

INSTALLATION MANUAL

NORTHERN AIR® EXTREME

ENGLISH



NORDICCO®
CLEAN • CLIMATE-FRIENDLY • COMFORT

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.

! IMPORTANT: Extreme fans must be installed with the supplied CAT communication cable or thru Northern Sky. Cable must be twisted pair, shielded. CAT 5/6. Cable must use shielded RJ45 connectors with a soldered drain. Individual CAT 5/6 cable lengths must not exceed 60 m in order to prevent network communication issues.



Extreme Models are the ideal choice for providing year-round comfort in air circulation and destratification applications. Featuring an aerodynamic, extruded aluminum airfoil design and a high efficiency direct drive motor, Extreme delivers maximum airflow at a fraction of the operating cost of other HVLS fans. And, with its universal ceiling mount, the Extreme fan is the easiest 6 m and 7,3 m HVLS fan to install in the market!

Required Tools

The following tools will be required to complete the installation of every Extreme fan. Additional tools may be required depending on the application and installation location of the fan.

- Socket Wrench and 17mm Sockets
- 11 mm, 13 mm, 14 mm and 19 mm Wrenches
- Adjustable Wrench
- Torque Wrench (up to 70 Nm)
- Torque Wrench (up to 160 Nm)
- Drill and 19 mm Drill Bit
- Phillips Screwdriver
- Level
- Impact Driver
- #2 Phillips Bit and Driver
- 10 mm Magnetic Nut Driver
- Magnetic Nut Driver Extension

NOTE: Extreme fans components can weigh 41 kg or greater depending upon the fan size and accessories that are provided. A suitable means for lifting the weight of the fan to the mounting point, such as a scissor lift, should be used for all Extreme fan installations.

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Fan Networking

First Fan
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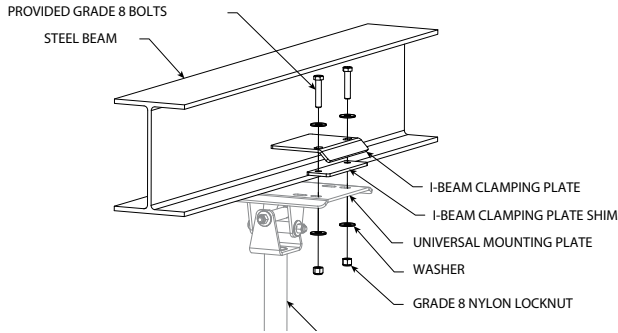
Pre-Start-Up Checks
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Quick Start Guide

REFER TO INSTALLATION MANUAL FOR COMPLETE INSTALLATION INSTRUCTIONS.
QUICK START GUIDE DOES NOT REPLACE INSTALLATION MANUAL INSTRUCTIONS.

STEP #1 - MOUNT INSTALLATION



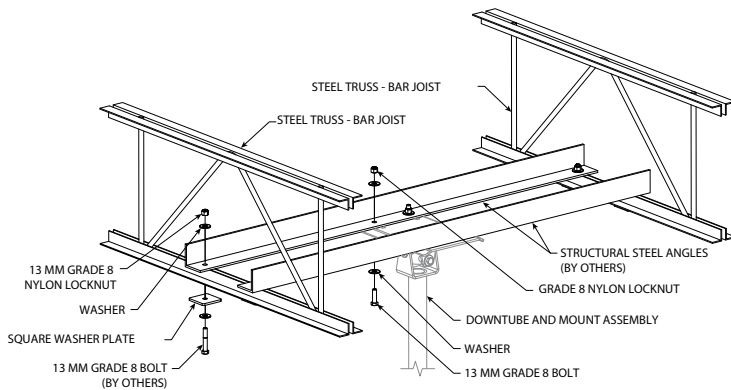
STEEL I-BEAM INSTALLATION

- GO TO SECTION MECHANICAL INSTALLATION
- FASTENER KIT

IMPORTANT: I-BEAM MUST HAVE MINIMUM 127 MM. FLANGE WIDTH AND 13 MM. FLANGE THICKNESS

IMPORTANT: DO NOT INSTALL ON FABRICATED I-BEAMS

IMPORTANT: TORQUE ALL BOLTS TO 45 FT-LBF (61.0 N-m)



STEEL TRUSS INSTALLATION

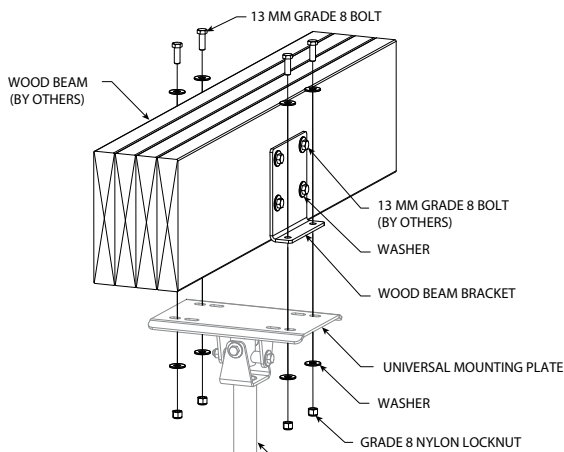
- GO TO SECTION MECHANICAL INSTALLATION
- FASTENER KIT

IMPORTANT: TRUSSES MUST HAVE MINIMUM 127 MM CHORD WIDTH

IMPORTANT: STEEL ANGLES MUST BE MINIMUM OF 100 x 100 x 6,5 MM THICK

IMPORTANT: SPAN LENGTH MUST NOT EXCEED 2,4 M.

IMPORTANT: TORQUE ALL BOLTS TO 80 FT-LBF (108.5 N-m)



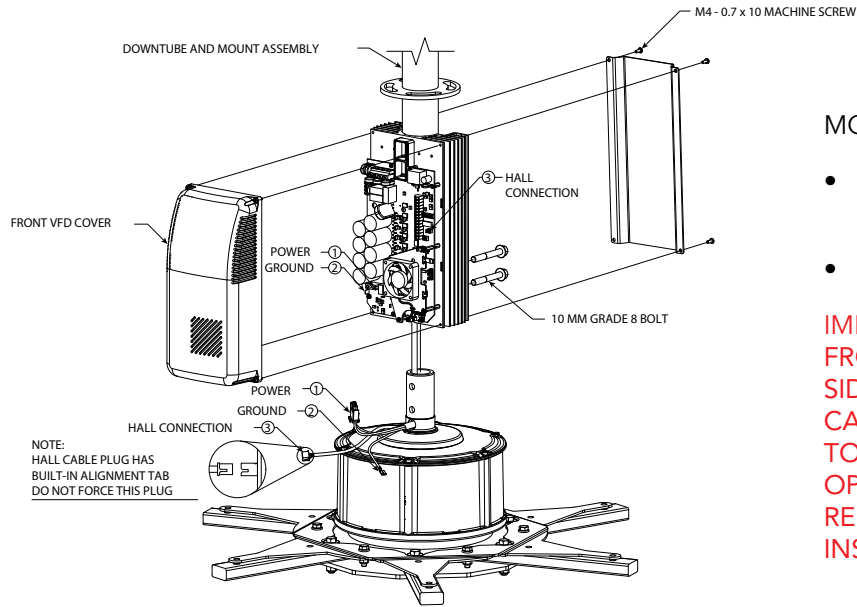
WOOD BEAM INSTALLATION

- GO TO SECTION MECHANICAL INSTALLATION
- FASTENER KIT

IMPORTANT: WOOD BEAM MUST BE 115 TO 225 MM WIDE

IMPORTANT: TORQUE ALL BOLTS TO 80 FT-LBF (108.5 N-m)

STEP #2 - MOTOR INSTALLATION



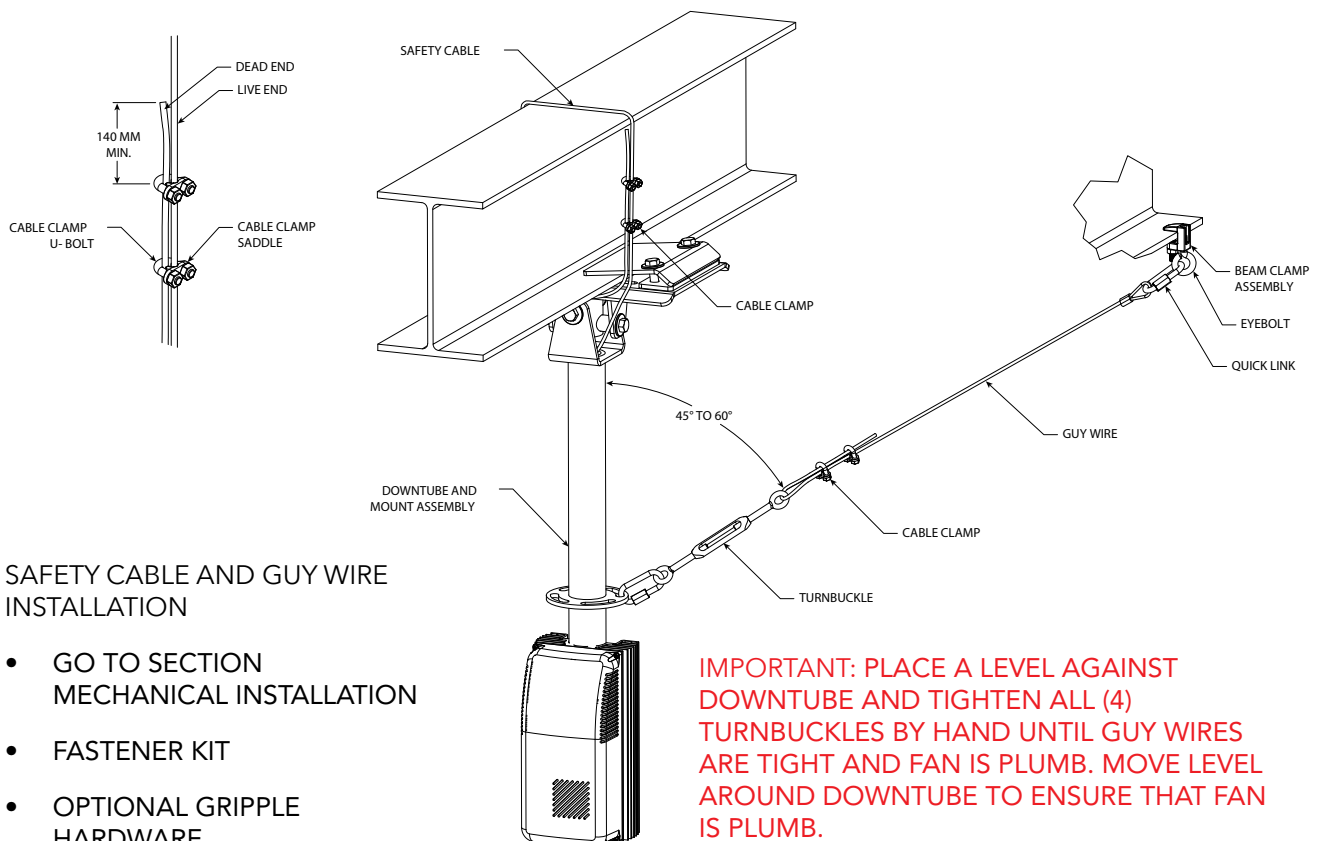
MOTOR INSTALLATION

- GO TO SECTION MECHANICAL INSTALLATION
- FASTENER KIT

IMPORTANT: ELECTRICAL CABLES FROM MOTOR MUST BE ON SAME SIDE AS BLACK PLASTIC VFD COVER. CABLES ARE NOT LONG ENOUGH TO REACH CIRCUIT BOARD FROM OPPOSITE SIDE. MOTOR MUST BE REMOVED AND ROTATED 180° IF INSTALLED INCORRECTLY.

IMPORTANT: TORQUE BOLTS TO 33 FT-LBF (44.75 N-m)

STEP #3 - SAFETY CABLE AND GUY WIRE INSTALLATION

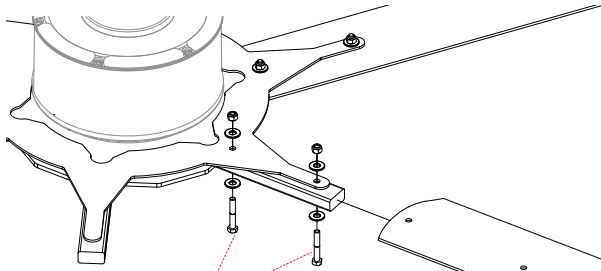


SAFETY CABLE AND GUY WIRE INSTALLATION

- GO TO SECTION MECHANICAL INSTALLATION
- FASTENER KIT
- OPTIONAL GRIPPLE HARDWARE

IMPORTANT: PLACE A LEVEL AGAINST DOWNTUBE AND TIGHTEN ALL (4) TURNBUCKLES BY HAND UNTIL GUY WIRES ARE TIGHT AND FAN IS PLUMB. MOVE LEVEL AROUND DOWNTUBE TO ENSURE THAT FAN IS PLUMB.

STEP #4 - AIRFOIL INSTALLATION



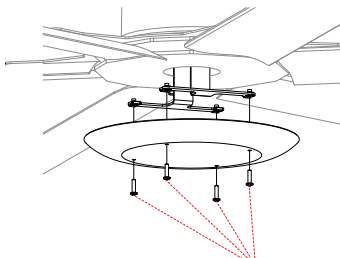
TORQUE TO 25 FT-LBF
(34 N-m)

AIRFOIL INSTALLATION

- GO TO SECTION MECHANICAL INSTALLATION
- FASTENER KIT

TORQUE TO 60 IN-LBF
(6.8 N-m)

STEP #5 - HUB PLATE INSTALLATION



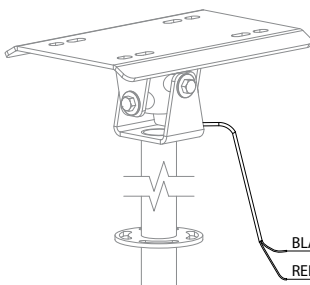
TORQUE TO 96 IN-LBF
(10.8 N-m)

HUB PLATE INSTALLATION

- GO TO SECTION MECHANICAL INSTALLATION
- HARDWARE KIT

IMPORTANT: ROTATE FAN BY HAND TO ENSURE THAT IT MOVES FREELY AND DOES NOT RUB OR CONTACT ANY OBSTRUCTIONS.

STEP #6 - FIRE ALARM RELAY INSTALLATION



FIRE ALARM RELAY INSTALLATION

- GO TO SECTION MECHANICAL INSTALLATION

IMPORTANT: MUST USE PROVIDED PAM-1 RELAY OR OTHER APPROVED ELECTROMECHANICAL RELAY



STEP #7 - MOTOR CABLE CONNECTION TO VFD

MOTOR CABLE CONNECTION TO VFD

- GO TO SECTION MECHANICAL INSTALLATION

IMPORTANT: PLUGS MUST BE FULLY SEATED AND IN PROPER ORIENTATION FOR FAN OPERATION

NOTE: HALL CABLE PLUG HAS BUILT-IN ALIGNMENT TAB DO NOT FORCE THIS PLUG

STEP #8 - POWER WIRING

POWER WIRING

- GO TO SECTION MECHANICAL INSTALLATION

IMPORTANT: SOURCE POWER MUST COMPLY WITH REQUIRED SPECS

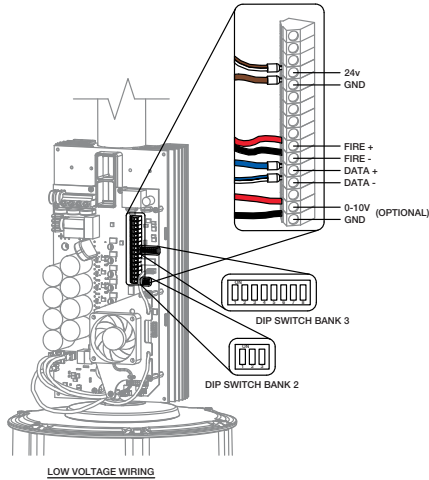
STEP #9 - COMMUNICATION WIRING - IF WIRED INSTALLATION

COMMUNICATION WIRING

- GO TO SECTION MECHANICAL INSTALLATION

IMPORTANT: MUST USE PROVIDED CAT 5/6 CABLE OR SHIELDED CABLE THAT COMPLIES WITH REQUIRED SPECS FOR CABLED INSTALLATION.

STEP #10 - FAN NETWORKING - IF WIRED INSTALLATION



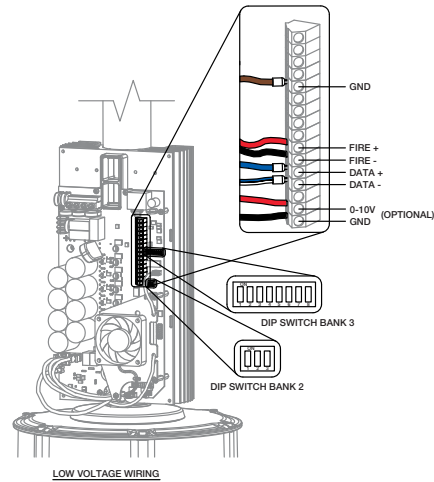
FIRST FAN IN DAISY-CHAIN

- GO TO SECTION FAN NETWORKING
- NO VFD WIRING MODIFICATIONS REQUIRED
- VERIFY VFD WIRING MATCHES
- MODIFY DIP SWITCH BANKS 2 AND 3 AS SHOWN

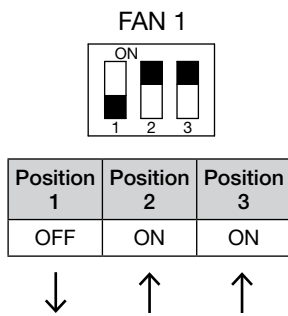
ALL REMAINING FANS IN DAISY-CHAIN

- GO TO SECTION FAN NETWORKING
- REMOVE WHITE/BROWN 24V WIRE AND CAP
- VERIFY VFD WIRING MATCHES
- MODIFY DIP SWITCH BANKS 2 AND 3 AS SHOWN

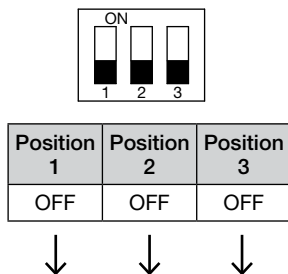
IMPORTANT: DO NOT REMOVE BROWN GND WIRE



DIPSWITCH BANK 2 SETTINGS



ALL OTHER FANS IN SERIES



DIPSWITCH BANK 3 SETTINGS

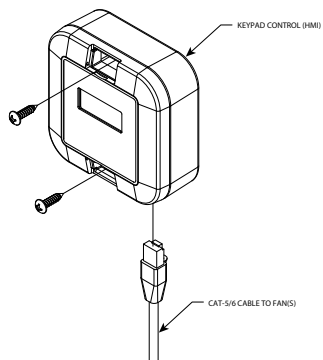
Fan Number	Modbus Address	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6, 7, 8
N/A	1	Reserved for HVLS Fan Control					Do Not Modify
1	2	On	Off	Off	Off	Off	
2	3	Off	On	Off	Off	Off	
3	4	On	On	Off	Off	Off	
4	5	Off	Off	On	Off	Off	
5	6	On	Off	On	Off	Off	
6	7	Off	On	On	Off	Off	
7	8	On	On	On	Off	Off	
8	9	Off	Off	Off	On	Off	
9	10	On	Off	Off	On	Off	
10	11	Off	On	Off	On	Off	

IMPORTANT: DO NOT MODIFY POSITIONS 6, 7, AND 8 ON DIPSWITCH BANK 3. DEFAULT SETTINGS ARE ON, OFF, OFF (UP, DOWN, DOWN)

STEP #11 - CONTROLS INSTALLATION - IF WIRED INSTALLATION

SURFACE MOUNT KEYPAD CONTROL (HMI)

- REFER TO CONTROL MANUAL



STEP #12 - FAN START-UP

FAN START-UP

- HMI - REFER TO CONTROL MANUAL

IMPORTANT: BLADE COUNT AND FAN SIZE MUST BE SET APPROPRIATELY IN CONTROL MENUS FOR PROPER FAN OPERATION.

General Information

General Safety Information

IMPORTANT: To reduce the risk of fire, electric shock, or injury to persons, Extreme fans must be installed with a mount assembly, motor assembly and airfoils that are marked (on their cartons) to indicate suitability with this model. Other mounts, motors, and airfoils cannot be substituted.

Only qualified personnel should install this fan. Personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards. Other considerations may be required if high winds or seismic activity are present. If more information is needed, contact a licensed professional engineer before moving forward.

1. Follow all local electrical and safety codes, as well as the National Electrical Codes and any National Fire Protection Agencies, where applicable.
2. The rotation of the impeller is critical. It must be free to rotate without striking or rubbing any stationary objects.
3. Motor must be securely and adequately grounded.
4. Do not allow the power cable to kink or come in contact with oil, grease, hot surfaces or chemicals. Replace cord immediately if damaged.
5. Verify that the power source is compatible with the equipment.

WARNING

To reduce the risk of fire, electric shock, or injury to persons, observe the following:

1. Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
2. Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

WARNING

To reduce the risk of fire, electric shock, or injury to persons, observe the following:

1. Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
2. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.

WARNING

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children.

DANGER

Always disconnect, lock, and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

CAUTION

When servicing the fan, motor may be hot enough to cause pain or injury. Allow motor to cool before servicing.

CAUTION

Precaution should be taken in explosive atmospheres.

Receiving

Upon receiving the product, check to ensure all items are accounted for by referencing the delivery receipt or packing list. Inspect each crate or carton for shipping damage before accepting delivery. Alert the carrier of any damage detected. The customer will note damage (or shortage of items) on the delivery receipt and all copies of the bill of lading which is countersigned by the delivering carrier. If damaged, contact your local representative immediately. Any physical damage to the unit after acceptance is not the responsibility of the manufacturer.

Unpacking

Verify that all required parts and the correct quantity of each item have been received using the component list within this manual. If any items are missing, report shortages to your local representative to arrange for obtaining missing parts. Sometimes it is not possible that all items for the unit be shipped together due to availability of transportation and truck space. Confirmation of shipment(s) must be limited to only items on the bill of lading.

Storage

Fans are protected against damage during shipment. If the unit cannot be installed and operated immediately, precautions need to be taken to prevent deterioration of the unit during storage. The user

assumes responsibility of the fan and accessories while in storage. The manufacturer will not be responsible for damage during storage. These suggestions are provided solely as a convenience to the user.

Indoor - The ideal environment for the storage of fans and accessories is indoors, above grade, in a low humidity atmosphere that is sealed to prevent the entry of blowing dust, rain or snow. Temperatures should be evenly maintained between -1° to 43°C (30° to 110°F). Wide temperature swings may cause condensation and “sweating” of metal parts. All accessories must be stored indoors in a clean, dry atmosphere.

Remove any accumulations of dirt, water, ice or snow and wipe dry before moving to indoor storage. To avoid “sweating” of metal parts, allow cold parts to reach room temperature. To dry parts and packages, use a portable electric heater to get rid of any moisture build up. Leave coverings loose to permit air circulation and to allow for periodic inspection.

The unit should be stored at least 90 mm (3-1/2 in.) off the floor on wooden blocks covered with moisture proof paper or polyethylene sheathing. Aisles between parts and along all walls should be provided to permit air circulation and space for inspection.

Inspection and Maintenance During Storage

While in storage, inspect fans once per month. Keep a record of inspection and maintenance performed.

If moisture or dirt accumulations are found on parts, the source should be located and eliminated. If paint deterioration begins, consideration should be given to touch-up or repainting. Fans with special coatings may require special techniques for touch-up or repair.

Machined parts coated with rust preventive should be restored to good condition promptly if signs of rust occur. Immediately remove the original rust preventive coating with petroleum solvent and clean with lint free cloths. Polish any remaining rust from surface with crocus cloth or fine emery paper and oil. Do not destroy the continuity of the surfaces. Thoroughly wipe clean with Tectyl® 506 or the equivalent. For hard to reach internal surfaces or for occasional use, consider using Tectyl® 511M Rust Preventive, WD-40® or the equivalent.

Removing from Storage

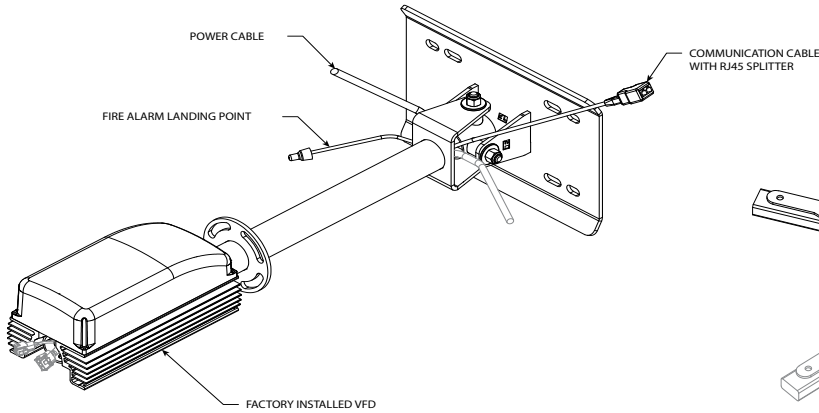
As fans are removed from storage to be installed in their final location, they should be protected and maintained in a similar fashion until the fan equipment goes into operation.

Fan Components

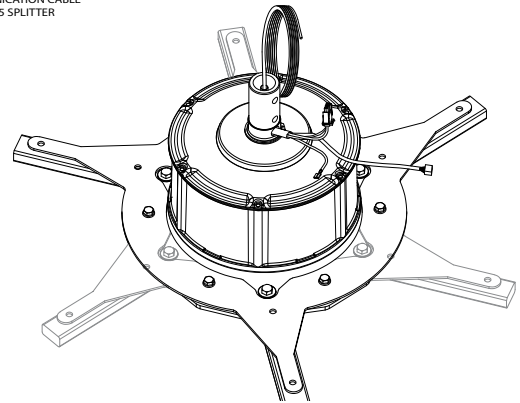
Verify that all of the following parts and hardware have been received prior to beginning installation. Contact your local representative or the manufacturer if replacement parts are required.

NOTE: Additional parts (provided by others) may be required to complete the fan installation, including additional wiring, steel angle or Unistrut® channel, and hardware for connecting the fan mount to the building structure.


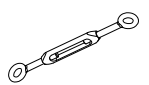


NOTE: Hardware quantities listed below indicate what is required to complete installation. Hardware kits may include extra fasteners as a convenience.

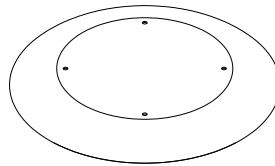


Downtube and Mount Assembly (1)



Motor/Hub Assembly (1)

Guy Wire Fastener Kit Bag # 916290	
 U-Bolt Steel Cable Clamps (10)	 Turnbuckle (4)
 Guy Wire Clamps (4)	 Quick Link (8)
Motor/Hub Fastener Kit Bag	
Grade 8, Hex Bolt (2)	
Machine Screw (4)	
Airfoil Blade and Hub Plate Fastener Kit	
Washers (24)	
Grade 8, Nylon Locknut (12)	
Grade 8, Hex Bolt (12)	
Screws (12)	
Machine Screws (4)	



Hub Plate (1)



Rear VFD Cover (1)



Winglet (6)

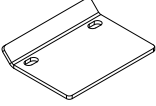
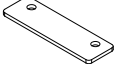


20 Ft. Guy Wire (4)




Airfoil Blade (6)


Optional Fan Components




I-Beam Mounting Kit (Optional)	
	
I-Beam Clamping Plate (2)	I-Beam Clamping Plate Shim (2)

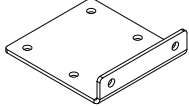
I-Beam Fastener Kit (Optional)
Washers (8)
Nylon Locknut (4)
Hex Bolt (4)

Steel Truss Mounting Kit (Optional)

Square Washer Plate (4)

Steel Truss Fastener Kit (Optional)
Washer (16)
Grade 8, Nylon Locknut (8)
Grade 8, Hex Bolt (4)

Gripple® Installation Kit (Optional)

20 Ft. Guy Wire (4)

Gripple® Fastener Kit (Optional)
  
No. 4 Gripple® (5) Quick Link (8) Turnbuckle (4)

Wood Beam Mounting Kit (Optional)

Wood Beam Bracket (2)

Wood Beam Fastener Kit (Optional)
Hex Bolt (4)
Nylon Locknut (8)
Washers (16)

Pre-Installation

Pre-Installation Checks

IMPORTANT: Consult all applicable national and local codes to ensure that all necessary code requirements are met. It is the sole responsibility of the installer to ensure compliance with applicable codes.

Prior to installing the fan, perform each of the following checks:

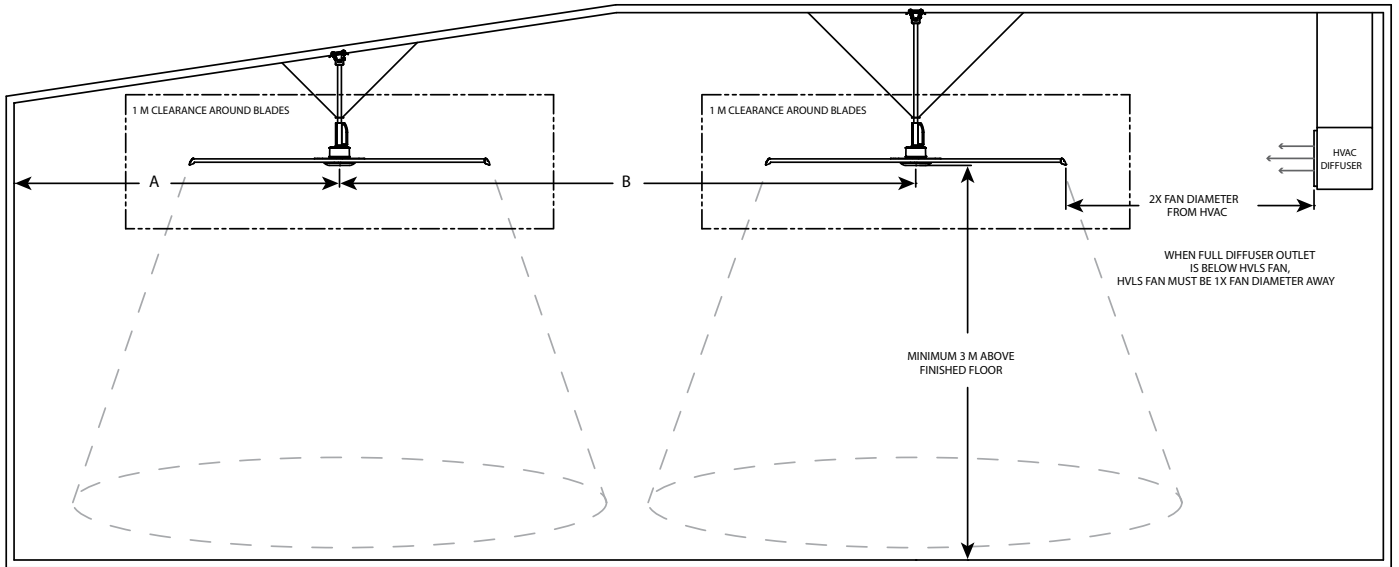
1. Verify that fan components are undamaged. Do not install or operate any damaged fan components, fans, or fan accessories. Failure to comply with this instruction may result in property damage, personal injury and/or death.
2. Verify that the fan is to be installed in a location where the airfoils will be a minimum of 3 m. above the finished floor with a minimum of 1.5 m. of horizontal and vertical clearance to any obstructions.
3. Verify that the fan is to be installed in a location where the center of the fan is a minimum of 1.5 fan diameters away from building walls and corners.
4. For best performance, the fan must be installed with a two fan diameter minimum clearance to radiant heaters and HVAC system discharges or intakes.
5. Check that the fan will not be mounted in a location near overhead doors or other building openings where gusts of wind may occur. Fan should not be installed or operated in locations where wind is present.
6. If the building is equipped with a fire sprinkler system, verify that the placement of the fan will not interfere with correct sprinkler operation and that the fan installation complies with all national, state and local codes. Fan must also be interlocked to shut down upon receiving a waterflow signal from the building's alarm system.
7. Check to see if the intended placement of the fan is directly below any building lights or skylights. If possible, avoid installing fan directly below a light source to prevent a strobing effect that can be caused by fan rotation.
8. If the building has a mezzanine or other elevated spaces that may be occupied by people, verify that no component of the fan can be reached from the highest level or deck. The fan must be positioned so that the tips of the airfoils are a minimum of 1.5 m away from the furthest point that a person could reach or otherwise come in contact, to prevent injury.

9. If the fan is to be mounted in an area where materials or equipment may be elevated into its path, ensure that the floor is marked or painted to alert personnel of the overhead location of the fan(s).
10. Before installation, it is important to verify that the mounting surface will bear the operating weight and maximum torque (twisting force) of the unit. It is the sole responsibility of the installer to ensure that the mounting structure and fan installation method are adequate for safe operation of the fan.

Fan Size m	Extreme	
	*Max. Fan Weight (kg)	Max. Torque (Nm)
6	123	165
7,3	130	170

*Maximum weight is shown in pounds and includes all available options, actual fan weight may be less.

Minimum Spacing Requirements



Fan Size (m)	Minimum Spacing From Center of Fan (m)	
	A	B
6	9,2	18,3
7,3	11	22

Mechanical Installation

Mounting Installation

DANGER

Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

The following mounting installations are covered in this manual. Identify the supplied mounting kit, locate the appropriate installation within this manual.

- I-Beam Mounting Kit
- Steel Truss Mounting Kit
- Wood Beam Mounting Kit

I-Beam Mounting Kit
(For Flanges up to 250 mm Wide)

IMPORTANT: A Structural Engineer must perform thorough evaluation of mounting structure and determine final mounting requirements before fan is installed. Manufacturer is not liable for any problems that arise as the result of insufficient structure, including (but not limited to) vibration, noise, or safety hazards. Product warranty will be voided at manufacturer's discretion if structure is deemed insufficient.

Installations must comply with the following requirements at a minimum, but The Structural Engineer may require more stringent specifications at their discretion:

- Do not install HVLS fans on fabricated I-beams.
- HVLS fans should only be installed on I-beams that are part of the existing building structure.
- I-beam must have a minimum flange width of 130 mm and a minimum flange thickness of 13 mm.
- Do not weld HVLS fans to I-beams.
- Do not use I-beam mounting kit on any other type of structure (steel trusses, steel angles, etc.).

Required Loose Components (Included):

- I-Beam Clamping Plate (2)
- I-Beam Clamping Plate Shim (2)

Required Components:

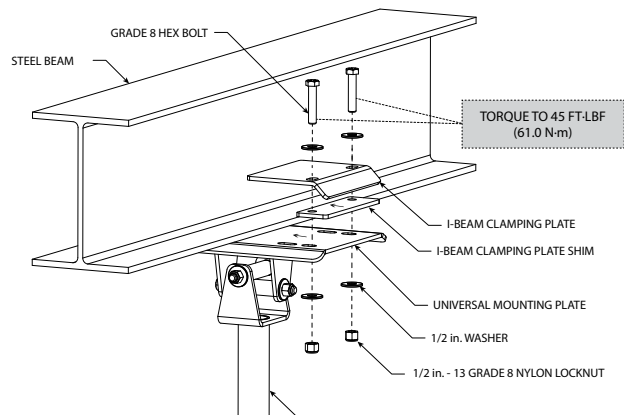
- Grade 8 Hex Bolt (4)
- Grade 8 Nylon Locknut (4)
- Washer (8)

Hardware/Tools Needed (Not Included):

- Torque Wrench
- Socket and Ratchet Kit
- Wrench

1. Using appropriate lifting equipment, raise the downtube and mount assembly until the universal mounting plate is positioned on the bottom of the I-beam.
2. Using the universal mounting plate as a guide, identify the appropriate set of mounting slots to use for installation. The universal mounting plate can accommodate I-beams with a flange width up to 250 mm, a flange thickness up to 25 mm, and a vertical web thickness up to 69 mm.
3. Attach (1) I-beam clamping plate shim and (1) I-beam clamping plate to the universal mounting plate using (2) grade 8 hex bolts, (4) washers, and (2) grade 8 nylon locknuts. Hook the I-beam clamping plate onto one side of the I-beam and tighten hardware until the universal mounting plate is snug against the beam but can still be moved (approximately 6 mm of the bolt threads exposed below the nylon locknut).

IMPORTANT: I-beam clamping plate shims and I-beam clamping plates must be installed so that the laser-cut arrows are pointing towards the I-beam. Ensure that the narrowest possible set of mounting holes is used on the universal mounting plate to ensure maximum engagement with the I-beam.



4. Attach the opposing I-beam clamp plate shim and I-beam clamp plate on to the universal mounting plate and I-beam. Hand tighten hardware.
5. Center the universal mounting plate under the I-beam. Ensure the I-beam clamp plates have maximum engagement on both sides and tighten hardware evenly to 45 ft·lbf (61.0 N·m).
6. Continue with Motor/Hub to Downtube Installation.

Steel Truss Mounting Kit

IMPORTANT: A Structural Engineer must perform thorough evaluation of mounting structure and determine final mounting requirements before fan is installed. Manufacturer is not liable for any problems that arise as the result of insufficient structure, including (but not limited to) vibration, noise, or safety hazards. Product warranty will be voided at manufacturer's discretion if structure is deemed insufficient.

Installations must comply with the following requirements at a minimum, but The Structural Engineer may require more stringent specifications at their discretion:

- Do not install HVLS fans on a single steel truss. Structural steel angles must be used to span a minimum of 2 trusses.
- Steel trusses must have a minimum chord width of 130 mm.
- Structural steel angle span lengths must not exceed 2,4 m. For span lengths up to 2,4 m, a minimum of 2 structural steel angles are required.
- Size of structural steel angles must be specified by a structural engineer. Angles must be a minimum of 100 x 100 x 6 mm thick. Larger angles may be required for span lengths up to 2,4 m. Angles shall be sufficiently stiff to avoid harmonic resonance excitation during fan operation (120 RPM; +/- 20%).

Required Loose Components (Included):

- Square Washer Plate (4)

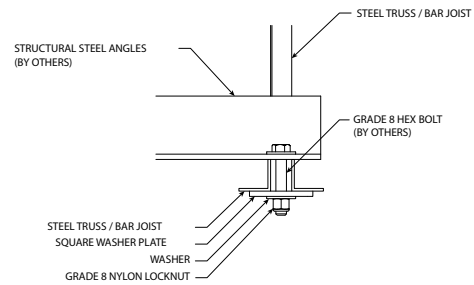
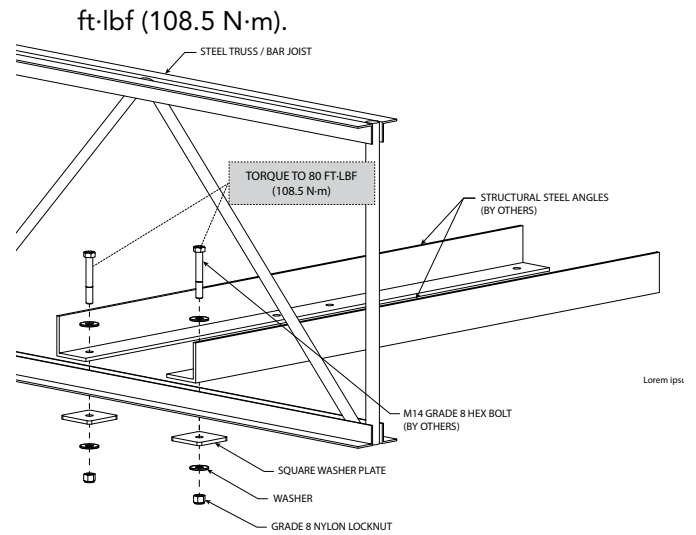
Required Components:

- Grade 8 Hex Bolt (4)
- Grade 8 Nylon Locknut (8)
- Washer (16)

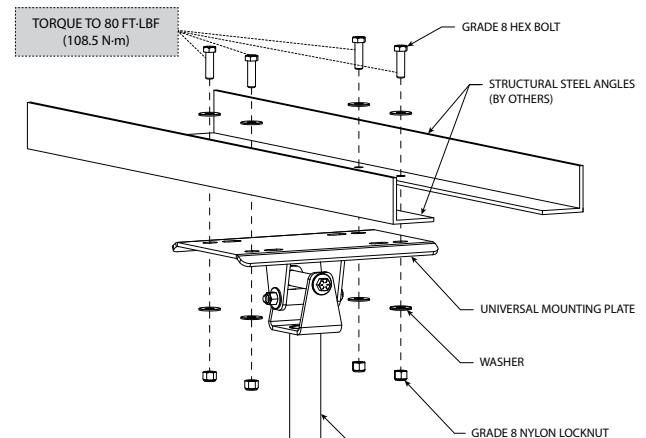
Hardware/Tools Needed (Not Included):

- Structural Steel Angles (2)
- Grade 8 Hex Bolt (4), length determined by truss and steel angle material thickness
- Torque Wrench
- Socket and Wrench Kit
- Wrench
- Drill and 15 mm Drill Bit

1. Size structural steel angles (by others) to fit within steel trusses/bar joists. Size of steel angle to be determined by structural engineer.
2. Mount structural steel angles to steel trusses/bar joists using (4) grade 8, M14 bolts (by others to accommodate varying material thickness), and supplied (8) washers, (4) square washer plates, and (4) 14M nylon locknuts. Note that the hardware should be installed through the gap in the bottom chord of the steel trusses/bar joists (reference drawing on to the right). Torque hardware to 80



3. Locate desired fan hanging location. Using the universal mounting plate as a template, mark and drill (4) 15 mm holes in structural steel angles.
4. Bolt universal mounting plate into place using supplied (4) grade 8 hex bolts, (8) washers and (4) grade 8 nylon locknuts. Torque to 80 ft·lbf (108.5 N·m).



5. Continue with Motor/Hub to Downtube Installation.

Wood Beam Mounting Kit

(For Beams 115-225 mm Wide)

IMPORTANT: A Structural Engineer must perform thorough evaluation of mounting structure and determine final mounting requirements before fan is installed. Manufacturer is not liable for any problems that arise as the result of insufficient structure, including (but not limited to) vibration, noise, or safety hazards. Product warranty will be voided at manufacturer's discretion if structure is deemed insufficient.

Installations must comply with the following requirements at a minimum, but The Structural Engineer may require more stringent specifications at their discretion:

- Do not use the wood beam mounting kit on wood beams that are less than 115 mm wide. For thinner wood beams, span two or more beams using structural steel angles or unistrut. Refer to steel truss or unistrut mounting kit instructions.

Required Loose Components (Included):

- Wood Beam Bracket (2)

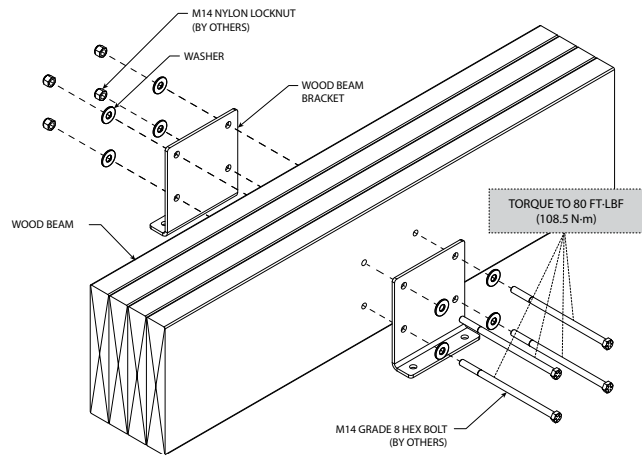
Required Components:

- Grade 8 Hex Bolt (4)
- Grade 8 Nylon Locknut (8)
- Washer (16)

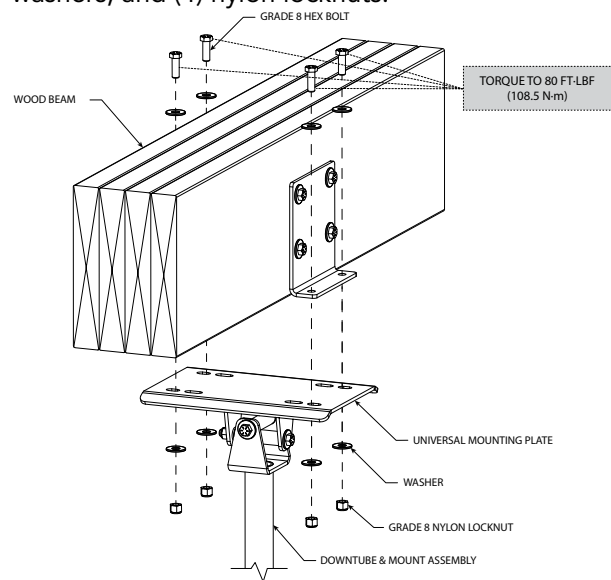
Hardware/Tools Needed (Not Included):

- M14 Grade 8 Hex Bolt (4), length determined by wood beam thickness
- Torque Wrench
- Socket and Wrench Kit
- Wrench
- Drill and 15 mm Drill Bit

- Locate desired fan hanging location. Using the supplied wood beam brackets as a template, mark and drill (4) 15 mm holes in the wood beam. Be sure bottom of brackets are flush or slightly below bottom of wood beam to effectively connect to the universal mounting plate.
- Bolt wood beam brackets into place using (4) grade 8, M14 bolts (by others to accommodate varying material thickness), and supplied (4) M14 nylon locknuts, and (8) washers. Torque hardware to 80 ft·lbf (108.5 N·m).



- With wood beam brackets installed, line up universal mounting plate and bolt into wood beam brackets using supplied (4) hex bolts, (8) 1/2 in. washers, and (4) nylon locknuts.



- Torque hardware to 80 ft·lbf (108.5 N·m).
- Continue with Motor/Hub to Downtube Installation.

Motor/Hub to Downtube Installation

Required Loose Components (Included):

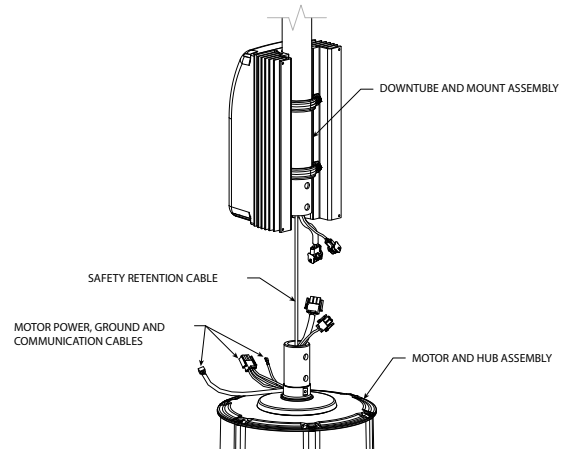
- Motor/Hub Assembly (1)
- Rear VFD Cover (1)

Required Components:

- Grade 8 Hex Bolt (2)
- M4 – 0.7 x 10 Machine Screw (4)

Hardware/Tools Needed (Not Included):

- 14 mm Socket Kit
- Socket Wrench
- Torque Wrench
- Phillips Screwdriver
- Lifting Equipment
- Cribbing (optional)
- Awl (optional)



4. Carefully align the motor axle with the downtube opening, making sure that the electrical cables protruding from the motor axle are on the same side as the black plastic VFD cover.

IMPORTANT: Electrical cables from motor must be on same side as black plastic VFD cover. Cables are not long enough to reach circuit board from opposite side. Motor must be removed and rotated 180° if installed incorrectly.

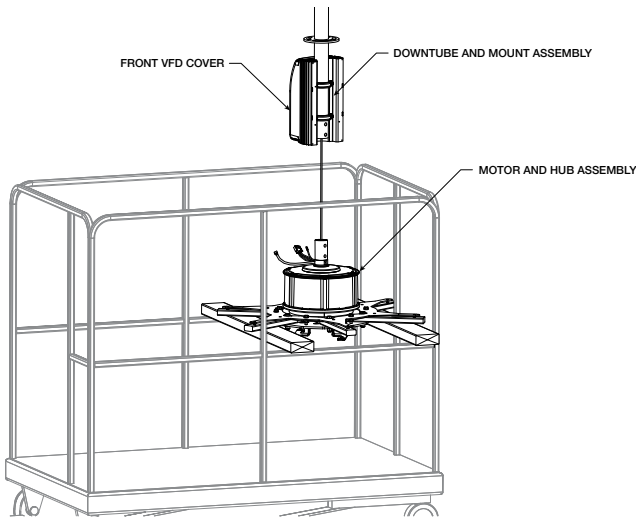
5. Slowly lift the motor/hub assembly until the motor axle is nested inside the downtube. Take care to align the motor axle holes with the downtube holes

IMPORTANT: Do not crush safety cable or wiring while lifting the motor/hub assembly into the downtube. If the safety cable or the wiring are damaged during installation, contact your local rep or the manufacturer.

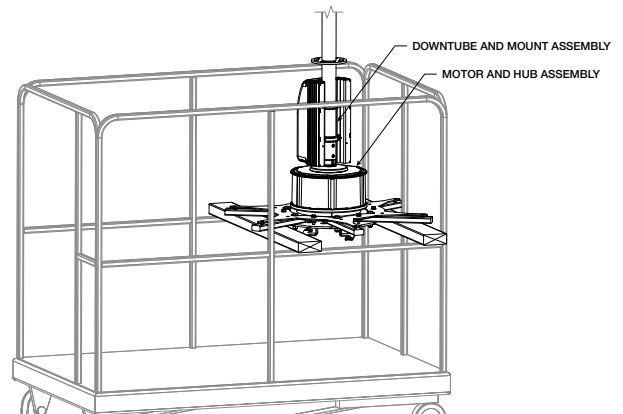
DANGER

Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

1. Using a scissor lift or other suitable lifting device, lift the motor/hub assembly by resting the struts on the lift structure or cribbing.

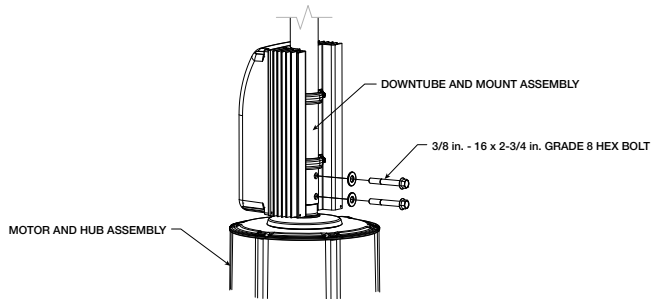


2. Feed the safety retention cable that is attached to the motor/hub assembly up through the bottom of the downtube until the loose end of the safety cable is accessible at the top of the downtube. Pull the loose end of the safety retention cable from the top of the downtube until all of the slack is pulled through.

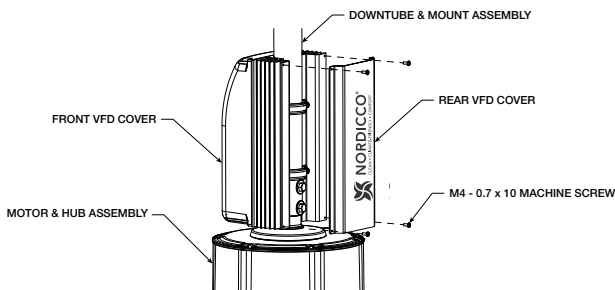


- Install the supplied (2) grade 8 hex bolts into the locknuts attached to the downtube. Torque the bolts to a value of 33 ft·lbf (44.75 N·m).

NOTE: The attached locknuts are not visible while the VFD is installed on the downtube of the fan.



- Install rear VFD cover to the back of the VFD using (4) M4-0.7 x 10mm machine screws.



Safety Retention Cable Installation

IMPORTANT: Do not put excessive tension on the safety retention cable during installation. Safety retention cable should be taut with only a small amount of slack in the cable to ensure proper functioning. Do not allow safety retention cable to contact any sharp edges.

IMPORTANT: Failure to install the safety retention cable will result in voiding of the fan warranty.

Standard Steel Cable Clamp

The following instructions apply to standard fan installations. For fans that were supplied with optional Gripple® hardware, refer to the instructions.

Required Components

- U-Bolt Steel Cable Clamp (2)

Hardware/Tools Needed (Not Included):

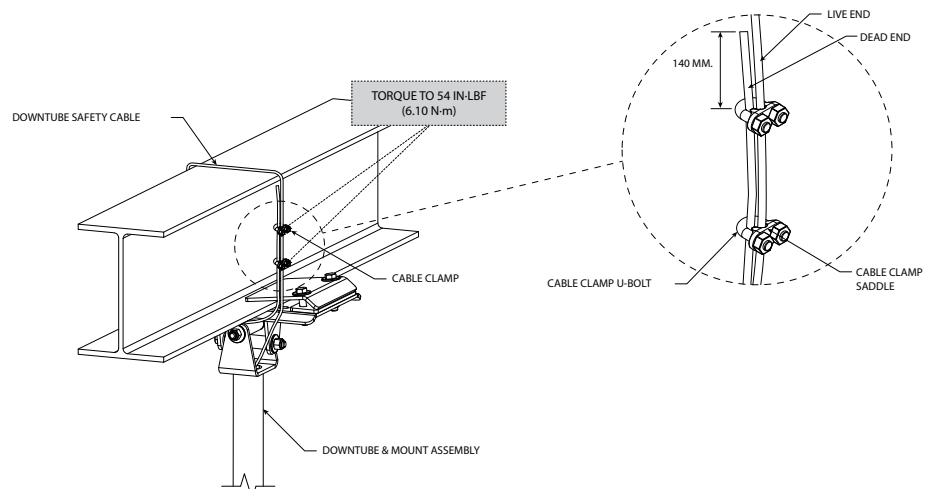
- Torque Wrench
- Socket and Wrench
- Cable Cutters (optional)

- From the top of the downtube, pull the safety retention cable until it is taut inside the downtube.
- Wrap the loose end of the safety cable around the mounting structure. Cable may be wrapped around structure multiple times if length allows. Do not allow the cable to come in contact with any sharp edges.
- Align the loose end of the safety cable (referred to as the dead-end) with the length of cable that is wrapped around the mounting structure (referred to as the live-end).
- Attach the dead-end of the safety cable to the live-end using the supplied u-bolt steel cable.

IMPORTANT: The first steel cable clamp must be installed a minimum of 140 mm away from the dead-end of the safety cable to ensure proper functioning.

IMPORTANT: Steel cable clamps are composed of two parts: the u-bolt and the saddle. Steel cable clamps must be installed with the u-bolt over the dead-end of the safety retention cable and the saddle over the live-end of the safety cable. Failure to install steel cable clamps in this manner may result in unsafe operating conditions. Refer to drawing below for correct orientation.

- Pull the dead-end of the safety cable through the steel cable clamps to tighten the cable. The cable should be pulled taut, leaving only a small amount of slack in the cable to ensure proper functioning.
- Tighten the nuts on the steel cable clamps using a socket and torque to 54 in·lbf (6.10 N·m), alternating between nuts until reaching proper torque.
- Cut or organize excess safety cable to ensure it does not interfere with fan performance. Make sure to leave at least 140 mm of cable between the dead-end of the cable and the first steel cable clamp to ensure proper functioning.



Gripple® Hardware (Optional)

Components required:

- No. 4 Gripple® Connector (1)

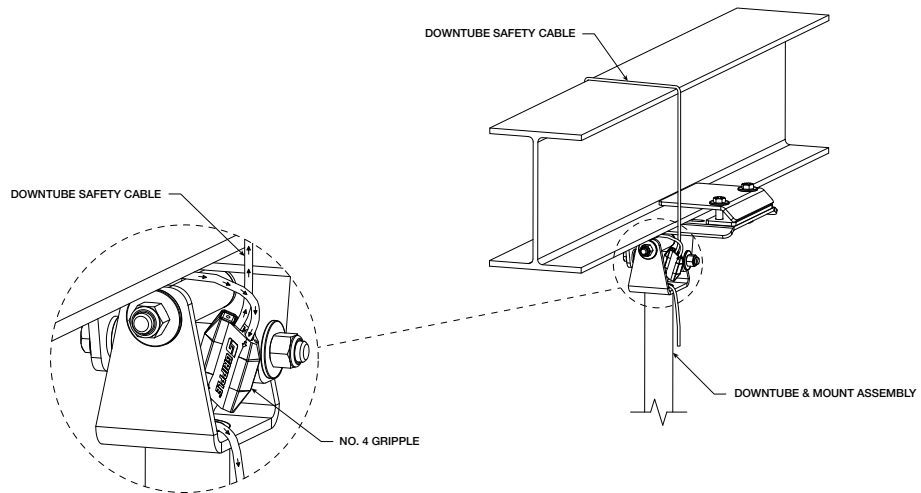
Hardware/Tools (Not Included):

- 1/16 in. Allen Wrench (optional)
- Cable Cutters (optional)

1. From the top of the downtube, pull the safety retention cable until the cable is taut inside the downtube.
2. Insert the loose end of the safety cable into the No. 4 Gripple connector. Note that the cable will only feed through the Gripple connector in one direction (marked on the Gripple connector with an arrow).
3. Slide the No. 4 Gripple connector down the safety cable until it is located near the opening at the top of the downtube.
4. Wrap the loose end of the safety cable around the mounting structure. Do not allow the cable to come in contact with any sharp edges.

5. Insert the loose end of the safety cable into the open hole of the No. 4 Gripple connector. Note that the cable will only feed through the Gripple connector in one direction (marked on the Gripple connector with an arrow).
6. Pull the loose end of the safety cable through the Gripple connector to tighten the cable. The cable should be pulled taut, leaving only a small amount of slack in the cable to ensure proper functioning.
7. Cut or organize excess safety cable to ensure it does not interfere with fan rotation.

NOTE: If necessary, the safety cable can be loosened by inserting the long end of a 1/16 in. allen wrench into either of the pin holes on the No. 4 Gripple connector and pulling the cable in the opposite direction of the arrow marked on the Gripple connector.



Guy Wire Installation

IMPORTANT: Guy wires must be installed 45° to 60° from vertical to ensure proper functioning.

Standard Steel Cable Clamp

Required Loose Components (Included):

- 6 m Guy Wire (4)

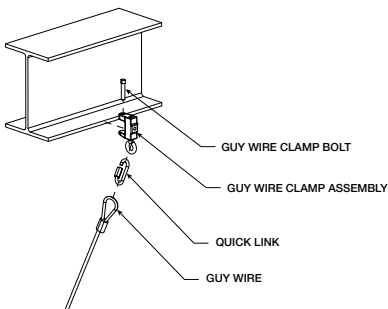
Required Components:

- Guy Wire Clamp Assembly (4)
- Guy Wire Clamp Bolt (4)
- Quick Link (8)
- U-Bolt Steel Cable Clamp (8)
- Turnbuckle (4)

Hardware/Tools Needed (Not Included):

- Level
- Torque Wrench
- Socket and Wrench
- Socket and Wrench
- Adjustable Wrench
- Cable Cutters (optional)

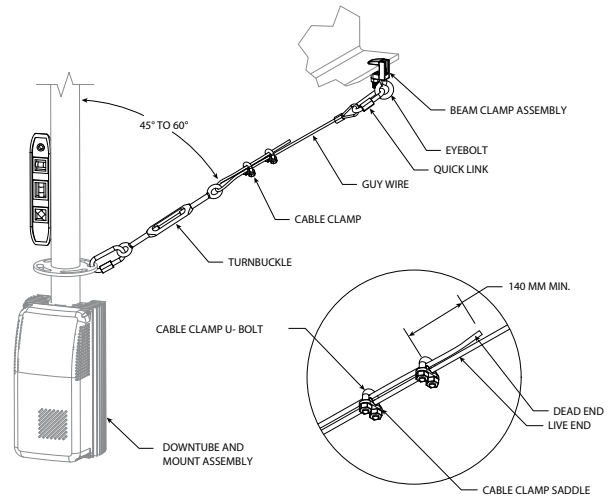
1. Secure guy wire clamps to the building structure using the guy wire clamp bolts and an adjustable wrench. Attach guy wires to the eyelets on the guy wire clamp assemblies using (4) supplied quick links.



2. Insert the loose end of each guy wire through the eyebolt on a turnbuckle. Turn the guy wire back onto itself and align the loose end of the guy wire (referred to as the dead-end) with the length of guy wire that is attached to the building structure (referred to as the live-end).
3. Attach the dead-end of each guy wire to the live-end using (2) of the supplied u-bolt steel cable clamps. Loosely tighten the nuts on the steel cable clamps, leaving enough room for the guy wire to slide through the steel cable clamps.

IMPORTANT: The first steel cable clamp must be installed a minimum of 140 mm away from the dead-end of the guy wire to ensure proper functioning.

IMPORTANT: Steel cable clamps consist of two parts: the u-bolt and the saddle. Steel cable clamps must be installed with the u-bolt over the dead-end of the guy wire and the saddle over the live-end of the guy wire. Failure to install steel cable clamps in this manner may result in unsafe operating conditions. Refer to drawing below for correct orientation.



4. Attach all (4) turnbuckles to the guy wire attachment ring located on the downtube using (4) supplied quick links.
5. Pull the dead-end of each guy wire through the steel cable clamps until taut.
6. Tighten the nuts on the steel cable clamps using a socket and torque to 54 in·lbf (6.10 N·m), alternating between nuts until reaching proper torque.
7. Place a level against the downtube and tighten all (4) turnbuckles by hand in a crisscross pattern until the guy wires are tight and the fan is level.

NOTE: When leveling the fan, place the level against the downtube in-between two neighboring guy wires to simplify the leveling process. The level should also be moved around the circumference of the downtube periodically to ensure that the fan is level in all directions.

8. Cut or organize excess guy wires to ensure that they do not interfere with fan performance. Make sure to leave at least 140 mm of wire between the dead-end of the guy wire and the first wire rope clip to ensure proper functioning.

Gripple® Hardware (Optional)

IMPORTANT: Guy wires must be installed 45° to 60° from vertical to ensure proper functioning.

Required Loose Components (Included):

- 6 m Guy Wire (4)
- No. 4 Gripple® Connector (4)

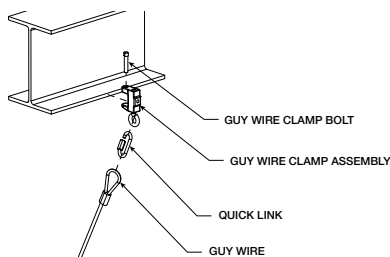
Components required:

- Guy Wire Clamp Assembly (4)
- Guy Wire Clamp Bolt (4)
- Quick Link (8)
- Turnbuckle (4)

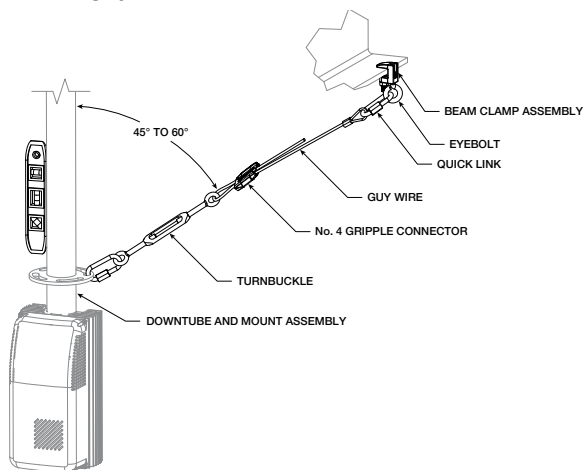
Hardware/Tools Needed (Not Included):

- Adjustable Wrench
- Level
- Allen Wrench (optional)

1. Secure guy wire clamps to the building structure using the guy wire clamp bolts. Attach guy wires to the eyelets on the guy wire clamp assemblies using (4) supplied quick links.



2. Insert the loose end of each guy wire into a No. 4 Gripple connector until a length of wire is pushed through the connector. Insert the loose end of the guy wire through the end of the turnbuckle and push back through the No. 4 Gripple connector to close the loop.
3. Attach all (4) turnbuckles to the guy wire attachment ring located on the downtube using (4) supplied quick links. Pull the loose end of each guy wire through the No. 4 Gripple connector until each guy wire is taut.



4. Place a level against the downtube and tighten all (4) turnbuckles by hand in a crisscross pattern until the guy wires are tight and the fan is level.

NOTE: When leveling the fan, place the level against the downtube in-between two neighboring guy wires to simplify the leveling process. The level should also be moved around the circumference of the downtube periodically to ensure that the fan is level in all directions.

5. Cut or organize excess guy wires to ensure that they do not interfere with fan rotation.

NOTE: If necessary, the guy wires can be loosened by inserting the long end of a 1/16 in. allen wrench into either of the pin holes on the No. 4 Gripple connector and pulling the cable in the opposite direction of the arrow marked on the Gripple connector.

Airfoil Blade and Winglet Installation

IMPORTANT: Do not operate fans without the airfoil blades. Failure to comply with this warning will result in voiding of the product warranty and may result in permanent damage to the VFD and motor.

WARNING

To reduce the risk of personal injury, do not bend motor struts, airfoil blades, or airfoil retaining links when installing the airfoil blades, balancing the blades, or cleaning the fan. Damage to these components may result in unsafe operation of the fan, which can lead to property damage, personal injury or death. Contact your local representative or the factory if replacement parts are needed.

WARNING

To reduce the risk of personal injury, do not insert foreign objects in between rotating fan blades.

Required Loose Components (Included):

- Airfoil Blade (6)
- Winglet (6)

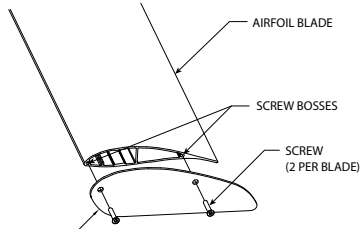
Required Components:

- #10 – 12 x 3/4 in. Screw (12)
- Washers (24)
- Grade 8 Nylon Locknut (12)
- Grade 8 Hex Bolt (12)

Hardware/Tools Needed (Not Included):

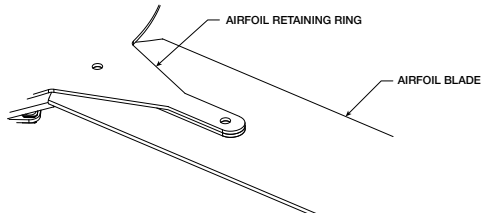
- Socket and Socket Wrench
- Wrench
- Torque Wrench
- #2 Phillips Bit and Driver

1. Install one winglet per airfoil blade using the screw bosses located in each blade on the opposite end from the mounting holes. Use a #2 phillips bit to install (2) screws per winglet. Torque screws to 60 in·lbf (6.8 N·m).

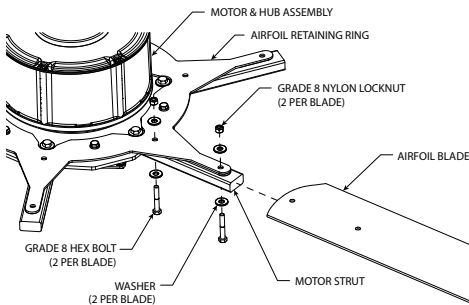


NOTE: Improperly fastened winglets may result in unwanted noise.

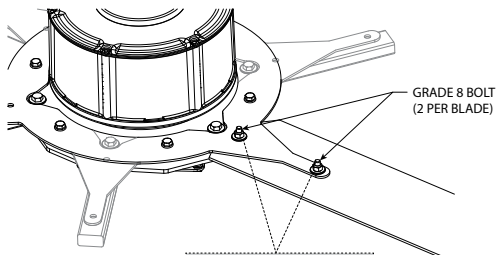
2. Lift the first blade into place, and slide over the motor strut allowing the airfoil retaining ring to rest on top of the airfoil blade. It might be necessary to use two people for this step.



3. With the blade in position on the motor strut, install (2) hex bolts, (4) washers, and (2) 18 nylon locknuts per blade as shown below. Hand tighten hardware.



4. Repeat steps 1 through 3 on remaining airfoil blades. Torque the installed bolts to 25 ft·lbf (34 N·m).



IMPORTANT: If airfoils must be removed and reinstalled for any reason, do not re-use the supplied nylon

locknuts. Re-use increases the risk of locknuts loosening during operation, which may result in unwanted noise and/or unsafe operation of the fan. Contact your local representative or the factory if replacement parts are needed.

Hub Plate Installation

Required Loose Components (Included):

- Hub Plate (1)

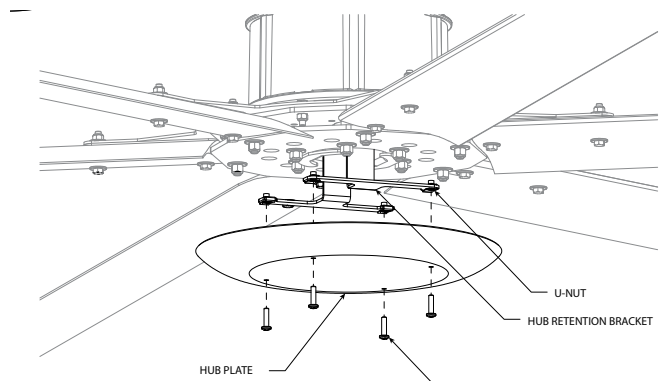
Required Components:

- Machine Screw (4)

Hardware/Tools Needed (Not Included):

- Torque Wrench

1. Align (4) holes in the faceplate with the (4) U-nuts on the hub retention bracket.
2. Insert (1) machine screw per hole and hand tighten to ensure all fasteners will engage the U-nuts.
3. Torque fasteners to 96 in·lbf (10.8 N·m).



IMPORTANT: Rotate fan impeller by hand to ensure that it rotates freely and does not rub on hub plate or come into contact with any obstructions.

Fire System Integration

Fire System Integration (Optional)

The following instructions apply to fans that were supplied with plug-and-play factory wiring, for fire system integration.

DANGER

Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

NOTE: The following instructions are only applicable to buildings that are equipped with a fire suppression system. If the building does not contain a fire suppression system, leave the crimp connector on the fire alarm landing point (located at the top of the downtube) and continue with the rest of the installation.

IMPORTANT: HVLS fans must be installed with the supplied, normally-closed PAM-1 fire alarm relay or an equivalent electromechanical or reed relay for proper function of the fire alarm emergency stop feature. Solid state relays or other digital switching relays cannot be used.

IMPORTANT: The fire alarm relay should only be installed by qualified personnel who are familiar with the operation of building fire suppression systems. It is the sole responsibility of the installer to ensure correct operation of the fire alarm relay in the event of a fire emergency in the building.

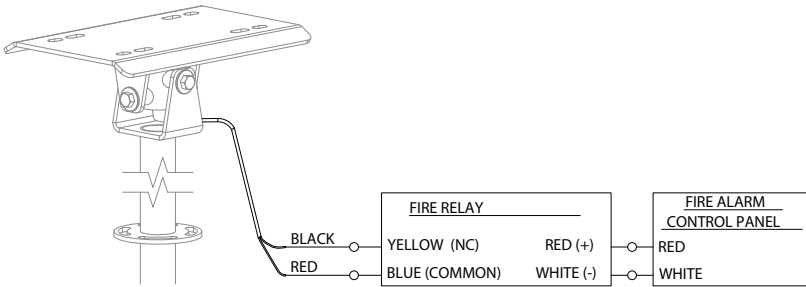
Required Loose Components (Included):

- Low Voltage (24VDC/VAC), Normally Closed Relay (1)

Hardware/Tools Needed (Not Included):

- Standard Screwdriver
- Cable Cutters
- Wire Strippers

1. If the building is equipped with a fire suppression system, remove the crimp connector from the fire alarm emergency stop landing point located at the top of the downtube by snipping the wires directly below the crimp connector.
2. Strip the loose wires and wire the supplied normally-closed relay to the fire alarm emergency stop landing point and the building's fire suppression system using the wiring diagram shown.



Mechanical Installation

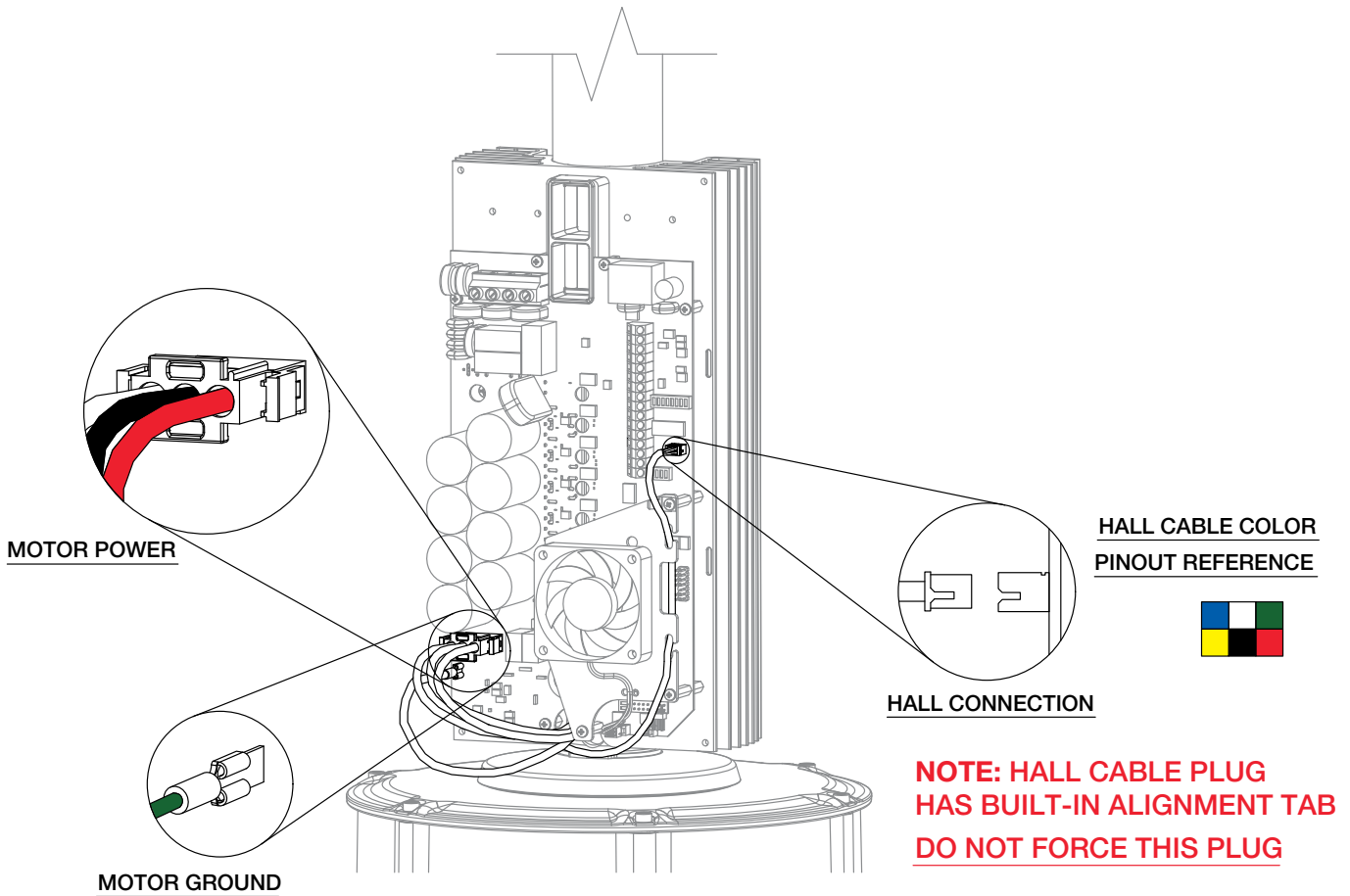
Electrical Installation

Motor Cable Connection

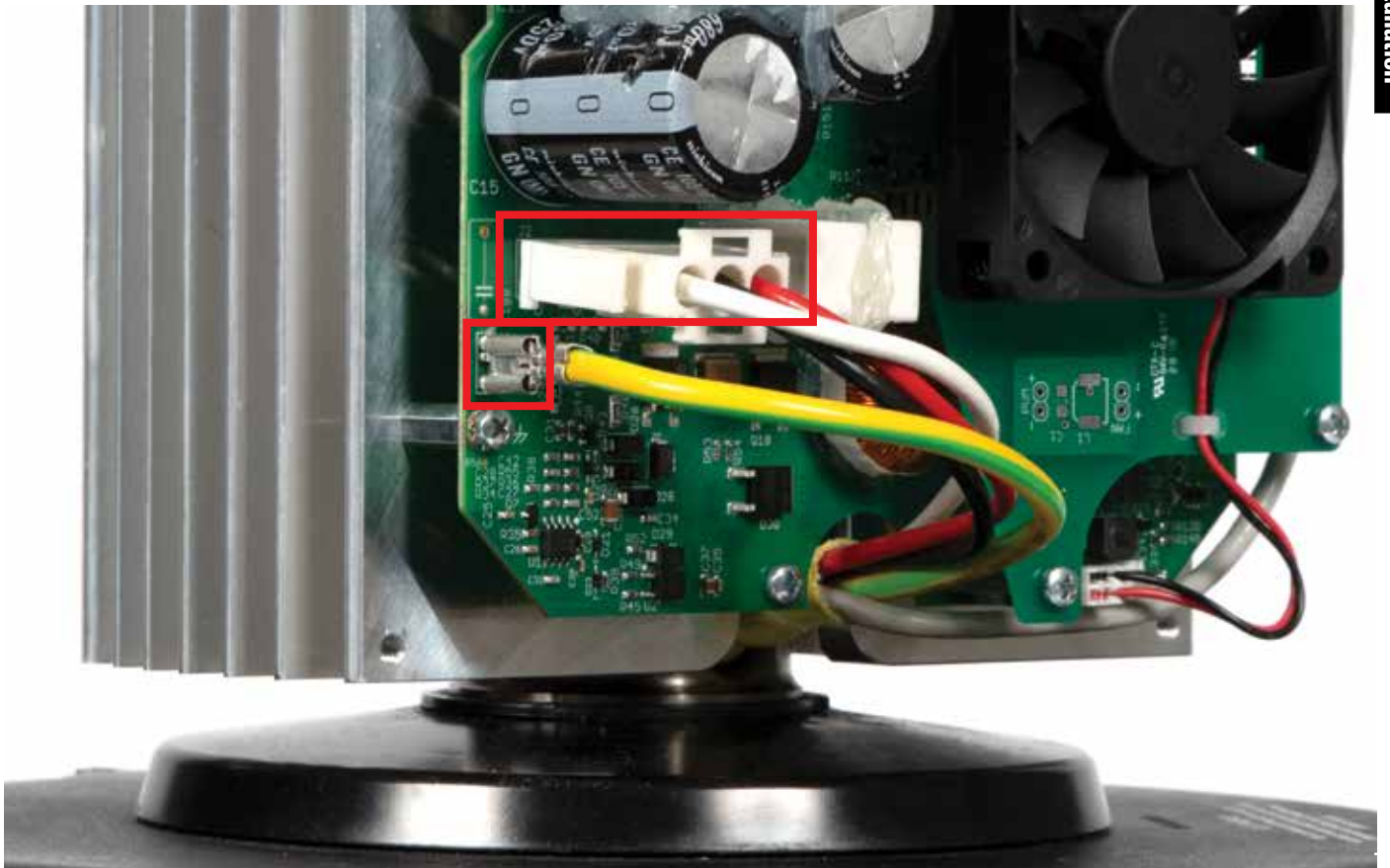
1. Using a phillips screwdriver, remove the black plastic cover on the front side of the VFD and set aside.
2. Locate the motor power, motor ground, and hall sensor cables that protrude from the top side of the motor. These cables should have been routed to the front of the VFD during mechanical installation.
3. Plug the motor power, motor ground, and hall sensor cables into the VFD circuit board as shown below. The motor power and hall sensor cables are designed to only fit in one orientation. Use the wire color references below and photos on the next two pages to identify the proper orientation. Do not force these plugs.

IMPORTANT: The motor power, motor ground, and hall sensor cables are not long enough to reach the VFD circuit board from the rear side. If the cables are not properly routed to the front of the VFD, the motor must be uninstalled and rotated 180° so that the cables can be connected.

Electrical Installation



Motor Power and Ground Cable Connection



Electrical
Installation

Hall Sensor Cable Connection



Electrical Installation



Power Wiring

DANGER

Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

IMPORTANT: Do not apply power until mechanical installation, fire alarm relay installation, communication wiring and fan control installation are complete.

IMPORTANT: Do not apply power to the fan above the rated voltage of the variable frequency drive (VFD). Failure to comply with this warning will result in voiding of the product warranty and may result in permanent damage to the VFD and motor.

IMPORTANT: To prevent electrical failures, source power must comply with the following power quality requirements. If source power falls outside of these specified tolerances, an external power line filter will be required (by others). If other power quality issues are present, contact the factory for support.

Allowable Voltage Fluctuation	+/- 10% of nominal
Allowable Frequency Fluctuation	+/- 5% of nominal (47-63 Hz)
Area of Use	Do not install fans in electrical environments with Pollution higher than Degree 2 in accordance with UL 61800-5-1
Surge Immunity	Do not install fans in electrical environments above Installation Class 3 in accordance with IEC 61000-4-5

Hardware/Tools Needed (Not Included):

- Phillips Screwdriver

With Optional Electrical Plug

1. If the fan is supplied with the optional electrical plug for power wiring, refer to the chart below for the corresponding receptacle that will be needed (provided by others).

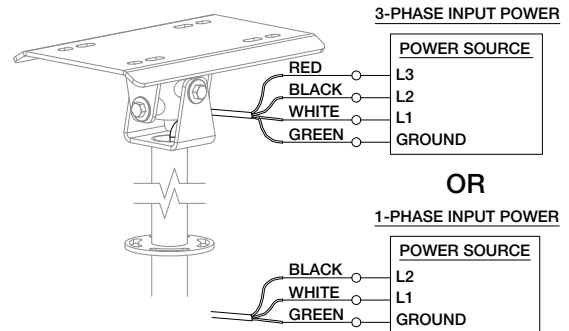
Electrical Plug Reference (Locking)			
Voltage	Phase	Plug*	Receptacle
208-230	1	L6-30P	L6-30R
277	1	L7-30P	L7-30R
208-230	3	L15-30P	L15-30R
460	3	L16-30P	L16-30R

***NOTE:** Plugs are available from manufacturer. Receptacles must be provided by others.

2. Install the receptacle according to all national and local codes for electrical wiring.
3. Insert the electrical plug into the receptacle and twist to lock the plug in place.
4. Secure any loose power cable to the building structure to ensure it does not interfere with fan performance.

Without Optional Electrical Plug

1. If the fan is not supplied with the optional electrical plug, refer to the wiring diagrams below to complete power wiring.
2. Secure any loose power cable to the building structure to ensure it does not interfere with fan performance.



Disconnect and Fuse Installation

1. If provided, mount and wire the optional safety disconnect switch outside of the sweep of the fan's airfoil blades. Installation should be completed per the disconnect manufacturer's recommendation. Be sure to follow all national and local codes for electrical installation.
2. Fusing is required unless otherwise specified by local authority. Refer to the fuse sizing chart below and install fuses per the manufacturer's recommendation. If the fan was supplied with the optional fused disconnect, the fuses received will match the models shown. Be sure to follow all national and local codes for electrical installation.

IMPORTANT: Warranty may be voided at manufacturer's discretion if correct fuses are not installed.

Fuse Sizing Chart			
Extreme 6 and 7,3 1100W Motor			
Motor Voltage	208-230V/ 1,3 PH/60 HZ	277V/ 1 PH/60 HZ	460V/ 3 PH/60 HZ
Motor Full Load Amps (FLA)*	12A	12A	3.3A
Fuse Required**	FRN-R-15	FRS-R-15	FRS-R-5
*FLA is based on worst case system conditions assuming lowest nominal voltage and phase.			
** Fuses shown are available as an optional accessory. Fuses provided by others must meet requirements of all national and local codes.			

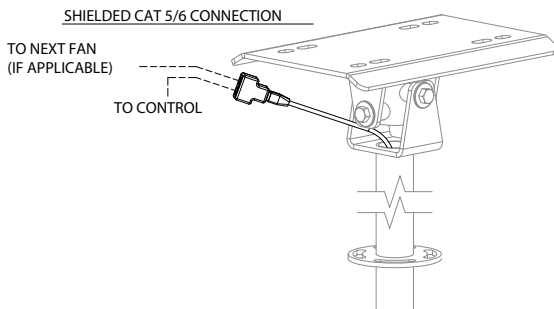
Communication Wiring

IMPORTANT: Extreme fans not installed with Northern Sky must be installed with the supplied CAT-5/6 communication cable or shielded CAT-5/6 (by others) that complies with the following specifications. Cable must be twisted pair, shielded 26 ga. CAT-5/6 cable with a drain wire and must be compliant with ISO 11801. Cable must use shielded RJ45 connectors with a soldered drain Individual CAT-5/6 cable lengths must not exceed 60 m in order to prevent network communication issues.

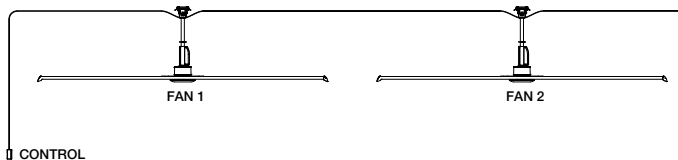
With Pre-Built CAT-5/6 Cable

Required Loose Components:

- 30-60 m CAT-5/6 Control Cable (1)
1. Plug one end of the shielded CAT-5/6 control cable into the 2-way RJ45 splitter located at the top of the downtube. The cable can be plugged into any open receptacle on the splitter.



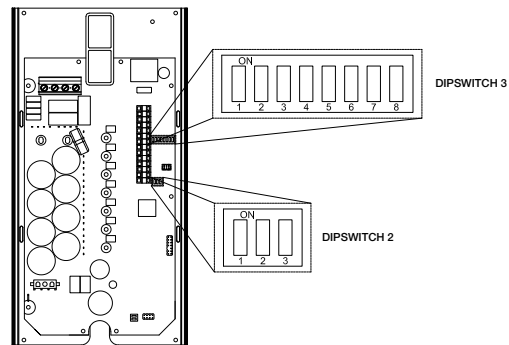
2. Identify the desired location for installation of the fan control and run the remainder of the CAT-5/6 control cable to this location.
3. Secure the CAT-5/6 control cable to the building structure to ensure it does not interfere with fan performance. To prevent communication issues, do not coil excess control cable or route control cable with power wiring.
4. If one control source will be used to operate multiple fans, the fans can be daisy-chained together to create a network using the following instructions.



- a. Connect a shielded CAT-5/6 control cable to the first fan in the daisy-chain using steps 1-3 above.
- b. Plug an additional CAT-5/6 control cable into the 2-way RJ45 splitter located at the top of the downtube on the first fan. Connect the other end of this CAT-5/6 cable into the 2-way splitter on the next fan.
- c. Repeat step 4b. for subsequent fans until all fans in the chain are connected in series.
- d. Follow the "Fan Networking" instructions to complete network setup for the fans.

Fan Networking

If networking multiple fans to run using a single control source, the dipswitch settings and wiring on each fan's VFD circuit board will need to be adjusted using the following instructions.



First Fan

1. Determine the first fan in the network daisy-chain by identifying the fan that will be directly connected to the control source.
2. Dipswitch 2 is used to set parameters that improve network function. Verify that each of the switches on dipswitch 2 are set as follows:
 - Position 1 – Off
 - Position 2 – On
 - Position 3 – On
3. Dipswitch 3 is used to set unique Modbus addresses for each fan in the daisy-chain. Adjust positions 1-5 on dipswitch 3 to set the desired Modbus address. A table with all possible Modbus addresses is shown to the right.

IMPORTANT: Positions 6 - 8 are used to set parameters needed for fan operation and should not be adjusted. Default settings are as follows:

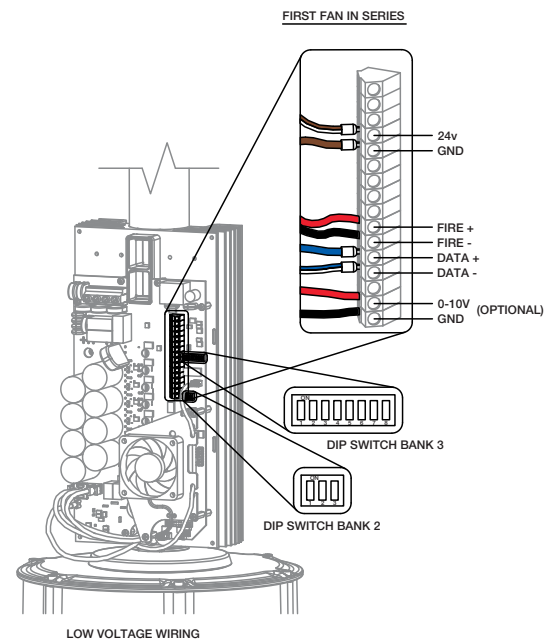
Position 6 – On

Position 7 – Off

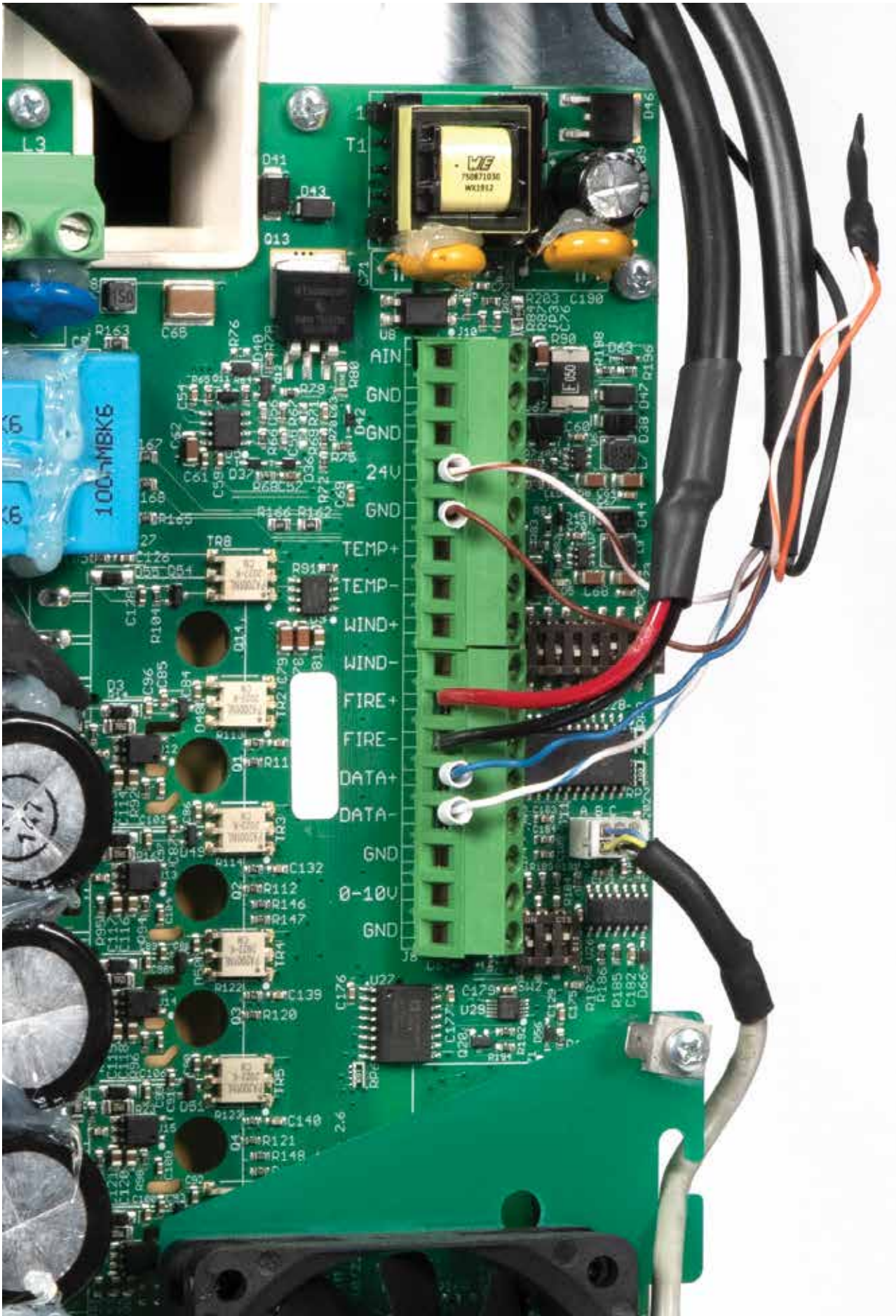
Position 8 – Off

- Verify that the low voltage wiring terminal strip on the VFD circuit board is wired as shown in the diagram and picture (First Fan). Reinstall the black plastic cover that was previously set aside on the front of the VFD.

Modbus Address Settings - Dipswitch 3								
Fan Number	Modbus Address	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6, 7, 8	
N/A	1	RESERVED FOR HVLS FAN CONTROLS						Do Not Modify
1	2	On	Off	Off	Off	Off		
2	3	Off	On	Off	Off	Off		
3	4	On	On	Off	Off	Off		
4	5	Off	Off	On	Off	Off		
5	6	On	Off	On	Off	Off		
6	7	Off	On	On	Off	Off		
7	8	On	On	On	Off	Off		
8	9	Off	Off	Off	On	Off		
9	10	On	Off	Off	On	Off		
10	11	Off	On	Off	On	Off		
11	12	On	On	Off	On	Off		
12	13	Off	Off	On	On	Off		
13	14	On	Off	On	On	Off		
14	15	Off	On	On	On	Off		
15	16	On	On	On	On	Off		
16	17	Off	Off	Off	Off	On		
17	18	On	Off	Off	Off	On		
18	19	Off	On	Off	Off	On		
19	20	On	On	Off	Off	On		
20	21	Off	Off	On	Off	On		
21	22	On	Off	On	Off	On		
22	23	Off	On	On	Off	On		
23	24	On	On	On	Off	On		
24	25	Off	Off	Off	On	On		
25	26	On	Off	Off	On	On		
26	27	Off	On	Off	On	On		
27	28	On	On	Off	On	On		



First Fan



Fan
Networking

All Remaining Fans

- Set dipswitch 2 as shown below. Dipswitch 2 is used to set parameters that improve network function and will need to be adjusted for all fans in the network except for the first fan.

Position 1 – Off

Position 2 – Off

Position 3 – Off

- Adjust positions 1 – 5 on dipswitch 3 so that each successive fan has a unique Modbus address. A table with all possible Modbus addresses is shown to the right.

IMPORTANT: Positions 6 - 8 are used to set parameters needed for fan operation and should not be adjusted. Default settings are as follows:

Position 6 – On

Position 7 – Off

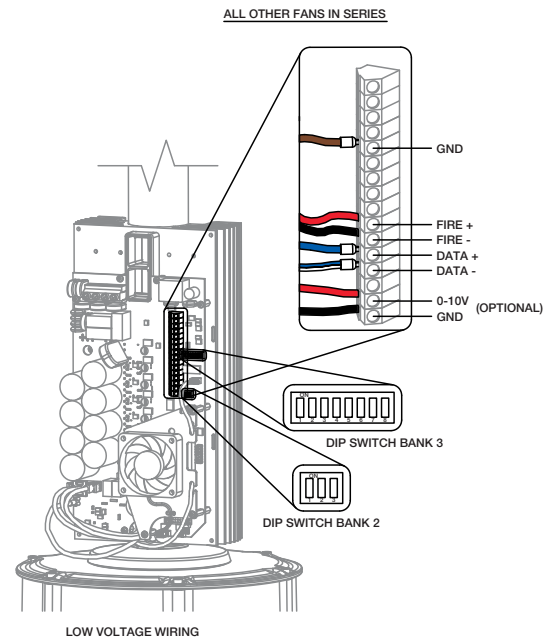
Position 8 – Off

NOTE: It is good practice to use successive Modbus addresses for networked fans, but this is not necessary for proper functioning of the network.

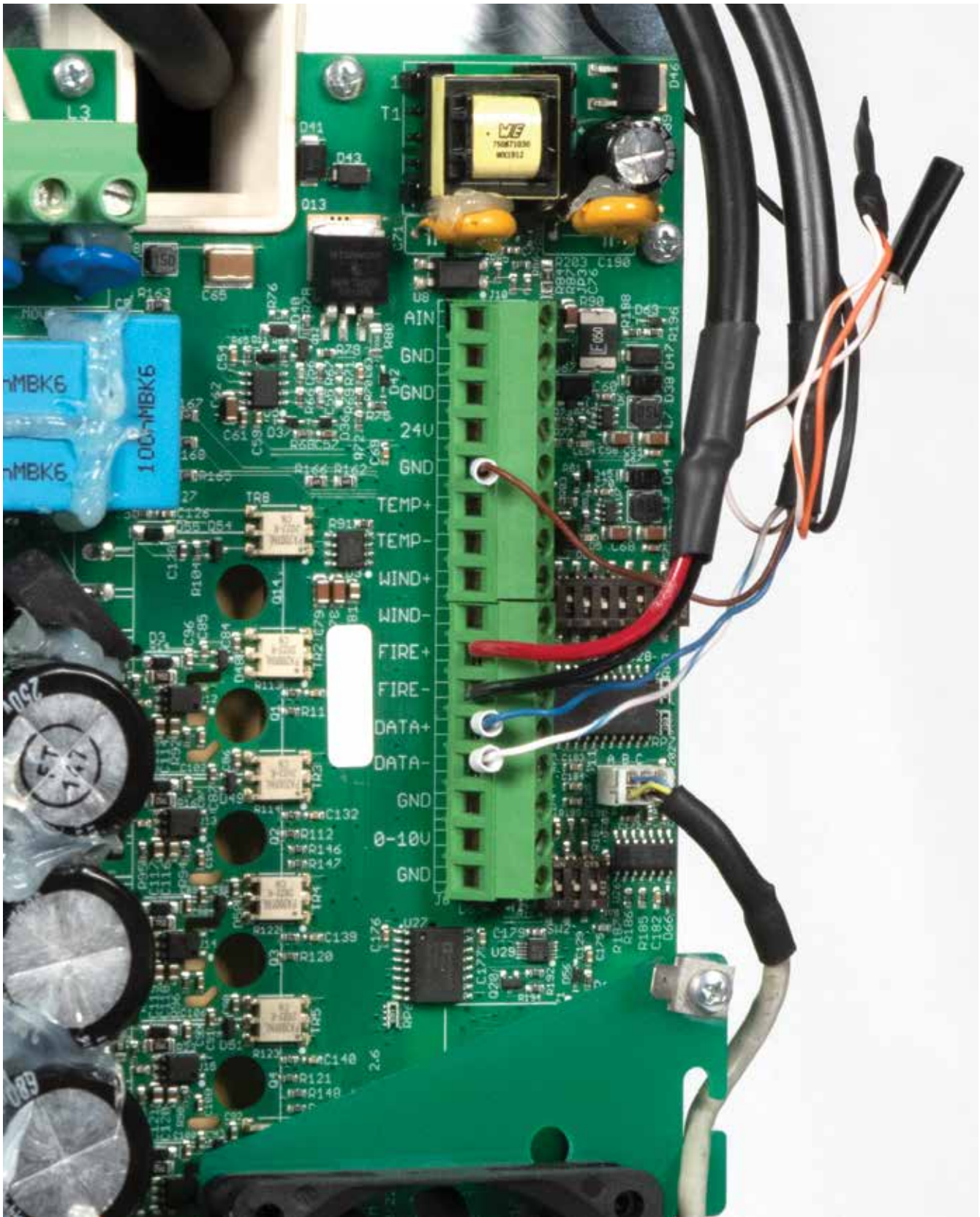
- On the low voltage wiring terminal strip, remove the 24V (white-brown) wire and cap with a wire nut or heat shrink. When complete, verify that the low voltage wiring terminal strip on the VFD circuit board is wired as shown in the diagram and picture (All Remaining Fans).
- Reinstall the black plastic cover that was previously set aside on the front of the VFD.

Modbus Address Settings - Dipswitch 3								
Fan Number	Modbus Address	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6, 7, 8	
N/A	1	RESERVED FOR HVLS FAN CONTROLS						
1	2	On	Off	Off	Off	Off		
2	3	Off	On	Off	Off	Off		
3	4	On	On	Off	Off	Off		
4	5	Off	Off	On	Off	Off		
5	6	On	Off	On	Off	Off		
6	7	Off	On	On	Off	Off		
7	8	On	On	On	Off	Off		
8	9	Off	Off	Off	On	Off		
9	10	On	Off	Off	On	Off		
10	11	Off	On	Off	On	Off		
11	12	On	On	Off	On	Off		
12	13	Off	Off	On	On	Off		
13	14	On	Off	On	On	Off		
14	15	Off	On	On	On	Off		
15	16	On	On	On	On	Off		
16	17	Off	Off	Off	Off	On		
17	18	On	Off	Off	Off	On		
18	19	Off	On	Off	Off	On		
19	20	On	On	Off	Off	On		
20	21	Off	Off	On	Off	On		
21	22	On	Off	On	Off	On		
22	23	Off	On	On	Off	On		
23	24	On	On	On	Off	On		
24	25	Off	Off	Off	On	On		
25	26	On	Off	Off	On	On		
26	27	Off	On	Off	On	On		
27	28	On	On	Off	On	On		

Do Not Modify



All Remaining Fans



Operation And Maintenance

Pre-Start-Up Checks

1. Disconnect and lock-out all power switches to fan.
2. Check all fasteners on the ceiling mount, mounting kit, blades, VFD, motor and accessories for tightness.
3. Rotate the fan impeller by hand to ensure that it rotates freely and does not come into contact with any obstructions.
4. Check all electrical connections for proper attachment.
5. Verify that the fan is hanging so that the airfoils and downtube are level and the fan is plumb to the floor. Adjust guy wire tension as necessary (if applicable).

Fan Operation

IMPORTANT: If unusual vibration or oscillating movement is observed during fan operation, immediately discontinue use of the fan and contact the manufacturer or a suitably qualified maintenance/repair technician.

1. When the fan is started, observe the operation and check for any unusual noise, vibration or overheating. Refer to the Troubleshooting section of this manual if a problem develops.
2. With the system in full operation, measure current input to the VFD and compare with the FLA ratings in the table above to determine if the motor/VFD system is operating under safe load conditions.
3. Keep approaches to fan clean and free from obstruction.

Fan Inspection

DANGER

Disconnect and secure to the 'OFF' position all electrical power to the fan prior to inspection or servicing. Failure to comply with this safety precaution could result in serious injury or death.

Inspection of the fan should be conducted at the first 30 minute and 24 hour intervals of satisfactory operation.

- 30 Minute Interval - Check all fasteners for tightness. Adjust and tighten as necessary.
- 24 Hour Interval - Inspect all fan components. Check all fasteners, airfoil retaining ring, the safety cable, and guy wires (if applicable). Adjust and tighten as necessary.

Fan Maintenance

NOTE: Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations and have experience with this type of equipment.

Once the fan has been put into operation, a periodic maintenance program should be set up to ensure reliable fan performance. A proper maintenance program will help deliver years of dependable service. Items to be included in this program are as follows:

1. Verify that all fasteners are tight and properly torqued.
2. Verify that all of the fan's safety systems – safety cable, airfoil retaining ring, and guy wires (if applicable) are properly installed. Inspect for signs of damage or failure. Safety cable and guy wire tension should also be checked. Safety cable should be wrapped around the building structure leaving as little slack as possible. Guy wires should be under enough tension to prevent any lateral movement of the motor and downtube (if applicable).
3. Inspect the fan for signs of fatigue, corrosion, or wear.
4. Impellers require little attention when moving clean air. Occasionally, oil and dust may accumulate causing imbalance. When this occurs, clean the impeller and other fan components to ensure smooth and safe operation. Remove any accumulated dust and dirt using hot water or mild cleaning solutions. Harsh chemicals should not be used to clean the fan as they may damage the fan's finish or motor.

IMPORTANT: Do not allow water or solvents to enter the motor or VFD. Under no circumstances should motors or VFDs be sprayed with steam, water or solvents.

5. Motor maintenance is generally limited to cleaning. Limit cleaning to exterior surfaces only. Removing dust buildup on motor housing ensures proper motor cooling.
6. Prior to restarting unit, check all fasteners for tightness each time maintenance checks are performed.

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