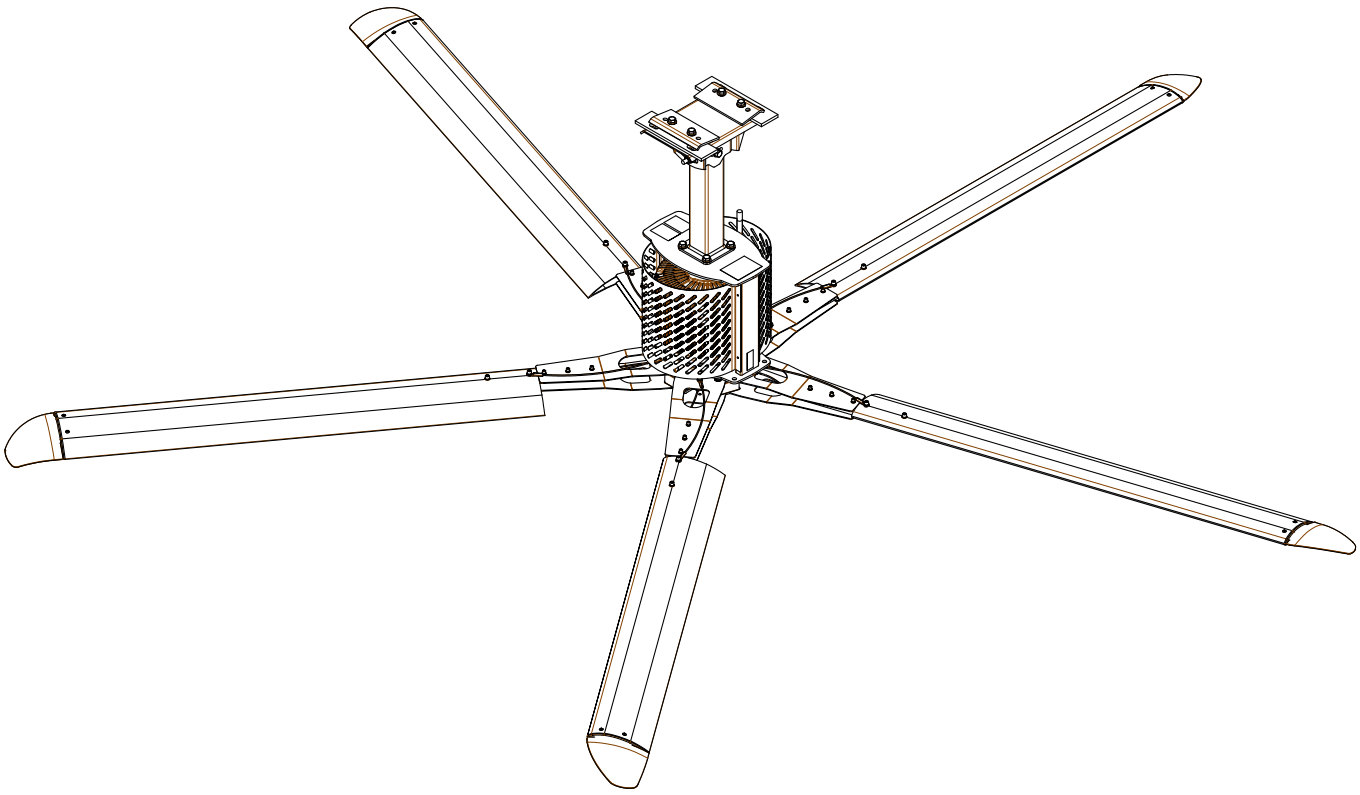
Direct Drive HVLS Fan
User's Manual



This manual applies to fans manufactured beginning January 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 User's Manual. Failure to do so could result in death or serious injury.

User's Manual

Installation, Operations, Maintenance and Parts

Part No. 6022221A

TABLE OF CONTENTS

INTRODUCTION

Welcome and thank you for choosing this industrial fan from Entrematic.

This User's Manual contains information that 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.

SAFETY SIGNAL WORDS

You may find safety signal words such as DANGER, WARNING, CAUTION or NOTICE throughout this User's Manual. Their use is explained below:

	**WARNING AND CAUTION SYMBOL** ***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.***
	**DANGER SYMBOL** ***Indicates an immently hazardous situation which, if not avoided, will result in death or serious injury***
	**ELECTRICAL WARNING SYMBOL** ***Indicates an electrical hazard with a medium level of risk that could result in death or serious injury.***

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⚠CAUTION	**CAUTION SYMBOL** ***Indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury.***
⚠WARNING	**WARNING SYMBOL** ***Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.***
NOTICE	**NOTICE SYMBOL** ***Notice is used to address practices not related to personal injury.***

IMPORTANT SAFETY INSTRUCTIONS
READ AND SAVE THESE INSTRUCTIONS

⚠WARNING	***READ THESE SAFETY PRACTICES BEFORE INSTALLING, OPERATING, OR SERVICING THE FAN. Failure to follow these safety practices could result in death or serious injury.*** ***READ AND FOLLOW THE OPERATING INSTRUCTIONS IN THIS MANUAL BEFORE OPERATING THE FAN. If you do not understand the instructions, ask your supervisor to teach you how to use them.*** ***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.***
⚠DANGER	***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 asemblies cannot be substituted.*** ***Be certain to follow the instructions in this manual.***

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⚠WARNING	***Installation of the equipment must comply with local and national electrical codes and must be in accordance with ANSI/NFPA 7-1999.*** ***Do not use this industrial 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 before use. If you do not understand the instructions, ask your supervisor to explain them to you or call your local distributor.*** ***DO NOT USE THE FAN IF IT APPEARS DAMAGED OR DOES NOT OPERATE PROPERLY. inform your supervisor immediately.*** ***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.*** ***To reduce the risk of electrical shock, do not expose to water or rain.*** ***Support directly from building structure. Do not install the fan unit onto structure of insufficient strength. Consult a professional engineer or registered architect. Improper installation of the fan could result in death or serious injury.***
⚠DANGER	***Before service, inspection, or cleaning, make certain the power is disconnected and properly locked out.*** ***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.*** ***Keep your body clear of moving parts at all times.*** ***All electrical troubleshooting and repair must be done by a qualified technician and meet all applicable codes.*** ***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 electrical shock, death, or serious injury.***
⚠WARNING	***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.*** ***If you have problems or questions, contact your local distributor for asssistance.***
⚠WARNING	***To reduce the risk of injury to persons, install fan so that the blades are at least 3.05m (10') above the floor.***
⚠WARNING	***Use caution when spinning the motor by hand. Voltage is produced from the permanent magnet motor and can cause electrical shock, death, or serious injury.***
⚠CAUTION	***Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards.***
⚠CAUTION	***When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.***

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⚠CAUTION	***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.***
⚠CAUTION	***When service or replacement of a component in the fan requires the removal of disconnection of a safety device, the safety device is to be reinstalled or remounted as previously installed.***
⚠WARNING	***Risk of fire, electric shock, or injury to persons during cleaning and user-maintenance. Disconnect the fan from the power supply before servicing.***
⚠WARNING	***Stay alert, watch what you are doing, and 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.***
⚠CAUTION	***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.***

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 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 in service.

The owner shall see that all nameplates and caution and instruction markings or labels are in place and that the appropriate operating and maintenance manuals are provided to users.

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

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HARDWARE

Mount — Building

(x4) 1/2-13UNC x 2-1/2

(x4) 1/2-13UNC lock nut

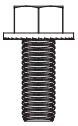
Mount — Assembly

(x2) 1/2-13UNC x 4-1/2 bolt

(x4) 1/2 dia. washer

(x2) 1/2-13UNC nyloc lock nut

Mount — Motor frame



(x4) 1/2-13UNC x 1-1/4 bolt

(x4) 1/2-13UNC lock nut

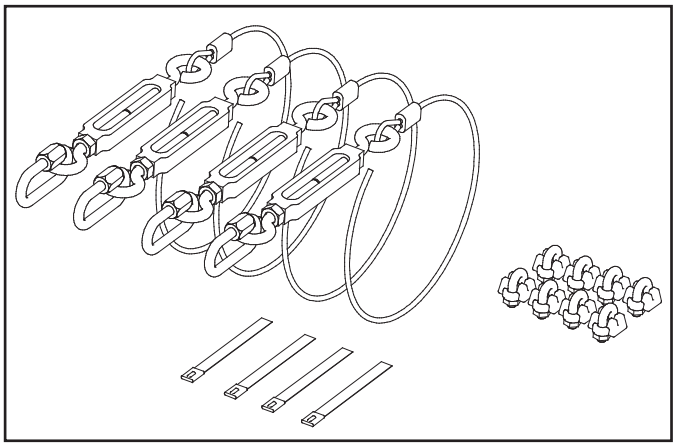
Mount — Blade

(x20) 3/8-16UNC lock nut

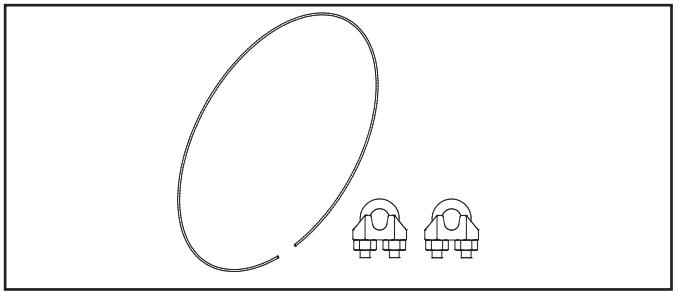
Mount — Fan cover

(x8) #12 14 x 3/4 TEKS

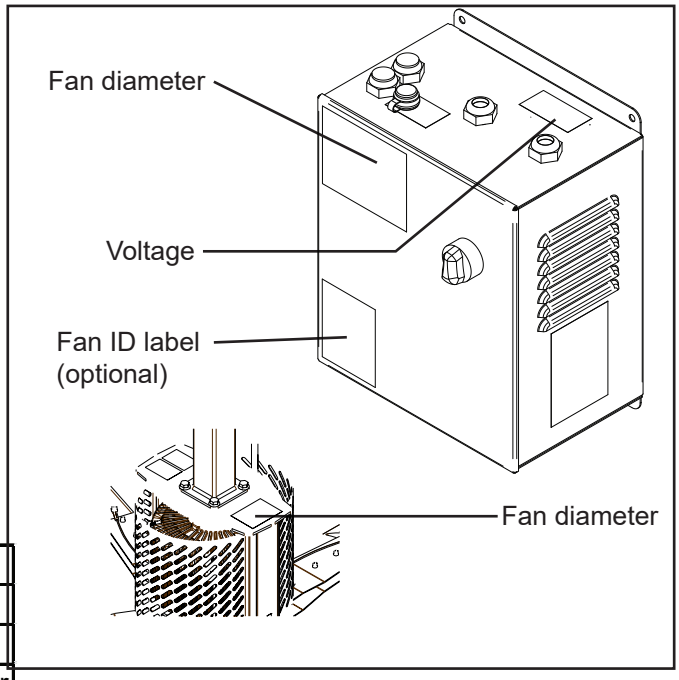
Guy wire assembly



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.

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PACKING KIT (Standard)

1. Blade Box – 5 each

2. Fan Motor Box
   a. Motor assembly with covers.
   b. Remote control panel with junction box. (Option)
   c. Category 5e cable – 100 ft (blue). (Option)
   d. Mounting hardware. See page 6.
   e. VFD box.

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 installs, a drill and 1/2" dia. drill bit are required.***

NOTICE

PRIOR TO FAN INSTALLATION:

1. Ensure that 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 blade length matches fan model size. See Fig. 1. Consult fan model designation located on the side of the fan powerhead frame.

3. Ensure all mounting hardware shown on page 6 is present.

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

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

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 (7.3 m).

- The fan shall be approximately centered between four adjacent sprinklers.

- The vertical clearance from the fan to sprinkler deflector shall be a minimum of 3 feet (0.9 m).

- 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.

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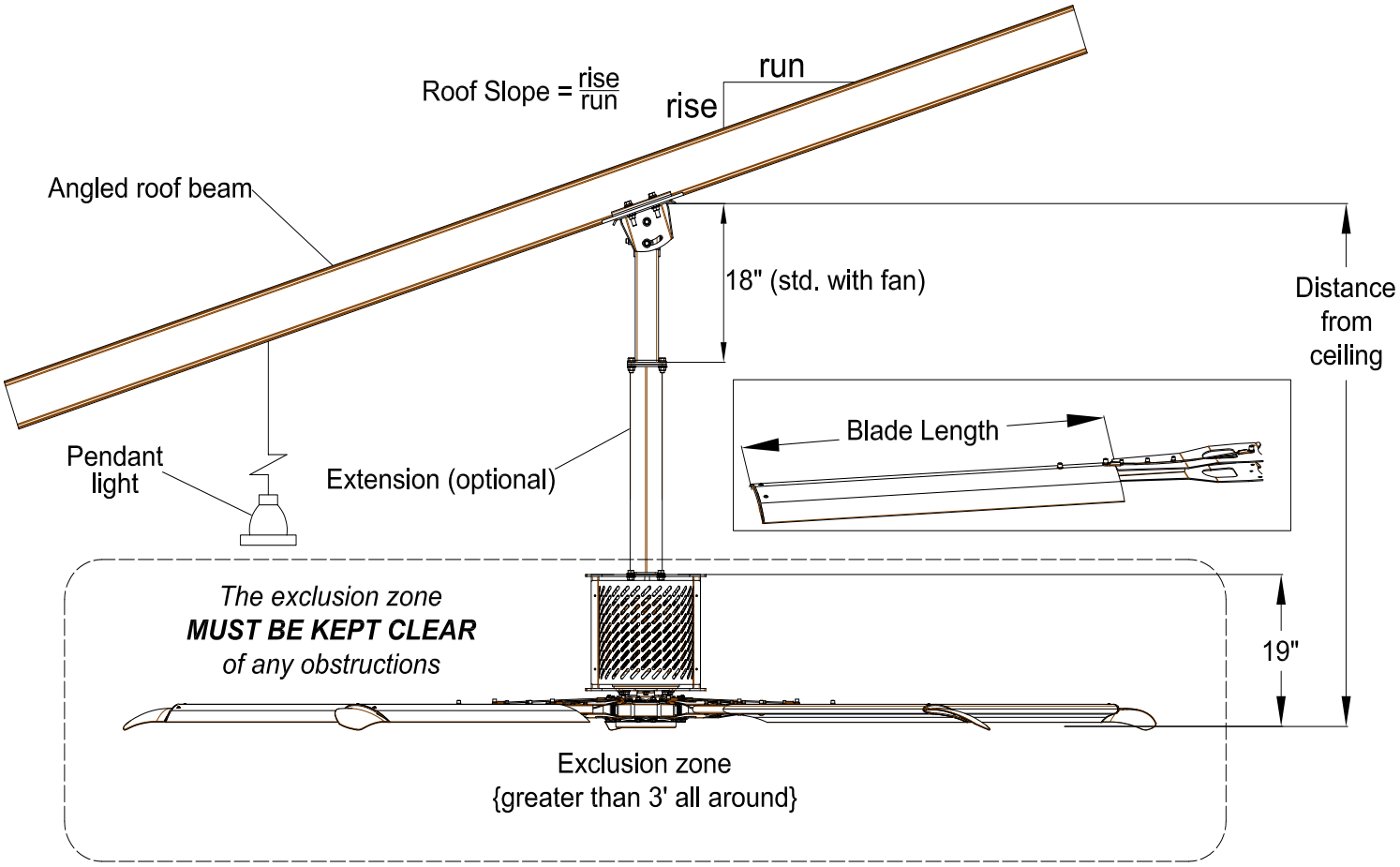
INSTALLATION CONSIDERATIONS

Fig. 1



ROOF SLOPE*	0	2/12	3/12	4/12	HANGING WEIGHT (LB)	MAXIMUM TORQUE (FT LB)	BLADE LENGTH (IN)
ROOF ANGLE*	0	9.5	14.0	18.4			
FAN DIAMETER (FT)	DISTANCE FROM CEILING (FT)						
8	3	3	3	3	179.1	300	21.16
10	3	3	4	5	187.4	300	33.16
12	4	4	5	6	195.8	300	45.16
14	4	6	6	6	230.0	300	57.16
16	5	7	8	9	238.7	300	69.16
18	5	8	9	9	247.0	300	81.16
20	6	9	10	11	255.4	300	93.16
24	6	10	11	12	272.1	300	117.16

*Consult factory for assistance with fan placement and extension selection.

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NOTE:

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 end of the blade.

⚠WARNING

Failure to maintain exclusion zones outlined on pages 8, 9 ,10 and 11 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 fan.

NOTE:

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

For applications near HVAC equipment (diffusers, radiant heaters, exhaust fans, louvers, etc.), the HVLS fan must be installed at minimum distances.

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INSTALLATION CONSIDERATIONS, continued

⚠WARNING

Failure to maintain exclusion zones outlined on pages 8, 9, 10, and 11 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 fan.

- Fans located above HVAC equipment must have a minimum clearance of greater than or equal to 1 fan diameter. See Fig. 2.
- Fans located at or below HVAC equipment must have a minimum clearance of greater than or equal to 2 fan diameters. See Fig. 3.

Fig. 2

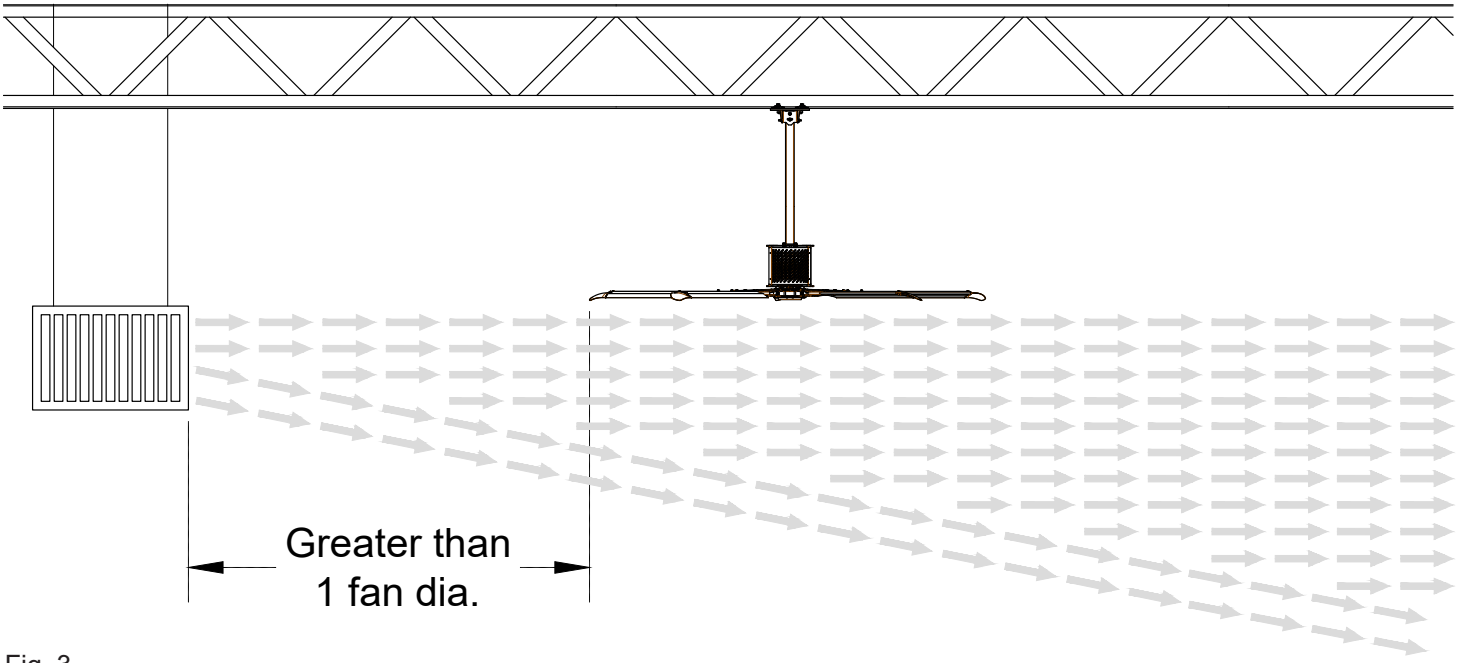
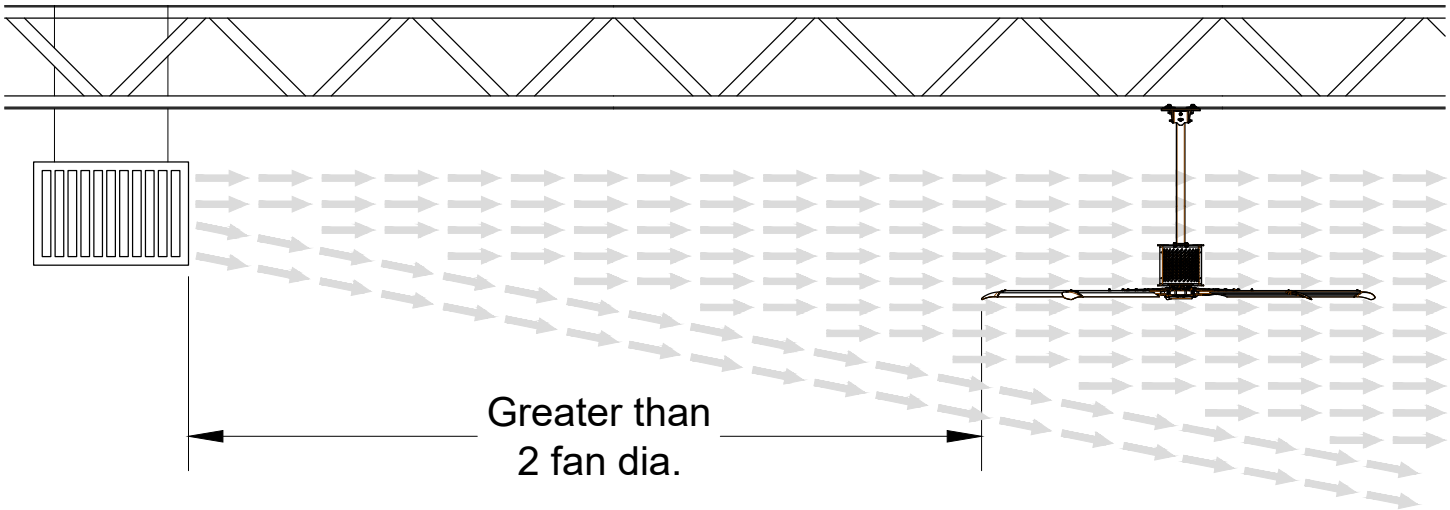


Fig. 3



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CLEARANCE FROM SOLID OBSTRUCTIONS

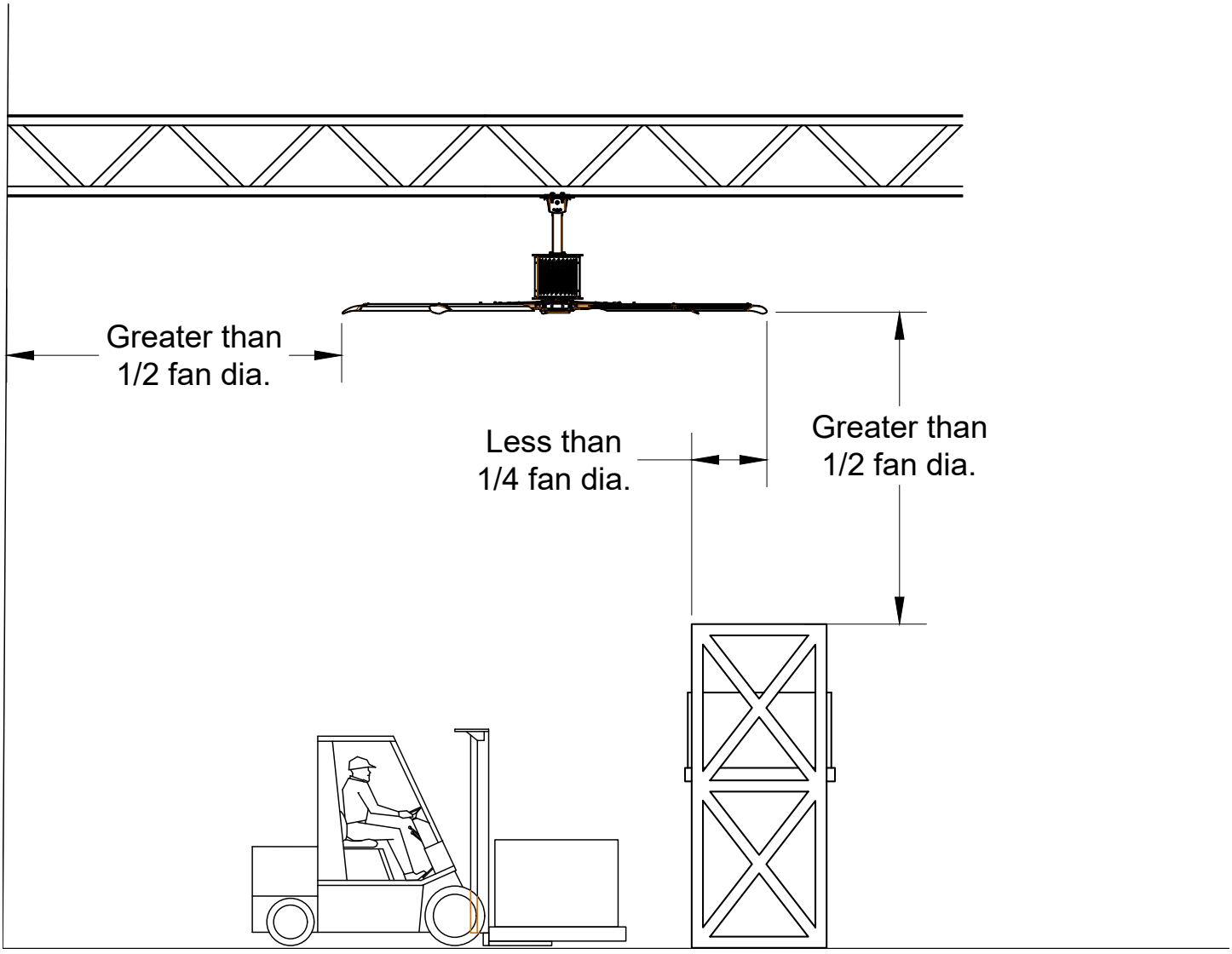
For applications near solid obstructions the HVLS fan must be installed at minimum distances.

- Fans located above solid obstructions such as racks, walls, etc. must have a minimum vertical clearance of greater than or equal to 1/2 fan diameter above and less than or equal to 1/4 fan diameter inside the fan blade arc. See Fig. 4.

⚠WARNING

Failure to maintain exclusion zones outlined on pages 8, 9, 10, and 11 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 fan.

Fig. 4



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INSTALLATION CONSIDERATIONS, continued

BUILDING STRUCTURE

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

- The truss can handle the load of our 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.

NOTE:

If there are questions on 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.

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

Ensure fan blade clearance meets the requirements. See Fig. 1-4.

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 fans blades are a minimum of 10' from any manned working surface (floor or mezzanine).

Ensure fan blade does not extend into exclusion zone. Extensions are available if required. See Fig. 1.

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

NOTE:

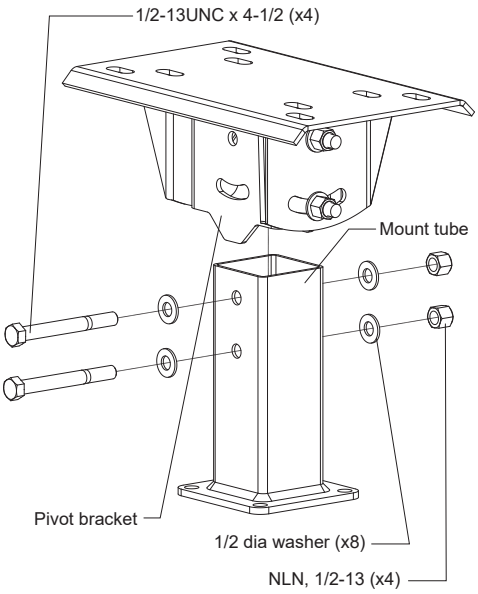
If the fan is part of a networked system, ensure placement is in accordance with the building layout. Fan network identification number is located on the front panel of the VFD box.

NOTE:

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

Fig. 5

Grade 5 hardware or better



(Grade 5 hardware required)

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NOTICE

For fans that will be subjected to high cross winds (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.

⚠DANGER

Before installation, make certain that the power is disconnected and properly locked out.

FAN MOUNT ASSEMBLY

1. Fasten pivot brackets to the extension tube with ears outboard. Leave the 1/2" dia. x 4-1/2" bolts and nylock nuts finger tight. See Fig. 5.

INSTALL FAN MOUNT

STANDARD I-BEAM

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

2. Install clamps. For thick flange I-beams add shims as required. Fasten using the supplied 1/2" dia x 2-1/2" screws, lock nuts and washers. Torque to 44-48 ft-lbs. See Fig. 7.

Fig. 6

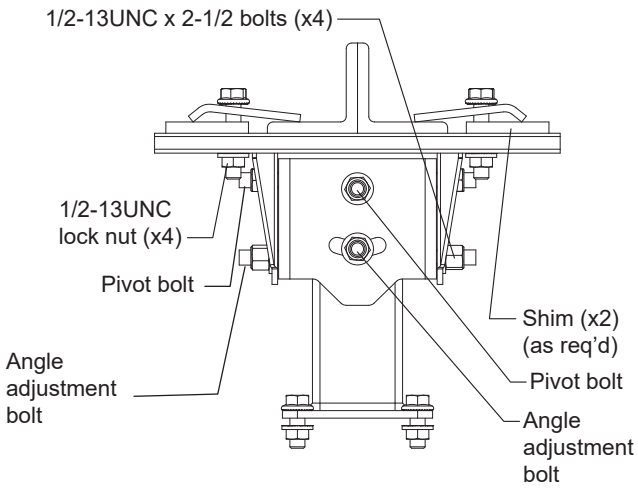
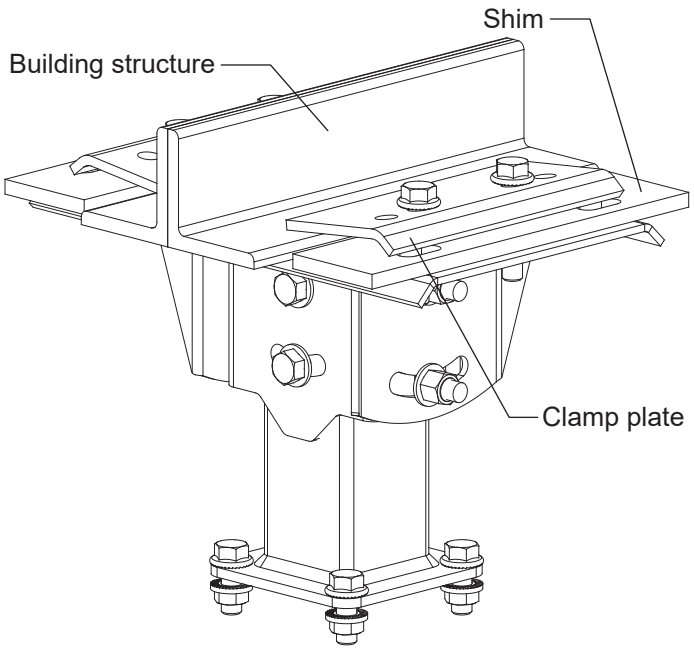


Fig. 7



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NOTICE

If building support beam is not level, ensure proper fan clearance using the mounting information shown on pages 8-11 or add mounting extensions as required to ensure clearance. See Fig. 1.

LAMINATED WOOD BEAM MOUNTING — (OPTIONAL KIT 6018028)

1. Attach 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). Ensure brackets are square to the bottom of the beam.

2. Attach mount assembly to the laminated wood beam brackets using the supplied 1/2" dia x 2-1/2" screws, nylock lock nuts and washers. Torque to 44-48 ft-lbs. See Fig. 8.

TRUSS MOUNT

NOTE:

Do not span gaps longer than 96".

To span two trusses or purlins with a gap of 96" or less, span the gap using two 4" x 4" x 1/4" steel angle iron. See Fig. 9.

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

NOTE:

Longest extension allowed is 20'. Any extensions longer than 12' must use the secondary guy wire kit (6020303 — standard and 60020304 — stainless steel).

Fig. 8

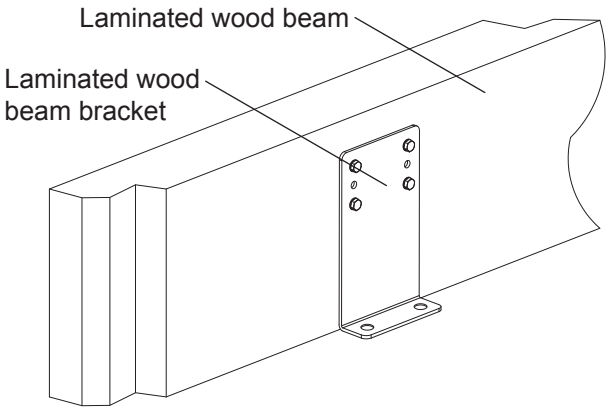
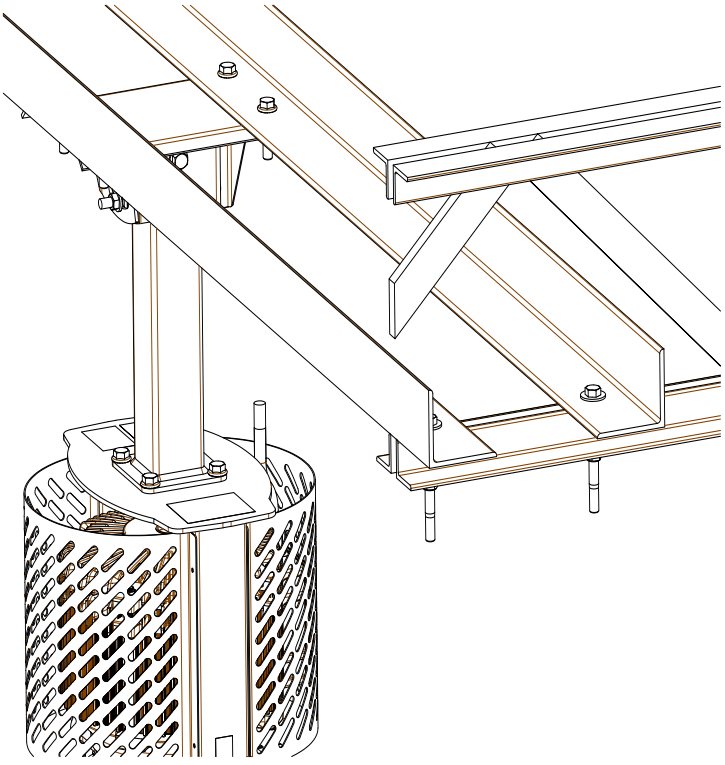


Fig. 9



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INSTALL POWERHEAD (MOTOR ASSEMBLY)

NOTE:

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

1. Using a powered lift, orient the powerhead with the blade hub down. Block motor as required for installation using the bottom of the frame assembly. Do not support using the hub or hub cap.

NOTE:

Fan powerhead may be oriented as required for aesthetics or commonality.

2. Raise the powerhead up until it contacts the bottom of the fan mount assembly. See Fig. 10.

3. Fasten the powerhead to the mount assembly using the supplied 1/2" dia x 1-1/4" bolts, self-locking nuts and washers. Torque to 44-48 ft-lbs. See Fig. 11.
4. Immediately attach safety cable. See Fig. 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 that the cable goes through the motor frame. See Fig. 12.
   e. Securely tighten the clamp fasteners. Make sure the u-bolts are over the free ends of the cable.
   f. Ensure assembly does not interfere with fan motor housing.

Fig. 10

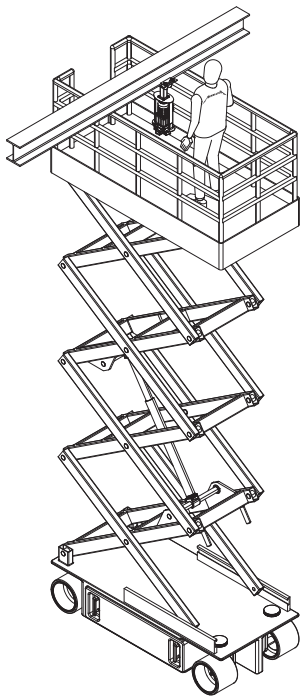


Fig. 11

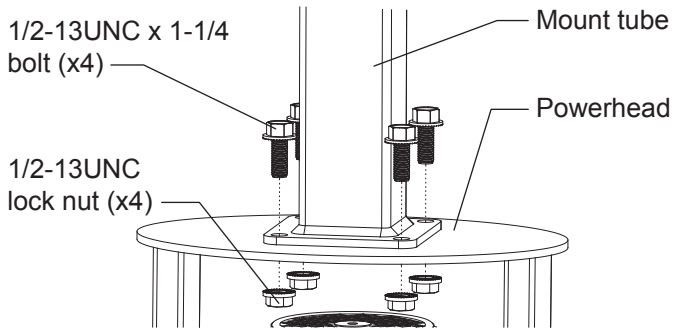
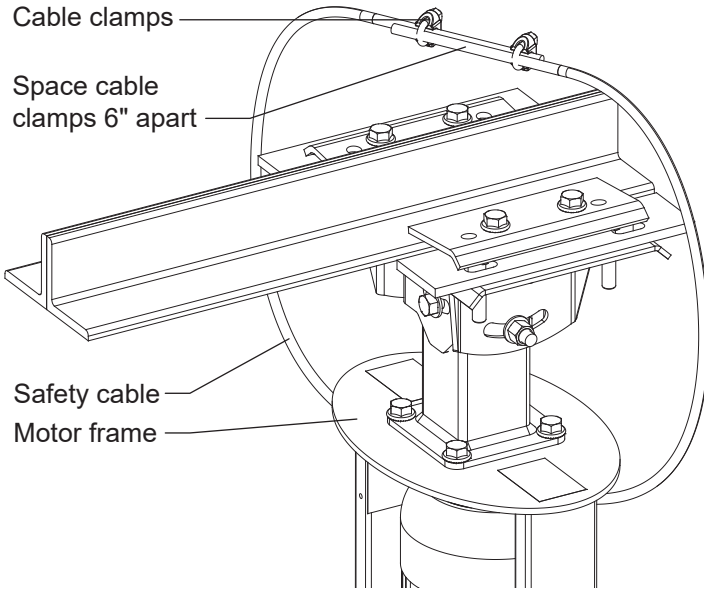


Fig. 12



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INSTALL GUY WIRES

Guy wires are designed to constrain lateral movement of the fan in operation. This movement may be due to impacts on the fan or winds impinging on the blades that would cause the fan to sway.

NOTICE

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

⚠WARNING

If a mounting extension has been used, ensure that the longer guy wires accompanying the extension are used. Ensure that the angle formed by the guy wire with the roof structure is less than 45º. See Fig. 14 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. Adjust turnbuckles to their longest position.

2. Attach the quick link with attached turnbuckle to the fan as shown. Repeat for all four quick links.

3. Attach one end of the guy wire to the building structure. Ensure the structure has sufficient strength to withstand the wire tension. 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 though the building structure and back through the clamp fasteners.
   c. Securely tighten the clamp fasteners so that it cannot slip. Make sure the u-bolts are over the free end of the cable.

4. Individually tighten the turn buckle on each cable until each cable is taut and the powerhead unit hangs plumb. Use a spirit level to verify powerhead unit hangs plumb.

5. Tighten pivot and angle adjustment bolts on fan mount. Torque to 44-48 ft-lbs. See Fig. 6.

Fig. 13

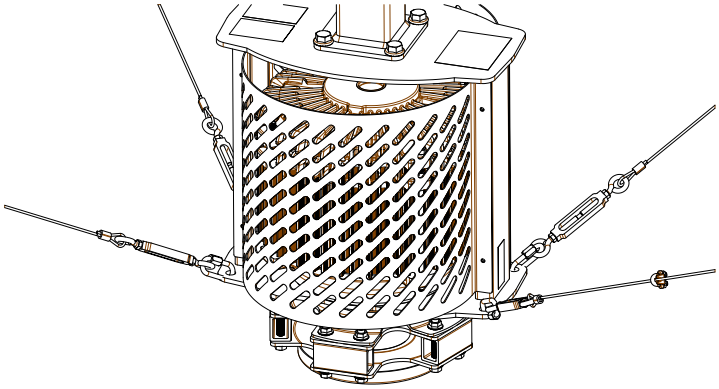
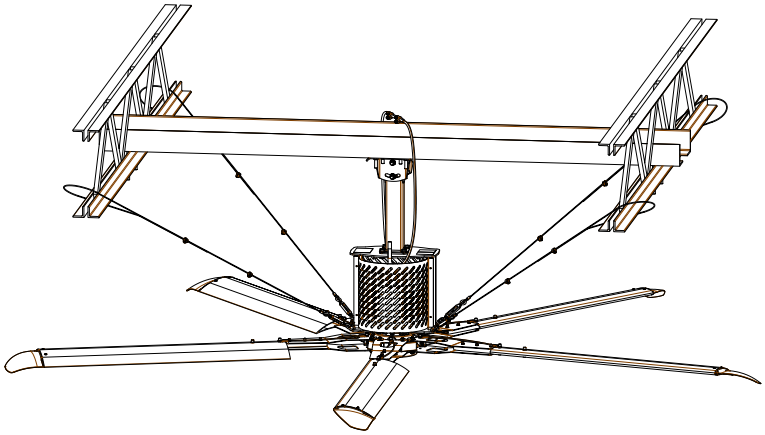


Fig. 14



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ELECTRICAL INSTALLATION

⚠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 the control box. Ensure that the voltage and phase of the incoming power agrees with the label located on top of the VFD box and fan. Be certain power is off when wiring to the control box. Failure to do so could result in electrical shock, death or serious injury.

STANDARD FANS

NOTE:

Reference wiring diagrams on pages 21-30 for all field connections.

INSTALL VFD BOX

⚠WARNING

The VFD box must be installed outside and a safe distance from the blade diameter for service purposes.

NOTICE

Verify voltage and phase before mounting. Ensure voltage shown on VFD box is correct.

1. Mount VFD box outside the fan blade arc. Orient box such that front panel is accessible and visible with the connectors on top of the panel.

2. Route the fan S.O. cable from the fan to the VFD box. Ensure the cable is supported throughout its routing.

3. Route supply power from the building source to the VFD box.

4. Wire VFD box in accordance with the wiring diagrams located on pages 21-30.

5. Attach remote signal (blue) CAT5e cable to the VFD box.

NOTICE

Maximum length of the cable between the VFD box and the motor is 150 linear feet.
Do not run motor cables in the same conduit as input voltage.
Do not run motor cables in the same conduit as other motor cables.
If multiple VFD panels are mounted in the same location, tie the grounds in series.

INSTALL MOTOR COVER

1. Ensure that the motor S.O. cable has been routed to VFD box and is secured. See electrical installation instructions.

2. Locate each motor cover and install the cover fasteners. Do not overtighten. See Fig. 15.

⚠WARNING

Do not install motor covers when installaing in temperatures above 45C (113F).

INSTALL BLADES

⚠WARNING

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.

NOTE:

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

1. The hub assembly has special blade retention lock nuts pre-assembled to it. Remove them now and use them to mount the blade assemblies in the steps below. Use only the factory supplied lock nuts provided for blade mounting.

2. With the blade oriented such that the blade retention lanyard is on top, support the blade assembly from below. Orient and guide the assembly onto the top attachment studs on the hub assembly. Spread the strut arms slightly onto the upper studs as shown. Angle the blade upward as needed to slide blade onto studs. See Fig. 16.

3. Still supporting the blade assembly, rotate the blade assembly down as shown and allow the bottom blade strut to ride up and over the bottom attachment studs on the hub assembly. See Fig. 17.

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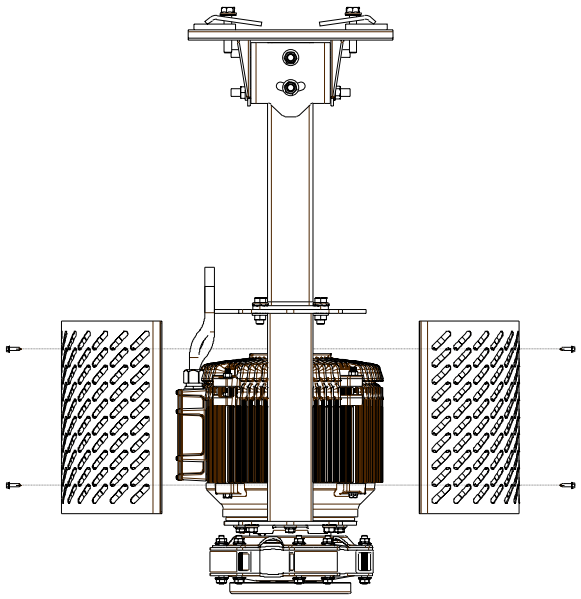
Fig. 15



NOTICE

Do not lean on blade. Damage to strut may occur.

4. Install blade retention lock nuts. Hand tighten nuts ensuring strut arms are firmly pressing against hub. Torque blade retention nuts to 24-28 ft-lbs. See Fig. 16.

5. Repeat for each blade assembly.

VERIFY CLEARANCE AND CABLE TENSION

1. Rotate fan by hand and observe clearance of each blade with closest obstruction. If necessary, reposition fan. Blade tips droop when not in operation and rise when in operation. Reference chart on page 8 for min. clearance.

2. Verify guy wire tension by attempting to move powerhead in any horizontal direction. If movement is detected, re-tension guy wires.

3. Lock the individual turnbuckles using the stop nut on each and secure it with the turnbuckle strap. See Fig. 19.

Fig. 16

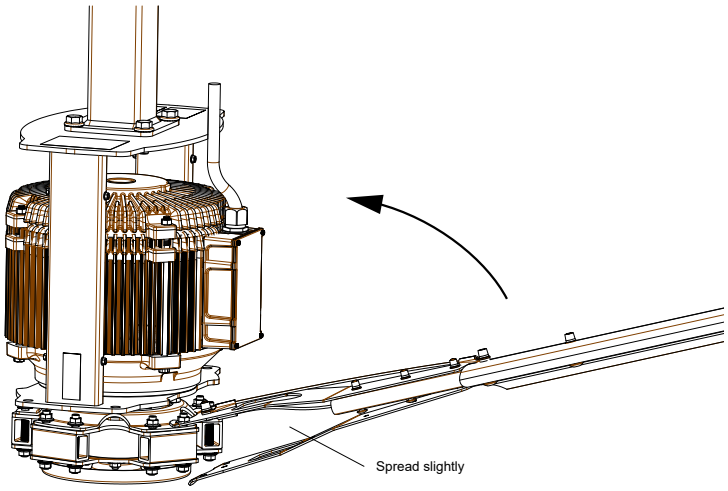
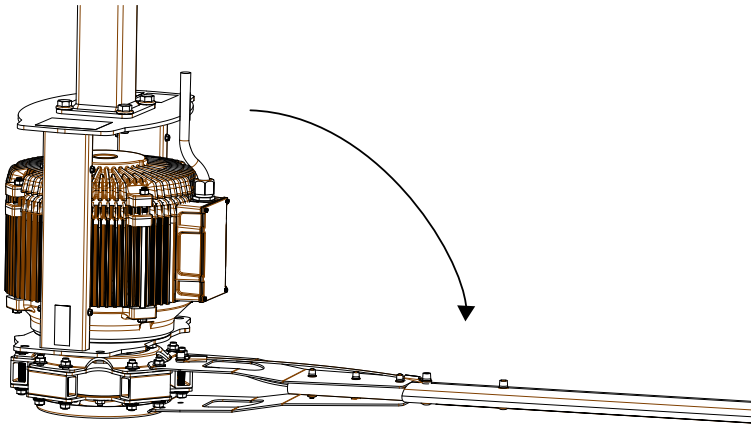


Fig. 17



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INSTALL REMOTE CONTROL

NOTICE

Do not over-torque mounting screws. Damage to display screen may occur if mounting screws are over-torqued. It is the installer's responsibility to torque properly.

1. Mount the touch screen remote 53" above the floor to factory supplied junction box inside building as close to the fan assembly as practical. Direct line of sight is preferred. See Fig 20.

NOTE:

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 and wire the 4 leads of the remote signal (blue) cable to the orange connector of the touch screen remote control. Excess blue cable length should be neatly coiled and secured near VFD box.

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

NOTE:

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

Fig. 18

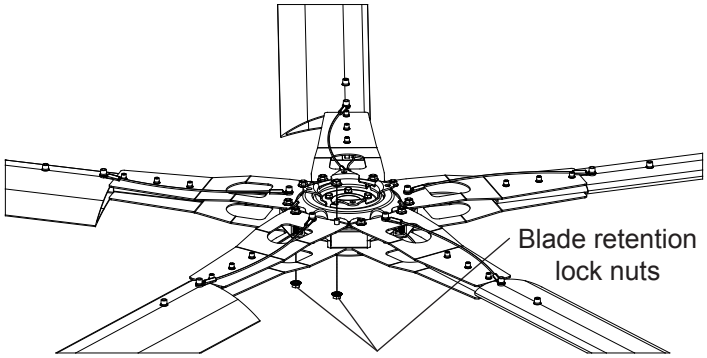

Fig. 19

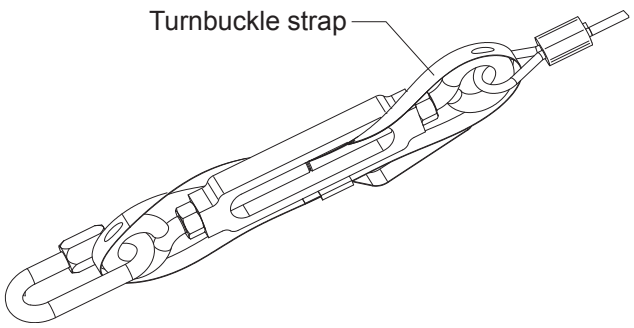

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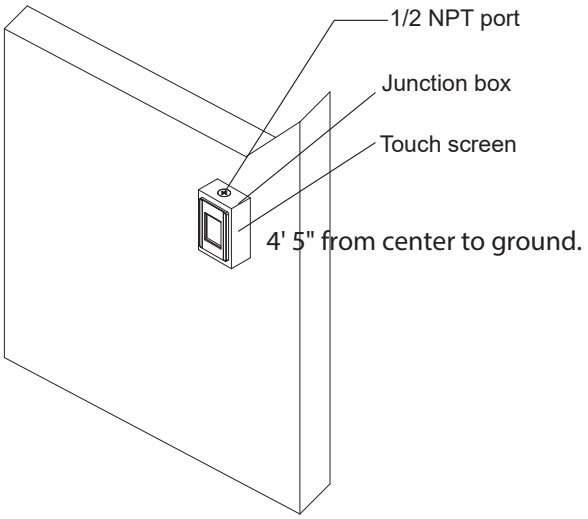
Fig. 20



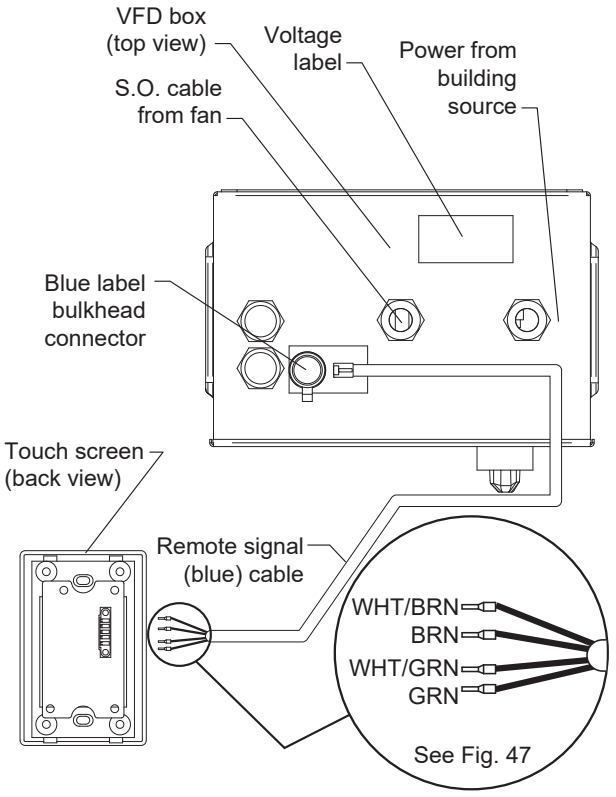


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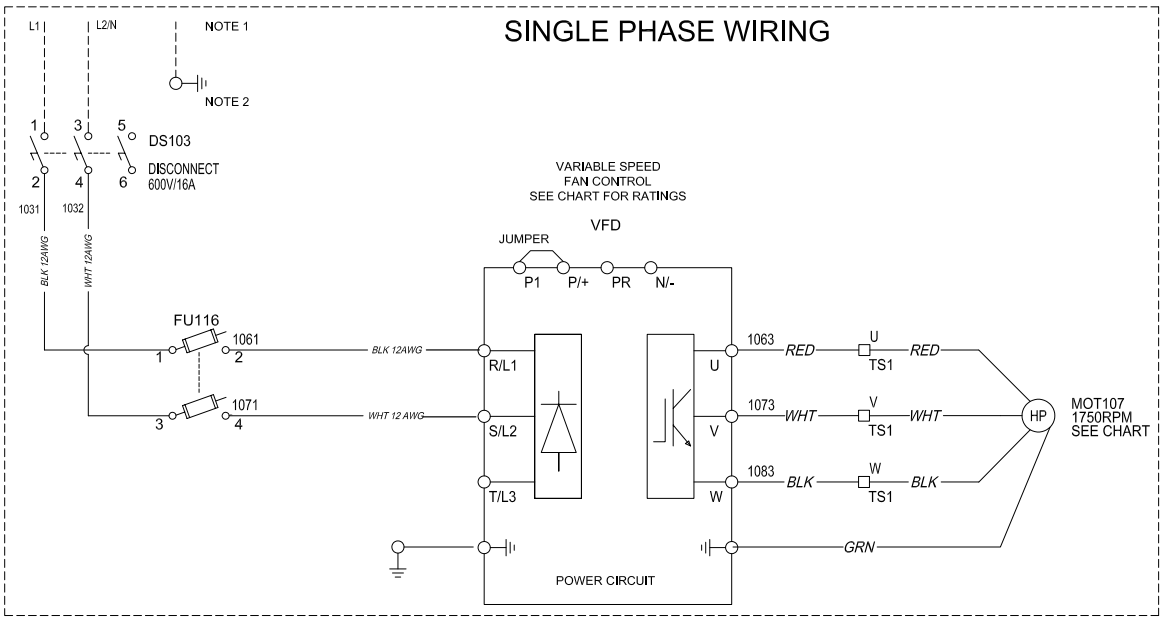
Fig. 21

1PH WIRING DETAILS



WIRE LEGEND

PANEL WIRING
FIELD WIRING (BY OTHERS)
PC BOARD TRACES

NOTE:
TERMINALS WILL ACCEPT STRANDED WIRE ONLY

SIZING CHART			
	6022500, 6022504, 6022508, 6022512	6022501, 6022505, 6022509, 6022513	6022520, 6022542, 6022545, 6022517
VOLTAGE	120V/1PH/50 60HZ	230V/1PH/50 60HZ	230V/1PH/50 60HZ
FLA	19.3A	12.6A	13.0A
FUSE	KTKR20	KTKR15	KTKR15
MOTOR	0.8kW,6A @ 230V/60hZ	0.8kW,6A @ 230V/60hZ	1.2kW, 5.6A @ 230V/60hZ
VFD	100-115V 1PH 230V 3PH 4.2A	200-240V 1PH 230V 3PH 10A	200-240V 1PH 230V 3PH 10A
O/L	6.0	6.0	5.6

1. FIELD WIRING TO BE MINIMUM 14AWG, 600V, 90°C.
2. THE SAFETY GROUND MUST BE CONNECTED TO EARTH GROUND ROD VIA PLANT GROUND OR BUS BAR. GROUNDING POINTS MUST COMPLY WITH NATIONAL AND LOCAL INDUSTRIAL SAFEY REGULATIONS AND/OR ELECTRICAL CODES.
3. FACTORY INSTALLED JUMPER-REMOVE IF FIRE ALARM SYSTEM IS USED. REPLACE WITH NORMALLY CLOSED CONTACT ON FIRE ALARM.
4. RECOMMENDED CABLE FOR FOR IFAN - BELDEN 8723.

⚠DANGER

Before doing any electrical work, make certain the power is disconnected and properly locked or tagged off. 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 that the voltage and phase of the incoming power agrees with the label located on top of the VFD box and fan. Be certain power is off when wiring to the control box. Failure to do so could result in electrical shock, death or serious injury.

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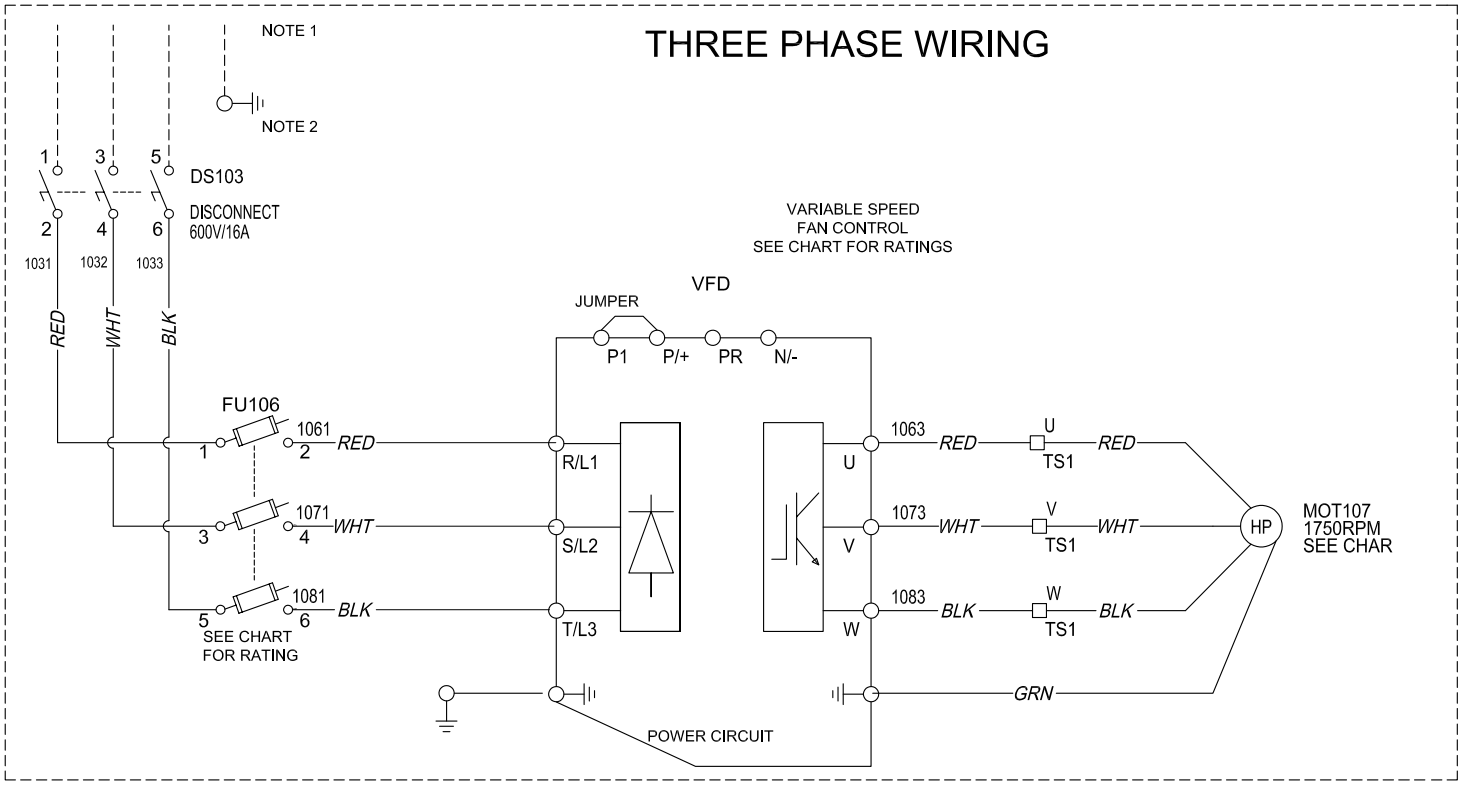
ELECTRICAL SCHEMATICS, continued

Fig. 22

3PH WIRING DETAILS



WIRE LEGEND

- PANEL WIRING
- FIELD WIRING (BY OTHERS)
- PC BOARD TRACES

NOTE:
TERMINALS WILL ACCEPT STRANDED WIRE ONLY

SIZING CHART				
	6022502, 6022506, 6022510, 6022514	6022503, 6022507, 6022511, 6022515	6022540, 6022543, 6022546, 6022518	6022541, 6022544, 6022547, 6022519
VOLTAGE	230V/3PH/50 60HZ	480V/3PH/50 60HZ	230V/3PH/50 60HZ	460V/3PH/50 60HZ
FLA	7.3A	3.8A	7.5A	3.4A
FUSE	KTKR10	KTKR5	KTKR10	KTKR5
MOTOR	0.8kW, 6A @ 230V/60hZ	0.8kW, 3A @ 460V/60hZ	1.2kW, 5.6A @ 230V/60hZ	1.2kW,2.8A @ 460V/60hZ
VFD	200-240V 3PH 230V 3PH 10A	380-480V 3PH 480V 3PH 5.0A	200-240V 3PH 230V 3PH 10A	380-480V 3PH 480V 3PH 5.0A
O/L	6.0	6.0	5.6	5.6

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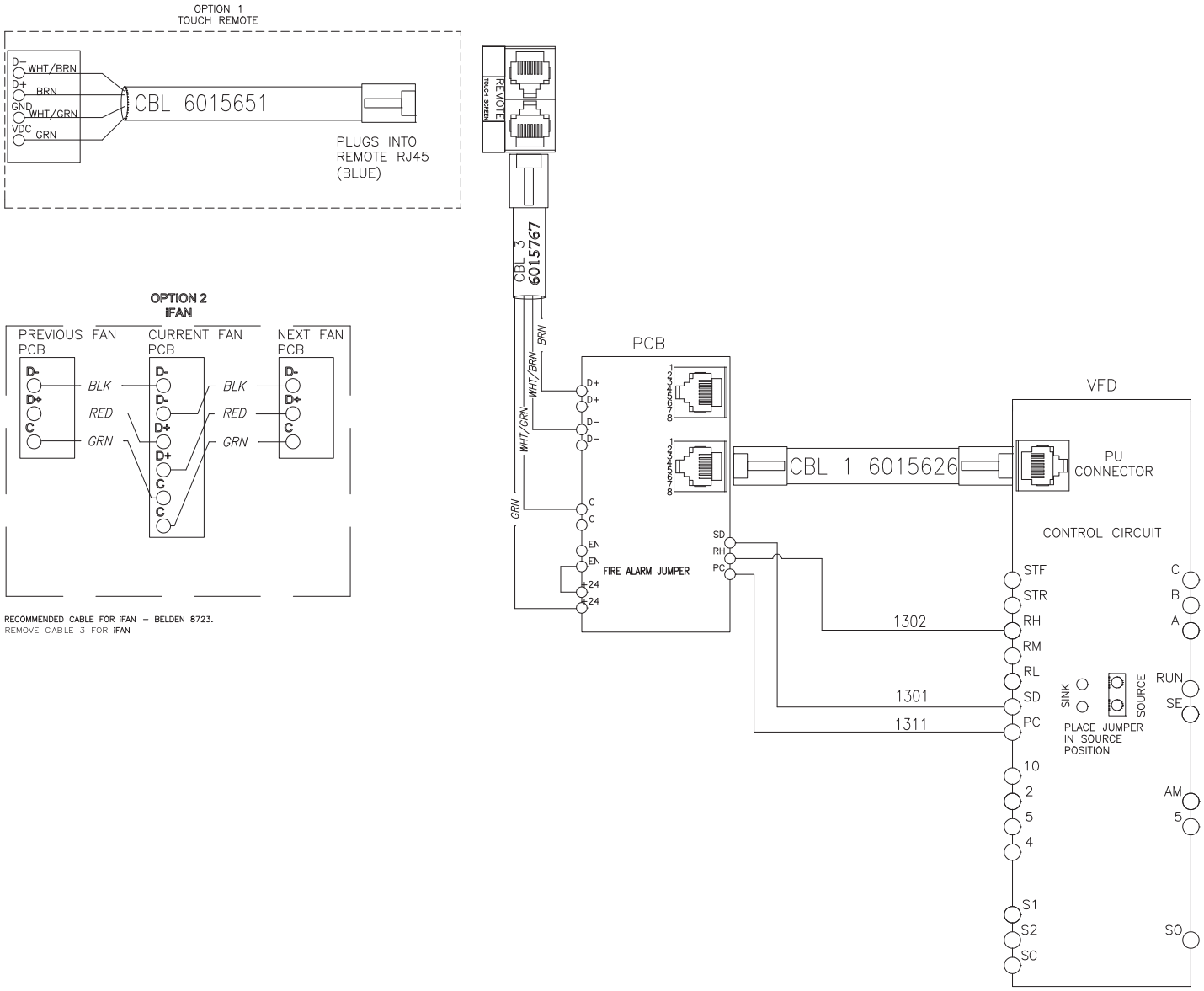
Fig. 23

VARIABLE FREQUENCY DRIVE I/O



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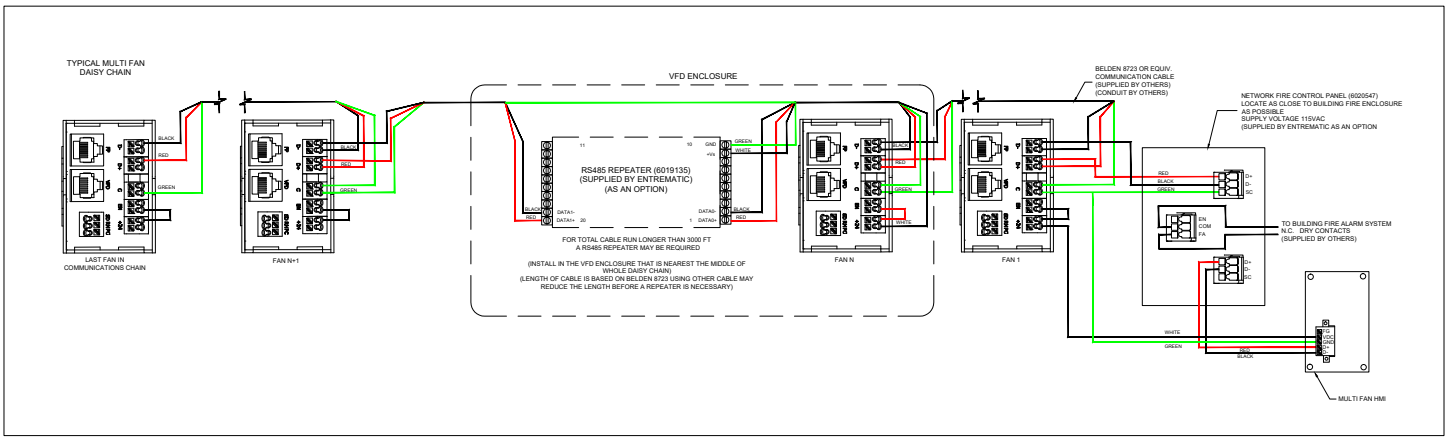
MULTI FAN WIRING DETAILS — OPTIONAL

Fig. 24



Download this drawing

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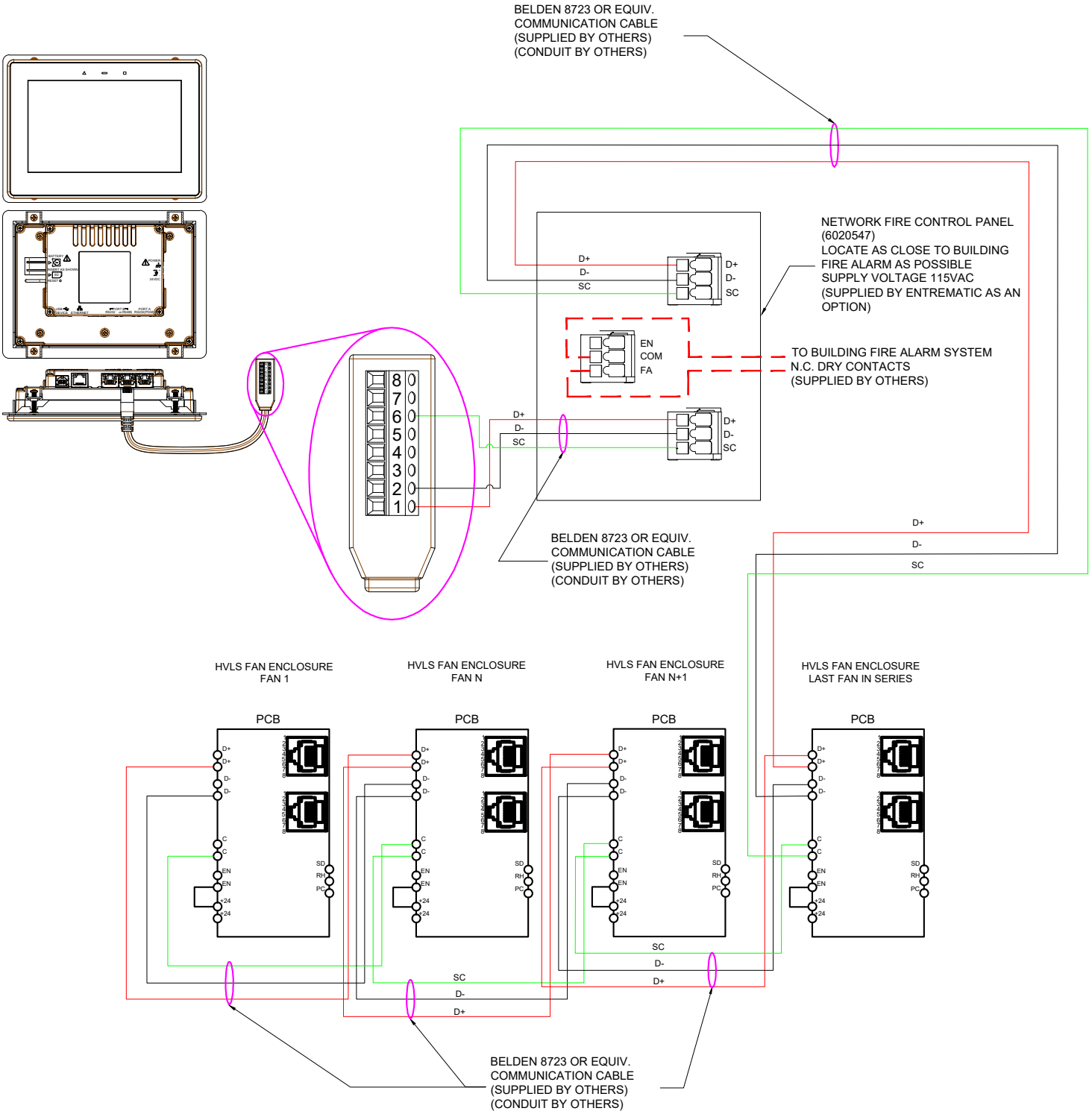
Fig. 25



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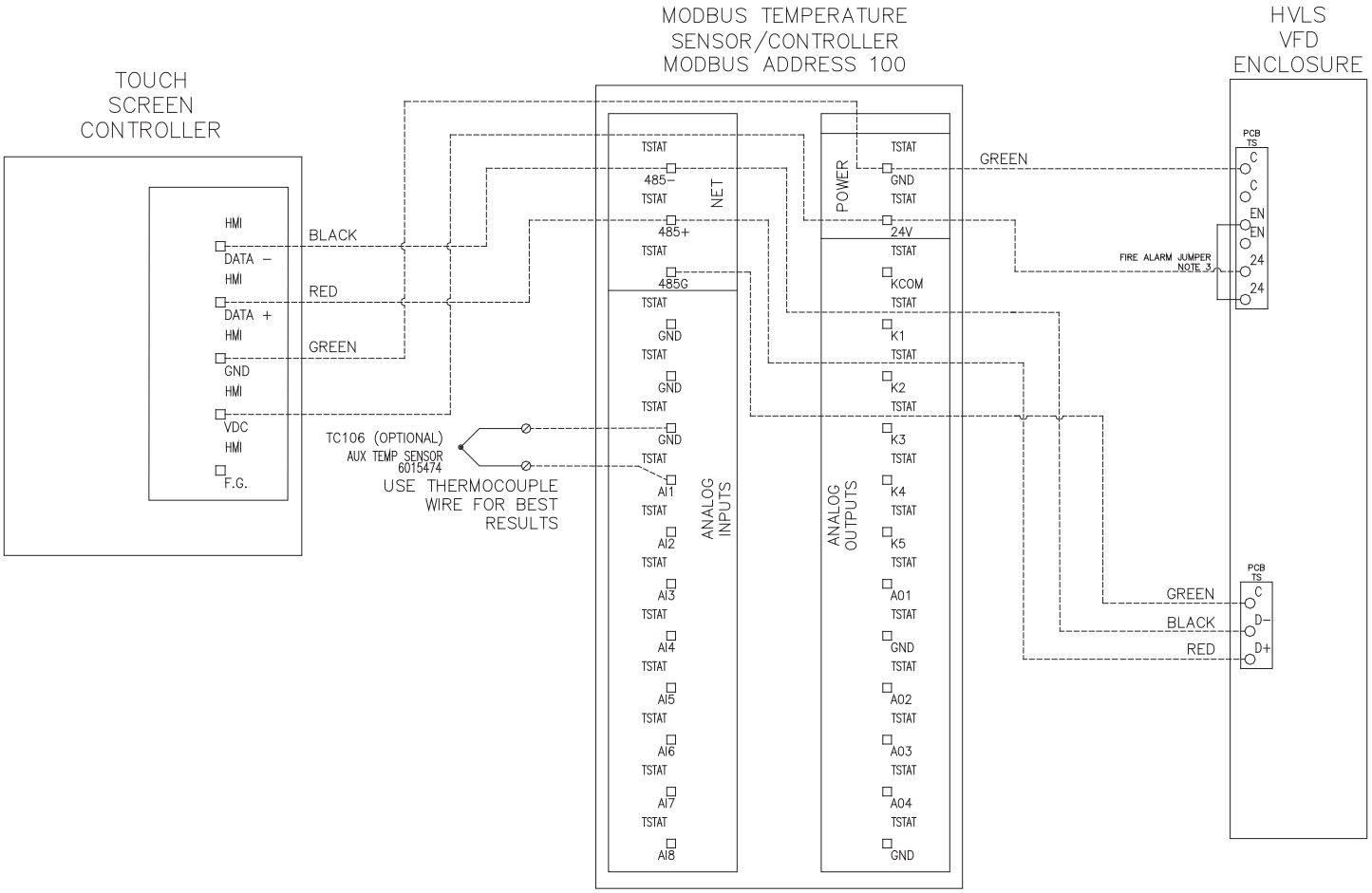
TEMP CONTROL WIRING DETAILS — OPTIONAL

Fig. 26



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FIRE CONTROL SYSTEM FAN SHUTDOWN — OPTIONAL

This fan includes a fire alarm jumper for a building fire control systems option that allows the fan to be shut-down by the fire control system in case of a fire emergency.

NOTE:

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

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

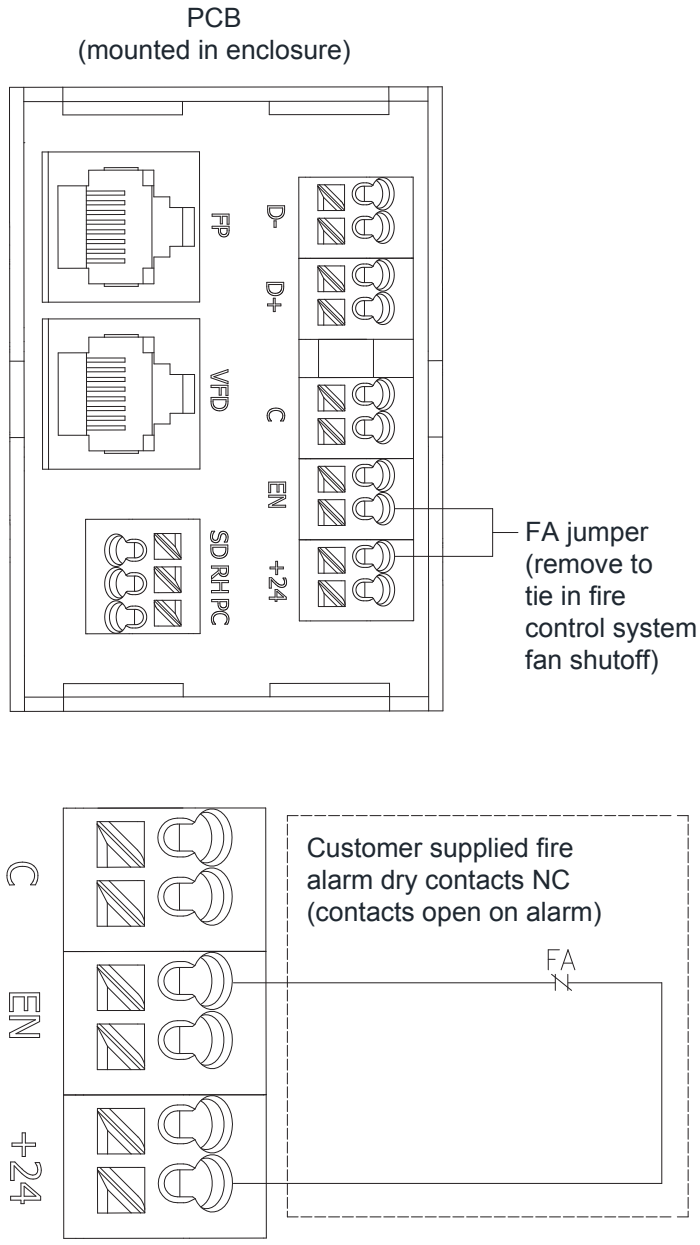
2. The fire control system fan shutdown option is not enabled when shipped. To enable the fire control system fan shutdown option, remove the jumper between enable (EN) and (24) and replace with a set of dry, normally closed contacts. See schematics for optional Fire Control Panels on pages 28 and 29.

3. To test the fire control system fan shutdown operation remove the wire from the NC contact at the building fire control panel. The fan should coast to a stop. See Fig. 27.

NOTICE

If the jumper is left installed the fan will not shut down due to fire control system contacts.

Fig. 27



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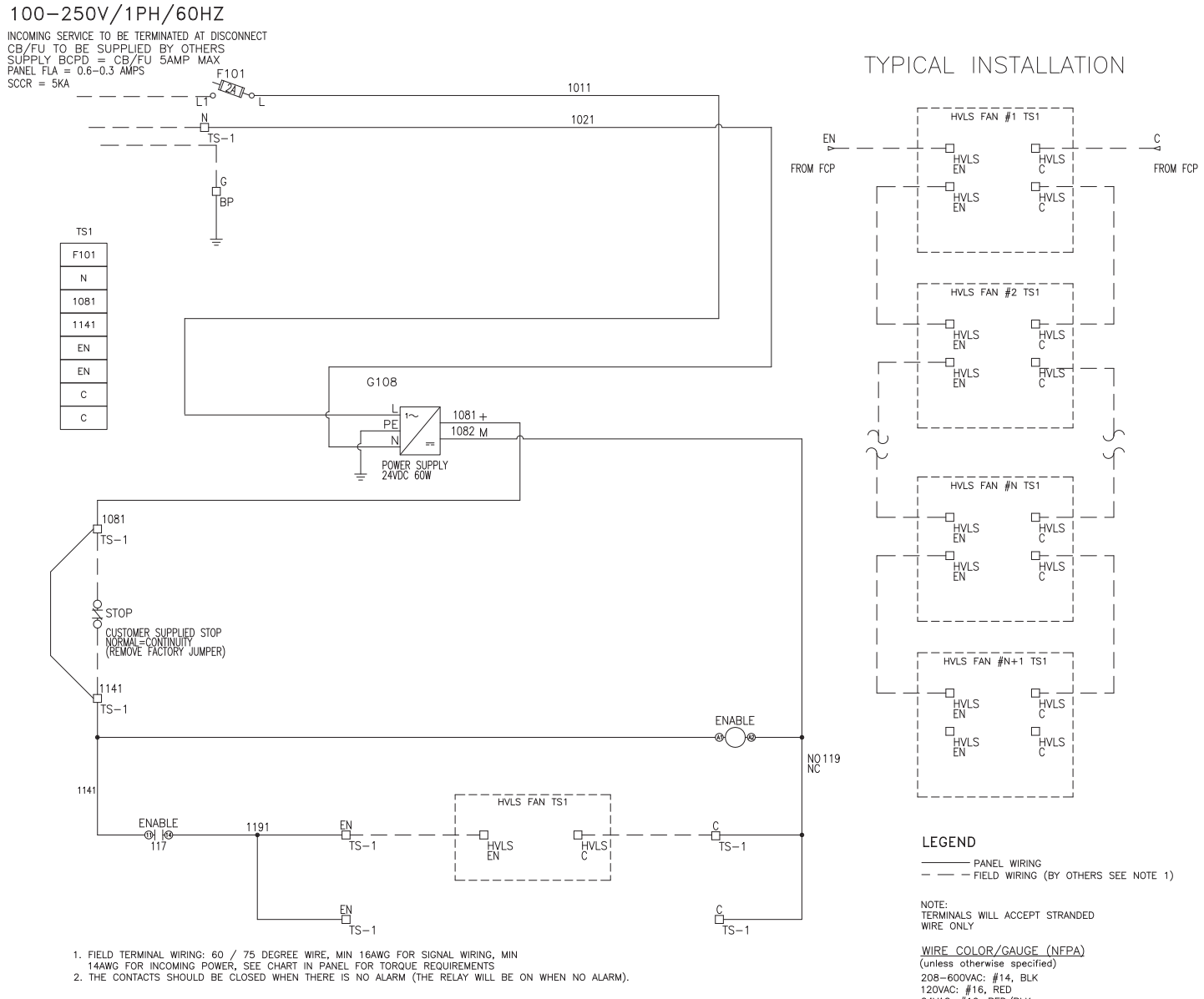
FIRE CONTROL SYSTEM FAN SHUTDOWN — OPTIONAL, continued

Fig. 28

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



1. FIELD TERMINAL WIRING: 60 / 75 DEGREE WIRE, MIN 16AWG FOR SIGNAL WIRING, MIN 14AWG FOR INCOMING POWER, SEE CHART IN PANEL FOR TORQUE REQUIREMENTS
2. THE CONTACTS SHOULD BE CLOSED WHEN THERE IS NO ALARM (THE RELAY WILL BE ON WHEN NO ALARM).

⚠DANGER

Before doing any electrical work, make certain the power is disconnected and properly locked or tagged off. 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 that the voltage and phase of the incoming power agrees with the label located on top of the VFD box and fan. Be certain power is off when wiring to the control box. Failure to do so could result in electrical shock, death or serious injury.

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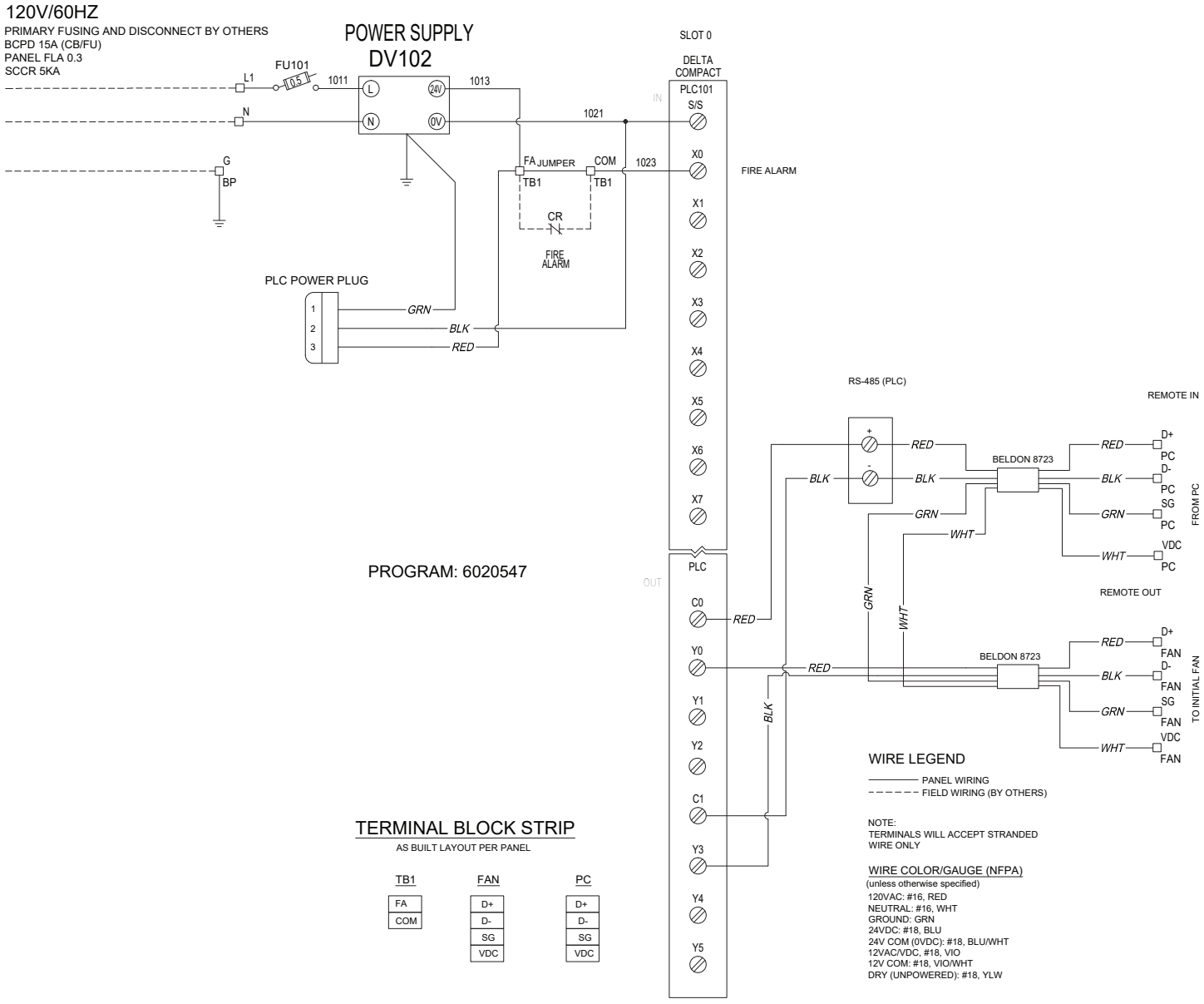
Fig. 29

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



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550-600V SUPPLY WIRING DETAILS — OPTIONAL

To connect 480V fan to 550-600V building supply, a step down transformer assembly (6017277) must be installed between power supply and the VFD enclosure. Wiring (by others) must be 600V rated 14 ga. All wiring must be installed in accordance with any national, state or local code requirements.

NOTICE

The transformer assembly is rated for one single fan load only. Each fan must have its own step down transformer assembly (6017277).

1. Locate and mount the step down transformer (6017277) outside the blade arc and near the VFD enclosure.

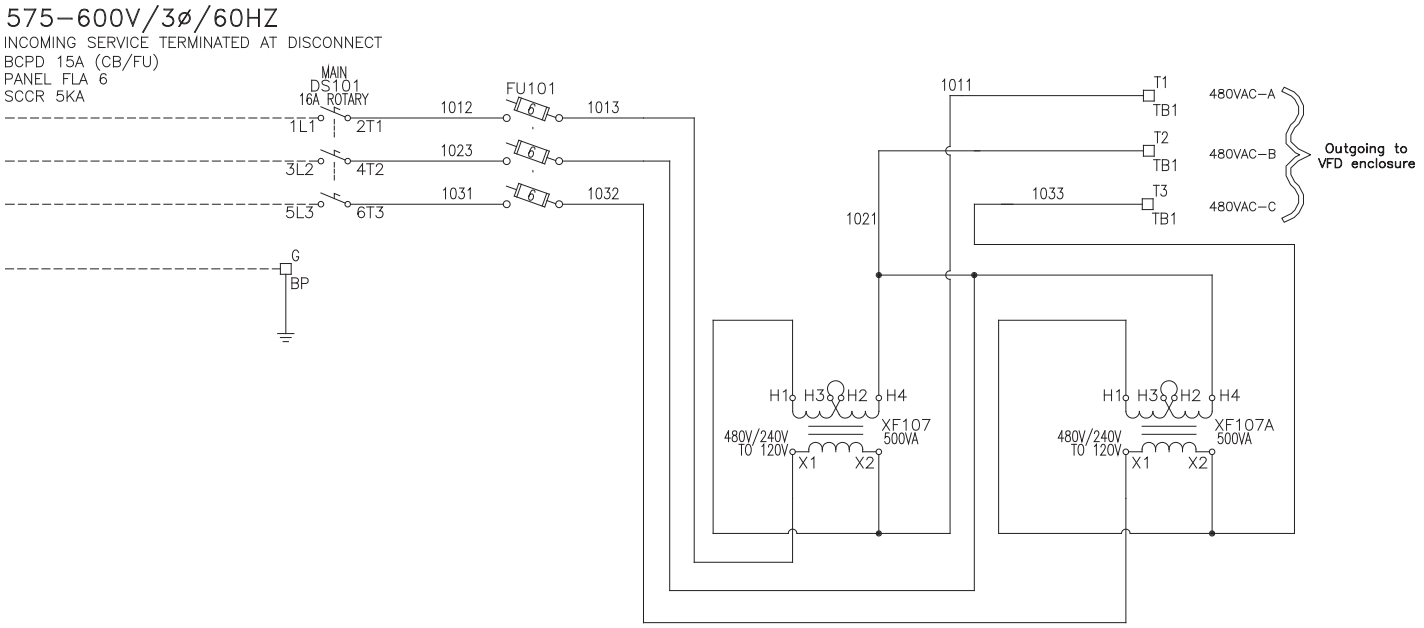
2. Route supply power from the building source to the step down transformer.

3. Follow VFD installation instructions on page 17 using power from step down transformer (6017277) as the power source.

⚠DANGER

Before doing any electrical work, make certain the power is disconnected and properly locked or tagged off. 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 enclosure. Ensure that the voltage and phase of the incoming power agrees with the label located on top of the VFD box and fan. Be certain power is off when wiring to the control box. Failure to do so could result in electrical shock, death or serious injury.

Fig. 30



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The HMI program will control up to a total of six fans. The HMI program will also allow the use of two types of accessories; temperature control and high wind shutdown (anemometer). Both accessories can be used with the HMI configured for a single fan or if the HMI is configured for multiple fans, only the anemometer can be used.

Once installation is complete, the initial view of the touchscreen control will prompt the installer to set and confirm the quantity of fans (1-6) that this HMI will control. The selected quantity will be highlighted green. Next, the installer will choose a diameter for each fan that the HMI is to control by following the directions on the screen. The size of the fan is the diameter and is found on the front of the VFD enclosure as well as the fan shipping carton and the blade shipping carton. After setting the diameter of each fan; advance to the next screen. The chosen diameter(s) will be displayed on the screen. Verify that the diameter of each fan is correct. Advance to the next screen when this is complete. The fan diameter will be displayed in the top right corner of the main screen; Fan 1, Fan 2, Fan 3, etc.

If a single fan was chosen on the “Fan Quantity” screen, the next screen will be the temperature screen. If choosing “YES” to enable the temperature sensor option Choose Yes to enable or No to disable.the next screen will prompt the installer to choose if the temperature will be displayed in degrees Fahrenheit or Celsius as well as a “YES” or “NO” option for a NEMA 4X temp sensor.

NOTE:

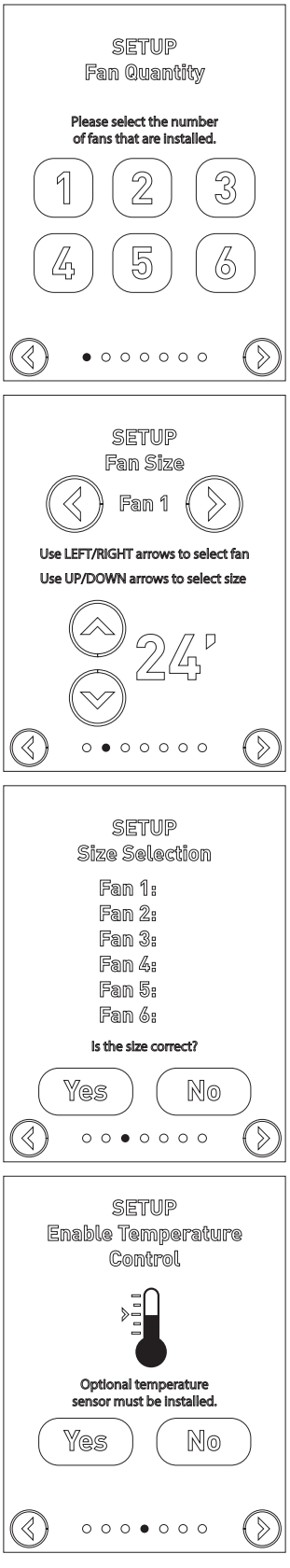
The Temperature Control options requires the use of an optional temperature sensor (Std: 6013861 or 4X: 6016700). The 4X option should only be used if temp sensor part number 6016700 is being used.

After selecting the temperature control options or if more than a single fan was chosen, the next screen will be the “Wind Control” screen. This screen will allow you to enable the wind shutdown option by selecting “YES” to enable or “NO” to disable. The selection will be highlighted in green.

NOTE:

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

Fig. 31



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HMI SETUP, continued

If the Wind Control is enabled the next screen will be the “Wind Unit” screen. The installer will be able to choose what unit of speed is used, MPH (miles per hour), KM/H (kilometer per hour), Knots or M/S (meters per second); select one by pressing it. The chosen unit will have a green dot next to it.

NOTE:

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

If an error is made, the set up screens can be revisited from the Main Screen.

- Press the “menu” icon in the bottom left corner.
- Press the “setup” icon.
- Enter the passcode; default is 1-1-1-1.
- This will take you back to the beginning of the setup process.

See Fig. 31 and 32.

Operate the industrial fan following the operating instructions beginning on page 33. Check for proper rotation direction, stability and noise level.

Train authorized personnel how to use the industrial fan using the operating procedures located on pages 32-38 in this manual.

TEMPERATURE CONTROL INSTALLATION — OPTIONAL

1. Mount temperature control unit to the factory supplied junction box inside building 60" above the floor. See Fig. 26 and wiring details on page 26.

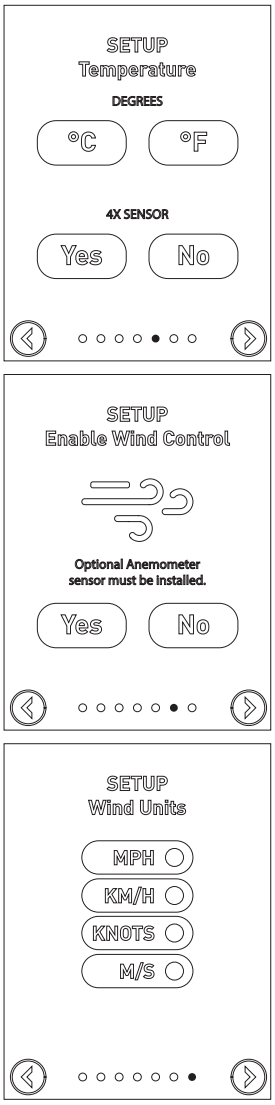
WIND CONTROL INSTALLATION — OPTIONAL

NOTE:

The optional Wind Control requires the use of an anemometer, supplied by Entrematic (6020770). 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 (hardware by others).

2. Mount the wind speed/direction sensor to the pipe. The data cable may be passed through the center of the . mounting pipe or outside of the mounting pipe.
3. Route the data cable and terminate at the VFD box. If a longer data cable is required, use Belden 8723 or equivalent to extend the length.

Fig. 32



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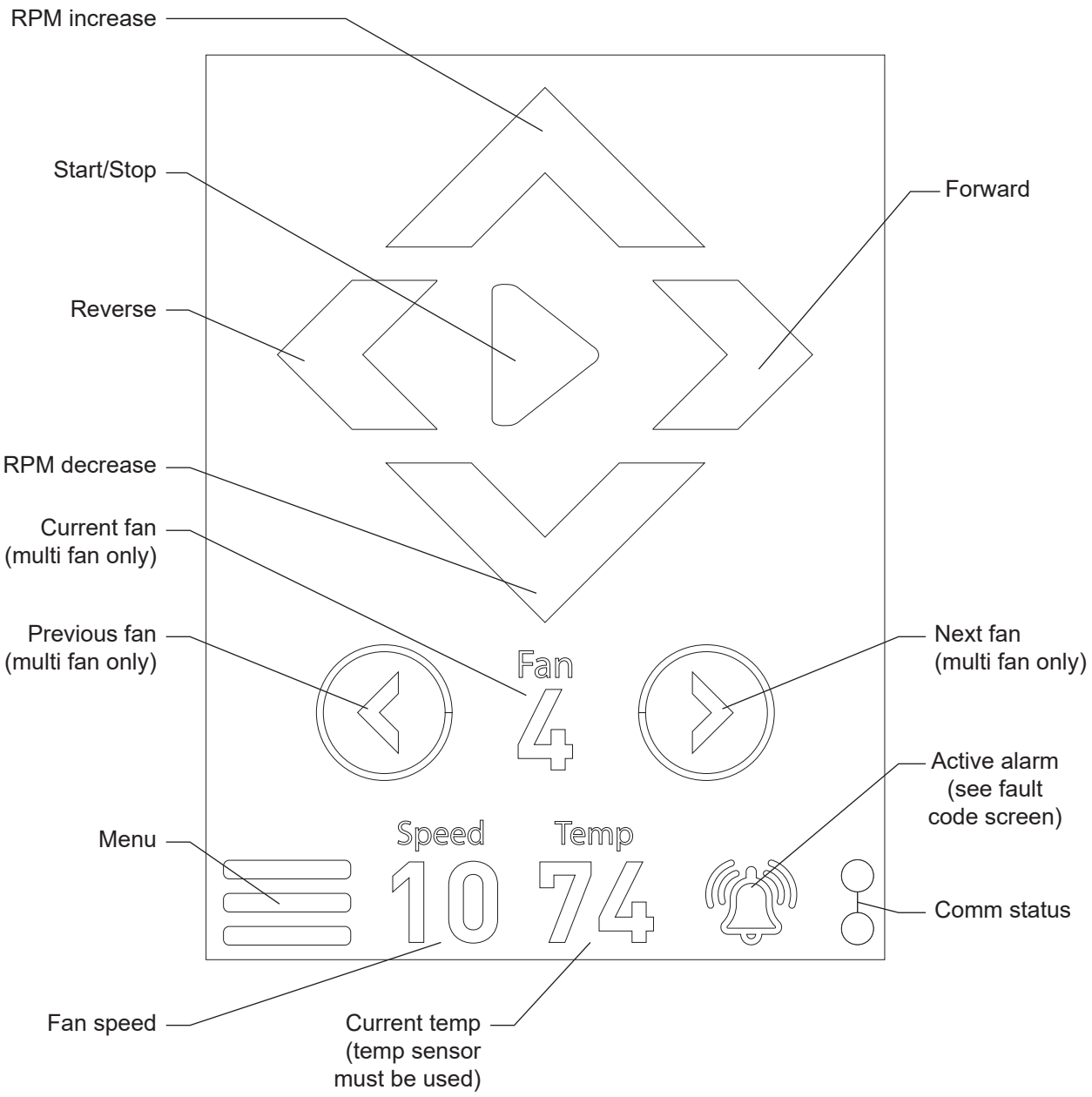
OPERATING INSTRUCTIONS

Fig. 33

FAN CONTROL SCREEN



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⚠WARNING

Before operating the industrial fan, read and follow the Safety Practices, Warnings and Operating Instructions in this manual. Use by untrained personnel could result in death or serious injury.

VERIFY PRIOR TO OPERATION

1. Voltage/phase.
2. Obstruction clearance.
3. Safety cables present and properly installed.
4. All fasteners are properly torqued.

STARTING THE FAN

Visually inspect the fan to ensure that there are no obstructions or personnel in the movement area.

LOGIN SCREEN

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

NOTE:

Default password: 1111

NORMAL OPERATION

1. Verify normal communication — the communication status symbol in bottom right-hand corner will be green.
2. Press the **Start** button and select fan direction to begin fan rotation.
3. Set desired speed by pressing either **RPM increase** or **RPM decrease** until desired speed is displayed. Maximum speed is 10, minimum speed is 1. See Fig. 34.

CHANGING DIRECTION

1. Select either **Forward** or **Reverse**. It is not necessary to stop the fan first.

Fig.34

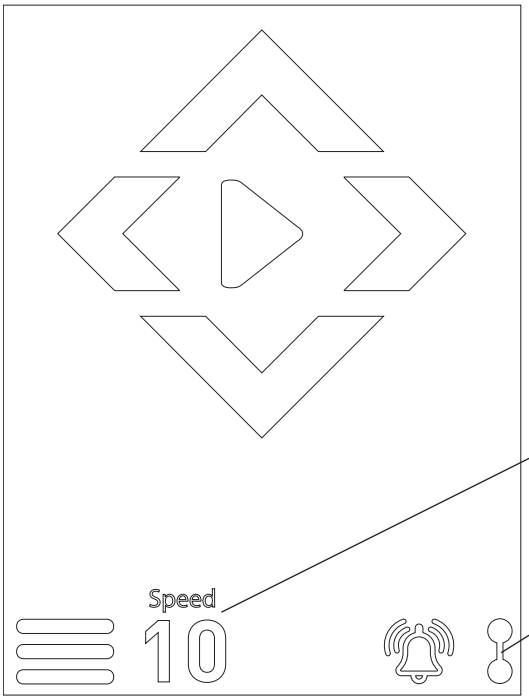
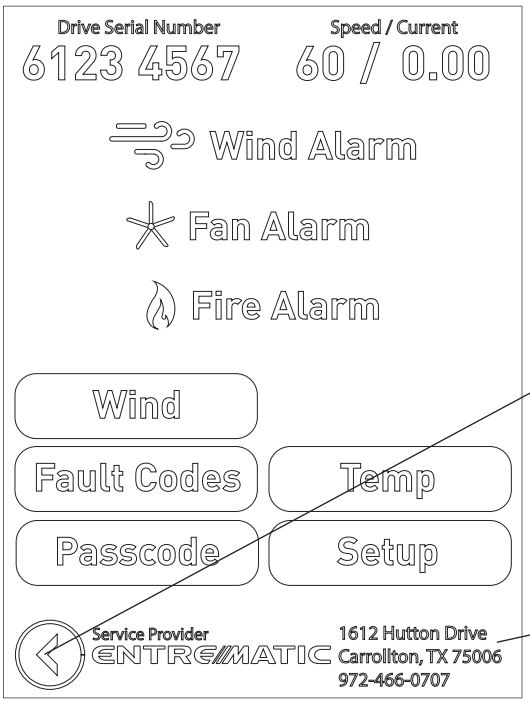


Fig. 35



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DIAGNOSTIC SCREEN
The diagnostic screen (see Fig. 37) contains:

Service Provider information. Contact this provider for all fan service issues.

FAN INFORMATION:
VFD serial number
Motor Speed (x10)
Motor Current (x10)
Wind Alarm, if enabled
Fan Alarm, if alarm present
Fire Alarm, if alarm present

BUTTON INFORMATION
The Wind button displays the Wind Control screen.
The Faul 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.

FAULT CODES
If a fault code alarm appears (see Fig.36), select the **Fault Codes** button to display the fault codes.

To navigate back to the previous screen, select the green return arrow.

The fault code screen will display the active fault code number and a description of the fault code can be found in the Fault Directory by pressing this button. If the fan is currently under fault, the Active Fault Code being displayed in the box in the top right-hand corner will be displaying a number that caused the fault. Match the number with

Fig. 36

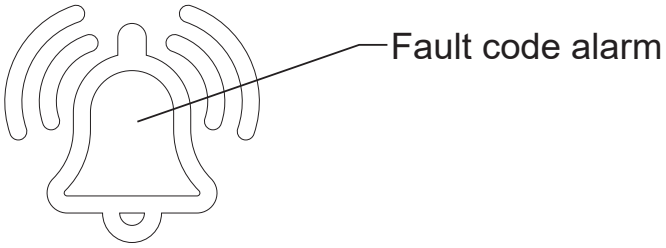
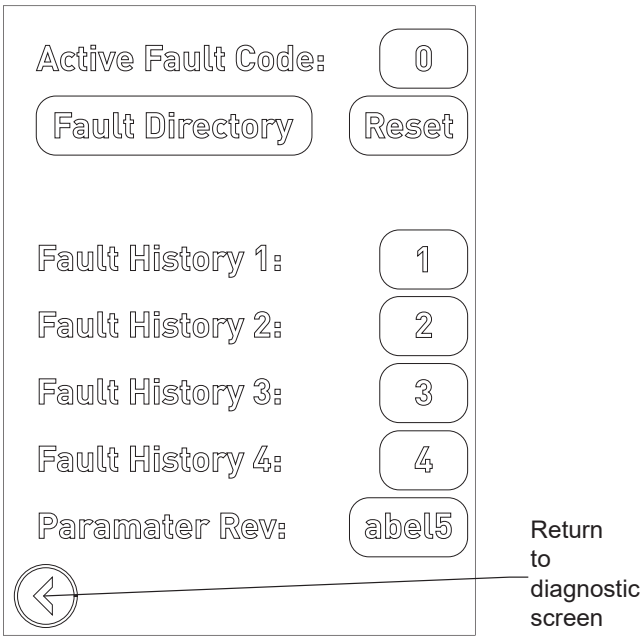


Fig. 37



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

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the error codes and remove the fault condition. Once the condition has been removed, pressing the reset button will reset the fan and allow operation again. The Fault History of the last 4 faults are displayed. Finally, the arrow in the bottom left corner will navigate back to the diagnostic screen. See Fig. 37.

PASSCODE PROTECTION

The remote is capable of password protection to prevent unauthorized use.

1. Press the **Passcode** button from the main screen.

2. Press the **Passcode** button on the diagnostic screen.

NOTE:

If the password has already been previously customized, enter it now. If not, 1-1-1-1 is the default password.

On the password screen, the options are to enable the password, disable the password and change the password. By default, the password is not enabled.

To enable password, touch the unlocked padlock icon. The padlock icon will switch from unlocked to locked.

To disable password, touch the locked padlock icon. The padlock icon will switch from locked to unlocked.

UPDATING PASSWORD

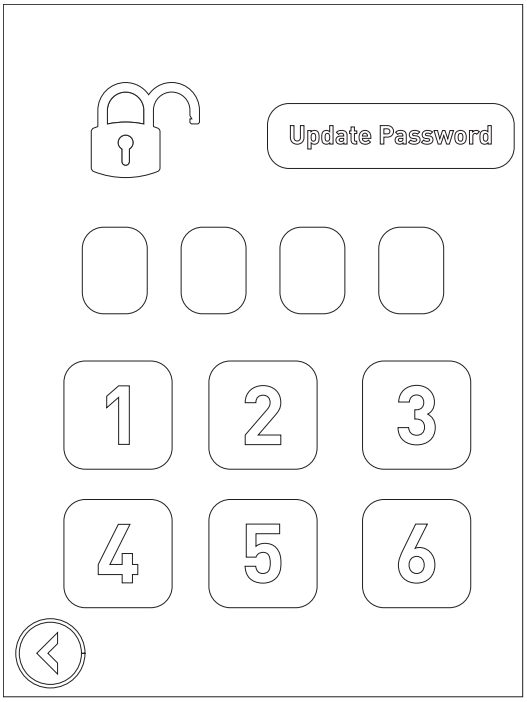
1. Enter the desired password using the numeric keypad.

2. Press the **Update Passcode** button. See Fig. 38.

NOTE:

When the password is enabled, the unit will automatically log out after 2 minutes. To return to diagnostic screen, select return arrow.

Fig. 38



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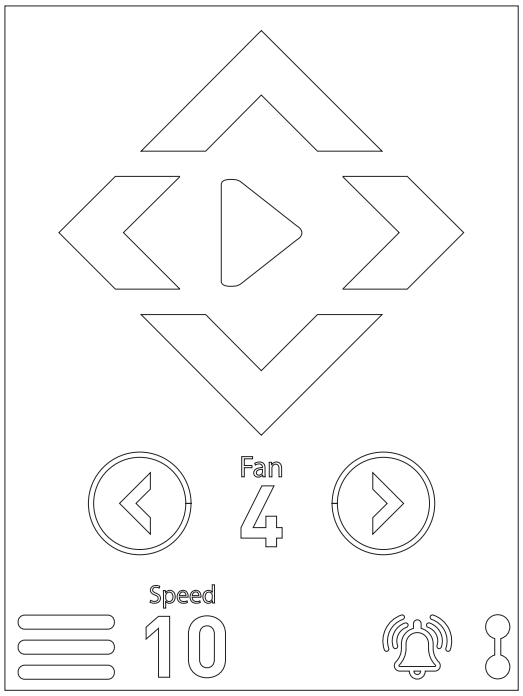
MULTI FAN CONTROL — OPTIONAL

1. Toggle through PREVIOUS or NEXT fan icons to select the fan that you would like to control.

2. The communication status on the bottom right corner will be all Green if the displayed fan is communicating.

3. Depending on the Fan Quantity that was set. The Fan# can be cycled through from 1 to the set fan quantity and then ALL which allows user to control all fans at one time.

Fig. 39



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TEMPERATURE CONTROL (OPTIONAL)

1. To enable temperature control, cycle through START/STOP/TEMP control. When in temp control mode, a thermometer icon displays. See Fig. 40.

   To setup the Temperature control settings:

2. From the main screen, press the menu button, and then press the Temp button.

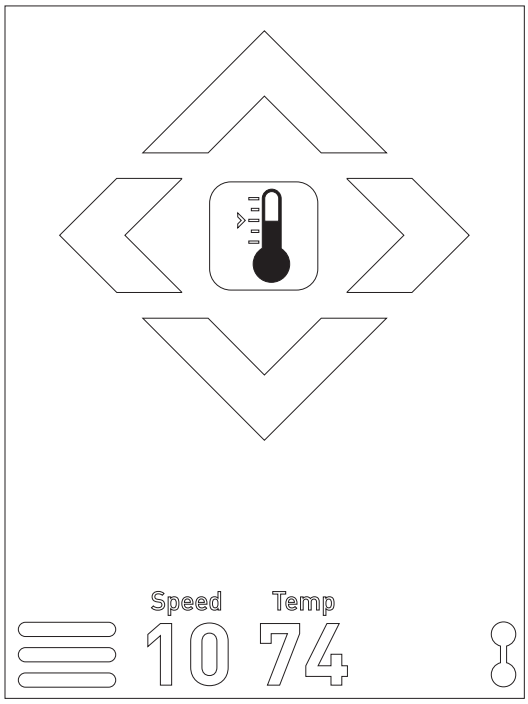
3. Enter a temperature at which to start the fan automatically. At this value the fan will start at speed 2.

4. Enter a value to increment the temperature for the next speed setting. This value is added to the start temperature from step 2 to set the temperature at which the fan will switch to speed 4, 6 and 8. For example: if 70° is entered for the start temperature and 3 is entered for the increment then the fan will start at speed 2 at 70° degrees and switch to speed 4 at 73° degrees and switch to speed 6 at 76° degrees and so on.

5. The fan will decrease in speed as the temperature decreases until it goes below the start point. Once the temperature is below the start temperature minus the increment temperature the fan will stop on its own.

6. To disable the temperature control, cycle through START/STOP/TEMP control, disabling temperature control will allow the fan to be controlled from the keypad on the main screen.

Fig. 40



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⚠DANGER

Before service, inspection, or cleaning make certain that the power is disconnected and properly locked out.

⚠WARNING

Before servicing the industrial fan, read and follow the Safety Practices on page 2 through 5 and the Operation section in this manual. Failure to do so could result in death or serious injury.

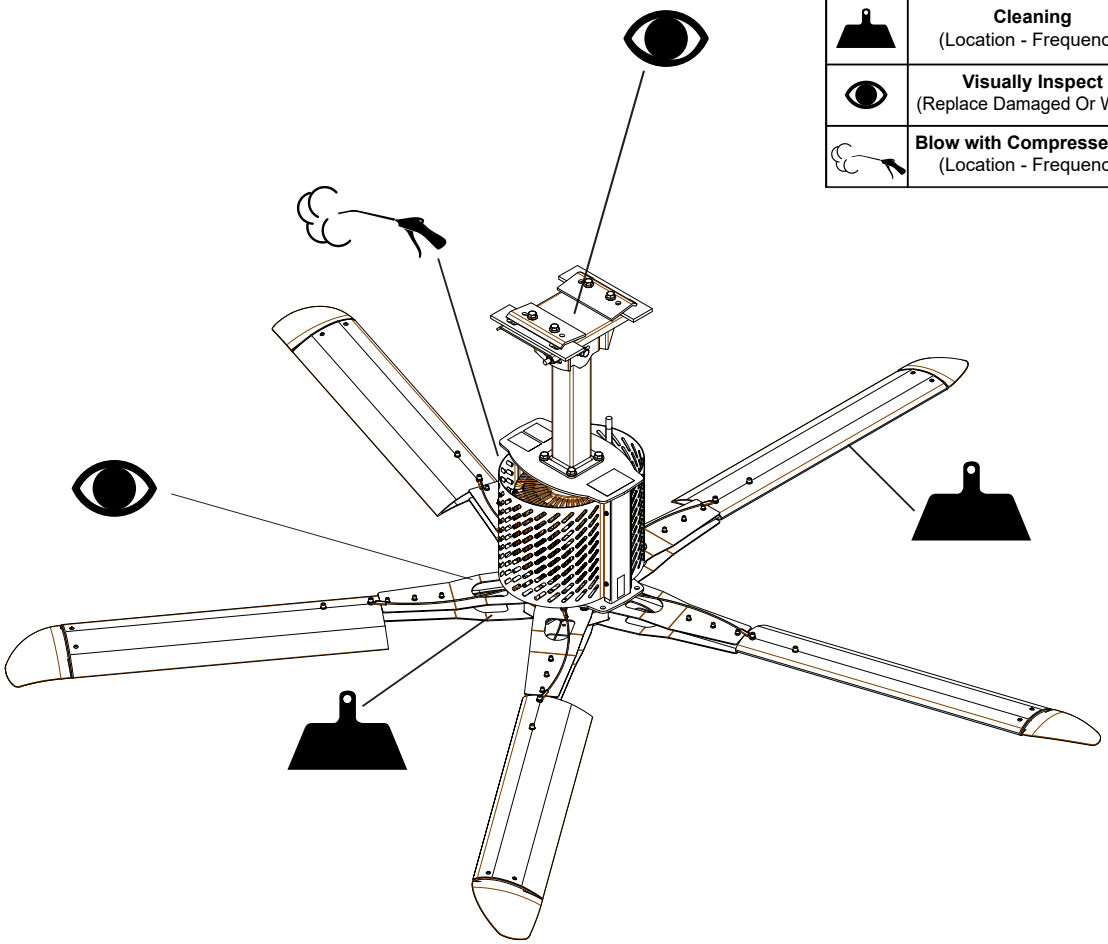
To ensure the continued proper operation of your industrial fan, perform the following planned maintenance procedures.

ANNUALLY

1. Inspect control panel for loose connections. Tighten as required.
2. Using dry air (shop air), blow out debris from fan motor cooling fan as required.
3. Inspect mounting hardware and tighten as required. Torque to 44–48 ft-lbs.
4. Inspect safety and guy wires for chaffing or wear. Ensure turnbuckle nut is secure. Replace as required.
5. Inspect guy wires for tension. Re-tighten as required.
6. Clean fan blades as required. Use a soft dry cloth. If necessary, use a mild detergent to clean surfaces. Do not use harsh cleansers.

Fig. 41

Legend	
Symbol	**Description**
	Cleaning (Location - Frequency)
	Visually Inspect (Replace Damaged Or Worn)
	Blow with Compressed Air (Location - Frequency)



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TROUBLESHOOTING GUIDE

⚠WARNING

Before servicing the industrial fan, read and follow the Safety Practices on page 2 through 5 and the Operation section in this manual. Failure to do so could result in death or serious injury.

The functions of the industrial fan are controlled by a VFD (Variable Frequency Drive). Error codes are displayed on the touch screen Fault code screen. See table on pages 41-42 for VFD diagnostics.

Use the Troubleshooting Guide if the industrial fan fails to perform properly. Find the condition that most closely matches your situation and make the recommended adjustments.

⚠DANGER

Before service, inspection, or cleaning make certain that the power is disconnected and properly locked out.
Before doing any electrical work, make certain the power is disconnected and properly locked or tagged off. 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 the control box. Ensure that the voltage and phase of the incoming power agrees with the label located on top of the VFD box and fan. Be certain power is off when wiring to the control box. Failure to do so could result in electrical shock, death or serious injury.

Problem	Possible Cause	Solution
1. Fan does not operate.	a. No power to control panel.	a. Ensure that the disconnect is in the ON position. Check for primary power at terminals..
	b. Primary fuse(s) blown.	b. Replace fuse(s).
1. Fan does not operate. Control panel has power.	a. Obstructions preventing movement.	a. Check fan unit. Ensure there are no obstructions preventing movement.
	b. Remote not properly connected	b. Check connections between remote/ VFD.
	c. VFD faulted	c. Check for VFD fault. Check fault code action - reset drive. (power OFF/power ON)
	d. Fire circuit open.	d. RED fire alarm indicator - fire alarm is active if fire alarm circuit is open. Review building fire system and reset if necessary.
3. Fan operating, but turning in wrong direction.	a. Wire sequence	a. Switch two phases of th output wiring from the VFD to the motor.
	b. Intermittent connectivity inside remote control panel.	b. Make sure the connections inside the remote control touchscreen are secure.
4. Fan operating, but shows excessive wobble.	a. Guy wires not tensioned properly	a. Re-tension guy wires in accordance with the installation instructions on page 16.
	b. Winglet missing.	b. Replace winglet.
4. Fan generating a ticking noise, tick increases with speed.	a. Blade bolts not properly tightened.	a. Loosen the blade nuts. Support the blade level (horizontally before torquing the bolts to 24-28 ft-lbs.

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VARIABLE FREQUENCY DRIVE (VFD) – FAULT CODES

These codes will be shown on the VFD display

Fig. 42

Operation Panel Indication			Name
Error message	E---	**E---**	Faults history
	HOLd	**HOLD**	Operation panel lock
	LOCd	**LOCD**	Password locked
	Er 1 to Er4	**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
	Uu	**UV**	Undervoltage
	SA	**SA**	Safety stop
Alarm	Fn	**FN**	Fan alarm
Fault	E.OC 1	**E.OC1**	Overcurrent trip during acceleration
	E.OC2	**E.OC2**	Overcurrent trip during constant speed
	E.OC3	**E.OC3**	Overcurrent trip during deceleration or stop
	E.Ou 1	**E.OV1**	Regenerative overvoltage trip during acceleration
	E.Ou2	**E.OV2**	Regenerative overvoltage trip during constant speed
	E.Ou3	**E.OV3**	Regenerative overvoltage trip during deceleration or stop

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VARIABLE FREQUENCY DRIVE (VFD) – FAULT CODES

These codes will be shown on the VFD display

Fig. 43

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

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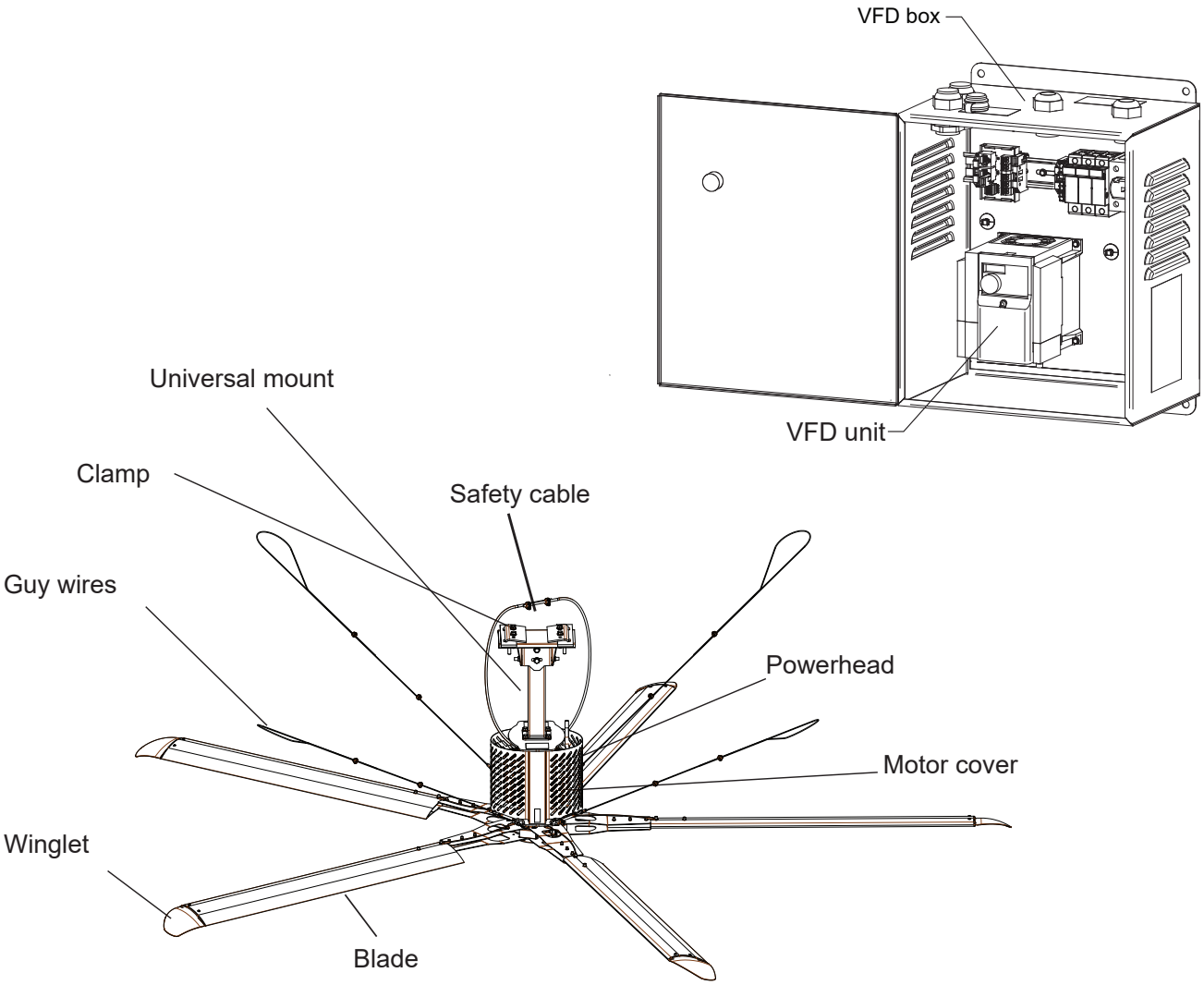
VFD BOX – NEMA 1, Solid State VFD (Variable Frequency Drive), 120VAC, 1PH, 208-240VAC 1PH, 208 – 480 VAC, 3PH, line reactor (where required), Class CC fuses, UL and UL-C listed panel and components. Power disconnect.

MOTOR
IP65 AC Brushless Direct Drive Motor

Fig. 44



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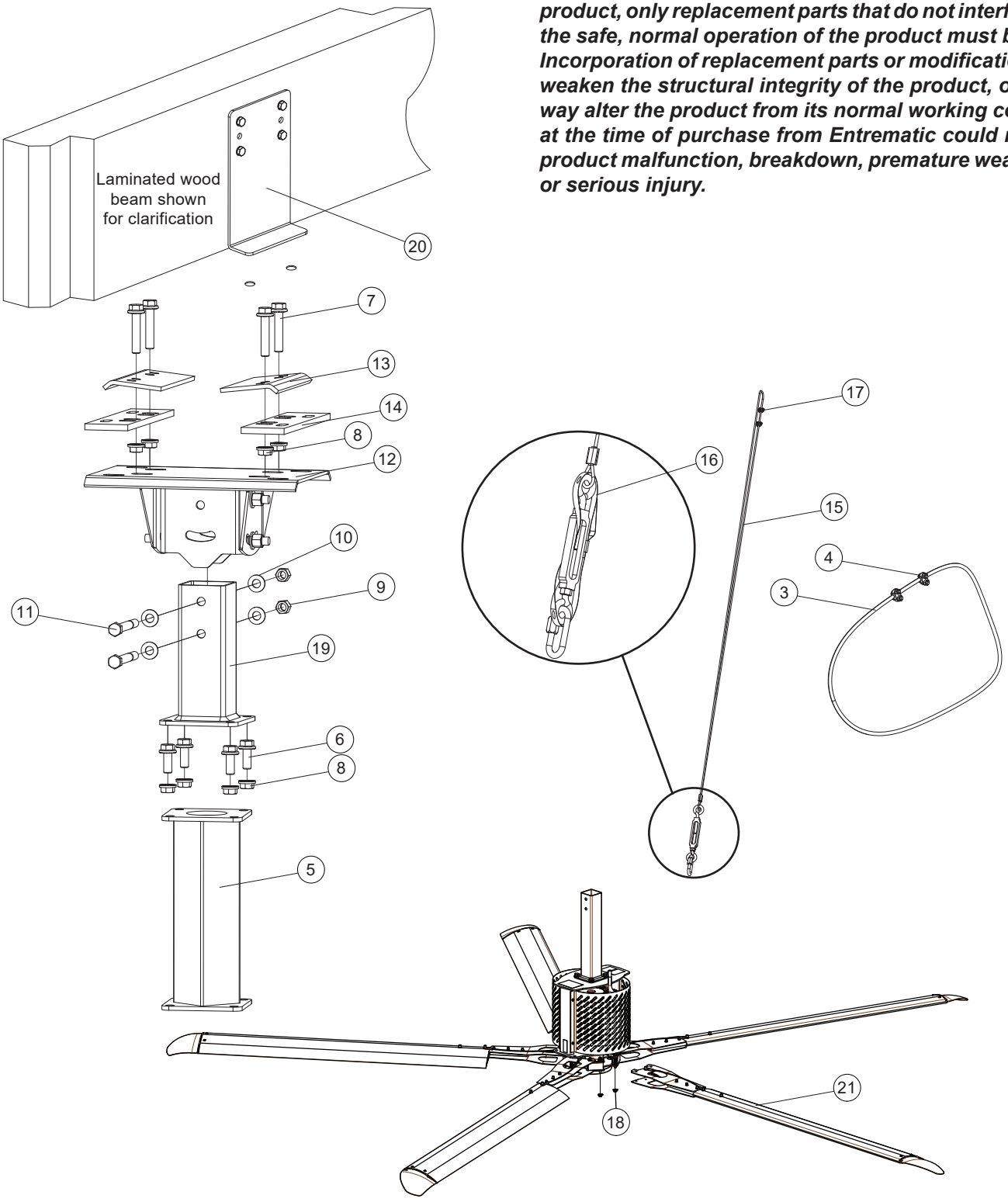
PARTS LIST — FAN

Fig.45



⚠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 Entrematic could result in product malfunction, breakdown, premature wear, death or serious injury.

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Item	Quantity	Description	Part Number
1	1	DD Powerhead, 8/10/12/14 Low	6021600
		DD Powerhead, 16/18/20/24 Low	6021602
		DD Powerhead, 16/18/20/24 High	6021603
2	1	Silver Motor Cover	6023264
		Black Motor Cover	6023019
3	1	Safety Cable - 170" long - 6", 1', 2' ext	6014884
		Safety Cable - 242" long - 3', 4', 5' ext	6014887
		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 36"- optional	6015867
		HVLS Ext Mnt 48"- optional	6015870
		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 132"- optional	6015875
		HVLS Ext Mnt 144" - optional	6015876
6	4	1/2-13UNV x 1 1/4" LG Ser FLG	6015851
7	4	1/2-13UNC x 2 1/2" LG Ser FLg	6015852
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	HHB 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 (includes items 16 & 17)	6014914
		Guy Wire Kit - 9FT, 10FT EXT (includes items 16 & 17)	6015678

NOTE:

For corrosion resistant or explosion proof fans, consult factory for parts.

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PARTS LIST — FAN, continued

Item	Quantity	Description	Part Number
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	6022261
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	6050508
		20' Black Blade Assy	6020509
		22' Black Blade Assy	6020510
		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
		22' Clear Blade Assy	6020519
		24' Clear Blade Assy	6020520
22	8	Fan Cover Fasteners	215702

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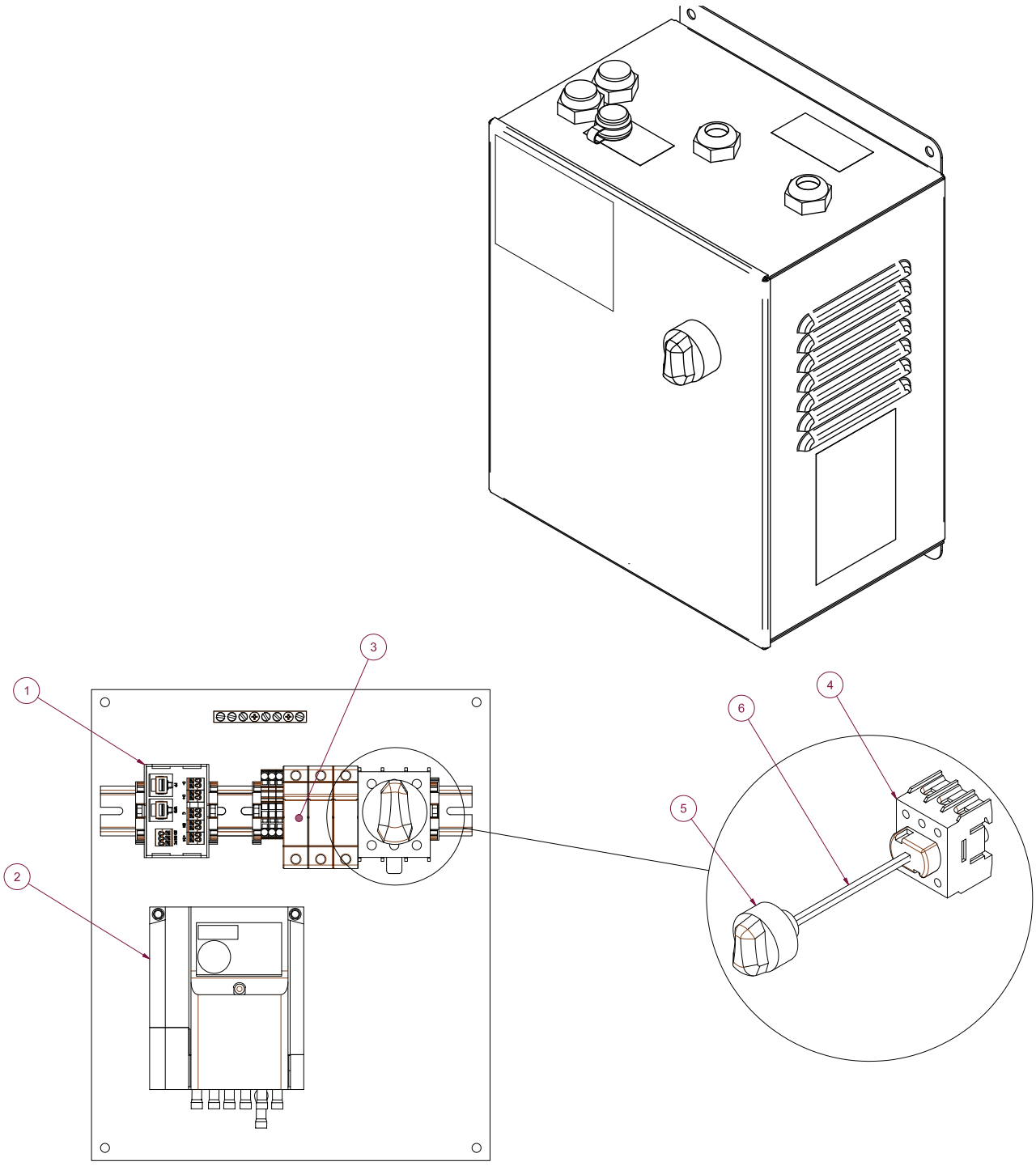
PARTS LIST — VFD BOX

Fig. 46



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PARTS LIST — VFD BOX, continued

VFD Panel 120V/1P

		VFD PANEL, 120V/1P, 8FT	6022500
		VFD PANEL, 120V/1P, 10FT	6022504
		VFD PANEL, 120V/1P, 12FT	6022508
		VFD PANEL, 120V/1P, 14FT	6022512
ITEM	**PART NUMBER**	**PART DESCRIPTION**	**QTY**
1	6015547	INTERFACE, HVLS, DIN MOUNT	1
2	6022070	MITSUBISHI VFD, DD, 120V/1PH	1
3	6011801	FUSE 20A, 600V, KTKR20	2
4	6015597	ROTARY DISCONNECT	1
5	6015598	DISCONNECT HANDLE	1
6	6015599	DISCONNECT SHAFT 150MM	1

VFD Panel 230V/1P

		VFD PANEL, 230V/1P, 8FT	6022501
		VFD PANEL, 230V/1P, 10FT	6022505
		VFD PANEL, 230V/1P, 12FT	6022509
		VFD PANEL, 230V/1P, 14FT	6022513
		VFD PANEL, 230V/1P, 16FT	6022517
		VFD PANEL, 230V/1P, 18FT	6022520
		VFD PANEL, 230V/1P, 20FT	6022542
		VFD PANEL, 230V/1P, 24FT	6022545
ITEM	**PART NUMBER**	**PART DESCRIPTION**	**QTY**
1	6015547	INTERFACE, HVLS, DIN MOUNT	1
2	6022071	MITSUBISHI VFD, DD, 240V/1P/3P	1
3	6011800	FUSE 15A, 600V, KTKR15	2
4	6015597	ROTARY DISCONNECT	1
5	6015598	DISCONNECT HANDLE	1
6	6015599	DISCONNECT SHAFT 150MM	1

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VFD Panel, 230V/3P

VFD PANEL, 230V/3P, 8FT	6022502
VFD PANEL, 230V/3P, 10FT	6022506
VFD PANEL, 230V/3P, 12FT	6022510
VFD PANEL, 230V/3P, 14FT	6022514
VFD PANEL, 230V/3P, 16FT	6022518
VFD PANEL, 230V/3P, 18FT	6022540
VFD PANEL, 230V/3P, 20FT	6022543
VFD PANEL, 230V/3P, 24FT	6022546

ITEM	PART NUMBER	PART DESCRIPTION	QTY
1	6015547	INTERFACE, HVLS, DIN MOUNT	1
2	6022071	MITSUBISHI VFD, DD, 240V/1P/3P	1
3	6014015	FUSE 10A, 600V, KTKR10	3
4	6015597	ROTARY DISCONNECT	1
5	6015598	DISCONNECT HANDLE	1
6	6015599	DISCONNECT SHAFT 150MM	1

VFD Panel, 480V/3P

VFD PANEL, 480V/3P, 8FT	6022503
VFD PANEL, 480V/3P, 10FT	6022507
VFD PANEL, 480V/3P, 12FT	6022511
VFD PANEL, 480V/3P, 14FT	6022515
VFD PANEL, 480V/3P, 16FT	6022519
VFD PANEL, 480V/3P, 18FT	6022541
VFD PANEL, 480V/3P, 20FT	6022544
VFD PANEL, 480V/3P, 24FT	6022547

ITEM	PART NUMBER	PART DESCRIPTION	QTY
1	6015547	INTERFACE, HVLS, DIN MOUNT	1
2	6022072	MITSUBISHI VFD, DD, 480V/1P	1
3	6011797	FUSE 5A, 600V, KTKR5	3
4	6015597	ROTARY DISCONNECT	1
5	6015598	DISCONNECT HANDLE	1
6	6015599	DISCONNECT SHAFT 150MM	1

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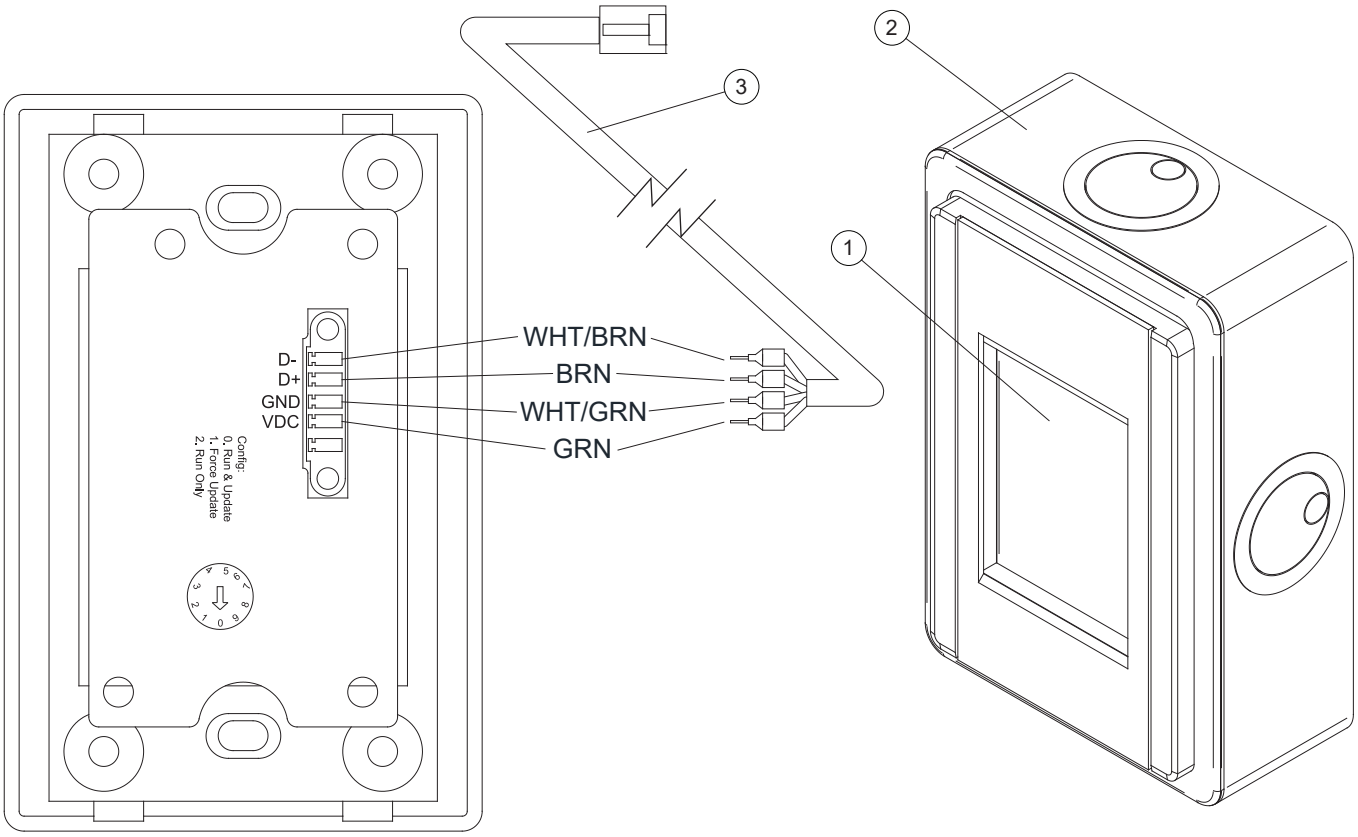
PARTS LIST — REMOTE CONTROL PANEL, continued

Fig. 47



Item	Quantity	Part Description	Part Number
1	1	TOUCH SCREEN CONTROLLER, KELLEY TOUCH SCREEN CONTROLLER, SERCO TOUCH SCREEN CONTROLLER, ENTREMATIC	6015758 6015759 6018648
2	1	J-BOX , PLASTIC, IVORY	6015648
3	1	CABLE CAT5, 100' W/ FERRULE (BLUE)	6015651

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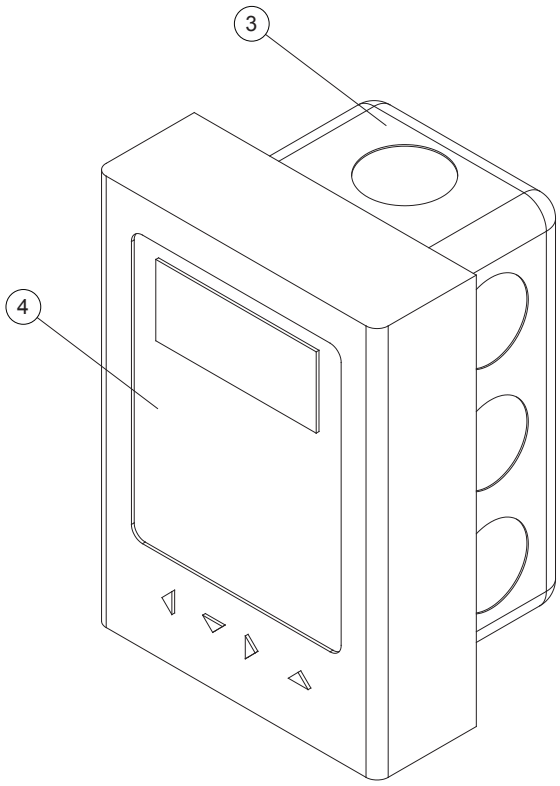
PARTS LIST — TEMP CONTROL (OPTIONAL)

Fig. 48



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

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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 date of 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 4 Front 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 fan hub, mounting airfoils and winglets.

Electrical is defined as all electrical components of the fan including the Motor Variable Frequency Drive and all components or 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 purchaser does not notify 4FRONT's warranty department within 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.

Warranty and Factory Service Request Procedure

Entrematic HVLS Warranty Request

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Please direct questions about your fan to your local distributor.

Your local distributor is:

Corporate Office:

1612 Hutton Dr. Suite 140
Carrollton, TX. 75006
Tel. (972) 466-0707
Fax (972) 323-2661

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