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SERIES: CFM-120BF | DESCRIPTION: DC AXIAL FAN

FEATURES

- dual ball bearing system
- 120 x 120 mm frame
- multiple speed options
- PWM/tachometer wires available

MODEL	input voltage		input current[1]		input power[1]		rated speed[1]	airflow[2]	static pressure[3]	noise[4]
	rated (Vdc)	range (Vdc)	typ (A)	max (A)	typ (W)	max (W)	typ (RPM±10%)	(CFM)	(inch H_2O)	typ (dBA)
CFM-A225BF-153-577	12	10.8~13.2	1.56	1.87	18.72	22.44	5,300	169.5	0.82	57.8
CFM-A225BF-158-597	12	10.8~13.2	2.00	2.40	24.00	28.80	5,800	185.5	0.98	59.7
CFM-A225BF-163-615	12	10.8~13.2	2.63	3.16	31.56	37.92	6,300	201.4	1.16	61.5
CFM-A225BF-240-516	24	21.6~26.4	0.35	0.53	8.40	12.72	4,000	127.9	0.47	51.7
CFM-A225BF-253-577	24	21.6~26.4	0.77	0.92	18.48	22.08	5,300	169.5	0.82	57.8
CFM-A225BF-258-597	24	21.6~26.4	0.95	1.14	22.80	27.36	5,800	185.5	0.98	59.7
CFM-A225BF-263-615	24	21.6~26.4	1.20	1.44	28.80	34.56	6,300	201.4	1.16	61.5
CFM-A225BF-420-336	48	43.2~52.8	0.04	0.06	1.92	2.88	2,000[5]	65.21	0.18	33.6
CFM-A225BF-430-440	48	43.2~52.8	0.10	0.15	4.80	7.20	3,000	94.79	0.37	44.0
CFM-A225BF-440-521	48	43.2~52.8	0.21	0.32	10.08	15.36	4,000	128.86	0.59	52.1
CFM-A225BF-453-604	48	43.2~52.8	0.37	0.56	17.76	26.88	5,300	173.38	1.16	60.4
CFM-A225BF-458-621	48	43.2-52.8	0.50	0.60	24.0	28.80	5,800	186.68	1.24	62.1
CFM-A225BF-463-645	48	43.2-52.8	0.67	0.80	32.16	38.40	6,300	203.89	1.32	64.5
CFM-A238BF-165-635	12	10.8~13.2	2.64	3.17	31.68	38.04	6,500	213.8	1.43	63.5
CFM-A238BF-270-651	24	21.6~26.4	1.69	2.54	40.56	60.96	7,000	230.2	1.65	65.1
CFM-A238BF-280-680	24	21.6~26.4	2.45	2.94	58.8	70.56	8,000	263.1	2.16	68.1
CFM-A238BF-440-524	48	43.2~52.8	0.31	0.47	14.88	22.56	4,000	134.88	0.83	52.4
CFM-A238BF-450-573	48	43.2~52.8	0.38	0.57	18.24	27.36	5,000	165.91	1.24	57.3
CFM-A238BF-460-619	48	43.2~52.8	0.53	0.64	25.44	30.72	6,000	198.34	1.60	61.9
CFM-A238BF-470-662	48	43.2~52.8	0.89	1.07	42.72	51.36	7,000	235.10	1.89	66.2
CFM-A238BF-480-691	48	43.2~56.0	1.29	1.55	61.92	74.40	8,000	268.15	2.45	69.1

Notes:
1. At rated voltage, after 3 minutes.
2. At rated voltage, room temperature, 65% humidity, 0 inch H_2O 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±250 at rated voltage
6. All specifications are measured at 25°C, 65% relative humidity unless otherwise specified.

PART NUMBER KEY

CFM - A225BF - 153 - 577 - 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[7]	12 Vdc input models	10.8	12	13.2	Vdc
	24 Vdc input models	21.6	24	26.4	Vdc
	48 Vdc input models	43.2	48	56.0	Vdc
starting voltage	12 Vdc input models		8		Vdc
	24 Vdc input models		14		Vdc
	CFM-A225BF, 48 Vdc input models		35		Vdc
	CFM-A238BF, 48 Vdc input models		40		Vdc

Note: 7. See Model section on page 1 for specific input voltage ranges.

PERFORMANCE[8]

parameter	conditions/description	min	typ	max	units
rated speed	at rated voltage, 25°C, after 3 minutes	5,300		8,000	RPM
air flow	at 0 inch H_2O, see performance curves	65.21		268.15	CFM
static pressure	at 0 CFM, see performance curves	0.18		2.45	inch H_2O
noise	at 1 m, rated speed	33.6		69.1	dBA

Note: 8. See Model section on page 1 for specific values.

PROTECTIONS / FEATURES[9]

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

Notes: 9. See Application Notes for details.

SAFETY & COMPLIANCE

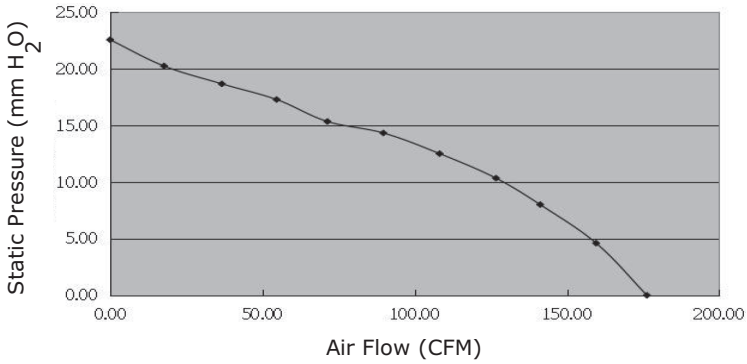
parameter	conditions/description	min	typ	max	units
insulation resistance	at 500 Vdc between frame and positive terminal	10			MΩ
dielectric strength	at 500 Vac, 60 Hz, 1 minute between housing and positive terminal			5	mA
safety approvals	UL/cUL 507, TUV (EN/IEC 62368-1:2020+A11)				
EMI/EMC	EN 55032:2015, 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-A225BF-153-577



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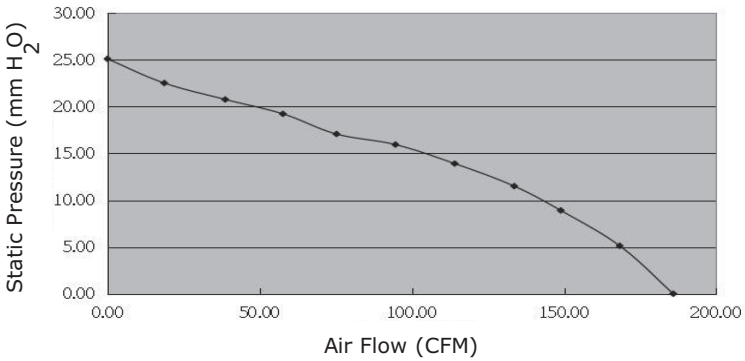

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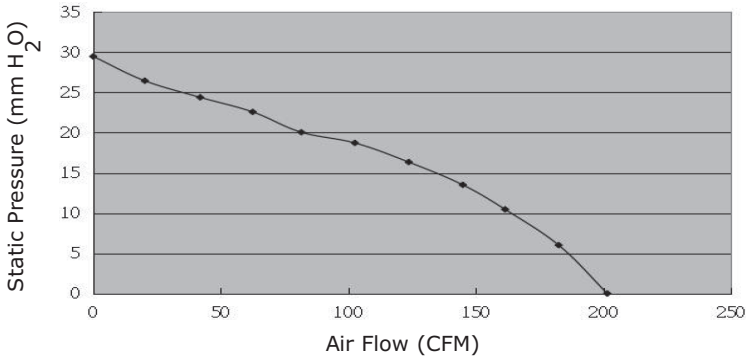

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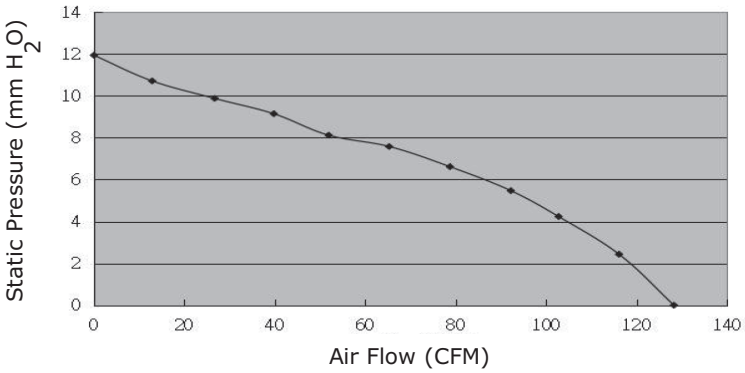

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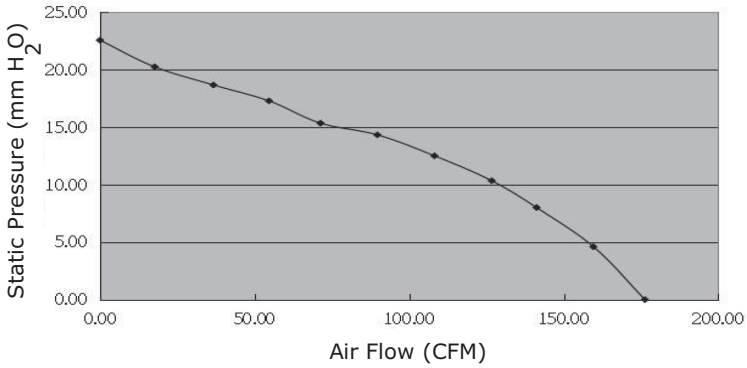

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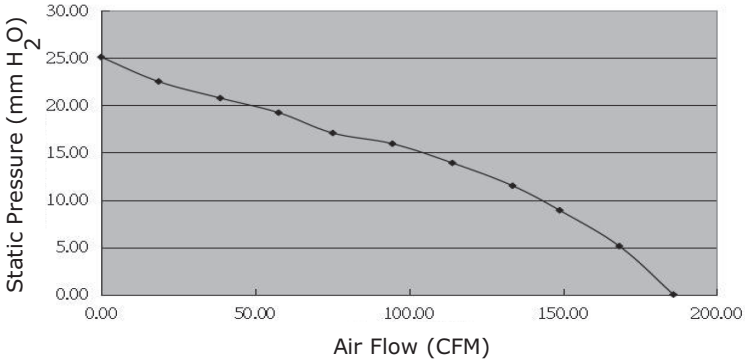

PERFORMANCE CURVES (CONTINUED)

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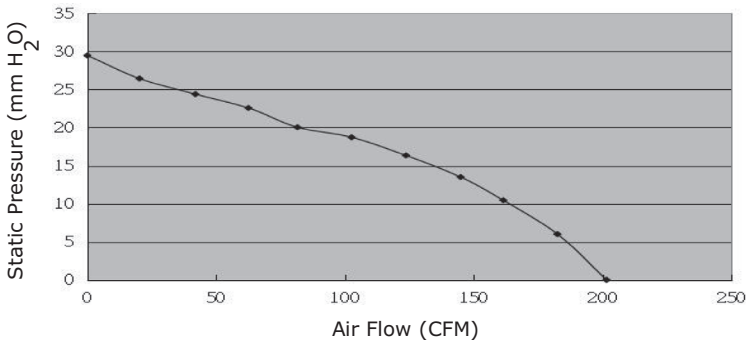

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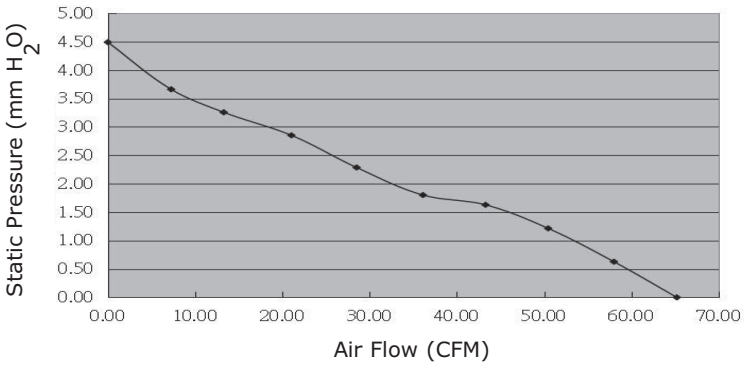

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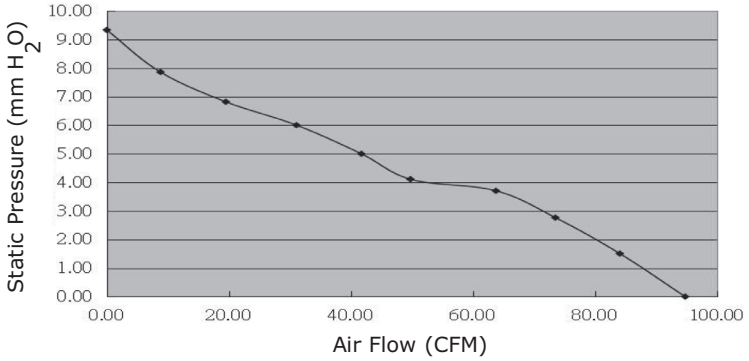

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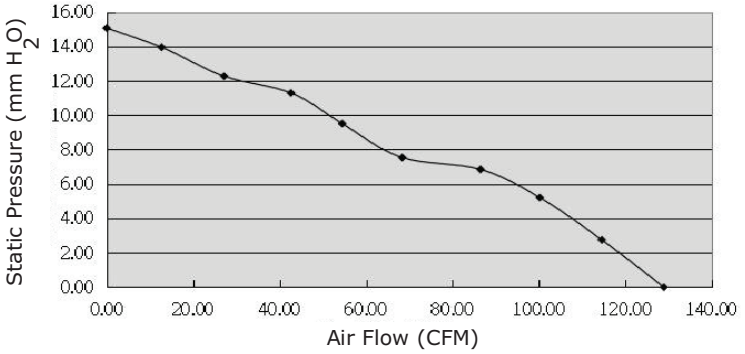

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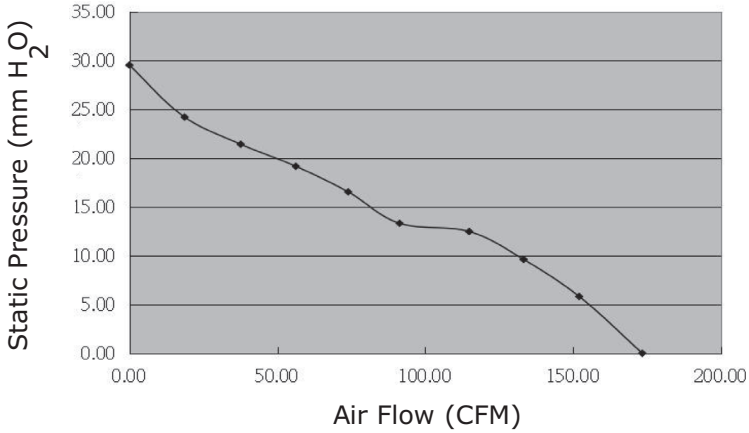

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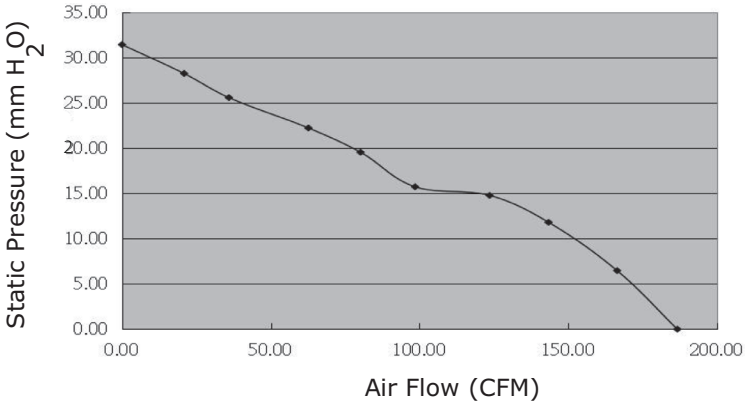

PERFORMANCE CURVES (CONTINUED)

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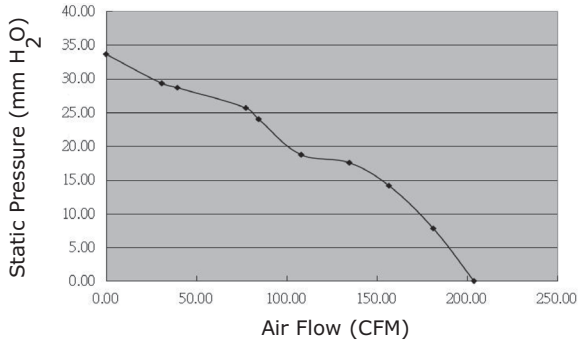

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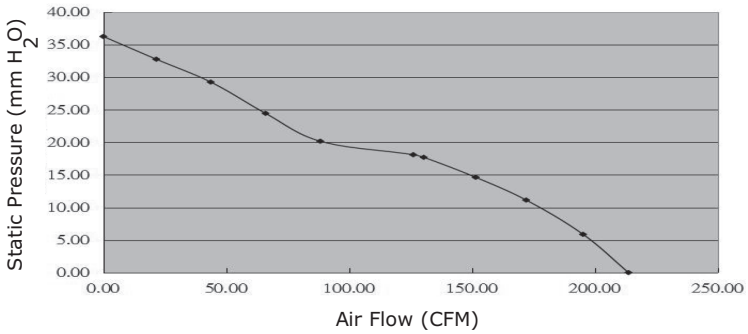

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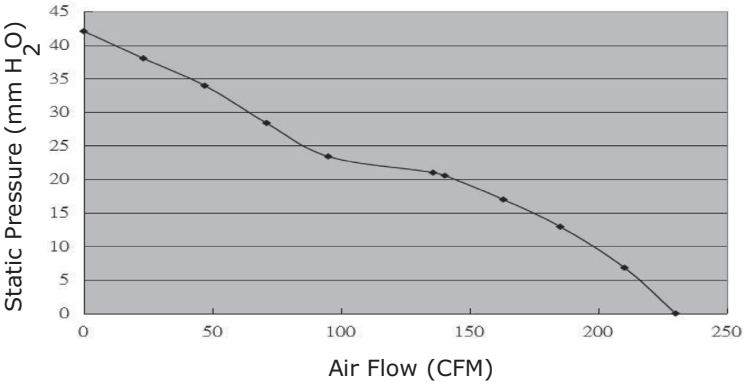

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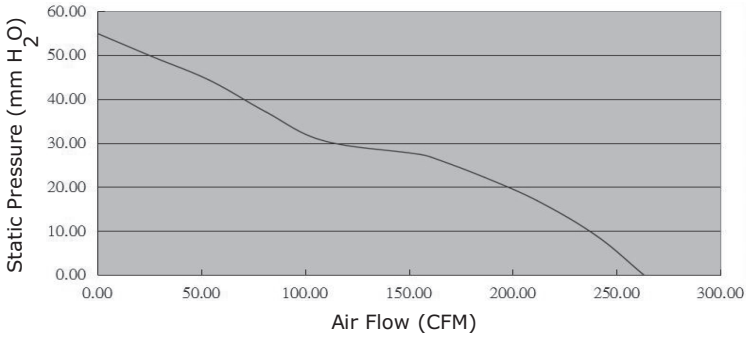

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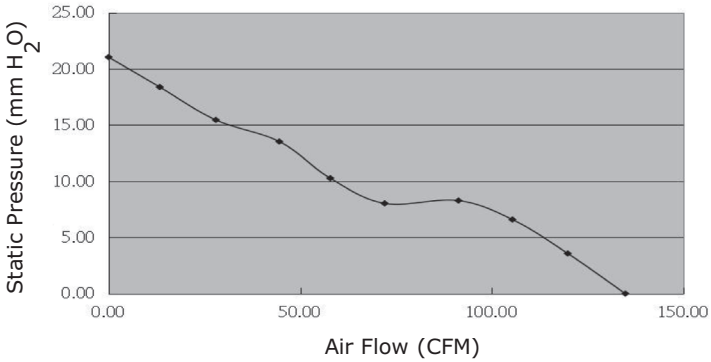

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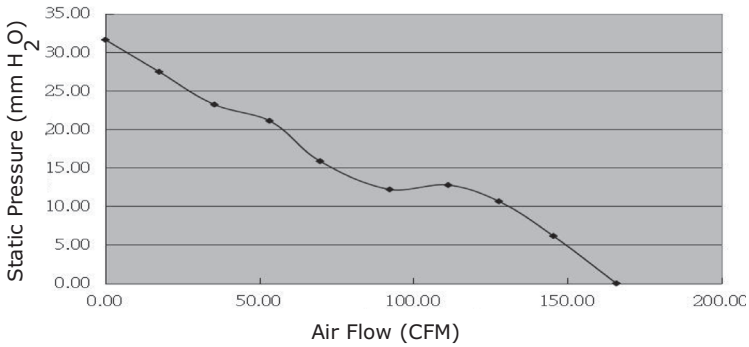
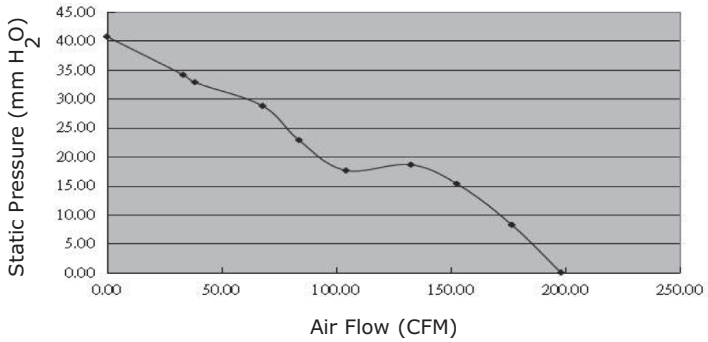
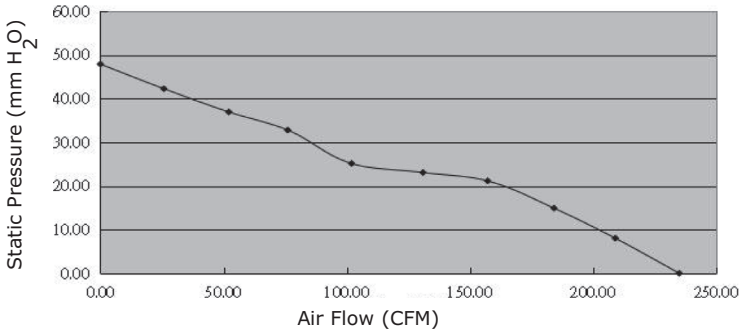


PERFORMANCE CURVES (CONTINUED)

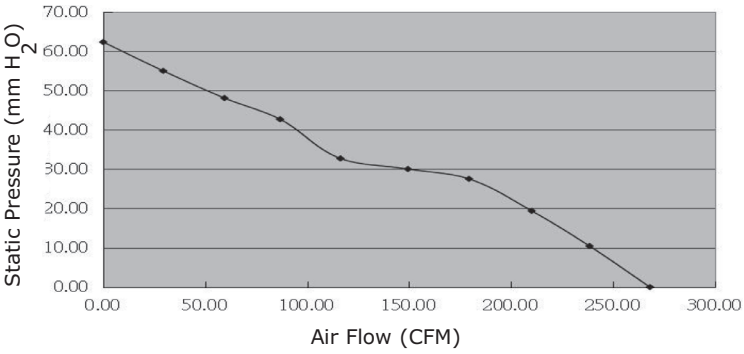
CFM-A238BF-460-619



CFM-A238BF-470-662



CFM-A238BF-480-691



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-A225BF models: 120 x 120 x 25.4 CFM-A238BF models: 120 x 120 x 38				mm
material	PBT (UL94V-0)				
weight	CFM-A225BF models CFM-A238BF models	149 293.4		254 398.2	g g

MECHANICAL DRAWING

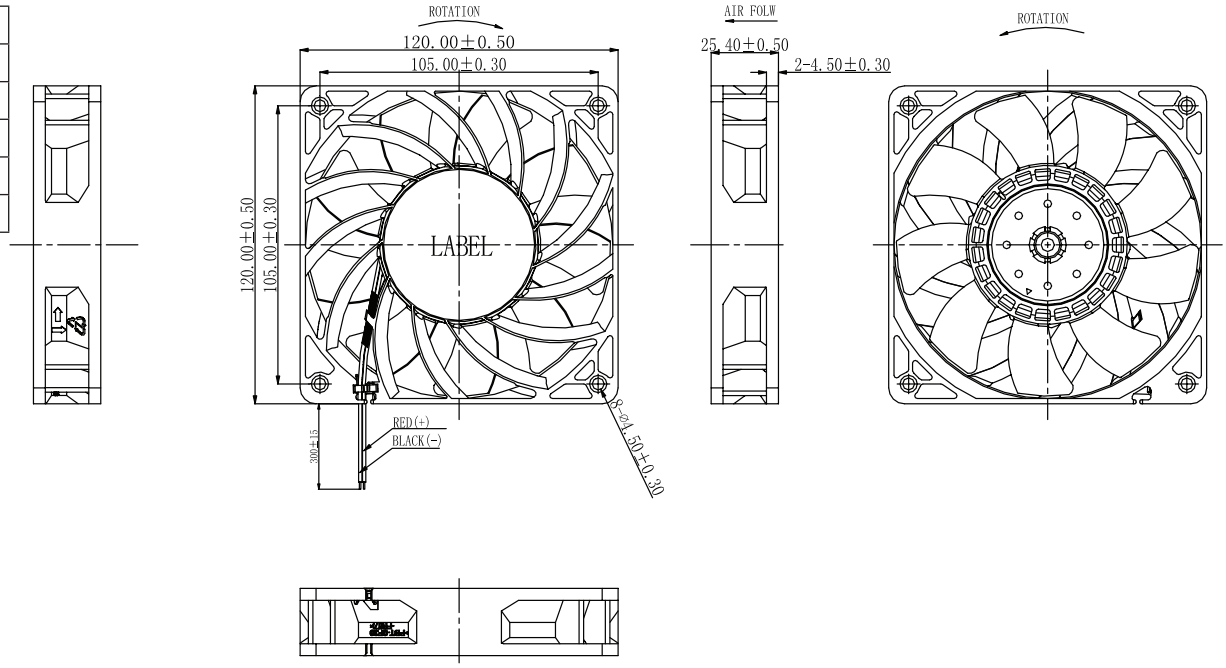
units: mm

2 wire versions (+Vin & -Vin): UL 1430, 24 AWG
3 wire versions (+Vin, -Vin, & tach): UL 1430, 24 AWG
4 wire versions (+Vin, -Vin, tach, & PWM): UL 1430, 24 AWG

MOUNTING SCREW (Pan Head)			
Screw Type	Size	Standard	Torque
Machine Screw	M4	JIS B1111-1974	4.5 kgf-cm
Self-tapping Screw	M5	JIS B1122 Type 2	5.5 kgf-cm

CFM-A225BF

WIRE CONNECTIONS	
Wire Color	Function
Red	+Vin
Black	-Vin
Yellow[10]	Tach Signal
Blue[10]	PWM



Notes: 10. Wires only present on versions with output signals.

MECHANICAL DRAWING (CONTINUED)

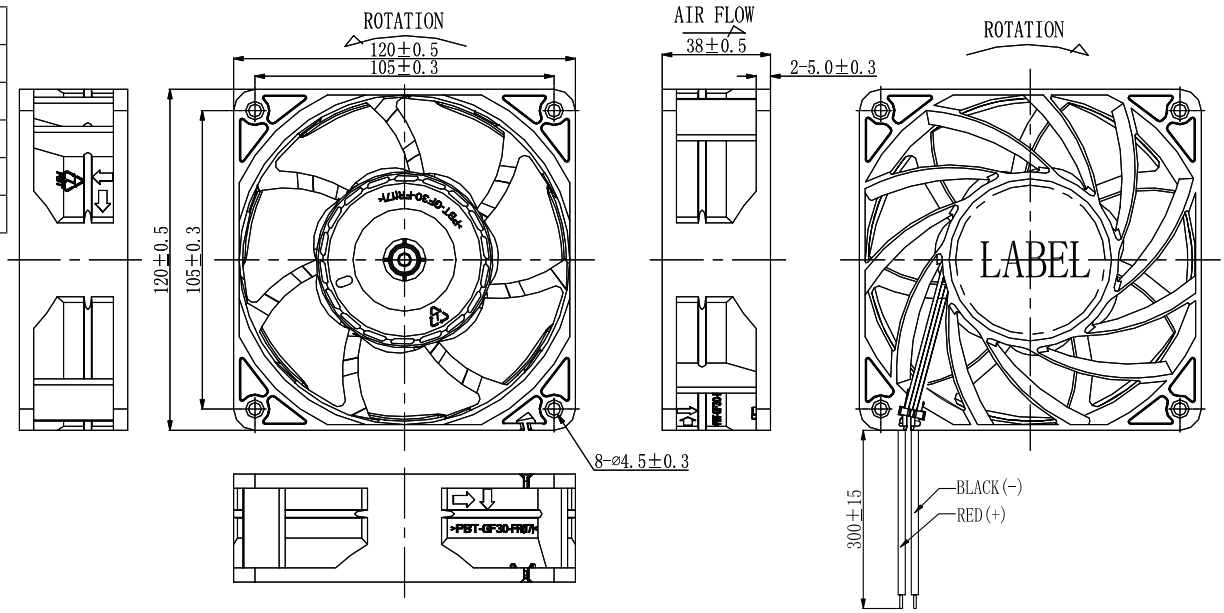
units: mm

2 wire versions (+Vin & -Vin): UL 1430, 24 AWG
3 wire versions (+Vin, -Vin, & tach): UL 1430, 24 AWG
4 wire versions (+Vin, -Vin, tach, & PWM): UL 1430, 24 AWG

MOUNTING SCREW (Pan Head)			
Screw Type	Size	Standard	Torque
Machine Screw	M4	JIS B1111-1974	4.5 kgf-cm
Self-tapping Screw	M5	JIS B1122 Type 2	5.5 kgf-cm

CFM-A238BF

WIRE CONNECTIONS	
Wire Color	Function
Red	+Vin
Black	-Vin
Yellow[10]	Tach Signal
Blue[10]	PWM



Notes: 10. Wires only present on versions with output signals.

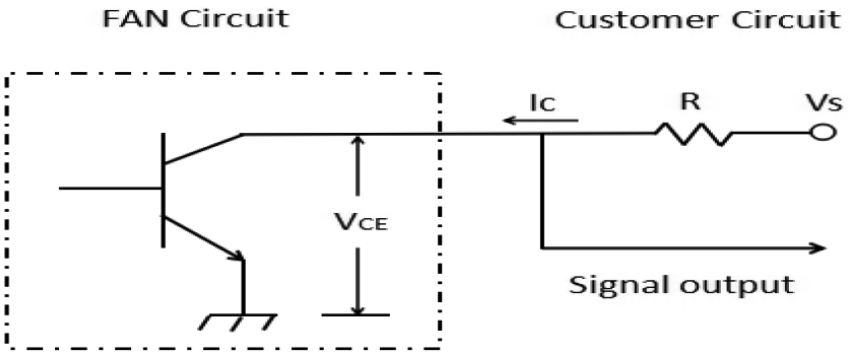
APPLICATION NOTES

Locked Rotor Protection/Auto Restart
At rated voltage, the current will be reduced or shut down to protect the motor from damage in 72 hours of locked rotor condition. 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.

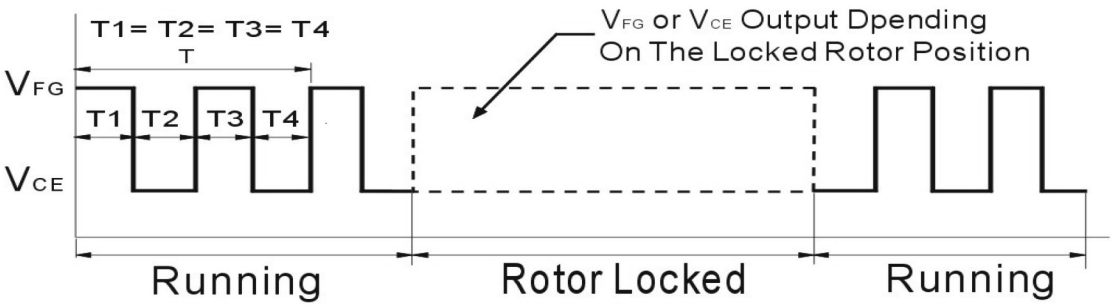
Tachometer Signal (Yellow Wire)
The tachometer signal is for detecting the rotational speed of the fan motor. The output will be a square wave when fan is operating and V_{FG} or V_{CE} depending on the locked rotor position when fan motor is locked (See Figures 1~2 below).

Figure 1: Tachometer Output Circuit



Output Type: Open Collector
Vs: (V_{FG})
5 V fan: 3.3~5 V
All others: 3.3~15 V
Ic≤5 mA
R≥Vs/Ic
V_{CE}(sat)≤0.5 V

Figure 2: Tachometer Output Waveform



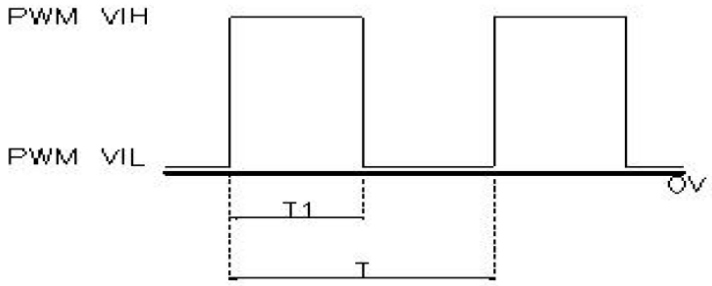
4 Pole Motor
N=RPM
T=60/N (sec)
FG=1/T*2 (Hz)
N=FG*30

APPLICATION NOTES (CONTINUED)

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 x 100%

Model	PWM Frequency Range (kHz)	PWM VIH (V)	PWM VIL (V)
CFM-A225BF-153-577-22	2~60	2.8~6	0~0.7
CFM-A225BF-158-597-22	2~60	2.8~6	0~0.7
CFM-A225BF-163-615-22	2~60	2.8~6	0~0.7
CFM-A225BF-240-516-22	2~60	2.8~6	0~0.7
CFM-A225BF-253-577-22	2~60	2.8~6	0~0.7
CFM-A225BF-258-597-22	2~60	2.8~6	0~0.7
CFM-A225BF-263-615-22	2~60	2.8~6	0~0.7
CFM-A225BF-420-336-22	0.8~60	2.8~5.5	0~0.6
CFM-A225BF-430-440-22	0.8~60	2.8~5.5	0~0.6
CFM-A225BF-440-521-22	0.8~60	2.8~5.5	0~0.6
CFM-A225BF-453-604-22	0.8~60	2.8~5.5	0~0.6
CFM-A225BF-458-621-22	0.8~60	2.8~5.5	0~0.6
CFM-A225BF-463-645-22	0.8~60	2.8~5.5	0~0.6
CFM-A238BF-165-635-22	2~60	2.8~6	0~0.7
CFM-A238BF-270-651-22	2~60	2.8~6	0~0.7
CFM-A238BF-280-680-22	2~60	2.8~6	0~0.7
CFM-A238BF-440-524-22	0.8~60	2.8~5.5	0~0.6
CFM-A238BF-450-573-22	0.8~60	2.8~5.5	0~0.6
CFM-A238BF-460-619-22	0.8~60	2.8~5.5	0~0.6
CFM-A238BF-470-662-22	0.8~60	2.8~5.5	0~0.6
CFM-A238BF-480-691-22	0.8~60	2.8~5.5	0~0.6

Soft Start

When the fan power is on, the current will increase slowly (~15 seconds) until the fan reaches the rated speed.

REVISION HISTORY

rev.	description	date
1.0	initial release	01/21/2022
1.01	added PWM signal versions	05/19/2022
1.02	updated datasheet	07/21/2022
1.03	logo, datasheet style update	08/12/2022
1.04	updated PWM details	03/06/2024
1.05	CUI Devices rebranded to Same Sky	09/12/2024
1.06	added new models	04/08/2026

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

Same Sky offers a one (1) year limited warranty. Complete warranty information is listed on our website.

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