

Application

The XAV-545 aluminum grille is designed in accordance with ICC 500 (2014), FEMA P-361 (2015) and FEMA P-320 (2014) guidelines for storm shelters and safe rooms. It offers exceptional protection against wind pressures and debris impacts produced by tornadoes and hurricanes. The XAV-545 is a UL Classified Windstorm Rated Assembly with a design pressure of 300 psf and has been impact-tested using 15-lb 2 x 4 timbers launched at 100 mph.

For the default flange-mount installation method, the XAV-545 may be sized to cantilever forward of the wall opening (external mount) or slip into the opening (internal mount). The XAV-545 is also available with a non-flanged frame and continuous angles for installation.

Standard Construction

Material: Aluminum.

Frame: 5 1/2" deep x 0.25" thick (140 x 6).

Blades: 0.25" (6) Inverted V.

Screen: 18 x 16 aluminum mesh overlaid with 5/8" x 0.050" (15.9 x 1.3) expanded and flattened aluminum.

Mullion: Visible.

Flange: Single section: 5 1/2" (140) on jambs.
Multiple section: Single section high - 5 1/2" (140) on top and bottom.
Single section wide - 5 1/2" (140) on jambs.

Factory Finish: Mill.

Minimum Size: 12" x 12" (305 x 305)

Maximum Size: Single section: 48" x 96" (1219 x 2438)
Multiple section: Unlimited width x single section high
Single section wide x unlimited height

Mount Direction: Internal (flange at front).

Options

- Alternate Factory finish:
 - High Performance Fluoropolymer 100% resin Newlar®/70% resin Kynar®
 - Polyester Powder
 - Baked Enamel
 - Prime Coat
- Alternate Flange Configurations:
 - Top/bottom flange (single section high only)
 - Non-Flanged (includes continuous angles for installation)
 - Four-sided flange (single section only)
- External Mount (flange at rear)

Ratings

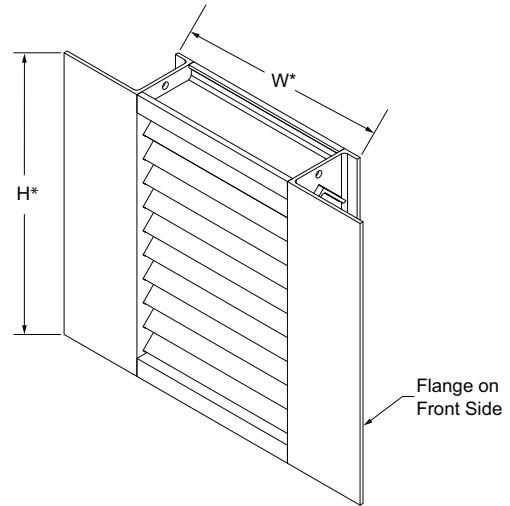
Free Area: [48" x 48" (1219 x 1219) unit]: 7.5 ft² (0.69 m²)
46.8%

Performance @ Beginning Point of Water Penetration

Free Area Velocity: 555 fpm (2.82 m/s)
Air Volume Delivered: 4151 cfm (1.96 m³/s)
Pressure Loss: 0.09 in.wg. (22 Pa)

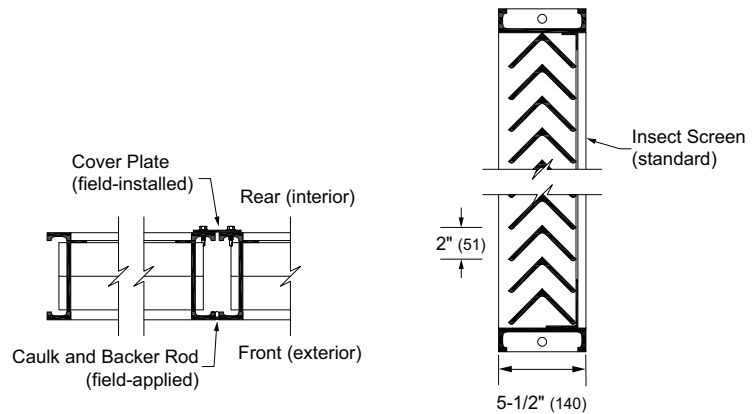
Design Pressure: 300 psf

Classified as a UL Windstorm Rated Assembly for static pressure, cyclic pressure, and impact resistance.



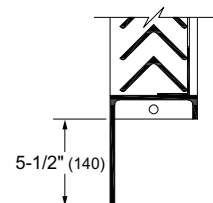
Jamb Flange/Internal Mount
(Standard for single section assemblies)

*Grille dimensions furnished approximately 1/2" (13) undersize.



Visible Vertical Mullion
(standard)

Vertical Section
(Standard)

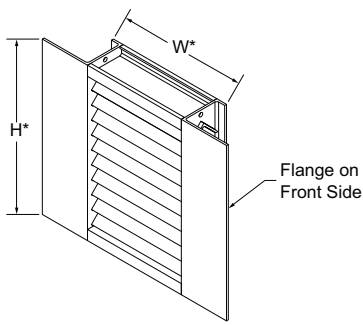


Top/Bottom Flange
(optional)

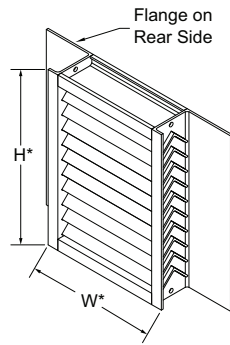


Certified Ratings:

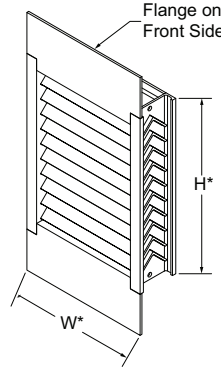
Pottorff certifies that the model XAV-545 shown herein is licensed to bear the AMCA seal. The ratings shown are based on test and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings seal applies to water penetration and air performance ratings.



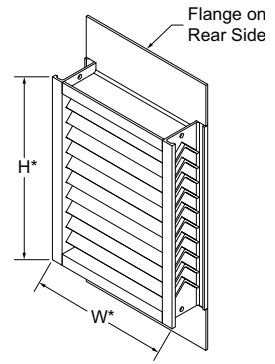
Jamb Flange/Internal Mount
(single section wide only)
*Grille dimensions furnished approximately 1/2" (13) undersize



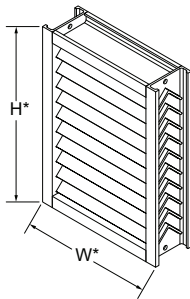
Jamb Flange/External Mount
(single section wide only)
*Grille dimensions furnished approximately 1/2" (13) oversize



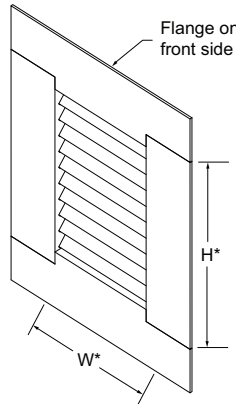
Top/Bottom Flange Internal Mount
(single section high only)
*Grille dimensions furnished approximately 1/2" (13) undersize



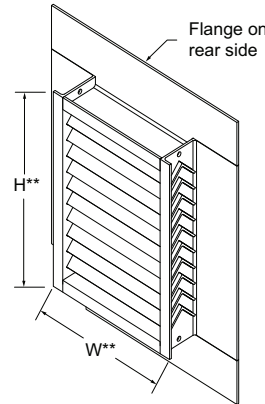
Top/Bottom Flange External Mount
(single section high only)
*Grille dimensions furnished approximately 1/2" (13) oversize



Non-Flanged
*Grille dimensions furnished approximately 1/2" (13) undersize



Four-Sided Flange Internal Mount
(single section only)
*Louver dimensions furnished approximately 1/2" (13) oversize



Four-Sided Flange External Mount
(single section only)
**Louver dimensions furnished approximately 1/2" (13) oversize

Anchor Requirements

| Attachment Method | Attachment Location | Building Substrate | Anchor Type | Min. Edge Distance | Max. Spacing | Min. Embedment |
|--|---------------------|---|--|--------------------|--------------|----------------|
| Flange-Mounted (Internal or External Mount) | Jambs | Grout-Filled CMU ($f_m \geq 1500$ psi) | 3/8" x 4" Hilti Kwik HUS-EZ Screw Anchor | 4" | 7" | 3 1/4" |
| | | Concrete ($f_c \geq 4000$ psi) | 3/8" x 4" Hilti Kwik HUS-EZ Screw Anchor | 1 1/2" | 12" | 3 1/4" |
| | | Steel (Min. 3/16" Thick, $F_y \geq 36$ ksi) | 3/8" x 1" Self-Tapping Screw* | 3/4" | 8" | 3/16" |
| | Top/Bottom | Grout-Filled CMU ($f_m \geq 1500$ psi) | 1/2" Through-Bolt w/ Nut & Flat Washer | 3 3/8" | 7" | Full |
| | | Concrete ($f_c \geq 4000$ psi) | 3/8" x 4" Hilti Kwik HUS-EZ Screw Anchor | 1 1/2" | 7" | 3 1/4" |
| | | Steel (Min. 3/16" Thick, $F_y \geq 36$ ksi) | 3/8" x 1" Self-Tapping Screw* | 3/4" | 4 1/2" | 3/16" |
| Continuous Angles (Non-Flanged, Internal Mount Only) | Jambs | Grout-Filled CMU ($f_m \geq 1500$ psi) | 1/2" x 5" Hilti Kwik HUS-EZ Screw Anchor | 4" | 8" | 4 1/4" |
| | | Concrete ($f_c \geq 4000$ psi) | 3/8" x 4" Hilti Kwik HUS-EZ Screw Anchor | 2 1/4" | 12" | 3 1/4" |
| | | Steel (Min. 3/16" Thick, $F_y \geq 36$ ksi) | 3/8" x 1" Self-Tapping Screw* | 3/4" | 10" | 3/16" |
| | Top/Bottom | Grout-Filled CMU ($f_m \geq 1500$ psi) | 1/2" Through-Bolt w/ Nut & Flat Washer | 3 3/8" | 8" | Full |
| | | Concrete ($f_c \geq 4000$ psi) | 5/8" x 4" Hilti Kwik HUS-EZ Screw Anchor | 2 1/4" | 7" | 3 1/4" |
| | | Steel (Min. 3/16" Thick, $F_y \geq 36$ ksi) | 3/8" x 1" Self-Tapping Screw* | 3/4" | 8" | 3/16" |

*Note: It is acceptable to substitute 3/8-16 bolts, nuts, and flat washers instead of 3/8" self-tapping screws.

Free Area (ft²)

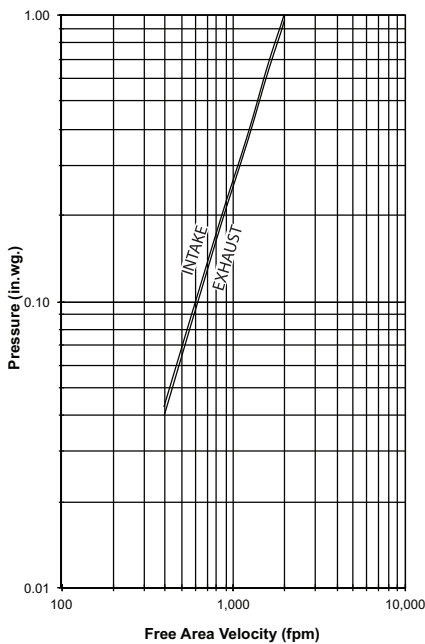
| Height (Inches) | Width (Inches) | | | | | | |
|-----------------|----------------|-----|-----|-----|------|------|------|
| | 12 | 18 | 24 | 30 | 36 | 42 | 48 |
| 12 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| 18 | 0.4 | 0.6 | 0.9 | 1.1 | 1.4 | 1.6 | 1.9 |
| 24 | 0.6 | 1.0 | 1.4 | 1.8 | 2.2 | 2.6 | 3.0 |
| 30 | 0.8 | 1.4 | 1.9 | 2.5 | 3.0 | 3.6 | 4.1 |
| 36 | 1.0 | 1.7 | 2.4 | 3.1 | 3.8 | 4.5 | 5.2 |
| 42 | 1.3 | 2.1 | 3.0 | 3.8 | 4.7 | 5.5 | 6.4 |
| 48 | 1.5 | 2.5 | 3.5 | 4.5 | 5.5 | 6.5 | 7.5 |
| 54 | 1.7 | 2.9 | 4.0 | 5.2 | 6.3 | 7.5 | 8.6 |
| 60 | 1.9 | 3.2 | 4.5 | 5.8 | 7.1 | 8.4 | 9.7 |
| 66 | 2.2 | 3.6 | 5.1 | 6.5 | 8.0 | 9.4 | 10.8 |
| 72 | 2.4 | 4.0 | 5.6 | 7.2 | 8.8 | 10.4 | 12.0 |
| 78 | 2.6 | 4.4 | 6.1 | 7.9 | 9.6 | 11.3 | 13.1 |
| 84 | 2.8 | 4.7 | 6.6 | 8.5 | 10.4 | 12.3 | 14.2 |
| 90 | 3.1 | 5.1 | 7.2 | 9.2 | 11.2 | 13.3 | 15.3 |
| 96 | 3.3 | 5.5 | 7.7 | 9.9 | 12.1 | 14.3 | 16.5 |

Weights (Approximate weight in lbs.)

| Height (Inches) | Width (Inches) | | | | | | |
|-----------------|----------------|-----|-----|-----|-----|-----|-----|
| | 12 | 18 | 24 | 30 | 36 | 42 | 48 |
| 12 | 20 | 28 | 37 | 45 | 53 | 62 | 70 |
| 18 | 29 | 38 | 49 | 60 | 71 | 82 | 93 |
| 24 | 38 | 49 | 61 | 74 | 88 | 102 | 115 |
| 30 | 47 | 61 | 75 | 89 | 105 | 121 | 137 |
| 36 | 56 | 72 | 89 | 106 | 122 | 141 | 160 |
| 42 | 65 | 84 | 103 | 122 | 142 | 161 | 182 |
| 48 | 73 | 95 | 117 | 139 | 161 | 183 | 204 |
| 54 | 82 | 107 | 131 | 156 | 180 | 204 | 229 |
| 60 | 91 | 118 | 145 | 172 | 199 | 226 | 253 |
| 66 | 100 | 130 | 159 | 189 | 218 | 248 | 277 |
| 72 | 109 | 141 | 173 | 205 | 238 | 270 | 302 |
| 78 | 118 | 153 | 188 | 222 | 257 | 291 | 326 |
| 84 | 127 | 165 | 202 | 239 | 276 | 313 | 350 |
| 90 | 136 | 176 | 216 | 255 | 295 | 335 | 374 |
| 96 | 145 | 188 | 230 | 272 | 314 | 356 | 399 |

Pressure Loss

(Data corrected to standard air density)



Louver Test Size = 48" x 48" (1219 x 1219)

Pressure loss tested in accordance with Figure 5.5 of AMCA Standard 500-L.

Water Penetration

AMCA defines the beginning point of water penetration as the free area velocity at the intersection of a simple linear regression of test data and the line of 0.01 ounces of water per square foot of free area measured through a 48" x 48" louver during a 15 minute period. The AMCA water penetration test provides a method for comparing louver models and designs as to their efficiency in resisting the penetration of rainfall under specific lab conditions. Pottorff recommends that intake louvers are selected with a reasonable margin of safety below the beginning point of water penetration in order to avoid unwanted penetration during severe storm conditions.

Selection Criteria

Follow the steps listed below to calculate the louver size needed to satisfy the required air volume while minimizing the adverse effects of water penetration and pressure loss.

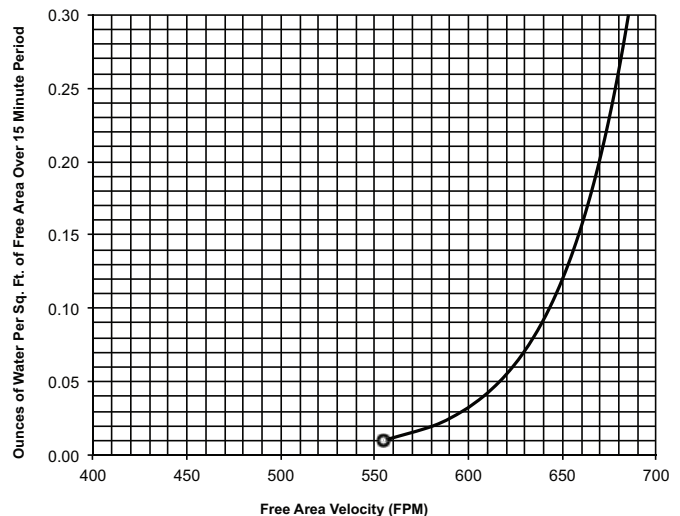
1. Determine the Free Area Velocity (FAV) at the maximum allowable pressure loss using the *Pressure Loss* chart to the left. While job conditions vary, typically, the maximum allowable pressure loss should not exceed 0.15 in. wg., and the FAV for 0.15 in. wg. pressure loss is listed on the front page of this sheet.
2. **Intake Applications** If the FAV at the Beginning Point of Water Penetration (shown below) is less than the FAV from step 1, then use the FAV at the Beginning Point of Water Penetration in step 3, otherwise use the FAV from step 1.
3. Calculate the total louver square footage required using the following equation.

$$\frac{\text{Required Air Volume (cfm)}}{\text{FAV (fpm)}} = \frac{\text{Required Louver (Free-Area) Size (ft}^2\text{)}}{\text{FAV (fpm)}}$$

4. Using the *Free Area* chart above, select a louver width and height that yields a free area ft² greater than or equal to the required louver size calculated in step 3.

Water Penetration

Beginning Point of Water Penetration = 555 fpm



Louver Test Size = 48" x 48" (1219 x 1219)



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