San Ace 40 GA type
High air flow and low power consumption fan

Features

Energy-saving
Power consumption is reduced to approx. 46 % compared with our conventional fan*1.

High static pressure and High air flow
Max. static pressure: increased to approx. 2 times
Max. air flow: increased to approx. 1.8 times compared with our conventional product*2.

Low sound pressure level
Sound pressure level is ideal while achieved air flow is increased compared with our conventional product *1.

*1: Specification of Model No. 9GA0412H7001. our conventional product is 40sq.x15mm thick. San Ace 40, Model No. 10P0412H701.
*2: Specification of Model No. 9GA0412P7G001. our conventional product is 40sq.x16mm thick. San Ace 40, Model No. 10P0412S701.

40 × 40 × 15 mm

Specifications

With PWM speed control function - With pulse sensor

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</thead>
<tbody>
<tr>
<td>9GA0412P7G001</td>
<td>12</td>
<td>10.2 to 13.8</td>
<td>100</td>
<td>0.17</td>
<td>2.04</td>
<td>13,100</td>
<td>0.36</td>
<td>12.7</td>
<td>192</td>
<td>0.77</td>
<td>42</td>
</tr>
<tr>
<td>9GA0412H7001</td>
<td>12</td>
<td>7 to 13.8</td>
<td>0.17</td>
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<td>13,100</td>
<td>0.36</td>
<td>12.7</td>
<td>192</td>
<td>0.77</td>
<td>42</td>
<td>10 to 70</td>
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</table>

Note: Does not rotate when PWM duty cycle is 0%.
Expected life at 40 degreeC ambient is just reference value.

With pulse sensor

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<td>13,100</td>
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<td>192</td>
<td>0.77</td>
<td>42</td>
</tr>
<tr>
<td>9GA0412H7001</td>
<td>12</td>
<td>7 to 13.8</td>
<td>0.06</td>
<td>0.72</td>
<td>7,300</td>
<td>0.2</td>
<td>7.1</td>
<td>69.6</td>
<td>0.24</td>
<td>28</td>
</tr>
</tbody>
</table>

Expected life at 40 degreeC ambient is just reference value.

Common Specifications

- Material: Frame, Impeller: Plastics (Flammability: UL94V-0)
- Life Expectancy: Varies for each model
  (L10: Survival rate: 90% at 60°C, rated voltage, and continuously run in a free air state)
- Motor Protection System: Current blocking function and Reverse polarity protection
- Dielectric Strength: 50/60 Hz, 500VAC, 1 minute (between lead conductor and frame)
- Sound Pressure Level (SPL): Expressed as the value at 1m from air inlet side
- Operating Temperature: Varies for each model (Non-condensing)
- Storage Temperature: −30°C to +70°C (Non-Condensing)
- Lead Wire: red: black: Sensor: yellow
  Control (With PWM speed control function): brown
- Mass: Approx. 28g
**Air Flow - Static Pressure Characteristics**

With PWM speed control function · With a pulse sensor

- **PWM Duty Cycle**

<table>
<thead>
<tr>
<th>Static Pressure (inch H2O) (Pa)</th>
<th>DC12V</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>50%</td>
</tr>
<tr>
<td>0.2</td>
<td>100%</td>
</tr>
</tbody>
</table>

- **Operating Voltage Range**

<table>
<thead>
<tr>
<th>Static Pressure (inch H2O) (Pa)</th>
<th>PWM Duty Cycle100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>13.8V</td>
</tr>
<tr>
<td>0.2</td>
<td>12V</td>
</tr>
<tr>
<td>0.3</td>
<td>10.2V</td>
</tr>
</tbody>
</table>

**PWM Duty - Speed Characteristics Example**

Voltage : DC12V  
PWM Frequency : 25kHz

![Graph showing speed vs. PWM duty cycle]

- **PWM Input Signal Example**

Input Signal Wave Form

- $V_{IH}$
- $V_{IL}$

\[
V_{IL} = 0V \text{ to } 0.4V \\
V_{IH} = 4.75V \text{ to } 5.25V \\
PWM Duty Cycle (%) = \frac{T_1}{T} \times 100 \\
PWM Frequency 25 (kHz) = \frac{1}{T_0} \\
Source Current (I_{source}) = 1mA \text{ Max. at control voltage 0V} \\
Sink Current (I_{sink}) = 1mA \text{ Max. at control voltage 5.25V} \\
Control Terminal Voltage = 5.25V \text{ Max. (Open Circuit)} \\
When the control lead wire is open, speed is same as one at 100% PWM duty cycle.

This fan speed should be controlled by PWM input signal of either TTL input or open collector, drain input.
**PWM Duty Cycle**

With PWM speed control function

With a pulse sensor

**Operating Voltage Range**

**Air Flow - Static Pressure Characteristics**

- Static Pressure
- Air Flow

<table>
<thead>
<tr>
<th>DC12V</th>
<th>13.8V</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.1</td>
</tr>
<tr>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>0.4</td>
<td>0.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Static Pressure (in H2O)</th>
<th>Static Pressure (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7V</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>12V</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>13.8V</td>
<td>0.5</td>
<td>0.6</td>
</tr>
</tbody>
</table>

**Connection Schematic**

DC fan input voltage

PWM Input Signal

Control

I_{source}

I_{sink}

Inside of DC fan

**Specifications for Pulse Sensors**

Output circuit: Open collector

Output waveform (Need pull-up resistor)

Inside of DC fan

Sensor

Pull-up resistor

Sensor output

V_{source}

V_{sink}

0V

In case of steady running

\[ T_1 = \frac{1}{4} T_0 \]

\[ T_1 = \frac{1}{4} T_0 = 60/4N \text{ (sec)} \]

\[ N = \text{Fan speed (min}^{-1} \text{)} \]
**Dimensions (unit : mm)** (With PWM speed control function · With pulse sensor)

![Diagram of dimensions]

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

![Diagram of reference dimensions]

**Notice**

- The products shown in the catalog are subject to Japanese Export Control Law. Diversion contrary to the law of exporting country is prohibited.
- To protect against electrolytic corrosion that may occur in locations with strong electromagnetic noise, we provide fans that are unaffected by electrolytic corrosion.