



LXIPEB33B
507677-01
JUNE 12, 2017
SUPERSEDES: NONE

LAPEB 30/36
LAPEV 30/36

INSTALLATION INSTRUCTIONS FOR HIGH STATIC POWER EXHAUST BLOWER (PEB) AND HIGH STATIC POWER EXHAUST FAN WITH VARIABLE FREQUENCY DRIVE (PEV) USED 242-360 UNITS

SHIPPING AND PACKING LIST

- Package 1 of 1 contains: **See Illustration 1 and 2.**
- 1 - Power Exhaust Assembly
 - a. Outdoor Exhaust Air Hood(s) w/ Barometric Damper(s)
 - b. Sub-Fused Control Box w/ Factory Installed High Voltage Connecting Harness
 - c. Low Voltage Harness for Communication from Rooftop Unit.
 - 1 - Adapter Panel
 - 1 - Hardware Bag Assembly
 - 14 - Gasket $\frac{3}{4}$ " x $\frac{1}{4}$ "
 - 10 - Self-tapping Screw(s) #10-16 x $\frac{1}{2}$ "
 - 1 - Installation Instructions
 - 2 - Wiring Stickers
 - 3 - Wire Ties

PRINCIPLE OF OPERATION

The power exhaust contains forward curve belt driven blower assemblies with (3) three phase motors using variable pitch sheaves on PEV models a variable frequency drive (VFD) is installed.

These blower assemblies are located in the cabinet that attaches to the rooftop unit horizontal return air section. When the rooftop unit provides a signal to operate, a contactor located in the power exhaust control box is energized, providing high voltage power to each motor. This allows the blower assemblies to exhaust air from the building through the return air duct work of the rooftop unit. On the PEV models a pressure differential is measured between outside air and return air and a signal is sent to VFD for change of motor speed.

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer or service agency.

⚠ CAUTION



Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.

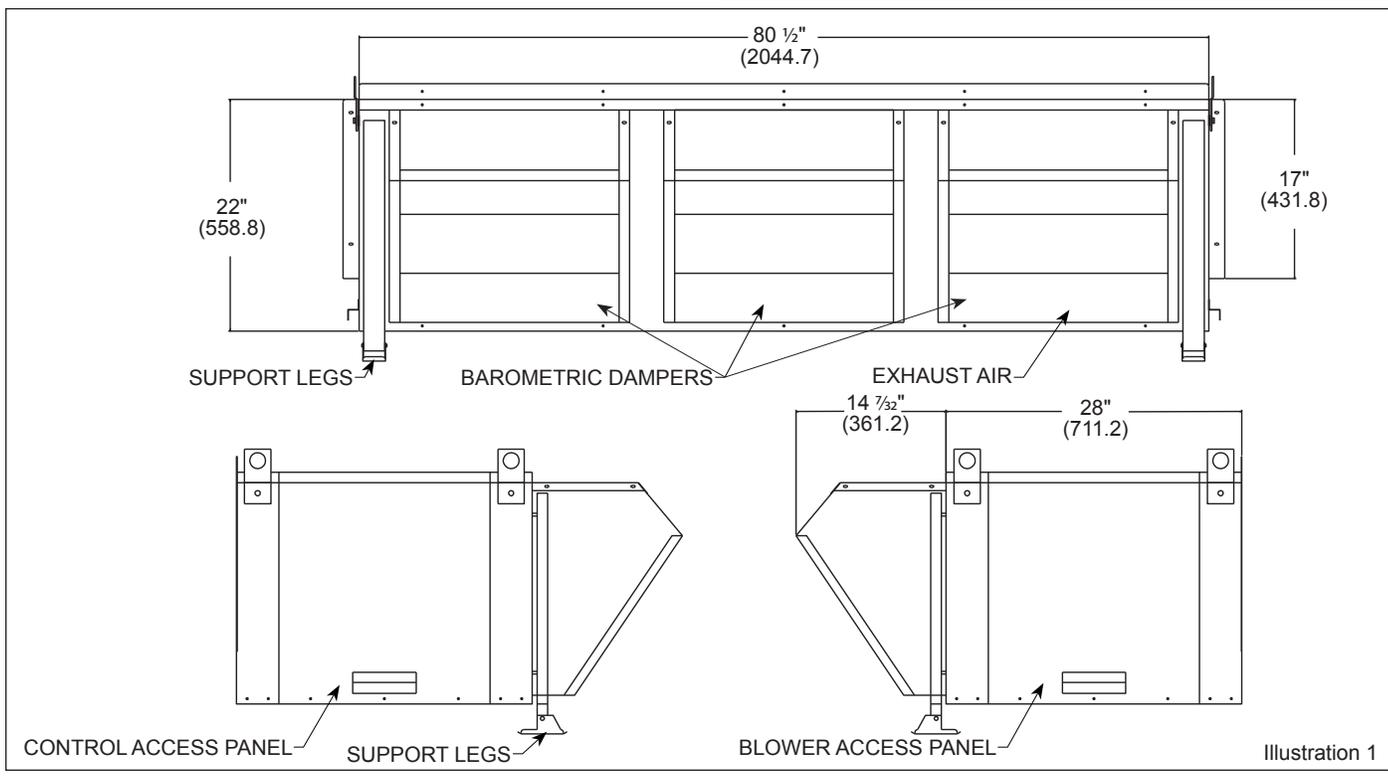
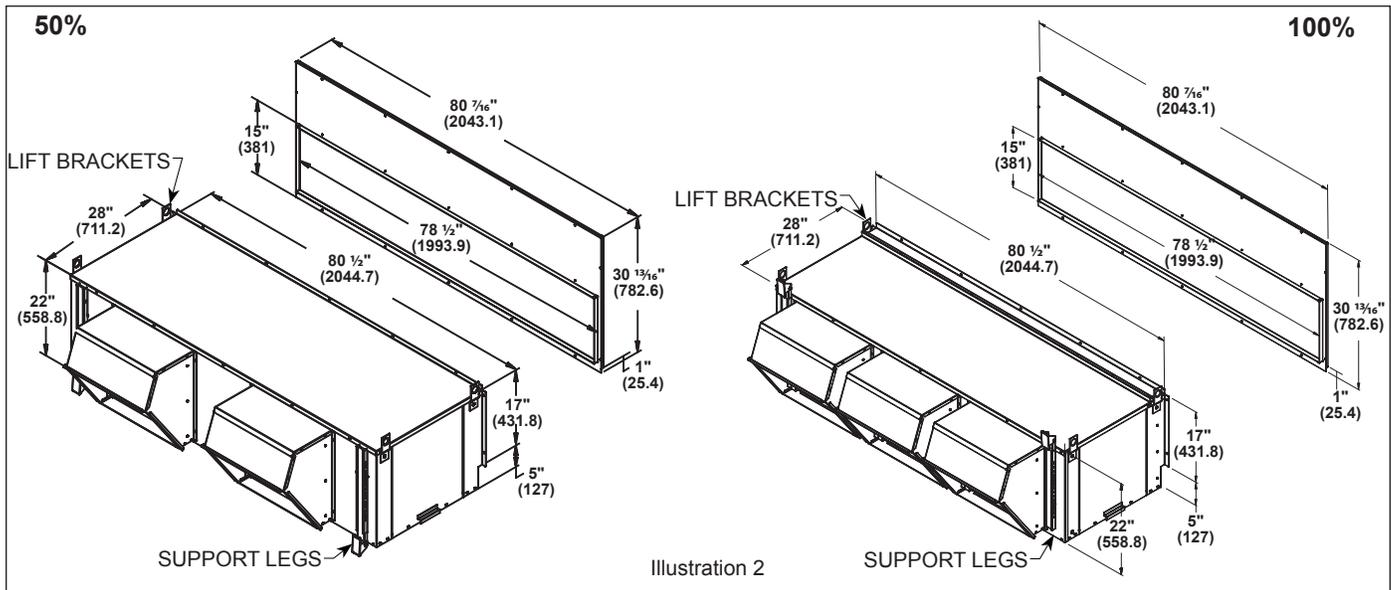


Illustration 1



GENERAL

These instructions are intended as a general guide and do not supersede local codes in any way. Authorities having jurisdiction should be consulted before installation.

REQUIREMENTS

When installed, the unit must be electrically wired and grounded in accordance with local codes or, in the absence of local codes, with the current National Electric Code, ANSI/NFPA No. 70.

SHIPPING DAMAGE

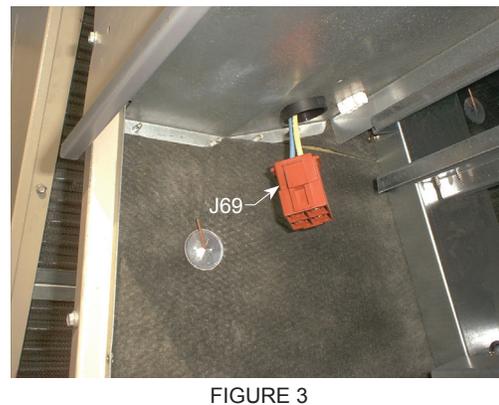
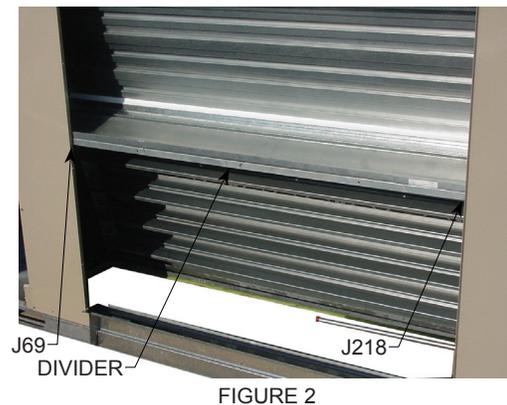
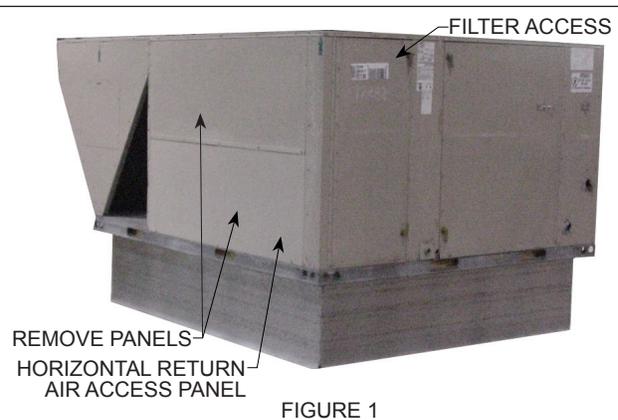
Check unit for shipping damage. Receiving party should contact last carrier immediately if shipping damage is found.

RIGGING UNIT FOR LIFTING

1. Maximum weight of PEB/PEV unit is - 631 Lbs. (Crated)
2. Remove crating and retrieve hardware bag that is attached to control box inside PEB/PEV. Also retrieve adaptor panels.
3. All PEB/PEV door panels must be in place for rigging.
4. Lifting lugs are supplied with the PEB/PEV unit. Loosen machine bolts and rotate lifting lug. Retighten bolt before lifting.

RIGGING UNIT FOR LIFTING

1. Disconnect all power to rooftop unit.
2. Remove the rooftop unit horizontal supply air and return air access panels. Also remove any hoods and/or barometric damper. Discard barometric damper and horizontal return air access panel. **See Figure 1.**
3. Locate J69 on rooftop unit, under side of damper on left hand side of the economizer area. **See Figure 2 and 3.** This connection will be used later.
4. Locate J218 on rooftop unit, under side of damper on right hand side of the economizer area. **See Figure 2 and 4.** This connection will be used later.



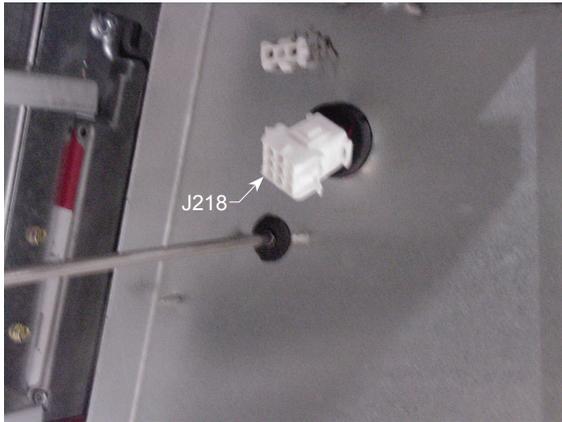


FIGURE 4

5. Install provided adapter panel using existing screws that were removed in **Step 2**.

INSTALL POWER EXHAUST ASSEMBLY

1. Using lifting lugs, raise PEB/PEV unit approximately three (3) feet. Remove nut and bolt assembly to slide telescoping part of leg out of guide from the top. Reinsert leg into bottom of guide having attached flat foot under unit. Do not fasten tightly, adjustment will need to be made when PEB/PEV is put into position on unit. **See Figure 5.**



FIGURE 5

Note - Equipment support kit or equivalent should be used under feet of standoff legs to prevent roof damage.

2. Apply $\frac{3}{4}$ " x $\frac{1}{4}$ " gasket material (provided in hardware bag) to open side of PEB/PEV on the turned out flanges of this unit.
3. Locate the connector P218 wiring harness in the PEB/PEV. **See Figure 6.** Route harness into the return air of the rooftop unit near J218. **See Figure 2 and 4.** These harnesses will be connected after the PEB/PEV is attached to rooftop unit. **Refer to wiring diagrams on Pages 8 thru 9.**
4. Locate the connector P69 wiring harness in the PEB/PEV. Route harness into the return air of the rooftop unit near J69. Connect after power exhaust assembly is attached to rooftop unit. **See Figure 7. Refer to wiring diagrams on Pages 8 thru 9.**

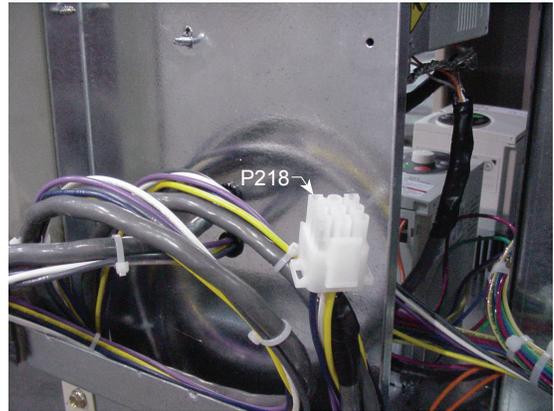


FIGURE 6

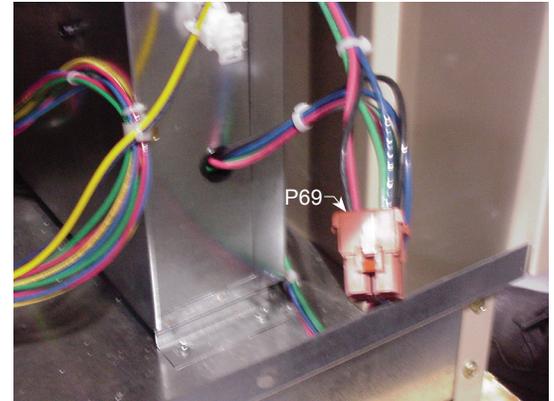


FIGURE 7

5. Position PEB/PEV in front of horizontal exhaust air opening. Line up the PEB/PEV to the rooftop unit. Insure that there are not any screws on the rooftop unit that will interfere with the mounting flanges of the PEB/PEV and if so remove them.
6. Lower PEB/PEV onto rooftop unit base rail catching the front edge of the PEB/PEV bottom. Slide the PEB/PEV so that it is tight against the adapter panel and top panel holes align with adapter panel holes. Now secure PEB/PEV top and side to the rooftop unit with supplied screws. **See Figure 8.**



FIGURE 8

7. With the PEB/PEV in place, adjust the standoff legs to level and support PEB/PEV against rooftop unit. Tighten securely. Release all the weight from lifting crane. Rotate lifting lug to original position and tighten machine bolts. **See Figure 9 and 10.**



FIGURE 10

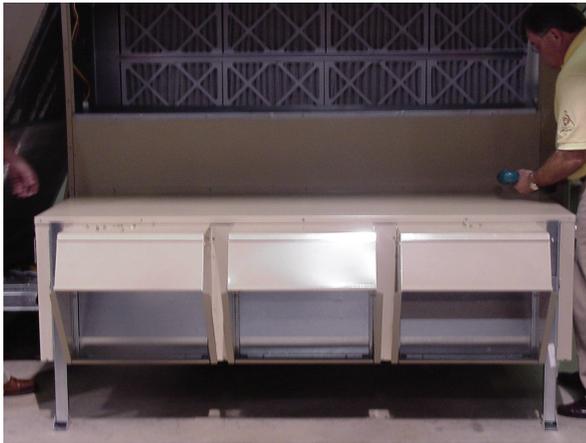


FIGURE 11

8. Check and seal, if necessary, along the edges where the PEB/PEV meets the rooftop unit to ensure there is no air leakage.
9. Remove access panels and connect P69 to J69 and P218 to J218.
 - a. PEV models, drop provided sensor tube into return air
10. Replace access panels onto the PEB/PEV unit and secure.
11. Restore power to unit.
12. Once PEB/PEV is working properly, caulk any open joints, holes, or seams to make the units completely air and water tight.
13. Leave this instruction manual in the pouch on the inside of the control compartment door on the Lennox rooftop unit.

BLOWER SPEED ADJUSTMENT

Note - To access motor sheaves for center blower assembly, top panel of power exhaust will need to be removed.

Blower speed selection is accomplished by changing the sheave setting on exhaust air blowers. All blowers are factory set at "open" for minimum airflow. To determine air flow setting, measure the return duct static pressure and read CFM from table. **Reference Tables.**

PRESSURE TRANSDUCERS WITH VDC OUTPUT

Range (w.c.)	Output
0 to 1.0 / 0 to 0.5 / 0 to 0.25 / -0.5 to + 0.5 / -0.25 to + 0.25 / -0.125 to +0.125	0-10 VDC

Indicates Factory Setting

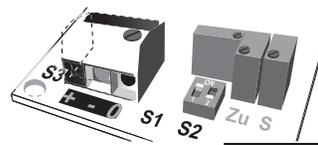
Wiring

Refer to PEB Power Exhaust unit diagram for detail connections.

Tubing

The high pressure tubing is coiled inside PEB/PEV and has a pressure tap on the end. This is 3 feet long and hangs inside the return air duct. **Note: This tube may need to be replaced with a longer tube if specification calls for measuring room pressure.** The low pressure tubing is factory mounted to the corner post of the PEB/PEV. Use flexible 1/4" O.D. 5/32" I.D. tubing for the high and low pressure connections.

Adjustments



Range Configuration: Uni-Directional Switch 1 (S1)

R2	0 - 1.0 "wc / 250 pa (default)	
	0 - 0.5 "wc / 125 pa	
	0 - 0.25 "wc / 62.5 pa	

Output Configuration: Switch 2 (S2)

Uni-directional (default)	
Bi-directional	

Range Configuration: Bi-Directional Switch 1 (S1)

R2	+/- 0.5 "wc / 125 pa (default)	
	+/- 0.25 "wc / 62.5 pa	
	+/- 0.125 "wc / 31.25 pa	

Output Configuration: Switch 3 (S3)

0 - 10 (default)	
0 - 5 VDC	

⚠ CAUTION

Never connect 120 Vac to these transducers. Never connect AC voltage to a unit intended for DC supply.

Checkout

1. Verify that the unit is mounted in the correct position.
2. Verify appropriate input signal and supply voltage.
3. Verify appropriate **configuration range**.

Transducer Operation

This is a rough functional check only.

1. Adjust the pressure by blowing into high pressure tube to obtain maximum output signal for appropriate range.
2. Output should be 10 Vdc.
3. Adjust the pressure by releasing pressure from high pressure tube to obtain minimum output signal.
4. Output should be 0 Vdc.

Note - For applications requiring a high degree of accuracy, the use of laboratory quality meters and gauges are recommended.

SYSTEM CHECK

1. Verify that the (3) three phase blower motors are phased sequentially ensuring correct rotation and operation. If not go to **Step 2**.
2. Disconnect main power to unit before making adjustment to PEB/PEV unit.
 - a. Disconnect power.
 - b. Remove PEB/PEV control access cover
 - c. Reverse any two power leads (L1 and L2) to the PEB/PEV control box. **See Figure 12.**
 - d. Replace PEB/PEV control access cover.
 - e. Reapply power.
3. Set thermostat to normal operating position.
4. Restore power to unit.

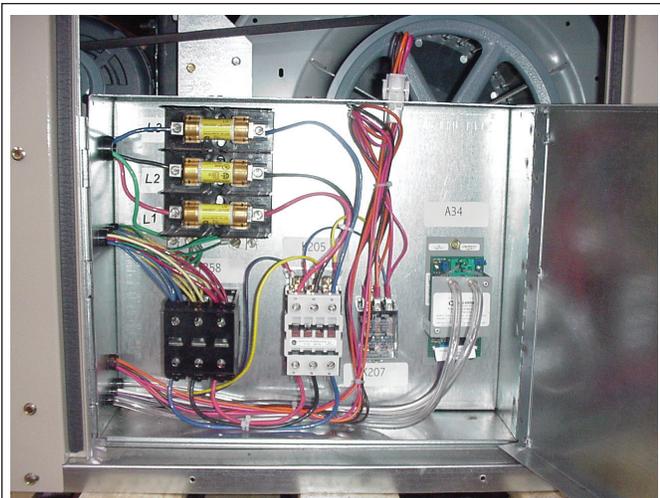


FIGURE 12

MAINTENANCE

Motor Maintenance

All motors use prelubricated sealed bearings; no further lubrication is necessary.

Mechanical Inspection

Make visual inspection of dampers, linkage assemblies and PEB/PEV rotating bearings during routine maintenance. To access blower pulley, belt and bearings for assembly behind control box. Remove (2) two screws on right side of box at the base. Then pivot box away from blower assembly. **See Figure 13.**



FIGURE 13

Belt and Pulley Alignment

Proper alignment is essential to maintain long V-Belt life. Belt alignment should be checked every time belt maintenance is performed, each time the belt is replaced, and whenever sheaves are removed or installed.

Belt Installation

Always move the drive unit forward so the belt can be easily slipped into the groove without forcing them. Never force the belt into a sheave with a screw driver or wedge. You will damage the fabric and break the cords. It is recommended that the pulley center distances be offset by $\frac{3}{4}$ " for proper length. This will allow the motor assembly to slide forward to remove belt and backward for belt tension.

Belt Tension

Belt Tension should be checked at least every 6 months, more frequently in some applications. Measure the span length (center distance between pulleys when belt is snug). Mark center of span, then apply a force (6 to 9 Lbs on new belts) perpendicular to the span large enough to deflect the belt " for every inch in span length.

Variable Frequency Drive (VFD)

To access VFD remove access door opposite control box.
See Figure 14. These VFD are preprogrammed. A list of the parameters are listed on **Page 10** of this instruction.

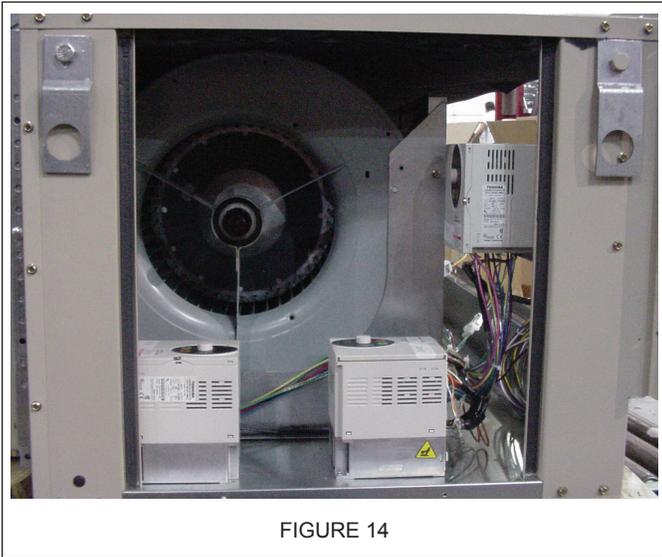


FIGURE 14

For units that have bypass option, to switch to direct control from VFD control do the following steps.

1. Disconnect power at rooftop unit.
2. Remove access doors on each end.
3. Remove top panel of PEV.
4. Unplug each motor harness from wiring cap and connect to properly marked alternate cap. **See Figure 15. Refer to wiring diagrams.**
5. At control box remove jumper plug (J211) from top of box, and store inside control box.
6. Reattach top panel.
7. Place access doors back on each end of PEV.
8. Reconnect power at rooftop unit.

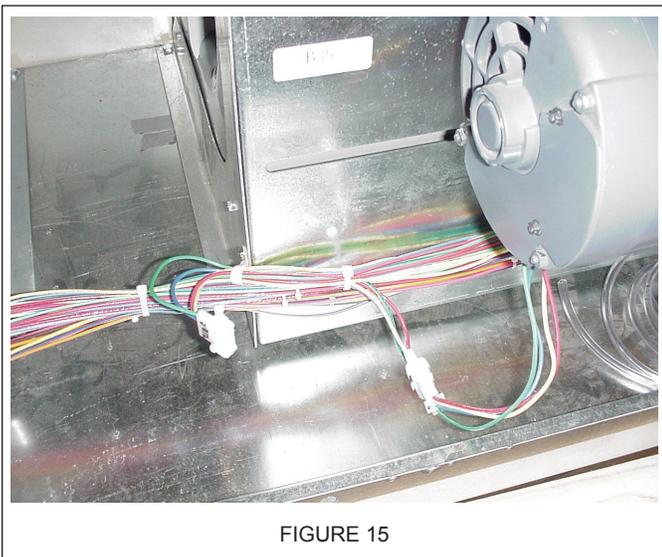


FIGURE 15

High Static Power Exhaust Fans - 50%

Unit contains:

Motors-- (2) @ 200-230/460 Volt, 2.0 HP, 3Ph, 1725 RPM, 50/60Hz, 6.5-6.6/3.3 FLA, 1.15 Service Factor, 56H Frame, Open Drip Proof, 7/8" x 2.31" shaft.

Motors-- (2) @ 575 Volt, 2.0 HP, 3Ph, 1725 RPM, 50/60Hz, 2.4 FLA, 1.15 Service Factor, 56H Frame, Open Drip Proof, 7/8" x 2.31" shaft.

Adjustable motor sheaves - (2) @ 3.25" dia.x 7/8" bore, variable pitch (2.55 to 3.35), 5 turns.
Blower pulley -- (2) @ 10.00" dia. x 1" bore, fixed pitch (9.75).

Adjustable motor sheaves - (2) @ 3.75" dia.x 7/8" bore, variable pitch (2.65 to 3.65), 5 turns.
Blower pulley -- (2) @ 8.00" dia. x 1" bore, fixed pitch (7.75).

Adjustable motor sheaves - (2) @ 4.75" dia.x 7/8" bore, variable pitch (3.65 to 4.65), 5 turns.
Blower pulley -- (2) @ 9.00" dia. x 1" bore, fixed pitch (8.75).

Data contains a 10% belt loss factor.

E.S.P.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0											
CFM	RPM	BHP																				
4000	345	0.15	368	0.16	412	0.19	472	0.23	527	0.26	578	0.31	625	0.35	670	0.39	714	0.43	756	0.48	xxxx	xxxx
4250	366	0.18	387	0.19	425	0.22	479	0.25	534	0.30	584	0.34	630	0.38	674	0.43	716	0.47	757	0.51	797	0.56
4500	387	0.22	407	0.23	440	0.25	488	0.28	541	0.33	590	0.37	636	0.42	679	0.47	720	0.51	760	0.56	798	0.61
4750	409	0.25	426	0.26	456	0.29	498	0.32	549	0.37	597	0.41	642	0.46	684	0.51	724	0.56	763	0.61	801	0.66
5000	430	0.30	447	0.31	473	0.33	510	0.36	557	0.41	604	0.45	649	0.51	690	0.56	730	0.61	768	0.66	804	0.71
5250	451	0.34	467	0.35	490	0.37	523	0.40	566	0.45	612	0.50	656	0.55	697	0.61	736	0.66	773	0.71	809	0.77
5500	473	0.39	487	0.40	509	0.43	538	0.45	576	0.50	619	0.55	663	0.60	703	0.66	742	0.72	779	0.77	814	0.83
5750	494	0.45	508	0.46	527	0.48	553	0.51	588	0.55	628	0.60	670	0.66	710	0.71	749	0.78	785	0.83	820	0.89

High Static Power Exhaust Fans - 100%

Unit contains:

Motors --(3) @ 200-230/460 Volt, 2.0 HP, 3Ph, 1725 RPM, 50/60Hz, 6.5-6.6/3.3 FLA, 1.15 Service Factor, 56H Frame, Open Drip Proof, 7/8" x 2.31" shaft.

Motors -- (3) @ 575 Volt, 2.0 HP, 3Ph, 1725 RPM, 50/60Hz, 2.4 FLA, 1.15 Service Factor, 56H Frame, Open Drip Proof, 7/8" x 2.31" shaft.

Adjustable motor sheaves-- (3) @ 3.25" dia.x 7/8" bore, variable pitch (2.55 to 3.35), 5 turns.
Blower pulley-- (3) @ 10.00" dia. x 1" bore, fixed pitch (9.75)

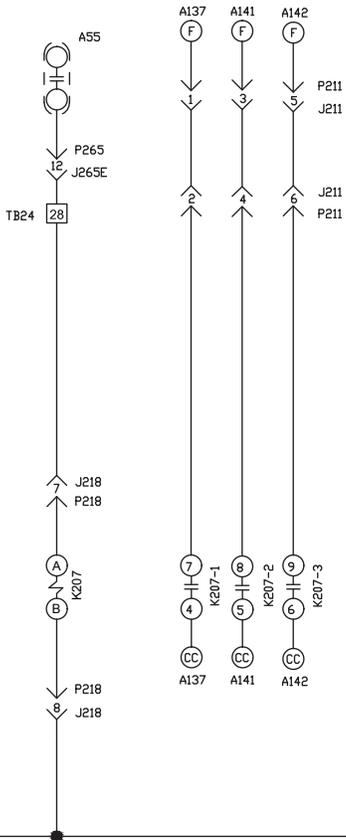
Adjustable motor sheaves - (3) @ 3.75" dia.x 7/8" bore, variable pitch (2.65 to 3.65), 5 turns.
Blower pulley-- (3) @ 8.00" dia. x 1" bore, fixed pitch (7.75)

Adjustable motor sheaves - (3) @ 4.75" dia.x 7/8" bore, variable pitch (3.65 to 4.65), 5 turns.
Blower pulley-- (2) @ 9.00" dia. x 1" bore, fixed pitch (8.75).

Data contains a 10% belt loss factor.

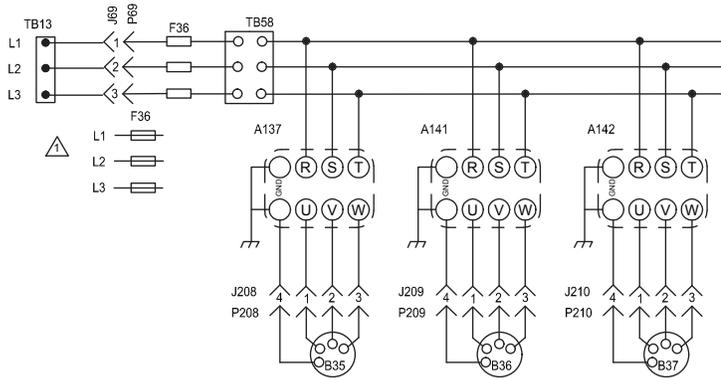
E.S.P.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0											
CFM	RPM	BHP																				
8500	487	0.43	501	0.44	521	0.46	548	0.49	584	0.53	625	0.58	667	0.64	708	0.70	746	0.75	783	0.81	818	0.87
9000	515	0.51	528	0.52	547	0.54	570	0.57	601	0.61	638	0.66	678	0.71	717	0.77	755	0.83	791	0.90	826	0.96
9500	544	0.60	556	0.61	573	0.63	594	0.66	620	0.69	652	0.74	689	0.80	727	0.86	764	0.93	800	0.99	834	1.05
10000	572	0.70	584	0.71	599	0.73	618	0.76	641	0.79	669	0.83	702	0.89	738	0.95	774	1.02	810	1.09	843	1.15
10500	601	0.81	612	0.82	626	0.84	643	0.87	663	0.90	688	0.94	718	0.99	750	1.05	785	1.12	819	1.19	853	1.27
11000	629	0.93	640	0.95	653	0.97	668	0.99	687	1.02	709	1.06	735	1.11	764	1.16	796	1.23	830	1.31	862	1.38
11500	658	1.06	668	1.08	680	1.10	694	1.12	711	1.15	731	1.19	754	1.24	780	1.29	810	1.36	841	1.43	872	1.50
12000	686	1.21	696	1.22	707	1.24	721	1.27	736	1.30	754	1.34	774	1.38	798	1.43	825	1.49	853	1.56	883	1.64

24V POWER



KEY	COMPONENT
A55	PANEL, MAIN
A137	INVERTER, EXHAUST 1
A141	INVERTER, EXHAUST 2
A142	INVERTER, EXHAUST 3
B35	MOTOR, EXH, BLO 1
B36	MOTOR, EXH, BLO 2
B37	MOTOR, EXH, BLO 3
F36	FUSE, INVERTER
J69	JACK, INTERFACE
J208	JACK, MOTOR, EXH BLO B35
J209	JACK, MOTOR, EXH BLO B36
J210	JACK, MOTOR, EXH BLO B37
J211	JACK, MOTOR, EXH BLO, AUX
J218	JACK, CONTROL, INVERTER
J265	JACK, CONTACTORS AND RELAYS
K207,-1,2,3	RELAY, EXH BLO, ADDER
P69	PLUG, INTERFACE
P208	PLUG, MOTOR, EXH BLO, B35
P209	PLUG, MOTOR, EXH BLO, B36
P210	PLUG, MOTOR, EXH BLO, B37
P211	PLUG, INVERTER, EXH BLO, AUX
P218	PLUG, CONTROL, INVERTER
P265	PLUG, CONTACTORS AND RELAYS
TB13	TERMINAL STRIP, POWER DISTRIBUTION
TB24	TERMINAL STRIP, UNIT ADDER
TB58	TERMINAL STRIP, INVERTER

24V COMMON



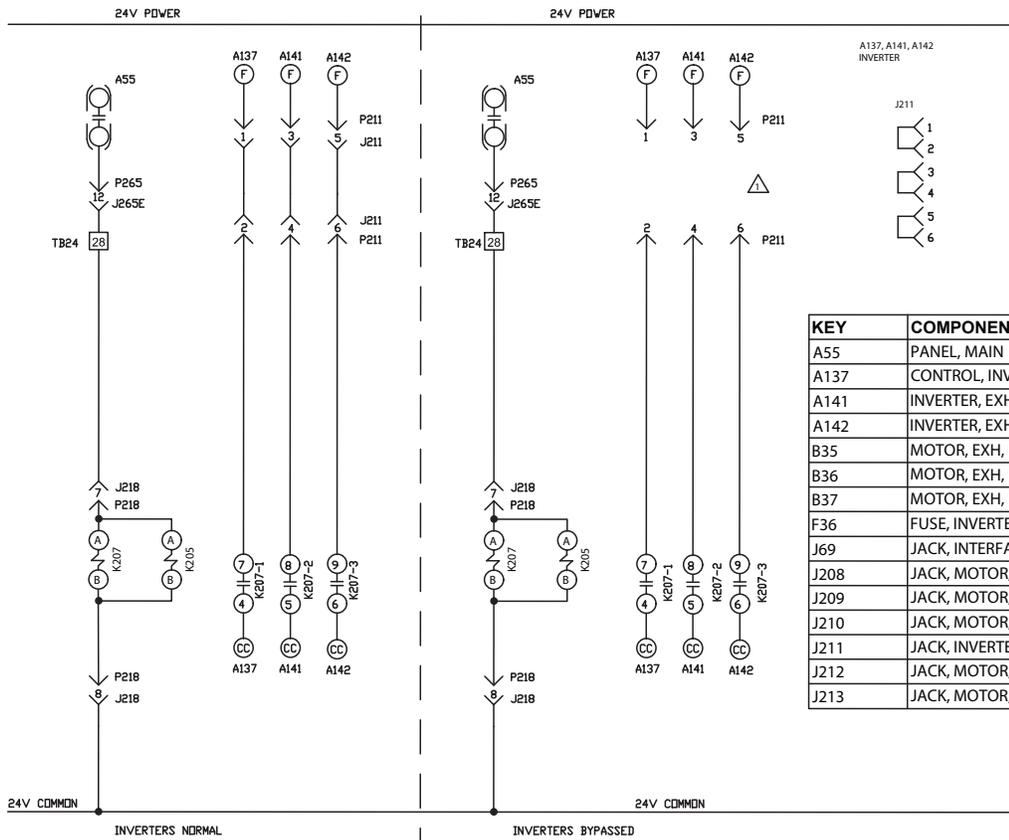
← DENOTES OPTIONAL COMPONENTS
 — LINE VOLTAGE FIELD INSTALLED NEC/CEC CLASS 1
 NOTE-ALL REMAINING WIRES FACTORY INSTALLED

⚠ SEPARATE DISCONNECT WIRING WHEN NOT FACTORY INSTALLED

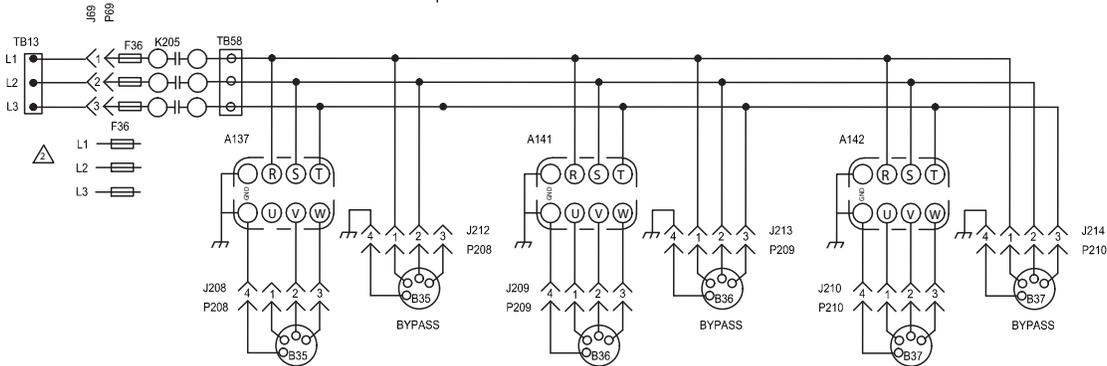
02/17		WIRING DIAGRAM	02/17
		537376-01	
POWER EXHAUST			
RSI D BOX PEB INVERTERS LESS BYPASS			
SECTION 5B			REV 1
Supersedes		New Form No.	
534,752W		537376-01	

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KEY	COMPONENT
A55	PANEL, MAIN
A137	CONTROL, INVERTER, RETURN
A141	INVERTER, EXHAUST 2
A142	INVERTER, EXHAUST 3
B35	MOTOR, EXH, BLO 1
B36	MOTOR, EXH, BLO 2
B37	MOTOR, EXH, BLO 3
F36	FUSE, INVERTER
J69	JACK, INTERFACE
J208	JACK, MOTOR, EXH BLO B35
J209	JACK, MOTOR, EXH BLO B36
J210	JACK, MOTOR, EXH BLO B37
J211	JACK, INVERTER EXH BLO, AUX
J212	JACK, MOTOR, EXH BLO B35, BYPASS
J213	JACK, MOTOR, EXH BLO B36, BYPASS



J214	JACK, MOTOR, EXH BLO B37, BYPASS
J218	JACK, CONTROL, INVERTER
J265	JACK, CONTACTORS AND RELAYS
K205	CONTACTOR, BYPASS, EXH.
K207-1,2,3	RELAY, EXH BLO, ADDER
P69	PLUG, INTERFACE
P208	PLUG, MOTOR, EXH BLO, B35
P209	PLUG, MOTOR, EXH BLO, B36
P210	PLUG, MOTOR, EXH BLO, B37
P211	PLUG, INVERTER, EXH BLO, AUX
P218	PLUG, CONTROL, INVERTER
P265	PLUG, CONTACTORS AND RELAYS
TB13	TERMINAL STRIP, POWER DISTRIBUTION
TB24	TERMINAL STRIP, UNIT ADDER
TB58	TERMINAL STRIP, INVERTER BYPASS

△ TO BYPASS INVERTERS, UNPLUG J211 FROM P211

△ SEPARATE DISCONNECT WIRING WHEN NOT FACTORY INSTALLED

— DENOTES OPTIONAL COMPONENTS
 — LINE VOLTAGE FIELD INSTALLED NEC/CEC CLASS 1
 NOTE-ALL REMAINING WIRES FACTORY INSTALLED

03/17		WIRING DIAGRAM	03/17
		537377-01	
POWER EXHAUST			
RSI D BOX PEB w/ INVERTERS w/ BYPASS			
SECTION 5B		REV 1	
Supersedes 534,754W		New Form No. 537377-01	

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INVERTER PARAMETER SETTINGS - S11 Series

Sequence For Entries	Display On Panel	COMM. NUMBER S11	Function	Setting		Information
				Default S11	Required S11	
1	F700	0700	Parameter Changes	0	0	0=Permitted; 1=Prohibited
2	F701	0701	Units Selection	0	1	Changes readout to amps and volts. (0=% or rated output; 1=amps &volts.)
3	CnOd	0003	Command Mode	1	0	0=Term Brd (IMC / external controller), 1 = Operation Panel
4	FnOd	0004	Freq. Setting Selection	0	1	0=Built in potentiometer, 1=VIA
5	ACC	0009	Acceleration Time (sec.)	10.0	10.0	Seconds to Maximum Frequency
6	dEC	0010	Deceleration Time (sec.)	10.0	10.0	Seconds From Maximum Frequency to stop
7	FH	0011	Max Frequency (Hz)	80.0	60.0	Maximum allowed Hz output
8	UL	0012	Upper limit Frequency (Hz)	60.0	60.0	Maximum recognized Hz command
9	LL	0013	Lower Freq Limit (Hz)	0.0	20.0	Minimum Hz continuous operation
10	uL	0014	Base Frequency (Hz)	60.0	60.0	Motor design Hz as shown on motor nameplate
11	tHr	0600	Electronic Motor Protection (A)	100	—.-	Program Motor FLA [as shown on motor nameplate]
12	F301	0301	Auto Restart Selection	0	1	1=Restart motor after momentary power loss, 0=disabled
13	F302	0302	Regenerative Ride-Through	0	1	1=Automatic setting, 0=Disabled.
14	F303	0303	Retry Number of Times	0	4	Number of restart attempts after an overload trip
15	F300	0300	PWM Carrier Frequency (kHz)	12.0	8.0	Adjustment Range is 2.0 kHz - 16.0 kHz

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