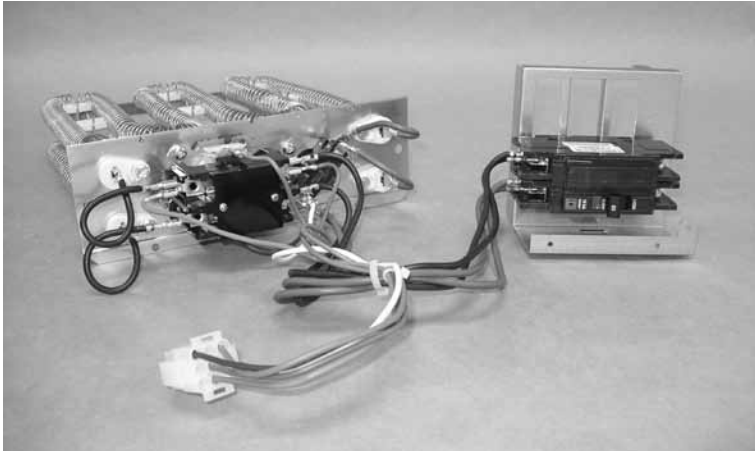


Installation Instructions

Electric Heater Kits

Installation in Standard and Variable Speed Indoor Air Handlers



IMPORTANT:

The instructions included with this heater kit are for installations in air handlers only.

These instructions are primarily intended to assist qualified individuals experienced in the proper installation of heating and/or air conditioning appliances. Some local codes require licensed installation/service personnel for this type of equipment. All installations must be in accordance with these instructions and with all applicable national and local codes and standards.

Before beginning the installation, read these instructions thoroughly and follow all warnings and cautions in the instructions and on the unit.

Improper installation, service, adjustment, or maintenance can cause explosion, fire, electrical shock, or other conditions which may result in personal injury or property damage. Unless otherwise noted in these instructions, only factory

authorized kits or accessories may be used when modifying this product.

INTRODUCTION

The H4HK Series of electric heater kits are approved for field installation in air handlers and variable speed air handlers. All sizes are available with factory-provided circuit-breakers for short circuit protection and to provide a disconnecting means. Also available are 5, 8, and 10 kw electric heater kits without circuit-breakers. Refer to the National Electric Code (ANSI/NFPA 70) and applicable local codes for over-current protection and disconnect requirements.

NOTE: The 15, 20 and 25 kw electric heater kits are **Not Approved** for installation in A-cabinet air handlers.

NOTE: These instructions are written assuming the air handler is in the upflow position (with the outlet facing up). For horizontal and downflow applications, it is recommended that the electric heater kit be installed prior to installation of the air handler.



WARNING:

To avoid the risk of electric shock, personal injury, or death, disconnect all electrical power to the unit before performing any maintenance or service. The unit may have more than one electrical power supply.

AIR HANDLER ELECTRICAL SUPPLY

All wiring must be in compliance with the National Electric Code and applicable local codes.

If the air handler was previously installed without electric heat the existing supply wiring may not be sufficient to carry the increased load. If installing electric heat in the B3 air handler the supply wiring can be aluminum or copper since the circuit breakers and terminal blocks supplied are approved for either wire type. Be sure to follow all of the rating information on the circuit breaker or terminal block and ensure that the supply wiring is sized according to the current NEC codes and any other state or local codes. See the rating label or **Table 1** for minimum circuit ampacities and maximum overcurrent protection.

All electric heater kits of 10 kw or less are supplied from the factory configured for use with a single supply circuit. Electric heater kits greater than 10 kw are supplied from the factory configured for use with two supply circuits. See the ratings label or **Table 1** for individual circuit ampacities and over-current protection ratings. If a single supply is desired, accessory kit #913874 is required to convert to single circuit connection.

INSTALLATION

Remove the upper access door from the air handler. Remove the circuit breaker bracket and cover package from the heater kit.

Remove the top-most (A-cabinet air handlers have only one) element close-off plate from the back of the air handler control box. For two-tiered electric heater kits remove both close-off plates.

Installation into Air Handler, All Heater Kits

Insert the element assembly into the opening in the air handler control box being careful not to damage the element wire or the ceramic element supports. Heating element alignment rod(s) will slide into alignment holes in the back of the air handler element box. Secure the element assembly to the back of the air handler control box with the screws removed when removing the element close-off plate(s). Install the circuit-breaker bracket. (See **Figure 1**)

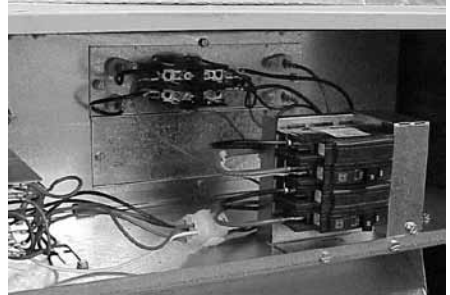


Figure 1. Sample Installation.
Shown without access door.

NOTE: on some B & C cabinet units a shipping bracket must be removed before installing the circuit breaker bracket.

Install the nine-pin plug from the element assembly into the receptacle located in the left-hand side of the air handler control box.

A wiring diagram and a ratings label are supplied with the electric heater kit. Attach the wiring diagram to the Blower Housing.

When installing the electric heater kit into a standard air handler, attach the rating label (included with the electric heater kit) on the air handler unit data label (located on the lower access door) over the electrical data section.

When installing the electric heater kit into a variable speed air handler the rating label supplied with the kit will not be used. Check the appropriate block on the air handler ratings label located on the lower access door just below the unit data label.

| | | | Standard Air Handler | | | | | | Variable Speed Air Handler | | | | | |
|-------------------|---------|------|--------------------------|-----------|----------------|---------------------------------|-----------|----------------|----------------------------|-----------|----------------|---------------------------------|-----------|----------------|
| | | | Minimum Circuit Ampacity | | | Maximum Over Current Protection | | | Minimum Circuit Ampacity | | | Maximum Over Current Protection | | |
| | | | Circuit A | Circuit B | Single Circuit | Circuit A | Circuit B | Single Circuit | Circuit A | Circuit B | Single Circuit | Circuit A | Circuit B | Single Circuit |
| Model Number H4HK | Voltage | kW | | | | | | | | | | | | |
| 005H | 240 | 4.8 | - | - | 30.0 | - | - | 30.0 | - | - | 33.8 | - | - | 40.0 |
| 008H | 240 | 7.6 | - | - | 44.1 | - | - | 50.0 | - | - | 47.8 | - | - | 50.0 |
| 010H | 240 | 9.6 | - | - | 55.0 | - | - | 60.0 | - | - | 58.8 | - | - | 60.0 |
| 012H | 240 | 11.6 | 35.2 | 30.2 | 65.4 | 40.0 | 40.0 | 70.0 | 39.0 | 30.2 | 69.2 | 40.0 | 40.0 | 70.0 |
| 015H | 240 | 14.4 | 55.0 | 25.0 | 80.0 | 60.0 | 30.0 | 80.0 | 58.8 | 25.0 | 83.8 | 60.0 | 30.0 | 90.0 |
| 020H | 240 | 19.2 | 55.0 | 50.0 | 105.0 | 60.0 | 50.0 | 125.0 | 58.8 | 50.0 | 108.8 | 60.0 | 50.0 | 125.0 |
| 025H | 240 | 22.0 | 59.2 | 60.0 | 119.6 | 60.0 | 60.0 | 125.0 | 60.0 | 60.0 | 123.3 | 60.0 | 60.0 | 125.0 |
| 005H | 208 | 3.6 | - | - | 26.6 | - | - | 30.0 | - | - | 30.4 | - | - | 40.0 |
| 008H | 208 | 5.7 | - | - | 38.7 | - | - | 40.0 | - | - | 42.4 | - | - | 50.0 |
| 010H | 208 | 7.2 | - | - | 48.3 | - | - | 50.0 | - | - | 52.0 | - | - | 60.0 |
| 012H | 208 | 8.8 | 31.4 | 26.4 | 57.9 | 40.0 | 30.0 | 60.0 | 35.2 | 26.4 | 61.6 | 40.0 | 30.0 | 70.0 |
| 015H | 208 | 10.8 | 48.3 | 21.6 | 69.9 | 50.0 | 30.0 | 70.0 | 52.0 | 21.6 | 73.7 | 60.0 | 30.0 | 80.0 |
| 020H | 208 | 14.4 | 48.3 | 43.3 | 91.5 | 50.0 | 50.0 | 100.0 | 52.0 | 43.3 | 95.3 | 60.0 | 50.0 | 100.0 |
| 025H | 208 | 16.5 | 51.9 | 52.3 | 104.2 | 60.0 | 60.0 | 125.0 | 55.6 | 52.3 | 107.9 | 60.0 | 60.0 | 125.0 |
| 009Q | 240 | 9.0 | - | - | 32.1 | - | - | 40.0 | - | - | 35.8 | - | - | 40.0 |
| 015Q | 240 | 14.4 | - | - | 48.4 | - | - | 50.0 | - | - | 52.1 | - | - | 60.0 |
| 009Q | 208 | 6.8 | - | - | 28.6 | - | - | 30.0 | - | - | 32.4 | - | - | 40.0 |
| 015Q | 208 | 10.8 | - | - | 42.5 | - | - | 50.0 | - | - | 46.3 | - | - | 50.0 |

Table 1. Electrical Ratings

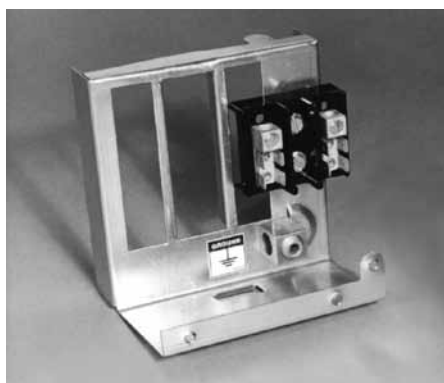


Figure 2. Circuit Breaker Brackets. Shown with Line Cover Removed and Terminal Block Installed.

⚠ WARNING:

To avoid risk of electric shock, personal injury, or death, disconnect electrical power to the unit before performing any maintenance or service. The unit may have more than one electric power supply.

Electric Heater Kits without Circuit Breakers

Attach the supplied power terminal block to the circuit-breaker bracket with the supplied screws as shown in Figure 2.

Using the 1/4" terminals, connect the red supply wire(s) from the element assembly to one pole of the terminal block and connect the black wires to the other pole.

Electric Heater Kits with Circuit Breakers

NOTE : Circuit breakers supplied with the H4HK electric heater kits are for short-circuit protection of the internal wiring and to serve as a unit disconnect. Circuit breakers supplied with the H4HK electric heater kits do not provide over-current protection of the supply wiring. Over-current protection of the supply wiring must be provided at the distribution panel and sized as shown in Table 1 or on the unit data label and per the NEC and applicable local codes. In some cases the over-current protection specified in Table 1 or on the unit data label is less than the 60 amp rating of the circuit breakers used in the H4HK electric heater kits. This is because the function of the over-current protection required at the distribution panel (field supplied) and the function of the circuit breakers in the H4HK electric heater kit is different.



Figure 3. Installation of Circuit Breakers

5, 8, and 10 kw electric heater kits supplied with a circuit breaker — Remove the lower circuit breaker knockout from the air handler upper access door.

Snap the circuit breaker on to the circuit breaker bracket as shown in **Figure 3**. The orientation of the circuit breaker must be as shown in **Figure 1**. (Side with 1/4" terminals to the left).

Using the 1/4" terminals, connect the heavy red supply lead(s) from the element assembly to one pole of the circuit breaker. Connect the heavy black supply lead(s) from the element assembly to the other pole of the circuit breaker.

15, 20 and 25 kw electric heater kits supplied with circuit breakers — Remove all circuit breaker knockouts in the air handler upper access door.

Snap the circuit breakers on to the circuit breaker bracket as shown in **Figure 3**. The orientation of the circuit breakers must be as shown in **Figure 1**. (Side with 1/4" terminals to the left).

The heavy red and black supply leads are bundled by circuit with wire ties at the factory. The bundle coming from the top element tier is circuit "A" (**note:** the element assembly is right-side-up when the limits are on the right side). The bundle coming from the bottom element tier is circuit "B".

Using the 1/4" terminals, connect the heavy red supply leads from circuit "A" to one pole of the top circuit breaker. Connect the heavy black supply leads from circuit "A" to the other pole of the top circuit breaker.

Using the 1/4" terminals, connect the heavy red

supply lead(s) from circuit "B" to one pole of the bottom circuit breaker. Connect the heavy black supply lead(s) from circuit "B" to the other pole of the bottom circuit breaker.

3-Phase 9 and 15 kw electric heater kits supplied with a circuit breaker — Remove all circuit breaker knockouts in the air handler upper access door.

Snap the 3-pole circuit breaker on to the circuit breaker bracket as shown in **Figure 3**. The orientation of the circuit breaker must be as shown in **Figure 1**. (Side with 1/4" terminals to the left).

Using the 1/4" terminals, connect the heavy red supply leads from element assembly to one pole of the circuit breaker. Connect the heavy yellow supply leads from element to the middle pole of the circuit breaker and connect the heavy black supply leads from the element to the third pole of the circuit breaker.

POWER WIRING

All wiring must comply with the current revision of the National Electric Code and must be sized for the minimum ampacities as listed on the unit data label or in **Table 1**.

If a single circuit adaptor kit is used it may need to be re-configured for some applications. Remove the single circuit adaptor kit cover and verify that the lugs are configured correctly for the application. If the lugs are not configured for the application, reference the instructions included with the kit and modify the configuration. Install the single circuit adaptor kit (if used) in the line side ("on" end) of the circuit breakers. Tighten the lugs securely (45 in-lbs recommended).

Connect the supply wiring to the circuit breaker(s), single circuit adaptor kit, or terminal block. Tighten the lugs securely.

When using dual supply circuits verify that the supply sized for circuit "A" is connected to the circuit breaker that is connected to the top element assembly.

Install metal circuit breaker line cover on the right side of the circuit breaker to cover the supply wires.

Note; on 3-phase heater kit installations after the air handler door has been attached to the

unit, install the circuit breaker close-off to the opening in the door just above the circuit breaker.

Replace the upper door and secure it to the unit. Restore power to the unit.

STAGING

The 15, 20, and 25 kw heater kits have the option of being staged if you have a two-stage thermostat. The brown wire (pin 1) must be the first stage of heat and orange wire (pin 2) is the second stage of heat. If you do not want staged heat with the 15, 20, and 25 kw heater kits just wire nut the brown and orange wires together before attaching them to the thermostat.

MOTOR SPEED SELECTION

Standard Air Handlers — The blower speed is preset at the factory for operation at the same speed for heating and cooling. For optimum system performance and comfort, it may be necessary to change the factory set speed. To change the blower speed, disconnect all electrical power to the unit and remove the upper door. Remove black and red wires from the blower motor jumpering terminal. Discard the blower motor jumpering terminal. Connect the heating speed wire (red) and the cooling speed wire (black) to the desired blower speed marked on the terminal block of the blower motor. Terminal 4 = High Speed, Terminal 5 = Medium Speed and Terminal 6 = Low Speed. See Table 2 for minimum required blower heating speed.

IMPORTANT: After making any changes to the blower speed setting be sure to bundle and insulate any unused blower motor leads so that they will not come in contact with the air handler cabinet or non-insulated live parts.

High speed operation may be required when using a 20 and 25 kw electric heater kit in a downflow application. (See Clearance section.)

Variable Speed Air Handlers — The minimum electric heat airflow is selected by setting switches on the air handler circuit board. Selecting the minimum electric heat airflow sets the minimum air flow that will be produced whenever electric heater kits are energized. When the electric heater kits are energized along with a heat pump the airflow may be higher depending on the basic cooling/heat-pump airflow setting. Reference the variable speed air handler installation instructions for further details.

CLEARANCE

Standard Air Handlers — All electric heater kits less than 20 kw are approved for use in air handler installations with zero-clearance to combustibles at any blower speed. For horizontal and upflow configuration, air handlers equipped with 20 kw and 25 kw electric heater kits are approved for installation with zero clearance to combustibles at any blower speed. When using a 20 kw and 25 kw electric heat kit in a downflow installation, the blower must be set for high speed for both heating and cooling.

Variable Speed Air Handlers — All installations of H4HK electric heater kits in variable speed air handlers are approved for zero-clearance to combustibles when the minimum electric heat airflow is set as directed in these instructions.

| Model H4HK | Applicable Cabinet Size | | | Minimum Required Blower Heating Speed | | |
|------------|-------------------------|---|---|---------------------------------------|------------|-----------|
| | A | B | C | Up-Flow | Horizontal | Down-Flow |
| 003H | X | X | X | LOW | LOW | LOW |
| 005H | X | X | X | LOW | LOW | LOW |
| 008H | X | X | X | LOW | LOW | LOW |
| 010H | X | X | X | LOW | LOW | LOW |
| 012H | X | | | HIGH | HIGH | HIGH |
| 012H | | X | X | LOW | LOW | MED |
| 015H | | X | X | LOW | LOW | MED |
| 020H | | X | X | LOW | LOW | HIGH |
| 025H | | X | X | MED | MED | HIGH |
| 009Q | | X | X | LOW | LOW | LOW |
| 015Q | | X | X | LOW | LOW | MED |

Table 2. Blower Heating Speed

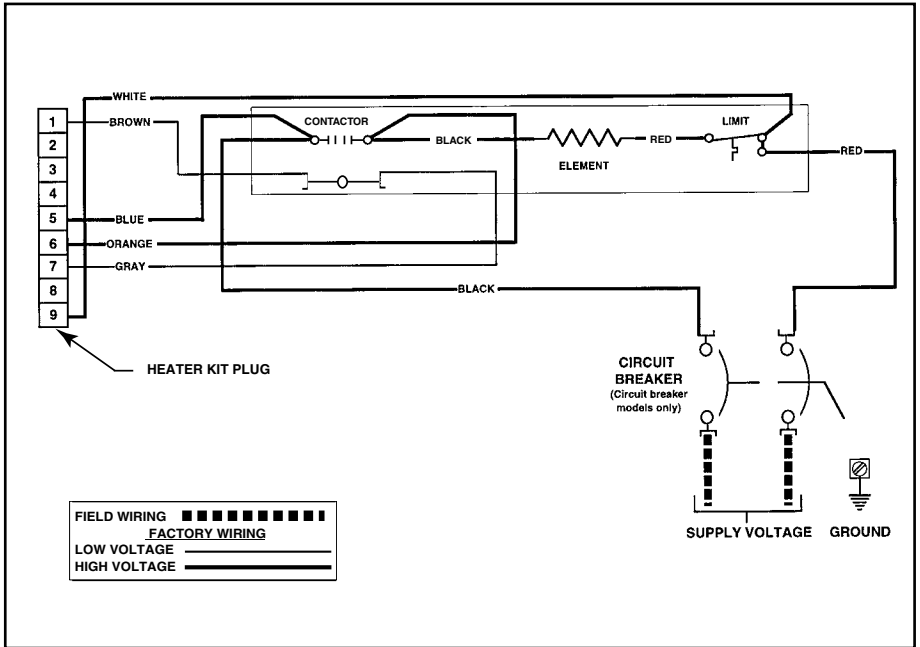


Figure 4. Typical System Wiring Diagram
5 kw 1-stage with circuit breaker

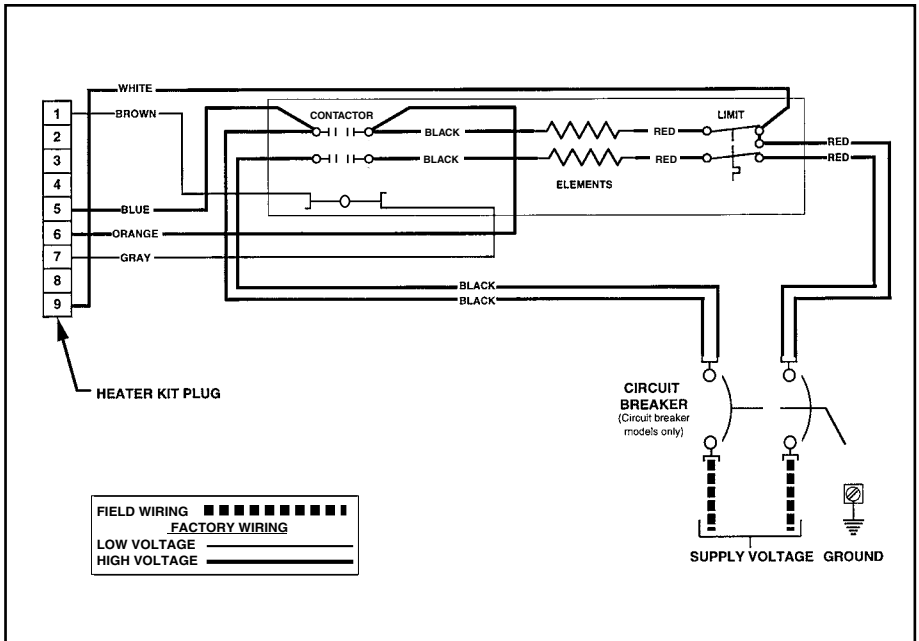


Figure 5. Typical System Wiring Diagram
8/10 kw 1-stage with circuit breaker

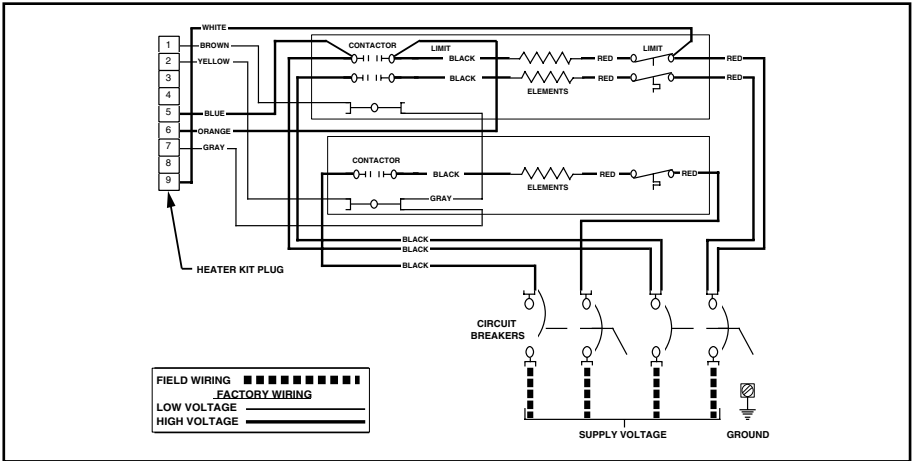


Figure 6. Typical System Wiring Diagram
 15/20 kw 1-stage (20 kw shown) has two 2-pole contactors
 15 kw has one 2-pole and one 1-pole contactor

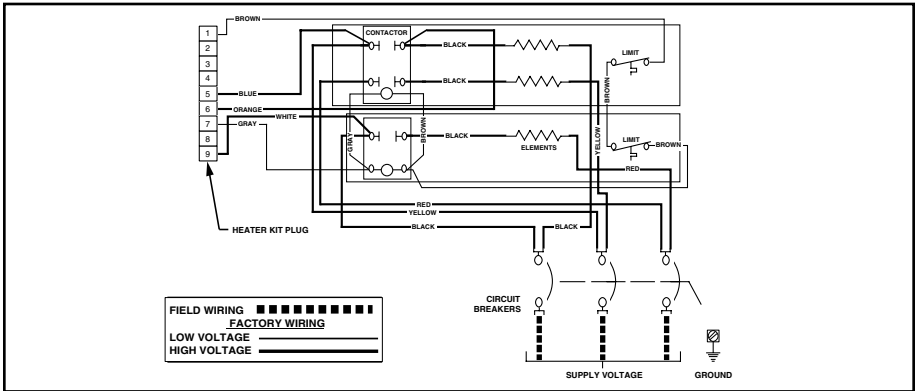


Figure 7. Typical 3-Phase System Wiring Diagram

INSTALLER: PLEASE LEAVE THESE INSTALLATION INSTRUCTIONS WITH THE HOMEOWNER



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708341B (Replaces 708341A)