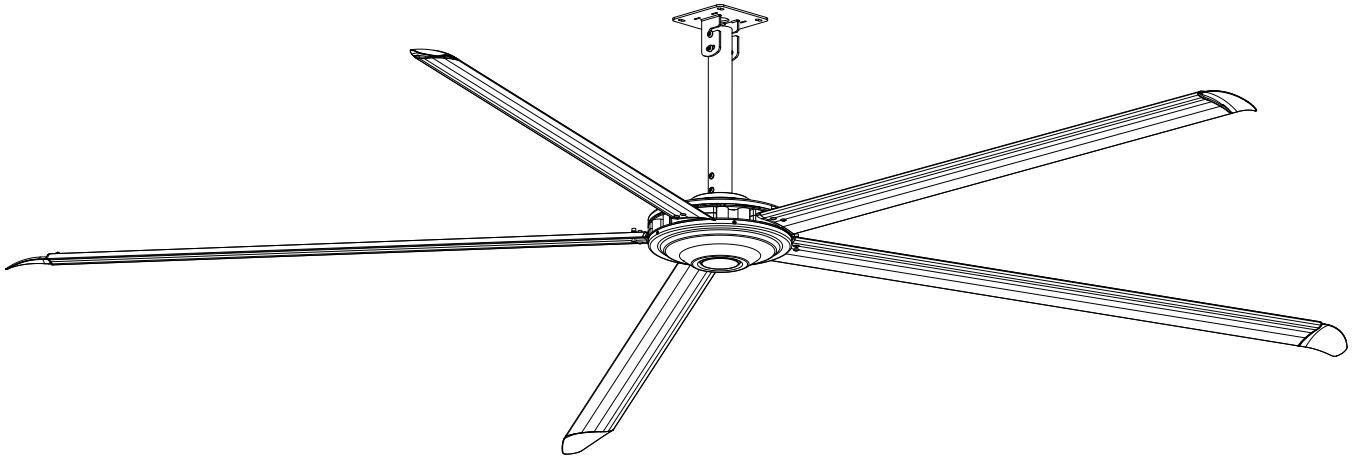


Commercial HVLS Fan User's Manual



This manual applies to fans manufactured beginning June 2020.

E506041

⚠ WARNING

Do not install, operate, or service this product unless you have read and understand the Safety Practices, Warnings, and Installation and Operating Instructions contained in this manual. Failure to do so could result in death or serious injury.

User's Manual Installation, Operations Maintenance and Parts

Part No. 6023693A

WARRANTY

THIS LIMITED WARRANTY IS 4FRONT ENGINEERED SOLUTIONS' SOLE AND EXCLUSIVE WARRANTY WITH RESPECT TO THE HVLS FAN AND IS IN LIEU OF ANY OTHER GUARANTEES OR WARRANTIES, EXPRESS OR IMPLIED. THIS LIMITED WARRANTY APPLIES ONLY TO THE ORIGINAL PURCHASER OF THE HVLS FAN AND CANNOT BE TRANSFERRED.

4Front Engineered Solutions warrants that this HVLS FAN will be free from flaws in material and workmanship under normal use for a period of one (1) year from the earlier of 1) 60 days after the initial shipment by 4Front Engineered Solutions, or 2) the date of installation of the HVLS FAN by the original purchaser, provided that the owner maintains and operates the HVLS FAN in accordance with this User's Manual.

In the event that this HVLS FAN proves deficient in material or workmanship within the applicable Limited Warranty period, owner shall so notify 4Front Engineered Solutions, and 4Front Engineered Solutions will, at its option:

1. Replace the HVLS FAN, or the deficient portion(s) thereof, without charge to the owner or
2. Alter or repair the HVLS FAN, on site or elsewhere, without charge to the owner.

In addition, 4Front Engineered Solutions warrants the HVLS FAN for an additional nine (9) years for mechanical and four (4) years for electrical replacement parts only.

Mechanical is defined as mechanical components of the fan, including the mounting, airfoils, and winglets.

Electrical is defined as all electrical components of the fan including the motor, Variable Frequency Drive, and all components of the VFD panel, not including the touchscreen. The warranty for the touchscreen is one (1) year.

Exclusions to the limited warranty: U.S. and Canada only. For International, visit <https://epicfan.com/international-warranty>.

This Limited Warranty does not cover any failure caused by improper installation, abuse, improper operation, negligence, or failure to maintain and adjust the HVLS FAN properly. Parts requiring replacement due to damage resulting from impact, abuse, or improper operation are not covered by this warranty. 4FRONT ENGINEERED SOLUTIONS DISCLAIMS ANY RESPONSIBILITY OR LIABILITY FOR ANY LOSS OR DAMAGE OF ANY KIND (INCLUDING WITHOUT LIMITATION, DIRECT, INDIRECT, CONSEQUENTIAL OR PUNITIVE DAMAGES, OR LOST PROFITS OR LOST PRODUCTION) arising out of or related to the use, installation or maintenance of the HVLS FAN (including premature product wear, product failure, property damage or bodily injury resulting from use of unauthorized replacement parts or modification of the HVLS FAN). 4Front Engineered Solutions' sole obligation with regard to an HVLS FAN that is claimed to be deficient in material or workmanship shall be as set forth in this Limited Warranty. This Limited Warranty will be null and void if the original purchase does not notify 4Front Engineered Solutions' warranty department with ninety (90) days after the product deficiency is discovered.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, INCLUDING, BUT NOT LIMITED TO, A WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, ALL OF WHICH 4FRONT ENGINEERED SOLUTIONS HEREBY DISCLAIMS.



Click [here](#) to view Warranty and Factory Service Request Procedure



Click [here](#) to view the Entrematic HVLS Warranty Request

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INTRODUCTION

Welcome and thank you for choosing this Commercial fan from 4Front Engineered Solutions.

This User's Manual contains information you need to safely install, operate, and maintain the fan. It also contains a complete parts list and information about ordering replacement parts. Please read and keep this User's Manual before using your new fan.

For more information, please visit our website at www.epicfan.com

HOW TO USE THIS MANUAL

This section explains the visual clues and conventions that will help you quickly locate the information you need. Other conventions and icons identify interactive elements that will provide additional information when using the online version of this manual.

BASIC ELEMENTS

- Names of menus, buttons, icons, and fields are highlighted in bold text.
- Text highlighted in blue indicates a link you can click to navigate to another topic.



INTERACTIVE ONLINE ELEMENTS

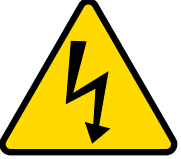



These elements are available in the online version of the document.

- The blue TOC icon at the top of every page takes you back to the Table of Contents.



SAFETY SIGNAL WORDS

You may find safety signal words such as DANGER, WARNING, CAUTION, or NOTICE in the User's Manual. The use of Safety Signal Words is explained below.

	WARNING AND CAUTION SYMBOL <i>This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.</i>
	DANGER SYMBOL <i>Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.</i>

	ELECTRICAL WARNING SYMBOL <i>Indicates an electrical hazard with a medium level of risk that could result in death or serious injury.</i>
	CAUTION SYMBOL <i>Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.</i>
	WARNING SYMBOL <i>Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</i>
	NOTICE SYMBOL <i>Notice is used to address practices not related to personal injury.</i>

SAFETY PRACTICES

	<p><i>READ THESE SAFETY PRACTICES BEFORE INSTALLING, OPERATING, OR SERVICING THE FAN. Failure to follow these safety practices could result in death or serious injury.</i></p>
	<p><i>READ AND FOLLOW THE OPERATING INSTRUCTIONS IN THIS MANUAL BEFORE OPERATING THE FAN. If you do not understand the instructions, ask your supervisor for instruction.</i></p> <p><i>To reduce the risk of personal injury, do not bend the blade brackets when installing the brackets or cleaning the fan. Do not insert foreign objects in between rotating fan blades.</i></p>
	<p><i>To reduce the risk of fire, HVLS fan motor assemblies must be installed with the blade assemblies that are marked on their cartons to indicate the suitability with this model, Other blade assemblies cannot be substituted.</i></p> <p><i>Be certain to follow the instructions in this manual.</i></p>

	<p><i>Installation of the equipment must comply with local and national electrical codes and must be in accordance with ANSI/NFPA 7-1999.</i></p> <p><i>Do not use this commercial fan until you have received proper training. Improper use could result in property damage, bodily injury, and/or death. Read and follow the complete Operating Instructions — HMI on page 40 before use. If you do not understand the instructions, ask your supervisor to explain them to you or call your local distributor.</i></p>
⚠ WARNING	<p>DO NOT USE THE FAN IF IT APPEARS DAMAGED OR DOES NOT OPERATE PROPERLY. <i>Inform your supervisor immediately.</i></p> <p><i>Do not operate the fan until all personnel, building structure, and equipment are clear of all moving parts and exclusion zones. Install guards as required.</i></p> <p><i>To reduce the risk of electrical shock, do not expose to water or rain.</i></p> <p><i>Support directly from the building structure. Do not install the fan unit onto a structure of insufficient strength. Consult a professional engineer or registered architect. Improper installation of the fan could result in death or serious injury.</i></p>
	<p><i>Before service, inspection, or cleaning, make certain the power is disconnected and properly locked out.</i></p> <p><i>If the fan does not operate properly using the procedures in this manual, BE CERTAIN TO REMOVE POWER FROM THE UNIT AND LOCK-OUT THE DISCONNECT ON THE POWER CIRCUIT. Call your local distributor for service.</i></p>
⚠ WARNING	<p>Keep your body clear of moving parts at all times.</p> <p><i>All electrical troubleshooting and repair must be done by a qualified technician and meet all applicable codes.</i></p> <p><i>If it is necessary to make troubleshooting checks inside the VFD box with the power on, USE EXTREME CAUTION. Do not place fingers or uninsulated tools inside the enclosure. Touching wires or other parts inside the enclosure could result in death or serious injury.</i></p>
⚠ WARNING	<p>Variable Frequency Drive (VFD) fan controllers contain high voltage capacitors. Before working on the fan controller, ensure isolation of the main voltage supply and verify voltage has bled off prior to beginning work. Failure to do so may result in death or serious injury.</p> <p><i>If you have problems or questions, contact your local distributor for assistance.</i></p>
⚠ WARNING	<p>To reduce the risk of injury to persons, install the fan so that the blades are at least 3.05m (10') above the floor.</p>

⚠ CAUTION	<i>Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards.</i>
⚠ CAUTION	<i>When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.</i>
⚠ CAUTION	<i>Exercise caution and common sense when powering the fan. Do not connect the fan to a damaged or hazardous power source. Do not attempt to resolve electrical malfunctions or failures on your own.</i>
⚠ CAUTION	<i>When service or replacement of a component in the fan requires the removal or disconnection of a safety device, the safety device is to be reinstalled or remounted as previously installed.</i>
⚠ WARNING	<i>Risk of fire, electric shock, or injury to persons during cleaning and user-maintenance. Disconnect the fan from the power supply before servicing.</i>
⚠ WARNING	<i>Stay alert. Watch what you are doing. Use common sense when installing fans. Do not install fans when tired, or under the influence of drugs, alcohol, or medications. A moment of inattention while installing fans may result in serious personal injury.</i>
⚠ CAUTION	<i>The installation of this fan requires the use of some power tools. Follow the safety procedures found in the owner's manual for each of these tools and do not use them for purposes other than intended by the manufacturer.</i>

OWNER'S RESPONSIBILITIES

The owner's responsibilities include the following:

The owner should recognize the inherent danger of the interface between the commercial fan and shop worker. The owner should, therefore, train and instruct operators in the safe use of the commercial fan.

Nameplates, cautions, instructions, and posted warnings shall not be obscured from the view of operating or maintenance personnel for whom such warnings are intended. Warnings which are worn or non-legible should be replaced.

Manufacturer's recommended periodic maintenance and inspection procedures in effect at the date of shipment shall be followed and written records of the performance of these procedures should be kept.

Commercial fans that are structurally damaged or have experienced impacts from external sources shall be removed from service, inspected by the manufacturer's authorized representative and repaired as needed before being placed back into service.

The owner shall see that all nameplates and maintenance manuals are provided to users.

Modifications or alterations of commercial fans shall be made only with written permission of the original manufacturer.

NATIONAL FIRE PROTECTION ASSOCIATION STANDARD

In accordance with NFPA 13 Standard from the National Fire Prevention Association as referenced in sections 12.1.4 and 11.1.7: High Volume Low Speed (HVLS) Fans: The installation of HVLS fans in buildings equipped with sprinklers, including ESFR sprinklers, shall comply with the following:

- The maximum fan diameter shall be 24 feet (7.3m).
- The fan shall be approximately centered between four adjacent sprinklers.
- The vertical clearance from the fan to the sprinkler deflector shall be a minimum of 3 feet (0.9m).
- All fans shall be interlocked to shut down immediately upon receiving a water flow signal from the alarm system in accordance with the requirements of NFPA 72-National Fire Alarm and Signaling Code.

FAN KIT

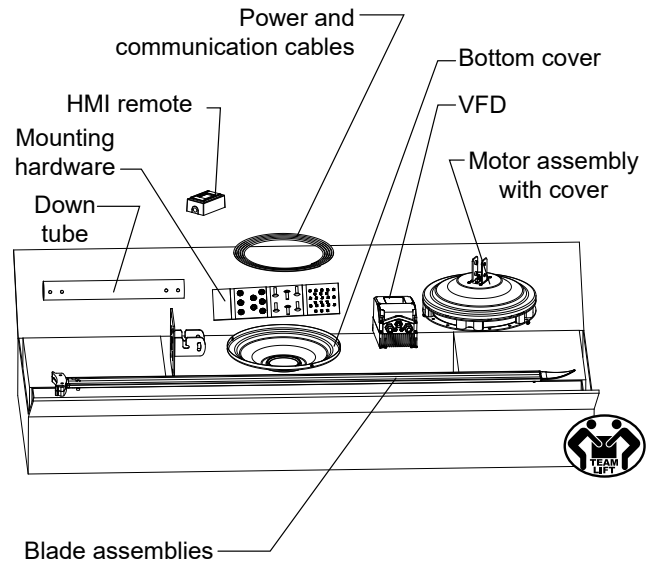
FAN BOX

- Blade Box - 5 blades each
- Motor assembly with covers
- HMI remote control (optional)
- Variable Frequency Drive (VFD)
- Mounting hardware
- Motor Power Cable
- Down Tube
- Communication cable (single fan control only)

REQUIRED TOOLS

- Wrenches: 9/16
- Sockets: 1/2, 9/16
- Spirit level, short
- Torque wrench: 15-60 ft-lbs (for use with sockets)
- Tape measure
- T-15 Torx (included)
- T-40 Torx (included)
- Gloves

Figure 21



PRIOR TO FAN INSTALLATION

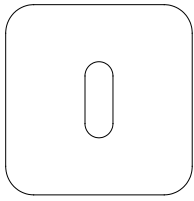
NOTICE

1. Ensure the blade length matches the fan model size by consulting the fan model designation located on the fan box.
2. Ensure all mounting hardware is present.
See [Hardware on page 13](#).

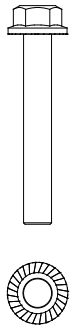
FOR OPTIONAL NETWORK (IFAN OR MULTI-FAN) FANS ONLY

Ensure the Fan Network Address number matches the network layout drawing where applicable. Consult the Part Number label on the side of the VFD.

HARDWARE

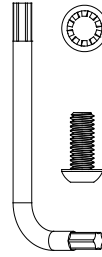


Fan mount
6017852 (x4)
Clamp plate



Fan mount bolt
6017873 (x4)
3/8-16UNC x 2-1/2" hex bolt
grade 5
serrated head

6015118 (x4)
3/8-16UNC hex nut
grade 5
serrated head



Motor mount hardware
6017838 (x4)
5/16" lock washer

6017835(x4)
5/16-18UNC x 3/4" Torx screw
grade 5

6017872 (x1)
T40 Torx wrench

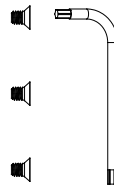


Down tube mount bolt
6017748 (x2)
3/8-16UNC x 3-1/4" hex bolt
grade 5
serrated head

6015118 (x2)
3/8-16UNC hex nut
grade 5
serrated head



Blade mounting bolt
6017837 (x10)
5/16-18UNC x 1-3/4" hex bolt
grade 5
serrated head



Bottom cover hardware
6017870 (x3)
8-32UNC x 1/4" Torx screw

6017871 (x1)
T15 Torx wrench

INSTALLATION CONSIDERATIONS

⚠ WARNING

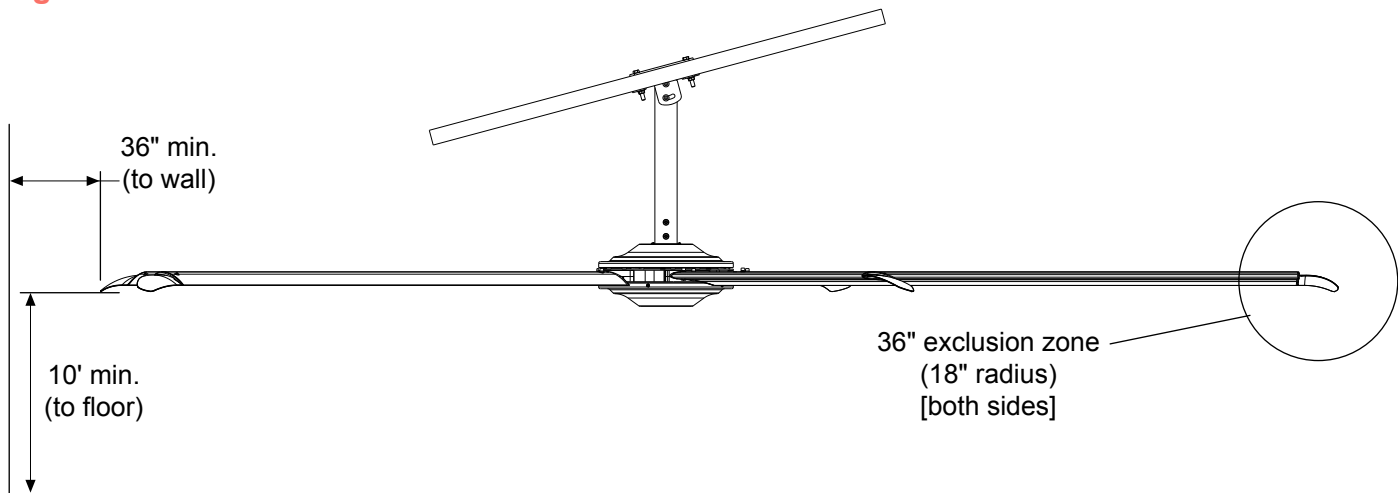
Do not mount the fan directly under or within the exclusion zone or in line with the HVAC supply discharge vent.

Do not mount directly under the air register.

Do not have air ducts in line with or above the fan blowing toward the fan.

HVAC registers blowing toward the fan must be at least 1 diameter away from the end of the blade.

Figure 1



NOTE:

The angle mount has 45° of motion. The extension lengths shown are minimum recommendations only, based solely off roof pitch and fan diameter. Other considerations such as placement of lights, sprinkler systems, HVAC systems, etc. must be evaluated when determining extension requirements. In addition, OSHA requirements state that the fan blades must be a minimum of 10 ft. above the floor. All fans must still maintain 3' between blades and typical obstructions.

ROOF SLOPE

COMMERCIAL FAN				
Roof Slope	0	2/12	3/12	4/12
Roof Angle/Degrease	0	9.5°	14.0°	18.4°
Fan Diameter	Extension requirement from mounting point (FT)			
6 FT/1.8 M	0 FT/0 M	1 FT/.31M	1 FT/.31M	1 FT/.31M
8 FT/2.4 M	0 FT/0 M	1 FT/.31M	1 FT/.31M	2 FT/.61M
10 FT/ 3.0M	0 FT/01M	1 FT/.31M	2 FT/.61M	2 FT/.61M
12 FT/3.7M	0 FT/0 M	1 FT/.31M	2 FT/.61 M	2 FT/.61M
14 FT/4.3 M	0 FT/0 M	2 FT/.61 M	2 FT/.61M	3 FT/.91M

*Non-standard obstructions may require additional length to the extensions. Please consult the factory for additional clarification on non-standard obstructions.

PLACEMENT AND SPACING

Consult your local distributor to help you plan the most efficient installation of your fans.

Ensure fan placement is such that the fan's blades are a minimum of 10 ft. from any manned working surface such as a floor or mezzanine.

Ensure the fan blade does not extend into the exclusion zone. Extensions are available if required. See **Figure 2**.

Avoid mounting blades directly under lights or skylights to avoid a visual strobing affect.

NOTE:

If the fan is part of a networked system, ensure fan placement is in accordance with the building layout.

NOTE:

Be certain to comply with all local and national codes during installation.

⚠ WARNING

For fans subjected to high cross winds from open bay doors or air conditioning diffuser ducts, the fan must be at least one fan diameter (as measured from the end of the winglet) from open bays or A/C ducts mounted at or above the blade plane.

In addition, all outdoor mounted fans must be at least one fan diameter from any obstructions and must be protected from the elements. Consult your local distributor for outdoor patio applications.

⚠ DANGER

Do not mount fans to flat ceilings.

NOTE:

Fans with long extensions may oscillate at high speeds. Any extensions 3 feet or longer require the installation of guy wires.

SUGGESTED FAN MOUNTING TYPES

	<i>If the building support beam is not level, ensure proper fan clearance using the mounting information shown in Installation Considerations on page 14 or add mounting extensions as required to ensure clearance. See Figure 2.</i>
NOTICE	

I-BEAM MOUNTING

1. Position the fan centered square to the bottom flange of the I-Beam.
2. Secure the clamp plates (6017852) using the provided 3/8-16 UNC hex serrated flange nuts and 3/8-16 UNC x 2 1/2" long bolts. See [Figure 4](#).

NOTE:

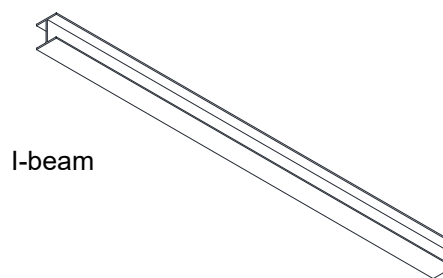
Ensure the clamp plates overlap the I-Beam flange by at least 30%.

3. Torque to 20-28 ft-lbs.

SOLID BEAM MOUNTING

1. Locate the beam bracket (6018175). See [Figure 6](#).
2. Ensure the bottom flange of the bracket is below the bottom of the beam.
3. Square the bottom flange to the beam.
4. Shim as required. The vertical flange of the beam bracket must be square with respect to the floor.

Figure 3



I-beam

Figure 4

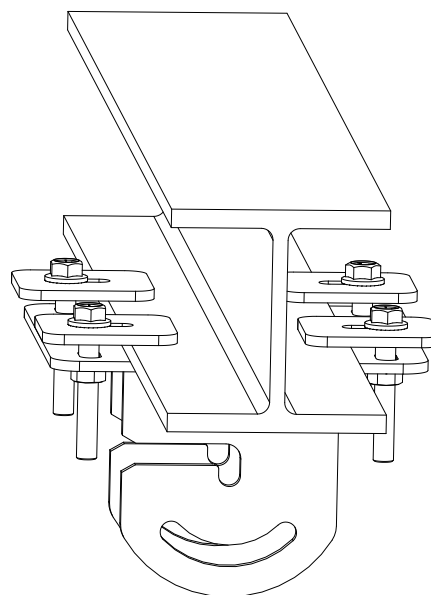
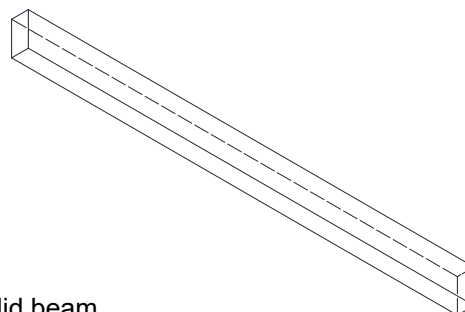


Figure 5



Solid beam

5. Using the holes in the beam bracket as a template, mark and drill at least four (4) 9/16" diameter holes through the beam. Space the holes as widely as practical. See **Figure 6**.
6. Align the beam brackets to the holes and fasten them into place using the 3/8" diameter grade 5 bolts (not provided).
7. Torque to 20-28ft-lbs.

Locking hardware (nuts and washers) are required.

Figure 6

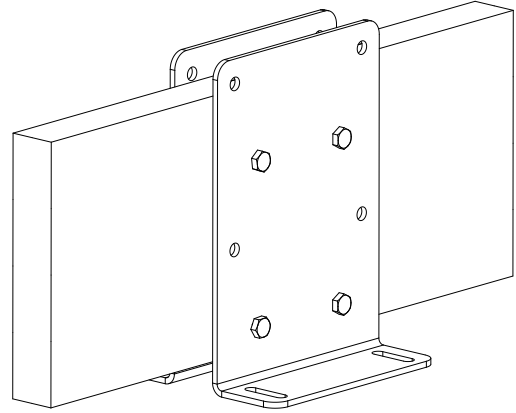
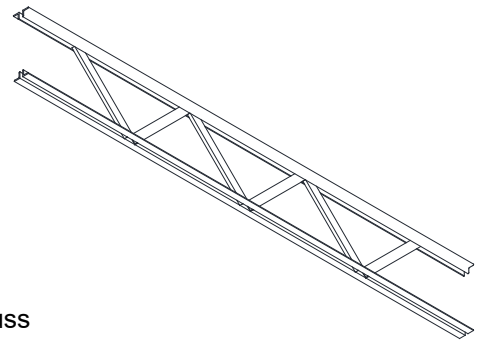


Figure 7



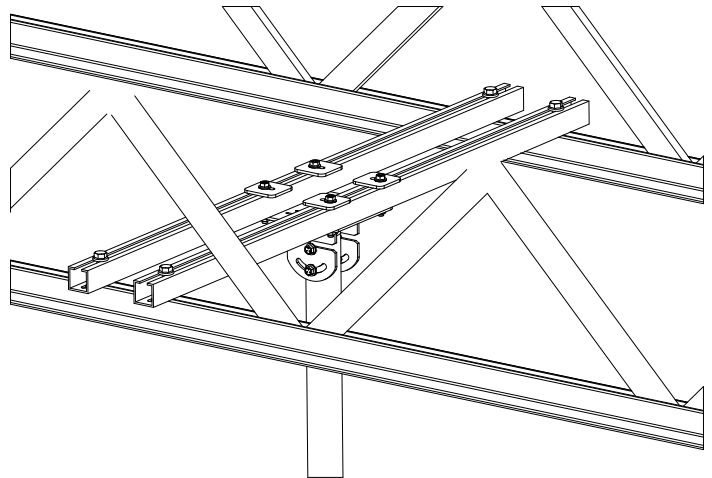
Truss

TRUSS MOUNT INSTALLATION

The recommended additional structural material for truss mounting is 1-5/8" x 1-5/8" 12 gauge strut channel beams and hardware. Other structural material may be used, but consult the factory prior to substituting other beams and hardware.

1. Size the strut channel beams to ensure at least 3" of overlap at each end on the adjoining truss members.
Do not span more than 6 feet.
2. Place the mount bracket at the desired location, preferably the center, on the strut channel beams.
3. Fasten the mount bracket using the provided 3/8" diameter grade 5 hardware (6017873 and 6015118).

Figure 8



NOTE:

Use 6017852 clamp plates as required.

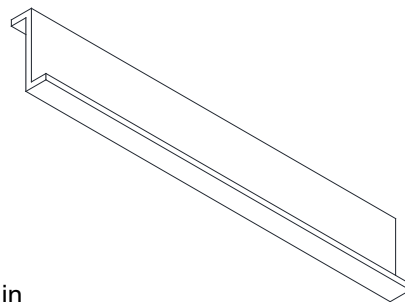
4. Torque to 20-28 ft-lbs.
5. Locate the beam/mount assembly on the building truss system. Top mounting is preferred. See **Figure 8**.

6. Fasten the strut channel beams to the building truss system using 3/8" diameter, grade 5 hardware. (Not provided.)

DO NOT use spring-loaded strut channel beam hardware.

Locking hardware (nuts and washers) are required.

Figure 9



Z-purlin

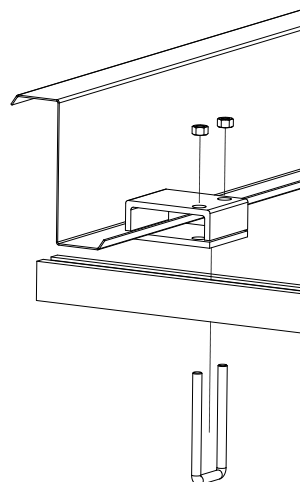
Z-PURLIN MOUNT INSTALLATION (OPTIONAL KIT 6017954)

When you mount a fan using the Z-Purlin optional kit, you must use the Unistrut® purlin clamp Part P2784 from.

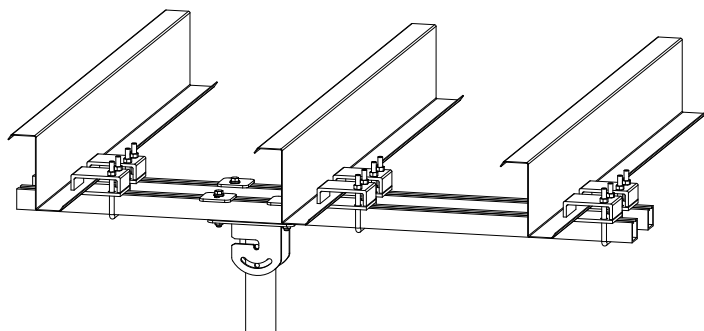
The strut must span a minimum of three purlins.

Consult a structural engineer prior to installing the fan.

Figure 10

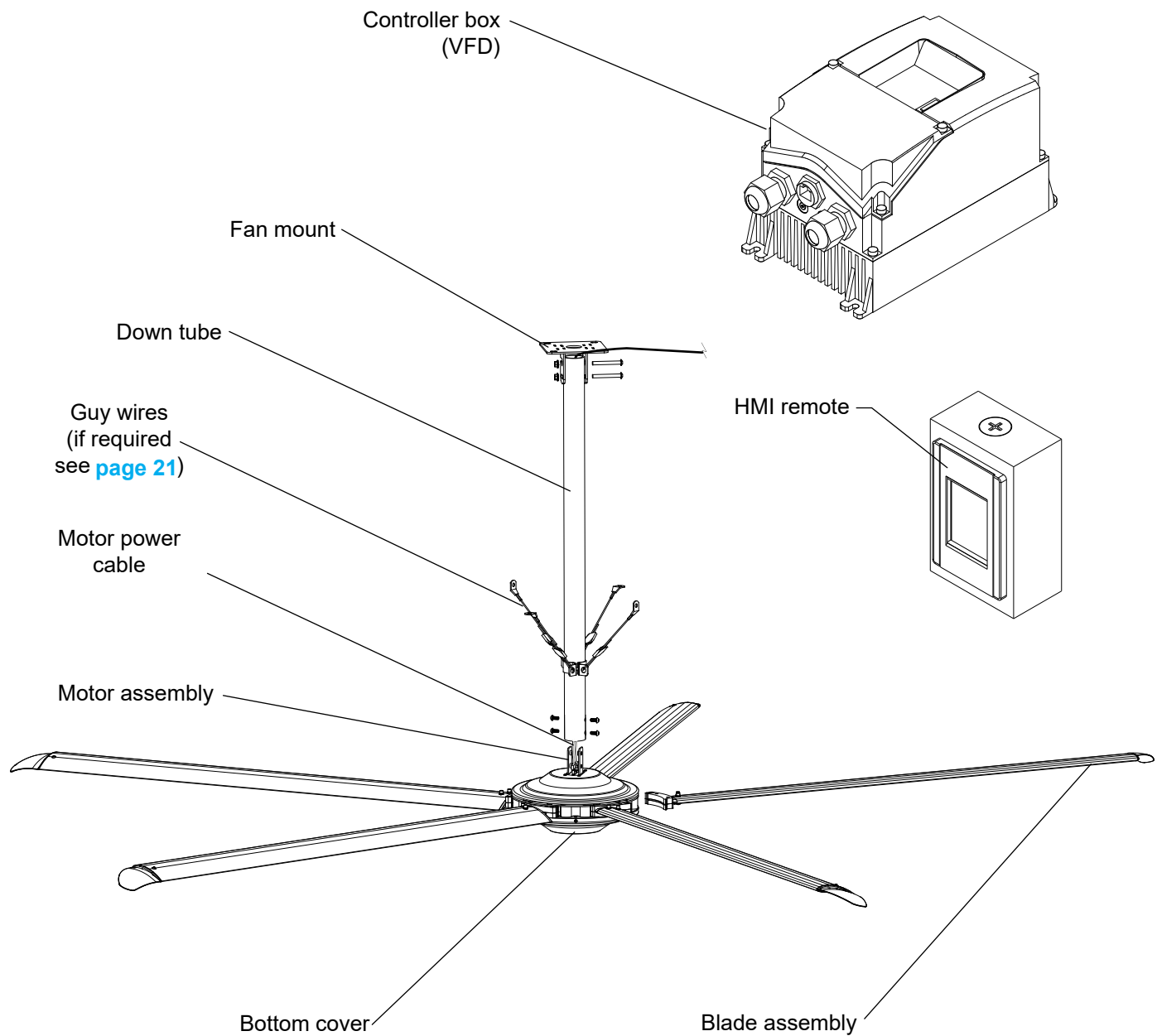


1. Attach two clamps on each purlin and loosely secure the strut channel to the clamps with the u-bolts. See **Figure 10**.
2. Mount the bracket at the desired location. The preferred location is near the center purlin.
3. Fasten the bracket using the provided 3/8" diameter grade 5 hardware (6017873 and 6015118).
4. Use clamp plates (6017852) as required.
5. Torque to 20-28ft-lbs. See **Figure 10**.
6. Check the strut channels to ensure they are parallel with each other and perpendicular to the purlins.
7. Tighten the u-bolts.
8. Torque to 20-28 ft-lbs.



COMPONENTS

Figure 11



INSTALLATION

DOWN TUBE ASSEMBLY

1. Route the motor power cable through the down tube.
2. With the tube located next to the motor assembly, install the cable connection to the top of the motor assembly. See **Figure 12**.

Use the support materials contained in the shipping package to support the motor assembly and prevent damage.

NOTICE

Ensure proper connection of the motor power cable. Failure to properly connect the cables can lead to operating issues.

3. Slide the down tube over the motor assembly mount bracket ensuring the cable is not pinched or in a bind.
4. Align the down tube so the holes in the down tube align with the holes in the motor assembly mount bracket.
5. Attach the down tube to the motor assembly mount bracket using the 5/16" diameter Torx screws (6017835) and washers (6017838) supplied.
6. Tighten the Torx screws using the Torx wrench (6017872) provided.

HANG THE MOTOR

1. In the top hole of the down tube, install the 3/8" diameter bolt (6017748) and nut (6015118) loosely. See **Figure 13**.
2. Check to make sure the screw does not pinch or bind the motor power cable.

Figure 12

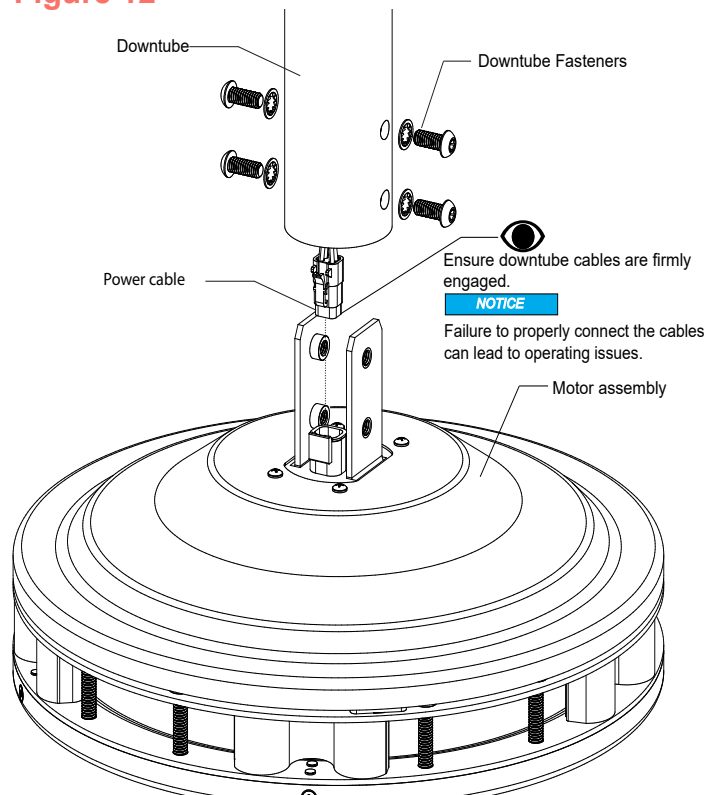
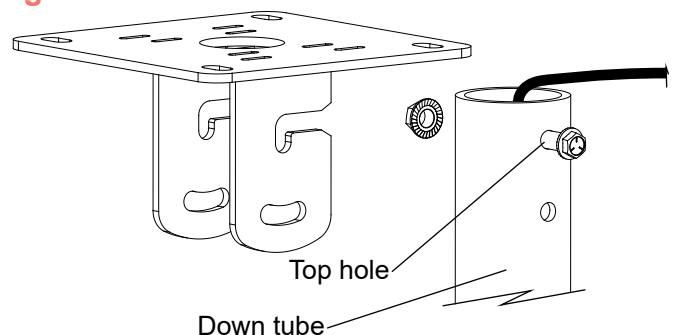


Figure 13



3. Using the bolt you just installed, hang the motor and the down tube assembly on the fan mount. See **Figure 14**.
4. Check to make sure the motor power cable is free of binding or pinching. See **Figure 15**.
5. Loosely install the 3/8" diameter bolt and nut (6017748) in the bottom hole at the top of the down tube.
6. Check to make sure the bolt does not pinch or bind the motor power cable. See **Figure 15**.
7. Use a spirit level to make sure the down tube is plumb.
8. Tighten the 3/8" diameter x 3-1/4" bolts to 20-28 ft-lbs.

Figure 14

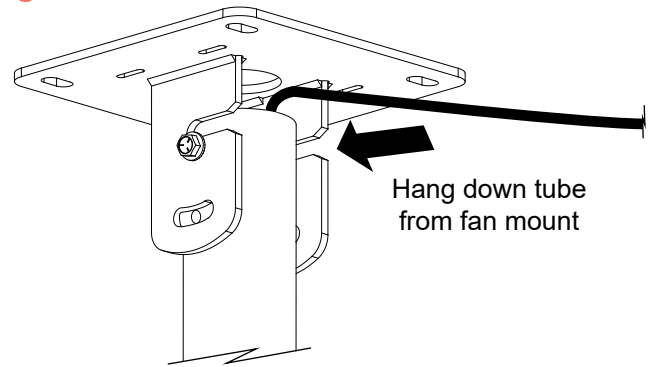
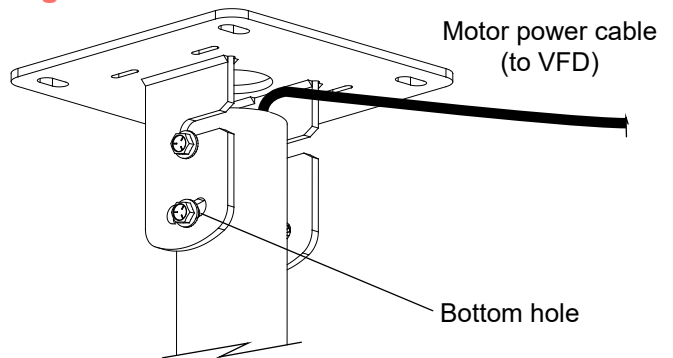


Figure 15



OPTIONAL GUY WIRE KIT (6016307)

Guy wires are required on all fan installations where the down tube is greater than three feet in length.

Guy wires are designed to constrain lateral movement of the fan while it is in operation. This movement may be due to impacts on the fan or winds impinging on the blades causing the fan to sway.

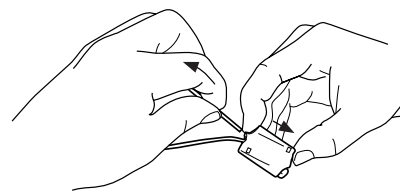
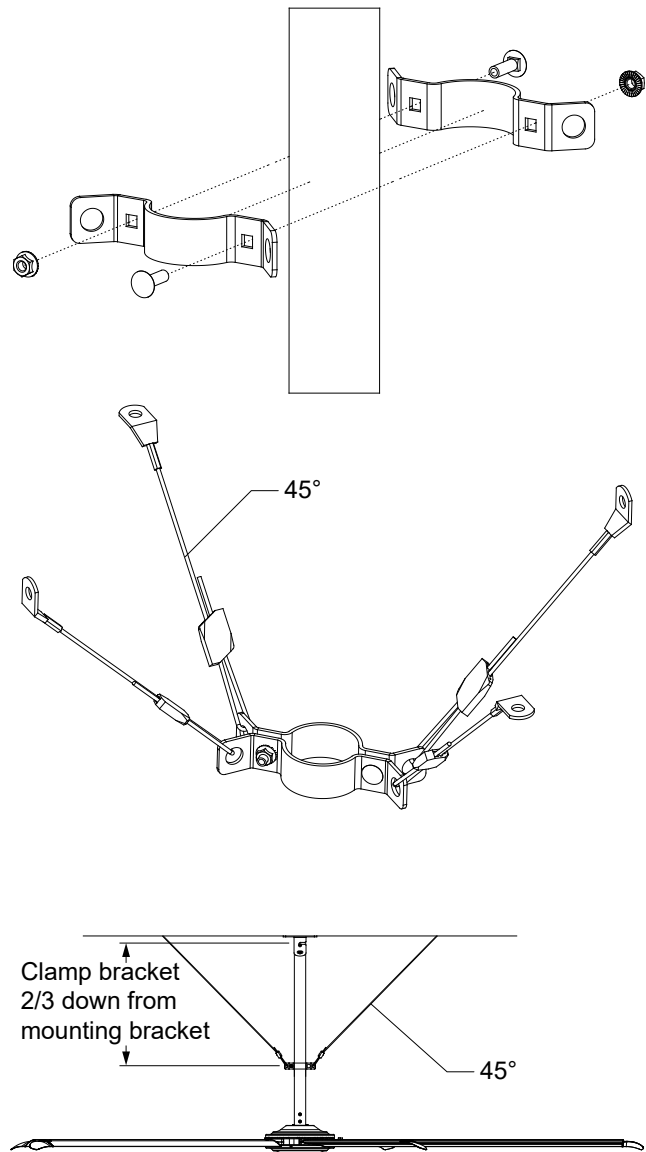
NOTICE	<i>Failure to attach guy wires may result in loss of warranty.</i>

⚠ WARNING

Ensure the proper guy wire length is accompanying the extension used. Ensure the angle formed by the guy wire with the roof structure is 45 degrees or less. See **Figure 16**.

Avoid any sharp edges or corners to reduce fatiguing and fraying of the guy wires. Failure to attach guy wires may result in severe injury or death.

1. Remove the parts from the package and inventory the contents.
 - Four cables
 - Four Gripple cable clamps
 - Two 5/16-18 x 1" serrated flanged hex hardware
 - Two guy wire clamp brackets
 - One Gripple release tool
2. Locate the down tube clamp with the 5/16" diameter x 1" bolts supplied.
3. Torque the clamp to 12-17 ft-lbs.
4. Attach each cable to the building structure by either:
 - Looping the cable through the cable eyelet and around a beam/truss or other secure building structure. This is the preferred method.
- OR
- Using 3/8" diameter grade 5 fasteners and lock washes (not provided) to secure the guy wires to the structure
5. Tighten fasteners to 20-28 ft-lbs.

Figure 16

To loosen, insert the thin rod provided into the end of the clamp. While gripping the clamp and pressing the rod into the clamp, pull on the cable end.

6. On each cable assembly, slide one Gripple cable approximately 12 inches on the cable. See **Figure 16**.
7. Loop one cable assembly through each lug on the down tube clamp bracket back through the Gripple cable clamp.

Leave the clamp loose.
8. Use a spirit level on the down tube, tighten the cable assemblies by pulling the cable through the Gripple cable clamp as required to achieve a taut cable set while maintaining the down tube plumb.
9. Secure the loose cable ends or trim them.

VARIABLE FREQUENCY DRIVE (VFD) INSTALLATION

▲ DANGER	<p><i>Before doing any electrical work, make certain the power is disconnected and properly tagged out and locked out.</i></p> <p><i>All electrical work must be done by a qualified technician and meet all applicable codes.</i></p> <p>USE EXTREME CAUTION.</p> <p><i>Touching wires could result in electrical shock, death or serious injury.</i></p> <p><i>On a 120V fan, never allow more than 130 volts incoming power to be connected to the controller box.</i></p> <p><i>Damage to the fan and serious injury or death may result.</i></p>
-----------------	--

NOTICE	<p><i>Do NOT place the Variable Frequency Drive (VFD) inside another enclosure.</i></p>
---------------	---

The VFD should be located outside of the blade arc where possible and oriented so that the connections are accessible.

1. Fasten the VFD to the building structure so the box is secure against movement. The fasteners are not included.

2. Route the motor power cable from the fan mounting location to the VFD.

Check to ensure the cable is routed clear of the fan blades and supported throughout their run.

Figure 17

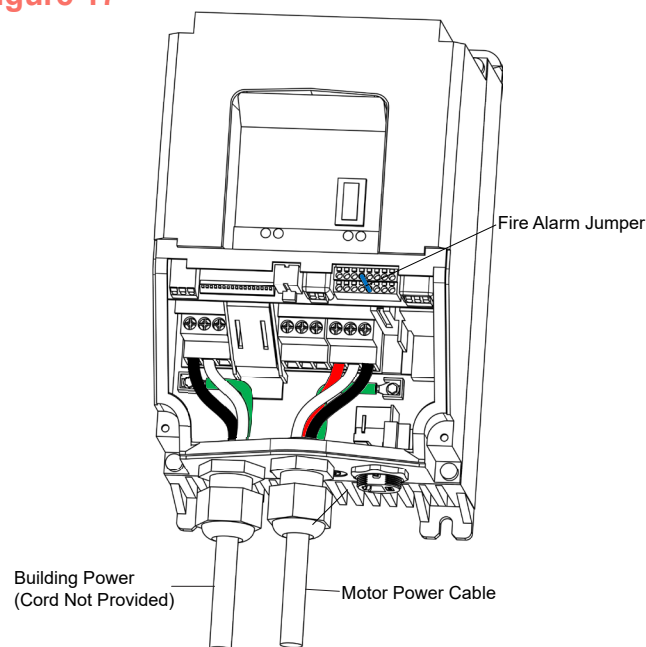
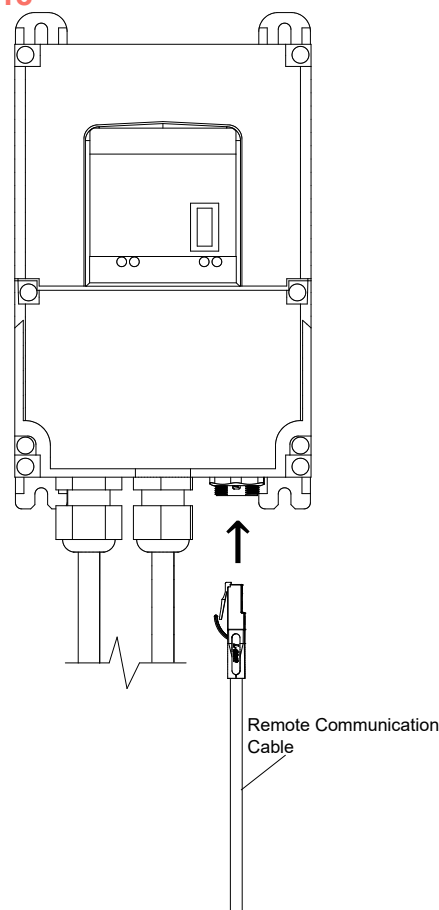


Figure 18



NOTICE

The maximum length of the cable between the VFD box and motor is 150 linear feet.

When extending power cable, you must use Shielded SO cord.

Do not run the motor cables in the same conduit as the input voltage.

Do not run the motor cables in the same conduit as other motor cables.

3. Connect the motor power cable from the fan to the VFD. See [Figure 17](#) and [Electrical Schematics on page 28](#).
4. Connect the remote signal cable to the VFD and route it to the touch screen remote location. See [Figure 18](#).

NOTICE

Ensure proper connection of the motor power cable. Do not alter factory-supplied cables. Failure to properly connect the cable can lead to operating issues.

NOTE:

If you are not using the fire alarm option, make sure the fire alarm jumper is in place to ensure proper operation. See [Fire Control System Fan Shutdown \(Optional\) on page 34](#).

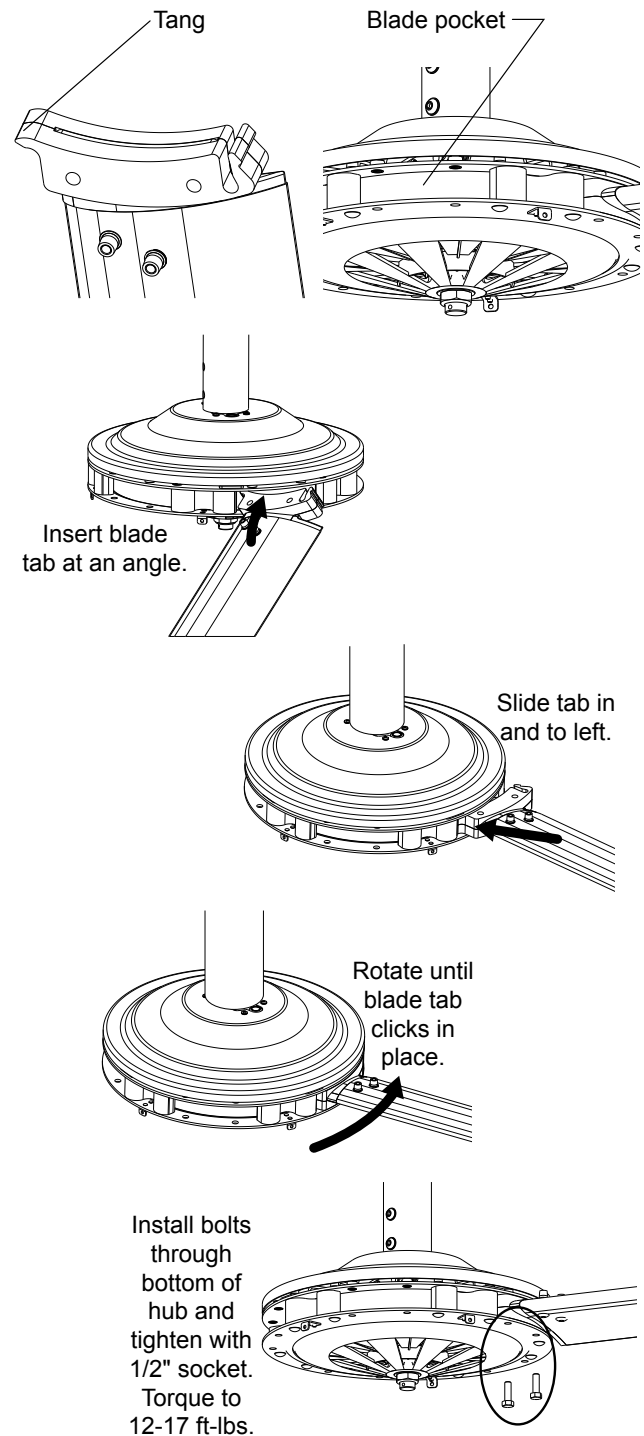
INSTALL BLADES

1. Position the mounting end of the blade assembly in an open blade pocket on the assembly rim as shown in **Figure 19**.
2. Angle the blade approximately 45° downward and rotated approximately 15° forward. See **Figure 19**.

This angle will position the forward tang of the blade mount between the two steel mount rings on the motor assembly.

3. Rotate the blade backward and upward to allow the mount end of the blade to slide into the blade pocket on the assembly rim.
4. Position the forward tang of the mount in the forward end of the blade pocket.
5. Rotate in the same plane as the hub to seat the blade mount into the blade pocket.
6. Insert two 5/16" x 1-3/4" (6017837) long fasteners from below through the hub mount ring and blade mount.
7. Tighten the fasteners enough to hold the blade in place but do not fully tighten at this time.
8. Repeat steps 1 through 7 for each of the remaining blades.
9. Fully torque the blade mount fasteners to 12-17 ft-lbs.

Figure 19



INSTALL THE BOTTOM COVER

1. Align the mounting holes on the bottom cover with the mounting holes on the motor assembly.
2. Install the three supplied #8 diameter Torx fasteners (6017870).
3. Firmly tighten the fasteners using the Torx tool (6017871) provided. See **Figure 20**.

Figure 20

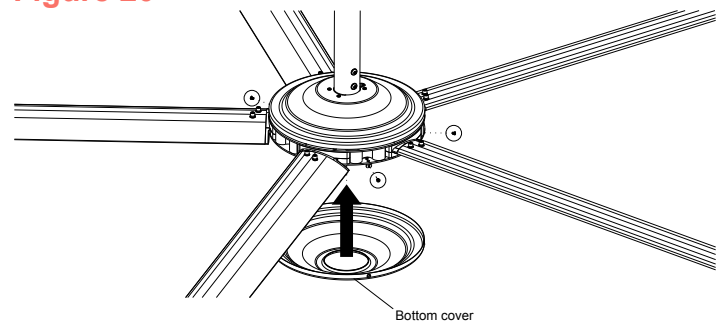


Figure 21

INSTALL HMI REMOTE CONTROL

NOTICE

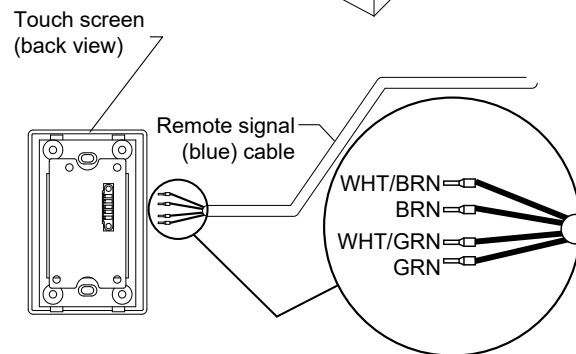
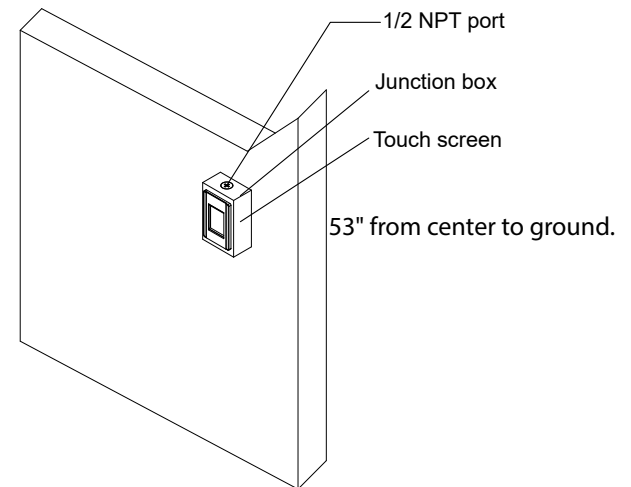
Do not over-torque the mounting screws. If you over-torque the mounting screws, it may cause damage to the screen.

It is the installer's responsibility to torque properly.

1. Mount the touch screen remote to the factory-supplied junction box inside the building as close to the fan assembly as practical.

Direct line of sight is preferred.

The height should be 4.5 feet (53 inches) to the center from the floor. See **Figure 21**.



NOTE:

The remote control signal cable (6023484) has terminated ferrules at one end. PROTECT these ferrules during cable routing.

2. Route the remote signal cable (6023484) from the VFD box through the hole in the factory-supplied junction box.
3. Wire the four leads of the remote control signal cable (6023484) to the orange connector of the touch screen remote control.

For any excess cable, coil it neatly and secure it near the VFD box.

4. Mount the touch screen to the junction box using the provided fasteners.

NOTE:

For cable runs exceeding 1000 feet, consult the factory.

VERIFY OPERATION — HMI

1. Ensure touchscreen lights up and then follow [HMI Setup on page 37](#).
-

TEMPERATURE CONTROL INSTALLATION — OPTIONAL

1. Mount the temperature control unit to the factory supplied junction box. The junction box is inside the building 60" above the floor.

ELECTRICAL SCHEMATICS

⚠ DANGER

Before doing any electrical work, make certain the power is disconnected and properly tagged out and locked out.

All electrical work must be done by a qualified technician and meet all applicable codes.

USE EXTREME CAUTION.

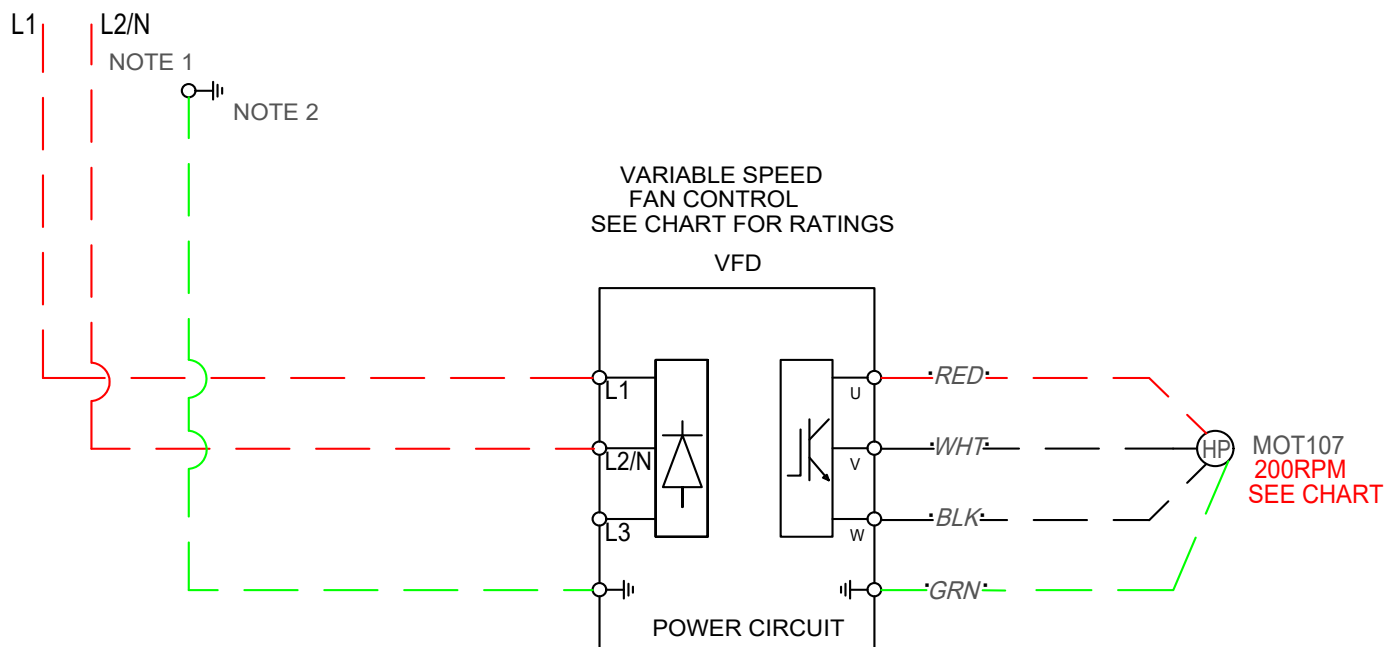
Touching wires could result in electrical shock, death or serious injury.

On a 120V fan, never allow more than 130 volts incoming power to be connected to the controller box.

Damage to the fan and serious injury or death may result.

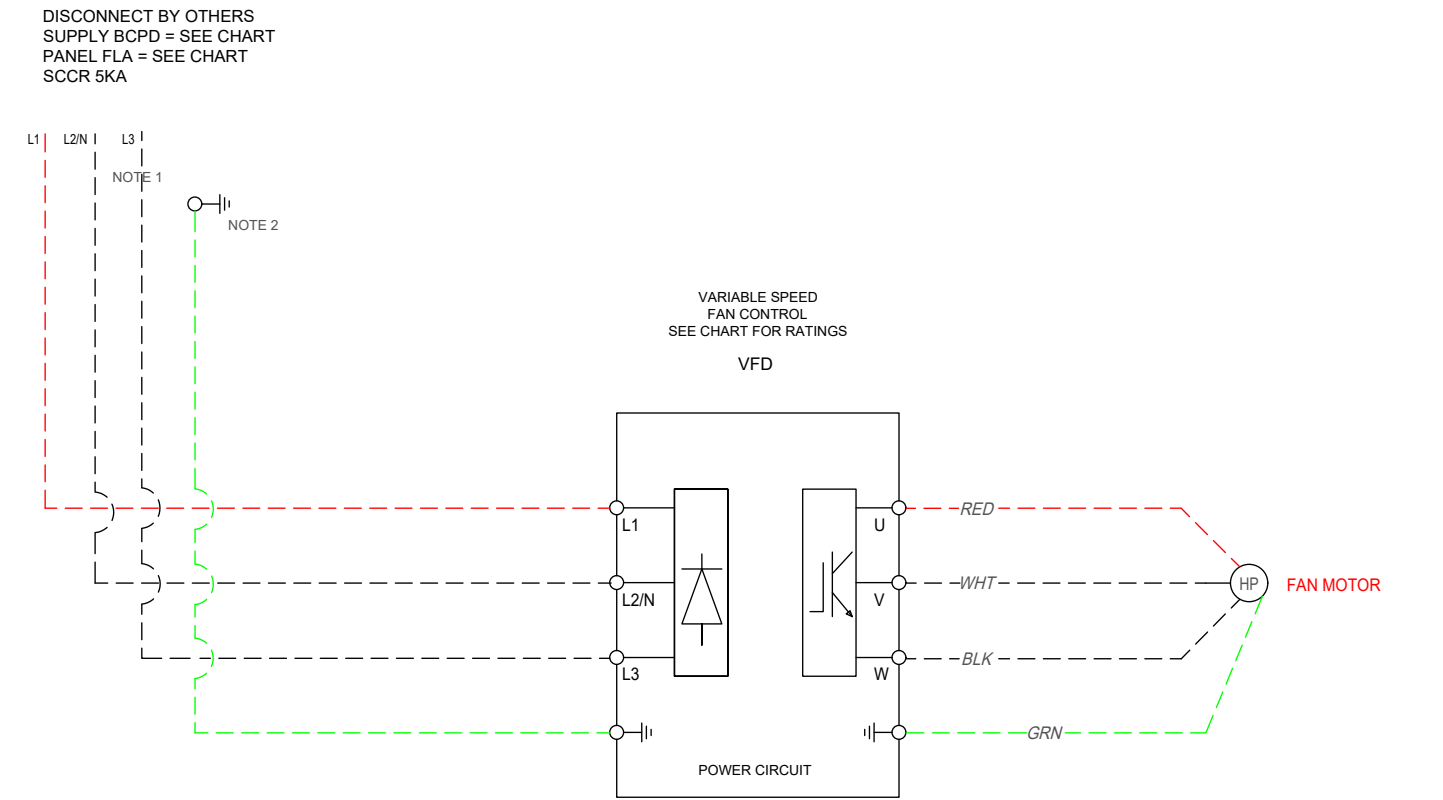
1 PHASE WIRING

Figure 22



3 PHASE WIRING

Figure 23

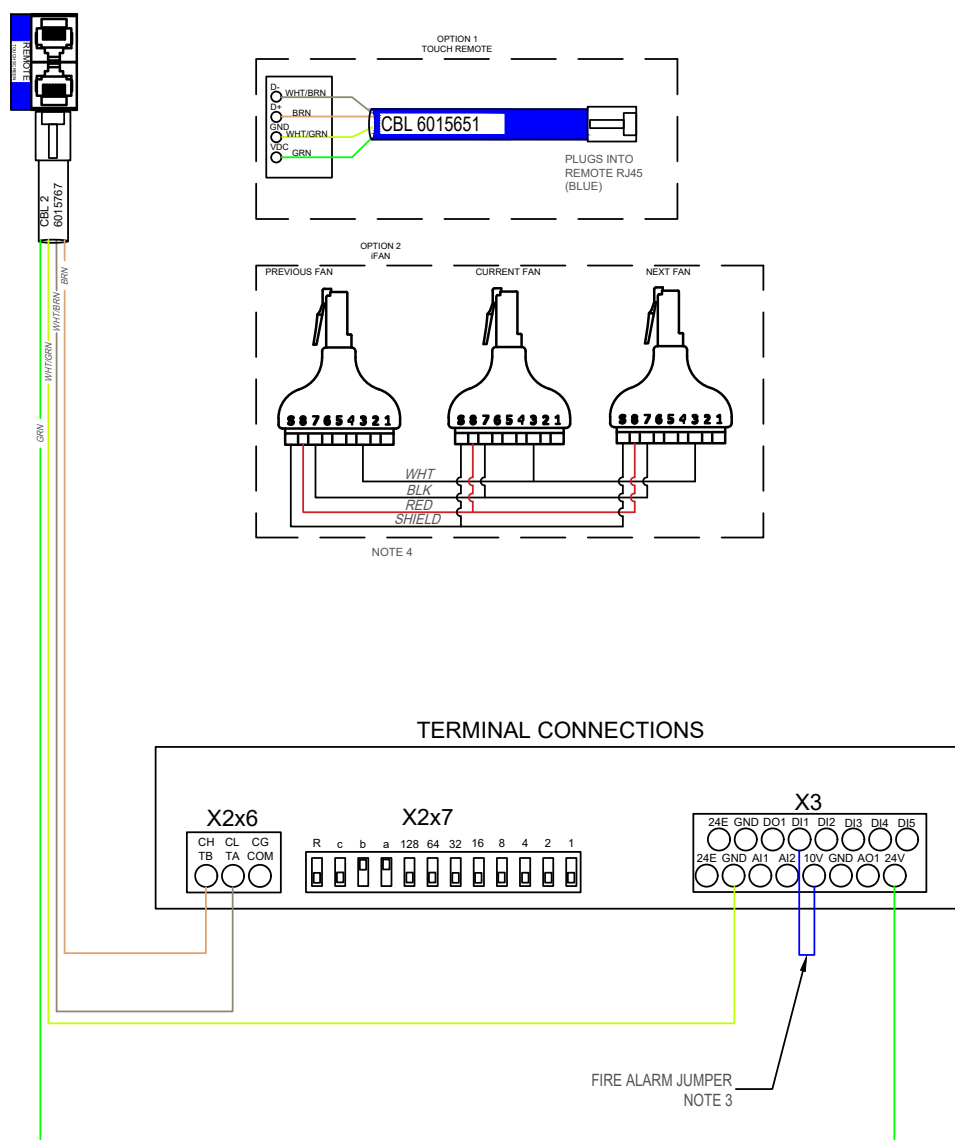


SIZING CHART

	6023470	6023490
VOLTAGE	120V/1PH/50 60HZ	230V/1PH 3PH/50 60HZ
FLA	7.4A	4.2A 1PH/2.5A 3PH
BCPD	10A	5A
MOTOR	0.75HP, 3.3FLA @ 127V/60HZ	0.75HP, 3.3FLA @ 127V/60HZ
VFD	120V/1PH 1HP/0.75KW/16.8A	230V/1PH 1HP/0.75KW/4.2A
O/L	3.3A	3.3A

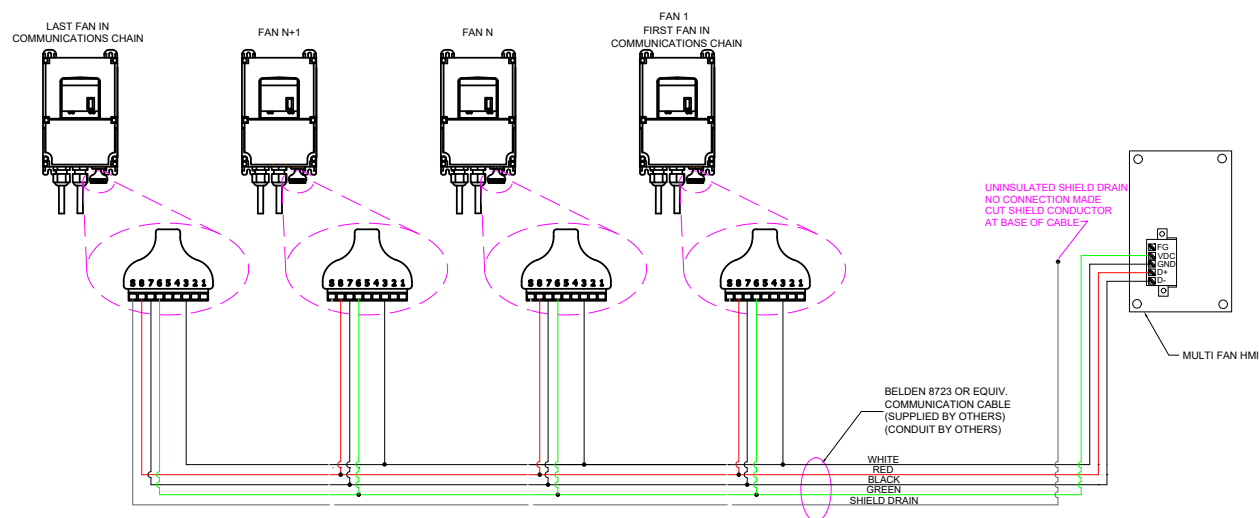
VARIABLE FREQUENCY DRIVE

Figure 24



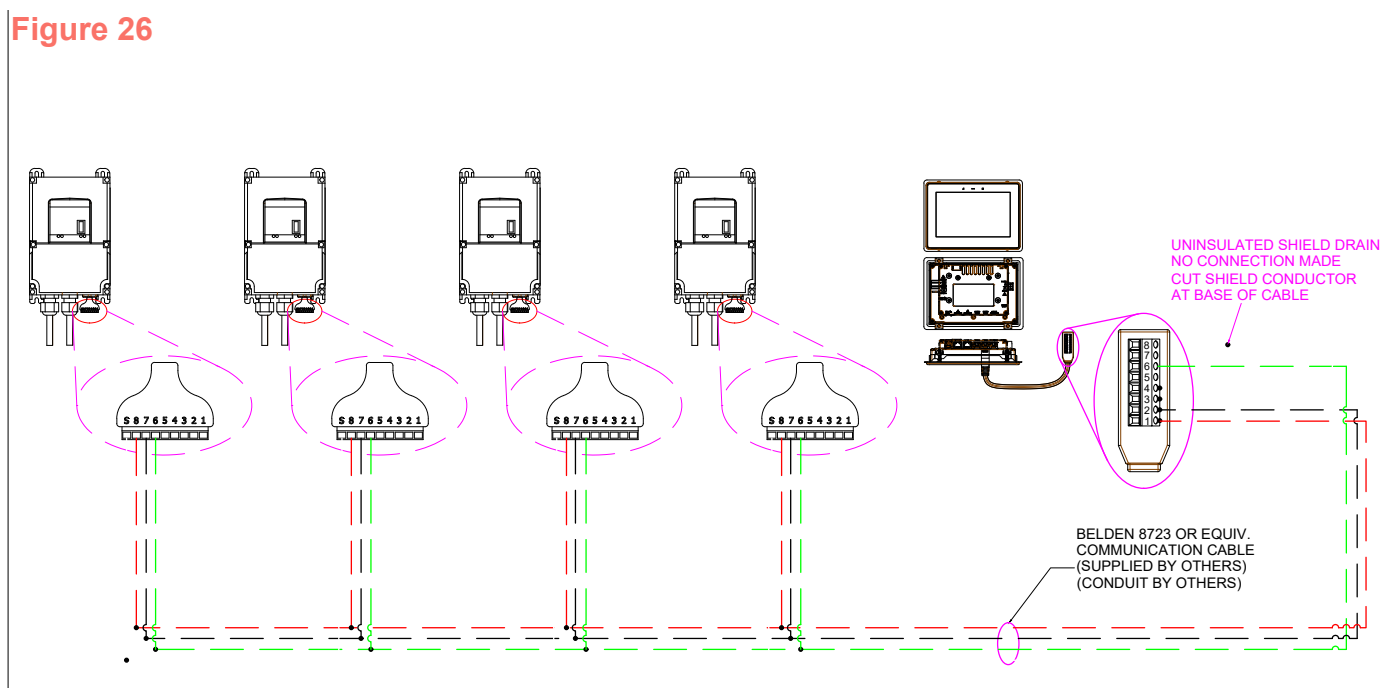
MULTI-FAN WIRING

Figure 25



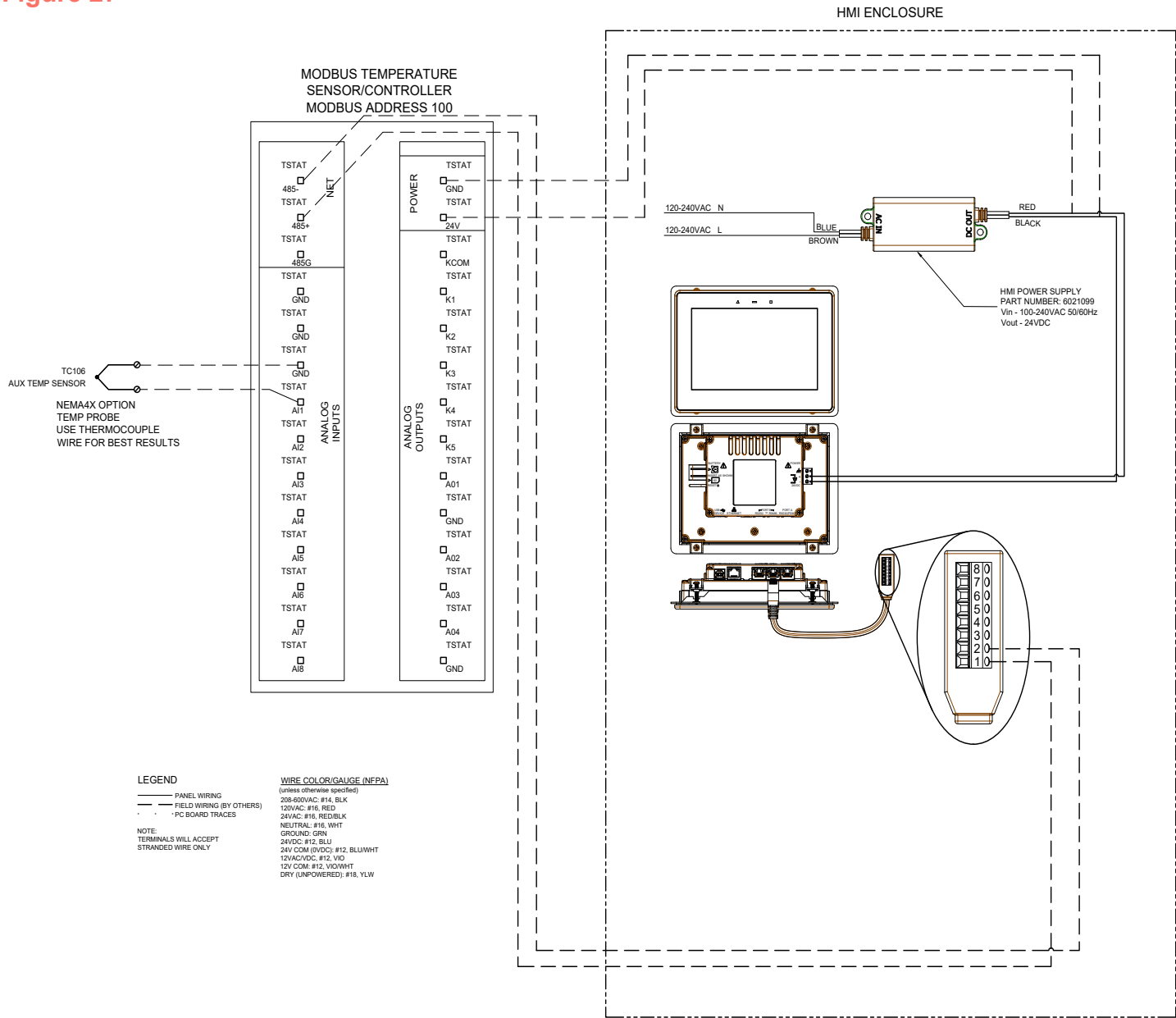
IFAN WIRING

Figure 26



OPTIONAL TEMPERATURE FAN WIRING

Figure 27



FIRE CONTROL SYSTEM FAN SHUTDOWN (OPTIONAL)

This fan includes a fire alarm option. This option allows the fan to be shut down by the fire control system in case of an emergency.

NOTE:

Ensure the fire alarm jumper is in place or the building fire control system is connected and the jumper removed.

	<i>The normally closed (NC) contacts must be dry contacts. They are open in the event of an active alarm.</i>
NOTICE	

ENABLE THE FIRE CONTROL SHUTDOWN OPTION

The fire control system fan shutdown option is not enabled when shipped. To enable the shutdown option:

- 1. Remove the jumper between DI1 and 10V.
- 2. Replace the jumper with a set of dry, normally closed contacts.

NOTE:

See [Fire Control System Fan Shutdown Panel — Standard Installation \(6015291\) \(Optional\)](#) on [page 35](#) for fire shutoff panel options.

TEST THE FIRE CONTROL SHUTDOWN OPERATION

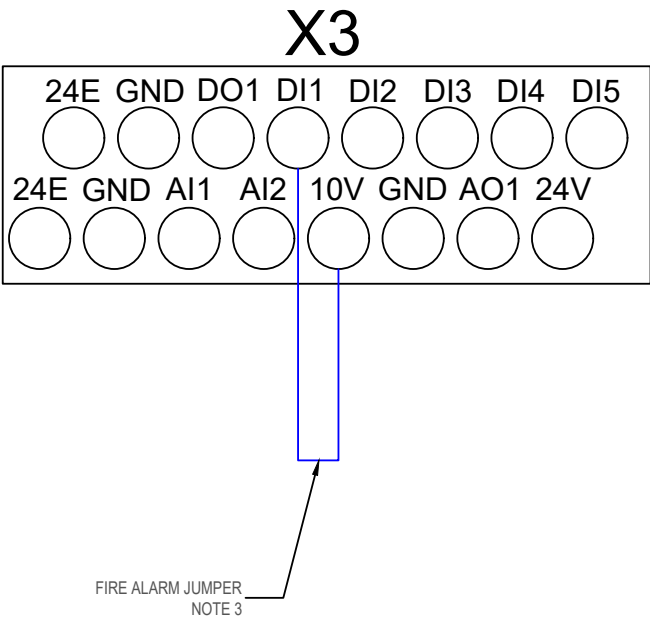
To test the fire control system fan shutdown:

- 1. Remove the wire from the NC contact at the building fire control panel.

The fan should coast to a stop.

	<i>If you leave the jumper installed, the fan will not shut down due to the fire control system contacts.</i>
NOTICE	

Figure 28



100-240V 1PH 60/50HZ
INCOMING SERVICE TO BE TERMINATED AT DISCONNECT
CB/FU TO BE SUPPLIED BY OTHERS
SUPPLY BCPO = CB/FU SAMP MAX
PANEL FLA = 0.6-0.3 AMPS
SCCR = 5KA

1011
1021

TS-1
N
G
BP
PE
G108
1081+
1082M
POWER SUPPLY
24VDC 60W

1081
TTS-1
STOP
CUSTOMER SUPPLIED STOP
NORMAL=CONTINUITY
(REMOVE FACTORY JUMPER)
1141
TS-1

1141
ENABLE
117
TS-1
TO 131
VFD TERMINAL STRIP
13
2
SEE NOTE 3
C
TS-1
TO 131
C
NO 119
NC

EN

FROM 119

HVLS FAN #1
TERMINAL STRIP X3

GND
SEE NOTE 3

DI1

C

FROM 119

HVLS FAN #N
TERMINAL STRIP X3

GND
SEE NOTE 3

DI1

(S SEE NOTE 1)

HVLS FAN #M
TERMINAL STRIP X3

GND
SEE NOTE 3

DI1

HVLS FAN
#LAST FAN IN SERIES
TERMINAL STRIP X3

GND
SEE NOTE 3

DI1

_____ PANEL WIRING
 - - - FIELD WIRING (BY OTHERS SEE NOTE 1)

NOTE:
TERMINALS WILL ACCEPT STRANDED
WIRE ONLY, TIGHTEN CONTROL
TERMINALS TO 4.5 LB-IN TORQUE

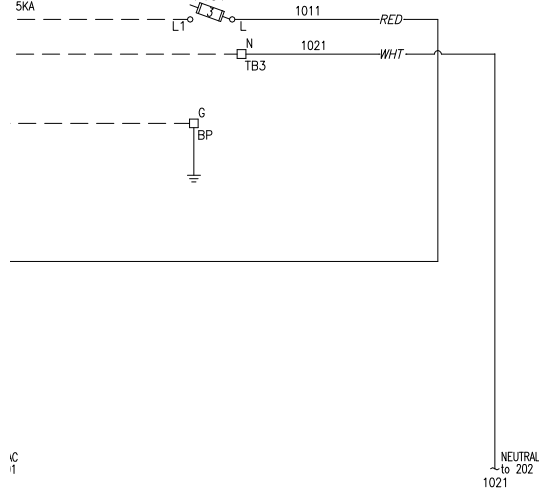
(unless otherwise specified)

208-600VAC: #14, BLK
120VAC: #16, RED
24VAC: #16, RED/BLK
NEUTRAL: #16, WHT
GROUND: GRN
24VDC: #18, BLU
24V COM (0VDC): #18, BLU/WHT
12VAC/VDC, #18, VIO
12V COM: #18, VIO/WHT
DRY (UNPOWERED): #18, YLW

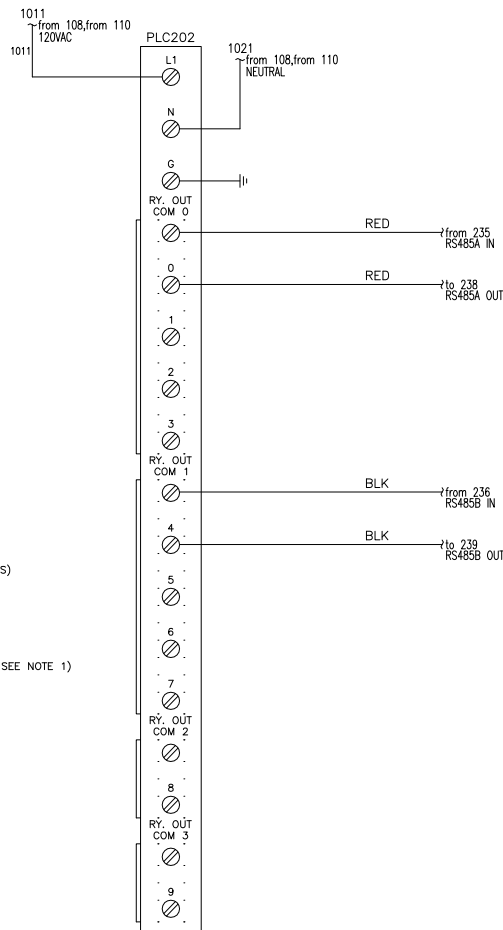
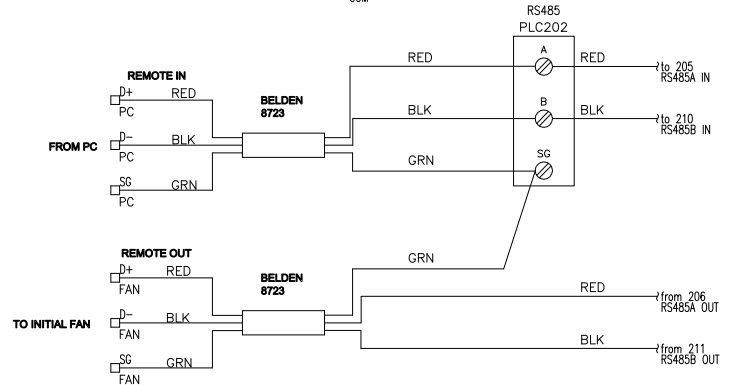
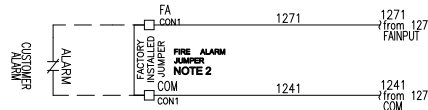
FIRE CONTROL SYSTEM FAN SHUTDOWN PANEL — NETWORK INSTALLATION (6020547) (OPTIONAL)

V/1PH/60HZ

3 SERVICE TO BE TERMINATED AT DISCONNECT
TO BE SUPPLIED BY OTHERS
1 BOPD = CB/FU 15AMP MAX
LA = 1.2 AMPS
5KA



IC
1



LEGEND

— PANEL WIRING
- - - FIELD WIRING (BY OTHERS)

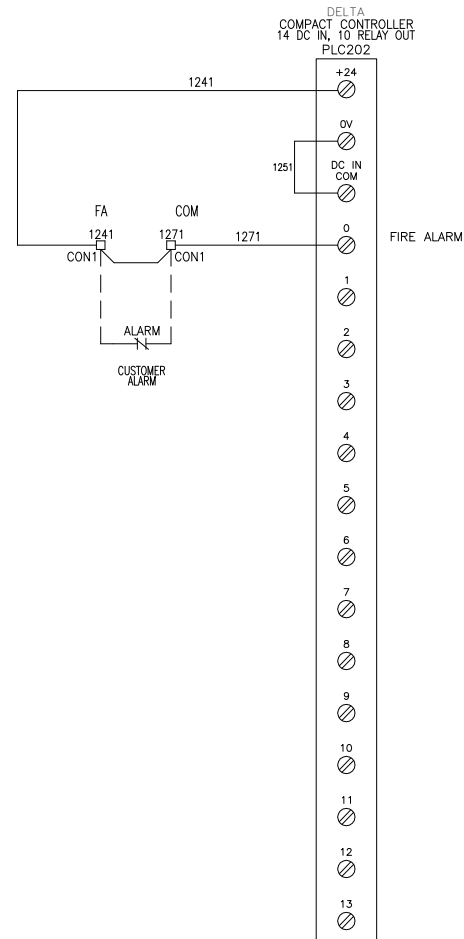
LEGEND

— PANEL WIRING
- - - FIELD WIRING (BY OTHERS SEE NOTE 1)

NOTE:
TERMINALS WILL ACCEPT STRANDED
WIRE ONLY

WIRE COLOR/GAUGE (NFWA)
(unless otherwise specified)

208-600VAC: #14, BLK
120VAC: #16, RED
24VAC: #16, RED/BLK
NEUTRAL: #16, WHT
GROUND: GRN
24VDC: #18, BLU
24V COM (OVDC): #18, BLU/WHT
12VAC/VDC: #18, VIO
12V COM: #18, VIO/WHT
DRY (UNPOWERED): #18, YLW



HMI SETUP

The Human Machine Interface (HMI) program controls up to a total of six fans. The program also allows the use of the Temperature Control accessory.

The temperature control accessory can only be used with a single fan configuration.

Once you complete the installation, the initial touchscreen control prompts you to configure your fan system. Follow the prompts on the HMI screen to complete these tasks.

DEFINE THE NUMBER OF FANS

1. Press the number of fans (1-6) the HMI will control. See **Figure 30**.

The number you selected changes to green.

SET THE DIAMETER OF THE FANS

NOTE:

The fan size is on the side of the fan shipping container.

1. Press the left or right arrow to select the fan for which you want to set the diameter.
2. Press the up or down arrow to select the diameter for the selected fan. See **Figure 31**.
3. Repeat steps 1 and 2 until you have set the diameter for all fans, and then advance to the next screen.
4. Verify that the sizes displayed are correct. If so, press the right arrow.

Figure 30

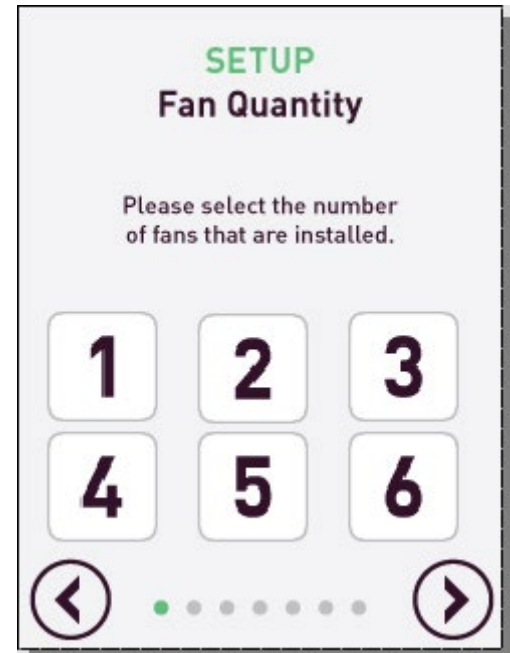
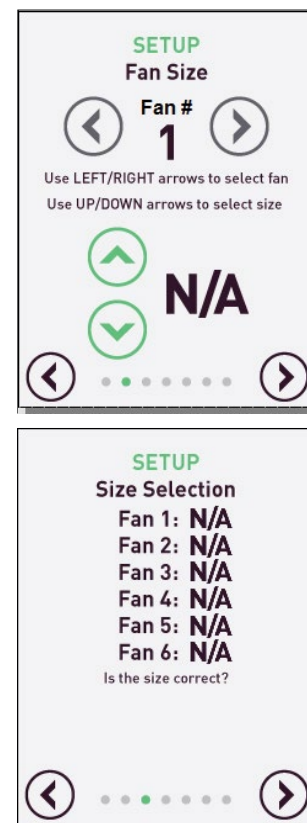


Figure 31



ENABLE THE TEMPERATURE CONTROL OPTION (OPTIONAL)

NOTE:

The Temperature Control option requires the use of an optional temperature sensor (Std: 6013861 or 4X: 6016700). The 4X option should only be used if the temp sensor part number 6016700 is being used.

If you chose a single fan for the Fan Quantity on the first screen, the Enable Temperature Control screen displays.

1. Press **Yes** to enable the temperature control; otherwise press **No**. See **Figure 32**.

The option you selected changes to green.

2. Press the right arrow to continue.

If you enabled Temperature Control, the Temperature setup screen displays.

Figure 32

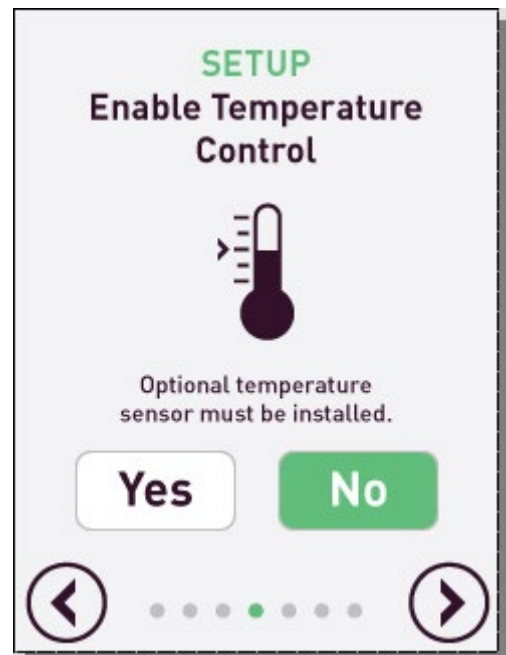


Figure 33

SETUP TEMPERATURE CONTROLS

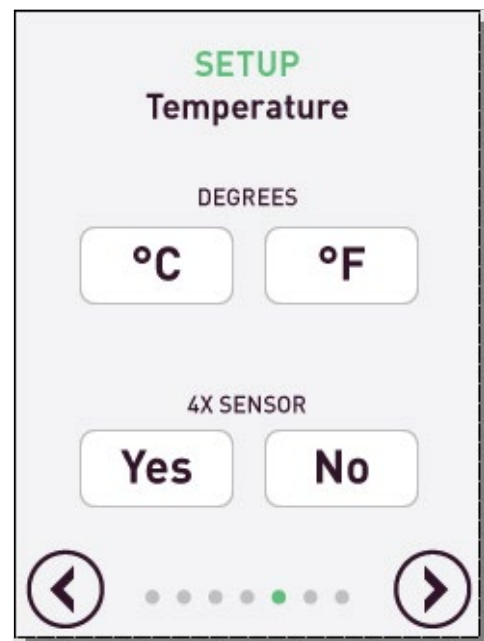
1. Press C for Centigrade or F for Fahrenheit.
2. Press Yes if you are using a NEMA 4X temperature sensor; otherwise press No. See **Figure 33**.

CORRECT ERRORS DURING HMI CONFIGURATION

If you make an error when configuring the HMI program, you can go back to the Setup screen to correct it. To access the Setup screen:

1. Press the menu icon in the bottom left-hand corner of the screen.
2. Press the setup icon.
3. Enter the passcode (default 1111).

The setup screen displays.



POST CONFIGURATION TASKS

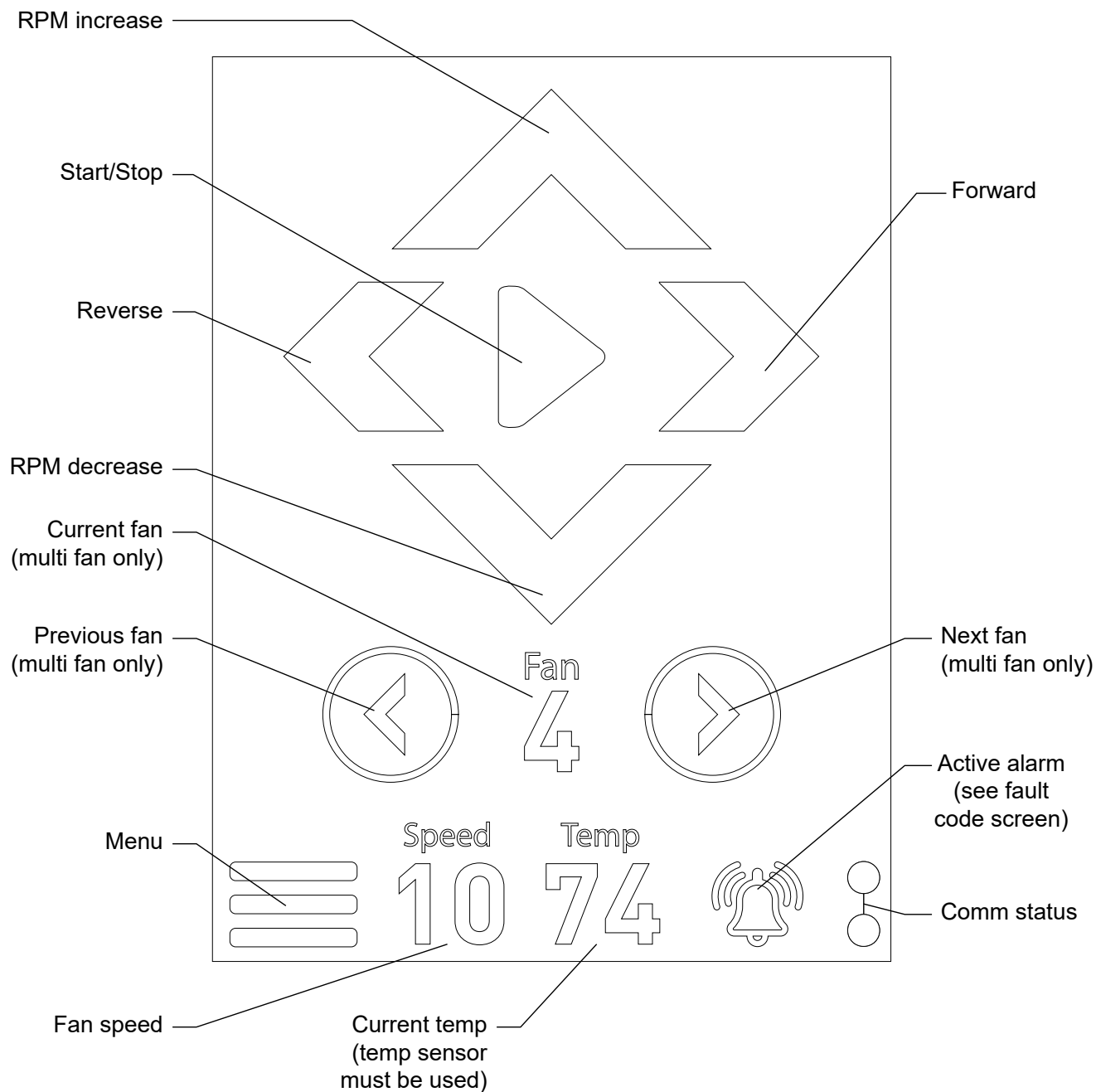
After you configure the HMI program for your location, you should:

1. Operate the fan using the [Operating Instructions — HMI on page 40](#).
2. Check the fan for proper rotation direction, stability, and noise level.
3. Train authorized personnel how to use the fan using the [Operating Instructions — HMI on page 40](#).

OPERATING INSTRUCTIONS — HMI

FAN CONTROL SCREEN

Figure 34



⚠ WARNING

Before operating the commercial fan, read and follow the [Safety Practices on page 7](#) and the [Operating Instructions — HMI on page 40](#). Use by untrained personnel could result in death or serious injury.

VERIFY PRIOR TO OPERATION

- The voltage and phase are correct.
- The clearance from obstructions matches the requirements.
- All safety cables are present and properly installed, if applicable.
- All fasteners are properly torqued.
- No personnel are in the movement area.

LOGIN SCREEN

If the passcode has been enabled, you must login before operating the fan.

The default password is 1111.

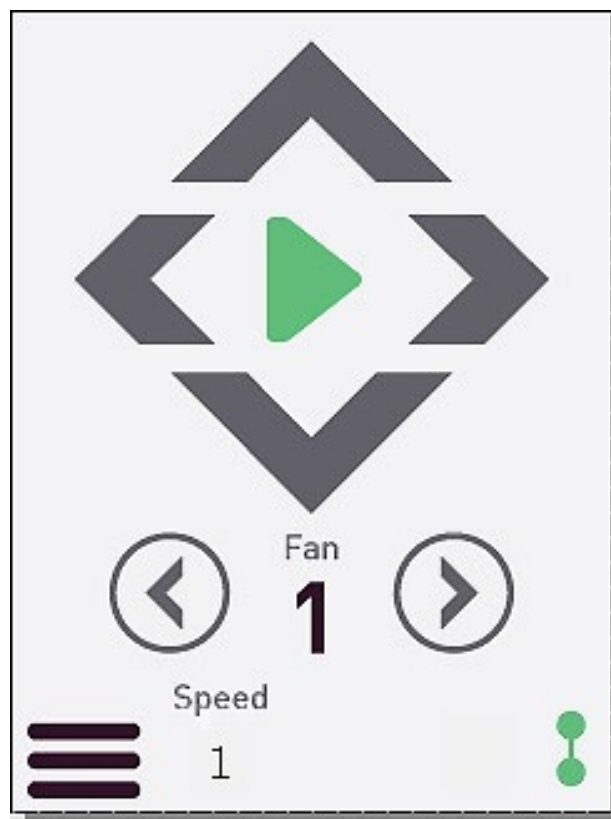
NORMAL FAN OPERATION

1. Verify the communication status symbol in the bottom right-hand corner is green.
If it is not, communication is not working properly.
2. Press the **Start** button, and then select the beginning fan rotation direction. See [Figure 34](#).
3. Set the desired speed by pressing either **RPM increase** or **RPM decrease** until your desired speed displays.

Maximum speed is 10.

Minimum speed is 1.

Figure 34



CHANGE THE FAN ROTATION DIRECTION

It is not necessary to stop the fan before changing its rotation.

- Select **Forward** or **Reverse**.

DIAGNOSTIC SCREEN

The Diagnostic screen shows the following information. See **Figure 35**.

SERVICE PROVIDER INFORMATION

Contact the provider shown on the Corporate Address page for all fan service issues.

FAN INFORMATION

Fan information is on the Diagnostic screen.

- VFD serial number
- Motor speed RPM
- Motor current (x10)
- Fan alarm, if an alarm is present
- Fire alarm, if an alarm is present

BUTTON INFORMATION

The Fault Code button displays the Active Alarm screen.

The Temp button displays the Temperature Settings screen.

The Passcode button displays the Passcode screen.

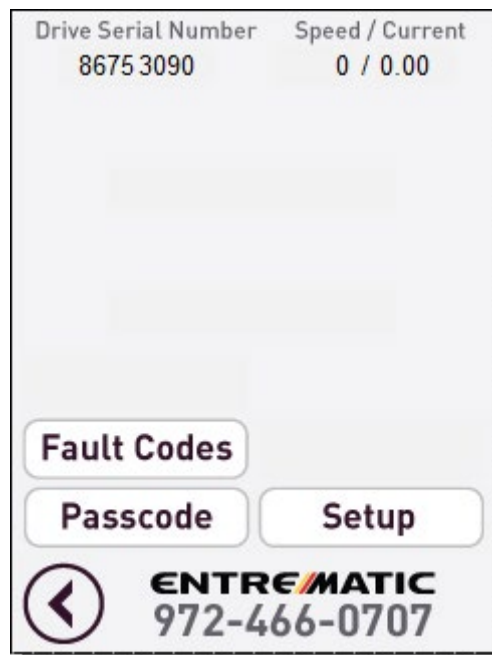
The Setup button displays the Setup screen.

FAULT CODES

If a Fan Alarm is displayed, press the Fault Code button to display the Active Fault Code screen.

If the fan is currently under a Fault Code, the Active Fault Code number that caused the fault displays in the top right-hand corner of the screen.

Figure 35



To resolve the Fault Code:

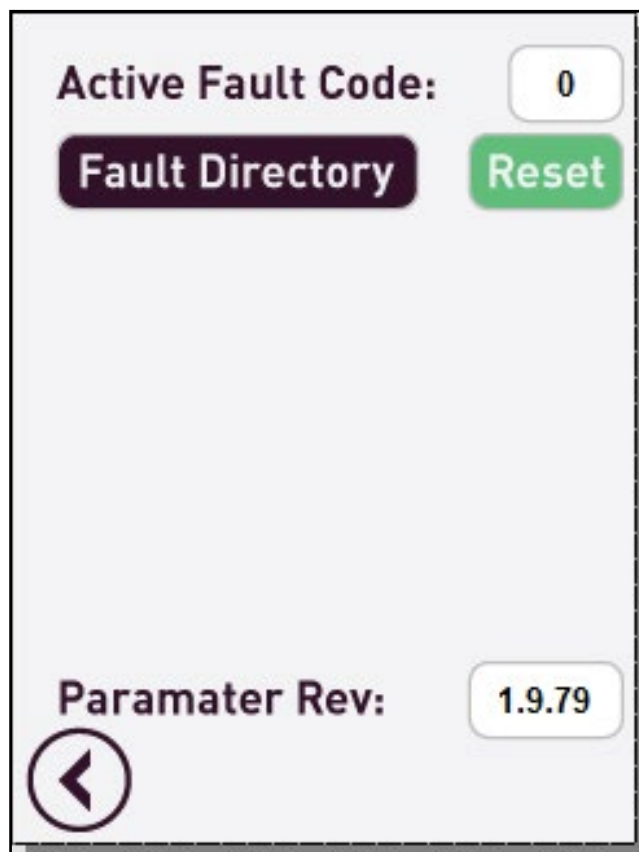
1. Press the **Fault Code Directory** button to display a description of the Fault Code. See **Figure 36**.
2. Match the number with the error code in the directory.
3. Resolve the issue causing the fault.
4. Press the **Reset** button to allow the fan to operate.

Figure 36



FAULT CODE DEFINITIONS

FAULT CODE	DEFINITION
8784	Continuous Overcurrent
8992	Short Circuit/Earth Leakage
9024	Short Circuit
9040	I ² *t Overload
9090	I*t Error Fault
12576	Mains Phase Fault
12816	DC Bus Overvoltage Fault
12832	DC Bus Undervoltage Trouble
16912	Overtemperature Fault
17024	Heat Sink Temperature Sensor Fault
17168	Moor Temperature Failure
25233	Maximum Allowed Trouble Codes Fault
29056	Motor Overcurrent Fault
30337	Memory Module not Present Fault
33185	Modbus Network Time-Out Fault
33533	Torque Limit Reached
66286	Motor Overspeed Fault
65289	Motor Phase Missing
65290	Motor Phase Failure Phase U
65291	Motor Phase Failure Phase V
65292	Motor Phase Failure Phase W
65337	Motor Overload
65366	Maximum Motor Frequency Reached



PASSCODE PROTECTION

You can add passcode protection to the remote to prevent unauthorized use.

1. Press the **Menu** button on the main screen.
2. Press the **Passcode** button on the diagnostic screen.
3. Type your passcode. See **Figure 37**.

NOTE:

The default passcode is 1111. If you have customized your passcode, enter your customized passcode.

ENABLE YOUR PASSCODE

By default the passcode is disabled.

- Press the unlocked padlock icon to enable the passcode entry requirement.

DISABLE YOUR PASSCODE

- Press the locked padlock icon to disable the passcode entry requirement.

UPDATE YOUR PASSCODE

1. Enter your new passcode using the numeric keypad.
2. Press the Update Passcode button. See **Figure 38**.

When the passcode is enabled, the system automatically logs you out after two minutes.

Figure 37



Figure 38



MULTI-FAN CONTROL — OPTIONAL

- Press the previous or next buttons to select the fan you would like to control. See **Figure 39**.

The All option lets you control all of the fans at the same time.

TEMPERATURE CONTROL — OPTIONAL

To enable the temperature control:

1. Cycle through the start/stop/temp control until you reach Temp. See **Figure 40**.
2. To access the temperature settings screen from the main menu, press the menu button, and then press the Temp button.
3. Type the temperature to start the fan automatically. See **Figure 41**.

At this temperature, the fan automatically starts at speed 2.

4. Type a value to increment the temperature for the next speed setting.

This value is added to the start temperature you entered in the previous step and sets the temperatures at which the fan switches to speeds 4, 6, 8, and 10.

EXAMPLE:

If you enter 70° for the start temperature and enter 3 for the increment value, the fan starts at speed 2 when the temperature is 70°.

When the temperature reaches 73°, the fan switches to speed 4.

When the temperature reaches 76°, the fan switches to speed 6.

The fan decreases in speed as the temperature decreases until the temperature falls below the start point. When the temperature falls below the start point minus the increment value, the fan automatically shuts off.

Figure 39

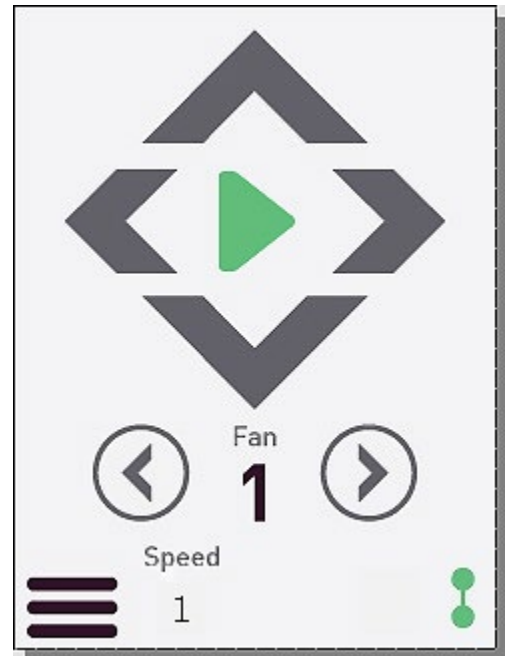
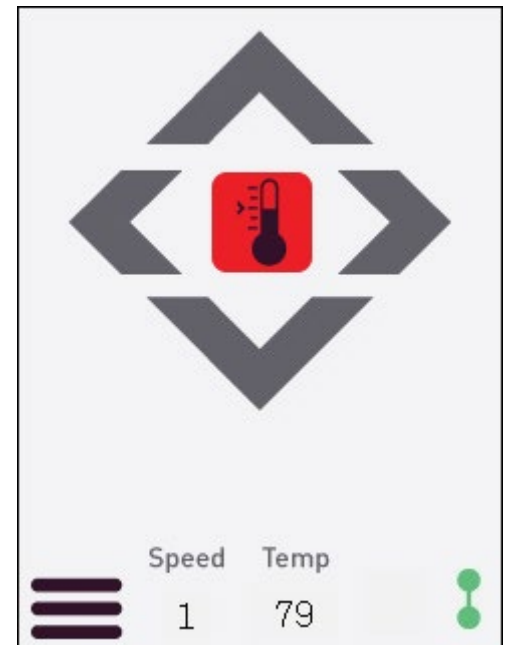


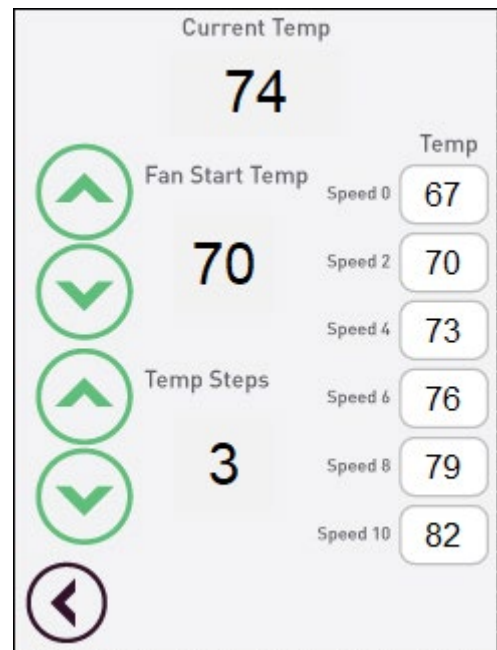
Figure 40



DISABLE THE TEMPERATURE CONTROL

To disable the temperature control, cycle to Stop or Run from the main screen.

Figure 41



PLANNED MAINTENANCE

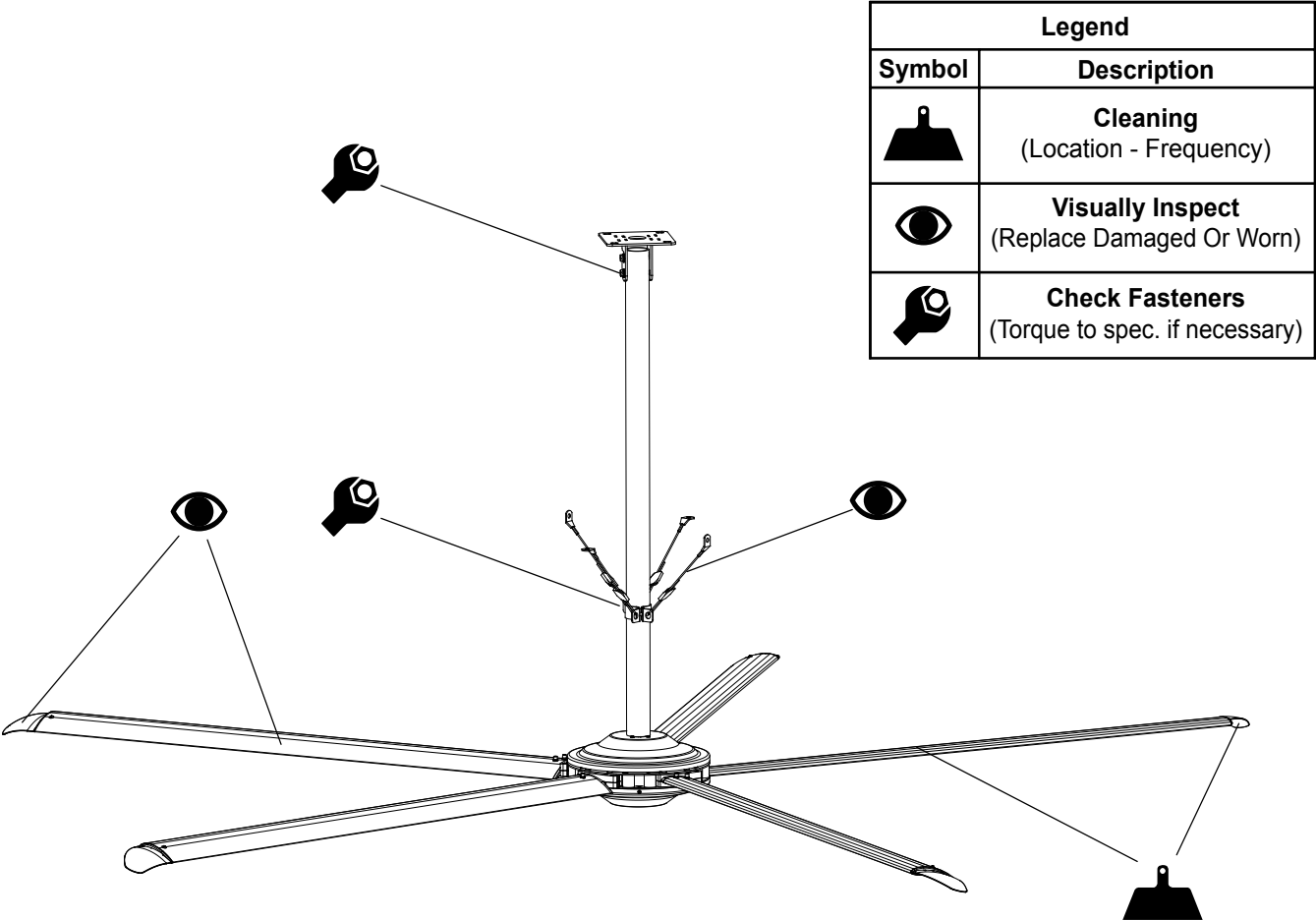
⚠ DANGER	<i>Before service, inspection or cleaning make sure the power is disconnected and properly locked out and tagged out.</i>
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⚠ WARNING	<i>Before servicing the fan, read Safety Practices on page 7 and Operating Instructions — HMI on page 40. Failure to do so could result in death or serious injury.</i>
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ANNUALLY


1. Inspect the blade mounting hardware and tighten as required
 - a. Torque to 20-28 ft-lbs.
2. Inspect guy wires for chafing or wear, if applicable.
 - a. Ensure wires are taut
 - b. Re-tighten cables as required.
 - c. Ensure all cable mounting hardware is secure.
 - d. Maintain plumb attitude of the down tube.
 - e. Torque to 12-17 ft-lbs.
3. Inspect fan blades and winglets.
4. Clean fan blades as required.
 - a. Use a soft dry cloth.
 - b. If necessary, use a mild detergent to clean surfaces. Do not use harsh cleaners.

Figure 42



TROUBLESHOOTING GUIDE

<div>  WARNING </div>	<p>Before servicing the fan, read Safety Practices on page 7 and Operating Instructions — HMI on page 40. Failure to do so could result in death or serious injury.</p>
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<div>  DANGER </div>	<p>Before doing any electrical work, make certain the power is disconnected and properly locked out or tagged out.</p> <p>Failure to do so may result in death or serious injury.</p> <p>All electrical troubleshooting and repair must be done by a qualified technician and meet all applicable codes.</p> <p>Do not route control wiring for any other device through this control box.</p> <p>Ensure the voltage and phase of the incoming power agrees with the label on the top of the VFD box and fan.</p> <p>Be certain the power is off when wiring to the control box.</p> <p>Failure to do so may result in electrical shock, death, or serious injury.</p>
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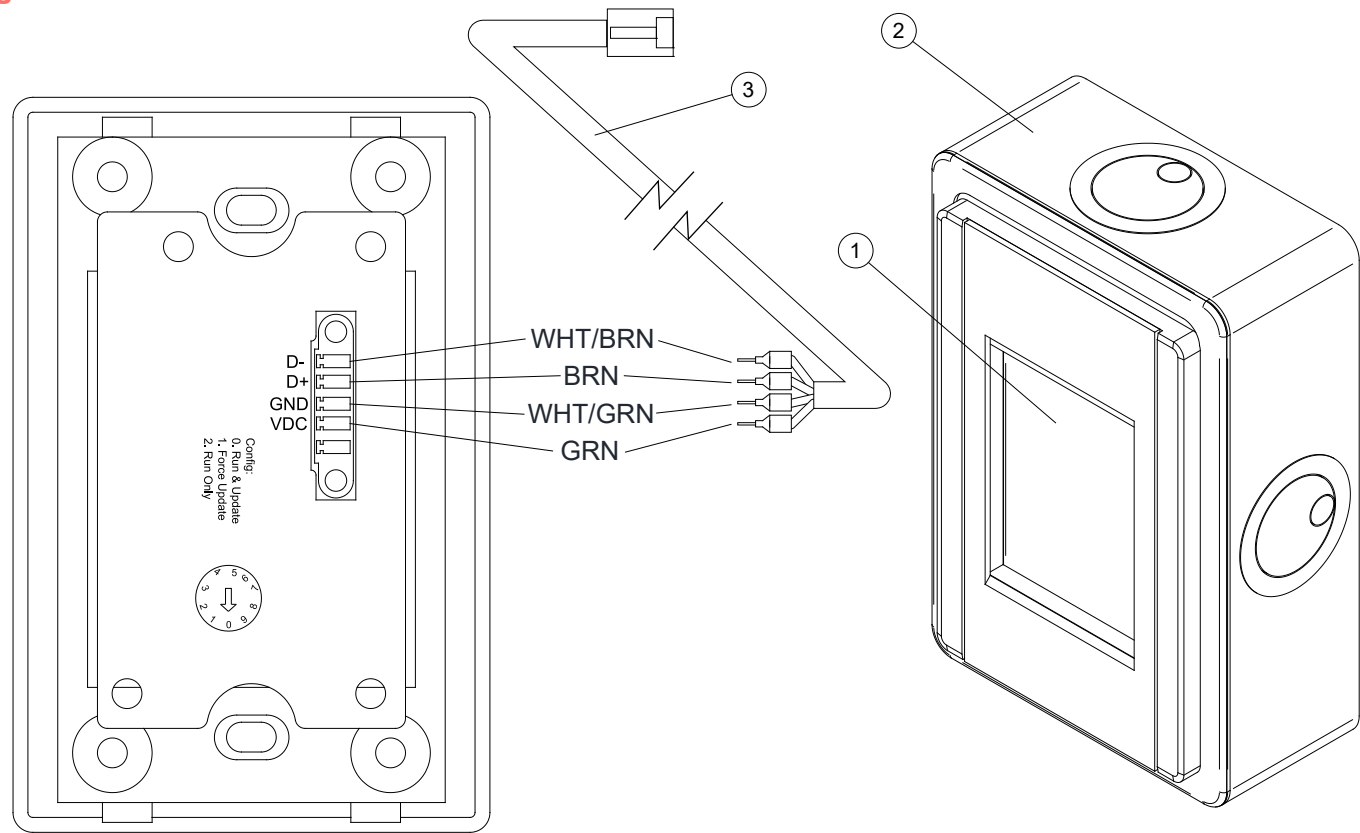
Use the Troubleshooting Guide if the fan fails to perform properly. Find the condition that closely matches your situation and make the recommended adjustments

PROBLEM	POSSIBLE CAUSE	SOLUTION
Fan runs but makes noise or vibrates.	Bad motor bearing	Check to see if the fan rotates freely by hand without binding.
	Missing or damaged winglet	Check winglets.
	Loose or damaged blade	Ensure blades are firmly attached and mounting fasteners are tight.
Fan does not operate	No power to the control panel	Check for primary power at the terminals.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Fan does not operate. Control Panel has power	Obstructions preventing movement	Check the fan unit to ensure there are no obstructions preventing movement.
	Remote not properly connected	Check connections between the remote and the VFD.
	VFD faulted	Check for the VFD fault. Check the Fault Action Code and reset the driver by powering the VFD off, and then on again.
	Motor power cable disconnected	Check cable connection
	Fire circuit is open	A RED fire alarm indicator shows the fire alarm is active or the circuit is open. Review the building fire alarm system, and then reset it if necessary.
Fan operating, but shows excessive wobble	Guy wires not tensioned properly	Re-tension guy wires in accordance with Optional Guy Wire Kit (6016307) on page 21.
	Winglet missing	Replace winglet.
Fan generating a ticking noise, tick increases with speed	Blade bolts are not properly tightened	Loosen the blade nuts. Support the blade level horizontally before you torque the bolts to 12-17 ft-lbs.

PARTS LIST — HMI REMOTE

Figure 43

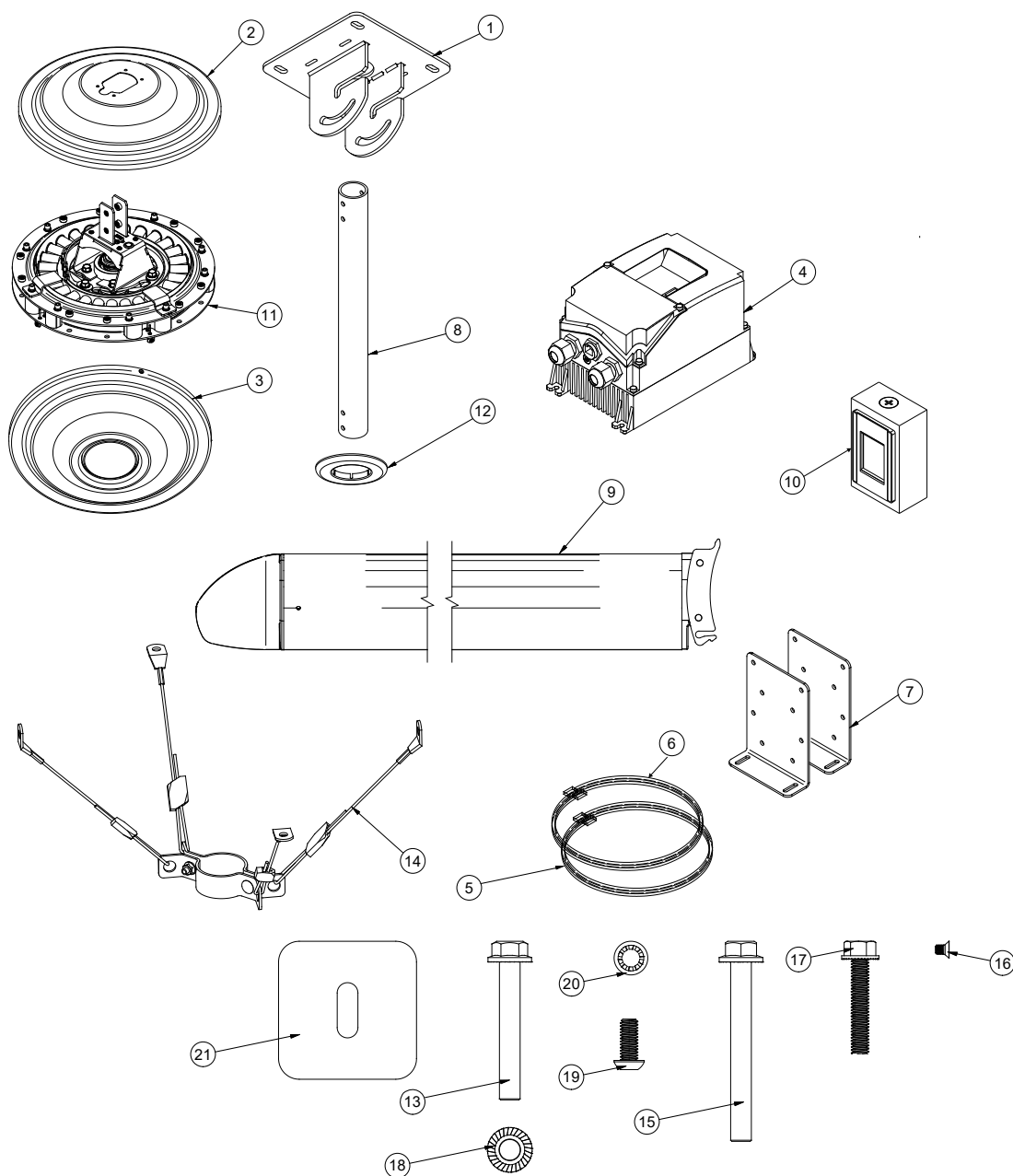


ITEM	QUANTITY	DESCRIPTION	PART NUMBER
1	1	Touchscreen Controller - Epic	6023472
	1	Touchscreen Controller - Kelley	6023473
	1	Touchscreen Controller - Serco	6023474
2	1	J-Box, Plastic, Ivory	6015648
3	1	Cable CAT5, 100" w/Ferrule (Blue)	6023484

PARTS LIST — FAN

▲ WARNING

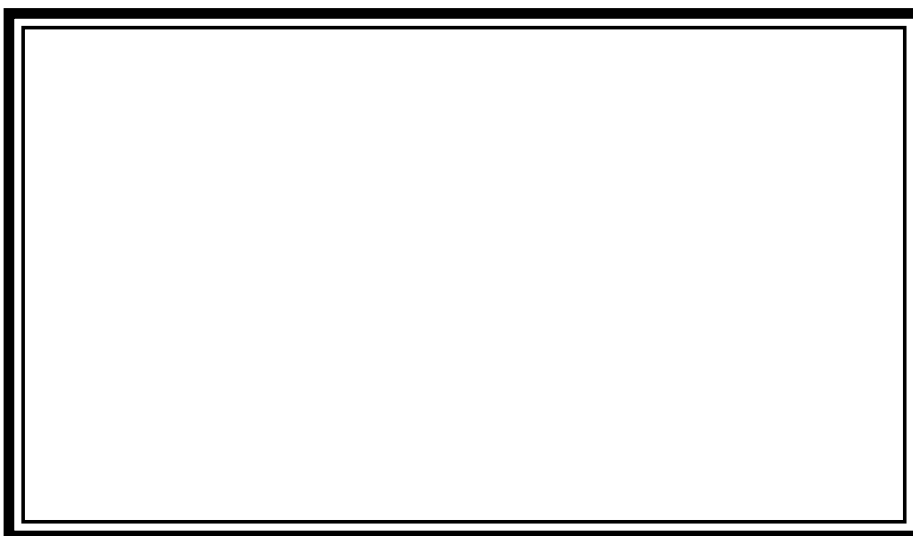
To ensure proper function, durability, and safety of the product, only replacement parts that do not interfere with the safe, normal operation of the product must be used. Incorporation of replacement parts or modifications that weaken the structural integrity of the product, or in any way alter the product from its normal working condition at the time of purchase from 4Front Engineered Solutions may result in product malfunction, breakdown, premature wear, death or serious injury.



ITEM	QUANTITY	DESCRIPTION	PART NUMBER
1	1	Mount	6018002
2*	1	Upper Cover - Silver	6016286
3*	1	Lower Cover - Silver	6016285
4	1	VFD - 120V/1PH	6023470
		VFD - 240V/1PH or 3PH	6023491
5	1	Power Cable	6023464
6	1	Control Cable	6023484
7	1	Beam Mount — Optional	6018175
8*	1	Down Tube - Silver	6016367
9*	1	Blade Assembly — 6 ft. - Silver	6017580
	1	Blade Assembly — 8 ft. - Silver	6017581
	1	Blade Assembly — 10 ft. - Silver	6017582
	1	Blade Assembly — 12 ft. - Silver	6017583
	1	Blade Assembly — 14 ft. - Silver	6017584
10	1	Controller Assembly	Consult Factory
11	1	Motor Assembly	6016280
12	1	Ceiling Cover Plate	6017848
13	4	3/8-16UNC x 2 1/2", FLNG SERTD Hex Bolt. GRD-5	6017873
14	1	Extension Guy Wire Kit, 3-5'	6016307
	1	Extension Guy Wire Kit, 5-10'	6017765
	1	Extension Guy Wire Kit, 10-15'	6017766
15	2	3/8-16 UNC x 3 1/4", FLNG SERTD Hex Bolt, GRD-5	6017748
16	3	8-32 UNC x 1/4", Lg FLT HD Screw - Torx ZP	6017870
17	10	5/16 UNC x 1 3/4, FLGD SRTD Hex Bolt, GRD-5, ZP	6017837
18	6	3/8-16UNC Hex Serrated Flange Nut	6015118
19	4	5/16UNC x 3/4 LG Torx SOC HD Screw, GRD-2, ZP	6017853
20	4	5/16 INT Tooth Lock Washer	6017838
21	4	Clamp Plate	6017852

* Consult factory for colors other than silver.

Please direct questions about your fan to your local distributor. Your local distributor is:



Corporate Office

1612 Hutton Drive, Suite 140

Carrollton, TX 75006

Tel: (972) 466-0707

Fax: (972) 323-2661



APS Resource

262.518.1000

Scan this code or [click](#) here to locate an APS Resource distributor. For replacement parts, please call the number above.