

SERIES: CFM-60B | **DESCRIPTION:** DC AXIAL FAN**FEATURES**

- dual ball bearing
- 60 x 60 mm frame
- multiple speed options
- PWM/tachometer wires available
- auto restart

**MODEL**

	input voltage		input current ¹	input power ¹	rated speed ¹	airflow ²	static pressure ³	noise ⁴
	rated [Vdc]	range [Vdc]	max [A]	max [W]	typ (RPM±600)	[CFM]	[inch H ₂ O]	typ [dBA]
CFM-6010B-130-215	12	10.8~13.2	0.06	0.72	3,000	10.64	0.06	21.5
CFM-6010B-140-278	12	10.8~13.2	0.12	1.44	4,000	14.36	0.10	27.5
CFM-6010B-150-326	12	10.8~13.2	0.23	2.76	5,000	18.13	0.15	33.8
CFM-6020B-030-257	5	4.5~5.5	0.14	0.70	3,000	11.43	0.06	25.7
CFM-6020B-040-320	5	4.5~5.5	0.41	2.05	4,000	15.24	0.12	32.0
CFM-6020B-130-257	12	10.8~13.2	0.08	0.96	3,000	11.43	0.06	25.7
CFM-6020B-140-320	12	10.8~13.2	0.12	1.44	4,000	15.24	0.12	32.0
CFM-6020B-150-368	12	10.8~13.2	0.21	2.52	5,000	19.05	0.18	36.8

- Notes:
1. At rated voltage, after 3 minutes.
 2. At rated voltage, room temperature, 65% humidity, 0 inch H₂O 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. All specifications are measured at 25°C, 65% relative humidity unless otherwise specified.

PART NUMBER KEY

CFM - 6020B - 030 - 257 - XX - CXX

Base Number

Fan Signals
 "blank" = no signals
 20 = tachometer signal
 22 = tachometer signal / PWM control signal

Reserved for Custom Configurations

INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage ⁶	5 Vdc input models	4.5	5	5.5	Vdc
	12 Vdc input models	10.8	12	13.2	Vdc
starting voltage	5 Vdc input models		3.5		Vdc
	12 Vdc input models		7.0		Vdc

Note: 6. See Model section on page 1 for specific input voltage ranges.

PERFORMANCE⁷

parameter	conditions/description	min	typ	max	units
rated speed	at rated voltage, 25°C, after 3 minutes	3,000		5,000	RPM
air flow	at 0 inch H ₂ O, see performance curves	10.64		19.05	CFM
static pressure	at 0 CFM, see performance curves	0.06		0.18	inch H ₂ O
noise	at 1 m, rated speed	21.5		36.8	dBA

Note: 7. See Model section on page 1 for specific values.

PROTECTIONS / FEATURES⁸

parameter	conditions/description	min	typ	max	units
auto restart	not available on models CFM-6010B-130-215 & CFM-6010B-140-278				
polarity protection	only available on models CFM-6010B-130-215, CFM-6010B-140-278, CFM-6010B-150-326, & CFM-6020B-030-257				
tachometer signal	available on "20" and "22" models				
PWM control signal	available on "22" models				

Notes: 8. See Application Notes for details.

SAFETY & COMPLIANCE

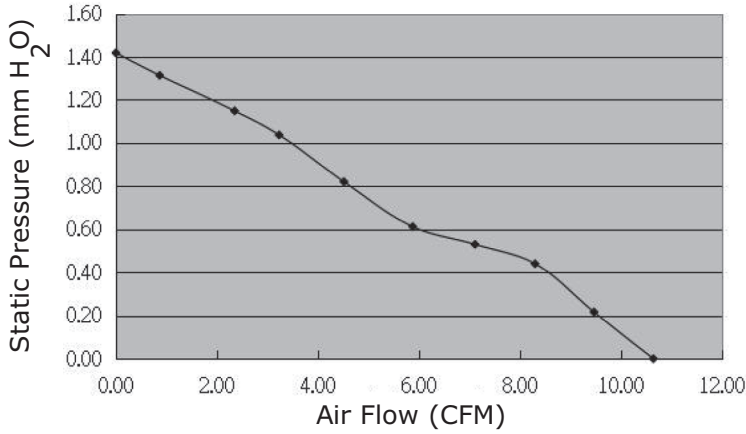
parameter	conditions/description	min	typ	max	units
insulation resistance	at 500 Vdc between frame and positive terminal	10			MΩ
dielectric strength	at 500 Vac, 60 Hz, 1 minute between housing and positive terminal			5	mA
safety approvals	UL/cUL 507, TUV [EN/IEC 62368-1:2020+A11]				
EMI/EMC	EN 55032:2015, EN 55035:2017				
life expectancy	at 40°C, 65% RH, 90% confidence level		70,000		hours
RoHS	yes				

ENVIRONMENTAL

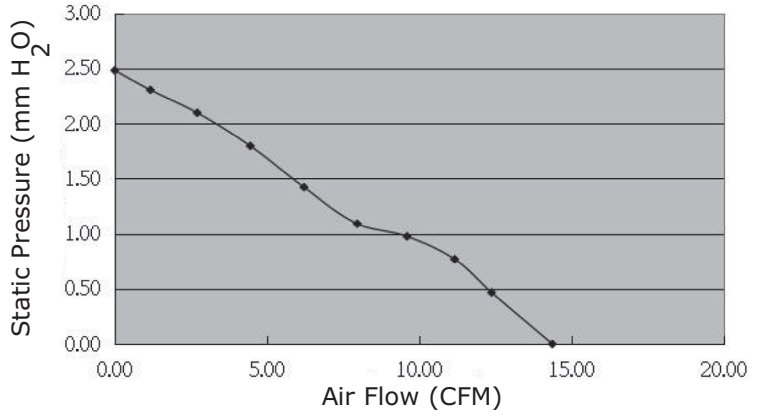
parameter	conditions/description	min	typ	max	units
operating temperature		-10		70	°C
storage temperature		-40		75	°C
operating humidity	non-condensing	35		85	%
storage humidity	non-condensing	35		85	%

PERFORMANCE CURVES

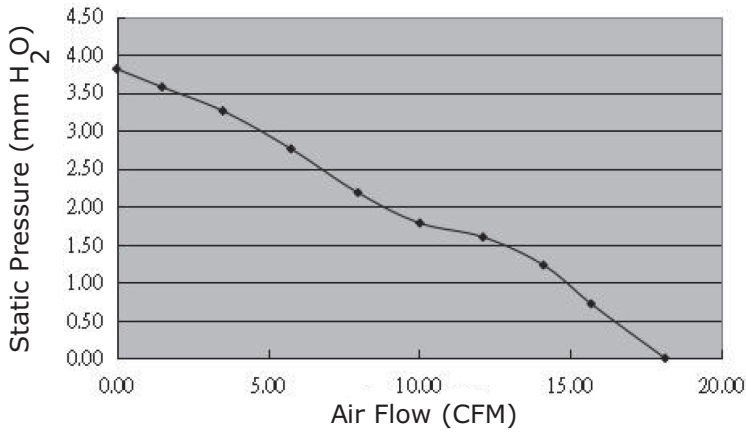
CFM-6010B-130-215



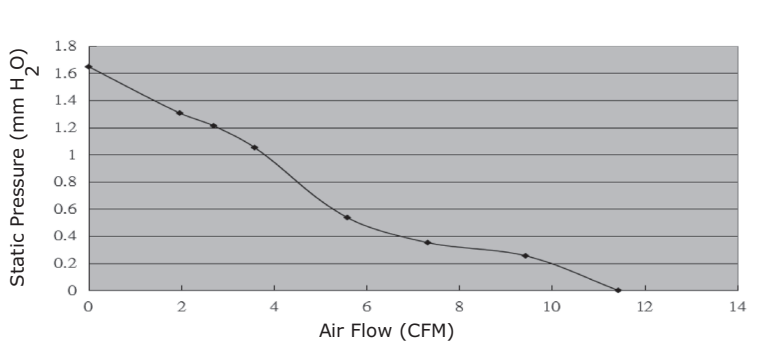
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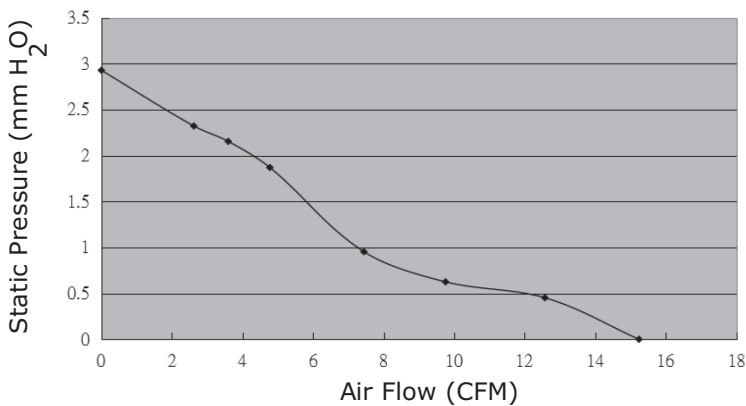
CFM-6010B-150-326



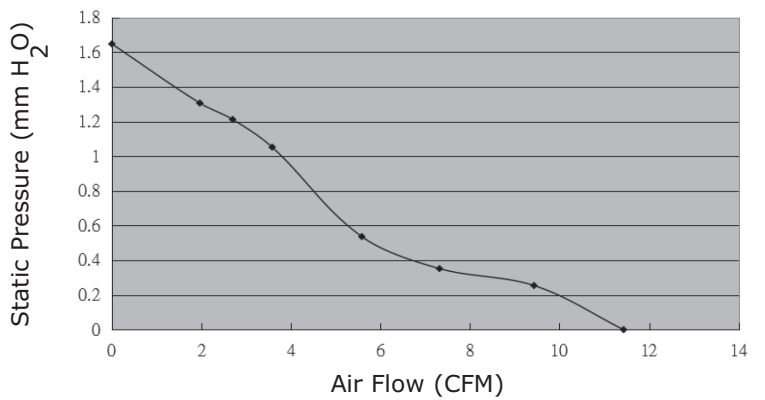
CFM-6020B-030-257



CFM-6020B-040-320

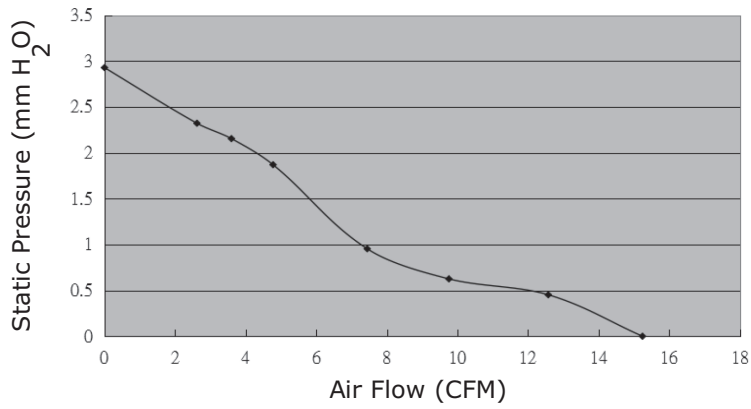


CFM-6020B-130-257

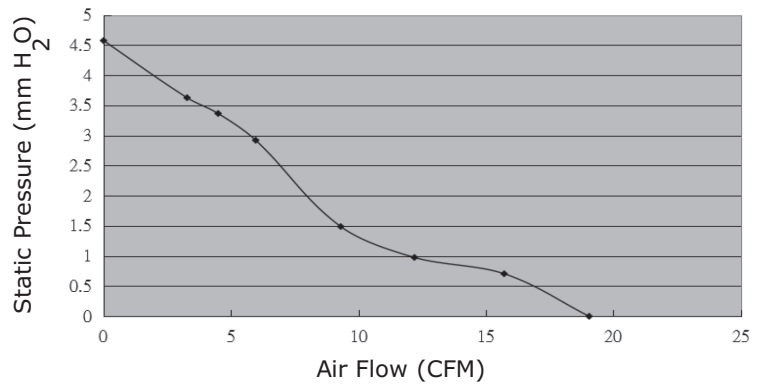


PERFORMANCE CURVES (CONTINUED)

CFM-6020B-140-320



CFM-6020B-150-368



MECHANICAL

parameter	conditions/description	min	typ	max	units
motor	4 pole DC brushless				
bearing system	dual ball bearing				
direction of rotation	counter-clockwise viewed from front of fan blade				
dimensions	CFM-6010B models: 60 x 60 x 10.5 CFM-6020B models: 60 x 60 x 20				mm mm
material	PBT (UL94V-0)				
weight	CFM-6010B models, weight varies by model CFM-6020B models	21.3	48.2	22.2	g g

MECHANICAL DRAWING

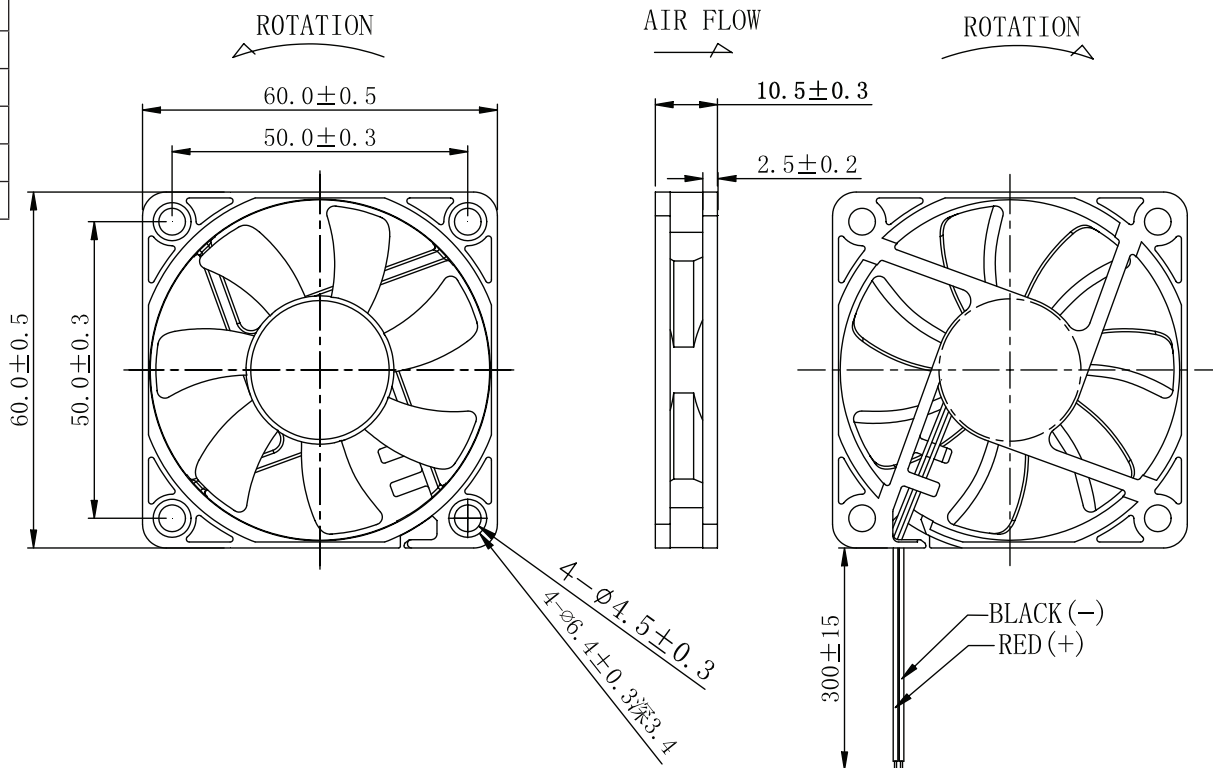
units: mm

2 wire versions (+Vin & -Vin): UL 1007, 24 AWG
 3 wire versions (+Vin, -Vin, & tach): UL 1007, 26 AWG
 4 wire versions (+Vin, -Vin, tach, & PWM): UL 1061, 26 AWG

MOUNTING SCREW (Pan Head)			
Screw Type	Size	Standard	Torque
Machine Screw	M4	JIS B1111-1974	7.5 kgf-cm
Self-tapping Screw	M5	JIS B1122 Type 2	7.5 kgf-cm

CFM-6010B

WIRE CONNECTIONS	
Wire Color	Function
Red	+Vin
Black	-Vin
Yellow ⁹	Tach Signal
Blue ⁹	PWM



Notes: ⁹ Wires only present on versions with output signals.

MECHANICAL DRAWING (CONTINUED)

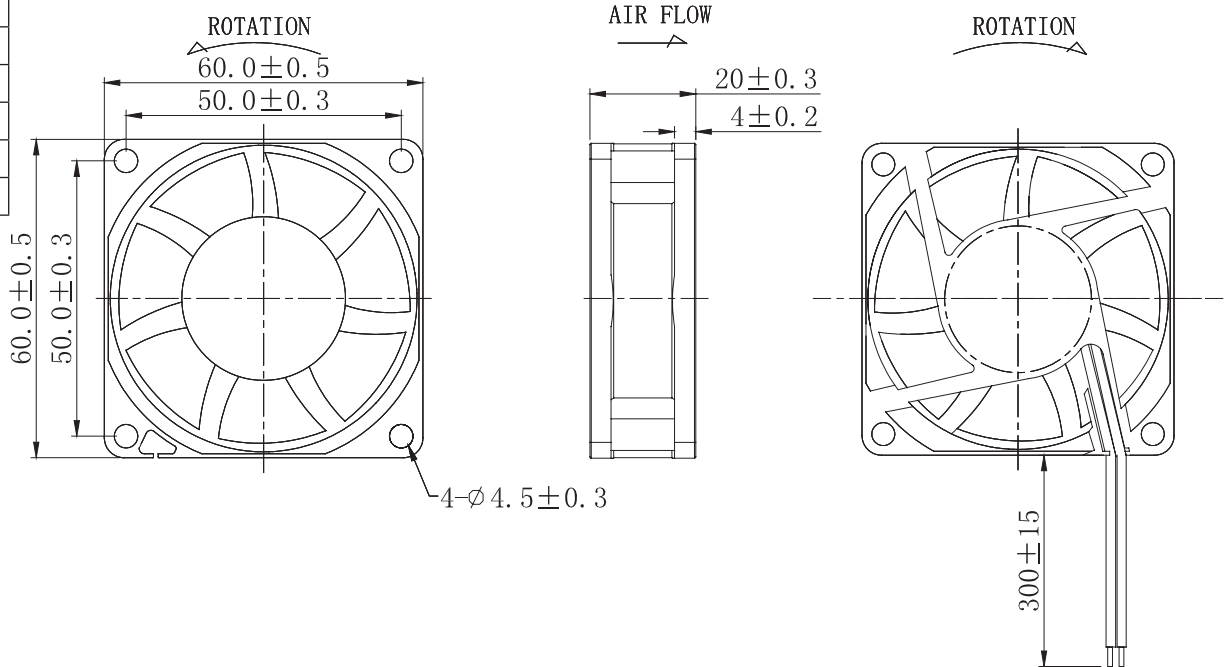
units: mm

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CFM-6020B

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Wire Color	Function
Red	+Vin
Black	-Vin
Yellow ⁹	Tach Signal
Blue ⁹	PWM



Notes: ⁹ Wires only present on versions with output signals.

APPLICATION NOTES

Auto Restart Protection

When the fan motor is locked by an external force, the device will temporarily turn off electrical power to the motor and restart automatically when the locked rotor condition is released.

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

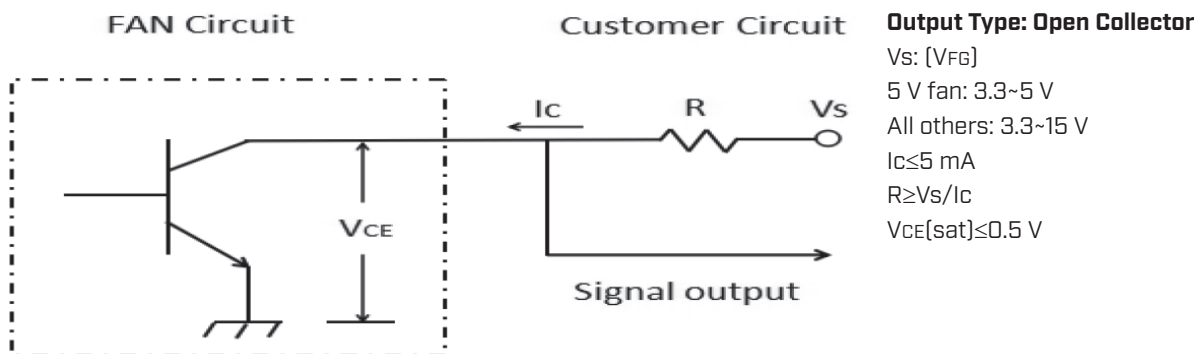
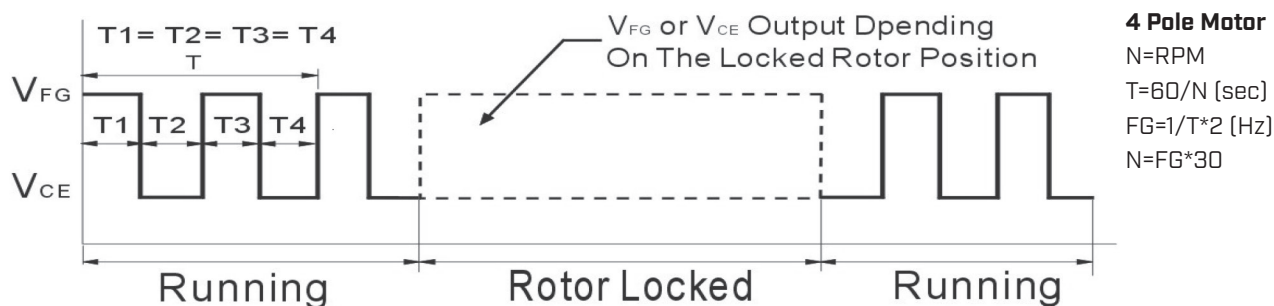


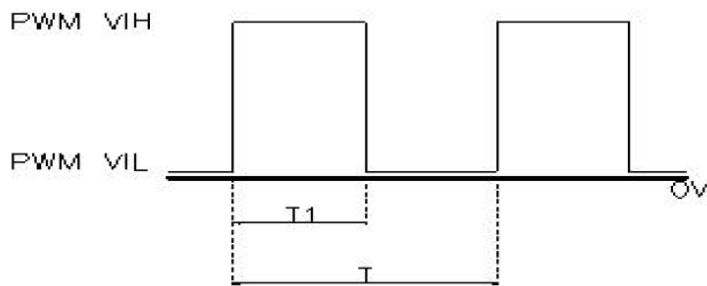
Figure 2: Tachometer Output Waveform



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 $V_{IH} = 2.8 \sim 5.5 \text{ V}$
 PWM $V_{IL} = 0 \sim 0.6 \text{ V}$

REVISION HISTORY

rev.	description	date
1.0	initial release	05/12/2021
1.01	added wire details for 3 wire versions	02/24/2022
1.02	added PWM signal versions	05/19/2022
1.03	logo, datasheet style update	08/12/2022
1.04	added new models	05/01/2023

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



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