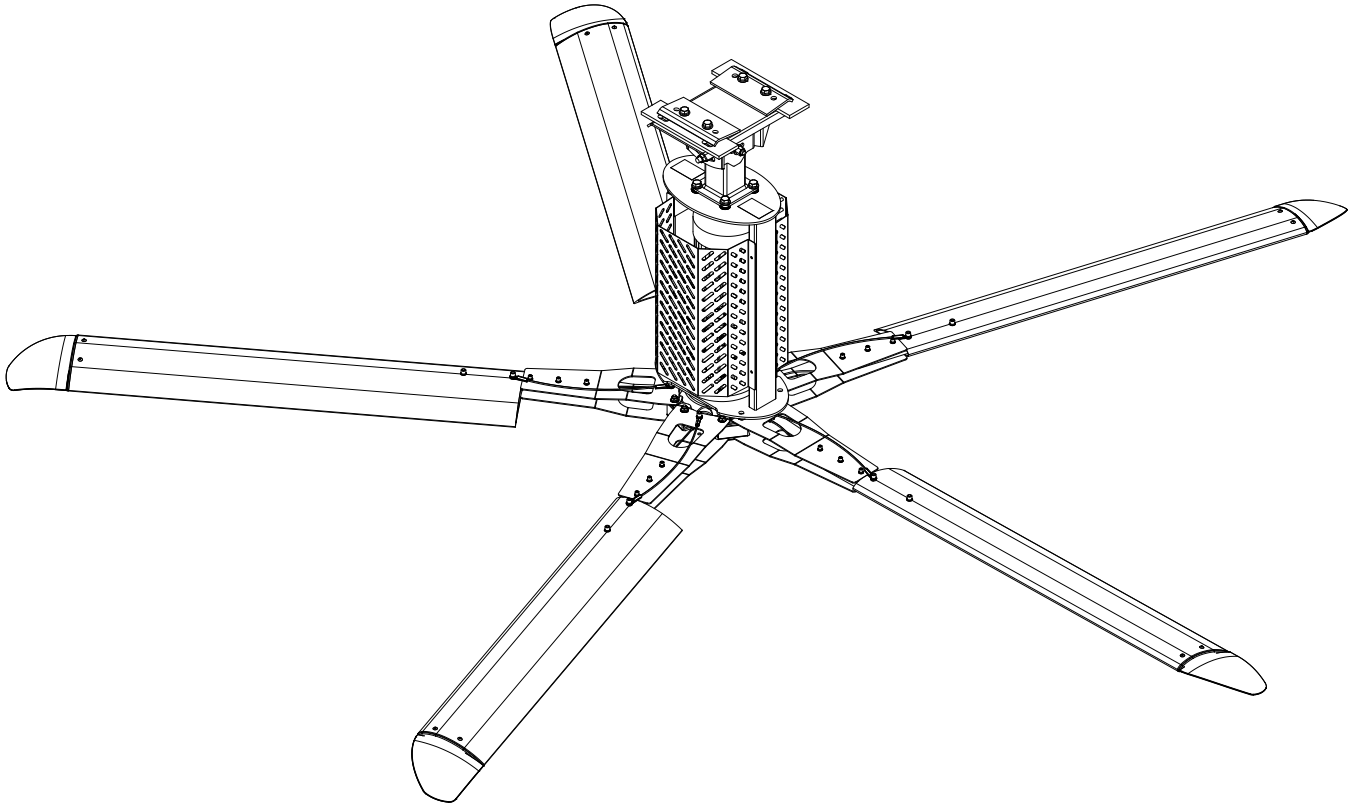


Industrial HVLS Fan User's Manual



This manual applies to fans manufactured beginning November 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. 6021140F

WARRANTY

THIS LIMITED WARRANTY IS 4FRONT's (DBA ENTREMATIC) 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 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, 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, and 4FRONT will, at its option:

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

In addition, 4FRONT warrants the HVLS FAN for fourteen (14) years for Mechanical and six (6) years for Electrical.

Mechanical is defined as mechanical components of the fan, including the powerhead (motor and gearbox), fan hub, mounting airfoils and winglets.

Electrical is defined as all electrical components of the fan including the 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://entrematicfans.com/international-warranty>.

This Limited Warranty does not cover any failure caused by improper installation including mounting location and exclusion zone violations, abuse, improper operation, negligence, or failure to maintain and adjust the HVLS FAN properly. Parts requiring replacement due to damage resulting from vehicle impact, abuse, or improper operation are not covered by this warranty. 4FRONT 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's sole obligation with regard to a 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's 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 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 industrial fan from Entrematic.

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 keep and read this User's Manual before using your new fan.

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 URL for the online version is provided on the back page of the manual. Scan the QR code above the URL for quick access to the online document.


- Numbered blue circles on diagrams and figures indicate a link to more information about the numbered part or element. Click on the circle for additional information.
- A pointing hand icon next to a figure indicates that the figure is interactive. Click on the figure for a different view of the feature or part or for additional information. 
- A play button (triangle) on a figure indicates a video that provides additional information about the part or feature. Click on the triangle to play the video. 
- 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,</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>
--	---

⚠ DANGER	<p>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.</p>
	<p>Be certain to follow the instructions in this manual.</p>
⚠ WARNING	<p>Installation of the equipment must comply with local and national electrical codes and must be in accordance with ANSI/NFPA 7-1999.</p> <p>Do not use this industrial fan until you have received proper training. Improper use could result in property damage, bodily damage, bodily injury, and/or death. Read and follow the complete OPERATING INSTRUCTIONS before use. If you do not understand the instructions, ask your supervisor to explain them to you or call your local distributor.</p> <p>DO NOT USE THE FAN IF IT APPEARS DAMAGED OR DOES NOT OPERATE PROPERLY. Inform your supervisor immediately.</p>
	<p>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.</p> <p>To reduce the risk of electrical shock, do not expose to water or rain.</p> <p>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.</p>
	<p>Before service, inspection, or cleaning, make certain the power is disconnected and properly locked out.</p> <p>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 DISCONNECTED ON THE POWER CIRCUIT. Call you your local distributor for service,</p>
⚠ WARNING	<p>Keep your body clear of moving parts at all times.</p> <p>All electrical troubleshooting and repair must be done by a qualified technician and meet all applicable codes.</p> <p>If it is necessary to make troubleshooting checks inside the VFD box with the power on, USE EXTREME CAUTION. Do not place fingers or un-insulated tools inside the enclosure. Touching wires or other parts inside the enclosure could result in death or serious injury.</p>

	<i>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.</i>
▲ WARNING	
	<i>If you have problems or questions, contact your local distributor for assistance.</i>
▲ WARNING	<i>To reduce the risk of injury to persons, install the fan so that the blades are at least 3.05m (10') above the floor.</i>
▲ 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 industrial fan and shop worker. The owner should, therefore, train and instruct operators in the safe use of the industrial 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.

Industrial 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 industrial fans shall be made only with written permission of the original manufacturer.

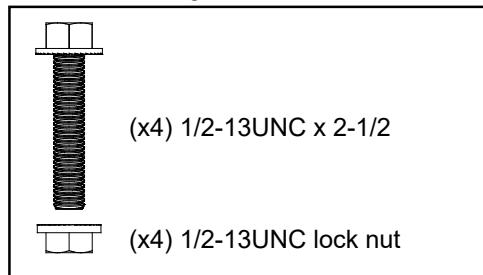
NATIONAL FIRE PROTECTION ASSOCIATION STANDARD

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:

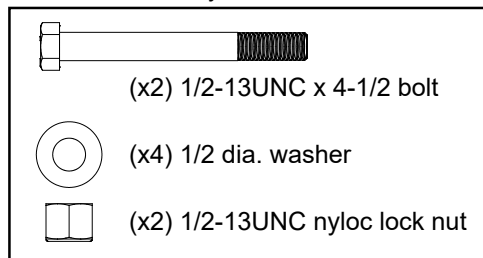
- The maximum fan diameter shall be 24 feet (7.3m).
- The fan shall be approximately centered between four adjacent sprinklers.
- The vertical clearance from the fan to the sprinkler deflector shall be a minimum of 3 feet (0.9m).
- All fans shall be interlocked to shut down immediately upon receiving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

HARDWARE

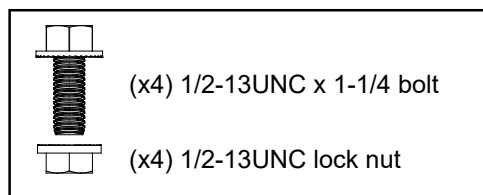
Mount — Building



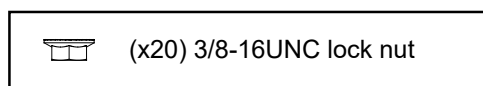
Mount — Assembly



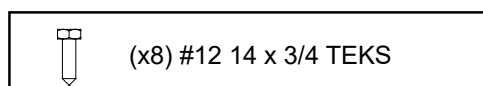
Mount — Motor frame



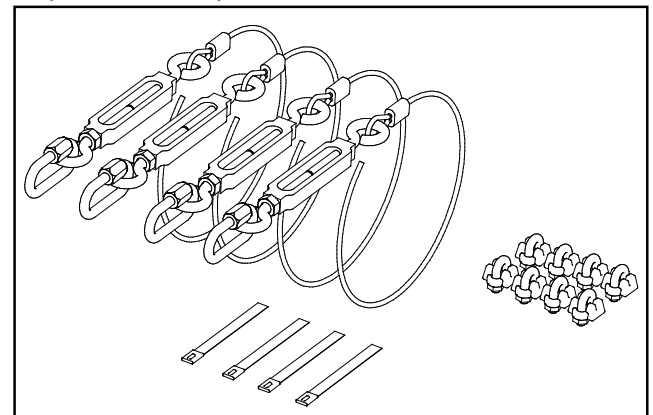
Mount — Blade



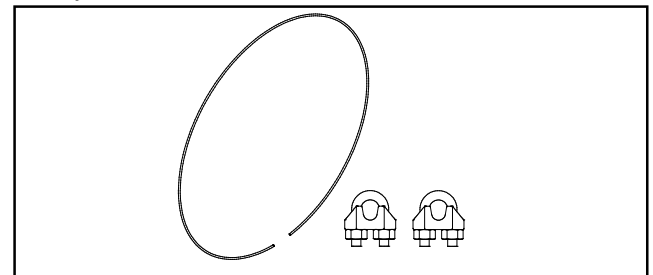
Mount — Fan cover



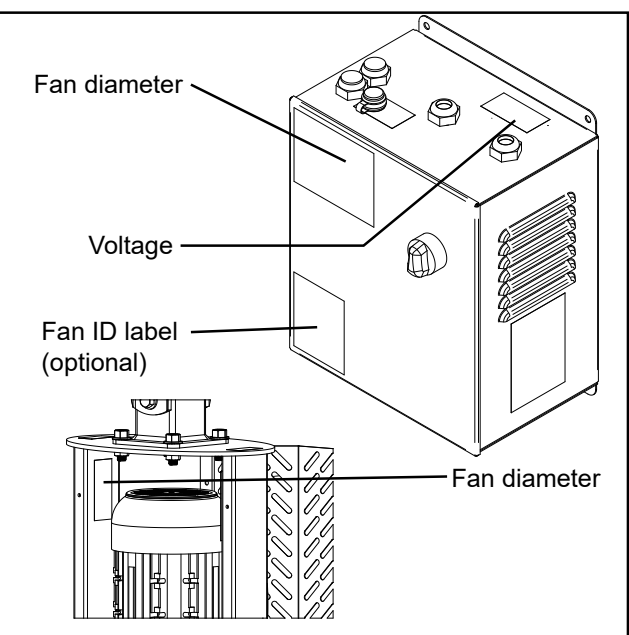
Guy wire assembly



Safety cable



Identification labels



Fastener torque requirements

Description	Torque	Wrench size
1/2 dia mount hardware	44-48 ft-lbs.	3/4 hex
3/8 dia blade mount hardware	24-28 ft-lbs.	9/16 hex
Cable clamp, guy wire	Secure tight	5/16 nut driver
Cable clamp, safety cable	Secure tight	1/2 nut driver
Motor cover fastener	Secure tight	5/16 nut driver

NOTE:

Additional spare hardware is provided as a courtesy.

FAN KIT

PACKING KIT (STANDARD)

1. Blade Box - 5 blades
2. Fan Motor Box
 - a. Motor/gearbox assembly with covers.
 - b. Remote control panel with junction box. (Option)
 - c. Category 5e cable — 100 ft. (blue) (Option)
 - d. Mounting hardware. See [HARDWARE on page 11](#).
 - e. Variable Frequency Drive (VFD) box.



Unpacking the Fan
Click [here](#) to view the video



Handling the Components
Click [here](#) to view the video.

REQUIRED TOOLS

- Wrenches: 7/16, 9/16, 3/4 (x2), 1/2
- Sockets: 7/16, 1/2, 9/16, 3/4
- Nut drivers: 1/4, 5/16
- Torque wrench: 15-60 ft-lbs (for use with sockets)
- Wire strippers
- 1/4" cable cutter
- Tape measure
- Spirit level, short
- Gloves
- For laminated wood beam installations, a drill and 1/2" diameter drill bit are required.

PRIOR TO FAN INSTALLATION

NOTICE

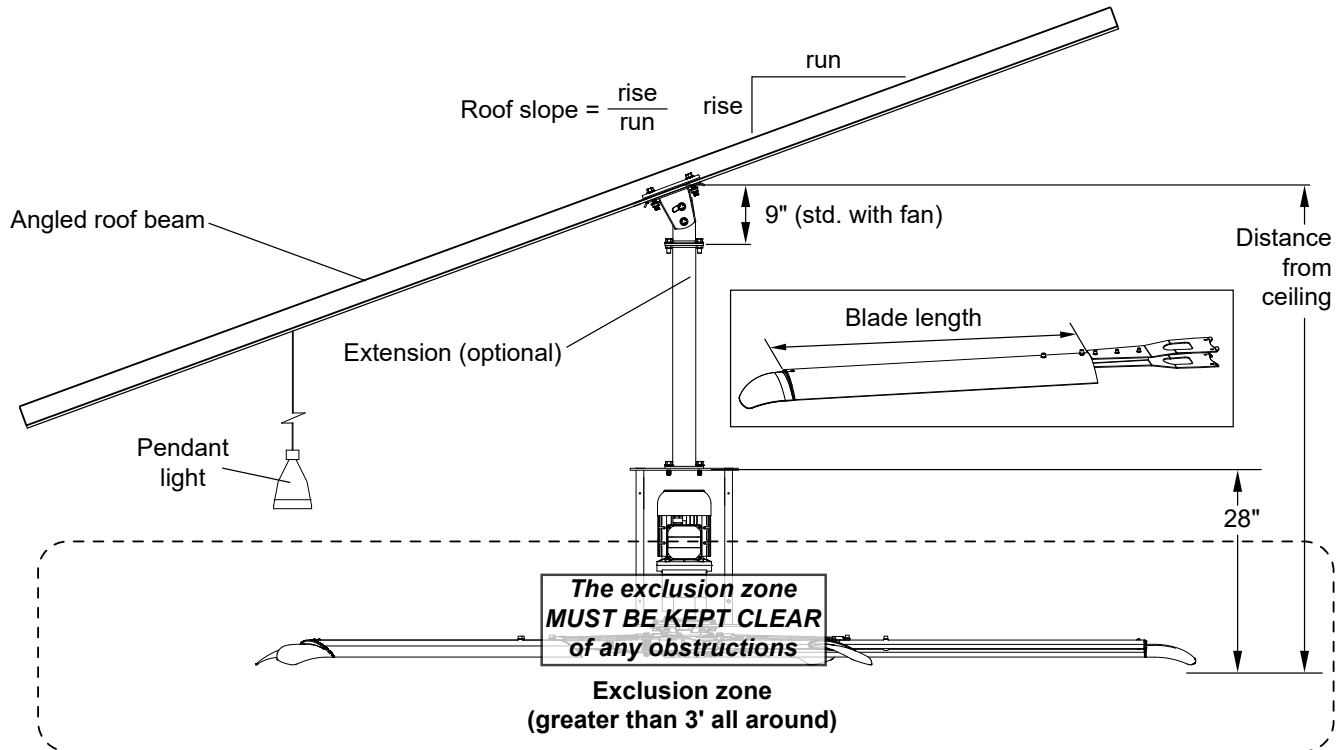
1. Ensure the supplied voltage matches the fan voltage. A label containing voltage information specific to the individual fan is located on top of the VFD box.
2. Ensure the blade length matches the fan model size by consulting the fan model designation located on the side of the fan powerhead frame. See **Figure 1**.
3. Ensure all mounting hardware shown in **HARDWARE on page 11** is present.

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

Ensure the Fan Network Address number matches the network layout drawing where applicable. Consult the square Network Address label on the front of the VFD enclosure.

INSTALLATION CONSIDERATIONS

Figure 1



ROOF SLOPE

NOTICE

The chart below does not account for any possible obstructions below the mounting positions. All fans must still maintain 3' between blades and typical obstructions.

INDUSTRIAL FAN							
Roof Slope*	0	2/12	3/12	4/12	Hanging Weight (LB)	Maximum Torque (Ft. Lb.)	
Roof Angle*	0	9.5°	14.0°	18.4°			Blade Length (in)
Fan Diameter	Extension requirement from mounting point (FT)						
8	0	1	1	2	160	300	21.16
10	0	1	2	2	181	300	33.16
12	0	1	2	2	190	300	45.16
14	0	2	2	3	194	300	57.16
16	0	2	2	3	208	300	69.16
18	0	2	3	3	206	300	81.16
20	0	2	3	4	220	300	93.16
24	0	2	3	4	258	300	117.16

* Non-standard obstructions may require additional length to the extensions. Please consult the factory for additional clarification on non-standard obstructions and assistance with fan placement and extension selection.

⚠ WARNING

Failure to maintain exclusion zones outlined in this section could result in fan failures, including blade separation, which could result in death or serious injury. DO NOT operate fans when physical obstructions or HVAC air flows extend into exclusion zones. Regularly inspect fans to ensure exclusion zones remain clear of interference before operating the fan.

All fan blade parts must be greater than 3' from all obstructions including lights, cables, sprinklers, and other building components and greater than one (1/2) fan diameter from any wall to the end of the blade.

ROOF ANGLES

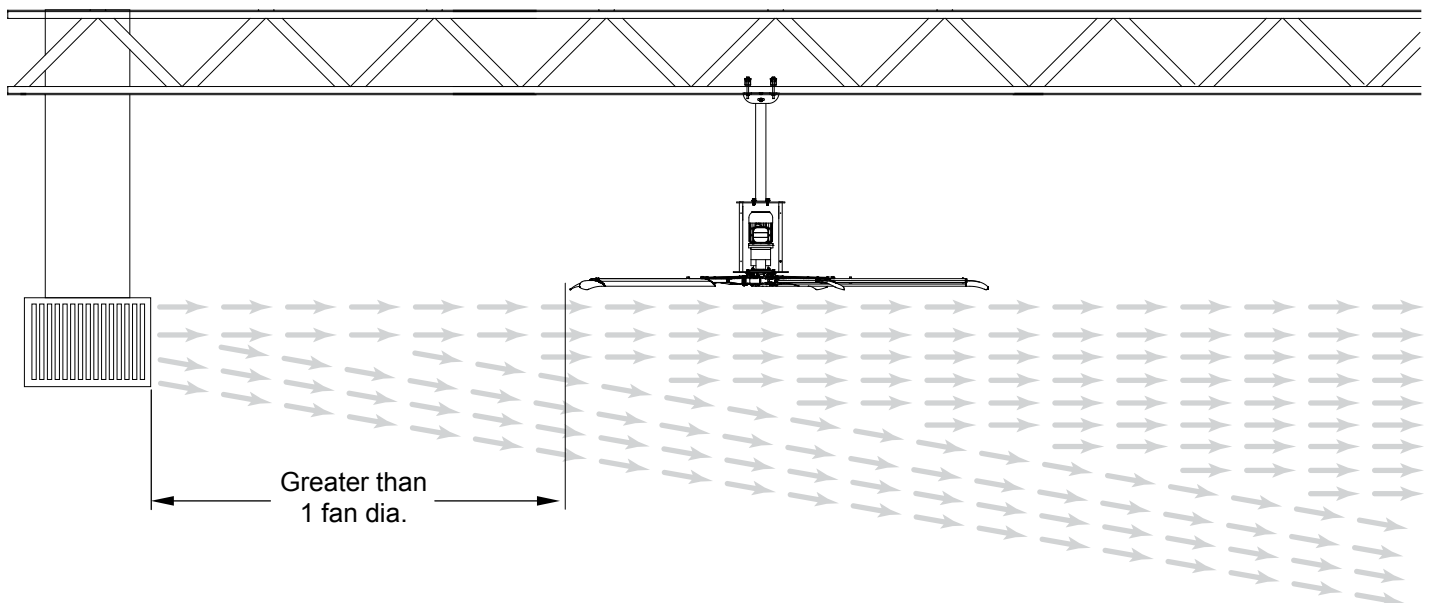
For roof angles in excess of 20°, consult the factory. The extension lengths shown are minimum recommendations only, based solely off roof pitch and fan diameter. Other considerations, such as placement of lights, sprinkler systems, HVAC systems, etc., must be evaluated when determining extension requirements. OSHA requirements state that fan blades must be at minimum 10' above the floor.

CLEARANCE FROM HVAC EQUIPMENT

For applications near HVAC equipment, such as diffusers, radiant heaters, exhaust fans, louvers, etc., the HVLS fan must be installed at minimum distances. Refer to the figures below.

- Fans located above HVAC equipment must have a minimum clearance of greater than or equal to 1 fan diameter. See **Figure 2**.

Figure 2



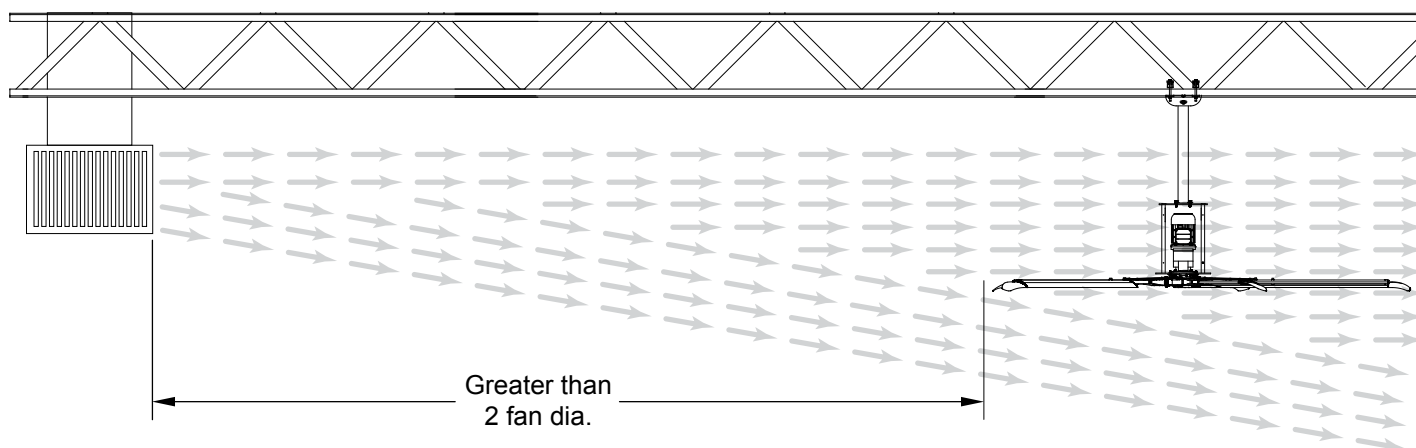
Placement of the Fan



Placement of the Fan
Click [here](#) to view the video

- Fans located at or below HVAC equipment must have a minimum clearance of greater than or equal to 2 fan diameters. See **Figure 3**.

Figure 3

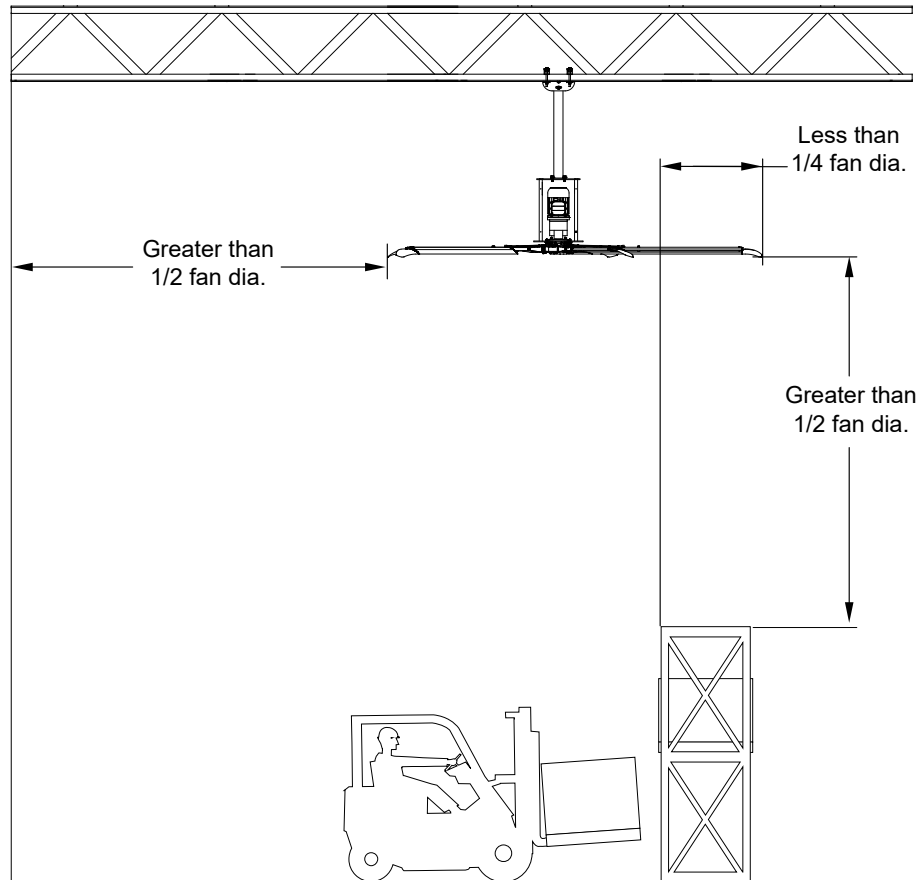


CLEARANCE FROM SOLID CONSIDERATIONS

For applications near solid obstructions, the HVLS fan must be installed at minimum distances.

Fans located above solid obstructions, such as racks, walls, etc. must have a minimum distance of greater than or equal to $\frac{1}{2}$ fan diameter above the obstruction. The obstruction below must also be less than or equal to $\frac{1}{4}$ fan diameter inside the fan blade arc. See **Figure 4**.

Figure 4



BUILDING STRUCTURE

For open structure roof designs, the fan should only be hung from either an I-beam or angle iron. Do not hang the fan from purlins, joists, or truss structures unless all of the following apply.

- The truss can handle the load of the fan.
- The bottom chords of the truss are larger than 5", but smaller than 10 1/2" combined.
- The fans are installed at the strongest point load on the truss.

If you have questions as to whether or not the truss can handle the fan load, you must consult a local structural engineer.

For solid beam or laminated wood beam mounting, use the laminated wood beam mounting kit available from Entrematic.

Ensure the fan blade clearance meets the requirements shown in **Figure 1** through **Figure 4**.

NOTE:

Consult a professional engineer or registered architect for specific mounting concerns.

PLACEMENT AND SPACING

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

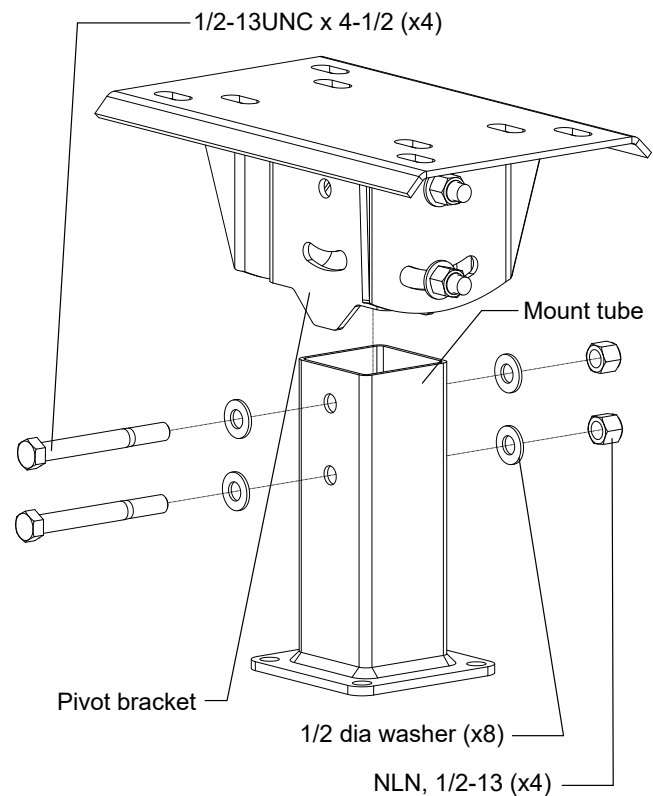
Ensure you place the fan so that fans are a minimum of 10' from any manned working surface (floor or mezzanine).

Ensure the fan blades do not extend into the exclusion zone. Extensions are available if you need them. See **Figure 1**.

Avoid mounting fans directly under lights or skylights to avoid a visual strobe affect.

Figure 5

Grade 5 hardware or better



(Grade 5 hardware required)

NOTE:

If the fan is part of a networked system, ensure placement is in accordance with the building layout. The fan network is located on the front panel of the Variable Frequency Drive (VFD) box.

NOTICE	<i>Be sure to comply with all local and national codes during installation.</i>

INSTALLATION

<p>▲ DANGER</p>	<p><i>Before installation, make certain the power is disconnected and properly locked out.</i></p>
------------------------	--

For fans that will be subjected to high cross winds due to 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 below the blade plane or there must be at least two fan diameters (as measured from the end of the winglet) for A/C ducts mounted at or above the blade plane.

FAN MOUNT ASSEMBLY

1. Fasten the pivot brackets to the extension tube with ears outboard.
2. Leave the 1/2" dia. x 4-1/2" bolts and nylock nuts finger tight. See **Figure 6**.

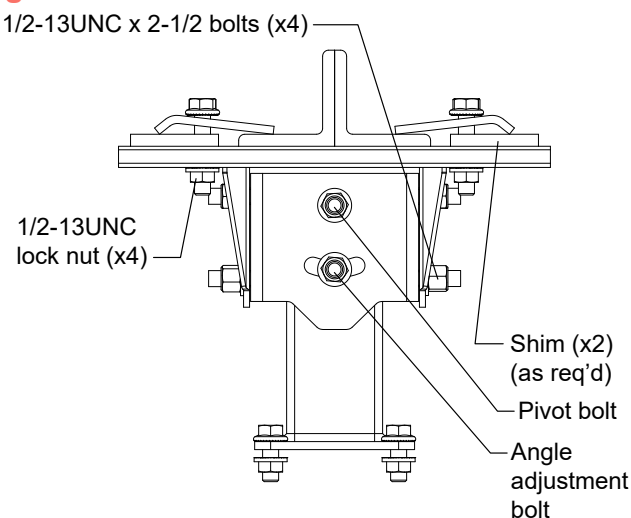
INSTALL FAN MOUNT

If the building support beam is not level, ensure the proper fan clearance using the mounting information in [Installation Considerations on page 14](#) or add mounting extensions. See **Figure 1**.

STANDARD I-BEAM

1. Locate the fan mount assembly on the bottom of the building support beam.
2. Align the mount assembly so that it is centered and square to the beam,
3. Orient the mount such that the pivoting axis is aligned with the building slope, if required.

Figure 6



Mounting Options
Click [here](#) to view the video

Installation

4. Install the clamps.
5. Add shims as required for thick flange I-Beams.
6. Fasten the clamps using the supplied 1/2" dia. x 2 1/2" screws, lock nuts, and washers.
7. Torque to 44-48 ft-lbs. See **Figure 7**.

LAMINATED WOOD BEAM MOUNTING — OPTIONAL KIT 6018028

1. Attach the laminated wood beam brackets to the wooden beam using a minimum of four 1/2" dia. grade 5 thru bolts and self-locking nuts (not supplied).
2. Ensure the brackets are square to the bottom of the beam.
3. Attach the mount assembly to the laminated wood beam brackets using the supplied 1/2" dia. x 2-1/2" screws, lock nuts, and washers.
4. Torque to 44-48 ft-lbs. See **Figure 8**.

TRUSS MOUNT

To span two trusses or purlins with a gap of 96" or less, span the gap using two 4" X 4" steel angle iron. See **Figure 9**.

NOTICE	<i>Do not span gaps larger than 96".</i>
---------------	--

INSTALL THE POWER HEAD (MOTOR/ GEARBOX ASSY)

The power head may be oriented as required for aesthetics or commonality.

Leave the protective bumper on the bottom of the power head assembly until the power head is mounted in place.

Figure 7

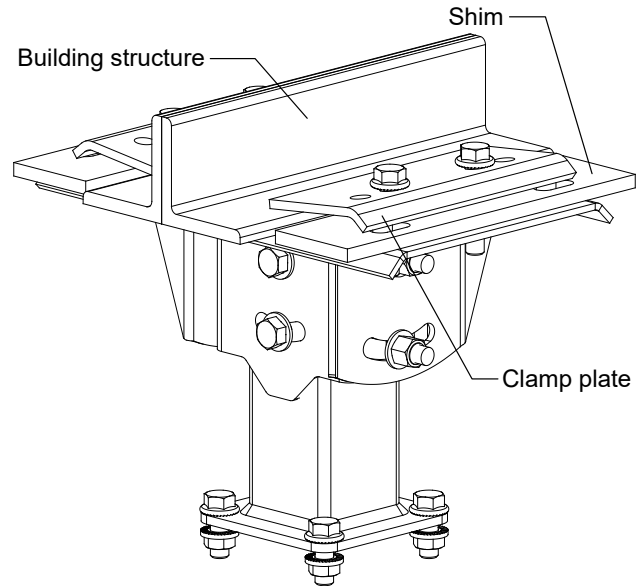


Figure 8

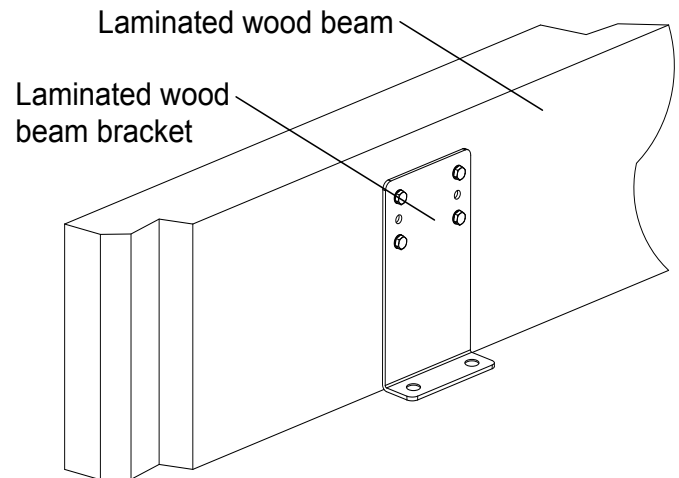
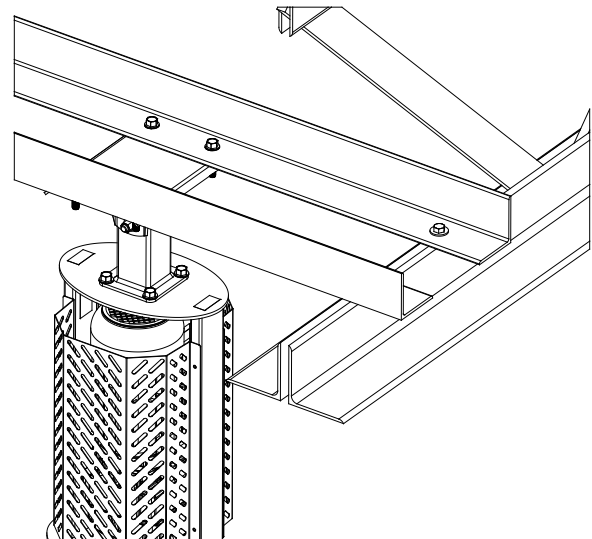


Figure 9



1. Using a powered lift, orient the power head with the blade hub down.
2. Block the motor as required for installation using the bottom of the frame assembly.

Do not support it using the hub or hub cap.

3. Raise the power head up until it contacts the bottom of the fan mount assembly. See **Figure 10**.

4. Use the supplied hardware to attach the powerhead to the bottom of the mount assembly. See **Figure 11**.

5. Immediately attach the safety cable. The torque rating must be 44-48ft-lbs. See **Figure 12**.

- a. Slide two of the supplied 1/4" dia. cable clamps over each end of the cable spaced 6" apart.
- b. Slide the ends through the cable clamps.
- c. Make sure the cable goes through the motor frame.
- d. Securely tighten the clamp fasteners.
- e. Make sure the u-bolts are over the free ends of the cable.
- f. Ensure the safety cable does not interfere with the fan motor housing.
- g. Trim any excess cable or wrap the cable multiple times to ensure the cable does not interfere with the fan motor housings or hub.



Mounting the Powerhead

Click [here](#) to view the video.

Figure 10

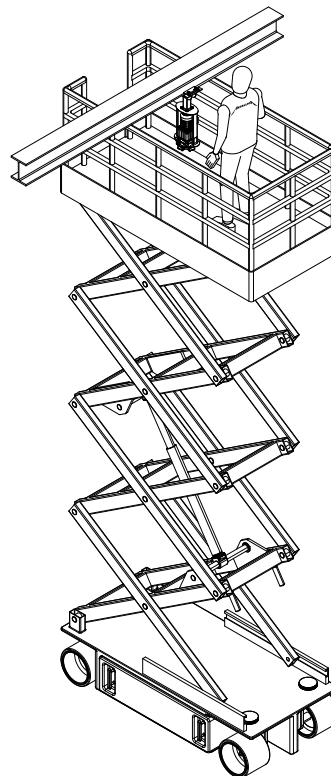


Figure 11

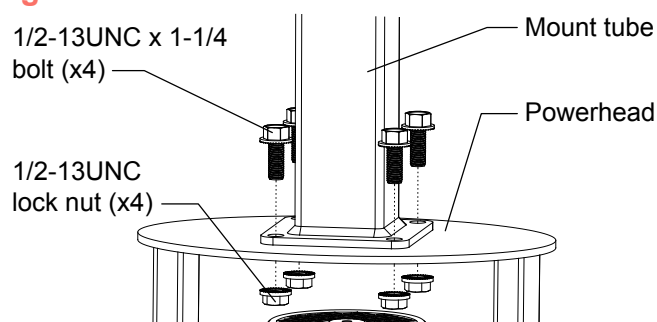
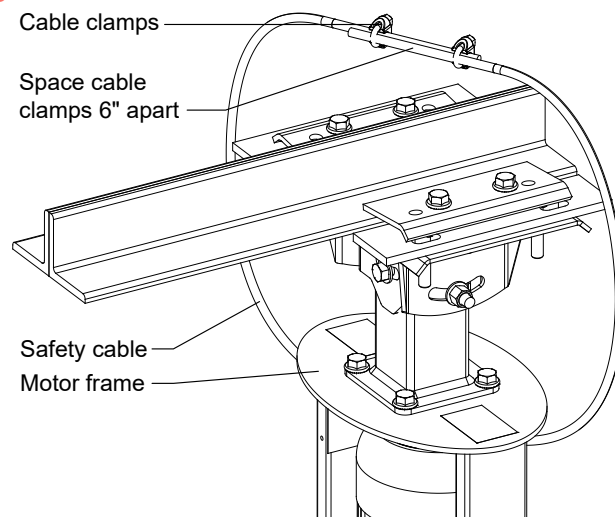


Figure 12

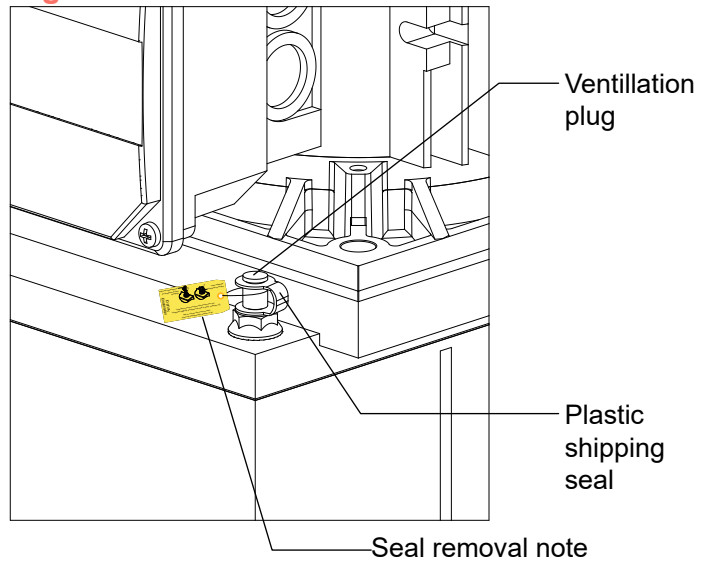


REMOVE THE GEARBOX VENT PLUG

1. Locate the ventilation plug on the gearbox. See **Figure 13**.
2. Pull and remove the plastic shipping seal and discard it.
3. Remove the yellow seal removal note and discard it.

NOTICE	<i>Failure to remove the ventilation shipping seal can result in damage and leaks.</i>

Figure 13



INSTALL THE GUY WIRES

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

Failure to attach guy wires may result in loss of warranty.

The longest extension allowed is 20'. Any extensions longer than 12' must use the secondary guy wire kit (6020303 — standard and 6020304 — stainless steel).

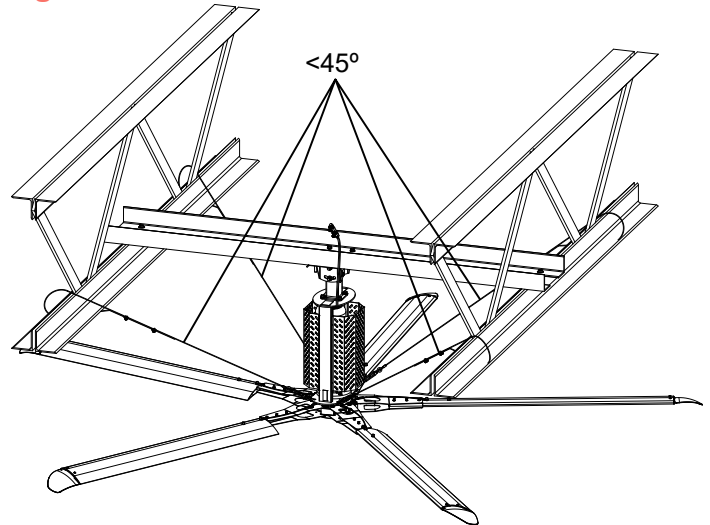
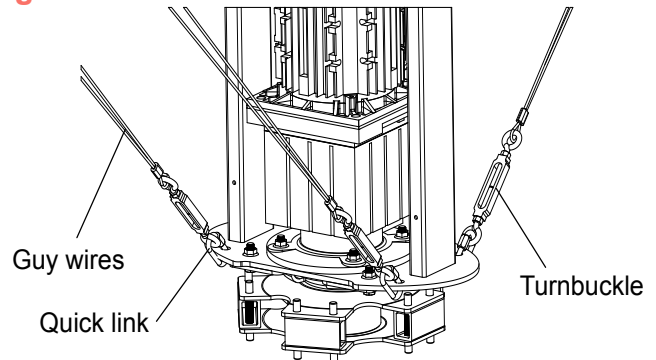
Consult a professional engineer or registered architect for specific mounting concerns.

⚠ WARNING

*If you have used a mounting extension, make sure you use the longer guy wires accompanying the extension. Ensure the angle formed by the guy wire with the roof structure is less than 45°. See **Figure 14**.*

Avoid all 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.

Figure 14**Figure 15**

Install Guy Wires

Click [here](#) to view the video

1. Adjust the turnbuckles to their longest position.
2. Attach the quick link with the attached turnbuckle to the fan as shown in **Figure 15**.
3. Repeat for all four quick links.
4. Attach one end of the guy wire to the building structure.
5. Ensure the structure has sufficient strength to withstand the wire tension.
6. Repeat for all four guy wires.
 - a. Slide two of the supplied 1/8" dia. cable clamps over one end of the wire.
 - b. Feed that end of the wire through the building structure and back through the clamp fasteners.
 - c. Securely tighten the clamp fasteners so they cannot slip.
 - d. Make sure the u-bolts are over the free end of the cable.

Installation

- Individually tighten the turnbuckles on each cable until it is taut and the power head unit hangs plumb.

Use a spirit level to verify the power head unit hangs plumb.

- Tighten the pivot and angle adjustment bolts on the fan mount.
- Torque to 44-48 ft-lbs. See **Figure 16**.

INSTALL THE VFD BOX

Verify the voltage and phase before mounting the box. Ensure the voltage from the building source wiring matches the voltage listed on the VFD box.

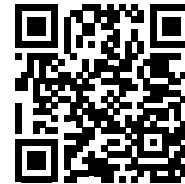
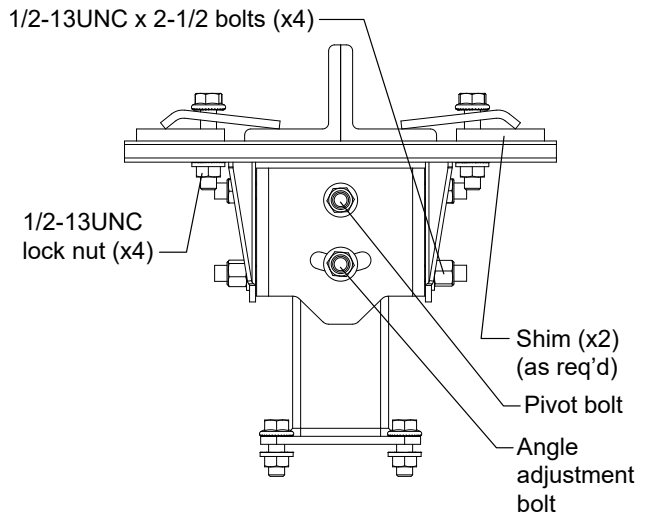
▲ WARNING	<i>The VFD Box must be installed outside and a safe distance from the blade diameter for service.</i>
------------------	---

NOTICE	<p><i>The maximum length of the cable between the VFD box and the motor is 150 linear feet.</i></p> <p><i>Do not run motor cables in the same conduit as the input voltage.</i></p> <p><i>Do not run the motor cables in the same conduit as other motor cables.</i></p> <p><i>If you mount multiple VFD panels in the same location, tie the grounds in series.</i></p>
---------------	--

- Mount the VFD box outside of the fan blade arc.

Orient the box so that the front panel is accessible and visible with the connectors on the top of the panel.

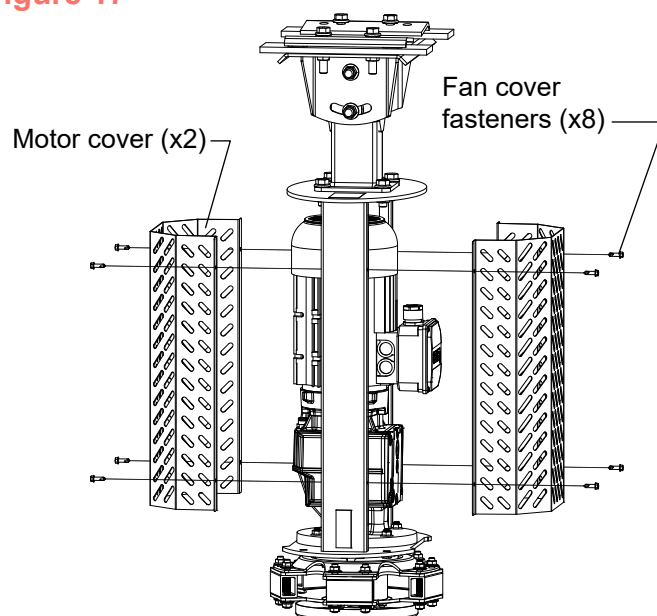
Figure 16



Installing the VFD Enclosure
Click [here](#) to view the video

2. Route the fan S.O. cable from the fan to the VFD box and check to make sure the cable is supported throughout its routing.
3. Route the supply power from the building source to the VFD box.
4. Wire the VFD box in accordance with the [Electrical Schematics on page 30](#).

Figure 17

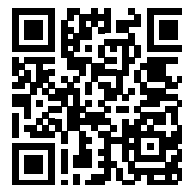


INSTALL THE MOTOR COVER

1. Check that the motor S.O. cable has been routed to the VFD box and ensure it is secured.
2. Locate each motor cover and install the cover fasteners. Do not over-tighten the fasteners. See **Figure 17**.

INSTALL THE BLADES

⚠ WARNING	<p><i>To reduce the risk of personal injury, do not bend the blade brackets when installing the brackets or cleaning the fan.</i></p> <p><i>Do not insert foreign objects in between the rotating fan blades.</i></p>
------------------	---



Installing the Blades

Click [here](#) to view the video.

Blade assemblies come pre-assembled from the factory. **Do not attempt to disassemble them.**

The hub assembly has special blade retention lock nuts pre-assembled to the hub. Remove them and use them to mount the assemblies as shown in the steps below.

Use only the factory supplied lock nuts provided for blade mounting.

1. With the blade oriented so that the blade retention lanyard is on top, support the blade assembly from below.

2. Orient and guide the assembly onto the top attachment studs on the hub assembly.
3. Spread the strut arms slightly onto the upper studs.
4. Angle the blade upward as needed onto the studs. See **Figure 18**.
5. Still supporting the blade assembly, rotate the blade assembly down and allow the bottom blade strut to ride up and over the bottom attachment studs on the hub assembly. See **Figure 19**.

NOTICE	<i>Do not lean on the blade. Damage to the strut may occur.</i>
---------------	---

6. Install the blade retention lock nuts.
7. Hand tighten the nuts to ensure the strut arms are firmly pressing against the hub.
8. Torque the blade retention nuts to 24-28ft-lbs. See **Figure 20**.
9. Repeat steps 1 through 8 for each blade assembly.

VERIFY CLEARANCE AND CABLE TENSION

1. Rotate the fan by hand and observe the clearance of each blade from its closest obstruction.
2. If necessary, reposition the fan.

NOTE:

Blade tips droop when not in operation and rise when in operation.

3. Verify the guy wire tension by attempting to move the power head in any horizontal direction.

If you detect movement, re-tension the guy wires.
4. Lock the individual turnbuckles using the stop nut on each.

Figure 18

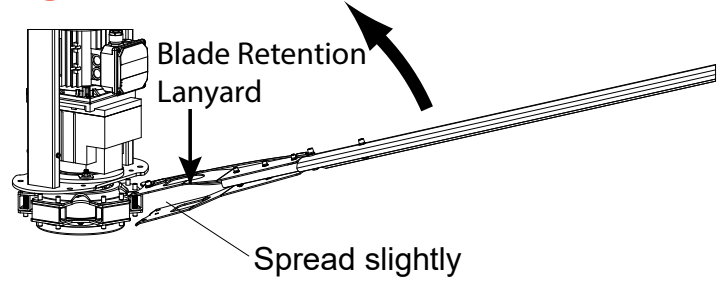


Figure 19

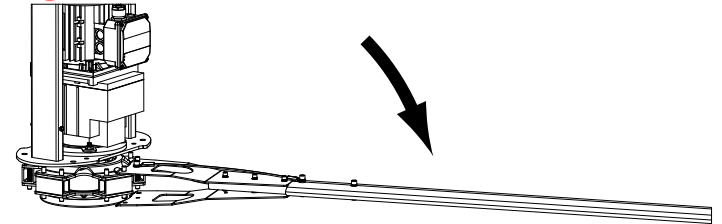
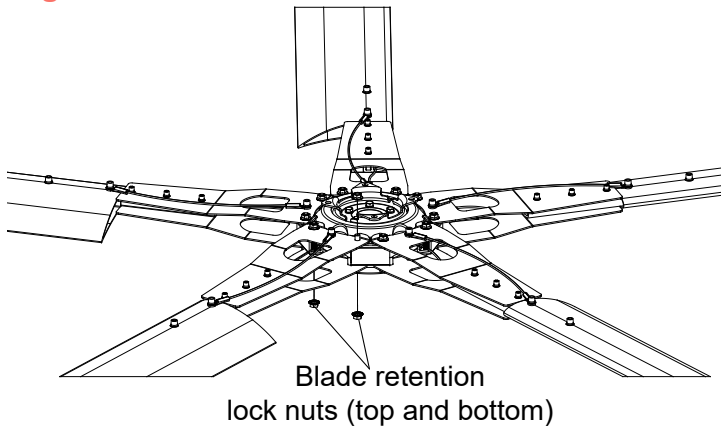


Figure 20



5. Secure the turnbuckle with the turnbuckle strap. See **Figure 21**.

INSTALL REMOTE CONTROL

NOTICE	<p><i>Do not over-torque the mounting screws.</i></p> <p><i>Damage to the display screen may occur if you over-torque the mounting screws.</i></p> <p><i>It is your responsibility to torque the screws properly.</i></p>
--------	---

1. Mount the touchscreen remote 53" above the floor to the factory supplied junction box inside the building

Mount the touchscreen as close to the fan assembly as practical. Direct line of sight is preferred. See **Figure 22**.

NOTE:

For remote signal (blue) CAT5e cable runs exceeding 1000', consult the factory.

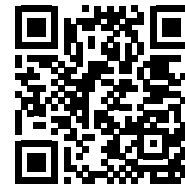
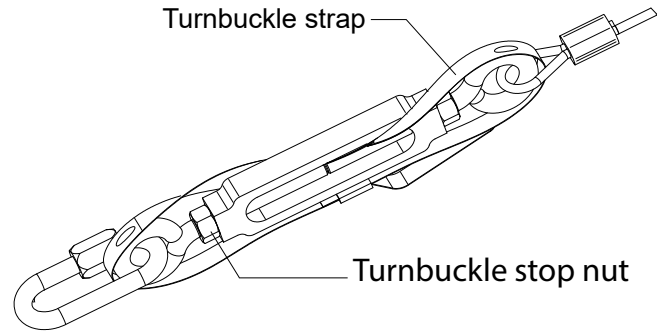
NOTE:

The Blue CAT5e cable has terminated ferrules at the remote end.

PROTECT these ferrules during cable routing.

2. Route the remote signal (blue) cable (6015651) from the top of the VFD box through the hole in the factory supplied junction box.
3. Wire the four leads of the remote signal (blue) cable to the orange connector of the touchscreen remote control.

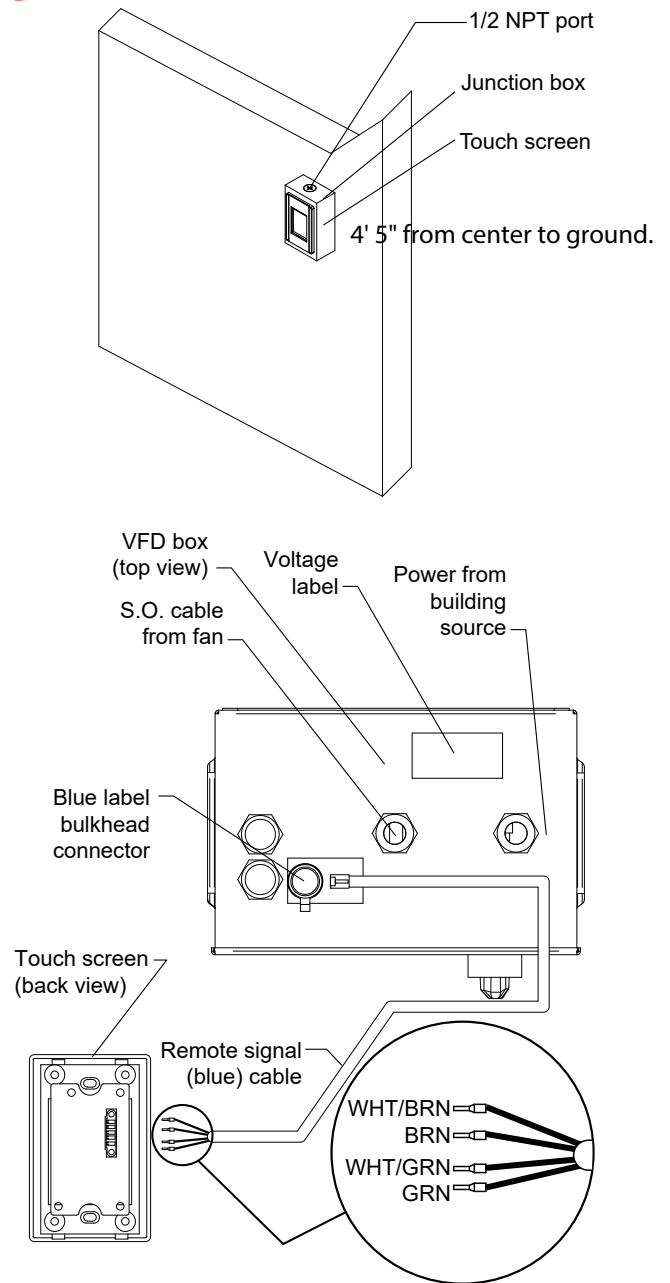
Figure 21



Install Remote Control
Click [here](#) to view the video.

4. Neatly coil the excess blue cable and secure it near the VFD box.
5. Mount the touchscreen to the junction box using the fasteners provided.

Figure 22



ELECTRICAL SCHEMATICS

⚠ DANGER

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

Failure to do so may result in death or serious injury.

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

Do not route control wiring for any other device through this control box.

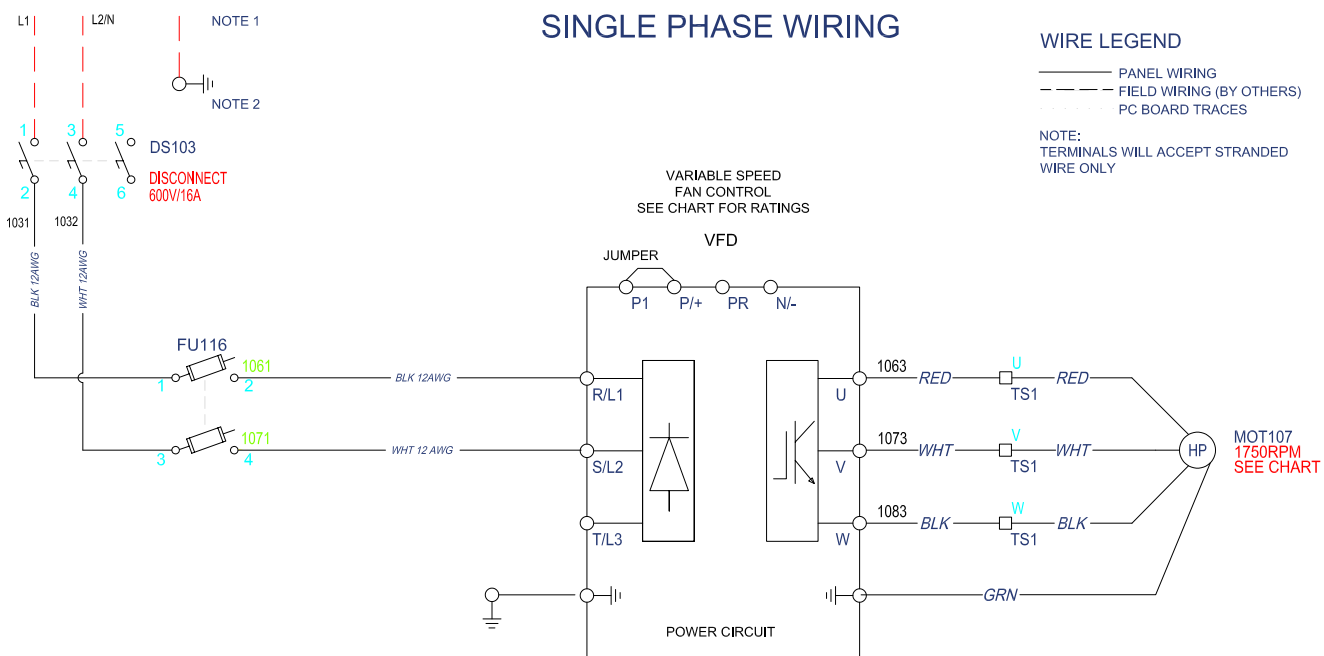
Ensure the voltage and phase of the incoming power agrees with the label on the top of the VFD box and fan.

Be certain the power is off when wiring to the control box.

Failure to do so may result in electrical shock, death, or serious injury.

1PH WIRING DETAILS

Figure 23



NOTE:

Terminals will accept stranded wire only.

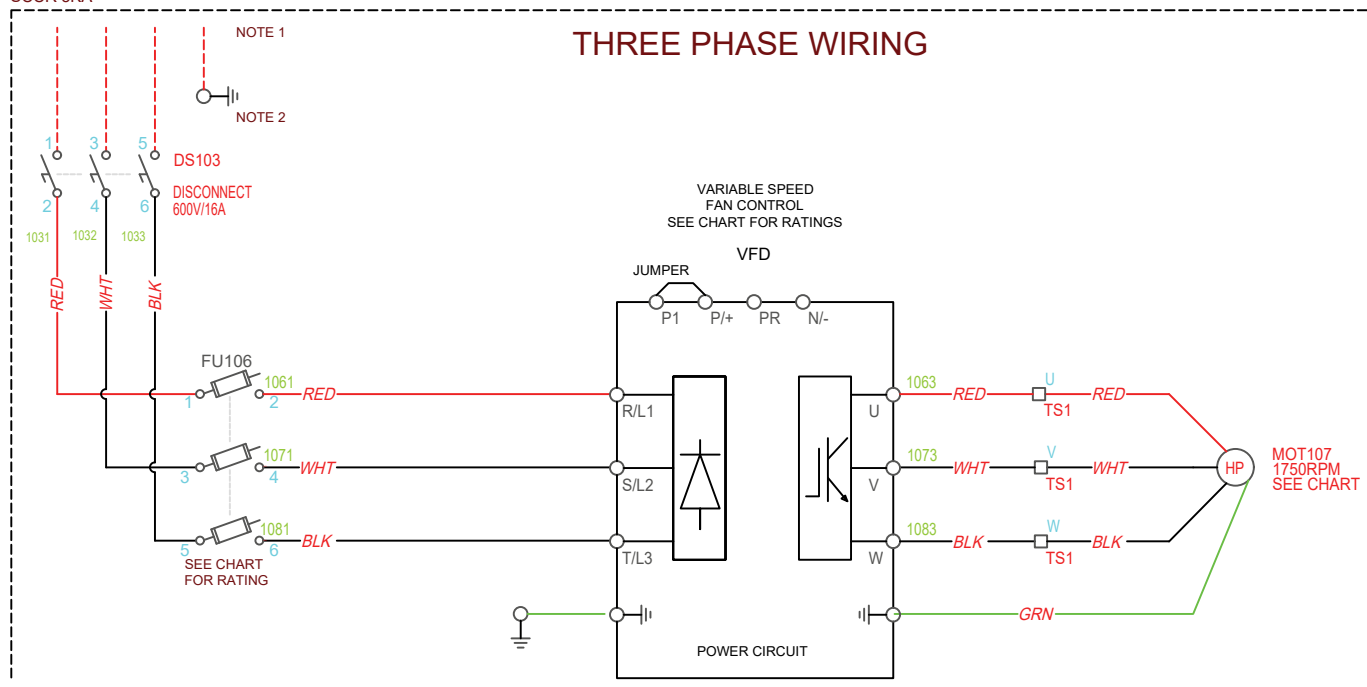
SIZING CHART		
	6021100	6021103
VOLTAGE	230V/1PH/50 60HZ	230V/1PH/50 60HZ
FLA	13.1A	14.3A
FUSE	KTKR15	KTKR20
MOTOR	1.5HP, 4.1 FLA@ 230V/60HZ	2HP, 5.6FLA @ 230V/60Hz
VFD	200 230/1PH 2HP/1.5KW/7.0A	200 230/1PH 2HP/1.5KW/7.0A
O/L	5.0	6.8

- Field wiring is to be a minimum 14AWG, 600V, 90°C.
- The safety ground must be connected to the earth ground rod via the plant ground or bus bar. Grounding points must comply with national and local industrial safety regulations and/or electrical codes.

3PH WIRING DETAILS

Figure 24

INCOMING SERVICE TERMINATED AT DISCONNECT
 SUPPLY BCPD = SEE CHART
 PANEL FLA = SEE CHART
 SCCR 5KA



NOTE:

Terminals will accept stranded wire only.

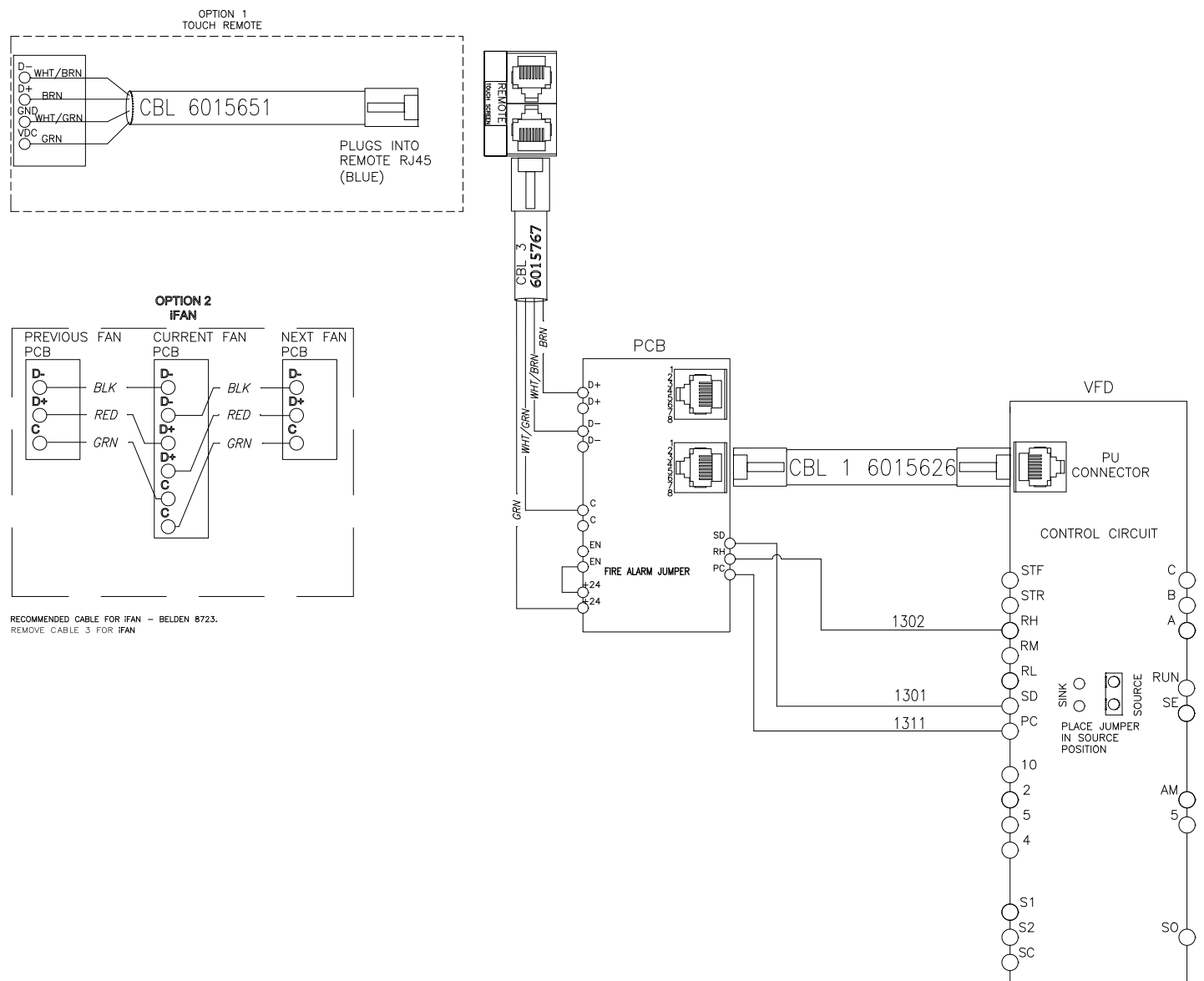
SIZING CHART			
	6021101	6021102	6021104
VOLTAGE	230V/3PH/50 60HZ	460V/3PH/50 60HZ	230V/3PH/50 60HZ
FLA	5.5A	3A	6.6A
FUSE	KTKR10	KTKR5	KTKR10
MOTOR	1.5HP, 4.1FLA @ 230V/60HZ	1.5 HP, 2.1FLA @ 460V/60HZ	2HP. 5.6FLA @ 230V/60HZ
VFD	200 230/3PH 2HP/1.5KW/7.0	360 480/3PH 2HP/1.5KW/3.6A	200 230/3PH 2HP/1.5KW /7.0A
O/L	5.0	2.6	6.8

SIZING CHART			
	6021105	6021106	6021107
VOLTAGE	460/3PH/50 60HZ	460V/3PH/50 60HZ	460V/3PH/50 60HZ
FLA	3.5A	3.5A	3A
FUSE	KTKR5	KTKR10	KTKR5
MOTOR	2HP, 2.8FLA @ 460V/60HZ	2HP, 2.8FLA @460V/60HZ	1.5HP, 2.1FLA @ 460V/60HZ
LINE REACTOR	N/A	6010719	6010718
VFD	360 480/3PH 2HP/1.5KW/3.6A	360 480/3PH 3HP/2.2KW/5A	360 480/3PH 3HP/2.2KW/5A
O/L	3.4	3.4	2.6

- Field wiring is to be a minimum 14 AWG.600V, 90°C.
- The safety ground must be connected to the earth ground rod via the plant ground or bus bar. Grounding points must comply with national and local industrial safety regulations and/or electrical codes.

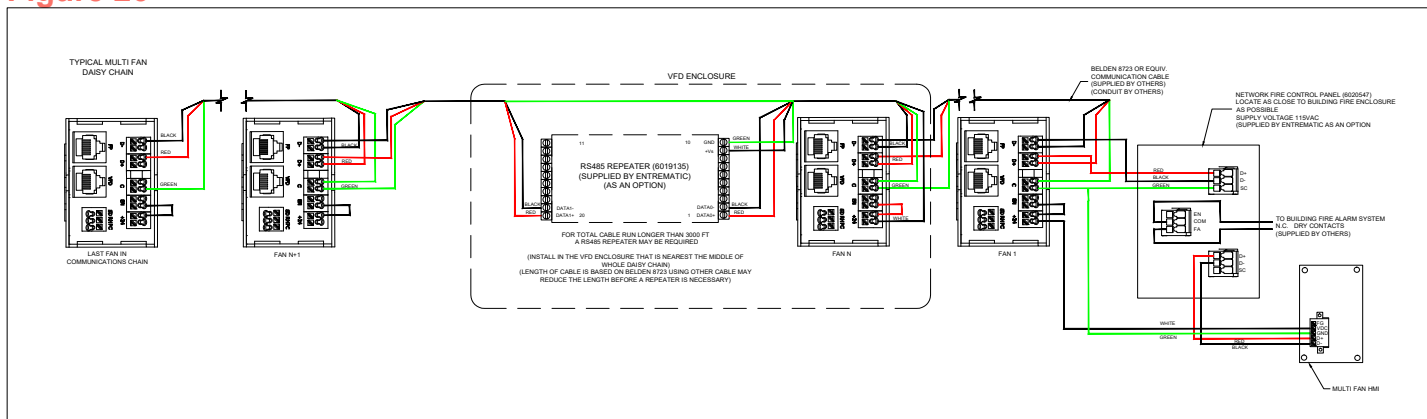
VARIABLE FREQUENCY DRIVE

Figure 25



MULTI FAN WIRING DETAILS — OPTIONAL

Figure 26



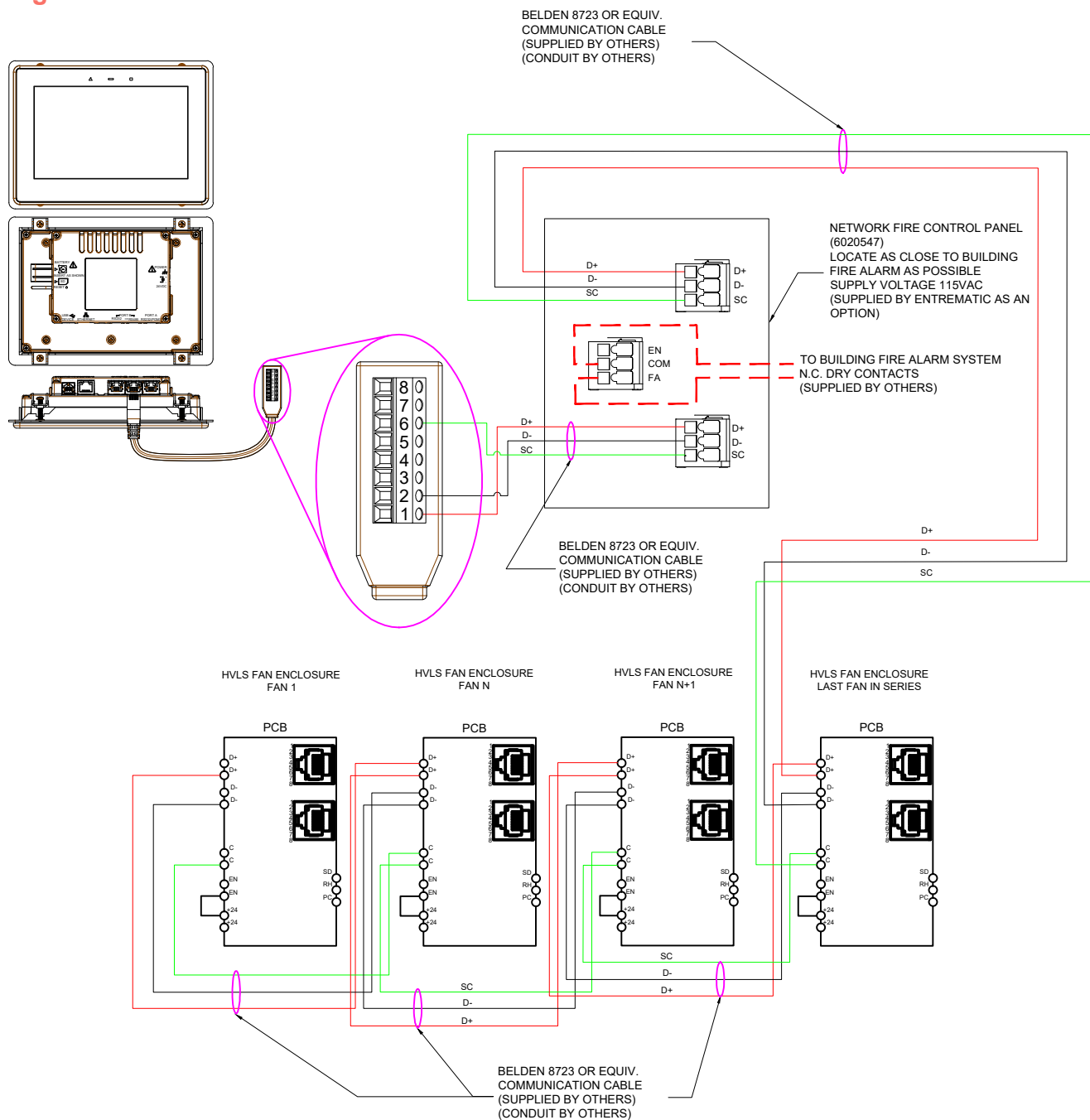
- The recommended cable for multi-fan and iFAN is Belden 8723.



Click [here](#) to view this drawing.

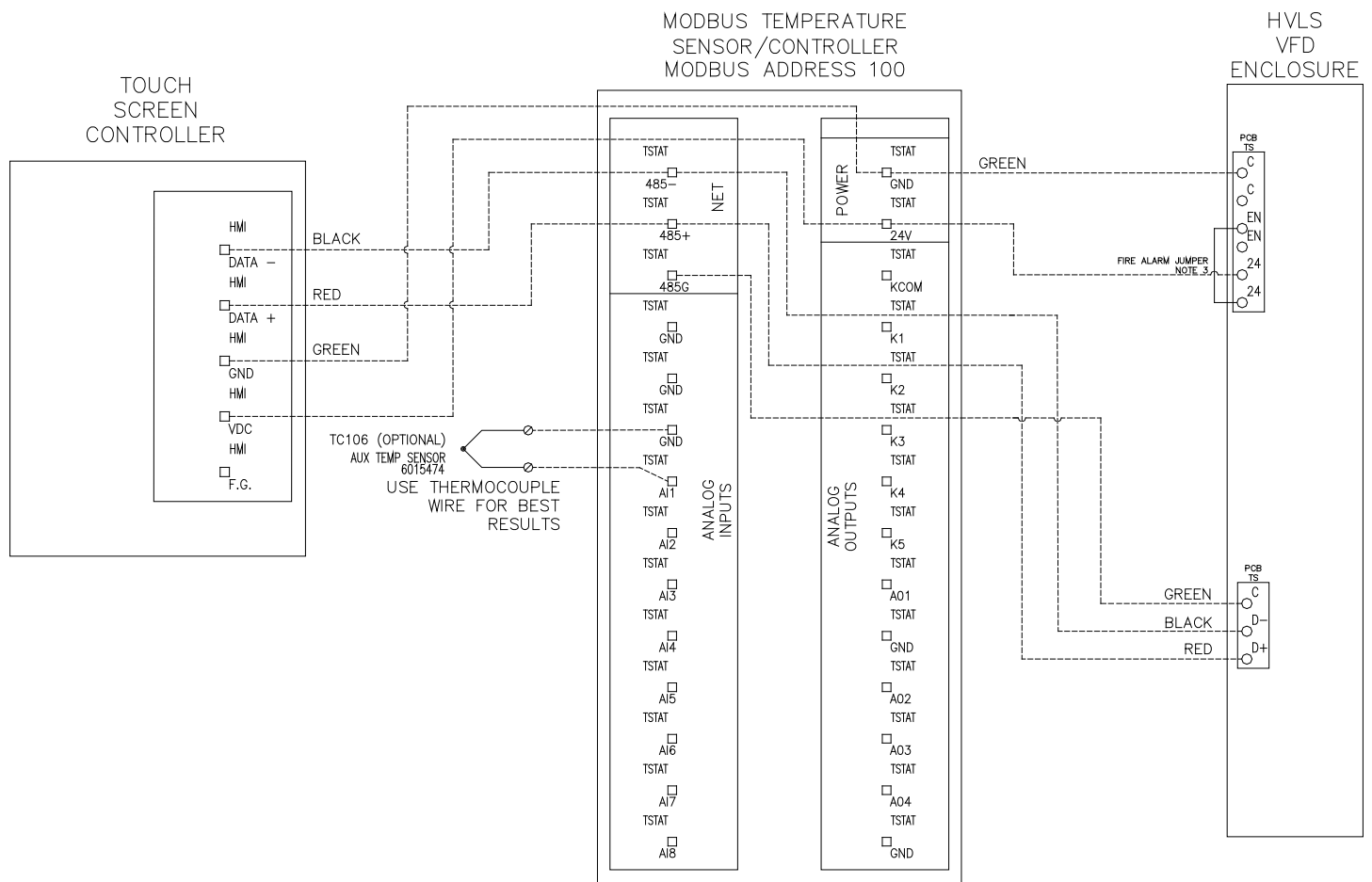
IFAN WIRING DETAILS

Figure 27



TEMP CONTROL WIRING DETAILS — OPTIONAL

Figure 28



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.

NOTICE

The normally closed (NC) contacts must be dry contacts. They open in the event of an active alarm.

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 enable (EN) and (24).
2. Replace the jumper with a set of dry, normally closed contacts. See the schematics for the optional fire control panels. See [Fire Control System Fan Shutdown Panel — Standard Installation \(6015291\)](#) on page 38.

TEST THE FIRE CONTROL SHUTDOWN OPERATION

To test the fire control system fan shutdown operation:

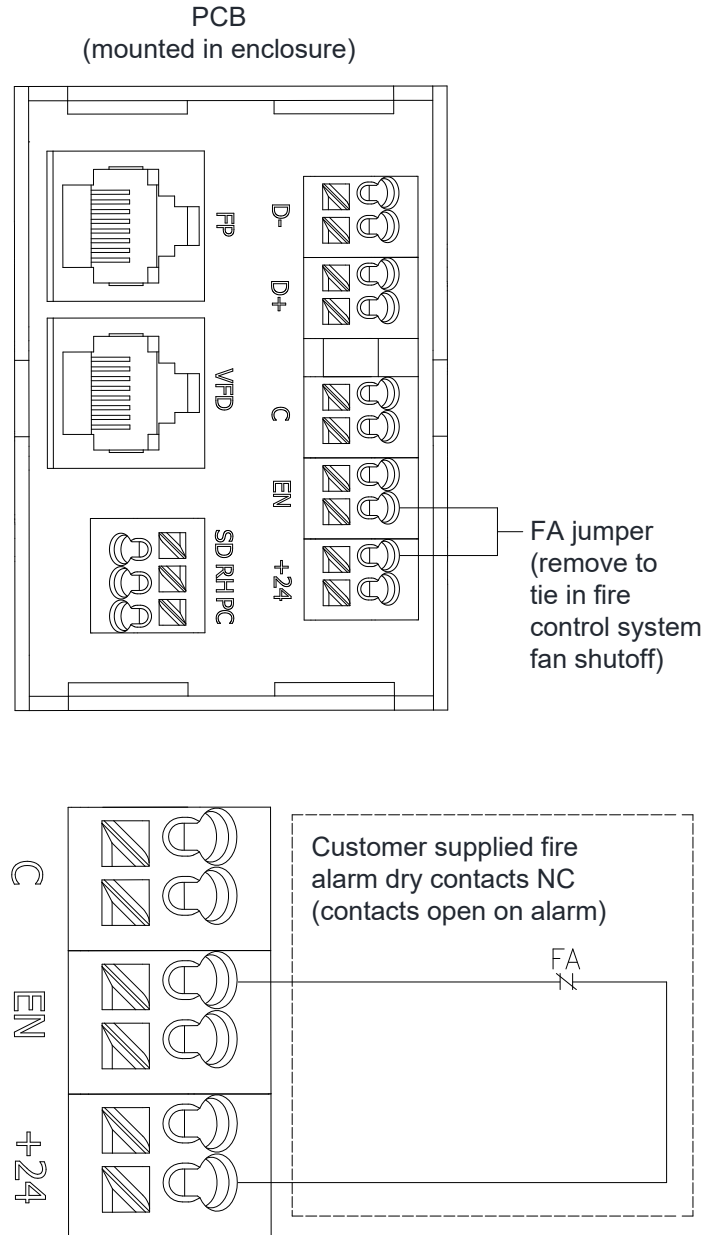
1. Remove the wire from the NC contact at the building fire control panel. See [Figure 29](#).

The fan should coast to a stop.

NOTICE

If you leave the jumper installed, the fan will not shut down due to the fire control system contacts.

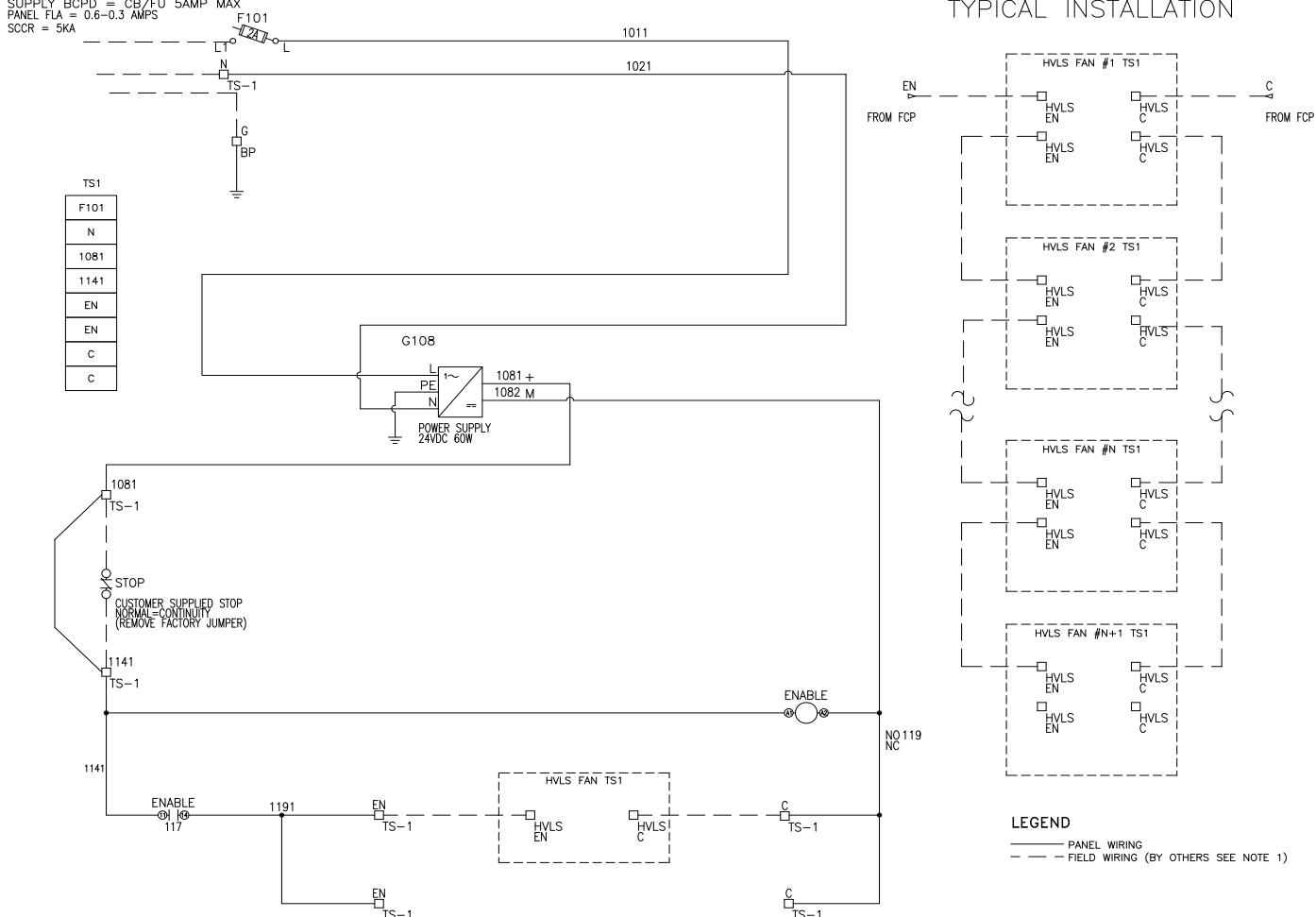
Figure 29



FIRE CONTROL SYSTEM FAN SHUTDOWN PANEL — STANDARD INSTALLATION (6015291)

Figure 30

100–250V/1PH/60HZ

 INCOMING SERVICE TO BE TERMINATED AT DISCONNECT
 CB/FU TO BE SUPPLIED BY OTHERS
 SUPPLY BCPD = CB/FU 5AMP MAX
 PANEL FLA = 0.6–0.3 AMPS
 SCCR = 5KA


NOTE: Terminals will accept stranded wire only.

- Field terminal wiring 60/75 degree wire, min. 16AWG for Signal Wiring. Min. 14AWG for incoming power. See the chart in the panel for torque requirements.
- The contacts should be closed when there is no alarm. (The relay will be on when there is no alarm.)

Wire Color/Gauge (NFPA) (unless otherwise specified)		
208 — 600 VAC	#14	BLK
120 VAC	#16	RED
24 VAC	#16	RED/BLK
Neutral	#16	WHT
Ground		GR
24 VDC	#18	BLU
24 V COM (VDC)	#18	BLU/WHT
12 VAC/VDC	#18	VIO
12V COM	#18	VIO/WHT
DRY UNPOWERED	#18	YLW

550-600V SUPPLY WIRING DETAILS — OPTIONAL

To connect the 480V fan to a 500-600V building supply, you must install a step down transformer assembly (6017277) between the power supply and the VFD enclosure. The wiring (by others) must be 600V rated 14 awg. All wiring must be installed in accordance with any national, state, or local code requirements.

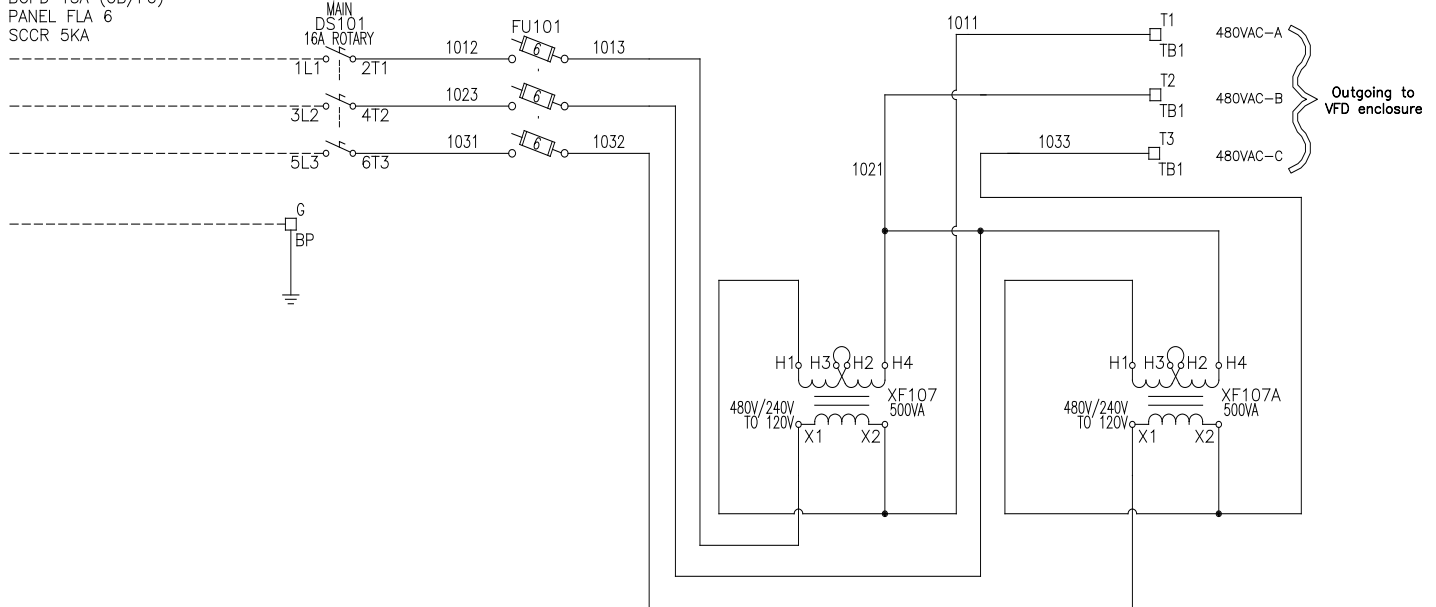
The transformer assembly is rated for one single fan load only. Each fan must have its own step down transformer assembly.

1. Locate and mount the step down transformer outside the blade arc and near the VFD enclosure.
2. Route the supply power from the building source to the step down transformer.
3. Follow the VFD installation instructions using the power from the step down transformer as the power source.

Figure 32

575–600V/3 ϕ /60HZ

INCOMING SERVICE TERMINATED AT DISCONNECT
BCPD 15A (CB/FU)
PANEL FLA 6
SCCR 5KA



HMI SETUP

The Human Machine Interface (HMI) program controls up to a total of six fans. The program also allows the use of two types of accessories:

- Temperature Control
- High Wind Shutdown (anemometer)

Both accessories can be used with a single fan configuration. If the program is configured for multiple fans, you can only use the anemometer.

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 33**.

The number you selected changes to green.

SET THE DIAMETER OF THE FANS

NOTE:

The fan size is on the front of the VFD enclosure, the fan shipping container, and the blade shipping carton.

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 34**.
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 33

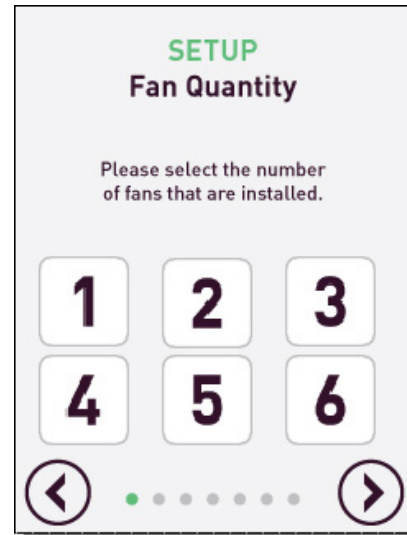
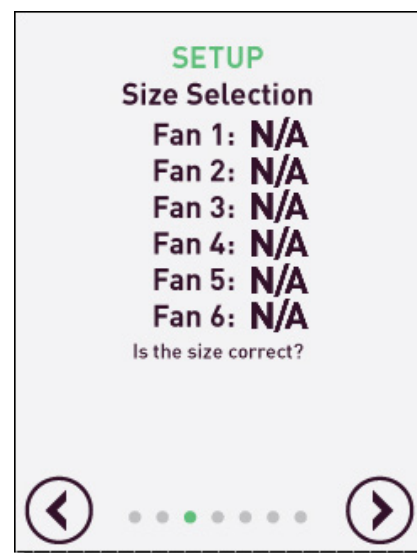
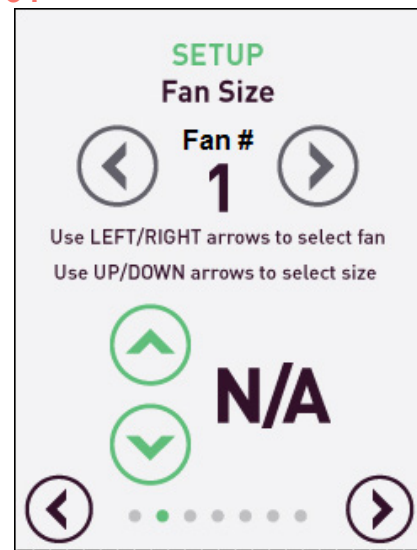


Figure 34



ENABLE THE TEMPERATURE CONTROL OPTION (OPTIONAL)

NOTE:

The Temperature Control options require 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.

OR

Press No to disable.

2. Press the right arrow to continue. See **Figure 35**.

If you enable Temperature control, the temperature settings screen displays.

SET THE TEMPERATURE SETTINGS

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 36**.

Figure 35

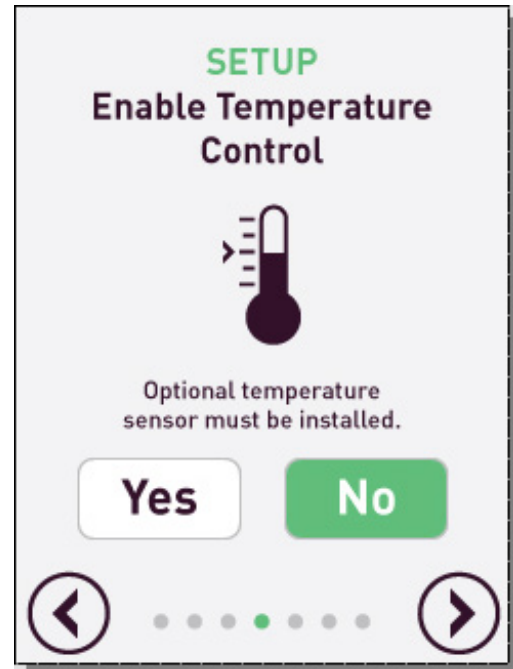
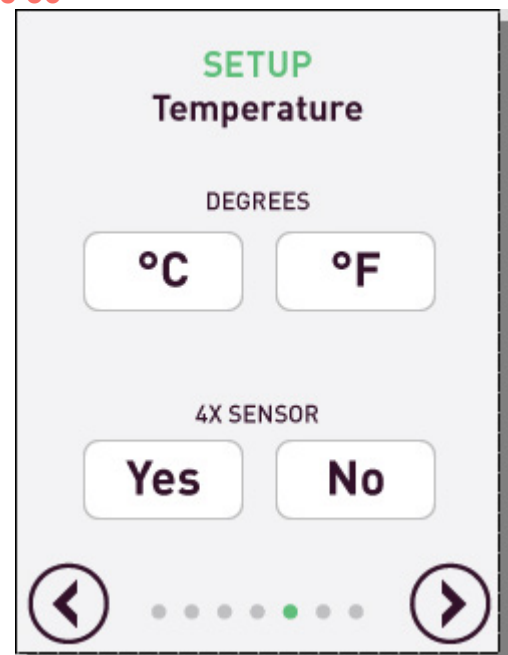


Figure 36



ENABLE THE WIND CONTROL OPTION

NOTE:

The Wind Control option requires the use of an anemometer supplied by Entrematic (6020770).

1. Press **Yes** to enable the wind shutdown option; otherwise press **No**.

The option you selected changes to green.
See **Figure 37**.

If you enable Wind Control, the Wind Unit screen displays.

SET THE UNIT OF WIND SPEED

NOTE:

The maximum speed and duration is set at the factory. If you want to change these parameters, you must contact the factory.

1. Press one of the following wind speeds:
 - MPH for miles per hour
 - KM/H for kilometers per hour
 - Knots for nautical miles per hour
 - M/S for meters per second

The dot next to your selection changes to green. See **Figure 38**.

CORRECT ERRORS DURING HMI CONFIGURATION

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

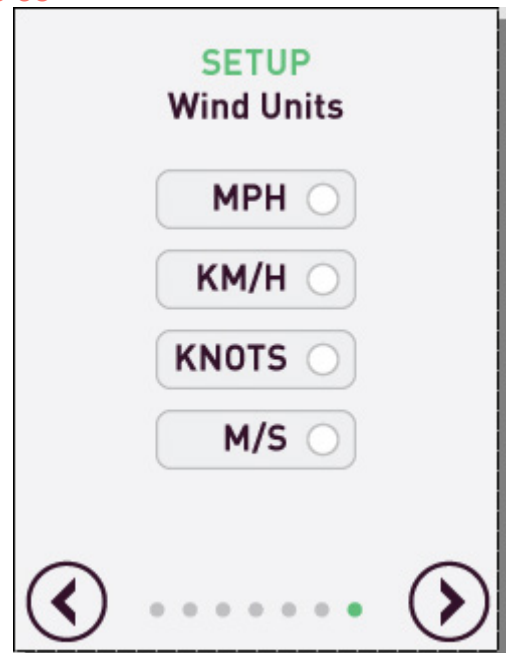
1. Press the menu icon in the bottom left-hand corner of the screen.
2. Press the setup icon.
3. Enter the passcode (default 1111).

The setup screen displays.

Figure 37



Figure 38



POST CONFIGURATION TASKS

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

1. Operate the fan using the [Operating Instructions on page 45](#).
1. Check the fan for proper rotation direction, stability, and noise level.
2. Train authorized personnel how to use the fan using the [Operating Instructions on page 45](#).

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.

See [Temp Control Wiring Details — Optional on page 36](#).

WIND CONTROL INSTALLATION — OPTIONAL

NOTE:

The Wind Control option requires the use of an anemometer supplied by Entrematic (6020770).

1. Attach a 3/4" schedule 40 pipe (1.06" dia.) or 1" dia. structural pipe fitting to the outside of the structure so that it protrudes no less than 24" above the highest peak of the structure.

This hardware is supplied by others.

2. Mount the wind speed/direction sensor to the pipe.

You can pass the data cable through the center of the mounting pipe or the outside of the mounting pipe.

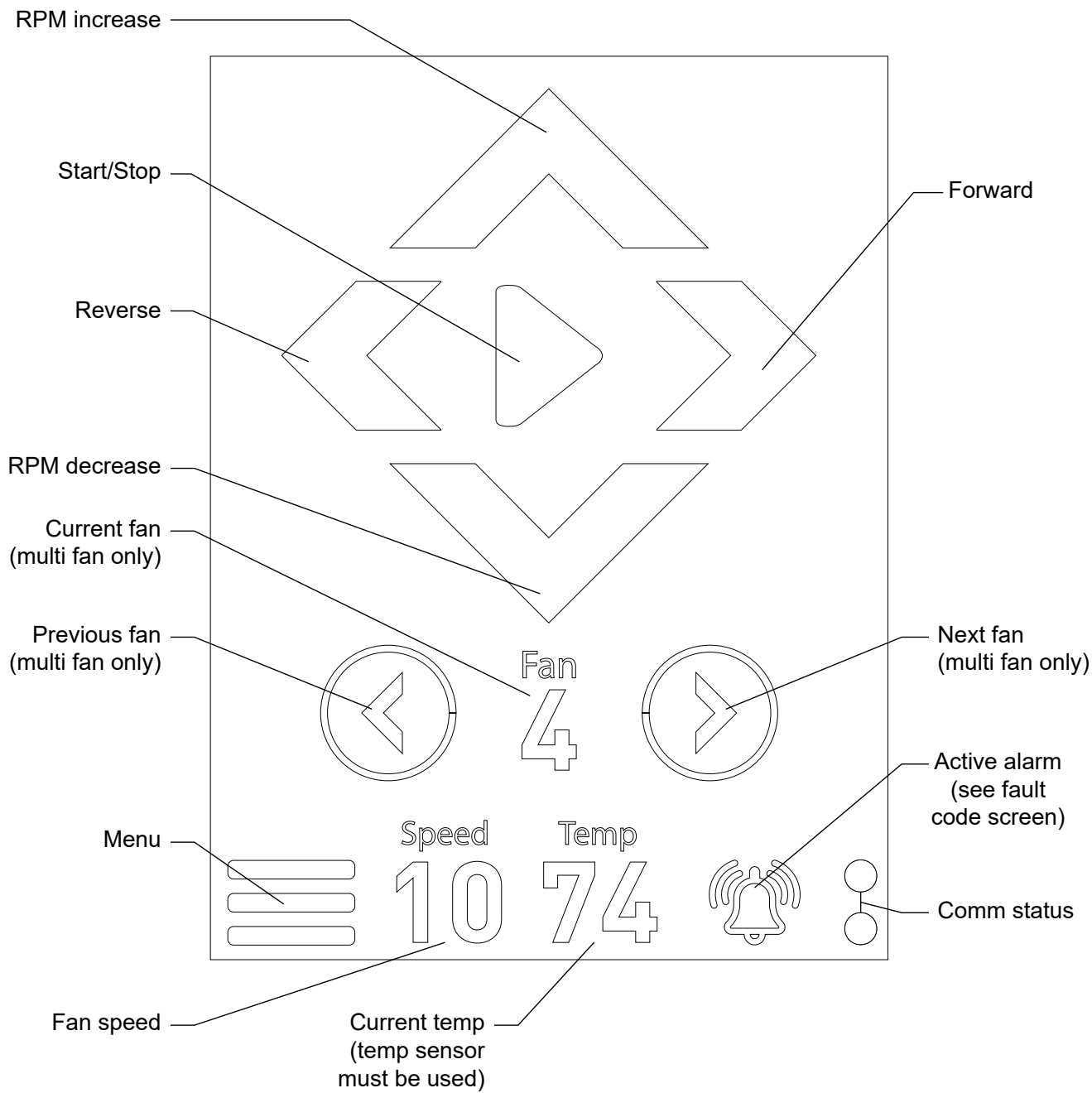
3. Route the data cable and terminate it at the VFD box.

If a longer data cable is required, use Belden 8723 or equivalent to extend the length.

OPERATING INSTRUCTIONS

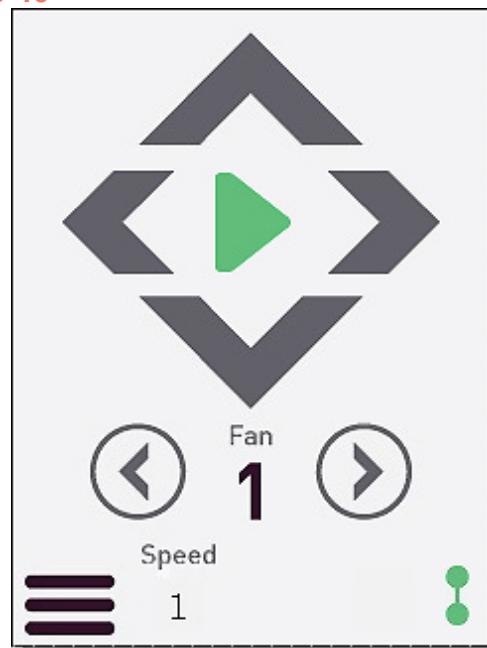
FAN CONTROL SCREEN

Figure 39



<p>▲ WARNING</p>	<p><i>Before operating the industrial fan, read and follow the Safety Practices, Warnings, and Operating Instructions in this manual.</i></p> <p><i>Use by untrained personnel could result in death or serious injury.</i></p>
-------------------------	---

Figure 40



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.
- 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 passcode 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 40**.
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.

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 41**.

SERVICE PROVIDER INFORMATION

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

FAN INFORMATION

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

BUTTON INFORMATION

The Wind button displays the Wind Control screen.

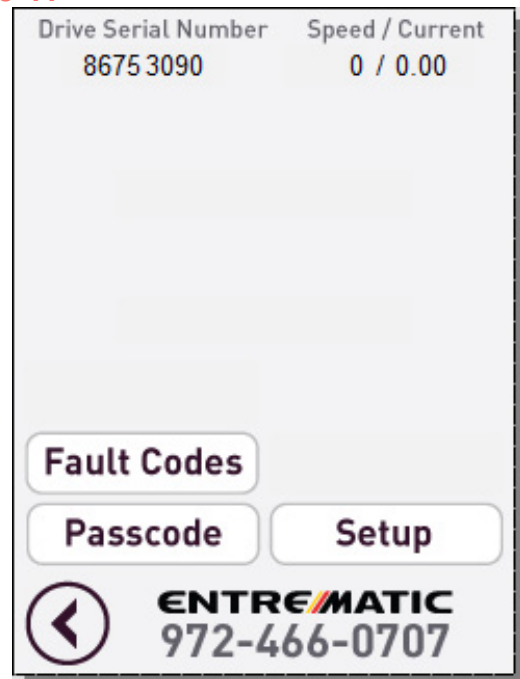
The Fault Code button displays the Active Alarm screen.

The Temp button displays the Current Temperature screen.

The Passcode button displays the Passcode screen.

The Setup button displays the Setup screen.

Figure 41



FAULT CODES

If a Fault Code alarm displays, press the Fault Code button to display the Active Fault Code screen.

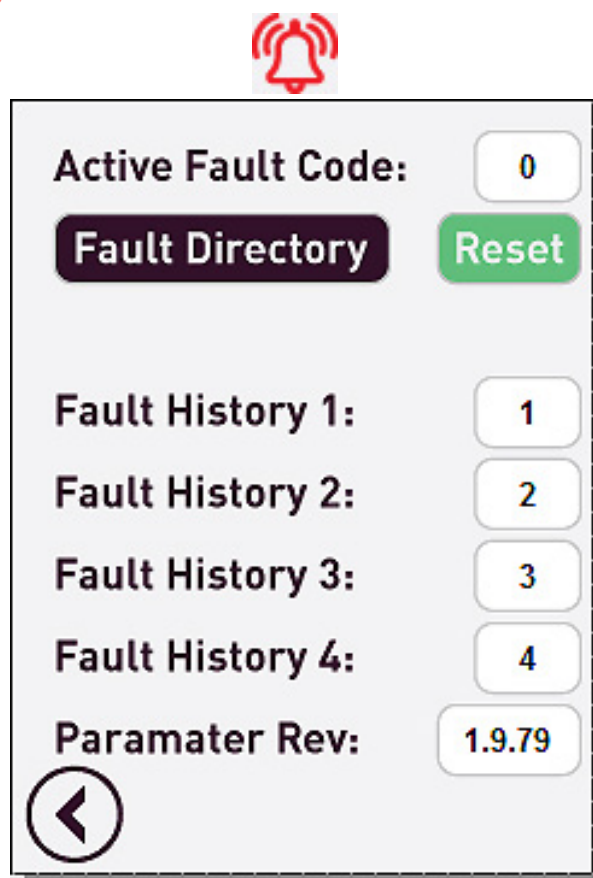
If the fan is currently under a Fault Code, the Active Fault Code number that caused the fault displays in the top right-hand corner of the screen.

To resolve the Fault Code:

1. Press the **Fault Code Directory** button to display a description of the Fault Code.
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.

The last four faults display in the Fault History.

Figure 42



FAULT CODE DEFINITIONS

CODE	DEFINITION	CODE	DEFINITION
0	No alarm/ fan OK	128	Ground fault overcurrent at start
16	Overcurrent during accel	129	Output phase loss
17	Overcurrent at speed	144	External thermal relay operation
18	Overcurrent during decel/stop	145	PTC thermistor operation
32	Overvoltage during accel	176	Parameter storage device default
33	Overvoltage at speed	177	PU disconnection
34	Overvoltage during decel/stop	178	Retry count excess
48	Inverter overload	192	CPU fault
49	Motor overload	196	Output current detection value exceeded
64	Heatsink overheat	197	Inrush current limit circuit fault
82	Input phase loss	199	Analog input fault
96	Stall prevention	201	Safety circuit fault
112	Brake transistor alarm	245	CPU fault

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.

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

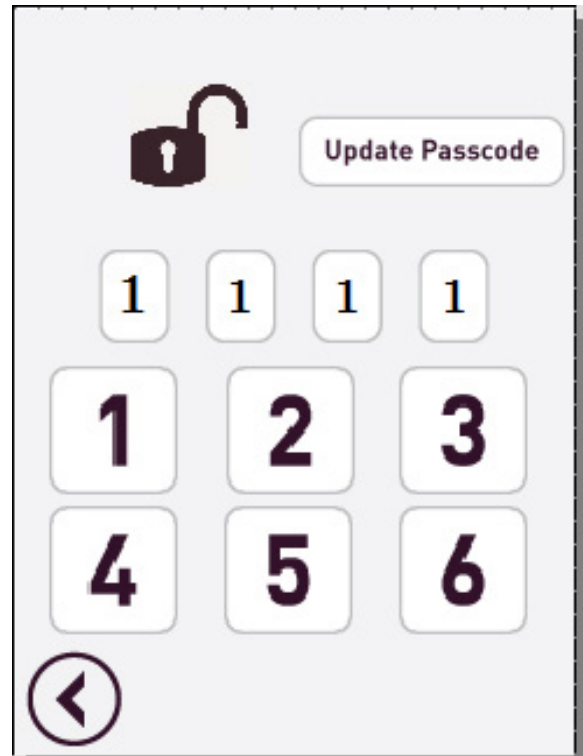
1. Enter your new passcode using the numeric keypad.
2. Press the Update Passcode button. See **Figure 44**.

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

Figure 43



Figure 44



MULTI-FAN CONTROL — OPTIONAL

Press the previous or next buttons to select the fan you would like to control. See **Figure 45**.

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 46**.
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 46**.

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.

DISABLE THE TEMPERATURE CONTROL

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

Figure 45

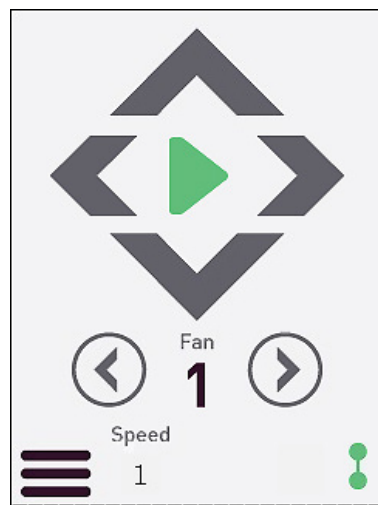


Figure 46

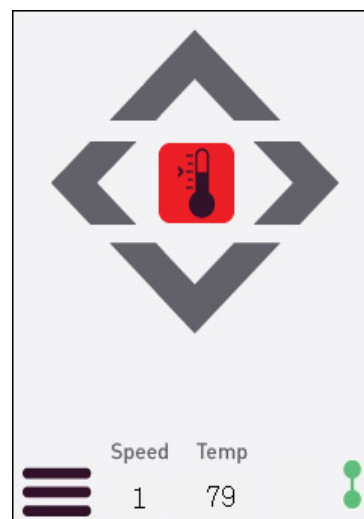
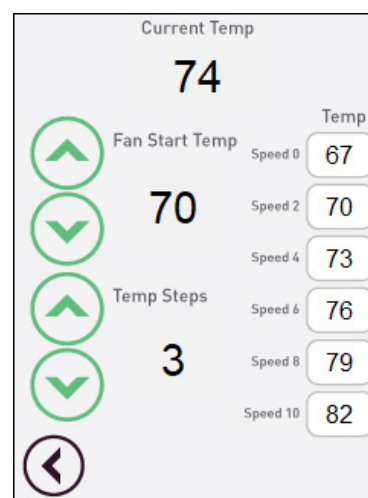


Figure 47



PLANNED MAINTENANCE

⚠ DANGER	<i>Before service, inspection or cleaning make sure the power is disconnected and properly locked out.</i>
-----------------	--

⚠ WARNING	<i>Before servicing the fan, read Safety Practices on page 7 and Operating Instructions on page 45. Failure to do so could result in death or serious injury.</i>
------------------	---

To ensure the continued proper operation of your fan, perform the following planned maintenance annually.

1. Inspect the control panel for loose connections and tighten as required.
2. Using dry air (shop air) blow out debris from the fan motor cooling fan.

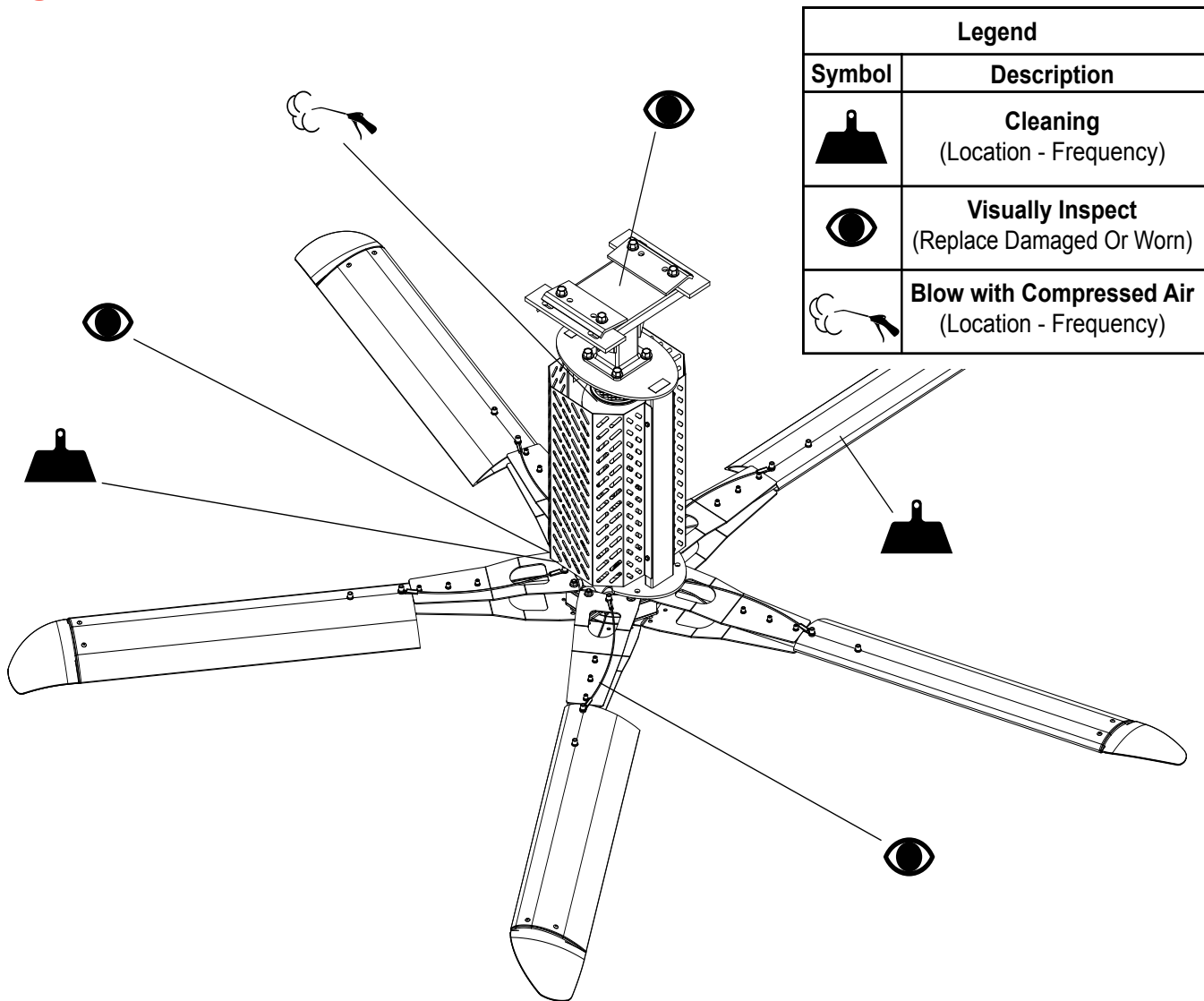
NOTE:

The fan motor cooling fan is located on the top of the powerhead motor.

3. Inspect the motor/gearbox for leaks.
 - a. If leaks are present, contact your distributor.
4. If there are any sudden changes in the motor noise or sound, contact your distributor.
5. Inspect the mounting hardware and tighten as required.
 - a. Torque to 44-48 ft-lbs.
6. Inspect the safety and guy wires for chaffing or wear.
 - a. Ensure the turnbuckle nut is secure.
 - b. Replace the nut as required.
7. Inspect the guy wires for tension.
 - a. Re-tighten as required.

8. Clean fan blades as required.
 - a. Use a soft dry cloth.
 - b. If necessary, use a mild detergent to clean surfaces.

Figure 48



TROUBLESHOOTING GUIDE

⚠ WARNING	<p>Before servicing the fan, read Safety Practices on page 7 and Operating Instructions on page 45. Failure to do so could result in death or serious injury.</p>
------------------	---

⚠ DANGER	<p>Before doing any electrical work, make certain the power is disconnected and properly locked out and 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>
-----------------	---

The functions of the fan are controlled by a Variable Frequency Drive (VFD). Error codes display on the touchscreen Fault Code screen.

Use the following table to find the condition that most closely matches your situation and make the recommended adjustments.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Fan does not operate.	No power to the control panel.	Ensure the disconnect is in the ON position. Check for primary power at the terminals.
	Primary fuses blown.	Replace fuse(s).
Fan does not operate, but the Control Panel has power.	Obstructions are preventing movement.	Check the fan unit. Ensure there are no obstructions preventing movement.
	Remote not properly connected	Check the connections between the remote and the VFD.
	VFD faulted	Check for the VFD fault. Check the fault code action - reset drive. (Power Off/Power ON)
	Fire circuit open.	RED fire alarm indicator - The fire alarm is active if the fire alarm circuit is open. Review the building fire system and reset if necessary.
Fan is operating, but turning in the wrong direction.	Wire sequence	Switch two phases of the output wiring from the VFD to the motor.
	Intermittent connectivity inside the remote control panel.	Make sure the connections inside the remote control touchscreen are secure.
Fan is operating, but shows excessive wobble.	Guy wires are not tensioned properly.	Re-tension the guy wires in accordance with Install the Guy Wires on page 23.
	Winglet is missing.	Replace the winglet.
The fan is generating a ticking noise and the tick increases with speed.	The blade bolts are not properly tightened.	Loosen the blade nuts. Support the blade level (horizontally) before torquing the bolts to 24-28 ft-lbs.

VARIABLE FREQUENCY DRIVE (VFD) FAULT CODES

These codes display on the VFD.

Figure 49

Operation Panel Indication			Name
Error message	E---	E---	Faults history
	HOLD	HOLD	Operation panel lock
	LOCd	LOCd	Password locked
	Er 1 to Er 4	Er1 to 4	Parameter write error
	Err.	Err.	Inverter reset
Warning	OL	OL	Stall prevention (overcurrent)
	oL	oL	Stall prevention (overvoltage)
	rb	RB	Regenerative brake pre-alarm
	TH	TH	Electronic thermal relay function pre-alarm
	PS	PS	PU stop
	MT	MT	Maintenance signal output
	UV	UV	Undervoltage
	SA	SA	Safety stop
Alarm	Fn	FN	Fan alarm
Fault	E.OC 1	E.OC1	Overcurrent trip during acceleration
	E.OC 2	E.OC2	Overcurrent trip during constant speed
	E.OC 3	E.OC3	Overcurrent trip during deceleration or stop
	E.OV 1	E.OV1	Regenerative overvoltage trip during acceleration
	E.OV 2	E.OV2	Regenerative overvoltage trip during constant speed
	E.OV 3	E.OV3	Regenerative overvoltage trip during deceleration or stop

Operation Panel Indication			Name
Fault	E.THT	E.THT	Inverter overload trip (electronic thermal O/L relay function)
	E.THM	E.THM	Motor overload trip (electronic thermal O/L relay function)
	E.FIN	E.FIN	Heatsink overheat
	E.ILF *	E.ILF *	Input phase loss
	E.OLT	E.OLT	Stall prevention stop
	E. BE	E. BE	Brake transistor alarm detection
	E. GF	E.GF	Output side earth (ground) fault overcurrent at start
	E. LF	E.LF	Output phase loss
	E.OHT	E.OHT	External thermal relay operation
	E.PTC*	E.PTC*	PTC thermistor operation
	E. PE	E. PE	Parameter storage device fault
	E.PUE	E.PUE	PU disconnection
	E.RET	E.RET	Retry count excess
	E. 5	E.5	CPU fault
	E.CPU	E.CPU	
	E.CDO*	E.CDO*	Output current detection value exceeded
	E.IOH *	E.IOH *	Inrush current limit circuit fault
	E.AIE *	E.AIE *	Analog input fault
	E.SAF *	E.SAF *	Safety circuit fault

COMPONENTS AND SPECIFICATIONS

VFD BOX

- NEMA 1
- Solid State VFD (Variable Frequency Drive)
- 208-240VAC 1PH, 208 – 480 VAC 3PH
- Line reactor (where required)
- Class CC fuses
- UL and UL-C listed panel and components
- Power disconnect

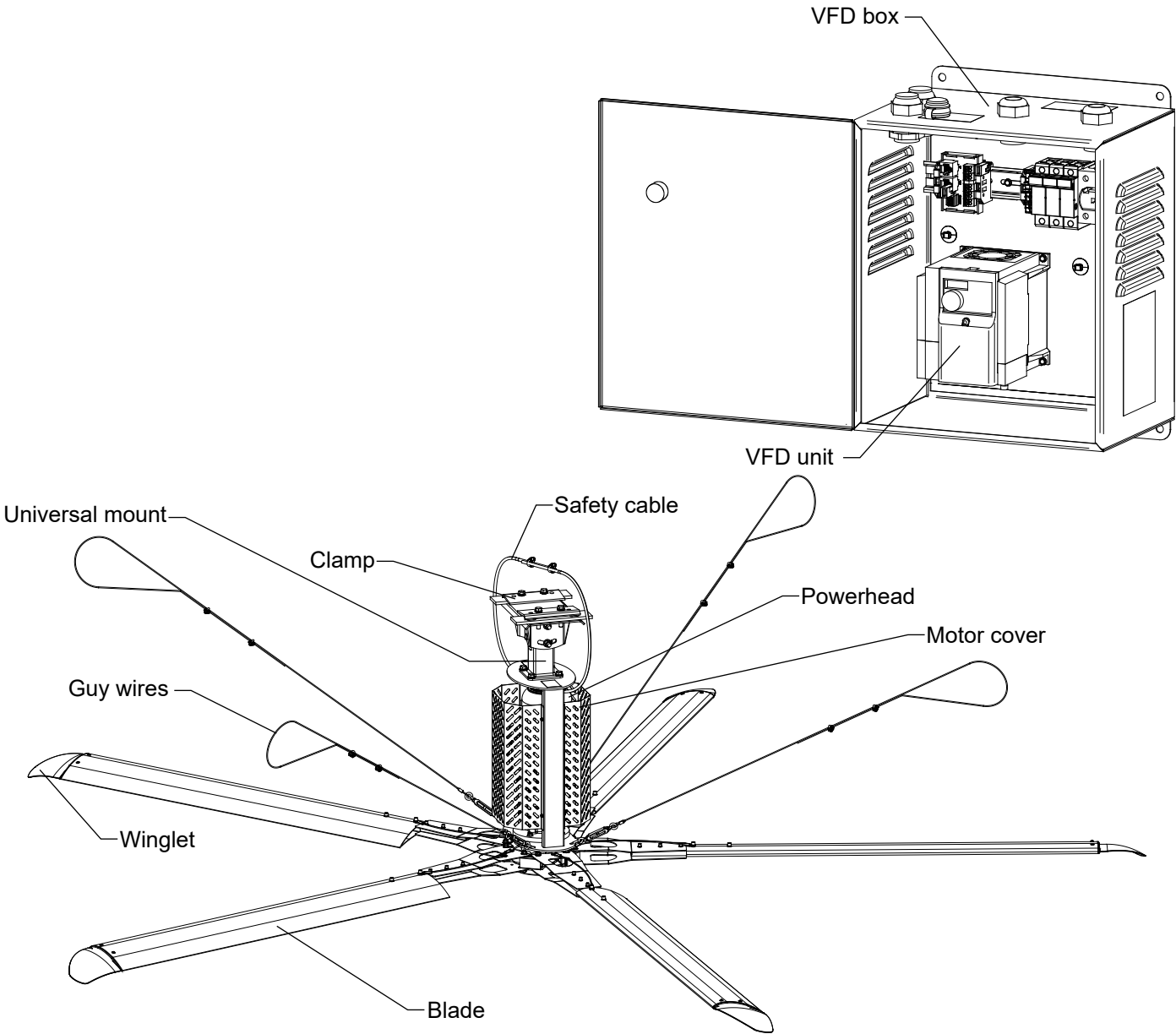
MOTOR

- NEMA standard T.E.F.C
- 1-1/2 or 2 HP
- Continuous duty three phase

GEARBOX

- Double helical gear reduced, sealed lubrication.

Figure 50



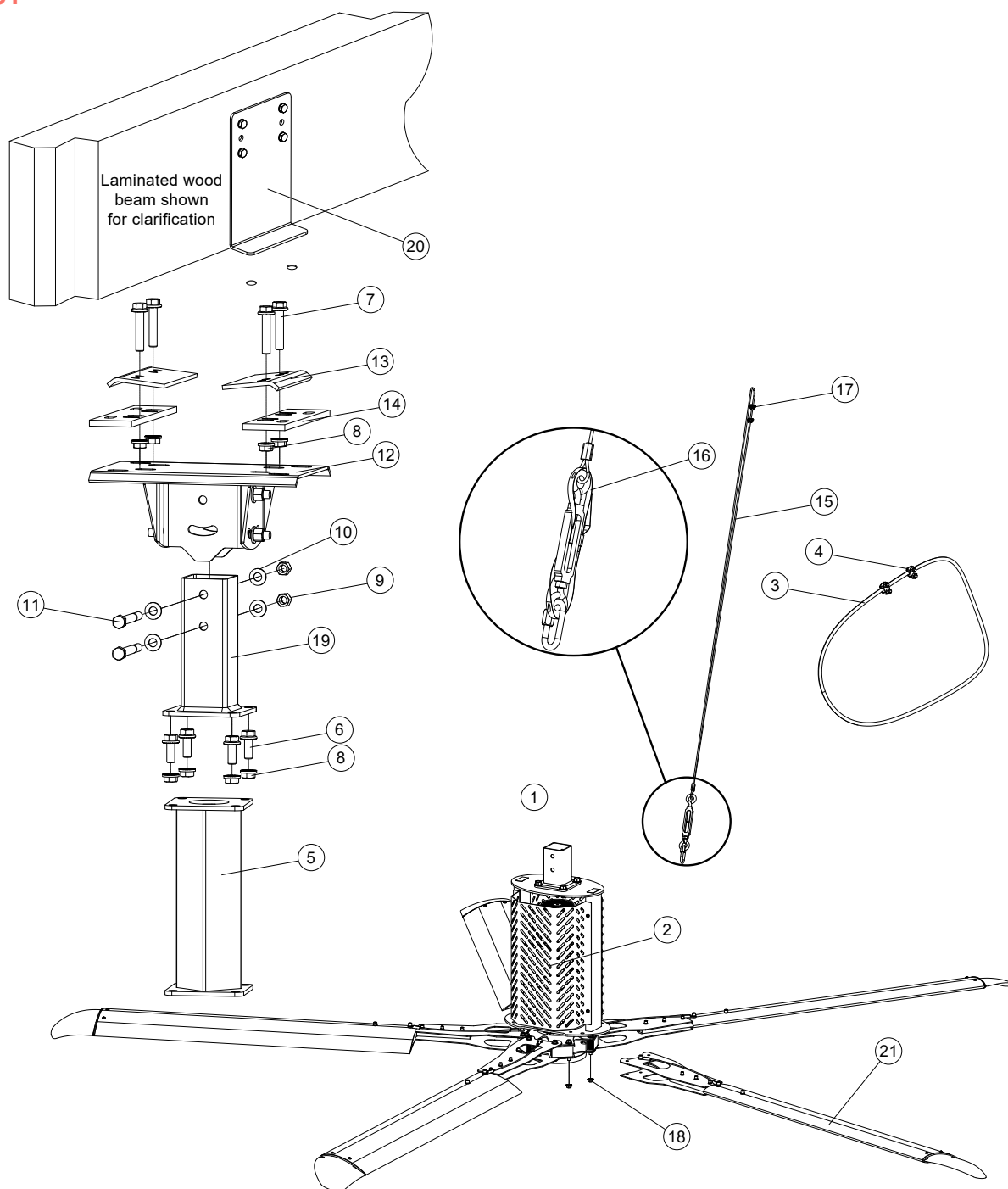
PARTS LIST — FAN

▲ 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 could result on product malfunction, breakdown, premature wear, death, or serious injury.

Figure 51

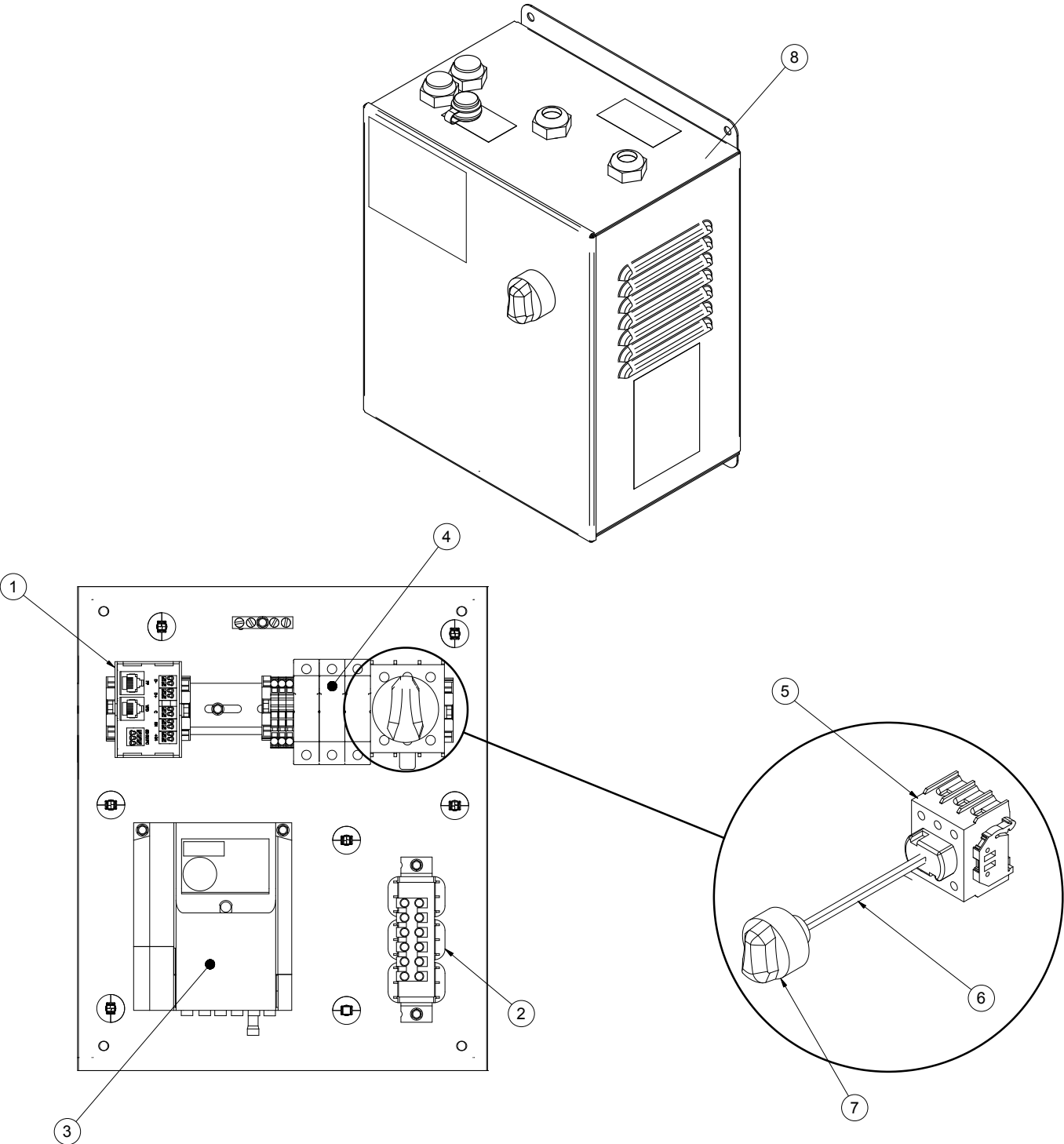


ITEM	QUANTITY	DESCRIPTION	PART NUMBER
1	1	POWERHEAD, 1.5HP, 8/10 LOW	6020700
		POWERHEAD, 1.5HP, 8/10 HIGH	6020701
		POWERHEAD, 1.5HP, 12/14 LOW	6020702
		POWERHEAD, 1.5HP, 12/14 HIGH	6020703
		POWERHEAD, 1.5HP, 16/18 LOW	6020704
		POWERHEAD, 1.5HP, 16/18 HIGH	6020705
		POWERHEAD, 1.5HP, 20 LOW	6020706
		POWERHEAD, 1.5HP, 20 HIGH	6020707
		POWERHEAD, 2HP, 24 LOW	6020708
		POWERHEAD, 2HP, 24 HIGH	6020709
2	2	SILVER MOTOR COVER	6015806
		BLACK MOTOR COVER	6015820
3	1	Safety cable — 170" LONG - 6", 1', 2' EXT	6014884
		Safety cable — 242" LONG - 3', 4', 5' EXT	601488
		Safety cable — 314" LONG - 6', 7', 8' EXT	6014890
		Safety cable — 386" LONG - 9', 10', 11', 12' EXT	6015864
4	2	CABLE CLAMP 1/4" PLD	441103
5	1	HVLS EXT MNT 12" — optional	6015865
		HVLS EXT MNT 24" — optional	6015866
		HVLS EXT MNT 24" — optional	6015866
		HVLS EXT MNT 24" — optional	6015866
		HVLS EXT MNT 24" — optional	6015866
		HVLS EXT MNT 36" — optional	6015867
		HVLS EXT MNT 48" — optional	6015868
		HVLS EXT MNT 60" — optional	6015869
		HVLS EXT MNT 72" — optional	6015870
		HVLS EXT MNT 84" — optional	6015871
		HVLS EXT MNT 96" — optional	6015872
		HVLS EXT MNT 108" — optional	6015873
		HVLS EXT MNT 120" — optional	6015874
		HVLS EXT MNT 120" — optional	6015874
		HVLS EXT MNT 132" — optional	6015875
		HVLS EXT MNT 144" — optional	6015876
6	4	1/2-13UNC X 1 1/4" LG SER FLG	6015851
7	4	1/2-13UNC X 2 1/2" LG SER FLG	6015852

ITEM	QUANTITY	DESCRIPTION	PART NUMBER
8	8	NUT, HEX FLG, SER, 1/2-13UNC	6015853
9	2	LN 1/2 NYLON INSERT LOCKNUT	214505
10	4	PW - 1/2" ID - SAE	234260
11	2	HGB 1/2-13UNC X 4 1/2 LG, GRD5	6013220
12	1	PIVOT, EXTRA WIDE HANGER BRACKET MOUNT	6014914
		PIVOT, HANGER BRACKET MOUNT	6016400
13	2	PLATE, HANGER BRACKET CLAMP	6014953
14	2	PLATE, CLAMP SPACER	6014954
15	1	GUY WIRE KIT - 6FT, 7FT, 8FT EXT (includes items 16 and 17)	6015676
		GUY WIRE KIT - 9FT, 10FT EXT (includes items 16 and 17)	6015678
16	4	SECONDARY STRAP TIE, BALL LOCK	6015265
17	8	1/8" WIRE CABLE CLAMP	6010900
18	20	NUT, HEX FLG, SER, 3/8-16UNF	6015118
19	1	Fan Mount Extension — STD	6020544
20	1	Laminated Wood Beam Bracket Set — optional	6018028
21	5	8' BLACK BLADE ASSY	6020503
		10' BLACK BLADE ASSY	6020504
		12' BLACK BLADE ASSY	6020505
		14' BLACK BLADE ASSY	6020506
		16' BLACK BLADE ASSY	6020507
		18' BLACK BLADE ASSY	6020508
		20' BLACK BLADE ASSY	6020509
		24' BLACK BLADE ASSY	6020511
		8' CLEAR BLADE ASSY	6020512
		10' CLEAR BLADE ASSY	6020513
		12' CLEAR BLADE ASSY	6020514
		14' CLEAR BLADE ASSY	6020515
		16' CLEAR BLADE ASSY	6020516
		18' CLEAR BLADE ASSY	6020517
		20' CLEAR BLADE ASSY	6020518
		24' CLEAR BLADE ASSY	6020520
22	8	Fan Cover Fasteners	215702

PARTS LIST — VFD BOX

Figure 52



602110 — 230V/1PH/1.5HP

ITEM	QUANTITY	PART DESCRIPTION	PART NUMBER
1	1	INTERFACE, HVLS DIN RAIL MOUNT PCB	6015547
2	—	—	—
3	1	mitsubishi vfd, 230V, 1PH, 2HP	6014904
4	2	FUSE 15A, 600V, KTK-R-15	6011800
5	1	ROTARY DISCONNECT	6015597
6	1	DISCONNECT SHAFT 150MM	6015599
7	1	DISCONNECT HANDLE	6015598
8	1	VFD CONTROL BOX ASSY (includes items 1-7)	6021100

6021103 — 230V/1PH/2HP

ITEM	QUANTITY	PART DESCRIPTION	PART NUMBER
1	1	INTERFACE, HVLS DIN RAIL MOUNT PCB	6015547
2	—	—	—
3	1	mitsubishi vfd, 230V, 1PH, 2HP	6014904
4	2	FUSE 20A, 600V, KTK-R-20	6011801
5	1	ROTARY DISCONNECT	6015597
6	1	DISCONNECT SHAFT 150MM	6015599
7	1	DISCONNECT HANDLE	6015598
8	1	VFD CONTROL BOX ASSY (includes items 1-7)	6021103

6021101 — 230V3PH/1.5HP

ITEM	QUANTITY	PART DESCRIPTION	PART NUMBER
1	1	INTERFACE, HVLS DIN RAIL MOUNT PCB	6015547
2	—	—	—
3	1	mitsubishi vfd, 230V, 3PH, 2HP	6014907
4	3	FUSE 10A, 600V, KTK-R-10	6014015
5	1	ROTARY DISCONNECT	6015597
6	1	DISCONNECT SHAFT 150MM	6015599
7	1	DISCONNECT HANDLE	6015598
8	1	VFD CONTROL BOX ASSY (includes items 1-7)	6021101

6021104 — 230V/3PH/2HP

ITEM	QUANTITY	PART DESCRIPTION	PART NUMBER
1	1	INTERFACE, HVLS DIN RAIL MOUNT PCB	6015547
2	—	—	—
3	1	mitsubishi VFD, 230V, 3PH, 2HP	6014907
4	3	FUSE 10A, 600V, KTK-R-10	6014015
5	1	ROTARY DISCONNECT	6015597
6	1	DISCONNECT SHAFT 150MM	6015599
7	1	DISCONNECT HANDLE	6015598
8	1	VFD CONTROL BOX ASSY (includes items 1-7)	6021104

6021102 — 460V/3PH/1.5HP

ITEM	QUANTITY	PART DESCRIPTION	PART NUMBER
1	1	INTERFACE, HVLS DIN RAIL MOUNT PCB	6015547
2	—	—	—
3	1	mitsubishi VFD, 480V, 3PH, 2HP	6014909
4	3	FUSE 5A, 600V, KTK-R-5	6011797
5	1	ROTARY DISCONNECT	6015597
6	1	DISCONNECT SHAFT 150MM	6015599
7	1	DISCONNECT HANDLE	6015598
8	1	VFD CONTROL BOX ASSY (includes items 1-7)	6021102

6021105 — 460V/3PH/2PH

ITEM	QUANTITY	PART DESCRIPTION	PART NUMBER
1	1	INTERFACE, HVLS DIN RAIL MOUNT PCB	6015547
2	—	—	—
3	1	mitsubishi VFD, 480V, 3PH, 2HP	6014909
4	3	FUSE 5A, 600V, KTK-R-5	6011797
5	1	ROTARY DISCONNECT	6015597
6	1	DISCONNECT SHAFT 150MM	6015599
7	1	DISCONNECT HANDLE	6015598
8	1	VFD CONTROL BOX ASSY (includes items 1-7)	6021105

6021107 — 460V/3PH/1.5HP

ITEM	QUANTITY	PART DESCRIPTION	PART NUMBER
1	1	INTERFACE, HVLS DIN RAIL MOUNT PCB	6015547
2	1	LINE REACTOR, 600V, 3.4A	6010718
3	1	mitsubishi VFD, 480V, 3PH, 3HP	6016452
4	3	FUSE 5A, 600V, KTK-R-5	6011797
5	1	ROTARY DISCONNECT	6015597
6	1	DISCONNECT SHAFT 150MM	6015599
7	1	DISCONNECT HANDLE	6015598
8	1	VFD CONTROL BOX ASSY (includes items 1-7)	6021107

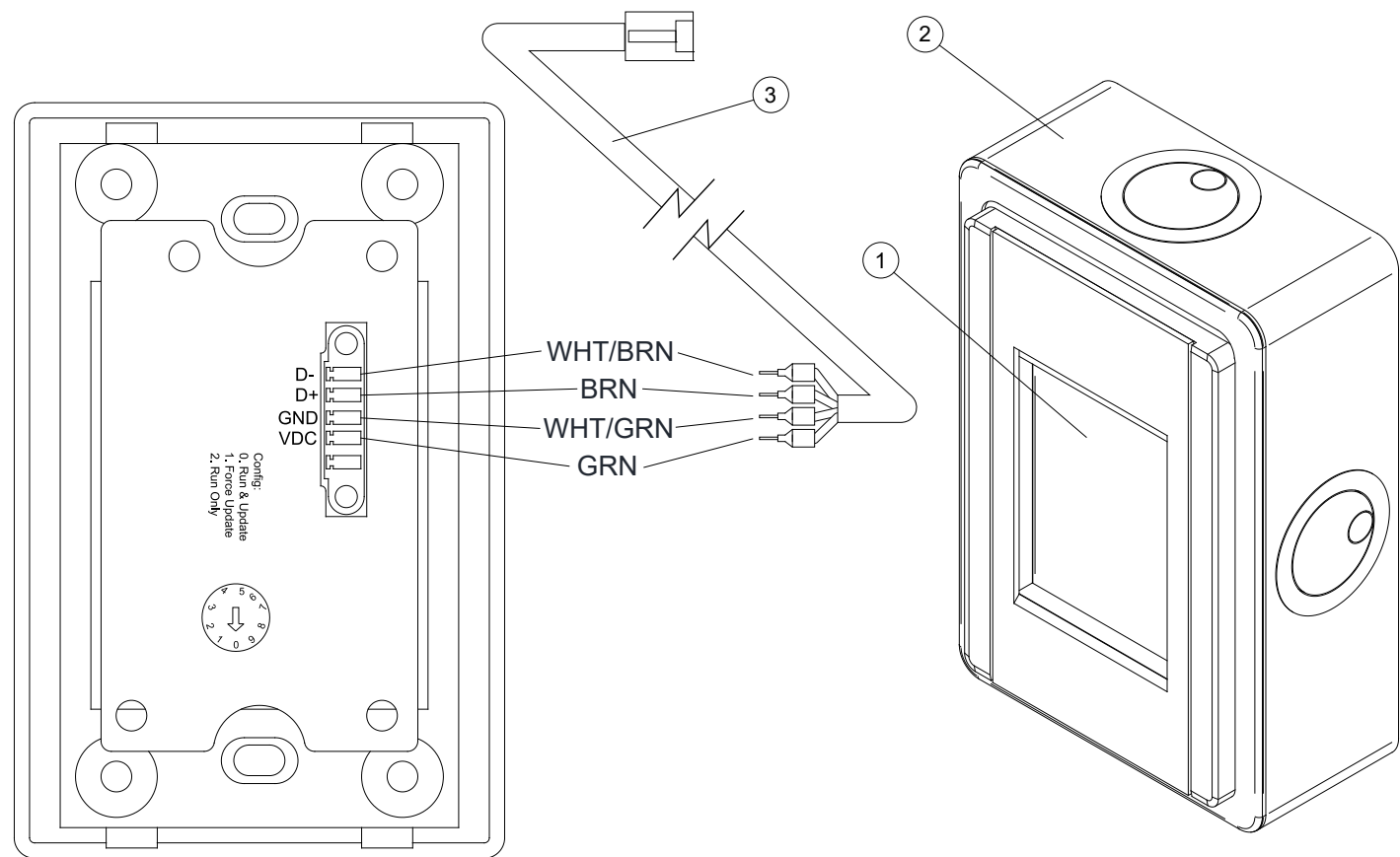
6021106 — 480V/3PH/2HP

1

ITEM	QUANTITY	PART DESCRIPTION	PART NUMBER
	1	INTERFACE, HVLS DIN RAIL MOUNT PCB	6015547
2	1	LINE REACTOR, 600V, 4.8A	6010719
3	1	mitsubishi VFD, 480V, 3PH, 3HP	6016452
4	3	FUSE 10A, 600V, KTK-R-10	6014015
5	1	ROTARY DISCONNECT	6015597
6	1	DISCONNECT SHAFT 150MM	6015599
7	1	DISCONNECT HANDLE	6015598
8	1	VFD CONTROL BOX ASSY (includes items 1-7)	6021106

PARTS LIST — REMOTE CONTROL PANEL

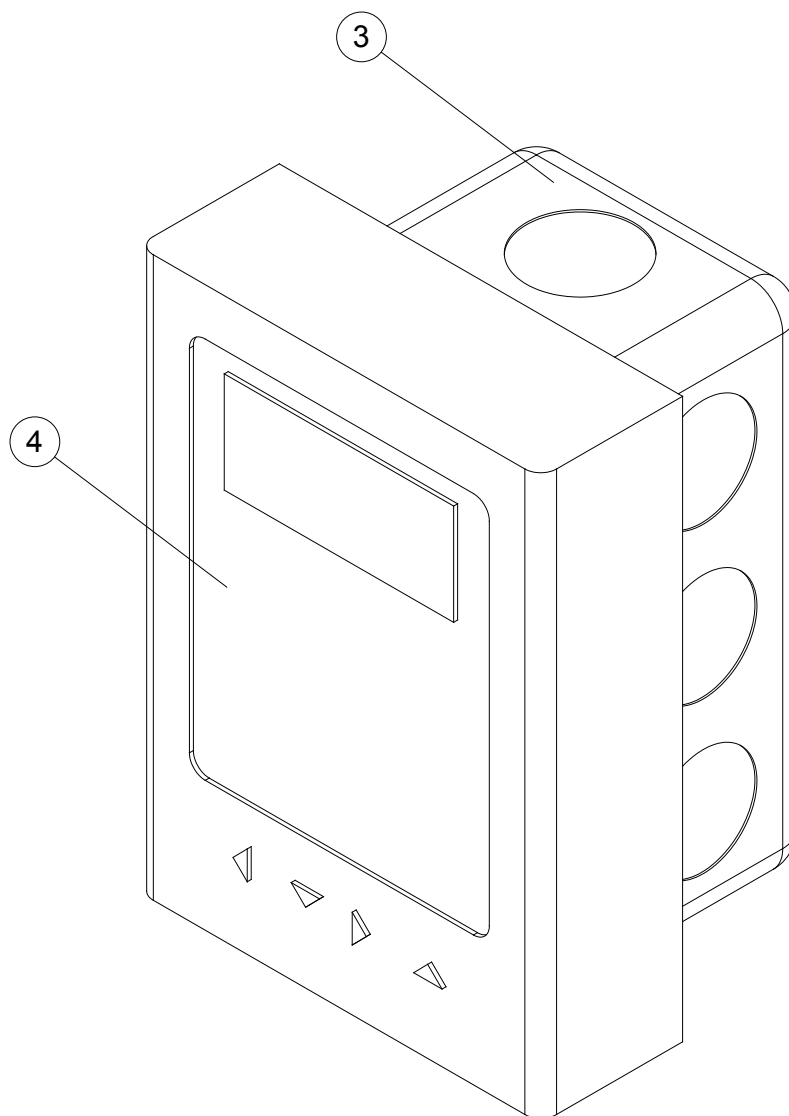
Figure 53



ITEM	QUANTITY	PART DESCRIPTION	PART NUMBER
1	1	TOUCH SCREEN CONTROLLER, KELLEY	6015758
		TOUCH SCREEN CONTROLLER, SERCO	6015759
		TOUCH SCREEN CONTROLLER, EPIC	6023293
2	1	J-BOX , PLASTIC, IVORY	6015648
3	1	CABLE CAT5, 100' W/ FERRULE (blue)	6015651

PARTS LIST — TEMP CONTROL (OPTIONAL)

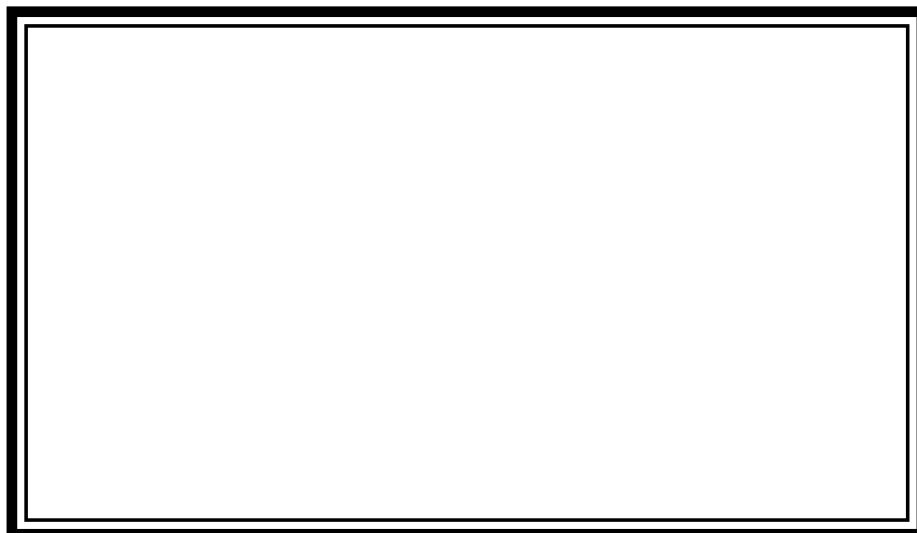
Figure 54



ITEM	QUANTITY	PART DESCRIPTION	PART NUMBER
1	1	TEMP CONTROL ASSEMBLY (includes items 2-4)	6013862
2	2	PHILIPS HEAD SCREW (not shown)	6013543
3	1	4X2 STEEL J-BOX	6013415
4	1	MODBUS TEMP/IO control	6013861

NOTES

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

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Resource distributor.

For replacement parts,
please call the number
above.