

INSTALLATION GUIDE

Installation Checklist

Did a structural engineer approve the mounting structure? (See p. 8 for Big Ass Fans approved mounting structures.)

Are you familiar with the function and use of the safety cable? (See p. 17 for information on properly securing the safety cable.)

Will the fan be installed so that the blades are at least 10 ft (3.05 m) above the floor?

Will the fan be installed so that the blades have at least 2 ft (0.61 m) of clearance from obstructions?

Will the fan be installed so that it is not subjected to high winds (such as from an HVAC system or near a large garage door)? Big Ass Fans recommends that a fan be installed at a distance (from HVAC equipment) no less than 2x the fan's diameter when measured from the center of the fan to the equipment. If the fan is mounted lower than an HVAC supply and return diffuser's discharge, the fan should be installed no less than 2x the fan's diameter from the diffuser when measured from the center of the fan to the diffuser. If the fan is mounted at the same height or higher than a downward discharge diffuser, the fan is recommended to be installed no less than 1x the fan's diameter from the diffuser when measured from the center of the fan to the diffuser.

Will the distance between multiple fans be at least 2.5x the fans' diameter when measured from the centers of the fans.

If installing to an I-beam, is the upper yoke the correct size? (See p. 11 for more information on installing the fan to an I-beam.)

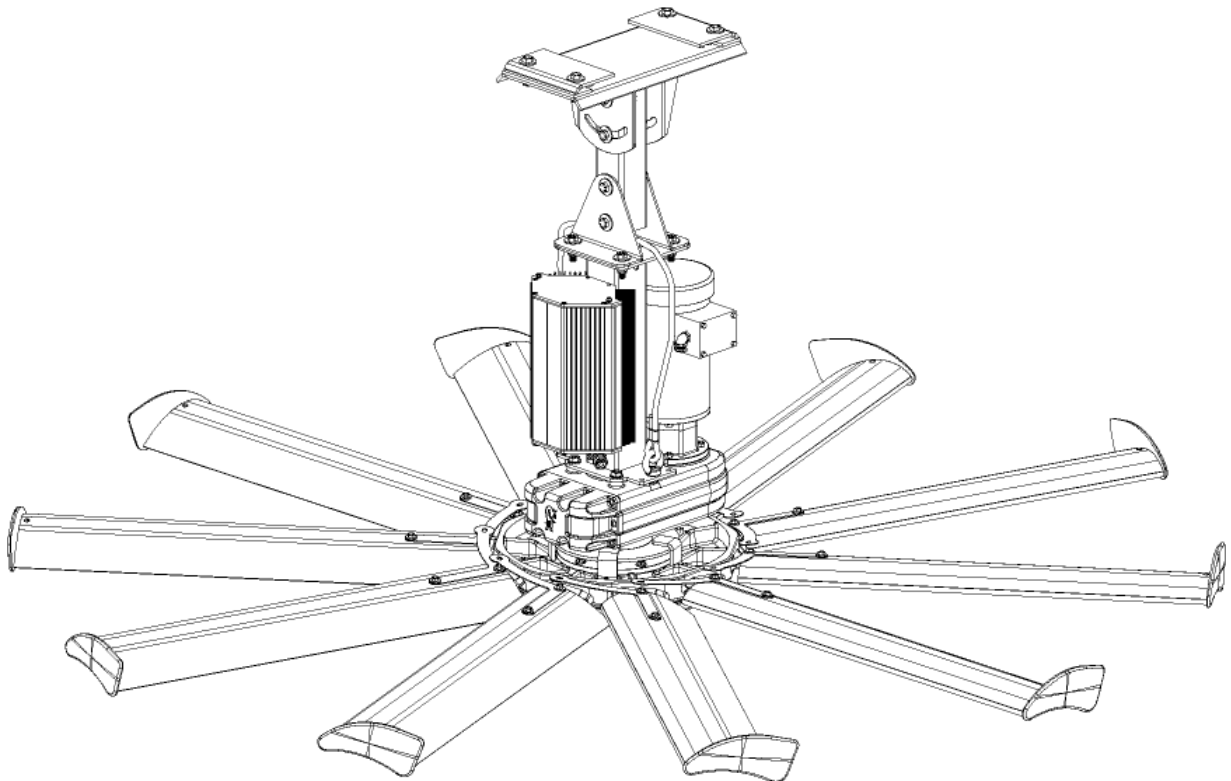
If you ordered multiple fans, did you keep the parts for each fan together? (It is critical that the airfoils be properly matched with the motor unit.)

Do you have the correct power circuit for the fan controller? (See p. 24 for information on selecting the correct circuit/fuse for the fan controller.)

Customer Service: 1-877-BIG-FANS
(International: 1-859-233-1271)

Installation Guide

8'-24' Powerfoil® X



Installation Guide:
170511- May 2011
Rev. B

**May be covered by one or more
of the following United States Patents:** 6,244,821;
6,589,016; 6,817,835; 6,939,108; 7,252,478; 7,284,960;
D607,988; D587, 799; 7,654,798; and other patents pending

2425 Merchant Street
Lexington, KY 40511
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www.bigassfans.com



Intertek
3128438

Conforms to ANSI/UL STD 507
Certified to CAN/CSA C22.2 No. 113



This product was manufactured in a plant
whose Management System is certified as
being in conformity with ISO 9001:2008



IMPORTANT SAFETY INSTRUCTIONS READ AND SAVE THESE INSTRUCTIONS

WARNING—TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

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

CAUTION: The installation of a Big Fan must be in accordance with the requirements specified in this installation manual and with any additional requirements set forth by the national electric code (NEC), ANSI/NFPA 70-1999, and all local codes. Code compliance is ultimately YOUR responsibility! Failure to comply with these codes could result in personal injury or property damage.

WARNING: The fan controllers contain high voltage capacitors which take time to discharge after removal of main supply. Before working on the fan controller, ensure isolation of main supply from line inputs at the fan controller. Wait 3 minutes for capacitors to discharge to safe voltage levels. Note: darkened display LEDs are not an indication of safe voltage levels. Failure to do so may result in personal injury or death.

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. Contact Big Ass Fans at 1-877-BIG-FANS if you have any questions regarding the electrical installation of this fan.

WARNING—To reduce the risk of fire, electric shock, and injury to persons, Big Ass Fans must be installed with Big Ass Fan supplied controllers. Other parts cannot be substituted.

CAUTION: When service or replacement of a component in the fan requires the removal or disconnection of a safety device, the safety device is to be reinstalled or remounted as previously installed.

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—TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

- a. Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
- b. 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.

CAUTION: Do not bend the blades when installing, adjusting, or cleaning the fan. Do not insert foreign objects in between rotating fan blades.

WARNING: Stay alert, watch what you are doing, and use common sense when installing fans. Do not install fans if tired or under the influence of drugs, alcohol, or medication. 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 those intended by the manufacturer.

CAUTION: The Big Ass Fans product warranty will not cover equipment damage or failure that is caused by improper installation.

ATTENTION: If installing a VESDA system, refer to the VESDA Installation Guide BEFORE hanging the fan.

CAUTION: Do not operate fan with a damaged cord or plug. Return fan to an authorized service facility for examination or repair.

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Introduction

1

Thank You

Thank you and congratulations on your Big Ass Fans purchase! You now have an efficient and cost-effective way to stay cool in the summer and warm in the winter. The sleek revolutionary design of our fans will look great in any commercial or industrial setting. More importantly, you can rest assured that you have a product that is backed by extensive research, thorough testing, and quality manufacturing.

If you have any questions or comments, contact us at 1-877-BIG-FANS or visit our Web site at www.BigAssFans.com.

Who We Are and What We Do

FOUNDED IN 1999, Lexington, KY-based Big Ass Fan Company is the preeminent designer and manufacturer of high volume/low speed (HVLS) ceiling and vertical fans designed to improve facility and worker comfort in large commercial, industrial, agricultural, and institutional buildings worldwide.

2

About this Fan

Powerfoil® X Specifications (with Powerfoil Winglets)

FAN DIAMETER:	8 ft (2.4 m)	10 ft (3 m)	12 ft (3.6 m)	14 ft (4.3 m)
AIR DISP. @ MAX SPEED:	41,905 cfm (19,777 l/s)	73,215 cfm (34,554 l/s)	103,460 cfm (48,828 l/s)	137,556 cfm (64,919 l/s)
MOTOR SIZE:	1.0 HP (.75 kW)	1.0 HP (.75 kW)	1.0 HP (.75 kW)	1.5 HP (1.1 kW)
REQUIRED SUPPLY CIRCUIT SIZE:	10A @ 200-250V 3Φ 10A @ 400-480V 3Φ 20A @ 200-250V 1Φ	10A @ 200-250V 3Φ 10A @ 400-480V 3Φ 20A @ 200-250V 1Φ	10A @ 200-250V 3Φ 10A @ 400-480V 3Φ 20A @ 200-250V 1Φ	15A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ
FULL LOAD CURRENT:	3.4A @ 200-250V, 1.7A @ 400-480V	3.4A @ 200-250V, 1.7A @ 400-480V	3.4A @ 200-250V, 1.7A @ 400-480V	5.6A @ 200-250V, 2.8A @ 400-480V
MAX RPM:	118 RPM	101 RPM	84 RPM	72 RPM
AIRFOIL LENGTH:	37.5 in (0.95 m)	49.5 in (1.26 m)	61.5 in (1.56 m)	73.5 in (1.87 m)
FAN WEIGHT*:	272 lbs (123 kg)	289 lbs (131 kg)	305 lbs (138 kg)	322 lbs (146 kg)
SUGGESTED DISTANCE FROM CEILING**:	3 ft (0.61 m)	3 ft (0.61 m)	3 ft (0.61 m)	4 ft (0.91 m)

(cont.)

FAN DIAMETER:	16 ft (4.9 m)	18 ft (5.5 m)	20 ft (6.1 m)	24 ft (7.3 m)
AIR DISP. @ MAX SPEED:	162,831 cfm (76,848 l/s)	200,817 cfm (94,775 l/s)	218,392 cfm (103,070 l/s)	345,941 cfm (163,266 l/s)
MOTOR SIZE:	1.5 HP (1.1 kW)	1.5 HP (1.1 kW)	2.0 HP (1.5 kW)	2.0 HP (1.5 kW)
REQUIRED SUPPLY CIRCUIT SIZE:	15A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ	15A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ	15A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ	15A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ
FULL LOAD CURRENT:	5.6A @ 200-250V, 2.8A @ 400-480V	5.6A @ 200-250V, 2.8A @ 400-480V	6.4A @ 200-250V, 3.2A @ 400-480V	6.4A @ 200-250V, 3.2A @ 400-480V
MAX RPM:	63 RPM	55 RPM	47 RPM	42 RPM
AIRFOIL LENGTH:	85.5 in (2.17 m)	97.5 in (2.48 m)	109.5 in (2.78 m)	133.5 in (3.39 m)
FAN WEIGHT*:	338 lbs (153 kg)	354 lbs (161 kg)	406 lbs (184 kg)	439 lbs (199 kg)
SUGGESTED DISTANCE FROM CEILING**:	4 ft (0.91 m)	4 ft (0.91 m)	5 ft (1.22 m)	5 ft (1.22 m)

*Weight does not include mounting yokes or extension tube. Add 36 lbs for standard mount kit with 1 ft extension, and 4 lbs for every additional foot of extension length. Add 5 lbs more for large upper yoke.

**The distance of the fan from the ceiling should be measured from the top of the winglet to the ceiling.

CAUTION—Big Ass Fans requires that the Powerfoil X fan be supplied from one of the following types of transformers:

400-480V models: 480V / 277V Wye Secondary (Neutral not utilized)
200-250V models: 208V / 120V Wye Secondary (Neutral not utilized)
240V / 120V Delta Secondary (Wild / High Phase B)

Integration into any other power distribution scheme may result in improper fan operation or premature hardware failure! See p. 24 for more information.

About this Fan (cont.)**Powerfoil® X Specifications (with PowerfoilPlus Winglets)**

FAN DIAMETER:	10 ft (3 m)	12 ft (3.6 m)	14 ft (4.3 m)	16 ft (4.9 m)
AIR DISP. @ MAX SPEED:	100,871 cfm (47,606 l/s)	132,536 cfm (62,550 l/s)	144,556 cfm (68,223 l/s)	184,944 cfm (87,284 l/s)
MOTOR SIZE:	1.0 HP (.75 kW)	1.5 HP (1.1 kW)	1.5 HP (1.1 kW)	1.5 HP (1.1 kW)
REQUIRED SUPPLY CIRCUIT SIZE:	10A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ	15A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ	15A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ	15A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ
FULL LOAD CURRENT:	3.4A @ 200-250V, 1.7A @ 400-480V	5.6A @ 200-250V, 2.8A @ 400-480V	5.6A @ 200-250V, 2.8A @ 400-480V	5.6A @ 200-250V, 2.8A @ 400-480V
MAX RPM:	84 RPM	72 RPM	63 RPM	56 RPM
AIRFOIL LENGTH:	49.5 in (1.26 m)	61.5 in (1.56 m)	73.5 in (1.87 m)	85.5 in (2.17 m)
FAN WEIGHT*:	296 lbs (134 kg)	312 lbs (141 kg)	329 lbs (149 kg)	345 lbs (156 kg)
SUGGESTED DISTANCE FROM CEILING**:	7 ft (2.1 m)	7 ft (2.1 m)	7 ft (2.1 m)	7 ft (2.1 m)

(cont.)

FAN DIAMETER:	18 ft (5.5 m)	20 ft (6.1 m)	24 ft (7.3 m)
AIR DISP. @ MAX SPEED:	210,046 cfm (99,111 l/s)	235,148 cfm (110,978 l/s)	368,516 cfm (173,920 l/s)
MOTOR SIZE:	1.5 HP (1.1 kW)	2.0 HP (1.5 kW)	2.0 HP (1.5 kW)
REQUIRED SUPPLY CIRCUIT SIZE:	15A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ	15A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ	15A @ 200-250V 3Φ 10A @ 400-480V 3Φ 30A @ 200-250V 1Φ
FULL LOAD CURRENT:	5.6A @ 200-250V, 2.8A @ 400-480V	6.4A @ 200-250V, 3.2A @ 400-480V	6.4A @ 200-250V, 3.2A @ 400-480V
MAX RPM:	47 RPM	46 RPM	39 RPM
AIRFOIL LENGTH:	97.5 in (2.48 m)	109.5 in (2.78 m)	133.5 in (3.39 m)
FAN WEIGHT*:	361 lbs (164 kg)	413 lbs (187 kg)	446 lbs (202 kg)
SUGGESTED DISTANCE FROM CEILING**:	7 ft (2.1 m)	7 ft (2.1 m)	7 ft (2.1 m)

*Weight does not include mounting yokes or extension tube. Add 36 lbs for standard mount kit with 1 ft extension, and 4 lbs for every additional foot of extension length. Add 5 lbs more for large upper yoke.

**The distance of the fan from the ceiling should be measured from the top of the winglet to the ceiling.

CAUTION—Big Ass Fans requires that the Powerfoil X fan be supplied from one of the following types of transformers:

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 200-250V models: 208V / 120V Wye Secondary (Neutral not utilized)
 240V / 120V Delta Secondary (Wild / High Phase B)

Integration into any other power distribution scheme may result in improper fan operation or premature hardware failure! See p. 24 for more information.

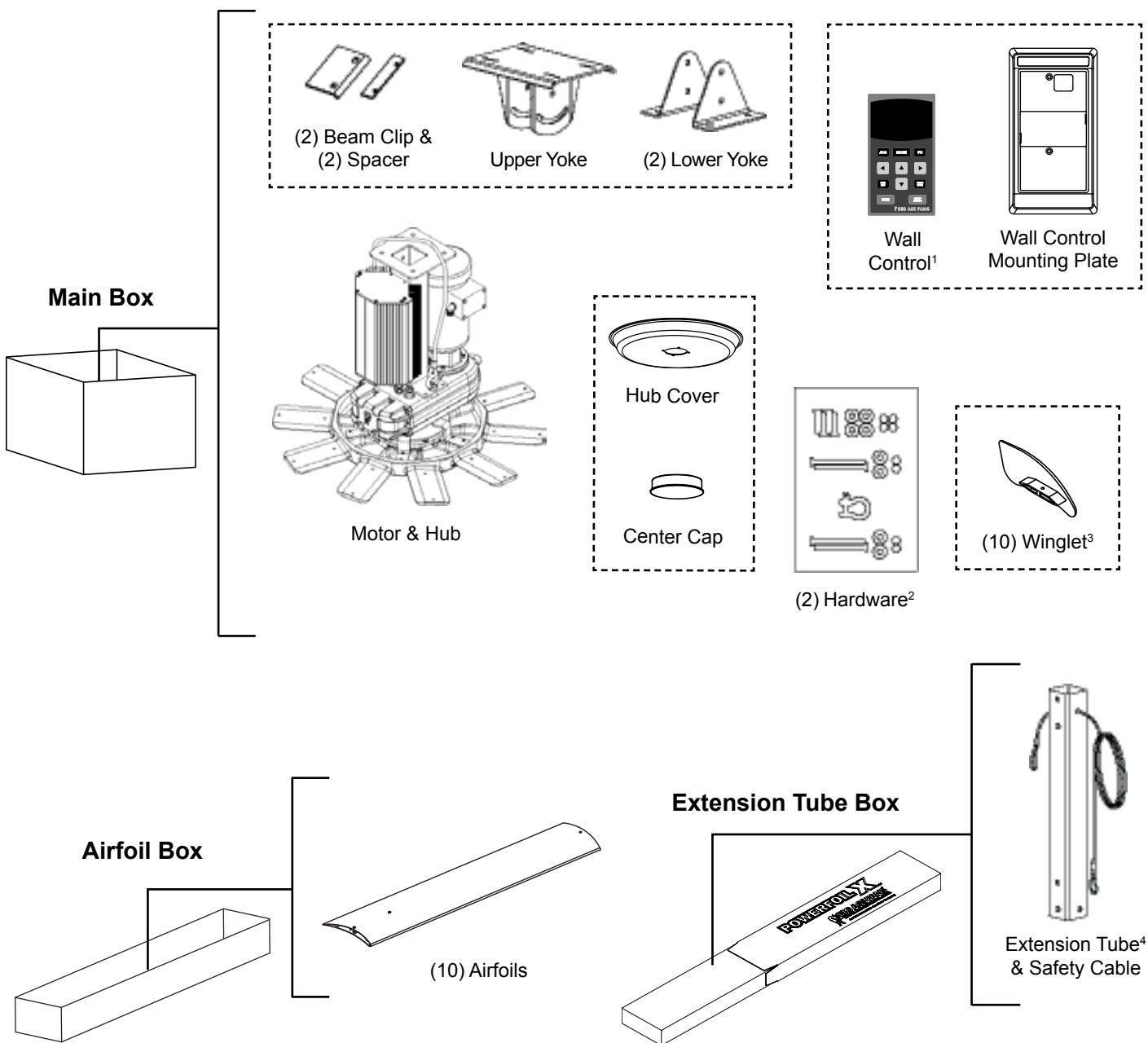
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What's in the Box

The fan is shipped in multiple boxes. The larger box contains the motor/hub assembly, upper yoke (with beam clips and spacers), lower yoke, extension tube (if 3 ft or shorter in length) with attached safety cable, winglets (Powerfoil® or Powerfoil®Plus), hub cover (with junction box and center cap), wall control (with wall control mounting plate), and hardware. The smaller box contains the airfoils. If the extension tube is 4 ft or longer, it will also be shipped in a separate box. If a light was ordered, it will also be shipped in a separate box.

CAUTION: If you ordered multiple fans, be sure to keep the components of each fan together. The fans each have differently rated components that are not interchangeable.

Note: Dashed lines indicate internal boxes. Drawings below are not to scale.



1. Adapter cable and CAT 5 patch cable are included in the box with the wall control. Adapter cable is connected to the wall control and must be utilized for proper fan operation. See p. 25 for installation instructions.
2. Airfoil retainers packed in bag with Installation Guide; winglet hardware packed in winglet box; hub cover hardware packed with junction box and center cap; guy wires (if ordered) are bagged separately in main box.
3. Powerfoil® (shown) or Powerfoil®Plus.
4. Safety cable is attached to extension tube. If extension tube is 4 ft or longer, it will be shipped in a separate box.


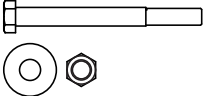
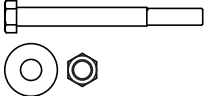
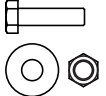

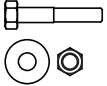

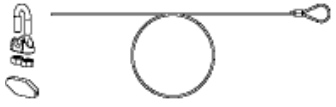
Pre-Installation

Parts Included




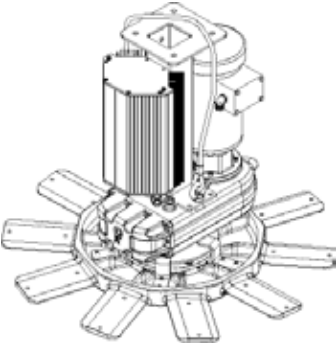

Note: Drawings below are not to scale.

Note: No hardware substitutions are acceptable.

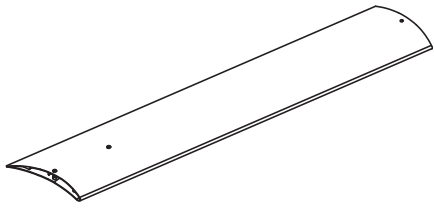



Hardware

			
Beam Clip Hardware (4) 1/2-13 x 2" GR 8 Bolt (8) 1/2" Flat Washer (4) 1/2-13 Nylock Nut	Single Pivot Hardware (2) 1/2-13 x 5" GR 8 Bolt (4) 1/2" Flat Washer (2) 1/2-13 Nylock Nut	Lower Yoke Hardware (2) 1/2-13 x 5" GR 8 Bolt (4) 1/2" Flat Washer (2) 1/2-13 Nylock Nut	Motor Hub Hardware (4) 1/2-13 x 1 3/4" GR 8 Bolt (8) 1/2" Flat Washer (4) 1/2-13 Nylock Nut
			
Winglet Hardware (10) 10-24 x 1/2" Bolt (10) 10-24 x 3/4" Barrel	Airfoil Hardware (20) 5/16-18 x 2" GR 8 Bolt (40) 5/16" Flat Washer (20) 5/16-18 Nylock Nut	Hub Cover Hardware¹ (4) 8-32 x 3/8" Screw	(4) Gripping Hardware² (1) Locking Carabiner (1) 1/4" Beam Clip (1) 1/4-20 x 1" Eyebolt (1) 1/4-20 Hex Nut (1) Gripping™ (1) Guy Wire (4) Wire Rope Clip



Mounting

		
(2) Beam Clip & (2) Spacer	Upper Yoke	(2) Lower Yoke
		
Motor & Hub		Extension Tube, Safety Cable ³ , & Shackle ⁴

Airfoils

	
(10) Airfoils	
	or
	
(10) Powerfoil® Winglets	(10) Powerfoil® Plus Winglets
	
(10) Airfoil Retainers	

Hub Cover

	
Hub Cover	Center Cap

1. The Hub Cover Hardware is packed in the hub cover box.
2. Guy wires are designed to constrain fan's lateral movement and are only included in some fan packages. Big Ass Fans recommends using guy wires if the fan's extension tube is 4 ft or longer, if the fan is exposed to high winds, or if the fan is close to any building fixtures. Gripping/Eyebolt hardware is bagged separately from hardware boards.
3. Safety cable is attached to extension tube.
4. Shackle included on hardware boards.

6

Tools Needed

Mechanical Installation
Standard Wrench Set
Standard Socket Set with Ratchet
Torque Wrench capable of 40 ft·lb (54.2 N·m)
Phillips and Flat Head Screwdriver
Standard and Metric Allen Wrench Set

Electrical Installation
Phillips and Flat Head Screwdriver
1/4" Nut Driver
5/16" Nut Driver
Pair of #10 to #14AWG Crimpers
Pair of Medium Size Channel Locks
Multimeter

Important Weights

Part	Weight
Single Pivot Mounting Kit (7/10)	32 lbs (14 kg)
Single Pivot Mounting Kit (10/15)	37 lbs (16 kg)
1 ft Extension	4 lbs (2 kg)
2 ft Extension	8 lbs (4 kg)
3 ft Extension	13 lbs (6 kg)
4 ft Extension	17 lbs (8 kg)
5 ft Extension	21 lbs (10 kg)
6 ft Extension	25 lbs (11 kg)
7 ft Extension	29 lbs (13 kg)
8 ft Extension	33 lbs (15 kg)
9 ft Extension	37 lbs (17 kg)
10 ft Extension	42 lbs (19 kg)

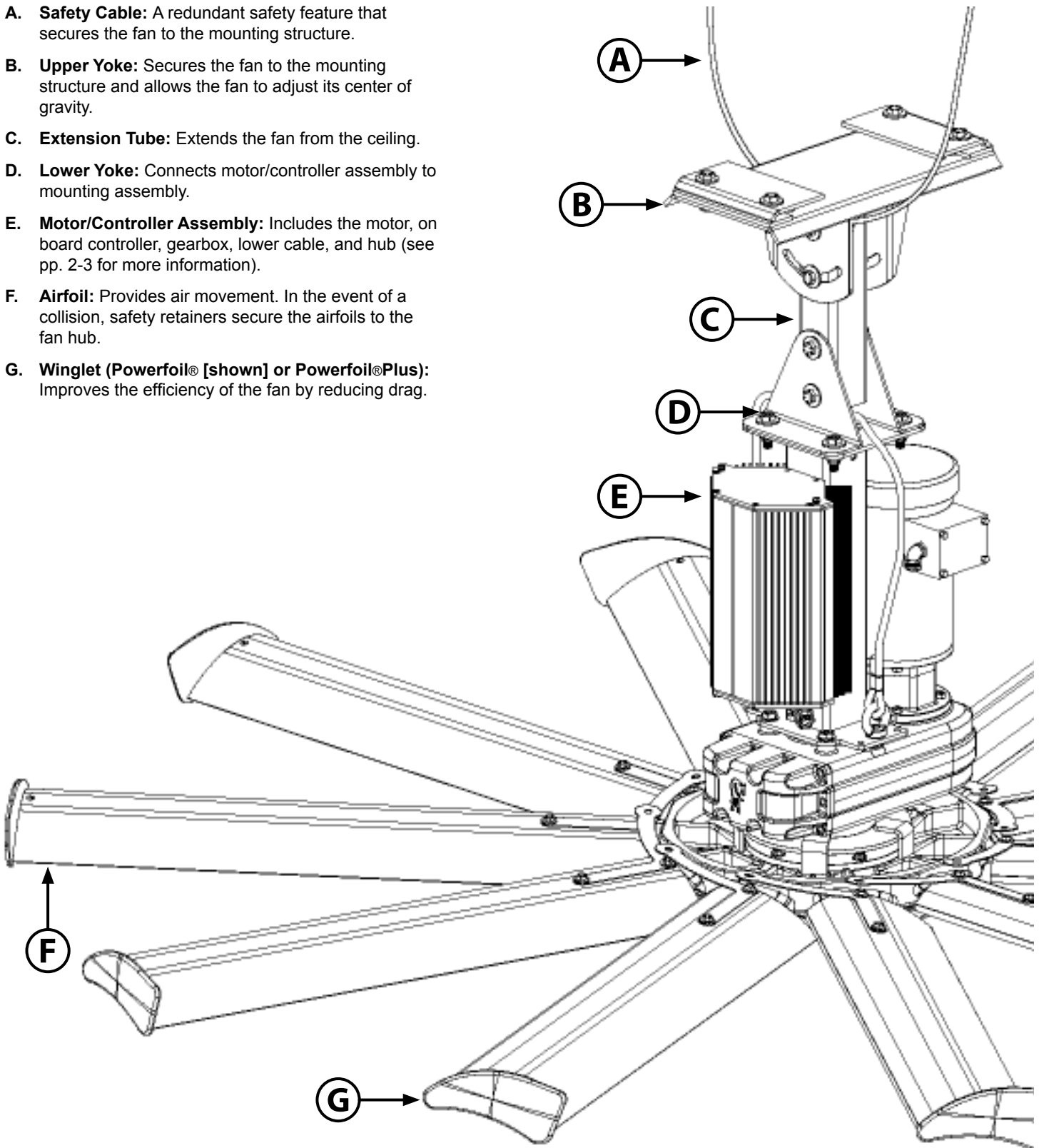
Part	Weight
Motor Assembly (1 HP)	204 lbs (93 kg)
Motor Assembly (2 HP)	240 lbs (109 kg)
Hub Cover	2 lbs (1 kg)
Hardware	6 lbs (3 kg)
Light Fixture (Optional)	14 lbs (6 kg)
8 ft Powerfoil foils	62 lbs (28 kg)
10 ft Powerfoil foils	80 lbs (36 kg)
12 ft Powerfoil foils	94 lbs (42 kg)
14 ft Powerfoil foils	110 lbs (49 kg)
16 ft Powerfoil foils	127 lbs (57 kg)
18 ft Powerfoil foils	141 lbs (63 kg)
20 ft Powerfoil foils	164 lbs (74 kg)
24 ft Powerfoil foils	195 lbs (88 kg)

Recommended Torque

Application	Thread Size	Torque
Mounting Bolts	1/2-13" UNC	40 ft·lb (54.2 N·m)
Airfoil Bolts	5/16-18" UNC	29 ft·lb (39 N·m)

Fan Diagram

- A. **Safety Cable:** A redundant safety feature that secures the fan to the mounting structure.
- B. **Upper Yoke:** Secures the fan to the mounting structure and allows the fan to adjust its center of gravity.
- C. **Extension Tube:** Extends the fan from the ceiling.
- D. **Lower Yoke:** Connects motor/controller assembly to mounting assembly.
- E. **Motor/Controller Assembly:** Includes the motor, on board controller, gearbox, lower cable, and hub (see pp. 2-3 for more information).
- F. **Airfoil:** Provides air movement. In the event of a collision, safety retainers secure the airfoils to the fan hub.
- G. **Winglet (Powerfoil® [shown] or Powerfoil®Plus):** Improves the efficiency of the fan by reducing drag.



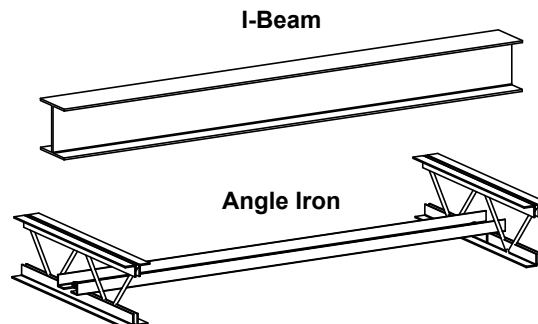
8

Preparing the Work Site

Mechanical Installation

- A 24-ft (7.3 m) Powerfoil fan (our largest model) weighs, at maximum, 475 lbs (215 kg). A scissor lift, or other suitable means for lifting the weight of the fan, and up to two installation personnel will be required.
- Big Ass Fans can only be hung from an I-beam or angle irons. If mounting from an I-beam, the I-beam must be part of the existing building structure. For specific requirements, see installation instructions starting on p. 11. Do not mount the fan to a single purlin, truss, or bar joist. Consult a structural engineer for installation methods not covered in the manual.

CAUTION: Mount fan only to an angle iron or I-beam.



- To reduce the risk of injury to persons, install the fan so that the blades are at least 10 ft (3.05 m) above the floor.
- The fan installation area must be free of obstructions such as lights, cables, sprinklers, or other building structure. The fan blades should have at least 2 ft (0.61 m) of clearance from any obstructions.
- Big Ass Fans recommends that a fan be installed at a distance (from HVAC equipment) no less than 2x the fan's diameter when measured from the center of the fan to the equipment. If the fan is mounted lower than an HVAC supply and return diffuser's discharge, the fan should be installed no less than 2x the fan's diameter from the diffuser when measured from the center of the fan to the diffuser. If the fan is mounted at the same height or higher than a downward discharge diffuser, the fan is recommended to be installed no less than 1x the fan's diameter from the diffuser when measured from the center of the fan to the diffuser.
- The distance between multiple fans should be no less than 2.5x the fans' diameter when measured from the centers of the fans.
- The mounting system must be able to withstand the torque forces generated by the fan. A 24-ft diameter fan generates nearly 300 ft-lb (406.7 N·m) of torque during operation.
- Fans mounted on lightweight I-beams (common in steel buildings) could cause the beam to flex and the fan to move significantly during operation. If this flexing causes a clearance problem, we suggest installing a stiffening strut to a nearby beam.
- If the fan's extension tube is 4 ft (1.2 m) or longer, the fan's lateral movement must be secured using guy wires (see p. 19 for more information). If the fan is close to any building fixtures it is recommended to secure the fan with guy wires as a safety measure.
- If installing a VESDA system, refer to the VESDA Installation Guide BEFORE hanging the fan.

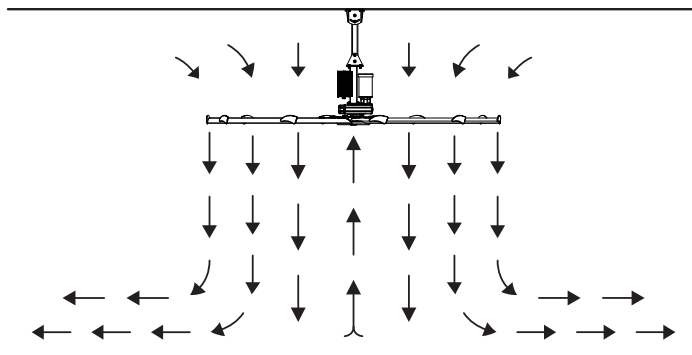
Electrical Installation

- To reduce the risk of electric shock, wiring should be performed by a qualified electrician! Incorrect assembly can cause electric shock or damage the motor and the controller!
- The installation of a Big Ass Fan must be in accordance with the National Electrical Code, ANSI/NFPA 70-1999, and all local codes.
- AC supply feeds for one fan controller may share the same conduit with AC supply feeds for one or more controllers.
- All unused conductors that share a conduit with the AC supply feeds must be grounded on both ends.
- If required, a local disconnect should be installed per NEC and all local codes.
- Refer to specifications on p. 24 for appropriate circuit requirements.
- Each fan requires dedicated branch circuit protection.
- To avoid damage to the VFD and fan controller, test the VFD and fan controller with a test cable before wiring the CAT 5 cable!

Understanding Airflow Patterns

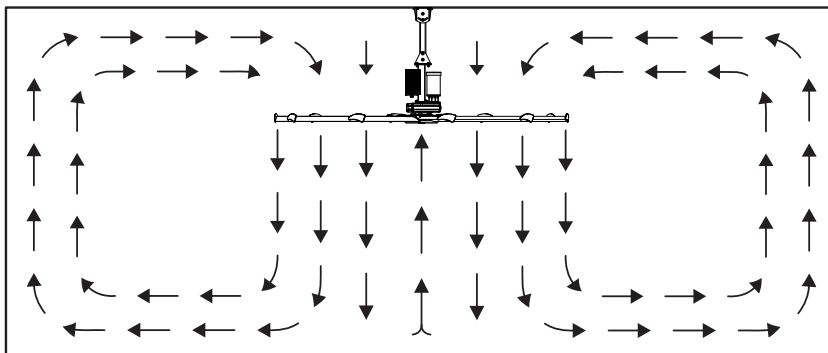
Airflow in an Open Area

The airflow moves from the fan toward the floor. Once the airflow hits the floor, it moves outward in all directions. When airflow is deflected off the floor it is called a floor jet. The depth of this floor jet varies depending on the size and speed of the fan. A 20-ft (6-m) Big Ass Fan at standard speed creates a floor jet 9 ft (2.7 m) deep.



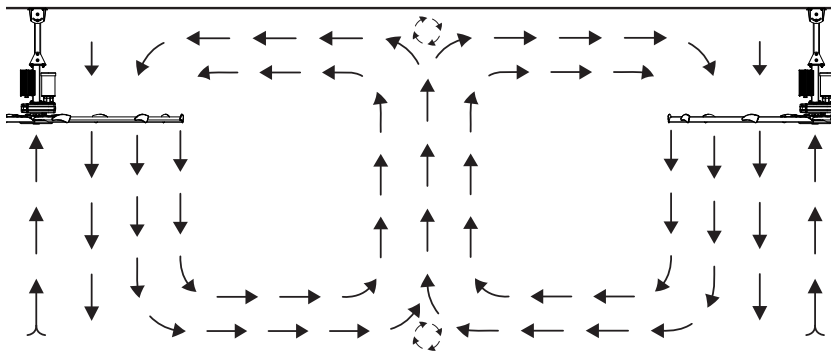
Airflow in an Enclosed Area

The floor jet radiates outward until it reaches the walls. The walls deflect the jet upward. After it hits the ceiling, the upward flow is directed inward, back toward the low pressure area above the fan where it is then pulled back toward the floor. This creates a convection-like air current that gathers momentum. Once this current is established, the fan begins to move air outside of the current, escalating its cooling effects.



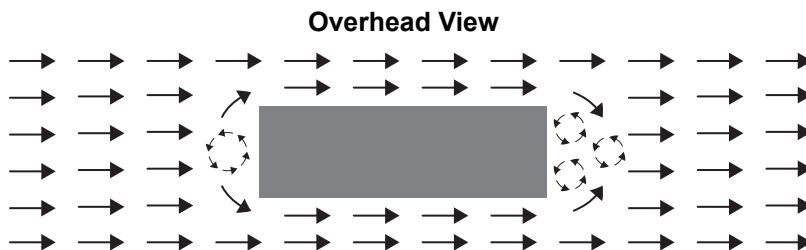
Airflow with Multiple Fans

Where there are multiple fans appropriately spaced, the expanding jets of adjacent fans meet to create a pressure zone. The pressure zone acts like a wall, causing each fan to behave more like a single enclosed fan. Typically, a single fan's performance will increase when working in conjunction with other fans.



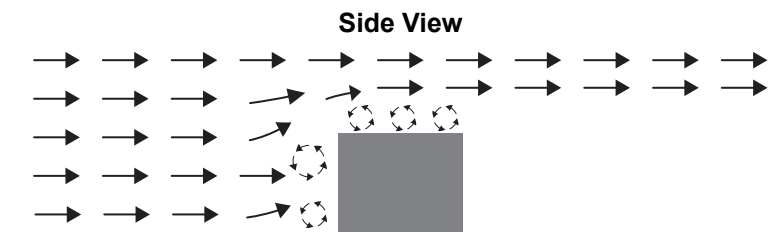
Airflow with Streamlined Obstruction

Obstructions on the floor tend to block the horizontally moving air. Thin or streamlined obstructions do not block much airflow, regardless of size. The air tends to flow smoothly around these obstructions, losing little momentum, and leaving only a small stagnant area behind the obstruction.



Airflow with Wide, Blunt Obstruction

A wide, blunt, or flat-faced obstruction forces the air to change direction, turning upward and outward. There is a stagnant area behind these obstructions that is wider and higher than the obstructions themselves.



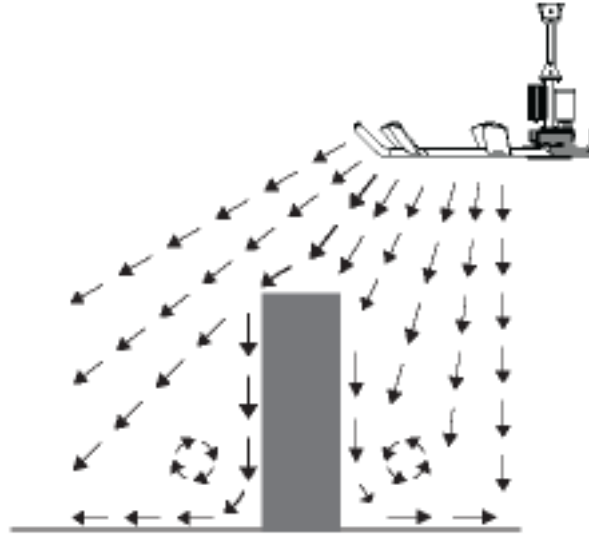
10

Understanding Airflow Patterns (cont.)

Powerfoil®Plus

The PowerfoilPlus hybrid airfoil creates a jet of air that flows outward from the fan at a 45° angle, ignoring floor obstructions and delivering airflow in a much broader pattern. The airflow generated from a 24-ft PowerfoilPlus fan can effectively maintain an operative temperature in an area up to 168 ft away from the fan.

The same principles of airflow apply to the PowerfoilPlus, but, when planning fan placement, consider its much larger coverage area as illustrated in the diagrams on the previous page.



Tips

Below are some techniques that make a dramatic difference in congested areas of your facility. You can treat air like water and scoop, direct, and channel it to where you need it most. If you are using a PowerfoilPlus fan, you will notice that it delivers air from a much higher angle, resolving many of the obstacles outlined below.

- Make sure people are not hidden behind structures that would block airflow. This may seem obvious, but work areas are routinely blocked by shelving, crates, and machinery.
- Position large obstructions so that their smallest profile is perpendicular to the direction of air movement. For example, a sheet metal press brake might have five times the frontal area if it is facing the airflow rather than if it is turned sideways.
- Wherever possible, position welding curtains, partitions, sheet materials, etc., to scoop air into the work area rather than deflect it.
- Take advantage of the air moving near the floor by creating ground level openings in your work area. It is better to have a work area blocked by materials stacked to the ceiling with an opening below than to have low stacks 3 ft (0.9 m) to 6 ft (1.8 m) high sitting on the floor.

Mounting Method 1: I-Beam

11



Big Ass Fans can only be hung from an I-beam or angle irons. See the following page for angle iron mounting instructions. Consult a structural engineer for installation methods not covered in this manual.

WARNING: The fan should not be installed unless the structure on which the fan is to be mounted is of sound construction, undamaged, and capable of supporting the loads of the fan and its method of mounting. A structural engineer should verify that the structure is adequate prior to fan installation. Verifying the stability of the mounting structure is the sole responsibility of the customer and/or end user, and Big Ass Fans hereby expressly disclaims any liability arising therefrom, or arising from the use of any materials or hardware other than those supplied by Big Ass Fans or otherwise specified in these installation instructions.


ATTENTION: It is not recommended to mount a Big Ass Fan to a fabricated I-beam.

ATTENTION: The I-beam on which the fan will mount must be part of the existing building structure.

ATTENTION: If installing a VESDA system, refer to the VESDA Installation Guide BEFORE hanging the fan.

1. Attach Upper Yoke (to I-Beam)

Measure the flange width of the I-beam from which the fan will be hung. Consult the tables and diagram below to determine what size upper yoke is included with your fan package. Select the upper yoke mounting holes that match the flange width of the I-beam.

CAUTION: Install the spacers  only if the thickness of the I-beam flange exceeds 3/8" (1 cm). The mounting holes on the spacer are closer to one side than the other. Make sure this side is facing the I-beam.

Secure the upper yoke to the I-beam with the Beam Clip Hardware as shown. Tighten the bolts to 40 ft-lb (54.2 N-m) using a 3/4" socket with torque wrench.

Proceed to "Hanging the Fan" (p. 17).

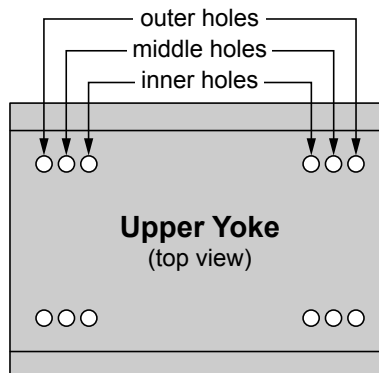
Beam Clip Hardware (BAF-Supplied):

- (4) 1/2-13 x 2" GR 8 Bolt
- (8) 1/2" Flat Washer
- (4) 1/2-13 Nylock Nut
- (2) Beam Clamp
- (2) Spacer

Small Upper Yoke

13-3/4" (45.7 cm) x 9 5/8" (24.4 cm)

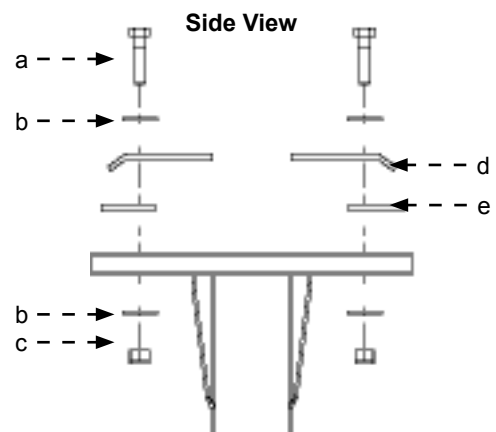
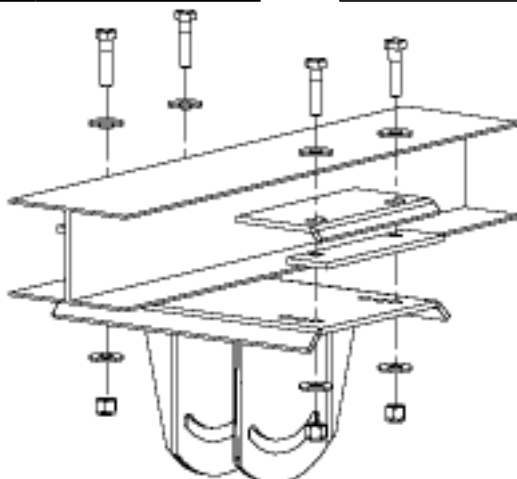
I-Beam Flange Width	Upper Yoke Mounting Holes
5" (12.7 cm) - 6 5/8" (16.8 cm)	inner holes
>6 5/8" (16.8 cm) - 8 1/4" (21 cm)	middle holes
>8 1/4" (21 cm) - 9 7/8" (25 cm)	outer holes



Large Upper Yoke

18-1/2" (57.7 cm) x 9 5/8" (24.4 cm)

I-Beam Flange Width	Upper Yoke Mounting Holes
9 7/8" (25 cm) - 11 3/8" (28.9 cm)	inner holes
>11 3/8" (28.9 cm) - 13" (33 cm)	middle holes
>13" (33 cm) - 14 5/8" (37.1 cm)	outer holes



12 Mounting Method 2: Angle Irons



If you are installing the fan to an I-beam and have attached the upper yoke (p. 11), proceed to "Hanging the Fan" (p. 17).

WARNING: The fan should not be installed unless the structure on which the fan is to be mounted is of sound construction, undamaged, and capable of supporting the loads of the fan and its method of mounting. A structural engineer should verify that the structure is adequate prior to fan installation. Verifying the stability of the mounting structure is the sole responsibility of the customer and/or end user, and Big Ass Fans hereby expressly disclaims any liability arising therefrom, or arising from the use of any materials or hardware other than those supplied by Big Ass Fans or otherwise specified in these installation instructions.

WARNING: Never use beam clamps when mounting the fan to angle irons! Beam clamps are only intended for I-beam installations.

ATTENTION: If installing a VESDA system, refer to the VESDA Installation Guide BEFORE hanging the fan.

1. Select Proper Angle Irons

Note: Angle irons and angle iron hardware are not included with the fan.

CAUTION: Do not install the fan from a single purlin, truss, or bar joist.

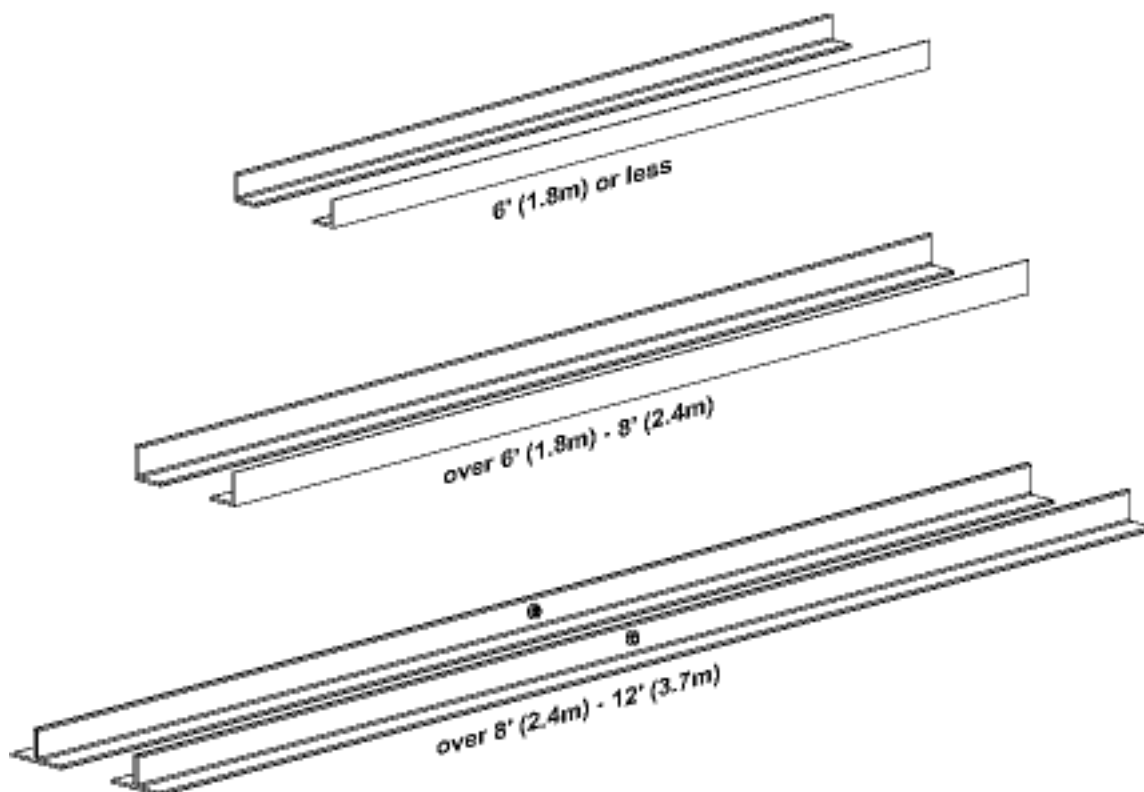
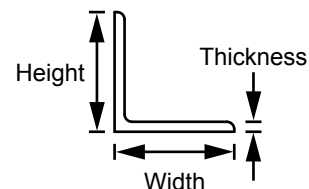
CAUTION: Unsupported angle iron spans should not exceed 12 ft (3.7 m).

Follow the table below when selecting angle irons for fan installation.

Angle Iron Span (between mounting points)	Minimum Angle Iron Dimensions (W x H x T)	Number of Angle Irons Needed
6 ft (1.8 m) or less	2.5" (6.4 cm) x 2.5" (6.4 cm) x 0.25" (0.6 cm)	2
over 6 ft (1.8 m)-8 ft (2.4 m)	3" (7.6 cm) x 3" (7.6 cm) x 0.25" (0.6 cm)	2
over 8 ft (2.4 m)-12 ft (3.7 m)	3" (7.6 cm) x 3" (7.6 cm) x 0.25" (0.6 cm)	4*

*2 pairs of angle irons. Pairs should be placed back to back and fastened in center (see step 2).

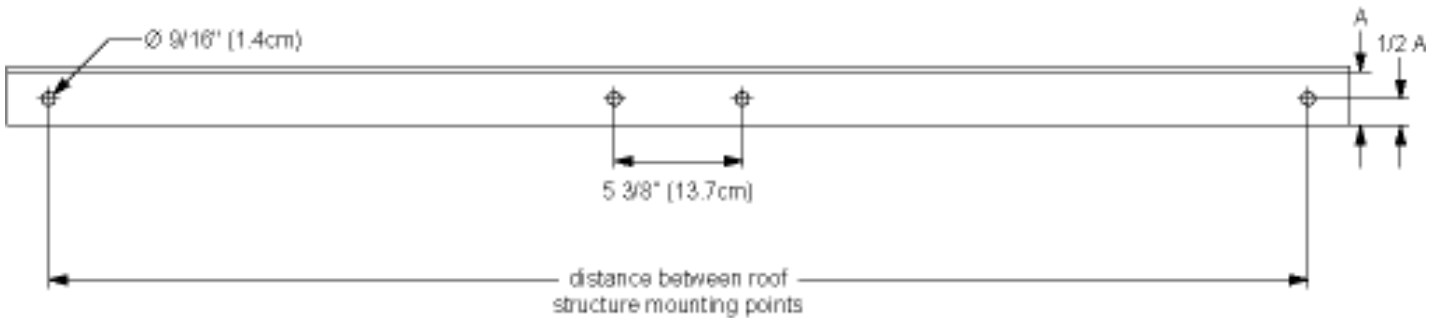
Angle Iron Side View
(see table for dimensions)



2. Pre-drill Angle Irons

Drill two $\text{Ø } 9/16"$ (1.4 cm) holes exactly $5\text{-}3/8"$ (13.7 cm) apart in the centers of two angle irons.

Measure the distance between the mounting points of the roof structure that the angle irons will span. Measure the same distance on the angle irons and drill $\text{Ø } 9/16"$ (1.4 cm) holes through each end of the angle irons. Drill holes in two angle irons if span is 8 ft (2.4 m) or less. Drill holes in 4 angle irons if span is greater than 8 ft (2.4 m).



3. Fasten Angle Irons Together (if span is longer than 8 ft)



If the angle iron span is 8 ft (2.4 m) or less, proceed to step 4a on the following page.

If the angle iron span is longer than 8 ft (2.4 m), it is necessary to use double angle irons.

Locate the center of the angle iron length. Drill $\text{Ø } 9/16"$ (1.4 cm) hole through the center of the vertical wall of the angle iron. Drill a total of four angle irons.

Place two drilled angle irons back to back. Fasten the angle irons together with customer-supplied Grade 8 hardware.

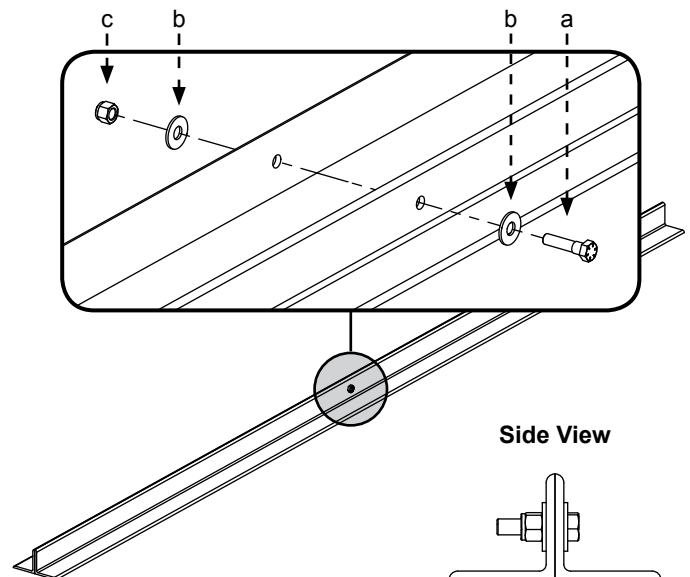
Align the angle irons to each other and tighten the bolts to **40 ft·lb (54.2 N·m)** using a $3/4"$ socket with torque wrench.

Repeat step for remaining two (2) angle irons.

Proceed to step 4b.

Grade 8 Hardware (Customer-Supplied):

- (2) $1/2\text{-}13$ Bolt
- (4) $1/2"$ Washers
- (2) $1/2"$ Nut



4a. Fasten Single Angle Irons to Roof Structure Mounting Points



If installation requires double angle irons (i.e., span is greater than 8 ft [2.4 m]), proceed to step 4b.

CAUTION: Do not install the fan from a single purlin, truss, or bar joist.

CAUTION: The angle irons must be fastened to the roof structure at each end.

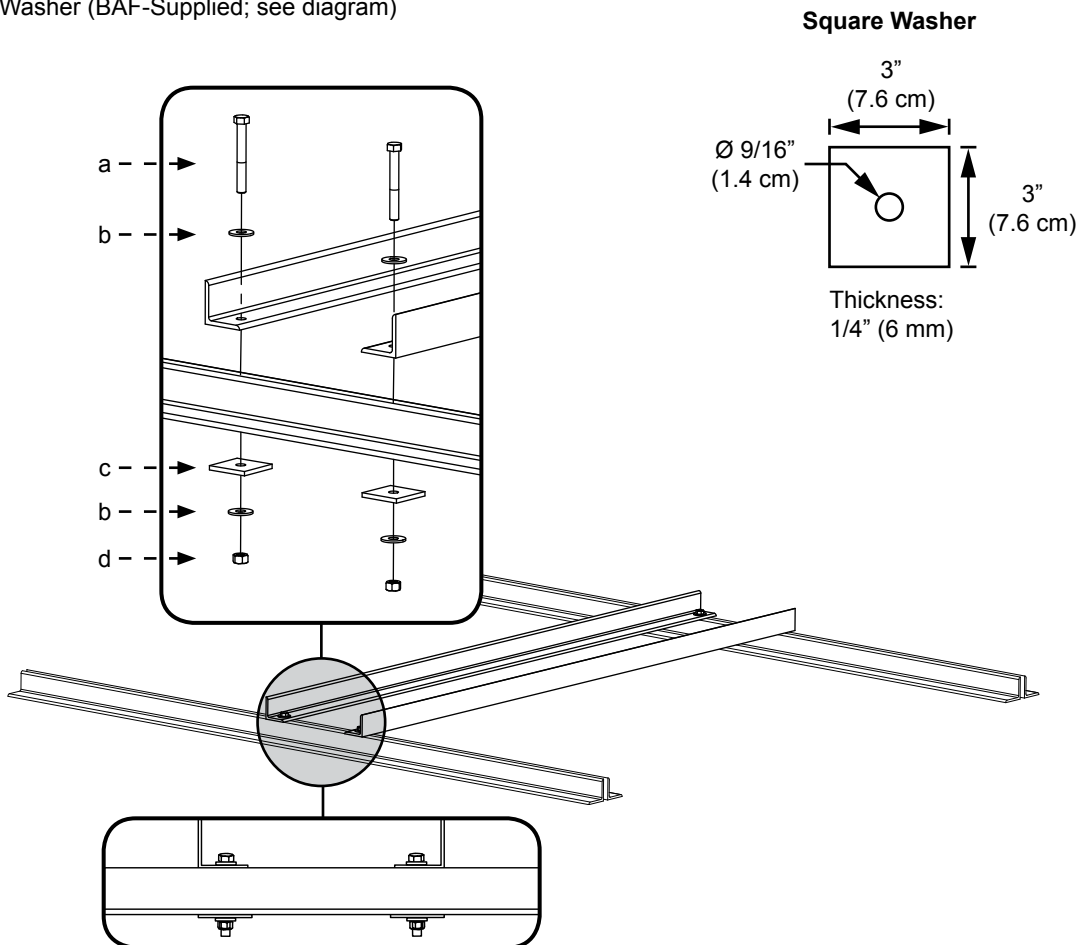
Fasten the angle irons to the roof structure mounting points at each end with customer-supplied Grade 8 hardware as shown.

ATTENTION: Do not tighten the hardware until the upper yoke has been mounted to the angle irons.

Proceed to step 5.

Grade 8 Hardware (Customer-Supplied):

- a. (4) 1/2-13 Bolt
- b. (8) 1/2" Washers
- c. (4) 3" Square Washer (BAF-Supplied; see diagram)
- d. (4) 1/2" Nut



4b. Fasten Double Angle Irons to Roof Structure Mounting Points

CAUTION: Do not install the fan from a single purlin, truss, or bar joist.

CAUTION: The angle irons must be fastened to the roof structure at each end.

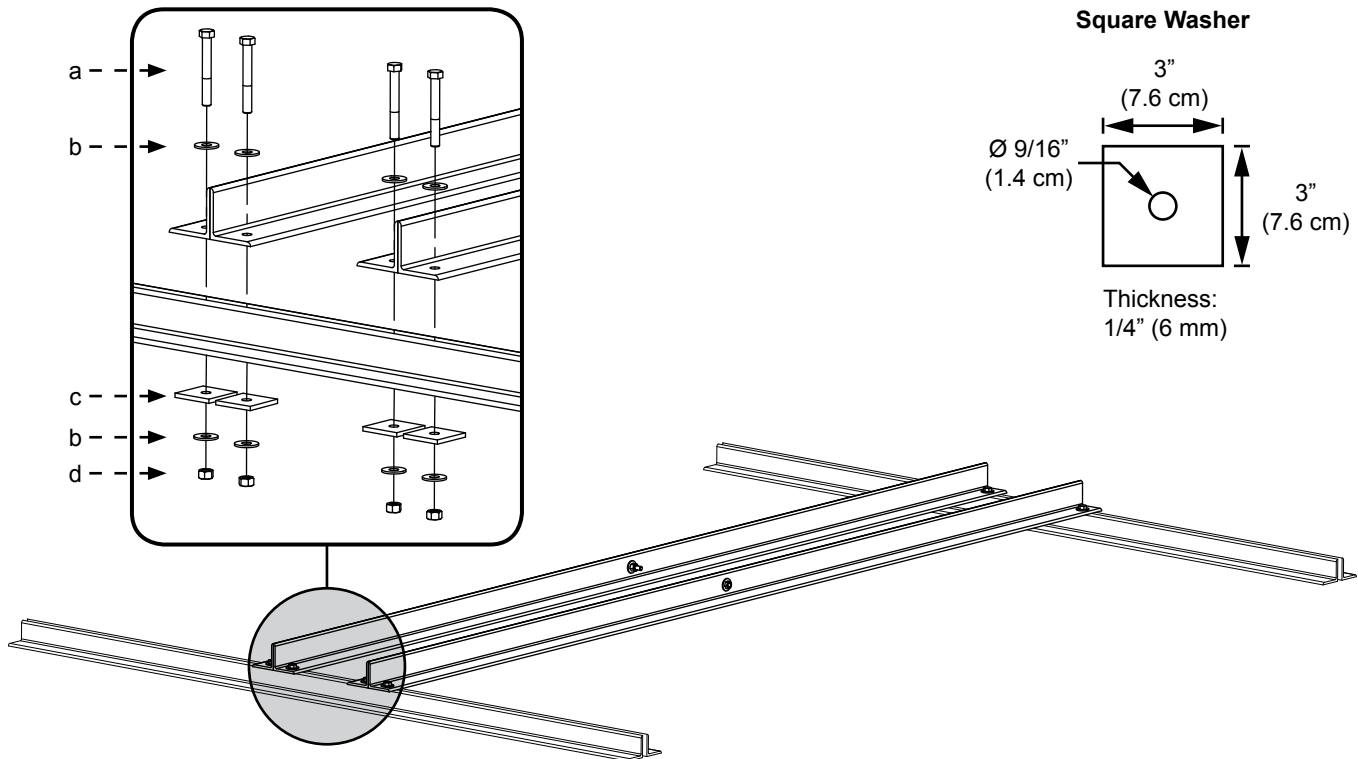
Fasten the angle irons to the roof structure mounting points at each end with customer-supplied Grade 8 hardware as shown.

CAUTION: The angle irons with fan mounting holes should be positioned on the inside, facing each other.

ATTENTION: Do not tighten the hardware until the upper yoke has been mounted to the angle irons.

Grade 8 Hardware (Customer-Supplied):

- (8) 1/2-13 Bolt
- (16) 1/2" Washers
- (8) 3" Square Washer (BAF-Supplied; see diagram)
- (8) 1/2" Nut



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Mounting Method 2: Angle Irons (cont.)

5. Attach Upper Yoke (to Angle Irons)

Secure the upper yoke directly to the angle irons with the Beam Clip Hardware as shown. Consult the diagrams below for distances between the angle irons.

CAUTION: The angle irons should be aligned with the outermost holes of the upper yoke.

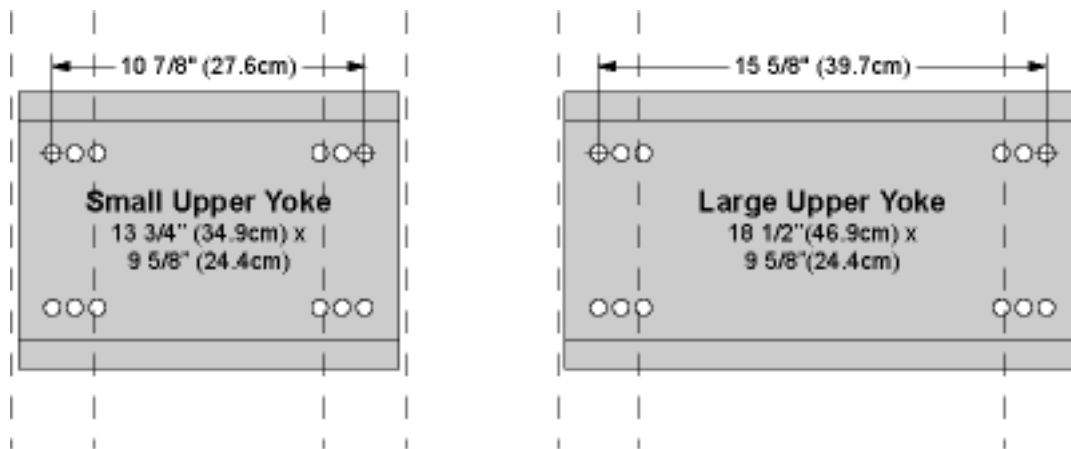
Tighten the bolts to **40 ft·lb (54.2 N·m)** using a 3/4" socket with torque wrench.

Note: If you are installing a VESDA system with your fan, proceed to the VESDA Installation Manual.

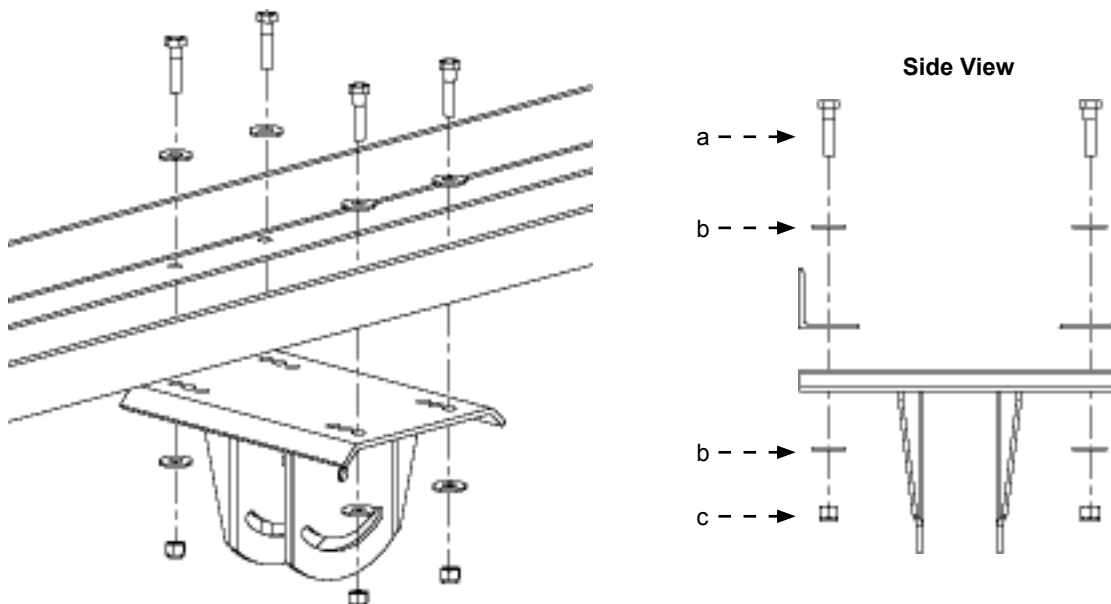
CAUTION: After attaching the upper yoke to the angle irons, tighten all the bolts securing the angle irons to the roof structure to **40 ft·lb (54.2 N·m)** using a 3/4" socket with torque wrench.

Beam Clip Hardware (BAF-Supplied):

- (4) 1/2-13 x 2" GR 8 Bolt
- (8) 1/2" Flat Washer
- (4) 1/2-13 Nylock Nut



Note: Dashed lines represent angle irons.



Hanging the Fan

17

ATTENTION: If installing a VESDA system, refer to the VESDA Installation Guide BEFORE hanging the fan.

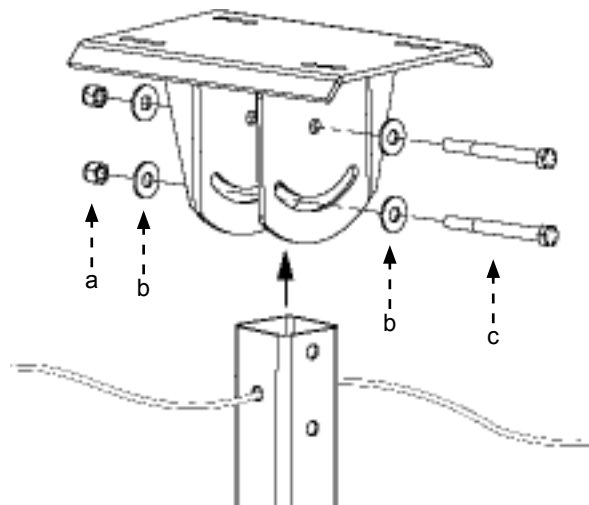
1. Attach Extension Tube (to Upper Yoke)

Fasten the extension tube to the upper yoke with the Single Pivot Hardware as shown. Before tightening the bolts, allow the extension tube to hang freely and balance itself.

Tighten the bolts to **40 ft·lb (54.2 N·m)** using a 3/4" socket with torque wrench.

Single Pivot Hardware (BAF-Supplied):

- (2) 1/2-13 Nylock Nut
- (4) 1/2" Flat Washer
- (2) 1/2-13 x 5" GR 8 Bolt

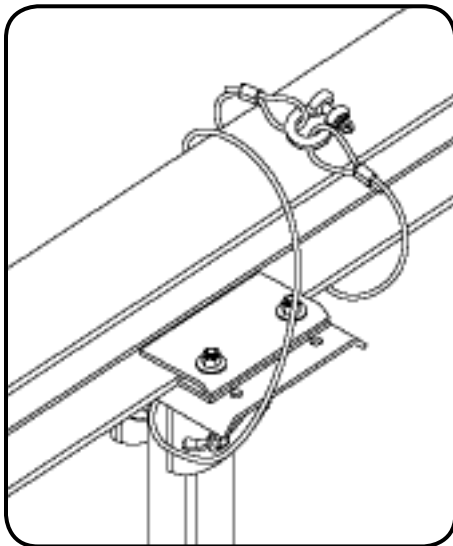


2. Secure Upper Safety Cable

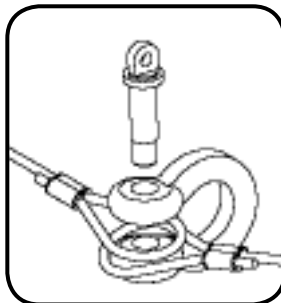
WARNING: The safety cable is a crucial part of the fan and must be installed correctly. If you have any questions, call Customer Service at 1-877-BIG-FANS.

Secure the safety cable to the I-beam or angle irons by wrapping the safety cable around it and securing the looped ends with the shackle as shown. The cable must be drawn tightly around the I-beam or angle iron, leaving as little slack as possible. If possible, the shackle should be on the topside of the I-beam or angle iron. Securely tighten the shackle.

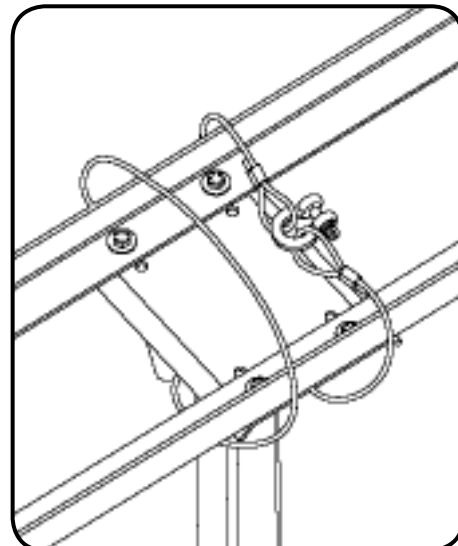
I-Beam Mount



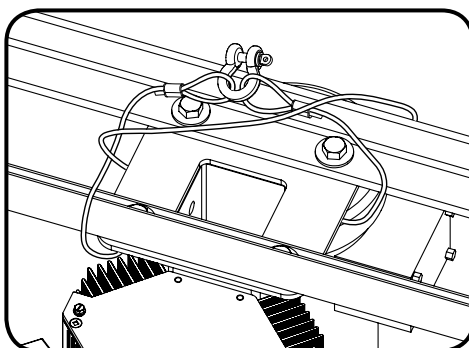
Shackle



Angle Iron Mount



Direct Mount



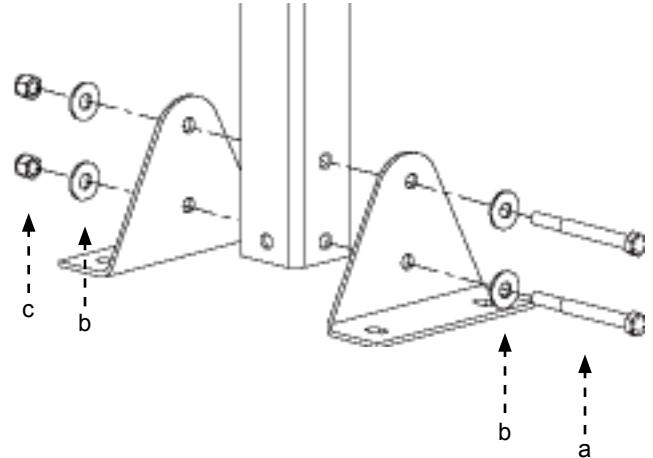
3. Attach Lower Yoke (to Extension Tube)

Attach the lower yoke to the bottom of the extension tube with the Lower Yoke Hardware as shown.

Tighten the bolts to **40 ft-lb (54.2 N-m)** using a 3/4" socket with torque wrench.

Lower Yoke Hardware (BAF-Supplied):

- a. (2) 1/2-13 x 5" GR 8 Bolt
- b. (4) 1/2" Flat Washer
- c. (2) 1/2-13 Nylock Nut



4. Attach Motor Frame (to Lower Yoke)

Attach the motor frame to the lower yoke with the Motor/Hub Hardware as shown. **Do not rest the motor and hub unit on the ground!** Position the lower cable between the lower yoke brackets as shown on the right.

CAUTION: Do not remove motor from its protective packaging prior to hanging it!

CAUTION: To prevent damage, avoid contact with the bottom of the motor and hub unit!

CAUTION: The motor frame is heavy. Use caution when raising it.

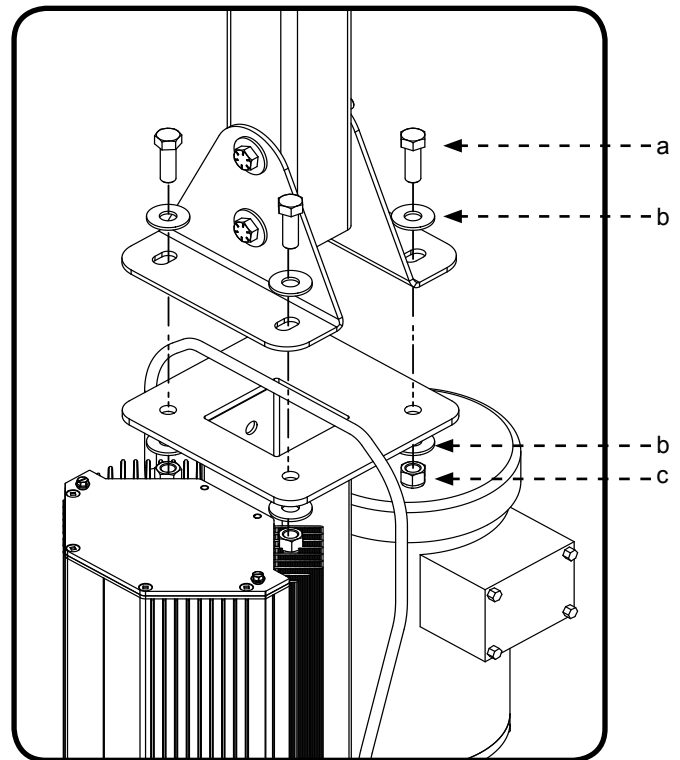
CAUTION: Secure all electrical cord/cable from interfering with this installation.

Tighten the bolts to **40 ft-lb (54.2 N-m)** using a 3/4" socket with torque wrench.

ATTENTION: Do not discard the motor unit packaging and foam. It should be used if the fan is ever moved or relocated.

Motor/Hub Hardware (BAF-Supplied):

- a. (4) 1/2-13 x 1 3/4" GR 8 Bolt
- b. (8) 1/2" Flat Washer
- c. (4) 1/2-13 Nylock Nut



ATTENTION: If installing a VESDA system with your Powerfoil X fan, refer to p. 3 of the VESDA Installation Guide for further instructions before installing guy wires and airfoils.

Installing Guy Wires



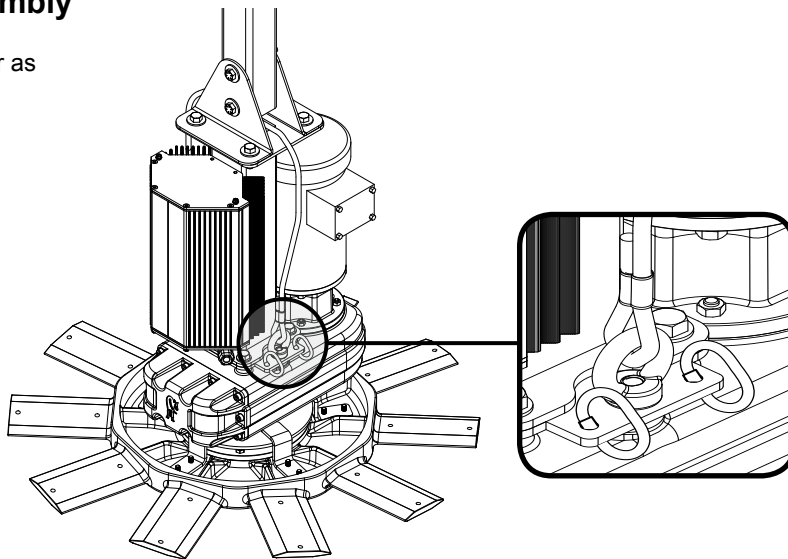
Guy wires may not be included in your fan order. They are intended to constrain the fan's lateral movement and are included with fans that have extension tubes 4 ft (1.2 m) or greater in length.

ATTENTION: If installing a VESDA system, do not install airfoils until all VESDA piping is installed.

1. Attach Locking Carabiner to Motor Assembly

Secure the locking carabiner to the guy wire clip on the motor as shown.

Securely tighten the carabiner.



2. Attach Beam Clamp

Attach the beam clamp to an I-beam or angle iron. The guy wire must be at a 30°-45° angle from the roof to the extension tube. Place the beam clamp accordingly.

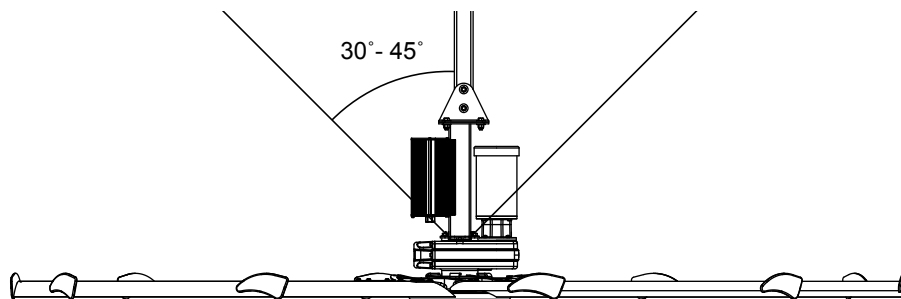
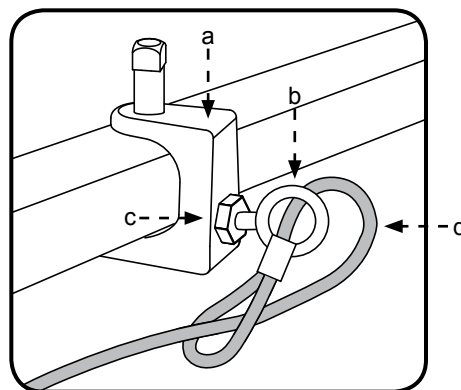
Fasten the small eyebolt and nut onto the beam clamp. The nut will be on the outside of the beam clamp.

Loop the guy wire through its crimped end to secure it to the eyebolt as shown.

Griple/Eyebolt Hardware (BAF-Supplied):

- 1/4" Beam Clamp
- 1/4-20 x 1" Eyebolt
- 1/4-20 Hex Nut
- Guy Wire

Beam Clamp

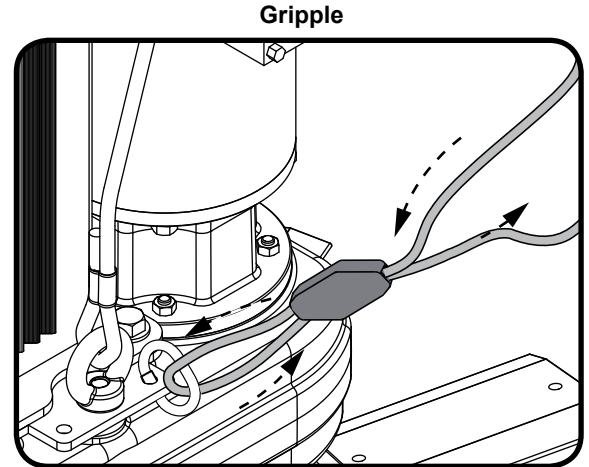


3. Route Guy Wire Through Gripple®

Route the guy wire through the Gripple, the carabiner on the motor, and back through the Gripple as shown.

ATTENTION: To back the guy wire out of the Gripple, insert 1/16 (1.5 mm) Allen wrench into the small hole on the Gripple.

ATTENTION: Do not tighten the Gripple until the remaining guy wires have been installed.



4. Install Three Remaining Guy Wires

Follow steps 1-3 to install the three remaining guy wires.

CAUTION: The guy wires should be spaced evenly around the fan and clear of the path the fan blades will rotate.

Evenly cinch all four guy wires into place using the Gripples. The wires should be taut. Maintain a distance of 6"-8" between the Gripple and the frame mounting eyebolt.

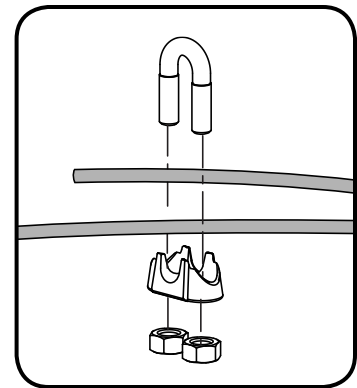
CAUTION: Over-tightening the guy wires could throw the fan off balance.

Once all of the guy wires are taut, secure their loose ends with the wire rope clips as shown. The wire rope clip nearest the eyebolt should create a loop of approximately 2" in length. The second wire rope clip should be located 3"-4" from the first clip. Trim the cables so there is no more than 1"-3" extending from the end of the Gripple.

Ensure all electrical cords/cable are unobstructed by guy wire system.

Torque specification for wire rope clamps: 4.5 ft·lb

Wire Rope Clip



Installing Airfoils



Big Ass Fans recommends completing electrical installation (p. 24) before installing the airfoils.

WARNING: Disconnect power to the fan before installing the airfoils.

ATTENTION: If installing a VESDA system, do not attach airfoils until all VESDA piping is installed.

1. Attach Winglets to Airfoils

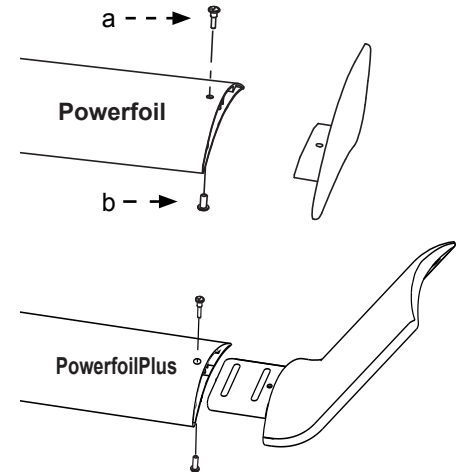
Attach the winglet to the airfoil using the Winglet Hardware as shown. You will need to use both a Phillips head and flat head screwdriver to properly secure the fasteners.

ATTENTION: The Powerfoil® winglets and Powerfoil®Plus winglets will be attached the same way, using the same hardware kit.

Attach winglets to all 10 airfoils before attaching the airfoils to the fan.

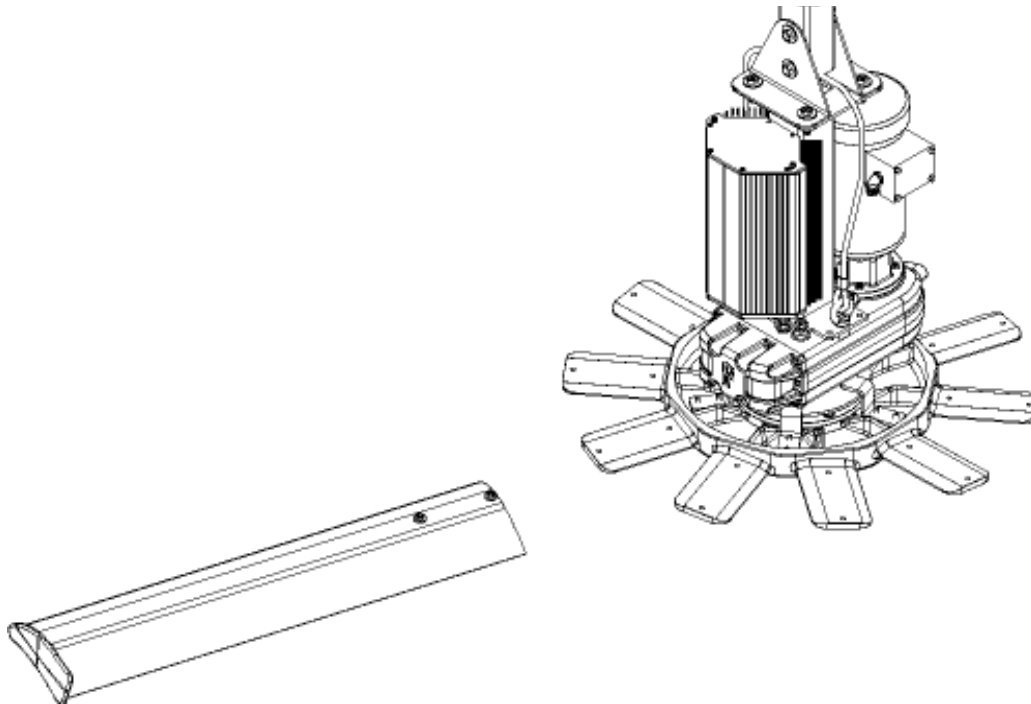
Winglet Hardware Kit (BAF-Supplied):

- a. (10) 10-24 x 1/2" Bolt
- b. (10) 10-24 x 3/4" Barrel



2. Position Airfoils

Slide the airfoils onto the tabs of the fan hub. **An airfoil will only attach to the fan hub in one direction. Do not force an airfoil into place.**



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3. Attach Airfoils to Hub

WARNING: Disconnect power to the fan before installing the airfoils.

Attach the 10 airfoil retainers using the Airfoil Hardware. Moving clockwise around the fan hub, position the airfoil retainers end over end as shown. Hole A should be positioned over top of Hole B. **Do not tighten the bolts until all the airfoil retainers have been attached!**

First, tighten the bolts along the outside perimeter to **29 ft-lb (39 N·m)** using a 1/2" socket with torque wrench.

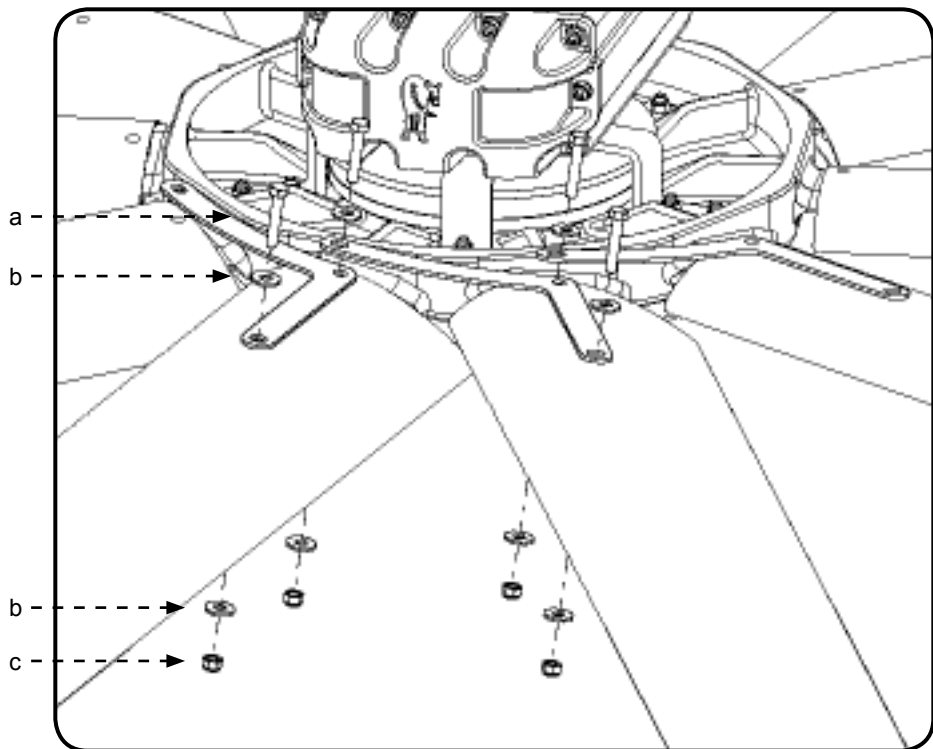
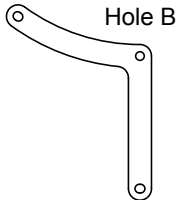
Second, tighten the bolts along the inside perimeter to **29 ft-lb (39 N·m)** using a 1/2" socket with torque wrench.

Airfoil Hardware Kit (BAF-Supplied):

- a. (20) 5/16-18 x 2" GR 8 Bolt
- b. (40) 5/16" Flat Washer
- c. (20) 5/16-18 Nylock Nut

Airfoil Retainer

Hole A



Installing Hub Cover



If your fan order included accessories (e.g., light, camera, etc.), consult the instructions packaged with those accessories.

WARNING: Disconnect power to the fan before installing the hub cover.

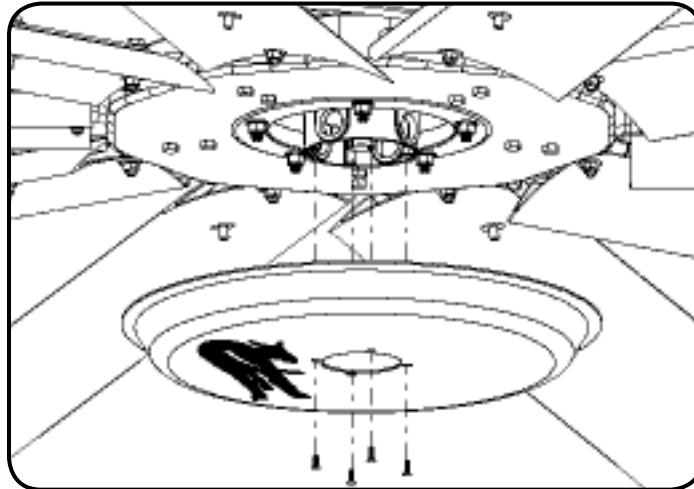
1. Attach Hub Cover (to Junction Box)

Attach the hub cover to the junction box using the four (4) screws.

Note: Adhere to a 50-lb maximum attachment load.

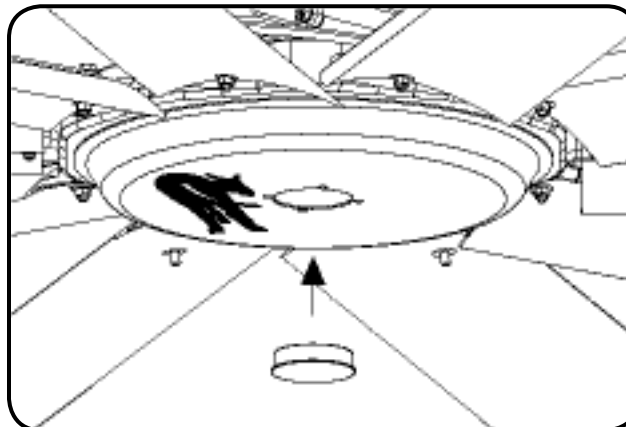
Hub Cover Hardware:

(4) 8-32 x 3/8" Screw



2. Attach Center Cap (to Hub Cover)

Snap the center cap into the hub cover.



24 Electrical Installation

Electrical Installation Safety



WARNING: To reduce the risk of electric shock, wiring should be performed by a qualified electrician! Incorrect assembly can cause electric shock or damage the motor and the controller! Hazard of electric shock!

WARNING: The installation of a Big Ass Fan must be in accordance with the requirements specified in this installation manual and with any additional requirements set forth by the national electric code (NEC), ANSI/NFPA 70-1999, and all local codes. Code compliance is ultimately YOUR responsibility! Failure to comply with these codes could result in personal injury or property damage.

WARNING: The fan controllers contain high voltage capacitors which take time to discharge after removal of mains supply. Before working on the fan controller, ensure isolation of mains supply from line inputs at the fan controller's disconnect (L1, L2, L3). Wait 3 minutes for capacitors to discharge to safe voltage levels. (Note: darkened display LEDs are not an indication of safe voltage levels.) Failure to do so may result in personal injury or death.

CAUTION: An incorrectly installed controller can result in component damage or reduction in the fan's life. Wiring or application errors such as under-sizing the controller, incorrect or inadequate AC supply, or excessive ambient temperatures may result in a malfunction of the fan system. Verify correct voltage, phase, and horsepower before beginning installation!

WARNING: 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. Contact Big Ass Fans at 1-877-BIG-FANS if you have any questions regarding the electrical installation of this fan.

CAUTION: For use with manufacturer-supplied variable frequency drive only. Not for use with other speed control devices!

CAUTION: To avoid a short circuit, be very careful not to get any metal chips in the control!

CAUTION: The Big Ass Fans product warranty will not cover equipment damage or failure that is caused by improper installation.

CAUTION: Do not operate fan with a damaged cord or plug. Return fan to an authorized service facility for examination or repair.

ATTENTION: To avoid damage to the VFD and fan controller, test the VFD and fan controller with a test cable before wiring the CAT 5 cable! See the following page for more information.

Power Requirements

Power Requirements

Fan Size	Controller HP (kW)	Nominal Input Voltage	Motor FLA	Req'd Min. Branch Circuit
8' Powerfoil-12' Powerfoil, 10' PowerfoilPlus	1.0 (0.75)	200-250V 3Φ, 400-480V 3Φ 200-250V 1Φ	3.4A 1.7A 3.4A	10A 10A 20A
14' Powerfoil-18' Powerfoil, 12' PowerfoilPlus-18' PowerfoilPlus	2.0 (1.5)	200-250V 3Φ, 400-480V 3Φ 200-250V 1Φ	5.6A 2.8A 5.6A	15A 10A 30A
20' Powerfoil-24' Powerfoil, 20' PowerfoilPlus-24' PowerfoilPlus	2.0 (1.5)	200-250V 3Φ 400-480V 3Φ 200-250V 1Φ	6.4A 3.2A 6.4A	15A 10A 30A

All Fan Models:

- Remote wall interface included (user-supplied parts required: 1 RJ-11 Connector, 1 RJ-45 Connector, CAT-5/5E cable up to 300 meters)
- Optional EMI/RFI filter (see pp. 29 & 31): 200-250V 3Φ 22RF9P5AL 400-480V 3Φ 22RF5P7AL

*Both models suitable for Class A environments up to 100 meters and Class B environments up to 5 meters.

Wiring Data Cable for Wall Control

WARNING: Failure to install the adapter cable may result in damage to the fan or controller and void all warranty!

ATTENTION: To avoid damage to the VFD and fan controller, test the VFD and fan controller with a test cable before wiring the CAT 5 cable!

The controller cable to be installed between wall controller and the fan should be Category 5 or 5e cable. The distance limitation between the wall controller and the Powerfoil X fan is 1000 feet.

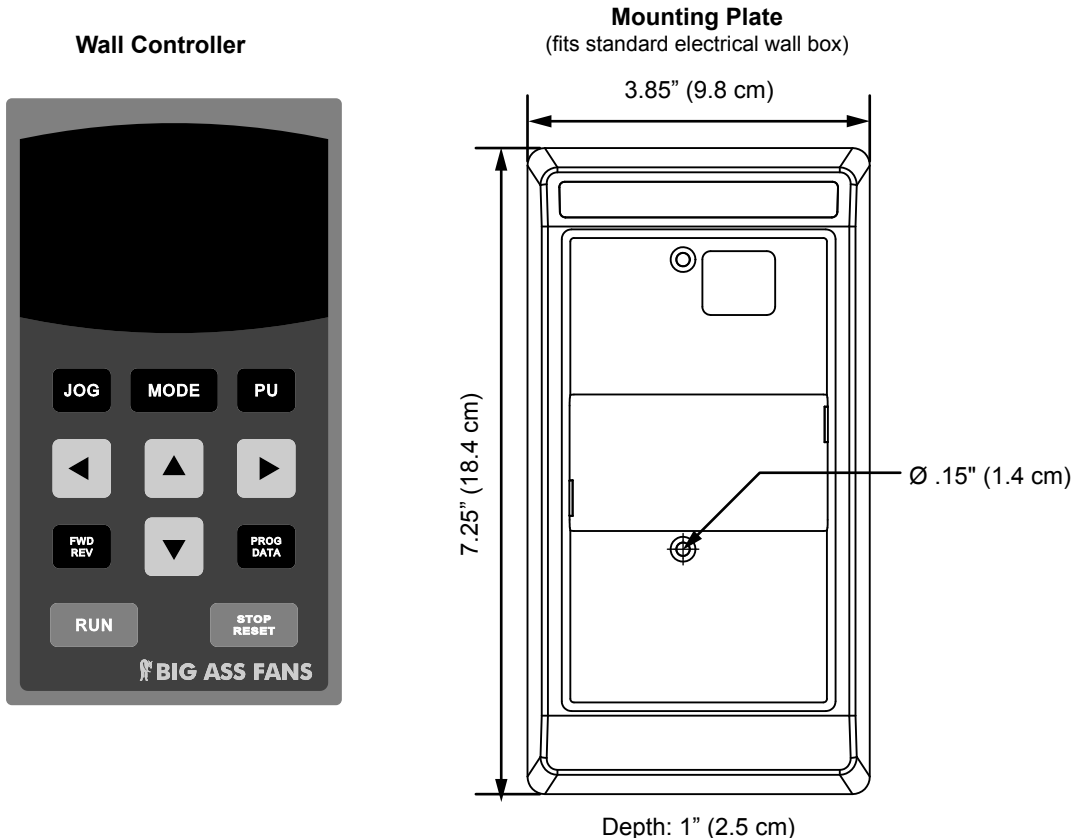
The short adapter cable included with the fan's wall control enables the installer to use a CAT5 or CAT5e patch cable for communications between the controller and the wall pad. The RJ-11 connector should be used on the wall control end of the cable and the RJ-45 Connector should be used on the fan end of the cable. *Note: For the RJ-11, Brown and Orange/White are not used.*

The patch cable can be configured to 568A or 568B wiring standards. A 5-ft patch cable is included with the wall control for testing purposes prior to airfoil installation.



Mounting Wall Control

- Using the Mounting Plate as a template, mark the two screw locations and the one RJ-11 connector pass-through.
- Attach mounting plate to wall surface using BAF-supplied hardware (6-32 X 7/8" countersunk) and appropriate anchors. Connect the control cable coming through the wall, and snap the wall control into the mounting plate.
- Mount the wall controller so that the fan(s) it controls is visible from wall controller location.

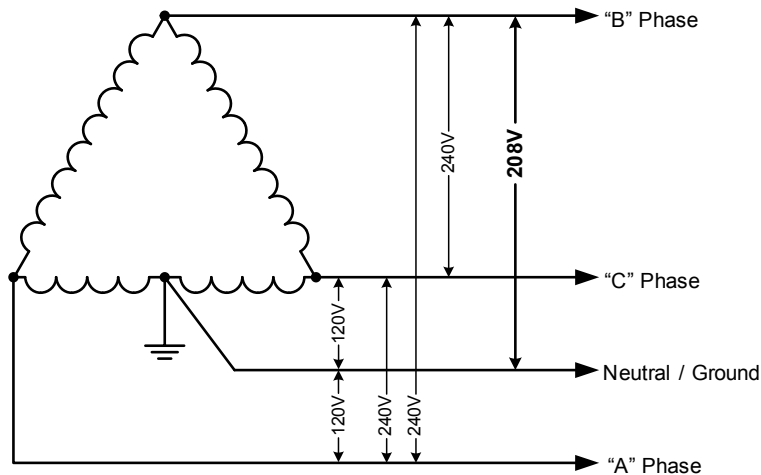


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Delta Secondary

There are many different arrangements available for industrial and commercial power distribution in the United States. The three most common are:

- **480/277V Three Phase (Wye secondary)**, which provides 480V between phases, and 277V from each phase to Neutral / Ground.
- **208/120V Three Phase (Wye secondary)**, which provides 208V between phases, and 120V from each phase to Neutral / Ground.
- **240/120V Three Phase (Delta Secondary)**, which provides 240V between phases for three phase loads, 120V from phase "A" and "C" to Neutral / Ground, and 208V from phase "B" to Neutral / Ground as shown below. In this transformer arrangement, phase "B" is commonly referred to as a "Wild Leg" or "High Leg," and shall be marked accordingly with an orange finish or other effective means per NEC 110.15.



CAUTION: Care must be taken when connecting to a Three phase 240/120V Secondary as shown above. All fan controller models rely on internal references made between each incoming phase and ground. To prevent nuisance tripping such as Overvoltage and Undervoltage faults, the following recommendations should be followed:

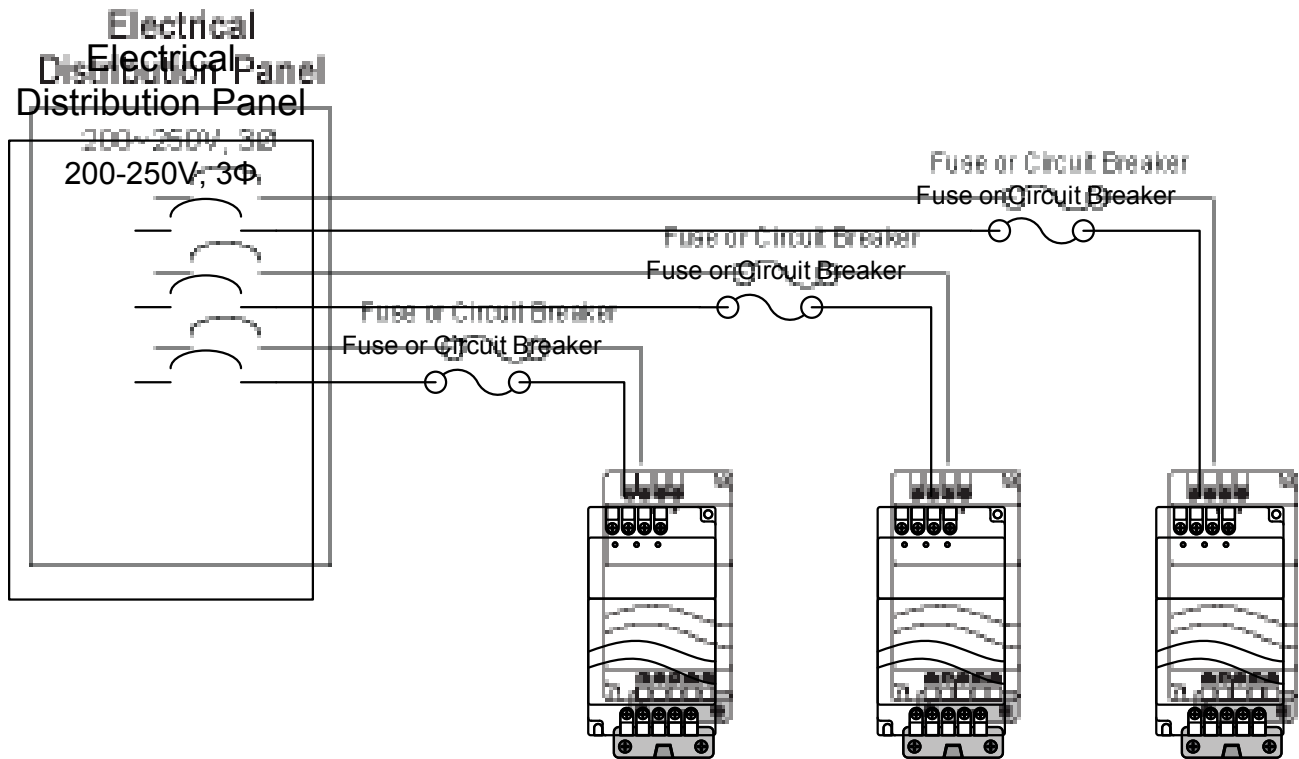
- 200-250 Three phase fan controllers should be connected so that the High leg, or phase "B," terminates on "L2" of the fan controller's input power terminals.

CAUTION: Installations utilizing supply transformers with a 480V Delta Secondary (ungrounded, corner grounded, open) MUST be avoided. Proper fan operation cannot be guaranteed due to a lack of proper phase to ground voltage references.

Branch Circuit Protection

CAUTION: The fan controllers do not include fuses for branch short circuit protection. These fan controller models should be installed with a dedicated fusible disconnect and/or input circuit breaker (see p. 27). National and local industrial safety standards and/or electrical codes may determine additional requirements for these installations.

CAUTION: Fan controllers may NOT be “daisy chained” on a branch circuit without providing either one fused disconnect or circuit breaker per controller.



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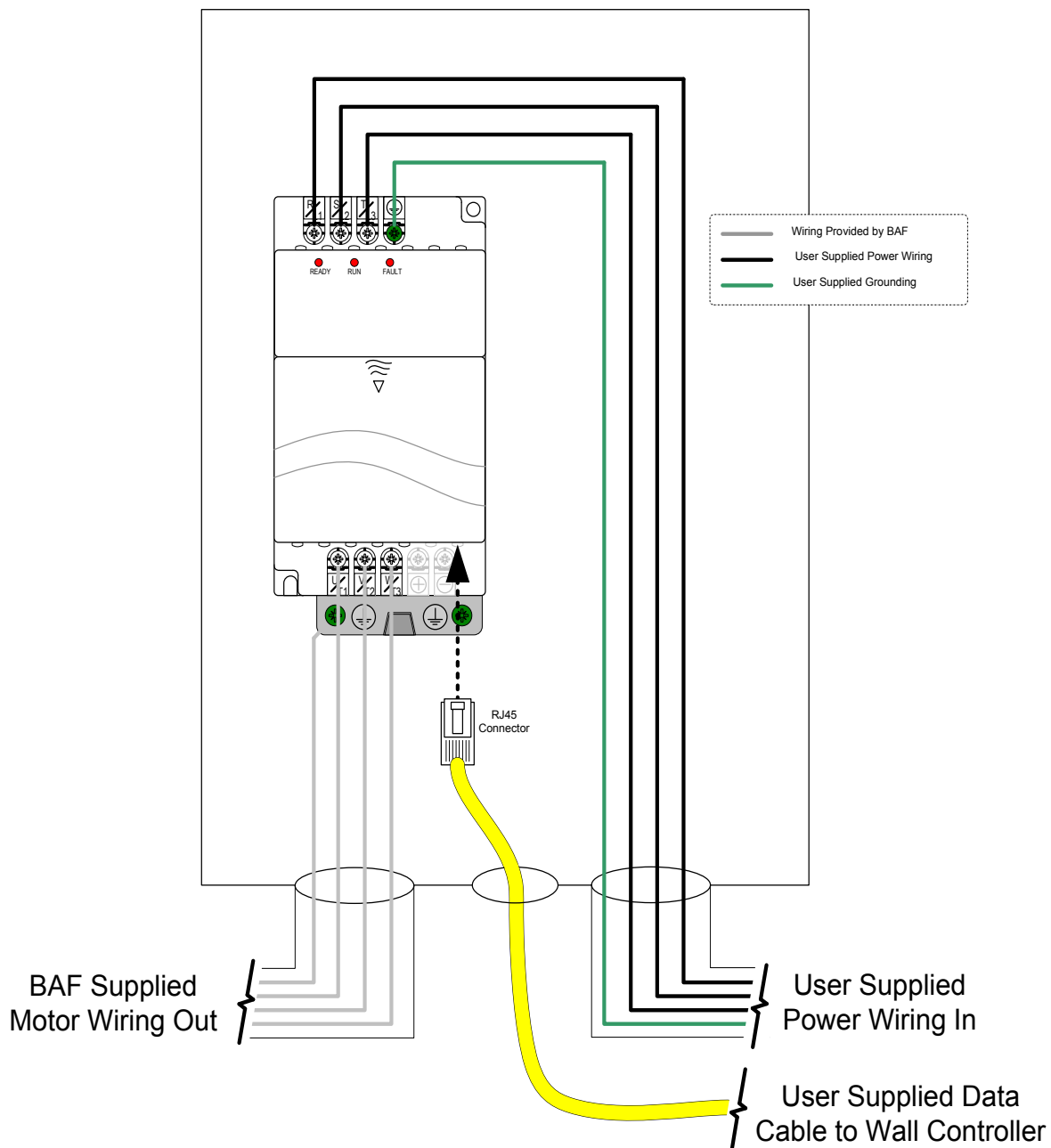
Wiring: Fan Controller (200-250V & 400-480V Three Phase)



WARNING: Wait 3 minutes after disconnecting before servicing!

WARNING: Improper installation can cause electric shock or damage to the motor and controller. A qualified electrician should perform the installation.

- This diagram is for a Standard Fan controller, 200-250V & 400-480V using three phase input from AC power supply.
- See the electrical diagram provided with the controller for detailed voltage, current, and circuit breaker/ fuse requirements. This information is also found in "Power Requirements" on p. 24.
- This fan controller does not contain fusing! Power must be supplied to this controller via a dedicated circuit breaker or properly fused disconnect! Refer to "Power Requirements" (p. 24) and "Branch Circuit Protection" (p. 27).



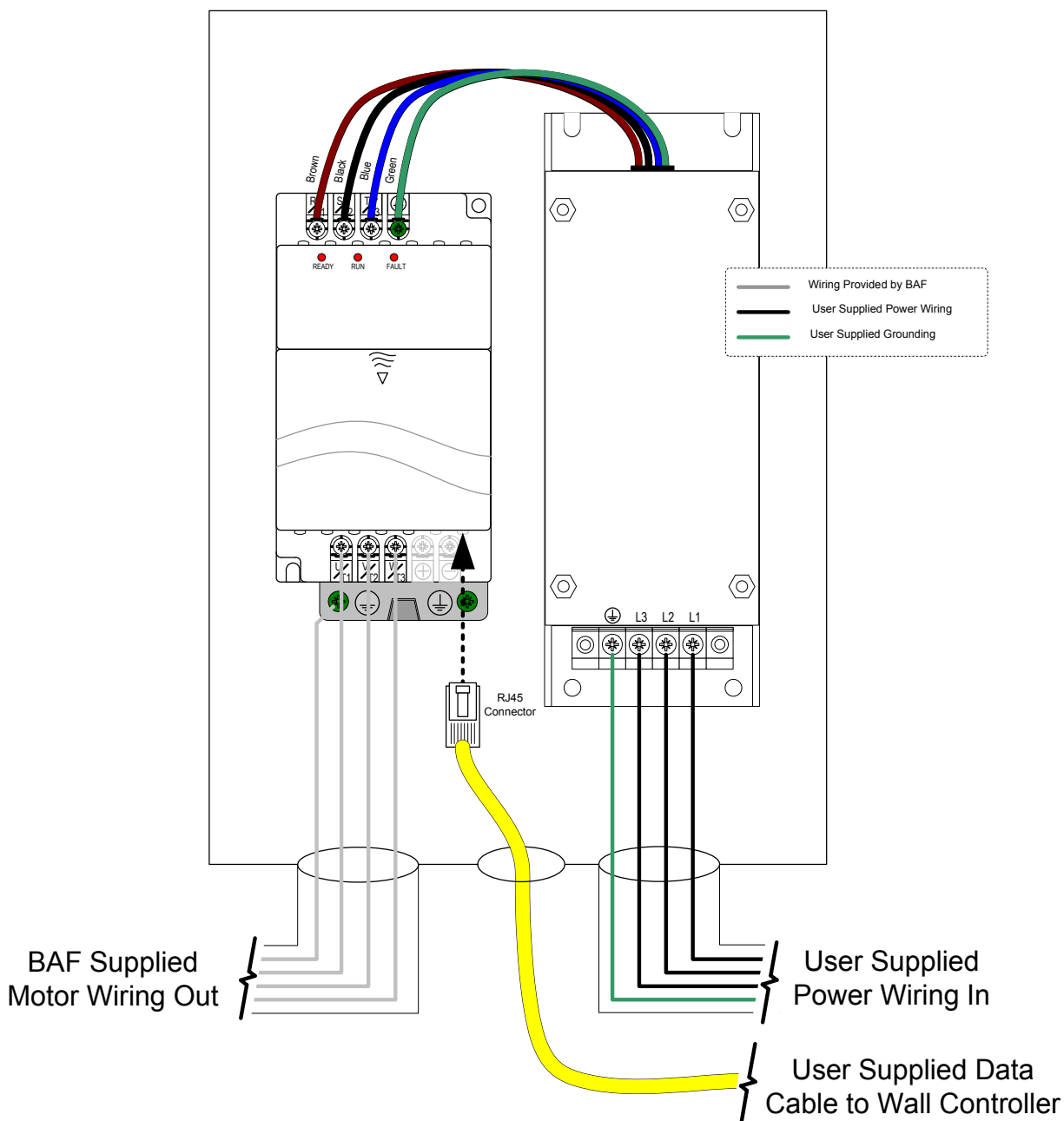
Wiring: Fan Controller with EMI Filter (200-250V & 400-480V Three Phase)



WARNING: Wait 3 minutes after disconnecting before servicing!

WARNING: Improper installation can cause electric shock or damage to the motor and controller. A qualified electrician should perform the installation.

- This diagram is for a Standard Fan controller with an EMI filter, 200-250V & 400-480V using three phase input from AC power supply.
- See the electrical diagram provided with the controller for detailed voltage, current, and circuit breaker/ fuse requirements. This information is also found in "Power Requirements" on p. 24.
- This fan controller does not contain fusing! Power must be supplied to this controller via a dedicated circuit breaker or properly fused disconnect! Refer to "Power Requirements" (p. 24) and "Branch Circuit Protection" (p. 27).



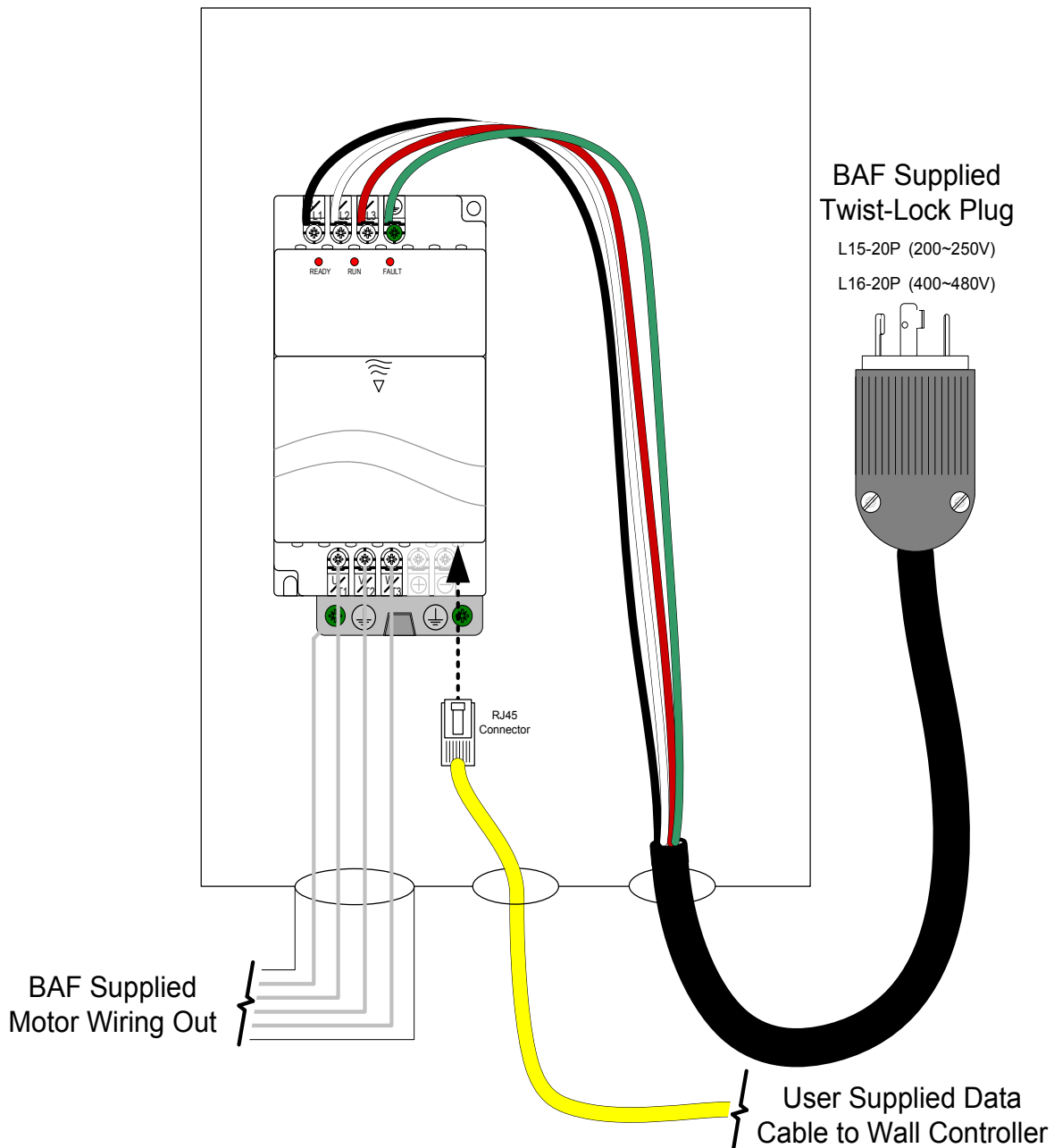
30

Wiring: Fan Controller (200-250V & 400-480V Three Phase)

WARNING: Wait 3 minutes after disconnecting before servicing!

WARNING: Improper installation can cause electric shock or damage to the motor and controller. A qualified electrician should perform the installation.

- This diagram is for a Standard Fan controller, 200-250V & 400-480V using three phase input from AC power supply.
- See the electrical diagram provided with the controller for detailed voltage, current, and circuit breaker/ fuse requirements. This information is also found in "Power Requirements" on p. 24.
- This fan controller does not contain fusing! Power must be supplied to this controller via a dedicated circuit breaker or properly fused disconnect! Refer to "Power Requirements" (p. 24) and "Branch Circuit Protection" (p. 27).



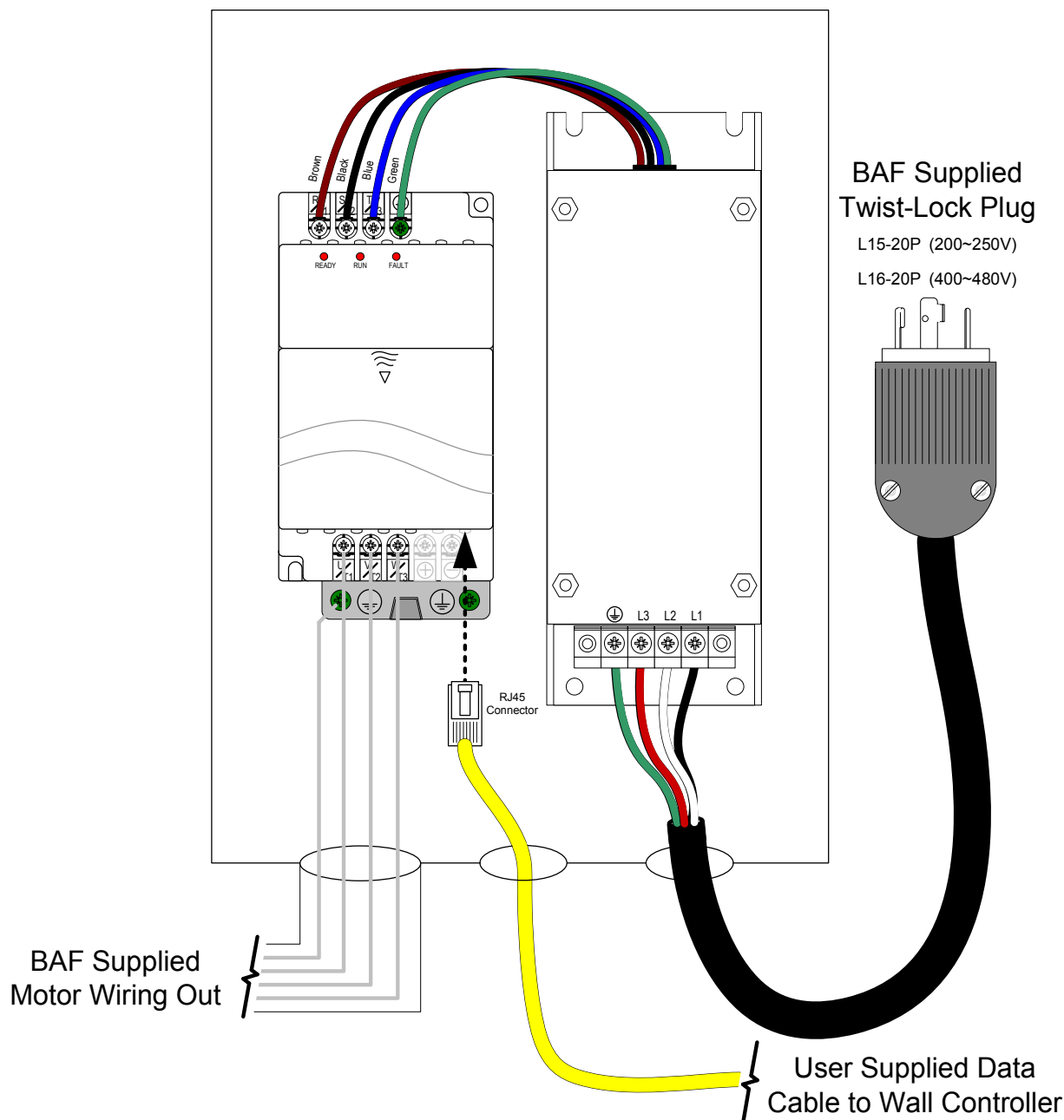
Wiring: Fan Controller with EMI Filter (200-250V & 400-480V Three Phase)



WARNING: Wait 3 minutes after disconnecting before servicing!

WARNING: Improper installation can cause electric shock or damage to the motor and controller. A qualified electrician should perform the installation.

- This diagram is for a Standard Fan controller, 200-250V & 400-480V using three phase input from AC power supply.
- See the electrical diagram provided with the controller for detailed voltage, current, and circuit breaker/ fuse requirements. This information is also found in "Power Requirements" on p. 24.
- This fan controller does not contain fusing! Power must be supplied to this controller via a dedicated circuit breaker or properly fused disconnect! Refer to "Power Requirements" (p. 24) and "Branch Circuit Protection" (p. 27).



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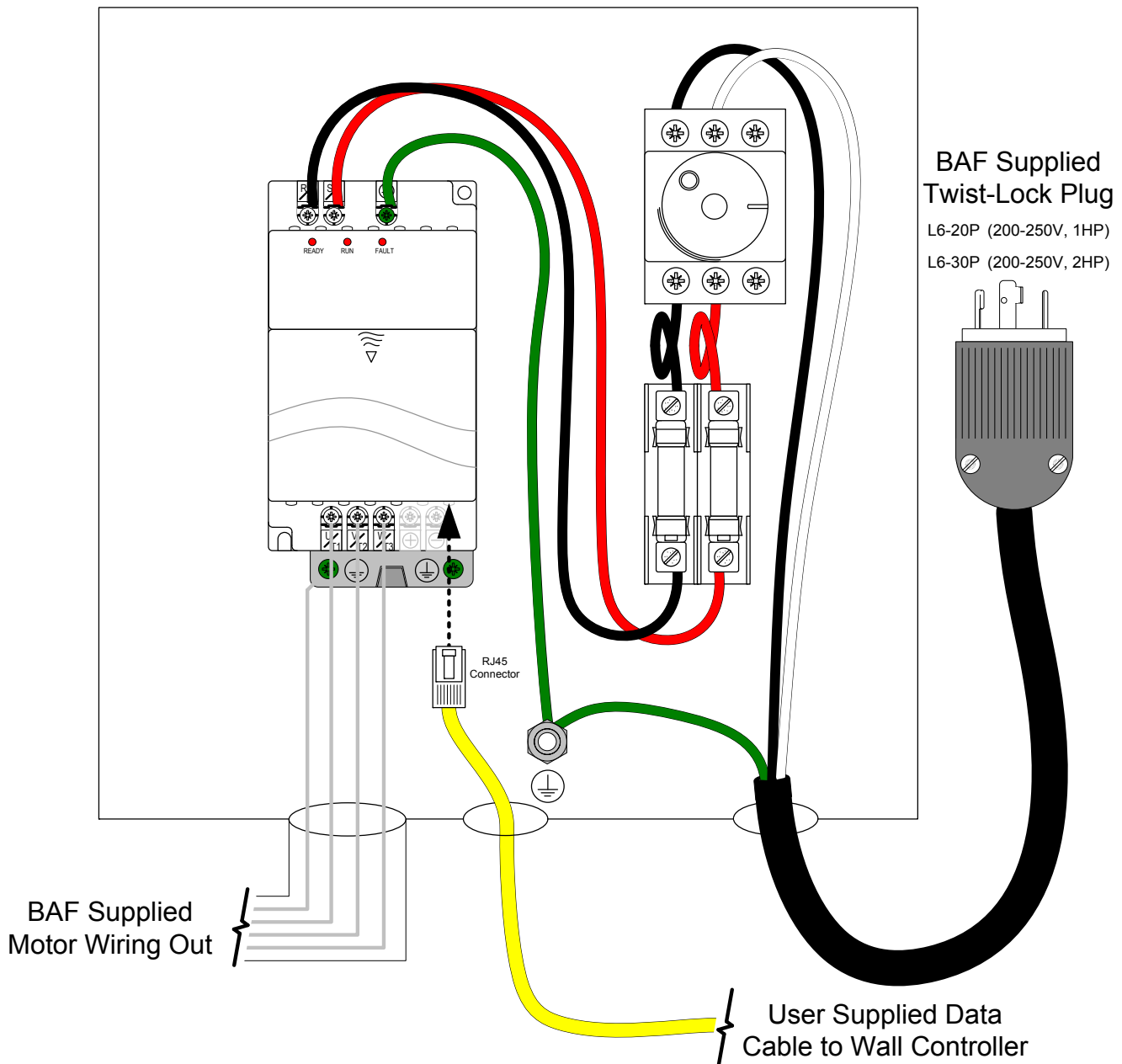
Wiring: Fan Controller (200-250V Single Phase)



WARNING: Wait 3 minutes after disconnecting before servicing!

WARNING: Improper installation can cause electric shock or damage to the motor and controller. A qualified electrician should perform the installation.

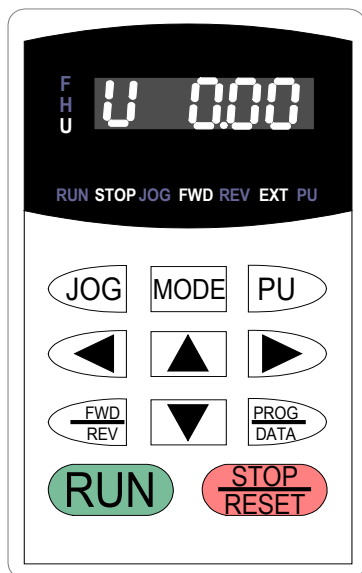
- This diagram is for a Standard Fan controller, 200-250V using single phase input from AC power supply.
- See the electrical diagram provided with the controller for detailed voltage, current, and circuit breaker/ fuse requirements. This information is also found in "Power Requirements" on p. 24.
- This fan controller does not contain fusing! Power must be supplied to this controller via a dedicated circuit breaker or properly fused disconnect! Refer to "Power Requirements" (p. 24) and "Branch Circuit Protection" (p. 27).



Wall Control Operation

Understanding Wall Control Operation

Wall Controller



Upon initial power-up of the fan, the wall controller display appears as shown to the left.

The wall control is preprogrammed to show the fan's current running speed in RPM (or "U" for "user") on the LED display. The display also indicates if the fan is stopped (STOP), set to run forward (FWD), or is set to respond to an external control source (EXT) such as an Energy Management or Building Automation System.

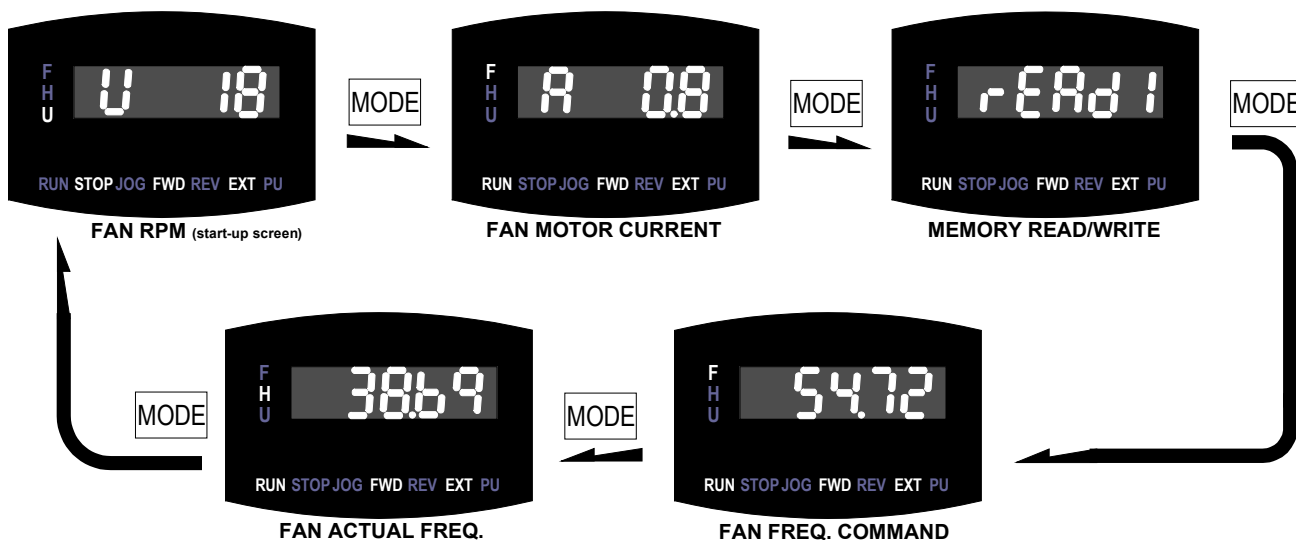
Other main LED display modes include Motor Current, memory status, Motor Command Frequency, and Motor Actual Frequency.

Several other useful indicators of fan status on the wall control are RUN/STOP, JOG, FWD/REV direction, and External or Local Control.

Cycling through Main LED Display Modes

MODE

To cycle through the possible display options on the wall control, press the MODE button repeatedly. Below are the possible screens in the order in which they appear on the display.



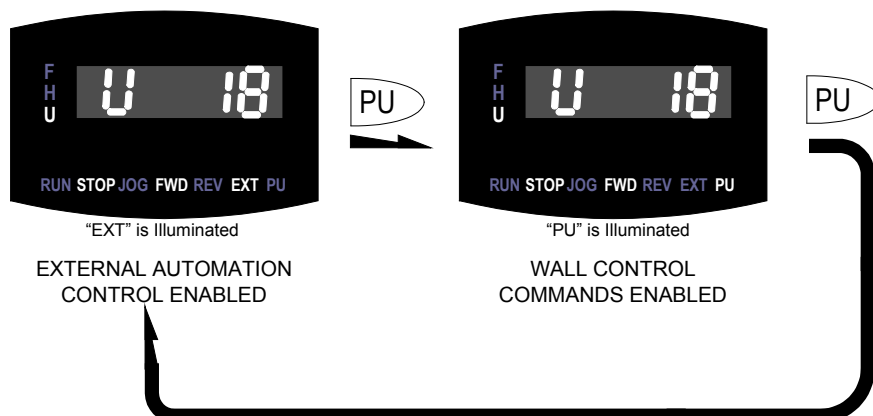
34

Toggling the Fan's Command Source

PU

To select the command source of the fan, press the PU (Programmer/User) button. The fan controller is programmed at the factory to accept digital and analog inputs from customer automation systems for start/stop and speed commands, or to be directly controlled from the wall control unit. Upon power-up, the fan puts priority on external commands provided by automation systems or other fans (see "Basic Distributed I/O Interface" and "Daisy Chaining").

To operate the fan from the wall control, press the PU button to make sure that the PU indicator is illuminated. The RUN, STOP, and FWD/REV buttons are functional only when the PU indicator is illuminated.



Starting, Stopping, and Direction Control

RUN

STOP
RESET

As long as the PU indicator is illuminated on the wall control (shown above), starting or stopping the fan is controlled by the RUN and STOP/RESET buttons.

When the RUN button is pressed, the STOP LED extinguishes and the RUN LED illuminates while the fan accelerates to the commanded speed.

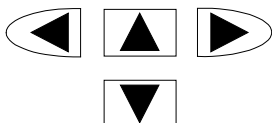
To decelerate the fan, press the STOP/RESET button. The RUN LED will flash, indicating that the fan controller has accepted the command, and the STOP LED illuminates.

FWD
REV

Proper fan rotation is initially set at the factory. To reverse the rotation of the fan, press the FWD/REV button. The fan does not have to be stopped in order to perform this action. When pressed while the fan is running, the current directions FWD or REV LED will flash, indicating a pending change in fan direction.

Note: The RUN, STOP/RESET, and FWD/REV buttons are disabled while External Automation Control is enabled (EXT LED illuminated.)

Changing the Fan Speed



As long as the PU indicator is illuminated, the UP, DOWN, LEFT, and RIGHT arrow buttons can be used to adjust the fan speed, which can be performed when the fan is stopped or running.

The UP and DOWN arrow buttons control the fan speed command. In an effort to accelerate this process, press either the LEFT or RIGHT arrow button to select which digit is controlled by the UP and DOWN buttons. Allowing selection of the digit can make changing the fan speed a very fast or very accurate operation.



Changing the fan speed can be performed regardless of Main LED Display mode, with the exception of the Memory Read/Write screen. When one of the direction keys is pressed, the current display mode is forced to change to the Fan Freq. Command screen as shown on the left.

Other Wall Control Functions



As long as the PU indicator is illuminated, the JOG button can be used to slowly rotate the fan blades to a different position or to verify proper fan rotation. Press and hold the JOG button to slowly accelerate the fan up to a maximum motor frequency of 5.0 Hz. Release the JOG button to rapidly stop the fan in two (2) seconds or less depending on how fast the fan is rotating in JOG mode.

Understanding and Clearing Fan Faults



The STOP/RESET button is used to reset the fan controller after the condition that induced the fault has been cleared.

Types of Faults



EF or “External Fault” is displayed when the fan has stopped due to an alarm condition associated with the fan’s Impact Detection System or VESDA fire detection system. EF also displays if the user has interfaced the fan system with other equipment requiring fan shutdown, such as an ESFR system. See “Basic ESFR Interfacing.”



All other error codes are considered “Internal” faults. These codes are specific to problems associated with the fan controller or motor. For example, the error code for “input power phase loss” is shown on the left. For a full list of error codes and their meanings, see “Fan Error Codes.”

Programming and Parameter Changes



To access parameters and make changes to the behavior of the fan system, press the PROG/DATA button. If this button is pushed inadvertently, exit programming mode by pressing the MODE button twice to return to the normal operational screen.

ATTENTION: Under no circumstances should an operator attempt to change or alter the programming of the Powerfoil X fan’s controller without the assistance of an authorized Big Ass Fans installer, the Big Ass Fans Customer Service Department, or the Big Ass Fans Engineering Department.

Fan Maximum Operating Frequencies

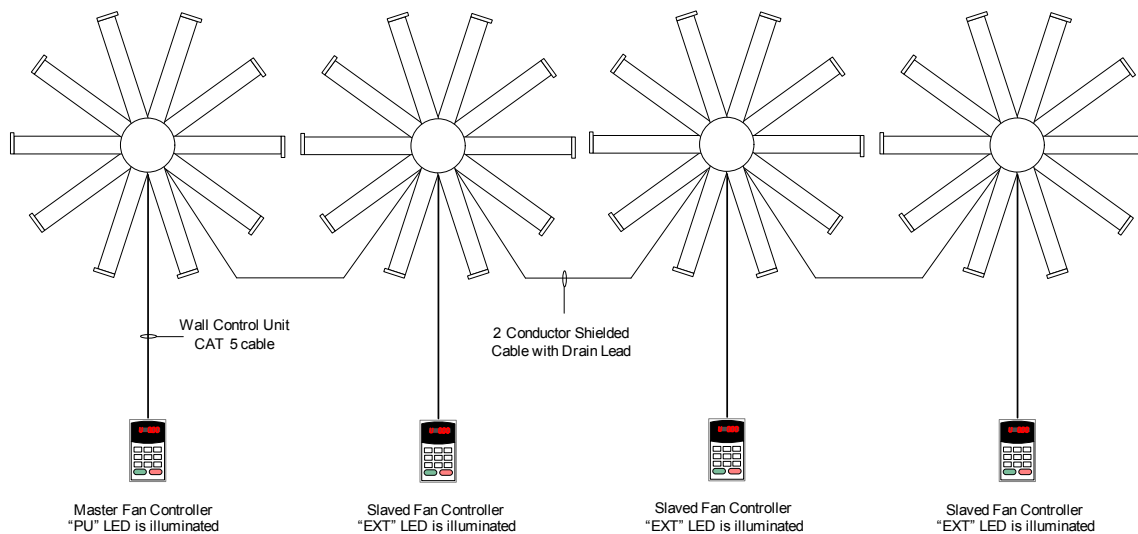
For optimum operating results, the Powerfoil® X utilizes a motor that is rated for operation up to 60 Hz, coupled to a NitroSeal Drive™ gear reducer. **ATTENTION:** If, in the product development process, it was determined that a motor frequency less than 60 Hz is optimal for maximum performance of your particular fan model, under no circumstances should the factory programmed maximum frequency command limits be changed. Damage to the fan assembly or loss of warranty coverage can result.

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Daisy Chaining

The Powerfoil® X fan is preprogrammed to operate in Master/Slave or Daisy Chain mode. Starting, stopping, and speed control signals are transmitted by the master fan controller to remaining slaved fans via 0-10 VDC analog outputs. The wall control unit for the slaved fans remains active as a display so that the operator can still view any fault messages, toggle between output frequency and fan RPM displays, or operate the fan via the PU button.

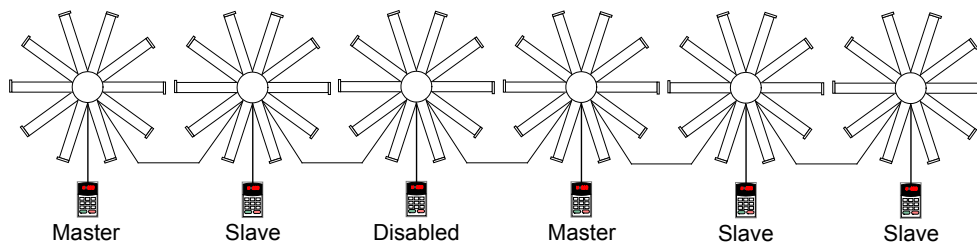
PU The PU button toggles the fan's command sources between the wall controller (PU LED illuminated) and external sources (EXT LED illuminated). In a daisy chained installation, the Master fan controller will operate via the wall control unit (PU mode), and the Slaved fan controller(s) will operate via the 0-10 VDC command reference provided by the master fan controller (EXT mode).



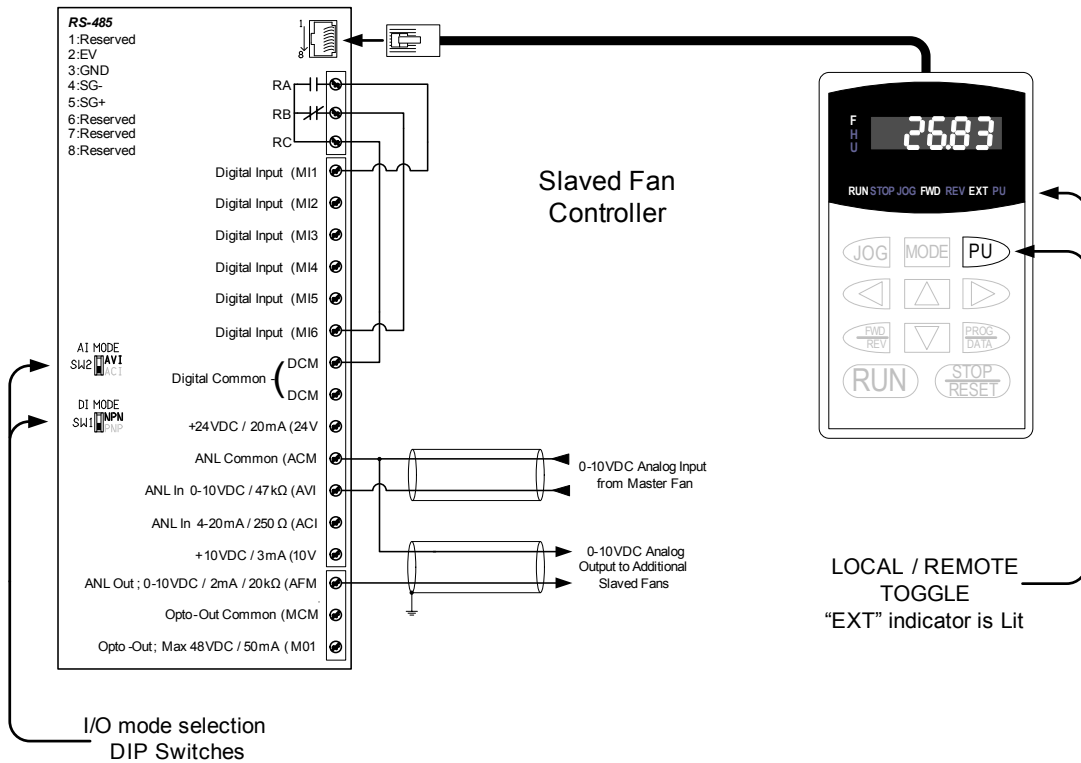
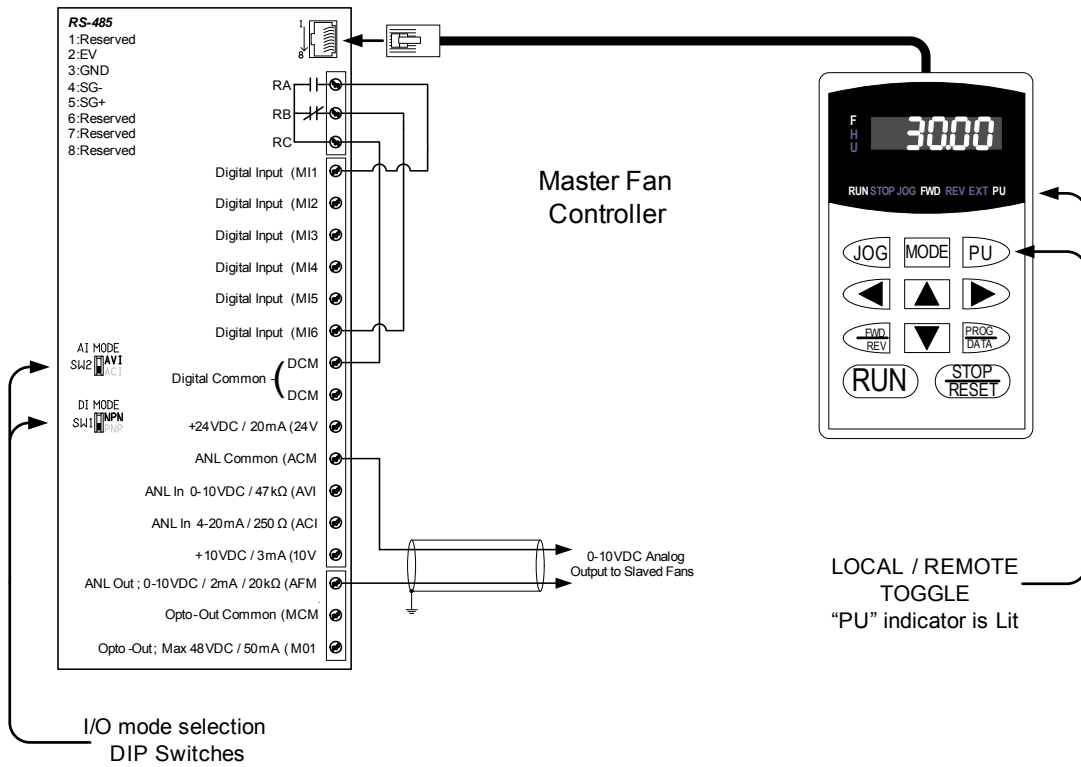
In the example above, the first fan controller is the Master fan controller (PU mode). The remaining fans (EXT mode), when connected with a 2 conductor shielded cable, will follow command references provided by the Master controller. See the following pages for detailed wiring diagrams. Limit 2 conductor shielded cable runs to 200 ft (61 m) or less. Consult Big Ass Fans Customer Service Department at 1-877-BIG-FANS for conversion to 4-20 mA current loop.

System Redundancy

In the event that one of the fans in the chain is disabled, the next fan controller in the chain can become the Master controller for all remaining fans simply by pressing the PU button.



Daisy Chaining

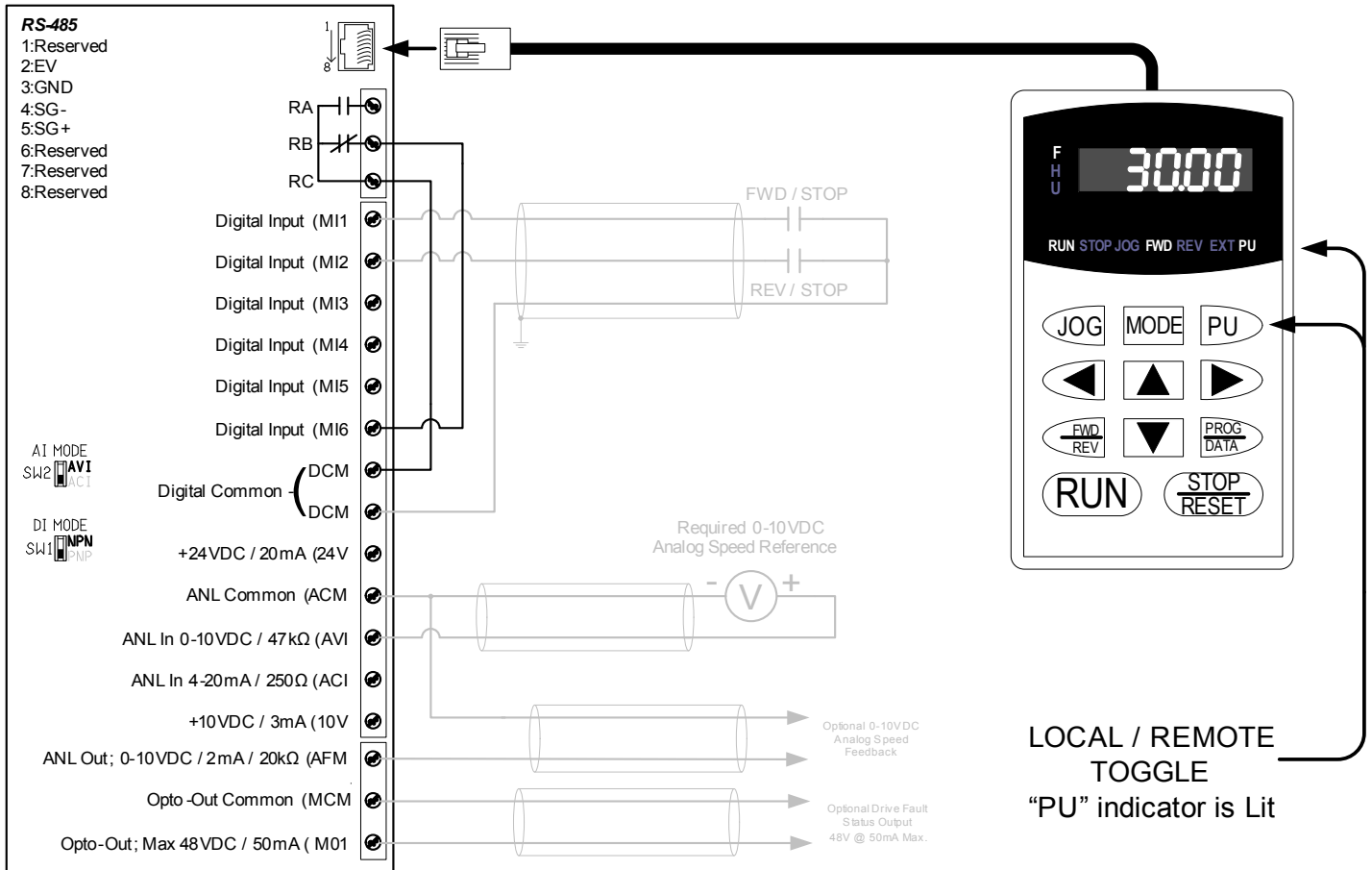


*Reverse Fan Rotation is disabled when operated as a slaved unit.

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Basic Distributed I/O Interface; LOCAL Control

(RA to Digital Input #1 jumper removed)



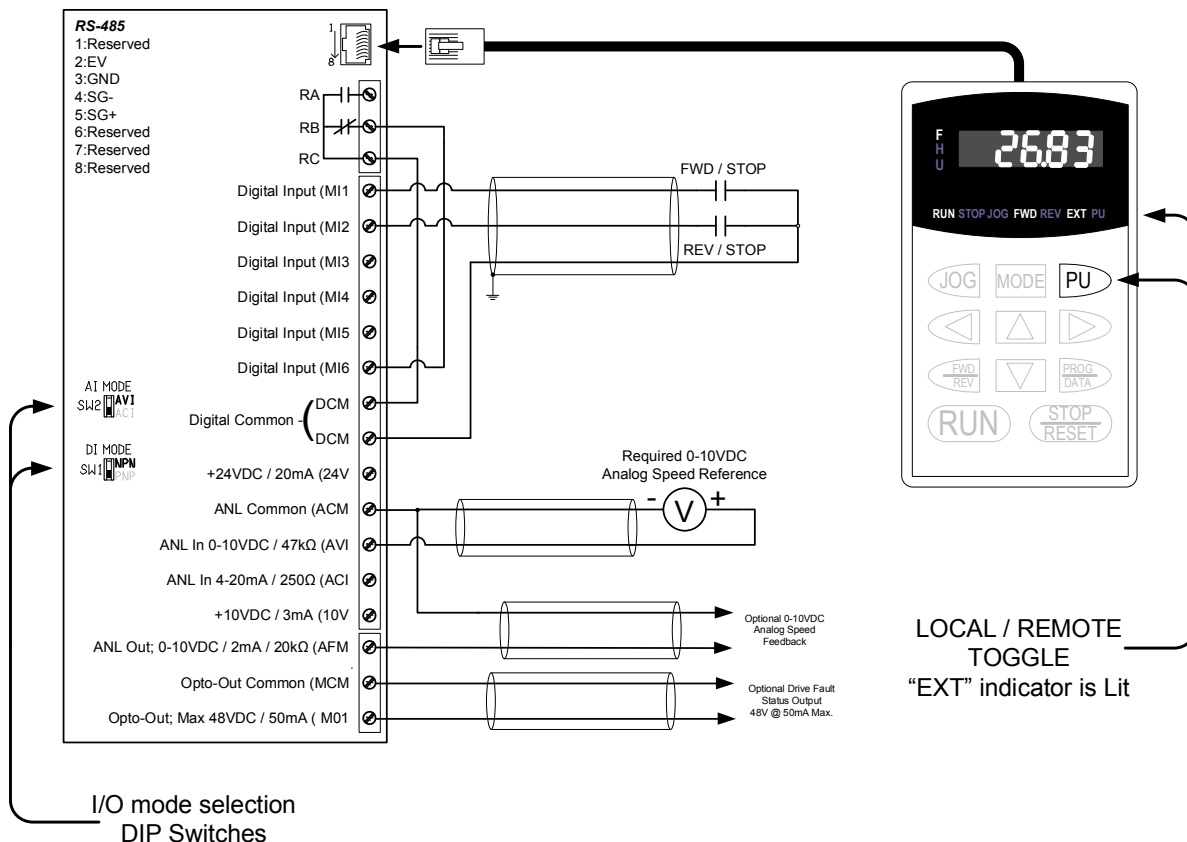
The Powerfoil X fan is programmed to be controlled via the included wall control unit, which handles starting, stopping, and speed control duties. Fault messages and toggling between output frequency and fan RPM displays are also controlled by the wall control unit.

***For the wall control unit to be active, the PU indicator light must be illuminated by pressing the PU button.**

This mode of operation is commonly referred to as "Local Control."

Basic Distributed I/O Interface; EXTERNAL Control

(RA to Digital Input #1 jumper removed)



The Powerfoil® X fan is also programmed to be controlled by an Energy Management System or Building Automation System. Starting, stopping, and speed control duties are handled by the distributed I/O (2 N.O. contacts, 1 analog) provided by the installer. The wall control unit remains active as a display so that fault messages can still be viewed and toggling between output frequency and fan RPM displays can still be performed.

***For distributed I/O to be active, the EXT indicator light must be illuminated by pressing the PU button as shown above.**

This mode of operation is commonly referred to as “External Control.”

About I/O Mode Selection: Big Ass Fans factory defaults for analog and digital inputs are ACI (4-20 mA) and NPN (inputs pulled down to DC Common). If required, the installer may switch these to AVI (0-10 VDC as shown above) and PNP (inputs pulled up to 24 VDC) via the dip switches shown above. A diagram can be provided to reflect these alternate connection schemes (if required).

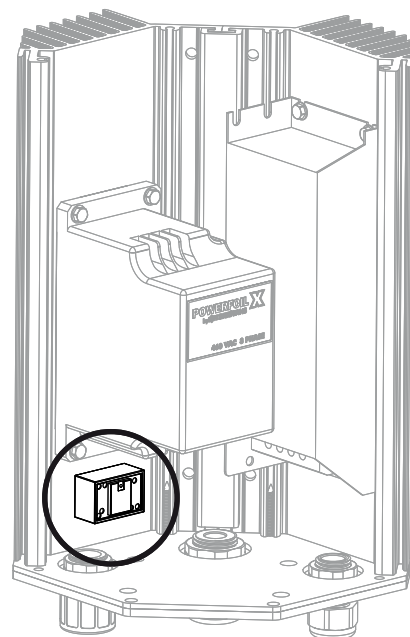
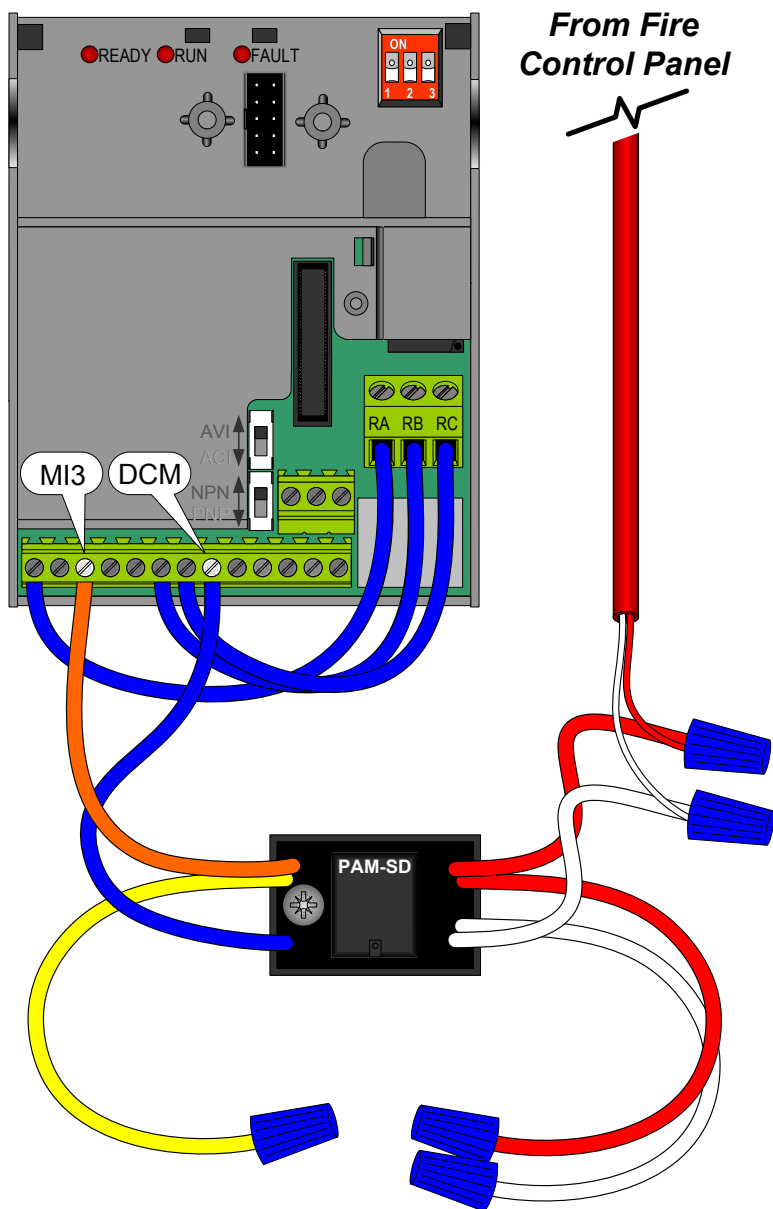
40

Basic ESFR Interfacing

Powerfoil® X Fire Signal Relay Wiring (as Shipped)

A contact closure across digital input terminals MI3 and DCM will result in fan shutdown. The relay uses a Normally Open contact (N.O) as shown below. The relay coil must be energized by the FCP for fan shut down.

Two additional relay coil leads are provided to facilitate supervision pass-through where required.



Note: The relay is housed in the onboard controller as shown above.

White(X2)- (-)	C	-Blue
Red(X2)- (+)	NC	-Yellow
	NO	-Orange

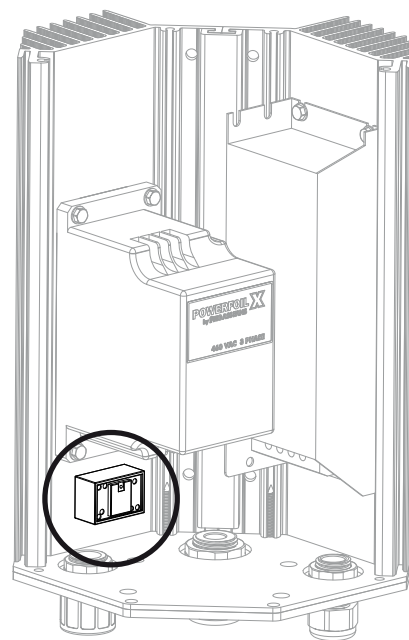
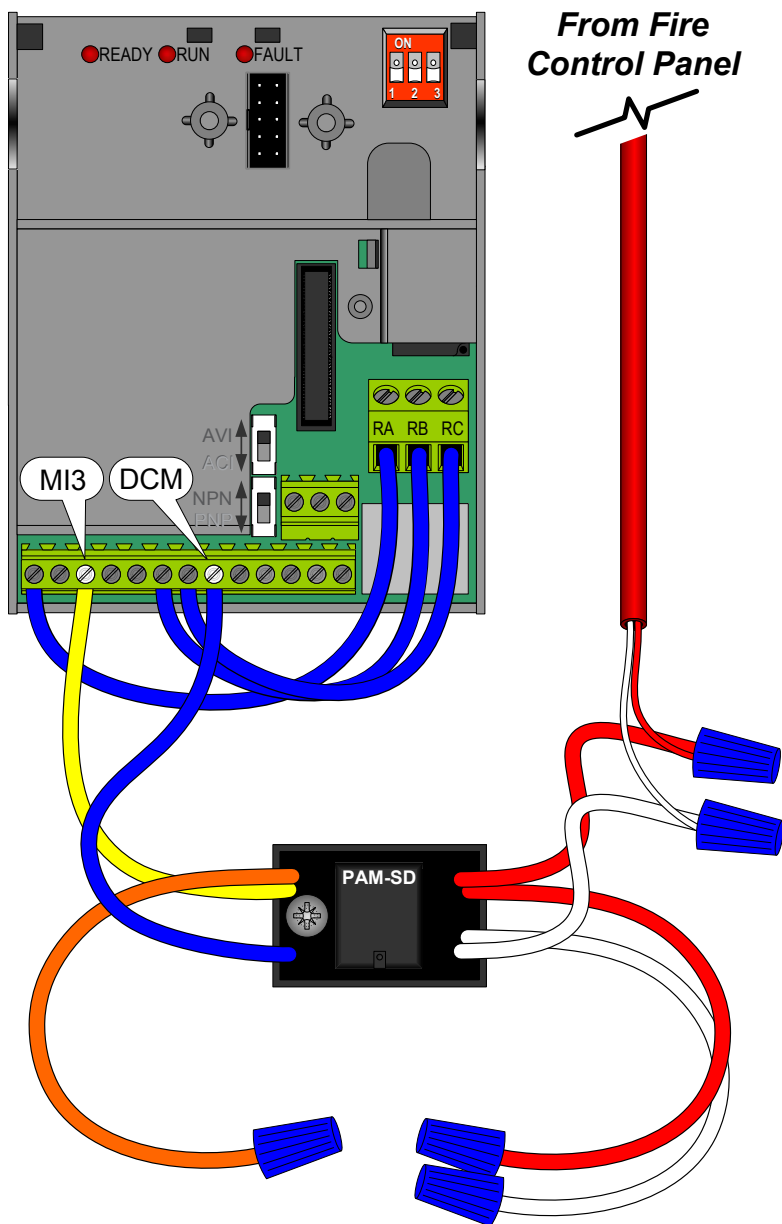
Coil: 20-32VDC
@ 20mA

Basic ESFR Interfacing (cont.)

Powerfoil® X Fire Signal Relay Wiring (Optional)

A contact closure across digital input terminals MI3 and DCM will result in fan shutdown. The relay uses a Normally Closed (N.C.) contact as shown. The relay coil must remain energized by the FCP for fan operation.

Two additional relay coil leads are provided to facilitate supervision pass-through where required.



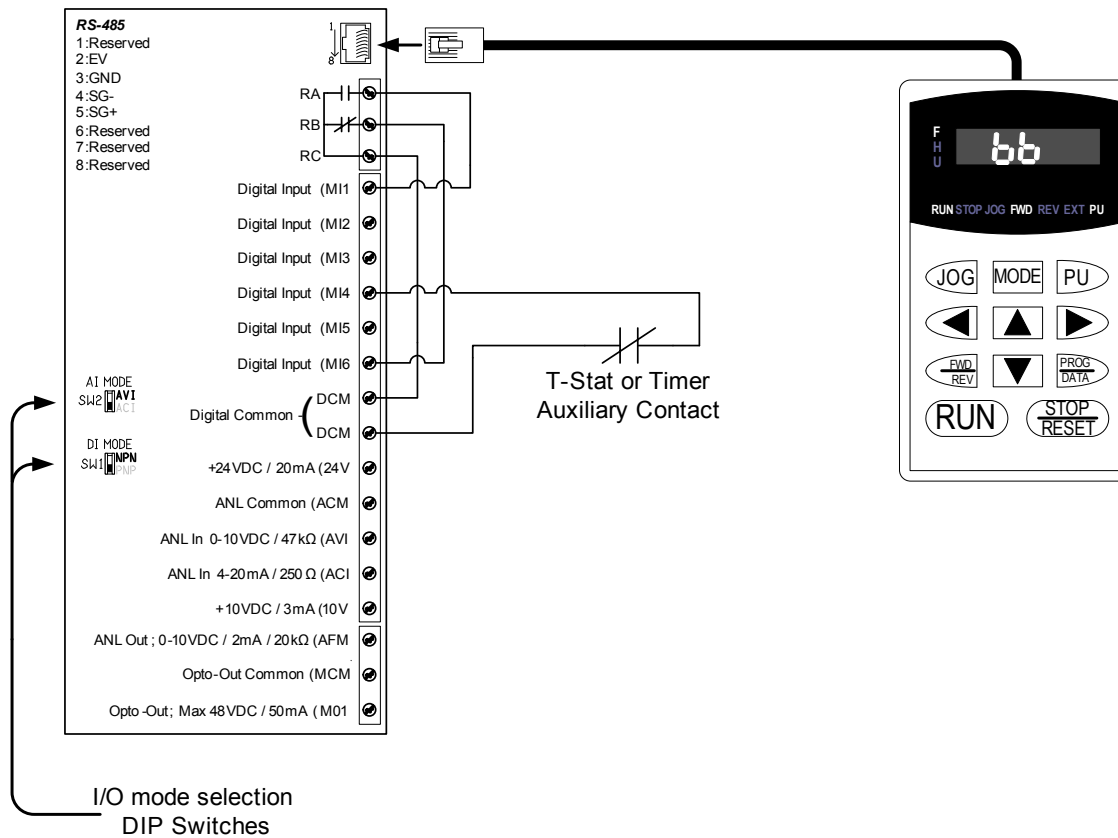
Note: The relay is housed in the onboard controller as shown above.

White(X2)-	(-)	C	-Blue
		NC	-Yellow
Red(X2)-	(+)	NO	-Orange

Coil: 20-32VDC @ 20mA

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Basic Timer and Thermostat Interfacing



When a contact closure is seen across Digital Input #4 (MI4) and DC Common (DCM), the fan is preprogrammed to issue a base-block code and initiate fan shutdown. This is essentially turning off the fan controller's output terminals, while leaving the fan controller in Run mode.

After the auxiliary contract has reopened, the fan will return to its previous operating mode.

Fan Error Codes

Below are common error codes that may display in the event of a system fault with descriptions and corrective actions. Contact Big Ass Fans Customer Service at 1-877-BIG-FANS to resolve codes that cannot be cleared or for codes not listed below.

Error Code	Description and Corrective Action
OH 1 OH 2	Fan Controller Overheating Ensure that the ambient temperature range around the fan controller is not in excess of 50°C or 122°F. If ambient temperatures are found to be acceptable, ensure that the controller enclosure heatsink fins are free of debris and dirt buildup.
LV	Low AC Input Voltage Ensure that the incoming AC line voltage is within nominal limits. For fans that operate in a range of 200-250 VAC 3Φ, the fan controller will ride through a voltage sag down to 180 VAC (-10% nominal). For fans that operate in a range of 400-480 VAC 3Φ, the fan controller will ride through a voltage sag down to 342 VAC (-10% nominal). Please consult a qualified electrical contractor or electrical engineer regarding facility's power distribution for a solution that will fit the facility's symptoms.
OL OL 1 OL 2	Overload, Overload 1, Overload 2 These three fault codes indicate that the motor has experienced load torque in excess of design limits. Check the fan blades for obstruction and abnormal buildup of debris or dust. Listen for abnormal gear noise while the fan is running. Contact Big Ass Fans Customer Service at 1-877-BIG-FANS for additional troubleshooting.
EF	External Fault This fault indicates that a customer-installed fault trigger has been activated on multi-function input terminal 3. MFIT 3 is factory configured as an NPN input; pulling this input down to DC Common will initiate fan shutdown. See "Basic ESFR Interfacing" on p. 40.
GFF	Ground Fault A short circuit to ground has been detected in the motor circuit. Check the motor wiring at the motor junction box and fan controller output terminals. This fault may also indicate a defective fan controller output transistor module.
CE--	Communication Error Confirm that the fan controller was not preordered to interface with Modbus/RTU communications protocols. This error will occur if fan controller addressing has been modified from factory defaults and interfaced with the standard wall control unit. Verify wiring of the data cable between the fan with the standard wall control unit. Verify wiring of the data cable between the fan controller and the wall control unit. See "Wiring Data Cable for Wall Control" on p. 25.
AE r r	Analog Signal Error When using a remote 4-20 mA analog speed reference in External/Remote mode (ACI), this fault indicates that a failure has occurred in the current loop. Verify proper wiring, supply voltage, and loop impedance.
PHL	Input Phase Loss This fault indicates the loss of input voltage on L1, L2, or L3.

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Operating the Fan

Heating Season

The Powerfoil® X fan returns heat from the ceiling down to floor level using a more efficient method than small ceiling fans. For maximum energy savings, the Powerfoil® X should be operated continuously during the heating season and should not be operated in reverse (clockwise). Big Ass Fans are designed to operate efficiently at very low speeds, so turning the fan very slowly in the forward direction (counter-clockwise) will provide enough air movement to circulate the hot air at the ceiling down to the floor without causing drafts. Follow the instructions below for proper fan operation:

1. Turn on the fan.
2. Verify that the fan is rotating in the counter-clockwise direction (when viewed from below).
3. If the fan is not rotating counter-clockwise, reverse the fan direction.

Optional Operating Instructions

Adjust the fan speed to the appropriate Starting Fan Speed listed in the table below.

Floor to Ceiling Height (ft)	Starting Fan Speed
< 40	25 Hz
≥ 40	40 Hz

Stand directly below the tips of the fan blades with hand outstretched. If you feel a draft, slightly turn down the fan speed (0.5). Repeat until the draft is no longer noticeable.

Cooling Season

The cooling effect created by the breeze from the Powerfoil X fan keeps occupants comfortable with the thermostat at a higher setting. During the cooling season, every degree higher that the thermostat is reset reduces the energy consumed by the air conditioner by 1.5-2%. To minimize energy usage during the cooling season, operate the fan only when building occupants are present.

1. Turn on the fan.
2. Verify the fan is spinning in the counter-clockwise direction (when viewed from below).
3. If the fan is not spinning counter-clockwise, reverse the direction of the fan.

Optional Operating Instructions

Adjust the fan speed to the appropriate Starting Fan Speed listed in the table below.

Floor to Ceiling Height (ft)	Starting Fan Speed
< 40	15 Hz
≥ 40	20 Hz

Increase the speed of the fan until desired air speed or maximum fan speed is reached. In air conditioned facilities, increase the thermostat setpoint by 2-7°F to save energy.

User Servicing

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Please take a few moments each year to perform the following preventive maintenance inspection to your fan to ensure its safe and efficient operation. If you have any questions, contact Customer Service at 1-877-BIG-FANS. If you require assistance, contact Field Service at 1-877-BIG-FANS to schedule a visit.

WARNING: Risk of fire, electric shock, or injury to persons during cleaning and user-maintenance! Disconnect the appliance from the power supply before servicing.

WARNING: 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: When service or replacement of a component in the fan requires the removal or disconnection of a safety device, the safety device is to be reinstalled or remounted as previously installed.

Annual Preventive Maintenance

Note: Actual installation setup may differ from picture.

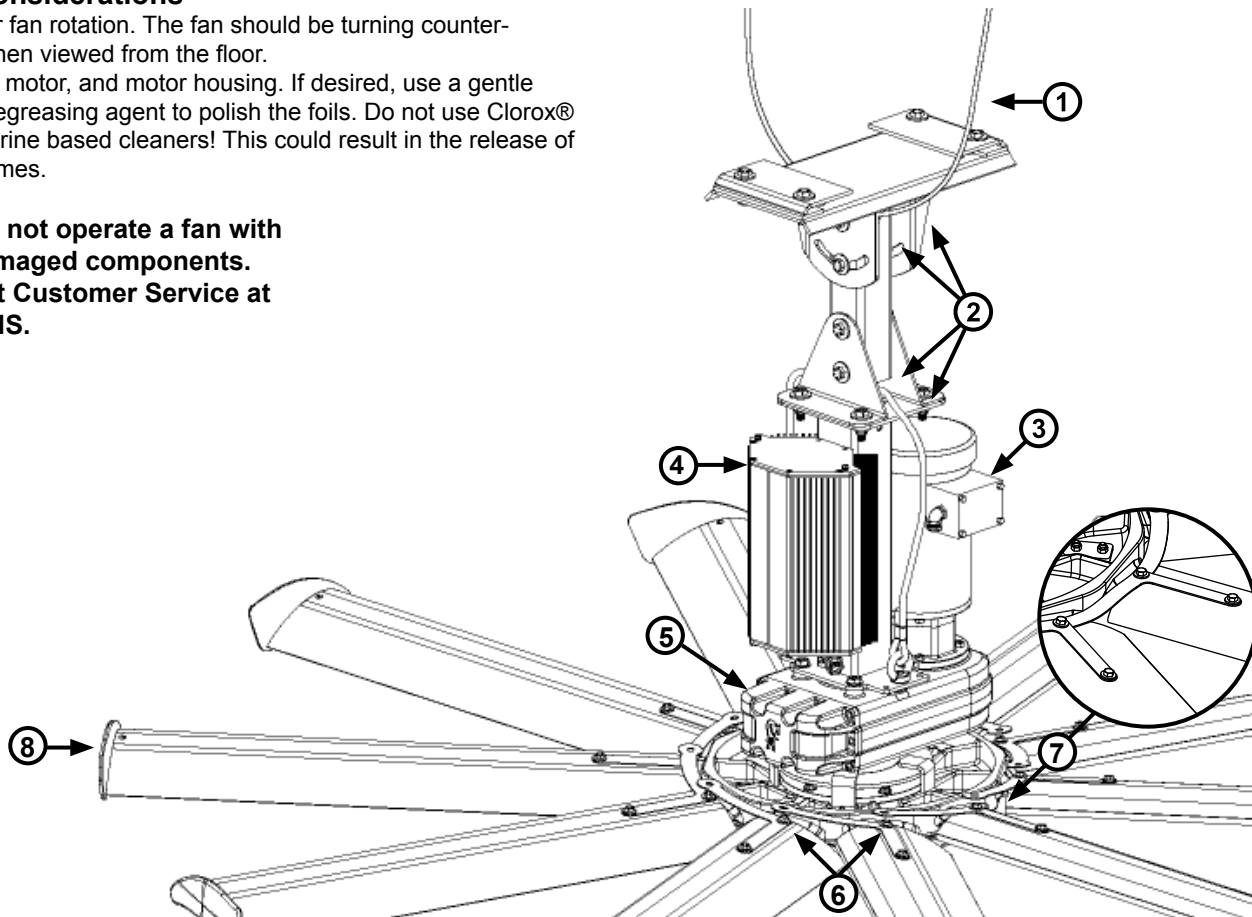
To be performed annually (see "Maintenance Checklist" in back of manual):

1. Check for the presence of the safety cable and shackle. The cable should be wrapped around the I-beam/angle irons, leaving as little slack as possible. The shackle should be securely tightened and located on the topside of the I-beam/angle irons.
2. Ensure all mounting bolts (12x) are present and torqued to 40 ft·lb (54.2 N·m). Ensure the lower cable is between the brackets of the lower yoke.
3. Inspect motor terminations inside junction box and tighten if necessary.
4. Check all connections in the fan controller and tighten as needed.
5. Check gear reducer for oil leakage. If leakage is present, contact Customer Service at 1-877-BIG-FANS.
6. Ensure all bolts (20x) securing airfoils to fan are present and torqued to 29 ft·lb (39 N·m).
7. Ensure airfoils are secured to one another by airfoil retainers (10x).
8. Ensure bolts securing hub safety clips are present and torqued to 29 ft·lb (39 N·m).

Additional Considerations

- Verify proper fan rotation. The fan should be turning counter-clockwise when viewed from the floor.
- Dust airfoils, motor, and motor housing. If desired, use a gentle cleaner or degreasing agent to polish the foils. Do not use Clorox® or other chlorine based cleaners! This could result in the release of toxic/fatal fumes.

WARNING: Do not operate a fan with missing or damaged components. Please contact Customer Service at 1-877-BIG-FANS.



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Troubleshooting

WARNING: Risk of fire, electric shock, or injury to persons during cleaning and user-maintenance! Disconnect the appliance from the power supply before servicing.

WARNING: Before servicing or cleaning unit, switch power off at the 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: When service or replacement of a component in the fan requires the removal or disconnection of a safety device, the safety device is to be reinstalled or remounted as previously installed.

General Troubleshooting

The Fan Turning in the Wrong Direction

The fan must be rotating counter-clockwise (when viewed from the floor) to be effective. If the fan is not rotating in this direction, press the “FWD/REV” button on the wall control.

Popping Noise Is Coming From the Fan

Airfoil popping comes from airfoils that are not tightened to the specified torque (see torque chart on p. 6).

- Switch off power at service panel and lock service disconnecting means. (If it cannot be locked, fasten a prominent warning device.) Tighten airfoil fasteners to specified torque. If popping still occurs, verify that the airfoils are not contacting each other. If the airfoils are contacting each other, contact Big Ass Fans Customer Service at 1-877-BIG-FANS.

The Fan Is Not Starting

- Make sure that all wires are securely connected.
- Make sure the wall control is set to “RUN” and PU mode.
- Verify that supply power is adequate and functional.
- Contact Customer Service at 1-877-BIG-FANS.

The Fan Controller Generates Radio Frequency (RF) Noise

Fan controllers generate radio frequency noise in many ways, but this noise can be prevented by using the proper wiring practices outlined in the “Electrical Installation” section (p. 24).

- Do not run your controller and sensitive equipment on the same power line.
- Install properly sized EM/RFI filter (see pp. 29, 31).
- Ensure proper grounding at the motor, controller, and from the controller to the utility.
- Contact Customer Service at 1-877-BIG-FANS.

The Motor Makes Noise When Fan Speed Is Increased

Audible high frequency carrier noise may be an indicator of a stall condition. Verify motor currents are within limits per fan specifications on pages 2-3.

Optional Parts Order Form

Fully complete this form, and then fax to Big Ass Fans at **859-967-1695**. A Big Ass Fans representative will phone or e-mail you with the total cost of part(s) and shipping. Credit card information will also be obtained at that time.

Optional Parts

Enter the number in the Quantity column for the requested part.

Quantity	Part Description
	Camera Kit
	Light Module
	SmartSense365™
	VESDA® System

Shipping Information

Enter your shipping address and contact information in the fields below, and then select your preferred shipping method.

Company Name: _____

Contact Name: _____

Shipping Address: _____

City, State, ZIP: _____

Phone Number: _____ Ext: _____

E-mail Address: _____

I prefer UPS Ground Shipping.

I prefer UPS Next Day Air Shipping.

50 Warranty

Big Ass Fans Warranty Policy

This warranty is limited solely to products purchased directly from Big Ass Fan Company or from one of its authorized dealers or re-sellers. Under no circumstances will warranty coverage extend to products purchased through eBay, craigslist, or other internet auction or internet-based retail sites. To verify that you have purchased products from an authorized dealer or re-seller, please contact Big Ass Fan Company Customer Service at 1-877-BIG-FANS. Coverage extends only to such products which fail subsequent to their initial installation, or subsequent to their re-installation within the same facility, if such failure occurs within the specified warranty period for the components involved, and subject to such other applicable terms and conditions as provided herein.

The manufacturer shall warrant the Big Ass Fan and components against defects in materials and workmanship pursuant to the following schedule:

Products	Warranty Period and Extent of Warranty
Airfoils	Lifetime (Parts)
Hub	Lifetime (Parts)
Gearbox	5 Years (Parts)/10 Years (Parts with Factory Install)
Motor	5 Years (Parts)/10 Years (Parts with Factory Install)
Controller Components	5 Years (Parts)/10 Years (Parts with Factory Install)
VESDA® Smoke Detector and Power Supply	2 Years (Parts)
Labor	1 Year
Refurbished Units	6 Months (Parts)

Definitions

1. "Labor" shall mean reimbursement by Big Ass Fan Company to the Big Ass Fan Company customer in whose facility the products are installed of all reasonable costs paid by the customer to an independent contractor (including an authorized dealer of Big Ass Fan Company) employed to remove, dismantle, reassemble, or reinstall any of the warranted products during the first year that the product is in service. Big Ass Fan Company may request proof of payment by the customer to the independent contractor of all the charges, and will reimburse the customer only to the extent of those charges that are determined by Big Ass Fan Company, in its sole discretion, to be reasonable and necessary under the circumstances.
2. The "warranty period" shall commence 10 days after Big Ass Fan Company's records show that the products were shipped or otherwise delivered to the customer or on the actual date that the products were installed, whichever is later. If the products were installed more than 10 days after receipt by the customer, the customer will be requested to provide satisfactory proof via documentation as to the actual date that the products were actually placed in service.
3. "Operate properly" applies to mechanical, electrical, and structural functions only. No guarantee, except by separate written agreement, is made regarding the dimensions of air movement generated or the appropriateness or the effectiveness of any product for its intended purpose or for the customer's particular application.

EXCLUSIONS

ANY OF THE FOLLOWING ACTIONS BY THE CUSTOMER OR ANY AGENT OF THE CUSTOMER WILL CONSTITUTE A BREACH OF AND WILL VOID ALL WARRANTIES:

1. **Improper installation, delivery, or maintenance, including, but not limited to:**
 - a. **Failure to follow the required installation procedures specified in the Big Ass Fan Company-supplied "Installation Guide" and in all other documentation supplied with the fans and related equipment, including documentation provided by the manufacturers of the individual fan and control components;**
 - b. **Failure to follow all relevant codes and ordinances, including, but not limited to the National Electric Code and state and local building codes;**
 - c. **Failure to follow electrical engineering industry standards regarding the approved method of installing solid-state electrical equipment having the characteristics of the fans, the fan controls, and their related components, even if such standards are not specifically referenced in any instructions or literature supplied by Big Ass Fan Company or provided by the manufacturers of the fan and control components; and/or**
 - d. **Failure to use all installation and mounting hardware supplied by Big Ass Fan Company.**

IMPORTANT: UNDER NO CIRCUMSTANCES WILL THE BIG ASS FAN COMPANY BE RESPONSIBLE FOR REMEDIAL WORK NECESSARY TO CORRECT INSTALLATION PROCEDURES THAT DO NOT CONFORM TO THOSE ESTABLISHED BY THE INSTRUCTIONS, CODES, AND STANDARDS DESCRIBED UNDER ITEMS 1.A THROUGH 1.D, ABOVE, REGARDLESS OF WHEN INSTALLATION WAS COMMENCED.

2. **Any modification or alteration of, or adjustment to the fans, fan controls, and/or mounting and installation hardware and/or any disassembly of the major components of the fans and fan controls for any purpose whatsoever, including any attempt to diagnose and/or repair any problem, without prior written authorization from Big Ass Fan Company Customer Service. Such disassembly includes, but is not limited to, separation of the motor from the gear reducer or motor drive,**

Big Ass Fans Warranty Policy (cont.)

- dismantling of the variable frequency drive, and/or removal of any electrical component from the fan controller unit.
3. **Misuse, abuse, accidents, unreasonable use, or Acts of God.**
 4. **Incorrect electric current, voltage or supply.**
 5. **Failure to use fan controls supplied by Big Ass Fan Company, unless:**
 - a. **Big Ass Fan Company Customer Service has provided written permission prior to installation; and**
 - b. **The fan controls are built, operated, and maintained according to specifications provided to and approved by Big Ass Fan Company Customer Service. Running the fans at higher than recommended speeds.**
 6. **Resetting parameters of any control without prior approval by Big Ass Fan Company Customer Service.**
 7. **Failure to perform periodic maintenance as detailed in the Big Ass Fan Company-supplied "Installation Guide".**
 8. **Consequential or incidental damages sustained by any person or entity as a result of any breach of these warranties are also excluded, except where such damages may not be excluded by law.**

OBTAINING WARRANTY SERVICE

To obtain service under this warranty, you must follow the instructions provided in Big Ass Fan Company's Warranty Claim Form Instructions on the following page. Contact Big Ass Fan Company Customer Service at 1-877-BIG-FANS to obtain faxable copies of this form. The form must be submitted to Big Ass Fan Company within the time period specified above along with satisfactory proof of date of original installation. The costs of removing, dismantling, reassembling, or reinstalling the product shall be borne by the customer after the first year, and during the first year, Big Ass Fan Company reserves the right to pay only those expenses incurred that it determines, in its sole discretion, are reasonable and necessary. Any other means of reporting a warranty claim or warranty service may be entered into strictly at the option of and with the written permission of Big Ass Fan Company.

REMEDY AND LIMIT OF LIABILITY

The exclusive remedy of the purchaser, and the limit of liability for Big Ass Fan Company, and for any and all losses in connection with this product, shall be repair or replacement of the warranted product or the affected components as provided above.

Big Ass Fan Company reserves the right to make the final determination, based on its own evaluation of the components, as to whether (1) the problem in question is the result of a defect in design, workmanship, or materials, and not the result of error, misuse, or abuse on the part of the customer as set forth under the exclusions detailed above; (2) whether the problem or defect is material and requires action under this warranty; and (3) whether the remedy of repair or replacement is appropriate.

With regard to electrical and electronic components provided by Big Ass Fan Company that comprise part of the products, including motors, motor drives, and variable frequency drives, Big Ass Fan Company relies on the determination by the original manufacturer as to whether the failure of such component was the result of a defect. If the manufacturer of such component determines that there was no defect and therefore refuses to cover it under warranty, Big Ass Fan Company likewise will not warranty such item unless Big Ass Fan Company determines that the failure of such electrical or electronic component was the result of a defect of design, workmanship, or material within some other part of the products.

With respect to replacement or repair rendered, Big Ass Fan Company warrants that the parts replaced or repaired will operate properly and be free from defects in materials and workmanship for a period of 90 days from the date of shipment to the customer, or for the remainder of the original warranty period, whichever is longer.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, AND OF ALL OTHER OBLIGATIONS AND LIABILITIES ON BIG ASS FAN COMPANY'S PART, AND BIG ASS FAN COMPANY NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF THE PRODUCTS. NO OTHER WARRANTY EXPRESSED OR IMPLIED, WHETHER OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY OR OF ANY OTHER KIND, WHETHER OR NOT SIMILAR IN NATURE TO ANY PREVIOUSLY SPECIFIED, SHALL EXIST WITH RESPECT TO SUCH PRODUCTS, ALL SUCH WARRANTIES BEING HEREBY WAIVED BY CUSTOMER. UNDER NO CIRCUMSTANCES SHALL BIG ASS FAN COMPANY BE LIABLE FOR ANY LOSS, DAMAGE, COST OF REPAIR, OR CONSEQUENTIAL DAMAGES OF ANY KIND IN CONNECTION WITH THE USE, SALE, OR REPAIR OF ANY PRODUCTS PURCHASED FROM BIG ASS FAN COMPANY, UNLESS SUCH DAMAGES CANNOT BE EXCLUDED BY LAW.

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Warranty Claim Form Instructions

1. Complete Warranty Claim Form (see following pages) and Responsibility Agreement (see following pages) and fax them to 859-967-1695, Attn: Customer Service. These pages will be faxed back to you for your records. The Warranty Claim Form will include our acknowledgment and a Return Materials Authorization (RMA) number. **Note: Do not return any item without first being assigned an RMA# by Big Ass Fan Company Customer Service.**
2. No more than 10 days prior to the date you have made arrangements to replace the component part, call Customer Service at 1-877-BIG-FANS to arrange for replacement component delivery and original component pickup. At that time, we will fax you a written acknowledgment of your call that includes a reminder of the return instructions. **Note:** Even if you are not able to replace the component immediately following your initial notice to us, returning the Warranty Claim Form and Responsibility Agreement will effectively stop the warranty clock from running. You can then make the product exchange when you are prepared to do so. However, the warranty period will continue to run until we receive these completed pages back from you, and no warranty will be honored without receipt of these pages within the warranty period. We will not send out any replacement part until you have called to let us know that you have scheduled installation of the replacement. This ensures that the replacement part is not lost or damaged while awaiting installation, and that you are not billed for the replacement because you have waited too long to return the original component (see Responsibility Agreement).
3. When you receive the replacement part, you have 10 working days to remove and replace the existing component and return it to us at **2425 Merchant Street, Lexington, KY 40511**.
 - a. Upon receiving the replacement part, verify that replacement part order is correct. If order is incorrect or damaged, notify Big Ass Fan Company within 24 hours after receiving order.
 - b. Use care unpacking the replacement component, as you will need to use BOTH the packaging from the replacement part AND the packing list and a return address label included inside this packaging to return the original part. If the original packaging and return documents are not used, you will be responsible for any damage incurred in transit as well as any additional costs involved. **Note: The RMA# must appear on the outside of the box being returned. Items without an RMA# will not be accepted.**
 - c. Use the delivery service or one of the truck lines specified in the acknowledgment for return of the part. We will refuse receipt of any shipment that is returned via an unauthorized carrier. If you prefer, we can make all arrangements for delivery and pickup.
 - d. Fax a copy of the bill of lading or other tracking information to 859-967-1695 when the item has been shipped so that we know to expect delivery of the original part.
4. If we do not receive the original part back within 15 working days from the date you receive delivery of the replacement, you will be invoiced for the cost of the replacement part, plus freight, on Net 15 terms (see Responsibility Agreement), and this invoice will be due and payable. If you subsequently return the replacement part to us after payment has been made, we will refund any payment made for the replacement part, unless we subsequently determine that the part is not covered under warranty.

Replacement of Products Under Warranty Acknowledgment & Return Instructions

We have received your request for replacement of a part that failed during normal use and which you believe to be covered under warranty. We are shipping this replacement part to you pursuant to your notice that you will be replacing the original part within 10 days.

This replacement part is being shipped to you prior to our receipt of the item that failed and prior to our evaluation of this part to determine the reasons for its failure and whether it is covered under warranty.

In order to evaluate the cause of the product failure, we need you to return the original part to our offices within 10 working days of receipt of the replacement part. Should the part be covered under warranty, you will not be charged for the replacement item; however, you will be charged for the replacement part plus shipping if (1) the part is not under warranty because the source of failure is outside the scope of the warranty, or (2) the warranty period has expired. If there is no warranty coverage, we will send you a detailed letter of explanation.

We also will charge you for the replacement item plus shipping and handling if you do not return the original item within 10 days of the receipt of the replacement item.

Instructions for returning the original item

1. Please use the return label that is included in the box containing the replacement part. The return shipment address is:

Big Ass Fan Company
ATTN: RMA# _____
2425 Merchant Street
Lexington, KY 40511

2. Use the packaging for the replacement part to return the original part.
3. Include the packing list we have provided which includes the RMA#.
4. If the part weighs over 50 lbs, ship the part using one of the following Authorized Truck Lines and bill the freight costs collect. We will only charge back the freight costs if the original part is not under warranty, or if you do not return the original component within 10 days of receipt of the replacement.
5. If the part weighs 50 lbs or less, use UPS Ground and bill our account #X4X306.

We apologize for the inconvenience, and appreciate your assistance and cooperation.

If you have questions, please contact us at 1-877-BIG-FANS.

Thank you,
Big Ass Fan Company



2425 Merchant Street
Lexington, KY 40511
Phone: 1-877-BIG-FANS
Fax: (859) 967-1695
www.bigassfans.com

Warranty Claim Form

Name (print): _____ Signature: _____

Company: _____

Shipping Address: _____

City/State/ZIP: _____

Phone: _____ Fax: _____

Items Returned: _____ Date of Purchase: _____

Reason(s) for Returning Item (please provide detail, including length of time after fan had been in operation that problem was noticed, nature of problem, any attempts you made to remedy the problem, etc.):

ATTENTION: Do not return any item without first being assigned an RMA# by Big Ass Fan Company Customer Service Department. The RMA# must appear on the outside of the box being returned. Items without an RMA# will not be accepted.

Date Replacement Parts Should Be Shipped (if known): _____

(Please do not request shipment until you are prepared to install. Call us at 1-877-BIG-FANS to arrange shipment when you have scheduled installation.)

Acknowledgment of Receipt of Warranty Return Notification
(to be completed by Big Ass Fan Company)

Acknowledged By: _____ **Date:** _____

RMA#: _____

Authorized Truck Line(s): _____



2425 Merchant Street
Lexington, KY 40511
Phone: 1-877-BIG-FANS
Fax: (859) 967-1695
www.bigassfans.com

Responsibility Agreement

To: Big Ass Fan Company

The undersigned understands and acknowledges receipt of the Warranty Claim Form and Instructions and agrees that Big Ass Fans ("Big Ass Fan Company") has the right, upon receipt of returned merchandise, to make final determination as to whether this merchandise should be replaced at no cost under Big Ass Fan Company's stated warranty policy.

The undersigned further agrees that if Big Ass Fan Company determines that this merchandise does not qualify under its stated warranty policy, Big Ass Fan Company can invoice for the replacement merchandise plus shipping and handling for the original part and all replacements, and such invoice will be paid within 15 days of receipt of the same.

The undersigned agrees to ship to Big Ass Fan Company's location at 2425 Merchant Street, Lexington, KY 40511 all of the merchandise replaced by Big Ass Fan Company including, but not limited to, defective or failed components, within 10 working days of the receipt of the any replacements.

The undersigned further agrees that if said replaced merchandise has not been shipped to Big Ass Fan Company within 10 working days, Big Ass Fan Company can invoice for the replacement merchandise plus shipping and handling, and the invoice will be paid within 15 days of receipt.

Signed: _____

Title: _____

For: _____
(Name of Company)

Date: _____



Check-In Procedure

(for Big Ass Fan Certified Installers Only)

2425 Merchant Street
 Lexington, KY 40511
 Phone: 1-877-BIG-FANS
 Fax: (859) 967-1695
 www.bigassfans.com

ATTENTION: These items must be completed prior to any additional installation crew members entering jobsite or any installation material being unloaded.

Company: _____ **Job Name:** _____

Address: _____

City/State/ZIP: _____

Contact Name: _____ **Phone:** _____

E-mail: _____

<input type="checkbox"/>	Fan placement is to be in accordance with agreed upon original Scope of Work and Layout. If this is to change, please note change and consult Field Service Manager for approval.
<input type="checkbox"/>	Installation techniques discussed (type of conduit, L-brackets if required, mounting technique explained). If extension tubes exceed 4 ft, the guy wires are explained and fully understood.
<input type="checkbox"/>	Times in/out, duration, and schedule presented and accepted.
<input type="checkbox"/>	Time (please list # of employees and total duration of jobs):
<input type="checkbox"/>	Safety rules and regulations brought to installer's attention (e.g., badges, safety harnesses, vests, hard hats, footwear, lock out/tag out, certification processes, work area free of trash and debris, etc.). If there are any areas that are forbidden or secure, they are brought to the supervisor's attention and instructed not to enter. If there are any special site conditions (i.e., open areas and operating machinery to be avoided), they are also brought to the supervisor's attention and instructed how to bypass the area if required. Safety Rules and Regulations listed:
<input type="checkbox"/>	The facility manager understands all electrical requirements (e.g., breaker size, voltage, brand, main panel space, etc.) and they are in accordance with original Scope of Work and Layout. Additional comments:

Customer Signature: _____

Contractor Signature: _____

Printed Name: _____

Printed Name: _____

The supervisor is to hold all documents until the job is complete, and then send all forms back to Field Service Manager. This will consist of the service/work order, Check-In document, and Close-Out document. The installation crew will not receive payment until all forms are signed by the facility manager and the supervisor. These documents will then be forwarded to the Field Service Manager at Big Ass Fans.



Close-Out Procedure

(for Big Ass Fan Certified Installers Only)

2425 Merchant Street
 Lexington, KY 40511
 Phone: 1-877-BIG-FANS
 Fax: (859) 967-1695
 www.bigassfans.com

Company: _____ Job Name: _____

Address: _____

City/State/ZIP: _____

Contact Name: _____ Phone: _____

E-mail: _____

Field Crew Supervisor and facility manager are to walk-thru completed installation.

<input type="checkbox"/>	The installation is complete and on time in accordance with original Check-In document. If not, explain:
<input type="checkbox"/>	Conduit runs accepted and installed in accordance with Check-In document, Scope of Work, and Layout. If not, explain:
<input type="checkbox"/>	Fan placement correct in accordance with both the Check-In document, Scope of Work, and Layout. If not, explain:
<input type="checkbox"/>	Breaker size and wire type correct in accordance with the Check-In document, Scope of Work, and Layout. If not, explain:
<input type="checkbox"/>	All Safety Rules and Regulations met in accordance with the Check-In document, Scope of Work, and Layout. If not, explain:
<input type="checkbox"/>	Fans have been running for over an hour and operate without visible defect or issue.
<input type="checkbox"/>	The fan is spinning in the correct direction (counter-clockwise when viewed from floor).
<input type="checkbox"/>	Angle iron is securely fastened and is without any apparent problems in accordance with installation techniques discussed at check-in.
<input type="checkbox"/>	If extension tube is 4 ft (1.2 m) or longer, guy wires are in place and there is no evidence of a wobble.
<input type="checkbox"/>	Supervisor has supplied and explained the Installation Guide. If not, explain:
<input type="checkbox"/>	The supervisor has explained and I understand how to operate fan including starting/stopping, speed operation, and power disconnect. If not, explain:
<input type="checkbox"/>	Time in/out and duration are in accordance with Check-In document:
	Additional comments:

Customer
 Signature: _____

Contractor
 Signature: _____

Printed Name: _____

Printed Name: _____

The supervisor is to hold all documents until the job is complete, and then send all forms back to Field Service Manager. This will consist of the service/work order, Check-In document, and Close-Out document. The installation crew will not receive payment until all forms are signed by the facility manager and the supervisor. These documents will then be forwarded to the Field Service Manager at Big Ass Fans.



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 **BIG ASS FANS**[®]
WWW.BIGASSFANS.COM

2425 Merchant Street Lexington, KY 40511 1-877-BIG-FANS