Splash Proof Centrifugal Fan

Centrifugal fans of IP54 and IP56 waterproof capability. For more information on IP rating, refer to p. 534. Related product: Splash Proof Fan p. 265, Centrifugal Fan p. 413, Oil Proof Fan p. 333

■ Model Numbering System

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

<table>
<thead>
<tr>
<th>Type name</th>
<th>Impeller size</th>
<th>Voltage</th>
<th>PWM control/fixation</th>
<th>Thickness</th>
<th>Speed code</th>
<th>Initial customer’s spec (2 to 3 digits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9W1T</td>
<td>M</td>
<td>48</td>
<td>P</td>
<td>4</td>
<td>H</td>
<td>01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type name</th>
<th>9W1T</th>
<th>9W2T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impeller size (mm)</td>
<td>Ø175</td>
<td>Ø133</td>
</tr>
<tr>
<td>Voltage (V)</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td>Thickness (mm)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Speed code</td>
<td>H</td>
<td>G</td>
</tr>
</tbody>
</table>

■ How to Read Specifications (DC fan)

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>9GA0412G7001</td>
<td>12</td>
<td>7 to 13.8</td>
<td>0.17</td>
<td>2.04</td>
<td>13100</td>
<td>0.36</td>
<td>12.7</td>
<td>192</td>
<td>0.77</td>
<td>42</td>
</tr>
</tbody>
</table>

Rated voltage .......................... This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC
Operating voltage range .......................... The voltage range over which fan operation is guaranteed.
Rated current .......................... The current when the fan is operating at rated voltage (at free air).
Rated input .......................... The power value when the fan is operating at rated voltage (at free air).
Max. airflow .......................... The maximum airflow that the fan can generate during rated operation (measured with our double chamber measuring device). Airflow is the volume of air generated by the fan per unit of time.
Max. static pressure .......................... The maximum static pressure value that the fan can produce during rated operation (measured with our double chamber measuring device). Static pressure indicates a fan’s ability to move air against resistance due to the internal structure of the device to which the fan is installed.
SPL .......................... SPL stands for Sound Pressure Level. The noise level during the fan’s rated operation. Please refer to the technical material section for the measurement method.
Operating temperature .......................... The temperature range over which fan operation is guaranteed (Non-condensing).
Expected life .......................... Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60˚C temperature. Expected life at 40˚C is for reference only. For more information, please refer to the technical material section.
## General Specifications

- **Material**
  - Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- **Expected life**
  - See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
- **Motor protection function**
  - Locked rotor burnout protection, Reverse polarity protection
  - For details, please refer to p. 529.
- **Dielectric strength**
  - 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- **Insulation resistance**
  - 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- **Sound pressure level (SPL)**
  - At 1 m away from the air inlet
- **Storage temperature**
  - -30 to +70°C (Non-condensing)
- **Lead wire**
  - Red (Sensor), Black (Control), Yellow (Control), Brown
- **Mass**
  - 160 g
- **Ingress protection**
  - IP54

## Specifications

When the optional inlet nozzle (109-1080) is mounted.

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

**9W1TM48P4G01** With pulse sensor with PWM control function

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9W1TM48P4G01**</td>
<td>48</td>
<td>36 to 60</td>
<td>100</td>
<td>0.36</td>
<td>17.28</td>
<td>4700</td>
<td>2.03</td>
<td>71.7</td>
<td>70</td>
</tr>
<tr>
<td>9W1TM48P4H01</td>
<td>48</td>
<td>36 to 60</td>
<td>100</td>
<td>0.22</td>
<td>10.56</td>
<td>6400</td>
<td>1.77</td>
<td>62.5</td>
<td>56</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz    ** Fan does not rotate when PWM duty cycle is 0%.

Max input of 9W1TM48P4G01: 22 W, 9W1TM48P4H01: 14 W at rated voltage.
**Dimensions (unit: mm)**

Airflow direction

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Φ100±1</td>
<td></td>
</tr>
<tr>
<td>Φ74±1</td>
<td></td>
</tr>
<tr>
<td>25±1</td>
<td></td>
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<tr>
<td>18.5±1</td>
<td></td>
</tr>
<tr>
<td>8.5±0.5</td>
<td></td>
</tr>
<tr>
<td>Φ56±0.3</td>
<td></td>
</tr>
<tr>
<td>50.5±1</td>
<td></td>
</tr>
<tr>
<td>126</td>
<td></td>
</tr>
<tr>
<td>3-M4</td>
<td></td>
</tr>
</tbody>
</table>

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

**Fan side**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Φ56±0.5</td>
<td></td>
</tr>
<tr>
<td>120°</td>
<td></td>
</tr>
<tr>
<td>3.6±0.5</td>
<td></td>
</tr>
<tr>
<td>120°</td>
<td></td>
</tr>
<tr>
<td>120°</td>
<td></td>
</tr>
</tbody>
</table>

**Inlet nozzle side**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Φ116.6±0.5</td>
<td></td>
</tr>
<tr>
<td>Φ106±0.5</td>
<td></td>
</tr>
</tbody>
</table>

**Reference Diagram for Mounting**

- Inlet nozzle
- Finger guard
- Fan
- Bolt length: 5 mm max.

**Options**

- **Finger guards**  
  Page: p. 513  
  Model no.: 109-099E, 109-099H

- **Inlet nozzle**  
  Page: p. 518  
  Model no.: 109-1080
 Splash Proof Centrifugal Fan

Ø133×91 mm
San Ace 133W 9W1T type

General Specifications

- **Material**: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- **Expected life**: See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
- **Motor protection function**: Locked rotor burnout protection, Reverse polarity protection
- **Dielectric strength**: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- **Insulation resistance**: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- **Sound pressure level (SPL)**: At 1 m away from the air inlet
- **Storage temperature**: -30 to +70°C (Non-condensing)
- **Lead wire**: Red, Black, Yellow, Control, Brown
- **Mass**: 720 g
- **Ingress protection**: IP54

Specifications

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

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</tr>
</thead>
<tbody>
<tr>
<td>9W1TJ24P0H61</td>
<td>24</td>
<td>20.4 to 27.6</td>
<td>100</td>
<td>1.2</td>
<td>28.8</td>
<td>4150</td>
<td>6.39</td>
<td>225</td>
<td>395</td>
<td>1.59</td>
<td>61</td>
</tr>
<tr>
<td>9W1TJ48P0H61</td>
<td>48</td>
<td>36 to 60</td>
<td>100</td>
<td>0.55</td>
<td>26.4</td>
<td>4150</td>
<td>6.39</td>
<td>225</td>
<td>395</td>
<td>1.59</td>
<td>61</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%. Max input is 45 W at rated voltage.

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

**9W1TJ24P0H61** With pulse sensor with PWM control function

PWM duty cycle

Operating voltage range

PWM duty - Speed characteristics example

**9W1TJ48P0H61** With pulse sensor with PWM control function

PWM duty cycle

Operating voltage range

PWM duty - Speed characteristics example
**Dimensions (unit: mm)**

- **Airflow direction**
- **Rotating direction**

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

**Fan side**

- ø58±0.5
- ø108±0.5

**Inlet nozzle side**

- ø118±0.5
- 4.845±0.5

**Reference Diagram for Mounting**

- Finger guard
- Inlet nozzle
- Fan

**Options**

- **Finger guards**
  - Model no.: 109-1112  
  - page: p. 514

- **Inlet nozzle**
  - Model no.: 109-1069, 109-1069H  
  - page: p. 518

*Lead wire*

- AWG24
- UL 1430

*Dimensions (unit: mm)*

- ø133±1
- 91±1
- 60.6±1
- ø92.8±1
- 60.6±1
- 46.8±1
- ø77.5±1
- 60.6±1
- +30

*Reference Diagram for Mounting*

- Bolt length: 6 mm max.

*Options*

- **Finger guards**
  - Model no.: 109-1112  
  - page: p. 514

- **Inlet nozzle**
  - Model no.: 109-1069, 109-1069H  
  - page: p. 518

**Inlet nozzle**

- ø58±0.3
- 27±1
- 45°±1°

**Finger guards**

- ø58±0.5
- ø118±0.5
- ø108±0.5

**Options**

- **Finger guards**
  - Model no.: 109-1112  
  - page: p. 514

- **Inlet nozzle**
  - Model no.: 109-1069, 109-1069H  
  - page: p. 518
Splash Proof Centrifugal Fan

San Ace 150W 9W1T type

General Specifications

- Material: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life: See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
- Motor protection function: Locked rotor burnout protection, Reverse polarity protection
- Dielectric strength: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- Sound pressure level (SPL): At 1 m away from the air inlet
- Storage temperature: -30 to +70°C (Non-condensing)
- Lead wire: Red Black Sensor Yellow Control Brown
- Mass: 330 g
- Ingress protection: IP54

Specifications

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

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>9W1TN48P1H01</td>
<td>48</td>
<td>36.0 to 55.2</td>
<td>100</td>
<td>0.32</td>
<td>15.4</td>
<td>3800</td>
<td>3.83</td>
<td>135</td>
<td>59</td>
<td>-20 to +70°C</td>
<td>40000/60°C (70000/40°C)</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%.
Max input is 22 W at rated voltage.

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

<table>
<thead>
<tr>
<th>PWM duty cycle</th>
<th>Operating voltage range</th>
<th>PWM duty - Speed characteristics example</th>
</tr>
</thead>
<tbody>
<tr>
<td>(inch H₂O) (Pa)</td>
<td>(inch H₂O) (Pa)</td>
<td>(inch H₂O) (Pa)</td>
</tr>
<tr>
<td>Airflow (m³/min) (CFM)</td>
<td>Airflow (m³/min) (CFM)</td>
<td>Airflow (m³/min) (CFM)</td>
</tr>
</tbody>
</table>

Voltage: 48 VDC
PWM frequency: 25 kHz
Fan speed: 3800 min⁻¹
**Dimensions (unit: mm)**

- Airflow direction
- Rotating direction
- Lead wire
  - AWG24
  - UL 1061
- Dimensions (unit: mm)
- Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)
- Reference Diagram for Mounting
- Options
  - Finger guards
    - Model no.: 109-1104, 109-1104H
  - Inlet nozzle
    - Model no.: 109-1081, 109-1081H

Bolt length: 4 to 6 mm.
Splash Proof Centrifugal Fan

$\varnothing 175 \times 69$ mm
San Ace 175W 9W1T type

### General Specifications
- Material: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life: See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
- Motor protection function: Locked rotor burnout protection, Reverse polarity protection
  For details, please refer to p. 529.
- Dielectric strength: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- Sound pressure level (SPL): At 1 m away from the air inlet
- Storage temperature: -30 to +70°C (Non-condensing)
- Lead wire: Red (Sensor), Black (Control), Yellow (Control), Brown
- Mass: 760 g
- Ingress protection: IP54

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

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

<table>
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</thead>
<tbody>
<tr>
<td>9W1TG48P0H61</td>
<td>48</td>
<td>36 to 60</td>
<td>100</td>
<td>0.65</td>
<td>31.2</td>
<td>3100</td>
<td>9.0</td>
<td>318</td>
<td>360</td>
<td>-20 to +70</td>
<td>40000/50°C</td>
</tr>
</tbody>
</table>

*PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%.
Max input is 60 W at rated voltage.

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

9W1TG48P0H61 (With pulse sensor with PWM control function)

<table>
<thead>
<tr>
<th>Operating voltage range</th>
<th>PWM duty cycle</th>
<th>PWM duty - Speed characteristics example</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Voltage: 48 VDC</th>
<th>PWM frequency: 25 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 V/60 V</td>
<td>36 V</td>
</tr>
<tr>
<td>Fan speed</td>
<td>3100 min⁻¹</td>
</tr>
</tbody>
</table>

Voltage: 48 VDC
PWM frequency: 25 kHz
**Dimensions (unit: mm)**

- Airflow direction
- Rotating direction

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

**Fan side**

**Inlet nozzle side**

**Reference Diagram for Mounting**

- Inlet nozzle
- Finger guard
- Fan

**Options**

- Finger guards: Model no.: 109-722
- Inlet nozzle: Model no.: 109-1073, 109-1073H

**Options**

- Lead wire
  - AWG24
  - UL 1430

**Options**

- Bolt length: 4 to 6 mm.
  - To prevent bolts from loosening, use plain washers and spring washers.
Splash Proof Centrifugal Fan

San Ace 221W 9W2T type △ UL us

Ø221×71 mm

General Specifications

- Material: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life: See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
- Motor protection function: Locked rotor burnout protection, Reverse polarity protection
- Dielectric strength: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- Sound pressure level (SPL): At 1 m away from the air inlet
- Storage temperature: -30 to +70°C (Non-condensing)
- Lead wire: Red, Black, Yellow, Brown
- Mass: 1250 g
- Ingress protection: IP56

Specifications

When the optional inlet nozzle (109-1 135H) is mounted.

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

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>9W2TP48POS001</td>
<td>48</td>
<td>36 to 72</td>
<td>100</td>
<td>2.3</td>
<td>110.4</td>
<td>3400</td>
<td>19.6</td>
<td>73.5</td>
<td>4300</td>
<td>40˚C to 70˚C</td>
<td>40000/60˚C</td>
</tr>
<tr>
<td>9W2TP48POS001</td>
<td>48</td>
<td>36 to 72</td>
<td>100</td>
<td>2.3</td>
<td>110.4</td>
<td>3400</td>
<td>19.6</td>
<td>73.5</td>
<td>4300</td>
<td>40˚C to 70˚C</td>
<td>40000/60˚C</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%.

Max input of 9W2TP24P0H001: 150 W, 9W2TP48P0S001: 210 W at rated voltage.

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

9W2TP24P0H001 With pulse sensor with PWM control function

<table>
<thead>
<tr>
<th>PWM duty cycle</th>
<th>Operating voltage range</th>
<th>PWM duty - Speed characteristics example</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 VDC</td>
<td>100%</td>
<td>Voltage: 24 VDC / PWM frequency: 25 kHz</td>
</tr>
</tbody>
</table>

9W2TP48POS001 With pulse sensor with PWM control function

<table>
<thead>
<tr>
<th>PWM duty cycle</th>
<th>Operating voltage range</th>
<th>PWM duty - Speed characteristics example</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 VDC</td>
<td>100%</td>
<td>Voltage: 48 VDC / PWM frequency: 25 kHz</td>
</tr>
</tbody>
</table>
### Dimensions (unit: mm)

- **Lead wire**
  - AWG 18
  - UL 1430

- **Airflow direction**

- **Rotating direction**
  - 4-M4
  - ø118.6±1

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

#### Fan side

- 4-ø4.5±0.5

#### Inlet nozzle side

- ø58±0.5

### Reference Diagram for Mounting

- **Finger guard**
- **Inlet nozzle**
- **Fan**

- **Bolt length**: 6 mm max.

### Options

- **Finger guards**
  - Model no.: 109-1138H
  - page: p. 516

- **Inlet nozzle**
  - Model no.: 109-1135H
  - page: p. 518
San Ace 225W 9W2T type

General Specifications

- **Material**: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- **Expected life**: See the table below. (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
- **Motor protection function**: Locked rotor burnout protection, Reverse polarity protection
- **Dielectric strength**: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- **Insulation resistance**: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- **Sound pressure level (SPL)**: At 1 m away from the air inlet
- **Storage temperature**: -30 to +70°C (Non-condensing)
- **Lead wire**: Red, Black, Yellow, Control, Brown
- **Mass**: 1500 g
- **Ingress protection**: IP56

Specifications

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

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

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>9W2TS48P0S001</td>
<td>48</td>
<td>36 to 72</td>
<td>100</td>
<td>2.45</td>
<td>117.6</td>
<td>3000</td>
<td>23.5</td>
<td>830</td>
<td>635</td>
<td>2.55</td>
<td>72.0</td>
<td>-25 to +70</td>
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<td></td>
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<td></td>
<td></td>
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<td>[40000/60˚C, 70000/40˚C]</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%.

Max input is 220 W at rated voltage.

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

PWM duty cycle

Operating voltage range

PWM duty - Speed characteristics example

Voltage: 48 VDC

PWM frequency: 25 kHz

Fan speed: 3000 min⁻¹
**Dimensions (unit: mm)**

- Airflow direction
- Rotating direction
- Lead wire
  - AWG 18
  - UL 1430
- 4-M4
- ø118.6±1

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

- Fan side
- Inlet nozzle side
- ø225.0
- ø153.0
- 99.0±1.5
- 90.4±1.5
- 90°
- 45°
- ø18.6±1
- ø58.0
- ±0.3
- ø200±0.5
- ø210±0.5
- (10)
- (70)
- 90°
- Inlet nozzle side
- ø225.0
- ø153.0
- 99.0±1.5
- 90.4±1.5

**Reference Diagram for Mounting**

- Finger guard
- Inlet nozzle
- Fan
- Bolt length: 6 mm max.

**Options**

- Finger guards
  - Model no.: 109-1137H
  - page: p. 516
- Inlet nozzle
  - Model no.: 109-1134H
  - page: p. 518
# Centrifugal Fan

Cooling fan blows air in a centrifugal course. It features high static pressure.

Related product: Splash Proof Centrifugal Fan p. 319

## Model Numbering System

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

<table>
<thead>
<tr>
<th>9T</th>
<th>M</th>
<th>48</th>
<th>P</th>
<th>4</th>
<th>H</th>
<th>01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type name</td>
<td>Impeller size</td>
<td>Voltage</td>
<td>PWM control/fixed</td>
<td>Thickness</td>
<td>Speed code</td>
<td>Individual customer’s spec (2 to 3 digits)</td>
</tr>
</tbody>
</table>

## Bracket-mounted Centrifugal Fan

<table>
<thead>
<tr>
<th>9B1T</th>
<th>P</th>
<th>48</th>
<th>P</th>
<th>0</th>
<th>H</th>
<th>001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type name</td>
<td>Impeller size</td>
<td>Voltage</td>
<td>PWM control/fixed</td>
<td>Thickness</td>
<td>Speed code</td>
<td>Individual customer’s spec (2 digits)</td>
</tr>
</tbody>
</table>

### How to Read Specifications (DC fan)

- **Rated voltage**
  - This is the necessary voltage to drive the fan. E.g.) 12 VDC, 24 VDC, 48 VDC

- **Operating voltage range**
  - The voltage range over which fan operation is guaranteed.

- **Rated current**
  - The current when the fan is operating at rated voltage (at free air).

- **Rated input**
  - The power value when the fan is operating at rated voltage (at free air).

- **Rated speed**
  - The speed when the fan is operating at rated voltage (at free air).

- **Max. airflow**
  - The maximum airflow that the fan can generate during rated operation (measured with our double chamber measuring device). Airflow is the volume of air generated by the fan per unit of time.

- **Max. static pressure**
  - The maximum static pressure value that the fan can produce during rated operation (measured with our double chamber measuring device). Static pressure indicates a fan’s ability to move air against resistance due to the internal structure of the device to which the fan is installed.

- **SPL**
  - SPL stands for Sound Pressure Level. The noise level during the fan’s rated operation. Please refer to the technical material section for the measurement method.

- **Operating temperature**
  - The temperature range over which fan operation is guaranteed (Non-condensing).

- **Expected life**
  - Service life hours that 90% of bearings will survive without failing when continuously operated at the rated voltage and 60°C temperature. Expected life at 40°C is for reference only.

For more information, please refer to the technical material section.
**Specifications**

When the optional inlet nozzle (109-1080) is mounted.

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

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9TM24P4H01</td>
<td>24</td>
<td>21.6 to 26.4</td>
<td>100</td>
<td>0.44</td>
<td>10.56</td>
<td>6400</td>
<td>1.77</td>
<td>62.5</td>
<td>560</td>
<td>-20 to +70</td>
<td>40000/60˚C</td>
</tr>
<tr>
<td>9TM48P4H01</td>
<td>48</td>
<td>36 to 60</td>
<td>100</td>
<td>0.22</td>
<td>10.56</td>
<td>6400</td>
<td>1.77</td>
<td>62.5</td>
<td>560</td>
<td>-30 to +70 (Non-condensing)</td>
<td>40000/60˚C</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz
Max input is 14 W at rated voltage.

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

**9TM24P4H01** with pulse sensor with PWM control function

**9TM48P4H01** with pulse sensor with PWM control function
### Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

**Fan side**

- Diameter: Ø56 ± 0.5
- Angle: 120°

**Inlet nozzle side**

- Diameter: Ø116.6 ± 0.5
- Diameter: Ø106 ± 0.5

### Reference Diagram for Mounting

![Reference Diagram for Mounting](image)

Bolt length: 5 mm max.

### Options

**Finger guards**

- Model no.: 109-099E, 109-099H
- Page: p. 513

**Inlet nozzle**

- Model no.: 109-1080
- Page: p. 518
**General Specifications**

- **Material**: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- **Expected life**: See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
- **Motor protection function**: Locked rotor burnout protection, Reverse polarity protection
- **Dielectric strength**: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- **Insulation resistance**: >10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- **Sound pressure level (SPL)**: At 1 m away from the air inlet
- **Storage temperature**: -30 to +70°C (Non-condensing)
- **PWM duty cycle**: See the table below. (PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%)

### Specifications

When the optional inlet nozzle (109-1069) is mounted. The models listed below have pulse sensors with PWM control function.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9TJ24P0H61</td>
<td>24</td>
<td>20.4 to 27.6</td>
<td>100</td>
<td>1.2</td>
<td>28.8</td>
<td>4150</td>
<td>6.39</td>
<td>226</td>
<td>395</td>
<td>1.59</td>
<td>-20 to +70</td>
<td>40000/60˚C</td>
</tr>
<tr>
<td>9TJ48P0H01</td>
<td>48</td>
<td>36 to 72</td>
<td>100</td>
<td>0.55</td>
<td>26.4</td>
<td>4150</td>
<td>6.39</td>
<td>226</td>
<td>395</td>
<td>1.59</td>
<td>-20 to +70</td>
<td>40000/60˚C</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%.

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

**9TJ24P0H61** With pulse sensor with PWM control function

- **PWM duty cycle**
- **Operating voltage range**
- **PWM duty - Speed characteristics example**

**9TJ48P0H01** With pulse sensor with PWM control function

- **PWM duty cycle**
- **Operating voltage range**
- **PWM duty - Speed characteristics example**
**Dimensions (unit: mm)**

- Lead wire: AWG24 UL 1430
- Rotating direction
- Airflow direction

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

**Fan side**

**Inlet nozzle side**

**Reference Diagram for Mounting**

- Finger guard
- Inlet nozzle

**Options**

- **Finger guards**
  - Model no.: 109-1112
  - page: p. 514

- **Inlet nozzle**
  - Model no.: 109-1069, 109-1069H
  - page: p. 518
Centrifugal Fan

Φ150×35 mm
San Ace C150 9T type  

General Specifications

- Material: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life: See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
- Motor protection function: Locked rotor burnout protection, Reverse polarity protection
- Dielectric strength: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- Sound pressure level (SPL): At 1 m away from the air inlet
- Storage temperature: -30 to +70°C (Non-condensing)
- Lead wire: Red, Black, Yellow, Control, Brown
- Mass: 330 g

Specifications

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

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>9TN24P1H01</td>
<td>24</td>
<td>20.4 to 27.6</td>
<td>100</td>
<td>0.62</td>
<td>14.9</td>
<td>3800</td>
<td>3.83</td>
<td>135</td>
<td>-20 to +70</td>
<td>4000/60°C</td>
</tr>
<tr>
<td>9TN48P1H01</td>
<td>48</td>
<td>36.0 to 55.2</td>
<td>100</td>
<td>0.32</td>
<td>15.4</td>
<td>3800</td>
<td>3.83</td>
<td>135</td>
<td>-20 to +70</td>
<td>4000/60°C</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%.

Max input of 9TN24P1H01: 21.4 W, 9TN48P1H01: 22 W.

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

9TN24P1H01 With pulse sensor with PWM control function

PWM duty cycle

Operating voltage range

PWM duty - Speed characteristics example

9TN48P1H01 With pulse sensor with PWM control function

PWM duty cycle

Operating voltage range

PWM duty - Speed characteristics example
### Dimensions (unit: mm)

Airflow direction

Rotating direction

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

#### Fan side

#### Inlet nozzle side

### Reference Diagram for Mounting

Bolt length: 4 to 6 mm.

### Options

#### Finger guards

Model no.: 109-1104, 109-1104H

#### Inlet nozzle

Model no.: 109-1081, 109-1081H
**Centrifugal Fan**

San Ace C175 9T type

**General Specifications**

- **Material**
  - Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)

- **Expected life**
  - See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60˚C, rated voltage)

- **Motor protection function**
  - Locked rotor burnout protection, Reverse polarity protection

- **Dielectric strength**
  - 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)

- **Insulation resistance**
  - 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)

- **Sound pressure level (SPL)**
  - At 1 m away from the air inlet

- **Storage temperature**
  - -30 to +70˚C (Non-condensing)

- **Lead wire**
  - Red, Black, Sensor, Yellow, Control, Brown

- **Mass**
  - 720 g

**Specifications**

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

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

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9TGA24P0H001</td>
<td>24</td>
<td>16 to 36</td>
<td>100</td>
<td>4.8</td>
<td>115</td>
<td>4950</td>
<td>15.3</td>
<td>541</td>
<td>830</td>
<td>3.33</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td>0.14</td>
<td>3.36</td>
<td>800</td>
<td>2.5</td>
<td>88.3</td>
<td>21.8</td>
<td>0.088</td>
<td>38</td>
</tr>
<tr>
<td>9TGA48P0G001</td>
<td>48</td>
<td>36 to 72</td>
<td>100</td>
<td>3.5</td>
<td>168</td>
<td>5700</td>
<td>17.6</td>
<td>622</td>
<td>1100</td>
<td>4.42</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td>0.07</td>
<td>3.36</td>
<td>800</td>
<td>2.5</td>
<td>88.3</td>
<td>21.8</td>
<td>0.088</td>
<td>38</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%.
Max input of 9TGA24P0H001: 210 W, 9TGA48P0G001: 325 W at rated voltage.

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

**9TGA24P0H001** With pulse sensor with PWM control function

PWM duty cycle

Operating voltage range

PWM duty - Speed characteristics example

<table>
<thead>
<tr>
<th>Voltage: 24 VDC PWM frequency: 25 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage: 48 VDC PWM frequency: 25 kHz</td>
</tr>
</tbody>
</table>

**9TGA48P0G001** With pulse sensor with PWM control function

PWM duty cycle

Operating voltage range

PWM duty - Speed characteristics example

<table>
<thead>
<tr>
<th>Voltage: 48 VDC PWM frequency: 25 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage: 36 V PWM frequency: 25 kHz</td>
</tr>
</tbody>
</table>

420
**Dimensions (unit: mm)**

![Dimension Diagram](image)

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

<table>
<thead>
<tr>
<th>Fan side</th>
<th>Inlet nozzle side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø177.5±1</td>
<td>Ø177.5±1</td>
</tr>
<tr>
<td>Ø173±1</td>
<td>Ø173±1</td>
</tr>
<tr>
<td>Ø58±0.5</td>
<td>Ø58±0.5</td>
</tr>
<tr>
<td>45°</td>
<td>45°</td>
</tr>
<tr>
<td>Ø158±0.5</td>
<td>Ø158±0.5</td>
</tr>
<tr>
<td>Ø148±0.5</td>
<td>Ø148±0.5</td>
</tr>
</tbody>
</table>

**Reference Diagram for Mounting**

![Reference Diagram](image)

**Options**

<table>
<thead>
<tr>
<th>Finger guards</th>
<th>Inlet nozzle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model no.: 109-722</td>
<td>Model no.: 109-1073, 109-1073H</td>
</tr>
</tbody>
</table>

*Lead wire: AWG20, UL 3266*

*Bolt length: 6 mm max.*
## General Specifications
- Material: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life: See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
- Motor protection function: Locked rotor burnout protection, Reverse polarity protection
- Dielectric strength: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- Sound pressure level (SPL): At 1 m away from the air inlet
- Storage temperature: -30 to +70°C (Non-condensing)
- Lead wire: Red, Black, Sensor, Yellow, Control, Brown
- Mass: 750 g

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

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

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9TG24P0G01</td>
<td>24</td>
<td>20.4 to 27.6</td>
<td>100</td>
<td>3.9</td>
<td>93.6</td>
<td>4700</td>
<td>14.0</td>
<td>494.7</td>
<td>885</td>
<td>3.55</td>
<td>-20 to +60</td>
</tr>
<tr>
<td>9TG24P0S01</td>
<td>2.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-20 to +70</td>
</tr>
<tr>
<td>9TG48P0G01</td>
<td>1.95</td>
<td>36 to 55.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40000/60°C</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%. Max input is 130 W at rated voltage.

Other sensor specifications are available as options. Refer to the index (p. 558).

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

#### 9TG24P0G01 With pulse sensor with PWM control function

**PWM duty cycle**

![PWM duty cycle graph]

**Operating voltage range**

![Operating voltage range graph]

**PWM duty - Speed characteristics example**

![PWM duty - Speed characteristics graph]

#### 9TG24P0S01 With pulse sensor with PWM control function

**PWM duty cycle**

![PWM duty cycle graph]

**Operating voltage range**

![Operating voltage range graph]

**PWM duty - Speed characteristics example**

![PWM duty - Speed characteristics graph]
### Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example

**PWM duty cycle**

![PWM duty cycle graph](image1)

**Operating voltage range**

![Operating voltage range graph](image2)

**PWM duty - Speed characteristics example**

![PWM duty - Speed characteristics example graph](image3)

### Dimensions (unit: mm)

- **Lead wire**
  - **AWG22 (Model: 9TG24P0G01)**
  - **AWG24 (Model: 9TG24P0S01, 9TG48P0G01)**

![Dimensions diagram](image4)

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

- **Fan side**
- **Inlet nozzle side**

![Reference Dimensions diagram](image5)
Bolt length: 4 to 6 mm. To prevent bolts from loosening, use plain washers and spring washers.

Finger guards  page: p. 514
Model no.: 109-722

Inlet nozzle  page: p. 518
Model no.: 109-1073, 109-1073H
Centrifugal Fan

San Ace C221 9T type

General Specifications

- Material: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life: See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
- Motor protection function: Locked rotor burnout protection, Reverse polarity protection
- Dielectric strength: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- Sound pressure level (SPL): At 1 m away from the air inlet
- Storage temperature: -30 to +70°C (Non-condensing)
- Lead wire: □Red □Black □Sensor □Yellow □Control □Brown
- Mass: 1050 g

Specifications

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

<table>
<thead>
<tr>
<th>Model no.</th>
<th>Rated voltage (V)</th>
<th>Operating voltage range (V)</th>
<th>PWM duty cycle (%)</th>
<th>Rated current (A)</th>
<th>Rated input (W)</th>
<th>Rated speed (min⁻¹)</th>
<th>Max. airflow (m³/min)</th>
<th>Max. static pressure (Pa)</th>
<th>SPL (dB(A))</th>
<th>Operating temperature (°C)</th>
<th>Expected life (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9TP24P0H001</td>
<td>24</td>
<td>16 to 36</td>
<td>100</td>
<td>3.2</td>
<td>76.8</td>
<td>3050</td>
<td>17.6</td>
<td>622</td>
<td>530</td>
<td>2.13</td>
<td>-20 to +70</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td>0.4</td>
<td>9.6</td>
<td>1000</td>
<td>5.75</td>
<td>203</td>
<td>57.4</td>
<td>0.23</td>
<td>53</td>
</tr>
<tr>
<td>9TP48P0G001</td>
<td>48</td>
<td>36 to 72</td>
<td>100</td>
<td>2.75</td>
<td>132</td>
<td>3650</td>
<td>21</td>
<td>742</td>
<td>760</td>
<td>3.05</td>
<td>-20 to +60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td>0.2</td>
<td>9.6</td>
<td>1000</td>
<td>5.75</td>
<td>203</td>
<td>57.4</td>
<td>0.23</td>
<td>53</td>
</tr>
<tr>
<td>9TP48P0H001</td>
<td>100</td>
<td>15</td>
<td>100</td>
<td>1.6</td>
<td>76.8</td>
<td>3050</td>
<td>17.6</td>
<td>622</td>
<td>530</td>
<td>2.13</td>
<td>-20 to +70</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td>0.2</td>
<td>9.6</td>
<td>1000</td>
<td>5.75</td>
<td>203</td>
<td>57.4</td>
<td>0.23</td>
<td>53</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%.

Max input of 9TP48PG001: 280 W, 9TP24P0H001/9TP48P0H001: 160 W at rated voltage.

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

9TP24P0H001 With pulse sensor with PWM control function

PWM duty cycle Operating voltage range PWM duty - Speed characteristics example

![Airflow-Static Pressure Characteristics](image1)

![PWM Duty-Speed Characteristics Example](image2)

Voltage: 24 VDC
PWM frequency: 25 kHz
Fan Speed: 3050 min⁻¹
**Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example**

9TP48P0G001  With pulse sensor with PWM control function

<table>
<thead>
<tr>
<th>Operating voltage range</th>
<th>PWM duty - Speed characteristics example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage: 48 VDC</td>
<td>Voltage: 48 VDC</td>
</tr>
<tr>
<td>PWM frequency: 25 kHz</td>
<td>PWM frequency: 25 kHz</td>
</tr>
<tr>
<td>Fan speed (min⁻¹)</td>
<td>3650 min⁻¹</td>
</tr>
</tbody>
</table>

9TP48P0H001  With pulse sensor with PWM control function

<table>
<thead>
<tr>
<th>Operating voltage range</th>
<th>PWM duty - Speed characteristics example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage: 48 VDC</td>
<td>Voltage: 48 VDC</td>
</tr>
<tr>
<td>PWM frequency: 25 kHz</td>
<td>PWM frequency: 25 kHz</td>
</tr>
<tr>
<td>Fan speed (min⁻¹)</td>
<td>3050 min⁻¹</td>
</tr>
</tbody>
</table>

**Dimensions (unit: mm)**

Airflow direction: 71±1, 63.5±1

Lead wire: AWG20 or AWG22

Airflow direction: 45°+1°, 30°0°, 4-M4

Rotating direction: 90°±0.3, ø104±1
**Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)**

**Reference Diagram for Mounting** Bracket-mounted model of this fan is available. For details, refer to pp. 430 to 432.

**Options**

<table>
<thead>
<tr>
<th>Finger guards</th>
<th>page: p. 516</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model no.: 109-1138</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inlet nozzle</th>
<th>page: p. 518</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model no.: 109-1135</td>
<td></td>
</tr>
</tbody>
</table>
Centrifugal Fan

San Ace C225  9T type

**General Specifications**

- **Material**: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- **Expected life**: See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60˚C, rated voltage)
- **Motor protection function**: Locked rotor burnout protection, Reverse polarity protection
- **Dielectric strength**: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- **Insulation resistance**: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- **Sound pressure level (SPL)**: At 1 m away from the air inlet
- **Storage temperature**: -30 to +70˚C (Non-condensing)
- **Lead wire**: Red, Black, Sensor, Yellow, Control, Brown
- **Mass**: 1220 g

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

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9TS48POG001</td>
<td>48</td>
<td>36 to 72</td>
<td>100</td>
<td>3.65</td>
<td>175.2</td>
<td>3550</td>
<td>28.1</td>
<td>992</td>
<td>3.46</td>
<td>-20 to +60</td>
<td>4000/60˚C</td>
<td></td>
</tr>
<tr>
<td>9TS48POH001</td>
<td>100</td>
<td>380 to 72</td>
<td>100</td>
<td>2.08</td>
<td>99.8</td>
<td>2900</td>
<td>22.7</td>
<td>802</td>
<td>2.37</td>
<td>-20 to +70</td>
<td>(1000/40˚C)</td>
<td></td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%. Max input of 9TS48POG001: 380 W, 9TS48POH001: 200 W at rated voltage.

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

**9TS48POG001** With pulse sensor with PWM control function

**PWM duty cycle**

<table>
<thead>
<tr>
<th>Static pressure [(inch H₂O) (Pa)]</th>
<th>Airflow [m³/min] (CFM)</th>
<th>Operating voltage range [V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>48VDC</td>
<td>100%</td>
<td>48V/72V</td>
</tr>
<tr>
<td>15%</td>
<td>0.5</td>
<td>36V</td>
</tr>
<tr>
<td>10%</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>7.5%</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>2.5%</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>1.5%</td>
<td>1.75</td>
<td></td>
</tr>
<tr>
<td>1%</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>0.5%</td>
<td>2.25</td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td>2.5</td>
<td></td>
</tr>
</tbody>
</table>

**Operating voltage range**

<table>
<thead>
<tr>
<th>Static pressure [(inch H₂O) (Pa)]</th>
<th>Airflow [m³/min] (CFM)</th>
<th>Operating voltage range [V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>48VDC</td>
<td>100%</td>
<td>48V/72V</td>
</tr>
<tr>
<td>15%</td>
<td>0.5</td>
<td>36V</td>
</tr>
<tr>
<td>10%</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>7.5%</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>2.5%</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>1.5%</td>
<td>1.75</td>
<td></td>
</tr>
<tr>
<td>1%</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>0.5%</td>
<td>2.25</td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td>2.5</td>
<td></td>
</tr>
</tbody>
</table>

**9TS48POH001** With pulse sensor with PWM control function

**PWM duty cycle**

<table>
<thead>
<tr>
<th>Static pressure [(inch H₂O) (Pa)]</th>
<th>Airflow [m³/min] (CFM)</th>
<th>Operating voltage range [V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>48VDC</td>
<td>100%</td>
<td>48V/72V</td>
</tr>
<tr>
<td>15%</td>
<td>0.5</td>
<td>36V</td>
</tr>
<tr>
<td>10%</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>7.5%</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>2.5%</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>1.5%</td>
<td>1.75</td>
<td></td>
</tr>
<tr>
<td>1%</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>0.5%</td>
<td>2.25</td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td>2.5</td>
<td></td>
</tr>
</tbody>
</table>

**Operating voltage range**

<table>
<thead>
<tr>
<th>Static pressure [(inch H₂O) (Pa)]</th>
<th>Airflow [m³/min] (CFM)</th>
<th>Operating voltage range [V]</th>
</tr>
</thead>
<tbody>
<tr>
<td>48VDC</td>
<td>100%</td>
<td>48V/72V</td>
</tr>
<tr>
<td>15%</td>
<td>0.5</td>
<td>36V</td>
</tr>
<tr>
<td>10%</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>7.5%</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>2.5%</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>1.5%</td>
<td>1.75</td>
<td></td>
</tr>
<tr>
<td>1%</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>0.5%</td>
<td>2.25</td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td>2.5</td>
<td></td>
</tr>
</tbody>
</table>


**Dimensions (unit: mm)**

- Airflow direction
- Rotating direction

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

- Fan side
- Inlet nozzle side

**Reference Diagram for Mounting**

Bracket-mounted model of this fan is available. For details, refer to pp. 433 to 434.

**Options**

- Finger guards
  - Model no.: 109-1137
  - page: p. 516

- Inlet nozzle
  - Model no.: 109-1134
  - page: p. 518
**General Specifications**

- Material: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life: See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)
- Motor protection function: Locked rotor burnout protection, Reverse polarity protection
  
  For details, please refer to p. 529.
- Dielectric strength: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- Sound pressure level (SPL): At 1 m away from the air inlet
- Storage temperature: -30 to +70°C (Non-condensing)
- Lead wire: Red, Black, Yellow, Control, Brown
- Mass: 1700 g

**Specifications**

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

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>9B1TP24P0H001</td>
<td>24</td>
<td>16 to 36</td>
<td>100</td>
<td>3.2</td>
<td>76.8</td>
<td>3050</td>
<td>17.6</td>
<td>622</td>
<td>530</td>
<td>2.13</td>
<td>71</td>
</tr>
<tr>
<td>9B1TP48P0G001</td>
<td>48</td>
<td>36 to 72</td>
<td>100</td>
<td>2.75</td>
<td>132</td>
<td>3850</td>
<td>21.0</td>
<td>742</td>
<td>760</td>
<td>3.05</td>
<td>74</td>
</tr>
<tr>
<td>9B1TP48P0H001</td>
<td>100</td>
<td>16 to 36</td>
<td>100</td>
<td>1.6</td>
<td>76.8</td>
<td>3050</td>
<td>17.6</td>
<td>622</td>
<td>530</td>
<td>2.13</td>
<td>71</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%.

Max input of 9B1TP24P0H001/9B1TP48P0H001: 160 W, 9B1TP48P0G001: 280 W at rated voltage.

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

**9B1TP24P0H001** With pulse sensor with PWM control function

![Airflow - Static Pressure Characteristics](image)

- Operating voltage range
- PWM duty cycle 100%
- Voltage: 24VDC
- PWM frequency: 25 kHz

![Fan Speed vs. Voltage](image)

- Fan speed
- Voltage: 24VDC
- PWM frequency: 25 kHz

![PWM Duty Cycle](image)

- PWM duty cycle
- Voltage: 24VDC
- PWM frequency: 25 kHz
**Airflow - Static Pressure Characteristics / PWM Duty - Speed Characteristics Example**

**PWM duty cycle**

![Graph showing airflow and static pressure characteristics](image1)

**Operating voltage range**

![Graph showing airflow and static pressure characteristics](image2)

**PWM duty - Speed characteristics example**

![Graph showing fan speed and PWM duty](image3)

**Dimensions (unit: mm)**

![Diagram showing dimensions](image4)
### Reference Dimensions of Mounting Holes and Vent Opening (unit: mm)

Inlet panel side

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>247.5±0.5</td>
<td></td>
</tr>
<tr>
<td>ø294.5±0.5</td>
<td></td>
</tr>
<tr>
<td>45°</td>
<td>(Each)</td>
</tr>
</tbody>
</table>

### Reference Diagram for Mounting

Finger guard 109-1146 should be mounted with four holes as in the drawing.

### Options

**Finger guards**

Model no.: 109-1146

Page: p. 517
Bracket-mounted Centrifugal Fan

270×270×119 mm

San Ace C270 9B1T type

- Material: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life: See the table below. (L10 life: 90% survival rate for continuous operation in free air at 60˚C, rated voltage)
- Motor protection function: Locked rotor burnout protection, Reverse polarity protection
- Dielectric strength: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and motor case)
- Insulation resistance: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and motor case)
- Sound pressure level (SPL): At 1 m away from the air inlet
- Storage temperature: -30 to +70˚C (Non-condensing)
- Lead wire: Red, Black, Yellow, Brown
- Mass: 1920 g

Specifications

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

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>9B1TS48P0G001</td>
<td>48</td>
<td>36 to 72</td>
<td>100</td>
<td>3.65</td>
<td>175.2</td>
<td>3550</td>
<td>28.1</td>
<td>982</td>
<td>-20 to +60</td>
<td>40000/60˚C</td>
</tr>
<tr>
<td>9B1TS48P0H001</td>
<td>48</td>
<td>36 to 72</td>
<td>100</td>
<td>2.08</td>
<td>99.8</td>
<td>2900</td>
<td>22.7</td>
<td>802</td>
<td>-20 to +60</td>
<td>40000/60˚C</td>
</tr>
</tbody>
</table>

* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%. Max input of 9B1TS48P0G001: 380 W, 9B1TS48P0H001: 200 W at rated voltage.

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

9B1TS48P0G001 With pulse sensor with PWM control function

Pulse waveform: 48 VDC

PWM duty cycle

Operating voltage range

PWM duty - Speed characteristics example

9B1TS48P0H001 With pulse sensor with PWM control function

PWM duty cycle

Operating voltage range

PWM duty - Speed characteristics example
**Dimensions (unit: mm)**

![Dimension Diagram]

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

![Reference Dimension Diagram]

**Reference Diagram for Mounting**

Finger guard 109-1146 should be mounted with four holes as in the drawing.

![Mounting Diagram]

**Options**

<table>
<thead>
<tr>
<th>Finger guards</th>
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</thead>
<tbody>
<tr>
<td>Model no.: 109-1146</td>
</tr>
</tbody>
</table>