

Installation Instructions

Part No: CRLOWAMB030B00, CRLOWAMB031B00, CRLOWAMB032B00
CRLOAMHP001A00

IMPORTANT: This book contains instructions for the installation, start-up and service of the Low Ambient Controller on 48/50TC*D14, 558/580J*14D, RGS150, RAS150, 48/50HC*D12, 551/581J*12, RGH120, RAH120, 50TCQD12, 50HCQD09, 548J*12, 549J*09, RHS120, RHH102.

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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

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Open all remote disconnects before servicing this equipment.

CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury.

When removing access panels or performing maintenance functions inside your unit, be aware of sharp sheet metal parts and screws. Although special care is taken to reduce sharp edges to a minimum, be extremely careful when handling parts or reaching into the unit.

GENERAL

The Low Ambient Controller (LAC) is a motor speed control device which adjusts condenser fan motor speed in response to varying discharge refrigerant pressure. A properly applied Low Ambient Controller extends the operating range of air-conditioning systems and permits operation at lower outdoor ambient temperatures.

To operate these units at very low ambient temperatures, Low Ambient Controller must be added. (See Fig. 1.) Field-fabricated and installed wind baffles are also required for units in areas with prevailing winds of more than 5 mph and where temperatures drop below 32°F (0°C). The Low Ambient Controller permits

Low Ambient Controller operation of the unit to an ambient temperature of -20°F (-29°C). The control regulates the speed of one 3-phase fan motor that is compatible with the control. Replacement of fan motor on most units is not necessary since the control is compatible with the factory-installed fan motors. See Table 1 for package usage. See Tables 2-5 for heat pump units and package contents. To verify that unit fan motors are compatible with control see Table 6 on page 3.

Field wiring of control is required.

This accessory kit will allow the Low Ambient Controller to be used on heat pump units (using the single 3-phase outdoor fan motor). A second relay assembly is provided as part of the heat pump adapter kit to override the Low Ambient Controller when in heat pump mode. The second relay must be installed by the technician. For cooling units, the second relay assembly is not needed.

PACKAGE USAGE

Table 1 — Low Ambient Controller Package Usage

UNIT	VOLTAGE-Ph-Hz	ITEM DESCRIPTION
48/50TC*D14 50TCQD12	208/230-3-60	CRLOWAMB030B00
	460-3-60 400-3-50	CRLOWAMB031B00
	575-3-60	CRLOWAMB032B00
48/50HC*D12 50HCQD09	208/230-3-60	CRLOWAMB030B00
	460-3-60	CRLOWAMB031B00
	575-3-60	CRLOWAMB032B00
580/558J*14D 548J*12	208/230-3-60	CRLOWAMB030B00
	460-3-60	CRLOWAMB031B00
	575-3-60	CRLOWAMB032B00
581J/511J*12 549J*09	208/230-3-60	CRLOWAMB030B00
	460-3-60	CRLOWAMB031B00
	575-3-60	CRLOWAMB032B00
RGS150 RAS150 RHS120	208/230-3-60	CRLOWAMB030B00
	460-3-60	CRLOWAMB031B00
	575-3-60	CRLOWAMB032B00
RGH120 RAH120 RHH102	208/230-3-60	CRLOWAMB030B00
	460-3-60	CRLOWAMB031B00

PACKAGE CONTENTS (ADDITIONAL PARTS FOR HEAT PUMP UNITS)

Table 2 — Heat Pump Adapter Kit (CRLOAMHP001A00)

ITEM	CRLOAMHP001A00	QTY
Relay, Low Ambient Controller, Fan	HN61KK055	1
FIOP Assy, Relay Base	HN79KK035	1
Resistor 10K 1/2W	HT21AZ110	1
Wire Assy	99WE0202XC201818	1
Wire Assy	99WE0202XC200618	1
Wire Assy	99WJ0202XC201818	1
Wire Assy	99WZ0202XC201818	1
Wire Assy	99WB0202XC210318	1
Wire Assy	99WG0282XC210318	1
Screw, PL PND #6 x .5	AL56AU126	2
Wire Tie	HY76TB035	4
Heat Pump Label Diagram	48TM504591	1

Table 3 — Low Ambient Controller Sub-Assembly (CRLOWAMB030B00)

ITEM	Part	QTY
Controller, 230-v	HK30WA391	1
Fuse 20A, KTK-R, Class CC	HY10KB200	3
Fuse Block	HY11UT035	1
Relay Base	HN79KK035	1
Relay	HN61KK055	1
Fuse Cover	HY12BM002	3
Wire Ties	HY76TB110	4
Screws 8 x 3/4	AL56AU168	8
Screws 6 x 1/2	AL56AU126	2
Harness	48TM402167	1
Bracket	48TM00061	1
Transducer	HK05ZZ011	1
Transducer Cable	30GT415783	1
Check Valve Tees	EC36SZ061	1
Wire Tie	HY76TB035	5
Screws 10 x 1/2 (Self Tapped)	AL48AT215	6
Diagram Label	48TM502162	1
Caution Label	48TM501658	1
Key Pad	48LC400142	1

Table 4 — Low Ambient Controller Sub-Assembly (CRLOWAMB031B00)

ITEM	Part	QTY
Controller, 460-v	HK30WA397	1
Fuse 15A, KTK-R, Class CC	HY10KB151	3
Fuse Block	HY11UT035	1
Relay Base	HN79KK035	1
Relay	HN61KK055	1
Fuse Cover	HY12BM002	3
Wire Ties	HY76TB110	4
Screws 8 x 3/4	AL56AU168	8
Screws 6 x 1/2	AL56AU126	2
Harness	48TM402167	1
Bracket	48TM00061	1
Transducer	HK05ZZ011	1
Transducer Cable	30GT415783	1
Check Valve Tees	EC36SZ061	1
Wire Tie	HY76TB035	5
Screws 10 x 1/2 (Self Tapped)	AL48AT215	6
Diagram Label	48TM502162	1
Caution Label	48TM501658	1
Key Pad	48LC400142	1

Table 5 — Low Ambient Controller Sub-Assembly (CRLOWAMB032B00)

ITEM	Part	QTY
Controller, 575-v	HK30WA464	1
Fuse 15A, KTK-R, Class CC	HY10KB151	3
Fuse Block	HY11UT035	1
Relay Base	HN79KK035	1
Relay	HN61KK055	1
Fuse Cover	HY12BM002	3
Wire Ties	HY76TB110	4
Screws 8 x 3/4	AL56AU168	8
Screws 6 x 1/2	AL56AU126	2
Harness	48TM402167	1
Bracket	48TM005758	1
Transducer	HK05ZZ011	1
Transducer Cable	30GT415783	1
Check Valve Tees	EC36SZ061	1
Wire Tie	HY76TB035	5
Screws 10 x 1/2 (Self Tapped)	AL48AT215	6
Diagram Label	48TM502162	1
Caution Label	48TM501658	1
Key Pad	48LC400142	1

Table 6 — Applicable Voltages and Motors

VOLTAGE	COMPATIBLE VOLTAGE MOTOR
208/230-3-60	HD52AH651
460-3-60	
400-3-50	
575-3-60	HD52AH578

Pre-Installation

Inspect the contents of this accessory package before installing. File a claim with the shipper if there is shipping damage or if a part is missing.

INSTALLATION

Step 1 — Install Field-Fabricated Wind Baffles

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Open all remote disconnects before servicing this equipment.

In areas with prevailing winds of more than 5 mph (8 km/h) and where temperatures drop below 32°F (0°C), wind baffles must be field fabricated to ensure proper cooling cycle operation at low-ambient temperatures with Low Ambient Controller. See Fig. 2 and Tables 7-8 for baffle details and dimensions. Use 20-gauge (1 mm) galvanized sheet metal, or similar corrosion-resistant material for the baffles. Use field-supplied screws to attach baffles to unit. Screws should be 1/4 in. (6.3 mm) diameter or larger. Screws should not be more than 1/2 in. (12.7 mm) in length. Drill required screw holes for mounting baffles.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in damage to unit.

To avoid damage to refrigerant coils, electrical components and wiring, use extreme care when drilling screw holes and screwing in fasteners.

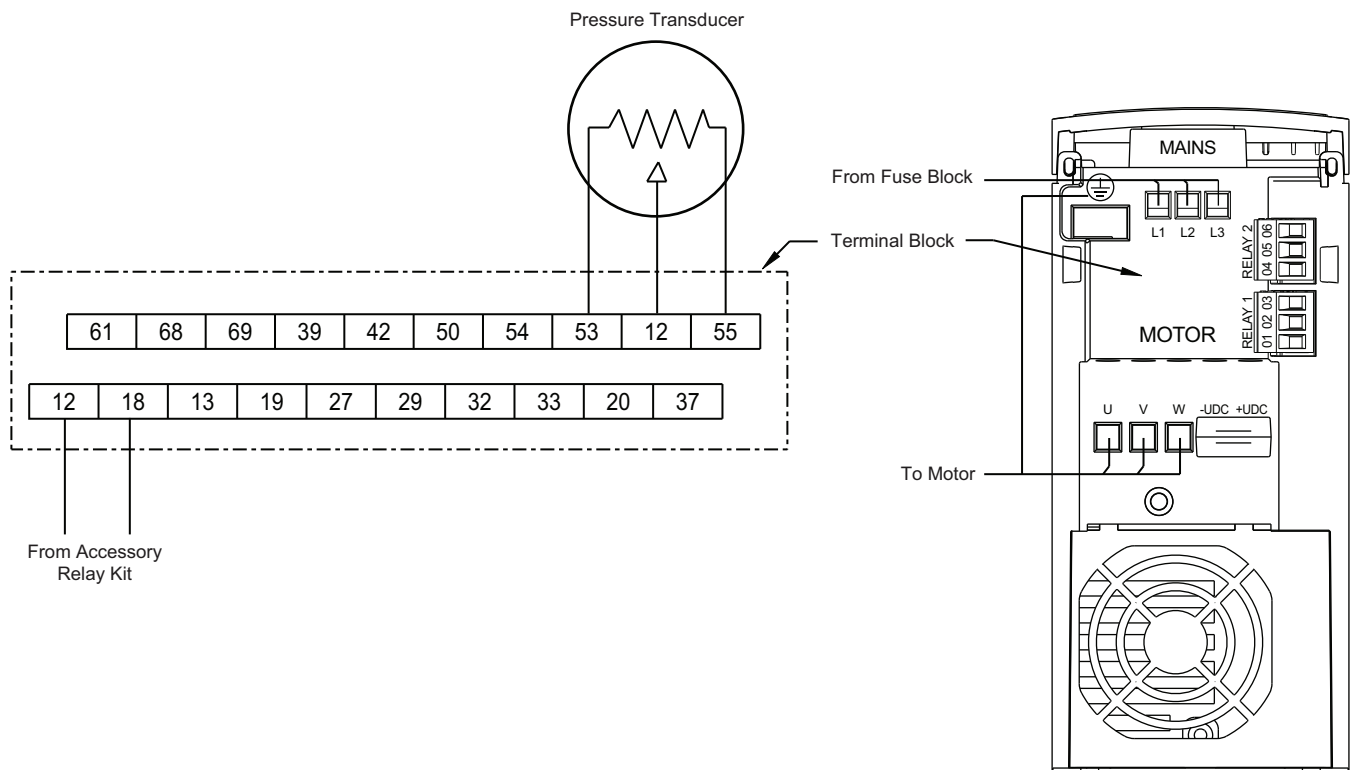


Fig. 1 — Low Ambient Controller Unit Connections

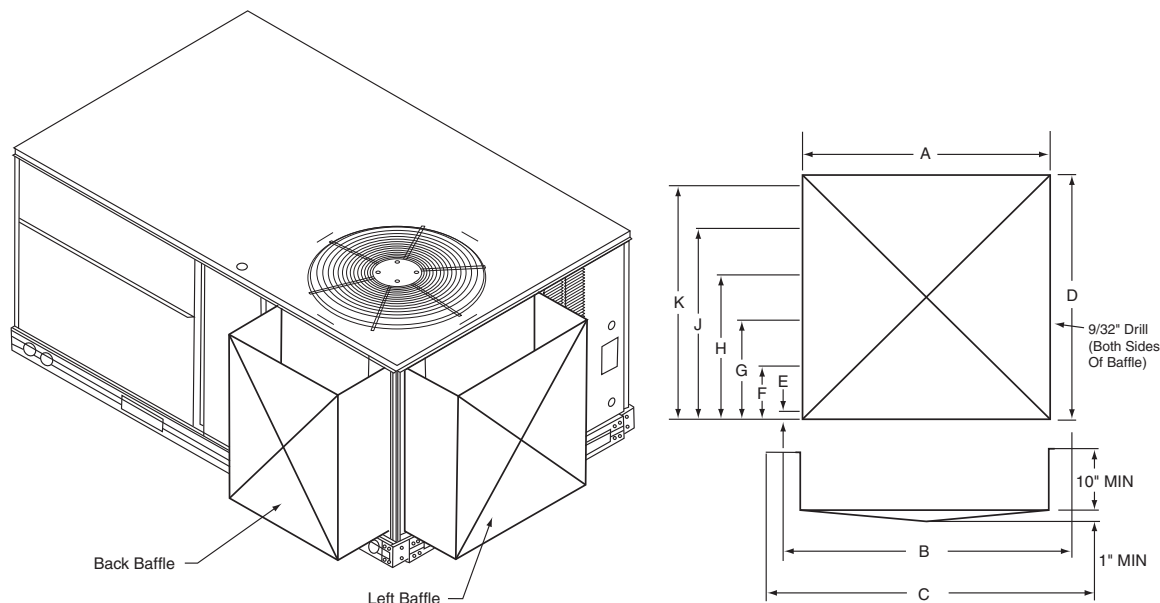


Fig. 2 — Wind Baffle Details

Table 7 — Dimensions for Copper Tube/Aluminum Fin Coils

BACK BAFFLE – INCHES (mm)											
UNIT	SIZE	A	B	C	D	E	F	G	H	J	K
50HCQD 549J	09	41-7/8 (1063.6)	42-1/2 (1079.5)	43-1/8 (1095.4)	43-1/2 (1104.9)	1-1/4 (31.8)	9-1/4 (235)	17-1/4 (438.2)	25-1/4 (641.4)	33-1/4 (844.6)	41-1/4 (1047.6)
48/50HCD 50TCQD 551J/581J 548J	12										
48/50TCD 558/580J	14										
RHH	102	41-7/8 (1063.6)	42-1/2 (1079.5)	43-1/8 (1095.4)	43-1/2 (1104.9)	1-1/4 (31.8)	9-1/4 (235)	17-1/4 (438.2)	25-1/4 (641.4)	33-1/4 (844.6)	41-1/4 (1047.6)
RGH/RAH/RHS	120										
RGS/RAS	150										

LEFT BAFFLE – INCHES (mm)											
UNIT	SIZE	A	B	C	D	E	F	G	H	J	K
50HCQD 549J	09	42-3/4 (1085.9)	43-3/8 (1101.7)	44 (1117.6)	43-1/2 (1104.9)	1-1/4 (31.8)	9-1/4 (235)	17-1/4 (438.2)	25-1/4 (641.4)	33-1/4 (844.6)	41-1/4 (1047.6)
48/50HCD 50TCQD 551J/581J 548J	12										
48/50TCD 558/580J	14										
RHH	102	42-3/4 (1085.9)	43-3/8 (1101.7)	44 (1117.6)	43-1/2 (1104.9)	1-1/4 (31.8)	9-1/4 (235)	17-1/4 (438.2)	25-1/4 (641.4)	33-1/4 (844.6)	41-1/4 (1047.6)
RGH/RAH/ RHS	120										
RGS/RAS	150										

Table 8 — Dimensions for Novation® Coils

BACK BAFFLE – INCHES (mm)											
UNIT	SIZE	A	B	C	D	E	F	G	H	J	K
48/50TCD 558/580J	14	40-1/4 (1022.3)	40-7/8 (1038.2)	41-1/2 (1054.1)	43-1/2 (1104.9)	4-1/4 (108)	11-1/4 (285.8)	18-1/4 (463.6)	25-1/4 (641.4)	32-1/4 (819.2)	39-3/16 (995.4)
LEFT BAFFLE – INCHES (mm)											
UNIT	SIZE	A	B	C	D	E	F	G	H	J	K
48/50TCD 558/580J	14	47-3/4 (1212.8)	48-1/4 (1225.5)	48-7/8 (1241.4)	43-1/2 (1104.9)	1-1/4 (31.8)	9-1/4 (235)	17-1/4 (438.2)	25-1/4 (641.4)	33-1/4 (844.6)	41-1/4 (1047.6)

Step 2 — Mounting and Electrical Connections for Low Ambient Controller

WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Open all remote disconnects before servicing this equipment.

WARNING

ELECTRICAL OPERATION HAZARD

Failure to follow this warning could result in personal injury and/or death.

Wait three minutes after disconnecting incoming power before servicing drive. Capacitors retain charge after power is removed. Before servicing this equipment.

CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in personal injury and damage to equipment.

To avoid damage to the small terminals on the Low Ambient Controller, use care when tightening the compression terminals and use the proper size screwdriver.

CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in personal injury and damage to equipment.

DO NOT connect incoming AC power to Low Ambient Controller output terminals U, V, and W. Severe damage to the control will result.

COOLING ONLY

For 48/50TC*D14, 558/580J*14D, and RGS/RAS150, use the following procedure to mount and connect the LAC (Low Ambient Controller) control to the unit.

1. Disconnect power to the unit. Lockout and tag power disconnect.
2. Remove compressor access panel, control box cover and indoor blower panel. Lifting the top cover on the control box side of unit will aid routing of wiring from the blower section to the control box.
3. Mount the LAC assembly on the tube sheet of indoor coil using the #10 screws, align bracket slot with tube sheet holes

then mount the left tab of the bracket into fan housing bracket into fan housing bracket re-using screws from side bracket. See Fig. 3. Verify that the fuses match those specified in the packaging list.

IMPORTANT: Do not drive screws into control box area.

4. Disconnect the OFM wires from the OFC-21 and OFC-23 and IFC-13 or TB10 and save. Remove the two jumper wires between OFC and C2 and discard. Remove the 24-v control wires from OFC and save. Remove and discard OFC.
5. Route all wires connected to LAC sub-assembly follow economizer harness then through bulkhead. Route the transducer harness cable separately from the rest to avoid electrical interference.

The following wiring refers to Fig. 4 (wiring diagram) and Fig. 5 (wire harness).

6. Connect violet and brown control wires that were connected to OFC to the violet and brown wires from FR13 and 14. Match the colors.
 - a. Connect U, V, and W to the BLK, YEL and BLU OFM wires previously disconnected. Match the colors.
 - b. Connect BLK 6, YEL 7, and BLU 8 coming from fuse block to C2-11, C2-13 and IFC-13 or TB10 for 208/230 units with electric heaters installed.
 - c. Connect the GRN/YEL ground wire to the ground screw in the control box used to ground the outdoor fan motor.
 - d. For 400-3-50 units, move the orange control wire from TB-1 to TB-13C on the LAC as indicated in Fig. 4.
7. Remove the cap from the discharge line service port of Circuit 1 and connect the check valve tee (EC36SZ061) to the port.

WARNING

PERSONAL INJURY HAZARD

Failure to follow this warning could result in personal injury or death.

Orient the valve so that the ports are directed away from the access panel.

8. Attach service port cap to check valve tee.
9. Connect transducer HK05ZZ011 to check valve tee.
10. Connect transducer harness cable to transducer.
11. Bundle any excess wire and dress harnesses with wire ties.
12. Place the appropriate wiring label on the control box cover.
13. Reattach control box cover, compressor access panel and indoor blower panel.
14. Place the caution label on the top cover above the control box near the outdoor fan grill.

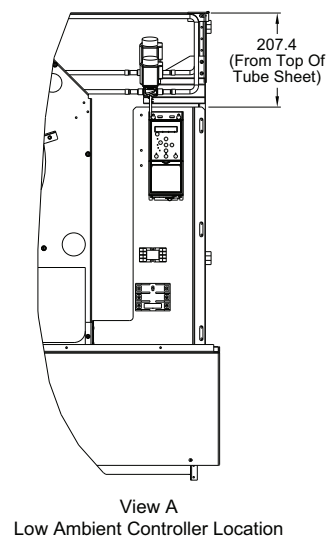
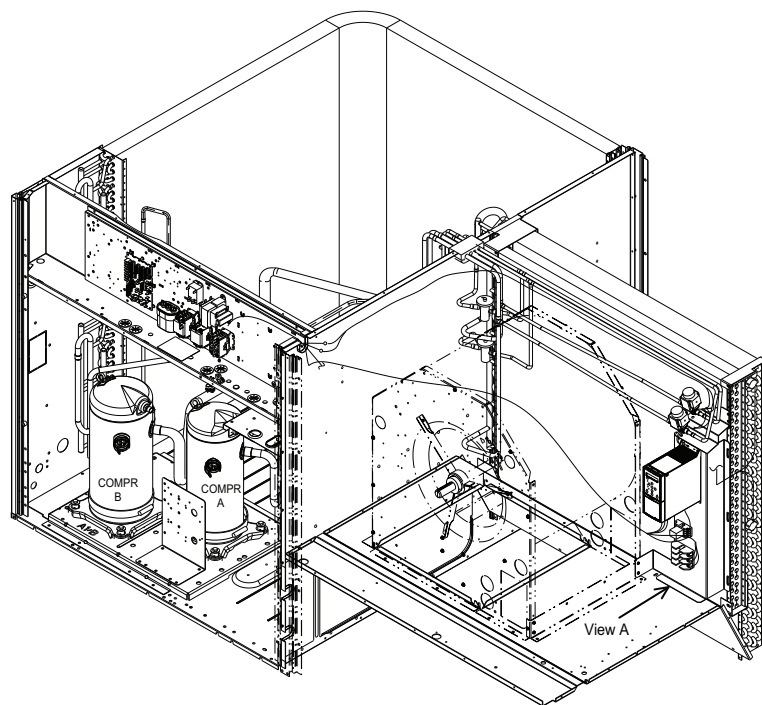


Fig. 3 — Low Ambient Controller Assembly on Bulkhead

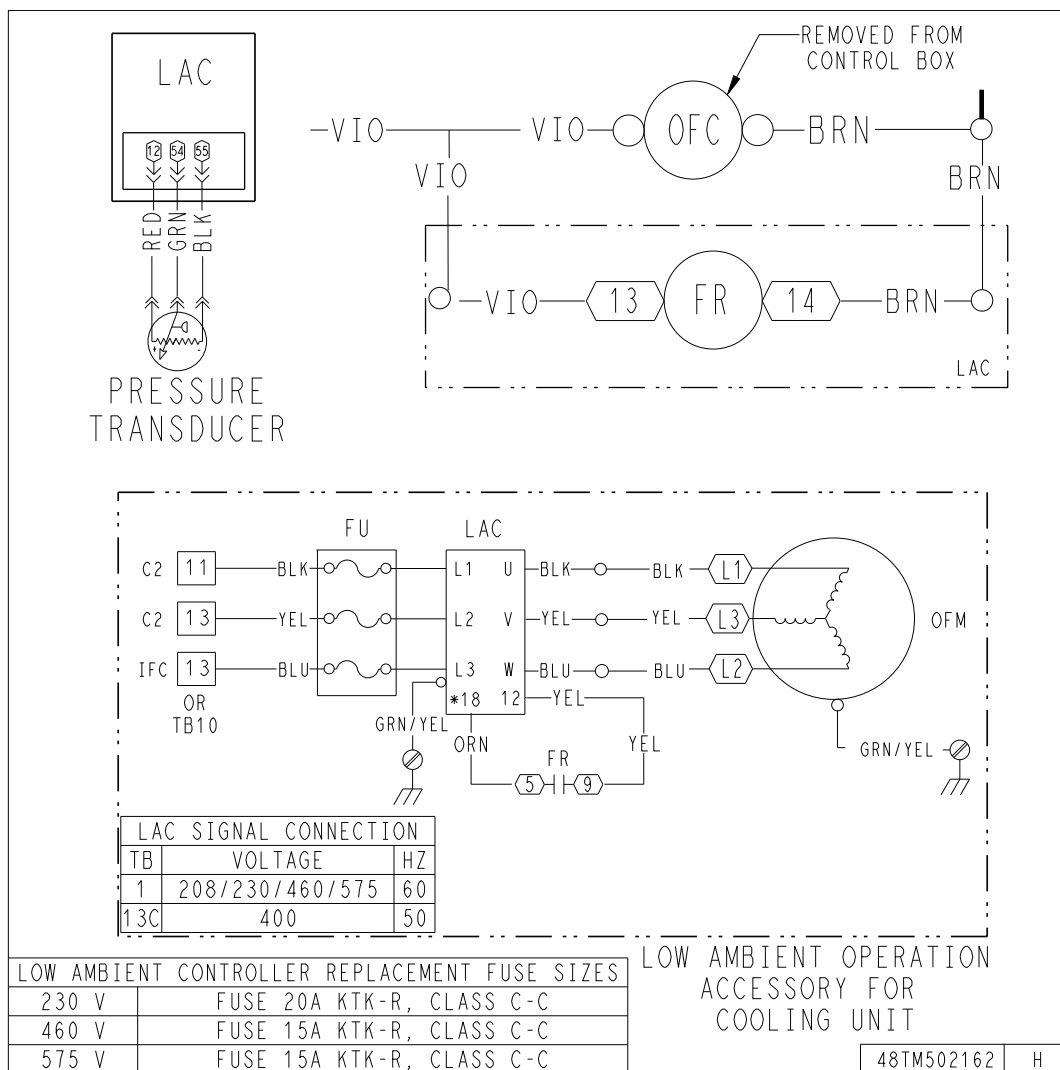


Fig. 4 — Wiring Diagram – Cooling Unit

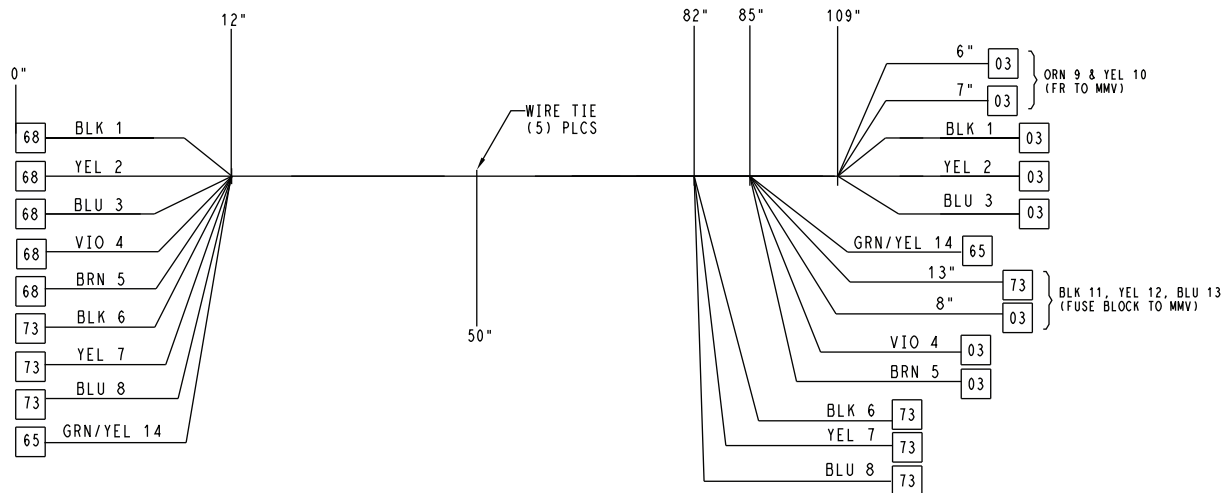


Fig. 5 — Wire Harness Diagram – Cooling Only

HEAT PUMP ONLY

For 50TCQD12, 50HCQD09, 548J*12, 549J*09, RHS120, and RHH102, use the following procedure to mount and connect the LAC control to the unit. (See Fig. 7 and 8.)

1. Disconnect power to the unit. Lockout and tag power disconnect.
2. Remove compressor access panel, control box cover and indoor blower panel. Lifting the top cover on the control box side of unit will aid routing of wiring from the blower section to the control box.
3. Locate the heat pump adapter kit and mount the relay (FR- H) to the LAC bracket using the (2) no. 8 screws provided.
4. Connect the blue, white and yellow wires to the LAC as shown - terminals 54, 12, and 55 respectively. The orange and brown wires will go into the control box along with the wires from the other fan relay (FR).

NOTE: If the transducer harness is connected to the LAC at the 2, 5, 6 terminals, disconnect and reconnect per item 6 below.

NOTE: On the LAC there are three #2 positions in the terminal block, these are connected internally.

5. Use the wire tires to secure the FR-H wiring to existing wires.
6. Connect the transducer harness to the FR-H as shown - green to #9, red to #10 and black to #11. This may need to be done prior to installing the LAC into the unit since there may be limited access to the relay terminals.
7. Mount the LAC assembly on the tube sheet of indoor coil using the #10 screws, align bracket slot with tube sheet holes then mount the left tab of the bracket into fan housing bracket re-using screws from side bracket. (See Fig. 3.) Verify that fuses match those specified in the packaging list.

IMPORTANT: Do not drive screws into control box area.

8. Disconnect the OFM wires from the OFC-21 and OFC-23 and IFC-13 or TB10 and save. Remove the two jumper wires between OFC and C2 and discard. Remove the 24-v control wires from OFC and save. Remove and discard OFC.
9. Route all wires connected to LAC sub-assembly follow economizer harness then through bulkhead. Route the transducer harness cable separately from the rest to avoid electrical interference.

The following wiring refers to Fig. 6 (wiring diagram) and Fig. 7 (second relay).

10. Connect violet and brown control wires that were connected to OFC to the violet and brown wires from FR13 and 14. Match the colors.
 - a. Connect BLK 1, YEL 2 and BLU 3 coming from LAC control U, V, and W to the BLK, YEL and BLU OFM wires previously disconnected. Match the colors.
 - b. Connect BLK 6, YEL 7, and BLU 8 coming from fuse block to C2-11, C2-13 and IFC- 13 or TB10 for 208/230 units with electric heaters installed.
 - c. Connect the GRN/YEL ground wire to the ground screw in the control box used to ground the outdoor fan motor.
 - d. For 400-3-50 units, move the orange control wire from TB-1 to TB-13C on the LAC as indicated in Fig. 6.
11. Orange wire (FR- H) to LCTB "W1".
12. Brown wire (FR- H) to LCTB "C" 24-v common.
13. Remove the cap from the discharge line service port of Circuit 1 and connect the check valve tee (EC36SZ061) to the port.

⚠ WARNING

PERSONAL INJURY HAZARD

Failure to follow this warning could result in personal injury or death.

Orient the valve so that the ports are directed away from the access panel.

14. Attach service port cap to check valve tee.
15. Connect transducer HK05ZZ011 to check valve tee.
16. Connect transducer harness cable to transducer.
17. Bundle any excess wire and dress harnesses with wire ties.
18. Place the appropriate wiring label on the control box cover.
19. Reattach control box cover, compressor access panel and indoor blower panel.
20. Place the caution label on the top cover above the control box near the outdoor fan grill.

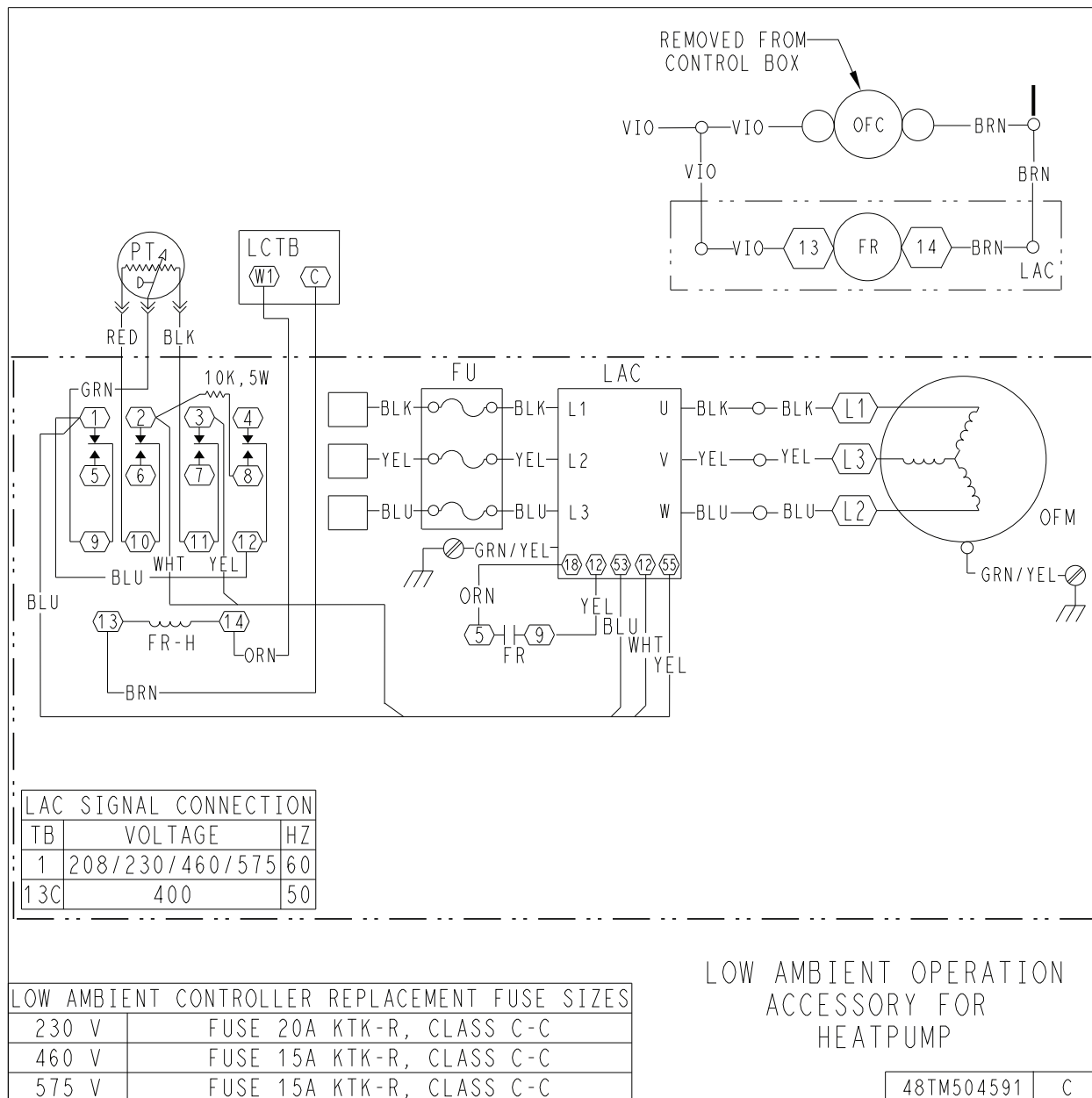


Fig. 6 — Wiring Diagram — Heat Pump Only

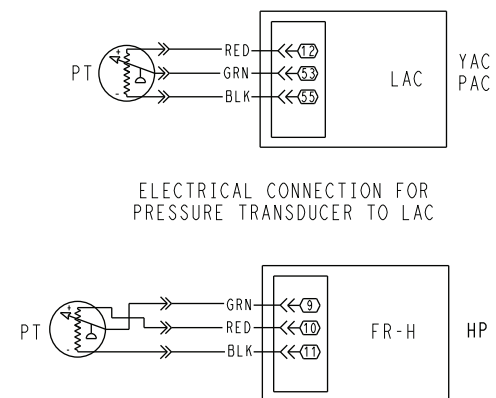
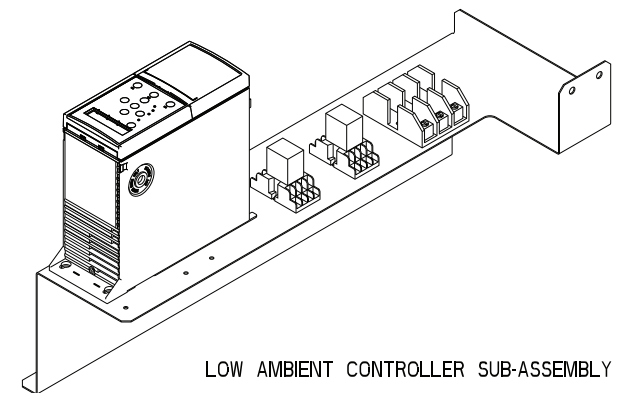
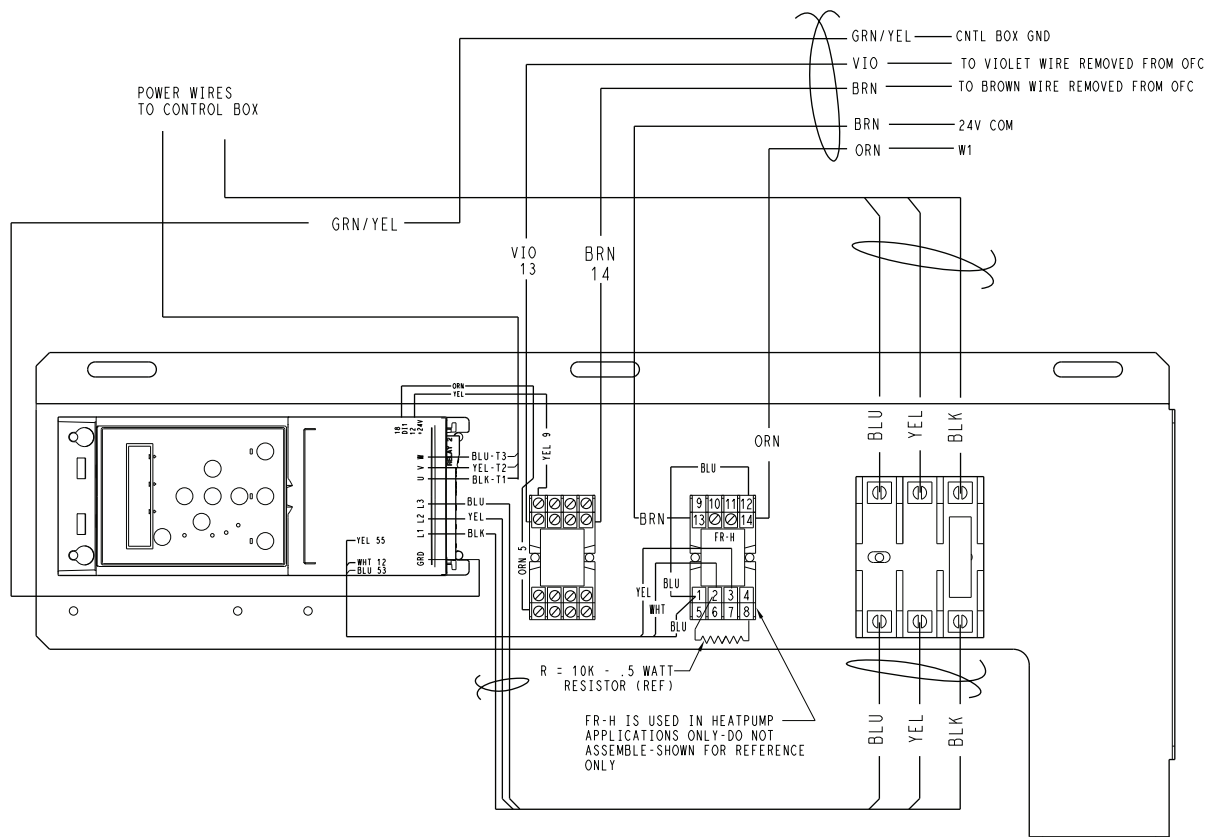
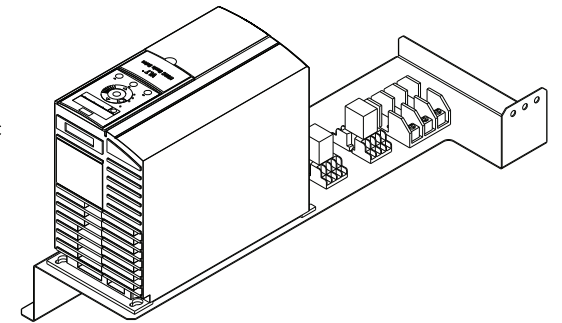
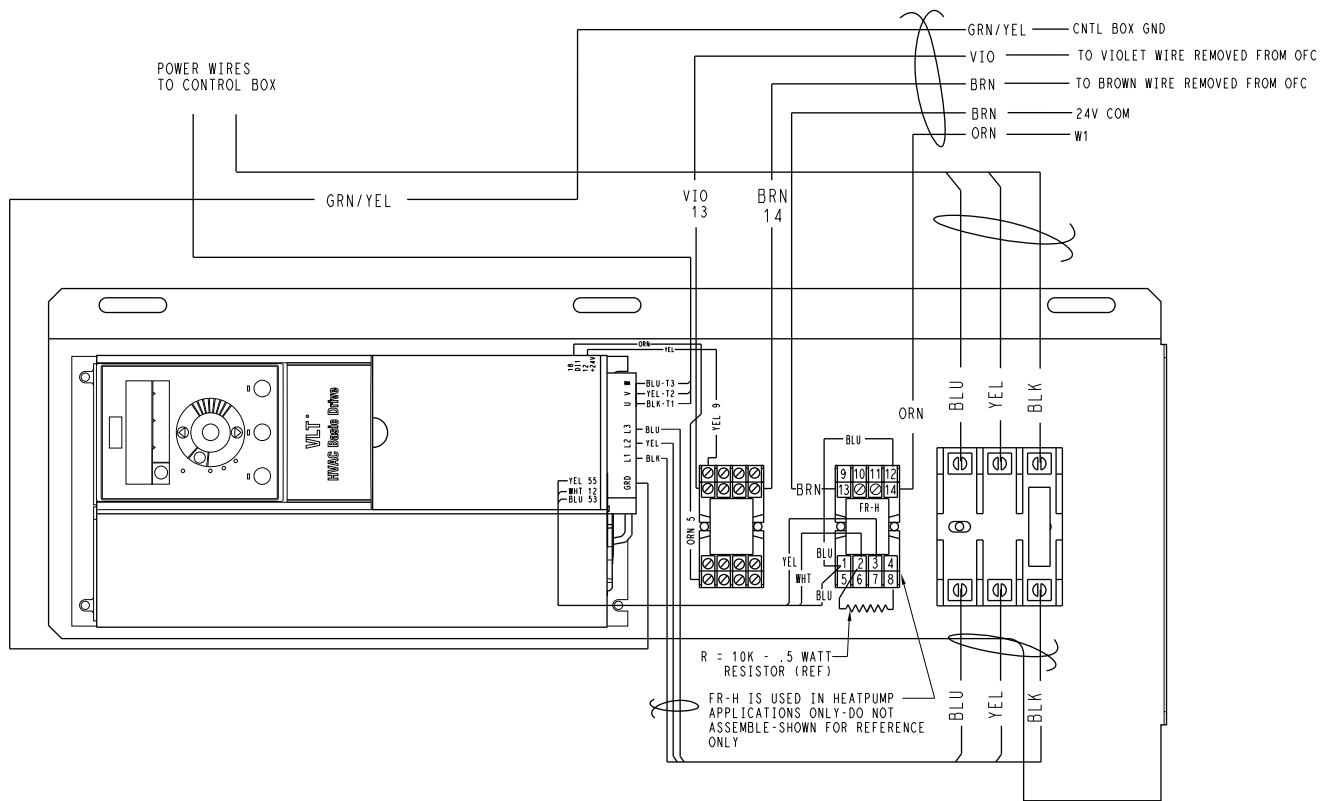
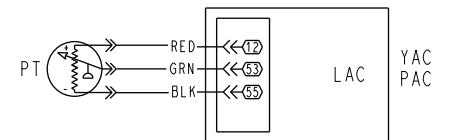


Fig. 7 — Assembly for Second Relay — 230/460V Heat Pump Only



LOW AMBIENT CONTROLLER SUB-ASSEMBLY



ELECTRICAL CONNECTION FOR PRESSURE TRANSDUCER TO LAC

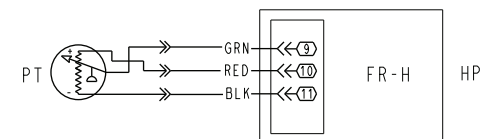


Fig. 8 — Assembly for Second Relay — 575V Heat Pump Only

Step 3 — Configure the Low Ambient Controller

The Low Ambient Controller is configured for an operation mode of internal PI (pressure independent) control and 4 to 20 mA feedback by installing the start contactor according to Table 9. No additional programming is required.

NOTE: The pressure transducer must be attached for proper configuration.

Table 9 — Configuration Table

NOMINAL VOLTAGE (V-Ph-Hz)	CONTROL INPUT (Pin 53)	START CONTACT
230-3-60 460-3-60 575-3-60	Internal PI control, 4 to 20 mA feedback	TB1-TB2
400-3-50	Internal PI control, 4 to 20 mA feedback	TB13C-TB2

Step 4 — Test Low Ambient Controller

To test the control and motor in the test mode, run compressor no. 1. The Low Ambient Controller electronic control adjusts the fan speed based on the discharge pressure input. Ensure that fans are rotating clockwise (as viewed from above). If rotation is backward, lock out all power then swap 2 leads AFTER the Low Ambient Controller.

START-UP

The Low Ambient Controller electronic control will be powered up as long as unit voltage is present. When the system calls for cooling, the fan relay will be energized to initiate the start-up sequence for the Low Ambient Controller. The Low Ambient Controller will start the condenser fan when the compressor engages. The control will adjust the fan speed to maintain approximately 200 psig discharge pressure. Above that pressure, the fan should operate at full speed.

The Low Ambient Controller uses a 4 to 20 mA signal input from a pressure transducer attached to the liquid line service valve gauge port on circuit A. The pressure transducer is connected to terminals 2, 5 and 6 on the controller. The controller is configured by jumper wires and sensor input types. Field programming is required. If controller does not function properly, the information provided below can be used to program and troubleshoot the drive.

Drive Programming

Table 10 on page 13 shows all program parameters for each of the operating modes. Refer to “TROUBLESHOOTING” on page 14 before attempting to change programming in the Low Ambient Controller.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in personal injury and damage to equipment.

It is strongly recommended that the user NOT change any programming without consulting service personnel. Unit damage may occur from improper programming.

NOTE: No password is required to reprogram the Low Ambient Controller.

Local Control Panel (LCP)

The Local Control Panel (LCP) as shown in Fig. 9 consists of the following sections:

- Alphanumeric display
- Menu key
- Navigation Keys and Status LEDs
- Operation Keys and LEDs

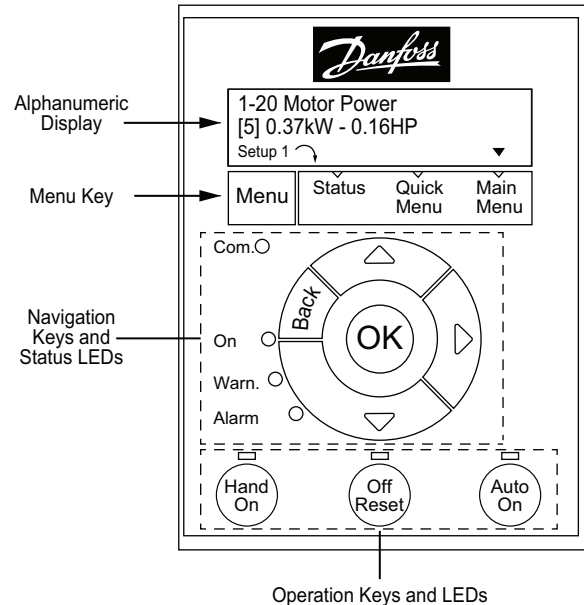
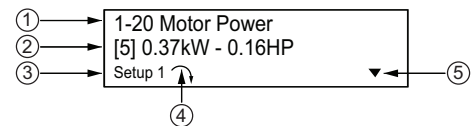


Fig. 9 — Local Control Panel (LCP)

ALPHANUMERIC DISPLAY

The LCD display is back lit with 2 alphanumeric lines. All data is displayed on the LCD display.



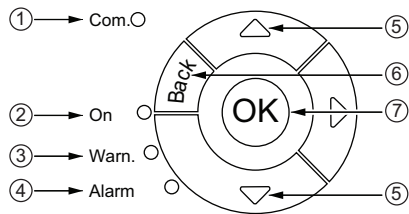
1	Parameter number and name.
2	Parameter value.
3	Setup number shows the active setup and edit setup. If the same setup acts as both the active and edit setup, only that setup number is shown (factory setting). When the active and edit setup differ both numbers are shown in the display (SETUP 12). The flashing number indicates the edit setup.
4	The symbol in the number 4 position in the figure above indicates motor direction. The arrow points either clockwise or counter-clockwise to show the motor's current direction.
5	The position of the triangle indicates the currently selected menu: Status, Quick Menu or Main Menu.

MENU KEY

Use the Menu key (see Fig. 9) to select between Status, Quick Menu or Main Menu. The triangle icon at the bottom of the alphanumeric display indicates the currently selected mode. See number 5 in the table above.

NAVIGATION KEYS AND STATUS LEDS

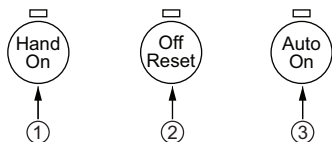
The Navigation keys and Status LEDs are detailed in the following table.



1	Com. LED: Flashes when bus communications is communicating.
2	On (Green LED): Control selection is working.
3	Warn.(Yellow LED): Indicates a warning
4	Alarm (flashing Red LED): Indicates an alarm.
5	Up ▲ and Down ▼ Arrow keys: Use the Up and Down arrow keys to navigate between parameter groups, parameters and within parameters. Also used for setting local reference.
6	Back key: Press to move to the previous step or layer in the navigation structure.
7	OK key: Press to select the currently displayed parameter and for accepting changes to parameter settings.

OPERATION KEYS AND LEDS

The following table details the functions of the Operating keys. An illuminated yellow LED above the key indicates the active key.



1	Hand On key: Starts the motor and enables control of the low ambient controller (LAC) via the LCP keypad. NOTE: Please note that terminal 27 Digital Input (5-12 Terminal 27 Digital Input) has coast inverse as default setting. This means that the Hand On key will not start the motor if there is no 24V to terminal 27, so be sure to connect terminal 12 to terminal 27.
2	Off/Reset key: Stops the motor (off). If in alarm mode the alarm will be reset.
3	Auto On key: The low ambient controller is controlled either via control terminals or serial communication.

Changes Made Function

The changes made function lists all parameters changed from the default setting.

- The list shows only parameters that have been changed in the current edit setup.
- Parameters have been reset to default values are not listed.
- The message *Empty* indicates that no parameters have been changed.

CHANGING PARAMETER SETTINGS

Use the following procedure to change parameter settings

1. To enter the Quick Menu, press the Menu key until the triangle indicator in the display is placed above Quick Menu.
2. Press the Up (▲) or Down (▼) arrow keys to select the wizard, closed-loop setup, motor setup, or changes made.
3. Press the OK key.
4. Press ▲ or ▼ to browse through the parameters in the Quick Menu.
5. Press the OK key to select a parameter.
6. Press ▲ or ▼ to change the value of a parameter setting.
7. Press the OK key to accept the change.
8. Press either the Back key twice to enter Status, or press the Menu key once to enter the Main Menu.

ACCESSING ALL PARAMETERS VIA THE MAIN MENU

Use the following procedure to access all parameters via the Main Menu

1. Press the Menu key until the triangle indicator in the display is placed above Main Menu.
2. Press the Up (▲) or Down (▼) arrow keys to browse through the parameter groups.
3. Press the OK key to select a parameter group.
4. Press the Up (▲) or Down (▼) arrow keys to browse through the parameters in the specific group.
5. Press the OK key to select the parameter.
6. Press the Up (▲) or Down (▼) arrow keys to set/change the parameter value.
7. Press the OK key to accept the change.

Table 10 — Low Ambient Control Parameters per Accessory Part Number

PARAMETERS	DISCRIPTION	LOW AMBIENT CONTROL PART NUMBER		
		CRLOWAMB030B00	CRLOWAMB031B00	CRLOWAMB032B00
0-03	Regional Settings	[1]	[1]	[1]
0-06	Grid Type	[102]	[122]	[132]
1-20	Motor Power	[9]	[9]	[9]
1-22	Motor Voltage	230	460	575
1-23	Motor Frequency (Hz)	60	60	60
1-24	Motor Current (Must-Hold Amps)	6.4	3.2	2.6
1-25	Motor Nominal Speed	1140	1140	1150
1-71	Start Delay (Sec)	0	0	0
1-73	Flying Start	1	1	1
1-82	Min Speed for Function (Hz)	0	0	0
1-90	Motor Thermal Protection	4	4	4
3-02	Minimum Reference	9	9	9
3-03	Maximum Reference	60	60	60
3-41	Ramp Up Time (Sec)	40	40	40
3-42	Ramp Down Time (Sec)	40	40	40
4-18	Current Limit	110	110	110
5-10	Terminal 18 Digital Input	8	8	8
5-11	Terminal 19 Digital Input	0	0	0
5-12	Terminal 27 Digital Input	0	0	0
5-13	Terminal 29 Digital Input	0	0	0
6-10	Terminal 53 Low Voltage	0	0	—
6-11	Terminal 53 High Voltage	0	0	—
6-12	Terminal 53 Low Current	11	11	11
6-13	Terminal 53 High Current	12.22	12.22	12.22
6-14	Terminal 53 Low Reference	0	0	—
6-15	Terminal 53 High Reference	0	0	—
6-19	Terminal 53 mode	0	0	0
6-20	Terminal 54 Low Voltage	0	0	0
6-21	Terminal 54 High Voltage	0	0	0
6-25	Terminal 54 High Ref./Feedb. Value	0	0	0
8-30	Protocol	—	—	—
8-31	Address	—	—	—
8-32	Baud Rate	—	—	—
8-33	Parity / Stop Bits	—	—	—
14-20	Reset Mode	3	3	3
14-21	Auto. Restart Time (S)	10	10	10
14-29	Service Code	—	—	—
14-50	RFI Filter	0	0	0

LEGEND

— Not Applicable

TROUBLESHOOTING

Troubleshooting the Low Ambient Controller requires a combination of observing system operation and VFD (variable frequency drive) display information. See Table 11 for a listing of Faults and Alarms/Warnings and their causes.

Loss of CCN Communications

Carrier Comfort Network® (CCN) communications with external control systems can be affected by high frequency electrical noise generated by the Low Ambient Controller. Ensure unit is well grounded to eliminate ground currents along communication lines.

If communications are lost only while Low Ambient Controller is in operation, order a signal isolator (CEAS420876-2) and power supplies (CEAS221045-01, 2 required) for the CCN communication line.

Table 11 — Fault and Alarm/Warning Numbers

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 the value set in parameter 6-10 Terminal 53 Low Voltage, parameter 6-12 Terminal 53 Low Current, or parameter 6-20 Terminal 54 Low Voltage.
4	14	Mains ph. loss	X	X	X	Missing phase on the supply side or too high voltage imbalance. Check supply voltage.
7	11	DC over volt	X	X	—	DC-link voltage exceeds the limit.
8	10	DC under volt	X	X	—	DC-link voltage drops below voltage warning low-limit.
9	9	Inverter overload	X	X	—	More than 100% load for a long time.
10	8	Motor ERT over	X	X	—	Motor is too hot due to more than 100% load for a long time. See parameter 1-90 Motor Thermal Protection.
11	7	Motor th over	X	X	—	Thermistor or thermistor connection is disconnected. See parameter 1-90 Motor Thermal Protection.
13	5	Over Current	X	X	X	Inverter peak current limit is exceeded.
14	2	Earth Fault	—	X	X	Discharge from output phases to ground.
16	12	Short Circuit	—	X	X	Short circuit in motor or on motor terminals.
17	4	Ctrl. word TO	X	X	—	No communication to drive.
24	50	Fan Fault	X	X	—	The heat sink cooling fan is not working (only on 400 V, 30-90 kW units.)
30	19	U phase loss	—	X	X	Motor phase U is missing. Check the phase.
31	20	V phase loss	—	X	X	Motor phase V is missing. Check the phase. See parameter 4-58 Missing Motor Phase Function.
32	21	W phase loss	—	X	X	Motor phase W is missing. Check the phase. See parameter 4-58 Missing Motor Phase Function.
38	17	Internal fault	—	X	X	Contact your local service representative.
44	28	Earth Fault	—	X	X	Discharge from output phases to ground.
46	33	Control Voltage Fault	—	X	X	Control voltage is low. Contact your local service representative.
47	23	24 V supply low	X	X	X	24 V DC supply may be overloaded.
50	—	AMA calibration failed	—	X	—	Contact your local service representative.
51	15	AMA Unom, Inom	—	X	—	The setting of motor voltage, motor current, and motor power is 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 to perform AMA.
54	—	AMA small mot	—	X	—	The motor is too small to perform AMA.
55	—	AMA par. range	—	X	—	The parameter values found from the motor are outside the 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. ^a
58	—	AMA internal	X	X	—	Contact your local service representative.
59	25	Current limit	X	—	—	The current is higher than the value in parameter 4-18 Current Limit.
60	44	External Interlock	—	X	—	External interlock has been activated. To resume normal operation, apply 24 V DC to the terminal programmed for external interlock and reset the drive (via serial communication, digital I/O, or by pressing the [Reset] key on the Local Control Panel (LCP)).
66	26	Heat sink Temperature Low	X	—	—	This warning is based on based on the temperature sensor in the IGBT module (on 400 V, 30-90 kW (40-125 hp) and 600 V units).
69	1	Pwr. Card Temp	X	X	X	The temperature sensor on the power card exceeds the upper or lower limits.

Table 11 — Fault and Alarm/Warning Numbers(cont)

FAULT NUMBER	ALARM/WARNING BIT NUMBER	FAULT TEXT	WARNING	ALARM	TRIP LOCKED	CAUSE OF PROBLEM
70	36	Illegal FC configuration	—	X	X	The control card and power card are not matched.
79	—	Illegal power selection configuration	X	X	—	Internal fault. Contact your local service representative.
80	29	Drive initialized	—	X	—	All parameter settings are initialized to default settings.
87	47	Auto DC Breaking	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.
126	—	Motor Rotating	—	X	—	High back EMF voltage. Stop the rotor of the PM motor.
200	—	Fire Mode	X	—	—	Fire mode has been activated.
202	—	Fire Mode Limits Exceeded	X	—	—	Fire mode has suppressed 1 or more warranty voiding alarms.
250	—	New spare part	—	X	X	The power or switch mode power supply has been exchanged (on 400 V, 30-90 kW (40-125 hp) and 600 V units). Contact your local service representative.
251	—	New Typecode	—	X	X	The drive has a new type code (on 400 V, 30-90 kW (40-125 hp) and 600 V units). Contact your local service representative.

NOTE(S):

- a. NOTICE - Repeated runs may heat the motor to a level where the resistance R_s and R_r are increased. In most cases, however, this is not critical.

LEGEND

— Not Applicable

