

## General Specifications

### Allowable Ambient Temperature Range:

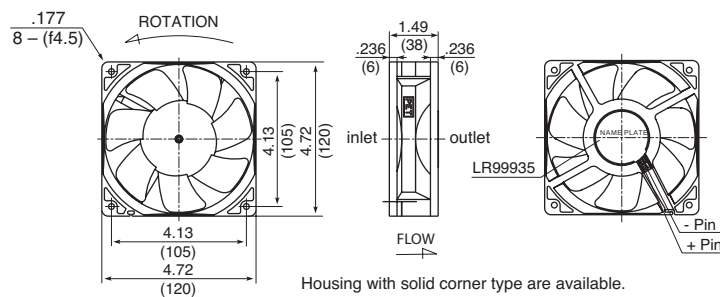
-10°C ~ +70°C (65%RH) (Operating)  
-40°C ~ +75°C (65%RH) (Storage)  
(non-condensing environment)

### Expected Life

Failure Rate: 10%

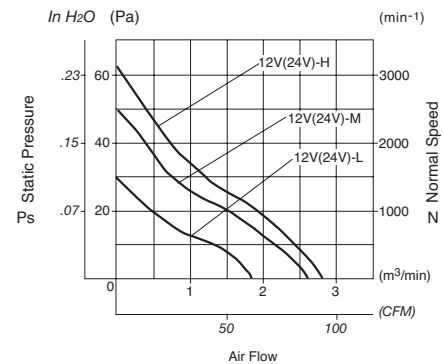
30,000 Hours (25°C, 65%RH)

## Outline

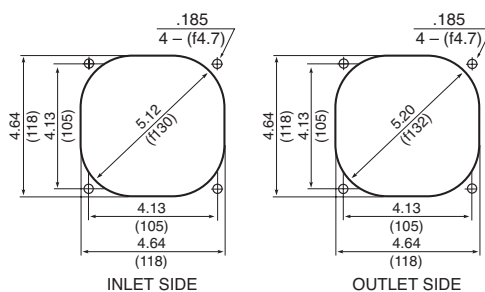
Units:  $\frac{\text{inch}}{(\text{mm})}$ 

Housing with solid corner type are available.

## Characteristic Curves



## Panel Cut-outs



## Material

Bearing: Hydro Wave Bearing

## Specifications

| MODEL      | Rated Voltage | Operating Voltage | Current          | Input Power      | Rated Speed                       | Max. Air Flow    |                       | Max. Static Pressure |                   | Noise             | Mass |
|------------|---------------|-------------------|------------------|------------------|-----------------------------------|------------------|-----------------------|----------------------|-------------------|-------------------|------|
|            | (V)           | (V)               | (A) <sup>1</sup> | (W) <sup>1</sup> | (min <sup>-1</sup> ) <sup>1</sup> | CFM <sup>1</sup> | (m³/min) <sup>1</sup> | in H <sub>2</sub> O  | (Pa) <sup>1</sup> | (dB) <sup>1</sup> | (g)  |
| FBA12G 12L | 12            | 7.0 ~ 13.8        | 170              | 2.04             | 1700                              | 68.9             | 1.94                  | .13                  | 32.4              | 30.0              | 270  |
| FBA12G 12M | 12            | 7.0 ~ 13.8        | 280              | 3.36             | 2100                              | 86.5             | 2.45                  | .18                  | 47.1              | 35.5              | 270  |
| FBA12G 12H | 12            | 7.0 ~ 13.8        | 370              | 4.44             | 2500                              | 103.8            | 2.94                  | .26                  | 66.7              | 41.5              | 270  |
| FBA12G 24L | 24            | 14.0 ~ 27.6       | 96               | 2.30             | 1700                              | 68.9             | 1.95                  | .13                  | 32.4              | 30.0              | 270  |
| FBA12G 24M | 24            | 14.0 ~ 27.6       | 124              | 2.98             | 2100                              | 86.5             | 2.45                  | .18                  | 47.1              | 35.5              | 270  |
| FBA12G 24H | 24            | 14.0 ~ 27.6       | 200              | 4.80             | 2500                              | 103.8            | 2.94                  | .26                  | 66.7              | 41.5              | 270  |

Rotation: Clockwise

Airflow Outlet: Air Out Over Struts

\*1: Average Values in Free Air

## FEATURES

### Specifications of Various Sensors

| LOCKED ROTOR ALARM SIGNAL        |                                                                                                                                                              |                                                                  |                    |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------|
| Signal given when fan is running | Signal given when fan is locked up                                                                                                                           | Available Models                                                 | Part Number Suffix |
| VH<br>VL                         | VH<br>VL                                                                                                                                                     | Axial models<br>FBK04F                                           | 1BS<br>S           |
|                                  | V goes VL to VH                                                                                                                                              | FAL                                                              | S                  |
|                                  |                                                                                                                                                              | FCB                                                              | S                  |
| 2 PULSE PER REVOLUTION SIGNAL    |                                                                                                                                                              |                                                                  |                    |
| Signal given when fan is running | Signal given when fan is locked up                                                                                                                           | Available Models                                                 | Part Number Suffix |
| VH<br>VL                         | VH<br>VL                                                                                                                                                     | Axial models except:<br>FBK04F<br>FBA06T<br>FBA08T<br>FCB<br>FAL | 1BX                |
| 1 Revolution<br>2PPR             | Lock<br>A B<br>If fan locks on VH, signal stays locked. If fan locks on VL, signal stays at VL for a few hundred MS, then moves to VH. (A:B ~1:5; A ≥ 100MS) |                                                                  |                    |

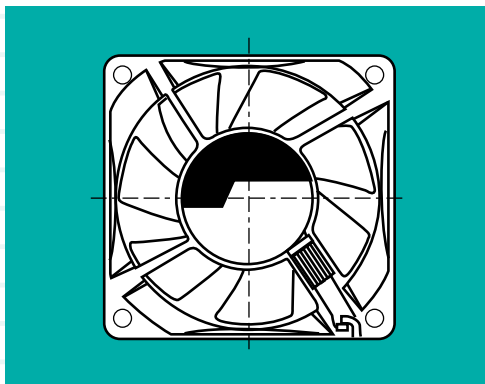
In Panaflo FBA series models, a locked rotor alarm sensor is available in all models.

For Blowers and Crossflo fans, a locked sensor can be provided as an option.

A pulse sensor that transmits signals when the motor rotates is also available as an option.

The 2 pulse per revolution sensor output is available in all FBA Series models except the 15 mm "T" versions.

### Panaflo Built-in Connector System



#### Lead Wire Connectors:

Style: MASS TERMINATION (standard)

AMP P/N 173977-3

CRIMP TYPE (this style is a 2 piece assembly)

AMP P/N 175778-3 (housing)

AMP P/N 175102-1 (terminal)

#### Notes:

- Connector style effects lead wire guage. Please refer to fan specs for further details.
- All axial fans except the FBA06T, FBA08T and FBK04F versions come standard with the mass termination connector. The FBA06T, FBA08T and FBK04F fan leads are connected directly to the PC board in the fan assembly.
- All FCB Crossflo models and FAL Blower fan leads are soldered directly to the PC board in the fan assembly.

## High Reliability with HWB (Hydro Wave Bearing)

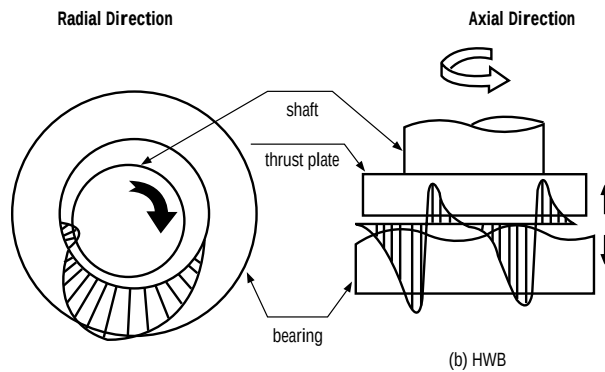


Figure 1: Pressure distribution in each load direction.

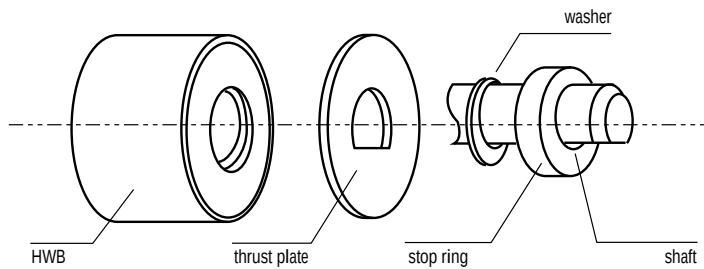


Figure 1: Construction of HWB

Panaflo's unique hydrowave bearing (HWB) addresses the traditional weakness of sleeve bearings...axial friction. By utilizing our unique HWB system, the thrust plate "floats" on a circulating film of oil, which greatly reduces the axial friction and the bearing's deterioration. The HWB pattern on the bearing virtually eliminates thrust plate contact which is depicted above.

As the shaft rotates it acts as a pump constantly circulating the oil in the radial, as well as the axial direction. The sealed system and reservoirs of oil maintain the proper lubrication to minimize mechanical contact and prolong the fan's life expectancy. The radial direction analysis shown above is essentially the same as a traditional sleeve bearing. Panasonic's unique HWB reduces the axial contact.

## COMMON SPECIFICATIONS

### Protection

- Locked rotor protection circuits
- Automatically restarts in a few seconds
- Reverse voltage protection

### Insulation Resistance

- 10M  $\Omega$  minimum at 500v DC (frame to leads)

### Dielectric Strength

- 500v AC (50/60Hz) for 1 minute (frame to leads)

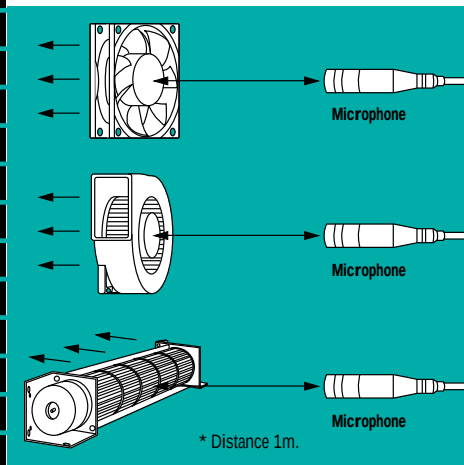
### Plastic Rating

- All Panaflo fans are manufactured with a UL94V-0 plastic (flammability)

### Insulation Class

- JIS Class E (120° C)
- VDE Class E (90° C)
- UL Class A (105° C)
- CSA Class A (105° C)

### Noise Data



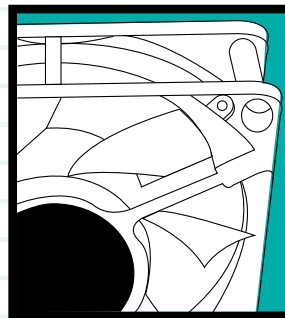
### Noise Data

The noise data is measured at 1 meter from the air intake side of the fan suspended in a semi-anechoic chamber (background noise 13dB-A max.).

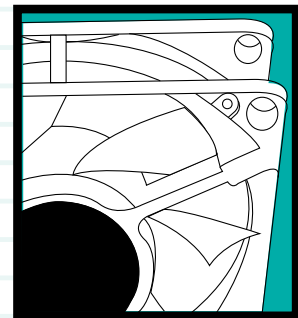
### Construction with and without Solid Corner Housing

Panaflo fans are available in two different versions for mounting: with solid corner housing and without. Specific mounting methods and applications require the use of solid corners. Select the appropriate housing for your application. Some models may be available only with solid corner housing. For details, please refer to the corresponding page for each model.

#### With Solid Corner

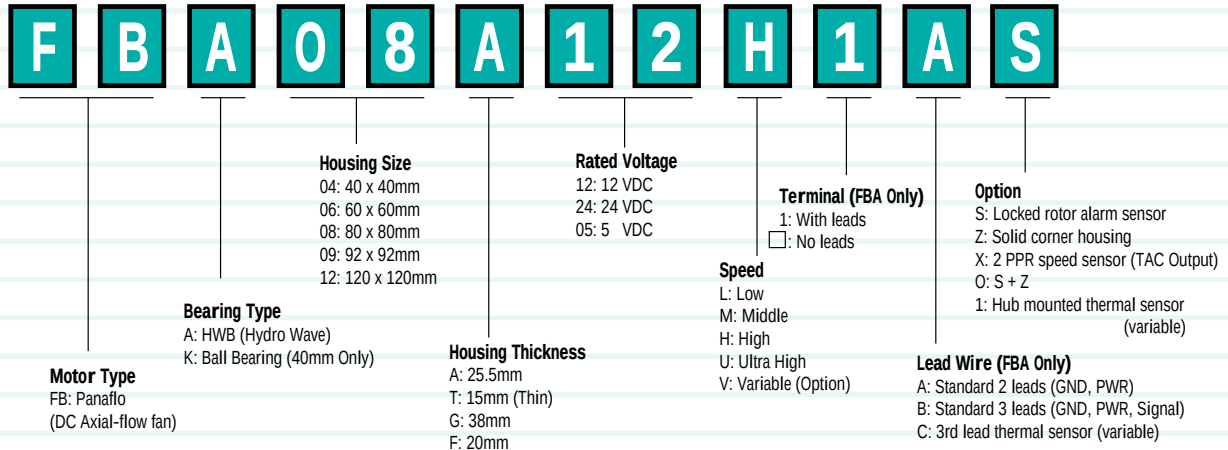


#### Without Solid Corner

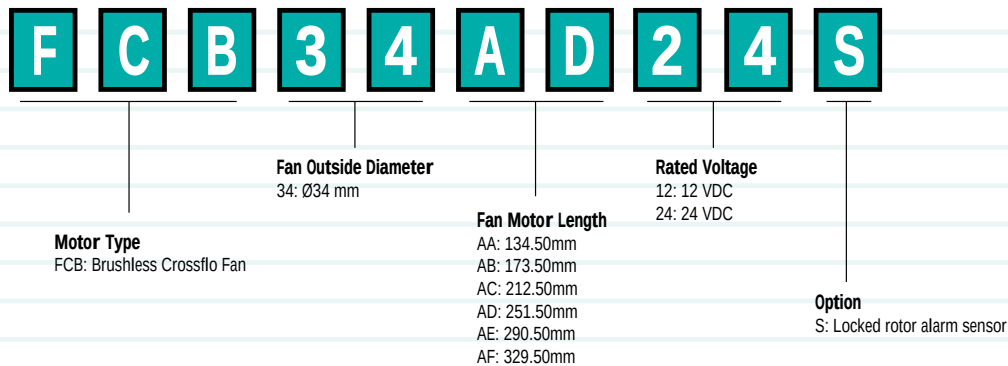


## PANAFLO FAN PRODUCT DESIGNATION CODE

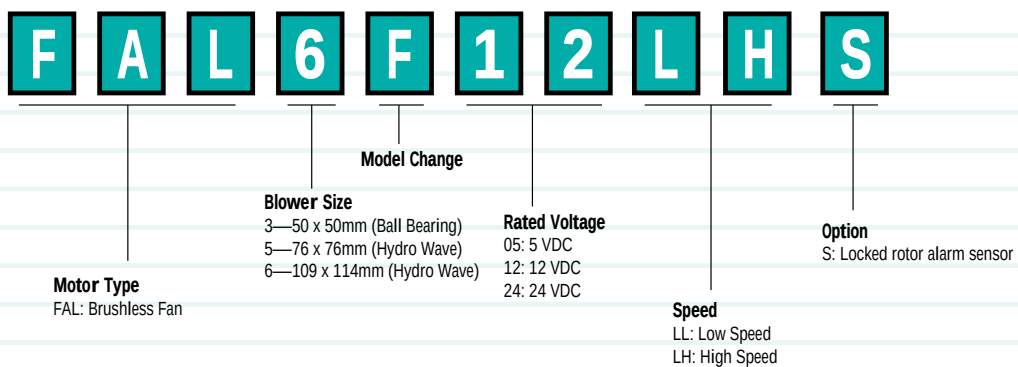
### Panaflo Fan



### Crossflo Fan



### Blowers



| Type<br>and Size | Model         | Rated<br>Voltage<br>(V) | Operating<br>Voltage<br>(V) | Rated<br>Current<br>(mA) | Rated<br>Input<br>(W) | Nominal<br>Speed<br>(r/min) | Maximum<br>Air Flow |       | Maximum<br>Air Pressure |       | Noise<br>(dB-A) | Safety<br>Standard<br>UL CSA | Locked<br>Rotor<br>Alarm<br>Sensor |   |   |
|------------------|---------------|-------------------------|-----------------------------|--------------------------|-----------------------|-----------------------------|---------------------|-------|-------------------------|-------|-----------------|------------------------------|------------------------------------|---|---|
|                  |               |                         |                             |                          |                       |                             | (m3/min)            | (CFM) | (mmh20)                 | (Pa)  |                 |                              |                                    |   |   |
| DC AXIAL FANS    | FBK04F        | FBK04F05L               | 5                           | 4.5—6.0                  | 120                   | 0.60                        | 4700                | 0.11  | 3.9                     | 2.50  | 24.5            | 24.0                         | •                                  | • |   |
|                  | 40mm          | FBK04F05H               | 5                           | 4.5—6.0                  | 280                   | 1.40                        | 7500                | 0.19  | 6.7                     | 6.60  | 64.7            | 33.0                         | •                                  | • |   |
|                  | DC axial fans | FBK04F12L               | 12                          | 7.0—13.8                 | 75                    | 0.90                        | 4700                | 0.11  | 3.9                     | 2.50  | 24.5            | 23.0                         | •                                  | • |   |
|                  |               | FBK04F12H               | 12                          | 7.0—13.8                 | 150                   | 1.80                        | 7500                | 0.19  | 6.7                     | 6.60  | 64.7            | 32.0                         | •                                  | • |   |
|                  |               | FBK04F12U               | 12                          | 7.0—13.8                 | 170                   | 2.04                        | 9500                | 0.26  | 9.2                     | 12.00 | 117.7           | 42.0                         | •                                  | • |   |
|                  |               | FBK04F24H               | 24                          | 14.0—27.6                | 92                    | 2.21                        | 7500                | 0.19  | 6.7                     | 6.60  | 64.7            | 33.0                         | •                                  | • |   |
|                  |               | FBK04F24U               | 24                          | 14.0—27.6                | 100                   | 2.40                        | 9500                | 0.26  | 9.2                     | 12.00 | 117.7           | 42.0                         | •                                  | • |   |
|                  | FBA06A        | FBA06A12L1A             | 12                          | 7.0—13.8                 | 110                   | 1.32                        | 3200                | 0.40  | 14.1                    | 3.10  | 30.4            | 24.0                         | •                                  | • | • |
|                  | 60mm          | FBA06A12M1A             | 12                          | 7.0—13.8                 | 130                   | 1.56                        | 3700                | 0.47  | 16.6                    | 3.95  | 38.7            | 28.0                         | •                                  | • | • |
|                  | DC axial fans | FBA06A12H1A             | 12                          | 7.0—13.8                 | 170                   | 2.04                        | 4200                | 0.54  | 19.1                    | 5.20  | 51.0            | 32.0                         | •                                  | • | • |
|                  |               | FBA06A12U1A             | 12                          | 7.0—13.8                 | 210                   | 2.52                        | 4550                | 0.58  | 20.5                    | 6.0   | 58.0            | 37.0                         | •                                  | • | • |
|                  |               | FBA06A24L1A             | 24                          | 14.0—27.6                | 70                    | 1.68                        | 3200                | 0.40  | 14.1                    | 3.10  | 30.4            | 24.0                         | •                                  | • | • |
|                  |               | FBA06A24M1A             | 24                          | 14.0—27.6                | 90                    | 2.16                        | 3700                | 0.47  | 16.6                    | 3.95  | 38.7            | 28.0                         | •                                  | • | • |
|                  |               | FBA06A24H1A             | 24                          | 14.0—27.6                | 105                   | 2.52                        | 4200                | 0.54  | 19.1                    | 5.20  | 51.0            | 32.0                         | •                                  | • | • |
|                  | FBA06T        | FBA06T12L               | 12                          | 7.0—13.8                 | 88                    | 1.06                        | 3200                | 0.34  | 12.0                    | 2.80  | 27.5            | 24.0                         | •                                  | • | • |
|                  | 60mm          | FBA06T12H               | 12                          | 7.0—13.8                 | 145                   | 1.74                        | 4200                | 0.47  | 16.6                    | 4.75  | 46.6            | 32.0                         | •                                  | • | • |
|                  | Thin          | FBA06T24L               | 24                          | 14—27.6                  | 56                    | 1.34                        | 3200                | 0.34  | 12.0                    | 2.80  | 27.5            | 24.0                         | •                                  | • | • |
|                  |               | FBA06T24H               | 24                          | 14—27.6                  | 83                    | 1.99                        | 4200                | 0.47  | 16.6                    | 4.75  | 46.6            | 32.0                         | •                                  | • | • |
|                  | FBA08A        | FBA08A12L1A             | 12                          | 7.0—13.8                 | 68                    | 0.82                        | 1900                | 0.68  | 24.0                    | 1.57  | 15.4            | 21.0                         | •                                  | • | • |
|                  | 80mm          | FBA08A12M1A             | 12                          | 7.0—13.8                 | 124                   | 1.49                        | 2450                | 0.91  | 32.1                    | 2.51  | 24.6            | 28.0                         | •                                  | • | • |
|                  | DC axial fans | FBA08A12H1A             | 12                          | 7.0—13.8                 | 173                   | 2.08                        | 2950                | 1.12  | 39.6                    | 3.78  | 37.1            | 32.0                         | •                                  | • | • |
|                  |               | FBA08A12U1A             | 12                          | 7.0—13.8                 | 270                   | 3.24                        | 3450                | 1.33  | 46.9                    | 4.80  | 47.0            | 38.2                         | •                                  | • | • |
|                  |               | FBA08A24L1A             | 24                          | 14—27.6                  | 54                    | 1.30                        | 1900                | 0.68  | 24.0                    | 1.57  | 15.4            | 21.0                         | •                                  | • | • |
|                  |               | FBA08A24M1A             | 24                          | 14—27.6                  | 71                    | 1.70                        | 2450                | 0.91  | 32.1                    | 2.51  | 24.6            | 28.0                         | •                                  | • | • |
|                  |               | FBA08A24H1A             | 24                          | 14—27.6                  | 105                   | 2.52                        | 2950                | 1.12  | 39.6                    | 3.78  | 37.1            | 32.0                         | •                                  | • | • |
|                  | FBA08T        | FBA08T12L               | 12                          | 7.0—13.8                 | 79                    | 0.95                        | 2000                | 0.62  | 21.9                    | 1.55  | 15.2            | 23.0                         | •                                  | • | • |
|                  | 80mm          | FBA08T12H               | 12                          | 7.0—13.8                 | 200                   | 2.40                        | 3100                | 0.95  | 33.5                    | 3.20  | 31.4            | 34.0                         | •                                  | • | • |
|                  | Thin          | FBA08T24L               | 24                          | 14—27.6                  | 47                    | 1.13                        | 2000                | 0.62  | 21.9                    | 1.55  | 15.2            | 23.0                         | •                                  | • | • |
|                  |               | FBA08T24H               | 24                          | 14—27.6                  | 110                   | 2.64                        | 3100                | 0.95  | 33.5                    | 3.20  | 31.4            | 34.0                         | •                                  | • | • |
|                  | FBA09A        | FBA09A12L1A             | 12                          | 7.0—13.8                 | 110                   | 1.32                        | 2100                | 1.21  | 42.7                    | 2.30  | 22.6            | 27.0                         | •                                  | • | • |
|                  | 90mm          | FBA09A12M1A             | 12                          | 7.0—13.8                 | 150                   | 1.80                        | 2450                | 1.36  | 48.0                    | 3.00  | 29.4            | 30.0                         | •                                  | • | • |
|                  | DC axial fans | FBA09A12H1A             | 12                          | 7.0—13.8                 | 225                   | 2.70                        | 2850                | 1.61  | 56.8                    | 3.98  | 39.0            | 35.0                         | •                                  | • | • |
|                  |               | FBA09A12U1A             | 12                          | 7.0—13.8                 | 430                   | 5.16                        | 3450                | 1.95  | 68.8                    | 5.0   | 49.0            | 43.0                         | •                                  | • | • |
|                  |               | FBA09A24L1A             | 24                          | 14—27.6                  | 80                    | 1.92                        | 2100                | 1.21  | 42.7                    | 2.30  | 22.6            | 27.0                         | •                                  | • | • |
|                  |               | FBA09A24M1A             | 24                          | 14—27.6                  | 110                   | 2.64                        | 2450                | 1.36  | 48.0                    | 3.00  | 29.4            | 30.0                         | •                                  | • | • |
|                  |               | FBA09A24H1A             | 24                          | 14—27.6                  | 140                   | 3.36                        | 2850                | 1.61  | 56.8                    | 3.98  | 39.0            | 35.0                         | •                                  | • | • |
|                  | FBA12G        | FBA12G12L1A             | 12                          | 7.0—13.8                 | 180                   | 2.16                        | 1700                | 1.95  | 68.9                    | 3.30  | 32.4            | 30.0                         | •                                  | • | • |
|                  | 120mm         | FBA12G12M1A             | 12                          | 7.0—13.8                 | 340                   | 4.08                        | 2100                | 2.45  | 86.5                    | 4.80  | 47.1            | 35.5                         | •                                  | • | • |
|                  | DC axial fans | FBA12G12H1A             | 12                          | 7.0—13.8                 | 460                   | 5.52                        | 2500                | 2.94  | 103.8                   | 6.80  | 66.7            | 41.5                         | •                                  | • | • |
|                  |               | FBA12G12U1A             | 12                          | 7.0—13.8                 | 510                   | 6.12                        | 2750                | 3.25  | 114.7                   | 8.0   | 38.0            | 45.5                         | •                                  | • | • |
|                  |               | FBA12G24L1A             | 24                          | 14—27.6                  | 110                   | 2.64                        | 1700                | 1.95  | 68.9                    | 3.30  | 32.4            | 30.0                         | •                                  | • | • |
|                  |               | FBA12G24M1A             | 24                          | 14—27.6                  | 160                   | 3.84                        | 2100                | 2.45  | 86.5                    | 4.80  | 47.1            | 35.5                         | •                                  | • | • |
|                  |               | FBA12G24H1A             | 24                          | 14—27.6                  | 230                   | 5.52                        | 2500                | 2.94  | 103.8                   | 6.80  | 66.7            | 41.5                         | •                                  | • | • |

| Type and Size | Model         | Rated Voltage (V) | Operating Voltage (V) | Rated Current (mA) | Rated Input (W) | Nominal Speed (r/min) | Maximum Air Flow (m3/min) (CFM) |       | Maximum Air Pressure (mmh20) (Pa) |       | Noise (dB-A) | Safety Standard UL CSA | Locked Rotor Alarm Sensor |
|---------------|---------------|-------------------|-----------------------|--------------------|-----------------|-----------------------|---------------------------------|-------|-----------------------------------|-------|--------------|------------------------|---------------------------|
| CROSSFLO      | FCB34         | FCB34AA12         | 12                    | 10.2—13.8          | 165             | 1.98                  | 2800                            | 0.32  | 11.3                              | 1.30  | 12.7         | 38.0                   | •                         |
|               | Crossflo Fans | FCB34AB12         | 12                    | 10.2—13.8          | 340             | 4.08                  | 3300                            | 0.61  | 21.5                              | 3.00  | 29.4         | 42.0                   | •                         |
|               |               | FCB34AC12         | 12                    | 10.2—13.8          | 375             | 4.50                  | 3100                            | 0.80  | 28.2                              | 2.00  | 19.6         | 42.0                   | •                         |
|               |               | FCB34AD12         | 12                    | 10.2—13.8          | 415             | 4.98                  | 3000                            | 0.96  | 33.9                              | 1.90  | 18.6         | 42.0                   | •                         |
|               |               | FCB34AE12         | 12                    | 10.2—13.8          | 430             | 5.16                  | 2900                            | 1.14  | 40.3                              | 1.90  | 18.6         | 42.0                   | •                         |
|               |               | FCB34AF12         | 12                    | 10.2—13.8          | 440             | 5.28                  | 2800                            | 1.22  | 43.1                              | 1.85  | 18.1         | 42.0                   | •                         |
|               |               | FCB34AA24         | 24                    | 20.4—27.6          | 110             | 2.64                  | 2800                            | 0.33  | 11.7                              | 1.50  | 14.7         | 39.0                   | •                         |
|               |               | FCB34AB24         | 24                    | 20.4—27.6          | 165             | 3.96                  | 3300                            | 0.64  | 22.6                              | 2.40  | 23.5         | 42.0                   | •                         |
|               |               | FCB34AC24         | 24                    | 20.4—27.6          | 200             | 4.80                  | 3100                            | 0.80  | 28.2                              | 2.00  | 19.6         | 42.0                   | •                         |
|               |               | FCB34AD24         | 24                    | 20.4—27.6          | 210             | 5.04                  | 3000                            | 0.95  | 33.5                              | 2.00  | 19.6         | 42.0                   | •                         |
|               |               | FCB34AE24         | 24                    | 20.4—27.6          | 230             | 5.52                  | 2900                            | 1.10  | 38.8                              | 2.10  | 20.6         | 42.0                   | •                         |
|               |               | FCB34AF24         | 24                    | 20.4—27.6          | 250             | 6.00                  | 2800                            | 1.15  | 40.6                              | 2.20  | 21.6         | 42.0                   | • • •                     |
| BLOWERS       | FAL3F         | FAL3F05LH         | 5                     | 4.5—6.0            | 205             | 1.64                  | 4400                            | 0.112 | 3.95                              | 8.1   | 79.4         | 28.5                   | • • •                     |
|               | Blowers       | FAL3F05LL         | 5                     | 4.5—6.0            | 380             | 1.90                  | 5400                            | 0.140 | 4.94                              | 15.4  | 151          | 36.0                   | • • •                     |
|               |               | FAL3F12LL         | 24                    | 7.0—13.8           | 111             | 1.33                  | 4400                            | 0.112 | 3.95                              | 8.4   | 79.4         | 28.5                   | • • •                     |
|               |               | FAL3F12LH         | 12                    | 7.0—13.8           | 185             | 2.22                  | 5200                            | 0.138 | 4.87                              | 15.0  | 151          | 35.0                   | • • •                     |
|               |               | FAL3F24LH         | 24                    | 14.0—27.6          | 105             | 2.52                  | 5200                            | 0.138 | 4.87                              | 15.0  | 151          | 35.0                   | • • •                     |
|               | FAL5F         | FAL5F12LH         | 12                    | 7.0—13.8           | 200             | 2.40                  | 2900                            | 0.30  | 10.6                              | 10.00 | 98.07        | 36.0                   | • • •                     |
|               |               | FAL5F24LH         | 24                    | 14—27.6            | 100             | 2.40                  | 2900                            | 0.30  | 10.6                              | 9.70  | 95.12        | 36.0                   | • • •                     |
|               |               | FAL5F12LL         | 12                    | 7.0—13.8           | 140             | 1.68                  | 2400                            | 0.25  | 8.83                              | 6.20  | 60.8         | 30.0                   | • • •                     |
|               |               | FAL5F24LL         | 24                    | 14—27.6            | 70              | 1.68                  | 2400                            | 0.25  | 8.83                              | 6.30  | 61.8         | 30.0                   | • • •                     |
|               | FAL6F         | FAL6F12LL         | 12                    | 7.0—13.8           | 280             | 3.36                  | 2100                            | 0.53  | 18.7                              | 11.25 | 110.3        | 40.0                   | • • •                     |
|               |               | FAL6F12LH         | 12                    | 7.0—13.8           | 500             | 6.00                  | 2550                            | 0.65  | 23.0                              | 18.00 | 176.5        | 45.0                   | • • •                     |
|               |               | FAL6F24LL         | 24                    | 14—27.0            | 155             | 3.72                  | 2100                            | 0.53  | 18.7                              | 11.50 | 112.8        | 40.0                   | • • •                     |
|               |               | FAL6F24LH         | 24                    | 14—27.0            | 295             | 7.08                  | 2550                            | 0.67  | 23.7                              | 19.70 | 193.2        | 45.0                   | • • •                     |