San Ace C70 9TD type
Centrifugal Fan

Features

Compact, Thin Profile
This is the industry’s first centrifugal fan with an outer diameter of 70 mm and a thickness of 20 mm. It is suitable for mounting on small and thin equipment and integration in board modules.

High Airflow and High Static Pressure
This fan delivers a maximum airflow of 1.13 m³/min and a maximum static pressure of 560 Pa. Compared with the current model, the maximum airflow has increased approximately 3.9 times and maximum static pressure has increased approximately 1.9 times.

High Energy Efficiency and Low Noise
The PWM control function enables the control of fan speed, contributing to lowering noise and improving energy efficiency of devices.

70 × 20 mm

Specifications

When the optional inlet nozzle (109-1106) is mounted.

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<tbody>
<tr>
<td>9TD12P6G001</td>
<td>12</td>
<td>10.8 to 13.2</td>
<td>100</td>
<td>1.0</td>
<td>12</td>
<td>9200</td>
<td>1.13</td>
<td>39.9</td>
<td>560</td>
<td>2.24</td>
<td>-20 to +70</td>
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* PWM frequency: 25 kHz. Fan does not rotate when PWM duty cycle is 0%. Max input is 12.6 W at rated voltage.

Common Specifications

- Material: Motor case: Aluminum (Black coating), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life: Refer to specifications (L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage) Expected life at 40°C is for reference only.
- Motor protection system: Current blocking function and 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
- Operating temperature: Refer to specifications (Non-condensing)
- Storage temperature: -30 to +70°C (Non-condensing)
- Lead wire: Red, Black, Sensor, Yellow, Control, Brown
- Mass: Approx. 90 g
San Ace C70 STD type

**Airflow - Static Pressure Characteristics**

- **PWM duty cycle**
  - Operating voltage range

![Graph showing airflow vs. static pressure for different PWM duty cycles.]

- **Operating voltage range**
  - PWM duty cycle 100%

![Graph showing airflow vs. static pressure for different voltages.]

**PWM Duty - Speed Characteristics Example**

- Voltage: 12 VDC
- PWM frequency: 25 kHz

![Graph showing fan speed vs. PWM duty cycle.]

- Fan speed: 9200 min⁻¹
  - PWM frequency: 25 kHz

![Diagram showing connection schematic.]

**Specifications for Pulse Sensors**

- Output circuit: Open collector
- T1 to 4 ≒ (1/4) T0 = 60/4N (s)
- N = Fan speed (min⁻¹) (One revolution)

![Sensor output graph.]

- Sensor output: VCE = +13.2 V max.
- Ic = 5 mA max. [VOL = VCE (SAT) = 0.6 V max.]

![Diagram showing sensor output and pull-up resistor.]

- Pull-up voltage: 3 V
- 10 k/Ω
### PWM Input Signal Example

**Input signal waveform**

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

![Input signal waveform diagram]

$V_{in} = 4.75$ 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 ($I_{source}$) = $2$ 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

- **Input voltage**
- **Inside of fan**
- **PWM input signal**

![Diagram of connection schematic]

### Specifications for Pulse Sensors

Output circuit: Open collector

Inside of fan

- **Sensor**
- **Pull-up resistor**
- **Pull-up voltage**
- **Sensor output ($V_{CD}$)**

Output waveform (Need pull-up resistor)

In case of steady running

- **$T_{0}$**
- **$T_{1}$**
- **$T_{2}$**
- **$T_{3}$**

($One revolution$)

- $V_{in}$ = $4.75$ to $5.25$ V
- $V_{L}$ = $0$ to $0.4$ V

$V_{Z}$ = $13.2$ V max.

$I_{C}$ = $5$ mA max.  [$V_{id} = V_{CD}$ (SAT) = $0.6$ V max.]

$N$ = Fan speed  (min$^{-1}$)
### Dimensions (unit: mm)

**Fan**

- **Inlet nozzle side**
  - $120^\circ$ 
  - ø48±0.5

- **Fan side**
  - $120^\circ$

- **3-ø3.5**

- **ø77±0.5**

- **4-ø4.5**

- **ø87±0.5**

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

**Fan side**

- ø89±0.5

**Inlet nozzle side**

- ø98±1

### Reference Diagram for Mounting

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

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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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Specifications are subject to change without notice.