USER'S INFORMATION MANUAL



Condensing Boiler

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 or other combustible materials in the vicinity of this or any other appliance.

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 nearby 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.

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Water quality

Warning

Water quality has a significant impact on the lifetime and performance of a boiler's heat exchanger.

Improperly prepared water in a heating circuit may cause damage to the heat exchanger through fouling or corrosion. Repeated or uncontrolled water fills will increase the potential for damage.

High levels of dissolved solids or minerals may precipitate out of the fluid onto the hottest part of the heat exchanger, impairing heat transfer and resulting in overheating and premature failure. The amount of solids that may form on the heat exchanger will depend on the degree of hardness and the total water volume in the system. Because a high water volume system with a low hardness may cause as much damage as less volume and higher hardness, for high-volume systems it is recommended to reduce dissolved solids to 10 ppm - 30 ppm before the introduction of inhibitors and / or glycol. Final water chemistry limits are as follows:

- Hardness to be between 1 and 9 grains
- TDS is to be between 10 and 150 ppm
- Acidity pH is to be between 6.6 and 8.5
- Chloride is to be less than 125 mg/l
- Iron is to be less than 0.3 mg/l
- Cu less than 0.1 mg/l
- Conductivity is to be between 20 and 300 µS/cm at 77°F (25°C)

Important: Ensure that these limits are acceptable for the other water-side components in the system.

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Safety information

Manual safety markings



Danger

Points out an immediate hazardous situation that must be avoided to prevent serious injury or death.



Warning

Points out a potential hazardous situation that must be avoided to prevent serious injury or death.



Caution

Points out a potential hazardous situation that must be avoided to prevent possible moderate injury and/or property damage.



Note

Points out installation, maintenance and operational notes to enhance efficiency, longevity and proper operation of the boiler.

Important safety instructions

Installation, start-up and servicing of the boiler must be performed by competent, qualified, licensed and trained heating technicians.

Failure to read and comply with all instructions and applicable national and local codes may result in hazardous conditions that could result in property damage and injury to occupants, and in extreme cases to death. Keep instructions near the appliance for future reference.

Caution

The heat exchanger has a small amount of combustion chamber insulation (refractory), that contains ceramic fibers.

When exposed to extremely high temperatures, the ceramic fibers, which contain crystalline silica, can be converted into cristobalite, classified as a possible human carcinogen.

Avoid disturbing or damaging the refractory. If damage occurs, contact the factory for directions.

Avoid breathing in fumes and contact with skin and eyes. Follow these precautions:

1. For conditions of frequent use or heavy exposure, you need a respirator. For respirators certifi ed by NIOSH, refer to the “NIOSH Guide to the Selection and Use of Particulate Respirators Certifi ed under 42 CFR 84".

   For current information, contact NIOSH on 1-800- 356-4676 or on the web at www.cdc.gov/niosh.

2. Wear long sleeved, loose fitting clothing, gloves and eyes protection.
3. Assure adequate ventilation.
4. Wash with soap and water after contact.
5. Wash potentially contaminated clothes separately from other laundry, and rinse clothes thoroughly.
6. Discard used insulation in an air tight plastic bag.

NIOSH first aid guidelines:

- **Eye contact - Irrigate and wash immediately.**
- **Breathing in fumes - Provide fresh air.**

Danger

Should overheating occur or the gas supply fails to shut off, do not turn off or disconnect the electrical supply to the pump. Instead shut off the gas supply at a location external to the appliance.

Warning

Keep boiler area free and clear of combustible materials, gasoline, and other flammable vapors and liquids.

Warning

Combustion air must not be drawn from areas containing corrosive air from swimming pools or spas, including air directly next to outdoor pools and spas.

Warning

The boiler must not be exposed to water leaks from piping or components located overhead. This includes condensation dropping from un-insulated cold water lines overhead.

Warning

In areas of high snow fall, users must check side wall exhaust vent and air intake terminations on a regular basis to ensure blockages do not occur.

Warning

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

Warning

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury, or loss of life. Read and understand the entire manual before attempting installation, start-up, operation, or service. Installation and service must be performed only by an experienced, skilled installer or service agency.

Failure to follow all instructions in the proper order can cause personal injury or death. Read all instructions, including all those contained in component manufacturers' manuals before installing, starting up, operating, maintaining, or servicing the appliance.

Warning

Close fill valve after any addition of water to the system, to reduce risk of water escapement.

Warning

Disconnect power supply before any wiring/service is performed. Failure to do so could result in damage to appliance and/or electric shock.

Caution

The boiler must be installed so that electrical components are not exposed to water during operation.

Warning

Bacteria growth can develop in domestic hot water tanks and indirect water heaters if the minimum water temperature is not set high enough to prevent its growth.

Known Corrosive Contaminants to Avoid	
Cements and glues	Refrigerant leaks from cracks in coils
Paint or varnish removers	Sodium chloride or potassium chloride used for water softening
Adhesives used to fasten building products and other similar products	Chemicals in perming solutions
Chlorinated waxes or cleaners	Chlorofluorocarbon chemicals found in spray cans
Chlorine-based swimming pool chemicals	Antistatic dryer sheets in clothes dryers
Hydrochloric acid or muriatic acid used in household cleaning and stain removal	Chlorine-type bleaches, detergents, and cleaning solvents found in household laundry rooms
Calcium chloride used for snow clearing	

Domestic hot water

Warning

HOT WATER CAN SCALD!

Water Temperatures over 125°F / 52°C can cause severe burns instantly or death from scalds.

Children, disabled, and elderly are at highest risk of being scalded.

- Never leave them unattended in or near the shower, bathtub or sink.
- Never allow small children to use a hot water faucet or draw their own bath.

To avoid any potential scald hazard or if codes require specific water temperatures at the hot water faucet, the installer must:

- Install a thermostatic mixing valve at the outlet of the Domestic Hot Water Indirect Water Heater outlet and ensure it is working properly. AND
- Set the thermostatic mixing valve to the lowest temperature which satisfies your hot water needs.

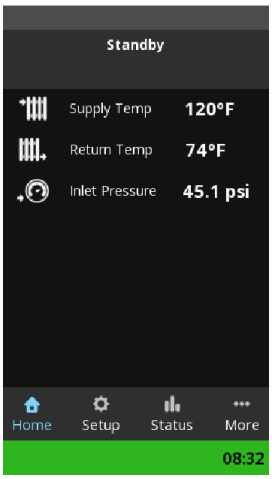
To avoid injury:

- Feel and adjust water temperature before bathing or showering.
- Water drained from the system drain valve may be extremely hot.
- Make sure all connections are tight.
- Direct water flow away from any person.

About the boiler controller

This boiler is equipped with a touchscreen controller for programming the boiler. For detailed instructions on using the controller, see the *V10 Touchscreen Controller* manual.

The controller is equipped to provide:



- Control of up to five pumps – one boiler pump + four separate load pumps
- Outdoor Reset control
- Set Point temperature regulation
- Domestic Hot Water (DHW)
- External control using 0-10VDC or 4-20mA signal
- Manual control of firing rate for gas valve calibration
- Alarm dry contacts
- Zoning - simultaneous operation of up to four load pumps
- Load Combining – simultaneous operation of two similar water temperature loads
- Programmable setback / override schedule
- The control can manage or operate in a network of up to 24 V10 controller boilers without additional controller
- Features available in the touchscreen control include:
  - » Setup Menu for simple, quick programming
  - » Superior warning messages while setting up the control
  - » Advanced Error messages with visual display on the Home Screen

Controller

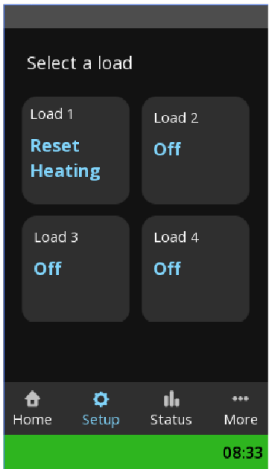
When the boiler is first energized, the controller will go through a power up sequence that will take approximately 45 seconds. During this time the controller is completing a self- diagnostic and loading all previous settings. In the event of a power interruption the boiler will automatically resume operation when power is restored with all the previously stored values. The controller provides overall management of the boiler operations including:

- Power-up, self-diagnostics, easy Load parameter adjustments
- Burner operation, safety management systems, Call for Heat management and Load Priority
- Real-time boiler data
- Temperature and throttle operation
- Maintenance of operational and error service logs
- 2-way communication with other V10 controller boilers

Operational and historical data may be accessed at any time using the System Status and Load Profiles sections of the control. Error logs are available in the Diagnostics section and the controller is capable of recording any or all errors since original power-up complete with the date and time of the error.

Control interface

The control interface is provided through a color touchscreen display. The touchscreen responds to a light finger touch on the screen. You can also use a stylus or similar device to operate the touch controls. Do not use a sharp or metallic object such as a screw driver to operate the control as it could damage the touchscreen.



The controller display is divided into two areas, the screen active area and the boiler status bar. All screens have an active area consisting of the screen title bar at the top and a border surrounding the active area. At the bottom of the display there is space reserved for the boiler status bar.

Prior to any interaction with the touchscreen, the display shows the Home screen details of the current boiler status. If the controller has been left on the Home screen long enough (user adjustable, 10 minutes by default) the display will be dimmed to save power.

The control will automatically return to the home screen if left unattended. The screens will step back one screen at a time in 10 minute increments if the touchscreen has not been touched. The pop-up windows will also step back automatically in 2 minute intervals.

The boiler status bar indicates if the boiler is in a normal, warning or alarm state. When no warning or alarm state is present, the bar will be green and the time will be displayed inside the green area. The bar can also be yellow or red, corresponding a warning or alarm state. Text inside the bar will indicate the specific warning or alarm present. If more than one alarm is present the text display will slowly change, rotating though the alarms that are present.

Boiler operation

Lighting and shutting down the boiler

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.

A. This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.

B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

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

C. Use only your hand to turn the gas control valve. Never force using tools. If the valve will not turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

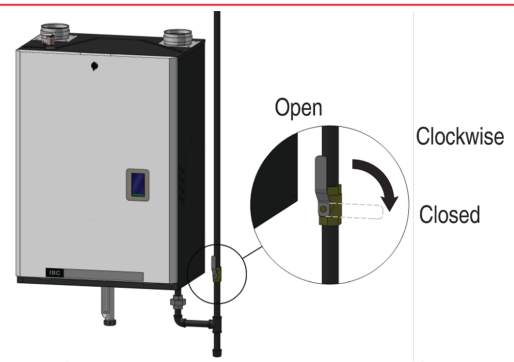
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

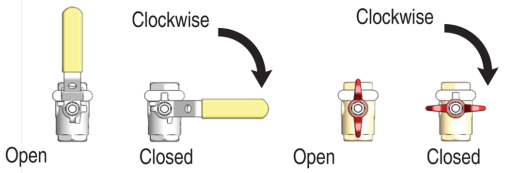
OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label before doing anything.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance by selecting main power switch to OFF.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
5. Locate manual gas shut-off valve (see pictures below) and turn clockwise to "CLOSE".
6. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow step "B" in the safety information above on this label. If you don't smell gas, go to the next step.

TO TURN OFF GAS APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance by selecting main power switch to OFF.
3. Turn gas control valve to CLOSE.





OPERATING INSTRUCTIONS *cont.*

7. Turn gas control valve to OPEN.
8. Turn on electric power to appliance by selecting main power switch to ON.
9. Set thermostat to desired setting.
10. If the appliance will not operate, follow the instructions "TO TURN OFF GAS APPLIANCE" and call your service technician or gas supplier.

Service and Maintenance

Inspection of the boiler is to be performed annually by a qualified service technician.

Carbon monoxide (CO) alarm

This product burns gas to produce heat. The appliance must be properly installed, operated, and maintained to avoid exposure to appreciable levels of carbon monoxide and the installer is required to confirm that at least one carbon monoxide alarm is installed in the living space before the appliance is put into operation. It is important for the carbon monoxide alarms to be installed, maintained, and replaced following the alarm manufacturer's instructions and applicable local codes.

Maintenance checklists

Daily Maintenance	Check
Check the surrounding area – inspect for water leaks in the general area around the boiler and boiler piping	☐
Check the maximum pressure relief valve setting. The heating system pressure should not drop below 10psi in most applications. If the pressure is outside this normal range or if the water pressure fluctuates more than 2-3psi, contact your qualified service technician for service.	☐
Check the area around the boiler and the air intake opening for obstructions and chemical contaminates.	☐

Monthly Maintenance	Check
Check all the daily maintenance items.	☐
Check the pressure relief valve and discharge piping for signs of leakage or moisture. If water or moisture is found, contact your qualified service technician as soon as possible for service.	☐
Check the condensate trap and outlet pipe. The condensate trap must be full of water. The outlet hose may be connected to a condensate neutralizer, if so, check that the pH of the water coming out of the neutralizer is above 6.0pH. If the pH is below 6.0 then the neutralizer will need to be re-charged or replaced. Contact your qualified service technician for service.	☐
Inspect the flue gas exhaust and air intake connections. All connections should be tight and leak free.	☐
Inspect flue gas exhaust piping, combustion air piping and terminations.	☐

Annual Maintenance	Check
Check the Error Logs for any issues.	☐
Inspect the flue gas exhaust and air intake connections. All connections should be tight and leak free.	☐
Inspect flue gas exhaust piping, combustion air piping and terminations.	☐
Inspect the boilers interior and vacuum if required.	☐
Check for water, gas and condensate leaks in the boiler and around the boiler.	☐
Check the condensate trap and clean if required. Re-fill the trap.	☐
Check the water pressure, expansion tank and pumps.	☐
Check the electrical connections.	☐
Check the ignition electrode and remove oxidation from the electrode. Replace if necessary.	☐
Check the gas valve and ignition cable.	☐
Check the controller settings.	☐
Check the burner's flame {should be a quick and quiet ignition across the full burner).	☐
If required, clean the heat exchanger and the burner. Refer to instructions in the boiler's *Installation and Operating Instructions* manual	☐

Note

Installers should inquire of local water purveyors as to the suitability of their supply for use in hydronic heating systems.

If water quality is questionable, a local water treatment expert must be consulted for testing, assessment and, if required, treatment.

Alternatively, water or hydronic fluid of known quality can be brought to the site.

Warning

Do not use automotive-type ethylene or other types of automotive glycol antifreeze, or undiluted antifreeze of any kind. This may result in severe boiler damage. It is the responsibility of the Installer to ensure that glycol solutions are formulated to inhibit corrosion in hydronic heating systems of mixed materials. Improper mixtures and chemical additives may cause damage to ferrous and non-ferrous components as well as non-metallic, wet components, normally found in hydronic systems. Ethylene glycol is toxic, and may be prohibited for use by codes applicable to your installation location. For environmental and toxicity reasons, it is recommended to use only using non-toxic propylene glycol.

Relief valve - maintenance and testing

The relief valve manufacturer requires that under normal operating conditions a “try lever test” must be performed every two months. Under severe service conditions, or if corrosion and/or deposits are noticed within the valve body, testing must be performed more often. A “try lever test” must also be performed at the end of any non-service period.

Caution

Before testing the relief valve, make certain the discharge pipe is properly connected to the valve outlet and arranged to contain and safely dispose of equipment discharge.

Test at or near maximum operating pressure by holding the test lever fully open for at least 5 seconds to flush the valve seat free of sediment and debris. Then release the lever and allow the valve to snap shut.

If the lever does not activate, or there is no evidence of discharge, discontinue use of equipment immediately and contact a licensed contractor or qualified service professional.

If the relief valve does not completely seal, and fluid continues to leak form the discharge pipe, perform the test again to flush any debris that my be lodged in the valve. If repeated attempts fail to stop the leakage, contact a licensed contractor or qualified service professional to replace the valve.

While performing a "try lever test", a quantity of heat transfer fluid will be discharged from the piping system and the system pressure will drop. This fluid must be replaced. We strongly recommend using a system pressurization unit, such as an *Axiom Industries model MF200*, to refill and pressurize your system. Capture the discharged fluid in a container and recycle it returning it to the system feeder unit. This is particularly important when your system contains treatment chemicals or glycol solutions. If the system uses plain water, the boiler auto-fill valve must be turned on to recharge the lost fluid.

Blocked vent safety system

The boiler is equipped with a blocked vent safety system to prevent the boiler from operating in the event the boilers exhaust piping is blocked. The boiler will automatically stop operating when the restriction in the venting system becomes too restrictive. If the boiler shuts down due to a blocked vent, a qualified service technician must be called to inspect the boiler and venting system and correct the problem.

The following message is relevant to users in the USA:

Important

- This Boiler is equipped with a feature that saves energy by reducing the boiler water temperature as the heating load decreases. This feature is equipped with an override which is provided primarily to permit the use of an external energy management system that serves the same function. THIS OVERRIDE MUST NOT BE USED UNLESS AT LEAST ONE OF THE FOLLOWING CONDITIONS IS TRUE:
- An external energy management system is installed that reduces the boiler water temperature as the heating load decreases.
- This boiler is not used for any space heating.
- This boiler is part of a modular or multiple boiler system having a total input of 300,000 BTU/hr or greater.
- This boiler is equipped with a tankless coil (not applicable to these boilers).

US installers should contact the manufacturer for any further information required.

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