



HP Series Heater Kit

FIELD INSTALLATION INSTRUCTIONS

ALL PACKAGED UNITS



CAUTION

Installation and service of this equipment should only be performed by trained and qualified personnel

The FHP Manufacturing HP-Series Electric Heater Kit is a field-installable electric resistance heater kit designed specifically for the FHP Manufacturing GT, GS, EV, ES, AP and AU product lines. This kit cannot be installed in any other FHP product, nor can it be retrofitted on to equipment not manufacturing by FHP Manufacturing. Refer to Table 1 for proper Heater to Unit combinations.

Failure to follow installation instructions or attempting to apply this product improperly will void all FHP equipment warranties and could be hazardous.

KIT CONTENTS

The HP-Series Heater Kit comes with the following:

- Electric resistance heater elements and control box including control wire harness for heater kit
- Terminal covers for heater elements

- Heater package data plate and labels
- Replacement electrical diagrams
- Screws and mounting hardware

The FHP HP-Series Heater Kit does not include a heater element mounting collar (required for installation). Refer to Table 2 for a complete list of heater collar part numbers for FHP equipment.

POWER REQUIREMENTS



CAUTION

Do not attempt to connect an FHP Heat Pump with an HP Heater Kit to a single power supply.

FHP Heat Pumps with an HP Series heater kit installed require two (2) separate power supplies: one for the compressor and one for the electric heater and control circuit. The Ampacity and fusing requirements for the compressor can be found on the heat pump data plate. The requirements for the installed HP heater kit can be found on the heater data plate provided and on Table 3 in this guide.

FHP units with electric heat are not rated for and cannot be installed with single point power.

Heater Model	kW Output		Number of Heater Stages*	BtuH Output		GT/GS Models									
						010	018	024	030	036	042	048	054	062	070
	208V	240V		208V	240V	EV/ES and AU/AP Models									
					018	024 - 025	030	035 - 036	042	048 - 049		060 - 061	070 - 071		
HP050	3.6	4.8	1	12,300	16,300	X	X	X	X	X	X	X	X	X	
HP075	4.9	7.2	2	16,700	24,500		X	X	X	X	X	X	X	X	
HP100	7.2	9.6	2	24,600	32,700		X	X	X	X	X	X	X	X	
HP150	10.8	14.4	2	36,900	49,100						X	X	X	X	
HP200	14.4	19.2	2	49,200	65,500						X	X	X	X	


TABLE 1 - HP SERIES HEATER PACKAGE / HEAT PUMP COMPATIBILITY

* Field supplied sequencer or staging device required.

HEATER COLLAR PART NUMBERS	
FHP Heat Pump Model	Part Number
GT/GS018-024 EV/ES/AU018-025	585-002
GT/GS030-036 EV/ES/AU030-036	585-003
GT/GS042 AP 25 & 35 EV/ES/AU042	585-004
GT/GS048-054 AP 49 EV/ES/AU048-049	585-005
GT/GS062 AP 61 EV/ES/AU060-061	585-006
GT/GS070 AP/AU/EV/ES070-071	585-007

TABLE 2

INSTALLATION



WARNING
Improper installation of an electric resistance heater can result in severe injury or death due to electric shock or fire

STEP 1

Unpack the heater kit and inspect the contents for completeness and damage. If any part of the kit appears damaged, do not attempt to install the kit or repair damaged parts. Contact your FHP Manufacturing dealer immediately.

STEP 2

Disconnect power from the heat pump.

STEP 3

Remove both the blower and compressor access panels from the heat pump. For vertical units, these will be the upper and lower front access panels.

STEP 4

Remove the heat pump blower from the blower panel by removing the two (sizes 018-042) or three (above size 042) bolts along the front of the blower near the blower outlet. Tilt the blower away from the blower panel and pull it forward off of the mounting pins at the rear of the blower opening.

STEP 5

Install heater collar in blower opening of the heat pump. Align the rear of the heater collar over the mounting pins at the rear of the opening and rotate the collar into place. Secure with bolts. Install blower housing into heater collar. Make sure not to pinch any electrical wires. (Figure 1)

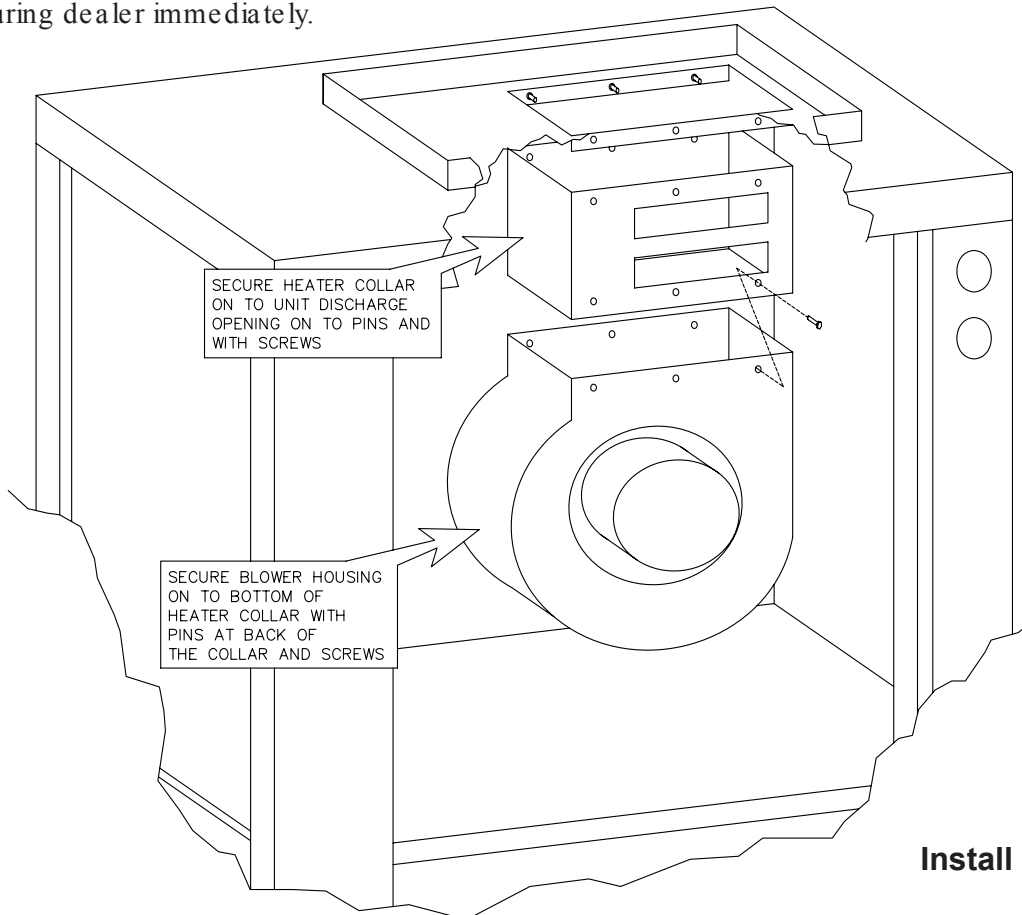
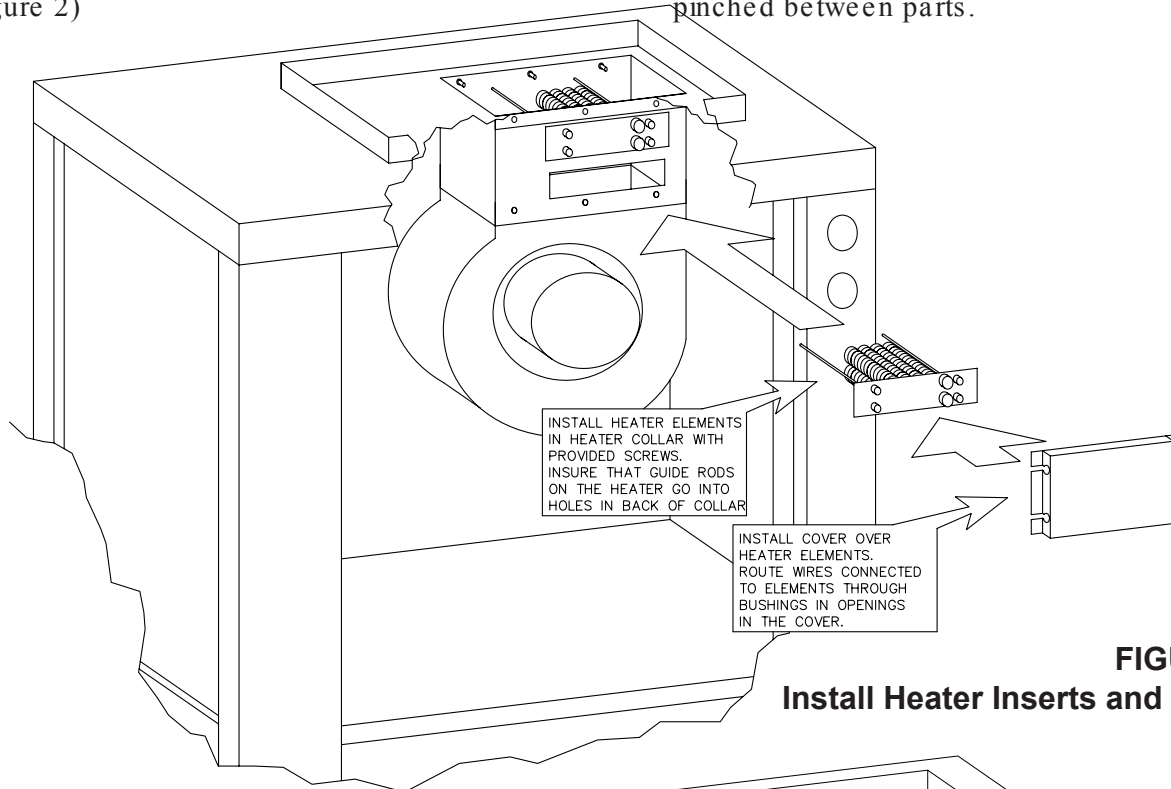


FIGURE 1
Install Heater Collar

STEP 6

Install the heater insert(s) into the heater collar. Make sure that the two rods on each insert go through the appropriate holes in the back of the heater collar. These rods stabilize the insert and prevent vibration when the fan is operating.

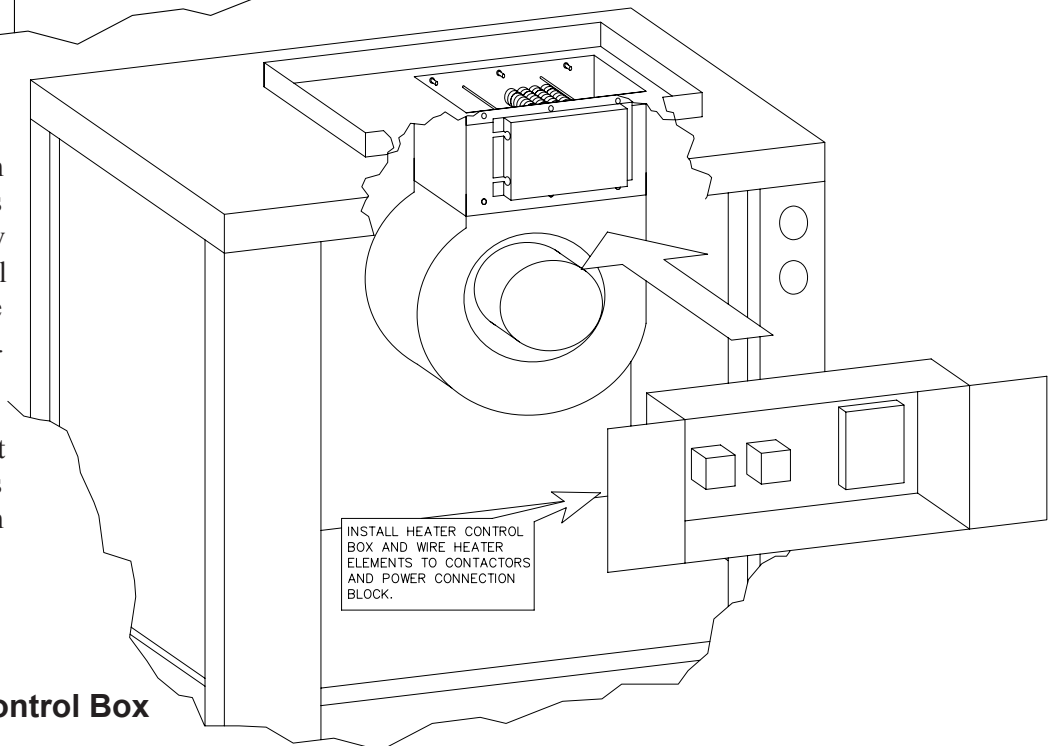
Secure each insert to the collar front with four (4) #10 sheet metal screws. (Figure 2)



STEP 8

Install heater control box in unit (between corner posts on vertical and counterflow units, on heater electrical post on horizontals). Make sure no wires are pinched. (Figure 3)

Connect the heater element wires to the heater contactors and power connection terminal block.



GT and EV units

The following 3 steps apply to GT and EV units only

STEP 9

In the unit main electrical box, locate the blower motor common lead and transformer primary common lead (connected to L2 on the compressor contactor), and the blower relay power lead and transformer primary voltage tap lead (connected to L1 on the compressor contactor). Remove any wire ties that may interfere with access to these wires.

(Figure 4)

FIGURE 4
GT, EV Electrical Box

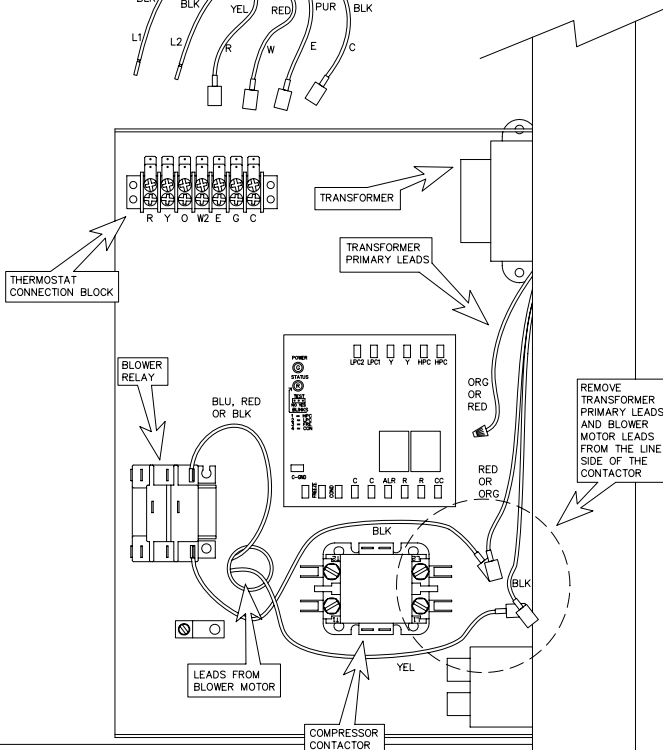
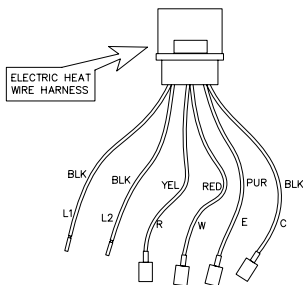
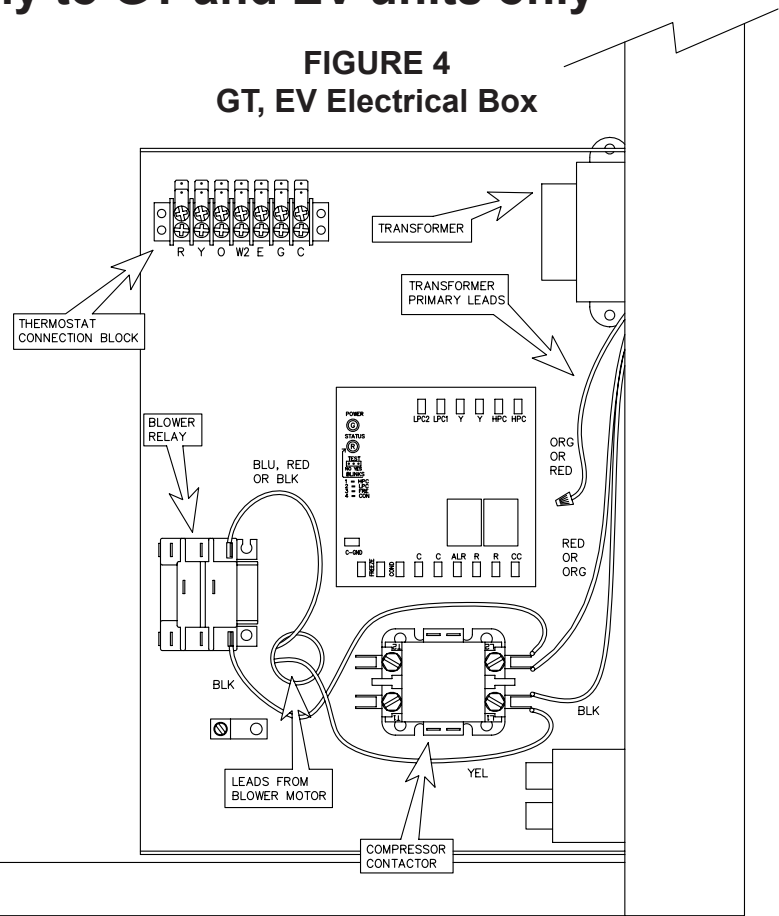


FIGURE 5
Isolating Blower and Transformer Wires

STEP 10

Remove the four (4) leads from step 9 from L1 and L2 of the compressor contactor.

Route the control wires and power wires from the heater wire harness through the divider between the unit air handling section and compressor compartment. Make sure to pass these wires through plastic bushing in holes in the divider. Do not route these wires around, in front of or over the divider. Do not route them through holes in the divider that do not have plastic busings.

Route these wires through bushings in the main electrical box top or back into the unit main electrical box. Do not pass wires around the sides or top of the box. Do not route wires through holes not protected by bushings.

(Figure 5)

STEP 11

Cut the quick connect terminals off of the wires in Step 9. Connect the following wires together with crimp nuts:

- The blower relay power lead, transformer primary voltage tap lead and L1 from the heater wire harness.
- The blower motor common lead, transformer primary common lead and L2 from the heater wire harness.

Connect the low voltage wires from the heater wire harness to the unit thermostat terminal board:

- Black (C) to C
- Yellow (R) to R
- Red (W) to W
- Purple (E) to E

Connect the male portion of the heater wire harness to the receptacle in the heater control box. (Figure 6)

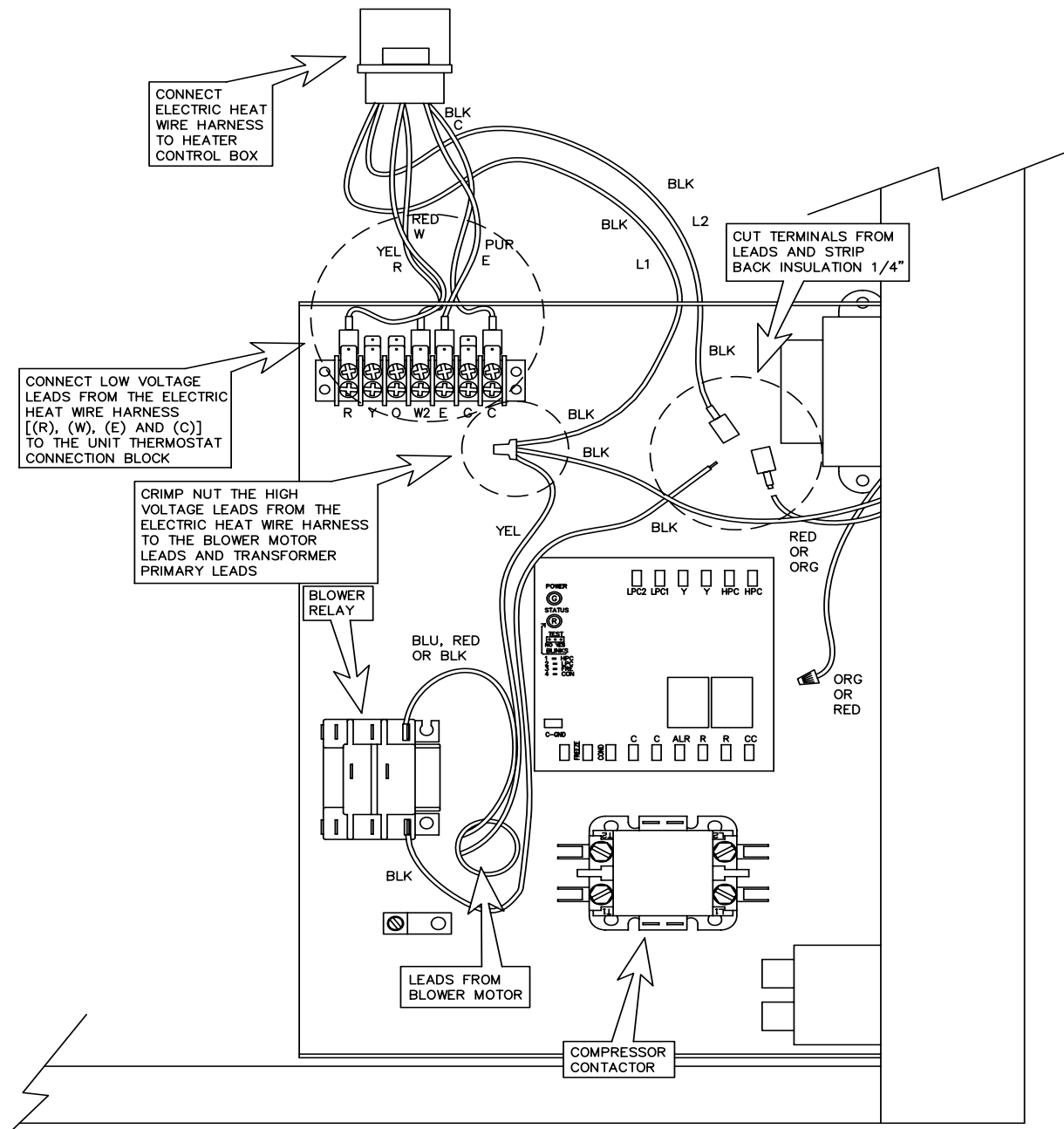


FIGURE 6
Connecting Heater Wire Harness

GS, ES, AU and AP units

The following 3 steps apply to GS, ES, AU and AP units only

STEP 9

In the unit main electrical box, locate the blower motor L2 power lead from the ECM motor power harness and transformer primary common lead (connected to L2 on the compressor contactor), and the blower L1 power lead from the ECM motor power harness and transformer primary voltage tap lead (connected to L1 on the compressor contactor). Remove any wire ties that may interfere with access to these wires.

(Figure 4)

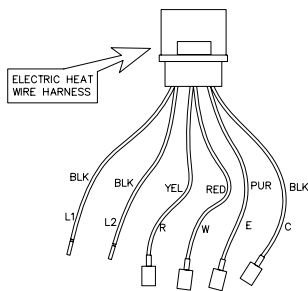
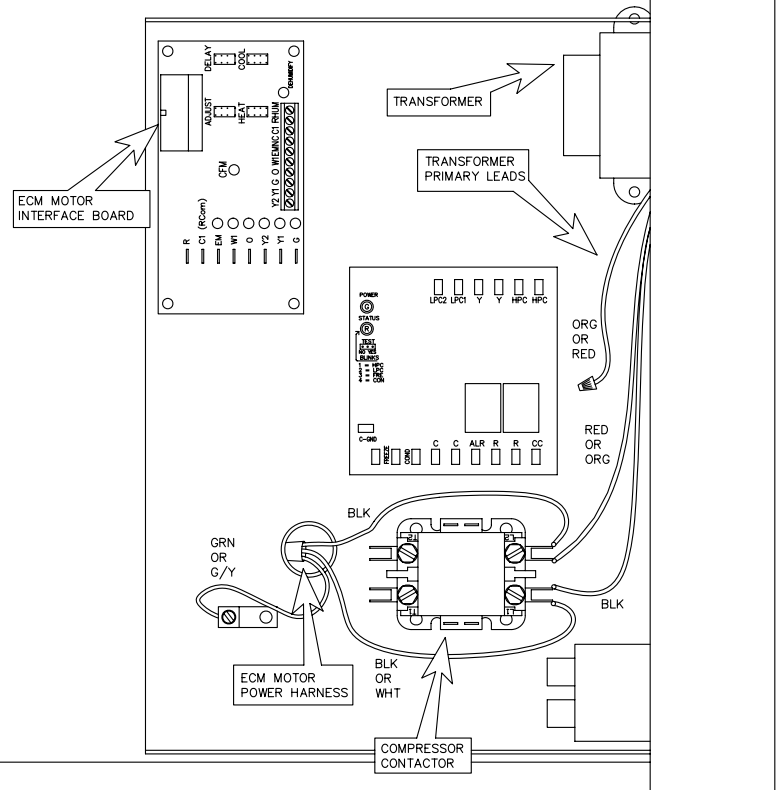


FIGURE 4
GS, ES and AU Electrical Box



STEP 10

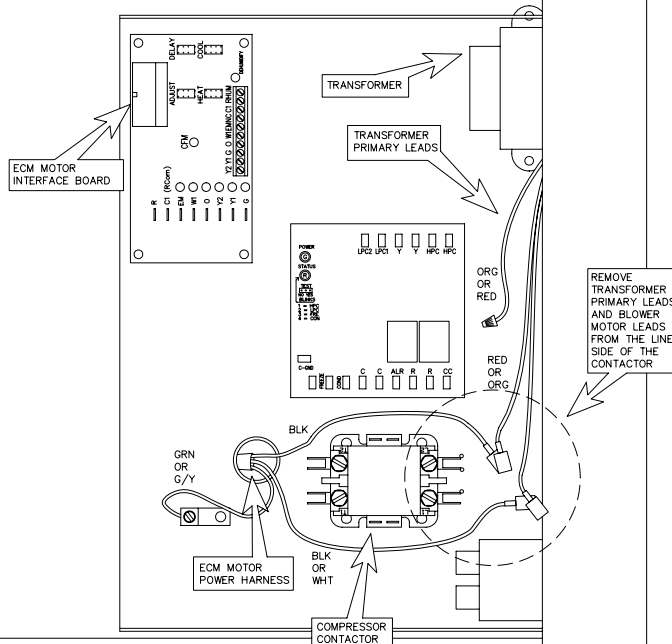
Remove the four (4) leads from step 9 from L1 and L2 of the compressor contactor.

Route the control wires and power wires from the heater wire harness through the divider between the unit air handling section and compressor compartment. Make sure to pass these wires through plastic bushing in holes in the divider. Do not route these wires around, in front of or over the divider. Do not route them through holes in the divider that do not have plastic busings.

Route these wires through bushings in the main electrical box top or back into the unit main electrical box. Do not pass wires around the sides or top of the box. Do not route wires through holes not protected by bushings.

(Figure 5)

FIGURE 5
Isolating Blower and Transformer Wires



STEP 11

Cut the quick connect terminals off of the wires in Step 9. Connect the following wires together with crimp nuts:

- The blower motor L1 power lead, transformer primary voltage tap lead and L1 from the heater wire harness.
- The blower motor L2 power lead, transformer primary common lead and L2 from the heater wire harness.

Connect the low voltage wires from the heater wire harness to the ECM interface board:

- Black (C) to C
- Yellow (R) to R
- Red (W) to W
- Purple (E) to E

Connect the male portion of the heater wire harness to the receptacle in the heater control box. (Figure 6)

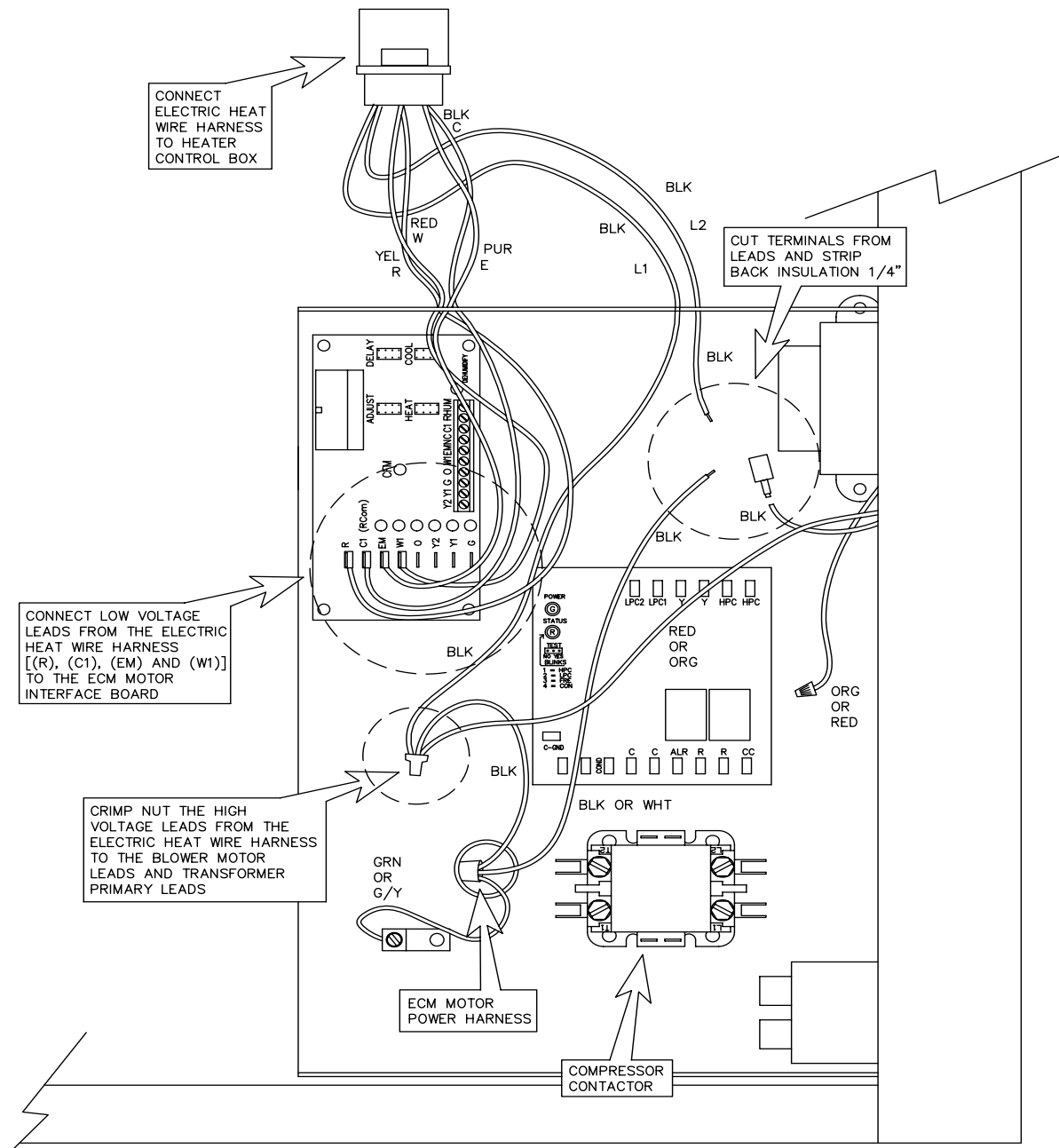


FIGURE 6
Connecting Heater Wire Harness

The following steps apply to all models

STEP 12

Connect electrical service to the Electric Heater Power Block in the heater control box. Use the field power knockout provided in the heat pump corner post. Make sure that the conductors and circuit breakers are of the correct size (Refer to Table 3). Use the ground lug provided in the heater control box to connect the field ground from the power supply.

Note: In all 10 kW and above heater boxes, there are two heater relays and one emergency heat relay. The heater relays can be identified by the heavy gauge (#12) wires on the contacts. On these units the heater relay coils are wired together with a wire nut. If staging of the heater banks is desired, remove the wire nut and connect a staging device between the two wires (in most cases this is an outdoor thermostat that brings on both stages of heat only when the outdoor temperature falls below a specified point).

Remember: The heater electrical service provides power to the unit transformer and blower motor.

STEP 13

If not already done, connect the thermostat to the 7-position thermostat connection terminal block in the heat pump main control box for the GT/EV units or the ICM interface board for GS/ES units. Note that on GT/EV units, W2 is auxiliary heat and on GS/ES units, W1 is. Refer to your thermostat wiring instruction for correct wiring connection.

STEP 14

Install the adhesive back label “UNIT EQUIPPED WITH ELECTRIC HEATER PACKAGE...” to the front side of the main heat pump control box cover.

STEP 15

Install the adhesive back wiring diagram on top of the existing diagram on the reverse side of the main heat pump control box cover.

STEP 16

Replace the electrical box covers on both control boxes and both heat pump access panels.

STEP 17

Install the adhesive back heater package data label directly above the heat pump data plate. Make sure that the appropriate heater kit is permanently marked on the label.

STEP 18

Install the remaining two adhesive back labels (UL, and Caution) to the upper front access panel of the heat pump.

Power may be restored to the heat pump and electric heater package.

Heater Model	kW Output		Number of Heater Circuits	Heater Amps		Minimum Circuit Ampacity		Max Fuse or Breaker		Minimum AWG
	208V	240V		208V	240V	208V	240V	208V	240V	
HP050	3.6	4.8	1	17.3	20.0	27.1	30.4	30	30	8
HP075	4.9	7.2	2	23.6	30.0	35.7	43.8	40	45	8
HP100	7.2	9.6	2	34.7	40.0	52.2	58.8	60	60	6
HP150	10.8	14.4	2	52.0	60.0	73.9	83.8	80	90	4
HP200	14.4	19.2	2	69.3	80.0	92.9	106.3	100	110	2

TABLE 3 - HP SERIES HEATER PACKAGE ELECTRICAL DATA

All heaters are rated single phase, 60 Hz. MCA and max fuse ratings include unit blower motor load. Fuses must be type ‘D’ time delay. Breakers must be HACR type or HRC Form 1. Wire size based upon 60 deg C copper conductors.

CAUTION: UNIT CONTAINS TWO POWER SUPPLIES –
INSURE BOTH SUPPLIES ARE OFF BEFORE SERVICING.

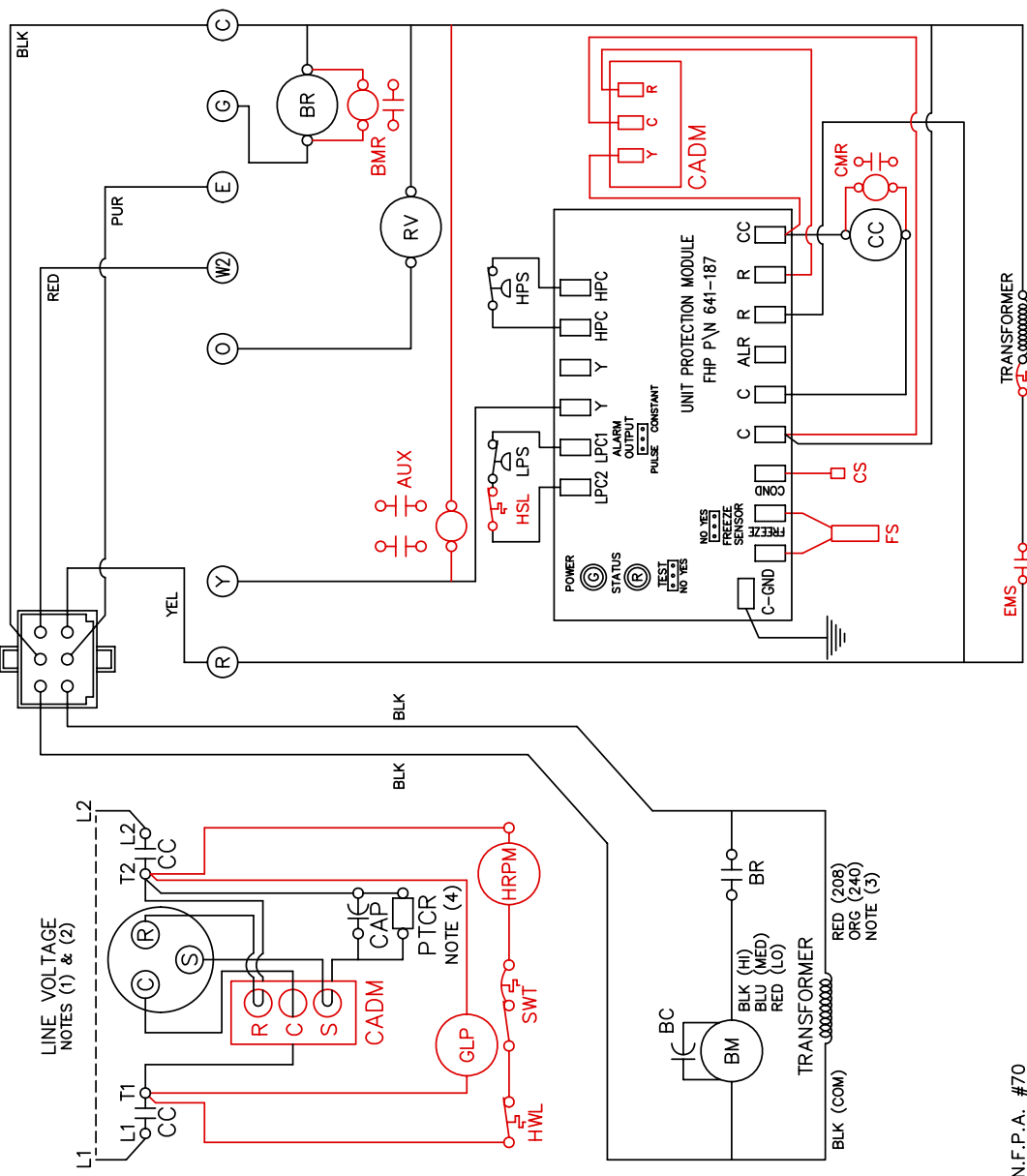
STATUS LED/ALARM BLINK CODES
1 HIGH PRESSURE FAULT
2 LOW PRESSURE FAULT
3 FREEZE SENSOR FAULT
4 CONDENSATE FAULT
5 BROWN OUT FAULT

FACTORY WIRE _____
FIELD WIRE - - - - -

STANDARD COMPONENTS LEGEND:
 BC – BLOWER MOTOR CAPACITOR
 BM – BLOWER MOTOR
 BR – BLOWER RELAY
 CAP – COMPRESSOR CAPACITOR
 CC – COMPRESSOR CONTACTOR
 EOVLD – EXTERNAL OVERLOAD (NOTE 5)
 HPS – HIGH PRESSURE SWITCH
 LPS – LOW PRESSURE SWITCH
 PTCR – POS TEMP COEFF RESISTOR (WHEN SUPPLIED)
 RV – REVERSING VLV (HEAT PUMPS)

OPTIONAL COMPONENTS LEGEND:
 [] AUX – AUXILIARY RELAY (FOR LOOP PUMP, ETC.)
 [] BMR – BLOWER MONITOR RELAY
 [] CADM – COMFORT ALERT DIAGNOSTICS MODULE
 [] CBR – 24V ORCT BRKR (75VA ONLY)
 [] CMFR – COMPR MALFUNCTION RELAY
 [] CMR – COMP MONITOR RELAY
 [] CS – CONDENSATE SENSOR (IN DRAIN PAN)
 [] EMS – ENERGY MGMT SYSTEM RELAY
 [] FS – FREEZE SENSOR
 [] GLP – GROUND LOOP PUMP
 [] HRP – HEAT RECOVERY PACKAGE, INCLUDES:
 [] HRP M – HEAT RECOVERY PUMP MOTOR
 [] HWL – HOT WATER LIMIT (140 DEG)
 [] SWT – ON/OFF SWITCH AND OVERLOAD

HEATER PACKAGE WIRE HARNESS
CONNECTED TO ELECTRIC HEATER CONTROL BOX



- NOTES:
- SEE UNIT NAME PLATE FOR ELECTRICAL RATING
 - ALL FIELD WIRING MUST BE IN ACCORDANCE WITH N.E.C.-N.F.P.A. #70
 - 208/230V UNITS ARE FACTORY WIRED FOR 230V OPERATION. FOR 208V OPERATION, REMOVE ORG LEAD AND REPLACE WITH RED LEAD. CAP ALL UNUSED LEADS
 - PTCR IS STANDARD ON SELECT UNITS.
 - EXTERNAL OVERLOAD STANDARD ON ALL UNITS EQUIPPED WITH ROTARY COMPRESSORS.
 - FOR ALTERNATE EMS COIL VOLTAGES CONSULT FACTORY.
 - UPM-1 INCLUDES BUILT IN: 5 MINUTE DELAY ON BREAK
90 SECOND LOW PRESSURE BYPASS
 - "TEST" JUMPER PIN REDUCES DELAYS TO 5 SEC WHEN SET TO YES.
 - "FREEZE SENSOR" JUMPER PIN MUST BE SET TO NO IF FREEZE SENSOR IS NOT INSTALLED.
 - "ALARM OUTPUT" JUMPER PIN MUST BE SET TO PULSE IF BLINKING T-STAT SERVICE LIGHT IS DESIRED.

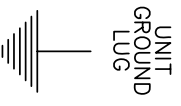
1 STAGE – 208/230V – DIRECT DRIVE MOTOR 1-1/2 THROUGH 6 TONS WITH ELECTRIC HEAT		
DWG NO. G T111030	DATE 9-26-06	REV 0
	DRAWN BY RKS	

CAUTION: UNIT CONTAINS TWO POWER SUPPLIES – INSURE BOTH SUPPLIES ARE OFF BEFORE SERVICING.

HEATER PACKAGE WIRE HARNESS
CONNECTED TO ELECTRIC HEATER CONTROL BOX

STATUS LED/ALARM BLINK CODES	
1	HIGH PRESSURE FAULT
2	LOW PRESSURE FAULT
3	FREEZE SENSOR FAULT
4	CONDENSATE FAULT
5	BROWN OUT FAULT

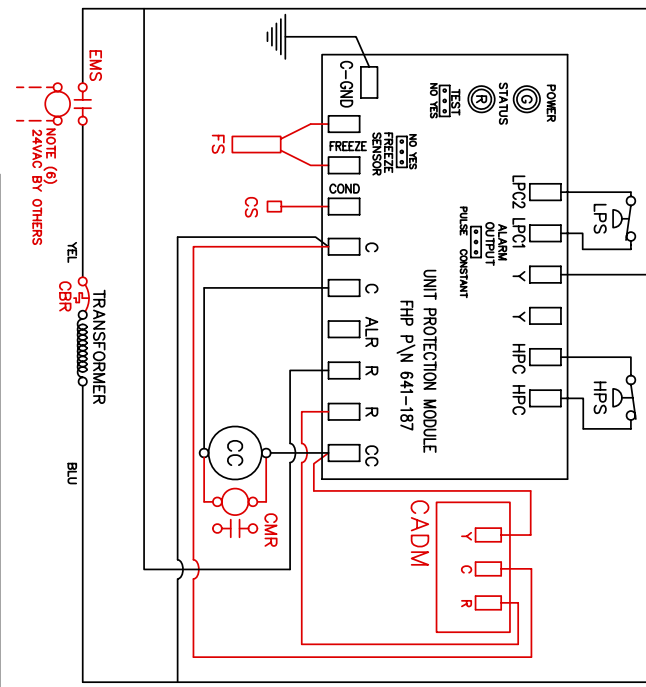
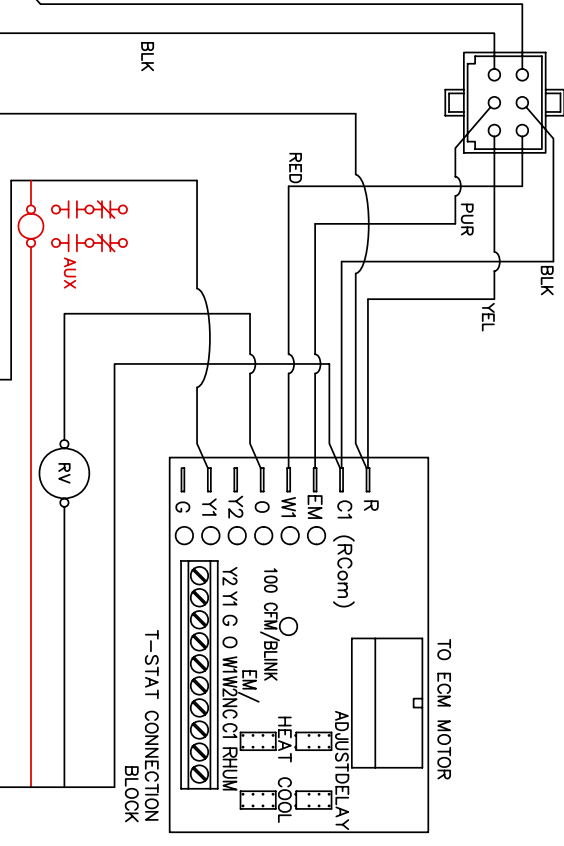
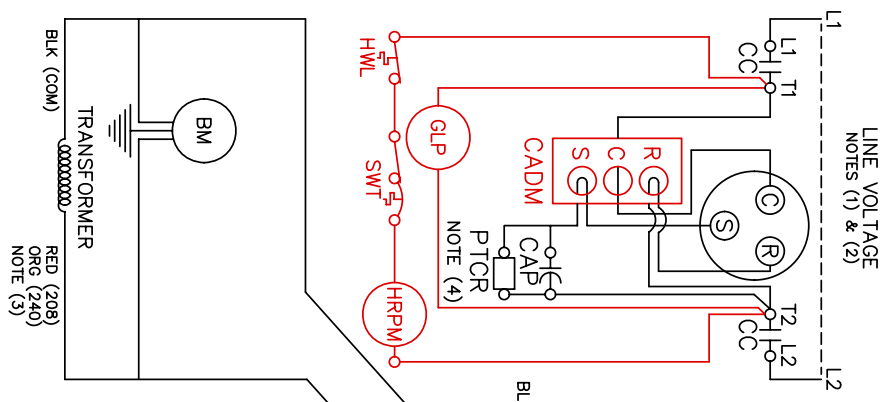
FACTORY WIRE _____
FIELD WIRE -----



- STANDARD COMPONENTS LEGEND:**
- BM – BLOWER MOTOR
 - CAP – COMPRESSOR CAPACITOR
 - CC – COMPRESSOR CONTACTOR
 - CCH – CRANKKCS HTR (WHEN SUPPLIED)
 - EVOYD – EXTERNAL OVERLOAD (NOTE 5)
 - HPS – HIGH PRESSURE SWITCH
 - LPS – LOW PRESSURE SWITCH
 - PTCR – POS TEMP COEFF RESISTOR (WHEN SUPPLIED)
 - RV – REVERSING VLV (HEAT PUMPS)

OPTIONAL COMPONENTS LEGEND:

- [] AUX – AUXILIARY RELAY (FOR LOOP PUMP, ETC.)
- [] CADM – COMFORT ALERT DIAGNOSTICS MODULE
- [] CBR – 24V CRCT BRKR (75VA ONLY)
- [] CMFR – COMPR MALFUNCTION RELAY
- [] CMR – COMPR MONITOR RELAY
- [] CS – CONDENSATE SENSOR INSTALLED
- [] EMS – ENERGY MGMT SYSTEM RELAY
- [] FS – FREEZE SENSOR INSTALLED (NOTE 10)
- [] GLP – GROUND LOOP PUMP
- [] HP – HP SERIES ELECTRIC HTR PKG
- [] HRP – HEAT RECOVERY PACKAGE, INCLUDES: HRPMP – HEAT RECOVERY PUMP MOTOR HWL – HOT WATER LIMIT (140 DEG) SWT – ON/OFF SWITCH AND OVERLOAD



- NOTES:**
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 - PTCR IS STANDARD ON SELECT UNITS.
 - EXTERNAL OVERLOAD STANDARD ON ALL UNITS EQUIPPED WITH ROTARY COMPRESSORS.
 - FOR ALTERNATE EMS COIL VOLTAGES CONSULT FACTORY.
 - UPM-1 INCLUDES BUILT IN:
 - 30-60 SECOND RANDOM START
 - 5 MINUTE DELAY ON BREAK
 - 90 SECOND LOW PRESSURE BYPASS
 - "TEST" JUMPER PIN REDUCES DELAYS TO 5 SEC WHEN SET TO YES.
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1 STAGE - 208/230V SINGLE PHASE - ECM MOTOR	DWG NO.	DATE	REV
1-1/2 THROUGH 6 TONS WITH ELECTRIC HEAT	GS111018	9-26-06	0
UPM-1	DRAWN BY		
	RKS		

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STATUS LED/ALARM BLINK CODES
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2 LOW PRESSURE FAULT
3 FREEZE SENSOR FAULT
4 CONDENSATE FAULT
5 BROWN OUT FAULT

FACTORY WIRE ———
FIELD WIRE - - - - -

STANDARD COMPONENTS LEGEND:

- BM – BLOWER MOTOR
- CAP – COMPRESSOR CAPACITOR
- CC – COMPRESSOR CONTACTOR
- CCH – CRANKCS HTR (WHEN SUPPLIED)
- HPS – HIGH PRESSURE SWITCH
- LPS – LOW PRESSURE SWITCH
- PTCR – POS TEMP COEFF RESISTOR (WHEN SUPPLIED)
- RV – REVERSING VLV (HEAT PUMPS)
- Y2S – HIGH SPEED COMPR SOLENOID (ON COMPR)

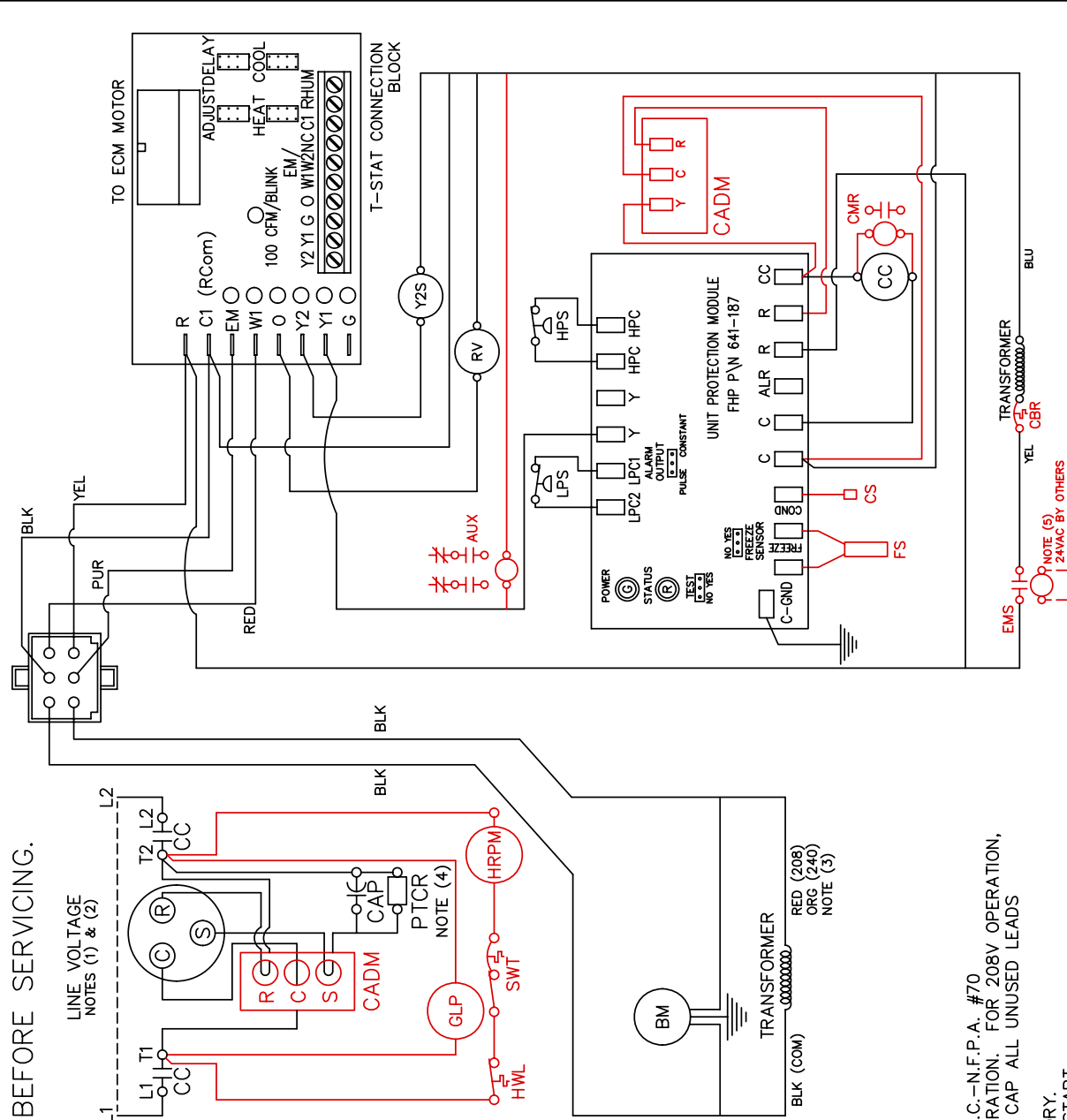
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- [] CMFR – COMPR MALFUNCTION RELAY
- [] CMR – COMPR MONITOR RELAY
- [] CS – CONDENSATE SENSOR INSTALLED
- [] EMS – ENERGY MGMT SYSTEM RELAY
- [] FS – FREEZE SENSOR INSTALLED (NOTE 10)
- [] GLP – GROUND LOOP PUMP
- [] HP – HP SERIES ELECTRIC HTR PKG
- [] HRP – HEAT RECOVERY PACKAGE, INCLUDES: HEAT RECOVERY PUMP MOTOR
- [] HWL – HOT WATER LIMIT (140 DEG)
- [] SWT – ON/OFF SWITCH AND OVERLOAD

NOTES:

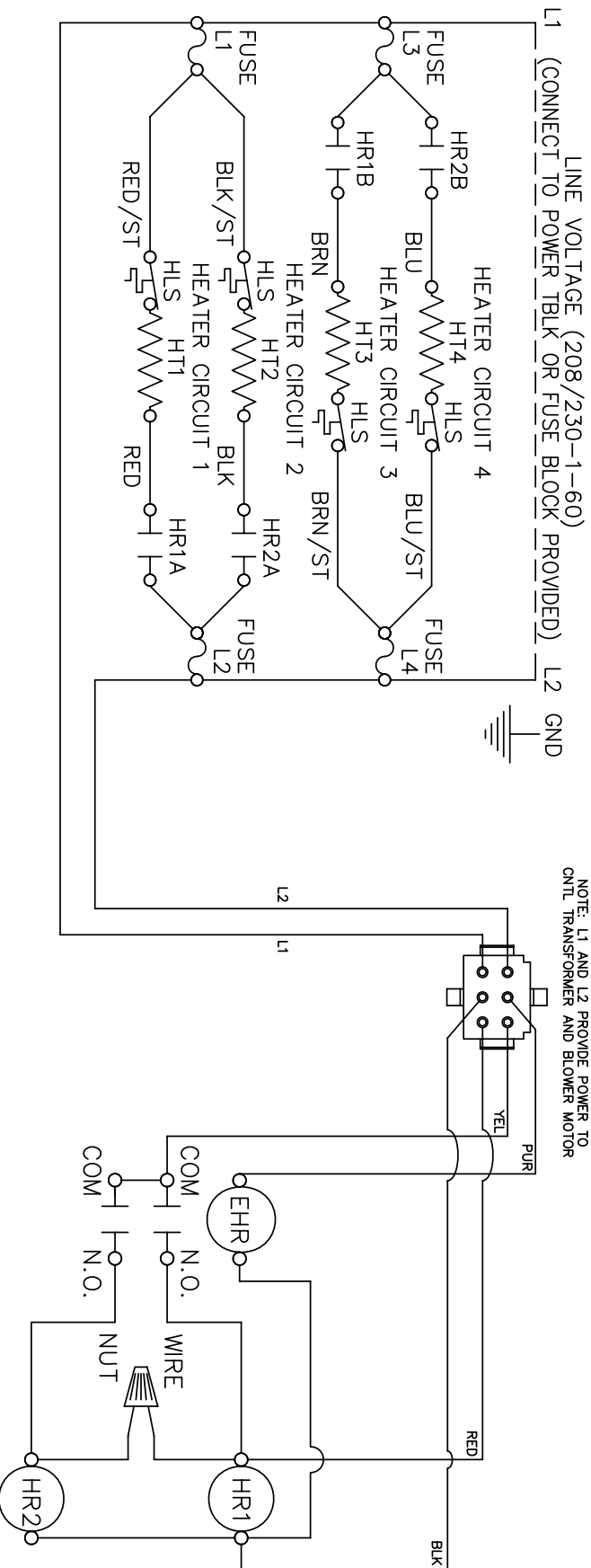
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4. PTCR IS STANDARD ON SELECT UNITS.
5. FOR ALTERNATE EMS COIL VOLTAGES CONSULT FACTORY.
6. UPM-I INCLUDES BUILT IN: 30-60 SECOND RANDOM START
5 MINUTE DELAY ON BREAK
90 SECOND LOW PRESSURE BYPASS
7. "TEST" JUMPER PIN REDUCES DELAYS TO 5 SEC WHEN SET TO YES.
8. "FREEZE SENSOR" JUMPER PIN MUST BE SET TO NO IF FREEZE SENSOR IS NOT INSTALLED.
9. "ALARM OUTPUT" JUMPER PIN MUST BE SET TO PULSE IF BLINKING T-STAT SERVICE LIGHT IS DESIRED.

HEATER PACKAGE WIRE HARNESS
CONNECTED TO ELECTRIC HEATER CONTROL BOX



2 STAGE COMPR – 208/230V 1-PHASE – ECM MOTOR					
2 THROUGH 6 TONS WITH ELECTRIC HEAT					
UPM-I					
DWG NO. GS111019	RKS	DATE	9-26-06	REV	0

CAUTION: UNIT CONTAINS TWO POWER SUPPLIES –
INSURE BOTH SUPPLIES ARE OFF BEFORE SERVICING.



- NOTES:
1. SEE UNIT NAME PLATE FOR ELECTRICAL RATING
 2. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH N.E.C.-N.F.P.A. #70
 3. WIRE OUTDOOR T-STAT IN PLACE OF WIRE NUT
IF HTR STAGING IS REQUIRED (7.5-20kW)

HEATER PACKAGES CONTAIN THE FOLLOWING:

- 3.5-5kW – HEATER CIRCUIT 1, HR1, EHR
- 7.5-10kW – HEATER CIRCUIT 1, 2, HR1, HR2, EHR, WIRE NUT
- 15kW – HEATER CIRCUIT 1, 2, 3, HR1, HR2, EHR, WIRE NUT
- 20kW – HEATER CIRCUIT 1, 2, 3, 4, HR1, HR2, EHR, WIRE NUT
- 3.5-10kW HEATERS ARE NON FUSED, 15 & 20kW ARE FUSED

- LEGEND:
- BM – BLOWER MOTOR
 - BC – BLOWER MOTOR CAPACITOR (PSC MOTORS ONLY)
 - EHR – EMERGENCY HEAT RELAY
 - HLS – HIGH TEMP LIMIT SWITCH
 - HT1-4 – HEATER ELEMENT 1-4
 - HR1,2 – HEATER RELAY 1, 2
 - PLTB – POWER INTERCONNECT TERMINAL BLOCK

WIRING DIAGRAM			
HP SERIES HEATER PACKAGE			
208-230/1/60V PACKAGE UNITS			
SIZE	GSSN.	DWG NO.	DRAWN BY
	HP100000	HP100000	RKS
SCALE		DATE	9-30-06
			REV 2