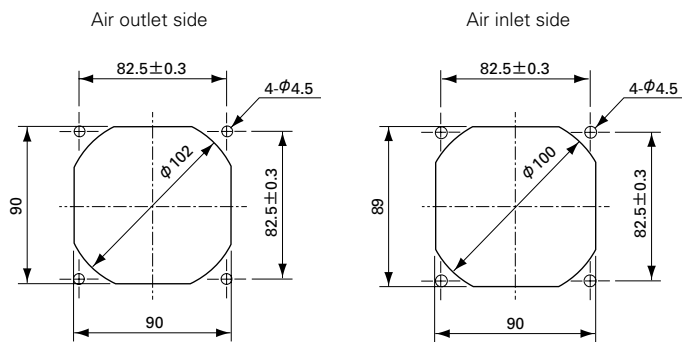
## Air Flow and Static Pressure Characteristics



**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



# Splash Proof Fan

□ **92mm**  
San Ace 92WS



Splash Proof Fans

## General specifications

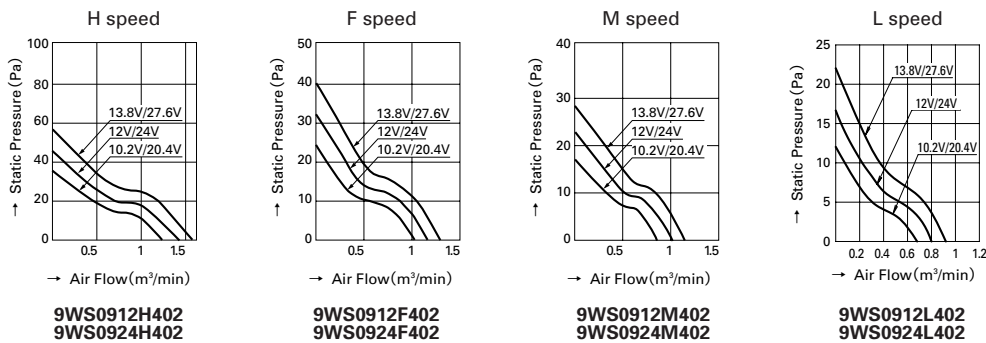
### IP54 (Dust resistant device with protection against water spray)

- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....H, F speeds ⊕red, ⊖black  
M, L speeds ⊕red, ⊖black or blue
- Mass .....150g

## 25mm thick Specifications

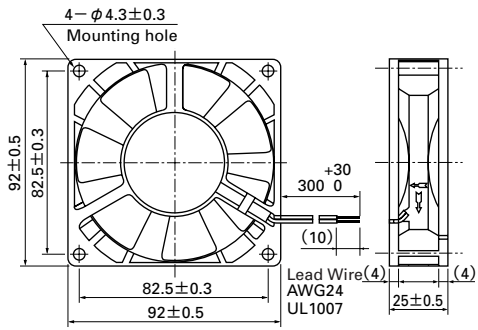
| Model No.   | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 9WS0912H402 | 12                | 10.2~13.8                   | 0.17              | 2.04            | 2,850                            | 1.38 48.7                            | 45.1 0.181                                  | 33             | -10 ~ +70                        | 40,000              |
| 9WS0912F402 |                   |                             | 0.13              | 1.56            | 2,450                            | 1.18 41.7                            | 32.3 0.130                                  | 30             |                                  |                     |
| 9WS0912M402 |                   |                             | 0.1               | 1.2             | 2,100                            | 1.01 35.7                            | 23.5 0.094                                  | 27             |                                  |                     |
| 9WS0912L402 |                   |                             | 0.06              | 0.72            | 1,700                            | 0.8 28.2                             | 16.7 0.067                                  | 23             |                                  |                     |
| 9WS0924H402 | 24                | 20.4~27.6                   | 0.1               | 2.4             | 2,850                            | 1.38 48.7                            | 45.1 0.181                                  | 33             |                                  |                     |
| 9WS0924F402 |                   |                             | 0.07              | 1.68            | 2,450                            | 1.18 41.7                            | 32.3 0.130                                  | 30             |                                  |                     |
| 9WS0924M402 |                   |                             | 0.06              | 1.44            | 2,100                            | 1.01 35.7                            | 23.5 0.094                                  | 27             |                                  |                     |
| 9WS0924L402 |                   |                             | 0.05              | 1.2             | 1,700                            | 0.8 28.2                             | 16.7 0.067                                  | 23             |                                  |                     |

## Air Flow and Static Pressure Characteristics



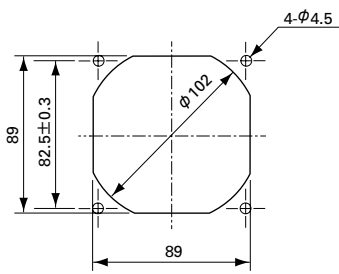
92mm

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# Splash Proof Fan 120mm San Ace 120W



“San Ace 120W” W type

### General specifications

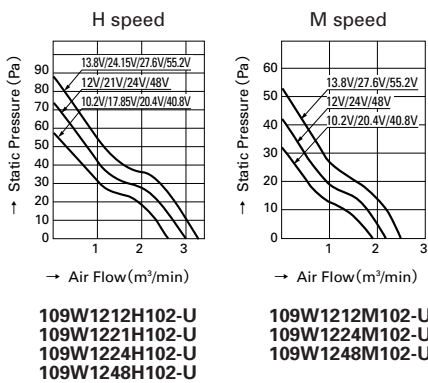
#### IP55 (Dust resistant device with protection against water jets)

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....H speed ⊕red,⊖black  
M speed ⊕red,⊖black or blue
- Mass .....420g

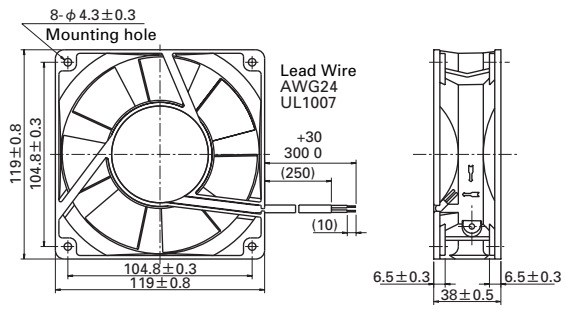
## 38mm thick Specifications

| Model No.             | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109W1212H102-U</b> | 12                | 10.2~13.8                   | 0.4               | 4.8             | 2,850                            | 3.0 106.0                            | 70.5 0.283                                  | 41             | -10 ~ +60                        | 100,000             |
| <b>109W1212M102-U</b> |                   |                             | 0.22              | 2.64            | 2,150                            | 2.25 79.4                            | 41.1 0.165                                  | 34             |                                  |                     |
| <b>109W1221H102-U</b> | 21                | 17.8~24.2                   | 0.24              | 5.04            | 2,850                            | 3.0 106.0                            | 70.5 0.283                                  | 41             |                                  |                     |
| <b>109W1224H102-U</b> |                   |                             | 0.21              | 5.04            | 2,850                            | 3.0 106.0                            | 70.5 0.283                                  | 41             |                                  |                     |
| <b>109W1224M102-U</b> | 24                | 20.4~27.6                   | 0.1               | 2.4             | 2,150                            | 2.25 79.4                            | 41.1 0.165                                  | 34             |                                  |                     |
| <b>109W1248H102-U</b> |                   |                             | 0.12              | 5.76            | 2,850                            | 3.0 106.0                            | 70.5 0.283                                  | 41             |                                  |                     |
| <b>109W1248M102-U</b> | 48                | 40.8~55.2                   | 0.06              | 2.88            | 2,150                            | 2.25 79.4                            | 41.1 0.165                                  | 34             |                                  |                     |

### Air Flow and Static Pressure Characteristics

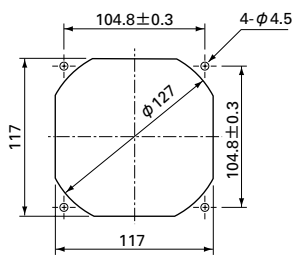


## Dimensions (unit : mm)



## Reference dimension of mounting holes and vent opening (unit : mm)

Air inlet side · Air outlet side



# Splash Proof Fan □ 120mm

## San Ace 120W



"San Ace 120W" WP type

**General specifications** IP55 (Dust resistant device with protection against water jets)

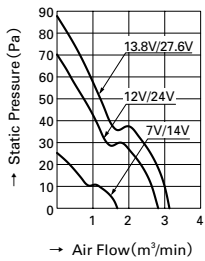
- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ...Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....360g

### 38mm thick Specifications

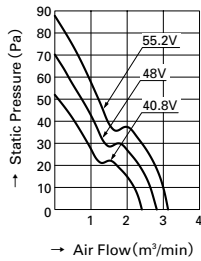
| Model No.                 | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9WP1212H102 (1021)</b> | 12                | 7 ~ 13.8                    | 0.38              | 4.56            | 2,600                            | 2.80 99                              | 70.4 0.283                                  | 39             | -10 ~ +70                        | 40,000              |
| <b>9WP1224H102 (1021)</b> | 24                | 14 ~ 27.6                   | 0.22              | 5.28            | 2,600                            | 2.80 99                              | 70.4 0.283                                  | 39             |                                  |                     |
| <b>9WP1248H102 (1021)</b> | 48                | 40.8 ~ 55.2                 | 0.11              | 5.28            | 2,600                            | 2.80 99                              | 70.4 0.283                                  | 39             |                                  |                     |

The numbers in ( ) represent ribless models.

### Air Flow and Static Pressure Characteristics

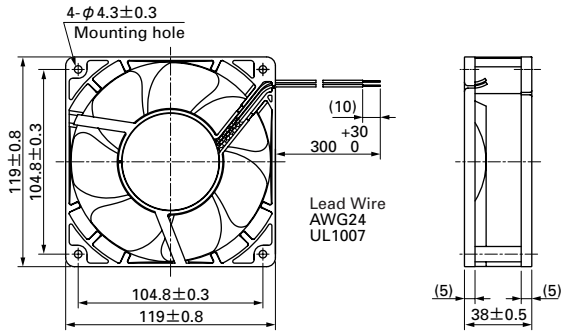


**9WP1212H102(1021)**  
**9WP1224H102(1021)**

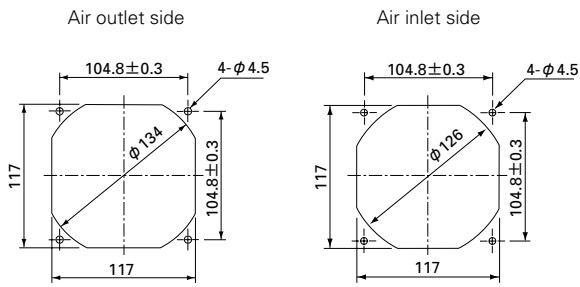


**9WP1248H102(1021)**

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



# Splash Proof Fan 120mm San Ace 120W

"San Ace 120W" G type

### General specifications

**IP55 (Dust resistant device with protection against water jets)**

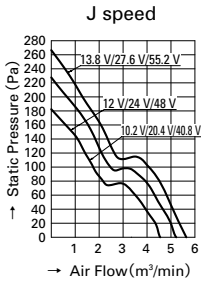
- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....J, G, E, H, F speeds ⊕red,⊖black  
M speed ⊕red,⊖black or blue
- Mass .....410g



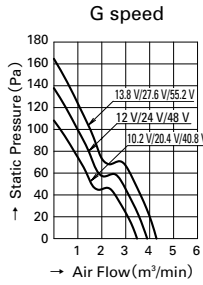
## 38mm thick Specifications

| Model No.   | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) |     | Static Pressure (Pa) (inchH <sub>2</sub> O) |       | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|-----|---|-------|----------------|----------------------------------|---------------------|
| 9WG1212J102 | 12                | 10.2~13.8                   | 1.90              | 22.8            | 4,800                            | 5.10                                 | 180 | 230   | 0.924 | 57             | -10 ~ +70                        | 60,000              |
| 9WG1212G102 |                   |                             | 0.98              | 11.76           | 3,600                            | 3.88                                 | 137 | 135   | 0.542 | 49             |                                  | 80,000              |
| 9WG1212E102 |                   |                             | 0.61              | 7.32            | 3,100                            | 3.34                                 | 118 | 100   | 0.402 | 46             |                                  | 100,000             |
| 9WG1212H102 |                   | 7 ~13.8                     | 0.38              | 4.56            | 2,600                            | 2.80                                 | 99  | 70.4  | 0.283 | 39             |                                  |                     |
| 9WG1212F102 |                   |                             | 0.28              | 3.36            | 2,280                            | 2.45                                 | 87  | 54.2  | 0.218 | 36             |                                  |                     |
| 9WG1212M102 |                   |                             | 0.21              | 2.52            | 1,950                            | 2.10                                 | 74  | 39.6  | 0.159 | 32             |                                  |                     |
| 9WG1224J102 | 24                | 20.4~27.6                   | 1.00              | 24              | 4,800                            | 5.10                                 | 180 | 230   | 0.942 | 57             | -10 ~ +70                        | 60,000              |
| 9WG1224G102 |                   |                             | 0.50              | 12              | 3,600                            | 3.88                                 | 137 | 135   | 0.542 | 49             |                                  | 80,000              |
| 9WG1224E102 |                   |                             | 0.34              | 8.16            | 3,100                            | 3.34                                 | 118 | 100   | 0.402 | 46             |                                  | 100,000             |
| 9WG1224H102 |                   | 14 ~27.6                    | 0.22              | 5.28            | 2,600                            | 2.80                                 | 99  | 70.4  | 0.283 | 39             |                                  |                     |
| 9WG1224F102 |                   |                             | 0.16              | 3.84            | 2,280                            | 2.45                                 | 87  | 54.2  | 0.218 | 36             |                                  |                     |
| 9WG1224M102 |                   |                             | 0.11              | 2.64            | 1,950                            | 2.10                                 | 74  | 39.6  | 0.159 | 32             |                                  |                     |
| 9WG1248J102 | 48                | 40.8~55.2                   | 0.51              | 24.48           | 4,800                            | 5.10                                 | 180 | 230   | 0.924 | 57             | -10 ~ +70                        | 60,000              |
| 9WG1248G102 |                   |                             | 0.25              | 12              | 3,600                            | 3.88                                 | 137 | 135   | 0.542 | 49             |                                  | 80,000              |
| 9WG1248E102 |                   |                             | 0.17              | 8.16            | 3,100                            | 3.34                                 | 118 | 100   | 0.402 | 46             |                                  | 100,000             |
| 9WG1248H102 |                   |                             | 0.11              | 5.28            | 2,600                            | 2.80                                 | 99  | 70.4  | 0.283 | 39             |                                  |                     |
| 9WG1248F102 |                   |                             | 0.09              | 4.32            | 2,280                            | 2.45                                 | 87  | 54.2  | 0.218 | 36             |                                  |                     |
| 9WG1248M102 |                   |                             | 0.07              | 3.36            | 1,950                            | 2.10                                 | 74  | 39.6  | 0.159 | 32             |                                  |                     |

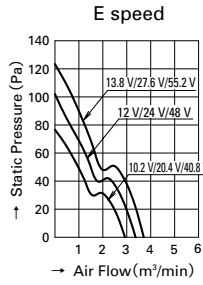
## Air Flow and Static Pressure Characteristics



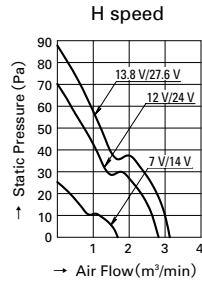
**9WG1212J102**  
**9WG1224J102**  
**9WG1248J102**



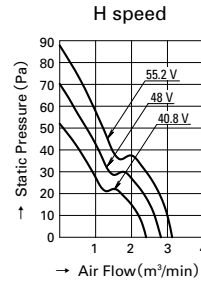
**9WG1212G102**  
**9WG1224G102**  
**9WG1248G102**



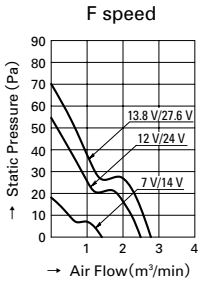
**9WG1212E102**  
**9WG1224E102**  
**9WG1248E102**



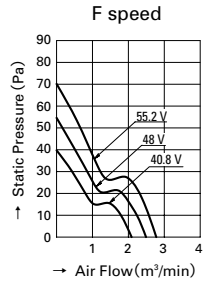
**9WG1212H102**  
**9WG1224H102**



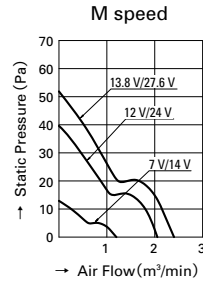
**9WG1248H102**



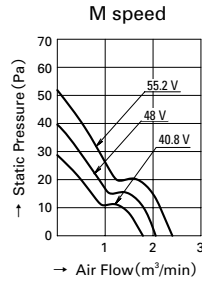
**9WG1212F102**  
**9WG1224F102**



**9WG1248F102**

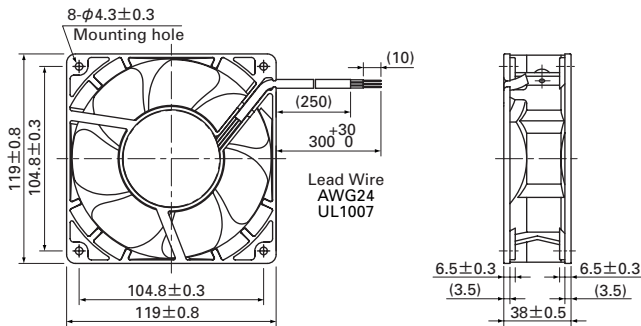


**9WG1212M102**  
**9WG1224M102**



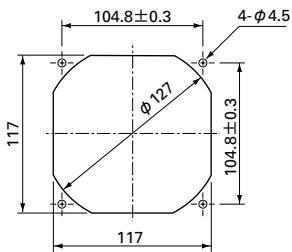
**9WG1248M102**

## Dimensions (unit : mm)



## Reference dimension of mounting holes and vent opening (unit : mm)

Air inlet side · Air outlet side



# Splash Proof Fan □ 120mm

## San Ace 120WS



### General specifications

#### IP54 (Dust resistant device with protection against water spray)

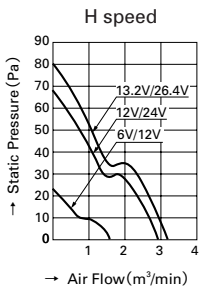
- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....H speed ⊕red, ⊖black  
M speed ⊕red, ⊖black or blue
- Mass .....260g

### 38mm thick Specifications

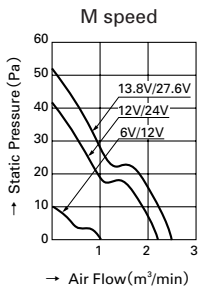
| Model No.                | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9WS1212H102(1021)</b> | 12                | 6 ~13.2                     | 0.47              | 5.64            | 2,600                            | 2.9 102.4                            | 67.62 0.272                                 | 39             | -10 ~+60                         | 40,000              |
| <b>9WS1212M102(1021)</b> |                   | 6 ~13.8                     | 0.23              | 2.76            | 1,950                            | 2.2 77.7                             | 42.14 0.169                                 | 32             | -10 ~+70                         |                     |
| <b>9WS1224H102(1021)</b> | 24                | 12 ~26.4                    | 0.23              | 5.52            | 2,600                            | 2.9 102.4                            | 67.62 0.272                                 | 39             | -10 ~+60                         |                     |
| <b>9WS1224M102(1021)</b> |                   | 12 ~27.6                    | 0.13              | 3.12            | 1,950                            | 2.2 77.7                             | 42.14 0.169                                 | 32             | -10 ~+70                         |                     |
| <b>9WS1248H102(1021)</b> | 48                | 40.8 ~52.8                  | 0.13              | 6.24            | 2,600                            | 2.9 102.4                            | 67.62 0.272                                 | 39             | -10 ~+60                         |                     |
| <b>9WS1248M102(1021)</b> |                   | 40.8 ~55.2                  | 0.07              | 3.36            | 1,950                            | 2.2 77.7                             | 42.14 0.169                                 | 32             | -10 ~+70                         |                     |

The numbers in ( ) represent ribless models.

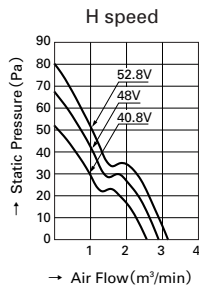
### Air Flow and Static Pressure Characteristics



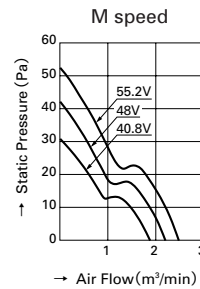
**9WS1212H102(1021)**  
**9WS1224H102(1021)**



**9WS1212M102(1021)**  
**9WS1224M102(1021)**

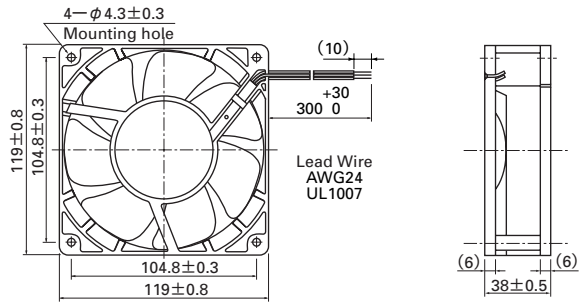


**9WS1248H102(1021)**

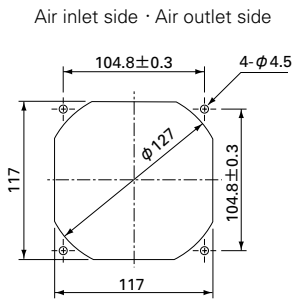


**9WS1248M102(1021)**

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



# Splash Proof Fan □ 140mm

## San Ace 140W

"San Ace 140W" W type

### General specifications

**IP55 (Dust resistant device with protection against water jets)**

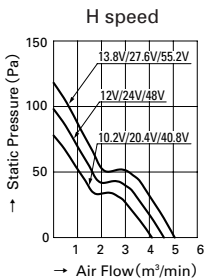
- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage,and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....H, S speeds     ⊕red,⊖black  
.....M speed             ⊕red,⊖black or blue
- Mass .....650g (38mm thick) 700g (51mm thick)



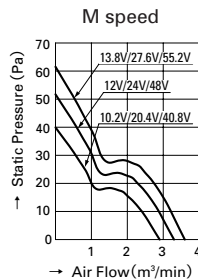
## 38mm thick Specifications

| Model No.             | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109W1412H102-U</b> | 12                | 10.2~13.8                   | 0.73              | 8.76            | 2,600                            | 4.5 159                              | 98 0.394                                    | 46             | -10 ~ +60                        | 100,000             |
| <b>109W1412M102-U</b> |                   |                             | 0.3               | 3.6             | 1,900                            | 3.3 117                              | 52 0.209                                    | 38             |                                  |                     |
| <b>109W1424H102-U</b> | 24                | 20.4~27.6                   | 0.37              | 8.88            | 2,600                            | 4.5 159                              | 98 0.394                                    | 46             |                                  |                     |
| <b>109W1424M102-U</b> |                   |                             | 0.16              | 3.84            | 1,900                            | 3.3 117                              | 52 0.209                                    | 38             |                                  |                     |
| <b>109W1448H102-U</b> | 48                | 40.8~55.2                   | 0.2               | 9.6             | 2,600                            | 4.5 159                              | 98 0.394                                    | 46             |                                  |                     |
| <b>109W1448M102-U</b> |                   |                             | 0.09              | 4.32            | 1,900                            | 3.3 117                              | 52 0.209                                    | 38             |                                  |                     |

### Air Flow and Static Pressure Characteristics



**109W1412H102-U**  
**109W1424H102-U**  
**109W1448H102-U**

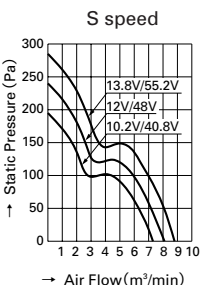


**109W1412M102-U**  
**109W1424M102-U**  
**109W1448M102-U**

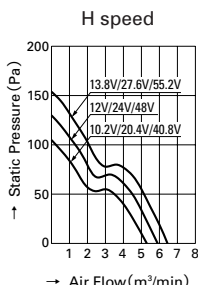
## 51mm thick Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9WB1412S502</b> | 12                | 10.2~13.8                   | 2.7               | 32.4            | 4,200                            | 8.1 286                              | 240 0.964                                   | 57             | -10 ~ +70                        | 60,000              |
| <b>9WB1412H502</b> |                   |                             | 1.25              | 15              | 3,100                            | 5.9 208                              | 130 0.522                                   | 49             |                                  |                     |
| <b>9WB1412M502</b> |                   |                             | 0.46              | 5.52            | 2,050                            | 3.9 138                              | 63 0.253                                    | 39             |                                  |                     |
| <b>9WB1424H502</b> | 24                | 20.4~27.6                   | 0.6               | 14.4            | 3,100                            | 5.9 208                              | 130 0.522                                   | 49             |                                  | 100,000             |
| <b>9WB1424M502</b> |                   |                             | 0.22              | 5.28            | 2,050                            | 3.9 138                              | 63 0.253                                    | 39             |                                  |                     |
| <b>9WB1448S502</b> | 48                | 40.8~55.2                   | 0.71              | 34.08           | 4,200                            | 8.1 286                              | 240 0.964                                   | 57             |                                  | 60,000              |
| <b>9WB1448H502</b> |                   |                             | 0.27              | 12.96           | 3,100                            | 5.9 208                              | 130 0.522                                   | 49             | 100,000                          |                     |

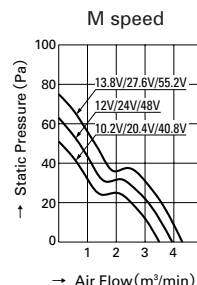
### Air Flow and Static Pressure Characteristics



**9WB1412S502**  
**9WB1448S502**

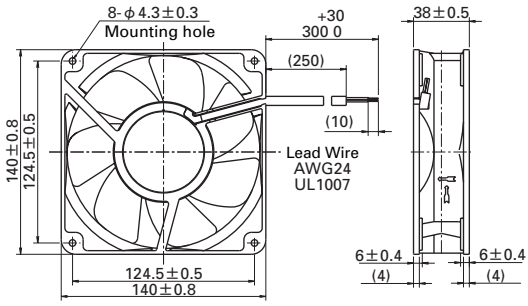


**9WB1412H502**  
**9WB1424H502**  
**9WB1448H502**

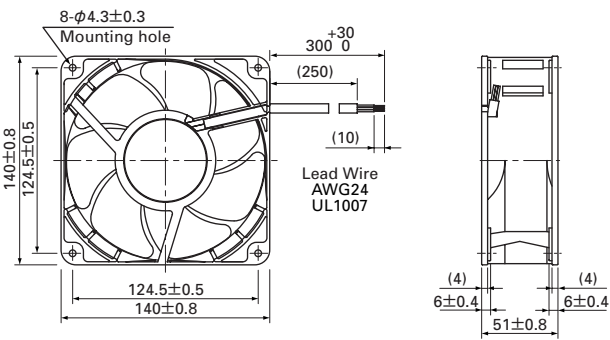


**9WB1412M502**  
**9WB1424M502**

**Dimensions (unit : mm)**

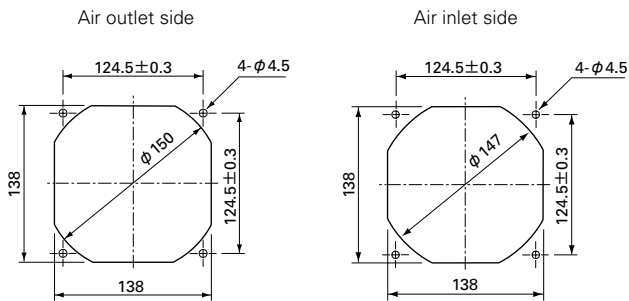


**38mm thick**



**51mm thick**

**Reference dimension of mounting holes and vent opening (unit : mm)**





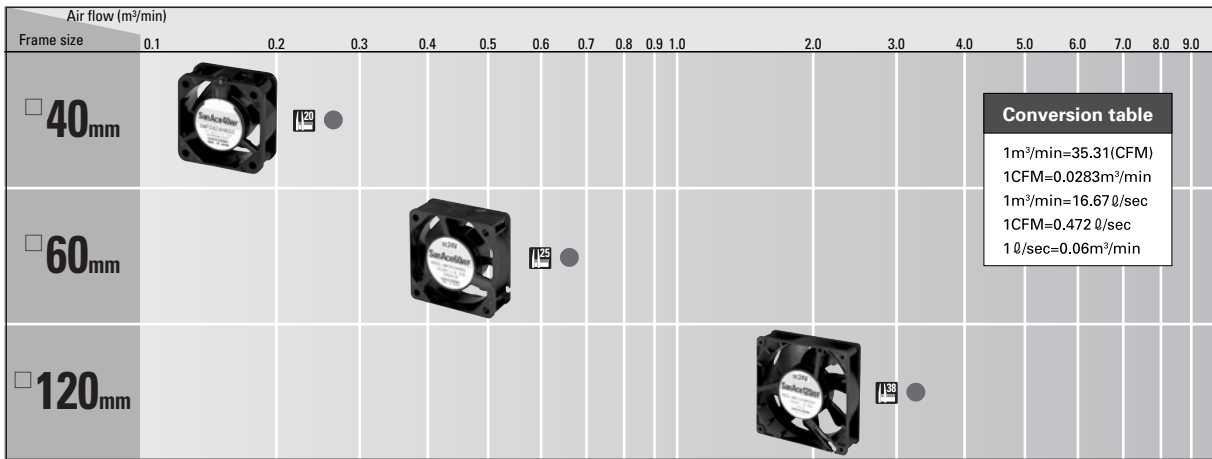
# COOLING SYSTEMS

## DC FAN

## Oil Proof Fans

Oil Proof Fans

### Domain diagram



40mm

60mm

120mm

# Oil Proof Fan

□ **40mm**  
San Ace 40WF



Oil Proof Fans

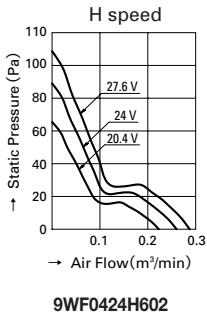
**General specifications** The product can be used in an oil mist environment\*

- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....50g

## 20mm thick Specifications

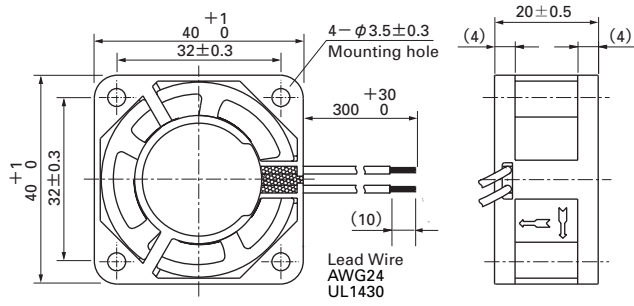
| Model No.          | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9WF0424H602</b> | 24                | 20.4~27.6                   | 0.11              | 2.64            | 13,100                           | 0.26 9.2                             | 90 0.361                                    | 42             | -10 ~ +70                        | 40,000              |

### Air Flow and Static Pressure Characteristics



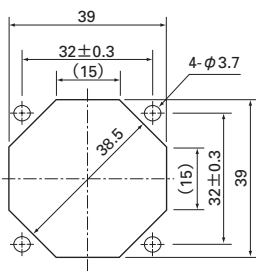
\* Environment where machining oil mist is scattered.  
Usage of this product requires an evaluation with the oil that will be used.

## Dimensions (unit : mm)



## Reference dimension of mounting holes and vent opening (unit : mm)

Air inlet side · Air outlet side



# Oil Proof Fan

□ **60mm**  
San Ace 60WF



Oil Proof Fans

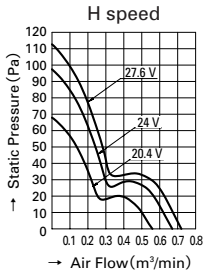
**General specifications** The product can be used in an oil mist environment\*

- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....110g

## 25mm thick Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9WF0624H402</b> | 24                | 20.4~27.6                   | 15                | 3.6             | 6,500                            | 0.67 23.6                            | 97 0.390                                    | 41             | -10 ~ +70                        | 40,000              |

### Air Flow and Static Pressure Characteristics

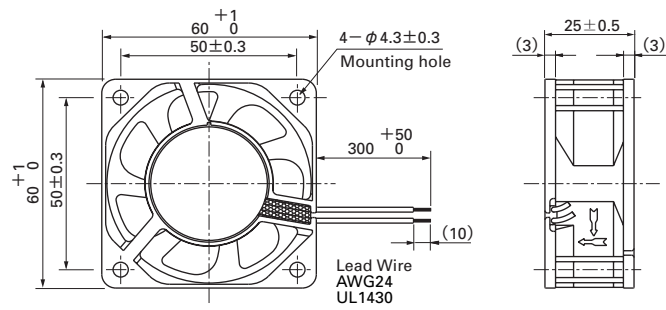


9WF0624H402

60mm

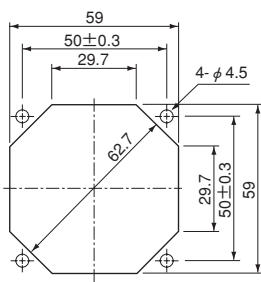
\* Environment where machining oil mist is scattered.  
Usage of this product requires an evaluation with the oil that will be used.

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# Oil Proof Fan □ 120mm

## San Ace 120WF



Oil Proof Fans

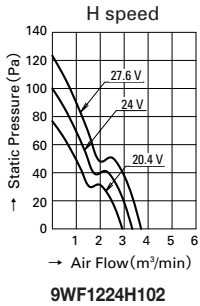
**General specifications** The product can be used in an oil mist environment\*

- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....355g

### 38mm thick Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9WF1224H102</b> | 24                | 20.4~27.6                   | 0.32              | 7.68            | 3,100                            | 3.34 118                             | 100 0.402                                   | 46             | -10 ~ +70                        | 40,000              |

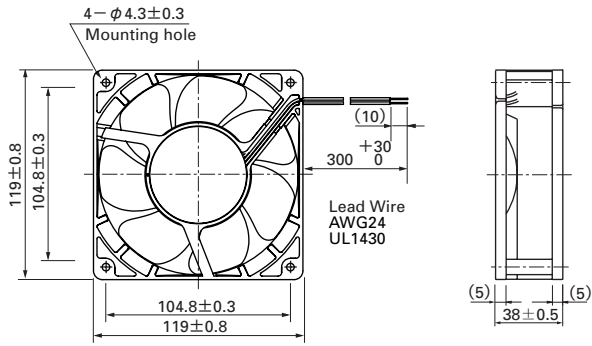
### Air Flow and Static Pressure Characteristics



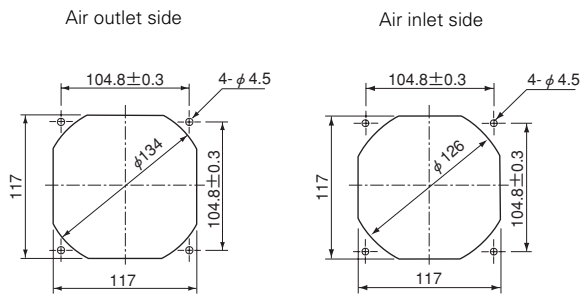
\* Environment where machining oil mist is scattered.  
Usage of this product requires an evaluation with the oil that will be used.

120mm

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



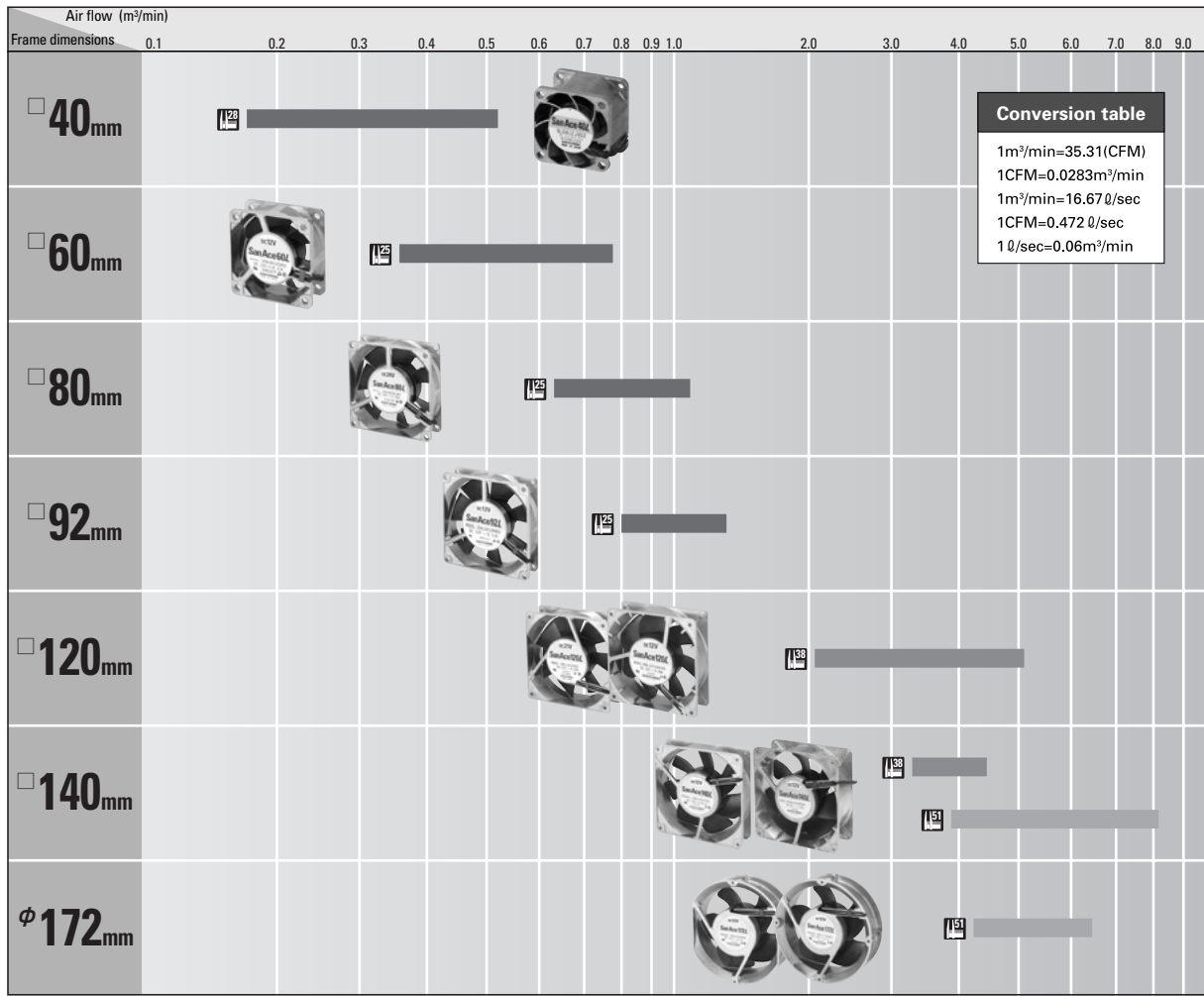


# DC FAN

# Long Life Fans

Long Life Fans

## Domain diagram



**Conversion table**

- 1m³/min=35.31(CFM)
- 1CFM=0.0283m³/min
- 1m³/min=16.67 l/sec
- 1CFM=0.472 l/sec
- 1 l/sec=0.06m³/min



# Long Life Fan □ 40mm

## San Ace 40L



### General specifications

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....55g

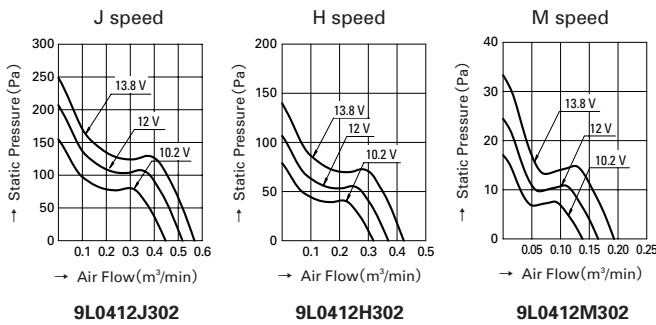
Long Life Fans

## 28mm thick Specifications

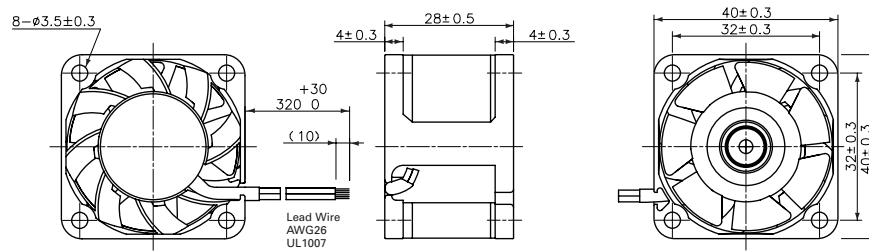
| Model No.  | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow              |       | Static Pressure |                        | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|-----------------------|-------|-----------------|------------------------|----------------|----------------------------------|---------------------|
|            |                   |                             |                   |                 |                                  | (m <sup>3</sup> /min) | (CFM) | (Pa)            | (inchH <sub>2</sub> O) |                |                                  |                     |
| 9L0412J302 | 12                | 10.2~13.8                   | 0.31              | 3.72            | 11,700                           | 0.52                  | 18.4  | 206             | 0.827                  | 48             | -10 ~ +70                        | 100,000             |
| 9L0412H302 |                   |                             | 0.15              | 1.80            | 8,400                            | 0.37                  | 13.1  | 106             | 0.426                  | 40             |                                  |                     |
| 9L0412M302 |                   |                             | 0.045             | 0.54            | 4,000                            | 0.16                  | 5.65  | 24              | 0.096                  | 19             |                                  |                     |

40mm

### Air Flow and Static Pressure Characteristics

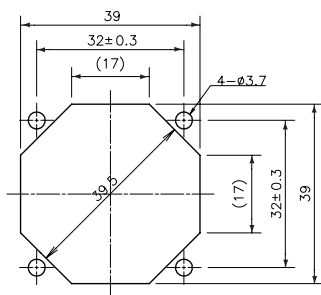


## Dimensions (unit : mm)



## Reference dimension of mounting holes and vent opening (unit : mm)

Air inlet side · Air outlet side



# Long Life Fan □ 60mm

## San Ace 60L



### General specifications

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....G, S, H, F speeds ⊕red,⊖black  
M speed                   ⊕red,⊖black or blue
- Mass .....100g

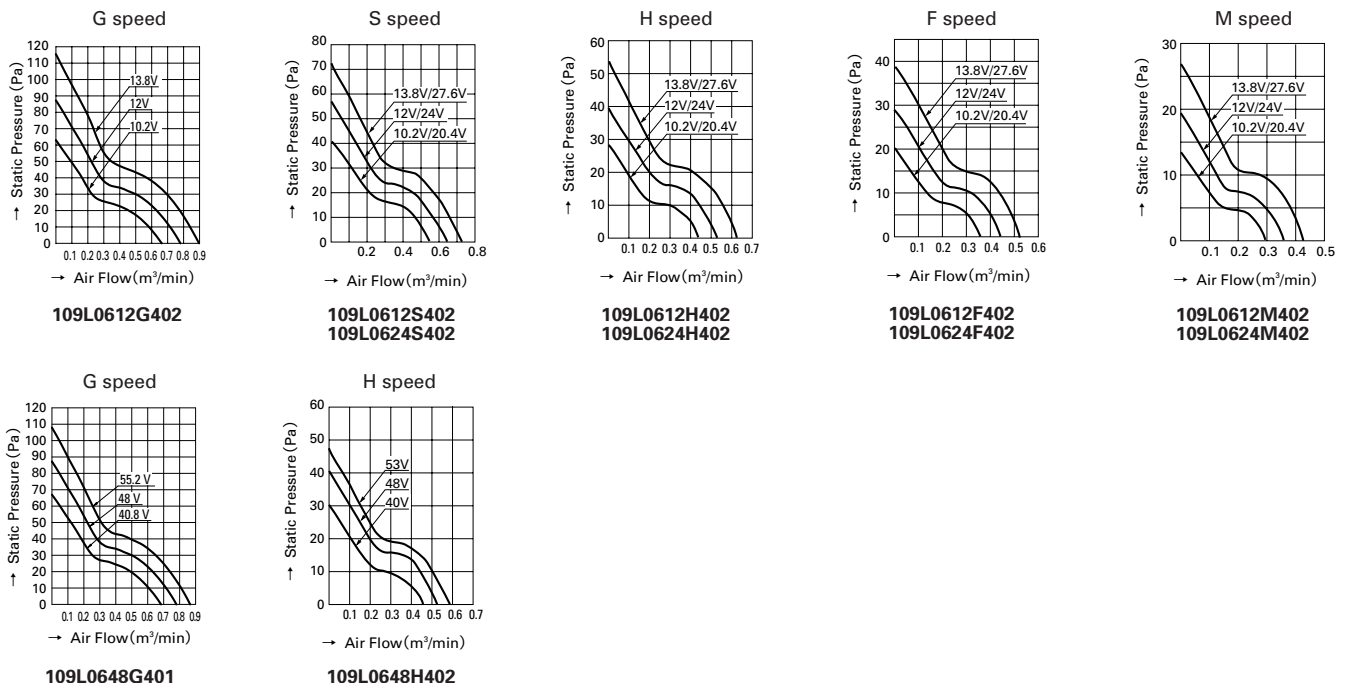
Long Life Fans

## 25mm thick Specifications

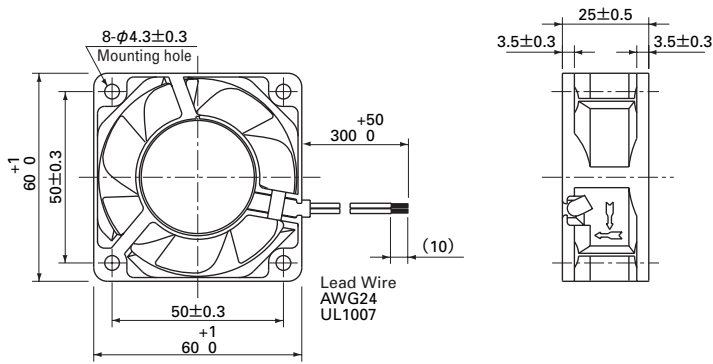
| Model No.           | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109L0612G402</b> | 12                | 10.2~13.8                   | 0.24              | 2.88            | 5,600                            | 0.78 27.5                            | 87.3 0.351                                  | 39             | -10 ~ +70                        | 100,000             |
| <b>109L0612S402</b> |                   |                             | 0.17              | 2.04            | 4,600                            | 0.65 23.0                            | 57.3 0.230                                  | 33             |                                  |                     |
| <b>109L0612H402</b> |                   |                             | 0.11              | 1.32            | 3,800                            | 0.53 18.7                            | 40.2 0.161                                  | 28             |                                  |                     |
| <b>109L0612F402</b> |                   |                             | 0.09              | 1.08            | 3,200                            | 0.44 15.5                            | 29.4 0.118                                  | 24             |                                  |                     |
| <b>109L0612M402</b> |                   |                             | 0.06              | 0.72            | 2,600                            | 0.36 12.7                            | 19.6 0.079                                  | 20             |                                  |                     |
| <b>109L0624S402</b> | 24                | 20.4~27.6                   | 0.08              | 1.92            | 4,600                            | 0.65 23.0                            | 57.3 0.230                                  | 33             |                                  |                     |
| <b>109L0624H402</b> |                   |                             | 0.06              | 1.44            | 3,800                            | 0.53 18.7                            | 40.2 0.161                                  | 28             |                                  |                     |
| <b>109L0624F402</b> |                   |                             | 0.05              | 1.20            | 3,200                            | 0.44 15.5                            | 29.4 0.118                                  | 24             |                                  |                     |
| <b>109L0624M402</b> |                   |                             | 0.04              | 0.96            | 2,600                            | 0.36 12.7                            | 19.6 0.079                                  | 20             |                                  |                     |
| <b>109L0648G401</b> |                   |                             | 48                | 40.8~55.2       | 0.07                             | 3.36                                 | 5,600                                       | 0.78 27.6      |                                  |                     |
| <b>109L0648H402</b> | 40 ~53            | 0.04                        |                   | 1.92            | 3,800                            | 0.53 18.7                            | 40.2 0.161                                  | 28             |                                  |                     |

### Air Flow and Static Pressure Characteristics

60mm

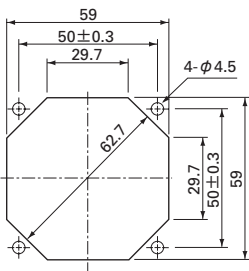


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# Long Life Fan □ 80mm San Ace 80L



## General specifications

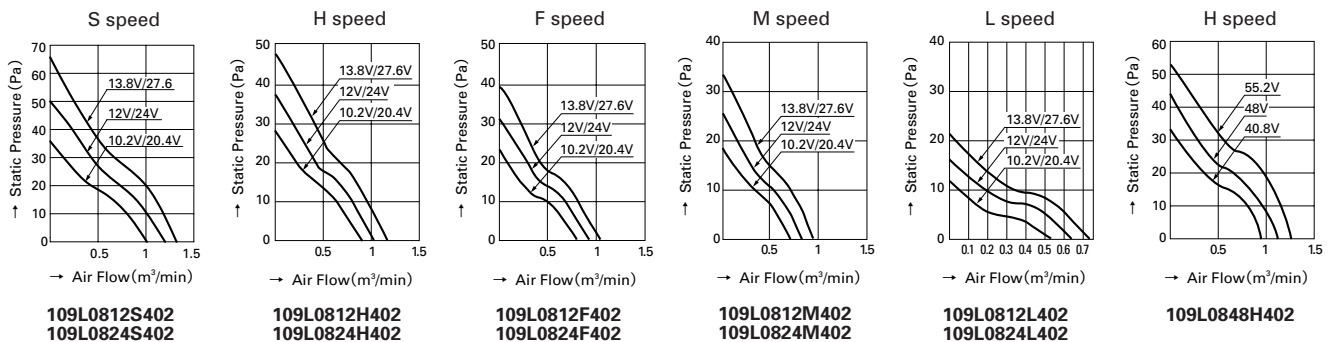
- Material ······Frame:Aluminum, Impeller:Plastics
- Life Expectancy ······Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ······Current blocking function (with reverse polarity protection)
- Dielectric Strength ······50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ······Measured at 1m from the air inlet
- Operating Temperature Range ······Varies for each model (Non-condensing)
- Lead Wire ········S, H, F speeds ⊕red, ⊖black  
M, L speeds ⊕red, ⊖black or blue
- Mass ············150g

Long Life Fans

## 25mm thick Specifications

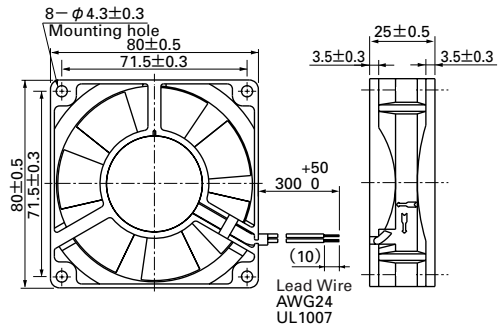
| Model No.           | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109L0812S402</b> | 12                | 10.2~13.8                   | 0.26              | 3.12            | 3,400                            | 1.2 42.4                             | 50 0.2                                      | 37             | -10 ~ +70                        | 100,000             |
| <b>109L0812H402</b> |                   |                             | 0.18              | 2.16            | 3,000                            | 1.06 37.4                            | 39.2 0.157                                  | 32             |                                  |                     |
| <b>109L0812F402</b> |                   |                             | 0.14              | 1.68            | 2,700                            | 0.93 32.8                            | 32.3 0.130                                  | 29             |                                  |                     |
| <b>109L0812M402</b> |                   |                             | 0.1               | 1.2             | 2,400                            | 0.83 29.3                            | 26.5 0.106                                  | 26             |                                  |                     |
| <b>109L0812L402</b> |                   |                             | 0.08              | 0.96            | 1,900                            | 0.63 22.2                            | 16.7 0.067                                  | 22             |                                  |                     |
| <b>109L0824S402</b> | 24                | 20.4~27.6                   | 0.11              | 2.64            | 3,400                            | 1.2 42.4                             | 50 0.2                                      | 37             |                                  |                     |
| <b>109L0824H402</b> |                   |                             | 0.09              | 2.16            | 3,000                            | 1.06 37.4                            | 39.2 0.157                                  | 32             |                                  |                     |
| <b>109L0824F402</b> |                   |                             | 0.08              | 1.92            | 2,700                            | 0.93 32.8                            | 32.3 0.130                                  | 29             |                                  |                     |
| <b>109L0824M402</b> |                   |                             | 0.07              | 1.68            | 2,400                            | 0.83 29.3                            | 26.5 0.106                                  | 26             |                                  |                     |
| <b>109L0824L402</b> |                   |                             | 0.05              | 1.2             | 1,900                            | 0.63 22.2                            | 16.7 0.067                                  | 22             |                                  |                     |
| <b>109L0848H402</b> | 48                | 40.8~55.2                   | 0.06              | 2.88            | 3,150                            | 1.1 38.8                             | 43.1 0.173                                  | 34             |                                  |                     |

## Air Flow and Static Pressure Characteristics

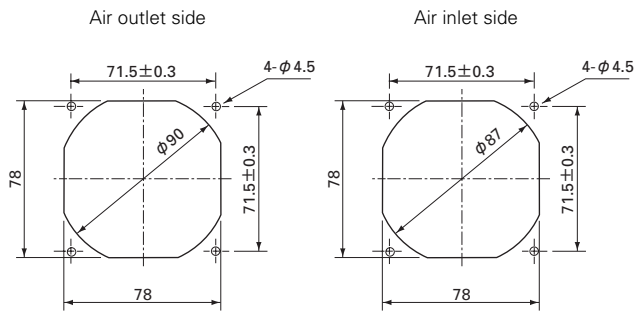


80mm

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



# Long Life Fan □ 92mm

## San Ace 92L



### General specifications

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....S, C, H, F speeds ⊕red,⊖black  
M, L speeds ⊕red,⊖black or blue
- Mass .....170g

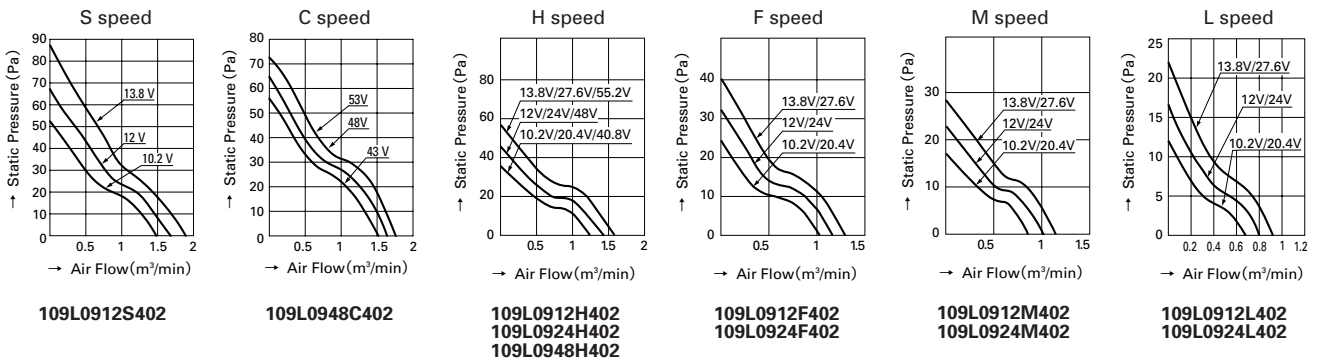
Long Life Fans

### 25mm thick Specifications

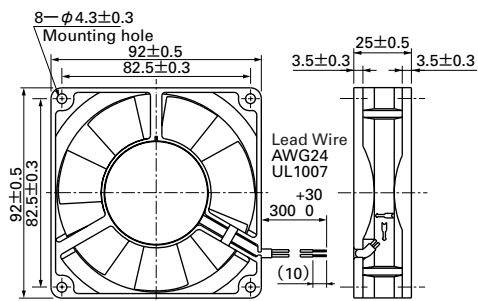
| Model No.           | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109L0912S402</b> | 12                | 10.2 ~ 13.8                 | 0.32              | 3.84            | 3,500                            | 1.69 59.7                            | 66.6 0.267                                  | 39             | - 10 ~ +70                       | 100,000             |
| <b>109L0912H402</b> |                   |                             | 0.21              | 2.52            | 2,850                            | 1.38 48.7                            | 45.1 0.181                                  | 33             |                                  |                     |
| <b>109L0912F402</b> |                   |                             | 0.14              | 1.68            | 2,450                            | 1.18 41.7                            | 32.3 0.130                                  | 30             |                                  |                     |
| <b>109L0912M402</b> |                   |                             | 0.11              | 1.32            | 2,100                            | 1.01 35.7                            | 23.5 0.094                                  | 27             |                                  |                     |
| <b>109L0912L402</b> |                   |                             | 0.08              | 0.96            | 1,700                            | 0.80 28.2                            | 16.7 0.067                                  | 23             |                                  |                     |
| <b>109L0924H402</b> | 24                | 20.4 ~ 27.6                 | 0.12              | 2.88            | 2,850                            | 1.38 48.7                            | 45.1 0.181                                  | 33             |                                  |                     |
| <b>109L0924F402</b> |                   |                             | 0.08              | 1.92            | 2,450                            | 1.18 41.7                            | 32.3 0.130                                  | 30             |                                  |                     |
| <b>109L0924M402</b> |                   |                             | 0.06              | 1.44            | 2,100                            | 1.01 35.7                            | 23.5 0.094                                  | 27             |                                  |                     |
| <b>109L0924L402</b> |                   |                             | 0.05              | 1.2             | 1,700                            | 0.80 28.2                            | 16.7 0.067                                  | 23             |                                  |                     |
| <b>109L0948C402</b> | 48                | 43 ~ 53                     | 0.1               | 4.8             | 3,400                            | 1.65 58.3                            | 64.2 0.258                                  | 38             |                                  | 80,000              |
| <b>109L0948H402</b> |                   | 40.8 ~ 55.2                 | 0.06              | 2.88            | 2,850                            | 1.38 48.7                            | 45.1 0.181                                  | 33             | 100,000                          |                     |

### Air Flow and Static Pressure Characteristics

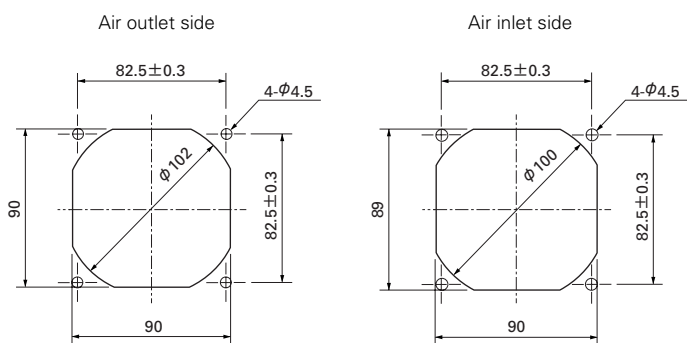
92mm



**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



# Long Life Fan □ 120mm

## San Ace 120L



### General specifications

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....H speed ⊕red, ⊖black  
M speed ⊕red, ⊖black or blue
- Mass .....320g (Standard type), 370g (Low noise type)

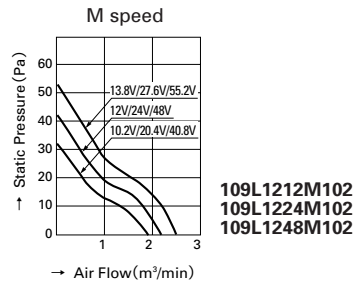
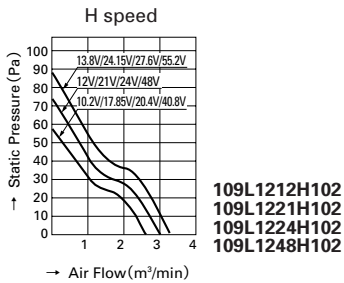
Long Life Fans

## 38mm thick (Standard type)

### Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109L1212H102</b> | 12                | 10.2~13.8                   | 0.4               | 4.8             | 2,850                            | 3.0 106.0                            | 70.5 0.283                                  | 41             | -10 ~ +70                        | 200,000             |
| <b>109L1212M102</b> |                   |                             | 0.22              | 2.64            | 2,150                            | 2.25 79.4                            | 41.1 0.165                                  | 34             |                                  |                     |
| <b>109L1221H102</b> | 21                | 17.8~24.2                   | 0.24              | 5.04            | 2,850                            | 3.0 106.0                            | 70.5 0.283                                  | 41             |                                  |                     |
| <b>109L1224H102</b> |                   |                             | 24                | 20.4~27.6       | 0.21                             | 5.04                                 | 2,850                                       | 3.0 106.0      |                                  |                     |
| <b>109L1224M102</b> | 0.1               | 2.4                         |                   |                 | 2,150                            | 2.25 79.4                            | 41.1 0.165                                  | 34             |                                  |                     |
| <b>109L1248H102</b> | 48                | 40.8~55.2                   | 0.12              | 5.76            | 2,850                            | 3.0 106.0                            | 70.5 0.283                                  | 41             |                                  |                     |
| <b>109L1248M102</b> |                   |                             | 0.06              | 2.88            | 2,150                            | 2.25 79.4                            | 41.1 0.165                                  | 34             |                                  |                     |

### Air Flow and Static Pressure Characteristics

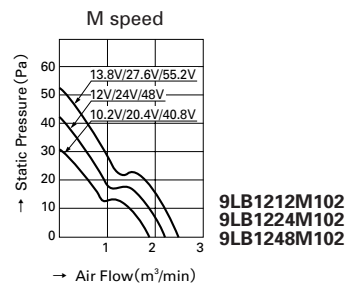
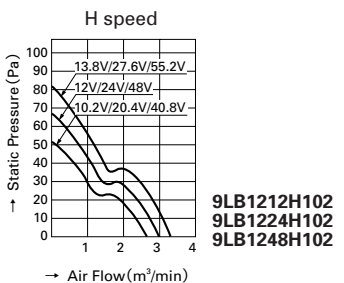


## 38mm thick (Low noise type)

### Specifications

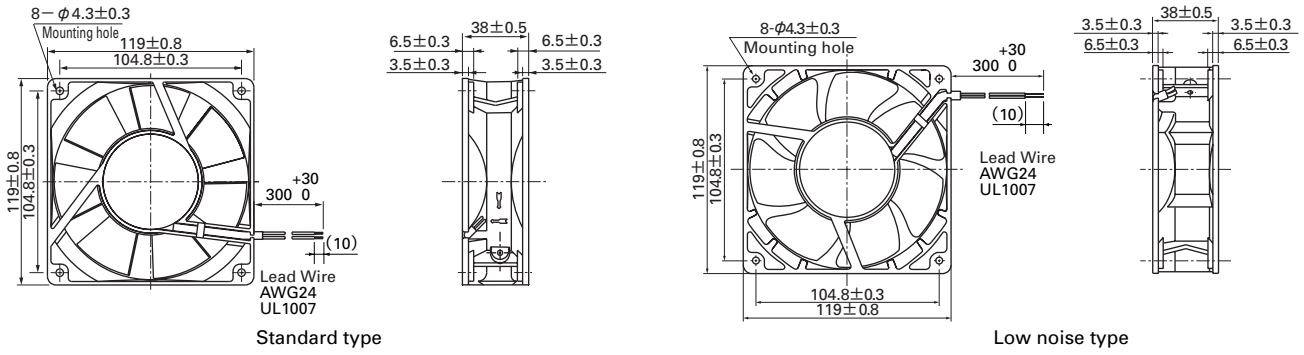
| Model No.          | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9LB1212H102</b> | 12                | 10.2~13.8                   | 0.39              | 4.68            | 2,600                            | 2.9 102.4                            | 67.62 0.272                                 | 39             | -10 ~ +70                        | 200,000             |
| <b>9LB1212M102</b> |                   |                             | 0.22              | 2.64            | 2,000                            | 2.2 77.7                             | 42.14 0.169                                 | 32             |                                  |                     |
| <b>9LB1224H102</b> | 24                | 20.4~27.6                   | 0.19              | 4.56            | 2,600                            | 2.9 102.4                            | 67.62 0.272                                 | 39             |                                  |                     |
| <b>9LB1224M102</b> |                   |                             | 0.11              | 2.64            | 2,000                            | 2.2 77.7                             | 42.14 0.169                                 | 32             |                                  |                     |
| <b>9LB1248H102</b> | 48                | 40.8~55.2                   | 0.11              | 5.28            | 2,600                            | 2.9 102.4                            | 67.62 0.272                                 | 39             |                                  |                     |
| <b>9LB1248M102</b> |                   |                             | 0.06              | 2.88            | 2,000                            | 2.2 77.7                             | 42.14 0.169                                 | 32             |                                  |                     |

### Air Flow and Static Pressure Characteristics

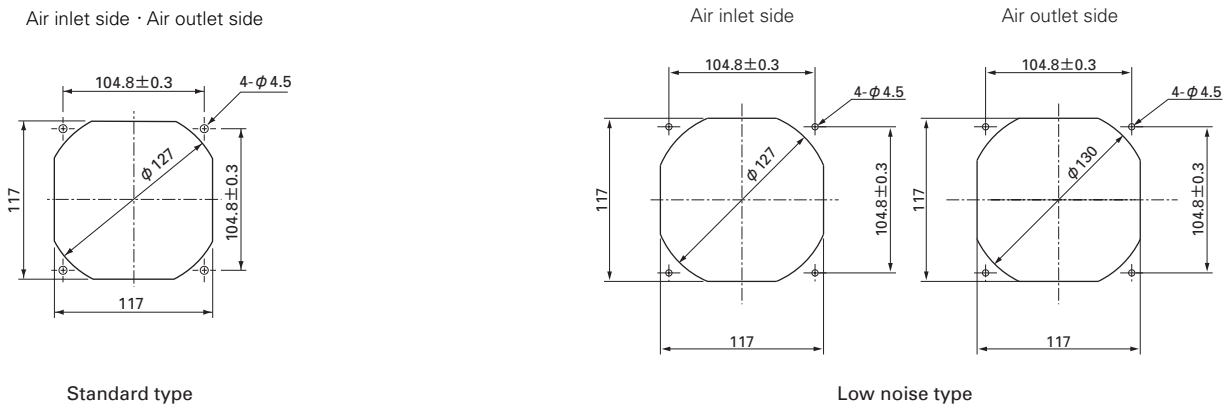


120mm

**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



# Long Life Fan □ 120mm

## San Ace 120L



### "San Ace 120L" G Type

#### General specifications

Material .....Frame:Aluminum, Impeller:Plastics  
 Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
 rated voltage,and continuously run in a free air state)  
 Motor Protection System ....Current blocking function (with reverse polarity protection)  
 Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)  
 Noise Measurement Method ..Measured at 1m from the air inlet  
 Operating Temperature Range .....Varies for each model (Non-condensing)  
 Lead Wire .....J, G, E, H, F speeds ⊕red,⊖black  
 M speed ⊕red,⊖black or blue  
 Mass .....370g

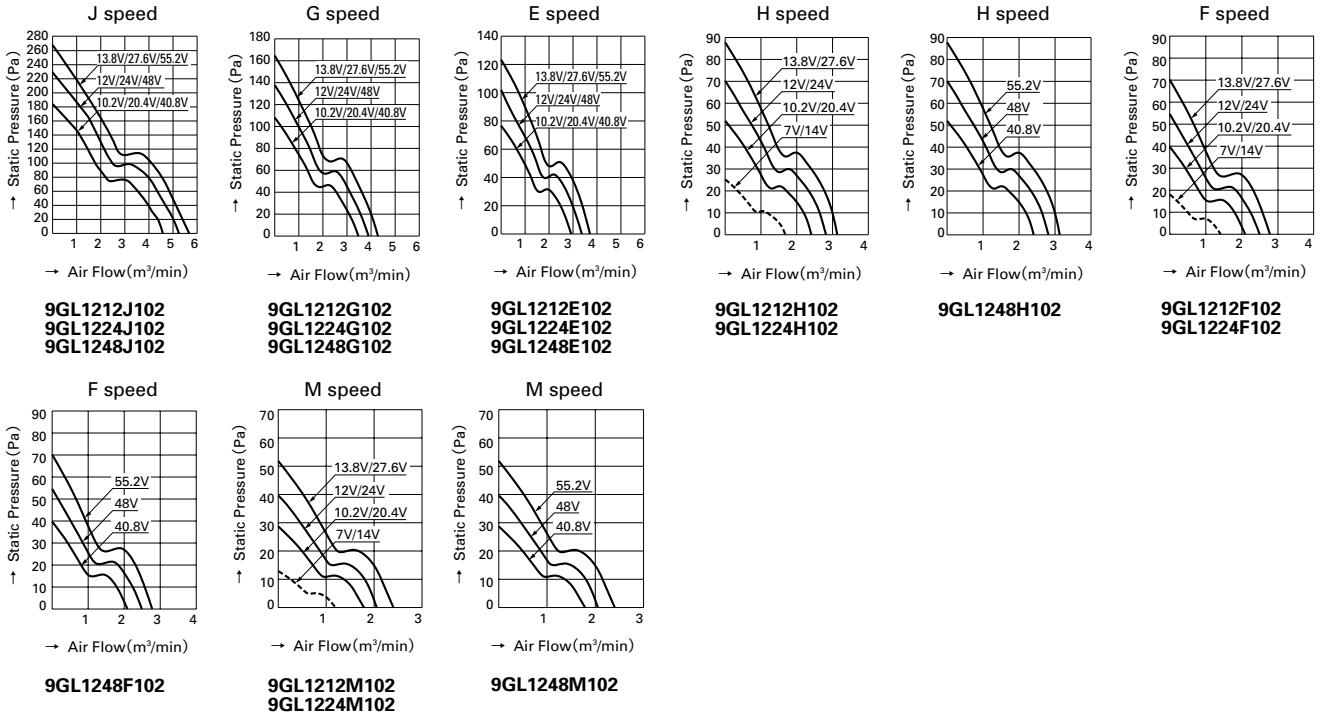
### 38mm thick Specifications

| Model No.   | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) |     | Static Pressure (Pa) (inchH <sub>2</sub> O) |       | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|-----|---|-------|----------------|----------------------------------|---------------------|
| 9GL1212J102 | 12                | 10.2~13.8                   | 1.9               | 22.8            | 4,800                            | 5.10                                 | 180 | 230   | 0.924 | 57             | -10 ~ +70                        | 60,000              |
| 9GL1212G102 |                   |                             | 0.98              | 11.8            | 3,600                            | 3.88                                 | 137 | 135   | 0.542 | 49             |                                  | 80,000              |
| 9GL1212E102 |                   |                             | 0.61              | 7.32            | 3,100                            | 3.34                                 | 118 | 100   | 0.402 | 46             |                                  | 100,000             |
| 9GL1212H102 |                   | 7 ~13.8                     | 0.38              | 4.56            | 2,600                            | 2.80                                 | 99  | 70.4  | 0.283 | 39             |                                  |                     |
| 9GL1212F102 |                   |                             | 0.28              | 3.36            | 2,280                            | 2.45                                 | 87  | 54.2  | 0.218 | 36             |                                  |                     |
| 9GL1212M102 |                   |                             | 0.21              | 2.52            | 1,950                            | 2.10                                 | 74  | 39.6  | 0.159 | 32             |                                  |                     |
| 9GL1224J102 | 24                | 20.4~27.6                   | 1.0               | 24.0            | 4,800                            | 5.10                                 | 180 | 230   | 0.924 | 57             | -10 ~ +70                        | 60,000              |
| 9GL1224G102 |                   |                             | 0.50              | 12.0            | 3,600                            | 3.88                                 | 137 | 135   | 0.542 | 49             |                                  | 80,000              |
| 9GL1224E102 |                   |                             | 0.34              | 8.16            | 3,100                            | 3.34                                 | 118 | 100   | 0.402 | 46             |                                  | 100,000             |
| 9GL1224H102 |                   | 14 ~27.6                    | 0.22              | 5.28            | 2,600                            | 2.80                                 | 99  | 70.4  | 0.283 | 39             |                                  |                     |
| 9GL1224F102 |                   |                             | 0.16              | 3.84            | 2,280                            | 2.45                                 | 87  | 54.2  | 0.218 | 36             |                                  |                     |
| 9GL1224M102 |                   |                             | 0.11              | 2.64            | 1,950                            | 2.10                                 | 74  | 39.6  | 0.159 | 32             |                                  |                     |
| 9GL1248J102 | 48                | 40.8~55.2                   | 0.51              | 24.5            | 4,800                            | 5.10                                 | 180 | 230   | 0.924 | 57             | -10 ~ +70                        | 60,000              |
| 9GL1248G102 |                   |                             | 0.25              | 12.0            | 3,600                            | 3.88                                 | 137 | 135   | 0.542 | 49             |                                  | 80,000              |
| 9GL1248E102 |                   |                             | 0.17              | 8.16            | 3,100                            | 3.34                                 | 118 | 100   | 0.402 | 46             |                                  | 100,000             |
| 9GL1248H102 |                   |                             | 0.11              | 5.28            | 2,600                            | 2.80                                 | 99  | 70.4  | 0.283 | 39             |                                  |                     |
| 9GL1248F102 |                   |                             | 0.09              | 4.32            | 2,280                            | 2.45                                 | 87  | 54.2  | 0.218 | 36             |                                  |                     |
| 9GL1248M102 |                   |                             | 0.07              | 3.36            | 1,950                            | 2.10                                 | 74  | 39.6  | 0.159 | 32             |                                  |                     |

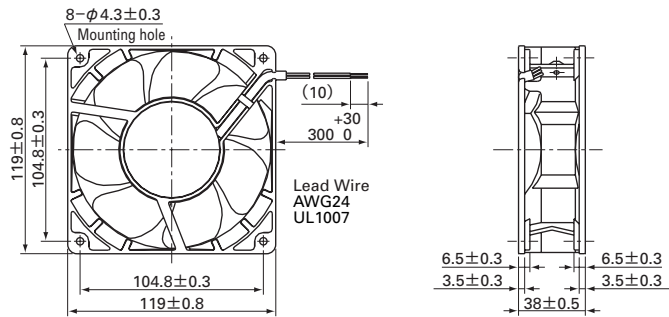
Long Life Fans

120mm

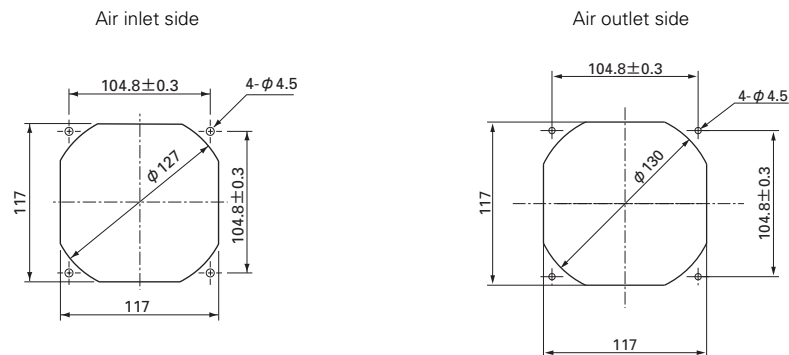
## Air Flow and Static Pressure Characteristics



## Dimensions (unit : mm)



## Reference dimension of mounting holes and vent opening (unit : mm)



# Long Life Fan □ 140mm

## San Ace 140L



### General specifications

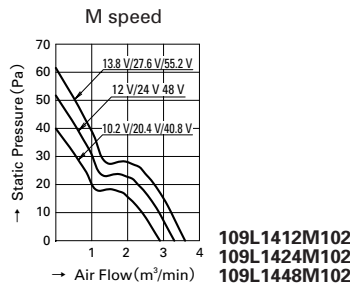
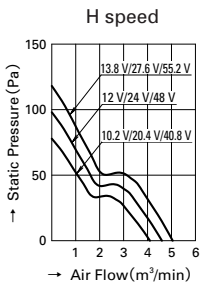
- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....S, H speeds ⊕red,⊖black  
.....M speed ⊕red,⊖black or blue
- Mass .....600g(38mm thick) ,610g(51mm thick)

Long Life Fans

### 38mm thick Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min (CFM)) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109L1412H102</b> | 12                | 10.2~13.8                   | 0.73              | 8.76            | 2,600                            | 4.5 159                              | 98 0.394                                    | 46             | - 10 ~ +70                       | 100,000             |
| <b>109L1412M102</b> |                   |                             | 0.3               | 3.6             | 1,900                            | 3.3 117                              | 52 0.209                                    | 38             |                                  |                     |
| <b>109L1424H102</b> | 24                | 20.4~27.6                   | 0.37              | 8.88            | 2,600                            | 4.5 159                              | 98 0.394                                    | 46             |                                  |                     |
| <b>109L1424M102</b> |                   |                             | 0.16              | 3.84            | 1,900                            | 3.3 117                              | 52 0.209                                    | 38             |                                  |                     |
| <b>109L1448H102</b> | 48                | 40.8~55.2                   | 0.2               | 9.6             | 2,600                            | 4.5 159                              | 98 0.394                                    | 46             |                                  |                     |
| <b>109L1448M102</b> |                   |                             | 0.09              | 4.32            | 1,900                            | 3.3 117                              | 52 0.209                                    | 38             |                                  |                     |

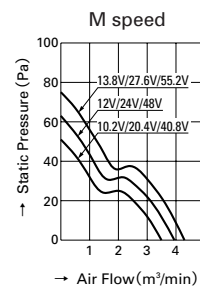
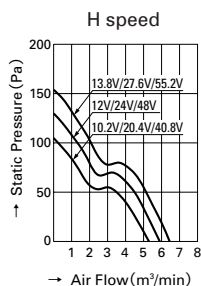
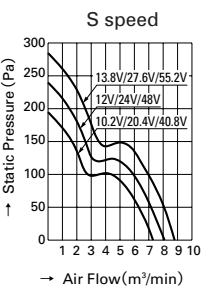
### Air Flow and Static Pressure Characteristics



### 51mm thick Specifications

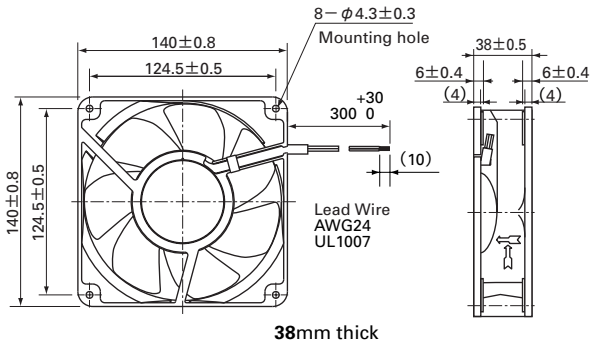
| Model No.          | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min (CFM)) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9LB1412S502</b> | 12                | 10.2~13.8                   | 2.7               | 32.4            | 4,200                            | 8.1 286                              | 240 0.964                                   | 57             | - 10 ~ +70                       | 60,000              |
| <b>9LB1412H502</b> |                   |                             | 1.25              | 15.0            | 3,100                            | 5.9 208                              | 130 0.522                                   | 49             |                                  | 100,000             |
| <b>9LB1412M502</b> |                   |                             | 0.46              | 5.5             | 2,050                            | 3.9 138                              | 63 0.253                                    | 39             |                                  | 60,000              |
| <b>9LB1424S502</b> | 24                | 20.4~27.6                   | 1.38              | 33.1            | 4,200                            | 8.1 286                              | 240 0.964                                   | 57             |                                  | 60,000              |
| <b>9LB1424H502</b> |                   |                             | 0.60              | 14.4            | 3,100                            | 5.9 208                              | 130 0.522                                   | 49             |                                  | 100,000             |
| <b>9LB1424M502</b> |                   |                             | 0.22              | 5.3             | 2,050                            | 3.9 138                              | 63 0.253                                    | 39             |                                  | 60,000              |
| <b>9LB1448S502</b> | 48                | 40.8~55.2                   | 0.71              | 34.1            | 4,200                            | 8.1 286                              | 240 0.964                                   | 57             | 60,000                           |                     |
| <b>9LB1448H502</b> |                   |                             | 0.27              | 13.0            | 3,100                            | 5.9 208                              | 130 0.522                                   | 49             | 100,000                          |                     |
| <b>9LB1448M502</b> |                   |                             | 0.12              | 5.8             | 2,050                            | 3.9 138                              | 63 0.253                                    | 39             | 60,000                           |                     |

### Air Flow and Static Pressure Characteristics

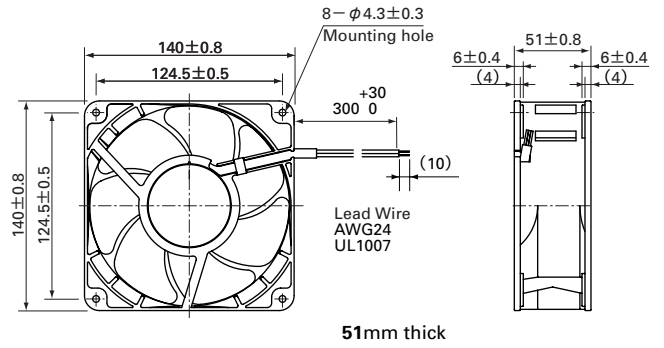


140mm

**Dimensions (unit : mm)**

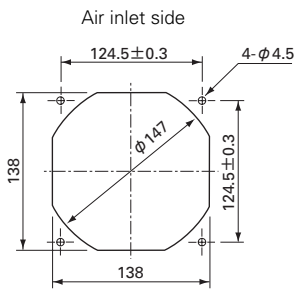


**38mm thick**

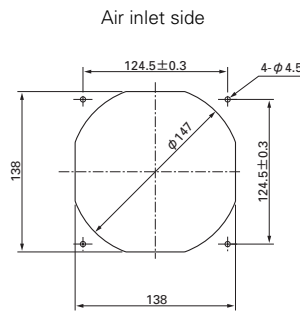
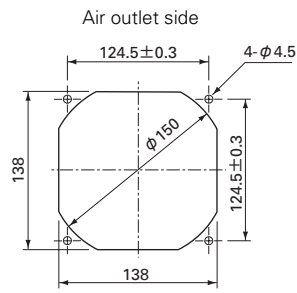


**51mm thick**

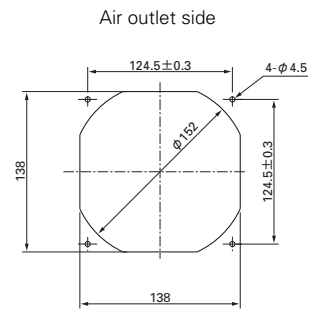
**Reference dimension of mounting holes and vent opening (unit : mm)**



**38mm thick**



**51mm thick**



# Long Life Fan $\varnothing$ 172mm

## San Ace 172L



### General specifications

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....H speed  $\oplus$ red,  $\ominus$ black  
M speed  $\oplus$ red,  $\ominus$ black or blue
- Mass .....760g

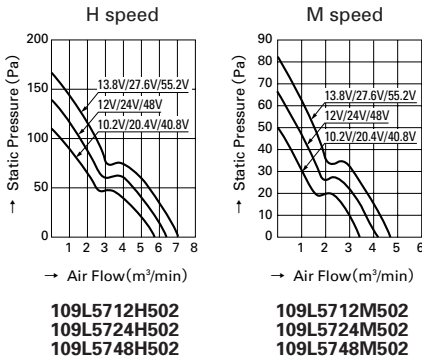
Long Life Fans

## 51 mm thick (Sidecut type)

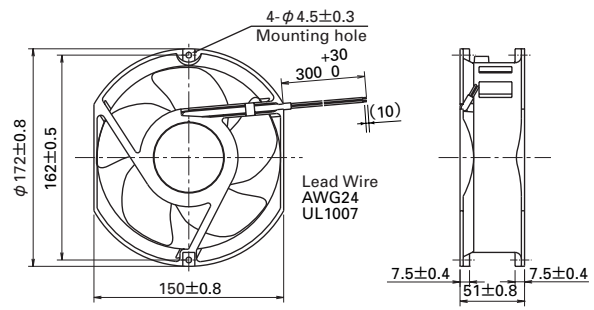
### Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109L5712H502</b> | 12                | 10.2~13.8                   | 1.2               | 14.4            | 3,050                            | 6.4 226                              | 137.2 0.551                                 | 52             | -10 ~ +70                        | 100,000             |
| <b>109L5712M502</b> |                   |                             | 0.48              | 5.76            | 2,000                            | 4.2 148                              | 67.6 0.271                                  | 41             |                                  |                     |
| <b>109L5724H502</b> | 24                | 20.4~27.6                   | 0.58              | 13.92           | 3,050                            | 6.4 226                              | 137.2 0.551                                 | 52             |                                  |                     |
| <b>109L5724M502</b> |                   |                             | 0.2               | 4.80            | 2,000                            | 4.2 148                              | 67.6 0.271                                  | 41             |                                  |                     |
| <b>109L5748H502</b> | 48                | 40.8~55.2                   | 0.28              | 13.44           | 3,050                            | 6.4 226                              | 137.2 0.551                                 | 52             |                                  |                     |
| <b>109L5748M502</b> |                   |                             | 0.11              | 5.28            | 2,000                            | 4.2 148                              | 67.6 0.271                                  | 41             |                                  |                     |

### Air Flow and Static Pressure Characteristics

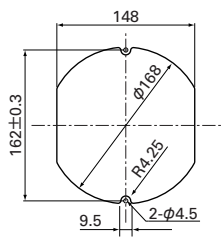


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side



# Long Life Fan $\varnothing 172\text{mm}$ San Ace 172L



## General specifications

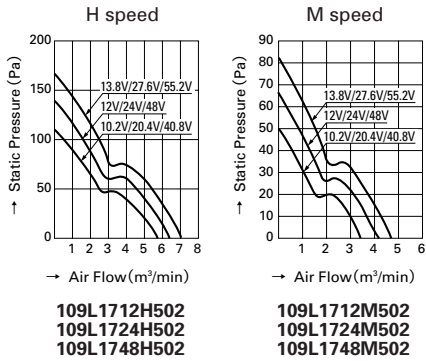
- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ...Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....H speed  $\oplus$ red, $\ominus$ black  
M speed  $\oplus$ red, $\ominus$ black or blue
- Mass .....780g

Long Life Fans

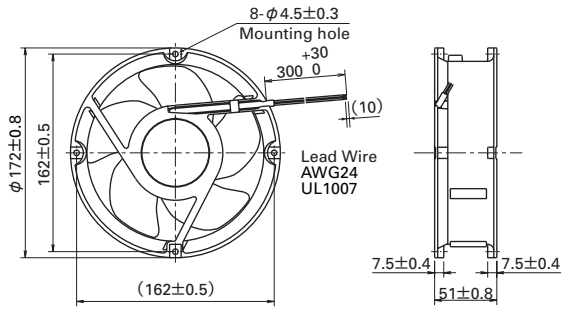
## 51 mm thick (Round type) Specifications

| Model No.           | Rated Voltage (V) | Operating Voltage range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|---------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109L1712H502</b> | 12                | 10.2~13.8                   | 1.2               | 14.4            | 3,050                            | 6.4 226                              | 137.2 0.551                                 | 47             | -10 ~ +70                        | 100,000             |
| <b>109L1712M502</b> |                   |                             | 0.48              | 5.76            | 2,000                            | 4.2 148                              | 67.6 0.271                                  | 36             |                                  |                     |
| <b>109L1724H502</b> | 24                | 20.4~27.6                   | 0.58              | 13.92           | 3,050                            | 6.4 226                              | 137.2 0.551                                 | 47             |                                  |                     |
| <b>109L1724M502</b> |                   |                             | 0.2               | 4.80            | 2,000                            | 4.2 148                              | 67.6 0.271                                  | 36             |                                  |                     |
| <b>109L1748H502</b> | 48                | 40.8~55.2                   | 0.28              | 13.44           | 3,050                            | 6.4 226                              | 137.2 0.551                                 | 47             |                                  |                     |
| <b>109L1748M502</b> |                   |                             | 0.11              | 5.28            | 2,000                            | 4.2 148                              | 67.6 0.271                                  | 36             |                                  |                     |

## Air Flow and Static Pressure Characteristics

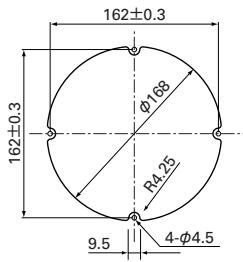


**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side

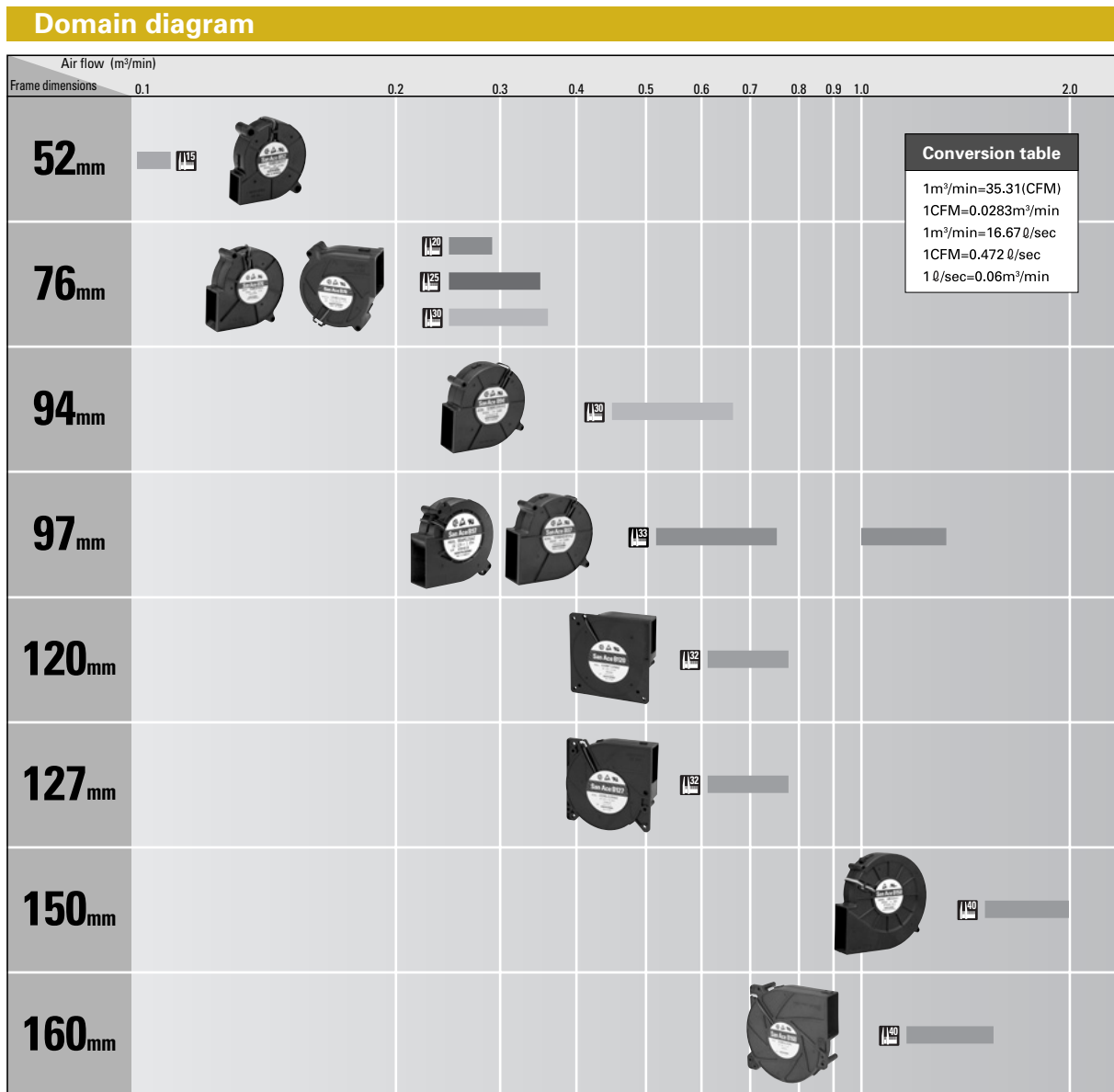




# COOLING SYSTEMS

## DC FAN

## Blowers



Blowers

- 52mm
- 76mm
- 94mm
- 97mm
- 120mm
- 127mm
- 150mm
- 160mm

# Blower

# 52mm San Ace B52



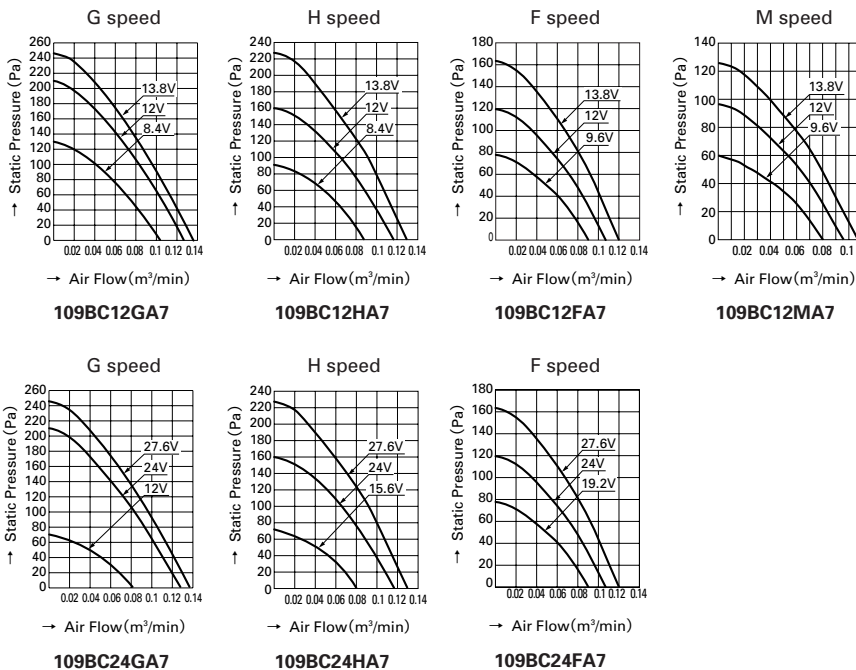
## General specifications

- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ...Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....30g

## 15mm thick Specifications

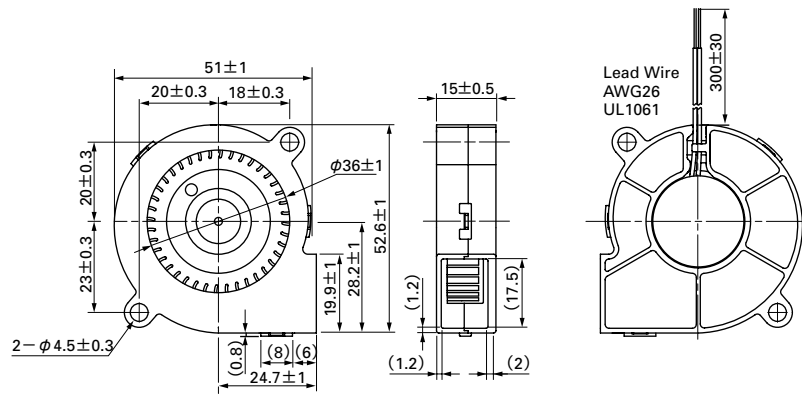
| Model No.         | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109BC12GA7</b> | 12                | 8.4~13.8                    | 0.19              | 2.3             | 6,100                            | 0.125 4.4                            | 205 0.823                                   | 43             | -20 ~ +60                        | 30,000              |
| <b>109BC12HA7</b> |                   |                             | 0.15              | 1.8             | 5,500                            | 0.117 4.1                            | 160 0.643                                   | 40             |                                  |                     |
| <b>109BC12FA7</b> |                   | 9.6~13.8                    | 0.12              | 1.5             | 5,000                            | 0.106 3.7                            | 119 0.478                                   | 38             |                                  |                     |
| <b>109BC12MA7</b> |                   |                             | 0.09              | 1.1             | 4,500                            | 0.096 3.4                            | 96 0.386                                    | 35             |                                  |                     |
| <b>109BC24GA7</b> | 24                | 12.0~27.6                   | 0.1               | 2.4             | 6,100                            | 0.125 4.4                            | 205 0.823                                   | 43             |                                  |                     |
| <b>109BC24HA7</b> |                   | 15.6~27.6                   | 0.09              | 2.2             | 5,500                            | 0.117 4.1                            | 160 0.643                                   | 40             |                                  |                     |
| <b>109BC24FA7</b> |                   | 19.2~27.6                   | 0.06              | 1.5             | 5,000                            | 0.106 3.7                            | 119 0.478                                   | 38             |                                  |                     |

## Air Flow and Static Pressure Characteristics



52mm

Dimensions (unit : mm)



# Blower

## 76mm San Ace B76



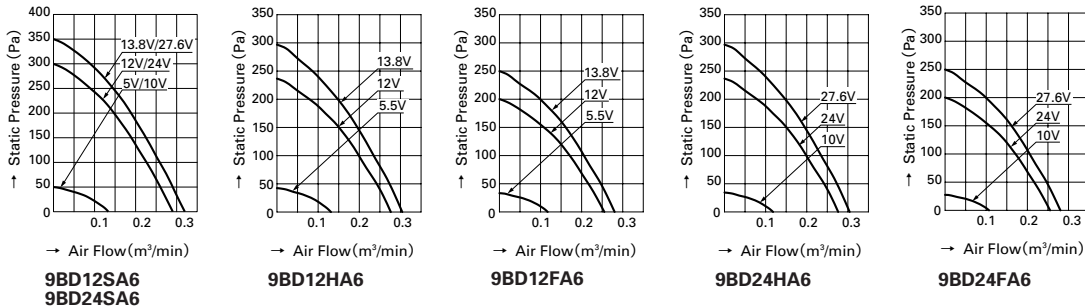
### General specifications

- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....50g (20mm thick) 95g (25mm thick)

### 20mm thick Specifications

| Model No. | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 9BD12SA6  | 12                | 5.0 ~ 13.8                  | 0.30              | 3.6             | 4,750                            | 0.29 10.2                            | 300 1.205                                   | 44             | -20 ~ +70                        | 30,000              |
| 9BD12HA6  |                   |                             | 0.24              | 2.9             | 4,400                            | 0.27 9.5                             | 230 0.924                                   | 42             |                                  | 40,000              |
| 9BD12FA6  |                   |                             | 0.20              | 2.4             | 4,050                            | 0.25 8.8                             | 200 0.803                                   | 40             |                                  | 30,000              |
| 9BD24SA6  | 24                | 10.0 ~ 27.6                 | 0.14              | 3.4             | 4,750                            | 0.29 10.2                            | 300 1.205                                   | 44             |                                  | 30,000              |
| 9BD24HA6  |                   |                             | 0.12              | 2.9             | 4,400                            | 0.27 9.5                             | 230 0.924                                   | 42             |                                  | 40,000              |
| 9BD24FA6  |                   |                             | 0.10              | 2.4             | 4,050                            | 0.25 8.8                             | 200 0.803                                   | 40             |                                  | 40,000              |

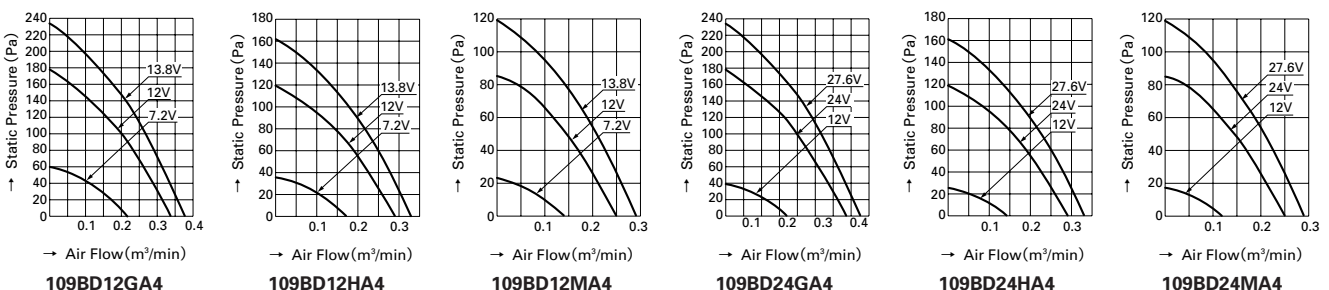
### Air Flow and Static Pressure Characteristics



### 25mm thick Specifications

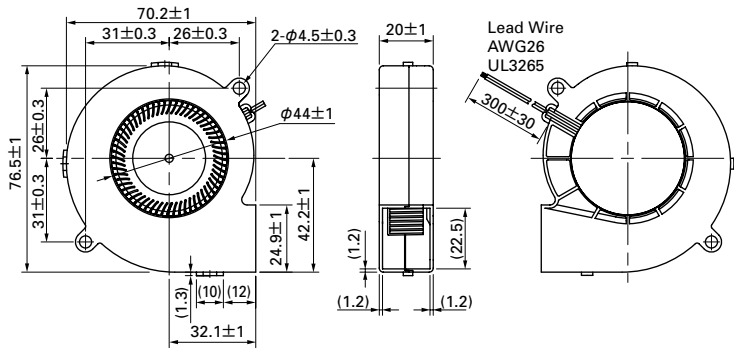
| Model No.  | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109BD12GA4 | 12                | 7.2 ~ 13.8                  | 0.33              | 4.0             | 4,500                            | 0.34 12.0                            | 178 0.715                                   | 48             | -20 ~ +60                        | 40,000              |
| 109BD12HA4 |                   |                             | 0.23              | 2.8             | 3,800                            | 0.29 10.2                            | 119 0.478                                   | 43             |                                  |                     |
| 109BD12MA4 |                   |                             | 0.18              | 2.2             | 3,400                            | 0.25 8.8                             | 85 0.341                                    | 39             |                                  |                     |
| 109BD24GA4 | 24                | 12 ~ 27.6                   | 0.19              | 4.6             | 4,500                            | 0.34 12.0                            | 178 0.715                                   | 48             |                                  |                     |
| 109BD24HA4 |                   |                             | 0.12              | 2.9             | 3,800                            | 0.29 10.2                            | 119 0.478                                   | 43             |                                  |                     |
| 109BD24MA4 |                   |                             | 0.09              | 2.2             | 3,400                            | 0.25 8.8                             | 85 0.341                                    | 39             |                                  |                     |

### Air Flow and Static Pressure Characteristics

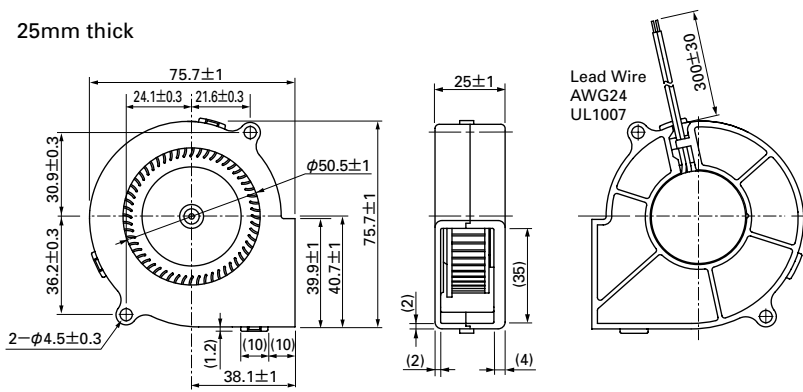


**Dimensions (unit : mm)**

20mm thick



25mm thick



# Blower

# 76mm San Ace B76



## General specifications

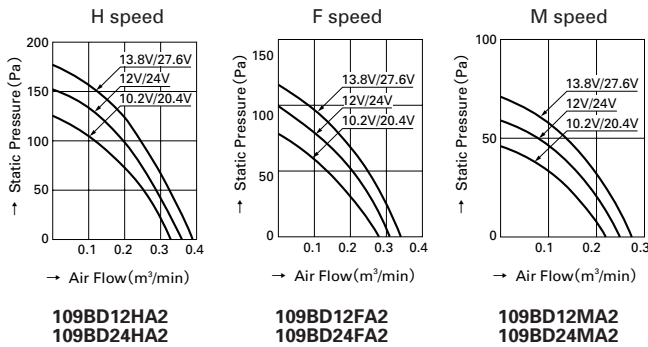
- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ...Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....H, F speeds ⊕red, ⊖black  
M speed ⊕red, ⊖black or blue
- Mass .....100g

Blowers

## 30mm thick Specifications

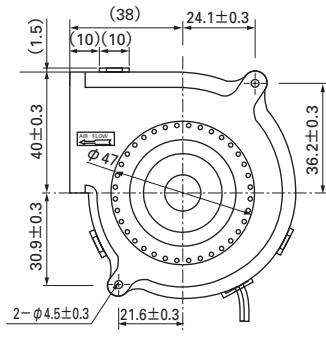
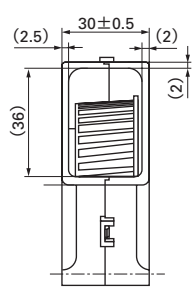
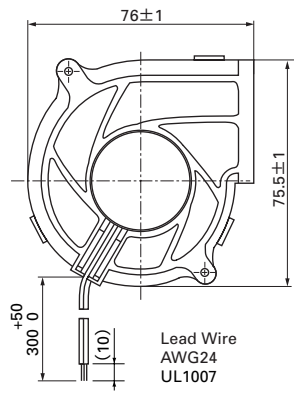
| Model No.         | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109BD12HA2</b> | 12                | 10.2~13.8                   | 0.37              | 4.44            | 3,000                            | 0.36 12.7                            | 151.9 0.610                                 | 41.5           | -10 ~ +60                        | 40,000              |
| <b>109BD12FA2</b> |                   |                             | 0.27              | 3.24            | 2,600                            | 0.31 10.9                            | 98 0.394                                    | 37             |                                  |                     |
| <b>109BD12MA2</b> |                   |                             | 0.14              | 1.68            | 2,100                            | 0.25 8.8                             | 58.8 0.236                                  | 32.5           |                                  |                     |
| <b>109BD24HA2</b> | 24                | 20.4~27.6                   | 0.17              | 4.08            | 3,000                            | 0.36 12.7                            | 151.9 0.610                                 | 41.5           | -10 ~ +60                        |                     |
| <b>109BD24FA2</b> |                   |                             | 0.14              | 3.36            | 2,600                            | 0.31 10.9                            | 98 0.394                                    | 37             | -10 ~ +70                        |                     |
| <b>109BD24MA2</b> |                   |                             | 0.10              | 2.40            | 2,100                            | 0.25 8.8                             | 58.8 0.236                                  | 32.5           | -10 ~ +70                        |                     |

## Air Flow and Static Pressure Characteristics



76mm

**Dimensions (unit : mm)**



# Blower

## 94mm San Ace B94



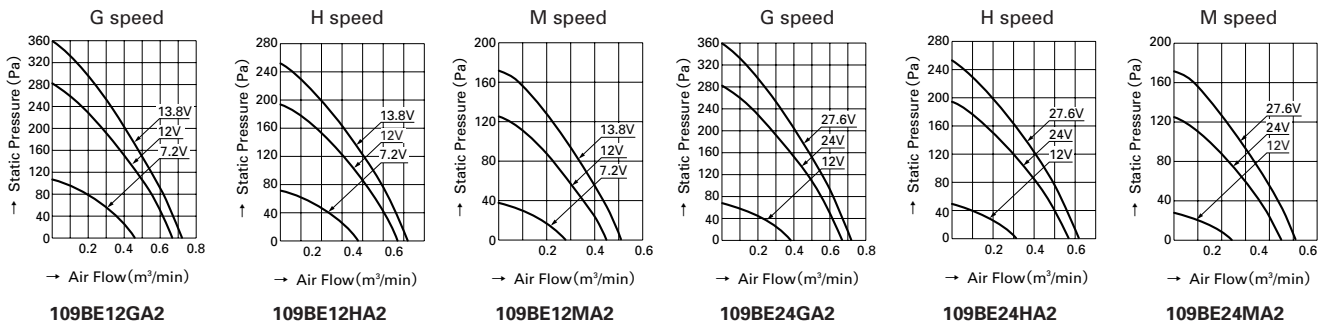
### General specifications

- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....135g

### 30mm thick Specifications

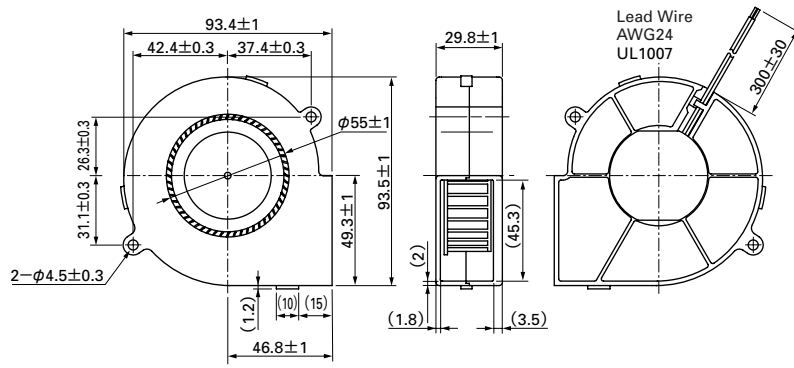
| Model No.         | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109BE12GA2</b> | 12                | 7.2~13.8                    | 0.65              | 7.8             | 3,900                            | 0.67 23.7                            | 282 1.133                                   | 54             | -20 ~ +60                        | 40,000              |
| <b>109BE12HA2</b> |                   |                             | 0.42              | 5.1             | 3,300                            | 0.57 20.1                            | 194 0.779                                   | 49             |                                  |                     |
| <b>109BE12MA2</b> |                   |                             | 0.29              | 3.5             | 2,700                            | 0.45 15.9                            | 125 0.502                                   | 44             |                                  |                     |
| <b>109BE24GA2</b> | 24                | 12 ~ 27.6                   | 0.33              | 8.0             | 3,900                            | 0.67 23.7                            | 282 1.133                                   | 54             |                                  |                     |
| <b>109BE24HA2</b> |                   |                             | 0.26              | 6.3             | 3,300                            | 0.57 20.1                            | 194 0.779                                   | 49             |                                  |                     |
| <b>109BE24MA2</b> |                   |                             | 0.15              | 3.6             | 2,700                            | 0.45 15.9                            | 125 0.502                                   | 44             |                                  |                     |

### Air Flow and Static Pressure Characteristics



94mm

Dimensions (unit : mm)



# Blower

## 97mm San Ace B97



### "San Ace" B97 High Air Flow Type

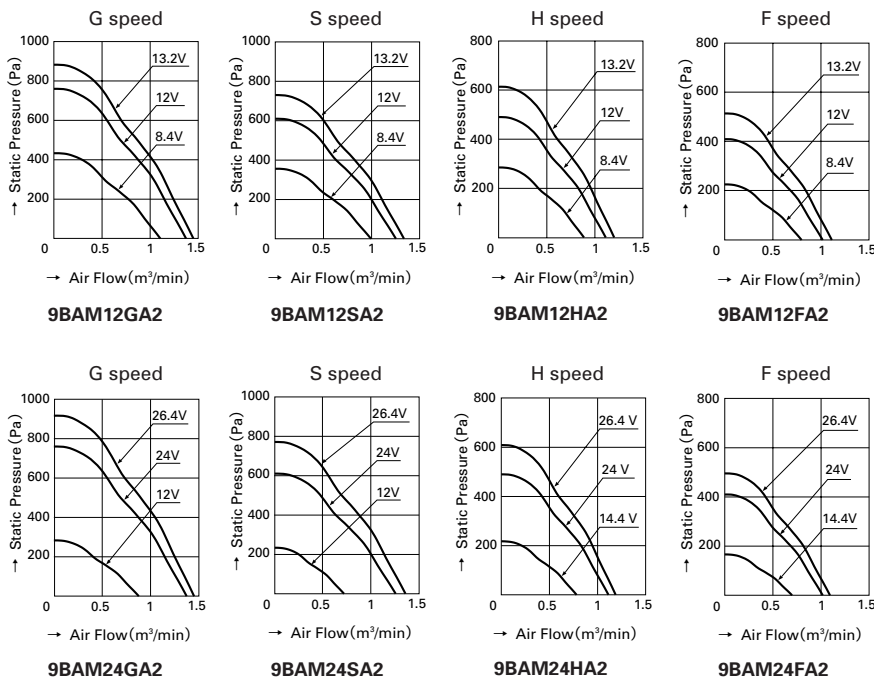
#### General specifications

- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....170g

### 33mm thick Specifications

| Model No. | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 9BAM12GA2 | 12                | 8.4~13.2                    | 1.85              | 22.2            | 5,800                            | 1.37 48.4                            | 760 3.052                                   | 62             | -20 ~ +60                        | 40,000              |
| 9BAM12SA2 |                   |                             | 1.45              | 17.4            | 5,300                            | 1.25 44.2                            | 610 2.450                                   | 60             |                                  |                     |
| 9BAM12HA2 |                   |                             | 1.20              | 14.4            | 4,700                            | 1.10 38.9                            | 490 1.968                                   | 58             |                                  |                     |
| 9BAM12FA2 |                   |                             | 0.98              | 11.8            | 4,300                            | 1.00 35.3                            | 410 1.647                                   | 56             |                                  |                     |
| 9BAM24GA2 | 24                | 12.0~26.4                   | 0.90              | 21.6            | 5,800                            | 1.37 48.4                            | 760 3.052                                   | 62             |                                  |                     |
| 9BAM24SA2 |                   |                             | 0.71              | 17.0            | 5,300                            | 1.25 44.2                            | 610 2.450                                   | 60             |                                  |                     |
| 9BAM24HA2 |                   | 14.4~26.4                   | 0.60              | 14.4            | 4,700                            | 1.10 38.9                            | 490 1.968                                   | 58             |                                  |                     |
| 9BAM24FA2 |                   |                             | 0.49              | 11.8            | 4,300                            | 1.00 35.3                            | 410 1.647                                   | 56             |                                  |                     |

#### Air Flow and Static Pressure Characteristics



97mm



# Blower

# 97mm San Ace B97



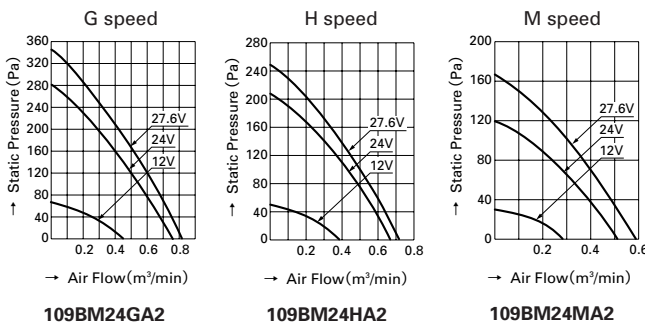
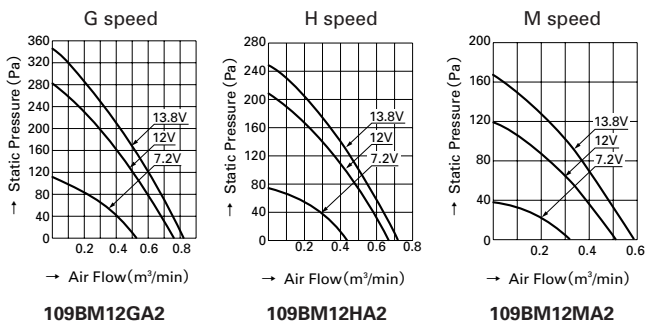
### General specifications

- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ...Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....160g

### 33mm thick Specifications

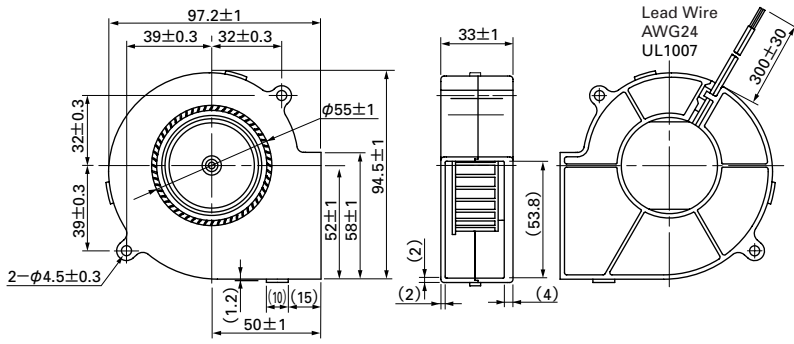
| Model No.         | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109BM12GA2</b> | 12                | 7.2~13.8                    | 0.68              | 8.2             | 3700                             | 0.76 26.9                            | 281 1.129                                   | 52             | -20 ~ +60                        | 40,000              |
| <b>109BM12HA2</b> |                   |                             | 0.42              | 5.1             | 3200                             | 0.67 23.7                            | 204 0.819                                   | 49             |                                  |                     |
| <b>109BM12MA2</b> |                   |                             | 0.30              | 3.6             | 2600                             | 0.51 18.0                            | 119 0.478                                   | 44             |                                  |                     |
| <b>109BM24GA2</b> | 24                | 12 ~27.6                    | 0.34              | 8.2             | 3700                             | 0.76 26.9                            | 281 1.129                                   | 52             |                                  |                     |
| <b>109BM24HA2</b> |                   |                             | 0.26              | 6.3             | 3200                             | 0.67 23.7                            | 204 0.819                                   | 49             |                                  |                     |
| <b>109BM24MA2</b> |                   |                             | 0.15              | 3.6             | 2600                             | 0.51 18.0                            | 119 0.478                                   | 44             |                                  |                     |

### Air Flow and Static Pressure Characteristics



97mm

Dimensions (unit : mm)



# Blower

# 120mm San Ace B120



### General specifications

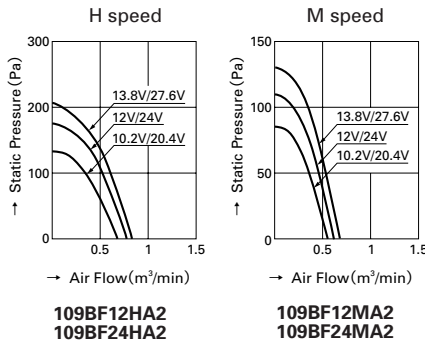
- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....H speed ⊕red, ⊖black  
M speed ⊕red, ⊖black or blue
- Mass .....270g

Blowers

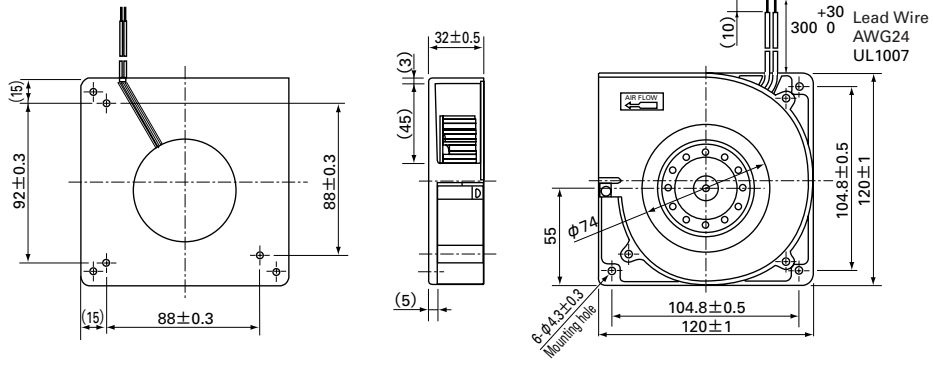
## 32mm thick Specifications

| Model No.         | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109BF12HA2</b> | 12                | 10.2~13.8                   | 0.6               | 7.2             | 2,400                            | 0.78 27.5                            | 175.4 0.704                                 | 52             | -10 ~ +60                        | 40,000              |
| <b>109BF12MA2</b> |                   |                             | 0.32              | 3.84            | 1,900                            | 0.61 21.5                            | 109.8 0.441                                 | 44             |                                  |                     |
| <b>109BF24HA2</b> | 24                | 20.4~27.6                   | 0.3               | 7.2             | 2,400                            | 0.78 27.5                            | 175.4 0.704                                 | 52             |                                  |                     |
| <b>109BF24MA2</b> |                   |                             | 0.16              | 3.84            | 1,900                            | 0.61 21.5                            | 109.8 0.441                                 | 44             |                                  |                     |

### Air Flow and Static Pressure Characteristics



**Dimensions (unit : mm)**



# Blower

# 127mm San Ace B127



### General specifications

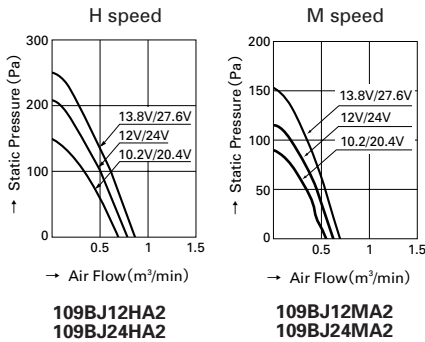
- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....H speed ⊕red, ⊖black  
M speed ⊕red, ⊖black or blue
- Mass .....290g

Blowers

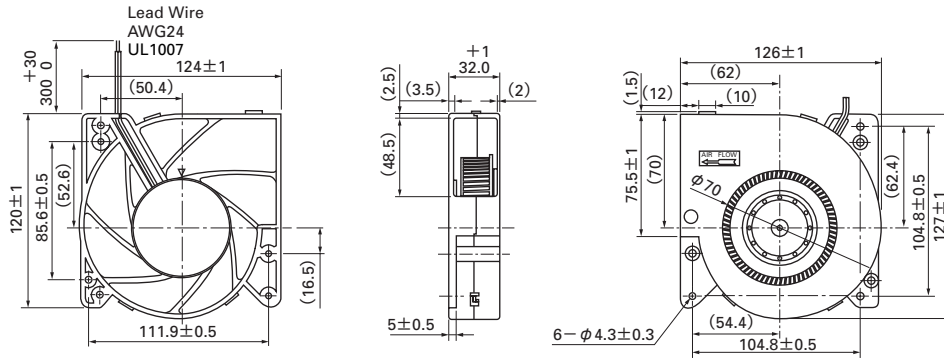
## 32mm thick Specifications

| Model No.         | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109BJ12HA2</b> | 12                | 10.2~13.8                   | 0.52              | 6.24            | 2,400                            | 0.78 27.5                            | 205.8 0.826                                 | 46             | -10 ~ +70                        | 40,000              |
| <b>109BJ12MA2</b> |                   |                             | 0.29              | 3.48            | 1,900                            | 0.61 21.5                            | 109.8 0.441                                 | 40             |                                  |                     |
| <b>109BJ24HA2</b> | 24                | 20.4~27.6                   | 0.26              | 6.24            | 2,400                            | 0.78 27.5                            | 205.8 0.826                                 | 46             | -10 ~ +60                        |                     |
| <b>109BJ24MA2</b> |                   |                             | 0.15              | 3.6             | 1,900                            | 0.61 21.5                            | 109.8 0.441                                 | 40             |                                  |                     |

### Air Flow and Static Pressure Characteristics



**Dimensions (unit : mm)**



# Blower

# 150mm San Ace B150



## General specifications

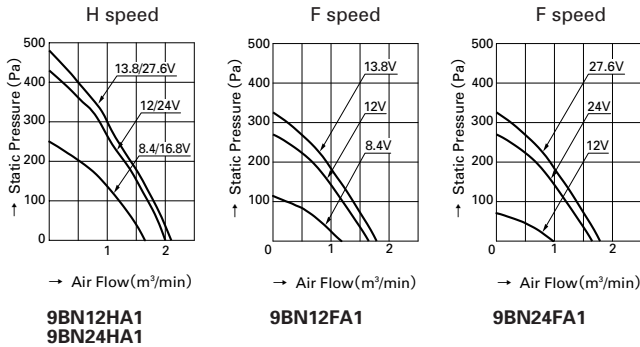
- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ....Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Lead Wire .....⊕red, ⊖black
- Mass .....380g

Blowers

## 40mm thick Specifications

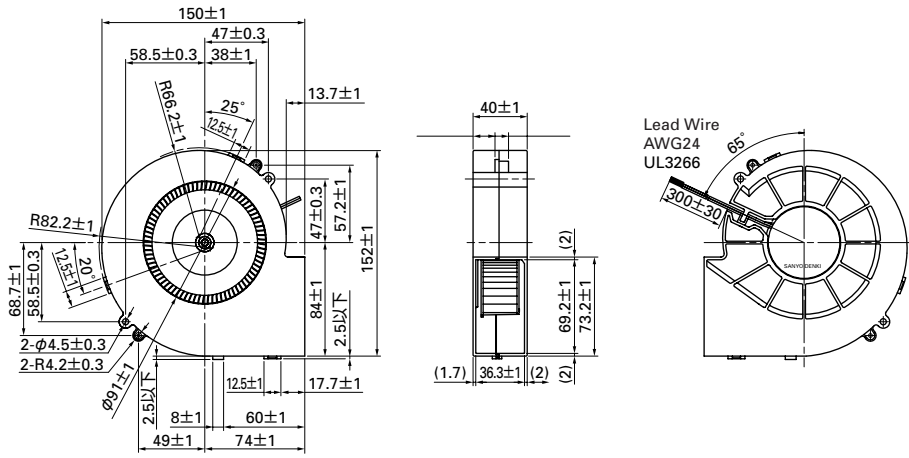
| Model No.       | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9BN12HA1</b> | 12                | 8.4~13.8                    | 1.6               | 19.2            | 2,700                            | 2.0 70.7                             | 430 1.727                                   | 56             | -20 ~ +70                        | 40,000              |
| <b>9BN12FA1</b> |                   |                             | 1.1               | 13.2            | 2,200                            | 1.65 58.3                            | 270 1.084                                   | 51             |                                  |                     |
| <b>9BN24HA1</b> | 24                | 16.8~27.6                   | 0.74              | 17.8            | 2,700                            | 2.0 70.7                             | 430 1.727                                   | 56             |                                  |                     |
| <b>9BN24FA1</b> |                   |                             | 0.54              | 13.0            | 2,200                            | 1.65 58.3                            | 270 1.084                                   | 51             |                                  |                     |

## Air Flow and Static Pressure Characteristics



150mm

Dimensions (unit : mm)



# Blower

# 160mm San Ace B160



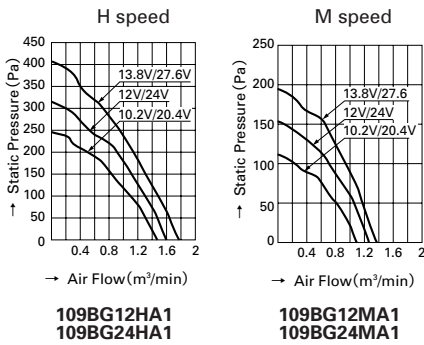
### General specifications

- Material .....Frame, impeller : Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....H speed ⊕red, ⊖black  
M speed ⊕red, ⊖black or blue
- Mass .....580g

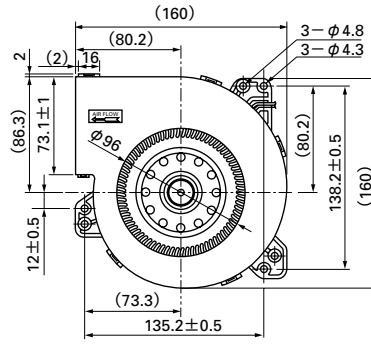
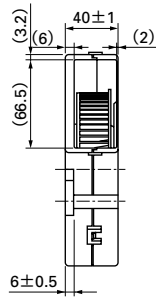
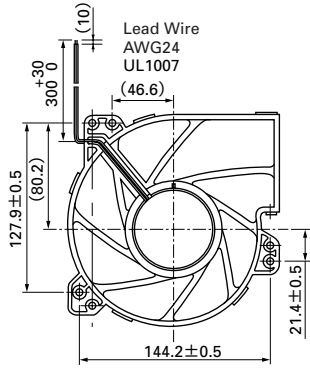
### 40mm thick Specifications

| Model No.         | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-------------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109BG12HA1</b> | 12                | 10.2~13.8                   | 1.3               | 15.6            | 2,300                            | 1.62 57.2                            | 313.6 1.259                                 | 55             | -10 ~ +60                        | 40,000              |
| <b>109BG12MA1</b> |                   |                             | 0.64              | 7.68            | 1,800                            | 1.26 44.5                            | 156.8 0.629                                 | 50             |                                  |                     |
| <b>109BG24HA1</b> | 24                | 20.4~27.6                   | 0.62              | 14.88           | 2,300                            | 1.62 57.2                            | 313.6 1.259                                 | 55             |                                  |                     |
| <b>109BG24MA1</b> |                   |                             | 0.31              | 7.44            | 1,800                            | 1.26 44.5                            | 156.8 0.629                                 | 50             |                                  |                     |

### Air Flow and Static Pressure Characteristics



**Dimensions (unit : mm)**





DC FAN

Centrifugal Fans

Domain diagram



**Conversion table**

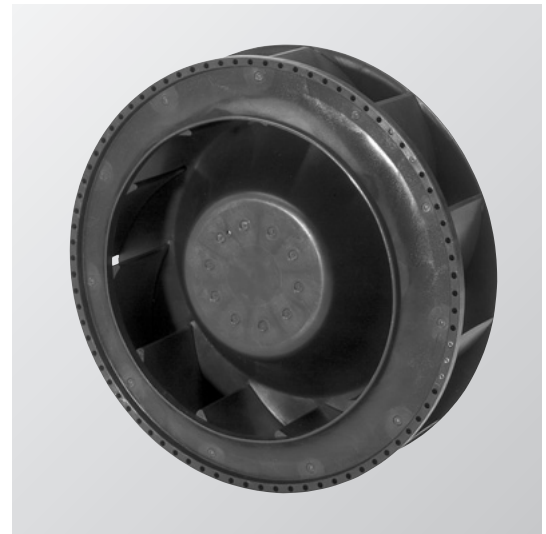
- 1m<sup>3</sup>/min=35.31(CFM)
- 1CFM=0.0283m<sup>3</sup>/min
- 1m<sup>3</sup>/min=16.67 l/sec
- 1CFM=0.472 l/sec
- 1 l/sec=0.06m<sup>3</sup>/min

Centrifugal Fans

200mm

# Centrifugal Fan $\varnothing$ 220mm

## San Ace C220



### General specifications

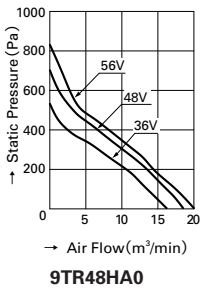
- Material ..... Impeller : Plastic  
Attachment base: Aluminum
- Life Expectancy ..... Varies for each model (Survival rate: 90% at 60°C,  
rated voltage, and continuously run in a free air state)
- Motor Protection System ..... Current cut function (with reverse polarity protection)
- Dielectric Strength ..... 50/60 Hz, 500VAC, 1 minute (between Lead conductor and Attachment base)
- Noise Measurement Method ..... Measured at 1m from the air inlet
- Operating Temperature Range ..... Varies for each model (Non-condensing)
- Lead Wire .....  $\oplus$ red,  $\ominus$ black
- Mass ..... 1,300g

### 71mm thick Specifications

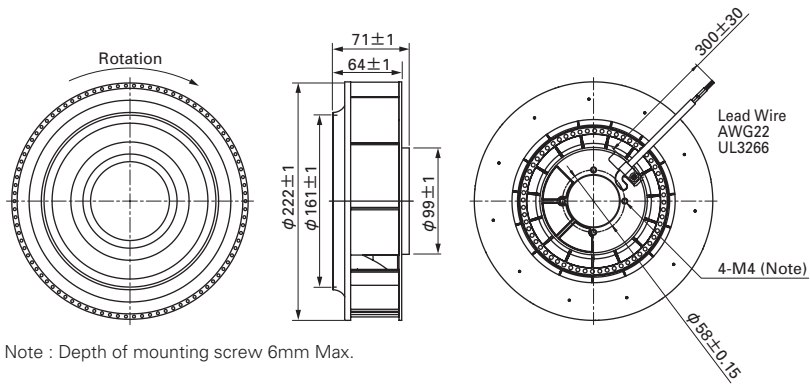
| Model No.       | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Input (W) | Rated Speed (min <sup>-1</sup> ) | Air Flow              |       | Static Pressure |                        | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|-----------------------|-------|-----------------|------------------------|----------------|----------------------------------|---------------------|
|                 |                   |                             |                   |                 |                                  | (m <sup>3</sup> /min) | (CFM) | (Pa)            | (inchH <sub>2</sub> O) |                |                                  |                     |
| <b>9TR48HA0</b> | 48                | 36~56                       | 2.10              | 100.8           | 3,200                            | 18.5                  | 653.7 | 700             | 2.81                   | 71             | -20 ~ +60                        | 40,000              |

Note) Air Flow-Static Pressure Characteristics and Sound Pressure Level were measured with Inlet Ring (See following figure).

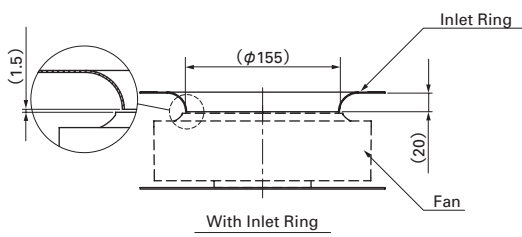
### Air Flow and Static Pressure Characteristics



## Dimensions (unit : mm)



## Reference Dimension of Inlet Ring (unit : mm)



Note : Please contact us if you need further information.



# CPU Coolers

## Liquid Cooling Solution Systems

Performance

**SAN ACE MC Liquid**  
109-LC1-001

**SAN ACE MC-HX**  
9H9912G5516

**SAN ACE MC**  
109X912PT0H016

**SAN ACE MC**  
109X9912T0S016  
109X9912S0016

**SAN ACE MC**  
109X9212PT0H016

**SAN ACE MC**  
9G0912PT2E012  
9G0912P2E012

**SAN ACE MC**  
9H9912G5016

**SAN ACE MC**  
109X9412S1016

**SAN ACE MC**  
109X9412G4016

**SAN ACE MC**  
109X9812T0H016  
109X9812H0016

**SAN ACE MC**  
109X7612H1176

**SAN ACE MC**  
109X9612S5016

**SAN ACE MC**  
109X7412S4016

**SAN ACE MC**  
109X6512A2016

Intel® Pentium® D

Intel® Pentium® 4

Intel® Pentium® III

2002      2003      2004      2005      2006

CPU Coolers  
Liquid Cooling  
Solution System

775-land/LGA

Socket478

Socket423

FC-PGA2

FC-PGA

Liquid cooling  
solution system

Intel® Pentium® is a trademark of Intel Corporation.

# CPU Cooler

For Intel® 775 land-LGA Package  
**CPU Cooler "SAN ACE MC"**  
 Thermal Module (Type I) for BTX



## General specifications

Material ······Frame, Impeller, Duct: Plastics Duct sael: Rubber sponge  
 Heatsink: Aluminum (Core: Copper)  
 Life Expectancy ······Varies for each model (Survival rate: 90% at 60°C,  
 rated voltage, and continuously run in a free air state)  
 Motor Protection System ······Current blocking function (with reverse polarity protection)  
 Dielectric Strength ······50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)  
 Noise Measurement Method ······Measured at 1m from the air inlet  
 Operating Temperature Range ······Varies for each model (Non-condensing)  
 Lead Wire ······⊕ Yellow (Connector: Pin2)  
 ⊖ Black (Connector: Pin1)  
 (Sensor) Green (Connector: Pin3)  
 (Control) Blue (Connector: Pin4)  
 Connector ······Molex P/N 47054-1000 or Wieson 2510C888-001  
 Contact ······Molex P/N 5159PBT or Equivalent or Wieson 2511-T1  
 Mass ······970g

## Specifications

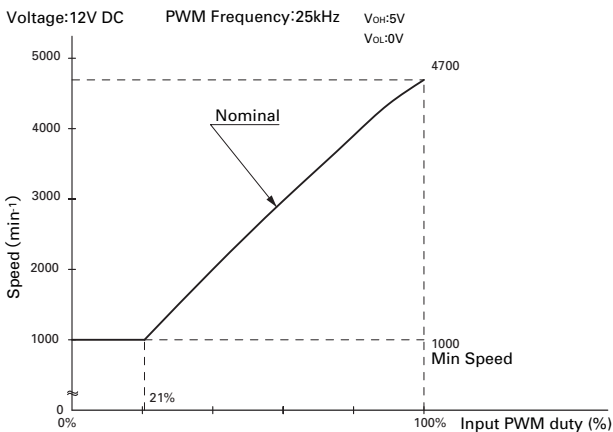
| Model No.              | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Speed (min <sup>-1</sup> ) | Ψc-a Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |       |
|------------------------|-------------------|-----------------------------|-------------------|----------------------------------|-------------------------------|----------------|----------------------------------|---------------------|-------|
| <b>9G0912P2E012*</b>   | 12                | 10.8~13.2                   | 0.90              | 4,700                            | 0.260                         | 52             | 0 ~ +70                          | 40,000              |       |
| <b>9G0912PT2E012**</b> |                   |                             |                   | 4,700                            |                               |                |                                  |                     | 0.300 |
|                        |                   |                             |                   | 2,500                            |                               |                |                                  |                     |       |

\* PWM Control Function  
 \*\* PWM Control Function and Thermally Speed Control

## Control input PWM duty - Fan speed characteristics

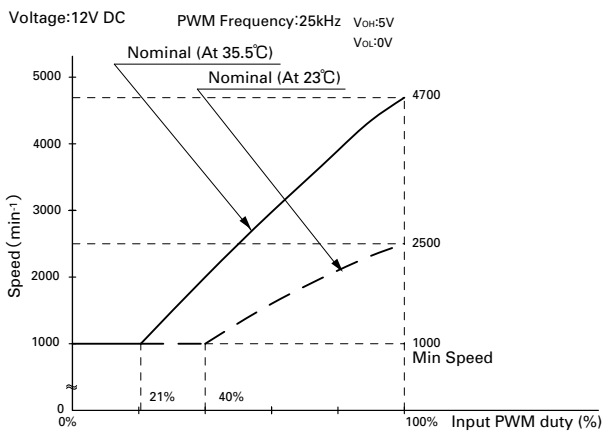
**9G0912P2E012 [PWM Control Function]**

[Example]



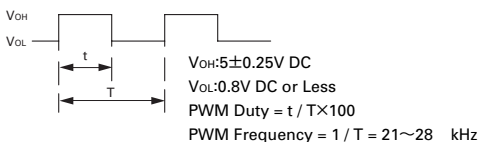
**9G0912PT2E012 [PWM Control Function and Thermally Speed Control]**

[Example]



### Waveform of control input

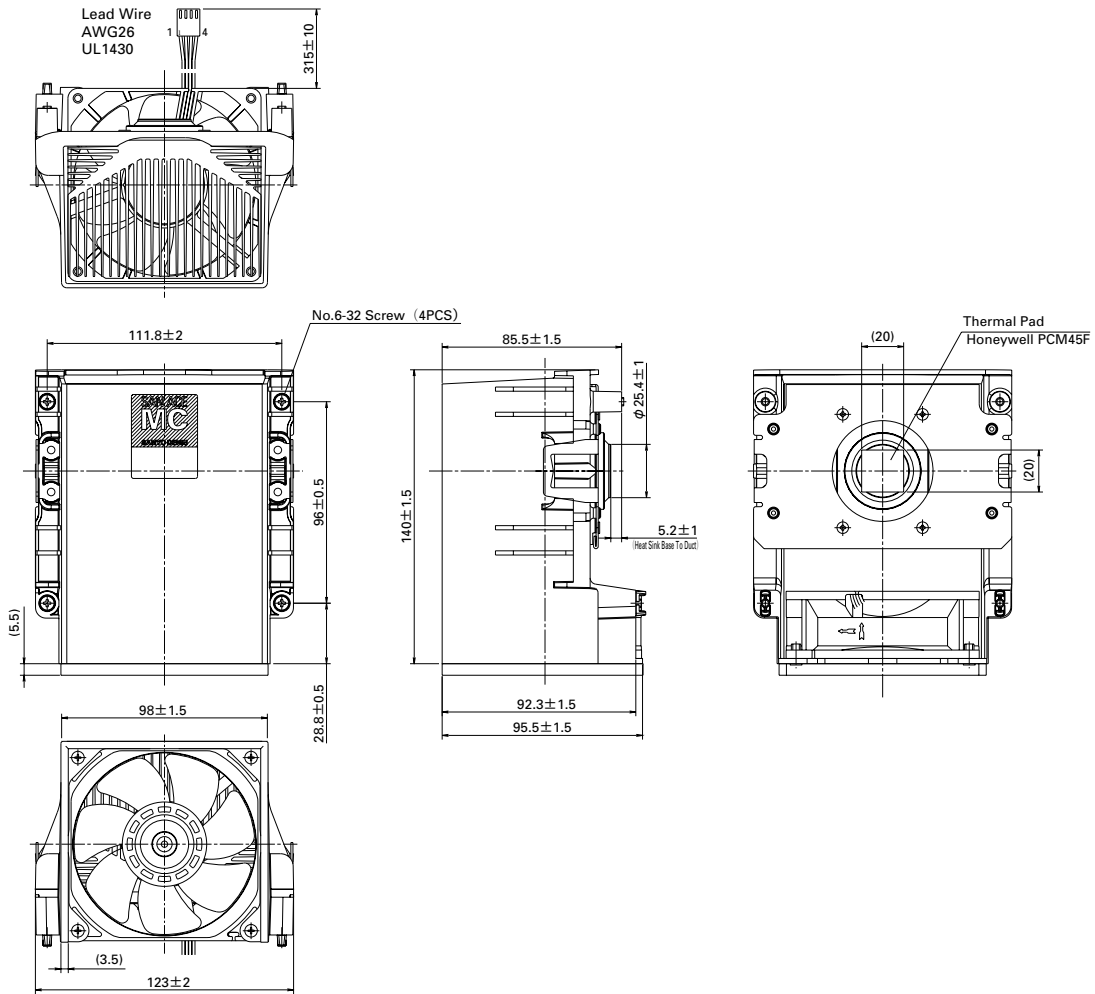
PWM Signal input : Between blue lead and black lead



### Control Current

I Source max.: 5 mA (AT 0V Control Voltage)  
 I Sink max.: 5 mA (AT 5V Control Voltage)

**Dimensions (unit : mm)**



# CPU Cooler

## For Intel® 775-land LGA Package CPU Cooler "SAN ACE MC"

### PWM Control Function and Thermally Speed Control

#### General specifications

- Material .....Frame,impeller:Plastics  
Heatsink:aluminum (Core:copper)
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage,and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕yellow (connector No.2 side)  
⊖black (connector No.1 side)  
Ⓢ(Sensor) green (connector No.3)  
Ⓢ(Control) blue (connector No.4)
- Connector .....Molex P/N 47054-1000 or Wieson 2510C888-001
- Contact .....Molex P/N 5159PBT or Equivalent or Wieson 2511-T1
- Mass .....575g

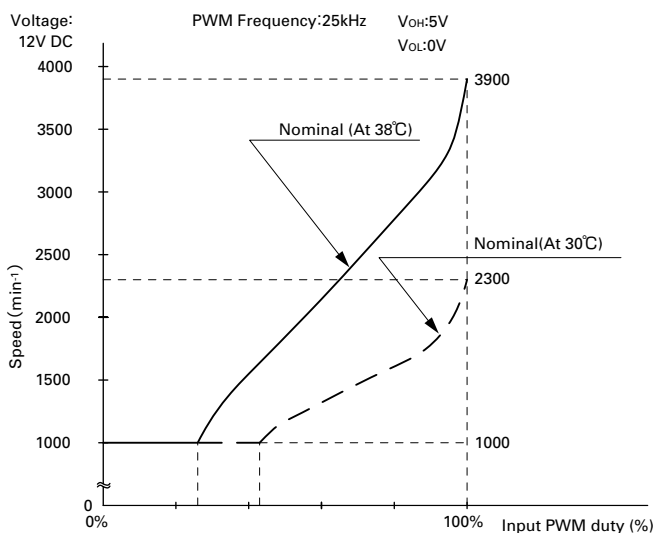


#### Specifications

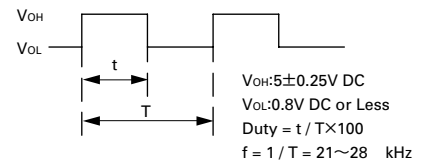
| Model No.       | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Speed (min <sup>-1</sup> ) | θ c-a Thermal Resistance (KW) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------------|-------------------|-----------------------------|-------------------|----------------------------------|-------------------------------|----------------|----------------------------------|---------------------|
| 109X9112PT0H016 | 12                | 10.8~13.2                   | 0.31              | 3,900                            | 0.266                         | 42             | 0 ~ +70                          | 40,000              |
|                 |                   |                             |                   | 2,300                            | 0.320                         | 27             |                                  |                     |

#### Control input PWM duty - Fan speed characteristics

[Example]

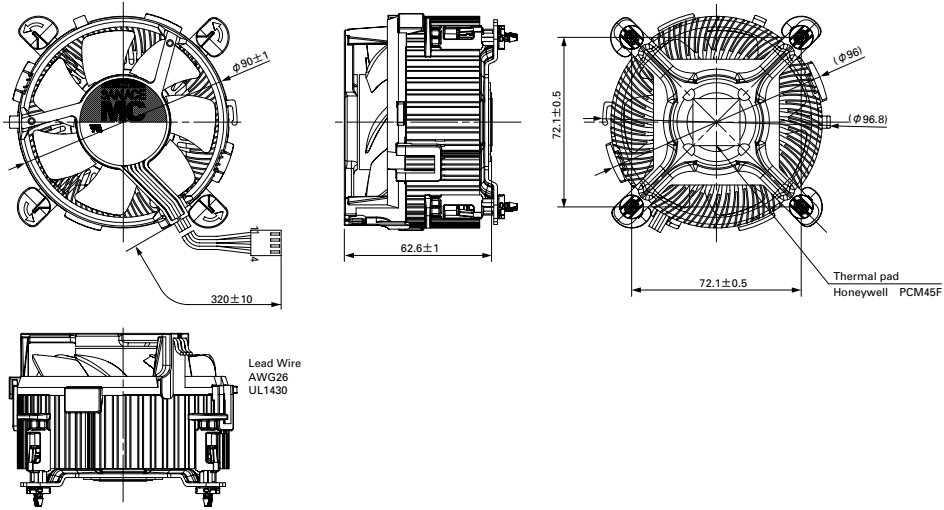


PWM Waveform of control input  
PWM Signal input ; Between blue lead and black lead



Control input Current  
I Source max.:5 mA (AT 0V Control Voltage)  
I Sink max.:5 mA (AT 5V Control Voltage)

**Dimensions (unit : mm)**



# CPU Cooler

For Intel® Pentium® 4 Processor (775-land LGA Package)  
CPU Cooler "SAN ACE MC"



## PWM Control Function and Thermally Speed Control General specifications

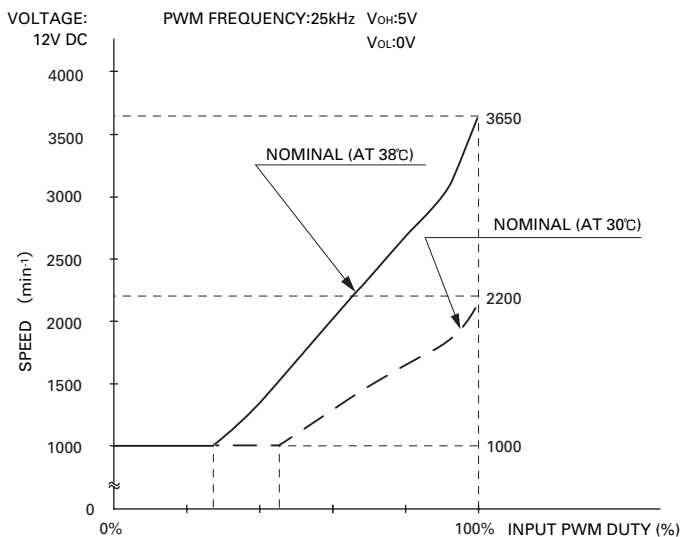
- Material .....Frame,impeller:Plastics  
Heatsink:aluminum (Core:copper)
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage,and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕yellow (connector No.2 side)  
⊖black (connector No.1 side)  
Ⓢensor green (connector No.3 side)  
Ⓢontrol blue (connector No.4 side)
- Connector .....Molex P/N 47054-1000 or Wieson 2510C888-001
- Contact .....Molex P/N 5159PBT or Equivalent or Wieson 2511-T1
- Mass .....490g

## Specifications

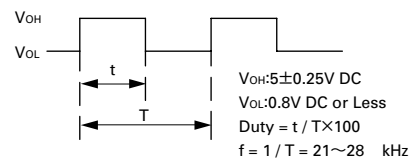
| Model No.       | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Speed (min <sup>-1</sup> ) | θ c-a Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------------|-------------------|-----------------------------|-------------------|----------------------------------|--------------------------------|----------------|----------------------------------|---------------------|
| 109X9212PT0H016 | 12                | 10.8~13.2                   | 0.28              | 3,650                            | 0.276                          | 42             | 0 ~ +70                          | 40,000              |
|                 |                   |                             |                   | 2,200                            | 0.340                          | 28             |                                  |                     |

## Control input PWM duty - Fan speed characteristics

[EXAMPLE]

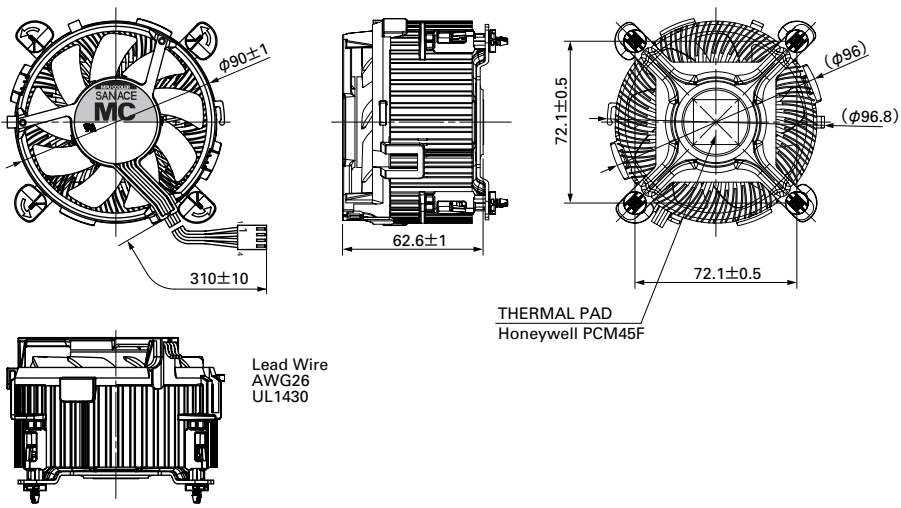


PWM WAVEFORM OF CONTROL INPUT  
PWM SIGNAL INPUT: BETWEEN BLUE LEAD AND BLACK LEAD



CONTROL INPUT CURRENT  
I SOURCE MAX.:5 mA (AT 0V CONTROL VOLTAGE)  
I SINK MAX.:5 mA (AT 5V CONTROL VOLTAGE)

**Dimensions (unit : mm)**



# CPU Cooler

## For Intel® Pentium® 4 Processor (Socket 478) CPU Cooler "SAN ACE MC"

### General specifications

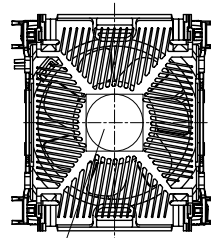
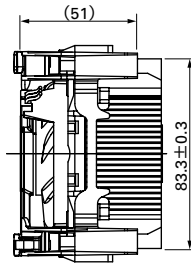
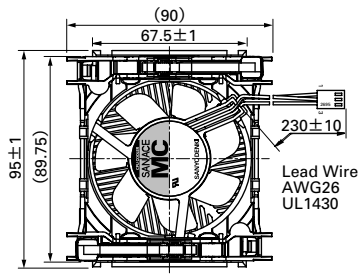
- Material .....Frame,impeller:resin mold Heatsink:aluminum (Core:copper)
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage,and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ..Varies for each model (Non-condensing)
- Lead Wire .....⊕yellow (connector No.2 side)  
⊖black (connector No.1 side)  
sensor green (connector No.3 side)
- Connector .....(Molex)22-01-3037 : P/N2695-03RP
- Contact .....Molex P/N5159PBT or 2759T-equivalent
- Mass .....450g



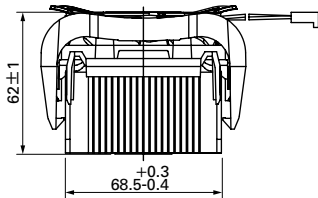
### Specifications

| Model No.      | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Rotating Speed (min <sup>-1</sup> ) | $\theta_{c-a}$ Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------|-------------------|-----------------------------|-------------------|---|---|----------------|----------------------------------|---------------------|
| 109X9912T0D516 | 12                | 9~13.8                      | 0.44              | 5,200                                     | 0.28                                    | 44             | 0 ~ +70                          | 40,000              |
|                |                   |                             |                   | 2,570                                     | 0.385                                   | 26             |                                  |                     |

**Dimensions (unit : mm)**



Thermal Pad  
Honeywell PCM45F



# CPU Cooler

## For Intel® Pentium® 4 Processor 3.06GHz (Socket 478)

### General specifications

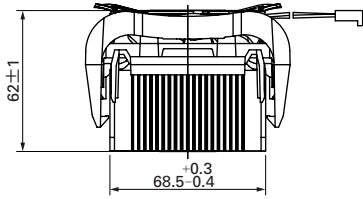
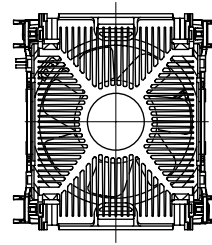
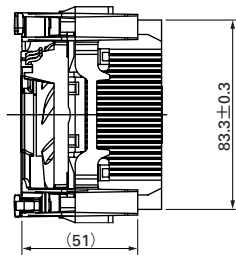
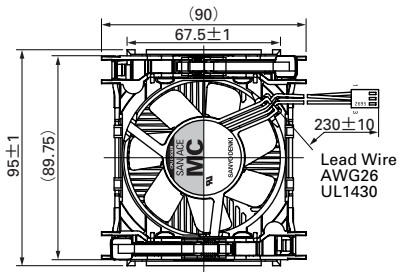
- Material ..... Frame, impeller: Plastics  
Heatsink: aluminum (Core: copper)
- Life Expectancy ..... Varies for each model (Survival rate: 90% at 60°C,  
rated voltage, and continuously run in a free air state)
- Motor Protection System ..... Current blocking function (with reverse polarity protection)
- Dielectric Strength ..... 50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..... Measured at 1m from the air inlet
- Operating Temperature Range ..... Varies for each model (Non-condensing)
- Lead Wire ..... ⊕ yellow (connector No.2 side)  
⊖ black (connector No.1 side)  
Ⓢ (sensor) green (connector No.3 side)
- Connector ..... Molex 22-01-3037 : P/N2695-03RP
- Contact ..... Molex P/N5159PBT or equivalent
- Mass ..... 450g



### Specifications

| Model No.      | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Rotating Speed (min <sup>-1</sup> ) | θ <sub>c-a</sub> Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------|-------------------|-----------------------------|-------------------|---|---|----------------|----------------------------------|---------------------|
| 109X9912T0S016 | 12                | 9~13.8                      | 0.48              | 5,400                                     | 0.295                                     | 45             | 0 ~ +70                          | 40,000              |
|                |                   |                             |                   | 2,610                                     | 0.42                                      | 28             |                                  |                     |
| 109X9912S0016  |                   |                             |                   | 5,400                                     | 0.295                                     | 45             |                                  |                     |

## Dimensions (unit : mm)



# CPU Cooler

## For Intel® Pentium® 4 Processor (Socket 478) CPU Cooler "SAN ACE MC"

### General specifications

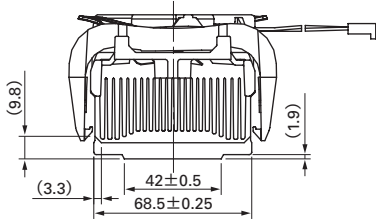
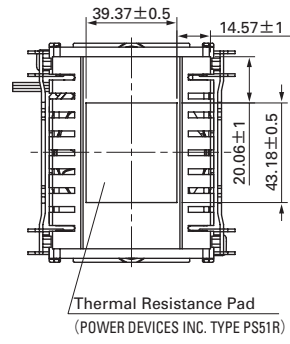
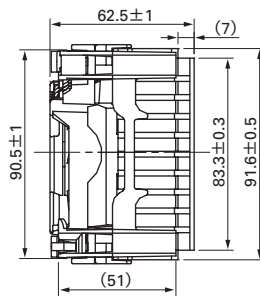
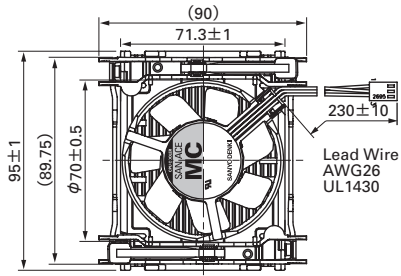
|                             |   |
|-----------------------------|---|
| Material                    | Frame, impeller : Plastics Heat sink : aluminum   |
| Life Expectancy             | Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state) |
| Motor Protection System     | Current blocking function (with reverse polarity protection)  |
| Dielectric Strength         | 50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)   |
| Noise Measurement Method    | Measured at 1m from the air inlet   |
| Operating Temperature Range | Varies for each model (Non-condensing)  |
| Lead Wire                   | ⊕yellow (connector No.2 side)<br>⊖black (connector No.1 side)<br>sensor green (connector No.3 side)         |
| Connector                   | (Molex)22-01-3037 : P/N2695-03RP  |
| Contact                     | Molex P/N5159PBT or 2759T-equivalent  |
| Mass                        | 390g  |



### Specifications

| Model No.             | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Rotating Speed (min <sup>-1</sup> ) | $\theta_{c-a}$ Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------------------|-------------------|-----------------------------|-------------------|---|---|----------------|----------------------------------|---------------------|
| <b>109X9812T0H016</b> | 12                | 9~13.8                      | 0.21              | 3,900                                     | 0.42                                    | 39             | 0 ~ +60                          | 40,000              |
| <b>109X9812H0016</b>  |                   |                             |                   | 2,600                                     | 0.49                                    | 26             |                                  |                     |
|                       |                   | 7~13.8                      | 0.21              | 3,900                                     | 0.42                                    | 39             |                                  |                     |

**Dimensions (unit : mm)**

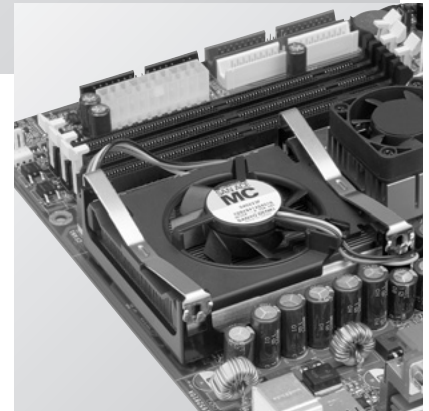


# CPU Cooler

## For Intel® Pentium® 4 Processor 2.0GHz (Socket 478) CPU Cooler "SAN ACE MC" for 1U server

### General specifications

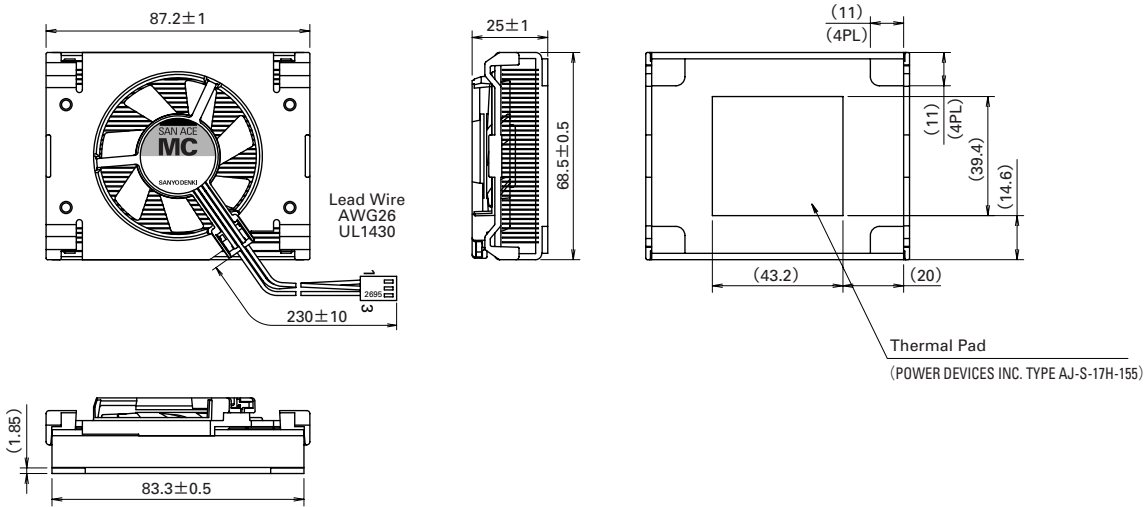
- Material .....Frame, impeller : Plastics Heat sink : copper
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage, and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕yellow (connector No.2 side)  
⊖black (connector No.1 side)  
sensor green (connector No.3 side)
- Connector .....(Molex)22-01-3037 : P/N2695-03RP
- Contact .....Molex P/N5159PBT or 2759T-equivalent
- Mounting method .....Use Mounting Clip 109-1011 2pcs.
- Option(separate order) .....Model No.109-1011
- Mass .....340g



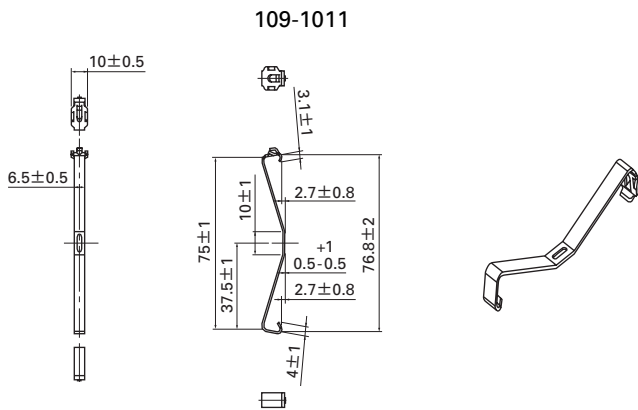
### Specifications

| Model No.            | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Speed (min <sup>-1</sup> ) | θ <sub>c-a</sub> Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------------|-------------------|-----------------------------|-------------------|----------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109X9412G4016</b> | 12                | 7~13.8                      | 0.07              | 7,600                            | 0.435                                     | 52             | 0~+70                            | 40,000              |

**Dimensions (unit : mm)**



**Mounting Clip**



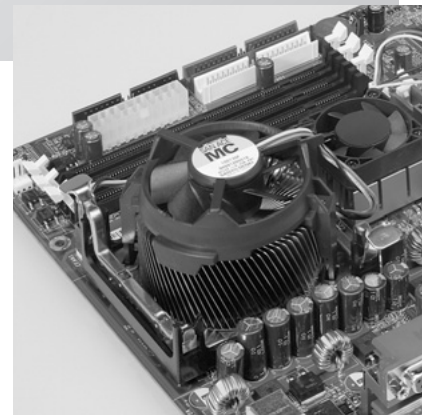
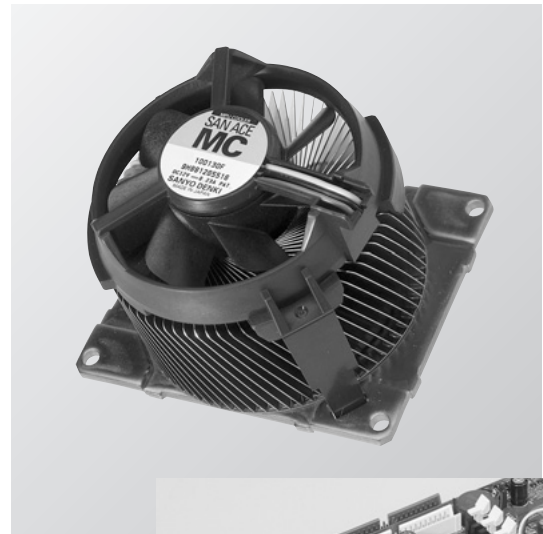
Material : Stainless steel

# CPU Cooler

## For Intel® Pentium® 4 Processor 2.8GHz (Socket 478) CPU Cooler "SAN ACE MC-HX"

### General specifications

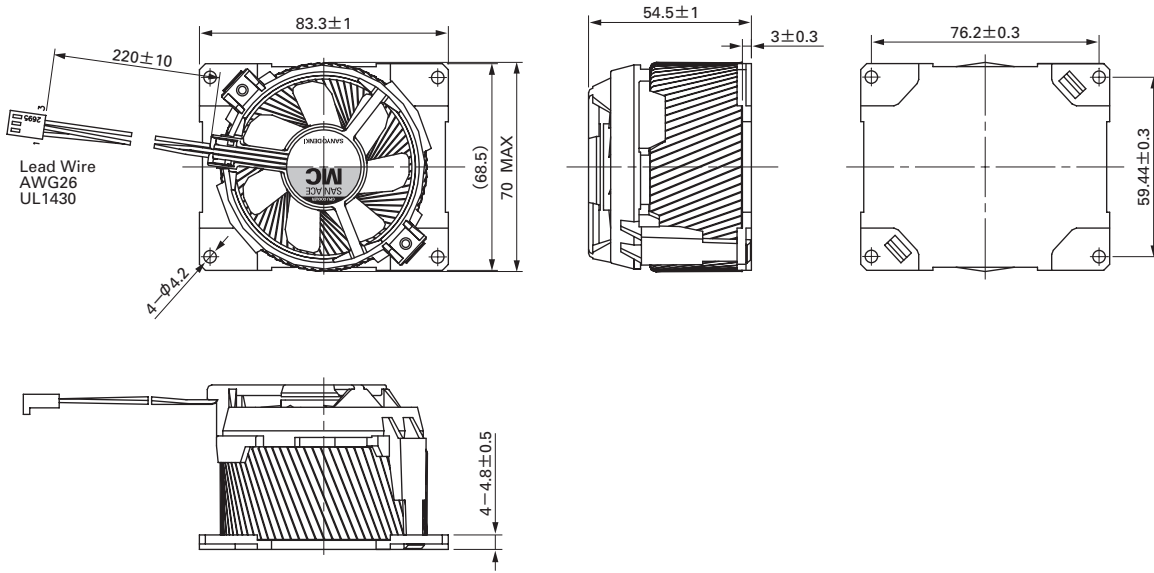
- Material .....Frame, impeller : Plastics Heat sink : copper
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage, and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕yellow (connector No.2 side)  
⊖black (connector No.1 side)  
sensor green (connector No.3 side)
- Contact .....(Molex)P/N5159PBT or 2759T-equivalent
- Option(separate order).....Mounting method : Mount using 109-1007 specialized  
metalfittings(2pcs.)
- Mass .....410g



### Specifications

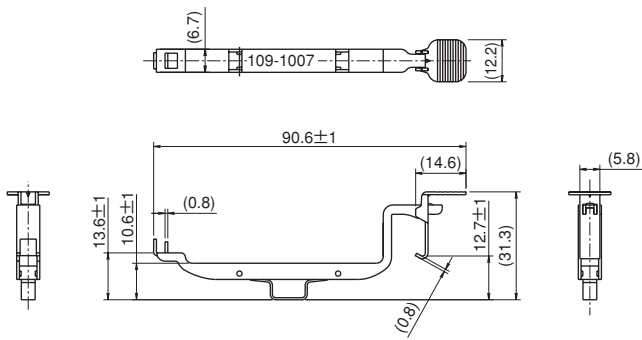
| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Speed (min <sup>-1</sup> ) | θ c-a Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|----------------------------------|--------------------------------|----------------|----------------------------------|---------------------|
| <b>9H9912G5516</b> | 12                | 7~13.8                      | 0.23              | 5,200                            | 0.37                           | 39             | 0 ~ +70                          | 40,000              |

**Dimensions (unit : mm)**



**Mounting Clip**

109-1007



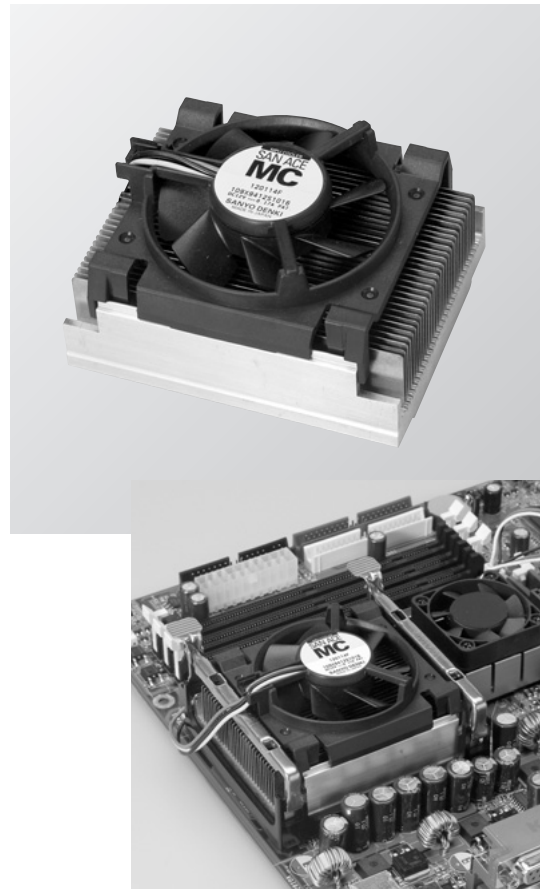
Material : Stainless steel

# CPU Cooler

## For Intel® Pentium® 4 Processor 2.0GHz (Socket 478)

### General specifications

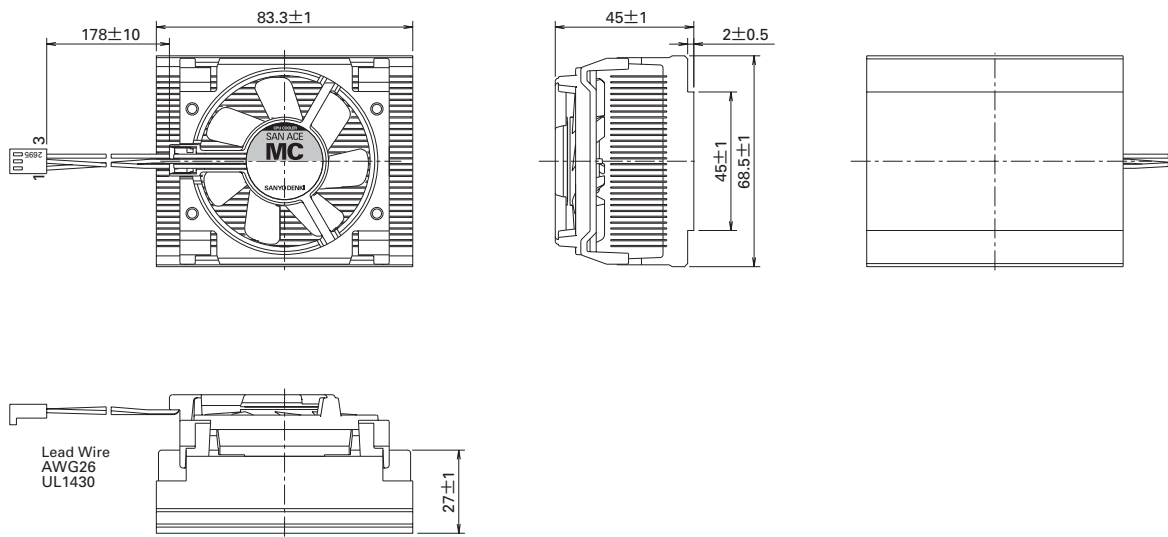
- Material .....Frame, impeller : Plastics  
Heat sink : aluminum base + copper fin
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage, and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕yellow (connector No.2 side)  
⊖black (connector No.1 side)  
(sensor) green (connector No.3 side)
- Connector .....Molex 22-01-3037 : P/N2695-03RP
- Contact .....Molex P/N5159PBT or 2759T-equivalent
- Mass .....360g
- Option (Separate order) .....Mount using 109-1008 specialized metal fittings (2pcs)



### Specifications

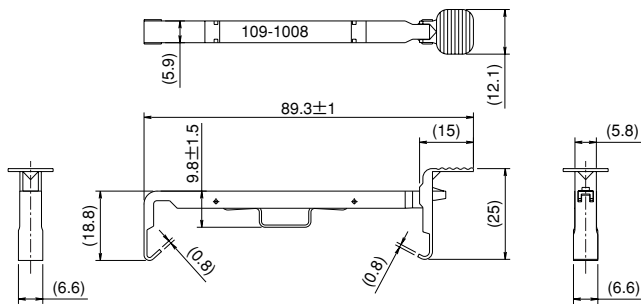
| Model No.            | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Speed (min <sup>-1</sup> ) | $\theta_{c-a}$ Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------------|-------------------|-----------------------------|-------------------|----------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109X9412S1016</b> | 12                | 7~13.8                      | 0.17              | 4,800                            | 0.445                                   | 39             | 0 ~ +70                          | 40,000              |

**Dimensions (unit : mm)**



**Installation metal fittings (unit : mm)**

109-1008



Material : Stainless steel

# CPU Cooler

## For Intel® Pentium® 4 Processor (Socket 423) CPU Cooler "SAN ACE MC-HX"

### General specifications

- Material .....Frame, impeller : resin mold Heat sink : copper
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage, and continuously run in a free air state)
- Motor Protection System ....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ..Varies for each model (Non-condensing)
- Lead Wire .....⊕yellow (connector No.2 side)  
.....⊖black (connector No.1 side)  
.....sensor green (connector No.3 side)
- Connector .....(Molex)22-01-3037 : P/N2695-03RP
- Contact .....Molex P/N5159PBT or 2759T-equivalent
- Mass .....410g



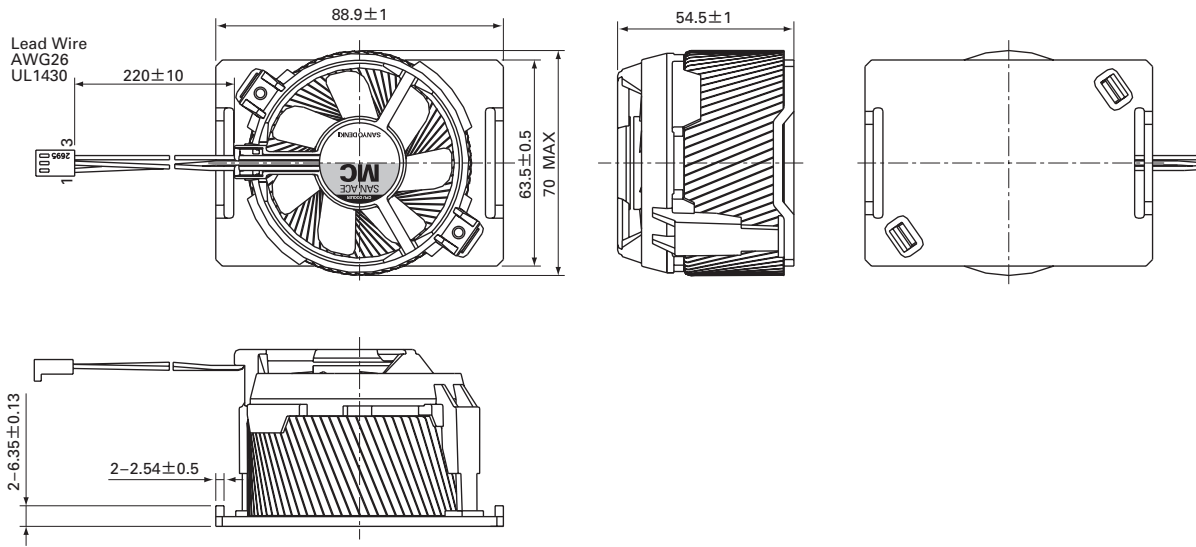
### Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Speed (min <sup>-1</sup> ) | $\theta_{c-a}$ Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|-------------------|----------------------------------|---|----------------|----------------------------------|---------------------|
| <b>9H9912G5016</b> | 12                | 7~13.8                      | 0.07              | 4,800                            | 1.15                                    | 35             | 0 ~+70                           | 40,000              |

CPU Coolers  
Liquid Cooling  
Solution System

Socket423

**Dimensions (unit : mm)**



# CPU Cooler

## For Intel® Pentium® 4 Processor 2.0GHz (Socket 423)

### General specifications

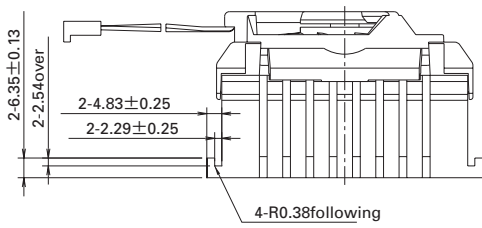
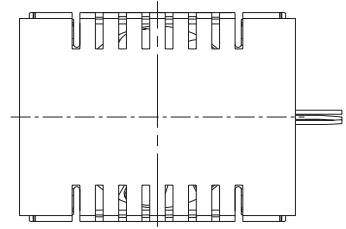
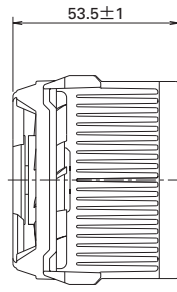
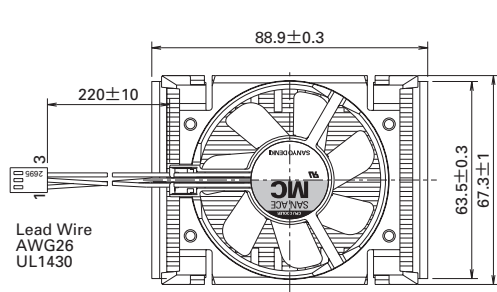
- Material .....Frame, impeller : resin mold  
Heat sink : aluminum
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage, and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Lead Wire .....⊕yellow (connector No.2 side)  
⊖black (connector No.1 side)  
(sensor) green (connector No.3 side)
- Connector .....Molex 22-01-3037 : P/N2695-03RP
- Contact .....Molex P/N5159PBT or 2759T-equivalent
- Mass .....265g



### Specifications

| Model No.            | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Speed (min <sup>-1</sup> ) | $\theta_{c-a}$ Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------------|-------------------|-----------------------------|-------------------|----------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109X9612S5016</b> | 12                | 9~13.8                      | 0.23              | 5,000                            | 0.44                                    | 40             | 0 ~ +70                          | 40,000              |

**Dimensions (unit : mm)**



# CPU Cooler

## For Intel® Pentium® III Processor 1.4GHz (FC-PGA2)

### General specifications

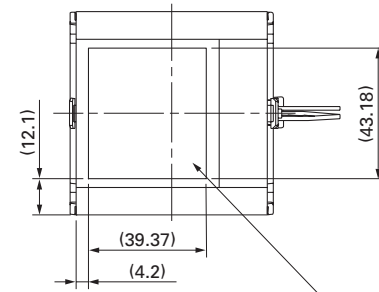
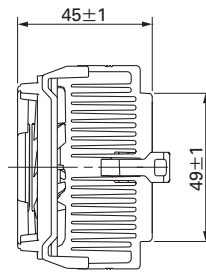
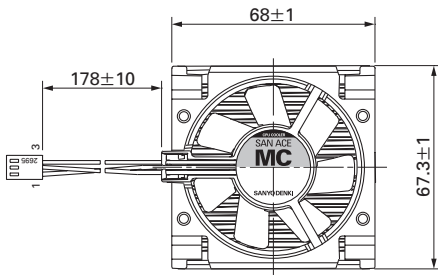
- Material ..... Frame, impeller : resin mold  
Heat sink : aluminum
- Life Expectancy ..... Varies for each model (Survival rate: 90% at 60°C,  
rated voltage, and continuously run in a free air state)
- Motor Protection System ..... Current blocking function (with reverse polarity protection)
- Dielectric Strength ..... 50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..... Measured at 1m from the air inlet
- Operating Temperature Range ..... Varies for each model (Non-condensing)
- Lead Wire ..... ⊕yellow (connector No.2 side)  
⊖black (connector No.1 side)  
(sensor) green (connector No.3 side)
- Connector ..... Molex 22-01-3037 : P/N2695-03RP
- Contact ..... Molex P/N5159PBT-equivalent
- Mass ..... 180g



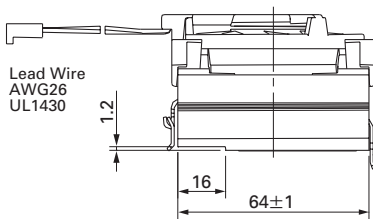
### Specifications

| Model No.            | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Speed (min <sup>-1</sup> ) | $\theta_{c-a}$ Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------------|-------------------|-----------------------------|-------------------|----------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109X7612H1176</b> | 12                | 7~13.8                      | 0.1               | 3,900                            | 0.59                                    | 31             | 0 ~ +70                          | 40,000              |

**Dimensions (unit : mm)**



Thermal resistance Pad  
(POWER DEVICES INC. : AJ-S-17H-155 Type)



Lead Wire  
AWG26  
UL1430

# CPU Cooler

## For Intel® Pentium® III Processor 1.4GHz (FC-PGA2)

### General specifications

- Material ..... Frame, impeller : resin mold  
Heat sink : aluminum base + copper fin
- Life Expectancy ..... Varies for each model (Survival rate: 90% at 60°C,  
rated voltage, and continuously run in a free air state)
- Motor Protection System ..... Current blocking function (with reverse polarity protection)
- Dielectric Strength ..... 50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..... Measured at 1m from the air inlet
- Operating Temperature Range ..... Varies for each model (Non-condensing)
- Lead Wire ..... ⊕yellow (connector No.2 side)  
⊖black (connector No.1 side)  
(sensor) green (connector No.3 side)
- Connector ..... Molex 22-01-3037 : P/N2695-03RP
- Contact ..... Molex P/N5159PBT or 2759T-equivalent
- Mass ..... 145g



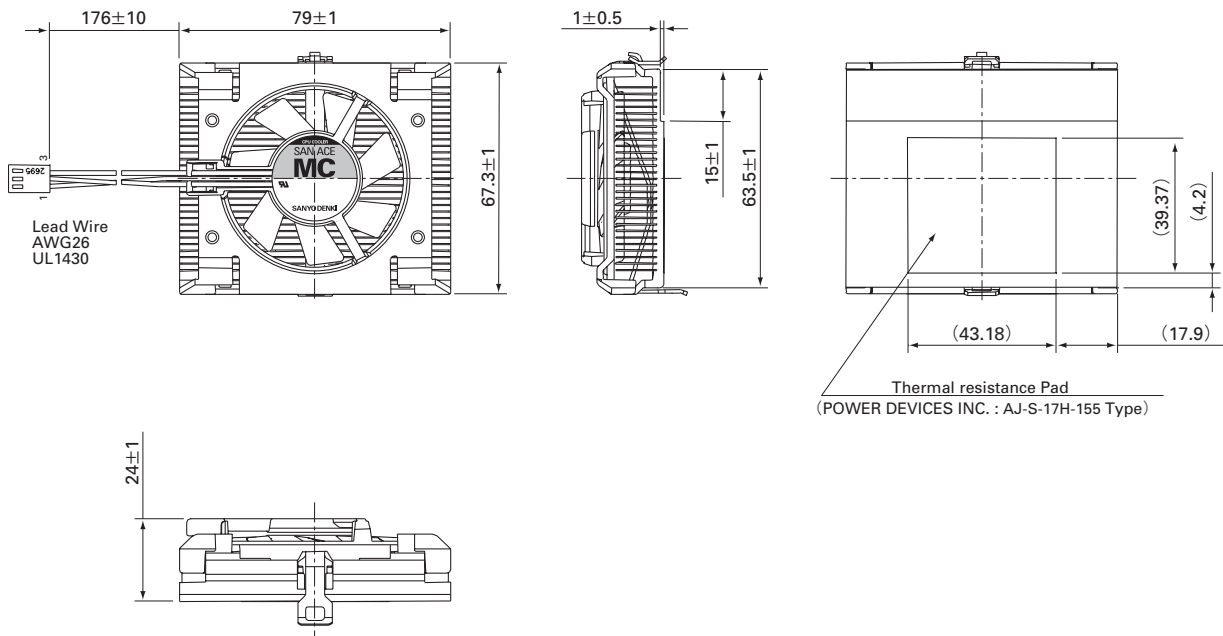
### Specifications

| Model No.            | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Speed (min <sup>-1</sup> ) | $\theta_{c-a}$ Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------------|-------------------|-----------------------------|-------------------|----------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109X7412S4016</b> | 12                | 7~13.8                      | 0.22              | 6,000                            | 0.625                                   | 42             | 0 ~ +70                          | 40,000              |

CPU Coolers  
Liquid Cooling  
Solution System

FC-PGA2

**Dimensions (unit : mm)**

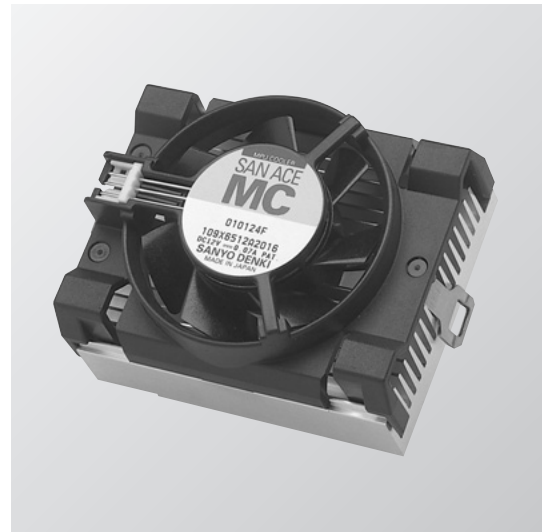


# CPU Cooler

For Intel® Pentium® III Processor 800MHz (FC-PGA)

## General specifications

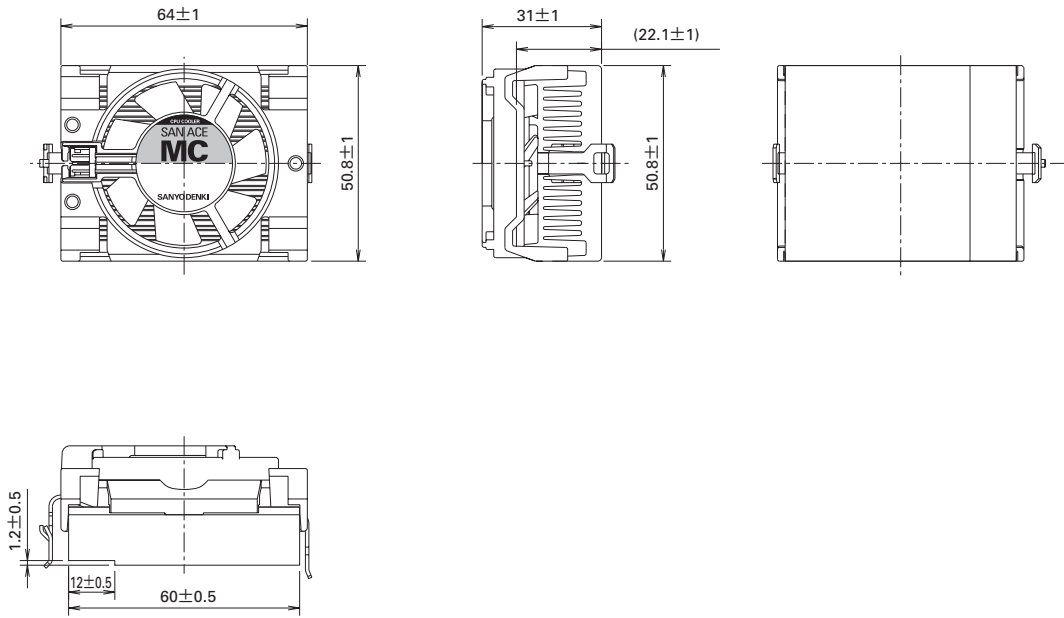
- Material .....Frame, impeller : resin mold  
Heat sink : aluminum
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
rated voltage, and continuously run in a free air state)
- Motor Protection System .....Current blocking function (with reverse polarity protection)
- Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Post Header .....AMP P/N 173981-3 or equivalent  
Kyocera Elco  
P/N 00-8283-0312-00-000 or compatible  
⊕No.3Pin  
⊖No.2Pin  
(sensor) No.1Pin
- Mass .....110g



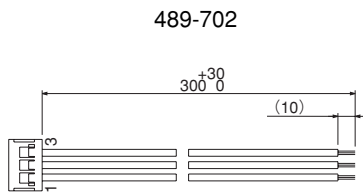
## Specifications

| Model No.            | Rated Voltage (V) | Operating Voltage Range (V) | Rated Current (A) | Rated Speed (min <sup>-1</sup> ) | $\theta_{c-a}$ Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------------|-------------------|-----------------------------|-------------------|----------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109X6512A2016</b> | 12                | 7~13.8                      | 0.07              | 4,800                            | 1.15                                    | 35             | 0 ~ +70                          | 40,000              |

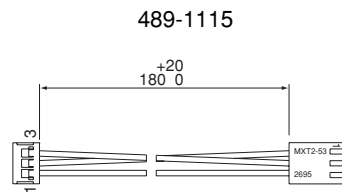
**Dimensions (unit : mm)**



**Relay harness**



Connector : AMP 179228-3  
Contact : AMP 179518-1  
or 179227-1  
Read Wire : AWG24 UL1007



Connector : Molex P/N 2695-03RP  
Contact : Molex P/N 5159PBT  
or equivalent  
Read Wire : AWG24 UL1007

# Liquid Cooling Solution System

## "SAN ACE MC-Liquid" Preminent cooling performance

### General specifications

Material .....Plastics:Fan frame, Fan impeller, Fan Grad. Pump casing  
 Pump impeller, Tube, Gasket stand  
 Aluminum:pump motor casing, Radiator  
 Rubber Sponge : Gasket  
 Copper:Cold plate

Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
 rated voltage,and continuously run in a free air state)

Motor Protection System ....Current blocking function (with reverse polarity protection)

Dielectric Strength .....50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)

Noise Measurement Method ..Measured at 1m from the air inlet Side on Fan

Operating Temperature Range ..Varies for each model (Non-condensing)

Fan .....Thermal Speed Control

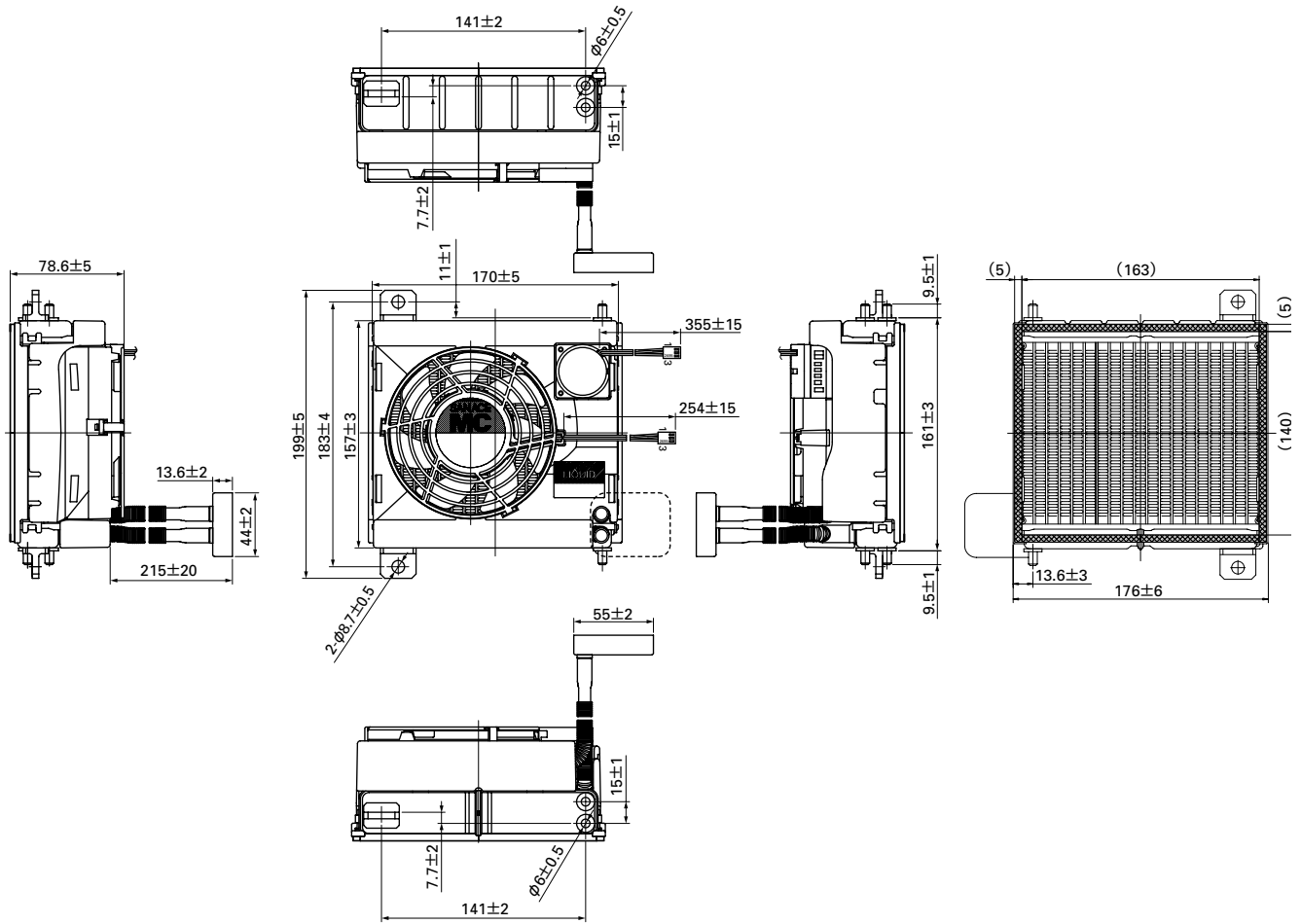
Mass .....1,150g



### Specifications

| Model No.          | Rated Voltage (V) | Operating Voltage Range (V) |        | Rated Current (A) |      | Rated Speed (min <sup>-1</sup> ) |       | $\theta_{c-a}$ Thermal Resistance (K/W) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------------|-----------------------------|--------|-------------------|------|----------------------------------|-------|---|----------------|----------------------------------|---------------------|
|                    |                   | Fan                         | Pump   | Fan               | Pump | Fan                              | Pump  |   |                |                                  |                     |
| <b>109-LC1-001</b> | 12                | 7~12.6                      | 7~12.6 | 0.25              | 0.12 | 2,400                            | 2,000 | 0.22                                    | 42             | 0 ~ +60                          | 40,000              |
|                    |                   |                             |        |                   |      | 1,300                            | 2,000 | 0.255                                   | 28             |                                  |                     |

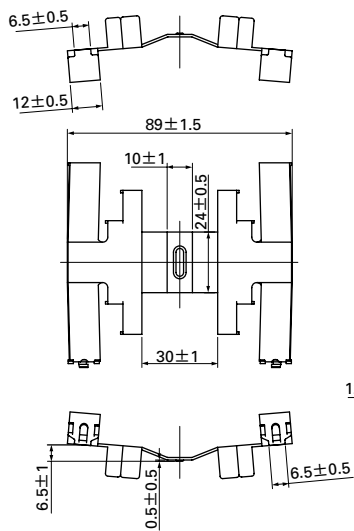
**Dimensions (unit : mm)**



CPU Coolers  
Liquid Cooling  
Solution System

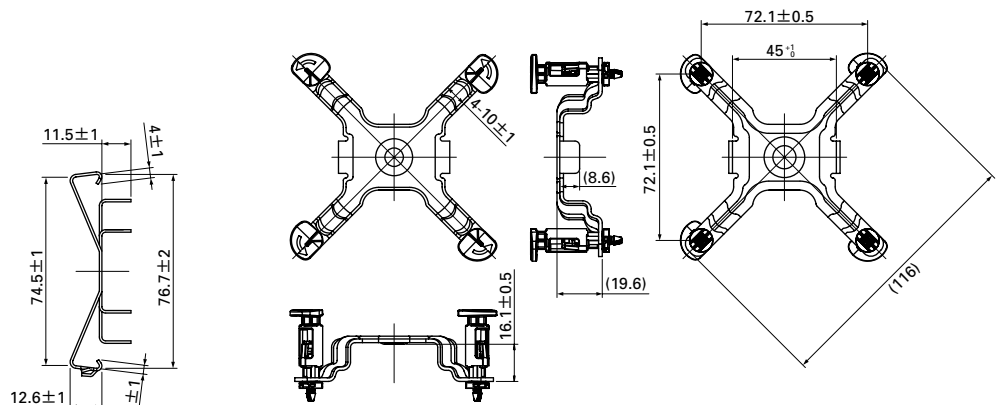
**Mounting Clip (unit : mm)**

**For Socket478**  
Model No : 109-1017



Material : Stainless steel

**For 775-land LGA Package**  
Model No : 109-1026



Material : Plastic, Steel

Liquid cooling  
solution system

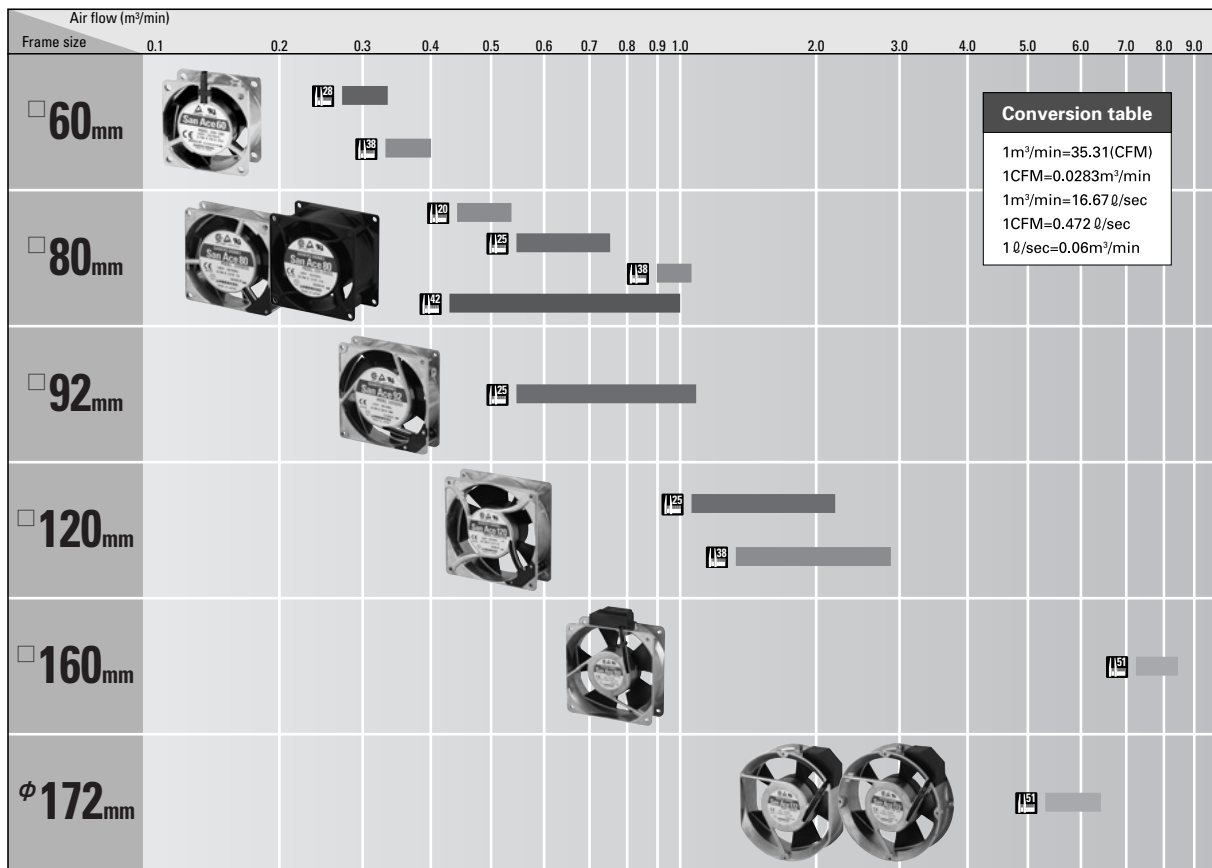


# COOLING SYSTEMS

## AC FAN

## AC Fans

### Domain diagram



- AC Fans
- 60mm
- 80mm
- 92mm
- 120mm
- 160mm
- 172mm

# AC Fan

## 60mm San Ace 60



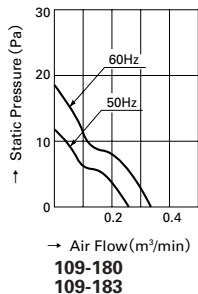
### General specifications

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Construction .....Shaded coil motor
- Motor Protection System .....Impedance protection
- Dielectric Strength .....50/60 Hz, 1500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Operating Voltage Range .....±10%
- Lead Wire .....black, 2pcs
- Mass .....120g (28mm thick) 170g (38mm thick)

### 28mm thick Specifications

| Model No. | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109-180   | 100         | 50/60          | 5/4       | 0.06/0.05   | 0.07/0.06                | 2250/2700                        | 0.27/0.33 9.5/11.7                   | 11.8/18.6 0.047/0.075                       | 24/26          | -30 ~ +70                        | 25,000              |
| 109-183   | 115         |                |           |             | 0.06/0.05                |                                  |                                      |   |                |                                  |                     |

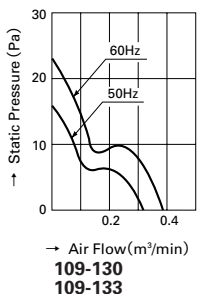
### Air Flow and Static Pressure Characteristics



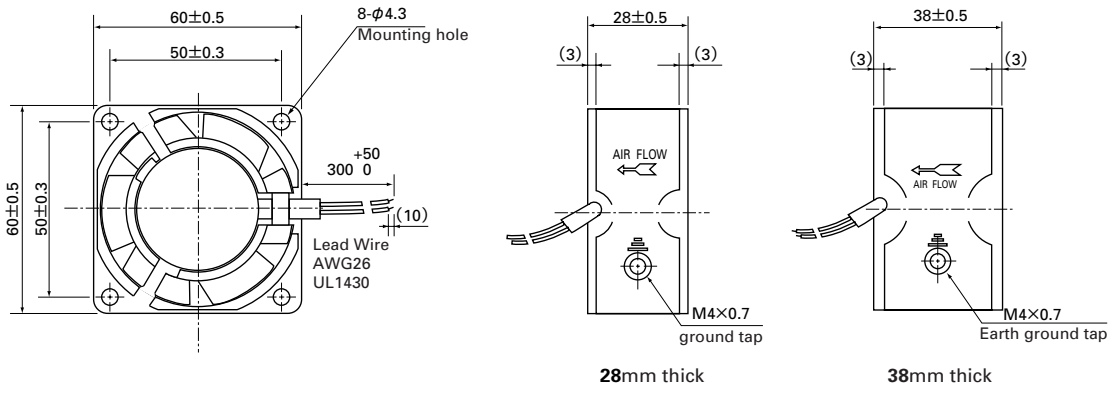
### 38mm thick Specifications

| Model No. | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109-130   | 100         | 50/60          | 6/5       | 0.08/0.07   | 0.08/0.07                | 2600/3150                        | 0.33/0.4 11.7/14.1                   | 16.3/23.3 0.065/0.094                       | 28/30          | -30 ~ +60                        | 25,000              |
| 109-133   | 115         |                |           | 0.07/0.06   |                          |                                  |                                      |   |                |                                  |                     |

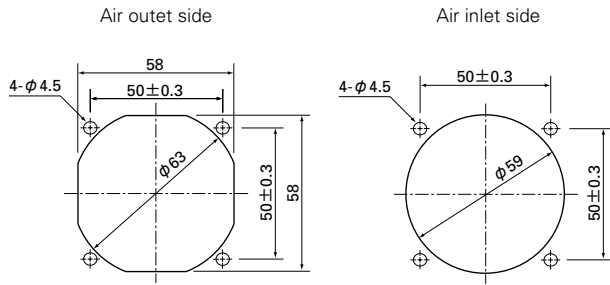
### Air Flow and Static Pressure Characteristics



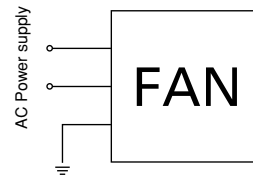
**Dimensions (unit : mm)**



**Reference dimension of mounting holes and vent opening (unit : mm)**



**Wiring diagram**



# AC Fan

□ **80mm**  
San Ace 80



Compact and silent

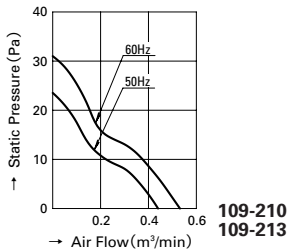
### General specifications

- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
- Motor Construction.....Shaded coil motor
- Motor Protection System ....Impedance protection
- Dielectric Strength .....50/60 Hz, 1500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method ..Measured at 1m from the air inlet
- Operating Temperature Range ....Varies for each model (Non-condensing)
- Operating Voltage Range ....±10%
- PLUG cord .....For general 489-016(L10,L21)  
For UL/CSA 489-147(L10,L21)
- Lead Wire .....black, 2pcs (20mm thick)
- Mass .....180g (20mm thick) 270g (25mm thick) 400g (38mm thick)

### 20mm thick Specifications

| Model No.      | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (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 ~ +60                        | 25,000              |
| <b>109-213</b> | 115         |                |           | 0.06/0.05   | 0.06/0.05                |                                  |                                      |   |                |                                  |                     |

### Air Flow and Static Pressure Characteristics

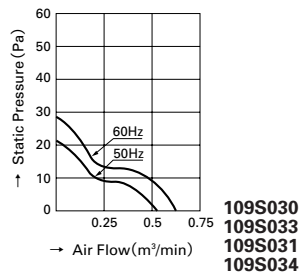
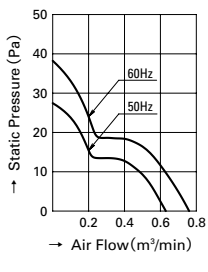


### 25mm thick Specifications

| Model No.        | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |           |           |
|------------------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|-----------|-----------|
| <b>109S050</b>   | 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 0.110/0.154                       | 30/33          | -30 ~ +60                        | 25,000              |           |           |
| <b>109S053</b>   | 115         |                |           | 0.1 /0.08   | 0.11/0.09                |                                  |                                      |   |                |                                  |                     |           |           |
| <b>109S051</b>   | 200         |                |           | 0.06/0.05   | 0.06/0.05                |                                  |                                      |   |                |                                  |                     |           |           |
| <b>109S054</b>   | 230         |                |           | 0.05/0.04   | 0.05/0.04                |                                  |                                      |   |                |                                  |                     |           |           |
| ☆ <b>109S030</b> | 100         |                |           | 2350/2700   | 0.12/0.1                 | 0.13/0.11                        | 0.55/0.63 19.4/22.3                  | 21.6/28.4 0.087/0.114                       | 28/30          |                                  |                     |           |           |
| ☆ <b>109S033</b> | 115         |                |           |             |                          |                                  |                                      |   |                |                                  |                     | 0.1 /0.08 | 0.11/0.09 |
| ☆ <b>109S031</b> | 200         |                |           |             |                          |                                  |                                      |   |                |                                  |                     | 0.06/0.05 | 0.06/0.05 |
| ☆ <b>109S034</b> | 230         |                |           |             |                          |                                  |                                      |   |                |                                  |                     | 0.05/0.04 | 0.05/0.04 |

Note: ☆represents half-speed.

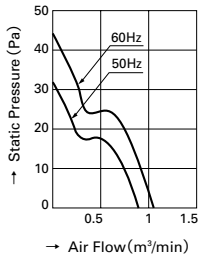
### Air Flow and Static Pressure Characteristics



# 38mm thick Specifications

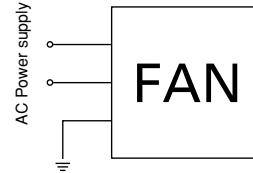
| Model No. | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 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 ~ +60                        | 25,000              |
| 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                |                                  |                                      |   |                |                                  |                     |

## Air Flow and Static Pressure Characteristics

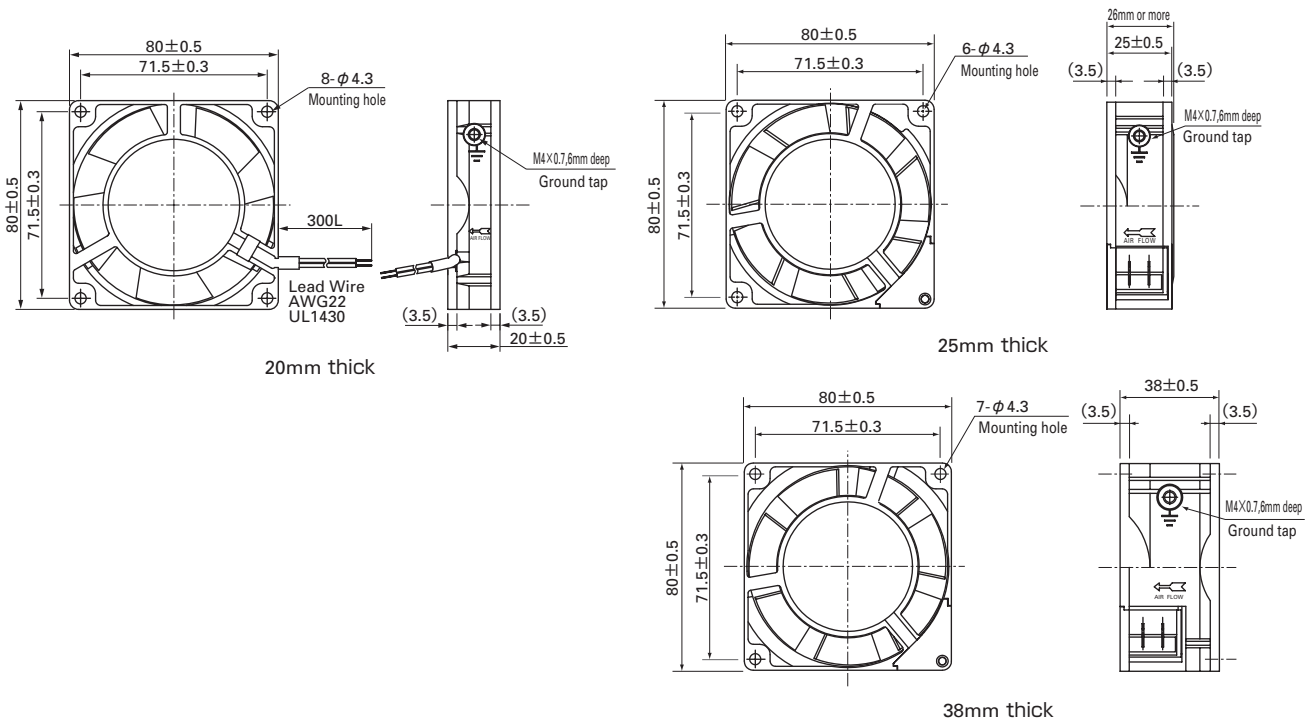


109-150  
109-153  
109-151  
109-154

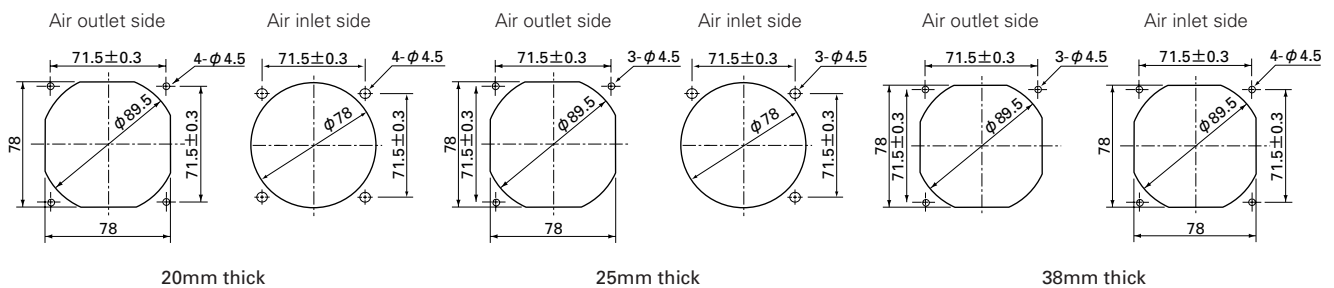
## Wiring diagram



## Dimensions (unit : mm)



## Reference dimension of mounting holes and vent opening (unit : mm)



AC Fans

80mm

# AC Fan

□ **80mm**  
San Ace 80



## General specifications

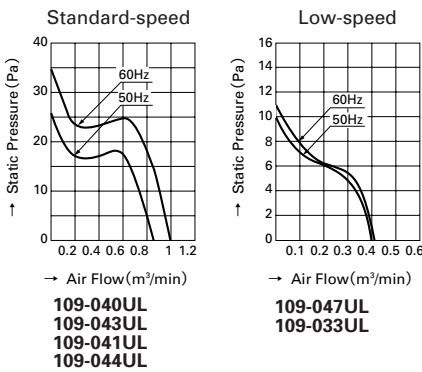
- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Construction .....Shaded coil motor
- Motor Protection System .....Impedance protection
- Dielectric Strength .....50/60 Hz, 1500VAC, 1 minute (between lead conductor and frame)
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Operating Voltage Range .....±10%
- Plug cord .....For general 489-008(L10,L21,L35)
- Mass .....410g

## 42mm thick Specifications

| Model No.          | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109-040UL</b>   | 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 ~ +60                        | 25,000              |
| <b>109-043UL</b>   | 115         |                |           | 0.11/0.1    | 0.14/0.12                |                                  |                                      |   |                |                                  |                     |
| <b>109-041UL</b>   | 200         |                |           | 0.07/0.06   | 0.08/0.07                |                                  |                                      |   |                |                                  |                     |
| <b>109-044UL</b>   | 230         |                |           | 0.06/0.05   | 0.07/0.06                |                                  |                                      |   |                |                                  |                     |
| ※ <b>109-047UL</b> | 100         |                |           | 4/3.5       | 0.05/0.05                |                                  |                                      |   |                |                                  |                     |
| ※ <b>109-033UL</b> | 115         | 0.04/0.04      | 0.04/0.04 |             |                          |                                  |                                      |   |                |                                  |                     |

※represents low-speed.

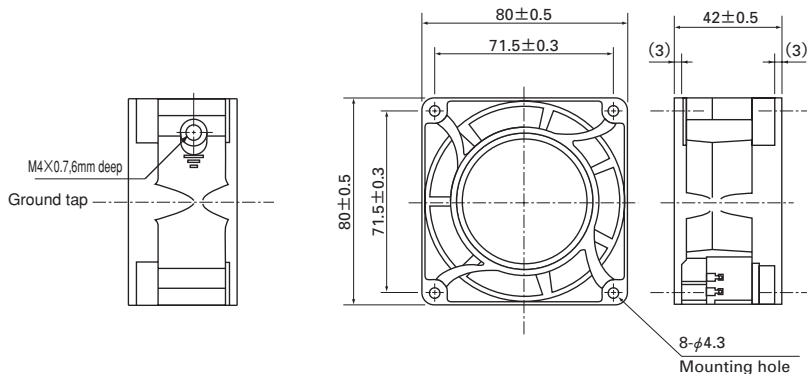
## Air Flow and Static Pressure Characteristics



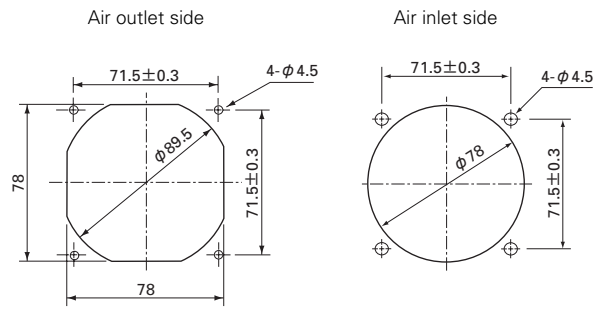
AC Fans

80mm

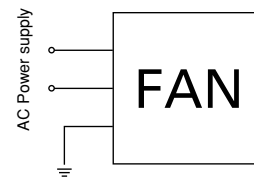
## Dimensions (unit : mm)



## Reference dimension of mounting holes and vent opening (unit : mm)



## Wiring diagram



# AC Fan

□ **92mm**  
San Ace 92



## General specifications

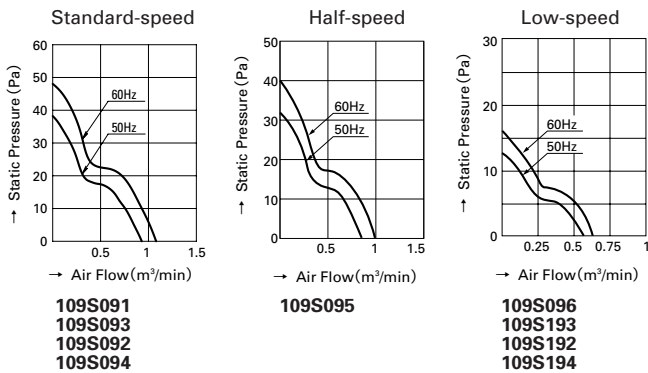
Material .....Frame:Aluminum, Impeller:Plastics  
 Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
 rated voltage, and continuously run in a free air state)  
 Motor Construction .....Shaded coil motor  
 Motor Protection System .....Impedance protection  
 Dielectric Strength .....50/60 Hz, 1500VAC, 1 minute (between lead conductor and frame)  
 Noise Measurement Method .....Measured at 1m from the air inlet  
 Operating Temperature Range .....Varies for each model (Non-condensing)  
 Operating Voltage Range .....±10%  
 Plug cord .....For general 489-016 (L10, L21)  
 For UL/CSA 489-047 (L10,L21)  
 Mass .....290g

## 25mm thick Specifications

| Model No.        | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|------------------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109S091</b>   | 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 ~ +60                        | 25,000              |
| <b>109S093</b>   | 115         |                |           | 0.09/0.08   | 0.11/0.1                 |                                  |                                      |   |                |                                  |                     |
| <b>109S092</b>   | 200         |                | 11/10     | 0.07/0.06   | 0.08/0.08                |                                  |                                      |   |                |                                  |                     |
| <b>109S094</b>   | 230         |                | 10/9      | 0.06/0.05   | 0.07/0.07                |                                  |                                      |   |                |                                  |                     |
| ☆ <b>109S095</b> | 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          |                                  |                     |
| ※ <b>109S096</b> | 100         |                | 7/6       | 0.09/0.08   | 0.09/0.08                | 1500/1700                        | 0.55/0.65 19.4/23                    | 12.5/16.3 0.050/0.065                       | 24/27          |                                  |                     |
| ※ <b>109S193</b> | 115         |                |           | 0.08/0.07   | 0.08/0.07                |                                  |                                      |   |                |                                  |                     |
| ※ <b>109S192</b> | 200         |                | 8/7       | 0.06/0.05   | 0.06/0.05                |                                  |                                      |   |                |                                  |                     |
| ※ <b>109S194</b> | 230         |                |           | 0.05/0.04   | 0.05/0.04                |                                  |                                      |   |                |                                  |                     |

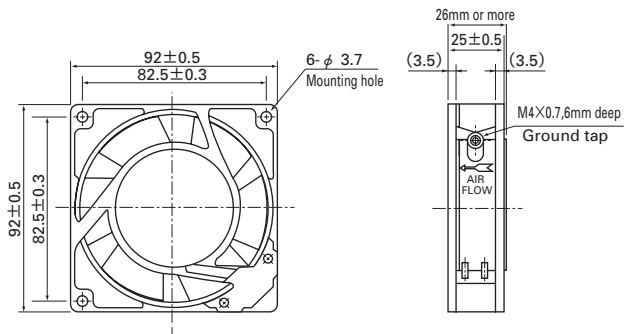
☆ represents half-speed. ※ represents low-speed

## Air Flow and Static Pressure Characteristics



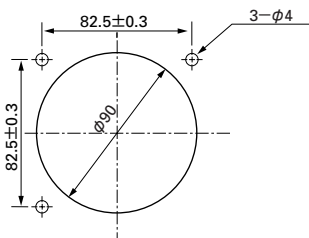
92mm

## Dimensions (unit : mm)

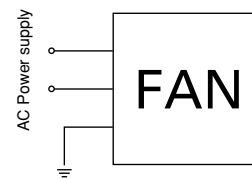


## Reference dimension of mounting holes and vent opening (unit : mm)

Air inlet side · Air outlet side



## Wiring diagram



# AC Fan

# 120mm San Ace 120



## General specifications

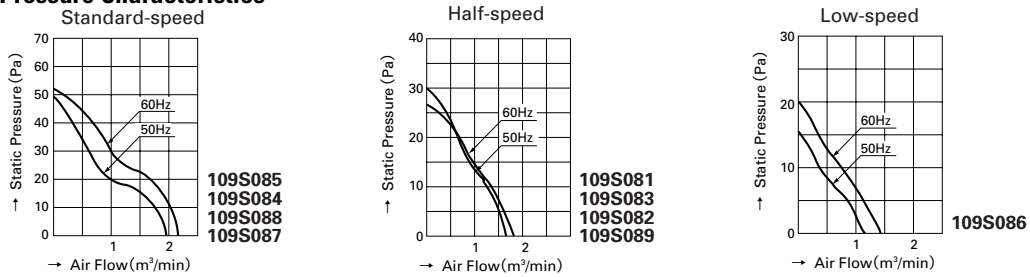
Material .....Frame:Aluminum, Impeller:Plastics  
 Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)  
 Motor Construction.....Shaded coil motor  
 Motor Protection System ....Impedance protection  
 Dielectric Strength .....50/60 Hz, 1500VAC, 1 minute (between lead conductor and frame)  
 Noise Measurement Method ..Measured at 1m from the air inlet  
 Operating Temperature Range ....Varies for each model (Non-condensing)  
 Operating Voltage Range ....±10%  
 Plug cord.....489-006 (L10,L21) / 489-016(L10,L21)  
 38mm thick For UL/CSA 489-007 (L10,L21) 25mm thick For UL/CSA 489-047 (L10,L21)  
 ※Be sure to use a UL/CSA plug cord with any products with a 'UL' at the end of their model numbers.  
 Mass .....370g (25mm thick) 550g (38mm thick)

## 25mm thick Specifications

| Model No.        | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|------------------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109S085</b>   | 100         | 50/60          | 13.5/12   | 0.16/0.14   | 0.19/0.17                | 2500/2900                        | 1.92/2.22 67.8/78.4                  | 49/53.9 0.197/0.216                         | 38/41          | -30 ~ +60                        | 25,000              |
| <b>109S084</b>   | 115         |                |           | 0.14/0.12   | 0.16/0.15                |                                  |                                      |   |                |                                  |                     |
| <b>109S088</b>   | 200         |                |           | 0.08/0.07   | 0.1 /0.09                |                                  |                                      |   |                |                                  |                     |
| <b>109S087</b>   | 230         |                |           | 0.07/0.06   | 0.08/0.07                |                                  |                                      |   |                |                                  |                     |
| ☆ <b>109S081</b> | 100         | 9.5/8.5        | 12/10     | 0.11        | 0.11/0.1                 | 2200/2350                        | 1.63/1.78 57.6/62.9                  | 29.4/26.3 0.118/0.106                       | 34/35          |                                  |                     |
| ☆ <b>109S083</b> | 115         |                |           | 0.1         | 0.1 /0.09                |                                  |                                      |   |                |                                  |                     |
| ☆ <b>109S082</b> | 200         |                |           | 0.07        | 0.07/0.06                |                                  |                                      |   |                |                                  |                     |
| ☆ <b>109S089</b> | 230         |                |           | 0.06        | 0.06/0.05                |                                  |                                      |   |                |                                  |                     |
| ※ <b>109S086</b> | 100         |                |           | 0.14/0.12   | 0.15/0.13                | 1400/1600                        | 1.11/1.35 39.2/47.7                  | 15.7/19.6 0.063/0.079                       | 24/27          |                                  |                     |

☆ represents half-speed. ※ represents low-speed

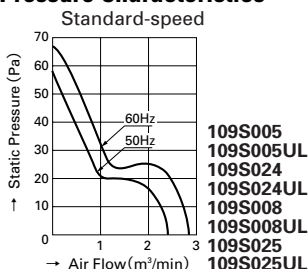
## Air Flow and Static Pressure Characteristics



## 38mm thick Specifications

| Model No.        | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|------------------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109S005</b>   | 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          | -30 ~ +60                        | 25,000              |
| <b>109S005UL</b> |             |                |           | 0.16/0.14   | 0.21/0.18                |                                  |                                      |   |                |                                  |                     |
| <b>109S024</b>   | 120         |                |           | 0.09/0.08   | 0.13/0.11                |                                  |                                      |   |                |                                  |                     |
| <b>109S024UL</b> | 115         |                |           |             |                          |                                  |                                      |   |                |                                  |                     |
| <b>109S008</b>   | 200         |                |           | 0.08/0.07   | 0.11/0.09                |                                  |                                      |   |                |                                  |                     |
| <b>109S008UL</b> |             |                |           |             |                          |                                  |                                      |   |                |                                  |                     |
| <b>109S025</b>   | 230         |                |           |             |                          |                                  |                                      |   |                |                                  |                     |
| <b>109S025UL</b> |             |                |           |             |                          |                                  |                                      |   |                |                                  |                     |

## Air Flow and Static Pressure Characteristics



AC Fans

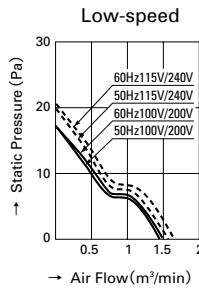
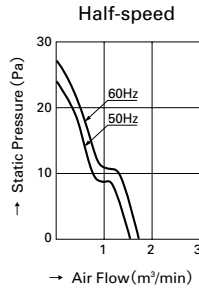
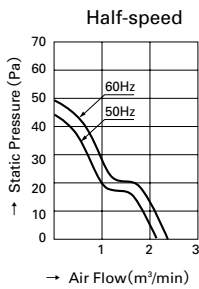
120mm

# 38mm thick Specifications

| Model No.  | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A])        | Operating Temperature Range (°C) | Life Expectancy (h) |       |
|------------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|-----------------------|----------------------------------|---------------------|-------|
| ☆109S029UL | 100         | 50/60          | 14/12     | 0.18/0.16   | 0.23/0.21                | 2450/2700                        | 2.15/2.35 76 /83                     | 44.1/49.0 0.177/0.197                       | 38/40                 | -30 ~ +60                        | 25,000              |       |
| ☆109S013   |             |                | 13/11     | 0.16/0.14   | 0.16/0.15                | 1800/2000                        | 1.54/1.72 54.4/60.8                  | 24 /27 0.096/0.108                          | 30/32                 |                                  |                     |       |
| ☆109S013UL |             |                | 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                 |                                  |                     |       |
| ※109S006   |             |                | 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                 |                                  |                     |       |
| ※109S006UL |             |                | 115       | 10/10       | 0.13/0.11                | 0.13/0.11                        | 1800/1900                            | 1.56/1.64 55 /57.9                          | 20 /20.6 0.080/0.083  |                                  |                     | 30/31 |
| ※109S010   |             |                | 200       | 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 |
| ※109S010UL | 200         | 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                                       |                       |                                  |                     |       |
|            | 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                                       |                       |                                  |                     |       |

☆ represents half-speed. ※ represents low-speed

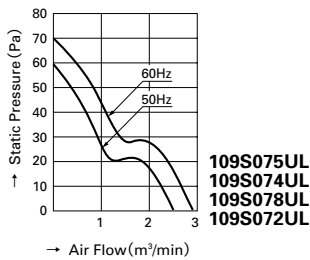
## Air Flow and Static Pressure Characteristics



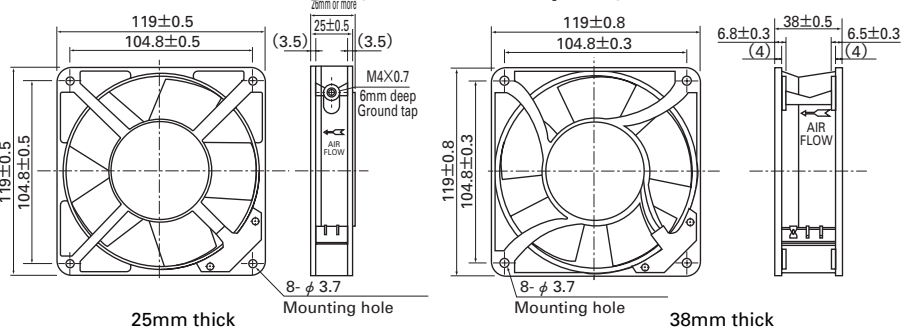
# 38mm thick Specifications

| Model No. | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (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 ~ +60                        | 25,000              |
| 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                |                                  |                                      |   |                |                                  |                     |

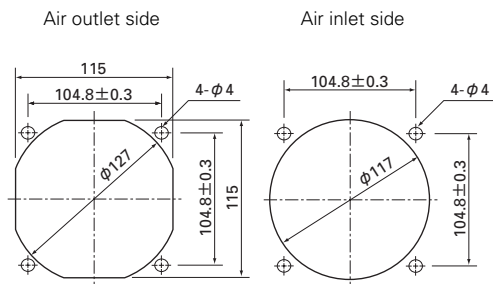
## Air Flow and Static Pressure Characteristics



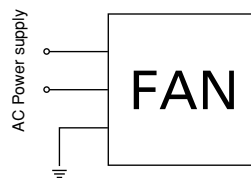
## Reference dimension of mounting holes and vent opening (unit : mm)



## Reference dimension of mounting holes and vent opening (unit : mm)

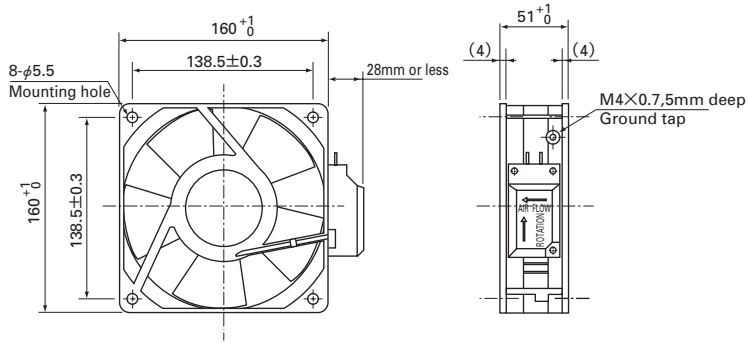


## Wiring diagram



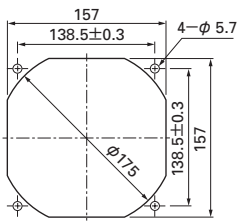


**Dimensions (unit : mm)**

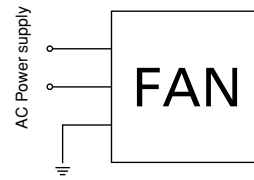


**Reference dimension of mounting holes and vent opening (unit : mm)**

Air inlet side · Air outlet side

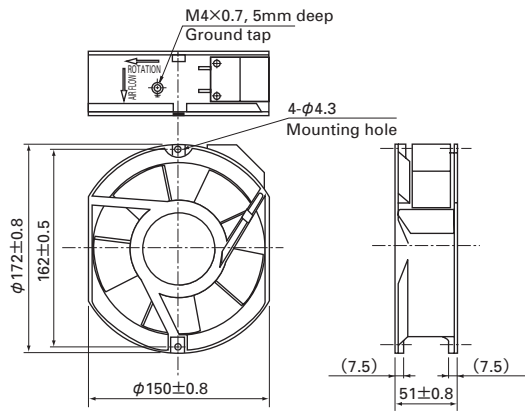


**Wiring diagram**



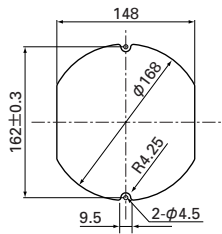


## Dimensions (unit : mm)

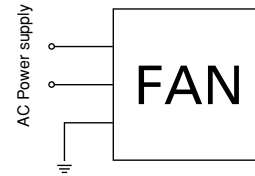


## Reference dimension of mounting holes and vent opening (unit : mm)

Air inlet side · Air outlet side

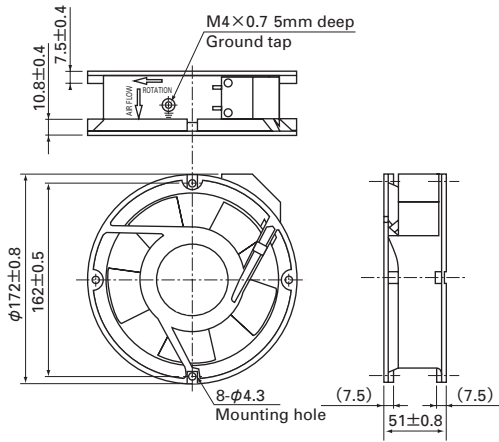


## Wiring diagram



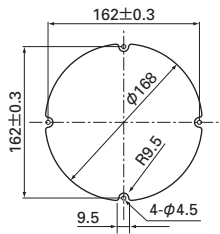


## Dimensions (unit : mm)

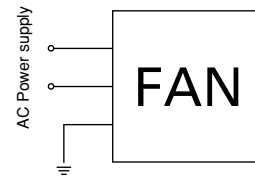


## Reference dimension of mounting holes and vent opening (unit : mm)

Air inlet side · Air outlet side



## Wiring diagram



# AC Fan

With Sensor

92mm  
San Ace 92



## General specifications

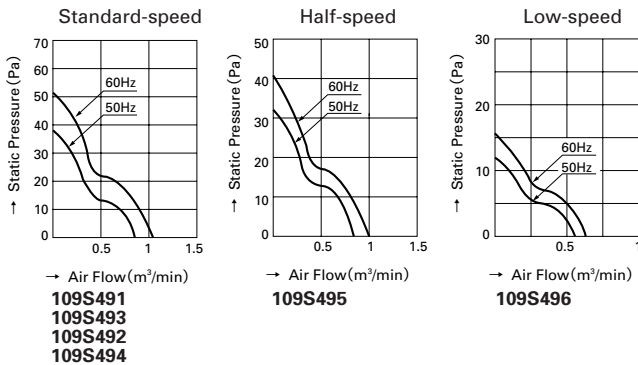
- Material .....Frame:Aluminum, Impeller:Plastics
- Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Construction .....Shaded coil motor
- Motor Protection System .....Impedance protection
- Dielectric Strength .....between AC input and DC input (Sensor output) : 50/60 Hz, 1000 VAC, 1 minute  
between AC input and G:50/60 Hz, 1500 VAC, 1 minute  
between G and DC input (Sensor output) : 50/60 Hz, 1000 VAC, 1 minute
- Noise Measurement Method .....Measured at 1m from the air inlet
- Operating Temperature Range .....Varies for each model (Non-condensing)
- Operating Voltage Range .....±10%
- Sensor-Purpose Lead Wire .....⊕brown, ⊖black, (Sensor) yellow
- Plug cord .....For general 489-016 (L10, L21)  
For UL/CSA 489-047 (L10, L21)
- Mass .....310g

## 25mm thick Specifications

| Model No.        | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|------------------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109S491</b>   | 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~+60                          | 25,000              |
| <b>109S493</b>   | 115         |                |           | 0.09/0.08   | 0.11/0.1                 |                                  |                                      |   |                |                                  |                     |
| <b>109S492</b>   | 200         |                | 11/10     | 0.07/0.06   | 0.08/0.08                |                                  |                                      |   |                |                                  |                     |
| <b>109S494</b>   | 230         |                | 10/ 9     | 0.06/0.05   | 0.07/0.07                |                                  |                                      |   |                |                                  |                     |
| ☆ <b>109S495</b> | 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          |                                  |                     |
| ※ <b>109S496</b> |             | 7/ 6           | 0.09/0.08 | 0.09/0.08   | 1500/1700                | 0.55/0.65 19.4/23                | 12.5/16.3 0.050/0.065                | 24/27                                       |                |                                  |                     |

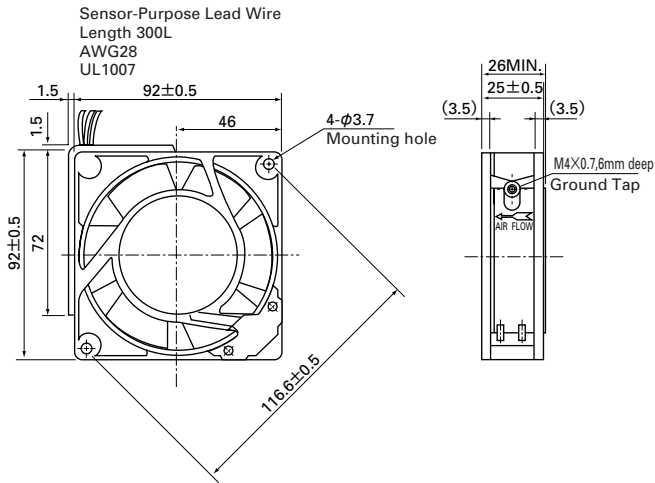
☆ represents half-speed. ※ represents low-speed

## Air Flow and Static Pressure Characteristics

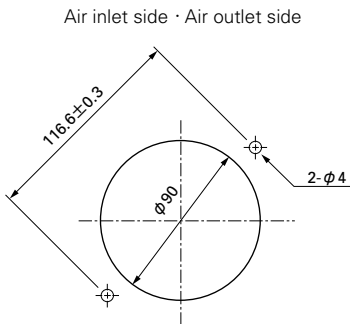


92mm

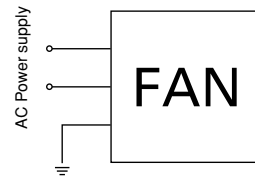
**Dimensions (unit : mm)**



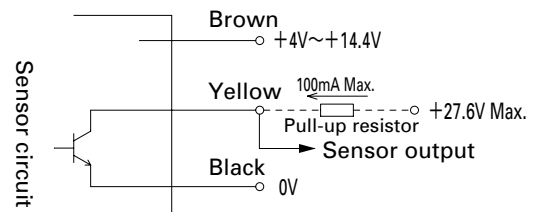
**Reference dimension of mounting holes and vent opening (unit : mm)**



**Wiring diagram (For fan power supply)**



**Wiring diagram (Sensor Output Circuit)**



# AC Fan With Sensor

# 120mm San Ace 120



## General specifications

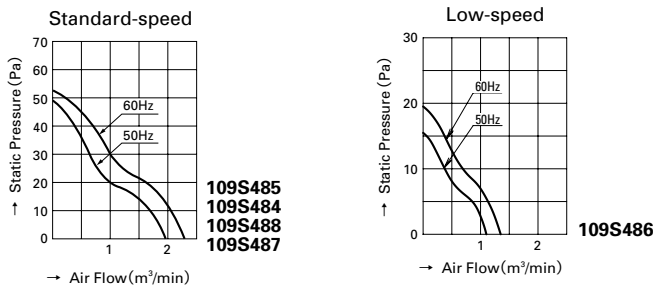
- Material .....Frame:Aluminum, Impeller:Plastics
  - Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C, rated voltage,and continuously run in a free air state)
  - Motor Construction .....Shaded coil motor
  - Motor Protection System .....Impedance protection
  - Dielectric Strength .....between AC input and DC input (Sensor output) : 50/60 Hz, 1000 VAC, 1 minute  
between AC input and G:50/60 Hz, 1500 VAC, 1 minute  
between G and DC input (Sensor output) : 50/60 Hz, 1000 VAC, 1 minute
  - Noise Measurement Method .....Measured at 1m from the air inlet
  - Operating Temperature Range .....Varies for each model (Non-condensing)
  - Operating Voltage Range .....±10%
  - Sensor-Purpose Lead Wire .....⊕brown, ⊖black, (Sensor) yellow
  - Plug cord .....25mm thick For 489-016 (L10, L21)  
38mm thick For UL/CSA 489-007 (L10, L21)  
25mm thick For UL/CSA 489-047 (L10, L21)
- ※Be sure to use a UL/CSA plug cord with any products with a 'UL' at the end of their model numbers.  
Mass .....390g (25mm thick) 580g (38mm thick)

## 25mm thick Specifications

| Model No.        | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|------------------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109S485</b>   | 100         | 50/60          | 13.5/12   | 0.16/0.14   | 0.19/0.17                | 2500/2900                        | 1.92/2.22 67.8/78.4                  | 48 /52 0.193/0.209                          | 38/41          | -10 ~ +60                        | 25,000              |
| <b>109S484</b>   | 115         |                |           | 0.14/0.12   | 0.16/0.15                |                                  |                                      |   |                |                                  |                     |
| <b>109S488</b>   | 200         |                |           | 0.08/0.07   | 0.1 /0.09                |                                  |                                      |   |                |                                  |                     |
| <b>109S487</b>   | 230         |                |           | 0.07/0.06   | 0.08/0.07                |                                  |                                      |   |                |                                  |                     |
| ※ <b>109S486</b> | 100         | 12 /10         | 0.14/0.12 | 0.15/0.13   | 1400/1600                | 1.11/1.35 39.2/47.7              | 15.7/19.6 0.059/0.075                | 24/27                                       |                |                                  |                     |

※ represents low-speed

## Air Flow and Static Pressure Characteristics

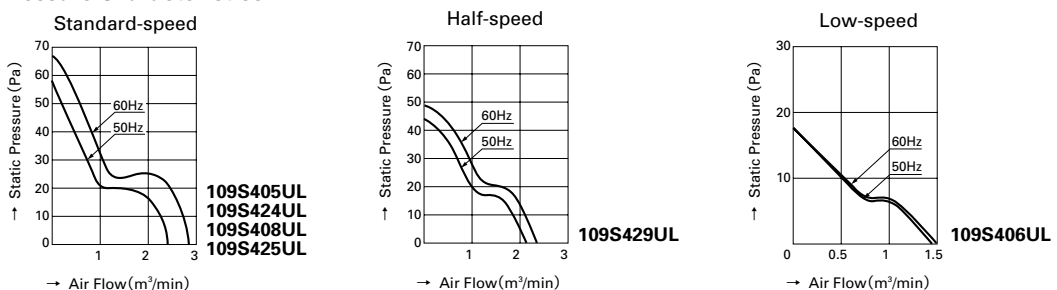


## 38mm thick Specifications

| Model No.          | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|--------------------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109S405UL</b>   | 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 ~ +60                        | 25,000              |
| <b>109S424UL</b>   | 115         |                |           | 0.16/0.14   | 0.21/0.18                |                                  |                                      |   |                |                                  |                     |
| <b>109S408UL</b>   | 200         |                |           | 0.09/0.08   | 0.13/0.11                |                                  |                                      |   |                |                                  |                     |
| <b>109S425UL</b>   | 230         |                |           | 0.08/0.07   | 0.11/0.09                |                                  |                                      |   |                |                                  |                     |
| ☆ <b>109S429UL</b> | 100         |                |           | 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          |                                  |                     |
| ※ <b>109S406UL</b> |             | 7/6            | 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                                       |                |                                  |                     |

☆ represents half-speed. ※ represents low-speed

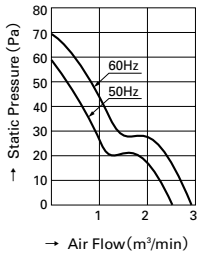
## Air Flow and Static Pressure Characteristics



# 38mm thick Specifications

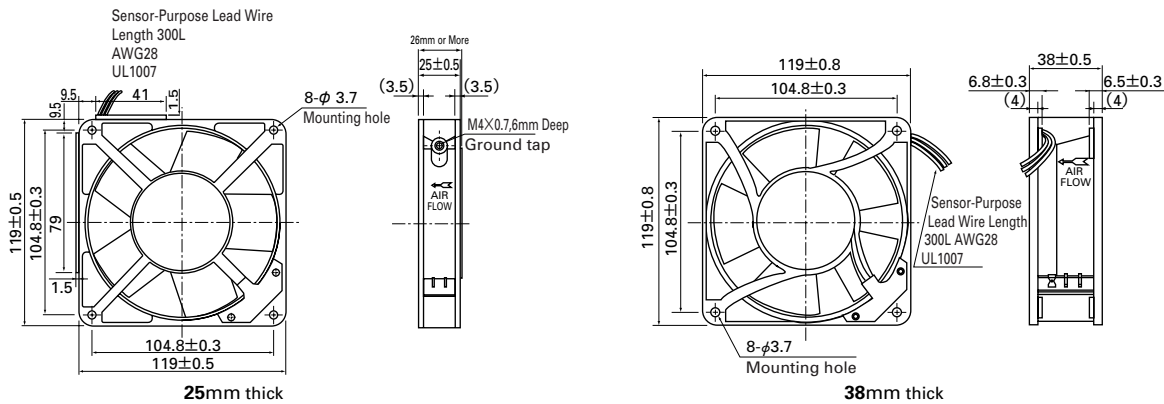
| Model No. | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|-----------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| 109S475UL | 100         | 50/60          | 18/16     | 0.24/0.21   | 0.32/0.28                | 2700/3100                        | 2.5/2.9 88.3/102.4                   | 57.9/68.7 0.233/0.276                       | 42/45          | -10 ~ +60                        | 25,000              |
| 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                |                                  |                                      |   |                |                                  |                     |

## Air Flow and Static Pressure Characteristics

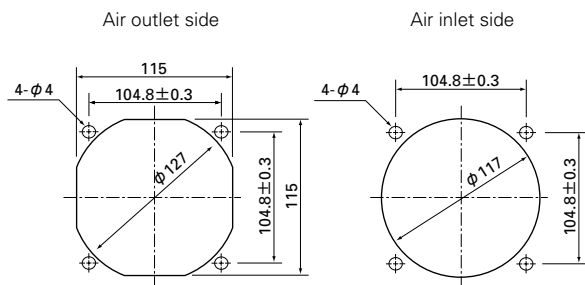


109S475UL  
109S474UL  
109S478UL  
109S472UL

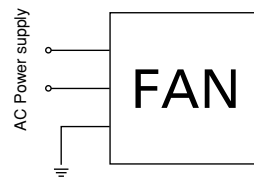
## Dimensions (unit : mm)



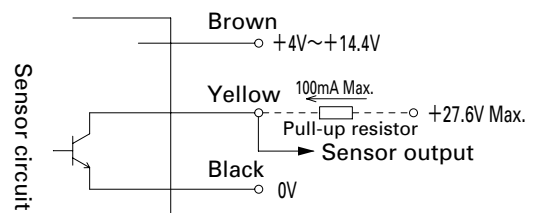
## Reference dimension of mounting holes and vent opening (unit : mm)



## Wiring diagram (For fan power supply)



## Wiring diagram (Sensor Output Circuit)



AC Fans

120mm

## AC Fan With Sensor

□ **160mm**  
San Ace 160



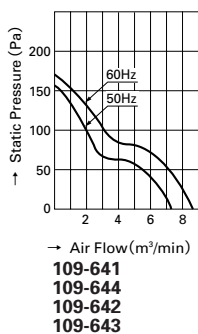
### General specifications

Material .....Frame:Aluminum, Impeller:Plastics  
 Life Expectancy .....Varies for each model (Survival rate: 90% at 60°C,  
 rated voltage, and continuously run in a free air state)  
 Motor Construction .....Capacitor motor  
 Motor Protection System .....Thermal protection  
 Dielectric Strength .....between AC input and DC input (Sensor output) : 50/60 Hz, 1000 VAC, 1 minute  
 between AC input and G:50/60 Hz, 1500 VAC, 1 minute  
 between G and DC input (Sensor output) : 50/60 Hz, 1000 VAC, 1 minute  
 Noise Measurement Method .....Measured at 1m from the air inlet  
 Operating Temperature Range .....Varies for each model (Non-condensing)  
 Operating Voltage Range .....±10%  
 Sensor-Purpose Lead Wire .....⊕brown, ⊖black, (Sensor) yellow  
 Plug cord .....For UL/CSA 489-084 (L10, L21)  
 489-086 (L10, L21)  
 Mass .....1,100g

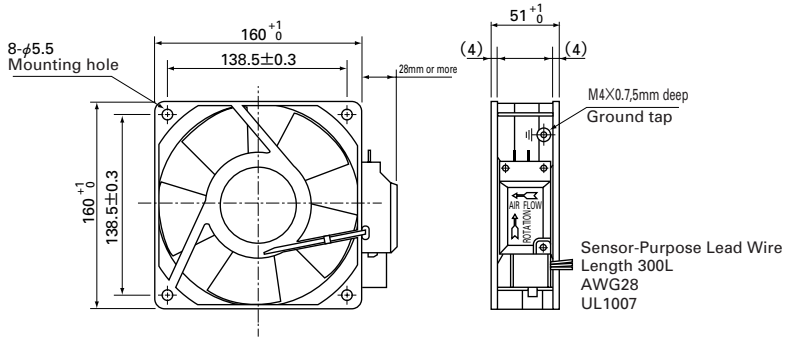
### 51mm thick Specifications

| Model No.      | Voltage (V) | Frequency (Hz) | Input (W) | Current (A) | Locked Rotor Current (A) | Rated Speed (min <sup>-1</sup> ) | Air Flow (m <sup>3</sup> /min) (CFM) | Static Pressure (Pa) (inchH <sub>2</sub> O) | Noise (dB [A]) | Operating Temperature Range (°C) | Life Expectancy (h) |
|----------------|-------------|----------------|-----------|-------------|--------------------------|----------------------------------|--------------------------------------|---|----------------|----------------------------------|---------------------|
| <b>109-641</b> | 100         | 50/60          | 37.5/33   | 0.43/0.35   | 0.72/0.70                | 2850/3350                        | 7.2/8.5 254.4/300.4                  | 156.8/166.6 0.630/0.669                     | 56/60          | -10 ~ +60                        | 25,000              |
| <b>109-644</b> | 115         |                |           | 0.39/0.31   | 0.62/0.61                |                                  |                                      |   |                |                                  |                     |
| <b>109-642</b> | 200         |                |           | 0.23/0.18   | 0.36/0.35                |                                  |                                      |   |                |                                  |                     |
| <b>109-643</b> | 230         |                |           | 0.21/0.16   | 0.32/0.31                |                                  |                                      |   |                |                                  |                     |

### Air Flow and Static Pressure Characteristics

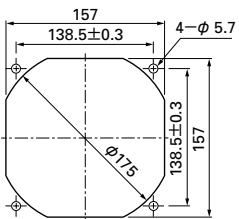


**Dimensions (unit : mm)**

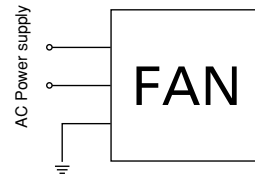


**Reference dimension of mounting holes and vent opening (unit : mm)**

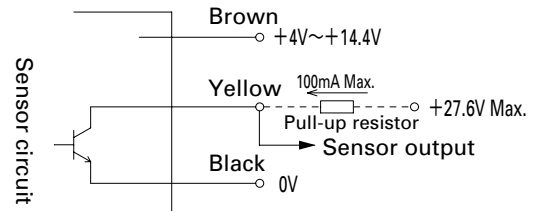
Air inlet side · Air outlet side



**Wiring diagram (For fan power supply)**

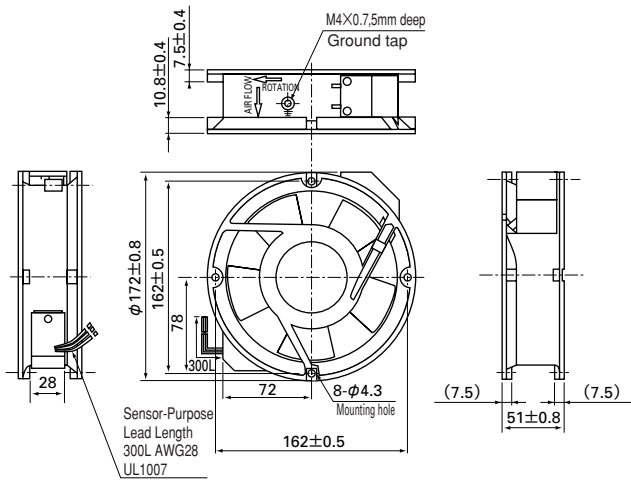


**Wiring diagram (Sensor Output Circuit)**



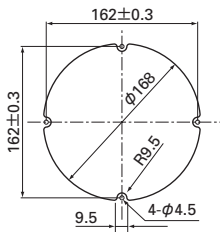


**Dimensions (unit : mm)**

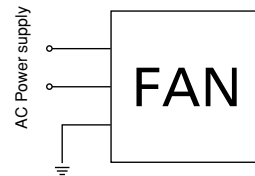


**Reference dimension of mounting holes and vent opening (unit : mm)**

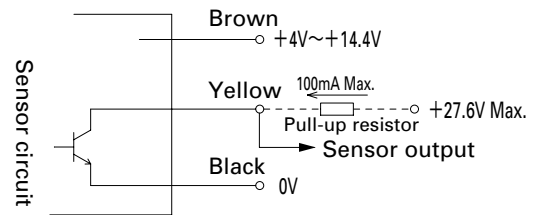
Air inlet side · Air outlet side



**Wiring diagram (For fan power supply)**



**Wiring diagram (Sensor Output Circuit)**

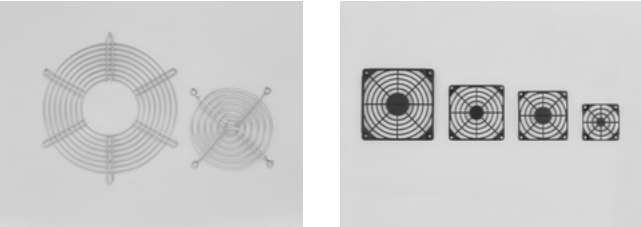




# COOLING SYSTEMS

## OPTIONS

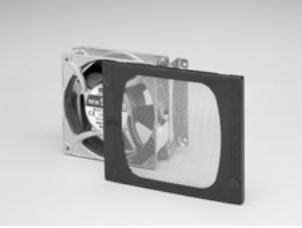
### Finger guards • Resin finger guard



### Filter kits • Resin filter kits



### Screen kits



### Plug cord



### Connector • Thermistor • Alarm IC

Options

Finger guards  
Resin finger guard

Filter kits  
Resin filter kits

Screen kits

Plug cord

Connector  
Thermistor  
Alarm IC

# Finger guards

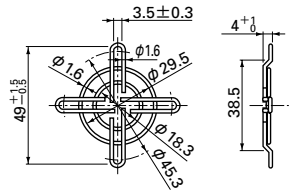
| Surface treatment     | color  |
|-----------------------|--------|
| Nickel-chrome plating | silver |
| Cation electroplating | black  |

|     |                         |
|-----|-------------------------|
| *   | Either outlet and inlet |
| **  | Outlet side             |
| *** | Inlet side              |

## Dimensions (unit : mm)

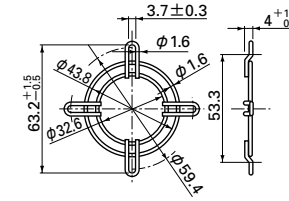
### ●40×40mm type\*

Model : 109-059 Surface treatment : Nickel-chrome plating



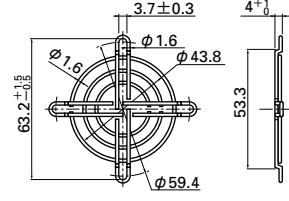
### ●52×52mm type\*\*

Model : 109-149 Surface treatment : Nickel-chrome plating



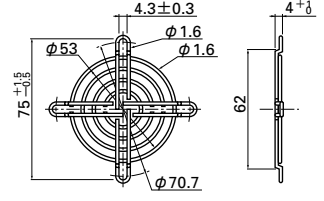
### ●52×52mm type\*

Model : 109-149E Surface treatment : Nickel-chrome plating



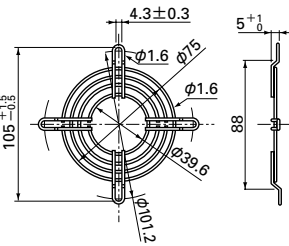
### ●60×60mm type\*

Model : 109-139E Surface treatment : Nickel-chrome plating  
Model : 19-139H Surface treatment : Cation electroplating



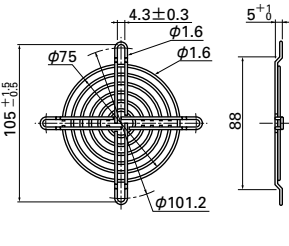
### ●80×80mm type\*\*

Model : 109-049C Surface treatment : Nickel-chrome plating



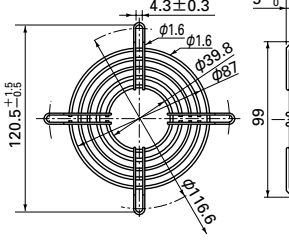
### ●80×80mm type\*

Model : 109-049E Surface treatment : Nickel-chrome plating  
Model : 109-049H Surface treatment : Cation electroplating



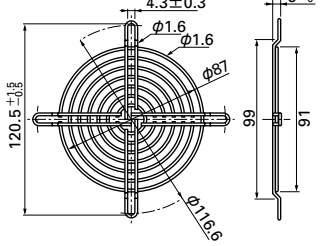
### ●92×92mm type\*\*

Model : 109-099C Surface treatment : Nickel-chrome plating



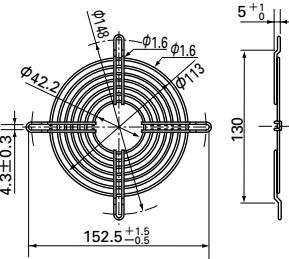
### ●92×92mm type\*

Model : 109-099E Surface treatment : Nickel-chrome plating  
Model : 109-099H Surface treatment : Cation electroplating



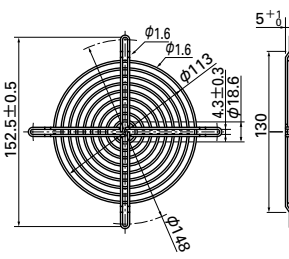
### ●120×120mm type\*\*

Model : 109-019C Surface treatment : Nickel-chrome plating  
Model : 109-019H Surface treatment : Cation electroplating



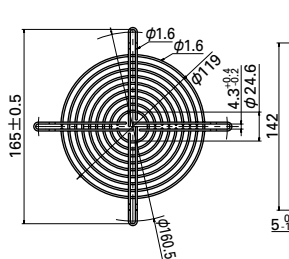
### ●120×120mm type\*

Model : 109-019E Surface treatment : Nickel-chrome plating  
Model : 109-019K Surface treatment : Cation electroplating



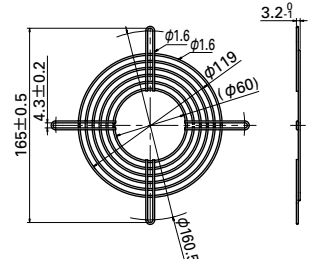
### ●127×127mm type\*

Model : 109-722 Surface treatment : Nickel-chrome plating



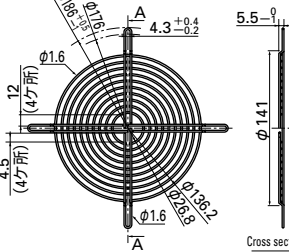
### ●127×127mm type\*\*

Model : 109-723 Surface treatment : Nickel-chrome plating



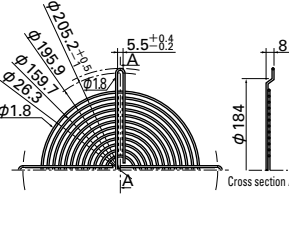
### ●140×140mm type\*

Model : 109-719 Surface treatment : Nickel-chrome plating  
Model : 109-719H Surface treatment : Cation electroplating



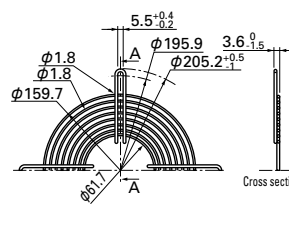
### ●160×160mm type\*

Model : 109-619E Surface treatment : Nickel-chrome plating



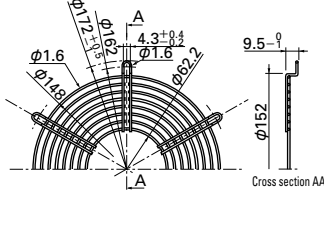
### ●160×160mm type\*\*

Model : 109-620 Surface treatment : Nickel-chrome plating



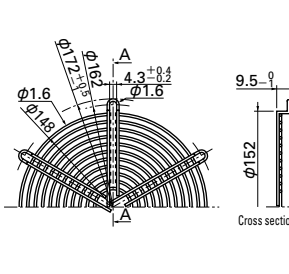
### ●φ172mm type\*\*

Model : 109-319 Surface treatment : Nickel-chrome plating



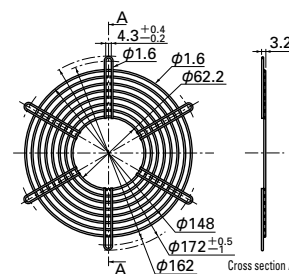
### ●φ172mm type\*

Model : 109-319E Surface treatment : Nickel-chrome plating  
Model : 109-319H Surface treatment : Cation electroplating



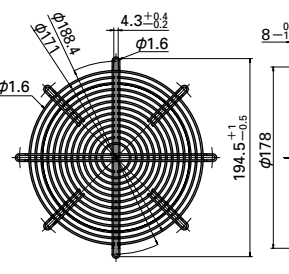
### ●φ172mm type\*\*

Model : 109-320 Surface treatment : Nickel-chrome plating



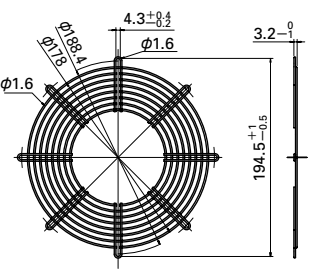
### ●φ200mm type\*

Model : 109-720 Surface treatment : Nickel-chrome plating  
Model : 109-720H Surface treatment : Cation electroplating



### ●φ200mm type\*\*

Model : 109-721 Surface treatment : Nickel-chrome plating  
Model : 109-721H Surface treatment : Cation electroplating



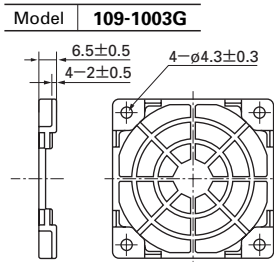
Options

Finger guards  
Resin finger guard

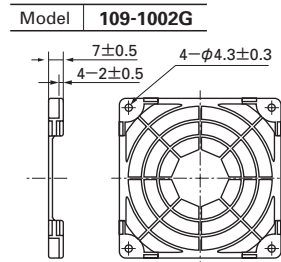
# Resin finger guards

Dimensions (unit : mm)

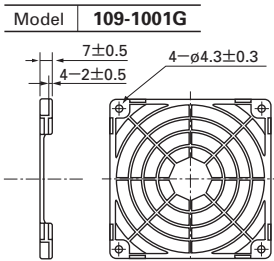
## 60mm type



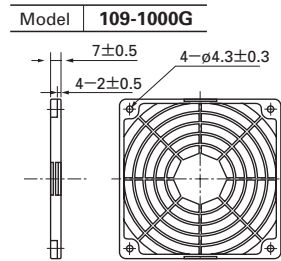
## 80mm type



## 92mm type



## 120mm type



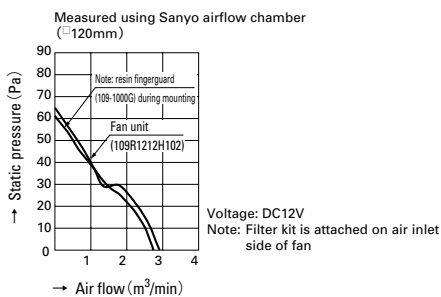
Material

Frame : (SPS+PS alloy) Resin  
UL File No.E48268 94V-0

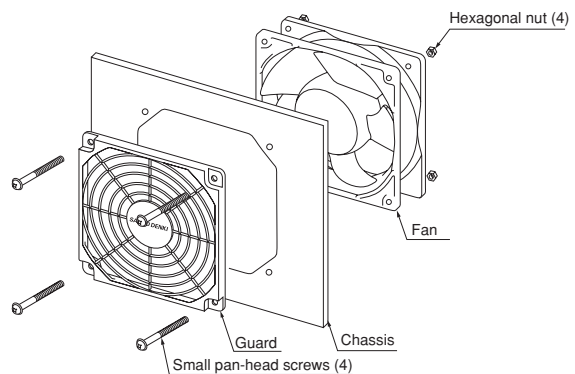
Options

Finger guards  
Resin finger guard

## Air Flow and Static Pressure Characteristics



## Mounting example



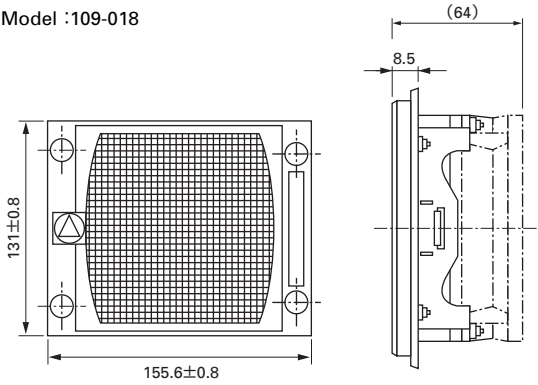
Plastic finger guards are placed on both the intake and exhaust sides of the fan.  
No nuts or screws for use in attachment included.

# Filter kits

Applicable models : AC Fan 120×120mm type

## Dimensions (unit : mm)

Model : 109-018



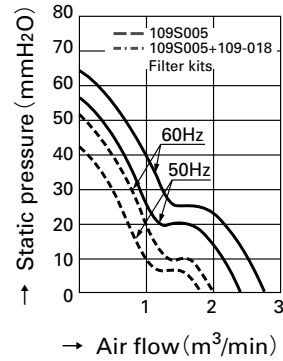
### Material

Steel Wire Mesh : Stainless 16-mesh nets in 3 layers

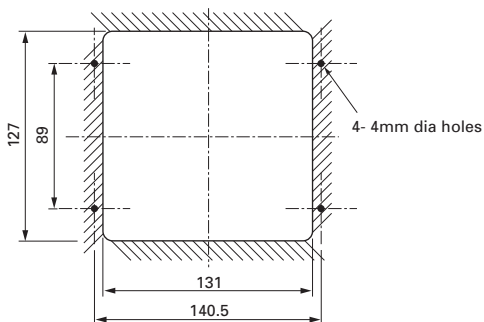
Cover : Resin

Metal fittings : Steel (chromate-plated)

## Air Flow and Static Pressure characteristics (by SANYO airflow chamber)

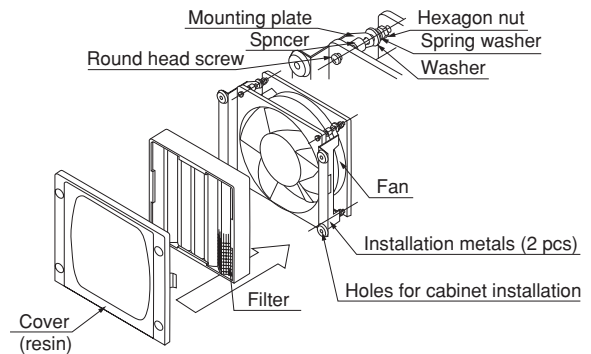


## Reference Dimensions Of Mounting Holes (in : mm)



Filter kits  
Resin filter kits

## Reference Diagram For Mounting



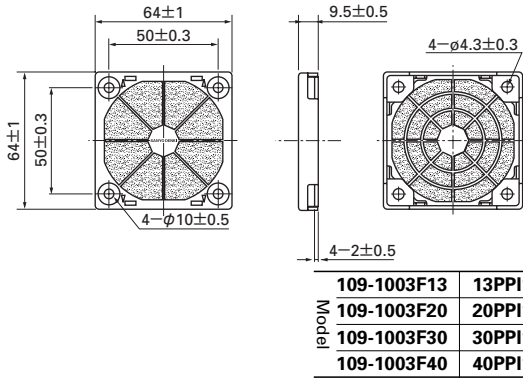
The parts shown in the installation diagram (nuts, washers, and screws) are included.

# Resin filter kits

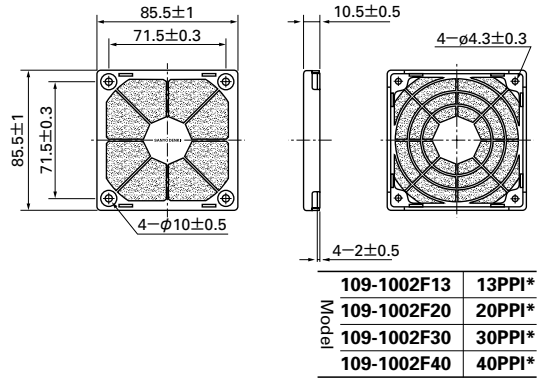
Applicable models : AC Fan, DC Fan

Dimensions (unit : mm)

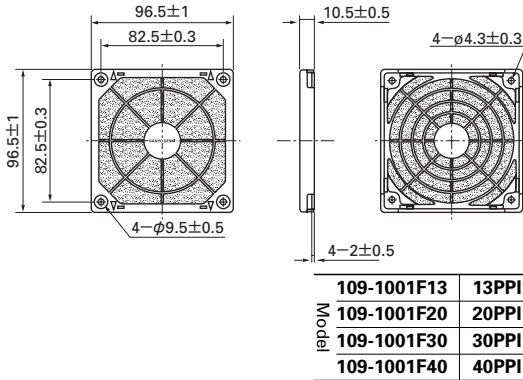
## 60mm type



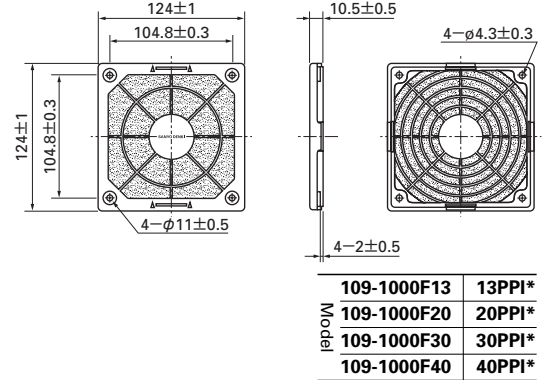
## 80mm type



## 92mm type



## 120mm type



### Material

Guard, cover : (SPS+PS alloy) Resin  
UL File No. E48268 94V-0  
Filter : Polyurethane foam  
UL File No. E74916(S) 94HF-1

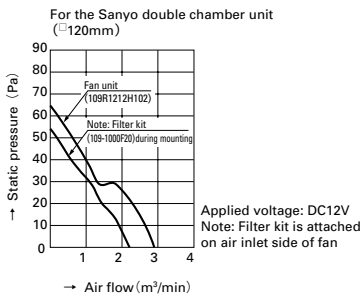
### PPI

Particles Per Inch : Indicates the number of holes per inch.  
Note that the higher the number, the finer the grain of the sponge.

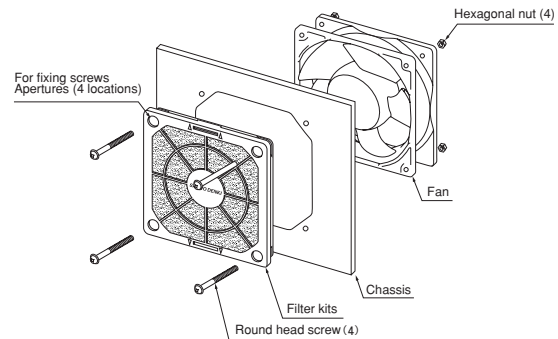
### Replacement filter (5 sheets each)

|       |             |       |        |             |       |
|-------|-------------|-------|--------|-------------|-------|
| □60mm | 109-1003M13 | 13PPI | □80mm  | 109-1002M13 | 13PPI |
|       | 109-1003M20 | 20PPI |        | 109-1002M20 | 20PPI |
|       | 109-1003M30 | 30PPI |        | 109-1002M30 | 30PPI |
|       | 109-1003M40 | 40PPI |        | 109-1002M40 | 40PPI |
| □92mm | 109-1001M13 | 13PPI | □120mm | 109-1000M13 | 13PPI |
|       | 109-1001M20 | 20PPI |        | 109-1000M20 | 20PPI |
|       | 109-1001M30 | 30PPI |        | 109-1000M30 | 30PPI |
|       | 109-1001M40 | 40PPI |        | 109-1000M40 | 40PPI |

## Performance comparison of air flow vs static pressure



## Reference Diagram For Mounting



Although the filter kit is composed of 3 components, including a guard, a filter and a cover, it is delivered as a finished product at delivery, saving assembly time when mounting. The filter and cover can be easily removed from the guard with one touch, removing the need for fan removal when undertaking maintenance, such as for cleaning or replacements. As cooling ability decreases with filter contamination due to clogging, regular replacements are recommended. No nuts or screws for use in attachment included.

Options

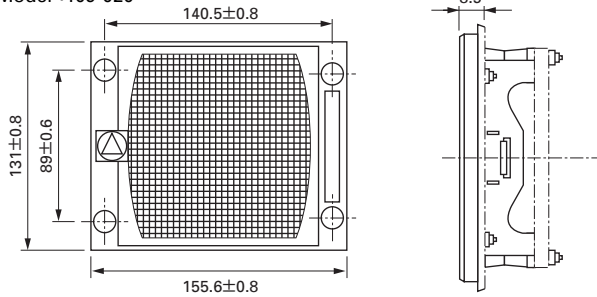
Filter kits  
Resin filter kits

# Screen kits

Applicable models : AC Fan 120×120mm type

## Dimensions (unit : mm)

Model : 109-020



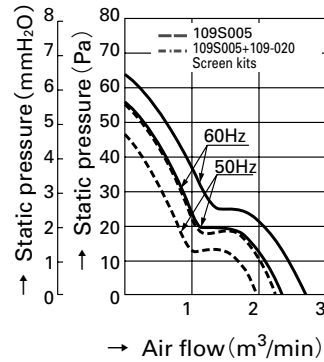
### Material

Steel Wire Mesh : Stainless 16-mesh nets in 3 layers

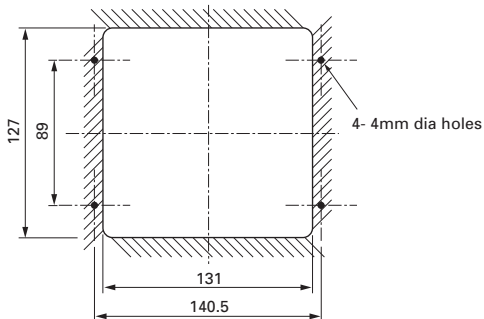
Cover : Resin

Metal fittings : Steel (chromate-plated)

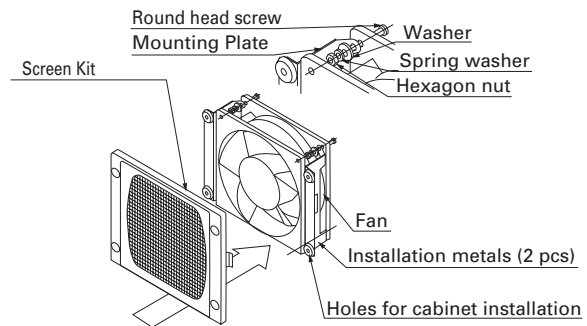
## Air Flow and Static Pressure characteristics (by SANYO airflow chamber)



## Reference Dimensions Of Mounting Holes (in : mm)



## Reference Diagram For Mounting



The parts shown in the installation diagram (nuts, washers, and screws) are included.

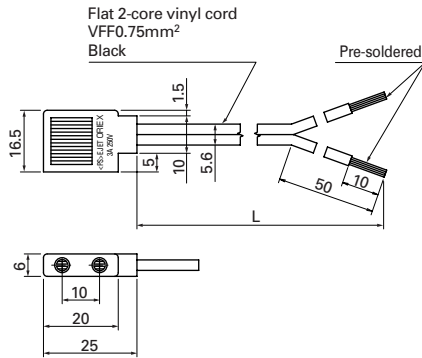


# AC Fan Plug cord

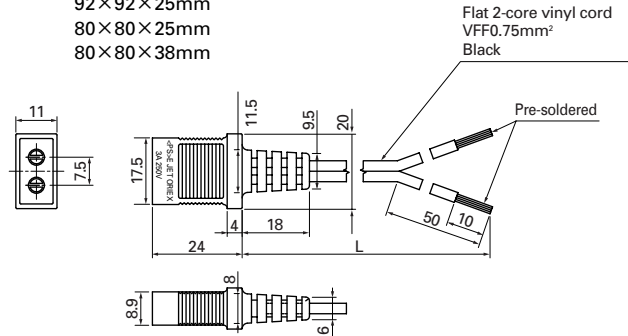
Dimensions (unit : mm)

## PRODUCTS COMPLIANT WITH ELECTRICAL APPLIANCE AND MATERIAL SAFETY LAW

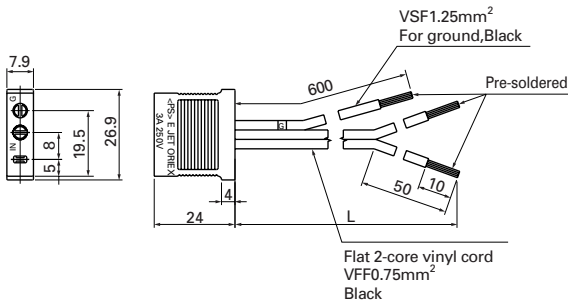
● Model No. : 489-008-L10/489-008-L21/489-008-L35  
For : 80×80×42mm



● Model No. : 489-016-L10/489-016-L21  
For : 120×120×25mm  
92×92×25mm  
80×80×25mm  
80×80×38mm



● Model No. : 489-006-L10/489-006-L21  
For : 120×120×38mm



Options

Plug cord

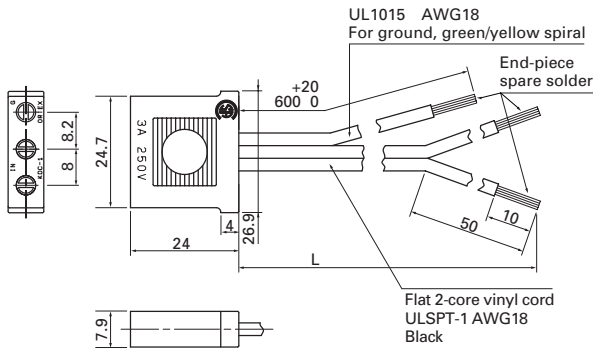
## POWER CORD LENGTH

| Model | Power cord length(mm) |
|-------|-----------------------|
| —L10  | 1000                  |
| —L21  | 2100                  |
| —L35  | 3500                  |

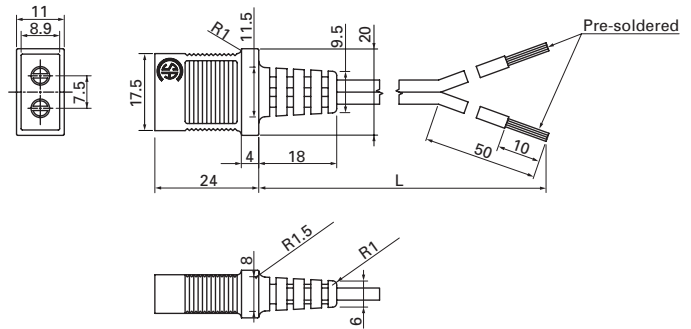
## Dimensions (unit : mm)

### UL/CSA CERTIFIED

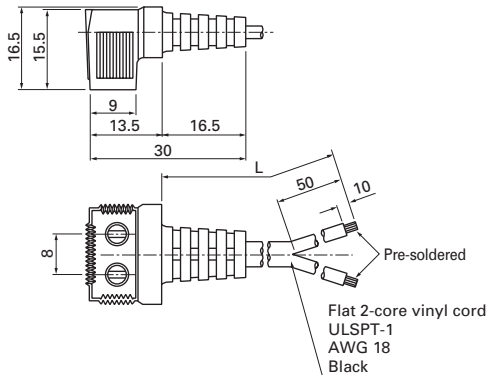
- **Model No. : 489-007-L10/489-007-L21**  
UL FILE No.E50197 CSA FILE No.LR67048  
For : 120×120×38mm



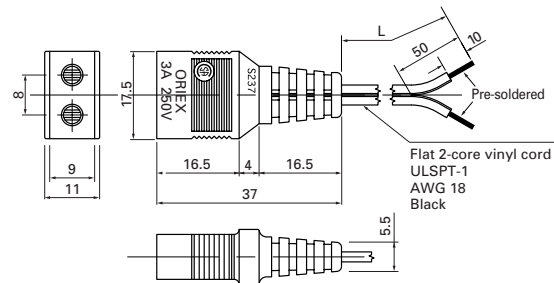
- **Model No. : 489-047-L10/489-047-L21**  
UL FILE No.E50197 CSA FILE No.LR67048  
For : 120×120×25mm  
92×92×25mm  
80×80×25mm  
80×80×38mm



- **Model No. : 489-084-L10/489-084-L21**  
UL FILE No.E50197 CSA FILE No.LR67048  
L-shaped  
For :  $\phi$  172mm×51mm  
160×160×51mm



- **Model No. : 489-086-L10/489-086-L21**  
UL FILE No.E50197 CSA FILE No.LR67048  
straight  
For :  $\phi$  172mm×51mm  
160×160×51mm



## POWER CORD LENGTH

| Model | Power cord length(mm) |
|-------|-----------------------|
| —L10  | 1000                  |
| —L21  | 2100                  |
| —L35  | 3500                  |

# Recommended connectors for DC fans

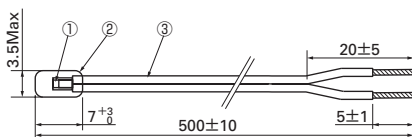
| Brand                               | Housing model number | Contact model number       |
|-------------------------------------|----------------------|----------------------------|
| Hirose                              | DF3AA- * EP-2C       | DF3-EP2428PCF              |
|                                     | DF1B- * ES-2.5RC     | DF1B-2428SCF               |
| Tyco Electronics AMP.               | 179228- *            | 179227-1                   |
|                                     | 171822- *            | 170262-1                   |
| Japan Solderless Terminals          | PHR- *               | SPH-002T-P0.5S             |
|                                     | XHP- *               | SXH-001T-P0.6              |
|                                     | SMR-0 * V-N          | SYM-001T-0.6               |
|                                     | EHR- *               | SEH-001T-P0.6              |
|                                     | H * P-SHF-AA         | SHF-001T-0.8BS             |
| Molex Inc. (Japan)                  | 5051- *              | 5159T                      |
|                                     | 5264- *              | 5263PBT                    |
|                                     | 51030-0 * 30         | 50084-8014                 |
|                                     | 51065-0 * 00         | 50212-8000                 |
|                                     | 5557-0 * R           | 5556 *                     |
|                                     | 5559-0 * P           | 5558 *                     |
| Japan Aviation Electronics Industry | IL-S- * S-S2C2-S     | IL-S-C2-S-10000            |
|                                     | IL-G- * S-S3C2-SA    | IL-G-C2-SC-10000,          |
|                                     | IL- * S-S3L- (N)     | IL-C2-1-10000, IL-C2-10000 |

Note 1 : ( \* ) indicates number of poles (ex : -2 or -02 for two poles, -3 or -03 for three poles).

Note 2 : The specifications in this table are for reference purposes only. When selecting, please check catalogs of each brand.

# Thermistor

Model : 169-002



Connector  
Thermistor  
Alarm IC

| Number | Name           | Standards, materials, etc.     |
|--------|----------------|--------------------------------|
| ①      | Thermistor     | Chip                           |
| ②      | Insulated cord | Epoxy resin                    |
| ③      | Lead           | UL2555 CSA TR-64 AWG#28 (blue) |

| Item |                             | Spec                             |
|------|-----------------------------|----------------------------------|
| 2-1  | Resistance                  | R25 6.8 KΩ±3%                    |
| 2-2  | B constant                  | 25 / 50 3950 K±2%                |
| 2-3  | Maximum rated power         | 188mW (25°C under still air)     |
| 2-4  | Insulation resistance       | 100MΩ or more (500 VDC megger)   |
| 2-5  | Dielectric strength         | No problem (1,500 VAC, 1 minute) |
| 2-6  | Operating temperature range | -30°C ~ +80°C                    |
| 2-7  | Storage temperature range   | -40°C ~ +100°C                   |

This thermistor part number is 159-682-86003  
(manufactured by Hokuriku Electric Industry).  
For details, contact Tokyo Office at 03-3722-1341.

# IC L8730 for DC fan alarm

## Characteristics

### Startup delay

L8730 doesn't output signal until fan normally runs after start-up

### Input type

Single input: L8730 can input digital signal of  $V_{ov}$  and GND

### Supply voltage range

$+5V \pm 0.5V$

### Output current

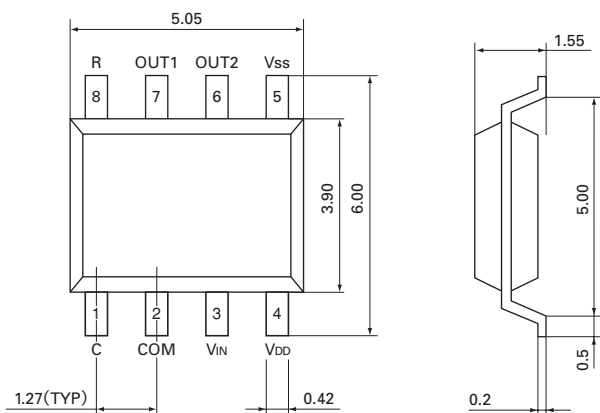
10mA max.(sink/Open drain output)

The output with latch is also available

### Noise margin

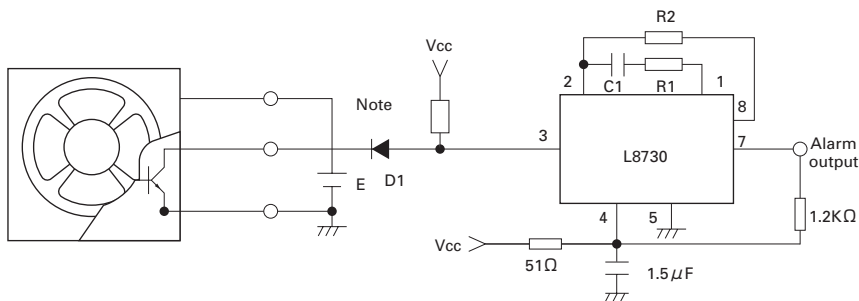
Malfunction-protective circuit in embedded

## Dimensions



## Application

Use it for your receiving circuit of a our DC fan (with a pulse sensor).



E: Power supply for fan drive circuit  
 $V_{cc} : 5V \pm 0.5V$   
 At normal speed [H]:  $V_{cc}$   
 At abnormal speed [L]: 0.5V max

Note: Insert a D1 in case of  $E > V_{cc}$ .

| Trip speed<br>$\text{min}^{-1}$ | C1<br>PF | R1<br>K $\Omega$ | R2<br>K $\Omega$ | Startup delay |
|---------------------------------|----------|------------------|------------------|---------------|
| 850                             | 1,100    | 22               | 68               | 19.5sec       |
| 1,700                           | 560      | 22               | 68               | 10sec         |
| 2,700                           | 330      | 22               | 68               | 6sec          |

Options

Connector  
 Thermistor  
 Alarm IC



# **Model No. index**

## DC Fans

| Model No.          | Size    | Thick | Page |
|--------------------|---------|-------|------|
| 109P0405H902       | 40×40mm | 10    | 36   |
| 109P0405M902       | 40×40mm | 10    | 36   |
| 109P0412H902       | 40×40mm | 10    | 36   |
| 109P0412M902       | 40×40mm | 10    | 36   |
| 109P0405H702       | 40×40mm | 15    | 36   |
| 109P0405M702       | 40×40mm | 15    | 36   |
| 109P0412H702       | 40×40mm | 15    | 36   |
| 109P0412M702       | 40×40mm | 15    | 36   |
| 109P0412S702       | 40×40mm | 15    | 36   |
| 109P0424H702       | 40×40mm | 15    | 36   |
| 109P0405F602       | 40×40mm | 20    | 38   |
| 109P0405H602       | 40×40mm | 20    | 38   |
| 109P0405M602       | 40×40mm | 20    | 38   |
| 109P0412F602       | 40×40mm | 20    | 38   |
| 109P0412G602       | 40×40mm | 20    | 38   |
| 109P0412H602       | 40×40mm | 20    | 38   |
| 109P0412M602       | 40×40mm | 20    | 38   |
| 109P0424F602       | 40×40mm | 20    | 38   |
| 109P0424H602       | 40×40mm | 20    | 38   |
| 109P0405F302       | 40×40mm | 28    | 39   |
| 109P0405F3023      | 40×40mm | 28    | 42   |
| 109P0405H302       | 40×40mm | 28    | 39   |
| 109P0405H3023      | 40×40mm | 28    | 42   |
| 109P0412B302       | 40×40mm | 28    | 39   |
| 109P0412B3023      | 40×40mm | 28    | 42   |
| 109P0412F302       | 40×40mm | 28    | 39   |
| 109P0412F3023      | 40×40mm | 28    | 42   |
| 109P0412G302       | 40×40mm | 28    | 39   |
| 109P0412G3023      | 40×40mm | 28    | 42   |
| 109P0412H302       | 40×40mm | 28    | 39   |
| 109P0412H3023      | 40×40mm | 28    | 42   |
| 109P0412J3023      | 40×40mm | 28    | 42   |
| 109P0412K3023      | 40×40mm | 28    | 42   |
| 109P0412M302       | 40×40mm | 28    | 39   |
| 109P0412M3023      | 40×40mm | 28    | 42   |
| 109P0424B302       | 40×40mm | 28    | 39   |
| 109P0424B3023      | 40×40mm | 28    | 42   |
| 109P0424F302       | 40×40mm | 28    | 39   |
| 109P0424F3023      | 40×40mm | 28    | 42   |
| 109P0424G302       | 40×40mm | 28    | 39   |
| 109P0424G3023      | 40×40mm | 28    | 42   |
| 109P0424H302       | 40×40mm | 28    | 39   |
| 109P0424H3023      | 40×40mm | 28    | 42   |
| 109P0424J3023      | 40×40mm | 28    | 42   |
| 9GV0412G302(3021)  | 40×40mm | 28    | 40   |
| 9GV0412J302(3021)  | 40×40mm | 28    | 40   |
| 9CR0412H502        | 40×40mm | 56    | 46   |
| 9CR0412S502        | 40×40mm | 56    | 46   |
| 9CRA0412G502       | 40×40mm | 56    | 44   |
| 9CRA0412J502       | 40×40mm | 56    | 44   |
| 109P0505M702       | 52×52mm | 15    | 48   |
| 109P0512A702       | 52×52mm | 15    | 48   |
| 109P0512H702       | 52×52mm | 15    | 48   |
| 109P0512M702       | 52×52mm | 15    | 48   |
| 109P0524H702       | 52×52mm | 15    | 48   |
| 109P0524M702       | 52×52mm | 15    | 48   |
| 109P0605H702       | 60×60mm | 15    | 50   |
| 109P0605M702       | 60×60mm | 15    | 50   |
| 109P0612H702       | 60×60mm | 15    | 50   |
| 109P0612M702       | 60×60mm | 15    | 50   |
| 109P0612S702       | 60×60mm | 15    | 50   |
| 109P0624H702       | 60×60mm | 15    | 50   |
| 109P0624M702       | 60×60mm | 15    | 50   |
| 109P0612H602       | 60×60mm | 20    | 50   |
| 109P0612M602       | 60×60mm | 20    | 50   |
| 109P0612V602       | 60×60mm | 20    | 50   |
| 109P0624H602       | 60×60mm | 20    | 50   |
| 109P0624M602       | 60×60mm | 20    | 50   |
| 109P0624V602       | 60×60mm | 20    | 50   |
| 109P0648H602       | 60×60mm | 20    | 50   |
| 109R0605F402(4021) | 60×60mm | 25    | 51   |
| 109R0605H402(4021) | 60×60mm | 25    | 51   |
| 109R0605M402(4021) | 60×60mm | 25    | 51   |

## DC Fans

| Model No.          | Size    | Thick | Page |
|--------------------|---------|-------|------|
| 109R0612D402(4021) | 60×60mm | 25    | 51   |
| 109R0612F402(4021) | 60×60mm | 25    | 51   |
| 109R0612G402(4021) | 60×60mm | 25    | 51   |
| 109R0612H402(4021) | 60×60mm | 25    | 51   |
| 109R0612J402(4021) | 60×60mm | 25    | 51   |
| 109R0612M402(4021) | 60×60mm | 25    | 51   |
| 109R0612S402(4021) | 60×60mm | 25    | 51   |
| 109R0624D402(4021) | 60×60mm | 25    | 51   |
| 109R0624F402(4021) | 60×60mm | 25    | 51   |
| 109R0624G402(4021) | 60×60mm | 25    | 51   |
| 109R0624H402(4021) | 60×60mm | 25    | 51   |
| 109R0624J402(4021) | 60×60mm | 25    | 51   |
| 109R0624M402(4021) | 60×60mm | 25    | 51   |
| 109R0624S402(4021) | 60×60mm | 25    | 51   |
| 109R0648G402(4021) | 60×60mm | 25    | 51   |
| 109R0648H402(4021) | 60×60mm | 25    | 51   |
| 109R0648J402(4021) | 60×60mm | 25    | 51   |
| 9A0612F402(4021)   | 60×60mm | 25    | 90   |
| 9A0612G402(4021)   | 60×60mm | 25    | 90   |
| 9A0612H402(4021)   | 60×60mm | 25    | 90   |
| 9A0612M402(4021)   | 60×60mm | 25    | 90   |
| 9A0612S402(4021)   | 60×60mm | 25    | 90   |
| 9A0624F402(4021)   | 60×60mm | 25    | 90   |
| 9A0624G402(4021)   | 60×60mm | 25    | 90   |
| 9A0624H402(4021)   | 60×60mm | 25    | 90   |
| 9A0624M402(4021)   | 60×60mm | 25    | 90   |
| 9A0624S402(4021)   | 60×60mm | 25    | 90   |
| 9G0612G102(1021)   | 60×60mm | 38    | 52   |
| 9G0612S102(1021)   | 60×60mm | 38    | 52   |
| 9G0624G102(1021)   | 60×60mm | 38    | 52   |
| 9G0624S102(1021)   | 60×60mm | 38    | 52   |
| 9G0648G102(1021)   | 60×60mm | 38    | 52   |
| 9G0648S102(1021)   | 60×60mm | 38    | 52   |
| 109P0812H702       | 80×80mm | 15    | 54   |
| 109P0812M702       | 80×80mm | 15    | 54   |
| 109P0824H702       | 80×80mm | 15    | 54   |
| 109P0824M702       | 80×80mm | 15    | 54   |
| 109P0812H602       | 80×80mm | 20    | 54   |
| 109P0812M602       | 80×80mm | 20    | 54   |
| 109P0824H602       | 80×80mm | 20    | 54   |
| 109P0824M602       | 80×80mm | 20    | 54   |
| 109R0805F402(4021) | 80×80mm | 25    | 54   |
| 109R0805M402(4021) | 80×80mm | 25    | 54   |
| 109R0812F402(4021) | 80×80mm | 25    | 54   |
| 109R0812G402(4021) | 80×80mm | 25    | 54   |
| 109R0812H402(4021) | 80×80mm | 25    | 54   |
| 109R0812L402(4021) | 80×80mm | 25    | 54   |
| 109R0812M402(4021) | 80×80mm | 25    | 54   |
| 109R0812S402(4021) | 80×80mm | 25    | 54   |
| 109R0824F402(4021) | 80×80mm | 25    | 54   |
| 109R0824G402(4021) | 80×80mm | 25    | 54   |
| 109R0824H402(4021) | 80×80mm | 25    | 54   |
| 109R0824L402(4021) | 80×80mm | 25    | 54   |
| 109R0824M402(4021) | 80×80mm | 25    | 54   |
| 109R0824S402(4021) | 80×80mm | 25    | 54   |
| 109R0848K402(4021) | 80×80mm | 25    | 54   |
| 109R0848S402(4021) | 80×80mm | 25    | 54   |
| 9A0812F402(4021)   | 80×80mm | 25    | 92   |
| 9A0812G402(4021)   | 80×80mm | 25    | 92   |
| 9A0812H402(4021)   | 80×80mm | 25    | 92   |
| 9A0812L402(4021)   | 80×80mm | 25    | 92   |
| 9A0812M402(4021)   | 80×80mm | 25    | 92   |
| 9A0812S402(4021)   | 80×80mm | 25    | 92   |
| 9A0824F402(4021)   | 80×80mm | 25    | 92   |
| 9A0824G402(4021)   | 80×80mm | 25    | 92   |
| 9A0824H402(4021)   | 80×80mm | 25    | 92   |
| 9A0824L402(4021)   | 80×80mm | 25    | 92   |
| 9A0824M402(4021)   | 80×80mm | 25    | 92   |
| 9A0824S402(4021)   | 80×80mm | 25    | 92   |
| 109P0812A202(2021) | 80×80mm | 32    | 55   |
| 109P0812H202(2021) | 80×80mm | 32    | 55   |
| 109P0812M202(2021) | 80×80mm | 32    | 55   |
| 109P0824A202(2021) | 80×80mm | 32    | 55   |

## DC Fans

| Model No.          | Size      | Thick | Page |
|--------------------|-----------|-------|------|
| 109P0824H202(2021) | 80×80mm   | 32    | 55   |
| 109P0824M202(2021) | 80×80mm   | 32    | 55   |
| 109P0848H202(2021) | 80×80mm   | 32    | 55   |
| 9G0812G102(1021)   | 80×80mm   | 38    | 56   |
| 9G0812H102(1021)   | 80×80mm   | 38    | 56   |
| 9G0824G102(1021)   | 80×80mm   | 38    | 56   |
| 9G0824H102(1021)   | 80×80mm   | 38    | 56   |
| 9G0848G102(1021)   | 80×80mm   | 38    | 56   |
| 9G0848H102(1021)   | 80×80mm   | 38    | 56   |
| 109P0912F402(4021) | 92×92mm   | 25    | 58   |
| 109P0912H402(4021) | 92×92mm   | 25    | 58   |
| 109P0912L402(4021) | 92×92mm   | 25    | 58   |
| 109P0912M402(4021) | 92×92mm   | 25    | 58   |
| 109P0912W402(4021) | 92×92mm   | 25    | 58   |
| 109P0924F402(4021) | 92×92mm   | 25    | 58   |
| 109P0924H402(4021) | 92×92mm   | 25    | 58   |
| 109P0924L402(4021) | 92×92mm   | 25    | 58   |
| 109P0924M402(4021) | 92×92mm   | 25    | 58   |
| 109P0924W402(4021) | 92×92mm   | 25    | 58   |
| 109P0948H402(4021) | 92×92mm   | 25    | 58   |
| 9A0912F402(4021)   | 92×92mm   | 25    | 94   |
| 9A0912G402(4021)   | 92×92mm   | 25    | 94   |
| 9A0912H402(4021)   | 92×92mm   | 25    | 94   |
| 9A0912L402(4021)   | 92×92mm   | 25    | 94   |
| 9A0912M402(4021)   | 92×92mm   | 25    | 94   |
| 9A0912S402(4021)   | 92×92mm   | 25    | 94   |
| 9A0924F402(4021)   | 92×92mm   | 25    | 94   |
| 9A0924G402(4021)   | 92×92mm   | 25    | 94   |
| 9A0924H402(4021)   | 92×92mm   | 25    | 94   |
| 9A0924L402(4021)   | 92×92mm   | 25    | 94   |
| 9A0924M402(4021)   | 92×92mm   | 25    | 94   |
| 9A0924S402(4021)   | 92×92mm   | 25    | 94   |
| 9G0912A202(2021)   | 92×92mm   | 32    | 59   |
| 9G0912H202(2021)   | 92×92mm   | 32    | 59   |
| 9G0912M202(2021)   | 92×92mm   | 32    | 59   |
| 9G0912S202(2021)   | 92×92mm   | 32    | 59   |
| 9G0924A202(2021)   | 92×92mm   | 32    | 59   |
| 9G0924H202(2021)   | 92×92mm   | 32    | 59   |
| 9G0924M202(2021)   | 92×92mm   | 32    | 59   |
| 9G0924S202(2021)   | 92×92mm   | 32    | 59   |
| 9G0948A202(2021)   | 92×92mm   | 32    | 59   |
| 9G0948H202(2021)   | 92×92mm   | 32    | 59   |
| 9G0948M202(2021)   | 92×92mm   | 32    | 59   |
| 9G0948S202(2021)   | 92×92mm   | 32    | 59   |
| 9G0912G102(1021)   | 92×92mm   | 38    | 60   |
| 9G0912H102(1021)   | 92×92mm   | 38    | 60   |
| 9G0924G102(1021)   | 92×92mm   | 38    | 60   |
| 9G0924H102(1021)   | 92×92mm   | 38    | 60   |
| 9G0948G102(1021)   | 92×92mm   | 38    | 60   |
| 9G0948H102(1021)   | 92×92mm   | 38    | 60   |
| 109P1205M402(4021) | 120×120mm | 25    | 62   |
| 109P1212F402(4021) | 120×120mm | 25    | 62   |
| 109P1212H402(4021) | 120×120mm | 25    | 62   |
| 109P1212M402(4021) | 120×120mm | 25    | 62   |
| 109P1224F402(4021) | 120×120mm | 25    | 62   |
| 109P1224H402(4021) | 120×120mm | 25    | 62   |
| 109P1224M402(4021) | 120×120mm | 25    | 62   |
| 9G1212A402(4021)   | 120×120mm | 25    | 64   |
| 9G1212E402(4021)   | 120×120mm | 25    | 64   |
| 9G1212F402(4021)   | 120×120mm | 25    | 64   |
| 9G1212G402(4021)   | 120×120mm | 25    | 64   |
| 9G1212H402(4021)   | 120×120mm | 25    | 64   |
| 9G1212M402(4021)   | 120×120mm | 25    | 64   |
| 9G1224A402(4021)   | 120×120mm | 25    | 64   |
| 9G1224E402(4021)   | 120×120mm | 25    | 64   |
| 9G1224F402(4021)   | 120×120mm | 25    | 64   |
| 9G1224G402(4021)   | 120×120mm | 25    | 64   |
| 9G1224H402(4021)   | 120×120mm | 25    | 64   |
| 9G1224M402(4021)   | 120×120mm | 25    | 64   |
| 9G1248A402(4021)   | 120×120mm | 25    | 64   |
| 9G1248E402(4021)   | 120×120mm | 25    | 64   |
| 9G1248F402(4021)   | 120×120mm | 25    | 64   |
| 9G1248G402(4021)   | 120×120mm | 25    | 64   |

## DC Fans

| Model No.           | Size      | Thick | Page |
|---------------------|-----------|-------|------|
| 9G1248H402(4021)    | 120×120mm | 25    | 64   |
| 9G1248M402(4021)    | 120×120mm | 25    | 64   |
| 109R1212F102(1021)  | 120×120mm | 38    | 62   |
| 109R1212H102(1021)  | 120×120mm | 38    | 62   |
| 109R1212M102(1021)  | 120×120mm | 38    | 62   |
| 109R1212MH102(1021) | 120×120mm | 38    | 62   |
| 109R1224H102(1021)  | 120×120mm | 38    | 62   |
| 109R1224M102(1021)  | 120×120mm | 38    | 62   |
| 109R1224MH102(1021) | 120×120mm | 38    | 62   |
| 109R1248H102(1021)  | 120×120mm | 38    | 62   |
| 109R1248M102(1021)  | 120×120mm | 38    | 62   |
| 9G1212E102(1021)    | 120×120mm | 38    | 66   |
| 9G1212F102(1021)    | 120×120mm | 38    | 66   |
| 9G1212G102(1021)    | 120×120mm | 38    | 66   |
| 9G1212H102(1021)    | 120×120mm | 38    | 66   |
| 9G1212M102(1021)    | 120×120mm | 38    | 66   |
| 9G1224E102(1021)    | 120×120mm | 38    | 66   |
| 9G1224F102(1021)    | 120×120mm | 38    | 66   |
| 9G1224G102(1021)    | 120×120mm | 38    | 66   |
| 9G1224H102(1021)    | 120×120mm | 38    | 66   |
| 9G1224M102(1021)    | 120×120mm | 38    | 66   |
| 9G1248E102(1021)    | 120×120mm | 38    | 66   |
| 9G1248F102(1021)    | 120×120mm | 38    | 66   |
| 9G1248G102(1021)    | 120×120mm | 38    | 66   |
| 9G1248H102(1021)    | 120×120mm | 38    | 66   |
| 9G1248M102(1021)    | 120×120mm | 38    | 66   |
| 9SG1212G102         | 120×120mm | 38    | 68   |
| 9SG1224G102         | 120×120mm | 38    | 68   |
| 9SG1248G102         | 120×120mm | 38    | 68   |
| 109E1312A102        | 127×127mm | 38    | 72   |
| 109E1312S102        | 127×127mm | 38    | 72   |
| 109E1324A102        | 127×127mm | 38    | 72   |
| 109E1324G102        | 127×127mm | 38    | 72   |
| 109E1324S102        | 127×127mm | 38    | 72   |
| 109E1348A102        | 127×127mm | 38    | 72   |
| 109E1348G102        | 127×127mm | 38    | 72   |
| 109E1348S102        | 127×127mm | 38    | 72   |
| 109P1312H102(1021)  | 127×127mm | 38    | 70   |
| 109P1312S102(1021)  | 127×127mm | 38    | 70   |
| 109P1324H102(1021)  | 127×127mm | 38    | 70   |
| 109P1324S102(1021)  | 127×127mm | 38    | 70   |
| 109P1348H102(1021)  | 127×127mm | 38    | 70   |
| 109P1348S102(1021)  | 127×127mm | 38    | 70   |
| 109P1412H102        | 140×140mm | 38    | 74   |
| 109P1412M102        | 140×140mm | 38    | 74   |
| 109P1424H102        | 140×140mm | 38    | 74   |
| 109P1424M102        | 140×140mm | 38    | 74   |
| 109P1448H102        | 140×140mm | 38    | 74   |
| 109P1448M102        | 140×140mm | 38    | 74   |
| 9GV1512H502(5021)   | 150×150mm | 50    | 76   |
| 9GV1512M502(5021)   | 150×150mm | 50    | 76   |
| 109E4712L402        | φ172      | 25    | 78   |
| 109E4712M402        | φ172      | 25    | 78   |
| 109E4724F402        | φ172      | 25    | 78   |
| 109E4724H402        | φ172      | 25    | 78   |
| 109E4724L402        | φ172      | 25    | 78   |
| 109E4724M402        | φ172      | 25    | 78   |
| 109E4748F402        | φ172      | 25    | 78   |
| 109E4748H402        | φ172      | 25    | 78   |
| 109E4748L402        | φ172      | 25    | 78   |
| 109E4748M402        | φ172      | 25    | 78   |
| 109E4748S402        | φ172      | 25    | 78   |
| 109E1712H502        | φ172      | 51    | 84   |
| 109E1712K502        | φ172      | 51    | 84   |
| 109E1712M502        | φ172      | 51    | 84   |
| 109E1724C502        | φ172      | 51    | 84   |
| 109E1724H502        | φ172      | 51    | 84   |
| 109E1724K502        | φ172      | 51    | 84   |
| 109E1724M502        | φ172      | 51    | 84   |
| 109E1748C502        | φ172      | 51    | 84   |
| 109E1748H502        | φ172      | 51    | 84   |
| 109E1748K502        | φ172      | 51    | 84   |
| 109E1748M502        | φ172      | 51    | 84   |

## DC Fans

| Model No.     | Size  | Thick | Page |
|---------------|-------|-------|------|
| 109E5712H502  | φ 172 | 51    | 82   |
| 109E5712K502  | φ 172 | 51    | 82   |
| 109E5712M502  | φ 172 | 51    | 82   |
| 109E5724C502  | φ 172 | 51    | 82   |
| 109E5724H502  | φ 172 | 51    | 82   |
| 109E5724K502  | φ 172 | 51    | 82   |
| 109E5724M502  | φ 172 | 51    | 82   |
| 109E5748C502  | φ 172 | 51    | 82   |
| 109E5748H502  | φ 172 | 51    | 82   |
| 109E5748K502  | φ 172 | 51    | 82   |
| 109E5748M502  | φ 172 | 51    | 82   |
| 9GV5724H502   | φ 172 | 51    | 80   |
| 9GV5748H502   | φ 172 | 51    | 80   |
| 109E2024AS002 | φ 200 | 70    | 86   |
| 109E2024H002  | φ 200 | 70    | 86   |
| 109E2024MH002 | φ 200 | 70    | 86   |
| 109E2024S002  | φ 200 | 70    | 86   |
| 9EC2024H002   | φ 200 | 70    | 88   |
| 9EC2048A002   | φ 200 | 70    | 88   |
| 9EC2048H002   | φ 200 | 70    | 88   |

The numbers in ( ) represent ribless models

## Thermal Speed Controlled Fans

| Model No.           | Size      | Thick | Page |
|---------------------|-----------|-------|------|
| 109P0512T7H12       | 52×52mm   | 15    | 100  |
| 109P0512T7H122      | 52×52mm   | 15    | 101  |
| 109P0612T7H12       | 60×60mm   | 15    | 102  |
| 109P0612T7H122      | 60×60mm   | 15    | 103  |
| 109P0612T6H12       | 60×60mm   | 20    | 102  |
| 109P0612T6H122      | 60×60mm   | 20    | 103  |
| 109R0612T4H12(121)  | 60×60mm   | 25    | 102  |
| 109R0612T4H122(123) | 60×60mm   | 25    | 103  |
| 109P0812T6H12       | 80×80mm   | 20    | 104  |
| 109P0812T6H122      | 80×80mm   | 20    | 105  |
| 109R0812T4H12(121)  | 80×80mm   | 25    | 104  |
| 109R0812T4H122(123) | 80×80mm   | 25    | 105  |
| 109P0912T4H12(121)  | 92×92mm   | 25    | 106  |
| 109P0912T4H122(123) | 92×92mm   | 25    | 107  |
| 109P1212T4H12(121)  | 120×120mm | 25    | 108  |
| 109P1212T4H122(123) | 120×120mm | 25    | 109  |
| 109R1212T1H12(121)  | 120×120mm | 38    | 108  |
| 109R1212T1H122(123) | 120×120mm | 38    | 109  |

The numbers in ( ) represent ribless models

## Splash Proof Fans

| Model No.         | Size    | Thick | Page |
|-------------------|---------|-------|------|
| 9WP0612H402(4021) | 60×60mm | 25    | 114  |
| 9WP0624H402(4021) | 60×60mm | 25    | 114  |
| 9WP0648H402(4021) | 60×60mm | 25    | 114  |
| 109W0812F402-U    | 80×80mm | 25    | 116  |
| 109W0812H402-U    | 80×80mm | 25    | 116  |
| 109W0812L402-U    | 80×80mm | 25    | 116  |
| 109W0812M402-U    | 80×80mm | 25    | 116  |
| 109W0824F402-U    | 80×80mm | 25    | 116  |
| 109W0824H402-U    | 80×80mm | 25    | 116  |
| 109W0824L402-U    | 80×80mm | 25    | 116  |
| 109W0824M402-U    | 80×80mm | 25    | 116  |
| 109W0848H402-U    | 80×80mm | 25    | 116  |
| 9WS0812F402(4021) | 80×80mm | 25    | 120  |
| 9WS0812H402(4021) | 80×80mm | 25    | 120  |
| 9WS0812M402(4021) | 80×80mm | 25    | 120  |
| 9WS0824F402(4021) | 80×80mm | 25    | 120  |
| 9WS0824H402(4021) | 80×80mm | 25    | 120  |
| 9WS0824M402(4021) | 80×80mm | 25    | 120  |
| 9WP0812H402(4021) | 80×80mm | 38    | 118  |
| 9WP0824H402(4021) | 80×80mm | 38    | 118  |
| 9WP0848S402(4021) | 80×80mm | 38    | 118  |
| 109W0912F402-U    | 92×92mm | 25    | 122  |
| 109W0912H402-U    | 92×92mm | 25    | 122  |
| 109W0912L402-U    | 92×92mm | 25    | 122  |
| 109W0912M402-U    | 92×92mm | 25    | 122  |
| 109W0924F402-U    | 92×92mm | 25    | 122  |
| 109W0924H402-U    | 92×92mm | 25    | 122  |

## Splash Proof Fans

| Model No.         | Size      | Thick | Page |
|-------------------|-----------|-------|------|
| 109W0924L402-U    | 92×92mm   | 25    | 122  |
| 109W0924M402-U    | 92×92mm   | 25    | 122  |
| 109W0948H402-U    | 92×92mm   | 25    | 122  |
| 9WS0912F402       | 92×92mm   | 25    | 124  |
| 9WS0912H402       | 92×92mm   | 25    | 124  |
| 9WS0912L402       | 92×92mm   | 25    | 124  |
| 9WS0912M402       | 92×92mm   | 25    | 124  |
| 9WS0924F402       | 92×92mm   | 25    | 124  |
| 9WS0924H402       | 92×92mm   | 25    | 124  |
| 9WS0924L402       | 92×92mm   | 25    | 124  |
| 9WS0924M402       | 92×92mm   | 25    | 124  |
| 109W1212H102-U    | 120×120mm | 38    | 126  |
| 109W1212M102-U    | 120×120mm | 38    | 126  |
| 109W1221H102-U    | 120×120mm | 38    | 126  |
| 109W1224H102-U    | 120×120mm | 38    | 126  |
| 109W1224M102-U    | 120×120mm | 38    | 126  |
| 109W1248H102-U    | 120×120mm | 38    | 126  |
| 109W1248M102-U    | 120×120mm | 38    | 126  |
| 9WG1212E102       | 120×120mm | 38    | 130  |
| 9WG1212F102       | 120×120mm | 38    | 130  |
| 9WG1212G102       | 120×120mm | 38    | 130  |
| 9WG1212H102       | 120×120mm | 38    | 130  |
| 9WG1212J102       | 120×120mm | 38    | 130  |
| 9WG1212M102       | 120×120mm | 38    | 130  |
| 9WG1224E102       | 120×120mm | 38    | 130  |
| 9WG1224F102       | 120×120mm | 38    | 130  |
| 9WG1224G102       | 120×120mm | 38    | 130  |
| 9WG1224H102       | 120×120mm | 38    | 130  |
| 9WG1224J102       | 120×120mm | 38    | 130  |
| 9WG1224M102       | 120×120mm | 38    | 130  |
| 9WG1248E102       | 120×120mm | 38    | 130  |
| 9WG1248F102       | 120×120mm | 38    | 130  |
| 9WG1248G102       | 120×120mm | 38    | 130  |
| 9WG1248H102       | 120×120mm | 38    | 130  |
| 9WG1248J102       | 120×120mm | 38    | 130  |
| 9WG1248M102       | 120×120mm | 38    | 130  |
| 9WP1212H102(1021) | 120×120mm | 38    | 128  |
| 9WP1224H102(1021) | 120×120mm | 38    | 128  |
| 9WP1248H102(1021) | 120×120mm | 38    | 128  |
| 9WS1212H102(1021) | 120×120mm | 38    | 132  |
| 9WS1212M102(1021) | 120×120mm | 38    | 132  |
| 9WS1224H102(1021) | 120×120mm | 38    | 132  |
| 9WS1224M102(1021) | 120×120mm | 38    | 132  |
| 9WS1248H102(1021) | 120×120mm | 38    | 132  |
| 9WS1248M102(1021) | 120×120mm | 38    | 132  |
| 109W1412H102-U    | 140×140mm | 38    | 134  |
| 109W1412M102-U    | 140×140mm | 38    | 134  |
| 109W1424H102-U    | 140×140mm | 38    | 134  |
| 109W1424M102-U    | 140×140mm | 38    | 134  |
| 109W1448H102-U    | 140×140mm | 38    | 134  |
| 109W1448M102-U    | 140×140mm | 38    | 134  |
| 9WB1412H502       | 140×140mm | 51    | 134  |
| 9WB1412M502       | 140×140mm | 51    | 134  |
| 9WB1412S502       | 140×140mm | 51    | 134  |
| 9WB1424H502       | 140×140mm | 51    | 134  |
| 9WB1424M502       | 140×140mm | 51    | 134  |
| 9WB1448H502       | 140×140mm | 51    | 134  |
| 9WB1448S502       | 140×140mm | 51    | 134  |

The numbers in ( ) represent ribless models

## Oil Proof Fans

| Model No.   | Size      | Thick | Page |
|-------------|-----------|-------|------|
| 9WF0424H602 | 40×40mm   | 20    | 138  |
| 9WF0624H402 | 60×60mm   | 25    | 140  |
| 9WF1224H102 | 120×120mm | 38    | 142  |

**Long Life Fans**

| Model No.    | Size      | Thick | Page |
|--------------|-----------|-------|------|
| 9L0412H302   | 40×40mm   | 28    | 146  |
| 9L0412J302   | 40×40mm   | 28    | 146  |
| 9L0412M302   | 40×40mm   | 28    | 146  |
| 109L0612G402 | 60×60mm   | 25    | 148  |
| 109L0612F402 | 60×60mm   | 25    | 148  |
| 109L0612H402 | 60×60mm   | 25    | 148  |
| 109L0612M402 | 60×60mm   | 25    | 148  |
| 109L0612S402 | 60×60mm   | 25    | 148  |
| 109L0624F402 | 60×60mm   | 25    | 148  |
| 109L0624H402 | 60×60mm   | 25    | 148  |
| 109L0624M402 | 60×60mm   | 25    | 148  |
| 109L0624S402 | 60×60mm   | 25    | 148  |
| 109L0648G401 | 60×60mm   | 25    | 148  |
| 109L0648H402 | 60×60mm   | 25    | 148  |
| 109L0812F402 | 80×80mm   | 25    | 150  |
| 109L0812H402 | 80×80mm   | 25    | 150  |
| 109L0812L402 | 80×80mm   | 25    | 150  |
| 109L0812M402 | 80×80mm   | 25    | 150  |
| 109L0812S402 | 80×80mm   | 25    | 150  |
| 109L0824F402 | 80×80mm   | 25    | 150  |
| 109L0824H402 | 80×80mm   | 25    | 150  |
| 109L0824L402 | 80×80mm   | 25    | 150  |
| 109L0824M402 | 80×80mm   | 25    | 150  |
| 109L0824S402 | 80×80mm   | 25    | 150  |
| 109L0848H402 | 80×80mm   | 25    | 150  |
| 109L0912F402 | 92×92mm   | 25    | 152  |
| 109L0912H402 | 92×92mm   | 25    | 152  |
| 109L0912L402 | 92×92mm   | 25    | 152  |
| 109L0912M402 | 92×92mm   | 25    | 152  |
| 109L0912S402 | 92×92mm   | 25    | 152  |
| 109L0924F402 | 92×92mm   | 25    | 152  |
| 109L0924H402 | 92×92mm   | 25    | 152  |
| 109L0924L402 | 92×92mm   | 25    | 152  |
| 109L0924M402 | 92×92mm   | 25    | 152  |
| 109L0948C402 | 92×92mm   | 25    | 152  |
| 109L0948H402 | 92×92mm   | 25    | 152  |
| 109L1212H102 | 120×120mm | 38    | 154  |
| 109L1212M102 | 120×120mm | 38    | 154  |
| 109L1221H102 | 120×120mm | 38    | 154  |
| 109L1224H102 | 120×120mm | 38    | 154  |
| 109L1224M102 | 120×120mm | 38    | 154  |
| 109L1248H102 | 120×120mm | 38    | 154  |
| 109L1248M102 | 120×120mm | 38    | 154  |
| 9GL1212E102  | 120×120mm | 38    | 156  |
| 9GL1212F102  | 120×120mm | 38    | 156  |
| 9GL1212G102  | 120×120mm | 38    | 156  |
| 9GL1212H102  | 120×120mm | 38    | 156  |
| 9GL1212J102  | 120×120mm | 38    | 156  |
| 9GL1212M102  | 120×120mm | 38    | 156  |
| 9GL1224E102  | 120×120mm | 38    | 156  |
| 9GL1224F102  | 120×120mm | 38    | 156  |
| 9GL1224G102  | 120×120mm | 38    | 156  |
| 9GL1224H102  | 120×120mm | 38    | 156  |
| 9GL1224J102  | 120×120mm | 38    | 156  |
| 9GL1224M102  | 120×120mm | 38    | 156  |
| 9GL1248E102  | 120×120mm | 38    | 156  |
| 9GL1248F102  | 120×120mm | 38    | 156  |
| 9GL1248G102  | 120×120mm | 38    | 156  |
| 9GL1248H102  | 120×120mm | 38    | 156  |
| 9GL1248J102  | 120×120mm | 38    | 156  |
| 9GL1248M102  | 120×120mm | 38    | 156  |
| 9LB1212H102  | 120×120mm | 38    | 154  |
| 9LB1212M102  | 120×120mm | 38    | 154  |
| 9LB1224H102  | 120×120mm | 38    | 154  |
| 9LB1224M102  | 120×120mm | 38    | 154  |
| 9LB1248H102  | 120×120mm | 38    | 154  |
| 9LB1248M102  | 120×120mm | 38    | 154  |
| 109L1412H102 | 140×140mm | 38    | 158  |
| 109L1412M102 | 140×140mm | 38    | 158  |
| 109L1424H102 | 140×140mm | 38    | 158  |
| 109L1424M102 | 140×140mm | 38    | 158  |
| 109L1448H102 | 140×140mm | 38    | 158  |
| 109L1448M102 | 140×140mm | 38    | 158  |

**Long Life Fans**

| Model No.    | Size      | Thick | Page |
|--------------|-----------|-------|------|
| 9LB1412H502  | 140×140mm | 51    | 158  |
| 9LB1412M502  | 140×140mm | 51    | 158  |
| 9LB1412S502  | 140×140mm | 51    | 158  |
| 9LB1424H502  | 140×140mm | 51    | 158  |
| 9LB1424M502  | 140×140mm | 51    | 158  |
| 9LB1424S502  | 140×140mm | 51    | 158  |
| 9LB1448H502  | 140×140mm | 51    | 158  |
| 9LB1448M502  | 140×140mm | 51    | 158  |
| 9LB1448S502  | 140×140mm | 51    | 158  |
| 109L1712H502 | φ 172     | 51    | 162  |
| 109L1712M502 | φ 172     | 51    | 162  |
| 109L1724H502 | φ 172     | 51    | 162  |
| 109L1724M502 | φ 172     | 51    | 162  |
| 109L1748H502 | φ 172     | 51    | 162  |
| 109L1748M502 | φ 172     | 51    | 162  |
| 109L5712H502 | φ 172     | 51    | 160  |
| 109L5712M502 | φ 172     | 51    | 160  |
| 109L5724H502 | φ 172     | 51    | 160  |
| 109L5724M502 | φ 172     | 51    | 160  |
| 109L5748H502 | φ 172     | 51    | 160  |
| 109L5748M502 | φ 172     | 51    | 160  |

**Blowers**

| Model No.  | Size | Thick | Page |
|------------|------|-------|------|
| 109BC12FA7 | 52   | 15    | 166  |
| 109BC12GA7 | 52   | 15    | 166  |
| 109BC12HA7 | 52   | 15    | 166  |
| 109BC12MA7 | 52   | 15    | 166  |
| 109BC24FA7 | 52   | 15    | 166  |
| 109BC24GA7 | 52   | 15    | 166  |
| 109BC24HA7 | 52   | 15    | 166  |
| 9BD12FA6   | 76   | 20    | 168  |
| 9BD12HA6   | 76   | 20    | 168  |
| 9BD12SA6   | 76   | 20    | 168  |
| 9BD24FA6   | 76   | 20    | 168  |
| 9BD24HA6   | 76   | 20    | 168  |
| 9BD24SA6   | 76   | 20    | 168  |
| 109BD12GA4 | 76   | 25    | 168  |
| 109BD12HA4 | 76   | 25    | 168  |
| 109BD12MA4 | 76   | 25    | 168  |
| 109BD24GA4 | 76   | 25    | 168  |
| 109BD24HA4 | 76   | 25    | 168  |
| 109BD24MA4 | 76   | 25    | 168  |
| 109BD12FA2 | 76   | 30    | 170  |
| 109BD12HA2 | 76   | 30    | 170  |
| 109BD12MA2 | 76   | 30    | 170  |
| 109BD24FA2 | 76   | 30    | 170  |
| 109BD24HA2 | 76   | 30    | 170  |
| 109BD24MA2 | 76   | 30    | 170  |
| 109BE12GA2 | 94   | 30    | 172  |
| 109BE12HA2 | 94   | 30    | 172  |
| 109BE12MA2 | 94   | 30    | 172  |
| 109BE24GA2 | 94   | 30    | 172  |
| 109BE24HA2 | 94   | 30    | 172  |
| 109BE24MA2 | 94   | 30    | 172  |
| 109BM12GA2 | 97   | 33    | 176  |
| 109BM12HA2 | 97   | 33    | 176  |
| 109BM12MA2 | 97   | 33    | 176  |
| 109BM24GA2 | 97   | 33    | 176  |
| 109BM24HA2 | 97   | 33    | 176  |
| 109BM24MA2 | 97   | 33    | 176  |
| 9BAM12FA2  | 97   | 33    | 174  |
| 9BAM12GA2  | 97   | 33    | 174  |
| 9BAM12HA2  | 97   | 33    | 174  |
| 9BAM12SA2  | 97   | 33    | 174  |
| 9BAM24FA2  | 97   | 33    | 174  |
| 9BAM24GA2  | 97   | 33    | 174  |
| 9BAM24HA2  | 97   | 33    | 174  |
| 9BAM24SA2  | 97   | 33    | 174  |
| 109BF12HA2 | 120  | 32    | 178  |
| 109BF12MA2 | 120  | 32    | 178  |
| 109BF24HA2 | 120  | 32    | 178  |
| 109BF24MA2 | 120  | 32    | 178  |

## Blowers

| Model No.  | Size | Thick | Page |
|------------|------|-------|------|
| 109BJ12HA2 | 127  | 32    | 180  |
| 109BJ12MA2 | 127  | 32    | 180  |
| 109BJ24HA2 | 127  | 32    | 180  |
| 109BJ24MA2 | 127  | 32    | 180  |
| 9BN12FA1   | 150  | 40    | 182  |
| 9BN12HA1   | 150  | 40    | 182  |
| 9BN24FA1   | 150  | 40    | 182  |
| 9BN24HA1   | 150  | 40    | 182  |
| 109BG12HA1 | 160  | 40    | 184  |
| 109BG12MA1 | 160  | 40    | 184  |
| 109BG24HA1 | 160  | 40    | 184  |
| 109BG24MA1 | 160  | 40    | 184  |

## Centrifugal Fans

| Model No. | Size  | Thick | Page |
|-----------|-------|-------|------|
| 9TR48HA0  | φ 220 | 71    | 188  |

## CPU Coolers

| Model No.       | Size      | Thick | Page |
|-----------------|-----------|-------|------|
| 9G0912P2E012    |           |       | 192  |
| 9G0912PT2E012   |           |       | 192  |
| 109X9112PT0H016 | φ 90      | 62.6  | 194  |
| 109X9212PT0H016 | φ 90      | 62.6  | 196  |
| 109X9912T0D516  | 95×90     | 51    | 198  |
| 109X9912T0S016  | 95×90     | 51    | 200  |
| 109X9912S0016   | 95×90     | 51    | 200  |
| 109X9812T0H016  | 95×90     | 62.5  | 202  |
| 109X9812H0016   | 95×90     | 62.5  | 202  |
| 109X9412G4016   | 83.3×87.2 | 25    | 204  |
| 9H9912G5516     | 70×83.3   | 54.5  | 206  |
| 109X9412S1016   | 68.5×83.3 | 45    | 208  |
| 9H9912G5016     | 70×88.9   | 54.5  | 210  |
| 109X9612S5016   | 67.3×88.9 | 53.5  | 212  |
| 109X7612H1176   | 67.3×68   | 45    | 214  |
| 109X7412S4016   | 67.3×79   | 24    | 216  |
| 109X6512A2016   | 50.8×64   | 31    | 218  |
| 109-LC1-001     | 199.5×170 | 78.6  | 220  |

## AC Fans

| Model No.  | Size    | Thick | Page |
|------------|---------|-------|------|
| 109-180    | 60×60mm | 28    | 224  |
| 109-183    | 60×60mm | 28    | 224  |
| 109-130    | 60×60mm | 38    | 224  |
| 109-133    | 60×60mm | 38    | 224  |
| 109-210    | 80×80mm | 20    | 226  |
| 109-213    | 80×80mm | 20    | 226  |
| 109S050    | 80×80mm | 25    | 226  |
| 109S051    | 80×80mm | 25    | 226  |
| 109S053    | 80×80mm | 25    | 226  |
| 109S054    | 80×80mm | 25    | 226  |
| ☆109S030   | 80×80mm | 25    | 226  |
| ☆109S031   | 80×80mm | 25    | 226  |
| ☆109S033   | 80×80mm | 25    | 226  |
| ☆109S034   | 80×80mm | 25    | 226  |
| 109-150    | 80×80mm | 38    | 227  |
| 109-151    | 80×80mm | 38    | 227  |
| 109-153    | 80×80mm | 38    | 227  |
| 109-154    | 80×80mm | 38    | 227  |
| 109-040UL  | 80×80mm | 42    | 228  |
| 109-041UL  | 80×80mm | 42    | 228  |
| 109-043UL  | 80×80mm | 42    | 228  |
| 109-044UL  | 80×80mm | 42    | 228  |
| ※109-033UL | 80×80mm | 42    | 228  |
| ※109-047UL | 80×80mm | 42    | 228  |
| 109S091    | 92×92mm | 25    | 230  |
| 109S092    | 92×92mm | 25    | 230  |
| 109S093    | 92×92mm | 25    | 230  |
| 109S094    | 92×92mm | 25    | 230  |
| 109S491    | 92×92mm | 25    | 240  |
| 109S492    | 92×92mm | 25    | 240  |
| 109S493    | 92×92mm | 25    | 240  |

## AC Fans

| Model No.  | Size      | Thick | Page |
|------------|-----------|-------|------|
| 109S494    | 92×92mm   | 25    | 240  |
| ☆109S095   | 92×92mm   | 25    | 230  |
| ☆109S495   | 92×92mm   | 25    | 240  |
| ※109S096   | 92×92mm   | 25    | 230  |
| ※109S192   | 92×92mm   | 25    | 230  |
| ※109S193   | 92×92mm   | 25    | 230  |
| ※109S194   | 92×92mm   | 25    | 230  |
| ※109S496   | 92×92mm   | 25    | 240  |
| 109S084    | 120×120mm | 25    | 232  |
| 109S085    | 120×120mm | 25    | 232  |
| 109S087    | 120×120mm | 25    | 232  |
| 109S088    | 120×120mm | 25    | 232  |
| 109S484    | 120×120mm | 25    | 242  |
| 109S485    | 120×120mm | 25    | 242  |
| 109S487    | 120×120mm | 25    | 242  |
| 109S488    | 120×120mm | 25    | 242  |
| ☆109S081   | 120×120mm | 25    | 232  |
| ☆109S082   | 120×120mm | 25    | 232  |
| ☆109S083   | 120×120mm | 25    | 232  |
| ☆109S089   | 120×120mm | 25    | 232  |
| ※109S086   | 120×120mm | 25    | 232  |
| ※109S486   | 120×120mm | 25    | 242  |
| 109S005    | 120×120mm | 38    | 232  |
| 109S005UL  | 120×120mm | 38    | 232  |
| 109S008    | 120×120mm | 38    | 232  |
| 109S008UL  | 120×120mm | 38    | 232  |
| 109S024    | 120×120mm | 38    | 232  |
| 109S024UL  | 120×120mm | 38    | 232  |
| 109S025    | 120×120mm | 38    | 232  |
| 109S025UL  | 120×120mm | 38    | 232  |
| 109S072UL  | 120×120mm | 38    | 233  |
| 109S074UL  | 120×120mm | 38    | 233  |
| 109S075UL  | 120×120mm | 38    | 233  |
| 109S078UL  | 120×120mm | 38    | 233  |
| 109S405UL  | 120×120mm | 38    | 242  |
| 109S408UL  | 120×120mm | 38    | 242  |
| 109S424UL  | 120×120mm | 38    | 242  |
| 109S425UL  | 120×120mm | 38    | 242  |
| 109S472UL  | 120×120mm | 38    | 243  |
| 109S474UL  | 120×120mm | 38    | 243  |
| 109S475UL  | 120×120mm | 38    | 243  |
| 109S478UL  | 120×120mm | 38    | 243  |
| ☆109S013   | 120×120mm | 38    | 233  |
| ☆109S013UL | 120×120mm | 38    | 233  |
| ☆109S029UL | 120×120mm | 38    | 233  |
| ☆109S429UL | 120×120mm | 38    | 242  |
| ※109S006   | 120×120mm | 38    | 233  |
| ※109S006UL | 120×120mm | 38    | 233  |
| ※109S010   | 120×120mm | 38    | 233  |
| ※109S010UL | 120×120mm | 38    | 233  |
| ※109S406UL | 120×120mm | 38    | 242  |
| 109-601    | 160×160mm | 51    | 234  |
| 109-602    | 160×160mm | 51    | 234  |
| 109-603    | 160×160mm | 51    | 234  |
| 109-604    | 160×160mm | 51    | 234  |
| 109-641    | 160×160mm | 51    | 244  |
| 109-642    | 160×160mm | 51    | 244  |
| 109-643    | 160×160mm | 51    | 244  |
| 109-644    | 160×160mm | 51    | 244  |
| 109-311    | φ 172     | 51    | 238  |
| 109-312    | φ 172     | 51    | 238  |
| 109-313    | φ 172     | 51    | 238  |
| 109-314    | φ 172     | 51    | 238  |
| 109-371    | φ 172     | 51    | 246  |
| 109-372    | φ 172     | 51    | 246  |
| 109-373    | φ 172     | 51    | 246  |
| 109-374    | φ 172     | 51    | 246  |
| 109S301    | φ 172     | 51    | 236  |
| 109S302    | φ 172     | 51    | 236  |
| 109S303    | φ 172     | 51    | 236  |
| 109S304    | φ 172     | 51    | 236  |

☆ represents half-speed. ※ represents low-speed

**Finger guards**

| Model No. | Size           | Thick | Page |
|-----------|----------------|-------|------|
| 109-059   | 40×40mm type   | 4     | 250  |
| 109-149   | 52×52mm type   | 4     | 250  |
| 109-149E  | 52×52mm type   | 4     | 250  |
| 109-139E  | 60×60mm type   | 4     | 250  |
| 109-139H  | 60×60mm type   | 4     | 250  |
| 109-049C  | 80×80mm type   | 5     | 250  |
| 109-049E  | 80×80mm type   | 5     | 250  |
| 109-049H  | 80×80mm type   | 5     | 250  |
| 109-099C  | 92×92mm type   | 5     | 250  |
| 109-099E  | 92×92mm type   | 5     | 250  |
| 109-099H  | 92×92mm type   | 5     | 250  |
| 109-019C  | 120×120mm type | 5     | 250  |
| 109-019H  | 120×120mm type | 5     | 250  |
| 109-019E  | 120×120mm type | 5     | 250  |
| 109-019K  | 120×120mm type | 5     | 250  |
| 109-722   | 127×127mm type | 5     | 250  |
| 109-723   | 127×127mm type | 3.2   | 250  |
| 109-719   | 140×140mm type | 5.5   | 250  |
| 109-719H  | 140×140mm type | 5.5   | 250  |
| 109-619E  | 160×160mm type | 8     | 250  |
| 109-620   | 160×160mm type | 3.6   | 250  |
| 109-319   | φ 172mm type   | 9.5   | 250  |
| 109-319E  | φ 172mm type   | 9.5   | 250  |
| 109-319H  | φ 172mm type   | 9.5   | 250  |
| 109-320   | φ 172mm type   | 3.2   | 250  |
| 109-720   | φ 200mm type   | 8     | 250  |
| 109-720H  | φ 200mm type   | 8     | 250  |
| 109-721   | φ 200mm type   | 3.2   | 250  |
| 109-721H  | φ 200mm type   | 3.2   | 250  |

**Resin finger guards**

| Model No.   | Size       | Thick | Page |
|-------------|------------|-------|------|
| 109-1003F13 | 60mm type  | 9.5   | 253  |
| 109-1003F20 | 60mm type  | 9.5   | 253  |
| 109-1003F30 | 60mm type  | 9.5   | 253  |
| 109-1003F40 | 60mm type  | 9.5   | 253  |
| 109-1002F13 | 80mm type  | 10.5  | 253  |
| 109-1002F20 | 80mm type  | 10.5  | 253  |
| 109-1002F30 | 80mm type  | 10.5  | 253  |
| 109-1002F40 | 80mm type  | 10.5  | 253  |
| 109-1001F13 | 92mm type  | 10.5  | 253  |
| 109-1001F20 | 92mm type  | 10.5  | 253  |
| 109-1001F30 | 92mm type  | 10.5  | 253  |
| 109-1001F40 | 92mm type  | 10.5  | 253  |
| 109-1000F13 | 120mm type | 10.5  | 253  |
| 109-1000F20 | 120mm type | 10.5  | 253  |
| 109-1000F30 | 120mm type | 10.5  | 253  |
| 109-1000F40 | 120mm type | 10.5  | 253  |

**Filter kits • Screen kits**

| Model No. | Size      | Thick | Page |
|-----------|-----------|-------|------|
| 109-018   | 131×155.6 | 8.5   | 252  |
| 109-020   | 131×155.6 | 8.5   | 254  |

**Resin filter kits**

| Model No.   | Size       | Thick | Page |
|-------------|------------|-------|------|
| 109-1003F13 | 60mm type  | 9.5   | 253  |
| 109-1003F20 | 60mm type  | 9.5   | 253  |
| 109-1003F30 | 60mm type  | 9.5   | 253  |
| 109-1003F40 | 60mm type  | 9.5   | 253  |
| 109-1002F13 | 80mm type  | 10.5  | 253  |
| 109-1002F20 | 80mm type  | 10.5  | 253  |
| 109-1002F30 | 80mm type  | 10.5  | 253  |
| 109-1002F40 | 80mm type  | 10.5  | 253  |
| 109-1001F13 | 92mm type  | 10.5  | 253  |
| 109-1001F20 | 92mm type  | 10.5  | 253  |
| 109-1001F30 | 92mm type  | 10.5  | 253  |
| 109-1001F40 | 92mm type  | 10.5  | 253  |
| 109-1000F13 | 120mm type | 10.5  | 253  |
| 109-1000F20 | 120mm type | 10.5  | 253  |
| 109-1000F30 | 120mm type | 10.5  | 253  |
| 109-1000F40 | 120mm type | 10.5  | 253  |

**Plug cord**

| Model No.   | Size | Thick | Page |
|-------------|------|-------|------|
| 489-008-L10 |      |       | 256  |
| 489-008-L21 |      |       | 256  |
| 489-008-L35 |      |       | 256  |
| 489-016-L10 |      |       | 256  |
| 489-016-L21 |      |       | 256  |
| 489-006-L10 |      |       | 256  |
| 489-006-L21 |      |       | 256  |
| 489-007-L10 |      |       | 257  |
| 489-007-L21 |      |       | 257  |
| 489-047-L10 |      |       | 257  |
| 489-047-L21 |      |       | 257  |
| 489-084-L10 |      |       | 257  |
| 489-084-L21 |      |       | 257  |
| 489-086-L10 |      |       | 257  |
| 489-086-L21 |      |       | 257  |

**Thermistor**

| Model No. | Size | Thick | Page |
|-----------|------|-------|------|
| 169-002   |      |       | 258  |

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### GERMANY Telemeter Electronic GmbH

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www.wexon.fi

### ESTONIA DIGIMEN

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www.enika.cz

### TURKEY TEKA TEKNİK Cihazlar Sanayi ve Ticaret A.S.

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www.takateknik.com.tr

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## Note

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