CUI INC®

SERIES: CFM-120 | DESCRIPTION: DC AXIAL FAN

FEATURES

- 120 x 120 mm frame
- high fan speed for greater air flow
- dual ball bearing construction
- auto restart protection standard on all models

MODEL

MODEL	input voltage		input current		input power	rated speed	air flow[1]	static pressure[2]	noise
	rated (Vdc)	range (Vdc)	typ (A)	max (A)	max (W)	typ (RPM)	(CFM)	(inch H_2O)	max (dBA)
CFM-A225-13	12	6~13.8	0.59	0.79	9.48	4,100	126.89	0.49	53.5
CFM-A225-23	24	16~27.6	0.31	0.39	9.36	4,100	126.89	0.49	53.5
CFM-A225-43	48	30~55.2	0.17	0.23	11.04	4,100	126.89	0.49	53.5
CFM-A238-13	12	6~13.8	1.40	1.75	21	4,600	200.9	0.78	61.5
CFM-A238-23	24	16~27.6	0.77	0.88	21.12	4,600	200.9	0.78	61.5
CFM-A238-43	48	30~55.2	0.36	0.48	23.04	4,600	200.9	0.78	61.5

Notes: 1. At 0 inch H_20 static pressure.
2. At 0 CFM airflow.

PART NUMBER KEY

CFM-A2XX-X3-XX-CXX

- Base Number
- Depth
  - 25 = 25 mm
  - 38 = 38 mm
- Input Voltage
  - 1 = 12 Vdc
  - 2 = 24 Vdc
  - 4 = 48 Vdc
- Fan Signals
  - 10 = no signals
  - 11 = rotation detector signal
  - 20 = tachometer signal
  - 22 = tachometer signal / PWM control signal
- Reserved for Custom Configurations

INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage	12 Vdc input models	6	12	13.8	Vdc
	24 Vdc input models	16	24	27.6	Vdc
	48 Vdc input models	30	48	55.2	Vdc
current	CFM-A225-13		0.59	0.79	A
	CFM-A225-23		0.31	0.39	A
	CFM-A225-43		0.17	0.23	A
	CFM-A238-13		1.40	1.75	A
	CFM-A238-23		0.77	0.88	A
	CFM-A238-43		0.36	0.48	A
power	CFM-A225-13		7.08	9.48	W
	CFM-A225-23		7.44	9.36	W
	CFM-A225-43		8.16	11.04	W
	CFM-A238-13		16.80	21	W
	CFM-A238-23		18.48	21.12	W
	CFM-A238-43		17.28	23.04	W
starting voltage	at 25°C				
	12 Vdc input models		6		Vdc
	24 Vdc input models		12		Vdc
	48 Vdc input models		24		Vdc

PERFORMANCE

parameter	conditions/description	min	typ	max	units
rated speed	at 25°C, after 10 minutes				
	CFM-A225 models	3,690	4,100	4,510	RPM
	CFM-A238 models	4,140	4,600	5,060	RPM
air flow	at 0 inch H_2O, see performance curves				
	CFM-A225 models		126.89		CFM
	CFM-A238 models		200.9		CFM
static pressure	at 0 CFM, see performance curves				
	CFM-A225 models		0.49		inch H_2O
	CFM-A238 models		0.78		inch H_2O
noise	at 1 m				
	CFM-A225 models		51.5	53.5	dBA
	CFM-A238 models		59.5	61.5	dBA

PROTECTIONS / SIGNALS[1]

parameter	conditions/description	min	typ	max	units
auto restart protection	available on all models				
rotation detector	available on "11" models				
tachometer signal	available on "20" and "22" models				
PWM control signal	available on "22" models				

Notes: 1. See application notes for details.

SAFETY & COMPLIANCE

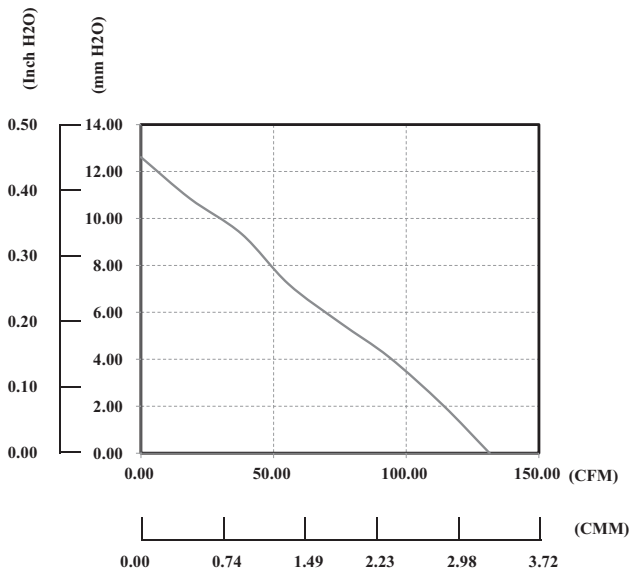
parameter	conditions/description	min	typ	max	units
insulation resistance of frame	at 500 Vdc between frame and positive terminal	10			MΩ
dielectric strength	at 500 Vac, 60 Hz, 1 minute between frame and positive terminal			5	mA
safety approvals	UL/cUL 507, TUV (EN 62368-1)				
EMI/EMC	EN 55022:2010+AC:2011 Class B, EN 61000-3-2:2014, EN 61000-3-3:2013, EN 55024:2010				
life expectancy	at 45°C, 15~65% RH		70,000		hours
RoHS	yes				

ENVIRONMENTAL

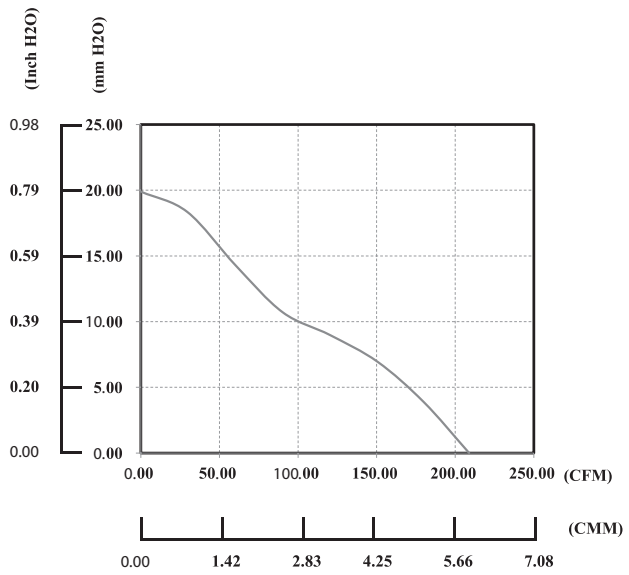
parameter	conditions/description	min	typ	max	units
operating temperature		-10		70	°C
storage temperature		-40		70	°C
operating humidity	non-condensing	5		90	%
storage humidity	non-condensing	5		95	%

PERFORMANCE CURVES

CFM-A225



CFM-A238



MECHANICAL

parameter	conditions/description	min	typ	max	units
motor	4 pole DC brushless				
bearing system	ball bearing				
direction of rotation	counter-clockwise viewed from front of fan blade				
dimensions	CFM-A225 models 120 x 120 x 25.4 CFM-A238 models 120 x 120 x 38				mm mm
material	PBT (UL94V-0)				
weight	CFM-A225-13 CFM-A225-23 CFM-A225-43 CFM-A238-13 CFM-A238-23 CFM-A238-43		190.0 189.8 190.6 297.0 283.7 283.2		g g g g g g

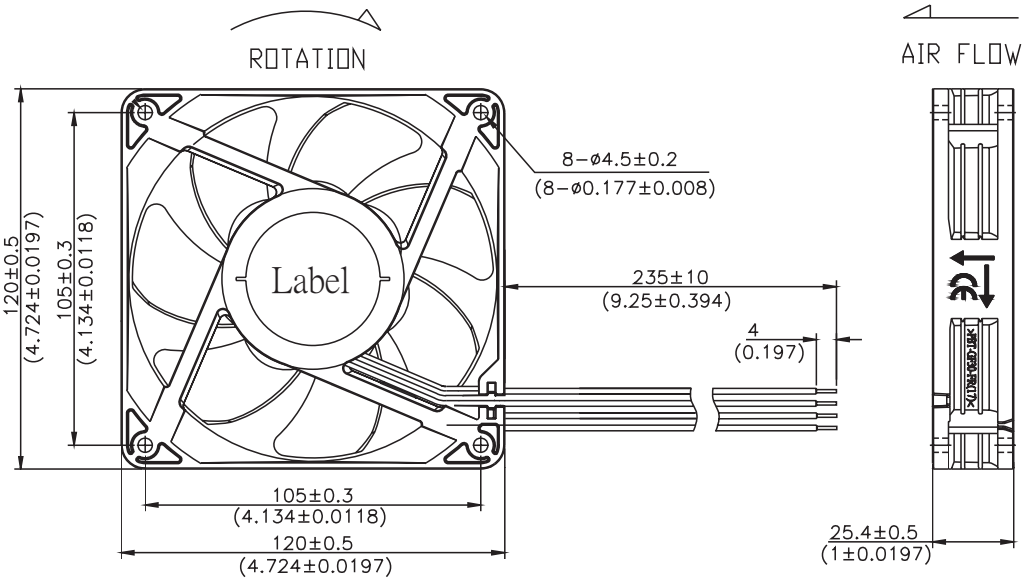
MECHANICAL DRAWING

units: mm [inch]

CFM-A225

wire: UL 1007, 24 AWG

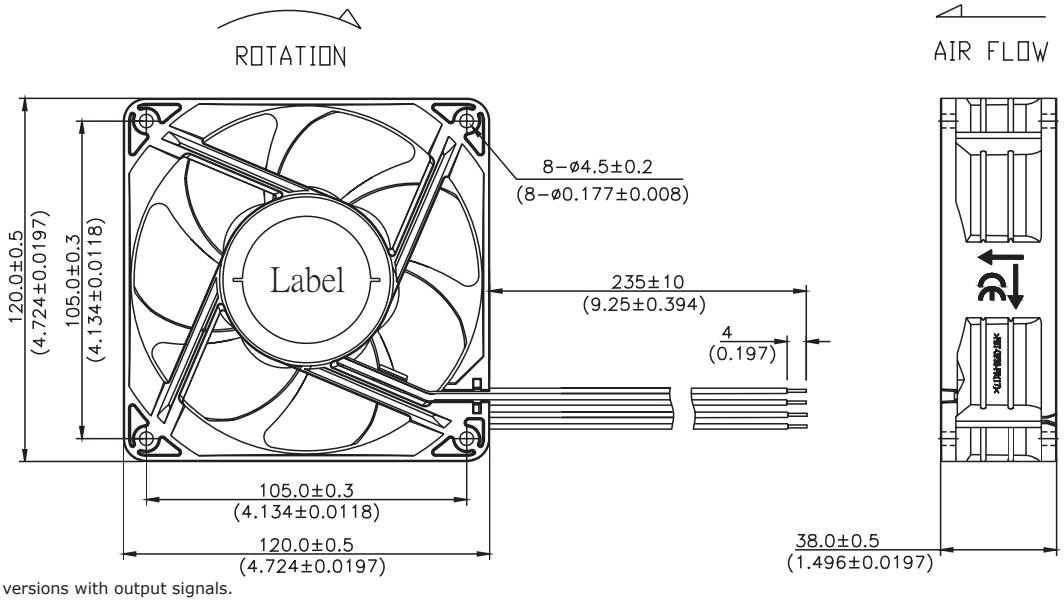
WIRE CONNECTIONS	
Wire Color	Function
Red	+Vin
Black	-Vin
Yellow[1]	FG Signal
White[1]	RD Signal
Blue[1]	PWM



CFM-A238

wire: UL 1007, 24 AWG

WIRE CONNECTIONS	
Wire Color	Function
Red	+Vin
Black	-Vin
Yellow[1]	FG Signal
White[1]	RD Signal
Blue[1]	PWM



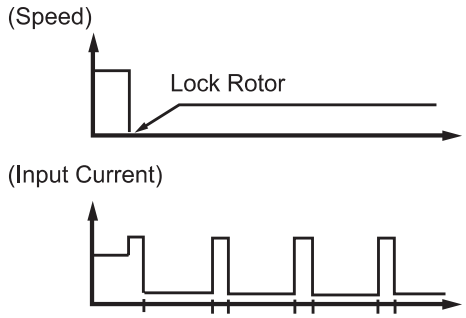
Note: 1. Wires only present on versions with output signals.

APPLICATION NOTES

Auto Restart Protection/Current Limit Protection

When the fan motor is locked, the device will cut off the drive current within two to six seconds and restart automatically after a few seconds. If the lock situation is continued, the device will work on a repeated cycle of cut-off and restart until the lock is released. (See Figure 1 below).

Figure 1 Current Limit Protection

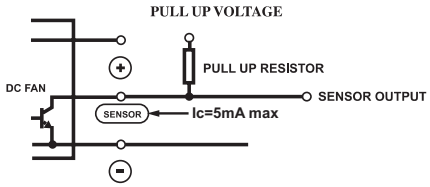


Lock Sensor/Rotation Detector

Lock Sensor is used to detect if the fan motor is operating or stopped. Alarm High: the output will be logical low when fan is operating and be logical high when fan motor is locked. (See Figures 2~3 below).

Figure 2 Alarm High Output Waveform

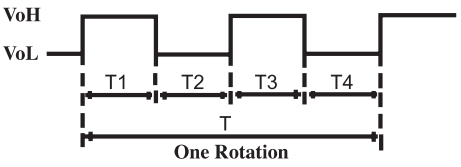
Figure 3 RD Signal Output Circuit: Open Collector



Pulse Sensor/Tachometer Signal/FG

Pulse Sensor is for detecting the rotational speed of the fan motor. At locked rotor condition, the signal stops cycling and the output is fixed at VoH or VoL (See Figures 4~5 below).

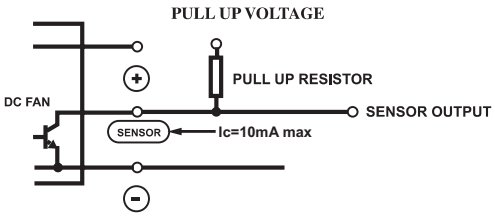
Figure 4 Output Waveform



$T_{1\text{-}4} \fallingdotseq (1/4)T$

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

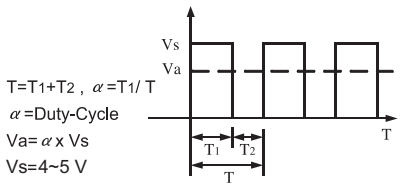
Figure 5 FG Signal Output Circuit: Open Collector



PMW Control Signal

A speed control lead can be provided that will accept a PWM signal from the customer circuit to vary the speed of the fan. The change in speed is linear by changing the Duty-Cycle of the PWM. Open collector type and pull-up voltage is changed by maximum operating voltage and sink current by consuming current. (See Figure 6 below).

Figure 6 Duty Cycle



REVISION HISTORY

rev.	description	date
1.0	initial release	08/15/2016
1.01	updated datasheet	07/27/2017
1.02	updated to be certified to EN 62368-1 safety standard	07/09/2019

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

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