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QR код



# 20002

# Cooling Systems

DC Axial Fans, Blowers & CPU Active Heatsinks



**SANYO DENKI**

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## Safety Precautions

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**SANYO DENKI**

A world leader in cooling fan technology, SANYO DENKI has continually set new standards in technology, quality, and reliability. In this catalogue of our latest standard range of DC fans and blowers, we present a wide selection of quality products that meet the demands for efficient electronic cooling at superb cost performance.

Our highly experienced design specialists are stationed at TECHNOLOGY CENTER, a R&D facility equipped with state-of-the-art engineering and testing equipment. Computer-aided development using the latest CAD supported computers, measuring and analyzing equipment, and an anechoic chamber for noise testing, ensure that optimal aerodynamic design and high mechanical precision are achieved during fan development.



TECHNOLOGY CENTER, Ueda (Japan)  
Built 1997, Floor Space 13,311 sq.m, ISO 14001



FUJIYAMA WORKS, Ueda (Japan)  
Built 1990, Floor Space 82,821 sq.m, ISO 14001

Our manufacturing plants are equipped with state-of-the-art equipment, computer integrated automated production lines, and zero-defect programmes to enable large scale production of high quality cost effective products.

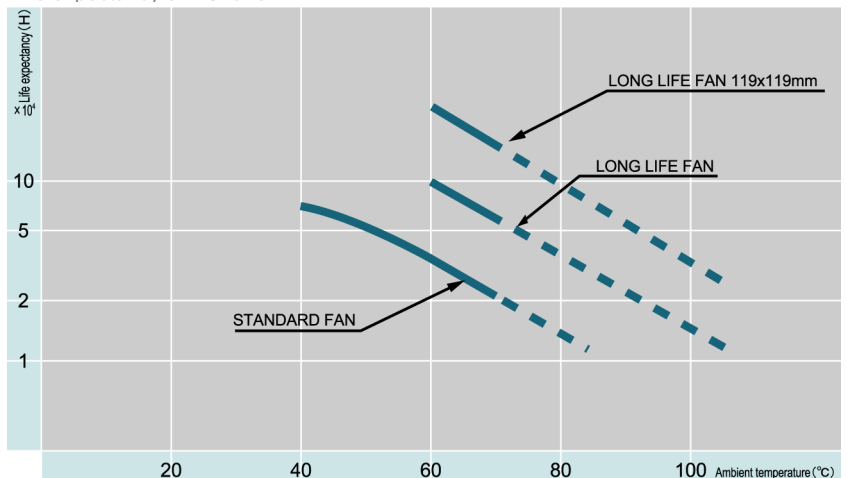


SANYO DENKI PHILIPPINES  
Subic, Philippines  
Built 2000  
Floor Space 10,800 sq.m  
ISO 9002

The bearing system plays a vital role in the service life and operating noise of fan motors. All SANYO DENKI fans come equipped with dual precision ball bearings, thus ensuring long reliable service life and quiet operation at high or low ambient temperatures.



Life expectancy of DC fans



Highly rated by users all over the world for its quality and reliability, our cooling products are used for cooling a wide variety of electronic devices such as personal computers and servers, electronic components in the telecommunications, information & networking, and industrial machinery industries. In recent years, a wide range of high performance low cost fans such as the SAN COOLER series have been developed specifically for manufacturing at SANYO DENKI PHILIPPINES.

Preservation of the global environment is a major concern of our business activities. All six factories in Japan have been awarded ISO 14001, with accreditation of our corporate headquarters due in 2002. Our cooling products are designed to utilize as little resources as possible by ensuring that they are small, lightweight and have long service lives. All products are also either UL, CSA and TÜV approved or in registration.



A worldwide network provides customers with easy access to sales, maintenance and technical expertise. Contact your nearest SANYO DENKI representative today to find out how we can help you achieve optimal cooling performance.

Click on links below for list of worldwide representatives and distributors



**North America**



**Europe**



**Asia**



**SANYO DENKI EUROPE SA.**

**Date of establishment:** December 1988  
**Business operation:**  
Sales of stepping system, servo system and cooling fans  
**Paid-in capital:** F.FR 1 million  
**Fiscal year-end:** December  
**Number of employees:** 14  
**Location:** Paris, France

**SANYO DENKI AMERICA, INC.**

**Date of establishment:** April 1995  
**Business operation:**  
Sales of cooling fans, stepping system and servo system  
**Paid-in capital:** US\$ 2 million  
**Fiscal year-end:** December  
**Number of employees:** 55  
**Location:** California, USA



**SANYO DENKI PHILIPPINES, INC.**

**Date of establishment:**  
February 2000  
**Business operation:**  
Production of cooling fans  
**Paid-in capital:** PHP 160 million  
**Fiscal year-end:** December  
**Number of employees:** 295  
**Location:**  
The Subic Bay, Philippines



**AUTOMATION INTELLIGENCE, INC.**

**Date of establishment:** December 1997  
**Business operation:**  
Development and sales of control system products and software  
**Paid-in capital:** US\$ 1.9 million  
**Fiscal year-end:** December  
**Number of employees:** 29  
**Location:** Georgia, USA



**SANYO DENKI CO.,LTD.**

**Date of establishment:** August 1927  
**Business operation:**  
Development, manufacturing and sales of Cooling, Servo, Power and Control Systems  
**Paid-in capital:** JPY 9.5 billion  
**Fiscal year-end:** March  
**Number of employees:** 1712  
**Location:** Tokyo, Japan

**NEW**  
**San Ace 92 G-Type**  
**High Airflow Low Power Consumption 92x32mm DC Axial Fans**

- Brushless DC Motor with Plastic Fan Housing and Impeller
- Permanently Lubricated Dual Ball Bearing System
- Current Limiting System with Reverse Polarity Protection
- Expected Service Life of 40,000 hours  
(90% survival rate at 60 °C, nominal voltage, continuous operation with unobstructed inlets and outlets )
- Color-coded 300mm UL 1007 AWG 24 Leads (stripped and thinned ends)
- Pulse/Lock/Inverse Lock/Low Speed/Inverse Low Speed Sensor Options
- Operating Temperature: -10 °C to +60 °C (No Condensation)
- Storage Temperature: -30 °C to +70 °C (No Condensation)
- Rotational Direction: CW looking at label
- Dielectric Strength: 50/60 Hz, 500 VAC, one (1) minute  
(between lead conductor and frame)
- Mass: 170g



**92 x 92 x 32mm**

Click on Model No in red to view air performance curves

Airflow	Airflow	Static Pressure	Static Pressure	Nominal Voltage	Voltage Range	Sound Pressure	Power Input	Nominal Speed	Model No.
m <sup>3</sup> /min	CFM	Pa	inch/H <sub>2</sub> O	V	V	dB(A)	W	min <sup>-1</sup>	
2.50	88.3	115.0	0.46	12	10.2 - 13.8	44	6.96	4300	<b>9G0912A202</b>
2.00	70.7	77.0	0.31	12	10.2 - 13.8	38	4.56	3500	<b>9G0912S202</b>
1.60	56.2	51.0	0.205	12	10.2 - 13.8	32	2.76	2850	<b>9G0912H202</b>
1.20	42.4	27.0	0.108	12	10.2 - 13.8	25	1.56	2100	<b>9G0912M202</b>
2.50	88.3	115.0	0.46	12	20.4 - 27.6	44	7.20	4300	<b>9G0924A202</b>
2.00	70.7	77.0	0.31	24	20.4 - 27.6	38	4.56	3500	<b>9G0924S202</b>
1.60	56.2	51.0	0.205	24	20.4 - 27.6	32	2.88	2850	<b>9G0924H202</b>
1.20	42.4	27.0	0.108	24	20.4 - 27.6	25	1.92	2100	<b>9G0924M202</b>
2.50	88.3	115.0	0.46	48	40.8 - 55.2	44	7.68	4300	<b>9G0948A202</b>
2.00	70.7	77.0	0.31	48	40.8 - 55.2	38	5.28	3500	<b>9G0948S202</b>
1.60	56.2	51.0	0.205	48	40.8 - 55.2	32	3.84	2850	<b>9G0948H202</b>
1.20	42.4	27.0	0.108	48	40.8 - 55.2	25	2.40	2100	<b>9G0948M202</b>

Click to view dimensional drawings

- **Models without sensor**
- **Models with sensor**
- **Ribless models without sensor**
- **Ribless Models with sensor**

Notes: (1) Listed models are non-sensor types  
 (2) Airflow, power input, speed and noise ratings are at nominal voltage against zero static pressure.  
 (3) Static pressure ratings are at nominal voltage against zero air flow.  
 (4) Noise ratings are average values as measured from a point one (1) meter from intake of fan suspended in an anechoic chamber.  
 (5) Air performance curves show fan outputs with unobstructed inlets and outlets.  
 (6) UL, CSA and TÜV approvals under application

NEW

### San Ace MC Series

#### Slim Type Active Heatsink for Intel® Pentium® 4 μPGA478 1.8-2.2GHz

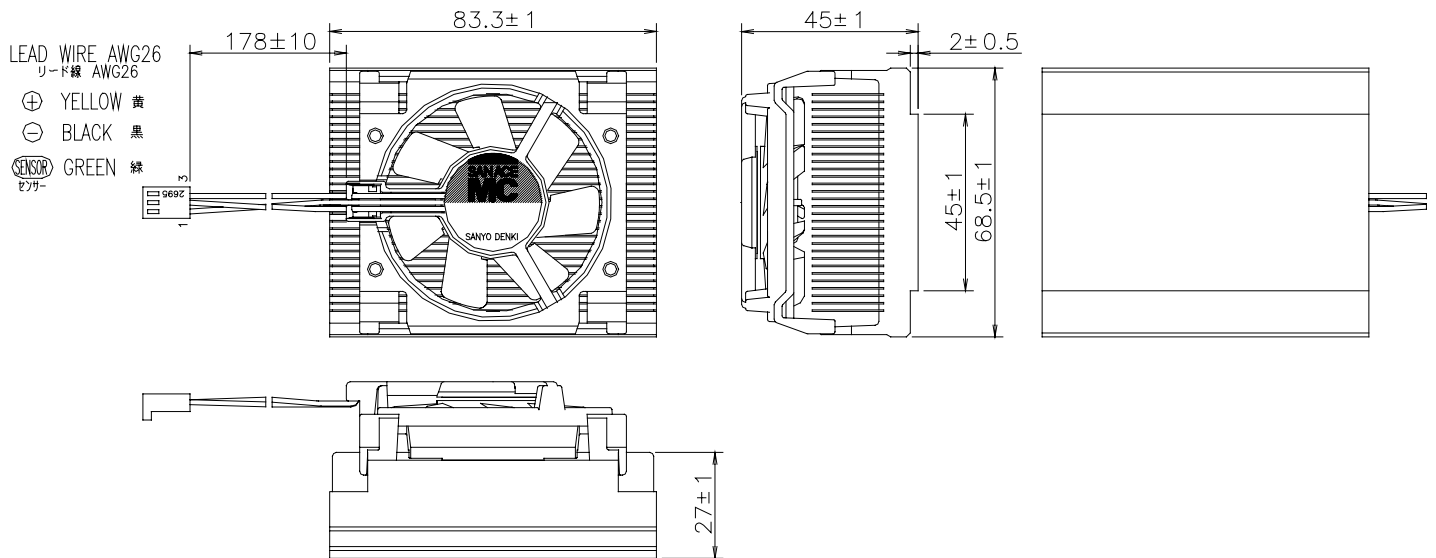
- Brushless DC Motor with Plastics Frame/Impeller and Aluminium Copper Hybrid or All Aluminium Heatsink
- Permanently Lubricated Dual Ball Bearing System
- Current Limiting System with Reverse Polarity Protection
- Color-coded 178mm AWG 26 Lead  
 +: Yellow (CN; Pin 2)    -: Black (CN; Pin 1)    Sensor: Green (CN; Pin 3)
- Expected Service Life of 40,000 hours  
 (90% survival rate at 60 °C, nominal voltage, continuous operation with unobstructed inlets and outlets )
- Operating Temperature: 0 °C to +70 °C (No Condensation)
- Storage Temperature: -30 °C to +75 °C (No Condensation)
- Rotational Direction: CW looking at label
- Dielectric Strength: 50/60 Hz, 500 VAC, one (1) minute  
 (between lead conductor and frame)
- Connector: Molex 22-01-3037 (P/N 2695-03RP)  
 Contact: Molex P/N 5159PBT or Equivalent



Size	Thermal Resistance	Nominal Voltage	Voltage Range	Sound Pressure	Current	Nominal Speed	Model No.	Clip
mm	K/W	V	V	db(A)	A	min <sup>-1</sup>		
83.3x68.5x45.0	0.45	12	7.0 - 13.8	39	0.17	4800	109X9412S1016	109-1008
83.3x68.5x45.0	0.49	12	7.0 - 13.8	39	0.17	4800	109X9412S1116	109-1008

Notes: (1) 109X9412S1016 is equipped with an aluminium base copper fin heatsink  
 (2) 109X9412S1116 is equipped with an all aluminium heatsink  
 (3) Sound pressure levels are average values as measured from a point one (1) meter from intake of fan suspended in an anechoic chamber.  
 (4) Intel® Pentium® is a registered trademark of Intel Corporation.

### Dimensions (109X9412S1016)



NEW

### San Ace MC Series

High Performance Active Heatsink for Intel® Pentium®4 μPGA478 2.2 GHz

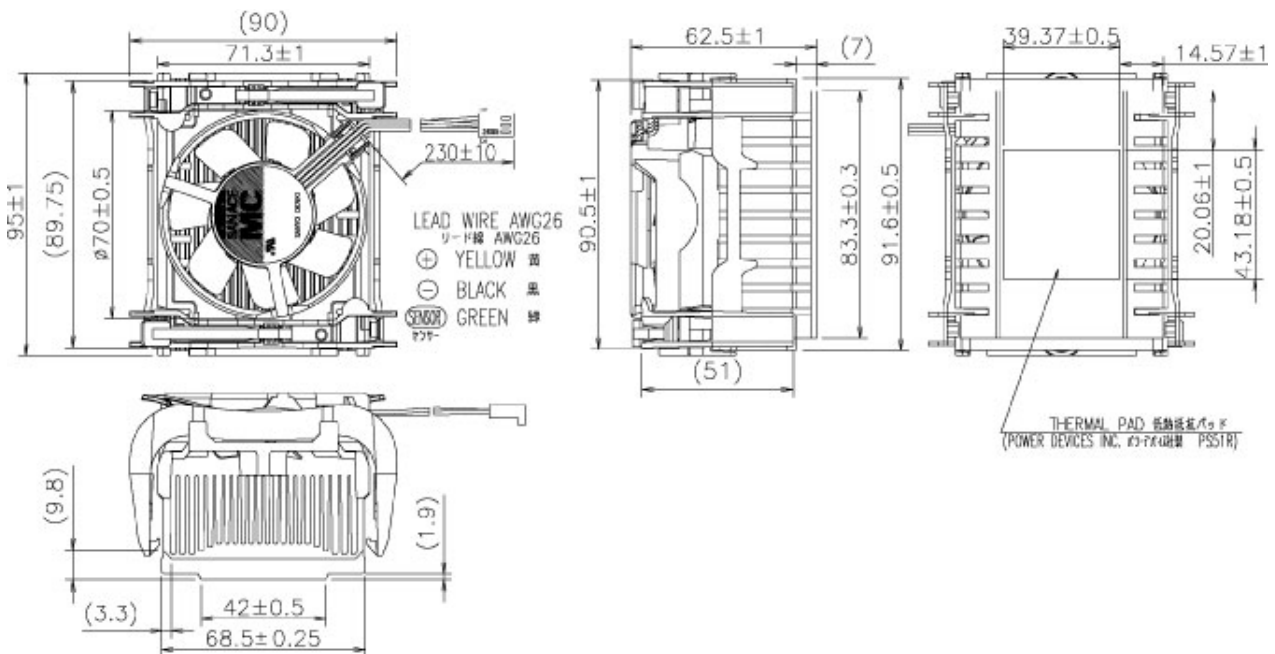
- Brushless DC Motor with Plastics Frame/Impeller and Aluminium Heatsink
- Permanently Lubricated Dual Ball Bearing System
- Current Limiting System with Reverse Polarity Protection
- Color-coded 230mm AWG 26 Lead  
+: Yellow (CN; Pin 2)    -: Black (CN; Pin 1)    Sensor: Green (CN; Pin 3)
- Expected Service Life of 40,000 hours  
(90% survival rate at 60 °C, nominal voltage, continuous operation with unobstructed inlets and outlets )
- Operating Temperature: 0 °C to +60 °C (No Condensation)
- Storage Temperature: -30 °C to +70 °C (No Condensation)
- Rotational Direction: CW looking at label
- Dielectric Strength: 50/60 Hz, 500 VAC, one (1) minute  
(between lead conductor and frame)
- Connector: Molex 22-01-3037 (P/N 2695-03RP)  
Contact: Molex P/N 5159PBT or Equivalent



Size mm	Thermal Resistance K/W	Nominal Voltage V	Voltage Range V	Sound Pressure db(A)	Current A	Nominal Speed min <sup>-1</sup>	Model No.	Clip
95.0x71.3x62.5	0.49/0.42	12	9.0 - 13.8	26/39	0.21	3900	109X9812T0H016	Preattached
95.0x71.3x62.5	0.42	12	7.0 - 13.8	39	0.21	3900	109X9812H0016	Preattached

- Notes: (1) Listed models are pulse sensor types.  
 (2) \*109X9812T0H016 is a thermal speed control fan with variable speeds between 33 °C - 43 °C.  
 (3) Noise ratings are average values as measured from a point one (1) meter from intake of fan suspended in an anechoic chamber.  
 (4) Intel® Pentium® is a registered trademark of Intel Corporation.

### Dimensions



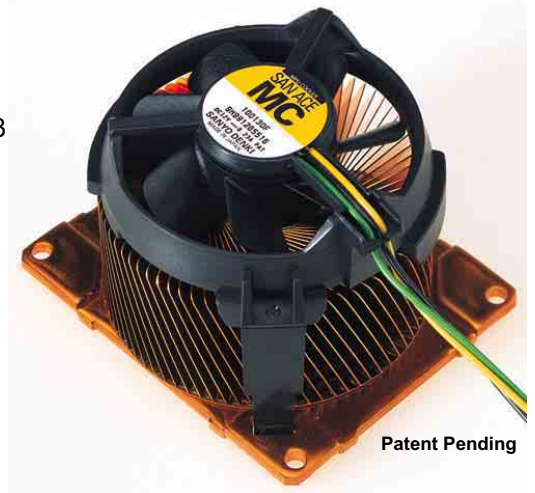


**NEW**

# San Ace MC-HX Series

Spiral Copper Active Heatsink for Intel® Pentium® 4 PGA423 & μPGA478 2.2GHz

- Brushless DC Motor with Plastics Frame/Impeller and Copper Heatsink
- Permanently Lubricated Dual Ball Bearing System
- Current Limiting System with Reverse Polarity Protection
- Color-coded 220mm AWG 26 Lead  
+: Yellow (CN; Pin 2)    -: Black (CN; Pin 1)    Sensor: Green (CN; Pin 3)
- Expected Service Life of 40,000 hours  
(90% survival rate at 60 °C, nominal voltage, continuous operation with unobstructed inlets and outlets )
- Operating Temperature: 0 °C to +70 °C (No Condensation)
- Storage Temperature: -30 °C to +75 °C (No Condensation)
- Rotational Direction: CW looking at label
- Dielectric Strength: 50/60 Hz, 500 VAC, one (1) minute  
(between lead conductor and frame)
- Connector: Molex 22-01-3037 (P/N 2695-03RP)  
Contact: Molex P/N 5159PBT or 2759T
- Mass: 410g



## Intel® Pentium® 4 μPGA478 Compatible

Click on Model No in red to view dimensional drawings

- Up to 2.2 GHz

Size	Thermal Resistance	Nominal Voltage	Voltage Range	Sound Pressure	Current	Nominal Speed	Model No.	Clip
mm	K/W	V	V	db(A)	A	min <sup>-1</sup>		
83.3x68.5x54.5	0.37	12	9.0 - 13.8	39	0.23	5200	<b>9H9912G5516</b>	109-1007

## Intel® Pentium® 4 PGA423 Compatible

Click on Model No in red to view dimensional drawings

- Up to 2.2 GHz

Size	Thermal Resistance	Nominal Voltage	Voltage Range	Sound Pressure	Current	Nominal Speed	Model No.	Clip
mm	K/W	V	V	db(A)	A	min <sup>-1</sup>		
88.9x63.5x54.5	0.37	12	9.0 - 13.8	39	0.23	5200	<b>9H9912G5016</b>	-

Notes: (1) Listed models are pulse sensor types  
 (2) Noise ratings are average values as measured from a point one (1) meter from intake of fan suspended in an anechoic chamber.  
 (3) Intel® Pentium® 4 is a registered trademark of Intel Corporation.

**NEW**

# Dyna Ace Series

## 19" Rack Mountable Ø172 x 147 x 25mm DC Axial Fans

- Brushless DC Motor with Aluminium Fan Housing and Plastics Impeller
- Permanently Lubricated Dual Ball Bearing System
- Current Limiting System with Reverse Polarity Protection
- Color-coded 300mm AWG 24 Leads (stripped and thinned ends) (+ Red/ - Black)
- Pulse/Lock/Inverse Lock/Low Speed/Inverse Low Speed Sensor Options
- Expected Service Life of 40,000 hours (90% survival rate at 60 °C, nominal voltage, continuous operation with unobstructed inlets and outlets )
- Operating Temperature: -10 °C to +60 °C (No Condensation)
- Storage Temperature: -30 °C to +70 °C (No Condensation)
- Rotational Direction: CCW looking at label
- Dielectric Strength: 50/60 Hz, 500 VAC, one (1) minute (between lead conductor and frame)
- Mass: 500 g



### Ø172 x 147 x 25mm

Click on Model No in red to view air performance curves

Airflow	Airflow	Static Pressure	Static Pressure	Nominal Voltage	Voltage Range	Sound Pressure	Power Input	Nominal Speed	Model No.
m <sup>3</sup> /min	CFM	Pa	inch/H <sub>2</sub> O	V	V	dB(A)	W	min <sup>-1</sup>	
5.20	183	86	0.35	12	10.8 - 13.8	51	18.0	2700	<a href="#">109E4712M402</a>
4.60	162	68	0.27	12	10.8 - 13.8	48	13.2	2400	<a href="#">109E4712L402</a>
6.40	226	130	0.52	24	20.4 - 27.6	57	28.8	3300	<a href="#">109E4724H402</a>
5.80	204	106	0.43	24	20.4 - 27.6	54	20.9	3000	<a href="#">109E4724F402</a>
5.20	183	86	0.35	24	20.4 - 27.6	51	15.6	2700	<a href="#">109E4724M402</a>
4.60	162	68	0.27	24	20.4 - 27.6	48	11.0	2400	<a href="#">109E4724L402</a>
6.80	240	146	0.59	48	40.8 - 55.2	58	31.2	3500	<a href="#">109E4748S402</a>
6.40	226	130	0.52	48	40.8 - 55.2	57	29.8	3300	<a href="#">109E4748H402</a>
5.80	204	106	0.43	48	40.8 - 55.2	54	20.6	3000	<a href="#">109E4748F402</a>
5.20	183	86	0.35	48	40.8 - 55.2	51	16.3	2700	<a href="#">109E4748M402</a>
4.60	162	68	0.27	48	40.8 - 55.2	48	13.0	2400	<a href="#">109E4748L402</a>

Click to view dimensional drawings

- [Models without sensor](#)
- [Models with sensor](#)

Notes: (1) Listed models are non-sensor types  
 (2) Airflow, power input, speed and noise ratings are at nominal voltage against zero static pressure.  
 (3) Static pressure ratings are at nominal voltage against zero air flow.  
 (4) Noise ratings are average values as measured from a point one (1) meter from intake of fan suspended in an anechoic chamber.  
 (5) Air performance curves show fan outputs with unobstructed inlets and outlets.

### San Ace 120L G Type

#### High Airflow 119 x 38mm Long Life Fan Motors

- Brushless DC Motor with Aluminium Fan Housing and Plastic Impeller
- Permanently Lubricated Dual Ball Bearing System
- Current Limiting System with Reverse Polarity Protection
- Color-coded 300mm AWG 24 Leads (stripped and thinned ends)
- Pulse/Lock/Inverse Lock/Low Speed/Inverse Low Speed Sensor Options
- Expected Service Life of 100,000 hours  
(90% survival rate at 60 °C, nominal voltage, continuous operation with unobstructed inlets and outlets )
- Operating Temperature: -10 °C to +60 °C (No Condensation)
- Storage Temperature: -30 °C to +70 °C (No Condensation)
- Rotational Direction: CW looking at label
- Dielectric Strength: 50/60 Hz, 500 VAC, one (1) minute  
(between lead conductor and frame)
- Mass: 370g



#### 119 x 119 x 38mm

Click on Model No in red to view air performance curves

Airflow	Airflow	Static Pressure	Static Pressure	Nominal Voltage	Voltage Range	Sound Pressure	Power Input	Nominal Speed	Model No.
m <sup>3</sup> /min	CFM	Pa	inch/H <sub>2</sub> O	V	V	dB(A)	W	min <sup>-1</sup>	
3.90	138	138.0	0.554	12	10.2 - 13.8	49	11.80	3600	<a href="#">9GL1212G102</a>
3.40	120	102.0	0.410	12	10.2 - 13.8	46	7.30	3100	<a href="#">9GL1212E102</a>
2.80	99	70.4	0.283	12	7.0 - 13.8	39	4.56	2600	<a href="#">9GL1212H102</a>
2.45	87	54.2	0.218	12	7.0 - 13.8	36	3.36	2280	<a href="#">9GL1212F102</a>
2.10	74	39.6	0.160	12	7.0 - 13.8	32	2.52	1950	<a href="#">9GL1212M102</a>
3.90	138	138.0	0.554	24	20.4 - 27.6	49	12.00	3600	<a href="#">9GL1224G102</a>
3.40	120	102.0	0.410	24	20.4 - 27.6	46	8.20	3100	<a href="#">9GL1224E102</a>
2.80	99	70.4	0.283	24	14.0 - 27.6	39	4.80	2600	<a href="#">9GL1224H102</a>
2.45	87	54.2	0.218	24	14.0 - 27.6	36	3.84	2280	<a href="#">9GL1224F102</a>
2.10	74	39.6	0.160	24	14.0 - 27.6	32	2.64	1950	<a href="#">9GL1224M102</a>
3.90	138	138.0	0.554	48	40.8 - 55.2	49	12.00	3600	<a href="#">9GL1248G102</a>
3.40	120	102.0	0.410	48	40.8 - 55.2	46	8.20	3100	<a href="#">9GL1248E102</a>
2.80	99	70.4	0.283	48	40.8 - 55.2	39	5.28	2600	<a href="#">9GL1248H102</a>
2.45	87	54.2	0.218	48	40.8 - 55.2	36	4.32	2280	<a href="#">9GL1248F102</a>
2.10	74	39.6	0.160	48	40.8 - 55.2	32	3.36	1950	<a href="#">9GL1248M102</a>

Click to view dimensional drawings

- **Models without sensor**
- **Models with sensor**

Notes: (1) Listed models are non-sensor types.

(2) Airflow, power input, speed and noise ratings are at nominal voltage against zero static pressure.

(3) Static pressure ratings are at nominal voltage against zero air flow.

(4) Noise ratings are average values as measured from a point one (1) meter from intake of fan suspended in an anechoic chamber.

(5) Air performance curves show fan outputs with unobstructed inlets and outlets.

(6) Ask our sales team for details of models with higher airflow performance than those shown above.

### San Ace MC

1U Compatible Active Heatsink for Intel® Pentium® III FC-PGA2 1.4 GHz/  
Intel® Celeron™ FC-PGA2 1.3 GHz

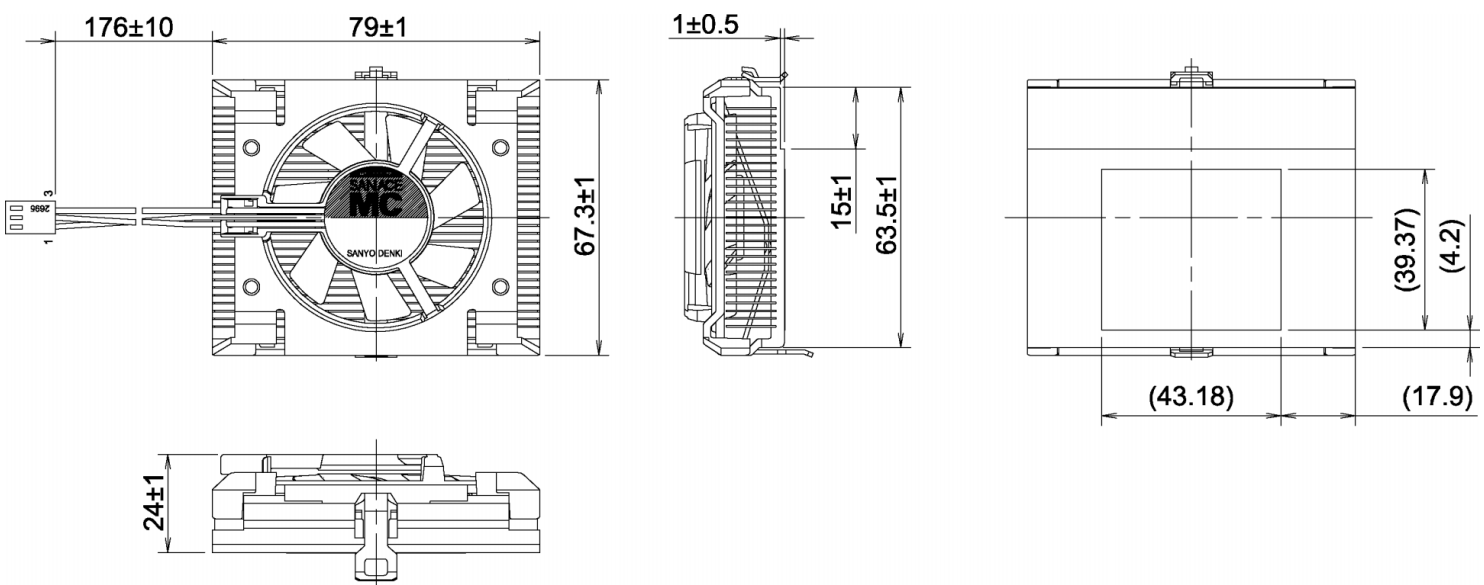
- Brushless DC Motor with Plastic Frame/Impeller and Aluminium Base Copper Fin Heatsink
- Permanently Lubricated Dual Ball Bearing System
- Current Limiting System with Reverse Polarity Protection
- Color-coded 176mm AWG 26 Leads with Molex Connector and Contact Connector: Molex 22-01-3037 (2695-03RP)  
Contact: Molex 5159PBT or 2759T
- Expected Service Life of 40,000 hours  
(90% survival rate at 60 °C, nominal voltage, continuous operation with unobstructed inlets and outlets )
- Operating Temperature: -10 °C to +70 °C (No Condensation)
- Storage Temperature: -30 °C to +75 °C (No Condensation)
- Rotational Direction: CW looking at label
- Dielectric Strength: 50/60 Hz, 500 VAC, one (1) minute  
(between lead conductor and frame)
- Thermal Contact: Power Devices Inc. (Type AS-J-17H-155)



Size	Thermal Resistance	Nominal Voltage	Voltage Range	Sound Pressure	Current	Nominal Speed	Model No.	Clip
mm	K/W	V	V	db(A)	A	min <sup>-1</sup>		
79.0x67.3x24.0	0.63	12	7.0 - 13.8	42	0.22	6000	109X7412S4016	Preattached

Notes: (1) Listed model is pulse sensor type.  
 (2) Noise ratings are average values as measured from a point one (1) meter from intake of fan suspended in an anechoic chamber.  
 (3) Intel® Pentium® III is a registered trademark of Intel Corporation.

### Dimensions



# San Ace 120 G-Type

## High Air Flow Low Power Consumption 119x25mm & 119x38mm DC Axial Fans

- Brushless DC Motor with Plastic Fan Housing and Impeller
- Permanently Lubricated Dual Ball Bearing System
- Current Limiting System with Reverse Polarity Protection
- Color-coded 300mm UL1007 AWG 24 Leads (stripped and thinned ends)
- Pulse/Lock/Inverse Lock/Low Speed/Inverse Low Speed Sensor Options
- Expected Service Life of 40,000 hours  
(90% survival rate at 60 °C, nominal voltage, continuous operation with unobstructed inlets and outlets )
- Operating Temperature: -10 °C to +60 °C (No Condensation)
- Storage Temperature: -30 °C to +70 °C (No Condensation)
- Rotational Direction: CW looking at label
- Dielectric Strength: 50/60 Hz, 500 VAC, one (1) minute  
(between lead conductor and frame)
- Mass: 240 - 330g



### 119 x 119 x 25mm

Click on Model No in red to view air performance curves

Airflow	Airflow	Static Pressure	Static Pressure	Nominal Voltage	Voltage Range	Sound Pressure	Power Input	Nominal Speed	Model No.
m <sup>3</sup> /min	CFM	Pa	inch/H <sub>2</sub> O	V	V	dB(A)	W	min <sup>-1</sup>	
3.68	130	120	0.48	12	10.8 - 13.8	51	10.8	4100	<a href="#">9G1212G402</a>
3.25	115	98	0.39	12	10.8 - 13.8	48	6.96	3650	<a href="#">9G1212E402</a>
2.83	100	77	0.31	12	10.8 - 13.8	44	4.80	3150	<a href="#">9G1212A402</a>
2.50	88	64	0.26	12	10.8 - 13.8	40	3.72	2850	<a href="#">9G1212H402</a>
1.98	70	42	0.17	12	10.8 - 13.8	35	2.28	2250	<a href="#">9G1212F402</a>
1.66	58	31	0.12	12	10.8 - 13.8	29	1.68	1950	<a href="#">9G1212M402</a>
3.68	130	120	0.48	24	20.4 - 27.6	51	11.28	4100	<a href="#">9G1224G402</a>
3.25	115	98	0.39	24	20.4 - 27.6	48	8.88	3650	<a href="#">9G1224E402</a>
2.83	100	77	0.31	24	20.4 - 27.6	44	5.04	3150	<a href="#">9G1224A402</a>
2.50	88	64	0.26	24	20.4 - 27.6	40	4.08	2850	<a href="#">9G1224H402</a>
1.98	70	42	0.17	24	20.4 - 27.6	35	2.40	2250	<a href="#">9G1224F402</a>
1.66	58	31	0.12	24	20.4 - 27.6	29	1.92	1950	<a href="#">9G1224M402</a>
3.68	130	120	0.48	48	40.8 - 55.2	51	11.04	4100	<a href="#">9G1248G402</a>
3.25	115	98	0.39	48	40.8 - 55.2	48	7.68	3650	<a href="#">9G1248E402</a>
2.83	100	77	0.31	48	40.8 - 55.2	44	6.24	3150	<a href="#">9G1248A402</a>
2.50	88	64	0.26	48	40.8 - 55.2	40	4.80	2850	<a href="#">9G1248H402</a>
1.98	70	42	0.17	48	40.8 - 55.2	35	2.88	2250	<a href="#">9G1248F402</a>
1.66	58	31	0.12	48	40.8 - 55.2	29	2.40	1950	<a href="#">9G1248M402</a>

# San Ace 120 G-Type

High Air Flow Low Power Consumption 119x25mm & 119x38mm DC Axial Fans

## 119 x 119 x 25mm

Click to view dimensional drawings

- Models without sensor**
- Ribless models without sensor**
- Models with sensor**
- Ribless Models with sensor**

## 119 x 119 x 38mm

Click on Model No in red to view air performance curves

Airflow	Airflow	Static Pressure	Static Pressure	Nominal Voltage	Voltage Range	Sound Pressure	Power Input	Nominal Speed	Model No.
m <sup>3</sup> /min	CFM	Pa	inch/H <sub>2</sub> O	V	V	dB(A)	W	min <sup>-1</sup>	
3.88	137	135.0	0.54	12	10.2 - 13.8	49	11.8	3600	<b>9G1212G102</b>
3.34	118	100.0	0.40	12	10.2 - 13.8	46	7.32	3100	<b>9G1212E102</b>
2.80	99	70.4	0.283	12	7.0 - 13.8	39	4.56	2600	<b>9G1212H102</b>
2.45	87	54.2	0.218	12	7.0 - 13.8	36	3.36	2280	<b>9G1212F102</b>
2.10	74	39.6	0.16	12	7.0 - 13.8	32	2.52	1950	<b>9G1212M102</b>
3.88	137	135.0	0.54	24	20.4 - 27.6	49	12.0	3600	<b>9G1224G102</b>
3.34	118	100.0	0.40	24	20.4 - 27.6	46	8.16	3100	<b>9G1224E102</b>
2.80	99	70.4	0.283	24	14.0 - 27.6	39	5.23	2600	<b>9G1224H102</b>
2.45	87	54.2	0.218	24	14.0 - 27.6	36	3.84	2280	<b>9G1224F102</b>
2.10	74	39.6	0.16	24	14.0 - 27.6	32	2.64	1950	<b>9G1224M102</b>
3.88	137	135.0	0.54	48	40.8 - 55.2	49	12.0	3600	<b>9G1248G102</b>
3.34	118	100.0	0.40	48	40.8 - 55.2	46	8.16	3100	<b>9G1248E102</b>
2.80	99	70.4	0.283	48	40.8 - 55.2	39	5.28	2600	<b>9G1248H102</b>
2.45	87	54.2	0.218	48	40.8 - 55.2	36	4.32	2280	<b>9G1248F102</b>
2.10	74	39.6	0.16	48	40.8 - 55.2	32	3.36	1950	<b>9G1248M102</b>

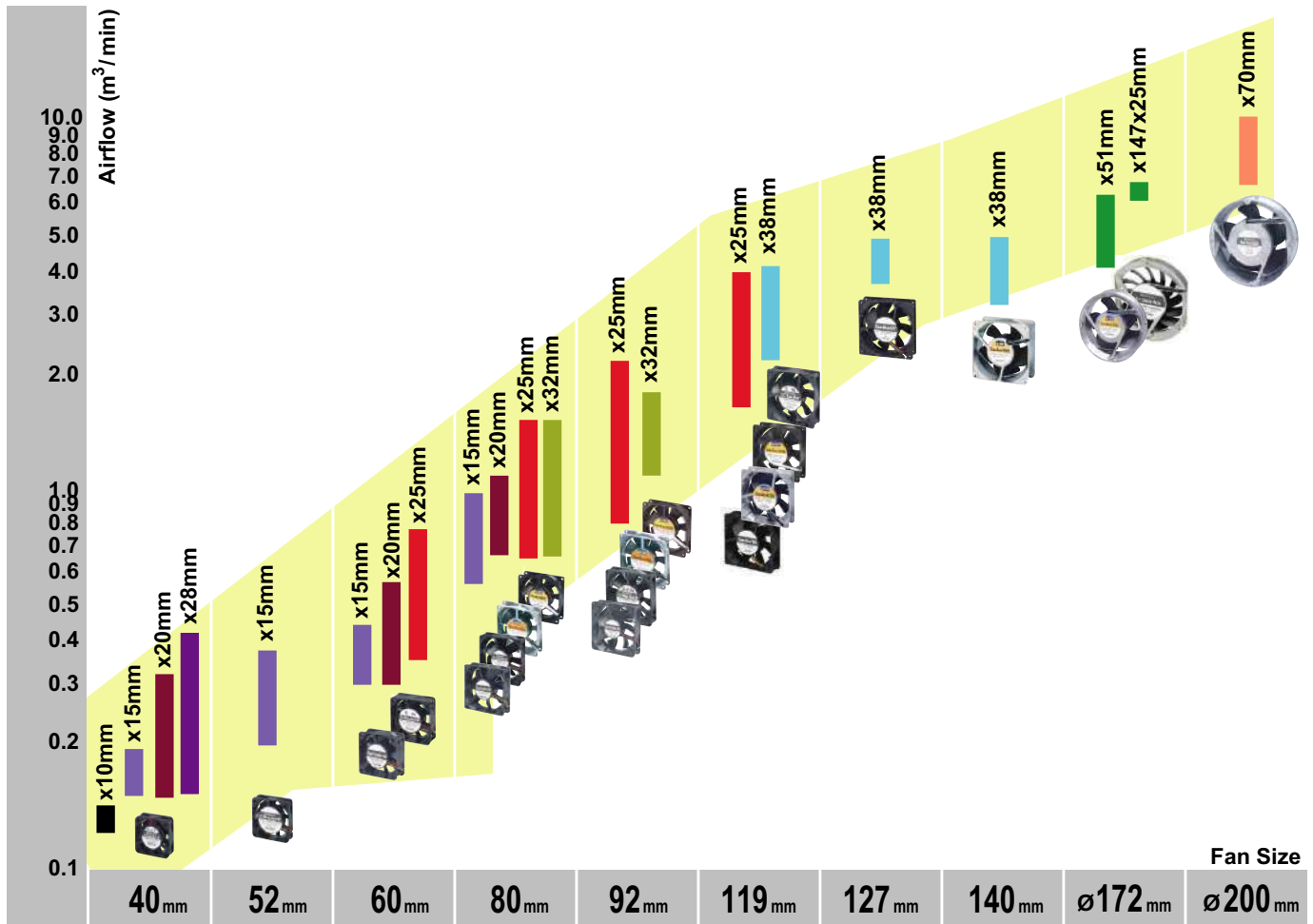
Click to view dimensional drawings

- Models without sensor**
- Ribless models without sensor**
- Models with sensor**
- Ribless Models with sensor**

- Notes: (1) Listed models are non-sensor types  
 (2) Airflow, power input, speed and noise ratings are at nominal voltage against zero static pressure.  
 (3) Static pressure ratings are at nominal voltage against zero air flow.  
 (4) Noise ratings are average values as measured from a point one (1) meter from intake of fan suspended in an anechoic chamber.  
 (5) Air performance curves show fan outputs with unobstructed inlets and outlets.  
 (6) Some model types are without UL, CSA and TÜV approvals.

### DC San Ace

High performance axial fans ranging from 40mm square to Ø200mm in 5, 12, 24 and 48 Vdc. Airflow from 3.18 to 369 CFM.



### San Cooler

New series of axial fans manufactured at SANYO DENKI PHILIPPINES. Comparable performance to DC SAN ACE with cost reductions from savings due to newly designed fan construction and lower manufacturing costs.

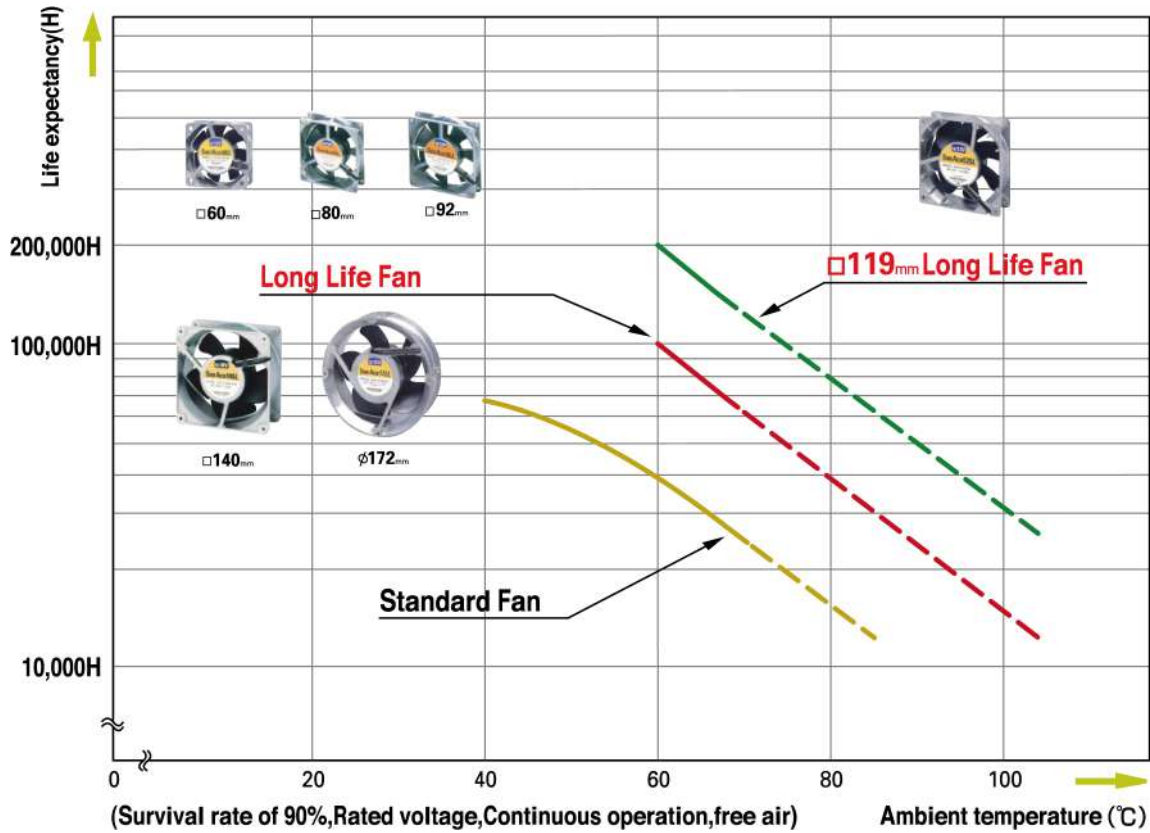
### Scirocco Ace

High performance centrifugal blowers in 4 sizes from 76mm to 160mm square at 12Vdc and 24Vdc. Airflow from 8.8 to 57.2 cfm.



### Long Life Fans

Fans capable of 100,000 - 200,000 of maintenance-free continuous operation at 60°C.



### Splash Proof Fans

Wide range of IPX4 and IP55 rated water protected fans.

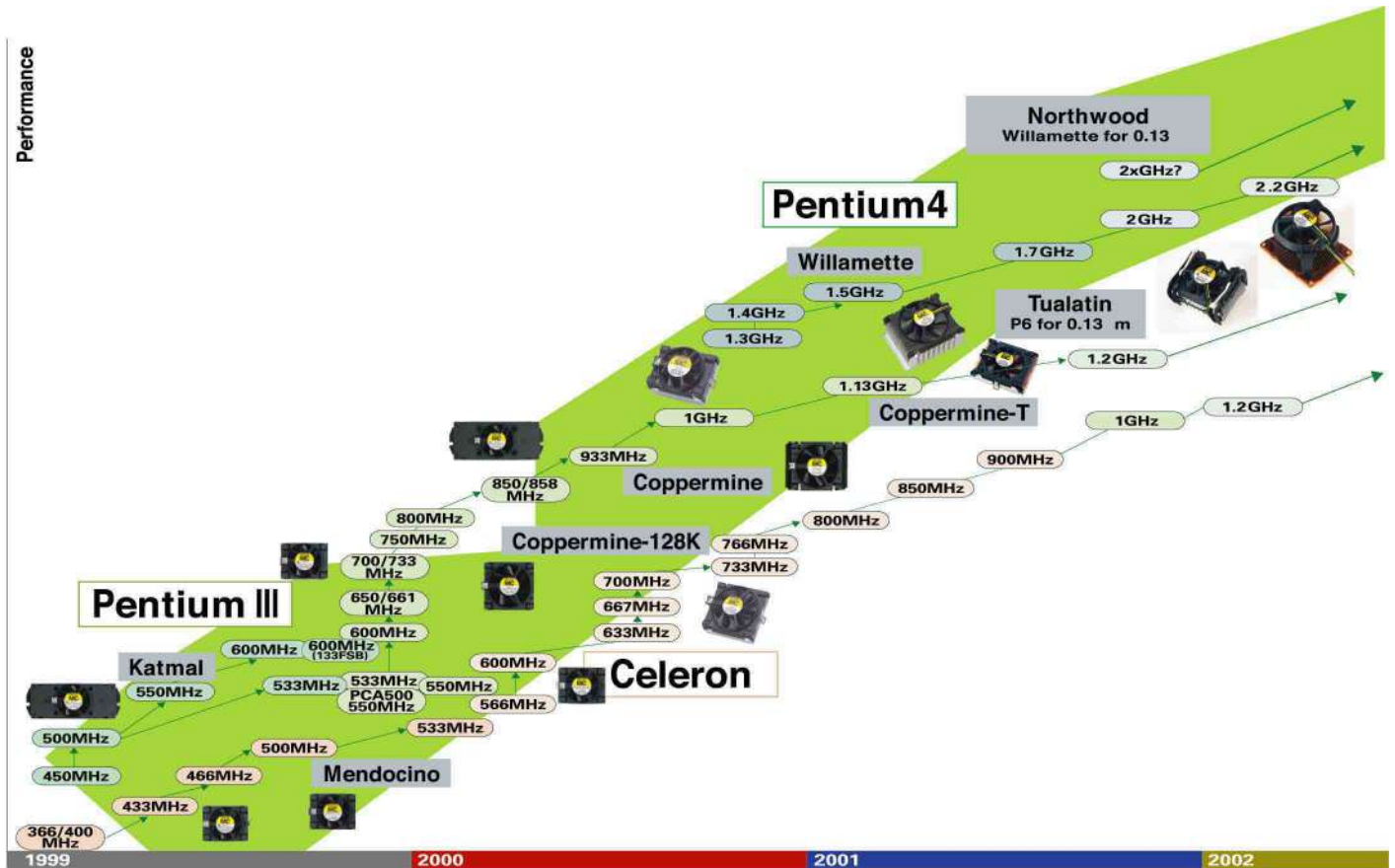


Size	60mm X 25mm	80mm X 25mm	92mm X 25mm	119mm X 38mm	140mm X 38mm	140mm X 51mm
Series						
W	_____	IP55	IP55	IP55	IP55	IP55
WS	_____	IPX4	IPX4	IPX4	_____	_____
WA	Oil protected	_____	_____	_____	_____	_____
All	Humi-Seal 1A27					



### San Ace MC

Active heatsinks compatible with all the latest Intel®processors.



### Customizations and Options

A wide variety of customer-specified fans and options are available to help you achieve optimal cooling performance. Contact the nearest SANYO DENKI representative to discuss your cooling problem with our specialist staff.

- Custom fans
  - Customer-specified fans tailored to requirements
- Custom interconnections
  - Special lead types, lead lengths, sleeving, interconnections
- Thermal speed control and dual-speed fans
  - Intelligent temperature-dependent speed control and dual-speed fans to cool appliances at the required speed, thus reducing noise levels in all operational conditions
- Fan Accessories
  - Finger Guards, Filter Guards, Mounting Clips, etc.
- Alarm Sensors
  - Pulse sensor, Lock Sensor, Inverse Lock Sensor, Low Speed Sensor

### Lock Sensor

Lock sensors are used to detect if the fan motor is in operation or stopped.

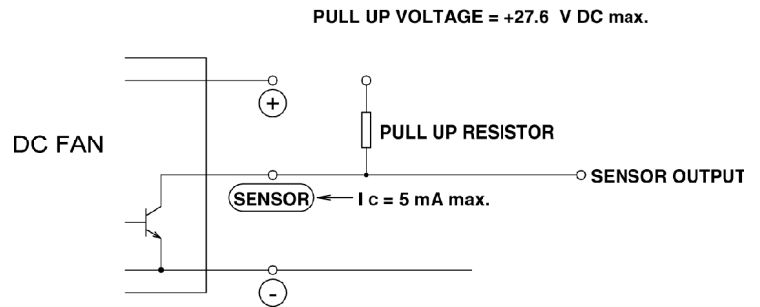
#### Output Circuit

Open Collector

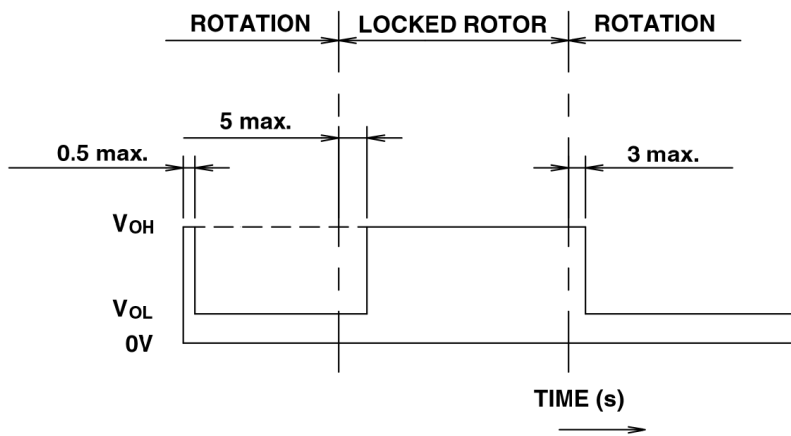
#### Specifications

$V_{CE} = +27.6 \text{ V max.}$  ( $V_{CE}$  is +60V max for 48V rated fans)

$I_C = 5 \text{ mA max.}$  ( $V_{OL} = V_{CE(SAT)} = 0.6 \text{ V max.}$ )  
 ( $V_{CE(SAT)}$  is 0.4V for 48V rated fans)



#### Output Waveform



Output reaches  $V_{OL}$  level within 0.5s of power on

### Inverse Lock Sensor

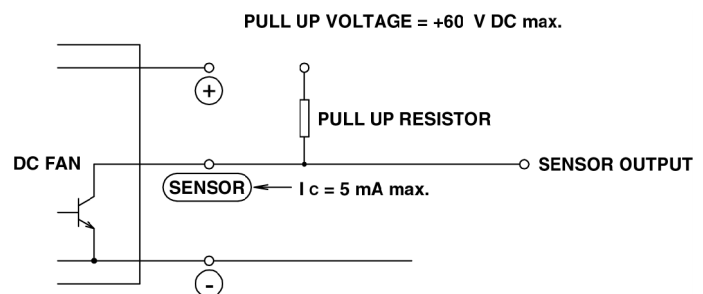
#### Output Circuit

Open Collector

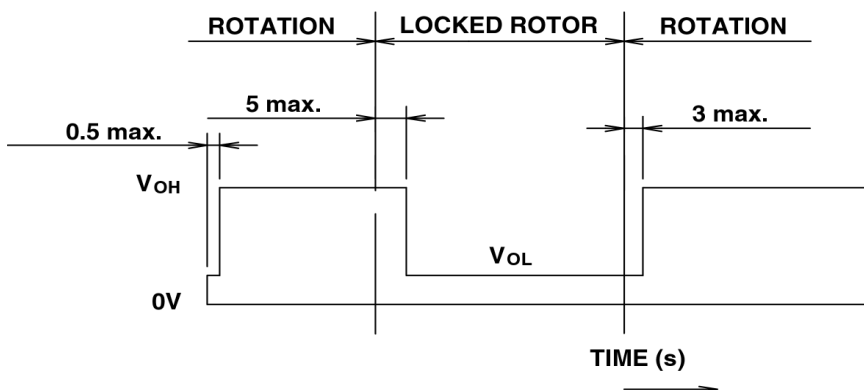
#### Specifications

$V_{CE} = +60 \text{ V max.}$  ( $V_{CE}$  is +60V max for 48V rated fans)

$I_C = 5 \text{ mA max.}$  ( $V_{OL} = V_{CE(SAT)} = 0.4 \text{ V max.}$ )



#### Output Waveform



Output reaches  $V_{OL}$  level within 0.5s of power on

### Low Speed Sensor

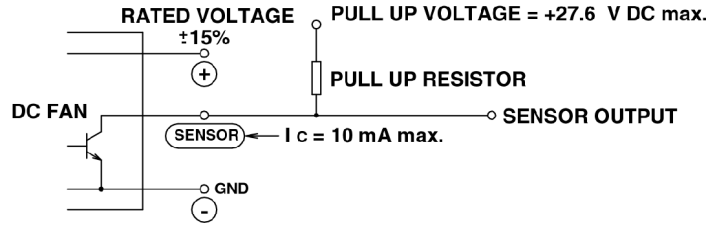
Low speed sensors output a signal when the rotational speed of the fan motor goes below the specified value. These sensors are used to detect declining cooling capability of fan motors.

**Output Circuit**  
Open Collector

**Specifications**

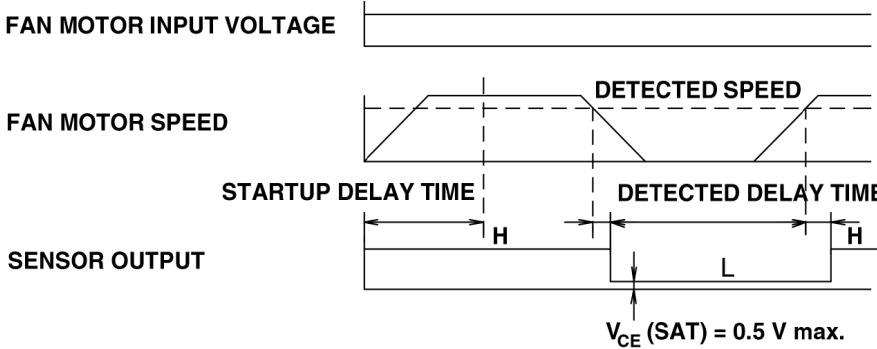
$V_{CE} = +27.6 \text{ V max.}$  ( $V_{CE}$  is +60V max for 48V rated fans)

$I_C = 10 \text{ mA max.}$  ( $V_{OL} = V_{CE}(\text{SAT}) = 0.5 \text{ V max.}$ )

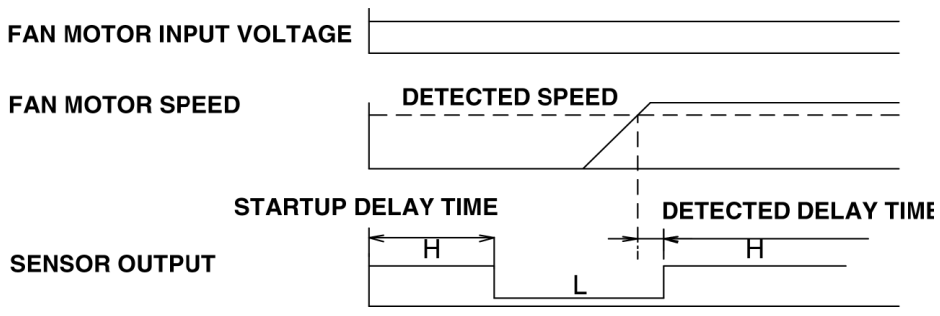


**Sensor Sequence**

■ Normal Operating Status



■ When fan blades are released after start-up delay time has elapsed (fan blades are to be kept locked during power-on)



### Pulse Sensor

Pulse sensors are used for detecting the rotational speed of the fan motor.

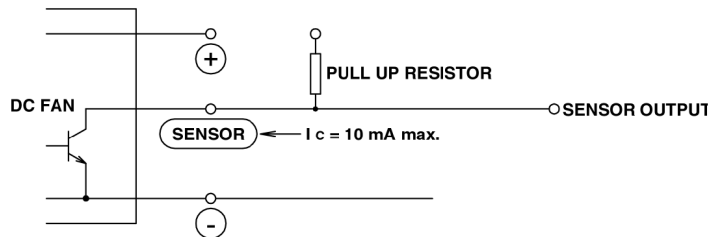
**Output Circuit**

Open Collector

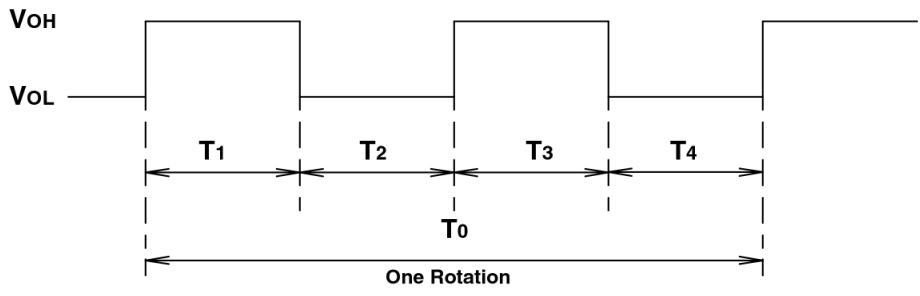
**Specifications**

$V_{CE} = +30 \text{ V max.}$  ( $V_{CE}$  is +60V max for 48V rated fans)

$I_C = 10 \text{ mA max.}$  ( $V_{CE}(\text{SAT}) = 0.4 \text{ V max.}$ )



**Output Waveform (during normal operation)**



$$T_{1-4} \doteq (1/4) T_0$$

$$T_{1-4} \doteq (1/4) T_0 = 60/4 \text{ N(s)}$$

$$N = \text{Fan Rotational Speed (min}^{-1}\text{)}$$

The following example is a guideline on to how to select an appropriate fan motor for cooling heat-producing equipment by forced air-cooling.

### Determine the Conditions of the Device to be Cooled

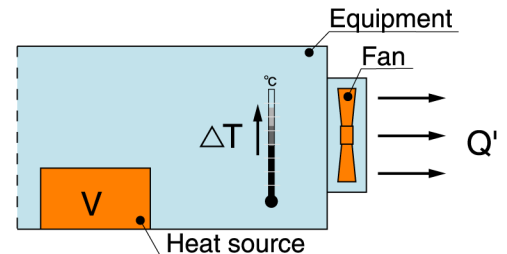
Determine the permissible temperature rise ( $\Delta T$ ), and the total heat generated inside the equipment ( $V$ ).

#### ■ Example

$V$  : Total generated heat = 100 Watt

$\Delta T$  : Permissible temperature rise = 15K\*

\* $\Delta T = 15K$ , for instance, signifies that the average airflow leaving the device may be only 15 C warmer than the ambient temperature.



### Calculate the Required Air Flow

Calculate the air flow required to satisfy the above conditions by using the formula\*\* below.

\*\*This formula assumes that heat is dissipated by cooling air coming from the fan motor only.

#### ■ Example (using $V = 100$ Watt, $\Delta T = 15K$ )

$Q'$  : Operating air flow ( $m^3/min.$ )

$$Q' = \frac{V}{20\Delta T} = \frac{100 \text{ W}}{20 \times 15K} \cong 0.33 \text{ m}^3/\text{min} \text{ (11.65 CFM)}$$

### Selecting the Fan Motor

The actual air flow when the fan motor is mounted onto the device can be determined from the air flow-static pressure characteristics curve of the fan motor and the pressure loss of the electronic device. However, since the pressure loss of the device cannot be determined without using a measuring instrument, a fan with a maximum airflow capacity of 1.5 to 2 times the operating air flow should be selected as a effective starting point for fan performance trials.

#### ■ Example (using $Q' = 0.33 \text{ m}^3/\text{min}$ )

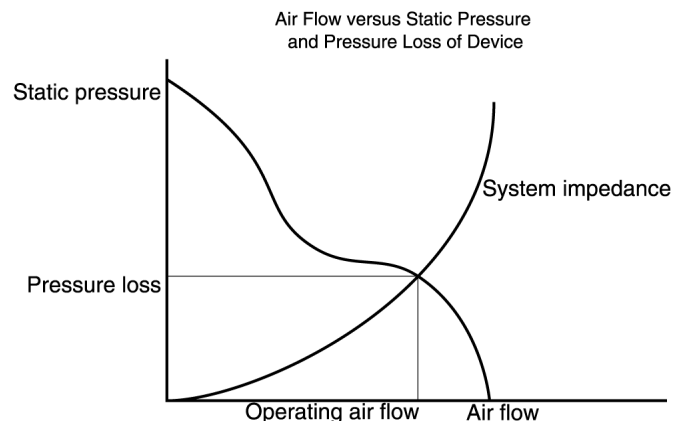
$Q$  : Maximum air flow ( $m^3/min.$ )

$Q' = Q \times 2/3$

$Q = Q' \times 3/2 = 0.33 \times 3/2 \cong 0.5 \text{ m}^3/\text{min} \text{ (17.66 CFM)}$

From the above calculations, fan motors having a maximum air flow of  $0.5 \text{ m}^3/\text{min}$  or more should be selected as possible candidates for performance trials . A final choice should be made after taking into account the space requirements, noise level, economy and ambient conditions of the application.

In this example, a fan of 60mm square, 25mm thickness and 12V, which meets the required maximum air flow calculated above is DC San Ace 109R0612H402 (maximum air flow =  $0.53 \text{ m}^3/\text{min}.$ ).



### Verifying the Selected Fan Motor

Calculate the temperature rise inside the device when 100 Watt of total generated heat is forcefully cooled by a 109R0612H402 fan motor.

#### ■ Example (using the above values)

$Q' = Q \times 2/3 = 0.53 \times 2/3 \cong 0.353 \text{ m}^3/\text{min}$

$\Delta T = V/20Q' = 100(W)/20 \times 0.353 \text{ m}^3/\text{min} \cong 14.2K$

Click on links in red for further details

\* Stated airflows are at nominal voltage against zero static pressure

### New Products

Description	Series
High Airflow Low Power Consumption 92x32mm DC Axial Fans	<a href="#">San Ace 92 G-Type</a>
Slim Type Active Heat Sink for Intel®Pentium® 4 μPGA478 1.8-2.2 GHz	<a href="#">San Ace MC</a>
High Performance Active Heat Sink for Intel®Pentium® 4 μPGA478 2.2 GHz	<a href="#">San Ace MC</a>
Spiral Copper Active Heat Sink for Intel®Pentium® 4 PGA423 & μPGA478 2.2 GHz	<a href="#">San Ace MC-HX</a>
19" Rack Mountable Ø172 x 147 x 25mm DC Axial Fans	<a href="#">Dyna Ace</a>
High Airflow 119x38mm Long Life Fans	<a href="#">San Ace 120L G-Type</a>
1U Compatible Active Heat Sink for Intel®Pentium® III FC-PGA2 1.4GHz	<a href="#">San Ace MC</a>
High Airflow Low Power Consumption 119x25mm & 119x38mm DC Axial Fans	<a href="#">San Ace 120 G-Type</a>

### DC Axial Fans

Edge Length (mm)	Thickness (mm)	Voltage (V)	Air Flow (cfm)	Series
40	10, 15, 20, 28	5, 12, 24	3.18 - 14.8	<a href="#">Fine Ace</a>
52	15	5, 12, 24	7.24 - 13.3	<a href="#">Micro Ace</a>
60	15, 20, 25	5, 12, 24, 48	7.40 - 37.0	<a href="#">Pico Ace</a>
80	15, 20, 25, 32	5, 12, 24, 48	14.8 - 55.0	<a href="#">Petit Ace</a>
92	25, 32	12, 24, 48	28.3 - 71.7	<a href="#">Mini Ace</a>
	32	12, 24, 48	42.4 - 88.3	<a href="#">NEW San Ace 92 G-Type</a>
119	25, 38	5, 12, 24, 48	43.1 - 102.4	<a href="#">San Ace</a>
	25, 38	12, 24, 48	58.0 - 137.0	<a href="#">NEW San Ace 120 G-Type</a>
127	38	12, 24, 48	132.0 - 170.0	<a href="#">San Ace 127</a>
140	38	12, 24, 48	116.0 - 159.0	<a href="#">San Ace 140</a>
Ø172	51, 150x51, <sup>NEW</sup> 147x25	12, 24, 48	108.0 - 279.0	<a href="#">Dyna Ace</a>
Ø200	70	24, 48	290.0 - 369.0	<a href="#">San Ace 200</a>

### Splash Proof Fans

Edge Length (mm)	Thickness (mm)	Voltage (V)	Air Flow (cfm)	Series
80	25	12, 24, 48	22.3 - 39.2	<a href="#">Splash Proof Fan W-Type</a>
92	25	12, 24, 48	28.2 - 48.8	
119	38	12, 24, 48	79.0 - 106.0	
140	38, 51	12, 24, 48	116.5 - 208.3	
80	25	12, 24	23.0 - 33.2	<a href="#">Splash Proof Fan WS-Type</a>
92	25	12, 24	28.2 - 48.7	
119	38	12, 24, 48	77.7 - 102.4	

Click on links in red for further details

\* Stated airflows are at nominal voltage against zero static pressure

### Long Life Fans

Edge Length (mm)	Thickness (mm)	Voltage (V)	Air Flow (cfm)	Series
60	25	12, 24, 48	12.7 - 27.6	<b>Long Life Fan</b>
80	25	12, 24, 48	22.2 - 42.4	
92	25	12, 24, 48	28.2 - 58.0	
119	38	5, 12, 21, 24, 48	54.8 - 106.0	
140	38, 51	12, 24, 48	116.5 - 208.3	
Ø172	51, 150x51	12, 24, 48	148.3 - 226.0	<b>Long Life Fan (Low Noise)</b> <b>NEW San Ace 120L G Type</b>
119	38	12, 24, 48	77.7 - 102.4	
119	38	12, 24, 48	74.0 - 138.0	

### DC Centrifugal Blowers

Edge Length (mm)	Thickness (mm)	Voltage (V)	Air Flow (cfm)	Series
76	30	12, 24	12.7 - 27.6	<b>Scirocco Ace</b>
119	32	12, 24	18.2 - 27.5	
127	32	12, 24	21.5 - 32.0	
160	40	12, 24	44.5 - 57.2	

### CPU Active Heatsinks

CPU	Core Speed (MHz)	Series
Intel® Pentium®4 µPGA478/PGA423	up to 2200	<b>San Ace MC</b>  <b>NEW San Ace MC-HX</b>
Intel® Pentium®III FC-PGA2/FC-PGA	500 - 1400	
Intel® Pentium®II SECC2	733 - 1000	
Intel® Celeron™ FC-PGA2/FC-PGA/PPGA	300 - 1300	
Intel® Pentium® Pro	All	
Intel® Pentium®	All	
Mobile CPU, PCI Card	All	
Intel® Pentium®4 µPGA478/PGA423	up to 2200	

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### San Cooler

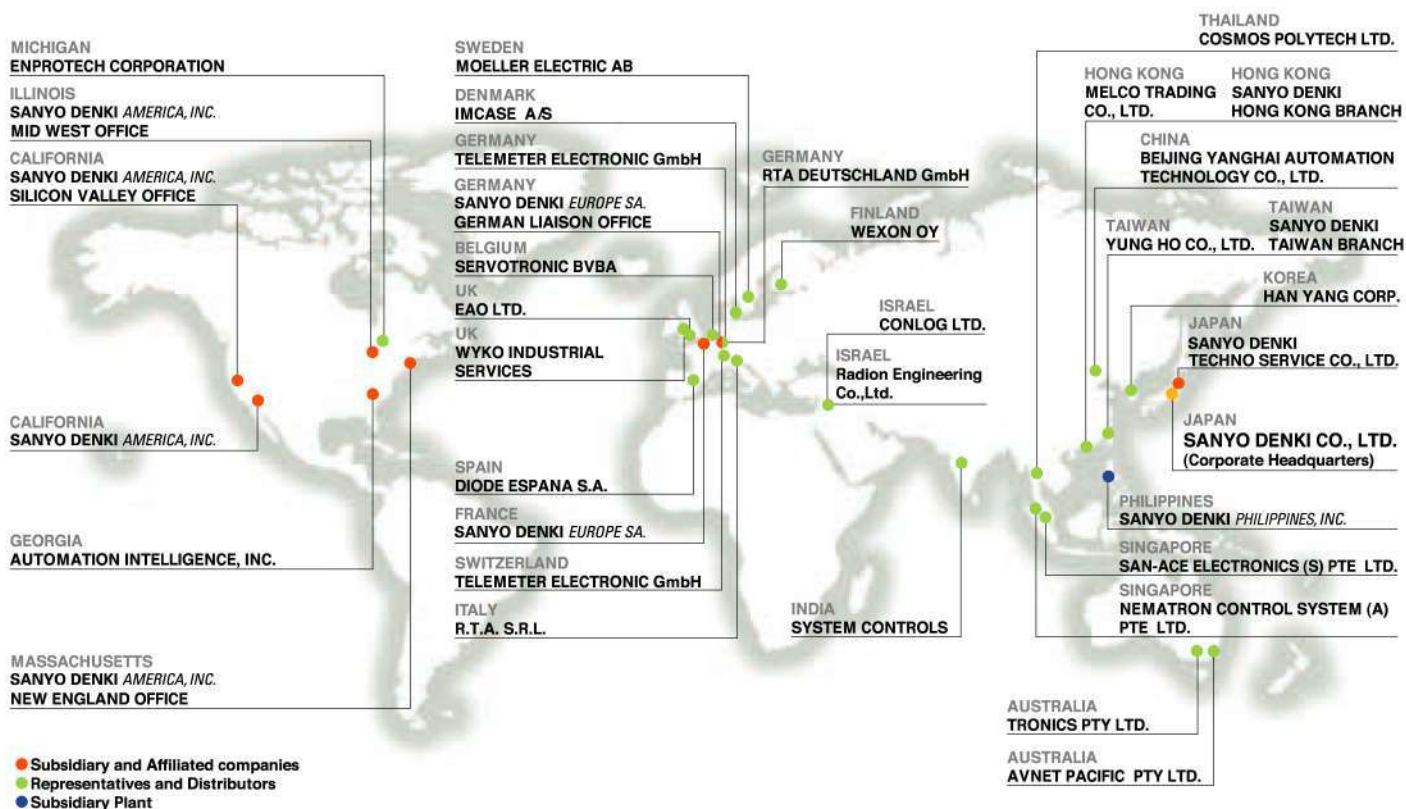
Edge Length (mm)	Thickness (mm)	Voltage (V)	Air Flow (cfm)	Series
60	25	12, 24	12.7 - 27.6	<b>San Cooler</b>
80	25	12, 24	23.0 - 53.0	
92	25	12, 24	23.0 - 62.1	



# Safety Precautions

Failure to observe any of the precautions described below may cause minor to moderate injuries or damage to property.

- Do not use these products in medical-related or any other equipment that may have a potential effect on human lives.
- Do not use these products in equipment that may have a serious impact on society and the general public.
- Do not use these products in a vehicle, ship, or in any other environment that is exposed to vibration.
- Do not attempt to disassemble or modify the products. Disassembling or modifying the products will void the warranty, and may render the product dangerous.
- Never put your finger or any other part of your body into the product whilst it is in operation. Personal injury can be caused as a result.
- Never insert an object into the product. Damage can be caused to the product as a result.
- Always observe the operating conditions and environmental requirements as indicated in this catalog when operating the product.
- Consider implementing additional protection measures against damage to your equipment in the event of the product failing.
- Install and use the product internally in your equipment.
- Static electricity may cause damage to the product. Adequately protect against static electricity during installation.
- Install a fingerguard to prevent accidental injuries from occurring.



# Deleted Models in this Catalog

Following models were deleted in this latest version of catalog. However, these models are not discontinued product. Please contact us for further assistance if necessary.

## ■ DC Fan

Size	Model No.	Frame material	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]	Life Expectancy [h]
92 × 92 × 25mm	109P0912J401	Plastics	12	6 to 13.8	0.56	6.72	4,300	2.03 71.6	92.2 0.37	47	- 20 to + 60	40,000
92 × 92 × 25mm	109P0912W401	Plastics	12	6 to 16	0.21	2.52	2,850	1.45 51.2	45 0.181	33	- 20 to + 70	40,000
92 × 92 × 25mm	109P0912H401	Plastics	12	10.2 to 13.8	0.21	2.52	2,850	1.45 51.2	45 0.181	33	- 20 to + 70	40,000
92 × 92 × 25mm	109P0912F401	Plastics	12	10.2 to 13.8	0.14	1.68	2,450	1.24 43.8	32.3 0.130	30	- 20 to + 70	40,000
92 × 92 × 25mm	109P0912M401	Plastics	12	10.2 to 13.8	0.1	1.2	2,100	1.04 36.7	23.5 0.094	27	- 20 to + 70	40,000
92 × 92 × 25mm	109P0912L401	Plastics	12	10.2 to 13.8	0.07	0.84	1,700	0.8 28.3	16.6 0.067	23	- 20 to + 70	40,000
92 × 92 × 25mm	109P0924W401	Plastics	24	12 to 30	0.12	2.88	2,850	1.45 51.2	45 0.181	33	- 20 to + 70	40,000
92 × 92 × 25mm	109P0924H401	Plastics	24	20.4 to 27.6	0.12	2.88	2,850	1.45 51.2	45 0.181	33	- 20 to + 70	40,000
92 × 92 × 25mm	109P0924F401	Plastics	24	20.4 to 27.6	0.08	1.92	2,450	1.24 43.8	32.3 0.130	30	- 20 to + 70	40,000
92 × 92 × 25mm	109P0924M401	Plastics	24	20.4 to 27.6	0.06	1.44	2,100	1.04 36.7	23.5 0.094	27	- 20 to + 70	40,000
92 × 92 × 25mm	109P0924L401	Plastics	24	20.4 to 27.6	0.05	1.2	1,700	0.8 28.3	16.6 0.067	23	- 20 to + 70	40,000
92 × 92 × 25mm	109P0948H401	Plastics	48	43 to 53	0.06	2.88	2,850	1.45 51.2	45 0.181	33	- 20 to + 70	40,000
φ 200mm × 70mm	109E2024S001	Aluminum	24	21.6 to 26.4	1.9	45.6	3,200	10.45 369	287.1 1.153	57	- 10 to + 70	40,000
φ 200mm × 70mm	109E2024H001	Aluminum	24	20.4 to 27.6	1.0	24	2,600	8.2 289.5	192 0.771	51	- 10 to + 70	40,000
					1.9	45.6	3,200	10.45 369	287.1 1.153	57		
φ 200mm × 70mm	109E2024AS001	Aluminum	24	21.6 to 26.4	1.45	34.8	2,800	9 317.8	215.6 0.865	54	- 10 to + 70	40,000
					1.0	24	2,600	8.2 289.5	192 0.771	51		
φ 200mm × 70mm	109E2024MH001	Aluminum	24	20.4 to 27.6	0.63	15.12	2,100	6.7 236.6	115.4 0.463	45	- 10 to + 70	40,000
					1.0	24	2,600	8.2 289.5	192 0.771	51		

## ■ Counter Rotating Fan

Size	Model No.	Frame material	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]	Life Expectancy [h]
							Inlet	Outlet					
40 × 40 × 56mm	9CRA0412K501	Plastics	12	10.8 to 12.6	1.8	21.6	17,000	13,000	0.95 33.5	650 2.61	65	- 20 to + 60	40,000
40 × 40 × 56mm	9CRA0412J501	Plastics	12	10.8 to 13.2	1.4	16.8	15,800	12,200	0.9 31.8	570 2.29	62	- 20 to + 70	40,000
40 × 40 × 56mm	9CRA0412G501	Plastics	12	10.8 to 13.2	1.0	12	14,000	10,400	0.77 27.2	435 1.75	59	- 20 to + 70	40,000
60 × 60 × 76mm	9CR0612S001	Plastics	12	10.8 to 13.2	3.2	38.4	11,500	7,000	2.26 80	550 2.21	66	- 10 to + 60	40,000
60 × 60 × 76mm	9CR0612H001	Plastics	12	10.8 to 13.2	2.7	32.4	10,300	6,500	1.98 70	450 1.81	64	- 10 to + 60	40,000
80 × 80 × 80mm	9CR0812S801	Plastics	12	10.8 to 13.2	5.5	66.0	8,000	5,300	4.53 160	520 2.09	71	- 10 to + 60	40,000
80 × 80 × 80mm	9CR0812H801	Plastics	12	10.8 to 13.2	3.6	43.2	7,000	4,600	3.97 140	400 1.61	68	- 10 to + 60	40,000

Size	Model No.	Frame material	Rated Voltage [V]	PWM Frequency [kHz]	Rated Current [A]	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)]	Expected Life [h]
						Duty Cycle 0%	Duty Cycle 100%				
60 × 60 × 76mm	9CR0612P0S03	Plastics	12	25.0	3.2	Inlet : 1,300 outlet : 800	Inlet : 11,500 outlet : 7,000	2.26 79.8	550 2.21	66	40,000
	9CR0612P0H03	Plastics	12	25.0	2.7	Inlet : 1,200 outlet : 800	Inlet : 10,300 outlet : 6,500	1.98 69.91	450 1.81	64	40,000
80 × 80 × 80mm	9CR0848P8S03	Plastics	48	25.0	1.29	Inlet : 2,000 outlet : 1,300	Inlet : 8,000 outlet : 5,300	4.53 159.95	520 2.09	71	40,000



## ■ Splash Proof Fan

Size	Model No.	Frame material	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]	Life Expectancy [h]
80 × 80 × 25mm	109W0812H401-U	Aluminum	12	10.2 to 13.8	0.18	2.16	3,000	1.06 37.4	39.2 0.157	32	-10 to +70	100,000
80 × 80 × 25mm	109W0812F401-U	Aluminum	12	10.2 to 13.8	0.14	1.68	2,700	0.93 32.8	32.3 0.130	29	-10 to +70	100,000
80 × 80 × 25mm	109W0812M401-U	Aluminum	12	10.2 to 13.8	0.10	1.20	2,400	0.83 29.3	26.5 0.106	26	-10 to +70	100,000
80 × 80 × 25mm	109W0812L401-U	Aluminum	12	10.2 to 13.8	0.08	0.96	1,900	0.63 22.2	16.67 0.067	22	-10 to +70	100,000
80 × 80 × 25mm	109W0824H401-U	Aluminum	24	20.4 to 27.6	0.09	2.16	3,000	1.06 37.4	39.2 0.157	32	-10 to +70	100,000
80 × 80 × 25mm	109W0824F401-U	Aluminum	24	20.4 to 27.6	0.08	1.92	2,700	0.93 32.8	32.3 0.130	29	-10 to +70	100,000
80 × 80 × 25mm	109W0824M401-U	Aluminum	24	20.4 to 27.6	0.07	1.68	2,400	0.83 29.3	26.5 0.106	26	-10 to +70	100,000
80 × 80 × 25mm	109W0824L401-U	Aluminum	24	20.4 to 27.6	0.05	1.20	1,900	0.63 22.2	16.67 0.067	22	-10 to +70	100,000
80 × 80 × 25mm	109W0848H401-U	Aluminum	48	40.8 to 55.2	0.06	2.88	3,150	1.10 38.8	43.1 0.173	34	-10 to +70	100,000
92 × 92 × 25mm	109W0912H401-U	Aluminum	12	10.2 to 13.8	0.21	2.52	2,850	1.38 48.7	45.1 0.181	33	-10 to +70	100,000
92 × 92 × 25mm	109W0912F401-U	Aluminum	12	10.2 to 13.8	0.14	1.68	2,450	1.18 41.7	32.3 0.130	30	-10 to +70	100,000
92 × 92 × 25mm	109W0912M401-U	Aluminum	12	10.2 to 13.8	0.11	1.32	2,100	1.01 35.7	23.5 0.094	27	-10 to +70	100,000
92 × 92 × 25mm	109W0912L401-U	Aluminum	12	10.2 to 13.8	0.08	0.96	1,700	0.80 28.2	16.7 0.067	23	-10 to +70	100,000
92 × 92 × 25mm	109W0924H401-U	Aluminum	24	20.4 to 27.6	0.12	2.88	2,850	1.38 48.7	45.1 0.181	33	-10 to +70	100,000
92 × 92 × 25mm	109W0924F401-U	Aluminum	24	20.4 to 27.6	0.08	1.92	2,450	1.18 41.7	32.3 0.130	30	-10 to +70	100,000
92 × 92 × 25mm	109W0924M401-U	Aluminum	24	20.4 to 27.6	0.06	1.44	2,100	1.01 35.7	23.5 0.094	27	-10 to +70	100,000
92 × 92 × 25mm	109W0924L401-U	Aluminum	24	20.4 to 27.6	0.05	1.20	1,700	0.80 28.2	16.7 0.067	23	-10 to +70	100,000
92 × 92 × 25mm	109W0948H401-U	Aluminum	48	40.8 to 55.2	0.06	2.88	2,850	1.38 48.7	45.1 0.181	33	-10 to +70	100,000

## ■ Long Life Fan

Size	Model No.	Frame material	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]	Life Expectancy [h]
60 × 60 × 25mm	109L0612G401	Aluminum	12	10.2 to 13.8	0.24	2.88	5,600	0.78 27.5	87.3 0.35	39	-20 to +70	100,000
60 × 60 × 25mm	109L0612S401	Aluminum	12	10.2 to 13.8	0.17	2.04	4,600	0.65 23.0	56.8 0.228	33	-20 to +70	100,000
60 × 60 × 25mm	109L0612H401	Aluminum	12	10.2 to 13.8	0.11	1.32	3,800	0.53 18.7	40.2 0.161	28	-20 to +70	100,000
60 × 60 × 25mm	109L0612F401	Aluminum	12	10.2 to 13.8	0.09	1.08	3,200	0.44 15.5	29.4 0.118	24	-20 to +70	100,000
60 × 60 × 25mm	109L0612M401	Aluminum	12	10.2 to 13.8	0.06	0.72	2,600	0.36 12.7	19.6 0.079	20	-20 to +70	100,000
60 × 60 × 25mm	109L0624D401	Aluminum	24	20.4 to 27.6	0.12	2.88	5,150	0.72 25.4	73.8 0.296	37	-20 to +70	100,000
60 × 60 × 25mm	109L0624S401	Aluminum	24	20.4 to 27.6	0.08	1.92	4,600	0.65 23.0	56.8 0.230	33	-20 to +70	100,000
60 × 60 × 25mm	109L0624H401	Aluminum	24	20.4 to 27.6	0.06	1.44	3,800	0.53 18.7	40.2 0.161	28	-20 to +70	100,000
60 × 60 × 25mm	109L0624F401	Aluminum	24	20.4 to 27.6	0.05	1.20	3,200	0.44 15.5	29.4 0.118	24	-20 to +70	100,000
60 × 60 × 25mm	109L0624M401	Aluminum	24	20.4 to 27.6	0.04	0.96	2,600	0.36 12.7	19.6 0.079	20	-20 to +70	100,000
60 × 60 × 25mm	109L0648G401	Aluminum	48	40.8 to 55.2	0.07	3.36	5,600	0.78 27.5	87.3 0.35	39	-20 to +60	80,000
60 × 60 × 25mm	109L0648H401	Aluminum	48	40 to 53	0.04	1.92	3,800	0.53 18.7	40.2 0.161	28	-20 to +70	100,000
80 × 80 × 25mm	109L0812S401	Aluminum	12	10.2 to 13.8	0.26	3.12	3,400	1.2 42.4	50 0.2	37	-20 to +70	100,000
80 × 80 × 25mm	109L0812H401	Aluminum	12	10.2 to 13.8	0.18	2.16	3,000	1.06 37.4	39.2 0.157	32	-20 to +70	100,000
80 × 80 × 25mm	109L0812F401	Aluminum	12	10.2 to 13.8	0.14	1.68	2,700	0.93 32.8	32.3 0.130	29	-20 to +70	100,000
80 × 80 × 25mm	109L0812M401	Aluminum	12	10.2 to 13.8	0.1	1.2	2,400	0.83 29.3	26.5 0.106	26	-20 to +70	100,000
80 × 80 × 25mm	109L0812L401	Aluminum	12	10.2 to 13.8	0.08	0.96	1,900	0.63 22.2	16.7 0.067	22	-20 to +70	100,000
80 × 80 × 25mm	109L0824S401	Aluminum	24	20.4 to 27.6	0.11	2.64	3,400	1.2 42.4	50 0.2	37	-20 to +70	100,000
80 × 80 × 25mm	109L0824H401	Aluminum	24	20.4 to 27.6	0.09	2.16	3,000	1.06 37.4	39.2 0.157	32	-20 to +70	100,000
80 × 80 × 25mm	109L0824F401	Aluminum	24	20.4 to 27.6	0.08	1.92	2,700	0.93 32.8	32.3 0.130	29	-20 to +70	100,000
80 × 80 × 25mm	109L0824M401	Aluminum	24	20.4 to 27.6	0.07	1.68	2,400	0.83 29.3	26.5 0.106	26	-20 to +70	100,000
80 × 80 × 25mm	109L0824L401	Aluminum	24	20.4 to 27.6	0.05	1.2	1,900	0.63 22.2	16.7 0.067	22	-20 to +70	100,000
80 × 80 × 25mm	109L0848H401	Aluminum	48	40.8 to 55.2	0.06	2.88	3,150	1.1 38.8	43.1 0.173	34	-20 to +70	100,000
92 × 92 × 25mm	109L0912S401	Aluminum	12	10.2 to 13.8	0.32	3.84	3,500	1.69 59.7	66.6 0.267	39	-20 to +70	100,000
92 × 92 × 25mm	109L0912H401	Aluminum	12	10.2 to 13.8	0.21	2.52	2,850	1.38 48.7	45.1 0.181	33	-20 to +70	100,000
92 × 92 × 25mm	109L0912F401	Aluminum	12	10.2 to 13.8	0.14	1.68	2,450	1.18 41.7	32.3 0.130	30	-20 to +70	100,000
92 × 92 × 25mm	109L0912M401	Aluminum	12	10.2 to 13.8	0.11	1.32	2,100	1.01 35.7	23.5 0.094	27	-20 to +70	100,000
92 × 92 × 25mm	109L0912L401	Aluminum	12	10.2 to 13.8	0.08	0.96	1,700	0.80 28.2	16.7 0.067	23	-20 to +70	100,000
92 × 92 × 25mm	109L0924H401	Aluminum	24	20.4 to 27.6	0.12	2.88	2,850	1.38 48.7	45.1 0.181	33	-20 to +70	100,000
92 × 92 × 25mm	109L0924F401	Aluminum	24	20.4 to 27.6	0.08	1.92	2,450	1.18 41.7	32.3 0.130	30	-20 to +70	100,000
92 × 92 × 25mm	109L0924M401	Aluminum	24	20.4 to 27.6	0.06	1.44	2,100	1.01 35.7	23.5 0.094	27	-20 to +70	100,000
92 × 92 × 25mm	109L0924L401	Aluminum	24	20.4 to 27.6	0.05	1.2	1,700	0.80 28.2	16.7 0.067	23	-20 to +70	100,000
92 × 92 × 25mm	109L0948C401	Aluminum	48	43 to 53	0.1	4.8	3,400	1.65 58.3	64.2 0.258	38	-20 to +70	80,000
92 × 92 × 25mm	109L0948H401	Aluminum	48	40.8 to 55.2	0.06	2.88	2,850	1.38 48.7	45.1 0.181	33	-20 to +70	100,000
120 × 120 × 38mm	9LB1212H101	Aluminum	12	10.2 to 13.8	0.39	4.68	2,600	2.9 102.4	67.62 0.272	39	-20 to +70	200,000
120 × 120 × 38mm	9LB1212M101	Aluminum	12	10.2 to 13.8	0.22	2.64	2,000	2.2 77.7	42.14 0.169	32	-20 to +70	200,000
120 × 120 × 38mm	9LB1224S101	Aluminum	24	20.4 to 27.6	0.46	11.04	3,500	3.88 137.0	120.8 0.485	48	-20 to +70	100,000
120 × 120 × 38mm	9LB1224H101	Aluminum	24	20.4 to 27.6	0.19	4.56	2,600	2.9 102.4	67.62 0.272	39	-20 to +70	200,000
120 × 120 × 38mm	9LB1224M101	Aluminum	24	20.4 to 27.6	0.11	2.64	2,000	2.2 77.7	42.14 0.169	32	-20 to +70	200,000
120 × 120 × 38mm	9LB1248H101	Aluminum	48	40.8 to 55.2	0.11	5.28	2,600	2.9 102.4	67.62 0.272	39	-20 to +70	200,000
120 × 120 × 38mm	9LB1248M101	Aluminum	48	40.8 to 55.2	0.06	2.88	2,000	2.2 77.7	42.14 0.169	32	-20 to +70	200,000

## Thermally Controlled Fan

Size	Model No.	Frame material	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]	Life Expectancy [h]
52 × 52 × 15mm	109P0512T7H12	Plastics	12	10.2 to 13.8	0.13	1.56	4,600	0.255 9.0	31.9 0.128	27	- 10 to + 70	60,000
					0.09	1.08	2,300	0.13 4.6	8.8 0.035	17		
52 × 52 × 15mm	109P0512T7H122	Plastics	12	10.2 to 13.8	0.13	1.56	4,900	0.27 9.5	36.2 0.145	28	- 10 to + 70	60,000
					0.09	1.08	2,400	0.14 4.9	9.6 0.039	17		
60 × 60 × 15mm	109P0612T7H12	Plastics	12	10.2 to 13.8	0.12	1.44	4,100	0.4 14.1	38.2 0.153	32	- 10 to + 70	60,000
					0.08	0.96	2,050	0.2 7.1	9.3 0.037	18		
60 × 60 × 15mm	109P0612T7H122	Plastics	12	10.2 to 13.8	0.12	1.44	4,300	0.42 14.8	42.0 0.169	32	- 10 to + 70	60,000
					0.08	0.96	2,100	0.2 7.0	9.7 0.039	18		
60 × 60 × 20mm	109P0612T6H12	Plastics	12	10.2 to 13.8	0.15	1.8	4,200	0.42 14.8	31.9 0.128	31	- 10 to + 70	60,000
					0.10	1.2	2,100	0.21 7.4	8.8 0.035	21		
60 × 60 × 20mm	109P0612T6H122	Plastics	12	10.2 to 13.8	0.15	1.8	4,400	0.44 15.5	35.0 0.141	33	- 10 to + 70	60,000
					0.10	1.2	2,150	0.22 7.8	9.2 0.037	21		
60 × 60 × 25mm	109R0612T4H12 109R0612T4H121	Plastics	12	10.2 to 13.8	0.13	1.56	3,800	0.53 18.7	40.2 0.161	28	- 10 to + 60	60,000
					0.10	1.20	1,900	0.26 9.2	9.8 0.039	15		
60 × 60 × 25mm	109R0612T4H122 109R0612T4H123	Plastics	12	10.2 to 13.8	0.13	1.56	3,950	0.55 19.4	41.8 0.168	28	- 10 to + 60	60,000
					0.10	1.20	1,950	0.27 9.5	10.3 0.041	15		
80 × 80 × 20mm	109P0812T6H12	Plastics	12	10.2 to 13.8	0.18	2.16	2,900	0.84 29.7	29.4 0.118	31	- 10 to + 60	60,000
					0.1	1.2	1,450	0.42 14.8	7.4 0.030	18		
80 × 80 × 20mm	109P0812T6H122	Plastics	12	10.2 to 13.8	0.18	2.16	3,050	0.88 31.0	32.5 0.131	32	- 10 to + 60	60,000
					0.1	1.2	1,450	0.42 14.8	7.4 0.030	20		
80 × 80 × 25mm	109R0812T4H12 109R0812T4H121	Plastics	12	10.2 to 13.8	0.14	1.68	2,900	1.03 36.4	35.3 0.142	29	- 10 to + 60	60,000
					0.09	1.08	1,450	0.51 18.0	8.8 0.035	14		
80 × 80 × 25mm	109R0812T4H122 109R0812T4H123	Plastics	12	10.2 to 13.8	0.14	1.68	3,000	1.07 37.8	37.7 0.151	29	- 10 to + 60	60,000
					0.09	1.08	1,450	0.51 18.0	8.8 0.035	14		
92 × 92 × 25mm	109P0912T4H12 109P0912T4H121	Plastics	12	10.2 to 13.8	0.2	2.4	2,850	1.45 51.2	45.1 0.181	33	- 10 to + 60	40,000
					0.1	1.2	1,400	0.71 25.0	11.3 0.045	18		
92 × 92 × 25mm	109P0912T4H122 109P0912T4H123	Plastics	12	10.2 to 13.8	0.2	2.4	3,000	1.52 53.7	50.0 0.201	35	- 10 to + 60	40,000
					0.1	1.2	1,400	0.71 25.0	11.3 0.045	18		
120 × 120 × 25mm	109P1212T4H12 109P1212T4H121	Plastics	12	10.2 to 13.8	0.55	6.6	2,800	2.5 88.3	53.9 0.216	40	- 10 to + 60	40,000
					0.22	2.64	1,400	1.25 44.1	13.7 0.055	25		
120 × 120 × 25mm	109P1212T4H122 109P1212T4H123	Plastics	12	10.2 to 13.8	0.55	6.6	2,800	2.5 88.3	53.9 0.216	40	- 10 to + 60	40,000
					0.22	2.64	1,400	1.25 44.1	13.7 0.055	25		
120 × 120 × 38mm	109R1212T1H12 109R1212T1H121	Plastics	12	10.2 to 13.8	0.48	5.75	2,600	2.9 102.4	64.7 0.260	39	- 10 to + 60	40,000
					0.23	2.76	1,300	1.4 49.4	16.2 0.065	24		
120 × 120 × 38mm	109R1212T1H122 109R1212T1H123	Plastics	12	10.2 to 13.8	0.48	5.75	2,600	2.9 102.4	64.7 0.260	39	- 10 to + 60	40,000
					0.23	2.76	1,300	1.4 49.4	16.2 0.065	24		

## Blower

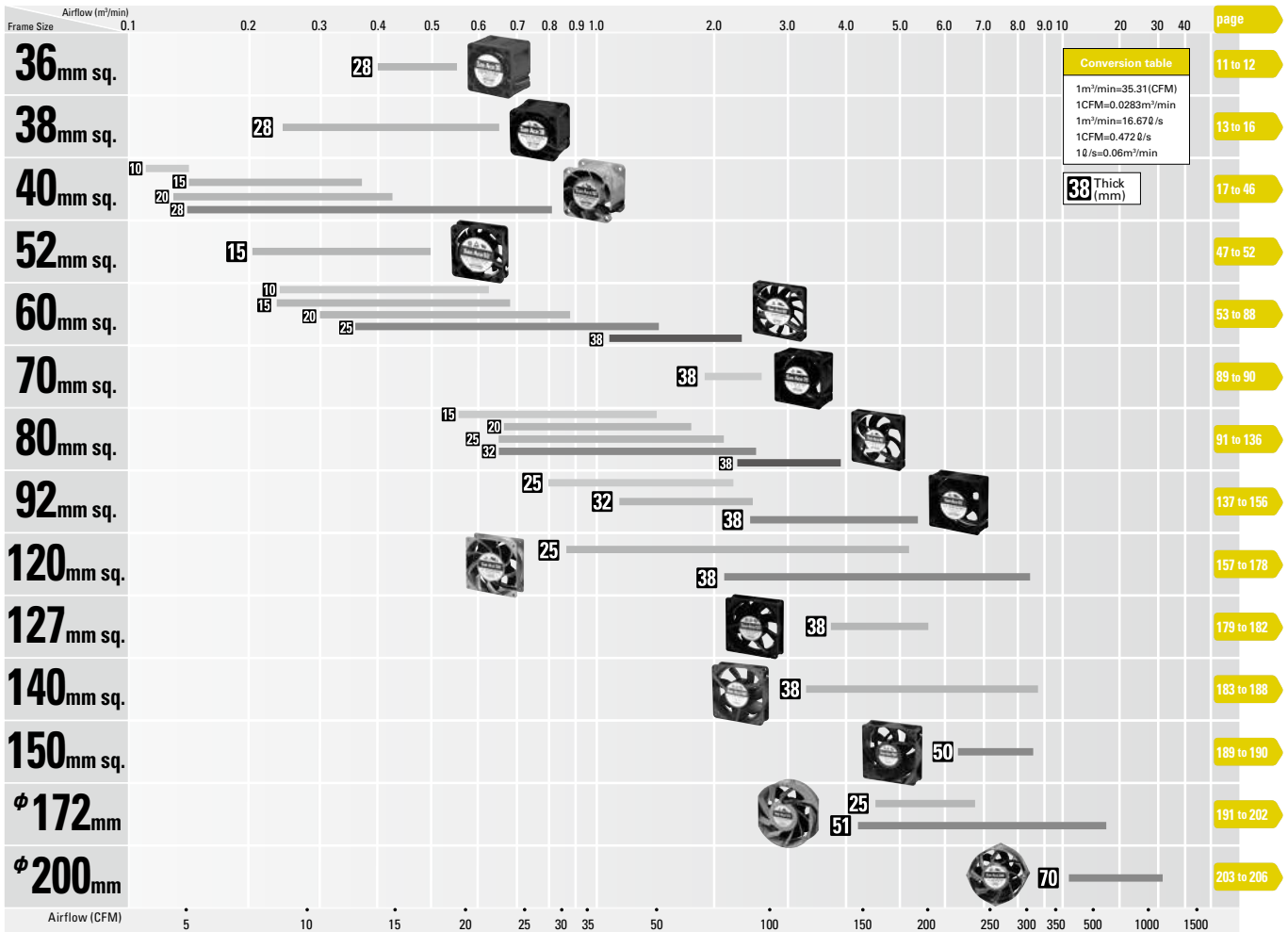
Size	Model No.	Frame material	Rated Voltage [V]	Operating Voltage Range [V]	Rated Current [A]	Rated Input [W]	Rated Speed [min <sup>-1</sup> ]	Max. Airflow [m <sup>3</sup> /min] [CFM]	Max. Static Pressure [Pa] [inchH <sub>2</sub> O]	SPL [dB(A)]	Operating Temperature [°C]	Life Expectancy [h]
120 × 32mm	109BF12HC2	Plastics	12	10.2 to 13.8	0.6	7.2	2,400	0.78 27.5	175.4 0.704	52	- 20 to + 60	40,000
120 × 32mm	109BF12MC2	Plastics	12	10.2 to 13.8	0.32	3.84	1,900	0.61 21.5	109.8 0.441	44	- 20 to + 60	40,000
120 × 32mm	109BF24HC2	Plastics	24	20.4 to 27.6	0.3	7.2	2,400	0.78 27.5	175.4 0.704	52	- 20 to + 60	40,000
120 × 32mm	109BF24MC2	Plastics	24	20.4 to 27.6	0.16	3.84	1,900	0.61 21.5	109.8 0.441	44	- 20 to + 60	40,000

• Storage temperature is -30°C to +70°C .

# DC Fan

Wide lineup including low power consumption fans (9GA type), silent fans (9S type), and high airflow and high static pressure fans.

## Domain Diagram



## Model Numbering System

Not every combination of the following codes or characters is available. Contact us for an available combination.

<b>9GV</b>	<b>12</b>	<b>12</b>	<b>J</b>	<b>1</b>	<b>01</b>	<b>1</b>
<b>Type name / frame material</b> 109P / Plastics 109R / Plastics 9GA / Plastics 9S / Plastics 9GV / Plastics Aluminum 9GE / Aluminum 9G / Plastics 9A / Plastics 9SG / Aluminum 109E / Aluminum 9EC / Aluminum 9GX / Plastics 9GAX / Plastics 9HV / Plastics Aluminum 9HVA / Plastics	<b>Frame size</b> 36: 36×36mm 03: 38×38mm 04: 40×40mm 05: 52×52mm 06: 60×60mm 08: 80×80mm 09: 92×92mm <b>12: 120×120mm</b> 13: 127×127mm 14: 140×140mm 15: 150×150mm 17: φ172mm 47: φ172mm×147mm (sidecut) 57: φ172mm×150mm (sidecut) 20: φ200mm	<b>Voltage</b> 05: 5V 12: 12V 24: 24V 48: 48V etc	<b>Speed code</b> A,B,C,D,E,F,G,H,J,K, L,M,S,W etc	<b>Frame thickness</b> 0: 70mm thick 1: 38mm thick 2: 32mm thick 3: 28mm thick 4: 25mm thick 5: 50mm thick 51mm thick 6: 20mm thick 7: 15mm thick 9: 10mm thick	<b>Sensor specifications</b> 01 or 001: With a pulse sensor 02 or 002: Without a sensor D01 or D001: With a lock sensor	<b>Frame form</b> Nil: Plastics frame: Ribbed frame Aluminum frame: Ribless frame 1: Plastics frame: Ribless frame 3: 40×40×28mm for 1U applications Plastics frame: Ribbed frame

### Fans with PWM control function

Example :

<b>9GV</b>	<b>12</b>	<b>12</b>	<b>P</b>	<b>4</b>	<b>G</b>	<b>01</b>	
<b>Type name / frame material</b> 9GV / Plastics Aluminum	<b>Frame size</b> 12: 120×120mm	<b>Voltage</b> 12: 12V	<b>PWM control function</b>	<b>Frame thickness</b>	<b>Speed code</b>	<b>Individual customer's spec</b> 2 to 4 digits	<b>Frame form</b> Nil: Plastics frame: Ribbed frame Aluminum frame: Ribless frame

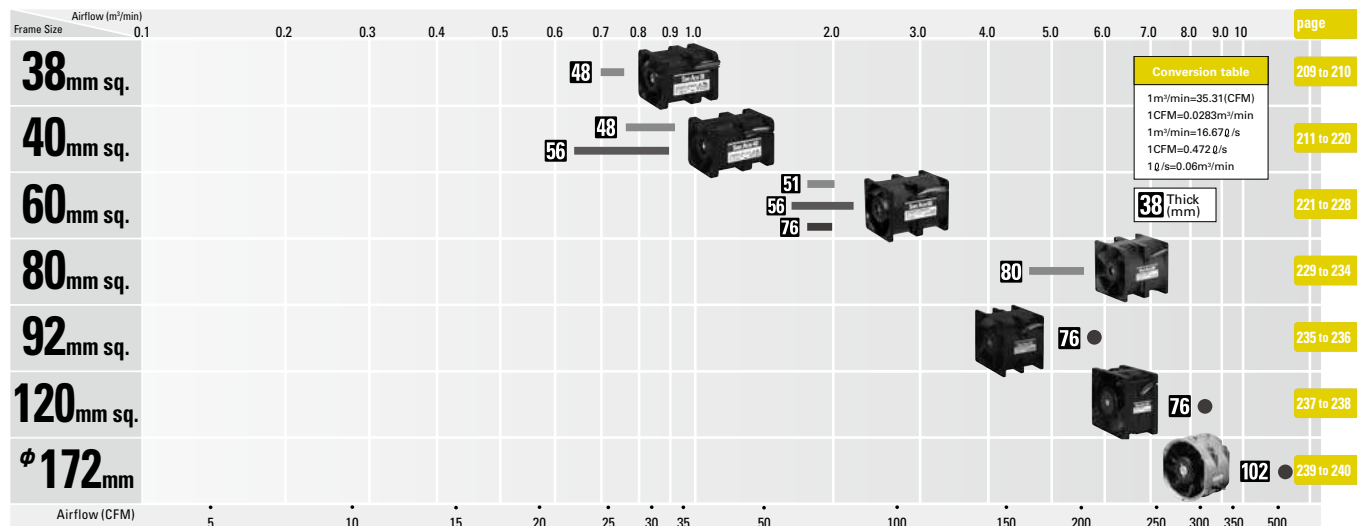
# Counter Rotating Fan

Counter rotating fans feature high airflow and high static pressure.

## Related product

Long Life Counter Rotating Fan ⇒ pp. 327, 333

## Domain Diagram



## Model Numbering System

Not every combination of the following codes or characters is available. Contact us for an available combination.

9CRA	04	12	K	4	01
<b>Type name / frame material</b> 9CR / Plastics Aluminum 9CRA / Plastics 9CRB / Plastics 9CRE / Aluminum 9CRD / Plastics 9CRF / Plastics	<b>Frame size</b> 03 : 38×38mm 04 : 40×40mm 06 : 60×60mm 08 : 80×80mm 12 : 120×120mm 57 : φ172mm×150mm (sidecut)	<b>Voltage</b> 12 : 12V 48 : 48V	<b>Speed code</b> J, G, S, H, K etc	<b>Frame thickness</b> 0 : 76mm thick 4 : 48mm thick 5 : 56mm thick, 51mm thick 6 : 56mm thick 8 : 80mm thick 9 : 102mm thick	<b>Sensor specifications</b> 01 : With a pulse sensor 02 : Without a sensor D01 : With a lock sensor

## Fans with PWM control function

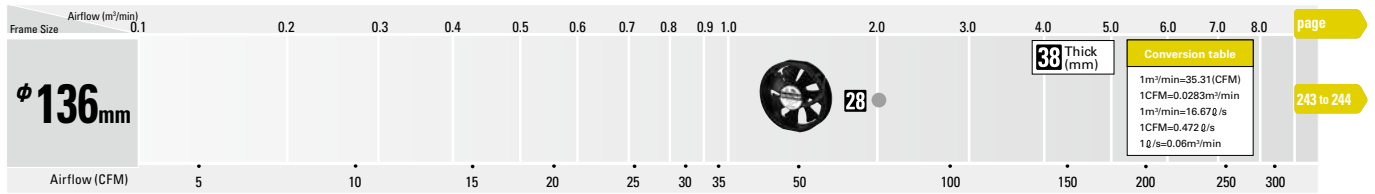
Example :

9CRA	03	12	P	4	K	03
<b>Type name / frame material</b> 9CRA / Plastics	<b>Frame size</b> 03 : 38×38mm	<b>Voltage</b> 12 : 12V	<b>PWM control function</b>	<b>Frame thickness</b>	<b>Speed code</b>	<b>Individual customer's spec</b> 2 or 3 digits

# Reversible Flow Fan

The wind directions can be switched with these fans. Equivalent cooling performance can be obtained in both directions.

## Domain Diagram



## Model Numbering System

Not every combination of the following codes or characters is available. Contact us for an available combination.

<b>9RF</b>	<b>13</b>	<b>12</b>	<b>P</b>	<b>3</b>	<b>H</b>	<b>001</b>
Type name / frame material 9RF / Plastics	Frame size 13: $\phi$ 136mm	Voltage 12: 12V 24: 24V	PWM control function	Frame thickness 3: 28mm thick	Speed code	Individual customer's spec

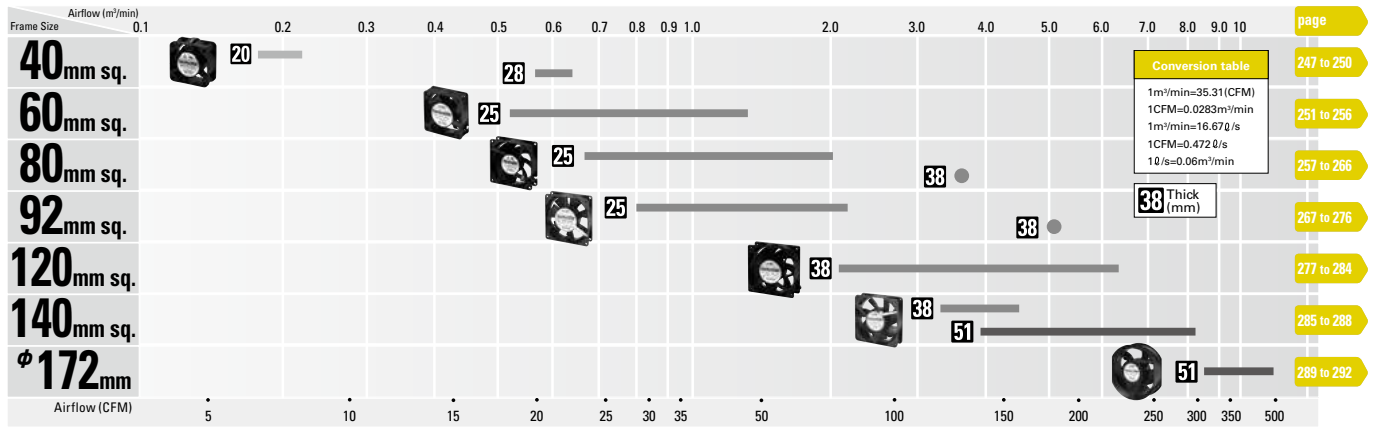
# Splash Proof Fan

Cooling fan of IP54, IP55 and IP68 waterproof capability.

## Related product

Splash Proof Centrifugal Fan ⇒ p. 293  
Oil Proof Fan ⇒ p. 303

## Domain Diagram



## Model Numbering System

Not every combination of the following codes or characters is available. Contact us for an available combination.

<b>9WS</b>	<b>12</b>	<b>12</b>	<b>H</b>	<b>1</b>	<b>01</b>	
<b>Type name / frame material</b> 109W / Aluminum 9WS / Plastics 9WE / Aluminum 9WG / Aluminum 9WB / Aluminum 9WP / Plastics 9WV / Plastics Aluminum 9WL / Aluminum	<b>Frame size</b> 04 : 40×40mm 06 : 60×60mm 08 : 80×80mm 09 : 92×92mm 12 : 120×120mm 14 : 140×140mm 17 : φ172mm 57 : φ172mm×150mm (sidecut)	<b>Voltage</b> 12 : 12V 24 : 24V 48 : 48V etc	<b>Speed code</b> A, D, E, F, G, H, J, L, M, S etc	<b>Frame thickness</b> 1 : 38mm thick 4 : 25mm thick 5 : 51mm thick 6 : 20mm thick	<b>Sensor specifications</b> 01 : With a pulse sensor 02 : Without a sensor D01 : With a lock sensor	<b>Frame form</b> Nil : Plastics frame: Ribbed frame Aluminum frame: Ribless frame 1 : Plastics frame: Ribless frame

## Fans with PWM control function

Example :

<b>9WV</b>	<b>08</b>	<b>48</b>	<b>P</b>	<b>1</b>	<b>H</b>	<b>001</b>	
<b>Type name / frame material</b> 9WV / Plastics Aluminum	<b>Frame size</b> 08 : 80×80mm	<b>Voltage</b> 48 : 48V	<b>PWM control function</b>	<b>Frame thickness</b>	<b>Speed code</b>	<b>Individual customer's spec</b> 2 or 3 digits	<b>Frame form</b> Nil : Plastics frame: Ribbed frame Aluminum frame: Ribless frame

## Ingress protection ratings (IP code)

■ IP Codes used by SANYO DENKI express the level of protection that internal electrical components (for fans: electrical components and motor coils) have against solid objects, water, and access to hazardous parts. San Ace Splash Proof fans feature high protection levels.

## Definition of Ingress Protection (IP Code)

Ingress Protection (IP Code) is defined in IEC (International Electrotechnical Commission) 60529\* DEGREES OF PROTECTION PROVIDED BY ENCLOSURES (IP Code). \*IEC 60529:2001

**I P X X**

Second digit: Protection against water

First digit: Protection against solid objects and access to hazardous parts

\*For details, please refer to p. 483.

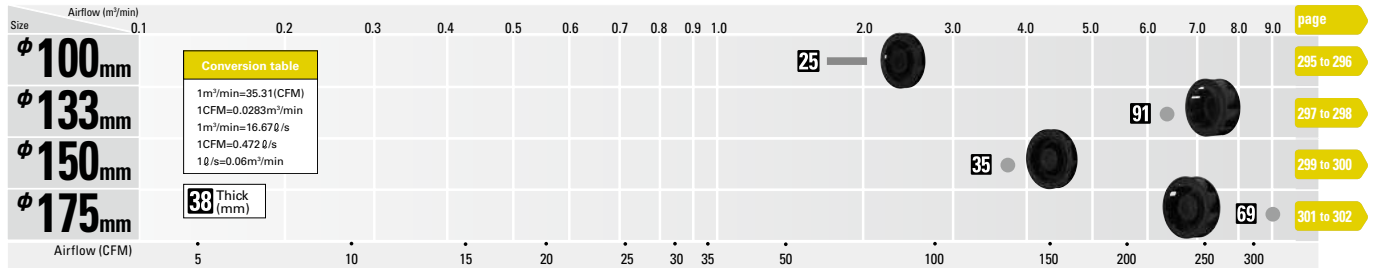
# Splash Proof Centrifugal Fan

Centrifugal fans of IP54 waterproof capability.

## Related product

Splash Proof Fan ⇒ p. 245 Centrifugal Fan ⇒ p. 371  
Oil Proof Fan ⇒ p. 303

## Domain Diagram



## Model Numbering System

Not every combination of the following codes or characters is available. Contact us for an available combination.

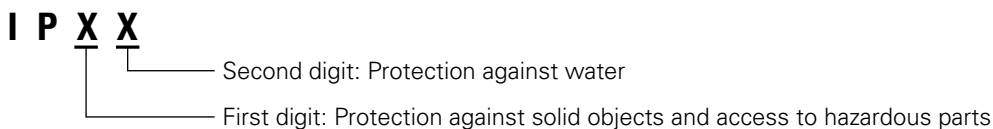
<b>9W1T</b>	<b>M</b>	<b>48</b>	<b>P</b>	<b>4</b>	<b>H</b>	<b>01</b>
<b>Type name</b> 9W1T: Splash Proof Centrifugal Fan	<b>Impeller size</b> M : φ100mm J : φ133mm N : φ150mm G : φ175mm	<b>Voltage</b> 24 : 24V 48 : 48V	<b>PWM control function</b> P	<b>Frame thickness</b> 0 : 69mm thick MIN 1 : 35mm thick 4 : 25mm thick	<b>Speed code</b> H,G etc	<b>Individual customer's spec</b> 2 or 3 digits

## Ingress protection ratings (IP code)

IP Codes used by SANYO DENKI express the level of protection that internal electrical components (for fans: electrical components and motor coils) have against solid objects, water, and access to hazardous parts. San Ace Splash Proof Centrifugal fans feature high protection levels.

### Definition of Ingress Protection (IP Code)

Ingress Protection (IP Code) is defined in IEC (International Electrotechnical Commission) 60529\* DEGREES OF PROTECTION PROVIDED BY ENCLOSURES (IP Code). \*IEC 60529:2001



First digit	Definition
0	No protection
1	Protection against solid objects > 50 mm
2	Protection against solid objects > 12.5 mm
3	Protection against solid objects > 2.5 mm
4	Protection against solid objects > 1 mm
5	Protection against a level of dust that could hinder operation or impair safety
6	Complete protection against dust

Second digit	Definition
0	No protection
1	Protection against dripping water
2	Protection against water spray up to 15°
3	Protection against spraying water
4	Protection against splashing water
5	Protection against low pressure water jets
6	Protection against high pressure water jets
7	Protection against temporary immersion in water
8	Protection against submersion in water

# Oil Proof Fan

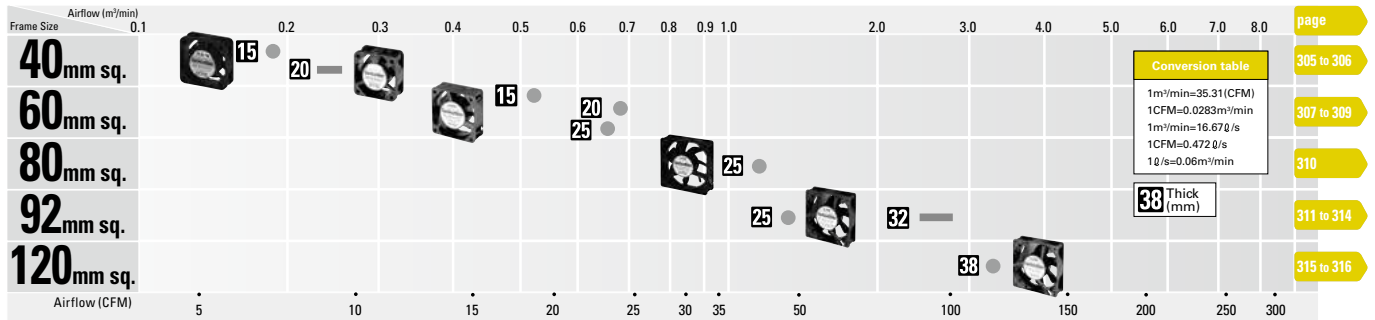
Cooling fan capable of operating in an oil-mist environment.

## Related product

Splash Proof Fan ⇒ p. 245

Splash Proof Centrifugal Fan ⇒ p. 293

## Domain Diagram



## Model Numbering System

Not every combination of the following codes or characters is available. Contact us for an available combination.

<b>9WF</b>	<b>12</b>	<b>24</b>	<b>H</b>	<b>1</b>	<b>01</b>	
<b>Type name / frame material</b> 9WF / Plastics	<b>Frame size</b> 04 : 40×40mm 06 : 60×60mm 08 : 80×80mm 09 : 92×92mm 12 : 120×120mm	<b>Voltage</b> 24 : 24V	<b>Speed code</b> H	<b>Frame thickness</b> 1 : 38mm thick 2 : 32mm thick 4 : 25mm thick 6 : 20mm thick 7 : 15mm thick	<b>Sensor specifications</b> 01 : With a pulse sensor 02 : Without a sensor D01 : With a lock sensor	<b>Frame form</b> Nil : Ribbed frame



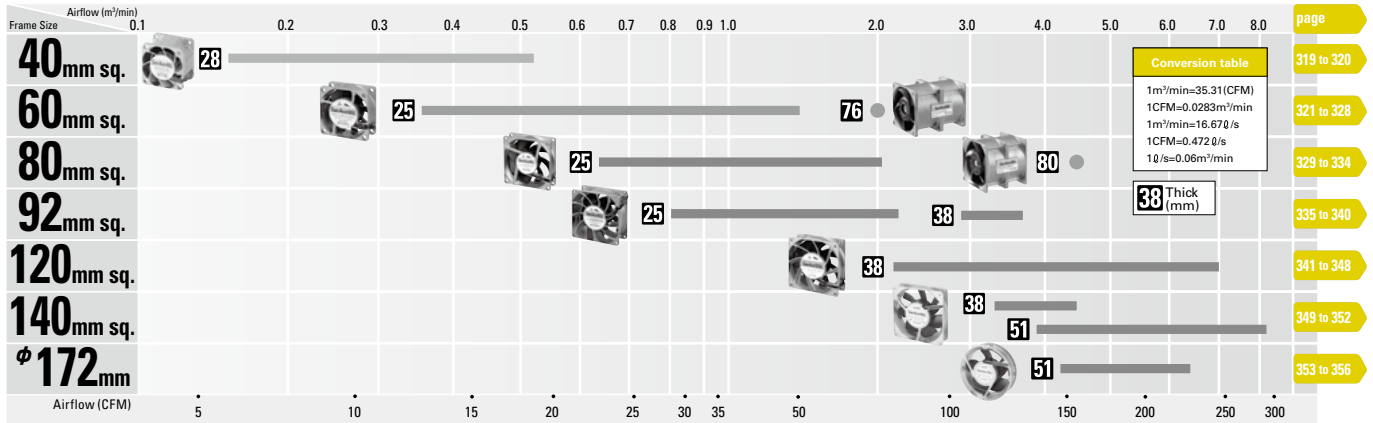
# Long Life Fan

Cooling fan with Max. 200,000 hours of expected life.

## Related product

Splash Proof, Long Life Fan ⇒ pp. 248, 251, 257, 267

## Domain Diagram



## Model Numbering System

Not every combination of the following codes or characters is available. Contact us for an available combination.

<b>109L</b>	<b>12</b>	<b>12</b>	<b>H</b>	<b>1</b>	<b>01</b>
<b>Type name / frame material</b> 109L / Aluminum 9LB / Aluminum 9GL / Aluminum 9L / Aluminum 9LG / Aluminum 9CRL / Aluminum	<b>Frame size</b> 04: 40×40mm 06: 60×60mm 08: 80×80mm 09: 92×92mm 12: 120×120mm 14: 140×140mm 17: φ172mm 57: φ172mm×150mm (sidecut)	<b>Voltage</b> 12: 12V 24: 24V 48: 48V etc	<b>Speed code</b> E, F, G, H, J, L, M, S etc	<b>Frame thickness</b> 0: 76mm thick 1: 38mm thick 3: 28mm thick 4: 25mm thick 5: 51mm thick 8: 80mm thick	<b>Sensor specifications</b> 01: With a pulse sensor 02: Without a sensor D01: With a lock sensor

## Fans with PWM control function

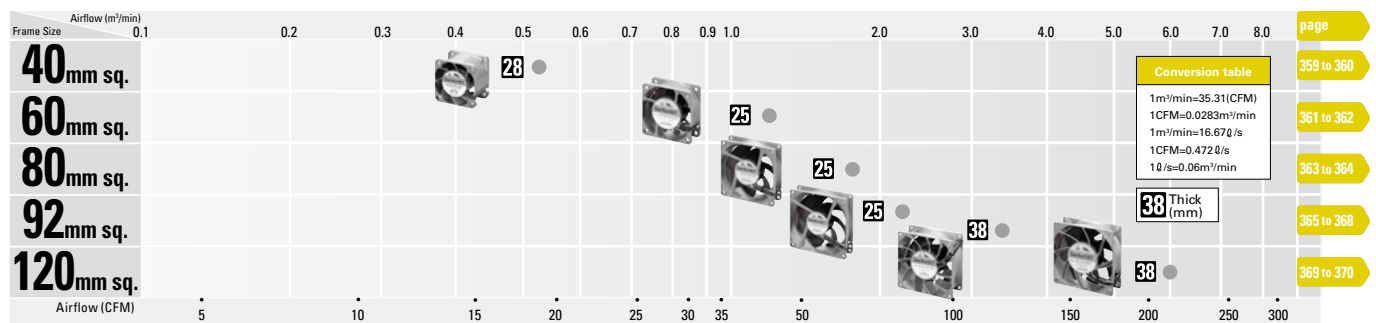
Example :

<b>9LG</b>	<b>06</b>	<b>12</b>	<b>P</b>	<b>4</b>	<b>S</b>	<b>001</b>
<b>Type name / frame material</b> 9LG / Aluminum	<b>Frame size</b> 06: 60×60mm	<b>Voltage</b> 12: 12V	<b>PWM control function</b>	<b>Frame thickness</b> 4: 25mm thick	<b>Speed code</b>	<b>Individual customer's spec</b> 2 or 3 digits

# Wide Temperature Range Fan

These fans can be used in a wide temperature range from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ .

## Domain Diagram



## Model Numbering System

Not every combination of the following codes or characters is available. Contact us for an available combination.

<b>9GT</b>	<b>04</b>	<b>12</b>	<b>P</b>	<b>3</b>	<b>J</b>	<b>001</b>
<b>Type name / frame material</b> 9GT / Plastics	<b>Frame size</b> 04 : 40×40mm 06 : 60×60mm 08 : 80×80mm 09 : 92×92mm 12 : 120×120mm	<b>Voltage</b> 12 : 12V 24 : 24V	<b>PWM control function</b>	<b>Frame thickness</b> 1 : 38mm thick 3 : 28mm thick 4 : 25mm thick	<b>Speed code</b>	<b>Individual customer's spec</b>

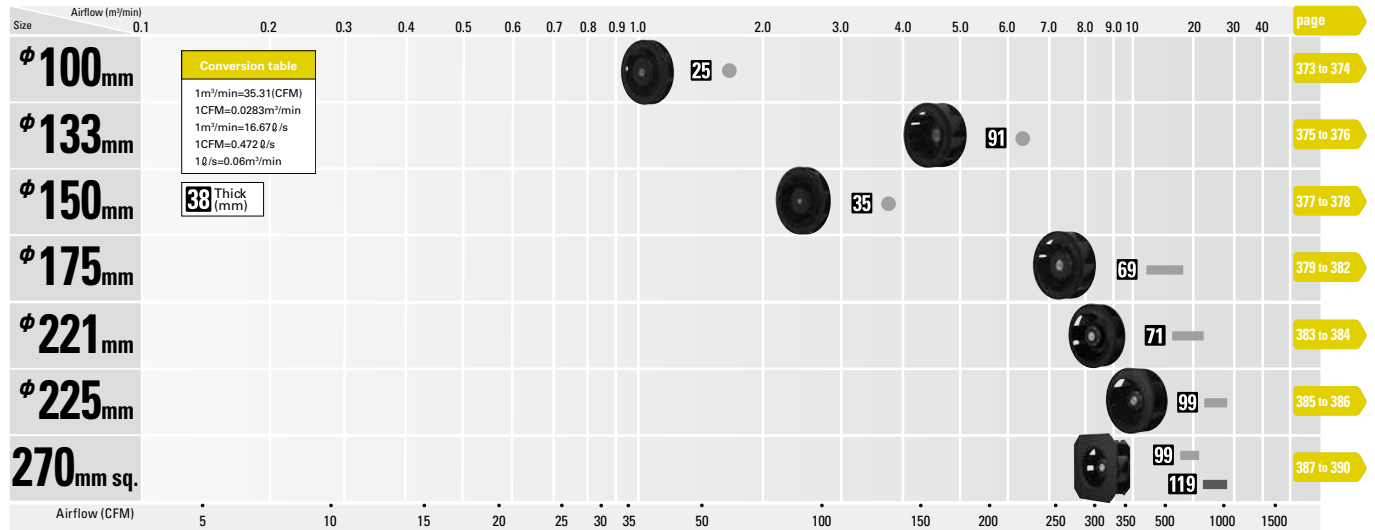
# Centrifugal Fan

Cooling fan blows air in a centrifugal course. It features high static pressure.

## Related product

Splash Proof Centrifugal Fan ⇒ p. 293

## Domain Diagram



## Model Numbering System

Not every combination of the following codes or characters is available. Contact us for an available combination.

<b>9T</b>	<b>M</b>	<b>48</b>	<b>P</b>	<b>4</b>	<b>H</b>	<b>01</b>
<b>Type name</b> 9T: Centrifugal Fan	<b>Impeller size</b> M: φ100mm J: φ133mm N: φ150mm G: φ175mm P: φ221mm S: φ225mm GA: φ175mm	<b>Voltage</b> 24: 24V 48: 48V	<b>PWM control function</b> P	<b>Frame thickness</b> 0: 69mm thick MIN 1: 35mm thick 4: 25mm thick	<b>Speed code</b> H,G etc	<b>Individual customer's spec</b> 2 or 3 digits

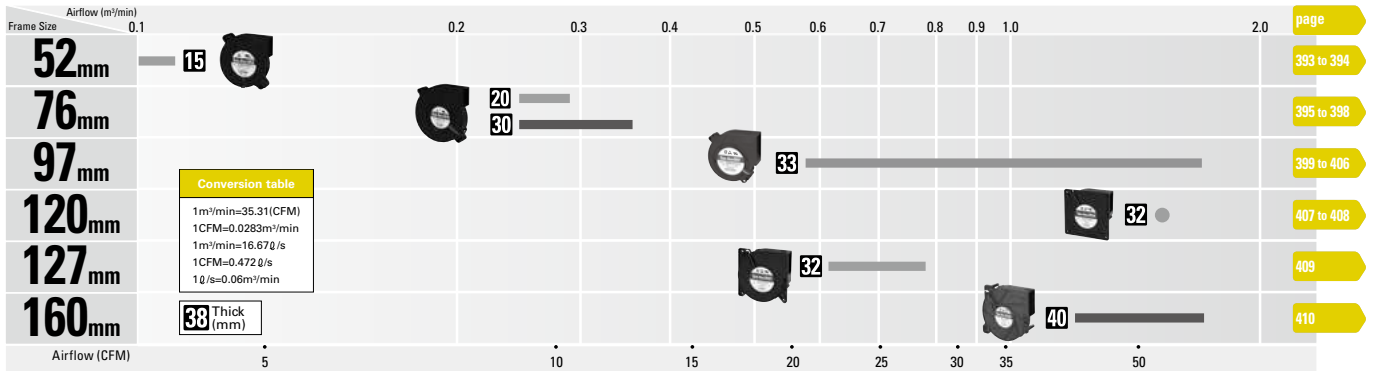
## Bracket-mounted Centrifugal Fan

<b>9B1T</b>	<b>P</b>	<b>48</b>	<b>P</b>	<b>0</b>	<b>H</b>	<b>001</b>
<b>Type name</b> 9B1T: Bracket-mounted Centrifugal Fan	<b>Impeller size</b> P: φ221mm S: φ225mm	<b>Voltage</b> 24: 24V 48: 48V	<b>PWM control function</b> P	<b>Frame thickness</b> 0: 99mm thick / 119mm thick	<b>Speed code</b> H,G etc	<b>Individual customer's spec</b> 3 digits

# Blower

Cooling fan specialized for high static pressure

## Domain Diagram



## Model Numbering System

Not every combination of the following codes or characters is available. Contact us for an available combination.

<b>109B</b>	<b>C</b>	<b>12</b>	<b>H</b>	<b>C</b>	<b>2</b>	<b>-1</b>
<b>Type name / frame material</b> 109B / Plastics 9B / Plastics	<b>Frame size</b> C : 52mm F : 120mm D : 76mm J : 127mm M : 97mm G : 160mm	<b>Voltage</b> 12 : 12V 24 : 24V etc	<b>Speed code</b> F,G,H,K,M,S etc	<b>Sensor specifications</b> A : Without a sensor C : With a pulse sensor D : With a lock sensor	<b>Frame thickness</b> 1 : 40mm thick 2 : 30mm thick, 32mm thick, 33mm thick 7 : 15mm thick 6 : 20mm thick	<b>Individual customer's spec</b>

<b>9B</b>	<b>MB</b>	<b>12</b>	<b>G</b>	<b>2</b>	<b>01</b>	<b>-1</b>
<b>Type name / frame material</b> 9B / Plastics	<b>Frame size</b> MB : 97mm FB : 120mm	<b>Voltage</b> 12 : 12V 24 : 24V	<b>Speed code</b> G / S / H etc	<b>Frame thickness</b> 2 : 32mm thick / 33mm thick	<b>Sensor specifications</b> 01 : With a pulse sensor 02 : Without a sensor	<b>Individual customer's spec</b>

### Fans with PWM control function

Example :

<b>9B</b>	<b>MB</b>	<b>12</b>	<b>P</b>	<b>2</b>	<b>G</b>	<b>01</b>
<b>Type name / frame material</b> 9B / Plastics	<b>Frame size</b> MB : 97mm FB : 120mm	<b>Voltage</b> 12 : 12V	<b>PWM control function</b>	<b>Frame thickness</b> 2 : 32mm thick / 33mm thick	<b>Speed code</b>	<b>Individual customer's spec</b> 2 or 3 digits

# San Ace 92RF

## 9RF type

### Reversible Flow Fan

#### Features

##### Reduces the required number of fans

- Wind direction of the fan can be switched so fewer fans are required. It therefore contributes to reducing equipment costs and saving space. It is suitable for the ventilation of houses, beverage vending machines, food display cases, LED lights, and other places where multiple fans are used to blow air in opposite directions.
- Controlling of rotational speed and wind direction can be performed by external PWM signals to deliver an appropriate rotational speed, contributing to reducing noise and saving energy.

##### Equivalent cooling performance in both directions

- It delivers approximately the same airflow and static pressure in both blowing directions, so ventilation management is easy.



φ92 mm × 38 mm

#### Specifications

The following nos. have **PWM controls and pulse sensors.**

Model no.	Airflow direction	Rated voltage [V]	Operating voltage range [V]	PWM duty cycle (Note) [%]	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]
9RF0912P1H001	Forward	12	10.2 to 13.8	100	0.17	2.0	5,500	1.20 42.4	156 0.63	39	-20 to +70	40,000 / 60 °C (70,000 / 40 °C)
	Reverse			0								
9RF0924P1H001	Forward	24	20.4 to 27.6	100	0.09	2.2	5,500	1.20 42.4	156 0.63	39		
	Reverse			0								

Note PWM frequency: 25 kHz

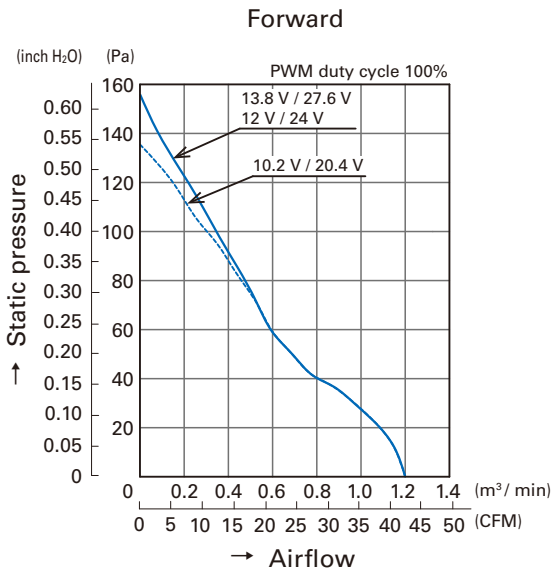
Models with the following sensor specifications are also available as options: **Without sensor**

Please contact us for availability of the following sensor specifications as it depends on the model: **Lock sensor**

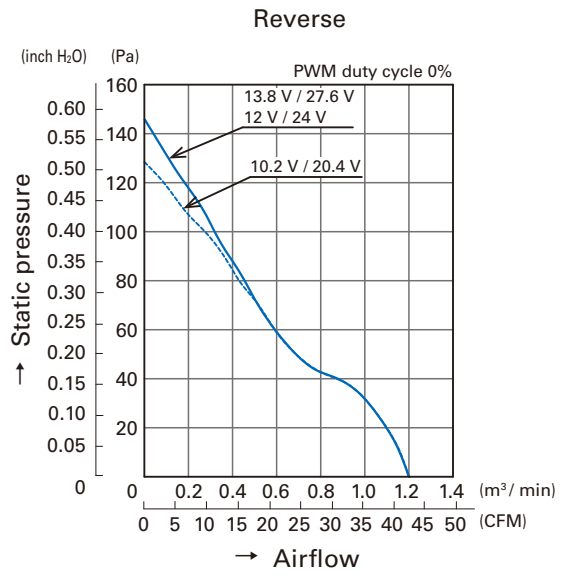
#### Common Specifications

- Material ..... Frame, Impeller: Plastics (Flammability: UL94V-0)
- Expected life ..... Refer to specifications  
(L10: Survival rate: 90% at 60 °C, rated voltage, and continuously run in a free air state)  
Expected life at 40 °C ambient is just reference value.
- 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 °C to +70 °C (Non-condensing)
- Lead wire ..... ⊕Red ⊖Black Sensor: Yellow Control: Brown
- Mass ..... Approx. 150 g

## Airflow - Static Pressure Characteristics

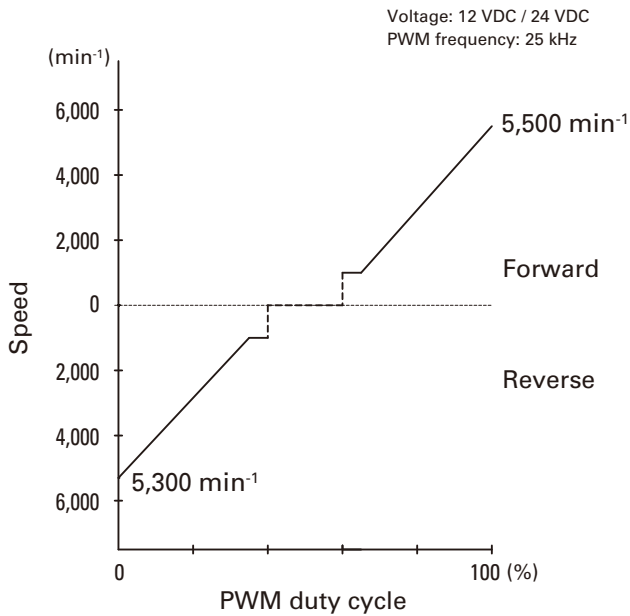


**9RF0912P1H001**  
**9RF0924P1H001**



**9RF0912P1H001**  
**9RF0924P1H001**

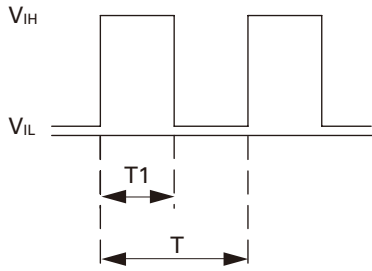
## PWM Duty - Speed Characteristics Example



**9RF0912P1H001**  
**9RF0924P1H001**

**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 ( $I_{source}$ ) = 1 mA max. (when control voltage is 0 V)

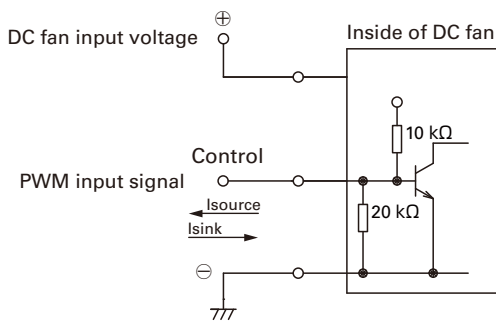
Current sink ( $I_{sink}$ ) = 1 mA max. (when control voltage is 5.25 V)

Control terminal voltage = 5.25 V max. (when control terminal is open)

When control terminal is open, fan rotational speed is the same as when PWM duty cycle is 100%.

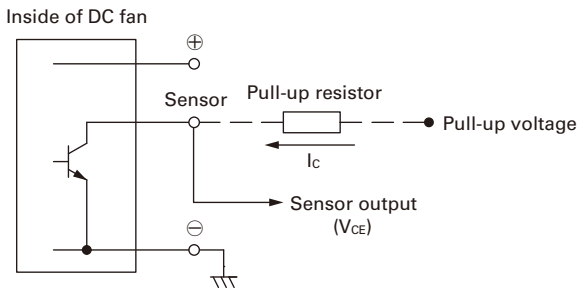
Either TTL input, open collector or open drain can be used for PWM control input signal.

**Example of Connection Schematic**



**Specifications for Pulse Sensors**

Output circuit: Open collector



**Rated voltage 12 V fan**

$V_{CE} = +13.8 \text{ V max.}$

$I_c = 5 \text{ mA max. [} V_{OL} = V_{CE} \text{ (SAT)} = 0.6 \text{ V max.]}$

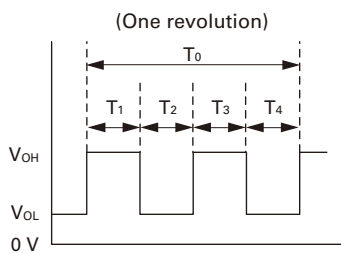
**Rated voltage 24 V fan**

$V_{CE} = +27.6 \text{ V max.}$

$I_c = 5 \text{ mA max. [} V_{OL} = V_{CE} \text{ (SAT)} = 0.6 \text{ V max.]}$

Output waveform (Need pull-up resistor)

In case of steady running

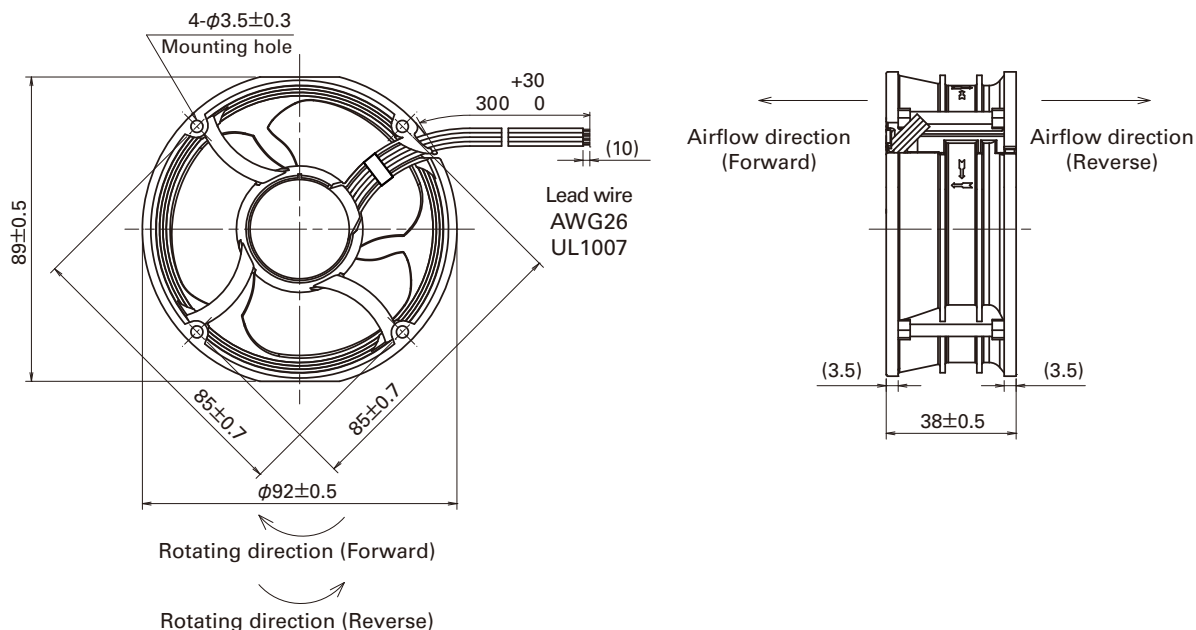


$T_{1 \text{ to } 4} \doteq (1/4) T_0$

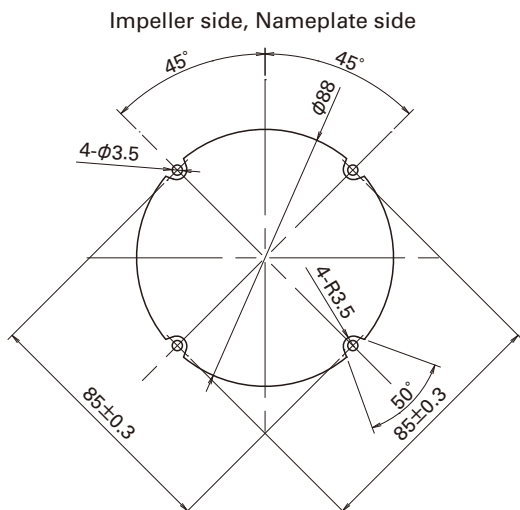
$T_{1 \text{ to } 4} \doteq (1/4) T_0 = 60/4N \text{ (sec)}$

$N = \text{Fan speed (min}^{-1}\text{)}$

**Dimensions (unit: mm)**



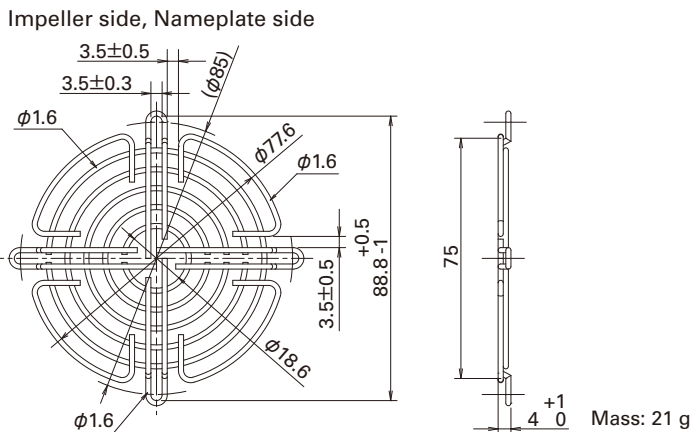
**Reference Dimension of Mounting Holes and Vent Opening (unit: mm)**



**Option (unit: mm)**

Finger guard

Model: 109-1147 Surface treatment: Nickel-chrome plating (Color: silver)



**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.



# San Ace Airflow Tester



With connection duct mounted

## Features (Patented as a movable measurement device for measuring device airflow and system impedance)

### Enables the selection of the optimal fan for a device

An optimal fan for a device can be selected by entering accurate measurement results into thermal design simulation software.

### Compact and lightweight

With a compact design and weight of approximately 6 kg, it is portable enough to measure immobile equipment.

## Measurement Functions

- **System Impedance** Measurement of the resistance to the flow of air within a device
- **Operating Airflow** Measurement of the actual airflow that passes through a device when a fan is mounted
- **P-Q Performance** Measurement of airflow versus static pressure characteristics\*

\* Performance curve that illustrates the characteristics of a fan for use within a certain system. It shows the relationship between airflow and static pressure.

## Specifications

Model no.		9AT2560S-000□ <sup>*1</sup>	9AT2560A-000□ <sup>*1</sup>	9AT2560C-000□ <sup>*1</sup>
Measurement units	Airflow	m <sup>3</sup> / min	CFM	CFM
	Static pressure	Pa	inchH <sub>2</sub> O	Pa
Measurement range	Airflow	0.20 to 8.00 m <sup>3</sup> / min	7 to 282 CFM	7 to 282 CFM
	Static pressure	0 to 1,000 Pa	0 to 4.01 inchH <sub>2</sub> O	0 to 1,000 Pa
Measurement accuracy	Airflow	±7% of maximum measurable airflow with each nozzle		
	Static pressure	±10 Pa (0.04 inchH <sub>2</sub> O) for measurement results lower than 200 Pa, ±50 Pa (0.20 inchH <sub>2</sub> O) for measurement results higher than 200 Pa		
Operating environment	Ambient temperature	0 to 40 °C		
	Humidity	20 to 85% RH (non-condensing)		
Display		Data no., Measurement values (airflow, static pressure <sup>*2</sup> ), Measurement status, Nozzle selection, Measurement mode selection		
Interface		Digital output: Included USB serial adapter		
Power supply	Input voltage	100 to 240 VAC, 50/60 Hz		
	Power consumption	260 VA max.		
Dimensions		600 (W) x 250 (H) x 250 (D) mm		
Mass		Main unit: Approx. 6 kg, Connection duct (including board holder): Approx. 1.5 kg		
Included peripherals		1 Set of measurement nozzles, Plastic mounting board (5 pcs / set), Connection duct, AC power cable (2.5 m), USB serial adapter, Instruction manual, Quick start guide, Data viewer software		

\*1 The AC power plug shape differs with the number in □ of model numbers.

AC power plug included in models with 1 in □ is for Japan and North America regions (2 parallel flat pins + a round grounding pin), Input voltage: 100/120 VAC, 50/60 Hz

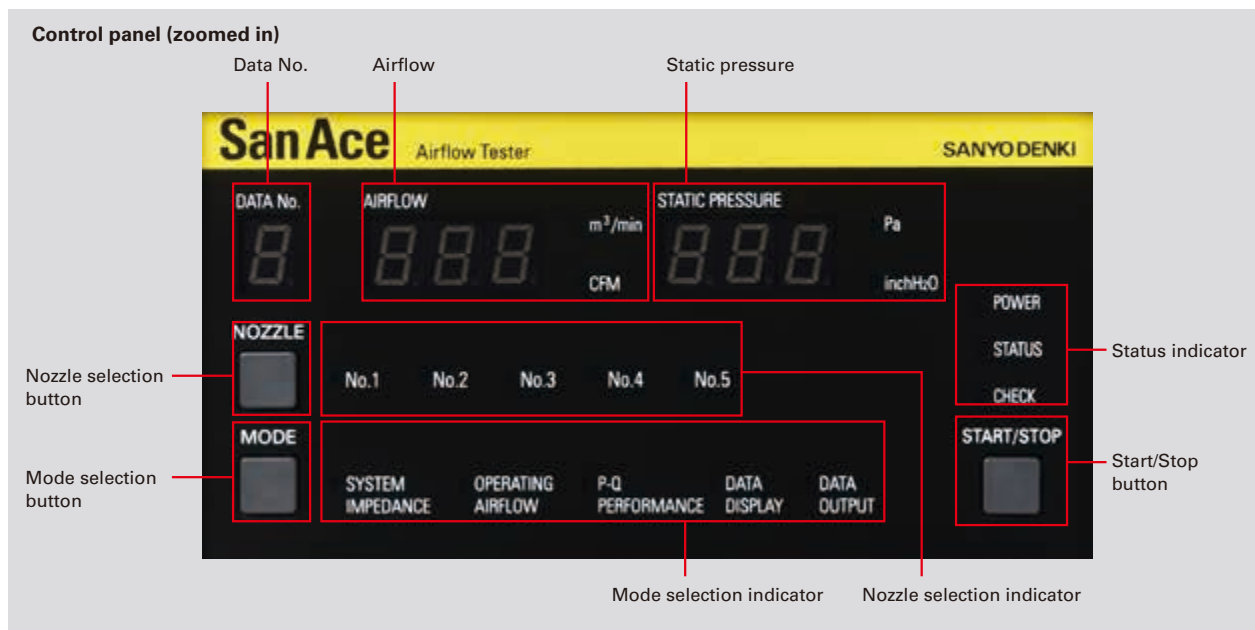
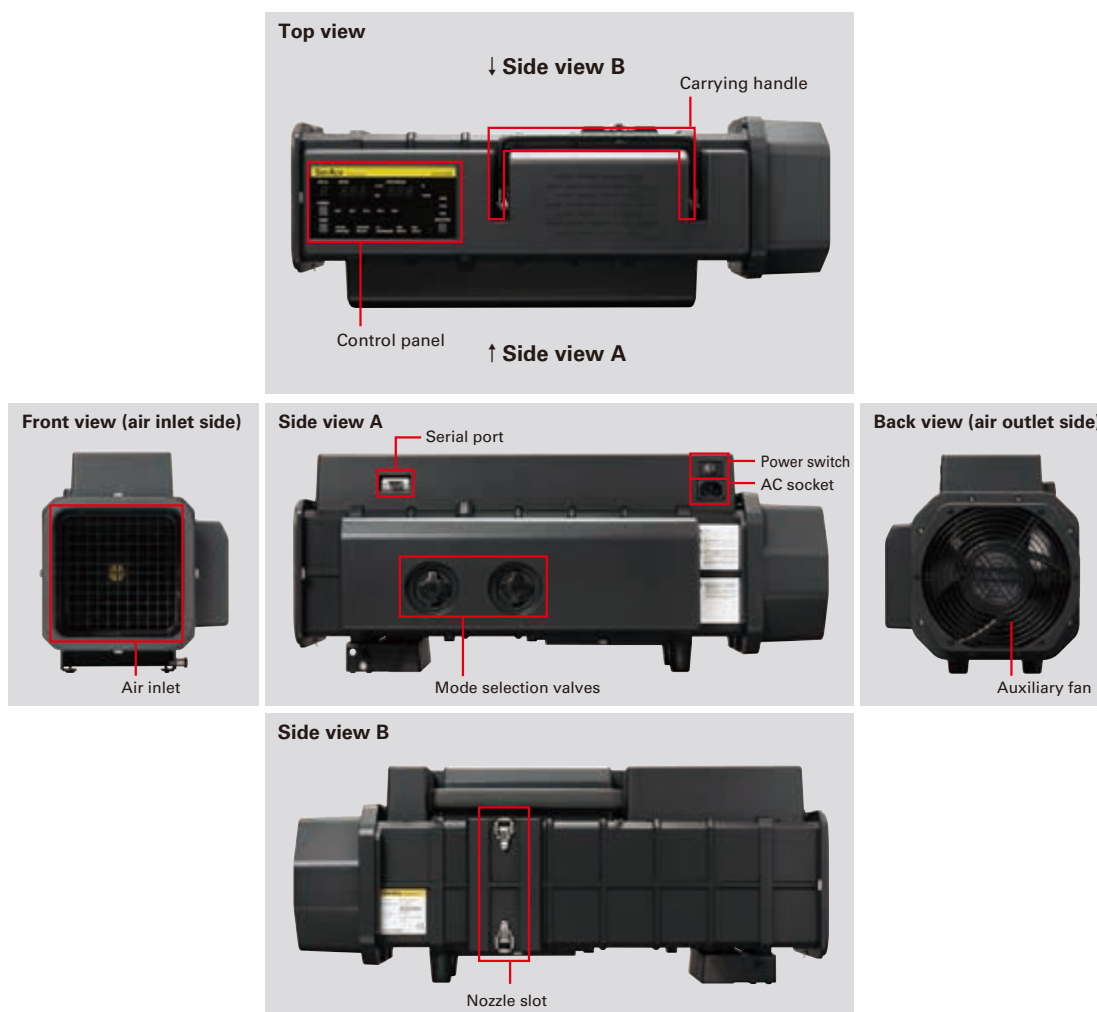
AC power plug included in models with 2 in □ is for Europe region (2 round pins + a female grounding contact), Input voltage: 220 VAC, 50 Hz

AC power plug included in models with 3 in □ is for China region (2 angled flat pins + a flat grounding pin), Input voltage: 220 VAC, 50 Hz

Product also available without an AC power cable. Model no. 9AT2560S-0000, 9AT2560A-0000, 9AT2560C-0000

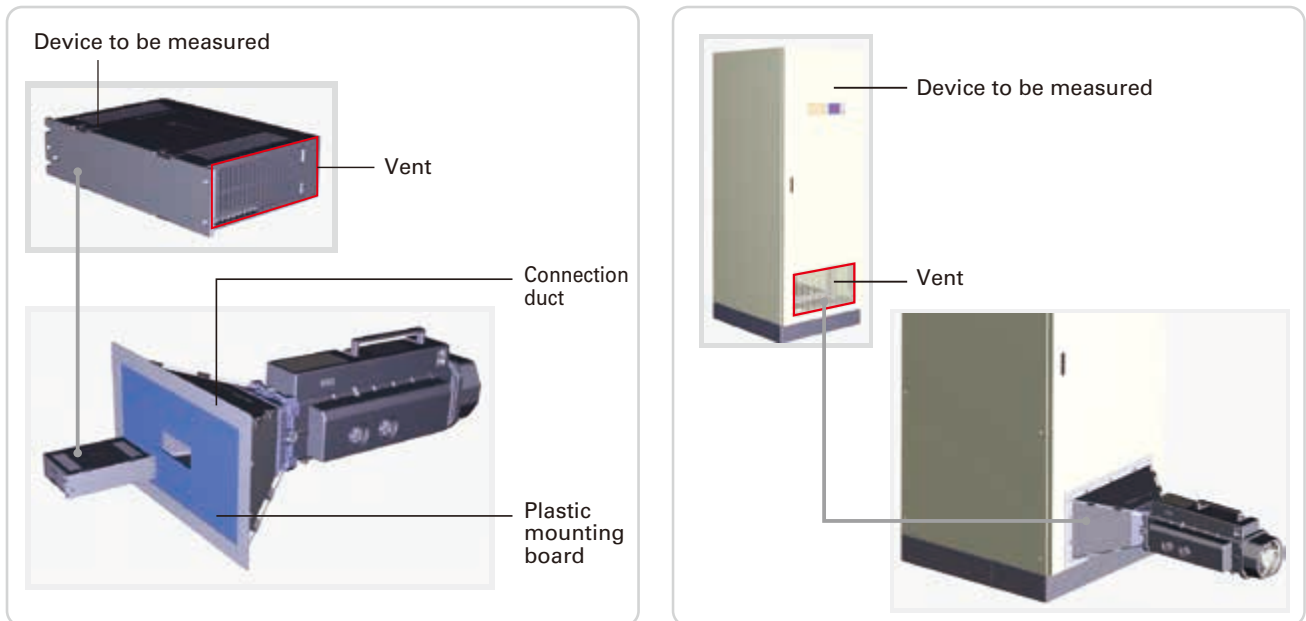
\*2 Static pressure values are calculated with standard atmosphere as 1013 hPa at 20 °C.

## Airflow Tester Part Names



## Usage Examples

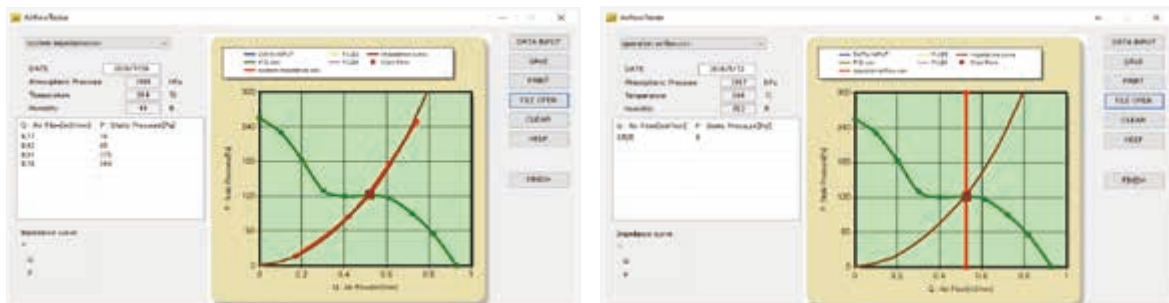
Cut out a hole in the mounting board matching the vent opening of the device to be measured, and place the mounting board firmly against the device to perform measurements.



## Data Viewer Software (included)

Obtained measurement data can be represented as a graph and saved on a PC.

Screen examples P-Q performance shown below based on catalog data.



## Option

**Carrying case** Measurement nozzle case included

Model no.	9AT2560-B001 Please add "CS" to the end of the model no. of Airflow Tester in page 1 when ordering Airflow Tester and carrying case as a set. e.g. 9AT2560S-0001CS
Dimensions	705 (W) x 385 (H) x 415 (D) mm



Carrying case, measurement nozzle case

**Plastic mounting boards**

Sized to fit the duct frame. Five boards included with Airflow Tester.

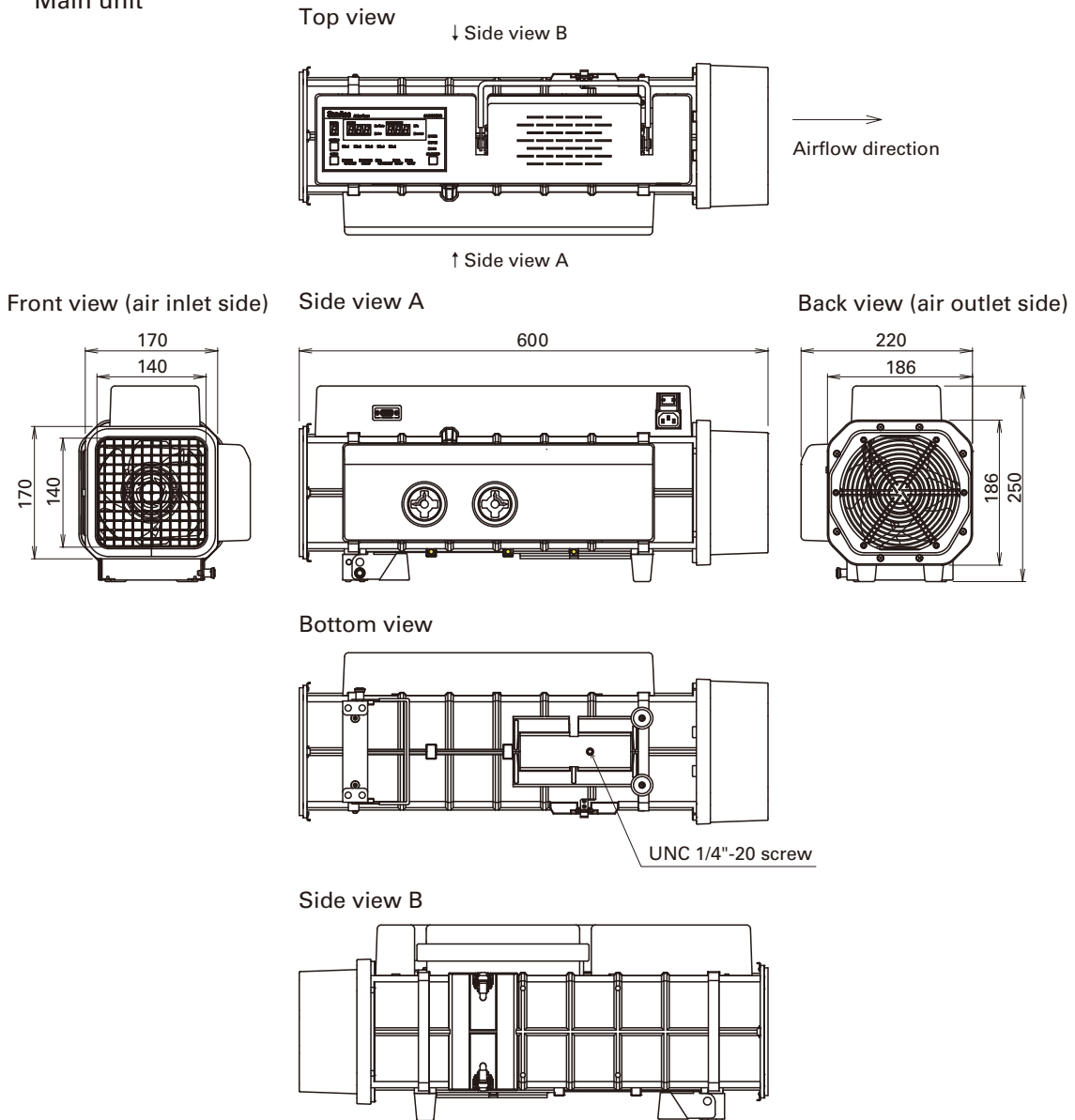
Model no.	9AT2560-P001
Quantity	5 pcs / set
Dimensions	525 (W) x 275 (H) x 4 (D) mm



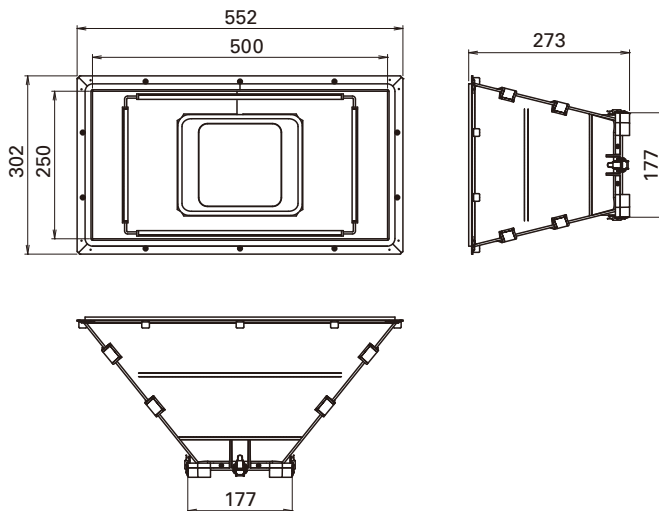
Plastic mounting boards (5 pcs)

■ Dimensions (unit: mm)

Main unit



Connection duct



**Notice**

- Before using the product, please read the included instruction manual carefully.
- Do not attempt to disassemble or modify the device.

**SANYO DENKI CO., LTD.**

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CATALOG No. C1059B003 '16.10

# San Ace PWM Controller

## Features

### Reduces system power consumption and fan noise

For PWM fan speed control, a PWM control circuit needs to be newly designed and configured.

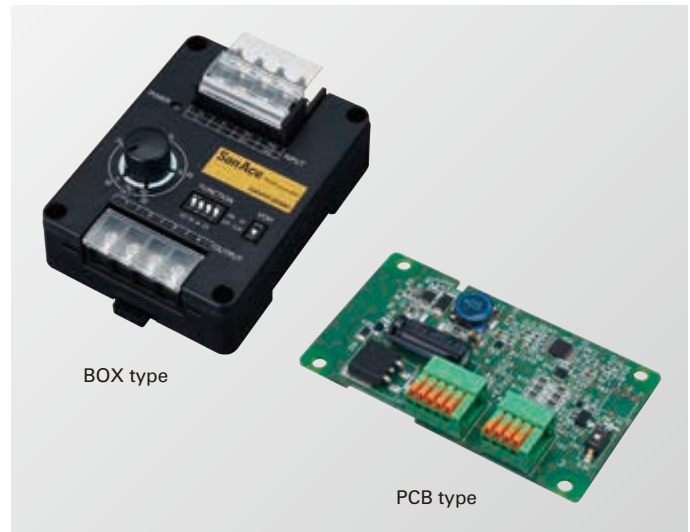
By using this product, however, PWM control function fans can be fully utilized without the need for preparing new circuits, contributing to reducing the system power consumption and the fan noise.

### Can be common-powered by the fan power supply

The controller can be powered by the fan power supply of rated voltage 12, 24, and 48 VDC, and no separate supply is required.

### Maximum of four fans connectable

Up to four fans with PWM control function can be connected and controlled.



BOX type

PCB type

## Specifications

	BOX type	PCB type		
Model no.	9PC8666X-S001	9PC8045D-V001	9PC8045D-R001	9PC8045D-T001
Size [mm]	86 (H) x 66 (W) x 38 (D)	80 (H) x 45 (W) x 17 (D)		
Rated voltage [V]	12 / 24 / 48			
Power consumption [W]	0.2 <sup>*1</sup>			
Operating temperature [°C]	-20 to +70			
Input terminal	Input voltage range [V] (V+, V-)	7 to 60		
	Control voltage range [V]	0 to 5.5		
Output terminal	PWM signal output	V <sub>OH</sub> (high level voltage): 3.3 or 5 VDC selectable		
	PWM frequency [kHz]	25		
	Output current	20 mA max. (total sum of 4 terminals)		
	Output breakdown voltage [V]	6.5		
	No. of connectable fans	Up to 4 fans		
Control functions <sup>*2</sup>	Voltage control, Internal adjustment (variable resistor) control, External adjustment (variable resistor) control <sup>*3</sup> , Thermistor control <sup>*3</sup>	Voltage control	Variable resistor control <sup>*3</sup>	Thermistor control <sup>*3</sup>
Mounting method	DIN rail mounting or screw mounting	Screw mounting		
Mass [g]	110	27		
Material	Case: Plastics	PCB: FR-4		

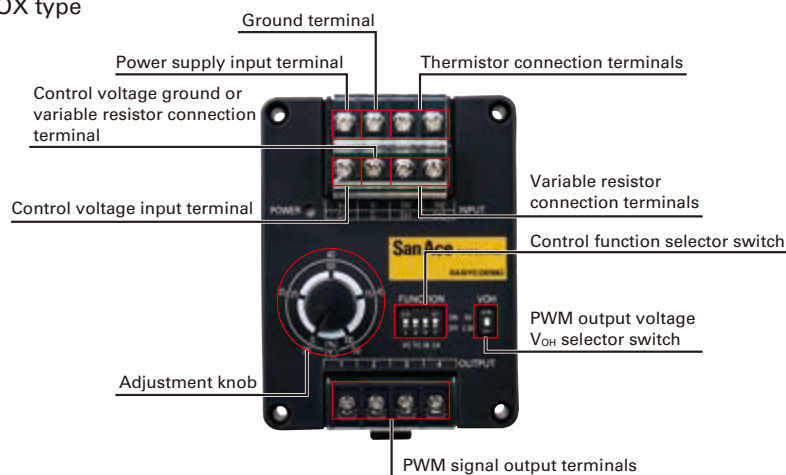
\*1 When output terminals are turned on \*2 Control functions are mutually exclusive for BOX type.

\*3 Variable resistor and thermistor are not supplied with the controller and need to be prepared separately.

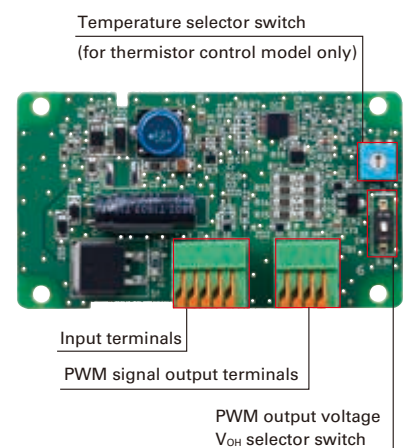
Be noted that if applied input voltage or frequency is out of range of the connected fan, how the fan speed responds to the PWM duty cycle may be altered.

## Front View (component names)

BOX type



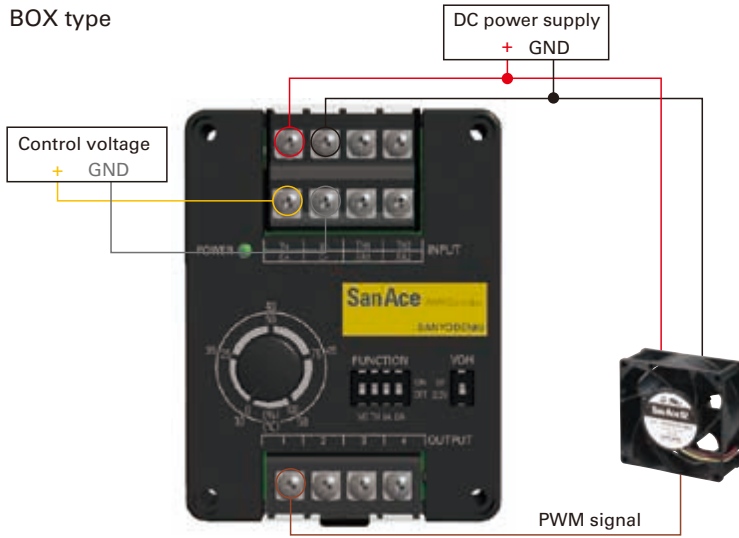
PCB type



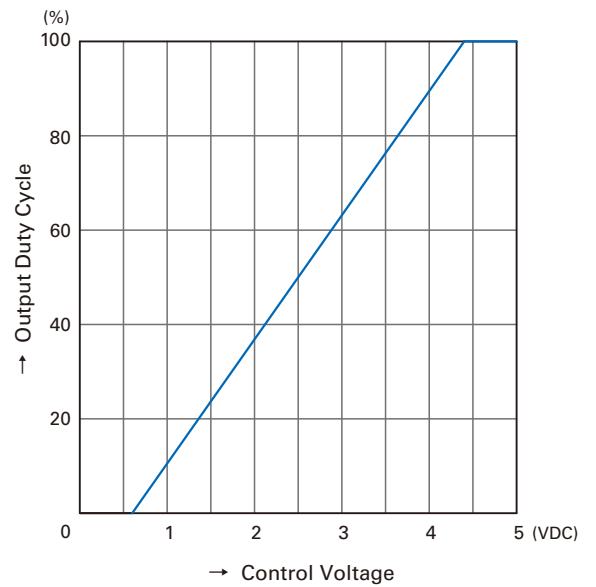
## Connection Examples and PWM Signal Output Characteristics

Controller can be common-powered by the power supply for 12, 24, and 48 VDC rated voltage fans. It can also be powered by a separate supply as long as both supplies share the same ground.

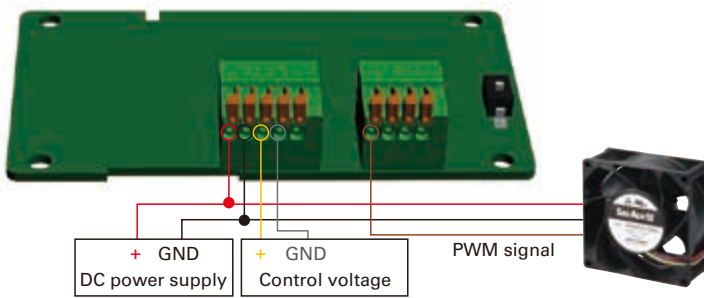
- Voltage control Output duty cycle controlled with input voltage of 0 to 5 VDC \*Ensure that the input voltage does not exceed 5.5 VDC.  
BOX type



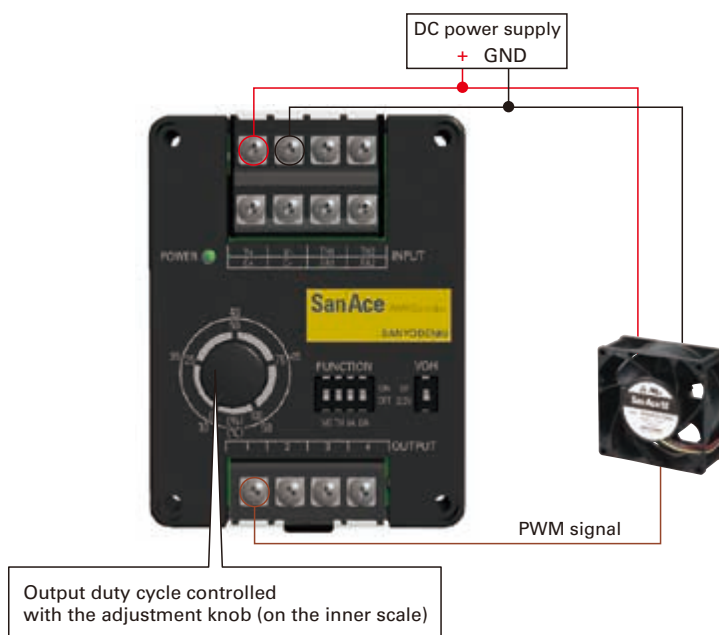
Control Voltage - Output Duty Cycle Characteristics



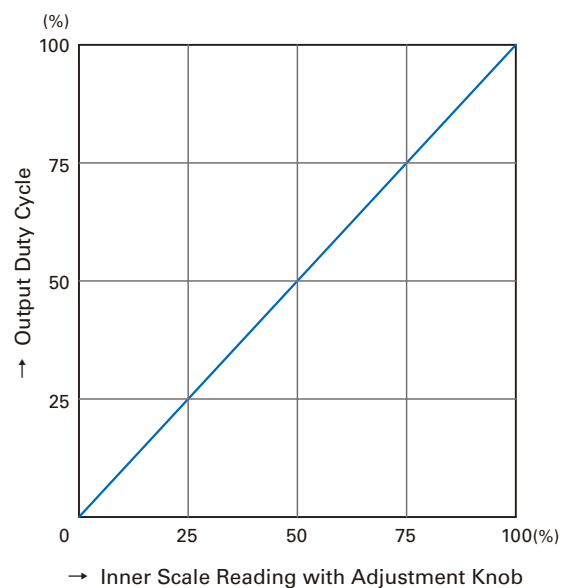
PCB type (Model no.: 9PC8045D-V001)



- Internal adjustment (variable resistor) control Output duty cycle controlled with the adjustment knob  
BOX type



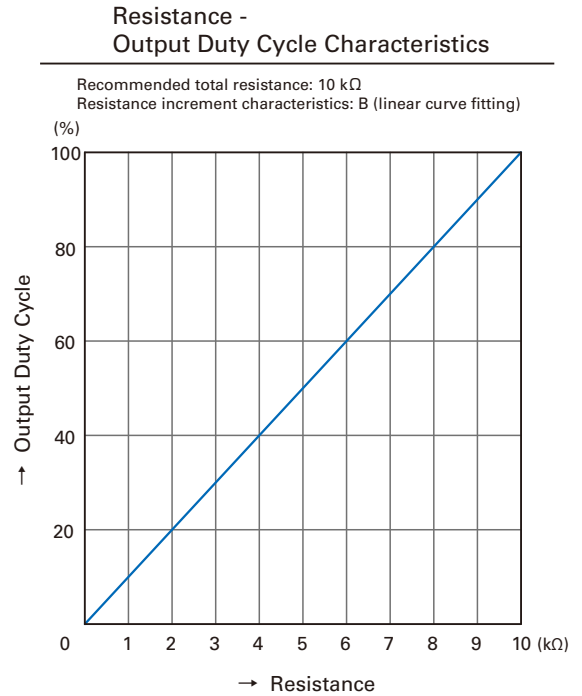
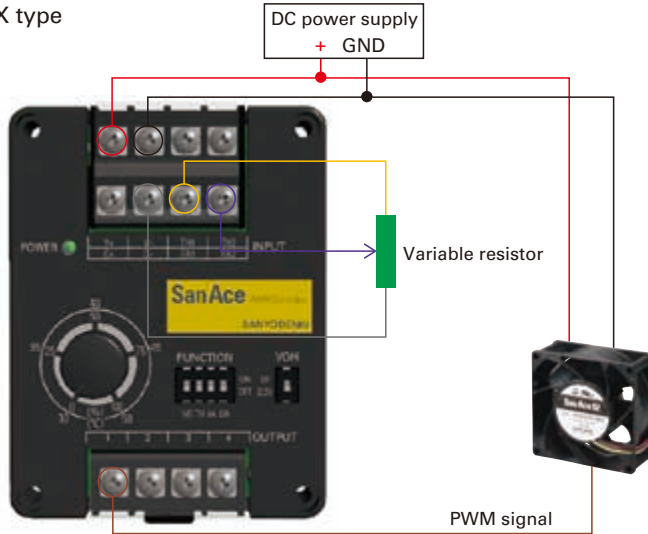
Inner Scale Reading - Output Duty Cycle Characteristics



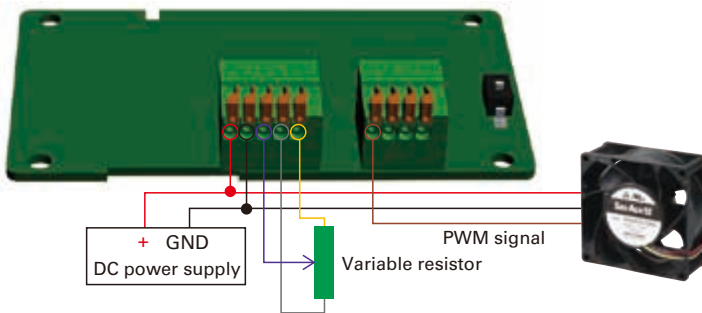
## Connection Examples and PWM Signal Output Characteristics

Controller can be common-powered by the power supply for 12, 24, and 48 VDC rated voltage fans. It can also be powered by a separate supply as long as both supplies share the same ground.

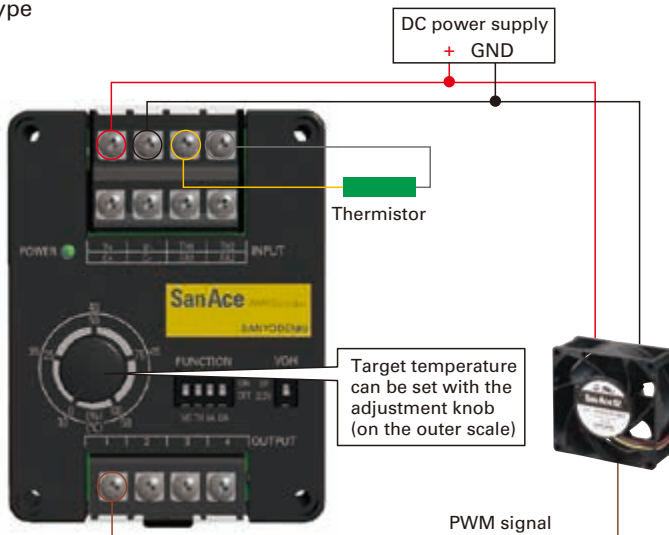
- External adjustment (variable resistor) control Output duty cycle controlled with variable resistor connected to terminals BOX type



PCB type (Model no.: 9PC8045D-R001)



- Thermistor control Automatic control of output duty cycle in response to the temperature detected with an external thermistor BOX type



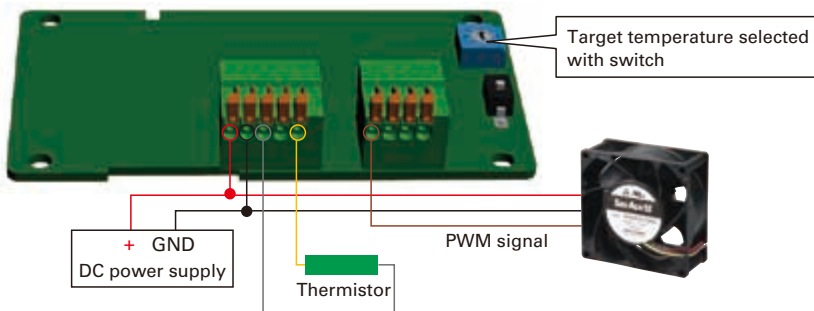
### Controlling Conditions

$T_{ST}$ : Temperature set with the adjustment knob (30 to 50 °C)  
 $T_{TH}$ : Temperature detected with thermistor

Recommended thermistor conditions  
Type: NTC  
 $R_{25}$  (Resistance at 25 °C): 10 kΩ  
B value:  $B_{25/85} = 3435$  K

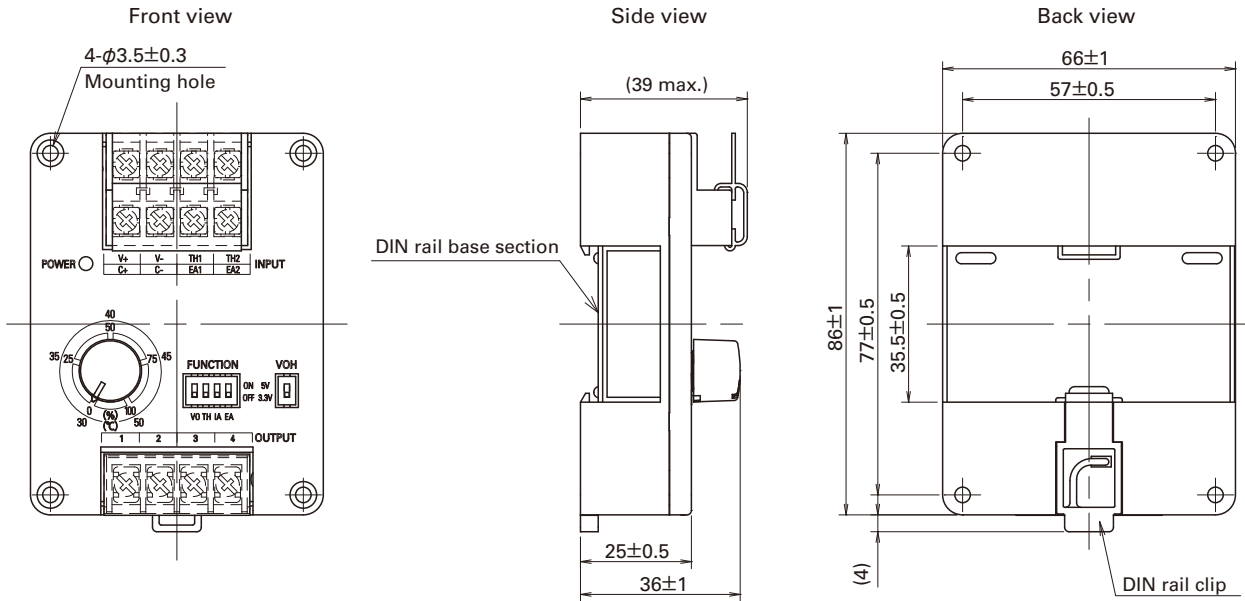
Temperature conditions	Duty cycle	Fan rotational speed (For reference)
$T_{ST} < T_{TH}$	Increases	Increases
$T_{ST} > T_{TH}$	Decreases	Decreases
$T_{ST} \approx T_{TH}$	Maintained	Maintained

PCB type (Model no.: 9PC8045D-T001)

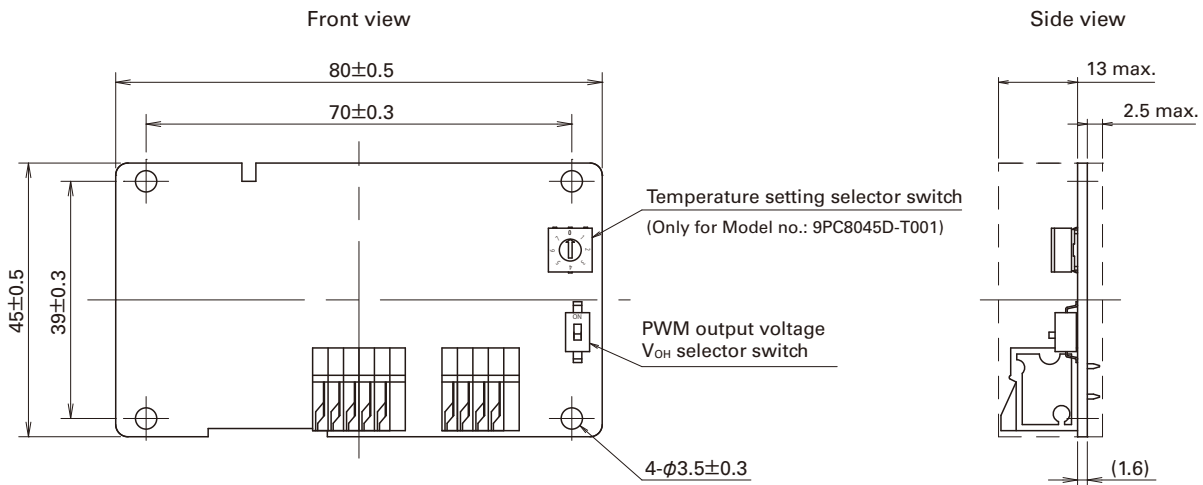


**Dimensions (unit: mm)**

**BOX type**



**PCB type**



**Precautions on use**

● Before using the product, please read the included instructions manual carefully.

**Notice**

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Specifications are subject to change without notice.

CATALOG No. C1060B002 '17.1



# San Ace 40 9CRB type

## Counter Rotating Fan

### Features

#### Energy-saving

Power consumption is reduced by approx. 25% compared with our conventional fan\*1,2,3.

\*1 40 x 40 x 56 mm thick. San Ace 40, Model no. 9CRD0412P5J03.

\*2 Specification of Model no. 9CRB0412P5J201.

\*3 When air flow and static pressure is almost identical.



**40 x 40 x 56 mm**

### Specifications

The following nos. have **PWM controls and pulse sensors**.

Model no.	Rated voltage [V]	Operating voltage range [V]	PWM duty cycle (Note) [%]	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]
						Inlet	Outlet							
9CRB0412P5S201	12	10.8 to 13.2	100	1.4	16.8	22,000	19,700	0.9	31.8	1,045	4.197	68	-20 to +70	40,000 / 60 °C
			0	0.09	1.08	3,800	3,500	0.15	5.3	31	0.124	26		
9CRB0412P5S301			100	1.4	16.8	22,000	19,700	0.9	31.8	1,045	4.197	68		
			0	0.09	1.08	3,800	3,500	0.15	5.3	31	0.124	26		
9CRB0412P5K001			100	0.88	10.56	19,000	17,000	0.76	26.83	730	2.93	62		
			0	0.11	1.32	5,700	5,100	0.21	7.41	67	0.26	33		
9CRB0412P5J201			100	0.72	8.64	17,300	16,000	0.71	25.1	650	2.61	61		
			0	0.07	0.84	3,450	3,200	0.13	4.59	26	0.10	24		

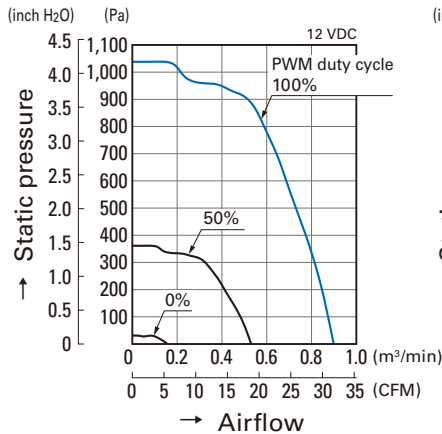
Note PWM frequency: 25 kHz

### Common Specifications

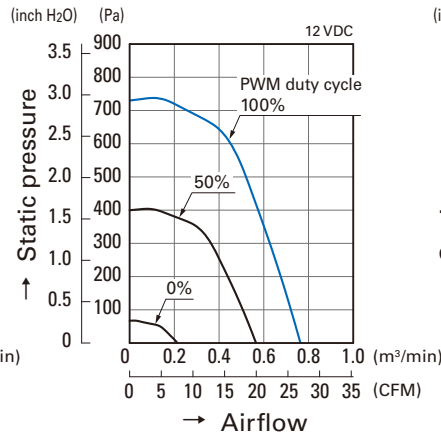
- Material ..... Frame, Impeller: Plastics (Flammability: UL94V-0)
- Expected life ..... Refer to specifications  
(L10: Survival rate: 90% at 60 °C, rated voltage, and continuously run in a free air state)
- Motor protection system ..... Current blocking function and Reverse polarity protection
- Dielectric 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 °C to +70 °C (Non-Condensing)
- Lead wire ..... Inlet: ⊕Red ⊖Black Sensor: Yellow Control: Brown  
Outlet: ⊕Orange ⊖Gray Sensor: Purple Control: White
- Mass ..... Approx. 100 g

## Airflow - Static Pressure Characteristics

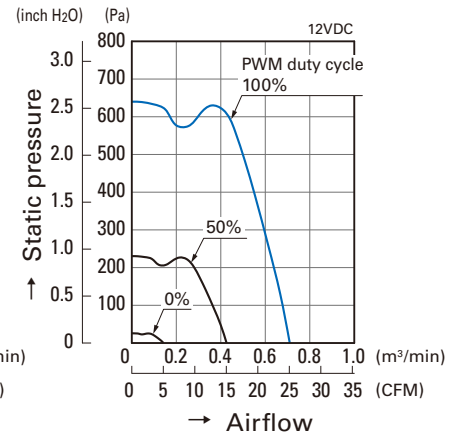
### PWM duty cycle



**9CRB0412P5S201**  
**9CRB0412P5S301**

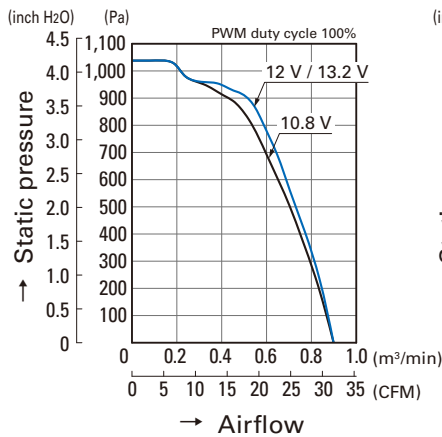


**9CRB0412P5K001**

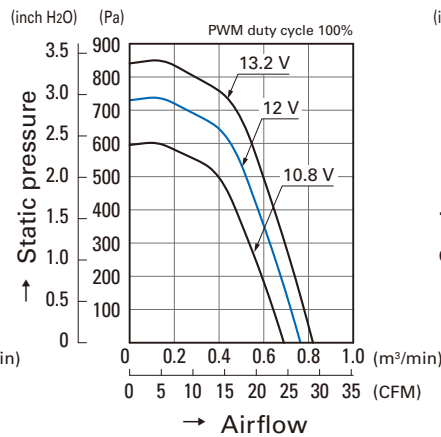


**9CRB0412P5J201**

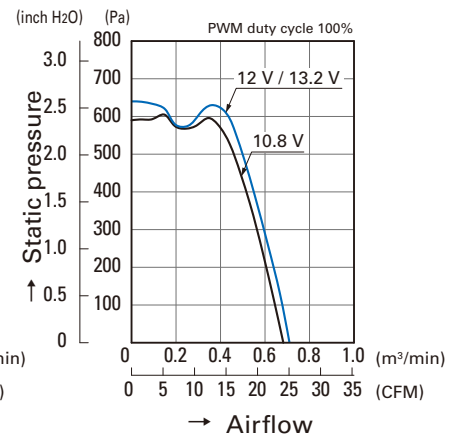
### Operating voltage range



**9CRB0412P5S201**  
**9CRB0412P5S301**

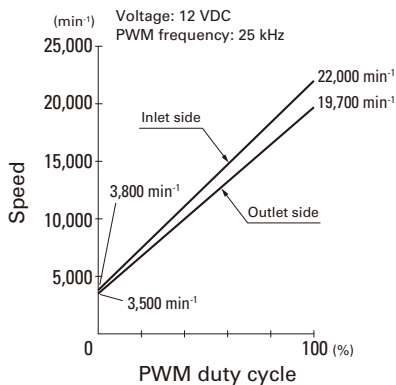


**9CRB0412P5K001**

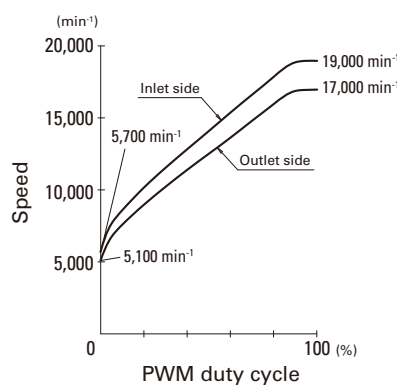


**9CRB0412P5J201**

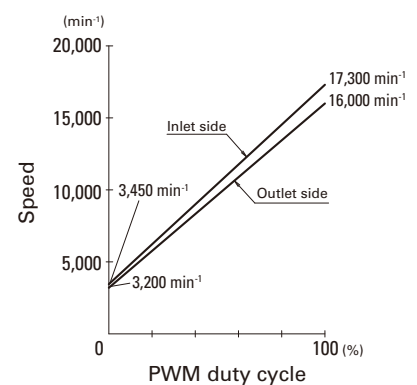
## PWM Duty - Speed Characteristics Example



**9CRB0412P5S201**  
**9CRB0412P5S301**



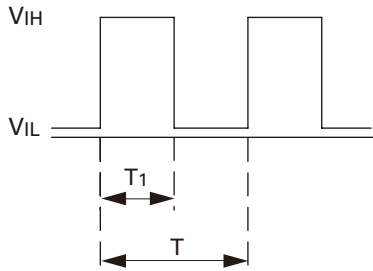
**9CRB0412P5K001**



**9CRB0412P5J201**

**PWM Input Signal Example**

Input signal waveform



$V_{IH}=4.75\text{ V to }5.25\text{ V, }2.8\text{ V to }3.8\text{ V}$  (Model no.: 9CRB0412P5K001 only)

$V_{IL}=0\text{ V to }0.4\text{ V}$

$$\text{PWM duty cycle (\%)} = \frac{T_1}{T} \times 100$$

$$\text{PWM frequency } 25\text{ (kHz)} = \frac{1}{T}$$

Source current ( $I_{source}$ ): 5 mA max. at control voltage 0 V

10 mA max. at control voltage 0 V (Model no.: 9CRB0412P5K001 only)

Sink current ( $I_{sink}$ ): 5mA max. at control voltage 5.25 V

10 mA max. at control voltage 3.8 V (Model no.: 9CRB0412P5K001 only)

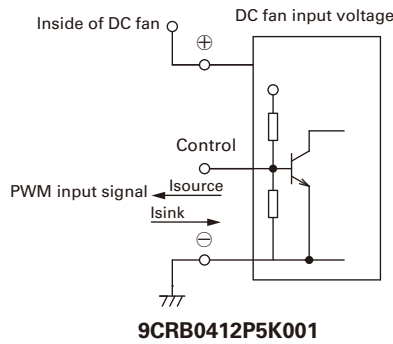
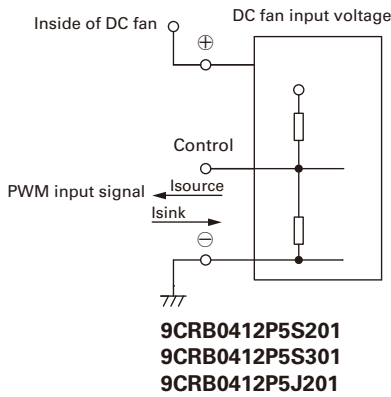
Control terminal voltage: 5.25 V max. (Open circuit)

3.8 V max. (Open circuit) (Model no.: 9CRB0412P5K001 only)

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

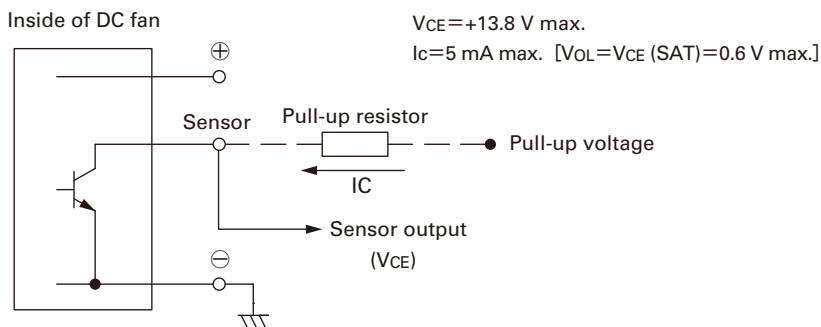
Either TTL input, open collector or open drain can be used for PWM control input signal.

**Example of Connection Schematic**

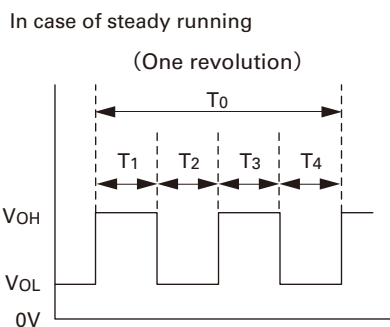


**Specifications for Pulse Sensors**

Output circuit : Open collector

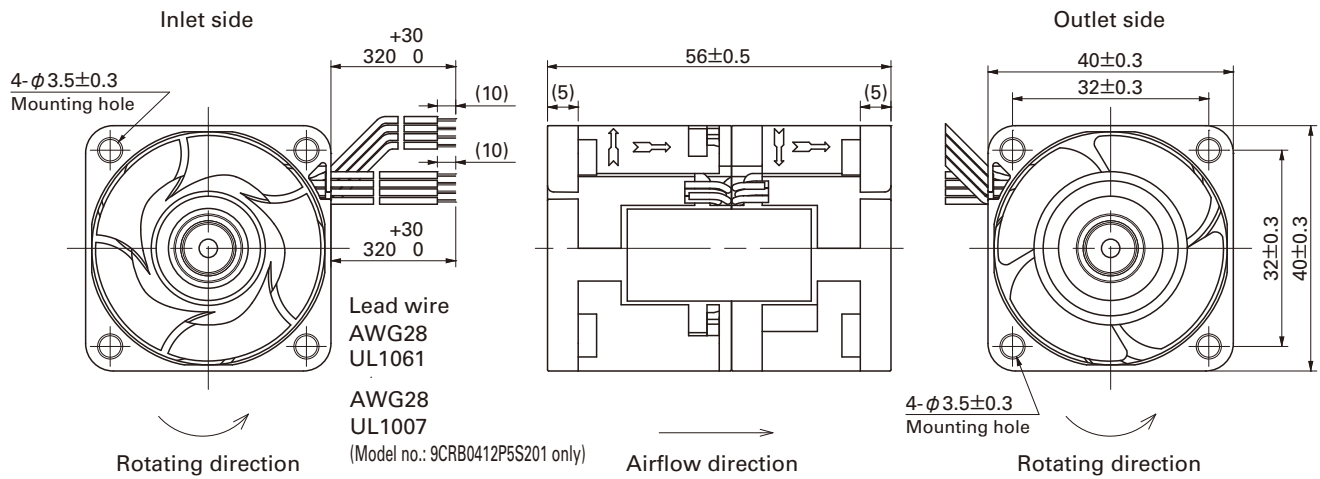


Output waveform (Need pull-up resistor)

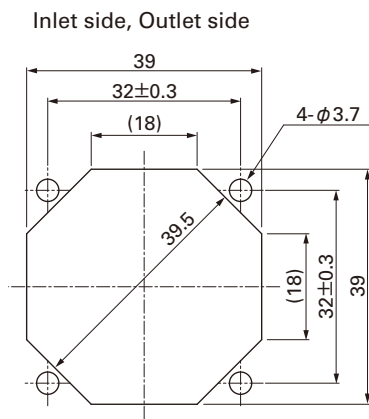


$T_1\text{ to }4 \doteq (1/4) T_0$   
 $T_1\text{ to }4 \doteq (1/4) T_0=60/4N\text{ (sec)}$   
 $N=\text{Fan speed (min}^{-1}\text{)}$

## ■ Dimensions (unit: mm)



## ■ Reference Dimension 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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CATALOG No. C1005B003 '16.9

# San Ace 120 9GA type

## Low Power Consumption Fan

### Features

#### Low Power Consumption

The power consumption has decreased by 45% compared with our current model.\*

#### High Static Pressure

The static pressure has increased by 63% compared with our current model.\*

#### Low Noise and High Energy Efficiency

The PWM control function enables the external control of fan speed, contributing to lower noise and higher energy efficiency of devices.

\* Our current DC fan model 9GV1212P4G01, 120 x 120 x 25 mm "San Ace 120 9GV type".



# 120 × 120 × 25 mm

### Specifications

The following nos. **have PWM controls, pulse sensors, and ribs. For ribless, append "1" to the model no.**

Model no.	Rated voltage [V]	Operating voltage range [V]	PWM duty cycle (Note 1, 2) [%]	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]
9GA1212P4G001	12	10.2 to 13.8	100	0.93	11.16	6,400	3.8 134	365 1.47	57	-20 to +70	40,000 / 60 °C (70,000 / 40 °C)
			25	0.16	1.92	2,550	1.5 53	60 0.24	34		
9GA1212P4S001	12	10.2 to 13.8	100	0.61	7.32	5,400	3.2 113	260 1.04	54		
			25	0.16	1.92	2,550	1.5 53	60 0.24	34		
9GA1224P4G001	24	20.4 to 27.6	100	0.47	11.28	6,400	3.8 134	365 1.47	57		
			25	0.10	2.40	2,550	1.5 53	60 0.24	34		
9GA1224P4S001	24	20.4 to 27.6	100	0.31	7.44	5,400	3.2 113	260 1.04	54		
			25	0.10	2.40	2,550	1.5 53	60 0.24	34		
9GA1248P4G001	48	40.8 to 53	100	0.24	11.52	6,400	3.8 134	365 1.47	57		
			25	0.08	3.84	2,550	1.5 53	60 0.24	34		
9GA1248P4S001	48	40.8 to 53	100	0.16	7.68	5,400	3.2 113	260 1.04	54		
			25	0.08	3.84	2,550	1.5 53	60 0.24	34		

Note 1 PWM frequency: 25 kHz Note 2 Fans do not rotate when PWM duty cycle is 0%.

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

The following nos. **have pulse sensors, and ribs. For ribless, append "1" to the model no.**

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]
9GA1212G4001	12	7 to 13.8	0.93	11.16	6,400	3.8 134	365 1.47	57	-20 to +70	40,000 / 60 °C (70,000 / 40 °C)
9GA1212S4001			0.61	7.32	5,400	3.2 113	260 1.04	54		
9GA1224G4001	24	14 to 27.6	0.47	11.28	6,400	3.8 134	365 1.47	57		
9GA1224S4001			0.31	7.44	5,400	3.2 113	260 1.04	54		
9GA1248G4001	48	36 to 53	0.24	11.52	6,400	3.8 134	365 1.47	57		
9GA1248S4001			0.16	7.68	5,400	3.2 113	260 1.04	54		

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

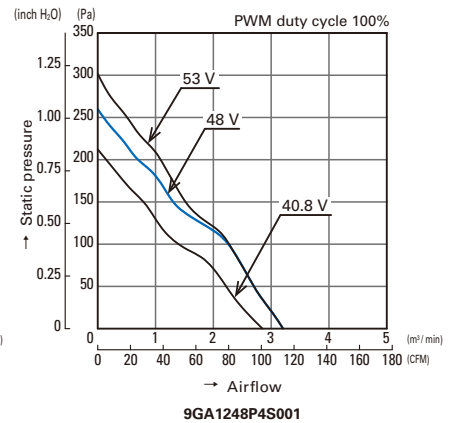
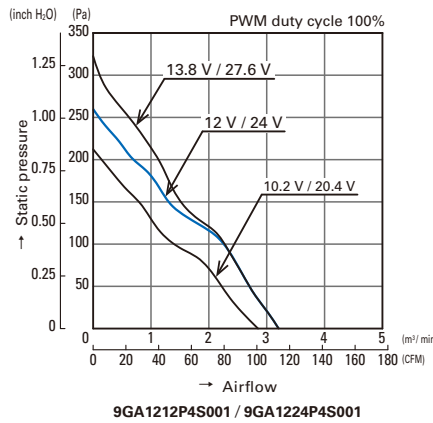
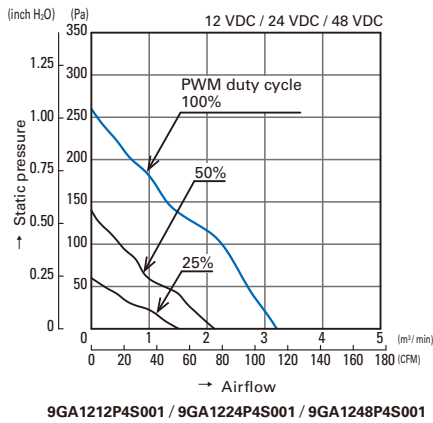
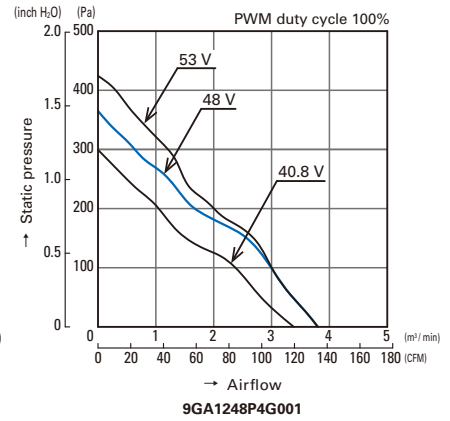
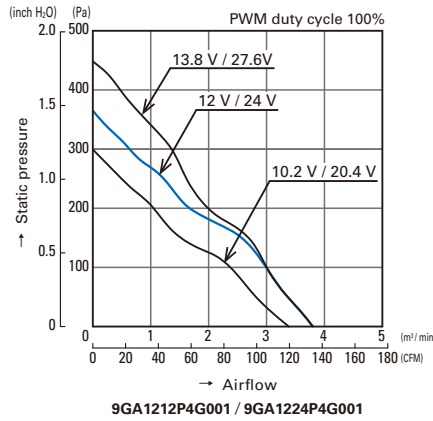
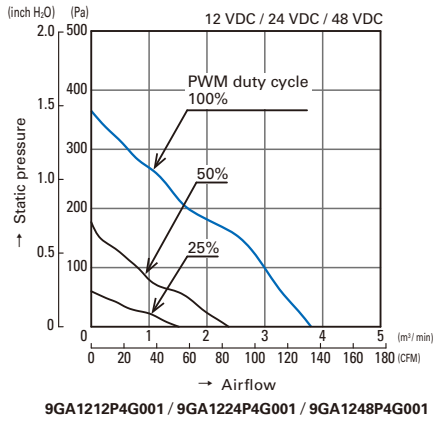
### Common Specifications

- Material ..... Frame, Impeller: Plastics (Flammability: UL94V-0)
- Expected life ..... Refer to specifications  
(L10: Survival rate: 90% at 60 °C, rated voltage, and continuously run in a free air state)  
Expected life at 40 °C ambient is just reference value.
- 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 °C 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 ..... Approx. 280 g

## Airflow - Static Pressure Characteristics

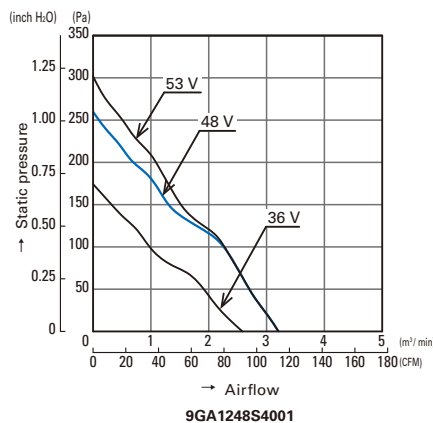
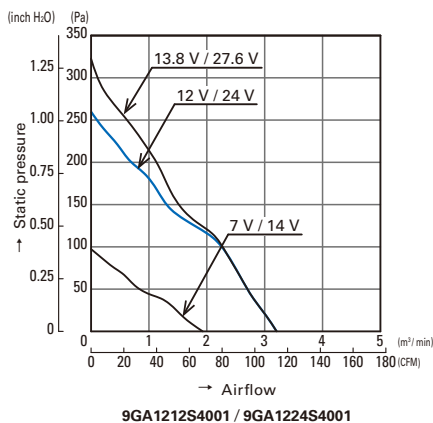
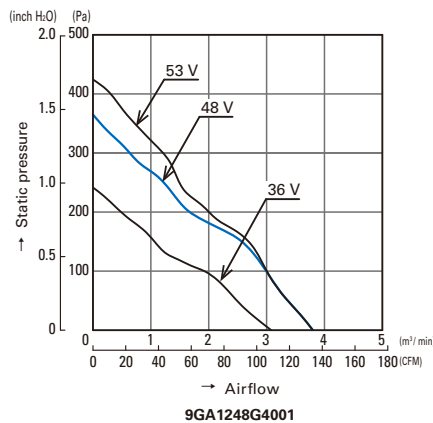
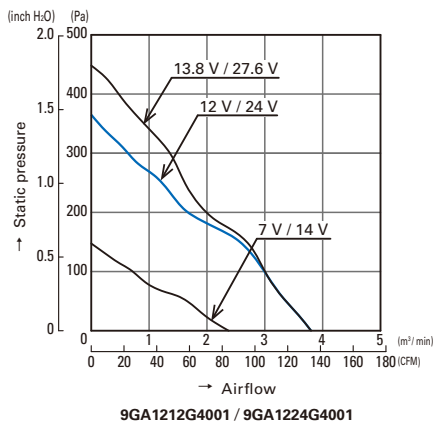
With pulse sensor and PWM control function

- PWM duty cycle
- Operating voltage range

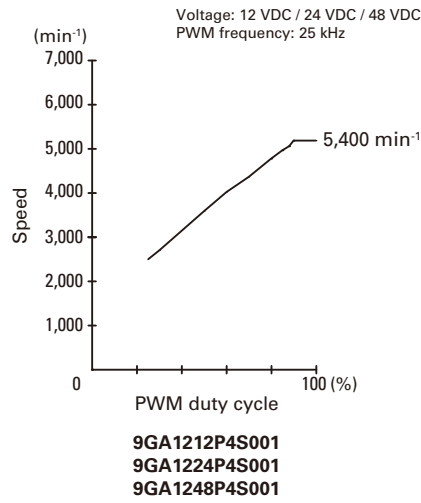
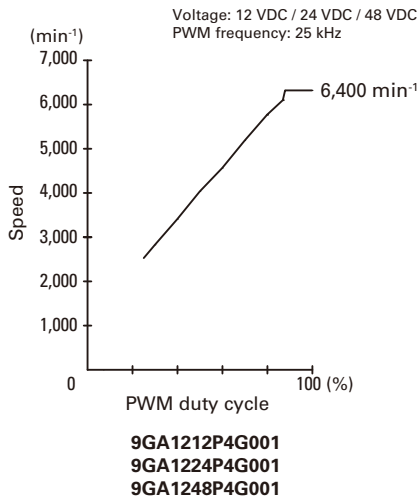


With pulse sensor

- Operating voltage range

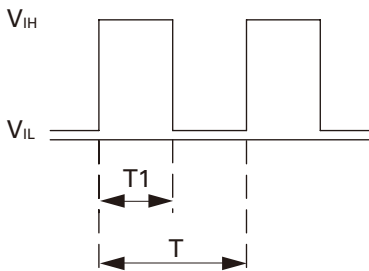


**PWM Duty - Speed Characteristics Example**



**PWM Input Signal Example**

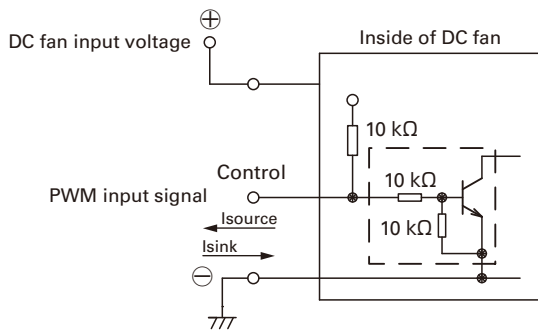
Input signal waveform



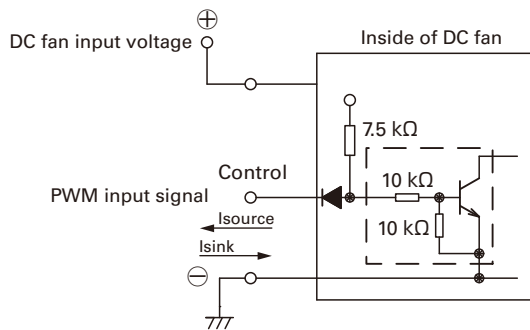
$V_{IH} = 4.75 \text{ to } 5.25 \text{ V}$     $V_{IL} = 0 \text{ to } 0.4 \text{ V}$   
 $\text{PWM duty cycle (\%)} = \frac{T_1}{T} \times 100$     $\text{PWM frequency } 25 \text{ (kHz)} = \frac{1}{T}$   
 Current source ( $I_{source}$ ) = 1 mA max. (when control voltage is 0 V)  
 Current sink (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



Rated voltage 12 V fan



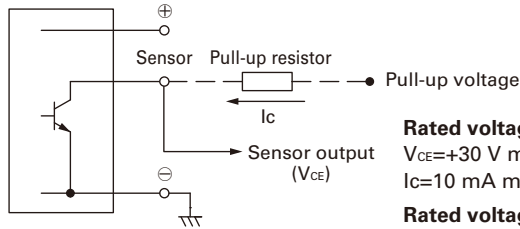
Rated voltage 24 V / 48 V fan

## Specifications for Pulse Sensors

Output circuit: Open collector

Output waveform (Need pull-up resistor)

Inside of DC fan



**Rated voltage 12 V / 24 V fan**

$V_{CE} = +30$  V max.

$I_c = 10$  mA max. [ $V_{OL} = V_{CE} (SAT) = 0.6$  V max.]

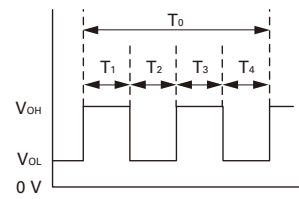
**Rated voltage 48 V fan**

$V_{CE} = +60$  V max.

$I_c = 10$  mA max. [ $V_{OL} = V_{CE} (SAT) = 0.6$  V max.]

In case of steady running

(One revolution)

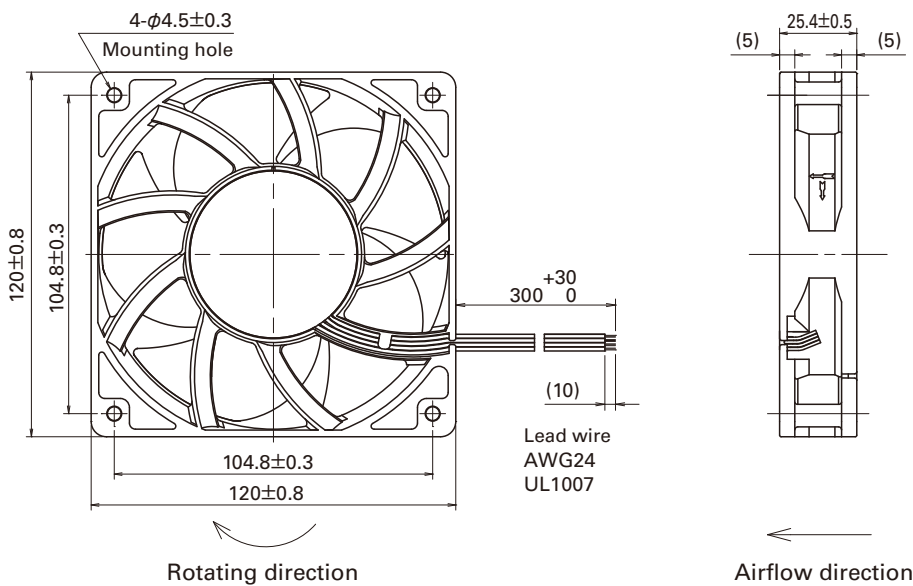


$$T_{1 \text{ to } 4} \doteq (1/4) T_0$$

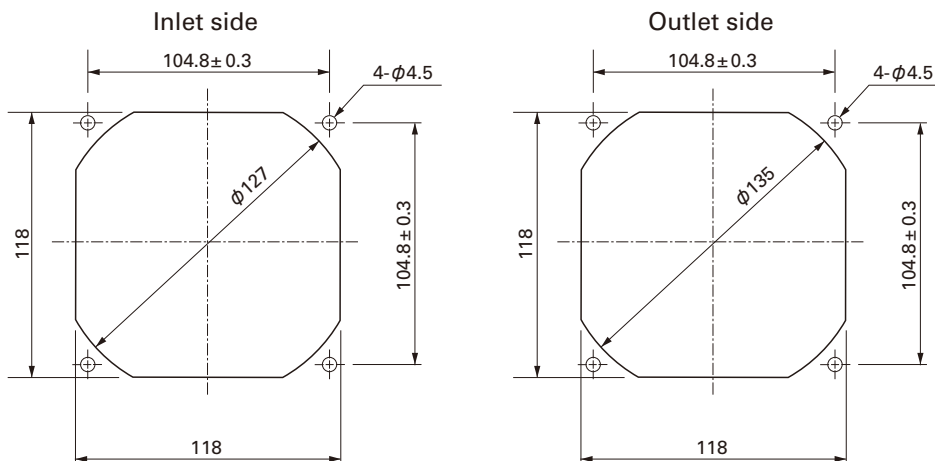
$$T_{1 \text{ to } 4} \doteq (1/4) T_0 = 60/4N \text{ (sec)}$$

$$N = \text{Fan speed (min}^{-1}\text{)}$$

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