

# San Ace 60W 9WPA type

## Splash Proof Fan

### Features

#### High Airflow and High Static Pressure

This fan delivers a maximum airflow of 1.52 m<sup>3</sup>/min and a maximum static pressure of 357 Pa. Compared with the current models,\* the maximum airflow has increased by 2 times and maximum static pressure has increased by 4 times.

#### Water and Dust Resistance

These fans have IP68-rated\*\* water and dust protection. They maintain stable operation even in harsh environments.

#### Low Noise and High Energy Efficiency

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

\* Current models: San Ace 60 9WPA type 60 × 60 × 25 mm DC Fan (model nos. 9WPA0612P4G001, 9WPA0624P4G001).

\*\* The degree of protection (IP code) is defined by IEC 60529 (International Electrotechnical Commission).

IP68:  
Completely protected against dust  
Protected against submersion in water

#### IPX8 Requirements

When the power is off, the fan is submerged in water pressurized to the equivalent of 2 meters for 60 minutes. Then it's run for 15 minutes at the rated voltage in free-air. During the test, there shall be no reduction in dielectric strength or fan characteristics.



## 60 × 60 × 25 mm

### Specifications

The models listed below **have ribs and pulse sensors with PWM control function.** For models without ribs, append "1" to the end of model numbers.

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]
9WPA0612P4G001	12	10.8 to 13.2	100	0.93	11.16	12000	1.52 53.7	357 1.44	56	-20 to +70	40000/60°C (70000/40°C)
			20	0.09	1.08	3500	0.41 14.5	31 0.13	22		
9WPA0624P4G001	24	21.6 to 26.4	100	0.46	11.04	12000	1.52 53.7	357 1.44	56		
			20	0.05	1.2	3500	0.41 14.5	31 0.13	22		

\* PWM input frequency is 25 kHz; models without specifications at 0% PWM duty cycle have zero fan speed at 0%.

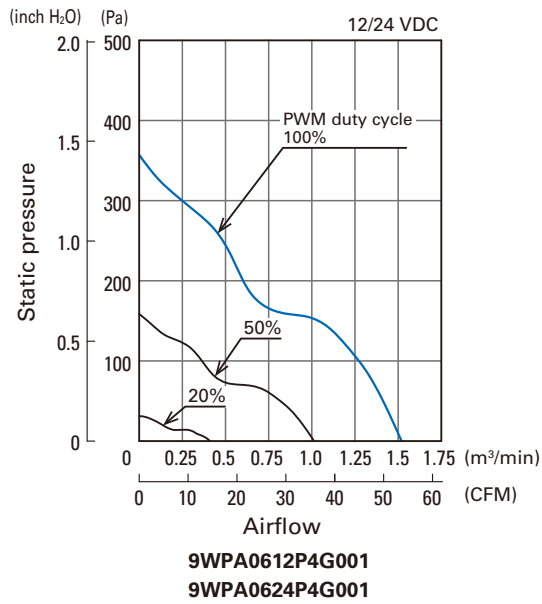
Models with the following sensor specifications are also available as options: **Without sensor** **Lock sensor**

### Common Specifications

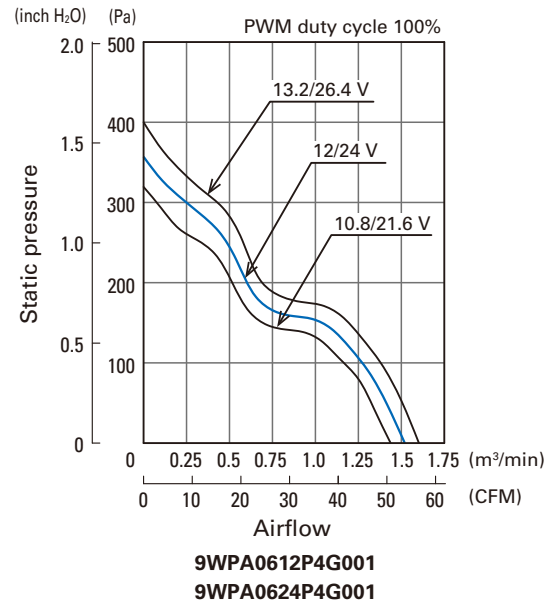
- Material ..... Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-0)
- Expected life ..... Refer to specifications  
(L10 life: 90% survival rate for continuous operation in indoor free air at 60°C, rated voltage)  
Expected life at 40°C is for reference only.
- Motor 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 or more with a 500 VDC megger (between lead wire conductors and frame)
- 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 ..... 110 g
- Ingress protection ..... IP68

## Airflow - Static Pressure Characteristics

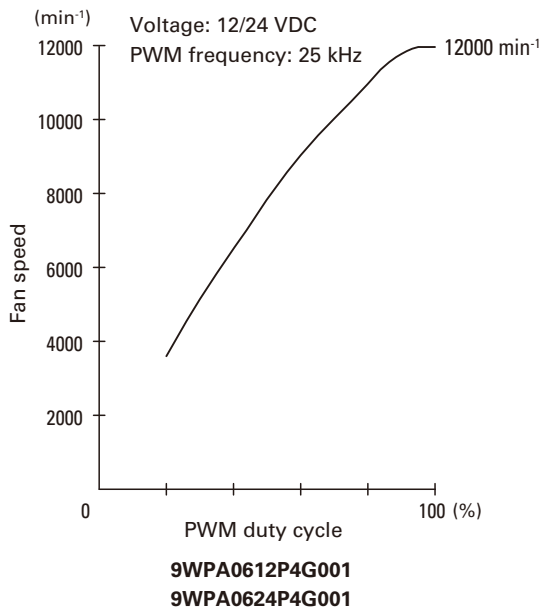
• PWM duty cycle



• Operating voltage range

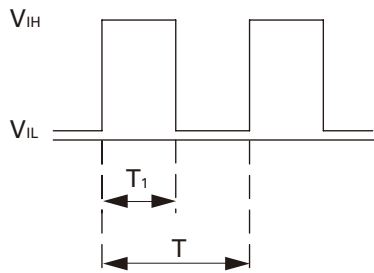


## PWM Duty - Speed Characteristics Example



### PWM Input Signal Example

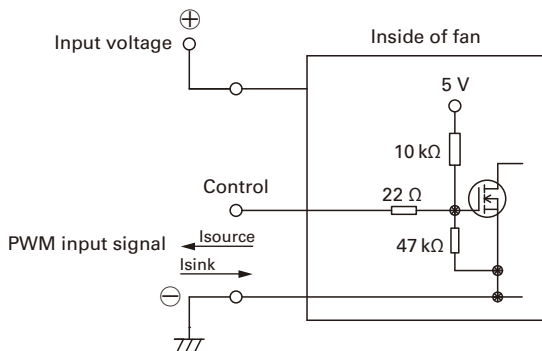
Input signal waveform



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

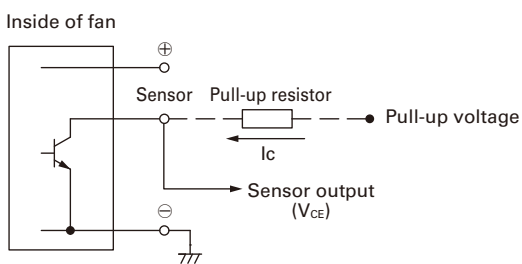
When the control terminal is open,  
 fan speed is the same as when PWM duty cycle is 100%.  
 Either TTL input, open collector or open drain can be used for  
 PWM control input signal.

### Example of Connection Schematic



### Specifications for Pulse Sensors

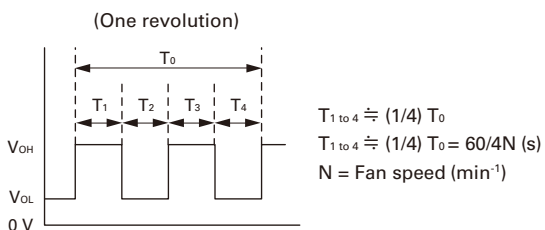
Output circuit: Open collector



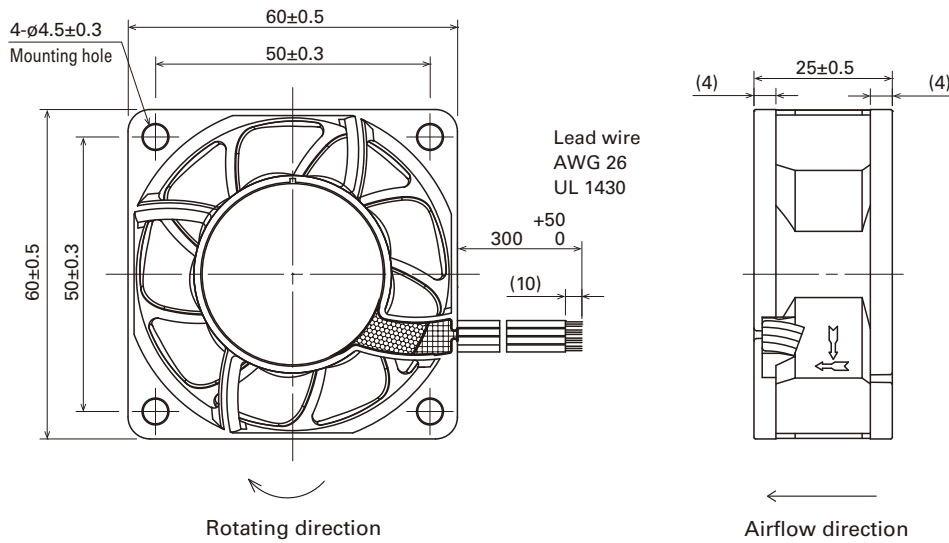
**Rated voltage 12 V fan**  
 $V_{CE} = +13.2 \text{ V max.}$   
 $I_c = 5 \text{ mA max. [} V_{OL} = V_{CE} \text{ (SAT)} = 0.8 \text{ V max.]}$   
**Rated voltage 24 V fan**  
 $V_{CE} = +26.4 \text{ V max.}$   
 $I_c = 5 \text{ mA max. [} V_{OL} = V_{CE} \text{ (SAT)} = 0.8 \text{ V max.]}$

Output waveform (Need pull-up resistor)

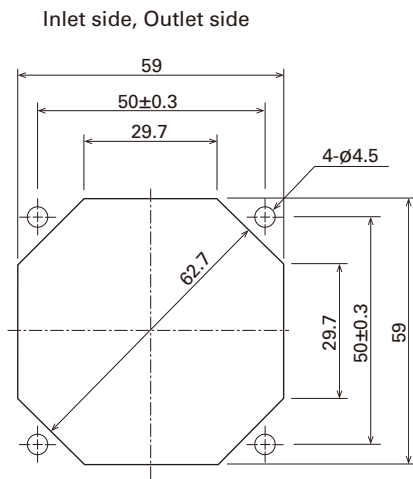
In case of steady running



## Dimensions (unit: mm) (With ribs)



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



## 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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