

SM Split AH/AV Air Handler Field-Installed Electric Heat Kit

HK050 | HK100 | HK150 | HK200



BOSCH

Installation, Operation, and Maintenance Manual

8733827057 (2021/04)

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DOCUMENT CONVENTIONS

Key to Symbols

Warnings



Warnings in this document are identified by a warning triangle printed against a gray background. Keywords at the start of the warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

The following keywords are defined and can be used in this document:

- **DANGER** indicates a situation that, if not avoided, will result in death or serious injury.
- **WARNING** indicates a situation that, if not avoided, could result in death or serious injury.
- **CAUTION** indicates a situation that, if not avoided, could result in minor to moderate injury.
- **NOTICE** is used to address practices not related to personal injury.

Important Information



This symbol indicates important information where there is no risk to property or people.

SAFETY WARNINGS



IMPORTANT: Read the entire instruction manual before starting installation.



WARNING: PERSONAL INJURY HAZARD
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.



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



WARNING: 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.



WARNING: This product can expose you to chemicals including Lead and Lead components, which are known to the State of California to cause cancer and birth defects or other reproductive harm.

For more information go to www.P65Warnings.ca.gov.



CAUTION: PERSONAL INJURY HAZARD

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

NOTICE: To avoid the release of refrigerant into the atmosphere, the refrigerant circuit of this unit must be serviced only by technicians who meet local, state, and federal proficiency requirements.

NOTICE: All refrigerant discharged from this unit must be recovered WITHOUT EXCEPTION. Technicians must follow industry accepted guidelines and all local, state, and federal statutes for the recovery and disposal of refrigerants. If a compressor is removed from this unit, refrigerant circuit oil will remain in the compressor. To avoid leakage of compressor oil, refrigerant lines of the compressor must be sealed after it is removed.

NOTICE: To avoid equipment damage, DO NOT use these units as a source of heating or cooling during the construction process. Doing so may affect the unit's warranty. The mechanical components and filters will quickly become clogged with construction dirt and debris, which may cause system damage or failure.

BOSCH HK SERIES HEATER PACKAGE

General Description

Bosch HK Series Heater Package is a field-installed electric resistance heater kit designed for the SM Split Air Handler (AH/AV).

The HK Series Electric Heat Kit Package is available in four (4) sizes, 5 kW, 10 kW, 15 kW, and 20 kW. Refer to table 1 for the compatible heater kits for each SM model.

The HK Series Electric Heat Kit Package can be installed on SM Air Handler Horizontal (AH) and Air Handler Vertical (AV).

Unit Model	Heater Compatibility			
	HK050-1202 (5kW)	HK100-1202 (10kW)	HK150-1202 (15kW)	HK200-1202 (20kW)
SM024	X	X		
SM036	X	X	X	
SM048	X	X	X	X
SM060	X	X	X	X

Table 1 Unit/Heater Compatibility

Component List

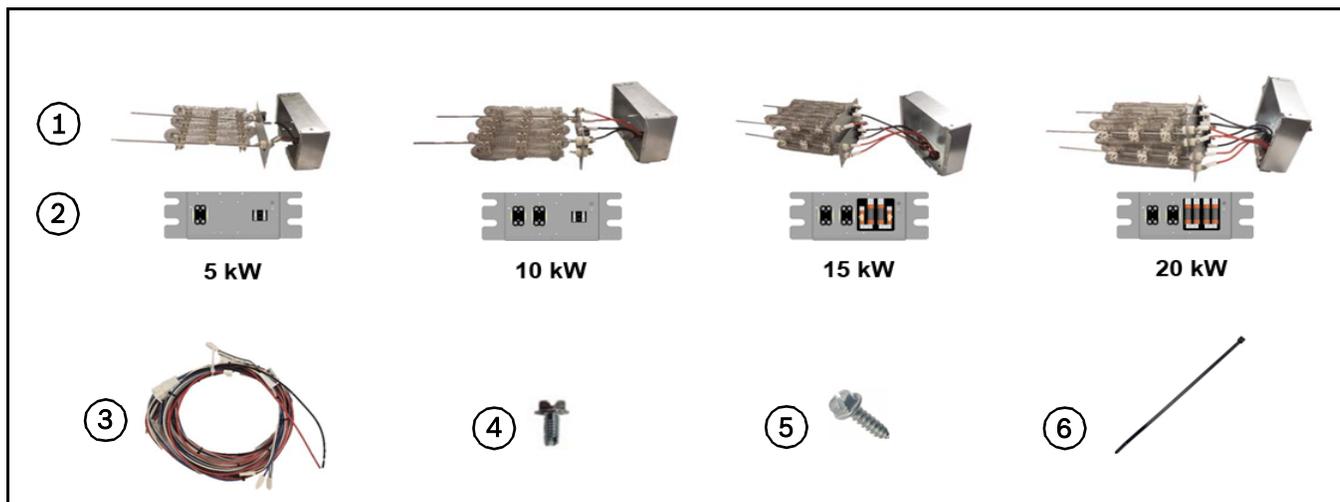


Fig. 1 Heater Kit Components

- [1] Electric Heat Elements per kW Capacity (Qty. 1)
- [2] Pre-wired Electric Control Box per kW Capacity (Qty. 1)
- [3] Electric Heat Harness (Qty. 1)

IMPORTANT: HK Series Heater Packages can only be installed on single-phase units.

IMPORTANT: An electric heater mounting collar is installed in the WSHP unit, there is no need to order it separately.

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

Unpacking and Inspection

1. Unpack the heater kit.
2. Ensure that the heater kit package includes all of the items listed in Fig. 1.
3. If any part of the kit appears damaged (i.e., broken heater elements, damaged relays) or missing, do not attempt to install the kit. Contact your local distributor for assistance.

ELECTRIC HEAT KIT INSTALLATION

This section contains information on the following:

Subject	Page
Required Tools List	5
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Installing the Electric Heat Element	6
Connecting the Electric Heat Wiring	8
Installing the Electric Heat Element Control Box	10
Connecting the Electric Heat Element Power Leads in the EH Control Box	12
Connecting the Field Line Voltage Wiring	12
Connecting the Thermostat Wire	12
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Required Tools List

- Phillips screwdriver
- Small flat head screwdriver
- 5/16" socket and a ratchet, nut driver, or drill
- 12" Ratchet/Socket Extender

Removing the Access Panels

1. Turn OFF the system at the thermostat.
2. Turn OFF the main power to the heat pump at the unit's disconnect switch or breaker panel.
3. Locate the access panels (See Fig. 2), the electrical access panel (front, pos.1) and the blower section (side, pos.2).

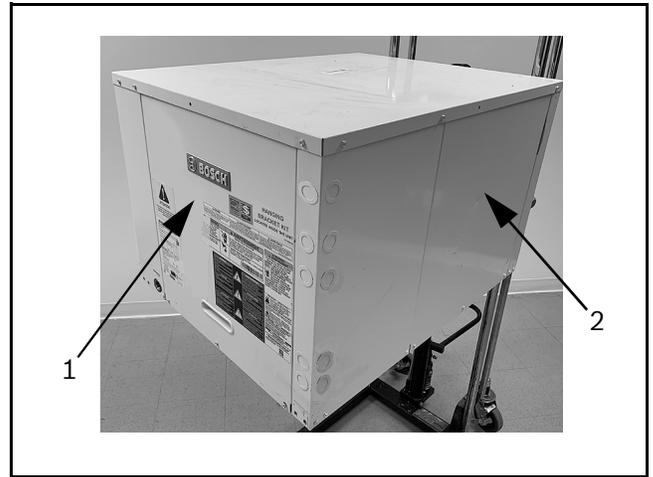


Fig. 2 Access Panels

4. Unscrew the three screws at the bottom of the electrical access panel. (See Fig. 3.)



Fig. 3 Remove the Electrical Access Panel Screws

5. Slide electrical access panel out to remove. (See Fig. 4.)



Fig. 4 Slide Out Electrical Panel

6. After the electrical access panel has been removed, locate and remove the blower access panel by unscrewing the three bottom screws. (See Fig. 5.)



Fig. 5 Remove the Blower Panel Screws

7. Once the three screws have been removed, slide the panel out and remove. (See Fig. 6.)

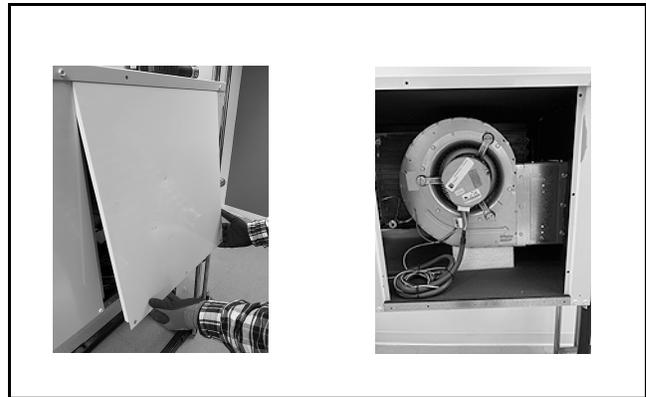


Fig. 6 Slide Out the Blower Access Panel

Installing the Electric Heat Element

1. On the Electric Heat Kit, cut the zip ties holding the element cover.
2. Electric Heat Elements come pre-wired from factory. Disconnect the red and black wires from the Heater Elements to facilitate installation. Note: Steps to re-wire elements are provided later.
3. On the unit, unscrew and remove the heater collar cover plate. (See Fig. 7.)

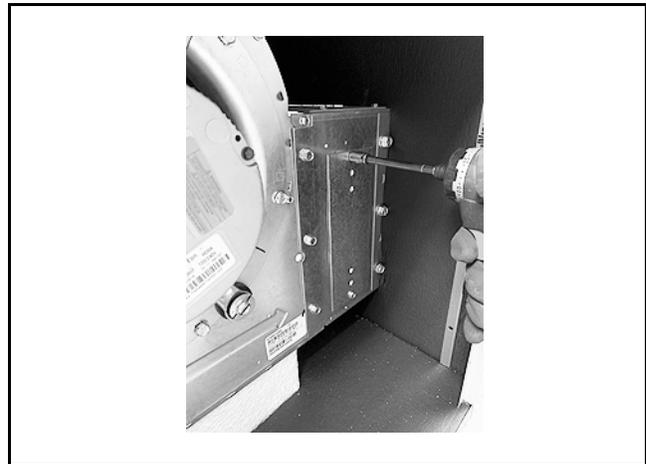


Fig. 7 Unscrew and Remove the Heater Collar Cover Plates

4. In preparation for the heater element installation, orient the heating elements with thermal overloads directly in-line with discharge air stream. This will ensure the heater elements thermal overloads are exposed to airflow. (See Fig. 8 and Fig. 11.)

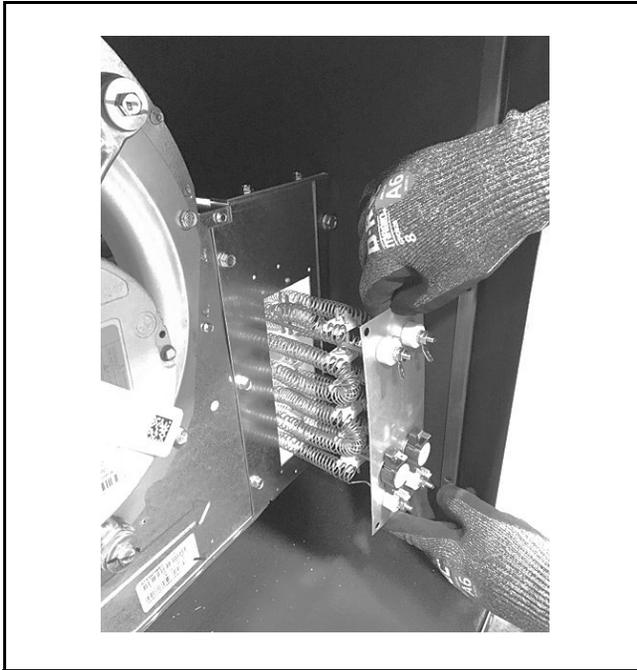


Fig. 8 Electric Heat Element Orientation

- Slide in the heating element rods into the holes in the rear of the heater collar. (See Fig. 9.)

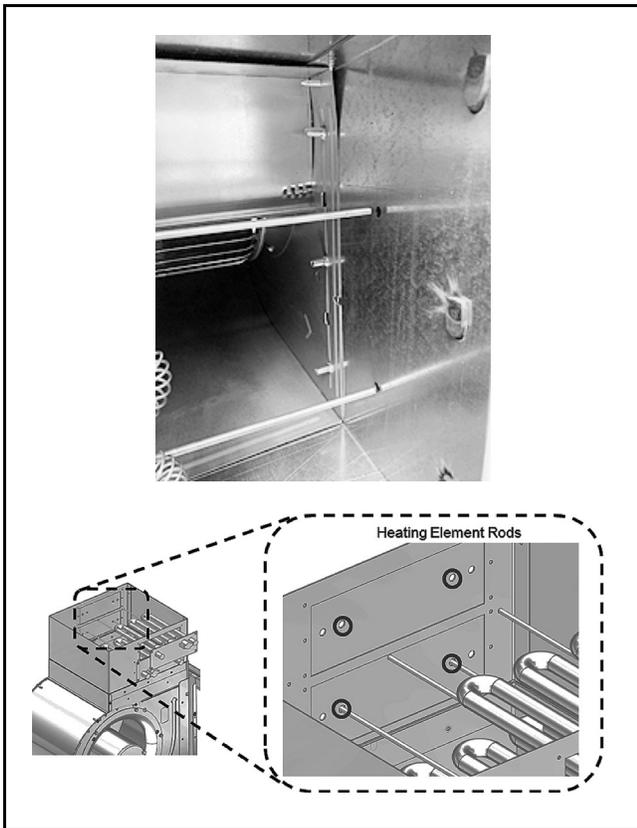


Fig. 9 Electric Heat Element Installed

- Screw the heating element into place. (See Fig. 10.)



Fig. 10 Screw in the Electric Heat Element

The installed heating element should look like the following for each kit. (See Fig. 11.)

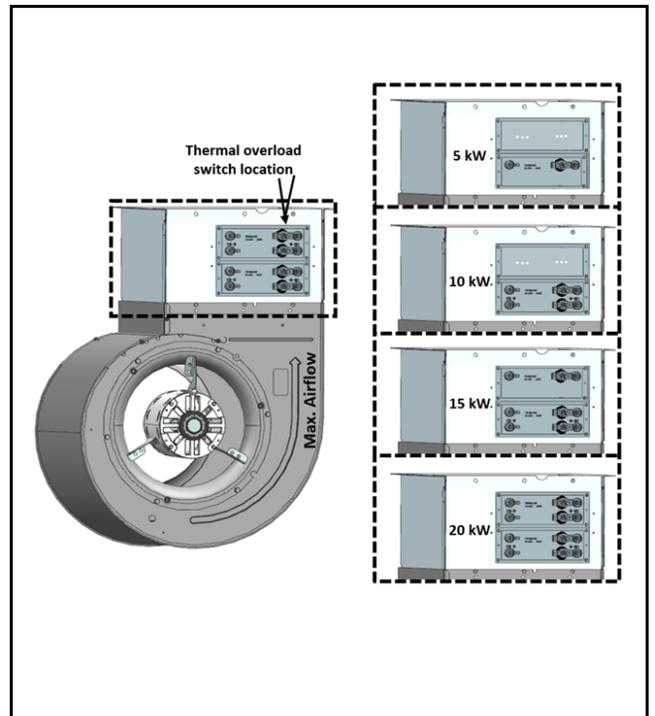


Fig. 11 Electric Heat Elements Installed

Connecting the Electric Heat Wiring

1. Ensure that the high-voltage Red and Black wires originating from the Electric Heat control box are routed through the grommets in the Electric Heat Element cover as show in Fig. 12.

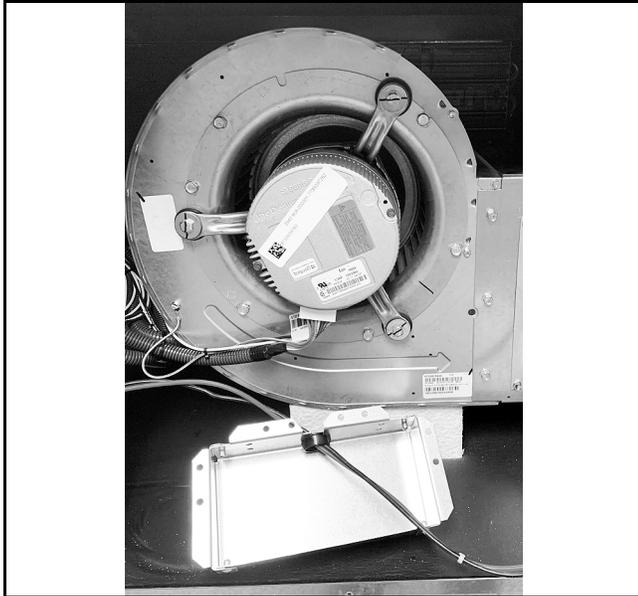


Fig. 12 Wire Routing

2. Ensure that the red and black high-voltage wires originating from Electric Heat control box to the Electric Heat elements are reconnected as shown in Fig. 13. (The Black wires are labeled HLS at the thermal overloads, and the Red wires labeled HT at the heater element connections.)

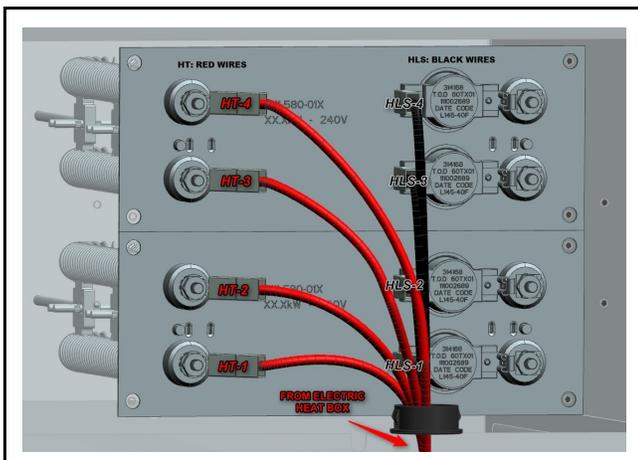


Fig. 13 HT and HLS connections

3. Move the heat element cover into position. (See Fig. 14.)

4. Line the heat element cover with the holes on the heating collar and screw into place. (See Fig. 14.)

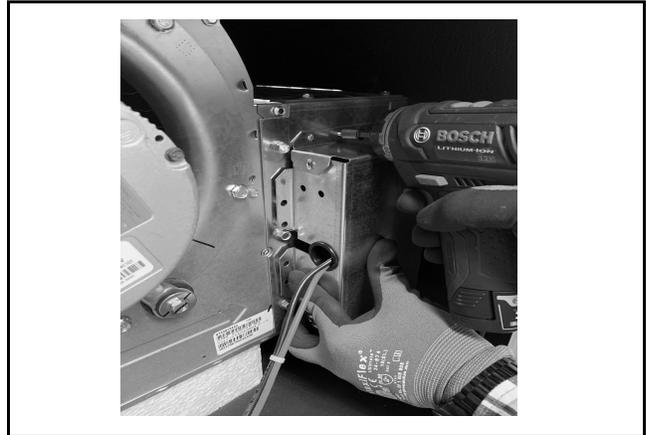


Fig. 14 Screw in the Heat Element Cover



Depending on the heater kit model/size, there may be multiple heating elements. If a second is required, repeat the above steps for the second heating element.

5. Locate the Blower Interconnect Harness and unplug from the blower connector side and the 2-pole terminal block side. (See Fig. 15.)

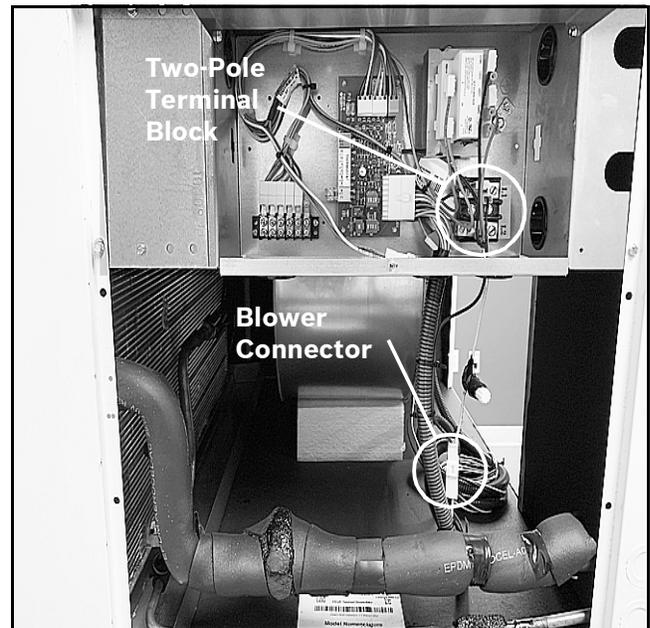


Fig. 15 Blower Connectors

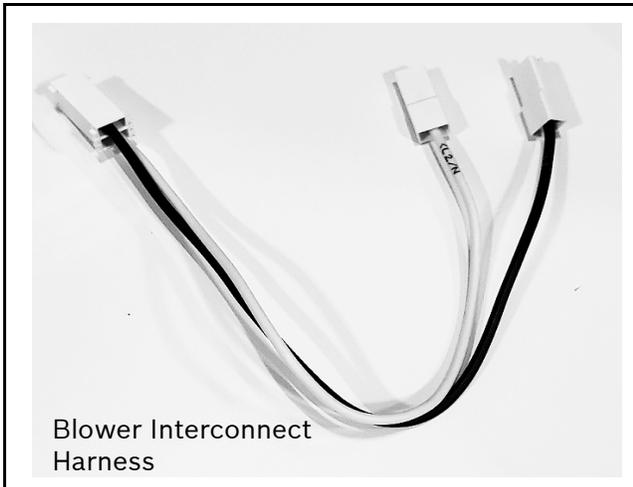


Fig. 16 Blower Interconnect Harness

6. Cut any zip ties holding the Blower Interconnect Harness.
7. Discard the Blower Interconnect Harness. (See Fig. 16.)
8. In the main Electrical Control Box, locate Motor Harness connected to ECM interface board. If the harness is routed through bottom knockout follow step 9 to re-locate in order to allow enough space to install the Electric Heat Control Box (See Fig. 18). If Motor Harness is not routed through bottom, skip step 9.

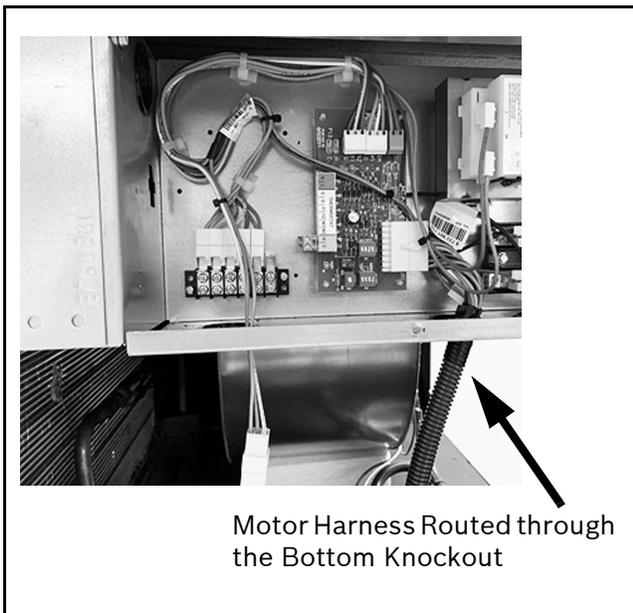


Fig. 17 Motor Harness Routed through Bottom Knockout

9. Reroute the Motor Harness from the bottom knockout through the left-side knockout as shown in Fig. 18 for right-hand configuration. Use the upper-right knockout for the left-hand configuration. (See Fig. 17 and Fig. 18.)

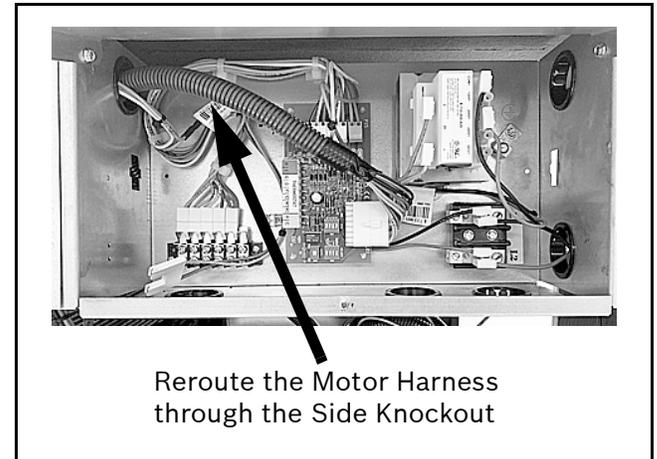


Fig. 18 Motor Harness Relocated through Side Knockout

10. In the main Air Handler unit Electrical box, locate the Electric Heat plug ((Blue (W2/EM), White (W1), and Gray (C) wires) labeled J-12 and mate to its counterpart plug labeled P12 in the Electric Heat Wiring Harness. (See Fig. 19.)

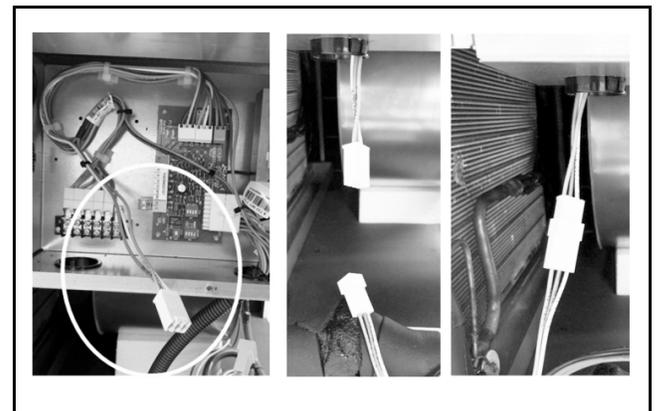


Fig. 19 Connect the Electric Heat Harnesses

11. Locate the blower connector from Step 5 (Fig. 15), connect it to the J19 connector (red and black wires) on the Electric Heat Wiring Harness.

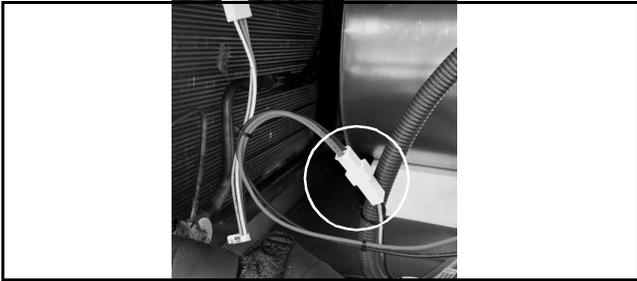


Fig. 20 Blower Connection

12. Locate the red and black wires that have single connectors coming from the J19 connector described in the previous step.

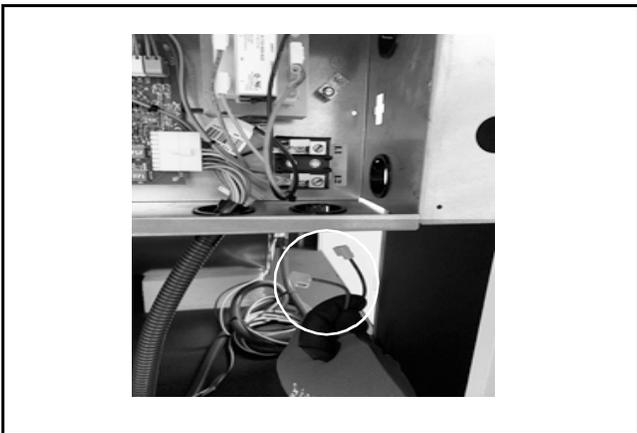


Fig. 21 Red and Black Wires

13. Feed the red and black wires through the side knockout.
14. Connect the red wire to the L2 terminal of the 2-pole terminal block. (See Fig. 22.)
15. Connect the black wire to the L1 terminal of the 2-pole terminal block (See Fig. 22.)



Depending on the size of the unit, there may be excess wire slack from the length of the wiring harness. Use the provided zip ties in the kit to neatly wrap up this excess wiring per preference.

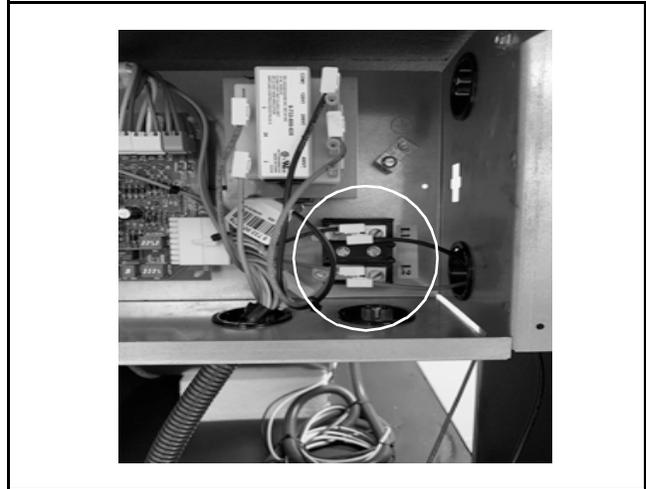


Fig. 22 Compressor 2-Pole Terminal Block Connections

Installing the Electric Heat Control Box

1. In the Electric Heat Control Box, locate the loose J39 Connector.
2. Locate the J39 mounting slot on the inner side of the EH Control box.
3. Line up the J39 Connector and insert it into the mounting slot. Fig. 23 shows connection slot for left-hand configuration.

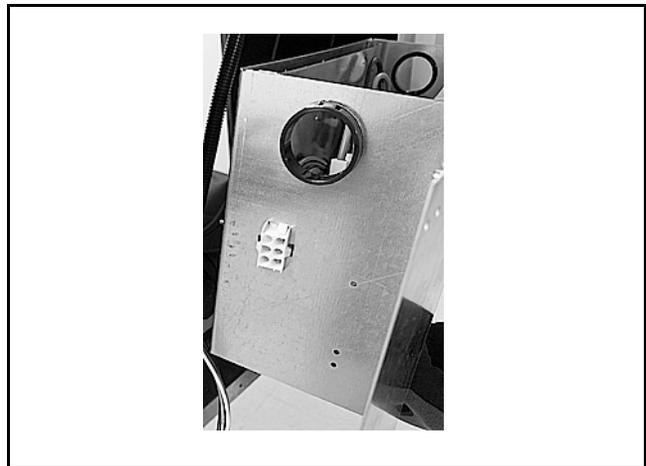


Fig. 23 J39 Connector

4. Connect the male end of Electric Heat Wiring Harness to the J39 Connector on the side of the Electric Control Box. (See Fig. 24.)

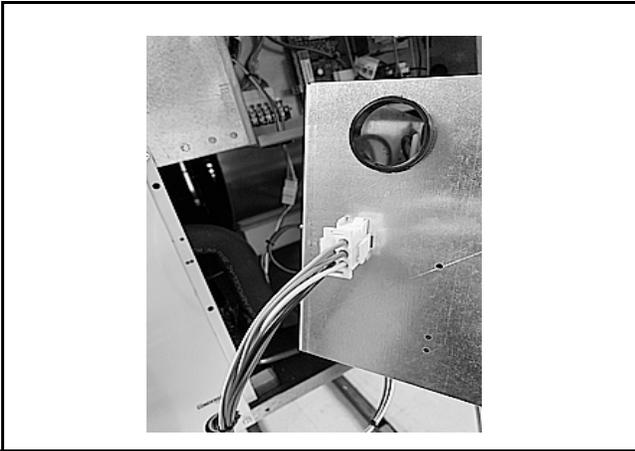


Fig. 24 J39 Connection

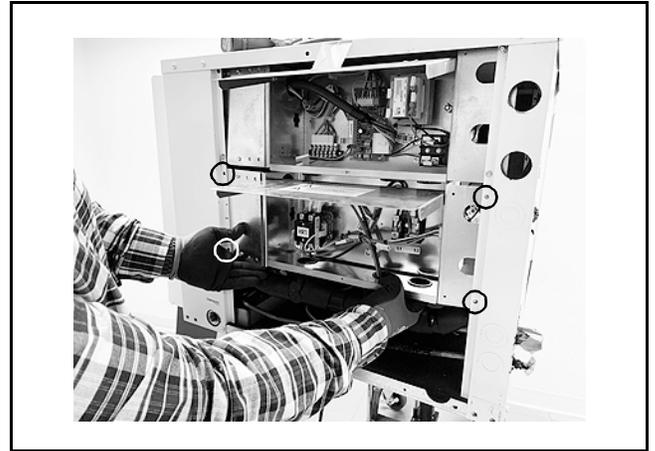


Fig. 26 Align the EH Control Box

5. Align the Electric Heat Control Box up with the mounting holes. Fig. 26 shows the mounting for right-hand configuration.

6. Secure with screws as shown to complete EH control box installation. (See Fig. 27.)



The Electric Heat Control Box must be installed from post to post on the Air Handler unit. Depending on the unit size/ configuration an extension plate (provided with kit) will be required. (See Fig. 25.)

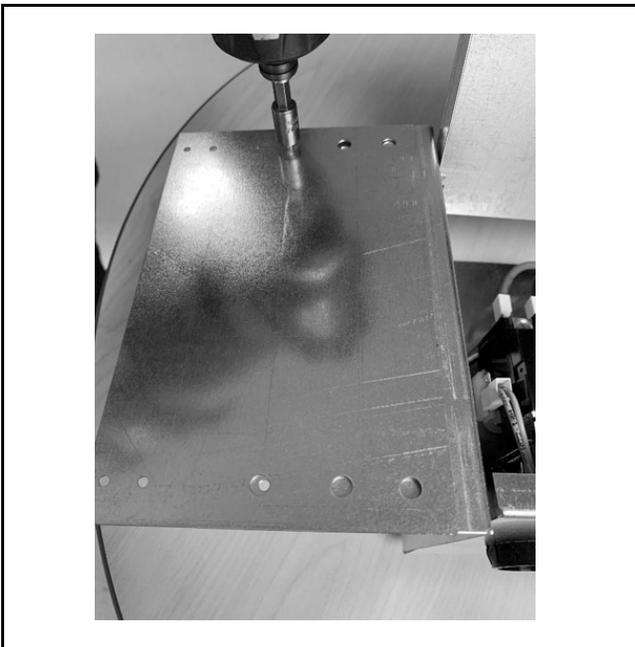


Fig. 25 Extension Plate



Fig. 27 Secure the Control Box with Screws

Connecting the Field Line Voltage Wiring



WARNING: UNIT OPERATION AND SAFETY HAZARD

Field wiring must comply with local and National Electric Code (NEC).



WARNING: UNIT OPERATION AND SAFETY HAZARD

Power to the Electric Heater must be within the operating voltage range indicated on the data tag label or the Electric Heat Electrical Data table (Table 3) of this manual.



WARNING: UNIT OPERATION AND SAFETY HAZARD

Properly-sized circuit breakers must be installed for the heater electrical load. Refer to the data tag label that is included in the heater kit or the Electric Heat Electrical Data (Table 3) of this manual.

1. Select the appropriate 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 Heat Electrical Data Table (Table 3) of this manual. Ensure that all national and local electrical codes are followed for installation, wire sizing, and breaker sizing.
2. Select the appropriate 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 Electric Heat Electrical Data Table (Table 3) of this manual.
3. Route the new line voltage wiring and the ground wire from the circuit breaker panel to the Electric Heat Control Box.
4. Use the knockout provided in the heat pump corner post as the entry for the electrical service wiring. A plastic grommet 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 the other line voltage wire to "L2" terminal connection. (See Fig. 28.)

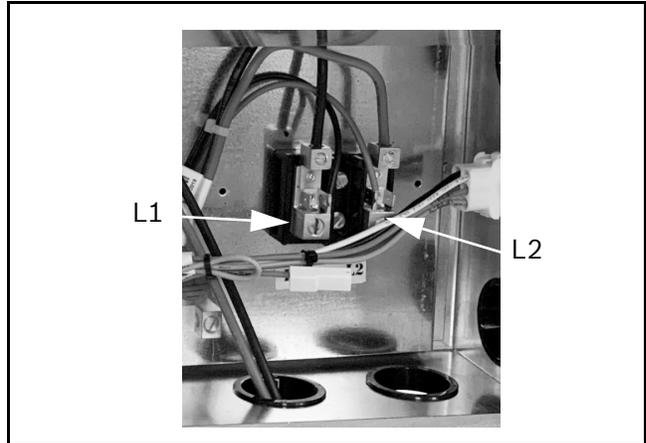


Fig. 28 Line Voltage Connections

6. Use the ground lug provided in the Electric Heat Control Box to connect the field ground wire from the power supply. (See Fig. 29.)

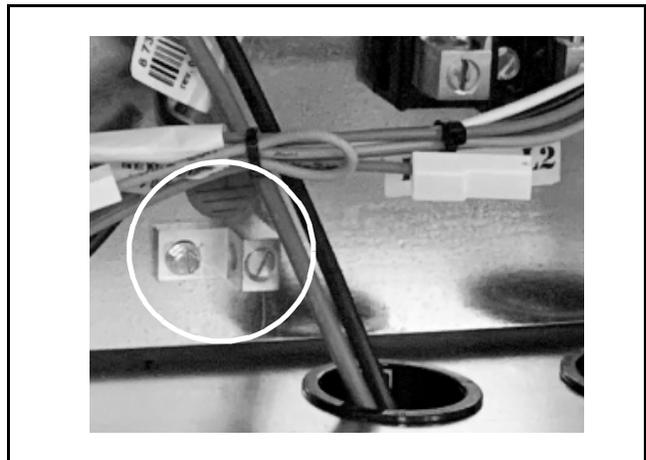


Fig. 29 Ground Lug

Connecting the Thermostat Wire

1. Check to see if that two low-voltage wires are available from the thermostat to make the "W1" and "W2" connections. If these wires are not there, 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.



Thermostat wiring should be 18 AWG (American Wire Gauge) for up to 60 foot, 16 AWG up to 100 ft, and 14 AWG up to 140 ft. Refer to the installation instructions of the thermostats for further details.

- 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 corresponding terminals on the thermostat to utilize the supplemental and emergency heat terminals.

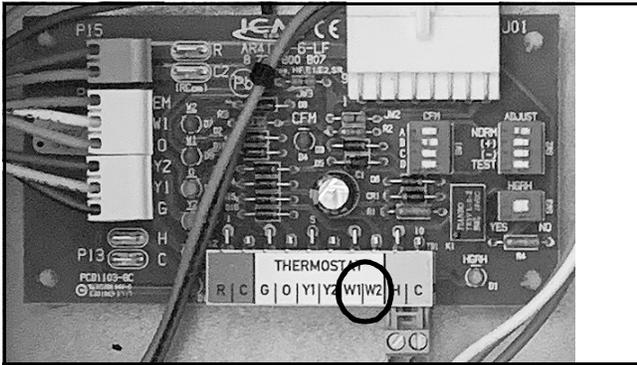


Fig. 30 ECM Interface Board Thermostat Output for Electric Heat

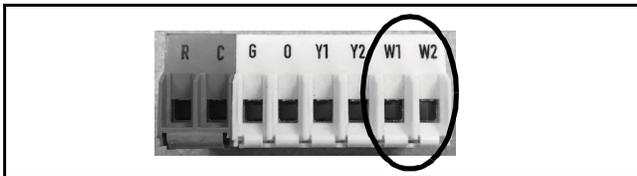


Fig. 31 Thermostat Terminals



The terminal labels may vary with the thermostat. Refer to the thermostat or unit heat terminals for specific wiring instructions.



When using a 2-cool, 3-heat thermostat both the W1 & W2 on the Heat Pump and W2 & EM on the thermostat must be connected together using a jumper. (See Fig. 32.)

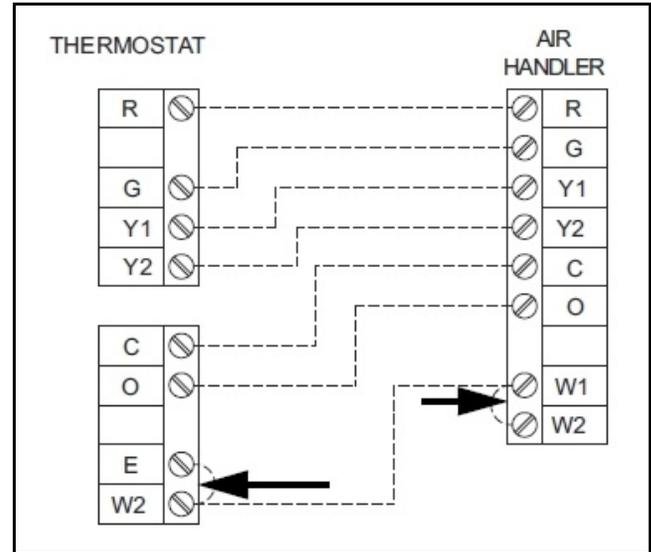


Fig. 32 Thermostat Jumpers

Replacing Wiring Diagram/Adding Heater Data Label

- Remove the wiring diagram that is mounted to the back side of the front panel of the air handler. Replace with the new wiring diagrams included with the Heater Kit as per Table 2:

Unit Model	Replace with Diagrams P/N
SM AIR HANDLER ECM MOTOR	8733901795

Table 2 Replacement Wiring Diagrams

- Attach the provided adhesive-backed heater data label to the main unit access panel next to main unit data plate label. See Fig. 33.



Fig. 33 Heater Data Label Location

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.

Installation of the Access Panels

Follow steps in reverse to reinstall unit panels. See the Removing the Access Panels section on page #5.

POST-INSTALLATION SYSTEM CHECKOUT

After completing the installation and before energizing the unit, the following system checks MUST be made:

1. Verify that the supply voltage to the Electric Heat is in accordance with the data tag label that is included in the heater kit or the Electrical Data (Table 3) of this manual.
2. Make sure that all electrical connections are tight and secure.
3. Check the breaker and wiring for the correct size.



DANGER: Ensure the cabinet and electrical box are properly grounded.

4. Verify that the low-voltage wiring between the thermostat and the unit is correct.
5. Ensure the unit is serviceable.
6. Confirm that all access panels are secured in place.

DECOMMISSIONING INFORMATION

Only trained and qualified technicians are allowed to decommission and dispose of equipment following the requirements of the Local Authority Having Jurisdiction (AHJ).



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

Protecting the Environment



By disposing of this product correctly you will help ensure that the waste undergoes the necessary treatment, recovery, and recycling, thus preventing potentially negative effects on the environment and human health, which could otherwise arise due to inappropriate waste handling.

Components



Many parts in the Heat Pump can be fully recycled at the end of the product life. Contact your city authorities for information about the disposal of recyclable products.

Refrigerant



At the end of the service life of this appliance, and prior to its environmental disposal, a person qualified to work with refrigerant circuits and [AHRI Certified](#)[®] Refrigerant Recovery/Recycling Equipment must recover the refrigerant from within the sealed system.

Hazardous Waste



Some components in the Heat Pump may be considered as hazardous waste, such as batteries. For their disposal contact your local household hazardous waste collection site.

ELECTRICAL DATA TABLE

Electric Heat Kit	Fan Motor		Heater Element				MCA		MOCP	
			kW		A					
	HP	FLA	208V	240V	208V	240V	208V	240V	208V	240V
HK050-1202 (5kW)	0.33	2.8	3.6	4.8	17.3	20	25.1	28.5	30	30
	0.5	4.3	3.6	4.8	17.3	20	27.0	30.4	30	35
	0.75	6.8	3.6	4.8	17.3	20	30.1	33.5	35	40
	1.0	9.1	3.6	4.8	17.3	20	33.0	36.4	40	45
HK100-1202 (10kW)	0.33	2.8	7.2	9.6	34.6	40	46.8	53.5	50	60
	0.5	4.3	7.2	9.6	34.6	40	48.6	55.4	50	60
	0.75	6.8	7.2	9.6	34.6	40	51.8	58.5	60	60
	1.0	9.1	7.2	9.6	34.6	40	54.6	61.4	60	70
HK150-1202 (15kW)	0.5	4.3	10.8	14.4	51.9	60	70.3	80.4	80	90
	0.75	6.8	10.8	14.4	51.9	60	73.4	83.5	80	90
	1.0	9.1	10.8	14.4	51.9	60	76.3	86.4	80	90
HK200-1202 (20kW)	0.75	6.8	14.4	19.2	69.2	80	95.0	108.5	100	110
	1.0	9.1	14.4	19.2	69.2	80	97.9	111.4	100	125

Table 3 Electric Heat Electrical Data

WIRING DIAGRAMS

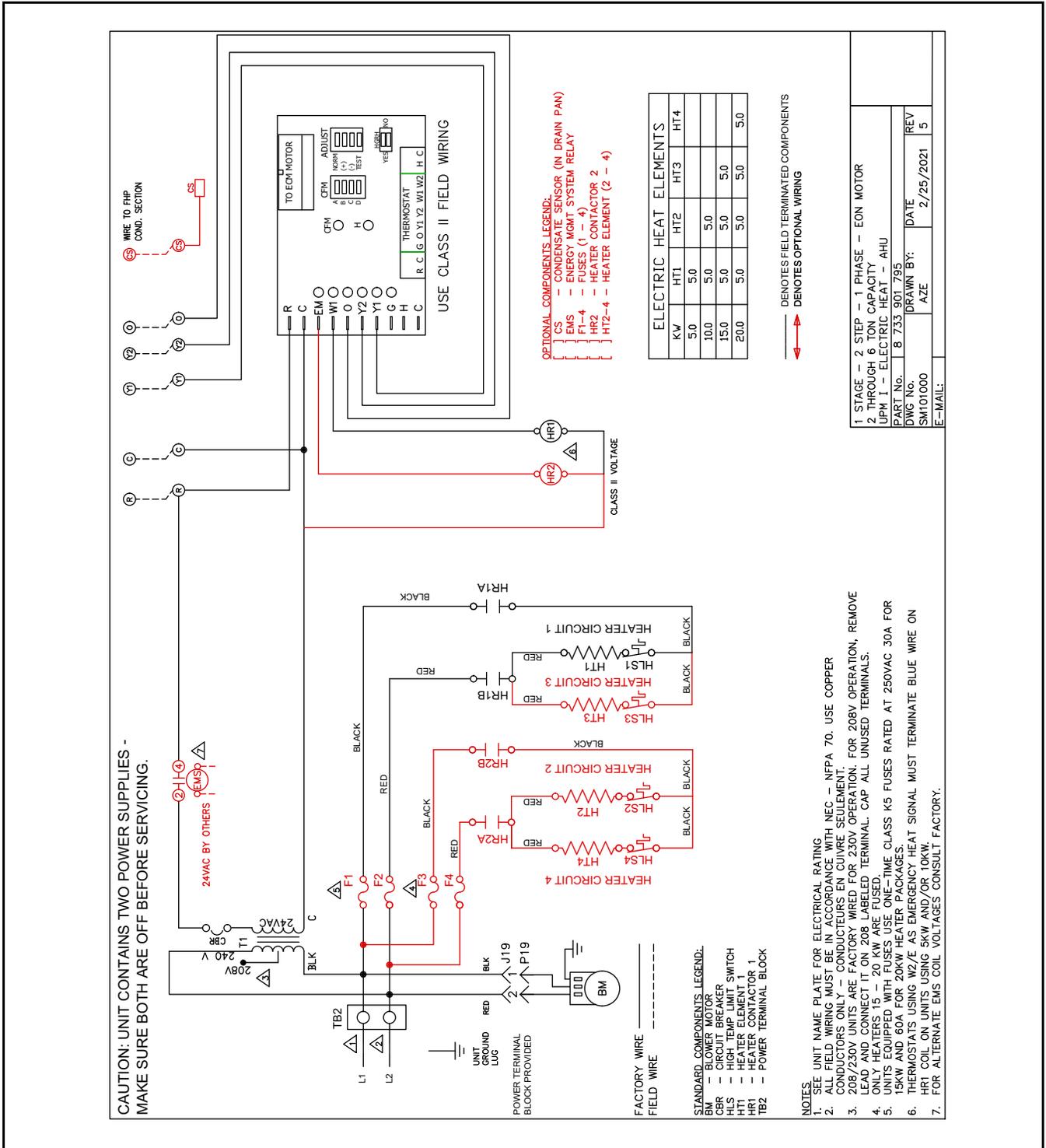


Fig. 34 Electric Heat Wiring Diagram - 1 Stage - 2 Stage - 1 Phase - EON Motor - 2 through 6 Ton Capacity

i FOR REFERENCE ONLY Actual unit wiring may vary from this example. Always refer to the wiring diagram attached to the unit.

NOTES

NOTES



BOSCH

Bosch Thermotechnology Corp.

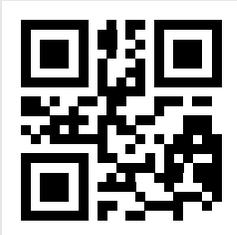
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