

Electric Heater Kit
For use with GB, GP and GT
Geothermal Heat Pumps

KW(A, B, C)EH0101N05
KW(A, B, C)EH0101N10
KW(A, B, C)EH0101F15
KW(A, B, C)EH0101F20


Installation Instructions

NOTE: Read the entire instruction manual before starting the installation.

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit.. Consult local building codes and current editions of the National Electrical Code (NEC) NFPA 70. In Canada, refer to current editions of the Canadian electrical code CSA 22.1.

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, and CAUTION. 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.

Before beginning any installation or modification, be sure the main electrical disconnect switch is in the OFF position. TAG THE DISCONNECT SWITCH WITH A SUITABLE WARNING LABEL

Unit contains two power supplies - make sure BOTH are off before servicing.

CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in compressor damage.

NEVER turn unit on its top or side to install support feet.

CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in unit damage.

This Electric Heater Kit is designed for installation in the heat pump model published in this document. Do not install this heater kit in a heat pump not specified in this manual.

CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when handling parts.

INTRODUCTION

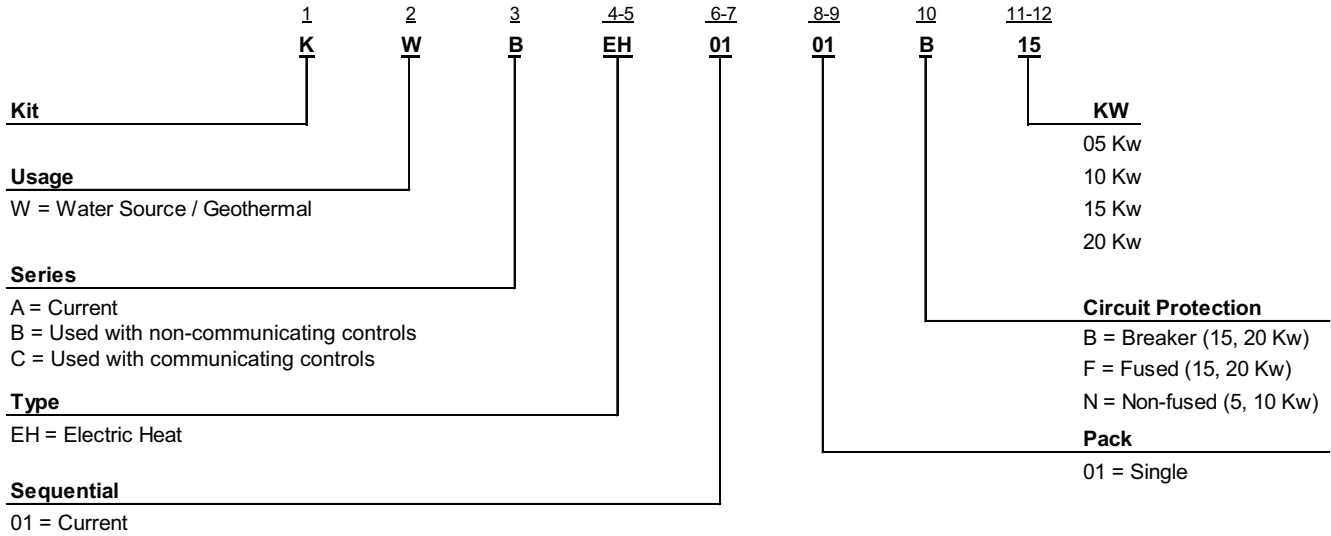
The Electric Heater Kit is a field installable electric resistance heater kit designed for the GB, GP and GT series heat pumps.

The heater kit requires separate electrical service connection, independent from the heat pump's power supply. Installation of this Heater Kit will convert the heat pump into a two point power connection. The Heater Kit is available in several kW capacities. Unit tonnage vs Heater Kit capacity compatibility table is below. The Heater Kit can be installed on vertical (VT), horizontal (HZ) and counter-flow (CF) units.

Aux. Heat Size Compatibility				
GHP Model	5 Kw	10 Kw	15 Kw	20 Kw
GT024	•	•	—	—
GT036	•	•	•	—
GT048	•	•	•	•
GT060	•	•	•	•
GT072	•	•	•	•
GP024	•	•	—	—
GP036	•	•	—	—
GP048	•	•	•	—
GP060	•	•	•	•
GP072	•	•	•	•
GB018	•	—	—	—
GB024	•	•	—	—
GB030	•	•	—	—
GB036	•	•	•	—
GB042	•	•	•	—
GB048	•	•	•	•
GB060	•	•	•	•

• = Heater Kit compatible / — = Heater Kit NOT compatible

AUXILIARY HEATER KIT NOMENCLATURE



PRE-INSTALLATION

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in unit damage.
DO NOT wire the heater elements into the same circuit as the compressor.

IMPORTANT: For ease of installation, it is recommended to guide heater elements into heater collar before installing ductwork.

IMPORTANT: Electric Heater Kit can only be installed on single phase units.

IMPORTANT: A heater collar is installed in the geothermal heat pumps so there is no need to order a collar separately.

IMPORTANT: A heat pump thermostat with supplemental electric heat feature is required to operate the system when this kit is installed.

IMPORTANT: Electric Heat is NOT available for any side-discharge models. Duct heaters should be used if electric heat is desired for side discharge units. Check with your local distributor for available duct heaters per your duct design.

Unpacking and Inspection

1. Unpack the heater kit and inspect contents and condition. If any part or the kit appears damaged (i.e.: broken heater elements, damage relays) or missing, do not attempt to install the kit. Contact your local distributor for further help.
2. Ensure that the heater kit package includes all the listed components. Contact your local distributor for further help.

EH Kit Components List:

- Pre-wired heater electrical box
- Heater elements
- Heater element(s) protective metal cover
- Wire harness pre-wired at one end.
- Wiring diagram
- Adhesive backed electrical data label
- Clear hardware accessory bag containing:
 - Heater element mounting screws (4 for each element bank)
 - Heater element cover mounting screws (2 for each cover)
 - Four electrical box mounting screws
 - Wire ties (2)
 - This installation manual

Required Tools:

- Phillips screwdriver (for GP & GB only)
- Small flat head screwdriver
- Field Heater Conversion Kit #8733939981 for GP and GB units. (This kit is included in the GP and GB units from the factory. If a kit is needed, please contact your local distributor.)

ELECTRIC HEAT KIT

The Electric Heat field installed kit contains two main electrical enclosures: Electric Heat Control Box and Electric Heat Elements, both are located in the blower compartment. (Fig. 1 through Fig. 4) The control box attaches to the corner post and the heat elements to the blower heater collar in the blower compartment.

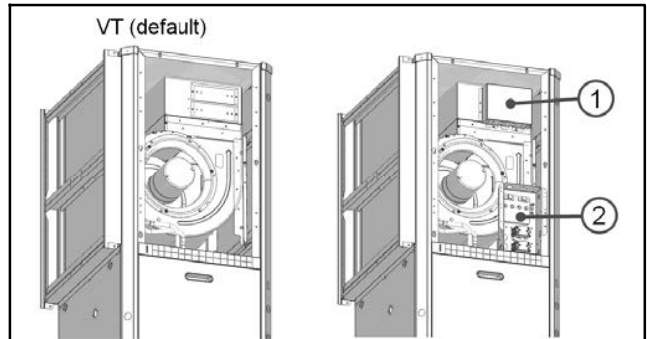


Fig. 1 — Electric Heater Element Cover (1) and Electric Heat Control Box (2) Location - Vertical Configuration

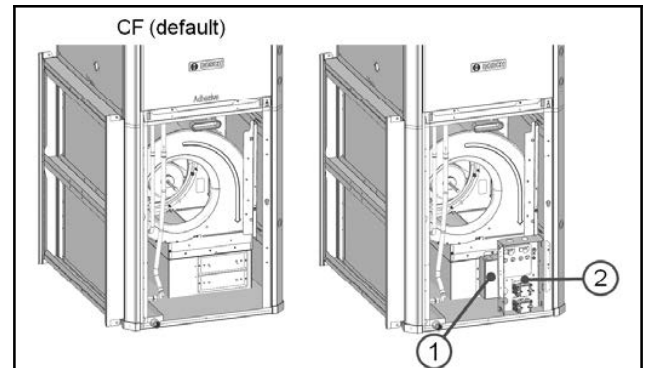


Fig. 2 — Electric Heater Element Cover (1) and Electric Heat Control Box (2) Location - Counter-flow Configuration

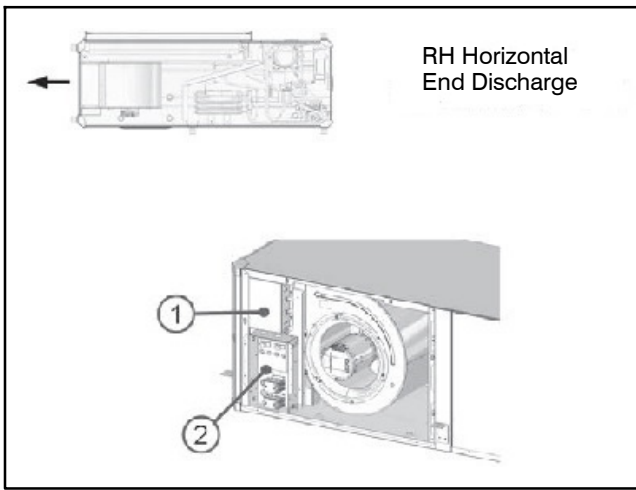


Fig. 3 — Electric Heater Element Cover (1) and Electric Heat Control Box (2) Location - RH Horiz. End Discharge Config.

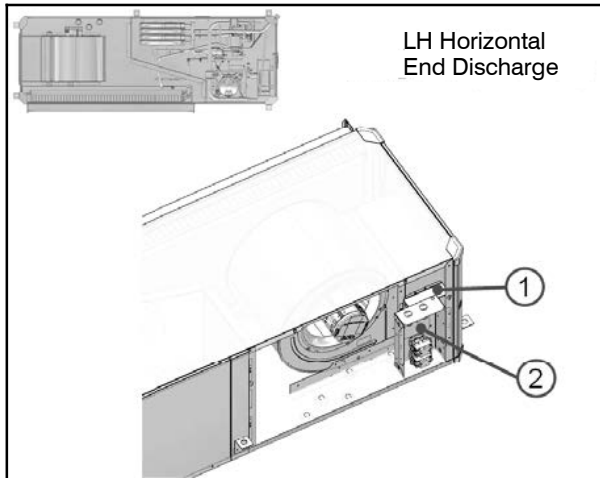


Fig. 4 — Electric Heater Element Cover (1) and Electric Heat Control Box (2) Location - LH Horiz. End Discharge Config.

INSTALLATION - HARDWARE

1. At Thermostat Turn system to "OFF"
2. Turn the main power to the heat pump to "OFF" at the unit's disconnect switch or breaker panel.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Before beginning any installation or modification, be sure the main electrical disconnect switch is in the OFF position. TAG THE DISCONNECT SWITCH WITH A SUITABLE WARNING LABEL

Unit contains two power supplies - make sure BOTH are off before servicing.

3. Prior to removing the blower panel, disconnect unit display from the back of the panel (GT unit only). See Fig. 5

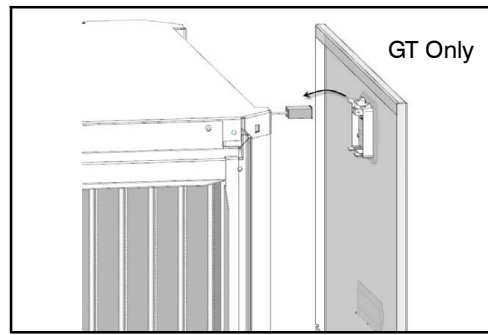


Fig. 5 — Disconnect Unit Display

4. Remove the access panel(s) from the unit exposing the blower section and compressor section of the packaged heat pump unit.
5. Remove the heater collar cover plate(s) (see Fig. 6)

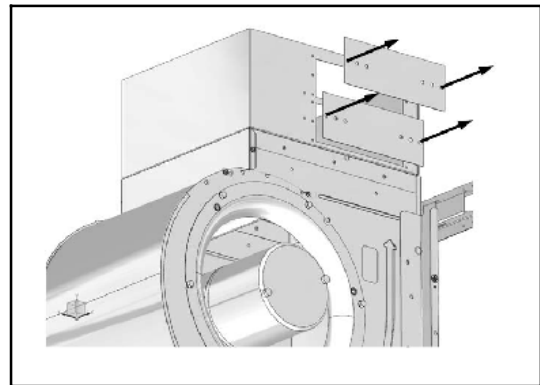


Fig. 6 — Heater Collar Cover Plate Removal

6. In preparation for heater element installation, orient the heating elements with thermal overloads (cut-outs) as shown in Fig. 7. This will ensure the heater elements are exposed to airflow.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in unit damage.

Proper thermal overloads (cut-outs) orientation is required for safe unit operation.

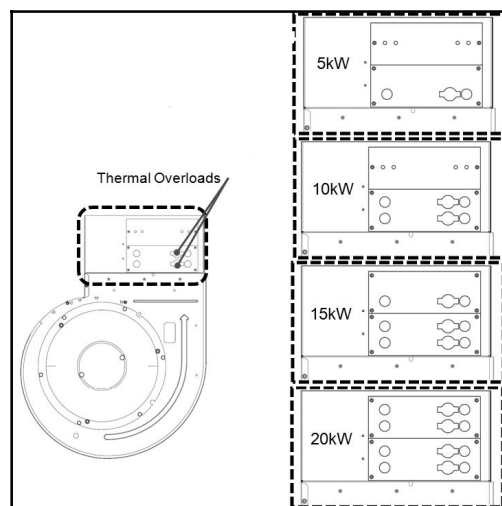


Fig. 7 — Thermal Overloads Cut-Outs

7. Remove two (2) wire ties as applicable on element kits (15 & 20 kw).

8. Insert heating element(s) into collar. Heating element rods must be inserted into inner most holes as shown in Fig. 9. This will support and prevent vibration of heater elements.

IMPORTANT: GT Series model sizes 060 and 072 have an additional extension bracket mounted on each cover plate. Heating element rods must be aligned to extension brackets accordingly. See Fig. 8.



Fig. 8 — Extension Bracket

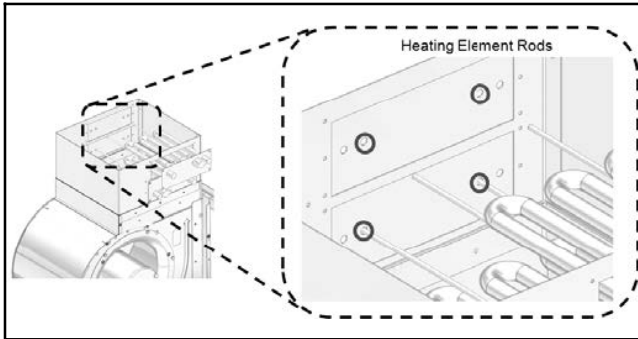


Fig. 9 — Heating Element Rods

IMPORTANT: If only one heating element is being installed, install it into the position closest to the blower wheel. Cover remaining opening with one of the cover plates removed in step 5. See Fig. 7.

9. Secure each insert with four of the supplied sheet metal screws (see Fig. 10)

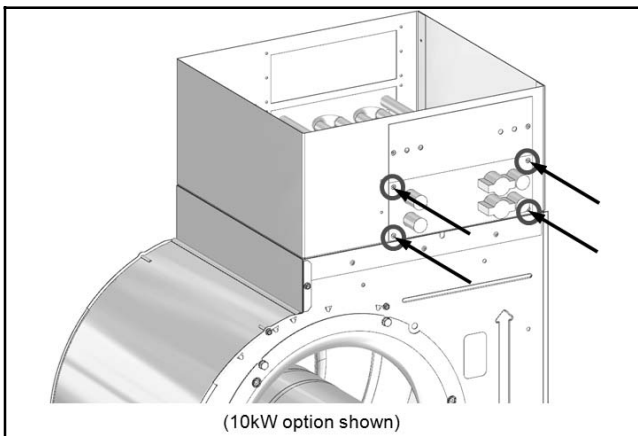


Fig. 10 — Secure Insert with Supplied Sheet Metal Screws

INSTALLATION - WIRING

The electric heater control box is completely pre-wired from the factory.

There are three Electric Heater control box layouts depending on heater kit model (see Fig. 11, 12 and 13)

HR1 controls heating elements 1 and 3 and HR2 controls heating elements 2 and 4.

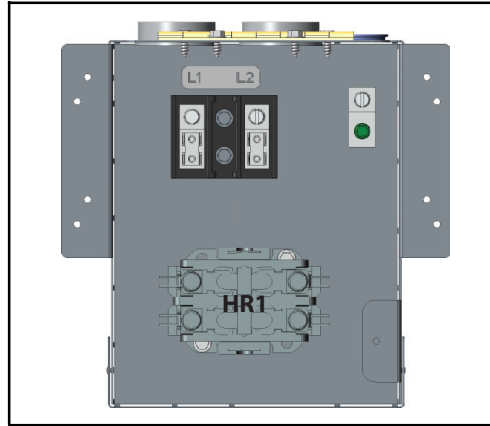


Fig. 11 — 5kW Control Box (KWAEH0101N05)

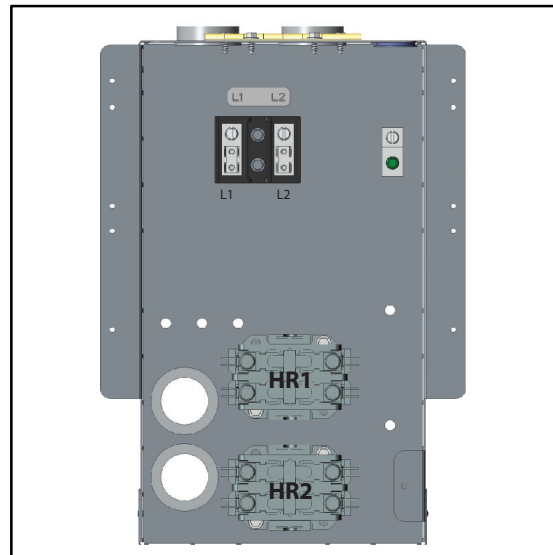


Fig. 12 — 10kW Control Box (KWAEH0101N10)

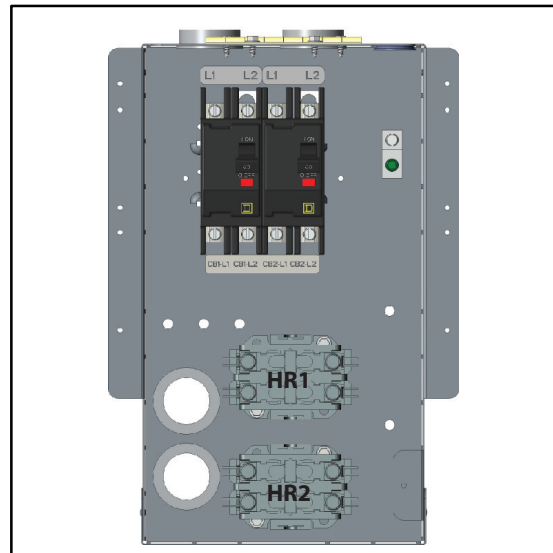


Fig. 13 — 15kW-20kW Control Box (KWAEH0101F15 / KWAEH0101F20)

Mount Heating Element Protective Cover

1. High voltage red and black wires are already separated and routed through grommets. Route the red wires through one cover hole and the black wires through the second cover hole as shown in Fig. 14.
2. Snap loose grommet in place on respective cover holes as per Fig. 14.
3. Remove two (2) screws on heater collar as shown in Fig. 15.
4. Mount protective cover to blower collar using four (4) screws as shown in Fig. 16.

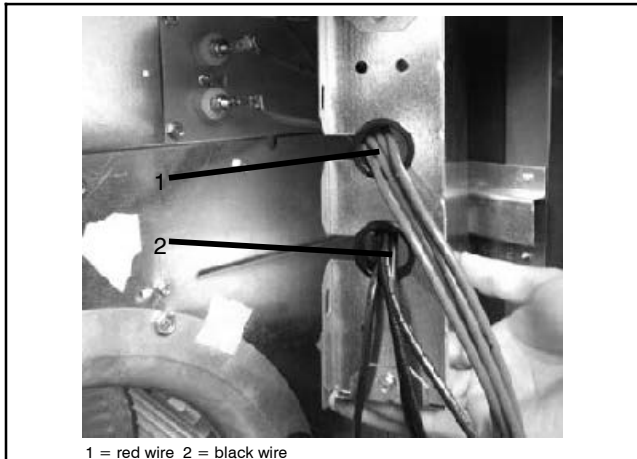


Fig. 14 — Routing Red and Black Wires

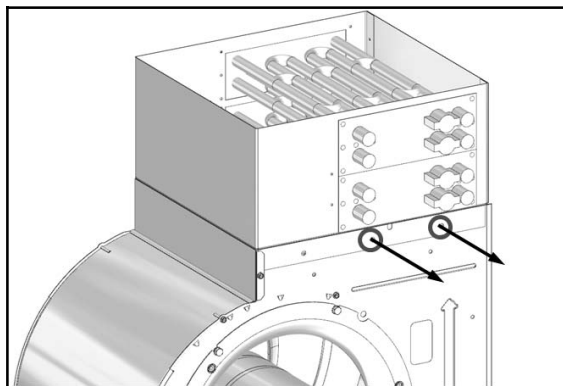


Fig. 15 — Remove Two (2) Screws

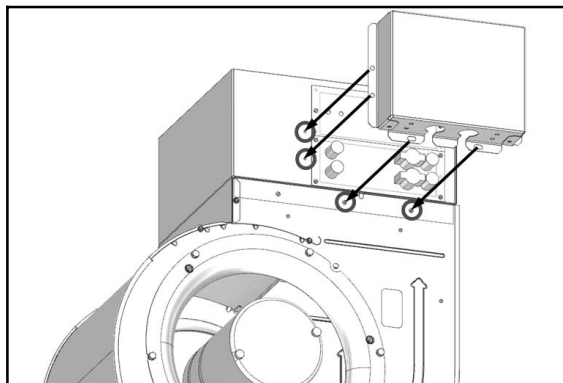


Fig. 16 — Mount Heater Element Cover to Blower Collar

EH Control Box Installation

1. Install heater control box per Fig. 1 - 4. Orient the heater control box with the contact(s) toward the bottom.
2. The GT unit corner post has pre-punched holes to align the EH control box to the back side of the insulated post for mounting. Use the 3/4" 10# screws to mount the control box.

3. The GP and GB units may require the field to pre-drill an additional mounting hole to secure the EH control box to the corner post. Mount to the back side of the corner post.

Route the EH Wiring Through Cabinet Divider Panel

1. Remove the cork tape around blower harness panel penetration hole to allow space to route electric heater wires.
2. On the wiring harness supplied with kit, identify the J39 plug.
3. Route J39 plug from the compressor compartment through the hole where cork tape was removed, towards the blower compartment. The 4 connector end will remain in the compressor compartment.
4. Reapply cork tape to wire route hole in divider panel.
5. Connect J39 plug into the connector P39 on the side of the electric heat control box. See Fig. 17.

NOTE: The control box is designed to allow the P39 connector to be relocated in the field to the opposite side of the control box for right-return air configuration.

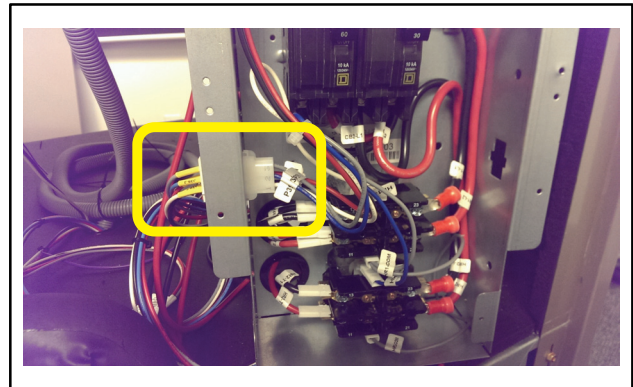


Fig. 17 — Connect J39 Plug Into P39 Connector

Route the EH Harness to E-Box

⚠ CAUTION

PERSONAL INJURY AND/OR UNIT DAMAGE HAZARD

Failure to follow this caution may result in personal injury and/or unit damage.

When routing wiring, avoid sharp edges as these can chafe wiring insulation, exposing the conductor which can result in equipment damage and personal injury.

1. The 4 connector end of the EH harness in the compressor compartment should terminate near the unit electrical box (E-box).
2. Locate the blower motor power leads at connection J19/P19 on the left outside of the E-box. The high voltage leads will be black and white. Disconnect this J19/P19 connection.
3. On the Electric Heater Harness, locate the J19 connector.
4. Mate this Electric Heater Harness J19 to the blower harness P19 connector.
5. Locate the contactor red and black wires (off L1 and L2) going to the transformer primary side (connected to 240v and COM) and remove this harness from the E-box. Discard.
6. Locate the red and black wires marked T1 COM and T1 VLT from the electric heater harness. See Fig. 18.
7. Route these red and black wires from EH harness through the lower grommet in the E-box.
8. Connect the red and black wire from EH harness T1 COM to the transformer COM and connect the T1 VLT to the transformer 240v or 208v per the desired primary voltage tap. See Table 1. Keep wires routed under the contactor along the bottom of the E-box. See Fig. 18.

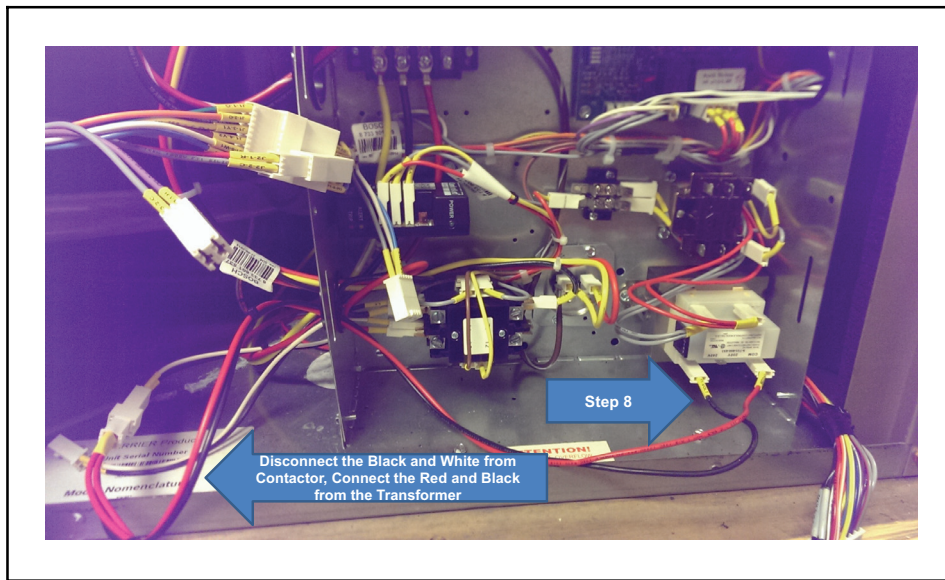


Fig. 18 — Routing EH Harness Into E-box

9. Locate the black and white wires on the left line side of the contactor. Plug end is marked J19 and contactor connections marked L1 and L2/N.
10. Disconnect and discard this harness.
11. Locate, on the electric heater harness, the remaining open plug marked P12.
12. **Low voltage wiring for GT** - Locate, on the inside of the E-box left side, plug J12. Mate EH heater P12 to E-box J12.
Low voltage wiring for GP/GB - Locate, on the inside of Ebox, the "Blue, Red, Purple" pigtail wires connected to unit Thermostat Terminal Block or ECM board. Mate EH heater P12 to these wires as indicated in Fig. 19.
13. Ensure all plug connections are well connected and re-install the E-box cover.

Simplified GT Plug Connections

Read step-by-step instructions before performing the following steps. This table is intended to help simplify the harness connection process.

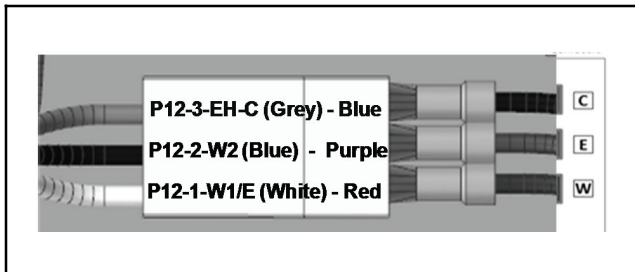
Remove and Discard:

1. Red and black harness from contactor L1 and L2 to the transformer primary.
2. Black and white harness contactor L1/L2N and Plug J19 wire harness.

Connect:

Heater Harness Connections	Mated Connections
J39	EH Box Plug on Side P39
J19	P19 Blower Harness
T1COM	Transformer Primary COM
T1VLT	Transformer Primary (208 or 230 vlt)
P12	J12 Inside E-box on Left Side

Table 1—Simplified GT Plug Connection Table



Heater Wire Harness		Pigtail Wires
P12-3-EH-C (grey)	to	Blue Wire
P12-2-W2 (blue)	to	Purple Wire
P12-1-W1/E (white)	to	Red Wire

Fig. 19 — Heater Harness Connection

Table 2—Electric heater electrical data

Circuit Branches	Fan Motor		208V/240V			Heater Element 208V/240V		
	HP	FLA	MCA	MOCP	Min. Wire Gauge	kW	A	
	5kW Single Circuit	0.33	2.8	25.1 / 28.5	30 / 30	10 / 10	3.6 / 4.8	17.3 / 20
0.5		4.1–4.3	27 / 30.4	30 / 35	10 / 8			
0.75		6	29.1 / 32.5	35 / 35	8 / 8			
0.75–1.0		6.8–7.6	31.1 / 34.5	35 / 40	8 / 8			
1.0		9.1	33 / 36.4	40 / 45	8 / 6			
10kW Single Circuit	0.33–0.5	2.8–4.3	48.6 / 55.4	50 / 60	6 / 4	7.2 / 9.6	34.6 / 40	
	0.75–1.0	6.0–7.6	52.8 / 59.5	60 / 60	4 / 4			
	1.0	9.1	54.6 / 61.4	60 / 70	4 / 4			
15kW Single Circuit	0.75–1.0	6.0–9.1	76.3 / 86.4	80 / 90	2 / 2	10.8 / 14.4	51.9 / 60	
15kW Dual Circuit	Ckt 1 +	0.75–1.0	6.0–7.6	52.8 / 59.5	60 / 60	4 / 4	7.2 / 9.6	34.6 / 40
		1.0	9.1	54.6 / 61.4	60 / 70	4 / 4		
Ckt 2	–	–	21.6 / 25	25 / 30	12 / 10	3.6 / 4.8	17.3 / 20	
20kW Single Circuit	0.75–1.0	6–9.1	97.9 / 111.4	100 / 125	1 / 1	14.4/19.2	69.2/80	
20kW Dual Circuit	Ckt 1 +	0.75–1.0	6–7.6	52.8 / 59.5	60 / 60	4 / 4	7.2 / 9.6	34.6 / 40
		1.0	9.1	54.6 / 61.4	60 / 70	4 / 4		
	Ckt 2	–	–	43.3 / 50	50 / 60	6 / 4	7.2 / 9.6	34.6 / 40

NOTE: Match the blower motor HP and FLA from unit data plate and determine appropriate MCA and MOCP as per table below. + for dual circuits - Ckt 1 includes blower motor FLA for calculation of MCA and MOCP.

THERMOSTAT WIRE CONNECTIONS

1. Assure that two low voltage wires are available from the thermostat to make the “W1” and “W2” connections. If these wires are not located, they will need to be pulled and routed from the back of the thermostat to main thermostat connections on the electrical box or to the motor control board.
2. Strip the insulation off of the “W1” and “W2” wires and insert into the thermostat control wire block or on the motor control board thermostat interface. Connect the other end of the wires to the back of the thermostat to the supplemental and emergency heat terminals. Reference the Thermostat Manual for proper connection.

SITE LINE VOLTAGE CONNECTION

Routing new line voltage wires from circuit breaker panel to heater electrical box:

1. Select the proper wire size based upon the heater electrical load that the blower motor and electric heater element(s) will require. Refer to the data tag label that is included in the heater kit or the Electric Heater Electrical Data Table 2. Ensure that all national and local electrical codes are followed for installation, wire sizing, and breaker sizing.
2. Select the proper breaker size based upon the heater electrical load that the heat pump will require. Refer to Electric Heater Electrical Data Table 2.
3. Route the new line voltage wiring and the ground wire from the circuit breaker panel to the heat pump.
4. Use the knockout provided in the heat pump corner post as the entry for the electrical service wiring.
5. Connect line voltage to:
 - “L1” and ”L2” terminal connection for single circuit electric heat or,
 - “L1” and ”L2” in CB1 and “L1” and ”L2” in CB2 for dual circuit electric heat.

Note: Refer to Fig. 20 - Electric Heater Wiring Diagram.

6. Use the ground lug provided in the heater control box to connect the field ground from the power supply.

WIRING DIAGRAM PLACEMENT

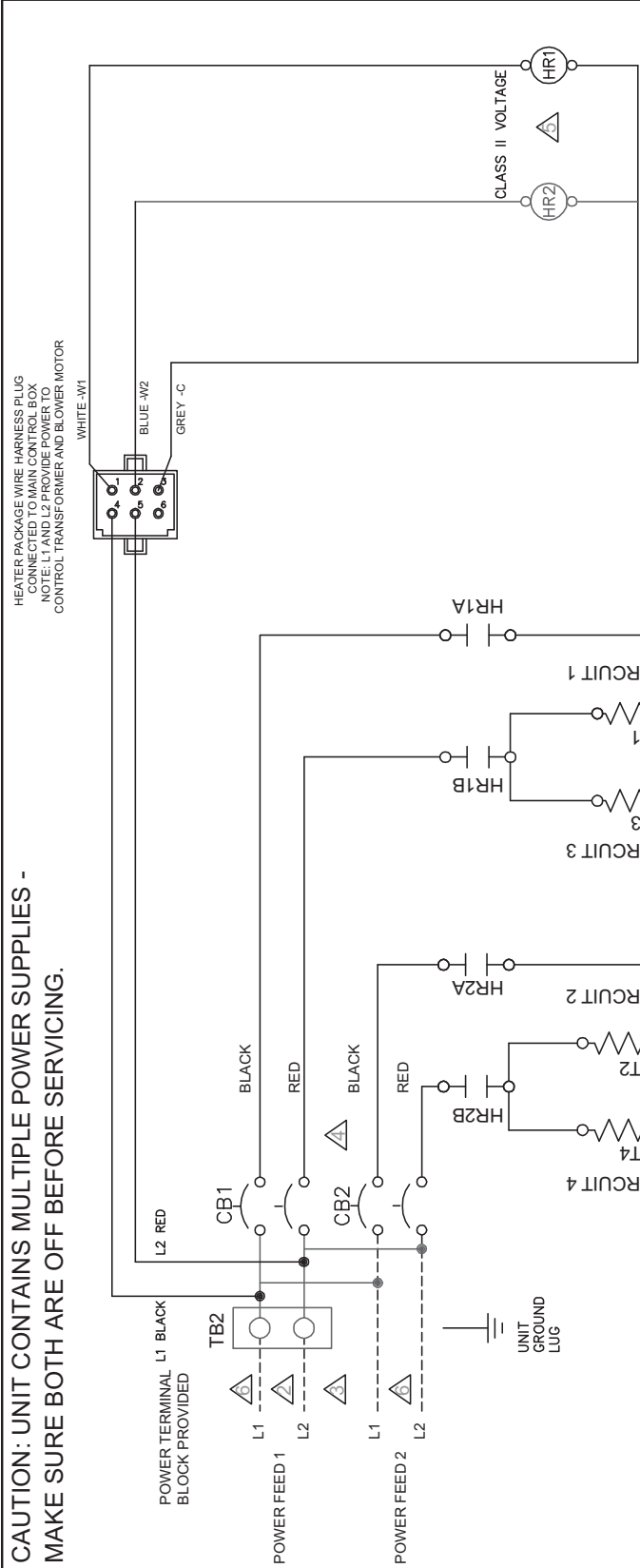
1. Remove the wiring diagram that is adhered to the back side of the front panel. Replace with the wiring diagram that was included with the heater kit.
2. Place the adhesive backed heater data label next to the knockout in the post where the new electrical service for the fan motor and heater elements is entering the cabinet.

UNIT START-UP

1. Turn the disconnect switch or breaker switch to the “ON” position for the compressor and for the new separate circuit servicing the blower motor and the heating elements.
2. Run the unit in Emergency mode with the heating elements engaged for at least 10 minutes to ensure the unit does not shut down due to any temperature limiting device.

WIRING DIAGRAMS

CAUTION: UNIT CONTAINS MULTIPLE POWER SUPPLIES - MAKE SURE BOTH ARE OFF BEFORE SERVICING.



HEATER PACKAGE WIRE HARNESS PLUG CONNECTED TO MAIN CONTROL BOX NOTE: L1 AND L2 PROVIDE POWER TO CONTROL TRANSFORMER AND BLOWER MOTOR

STANDARD COMPONENTS:

- CB1, 2 - CIRCUIT BREAKER 1 AND 2
- HLS - HIGH TEMP LIMIT SWITCH
- HT1-4 - HEATER ELEMENT (1-4)
- HR1, 2 - HEATER RELAY 1 AND 2
- TB2 - POWER INTERCONNECT TERMINAL BLOCK

- ▲ SEE UNIT NAME PLATE FOR ELECTRICAL RATING
- ▲ ALL FIELD WIRING MUST BE IN ACCORDANCE WITH NEC - NFPA 70
- ▲ USE COPPER CONDUCTORS ONLY - CONDUCTEURS EN CUIVRE SEULEMENT.
- ▲ ONLY HEATER KITS 15 - 20 KW ARE EQUIPPED WITH CIRCUIT BREAKERS (CB).
- ▲ THERMOSTATS USING W2/E AS EMERGENCY HEAT SIGNAL MUST TERMINATE BLUE WIRE ON HR1 COIL ON UNITS USING 5KW AND/OR 10KW.
- ▲ TB2 ONLY USED ON UNITS EQUIPPED WITH 5 - 10KW HEATER ELEMENTS, 15-20 KW UNITS REQUIRE TWO POWER SUPPLIES. REFER TO DATA PLATE FOR MCA RATINGS.

ELECTRIC HEAT ELEMENTS				
KW	HT1	HT2	HT3	HT4
5.0	5.0			
10.0	5.0	5.0		
15.0	5.0	5.0	5.0	
20.0	5.0	5.0	5.0	5.0

--- DENOTES FIELD TERMINATED COMPONENTS
 → DENOTES OPTIONAL WIRING

ELECTRIC HEAT FOR USE WITH UNITS 2 THRU 6 TONS CAPACITY 208-230 - 1 PHASE - 60HZ	
PART No.	8 733 811 120
DWG No.	DRAWN BY: DATE
	COC 7/9/2015
E-MAIL:	REV 3

Fig. 20 — Electric Heater Wiring Diagram

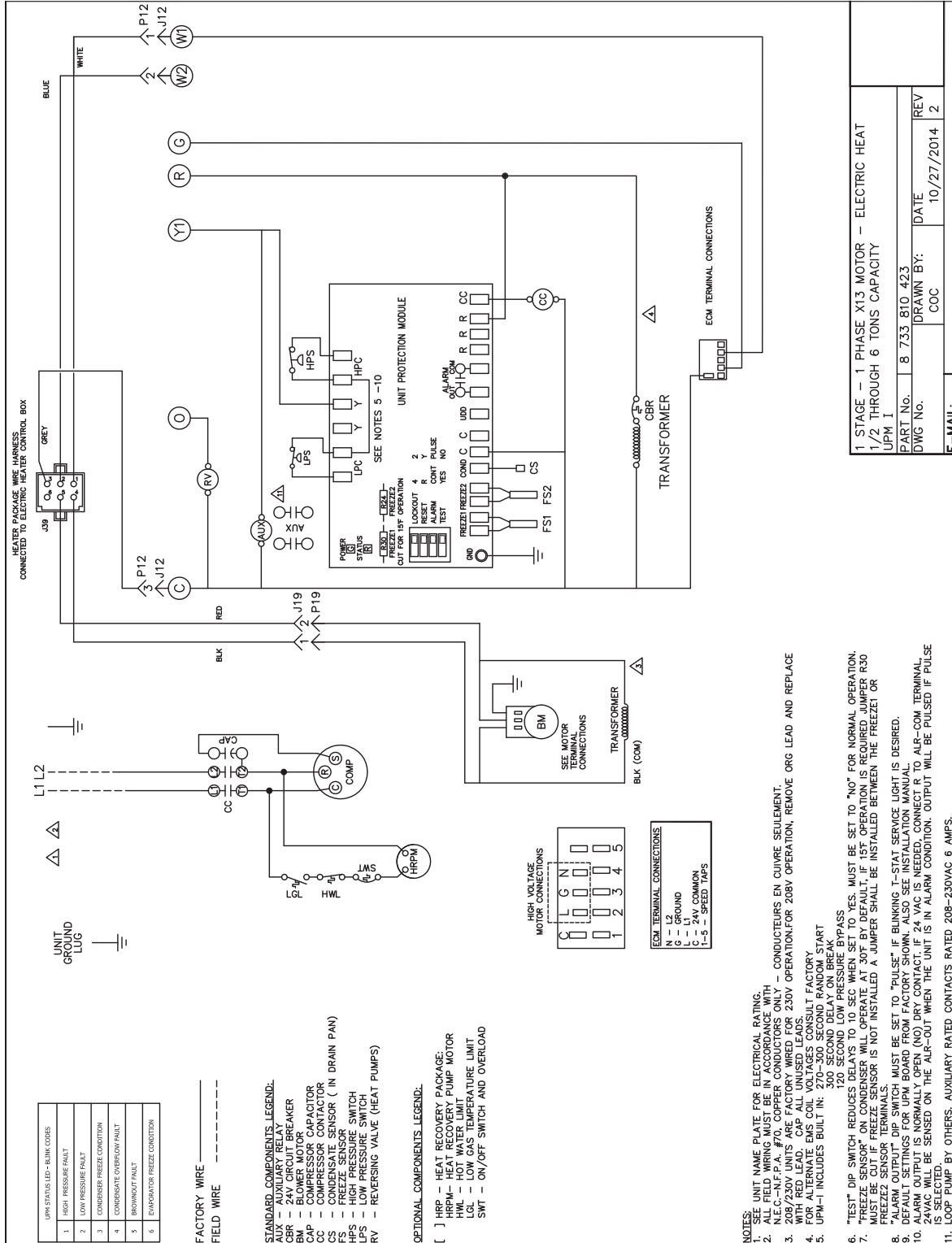


Fig. 21 — Electric Heater Wiring - GB Series

