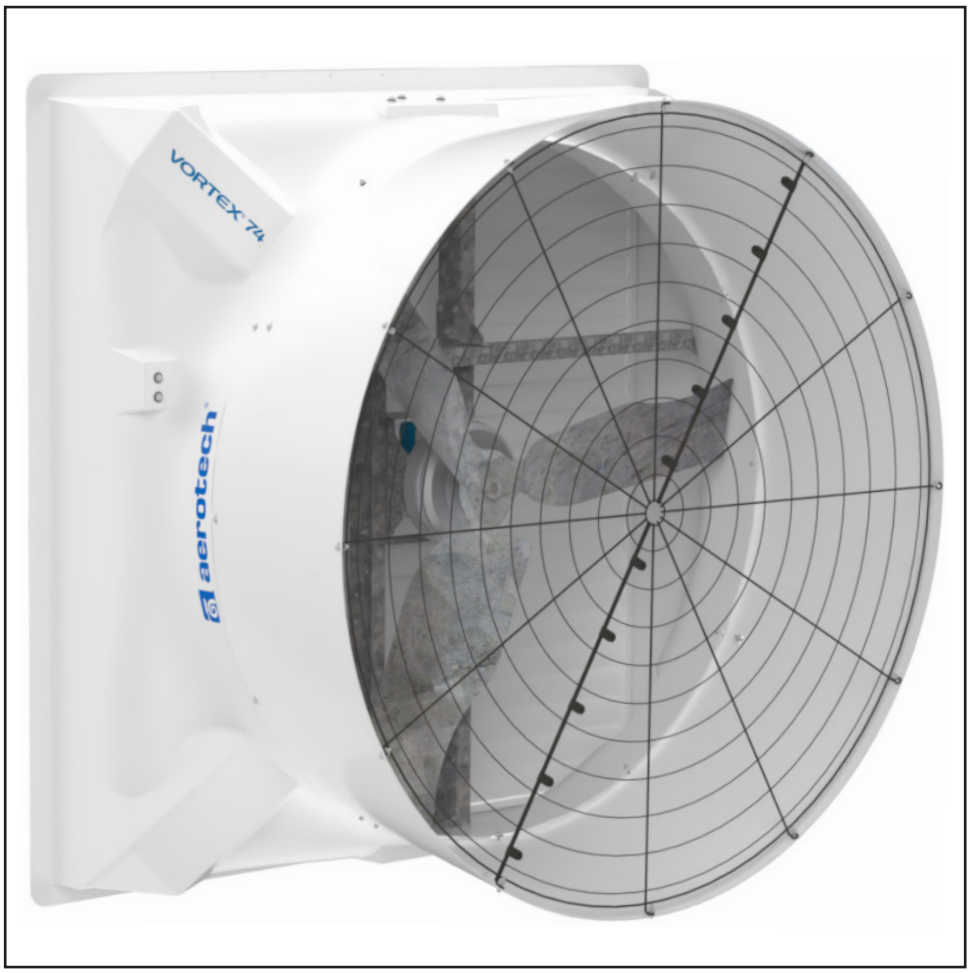
User Manual

# Munters Aerotech

## Vortex 74, 74" Munters Drive* Exhaust Fan

Model: VX74D3F43CT-HO • VX74D3F43CT-HE

*Protected by U.S. Patent No. US20230031171A1 and US11632932B2



# Vortex 74 Exhaust Fan
## with Munters Drive
## Instructions for Use and Maintenance

### Thank You:
Thank you for purchasing a Aerotech® Vortex 74 Exhaust Fan with Munters Drive. GrainProteinTech Climate Control & Air Treatment equipment is designed to be the highest performing, highest quality equipment you can buy. With the proper installation and maintenance it will provide many years of service.

### Please Note:
To achieve maximum performance and insure long life from your Aerotech® product it is essential that it be installed and maintained properly. Please read all instructions carefully before beginning installation.

### Warranty:
For Warranty claims information see the "Warranty Claims and Return Policy" form QM1021 available from the Grain & Protein Technologies office at 1-800-227-2376 or by e-mail at info@climatecontrolairtreatment.com.

### Conditions and Limitations:
- Products and Systems involved in a warranty claim under the "Warranty Claims and Return Policy" shall have been properly installed, maintained and operated under competent supervision, according to the instructions provided by Grain & Protein Technologies.
- Malfunction or failure resulting from misuse, abuse, negligence, alteration, accident or lack of proper installation or maintenance shall not be considered a defect under the Warranty.

# Index

# Unpacking the Equipment

# 1.

Before beginning installation, check the overall condition of the equipment. Remove packing materials, and examine all components for signs of shipping damage. Any shipping damage is the customer's responsibility and should be reported immediately to your freight carrier. Fan is shipped complete with all accessories.

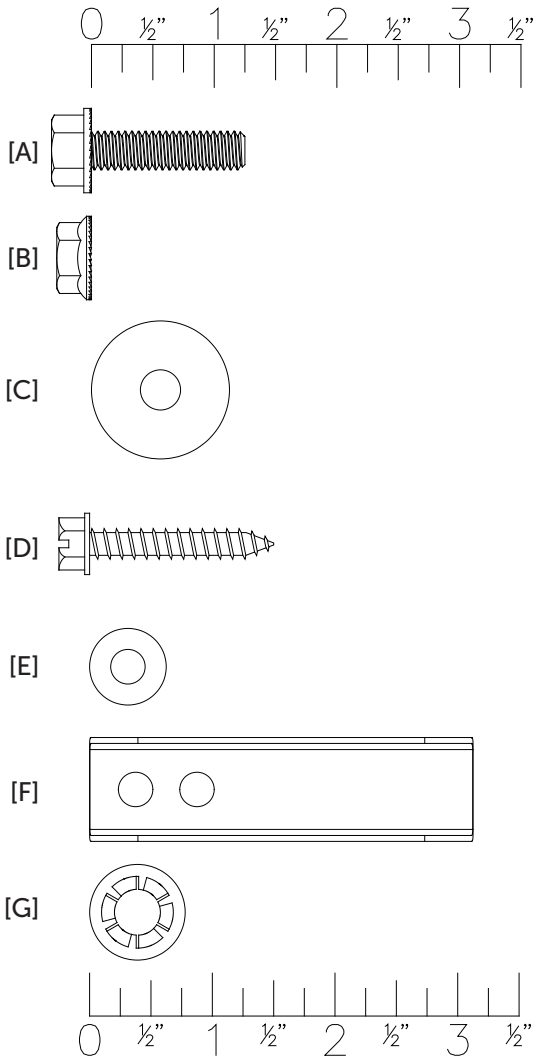
## 1.1 Parts List

*Each Fan includes:*

1 – Munters Drive Fan
4 – Cone Sections, PL
2 – Guard Sections, CTD
1 – Shutter
2 – Shutter Wind Bracket, GZ
1 – Shutter Wind Pipe, GZ
1 – Hardware Package as follows:

*HP1366– Vortex 74 Munters Drive*

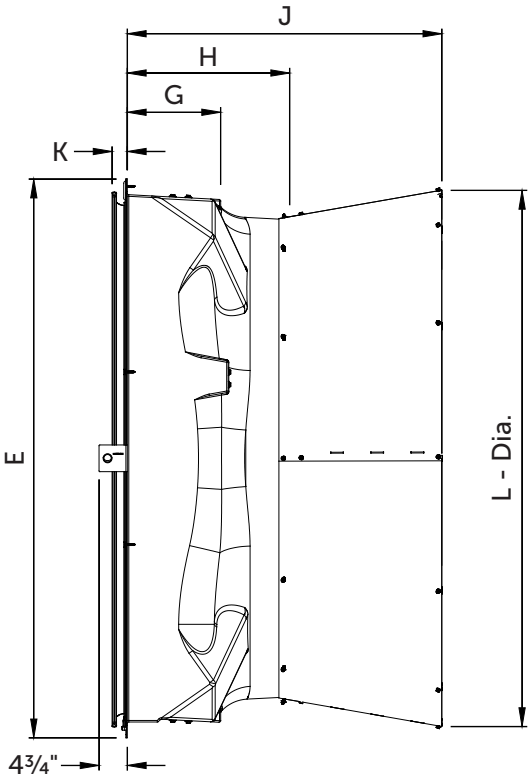
| ID | Qty. | Cat. No. | Description |
|---|---|---|---|
| [A] | 28 | KS1167 | 5⁄16"-18 x 1.25" SRTD Flange Head Bolt, ZP |
| [B] | 32 | KN0706 | 5⁄16"-18 SRTD Flange Nut, ZP |
| [C] | 12 | KW3011 | 5⁄16" x 1¼"O.D. Flat Washer, SS |
| [D] | 6 | KS2105 | #14 x 1.5" Hex Washer, Lag Screw, SS |
| [E] | 6 | KW3002 | ¼" Type-A, Narrow Flat Washer, SS |
| [F] | 6 | FH2732 | End Pivoting Shutter Clip, SS |
| [G] | 1 | KX1060 | Retainer Clip for 5⁄16" Bolt, Push Type, ZP |



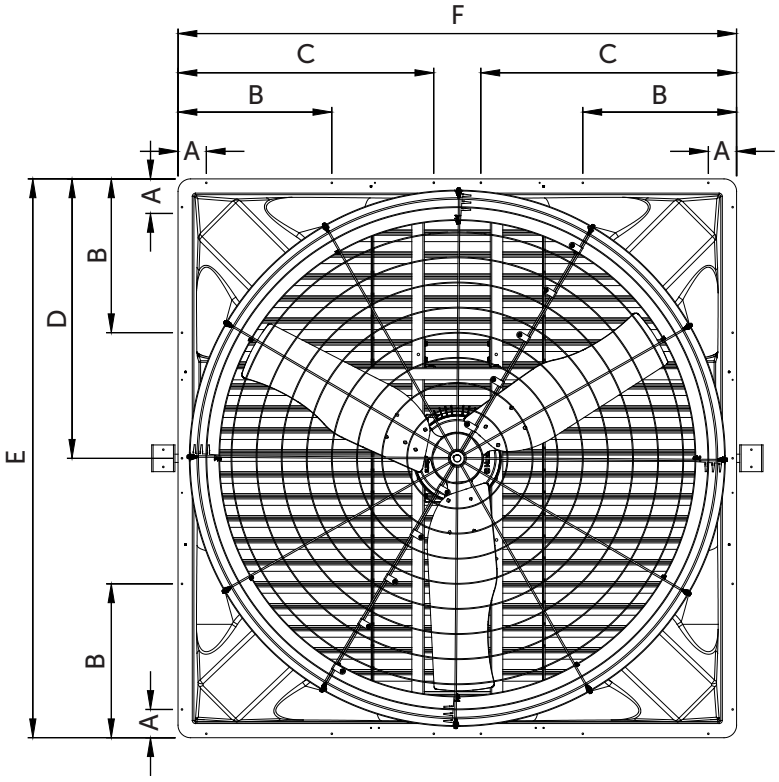
## 1.2 Fan Dimensions

### Fan Specifications:

Hertz: 60
Voltage: 460VAC
Phase: 3
Weight: 400 lbs. [182 Kg]




*SIDE VIEW*

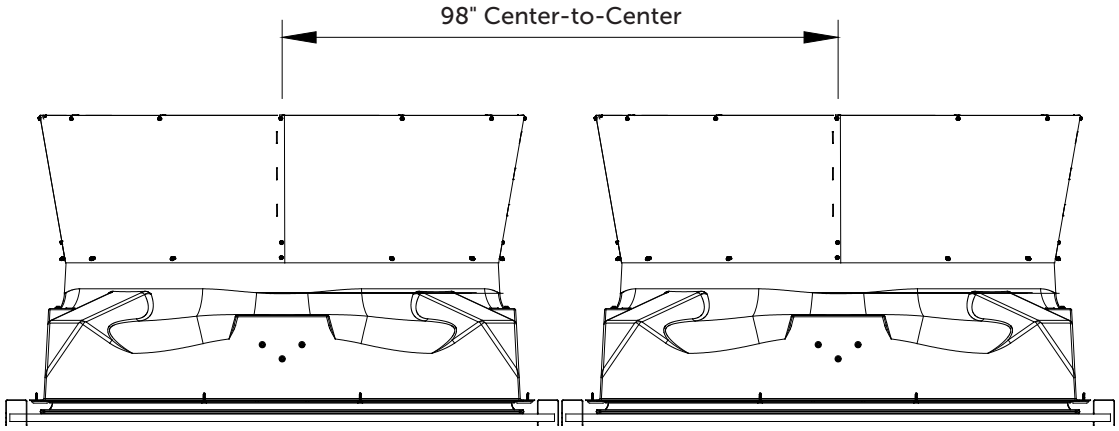



*FRONT VIEW*

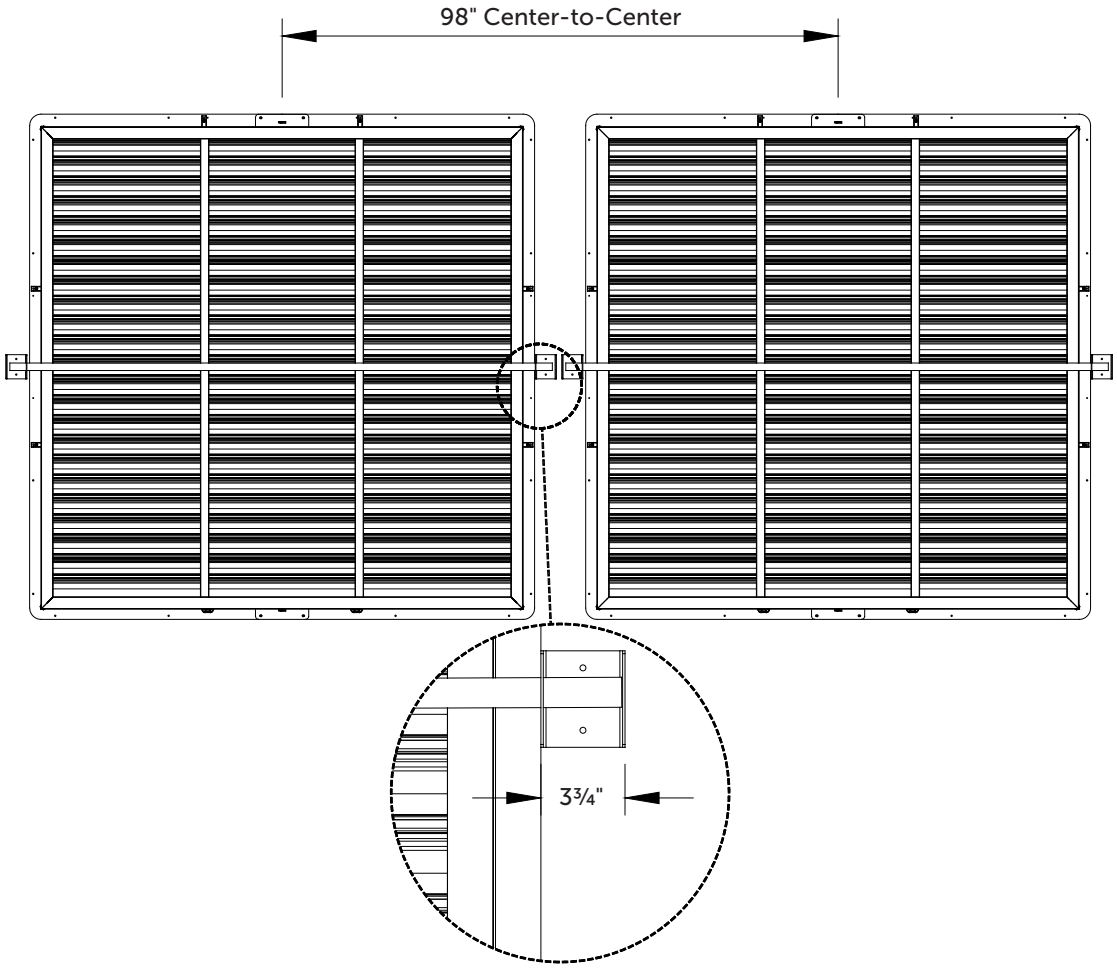
| FAN DIA. | A | B | C | D | E | F | G | H | J | K | L-Dia. | WALL OPENING (I.D., framed) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 74" | 4½" | 24½" | 40¾" | 44½" | 89" | 89" | 14⅞" | 25⅞" | 50⅛" | 2⁵⁄₁₆" | 85⅜" | 84½"W. | 84½"H. |

## 1.3A Recommended Fan Spacing

When determining fan spacing/fan layout, keep in mind that the fan requires 3¾" clearance for the Wind Kit Bracket to be installed. If the fans are to be installed side-by-side with the Wind Kit Brackets adjacent to each other, the minimum fan spacing is 98" Center-to-Center. *See Figure Below.*




**Top View**
*(Recommended Fan Spacing)*




**Elevation View**
*(Recommended Fan Spacing)*

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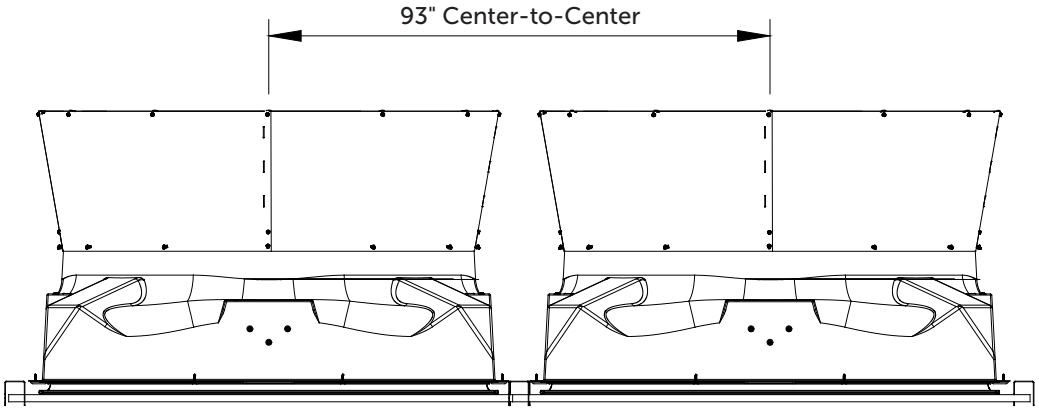
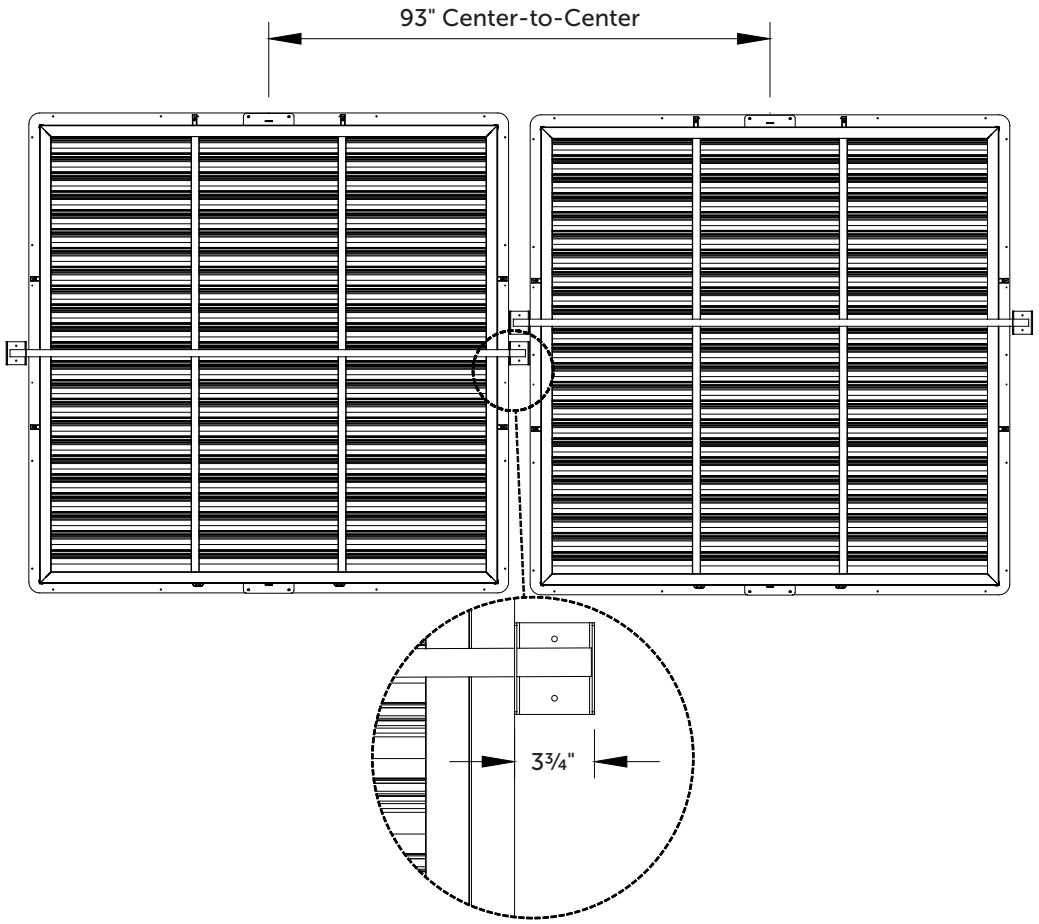
## 1.3B Minimum Fan Spacing (Optional)

If the fans are to be installed closer, then the Wind Kit Bracket for one fan should be offset 6" up or down from the previous fan, then the minimum fan spacing is 93" Center-to-Center. *See Figure Below.*




**Top View**




**Elevation View**

# Installation Instructions

# 2.

## 2.1 Installation

*Step 1*

Construct the framed opening to correct size according to the Chart on Page 5. The frame should be constructed of 4x4 Treated Posts or double 2x Treated Studs. 2 fans can fit between Columns that are 20'O.C., and 3 fans can fit between Columns that are 25' or 30' O.C. *See Figure 1A, 1B and 1C.*

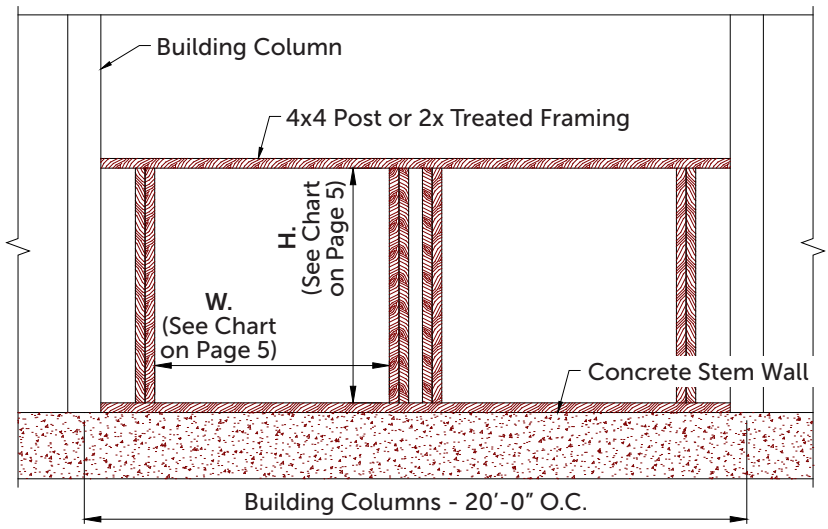



*Figure 1A*

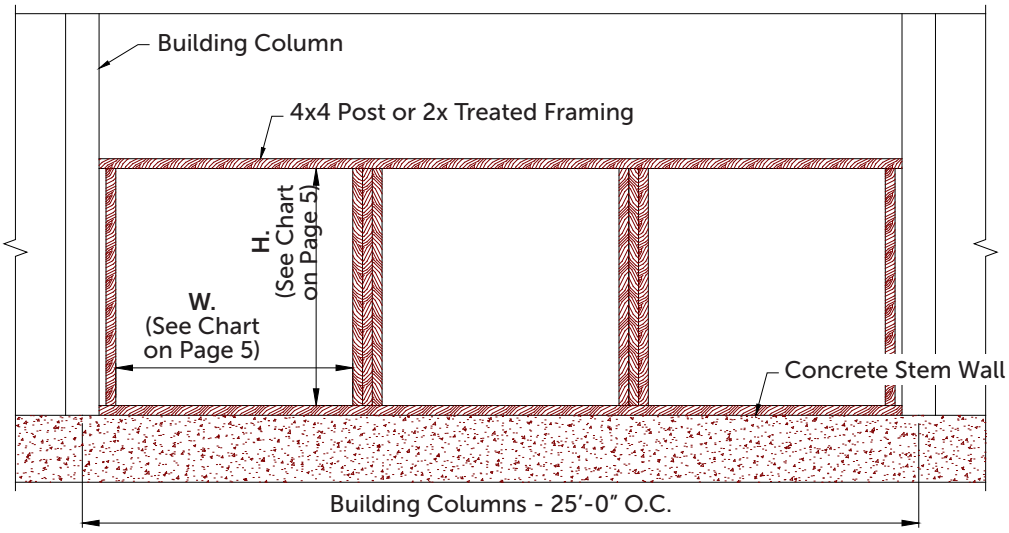



*Figure 1B*

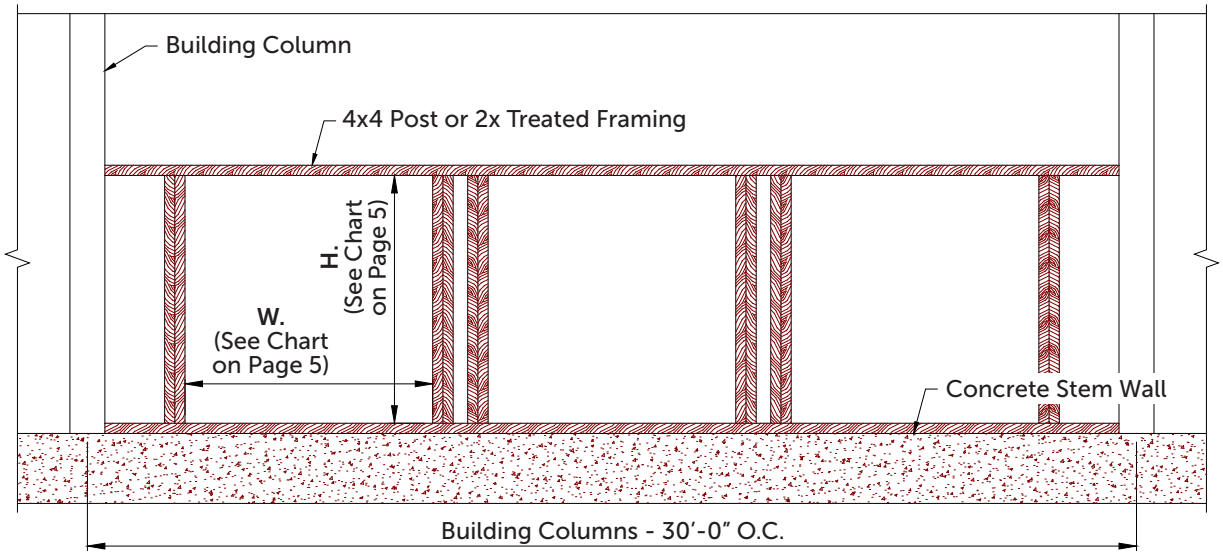



*Figure 1C*

*Step 3A*

Using the Center Support Strut, lift fan and insert into the framed opening from the inside. While holding fan tight to framing, fasten top of fan with (5) ¼" x 1.5"L. minimum Mounting Screw/Bolt (not provided). *See Figure 3A and 3B.* Next, fasten bottom of fan, then both sides with (5) ¼" x 1.5"L. minimum Mounting Screw/Bolt (not provided) per side. Install flashing around opening tight to fan and caulk around fan to seal.

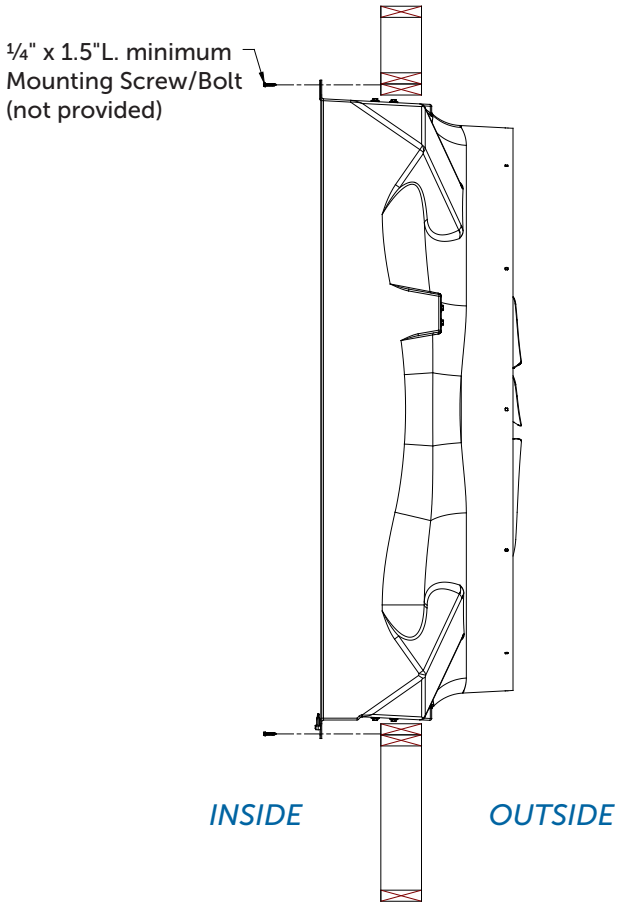



*Figure 3A*

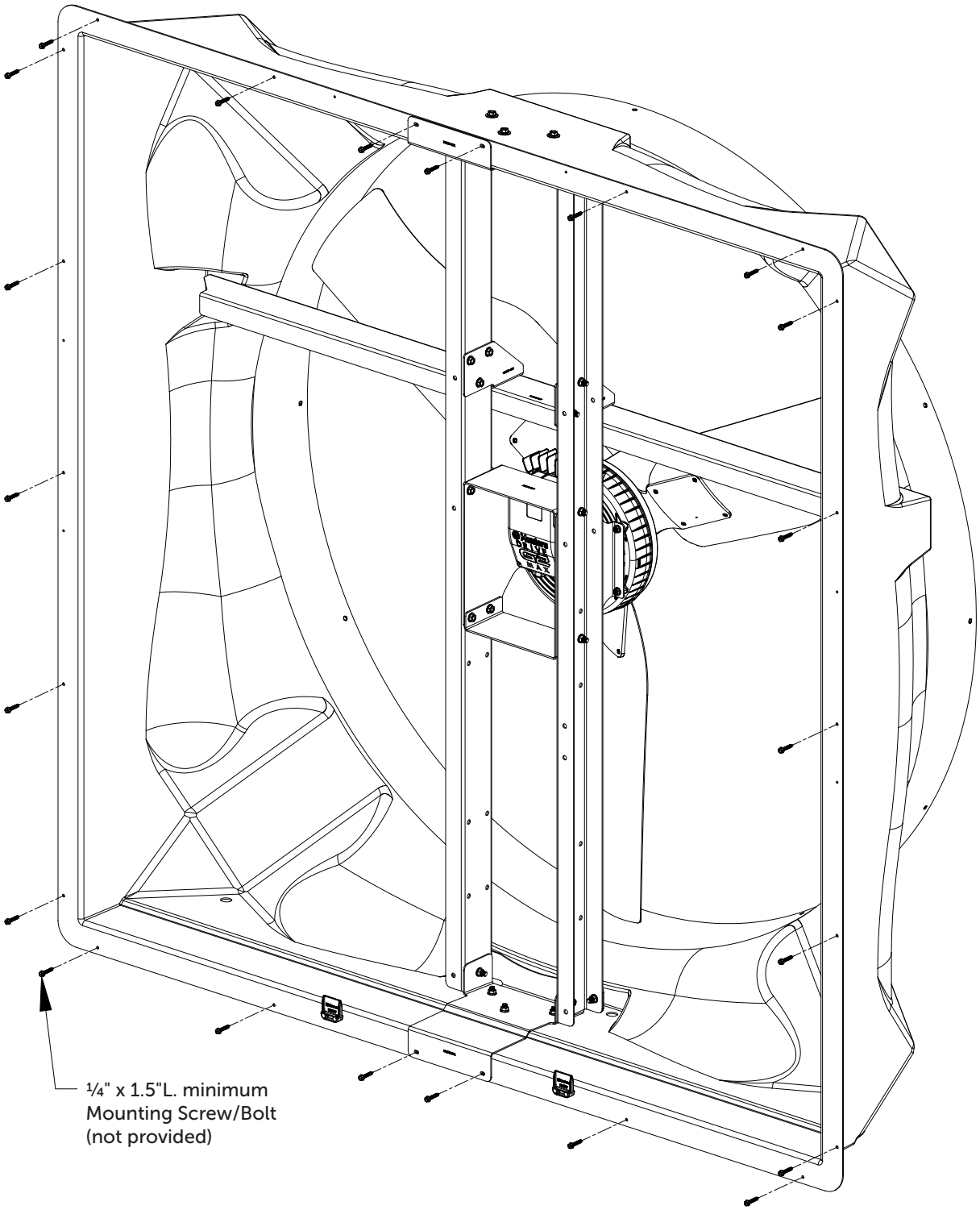



*Figure 3B*

*Step 3B*

If fan needs to be mounted, so that shutter does not stick into building then frame fan as shown in *Figure 3C.* Top and sides require 4" minimum and bottom requires 2" minimum.

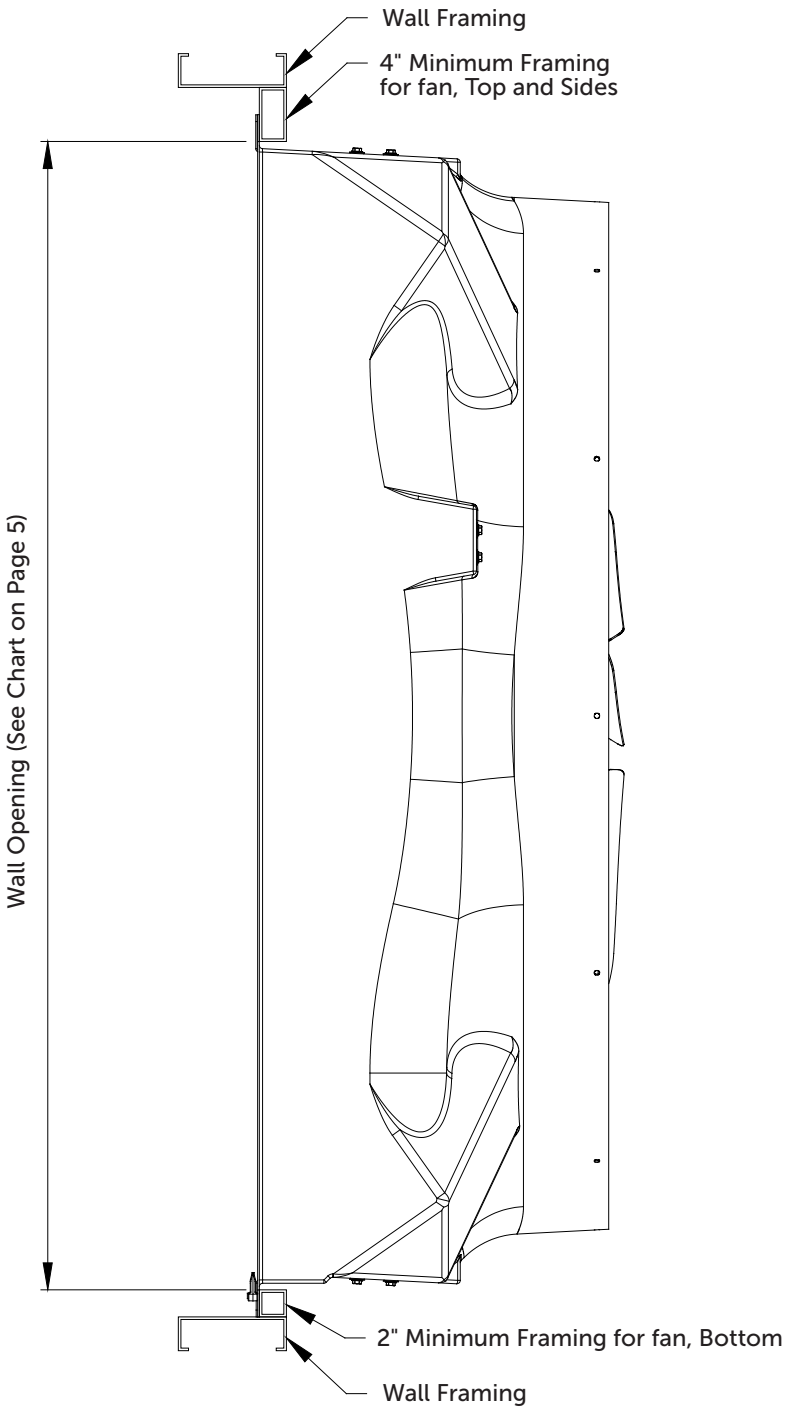



*Figure 3C*

## 2.2 Cone Installation

### *Step 4*

Place all 4 cone sections on a flat surface with tabs from one facing slots of the next. *See Figure 4A.* Curl up tab end of first cone section and insert tabs up into slots in the next cone section. A mallet may be needed to seat slots over tabs completely. *See Figure 4B.* Repeat this step until all 4 cone sections are connected and laying flat.

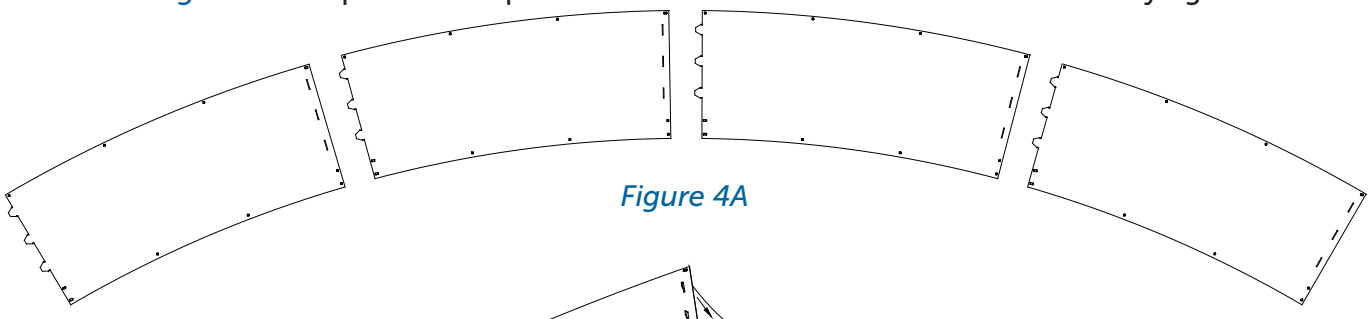


*Figure 4A*

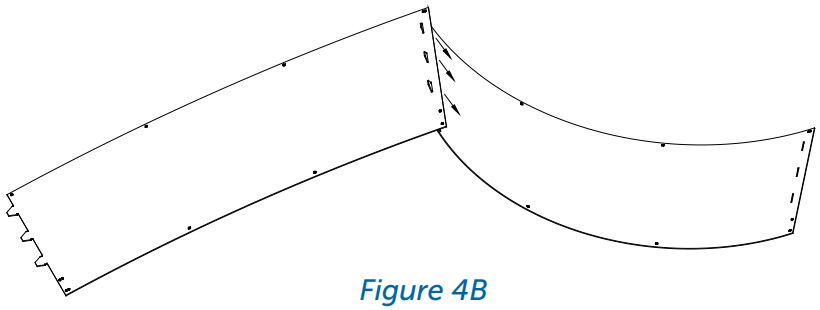


*Figure 4B*

### *Step 5*

Fasten each of the joints in the single outer hole using (1) Bolt [A] and Nut [B], with the nut on the side with the tabs. At the inner pair of holes of each joint fasten using (1) Bolt [A] and Nut [B] with the bolt head on the side with the tabs. *See Figure 5.*

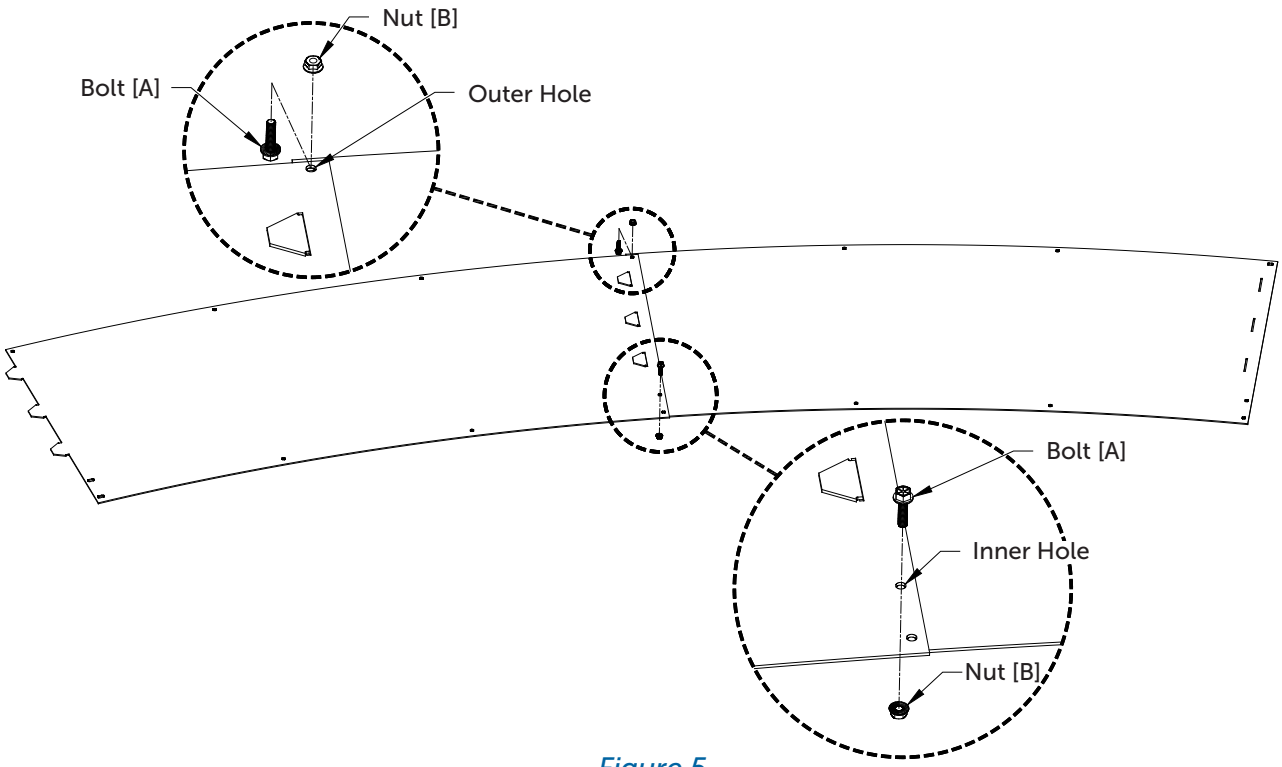



*Figure 5*

*Step 6*

Stand cone sections on end and curl ends around to form cone so that the nuts are outside and tabs on inside. Insert remaining tabs into slots so tabs are inside cone and fasten final joint using (1) Bolt [A] and Nut [B], with nut on inside of cone. At the inner pair of holes fasten using (1) Bolt [A] and Nut [B] with bolt head on inside of cone. *See Figure 6.* Leave all bolts and nuts loose at this time.

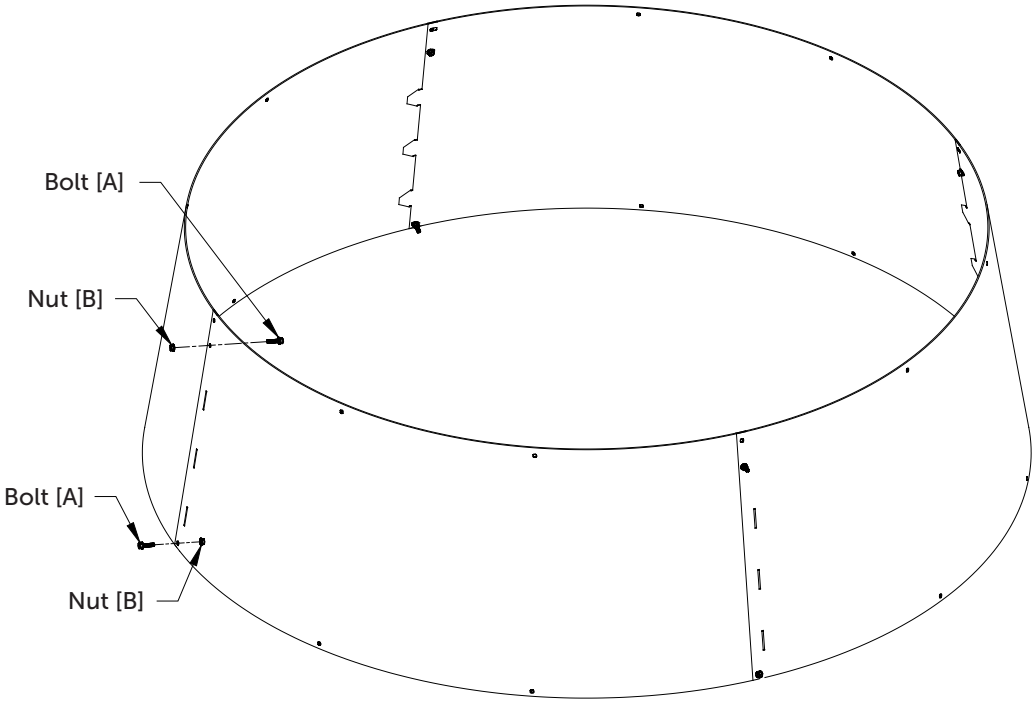



*Figure 6*

*Step 7*

Insert (1) Bolt [A] and Washer [C] in the top hole of the orifice with the bolt head on the inside of the orifice and secure in place using (1) Retainer Clip [G]. *See Figure 7.*

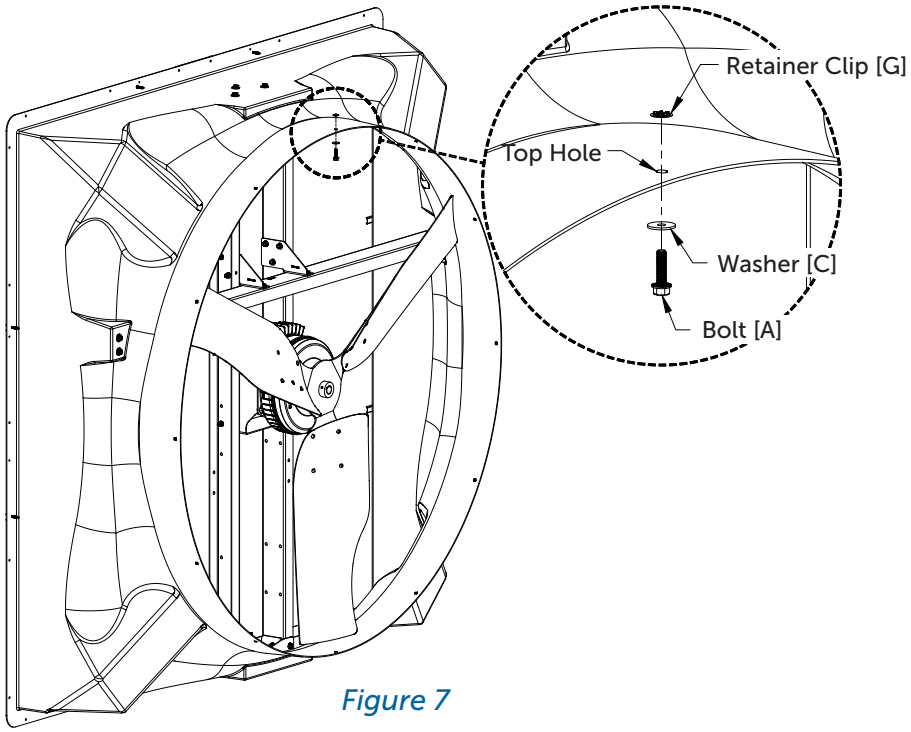



*Figure 7*

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*Step 8*

Install cone onto fan by putting the top of cone over top of fan orifice. The outer hole in the top of the cone should slide down over the bolt in the top of the orifice. *See Figure 8.*

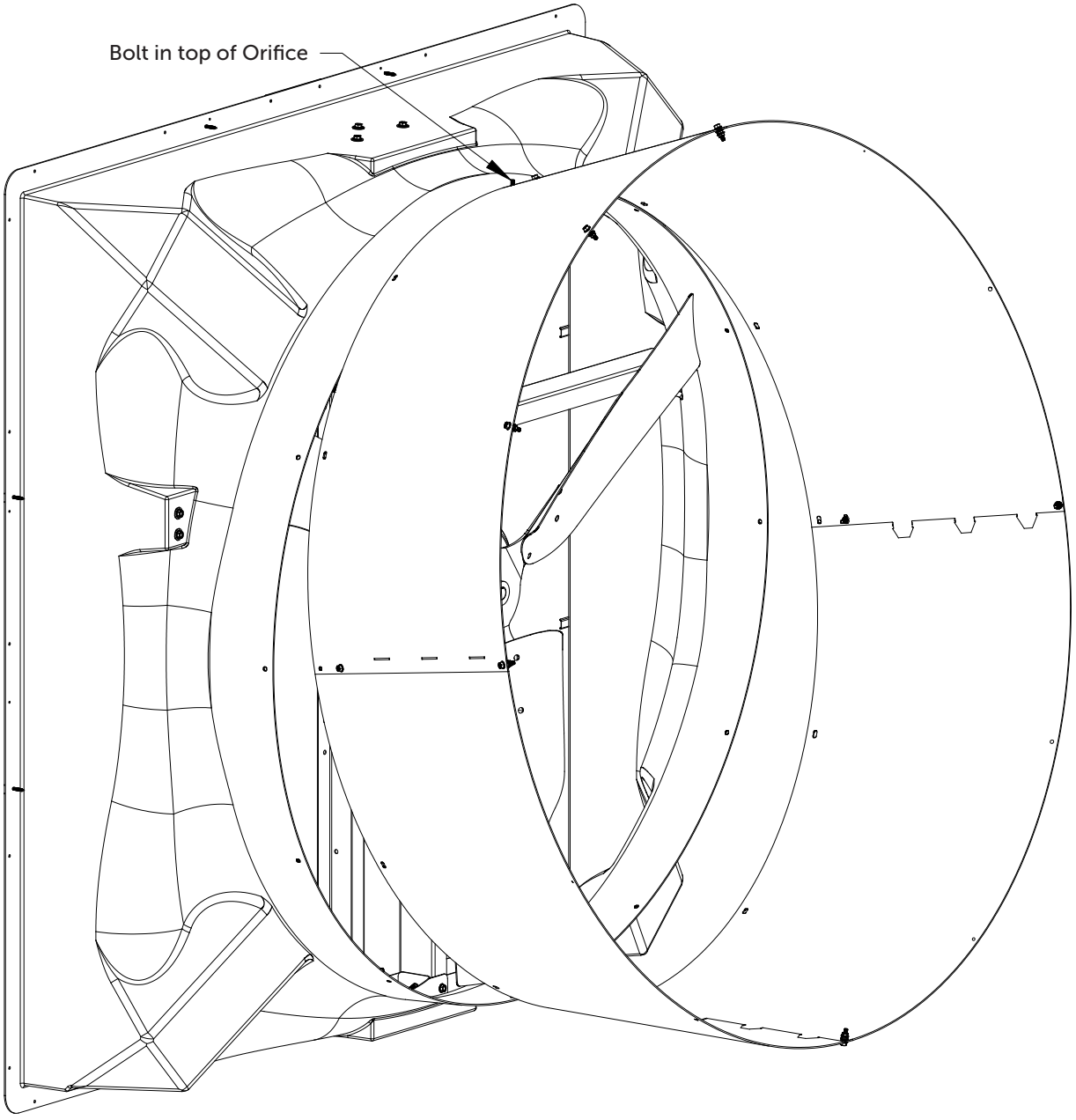


*Figure 8*

*Step 9*

Slide the rest of the cone over the rest of the orifice. Fasten cone to fan orifice using (11) Bolt [A], Washer [C] and (12) Nut [B] with bolt and washer on inside of fan orifice and nut on outside of cone. *See Figure 9.* Tighten all cone bolts at this time.

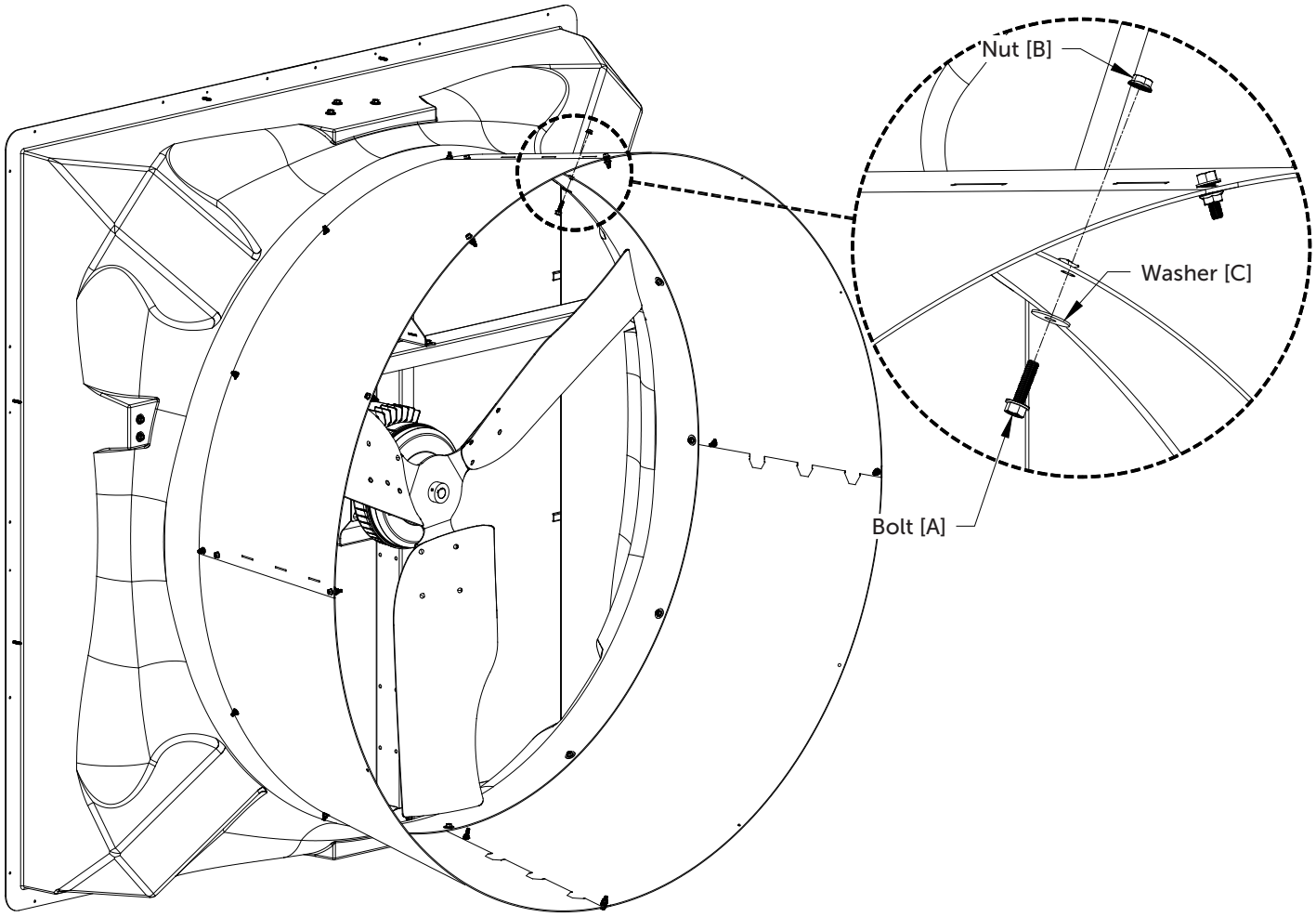


*Figure 9*

*Step 10*

Find the 2 Guard Sections and with all the eyelets facing the same direction, slide the guard tabs over the center guard wire and fasten the 2 guard sections with (1) Bolt [A] and Nut [B] in each tab. *See Figure 10.*

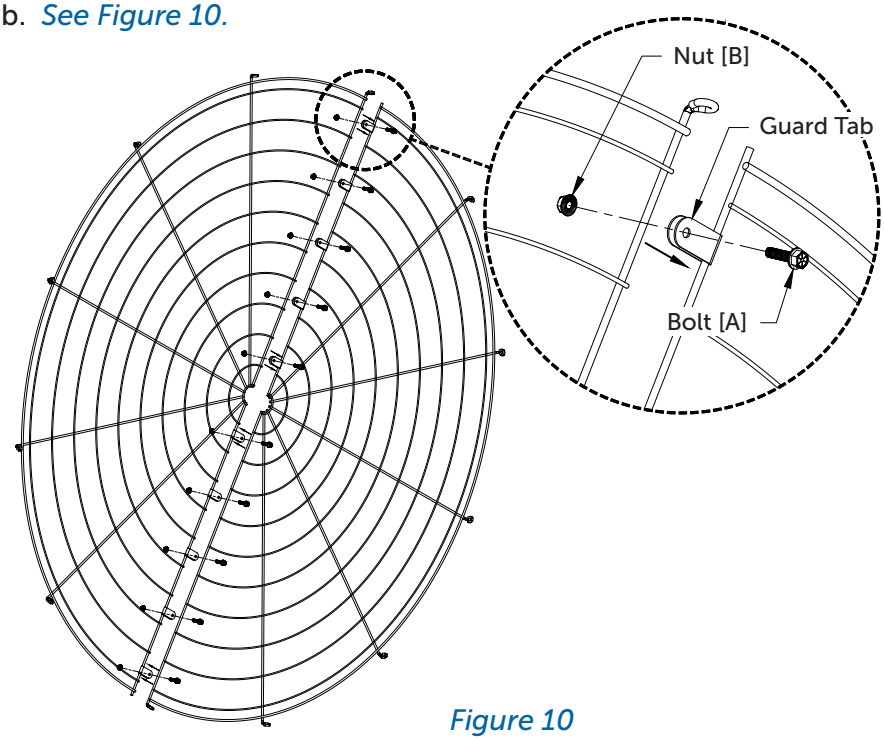


*Figure 10*

*Step 11*

Insert guard into cone with the eyelets facing you. Install eyelets over (4) Bolts already installed at joints in cone and fasten with Nut [B]. Secure (8) remaining eyelets using Bolt [A] and Nut [B]. *See Figure 11.*

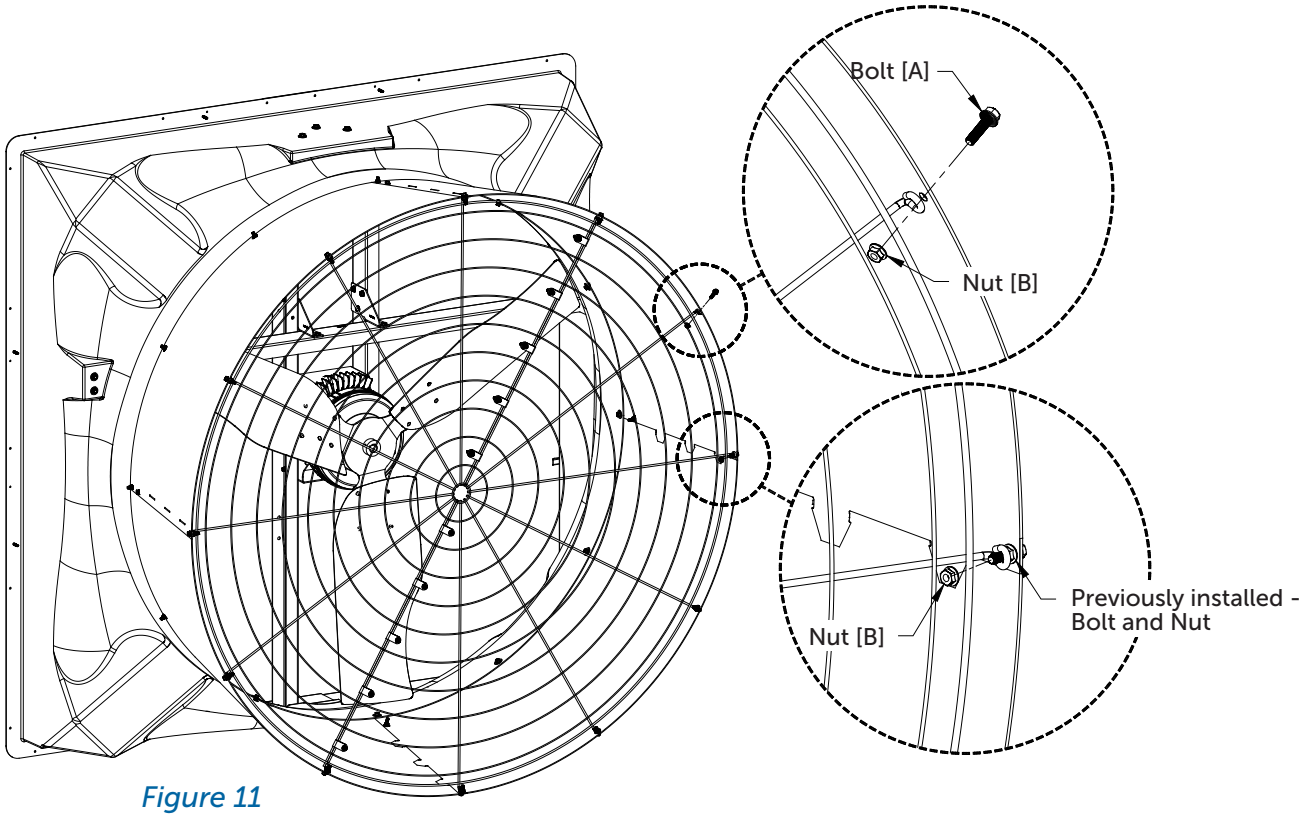


*Figure 11*

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## 2.3 PT Shutter Installation

*Step 12*

Install (6) End Pivoting Shutter Clips [F] at the pre-drilled shutter clip holes in the flange using (1) Lag Screw [D] and Washer [E]. The Washer should be mounted between the Shutter Clip and the flange. *See Figure 12.*

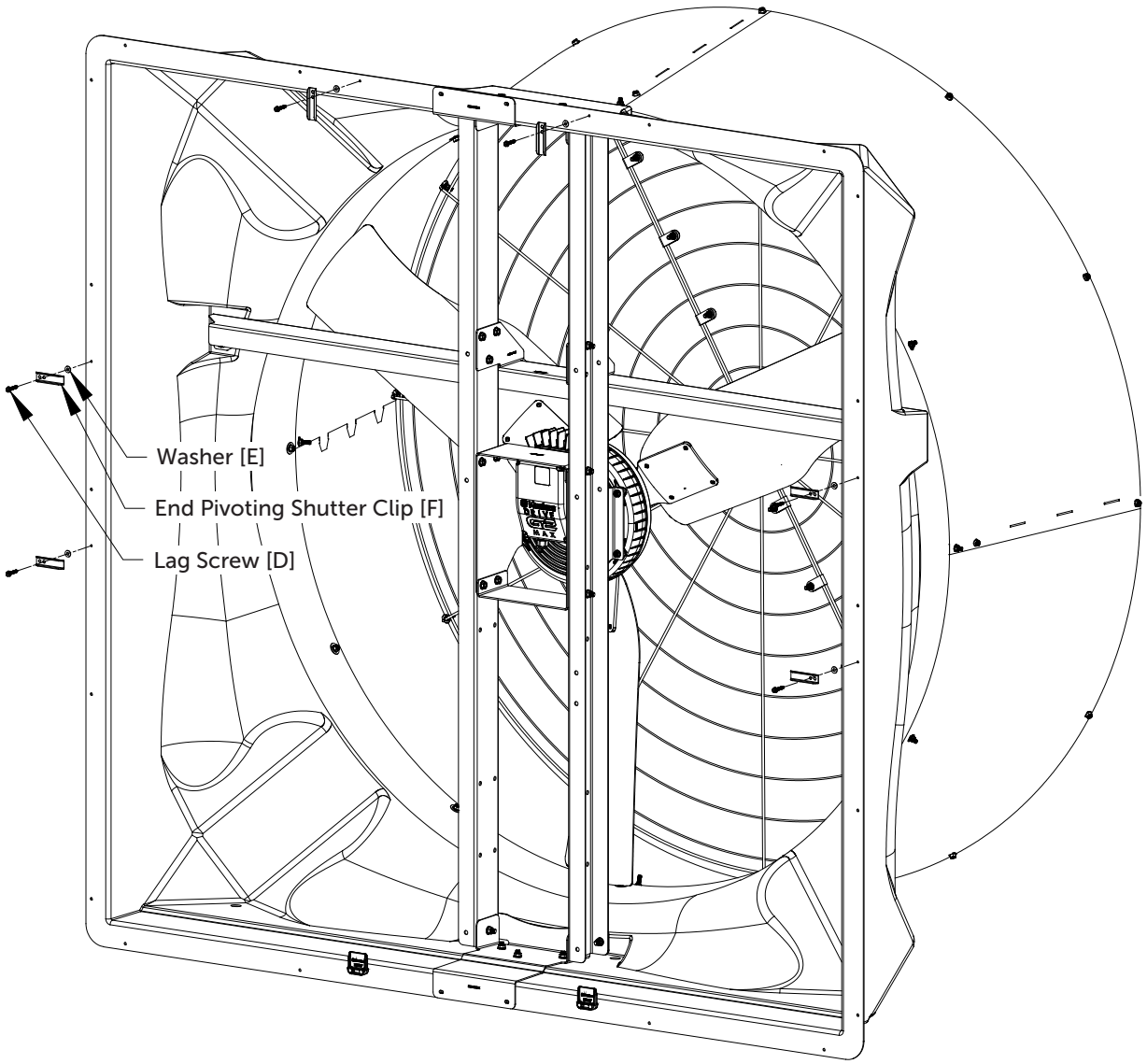


*Figure 12*

*Step 13A*

Insert PT Shutter into fan by sliding the bottom flange of shutter into bottom shutter clips and pressing shutter inward. *See Figure 13A.*

**Note:**

PT Shutter extends into room 2 5/16" from back of fan.

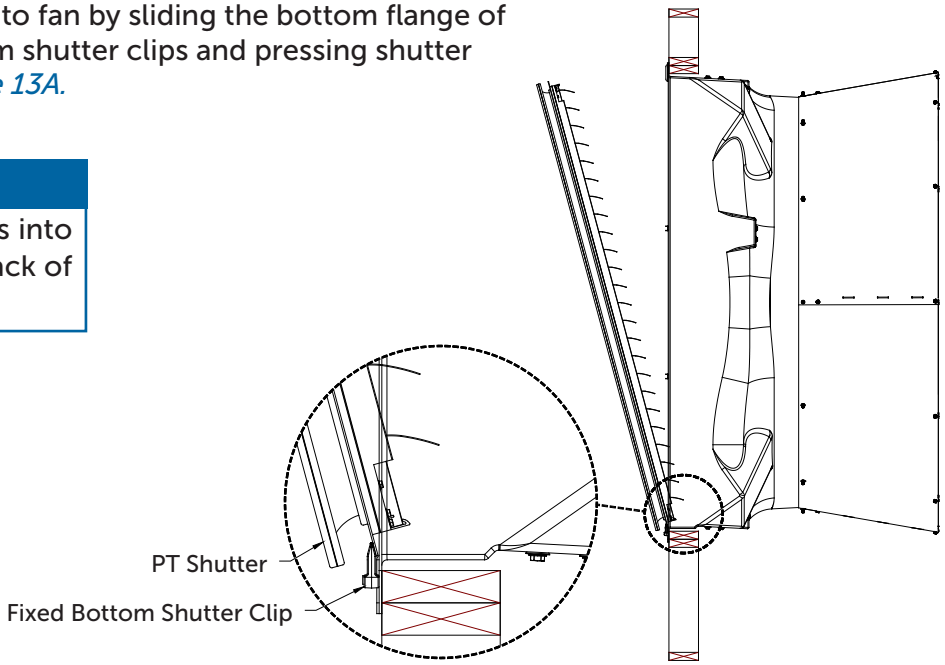


*Figure 13A*

*Step 13B*

Fasten shutter in place by rotating the side and top shutter clips over the shutter flanges. *See Figure 13B.*

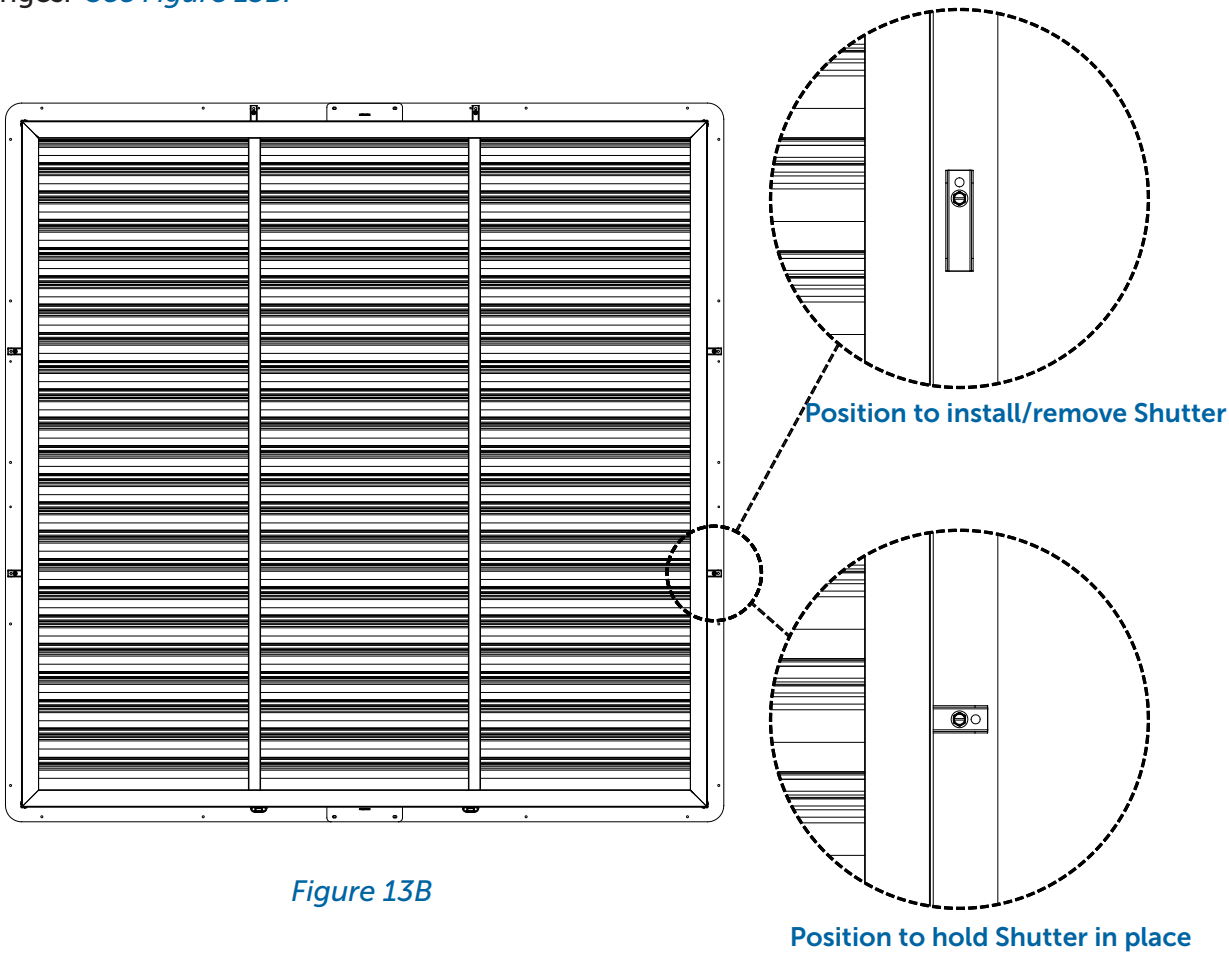


*Figure 13B*

## 2.4 Shutter Wind Kit Installation

*Step 14*

Mount one Wind Kit Bracket on each side of fan, 3'-6" above the bottom flange of fan. The opening in the 'U' slot should be facing up and each Bracket should be mounted in same direction. *See Figure 14A.* Fasten Brackets in place using (2) Lag Screws (not provided). *See Figure 14B.*

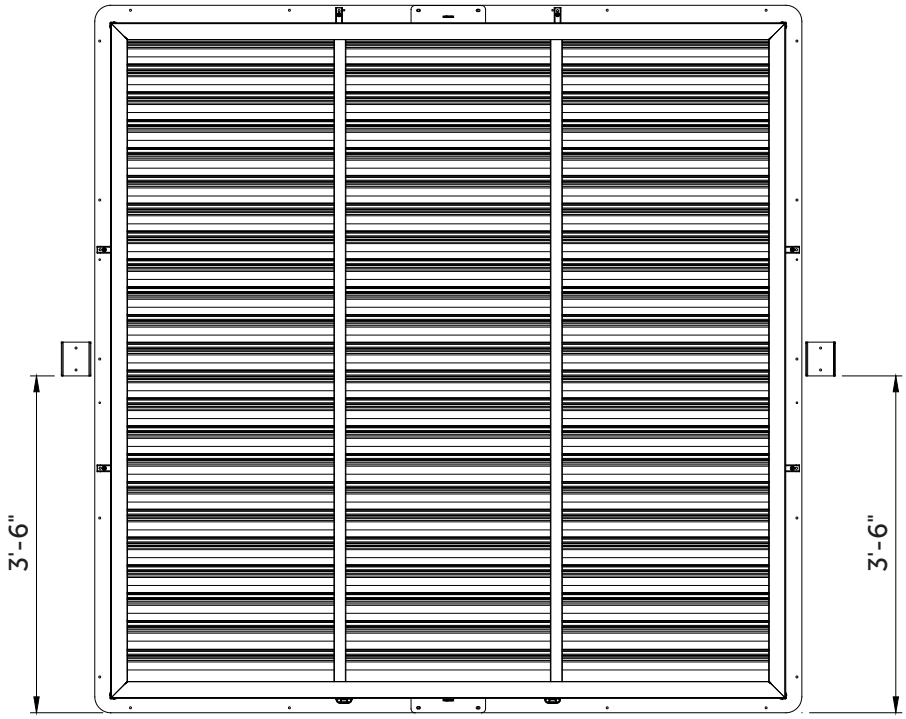


*Figure 14A*

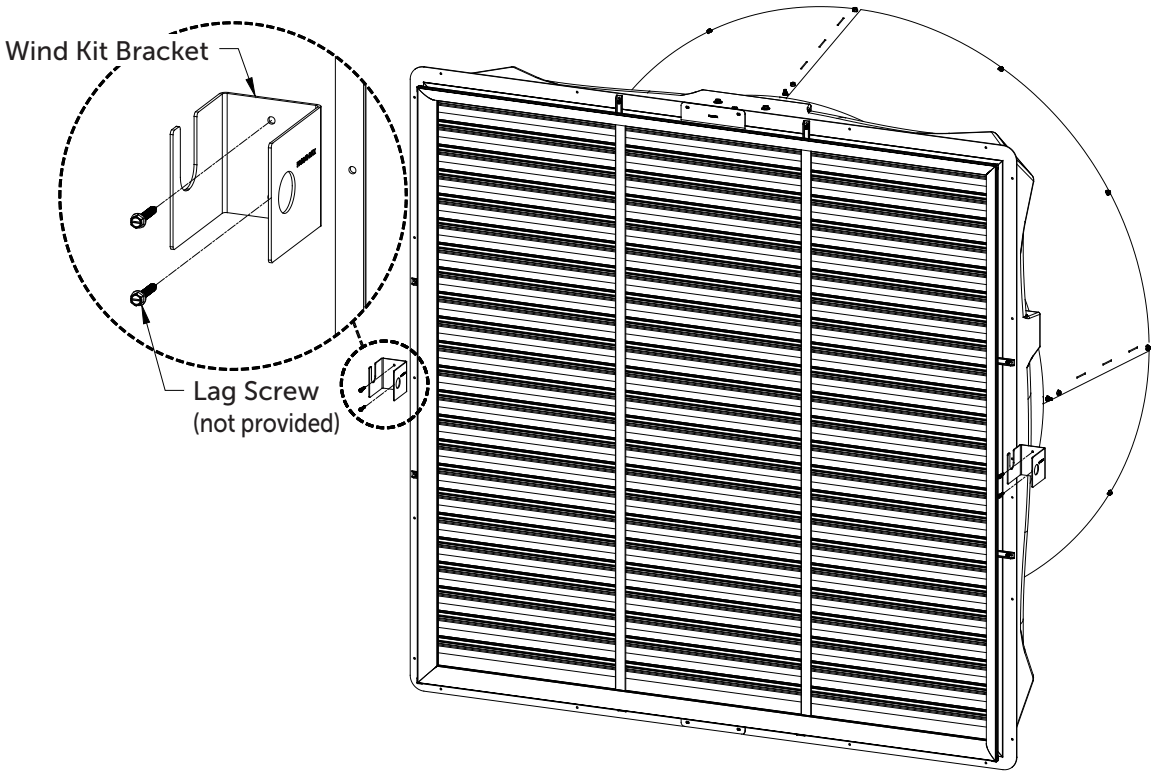


*Figure 14B*

*Step 15*

Slide the Wind Kit Pipe into the hole in the Left Wind Kit Bracket until it stops at the other side of the Bracket and set Pipe down into slot in opposite Bracket. *See Figure 15A.* For the completed Wind Kit installation *See Figure 15B.*

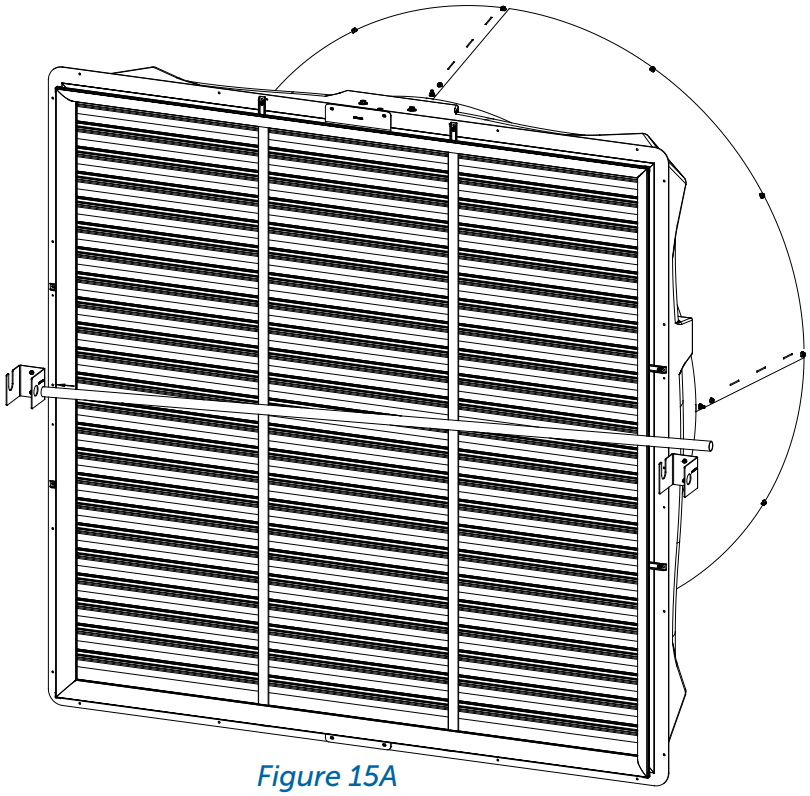

*Figure 15A*

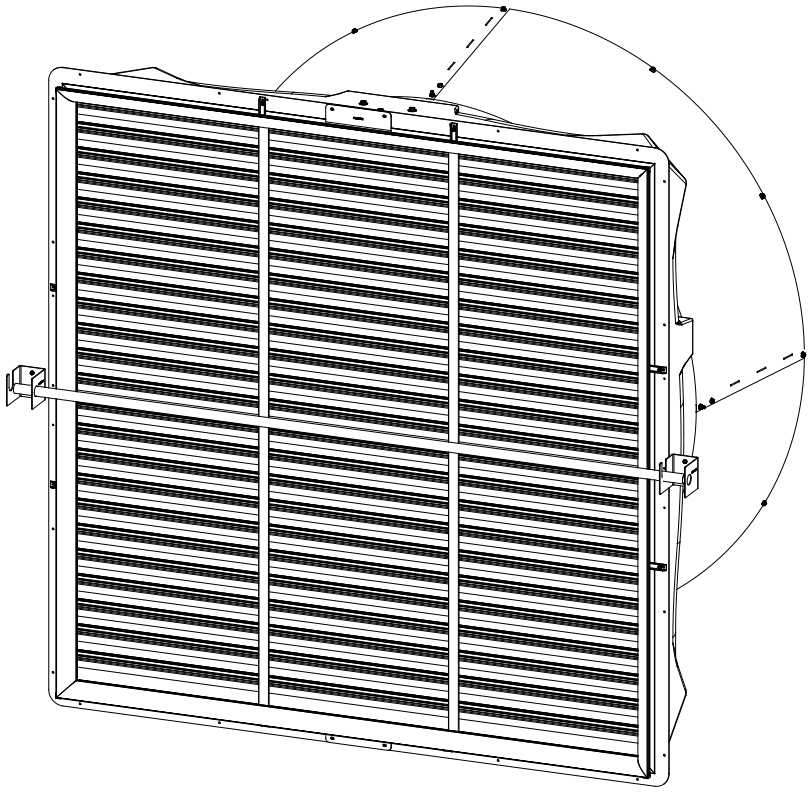

*Figure 15B*

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# Electrical Wiring

# 3.


All wiring should be installed in accordance with National, State, and Local electrical codes. Fans used to ventilate livestock buildings or other rooms where continuous air movement is essential should be connected to individual electrical circuits, with a minimum of two circuits per room. For electrical connection requirements, refer to diagram on motor nameplate and to information enclosed with the Munters environmental control to be used. After wiring check for proper motor rotation.

***Three Phase Fans:*** motor overload protection should be provided for each fan. A three-pole motor starter or slow blow motor fuses must be used. *See Figure 16.*

**NOTE:** A safety cut-off switch should be located adjacent to each fan.

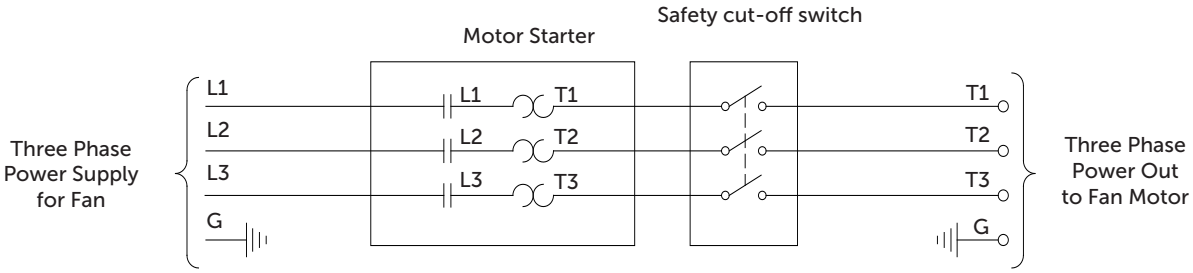



*Figure 16*
*Three Phase - Motor Overload Protection with Disconnect*

*KEY:*
L1=Line 1
L2=Line 2
L3=Line 3
G=Ground

## 3.1 Recommended Wire Routing:

As the power cable exits the Munters Drive Box form a drip loop and then run power cable down along strut and "Zip" tie the cable to strut to prevent cable from getting tangled in the propeller. *See Figure 17.* Then run the cable out of fan to circuit breaker or control panel. (Continued on next page).

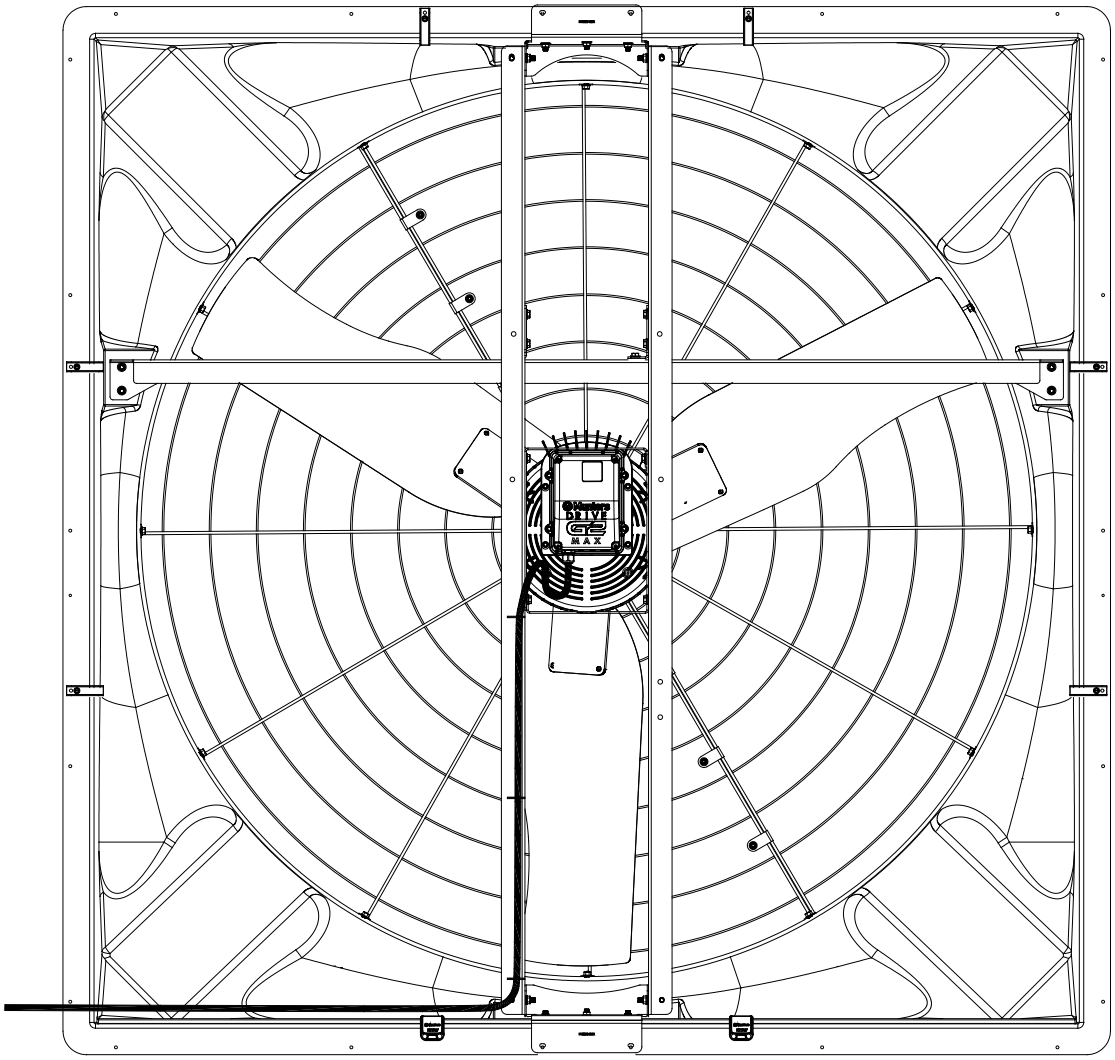
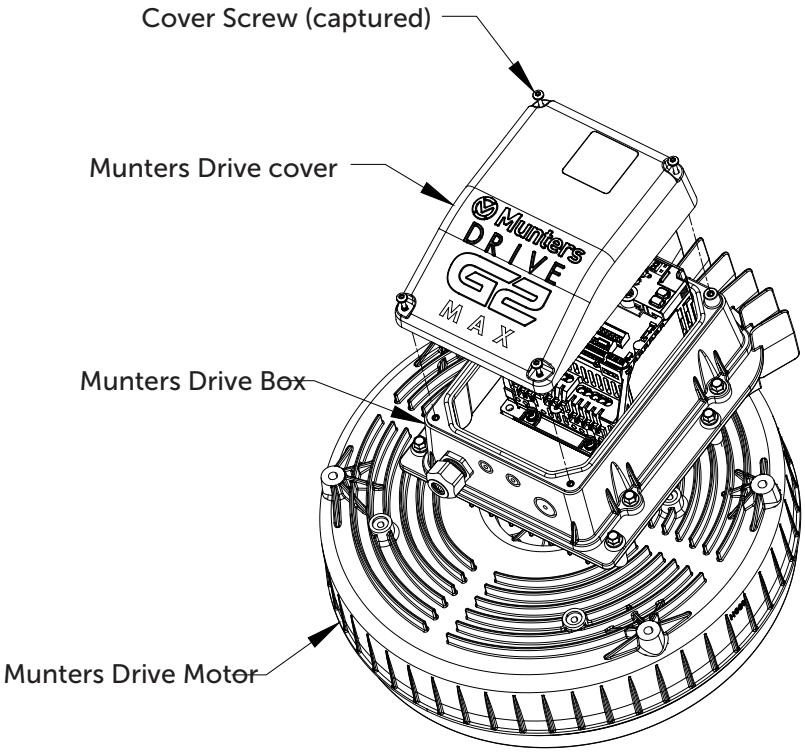


*Figure 17*

WARNING: Fan is designed to be operated with shutter in place. Do not apply power to fan without shutter being installed.

## 3.2 Three Phase Power connection:

All cables that enter the Munter Drive box must enter through a properly sized watertight fitting. Loosen the (4) screws in the cover of the Munters Drive box to access the terminals inside to connect power and other cables. *See Figure 18A.* Run the 3 phase power cable through watertight fitting into the Munters Drive box and connect to the terminals "R/L1, S/L2, T/L3" and Ground in the box. *See Figure 18B.* The Munters Drive is prewired to the Motor.




**⚠ WARNING**

High Voltage, disconnect power before servicing.

*****WARNING*****

Only the Cover of the Blue Box is designed to be removed. It has captured screws that remain in the cover. The Base of Blue Box and Heat Sink must not be removed from back of motor. Removing Base or Heat Sink from motor will void the warranty. Any water or other damage to the controller will not be covered if the either is removed.

*Figure 18A*

****NOTE**460V, 3 Ph**

Power to the Drive must be within -4%, +8% of nominal voltage.
**Munters Recommended;**
Absolute Minimum Voltage = 440V
Absolute Maximum Voltage = 500V

Munters Recommends Line to Line Voltage Unbalance to be 1% or less per NEMA MG-1-1998. Absolute maximum unbalance is 1.5%.

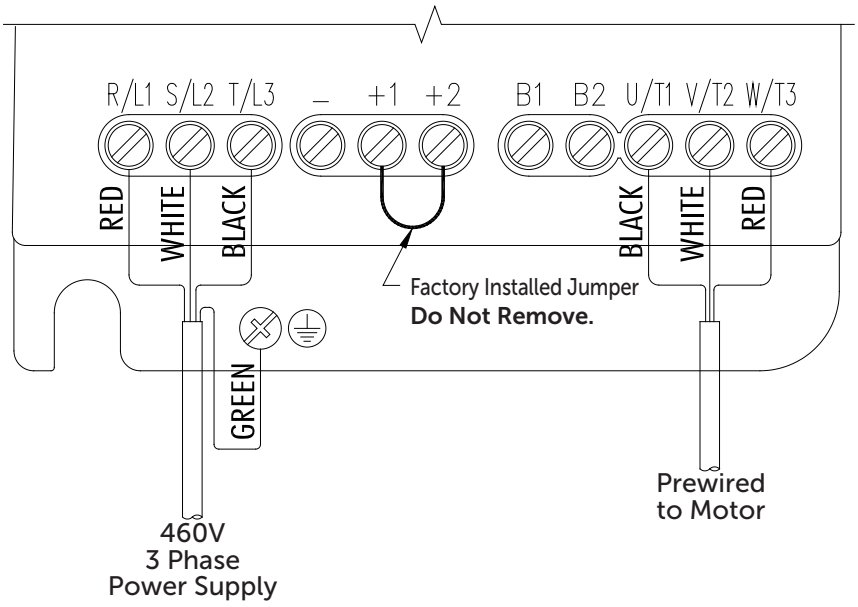



*Figure 18B*

## 3.3 Fan Operation with No Control

To operate the fan continuously with no control, provide a Jumper wires between terminals 'S1' and 'SN'. *See Figure 19.* Do not remove the Factory Installed Jumpers.

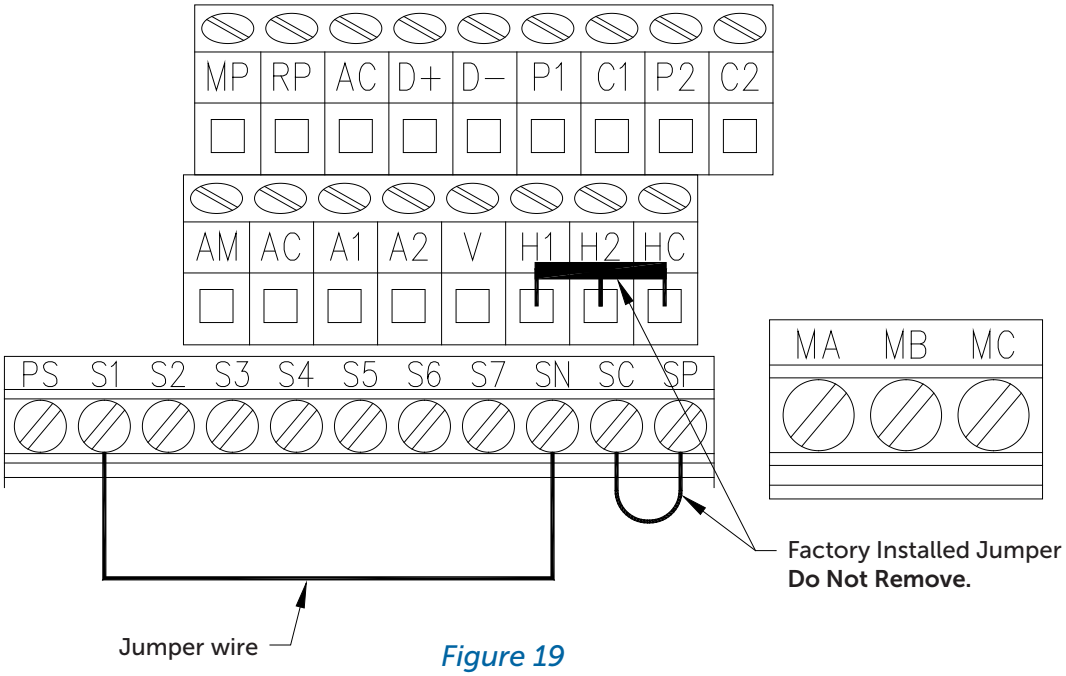



*Figure 19*

## 3.4 Fan Operation On/Off with Control

To operate the fan On/Off with a control, wire an 'ON' command from the'SN' terminal to the input relay in the control and from the output of the control relay to the 'S1' terminal. *See Figure 20.* Do not remove the Factory Installed Jumpers.

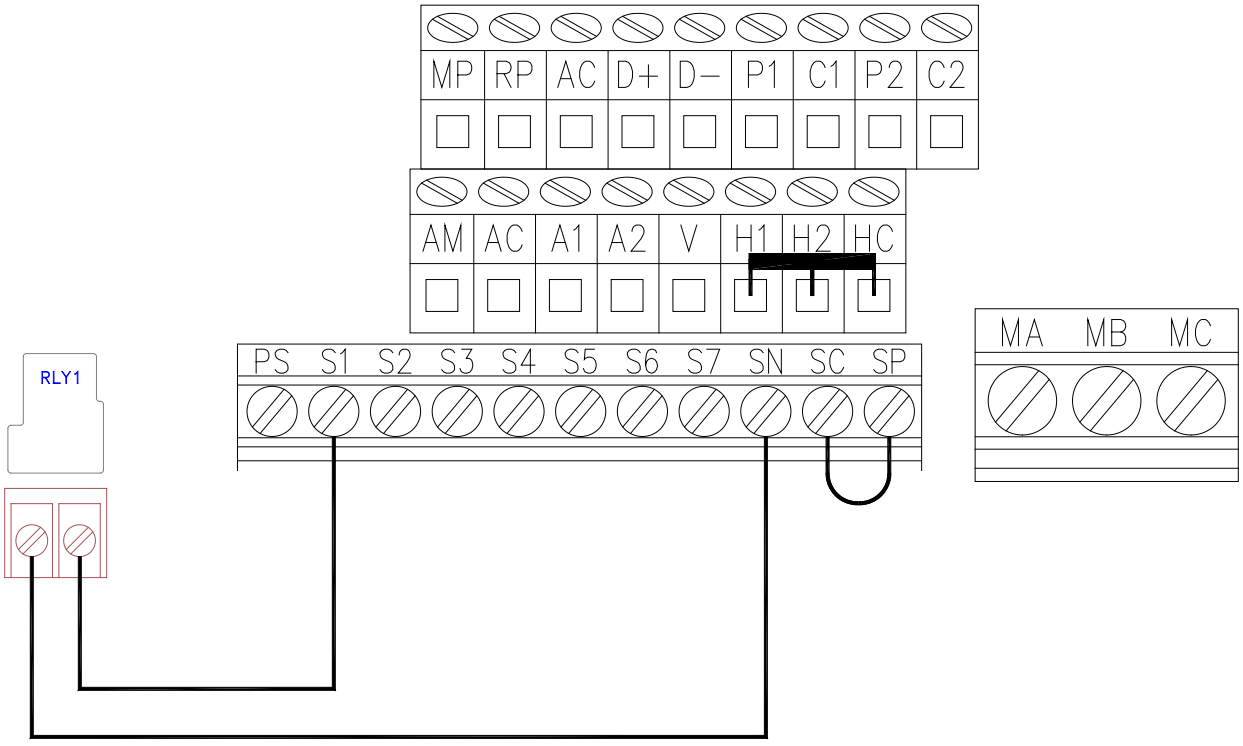



*Figure 20*

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## 3.5 Fan Operation Off/Low/High

To operate the fan Off/Low/High with a control, connect a wire from 'SN' terminal to the input side of the 'ON' relay in the control, then install a jumper from the input side of the 'ON' relay to the input side of the 'LOW' relay in the control. Then connect a wire from 'S1' terminal to the output side of the 'ON' relay and then connect a wire from the 'S7' terminal to the ouput side of the 'LOW' relay. *See Figure 21.* Do not remove the Factory Installed Jumper.

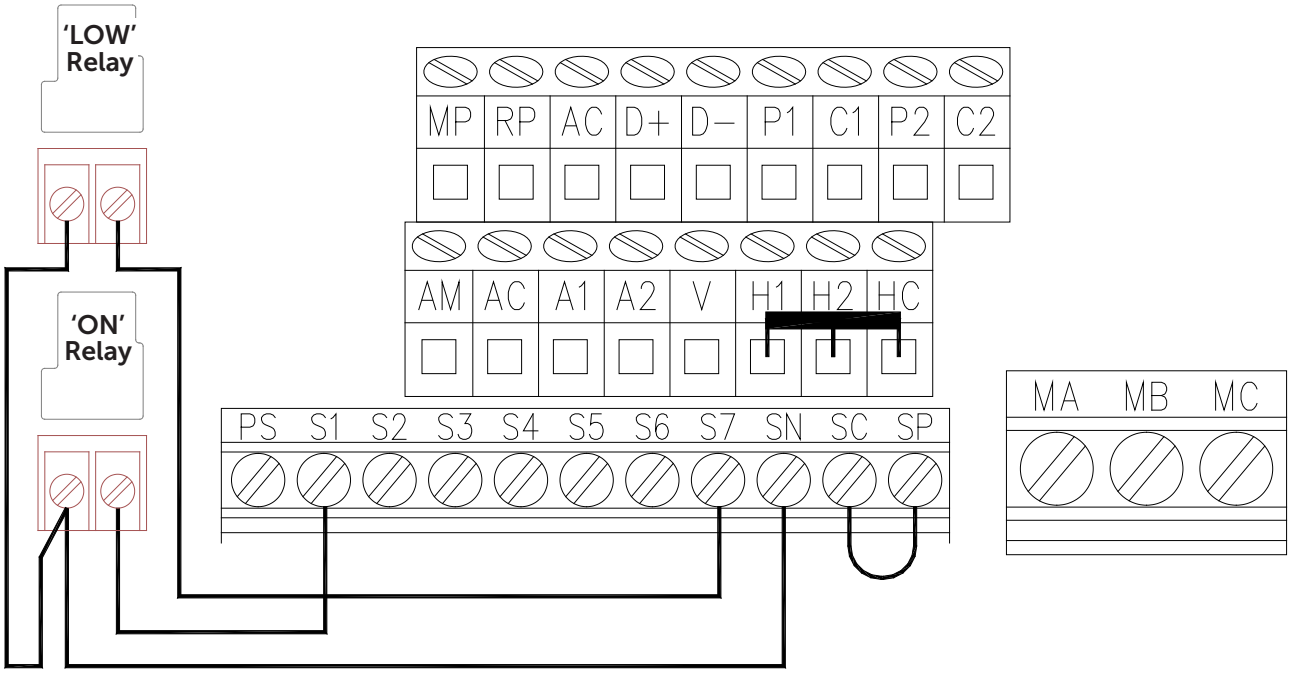


*Figure 21*

## 3.6 Fan Operation Off/Variable with 10-0V Signal

To operate the fan Off/Variable with a 10-0V Signal, wire an 'ON' command from the'SN' terminal to the input relay in the control and from the output of the control relay to the 'S1' terminal. Then connect wires from the 10-0V output in the control to the 'A1' and 'AC' terminals in the Munters Drive Box. The '+' output in the control shoud go to 'A1' and the ' - ' output should go to 'AC'. *See Figure 22.* Do not remove the Factory Installed Jumpers.

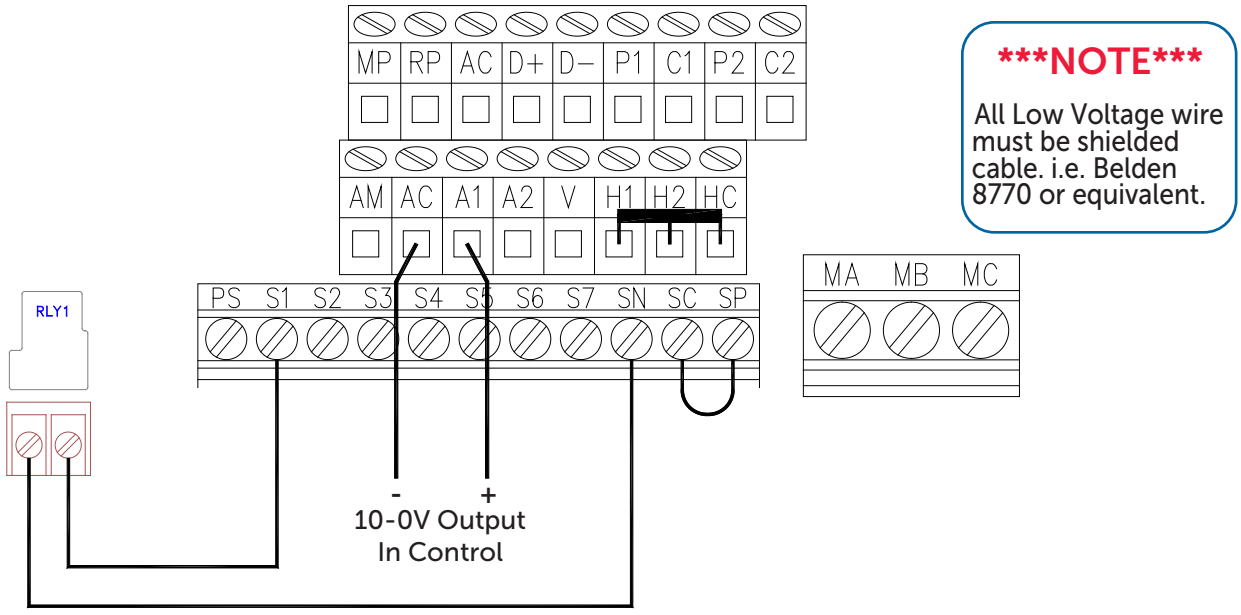


*Figure 22*

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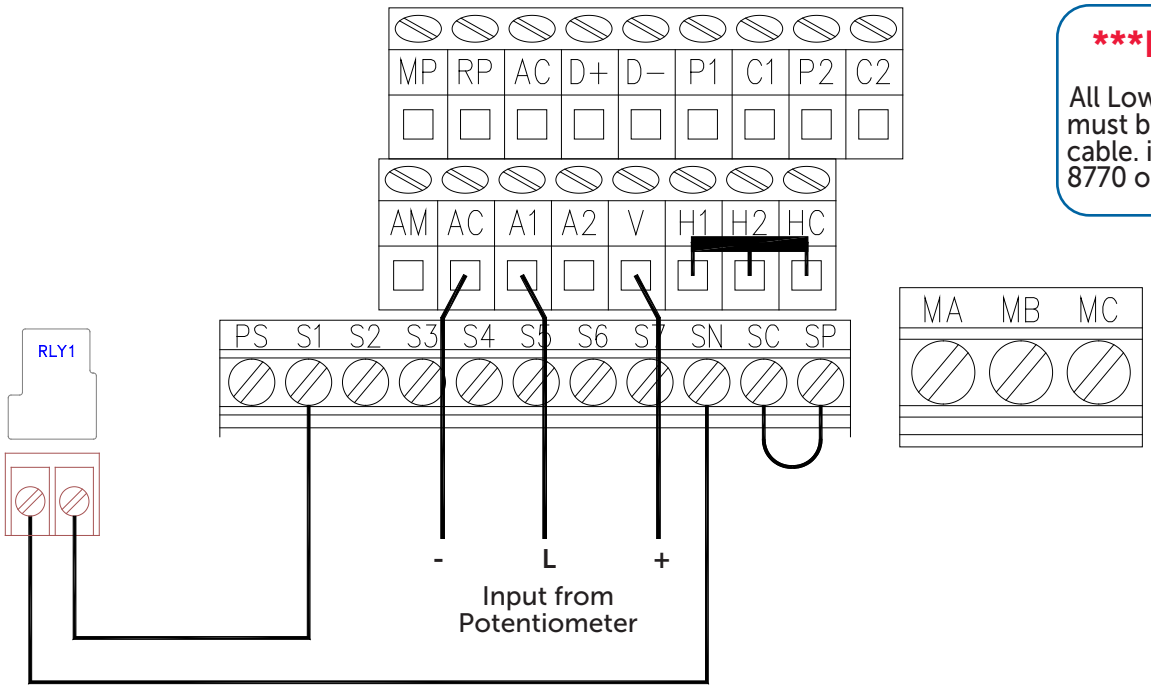
## 3.7 Fan Operation Off/Variable with Potentiometer

To operate the fan Off/Variable with a signal from a potemtiometer, wire an 'ON' command from the'S1' terminal to the input relay in the control and from the output of the control relay to the 'SN' terminal. Then connect wires from the Potentiometer as follows, connect ' - ' to 'AC', connect 'L' to 'A1' and connect '+' to 'V'. *See Figure 23.* Do not remove the Factory Installed Jumpers.




***NOTE***

All Low Voltage wire must be shielded cable. i.e. Belden 8770 or equivalent.

*Figure 23*

## 3.8 Alarm Connections

The Munters Drive uses a Normally Closed circuit for alarm connections. To connect a control to the Normally Closed output make appropriate connecions from the control to 'MB' and 'MC' terminals. *See Figure 24.* Do not remove the Factory Installed Jumpers.

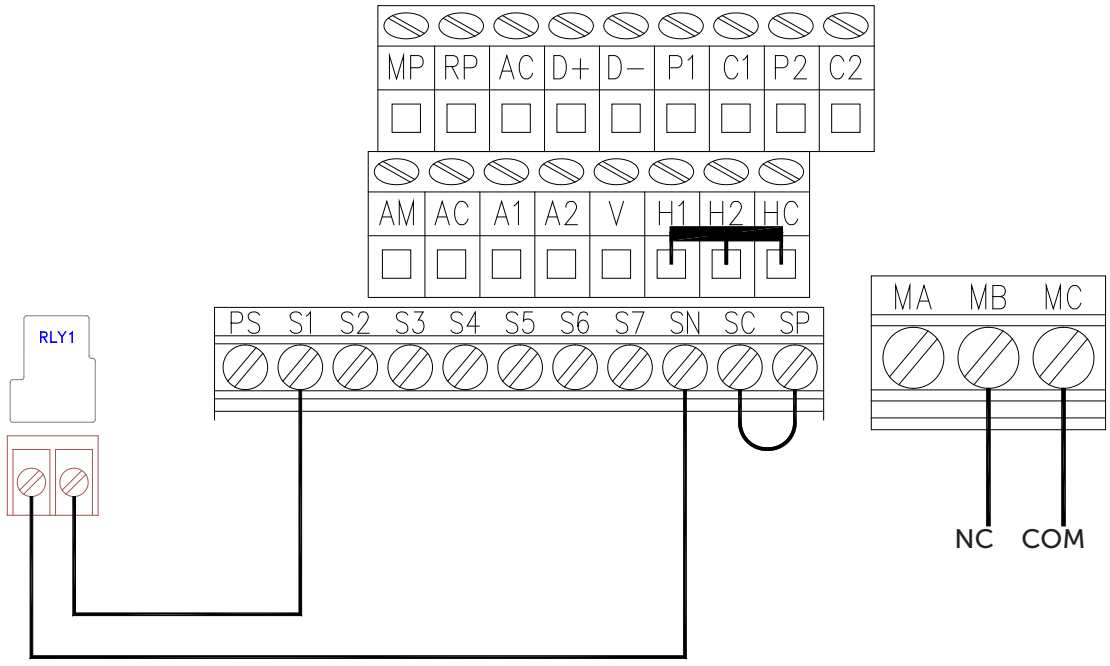



*Figure 24*

# Operation and Maintenance

# 4.

## 4.1 Operation


1) *INITIAL START-UP:* With electrical power off, verify that the fan propeller turns freely and that all fasteners are secure. With shutter in place, turn on electrical power and confirm that the fan operates smoothly.

2) *TEMPERATURE ADJUSTMENTS:* Set the fan control to the temperature shown on your Aerotech ventilation system drawing, or to a value which will provide the desired environmental conditions.

## 4.2 Maintenance


The following inspection and cleaning procedures should be performed monthly:


1) *INSPECT PROPELLER*: Check that propeller is secure on drive hub and that
there are no signs of damage. The blades are of a self-cleaning design and should not require maintenance.

2) *CLEAN* regularly for best results:
   - *FAN MOTOR:* Remove any dust accumulation from motor using a brush or cloth. (DO NOT use a pressure washer). A clean motor will run cooler and last longer. At the same time, verify that the motor is secure in its mount.
   - *SHUTTER:* Carefully clean dust from shutter and frame so that shutter opens and closes freely. A brush or cloth should be used.
   - *GUARD:* Clean any dust or feathers from fan guards using a brush. Dirty guards can reduce airflow.


3) *CHECK FASTENERS:* For safety, all fasteners should be inspected. Tighten any loose connections.

4) *INSPECT FAN CONTROL:* With power disconnected, inspect all electrical connections. Wiring should be secure and in good condition. Remove any dust build-up from control case and sensor using a soft brush or cloth.

*NEVER CLEAN ELECTRICAL EQUIPMENT WITH A PRESSURE WASHER!*

# Troubleshooting

# 5.

## 5.1 Troubleshooting



| SYMPTOM | POSSIBLE CAUSES | CORRECTIVE ACTION |
|---|---|---|
| Fan Not Operating | 1. Fan control set above room temperature<br>2. Blown fuse or open circuit breaker<br>3. Propeller blade contacting fan housing<br>4. Fan control defective<br>5. Motor defective | 1. Set to a lower temperature<br>2. Replace fuse or reset breaker<br>3. Realign propeller in fan housing<br>4. Repair or replace control<br>5. Repair or replace motor |
| Fan Does Not Start<br>Caution: There is a 10 second delay for the fan to start when an 'On' command is present. | 1. M-Drive motor/controller issue | 1. Verify AC voltage is present at fan<br>2. Turn AC power off to fan for 1 minute<br>3. Verify Prop turns feely<br>a. If not contact Product Support<br>b. If it turns freely go to next step<br>4. Turn AC power back on to fan<br>a. If starts up and runs, fan OK<br>-Periodically observe fan to verify it is still running<br>-If it continues to run, fan is OK<br>-If fan stops, look through clear window in drive cover to check what drive display reads. Contact Product Support<br>b. If fan tries to start but stops, look through clear window in drive cover to check what drive display reads. Contact Product Support |
| Fan Operating-Insufficient Airflow | 1. Shutter or Damper door jammed<br>2. Guard dirty<br>3. 10-0V signal set incorrectly | 1. Clean damper door & fan housing<br>2. Clean guard<br>3. Check and adjust 10-0V signal |
| Excessive Noise | 1. Propeller blade contacting fan housing | 1. Sand fan housing to remove high spot |
| Excessive Vibration | 1. Motor loose on mount<br>2. Propeller damaged | 1. Tighten fasteners<br>2. Replace propeller |

# Winterizing

# 6.

## 6.1 Winterizing

In most climates, it is probable that the ventilation system will never need to operate at a total capacity during the colder winter months. Consequently, it is advisable to "winterize" those fans which will not be used in cold weather to avoid unnecessary heat loss and condensation.

To winterize, turn fan control "off". Install the insulated closure panel over the fan intake. If you don't have an insulated closure panel, a piece of rigid insulation material can be used. Remember the insulation panel must be removed before warmer weather returns.

***NOTE:*** At least one single speed fan should be left uncovered and with power available to provide air movement in the event of variable speed control difficulties.

## 6.2 Winter Weather Protection

To prevent cone or fan damage from snow or ice sliding off building roof, weather protection must be provided. A weather shelter may be constructed to cover the entire fan, *See Figure 25,* or snow guards may be placed on the roof, *See Figure 26.*

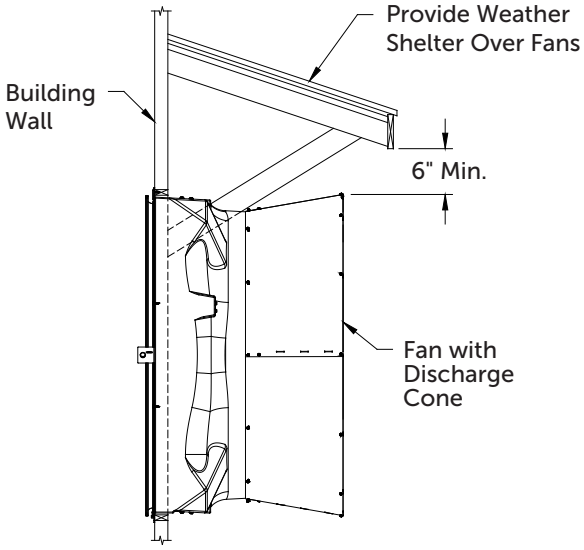



*Figure 25*

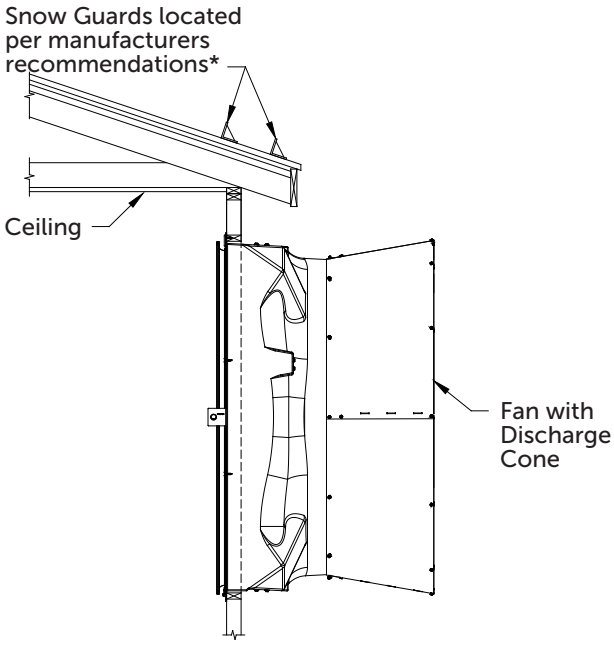



*Figure 26*

## *Snow Guard Suppliers

| *Company Name* | *Phone No.* | *Fax No.* | *Web Site* |
|---|---|---|---|
| Snojax, Inc. | 800-766-5291 | 717-697-2452 | www.snojax.com |
| Polar Blox | 800-298-4328 | 814 629-9090 | www.polarblox.com |
| LM Curbs | 800-284-1412 | 903 759-3598 | www.lmcurbs.com |
| Alpine Snow Guards | 888-766-4273 | 888-766-9994 | www.alpinesnowguards.com |

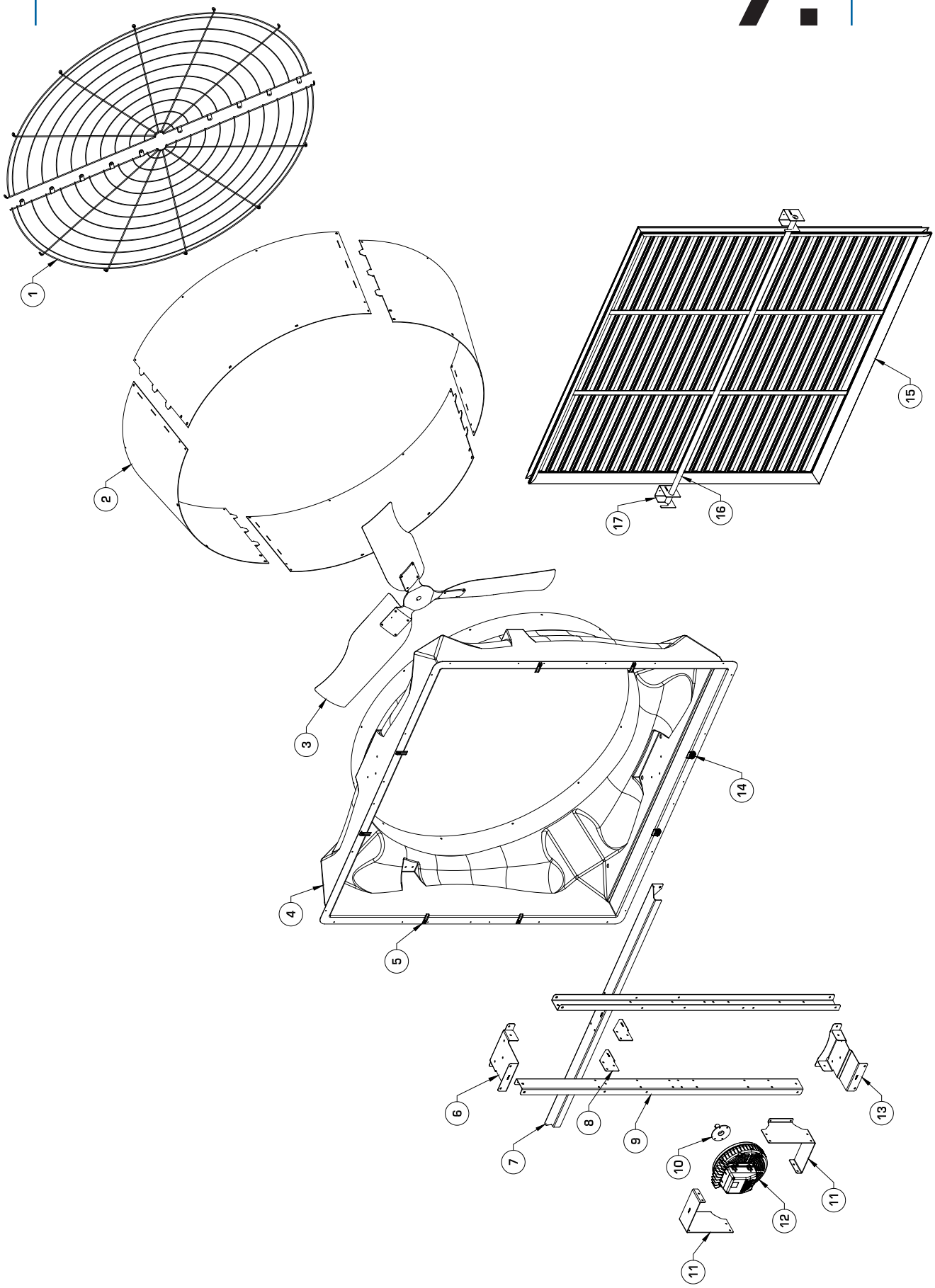
**⚠ IMPORTANT**

Grain & Protein Technologies Product and System Warranties do not cover cone or fan damage from external sources.

***Note:*** Snow guards are designed to prevent sudden, dangerous snow and ice slides when attached to the building roof according to manufacturers recommendations. The supplier listing above is given as a reference only. Grain & Protein Technologies does not endorse any specific snow guard product and no performance warranty is implied.

# Exploded View

# 7.




QM1474r0

| Item | Catalog No. | | Description | Qty. |
|---|---|---|---|---|
| | VX74D3F43CT-HO | VX74D3F43CT-HE | | |
| 1 | FH1475 | FH1475 | Outlet Guard Kit w/HDW, ½ Round (2), 74" Fan, CTD BLK | 1 |
| 2 | FH4674 | FH4674 | Discharge Cone Section w/ Tabs, PL | 4 |
| 3 | FP1874 | FP1874 | Prop Assembly, 74" Fan, 3-Blade, GZ | 1 |
| 4 | FH7371 | FH7371 | Housing Assembly, 74" Fan, w/ Clips, FG | 1 |
| 5 | FH2732 | FH2732 | End Pivoting Shutter Clip, SS | 6 |
| 6 | FH3077 | FH3077 | Strut Mount Bracket, Top, VX74 Fan, GZ | 1 |
| 7 | FH3074 | FH3074 | Center Strut Brace, VX74 Fan, GZ | 1 |
| 8 | FH3085 | FH3085 | Center Strut Brace Gusset, VX74 Fan, GZ | 2 |
| 9 | FH3073 | FH3073 | Center Strut C-Channel, VX74 Fan, GZ | 2 |
| 10 | FP2066 | FP2066 | Hub, Prop Adapter, 1.188"D. x 2.875"L., w/ Keyway, ZP | 1 |
| 11 | FH3079 | FH3079 | G2 Motor Mount Bracket, VX74, GZ | 2 |
| 12 | FM1465-VX74HO | FM1465-VX74HE | Assembly, Motor and Drive, Prgmd, VX74, 460V | 1 |
| 13 | FH3076 | FH3076 | Strut Mount Bracket, Bottom, VX74 Fan, GZ | 1 |
| 14 | FH1967 | FH1967 | Fixed Shutter clip, PL | 2 |
| 15 | PT74 | PT74 | Shutter, all plastic | 1 |
| 16 | FA2619 | FA2619 | Wind Bracket, GZ | 2 |
| 17 | AC1416 | AC1416 | Wind Pipe, GZ | 1 |
| - - | HP1366 | HP1366 | Hardware Pkg., VX74 Fan/Cone Install | 1 |


Munters Aerotech Atlas74 Exhaust Fan with Munters Drive is developed and produced by GrainProteinTech Climate Control Air Treatment US, LLC.

2691 Ena Dr., Lansing, MI 48917 | 1-800-227-2376



www.climatecontrolairtreatment.com