Installation Instructions

Power Exhaust Part Numbers: CRPWREXH071A01 – CRPWREXH079A01

CONTENTS

SAFETY CONSIDERATIONS

Installation of this accessory can be hazardous due to system pressures, electrical components, and equipment location (such as a roof or elevated structure). Only trained, qualified installers and service technicians should install, start-up, and service this equipment.

When installing this accessory, observe precautions in the literature, labels attached to the equipment, and any other safety precautions that apply:

- Follow all safety codes
- Wear safety glasses and work gloves
- Use care in handling and installing this accessory

It is important to recognize safety information. This is the safety-alert symbol: ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury.

⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation and service. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

GENERAL

IMPORTANT: In order to field install the High Capacity Power Exhaust accessory on 48/50K units, the unit must have the "Power and Control Accessory" option installed from the factory. Otherwise the accessory will not be able to operate.

⚠ CAUTION

When removing panels from the unit, be careful not to damage roof or other surfaces with the panels.

An economizer is required to install the High Capacity Power Exhaust accessory on 48/50K series units. See Table 1 for package usage. See Table 2 for a complete list of parts contained in each kit. For 48/50K 20-50 size units, either 1 or 2 module versions of the accessory may be ordered and installed depending on the desired exhaust airflow. For 48/50K unit size 60, either 2 or 3 module versions of the accessory may be ordered and installed depending on the desired exhaust airflow.

The high-capacity power exhaust blowers are shipped fully assembled. Each module is equipped with two belt-driven blowers powered by variable frequency drives. The package also comes with a relief hood, brackets, wiring, and additional gasket screws. When ordering two modules, they are strapped and stacked together, labeled as Module A and Module B. For three module configurations, Modules A and B are strapped and stacked together, while Module C is packaged separately.

In order to install the high capacity power exhaust accessory in the field, all 48/50K series units must also include the factory-installed option labeled "Power and Control Accessory for High Capacity Power Exhaust with BP Control." This option provides the necessary power and control harness, along with a terminal block, to support the accessory.

Table 1 — High-Capacity Power Exhaust Package Usage

48K UNIT SIZE	VOLTAGE (V-Ph-Hz)	NUMBER OF MODULES	PART NUMBER
48/50K 20-50	208/230-3-60	1	CRPWREXH071A01
		2	CRPWREXH074A01
	460-3-60	1	CRPWREXH072A01
		2	CRPWREXH075A01
	575-3-60	1	CRPWREXH073A01
		2	CRPWREXH076A01
48/50K 60	208/230-3-60	2	CRPWREXH074A01
		3	CRPWREXH077A01
	460-3-60	2	CRPWREXH075A01
		3	CRPWREXH078A01
	575-3-60	2	CRPWREXH076A01
		3	CRPWREXH079A01

Table 2 — High-Capacity Power Exhaust Parts List

ITEM DESCRIPTION	QUANTITY (PART NO. CRPWREXH---A01)								
	071	072	073	074	075	076	077	078	079
Power Exhaust Module Assembly	1	1	1	2	2	2	3	3	3
Auxiliary Control Panel Terminal Block[a]	1	1	1	1	1	1	1	1	1
ECB-1 to VFD Control Wiring Harness (20 ft)[a]	1	1	1	1	1	1	1	1	1
VFD to VFD Control Wiring Harness (10 ft)	—	—	—	1	1	1	2	2	2
Auxiliary Panel to VFD Power Wiring (20 ft)	1	1	1	2	2	2	3	3	3
CCB to Auxiliary Panel Power Wiring (36 ft)[a]	—	—	—	—	—	—	1	—	—
Replacement Control Circuit Breaker[a]	—	—	—	1	—	1	1	1	—

NOTE(S):

a. This part is not required for 48/50K Series units.

LEGEND

CCB — Control Circuit Breaker
ECB — Economizer Control Board
VFD — Variable Frequency Drive

INSTALLATION

Vertical Discharge Units (48/50K2, K3)

NOTE: For 48/50K unit sizes 20-50, one or two modules may be installed. For 48/50K unit size 60, two or three modules may be installed. Installation will be repeated for each module.

1. Unpack accessory packages.
2. Disconnect power to unit.
3. If the economizer hoods have been installed, perform the following:
   a. Remove the filters from the economizer hoods.
   b. Remove the 5 screws from the bottom of the economizer hood(s) and remove the 3 screws on each side of the economizer hood(s). Save screws.
   c. Remove the upper panel by removing screws and pulling out the economizer hood assembly at the bottom to release panel. Save screws.
   d. Remove the lower panel. Save screws.
   e. There are 2 economizer hoods and 4 panels on unit sizes 20-50. There are 3 economizer hoods and 6 panels on unit size 60. Repeat this step for each economizer hood and panel (if required). NOTE: If the economizer hoods have not been installed, remove the upper and lower panels covering each return air section. See Fig. 1 for panel locations. Save all screws.
4. Open the unit's filter access door to locate the factory installed power and control wiring with a terminal block. See Fig. 2 and 3 for auxiliary panel location.
5. Route the wires from the 20 ft long power exhaust power and control harnesses through the hole(s) in the auxiliary control panel. See Fig. 3 for terminal block and harness locations. Secure the metal clad connector with the locknut.
6. Connect the power harness wires from the power exhaust module to the terminal block located in the auxiliary control panel, as shown in Fig. 4-6.
7. Position each power exhaust module in front of the relief openings, make sure not to damage the roof. When B and C module accessory packages are included, ensure that module A is placed closest to the auxiliary control panel. NOTE: If external support is required for the power exhaust module, it must be field supplied.
8. Locate the bundled control harness in the auxiliary panel that supplies the speed signal to the VFD within the power exhaust module. For high-capacity power exhaust option, this harness runs from terminals TB6, pins 15 and 16 to the auxiliary panel location. NOTE: For information on terminal strips, review unit installation, start-up, and service manual.
9. Route the control wiring from Module A, closest to the auxiliary panel, and connect the VFD control wiring from the module to the unit's control harness, matching red to red and blue to black.
   NOTE: The wiring connector on the power exhaust module A may need to be replaced in the field with an insulated male spade connector to ensure proper connection with unit's control harness.
   NOTE: See Fig. 7 for VFD control wiring configuration.
10. Route the VFD (variable frequency drive) control wiring behind each support panel that separates each exhaust module and plug the control wiring into the VFD of the next module(s).
11. Set the power exhaust module in place over the exhaust opening on the unit. The bottom flange of the module will rest on top of the unit base rail. Caulk the module's mating flanges and secure to the unit.
12. Remove tape from damper blades.
13. Variable air volume (VAV) units and units with power exhaust with building pressure (BP) control include, pressure transducers for measuring the duct supply pressure (SP) or building pressure that require field supplied pneumatic tubing and pressure pickup ports. The pressure transducers are in an auxiliary control box, accessible through the filter access door. See Fig. 2 for the location of the main access door, which provides entry to the auxiliary panel. For pressure transducer locations, see Fig. 8.
14. For guidance on configuring high-capacity power exhaust in the 48/50K SmartVu control, please refer to the section titled "CONFIGURE EXHAUST FAN (OPTIONAL)" in the 48/50K Series unit installation manual.

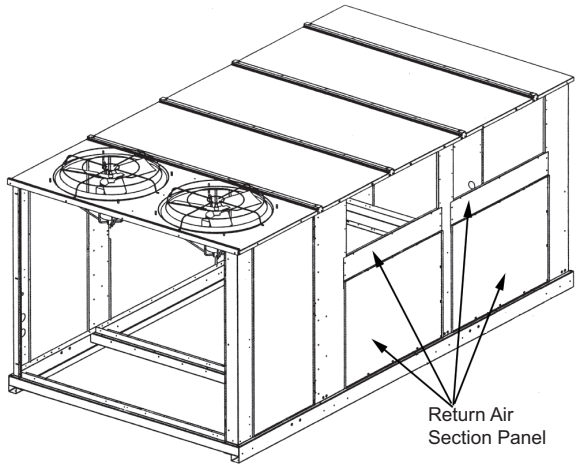


Fig. 1 — Typical Panel Locations (482/50K 20 Ton Unit Shown)

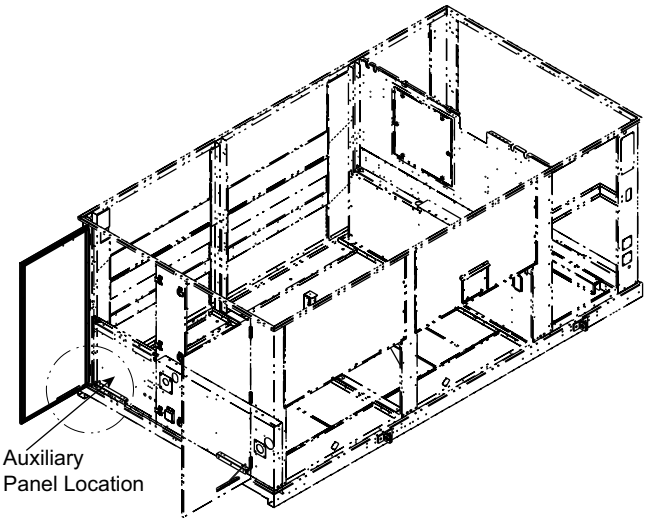


Fig. 2 — Auxiliary Panel Location (48/50K 20 Ton Unit Shown)

With cover removed over power terminal block

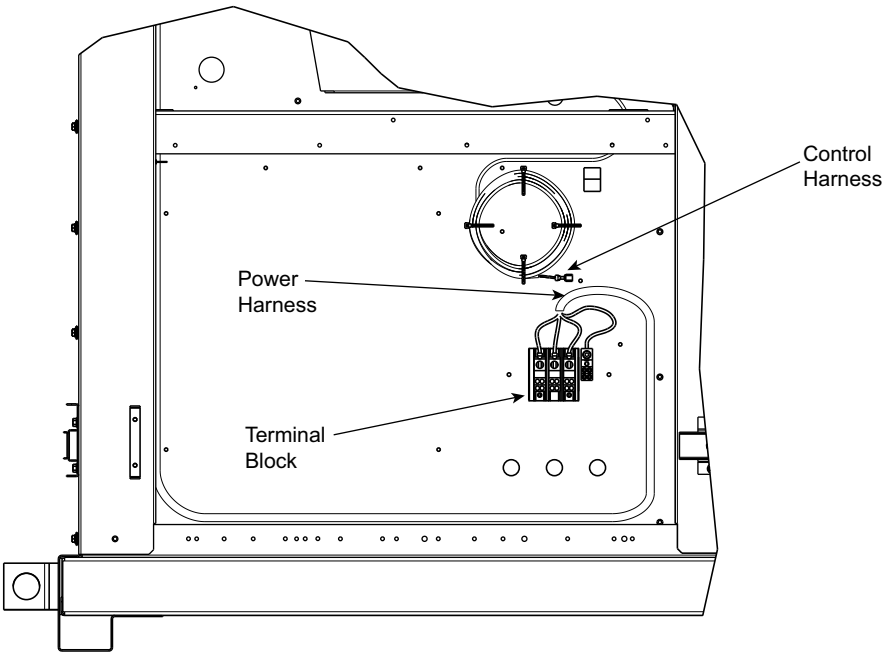


Fig. 3 — Auxiliary Control Box for 48/50K Units

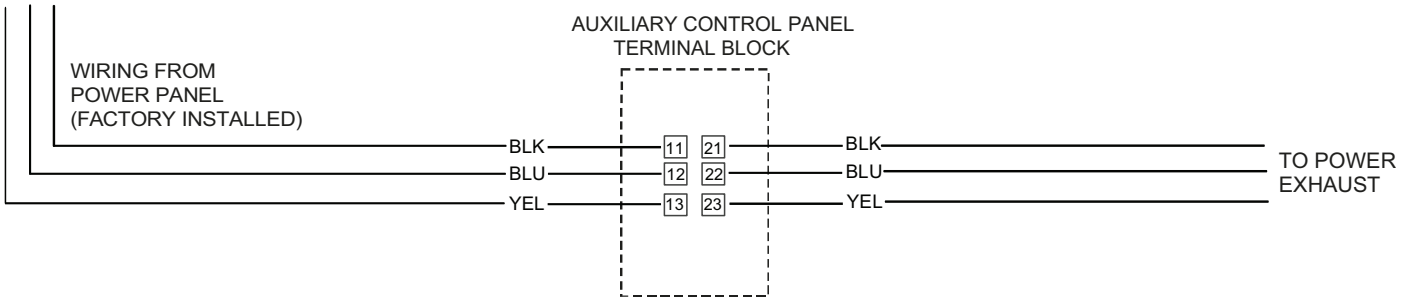


Fig. 4 — Power Exhaust Wiring (1 Module) for 48/50K Only

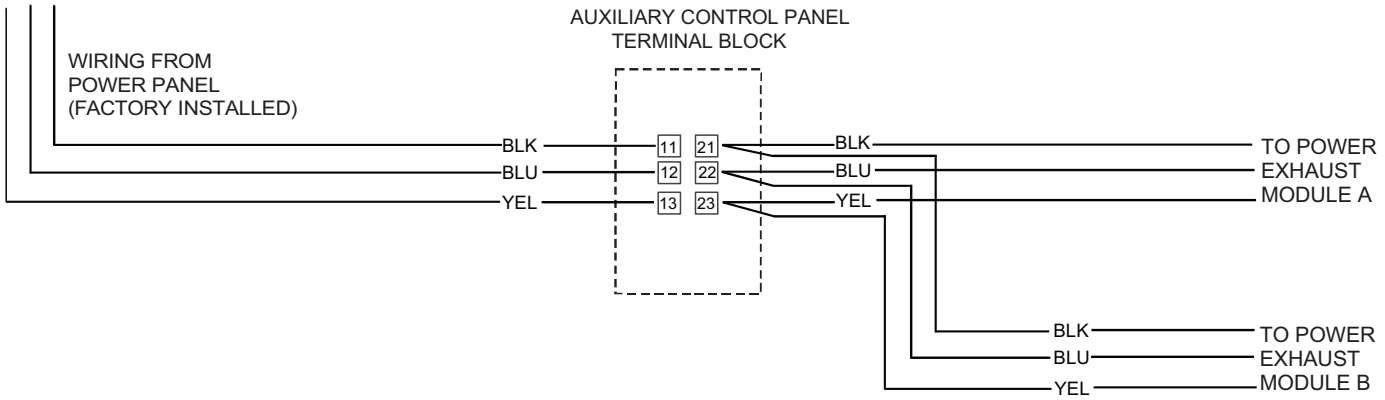


Fig. 5 — Power Exhaust Wiring (2 Modules) for 48/50K Only

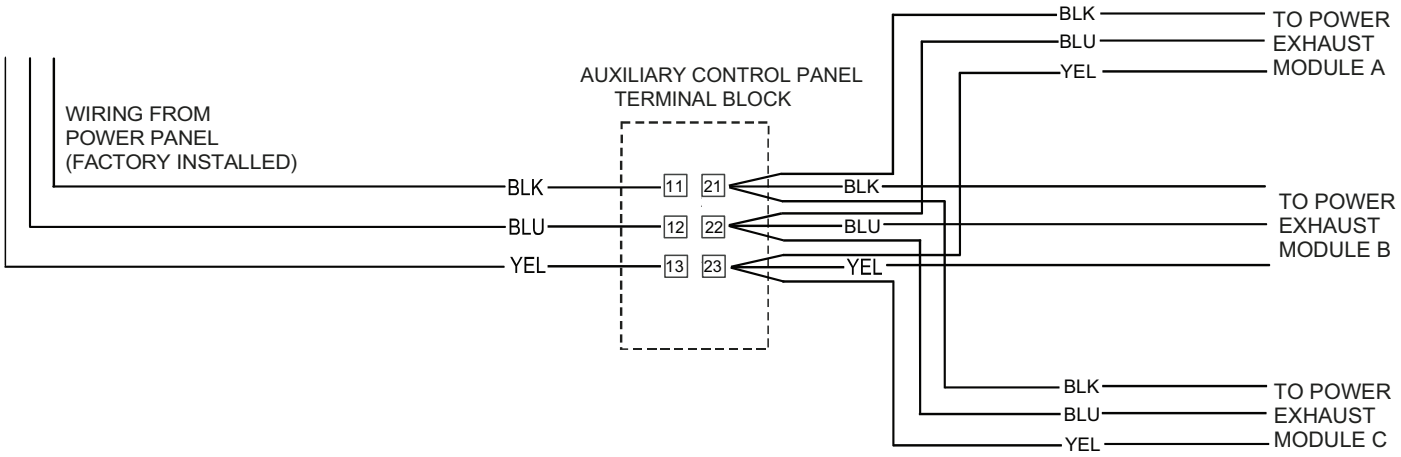


Fig. 6 — Power Exhaust Wiring (3 Modules) for 48/50K Only

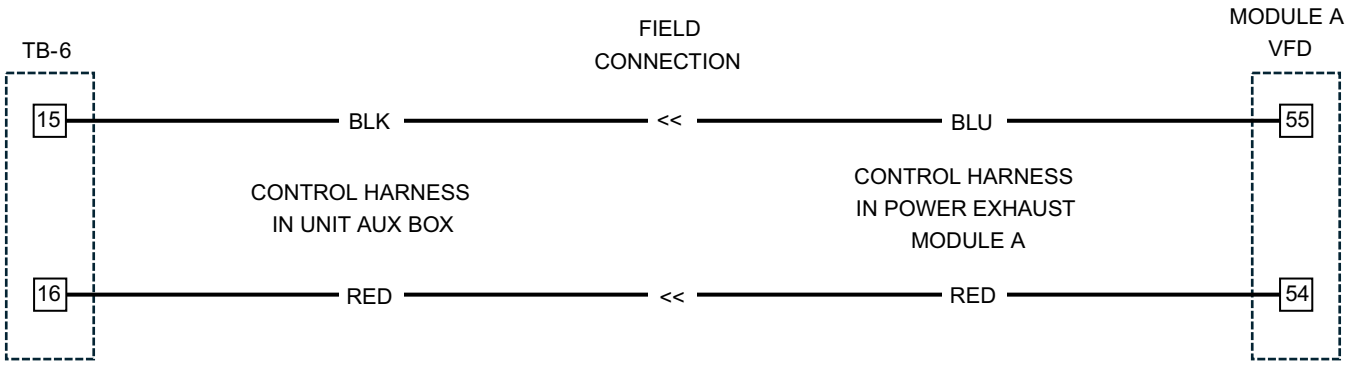


Fig. 7 — VFD Control Wiring

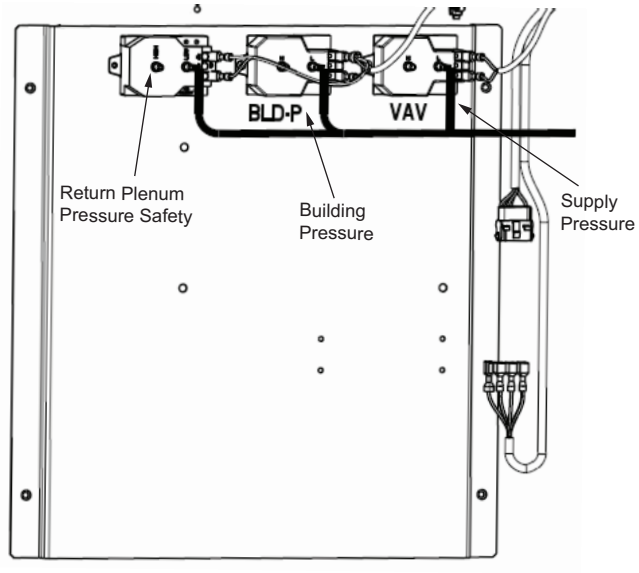
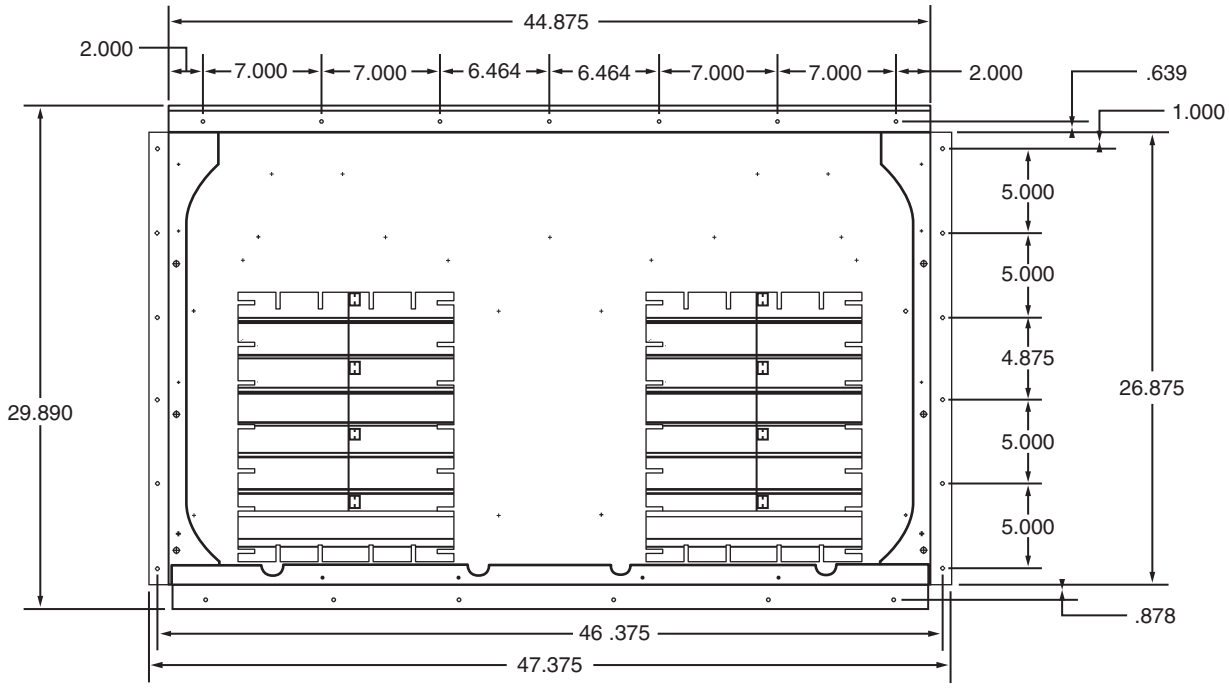


Fig. 8 — 48/50K Pressure Transducers in Auxiliary Control Box

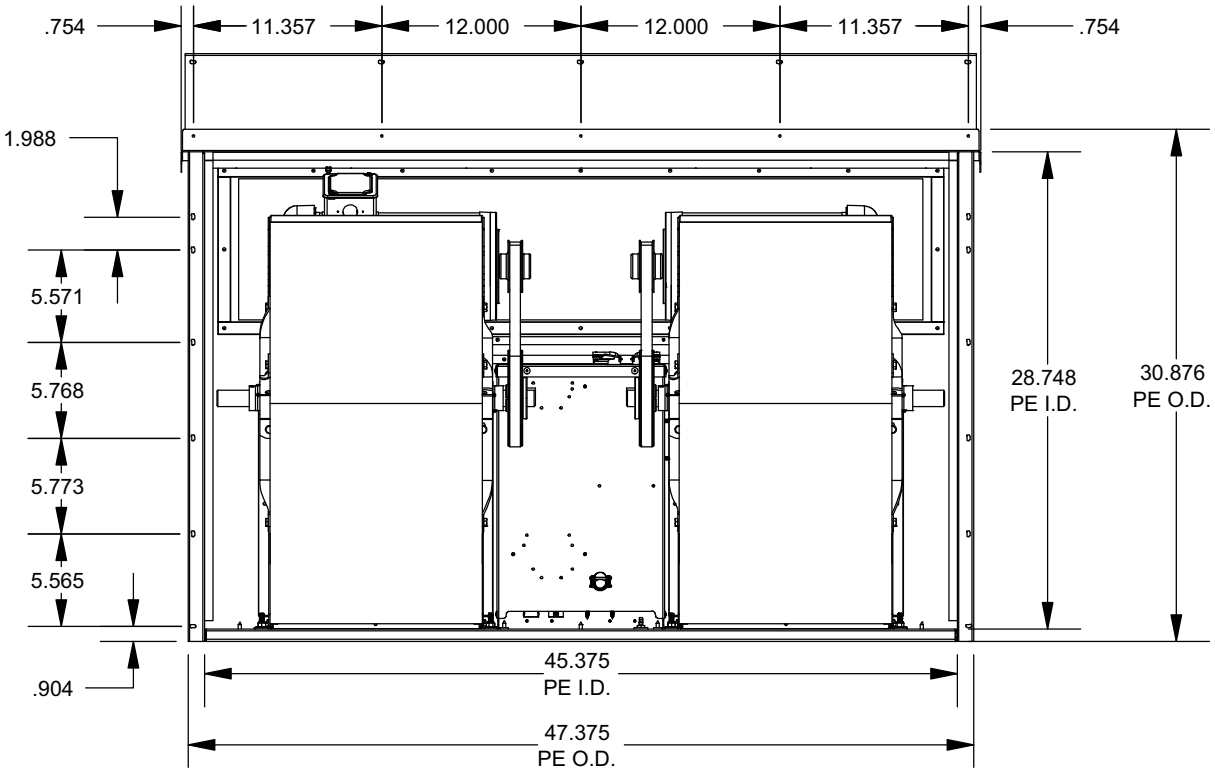
Horizontal Discharge Units (48/50K4, K5)

1. Unpack accessory package contents. The support panel is not used and may be discarded.
2. Disconnect power to unit.
3. Provide openings 43 in. wide by 26-1/2 in. high in the side of the return air duct for the number of accessories ordered. See Fig. 9-11 for discharge mounting and power exhaust locations.
   Ensure that the transition required to accommodate these openings begins at least 3-1/2 ft away from the outdoor-air hood. Any obstruction closer than 3-1/2 ft will interfere with the airflow and result in rain entering the hood through the filters. See Fig. 11 for power exhaust details, accessory locations, and dimensions.
4. Drill engagement holes for 1/4 in. screws around openings as shown in Fig. 9 or 10, depending on module voltage.
5. Open the unit filter access door to locate the factory installed control and power wiring with a terminal block. See Fig. 11 to locate the filter access door through the Auxiliary Control Panel Opening.
6. Route the wires from the 20 ft long power exhaust power and control harness through the hole(s) in the auxiliary control panel. Refer to Fig. 3 for terminal block and harness locations. Secure the metal clad connector with the locknut.
7. Connect the power harness wires from the power exhaust module to the terminal block located in the auxiliary control panel. Refer to Fig. 4-6 for power exhaust wiring.
8. Position each power exhaust module in front of the openings cut into the return duct. See Fig. 11 for dimensions and locations. When accessory packages for Modules B and C are included, ensure that Module A is placed closest to the auxiliary control panel.
   NOTE: Power exhaust modules cannot be supported by the duct. Field provided support is required.
9. Locate the bundled control harness in the auxiliary panel that supplies the speed signal to the VFD within the power exhaust module. Refer to Fig. 3 for harness locations. For high-capacity power exhaust option, the harness runs from terminals TB6, pins 15 and 16 to the auxiliary panel location.
10. Route the control wiring from Module A, closest to the auxiliary panel, and connect the VFD control wiring from the module to the unit's control harness, matching red to red and blue to black.
    NOTE: The wiring connector on the power exhaust Module A may need to be replaced in the field with an insulated male spade connector to ensure proper connection with unit's control harness. For additional module accessory packages, route the VFD (variable frequency drive) control wiring behind each module and plug the control wiring into the VFD of the next module(s).
    NOTE: Refer to Fig. 7 for VFD control wiring configuration.
11. Caulk the mating flanges of the module and set in place.
12. Variable air volume (VAV) units and units with power exhaust with building pressure (BP) control include, pressure transducers for measuring the duct supply pressure or building pressure that require field supplied pneumatic tubing and pressure pickup ports. The pressure transducers are in an auxiliary control box, accessible through the filter access door. Refer to Fig. 2 and "Auxiliary Control Panel Opening" in Fig. 11 for the location of auxiliary control box, located behind filter access door. Refer to Fig. 8 for pressure transducer locations.
13. For guidance on configuring high-capacity power exhaust in the 48/50K SmartVu control, please refer to section "CONFIGURE EXHAUST FAN (OPTIONAL)" in the 48/50K Series unit installation manual.



NOTE: Dimensions are in inches.

Fig. 9 — Horizontal Discharge Mounting Opening (230-460v Modules)



NOTE: Dimensions are in inches.

Fig. 10 — Horizontal Discharge Mounting Opening

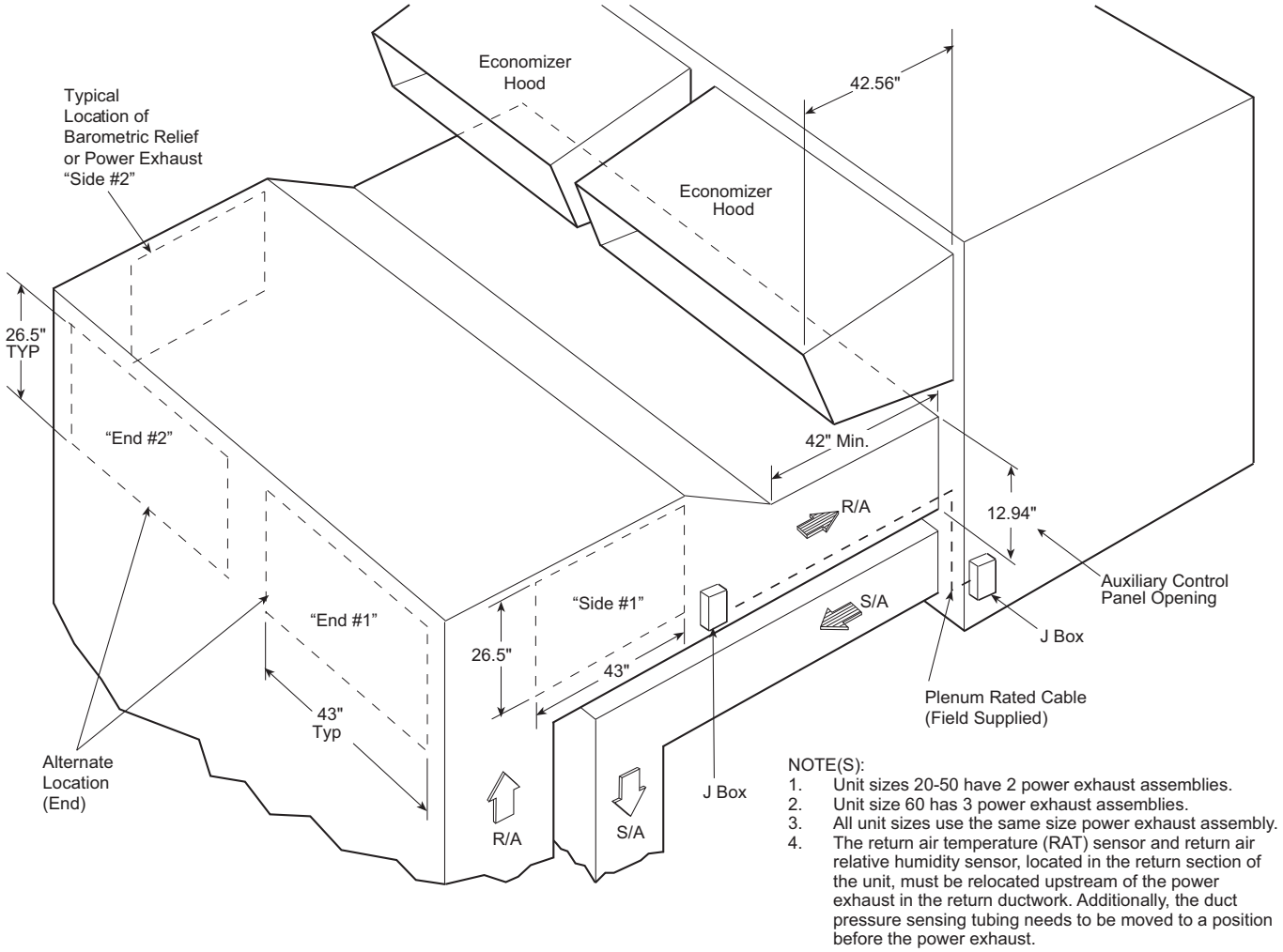


Fig. 11 — Power Exhaust Location on Side Return Duct

Programming

PROGRAMMING WITH THE LOCAL CONTROL PANEL

IMPORTANT: The adjustable frequency drive can also be programmed from a PC via RS485 com-port by installing the MCT-10 Set-up Software. This software can be ordered using code number: 130B1000, downloading from the Danfoss website https://www.danfoss.com/en-us/ or, contacting Carrier application engineering.

Local Control Panel (LCP)

The following instructions are valid for the FC101 Local Control Panel (LCP). The LCP is divided into four functional sections. See Fig. 12 for control panel example. See Table 3 for panel display definitions.

At power-up

At first power-up, the user is asked to choose the preferred language. Once selected, this screen will never be shown again in the following power-ups, but the language can still be changed in ***0-01 Language***. See Fig. 13 for language option screen.

Danfoss Parameters

See Table 4 on page 10 for high capacity Danfoss parameter descriptions, modes, and default settings.

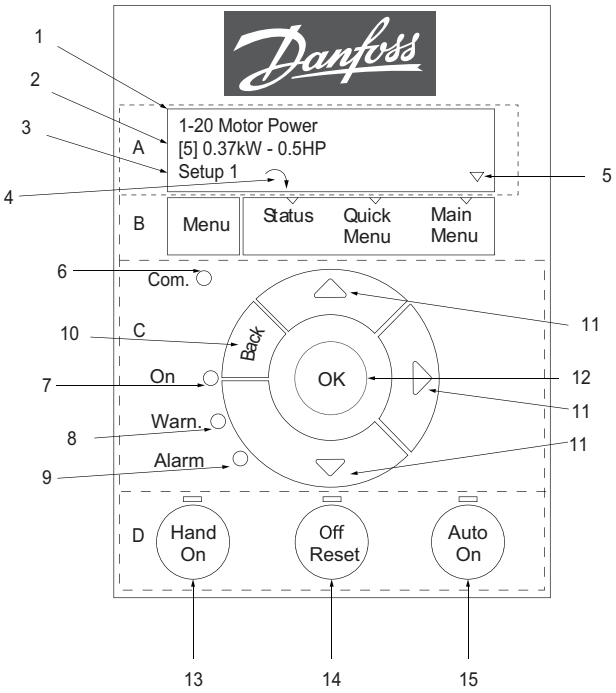


Fig. 12 — FC101 Local Control Panel

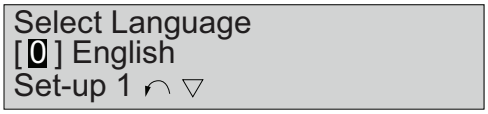


Fig. 13 — Select Language Option

Table 3 — Local Control Panel Display

NUMBER		DEFINITION
A	Alphanumeric Display — The LCD display is backlit with 2 alphanumeric lines. All data is displayed on the LCP.	
	1	Parameter number and name.
	2	Parameter value.
	3	The set-up number shows the active set-up and the edit setup. If the same set-up acts as both the active and edit setup, only that set-up number is shown (factory setting). When the active and edit set-up differ, both numbers are shown in the display (Set-up 12). The flashing number indicates the edit set-up.
	4	Motor direction is shown to the bottom left of the display, indicated by a small arrow pointing either clockwise or counterclockwise.
	5	The triangle indicates if the LCP is in status quick menu or main menu.
B	Menu Key — Use the menu key to select between status quick menu or main menu.	
C	Navigation Keys and LEDs	
	6	Com LED: Flashes when bus communication is communicating.
	7	Green LED/On: Control section is working.
	8	Yellow LED/Warning: Indicates a warning.
	9	Flashing Red LED/Alarm: Indicates an alarm.
	10	[Back]: For moving to the previous step or layer in the navigation structure.
	11	Arrows [▲] [▼] [►]: For navigating between parameter groups, parameters, and within parameters. Can also be used for setting local reference.
	12	[OK]: For selecting a parameter and for accepting changes to parameter settings.
D	Operation Keys and LEDs	
	13	[Hand On]: Starts the motor and enables control of the Adjustable frequency drive via the LCP.[a]
	14	[Off/Reset]: Stops the motor (off). If in alarm mode the alarm will be reset.
	15	[Auto On]: Adjustable frequency drive is controlled either via control terminals or serial communication.

NOTE(S):

a. Terminal 27 Digital Input (5-12 Terminal 27 Digital Input) has coast inverse as default setting so [Hand On] will not start the motor if there is no 24-v to terminal 27; ensure that terminal 12 connects to terminal 27.

Table 4 — High Capacity Danfoss Parameters

PARAMETERS	DESCRIPTION	MODE	DEFAULT
P0-03	Regional Settings	[1] North America	[0] International
P0-06	Grid Type	[102] 200-240v/60 Hz [122] 440-480v/60 Hz [132] 525-600v/60 Hz	Size Related
P1-01	Motor Control Principle	[0] U/f	VVC+
P1-20	Motor Power	[11] 3kw-4hp	Size Related
P1-22	Motor Voltage	208 460 575	Size Related
P1-23	Motor Frequency	60 Hz	Size Related
P1-24	Motor Current	11.2 5.4 4.8	Size Related
P1-25	Motor Nominal Speed	1725	Size Related
P3-02	Minimum Reference	0	0
P3-03	Maximum Reference	60	50
P3-15	Reference 1 Source	[2] Analog Input 54	Analog Input 53
P3-16	Reference 2 Source	[0] No reference	[2] Analog Input 54
P3-17	Reference 3 Source	[0] No reference	[11] Local Bus Reference
P4-12	Motor Speed Low Limit	0	0
P5-12	Terminal 27 Digital Input	[0] No operation	[7] External Interlock
P5-13	Terminal 29 Digital Input	[0] No operation	[14] Jog
P6-20	Terminal 54 Low Voltage	2	0.07-v
P6-21	Terminal 54 High Voltage	10	10-v
P6-24	Terminal 54 Low Ref./Feedb.	0	0
P6-25	Terminal 54 High Ref./Feedb.	60	60

TROUBLESHOOTING

Warnings and Alarms

The warnings and alarms shown in Table 5 can be used to find the root cause of failures. The VFD will show error codes; use the error code number to determine the cause of the problem.

Table 5 — Warnings and Alarms

FAULT NUMBER	ALARM/WARNING BIT NUMBER	FAULT TEXT	WARNING	ALARM	TRIP LOCKED	CAUSE OF PROBLEM
2	16	Live zero error	X	X		Signal on terminal 53 or 54 is less than 50% of value set in par. 6-10, 6-12, 6-20, or 6-22. Also see parameter group 6-0X.
4	14	Mains ph. loss	X	X	X	Missing phase on supply side or too high voltage imbalance. Check supply voltage. See parameter 14-12.
7	11	DC overvolt	X	X		Intermediate circuit voltage exceeds the limit.
8	10	DC undervolt	X	X		Intermediate circuit voltage drops below the “voltage warning low” limit.
9	9	Inverter overload	X	X		More than 100% load for too long.
10	8	Motor ETR over	X	X		Motor is too hot due to more than 100% load for too long. See parameter 1-90.
11	7	Motor th over	X	X		The thermistor or the thermistor connection is disconnected. See parameter 1-90.
13	5	Overcurrent	X	X	X	Inverter peak current limit is exceeded.
14	2	Ground Fault		X	X	Discharge from output phases to ground.
16	12	Short Circuit		X	X	Short-circuit in the motor or on the motor terminals.
17	4	Ctrl.word TO	X	X		No communication to Adjustable frequency drive. See parameter group 8-0X.
24	50	Fan Fault	X	X		The fan is not working (Only on 400v 40-125 hp [30-90 kW] units).
30	19	U phase loss		X	X	Motor phase U is missing. Check the phase. See parameter 4-58.
31	20	V phase loss		X	X	Motor phase V is missing. Check the phase. See parameter 4-58.
32	21	W phase loss		X	X	Motor phase W is missing. Check the phase. See parameter 4-58.
38	17	Internal fault		X	X	Contact your local Danfoss supplier.
44	28	Ground Fault		X	X	Discharge from output phases to ground.
47	23	Control Voltage Fault	X	X	X	24 vdc may be overloaded.
48	25	VDD1 Supply Low	X	X		Control voltage low. Please contact your local Danfoss supplier.
50		AMA Calibration failed		X		Contact your local Danfoss supplier.
51	15	AMA Unom, Inom		X		The setting of motor voltage, motor current and motor power is presumably wrong. Check the settings.
52		AMA low Inom		X		The motor current is too low. Check the settings.
53		AMA big motor		X		The motor is too big for the AMA to be carried out.
54		AMA small mot		X		The motor is too small for the AMA to be carried out.
55		AMA par. range		X		The parameter values found from the motor are outside acceptable range.
56		AMA user interrupt		X		The AMA has been interrupted by the user.
57		AMA timeout		X		Try to start the AMA again a number of times, until the AMA is carried out. Note that repeated runs may heat the motor to a level where the resistances Rs and Rr are increased. In most cases, however, this is not critical.
58		AMA internal	X	X		Contact your local Danfoss supplier.
59	25	Current limit	X			The current is higher than the value in par. 4-18 Current Limit.

LEGEND

AMA — Automatic Motor Adaptation

Table 5 — Warnings and Alarms (cont)

FAULT NUMBER	ALARM/WARNING BIT NUMBER	FAULT TEXT	WARNING	ALARM	TRIP LOCKED	CAUSE OF PROBLEM
60	44	External Interlock		X		External interlock has been activated. To resume normal operation, apply 24 vdc to the terminal programmed for external interlock and reset the Adjustable frequency drive (via serial communication, digital I/O, or by pressing reset button on keypad).
66	26	Heatsink TemperatureLow	X			This warning is based on the temperature sensor in the IGBT module (Only on 400-v 40–125 hp [30–90 kW] units).
69	1	Pwr. Card Temp	X	X	X	The temperature sensor on the power card is either too hot or too cold.
79		Illegal power section configuration	X	X		Internal fault. Contact your local Danfoss supplier.
80	29	Drive initialized		X		All parameter settings are initialized to default settings.
87	47	Auto DC Braking	X			The drive is auto DC braking.
95	40	Broken Belt	X	X		Torque is below the torque level set for no load, indicating a broken belt. See parameter group 22-6.
200		Fire Mode	X			Fire mode has been activated.
202		Fire Mode Limits Exceeded	X			Fire mode has suppressed one or more warranty voiding alarms.
250		New spare part		X	X	The power or switch mode power supply has been exchanged. (Only on 400-v 40–125 hp [30–90 kW] units). Contact your local Danfoss supplier.
251		New Type code		X	X	The Adjustable frequency drive has a new type code (Only on 400-v 40–125 hp [30–90 kW] units). Contact your local Danfoss supplier.

LEGEND

AMA — Automatic Motor Adaptation