

# 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 x 40 x 20 mm San Ace 40W 9WPA type Splash Proof Fan (model no. 9WP0412H6001).

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



## 40 x 40 x 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 (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 (70000/40°C)
9WPA0424H6001	24	14 to 27.6	0.038							

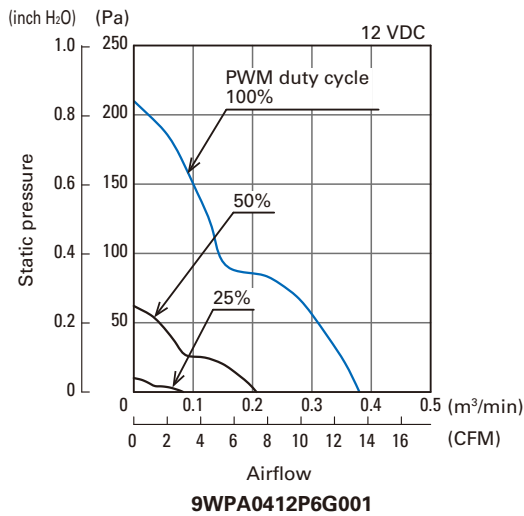
Models with the following sensor specifications are also available as options: **Without sensor**

#### Common Specifications

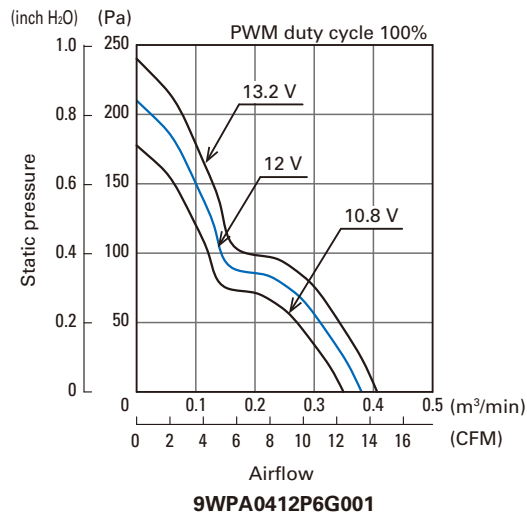
- Material ..... Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life ..... Refer to specifications  
(L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)  
Expected life at 40°C is for reference only.
- Motor 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

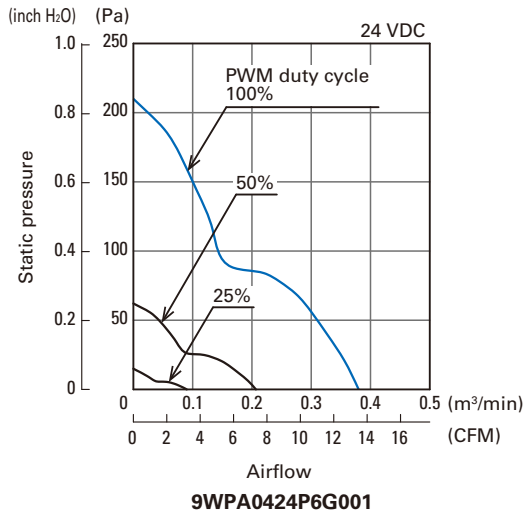
PWM duty cycle



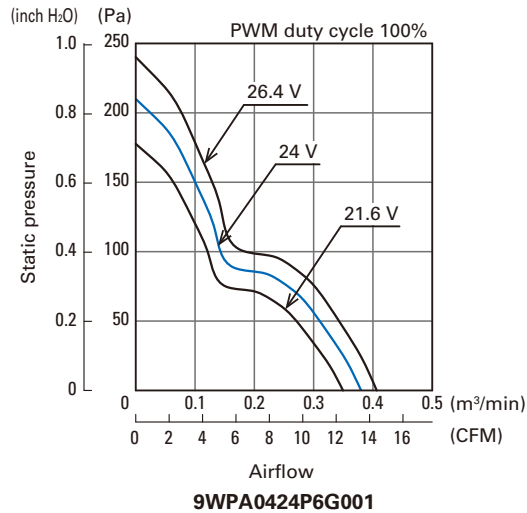
Operating voltage range



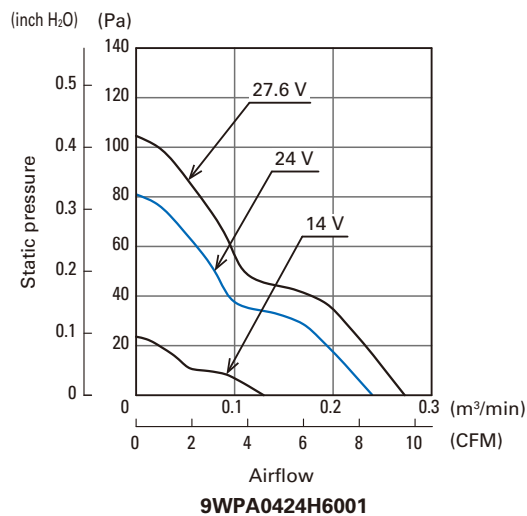
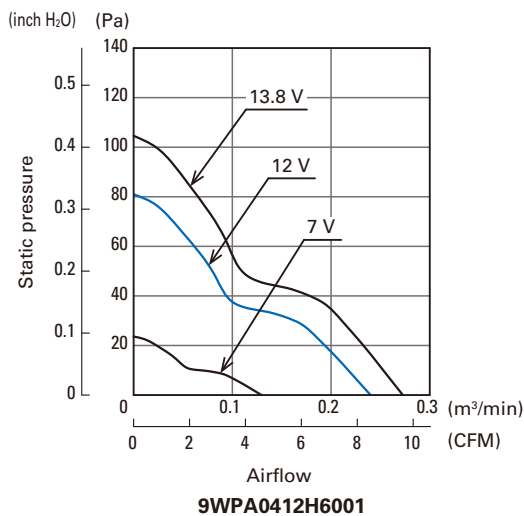
PWM duty cycle



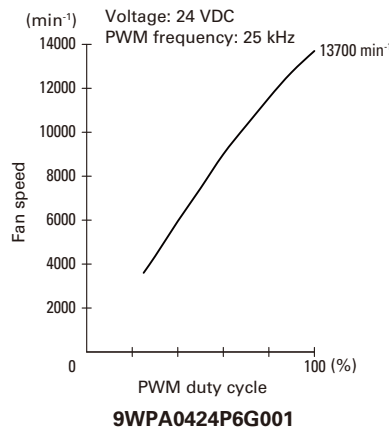
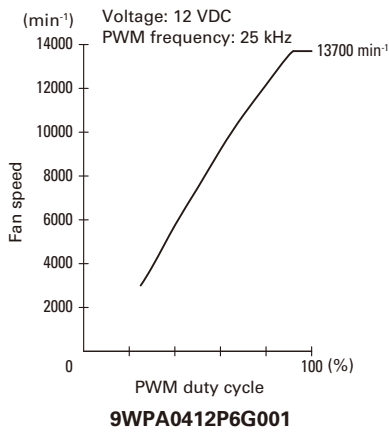
Operating voltage range



Operating voltage range

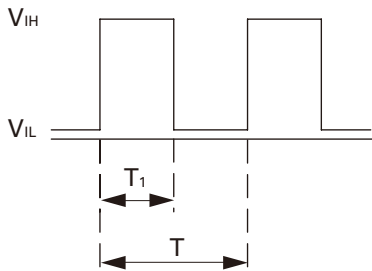


### PWM Duty - Speed Characteristics Example



### PWM Input Signal Example

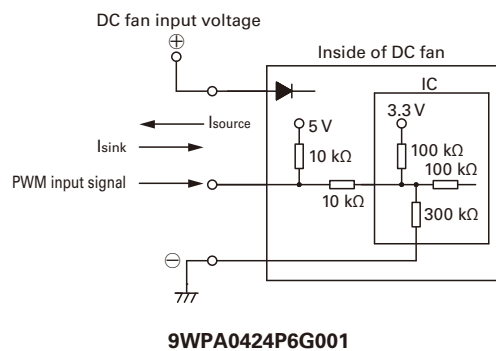
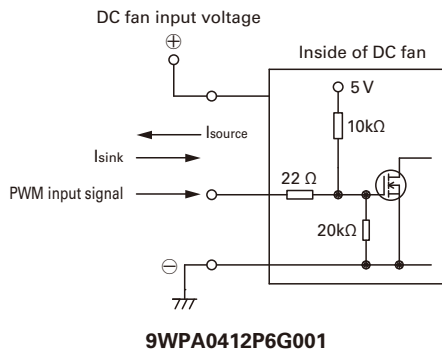
Input signal waveform



$V_{IH} = 4.75 \text{ to } 5.25 \text{ V}$     $V_{IL} = 0 \text{ to } 0.4 \text{ V}$   
 $\text{PWM duty cycle (\%)} = \frac{T_1}{T} \times 100$     $\text{PWM frequency } 25 \text{ (kHz)} = \frac{1}{T}$   
 Current source ( $I_{\text{source}}$ ) = 1.0 mA max. (when control voltage is 0 V)  
 Current sink ( $I_{\text{sink}}$ ) = 1.0 mA max. (when control voltage is 5.25 V)

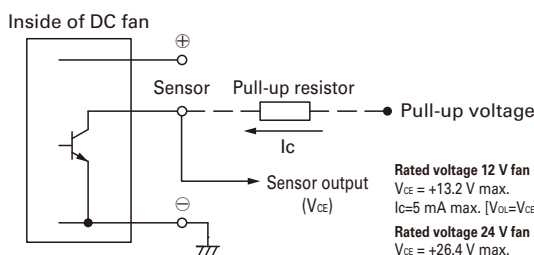
When the PWM control terminal is open, the fan speed is the same as the speed at 100% PWM duty cycle. The PWM signal can be used with open collector or drain input. Note that when using an open collector or drain input, or inputting a different voltage or frequency, the speed relative to the PWM duty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

### Example of Connection Schematic



### Specifications for Pulse Sensors

Output circuit: Open collector



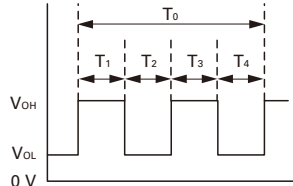
**Rated voltage 12 V fan** (With PWM control function)  
 $V_{CE} = +13.2 \text{ V max.}$   
 $I_C = 5 \text{ mA max.}$  [ $V_{OL} = V_{CE} \text{ (SAT)} = 0.6 \text{ V max.}$ ]  
**Rated voltage 24 V fan** (With PWM control function)  
 $V_{CE} = +26.4 \text{ V max.}$   
 $I_C = 5 \text{ mA max.}$ 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

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

Output waveform (Need pull-up resistor)

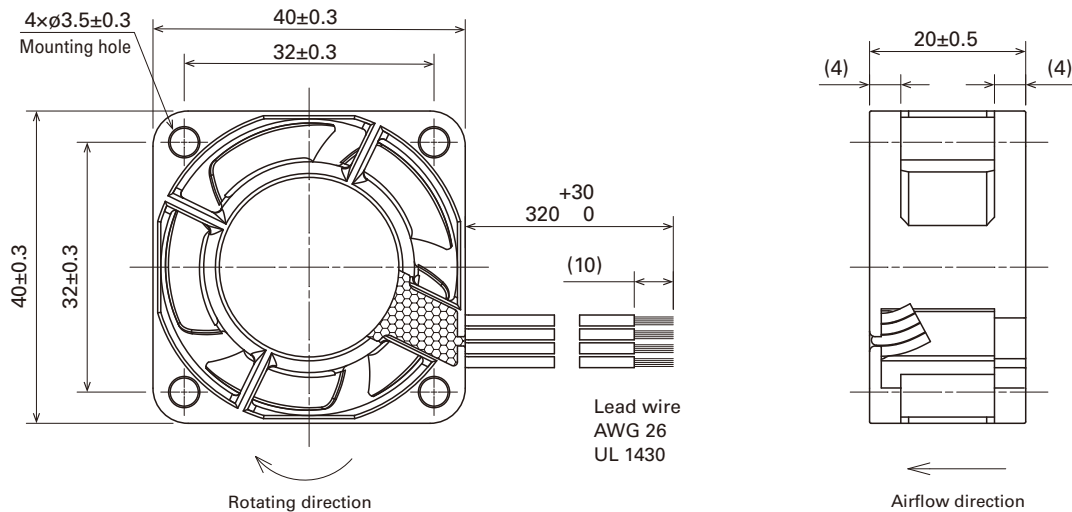
In case of steady running

(One revolution)

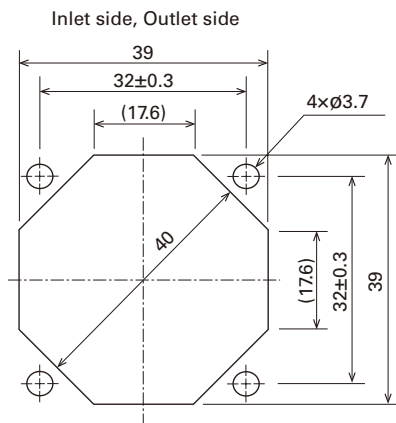


$T_{1 \text{ to } 4} \approx (1/4) T_0$   
 $T_{1 \text{ to } 4} \approx (1/4) T_0 = 60/4N \text{ (s)}$   
 $N = \text{Fan speed (min}^{-1}\text{)}$

## 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

## 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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