



SVFTM STAINLESS VERTICAL FIRETUBE

Models 725-1000 Commercial Condensing Gas-Fired Water Boilers

User Manual



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 telephone in your building.
- Immediately call your gas supplier from a neighbor's telephone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.
- Installation & service must be performed by a qualified installer, service technician or the gas supplier.

Read and Use: To do the following: Page(s) Safety warnings and information Learn precautions <u>3-4</u> List of air contaminants to avoid Prevent air contamination <u>5</u> **Operating instructions** Start or shut down the boiler <u>6</u> Identify and locate boiler **Boiler illustrations** <u>7</u> components Utilize the control display Control illustrations and information <u>8-10</u> Maintain the boiler Boiler maintenance schedules <u>11-17</u>

How to Use This Manual

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Section 1 Safety

This section is intended to provide safety information for users.

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Safety Signals	
Please Read Before Proceeding	

Safety Signals

The following defined terms are used throughout this manual to bring attention to the presence of hazards or other important information.

Danger indicates the presence of hazards that will cause severe personal injury, death, or substantial property damage.

Warning indicates the presence of hazards that can cause severe personal injury, death, or substantial property damage.

ACAUTION

Caution indicates the presence of hazards that will or can cause minor personal injury or property damage.

NOTICE

Notice indicates additional information that may be related to property damage, but is not related to personal injury.

IMPORTANT

Important indicates additional information that is important, but is not related to personal injury or property damage.

Please Read Before Proceeding

Adhere to all following guidelines and instructions in this section. Failure to adhere to these guidelines can result in severe personal injury, death, or substantial property damage.

User: Refer to this User Manual as your information source. Installation and service must be performed by a qualified installer, service technician, or gas supplier.

Installer: Refer to the Boiler Manual and all other information shipped with the boiler for installation and service.

Please include the boiler model number, CP number, and serial number when calling or writing about the boiler. The model number can be found on the boiler rating label.

IMPORTANT

Any claims for damage or shortage in shipment must be filed immediately against the transportation company by the consignee.

Boiler Maintenance

- To avoid electric shock, disconnect all electrical supplies to the boiler before performing maintenance.
- □ To avoid severe burns, allow boiler to cool before performing maintenance.
- □ This boiler contains ceramic fiber and fiberglass materials. Refer to the maintenance section of the boiler manual for warnings and information.
- The boiler must be maintained as outlined in this manual, including annual startup and service by a qualified service technician to ensure boiler system reliability.

Please Read Before Proceeding, continued

Safe Boiler Operation

- Do not block flow of combustion or ventilation air to boiler. This boiler is equipped with a control that automatically shuts down the boiler if the air or vent is blocked. Remove easily accessible and removable blockages. If the boiler indicates a manual reset lockout, select <Reset Lockout> on the control display after removing a blockage. If a blockage cannot be removed, have a qualified service technician check the boiler system.
- Do not allow contaminated air to enter the boiler room, or the air inlet pipe if direct vented. See <u>page 5</u> for details.
- Should overheating occur, or gas supply fail to shut off, do not turn off or disconnect electrical supply to pump. Shut off the gas supply at a location external to the appliance.

Boiler Water

- Have the boiler water chemistry checked at least annually by a qualified service technician.
- Do not use petroleum-based cleaning or sealing compounds in the boiler system. Gaskets and seals in the system may be damaged, which can result in substantial property damage.
- Do not use "homemade cures" or "boiler patent medicines." Serious injury or damage may result.
- Continual fresh make-up water will reduce boiler life. Mineral buildup in the heat exchanger reduces heat transfer, overheats the metal, and causes failure. Addition of oxygen carried in by make-up water can cause internal corrosion. Leaks in the boiler or piping must be repaired at once to prevent make-up water.
- Do not add cold water to a hot boiler. Thermal shock can cause the heat exchanger to crack.
- NEVER use automotive or standard glycol antifreeze inn this boiler system, including glycol made for hydronic systems.

Frozen Water Damage

Power outages, unattended residences or buildings, boiler component failures, or other electrical system failures in cold weather could result in frozen plumbing and water damage in a matter of hours. Consult with a boiler contractor or a home security agent to take preventative actions, such as installing a security system that operates during power outages, senses low temperature, and initiates an effective action. Consult with your boiler contractor or a home security agency.

Damage from Water Contact

DO NOT attempt to operate any boiler if any part of the boiler, burner, or controls has been partially or fully sprayed with or submerged under water. The boiler must either be replaced or completely repaired and inspected. The boiler and all components must be in good condition and fully reliable before operation.

If these requirements are not met, operating the boiler will cause fire, explosion, and electrical shock hazards, leading to serious injury, death, or substantial property damage.

Saltwater damage: The immediate effects of saltwater damage are like those of freshwater, with electrical components shorting out and the removal of critical lubricants. However, salt and other contaminants left behind can lead to long term issues due to the conductive and corrosive nature of salt residue. WM Technologies equipment contaminated with saltwater or polluted water will no longer be covered under warranty and should be replaced.

Electrical damage: If any electrical component or wiring has, or is suspected to have come into contact with water, replace the boiler.

SECTION 2 Operation

This section is intended to provide operating instructions and information for users.

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Operating the Boiler

Prevent Combustion Air Contamination

If the boiler combustion air inlet is located in any area likely to cause contamination, or if products which would contaminate the air cannot be removed, you must have the combustion air and vent repiped and terminated to another location. Contaminated combustion air will damage the boiler, and can result in severe personal injury, death, or substantial property damage.

Do not operate an SVF boiler if the combustion air inlet is located in a laundry room or pool facility. These areas will always contain hazardous contaminants.

Pool and laundry products, hobby products, and other common household products often contain fluorine or chlorine compounds. These chemicals can form strong acids when they pass through the boiler. The acid can eat through the boiler wall, causing serious damage. This damage presents a possible threat of flue gas spillage or boiler water leakage into the building.

If contaminating chemicals will be present near the location of the boiler combustion air inlet, have your installer pipe the boiler combustion air and vent to another location per the boiler manual. See Table 1 for a list of products to avoid, and areas where contaminants are likely present.

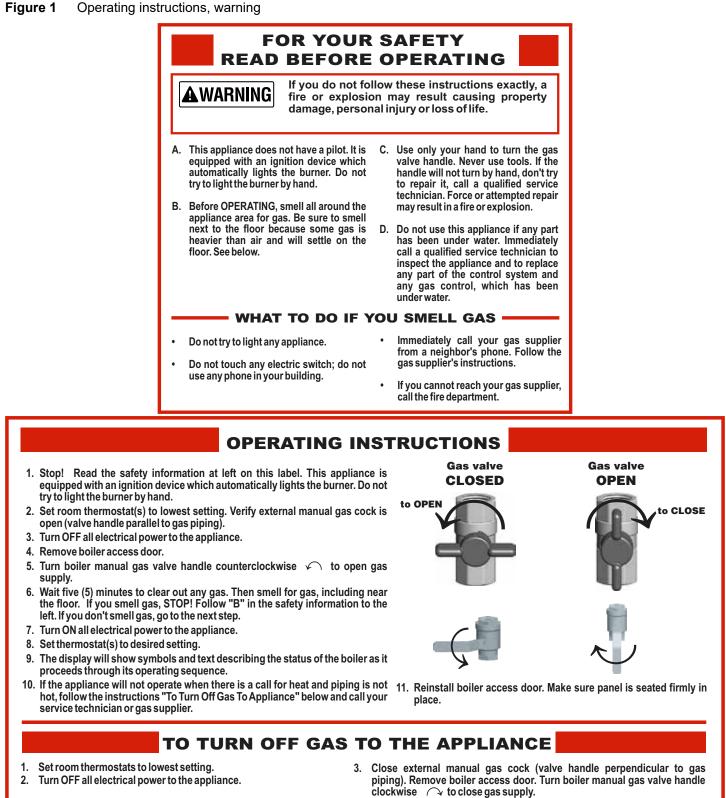
Table 1Corrosive contaminants and sources

Products to avoid
Spray cans containing chloro/fluorocarbons
Permanent wave solutions
Chlorinated waxes and cleaners
Chlorine-based swimming pool chemicals
Calcium chloride used for thawing
Sodium chloride used for water softening
Refrigerant leaks
Paint or varnish removers
Hydrochloric acid and muriatic acid
Cements and glues
Anti-static fabric softeners used in clothes dryers
Chlorine-type bleaches, detergents, and cleaning solvents
Adhesives used to fasten building products and other similar products
Excessive dust and dirt

Operating the Boiler, continued

Boiler Operation

See the warnings and operating instructions below and the figures on page 6 to start and turn off the boiler.

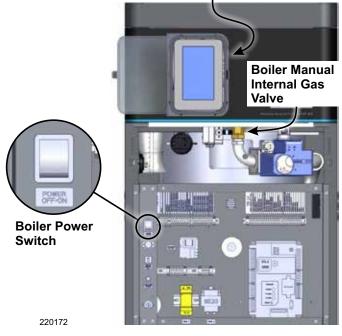


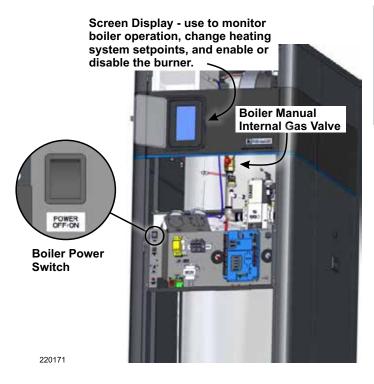
4. Reinstall boiler access door.

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Figure 2 SVF 725/850 power switch, screen display, and internal gas valve

> Screen Display - use to monitor boiler operation, change heating system setpoints, and enable or disable the burner.

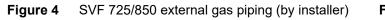




SVF 1000 power switch, screen display, and

internal gas valve

Figure 3



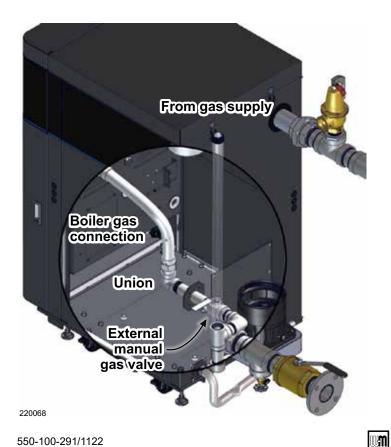
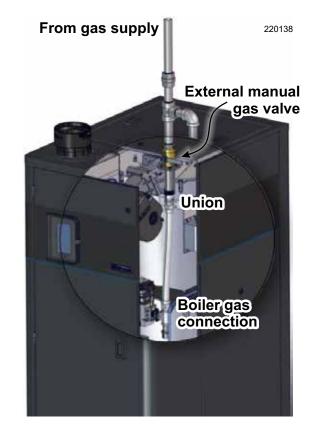


Figure 5 SVF 1000 external gas piping (by installer)



Boiler Control

Controller Startup

Once the boiler is powered on, the NURO[®] controller displays the initial boot followed by the Startup screen. During the initial boot, the NURO controller loads the display software, parameter settings, and confirms communication between components before initializing the user interface startup screen. See Figure 6 for the various screens mentioned in this section.

Once startup is completed, the EULA (End-User License Agreement) screen will appear. Once you agree with the License Agreement, press <Accept>.

IMPORTANT

If the controller encounters any errors during the startup process, the BootLoader screen will appear. Call your qualified service technician for assistance.

Next, the Local Representative screen will appear, which can be used to provide the boiler operator with contact information for the local service representative. This information can be edited through the Local Rep Setup screen (Settings>User Settings).

The Local Representative screen will automatically timeout after 30 seconds, or press <Home> to proceed to the Home screen.

Error Screen

In the event of an error, the "Status Bar" at the top will turn red in color and display the <Press for Information> button, which will access the Error screen. Refer to <u>Figure 7, page 9</u>. Use the Error screen to learn about the error, the status of the boiler at the time of the error, and troubleshooting steps.

Figure 6 Controller startup screens



BootLoader Error Screen

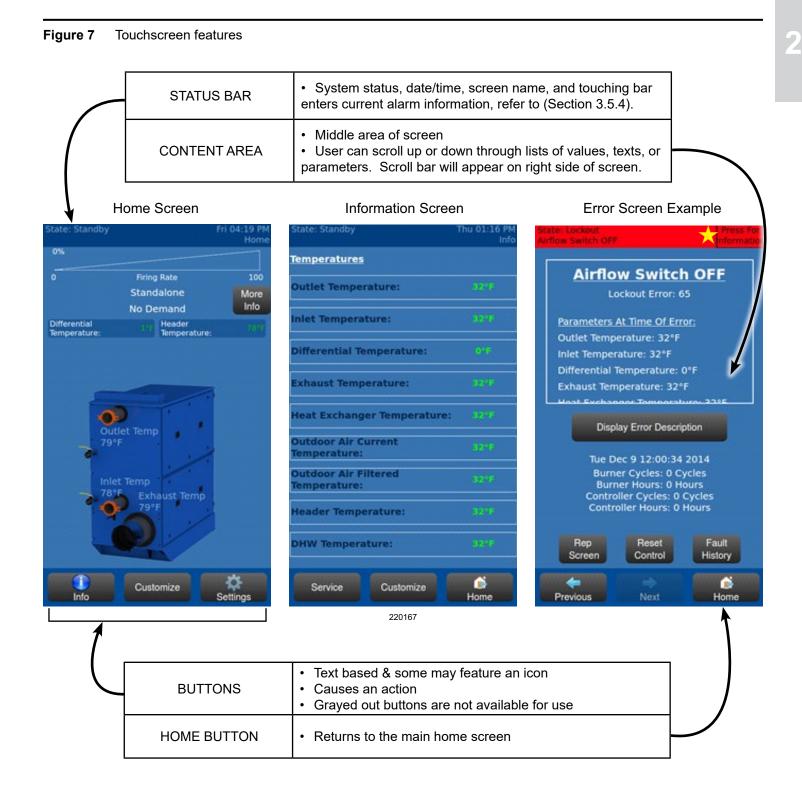
Local Representative Screen

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Home Screen

Navigating the Touchscreen Interface

There are several items featured on the touchscreen display designed to simplify navigation. For example, each screen features the "Status Bar", seen at the top of the figures in this section This "Status Bar" displays the current operational status toward the left, the current date & time in the top right, and the active screen name to the right. The active screen name is helpful when cross-referencing the User Manual or when calling a service technician.



Boiler Control, continued

Time and Date

When the NURO controller is connected to an active internet connection, the time and date can set automatically.

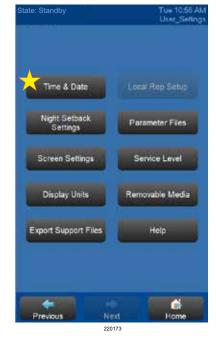
Activate the automatic setting through the following path: Home> Settings> All Parameters> Boiler Settings> General Boiler Settings. Scroll to the bottom of the screen, then push the <Modify> button by the parameter, "Get Time from the Internet." Select <On> then push <Accept>. The date and time will now set automatically.

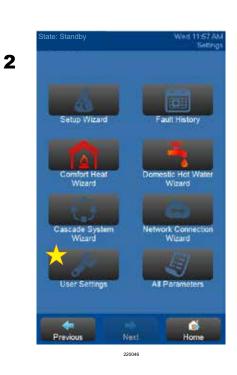
If internet access is not available to the controller, you can set the time and date manually: Home> Settings> User Settings> Time & Date. Change as necessary and click <Set Time>. See Figure 8.

Figure 8 Setting the time and date











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SECTION 3 Maintenance

This section is intended to provide service schedules and maintenance information for users.

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Maintenance Overview
Maintenance Procedures — DAILY
Maintenance Procedures — MONTHLY
Maintenance Procedures — EVERY 3 MONTHS 15
Maintenance Procedures — EVERY 6 MONTHS 16
Maintenance Procedures — END OF SEASON
Notes

Figure 9 Service and maintenance schedule

Maintenance Overview

Servicing and Maintaining the Boiler

The boiler must be inspected and started at the beginning of the heating season every year by a qualified service technician.

The maintenance and service of the boiler listed in Figure 9 and explained in this manual must be performed to assure maximum boiler efficiency and reliability.

	Owner Maintenance (see the following pages for instructions)
Beginning of Season	Contact your boiler service technician to inspect, service, and start up your boiler. You must have an annual start-up performed by a qualified service technician to ensure reliable operation of the boiler and system.
Daily	 Check the boiler area. Check air openings. Check the pressure and temperature gauge. Verify the boiler panels are securely in place.
Monthly	 Check the vent piping. Check the air piping. Check the relief valve. Check the condensate drain system. Check the air vents.
Every 3 Months	 Test low water cutoff by pressing the test button. Check the time and date on the control display.
Every 6 Months	 Check the boiler gas and water piping. Operate the relief valve.
End of Season	Shut down the boiler (unless the boiler is used for domestic water).

AWARNING

Follow the service and maintenance procedures given in this manual. Failure to perform service and maintenance could result in damage to the boiler or system. Failure to follow the directions in this manual and component literature could result in severe personal injury, death, or substantial property damage.

Maintenance Procedures — DAILY

Check the Boiler Area

Eliminate all combustible materials and air contaminants from the vicinity of the boiler and combustion air inlet.

If contaminants or flammable materials are found, immediately remove the products from the area; if they have been there for an extended period of time, call a qualified service technician to inspect the boiler for possible damage from acid corrosion.

If contaminants or flammable materials are found but cannot be removed, immediately call a qualified service technician to repipe the vent and air piping to locate the vent termination and air intake away from the contaminated areas.

All combustible materials and air contaminants must be eliminated from the vicinity of the boiler and piping intake and termination to prevent the potential of severe personal injury, death, or substantial property damage.

Combustible Materials:

Combustible materials, such as gasoline or any other flammable vapors or liquids, cannot be stored near the boiler. Remove immediately if found.

Air contaminants:

Products containing chlorine or fluorine will cause acidic condensate in the boiler if allowed to contaminate the boiler intake air. This will cause significant damage to the boiler over time. Read the list of potential materials listed in <u>Table 1, page 5</u> of this manual. Remove immediately if found.

Check the Pressure and Temperature Gauge

Make sure the pressure reading on the P&T gauge remains at least 5 psig less than the relief valve setting. For example, if the relief valve is set for 30 psig, the P&T gauge must be 25 psig or lower. If the pressure is too high, contact a qualified service technician.

DIRECT EXHAUST Installations

In direct exhaust installations, combustion air is taken from the inside. Air piping is not connected to the air intake.

- 1. Visually inspect all combustion air openings.
 - a. Remove any debris or blockage from combustion air louvers.

AWARNING

Combustion air openings must remain unobstructed to allow combustion and ventilation air to be drawn into the boiler room. Failure to provide proper combustion air can result in severe personal injury, death, or substantial property damage.

- 2. Verify that the boiler vent discharge is clean and free of obstructions.
- 3. Remove any debris on the flue exhaust openings.

If removing any debris does not allow the boiler to operate correctly afterwards, contact your qualified service technician to inspect the boiler and the vent and air systems.

DIRECT VENT Installations

In direct vent installations, combustion air is piped to the boiler from the outside.

- 1. Verify that the boiler vent discharge and air intake are clean and free of obstructions.
- 2. Remove any debris on the air intake or flue exhaust openings.

If removing any debris does not allow the boiler to operate correctly afterwards, contact your qualified service technician to inspect the boiler and the vent and air systems.

Maintenance Procedures — MONTHLY

IMPORTANT

In addition to the daily routine, perform the following procedures on a monthly basis.

Check Vent Piping

Visually inspect the flue gas vent piping for any signs of blockage, leakage or deterioration. Notify your qualified service technician at once for repairs if you find any problems.

Failure to inspect the vent system and have it repaired as necessary can result in vent system failure, causing severe personal injury or death.

Check Air Piping (Direct Vent Systems)

Visually inspect the air inlet to be sure it is unobstructed. Inspect entire length of air piping to ensure piping is intact and all joints are properly sealed. Call your qualified service technician if you notice any problems.

Check the Relief Valve

Inspect the boiler relief valve and the relief valve discharge pipe for signs of weeping or leakage.

If the relief valve often weeps, the expansion tank may not be working properly; Immediately contact your qualified service technician to inspect the boiler and system.

Check the Condensate Drain System

While the boiler is running, check the discharge end of the condensate drain tubing by holding your fingers in front of the opening.

If you notice flue gas escaping, this indicates a dry condensate drain trap. See the following steps to fill the trap.

If the condensate trap dries out on a regular basis, call your qualified service technician to inspect the boiler and condensate line and refill the condensate trap.

AWARNING

The condensate trap must be filled with water during all times of boiler operation to avoid flue gas emission from the condensate drain line. Failure to fill the trap could result in severe personal injury or death.

Under some circumstances, an SVF vent system may not produce enough condensate to keep the condensate trap full of liquid. If the trap is not full, small amounts of flue products can be emitted into the boiler room through the condensate drain line. Follow the procedure below to fill the trap.

- Fill the condensate trap with fresh water by pouring water into the exhaust sampling port on the flue connection (piping end of boiler).
 - a. Verify that the condensate assembly is unobstructed by pouring until the water runs out the end of the condensate drain line.
 - b. If the water does not run out, there is an obstruction. Proceed to the next step.
- 2. To remove an obstruction, remove and flush the trap and drain line.
 - a. Loosen any attachments to the supplied flexible drain hose.
 - b. Loosen the condensate trap inlet connection.
 - c. Remove and flush out the condensate trap and drain line.
 - d. Reinstall the trap and drain line. Tighten all attachments.
 - e. Pour water into the port and ensure that water runs out the end of the drain line.
 - f. If the water still does not run out, call your qualified service technician to inspect the boiler and clean or replace the condensate assembly.

(continued on the next page)

Maintenance Procedures — MONTHLY, continued

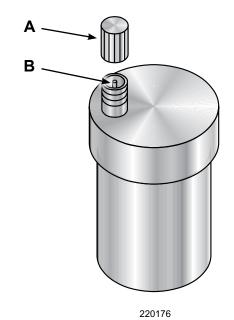
Check Automatic Air Vents

Refer to the figures in this section for the instructions below.

- 1. Remove the cap (A) from any automatic air vent in the system.
- 2. Check operation by depressing the valve (B) slightly with the tip of a screwdriver.
- 3. If the air vent valve appears to be working freely and not leaking, replace the cap.
 - a. Twist the cap all the way on.
 - b. Loosen the cap one turn to allow vent to operate.
- 4. If the vent does not operate correctly, have it replaced.

 Figure 11
 SVF 725/850 automatic air vent location





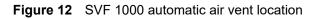




Figure 10 Automatic air vent cap and valve

Maintenance Procedures — EVERY 3 MONTHS

IMPORTANT

In addition to the daily routine, perform the following procedures every three months.

Test the Low Water Cutoff

A push-to-test low water cutoff (LWCO) button is factory installed on the switch panel on the left side of the control tray. The LWCO probe is mounted on the front of the heat exchanger.

Once the button is pushed, the boiler will shut down. The LWCO is manually reset through the main control. This can be performed through the control display by selecting <Reset Lockout>.

AWARNING

If the low water cutoff fails to cause a manual reset lockout condition, immediately turn off all power to the boiler. If the LWCO fails, or the service light is on, contact your service technician right away.

Check the Time and Date

Check the time and date shown on the control display. If the time or date is incorrect, correct it through the control. Refer to <u>page 10</u> for more information.

Figure 13 Low water cutoff test button (model 725/850 shown)



Maintenance Procedures — EVERY 6 MONTHS

IMPORTANT

In addition to the daily routine, perform the following procedures every six months.

Check the Water and Gas Piping

- Perform gas leak inspection per steps 1 through 7 of the Operating Instructions, <u>Figure 1, page 6</u>.
 - If gas odor or leak is detected, immediately shut down the boiler following procedures in the Operating Instructions (<u>Figure 1, page 6</u>). Call a qualified service technician.
- 2. Visually inspect for leaks around internal water piping. Also inspect external water piping, circulators, relief valve and fittings. Immediately call a qualified service technician to repair any leaks.

AWARNING

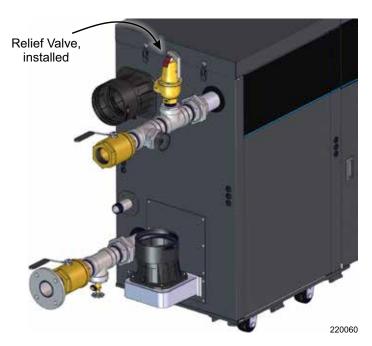
Have leaks fixed at once by a qualified service technician. Failure to comply could result in severe personal injury, death or substantial property damage.

Operate the Relief Valve

 Before proceeding, verify that the relief valve outlet has been piped to a safe place of discharge, avoiding any possibility of scalding from hot water.

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To avoid water damage or scalding due to valve operation, a metal discharge line must be connected to relief valve outlet and run to a safe place of disposal. This discharge line must be installed by a qualified heating installer or service technician in accordance with the instructions in the SVF Boiler Manual. The discharge line must be terminated so as to eliminate the possibility of severe burns or property damage should the valve discharge. Figure 14 Relief Valve (model 725/850 shown)



- 2. Read the boiler pressure/temperature gauge to make sure the system is pressurized.
- 3. Lift the relief valve top lever slightly, allowing water to relieve through the valve and discharge piping.
- 4. If water flows freely, release the lever and allow the valve to seat.
 - a. Watch the end of the relief valve discharge pipe to ensure that the valve does not weep after the line has had time to drain.
 - b. If the valve weeps, lift the seat again to attempt to clean the valve seat.
 - c. If the valve continues to weep afterwards, contact your qualified service technician to inspect the valve and system.
- 5. If water does not flow from the valve when you lift the lever completely, the valve or discharge line may be blocked.
 - a. Immediately shut down the boiler, following the operating instructions on page 6.
 - b. Call your qualified service technician to inspect the boiler and system.

Maintenance Procedures — END OF SEASON

To Continue Operation for DHW

If the boiler is to supply heat for domestic hot water generation during the summer, no changes should be needed.

- 1. Leave the boiler power on and allow the DHW storage tank to call for heat as necessary.
- 2. Set back room thermostats to prevent any unnecessary call for heat during the off season.

To Leave the Boiler in Stand-By Mode

- The SVF boiler's control provides effective features for stand-by operation. These features include periodic exercising of the boiler and system circulators, and automatic operation of the boiler at low fire if water temperatures drop too close to freezing. Configure the control as needed to operate the necessary circulators.
- 2. Leave the boiler power on and allow the control to monitor the boiler and system during the stand-by period.

The control must be configured to operate all circulators needed to ensure the system and all circuits will be protected against freezing. See the SVF Advanced manual for details.

3. Set back room thermostats to prevent any unnecessary call for heat during the off season.

To Shut Down the Boiler

- 1. DO NOT shut down boilers used for domestic water heating; these must operate year-round.
- 2. Follow "To Turn Off Gas to the Appliance" of the Operating Instructions, <u>Figure 1, page 6</u>.
- 3. DO NOT drain the system unless exposure to freezing temperatures will occur.
- 4. DO NOT drain the system if it is filled with an antifreeze solution, even if freezing temperatures will occur.

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