San Ace 225W
Bracket-mounted Splash Proof Centrifugal Fan

Features

Maximizes Strengths of the Centrifugal Fan
To maximize fan performance, an air inlet needs to be precisely mounted to the fan. Bracket-mounted centrifugal fan has an air inlet and a mounting bracket integrated in one unit. The precise assembly at factory ensures the optimized balance, helping the fan perform at its maximum potential.

Easy Installation
Centrifugal fan comes equipped with an air inlet and a mounting bracket, making your installation work easy.

Water and Dust Resistance
Its IP56-rated water and dust protection ensures stable fan operation even in harsh environments.

Specifications

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

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</thead>
<tbody>
<tr>
<td>9B1W2TS48P0S001</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>2.56</td>
<td>72.0</td>
</tr>
</tbody>
</table>

* PWM input frequency is 25 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.
Max input is 220 W at rated voltage.
Models with the following sensor specifications are also available as options: Without sensor Lock sensor

Common Specifications

- Material: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
  Bracket: Aluminum (Black coating), Plastic (Flammability: UL94V-0)
- Expected life: Refer to specifications
  (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
  Expected life at 40°C is for reference only.
- Motor protection function: Locked rotor burnout protection, Reverse polarity protection
- Dielectric strength: 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and bracket)
- Insulation resistance: 10 MΩ or more with a 500 VDC megger (between lead wire conductors and bracket)
- Sound pressure level (SPL): At 1 m away from the air inlet
- Storage temperature: -30 to +70°C (Non-condensing)
- Lead wire: Red, Black, Sensor, Yellow, Control, Brown
- Mass: 2200 g
- Ingress protection: IP56
PWM Input Signal Example

- **Input signal waveform**

  \[ T_1 \times 100 \%

  \]

- **VIH** = 4.75 to 5.25 V
- **VIL** = 0 to 0.4 V
- **PWM duty cycle (%)** =
- **PWM frequency** = 25 (kHz) =
- **Current source (I_{source})** = 1 mA max. (when control voltage is 0 V)
- **Current sink (I_{sink})** = 1 mA max. (when control voltage is 5.25 V)
- **Control terminal voltage** = 5.25 V max. (when control terminal is open)
- When the control terminal is open,
  - fan speed is the same as when PWM duty cycle is 100%
- Either TTL input, open collector or open drain can be used for PWM control input signal.

PWM Duty - Speed Characteristics Example

- **Voltage**: 48 VDC
- **PWM frequency**: 25 kHz

<table>
<thead>
<tr>
<th>Fan speed (min⁻¹)</th>
<th>4000</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWM duty cycle (%)</td>
<td>100</td>
</tr>
<tr>
<td>3000 min⁻¹</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td></td>
</tr>
</tbody>
</table>

Airflow - Static Pressure Characteristics

- **PWM duty cycle**

<table>
<thead>
<tr>
<th>Airflow (CFM)</th>
<th>Static pressure (inch H₂O)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0.5</td>
</tr>
<tr>
<td>10</td>
<td>1.0</td>
</tr>
<tr>
<td>15</td>
<td>1.5</td>
</tr>
<tr>
<td>20</td>
<td>2.0</td>
</tr>
<tr>
<td>25</td>
<td>2.5</td>
</tr>
<tr>
<td>30</td>
<td>3.0</td>
</tr>
</tbody>
</table>

- **Operating voltage range**

<table>
<thead>
<tr>
<th>Operating voltage range</th>
<th>Static pressure (inch H₂O)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48/72 V</td>
<td>0</td>
</tr>
<tr>
<td>36 V</td>
<td>1.0</td>
</tr>
</tbody>
</table>

![Graph of airflow vs. static pressure](image_url)
**PWM Input Signal Example**

Input signal waveform

V_H = 4.75 to 5.25 V  \( V_L = 0 \) to 0.4 V  

PWM duty cycle (\%) = \( \frac{T_1}{T} \times 100 \)  

PWM frequency 25 (kHz) = \( \frac{1}{T} \)  

Current source (I_{source}) = 1 mA max. (when control voltage is 0 V)  

Current sink (I_{sink}) = 1 mA max. (when control voltage is 5.25 V)  

Control terminal voltage = 5.25 V max. (when control terminal is open)  

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

**Example of Connection Schematic**

**Specifications for Pulse Sensors**

Output circuit: Open collector

Inside of DC fan

Pull-up resistor  

Pull-up voltage  

V_{CE}=+72 V max.  

I_c=10 mA max. \([V_{OL}=V_{CE} (SAT)=1 V max.]\)

Sensor output \((V_{CE})\)

Output waveform (Need pull-up resistor)  

In case of steady running

\[ T_{1 \text{ to } 4} \approx \frac{1}{4}T_0 \]  

\[ T_{1 \text{ to } 4} \approx \frac{1}{4}T_0 = 60/4N (s) \]  

N = Fan speed \( \text{(min}^{-1}) \)
Bracket-mounted Splash Proof Centrifugal Fan

**9B1W2TS type**

### Common Specifications

- **Material**
  - Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
  - Bracket: Aluminum (Black coating), Plastic (Flammability: UL94V-0)

- **Refer to specifications**
  - (L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)
  - Expected life at 40°C is for reference only.

- **Locked rotor burnout protection**
  - Reverse polarity protection

- **Motor protection function**
  - 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and bracket)

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

- **Insulation resistance**
  - 50/60 Hz, 500 VAC, for 1 minute (between lead wire conductors and bracket)

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

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

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

- **Motor case**
  - Red
  - Black

- **Sensor**
  - Yellow

- **Control**
  - Brown

- **Fan**
  - 2200 g

### Specifications

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</thead>
<tbody>
<tr>
<td>Without sensor</td>
<td>230</td>
<td>230 to 240</td>
<td>0.40</td>
<td>92</td>
<td>130</td>
<td>150</td>
<td>63</td>
<td>90</td>
<td>40000</td>
<td>70000</td>
<td>3000</td>
</tr>
<tr>
<td>Lock sensor</td>
<td>230</td>
<td>230 to 240</td>
<td>0.40</td>
<td>92</td>
<td>130</td>
<td>150</td>
<td>63</td>
<td>90</td>
<td>40000</td>
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### Notice

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

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https://www.sanyodenki.com

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