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MODEL:

SERIAL#:

HLR 15-75kW Hydronic Boiler Models



Instructions Manual

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HLR15 - HLR105 HOT WATER BOILERS



Features

- Maximum design 100psi, 250°F
- Maximum operating, 85psi, 235°F
- All boilers are manufactured in accordance with the requirements of the A.S.M.E. Boiler and Pressure Vessel Code and A.S.M.E. CSD-1. Each boiler bears the National Board Stamp "H".
- Shell fiberglass insulation thickness minimum 2".
- Power range 15kW - 105kW with up to 4 heating stages, depending on model.
- Heating stages managed by digital step controller.

Standard Equipment of Each Boiler Includes:

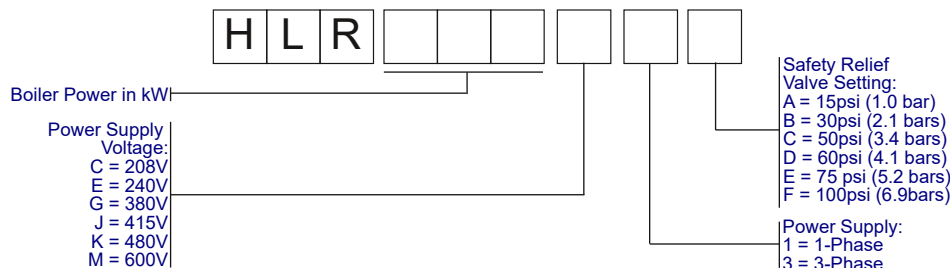
- A.S.M.E. pressure relief valve.
- One (1) primary high temperature cutoff control with automatic reset and one (1) secondary high temperature cutoff control with manual reset.
- One (1) low water cutoff control with manual reset.
- PID-step controller with number of heating stages depending on the boiler heating power.
- Digital readout of the operating temperature.
- Magnetic contactors.
- Internal branch circuit fusing.
- Main supply power distribution block.
- Indicator lights for POWER, HEATING, CIRCULATOR PUMP, and ALARMS.
- Pressure and temperature gauges.

Applications

- Space Heating
- Water Source Heat Pumps
- Bio-Diesel Reactors
- Tank Heating
- Swimming Pools
- De-Icing

HEATING POWER	OUTPUT CAPACITY	NO. OF STEPS	VOLTAGE ⁽¹⁾ 50/60Hz	PHASE	INLET & OUTLET SIZE	20°F RISE WATER FLOW	WATER CAPACITY	OPERATING TEMPERATURE RANGE	SHIP WT.
KW	BTU/HR				NPT	G.P.M. (L/min)	GAL. (L)	°F (°C)	Lbs (kg)
15	51,200	1	208/240 ⁽²⁾ /380/415/480/600	3	2"	5.3 (20)	5.8 (22)	35 (1) - 235 (113)	255 (116)
30	102,000	2	208/240 ⁽²⁾ /380/415/480/600	3	2"	10.7 (40)	5.8 (22)	35 (1) - 235 (113)	265 (120)
45	154,000	3	208/240/380/415/480/600	3	2"	16 (60)	5.8 (22)	35 (1) - 235 (113)	270 (122)
60	205,000	4	208/240/380/415/480/600	3	2"	21.3 (81)	5.8 (22)	35 (1) - 235 (113)	275 (125)
75	256,000	4	208/240/380/415/480/600	3	2"	26.7 (101)	5.8 (22)	35 (1) - 235 (113)	285 (129)
90	307,000	4	208/240/380/415/480/600	3	2"	32 (121)	5.8 (22)	35 (1) - 235 (113)	400 (181)
105	358,000	4	208/240/380/415/480/600	3	2"	37.3 (141)	5.8 (22)	35 (1) - 235 (113)	410 (186)

Model Number Key



Example: HLR75K3B = HLR-Series hot water boiler, 75kW heating power, power supply 480V, 3ph, safety valve set to 30psi

* Each boiler model requires two (2) power supplies: Heating power and control voltage. Nominal control voltage is 120V AC. Boiler models rated for 380V and 415V are equipped with control voltage transformers that require 220/240V applied to their primary side in order to provide the 120V AC control voltage to the boiler. As an option, all boiler models can be equipped with control voltage transformers so that only the heating power supply needs to be connected to the boiler.

Please note that all information provided within this brochure is approximate and subject to change without notice. Please contact Reimers Electra Steam, Inc. with any questions regarding the specifications or dimensions detailed within.

LIMITED WARRANTY - HOT WATER BOILERS

Reimers Electra Steam, Inc. warrants the following products of its own manufacture against defects in materials and workmanship under normal use and service. This warranty is in lieu and excludes all other expressed or implied warranties or merchantability of fitness for any particular use. No person is authorized to extend the terms of this warranty or assume any other liability except by written statement signed by an officer of Reimers Electra Steam, Inc. Clear Brook, Virginia 22624.

WARRANTY PERIOD

The pressure vessel and electrical & mechanical components are warranted for one year from date of shipment from Reimers Electra Steam, Inc. in Clear Brook, VA 22624.

LIMITATIONS

Products must be installed, used and maintained in accordance with our instructions, including reasonable & necessary maintenance by the user. Users are responsible for the suitability of the products to their application. There is no warranty for damage resulting from improper installation, abuse, power failure, fire, flood, lightening, improper water, misuse, improper specification, misapplication or other operating conditions beyond our control or parts that are normally expendable in usual course of operation.

Claims against carriers for damage in transit must be filed by the buyer. Reimers liability, if any, will not exceed the price of Reimers products claimed to be defective.

Components manufactured by any supplier other than Reimers shall bear only that warranty made by the manufacturer of that product and service for that warranty shall be the responsibility of that manufacturer and not Reimers.

REMEDY

Claims under this Limited Warranty must be made by obtaining a Return Authorization Number from our office (PHONE: 540-662-3811, FAX: 540-665-8101) & returning the defective part, freight prepaid to: Reimers Electra Steam, Inc., 4407 Martinsburg Pike, Clear Brook, Virginia 22624

Defective items will be repaired or replaced as necessary within a reasonable time without charge, other than incidental charges such as freight prepayment. Such repair or replacement within a reasonable time is the exclusive remedy available from Reimers Electra Steam, Inc., under this Limited Warranty.

CONSEQUENTIAL DAMAGES

Reimers Electra Steam, Inc., is not liable for labor costs incurred in the removal, reinstallation, or unauthorized repair of product, or for damages of any type whatsoever, including incidental and/or consequential damages.

THIS WARRANTY SUPERSEDES ALL PRESIOUS WARRANTIES



Read this manual before installing and using this product. Failure to do so can result in serious injury or death.

You have just purchased a quality steam boiler designed to the ASME Boiler Code and registered with the National Board of Boiler Inspectors. Treat this industrial equipment with care and respect. It is safe when installed, maintained, and used properly. Read the instruction carefully and contact the factory if you have any questions.



WARNING Read this manual before installing and using this product.
Failure to do so can result in serious injury or death.

Your boiler should be marked with a complete set of WARNING/CAUTION labels shown below. If one of these labels is missing, please contact our factory immediately.

US and All Other Non-Francophone Countries

Located on electrical enclosure door

⚠ WARNING		⚠ ADVERTENCIA	
	Risk of electric shock. This boiler is connected to more than one branch circuits. Disconnect all power and control circuits before servicing.		Riesgo the electrochoque. Esta caldera está conectado a mas de un circuito de alimentación. Desconecte los todos circuitos antes de realizar el mantenimiento.
	Read and understand the operator's manual before using this boiler.		Lea y comprenda el manual de instrucciones antes de utilizar esta

⚠ WARNING		⚠ AVERTISSEMENT	
	Risk of electric shock. This boiler is connected to more than one branch circuits. Disconnect all power and control circuits before servicing.		Risque de choc électrique. Cette chaudière est reliée à plusieurs circuits d'alimentation. Débrancher tous les circuits d'alimentation avant l'entretien.
	Read and understand the operator's manual before using this boiler.		Lire et comprendre les instructions avant d'utiliser cette chaudière.

Located on end caps of cylindrical boiler pressure vessel jacket

⚠ WARNING		⚠ ADVERTENCIA	
	Risk of electric shock. Disconnect all branch circuits before removing this cover.		Riesgo de electrochoque. Desconecte los todos circuitos antes de remover esta cubierta.

⚠ WARNING		⚠ AVERTISSEMENT	
	Risk of electric shock. Disconnect all branch circuits before removing this cover.		Risque de choc électrique. Débrancher tous les circuits avant de retirer le couvert.

Located on end caps of cylindrical boiler pressure vessel jacket

⚠ CAUTION		⚠ ATENCIÓN	
	All exposed pipes and valves may be hot. Do not touch.		Las tuberías y valvulas expuestas pueden estar calientes. No toque.

⚠ CAUTION		⚠ PRUDENCE	
	All exposed pipes and valves may be hot. Do not touch.		Tous les tuyaux et valves exposées peuvent être chauds Ne pas toucher

This manual contains safety messages. Each of the safety messages are preceded by one of the following signal word panels:



DANGER

Safety messages preceded by this label contain information, that if not followed will result in death or serious injury.



WARNING

Safety messages preceded by this label contain information, that if not followed could result in death or serious injury.



CAUTION

Safety messages preceded by this label contain information, that if not followed could result in minor or moderate injury.

NOTICE

Messages preceded by this label contain important information, but are not hazard-related.

Ensure that this manual is available to the boiler operator at any time.

Read carefully all safety labels attached to the boiler. If any safety label was damaged during shipment, contact the factory immediately:

Ph. 540-662-3811; e-mail: sales@reimersinc.com

Important Safety Information



1. BLOWDOWN VALVE: This valve is utilized to blow impurities from the boiler chamber. When opened, a large volume of hot water and steam is discharged. Ensure that this valve is properly piped for such discharge. State and local codes must be met as applicable.

2. ELECTRICAL: All field wiring to the boiler must be in accordance with the National Electric Code and any local codes that may apply. Wiring must be made by a competent certified electrician. Use copper wire only. Ensure that all electrical components are in a dry location, free from any possibility of water soaking. Electric foot switches when supplied must not be placed on a wet floor. They must be placed on dry surface, not subject to steam or water.

3. GAUGE GLASS: The gauge glass protector guards must be on at all times. When replacing the glass, be sure that the unit is not under pressure and is cool to touch. The gauge glass should be replaced once per year. If cracks or wear is evident, replace the gauge glass immediately.

4. MODIFICATION/MISUSE: This boiler has been designed and constructed in accordance with the ASME Boiler and Pressure Vessel Code. Any modification or misuse can result in a dangerous situation. Reimers Electra Steam, Inc. is not liable for any product that has been modified or improperly used.

5. PRESSURE GAUGE: The pressure gauge indicates the internal pressure of the boiler. It can fail. Periodically have your boiler inspector compare the gauge with a known gauge utilizing the test valve arrangement provided

6. REGISTRATION: Most states and cities require boiler registration and inspection. Check with your government authorities.

7. INSTALLATION AND REPAIR:

Installation and repair work of this unit must be performed only by experienced personnel. Before commencing a repair, ensure that the boiler is cold, not pressurized and electrically disconnected. All standard electrical and steam safety precautions must be taken during testing.

8. SAFETY VALVE: The safety valve is designed to discharge hot steam when the set pressure is exceeded. Ensure that the discharge port is pointing toward the back of the unit away from the operator or any aisles. Test the safety valve periodically to ensure that it is operating properly. Test carefully at full pressure by lifting lever using pliers and let it "slapping" shut. Steam discharge can scald. Ensure no one is exposed.

9. STEAM INSTALLATION: Steam piping must be of black pipe, not galvanized. Work must be done by an experienced steam fitter. All state and local codes must be met as applicable.

10. WATER: Ensure that all electrical components are in a dry location, free from any possibility of water soaking. Electric foot switches when supplied must not be placed on a wet floor. They must be placed on dry surface not subject to steam or water.

1. Installation

REIMERS ELECTRA STEAM, INC. boilers are heated by one or more immersion type heating elements. Automatic controls are provided to maintain pre-set operating pressure and proper water supply. Safety features include automatic low water cutoff, automatic pressure control, safety valve and visible water level gauge. Each boiler is manufactured in accordance with the ASME Power Boiler Code Standards and is individually inspected and stamped by an authorized National Board Insurance Inspector. All boilers are registered with the National Board of Boiler and Pressure Vessel Inspectors. When boiler is received, make sure it has not been damaged in shipment.

NOTE:

ASME DATA PLATE IS LOCATED ON END OF PRESSURE VESSEL BEHIND LABEL STAMPED WITH NATIONAL BOARD NUMBER OF UNIT.

When boiler is received, make sure it has not been damaged in shipment.

1.1 Location

Place the boiler in a level position, close to the equipment which it is to supply. This will insure minimum heat losses and allow more economical piping arrangements. All steam lines should be insulated. Review the overall dimensions of your boiler model on page 6 to select proper boiler location.

Regardless of the NFPA-70 working space requirements shown below, provide a minimum of 3ft clearance on both sides of the boiler for element servicing, 3ft of clearance to the front of the boiler and 1.5ft to the rear of the boiler.

Nominal Voltage To Ground (Volts)	Minimum Clear Distance		
	Condition 1	Condition 2	Condition 3
0 – 150	3ft (914mm)	3ft (914mm)	3ft (914mm)
151 – 600	3ft (914mm)	3.5ft (1.07m)	4ft (1.22m)

a.) Working space:

Electric boiler spacing is dictated by NFPA-70, Table 110.26 as follows:

Note: Where the conditions are as follows:

Condition 1 - Exposed live parts on one side of the working space and no live or grounded parts on the other side of the working space, or exposed live parts on both sides of the working space that are effectively guarded by insulating materials.

Condition 2 - Exposed live parts on one side of the working space and grounded parts on the other side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

Condition 3 - Exposed live parts on both sides of the working space.

(a) Dead-Front Assemblies. Working space shall not be required in the back or sides of assemblies, such as dead-front switchboards or motor control centers, where all connections and all renewable or adjustable parts, such as fuses or switches, are accessible from

locations other than the back or sides. Where rear access is required to work on non-electrical parts on the back of enclosed equipment, a minimum horizontal working space of 762 mm (30 in.) shall be provided.

b.) Regardless of the above working space required by the National Electrical Cod, the following clearance side of the boiler must be provided for heating element servicing:

HLR15-HLR60 1.5ft (460mm) on right side of boiler

HLR75 1.5ft (460mm) on both sides of boiler

c.) Alcove or closet installation per UL834: Proper location of this boiler model with regard to combustible and noncombustible surfaces and materials is coded on the boiler name plate. The following decoding sketch and description is provided for the user information:

Model	Dimension In. (cm)						
HLR	A	B	D	EL	ER	F	G
15-75	24 (61)	A6 (A15)	6 (15)	6 (15)	6 (15)	C	-

Description of dimensions and symbols

A - Clearance above top of boiler

B - Clearance from front of boiler

Prefix C to numeral indicates suitability for closet or alcove installation

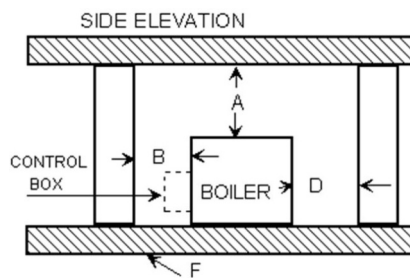
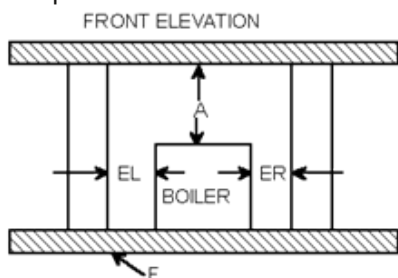
Prefix A indicates suitability for alcove but not for closet installation

D - Clearance from back of boiler

EL - Clearance from left side of boiler

ER - Clearance from right side of boiler

F - Indicates type of flooring: "NC" for noncombustible floor / "C" for combustible floor. Numeral indicates minimum clearance below suspended units to combustible floor



1.2 Heating Loop Piping

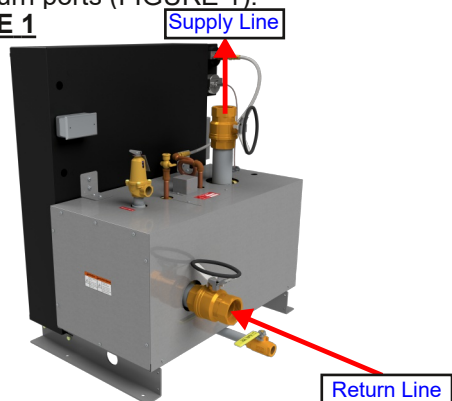
Piping: This hot water boiler is intended to be used in a closed pressure system with a circulating hot water pump. The boiler safety relief valve can have settings from 30 and up to 150psig. The expansion tank must be sized to meet the ASME standards for the overall water capacity of your heating system. The circulating system should also include an air trap and bleed, as well as automatic water fill. The water inlet and outlet are located on top of the boiler as shown in FIGURE 1.

Recommended heating loop piping size, depending on the boiler heating power:

HLR15 – HLR75: 2" NPT

Install stop valves as close as possible to the boiler supply and return ports (FIGURE 1).

FIGURE 1



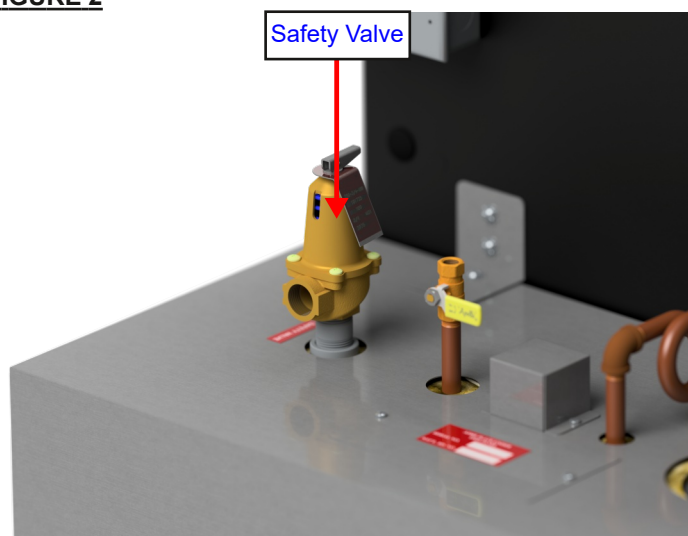
In order to ensure long term trouble-free boiler operation, we recommend that the water used as boiler feed water to be tested for hardness. If the water in your area is harder than 1grain (17mg/L), use a water softener. The main cause for premature heating element failure in electric steam boilers is water hardness. If severe corrosion during inspection of the pressure vessel as indicated in chapter 3.4 of this manual becomes evident, additional tests of your boiler feed water must be performed. A water analysis should be performed by a qualified and recognized water treatment company located in your area.

1.3 Safety Relief Valve

The safety valve is designed to discharge hot steam when the set pressure is exceeded. Ensure that the discharge port is pointing toward the back of the unit away from the operator and any aisles. If it is required that discharge piping be installed from the safety valve, the pipe should not be smaller than the valve outlet and should be rigidly supported so as not to place weight on the valve itself.

Important: No valve in this line!

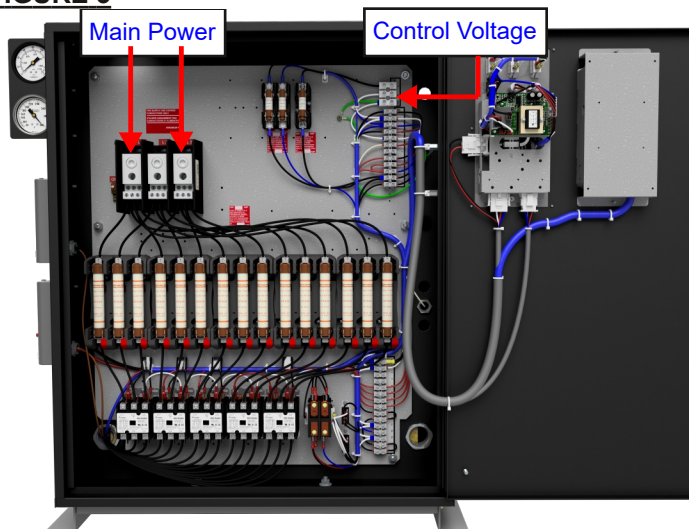
FIGURE 2



1.4 Electrical

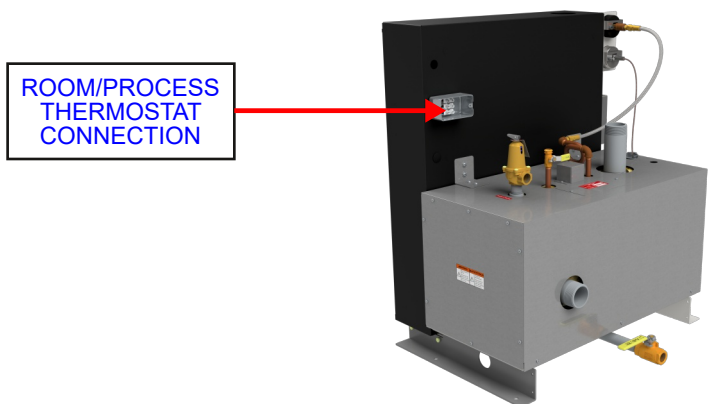
Install a fused disconnect switch near the boiler. It should be fused as marked on the boiler name plate. Connect the power supply from the disconnect switch to the terminals in the boiler control panel. A copy of the wiring diagram is in the control panel.

FIGURE 3



Important: Electrical connections to the boiler control panel (FIG. 3) should be made by a qualified Electrician. All wiring must comply with local electrical codes.

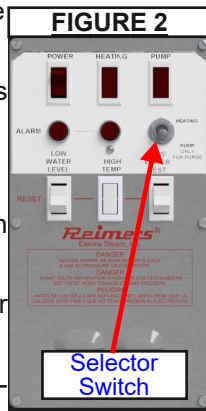
All boiler models that are equipped with a transformer option (OPT1010 or OPT1011) do not require a separate external control voltage power supply.



2. Operation

2.1 Boiler Startup

- With all power disconnected, check the control panel for loose wires caused by vibration in shipping. Review installation instructions to be sure boiler is properly wired and installed.
- Be sure that the boiler drain valve is closed
- Fill the system with water
- Ensure that the selector switch is in OFF-position (middle position)
- Turn on the control voltage power supply
- Turn the red POWER switch to the ON-position
- Start the circulating pump, or pumps by throwing the selector switch of the boiler controller into the PUMP-position. With pump running, bleed air from system and check entire system for leaks.
- This hot water boiler is equipped in its standard configuration with one temperature sensor, placed inside the boiler pressure vessel near the water outlet nozzle. It senses the water temperature as it exits the boiler. For space heating applications that require outdoor reset, a second sensor can be easily connected to the boiler controller in the field.



- > EXIT
- 1.3.4. Setting up the Stages = Not set
- > EXIT
- 1.4. Setup Alarms = Not set
- > EXIT

Honeywell Controller T775P2003 Setting Operating Parameters:

PROGRAMMING OUTPUT STAGES WITH NO RESET

- Entering Program Mode: Press the MENU button, then select PROGRAM and press the > button to view the Program menu.
 - SETPOINT = Set value to desired heating loop temperature
 - THROTTLING RANGE = recommended range 15 – 25°F
 - SENSOR = Not set
 - HEAT/COOL = HEAT
- > EXIT
- > EXIT

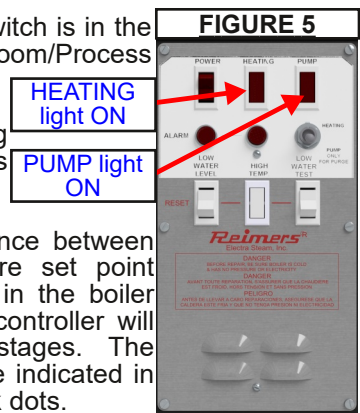
To set the boiler controller for reset mode, please refer to the Honeywell T775P2003 boiler controller manual that is attached to this manual.

- Turn the three phase power supply ON
- Turn the selector switch into the HEATING-position

2.2 Boiler Operation, Sequence of Events

- As soon as the selector switch is in the HEATING-position and the Room/Process thermostat calls for heating:

Both lights remain ON as long as the Room/Process thermostat calls for heating.



- Depending on the difference between the programmed temperature set point and the actual temperature in the boiler pressure vessel, the boiler controller will start energizing heating stages. The energized heating stages are indicated in the controller display as black dots.

NOTE: For all boilers equipped with the Honeywell T775P2003 controller (standard configuration), please continue reading this paragraph. For all boilers equipped with the BACnet™ enabled controller, model OPT-HLR-BMS, please refer to the separate instruction manual that comes with the boiler.

The Honeywell controller T775P2003 was set at the factory with its parameters as shown below and to the operating water temperature as ordered:

Honeywell Controller T775P2003 Setup:

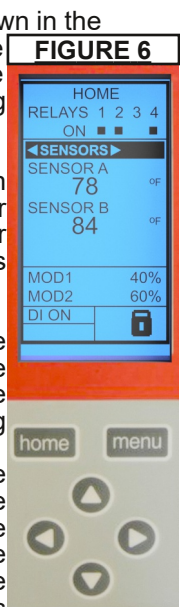
- Entering Setup Mode: Press and hold the MENU button for 5 seconds to display the Setup menu
- Setting up the Sensors:
 - # of Sensors = 1
 - Sensor A
 - UNITS = DEG F
 - CALIBRATE = 0.0°F
 - LABEL = BOILER A
 - > EXIT
- SENSOR B = Not set, unless outdoor reset sensor connected to controller
- SENSOR C: Not used
- > EXIT
- Setting up the Outputs
 - Number of STAGES = 4
 - SCHEDULE = NO
 - OPTIONS
 - RESET = NO, unless outdoor reset sensor is connected to controller
 - INTEGRAL = 0 sec.
 - DERIVATIVE = 0 sec.
 - ON DELAY = 0 sec.
 - OFF DELAY = 0 sec.
 - WWSD = NO
 - LEAD LAG = FOFO
 - DI OPTIONS = DISABLE
 - SHOW RT = NO

- The actual temperature of the boiler is shown in the middle portion of the display. To change the set point, follow the instructions above (Honeywell Controller T775P2003 Setting Operating Parameters)

- Various status messages may be shown in the lower portion of the boiler controller display. As long as the thermostat calls for heating, DI = OFF, when the thermostat does not call for heating, DI = ON.

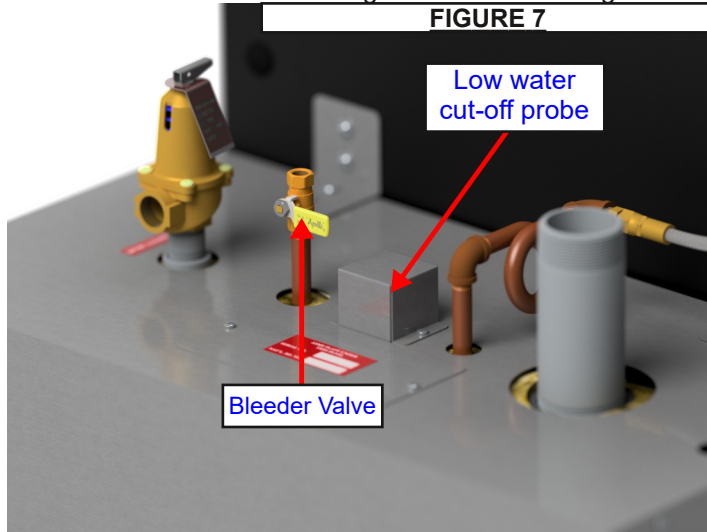
- As soon as the temperature in the pressure vessel approaches the programmed set point temperature, the boiler controller will begin to step out heating stages.

If the actual temperature in the pressure vessel (temperature indicated on the temperature gauge) is higher than the programmed temperature set point, then the throttling range must be increased. If the actual temperature in the pressure vessels swings too high over the programmed set point, the high temperature safety limit control(s) may trip.



2.2.2 Low Water Cut-Off Function

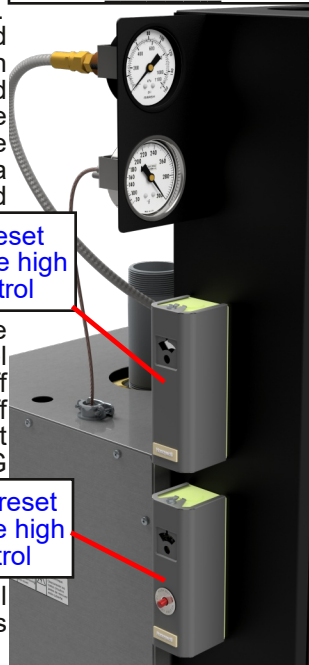
The low water cutoff function of the boiler control de-energizes the heating elements when the water level in the boiler pressure vessel falls below the minimum acceptable operating level. The control senses the water level in the boiler pressure vessel through a probe. When the tip of the probe is in contact with water in the boiler, the boiler operates normally. When the water level in the boiler falls below the tip of the probe the control senses that water level is low. The control will not de-energize the heating elements when the probe loses contact with the boiler water for short periods of time. But, when the probe loses contact with the probe for a set time, the control de-energizes the heating elements and turns on the "LOW WATER" boiler alarm light. Boiler operation can only be resumed after determining why water level is low, restoring normal water level in the boiler and pressing the "LOW WATER" reset button. After pressing the "LOW WATER" reset button the alarm light "LOW WATER" turns off, the lockout is reset and the heating elements are energized.



2.2.3 High Temperature Cutoff Function

As soon as the water temperature in the boiler reaches the high limit setting, the heaters and the HEATING-light will turn off. This may occur when the system is brought up from cold to fully heated condition. In this case, increase the throttling range as described above. However, if the high limit control actuates repeatedly it would indicate that the water temperature setting is too close to the hi-limit setting. Check these settings and increase the difference between them. Each boiler is equipped with two high limit temperature safety limit controls: One automatic reset control, set to a lower cut-off temperature and one manual reset control, set to a higher cut-off temperature. If the automatic reset control trips, the HEATING light on the front panel of the boiler controller turns off and all heating stages turn off immediately. If the manual reset control trips, then the HEATING light on the front panel of the boiler controller turns off, the HIGH TEMPERATURE alarm light will turn on and all heating stages turn off immediately.

FIGURE 8



3. Boiler Maintenance

WARNING Do not add any chemicals to the boiler feed water unless specifically recommended by a qualified and recognized water treatment company.

3.1 Re-Tightening the Electrical Terminal Connections inside the Electrical Enclosure and Pressure Vessel Jacket

Frequency: During boiler installation, 90days after boiler installation and then annual

Re-tighten the terminals of the contactors, fuse blocks and heating element terminals inside the electrical enclosure and pressure vessel jacket, following the maximum torque values listed below:

Component	Maximum Torque
50A-Contactor	25 in*lb
75A-Contactor	45 in*lb
Fuse Block	45 in*lb
Element Wires to Copper Lugs	20 in*lb
Copper Lugs to Element Terminals	12 in*lb

3.2 Testing the High Temperature Cut-Off Devices

Frequency: Once every six months

For this test, the boiler temperature should be near the boiler temperature setpoint and at least one heating stage energized.

3.2.1 Testing the Automatic Reset Temperature High Limit Safety Control

- Read the current boiler operating temperature setpoint
- Read and memorize the current setting of the automatic reset temperature high limit safety control
- Turn the dial of the temperature control towards the boiler temperature setpoint until all energized heating stages turn off together.
- Turn the dial of the temperature control to its initial position. The heating stages should energize staged in accordance with the programmed ON-delay time in the Honeywell step controller

3.2.2 Testing the Manual Reset Temperature High Limit Safety Control

Read the current boiler temperature boiler operating temperature setpoint

- Read and memorize the current setting of the manual reset temperature high limit safety control
- Turn the dial of the temperature control towards the boiler temperature setpoint until all energized heating stages turn off together. The HIGH TEMPERATURE alarm indicator light in the boiler controller panel should be ON.
- Turn the dial of the temperature control to its initial position. Press the red RESET button. The heating stages should energize staged in accordance with the programmed ON-delay time in the Honeywell step controller

3.3 Testing the Safety Relief Valve



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

Frequency:

Under normal operating conditions test valve every two (2) months. Under severe service conditions or if corrosion and/or deposits are noticed within the valve body, testing must be performed more often. A test must also be performed at the end of any non-service period.

Test the safety relief valve (preferably near its maximum pressure setting by holding the test lever fully open for at least 5 seconds to flush the valve seat free of sediment and debris. Then release and permit the valve to snap shut.

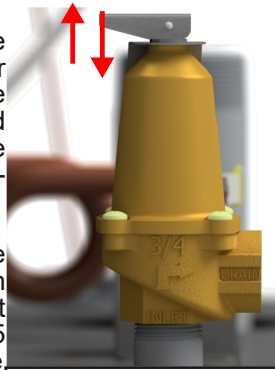


FIGURE 9

3.4 Element Inspection, Replacement, and Element Cleaning



Maintenance work must be performed by experienced personnel only. Ensure boiler is cold and drained and has no pressure or electricity.

- Close the water inlet and outlet stop valves (FIGURE 10)
- Turn off and lock out all boiler power supplies
- Ensure that the boiler drain valve (FIGURE 10) is piped to a safe point of discharge
- Open the boiler drain valve carefully and drain the pressure vessel. As soon as there is no pressure present in the vessel, open the bleeder valve (FIGURE 7) slightly to break the vacuum
- * Water Inlet and Outlet Stop Valves are not provided with the boiler

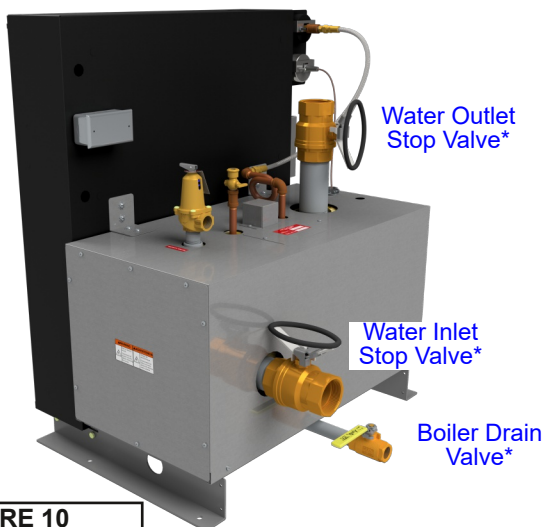
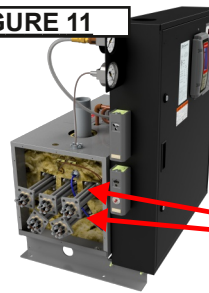


FIGURE 10

- Remove the left pressure vessel jacket end cap to access the heating elements
- Label the wires of heating elements and disconnect from the terminals
- Remove the four (4) nuts from each heating element flange and pull the elements slowly out of the pressure vessel
- Inspect and if necessary remove with a stiff wire brush rust, calcium or other deposits from the element rods
- Insert a flash light through one heating element opening

and inspect through the second opening the inner walls of the pressure vessel. It is normal that the inner walls of the vessel be covered by a layer of red, brown or black layer of rust. However, rough pressure vessel surface and layers of rust peeling off the surface are an indication for severe corrosion. In such case, contact a water treatment company.

FIGURE 11



Element Rods

- Install the heating elements back into the boiler pressure vessel, following the above procedure in reverse order.
- After installing the pressure vessel jacket end cap, turn on all power supplies of the boiler.
- Flip the red POWER switch of the boiler controller to the ON-position and leave the operating mode selector switch in the middle (OFF-position)
- Observe the LOW WATER alarm light in the boiler controller front panel. If it turns ON, the low water cut-off device works properly.
- Close the boiler drain valve, open the inlet and outlet valves and with the bleeder valve open, refill the boiler pressure vessel. Close the bleeder valve as soon as it discharges water.
- Press the LOW WATER RESET switch. The LOW WATER alarm light should turn OFF.
- The hot water boiler should be ready for operation.

3.5 Testing the Low Water Cut-Off Device

3.5.1 Testing the Electronic Low Water Cut-Off Device Only

Frequency: Any time.

- Press and hold the LOW WATER CUT-OFF TEST switch on the boiler controller panel
- After 3 seconds, the HEATING indicator light – if it was ON – will turn OFF; the LOW WATER alarm indicator light will turn ON
- Press the LOW WATER RESET switch to de-activate the LOW WATER alarm

3.5.2 Testing the Entire Low Water Cut-Off System (Electronic Low water Cut-Off Device + Low Water probe)

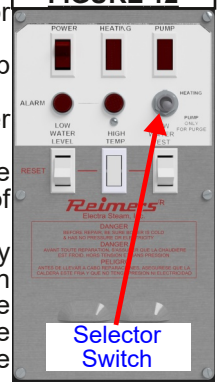
Frequency:

90 days after installation, then once every year

- Flip the boiler operating mode selector switch to the middle (OFF-position)
- Close the water inlet and outlet stop valves (FIGURE 10)
- Turn off and lock out all boiler power supplies
- Ensure that the boiler drain valve (FIGURE 10) is piped to a safe point of discharge
- Open the boiler drain valve carefully and drain the pressure vessel. As soon as there is no pressure present in the vessel, open the bleeder valve (FIGURE 7) slightly to break the vacuum.

- Flip the red POWER switch of the boiler controller to the ON-position and leave the operating mode selector switch in the middle (OFF-position)
- Observe the LOW WATER alarm light in the boiler controller front panel. If it turns ON, the low water cut-off device works properly.
- Close the boiler drain valve, open the inlet and outlet valves and with the bleeder valve open, refill the boiler

FIGURE 12



Selector Switch

- pressure vessel. Close the bleeder valve as soon as it discharges water.
- Press the LOW WATER RESET switch. The LOW WATER alarm light should turn OFF.
 - The hot water boiler should be ready for operation.

4. Troubleshooting

⚠ WARNING Ensure that the boiler is cold and has no pressure.
Electrical trouble shooting must be performed by a qualified electrician.

Boiler Status	Quick Fix
Control voltage to boiler turned on, POWER switch on boiler controller (5) turned ON, but no lights on the front panel of the boiler controller ON:	<ul style="list-style-type: none"> - Check circuit breaker or fuse of the wall outlet where the boiler control voltage circuit is hooked up to. If the circuit breaker is tripped or the fuse blown, check whether other appliances are plugged into outlets that are fed by the same circuit breaker/fuse. If that is the case, then plug those other appliances into outlets that are protected by other circuit breakers or fuses.
"Low Water" alarm light on boiler controller panel (5) ON:	<ul style="list-style-type: none"> - Press the "Low Water" reset button. If the "LOW WATER" alarm light remains on, check the water supply of the system. - Check whether the heating loop is filled with regular tap water and not with purified water (de-ionized, distilled, etc)
"HIGH TEMPERATURE" alarm light on boiler controller panel (5) ON:	<ul style="list-style-type: none"> - Press the "High TEMPERATURE" reset switch - If the temperature gauge indicates water temperature above the preset value, reduce water temperature setting and press the "HIGH TEMPERATURE" reset switch again.

If trouble shooting did not resolve problem, please contact our service technicians at:

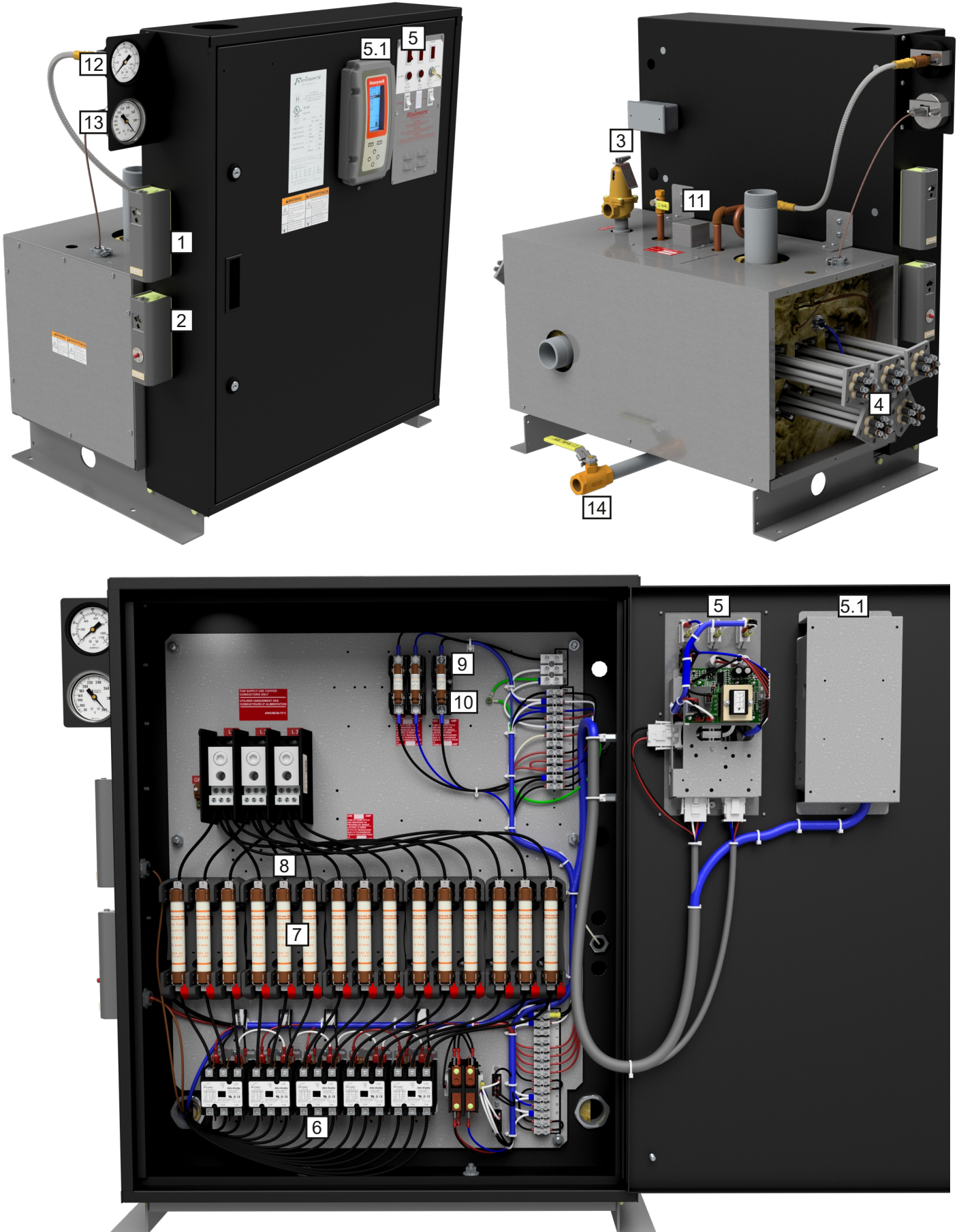
Phone: 540-662-3811
Email: techsupport@reimersinc.com

5. Parts list for HLR 120-180



WARNING

Use Reimers replacement parts. All components are designed and approved to be used in this Underwriters Laboratories listed and ASME National Board Stamped boiler. Failure to do so may cause serious injury or death.



NOTE: When ordering parts, please give boiler Model and Serial Number and detail shipping instructions.

ITEM NO.	PART NO.	DESCRIPTION	BOILER MODEL
1	02378	TEMPERATURE CONTROL AUTO RECYCLE 100 – 240°F	ALL MODELS
2	02599	TEMPERATURE CONTROL W/MANUAL RESET	ALL MODELS
3	02657	VALVE SAFETY 0.75", 100psi HOT WATER	NOTE 2
	02384	VALVE SAFETY 0.75", 30psi HOT WATER	NOTE 2
	02706	VALVE SAFETY 0.75", 60psi HOT WATER	NOTE 2
	02641	VALVE SAFETY 0.75", 75psi HOT WATER	NOTE 2
4	02608	ELEMENT 15KW, 208V	NOTE 1
	03267	ELEMENT 15KW, 240V	NOTE 1
	02609	ELEMENT 15KW, 380V	NOTE 1
	02610	ELEMENT 15KW, 480V	NOTE 1
	05116	ELEMENT 15KW, 600V	NOTE 1
	02022	FLANGE GASKET	ALL MODELS
5	20721-HLR	ELECTRONIC BOILER CONTROL	ALL MODELS
5.1	05012	ELECTRONIC BOILER & STEP CONTROLLER	ALL MODELS
6	02530	HEATING ELEMENT CONTACTOR 50A 120V 3PH	NOTE 2
7	02128	HEATING ELEMENT FUSE 250V, 50A UL	NOTE 2
	03383	HEATING ELEMENT FUSE 250V, 50A CSA	NOTE 2
	02454	HEATING ELEMENT FUSE 250V, 30A UL	NOTE 2
	04531	HEATING ELEMENT FUSE 250V, 30A CSA	NOTE 2
	02134	HEATING ELEMENT FUSE 600V, 30A UL/CSA	NOTE 2
	02453	HEATING ELEMENT FUSE 600V, 20A UL/CSA	NOTE 2
8	02142	HEATING ELEMENT FUSE BLOCKS 250V 60A	NOTE 2
	02613	HEATING ELEMENT FUSE BLOCKS 600V 30A	NOTE 2
9	02125	CONTROL CIRCUIT FUSE 250V 15A UL/CSA	ALL MODELS
10	02140	CONTROL CIRCUIT FUSE BLOCK	ALL MODELS
11	02630	ELECTRODE PROBE FITTING	ALL MODELS
12	02569	PRESSURE GAUGE	ALL MODELS
13	02567	TEMPERATURE GAUGE	ALL MODELS
14	03802	DRAIN VALVE 0.75"	ALL MODELS

NOTE 1: When ordering, specify voltage (V) and power (kw) of element.

NOTE 2: When ordering, specify model number of part and boiler serial number.