San Ace 136RF
Reversible Flow Fan

SANYO DENKI EUROPE SA. is pleased to introduce its new San Ace 136 9RF type DC fan, measuring 136mm diameter by 28mm thick. This reversible flow fan has been designed to deliver air flow in the two opposite directions, contributing to reduce equipment costs and to save space.

Features
1. Reduces the required number of fans
   - wind direction of the fan can be switched so fewer fans are required
   - reduces equipment costs and saves space
2. Same cooling performance in both directions
   - approximately same air flow and static pressure in both directions
3. PWM Speed Control Function
   - to manage power consumption and noise

Air Flow / Static Pressure Curves

Main Specifications 9RF serie
- Size: 136mm diameter by 28mm thick
- Air flow: 2m³/min - 70.7CFM
- Static pressure: forward: 102Pa - reverse: 104Pa
- Rated voltage: 12 or 24VDC depending on models
- Expected life time: 40,000 hours at 60°C
- Speed control: PWM (25kHz)
- Standard sensor: pulse sensor; without sensor & lock sensor (in option)

How to read Model Number*

PWM Duty Cycle / Speed

Target Applications
- House mechanical ventilation
- Air conditioner
- Cold drink vending machines
- Food display cases
- Printing machines
- Paper converting machines

For further information on reversible flow DC fans, please contact us at +33 1 48 63 26 61 or email us at info@sanyodenki.eu.
San Ace 136RF
Reversible Flow Fan

Features

Reduces the required number of fans
- Multiple fans are usually needed to blow air in both directions to ventilate houses, and to cool drink vending machines, food display cases, and printers.
- Wind direction of the fan can be switched so fewer fans are required.
- Reduces equipment costs and saves space.
- Rotational speed is controlled using an external PWM signal to deliver an appropriate rotational speed, reducing noise and saving energy.

Same cooling performance in both directions
- Has approximately the same airflow and static pressure in both blowing directions, so it is easy to control performance.

Specifications

The following nos. have PWM controls and pulse sensors.

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</thead>
<tbody>
<tr>
<td>9RF1312P3H001</td>
<td>Forward</td>
<td>10.2 to 13.8</td>
<td>100</td>
<td>0.15</td>
<td>1.8</td>
<td>3,100</td>
<td>2.00</td>
<td>70.7</td>
<td>102</td>
<td>0.410</td>
<td>~20 to +70</td>
<td>40,000 / 60℃</td>
</tr>
<tr>
<td>9RF1324P3H001</td>
<td>Reverse</td>
<td>20.4 to 27.6</td>
<td>100</td>
<td>0.09</td>
<td>2.2</td>
<td>3,100</td>
<td>2.00</td>
<td>70.7</td>
<td>102</td>
<td>0.410</td>
<td>46</td>
<td></td>
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Note: PWM frequency: 25 kHz

Available options: Without Sensor

Please inquire as the availability of these options depends on the model.

Common Specifications

- Material: Frame, Impeller: Plastics (Flammability: UL94V-0)
- Expected life: Refer to specifications (L10: Survival rate: 90% at 60℃, 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, 500 VAC, 1 minute (between lead conductor and frame)
- Sound pressure level (SPL): Expressed as the value at 1 m from air inlet side
- Operating temperature: Refer to specifications (Non-condensing)
- Storage temperature: ~30℃ to +70℃ (Non-condensing)
- Lead wire: Red ○ Black ○ Sensor: Yellow Control: Brown
- Mass: Approx. 220 g
**PWM Duty - Speed Characteristics Example**

Voltage: 12 VDC / 24 VDC  
PWM frequency: 25 kHz

Forward  
3,100 min⁻¹

Reverse  
3,100 min⁻¹

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<th>Airflow (CFM)</th>
<th>Static pressure (Pa)</th>
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<tr>
<td>0%</td>
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<td>10.2 V / 12 V / 13.8 V</td>
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**Airflow - Static Pressure Characteristics**

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**Specifications for Pulse Sensors**

In case of steady running:

- **Output waveform (Need pull-up resistor)**
- **IC (VCE)**
- **Sensor output**: 5 mA max.
- **Sensor Pull-up resistor**: Pull-up voltage
- **Rated voltage 12 V fan**: VCE = +13.8 V max., IC = 5 mA max. (VOL = VCE (SAT) = 0.6 V max.)
- **Rated voltage 24 V fan**: VCE = +27.6 V max., IC = 5 mA max. (VOL = VCE (SAT) = 0.6 V max.)

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### PWM Input Signal Example

**Input signal waveform**

\[ V_H = 4.75 \text{ V to } 5.25 \text{ V} \quad V_L = 0 \text{ V to } 0.4 \text{ V} \]

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

PWM frequency 25 kHz = \[ \frac{1}{T} \]

Source current (I\text{source}) : 1 mA max. at control voltage 0 V

Sink current (I\text{sink}) : 1 mA max. at control voltage 5.25 V

Control terminal voltage: 5.25 V max. (Open circuit)

When the control lead wire is open, the fan speed is the same as the one at a PWM duty cycle of 100%.

Either TTL input, open collector or open drain can be used for PWM control input signal.

### Example of Connection Schematic

![Connection Schematic Diagram]

### Specifications for Pulse Sensors

**Output circuit: Open collector**

- **Rated voltage 12 V fan**
  \[ V_{\text{CE}} = +13.8 \text{ V max.} \]
  \[ I_{\text{C}} = 5 \text{ mA max.} \text{ [} V_{\text{OS}} = V_{\text{CE (SAT)}} = 0.6 \text{ V max.}] \]

- **Rated voltage 24 V fan**
  \[ V_{\text{CE}} = +27.6 \text{ V max.} \]
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**Output waveform (Need pull-up resistor)**

- **In case of steady running**
  \[ T_1 \approx \frac{T_0}{4} \quad T_0 \]
  \[ T_1 \approx \frac{T_0}{4} \quad T_0 = 60/4N \text{ (sec)} \]

\[ N = \text{Fan speed (min}^{-1}) \]
- **PWM frequency:** 25 kHz
- **Dimensions (unit: mm)**
  - **4-φ3.5±0.3**
  - **Impeller side, Nameplate side**
  - **Mounting Hole**
  - **136±0.5**
  - **128±0.3**
  - **28±0.5**
- **Reference Dimension of Mounting Holes and Vent Opening (unit: mm)**
  - **Impeller side, Nameplate side**
  - **φ122**
  - **45°**
  - **45°**
  - **4-φ3.5**
  - **45°**
  - **45°**
  - **128±0.3**
  - **128±0.3**
  - **178±0.3**
  - **178±0.3**
- **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.
  - To protect against electrolytic corrosion that may occur in locations with strong electromagnetic noise, we provide fans that are unaffected by electrolytic corrosion.

**Dimensions (unit: mm)**

4-φ3.5±0.3

**Mounting Hole**

136±0.5

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φ122

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45°

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