



*"Manufactured in North America"*

**OWNER'S AND  
INSTALLER'S MANUAL  
for  
Room Heating Units**

**Models: 1002 and 1003**



<b>Introduction</b> .....	2
<b>General Information</b>	
What is ETS .....	3
Terminology .....	4
<b>Safety Information</b>	
Safety Precautions .....	5
Built-in Safety Devices .....	5
<b>Maintenance and Cleaning</b> .....	6
<b>Describing the Heater's Display Panel</b> .....	6-7
<b>Operating the Heater</b>	
Heater Start-up .....	8
Adjusting the Room Temperature Set Point .....	8
Adjusting the Brick Core Charge Level .....	8-9
How to Turn the Heater "OFF" and "ON" .....	9
<b>Installing the Heater</b>	
Placement .....	10
Clearance Requirements .....	10
Electrical Connections .....	11
Attaching the Heater to the Wall .....	12
Brick Loading .....	12
Setting the Method of Brick Core Charge Control .....	13
Remote Room Sensor .....	13
Installer's Instructions for Setting Heater Operation Functions .....	14
Installer's Final Checkout Procedure .....	14-15
<b>Heater Wiring</b>	
Room Heating Unit Identification Label .....	16
Field Connection Wire and Circuit Breaker Sizing Guide .....	16
Typical System Wiring Diagram .....	17
Line Voltage Wiring Diagram .....	18
Typical Control Wiring Information and Diagrams .....	18-19
<b>Room Heating Unit Specifications</b> .....	20
<b>Exploded View Heater Diagram</b> .....	20
<b>Heater Parts List</b> .....	21-22
<b>Advanced Heater Operation</b>	
How to Change the Heater's Operation .....	22-23
Temperature Conversion Chart .....	23
Describing the Heater Functions (L00-L10) .....	24-26
Explaining the Brick Core Operating Modes: "C", "P", and "A" .....	26-28
<b>Customer Notes</b> .....	29-30
<b>Warranty</b>	
Five (5) Year Warranty Policy .....	31

Dear Valued Customer:

**Congratulations on your new purchase!** The Steffes ETS heaters are of 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: 1002 and 1003. 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 all the information contained within this manual before installing the system. 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 Customer Notes section of this Owner's Manual. These numbers are located on the lower right side 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.

**What is ETS?**

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 damper. Some radiant heat will be given off 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 dampering system. When the room thermostat senses a need for heat, the heater's damper will open. Heat is allowed to be extracted from the ceramic brick core to maintain a constant, comfortable, room temperature.

## 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
<b>Automatic Charge Control</b>	Method of heat storage regulation where a sensor monitors outdoor temperature to automatically regulate the brick core charge level.
<b>Brick Core Charge Level</b>	The amount of heat that is stored in the heater's brick core.
<b>Charge Period</b>	Off-peak time in which the heater is allowed to store heat in its brick core.
<b>Control Panel</b>	Contains the buttons to adjust and the display to indicate heater functions. Located on the front of the heater in the upper right corner.
<b>Control Period</b>	On-peak time in which the heater is not allowed to store heat in its brick core.
<b>Data</b>	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.
<b>Edit Mode</b>	Process of changing or viewing the data in a microprocessor location. This is accomplished with the use of the <b>(M)</b> (mode) button, the <b>(↑)</b> (up arrow) button, and the <b>(↓)</b> (down arrow) button.
<b>Location (Function)</b>	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.
<b>Manual Charge Control</b>	Method of brick core charge regulation where the owner must periodically adjust the brick core temperature during the heating season in accordance with outdoor temperature.
<b>Microprocessor</b>	Device on the circuit board of the heater which stores and processes the data information and controls the operation of the heater.
<b>Off-peak</b>	Those times during the day or night when the power company may charge a lower rate for electricity and allows uncontrolled usage. (Heater is allowed to charge or store heat in its brick core during this time.)
<b>On-peak</b>	Those times during the day or night when the power company may charge a higher rate for electricity or controls the usage to certain appliances. (Heater is not allowed to charge or store heat in its brick core during this time.)
<b>Outdoor Sensor</b>	Device that senses outdoor air temperatures and communicates this information to the heater for automatic brick core charge regulation.
<b>Room Temperature Set Point (Room Setting)</b>	The targeted room temperature at which the heater is to maintain. If the room thermostat senses a temperature below this point, the heater's damper will open and allow heat to flow from the brick core.
<b>Storage Level Set Point (Storage Setting)</b>	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.

## Safety Precautions

1. DO NOT place anything on top of the room heating unit.
2. DO NOT energize the heater while disassembled or without ceramic heat storage bricks in place.
3. 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.
4. Be sure the minimum clearance requirements specified in this manual are never violated .

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

5. DO NOT allow objects to obstruct the flow of room air through the bottom air intake grill of the heater..
6. DO NOT stick any objects through the air discharge or air intake grills.
7. DO NOT allow objects to fall into the grill openings.
8. Disconnect power to the electrical supply circuit before servicing.
9. 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.
10. This manual must remain with the room heating unit.

## Built-in Safety Devices

TABLE 1

DEVICE NAME	FUNCTION	LOCATION ON HEATER
Upper Limit Switch	Monitors temperatures in the upper inner section of the heater. If abnormal temperatures are sensed in this area, this switch will turn the heater off. This switch will self reset after temperatures return to a normal range.	In upper rear of cabinet
Brick Core Limit Switch	Monitors the core temperature in the heater. If maximum core temperature is exceeded, this switch will turn the heater off. This switch will self reset after core temperature returns to a normal range.	In the electrical compartment
Discharge Air Limit Switches	Monitors the temperature in the discharge grill area of the heater. If normal operating temperature is exceeded, these switches will turn the heater off. These are fused switches which can't be reset.	Inside the Air Discharge Grill
Electronic Damper Control	Monitors discharge air temperature and regulates the discharge air damper accordingly. If normal operating discharge temperatures are exceeded, this control will close the discharge air damper.	Main control panel (Sensors are located in the air discharge area of heater)

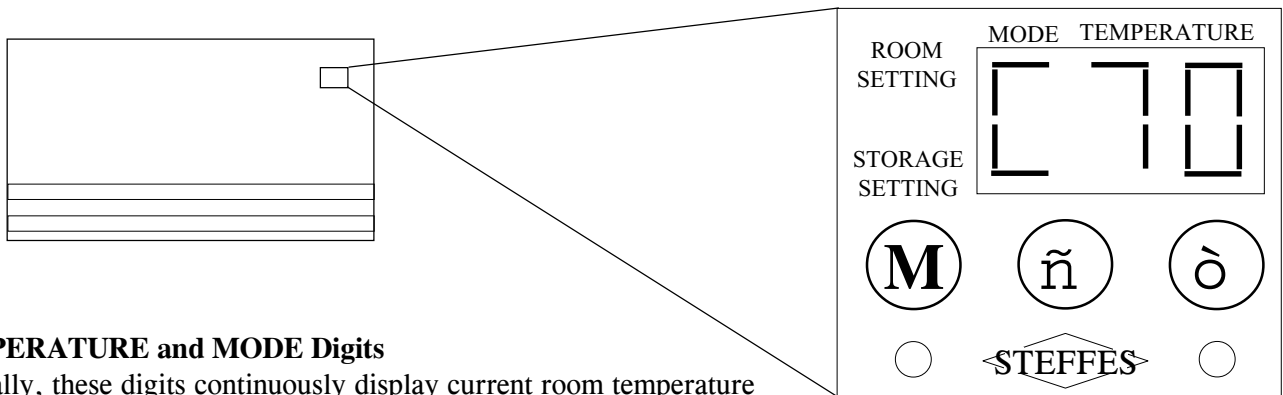
As with most heating systems, air borne particles in the room may be drawn into the heating system and oxidized. As these air borne particles are expelled back into the room, they may accumulate on the heater or other surfaces. Over time, these particles may appear as a black residue, commonly referred 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 build up, 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 ETS recommends using "Soft Scrub with Bleach" brand cleanser or its equal.

Regularly vacuum around all sides of the heater. No additional routine maintenance is required.

## Describing The Heater's Display Panel

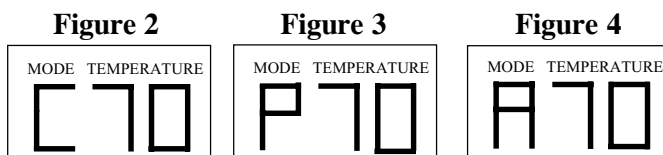
All operational functions of the heater are stored in the heater's microprocessor. These operational functions are factory preset; however, they can be adjusted by the user or installer. All operational functions are accessed through the heater's control panel. Typically, the user will only need to use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



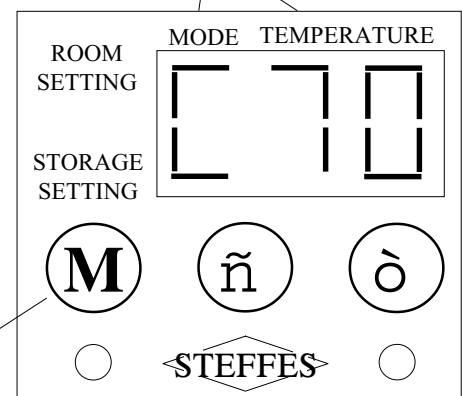
### TEMPERATURE and MODE Digits

Typically, these digits continuously display current room temperature and one of the following brick core operating modes:

- 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 1**  
**Heater Control Panel**



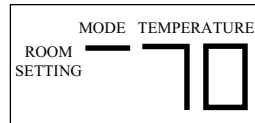
### **(M)** Mode (EDIT) Button

Activates the editing process for changing the operating information of the heater. **PLEASE USE CAUTION WHEN EDITING THE INFORMATION IN THE HEATER.**

## 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).

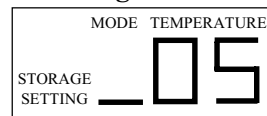
Figure 5



## 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

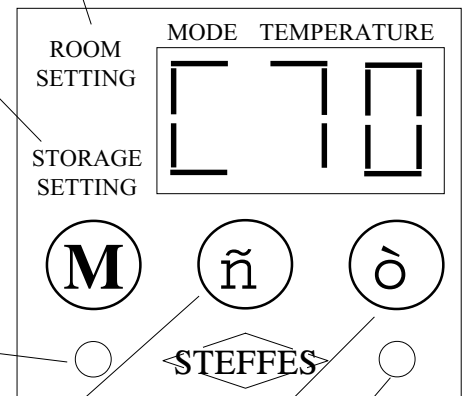
Increases room temperature set point. It is also used to scroll upward when viewing or adjusting the heater's operational functions.

## ⤵ 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.





## 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  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 adjustment.

## 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.

### Setting the Heater to "OFF" and turning it back "ON" when 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.

## Setting the Heater to "OFF" and turning it back "ON" when 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

The room heating unit was designed to be mounted in one of two places: on the floor or up on the wall. If installing on the floor, normally, standard flooring systems with any type of covering, i.e. wood floor, carpet, linoleum, will be sufficient; but, heater weight must be considered. If in doubt, consult a building contractor or an architect. (See Table 2 for weight and physical dimensions of room heating unit being installed.) If installing the heater at a height above the floor, a special wall mounting bracket must be used. This wall mounting kit does not come standard with the heater and must be ordered special. (Order item #1190036.)

### **F** IMPORTANT: The heater must be securely attached to wall studs.

Since the intake grill for the room air is located at the bottom of the heater, caution should be exercised when installing the heater on extremely thick carpet. Any contact with the intake grill could block the air passage through the brick core and inhibit the heating capabilities of the room unit.

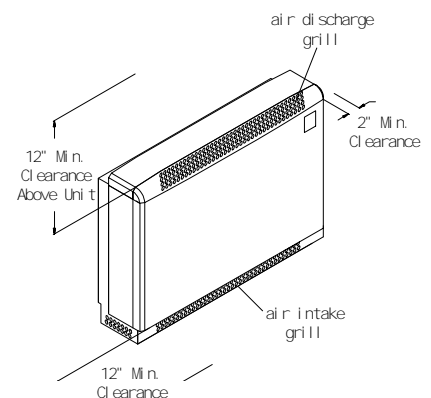
Avoid installing the heater near sources of extreme heat or cold so the built-in room temperature sensor can sample proper room air temperature.

## 2 CLEARANCE REQUIREMENTS

Allow a minimum of 2 inches of clearance from the sides of the heater and a minimum of 12 inches from the top of the heater. There is no back clearance as the heater's back panel surface mounts to the wall. (See Figure 7.)

If enclosing the room heating unit in a wooden cabinet or recessing it into a wall, allow 2 inches clearance on sides and 12 inches on top. Do not enclose or otherwise obstruct access to the heater's front panel and the air intake and discharge grills. Objects such as curtains, furniture, or bed covers must be kept a minimum of 4 inches from all room heating unit surfaces and 12 inches from the grills.

FIGURE 7



**If there is less than a 12" 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 knockouts for installation of the electrical wire. This wiring can be installed with flexible conduit or by installing the electrical cable directly into the heater. If installing electrical cable directly into the heater, be sure this cable is protected and not prone to physical damage.

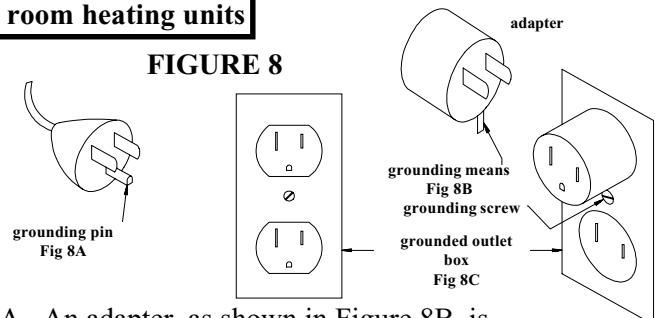
Direct wired heaters can only be connected with one branch circuit. Conductors used for the connection of the heater must be rated for a minimum of 75°C. To determine the correct wire size for the heating unit being installed, refer to the Unit Identification Label located on the right side of the heater. (See Figure 10. Table 2 will also provide information on conductor sizing.)



**Field wiring entering the heater must be routed so that it will not interfere with the heater's damper control system. Never install Class II (low voltage) wiring or any wiring for that matter in a line voltage area unless it is rated for line voltage.**

### 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 right side panel of the heater to determine correct circuit size. (See Figure 8 for cord and receptacle requirements.)



The room heater's cord has a plug as shown in Figure 8A. An adapter, as shown in Figure 8B, is available for connecting three blade grounding type plugs to two slot receptacles. The green grounding means extending from the adapter must be connected to a permanent ground, such as a properly grounded outlet box as shown in Figure 8C. This adapter 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 charging of the heater is capable of being controlled on-peak via low voltage wiring, a wireless power line carrier signal, or with a time clock. Since the heater is capable of being fed with only one line voltage branch circuit, line voltage control of the heater's charging is not possible. 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 of the heater to be included with the shipment of the heater.

If using low voltage control, all connections to the room heater's control circuit board must be routed through the low voltage raceway using the factory installed wiring. Class II (low voltage) wiring should never enter the line voltage compartment of this room heating unit. (See Figures 13 and 14.)



**Never install any wiring in a line voltage area unless it is rated for line voltage.**

If a Power Line Carrier Transmitter is being used for control of the room heating unit, low voltage connections to the heater are not necessary. Installation instructions for this method of control are provided with the 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 wires. An installation instruction sheet is included with the time clock. Please refer to these instructions for installation of this device inside the heater.

## 4 ATTACHING THE HEATER TO THE WALL

For cross reference to number coded components, refer to the Exploded View Diagram (Figure 15) and the Heater's Parts List.

- Step 1** Remove screws at the lower edge of the painted front panel (12). Caution should be taken to assure that the screws are removed without scratching the painted surfaces.
- Step 2** Pull the lower edge of the front panel forward and unhook it from the top panel (1). Carefully set the front panel aside.
- Step 3** Remove the galvanized front panel (18) by removing the screws that attach it to the heater.
- Step 4** With the heater placed in its desired location, mark the wall through the two mounting holes in the painted back panel (26). The mounting holes that are chosen **MUST** correspond to wall studs.
- Step 5** Move the heater to the side. Drill 3/16" holes into the studs where the wall is marked and move the heater back into place.
- Step 6** Located in the lower right side of the heater is a package containing hardware to mount the heater to the wall. Using a 7/16" socket and a long extension use the lag bolts (46) to attach the heater to the wall. Proceed to the Brick Loading section of this manual.

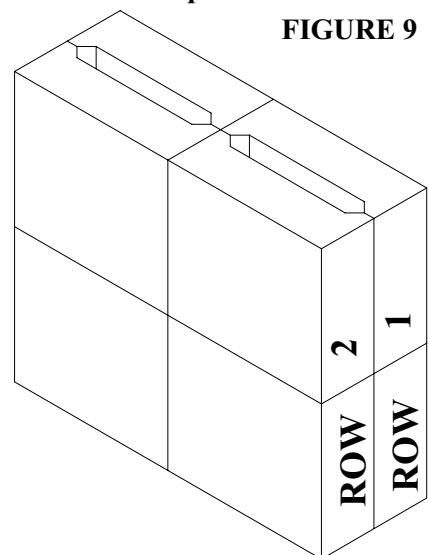
**The lag bolts must attach to wood wall studs. (If the wall is not a standard wood studded structure, alternate fasteners must be used to securely attach the wall bracket.) If the heater is being installed at a height above the floor, a special wall mounting bracket must also be used in addition to the lag bolts. This wall mounting kit does not come standard with the heater and must be ordered special. (Order item #1190036.)**

## 5 BRICK LOADING

For cross reference to number coded components, see the Exploded View Diagram (Figure 15) and the Heater's Parts List. Refer to Table 3 for the number of bricks required for each heater model.

**F IMPORTANT:** The heater must be securely mounted to the wall prior to brick loading.

- Step 1** To catch brick debris, to protect the flooring, and for easy clean-up of the installation, place the room unit's shipping box in front of the heater before loading the brick.
- Step 2** To facilitate loading brick row 1, pull the heating element up and lay it down so it hangs out the front of the heater (leave the wires attached).
- Step 3** Install brick row 1 with the indented side of the brick facing the front. (See Figure 9.)
- Step 4** Adjust the heating element so that it is in its original vertical position.
- Step 5** Install brick row 2 with the indented side of the brick facing the back of the heater. (See Figure 9.)



**Install bricks carefully to avoid damage to the base insulation panels (39, 40, and 41) and to the insulation (37) on the back side of the brick cavity.**

- Step 6** Reassemble the heater except for the painted front panel. Proceed to Setting the Method of Brick Core Charge Control section of this manual.

## **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.)

### **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 1000 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 existing power line in the home or building. The heater's built-in receiver will pick up the signals being transmitted through the power lines 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.

**If using a PLC signal for transmitting outdoor temperature information, Dip Switch #6 inside the heater on its control board must be in the "OFF" position. (Refer to the Typical Control Wiring Diagrams section in this manual 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.)

**With a direct wired outdoor sensor, Dip Switch #6 inside the heater on its control 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 **(M)** 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**

All 1000 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 and is available from the factory in three different configurations whereby one, two, or three heaters can be connected to one sensor. The number of heaters to be controlled by one sensor must be specified at the time of order of the sensor. Current room temperature is displayed on the heater's face plate whether the built-in sensor or remote sensor is being used. 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 not shipped with the heater but may be obtained from the distributor or factory (with power company consent) and should only be made available to installing electrical contractors or to power company personnel.

## 9 INSTALLER'S FINAL CHECKOUT PROCEDURE

1. After the brick is loaded, be sure the heater is de-energized. Place the main circuit board (#43) 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 (#15).
2. Inspect all field installed electrical connections to ensure they are tight. 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.
3. Check that all wiring is routed correctly. The field installed wiring in the heater's electrical compartment must not be placed near the damper actuator (#11) or its linkage (#10).

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

4. Check the damper system to make certain the damper (#9) at the top of the brick core cavity sets down completely over the openings so that a tight seal is achieved. This is critical for optimum performance of the heater.
5. Check the settings of the dip switches on the back of the heater's control circuit board (#43). In applications where the heater is being controlled by 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 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.)

**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 (M) 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 adjustment is complete.**

- \_\_\_ 6. Energize the heater. Set the heater to the charge mode and adjust the room temperature set point above the actual room temperature to initiate a heat call. With a clamp-on amp meter, check for proper amperage draw on the charging circuit. This is done at the L1 terminal block position (#14). Refer to the Unit Identification Label on the lower right side of the heater to determine heater voltage and input wattage of the heater being installed. Use the Charging Circuit Amperage Draw table below for reference to the correct amperage for the specific heater being installed.

INPUT WATTAGE	VOLTAGE	AMP DRAW
1.32	120	11.0
1.8	240	7.5
2.7	240	11.25

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


- \_\_\_ 7. Make certain all fuses and/or circuit breakers are labeled in the distribution panel.
- \_\_\_ 8. Return the main circuit board (#43) to its original position and install the heater's painted front panel (#12). 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.
- \_\_\_ 9. 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.



## ① ROOM HEATING UNIT IDENTIFICATION LABEL

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

FIGURE 10

<b>Steffes Corporation, Dickinson, ND</b>		VAC	Watts	Electric Air Heater
Manufactured in North America				
Model	Charge Crct #1			 <b>LISTED</b> <b>3P23</b>
S/N	Charge Crct #2			
Options	Fan/Cntrl Crct			
U.S. Patent #5.042.081	Temp Cntrl Crct			

## ② FIELD CONNECTION WIRE AND CIRCUIT BREAKER SIZING GUIDE

TABLE 3

WIRE SIZE	MAXIMUM kW			CIRCUIT BREAKER SIZE (240V Only)
	240VAC	277VAC	208VAC	
#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

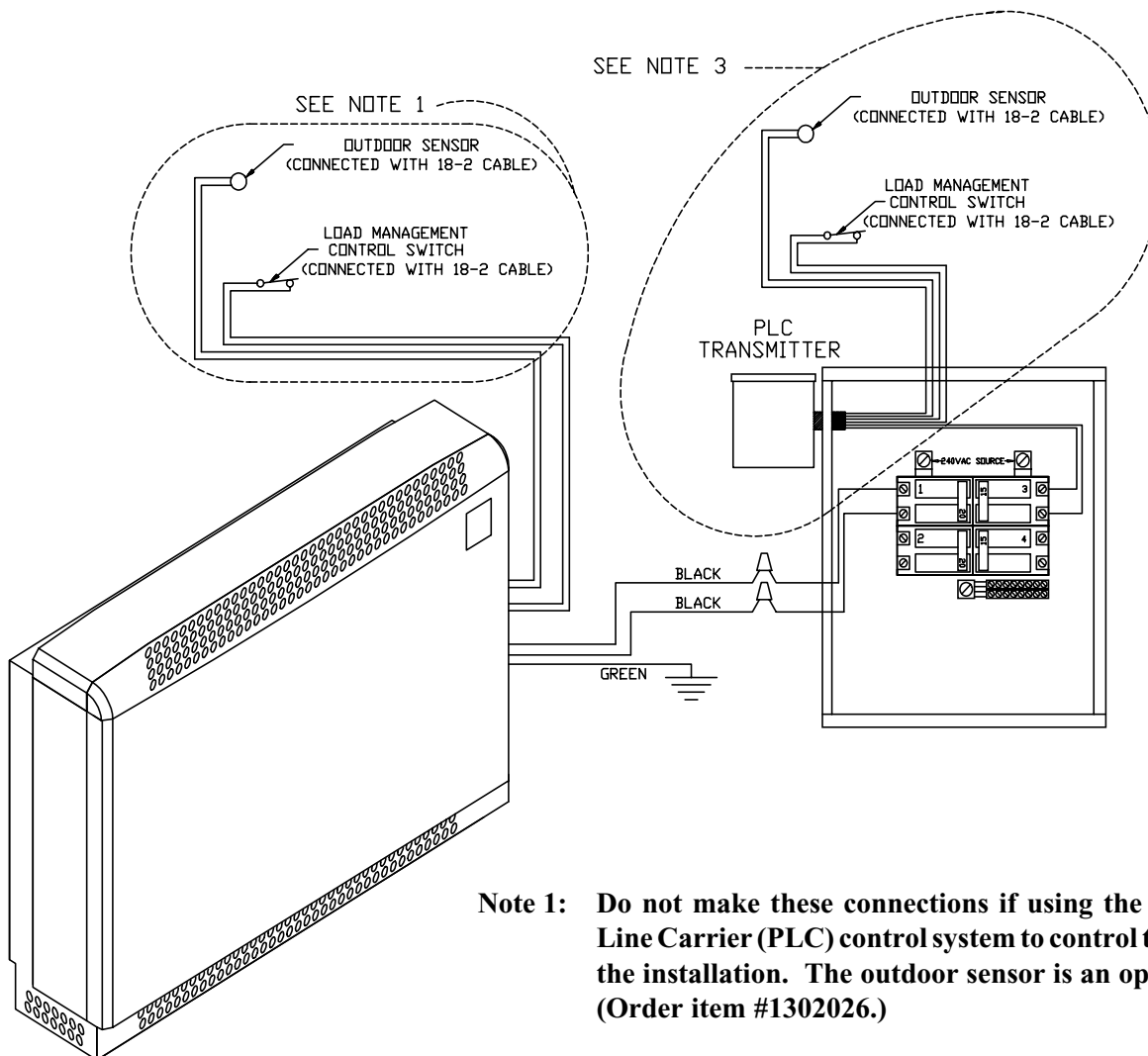
Use copper wire rated at 75°C minimum only.

**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.

## 4 TYPICAL SYSTEM WIRING DIAGRAM

Connections shown are for 230 VAC heaters. Refer to the Unit Identification Label on the lower right side of room heating unit for the heating element voltage of your heater.

FIGURE 11



**Note 1:** 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.)

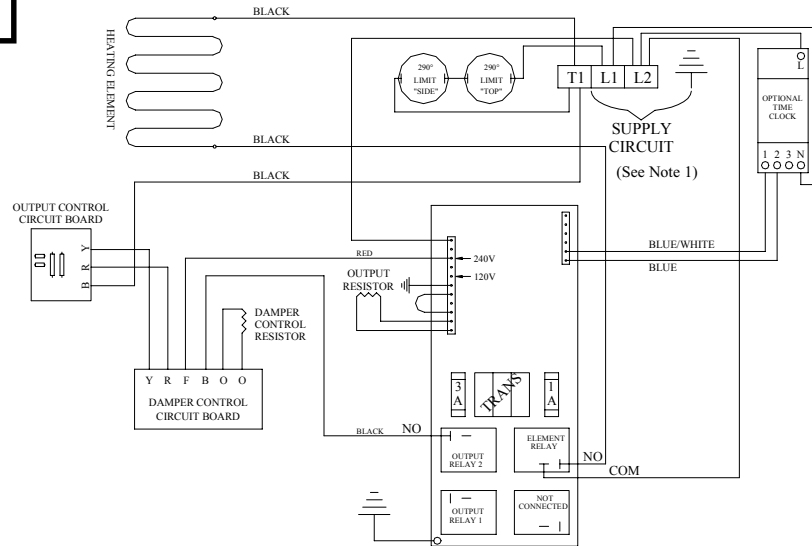
**Note 2:** The Steffes Power Line Carrier (PLC) system is an optional heater control method. PLC control is available with the use of the Steffes PLC Transmitter or the Steffes Comfort Control Relay Panel (CCRP). If using the PLC Transmitter and installing it outdoors, an outdoor sensor for automatic 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 LINE VOLTAGE WIRING DIAGRAM

Connections shown are for 230 VAC heaters. Refer to the Unit Identification Label on the lower right side of room heating unit for the heating element voltage of your heater.

**Models: 1002 and 1003**

FIGURE 12



**Note 1:** On 120V systems, the L2 terminal block position **MUST** always be the ungrounded "HOT" conductor.

## 6 TYPICAL CONTROL WIRING INFORMATION AND DIAGRAMS

The brick core charging of the 1000 series room heating unit is capable of being controlled by low voltage wiring, by a time clock or WIRELESS with the use of the Steffes Power Line Carrier (PLC) control system.

If using the wireless method, only one PLC system is needed in an installation; and, it can be mounted indoor or outdoor. It will transmit the load management control switch signal through the entire power line system in the home or building. In addition to controlling the heater, it will transmit outdoor temperature information for automatic brick core charging. An installation procedure manual will accompany the PLC control system.

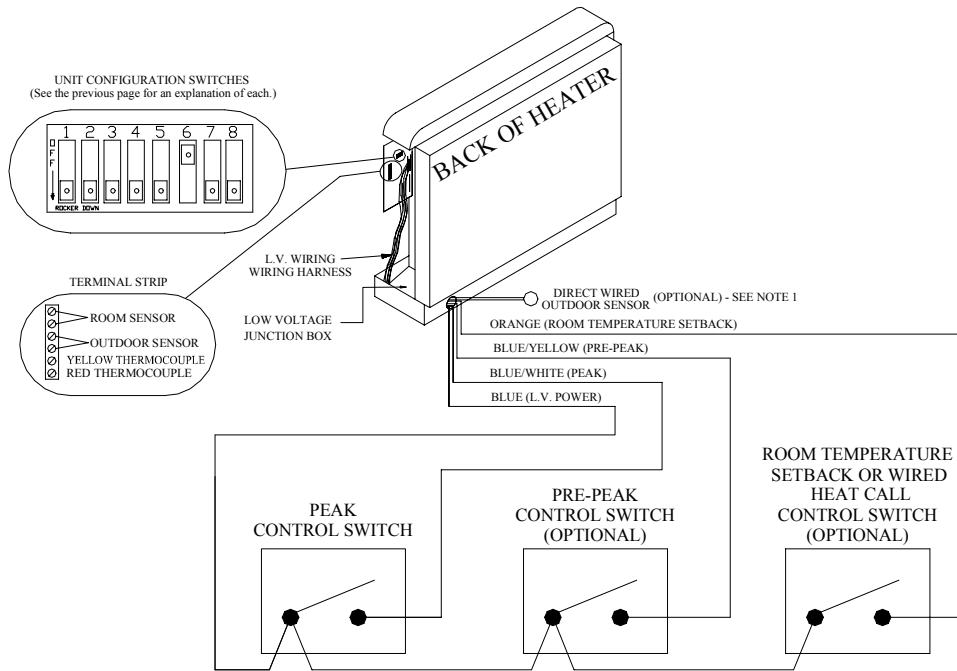
Depending on which method of heating element control is being used, the unit configuration dip switches will need to be set accordingly. (See Figure 13 for location of these dip switches in the heater.) The function of each dip switch is as follows:

- 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.)

**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.**

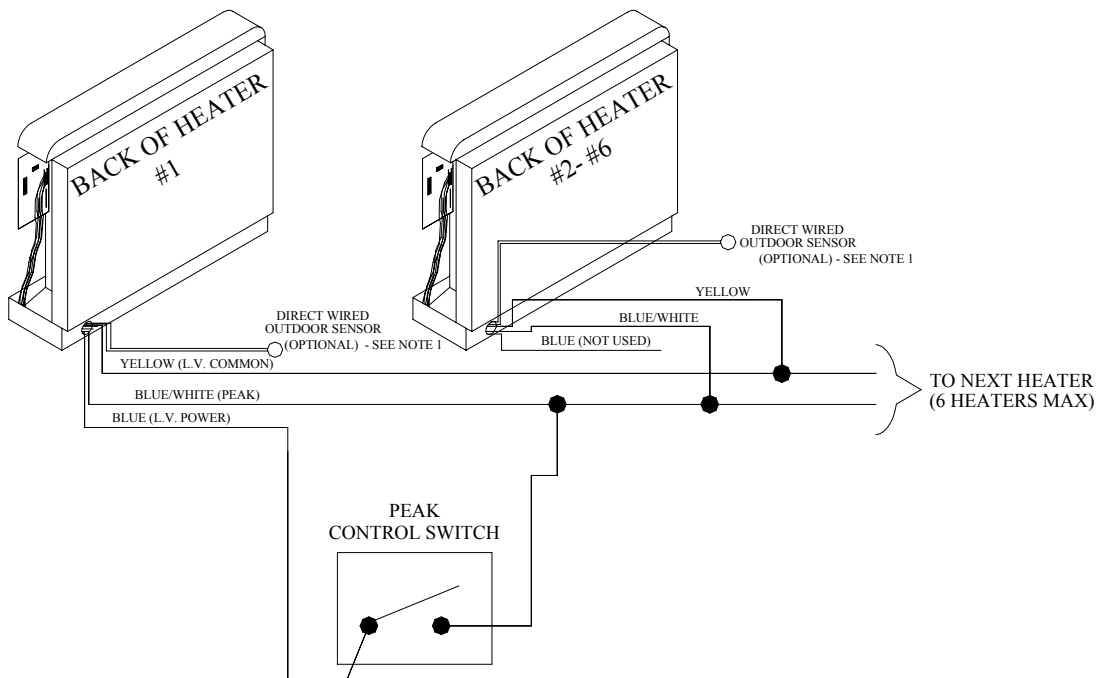
## SINGLE UNIT

FIGURE 13



## MULTIPLE UNITS

FIGURE 14



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

TABLE 3

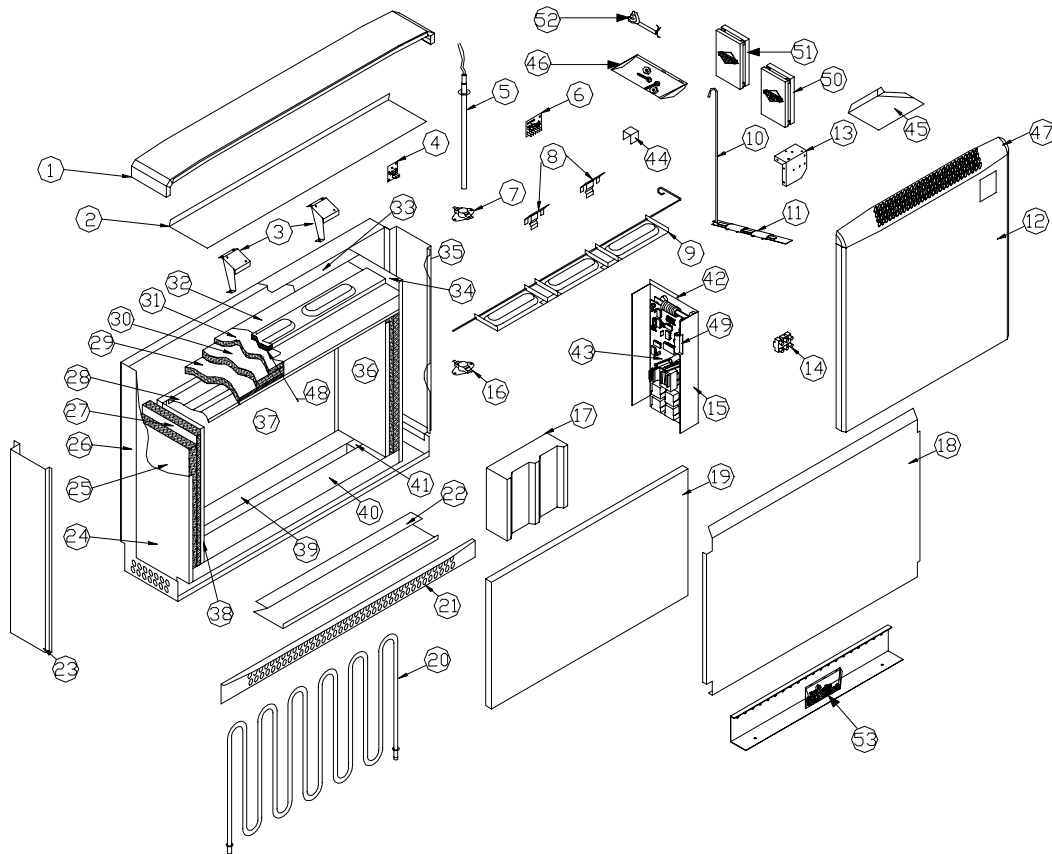
Models	Plug-in	Direct-wired	
	1002	1002	1003
Length - inches	27.3	27.3	35.3
Height - inches	25.1	25.1	25.1
Depth - inches	8.4	8.4	8.4
Number of Bricks	8	8	12
Number of Brick Boxes	2	2	3
Weight of Heater - lbs	62	62	78
Weight of Bricks - lbs	128	128	192
Installed Weight - lbs	190	190	270
*Element Input - Watts	1320	1800	2700
*Element Voltage	120	240 (standard) 208 & 277 opt	240 (standard) 208 & 277 opt
Storage Capacity			
kWh	8.5	8.5	12.75
BTU	29002	29002	43503

\* Refer to Unit Identification Label on lower right side of room heating unit for data specific to your heater. (See Figure 10.)

## Exploded View Heater Diagram

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

FIGURE 15



# Heater Parts List

(Note: When ordering replacement parts, please include unit model number and serial number.)

DWG REF NO.	DESCRIPTION	1002 (120V PLUG-IN) ITEM #	1002 ITEM #	1003 ITEM #
1	Painted Panel, Top	5944112	5944112	5944110
2	Heat Deflector, Top	5944047	5944047	5944045
3	Output Circuit Board Mount	5944090	5944090	5944090
4	Output Temperature Circuit Board	1041290	1041290	1041290
5	Core Thermocouple Sensor Assembly	1043014	1043014	1043014
6	Damper Control Circuit Board	1159044	1159044	1159044
7	Upper Limit Switch (290° F)	1012019	1012019	1012019
8	Damper Support	5944085	5944085	5944085
9	Damper Assembly	1043030	1043030	1043032
10	Damper Linkage	5944075	5944075	5944075
11	Damper Actuator Assembly	1043008	1043009	1043009
12	Painted Panel, Front	1040370	1040370	1040372
13	Terminal Block Mount	5944095	5944095	5944095
14	Terminal Block	1016017	1016017	1016017
15	Main Control Circuit Board Mount	5944100	5944100	5944100
16	Brick Core Limit Switch (290° F)	1012019	1012019	1012019
17	Brick	5903015	5903015	5903015
18	Galvanized Panel, Front	5944012	5944012	5944010
19	Insulation Panel, Front	1053030	1053030	1053032
20	Heating Element	1014110	1014120	1014130
21	Air Intake Grill	5944127	5944127	5944125
22	Heat Deflector, Bottom	5944052	5944052	5944050
23	Painted Panel, Left	5944120	5944120	5944120
24	Galvanized Panel, Left	5944000	5944000	5944000
25	Blanket Insulation, Side (Outer)	1050110	1050110	1050110
26	Painted Panel, Back	5944017	5944017	5944015
27	Blanket Insulation, Side (Inner)	1050111	1050111	1050111
28	Aluminized Panel, Top (Inner)	5944042	5944042	5944040
29	1" Blanket Insulation, Top (Lower)	1050100	1050100	1050101
30	1" Blanket Insulation, Top (Upper)	1050102	1050102	1050103
31	1/2" Blanket Insulation, Top (Lower)	1050104	1050104	1050105
32	Aluminized Panel, Top (Outer)	5944032	5944032	5944030
33	Heat Deflector, Base (Back)	5944037	5944037	5944035
34	Galvanized Panel, Right	5944005	5944005	5944005
35	Painted Panel, Right	5944115	5944115	5944115
36	Aluminized Panel, Right	5944055	5944055	5944055
37	Insulation Panel, Back	1053030	1053030	1053032
38	Aluminized Panel, Left	5944060	5944060	5944060
39	Brick Support Insulation, Back	1052050	1052050	N/A
"	Brick Support Insulation, Right Back	N/A	N/A	1052051
"	Brick Support Insulation, Left Back	N/A	N/A	1052061
40	Brick Support Insulation, Front	1052052	1052052	N/A
"	Brick Support Insulation, Right Front	N/A	N/A	1052053
"	Brick Support Insulation, Left Front	N/A	N/A	1052063
41	Brick Support Insulation, Right Side	1052054	1052054	1052054
"	Brick Support Insulation, Left Side	1052064	1052064	1052064
42	Face Plate	1159032	1159032	1159032
43	Main Control Circuit Board Assembly	1043016	1043016	1043016
44	Element Saddle	5944070	5944070	5944070
45	Low Voltage Raceway	5944135	5944135	5944135
46	Wall Mounting Hardware Kit	1190034	1190034	1190034
47	Air Discharge Grill	1040370	1040370	1040372
48	1/2" Blanket Insulation, Top (Upper)	1050106	1050106	1050107

(Note: When ordering replacement parts, please include unit model number and serial number.)

DWG REF NO.	DESCRIPTION	1002		
		(120V PLUG-IN) ITEM #	1002 ITEM #	1003 ITEM #
49.	Damper Voltage Dropping Resistor	1017012	1017018	1017017
50.	Remote Room Temperature Sensor, Optional	1302024	1302024	1302024
51.	Outdoor Temperature Sensor, Optional	1302026	1302026	1302026
52.	Cord Connect	1015000	N/A	N/A
53.	Wall Hanging Bracket, Optional	1190036	1190036	1190036

## Advanced Heater Operation



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.

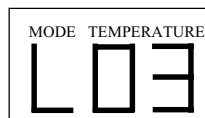
The data for the heaters operating functions are stored in specific locations in the heater's microprocessor and can be accessed through the control panel. All functions should be adjusted by the installer for the application at the time of the installation. The only adjustment the user should have to 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 16.)

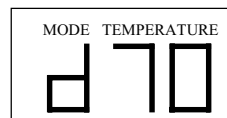
d = Indicates the specific data that is stored in a location. This data determines how the heater will function. (See Figure 17.)

Figure 16



In this example, you are in function location 3.

Figure 17



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 **(f)** 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.

**Table 4**

<u>Fahrenheit</u>	<u>Celsius</u>	<u>Fahrenheit</u>	<u>Celsius</u>	<u>Fahrenheit</u>	<u>Celsius</u>
-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 4, 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

**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)

**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)

**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) - "NOT OCCUPIED" Room Temperature Set Back**

This location indicates the number of degrees (°F) the room temperature set point will be reduced if a "NOT OCCUPIED" signal is received by the room heating unit. L06 is factory preset at d00.

**Data Value Range:** d00 to d65

**This location should be preset by the installer during the installation procedure if the "NOT OCCUPIED" 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

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

**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 specifically for each heater at the factory.

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

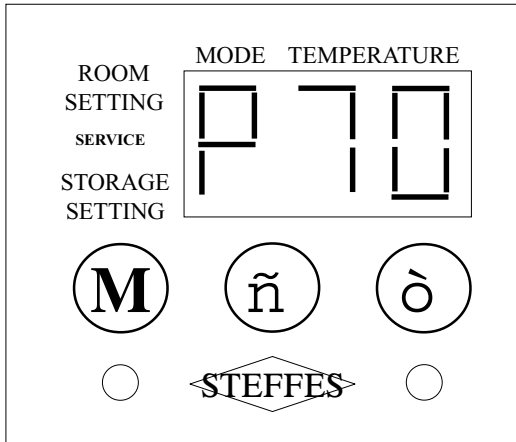
**If you are entering a negative data value into a location, the face plate will display a "-" (minus sign) rather than a "d" while in the edit mode.**

## **4** **EXPLAINING THE 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 18). 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 19.)

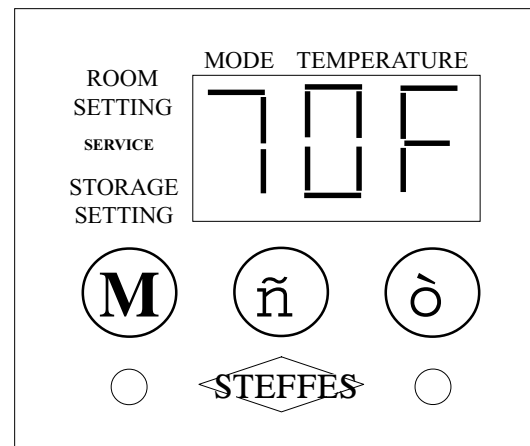
**These options can be preset to owner preference during the installation procedure when the heater operational functions are being set. The installing electrical contractor or power company personnel will have more information on how to change these functions in the heater.**

Figure 18



Room Temperature and Brick Core Operating Mode Peak Displayed

Figure 19



Room Temperature and Fahrenheit Displayed

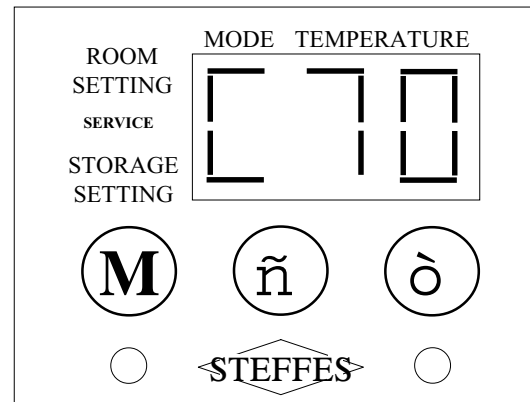
### 1. Charge Mode (Off-Peak): See Figure 20

- 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 damper opens 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 damper will open and the heating elements will come on. Heat will be released to the area until the heat call has been satisfied.

### 2. Peak Mode (On-Peak): See Figure 21

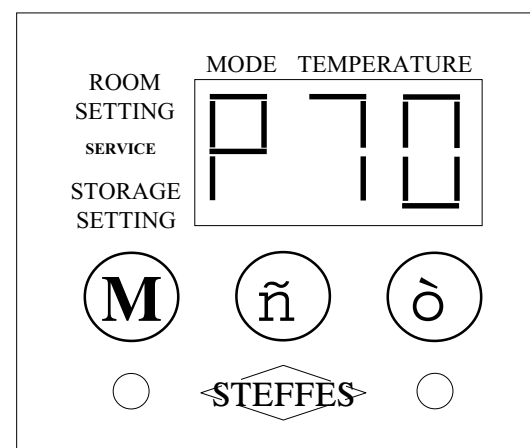
- MODE digit displays a "P".
- TEMPERATURE digits display actual room temperature.
- During this mode, the heater is not allowed to store heat in the bricks. The heating elements will remain off for the duration of the on-peak period. (Exception: If the utility company permits the use of the freeze protection and/or comfort override options, some element operation may occur. See below.)
- The damper opens when the room thermostat calls for heat and extracts heat from the brick core to maintain a constant, comfortable room temperature.

FIGURE 20



Control Panel Display

FIGURE 21



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.

**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.**

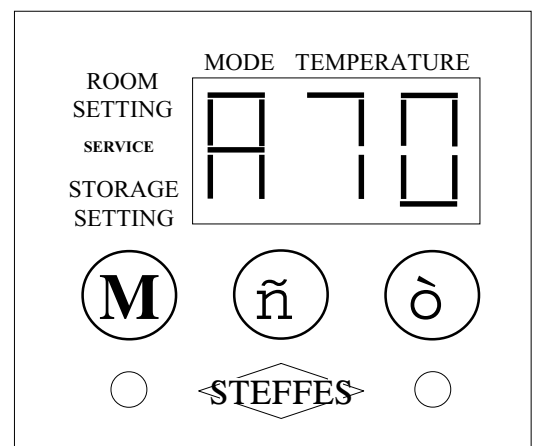
### 3. Anticipated Peak (Pre-Peak) Mode: See Figure 22

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

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 damper opens 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 damper operation during this time. Under some situations, limiting the amount of damper operation or not allowing it to open 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.

FIGURE 22



Control Panel Display





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 part(s) 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.

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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.

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.

