

SM Series Electric Heat Kit

HK050 | HK100 | HK150 | HK200 |



BOSCH

Installation Manual

8 733 904 449 (2013/04)

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INTRODUCTION



Installation and servicing of this equipment can be hazardous due to system pressure and electrical components. Only trained and qualified personnel should install, repair, or service the equipment.



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



When working on equipment, always observe precautions described in the literature, tags, and labels attached to the unit. Follow all safety codes. Wear safety glasses and work gloves. Use a quenching cloth for brazing, and place a fire extinguisher close to the work area.

Bosch HK Series Heater Package is a field installable electric resistance heater kit designed for the SM series heat pumps.

The HK series heater package requires separate electrical service connection, independent from the heat pump's power supply. Hence, installation of this Heater Package will convert SM Series Heat Pump into a two point power connection.

The HK series Heater Package is available in several kW capacities. Unit tonnage vs Heater Package capacity compatibility table is below. (Figure#1)

The HK series Heater Package can be installed on Vertical (VT), Horizontal (HZ) and Counter-flow (CF) units. Eight and ninth character of the SM heat pump signifies the configuration. Example: SM024-1VTC.



Improper installation of the electric resistance heater can result in severe injury or death due to electrical shock or fire.

Only trained and qualified personnel should install, repair, or service this equipment. All electrical service connection to the heater must be done to National and local electrical Standard & codes.



DO NOT wire the heater elements into the same circuit as the compressor.



The SM series HK Series Heater package 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.



HK Series Heater Package can only be installed on single phase units



A heater collar is installed in the SM models, no need to order separately.



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

Figure 1: HEATER COMPATIBILITY

Unit Model	HK050-1201 (5kW)	HK100-1201 (10kW)	HK150-1201 (15kW)	HK200-1201 (20kW)
SM024	X			
SM036	X	X		
SM048	X	X	X	
SM060	X	X	X	X
SM070	X	X	X	X
x Heater Package Compatibility				

PRE-INSTALLATION

Unpacking and Inspection

1. UNPACK the HK heater kit and inspect for 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 the following components. Contact your local distributor for further help.

Components List

- Pre-wired heater electrical box (including fuses on HK150 and HK200)
- Heater elements
- Heater element(s) protective metal cover
- Wire harness pre-wired at one end .
- New wiring diagram

- Adhesive back electrical data label
- Clear hardware accessory bag containing:
 - Heater element mounting 3/8 Philip-Hex screws (4 for each element bank)
 - Four Heater element cover mounting 3/8 Philip-Hex screws
 - Two electrical box mounting 3/8 Philip-Hex screws
 - Push in wire-ties
 - This installation manual



For technical assistance contact your local distributor or Bosch Technical Support:
 (954) 776-5471 or
 Bosch.Fhp.TechSupport@us.bosch.com.

Required Tools

- Phillips screwdriver
- Small flat head screwdriver
- 5/16" socket and a ratchet or drill
- Wire cutter
- Wire stripper
- Torque Phillips head screwdriver
- Multi meter

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. (Figure#2 through #6)
 The control box attaches to the corner post and the heat elements to the blower heater collar in the blower compartment.

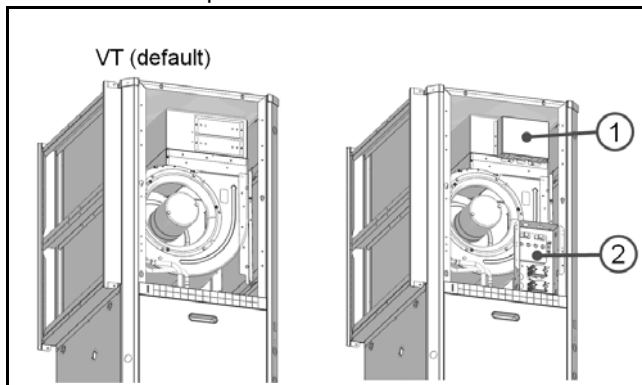


Figure # 2

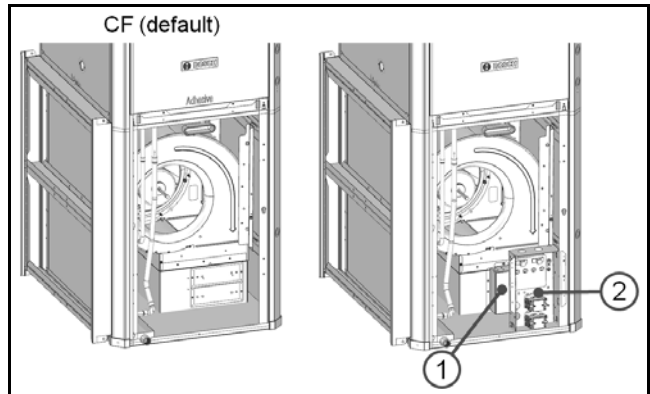


Figure # 3

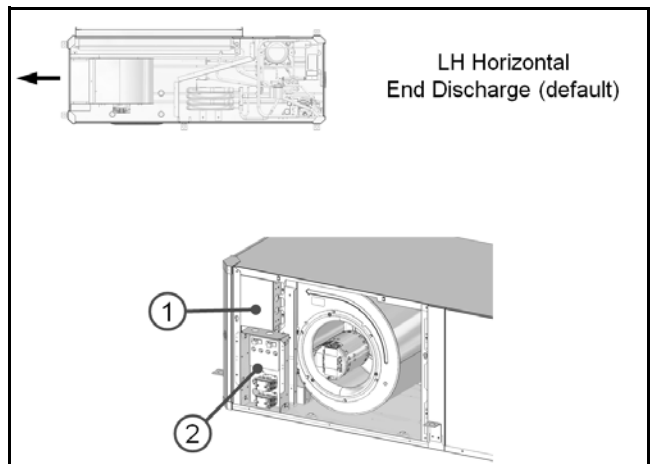


Figure # 4

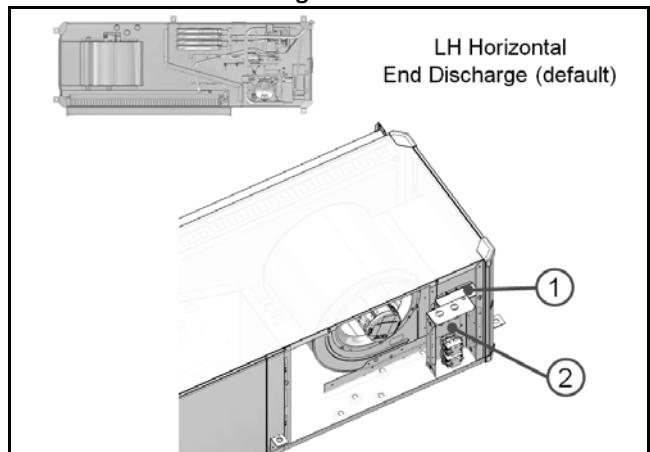


Figure # 5

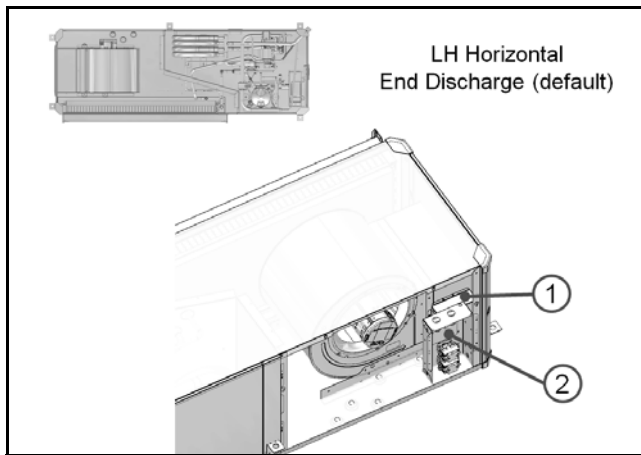
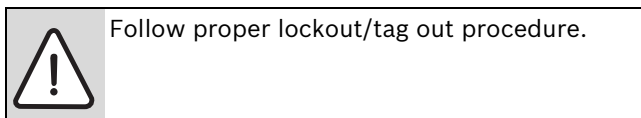


Figure # 6

- [1] Heating element cover
- [2] Electric Heat control box

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.



3. Prior to removing the blower panel, disconnect unit display from the back of the panel.(Figure#7)

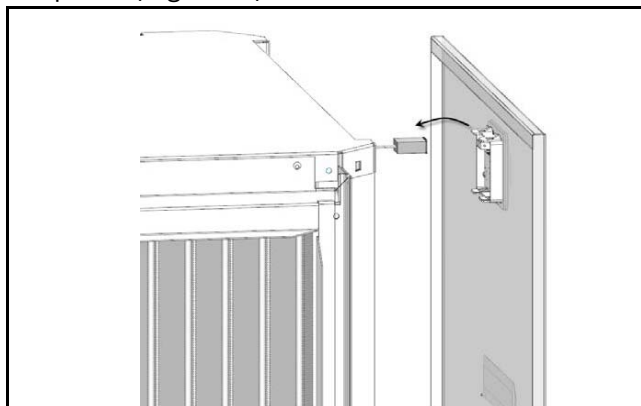


Figure # 7

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). (Figure#8)

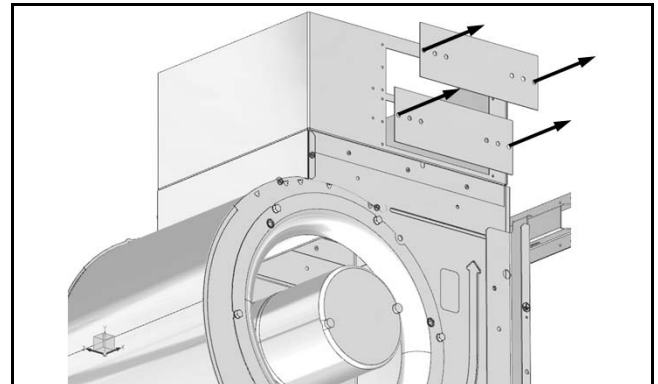


Figure # 8

6. In preparation for heater element installation orient the heating elements with thermal overloads (cutouts) are on the right side for VT & CF and top for HZ.(Figure#9)

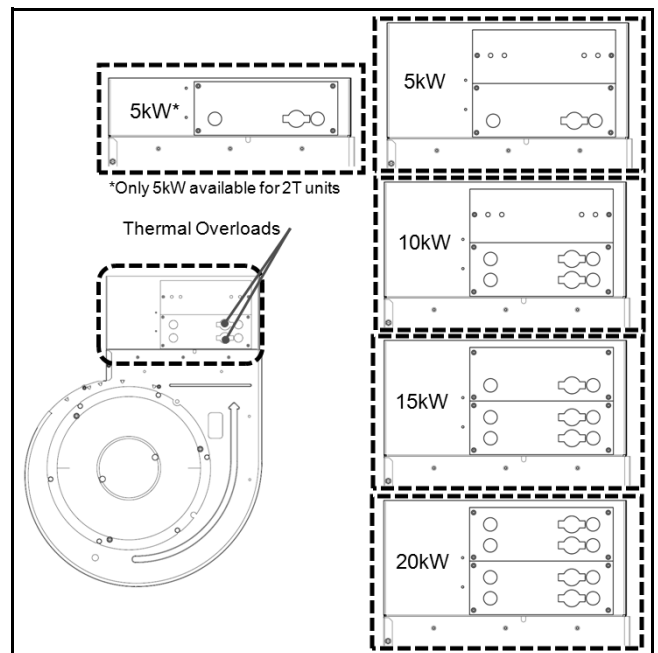
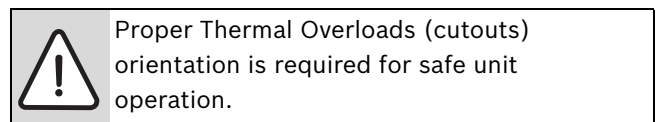
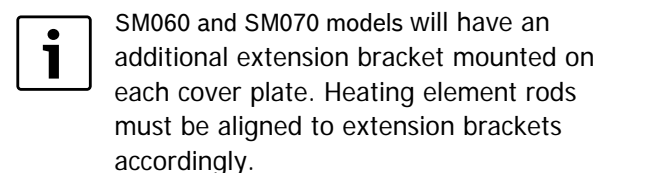


Figure # 9

7. Insert heating element(s) into collar. Heating element rods must be inserted into inner most holes as shown in Figure#10. This will support and prevent vibration of heater elements.



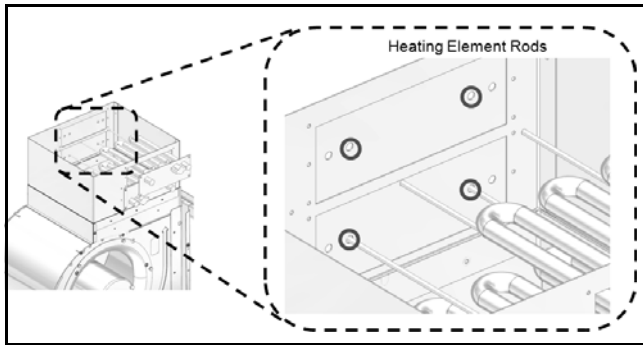


Figure # 10

i If only one heating element is being installed, install in into the position closest to the blower wheel. Remaining opening to be covered using (1) of the cover plates removed in step 5.

8. Secure each insert(s) with four of the supplied sheet metal screws (Figure#11).

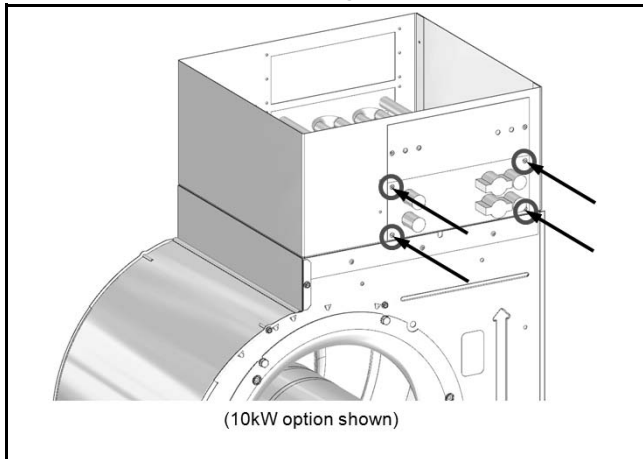


Figure # 11

INSTALLATION - WIRING

There are two Electric Heater control box layouts depending on HK model. (Figures#12 & #13)

i HR1 controls Heating Elements 1 and 3 and HR2 controls heating elements 2 and 4.

i Refer to wiring diagram on Pg13.

i Electric Heater control box is completely pre-wired from the factory.

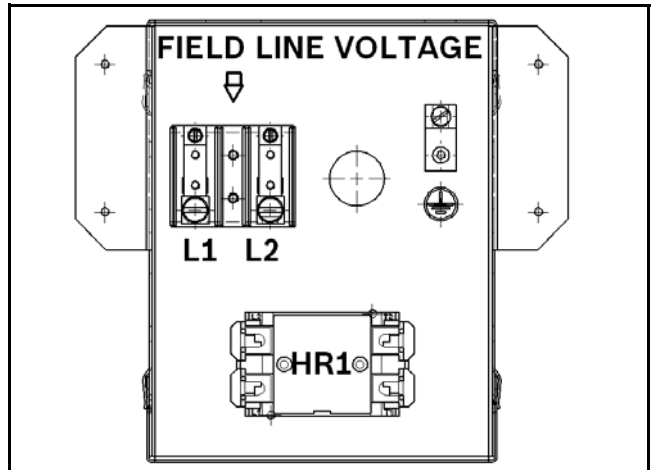


Figure # 12 5kW-10kW (HK050-100) Control Box

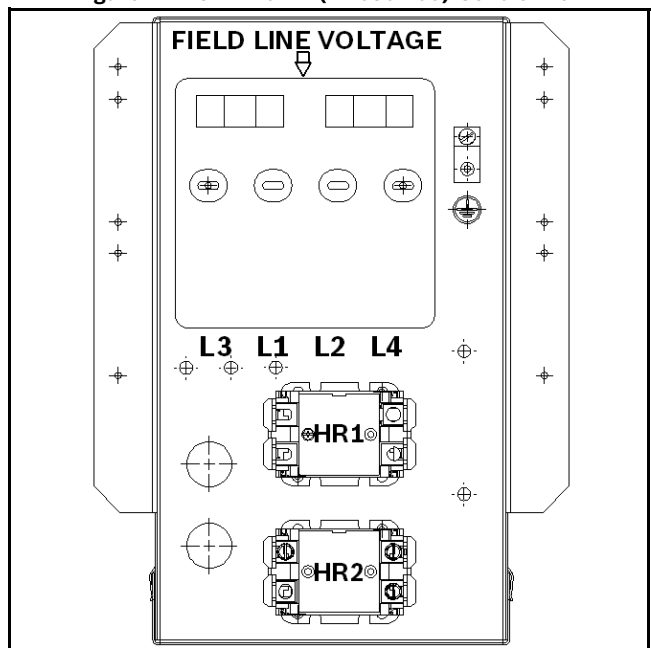


Figure # 13 15kW-20kW (HK150-200) Control Box

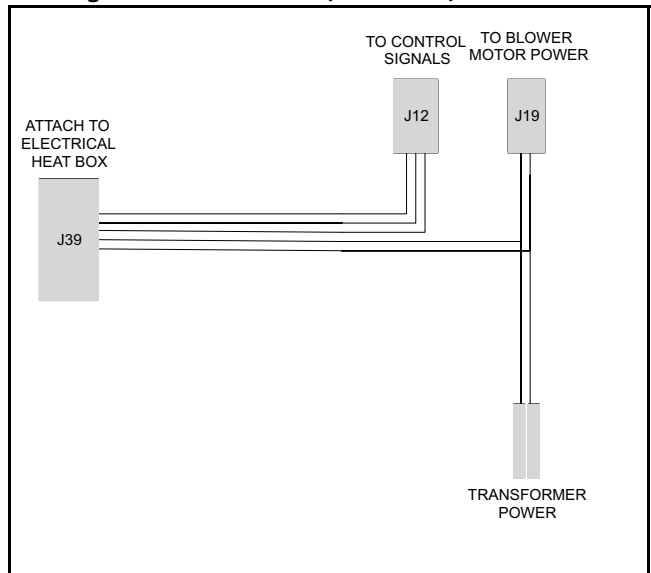


Figure # 14 Electric Heat Harness



Figure # 15

1. Route the high voltage Red and Black wires, originating from the Electric Heater control box through grommets in the Electric Heater Element cover as show in Figure#16.



Route all Red wired together through the same grommet and black wires through the second grommet.

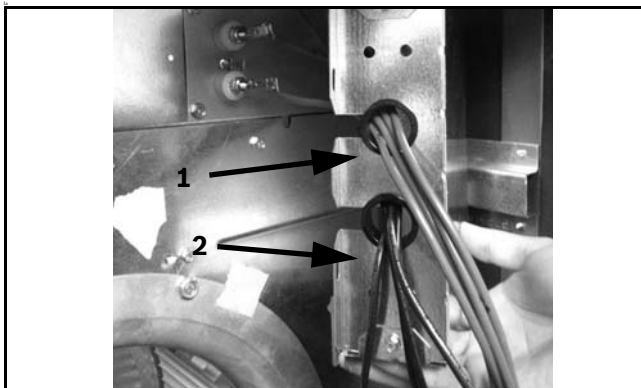


Figure # 16

- [1] Red wire
- [2] Black wire

2. For Vertical (VT) and Horizontal (HZ) units install the heater control box between the unit corner posts at the bottom of the of the blower section. Counter flow (CF) units install the heater control box between the unit corner posts at the bottom of the of the blower section. (Figure#2 through #6)



Orient the heater control box with contactor(s) towards the bottom.



Holes for Control Box are pre-punched in the corner post.



Ensure no wires are pinched between the metal parts

3. Connect red and black high voltage wires originating from Electric Heater control box to the Electric Heater elements as shown in Figure#18. Terminate Black wires labeled HLS at the thermal limits (cutouts) and Red wires labeled HT at the heater element connections.(Figure#17)



Each wire is labeled for ease of identification. Reference wiring diagram on Pg13.

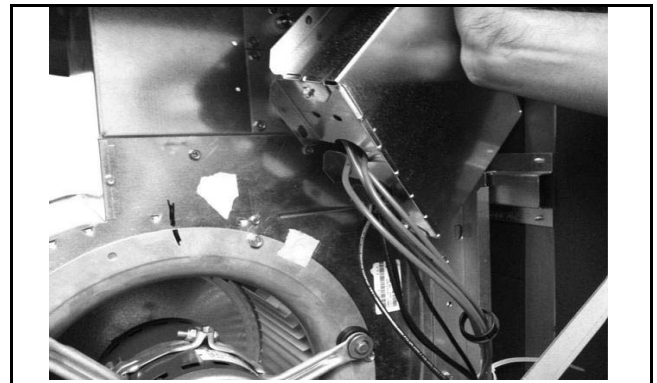


Figure # 17

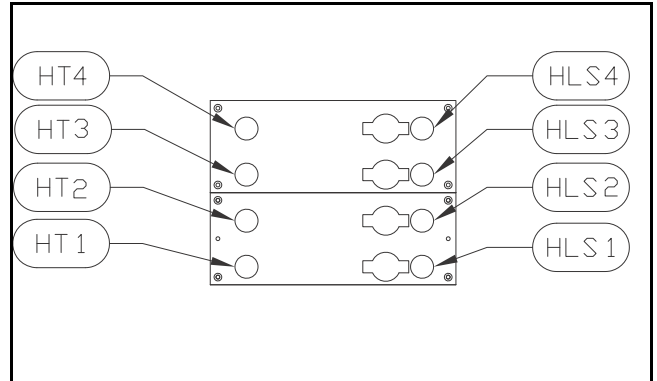


Figure # 18

4. Install the cover for the control box with the provided screws.
5. Remove and retain cork tape covering the hole in the divider panel.

6. On the wiring harness supplied with this kit identify J39 plug. (Figure#19)

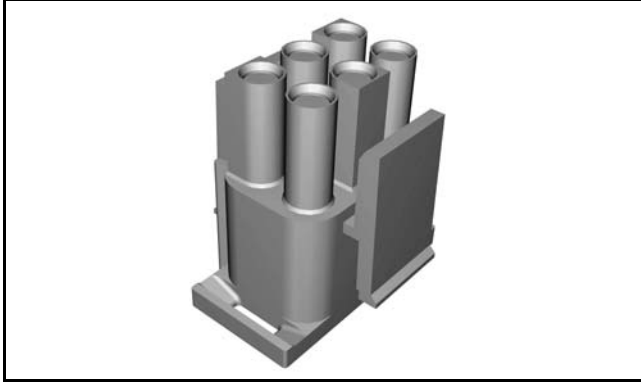


Figure # 19

7. Route J39 plug through the hole in the divider panel and mate the plug to the receiving connector P39 on the side of the electric heat control box.
8. Re-apply cork tape to the divider panel hole.
9. Route the other end of the harness (3 connector end) along the already installed blower harness, and terminate it at the unit electrical box (E-Box). Use tie-wraps every 12-18 inches for a neater finish. (Figure#20- #22)

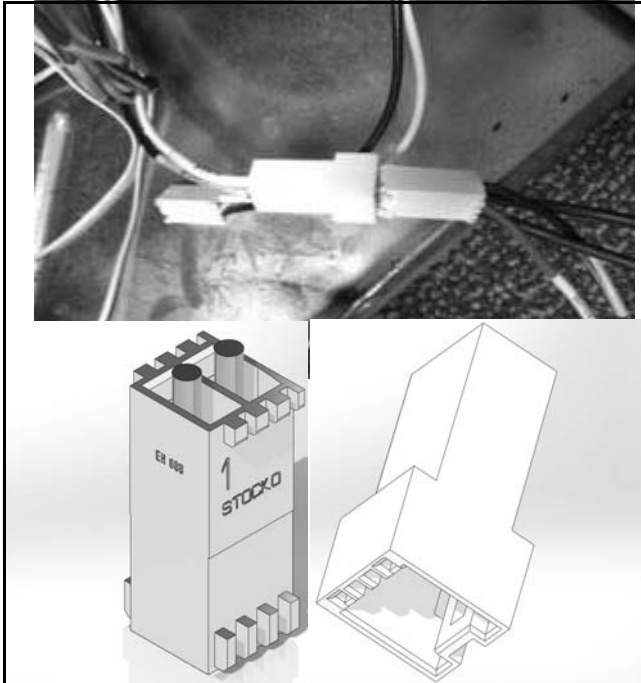


Figure # 20 J19 Blower Power Plug (two position)

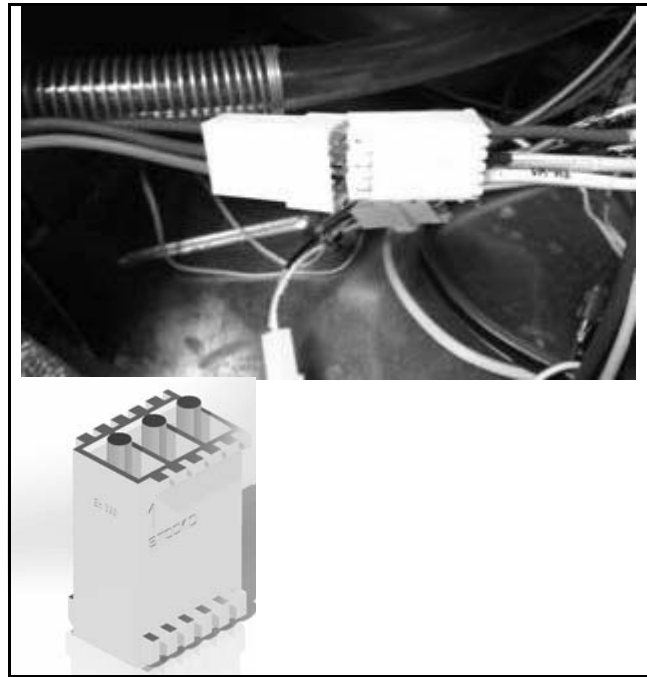


Figure # 21 P12 Control Signal Plug (three position)

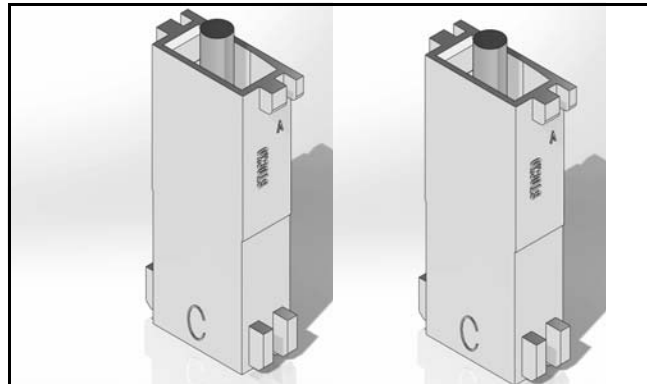


Figure # 22 Transformer Power

10. In the heat pump electrical box, disconnect the J19/P19 high voltage wires that connect the blower motor to the "line voltage" these wires are located on the left hand side of the e-box shown in the picture below.(Figure#23)



Figure # 23

11. Mate J19 plug originating from the electric heat control box (red and black wires) with P19 plug originating from blower harness at E-Box.(Figure#24)



When mating plugs, push both connectors together until they snap with a click.

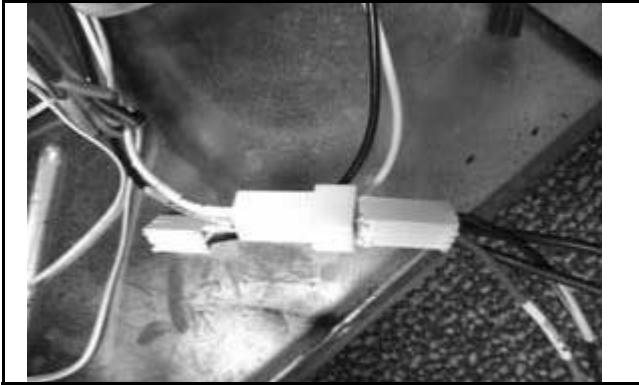


Figure # 24

12. Disconnect the red and black line voltage harness (8733901778) from the transformer primary side and the contactor line side, and remove the harness from the E-box entirely.(Figure#25 & #26)



Figure # 25 Transformer primary



Figure # 26 Primary disconnected

13. Route the two line voltage wires that derived from the P19 plug, these wires should be routed under the contactor along the bottom of the electrical box.(Figure#27)



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

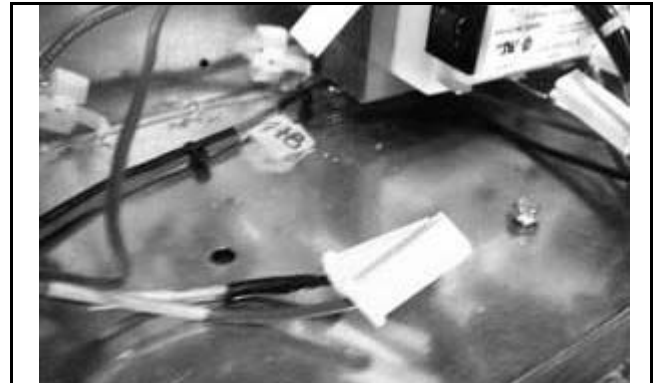


Figure # 27

14. Connect red and black wires from electric heat harness to transformer primary winding per wire labels.
15. There will be one harness (black and white wires) left connected to the compressor contactor. Remove and discard this loose harness from the contactor.(Figure#28)

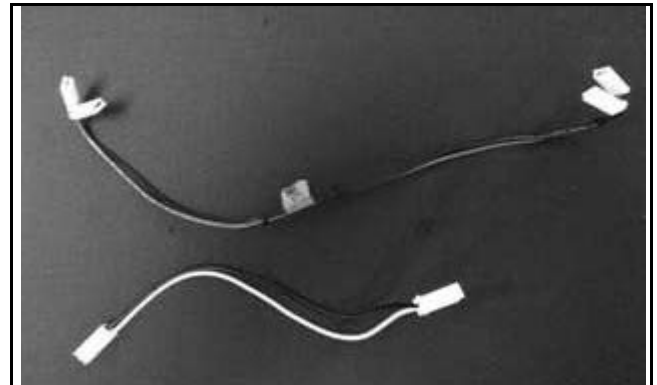


Figure # 28

16. There should now be one plug left labeled P12 on the electric heat harness. Mate this plug to its counterpart plug already available on the left hand side of the e-box labeled J12.(Figure#29 & #30)



Figure # 29

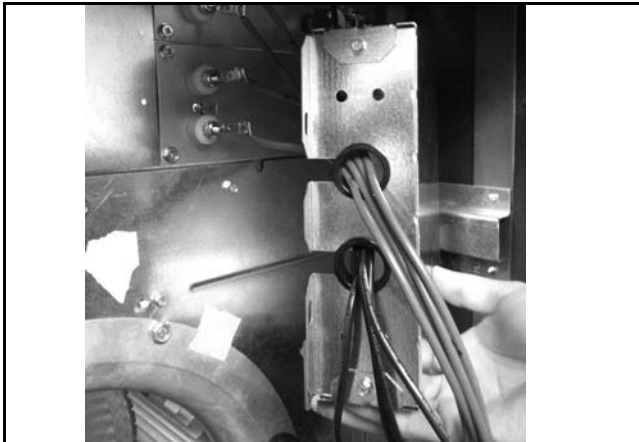


Figure # 30

17. Ensure heater element wires are routed through the plastic bushings available in the kit, and perform a continuity test to ensure all connections are secure. See Figure #31.



Use bottom holes on the plate to inset the plastic grommets and prevent the wires from laying on sharp edges

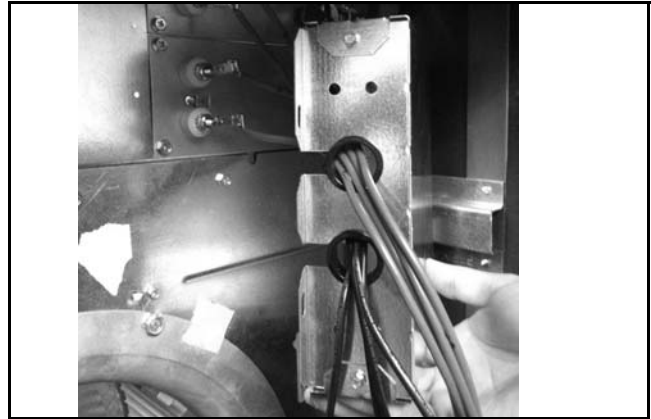


Figure # 31

18. Remove (2) screws as shown. (Figure#32)

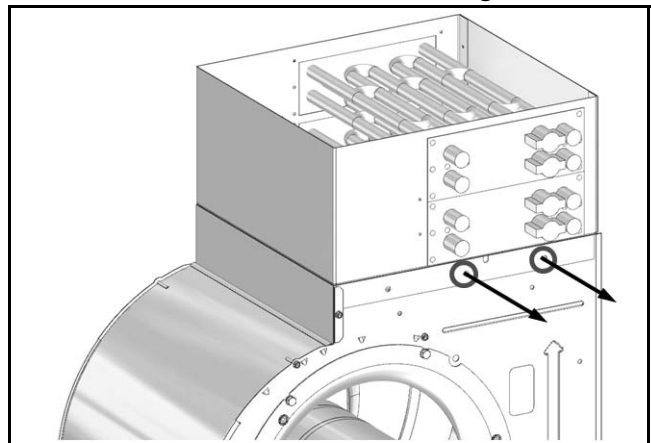


Figure # 32

19. Mount Heater Element cover to blower collar using (4) 3/8 Philip-Hex screws. (Figure#33)

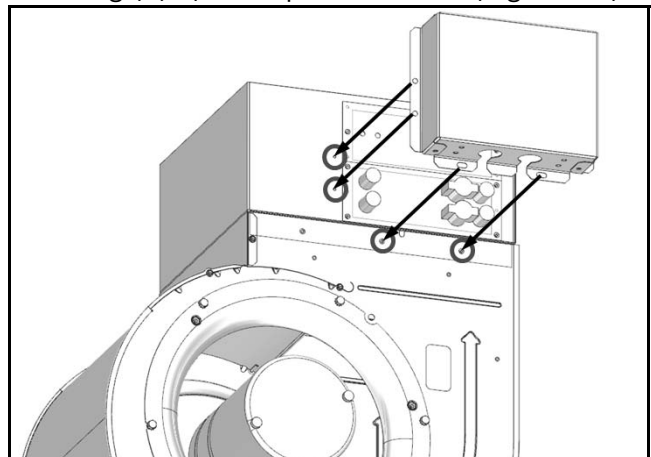


Figure # 33

20. Use push in wire ties to secure cables to cover and blower bracket. (Figure#34)

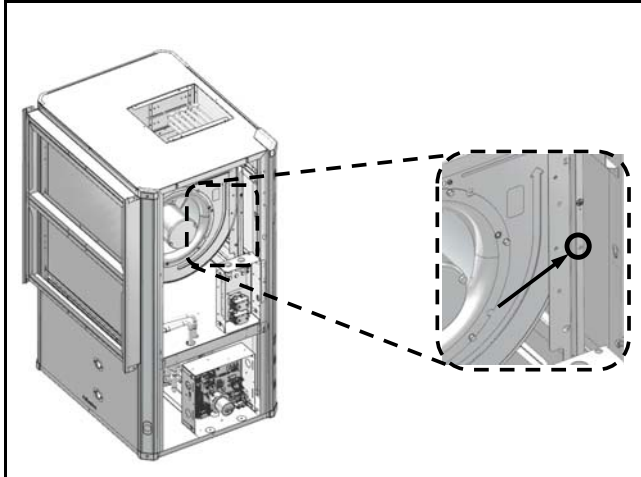


Figure # 34

THERMOSTAT WIRE CONNECTIONS

1. Assure that two low voltage wires are available from the thermostat to make the “W1” and “EM” 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 “EM” 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 User’s Manual for proper connection.

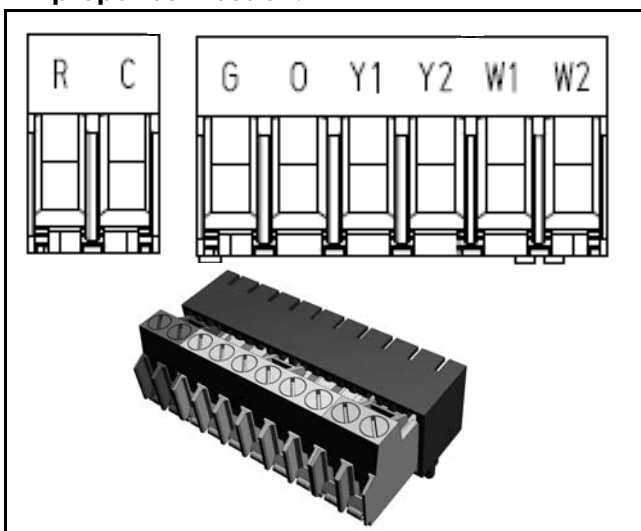


Figure # 35

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 electrical data at the end of this manual. 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 the data tag label that is included in the heater kit or the electrical data at the end of this manual.
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. A plastic bushing should be used to protect the wire insulation from the metal edge of the knockout
5. Connect one of the line voltage wires to “L1” terminal connection and the other line voltage wire to “L2” terminal connection. Torque to 22 in-lbs.
6. Use the ground lug provided in the heater control box to connect the field ground from the power supply.

WIRING DIAGRAM REPLACEMENT/ DATA PLATE 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. Using spray adhesive glue is recommended. See Figure #36

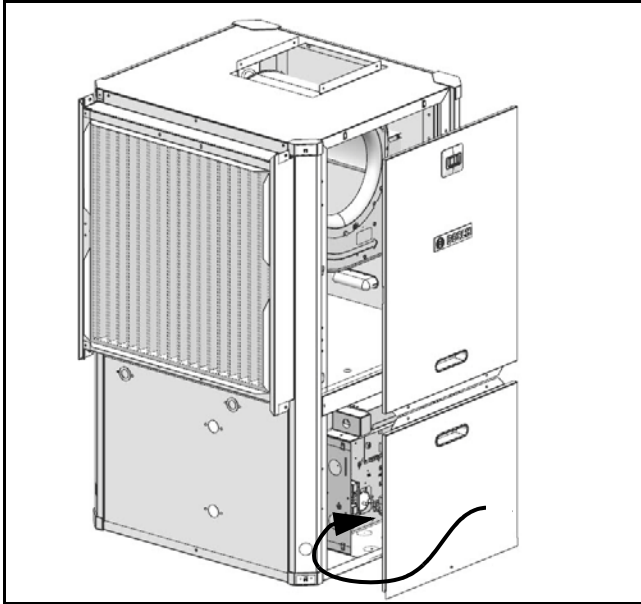


Figure # 36

2. Place the adhesive backed heater data label above existing dataplate label.

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 heating 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 DIAGRAM

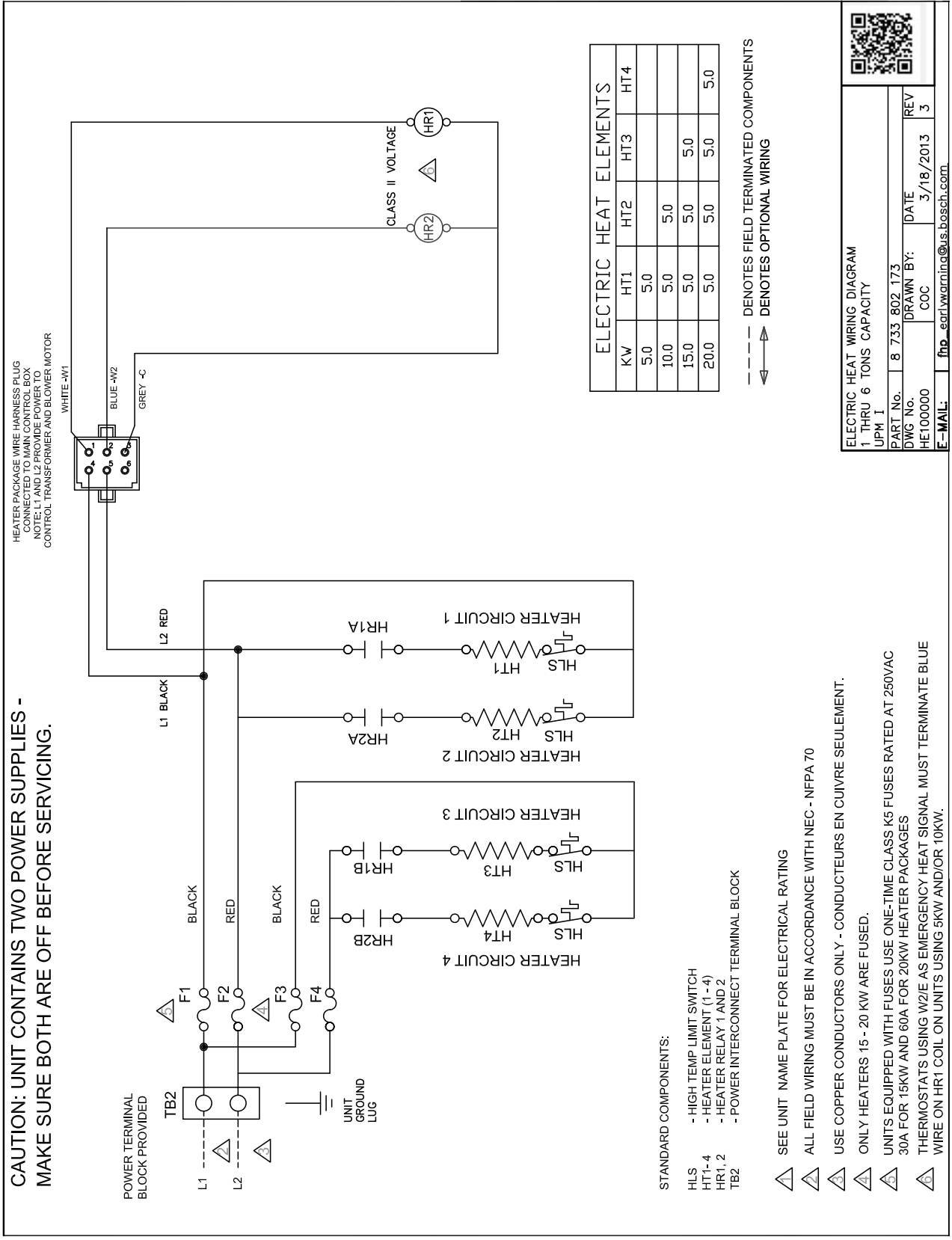


Figure # 37

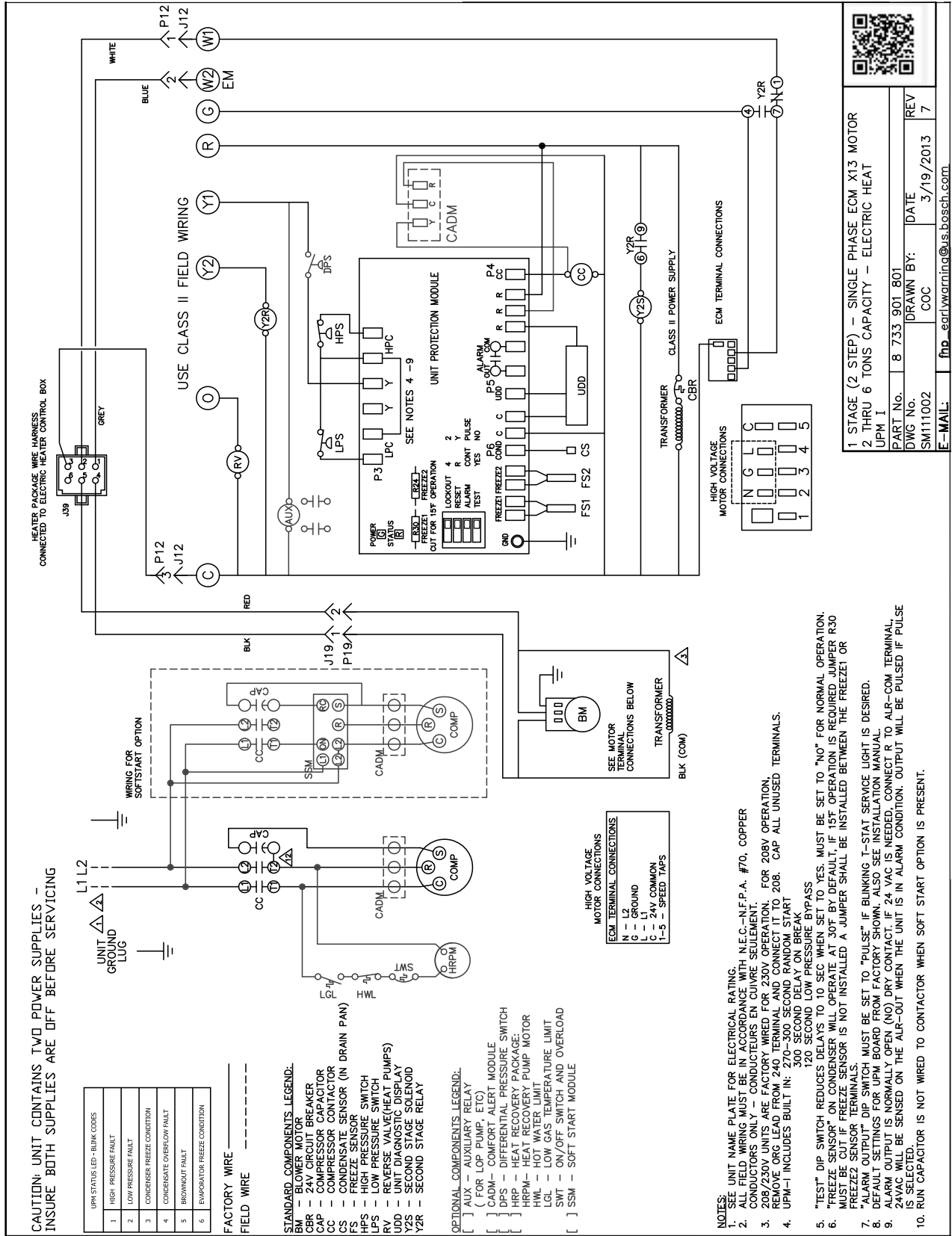


Figure # 38

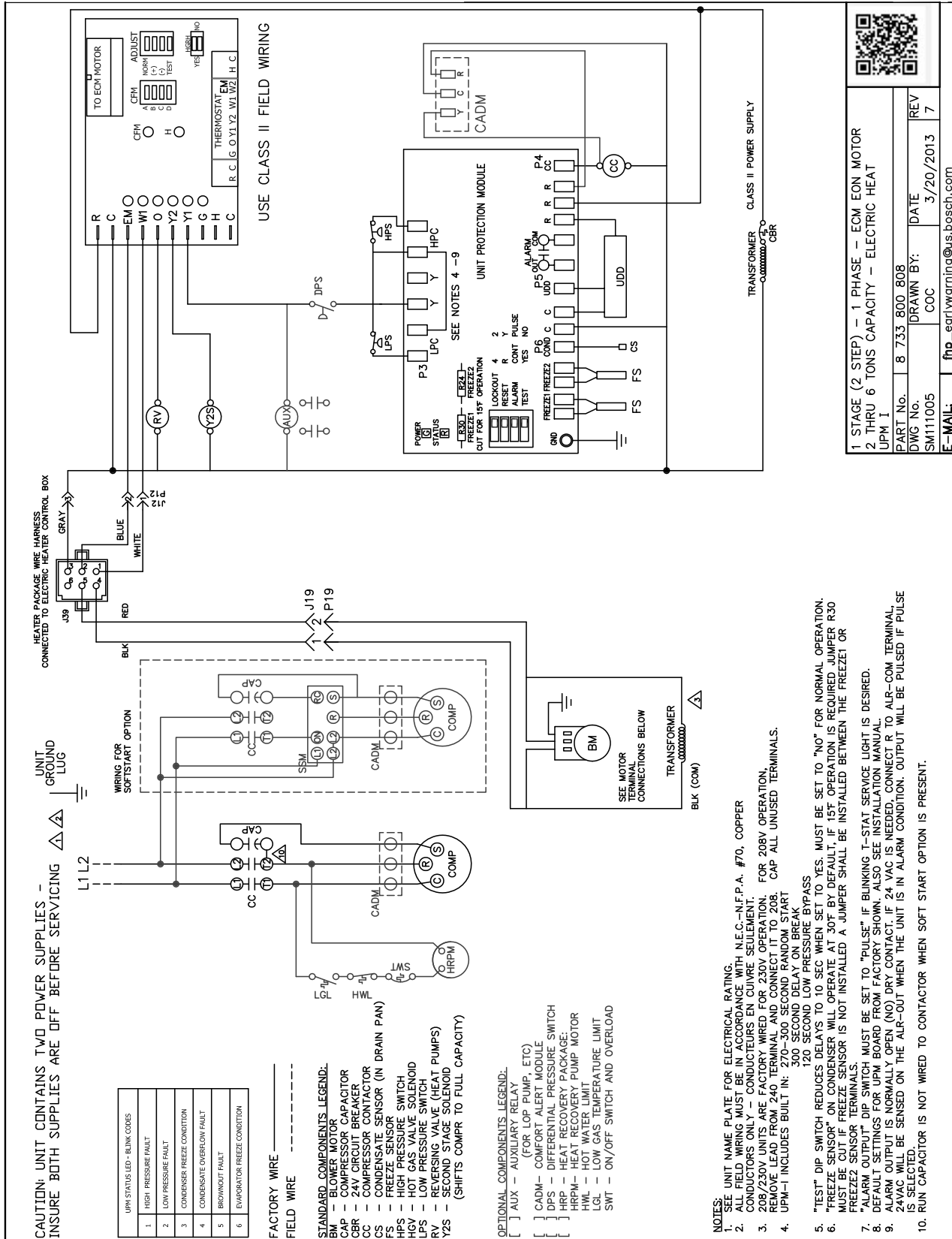


Figure # 39

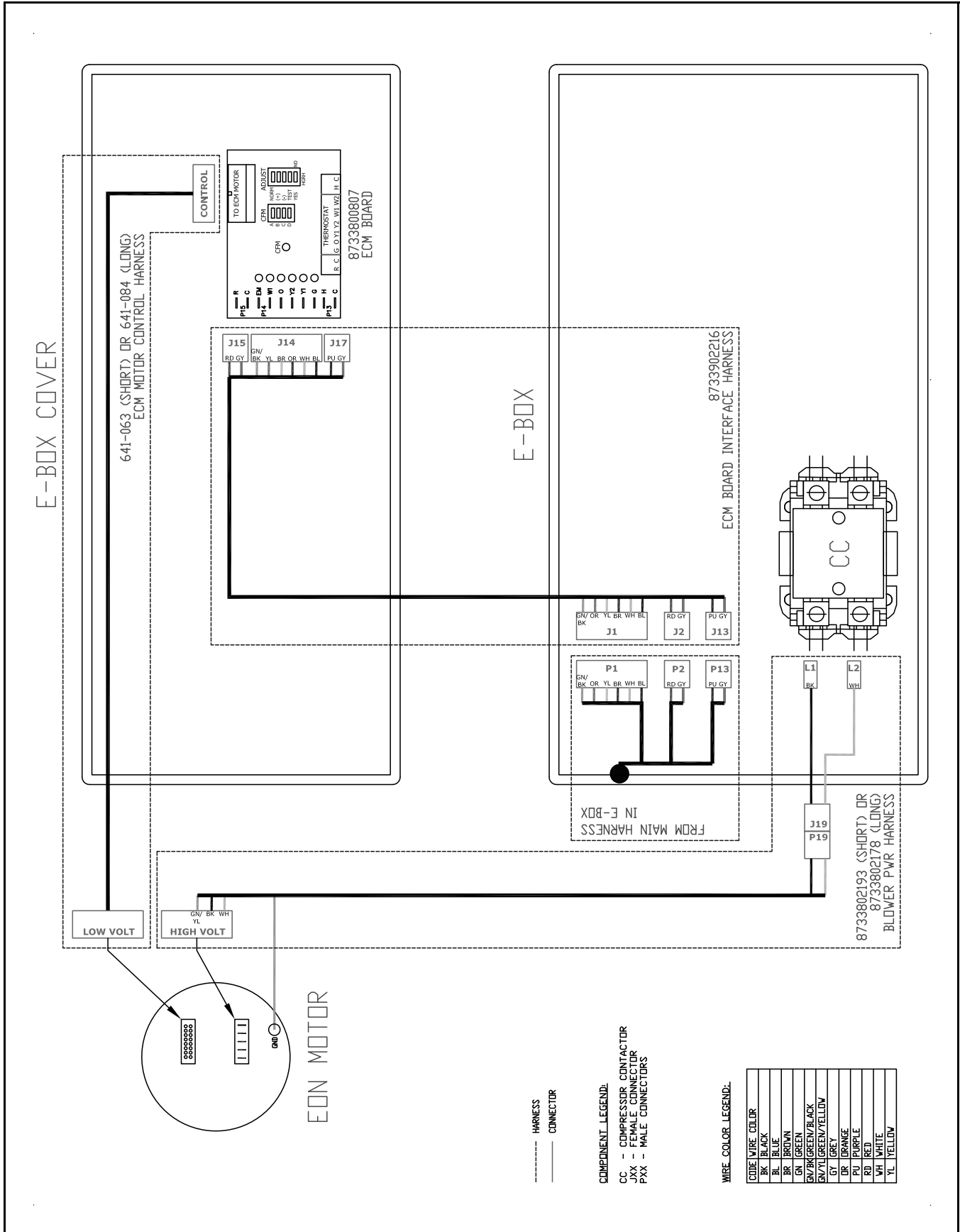


Figure # 40

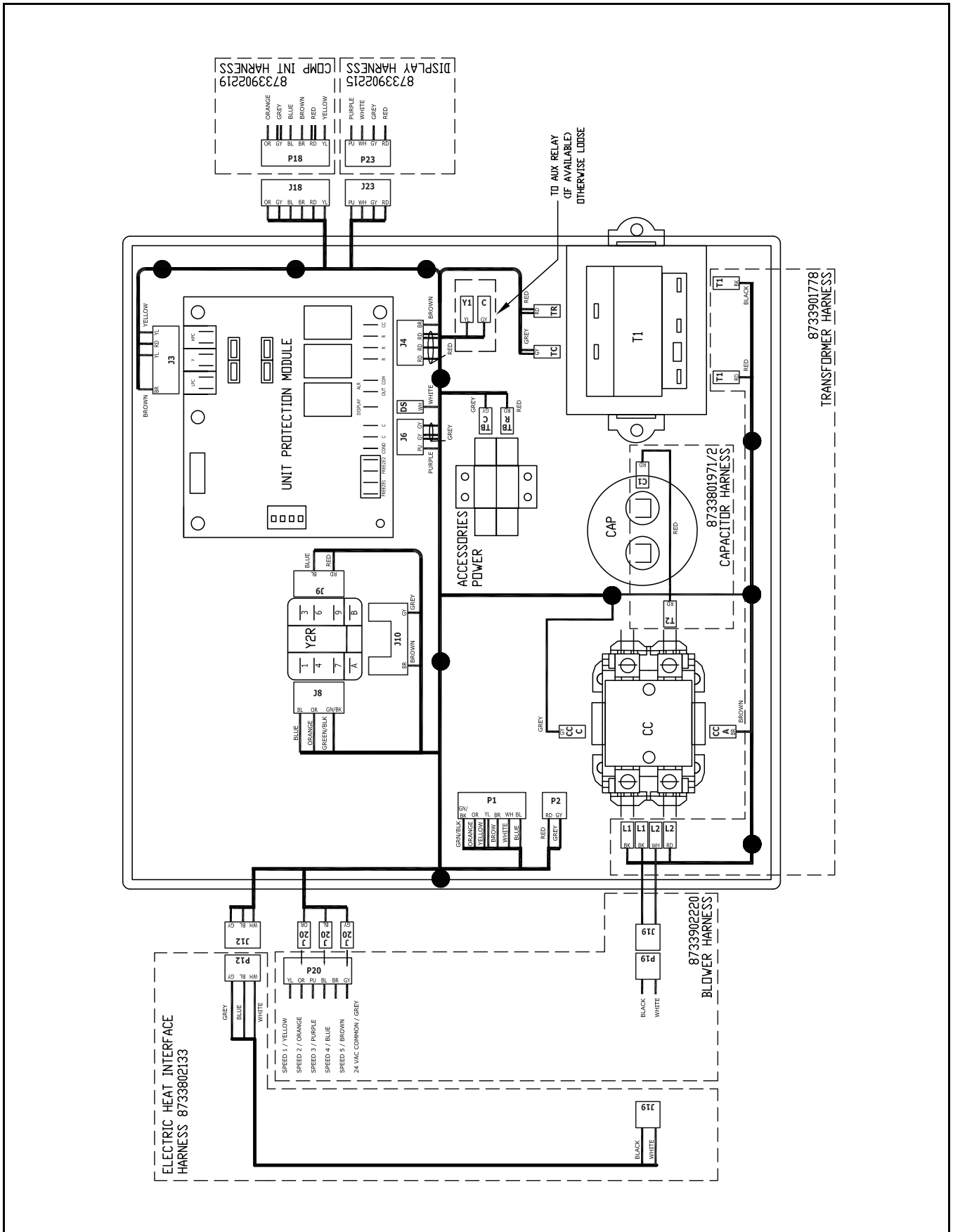


Figure # 41

ELECTRIC HEAT ELECTRICAL DATA

MODEL	RATED kW	STAGE	HEATER WATTS		HEATER AMPS		CIRCUIT FUSES	MCA		MOP	
			240V	208V	240V	208V		240V	208V	240V	208V
HK050-1201-RES	4.8	1	4,800	3,600	20.0	17.3	F1/F2	33.8	30.4	35	35
HK100-1201-RES	9.6	1	9,600	7,200	40.0	34.6	F1/F2	58.8	52.0	60	60
HK150-1201-RES	14.4	1	9,600	7,200	40.0	34.6	F1/F2	83.8	73.6	90.0	80.0
		1+2	14,400	10,800	60.0	51.9	F3/F4				
HK200-1201-RES	19.2	1	9,600	7,200	40.0	34.6	F1/F2	108.8	95.3	110	100
		1+2	19,200	14,400	80.0	69.2	F3/F4				

NOTES



BOSCH

601 N.W. 65th Court, Ft. Lauderdale, FL 33309
Phone: 866-642-3198 | Fax: 954-776-5529
www.boschtaxcredit.com | www.bosch-climate.us
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