RAVE™ FROM RITE-HITE® FANS

INSTALLATION AND OWNER'S MANUAL

RITE-HITE® FANS

CE

THIS MANUAL COVERS ALL UNITS SHIPPED DECEMBER 2014 TO DATE

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PRODUCT INTRODUCTION

Thank you for purchasing the Rave® Fan from RITE-HITE®.

IMPORTANT READ AND SAVE THESE INSTRUCTIONS

Read and understand contents of this manual prior to installation or operation of this equipment.
For best results, have this product serviced by your authorized RITE-HITE® Representative.

NOTICE TO USER

Your local RITE-HITE® Representative provides the Planned Maintenance Program (P.M.P.) which can be fitted to your specific operation. Call your local representative or RITE-HITE® at 1-414-355-2600 or toll free at 1-800-456-0600.
In Europe, call +31-(0)571-277505

ORIGINAL INSTRUCTIONS (ENGLISH)

The English version of this manual shall prevail over any error in, or conflicting interpretation of, any translations.

Original Declaration of Conformity

EC Declaration of Conformity

According to the Machinery Directive

2006/42/EG Annex IIA

The Manufacturer: Rite-Hite Aftermarket Corporation
8900 North Arbon Drive
Milwaukee, WI 56223 USA

Hereby declares that the below mentioned products

CE

Ceiling Fan
Type : Revolution HVLS Fan and Rave HVLS Fan
Rouge HVLS Fan and Renegade HVLS Fan
Year : 2013

Comply with all relevant requirements of the Machine Directive.

The mentioned products comply with the demands of the following relevant European directives:

2006/42/EG	Machinery Directive
2006/95/EG	Low Voltage Directive
2004/108/EG	EMC Directive

The following European Standards were applied:

EN 60204-1	Safety of Machinery – Electrical Equipment of Machines. Part 1 General Requirements
EN 12100-1	Safety of Machinery – General Methodolgy. Risk Assessment and Risk Reduction
EN 12100-2	Safety of Machinery – Basic Concepts. General Principles for Design Part 2: Technical Principles
EN 13857	Safety of Machinery – Safety Distances to prevent hazard zones being reached by upper and lower limbs
EN 349	Safety of Machinery – Minimum Gaps to prevent crushing of parts of the human body
EN 953	Safety of Machinery – Guards. General Requirements for the design and construction of fixed and movable guards.

Authorized:
Ron Snyder
Engineering Manger
Rite-Hite Aftermarket Corporation
4343 Chavenelle Drive
Dubuque, IA 52002 USA

Ron Snyder

Date: March 12, 2013

NOTES

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SAFETY

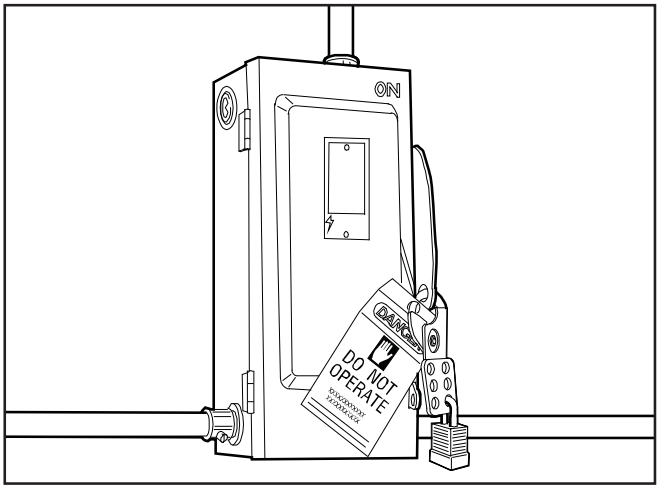

Figure 1

⚠ WARNING

When working with electrical or electronic controls, make sure that the power source has been locked out and tagged according to OSHA regulations or your country's local standards and approved local electrical codes.

⚠ WARNING

Installation to be completed in accordance with the National Electric Code, ANSI/NFPA 70-1999, and local codes.

LOCKOUT / TAGOUT PROCEDURES

The Occupational Safety and Health Administration (OSHA) requires that, in addition to posting safety warnings and barricading the work area, the power supply has been locked in the OFF position or disconnected. It is mandatory that an approved lockout device is utilized. An example of a lockout device is illustrated in Figure 1. The proper lockout procedure requires that the person responsible for the repairs is the only person who has the ability to remove the lockout device.

In addition to the lockout device, it is also a requirement to tag the power control in a manner that will clearly note that repairs are under way and state who is responsible for the lockout condition. Tagout devices have to be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or become unreadable.

RITE-HITE® Corporation does not recommend any particular lockout device, but recommends the utilization of a device that meets OSHA standards (refer to OSHA regulation 1910.147). RITE-HITE® Corporation also recommends the review and implementation of an entire safety program for the Control of Hazardous Energy (Lockout/Tagout). These regulations are available through OSHA publication 3120.

⚠ DANGER

Indicates a hazardous situation which, if not avoided, *will* result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation which, if not avoided, *could* result in minor or moderate injury.

⚠ WARNING

Indicates a hazardous situation which, if not avoided, *could* result in death or serious injury.

NOTICE

Indicates a situation which can cause damage to the equipment, personal property and/or the environment, or cause the equipment to operate improperly.

GENERAL INFORMATION

DESCRIPTION

The Rave® Fan is a high-volume/low-speed (HV/LS) industrial fan that provides more consistent air circulation and ventilation with better energy efficiency than traditional high-speed ceiling fans or industrial floor fans.

SERIAL LABEL

Model:	Rave Fan
Produced:	2014
Serial Number:	RHC 1234567-001
Electrical Data:	208-240V, 1ph, 50/60Hz
Diameter:	12' (3660 mm)

Rite-Hite Corporation
8900 North Arbon Drive
Milwaukee, WI 53223
USA
Tel: 1-414-355-2600
Fax: 1-414-355-9248
Made in the U.S.A.

CE

Protected by patents 7726945 and 8142156.
Other patents pending.

CONTROL BOX LABELS

The safety labels have specific placement and must be replaced if they are defaced or removed for any reason.

SPECIFICATIONS

Diameters:	8, 10, and 12 ft (2440 mm, 3050 mm, 3660 mm)
Blades:	Aluminum
Blade Finish:	Mill-finish standard, custom colors optional
# of Blades:	4
CFM:	Up to 100,000 CFM (12 ft diameter) Up to 2,830 m^3/h (3660 mm diameter, 4 blade)
Watts:	60 (@ 10Hz) to 640 (@ 60Hz) Typical
Frequency:	50/60 Hz
Coverage:	Up to 7,800 sq ft (725 m^2) 50 ft (15 m) from the fan's center in all directions
Decibels:	40 to 63 dBA depending on fan speed (measured 20 ft [6100 mm] below and 20 ft [6100 mm] from the fan's center)
Air Speed:	Up to 5 mph (2.2 m/s) at full speed
Controls:	Variable speed
Mounting Heights:	10 to 80 ft (3.1 to 24.4 m) from finished floor to bottom of blade
Weight:	150 lb (68 kg)

Table 2

Rave Fan - ¾ HP (½ kW)						
Voltage	**120V 1Φ**	**230V 3Φ**	**230V 3Φ**	**400V 3Φ**	**480V 3Φ**	**575V 3Φ**
VFD FLA	15.7	8.5	9.6	6.4	4.8	4.2
Motor FLA	2.9	2.9	2.9	1.7	1.7	1.5
CBox Fuse Amps	N/A	N/A	15	10	10	6
Min. Service Amps	20	15	15	10	10	10

COMPONENTS AND TOOLS

UNPACKING THE COMPONENTS

You should have received the following items:

(2) boxes of fan blades, they are packed (2) per box for a total of (4) blades – approximately 25 lb. (11.4 kg) per box.

(1) motor / hub assembly – approximately 80 lb. (36.4 kg)

(1) box containing miscellaneous mounting hardware and cables - approximately 25 lb. (11.4 kg)

(1) box containing the control box – approximately 35 lb. (15.9 kg)

Insure you have received all of the above items before installation begins. notify the factory if parts are missing or damaged.

NOTICE
Always be environmentally responsible and follow appropriate regulations for proper disposal of packaging material.

TOOLS REQUIRED

(2) 7/16" wrenches

(2) ½" wrenches

(1) 1 ¼" box end wrench

(1) 1 1/16" box end wrench

(2) ¾" wrenches

(1) vice grip

(1) large standard screwdriver

(1) small standard screwdriver

(1) Torque wrench capable of 50 ft-lb

(1) Metric 7mm deep well socket - only required for motor voltage change

(1) ¼" cable cutter

(4) 10 aWG electrical terminals for motor terminations

(1) Torpedo level

If you are mounting to support angles that span building joists, you will also need a drill and a 1/2 in. drill bit.

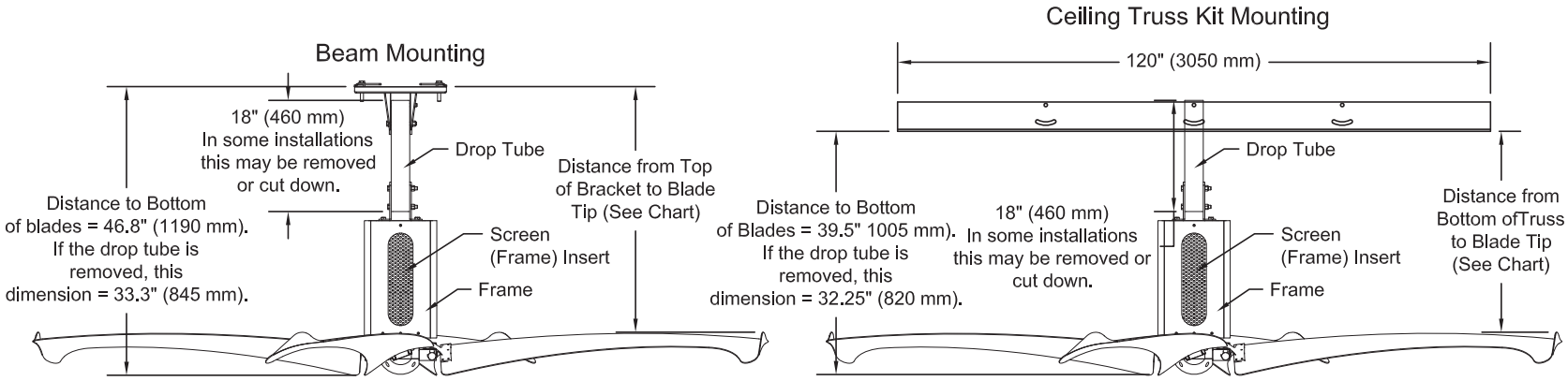

Figure 2

Table 2

Beam Mounting

				Distance From Top of Bracket to Blade Tip*	
Diameter	Airflow 4 Blade	Speed	Weight	At Rest	Full RPM
ft (mm)	cfm (cms)	rpm	lb (kg)	in (mm)	in (mm)
8' (2440)	50,000 (23.6)	20-120	140 (63.6)	40.0 (1015)	40.0 (1015)
10' (3050)	75,000 (35.4)	17-100	145 (65.9)	40.0 (1015)	39.25 (1000)
12' (3660)	100,000 (47.2)	13-80	150 (68.2)	40.0 (1015)	38.5 (980)

Table 3

Ceiling Truss Kit Mounting

Distance From Top of Bracket to Blade Tip*	
At Rest	Full RPM
in (mm)	in (mm)
32.75 (830)	32.75 (830)
32.75 (830)	32.0 (815)
32.75 (830)	31.25 (795)

* OPTIONAL EXTENSION KIT AVAILABLE TO INCREASE DIMENSION IF NECESSARY.

MOUNTING OF THE FAN

NOTICE

The weight of the fan that will be suspended from the ceiling is approximately 150 lb (68.2 kg) and will generate torque of up to 150 ft-lb (204 Nm).

If the ceiling support structure is an openweb design, all hanging dimensions can be taken from the underside of the ceiling. If the ceiling's support structure is a solid beam or solid channel, all measurements must be taken from the bottom of the beam as the basis point for the hanger dimension. If the roof is pitched, this must be accounted for above the tips of the blades. Failure to follow these guidelines will result in limited air movement from the fan.

FAN DISTANCE FROM CEILING AND OBSTRUCTIONS

NOTICE

The standard blade design on the Rite-Hite Rave™ Fan is angled upward to provide improved airflow. A combination of centrifugal force and air pressure causes the blades to move upward to their operating position. Measure the distance to possible obstructions and mount the fan accordingly using Table 2-3 to ensure the blades will have proper clearance in all areas when the fan is running. Whenever possible allow 12 in. (305 mm) additional clearance to existing obstructions.

Table 4

FAN DIAMETER ft (mm)	MINIMUM CLEARANCE DIMENSION AT FULL RPM ft (mm)
8 (2440)	2 (610)
10 (3050)	3 (915)
12 (3660)	3 (915)

⚠ WARNING

To reduce the risk of fire, electric shock, or personal injury, mount directly to a structural framing member.

I-BEAM AND TRUSS MOUNTING

I-BEAM MOUNTING

If the fan is being mounted to a building support I-beam (6 – 13-1/2 in. [150 – 350 mm] wide), mount the fan directly to the beam with the provided brackets. Clamp the brackets around the beam using the holes in the upper beam mounting bracket that are closest to the edge of the beam (see Figure 5).

If the fan is being mounted to a beam that is larger than the bracket (greater than 13-1/2 in. [350 mm] wide), clamp the bracket on one edge of the beam and drill holes through the beam to bolt the other side securely. Use only Grade 8 hardware.

Use a level to ensure the extension tube is hanging vertical.

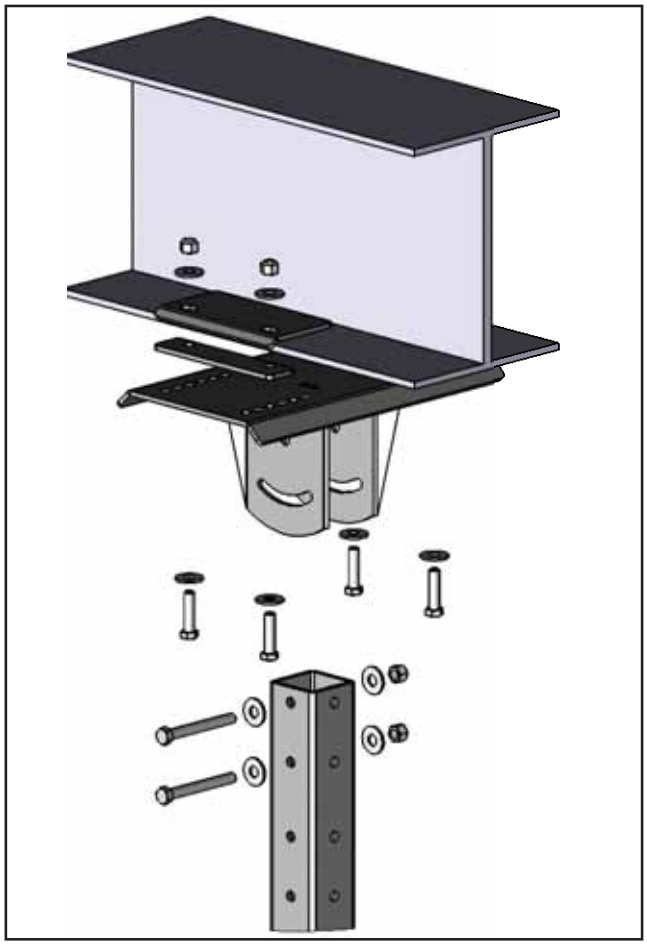

Figure 5

CEILING TRUSS MOUNTING

⚠ WARNING

Never mount the fan to only one building joist. Always mount the fan to two joists. One joist will not provide the rigidity and support necessary for the fan during operation, and may cause the fan to fall and cause injury.

When using a support channel to span two building joists, use material that will securely support the fan. Two pieces of 3 x 3 x 1/4 in. (75 x 75 x 7 mm) angle is recommended. Mount these angles in such a way that the fan can be hung using the standard I-beam mounting bracket (see Figure 6). Securely mount the angles to the building joists to ensure the angles cannot move. Use a level to ensure the extension tube is hanging vertical.

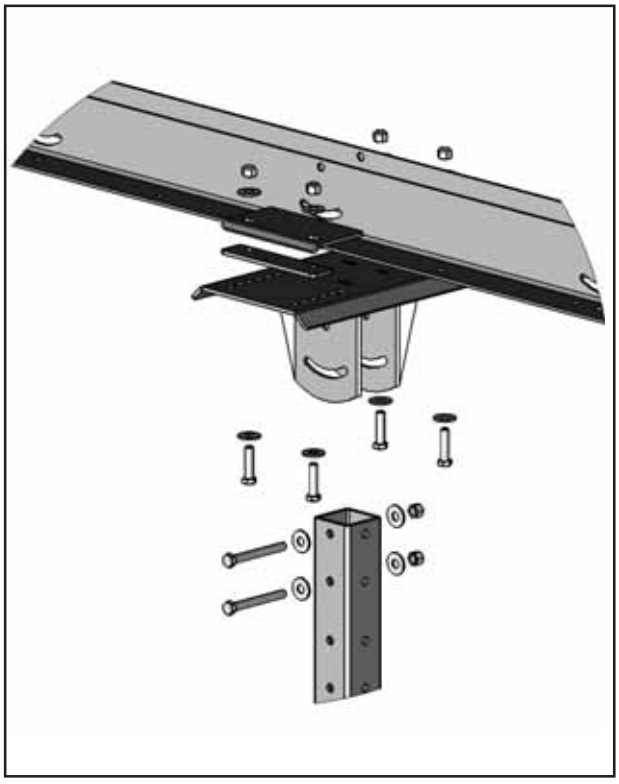

Figure 6

CEILING TRUSS MOUNTING (RITE-HITE–FORMED ANGLES)

⚠ WARNING

Never mount the fan to only one building joist. Always mount the fan to two joists. One joist will not provide the rigidity and support necessary for the fan during operation, and may cause the fan to fall and cause injury.

The truss kit supplied by Rite-Hite is designed to make installation of the kit easier.

The two formed angles span existing building trusses. Figure 7 shows how the brackets are used to secure the angles to the building trusses while setting the gap between the angles for the 3 x 3 in. (75 x 75 mm) drop tube.

Several mounting positions have been cut into the angles to allow for flexibility in positioning the fan.

NOTE: When the truss kit is ordered from Rite-Hite, the standard I-beam ceiling bracket will not be provided.

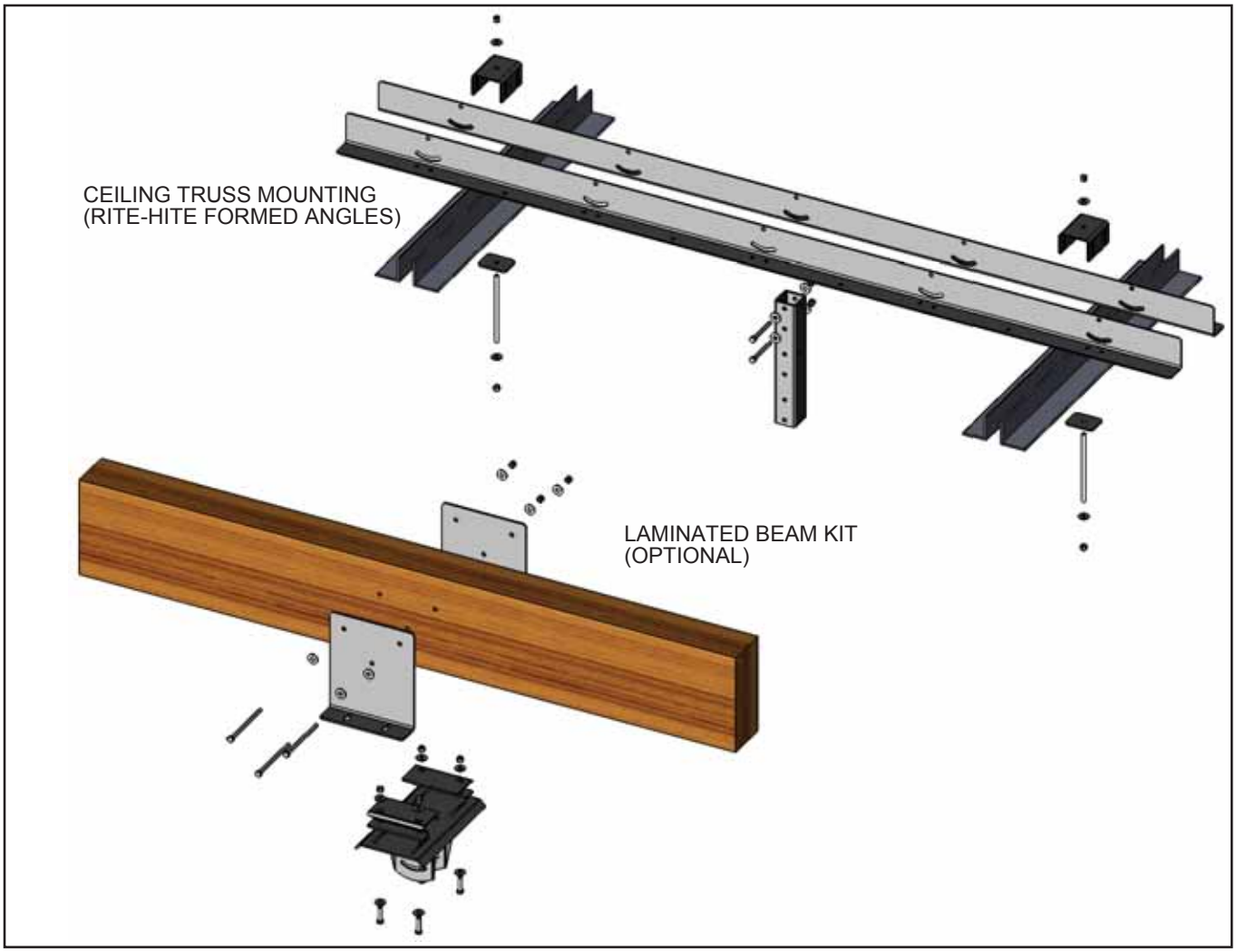

Figure 7

LAMINATED BEAM KIT (OPTIONAL)

LAMINATED BEAM KIT (OPTIONAL)

1. Through-bolt the laminated beam brackets with one bracket on each side of the laminated (or concrete) beam.
2. Attach the standard ceiling mounting bracket to this bracket in the normal manner.

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MOTOR BRACKET

ATTACHMENT OF MOTOR BRACKET

The motor bracket attaches to the extension tube with two 1/2 x 4-1/2 in. Grade 8 bolts, washers, and locknuts.

1. Position the motor bracket so that one angle is on each side of the extension tube.
2. Insert the bolts through the holes in the angles at the top of the motor bracket and through the extension tube and back through the second angle.
3. Tighten both locknuts securely.
4. When an extended down tube is used, the smaller square tubing (3 x 3 in. [75 x 75 mm]) will telescope inside the larger square tubing (3-1/2 x 3-1/2 in. [90 x 90 mm]). The brackets on the top of the motor bracket are bolted in slots to allow the larger tube to bolt to the top of the motor. The 3 x 3 in. (75 x 75 mm) tube should always bolt to the ceiling bracket.
5. If the fan assembly is mounted directly to the ceiling bracket without an extension tube, use four 1/2 x 1-1/2 in. Grade 8 bolts (not provided) to bolt the brackets together properly.

Figure 8

SAFETY CABLES

⚠ WARNING

Always use safety cables. If safety cables are not used, the fan may fall and cause injury.

Safety cables, which support the fan to the ceiling if one of the bolted joints would come loose, are included with this kit.

1. Wrap a safety cable around the bolted brackets at the ceiling and at the top of the extension tube.
2. Wrap a second safety cable through the bottom of the extension tube and through the top of the motor housing.
3. If installing with adjustable-length extension tubes, use a third safety cable to secure the center bolted joint of the extension tubes.

Secure the safety cables with the provided clamps (see Figures 9).

Figure 9

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STABILIZATION CABLES

⚠ WARNING

Always use stabilization cables. If safety cables are not used, the fan may tilt and cause the blades to impact a ceiling joist or other object under certain conditions causing debris to fall.

Stabilization cables, which help to stabilize the fan for any situations such as cross winds or impacts which may otherwise be strong enough to tilt the fan and cause the blades to impact a ceiling joist or other object, are included with this kit. Use the stabilization cables to attach the fan bracket back to the ceiling in four locations.

1. For the most support possible, attach the stabilization cables to the ceiling at 90° to each other and as far away as possible from the point where the fan is mounted.
2. Secure the stabilization cables to the ceiling with two cable clamps, and tighten with a turnbuckle.
3. Cut stabilization cable to length as required.
4. Ensure that stabilization cables are attached in a position that does not allow the blades to hit the stabilization cables when the fan is operating.
5. Tighten the stabilization cables one turn past hand-tight.
6. Install stabilization cable clamp nuts away from turnback, as shown in Figure 11.

Figure 10

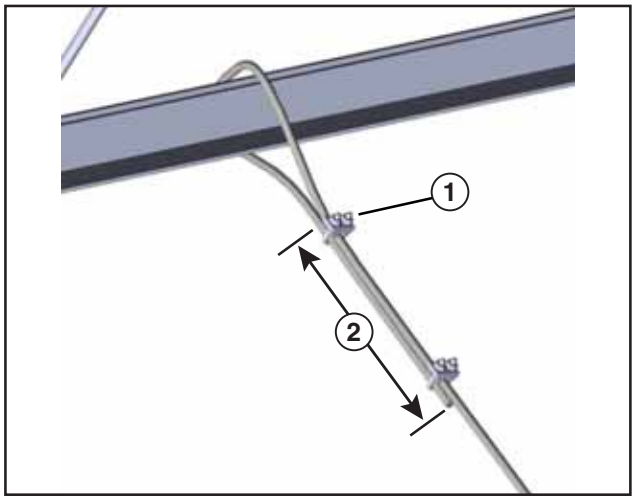

Figure 11

1 – Cable Clamp Nuts 2 – Turnback

Figure 12

BLADE ATTACHMENT

1. Clean each blade with a paper towel to remove fingerprints and dirt before the blades are installed.
2. Set the fan blades in place on the fan hub.
3. Raise the fan blade above the arm of the fan hub and allow the blade to slide into the slot provided on the fan hub.
4. Attach each fan blade to the fan hub with a 22 mm bolt (provided).
5. Use a torque wrench with a 3/4 in. drive extension to tighten the bolt to 75 ft-lb (102 Nm).

NOTE: In the event that a fan blade is damaged, both the damaged blade and the blade opposite must be replaced. Replacement blades are provided in pairs.

Figure 13

FAN LEVELING

Level the fan hub after blade attachment.

1. Hold a level across the center of the hub in all directions.
2. Make fine adjustments with the stabilization cables.
3. After run/test, go back and test level and cable tension.

GUARDING THE FAN

⚠ WARNING

Rotating fan blades can cause serious injury.

Guard the fan if there is potential for a person or object to come into contact with moving fan blades. In some cases, this guarding can be a structure built near the edge of the blades to keep fork trucks and other objects from entering a danger area. In other cases, such as when fans are mounted on low ceilings, it may be necessary to build a “cage” around the fan blades to ensure objects do not come into contact with the moving fan blades. It is best to mount this cage independent of the fan and support the cage from the ceiling or columns as necessary.

LINE REACTOR (STANDARD)

A line reactor is provided to protect the fan drive from power line disturbances. It also reduces harmonics created by the drive.

ELECTROMAGNETIC COMPATABILITY (EMC) FILTER (OPTIONAL)

The EMC filter is an optional component used to reduce electromagnetic interference. It should be considered in the following applications:

1. If compliance with IEC 61800-3 C2 is required.
2. If the fan may be affected by electrical interference on the line (from VFDs, welding equipment, etc...).
3. If sensitive electronic or radio equipment is in use that may be affected by the fan VFD.

OPEN AIR ENVIRONMENT

When fans are used in open air environments, it is recommended that the fans be shut down during periods of high wind speed. A wind speed control kit is available from Rite-Hite Fans. See page 57 for parts list and pages 33-34 for wiring diagram.

REMOTE STOP INPUT (FIRE SUPPRESSION, WIND SENSORS, BUILDING AUTOMATION, ETC.)

Any device with a relay output can stop the Rave Fan remotely by opening a contact.

CONTROL BOX SIZE

Controls are mounted in a 16x14x8 enclosure. Overall size is 17.6" x 16" x 8.4" (447mm x 406mm x 212mm)

SPEED CONTROL STATION

Figure 14

The fan control station is provided in a 4.75 x 4.75 x 1.75 in. (120 x 120 x 45 mm) enclosure suitable for mounting on a wall or column. The face of the controller may be removed and mounted flush in a standard double gang wall box.

The control station uses low voltage (24 VDC) control. A 7-conductor cable (24 AWG min/ 0.5 mm diameter min, 0.2 mm^2 min) connects the control station to the variable-frequency drive (VFD) enclosure. CAT5 is acceptable for this run (500 ft [152 m] maximum length).

A power button is provided to turn the fan on and off.

The turtle and rabbit buttons incrementally decrease and increase fan speed.

Pressing the direction button causes the fan to change direction.

A ring of LEDs in the FANS logo provides a visual indication of fan speed (1 LED = slowest, 7 LEDs = fastest).

After turning the power on, or a direction change, the LEDs flash to indicate direction. Standing below the fan, looking up, the blades should turn clockwise (forward) when the LEDs flash in a clockwise pattern. If the rotation is counterclockwise, disconnect power to the control box and swap two of the three motor wires (terminals U, V, W) to reverse fan direction.

The VFD is factory-set to linearly increase fan speed to satisfy the majority of applications. By changing parameters in the drive, the speed curve can be modified for specific applications.

Table 5

Fan Speed Indication	Default Frequency	Allen Bradley PowerFlex40 Parameter	Schneider Altivar Parameter	AB PF4 (obsolete) Parameter
0 LED	**OFF**			
1 LED	**10Hz**	**A077**	SP8	A073
2 LEDs	**18Hz**	**A076**	SP7	N/A
3 LEDs	**26Hz**	**A075**	SP6	A072
4 LEDs	**35Hz**	**A074**	SP5	N/A
5 LEDs	**44Hz**	**A073**	SP4	A071
6 LEDs	**52Hz**	**A072**	SP3	N/A
7 LEDs	**60Hz**	**A071**	SP2	A070

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MOTOR WIRING

The fan motor will receive three-phase power from the fan control box even if single-phase power is provided to the control box. Remove the cover from the motor junction box. Change the wire leads as necessary for high or low voltage. See Figure 16 for the appropriate wiring.

NOTICE

Use one of the wire types listed below to connect the fan control box to the motor.

Acceptable unshielded cable types:
THHN/THWN Min 600V 90°C

Acceptable shielded XLPE VFD cable types:
Belden 29501
AlphaWire V16014

Do not use solid core wiring of any size or insulation class for controller output/motor leads.

CONDUIT RESTRICTIONS

NOTICE

*AC supply lines for a controller **MAY** share the same conduit with AC supply lines for one or more additional controllers.*

*AC supply lines for a controller and output/motor leads for the same controller or another controller **MAY NOT** share the same conduit.*

The conduit with the incoming power and the conduit with the power going to the motor should be separated by a minimum of 6 in. (150 mm).

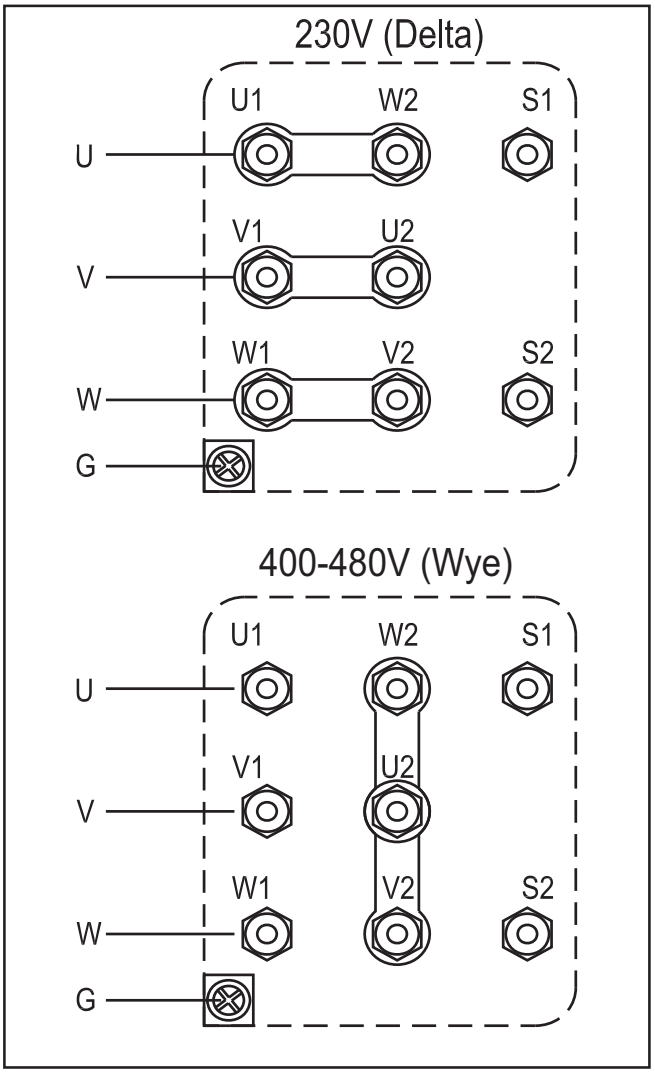
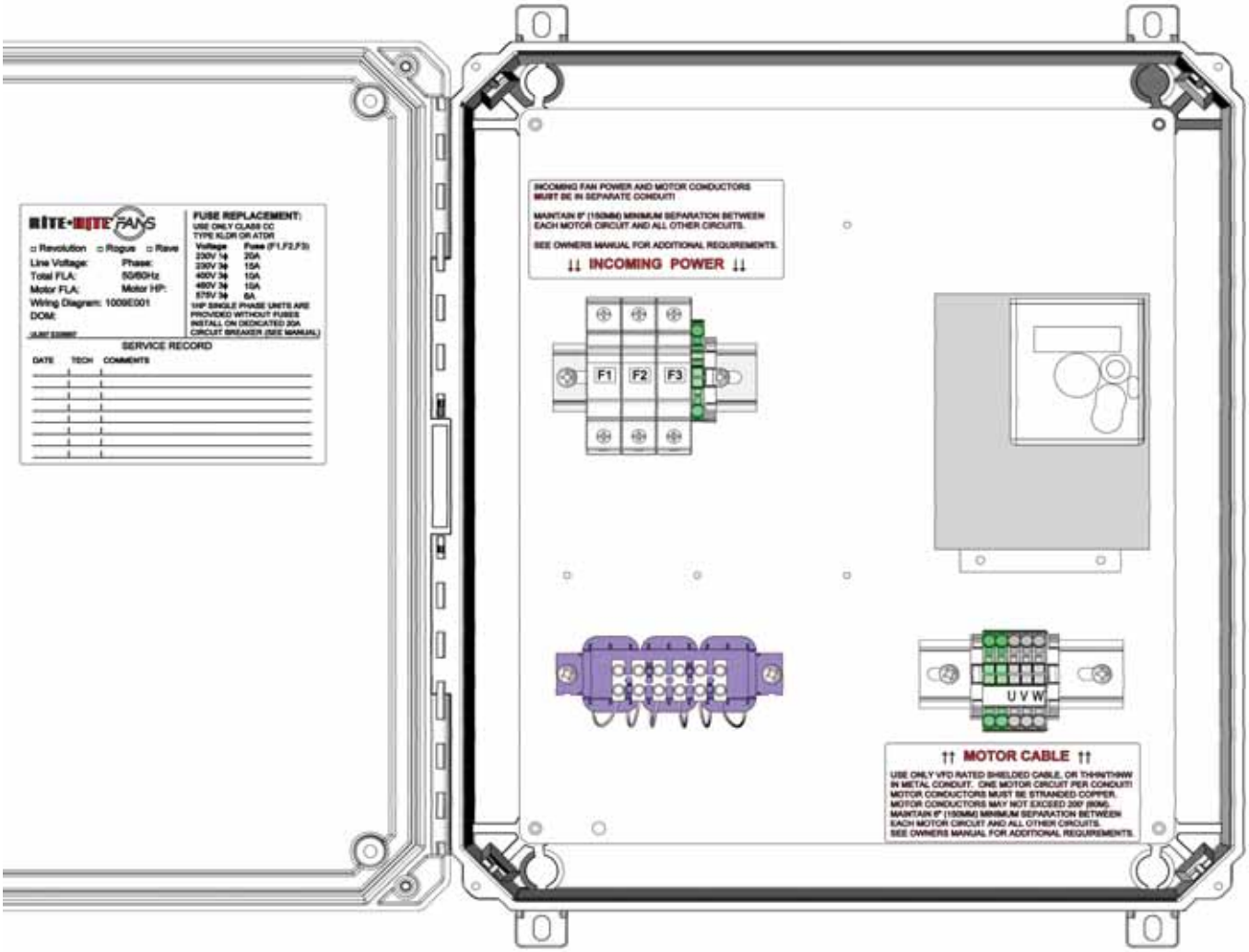
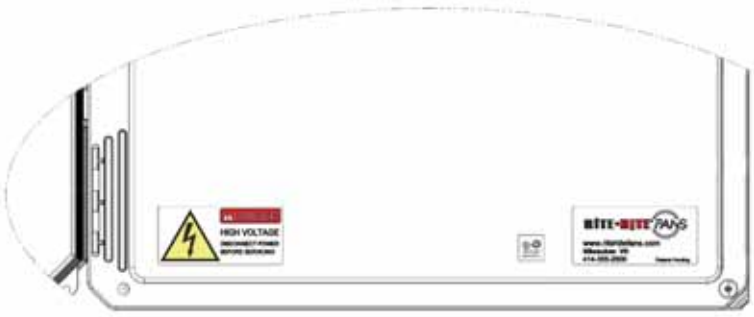


Figure 15

FAN CONTROL BOX LAYOUT





FRONT OF LID

IMPORTANT
USE STRANDED COPPER CONDUCTORS ONLY, MINIMUM 75°C.
TO MAINTAIN 4X RATING, USE ONLY UL LISTED 4X FITTINGS.
DO NOT MAKE CONDUIT CONNECTIONS THROUGH TOP OF ENCLOSURE.
TO REDUCE RISK OF ELECTRIC SHOCK, AN EARTH GROUND CONNECTION MUST BE FIELD INSTALLED TO THE GREEN/YELLOW CONTROL BOX GROUND TERMINAL

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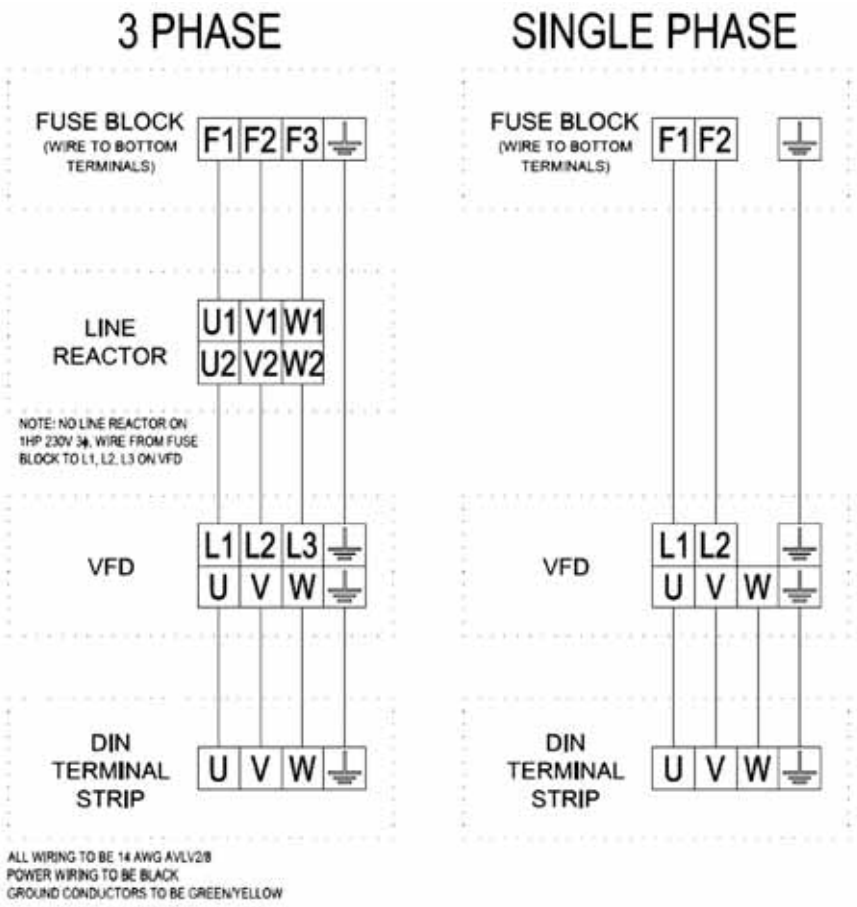


CONTROL WIRING (ALL UNITS)

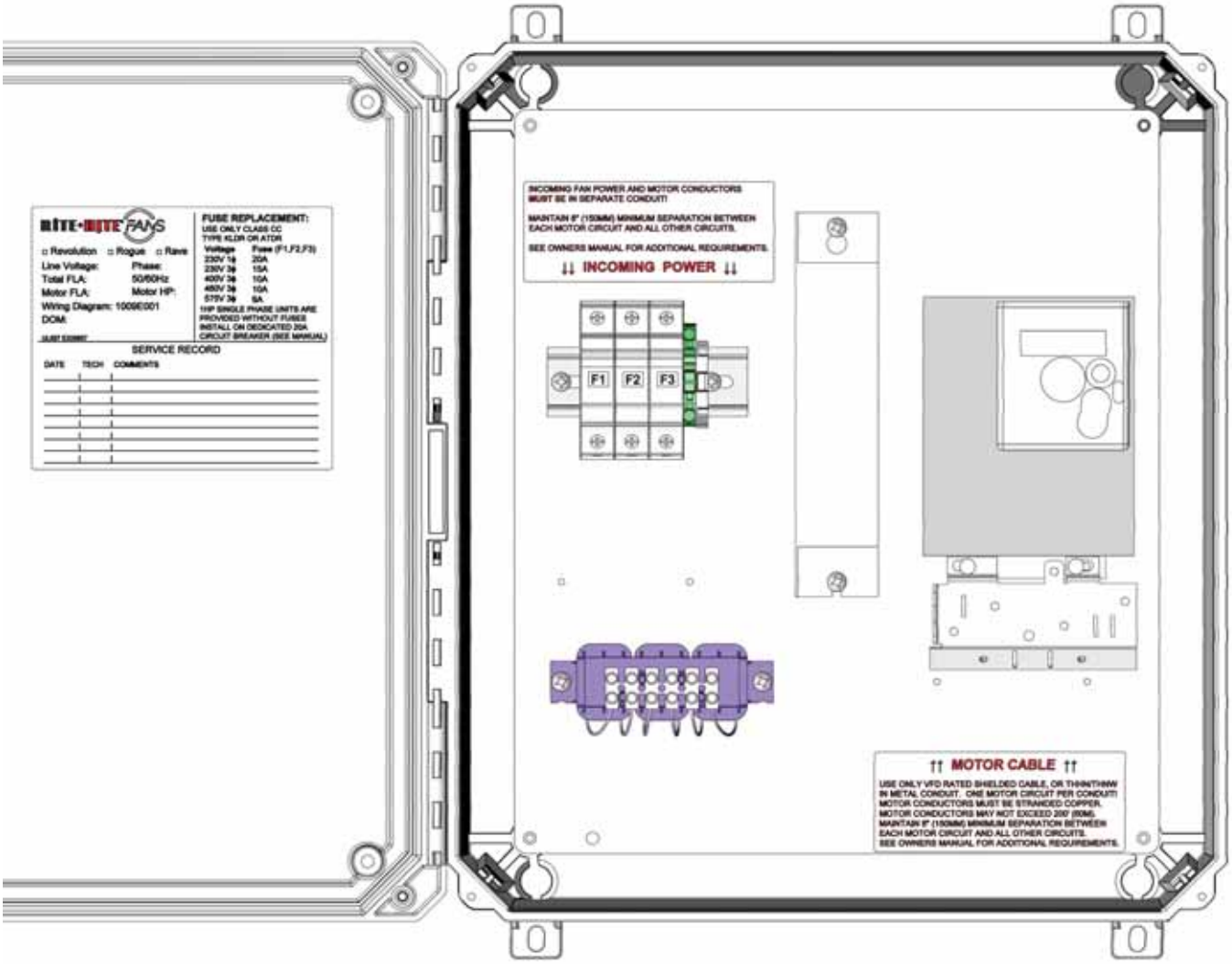
CONTROL WIRING TO BE 16 AWG YELLOW AVLV2/8

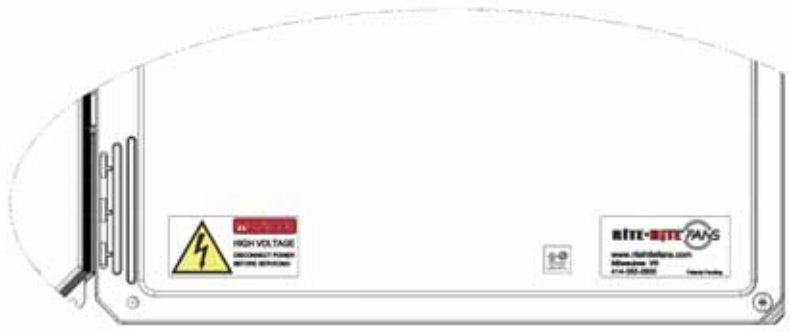
REVOLUTION & ROGUE = 2HP CONTROLS
RAVE = 1HP CONTROLS

BOM Table

ITEM	1HP 230V 3PH	1HP 400V	1HP 460V	2HP 230V 1PH	2HP 230V 3PH	2HP 400V	2HP 460V	2HP 575V	PART NUMBER	DRAWING	DESCRIPTION
6	1	1	1	1	1	1	1	1	12200087	1009M100	BACKPANEL,FAN
7	1	1	1	1	1	1	1	1	38120020	(1009M112)	DIN RAIL,LOW-PROFILE,4"
8	1	1	1	1	1	1	1	1	43750013	(1009M110)	ENCL,FBRGLS,16X14X8
1	-	-	-	1	-	-	-	-	51000003	(1009M111)	FUSE HOLDER,2POLE,600V,30A
3	1	1	1	-	1	1	1	1	51000013	(1009M111)	FUSE HOLDER,3POLE,600V,30A
10	-	-	-	-	-	-	-	3	51000065	(1009M115)	FUSE,6A,600V,CC,ATDR
11	-	3	3	-	-	3	3	-	51000066	(1009M115)	FUSE,10A,600V,CC,ATDR
12	3	-	-	-	3	-	-	-	51000067	(1009M115)	FUSE,15A,600V,CC,ATDR
13	-	-	-	2	-	-	-	-	51000068	(1009M115)	FUSE,20A,600V,CC,ATDR
14	-	-	-	1	-	-	-	-	53300050	(1009M102)	INV,2HP,230V,1PH,SQ D,ATV312
15	1	-	-	-	1	-	-	-	53300051	(1009M103)	INV,2HP,230V,3PH,SQ D,ATV312
16	-	1	1	-	-	1	1	-	53300052	(1009M104)	INV,2HP,460V,3PH,SQ D,ATV312
17	-	-	-	-	-	-	-	1	53300053	(1009M105)	INV,2HP,575V,3PH,SQ D,ATV312
4	-	1	1	-	-	-	-	-	66240001	(1009M113)	REACTOR,LINE,18MH,2.1A
2	-	-	-	-	1	-	-	-	66240003	(1009M113)	REACTOR,LINE,1.5MH,7.6A
5	-	-	-	-	-	1	1	-	66240002	(1009M113)	REACTOR,LINE,6.8MH,3.4A
19	-	-	-	-	-	-	-	1	66240004	(1009M114)	REACTOR,LINE,11MH,3.4A
20	6	8	8	8	8	8	8	8	67880148	(9900M284)	SCR,THSMS,#8X3/8,SS
21	1	1	1	1	1	1	1	1	73100024	(1009M117)	TERMINAL,END STOP,SCREWLESS
22	1	1	1	1	1	1	1	1	73100094	(1009M116)	TERMINAL,WA,CAGE,30A,2HOLE,GND
23	1	1	1	1	1	1	1	1	73100095	1009M002	TERMINAL,ASSY,FAN
24	1	1	1	1	1	1	1	1	53851058	1009M003	LABEL,SET,FAN,ELECTRICAL
25	1	1	1	1	1	1	1	1	53850715	(1009M119)	LABEL,UL,FAN ACCESSORY
26	1	1	1	1	1	1	1	1	-	1009M004	HARN,WIRE KIT,CBOX,FAN

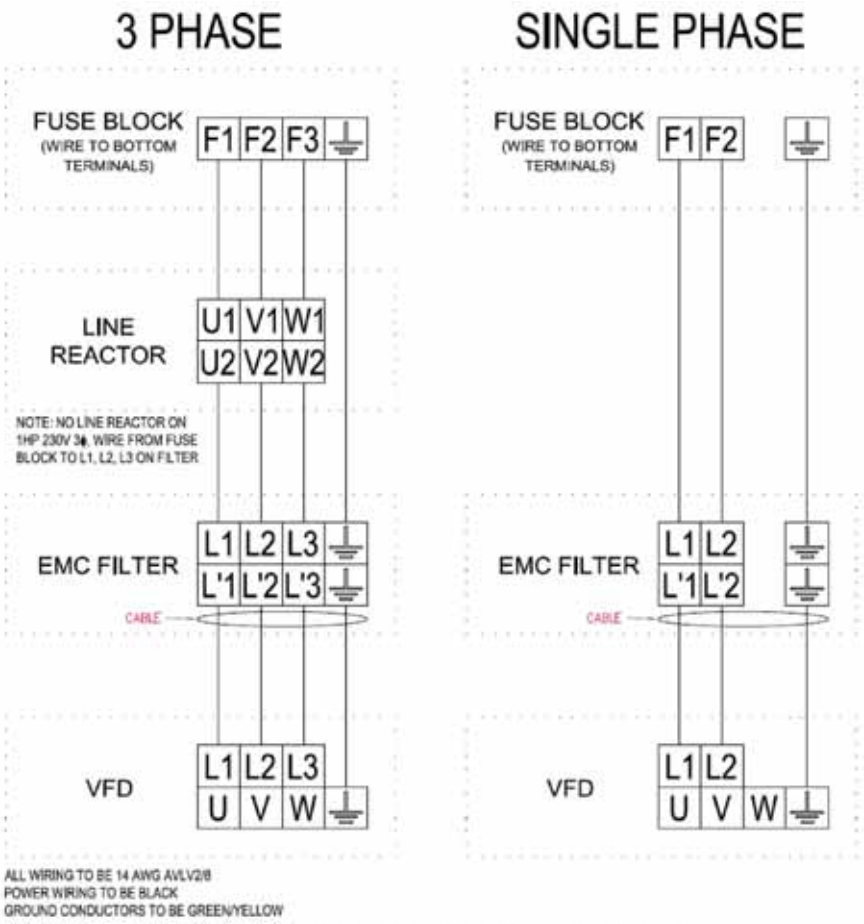
FAN CONTROL BOX LAYOUT - EMC OPTION





FRONT OF LID

IMPORTANT
USE STRANDED COPPER CONDUCTORS ONLY, MINIMUM 75°C.
TO MAINTAIN 4X RATING, USE ONLY UL LISTED 4X FITTINGS.
DO NOT MAKE CONDUIT CONNECTIONS THROUGH TOP OF ENCLOSURE.
TO REDUCE RISK OF ELECTRIC SHOCK, AN EARTH GROUND CONNECTION MUST BE FIELD INSTALLED TO THE GREEN/YELLOW CONTROL BOX GROUND TERMINAL



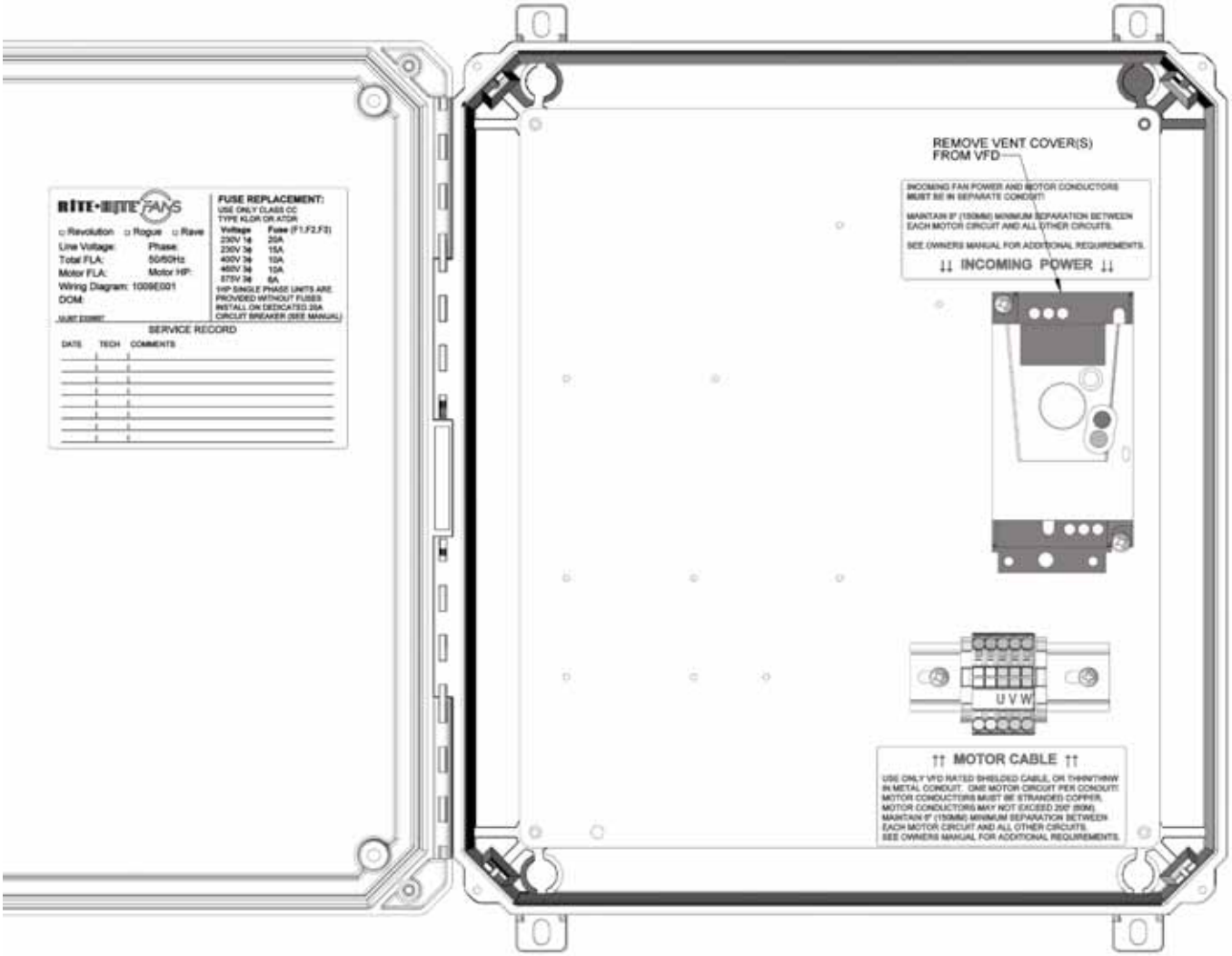
CONTROL WIRING (ALL UNITS)

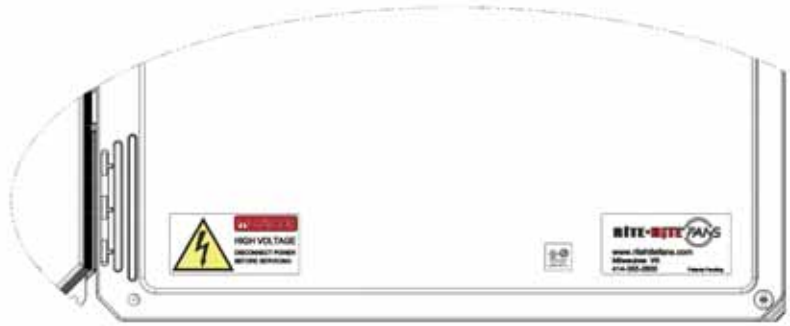
CONTROL WIRING TO BE 16 AWG YELLOW AVLV2/8

REVOLUTION & ROGUE = 2HP CONTROLS
RAVE = 1HP CONTROLS

BOM Table										
ITEM	1HP 230V 3PH EMC	1HP 400V EMC	1HP 460V EMC	2HP 230V 1PH EMC	2HP 230V 3PH EMC	2HP 400V EMC	2HP 460V EMC	PART NUMBER	DRAWING	DESCRIPTION
6	1	1	1	1	1	1	1	12200087	1009M100	BACKPANEL,FAN
7	1	1	1	1	1	1	1	38120020	(1009M112)	DIN RAIL,LOW-PROFILE,4"
8	1	1	1	1	1	1	1	43750013	(1009M110)	ENCL,FBRGLS,16X14X8
9	-	-	-	1	-	-	-	45500017	(1009M101)	FILTER,EMC,A312,2HP,1PH,230V
10	1	1	1	-	1	1	1	45500018	(1009M101)	FILTER,EMC,A312,1-2HP,3PH,230-460V
4	-	-	-	1	-	-	-	51000003	(1009M111)	FUSE HOLDER,2POLE,600V,30A
5	1	1	1	-	1	1	1	51000013	(1009M111)	FUSE HOLDER,3POLE,600V,30A
12	-	3	3	-	-	3	3	51000066	(1009M115)	FUSE,10A,600V,CC,ATDR
13	3	-	-	-	3	-	-	51000067	(1009M115)	FUSE,15A,600V,CC,ATDR
14	-	-	-	2	-	-	-	51000068	(1009M115)	FUSE,20A,600V,CC,ATDR
15	-	-	-	1	-	-	-	53300050	(1009M102)	INV,2HP,230V,1PH,SQ D,ATV312
16	1	-	-	-	1	-	-	53300051	(1009M103)	INV,2HP,230V,3PH,SQ D,ATV312
17	-	1	1	-	-	1	1	53300052	(1009M104)	INV,2HP,460V,3PH,SQ D,ATV312
1	-	1	1	-	-	-	-	66240001	(1009M113)	REACTOR,LINE,18MH,2.1A
3	-	-	-	-	1	-	-	66240003	(1009M113)	REACTOR,LINE,1.5MH,7.6A
2	-	-	-	-	-	1	1	66240002	(1009M113)	REACTOR,LINE,6.8MH,3.4A
19	6	6	6	6	6	6	6	67880148	(9900M284)	SCR,THSMS,#8X3/8,SS
20	1	1	1	1	1	1	1	73100024	(1009M117)	TERMINAL,END STOP,SCREWLESS
21	1	1	1	1	1	1	1	73100094	(1009M116)	TERMINAL,WA,CAGE,30A,2HOLE,GND
22	1	1	1	1	1	1	1	53851058	1009M003	LABEL,SET,FAN,ELECTRICAL
23	1	1	1	1	1	1	1	53850715	(1009M119)	LABEL,UL,FAN ACCESSORY
24	1	1	1	1	1	1	1	-	1009M004	HARN,WIRE KIT,CBOX,FAN

FAN CONTROL BOX LAYOUT - SINGLE PHASE





FRONT OF LID

IMPORTANT
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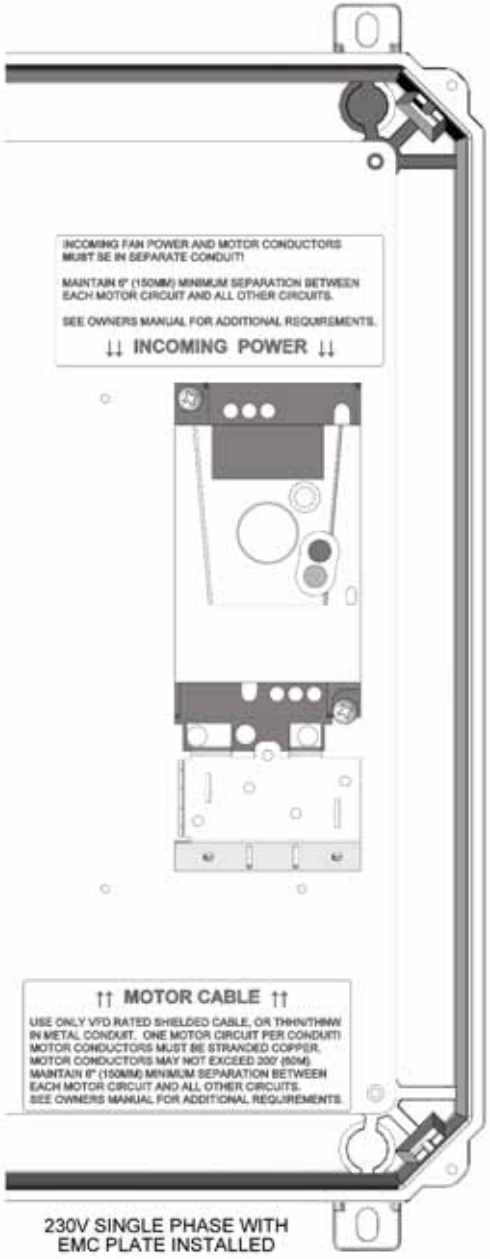
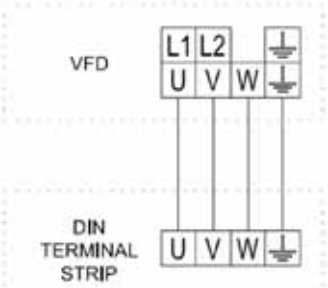


230V SINGLE PHASE WITH EMC PLATE INSTALLED

STANDARD



ALL WIRING TO BE 14 AWG AVLV2/8
POWER WIRING TO BE BLACK
GROUND CONDUCTORS TO BE GREEN/YELLOW

EMC OPTION

NO FACTORY WIRING REQUIRED WITH EMC OPTION

REVOLUTION & ROGUE = 2HP CONTROLS
RAVE = 1HP CONTROLS

REFERENCE 1009M004 FOR CUT WIRE LENGTHS

BOM Table

ITEM	1HP 120V	1HP 230V 1PH	1HP 230V 1PH EMC	PART NUMBER	DRAWING	DESCRIPTION
1	2	4	2	67850215	(9900M284)	SCR,RWH,PHLP,DR/TP,#8X1/2,ZNC
2	2	-	-	67850215	(9900M285)	SCR,RWH,PHLP,DR/TP,#8X3/4,ZNC
3	1	1	1	12200087	1009M100	BACKPANEL,FAN
4	1	1	1	43750013	(1009M110)	ENCL,FBRGLS,16X14X8
5	1	-	-	53300055	(1009M106)	INV,1HP,110V,1PH,ATV 12
6	-	1	1	53300056	(1009M107)	INV,1HP,220V,1PH,ATV 12
7	-	-	1	53300062	(1009M109)	INV,EMC PLATE W/CLAMPS,SIZE 1
8	1	1	1	53850715	(1009M119)	LABEL,UL,FAN ACCESSORY
9	1	1	1	53851058	1009M003	LABEL,SET,FAN,ELECTRICAL
10	1	1	-	73100095	1009M002	TERMINAL,ASSY,FAN

EMC COMPLIANCE OPTION

EMC COMPLIANCE OPTION

The EMC Compliance Option adds an EMC filter on the line side of the VFD, and a grounding plate for bonding the motor cable shield.
To maintain IEC 61800-3 C2 compliance, the following installation guidelines must be observed:

- Ensure maximum physical separation between low voltage control cables and high voltage power cables (minimum 150mm or 6”).

- Ensure maximum physical separation between motor cable and all other circuits (minimum 150mm or 6 inches).

- Use shielded, low capacitance VFD cable with XLPE (Cross-linked Polyethylene) insulation. Example products:
  - Belden 29501
  - AlphaWire V16014

- Bond motor cable shield to the VFD plate on one end (using clamps) and to the motor frame on the other end (using EMC cable gland).

- For 400V and 460V applications, maximum motor cable length must not exceed 50m or 160 feet.
  - 1.5kW VFD, 230V, 1Φ – 50m (160’) maximum cable length
  - 1.5kW VFD, 230V, 3Φ – 5m (16’) maximum cable length
  - 0.75kW VFD, 230V, 1Φ – 10m (32’) maximum cable length with internal filter if switching frequency (SFr) is set to 4, 8, or 12 kHz.

Clamp motor cable shield to EMC plate as shown in Figure 17:

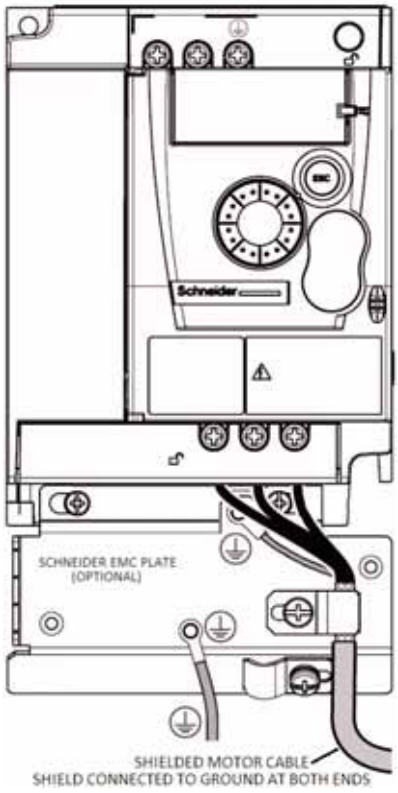
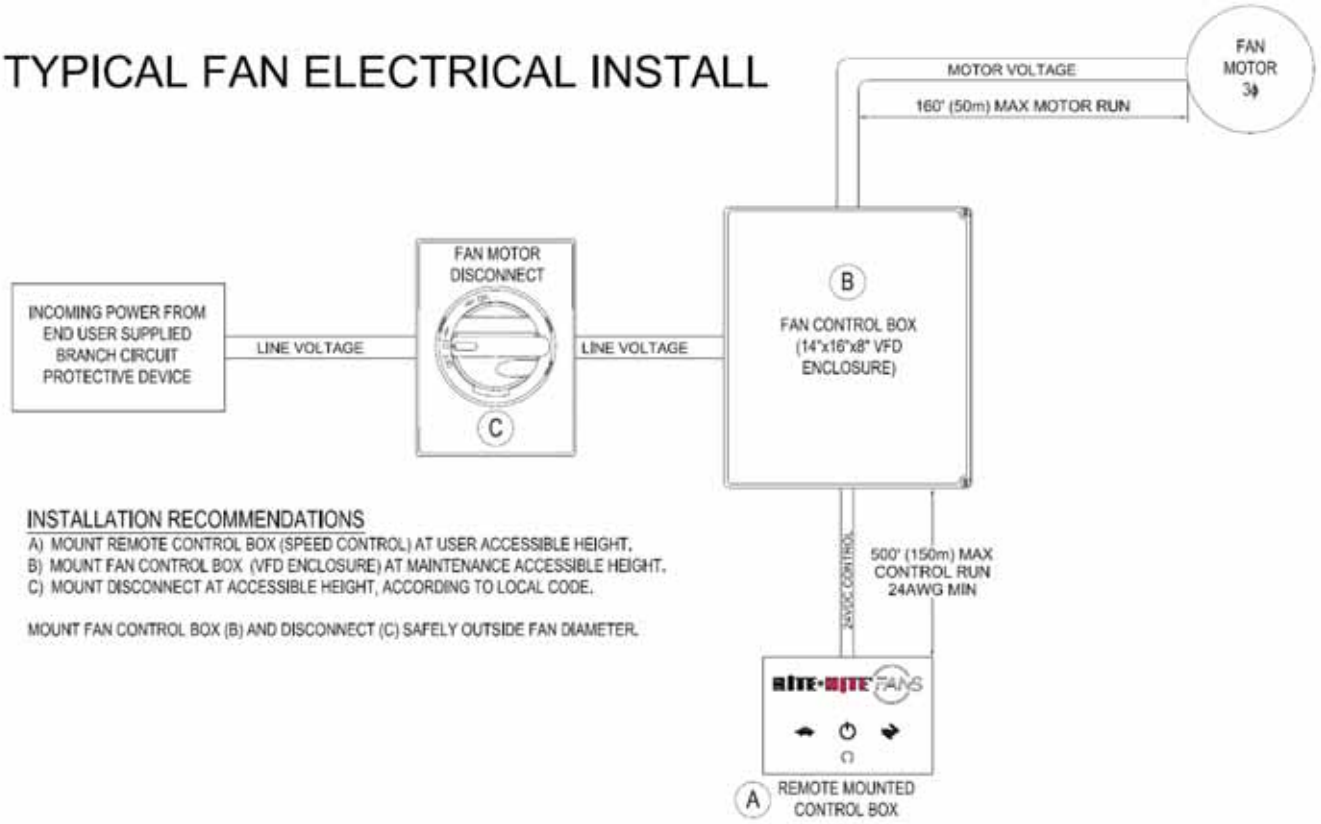


Figure 16

CONTROL BOX WIRING

TYPICAL FAN ELECTRICAL INSTALL

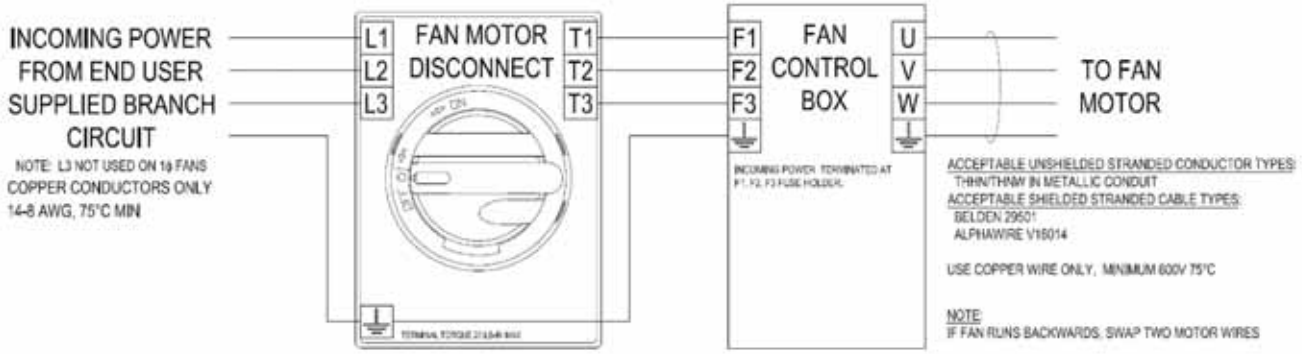


INSTALLATION RECOMMENDATIONS

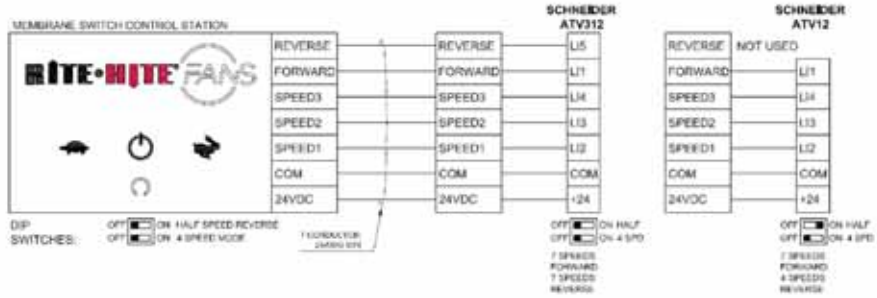
A) MOUNT REMOTE CONTROL BOX (SPEED CONTROL) AT USER ACCESSIBLE HEIGHT.
B) MOUNT FAN CONTROL BOX (VFD ENCLOSURE) AT MAINTENANCE ACCESSIBLE HEIGHT.
C) MOUNT DISCONNECT AT ACCESSIBLE HEIGHT, ACCORDING TO LOCAL CODE.

MOUNT FAN CONTROL BOX (B) AND DISCONNECT (C) SAFELY OUTSIDE FAN DIAMETER.

FIELD WIRING: POWER



FIELD WIRING: CONTROL



Revolution & Rogue Fan - 2 HP (1.5 kW)						
Voltage		230V 1Φ	230V 3Φ	400V 3Φ	480V 3Φ	575V 3Φ
VFD FLA		13.3	9.6	6.4	4.8	4.2
Motor FLA		5.8	5.8	3.3	3.0	2.6
CBox Fuse Amps		20	15	10	10	6
Min. Service Amps		20	15	10	10	10
VFD Nominal HP		2	2	2	2	2
		MAXIMUM NUMBER OF FANS PER BRANCH CIRCUIT				
Voltage		230V 1Φ	230V 3Φ	400V 3Φ	480V 3Φ	575V 3Φ
Branch Circuit Amps	15	N/A	1	1	2	2
	20	1	1	2	3	3
	25	1	2	3	4	4
	30	1	2	3	5	5
	35	2	2	4	5	6
	40	2	3	5	6	7

Rave Fan - ¾ HP (½ kW)							
Voltage		120V 1Φ	230V 1Φ	230V 3Φ	400V 3Φ	480V 3Φ	575V 3Φ
VFD FLA		15.7	8.5	9.6	6.4	4.8	4.2
Motor FLA		2.9	2.9	2.9	1.7	1.7	1.5
CBox Fuse Amps		N/A	N/A	15	10	10	6
Min. Service Amps		20	15	15	10	10	10
VFD Nominal HP		1	1	2	2	2	2
		MAXIMUM NUMBER OF FANS PER BRANCH CIRCUIT					
Voltage		120V 1Φ	230V 1Φ	230V 3Φ	400V 3Φ	480V 3Φ	575V 3Φ
Branch Circuit Amps	15	ONE FAN PER 20A BRANCH CIRCUIT. BRANCH PROTECTION (20A MAX) PROVIDED BY OTHERS.		1	1	2	2
	20			1	2	3	3
	25			2	3	4	4
	30			2	3	5	5
	35			2	4	5	6
	40			3	5	6	7

CONTROL BOX MOUNTING

⚠ CAUTION

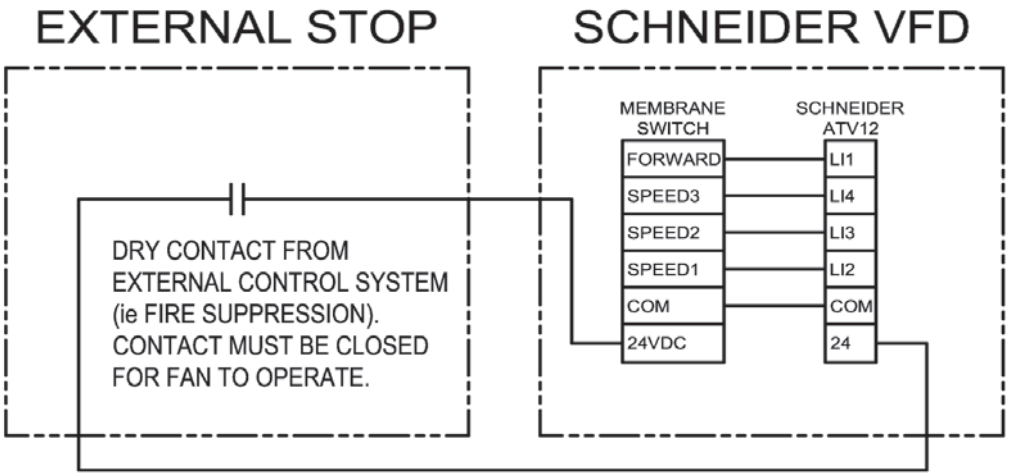
Never mount ceiling-mounted standard control boxes inside the fan diameter. A control box mounted above a fan and inside the fan diameter cannot be locked out safely.

Mount the control box securely to a wall or building column with appropriate anchors (not provided). Mount the control box no farther than 160 ft (50 m) from the fan it is controlling. Ensure that the fan is visible from the control box mounting location.

An authorized electrician must verify the electrical system (ground system, insulation, etc.) before the fan is put into operation. The customer should record and store the verification data.

STOP CIRCUIT FOR MULTIPLE FANS

STOP CIRCUIT FOR FANS: SCHNEIDER VFD



FIELD WIRING INSTRUCTIONS

LOCK OUT AND TAG OUT ALL POWER SUPPLIES ACCORDING TO OSHA REGULATIONS OR YOUR COUNTRY'S LOCAL STANDARDS AND APPROVED LOCAL ELECTRICAL CODES.

ONE DRY CONTACT REQUIRED FOR EACH SCHNEIDER ALTIVAR VFD

INSTALL A RELAY BETWEEN 24VDC TERMINAL ON MEMBRANE SWITCH CONTROLLER AND +24V TERMINAL ON EACH VFD.
FANS WILL STOP WHEN RELAY OPENS.

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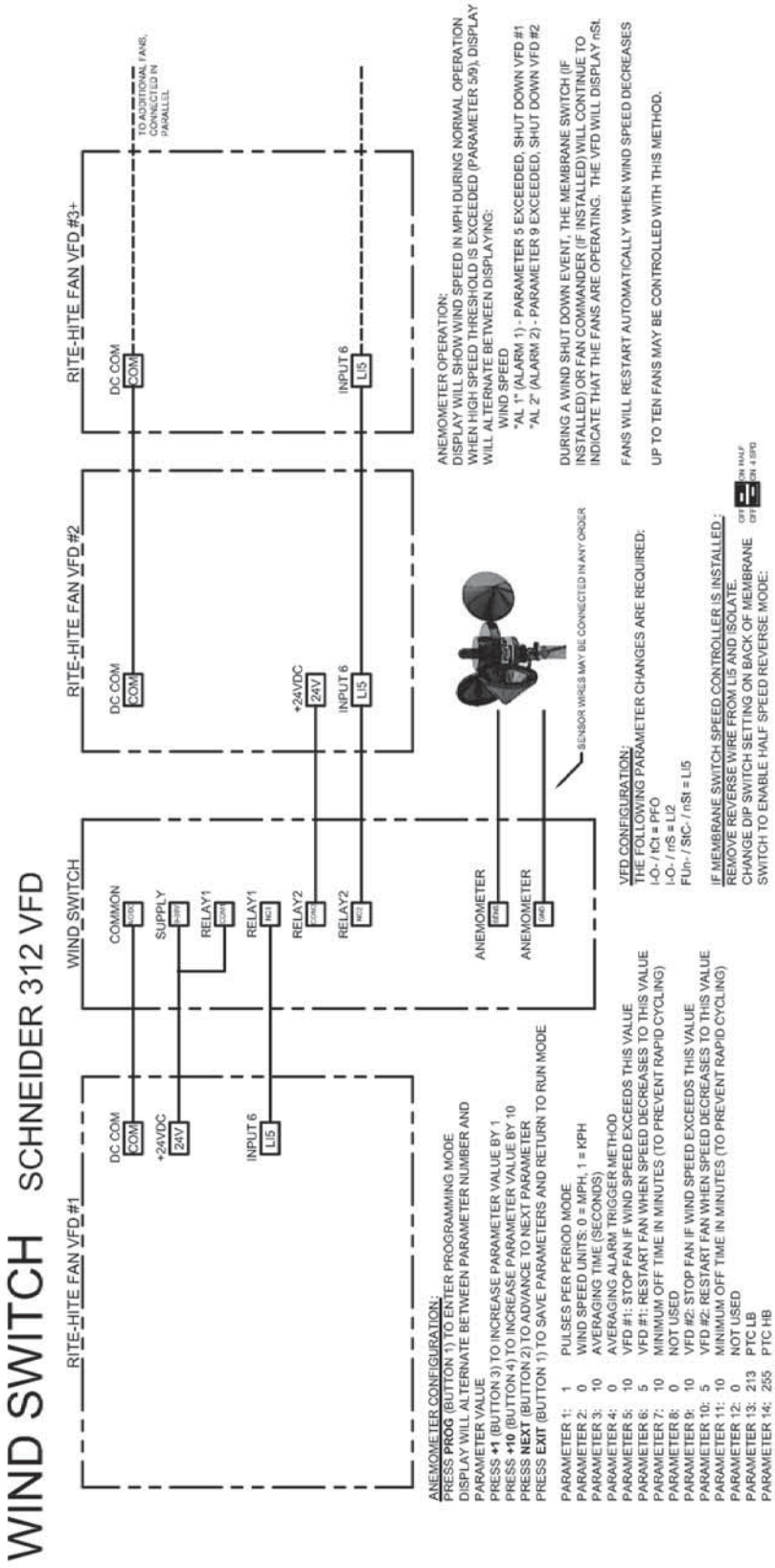
WIND SWITCH


WIND SWITCH SCHNEIDER 312 VFD
RITE-HITE FAN VFD #1
WIND SWITCH
COMMON
SUPPLY
RELAY1
RELAY1
RELAY2
RELAY2
DC COM
COM
+24VDC
24V
INPUT 6
LI5
ANEMOMETER
ANEMOMETER
RITE-HITE FAN VFD #2
DC COM
COM
+24VDC
24V
INPUT 6
LI5
RITE-HITE FAN VFD #3+
DC COM
COM
INPUT 6
LI5
TO ADDITIONAL FANS, CONNECTED IN PARALLEL
SENSOR WIRES MAY BE CONNECTED IN ANY ORDER
ANEMOMETER CONFIGURATION:
PRESS PROG (BUTTON *1) TO ENTER PROGRAMMING MODE
DISPLAY WILL ALTERNATE BETWEEN PARAMETER NUMBER AND PARAMETER VALUE
PRESS +1 (BUTTON 3) TO INCREASE PARAMETER VALUE BY 1
PRESS +10 (BUTTON 4) TO INCREASE PARAMETER VALUE BY 10
PRESS NEXT (BUTTON 2) TO ADVANCE TO NEXT PARAMETER
PRESS EXIT (BUTTON 1) TO SAVE PARAMETERS AND RETURN TO RUN MODE
PARAMETER 1: 1 PULSES PER PERIOD MODE
PARAMETER 2: 0 WIND SPEED UNITS: 0 = MPH, 1 = KPH
PARAMETER 3: 10 AVERAGING TIME (SECONDS)
PARAMETER 4: 0 AVERAGING ALARM TRIGGER METHOD
PARAMETER 5: 10 VFD #1: STOP FAN IF WIND SPEED EXCEEDS THIS VALUE
PARAMETER 6: 5 VFD #1:: RESTART FAN WHEN SPEED DECREASES TO THIS VALUE
PARAMETER 7: 10 MINIMUM OFF TIME IN MINUTES (TO PREVENT RAPID CYCLING)
PARAMETER 8: 0 NOT USED
PARAMETER 9: 10 VFD #2: STOP FAN IF WIND SPEED EXCEEDS THIS VALUE
PARAMETER 10: 5 VFD #2: RESTART FAN WHEN SPEED DECREASES TO THIS VALUE
PARAMETER 11: 10 MINIMUM OFF TIME IN MINUTES (TO PREVENT RAPID CYCLING)
PARAMETER 12: 0 NOT USED
PARAMETER 13: 213 PTC LB
PARAMETER 14: 255 PTC HB
PARAMETER 15: 255 PTS
PARAMETER 16: 68 PPPT
PARAMETER 17: 16 OFT
VFD CONFIGURATION:
THE FOLLOWING PARAMETER CHANGES ARE REQUIRED:
I-O- / tCt = PFO
I-O- / rrS = LI2
FUn- / StC- / nSt = LI5
IF MEMBRANE SWITCH SPEED CONTROLLER IS INSTALLED:
REMOVE REVERSE WIRE FROM LI5 AND ISOLATE.
CHANGE DIP SWITCH SETTING ON BACK OF MEMBRANE SWITCH TO ENABLE HALF SPEED REVERSE MODE:
ON HALF SPEED
OFF 4 SPD
FANS WILL RESTART AUTOMATICALLY WHEN WIND SPEED DECREASES
UP TO TEN FANS MAY BE CONTROLLED WITH THIS METHOD.
ANEMOMETER OPERATION:
DISPLAY WILL SHOW WIND SPEED IN MPH DURING NORMAL OPERATION
WHEN HIGH SPEED THRESHOLD IS EXCEEDED (PARAMETER 5/9), DISPLAY WILL ALTERNATE BETWEEN DISPLAYING:
WIND SPEED
"AL 1" (ALARM 1) - PARAMETER 5 EXCEEDED, SHUT DOWN VFD #1
"AL 2" (ALARM 2) - PARAMETER 9 EXCEEDED, SHUT DOWN VFD #2
DURING A WIND SHUT DOWN EVENT, THE MEMBRANE SWITCH (IF INSTALLED) OR FAN COMMANDER (IF INSTALLED) WILL CONTINUE TO INDICATE THAT THE FANS ARE OPERATING. THE VFD WILL DISPLAY nSt.

MOTOR WIRING CONT. / ANNUAL PLANNED MAINTENANCE

RUN / TEST

Turn the power disconnect switch on the control box to the ON position. Allow a few seconds for the frequency drive to power up.

Adjust the fan speed to 60 Hz. Count the number of revolutions the fan makes in 1 minute. They should be approximately the following:

12' (2440 mm) Fans = 80 rpm
10' (3050 mm) Fans = 100 rpm
8' (4880 mm) Fans = 130 rpm

If the fans do not spin at these speeds, consult factory for assistance.

FORWARD / REVERSE

The Rave® Fan is the most efficient running in the forward direction (blowing air downward). For some installations where it is not desirable to move the air downward, or you do not want to feel as much air movement, the fan can be run in reverse.

FAN BLADE CLEANING

- Dirt and dust may be removed from the blades by using a cloth or soft nonmetallic brush.
- Stubborn stains may be removed with a cloth dampened with a mild detergent solution. Do not use strong solvents.

FAN MOUNTING

- Re-torque all fasteners (1/2-13 Grade 8 [98 ft- lb or 133 Nm], 5/16-18 Grade 8 [29 ft- lb or 39 Nm]).
- Check the fan, including mounting supports, to make sure all hardware is tight and shows no wear and tear.

CABLES

- Re-torque clamps.
- Check for fraying or wear.

GEAR REDUCER

- Check for oil leaks. If leaks are present, contact factory.
- Check oil level. The oil type is marked on the gear case. Add oil if necessary.

MOTOR

- Check motor for accumulated dust and dirt. Remove using a brush or compressed air.

FAN CONTROLLER

- Examine all terminal connections inside the VFD control box. Tighten any loose connections.

⚠ WARNING

When cleaning or attempting to re-torque, always follow lockout/ tagout procedures (see page 5).

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FAN NOISE

The audible noise produced by Rite-Hite fans can be characterized in the following ways:

- Low-pitched “rumbling” noise is commonly from the gearcase. It will change pitch as the fan increases in speed. Once the fan reaches a set speed, the rumbling noise should turn to white noise and blend into its environment. Refer to SPECIFICATIONS for the sound level operating range.
- High-pitched noise is typically caused by the VFD. Field adjustments should be made during electrical installation with feedback from the customer. Refer to HIGH-FREQUENCY MOTOR NOISE in the TROUBLESHOOTING section.
- Wind noise will be present because the fan is moving a high volume of air. This will be more evident if there are obstructions to the airflow.
- The attachment hardware sometimes causes vibration noise. Take the necessary steps to identify and eliminate the vibration.

MAXIMUM SPEED CHANGES – SCHNEIDER ELECTRIC VFD

The maximum speed of the motor is limited by VFD parameters HSP and tFr. To ensure reliable operation in all applications, HSP is set to 60 at the factory.

To increase the maximum allowable fan speed, ensure that tFr is set to 70, and change the value of HSP to no more than 70.

The actual fan speed for each set point is determined by the values in parameters SP2 through SP8. See SPEED CONTROL STATION on page 22 to change speed set points.

Increasing fan speed may cause the VFD to fault in many applications. If this occurs, reduce the value of HSP.

As a reference, motor current is displayed in parameter LCr. When increasing speed, verify that LCr does not exceed the motor nameplate FLA.

Increasing blade speed will cause the blade tips to rise higher during operation. Ensure adequate overhead clearance before increasing speed.

TROUBLESHOOTING

MOTOR WOBBLE

Ensure all hardware is tight.

Ensure stabilization cables are taunt.

Ensure the motor bracket is installed vertical.

Tighten all mounting hardware and secure in the vertical position by tightening the appropriate stabilization cable.

HIGH-FREQUENCY MOTOR NOISE

When installing a fan in an abnormally quiet area, one may notice a high frequency noise from the motor. This noise is the VFD's carrier frequency. By default, the carrier frequency is set at 4 kHz to maximize the performance of the drive. To decrease audible noise the carrier frequency (SFr) may be increased up to 16 kHz. However, increasing the carrier frequency above 4 kHz results in decreased drive performance. Adjust this setting only as high as necessary to mitigate the objectionable noise.

For optimal performance and component life, the maximum fan speed (HSP) should be limited such that the output current (LCr) does not exceed the maximum allowable drive current for the selected carrier frequency.

Table 6

Maximum Drive Output Current (Amps)

	Carrier Frequency kHz (SFr)							
	2	4	6	8	10	12	14	16
2HP 600V Altivar 312	2.7	2.7	2.5	2.4	2.2	2.1	1.9	1.7
2HP 400V Altivar 312	4.1	4.1	3.8	3.6	3.4	3.2	2.9	2.6
2HP 200V Altivar 312	8.0	8.0	7.6	7.2	6.8	6.4	5.8	5.2
1HP 200V Altivar 12	4.2	4.2	3.9	3.7	3.5	3.3	3.1	2.9

TROUBLESHOOTING

SPEED CONTROLLER

1. Verify proper DIP switch settings.
   For most applications, both DIP switches should be off (as shown).

   If your fan uses a Schneider Alitvar 12 VFD (model number on front of VFD starts with ATV12*), the “HALF SPEED” DIP switch on the top must be switched to the ON position.

Figure 19

2. The speed controller is powered by 24 VDC, supplied by the VFD.
   Using a DMM (Digital MultiMeter), set to DC Volts; measure the voltage between the COM and 24VDC terminals on the back of the speed controller.
   If this voltage is less than 22 VDC, check wiring for a short or open circuit.

3. The speed controller uses discrete outputs to communicate speed to the VFD.
   Each output is either on or off, and can be easily measured with a digital multimeter (set to measure DC Volts) at the terimals on the back of the speed controller.
   If the voltage from output to COM is less than 5 VDC, the output is off.
   If the voltage from output to COM is greater than 20 VDC, the output is on.
   If the voltage is between 5 VDC and 20 VDC, check wiring for a short or open circuit.
   At the slowest speed (one LED illuminated), in the forward direction (default at power up), the speed controller should have the following outputs:

SPEED1:	ON	(COM to SPEED1 > 20VDC)
SPEED2:	ON	(COM to SPEED1 > 20VDC)
SPEED3:	ON	(COM to SPEED1 > 20VDC)
FORWARD:	ON	(COM to SPEED1 > 20VDC)
REVERSE:	OFF	(COM to SPEED1 < 5VDC)

   If the correct voltages are measured, the speed controller is sending the proper signal, but the VFD is not receiving or interpreting the signal. Skip to Step 5.

   If the correct voltage is not observed, remove the wires from SPEED1, SPEED2, SPEED3, FORWARD, and REVERSE. With output wires disconnected, repeat the measurements at the terminals on the back of the speed controller.

   If correct voltages are still not measured, you may have a bad speed controller. Call Rite-Hite Customer Service.

   If correct voltages are measured with the output wires disconnected, a wiring error or short in the cable is likely causing the voltage to drop.

   Verify that each wire is terminated at the proper VFD terminal.

   With both ends of the cable disconnected and isolated, verify with a DMM that there is no continuity (open circuit indication in “ohms” mode) between conductors, and no continuity between any conductor and ground.

TROUBLESHOOTING

4. If the speed controller appears to be functioning properly, but the fan is not operating properly, the VFD may not be receiving the proper signal. With a DMM, measure the voltage at each corresponding VFD input:

I/O Check: Set fan to slowest speed (1 LED), Forward direction

Speed Controller Terminals	Proper DC Voltage at output of Speed Controller	AB Powerflex 40 Terminals	Proper DC Voltage at inputs of AB PowerFlex 40 VFD	Schneider Altivar Terminals	Proper DC Voltage at inputs of Schneider Altivar VFD
SPEED1:	(COM to SPEED1 > 20VDC)	7	(4 to 7 > 20VDC)	LI2	(COM to LI2 > 20VDC)
SPEED2:	(COM to SPEED1 > 20VDC)	6	(4 to 6 > 20VDC)	LI3	(COM to LI3 > 20VDC)
SPEED3:	(COM to SPEED1 > 20VDC)	5	(4 to 5 > 20VDC)	LI4	(COM to LI4 > 20VDC)
FORWARD:	(COM to SPEED1 > 20VDC)	2	(4 to 2 > 20VDC)	LI1	(COM to LI1 > 20VDC)

If the proper voltage is present at the speed controller, but not at the VFD, a wiring error or break in the cable is likely. Verify connections and test cable for continuity.

If the proper voltage is present at the VFD, but the VFD is not running at the commanded speed (10 Hz, forward), a parameter setting may have been changed. Go to Step 6.

5. The speed controller uses three VFD inputs to select a preset speed. The actual speed value (in Hz) corresponding to each preset speed is stored in the VFD parameters.
   For example, when the speed controller displays six LEDs (Speed 6), it turns on input (LI3). When the VFD sees input LI3 on, with inputs LI2 and LI4 off, it runs the fan at the speed stored in parameter SP3 (52 Hz by default).
   Rotational direction is determined by the Forward and Reverse signals. For the previous example, the fan will run forward if VFD input LI1 is on. If VFD input LI5 is on, it will run in reverse. If neither input is on, the fan will not operate.
   Using a DMM, step through each of the seven speed settings and verify the proper input states. Check for swapped wires if the input states do not match the following table.

TROUBLESHOOTING

		AB PowerFlex 40				Schneider Altivar 12/312			
		VFD Input Terminal			Speed	VFD Input Terminal			Speed
Set Speed	Hz	7	6	5	Preset	LI2	LI3	LI4	Preset
Speed 7	60	OFF	OFF	ON	A071	OFF	OFF	ON	SP2
Speed 6	52	OFF	ON	OFF	A072	OFF	ON	OFF	SP3
Speed 5	44	OFF	ON	ON	A073	OFF	ON	ON	SP4
Speed 4	35	ON	OFF	OFF	A074	ON	OFF	OFF	SP5
Speed 3	26	ON	OFF	ON	A075	ON	OFF	ON	SP6
Speed 2	18	ON	ON	OFF	A076	ON	ON	OFF	SP7
Speed 1	**10**	ON	ON	ON	A077	ON	ON	ON	SP8

If all the I/O states match the table, it is possible the preset parameters were changed in the VFD. Verify that each preset matches the desired speed (i.e., SP2 = 60 Hz, SP3 = 52 Hz, etc.).

6. If any parameters have been changed from the factory settings, the speed controller may not work properly.
   Verify the following Allen-Bradley parameter settings:

   P034 = 10 P035 = 60 P036 = 2 P038 = 4 A051 = 4 A052 = 4 A053 = 4

   Verify the following Schneider parameter settings:

   FUn- PSS- PS2 = L4H/LI4 FUn- PSS- PS4 = L3H/LI3 FUn- PSS- PS8 = L2H/LI2

TROUBLESHOOTING

SCHNEIDER ELECTRIC FREQUENCY DRIVE

<table>
<tr><th>Problem</th><th>Cause</th><th>Resolution</th></tr>
<tr><td rowspan="5">Display on Frequency drive does not light up.</td><td>No power to control box</td><td>Use voltage meter on AC setting to determine if there is incoming power. Measure across L1/L2, L2/L3, L1/L3. All readings should be within 2%.</td></tr>
<tr><td>Loose wires</td><td>Check for loose wires along path at locations where readings change.</td></tr>
<tr><td>Check fuses to make sure they are good</td><td>Replace if necessary.</td></tr>
<tr><td>Check to make sure load switch is turned to on</td><td>Turn to ON position.</td></tr>
<tr><td>Frequency drive failure</td><td>Consult factory.</td></tr>
<tr><td rowspan="5">Display on Frequency drive lights up but fan not does run.</td><td>No start command given</td><td>Turn fan control switch off and then back on.</td></tr>
<tr><td>Loose wire</td><td>Check for loose wires at frequency drive and switch.</td></tr>
<tr><td>Stop signal from fire protection system</td><td>If fan is wired to shut off with fire protection system, verify that fan is not getting signal to shut down from fire protection system.</td></tr>
<tr><td>Reset from fault</td><td>Turn fan load switch off. Wait for 30 seconds, and then turn back on. Turn fan control switch off and then back on.</td></tr>
<tr><td>VFD is not programmed for correct control switch</td><td>If you are using the membrane switch shown in Figure 15, settings should be set to the parameters below.
<table>
<tr><th>Menu</th><th>Parameter</th><th>Description</th><th>Value</th></tr>
<tr><td>FUn-</td><td>PSS-PS2</td><td>Preset Speed Bit</td><td>LI4</td></tr>
<tr><td>FUn-</td><td>PSS-PS4</td><td>Preset Speed Bit</td><td>LI3</td></tr>
<tr><td>FUn-</td><td>PSS-PS8</td><td>Preset Speed Bit</td><td>LI2</td></tr>
<tr><td>I-O-</td><td>rrS</td><td>Reverse Direction</td><td>LI5</td></tr>
</table></td></tr>
</table>

SCHNEIDER ELECTRIC FREQUENCY DRIVE

<table>
<tr><th>Problem</th><th>Cause</th><th>Resolution</th></tr>
<tr><td>Display on Frequency drive lights up but fan not does run. (continued)</td><td></td><td>If you are using analog control switches, settings must be set to the parameters below.
<table>
<tr><th>Menu</th><th>Parameter</th><th>Description</th><th>Value</th></tr>
<tr><td>FUn-</td><td>PSS-PS2</td><td>Preset Speed Bit</td><td>nO</td></tr>
<tr><td>FUn-</td><td>PSS-PS4</td><td>Preset Speed Bit</td><td>nO</td></tr>
<tr><td>FUn-</td><td>PSS-PS8</td><td>Preset Speed Bit</td><td>nO</td></tr>
<tr><td>I-O-</td><td>rrS</td><td>Reverse Direction</td><td>LI2</td></tr>
</table></td></tr>
<tr><td rowspan="4">Frequency drive faults when fan starts.</td><td rowspan="4">OLF Motor Overload</td><td>Check the fan for damage. Restart if no damage is found. Consult factory if damage is found.</td></tr>
<tr><td>Verify that motor current (LCR) is no greater than motor rated FLA.</td></tr>
<tr><td>With power off check that gearbox spins smoothly.</td></tr>
<tr><td>Verify proper fan speed, reference RUN/TEST section (Page 34)

If the fan rotates at a different speed than above, check the gearbox label to ensure the wrong size blades were not installed on the fan.</td></tr>
</table>

SCHNEIDER ELECTRIC FREQUENCY DRIVE

Problem	Cause	Resolution
Frequency drive faults when fan starts (continued).	OLF Motor Overload (Continued)	Check to ensure motor wiring matches voltage provided.
		Check to make sure all blades are locked in at the same angle, and that one or more did not turn.
	OCF, OLF, OPF, OPF1, OPF2, SCF, SCF1, SCF3, SCF5 MOTOR FAULT	SEE MOTOR TROUBLESHOOTING SECTION
Fan runs, but operation is not smooth	Gearbox issues	Spin the fan blades by hand. Listen for any irregular noises that could be related to gear issues. Consult factory if irregular noises are present.
	Incoming / Outgoing wiring not separated	Run incoming wire and outgoing wiring in separate conduit a minimum of 6 in. (150 mm) apart.

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TROUBLESHOOTING

MOTOR

MOTOR TROUBLESHOOTING:

1. FOLLOWING LOCK-OUT TAG-OUT PROCEDURE, ISOLATE POWER FROM FAN CONTROLS.
2. DISCONNECT FAN MOTOR CABLE FROM U, V, W, AND GROUND TERMINALS.
3. USING ELECTRICAL METER, MEASURE RESISTANCE (OHMS, Ω) BETWEEN PHASE W AND PHASE V (AS SHOWN). RECORD THE FOLLOWING SIX RESISTANCE VALUES:

PHASE W TO V	☐ Ω	PHASE W TO GND	☐ Ω
PHASE W TO U	☐ Ω	PHASE V TO GND	☐ Ω
PHASE V TO U	☐ Ω	PHASE U TO GND	☐ Ω

PHASE TO PHASE VALUES SHOULD BE EQUAL (±5%).
PHASE TO GROUND VALUES SHOULD BE INFINITE. (OPEN CIRCUIT - METER DISPLAY "OL")

IF PHASE-PHASE VALUES ARE NOT EQUAL, OR IF PHASE-GROUND RESISTANCE IS MEASURED:

DISCONNECT MOTOR CABLE FROM MOTOR.
REPEAT MEASUREMENTS AT MOTOR WIRING TERMINALS.

TROUBLESHOOTING

SCHNEIDER FAULT CODES

VFD Fault Codes:

Before calling Rite-Hite Customer Service:

- **Make note of any active fauts displayed on the VFD.**
- **Check the previous fault code (parameter LFt on a 312, dP1 on a 12)**

Altivar 312	Altivar 12	Fault Description	Cycle power to VFD. If Fault persists...
bLF		Brake Control	Reset VFD to Rite-Hite Defaults
CFF	CFF	Incorrect Parameters	Reset VFD to Rite-Hite Defaults
CF1	CF1	Invalid Parameters	Reset VFD to Rite-Hite Defaults
CnF		Com Card	Reset VFD to Rite-Hite Defaults
COF		CANopen	Reset VFD to Rite-Hite Defaults
CrF	CrF1	Capacitor Charge	Replace Drive
EEF		EEPROM	Replace Drive
EPF		Blade Impact Detected (LI6)	Call Customer Service
IF1	InF1	Unknown Rating	Replace Drive
IF2	InF2	Display/Power card	Replace Drive
IF3	InF3	EEPROM/Serial	Replace Drive
IF4	InF4	EEPROM	Replace Drive
	InF9	Current Measurement	Replace Drive
	----	Firmware	Replace Drive
	InFb	Thermal Sensor	Replace Drive
	InFE	CPU	Replace Drive
LFF	LFF1	4-20mA Loss	Reset VFD to Rite-Hite Defaults
nOF		No Code	Reset VFD to Rite-Hite Defaults
ObF	ObF	Bus Overvoltage	Verify line voltage and decel ramp
OCF	OCF	Overcurrent	Verify motor parameters & gear ratio, ohm motor
OHF	OHF	Drive Overheat	Reduce Carrier Hz, check VFD fan
	OLC	Blade Impact Detected	Call Customer Service
OLF	OLF	Motor Overload	Verify motor parameters & gear ratio, ohm motor
OPF	OPF1	Motor Phase Loss	Verify motor wiring, ohm motor at Cbox
	OPF2	Motor Phase Loss	Verify motor wiring, ohm motor at Cbox
OSF	OSF	Line Overvoltage	Verify line AC voltage
PHF	PHF	Line Phase Loss	Verify line AC voltage
SCF	SCF1	Motor Short Circuit	Ohm motor at Cbox and at motor Jbox
	SCF3	Motor Ground Fault	Ohm motor at Cbox and at motor Jbox
	SCF4	IGBT Short	Replace Drive
	SCF5	Motor Short Circuit	Ohm motor at Cbox and at motor Jbox
SLF	SLF1	Modbus	Verify Modbus wiring and Fan Commander settings
SOF	SOF	Motor Overspeed	Call Customer Service
	tJF	IGBT Overheat	Reduce Carrier Hz, check VFD fan
tnF	tnF	Auto-Tuning	Call Customer Service
	ULF	Process Underload	Reset VFD to Rite-Hite Defaults
USF	USF	Line Undervoltage	Verify line AC voltage

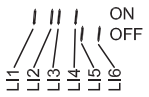
ATV312 PARAMETER SHEET

To access Altivar 312 parameters:

Press the navigation dial.
Turn the dial to scroll through parameter menus.
Press the dial to enter a menu.
Press the ESC key to return to the previous parent menu.
***Example value shown: Always verify actual motor nameplate data!**

Menu	Param	Value*	Description
rEF-			
SEt-	ItH	30	Motor Nameplate Current: 3.0A*
	Ctd	50	Impact Detection Threshold: 5.0A
	SFr	40	Carrier Frequency: 4.0kHz
drC-	UnS	460	Motor Nameplate Voltage: 460V*
	FrS	600	Motor Nameplate Frequency: 60.0Hz*
	nCr	30	Motor Nameplate Current: 3.0A*
	nSP	1745	Motor Nameplate Speed: 1745 RPM*
	COS	075	Motor Nameplate PF: 0.75*
	FCS	rEC1	Reset VFD to Rite-Hite Defaults
I_O-			
CtL-			
FUn-			
FLt-			
COM-	Add	1	Modbus Address: 1
	tbr	96	Modbus baudrate: 9600 baud
SUP-	rFr		VFD Output Frequency
MONITORING (READ ONLY)	LCr		Motor Current
	ULn		AC line voltage (calculated)
	tHd		Drive Thermal State (%)
	LFt		Last Fault Code
	Otr		Motor Torque (%)
	rtH		Motor Run Time (hours/kilo-hours)
	L IS	11111	Digital Input State

Example shown is slow forward:
LI1, LI2, LI3, LI4 are ON (high)
LI5, LI6 are OFF (low)



TROUBLESHOOTING

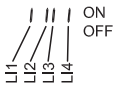
ATV 12 PARAMETER SHEET

To access Altivar 12 parameters:

Press the navigation dial.
Turn the dial to scroll through parameter menus.
Press the dial to enter a menu.
Press the ESC key to return to the previous parent menu.
***Example value shown: Always verify actual motor nameplate data!**

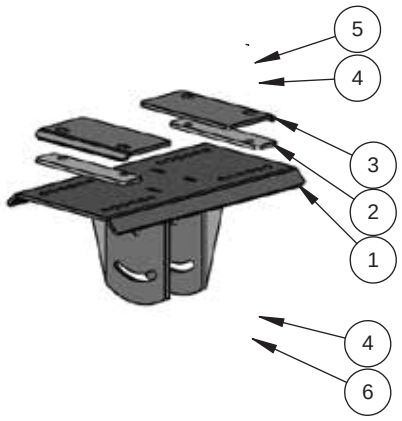
Menu1	Menu2	Menu3	Menu4	Param	Value*	Description
rEF						
MOn MONITORING (READ ONLY)				rFr		VFD Output Frequency
				LCr		Motor Current
				ULn		AC line voltage (calculated)
				tHd		Drive Thermal State (%)
				OPr		Motor Power (%)
	MA1-			LI5I	1111	Digital Input State
				dP1		Last Fault Code
CONF				Fr1	AI1	Speed Reference
				FCS	rEC1	Reset VFD to Rite-Hite Defaults
	FULL	IO-				
		drC-		COS	070	Motor Nameplate PF: 0.70*
				UnS	230	Motor Nameplate Voltage: 230V*
				nCr	29	Motor Nameplate Current: 2.9A*
				FrS	500	Motor Nameplate Frequency: 50.0Hz*
				nSP	930	Motor Nameplate Speed: 930 RPM*
				SFr	40	Carrier Frequency: 4.0kHz
		CtL-				
		FUn-				
		FLt-	tHt-	ItH	29	Motor Nameplate Current: 2.9A*
		CON-		Add	1	Modbus Address: 1
				tbr	96	Modbus baudrate: 9600 baud

Example shown is slow forward:
LI1, LI2, LI3, LI4 are ON (high)



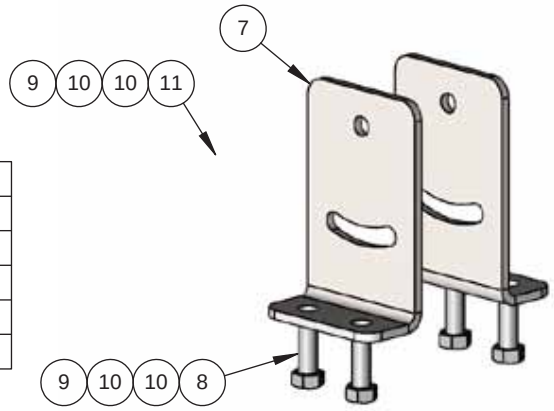
PARTS

BRACKETING & HOUSING



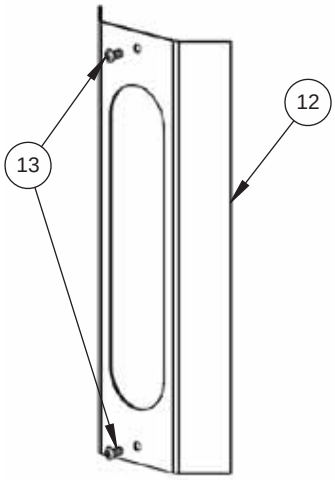
ITEM	QTY.	DESCRIPTION
1	1	BRKT,WLDMNT,SWVL,FAN,[COLOR]
2	2	PLATE,SHIM,MNT,FAN,[COLOR]
3	2	PLATE,CLAMP,MNT,FAN,[COLOR]
4	8	WSHR,FLAT,1/2X1-3/8X7/64,ZNC
5	4	NUT,HEX,NYL LOCK,1/2-13,GR8,Z
6	4	SCR,HHMS,1/2-13X2,GRD8,ZNC

PART NUMBER	DESCRIPTION
14501232	BRKT,ASSY,SWVL,CLNG,FAN,BK
14501233	BRKT,ASSY,SWVL,CLNG,FAN,GY
14501234	BRKT,ASSY,SWVL,CLNG,FAN,WH



ITEM	QTY.	DESCRIPTION
7	2	BRKT,MNT,HOUSING,SWVL,FAN,[COLOR]
8	4	SCR,HHMS,1/2-13X1-1/2,GR8,ZNC
9	6	NUT,HEX,NYL LOCK,1/2-13,GR8,Z
10	12	WSHR,FLAT,1/2X1-3/8X7/64,ZNC
11	2	SCR,HHMS,1/2-13X4-1/2,GR8,ZNC

PART NUMBER	DESCRIPTION
14501243	BRKT,ASSY,SWVL,HOUSING,RAVE,BK
14501244	BRKT,ASSY,SWVL,HOUSING,RAVE,GY
14501245	BRKT,ASSY,SWVL,HOUSING,RAVE,WH



MOTOR HOUSING COVER & SCREWS					
ITEM	BLACK	GREY	WHITE	PART NUMBER	DESCRIPTION
12	1	-	-	17900194	CVR,HOUSING,MOTOR,RAVE,BK
12	-	1	-	17900195	CVR,HOUSING,MOTOR,RAVE,GY
12	-	-	1	17900196	CVR,HOUSING,MOTOR,RAVE,WH
13	2	2	2	67870127	SCR,BHMS,SCKT,5/16-18X5/8,BLK

MOTOR ASSEMBLY

1001.XXX
MOT,ASSY,1HP,[XXX]V,DIA,[X]BLD QTY

PART NUMBER	DESCRIPTION	FINISH
67820002	SCREEN,ABS,CHROME PLATED	CHROME PLATE
67820001	SCREEN,ABS,PNTD SILVER	SILVER PAINT

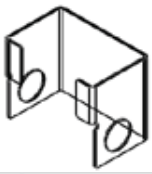
BLADES AND HUB PARTS

PART NUMBER	DESCRIPTION	FINISH
12510007	BLADE,SET(2),RAVE,8',MILL	MILL FIN
12510004	BLADE,SET(2),RAVE,8',POLISHED	POLISHED

PART NUMBER	DESCRIPTION	FINISH
12510005	BLADE,SET(2),RAVE,10',POLISHD	POLISHED
12510008	BLADE,SET(2),RAVE,10',MILL	MILL FIN

PART NUMBER	DESCRIPTION	FINISH
12510006	BLADE,SET(2),RAVE,12',POLISHD	POLISHED
12510009	BLADE,SET(2),RAVE,12',MIL	MIL FIN

53760006
KIT,BLD,SCR/NUT,22MMX102MM,AL



PART NUMBER	DESCRIPTION	FINISH
17900198	CVR,CLEVIS,HUB,RAVE,MILL	MILL
17900199	CVR,CLEVIS,HUB,RAVE,POL	POL

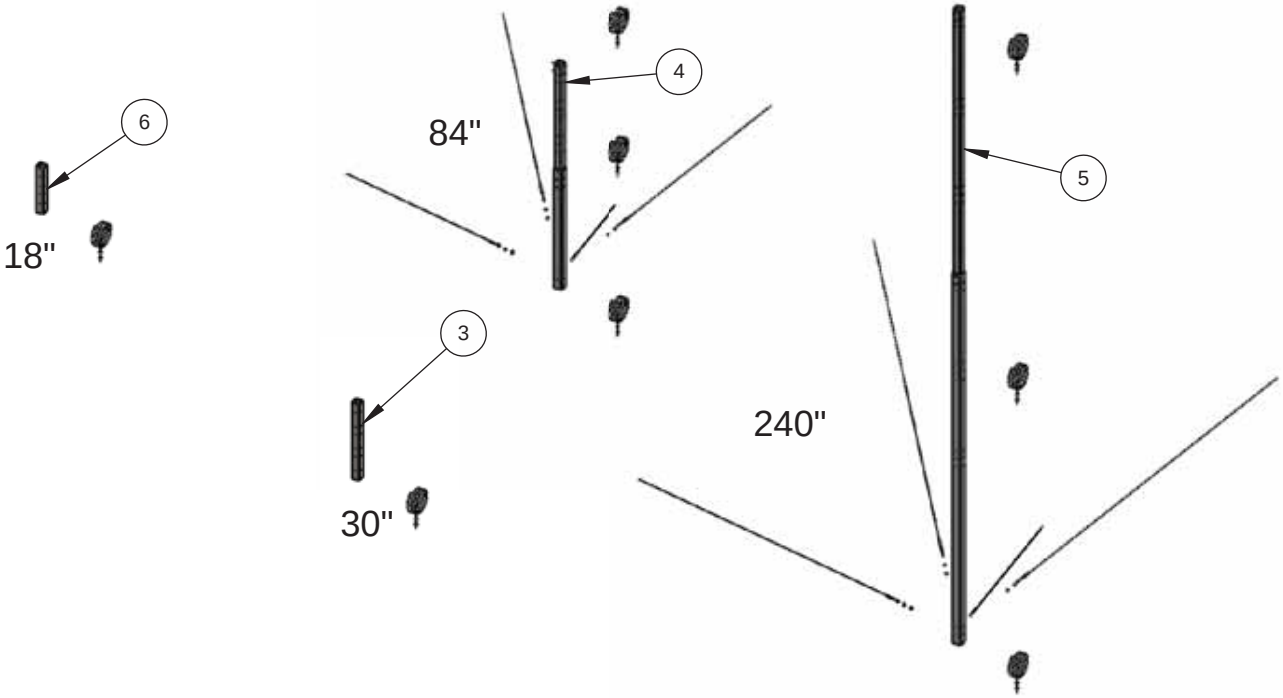
67870128
SCR,SHCS,AL,5/16-18X1/2,NYL,SS

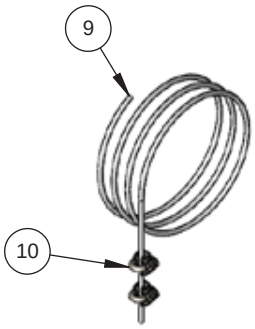
PART NUMBER	DESCRIPTION	FINISH
17900200	CVR,HUB,DOME,RAVE,CHROME	CHROME PLATED
17900202	CVR,HUB,DOME,RAVE,PNT	SILVER PAINT

EXTENSION TUBE ASSEMBLIES AND CABLES

PART NUMBER	DESCRIPTION
53760039	KIT,EXTN,W/CABLES,RAVE,BK,18"
53760040	KIT,EXTN,W/CABLES,RAVE,GY,18"
53760041	KIT,EXTN,W/CABLES,RAVE,WH,18"
53760042	KIT,EXTN,W/CABLES,RAVE,BK,30"
53760043	KIT,EXTN,W/CABLES,RAVE,GY,30"
53760044	KIT,EXTN,W/CABLES,RAVE,WH,30"
53760045	KIT,EXTN,W/CABLES,RAVE,BK,84"
53760046	KIT,EXTN,W/CABLES,RAVE,GY,84"
53760047	KIT,EXTN,W/CABLES,RAVE,WH,84"
53760048	KIT,EXTN,W/CABLES,RAVE,BK,240"
53760049	KIT,EXTN,W/CABLES,RAVE,GY,240"
53760050	KIT,EXTN,W/CABLES,RAVE,WH,240"

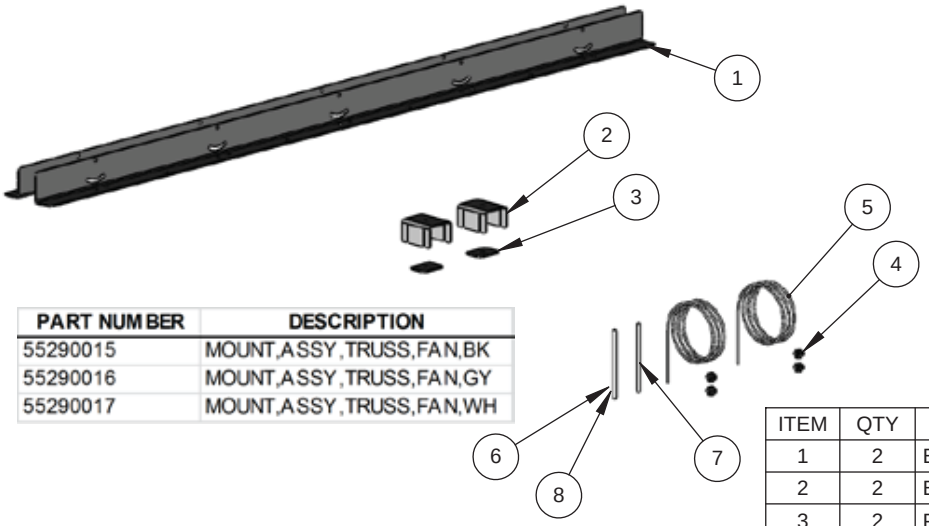
ITEM	18"	30"	84"	240"	DESCRIPTION
1	-	-	4	-	CABLE,AIRCRAFT,GLV,1/4,240"
2	-	-	-	4	CABLE,AIRCRAFT,GLV,1/4,420"
3	-	1	-	-	EXTN,ASSY,FAN,30",[COLOR]
4	-	-	1	-	EXTN,ASSY,FAN,84",[COLOR]
5	-	-	-	1	EXTN,ASSY,FAN,240",[COLOR]
6	1	-	-	-	EXTN,ASSY,FAN,18",[COLOR]
7	1	1	3	3	CABLE,AIRCRAFT,GLV,1/4,84"
8	2	2	14	14	CLAMP,CABLE,ZINC,1/4,SNGL SAD





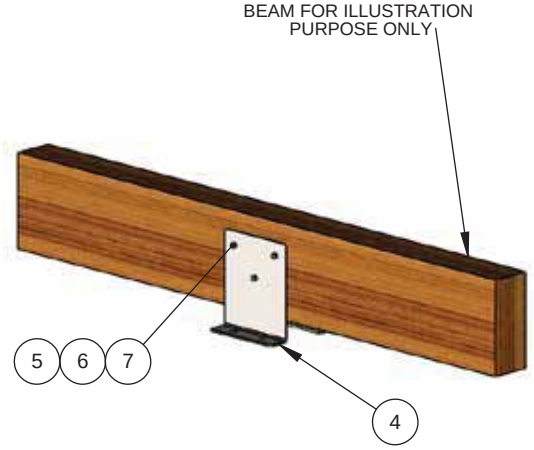
15700022	CABLE,ASSY,SAFETY,84"	
ITEM	QTY	DESCRIPTION
9	1	CABLE,AIRCRAFT,GLV,1/4,84"
10	2	CLAMP,CABLE,ZINC,1/4,SNGL SAD

MOUNTING



PART NUMBER	DESCRIPTION
55290015	MOUNT,ASSY,TRUSS,FAN,BK
55290016	MOUNT,ASSY,TRUSS,FAN,GY
55290017	MOUNT,ASSY,TRUSS,FAN,WH

ITEM	QTY	DESCRIPTION
1	2	BRKT,MNT,TRUSS,FAN,[COLOR]
2	2	BRKT,CLAMP,TRUSS,FAN,[COLOR]
3	2	PLATE,CLAMP,TRUSS,FAN,[COLOR]
4	4	CLAMP,CABLE,ZINC,1/4,SNGL SAD
5	2	CABLE,AIRCRAFT,GLV,1/4,84"
6	4	WSHR,FLAT,1/2X1-3/8X7/64,ZNC
7	2	ROD,THRD,1/2-13X10",FLTD,STNLS
8	4	NUT,HEX,NYL LOCK,1/2-13,GR8,Z



PART NUMBER	DESCRIPTION
14501240	BRKT,ASSY,MNT,LAM BEAM,FAN,WH
14501238	BRKT,ASSY,MNT,LAM BEAM,FAN,BK
14501239	BRKT,ASSY,MNT,LAM BEAM,FAN,GY

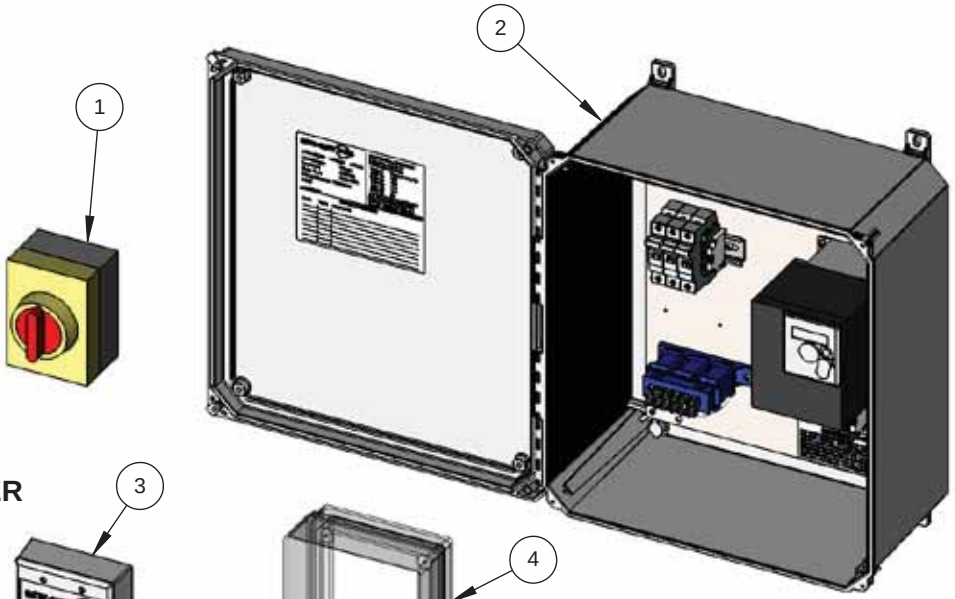
ITEM	QTY	DESCRIPTION
4	2	BRKT,MNT,LMNTD BEAM,FAN,[COLOR]
5	3	NUT,HEX,NYL LOCK,1/2-13,GR8,Z
6	6	WSHR,FLAT,1/2X1-3/8X7/64,ZNC
7	3	SCR,HHMS,1/2-13X8,GRD8,ZNC

CONTROLS

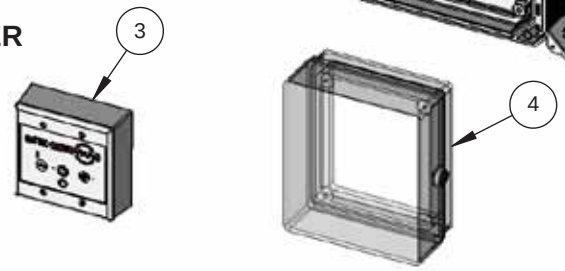
ITEM	PART NUMBER	DESCRIPTION
1	38400010	DISC,RTRY,MOT,25A
2	1752.XXX	CONTROL BOX,HVLS FAN
3	72700260	SW,ASSY,RH FAN
4	17900188	CVR,FAN CONTROL, LOCKING
5	*	REACTOR,LINE,[XXX]VAC,[X]A
6	*	FILTER,EMC,[X]PH,[XXX]V,B-FRAME

* REFERENCE BOM TABLE IN FAN CONTROL BOX LAYOUT SECTION

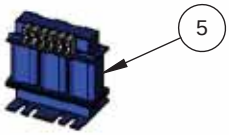
CONTROL BOXES



FAN SPEED CONTROLLER

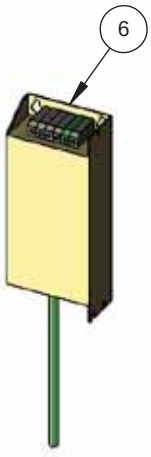


LINE REACTOR



GRAPHICAL REPRESENTATION.
ACTUAL SIZE VARIES.

EMC FILTERS



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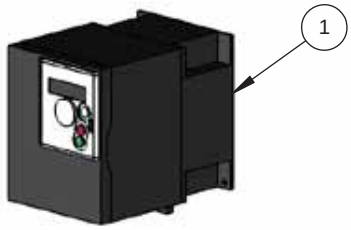
CONTROLS (CONT'D)

CONTROLS (CONT'D)

ITEM	PART NUMBER	DESCRIPTION
1	*	INV,[X]HP,[XXX]V,[X]PH,ATV[XXX]
2	SEE NOTE	CB FAN CMNDR [TYPE]
3	SEE NOTE	CONN,RJ-45, 2-PIN TERMINALS
4	SEE NOTE	CABLE,RS485,MODBUS,1000FT
5	76210072	OPT,FAN,WIND SPEED CONTROL
5.1	17500023	CTRLR,WIND SWITCH,9-36V
5.2	68900009	SENSOR,ANEMOMETER

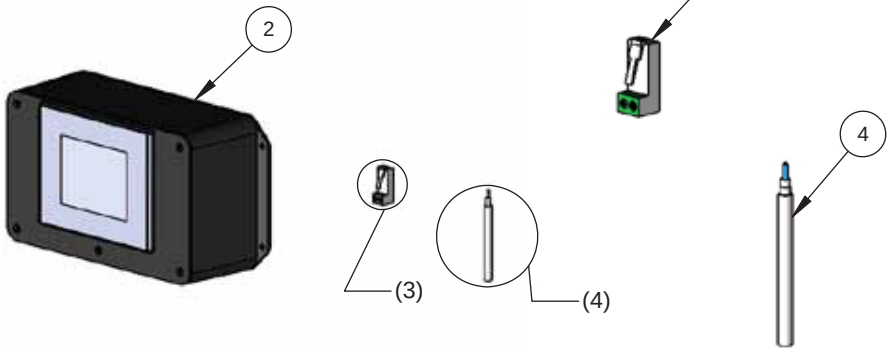
* REFERENCE BOM TABLE IN FAN CONTROL BOX LAYOUT SECTION

REPLACEMENT INVERTERS

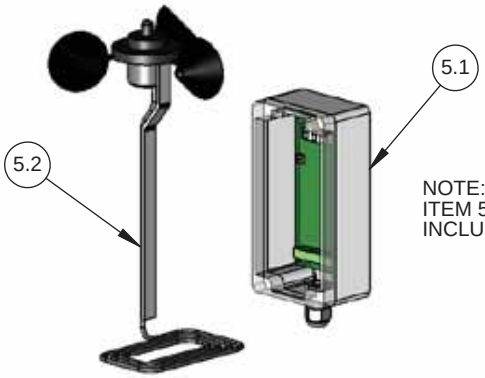


FAN COMMANDER

NOTE:
FURTHER DETAIL AVAILABLE IN FAN COMMANDER PUBLICATION



WIND SPEED CONTROL



NOTE:
ITEM 5 (76210072, OPT,FAN,WIND SPEED CONTROL) INCLUDES BOTH 5.1 & 5.2

APPENDIX

⚠ WARNING

WHEN WORKING ON ELECTRICAL SYSTEMS, ENSURE POWER SOURCE HAS BEEN LOCKED OUT AND TAGGED ACCORDING TO OSHA AND LOCAL REQUIREMENTS.

⚠ ADVERTISSEMENT

LORSQUE VOUS TRAVAILLEZ SUR LES SYSTÈMES ÉLECTRIQUES, ASSURER QUE LA SOURCE D"ALIMENTATION A ÉTÉ VERROUILLÉ ET ÉTIQUETÉ SELON LES EXIGENCES D"OSHA ET LOCAUX.

⚠ WARNING

INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE, ANSI/NFPA 70-1999, AND LOCAL CODES.

⚠ ADVERTISSEMENT

INSTALLATION DOIT ÊTRE CONFORME AU CODE SELON LA NATIONAL ELECTRIC CODE, ANSI / NFPA 70-1999, ET LES CODES LOCAUX .

⚠ WARNING

TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR PERSONAL INJURY, MOUNT DIRECTLY TO A STRUCTURAL FRAMING MEMBER.

⚠ ADVERTISSEMENT

POUR RÉDUIRE LES RISQUES D'INCENDIE , DE CHOC ÉLECTRIQUE, OU DE BLESSURES, JOINDRE DIRECTEMENT SUR UN ENCADREMENT OU UN ÉLÉMENT STRUCTUREL.

⚠ WARNING

NEVER MOUNT THE FAN TO ONLY ONE BUILDING JOIST. ALWAYS MOUNT THE FAN TO TWO JOISTS. ONE JOIST WILL NOT PROVIDE THE RIGIDITY AND SUPPORT NECESSARY FOR THE FAN DURING OPERATION, AND MAY CAUSE THE FAN TO FALL AND CAUSE INJURY.

⚠ ADVERTISSEMENT

NE JAMAIS INSTALLER LE VENTILATEUR À UNE SEULE POUTRE DE BÂTIMENT. INSTALLEZ TOUJOURS LE VENTILATEUR à DEUX POUTRES . UNE SEULE POUTRELLE NE FOURNIRA PAS LA RIGIDITÉ ET LE SOUTIEN NÉCESSAIRES POUR LE VENTILATEUR PENDANT LE FONCTIONNEMENT, ET PEUT ENTRAÎNER LE VENTILATEUR À TOMBER ET CAUSER DES BLESSURES.

⚠ WARNING

ALWAYS USE SAFETY CABLES. IF SAFETY CABLES ARE NOT USED, THE FAN MAY FALL AND CAUSE INJURY.

⚠ ADVERTISSEMENT

TOUJOURS UTILISER DES CÂBLES DE SÉCURITÉ . SI LES CÂBLES DE SÉCURITÉ NE SONT PAS UTILISÉS, LE VENTILATEUR PEUT TOMBER ET BLESSER QUELQU'UN .

⚠ WARNING

ALWAYS USE STABILIZATION CABLES. IF SAFETY CABLES ARE NOT USED, THE FAN MAY TILT AND CAUSE THE BLADES TO IMPACT A CEILING JOIST OR OTHER OBJECT UNDER CERTAIN CONDITIONS CAUSING DEBRIS TO FALL.

⚠ ADVERTISSEMENT

UTILISEZ TOUJOURS DES CÂBLES DE STABILISATION. SI LES CÂBLES DE SÉCURITÉ NE SONT PAS UTILISÉS, SOUS CERTAINES CONDITIONS LÌNCLINAISON DU VENTILATEUR PEUT CHANGER ET PROVOQUER LES LAMES A FAIRE CONTACT AVEC UNE POUTRE DE PLAFOND OU UN AUTRE OBJET PROVOQUANT POSSIBLEMENT DES DEBRIS À TOMBER.

⚠ WARNING

ROTATING FAN BLADES CAN CAUSE SERIOUS INJURY.

⚠ ADVERTISSEMENT

LES LAMES ROTATIF DU VENTILATEUR PEUT CAUSER DES BLESSURES GRAVES.

⚠ CAUTION

NEVER MOUNT CONTROL BOXES INSIDE THE FAN DIAMETER.

⚠ ATTENTION

NE JAMAIS INSTALLER LES CAISSONS DE CONTRÔLE DANS LE DIAMÈTRE DU VENTILATEUR.

⚠ WARNING

WHEN CLEANING OR ATTEMPTING TO RE-TORQUE, ALWAYS FOLLOW LOCKOUT/ TAGOUT PROCEDURES.

⚠ ADVERTISSEMENT

POUR NETTOYER OU DE TENTER DE RESSERRER, SUIVEZ TOUJOURS LES PROCÉDURES DE VERROUILLAGE / ÉTIQUETAGE.

RITE-HITE® WARRANTY

RITE-HITE® WARRANTY

RITE-HITE® warrants that its **Rave® Fan**, will be free from defects in design, materials and workmanship for a period of three (3) years parts and three (3) years labor from the date of shipment. All claims for breach of this warranty must be made within thirty (30) days after the defect is or can, with reasonable care, be discovered to be entitled to the benefits of this warranty, the products must have been properly installed, maintained, operated within their rated capacities, and not otherwise abused. Periodic lubrication and adjustment is the sole responsibility of the owner. This warranty is RITE-HITE® exclusive warranty. RITE-HITE® EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. Non-standard RITE-HITE® warranties, if any, must be specified by RITE-HITE in writing.

In the event of any defects covered by this warranty, RITE-HITE® will remedy such defects by repairing or replacing any defective equipment or parts, bearing all of the costs for parts, labor, and transportation. This shall be the exclusive remedy for all claims whether based on contract negligence or strict liability. Neither RITE-HITE®, ANY OTHER MANUFACTURER WHOSE PRODUCTS ARE THE SUBJECT OF THIS TRANSACTION, NOR ANY RITE-HITE® REPRESENTATIVE, SHALL IN ANY EVENT BE LIABLE FOR ANY LOSS OR USE OF ANY EQUIPMENT OR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND WHETHER FOR BREACH OF WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. The application of a manufacturer's specifications to a particular job is the responsibility of the purchaser. RITE-HITE® SHALL NOT IN ANY EVENT BE LIABLE FOR ANY LOSS OF THE USE OF ANY EQUIPMENT OR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND.

RITE® HITE

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