

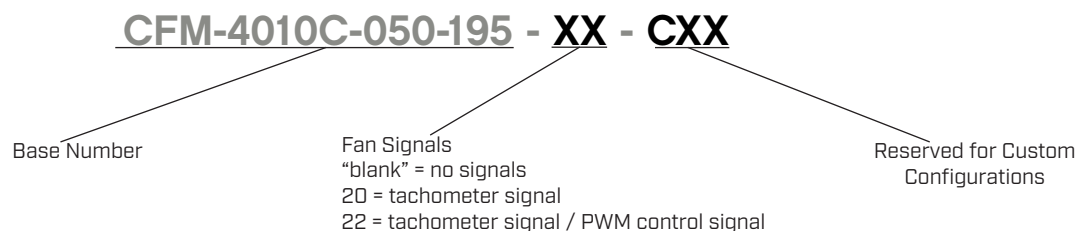
**SERIES:** CFM-40C | **DESCRIPTION:** DC AXIAL FAN**FEATURES**

- omniCOOL™ bearing system
- 40 x 40 mm frame
- multiple speed options
- PWM/tachometer wires available

**MODEL**

	input voltage		input current <sup>1</sup>	input power <sup>1</sup>	rated speed <sup>1</sup>	airflow <sup>2</sup>	static pressure <sup>3</sup>	noise <sup>4</sup>
	rated [Vdc]	range [Vdc]	max [A]	max [W]	typ [RPM±15%]	[CFM]	[inch H <sub>2</sub> O]	typ [dBA]
CFM-4010C-050-195	5	4.5~5.5	0.08	0.40	5,000 <sup>5</sup>	4.22	0.07	19.5
CFM-4010C-065-251	5	4.5~5.5	0.17	0.85	6,500	5.49	0.11	25.1
CFM-4010C-080-296	5	4.5~5.5	0.24	1.20	8,000	6.76	0.17	29.6
CFM-4010C-150-195	12	10.8~13.2	0.05	0.60	5,000 <sup>5</sup>	4.22	0.07	19.5
CFM-4010C-165-251	12	10.8~13.2	0.06	0.72	6,500	5.49	0.11	25.1
CFM-4010C-180-296	12	10.8~13.2	0.09	1.08	8,000	6.76	0.17	29.6
CFM-4010C-250-195	24	21.6~26.4	0.05	1.20	5,000 <sup>6</sup>	4.22	0.07	19.5
CFM-4010C-265-251	24	21.6~26.4	0.05	1.20	6,500	5.49	0.11	25.1
CFM-4010C-280-296	24	21.6~26.4	0.06	1.44	8,000	6.76	0.17	29.6

- Notes:
1. At rated voltage, after 3 minutes.
  2. At rated voltage, room temperature, 65% humidity, 0 inch H<sub>2</sub>O static pressure.
  3. At rated voltage, 0 CFM airflow.
  4. Measured in an anechoic chamber as per ISO3745/GB4214-84 at rated voltage, with background noise 20±2 dBA at 1 m from the fan intake.
  5. Typical rated speed is measured as RPM±18% at rated voltage.
  6. Typical rated speed is measured as RPM±14% at rated voltage.
  7. All specifications are measured at 25°C, 65% relative humidity unless otherwise specified.

**PART NUMBER KEY**

## INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage <sup>8</sup>	5 Vdc input models	4.5	5	5.5	Vdc
	12 Vdc input models	10.8	12	13.2	Vdc
	24 Vdc input models	21.6	24	26.4	Vdc
starting voltage	5 Vdc input models		3.5		Vdc
	12 Vdc input models		7.0		Vdc
	24 Vdc input models		14.0		Vdc

Note: 8. See Model section on page 1 for specific input voltage ranges.

## PERFORMANCE<sup>9</sup>

parameter	conditions/description	min	typ	max	units
rated speed	at rated voltage, 25°C, after 3 minutes	5,000		8,000	RPM
air flow	at 0 inch H <sub>2</sub> O, see performance curves	4.22		6.76	CFM
static pressure	at 0 CFM, see performance curves	0.07		0.17	inch H <sub>2</sub> O
noise	at 1 m, rated speed	19.5		29.6	dBA

Note: 9. See Model section on page 1 for specific values.

## PROTECTIONS / FEATURES<sup>10</sup>

parameter	conditions/description	min	typ	max	units
polarity protection	on all models				
tachometer signal	available on "20" and "22" models				
PWM control signal	available on "22" models				

Notes: 10. See Application Notes for details.

## SAFETY & COMPLIANCE

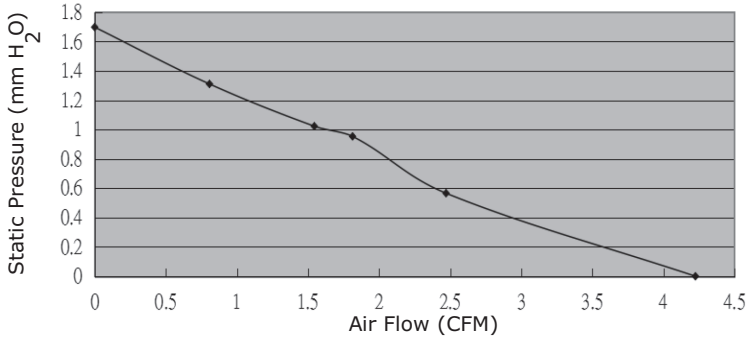
parameter	conditions/description	min	typ	max	units
insulation resistance	at 500 Vdc between frame and positive terminal	10			MΩ
dielectric strength	at 500 Vac, 60 Hz, 1 minute between housing and positive terminal			5	mA
safety approvals	UL/cUL 507, TUV [EN/IEC 62368-1:2020+A11]				
EMI/EMC	EN 55032:2015, EN 55035:2017				
life expectancy	at 40°C, 65% RH, 90% confidence level		40,000		hours
RoHS	yes				

## ENVIRONMENTAL

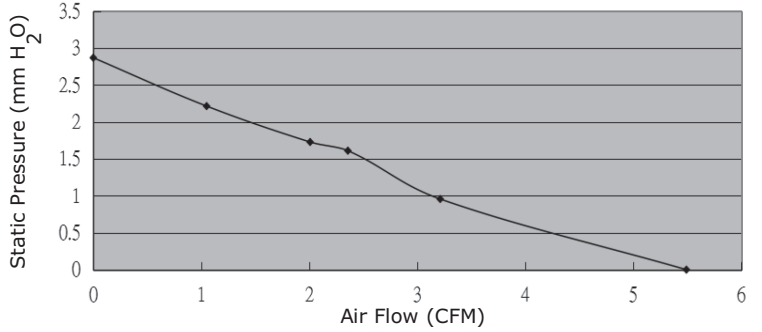
parameter	conditions/description	min	typ	max	units
operating temperature		-10		70	°C
storage temperature		-40		75	°C
operating humidity	non-condensing	35		85	%
storage humidity	non-condensing	35		85	%

## PERFORMANCE CURVES

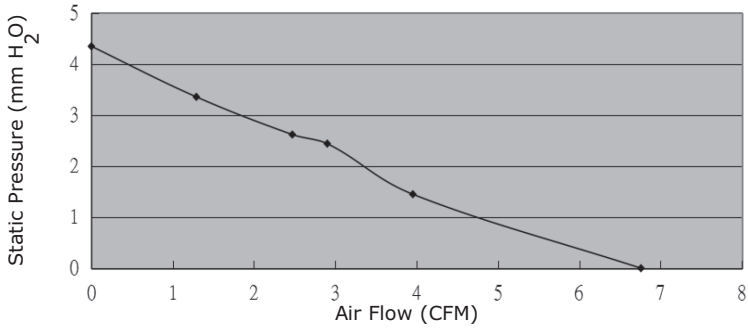
**CFM-4010C-050-195**



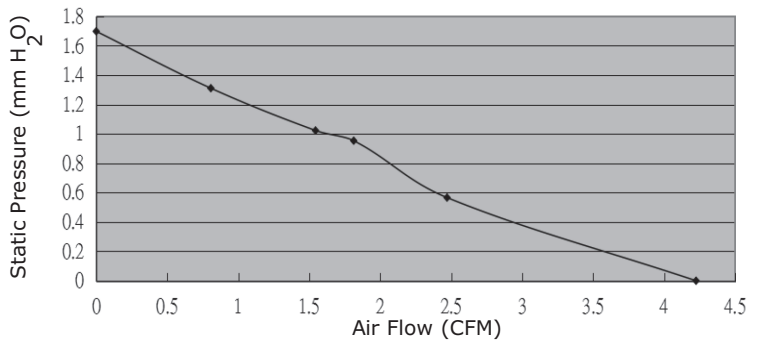
**CFM-4010C-065-251**



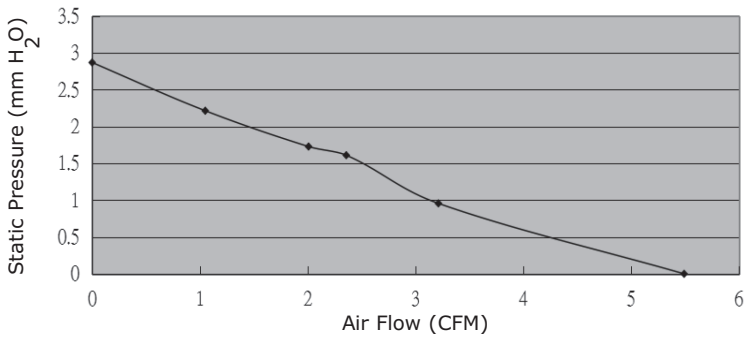
**CFM-4010C-080-296**



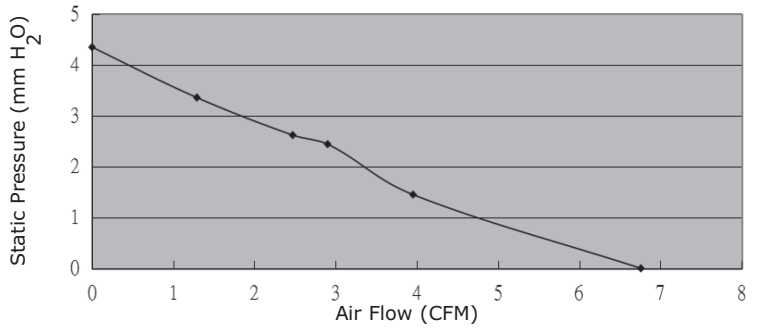
**CFM-4010C-150-195**



**CFM-4010C-165-251**

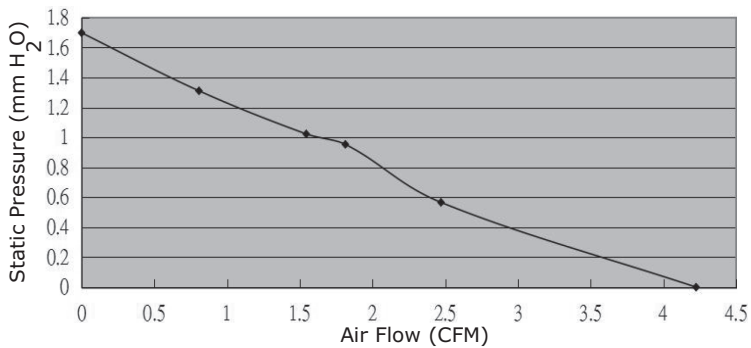


**CFM-4010C-180-296**

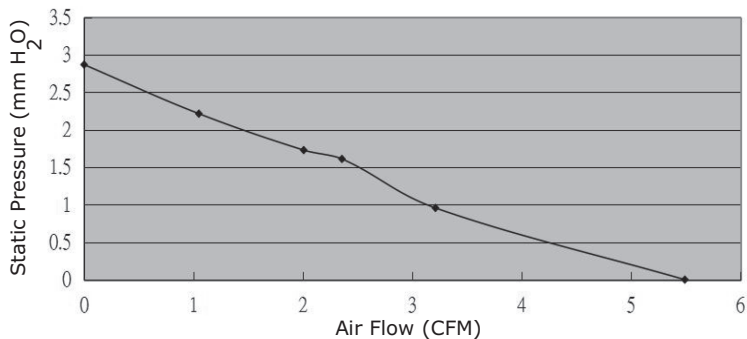


## PERFORMANCE CURVES (CONTINUED)

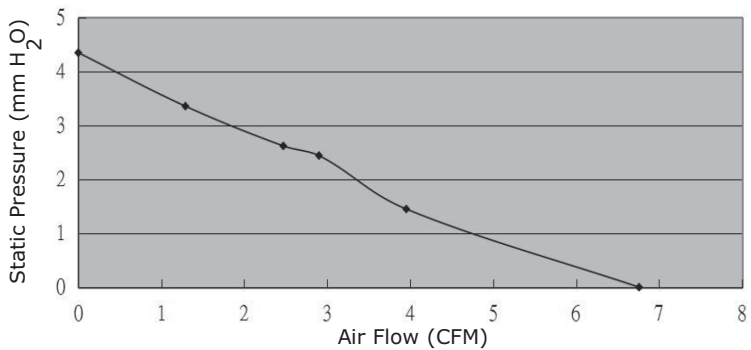
**CFM-4010C-250-195**



**CFM-4010C-265-251**



**CFM-4010C-280-296**



## MECHANICAL

parameter	conditions/description	min	typ	max	units
motor	4 pole DC brushless				
bearing system	omniCOOL™				
direction of rotation	counter-clockwise viewed from front of fan blade				
dimensions	40 x 40 x 10.5				mm
material	PBT [UL94V-0]				
weight	CFM-4010C-250-195		13.0		g
	CFM-4010C-265-251		13.6		g
	CFM-4010C-280-296		12.6		g
	all other models		13.8		g

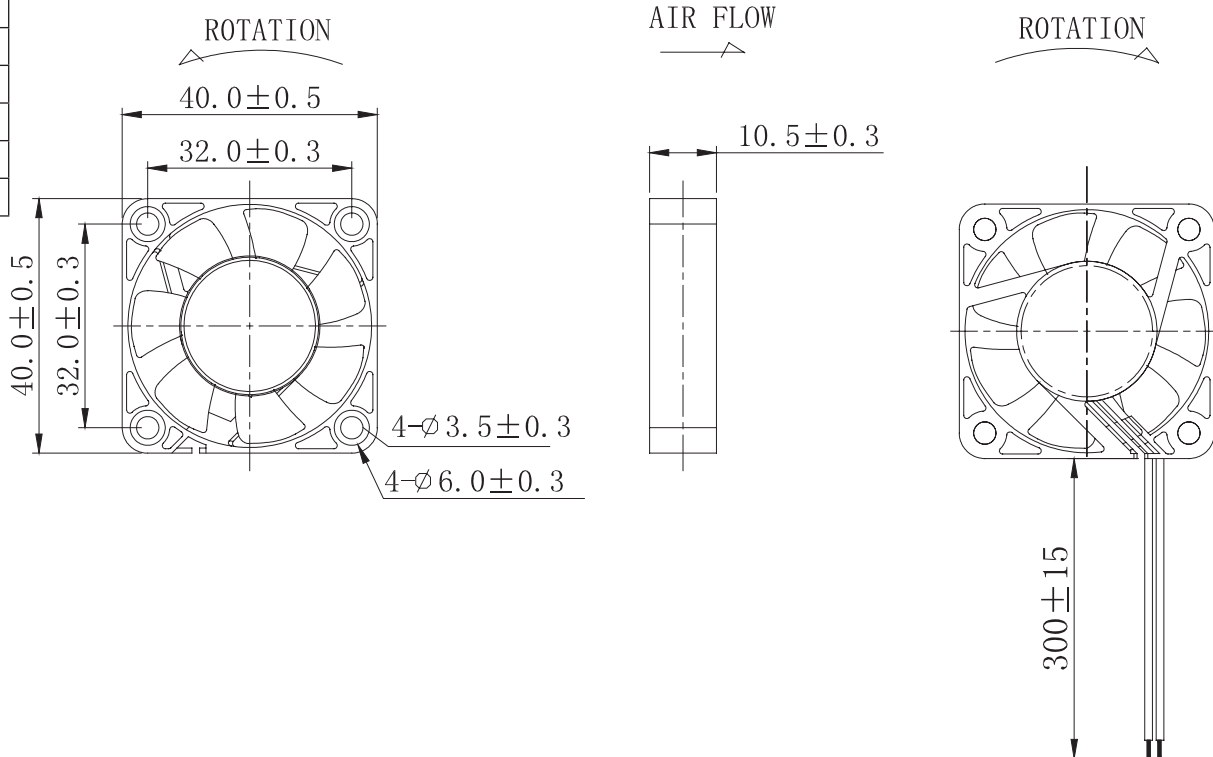
## MECHANICAL DRAWING

units: mm

2 wire versions (+Vin & -Vin): UL 1007, 26 AWG  
 3 wire versions (+Vin, -Vin, & tach): UL 1061, 26 AWG  
 4 wire versions (+Vin, -Vin, tach, & PWM): UL 1061, 28 AWG

MOUNTING SCREW (Pan Head)			
Screw Type	Size	Standard	Torque
Machine Screw	M3	JIS B1111-1974	7.5 kgf-cm

WIRE CONNECTIONS	
Wire Color	Function
Red	+Vin
Black	-Vin
Yellow <sup>11</sup>	Tach Signal
Blue <sup>11</sup>	PWM



Notes: 11. Wires only present on versions with output signals.

## APPLICATION NOTES

### Polarity Protection

Able to withstand 10 minutes of reverse polarity connection between the positive and negative wires without causing damage.

### Tachometer Signal (Yellow Wire)

The tachometer signal is for detecting the rotational speed of the fan motor. The output will be a square wave when fan is operating and  $V_{FG}$  or  $V_{CE}$  depending on the locked rotor position when fan motor is locked (See Figures 1~2 below).

Figure 1: Tachometer Output Circuit

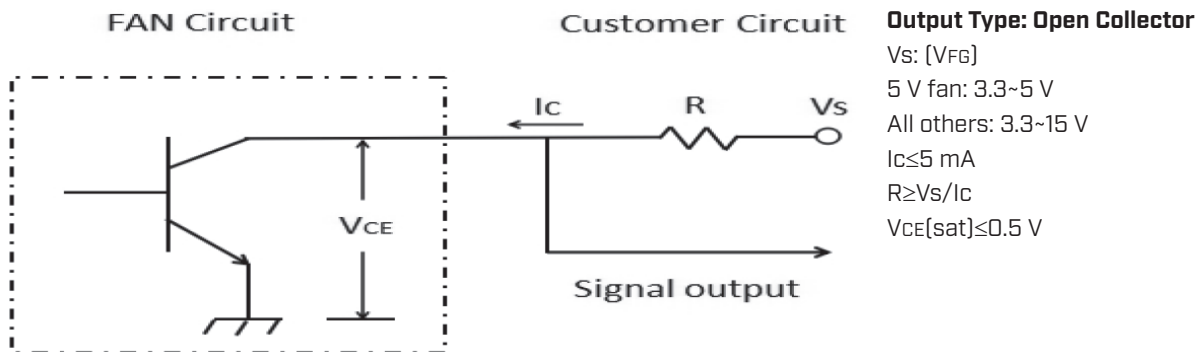
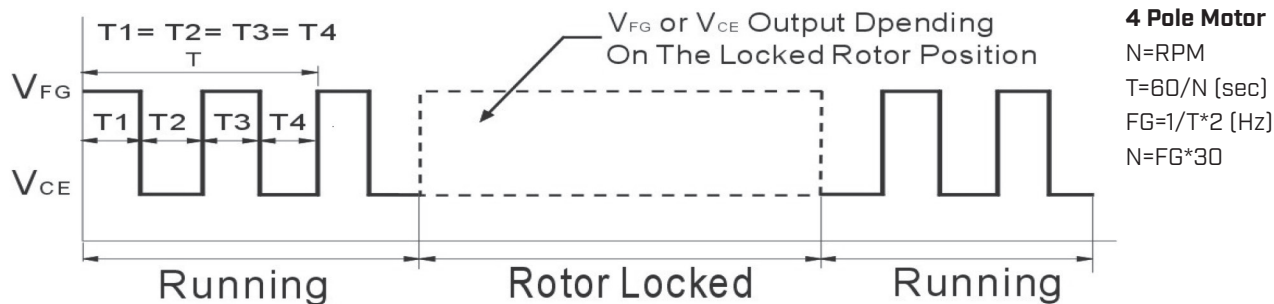


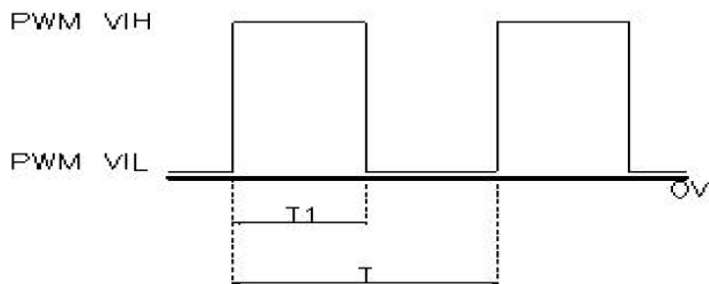
Figure 2: Tachometer Output Waveform



### PWM Signal (Blue Wire)

This wire is for speed control of the fan motor using a PWM input signal from the customer circuit (See Figure 3 below).

Figure 3: PWM Input Signal



PWM Duty Cycle [%] =  $T1 / T \times 100\%$   
 PWM Frequency Range: 20~30 kHz  
 PWM  $V_{IH}$  = 2.8~5.5 V  
 PWM  $V_{IL}$  = 0~0.6 V

## REVISION HISTORY

rev.	description	date
1.0	initial release	05/12/2021
1.01	added models CFM-4010C-250-195, CFM-4010C-265-251 and CFM-4010C-280-296	10/06/2021
1.02	added wire details for 3 wire versions	02/24/2022
1.03	added PWM signal versions	05/19/2022
1.04	logo, datasheet style update	08/12/2022

The revision history provided is for informational purposes only and is believed to be accurate.



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