

# USER'S INFORMATION MANUAL

**WARNING: If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.**

- **Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**
  
- **WHAT TO DO IF YOU SMELL GAS**
  - **Do not try to light any appliance.**
  - **Do not touch any electrical switch; do not use any phone in your building.**
  - **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
  - **If you cannot reach your gas supplier, call the fire department.**
  
- **Installation and service must be performed by a qualified installer, service agency or the gas supplier.**

# 1 - GENERAL

## 1.1 GENERAL

This boiler has few user serviceable parts. Maintenance and Service must be completed by qualified agency.

### **WARNING**

Fire, explosion, asphyxiation and electrical shock hazard. Improper maintenance and service could result in death or serious injury. Read this manual and understand all requirements, including use of qualified agency where directed.

## 1.2 BECOME FAMILIAR WITH SYMBOLS IDENTIFYING POTENTIAL HAZARDS.



This is the safety alert symbol. Symbol alerts you to potential personal injury hazards. Obey all safety messages following this symbol to avoid possible injury or death.

### **DANGER**

Indicates a hazardous situation which, if not avoided, WILL result in death or serious injury

### **WARNING**

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

### **CAUTION**

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

### **NOTICE**

Used to address practices not related to personal injury.

Information and specifications outlined in this manual in effect at the time of printing of this manual. Manufacturer reserves the right to discontinue, change specifications or system design at any time without notice and without incurring any obligation, whatsoever.

### **WARNING**

Following service procedures must be performed by qualified service agent. Boiler owner shall not attempt these steps. Failure to do so could result in death or serious injury.

### **WARNING**

Combustion chamber insulation in this product contains ceramic fiber material. Ceramic fibers can be converted to cristobalite in very high temperature applications. The International Agency for Research on Cancer (IARC) has concluded, Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group1). Avoid breathing dust and contact with skin and eyes. Use NIOSH certified dust respirator (N95). This type of respirator is based on the OSHA requirements for cristobalite at the time this document was written. Other types of respirators may be needed depending on the job site conditions. Current NIOSH recommendations can be found on the NIOSH website at <http://www.cdc.gov/niosh/homepage.html>. NIOSH approved respirators, manufacturers, and phone numbers are also listed on this website. Wear long-sleeved, loose fitting clothing, gloves, and eye protection. Apply enough water to the combustion chamber lining to prevent dust. Wash potentially contaminated clothes separately from other clothing. Rinse clothes washer thoroughly.

NIOSH stated First Aid. Eye: Irrigate immediately. Breathing: Fresh air.

Use of CO monitor is manufacturer recommended and may be requirement of local jurisdiction.

### **CAUTION**

#### **WHAT TO DO IF YOU SMELL GAS**

- **Do not try to light any appliance.**
- **Do not touch any electrical switch; do not use any phone in your building.**
- **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

## 1 - GENERAL

FOR YOUR SAFETY READ BEFORE OPERATING



### Hot Water Can Scald!

Water heated to temperature for clothes washing, dish washing and other sanitizing needs can scald and cause permanent injury.

Children, elderly, and infirm or physically handicapped persons are more likely to be permanently injured by hot water. Never leave them unattended in bathtub or shower. Never allow small children to use a hot water tap or draw their own bath.

If anyone using hot water in the building fits the above description, or if state laws or local codes require certain water temperatures at hot water taps, you must take special precautions:

- Use lowest possible temperature setting.
- Install some type of tempering device, such as an automatic mixing valve, at hot water tap or water heater. Automatic mixing valve must be selected and installed according to manufacturer's recommendations and instructions.

Water passing out of drain valves may be extremely hot. To avoid injury:

- Make sure all connections are tight.
- Direct water flow away from any person.

| Water Temperature Setting | 1st Degree Burn Exposure Time For An Adult | 2nd and 3rd Degree Burn Exposure Time For An Adult |
|---------------------------|--|--|
| 120° F                    | 1 minute                                   | 5 minutes  |
| 130° F                    | 5 seconds                                  | 30 seconds   |
| 140° F                    | 2 seconds                                  | 5 seconds  |
| 150° F                    | 1 second                                   | 1.5 seconds  |
| 160° F                    | Instantaneous                              | 0.5 seconds  |

**Note:** Warning for Infants, Children, and the Elderly: Great care must be taken when exposing the aforementioned groups to warm or hot water as they can be badly burned in exposure times less than half of the time for an adult.

### ⚠ WARNING

**If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.**

- This appliance is equipped with an ignition device which automatically lights burner. **Do NOT try to light this burner by hand.**
- Before operating smell all around appliance area for gas. Be sure to smell next to floor because some gas is heavier than air and will settle to the floor.
- **Use only your hand to turn the gas shutoff valve.** Never use tools. If valve will not turn by hand, do not try to repair it, call a qualified service technician. Force or attempted repair may result in fire or explosion.
- **Do not use this appliance if any part has been under water.** Immediately call a qualified service technician to inspect appliance and to replace any part of control system and any gas control which has been under water.
- **Do not block the flow of combustion or ventilation air to boiler.**

### 1.3 WHAT TO DO SHOULD OVERHEATING OCCUR

Do not turn off or disconnect electrical supply to pumps. Shut off gas supply at location external to appliance.

### 1.4 WHAT TO DO IF BOILER OR ANY PART HAS BEEN UNDER WATER

Do not use boiler if any part has been under water. Immediately call a qualified service technician to inspect boiler and to replace any part of control system and any gas control which has been under water.

## 2 - OPERATING INSTRUCTIONS

### FOR YOUR SAFETY READ BEFORE OPERATING

#### **WARNING**

**If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.**

- This appliance is equipped with an ignition device which automatically lights burner. **Do NOT try to light this burner by hand.**
- Before operating smell all around appliance area for gas. Be sure to smell next to floor because some gas is heavier than air and will settle to the floor.
- **Use only your hand to turn the gas shutoff valve.** Never use tools. If valve will not turn by hand, do not try to repair it, call a qualified service technician. Force or attempted repair may result in fire or explosion.
- **Do not use this appliance if any part has been under water.** Immediately call a qualified service technician to inspect appliance and to replace any part of control system and any gas control which has been under water.
- **Do not block the flow of combustion or ventilation air to boiler.**

#### **WARNING**

Fire, explosion, and asphyxiation hazard. Boiler is set for natural gas from the factory. If propane is to be used the gas valve must be adjusted before turning the boiler on. Failure to follow these instructions could result in death or serious injury.

### 2.1 INITIAL START-UP

Heating contractor will perform initial start-up. Heating Contractor will explain the operation of boiler control and system to system operator/owner. Following procedures will be carried out by your contractor prior to initial start-up:

- Check for leaks.
- If pressure relief valve is discharging, contractor will locate source and take corrective measures. Never cap or plug end of pressure relief valve discharge pipe.
- Ensure heating system is at correct water pressure.
- Ensure fresh combustion air supply vents to boiler are open and unobstructed. Do Not obstruct flow of combustion and ventilation air.
- Open main fuel supply valve.
- Activate system - Turn power supply on at breaker and activate system's power switch. Your heating system is now ready for operation.
- **Start-up cycle begins, this cannot be interrupted.** During start-up cycle, display shows following information:  
A short test where all segments of the display are visible.



**Fxx** : Software version

**Pxx** : Parameter version. Version numbers are displayed alternately.

- Air purge cycle is automatically carried out for 3 minutes.

### 2.2 OPERATING INSTRUCTIONS

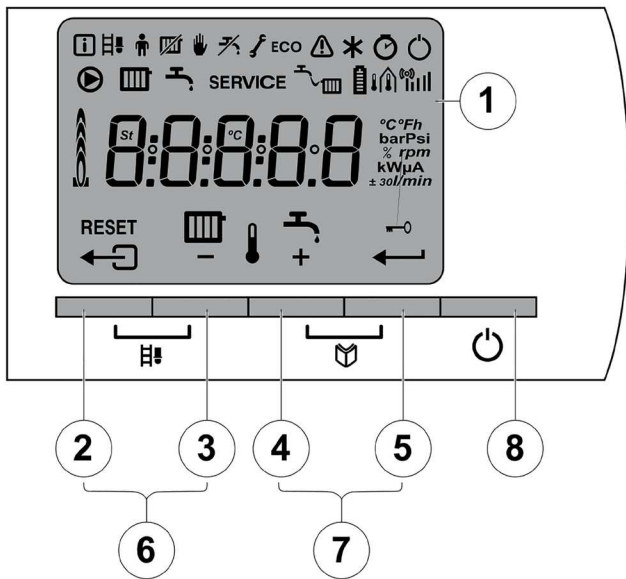
**Stop! Read Safety information above.**









- Set thermostat to lowest setting.
- Turn "**OFF**" all electrical power to appliance.
- This appliance is equipped with an ignition device which automatically lights the burner. **Do not try to light burner by hand!**
- Check all gas connections to the boiler are tight.
- Check condensate trap is completely filled with clean water.
- Check there are no leaks from any water connections.
- Check all electrical connections, including ground connection.
- Check electrical connections to thermostat and other external controls.
- Turn gas shutoff valve clockwise  to closed position. Handle should be perpendicular to gas pipe.
- Wait 5 minutes for any gas to clear. Smell for gas, including near floor. If you smell gas, **STOP!** Follow instructions on this page: "**What To Do If You Smell Gas.**" If you do **not** smell gas, go to next step.
- Turn gas shutoff valve counter clockwise  to the open position. Handle should be parallel to gas pipe.
- Replace front jacket panel.
- Turn "**ON**" electrical power to appliance.
- Set thermostat to desired setting.
- If the appliance will not operate, follow instructions TO TURN OFF GAS TO APPLIANCE and call your service technician or gas supplier.

### 2.3 TO TURN OFF GAS TO APPLIANCE











- Set thermostat to lowest setting.
- Turn "**OFF**" all electric power to appliance if service is to be performed.
- Turn external gas shutoff valve to closed position. Handle should be (90° to gas pipe) perpendicular to gas pipe.









#### 3.1 CONTROL PANEL



|          |  |
|----------|--|
| <b>1</b> | <b>Display</b>   |
| <b>2</b> |  [Escape] or RESET button  |
| <b>3</b> |  Heating Temperature or [-] button   |
| <b>4</b> |  DHW temperature or [+] button   |
| <b>5</b> |  [Enter] or cancel  lock-out button |
| <b>6</b> |  Setup buttons (press the 2 and 3 buttons simultaneously)  |
| <b>7</b> |  [Menu] buttons (press the 4 and 5 buttons simultaneously)   |
| <b>8</b> |  <b>ON/OFF switch</b>  |

#### 3.2 SYMBOLS

|   |  |
|---|--|
|  | <b>Information menu:</b><br>Reading the various current values   |
|  | <b>Chimney-sweeping position:</b> Forced full or part load for CO2 measurement. (For Service Use)                          |
|  | <b>User menu:</b> Parameters at user level can be changed.   |
|  | <b>Heating program deactivated:</b> Heating function is deactivated.   |
|  | <b>Manual mode:</b><br>Boiler is set to manual operation.  |
|  | <b>DHW program deactivated:</b><br>DHW mode is deactivated.  |
|  | <b>Service menu:</b> Parameters at installer level can be changed.   |
| <b>ECO</b>  | <b>Energy-saving mode:</b> Economic mode activated.  |
|  | <b>Fault:</b> Boiler fault indicated.<br>Can be seen from é code and red display. (Contact Trained Service Representative) |
|  | <b>Frost protection:</b><br>Boiler running in frost protection mode.   |
|  | <b>Hour counter menu:</b> Readout of operating hours, number of successful starts and hours on main supply.                |

|   |  |
|---|--|
|  | <b>ON/OFF switch:</b> After 5 lock-outs, boiler must be switched OFF/ON again.   |
|  | <b>Boiler pump:</b> Boiler Pump Operating  |
|  | <b>Heating system function:</b> Access to heating system temperature parameter.  |
|  | <b>DHW function:</b> Access to potable hot water temperature parameter.  |
| <b>SERVICE</b>  | <b>Yellow display with symbols:</b>  + service + A (Maintenance message).<br>(Contact Trained Service Representative) |
|  | <b>Water pressure:</b> Water pressure is too low.<br>(Contact Trained Service Representative)  |
|  | <b>Burner Level:</b> Boiler is running at full or low load.  |
|  | <b>Locking keys:</b> Key lock-out is activated.  |

## 4 - OPERATING SEQUENCE

### 4.1 Normal Operating Sequence

The information menu **i** gives the following status and sub-status information:

| State (St) |                                 | Sub-status (Su) |   |
|------------|---------------------------------|-----------------|---|
| 0          | Rest                            | 0               | Rest  |
| 1          | Boiler starts (Demand for heat) | 1               | Short pre-purge of the fan                                      |
|            |                                 | 2               | Control three-way valve   |
|            |                                 | 3               | Start pump  |
|            |                                 | 4               | sw checks sensor temperatures before the burner starts          |
| 2          | Burner start                    | 10              | Open flue gas damper/external gas valve                         |
|            |                                 | 11              | Increase fan speed  |
|            |                                 | 13              | Pre-purge   |
|            |                                 | 14              | Wait for release signal from RL connection                      |
|            |                                 | 15              | Burner on   |
|            |                                 | 17              | Pre-ignition  |
|            |                                 | 18              | Ignition  |
|            |                                 | 19              | Flame detection   |
|            |                                 | 20              | Intermediate ventilation  |
| 3          | Burner on (heating mode)        | 30              | Temperature control   |
|            |                                 | 31              | Limited temperature control ( $\Delta T$ safety)                |
|            |                                 | 32              | Output controlled by 0-10 v signal                              |
|            |                                 | 33              | Temperature protection gradient level 1 (Modulate down)         |
|            |                                 | 34              | Temperature protection gradient level 2 (low-fire)              |
|            |                                 | 35              | Temperature protection gradient level 3 (Blockage)              |
|            |                                 | 36              | Modulate up for flame control                                   |
|            |                                 | 37              | Temperature stabilization time                                  |
|            |                                 | 38              | Cold start  |
| 4          | Burner on (DHW mode)            | 30              | Temperature control   |
|            |                                 | 31              | Limited temperature control ( $\Delta T$ safety)                |
|            |                                 | 32              | Output controlled   |
|            |                                 | 33              | Temperature protection gradient level 1 (Modulate down)         |
|            |                                 | 34              | Temperature protection gradient level 2 (low-fire)              |
|            |                                 | 35              | Temperature protection gradient level 3 (Blockage)              |
|            |                                 | 36              | Modulate up for flame control                                   |
|            |                                 | 37              | Temperature stabilization time                                  |
|            |                                 | 38              | Cold start  |
| 5          | Burner stop                     | 40              | Burner off  |
|            |                                 | 41              | Post-purge  |
|            |                                 | 42              | Close flue gas damper/external gas valve                        |
|            |                                 | 43              | Recirculation protection (checks to see if gas valve is closed) |
|            |                                 | 44              | Fan Stops   |
| 6          | Boiler stops (End of heat call) | 60              | Pump post circulation   |
|            |                                 | 61              | Pump off  |
|            |                                 | 62              | Control three-way valve   |
|            |                                 | 63              | Short-cycling counter activates                                 |
| 8          | Stop                            | 0               | Wait for burner start   |
|            |                                 | 1               | Short cycling protection function                               |
| 9          | Lock-out                        | xx              | Shutdown codexx   |
| 17         | Deaeration/ air purge           | 0               | Rest  |
|            |                                 | 2               | Control three-way valve   |
|            |                                 | 3               | Start pump  |
|            |                                 | 61              | Pump off  |
|            |                                 | 61              | Control three-way valve   |









## 5 - START UP PROCEDURE

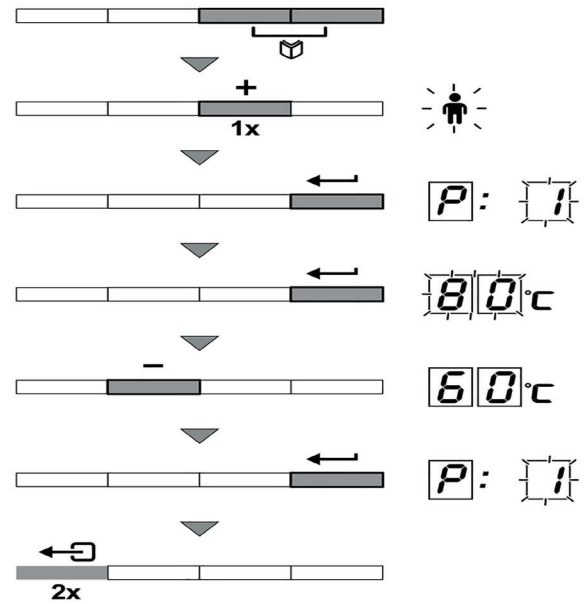
### 5.1 USER LEVEL PARAMETERS

Parameters **P1** to **P8** can be adjusted by end user to meet heating system and DHW comfort needs.

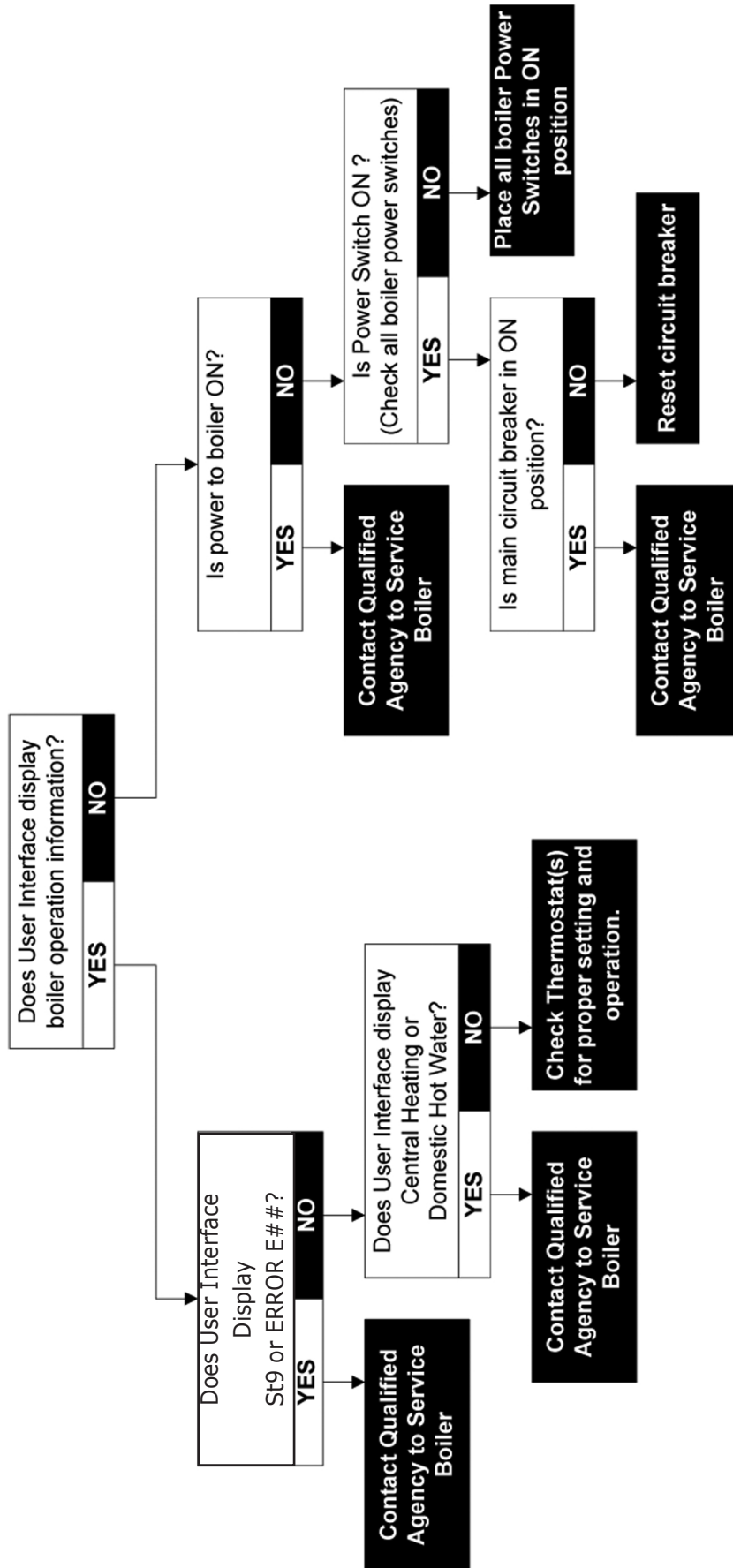
Modification of factory settings may be detrimental to operation of the boiler.

- Press the two Menu buttons  simultaneously and then (+) button until  symbol flashes on the menu bar.
- Select User Menu using  button, (**P1**) button is displayed with "1" flashing.
- Press  button a second time, central heating supply temperature value appears and flashes, e.g. 170°F.
- Change the value by pressing (-) button or (+) button. In this example using (-) to (140°F).
- Confirm the value with  button, (**P1**) is displayed with "1" flashing.
- Press  button 2 times to return to current operating mode.

**FIGURE 5-1 - User Level Parameter Change Sequence**



| Parameter  | Description  | Adjustment Range   | Factory Setting |     |
|--|--|--|-----------------|-----|
|  |  |  | 240             | 380 |
| <b>P1</b>  | Max supply temperature for the CH mode (Set temperature) | 68 to 176°F<br>20 to 80°C  | 176°F/80°C      |     |
| <b>P2</b>  | Max DHW temperature set point                            | 104 to 149°F<br>40 to 65 °C  | 140°F/60°C      |     |
| <b>*P3</b>   | Switch on/off CH/DHW function                            | 0 = Heating off / DHW off<br>1 = Heating on / DHW on<br>2 = Heating on / DHW off<br>3 = Heating off / DHW on | 2               |     |
| <b>*P4</b>   | Pre-heating a DHW plate exchanger                        | 0 = Always on 1 = Always off<br>2 = Controller   | 2               |     |
| <b>*P5</b>   | On/off thermostat anticipator                            | 0 = No<br>1 = Yes  | 0               |     |
| <b>P6</b>  | Type of information on display                           | 0 = Simple<br>1 = Extended<br>2 = Automatic<br>3 = Automatic + Key lock                                      | 1               |     |
| <b>*P7</b>   | Pump post run time CH                                    | 1 to 98 minutes<br>99 minutes = continuous   | 3               |     |
| <b>P8</b>  | Display brightness when backlight is active              | 0 = Low<br>1 = High  | 1               |     |
| <p><b>* Manufacturer Recommends changes to the identified (*) parameters be made by a Qualified Service Representative ONLY.</b></p> |  |  |                 |     |





## 7 - GENERAL MAINTENANCE AND CLEANING

Perform general housekeeping and maintenance as specified below.

### 7.1 CONTINUOUS

- Keep boiler area free from combustible materials, gasoline and other flammable vapors and liquids.
- Keep combustion air and vent terminations (outside building) free from trash, vegetation and other items capable of blocking flow.

### 7.2 MONTHLY

- Inspect combustion air, vent, and condensate drain piping for deterioration, leaks or sagging. Contact qualified agency, as necessary.
- Inspect condensate drain trap inside boiler.
  - Follow instructions TO TURN OFF GAS TO APPLIANCE. See section 2.
  - Inspect condensate drain trap for sediment or blockage. Contact qualified agency if cleaning required.
- Inspect system piping for leaks. Contact qualified agency, as necessary.
- Check air vent(s) for leakage.
- Follow OPERATING INSTRUCTIONS to return to normal operation.

### 7.3 CHECK ACCORDING TO MANUFACTURER'S INSTRUCTIONS

- Safety Relief Valve - Refer to manufacturer's instructions.

### WARNING

Burn and scald hazard. Verify Safety Relief Valve discharge piping run to safe discharge location before conducting maintenance procedure. Contact qualified agency to correct improper piping.

### 7.4 ANNUALLY OR BEGINNING EACH HEATING SEASON

- Contact qualified agency to perform maintenance and cleaning per Installation, Operation and Maintenance manual. Inspection will include examining all flue product carrying areas, vent system, burner and heat exchanger. Will also include filling boiler with water if drained as part of End of Heating Season procedure.

### WARNING

Asphyxiation hazard. Contact qualified agency if condensate trap is not filled with water.

- Condensate trap may require cleaning and refilling.

### 7.5 END OF HEATING SEASON, IF BOILER NOT USED FOR DOMESTIC HOT WATER.

- Follow instructions to TURN OFF GAS TO APPLIANCE. See section 2.
- Contact qualified agency to drain heating system (if system does not use antifreeze) and condensate trap if heating system is exposed to freezing temperatures while out of service.

## Installer Information

|          |        |
|----------|--------|
| Name:    |        |
| Address: |        |
| Phone:   | Email: |





# Installer Information

|          |        |
|----------|--------|
| Name:    |        |
| Address: |        |
| Phone:   | Email: |



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