V10

STEFFES CORPORATION

"Manufactured in North America"

OWNER'S AND INSTALLER'S MANUAL

for

Room Heating Units

Models: 2002, 2003, 2004, 2005, & 2006

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2 Introduction

Dear Valued Customer:

Congratulations on your new purchase! The Steffes ETS heaters are the highest quality storage heat systems available today. We are confident you will be pleased with the warm, comfortable heat this system provides as well as the savings you should see in your electric heat bill.

Electric Thermal Storage has been used in the United States for over 20 years. Today, Steffes is known as the leader in this technology. Not only are we setting the industry standards for quality; but, we are also working closely with power companies to ensure comfort, safety, reliability, service, and support needs are being met.

We are committed to ensuring your new heating system will provide you with total satisfaction for many years to come. Your support is appreciated and your comments on the equipment are welcome.

Thank you for choosing Steffes ETS!

Sincerely,

Paul Steffes
President and Chief Executive Officer

- This manual provides information for the correct installation procedures and electrical connections for Steffes ETS room heating units, Models: 2002, 2003, 2004, 2005 and 2006. The information in this manual can help you take full advantage of the many features built-in to your heater and ensure years of safe, reliable operation. Read the enclosed instructions, safety tips, and warranty information. Store this manual in a safe place for future reference.
- Assembly of and/or service to these units should be performed only by a qualified electrician in accordance with information contained herein and in accordance with national, state, and local electrical codes.
- This manual should be retained by new owners if ownership of the heater changes.
- Any deviation from these instructions may void the warranty and could result in hazardous operating conditions.
- A Supplemental Installer's Guide is available from the factory or distributor (with power company consent) and should only be made available to installing electrical contractors or to power company personnel. This guide describes those heater functions that are related to power company control and how to change them. It is not required to complete an installation.
- The warranty registration card provided as part of the documentation included with the heater must be completed and returned to Steffes Corporation. Failure to do so may adversely affect warranty claims.
- Record the Serial Number and Model Number in the space provided in the Installation Information Section of this Owner's Manual. These numbers are located on the lower left side panel of the heater, on the shipping box, and on the Warranty Registration Card. Retain this manual for quick future reference to these numbers.
- **Disclaimer:** In compiling this manual, Steffes Corporation has used its best judgement based upon information available, but disclaims any responsibility or liability for any errors or miscalculations contained herein, or any revisions hereof, or which result, in whole or in part, from the use of this manual or any revisions hereof.

1 General Operation

Steffes ETS room heating units utilize off-peak electricity available during those times of the day or night when the power company can supply you with electricity more economically. By using this off-peak electricity for heating, the power company may offer you a special incentive such as a reduced electric rate, an off-peak heating rate, a time-of-use (TOU) rate, or monthly credits on your heating bill.

When off-peak hours are available, the room heating unit converts electricity to heat which is then stored in its ceramic brick core. The ceramic brick core of the heater can store heat at varying levels depending upon outdoor temperature, owner preference, utility peak conditions, and the requirements of the space being heated. This stored heat becomes available for space heating needs as determined by the room temperature sensor located in the heater. (An optional remote room temperature sensor is also available. Order item #1302024.)

Heating is accomplished radiantly and by a thermostatically controlled blower. A small amount of heat will be radiated by the heater's cabinet. However, most of the heating requirements in the area where the heater is installed will be satisfied by the heater's blower. When the room thermostat senses a need for heat, the heater's blower will circulate room air through the heater's ceramic brick core. This air is heated and discharged back into the room to maintain a constant, comfortable room temperature.

② Terminology

This manual contains terms which may need an explanation. The table below lists some of these terms and a brief description of each.

TERM	DEFINITION
Automatic Charge Control	Method of brick core charge regulation where a sensor monitors outdoor temperature to automatically adjust the brick core temperature.
Brick Core Charge Level	The amount of heat that is stored in the heater's brick core.
Charge Period	Off-peak time in which the heater is allowed to store heat in its brick core.
Control Panel	Contains the buttons to adjust and the display to indicate heater functions. Located on the front of the heater in the upper right corner.
Control Period	On-peak time in which the heater is not allowed to store heat in its brick core.
Data	The specific information for heater operation which is set and stored in a location on the heater's microprocessor. This data is accessed through the control panel. Displayed as a "d" on the control panel when in the edit mode.
Edit Mode	Process of changing or viewing the data in a microprocessor location. This is accomplished with the use of the Ⓜ (mode) button, the ⇧ (up arrow) button, and the ⇩ (down arrow) button.
Location (Function)	Where the specific operating information (data) of the heater is stored. These locations are part of the heater's microprocessor and are accessed through the control panel. Displayed as an "L" on the control panel when in the edit mode.
Manual Charge Control	Method of brick core charge regulation where the owner must periodically adjust the brick core temperature setting in relation to the outdoor temperature.
Microprocessor	Device on the circuit board of the heater which stores and processes the data information and controls the operation of the heater.
Off-peak	The time during the day or night when the power company can supply electricity more economically and may offer a special incentive such as a reduced electric rate or billing credits for the electricity consumed during this time. Typically, electrical usage is not controlled during an off-peak time. (The heater will provide heat to satisfy comfort requirements during this time as well as charge or store heat in its brick core.)
On-peak	The time during the day or night when the power company experiences a high demand for electricity. To limit demand, certain appliances are controlled to avoid usage by them and/or a premium for the electricity consumed during this time may be charged to discourage electrical usage. (The heater is not allowed to charge or store heat in its brick core during peak periods. Heating requirements are satisfied by only the heat it has stored in its brick core.)
Outdoor Sensor	Device that senses outdoor air temperatures and communicates this information to the heater for automatic charge control.
Room Temperature Set Point (Room Setting)	The targeted room temperature at which the heater is to maintain. If the room thermostat senses a temperature below this point, the heater's blowers will come on and extract heat from the brick core.
Storage Level Set Point (Storage Setting)	The targeted amount of heat that is to be stored in the brick core of the heater. If the brick core temperature is below this set point, the heating elements will come on (only if off-peak) and add heat to the brick core.

① Safety Precautions

1. DO NOT energize the heater while disassembled or without ceramic heat storage bricks in place.
2. As is true with all heating appliances, materials that may produce explosive or flammable gases MUST NOT be used or stored near the room heating unit.
3. Be sure the minimum clearance requirements specified in this manual are never violated .

WARNING: Violation of the clearance requirements may create a fire hazard!

4. DO NOT allow objects to fall between the room heating unit and the wall.
5. DO NOT place anything on top of the room heating unit.
6. DO NOT stick any objects through the air discharge grill.
7. This heater may be connected to more than one branch circuit. Disconnect power to all circuits before servicing.
8. Installation of and/or service to this heater should be performed by a qualified electrician in accordance with information contained herein and with national, state, and local electrical codes.
9. This manual must remain with the room heating unit.

② Built-in Safety Devices

DEVICE NAME	FUNCTION	LOCATION ON HEATER
Core Charging High Limit Switches	These limit switches run across the entire back of the heater and monitor the temperature of the outside back panel and the heater's brick core. If the normal operating temperature is exceeded, this switch will interrupt power to the heating elements and prevent heat from being stored in the brick core. The red "SERVICE" light will illuminate to indicate this switch has shut the power off to the heating elements. (This switch will automatically reset when the temperature returns to a normal range.)	Inside the Back Panel
Red "SERVICE" Light	Illuminates when the core charging high limit switch has interrupted power to the heating elements. The heater will not store heat in the brick core when this light is illuminated. Illumination of the light may indicate there is not enough clearance between the heater and some object; or, possibly, there is an operational difficulty within the heater. If the clearance requirements have been maintained and the light illuminates repeatedly, notify a service technician. (Since this light works in conjunction with the core charging high limit switch, it will automatically turn off when this switch resets.)	On the Control Panel
Discharge Air High Limit Switches	Monitor discharge air temperature and interrupt power to the blower if the normal operating temperature is exceeded. This limit switch helps protect against the heating of objects which may obstruct the air discharge area.	Inside the Air Discharge Grill
Tip Over Switch *(Heaters equipped with a security base only.)*	Interrupts power to the heating elements and the blower to prevent the heater from storing heat in or discharging heat from the brick core if the heater is not in the upright position.	Inside the Electrical Compartment

6 Maintenance and Cleaning

As with most heating systems, air borne particles in the room may be drawn into the heating system and oxidized. As these air borne particles are expelled back into the room, they may accumulate on the heater or other surfaces. Over time, these particles may appear as a black residue, commonly referred to as soot. High concentrations of air borne particles from such things as aerosols, dust, candles, incense, pet hair, high humidity, smoke, or cooking can contribute to poor indoor air quality and accelerate this process.

To minimize the black residue buildup, clean the outer surface of the heater on a regular basis. Wash the cabinet only when cool with any liquid cleaner. Do not use scouring powders or furniture polish. Steffes recommends using "Soft Scrub with Bleach" brand cleanser or its equal.

Regularly vacuum around all sides of the heater. Check the back of the heater to make sure no objects have fallen behind it. Check all sides of the heater to be sure the required clearances are not being violated. Objects should never be placed on top of the heater. No additional routine maintenance is required.

Describing The Heater's Display Panel

All operational functions of the heater are stored in the heater's microprocessor. These operational functions are factory preset; however, they can be adjusted by the user or installer. All operational functions are accessed through the heater's control panel. Typically, the user will only need to use this panel to adjust the room temperature; and, possibly, to set the brick core temperature if manual charge control is used.

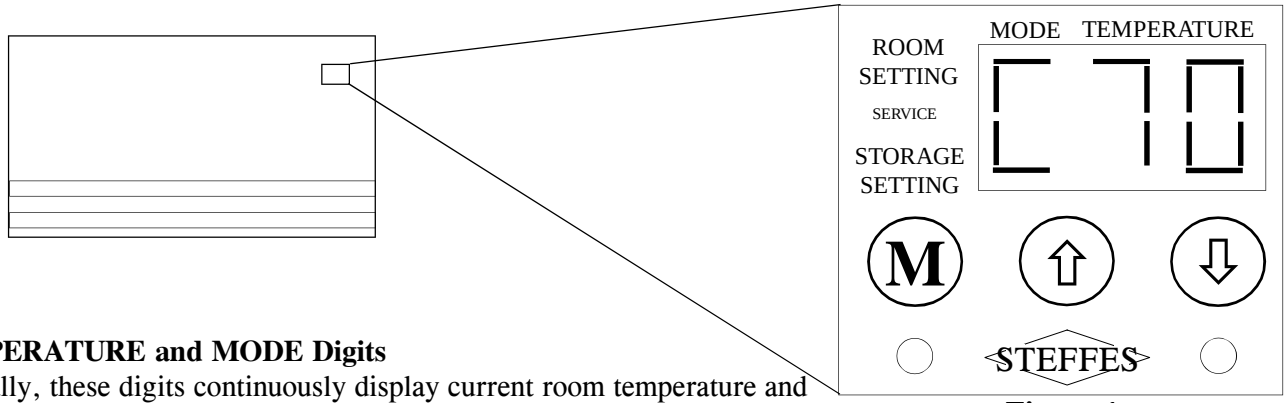


Figure 1
Heater Control Panel

TEMPERATURE and MODE Digits
Typically, these digits continuously display current room temperature and one of the following brick core operating modes (Refer to the Advanced Heater Operation section of this manual for more information):

C = (charge period) Off-peak time in which the heater is allowed to store heat in its brick core. (See Figure 2)

P = (peak period) On-peak time in which the heater is not allowed to store heat in its brick core. (See Figure 3)

A = (anticipated peak period) Used only in certain utility programs. It is an alternative method of storing heat in the heater's brick core. (See Figure 4)

Figure 2

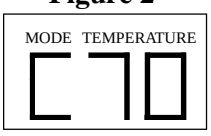


Figure 3

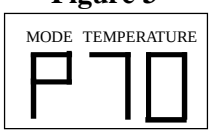
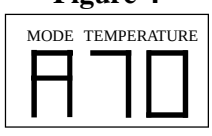
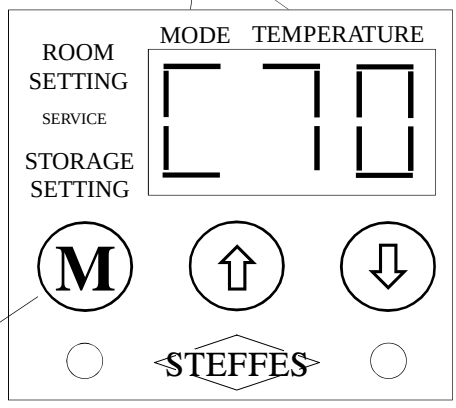


Figure 4



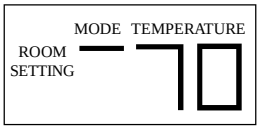


Ⓜ Mode (EDIT) Button
Activates the editing process for changing the operating information of the heater. **PLEASE USE CAUTION WHEN EDITING THE INFORMATION IN THE HEATER.**

Describing The Heater's Display Panel (cont'd)

ROOM SETTING
A green bar will illuminate next to ROOM SETTING on the MODE digit when the room temperature set point is being adjusted. (See Figure 5.) The set point can range from 45°F (7.2°C) through 85°F (29.4°C).

Figure 5



SERVICE LIGHT
This is one of the many built-in safety devices on the heater. This red light will illuminate whenever the core charging high limit switch has interrupted power to the heating elements. This interruption may be the result of not enough clearance between the heater and some object; or, possibly, there is an operational difficulty within the heater. If this light is illuminated, the heater will not store heat in the brick core. It will automatically reset (turn off) when the core charging high limit switch restores power to the elements. (Refer to Table 1, Built-in Heater Safety Devices, for more information on the light and the core charging high limit switch.)

NOTE **If the light illuminates <u>REPEATEDLY</u>, notify a service technician.**

STORAGE SETTING
This is only applicable when using manual charge control. A green bar will illuminate next to STORAGE SETTING (on the MODE digit) which indicates the storage level set point can be adjusted. (See Figure 6.)

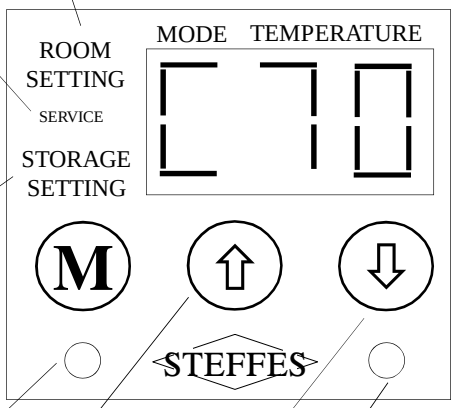
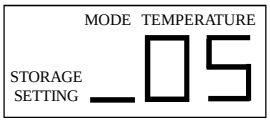


Figure 6



Left Indicator Light
Illuminates green whenever the heating elements are on.

Up Arrow Button
Increases room temperature set point. It is also used to scroll upward when viewing or adjusting the heater's operational functions.

Down Arrow Button
Decreases room temperature set point. It is also used to scroll downward when viewing or changing the heater's operational functions.

Right Indicator Light
Illuminates green continuously if automatic brick core charge regulation is being utilized.

8 Operating the Heater

1 HEATER START-UP

On start-up of the heater, you may experience some odors relating to the first time operation of the heating components. There also may be an odor associated with dust accumulation in the system if the heater is shut down for an extended period of time. Allowing the heater to charge to its highest heat storage level (full core charge) will help expel these odors in a timely manner.

Since room air passes directly through the hot brick core of the heater, air borne particles and odors may be drawn into the heating system and oxidized. During the oxidation process, odors can be amplified; thus, it is recommended not to operate the heating system if odors such as that from paints, varnishes, or chemicals are present in the air. Allow the area to be completely aired out before operating the heater.

2 ADJUSTING THE ROOM TEMPERATURE SET POINT

Room temperature set point is adjusted differently if using manual charge control versus automatic charge control. Thus, when making adjustments to the room temperature set point or the brick core charge level, you must determine whether your heating system is set for automatic or manual charge control.

Automatic charge control - The right indicator light on the control panel will be illuminated. With automatic charge control, a sensor regulates the amount of heat stored in the heater's brick core automatically in relation to outdoor temperature.

Manual charge control - The right indicator light will not be illuminated. With manual charge control, the user regulates the amount of heat stored in the heater's brick core in relation to outdoor temperature.

How to Adjust Room Temperature Set Point if Using Automatic Charge Control

Step 1 Press the ⇧ arrow button to increase the set point or the ⇩ arrow button to decrease the set point. The face plate will automatically return to displaying current room temperature a few seconds after making an adjustment.

How to Adjust Room Temperature Set Point if Using Manual Charge Control

Step 1 Press and hold the M button until a green bar appears on the MODE digit of the control panel face plate to indicate room setting can be adjusted. The room temperature set point will appear on the TEMPERATURE digits of the face plate.

Step 2 Press the ⇧ arrow button or the ⇩ arrow button to adjust the room temperature set point. The face plate will automatically return to displaying current room temperature after making an adjustment.

3 ADJUSTING THE BRICK CORE CHARGE LEVEL

The room heating unit's brick core charge level can be regulated either manually or automatically. The method of control will be set at the time of installation. If the right indicator light is illuminated on the face plate, the heater is set for automatic charge control. If it is not illuminated, the heater is set for manual charge control. The room heating unit will come factory preset for automatic charge control.

Automatic Charge Control

If the room heating unit is set for automatic charge control, the brick core charge level will be regulated automatically in relation to outdoor temperature. An outdoor sensor is required for this method of charge control.

The outdoor sensor will monitor outdoor temperature and provide the information to the heater. The heater will respond by storing heat in the brick core accordingly. The outdoor temperature at which brick core charging in the heater is to begin and the outdoor temperature the heater should be at full brick core charge may be adjusted at the time of installation. The heater comes factory preset to start charging at 60°F (15.6°C) and to be at full brick core charge at 20°F (-6.67°C).

Manual Charge Control

If manual charge control is being used, the owner must periodically adjust the brick core charge level setting during the heating season in relation to outdoor temperature and the heating requirements of the area. To adjust the brick core charge level, do the following:

Step 1 Press and hold the (M) button until a green bar appears on the MODE digit of the control panel face plate next to room setting. Release the button.

Step 2 Press the (M) button again. The green bar on the MODE digit of the control panel face plate will move to indicate storage setting can be adjusted. Core charge level set point is displayed on the TEMPERATURE digits.

Step 3 Press the (⇩) or (⇧) arrow buttons to adjust the core charge level set point. The core charge level can be set to any data value from 00 through 10.

00 = no core charging will occur
05 = 50% core charge will be maintained
10 = maximum core charge will be maintained

The face plate will automatically return to displaying current room temperature a few seconds after making an adjustement.

4 HOW TO TURN THE HEATER "OFF" AND "ON"

You may wish to turn the heater off during the summer months. Brick core charging and room temperature sensing can be turned off without disconnecting power to the heater.

Using Automatic Charge Control

Step 1 To turn the heater "OFF", use the (⇩) arrow button to decrease the room temperature set point until the control panel face plate displays "OFF".

Step 2 To turn the heater back "ON", press the (⇧) arrow button to adjust room temperature to the desired set point.

Using Manual Charge Control

Step 1 To turn the heater "OFF", hold the (M) button until room temperature set point appears on the TEMPERATURE digits of the face plate.

Step 2 Use the (⇩) arrow button to decrease the room temperature set point until the control panel face plate displays "OFF".

Step 3 To turn the heater back "ON", press and hold the (M) and the (⇧) arrow buttons at the same time. When room temperature set point displays on the face plate, let go of the (M) button. Use the (⇧) arrow button to adjust room temperature to the desired set point.

Installing The Heater

1 PLACEMENT

Room heating units can normally be placed on standard flooring systems with any type of covering, i.e. wood floor, carpet, linoleum; but, heater weight must be considered. If in doubt, consult a building contractor or an architect. (Refer to the Heater Specifications section in this manual for weight and physical dimensions of the room heating unit being installed.)

When installing on extremely thick carpet, it may be necessary to slightly elevate the heater to avoid carpet contact with the air discharge grill. The carpet should not come within ¾ inch of the air discharge grill openings.

Heaters can be placed on an outside or inside wall. Best operating efficiency will be achieved by placing it along an inside wall, adjacent to an outside wall. Avoid installing the heater near sources of extreme heat or cold so the built-in room temperature sensor can sample proper room air temperature. It is also best to not place the heater near an open stairwell.

2 CLEARANCE REQUIREMENTS

Allow a minimum of 1½ inches of clearance from the sides and back of the heater and a minimum of 3 inches from the top of the heater. The factory supplied wall mounting bracket, located on the heating unit's shipping pallet, will provide the correct wall-to-back-of-heater clearance. If the heater is a 120V plug-in model with a security base, the base will provide the proper wall-to-back-of-heater clearance. The base is packaged inside the shipping box on the back side of the heater.

If enclosing the room heating unit in a wooden cabinet or recessing the room heating unit into a wall, allow 2 inches clearance on sides and 4 inches on top. Do not enclose or otherwise obstruct access to the heater's front panel and grill. Objects such as curtains, furniture, or bed covers must be kept a minimum of 4 inches from all room heating unit surfaces and 15 inches from the grill.

NOTE **If there is less than a 12 inch clearance on the right side of the room heating unit, we recommend installing a remote wall mounted room temperature sensor. (Order item #1302024.)**

3 ELECTRICAL CONNECTIONS

Line voltage connections for direct wired room heating units

Heaters that are designed for direct wired connections are equipped with flexible conduit installed in the room heating unit's back panel. This conduit is pre-wired for ease of field connections. The wiring in the conduit may not be the same size as the field wiring conductors.

Direct wired heaters are capable of being connected to more than one branch circuit. One or two charging circuits may be utilized depending on room heating unit size (See Table 2). Each room heating unit is capable of being connected with a separate blower and element circuit or with one circuit for blower and element operation. To determine the correct wire sizes for the room heating unit being installed, refer to the Unit Identification Label on the lower left side panel. (See Figure 11. Table 1 and Table 2 will also provide information on conductor sizing.)

CAUTION **Never install Class II (low voltage) wiring or any wiring in a line voltage area unless the wire is rated for line voltage.**

Installing The Heater (cont'd)

Once the proper circuits are wired to the room heating unit, install a field connection junction box. This junction box must be large enough to conform to all applicable electrical codes and regulations. The junction box can be installed behind the heater or mounted in the floor below the heater. If a location below the floor is chosen, the box must remain accessible for future service to the room heating unit. If a location behind the heater is chosen, the box should remain as near the floor as practical.

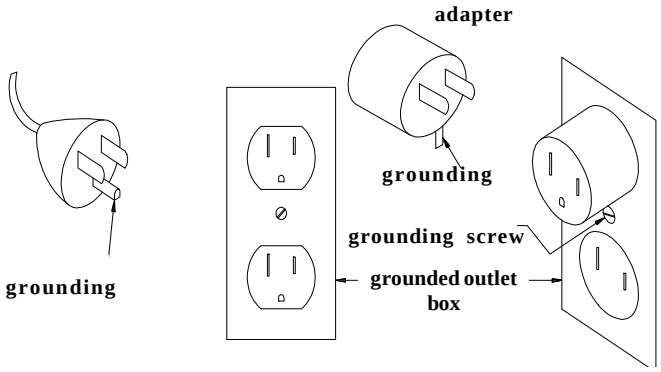
A panel label is provided in the hardware package to identify the branch circuits feeding the room heating unit.

☞ **IMPORTANT: This label must be applied in the electrical panel and circuits must be identified.**

Line voltage connections for cord connected, plug-in room heating units

120V cord connected room heating units must only be used with receptacles that are of the grounding type and suitable for the load of the heater. See the Unit Identification Label on the lower left side panel of the heater to determine correct circuit size. (See Figure 7 for cord and receptacle requirements.)

FIGURE 7



The room heater's cord has a plug as shown in Figure 7A. An adapter, as shown in Figure 7B, is available for connecting three-blade grounding type plugs to two-slot receptacles. The green grounding means extending from the adapator must be connected to a permanent ground, such as a proprerly grounded outlet box as shown in Figure 7C. This adaptor should not be used if a three-slot grounded receptacle is available.

Heating element (brick core charging) control wiring connections for all room heating units

The heating elements in the heater are capable of being controlled on-peak (not able to store heat in the brick core) via low voltage wiring, line voltage wiring, with a wireless power line carrier signal, or with a time clock. The power line carrier transmitter and time clock are optional control devices. If either of these methods of control are desired, they must be specified at the time of order to be included with the heater shipment.

If using low voltage control, all connections to the room heating unit's control circuit must be routed through the low voltage raceway using the factory installed wiring. Class II (low voltage) wiring should never enter a line voltage area of the heater, including its umbilical cord, unless it is rated for line voltage. (See Figures 13 and 14.)

If a power line carrier transmitter is being used for peak control of the room heating unit, low voltage connections are not necessary. The transmitter can be mounted indoor or outdoor. It will transmit the peak control signal through the entire power line system in the building. In addition to providing peak control information, it will also transmit outdoor temperature information for automatic brick core charging. Installation instructions for this method of control are provided with the Steffes power line carrier control system.

If using a time clock for peak control of the heater, the time clock is connected to the heater via low voltage wiring. An installation instruction sheet is included with the time clock. Please refer to these instructions for installation of this device inside the heater.

If line voltage control is utilized, an external switching device (such as a relay panel) is necessary to directly control the heating element charging circuit. If relying on this method of control, the face plate on the heater will continuously display a brick core operating mode of "C" (charge) regardless of whether it is an off-peak or on-peak time. It is suggested that the installer change the heater so that current room temperature followed by an "F" (Fahrenheit) or "C" (Celsius) is displayed. This is done by adjusting the data in Location 14 (L14) to d01, or a peak control sequencer can be installed to correct the brick core operating mode display. (Order item #1309006.)

Installing The Heater (cont'd)

④ ATTACHING THE WALL MOUNT BRACKET OR SECURITY BASE

NOTE **For cross reference to number coded components, Refer to the Exploded View Diagram (Figure 18) and the Heater Parts List.**

The room heating unit is attached in one of two ways: wall support bracket (54) or security base (51 and 52). Follow steps 1 and 2 regardless of the method of attachment.

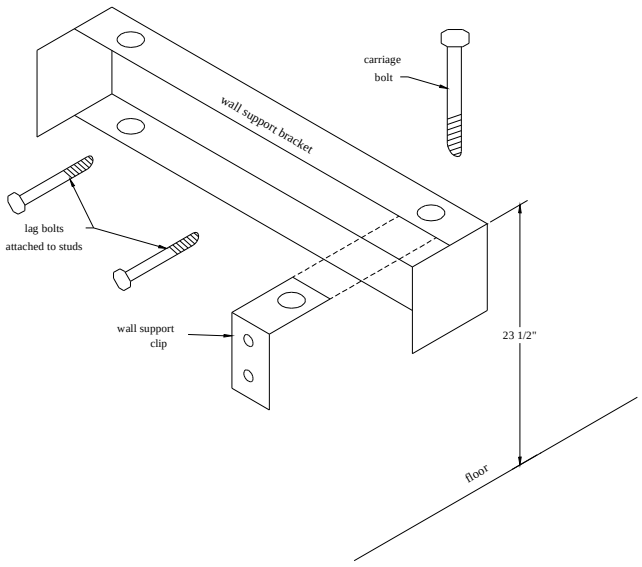
Step 1 Remove the screws at the lower edge of the painted front panel (18). A plastic grill guard is provided to protect the grill from being scratched while removing the screws.

Step 2 Pull the lower edge of the front panel forward and unhook it from the top panel (19). Carefully set the front panel aside.

NOTE **If installing a unit with a wall bracket, do step 3. If the room heating unit being installed is equipped with a security base, proceed to step 4.**

FIGURE 8

Step 3 Located in the lower right side of the heater (near the blower) is a package containing the hardware (53) to mount the wall support bracket (54). The wall support bracket is shipped on the pallet under the room heating unit. Establish room heating unit location. Mark the location on the wall where the wall support bracket will be attached. The top of this should be 23½" from the floor. It must attach securely to wall studs. Pre-drill two 3/16" holes on each side of the bracket. Use the lag bolts provided to attach the wall support bracket to the wall with the label on the bracket facing upward. (See Figure 8.) Use the carriage bolts to secure heater to the bracket.



NOTE **The wall bracket MUST be mounted with the label facing up and the lag bolts must attach to wood wall studs. If the wall is not a standard wood studded structure, alternate fasteners must be used to securely attach the wall bracket.**

Step 4 **(Do this step only if installing a heater with a security base.)** 120V plug-in cord models may come equipped with a security base (51 and 52) rather than a wall support bracket (54). This base must be attached to the bottom panel of the room heating unit. It is packaged inside the shipping box on the back side of the heater. The hardware needed to mount the base to the heater is in a package located in the lower right side of the heater (near the blower).

To install the base, gently lay the room heating unit on its back. You may find it helpful to elevate the bottom of the room heating unit a few inches to make the installation of the base easier.

Align the holes in the security base with the pre-drilled holes in the bottom of the room heating unit. Using the six #14 x 1¼ inch sheet metal screws provided in the hardware package, attach the security base to the painted bottom panel (9) of the room heating unit.

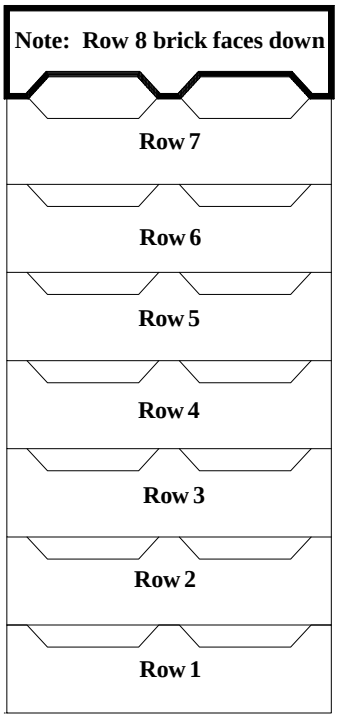
After the base is attached, return the unit to its upright position and place into room location in preparation for brick loading.

5 BRICK LOADING

NOTE **For cross reference to number coded components, refer to the Exploded View Diagram (Figure 18) and the Heater Parts List. Refer to the Heater Specifications section in this manual for the number of bricks required for each heater model.**

Step 1 The heater must be securely mounted to the wall or to its security base (if equipped) prior to brick loading.

FIGURE 9



Step 2 To catch brick debris, to protect the flooring, and for easy clean-up upon completion of the installation, place the room unit's shipping box in front of the room heater before loading the brick.

Step 3 Remove the screws on the right side of the galvanized front panel (14). Rotate this panel to the left and remove.

Step 4 If installing a Model 2004, 2005, or 2006, remove and discard the cardboard spacer(s) that secured the heating elements (12) during shipment.

Step 5 Begin the brick loading with row one by installing the first brick (13) face-up in the far left side (as you face the heater) of the room heater's storage cavity. (See Figure 9 for a side view of brick stacking.) Be sure the grooved side of the brick is up, and that it fits tight against the right aluminized steel air channel (47).

NOTE **Install bricks carefully to avoid damage to the bottom insulation panel (49) and to the back insulation panel (23) inside the brick cavity.**

Step 6 Continue the brick loading process installing the remaining brick in row one from right to left. Load remaining rows, one row at a time, beginning with left brick, then loading from the right to left. All bricks in rows one through seven must be loaded with the grooved side up.

NOTE **Avoid loading bricks in a fashion that would cause an uneven horizontal line across the brick core. Bricks should line up side-to-side.**

Step 7 Install the eighth (top) row of bricks with the grooved side of the bricks facing down. (See Figure 9.) A 3" x 11" metal brick installation tool is enclosed in the Owner's Manual packet to assist with loading the top row of brick. Be careful if using this tool as the edges are sharp. To use, be sure to bend one end down to avoid contact with the sharp edge. Lay the metal tool over the far right brick in row 7 with the bent end out. Slide a brick over the metal piece and into position. Pull the metal piece out. Continue this procedure until the entire top row of bricks are installed.

☞ **IMPORTANT: The top bricks (row 8) must face downward.**

Step 8 Once all bricks are loaded, replace the galvanized front panel (14).

6 SETTING THE METHOD OF BRICK CORE CHARGE CONTROL

With automatic charge control, outdoor temperature information can be supplied to the room heating unit in one of two ways: Steffes power line carrier system or direct wired outdoor sensor.

The room heating unit is shipped from the factory set for automatic charge control for use with the Steffes power line carrier control system. The heater comes preset to start charging at an outdoor temperature of 60°F (15.6°C) and to be at a full core charge level at 20°F (-6.7°C). (The installing electrical contractor or power company personnel will have more information on how to adjust these temperatures to more accurately reflect the climate in your area, if necessary.)

Installing The Heater (cont'd)

Power Line Carrier and Automatic Charge Control

The Steffes power line carrier (PLC) control system has the capability of sending outdoor temperature information, WIRELESS, to an unlimited number of 2000 series heater for automatic charge control. No direct wiring to the heater is required with a PLC control system. The outdoor temperature information is transmitted through the entire power line system in the home or building. The heater's built-in receiver will pick up the signals being transmitted on the power line and respond accordingly. PLC control is available with the use of the Steffes PLC Transmitter or the Steffes Comfort Control Relay Panel (CCRP). Only one PLC system is needed in an installation. If using the PLC Transmitter and installing it outdoors, an outdoor sensor may be utilized but is not required. If installing the PLC Transmitter indoors or if using the CCRP's built-in PLC system, one external outdoor temperature sensor is required for automatic charge control. An installation procedure manual will accompany the PLC Transmitter and CCRP. Please refer to these instructions for installation of either device.

NOTE **If using a PLC signal for transmitting outdoor temperature information, Dip Switch #6 inside the heater on its microprocessor board must be in the "OFF" position. (Refer to the Typical Control Wiring Diagrams section for more information on the heater's dip switches.)**

Direct Wired Outdoor Sensor and Automatic Charge Control

An outdoor sensor can be direct wired into each room heating unit using low voltage wire. One outdoor sensor is required for each room heating unit that is installed. An installation instruction sheet is included with the outdoor sensor. Please refer to these instructions for installation of this device. (Order item #1302026.)

NOTE **If using a direct wired outdoor sensor for transmitting outdoor temperature information, Dip Switch #6 inside the heater on its microprocessor board must be in the "ON" position. (Refer to the Typical Control Wiring Diagrams section in this manual for more information on the heater's dip switches.)**

Manual Charge Control

No additional devices are required for brick core charging if the charge level is to be set manually by the user. Since the heater comes factory preset for automatic charge control, Location 19 (L19) must be adjusted to manual control. Location 7 (L07) should also be adjusted so that both room and brick core temperature can be adjusted after the Ⓜ button is pressed for a few seconds. (The installing electrical contractor or power company personnel will have more information on how to make these adjustments.)

⑦ REMOTE ROOM SENSOR (OPTIONAL)

All 2000 series room heating units come factory equipped with a built-in room temperature sensor. This sensor is installed in the electrical compartment on the right side panel of the heater, near the floor. In installations where it is desired to monitor temperature at another point in the room, a remote room temperature sensor may be used. If a remote sensor is installed, the built-in sensor is disconnected. The remote sensor will provide the room temperature information to the heater. With either option, current room temperature is dislayed on the heater's face plate. An installation instruction sheet is included with the remote room sensor. Please refer to these instructions for installation of this device. (Order item #1302024.)

⑧ INSTALLER'S INSTRUCTIONS FOR SETTING HEATER OPERATION FUNCTIONS

The heater is shipped from the factory preset with standard operating functions. The owner should not have to make adjustments; however, if it is necessary to do so, the Advanced Heater Operation section of this manual explains those functions that are owner accessible and how to change them. The heater also contains functions related to power company control that are explained in a Supplemental Installer's Guide. This guide is only available to power company officials and factory certified installers.

9 INSTALLER'S FINAL CHECKOUT PROCEDURE

For cross reference to number coded components, refer to the Exploded View Diagram (Figure 18) and Heater Parts List in the Owner's Manual.

____ 1. De-energize the electrical circuit(s) feeding the heater. Place the control circuit board (2) in the service position by sliding it off its mounting screws and hooking it on these same screws using the eyelets provided on the front of the mounting plate (1). Inspect all field installed electrical connections to ensure they are tight and that all wires are routed correctly. Keep in mind that ETS devices run for long periods of time at high electrical loads. Poor or marginal electrical connections will cause the connection to overheat and fail.

NOTE **Class II (low voltage) wiring or any wiring not rated for line voltage should never be installed in a line voltage area.**

____ 2. Check the damper system to ensure the damper operates freely and that there is no debris in this area which could inhibit its operation. To do so, manually press the damper lever extending from the damper assembly (34). Be careful not to bend the damper actuator (40). If the damper is not free, remove the blower and clean any debris from that area.

____ 3. Check the settings of the dip switches on the back of the control circuit board (2). In applications where the heater is being controlled by the power line carrier transmitter, typically all dip switches will be set in the "OFF" position. If using a hard wired outdoor temperature sensor for automatic charge control, set dip switch 6 on the back of the circuit board (2) to the "ON" position. With manual charge control, dip switch 6 must be set to the "OFF" position. (The Supplemental Installer's Guide provides more information on the dip switches.)

NOTE **If manual charge control is being utilized, the data in Location 19 (L19) must be set to d02. It is the factory recommendation to also set the data in Location 7 (L07) to d02 so that both room and brick core temperatures can be adjusted after the Ⓜ button is pressed for a few seconds. It may be necessary to unlock these locations to make the change. This is done by changing the data in Location 39 (L39) to d20. Remember to reset the lock when adjustments are complete.**

____ 4. Energize the heater and check blower (37) operation. If the blower is operating, adjust the room temperature set point below the actual room temperature. To make certain the blower will start in low speed, set the room temperature one degree above actual room temperature. To check to ensure the heater's blower will operate in high speed, adjust the room temperature set point to at least five degrees above actual room temperature.

____ 5. Set the heater to the charge mode and adjust the room temperature so the blower is operating. With a clamp-on amp meter, check for proper amperage draw on the charging circuit(s). On Models 2002 and 2003, this is done at B1 terminal block position. On Models 2004, 2005, and 2006, this is done by totalling the readings from the B1 and R1 terminal block positions (30). Refer to the Unit Identification Label on the lower left side panel of the heater for information on voltage and input wattage of the heater being installed. Use the Charging Circuit Amperage Draw table on the next page for reference to the correct amperage for the specific heater being installed.

Installing The Heater (cont'd)

CHARGING CIRCUIT AMPERAGE DRAW

INPUT WATTAGE	VOLTAGE	AMP DRAW
1.32	120	11.0
2.4	240	10.0
3.0	240	12.5
3.6	240	15.0
4.5	240	18.75
4.8	240	20.0
5.4	240	22.5
6.0	240	25.0
7.2	240	30.0
7.5	240	31.25
9.0	240	37.5

(AMP draw is calculated by taking the total input wattage divided by the input voltage. Allow +/- 5% tolerance at nominal input voltage.)

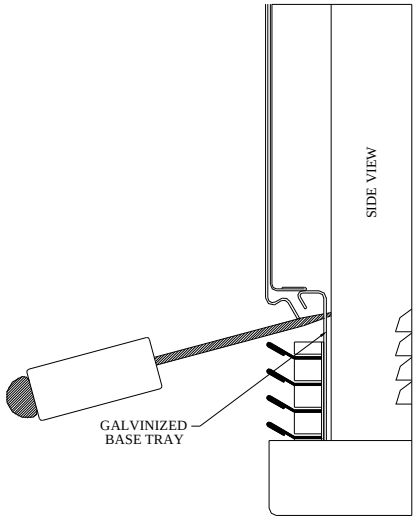
____ 6. Make certain all fuses and/or circuit breakers are labeled in the distribution panel. Use the Steffes orange panel label provided in the wall mounting bracket hardware package (53).

NOTE **This label is important since the heater may be connected to more than one branch circuit**.

____ 7. Check all other system controls for proper operation.

____ 8. De-energize the heater. Return the control circuit board (2) to its original position. Install the painted front panel (18). To assist in aligning the front panel with the top panel (19) and to make it easier to install the front panel screws, lifting slots have been provided in the galvanized base tray (57), one at each end. Place the tip of a screwdriver in one of these slots and lift upward. (See Figure 10.) Install the screw. Do the same on the other end. Be sure to use the plastic grill guard when installing the screws to protect the grill (10) from being scratched. The grill guard should be removed after the installation. Energize the system.

FIGURE 10



____9. Present owner with the manual and warranty information. The owner's registration card must be completed and returned to Steffes Corporation to ensure warranty coverage. The owner should retain the top portion of the card for their records. The installer should retain the Supplemental Guide.

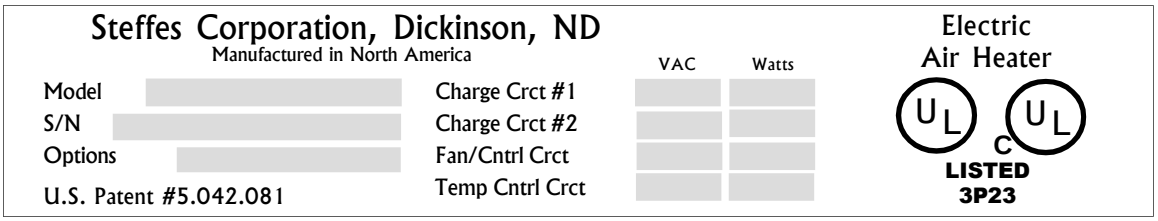
____ 10. Take the time needed to instruct the owner on how to operate the system. Many service calls with new ETS systems are a result of owner confusion on equipment operation. The time spent in training will greatly reduce the chance of a call back.

Heater Wiring

1 ROOM HEATING UNIT IDENTIFICATION LABEL

All heaters are UL and cUL safety listed. The listing identification label is located on the lower left side panel of the heater.

FIGURE 11



2 ROOM HEATING UNIT UMBILICAL CORD (WIRING HARNESS) COLOR CODE

TABLE 1

WIRE COLOR	CIRCUIT DESCRIPTION
Black	Models 2002 & 2003: All heating elements. Models 2004, 2005, & 2006: Upper heating elements.
Red	Models 2004, 2005, & 2006: Lower heating elements.
Blue	Blower and control circuit.

Refer to the Unit Identification Label on the lower left side of room heating unit for proper blower and heating element voltages. (See Figure 11.)

3 FIELD CONNECTION WIRE AND CIRCUIT BREAKER SIZING GUIDE

TABLE 2

	MAXIMUM kW			
WIRE SIZE	240VAC	277VAC	208VAC	MAXIMUM CIRCUIT BREAKER SIZE (240V Only)
#14 AWG	2.8	3.3	2.4	15
#12 AWG	3.8	4.4	3.3	20
#10 AWG	5.7	6.6	4.9	30
#8 AWG	7.6	8.8	6.6	40
#6 AWG	11.5	13.2	9.9	60

Use copper wire rated at 75°C minimum only.

Disclaimer: The field connection wire and breaker size guide reflects only the code interpretation of Steffes Corporation. It is the responsibility of the installer to follow all applicable codes and regulations for the installation.

Models 2004, 2005, and 2006 units are equipped with a two-circuit element feed option. If dual feed is used, refer to the Unit Identification Label located on the left side panel for proper sizing of each circuit. (See Figure 11.) If single-feed connection is used, size circuit for total wattage. (Charge Circuit #1 + Charge Circuit #2 = Total Wattage.)

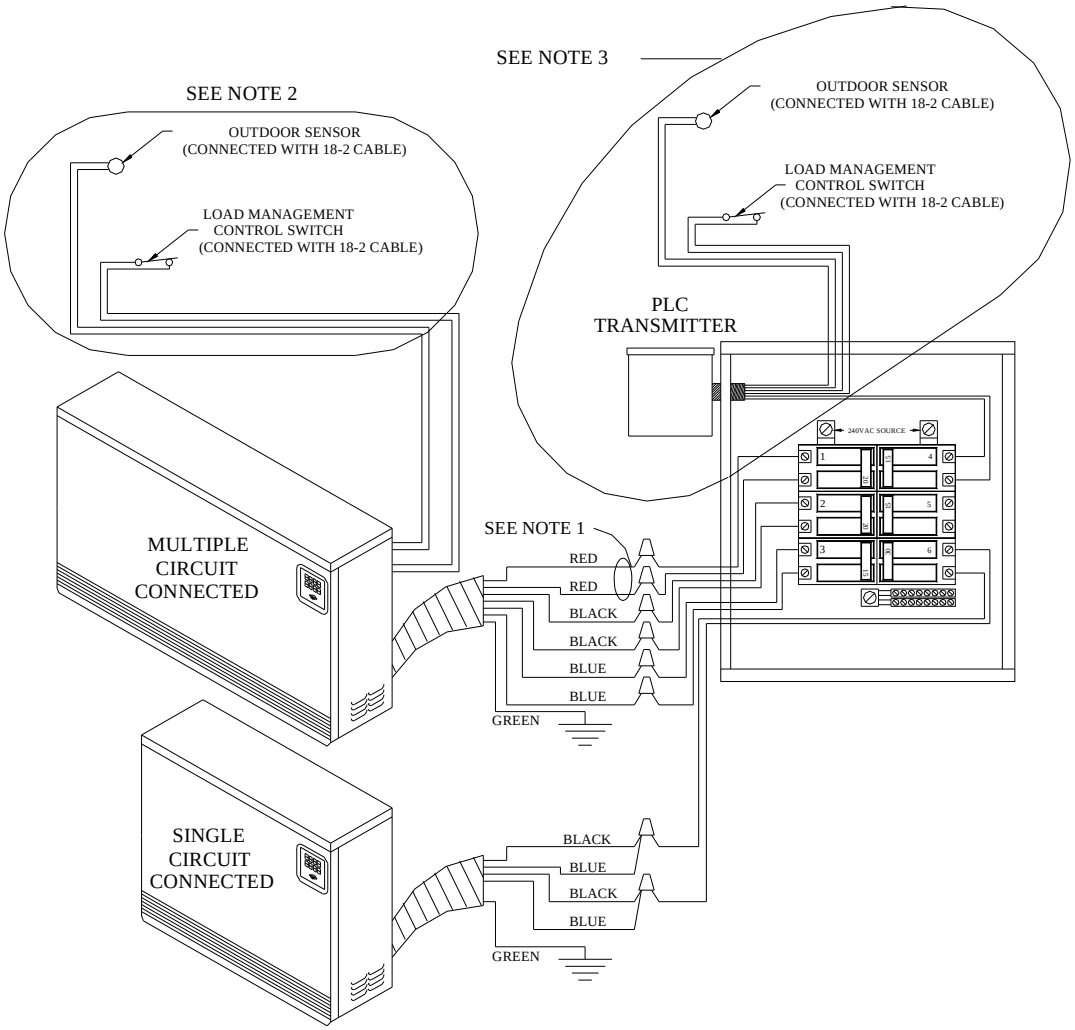
Heater Wiring (cont'd)

④ TYPICAL SYSTEM WIRING DIAGRAM

NOTE **Connections shown are for 230 VAC blowers. Refer to the Unit Identification Label on the lower left side panel of the room heating unit for proper blower and heating element voltages of your heater.**

Low Voltage Wired Outdoor Sensor and Load Management Control

FIGURE 12



NOTE 1: **Models 2004, 2005, and 2006 are equipped with a two-circuit element feed option.**

NOTE 2: **Do not make these connections if using the Steffes power line carrier (PLC) control system to control the heater(s) in the installation. The outdoor sensor is an optional feature. (Order item #1302026.)**

NOTE 3: **The Steffes Power Line Carrier (PLC) system is an optional heater control method. PLC control is available with the use of the Steffes PLC Transmitter or the Steffes Comfort Control Relay Panel (CCRP). If using the PLC Transmitter and installing it outdoors, an outdoor sensor for automatic brick core charge regulation is not required. If installing the PLC Transmitter indoors or if using the PLC control system built into the CCRP, one external outdoor sensor is required for automatic brick core charge regulation.**

5 HEATER DIP SWITCH SETTINGS

The brick core charging of the 2000 series room heating unit is capable of being controlled by low voltage wiring, by line voltage wiring, by a time clock or by a power line carrier signal (wireless control) with the use of the Steffes power line carrier (PLC) control system.

Depending on which method of heating element control is being used, the unit configuration dip switches will need to be set accordingly. (See Figure 13 for location of these dip switches in the heater.) The function of each dip switch is as follows:

Dip Switch #1 = Invert Peak Signal (Should be "ON" if using a time clock for control purposes.)
Dip Switch #2 = NOT USED (Should always remain in "OFF" position.)
Dip Switch #3 = Invert Occupied/Not Occupied Signal (Room Temperature Set back)
Dip Switch #4 = Invert Anticipated (Pre-Peak) Signal
Dip Switch #5 = Enable Auxiliary Heat Call Feature
Dip Switch #6 = Automatic Charge Control Configuration (Should be "ON" if a direct wired outdoor sensor is being used for automatic brick core charge regulation.)
Dip Switch #7 = Security (Editing Control) Mode
Dip Switch #8 = Used for factory purposes ONLY. (Must always remain in "OFF" position.)

NOTE **If the dip switch button is set in the up position, the dip switch is in the "ON" (activated) position. If the dip switch button is set in the down position, the dip switch is in the "OFF" (deactivated) position. (See Figure 13 for location of the dip switches in the heater.)**

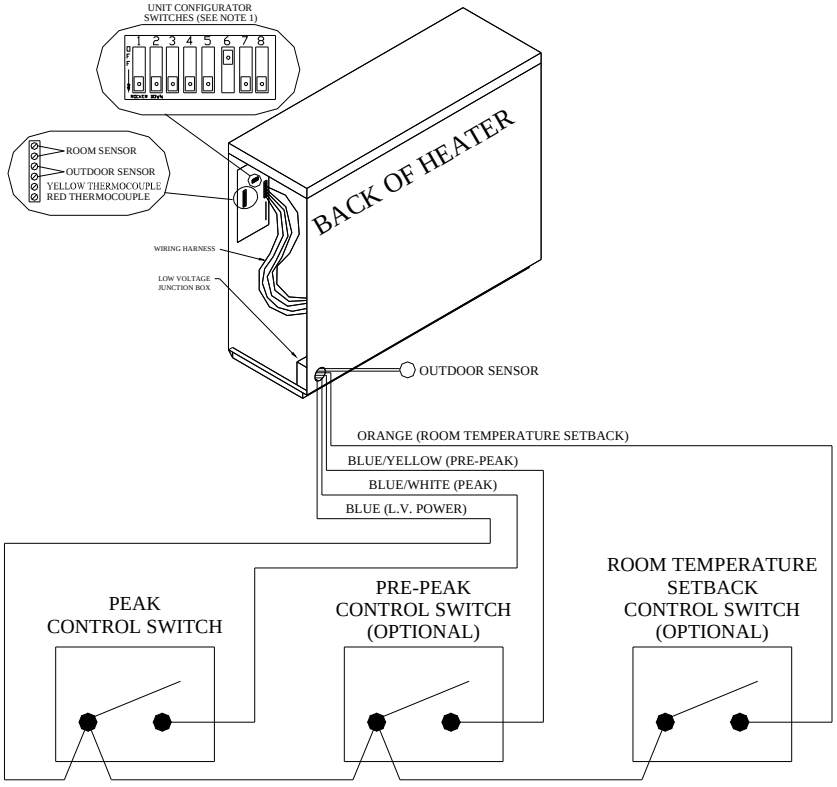
Heater Wiring (cont'd)

6 TYPICAL LOW VOLTAGE CONTROL WIRING DIAGRAMS

NOTE **Never install any wiring in a line voltage area unless the wire is rated for line voltage.**

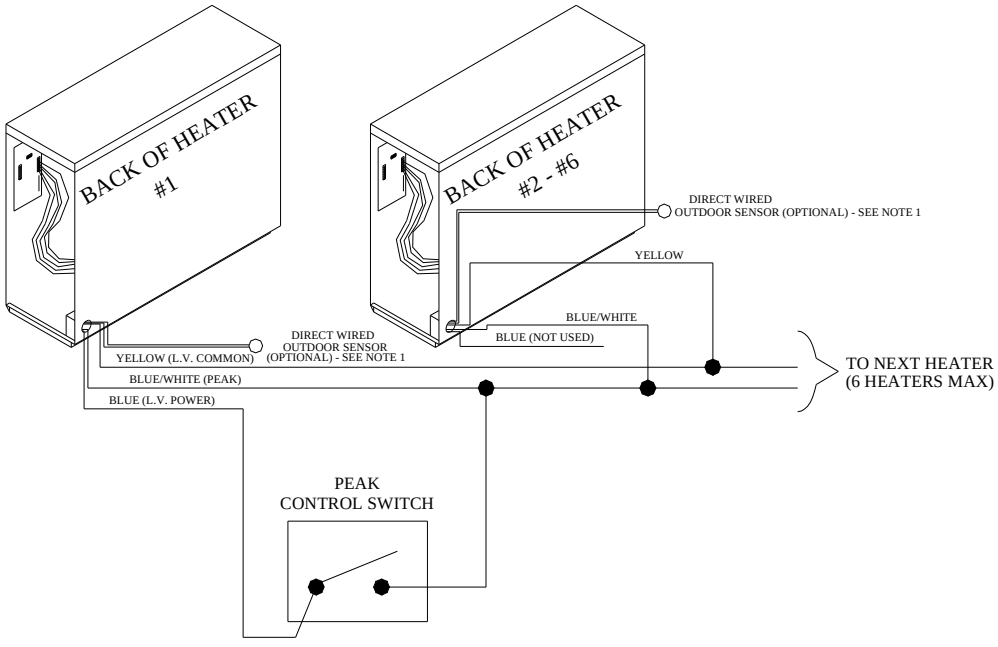
SINGLE UNIT

FIGURE 13



MULTIPLE UNITS

FIGURE 14



NOTE 1: If using a direct wired outdoor temperature sensor for automatic charge control, one outdoor sensor is required for each heater that is installed.

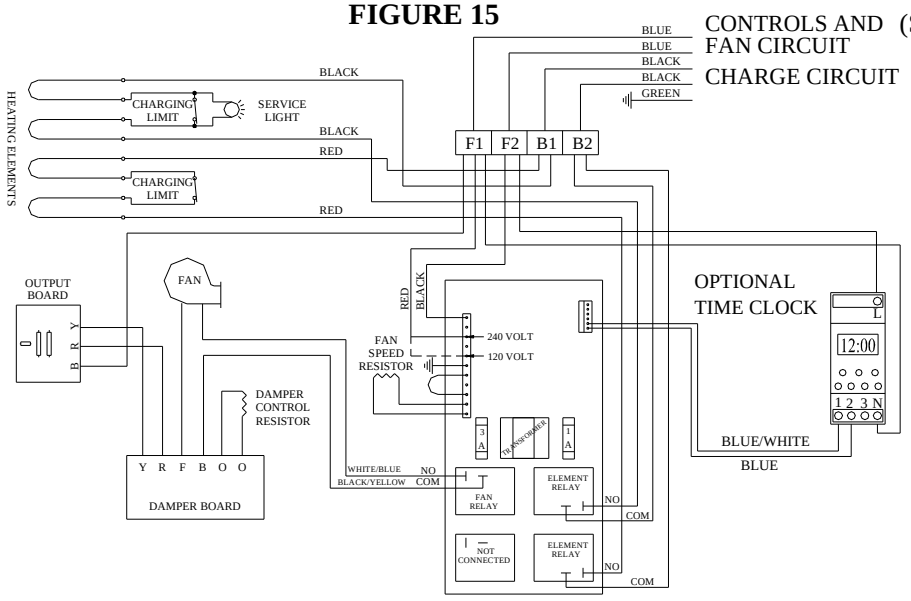
NOTE 2: Dip switch #6 must be turned "ON" only if connecting a hard wired outdoor temperature sensor.

7 ROOM HEATING UNIT LINE VOLTAGE WIRING DIAGRAMS

Models: 2002 & 2003 (direct wired)

NOTE **Connections shown are for 230 VAC blowers. Refer to the Unit Identification Label on the lower left side panel of the room heating unit for proper blower and heating element voltages of your heater.**

FIGURE 15

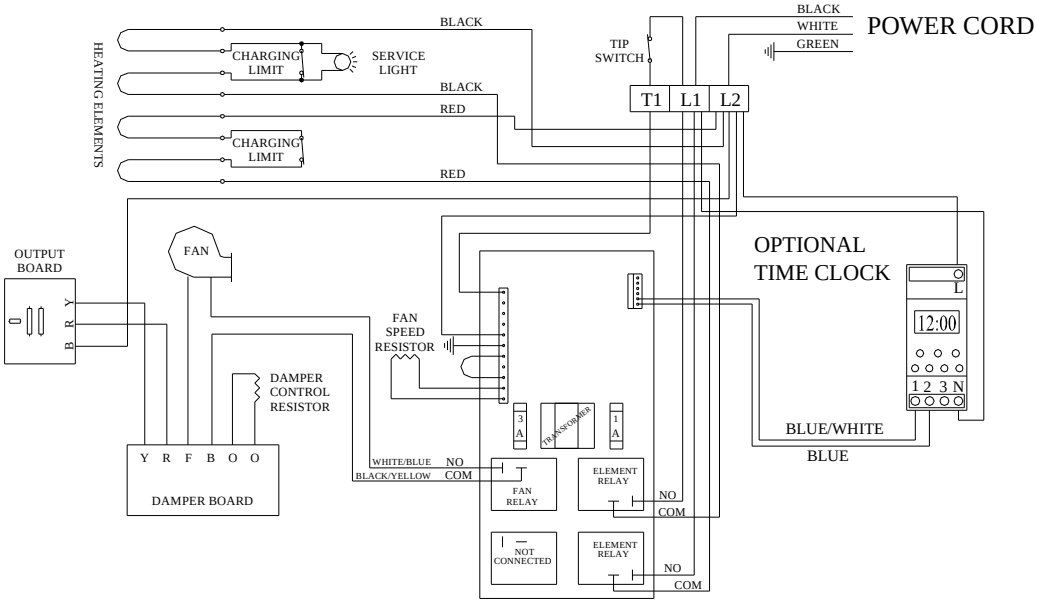


NOTE 1: If installing a unit configured with a 115VAC blower, and the Steffes power line carrier (PLC) control system is being utilized, the F2 terminal block position must be the hot (ungrounded) leg.

Models: 2002, & 2003 (cord connected)

NOTE **Connections shown are for 115 VAC blowers. Refer to the Unit Identification Label on the lower left side panel of the room heating unit for proper blower and heating element voltages of your heater.**

FIGURE 16

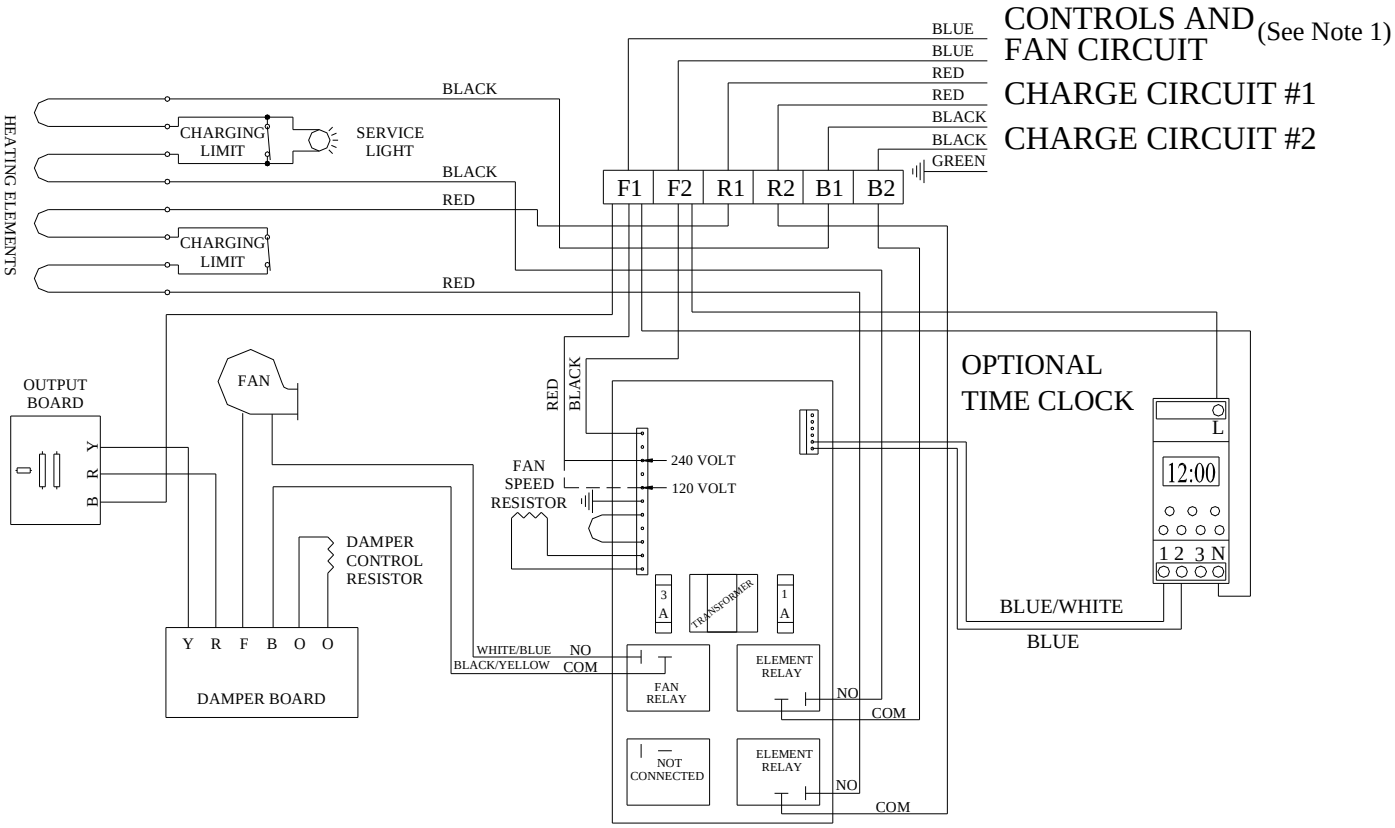


Heater Wiring (cont'd)

Models: 2004, 2005 & 2006 (direct wired)

NOTE **Connections shown are for 230 VAC blowers. Refer to the Unit Identification Label on the lower left side panel of the room heating unit for proper blower and heating element voltages of your heater.**

FIGURE 17



NOTE 1: If installing a unit configured with a 115VAC blower, and the Steffes power line carrier (PLC) control system is being utilized, the F2 terminal block position must be the hot (ungrounded) leg.

Room Heating Unit Specifications

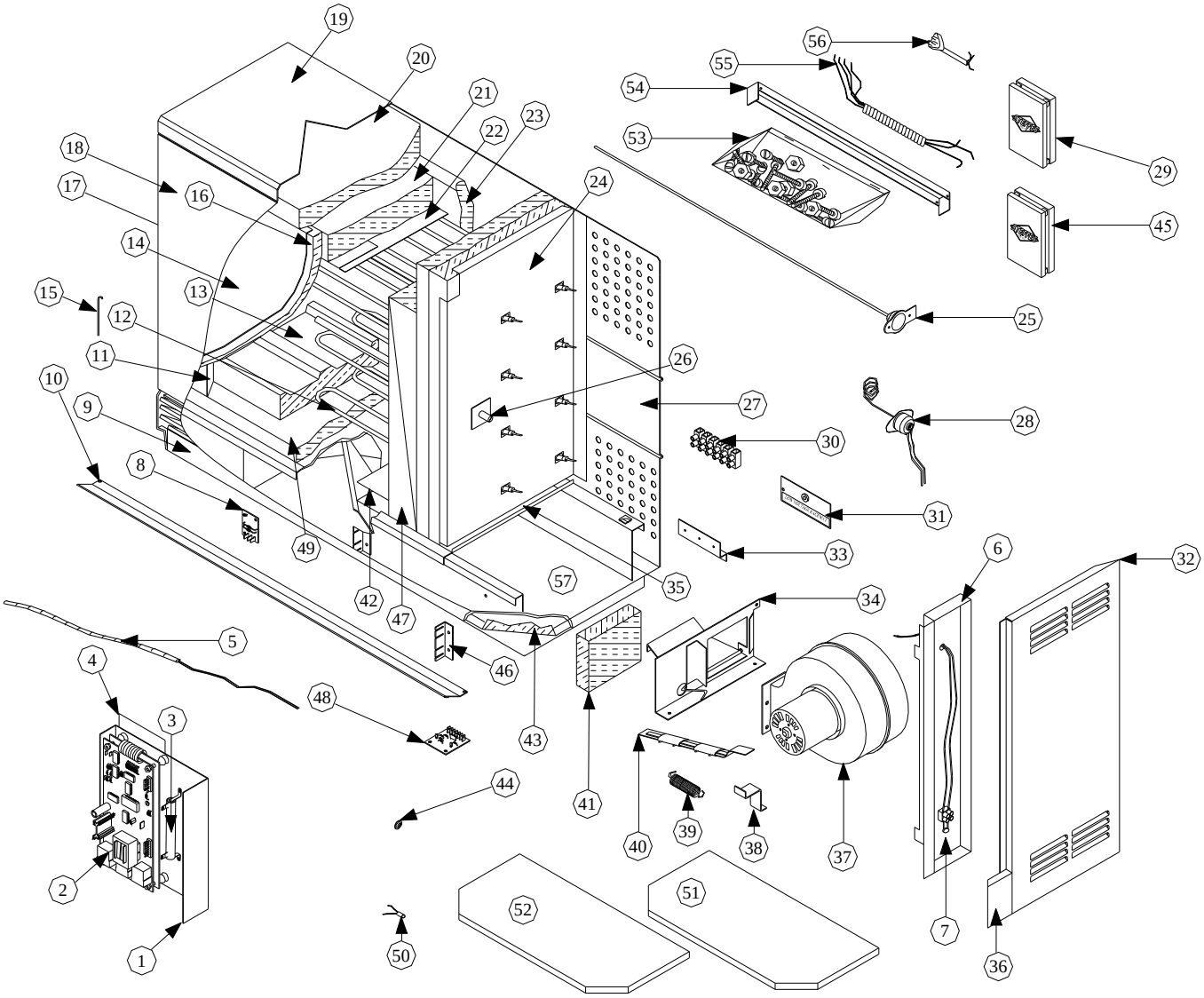
MODEL	2002 plug-in	2002	2003	2004	2005	2006
Length - inches	30	30	37	44	51	58
Height - inches	24.5	24.5	24.5	24.5	24.5	24.5
Depth - inches (w/out wall bracket)	10.5	10.5	10.5	10.5	10.5	10.5
Number of Bricks	16	16	24	32	40	48
Number of Brick Boxes	4	4	6	8	10	12
Weight of Heater - lbs	105	91	112	126	145	164
Weight of Bricks - lbs	176	176	264	352	440	528
Installed Weight - lbs	281	267	376	478	585	692
*Inputs Available - kW 120V 208V, 240V, 277V	 1.32 N/A	 N/A 2.4, 3.0, 3.6	 N/A 3.6, 4.5, 5.4	 N/A 4.8, 6.0, 7.2	 N/A 6.0, 7.5, 9.0	 N/A 7.2, 9.0
*Element Voltage	120	240 (std) 208 & 277 opt	240 (std) 208 & 277 opt	240 (std) 208 & 277 opt	240 (std) 208 & 277 opt	240 (std) 208 & 277 opt
*Blower Voltage	115	230 (std) 115, 208, & 277 opt	230 (std) 115, 208, & 277 opt	230 (std) 115, 208, & 277 opt	230 (std) 115, 208, & 277 opt	230 (std) 115, 208, & 277 opt
Number of Blowers	1	1	1	1	1	1
Blower Wattage Minimum Maximum	 30 120	 30 120	 30 120	 30 120	 30 120	 30 120
Storage Capacity kWh BTU	 13.5 46,062	 13.5 46,062	 20.25 69,093	 27 92,124	 33.75 115,155	 40 136,480

**Refer to the Unit Identification Label on lower left side panel of the room heating unit for data specific to your heater. (See Figure 11.)*

24 Exploded View Heater Diagram

NOTE **When ordering replacement parts, please include model number and serial number of the heater.**

FIGURE 18



Heater Parts List

REF NO.	Description	2002 Plug-in Item #	2002 Item #	2003 Item #	2004 Item #	2005 Item #	2006 Item #
1.	Control Circuit Board Mounting Plate	5940308	5940308	5940308	5940308	5940308	5940308
2.	Control Circuit Board Assy (Microprocessor)	1043012	1043012	1043012	1043012	1043012	1043012
3.	*Blower Resistor (240VAC)	1017011	1017050	1017016	1017016	1017046	1017046
4.	Face Plate	1159032	1159032	1159032	1159032	1159032	1159032
5.	Brick Core Thermocouple (Sensor)	1043004	1043004	1043005	1043005	1043005	1043005
6.	Room Temperature Sensor Mounting Panel	5949087	5949087	5949087	5949087	5949087	5949087
7.	Built-in Room Temperature Sensor Assembly	1040360	1040360	1040362	1040362	1040362	1040362
8.	Output Temperature Sensor Circuit Board	1040388	1040388	1040388	1040388	1040388	1040388
9.	Painted Panel, Bottom	5943060	5943060	5943062	5943064	5943066	5943068
10.	Grill Slats	5943100	5943100	5943102	5943104	5943106	5943108
11.	Aluminized Air Channel, Left	5949028	5949028	5949028	5949028	5949028	5949028
12.	*Heating Elements	Contact factory with serial number of heater.					
13.	Heat Storage Brick	5903010	5903010	5903010	5903010	5903010	5903010
14.	Galvanized Panel, Front	5943010	5943010	5943012	5943014	5943016	5943018
15.	Grill Pin	5943099	5943099	5943099	5943099	5943099	5943099
16.	Insulation Panel, Front	1053010	1053010	1053012	1053014	1053016	1053018
17.	Painted Panel, Left	5943020	5943020	5943020	5943020	5943020	5943020
18.	Painted Panel, Front	5943000	5943000	5943002	5943004	5943006	5943008
19.	Painted Panel, Top	5943050	5943050	5943052	5943054	5943056	5943058
20.	1 ½" Blanket Insulation, Outer	1050073	1050073	1050074	1050075	1050076	1050077
21.	1 ½" Blanket Insulation, Inner	1050082	1050082	1050083	1050084	1050085	1050086
22.	Aluminized Air Channel, Top	5949060	5949060	5949062	5949064	5949066	5949068
23.	Insulation Panel, Back	1053010	1053010	1053012	1053014	1053016	1053018
24.	Galvanized Panel, Right	5943040	5943040	5943040	5943040	5943040	5943040
25.	Core Charging High Limit Guide Tube	1105016	1105016	1105018	1105020	1105022	1105024
26.	Thermocouple Tube	5943222	5943222	5943220	5943220	5943220	5943220
27.	Galvanized Panel, Back	5943070	5943070	5943072	5943074	5943076	5943078
28.	Core Charging High Limit Switch	1040406	1040406	1040406	1040408	1040408	1040410
29.	Outdoor Temperature Sensor, Optional	1302026	1302026	1302026	1302026	1302026	1302026
30.	Terminal Block Kit	1040242	1040242	1040242	1040243	1040243	1040243
31.	Low Voltage Raceway Cover	5943216	5943216	5943216	5943216	5943216	5943216
32.	Painted Panel, Right	5943030	5943030	5943030	5943030	5943030	5943030
33.	Terminal Block Mounting Bracket	5943212	5943212	5943212	5943212	5943212	5943212
34.	Damper Assembly	1043010	1043010	1043010	1043010	1043010	1043010
35.	Galvanized Plate, Bottom	5943080	5943080	5943082	5943084	5943086	5943088
36.	Grill End Bracket, Right	5940998	5940998	5940998	5940998	5940998	5940998
"	Grill End Bracket, Left	5940996	5940996	5940996	5940996	5940996	5940996
37.	*Blower Assembly (230VAC)	1021001	1021001	1021001	1021001	1021001	1021001
38.	Damper Resistor Mount	5943226	5943226	5943226	5943226	5943226	5943226
39.	Fan Mounting Spring	1159006	1159006	1159006	1159006	1159006	1159006
40.	Damper Actuator Assembly	1043007	1043006	1043006	1043006	1043006	1043006
41.	Damper Assembly Insulation	N/A	N/A	N/A	N/A	N/A	N/A
42.	Base Cap Insulation	5943130	5943130	5943130	5943130	5943130	5943130
43.	1" Base Insulation	1050066	1050066	1050067	1050068	1050069	1050070
44.	Element Push Nut	1151015	1151015	1151015	1151015	1151015	1151015
45.	Remote Room Temperature Sensor (optional)	1302024	1302024	1302024	1302024	1302024	1302024
46.	Grill Support Rail	5943024	5943024	5943024	5943024	5943024	5943024
47.	Aluminized Air Channel, Right	5949026	5949026	5949026	5949026	5949026	5949026
48.	Damper Circuit Board	1159044	1159044	1159044	1159044	1159044	1159044
49.	Insulation Panel, Bottom	1053020	1053020	1053022	1053024	1053026	1053028
50.	*Red Service Light (240VAC)	1015021	1015021	1015021	1015021	1015021	1015021
51.	Security Base Shell	5942114	N/A	N/A	N/A	N/A	N/A
52.	Security Base Filler	1190023	N/A	N/A	N/A	N/A	N/A
53.	Wall Bracket Hardware Kit	1190032	1190032	1190032	1190032	1190032	1190032
54.	Wall Support Bracket	5943200	5943200	5943202	5943204	5943206	5943208
55.	Umbilical Cord	N/A	1040600	1040600	1040602	1040602	1040602
56.	Cord Connect	1015000	N/A	N/A	N/A	N/A	N/A
57.	Galvanzied Base Tray	5943110	5943110	5943112	5943114	5943116	5943118

**Optional voltages or wattages are available. Contact factory with model number and serial number of the heater.*

26 Advanced Heater Operation

CAUTION

The room heating unit is shipped from the factory preset with standard operating functions. Adjustments should not have to be made; however, if you find it is necessary to do so, this section contains the information for changing the standard configuration. Please proceed with caution when making the adjustments.

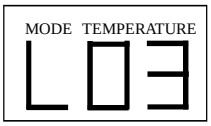
The data for the heaters operating functions are stored in specific locations in the heater's microprocessor and can be accessed through the control panel. All functions should be adjusted by the installer for the application at the time of the installation. The only adjustment the user should have to make is setting the room temperature which is typical with any heating system. If the ETS system has been set for manual charge control, the user will also need to adjust the brick core charge level on occasion.

Usually, the owner can access heater data stored in Locations 0 through 10 (L00 - L10) and can make adjustments if desired. When adjusting or viewing any of the heater data, the MODE digit will indicate an "L" or a "d".

L = Indicates the location of the heater function that is being viewed or changed. (See Figure 19.)

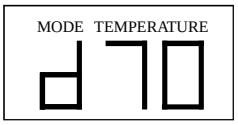
d = Indicates the specific data that is stored in a location. This data determines how the heater will function. (See Figure 20.)

Figure 19



In this example, you are in function location 3.

Figure 20



In this example, the data stored in a location is 70.

1 HOW TO CHANGE THE HEATER'S OPERATION

Step 1 Hold the (M) button until a "d" appears on the MODE digit.

Step 2 Release the (M) button. The face plate will display "L00". The "L" under the MODE digit indicates a specific location of the heater's microprocessor, and the "00" indicates the location number.

Step 3 Press the (⇧) arrow button until the location to be edited is reached.

Step 4 After reaching the location to be edited, press and hold the (M) button. A "d" under the MODE digit and two numbers under the TEMPERATURE digits will be displayed. This is the data that is currently stored in this specific location.

Step 5 Continue to hold the (M) button and use the (⇧) or the (⇩) arrow buttons to change the data to the desired value.

Step 6 Release the (M) button. The face plate will automatically return to displaying the current room temperature after the adjustments have been made, or press the (⇩) arrow button until the current room temperature is displayed. Any changes made to the heater settings will be stored in the locations that have been adjusted.

2 TEMPERATURE CONVERSION CHART

The room temperature display can be set to read in Celsius or Fahrenheit. All other heater functions relating to temperature will be reflected in Fahrenheit only. Use this conversion chart to equate the Fahrenheit reading to Celsius, if desired.

Fahrenheit	Celsius	Fahrenheit	Celsius	Fahrenheit	Celsius
-40	-40.0	65	18.3	87	30.6
-30	-34.4	66	18.9	88	31.1
-20	-28.9	67	19.4	89	31.7
-10	-23.3	68	20.0	90	32.2
0	-17.8	69	20.6	91	32.8
5	-15.0	70	21.1	92	33.3
10	-12.2	71	21.7	93	33.9
15	-9.4	72	22.2	94	34.4
20	-6.7	73	22.8	95	35.0
25	-3.9	74	23.3	96	35.6
30	-1.1	75	23.9	97	36.1
32	0.0	76	24.4	98	36.7
35	1.7	77	25.0	99	37.2
40	4.4	78	25.6	100	37.8
45	7.2	79	26.1	200	93.3
50	10.0	80	26.7	400	204.4
55	12.8	81	27.2	600	315.6
60	15.6	82	27.8	800	426.7
61	16.1	83	28.3	1000	537.8
62	16.7	84	28.9	1200	648.9
63	17.2	85	29.4	1400	760.0
64	17.8	86	30.0	1600	871.1
				1800	982.2

3 DESCRIBING THE HEATER FUNCTIONS (L00 through L10)

All heater functions relating to temperature will be reflected in Fahrenheit, even if the room temperature display is set to read in Celsius. The Celsius equivalency to Fahrenheit is listed next to these temperature function descriptions for your reference. For a complete list of temperature conversions, refer to the Temperature Conversion Chart, Table 5, in this manual.

Location 0 (L00) - Room Temperature Set Point

This is the room temperature set point. This set point typically is not adjusted in this location but rather in the standard edit mode. The maximum value of this set point is dictated by the value in Location 8 (L08), and the minimum value is dictated by the value in Location 9 (L09).

Data Value Range: d00 to d99 (degrees Fahrenheit)
(Celsius equivalency: -17.8 to 37.2)

Refer to Adjusting the Room Temperature Set Point section of this manual for more information.

Location 1 (L01) - Brick Core Temperature Set Point

If Using Automatic Charge Control: The data entered into this location provides a trim adjustment to brick core temperature. As the heater charges automatically in relation to outdoor temperature, this trim will either increase (up by +25%) or decrease (down by -25%) brick core temperature. If you do not desire to use the trim function, this should be set at d05. L01 is factory preset at d05.

Data Value Range: d00 to d10

d00 = -25% trim
d10 = +25% trim

If Using Manual Charge Control: The data entered in this location indicates the targeted brick core charge level for the room heating unit. It is factory preset at d05 (approximately 50% core charge).

Data Value Range: d00 to d10

d00 = no core charging will occur
d05 = 50% core charge will be maintained
d10 = maximum core charge will be maintained

NOTE **Refer to Adjusting the Brick Core Charging Level section in this manual for more information.**

Location 2 (L02)

Presently, this location is not used. L02 is factory preset at d01 and should not be changed.

Location 3 (L03) - Display Illumination

This location is used to set the face plate's illumination status. Usually, the face plate is preset for continuous display of current room temperature. This can be changed so the face plate display goes blank after a few seconds of inactivity. L03 is factory preset at d00.

Data Value Range: d00 to d04

d00 = continuous illumination of the face plate
d01 = display goes blank after a period of inactivity (less than one minute)
d02, d03, d04 = currently, no function associated with these values

Location 4 (L04) - Automatic Charge Control Start Charging Set Point

This location indicates the outdoor temperature at which the room heating unit should start brick core charging. L04 is factory preset at d60 (60°F which equates to 15.6°C).

Data Value Range: any value up to d90 (degrees Fahrenheit)

NOTE **Only applicable if using Automatic Charge Control. Refer to Adjusting the Brick Core Charging Level section of this manual for more information.**

Location 5 (L05) - Automatic Charge Control Full Charge Set Point

This location indicates the outdoor temperature where the room heating unit should have a full brick core charge. Example: If Location 4 (L04) has a value of d60 and Location 5 (L05) has a value of d20, the room heating unit will take a proportional charge at any outdoor temperature between these two set points. L05 is factory preset at d20 (20°F which equates to -6.7°C).

Data Value Range: any value up to d90 (degrees Fahrenheit)

NOTE **Only applicable if using Automatic Charge Control. If you are entering a negative data value into a location, the face plate will display a "-" (minus sign) rather than a "d" while in the edit mode. Refer to Adjusting the Brick Core Charging Level section of this manual for more information.**

Location 6 (L06) - Room Temperature Set Back

This location indicates the number of degrees (°F) the room temperature set point will be reduced if a room temperature set back signal is received by the room heating unit. L06 is factory preset at d00.

Data Value Range: d00 to d65

NOTE **This location should be preset by the installer during the installation procedure if the room temperature set back function is to be enabled in the application. It is the factory recommendation that the owner does not adjust this setting once it has been set.**

Location 7 (L07) - Display Operation Mode

This location sets the display operation mode for room temperature and brick core temperature. L07 is factory preset at d00.

Data Value Range: d00 to d04

d00 = will allow for only room temperature setting adjustment at any time.
d01 = will allow for only room temperature setting adjustment; however, the (M) button must first be depressed for a few seconds
d02 = will allow for room and core temperature settings to be edited after the (M) button is depressed for few seconds
d03, d04 = not recommended to be utilized

NOTE **If using manual charge control, the data in this location should be set to d02.**

Location 8 (L08) - Room Temperature - Maximum Value

This location is used to set the **maximum** room temperature set point. This set point is the highest temperature to which the room temperature thermostat can be adjusted. For example: If the data value in this location is set to d85, then 85°F will be the highest room temperature to which the thermostat can be adjusted. L08 is factory preset at d85 (85°F which equates to 29.4°C).

Data Value Range: d45 to d99 (degrees Fahrenheit)
(Celsius equivalency: 7.2 to 37.2)

Location 9 (L09) - Room Temperature - Minimum Value

This location is used to set the **minimum** room temperature set point. This set point is the lowest temperature to which the room temperature thermostat can be adjusted. For example: If the data value in this location is set to d45, then 45°F will be the lowest room temperature to which the thermostat can be adjusted. When adjusting the room temperature set point below this setting, the heater will be shut off. "OFF" will be displayed on the face plate. L09 is factory preset at d45 (45°F which equates to 7.2°C).

Data Value Range: d01 to d80 (degrees Fahrenheit)
(Celsius equivalency: -17.2 to 26.7)

Location 10 (L10) - Room Temperature Display Calibration

This location allows for calibrating of the current room temperature value which is displayed. By entering a negative number into this location, the actual room temperature value displayed will be decreased by that number. By entering a positive number, the room temperature value displayed will be increased by that number. For example: The room heating unit could sense it is 68°F in the room; however, with a data value of d04 entered into this location, the face plate will display 72°F. Calibration of the room temperature may vary from heater to heater and will be set at the factory.

Data Value Range: -20 to d20 (degrees Fahrenheit)

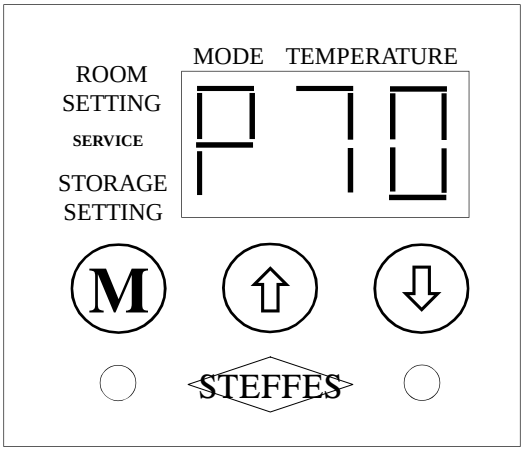
NOTE **If you are entering a negative data value into a location, the face plate will display a "-" (minus sign) rather than a "d" while in the edit mode.**

4 BRICK CORE OPERATING MODES: "C", "P", AND "A"

Typically, the face plate of the control panel will continuously display current room temperature. It will also display a "C" for charge, "P" for peak, or "A" for anticipated peak to indicate the current brick core operating mode (See Figure 21). The face plate can be set so these brick core charging modes are not displayed; but, rather, an "F" for Fahrenheit or "C" for Celsius is displayed after the room temperature (See Figure 22.)

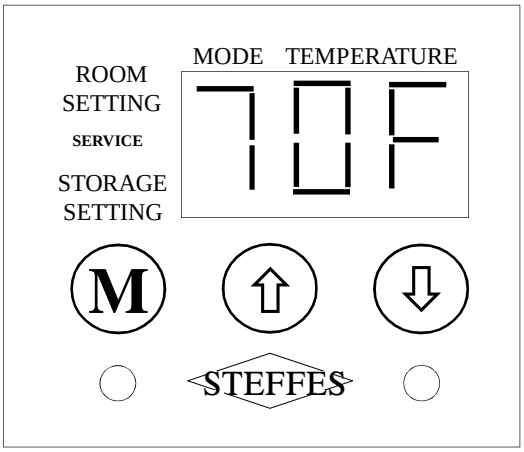
NOTE **These options can be preset to owner preference during the installation procedure when the heater operational functions are being set. The installing electrical contractor or power company personnel will have more information on how to change these functions in the heater.**

Figure 21



Room Temperature and Brick Core Operating Mode Peak Displayed

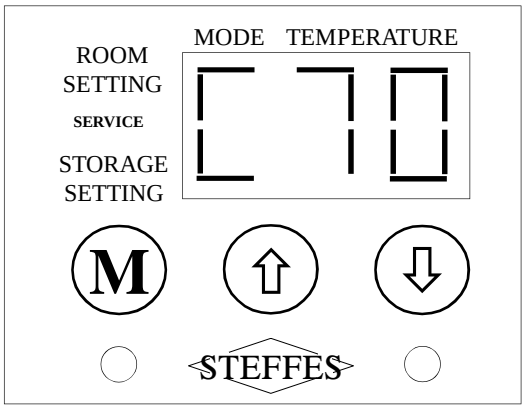
Figure 22



Room Temperature and Fahrenheit Displayed

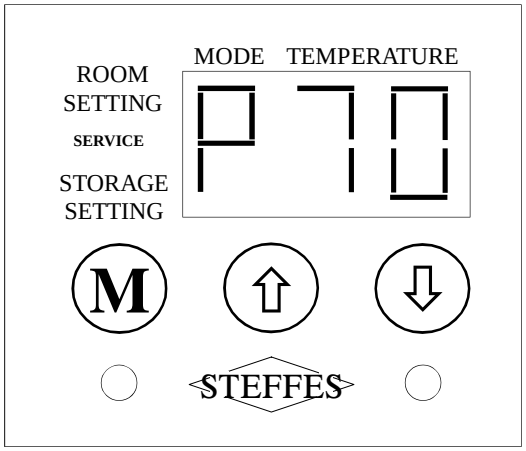
1. **Charge Mode (Off-Peak): See Figure 23**
   - MODE digit displays a "C".
   - TEMPERATURE digits display current room temperature.
   - During this mode, if the temperature of the brick core is insufficient (based on the manual charge setting or the automatic charge control outdoor temperature information), the heating elements will be on. Heat will be stored in the bricks to maintain the appropriate charge level. Once the appropriate brick core charge level is reached, the heating elements will automatically turn off.
   - The blower turns on when the room thermostat calls for heat and extracts heat from the brick core to maintain a constant, comfortable room temperature.
   - If the room thermostat calls for heat during a time when there is no heat stored in the brick core, the blower and heating elements will come on and begin releasing heat to the area until the heat call has been satisfied.
2. **Peak Mode (On-Peak): See Figure 24**
   - MODE digit displays a "P".
   - TEMPERATURE digits display actual room temperature.
   - During this mode, the heater is not allowed to store heat in the bricks. The heating elements will remain off for the duration of the on-peak period. (Exception: If the utility company permits the use of the freeze protection and/or comfort override options, some element operation may occur. See below.)
   - The blower turns on when the room thermostat calls for heat and extracts heat from the brick core to maintain a constant, comfortable room temperature.

FIGURE 23



Control Panel Display

FIGURE 24



Control Panel Display

Comfort Override (power company permitting)
This feature is used to achieve room comfort in the area where the heater is located if the stored heat in the brick core has been depleted. If the power company permits the use of this feature, it will allow the heating elements to come on during a peak mode. This occurs only if the room temperature falls a preset number of degrees below the room temperature set point and the stored heat in the brick core has been depleted.

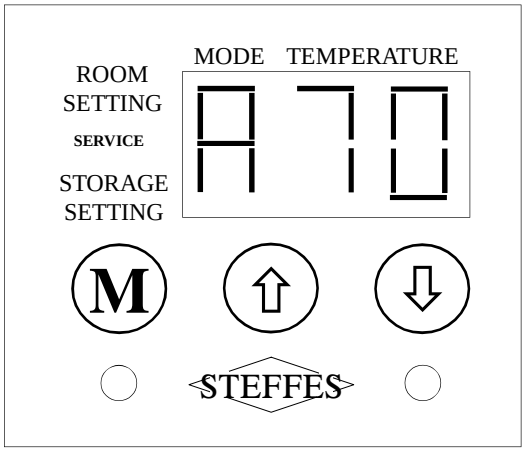
Freeze Protection (power company permitting)
This feature is used to maintain a temperature above freezing in the area where the heater is located. If the power company permits the use of this feature, it will allow the heating elements to come on during a peak mode. This occurs only if room temperature falls below the freeze protection temperature set point as programmed in the heater.

NOTE **Freeze protection and peak override options may not be available in your area. Please consult your power company if you are unsure of whether these options are available to you.**

3. Anticipated Peak (Pre-Peak) Mode: See Figure 25

This mode is used only in specialiazed installations. You may not have this option enabled on your heating unit.

FIGURE 25



Control Panel Display

This mode of operation is used in situations where the power company sends a signal to the equipment prior to the possibility of a control (on-peak) period. Once the signal is received, the room heating unit will charge to a level needed to satisfy the heating requirements of the area during the control period.

- MODE digit displays an "A".
- TEMPERATURE digits display actual room temperature.
- During this mode, the heater is allowed to store heat in the brick core. If the brick core charge level is insufficient (based on the manual charge setting or the automatic charge control outdoor temperature information), the heating elements will be on. Heat will be stored in the bricks to maintain the appropriate charge level. Once the appropriate brick core charge level is reached, the heating elements will automatically turn off.
- The heater can be set so that the blower comes on as the room thermostat calls for heat, or it can be set so that it cannot come on at all during an anticipated peak period. The heater can also be set so that there is limited blower operation during this time. Under some situations, limiting the amount of blower operation, or not allowing it to come on at all, may be necessary to ensure that the room heating unit will have an adequate amount of heat stored in the bricks for an upcoming peak control period.

Customer Notes

Please record your model and serial number below. This information is located on the lower left side panel of the heater. Retain this information for future reference.

Model Number _____

Serial Number _____

Date Purchased _____

Purchased From _____

Date Installed _____

Installed By _____

Notes:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

☞ **REMINDER: Please remember to fill out your Warranty Registration Card and mail it in as soon as possible. Thank you!**

Warranty

Registering your purchase is an essential step to ensure warranty coverage. A Warranty Registration card is included with the Owner's Manual. Simply complete, detach the bottom portion, and return the card today. Retain the top portion of the card for your files.

Your Steffes product is protected by one of the most comprehensive warranties and outstanding service networks in the industry. We welcome comments you have relating to the equipment. Enjoy your new purchase!

Steffes Corporation ("Steffes") warrants that the Steffes Electric Thermal Storage Heating Appliance is free from defects in materials and workmanship under normal use and service. Steffes' obligation under this Warranty is limited to the repair or replacement of the appliance or parts only which prove to be defective under normal use within **five (5) years** of the date of installation and which Steffes' examination of the returned appliance or part(s) shall verify to Steffes' satisfaction that it is defective. The user shall be responsible for any labor costs associated with the repair or replacement of the appliance or part(s), including the cost of returning the defective appliance or part(s) to Steffes Corporation.

This Warranty is void if the heating appliance is moved from the premises in which it was originally installed. This Warranty shall not apply to an appliance or part which has been altered in any respect, or improperly installed, serviced or used, or has been subject to accident, negligence, abuse or misuse.

THE ABOVE WARRANTY BY STEFFES IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

The user assumes all risk and liability whatsoever resulting from the use of this heating appliance. In no event shall Steffes be liable for any indirect, special or consequential damages or lost profits.

This Limited Warranty contains the complete and exclusive statement of Steffes' obligations with respect to the heating appliance and any parts thereof. The provisions hereof may not be modified in any respect except in writing signed by a duly authorized officer of Steffes.

NOTE

The equipment described herein is intended for installation in accordance with applicable local, state and national electrical codes and must be installed by a qualified electrician.

This manual should be retained by owner upon completion of the installation and made available to service personnel as required.

STEFFES CORPORATION 3050 Hwy 22 North • Dickinson, ND 58601-9413• 701-483-5400