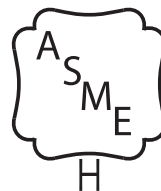


Saint Roch Optimajor 6,8,10,12,14 Section Boilers

Boiler Manual And Installation
Instructions for Atmospheric
Venting

**Please Read Instructions Carefully
Save for Future Reference**



Conforms to UL Std. 726

Danger

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 neighbor's phone. Follow the gas supplier's instructions.
- If you can not reach your gas supplier call the fire department
- Installation and service must be performed by a qualified licensed installer, service agency or the gas supplier.

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.

Manufactured by:
SAINT ROCH S.R.L
ITALY

Distributed By:
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REV. 522

Dear Customer:

Thank you for buying a Saint Roch Optimajor Commercial Boiler.

The Optimajor is a cast iron, oil or gas fired hot water boiler, using the famous 3-pass design. The boiler is simple, rugged and engineered for maximum heating efficiency. We realize that it is not possible to answer all questions about the Linear series boiler in this manual. Reading this installation manual does not make the reader an expert in all aspects of installation and operation, and does not replace the need for a qualified, licensed heating contractor. We urge you to contact your installing contractor or distributor if you are in question about any aspect of your boiler's performance. Our main concern is that you are satisfied with your boiler and its performance. We require that your contractor complete efficiency tests using instruments.

The controls and accessories listed in this manual are intended to serve as guidelines rather than specific recommendations. We realize that other makes and models of such devices are available and can be used as successfully as those we specify. The installing contractor is the best judge of a system's specific requirements, as well as the local availability of certain makes and models of controls and accessories. The preceding does not apply, however, to the equipment that comes with every boiler, such as the overheat control and pressure relief valve.

The installation of the specific devices supplied with every boiler is absolutely necessary to the safe operation of the boiler and protection of the heating system.

This Linear boiler has a limited warranty, a copy of which is provided with the boiler. Please be sure to return the warranty registration card as the warranty will be void without your boiler's serial numbers, date of installation and the name of your installer being on record in our files.

Thank you for purchasing our Saint Roch Optimajor boiler. If you have questions or comments, please don't hesitate to contact us immediately. Our goal is 100% customer satisfaction.

Sincerely,

Jim Quincy
President
QHT Inc.

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⚠ WARNING
IMPORTANT INFORMATION
Please read this page carefully.

Homeowner:

- For homeowner or person responsible for simple start-up and routine maintenance of the system. Instructions must be followed to assure proper operation of your boiler.

In addition, it is your responsibility to:

- Have boiler and burner installed by a qualified installer.
- Have boiler and burner serviced annually by a qualified service technician.
- Review and understand start-up and routine maintenance procedures with qualified service technician.
- Perform routine maintenance as described on page ?

Service Technician:

- For a qualified service technician who has the necessary equipment to check the boiler and system performance, and is responsible for start-up and service of boiler and system.
- All instructions in this manual must be followed to assure proper operation of this boiler.
- Annually service boiler and burner to assure proper operation. See page ? for service record.
- Review and explain start-up and routine maintenance procedures with homeowner.

⚠ WARNING

⚠ WARNING

⚠ WARNING

- Fire, explosion, asphyxiation and electrical shock hazard. Improper installation could result in death or serious injury. Read this manual and understand all requirements before beginning installation.
- Modification, substitution or elimination of factory equipped, supplied or specified components could result in death or serious injury.
- Installation or venting a boiler or any other oil appliance with improper methods or materials may result in serious injury or death due to fire or to asphyxiation from poisonous gases such as carbon monoxide which is odorless and invisible.
- Fire, Explosion, Asphyxiation, Electrical shock hazard, Flooding will result in damages such as electrical problems, corrosion, inoperative parts, mold and other unforeseen issues which can occur over time. Any equipment determined by a professional as damaged by a flood, defined as excess of water or other liquid, shall be replaced. Failure to follow these directions will result in a Hazardous Situation.

⚠ WARNING

Symptoms of CO poisoning include the following:

- | | |
|---------------------------------|---------------------------|
| • dizziness | • unclear thinking |
| • vision problems | • nausea |
| • shortness of breath | • weakness |
| • headache | • unconsciousness |
| • loss of muscle control | |

IF ANY OF THE SYMPTOMS OCCUR, VACATE THE PREMISES IMMEDIATELY AND CONTACT A QUALIFIED HEATING SERVICE COMPANY, THE GAS COMPANY OR THE FIRE DEPARTMENT.

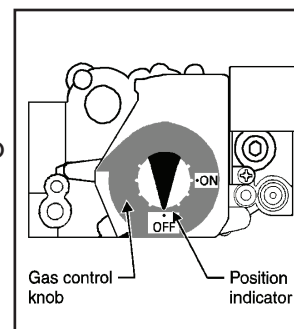
United States installations must comply with:

- State and local plumbing, heating and electrical codes.
- National codes where applicable.
- Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1, – latest edition, when required.
- National Electrical Code, ANSI/NFPA 70, – latest edition and any additional national, state or local codes.

HOMEOWNER INFORMATION FOR GAS

TO START UP THE APPLIANCE

1. STOP! Read the safety information on the side of the boiler. DO NOT START THE BOILER UNLESS ALL CLEANOUT DOORS ARE SECURED AND SEALED. (Skip to step 9 for oil burning boilers)
2. Set thermostat to lowest setting
3. Turn off all electric power to the appliance
4. Do not attempt to light the burner by hand
5. Turn the manual shut off on the combination gas valve clockwise to the off position.
6. Wait five minutes to clear out any gas. Then smell for gas, including near the floor.



If you smell gas, STOP!

- 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 neighbor's phone. Follow the gas supplier's instructions.
 - If you can not reach your gas supplier call the fire department
7. If you don't smell gas, go to the next step.
 8. Return the manual valve on the combination gas valve to the on position by reversing step "5".
 9. Turn on all electric power to the appliance.
 10. Set thermostat to the desired setting.
 11. If the burner fails to light you may press the reset button once. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier. DO NOT ATTEMPT TO START THE BURNER WHEN EXCESS GAS HAS ACCUMULATED, WHEN THE UNIT IS FULL OF VAPOR, OR WHEN THE COMBUSTION CHAMBER IS VERY HOT.

NOTE: ALWAYS KEEP THE MANUAL FUEL SUPPLY VALVE SHUT OFF IF THE BURNER IS SHUT DOWN FOR AN EXTENDED PERIOD OF TIME.

TO TURN OFF GAS APPLIANCE

Set the thermostat to the lowest setting.
Turn off electric power to the appliance if service is to be performed.
Turn the gas control valve to the off position.

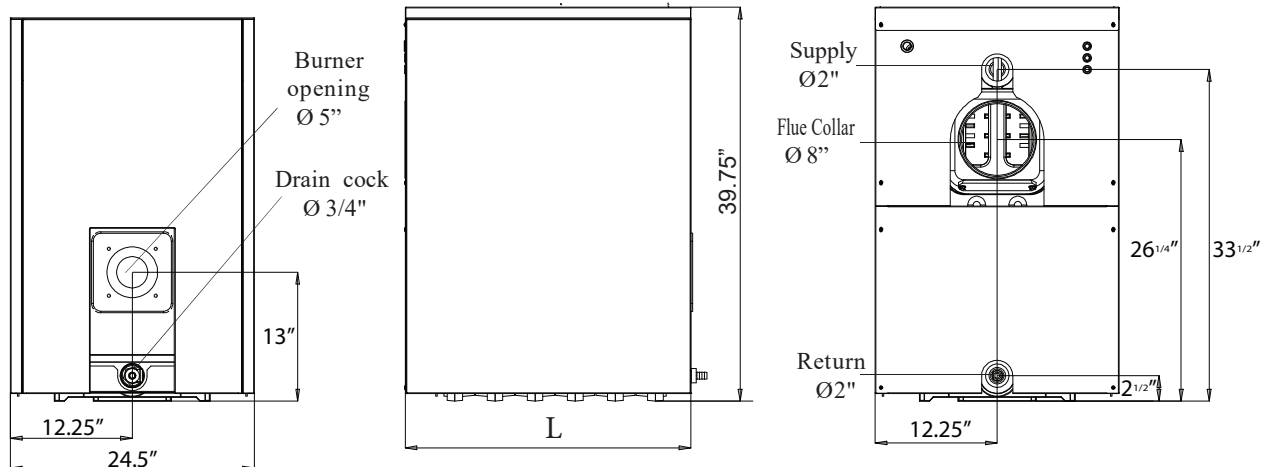
1. General Information

The St. Roch Optimajor series boilers are wet base design, sectional, cast-iron boilers for forced hot water heating systems. The Optimajor boilers are designed for firing with oil and deliver high efficiencies through unique design and construction.

The Optimajor series boilers are shipped from the factory in assembled blocks and each boiler can range from 6 to 14 sections. The sections can then be disassembled before delivery to the jobsite by QHT and then field assembled. The boiler jacket, burner and controls are packed separately for shipping.

Note: All equipment should be inspected upon delivery, and any damage or shortage should be reported immediately.

Product Code	# of Sections	Heating Capacity (BTU/HR)	Net Output (BTU/HR)	Length (Inch)	Width (Inch)	Height (Inch)	Water Content (gal)	Pressure Drop (in. w.c.)	Weight (Lbs)	Efficiency (%)
OPTI GLP 6	6	267,000	232,000	29"	24.5"	39.75"	13	1.09	871	87
OPTI GLP 8	8	377,000	328,000	37"	24.5"	39.75"	17	2.14	1091	87
OPTI GLP 10	10	479,000	417,000	45"	24.5"	39.75"	20	3.51	1312	87
OPTI GLP 12	12	588,000	512,000	53"	24.5"	39.75"	25	5.20	1532	87
OPTI GLP 14	14	667,000	580,000	61"	24.5"	39.75"	29	7.22	1752	87



2. Boiler Block Assembly

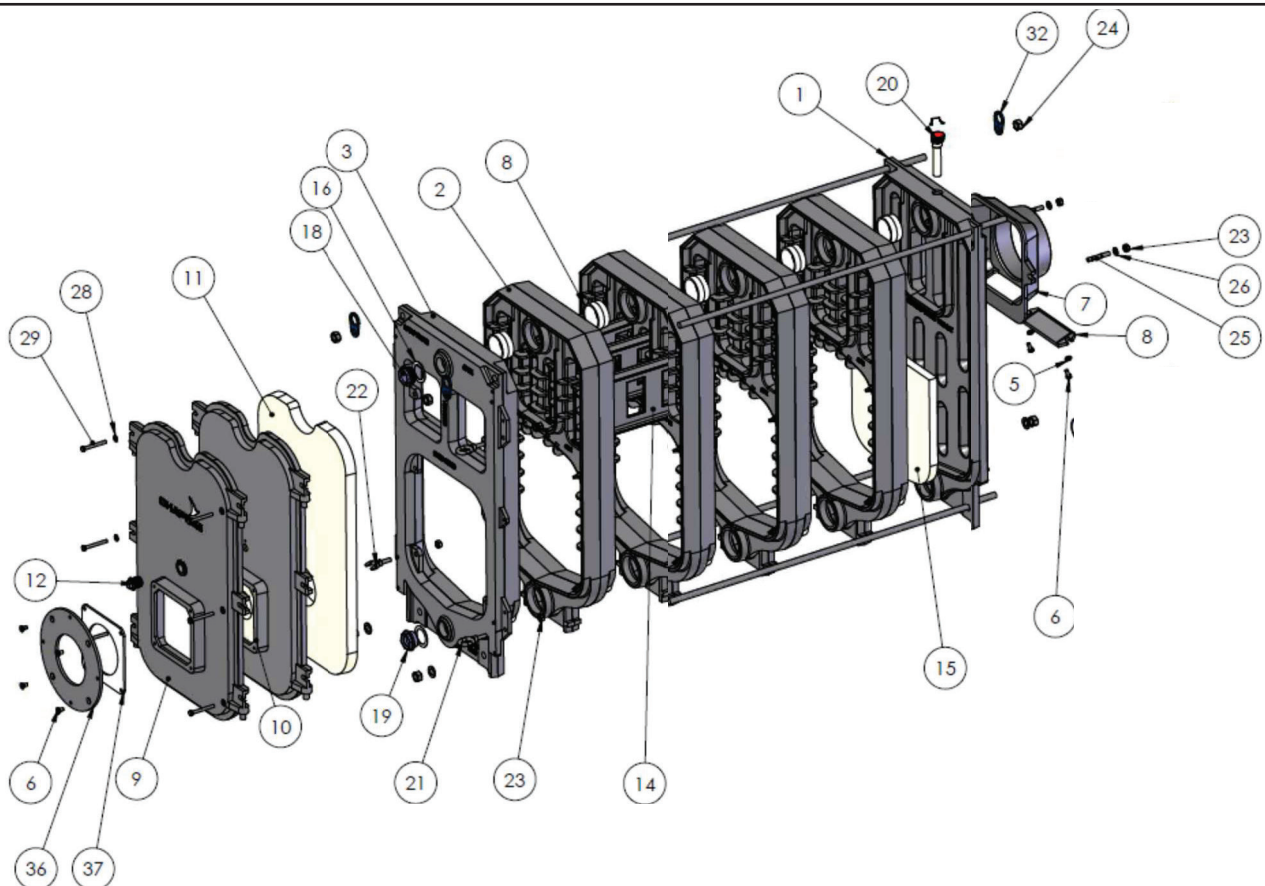
All OPTIMAJOR series boilers are shipped from the factory in assembled boiler blocks. If, however, the block needs to be split into sections for ease of delivery, please read the following:

To assemble split blocks, move sections into parallel and facing each other. Sections may be slid along boards placed underneath the sections. Inspect nipple ports for damage or burrs. Remove any burrs by sanding the port very lightly. Wipe the push nipples and nipple ports with a clean cloth. Apply a film of nipple compound to both the nipple and port. Install the nipple in the port and then seal by tapping with a hammer cushioned with a block of wood. Apply adhesive to ribs of one section only and slide sections together. Install the four draw rods and draw the sections together evenly (measure with yardstick). Draw the sections together until sections make gasket-to-iron contact at a point around the top and bottom ports of each section.

DO NOT OVER TIGHTEN TIE RODS

Boiler Block Assembly:

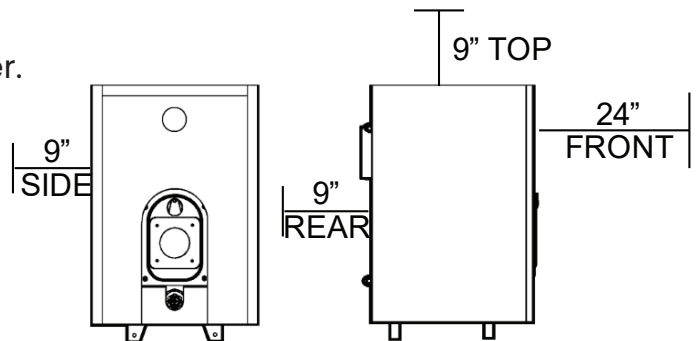
- | | | |
|-------------------------------|----------------------------|------------------------------|
| 1. Rear Section | 11. Boiler Door Insulation | 22. Front Door Hinge Fork |
| 2. Intermediate Section | 12. Sight Hole Plug | 23. Nuts (Qty 2) |
| 3. Front Section | 13. | 24. Draw Rod Nuts (Qty 4) |
| 4. | 14. Baffles | 25. Stud (Qty 2) |
| 5. Rear Cleanout Bolt | 15. Rear Firing Wall | 26. Stud Washers (Qty 2) |
| 6. Rear Cleanout Nut | 16. Upper Bushing Gasket | 27. Draw Rod Washers (Qty 4) |
| 7. Exhaust Collar | 17. Burner Door Insulation | 28. Boiler Door Bolt (Qty 4) |
| 8. Rear Cleanout Plate | 18. 1/4" X 1 1/4" Bushing | 29. |
| 9. Front Door Insulation Bolt | 19. 1 1/4" Plug | 30. |
| 10. | 20. Front Door Hinge (3) | 31. |
| | 21. 1/4" X 1 1/4" Bushing | 32. Eye Hook |



3. Boiler Location

The following are the minimum clearances to construction or combustible materials:

1. 9" from the top, sides, and rear of the boiler.
2. 18" from the flue pipe in any direction.
3. 24" from the front of the boiler.



The boiler should be installed on a level, flat concrete floor or pad that is structurally sound and will support the combined weight of the boiler when filled with water. This boiler is designed to be installed on a noncombustible flooring only. The boiler should be installed as close to the chimney as possible. Locate the boiler in an area that gives easy access to the rear of the boiler. To provide good serviceability, the boiler should be installed using minimum recommended service and accessibility clearances as previously listed in the manual. Under no circumstances should the unit be installed next to combustible materials with clearances less than listed in installation clearances in the install manual.

To assemble the two section sets into a boiler block, you will need the tool kit, two clamping threaded rods, pry bar, a plastic or wooden mallet, nipples, pipe dope and tubes of sealant.

DANGER

The boiler must be located on a non-combustible floor. A smooth, level concrete floor is recommended. Locate the boiler as close as possible to the chimney. If the boiler is installed on combustible flooring, consult local authorities for proper method of covering floor. The boiler must not be installed on carpeting.

Caution: Do not store or use flammable materials, chemicals or flammable liquids, especially gasoline, in the vicinity of this heating appliance.

PROVISIONS FOR COMBUSTION AIR AND VENTILATION AIR MUST BE IN ACCORDANCE WITH SECTION 5.3, "AIR FOR COMBUSTION AND VENTILATION", OF THE NATIONAL FUEL GAS CODE, ANSI Z223.1, OR APPLICABLE PROVISIONS OF THE LOCAL BUILDING CODES.

DO NOT INSTALL THE BOILER UNTIL PROPER COMBUSTION AIR HAS BEEN ARRANGED.

WARNING

Boiler is certified as an indoor appliance. Do not install boiler outdoors or locate where it will be exposed to freezing temperatures.

4. Installation of Boiler Trim Components

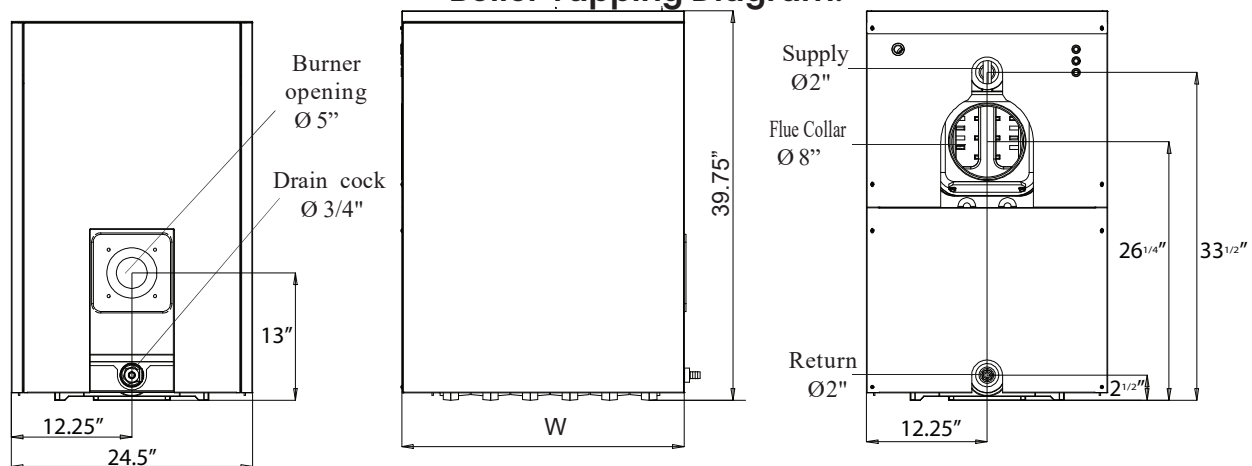
Trim Kit Components:

- 1 – Tridicator pressure/temp gauge
- 1 – $\frac{3}{4}$ " X 3" Nipple
- 1 – 30 PSI pressure relief valve
- 1 – $\frac{3}{4}$ " Boiler drain
- 1 – Cera-fiber Pad for bottom of the combustion chamber
- 1 – $\frac{3}{4}$ " Plugs
- 1 – $\frac{3}{4}$ " 90° Elbow
- 1 – $\frac{3}{4}$ " Electrowell

(Gas systems only)

- 1-Double acting barometric damper with manual reset spill switch

Boiler Tapping Diagram:



1. Install limit control sensor in rear section TOP using $\frac{3}{4}$ " immersion well. All tapings and joints should be sealed with piping compound. The limit can be adjusted up to 220° F, and should be set to the desired temperature by the installer. The differential is also adjustable between 5 and 30 degrees. It should be set as close to 30 degrees as possible to prevent short cycling of the boiler. Run the sensor from behind the control to the immersion well and fix it according to manufacturer's instructions.
2. Install Pressure Relief Valve in opposite, manifold using 3" nipple and $\frac{3}{4}$ " elbow, Pipe must discharge to the floor.
3. Install $\frac{3}{4}$ " boiler drain in lower right rear tapping.
4. Install combination pressure/temperature gauge in the manifold. The gauge must be tightened using a wrench and not your hand.
5. **Place the 14" x 24" Cera-fiber blanket on the floor of the combustion chamber of the boiler**

SAFETY RELIEF VALVE

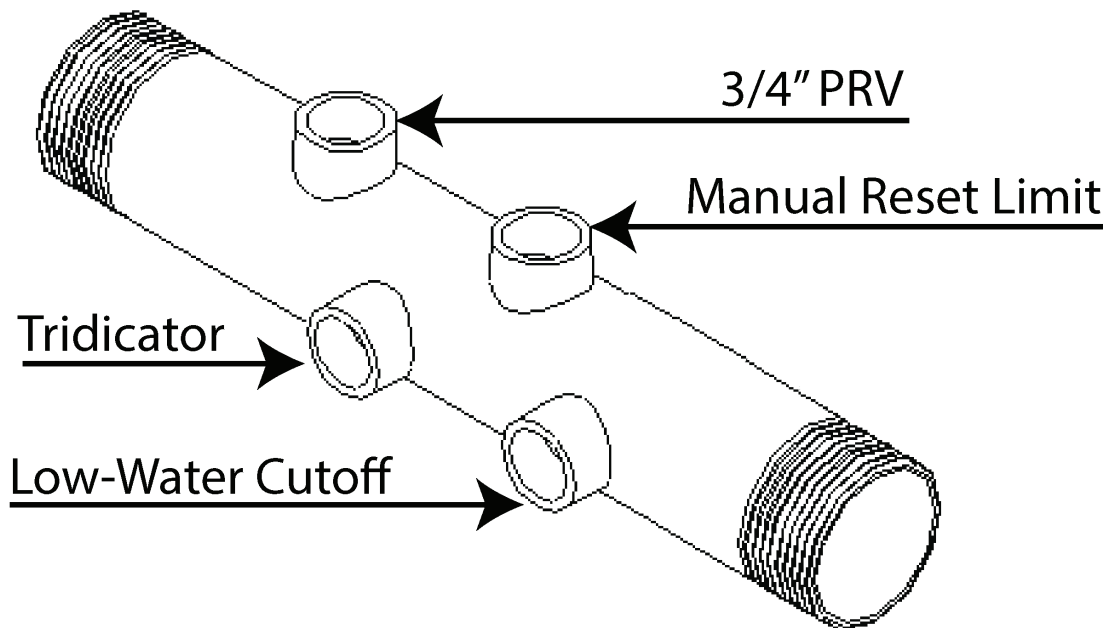
1. The safety relief valve should be piped into one of the tapings on manifold in the rear of the boiler
2. The relief valve should be installed using the hardware supplied in the trim kit without valving between the PRV and the boiler.
3. Pipe the discharge for the safety relief valve with copper tube to the floor and make sure installation of the pipe conforms to local codes.

4. Installation of Boiler Trim Components (Continued....)

All piping must conform to state and local codes.

The supply and return for Optimajor boilers 2" NPT. Be sure to provide unions and isolation valves at the manifold inlet and outlet of the boiler, so the boiler may be readily isolated for service.

Each Optimajor boiler will come with a 4 port supply manifold. This manifold is used to install the Tridicator, PRV, and Manual Reset LWC. The manifold is pictured below.



Install the provided pressure relief valve vertically in the manifold. Pipe the discharge directly to a drain, if possible. If not, the discharge should be piped to the floor. In either case, the discharge pipe should be of the same diameter as the outlet of the relief valve, with no valves or obstructions to impede overflow from the boiler. Install the Tridicator in another port so that it can easily be read. Lastly install the Manual Reset LWC in the header so that it can easily be reached for service.

Install manual and/or automatic air venting devices at the high points in the system to eliminate trapped air.

The weight of all piping should be supported by suitable hangars and floor stands, not by the boiler.

It is recommended that the make-up water line have a backflow preventer and a pressure-reducing valve to reduce line pressure to 10 to 15 psi installed adjacent to the boiler.

NOTE: If the heating system is to be filled with antifreeze, use only formulations expressly made for hydronic heating systems (such as propylene glycol). Do not use automotive types of antifreeze (ethylene glycol). Use of antifreeze will alter system output and characteristics. Consult factory rep's for details or assistance.

Clearance for hot water pipes are 1 inch to combustibles.

5. Piping The Boiler

All piping must conform to state and local codes. Page 11 shows the location and size of the boiler tappings. It is recommended to install unions and gate valves at the inlet and outlet of the boiler, so it may be readily isolated for service.

For Canadian installations, a low water cut off is required if the boiler is installed above the level of radiation. Even if the boiler is installed below the level of radiation it is strongly recommended that a low water cut off be installed. Install manual and/or automatic air venting devices at the high points in the system to eliminate trapped air. The weight of all piping should be supported by suitable hangers and floor stands, not by the boiler's purging/expansion station. Clearance for hot water pipes are 1 inch to combustibles. The make-up water line must be piped into the boiler and be fitted with a backflow preventer and a pressure reducing valve to reduce line pressure to 10 to 15 psi.

In the case of a gas installation, the boiler should be installed such that the gas ignition system components are protected from water (dripping, spraying, etc.) during appliance operation and service (circulator replacement, condensate trap, control replacement, etc.).

If the boiler is to be used in conjunction with a chilled water system, it must be piped with the appropriate valves to ensure the chilled medium does not enter the boiler. If the boiler is connected to heating coils in an air handling system, where the coils could be exposed to cold air circulation, provisions for freeze protection control must be installed. The boiler must have flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.

NOTE: If the heating system is to be filled with antifreeze, use only formulations expressly made for hydronic heating systems (such as propylene glycol). Do not use automotive types of antifreeze (ethylene glycol). Use of antifreeze will alter system output and characteristics. Consult a factory representative for details or assistance.

6. Intake Venting

1. Be certain adequate air is available for combustion and ventilation.

a.) **Boiler located in unconfined space:**

Installation in large areas, such as basements, can usually be assumed to provide sufficient air.

b.) **Boiler located in confined space : (See Figure A. on page 14)**

If all air for combustion and ventilation is to come from within the building:

Two (2) openings shall be provided with one (1) opening commencing within 12 inches of the ceiling and one (1) opening commencing within 12 inches of the floor of the enclosure. These openings shall not be located closer than 3 inches from either the top or bottom of the enclosure and shall be open to areas connecting freely with the outdoors. The area of each opening shall not be less than one square inch per 1000 BTU/HR. of total input rating of all appliances within the enclosure; with a minimum of 100 square inches for each opening.

If all the air for combustion and ventilation is to come from outside the building:

Two (2) openings shall be provided with one opening commencing within 12 inches of the top and an opening commencing within 12 inches of the bottom of the enclosure. These openings shall not be located closer than 3 inches from either the top or bottom of the enclosure, and shall connect directly or by ducts too the outdoors. The area of each opening shall be equal to one square inch per 4000 BTU/HR of total input rating. If ducts are used to convey the air, vertical ducts require areas of one square inch per 4000 BTU/HR. Horizontal ducts require one square inch per 2000 BTU/HR. Ducts shall have the same cross sectional area as the full area of the louver openings.

The upper opening is essential for maintenance of proper air circulation with the boiler and to maintain proper control temperatures. When a duct is used for ventilation, check for louver free net area and correct for screen resistance to ensure that the sufficient ventilation area has been satisfied. DO NOT INSTALL THE BOILER UNTIL PROPER COMBUSTION AIR HAS BEEN ARRANGED.

6. Intake Venting (Continued...)

c.) **Boiler located in a room under negative pressure:**

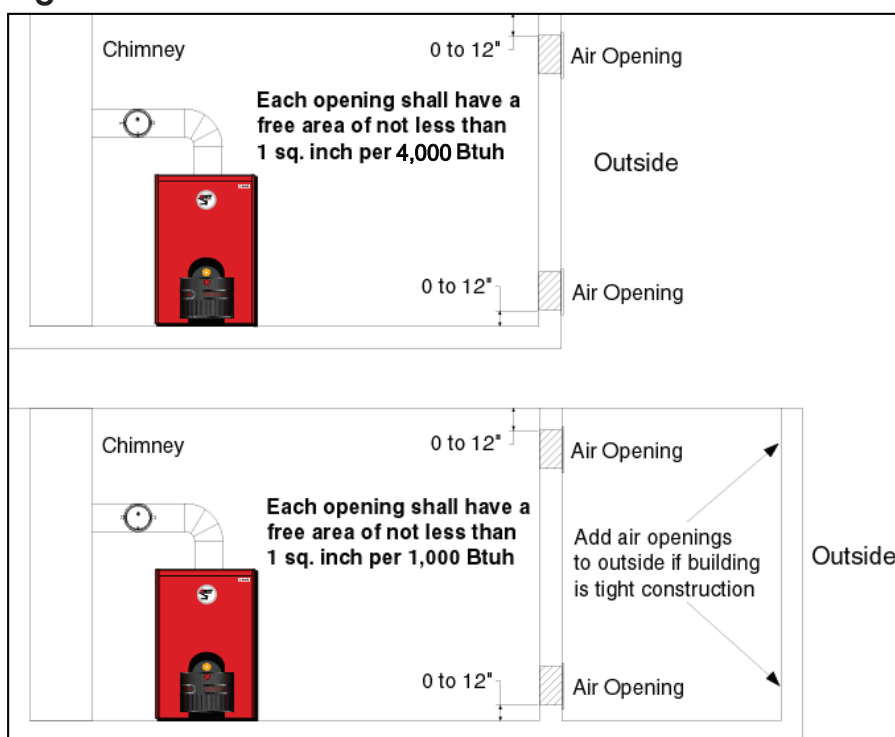
If the boiler is to be installed within a home where the operation of exhaust fans, attic fans, kitchen ventilation systems, clothes dryers or fireplaces may create severe negative vent pressures causing unsatisfactory combustion and venting, special provisions should be made for additional make-up air to supply the other air requirements. If building is of tight construction, combustion air requirements may not be met and combustion air ducts from outside may be necessary. Please refer to NFPA No. 31.

Tight Construction (as defined by ANSI Z223.1):

1. Walls and ceilings exposed to the outside atmosphere have a continuous water vapor retarder with a rating of 1 perm or less with openings sealed with gaskets, etc..
2. Weather-stripping has been added on open able windows and doors, and caulking or sealants are applied to areas such as: joints around windows and door frames, between sole plates and floors, between wall ceiling joints, between wall panels, at penetrations for plumbing, electrical, and gas lines, and in other openings.

If the building is of tight construction, air openings must be provided from the outside, with appropriate sizing depending on amount of BTU/HR as shown in Figure A. The boiler room must never be under a negative pressure, even if the appliance is installed as direct vent. Always provide air openings sized not only to the dimensions required for the firing rate of all appliances, but also to handle the air movement rate of the exhaust fans or air movers using air from the building or boiler room.

Figure A.



7. Exhaust Venting

The Optimajor boiler is a high efficiency unit that requires proper venting. The boiler must be vented to the outdoors by means of a tile lined masonry or an approved pre-fabricated chimney of the size and height recommended by the manufacturer or by a listed "power venting" unit which provides draft by mechanical venting.

The chimney discharge opening must be located at least 24 inches above any part of the building structure within 10 feet of the chimney. Be sure the chimney and smoke pipe don't become obstructed by squirrels, bird nests, soot buildup, chimney liner deterioration, etc. The "power ventor" system should be installed on the leeward side of the building. Very specific requirements must be met concerning clearances from combustibles and distances from doors and windows. Please consult with manufacturer of "power ventor" for this information. In any case, the "ventor" must be installed by a licensed burner mechanic and done in accordance with local codes. The B-40 boiler is a very low stack temperature boiler (between 320 and 400F gross stack temp.) so caution should be used when connecting to an outside built chimney. Should you have concern that the flue gases could condense, then you should consider using a listed, "power venting" unit. If "power venting" is used to discharge flue gases, then the power vent unit should be equipped with a postpurge control as well as delay-off, timing control to prevent problems with fogging and nozzle post drip.

Note: 88% steady state efficiency is achieved when flue gas contains over 12.5% CO₂ and the gross stack temp. is below 350F.

The smoke-pipe connection from the boiler to the chimney should be as short as possible, with a minimum number of elbows. The vent pipe must have a vertical rise of at least 1/4 inch per foot of horizontal run. The vent pipe must be of the same diameter as the flue outlet on the boiler. The chimney connector should have a minimum thickness of 24 gauge, corrosion resistant (galvanized) steel, assembled with a minimum of three (3) sheet-metal screws, and sealed with high temperature silicon at each joint. In most cases a barometric draft control isn't recommended as the B-40 is designed to be pressure-fired. However, one may be needed if the boiler is being used in a high draft situation.

7.1 Blocked Flue Switch (Canadian Installations Only)

1. Pierce a 5/8" hole into the vent pipe near the appliance outlet. Remove one of the securing nuts from the pipe of the safety switch. Tighten the other securing nut onto the pipe as far as possible.
2. Insert the threaded pipe end into the pierced hole, then install the securing nut, then install the securing nut, which was removed in step 1, and tighten securely.
3. Please consult the wiring section of this manual for the wiring of the blocked flue switch.

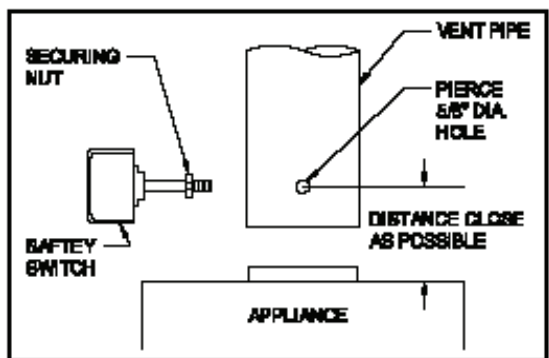


Figure 1

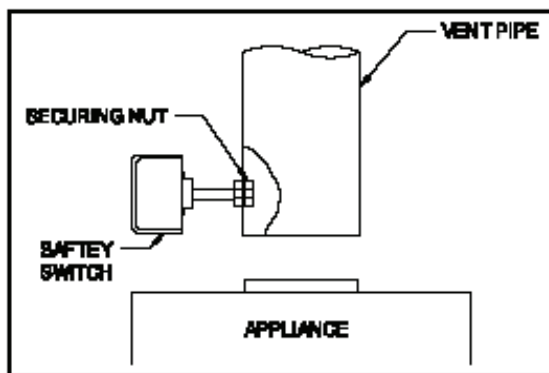


Figure 2

7.2 Common Exhaust Venting

Common Vent Exhaust:

If this boiler is replacing one which was part of a common venting system, it is likely that the vent is too large to vent the appliances still attached to it. To prevent this, at the time of removal, the following steps shall be followed with each appliance remaining connected to the common venting system. Place each appliance in operation, while the other appliances remaining connected to the common venting system are not in operation.

1. Seal any unused openings in the common venting system.
2. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion or other deficiencies which could cause an unsafe condition.
3. Insofar as practical, close all building doors and windows and all doors between the space in which the appliance remaining connected to the common venting system is located and other spaces of the building. Turn on any appliance not connected to the common vent system. Turn on all exhaust fans except for summer exhaust fans. Close the fireplace damper if applicable.
4. Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so appliance will operate continuously.
5. Test for spillage at the barometric damper opening after 5 minutes of main burner operation. Use the flame of a match or candle, or smoke from a cigarette, cigar or pipe.
6. After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return the doors, windows, exhaust fans, fireplace dampers and any other gas-burning appliance to their previous condition of use.
7. Any improper operation of the common venting system should be corrected so the installation conforms with the National Fuel Gas Code, ANSI Z223.1 and/or CAN/CGA B149, Installation Codes. When resizing any portion of the common venting system, the common venting system should be resized to approach the minimum size as determined using the appropriate tables in Part 11 of the National Fuel Gas Code, ANSI Z223.1, and/or CAN/CGA B149, Installation Codes.

7.3 Exhaust Venting With Gas

For boilers connected to gas vents or chimneys, vent installations shall be in accordance with part 7, Venting of Equipment, of the National Fuel Gas Code, ANSI Z223.1 or Section 7, Venting Systems and Air Supply for Appliances, of the CAN/CGA B149, Installation Codes, or applicable provisions of the local building codes.

Vent connectors serving appliances vented by natural draft shall not be connected into any portion of mechanical draft systems operating under positive pressure.

8. Burner Setup

Good, reliable operation with a minimum of service, starts with attention to the small details: **Please review burner manufacturer manuals for proper install guidelines!**

Oil:

1. Setting the nozzle position and electrodes to the manufactures specs using the manufacturer's gauges.
2. Installing a quality micron filter at the burner.(replace old oil lines and clear sludge)
3. Making careful/tight flare connections, without couplings, on oil suction line.
4. Checking fuel pump pressure is set to specs on following page.
5. Checking draft at the breeching to insure it is adequate to overcome flue gas resistance. (-.02 to -.04 in. w.c.)
6. Setting the air band properly with well maintained instruments. A good target is 12% to 12.5% of (CO₂).
7. To achieve the rated efficiency level the CO₂ should be set to 12.5% CO₂.

To ensure proper burner setup, gauges should be used to check things such as the pump pressure, CO₂ levels, CO levels, etc...

Gas:

1. Checking the electrode, orifice size, and flame rod settings against manufacturer's specs to insure proper operation.
2. Installing properly sized gas piping according to BTU input required and length of gas line run.
3. **Making sure there is proper manifold pressure before and after the gas valve using a calibrated manometer.**
4. Checking draft at the breeching to insure it is adequate to overcome flue gas resistance. (-.02 to -.04 in. w.c.)
5. Setting the air band properly with well maintained instruments. A good target is 9.5% to 10.0% of (CO₂) for natural gas, or 11.0% to 11.5% of (CO₂) for LP gas.

NOTE: Elevated CO during combustion analysis for the first few hours of operation from off gassing due to insulation in the combustion chamber.

8.1 Oil Burner Setup

This page is only for boilers using an oil burner. If a gas burner is being used, please refer to page 17 for the proper setup of the burner and gas lines.

BURNER MANUFACTURER: RIELLO					
Boiler Model:	OPTI GLP 6	OPTI GLP 8	OPTI GLP 10	OPTI GLP 12	OPTI GLP 14
Burner Model:	40 F10	40 F20	40 F20	40 F20	40 F20
Firing Rate (GPH):	2.23	3.13	4.00	4.90	5.54
Insertion Depth:	3.5"	5"	5"	5"	5"
Nozzle:	1.75X60	2.50X60	3.00X60	3.50X60	4.00X60
Spray Pattern:	B	B	B	W	W
Pump Pressure:	190 psi	175 psi	190 psi	205 psi	205 psi
Turbulator:	4	0	1	3	5
Air Gate:	4.00	2.75	3.50	4.50	5.25

8.2 Gas Burner Setup

This page is only for boilers using a gas burner. If an oil burner is being used, please refer to page 16 for the proper setup of the burner.

BURNER MANUFACTURER: RIELLO										
Boiler Model:	OPTI GLP 6		OPTI GLP 8		OPTI GLP 10		OPTI GLP 12		OPTI GLP 14	
Burner Model:	40 G400		40 G900		40 G900		40 G900		40 G900	
Input (MBH):	306		430		550		675		775	
Fuel Type:	Nat	LP	Nat	LP	Nat	LP	Nat	LP	Nat	LP
Orifice:	C4	C15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manifold Pressure:	4.46"	3.72"	1.5"	1.5"	1.4"	2.1"	1.8"	2.6"	2.2"	3.2"
Head Setting:	3	3	1	1	2	2	3	3	4	4
Air Gate:	3.4	3.4	1.8	3	2.2	3.2	2.8	3.7	3.5	4.1

Note: Consult burner manufacturers literature for gas manifold diagram and controls.

To determine how much gas is coming into the burner, or to set the gas meter correctly, the following formula can be used.

$$\text{Ft}^3/\text{hr} = [3600/(\text{sec. Per rev.})] * (\text{Size of gas meter})$$

The chart to the right can be used to determine the flow rate depending upon the time per revolution and the size of the gas meter dial.

Seconds Per Revolution	Size of Gas Meter Dial (Cubic Foot)		
	.5	1	2
20	90	180	360
25	72	144	288
30	60	120	240
35	51	103	206
40	45	90	180
45	40	80	160
50	36	72	144
55	33	65	131
60	30	60	120

9. Gas Line Piping

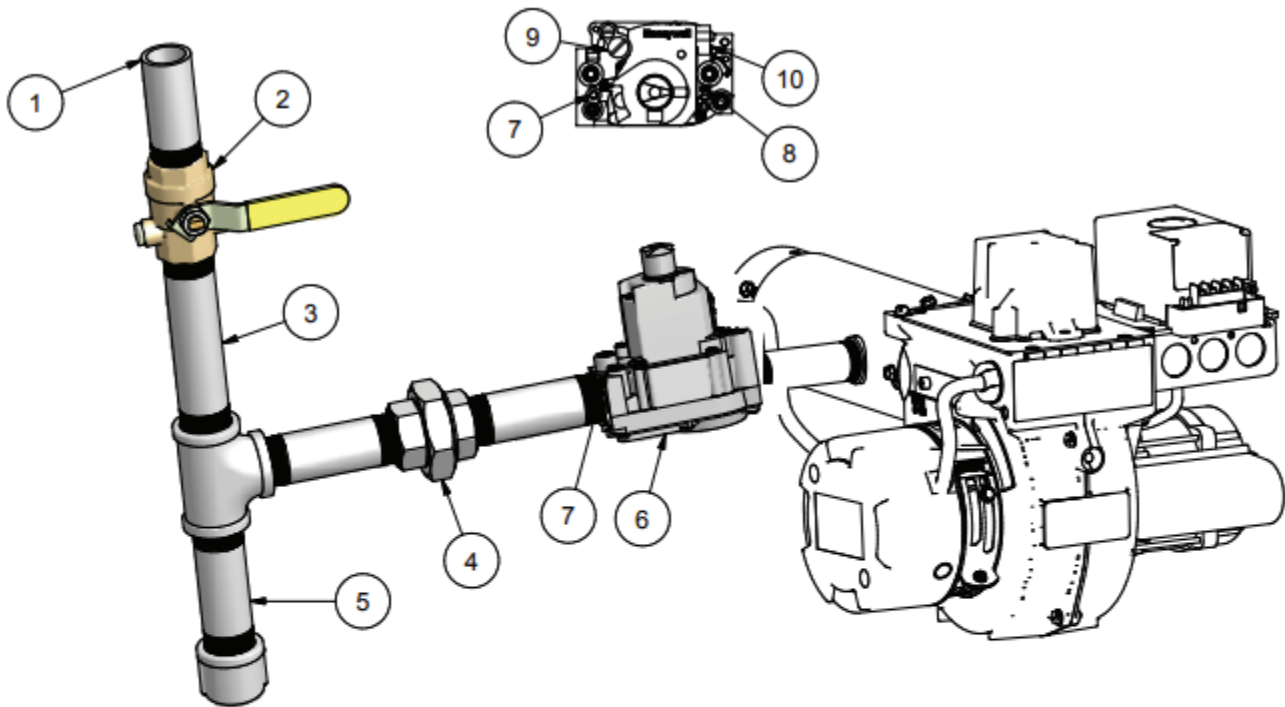
Gas supply piping is to be sized and installed properly in order to provide a supply of gas sufficient to meet the maximum demand without undue loss of pressure between the meter and the boiler. Consult with the *National Fuel Gas Code ANSI Z223.1* for proper sizing of gas piping for various lengths and diameters.

Locate a drop pipe adjacent to, but not in front of the boiler. Locate a tee in the drop pipe at the same elevation as the gas inlet connection to the boiler. Extend the drop line with a nipple towards the floor and cap to form a sediment trap. Install a shut off valve before the tee with sediment trap and a union after the tee before the combination gas valve.

When installing the boiler, make sure a pipe compound resistant to the action of liquefied petroleum is used. Check piping for leaks. Always check leaks with a water and soap solution. **DO NOT USE A FLAME FOR CHECKING GAS LEAKS**

The boiler and its individual shut-off valve must be disconnected from the gas supply piping during any pressure testing of that piping at test pressures in excess of 1/2 psi.

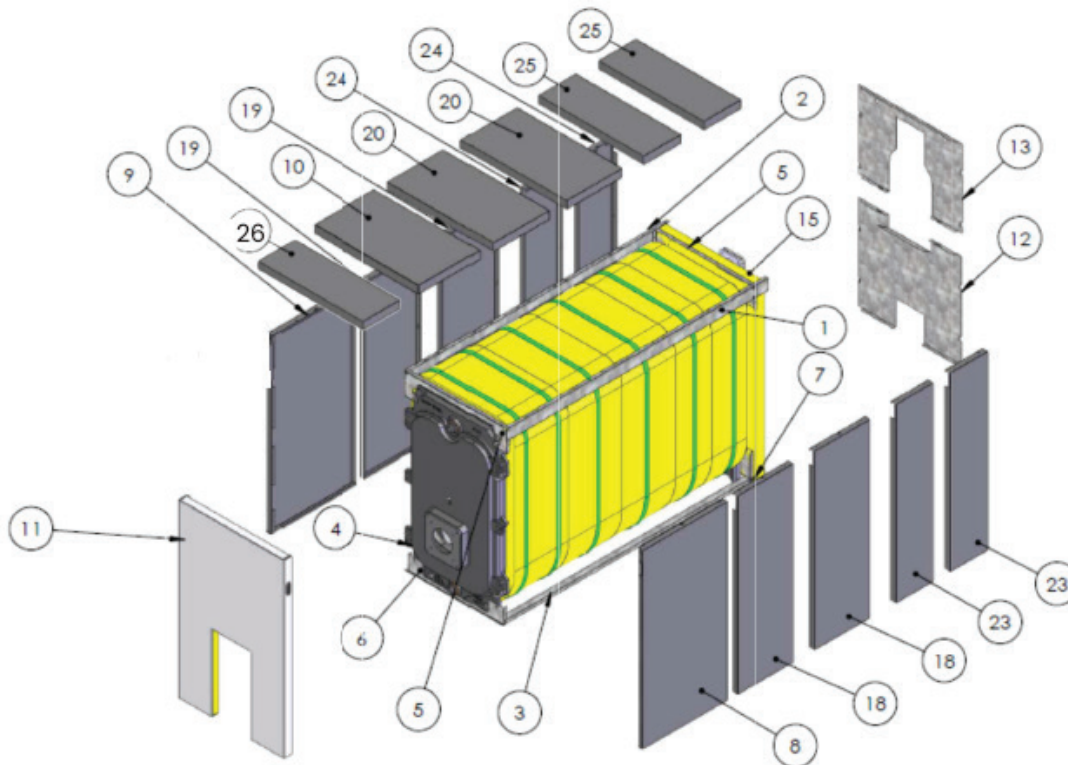
Connecting gas supply piping to burner



- | | | | |
|---|--|----|---------------------------------|
| 1 | Pipe to meter or branch | 5 | Sediment leg |
| 2 | Main manual gas shutoff valve | 6 | Burner combination gas valve |
| 3 | Use clean, burr-free black iron pipe and malleable iron fittings | 7 | Upstream pressure tap, 1/8" |
| 4 | Ground joint union | 8 | Outlet pressure tap, 1/8" |
| | | 9 | Gas regulator access screw |
| | | 10 | Gas valve electrical connection |

10. Boiler Jacket Assembly

NOTE: All piping, boiler controls, gauges and valves must be installed before the jacket has been assembled on the boiler. Refer to the following page to clarify these boiler jacket assembly instructions.



Boiler Jacket Assembly:

1	Top Casing Rail (R)
2	Top Casing Rail (L)
3	Bottom Casing Rail (R)
4	Bottom Casing Rail (L)
5	Upper Brackets
6	Lower Bracket Front

7	Lower Bracket Rear
8	Common Panel (R)
9	Common Panel (L)
10	Common Panel (Top)
11	Insulated Front Panel
12	Lower Plate (Rear)

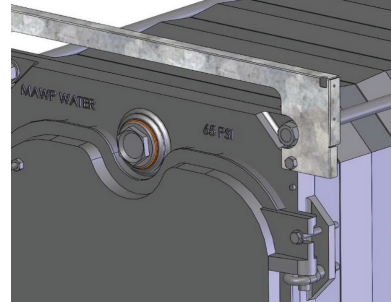
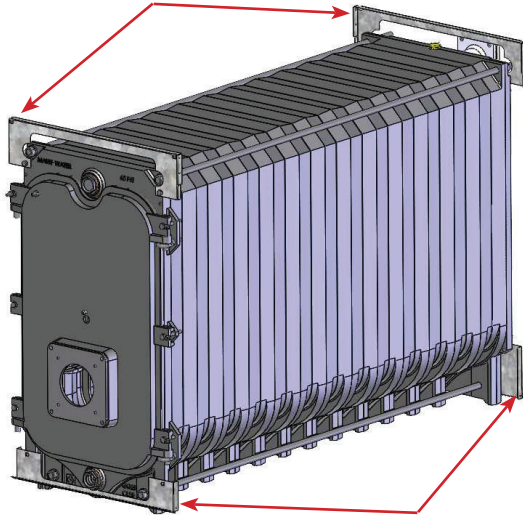
13	Upper Plate (Rear)
14	Block Insulation
15	Insulation (Rear)
18	Ext. 3 Side Panel (R)
19	Ext. 3 Side Panel (L)
20	Ext. 3 Panel (Top)

23	Ext. 2 Side Panel (R)
24	Ext. 2 Side Panel (L)
25	Ext. 2 Panel (Top)
26	Front Panel (Top)

10. Boiler Casing Continued

STEP 1

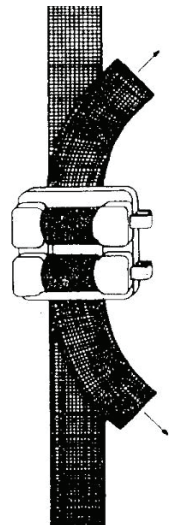
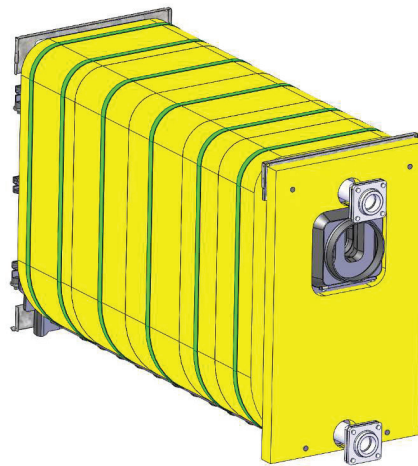
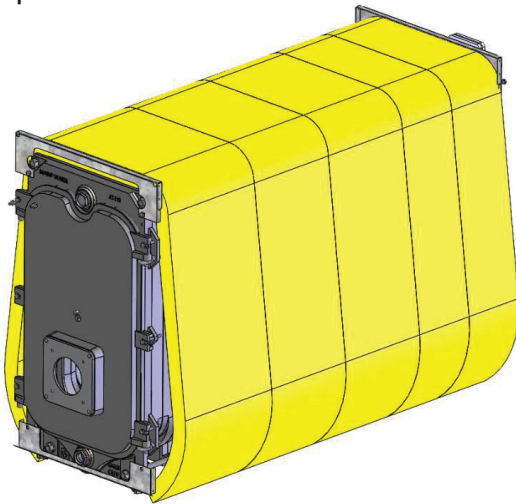
Install top and bottom brackets on front and back tie-rods as shown below.



**** MAKE SURE SHELF OF BRACKETS FACE IN TOWARDS EACH OTHER ON ALL 4 BRACKETS**

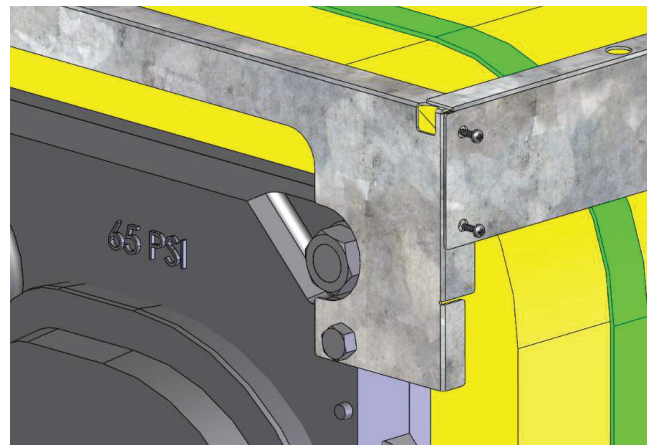
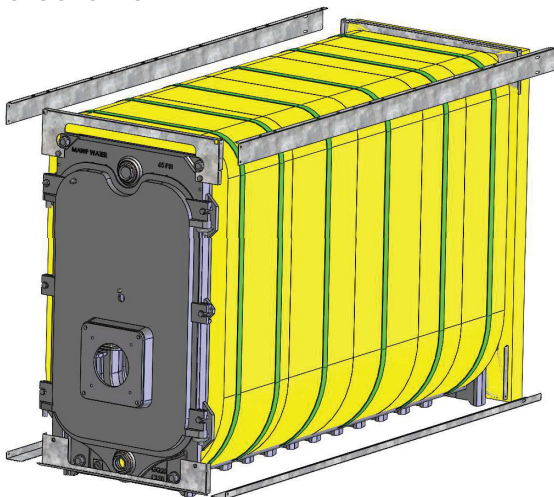
STEP 2

Wrap boiler block with insulation material and strap it as shown.



STEP 3

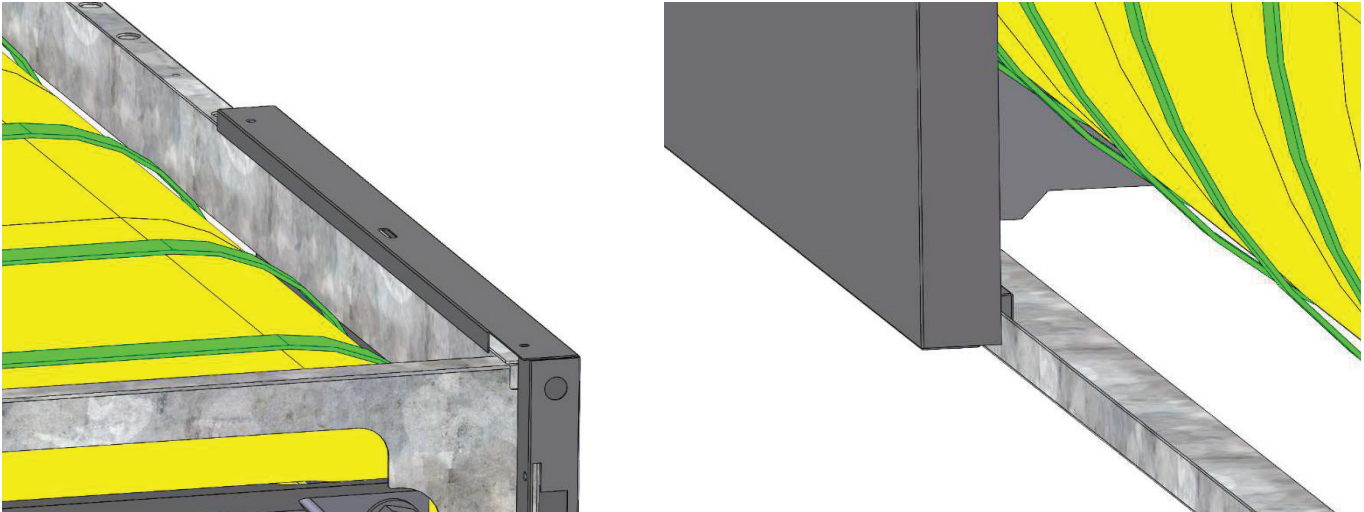
Install side rails to each top and bottom bracket from front to back. Attach with supplied screws



10. Boiler Casing Continued

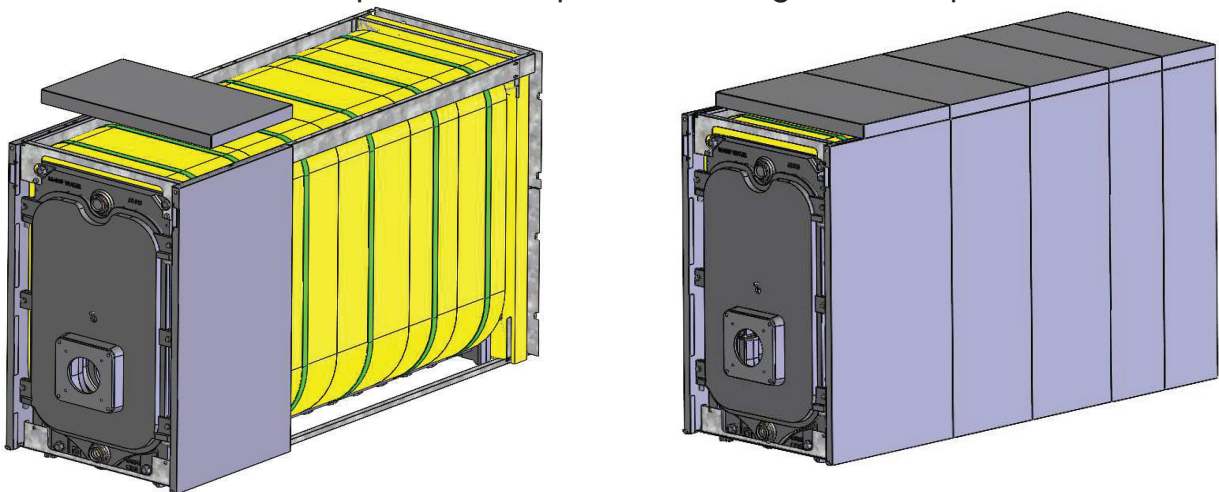
STEP 4

Install side common panels onto side rails top and bottom as shown.



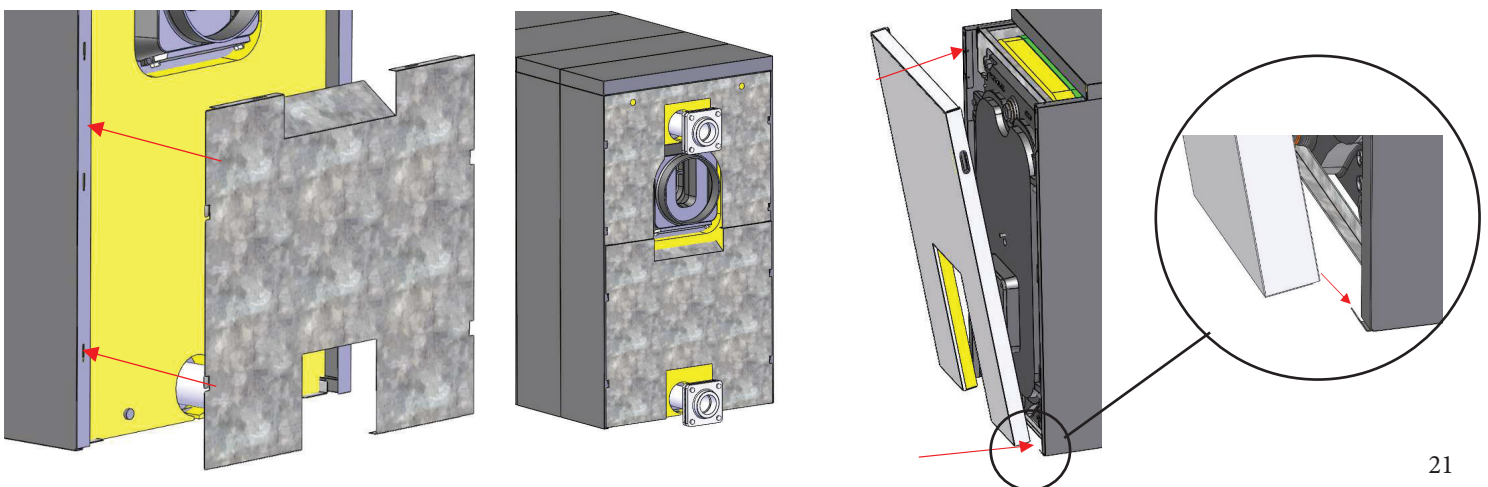
STEP 5

Interlock the common top cover and proceed along with side panels and covers.



STEP 6

Secure two rear panels onto back of boiler casing by starting with LOWER piece first and interlocking the top piece into it. Then place front door on by interlocking the bottom into the hooks on the side panels and pushing the top into position.



11. Baffle Installation

To achieve maximum efficiency, baffles have been installed in the second pass of the boiler. One baffle is installed into each of the 2nd passes as shown in Fig. 10.1. For the baffle to fit correctly, the shortest leg of the baffle must be facing down. If the steady state flue temperature is too low, less than 325° F, the baffles may be removed to increase the temperature.

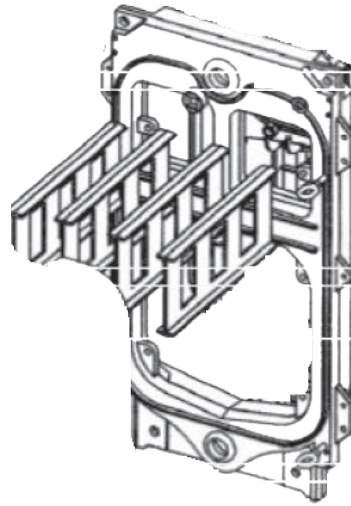


Fig 10.1

12. Wiring

The electricity to the boiler shall come from a dedicated breaker in the electric service box. A service switch should be mounted on the side of the boiler so the burner technician can service the burner and controls. The electrical wiring should be routed so as not to interfere with normal servicing of the boiler. Wiring done in the field between devices not attached to boiler shall conform with the temperature limitations for type T wire (63F/35C) or other specified wire as applicable when installed in accordance to manufacturer's instructions and wiring diagrams.

If an external electrical source is utilized, the boiler, when installed, must be electrically bonded to ground in accordance with the requirements of the authority having jurisdiction or, in the absence of such requirements, with the National Electrical Code, ANSI/NFPA 70 and/or the Canadian Electrical Code Part 1, CSA C22.1, Electrical Code.

Since the boiler is equipped with a swinging burner door, the supplied 48" long burner wiring harness with 4-prong quick disconnect plug needs to be used. The short end of the wiring harness needs to be wired to the burner following the respective burner wiring diagram in the subsequent pages of this manual. The long end of the wiring harness needs to be wired into the burner operating control located at the installers discretion.

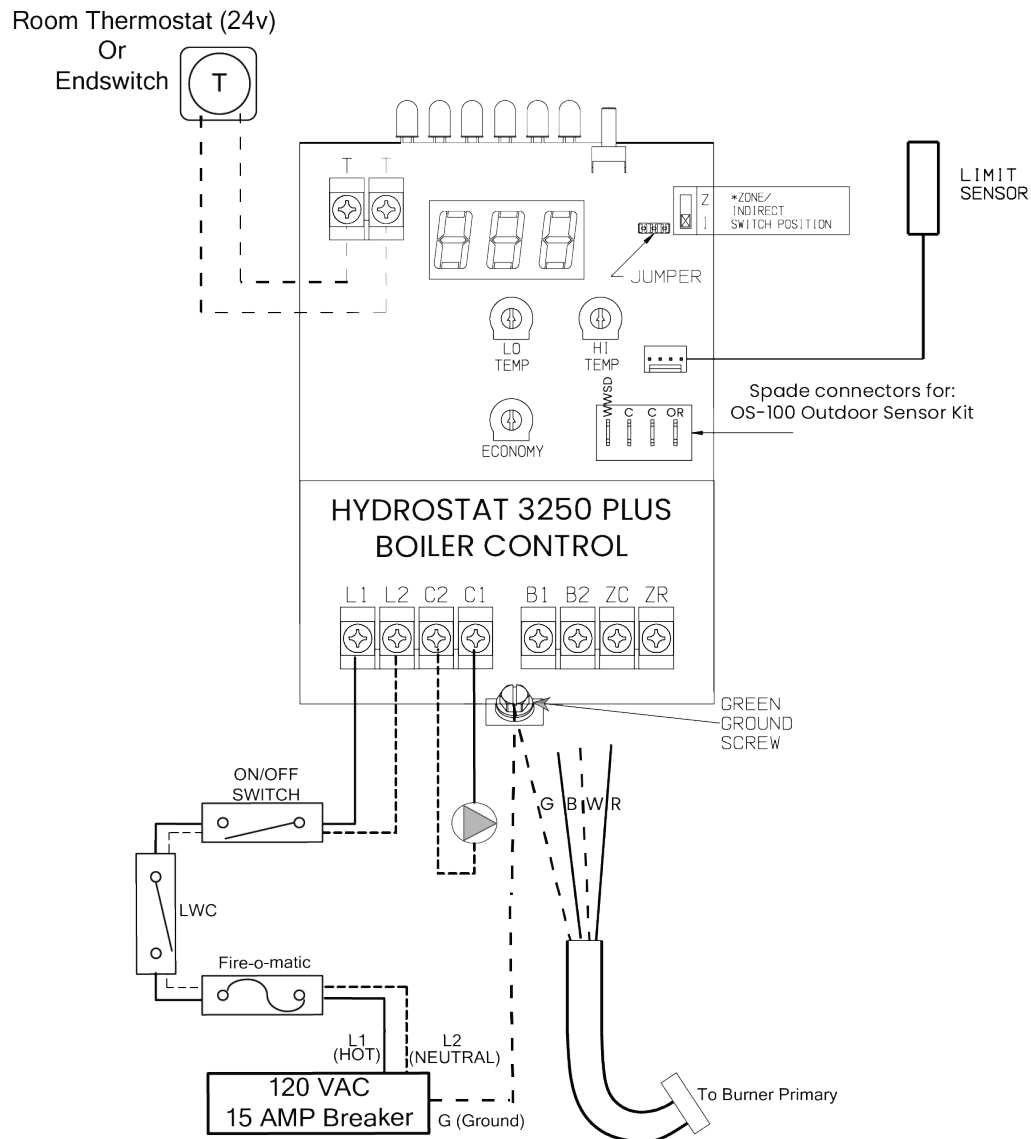
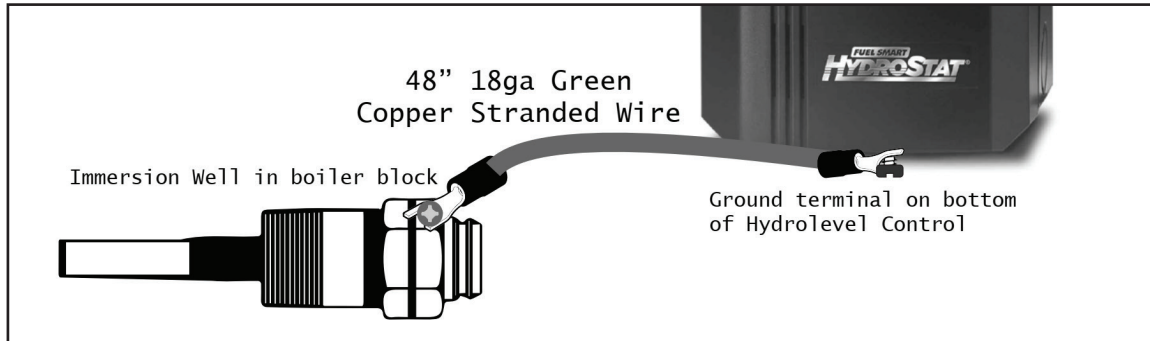
NOTE: You must connect a pump to C terminals on hydrostat when using DHW. Pump needs to turn on to push heat for DHW through boiler.

Refer to pages 25 for oil wiring diagrams and page 26 for gas wiring diagrams. Priority wiring for Hydrolevel controls is on pages 24.

12.1 Wiring Hydrostat Control

Hydrolevel 3250 controller Low Water Cutoff

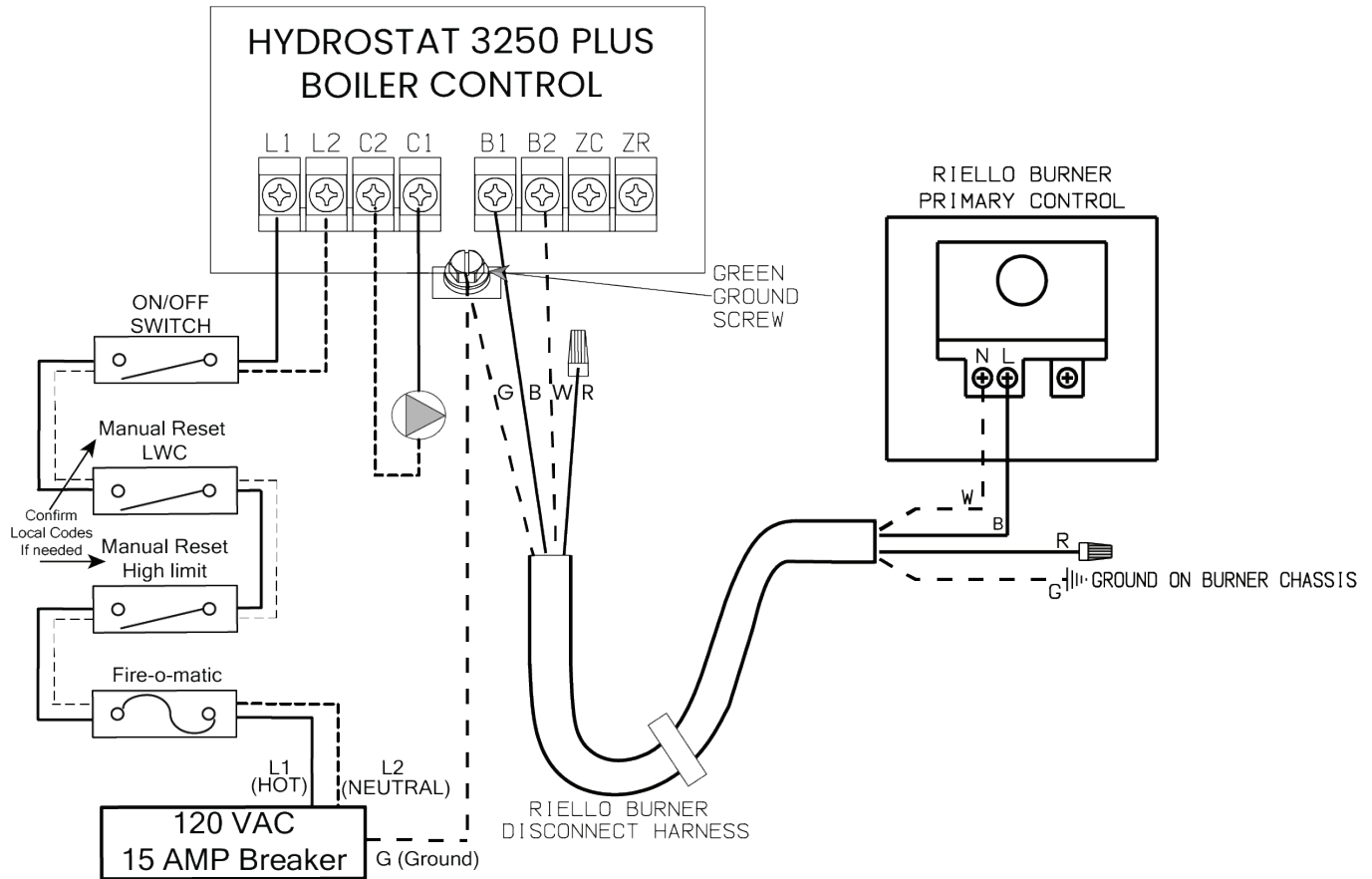
QHT has added a ground wire and providing a mechanical connection for grounding the Hydrolevel Immersion well back to the 3250 grounding lug.



NOTE: All wiring must be done in accordance with applicable state, local and national codes. Use only copper conductors.

12.2 Oil Burner Wiring

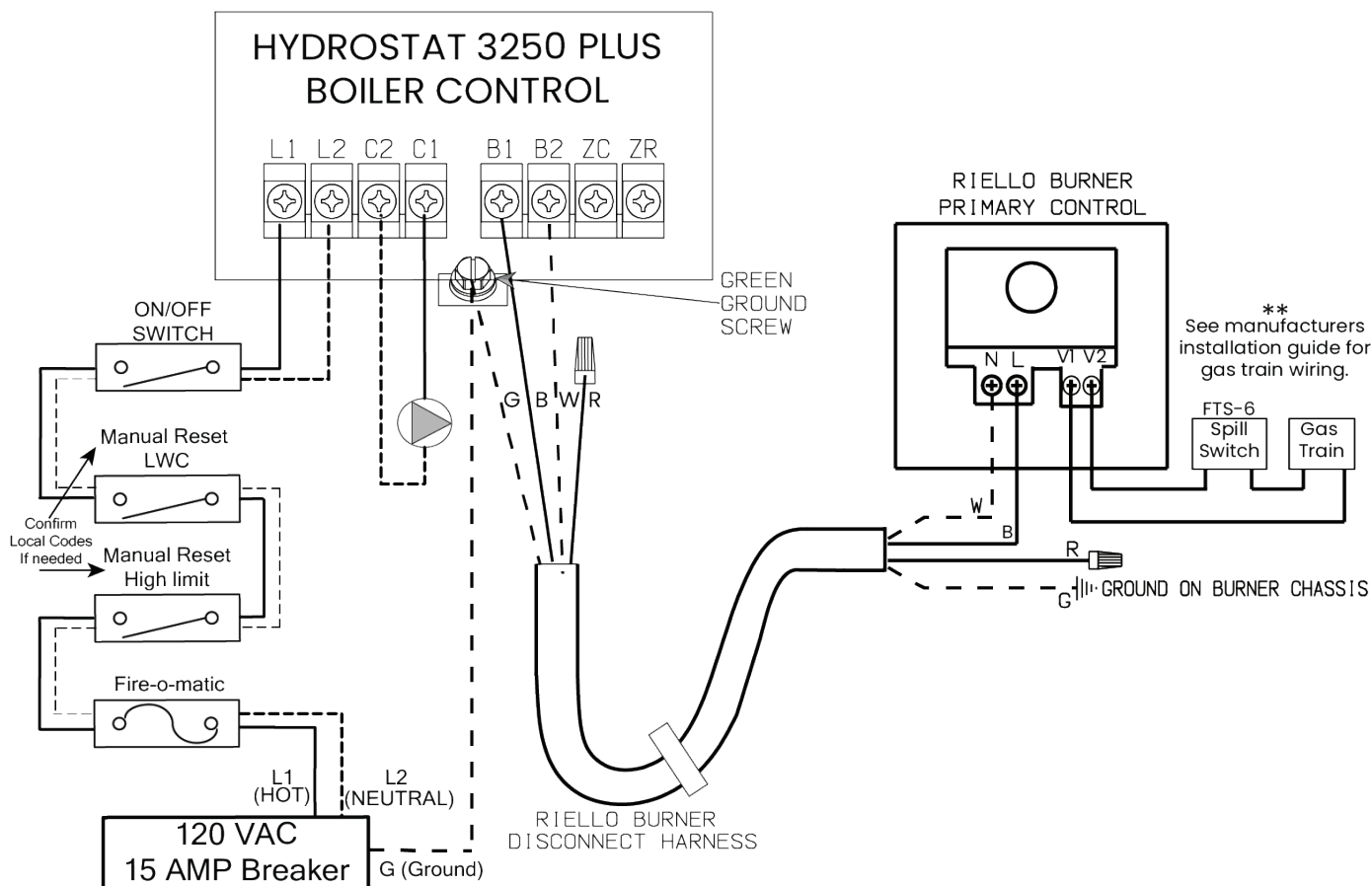
Riello Oil Burner



NOTE: All wiring must be done in accordance with applicable state, local and national codes. Use only copper conductors.

12.3 Gas Burner Wiring

Riello Gas Burner



13. Commissioning

Before a gas boiler may be put into operation and tested, it's gas connection must be leak tested. After installation of oil/gas-fired boiler, operation and performance tests shall be conducted to make certain that the burner is operating in an acceptable manner and that all safety controls and devices function properly. **It is critical that the high limit, low water cutoff and burner "cad cell" relay be checked for normal operation before leaving the job.**

CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

14. Maintenance

The Optimajor boiler system should be serviced once a year.

1. Turn boiler safety switch off.
2. Open lower swing door and remove upper clean out plate.
3. Brush upper passages first and then clean combustion chamber of any debris with brush and vacuum.
4. Remove smoke pipe and clean out debris from cleaning or soot build up.
5. Inspect smoke pipe for any corrosion before reinstalling. Replace if necessary.
6. Consult the burner manufacturers manual for annual maintenance of the burner.
7. Once the burner has been serviced, check the combustion and verify it against Section 8 on page 16 of this manual.
8. Inspect the boiler and make sure it is operating normally, i.e. temperature and pressure.
9. Inspect the Pressure Relief Valve and manually set it off to ensure it is operating normally and not leaking.
10. If a Low Water Cut-Off is installed follow the manufactures suggested maintenance and test procedures.
11. Adjust room thermostat so there is a call for heat and test boiler high limit for proper operation.
12. Remove all combustible materials from around boiler and ensure the area is free of debris so the burner has adequate intake air supply.

NOTICE

Verify proper operation of high limit, low water cutoff and burner "cad cell" after servicing.

15. Installer Notes

System Checklist		Burner Performance Test:	Install
Boiler Model #:	Serial #:	Gross Stack Temp	
Original Purchaser:	Installer:	Room Temp (Ambient)	
		Net Stack Temp	
		CO2	
		O2	
		Smoke Reading	
		Combustion EFF%	
Burner Checklist			
Burner Manufacturer:	Burner Fuel Type:		
Burner Model #:	Burner Serial #:		
Input:	Pump/Manifold Pressure:		
Nozzle/Orifice:	Head Setting:	Air Setting:	

Warranty for Saint Roch Commercial Cast-Iron Water Boilers



FIRST YEAR through TENTH YEAR-WARRANTY FOR Optimajor SERIES COMMERCIAL HOT WATER BOILERS: QHT warrants that its cast-iron boiler and casing are free from defects in material and workmanship for ten years from the date of installation at the original installation site to the original owner. If the boiler is found to be defective within this period, QHT will replace the boiler block or casing.

ELEVENTH YEAR through TWENTIETH YEAR -WARRANTY FOR THE CAST IRON BOILER BLOCKS OF THE B40 SERIES COMMERCIAL BOILERS: St. Roch warrants that the cast-iron sections of the St. Roch Optimajor boilers are free from defects in material and workmanship to the original owner for a period of 20 years. If the Optimajor boiler section is then found to be defective, QHT and St. Roch will replace the defective section of the cast iron boiler block.

This warranty is subject to the condition that a heating contractor whose principal occupation is the sale and installation of heating equipment must have installed the boiler. In addition, the boiler must be installed in accordance with the boiler manual supplied by QHT Inc with every boiler. PARTS, WHICH ARE COVERED, consists of all materials supplied by Saint Roch. Other parts supplied in the trim kit or in the burner pack carry their own warranty and each manufacturer has responsibility for its own products.

NOTE: ANY PART, WHICH IS REPLACED UNDER WARRANTY, CARRIES ONLY THE UNEXPIRED PORTION OF THE ORIGINAL WARRANTY.

OWNER RESPONSIBILITIES:

1. Provide for proper installation, which includes pressure relief and pressure reducing valves and high limit safety controls on closed systems.
2. Provide qualified periodic service to prolong proper operation and service.
3. Insure that boiler is installed with approved burner and that installation conforms to all codes and ordinances.
4. This warranty does not apply to boilers, which are subject to misuse, abuse, neglect, alteration, accident, excessive temperature, excessive pressure, or corrosive water or atmosphere.
5. Owner will be responsible for return of faulty components to Portsmouth, NH, freight pre-paid.

QHT AND Saint Roch WILL NOT BE RESPONSIBLE FOR:

1. Components that are part of the heating system, but were not manufactured by Biasi or QHT as part of the commercial boiler system.
2. The workmanship of the installers of Biasi B40 Linear boilers. Furthermore, this warranty does not assume any liability for unsatisfactory performance caused by improper installation.
3. Any costs for labor to remove or replace the faulty component.
4. Improper burner application or adjustments, control settings, care or maintenance.
5. Any damage associated with corrosion or leakage due to the use of "non-barrier", plastic pipe in the heating system.

*THIS WARRANTY DOES NOT EXTEND TO ANYONE EXCEPT THE FIRST PURCHASER AT RETAIL AND ONLY WHEN THE BOILER IS IN THE ORIGINAL INSTALLATION SITE.

*IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY SHALL BE LIMITED TO THE DURATION OF THE EXPRESSED WARRANTY. BIASI AND QHT EXPRESSLY DISCLAIM AND EXCLUDE ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR BREACH OF ANY EXPRESSED OR IMPLIED WARRANTY.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE.

For prompt warranty service, notify the installer, who, in turn, will notify the distributor from whom he purchased the boiler. If this does not result in corrective action, contact Saint Roch through Quincy Hydronic Technology (Address Below) with details in support of the warranty claim. All claims must be processed through proper trade channels. Contact with Biasi directly is not recommended for rapid claim settlement.

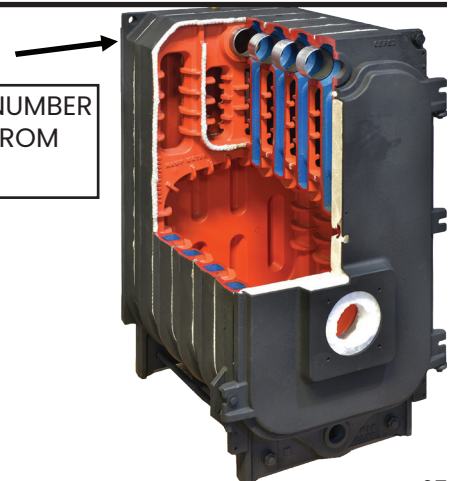
QHT, Inc.
3560 Lafayette Road
Bldg 2, Unit A
Portsmouth, NH, 03801
Tel. (603) 334-6400

To register your boilers warranty please visit:
www.qhtinc.com/warranty-registration

Or Scan the QR Code:



LOCATE BOILER SERIAL NUMBER
ON STICKER HANGING FROM
BOILER DRAW ROD.



Setting the Standard for Indoor Comfort, Environmental Integrity and Fuel Efficiency

QHT supplies the most durable, fuel efficient and environmentally sustainable boilers, radiators and convectors available. From its Portsmouth, NH warehouse facility, QHT assembles and distributes an extensive range of steel panel radiators, towel bars, boilers and fan convectors. In most cases, almost all products shown in this guide book can be shipped next day to anywhere in the US /Canada.

QHT has worked 35 years as a manufacturers' representative for HVAC products sold to wholesale distributors in the U.S. and Canada.

Customer service and support are the key to QHT's business. The staff at QHT will take care of your needs. In addition to providing specialized packaging and shipping services, QHT product support extends to giving on-site training seminars for fan convectors, radiators, boilers, burners and controls.

QHT represents several manufacturers of boilers and radiators. QHT remains committed to providing energy conservation with low environmental impact.



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Portsmouth, NH 03801
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www.qhtinc.com**