Filter Fan Kits

Applications

- Most innovative technology for fan cooling and pressurizing of industrial enclosures.
- Provides a high quality, economical method of cooling enclosures
- Filtered passive ventilation can be provided by an exhaust filter for either convection cooling or in combination with a fan in forced air cooling
- Slim line design allows grille to protrude from enclosure surface less than one quarter inch
- Maintains aesthetics of enclosure

Features

- All models are 115V with an expected service life of 30,000 hours
- High-performance fan motors and finger guards
- Polycarbonate fire retardant plastic grilles, UL94-VO
- Durable, reusable filter mat included
- Patented “Click and Fit” system allows for rapid filter fan and exhaust filter installation without screws (This time-saving feature cuts installation time by up to 30 minutes when compared to traditional box fan packages)
- Cutout template provided with every unit
- Filter fan or exhaust filter simply snaps into cutout opening
- Connector type: WPF10 Series 2 has 12-inch wires. WPF20-WPF60 Series has terminal strip.

Standards

- cUL Recognized/CSA fan motor
- NEMA 1 (NEMA 12 with optional WPFG series gasket)
- IP43 (IP54 with optional WPFG Series gasket)

Accessories

- Gaskets (WPFG Series) recommended if installing on enclosure with textured finish
- Replacement Filters (WPFM Series)

Part Number | Price | Amps at 50/60 Hz | Rated Voltage | Power Consumption at 50/60 Hz | Free Flow Air Delivery (CFM) | Air Delivery with Exhaust (CFM) | Max. Static Press. (PA) | Ambient Temp. Degree F Max/Min | Filter Density (G/M2) | Filtering Level | Sound Level (dB) | Required Cutout Sizes
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
WPF10-115BK | <--- > | 0.15/0.15 | 115V | 12/12 Watts | 16 | 10 | 29 | 140/14 | 150 | 67% | 39 | 3.62x3.62 (92x92)
WPF20-115BK | <--- > | 0.25/0.25 | 115V | 19/19 Watts | 38 | 28 | 69 | 122/14 | 350 | 83% | 49 | 4.92x4.92 (125x125)
WPF25-115BK | <--- > | 0.25/0.25 | 115V | 18/18 Watts | 89 | 62 | 57 | 122/14 | 350 | 83% | 53 | 6.78x6.78 (172x172)
WPF30-115BK | <--- > | 0.5/0.5 | 115V | 43/44 Watts | 169 | 142 | 89 | 122/14 | 350 | 83% | 55 | 8.78x8.78 (223x223)
WPF50-115BK² | <--- > | 0.6/0.7 | 115V | 63/76 Watts | 324 | 249 | 205 | 122/14 | 350 | 83% | 69 | 11.46x11.46 (291x291)
WPF60-115BK² | <--- > | 1.2/1.6 | 115V | 122/173 Watts | 410 | 295 | 225 | 122/14 | 350 | 83% | 71 | 11.46x11.46 (291x291)

Note 1: For operation at 50Hz, reduce CFM by 15%.
Note 2: Intake fan use only
Dimensions in inches (millimeters)
Filter Fan Kit Cutouts and Dimensions

Installation cutouts

<table>
<thead>
<tr>
<th>Model</th>
<th>Cutout Details</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPF10-115BK</td>
<td>3.62&quot; x 3.62&quot; (92 mm x 92 mm)</td>
<td>106 mm x 106 mm</td>
</tr>
<tr>
<td>WPF20-115BK</td>
<td>4.92&quot; x 4.92&quot; (125 mm x 125 mm)</td>
<td>145 mm x 145 mm</td>
</tr>
<tr>
<td>WPF25-115BK</td>
<td>6.78&quot; x 6.78&quot; (172 mm x 172 mm)</td>
<td>223 mm x 223 mm</td>
</tr>
<tr>
<td>WPF30-115BK</td>
<td>9.19&quot; x 9.19&quot; (233 mm x 233 mm)</td>
<td>291 mm x 291 mm</td>
</tr>
<tr>
<td>WPF50-115BK</td>
<td>11.40&quot; x 11.40&quot; (291 mm x 291 mm)</td>
<td>364 mm x 364 mm</td>
</tr>
<tr>
<td>WPF60-115BK</td>
<td>13.78&quot; x 13.78&quot; (349 mm x 349 mm)</td>
<td>439 mm x 439 mm</td>
</tr>
</tbody>
</table>

Dimensions
Exhaust grille

Features
• Polycarbonate fire retardant plastic grilles, UL94-VO
• Durable, reusable filter mat included

Standards
• NEMA 1 (NEMA 12 with optional WPFG Series gasket)
• IP43 (IP54 with optional WPFG Series gasket)

Accessories
• Gaskets (WPFG Series) recommended if installing on enclosure with textured finish

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Price</th>
<th>Filter Density (G/M2)</th>
<th>Mass Filter Level %</th>
<th>Required Cutout Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPFA10BK</td>
<td>150</td>
<td>67%</td>
<td></td>
<td>3.62x3.62 (92x92)</td>
</tr>
<tr>
<td>WPFA20BK</td>
<td>350</td>
<td>83%</td>
<td></td>
<td>4.92x4.92 (125x125)</td>
</tr>
<tr>
<td>WPFA25-30BK</td>
<td>350</td>
<td>83%</td>
<td></td>
<td>8.78x8.78 (223x223)</td>
</tr>
<tr>
<td>WPFA50-60BK</td>
<td>350</td>
<td>83%</td>
<td></td>
<td>11.46x11.46 (291x291)</td>
</tr>
</tbody>
</table>

Dimensions in inches (millimeters)
Exhaust Grille and Filter Accessories

Replacement filter mats

Applications
- Replacement filter mats for WPF series filter fans and WPFA series exhaust grilles

Features
- Made of washable synthetic fibers
- Reusable up to 20 times
- 100% resistant to humidity

Rubber gaskets for filter fans and exhaust grilles

Features
- Packaged individually
- Provide added sealing protection between enclosure and fan housing
- Recommended when fans or exhaust grilles are installed on enclosures with textured finishes

Standards
- Changes filterfan rating (WPF series) from NEMA 1 to NEMA 12 when installed

Replacement Filter Mats

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Price</th>
<th>Use With This Filterfan Kit Part Number</th>
<th>Use With This Exhaust Grille and Filter Part Number</th>
<th>Mass Filter Lever %</th>
<th>Dimensions HxW</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPFM10</td>
<td></td>
<td>WPFI0-115BK</td>
<td>WPFA10BK</td>
<td>67</td>
<td>3.40x3.40 (85x85)</td>
</tr>
<tr>
<td>WPFM20</td>
<td></td>
<td>WPF20-115BK</td>
<td>WPFA20BK</td>
<td>83</td>
<td>4.50x4.50 (115x115)</td>
</tr>
<tr>
<td>WPFM25-30</td>
<td></td>
<td>WPF25-115BK</td>
<td>WPFA25-30BK</td>
<td>83</td>
<td>8.30x8.30 (210x210)</td>
</tr>
<tr>
<td>WPFM50-60</td>
<td></td>
<td>WPF50-115BK</td>
<td>WPFA50-60BK</td>
<td>83</td>
<td>11x11 (280x280)</td>
</tr>
</tbody>
</table>

Rubber Gaskets

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Price</th>
<th>Use With Filterfan Kit Part Number</th>
<th>Use With Exhaust Grille Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPFG10</td>
<td></td>
<td>WPFI0-115BK</td>
<td>WPFA10BK</td>
</tr>
<tr>
<td>WPFG20</td>
<td></td>
<td>WPF20-115BK</td>
<td>WPFA20BK</td>
</tr>
<tr>
<td>WPFG25-30</td>
<td></td>
<td>WPF25-115BK</td>
<td>WPFA25-30BK</td>
</tr>
<tr>
<td>WPFG50-60</td>
<td></td>
<td>WPF50-115BK</td>
<td>WPFA50-60BK</td>
</tr>
</tbody>
</table>

Enclosure Shipping Schedule

- Same day
- 1 - 7 days
- 1 - 10 days

Color indicates shipping lead time in business days.
Filter Fan Kits

Applications

Filter fans provide an optimum climate in enclosures. The interior temperature of enclosures is reduced by channeling cooler filtered outside air into the enclosure, thus expelling heated internal air. The resulting air flow prevents formation of localized heat pockets and protects electronic components from overheating.

Outdoor filter fans are used in outdoor enclosures where warm air must be dissipated. To clean and exchange the filter mat, you open the lockable door of the outdoor hood, eliminating the need to allow interior access to the enclosure. IP55 protection type is achieved due to the special design of the hood and the use of fine filter mats.

Features

- Easy filter change
- Outer door lock for outdoor models
- Impact resistant
- Weather/UV resistant UL 94V-0 (indoor)/UL94H-B (outdoor)
- No-screw installation - except outdoor models
- Low noise
- 120 VAC and 24 VDC models available
- Service life - 50,000 hrs@77°F (25°C) + 65%RH
- Connection type - 12 to 69 CFM - 2 wires w/case clamps, AWG 14, length 4"/136 to 373 CFM - 3 pole terminal, AWG 14, clamping torque 0.8 Nm
- Airflow direction easily switched on all models by reversing the axial fan.
- Includes self-adhesive gasket pre-installed on frame
- Optional mounting screws for additional support

Standards

All models except outdoor: CE, RoHS, IP55, UL Type 1 when using supplied filter. For use with NEMA 1 and NEMA 12 enclosures only.

UL #: E234324

Note: Using fine filter mat F5 increases the protection to UL Type 12, but reduces the airflow. (See Stego Air Volume and Pressure Data, later in this section.)

Filter Fan Kits

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Price</th>
<th>Amps (mA)</th>
<th>Rated Voltage</th>
<th>Power Consumption (60 Hz for 120V models)</th>
<th>Free Flow Air Delivery (CFM)*</th>
<th>Air Delivery with Exhaust (CFM)**</th>
<th>Max. Static Pressure (Pa)*</th>
<th>Operating Temp. (Max/Min F/C)</th>
<th>Filter Density (g/m2)</th>
<th>Filtering Level</th>
<th>Sound Level (dB)</th>
<th>Required Cutout Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>018000-02</td>
<td>$90</td>
<td>24 VDC</td>
<td>2.2W</td>
<td>12</td>
<td>9</td>
<td>19</td>
<td></td>
<td>158/14 °F (70/10°C)</td>
<td>350</td>
<td>94%</td>
<td>31</td>
<td>3.82 x 3.82 inch (97.03mm x 97.03mm)</td>
</tr>
<tr>
<td>018000-01</td>
<td>$160</td>
<td>120 VAC</td>
<td>13W</td>
<td>14</td>
<td>11</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td>31</td>
<td>40</td>
<td>4.92 x 4.92 inch (124.97mm x 124.97mm)</td>
</tr>
<tr>
<td>018010-02</td>
<td>$210</td>
<td>24 VDC</td>
<td>5W</td>
<td>32</td>
<td>25</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td>40</td>
<td>40</td>
<td>6.93 x 6.93 inch (176.02mm x 176.02mm)</td>
</tr>
<tr>
<td>018010-01</td>
<td>$180</td>
<td>120 VAC</td>
<td>15W</td>
<td>37</td>
<td>28</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td>39</td>
<td>39</td>
<td>9.84 x 9.84 inch (249.94mm x 249.94mm)</td>
</tr>
<tr>
<td>018020-02</td>
<td>$210</td>
<td>24 VDC</td>
<td>5W</td>
<td>60</td>
<td>40</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td>52</td>
<td>52</td>
<td>6.93 x 6.93 inch (176.02mm x 176.02mm)</td>
</tr>
<tr>
<td>018020-01</td>
<td>$180</td>
<td>120 VAC</td>
<td>15W</td>
<td>69</td>
<td>46</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
<td>52</td>
<td>52</td>
<td>9.84 x 9.84 inch (249.94mm x 249.94mm)</td>
</tr>
<tr>
<td>018040-01</td>
<td>$470</td>
<td>120 VAC</td>
<td>39W</td>
<td>136</td>
<td>84</td>
<td>60</td>
<td></td>
<td>140/-13°F (60/-25°C)</td>
<td>52</td>
<td>53</td>
<td>53</td>
<td>9.84 x 9.84 inch (249.94mm x 249.94mm)</td>
</tr>
<tr>
<td>018030-03</td>
<td>$840</td>
<td>24 VDC</td>
<td>20W</td>
<td>176</td>
<td>135</td>
<td>23</td>
<td></td>
<td>158/14 °F (70/10°C)</td>
<td>53</td>
<td>53</td>
<td>9.84 x 9.84 inch (249.94mm x 249.94mm)</td>
<td></td>
</tr>
<tr>
<td>018030-01</td>
<td>$700</td>
<td>120 VAC</td>
<td>60W</td>
<td>202</td>
<td>156</td>
<td>27</td>
<td></td>
<td>140/-13°F (60/-25°C)</td>
<td>52</td>
<td>52</td>
<td>9.84 x 9.84 inch (249.94mm x 249.94mm)</td>
<td></td>
</tr>
<tr>
<td>018050-01</td>
<td>$780</td>
<td>120 VAC</td>
<td>85W</td>
<td>373</td>
<td>203</td>
<td>85</td>
<td></td>
<td>140/-13°F (60/-25°C)</td>
<td>52</td>
<td>52</td>
<td>9.84 x 9.84 inch (249.94mm x 249.94mm)</td>
<td></td>
</tr>
</tbody>
</table>

Outdoor Filter Fans (Rain Hoods)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Price</th>
<th>Amps (mA)</th>
<th>Rated Voltage</th>
<th>Power Consumption (60 Hz for 120V models)</th>
<th>Free Flow Air Delivery (CFM)*</th>
<th>Air Delivery with Exhaust (CFM)**</th>
<th>Max. Static Pressure (Pa)*</th>
<th>Operating Temp. (Max/Min F/C)</th>
<th>Filter Density (g/m2)</th>
<th>Filtering Level</th>
<th>Sound Level (dB)</th>
<th>Required Cutout Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>018210-04</td>
<td>$210</td>
<td>24 VDC</td>
<td>5W</td>
<td>12</td>
<td>11.8</td>
<td>46</td>
<td></td>
<td>158/14 °F (70/10°C)</td>
<td>360</td>
<td>96%</td>
<td>40</td>
<td>4.92 x 4.92 inch (124.97mm x 124.97mm)</td>
</tr>
<tr>
<td>018210-02</td>
<td>$180</td>
<td>120 VAC</td>
<td>15W</td>
<td>14</td>
<td>14</td>
<td>54</td>
<td></td>
<td></td>
<td></td>
<td>40</td>
<td>40</td>
<td>6.93 x 6.93 inch (176.02mm x 176.02mm)</td>
</tr>
</tbody>
</table>

Dimensions in inches (millimeters)

*Fan with filter and louver
**Fan with filter, louver, exhaust filter, and grille.
Filter Fan Kit Cutouts and Dimensions

Dimensions [in mm]

018000-01
018000-02

018010-01
018010-02

CUTOUT DIMENSIONS
Filter Fan Kit Cutouts and Dimensions

Dimensions [in mm]

CUTOUT DIMENSIONS

CUTOUT DIMENSIONS

CUTOUT DIMENSIONS
Filter Fan Kit Cutouts and Dimensions

Dimensions [in mm]

018040-01

018030-01

018030-03
Filter Fan Kit Cutouts and Dimensions

Dimensions [in mm]

- Height: 11.25 [264.5]
- Width: 11.25 [264.5]
- Depth: 4.31 [107.0]
- Width of cutout: 10.35 [262.6]
- Height of cutout: 10.35 [262.6]
- Width of fan: 9.80 [248.9]
- Height of fan: 9.84 [248.6]
- Depth of fan: 8.01 [203.7]
- Width of filter: 6.18 [156.7]
- Height of filter: 5.18 [131.4]
- Thickness of filter: 0.28 [6.6]
- Width of cutout: 0.28 [6.6]
- Height of cutout: 0.26 [6.5]
- Thickness of cutout: 0.18 [4.5]
Exhaust Grilles With Filters

Features
- No-screw installation
- Mounting depth 0.6 in. (16mm)

Accessories
- Come with gaskets attached (adhesive-sided to stick on panel)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Price</th>
<th>Filter Density (g/m²)</th>
<th>Mass Filter Level %</th>
</tr>
</thead>
<tbody>
<tr>
<td>118000-00</td>
<td></td>
<td>350</td>
<td>94%</td>
</tr>
<tr>
<td>118010-00</td>
<td></td>
<td>350</td>
<td>94%</td>
</tr>
<tr>
<td>118020-00</td>
<td></td>
<td>350</td>
<td>94%</td>
</tr>
<tr>
<td>118030-00</td>
<td></td>
<td>350</td>
<td>94%</td>
</tr>
</tbody>
</table>

Outdoor Exhaust Grilles
<table>
<thead>
<tr>
<th>Part Number</th>
<th>Price</th>
<th>Filter Density (g/m²)</th>
<th>Mass Filter Level %</th>
</tr>
</thead>
<tbody>
<tr>
<td>118210-00</td>
<td></td>
<td>350</td>
<td>98%</td>
</tr>
</tbody>
</table>

Dimensions [in mm]

118000-00

- No-screw installation
- Mounting depth 0.6 in. (16mm)

Accessories
- Come with gaskets attached (adhesive-sided to stick on panel)
Enclosure Cooling – Selecting a Fan or Air Conditioner

Fan selection

To select the proper size (CFM) fan for your forced air cooling solution, you need to determine the amount of heat to be removed (in watts) and determine the Delta T (Max. allowable internal enclosure temperature °F – Max. outside ambient temperature °F).

CFM = Cubic Feet per Minute
P = Power to be dissipated in watts
CFM = (3.17 x P watts) / Delta T °F
ΔT = max. allowable internal enclosure temperature °F – max. outside ambient temperature °F

Air conditioner selection

To select the proper size air conditioner, the worst-case conditions should be considered, but take care not to choose an oversized unit.

There are two main factors in choosing an uninsulated metal NEMA rated enclosure located indoors:

- Internal heat load
- Heat load transfer

Internal Heat Load

Internal heat load is the heat generated by the components inside the enclosure. This can be determined by a few different methods. The preferred method is to add the maximum heat output specifications that the manufacturers list for all the equipment installed in the cabinet. This is typically given in Watts, so use the following conversion:

\[
\text{BTU per Hour} = \text{Watts} \times 3.413
\]

**Example:** The Watt-loss chart for the GS3 Drives shows that a GS3-2020 AC drive has a Watt-loss of 750 watts.

\[
\text{BTU per Hour} = 750 \text{ watts} \times 3.413
\]

Heat load transfer:

\[
\text{BTU per Hour} = 2559
\]

Heat Load Transfer

Heat load transfer is the heat lost (negative heat load transfer) or gained (positive heat load transfer) through the enclosure walls with the surrounding ambient air. This can be calculated by the following formula:

\[
\text{Heat load transfer (BTU/H)} = 1.25 \times \text{Surface Area (sq. ft.)} \times (\text{Max. outside ambient air} °F – \text{Max. allowable internal enclosure temperature air} °F)
\]

Surface Area (sq. ft.) = \(2 \times (H \times W) + (H \times D) + (W \times D)\) / 144 sq. inches

Note: 1.25 is an industry standard constant for metal enclosures;
0.62 should be used for plastic enclosures.

Once you have determined your Internal Heat Load and the Heat Load Transfer, you can choose the proper size unit by calculating the needed cooling capacity.

Cooling capacity (BTU/H) = Internal Heat Load ± Heat Load Transfer

Fan Selection Example

A NEMA 12 Hubbell Wiegmann N12302412 enclosure (30” high x 24” wide x 12” deep) contains a GS3-2020 AC drive (20 HP 230 volt) that has a maximum allowable operating temperature of 104°F and is located in a warehouse that has a maximum outside ambient air temperature of 95°F.

Power to be dissipated is stated in the specifications of the GS3-2020 and is found to be 750 watts, so \(P = 750 \text{ watts}\).

\[\Delta T = \text{Max. operating temperature for the GS3-2020 is 104°F} – \text{Max. ambient air temperature of 95°F}\]

\[\Delta T = 9°F\]

\[\text{CFM} = (3.17 \times 750 \text{ watts}) / 9°F \]

\[\text{CFM} = 264\]

Choose a Hubbell Wiegmann WP60-115BK filter fan kit that provides 295 CFM with exhaust kit WPFA50-60BK.

Air Conditioner Selection Example

A NEMA 12 Hubbell Wiegmann N12302412 enclosure (30” high x 24” wide x 12” deep) contains a GS3-4030 AC drive (30 HP 460 volt) that has a maximum allowable operating temperature of 104°F and is located in a warehouse that has a maximum outside ambient air temperature of 115°F.

Power to be dissipated is stated in the specifications of the GS3-4030 and is found to be 1290 watts.

Internal heat load:

\[\text{BTU per Hour} = 1290 \text{ watts} \times 3.413\]

\[\text{BTU per Hour} = 4403 \text{ BTU/H}\]

Heat load transfer:

\[\text{Heat load transfer (BTU/H)} = 261.25 \text{ BTU/H}\]

\[\text{CFM} = \frac{3.17 \times 750 \text{ watts}}{9°F}\]

\[\text{CFM} = 264\]

Select a Hubbell Wiegmann WP60-115BK filter fan kit that provides 295 CFM with exhaust kit WPFA50-60BK.