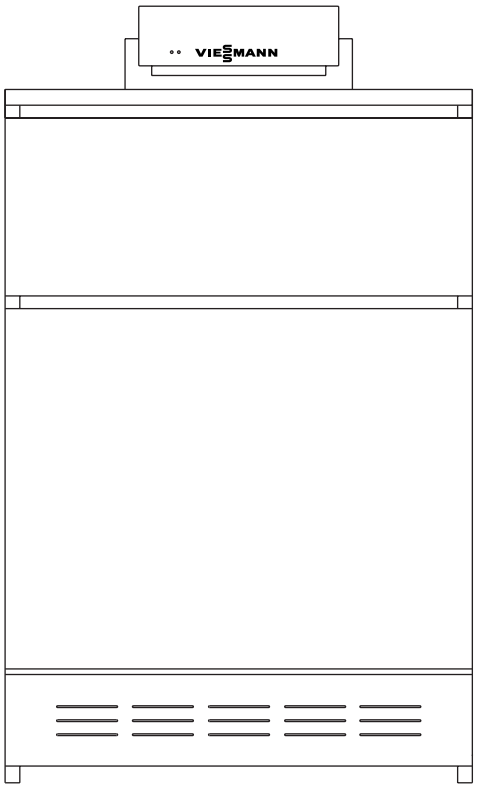
Installation / Service Manual

for Vitogas 050, RS Series

Gas-fired, atmospheric cast iron boiler

550 to 1050 MBH / 161 to 308 kW

IMPORTANT: READ AND SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE



These instructions cover the installation, operation and servicing of the Viessmann Vitogas 50, RS series of cast-iron sectional atmospheric gas-fired hot water boilers. These instructions must be read thoroughly prior to installation. These instructions must be saved and made available to service technicians when required. Install boiler according to these instructions.

The installation of this unit shall be in accordance with local codes or, in the absence of local codes, use CSA-B149.1 or .2 Installation Codes for Gas Burning Appliances for Canada. For U.S. installations use ANSI Z223.1. Always use latest editions of codes.

Where required by the authority having jurisdiction, the installation must conform to the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1.

These instructions must be placed in an envelope and affixed to the boiler.

Contents: **Page:**

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5167 456 v1.2 03/2007

⚠ **This "Attention" symbol is located beside all important safety recommendations. Please follow the instructions in detail to avoid property damage, severe personal injury, or loss of life.**

⚠ **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 liquids in the vicinity of this or any other appliance.

WHAT TO DO IF YOU SMELL GAS
- **Do not try to light any appliances.**
- **Do not touch any electrical switches, do not use any phone in your building.**
- **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

⚠ **Warning:**

The installation, adjustment, service, and maintenance of this boiler must be done by a licensed professional service technician who is qualified and experienced in the installation, service, and maintenance of commercial gas-fired hot water boilers. There are no user serviceable parts on the boiler, burner, or control. Failure to heed this warning can cause property damage, severe personal injury, or loss of life.

⚠ **Warning:**

Improper installation, adjustment, service, or maintenance can cause flue products to flow into living space. Flue products contain poisonous carbon monoxide gas which can cause nausea or asphyxiation resulting in severe personal injury or loss of life.

⚠ **Warning:**

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

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 which has been under water.

⚠ **Warning:**

Before each heating season begins, have the following service and maintenance done by a professional service technician:

1) **Boiler heat exchanger inspected and cleaned.**

2) **Vent system inspected for deterioration, leaks, corrosion, proper draft, and proper operation. Check vent system for compliance with local and national code requirements. Repair or replace as required.**

3) **Burner checked and if necessary adjusted for proper combustion and operation. Check for adequate supply of fresh outside combustion and ventilation air.**

Neglecting to perform necessary maintenance can cause unsafe operation.

⚠ **Warning:**

Never operate the boiler without an installed venting system which safely vents all products of combustion to the outdoors. The vent system must comply with all applicable local and/or national codes.

Improper, incomplete, obstructed, or deteriorated vent systems can present a serious risk of flue gases leaking into living space which could cause carbon monoxide poisoning.

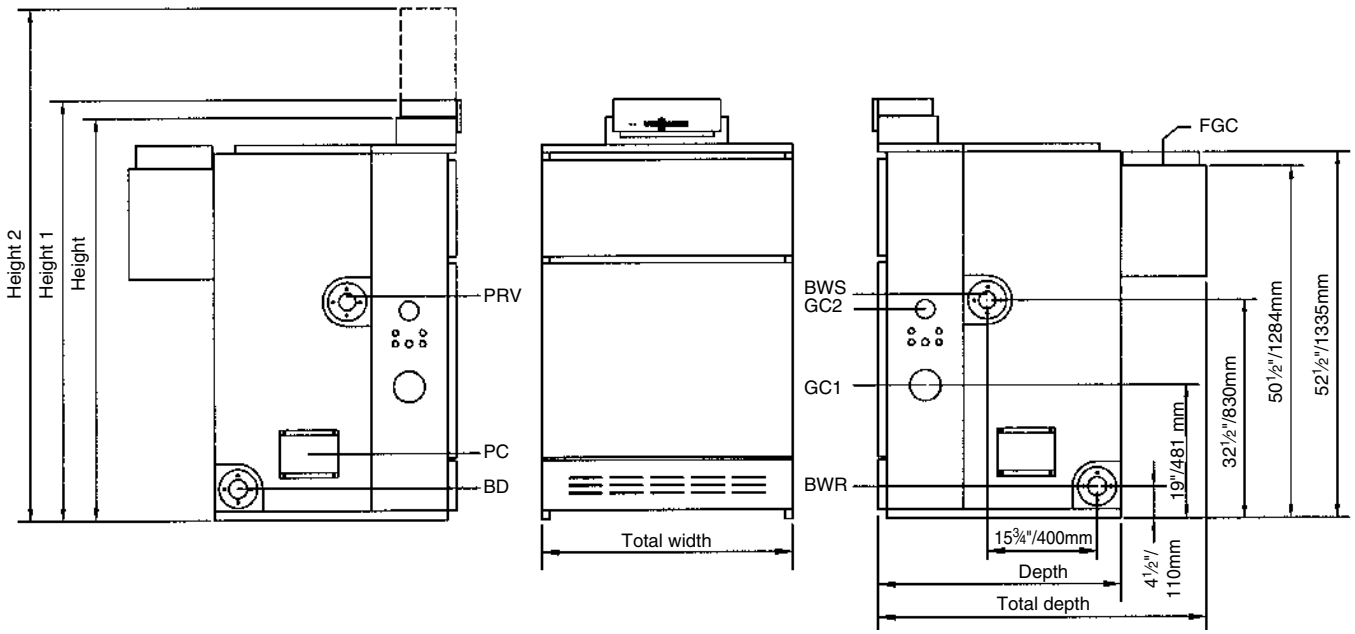
⚠ **Warning:**

Never operate the boiler without an adequate supply of fresh combustion air. This boiler needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air. All combustion and ventilation air must be supplied from the outside. Failure to heed this warning can cause severe personal injury or loss of life.

⚠ **Warning:**

Shut off all electrical power and turn off gas or oil supply to boiler before performing any service or maintenance on the boiler, burner, or control. Failure to follow this warning could result in electrical shock, serious personal injury or loss of life.

Do not store chemicals containing chlorine or other corrosive materials near the boiler, such as bleach, cleaning solvents, detergents, acids, hair spray, spray cans, paint thinners, paint, water softener salt, refrigerants.



Legend

BD	Boiler Drain	BWS	Boiler Water Supply	GC1	Main Gas Connection	PC	Pilot Cover Plate
BWR	Boiler Water Return	FGC	Flue Gas Collar	GC2	Pilot Gas Connection	PRV	Pressure Relief Valve Connection

Technical Data

Boiler Model		Model No.	RS-8	RS-11	RS-14
CSA input	full load **1*	MBH	550	800	1050
		kW	161	234	308
	partial load **2*	MBH	372	541	710
		kW	109	158	208
CSA output	full load **1*	MBH	468	680	893
		kW	137	199	261
	partial load **2*	MBH	316	460	604
		kW	93	135	177
Combustion efficiency		%	85.0	85.0	85.0
Heat exchanger surface area		ft²	99.47	140.63	181.79
		m²	9.2	13.1	16.9
Cast-iron sections			8	11	14
Burners			7	10	13
Manifold pressure					
Natural gas	full load	"w.c.	3.5	3.5	3.5
	partial load **3*	"w.c.	1.3	1.3	1.3
Propane gas	full load	"w.c.	10	10	10
	partial load **3*	"w.c.			
Man. gas supply pressure **4*		"w.c.	14	14	14
Dimensions					
Depth		inches	34¾	34¾	34¾
		mm	883	883	883
Width		inches	36¼	49½	69¼
		mm	921	1255	1582
Height		inches	53¾	53¾	53¾
		mm	1366	1366	1366

Boiler Model	Model No.	RS-8	RS-11	RS-14
Overall dimensions				
Total depth	inches	47	47	47
	mm	1195	1195	1195
Total width	inches	36¼	49½	62¼
	mm	921	1255	1582
Total height				
Height 1 (control unit in	inches	60¼	60¼	60¼
position for operation)	mm	1531	1531	1531
Height 2 (control unit in	inches	73½	73½	73½
position for servicing)	mm	1867	1867	1867
Weight, boiler with insulation,	lbs	1280	1709	2138
burners and packaging	kg	582	777	972
Boiler water content	USG	20	28	35
	ltr	77	106	134
Max. operating pressure	psig	60	60	60
	kPa	414	414	414
Boiler connections				
Boiler supply and return	Ø" (male thread)	2	2	2
Boiler drain	Ø"	¾	¾	¾
Gas supply connection	Ø (male thread)	1	1¼	1¼
Vent pipe collar	inches	10	12	14
		250	300	350

**1 Combustion results are based on a heating system supply temperature of 167°F / 75°C, return 140°F / 60°C*
**2 For two-stage boilers only*
**3 Parial load manifold pressure is factory preset. Any attempt to readjust in the field will render boiler warranty null and void.*
**4 If the gas supply pressure is higher than the maximum permissible value, a separate field supplied gas regulator must be installed upstream of the boiler gas train.*
For for information regarding other Viessmann System Technology componentry, please reference documentation of the respective product.

1.0 Shipping of boiler

The boiler is shipped in two pieces. An assembled cast-iron heat exchanger is shipped on a wooden pallet. The second piece is a crate containing the jacket, draft hood, gas train, and manifold. Boiler requires final field assembly.

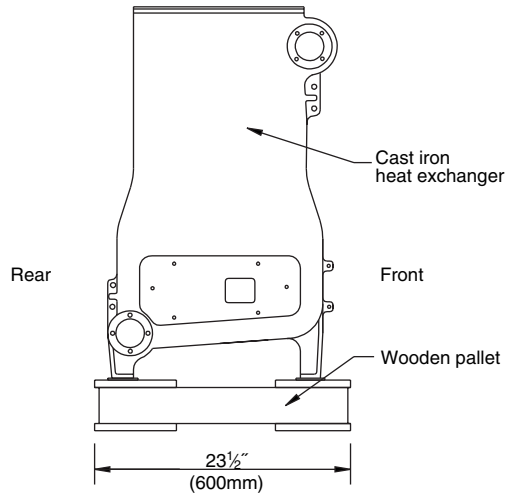


Fig. 1
Assembled cast-iron heat exchanger

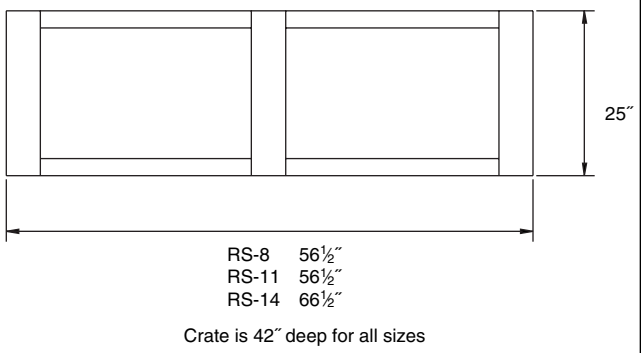


Fig. 2
Crate containing draft hood and jacket

Both pieces (Fig. 1 and Fig. 2) will fit through a standard 32″ doorway. Casting may be ordered split in two or more sections to facilitate handling. Refer to separate heat exchanger assembly instructions.

Assembly of split cast-iron heat exchanger requires the use of a Viessmann draw tool, which must be specified at time of ordering. See page 30 for use of draw tool.

1.1 Boiler features

The Vitogas 50, RS boiler series includes the following features and standard equipment:

- Cast-Iron sections of wet base design, fully assembled
- Boiler ID coding card
- Intermittent pilot ignition system
- Stainless steel burner tubes
- Horizontal to vertical draft diverter
- Accessory pack including 50 psi pressure relief valve, air vent and pressure gauge

The boiler comes with water connections on the right hand side in the standard configuration. If required, the connections can be made on the left side by reversing the gas inlet pipe and reversing the flange connections for the water connections. See section 2.2 and piping layouts Figs. 11, 23, 24 and 25.

Max. boiler operating pressure 60 psi (414 kPa).
Max. boiler temperature 248°F (120°C).

Any damages caused by operation in excess of the above mentioned temperatures and pressure are not the responsibility of Viessmann Manufacturing Company Inc.

List of parts shipped

For a complete list of parts refer to Replacement Parts List on page 25.

2.0 Installation

Important:

Note that the sheet metal enclosure is designed in such a way that the enclosure can be installed after all water piping, pipe insulation, draft hood and venting has been completed. Install sheet metal enclosure last to minimize the chance of damage to the enclosure. Final gas piping is done after installing sheet metal enclosure.

Before boiler is connected to a piping/heating system which has been in service (boiler is a replacement boiler), piping system should be flushed thoroughly with water in order to remove sludge, rust, debris, or other contaminants, especially in large piping systems such as old gravity systems. Failure to remove contaminants can lead to boiler failure.

Note: The RS boiler is for use in closed loop hot water forced circulation systems only. Do not use in steam applications.

2.1 Installation of supply and return flanges

Prior to placing the boiler in its installed position, ensure that the supply and return flanges are on the correct side of the boiler. The standard configuration has the supply, return connections on the right side. To reverse the water connections see section 2.2. Also see Fig. 23 on page 18.

2.2 Installation with piping on left side

To install boiler with water piping on the left side instead of the right, the following must be done:

a) Remove the supply flange and gasket, and the opposite flange threaded 1″ NPT (i.e. pressure relief valve fitting).
b) Remove the return flange, gasket, 60mm studs, and the opposite flange threaded ¾″ NPT (i.e. drain cock fitting). **NOTE** that the return flange is fitted with a water distribution tube. Holes are drilled to distribute water vertically into the casting and horizontally into the wet base casting legs. When

switching from right to left, rotate the tube 90° clockwise to align the holes with the water passages in the casting (see Fig. 3). Remount the flanges and gaskets.

c) Remove the 5-point well from the right tapping and the plug or well from the left. Install the well into the left tapping, and plug the right hand tapping. Use a thread sealer such as hemp (included in accessory kit) and pipe thread sealant when installing these fittings.

Note: Supply and return pipes must be installed on same side of boiler.

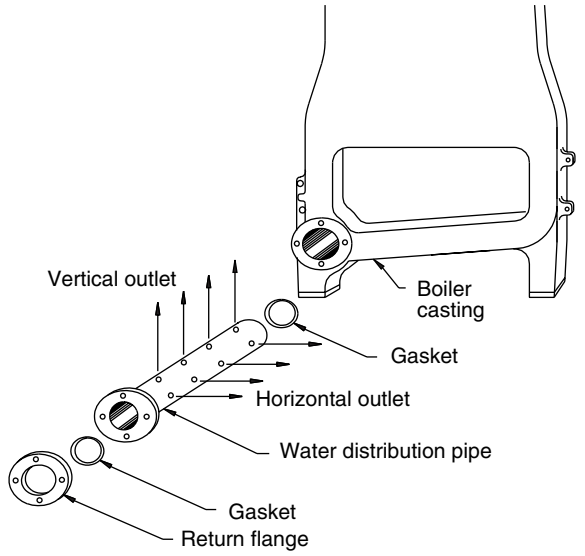


Fig. 3
Water distribution tube – boiler return

2.3 Location

The boiler must be installed in an indoor space not subject to freezing temperatures. The boiler should be located near a floor drain. The boiler must be installed on a solid level foundation capable of supporting the boiler and piping filled with water.

The boiler casting is shipped fully assembled on a wooden skid. To remove the boiler from the skid, lift it off using a hoist of sufficient capacity, or use a fork lift from the side. Refer to Technical Data, for boiler weight. Observe maximum allowable floor weight when positioning boiler.
Never lift boiler using the draw rods. Place the boiler so that the following clearances to combustible materials are maintained.

Top:	18″	(457 mm)
Back:	6″	(152 mm)
Side 1:	6″	(152 mm)
Side 2:	6″	(152 mm)

Floor: Non-combustible

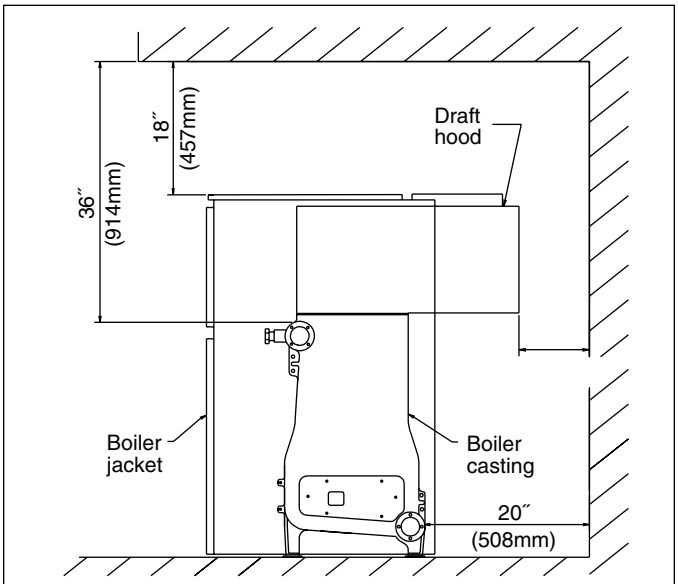


Fig. 4
Minimum clearances to combustibles – side view

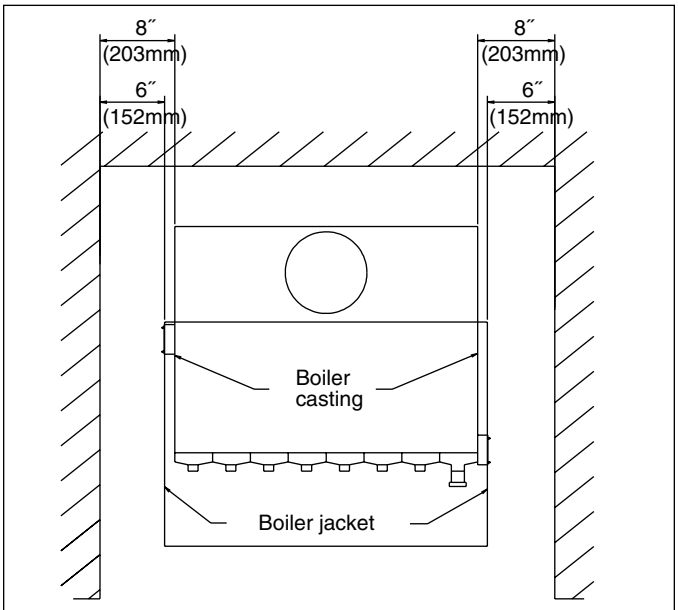


Fig. 5
Minimum clearances to combustibles – top view

Additionally, the following service clearances should be observed:

Front:	48″	(1220 mm)
Side:	24″	(610 mm)

(with supply, return, gas connections and pilot)

Note that these clearances are from the assembled boiler enclosure. See Fig. 4 for clearances from bare casting. If a concrete pad is required, refer to Technical Data, for boiler base dimensions. Boiler must not be installed on carpeting.

2.4 Combustion air supply

This boiler needs fresh air for safe operation and must be installed so there are provisions for adequate combustion and ventilation air. All combustion air must come from the outside.

Provisions for combustion and ventilation air must be made 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 codes. In Canada follow CAN/CGA-B149.1 or .2 Installation Codes. Always use latest edition of codes.

The following guideline is taken from the CAN/CGA-B149 Code:

Combustion air supply shall have a cross sectional area of not less than 100 in^2 plus 1 in^2 for each 14,000 Btu/h in excess of 400,000 Btu/h. This opening(s) shall be either located at, or ducted to, a point neither more than 18 inches nor less than 6 inches above the floor level.

In addition to the combustion air supply, a ventilation air supply connection shall be made at the highest practical point communicating with outdoors with a minimum area of 10% of the combustion supply opening area.

ATTENTION

The boiler must not be located in areas or rooms where chemicals are stored, or aggressive vapors (for example: bleach, hair spray, methyl chloride, carbon tetrachloride or perchloroethylene) or high dust levels or humidity levels are present. Heat exchanger corrosion might occur and reduce the lifetime of the boiler significantly. If above criteria are not properly observed and boiler damage results, any warranty on the complete boiler and related components will be null and void.

2.4.1 Assembly (see Figs. 6, 7, 11, 23, 26)

These instructions cover the assembly of the standard boiler with right hand water and left hand gas connections. Prior to installing the jacket assembly, ensure that the boiler well(s), plug, and flanges are tight. Refer to sections 8.2 and 8.4 for burner assembly instructions.

2.4.2 Draft hood

The draft hood is made up from four separate panels, refer to Fig. 6

a) Place top panel upside down on floor.
b) Attach the side panels to the top panel using the self-tapping screws (12 x ½″). An 8 mm or $^5/_{16}$″ socket is required.
c) Attach the front panel using the self-tapping screws.

Note: On RS-14 models only, install the downdraft deflector inside the draft hood using 2 Phillips screws.

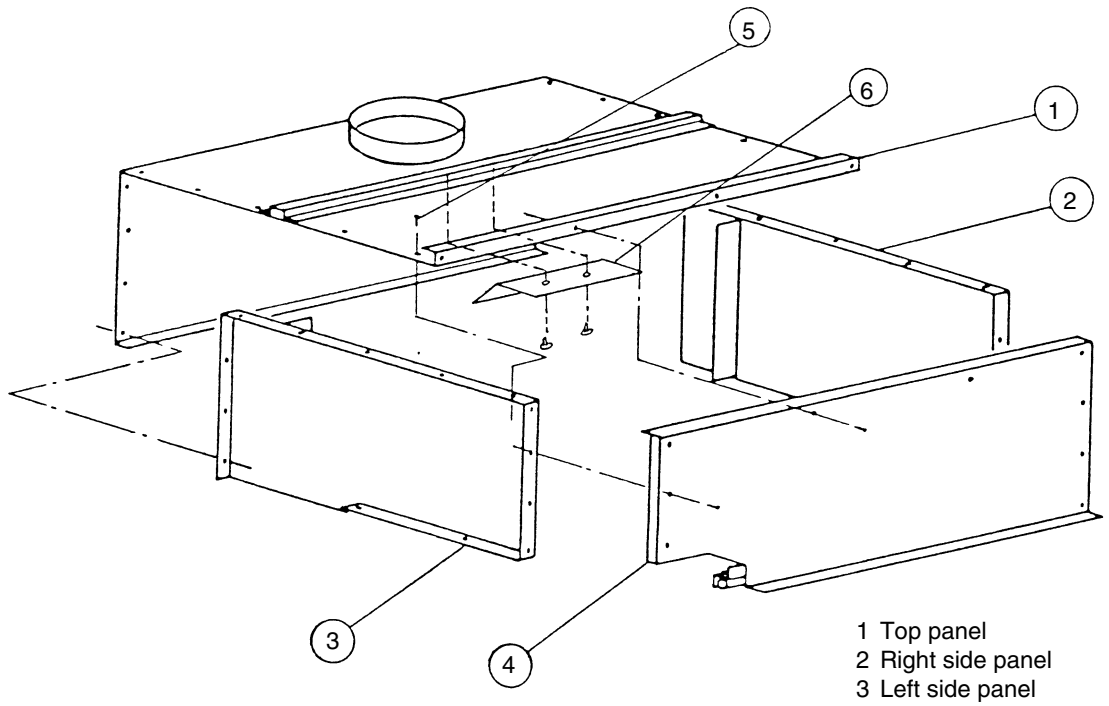
Ensure that there are no visible gaps where the panels are fastened together.

Mounting draft hood

The draft hood is mounted to the boiler using four M8 x 30 bolts and nuts. Refer to Fig. 7 for further details.

2.4.3 Boiler jacket assembly (see Fig. 26)

Install pilot burner (section 8.4) and wiring prior to assembling jacket.



1 Top panel
2 Right side panel
3 Left side panel
4 Front panel. Removable for inspection and cleaning
5 Self-tapping screw – 12 x ½″
6 Downdraft deflector (RS-14 only)

Fig. 6
Draft hood – exploded view

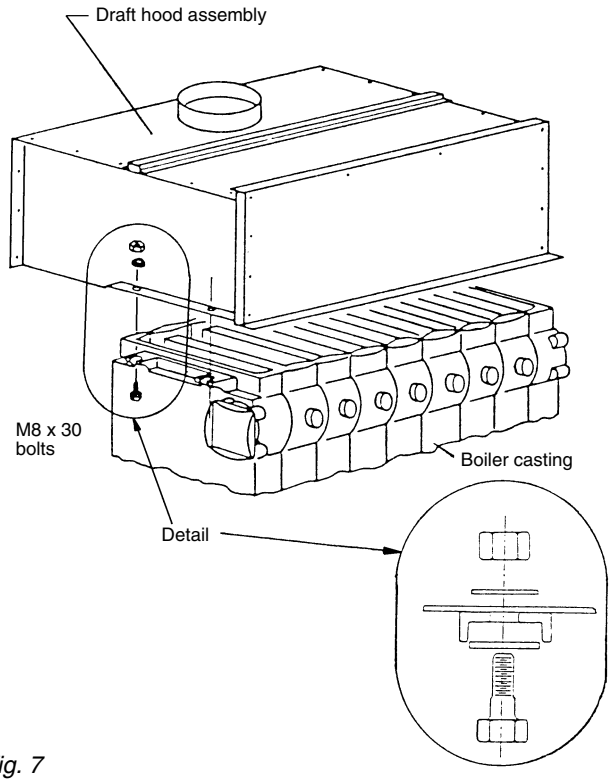


Fig. 7
Mounting draft hood

Refer to Fig. 26 for jacket assembly.

a) Assemble four frame rails (items 52, 53, 54) around casting base, with overhang toward front. Fasten with four M6 nuts.
b) Assemble side panels. Press upper (items 57, 58) and lower (items 81, 82) side panels together by inserting push studs into retainers. Press the front side panel (item 65) to the upper and lower panel assembly and fasten with Phillips screws (two per side).
c) Place the assembled side panels on the side frame. To ease assembly, tape the side panels to the draft hood to hold them vertical.
d) Attach rear panel (item 63) to side panels using eight 7 x ½˝ self-tapping Phillips screws. Angled fold must be at top and pointing inward. Remove tape applied in step c).
e) Position lower mid panel (item 67) so that the lower fold sits on the pins on the burner manifold. Fasten to side panels using two 7 x ½˝ Phillips screws.
f) Position upper mid panel (item 62) and fasten to lower mid panel and side panels using four 7 x ½˝ Phillips screws.
g) Position the top cover (item 69) and press push studs into retaining clips.
h) Press lower front panel (item 66) onto side panels.
i) Place blank cover over the unused opening on the lower side panel on the side opposite the pilot burner. Fasten using four 7 x ½˝ Phillips screws.
j) Mount the Vitotronic control housing on the middle of the top front panel using 4 x ½˝ Phillips sheet metal screws. The Vitotronic control can be mounted on the housing using the three black riveted screws shipped with the Vitotronic controls.

2.4.4 Gas controls (see Figs. 9, 11, 22, 23, 25)

Refer to Fig. 9, Gas controls, and Wiring diagram.

a) Connect gas train to the burner manifold using the union provided. Align gas train with manifold and tighten union.
b) Connect pilot gas tubing to the fitting downstream of the pilot gas valve. The tubing is connected using a compression fitting. Install pilot burner on same side as manifold gas train connection (see Figs. 23, 25).
c) Connect the gas supply pipe upstream of the “tee” fitting, using the union provided. Install a drip leg and shut-off valve in the gas supply pipe outside the boiler.
d) Connect low voltage wiring as shown in wiring diagram. Ensure that ground connection between pilot burner and ignition module is made.
e) Install upper front cover panel on four push pins. Insert the temperature sensors from the Vitotronic control into the 5-point well located in the upper right hand corner of the mid panel. (The insulation in this opening may require cutting.) Be careful not to kink the capillary tubes! Refer to Fig. 10.
f) Connect the #41 plug from the Vitotronic control to the #41 plug from the ignition system or to #41 plug of either a vent damper or a power venter (see wiring diagrams).

2.4.5 Gas connections

Connect gas to main burner via the opening for the gas pipe in the left or right side panel (see Figs. 11, 23).

Install a capped drip leg and a manual gas shut-off valve outside the boiler. Size gas supply to boiler according to local requirements. Under no circumstances shall the gas supply pipe be of smaller diameter than the boiler’s gas pipe.

Minimum natural gas supply pressure: 7.0˝ w.c. and 11˝ w.c. for LP (measure at gas connection to boiler).

Maximum gas supply pressure for all gases: 14.0˝ w.c.

All factory-assembled gas connections have been leak tested. A leak test must be repeated during the initial operation of the boiler by the installer. Use an approved liquid spray solution to check for leaks at all fittings and unions. Never use an open flame to check for leaks.

Check gas input by clocking gas meter after all water and electrical connections have been made, and boiler has been filled with water. When checking input using a gas meter, ensure that all other gas-fired equipment is shut off.

Safe lighting and other performance criteria were met with the gas manifold and control assembly provided on the boiler when the boiler underwent tests specified in ANSI Z21.13 boiler standard.

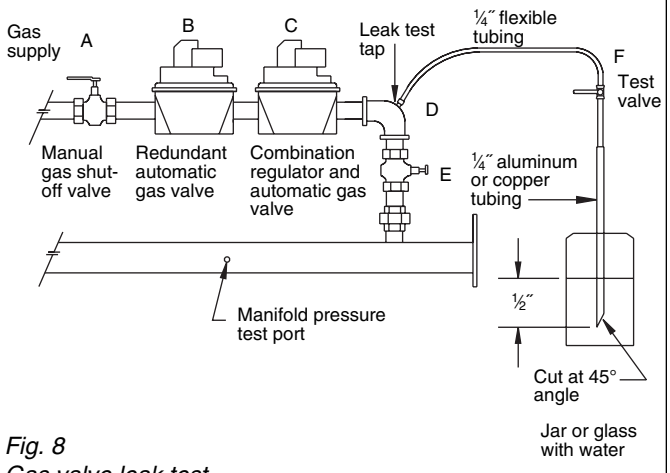


Fig. 8
Gas valve leak test

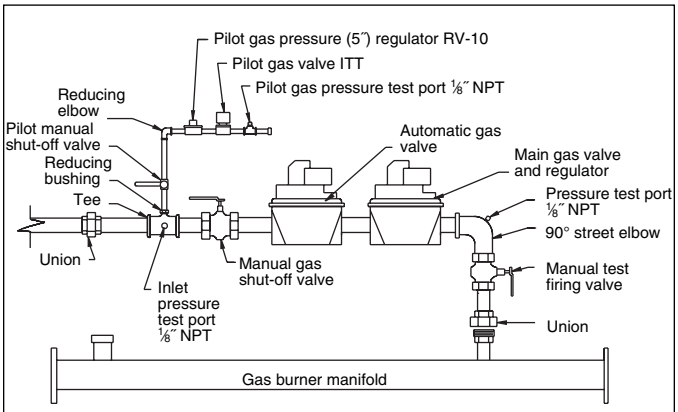


Fig. 9
Gas control assembly

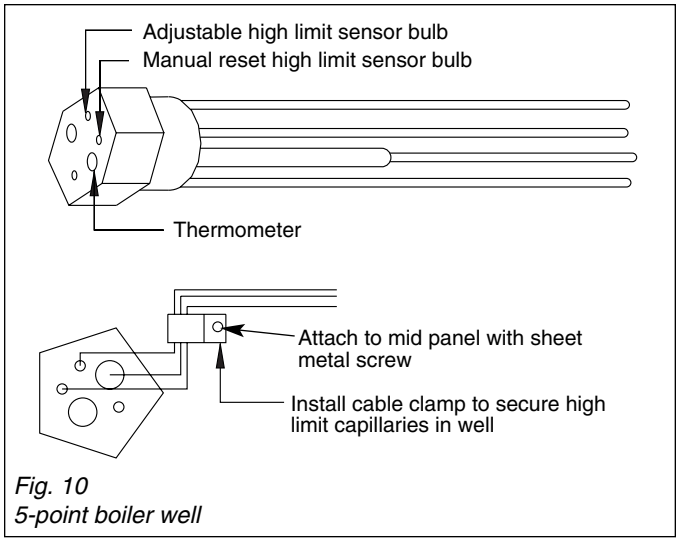


Fig. 10
5-point boiler well

3.0 Gas valve leakage test

Maximum inlet pressure for all gases 14″ w.c.

This is a test for checking the tightness of closure of the gas safety shut-off valves. It should be performed by qualified personnel during the initial start-up of a burner system, or whenever the valve is replaced. It is recommended that this test also be included in scheduled inspection and maintenance procedures. For a periodic inspection test, follow steps 1, 3, 4, 5, 8, 9, 10, 12, 13, 16 and 17.

1. De-energize the control system to ensure that there is no power to the safety shut-off valves (B) and (C), shown in Fig. 8.
2. Close the upstream manual gas valve (A).
3. Make sure the manual test valve (F) is closed in the leak test tap assembly (D).
4. Remove the leak test tap plug and connect the test apparatus to the leak tap (D).
5. Close the downstream manual gas valve (E).
6. Open the upstream manual gas valve (A).
7. Run the safety shut-off valves (B) and (C) to their fully open positions (through the safety system); then immediately de-energize the system to close the valves.
8. Immerse a ¼″ tube vertically ½″ (12.7mm) into a jar of water.
9. Slowly open the test valve (F).
10. When the rate of bubbles coming through the water stabilizes, count the number of bubbles appearing during a 10 second period. Each bubble appearing during a 10 second period represents a flow rate of approximately 0.001 ft³/h (27 cm³/h).

To meet all U.S. requirements, leakage must not exceed the values given below.

Gas valve size (in.)	Allowable leakage	No. of bubbles per 10 sec.
1, 1¼	353 cm³/h	13

Following the test:

11. Close the upstream manual gas valve (A).
12. Close the test valve (F), remove the test apparatus, and replace the leak test tap plug (D).
13. Open the upstream manual gas valve (A) and energize the safety shut-off valves (B) and (C).
14. Test with soap bubbles to ensure that there is no leak at the test tap (D).
15. De-energize the safety shut-off valves (B) and (C).
16. Open the downstream manual gas valve (E).
17. Restore the system to normal operation.

4.0 Water connections (see Figs. 11, 15, 23, 24, 25)

The 2″ NPT supply and return water connections must be on the same side of the boiler (right side is standard). Use isolation valves for service purposes.

The length of 2″ pipe should be limited to the distance from the boiler to the main headers which will usually be larger than 2″ diameter pipe. This distance should be kept as short as possible. Larger diameter pipe can be used to connect the boiler to the main supply and return headers. Use standard friction loss methods for calculating pipe sizes.

4.1 Low water cut-off

An approved low water cut-off device must be supplied and installed by the mechanical contractor (see Fig. 11). Do not install shut-off valve between low water cut-off and boiler.

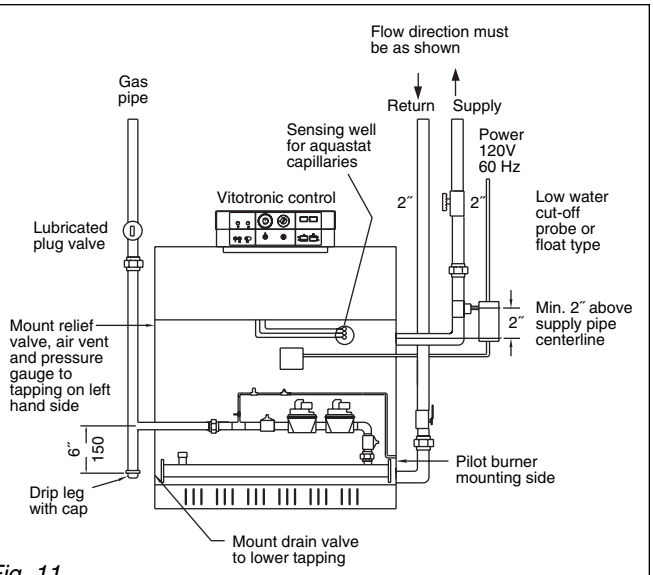


Fig. 11
Standard Vitogas 50, RS boiler piping connections
RS boiler with right hand water piping, left hand gas piping
(Boiler shown with access panel removed)

4.2 Pump selection and pump aquastat

Fig. 12 shows the head loss through the boiler at various flow rates for the Vitogas 50 boilers.

The minimum return water temperature is 120°F (48.8°C). The maximum temperature rise between return and supply is 68°F (37.7°C).

4.3 Initial system fill

Treatment for boiler feed water should be considered in areas of known problems, such as high mineral content and hardness. In areas where freezing might occur, an antifreeze may be added to the system water to protect the system. Please adhere to the specifications given by the antifreeze manufacturer. Never use silicate based automotive antifreeze.

Please observe that an antifreeze/water mixture may require a backflow preventer within the automatic water feed and influence components such as diaphragm expansion tanks, radiation, etc. A 40% antifreeze content will give freeze-up protection to approximately -10°F (-23.3°C). Do not use antifreeze other than specifically made for hot water heating systems. System also may contain components which might be negatively affected by antifreeze. Check total system frequently when filled with antifreeze.

A pressure reducing valve (or “fill” valve) is required to reduce the incoming water pressure. The total of the fill pressure, pump head, and any small pressure rise from thermal expansion of the water must be less than the boiler pressure relief valve setting. An expansion tank must be connected to the system close to the suction side of the circulating pump to prevent pressure increase resulting from thermal expansion of the system water.

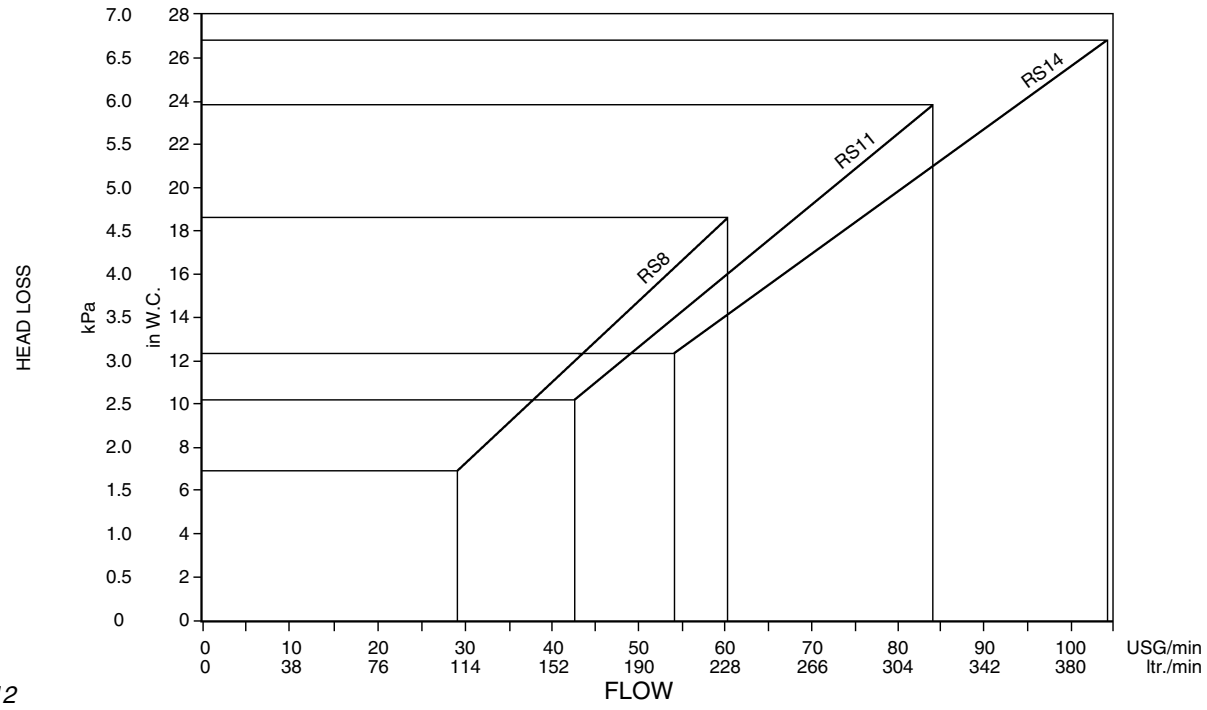


Fig. 12
Head loss through boiler

5.0 Boiler venting

In Canada follow CSA–B149.1 or .2, in USA follow National Fuel Gas Code ANSI Z223.1. Always use latest edition of national codes.

Vitogas 50, RS boilers are Category I boilers. Category I does not apply when boiler is side wall vented.

The mounted boiler draft hood must not be altered or modified in the field.

The boiler should be located as close to the chimney as possible. The vent connection must be made in the shortest possible way with minimum elbows.

When the vertical pipe becomes the chimney itself, the weight must not be supported by the horizontal to vertical draft hood on the boiler.

Avoid long horizontal runs of vent pipe. Horizontal runs must be supported by appropriate means to prevent sagging. Horizontal runs should have not less than ¼″ rise per ft. from the boiler to the vent terminal.

Metal strapping must be used to support horizontal runs every 4 ft.

Use approved vent material only. For venting purposes, a B-0, B-1 or B-1½ vent may be used. Use C vent for vent connectors.

With this boiler installation, it is recommended to install an approved liner within a masonry or unlined chimney. Observe and follow local rules and regulations.

The vent connector of this boiler must not be connected into any portion of mechanical draft systems operating under positive pressure.

Based upon proper chimney and breeching size, the boiler may be vented into a chimney/breeching with a direct-fired (atmospheric-fired) gas water heater. Observe national codes, local rules and regulations.

5.1 Removal of existing boiler

When an existing boiler is removed from a common venting system, the common venting is likely to be too large for proper venting of the appliances remaining connected to it.

At the time of removal of an existing boiler, the following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the common venting system are not in operation.

a) Seal any unused openings in the common venting system.

b) Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion, or any other deficiency which could cause an unsafe condition.

Negative pressure Test

c) Insofar as is practical, close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.

d) Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so appliance will operate continuously.

e) Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use an approved smoke test.

f) After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas burning appliance to their previous condition of use.

g) Any improper operation of the common venting system should be corrected so the installation conforms with the National Fuel Gas Code, ANSI Z223.1- latest edition. When resizing, any portion of the common venting system should be resized to approach the minimum size as determined using the appropriate tables in Appendix G in the National Fuel Gas Code, ANSI Z223.1- latest edition.

5.2 Side wall vent system

A side wall power vent system can be ordered. This package includes the appropriate power venter and vent terminal for each boiler model, as well as installation instructions. Consult Viessmann technical sales representative for ordering.

The vent system must terminate so that proper clearances are maintained as cited in the National Fuel Gas Code, ANSI Z223.1, Section 7, and as detailed in the Side Wall Vent System Installation Instructions. Observe and follow these instructions carefully.

6.0 Accessories

Pressure relief valve, pressure gauge, drain cock and fittings are packed separately. Refer to Fig. 13. Install relief valve and pressure gauge into upper flange with 1″ tapping. Install drain valve into lower flange with ¾″ tapping.

6.1 Installation of pressure relief valve (see Fig. 13)

Pressure relief valve must be installed. Do not install shut-off valve between pressure relief valve and boiler.

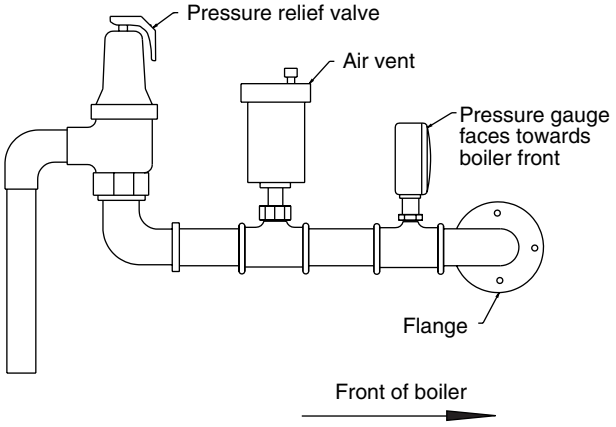


Fig. 13
Boiler accessories

The standard pressure relief valve is a Watts 1″ Model 174A set at 50 psi with a relief capacity of 1,400,000 Btu/h. Maximum allowable working pressure of boiler is 60 psig.

Optional relief valve is 1″ Watts 174A set at 60 psi with a relief capacity of 1,621,000 Btu/h.

Optional relief valve is 1″ Watts 174A set at 30 psi with a relief capacity of 958,000 Btu/h.

A discharge pipe the same diameter as the pressure relief valve discharge opening must be rigidly installed directly onto the pressure relief valve. The discharge should extend to the floor drain and end approximately 6″ above drain. Do not install a shut-off valve in discharge piping. Do not pipe discharge outdoors. Refer to Fig. 13.

Never cap or plug relief valve opening or discharge pipe. The discharge pipe must be arranged so as to prevent scalding of attendants. Follow instructions supplied with pressure relief valve.

If pressure relief valve is discharging frequently locate source of problem and correct. Significant amounts of make-up water will cause mineral deposits in boiler which may lead to boiler failure. This type of failure is not covered under warranty.

7.0 Start-up and operating instructions

Do not attempt to start the boiler if you smell gas. If you smell gas, open windows, do not touch electrical switches, extinguish any open flame, close all gas valves immediately. See page 14 for detailed lighting instructions.

Ensure that boiler is filled with water prior to start-up.

7.1 Pilot and manifold pressure check

Gas supply pressure must not exceed 14″ w.c. for all gases.

After checking for gas leakage according to sections 2.4.4, 2.4.5 and 3.0, ensure pilot pressure is between 5″ and 6″ w.c. for natural gas and between 8″ and 10″ w.c. for LP with pilot burner operating.

Attach manometer to test port downstream of pilot valve. Close main burner test firing valve so that only pilot burner operates. Pilot pressure is factory adjusted to 5.0″ w.c. with a supply pressure of 7.0″ w.c. for natural gas. Adjust pilot pressure if necessary to between 5.0″ and 6.0″ w.c. and between 8″ and 10″ w.c. for LP. The ionization signal has to be greater than 1 μA D.C. (typical 3-5 μA D.C.) Re-attach pressure port and leak test.

After checking pilot pressure, check manifold pressure with manometer to ensure it is 3.5″ w.c. Do no operate the burner at pressures higher than 3.5″ w.c. Test port at centre of gas manifold may be used. To open, turn screw in fitting counterclockwise two turns. To close, turn screw clockwise until it seats. Leak test pressure port.

For 2-stage RS boilers, the first stage pressure is factory preset to 1.3″ w.c. Do not attempt to readjust it. Any attempt to readjust this pressure will render the warranty null and void.

7.2 Boiler wiring

Boiler electrical requirements are 120V, 60 Hz, less than 12A. Pumps must be powered by separate power supply.

See wiring diagram in rear of manual and wiring label on boiler. Viessmann reserves the right to substitute electrical components as necessary. The boiler wiring label diagram takes precedence.

All wiring must be properly grounded! Before attempting to wire the unit, disconnect power supply at main service panel first. Dedicated ground wire must be run from boiler to service panel.

All electrical wiring is to be done in accordance with the latest edition of the National Electrical Code ANSI /NFPA 70. In Canada use CSA C22.1 Part 1 and/or local codes.

Caution:

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

7.3 Testing – gas pipe

The boiler and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 14″ w.c. (3.5 kPa).

The boiler must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply

piping system at test pressures equal to or less than 14″ w.c. (3.5 kPa).

Unions and manifold have been factory-tested. Leak test must be repeated during initial trial operation of burner by mechanical contractor.

Never check for gas leaks with an open flame. Use approved liquid spray solution for bubble test. Follow Fig. 14 whenever gas valve is replaced.

Proper piping practice

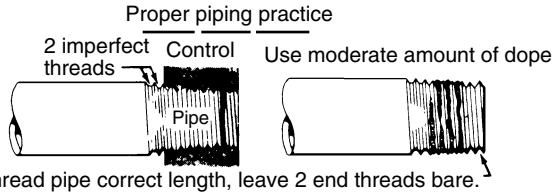


Fig. 14
Gas piping into gas valve

Support piping by proper suspension method. Piping must not rest on or be supported by boiler.

7.4 Boiler piping in heating/cooling application

The boiler, when used in connection with a refrigeration system, must be installed so the chilled medium is piped in parallel to the boiler with appropriate valves to prevent the chilled medium from entering the boiler (Fig. 15).

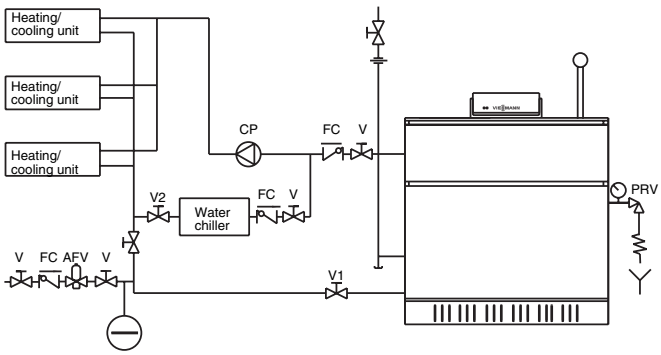


Fig. 15
Boiler piping in a heating/cooling application

The boiler piping system of a hot water heating boiler connected to heating coils located in air handling units where they may be exposed to refrigerated air circulation must be equipped with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.

Check installation instructions of chiller manufacturer carefully for additional requirements.

Cooling season starts: Close valve V1 and open valve V2.
Heating season starts: Close valve V2 and open valve V1.
A metal tag should be attached to these valves as to purpose.

Note:
In the above system, the circulating pump must be operated from a separate on/off switch – not from the pump aquastat on the boiler!

7.5 Main burner

Proper flame:	Upper main flame cone with light orange coloring, sharply defined individual flames.
Underfired:	Lazy-burning main flame cone, mushy flame appearance throughout, smaller flame sizes than in Fig. 16.
Overfired:	Increased burner noise, higher flame sizes than Fig. 16.

7.6 Pilot burner

Proper flame: Upper main flame cone with light orange coloring, sharply defined individual flame.

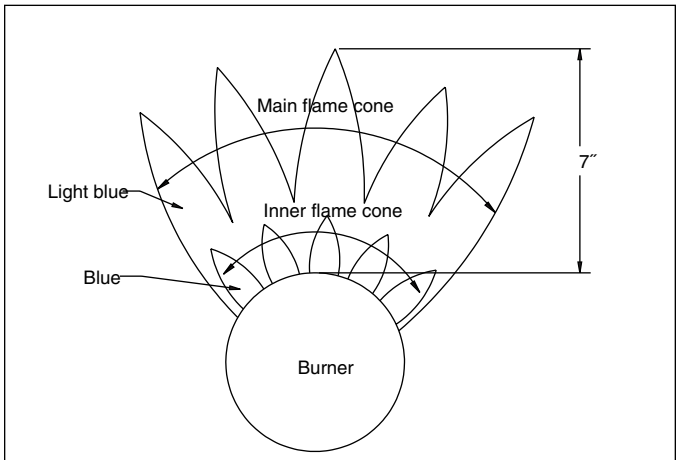


Fig. 16
Front view – single burner

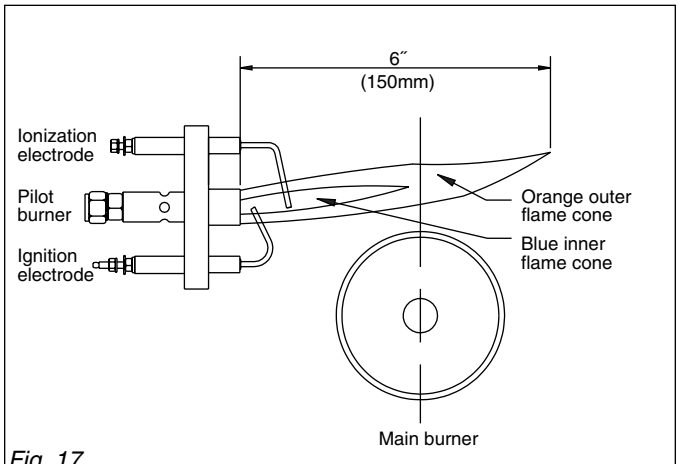


Fig. 17
Side view – pilot burner

Underfired: Lazy-burning main flame cone, mushy flame appearance throughout, smaller flame size than in Fig. 17.

Overfired: Increased pilot burner noise, long inner and outer flame cone towards main burner.

7.7 Periodically:

- Inspect low water cut-offs, including flushing of float types (if used).
- Inspect flow switch (if used).
- Inspect main burner flame and pilot burner

7.8 Service agency – annually:

Boiler servicing – heat exchanger cleaning

The heat exchanger should be cleaned once a year as outlined in section 8.3.

Before heating season starts, boiler/burner should be serviced by a qualified service agency.

7.9 Lighting instructions – (see page 14) electronic ignition – natural gas

a) Follow steps outlined on page 14

b) Ignition will occur at pilot burner. When pilot is ignited, ionization electrode will prove flame, and control will open main gas valve. Pilot flame will then ignite main burner.

Trial for pilot ignition is 15 seconds. If pilot flame is not established in 15 seconds, control will lock out.

If ignition control locks out then restart by turning power off, waiting 5 minutes, then turning power back on again. This can be done by turning the 120V power supply off, or the on/off switch on the boiler Vitotronic control. The remote operating control can also be used to reset the ignition control. Ignition will occur according to the above procedure.

The Honeywell ignition S8600B control does not require manual reset on flame failure. The S8600B is standard equipment.

If it is required to have manual reset on pilot flame failure, the boiler must be ordered with the RA890F flame safeguard control (not shown in this manual). Specify RA890F at the time of ordering for pricing and delivery.

7.10 Vitotronic control

For combination space heating and domestic hot water consult Viessmann sales representative for control options and piping diagrams.

If boiler water temperature exceeds 248°F (120°C), the fixed high limit will be tripped. To reset, use a pointed object, such as a pencil tip, to push in green button until an audible click is heard.

Note: If the operating limit is set at the maximum setting 194°F (90°C), the pump must run after burner shut-down to prevent a boiler temperature rise tripping the manual reset high limit. This can be avoided by setting the pump aquastat 18°F (10°C) below the operating limit setting.

8.0 Maintenance

WARNING: Always switch off and disconnect electricity supply and close the manual gas shut-off valve before carrying out service work or replacement of failed components.

8.1 General

Full maintenance should be undertaken not less than once per year. After servicing work has been completed or any component replaced, the boiler must be fully tested.

8.2 Main burner removal (see Figs. 16, 18, 19)

Main burner tubes are removed individually from the manifold. They are located at the back by a pin, and at the manifold by the gas orifice and an offset pin, and retained by a Phillips screw.

a) Ensure manual gas shut-off valve is in the closed position and turn off all electric power to the boiler.

b) Remove the front door of the casing and the lower front panel by pulling forward.

c) Remove the Phillips screw M5 x 8 securing each burner tube to the burner manifold and remove the burners.

d) Using a stiff brush, not a wire brush, brush the burners to dislodge any accumulated deposits. Inspect the burners to ensure that they are clean.

e) Examine the orifices and if damaged or deteriorated, replace with new ones of the correct size and marking (see Table 1 below). If necessary, clean the orifices. Do not broach with wire.

f) Re-assemble the orifices and burners in the reverse order to that above. To install burner tubes, insert the burner tube facing up from under the gas manifold, and slide along guide on bottom edge of boiler casting. When burner support pin engages in locating hole at the back of the casting, align burner tube with orifice, and pull tube back over the orifice and locating pin on manifold; fasten with Phillips screw. If the heat exchanger is to be cleaned, replace burner tubes only after cleaning is completed.

Table 1: GAS ORIFICES

Altitude above sea level	Natural Gas ømm	L.P. Gas ømm
0 – 2000 ft.	4.30	2.50
2000 – 4500 ft.	4.10	2.30
2000 – 7000 ft.	4.10	2.30

Lighting instructions – intermittent pilot ignition system:

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.

Boiler and piping system must be filled with water and purged of all air before operating boiler. All installation requirements and safety inspections must be completed before operating boiler.

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

B. BEFORE OPERATING smell all around the boiler 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

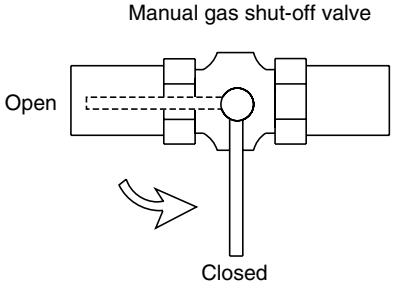
- **Do not try to light any appliance.**
- **Do not touch any electrical switch; do not use any phone in your building.**
- **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

C. Use only your hand to turn lever operated manual gas shut-off valves. If the lever handle will not turn by hand, call a qualified service technician or the gas supplier.

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 page.**
2. **Set the thermostat or other operating control to the lowest setting.**
3. **Turn off all electric power to the boiler.**
4. **This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.**



5. **Remove control access panel.**
6. **Turn all manual gas shut-off valves to closed position.**
7. **Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above. If you don't smell gas, go to the next step.**
8. **Turn all manual gas shut-off valves to the open position.**
9. **Replace control access panel.**
10. **Turn on all electric power to the boiler.**
11. **Set thermostat or other operating control to desired setting.**
12. **If the boiler will not operate, follow the instructions "To Turn Off Gas To Boiler" and call your service technician or gas supplier.**

TO TURN OFF GAS TO BOILER

1. **Set the thermostat or other operating control to lowest setting.**
2. **Turn off all electric power to the boiler if service is to be performed.**
3. **Remove control access panel.**
4. **Turn all manual gas shut-off valves to closed position.**
5. **Replace control access panel.**

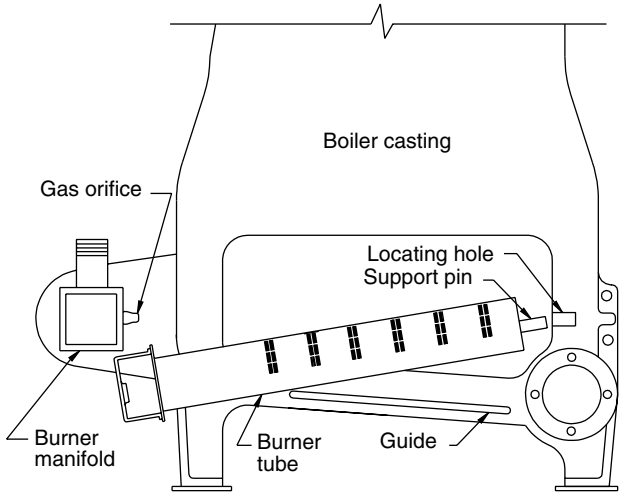


Fig. 18
Installing burner tubes – side view

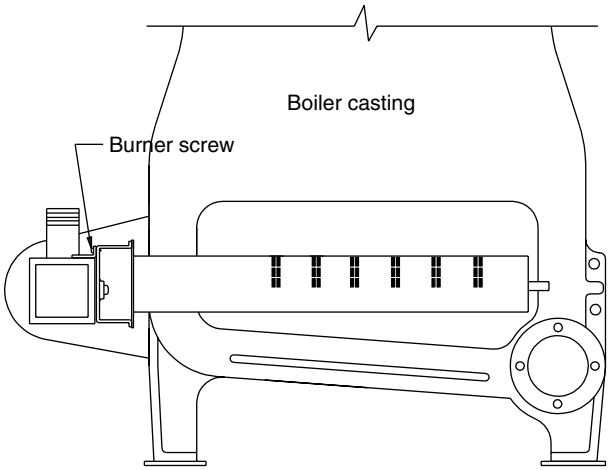


Fig. 19
Burner tube installed

8.3 Heat exchanger cleaning (see Fig. 20)

While the main burner tubes are removed from the appliance, the flueway should be cleaned.

a) Remove the main front panel and the top cover by pulling upwards to expose the draft hood. Disconnect wiring to Vitotronic control and remove sensors from boiler well. Remove the upper front panel with the Vitotronic control. Be careful not to kink any capillary tubes or strain any wiring.

b) Remove the four screws retaining the upper mid panel and remove the upper mid panel.

c) Remove all screws fixing the front inspection and cleaning cover to the draft hood.

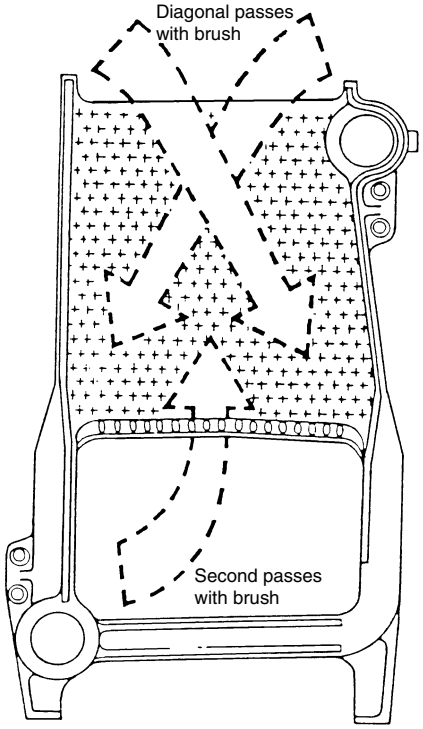


Fig. 20
Cleaning heat exchanger

d) Remove the front inspection and cleaning cover to get access to the heat exchanger.

e) Remove self tapping screw from lower side rear panel which is located through rear panel.

f) Remove lower side rear panel by using the two finger holes and pulling away from the upper side rear panel and lifting away from casing frame.

g) Remove the heat exchanger lower clean-out door by removing the four brass retaining nuts and lifting away.

h) Remove clean-out door gasket to expose flueways. Remove flue gas baffles (one per flueway).

i) Repeat e) – h) for opposite side.

Clean flue gas passageway as per Fig. 20 using the clean-out brush supplied.

8.4 Pilot burner assembly removal (see Figs. 17, 21, 22)

The pilot assembly may be removed either while the main burners are in the boiler or after the main burners have been removed, as previously described in Section 8.2.

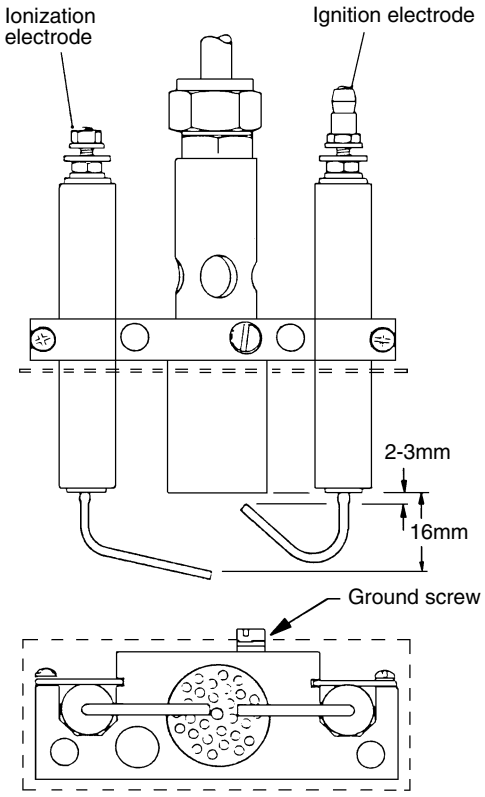


Fig. 21
Pilot burner assembly – electrode settings

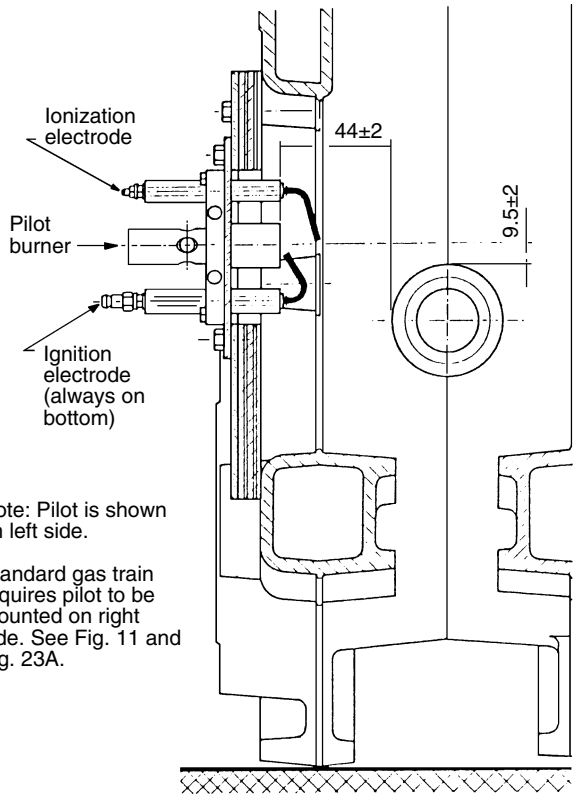


Fig. 22
Pilot burner installed

a) To remove the pilot assembly, release the ground wire at the ground screw on the pilot burner, detach the lead at the ionization probe and pull the lead at the spark electrode. Disconnect pilot tube at the pilot burner connection and remove the three nuts M6 securing the mounting plate assembly to the combustion chamber cover plate.

b) Inspect pilot burner, ionization probe and spark electrode, making sure that they are in a sound and clean condition. In particular check that ignition electrode is clean and undamaged, and that the spark gap is 2-3 mm, ionization and ignition leads are not broken, chafed or burnt. Clean the pilot orifice, do not broach out with wire (see Fig. 21).

c) Reassemble the pilot and refit onto the combustion chamber cover plate in reverse order to that above (see Fig. 22). Pilot burner should be removed when cleaning heat exchanger to prevent debris from blocking pilot orifice.

8.5 Water damage

Any electrical part or any gas control that has been under water cannot be reused but must be replaced. Mechanical parts that have been under water must be inspected for suitability by a boiler technician prior to reuse.

8.6 Burner damage

Do not allow drywall dust to accumulate in burners. Assemble boiler after all drywall work has been completed.

8.7 Freezing damage

Boiler and system must be protected from damage caused by expansion of freezing water.

Protect boiler and system from freezing by using a glycol mixture as described in section 4.3. Propylene glycol mixtures with a corrosion inhibitor are frequently used. Consult a reputable water treatment specialist.

If system is subject to freezing temperatures and is not filled with antifreeze for protection, the system including the boiler must be drained of water. Valve before automatic feed valve (if installed) must be closed; any other valves, air vents and drain valves must stay open.

9.0 Troubleshooting – spark ignition system

TROUBLE	CAUSE	REMEDY
Pilot burner will not light	No call for heat	Check that contacts on thermostat or operating control are closed.
	Boiler temperature too high	Allow boiler to cool and ensure that limit controls are reset.
	No power	Check for 120 VAC power to transformer. Check for 24 VAC power from transformer secondary side.
	Boiler not switched on	Switch boiler “on” from control panel.
	Low water cut-off switch open (if equipped)	Check that boiler and system are filled with water.
Pilot fails to light; boiler locks out	Pilot gas valve not opening	Check wiring to pilot valve. Replace gas valve if necessary.
	No gas	Check that all valves are open. Bleed air from line if necessary. Check orifice in pilot burner for blockage.
	No spark	Check electrode gap of igniter. Check connections on high tension cable to igniter. Ignition module faulty. Replace.
Pilot lights briefly, then locks out	Poor ionization	Check condition of ionization electrode and electrode gap. Repair or replace. Check pilot gas pressure.
	Poor ground	Check all ground connections back to main power panel.
Main burners fail to light	Gas valve fails to open	Check wiring to main gas valve. Replace main gas valve.
	Faulty ignition control module	Replace ignition control module.

Caution:

Condensation can occur in the heat exchanger if boiler is operated for long periods of time with return water temperatures less than 120°F (49°C). Significant flue gas condensation in the boiler will cause corrosion and premature failure. This type of failure is not covered under warranty.

For boilers connected to large water content systems, such as a previous gravity system with large free-standing radiators, a bypass line from supply pipe to the return pipe can be used. A minimum return water temperature of 120°F (49°C) can be achieved by diverting some of the flow of heated supply water into the flow of return water to the boiler. Valves suitable for balancing, such as globe valves, shall be used and a thermometer installed in the return line.

In order to assume minimum boiler water temperature protection, the respective space heating pump must be connected and controlled by the boiler control (refer to the corresponding Vitotronic boiler control manual). Pumps exceeding a rating of 120V/3A need a separate field supplied motor starter/contactor.

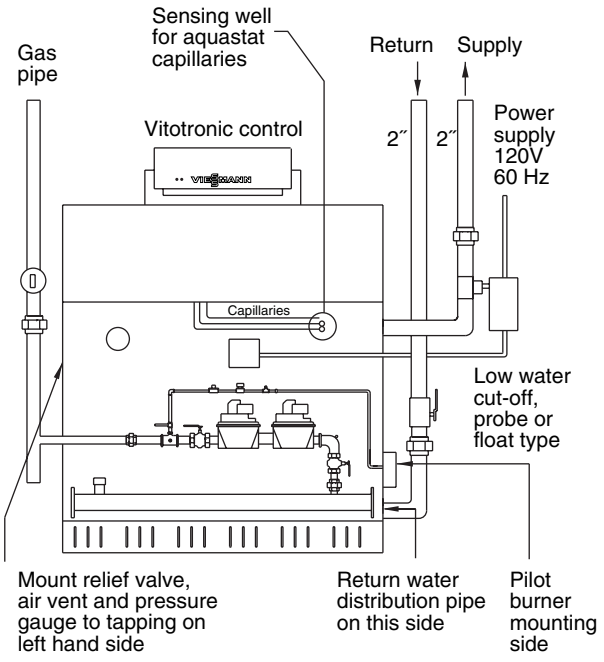
For boilers connected to underfloor heating systems utilizing plastic tubing with an oxygen diffusion barrier, a 4-way mixing valve with external control or other suitable alternative must be installed to prevent condensation and keep boiler return water a minimum of 120°F (49°C).

Technical sales representative can be contacted to help resolve doubts and technical questions regarding boiler installation.

10.0 Piping layouts

Single boiler installation – piping arrangements

Fig. A
RS boiler with right hand water piping – left hand gas piping



Note: Gas train connection to manifold must be on the same side as pilot assembly

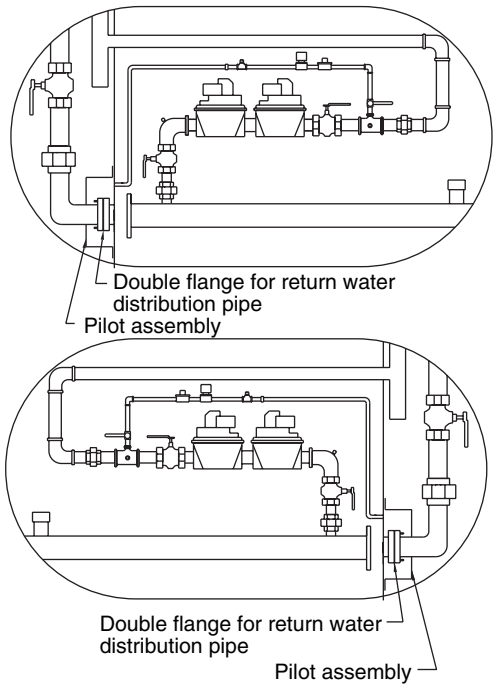


Fig. B
RS boiler with all piping and pilot on left hand side

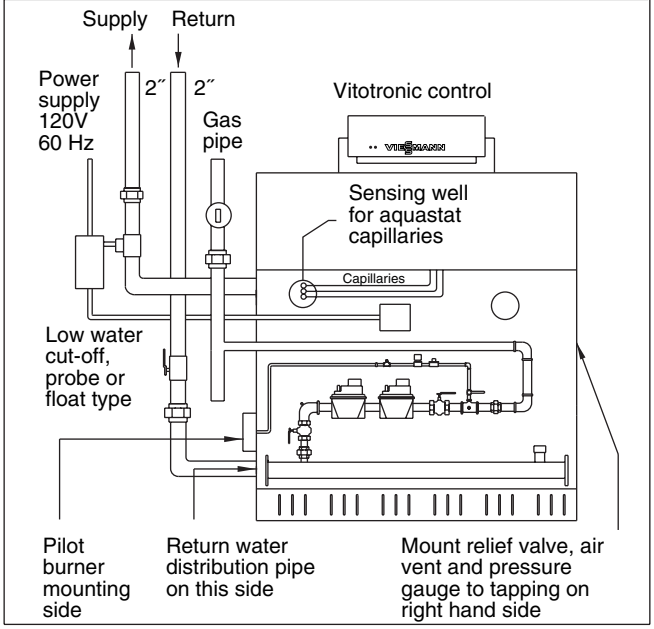
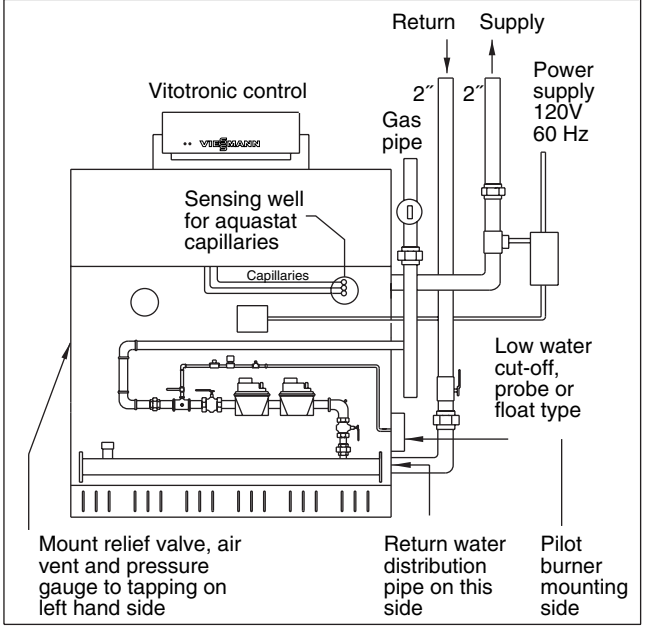


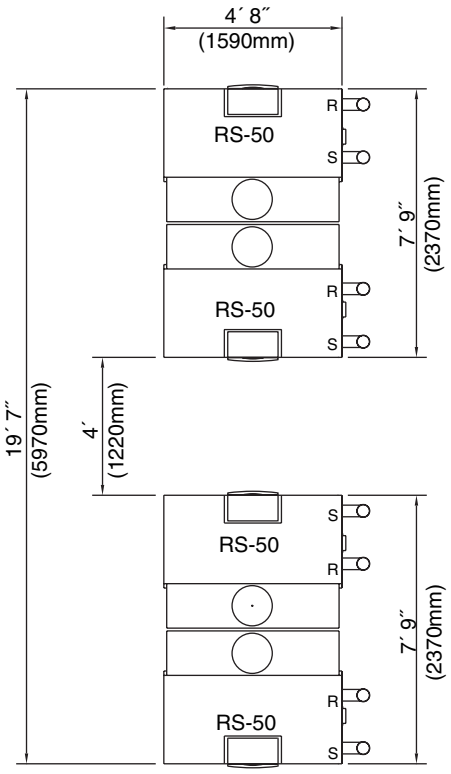
Fig. C
RS boiler with all piping and pilot on right hand side



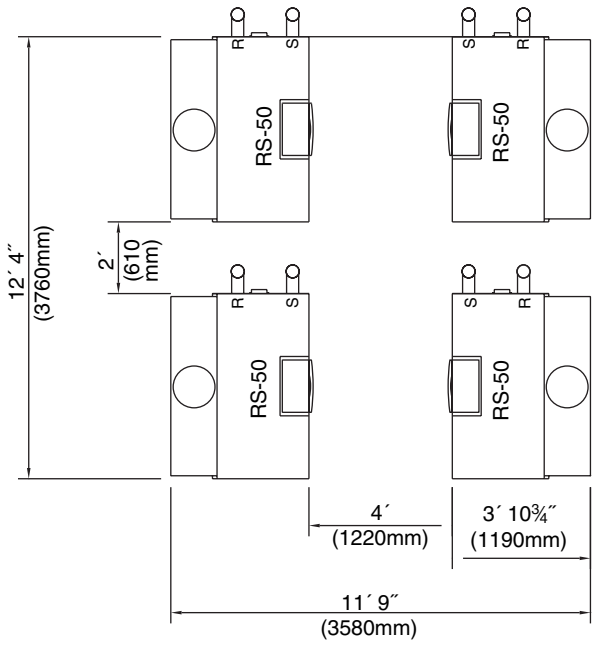
Figures A, B, C show piping arrangements for single boiler installation. RS boiler comes with water distribution pipe and 2″ threaded connections on right hand side as standard equipment. Refer to Section 2.2 for details on changing water piping from right side to left side. If necessary, return water distribution pipe and 5-point capillary well, may have to be moved.

Fig. 23

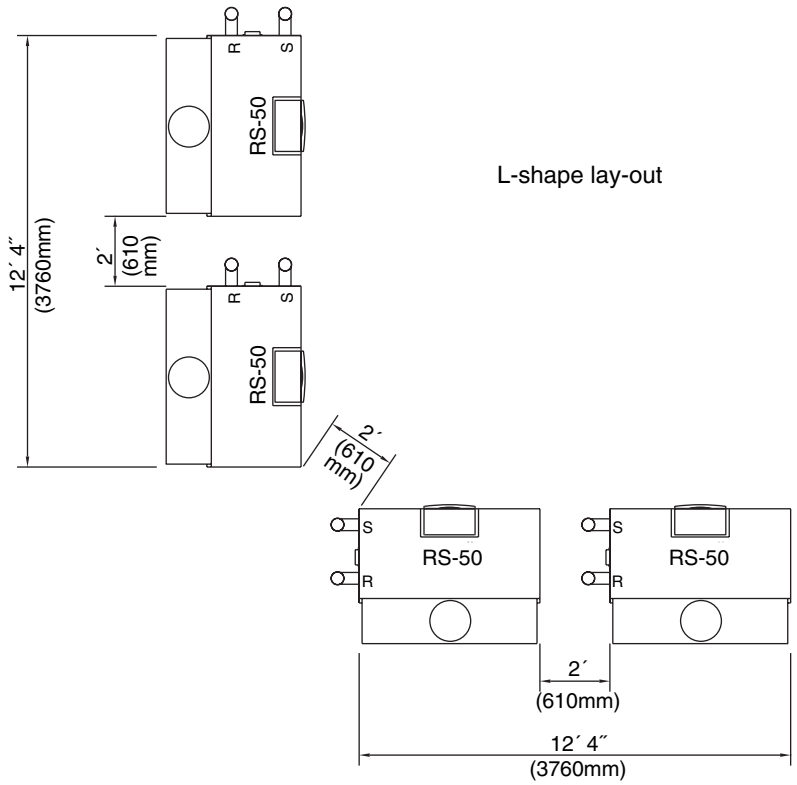
Multiple boiler installation – layouts



Back to back lay-out



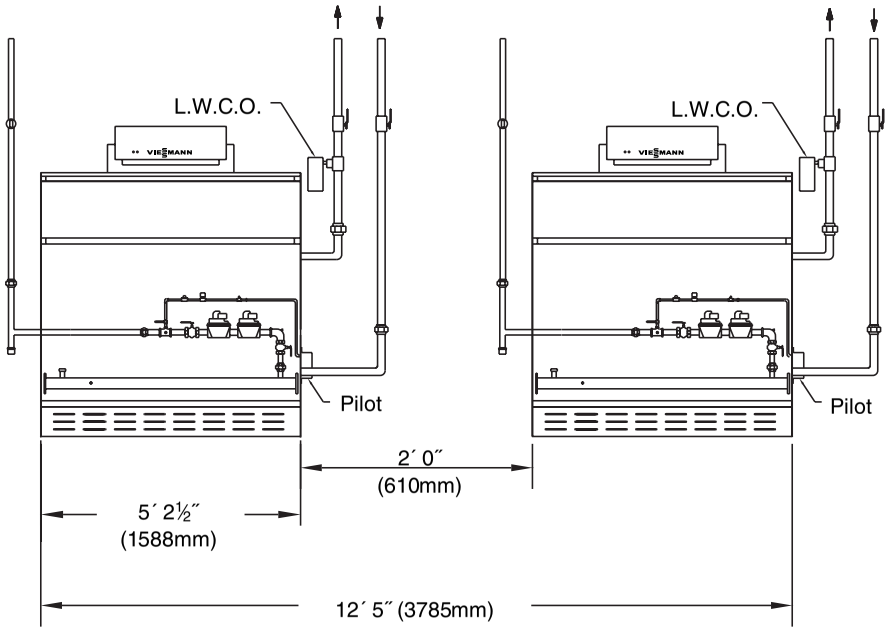
Front to front lay-out



L-shape lay-out

Fig. 24
Lay-outs Vitogas RS-50 gas boilers – top view dimensions in imperial and metric

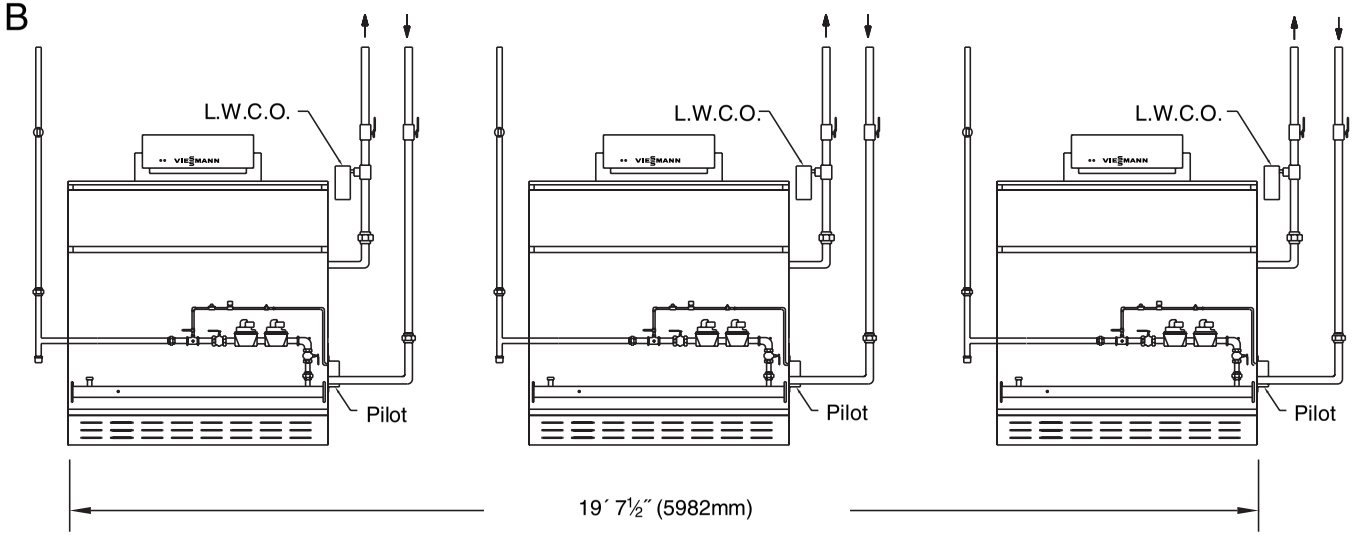
A



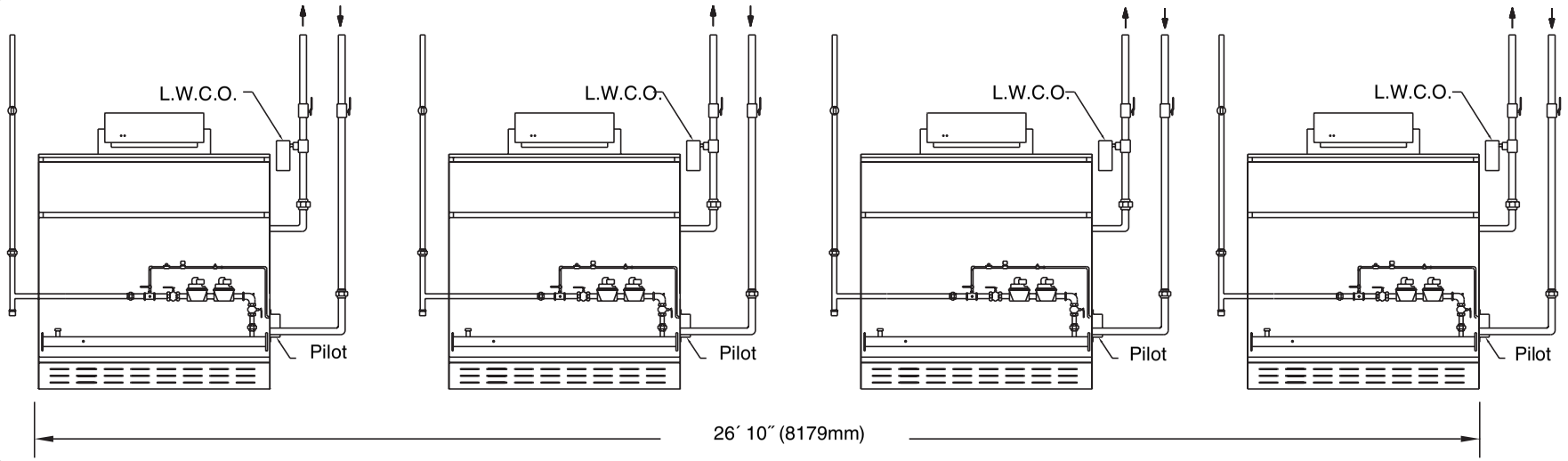
Two Vitogas RS-50
right hand side
standard configuration

Note: Minimum distance between boilers is 2´ 0˝ when pilot is between boilers.

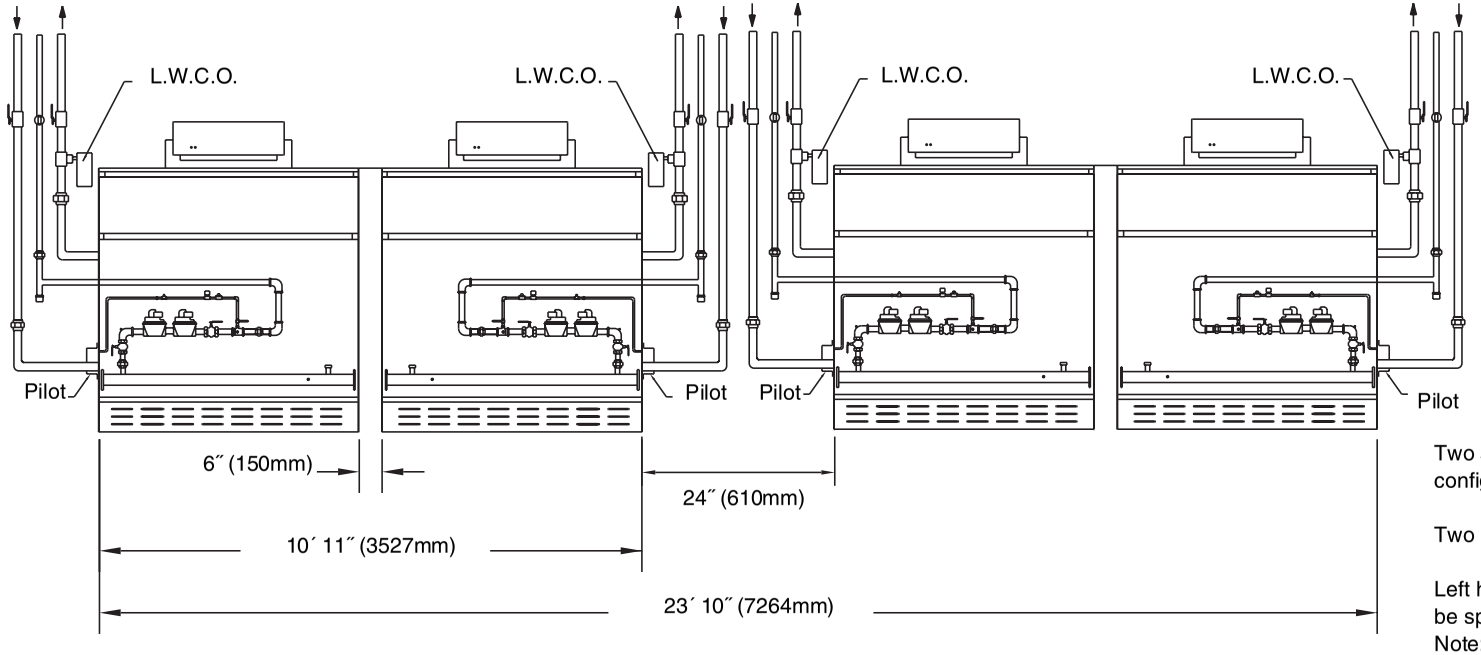
B



C



D



Two standard right hand side configuration

Two left hand side configuration

Left hand side configurations have to be specified at time of ordering.
Note: For layout D, pressure relief valve, air vent and pressure gauge have to be mounted on supply piping.

Fig. 25
Lay-outs of Vitogas RS-50 gas boilers – front elevation. Boilers shown with front access panel removed (Dimensions in imperial and metric)

Vitogas 050, RS single stage with Vitotronic control (Natural gas)

Vitotronic Boiler Control

Refer to internal wiring diagram supplied with the Vitotronic Contol

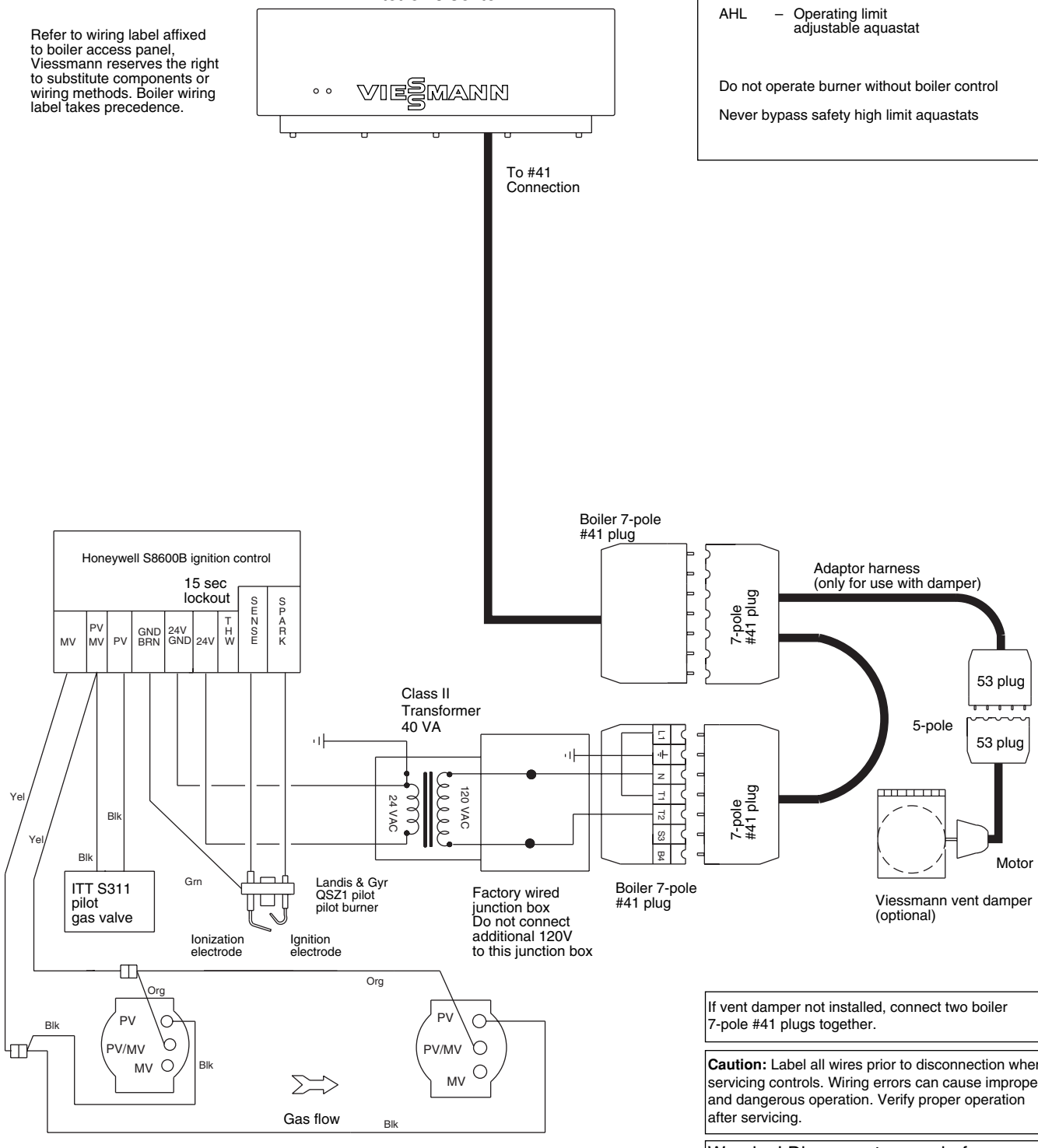
Refer to wiring label affixed to boiler access panel, Viessmann reserves the right to substitute components or wiring methods. Boiler wiring label takes precedence.

FHL – Safety limit manual reset fixed (fixed at 120°C, 248°F)

AHL – Operating limit adjustable aquastat

Do not operate burner without boiler control

Never bypass safety high limit aquastats



If vent damper not installed, connect two boiler 7-pole #41 plugs together.

Caution: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

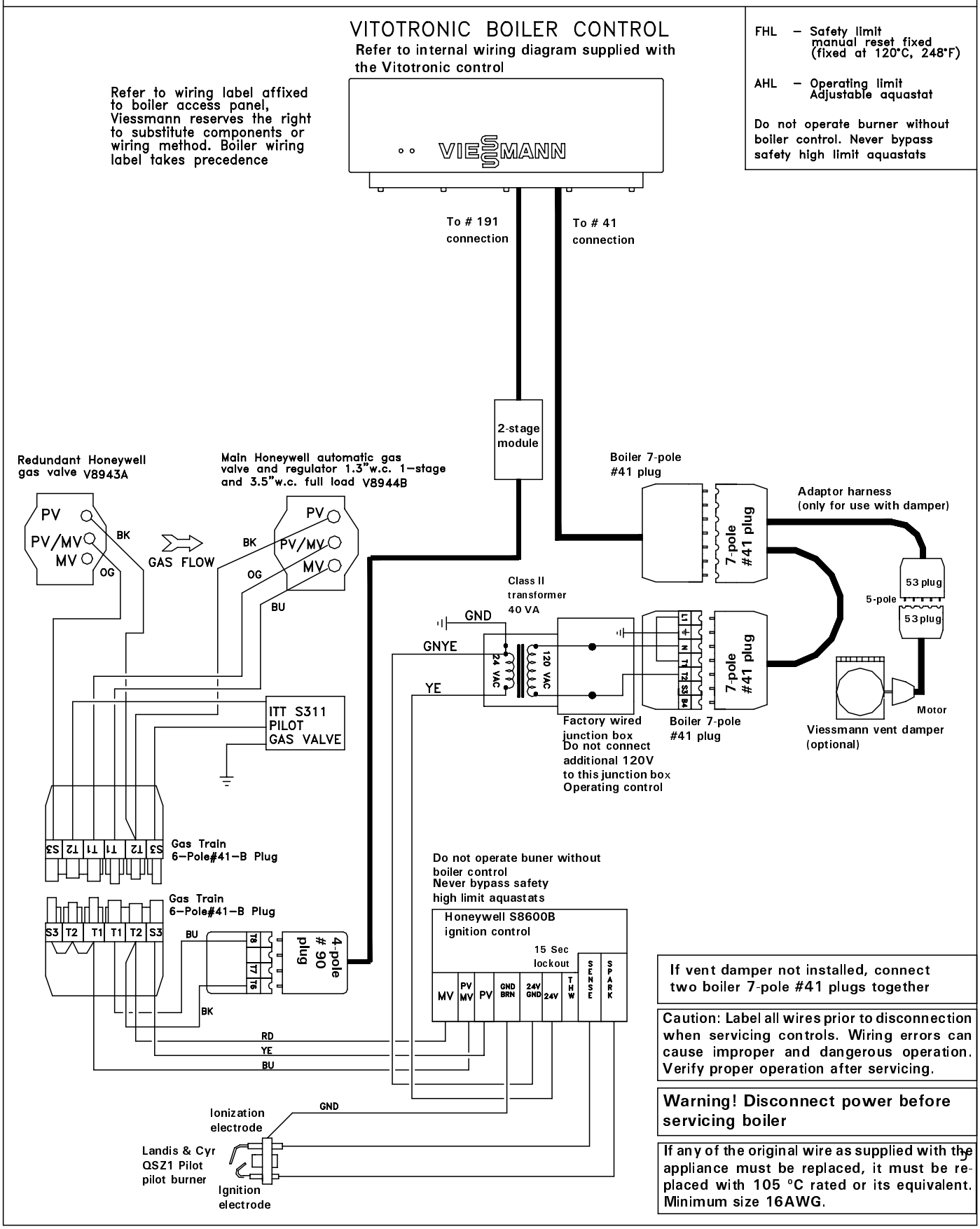
Warning! Disconnect power before servicing boiler

If any of the original wire as supplied with the appliance must be replaced, it must be replaced with 105°C rated or its equivalent. Minimum size 16 AWG.

Redundant Honeywell gas valve V8943A valve has "PV/MV" and "PV" terminal designations

Main Honeywell automatic gas valve and regulator V8943B valve has "PV/MV" and "PV" terminal designations

Vitogas 050, RS 2-stage with Vitotronic control (Natural Gas)



11.0 Checklist for proper installation

Before and after installation, use the following checklist to ensure proper installation. Improper installation could create a hazard, resulting in damage, severe personal injury, or loss of life. The correct answer is “yes” to all of the following questions.

a) Is the flow direction correct?
Water flows in at bottom connection and out at top 2˝ connection? ❒ Yes ❒ No

b) Are both the supply and return on the same side of the boiler? ❒ Yes ❒ No

c) Is the return water distribution pipe (double flange connection) used as the return connection? ❒ Yes ❒ No

d) Is the pilot on the same side of the boiler as the nipple used for the gas train connection? ❒ Yes ❒ No

> ⚠ **Warning:** Failure to correctly install the pilot burner will cause dangerous flame roll-out from the main burners. The worst flame roll-out will occur with propane gas. Flame roll-out can cause property damage or severe personal injury.

e) Is the 5-point well with control capillaries in the sensing tapping nearest the supply connection? ❒ Yes ❒ No

f) Is there a low water cut-off installed? ❒ Yes ❒ No

g) Is the gas supply pressure at the boiler gas train between 14 and 7 ˝w.c.? ❒ Yes ❒ No

h) Is the manifold pressure 3.5 ˝w.c. for natural gas operation with the pilot and main burners operating? ❒ Yes ❒ No

i) Is the pilot pressure for natural gas operation between 5 and 6 ˝w.c. with pilot running? ❒ Yes ❒ No

j) If the RS boiler has been installed in an older piping system, has it been flushed out to ensure debris, scale, rust and sludge will not settle in boiler? ❒ Yes ❒ No

k) Are all pressure measurement taps installed and tightened? ❒ Yes ❒ No

l) Are all main burners installed with ports facing up? ❒ Yes ❒ No

Caution
This boiler is not for use in systems where water is constantly or frequently replenished. Minerals such as calcium in make-up water can deposit on heat exchanger causing overheating, and eventually the boiler will leak. This type of failure is not covered by warranty. Water must not be drained from system for use by cleaning personnel. Do not draw water from boiler for any purpose.

Caution
The boiler warranty does not cover leaks resulting from corrosion caused by the use of underfloor plastic tubing without an oxygen diffusion barrier. Such systems must have the non-oxygen diffusion barrier tubing separated from the boiler with a heat exchanger. Viessmann recommends the use of underfloor plastic tubing with an oxygen diffusion barrier.

Note:
A minimum of 2˝ clearance from non-insulated hot water pipes to combustible construction must be maintained. In cases where the pipes are insulated with pipe insulation of appropriate and sufficient thickness and insulation values, the above clearance may be reduced to 0˝.

Caution:
For underfloor heating applications, an additional immersion or strap-on aquastat must be installed in the low temperature underfloor loop (ahead of the mixing valve) to de-energize the pump and/or boiler in the event of overheating. Too high a water temperature can cause damage to concrete slabs.

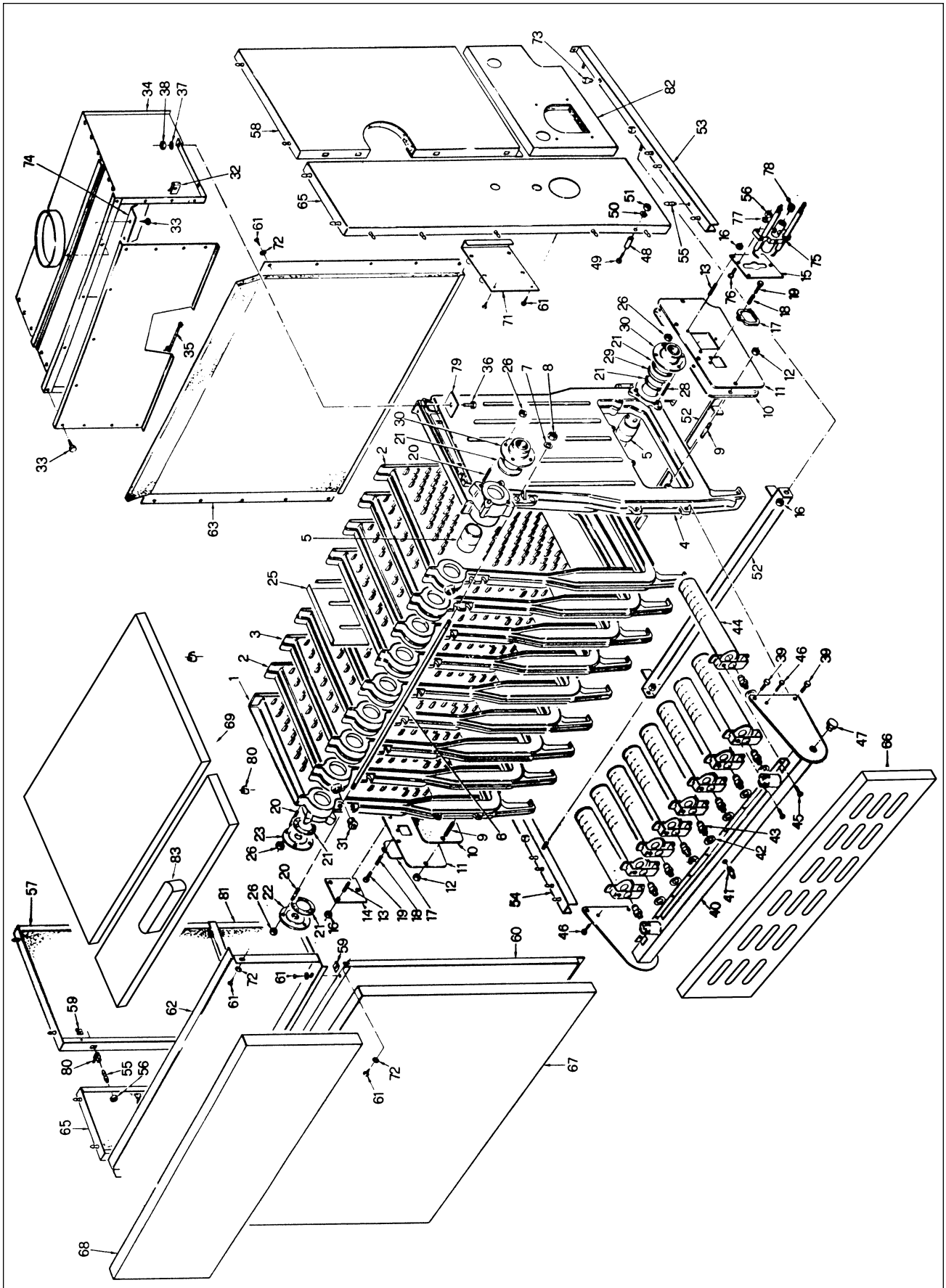


Fig. 26

Atola-RS Parts List

Pos.	Qty	Description and Model	Boiler
1	1	Left hand end section	
2	2	Intermediate section with drilling ¾″ NPSC	
3	4	Intermediate section	RS-8
3	7	Intermediate section	RS-11
3	10	Intermediate section	RS-14
4	1	Right hand end section	
5	14	Push nipple 2½″	RS-8
5	20	Push nipple 2½″	RS-11
5	26	Push nipple 2½″	RS-14
6a	2	Tie-rod M14x842	RS-8
6b	2	Tie-rod M14x1175	RS-11
6c	2	Tie-rod M14x1508	RS-14
7	4	Plain washer Ø 15x28	
8	4	Nut M14	
9	8	Stud M8x34	
10	2	Combustion chamber door insulation	
11	2	Combustion chamber door	
12	8	Nut M8	
13	6	Stud M6x17 Zn	
14	1	Blank plate	
15	1	Plate for pilot burner	
16	10	Nut M6 ZnCr	
17	2	Window	
18	2	Spring	
19	2	Screw Hex.H. M6x20	
20	12	Stud M12x50 – stamped B7	
21	5	Gasket 65x95x2	
22	1	Flange	
23	1	Flange	
24			
25a	7	Baffle	RS-8
25b	10	Baffle	RS-11
25c	13	Baffle	RS-14
26	16	Nut M12 – stamped 2H	
27			
28	4	Stud M12x60 – stamped B7	
29a	1	Water distributor	RS-8
29b	1	Water distributor	RS-11, RS-14
30	2	Flange 2″ NPT	
31	1	Plug ¾″	
32a	11	Fastener for self tapping screw	RS-8
32b	12	Fastener for self tapping screw	RS-11
32c	14	Fastener for self tapping screw	RS-14
33a	32	Self tapping screw Hex.H. #12x½″ ZnCr	RS-8, RS-11
33b	34	Self tapping screw Hex.H. #12x½″ ZnCr	RS-14
34a	1	Smoke chamber / D.D.D.	RS-8
34b	1	Smoke chamber / D.D.D.	RS-11
34c	1	Smoke chamber / D.D.D.	RS-14
35a	1	Ceramic fibre sealing cord Ø 15x750	RS-8
35b	1	Ceramic fibre sealing cord Ø 15x1090	RS-11
35c	1	Ceramic fibre sealing cord Ø 15x1420	RS-14
36	4	Screw Hex.H. M8x30 ZnCr	
37	4	Plain washer Ø 8, 4x17 ZnCr	
38	4	Nut M8 ZnCr	
39	4	Screw Hex.H. M8x16 ZnCr	
40a	1	Burner manifold	RS-8
40b	1	Burner manifold	RS-11
40c	1	Burner manifold	RS-14
41	1	Pressure test nipple Ø ⅛″	
42	7	Aluminum washer Ø 14	RS-8
42	10	Aluminum washer Ø 14	RS-11
42	13	Aluminum washer Ø 14	RS-14

Pos.	Qty	Description and Model	Boiler
43a	7	Nozzle Ø 4,30 – M14x1	RS-8-NG
43b	10	Nozzle Ø 4,30 – M14x1	RS-11-NG
43c	13	Nozzle Ø 4,30 – M14x1	RS-14-NG
44	7	Burner	RS-8
44	10	Burner	RS-11
44	13	Burner	RS-14
45	7	Screw TCB M5x8 ZnCr	RS-8
45	10	Screw TCB M5x8 ZnCr	RS-11
45	13	Screw TCB M5x8 ZnCr	RS-14
46	2	Screw Hex.H. M6x20 ZnCr	
47	1	Plug ¼″ Zn	
48	4	Spacer Ø 5x8x10 Zn	
49	4	Screw Hex.H. M4x16 ZnCr	
50	4	Grower washer Ø 4,3 ZnCr	
51	4	Nut M4 ZnCr	
52a	2	Frame, front and rear part	RS-8
52b	2	Frame, front and rear part	RS-11
52c	2	Frame, front and rear part	RS-14
53	1	Frame, right hand side part	
54	1	Frame, left hand side part	
55	38	Pin M5 ZnCr	
56	32	Nut M5 ZnCr	
57	1	Casing left hand side rear upper panel	
58	1	Casing right hand side rear upper panel	
59	4	Fastener for self tapping screw	
60a	1	Casing lower inner panel	RS-8
60b	1	Casing lower inner panel	RS-11
60c	1	Casing lower inner panel	RS-14
61			
62a	1	Casing upper inner panel	RS-8
62b	1	Casing upper inner panel	RS-11
62c	1	Casing upper inner panel	RS-14
63a	1	Casing rear panel	RS-8
63b	1	Casing rear panel	RS-11
63c	1	Casing rear panel	RS-14
64			
65	2	Casing side panel, front part with opening Ø 120	
66a	1	Casing front lower panel	RS-8
66b	1	Casing front lower panel	RS-11
66c	1	Casing front lower panel	RS-14
67a	1	Casing front central panel	RS-8
67b	1	Casing front central panel	RS-11
67c	1	Casing front central panel	RS-14
68a	1	Casing front upper panel	RS-8
68b	1	Casing front upper panel	RS-11
68c	1	Casing front upper panel	RS-14
69a	1	Casing top cover	RS-8
69b	1	Casing top cover	RS-11
69c	1	Casing top cover	RS-14
70			
71			
72	16	Plain washer Ø 4,3x9 ZnCr	
73	4	Pin M5 ZnCr	
74	1	Smoke chamber baffle	RS-14
75	1	Pilot burner LANDIS & GYR QSZ 1.070	
76	2	Screw Hex.H. M5x20 ZnCr	
77	2	External grip washer Ø 5,3 ZnCr	
78	1	Pilot nozzle Ø 0.70mm for Nat. Gas	
78a	1	Pilot nozzle Ø 0.50mm for propane gas	
79	4	Combustion chamber fixing plate	
80	38	Spring clip	
81	1	Casing left hand side rear lower panel	
82	1	Casing right hand side rear lower panel	
83	1	Vitotronic Control Housing	

Vitogas 050, RS controls and accessories

Please refer to the corresponding Vitotronic control manual shipped with the boiler

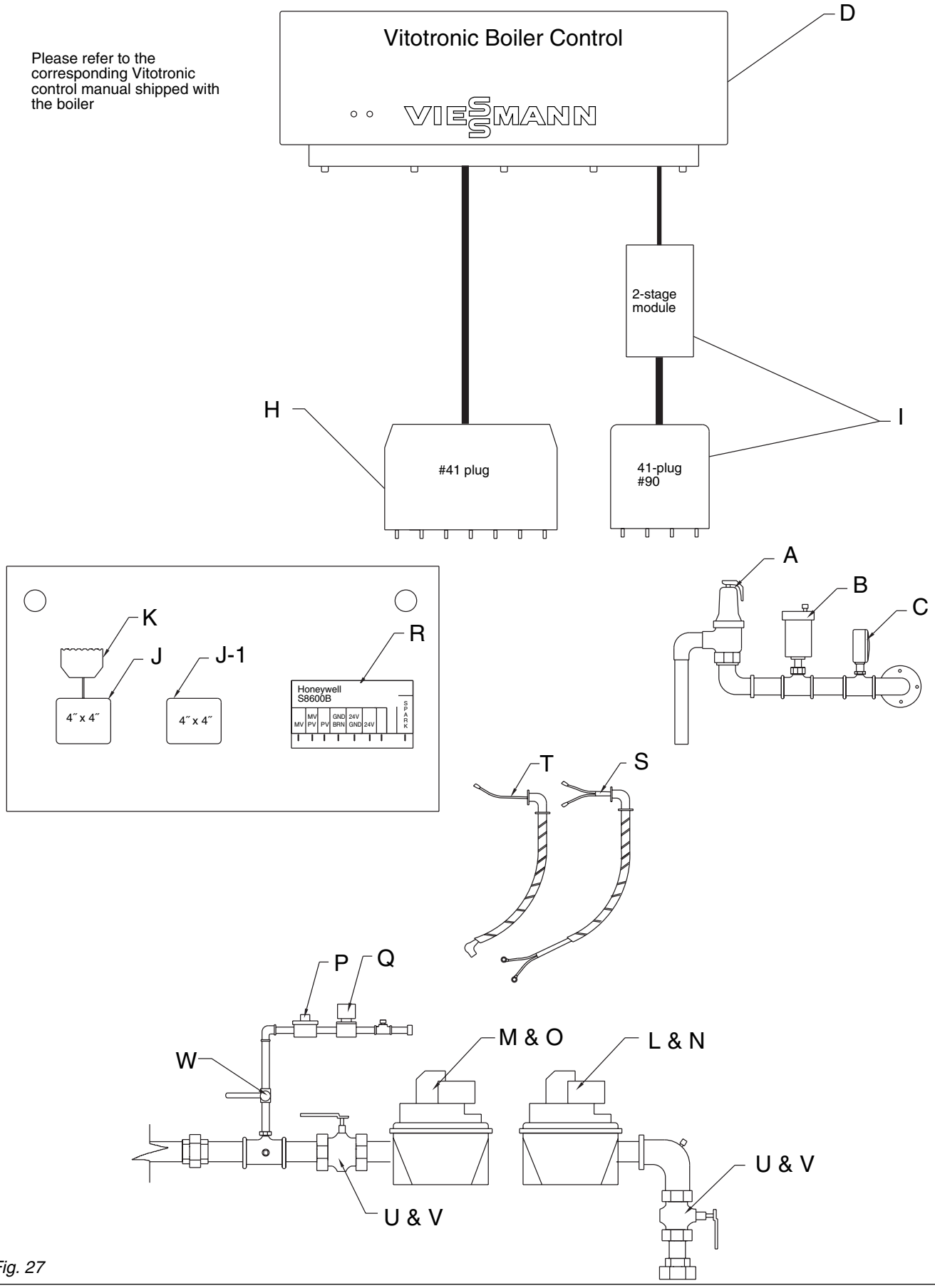


Fig. 27

Vitogas 050, RS Control and Accessories Parts List

Ref. No.	Description of part	RS-8	RS-11	RS-14
A	Pressure relief valve 1″ 50 psi	1	1	1
B	Automatic air vent	1	1	1
C	Pressure gauge 0-100 psi	1	1	1
D	Vitotronic controls	1	1	1
E	Adjustable high limit (not shown)	1	1	1
F	Fixed high limit (not shown)	1	1	1
G	Pump aquastat (not shown)	1	1	1
H	7-pole #41 plug male (comes with all the boilers)	1	1	1
I	Two-stage module and 4-pole #90 plug (comes with 2-stage boilers only)	1	1	1
J	Junction box (factory prewind)	1	1	1
J1	Junction box (supplied with all boilers. Used only with the Vitotronic 100)	1	1	1
K	7-pole 41 plug female			
L	Nat. gas valve & regulator 1″	1		
M	Automatic gas valve 1″	1		
N	Nat. gas valve & regulator 1¼″		1	1
O	Automatic gas valve 1¼″		1	1
P	Pilot pressure regulator MAX-RV101/835	1	1	1
Q	Solenoid pilot valve S311AF01NGHF ⅛″ NPT, 24V	1	1	1
R	Ignition module S8600B 1025 (15 sec. lockout)	1	1	1
S	Wiring harness for flame rod and ground	1	1	1
T	Ignition cable (36″)	1	1	1
U	Manual gas valve 1″ NPT	2		
V	Manual gas valve 1¼″ NPT		2	2
W	Brass ball valve ¼″ for pilot line	1	1	1
	Complete gas train RS-8, 1″ nat. gas, 24V	1		
	Complete gas train RS-11, 1¼″ nat. gas, 24V		1	
	Complete gas train RS-14, 1¼″ nat. gas, 24V			1

*Obtain replacement parts from your Viessmann dealer. Installation of incorrect replacement parts can cause unsafe operation.

*Refer to the corresponding Vitotronic boiler control manual for details.

*Refer to the corresponding wiring diagram shipped with the boiler (affixed to the inside of the front access panel).

*Mid panel does not show all other wiring harnesses and plugs. Locations of components are not exactly as shown.

12.0 Assembly of split cast-iron block using Viessmann draw tool

12.1 Section block assembly (see Figs. 10, 27, 28, 29, 30)

Depending on the boiler size, the cast-iron section assembly is shipped in pre-assembled blocks of two or more. Site assembly of the blocks is required and the following procedure must be strictly adhered to.

1) Remove the boiler tie rods from boiler block; individual section blocks come apart, remove the rubber shipping washers. See Fig. 27.

2) Remove the threaded flanges from end sections. See Fig. 27.

3) Ensure return water distribution tube and 5-point well are removed from cast-iron block. See Figs. 10, 27a.

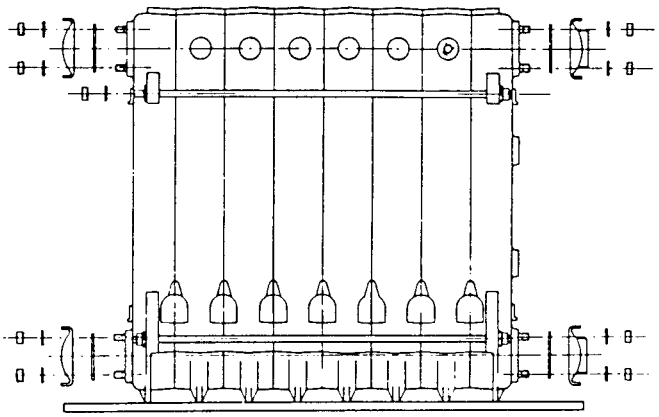


Fig. 27

12.2 Cleaning

1) Carefully clean the sealing grooves and the cast-iron push nipples with extra fine emery cloth. **Important:** The above cleaning procedure is required to remove all rust and/or foreign material that may have collected. Do not score the nipples or sealing grooves by over-cleaning.

2) Using a narrow putty knife, trowel the sealing compound provided carefully into the sealing grooves. Make sure that the complete groove system on each section block is completely filled with the sealing compound. Failure to fully seal each section block will result in flue gas leaks.

3) Carefully clean the smooth machined surfaces of the nipple ports assuring they are clear of all grease, metal cuttings and other debris. If necessary, use the extra fine emery cloth to carefully remove surface rust build-ups. Apply push nipple lubricant to all surfaces of the nipple ports and tapered push nipples.

4) Ensure that the push nipples are evenly inserted into the nipple ports, top and bottom. Place a wood block across the nipple and gently tap the wood until the nipple is securely in place. The nipple must be inserted absolutely straight into the nipple port. Apply force from your hammer evenly on the full rim edge of the nipple. Use a tape measure to ensure that the nipple is uniformly inserted. **Note:** The above procedure is intended to only locate the nipple securely in place. Do not apply excessive force when setting the nipples in place.

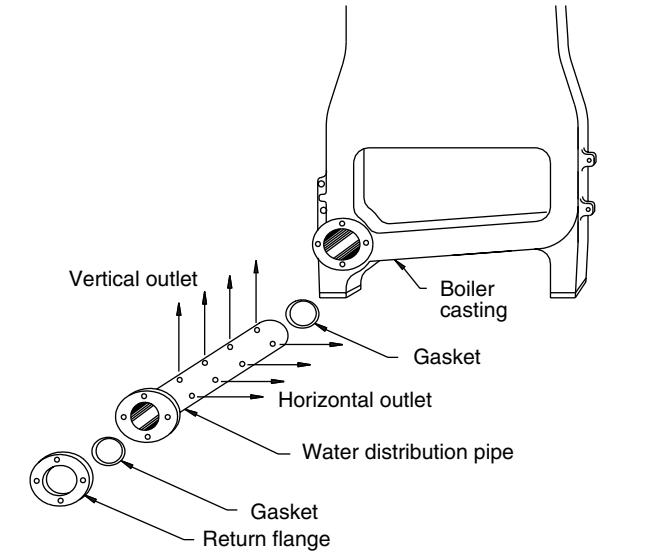


Fig. 27a
Water distribution tube – boiler return

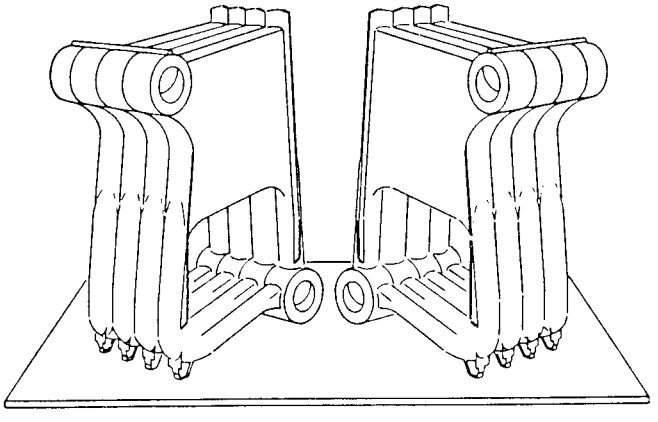


Fig. 28

12.3 Section block assembly

1) Provide a level concrete base for the boiler of not less than 4″ in thickness. The base must be of sufficient size to allow the base to extend 4″ beyond the front, back and sides of the boiler.

2) Place boiler skids (metal strips) on the base. The skids should be located so that the boiler legs, front and back, sit evenly on the skids. See Fig. 29.

3) Bring the section blocks together making sure that as they meet, they are kept exactly parallel to each other. Re-check the parallel alignment of the push nipple and nipple ports. Distance “X” must be the same as “Z”. Insert, adjust and tighten assembly tools by hand. Make sure the two hexagon brass nuts have full “thread grip” on assembly tool threads. See Fig. 30.
Attention: Use plenty of oil between hexagon brass nuts and steel pressure plates as well as on assembly tool threads!
Important: Use only a Viessmann assembly tool for this procedure.

4) Start to draw by tightening the two hexagon brass nuts equally with the two hexagon keys supplied. Always check during drawing the distance “X” = “Z”.
Attention: Do not force tightening after you have reached contact of any two different points of the sealing surfaces. See Fig. 30.

5) Insert the boiler tie rods again and tighten them with moderate force only. Remove assembly tools and re-install all flanges. See Figs. 27, 27a.

6) Check and seal all gaps between sections using the sealing compound provided. The boiler block must be hydrostatically tested at a maximum of 90 psi to ensure against water leaks. Ensure return water distribution tube is correctly installed (see Figs. 23, 27a) on right or left side.

7) Ensure 5-point well is installed in the tapping closest to the supply connection (see Fig. 23).

8) Proceed with installation of enclosure, gas train and controls. See section 2.0 on page 4.

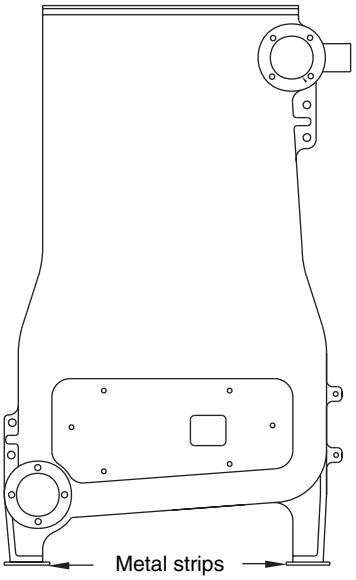


Fig. 29

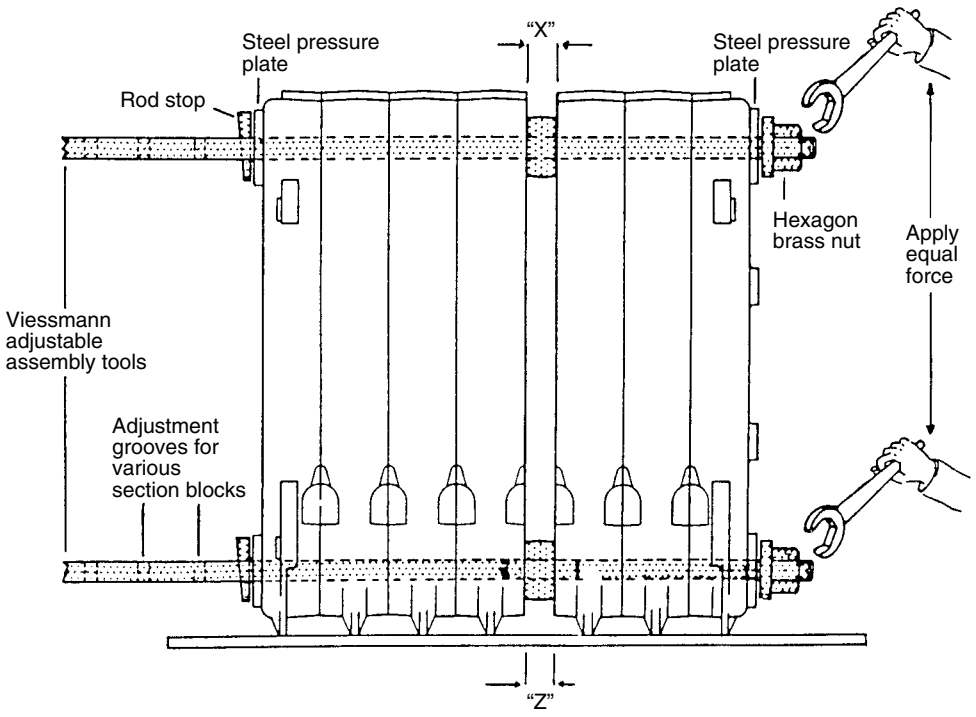


Fig. 30

Attention Installer:

Please make sure that all parts belonging to the assembly tools are packed again into the carrying case after the procedure, so that the assembly tool set is complete for the next user. Thank you for your accuracy and cooperation.

Maintenance record

	Year	Service Contractor	Clean heat exchanger	Check for proper supply of combustion air	Check vent system for leaks, corrosion, proper draft, adherence to codes, blockage*	Burner and gas controls inspected for proper operation, combustion test performed
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

*Any defects, blockages, etc. in vent system must be corrected to ensure safe operation.