

# San Ace 60 9CRH type

## Counter Rotating Fan

### Features

#### High Static Pressure

This fan achieves a maximum static pressure of 3,350 Pa, increasing by a factor of about 2.9 over our current model.<sup>(1)</sup>

#### High Airflow

The fan delivers a maximum airflow of 2.57 m<sup>3</sup>/min, achieving about a 12% increase compared to the current model.<sup>(1)</sup>

#### Contribution to SDGs

This fan uses a lead-free brass material and is RoHS Directive-compliant.<sup>(2)</sup> Using eco-friendly resources and technologies, it is certified as an Eco Product Plus.<sup>(3)</sup>

(1) Current model: 60 × 60 × 56 mm *San Ace 60 9CRA* type Counter Rotating Fan (model: 9CRA0612P6K001)

(2) The RoHS (Restriction of Hazardous Substances) Directive restricts the use of certain hazardous substances in electrical and electronic equipment distributed within the European Union.

(3) Eco Products are eco-friendly products designed to reduce the environmental impact of the product and its packaging materials compared to conventional products on the market. Our products are assessed over the product's life cycle against our own eco-design requirements including product size, weight, power consumption, and CO<sub>2</sub> emissions, and those meeting our standards and higher standards qualify as Eco Products and Eco Products Plus, respectively.



## 60 × 60 × 56 mm

### Specifications

The models listed below **have a pulse sensor with PWM control.**

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		Max. static pressure		SPL [dB(A)]	Operating temperature [°C]	Expected life [h]
						Inlet	Outlet	[m <sup>3</sup> /min]	[CFM]	[Pa]	[inchH <sub>2</sub> O]			
9CRH0612P6G001	12	10.8 to 13.2	100	5.6	67.2	26100	26800	2.57	90.8	3350	13.4	78	-20 to +70	40000/60°C (70000/40°C)
			20	0.16	1.9	3900	4000	0.35	12.3	74	0.3	34		
9CRH0648P6G001	48	36 to 60	100	1.4	67.2	26100	26800	2.57	90.8	3350	13.4	78		
			20	0.11	5.3	3900	4000	0.35	12.3	74	0.3	34		

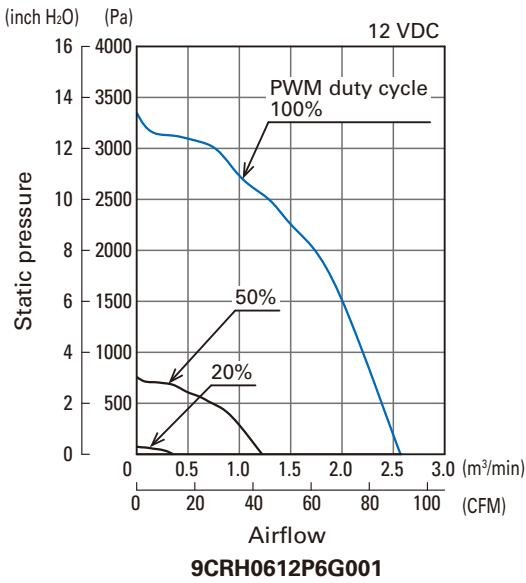
\* PWM frequency is 25 kHz. Models without ratings for 0% PWM duty cycle have zero speed at 0%. When control terminal is open, speed is the same as at 100% duty cycle.

### Common Specifications

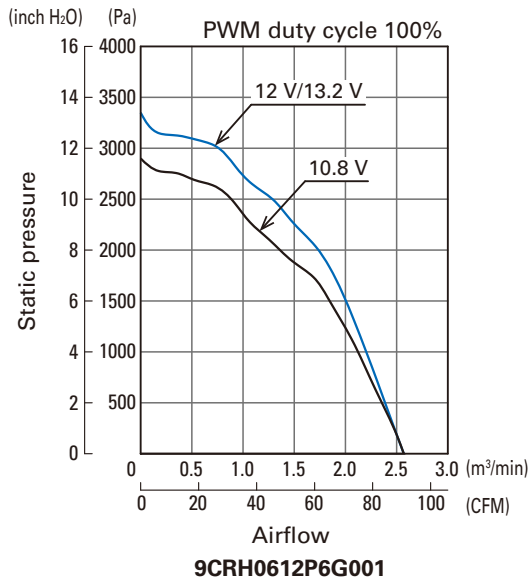
- Material ..... Frame: Plastic (Flammability: UL 94V-0), Impeller: Plastic (Flammability: UL 94V-1)
- Expected life ..... Refer to specifications  
(L10 life: 90% survival rate for continuous operation in free air at 60°C, rated voltage)  
Expected life at 40°C is for reference only.
- Motor protection 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 ..... Inlet ⊕Red ⊖Black (Sensor) Yellow (Control) Brown  
Outlet ⊕Orange ⊖Gray (Sensor) Purple (Control) White
- Mass ..... 200 g

## Airflow - Static Pressure Characteristics

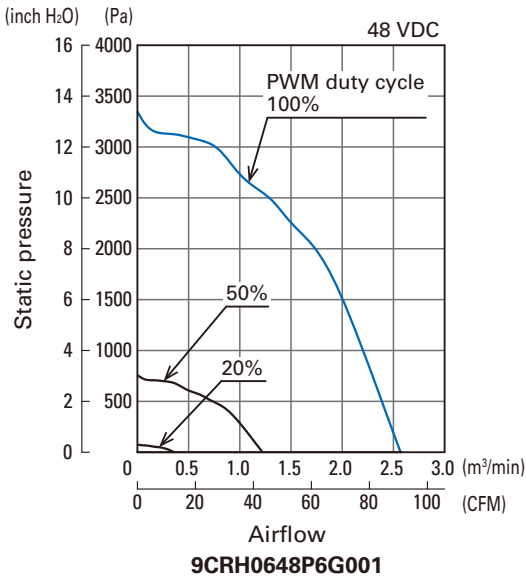
PWM duty cycle



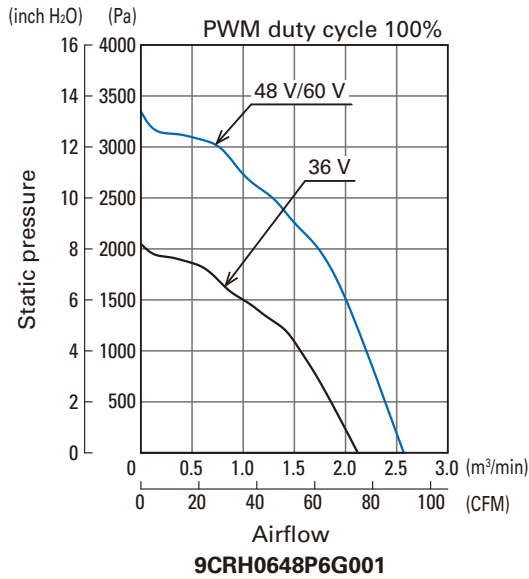
Operating voltage range



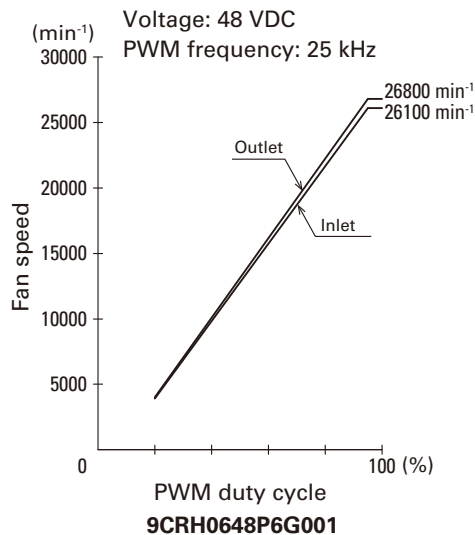
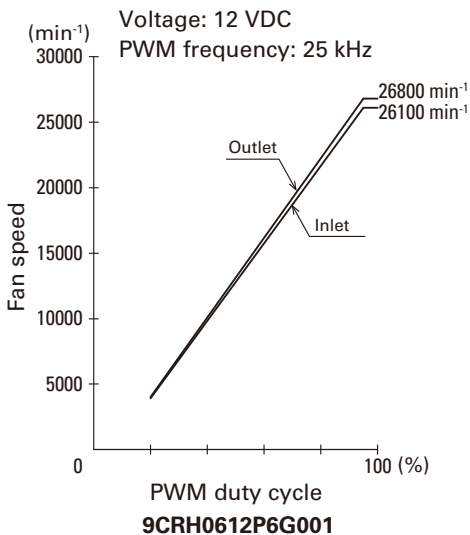
PWM duty cycle



Operating voltage range

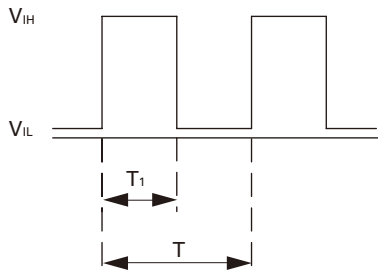


## PWM Duty - Speed Characteristics Example



**PWM Input Signal Example**

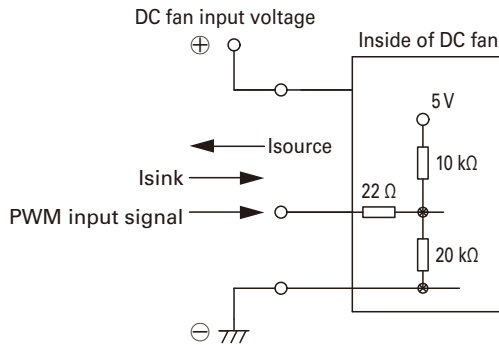
Input signal waveform



$V_{IH} = 4.75 \text{ to } 5.25 \text{ V}$     $V_{IL} = 0 \text{ to } 0.4 \text{ V}$   
 PWM duty cycle (%) =  $\frac{T_1}{T} \times 100$    PWM frequency 25 (kHz) =  $\frac{1}{T}$   
 Current source ( $I_{source}$ ) = 5.0 mA max. (when control voltage is 0 V)  
 Current sink ( $I_{sink}$ ) = 5.0 mA max. (when control voltage is 5.25 V)

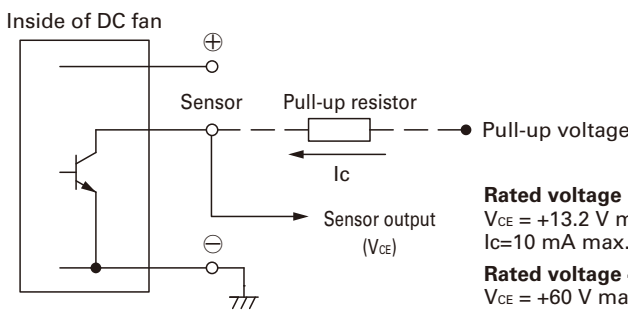
When the PWM control terminal is open, the fan speed is the same as the speed at 100% PWM duty cycle.  
 The PWM signal can be used with open collector or drain input.  
 Note that when using an open collector or drain input, or inputting a different voltage or frequency, the speed relative to the PWM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

**Example of Connection Schematic**



**Specifications for Pulse Sensors**

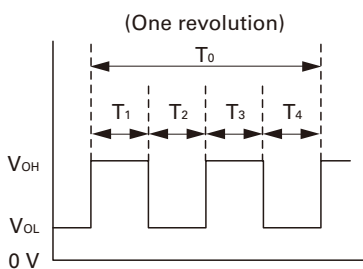
Output circuit: Open collector



**Rated voltage 12 V fan**  
 $V_{CE} = +13.2 \text{ V max.}$   
 $I_c = 10 \text{ mA max. [} V_{OL} = V_{CE} \text{ (SAT)} = 1 \text{ V max.]}$   
**Rated voltage 48 V fan**  
 $V_{CE} = +60 \text{ V max.}$   
 $I_c = 10 \text{ mA max. [} V_{OL} = V_{CE} \text{ (SAT)} = 1 \text{ V max.]}$

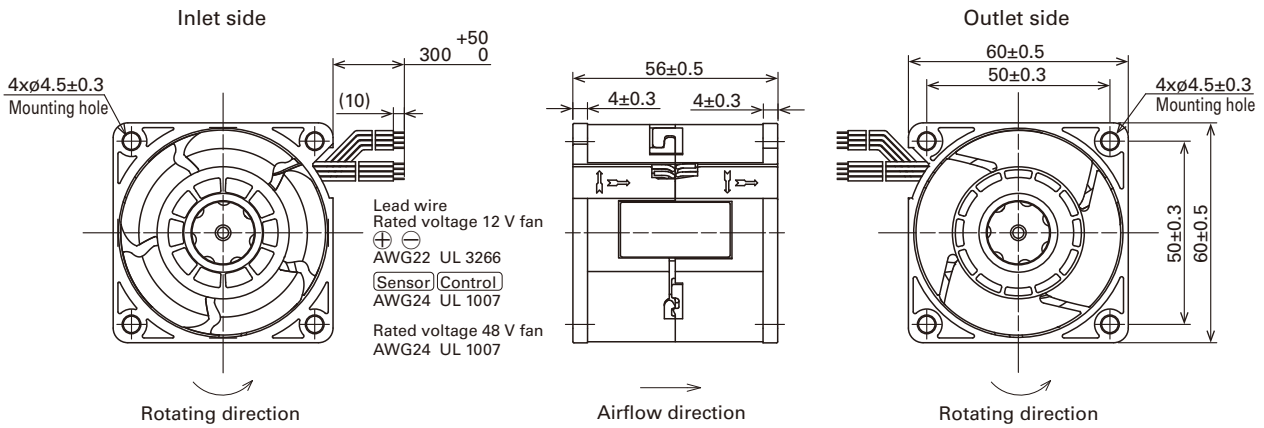
Output waveform (Need pull-up resistor)

In case of steady running



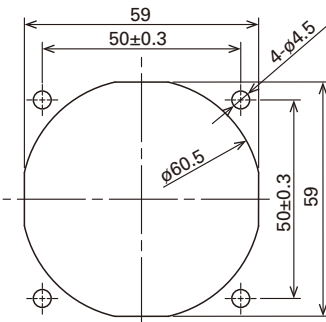
$T_{1 \text{ to } 4} \doteq (1/4) T_0$   
 $T_{1 \text{ to } 4} \doteq (1/4) T_0 = 60/4N \text{ (s)}$   
 $N = \text{Fan speed (min}^{-1}\text{)}$

## Dimensions (unit: mm)



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

Inlet side, Outlet side



## Options

### Finger guards

Model no.: 109-139E, 109-139H

### Resin finger guards

Model no.: 109-1003G

### Resin filter kits

Model no.: 109-1003F13 (13PPI), 109-1003F20 (20PPI),  
109-1003F30 (30PPI), 109-1003F40 (40PPI)

## 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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