

# San Ace 40W

## 9WPA type

### Splash Proof Fan

#### Features

##### High Airflow and High Static Pressure

This fan delivers a maximum airflow of 0.38 m<sup>3</sup>/min and maximum static pressure of 210 Pa<sup>(1)</sup> which are about 1.68 times and 3.19 times higher than our current model,<sup>(2)</sup> respectively.

##### Low Noise and Energy Saving

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

##### Water and Dust Protection

This fan achieves excellent IP68<sup>(3)</sup> water and dust protection, maintaining stable operation in harsh environments.

(1) For models 9WPA0412P6G001 and 9WPA0424P6G001

(2) Current model: 40 × 40 × 20 mm San Ace 40W 9WPA type Splash Proof Fan (model no. 9WPA0412H6001).

(3) The degree of protection (IP code) is defined by IEC 60529 (International Electrotechnical Commission) as follows.



## 40 × 40 × 20 mm

#### Specifications

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

| Model no.      | Rated voltage [V] | Operating voltage range [V] | PWM duty cycle* [%] | Rated current [A] | Rated input [W] | Rated speed [min <sup>-1</sup> ] | Max. airflow [m <sup>3</sup> /min] [CFM] | Max. static pressure [Pa] [inchH <sub>2</sub> O] | SPL [dB(A)] | Operating temperature [°C] | Expected life [h]          |
|----------------|-------------------|-----------------------------|---------------------|-------------------|-----------------|----------------------------------|------------------------------------------|--------------------------------------------------|-------------|----------------------------|----------------------------|
| 9WPA0412P6G001 | 12                | 10.8 to 13.2                | 100                 | 0.17              | 2.0             | 13700                            | 0.38 13.4                                | 210 0.84                                         | 44          | -20 to +70                 | 40000/60°C<br>(70000/40°C) |
|                |                   |                             | 25                  | 0.03              | 0.36            | 3000                             | 0.07 2.5                                 | 9.8 0.04                                         | 12          |                            |                            |
| 9WPA0424P6G001 | 24                | 21.6 to 26.4                | 100                 | 0.09              | 2.0             | 13700                            | 0.38 13.4                                | 210 0.84                                         | 44          |                            |                            |
|                |                   |                             | 25                  | 0.03              | 0.72            | 3600                             | 0.09 3.2                                 | 15 0.06                                          | 14          |                            |                            |

\* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

The models listed below **have ribs and pulse sensors.**

| Model no.     | Rated voltage [V] | Operating voltage range [V] | Rated current [A] | Rated input [W] | Rated speed [min <sup>-1</sup> ] | Max. airflow [m <sup>3</sup> /min] [CFM] | Max. static pressure [Pa] [inchH <sub>2</sub> O] | SPL [dB(A)] | Operating temperature [°C] | Expected life [h]          |
|---------------|-------------------|-----------------------------|-------------------|-----------------|----------------------------------|------------------------------------------|--------------------------------------------------|-------------|----------------------------|----------------------------|
| 9WPA0412H6001 | 12                | 7 to 13.8                   | 0.075             | 0.9             | 8800                             | 0.24 8.5                                 | 81 0.33                                          | 34          | -20 to +70                 | 40000/60°C<br>(70000/40°C) |
| 9WPA0424H6001 | 24                | 14 to 27.6                  | 0.038             |                 |                                  |                                          |                                                  |             |                            |                            |

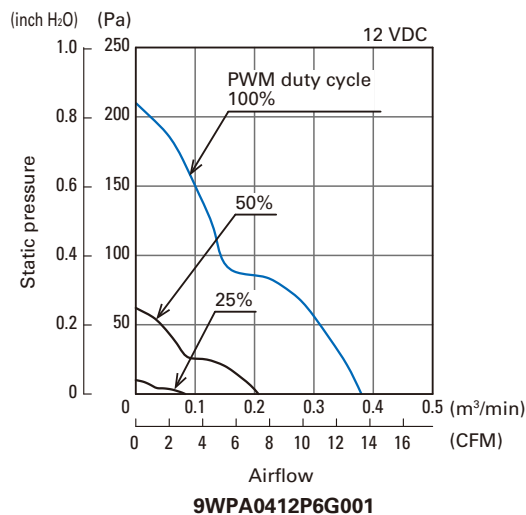
Models with the following sensor specifications are also available as options: **Without sensor**

#### Common Specifications

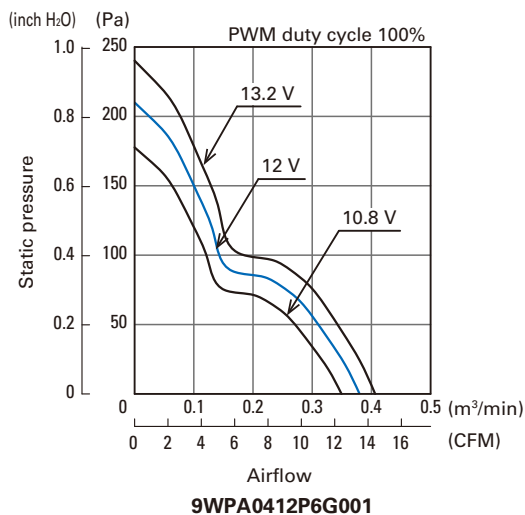
- ☐ Material ..... Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- ☐ Expected life ..... Refer to specifications  
(L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)  
Expected life at 40°C is for reference only.
- ☐ 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 frame)
- ☐ Insulation resistance ..... 10 MΩ min. at 500 VDC (between lead wire conductors and frame)
- ☐ Sound pressure level (SPL) ..... A-weighted 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  
(For models without PWM control function, there is no speed control wiring.)
- ☐ Mass ..... 47 g
- ☐ Ingress protection ..... IP68

## Airflow - Static Pressure Characteristics

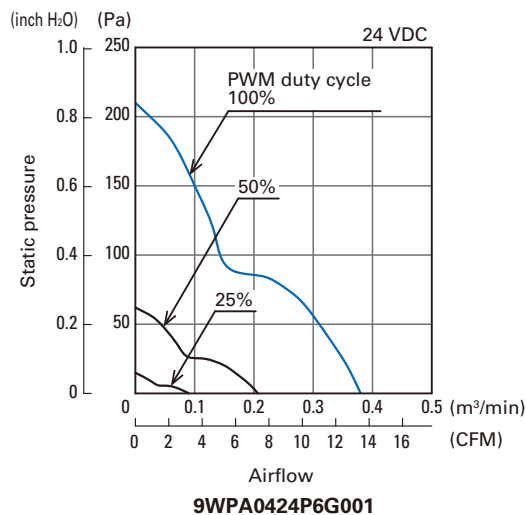
PWM duty cycle



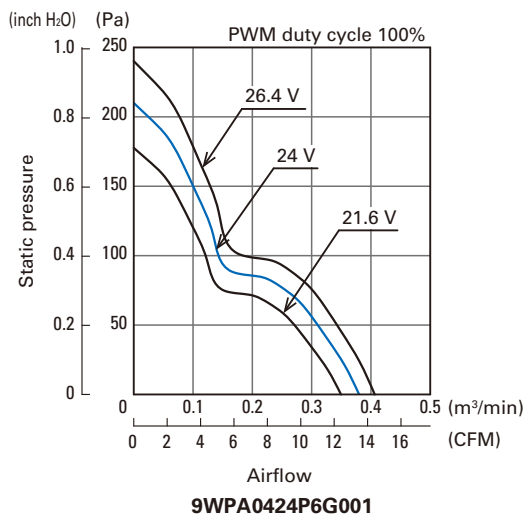
Operating voltage range



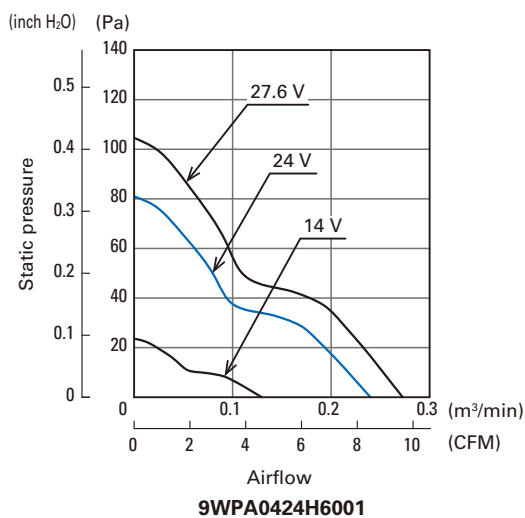
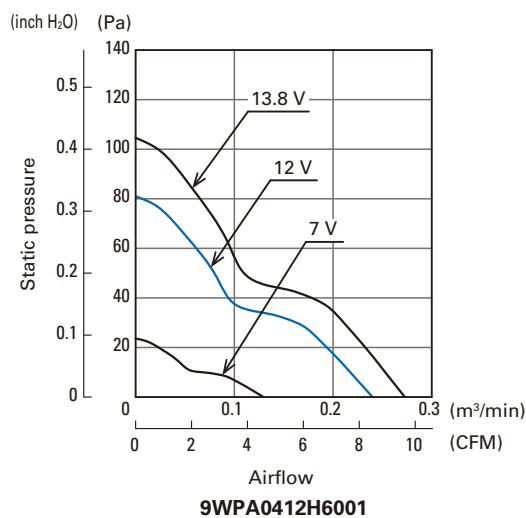
PWM duty cycle



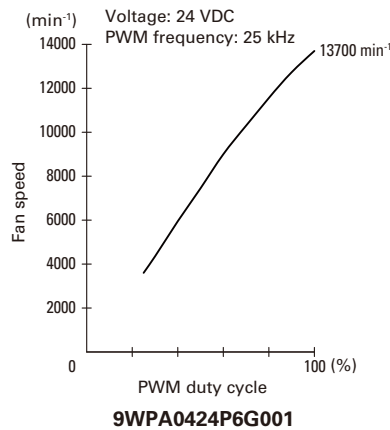
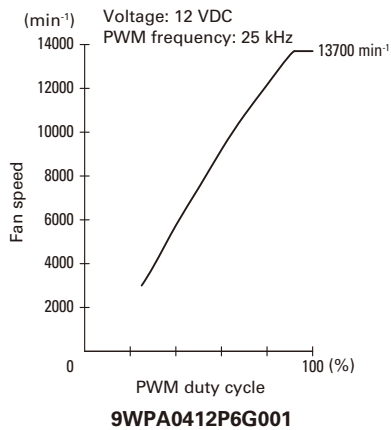
Operating voltage range



Operating voltage range

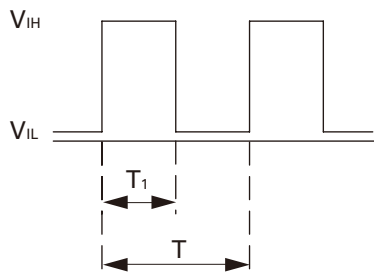


## PWM Duty - Speed Characteristics Example



## PWM Input Signal Example

Input signal waveform



$V_{IH} = 4.75$  to  $5.25$  V  $V_{IL} = 0$  to  $0.4$  V

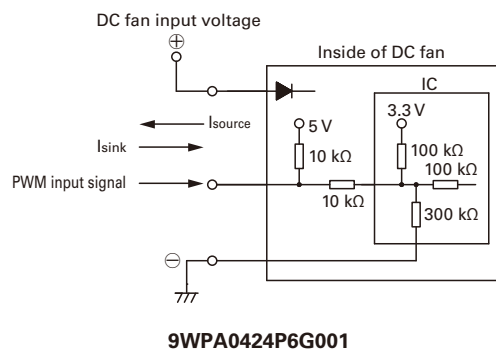
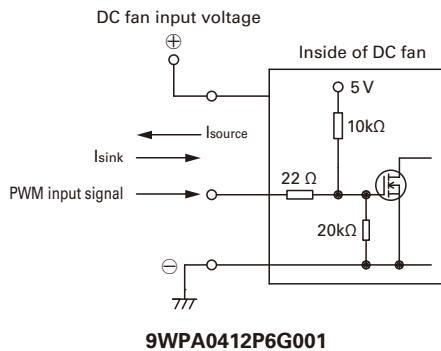
PWM duty cycle (%) =  $\frac{T_1}{T} \times 100$  PWM frequency 25 (kHz) =  $\frac{1}{T}$

Current source ( $I_{source}$ ) = 1.0 mA max. (when control voltage is 0 V)

Current sink ( $I_{sink}$ ) = 1.0 mA max. (when control voltage is 5.25 V)

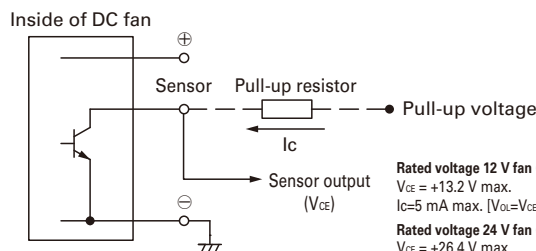
When the PWM control terminal is open, the fan speed is the same as the speed at 100% PWM duty cycle. The PWM signal can be used with open collector or drain input. Note that when using an open collector or drain input, or inputting a different voltage or frequency, the speed relative to the PWM duty cycle may differ from this specification.

## Example of Connection Schematic



## Specifications for Pulse Sensors

Output circuit: Open collector

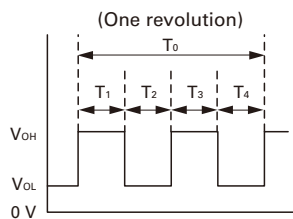


**Rated voltage 12 V fan** (With PWM control function)  
 $V_{CE} = +13.2$  V max.  
 $I_C = 5$  mA max. [ $V_{OL} = V_{CE} (SAT) = 0.6$  V max.]  
**Rated voltage 24 V fan** (With PWM control function)  
 $V_{CE} = +26.4$  V max.  
 $I_C = 5$  mA max. [ $V_{OL} = V_{CE} (SAT) = 0.6$  V max.]

**Rated voltage 12 V fan** (Without PWM control function)  
 $V_{CE} = +13.8$  V max.  
 $I_C = 5$  mA max. [ $V_{OL} = V_{CE} (SAT) = 0.6$  V max.]  
**Rated voltage 24 V fan** (Without PWM control function)  
 $V_{CE} = +27.6$  V max.  
 $I_C = 5$  mA max. [ $V_{OL} = V_{CE} (SAT) = 0.6$  V max.]

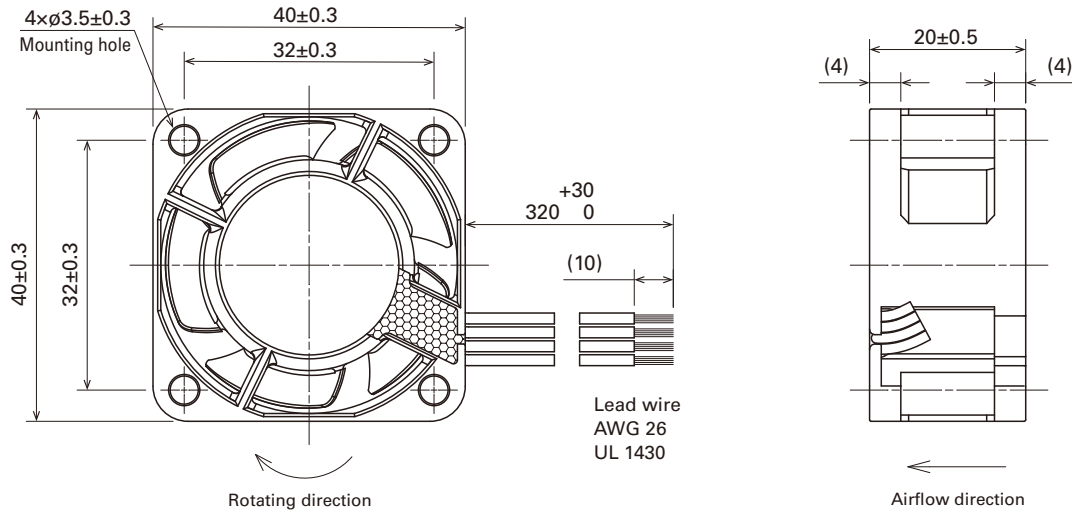
Output waveform (Need pull-up resistor)

In case of steady running

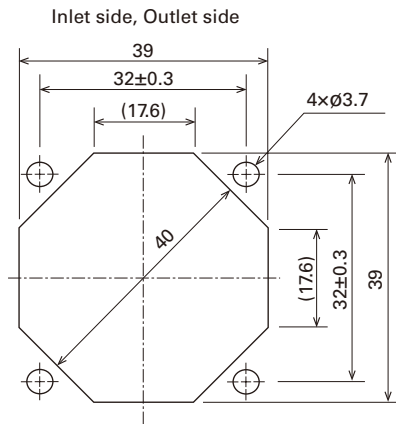


$T_1$  to  $T_4 \approx (1/4) T_0$   
 $T_1$  to  $T_4 \approx (1/4) T_0 = 60/4N$  (s)  
 $N = \text{Fan speed (min}^{-1}\text{)}$

## ■ Dimensions (unit: mm) (With pulse sensor with PWM control function)



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



## ■ Options

### Finger guards

Model no.: 109-059, 109-059H