

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

**FEATURES**

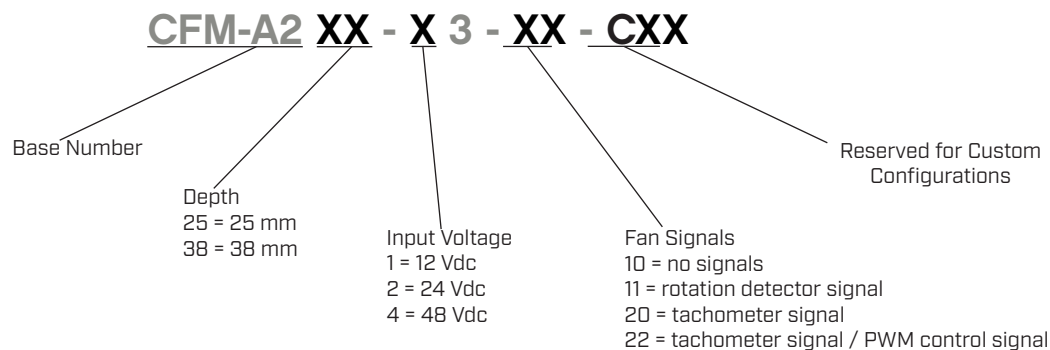
- 120 x 120 mm frame
- high fan speed for greater air flow
- dual ball bearing construction
- auto restart protection standard on all models



| MODEL        | input voltage |             | input current |         | input power | rated speed | air flow <sup>1</sup> | static pressure <sup>2</sup> | noise     |
|--------------|---------------|-------------|---------------|---------|-------------|-------------|-----------------------|------------------------------|-----------|
|              | rated [Vdc]   | range [Vdc] | typ [A]       | max [A] | max [W]     | typ [RPM]   | [CFM]                 | [inch H <sub>2</sub> O]      | 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<sub>2</sub>O static pressure.  
 2. At 0 CFM airflow.  
 \*. Discontinued CFM-A225-13-10, CFM-A225-13-11, CFM-A225-13-20, CFM-A225-23-11, CFM-A225-23-22, CFM-A225-43-11, CFM-A225-43-20, CFM-A225-43-22, CFM-A238-13-11, CFM-A238-23-11, CFM-A238-23-20, CFM-A238-23-22, and CFM-A238-43-20 models.

**PART NUMBER KEY**



## 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     |
| power                   | CFM-A238-43            |     | 0.36  | 0.48  | A     |
|                         | 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     |
| starting voltage        | CFM-A238-23            |     | 18.48 | 21.12 | W     |
|                         | CFM-A238-43            |     | 17.28 | 23.04 | W     |
|                         | 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 <sub>2</sub> O, 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 <sub>2</sub> O |
|                 | CFM-A238 models                                    |       | 0.78   |       | inch H <sub>2</sub> O |
| noise           | at 1 m                                             |       |        |       |                       |
|                 | CFM-A225 models                                    |       | 51.5   | 53.5  | dBA                   |
|                 | CFM-A238 models                                    |       | 59.5   | 61.5  | dBA                   |

## PROTECTIONS / SIGNALS<sup>1</sup>

| 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

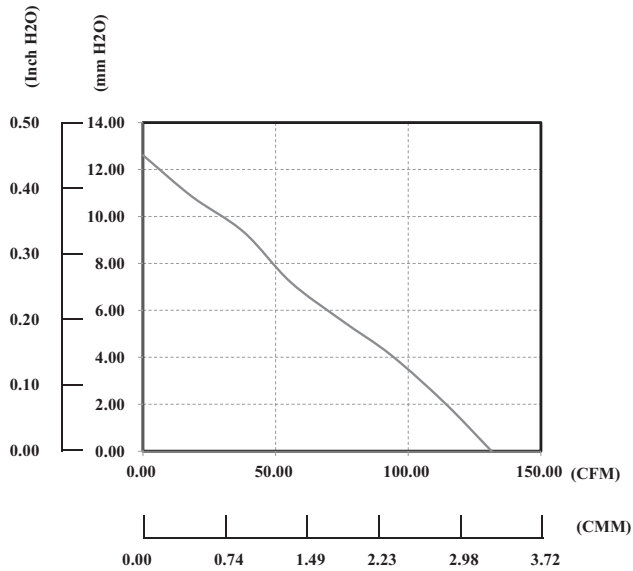
| parameter                      | conditions/description                                                             | min | typ    | max | units |
|--------------------------------|------------------------------------------------------------------------------------|-----|--------|-----|-------|
| insulation 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, 15-85% RH                                                                 |     | 70,000 |     | hours |
| RoHS                           | yes                                                                                |     |        |     |       |

## ENVIRONMENTAL

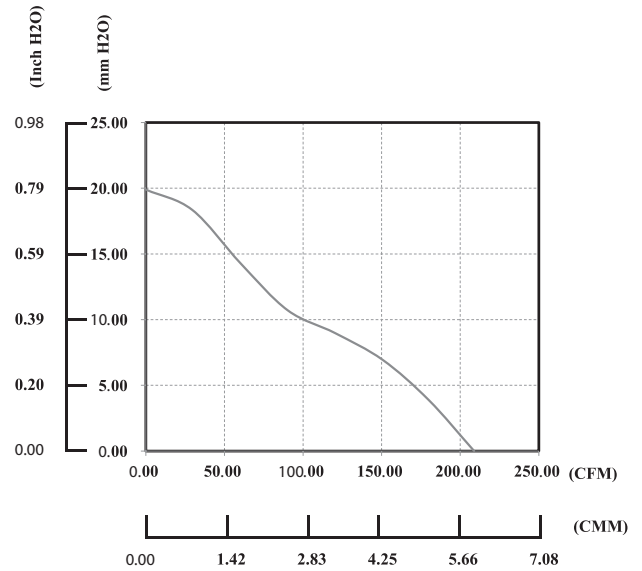
| parameter             | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature |                        | -10 |     | 70  | °C    |
| storage temperature   |                        | -40 |     | 70  | °C    |
| 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<br>CFM-A238 models 120 x 120 x 38 |     |       |     | mm<br>mm |
| material              | PBT (UL94V-0)                                                      |     |       |     |          |
| weight                | CFM-A225-13                                                        |     | 190.0 |     | g        |
|                       | CFM-A225-23                                                        |     | 189.8 |     | g        |
|                       | CFM-A225-43                                                        |     | 190.6 |     | g        |
|                       | CFM-A238-13                                                        |     | 297.0 |     | g        |
|                       | CFM-A238-23                                                        |     | 283.7 |     | g        |
|                       | CFM-A238-43                                                        |     | 283.2 |     | g        |

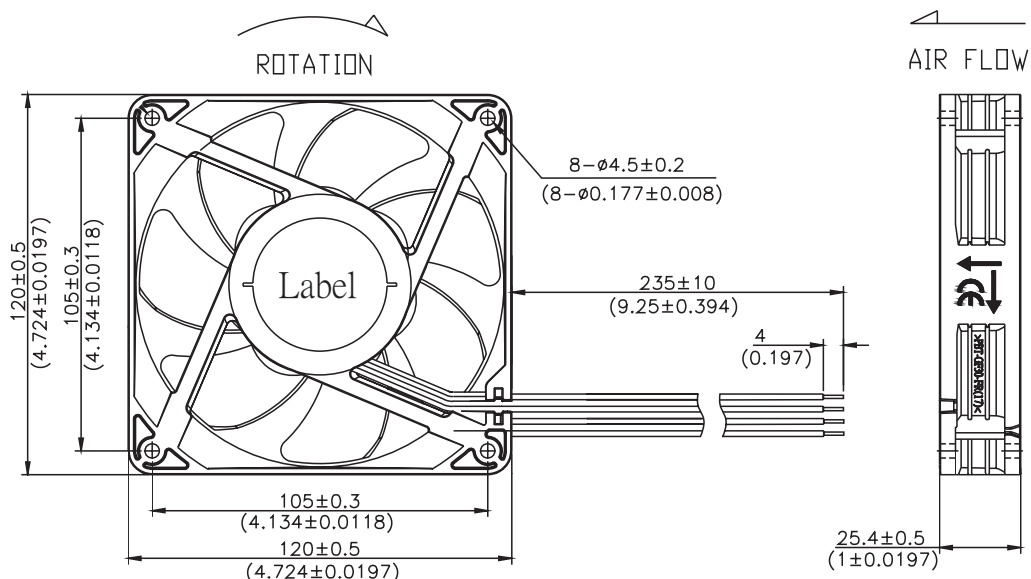
## MECHANICAL DRAWING

units: mm [inch]

### CFM-A225

wire: UL 1007, 24 AWG

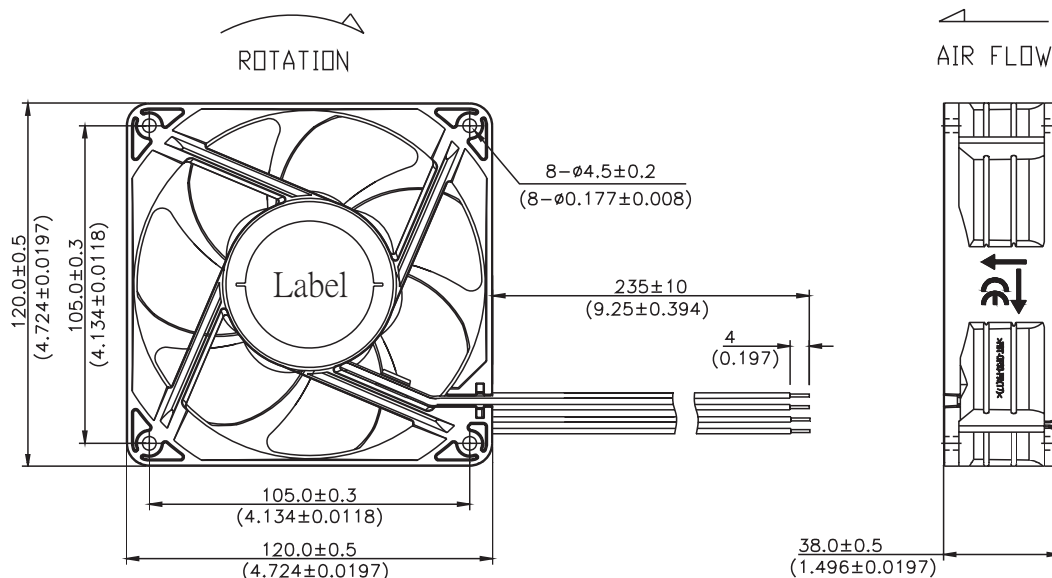
| WIRE CONNECTIONS    |           |
|---------------------|-----------|
| Wire Color          | Function  |
| Red                 | +Vin      |
| Black               | -Vin      |
| Yellow <sup>1</sup> | FG Signal |
| White <sup>1</sup>  | RD Signal |
| Blue <sup>1</sup>   | PWM       |



### CFM-A238

wire: UL 1007, 24 AWG

| WIRE CONNECTIONS    |           |
|---------------------|-----------|
| Wire Color          | Function  |
| Red                 | +Vin      |
| Black               | -Vin      |
| Yellow <sup>1</sup> | FG Signal |
| White <sup>1</sup>  | RD Signal |
| Blue <sup>1</sup>   | PWM       |

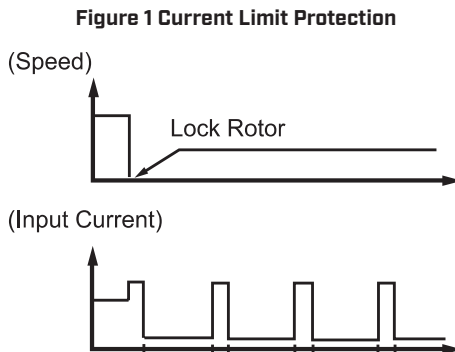


Note: 1. Wires only present on versions with output signals.

## 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].



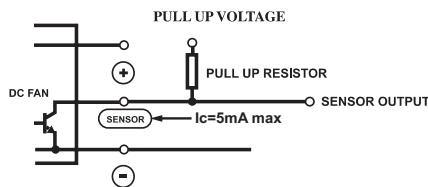
### Lock Sensor/Rotation Detector

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**



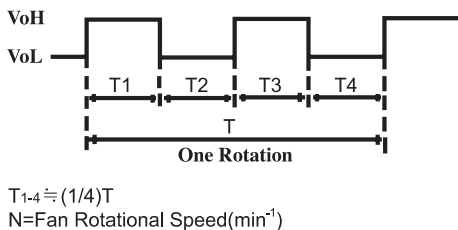
**Figure 3 RD Signal Output Circuit: Open Collector**



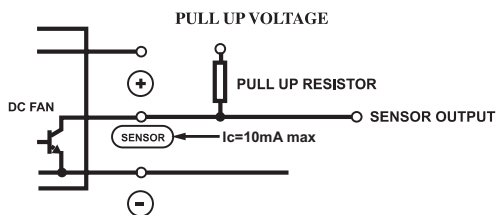
### Pulse Sensor/Tachometer Signal/FG

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**



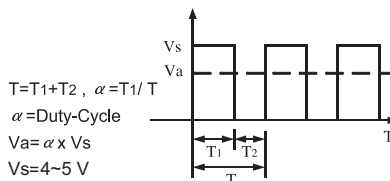
**Figure 5 FG Signal Output Circuit: Open Collector**



### 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 |
| 1.03 | brand update                                                                                                                                                                                           | 02/07/2020 |
| 1.04 | discontinued CFM-A225-23-22 and CFM-A238-23-22 models                                                                                                                                                  | 03/31/2022 |
| 1.05 | discontinued CFM-A225-13-10, CFM-A225-13-11, CFM-A225-13-20, CFM-A225-23-11, CFM-A225-43-11, CFM-A225-43-20, CFM-A225-43-22, CFM-A238-13-11, CFM-A238-23-11, CFM-A238-23-20, and CFM-A238-43-20 models | 04/26/2022 |
| 1.06 | 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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