

# BOILER INSTALLATION, OPERATION INSTRUCTIONS

# Riva

## ADVANCE SV

### WALL HUNG GAS BOILER FOR CENTRAL HEATING SUPPLY

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

**WARNING:** If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- **WHAT TO DO IF YOU SMELL GAS**
  - Do not try to light any appliance.
  - Do not touch any 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 installer, service agency or the gas supplier.

Manufactured by:



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Verona, Italy



Distributed By:



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Dear Customer:

Thank you for buying a Biasi Riva Advance SV.

The Riva Advance SV is a high efficiency condensing, wall mounted gas boiler which provides central heat supply water.

We realize that it is not possible to answer all questions about the Riva Advance SV system 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 external controls and accessories listed in this manual (excluding those supplied inside the boiler) 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 valves. **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.**

All BIASI wall hung boilers are built in accordance with the ASME boiler and pressure vessel code, and bear the "H" stamp. The Entire range of applications for the Riva Advance SV has been tested to standard CSA 4.9 and is CSA compliant.

This Riva Advance SV has a 2 year 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 (located on the ratings label affixed to the boiler), date of installation and the name of your installer being on record in our files.

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

**QHT inc.**

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## WARNING

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

**WARNING:** If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- **WHAT TO DO IF YOU SMELL GAS**
  - Do not try to light any appliance.
  - Do not touch any 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 installer, service agency or the gas supplier.

## DANGER

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

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

**Caution:** 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

Any appliance that burns natural gas, propane gas, fuel oil, wood or coal is capable of producing carbon monoxide (CO). Carbon Monoxide (CO) is a gas which is odorless, colorless and tasteless but is very toxic. CO is lighter than air and thus may travel throughout the building.

**BRIEF EXPOSURE TO HIGH CONCENTRATIONS OF CO, OR  
PROLONGED EXPOSURE TO LESSER AMOUNTS OF CO MAY  
RESULT IN CARBON MONOXIDE POISONING. EXPOSURE CAN BE  
FATAL AND EXPOSURE TO HIGH CONCENTRATIONS MAY RESULT  
IN THE SUDDEN ONSET OF SYMPTOMS INCLUDING  
UNCONSCIOUSNESS.**

Symptoms of CO poisoning include the following:

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

The symptoms of CO poisoning are often confused with those of influenza, and the highest incidence of poisoning occurs at the onset of cold weather or during flu season.

A victim may not experience any symptoms, only one symptom, or a few symptoms.

**Suspect the presence of carbon monoxide if symptoms tend to disappear when you leave your home.**

The following signs may indicate the presence of carbon monoxide:

- Hot gasses from appliance, venting system pipes or chimney, escaping into the living space.
- Flames coming out around the appliance.
- Yellow colored flames in the appliance.
- Stale or smelly air.
- The presence of soot or carbon in or around the appliance.
- Very high unexplained humidity inside the building.

If any of the symptoms of CO occur, or if any of the signs of carbon monoxide are present, **VACATE THE PREMISES IMMEDIATELY AND CONTACT A QUALIFIED HEATING SERVICE COMPANY OR THE GAS COMPANY OR THE FIRE DEPARTMENT.**

**ONLY QUALIFIED, LICENSED SERVICE CONTRACTORS SHOULD PERFORM WORK ON YOUR BIASI RIVA ADVANCE SV.**

## IMPORTANT INFORMATION

Please read this page carefully.

- **ALL BOILERS MUST BE INSTALLED IN ACCORDANCE WITH NATIONAL, STATE AND LOCAL PLUMBING, HEATING AND ELECTRICAL CODES AND ORDINANCES, AS WELL AS THE REGULATIONS OF THE SERVING ELECTRICAL, WATER AND GAS UTILITIES.**
- **All systems should be designed by competent contractors, and only persons knowledgeable in the layout and installation of heating systems should attempt the installation of any boiler. It is the responsibility of the installing contractor to see that all controls are correctly installed and operating properly when the installation is completed.**
- **This boiler is intended for use, only with propane or natural gas. All flammable liquids (especially gasoline), chemicals, rags, paper, wood scraps, debris, etc., should be kept away from the boiler at all times. Keep the boiler area clean and free of all fire hazards.**
- **Please read the literature and warranties supplied by the manufacturers of the various accessory equipment. This equipment is warranted by the respective manufacturers, not by Quincy Hydronic Technology, Inc. Each piece of equipment must be installed and used according to the recommendations of the manufacturer.**

### Codes and Regulations:

Installation of the boiler and related equipment must conform to national, state and local regulating agencies and codes applicable to the installation of the equipment. In the absence of local requirements, the following codes apply:

- |   |
|---|
| A. ANSI/NFPA - #70 National Electric Code     |
| B. ANSI/NFPA - #211 Chimneys and Vents        |
| C. ANSI/NFPA - #Z223.1 National Fuel Gas Code |
| C. ANSI/NFPA - Domestic Gas Conversion Burner |
| D. CAN/CGA - B149 Installation Codes          |
| E. ANSI/ASME - CSD-1                          |

The above codes are available from:

National Fire Protection Association (NFPA)  
Battery March Park  
Quincy, Massachusetts, 02269  
<http://www.nfpa.org>

CSA International  
8501 E. Pleasant Valley Road  
Cleveland, OH 44134-5575  
<http://www.csa-international.org>

# 1. General Information

The Riva Advance SV is a high efficiency condensing, wall mounted gas boiler which provides central heat. The boiler features a gas valve which modulates the energy input from 41.000 BTU/h to 116.000 BTU/h. The boiler is shipped fully assembled with the components listed on page 10. All units are pressure and combustion tested at the factory prior to shipping.

## Key Features:

- Wall mountable - saving valuable floor space.
- Several flue options available
- Electronic spark ignition
- Safety flow switch - positioned on the main circuit, which monitors the flow and protects the main heat exchanger from thermal shock should there be a lack of water in the system.
- Frost protection - contains an integral frost protection system to prevent frost damage which can occur in areas susceptible to very cold weather conditions.
- Boiler operation recognition system - should the boiler not be used for longer than 24 hours, it then performs a controlled system test to ensuring the motorized components within the boiler do not become inoperable due to lack of use.
- Gas valve modulation - the gas input modulates based off central heating temperature to within  $\pm 2$  °F.
- Diagnostic information system equipped with three LED diagnostic lights for quick error assessment.

# 2. Technical Information (M210.32 CV)

GENERAL		
Height	in	31.6
Width	in	15.7
Depth	in	13.8
Weight	lb	109.5

ELECTRICAL		
Voltage	V	120
Frequency	Hz	60
Current	A	1.6
Power consumption	W	180

RESTRICTORS REFERENCES	Gas (ø mm)	Air (color)
Natural	770	BLUE
Propane	550	BLUE

CENTRAL HEATING		
Maximum working temp.	°F	185
Temp. Regulation range*	°F	100-185
Maximum pressure	psi	30.0
Minimum pressure	psi	4.35
Max head loss (at 4.4 GPM)	ft	8.25
*At the minimum useful output		

## 2. Technical Information Cont.

### ENERGY CAPACITY

Nominal heat input (0/2000 ft)	MBH	116.0
Nominal heat input (2000/4500 ft)	MBH	110.2
Minimum heat input	MBH	41.0
Maximum useful output (0/2000 ft)	MBH	102.0
Maximum useful output (2000/4500 ft)	MBH	97.2
Minimum useful output	MBH	41.6

### GAS PRESSURE SUPPLY

Gas		Min	Max	Normal
Natural	inwc	6.8	10.0	8.0
Propane	inwc	10.0	15.0	12.0

### FLUE DESIGN

Minimum Venturi pressure	inwc	0.64
Flue pipe diameter		
Coaxial	in	2.25/4 3.25/5
Twin split pipes	in	3.25/3.25
Nominal heat flow rate (0/2000 ft)	MBH	116.0
Nominal heat flow rate (2000/4500 ft)	MBH	110.2
Max Exhaust temperature	°F	190

### GAS FLOW RATE

Gas		Min	Max
Natural	ft³/h	48.7	115.1
Propane	lb/h	2.2	5.2

### CLEARANCE TO COMBUSTIBLES

Front	in	18
Back	in	0
Top	in	10
Sides	in	2
Bottom	in	8
Flue pipe enclosed	in	2
Flue pipe free air	in	0
Hot water pipes	in	1"

### FLUE GAS FIGURES (at nominal heat input)

Gas	Min	Max
CO <sub>2</sub> content with Natural gas	9.0%	9.8%
CO <sub>2</sub> content with Propane gas	10.0%	11.0%
O <sub>2</sub> content	4.3%	5.0%

### FLUE GAS FIGURES (at minimum heat input)

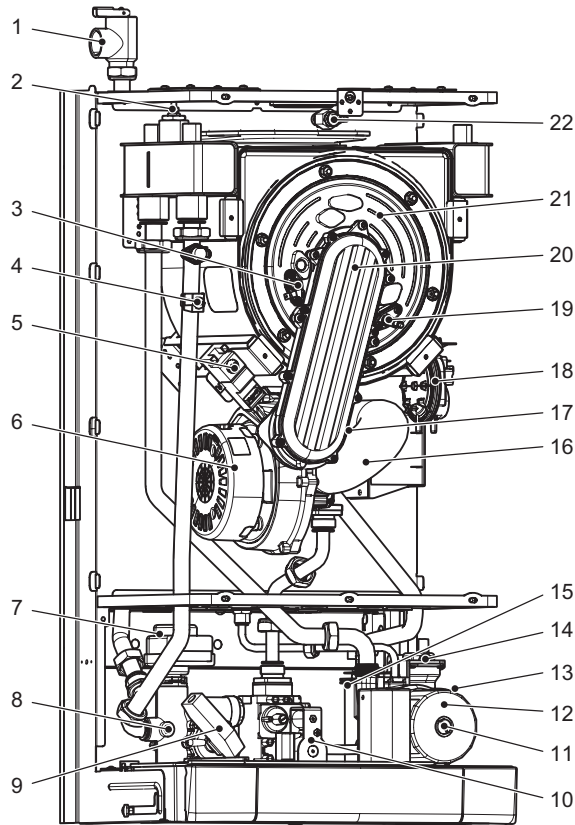
Gas	Min	Max
CO <sub>2</sub> content with Natural gas	9.0%	9.8%
CO <sub>2</sub> content with Propane gas	10.0%	11.0%
O <sub>2</sub> content	4.3%	5.0%

### DOMESTIC HOT WATER

Maximum temperature	°F	131
Minimum temperature	°F	95
Maximum pressure	psi	145
Minimum pressure	psi	4.35
D.h.w. ΔT 25°C / 45°F	gpm	4.5
D.h.w. ΔT 30°C / 54°F	gpm	3.8
D.h.w. ΔT 35°C / 63°F	gpm	3.2
D.h.w. ΔT 40°C / 72°F	gpm	2.8

## 3. Parts List

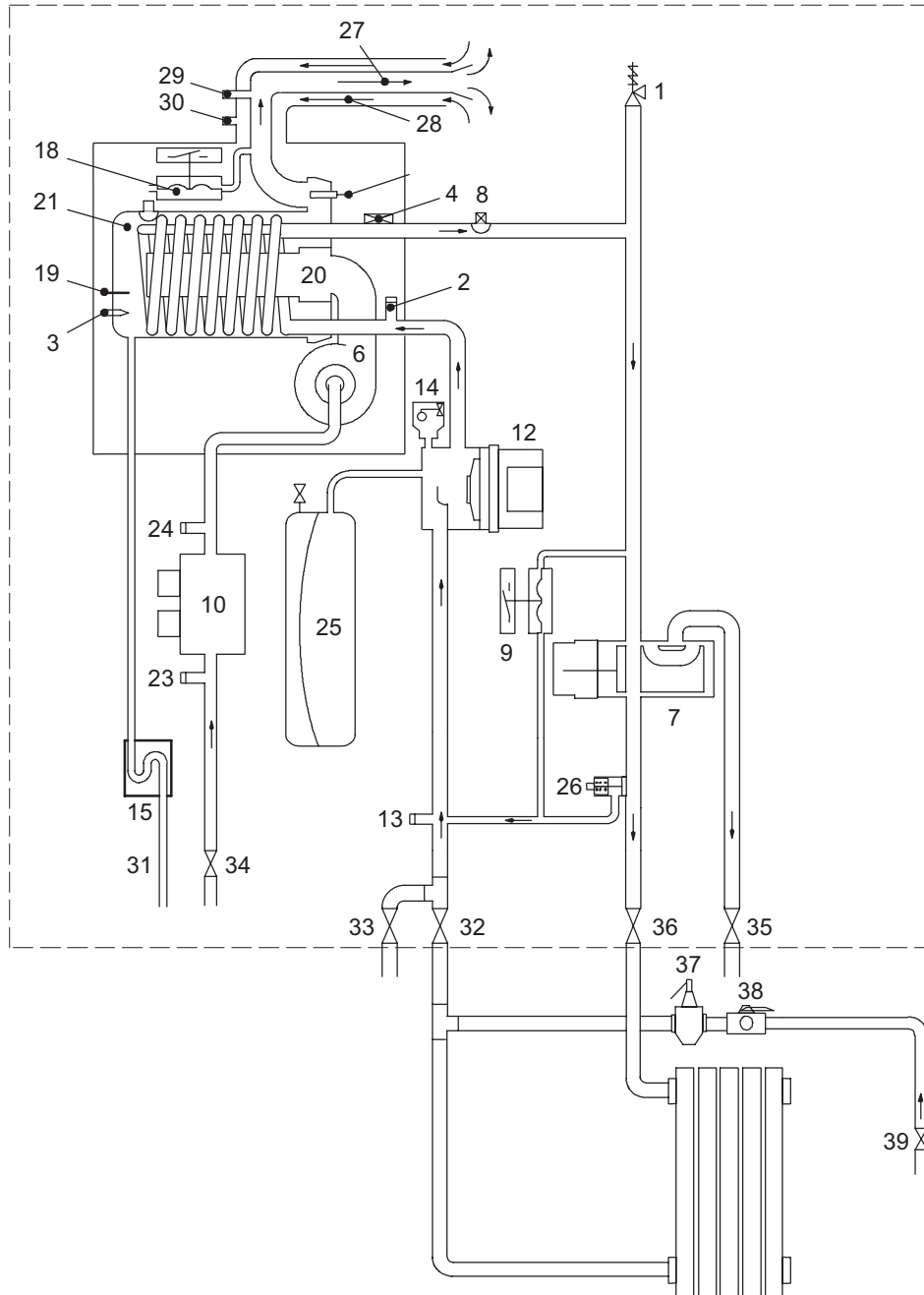
### Primary Components:



- 1 Central heating pressure relief valve
- 2 Condensing heat exchanger air purger valve
- 3 Ignition electrodes
- 4 Safety thermostat
- 5 Spark generator
- 6 Fan
- 7 Three-way diverter valve
- 8 C.h. temperature probe NTC
- 9 Primary circuit flow switch
- 10 Gas valve
- 11 Pump vent plug
- 12 Pump
- 13 Main circuit drain valve
- 14 Automatic air purger valve

- 15 Condensate trap
- 16 Transformer
- 17 Air hose
- 18 Air pressure switch
- 19 Flame-detecting electrode
- 20 Burner
- 21 Condensing heat exchanger
- 22 Flue temperature probe NTC
- 23 Gas valve inlet pressure test point
- 24 Gas valve outlet pressure test point
- 25 C.h. expansion tank
- 26 By-pass valve
- 27 Flue outlet pipe
- 28 Air intake pipe
- 29 Flue exhaust sampling point
- 30 Air sampling point
- 31 Condensate drain pipe
- 32 C.h. return valve
- 33 Tank serpentine return valve
- 34 Gas inlet valve
- 35 Tank serpentine flow valve
- 36 C.h. flow valve
- 37 Pressure reducing automatic fill valve
- 38 Backflow preventer
- 39 Water supply inlet cock

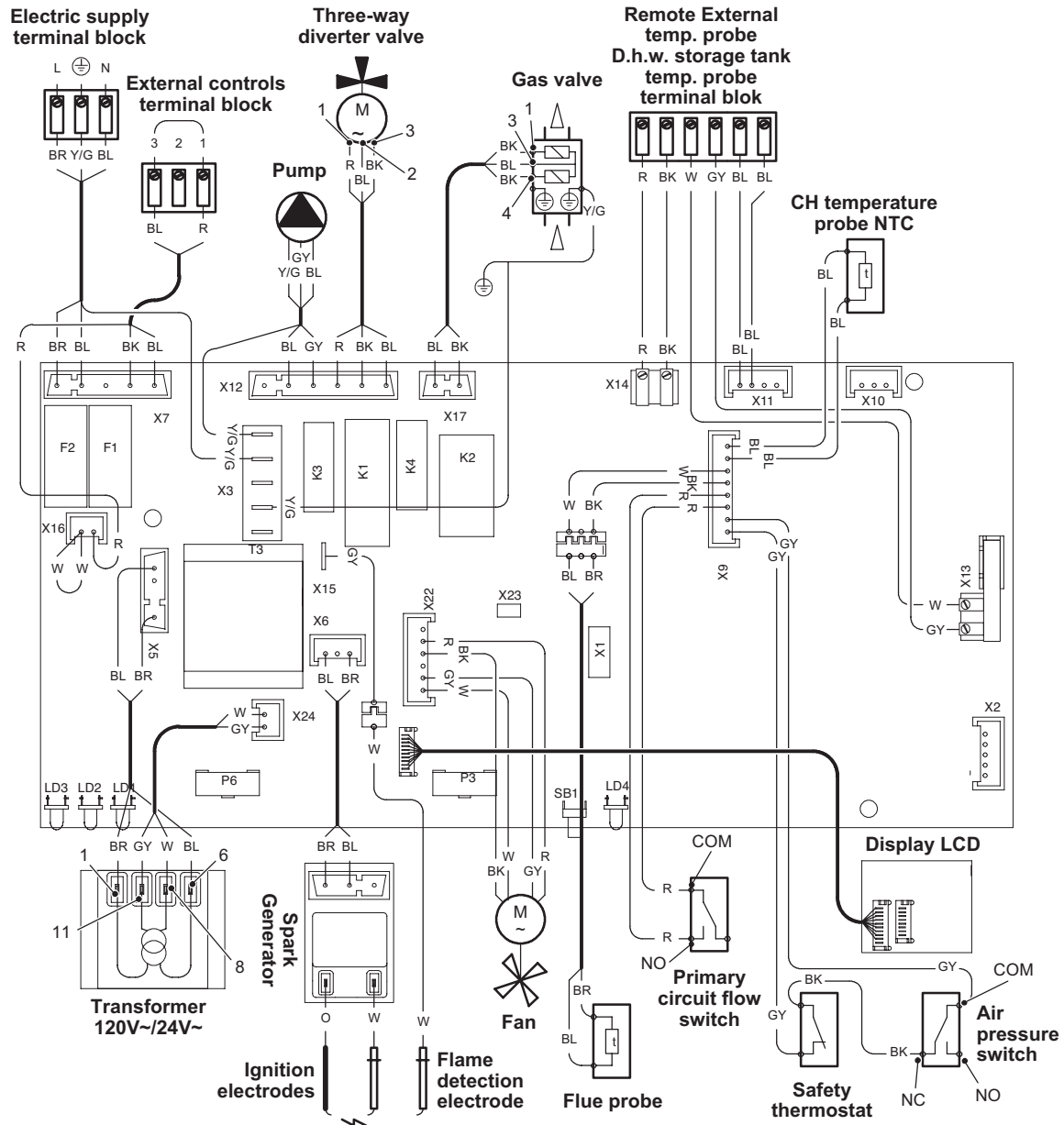
## 4. Internal Piping & Parts List



**Note:** Pressure Relief Valve (#22) should be piped to a drain or to the floor as close as possible to a drain.

**Note:** Figure is not intended to be a piping diagram, please refer to piping section of manual for piping practices and locations.

## 5. Electric Diagrams



BL	Blue	GY	Gray	Y/G	Yellow/Green
BK	Black	O	Orange	W	White
BR	Brown	R	Red		

### Caution:

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

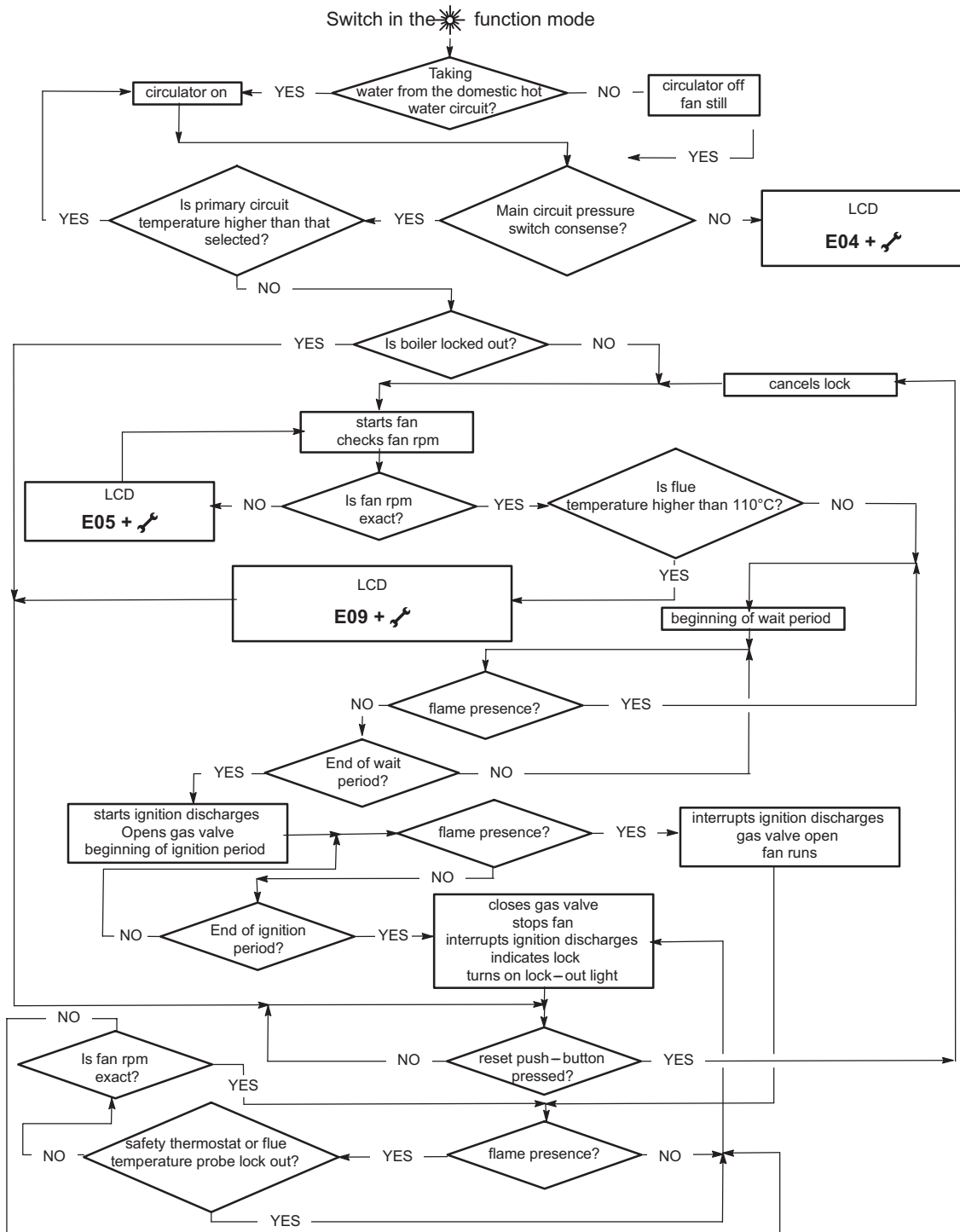
Verify proper operation after servicing.



## 5. Electric Diagrams Cont.

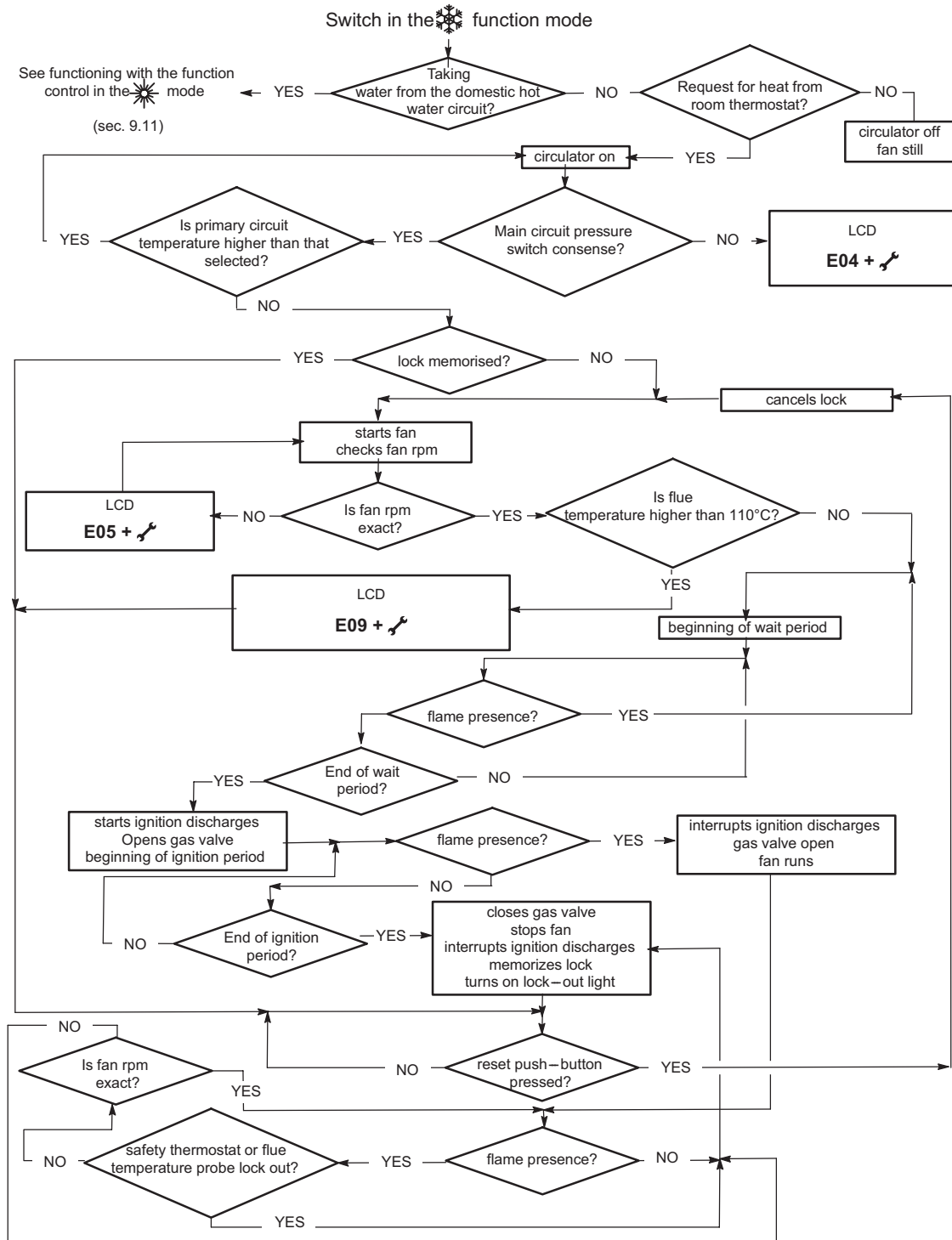
### 5.1 Sequence of Operation:

Thermal control in the  mode



## 5. Electric Diagrams Cont.

### Thermal control in the mode



## 6. Installation Location

The installation location chosen must:

- Comply with all clearances listed below.
- **Provide suitable location for the exhaust and intake venting.**
- Not be installed in an unheated space.
- Comply with all local codes and standards.

**Note:** Dimensions shown are minimums. Greater clearances will simplify installation and service.

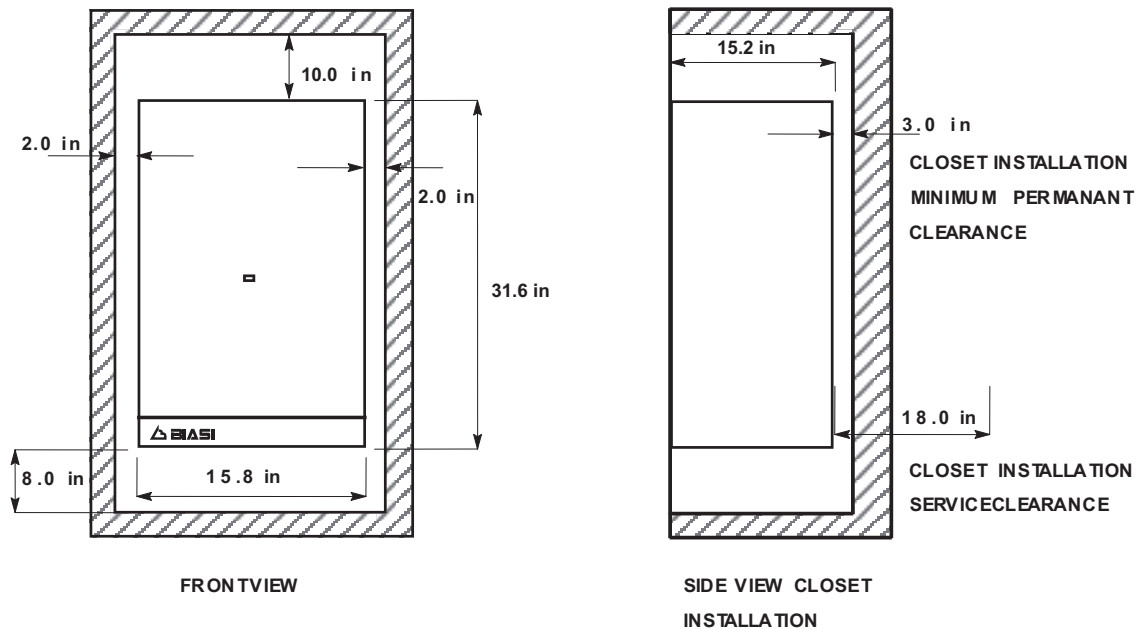


Figure 6.1

### **WARNING: Do not install the boiler on carpeting**

If the boiler is to be installed in an enclosed room with no fresh air intake, the room must have proper vent louvers installed. There should be two louvers, place each within 12" of the ceiling and floor respectively. Each vent will have a free area of 54 square inches.

**Note:** For boilers in an enclosed space it is recommended to install a CO detector in the boiler room.

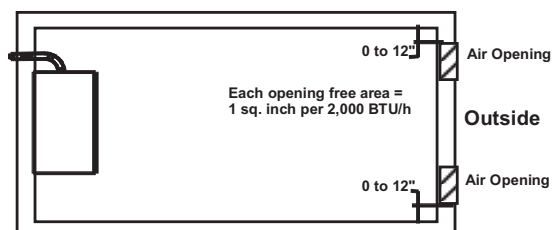


Figure 6.2

When choosing an installation location insure the exhaust and intake pipes comply with NFPA 54. The drawing on the next page illustrates the restrictions on exhaust locations.

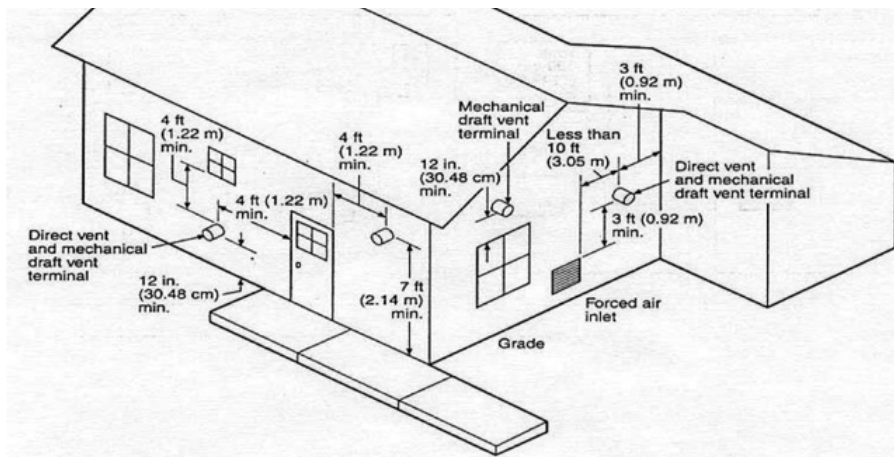
## 7. Exhaust Pipe Location

### CAUTION

EXTERNAL VENT SURFACES ARE HOT.

IT IS RESPONSABILITY OF THE HOMEOWNER TO KEEP THE VENT  
TERMINAL CLEAR OF SNOW AND ICE

**NOTE:** USE ONLY LISTED COMPONENTS SUPPLIED WITH THE BOILER.  
SURFACE DISCOLORATION OF THE BUILDING MAY OCCUR DUE TO  
IMPROPER INSTALLATION. QHT WILL NOT ACCEPT RESPONSIBILITY OR  
LIABILITY FOR SUCH DISCOLORATION.



**The exhaust hood must be installed on the leeward side of house and conform to the following guidelines:**

1. The vent hood shall not be less than 3 feet above any forced air inlet to the house.
2. The vent hood shall not be less than 1 feet below, 1 feet horizontally, or 1 foot above any door, window or gravity inlet into any building.
3. The vent hood shall not be less than 2 feet from an adjacent building.
4. The vent hood shall be not less than 7 feet above grade when located adjacent to public walkway.
5. The vent hood shall be located so that flue gasses are not directed to jeopardize people, overheat combustible structures, materials or enter buildings.
6. The vent hood shall not be located under a deck or so that flue gasses are directed to jeopardize people, overheat combustible structures, materials or enter buildings.
7. Minimum of 4 feet horizontal clearance from electric meters, gas meters, regulators and relief equipment.
8. **All joints in system are to be sealed to prevent leakage of products of combustion in the building.**
9. Avoid installing exhaust hood on the North, West, or the side of the house receiving the prevailing winds.
10. The vent should not be situated so that the flue gases are directed towards brickwork, siding, or other construction, in such a manner that may cause damage from heat or condensate from the flue gases

## 8. Mounting Bracket

**After a suitable installation location is chosen, verify that the mounting wall is properly braced and strong enough to support the 110 pound weight of the unit when filled with water.**

**NOTE: The boiler shall be installed such that the gas ignition system components are protected from water and liquids in general (dripping, spraying, rain, etc) during the appliance operation and service.**

Use the paper template provided with the boiler to determine the location of the mounting bracket. Securely mount the bracket to the wall using appropriate hardware for the particular wall construction.

### Mounting Steps:

1. Tape the paper template to the wall in the chosen location. Be sure to level the template.
2. Pre-drill two holes in the center of the “oval” slots on the mounting bracket, sized for the hardware being used.
3. Mount the bracket to the wall. Be sure to level the bracket by adjusting the screw in the vertical slot.
4. Pre-drill the remaining hole in the mounting bracket and secure the final screw.
5. Mark and drill the exhaust/intake pipe holes through the house. If you are using a coaxial pipe system, drill the hole marked A (ø 4”) in the drawing below and on the paper template. If you are using a separate pipe system drill holes marked B and C (ø 3.25”) shown below as well as on the paper template.
6. **Remove paper template and hang boiler on bracket.**

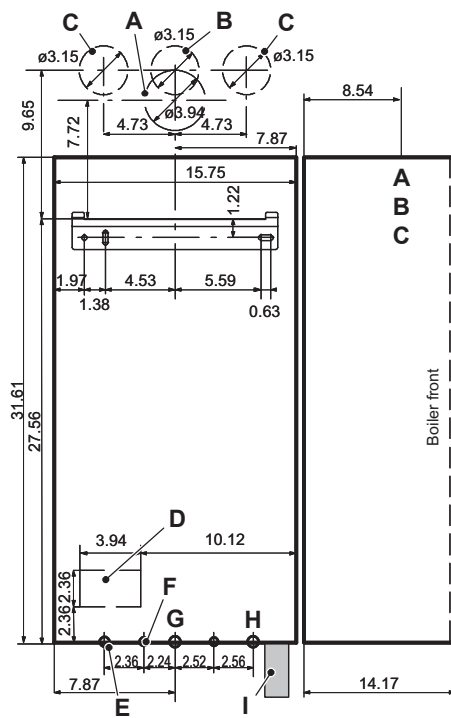


Figure 8.1

- A - Air intake/flue outlet pipe (co-axial)**
- B - Flue outlet pipe ø 80 mm (twin kit)**
- C - Air intake pipe ø 80 mm (twin kit)**
- D - Electric connections area**
- E - C.h. flow**
- F - D.h.w. tank coil flow**
- G - Gas**
- H - C.h. return and tank serpentine return**
- I - Condensate drain connection area**

## 9. Venting

The Riva Advance SV is a mechanical draft, side wall vented boiler. There are two side wall flue options available – separate and coaxial. The coaxial option has one configuration shown on the next page. The separate option has two possible configurations shown on the following pages. There is also a vertical roof venting option. Regardless of what vent kit is installed, they should all conform to the **Provisions for combustion and ventilation air in accordance with section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1, or Sections 7.2, 7.3 or 7.4 of CAN/CGA B149, Installation Codes, or applicable provisions of the local building codes.**

If the Biasi Riva Advance SV replaces a boiler that was attached to a common vent system, the common venting system is likely to be too large for proper venting of the appliances remaining connected to it. To ensure the remaining appliances will function properly, the test procedure below should be followed:

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 and other deficiencies which could cause an unsafe condition.
- (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 clothes dryers and any appliance not connected to the common venting system. 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 the flame of a match or candle, or smoke from a cigarette, cigar or pipe.
- (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 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.

## 9. Venting Requirements for the State of Massachusetts

The Commonwealth of Massachusetts requires compliance with regulation 248 CMR 4.00 and 5.00 for installation of through – the – wall vented gas appliances as follows:

(a) For direct-vent appliances, mechanical-vent heating appliances or domestic hot water equipment, where the bottom of the vent terminal and the air intake is installed below four feet above grade the following requirements must be satisfied:

1. If there is not one already present, on each floor level where there are bedroom(s), a carbon monoxide detector and alarm shall be placed in the living area outside the bedroom(s). The carbon monoxide detector shall comply with NFPA 720 (2005 Edition).

2. A carbon monoxide detector shall be located in the room that houses the appliance or equipment and shall:

- a. Be powered by the same electrical circuit as the appliance or equipment such that only one service switch services both the appliance and the carbon monoxide detector;
- b. Have battery back-up power;
- c. Meet ANSI/UL 2034 Standards and comply with NFPA 720 (2005 Edition); and
- d. Have been approved and listed by a Nationally Recognized Testing Laboratory as recognized under 527 CMR.

3. A Product-approved vent terminal must be used, and if applicable, a Product-approved air intake must be used. Installation shall be in strict compliance with the manufacturer's instructions. A copy of the installation instructions shall remain with the appliance or equipment at the completion of the installation.

4. A metal or plastic identification plate shall be mounted at the exterior of the building, four feet directly above the location of vent terminal. The plate shall be of sufficient size to be easily read from a distance of eight feet away, and read "Gas Vent Directly Below".

(b) For direct-vent appliances, mechanical-vent heating appliances or domestic hot water equipment where the bottom of the vent terminal and the air intake is installed above four feet above grade the following requirements must be satisfied:

1. If there is not one already present, on each floor level where there are bedroom(s), a carbon monoxide detector and alarm shall be placed in the living area outside the bedroom(s). The carbon monoxide detector shall comply with NFPA 720 (2005 Edition).

2. A carbon monoxide detector shall:

- a. Be located in the room that houses the appliance or equipment;
- b. Be either hard-wired or battery powered or both; and
- c. Shall comply with NFPA 720 (2005 Edition).

3. A Product-approved vent terminal must be used, and if applicable, a Product-approved air intake must be used. Installation shall be in strict compliance with the manufacturer's instructions. A copy of the installation instructions shall remain with the appliance or equipment at the completion of the installation.

## 9. Venting Cont.

### 9.1 Fitting the flue system:

In general, it has to be taken in consideration that the horizontal sections of the flue pipe must have an horizontal sloping not less than 1.5 degree (0.3 in per ft) towards the boiler.

In the standard horizontal flue kit the flue pipe is angled within the air duct therefore the air duct must be horizontally installed.

If one or more extensions have to be used they must be adequately supported so that there is no sag in the flue pipe and a minimum fall of 1.5 degree (0.3 in per ft) over the whole length towards the boiler is ensured.

### 9.2 Choice of flue:

The following flue kits are available for connecting to the boiler:

#### A Standard coaxial horizontal flue kit (Exhaust & intake outside) - PART# RI-9990387

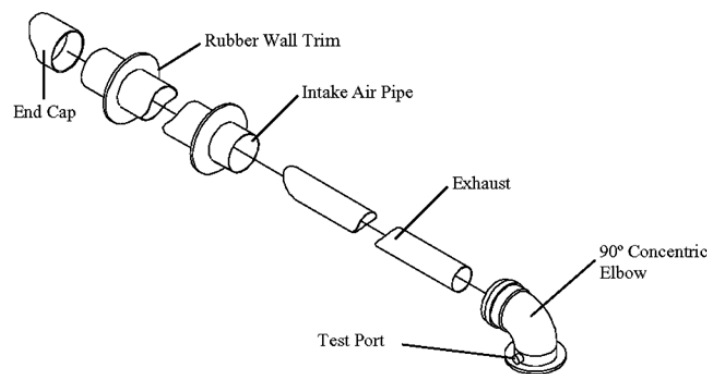


Figure 9.1 (Coaxial 2.4/4.0 inches – nominal length 3.3 ft)

It can be mounted to allow discharge to the rear or either side of the boiler via the flanged boiler adapter elbow. Minimum length required is 2.9 ft. Maximum equivalent length of 33 ft can be achieved utilizing extensions. This flue system can only be used to discharge horizontally, it is not designed to enable termination in the vertically.

#### **Installation:**

- Drill a hole 4.5" in diameter through the outside wall that is less than 18" thick.
- Cut the pipe as necessary so that a no more than 6" protrudes from the house.
- Slide the intake and exhaust pipes through the hole.
- Slide one rubber wall trim piece on the pipe from inside and one from outside.
- Connect exhaust (inner) pipe to concentric elbow.
- Connect intake (outer) pipe to concentric elbow.
- Secure elbow to boiler using gasket and four screws provided.
- Secure end cap on the intake pipe outside the house.



## 9. Venting Cont.

### B Riser coaxial horizontal flue kit (Exhaust & intake outside)

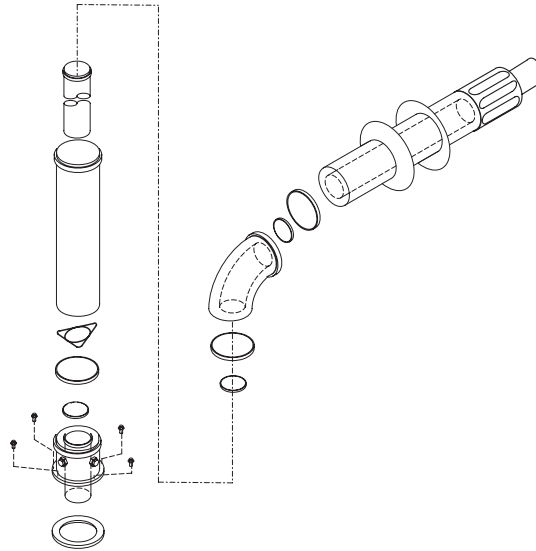


Figure 9.2 (Coaxial 2.4/4.0 inches – nominal length 4.5 ft)

It can be mounted to allow discharge to the rear or either side of the boiler via the flanged boiler adapter elbow. Minimum length required is 2.9 ft. Maximum equivalent length of 33 ft can be achieved utilizing extensions. This flue system can only be used to discharge horizontally, it is not designed to enable termination in the vertically.

#### **Installation:**

- Drill a hole 4.5" in diameter through the outside wall that is less than 18" thick.
- Cut the pipe as necessary so that a no more than 6" protrudes from the house.
- Slide the intake and exhaust pipes through the hole.
- Slide one rubber wall trim piece on the pipe from inside and one from outside.
- Connect exhaust (inner) pipe to concentric elbow.
- Connect intake (outer) pipe to concentric elbow.
- Secure elbow to boiler using gasket and four screws provided.
- Secure end cap on the intake pipe outside the house.

## 9. Venting Cont.

### C Standard separate horizontal flue kit (Exhaust & intake outside) - Part# RI-9990393

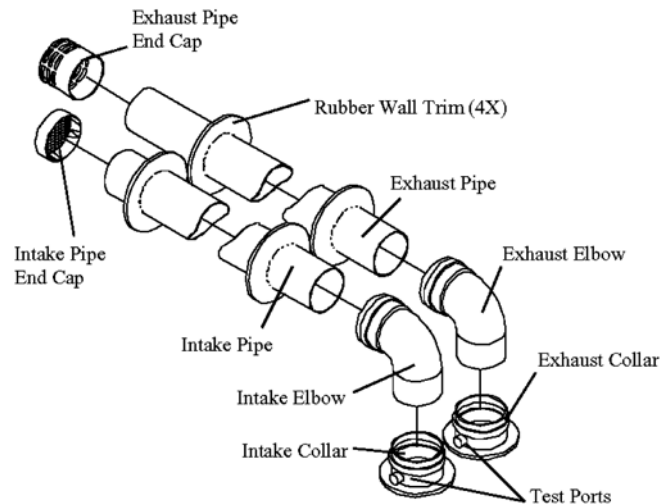


Figure 9.3 (Twin pipe Ø 3.25 in)

Various twin (split) pipes kits and optional accessories (elbows) are available to assist in the termination of the flue where the boiler is installed in a location remote to an outside wall. These kits allow for separation of the air supply pipe from the pipe that discharges the exhaust gasses. Consequently it is possible to extend the flue system to a greater distance than that provided by the standard coaxial horizontal flue.

If either an additional 45° or 90° accessory elbow is used then the maximum permissible length of either pipe must be reduced by 3.0 ft or 5.4 ft respectively. The sum of the lengths of the intake and exhaust must be less than 132 ft.

#### **Installation:**

- Drill two holes 3.5" in diameter through the outside wall that is less than 18" thick.
- Cut the pipes as necessary so that no more than 6" of intake pipe protrudes from the house and the exhaust pipe is a minimum of 4 inches longer than the intake pipe.
- Slide the Intake and exhaust pipes through the respective holes.
- Slide one rubber wall trim piece on each pipe from inside and one from outside.
- Attach each collar to the boiler with the gasket and screws provided.
- Insert each elbow into its corresponding collar.
- Connect each pipe to its corresponding elbow (as shown in the diagram).
- Secure end cap on the intake and exhaust pipe outside the house

## 9. Venting Cont.

### D Alternative separate kit (Exhaust & intake outside) - Part# RI-9990393

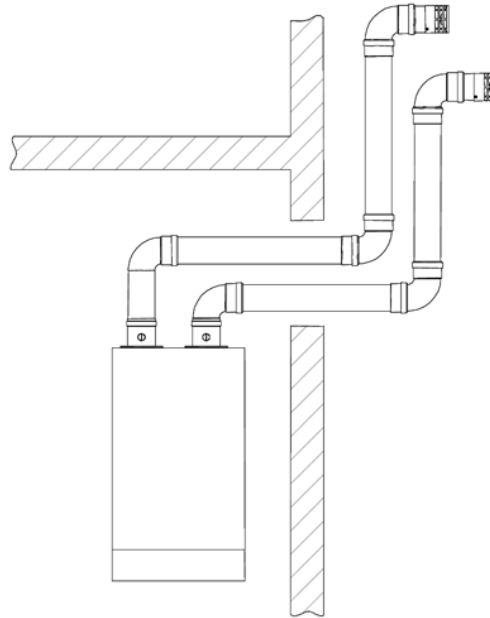


Figure 9.4 (Twin Pipe Ø 3.25 in)

These kits allow for separation of the air supply pipe from the pipe that discharges the exhaust gasses. Consequently it is possible to extend the flue system to a greater distance than that provided by the standard coaxial horizontal flue.

If either an additional 45° or 90° accessory elbow is used then the maximum permissible length of either pipe must be reduced by 3.0 ft or 5.4 ft respectively. The sum of the lengths of the two horizontal part must be less than 132 ft.

#### **Installation:**

- Drill two holes 3.5" in diameter through the outside wall Drill hole C (on the wall template) through the outside wall that is less than 18" thick.
- Cut the pipes as necessary so that no more than 6" of intake pipe protrudes from the house and the exhaust pipe is a minimum of 4 inches longer than the intake pipe.
- Slide the Intake and exhaust pipes through the respective holes.
- Slide one rubber wall trim piece on each pipe from inside and one from outside.
- Attach each collar to the boiler with the gasket and screws provided.
- Insert each elbow into its corresponding collar.
- Connect each pipe to its corresponding elbow (as shown in the diagram).
- Secure end cap on the intake and exhaust pipe outside the house.

## 9. Venting Cont.

### E Standard Vertical-roof kit (Exhaust & intake outside) - Part# RI-9990392

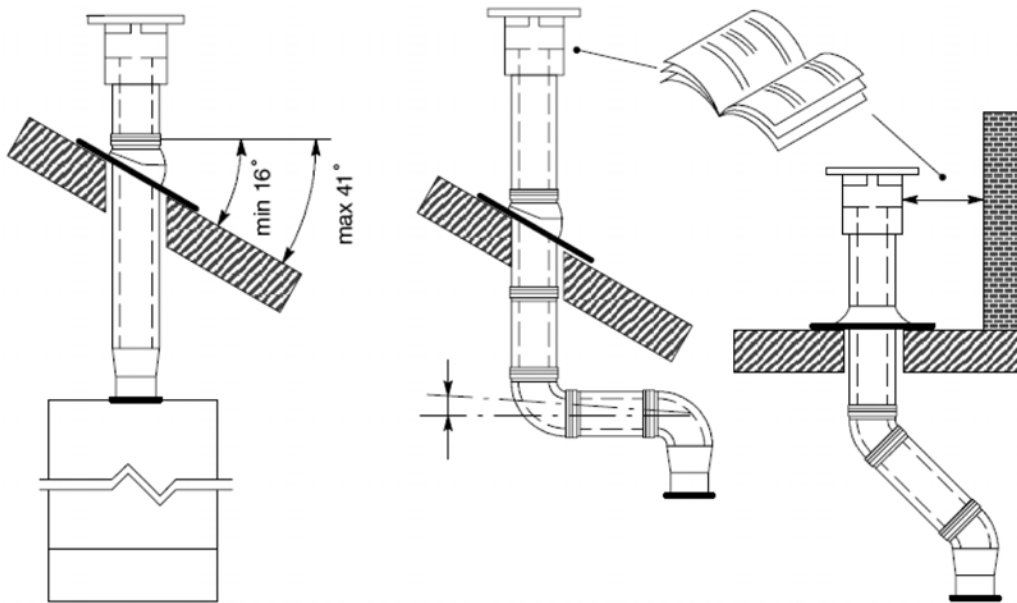


Figure 9.5 (vertical pipe Ø 3.1 / Ø 4.9 in)

This kit allows vertical termination of the flue pipe through the roof. The kit is 4 feet in length. Extension pieces (Co-axial) are also available which allows the flue system to be extended to a total overall maximum permissible length of 33 ft.

Optional 45° and 90° elbows can be used to offset the flue route.

Each additional elbow reduces the overall acceptable length of the flue system as follows:

45° reduce length by 1.6 ft.

90° reduce length by 3.2 ft.

#### **Installation:**

- Drill hole through the outside roof 5.25" in diameter.
- Cut the pipe as necessary.
- Slide the intake and exhaust pipes through the hole.
- Slide one rubber wall trim piece on the pipe from inside and one from outside.
- Connect exhaust (inner) pipe to concentric elbow.
- Connect intake (outer) pipe to concentric elbow.
- Secure elbow to boiler using gasket and four screws provided.
- Secure end cap on the intake pipe outside the house.

## 9. Venting Cont.

### F Plastic vent requirements

All piping that is used to vent the Riva Advance Combi boiler must conform to the standards listed below.

Parts	Material	United States	Canada
Exhaust and Intake Piping	PVC	ANSI/ASTM D1785	ULC S636
	CPVC	ANSI/ASTM DF441	
	Polypropylene		
Pipe Cement / Primer	PVC	ANSI/ASTM D2564	
	CPVC	ANSI/ASTM F493	

It is not permitted to use a cellular foam core pipe for venting the Riva Advance Combi boiler. All intake piping can be constructed of PVC pipe. The first 8 feet of exhaust pipe must be CPVC or Polypropylene pipe. After that point it is permissible to assemble the rest of the vent in PVC.

#### Canadian Installations:

- PVC/CPVC vent pipe must be listed to ULC S636. Pipe, fittings, and cements are certified as a system and must be installed as such. Different manufacturers have different materials, joining systems and adhesives. Do not mix pipe, fittings, solvents, or joining methods from different BH Vent manufacturers, this can result in unsafe conditions.
- Consult PVC/CPVC manufacturer's installation manual for correct joining of pipe for gas venting.

#### General installation PVC/CPVC:

1. Cut pipe to required lengths and dry fit the venting and intake system to ensure a proper fit.
2. Disassemble the system and de burr the inside and outside of the pipe ends.
3. Chamfer the outside of each end of the pipes.
4. Make sure that each pipe end and fitting are clean. Once they are do not handle the joining surfaces.
5. Apply primer to both the fitting and the pipe end.
6. While the primer is damp, apply a even coating of cement to the pipe end and the fitting.
7. Insert the pipe into the fitting making sure the pipe is completely seated.
8. Rotate the pipe 1/4 turn and hold in place for 30 seconds.
9. Wipe any excess cement away and check that there is a complete bead of sealant around the joint of the fitting.
10. Allow to cure for 2 hours before commissioning the boiler.
11. Install perforated metal pipe supports onto the pipe, making sure there is no sagging in the pipe. Place supports as close as possible to elbows to relieve stress on the joint.

## 9. Venting Cont.

### G PVC boiler adapter - Part# RI-99909120

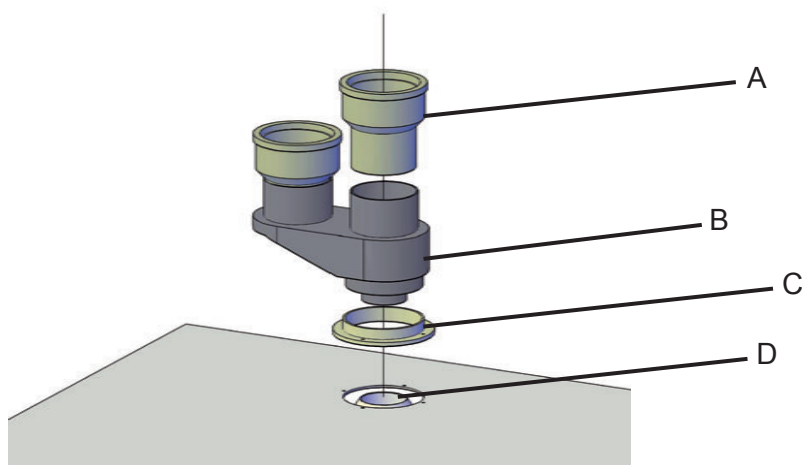


Figure 9.6

This kit is required to vent the Riva Advance Combi boiler using PVC/CPVC pipe. The kit includes a boiler connection adapted for PVC/CPVC. When venting with PVC/CPVC this boiler adapter is required in addition to one of the terminations on the following pages.

**Canada:** All PVC/CPVC pipe, fittings, and cement must be approved to ULC S636. Do not mix pipe and joining compounds from different manufacturers as this can result in an unsafe condition and void the certification.

#### **Installation:**

- Attach the collar (C) from the adapter kit to the top of the boiler using the supplied screws.
- Insert the boiler adapter (B) into the collar. Check that the exhaust gasket (D) is installed on the outlet of the boiler first.
- Once the adapter is positioned in place, tighten the clamp on the collar and install the supplied self tapping screw through the pre drilled hole on the collar.
- Insert the PVC adapters (A) into the boiler adapter (B).
- Slide the CPVC/PVC pipe into the PVC adapters (A), do not use any solvents or cement on this connection. It is a gasket connection that requires no sealing. If polypropylene pipe is being used, remove the PVC adapter A from the boiler adapter. Insert the polypropylene pipe into the boiler adapter and use the PVC adapter in the end of the polypropylene pipe to convert to PVC.

## 9. Venting Cont.

### H PVC concentric vent kit - Part# RI 3PPS-HK

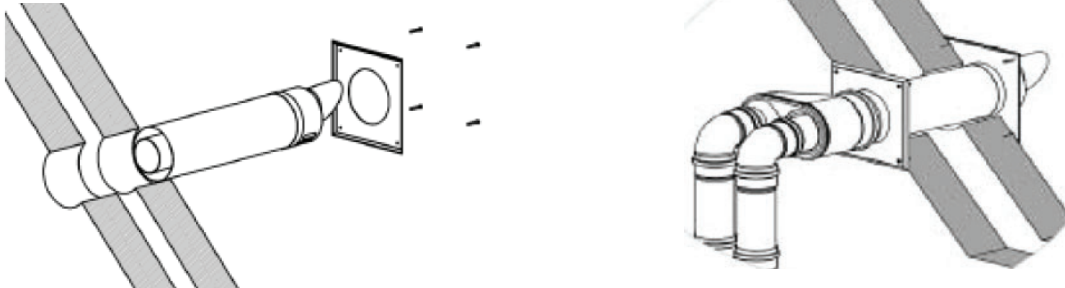


Figure 9.7 (Equivalent length - 5')

This kit allows horizontal termination of the flue pipe using PVC/CPVC pipe. The kit includes boiler connection and termination adapted for CPVC/PVC. 3" PVC/CPVC pipe may be added up to the total overall maximum permissible length of 32' intake and exhaust combined. Optional 45° and 90° elbows can be used to offset the flue route. Each additional elbow reduces the overall acceptable length of the flue system as follows:

Venting Specifications			
Max Length (intake + exhaust)	32 ft.	45° elbow	1.6 ft. equivalent
Min Length (intake + exhaust)	3 ft.	90° elbow	3.2 ft. equivalent

**Canada:** All PVC/CPVC pipe, fittings, and cement must be approved to ULC S636. Do not mix pipe and joining compounds from different manufacturers as this can result in an unsafe condition and void the certification.

#### **Installation:**

- Drill 5.5" hole through the outside wall making sure there is 1 foot clearance above normal snow level.
- Insert the termination through the flexible exterior gasket and the building wall.
- Fix the exterior gasket to the wall using 4 contractor supplied fasteners.
- Slide the interior wall gasket over the termination and fix it to the wall using 4 user supplied fasteners.
- Assemble the gaskets into the twin pipe adapter.
- Install the twin pipe adapter onto the termination.
- Install the PVC adapters supplied onto the twin pipe adapter according the manufacturers instructions.
- Install piping pitched back toward the boiler making sure not to exceed the maximum allowable length.
- Intake air piping can be constructed of PVC pipe. Exhaust piping should be CPVC or Polypropylene for the first 8 feet.
- Intake and exhaust piping should be assembled and secured according to the pipe manufacturers instructions.
- Install the vent adapter onto the top of the boiler using the gasket and screws provided.
- Install the pipe onto the boiler by simply pushing it into the adapters. Do not cement the pipe into the adapters, this is a gasket connection.

## 9. Venting Cont.

### I PVC roof vent kit - Part# RI 3PPS-VK



Figure 9.8 (Equivalent length - 9')

This kit allows vertical termination of the flue pipe using PVC/CPVC pipe. The kit includes boiler connection and termination adapted for CPVC/PVC. 3" PVC/CPVC pipe may be added up to the total overall maximum permissible length of 32' intake and exhaust combined. Optional 45° and 90° elbows can be used to offset the flue route. Each additional elbow reduces the overall acceptable length of the flue system as follows:

Venting Specifications			
Max Length (intake + exhaust)	32 ft.	45° elbow	1.6 ft. equivalent
Min Length (intake + exhaust)	3 ft.	90° elbow	3.2 ft. equivalent

**Canada:** All PVC/CPVC pipe, fittings, and cement must be approved to ULC S636. Do not mix pipe and joining compounds from different manufacturers as this can result in an unsafe condition and void the certification.

#### **Installation:**

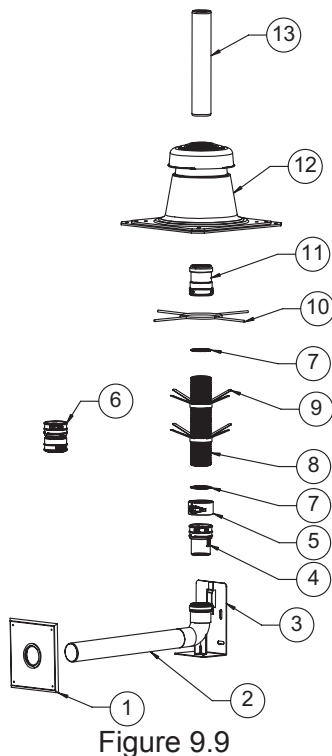
- Choose the appropriate weather collar for the installation, Pitched or Flat.
- Drill a hole through the roof large enough to accommodate the 5.5" vent terminal.
- Fix the flue collar in place and insert the termination from outside the building.
- Fix the supplied wall clamp around the vent terminal but do not tighten it.
- Assemble the gaskets with the concentric pipe adapter. It may be necessary to use a small amount of water.
- Install the PVC adapters supplied onto the twin pipe adapter according the manufacturers instructions.
- Install piping to the boiler making sure not to exceed the maximum allowable length.
- Intake air piping can be constructed of PVC pipe. Exhaust piping should be CPVC or Polypropylene for the first 8 feet.
- Intake and exhaust piping should be assembled and secured according to the pipe manufacturers instructions.
- Install the vent adapter onto the top of the boiler using the gasket and screws provided.
- Install the pipe onto the boiler by simply pushing it into the adapters. Do not cement the pipe into the adapters, this is a gasket connection.



## 9. Venting Cont.

### J Polypropylene chimney liner kit Part#

This kit allows for venting of the boiler through an existing chimney way. The kit includes all the parts needed from the chimney thimble to the chimney top termination. It is not permitted to use any other vent system than the listed kit. The connection to the boiler should be constructed of polypropylene pipe lengths. The total overall maximum permissible length of 100' intake and exhaust combined. Optional 45° and 90° elbows can be used to offset the flue route. Each additional elbow reduces the overall acceptable length of the flue system as follows:



1. Single wall shaft connector
2. Support elbow
3. Support bracket
4. Male flex adapter to rigid
5. Clamp (or tie)
6. Coupling
7. Seal
8. Flex liner
9. Spacer bracket
10. Support cross
11. Female flex adapter to rigid
12. Weather collar
13. Metal termination pipe

#### **Installation:**

- Please refer to the manufacturers instructions for installation of the liner kit.
- Once liner has been installed install piping to the boiler using 3" polypropylene pipe making sure not to exceed the maximum allowable length.
- Intake air piping can be constructed of Polypropylene pipe. Exhaust piping can only be constructed of a high temperature pipe like polypropylene for the first 8 feet.
- Intake and exhaust piping should be assembled and secured according to the pipe manufacturers instructions.
- Install the vent adapter onto the top of the boiler using the gasket and screws provided and remove the PVC adapters supplied with the adapter.
- Install the pipe onto the boiler by simply pushing it into the adapters. Do not cement the pipe into the adapters, this is a gasket connection.

## 9. Venting Cont.

### K Plastic separate vent kit

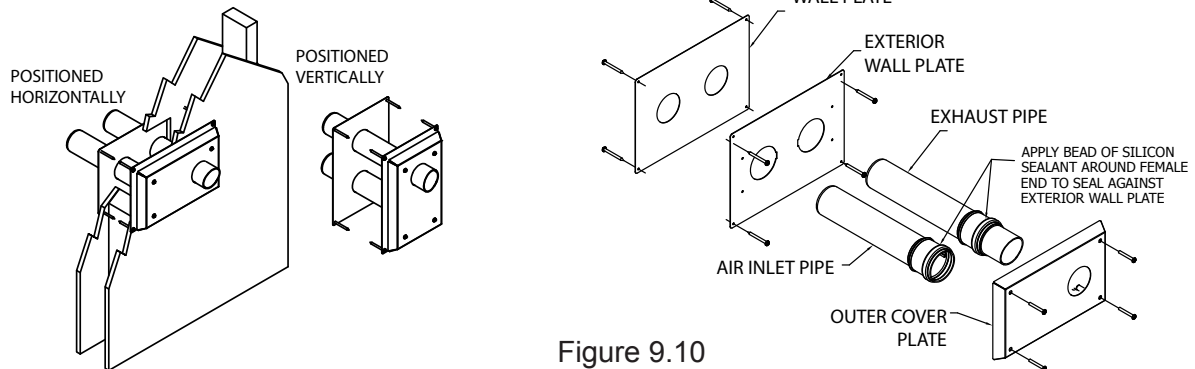


Figure 9.10

This kit allows horizontal termination of the flue pipe using 3" Plastic pipe. The kit includes PVC/CPVC boiler adapters. PVC pipe may be added up to the total overall maximum permissible length. Optional 45° and 90° elbows can be used to offset the flue route. Each additional elbow reduces the overall acceptable length of the flue system as follows:

Venting Specifications			
Max Length (intake + exhaust)	132 ft.	45° elbow	6 ft. equivalent
Min Length (intake + exhaust)	3 ft.	90° elbow	3.2 ft. equivalent

**Canada:** All PVC/CPVC pipe, fittings, and cement must be approved to ULC S636. Do not mix pipe and joining compounds from different manufacturers as this can result in an unsafe condition and void the certification.

### Installation:

- Drill two 4" holes through the outside wall or the roof.
- Mount the Exterior Wall Plate of the Termination on the outside wall, using RTV silicone sealant between the plate and the wall to prevent rain infiltration.
- Secure the back plate in place with 1 1/2" screws or appropriate hardware for your exterior wall.
- From the outside, apply a bead of silicone sealant around the female end of the pipe where the plate will meet the flared end.
- Then slide the two PolyPro vent pipe section into the holes of the Exterior Wall Plate. Twist the pipe so the female end's keyway slide past the Exterior Wall Plate as shown.
- If needed, the PolyPro vent pipe sections can be cut to length for your installation.
- On the exhaust vent, attach the termination nozzle and orient it so the protruding edge is at the top of the exhaust vent.
- Put the Outer Cover Plate over the vent pipe, with the exhaust extending through the Outer Cover Plate, and the air inlet being covered by it.
- The Outer Cover Plate will hold both the air inlet vent and the exhaust ven in place. Secure the Outer Cover Plate to the Exterior Wall Plate using the hardware supplied.
- On the inside wall, mount the Interior Wall Plate to the wall and secure with hardware supplied.
- Install the pipe onto the boiler by simply pushing it into the adapters. Do not cement the pipe into the adapters, this is a gasket connection.

## 10. Pipe Connections

The Riva Advance SV is supplied with a 3/4" stainless steel gas pipe (A in figure 10.1), 3 - 3/4" copper pipe (C, D, E, in figure 10.1), located in a plastic bag in the boiler package.

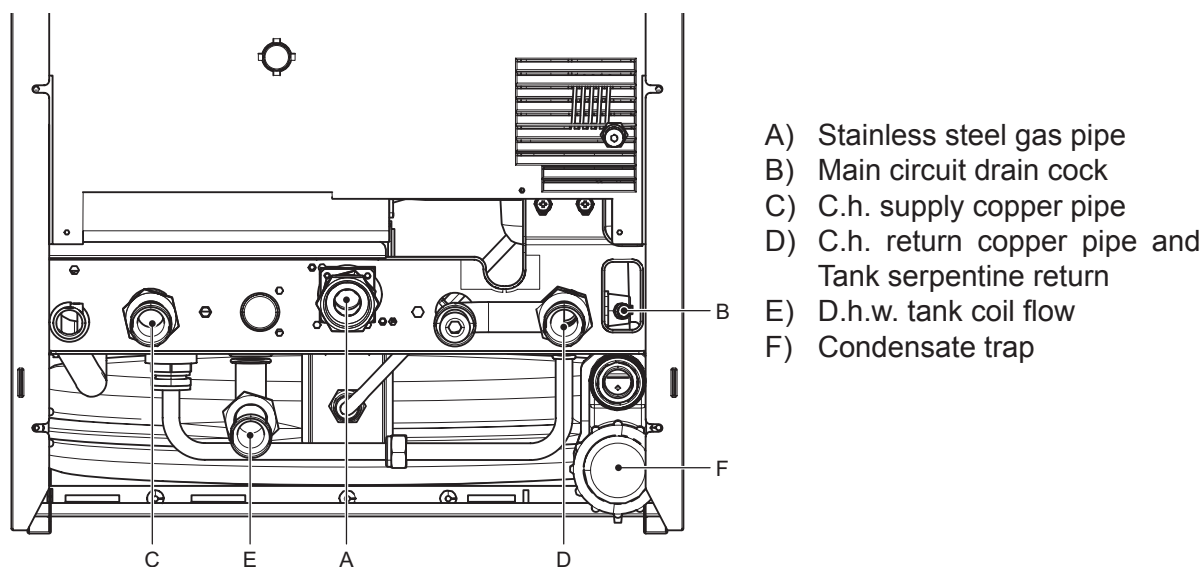


Figure 10.1

### Installation:

- Remove the protective caps off boiler connections (Figure 10.1).
- Thoroughly clean the connections.
- Attach the supplied components to the boiler connections (see Figure 10.1). Be sure to use the proper gaskets for the pipe connections.
- Attach the PRV to the PRV discharge pipe on the top of the boiler. Be sure to use the 3/4" flat washer supplied for the connection.
- Attach the condensate trap to an appropriate drain pipe.
- Before connecting the boiler to the heating system piping, review the suggested piping diagrams in Section 14 (page 48).
- If the c.h. system is above the boiler level, it is advisable to install c.h. cocks close to the boiler for service.
- A hot water boiler installed above radiation level or as required by the Authority having jurisdiction, must be provided with a low water cutoff device either as part of the boiler or at the time of boiler installation.

### Condensate trap:

The condensate trap allows the discharge of the condensate via the condensate drain pipe while preventing the escape of combustion products. A plastic ball closes the trap outlet in case that the trap is empty. The condensate trap is provided with two electrodes: if the drain pipe is plugged or in any case in which the condensate isn't correctly evacuated, the condensate level in the trap rises putting in contact the electrodes thus causing the boiler lock-out.

## 10. Pipe Connections Cont.

### 10.1 Installation of the hot water tank:

The hot water tank must be positioned under the boiler as shown in Figure 10.2.

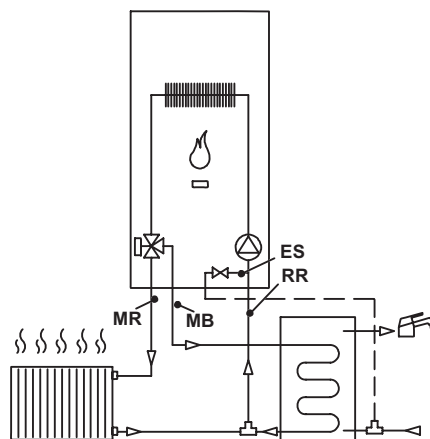


Figure 10.2

Connect the tank serpentine delivery to the boiler union, removing the blind plug indicated in Figure 10.3.

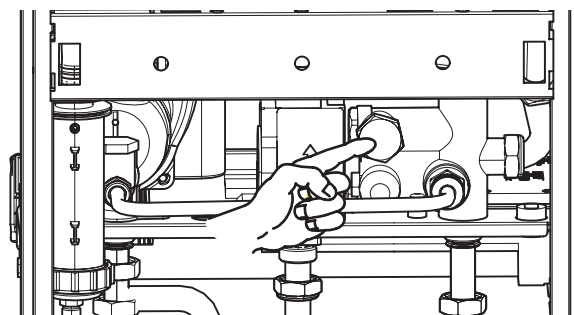


Figure 10.3

Connect the tank serpentine flow of the E boiler to the cock tank serpentine inlet circuit.

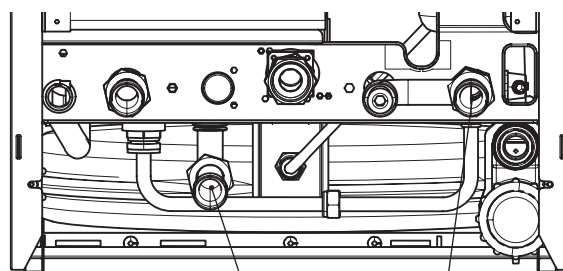


Figure 10.4

### 10.2 Antilegionella function:

The Antilegionella mode is used to eliminate any microorganisms in the water, heating the water contained in the tank to above 65°C for a maximum period of 15 minutes.

## 10. Pipe Connections Cont.

To activate the Antilegionella function, the tank must be integrated with an NTC probe, positioning it in the specific probe holder in the tank, and the boiler must be set for this type of operation.

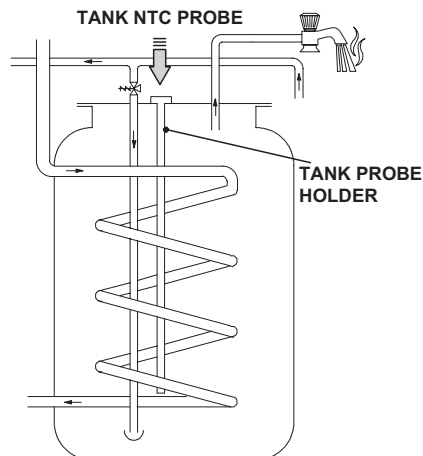


Figure 10.5

- Before powering the boiler, turn knob 11 as shown in the Figure 10.6.

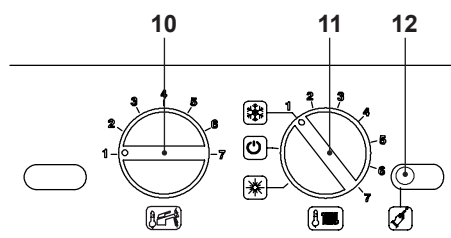


Figure 10.6

- Power the boiler, the following will appear on the LCD display.

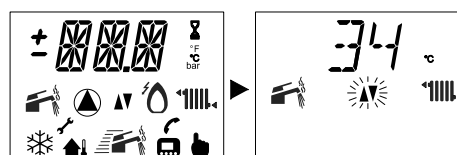


Figure 10.7

- To set the Antilegionella mode function, access programming and hold down the reset button 12 in Figure 10.6 for 15 seconds until parameter **P01** appears on the LCD display; the following appears on the LCD display (the sequence **P01** alternates with -- -- --).

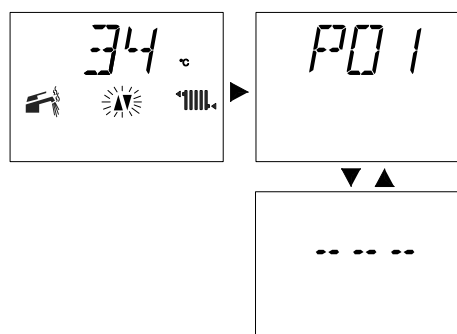


Figure 10.8

## 10. Pipe Connections Cont.

- Press the reset button 12 in Figure 10.6 to scroll the various parameters until reaching parameter **P17**, which is used to set the Antilegionella function; the following will appear on the LCD display (the sequence **P17** alternates with **01**).

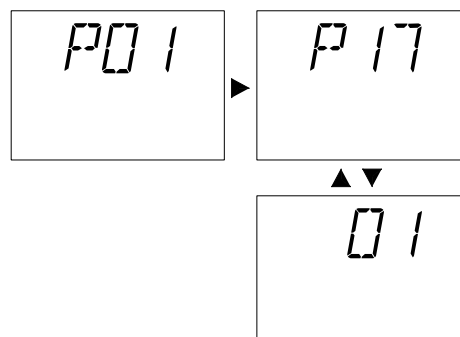


Figure 10.9

- To change the setting, turn the boiler setting knob 10, positioning it to the parameter pre-selected for the Antilegionella function.

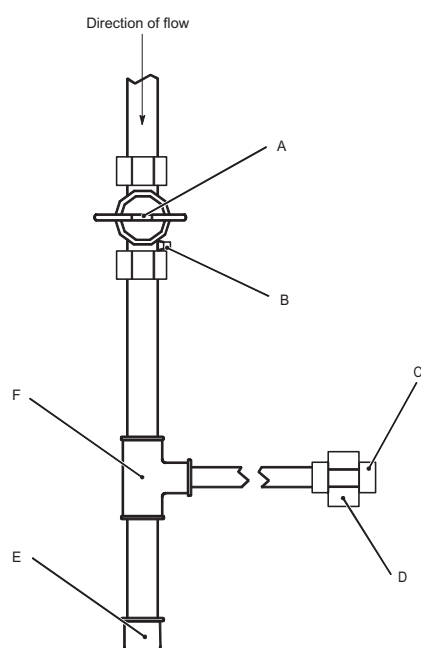
Knob setting	LCD	Frequency of use
1	01	OFF
4	04	every 2 days
7	07	every 3 days

This function becomes active 12 hours after it is set.

# 11. Gas Pipe Connections

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.

The boiler must be cut out from the gas supply piping system by closing its shut-off valve during any gas supply piping system pressure test where there is test pressures equal or lower than 1/2 psi (3,5 kPa).



- A) Manual T-handle Shutoff Valve
- B) Pressure Gauge Port
- C) Flexible Gas Line to Burner
- D) Male Union  $\frac{3}{4}$ " NPT
- E) Pipe Cap
- F) 1" X 1" X  $\frac{3}{4}$ " TEE

**Note:** Height of valve above ground level to conform to local codes, if any. Massachusetts statecode requires gas shut off to be a tee handled gas cock.

Figure 11.1

Locate a drop pipe adjacent to, but not in front of the boiler. Locate a tee (F) 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 (E). Install a shut off valve (A) before the tee with sediment trap and a union after the tee before the combination gas valve (D).

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.

The boiler and its gas connection must be leak tested before placing the boiler in operation. The boiler and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure test in excess of  $\frac{1}{2}$  psi (3.5 kPa).

## WARNINGS

**DO NOT USE A FLAME FOR CHECKING GAS LEAKS.**

# 12. Electrical Connections/Wiring

## 12.1 Power Connection:

### Removing Front Panel:

- Remove the front panel by removing screws A and sliding the front panel up and away from the boiler

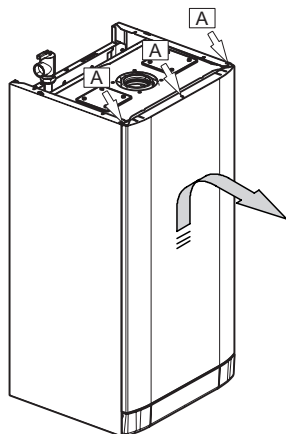


Figure 12.1

### Removing Side Panel:

- Remove screws B

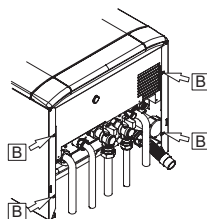


Figure 12.2

### Removing Service Panel:

- Remove screws B.

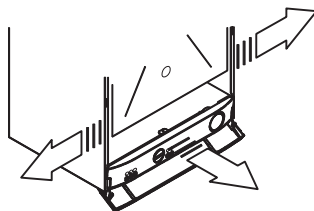


Figure 12.3

- Move the lower part of the side panels (figure 12.3).
- Pull the control panel. When completely pulled out, the panel can rotate 45° downward.

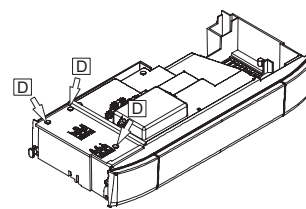


Figure 12.4

- Loosen screws D and remove the service panel (Fig. 12.4)

**For the electrical connection to the boiler use electric wires which conform to local regulations. 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 Canadian Electrical Code Part I CSA C22.1, Electrical Code. In United-States, keep a distance of at least 4 feet (1.22 m) horizontally from the vent terminal at the gas meters, electric meters, regulators and venting equipment. In Canada, keep a distance of 6 feet (1.83 m) between the vent terminal and its devices.**

## 12.2 Connection to the electricity supply:

- Connect the electrical supply cable coming from the fused spur isolation switch to the power supply terminal block of the boiler (as shown in figure 12.5) keeping the same connections for the live wire and the neutral wire.

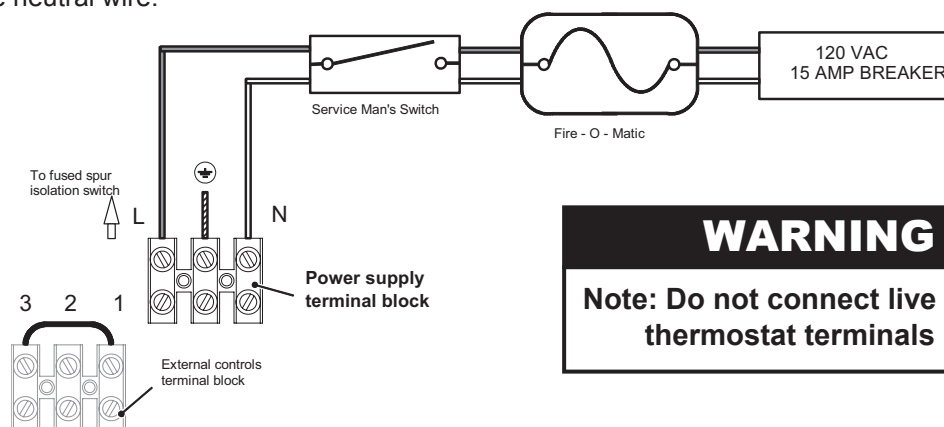


Figure 12.5



# 12. Electrical Connections/Wiring Cont.

## 12.3 Room Thermostat Connection:

- The room thermostat must be connected to the terminal block situated next to the control panel.

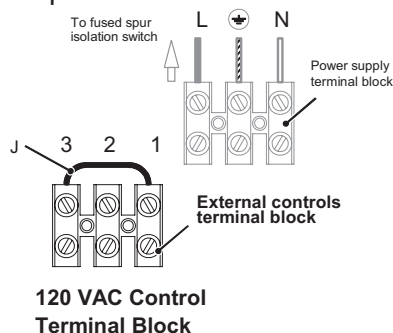


Figure 12.6

- Any external controls and connection lines must be rated at 120 VAC but under no circumstances should external live voltage be connected to terminals 1 and 3 on the boiler.**

- When connecting any type of external control, the jumper J in Fig. 12.6 must be removed.
- The room thermostat must be connected to the “Control Terminal Block” through a external relay such as the RIB01BDC. (Fig 12.7).

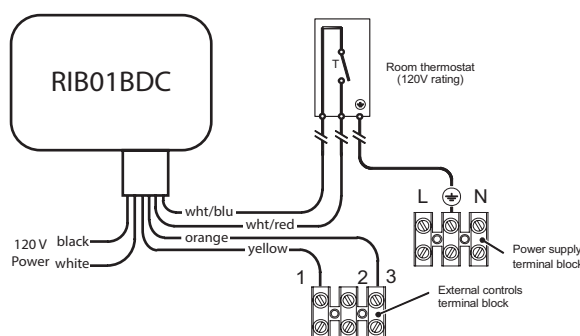


Figure 12.7

- Connect the room thermostat and relay control between terminals 1 and 3 as shown in Fig. 12.7.

## 12.4 Relay Panel Connection:

- The relay control must be connected to the terminal block situated next to the control panel.

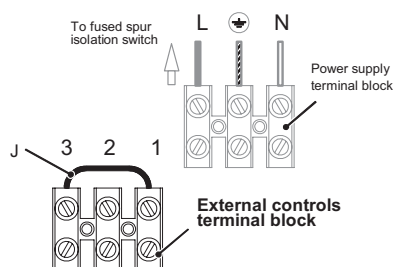


Figure 12.8

- When connecting any type of relay control, the jumper J in Fig. 12.8 must be removed.

- Connect the dry contact switch of the relay panel to the 120 VAC control terminal block (Fig 12.9).

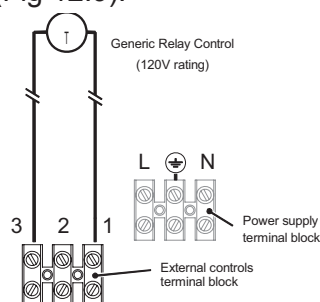


Figure 12.9

- Connect the dry contact switch to terminals 1 and 3 shown in Fig. 12.9.

## 12. Electrical Connections/Wiring Cont.

### 12.5 Finishing:

- Route the electrical supply cord and the external control cord as illustrated in Fig. 12.10.

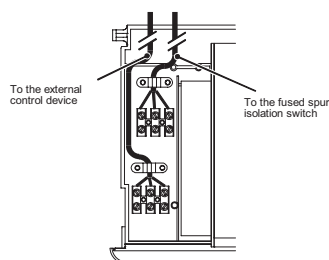


Figure 12.10

- Lock the cords in place with the flexible cord clamps.
- Replace the control panel reversing the steps on page 36.

### 12.6 Installing the external temperature probe:

The external probe must be installed on an external wall of the building, avoiding:

- Direct sun radiation.
- Wet walls or walls where mould tends to form.
- Installation near fans, exhaust or chimney vents.

## 12. Electrical Connections/Wiring Cont.

### 12.7 Electric connection between the boiler and the external probe:

When connecting the external probe to the boiler, use electric wires with a minimum gauge of 18 AWG or section of 0.50 mm<sup>2</sup>.

The electric wires for connecting the external probe to the boiler must run through different grooves than those at network voltage (120 VAC), as they are powered at a low safety voltage and their maximum length must not exceed 66 feet or 20 meters.

- Remove the two screws shown in Figure 12.11 and open the **external probe** connection terminal board.

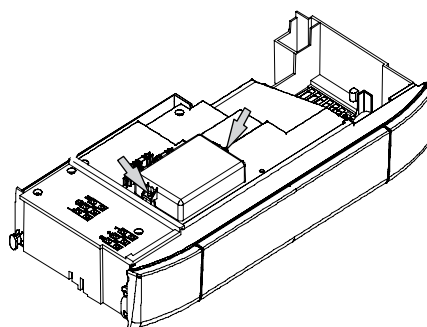


Figure 12.11

- Connect the two electric wires to terminals **E1** and **E2** on the terminal board as shown in Figure 12.12.
- Connect the same wires to the external probe terminals

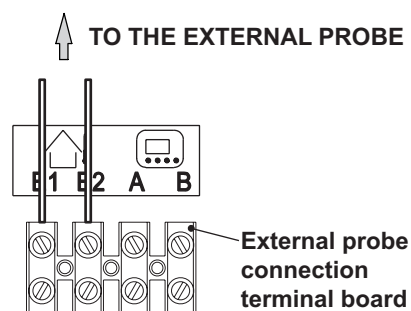


Figure 12.12

## 12. Electrical Connections/Wiring Cont.

The path of the external probe wires or cable must follow the indicated path and be fastened as shown in Figure 12.13.

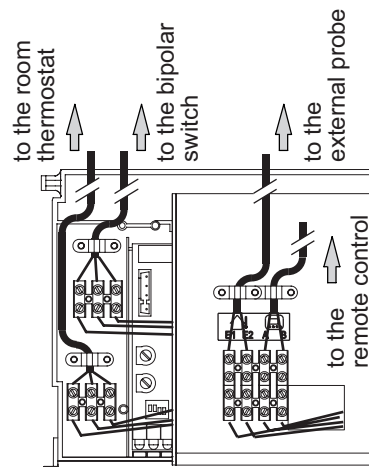


Figure 12.13

### 12.8 Remote control electric connection (optional):

Unscrew the screws and remove the terminal board cover (Figure 12.11). See also the REMOTE CONTROL manual to connect the remote control to the boiler.

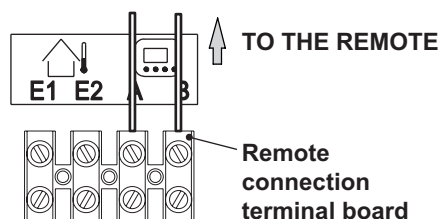


Figure 12.14

Connect the two electric wires to terminals **A** and **B** on the terminal board as shown in Figure 12.14.

**The electric bridge connected in the room thermostat terminal board between terminals "1 and 3" must not be removed Figure 12.15.**

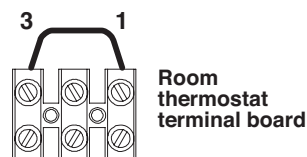
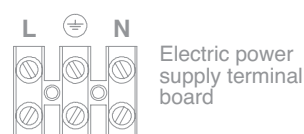


Figure 12.15

## 12. Electrical Connections/Wiring Cont.

The path of the electric power supply wires or cable of the boiler and the remote control must follow the indicated path and be fastened as shown in Figure 12.16.

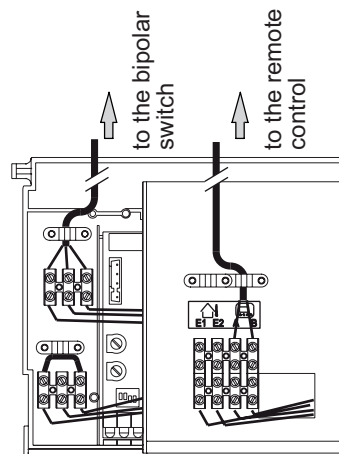



Figure 12.16

### 12.9 Remote enabling operation with the external probe:

For the boiler, operation with the external probe must be enabled. Its operation can be enabled by programming the REMOTE

- Press the button  for more than 3 seconds to enter the mode *INFO*.

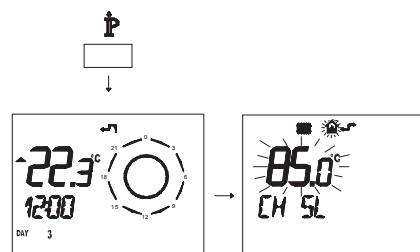




Figure 12.17

Press the buttons  and  at the same time to access transparent programming (Figure 12.18)

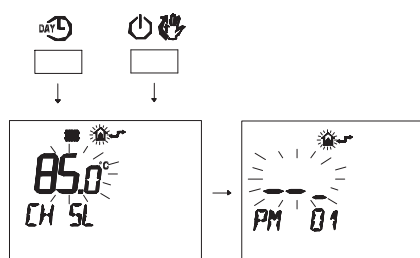


Figure 12.18

## 12. Electrical Connections/Wiring Cont.

- Press the buttons **F** **▲** or **F** **▲** to display the programming “PM15” external probe enabling (Figure 12.19)

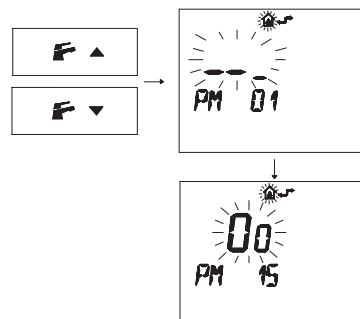


Figure 12.19

- Change the programmed SET using the buttons **▲** **⬆** or **▼** **⬆** until a **set of 60** is displayed, wait until the programmed number starts to flash (Figure 12.20)

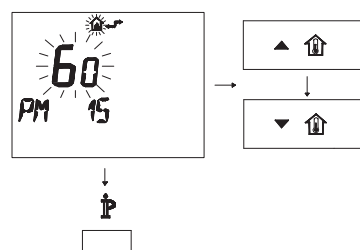


Figure 12.20

- To exit programming, press **⏏**.

### 12.10 Electric connection of the tank thermostat or NTC probe and setting:

To connect the tank thermostat to the boiler, use electric wires with a diameter of at least gauge of 18 AWG or 0.50 mm<sup>2</sup>.

**The electric wires used to connect the probes to the boiler must run through raceways different than those at the network voltage (120 V), as they are powered with a low safety voltage.**

- Remove the two screws shown in figure 12.21 and open the cover of the tank thermostat connection terminal board.

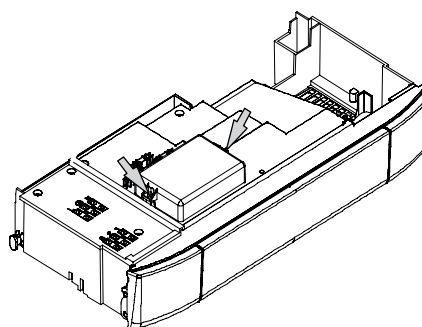


Figure 12.21

## 12. Electrical Connections/Wiring Cont.

- Connect terminals T1 and T2 on the terminal board with the two electric wires as shown in Figure 12.22.
- Connect the same wires to the tank thermostat terminals.

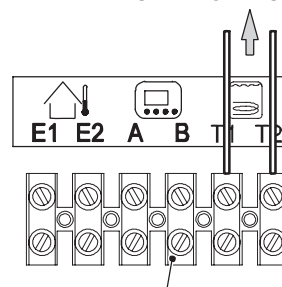
### PROGRAMMING

The boiler is set by the manufacturer in a heating only mode and can be combined with a hot water tank.

#### Setting the tank with a thermostat

- Before powering the boiler, turn knobs 10 and 11 as shown in Figure 12.23.

TO THE TANK OR NTC PROBE



Tank thermostat/NTC probe connection terminal board

Figure 12.22

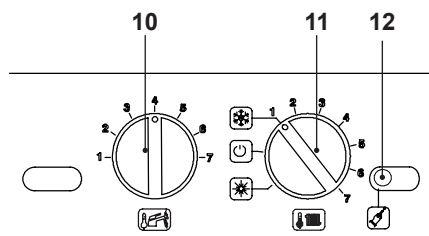


Figure 12.23

- Power the boiler, the following will appear on the LCD display.

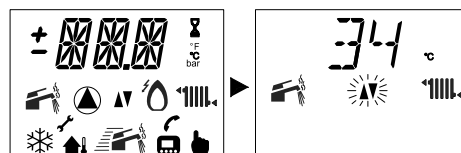


Figure 12.24

- To set the function with the thermostat, access programming and press the reset button 12 in figure 12.23 for 10 seconds, until parameter **P01** appears on the LCD display; the following will appear on the LCD display (the sequence **P01** alternates with -- -- --).

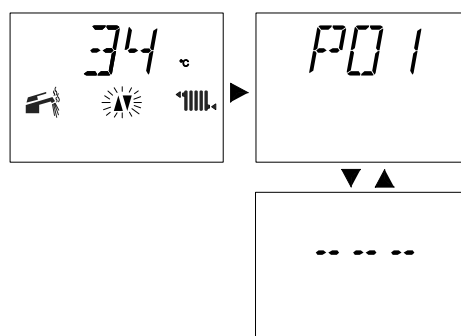


Figure 12.25

## 12. Electrical Connections/Wiring Cont.

- Press the reset button 12, in Figure 12.23 multiple times to scroll the various parameters, until reaching parameter **P03**, which is used to check the operation of the tank with a thermostat. The value displayed on the LCD is already set and must be **04**.

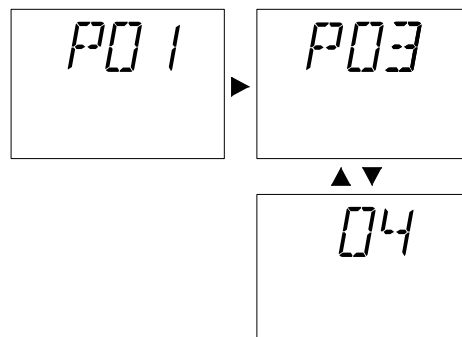


Figure 12.26

- Once checked, enter the programming parameter **P04** and check that the set parameter is **04**.

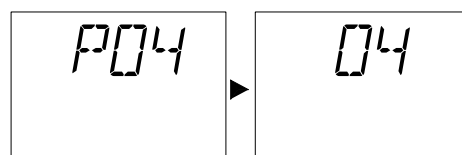


Figure 12.27

### Setting with the tank NTC probe

- Power the boiler, the following will appear on the LCD display.

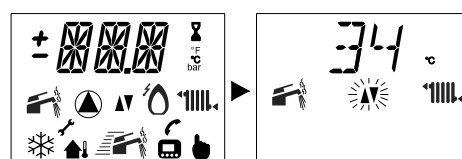


Figure 12.28

- To set operation with the NTC probe, access programming and hold down the reset button 12 in Figure 12.23 for 10 seconds until parameter **P01** appears on the LCD display; the following appears on the LCD display (the sequence **P01** alternates with -- -- --).

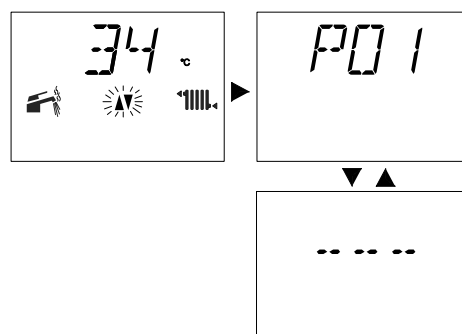


Figure 12.29



## 12. Electrical Connections/Wiring Cont.

- Press the reset button 12, in Figure 12.23 multiple times to scroll the various parameters, until reaching parameter **P03**, which is used to check the operation of the tank with an NTC probe.

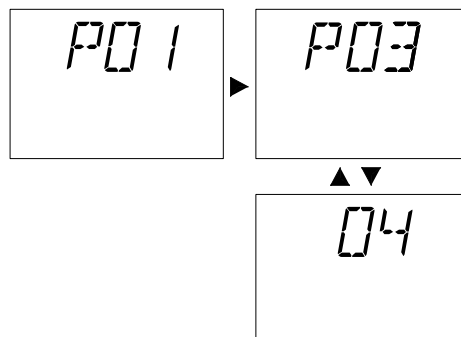


Figure 12.30

- The value that is displayed on the LCD is **04**, turn the boiler setting knob 10 in Figure 12.23, to the minimum setting.

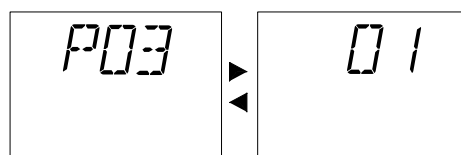


Figure 12.31

The following table shows the correlation between the boiler knob setting 10 in Figure 12.23 and the displays shown on the LCD for parameter **P03**.

PARAMETER P03	SET KNOB	LCD
Tank thermostat/ heating only	4	04
Tank NTC probe	1	01

Press the reset button 12 to access programming **P04**, the starting value shown on the LCD is **04**, turn the boiler setting knob 10 in Figure 12.23 to the minimum setting, the value shown on the LCD display deriving from this operation is **04**.

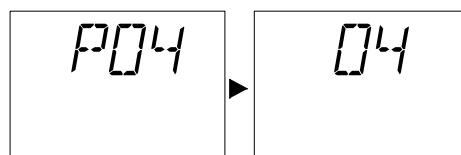


Figure 12.32

## 12. Electrical Connections/Wiring Cont.

The following table shows the correlation between the boiler knob setting 10 in Figure 12.23 and the displays shown on the LCD for parameter **P04**.

PARAMETER P04	SET KNOB	LCD
Tank thermostat/ heating only	4	04
Tank NTC probe	4	04

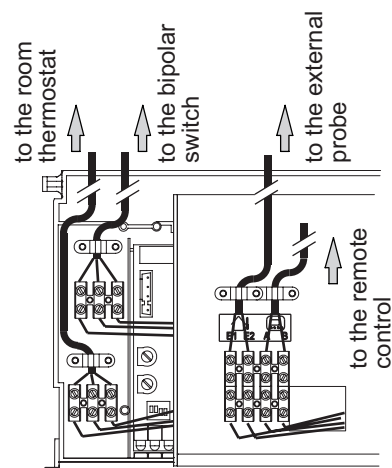


Figure 12.33

# 13. Circulator Sizing

## 13.1 Circulator capacity as a function of flow rate:

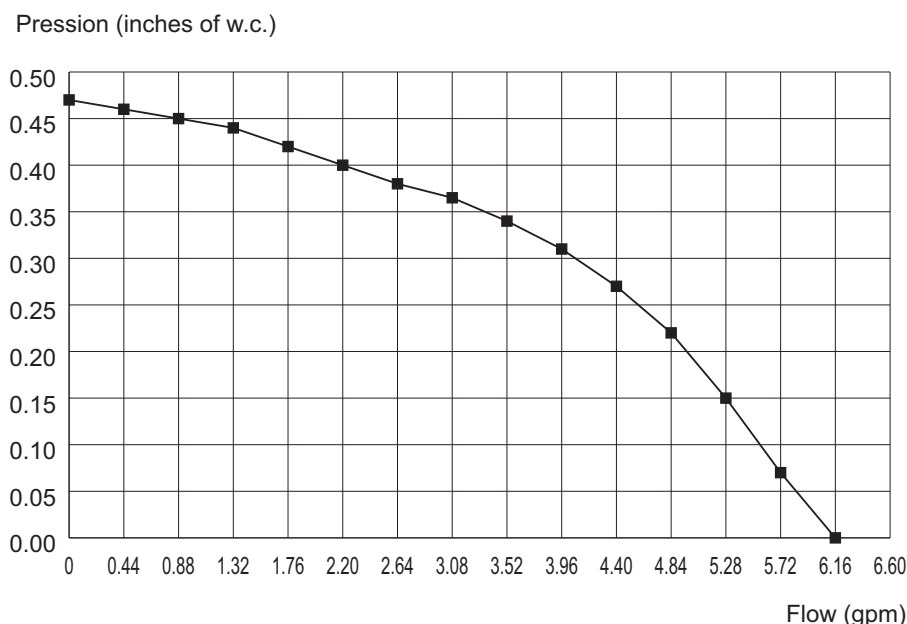


Figure 13.1

The hydraulic specification in Fig 13.1 represent the pressure (available head for the central heating system) as a function of the flow rate. The pressure loss due to the internal piping in the boiler has already been subtracted.

When determining proper piping of the heating system, verify that the internal boiler circulator will overcome the head loss of the system at the designed flow rate using the graph above.

If the internal circulator is **adequate**, direct system piping can be utilized. See section 14 page 48 for suggested direct supply/return piping.

If the internal circulator is **inadequate**, a secondary circulator must be utilized. See sections 14 for suggested primary/secondary piping.

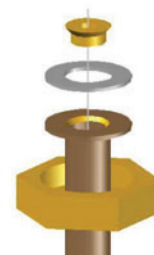
## 13.2 Expansion vessels:

The height difference between the C.h. PRV (1 on page 10) and the highest point in the system may be 23 ft at most. For greater differences, increase the pre-load pressure in the C.h. expansion vessel (25 on page 11) and the system when cold, by 0.1 bar for additional 3.3 ft. For systems with volumes greater than 39 gallons (154 L), an additional expansion vessel must be provided.

## 14. Piping

All external piping components are to be supplied by the installer. It is very important to use a primary secondary piping scheme when an external circulator will be used. Also, when the boiler is piped in a primary secondary manner, it is necessary to use the central heating flow restrictor supplied with the boiler. The flow restrictor ensures there will be enough back pressure to make the central heating flow switch in a low head loss piping system like primary secondary.

Installation of flow restrictor: The flow restrictor is installed inside the pipe tail that attaches to the boiler. Place the flow restrictor into the gasket for the central heating supply pipe tail. Place the gasket on the pipe tail so the flow restrictor seats into the pipe tail. Then install the pipe tail onto the boiler.



There are two methods for accomplishing a primary secondary piping system. The first is to use two closely spaced tees for the boiler supply and return. An example is shown below in Figure 14.1. The run legs should be sized so that there is no excessive head loss on the external circulator that is installed. In most circumstances 1 1/4" piping will be the best choice. When the boiler is piped in this way, the external circulator will not have any hydraulic effect on the Riva Advance SV. This is essential to ensure that the flow switch will operate properly.

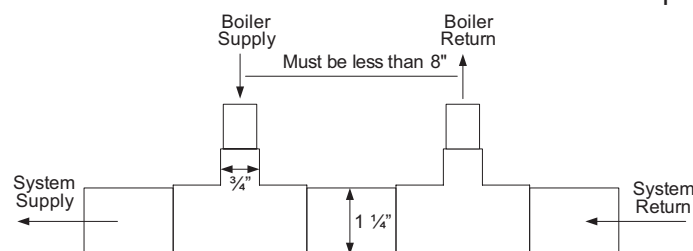


Figure 14.1

The second method is a hydraulic separator. Hydraulic separators are available commercially; however you can also construct your own. An example of a hydraulic separator is given in Figure 14.2. It is important that the separator be at least 2" in size to ensure proper performance.

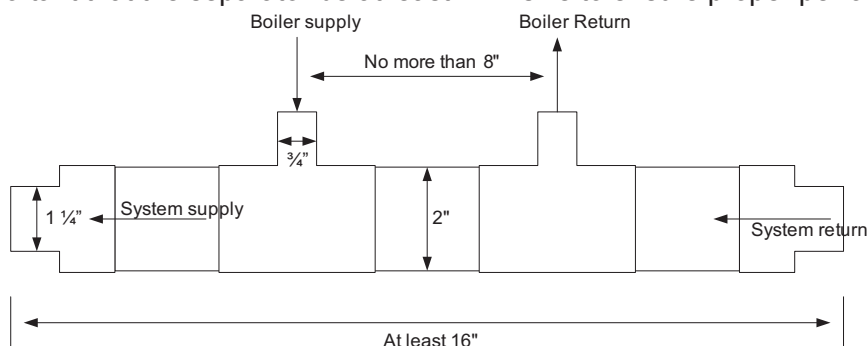


Figure 14.2

## 14. Piping Cont.

### 14.1 Primary – Secondary Piping:

All external piping components are to be supplied by the installer.

It is very important to use an hydraulic separator before secondary circulators.

All external piping components are to be supplied by the installer.

It is very important to use primary secondary piping or hydraulic separator before secondary circulators.

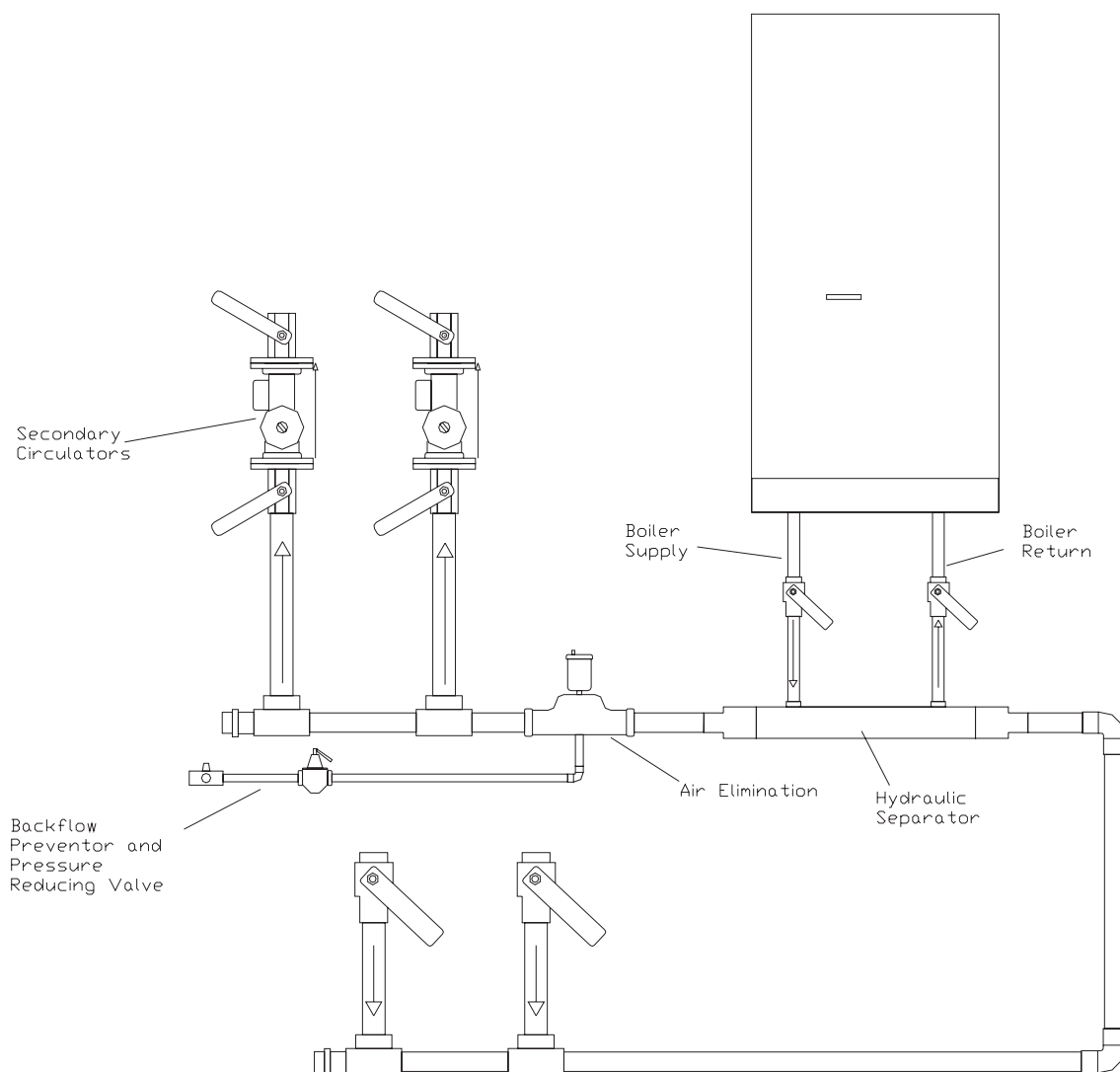


Figure 14.3

## 14. Piping Cont.

### 14.2 Primary – Secondary Piping with Zone Valves:

All external piping components are to be supplied by the installer.

It is very important to use primary secondary piping or hydraulic separator before secondary circulators.

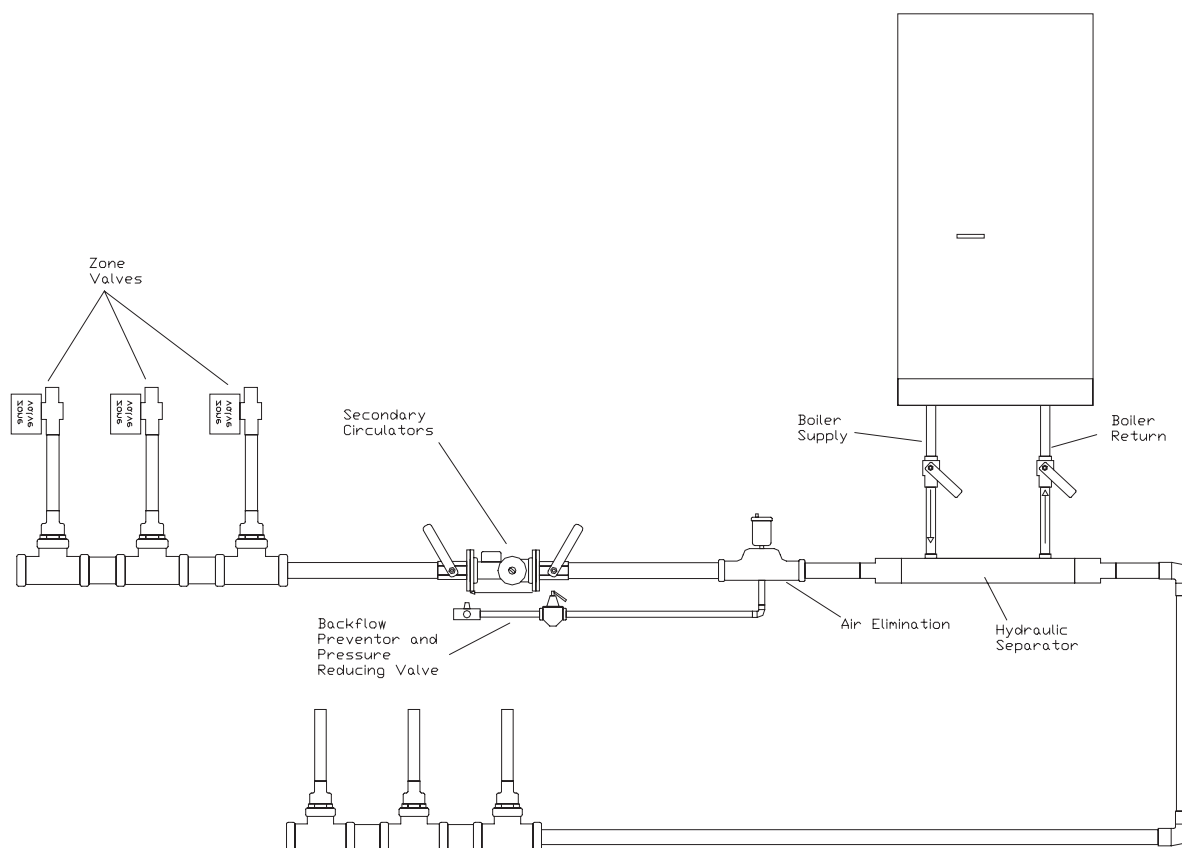


Figure 14.4

## 14. Piping Cont.

### 14.3 Manifold Piping with Zone Valves (shown conn. to radiators):

All external piping components are to be supplied by the installer.

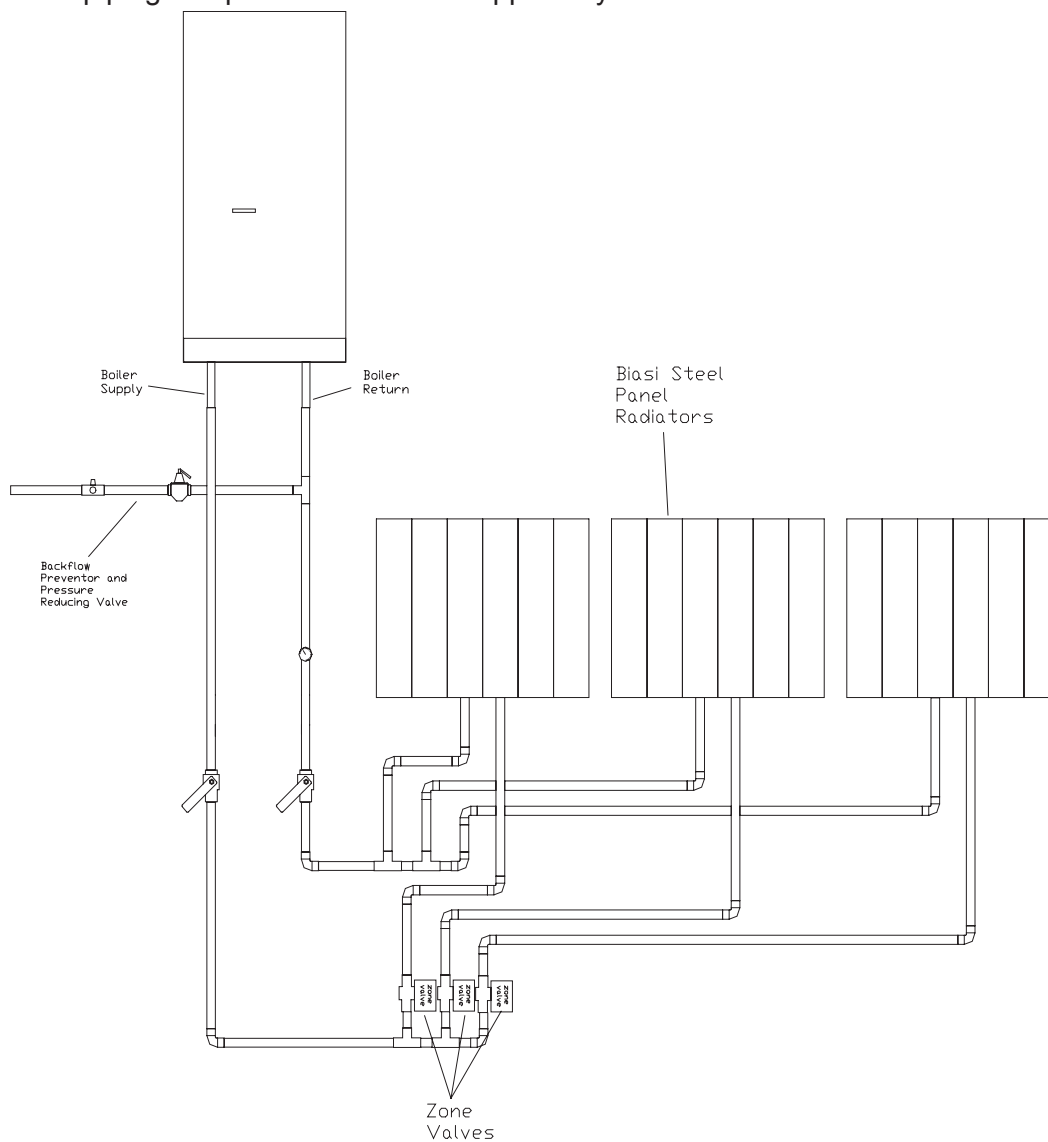


Figure 14.5

# 15. Commissioning

## 15.1 For proper system operation, make sure that:

- System filling and top ups will be done using softened water to reduce the total hardness. The water must also be conditioned in order to keep the pH within the foreseen threshold in order to prevent corrosion (see the following table).
- Both for new systems as well as when replacing, the system must have efficient systems that eliminate air and impurities up to 5 µm (for ex: Y filters, micro impurity separators and micro air bubble separators);
- Avoid draining system water during ordinary maintenance, even apparently insignificant quantities: for example, when cleaning the filters, provide the system with suitable shut-off valves;
- Always analyze the system water before opening the communication between the new generator and the system in order to determine if the parameters of the water indicate the need to completely drain the system, to use the water already contained in the system or to chemically wash the system, using mains water with the addition of detergent, when it is suspected that the system could be dirty or particularly blocked, and the next time new water is loaded. If the analysis of a sample of the water that will be used for loading the system shows the following values, the system can be used. Otherwise, an inhibitor must be used.

$9,6 < \text{pH} < 10,5$
$\text{Ca}_{++} + \text{Mg}_{++} : < 0,5 \text{ } ^\circ\text{F}$
$\text{OH} + 1/2 \text{CO}_3 : \text{de } 5 \text{ à } 15 \text{ } ^\circ\text{F}$
$\text{P}_2\text{O}_5 : \text{de } 10 \text{ à } 30 \text{ mg/l}$
$\text{Na}_2\text{SO}_3 : \text{de } 20 \text{ à } 50 \text{ mg/l}$

If the system water is also in contact with aluminum, a pH value <8.5 is required.

## 15.2 Initial filling of the system:

- Remove the front panel of the case.
- Lift the cap on the automatic air purger valve 3 (Fig 15.1) one full turn and leave open permanently.

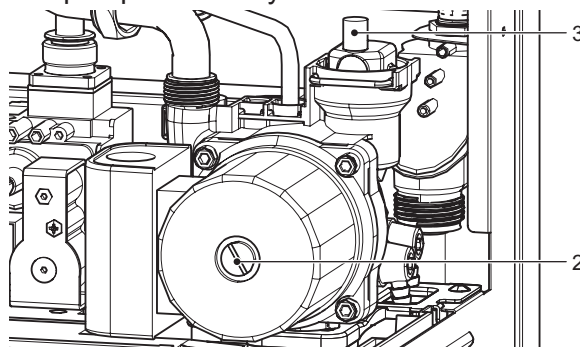


Figure 15.1

- Open the installer supplied automatic fill valve between the cold water inlet and Central Heating System (See 38 on piping diagrams on page 11 of this manual and the section "Refilling procedure" on page 12 of the User manual).
- Open each radiator air vent starting at the lower point and close it only when clear water, free of bubbles, flows out.
- Purge the air from the pump by unscrewing the pump plug 2 (Fig. 15.1); release the pump by turning the rotor in the direction indicated by the arrow on the information plate.
- Close the pump plug.
- Continue filling the system. The actual reading should ideally be 1.3 bar (19 psi) and not less than 0.3 bar (4.3 psi).
- Close all air release valves on the c.h. system.
- Inspect the boiler and the system for water soundness and remedy any leaks discovered.
- **Cold flush the system to remove any loose particles and any system debris before starting the boiler for the first time.**



## 15. Commissioning Cont.

- Reassemble the front panel of the case.
- Return fill valve to automatic position.
- Unscrew the condensing heat exchanger air purger valve 1 (Fig. 15.2).

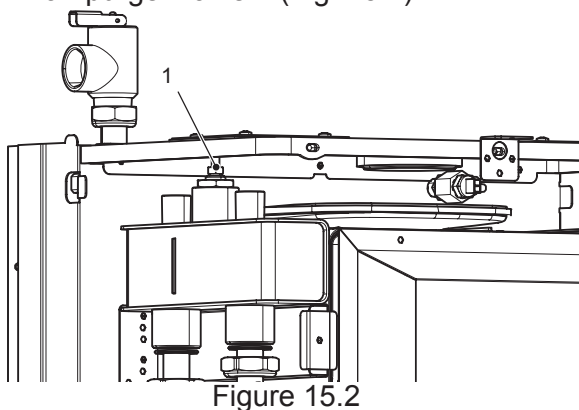


Figure 15.2

### **15.3 Condensate pipe and traps:**

The full length of the condensate pipe should be checked for leaks.

**Before running the boiler, ensure that the built in condensate trap and any other trap in the drain system is correctly filled with water.**



**Fill the built in condensate trap by removing the flue elbow and pouring a cupful of water into the flue outlet (Figure 15.3).**

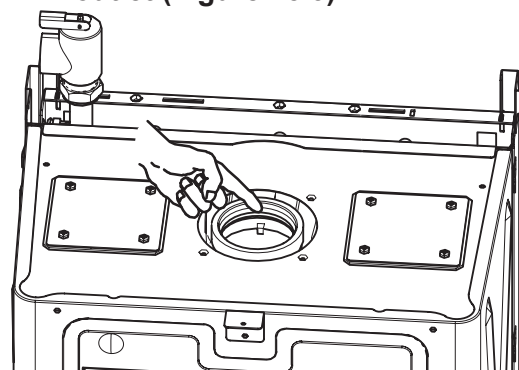


Figure 15.3

An alternative, to avoid the removal of the flue elbow, pour the water through the flue sampling point (Figure 15.4 )

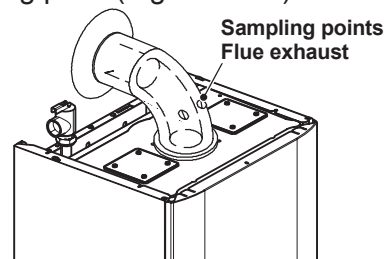


Figure 15.4

## 15. Commissioning Cont.

### 15.4 Lighting the boiler:

Note: If external controls are fitted (e.g. room thermostat) ensure they “call for heat”.

### **WARNINGS**

**THE BOILER AND ITS GAS CONNECTION MUST BE LEAK TESTED BEFORE THE BOILER IS PLACED IN OPERATION**

- Electrically power the boiler safely. The LCD display will show the sequence in Figure 15.5.
- Turn the function selector 7 as shown in Figure 15.6.

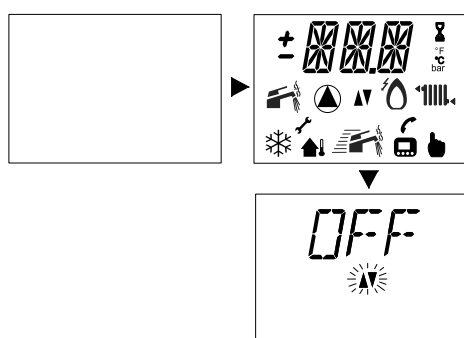


Figure 15.5

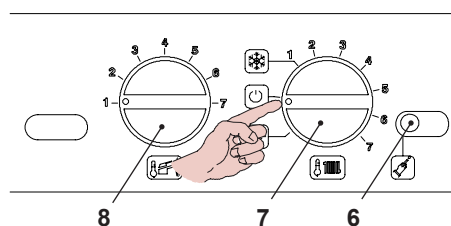


Figure 15.6

The LCD display shows the sequence in Figure 15.7.

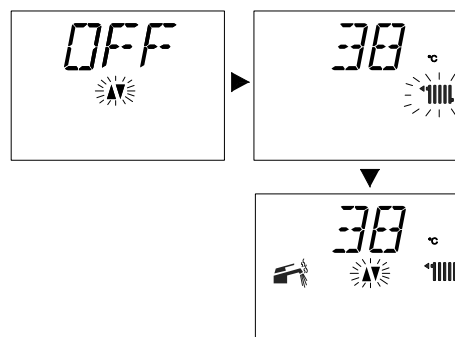


Figure 15.7

## 15. Commissioning Cont.

The boiler will now go through an ignition sequence and the burner will light.

If during the ignition attempt period the boiler fails to light, the full sequence control p.c.b. will go to lockout and the lock-out signal E1 will appear (See section “Operational Faults” on page 19 of the User manual).

To reset the boiler turn the knob 7 (figure 15.6) on the “U” position and then press and release the boiler reset button 6 (Fig. 15.6).

### **15.5 Checking the gas pressure at the burner:**

**This boiler has been tested to the highest quality control standards.**

**The maximum and minimum gas pressures are already set during this quality control process however the checking procedure must be followed to ensure maximum operating efficiency from the boiler.**

#### **Attention**

**Each time after measuring the gas pressure, carefully reclose the tapping point that was used.**

**Each time after making gas adjustments, the valve adjustment components must be sealed.**

**Attention, risk of electrocution.**

**The boiler is powered during the operations described in this section.**

**Do not touch any electric parts.**

### **15.6 Gas setting and operations:**

- Remove the front panel from the boiler body, see the section “Power Connection” on page 36.

#### **Check the network pressure.**

- With the boiler shut off (out of service), check the supply pressure at point C in Figure 15.16 and compare the read value with the value in the Gas supply pressure table in the section “Technical Information” pag. 9.
- Carefully reclose the tapping point C in Figure 15.16.

#### **Check the min. burner pressure.**

- Connect a flue gas analyser to the flue analysis point on the boiler exhausts Figure 15.8.

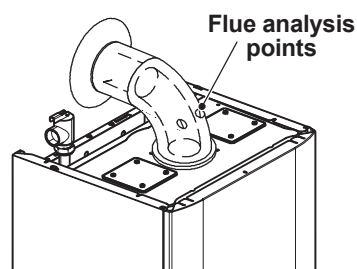


Figure 15.8

- Position the control panel knobs as shown in Figure 15.9

## 15. Commissioning Cont.

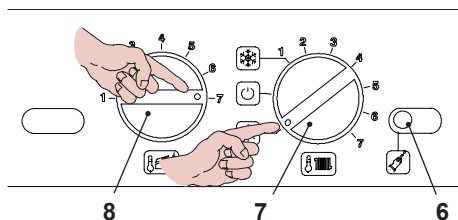


Figure 15.9

- Electrically power the boiler, the following will appear on the LCD display.

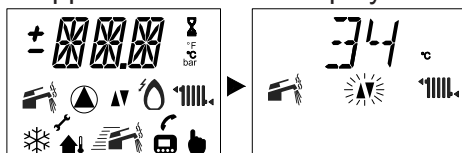


Figure 15.10

- To enter Chimney cleaning mode, enter programming by pressing the reset button 6 in Figure 15.9 for 10 seconds until parameter **P01** appears on the LCD display; the following will appear on the LCD display (the sequence **P01** alternates ---).

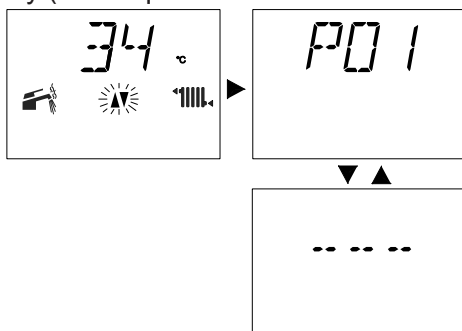


Figure 15.11

- Press the reset button 6 Figure 15.9 to scroll the various parameters until reaching the valid parameter **P09** for the Chimney cleaning mode setting: the following will appear on the LCD display (the sequence **P09** alternates with **00**).

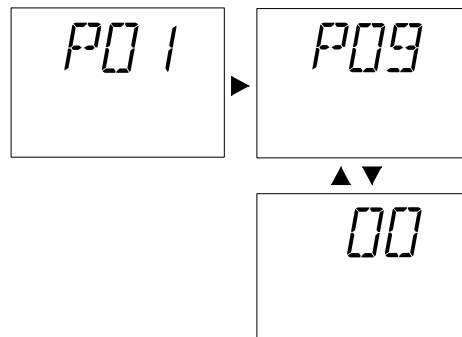


Figure 15.12

- Turn the hot water temperature adjustment knob 8 in Figure 15.14 to the minimum, the following will appear on the LCD display (the sequence **P09** alternates with **01**).

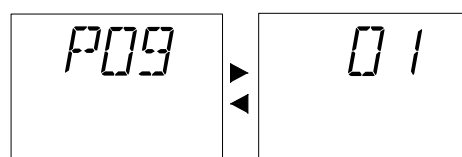


Figure 15.13

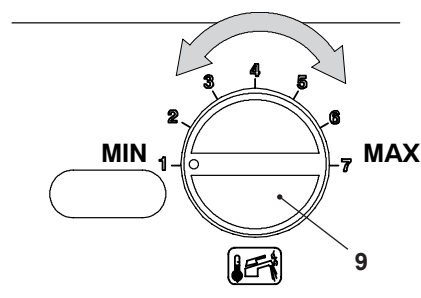


Figure 15.14

- The activation of Chimney cleaning also is indicated on the LCD display by the symbols shown in Figure 15.15 turning on alternately.

## 15. Commissioning Cont.

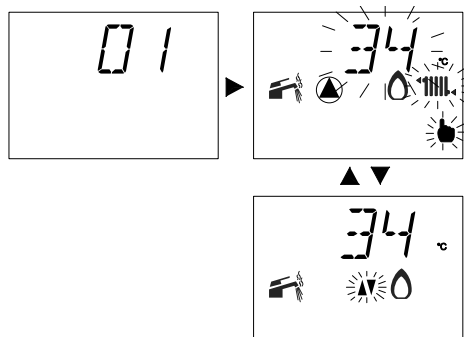


Figure 15.15

- Make sure that the display is indicating a heat request.
- Collect a large amount of domestic hot water by opening the cocks.
- Compare the  $\text{CO}_2$  value read on the flue gas analyser with the one in the table  $\text{CO}_2$  at Q. min. section "Technical Information" page 9.
- To calibrate the boiler  $\text{CO}_2$  (burner gas pressure) completely unscrew the protective brass cap B and turn the Allen screw  $\varnothing$  4 mm below Figure 15.16, turning it clockwise increases the  $\text{CO}_2$ .

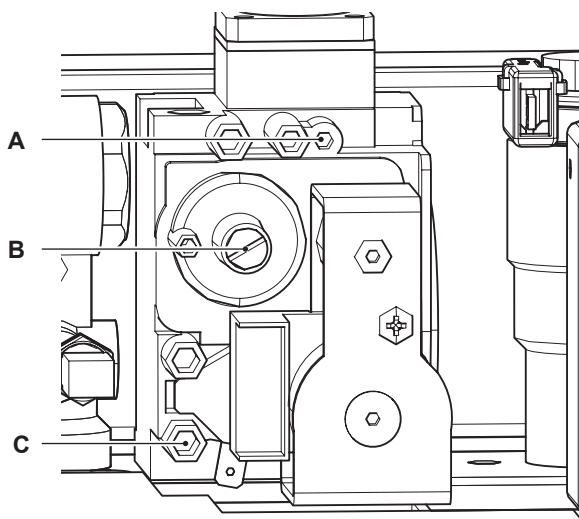


Figure 15.16

### Checking the maximum burner pressure.

- Turn the hot water temperature knob 8 to the maximum Figure 15.17 and check the  $\text{CO}_2$  value.

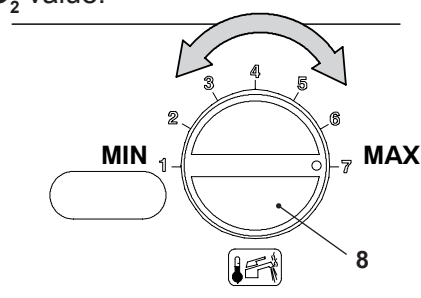


Figure 15.17

- The LCD display signals the variation with the symbols shown in Figure 15.18 turning on alternately. (Example: heating thermal power at maximum).

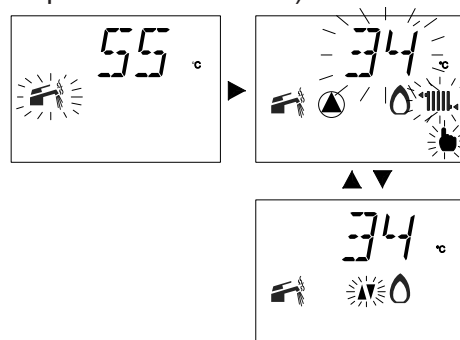


Figure 15.18

- Compare the  $\text{CO}_2$  value read on the smoke analyser with the one in the table section "Technical Information" page 9  $\text{CO}_2$  at Q. nom.
- If the two values do not coincide, turn the RQ maximum adjustment screw (A in Figure 15.16) on the gas valve and calibrate the  $\text{CO}_2$  to the same value shown in the table in the section "Technical Information" page 9. Turning it clockwise decreases the  $\text{CO}_2$ .
- Check that the value of the  $\text{CO}_2$  at Q. min. does not lie outside of the value range in

## 15. Commissioning Cont.

the table **CO<sub>2</sub> at Q. min.** in the section “Technical Information” page 9.

- Close the domestic hot water cocks.
- Turn off the boiler by positioning selector 7 to “U” Figure 15.19.

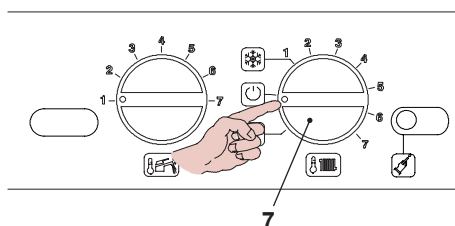


Figure 15.19

When checking the minimum and maximum burner pressures, check the gas flow rate at the meter and compare its value with the gas flow rate data see section “Technical Information” page 9.

**Reclose the flue analysis points.**

### 15.7 Setting the external probe K coefficient:

The boiler is set with a K coefficient equal to zero for boiler operation without a connected probe.

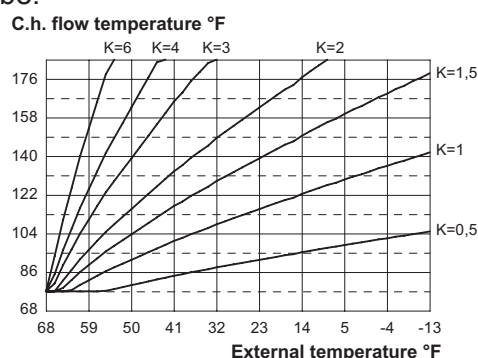


Figure 15.20

The K coefficient is a parameter that raises or lowers boiler delivery temperature as the external temperature changes.

When the external probe is installed, this parameter must be set based on the heating system efficiency to optimise the delivery temperature (Figure 15.20)

Ex. To achieve a delivery temperature to the heating system of 140°F (60°C) with an outdoor temperature of 23°F (-5°C), K must be set at 1.5 (dashed line in Figure 15.20).

### Sequence for setting the K coefficient

- Position the handles 8 and 7 indicated in Figure 15.21.

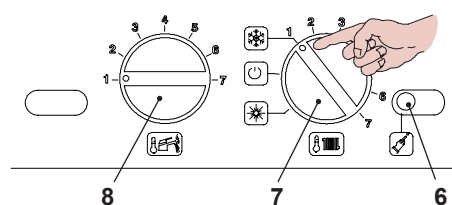


Figure 15.21

- Electrically power the boiler, the following will appear on the LCD display.

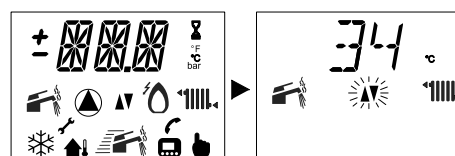


Figure 15.22

- To set the K coefficient, which is determined from Figure 15.22 access programming by pressing the reset button 6 in Figure 15.21 for 15 seconds until parameter **P01** appears on the LCD display; the following will appear on the LCD display (the

## 15. Commissioning Cont.

sequence **P01** alternates with -- -- --).

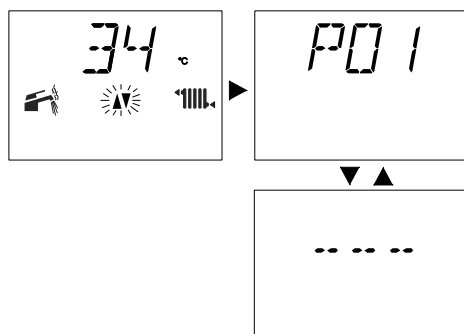


Figure 15.23

- Press the reset button 6, in Figure 15.21, to scroll the various parameters until reaching the valid parameter **P15** for setting the K coefficient; the following will appear on the LCD display (the sequence **P15** alternates with **00**).

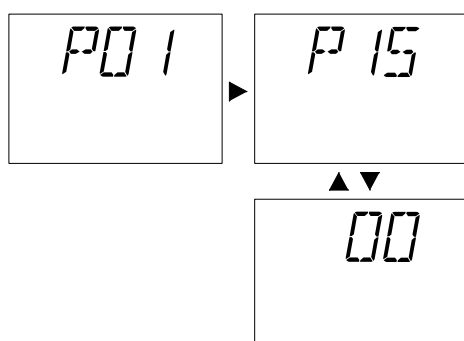


Figure 15.24

- Set the value by turning knob 8 in Figure 15.21 from a minimum of **30** (the sequence **P15** alternates with **30**)

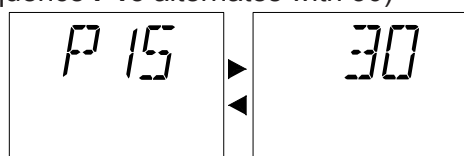


Figure 15.25

to a maximum of **255** based on the se-

lected K coefficient curve in Figure 15.20.

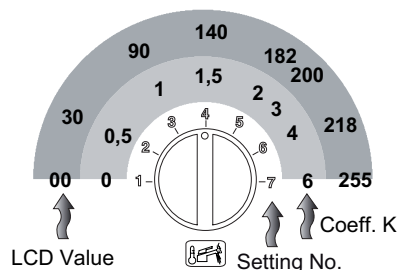


Figure 15.26

- Once the desired value is set, the confirmation that it was stored occurs automatically, after 5 seconds, with **OK** appearing on the LCD display.

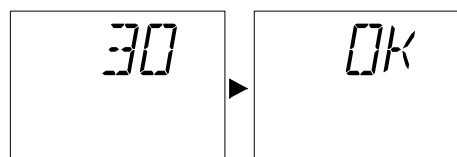


Figure 15.27

- To exit programming, position the function selector/heating temperature adjustment knob 7 as shown in Figure 15.28.

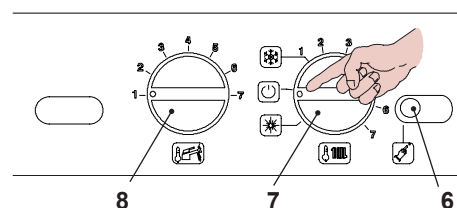


Figure 15.28

Knob 7 must be positioned as shown in Figure 15.29 to respect the trend of the delivery temperature with respect to the set K coefficient.

## 15. Commissioning Cont.

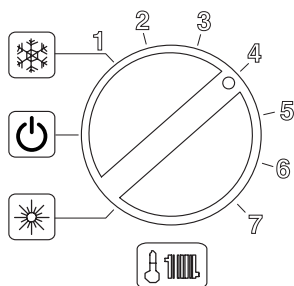


Figure 15.29

Turning knob 7 can change the heating delivery temperature  $\pm 15^{\circ}\text{C}$  with respect to the one set by the external probe K coefficient.

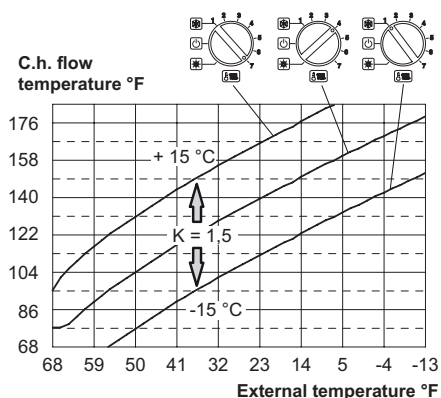


Figure 15.30

The temperature trend as the knob position is changed with **K 1.5** is shown in Figure 15.30.

### Sequence for setting the K coefficient with the remote connected

Programming the REMOTE, the K coefficient setting can be selected.

- Power the boiler electrically by setting the bipolar switch foreseen in the installation.
- Press the button **P** for more than 3 seconds to enter the mode **INFO** (Figure 15.31).

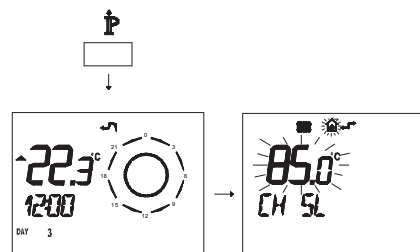


Figure 15.31

Press the button **OK** to display the **K REG** window (Figure 15.32).

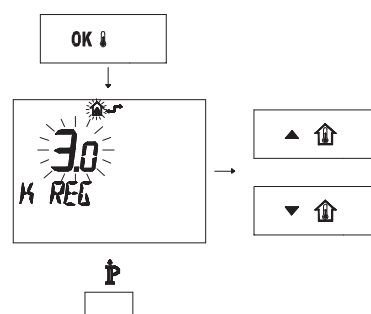


Figure 15.32

The buttons **▲** and **▼** can be used to change the value.

Press the button **P** to exit the mode **INFO** (Figure 15.32).



## 15. Commissioning Cont.

### 15.8 Labels placement:

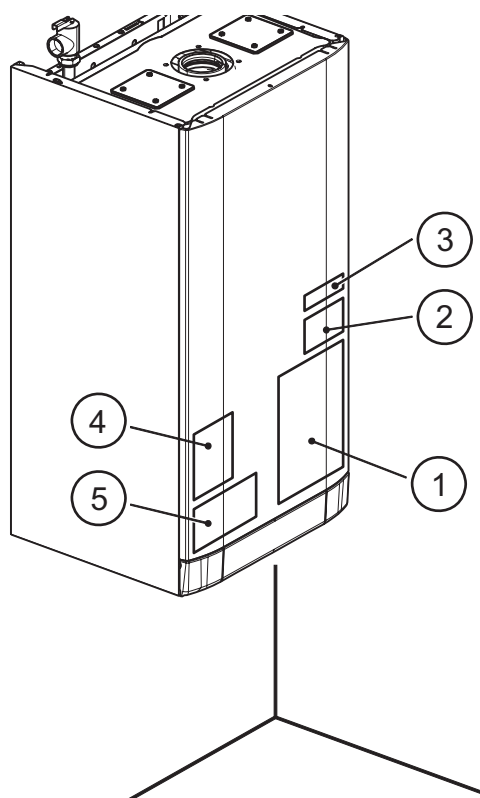


Figure 15.33

**Warning:** The installation is not complete unless labels supplied are placed on the boiler as shown in Figure 15.33.

All the labels supplied with the boiler are numbered for reference.

According to Figure 15.33 place all the labels on the boiler. Use label numbered as 1 (already installed in the front panel) to begin the placement in the correct way.

### 15.9 Checking the flue system and combustion:

- The flue system should be visually checked for soundness. Check all clamps, gaskets and fixings are secure and tight.
- Ensure that the flue terminal is sited correctly in accordance with the flue fitting instructions.

To check the exhaust gas:

- Remove the plugs indicated (Fig. 15.34).
- Insert the analyzer probe in the exhaust gas sampling point or in the air intake sampling point.
- Reference tables are given in the Sections 2 on page 9 of this manual for proper CO<sub>2</sub> levels.

## 15. Commissioning Cont.

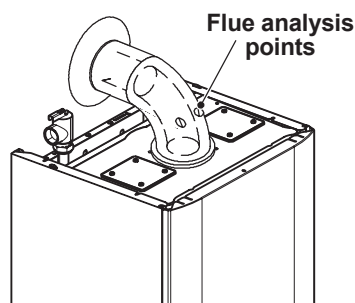


Figure 15.34

### **15.10 Instructing the user:**

- Hand over the User manual, this Installation, Operation and Service manual to the end user and explain how to use the unit in Central Heating mode.
- Take the User step by step through the lighting instructions.
- Show the User how to switch off the appliance quickly and indicate the position of the electric service switch and the boiler on/off switch.
- Explain the proper use and adjustment of all system controls; this will ensure the greatest possible safety and fuel economy.
- Explain the function and use of the function switch.
- Explain how to turn off the appliance for both short and long periods and advise on the precautions necessary to prevent damage should the appliance be inoperative when freezing conditions may occur.
- Fill in the details required on the Boiler warranty card and hand to the User advising them to return it for proper warranty coverage. Finally, advise the User that, for continued safe and efficient operation, the appliance must be serviced by a competent person at least once a year.

## 16. Gas Conversion

**WARNINGS:** Procedures to adapt the boiler to the type of gas available must be carried out by a competent and responsible person. Components used to adapt it to the type of gas available must be genuine parts only.

For instruction on calibrating the boiler gas valve see section “Gas setting and operations” on page 55.

### Operations and gas setting

**Check that the gas cock mounted on the gas piping to the boiler is closed and that the appliance is not powered.**

- Remove the body's front panel and turn the control panel as shown in section “Dismantling the external panels” to page 67.
- Take off the lid of the sealed chamber.
- Unscrew the connector A to the gas pipe (Figure 16.1).

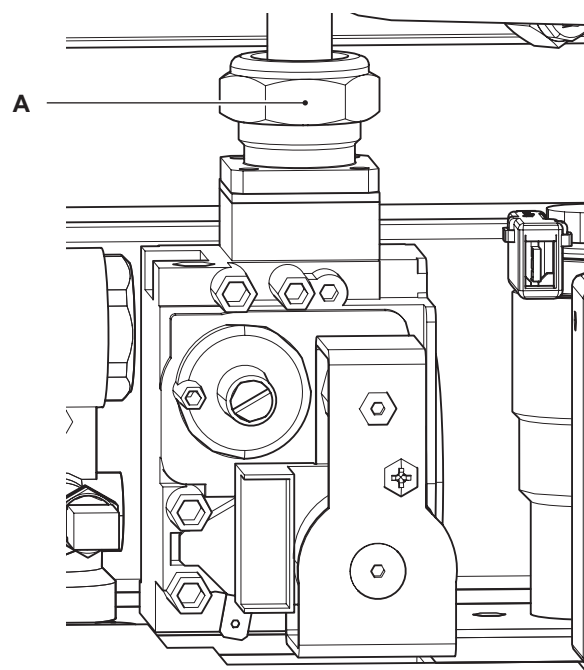


Figure 16.1

- Remove the fixing fork B and remove the gas pipe C (Figure 16.2).

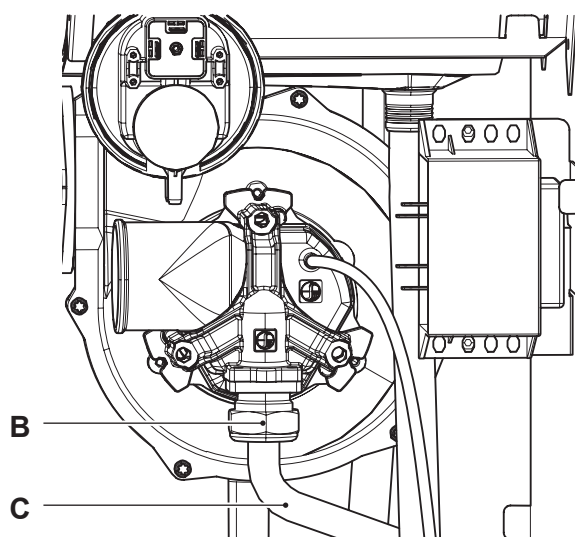


Figure 16.2

- Carry out gas conversion by correctly replacing the gas restrictor (Fig. 16.3), referring to the “Technical Information” section page 8.

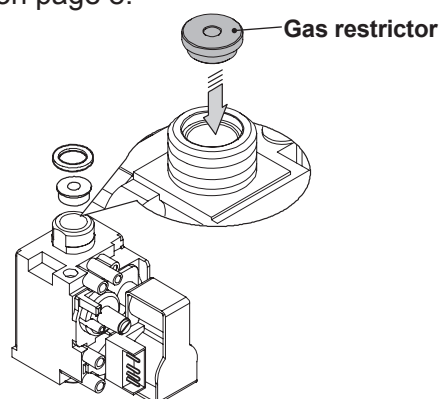


Figure 16.3

**Attention,** to reassemble repeat the operations carried out in reverse order. Be careful not to damage the OR gasket of the gas pipe when inserting the pipe in the air box (air/gas mixer). After any service operation on the components of the

## 16. Gas Conversion Cont.

gas circuit check all the connections for gas tightness (Figure 16.1).

The factory boiler is set for functioning with Natural gas (G20).

To set the functioning of the boiler with **LPG (G31)** gas, carry out the following settings:

### Gas setting - first step

- Disconnect the electric power supply from the boiler using the bipolar switch.
- Position the knobs 7 and 8 as shown in Figure 16.4.

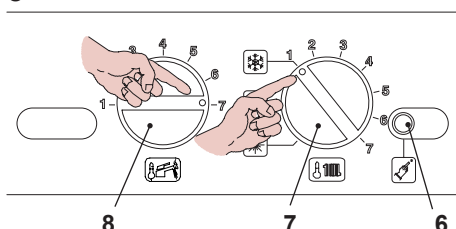


Figure 16.4

- Electrically power the boiler, the following will appear on the LCD display.

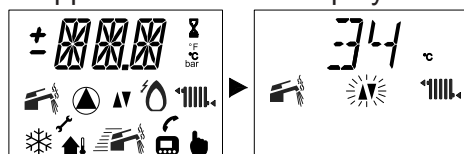


Figure 16.5

- To set the type of gas, enter programming by pressing the reset button 6 in Figure 16.4 for 15 seconds until parameter **P01** appears on the LCD display; the following will appear on the LCD display (the sequence **P01** alternates -- -- --).

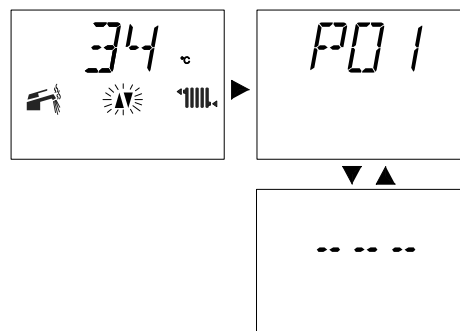


Figure 16.6

- Press the reset button 6 Figure 16.4 to scroll the various parameters until reaching the valid parameter **P05** for setting the type of gas; the following will appear on the LCD display (the sequence **P05** alternates with **01**).

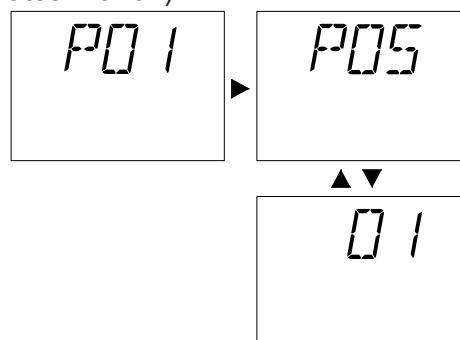


Figure 16.7

- To change the setting, turn knob 8 and position it in the preselected position, see Figure 16.8

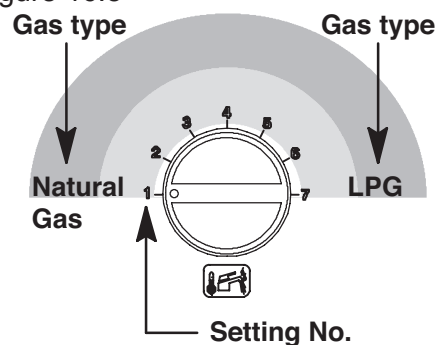


Figure 16.8

## 16. Gas Conversion Cont.

The following table summarises the correlation between gas type, knob set, LCD display.

GAS	KNOB position	LCD
Natural gas G20	1	01
LPG G30-G31	7	07

Example: If the supplied gas is LPG (G30-G31) and the boiler is setup to operate with natural gas (G20) turn the knob 8 in Figure 16.4 as shown in Figure 16.9.

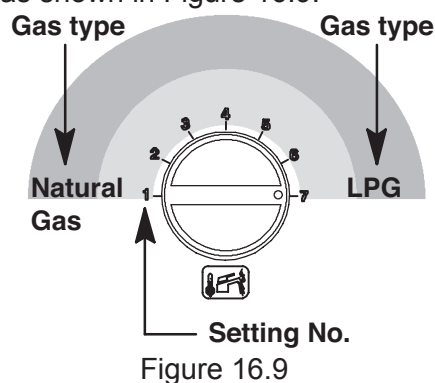


Figure 16.9

- The following will appear on the LCD display (the sequence **P05** alternates with **07**).

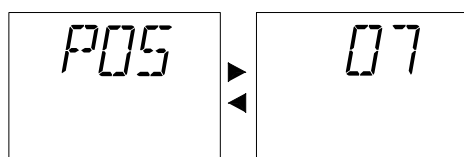


Figure 16.10

- Once the type of gas is set, the confirmation that it was stored occurs automatically, after 5 seconds, with **OK** appearing on the LCD display.

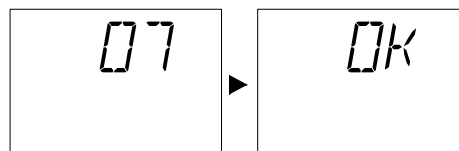


Figure 16.11

### Gas setting - second step

- Press the reset button 6 Figure 16.4 to access the valid parameter **P06** for setting the type of gas (second level); the following will appear on the LCD display (the sequence **P06** alternates with **01**).

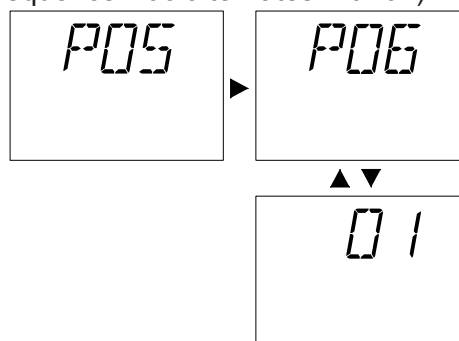


Figure 16.12

- To change the setting, turn the hot water temperature regulation knob 8 in Figure 16.4 to the preselected position see also Figure 16.9.

The following table summarises the correlation between gas type second level, knob set, LCD display.

GAS	KNOB position	LCD
Natural gas G20	1	01
LPG G30-G31	7	07

- The following will appear on the LCD display (the sequence **P06** alternates with **07**).

## 16. Gas Conversion Cont.

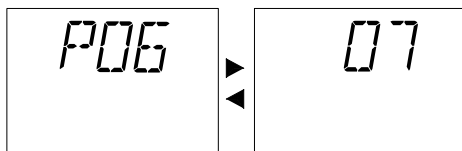


Figure 16.13

- To exit programming, position the function selector 7 to “U” (Figure 16.14), or disconnect the electric power supply from the boiler.

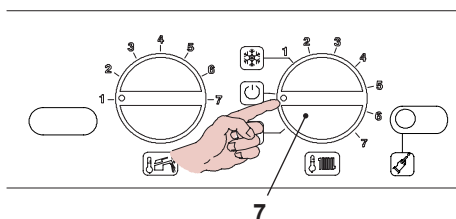


Figure 16.14

- Calibrate the gas valve according to the instructions provided in the section “Gas setting and operations” on page 55.
- Reposition the controls panel and re-mount the front panel of the body.
- Apply the label indicating the gas nature and pressure value for which the appliance is regulated. The self adhesive label is contained in the transformation kit.

# 17. Annual Maintenance

## 17.1 Warnings:

The procedures detailed in this chapter must be carried out only by a professionally qualified person. Thus you are advised to contact an Authorised Service Agent.

For efficient and continuous operation of the boiler you are advised to have, at least once a year, maintenance and cleaning done by an Approved Service Person.

Isolate the appliance from the electricity supply by turning off the fused spur isolation switch adjacent to the appliance and turn off the gas cock, before carrying out any procedures, whatsoever, for cleaning, maintenance, opening or dismantling boiler panels.

## 17.2 Dismantling the external panels:

### Front Panel:

- Loosen the three screws A (Fig. 17.1)
- Lift and remove the panel.

### Side Panels:

- Loosen the screws B (Figure 17.2). Bring the bottom of the panels away from the boiler and lift them, freeing them from the top hooks.
- Take off the front panel of the case, then the sealed chamber lid and the front panel of the combustion chamber. If you notice dirt on the fins of the primary heat (21 on page 10), cover the sloping surfaces of the burner (20 on page 10) entirely in a protective layer (sheets of newspaper or similar). Brush out the primary heat exchanger (21 on page 10) with a bristle paintbrush.

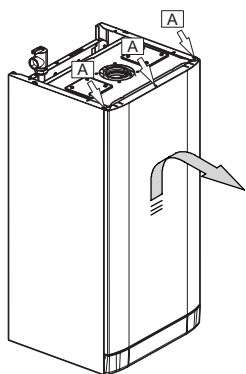


Figure 17.1

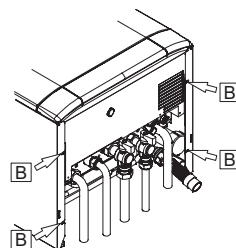


Figure 17.2

## 17.3 Emptying the d.h.w. system:

- Close the pressure reducing automatic fill valve (37 on Section 4)
- Open the central heating drain cock (F in Fig. 17.3).
- Empty the c.h. system.
- Close the central heating drain cock (F in Fig. 17.3).
- Open the pressure reducing automatic fill valve (37 on Section 4)

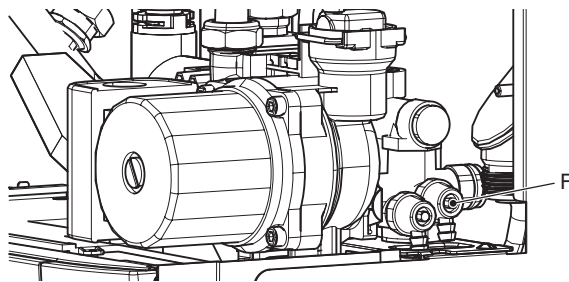


Figure 17.3

# 17. Annual Maintenance Cont.

## 17.4 Emptying the Domestic Hot Water circuit:

- Close the inlet valve
- Open the system domestic hot water valves

## 17.5 Combustion analysis check:

If it is necessary to carry out a combustion analysis remove the plugs indicated in Fig. 17.4.

Reference tables are given in the “Technical Information” section page 8.

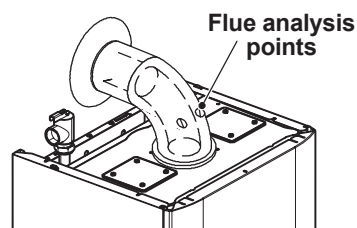


Figure 17.4

## 17.6 Cleaning the condensing heat exchanger and burner:

To remove the burner-fan group D (Fig. 17.6):

- Take off the front and side panels of the case.
- Remove the sealed chamber lid.
- Disconnect the connectors of the ignition electrodes E and detection electrode F (Fig. 17.6).
- Disconnect the rubber pipe G (Fig. 17.5).
- Unscrew the gas connector H (Fig. 17.6).
- Remove the fixing fork I and remove the gas pipe J (Fig. 17.5).
- Leave the air box with the air hose clamped to the water pipe.
- Remove the nuts K (Fig. 17.6) and the burner-fan group D.

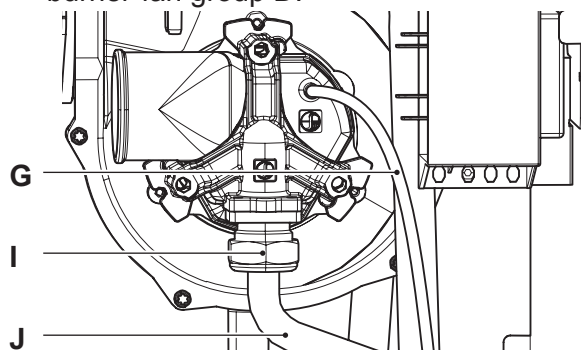


Figure 17.5 (right side of the fan)

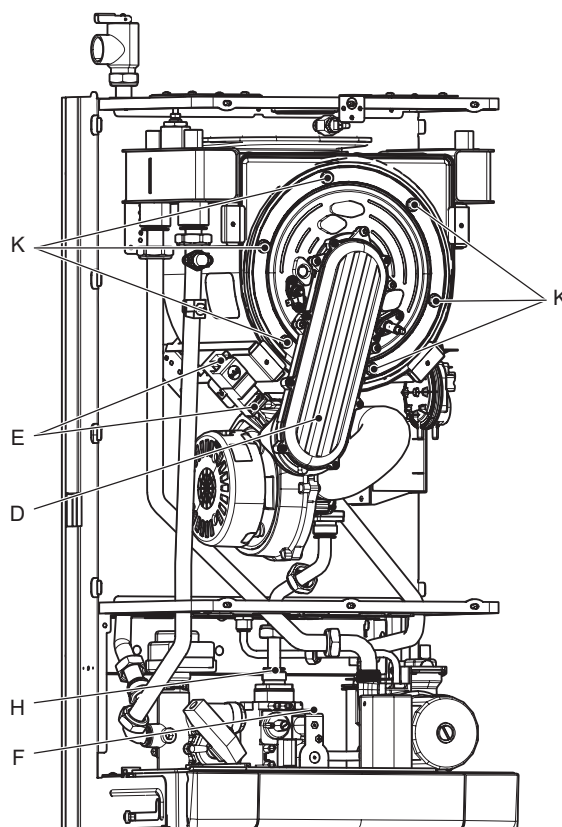


Figure 17.6

- Disconnect the connector of the fan L by pressing the plastic hook M placed on the



## 17. Annual Maintenance Cont.

rear side of the connector (Fig. 17.7).

If you notice dirt on the coil of the condensing heat exchanger (21 on page 10) brush out it with a bristle paintbrush and remove the dust with a Hoover.

Reassemble the parts carrying out the removal operations in reverse order.

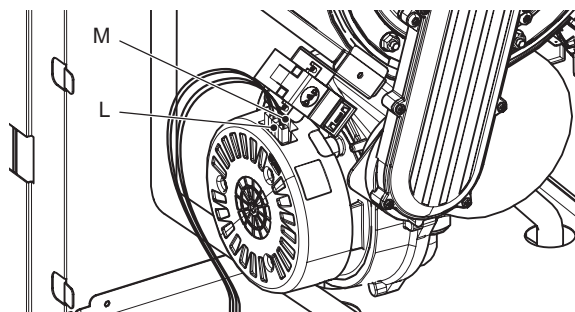


Figure 17.7 (rear view of the fan)

### **17.7 Checking the pressurization in the expansion vessel:**

Empty the central heating systems as described in section 17.3 of this chapter and check that the pressure in the expansion vessel is not less than 1 bar.

See also section 13.2 page 47 of this manual.

If the pressure is lower, take steps to correct the pressure level.

### **17.8 Cleaning the burner:**

The burner (20 on page 10) does not need special maintenance, but it is sufficient to dust it with a bristle paintbrush.

To reach the burner do the operations described in the section 17.6 of this manual.

### **17.9 Checking the flue:**

Have the integrity of the flue outlet pipe (27 on page 11) air intake pipe (28 on page 11), checked periodically, at least once a year.

For all the above maintenance operations it is advisable to call an qualified Service agent.

### **17.10 Drain pipe inspection:**

Check the soundness and integrity of the condensate drain pipe.

Verify the cleanness and correct filling of the condensate traps.

### **17.11 Visual inspection of appliance:**

Visually inspect all water joints, seals and connections for any evidence of leakage and re-tighten, grease or replace them as necessary.

### **17.12 Gas pressures and soundness:**

Check appliance for gas soundness. Recheck operational pressures as described in section 15.5 page 55 of this manual.

## 17. Annual Maintenance Cont.

### 17.13 Water inhibitor concentration:

Where chemical products are used the level of water treatment should be checked on an annual basis and re treated after full or partial drain down. A conductivitymeter can be used to check the correct concentration of inhibitor in the heating water.

### 17.14 Checking the condensate drain pipe:

The condensate drain pipe A (Fig. 17.8) does not require any particular maintenance but just check:

- That no solid deposits have formed, if so remove them.
- That the condensate drain piping is not clogged.

Unscrew the plug D to clean inside the pipe.

#### Removal

- Remove the forks E and remove the condensate trap A moving it downwards (Fig. 17.8).

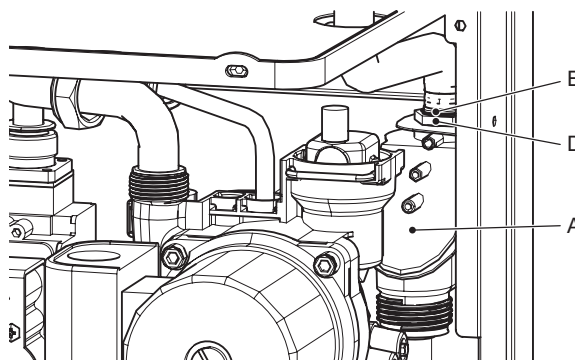


Figure 17.8

### 17.15 Setting the boiler chimney sweep function:

With the boiler set in chimney sweep mode, it is possible to exclude some boiler automatic functions making check and control operations easier.

- Position the control panel knobs as shown in Figure 17.9.

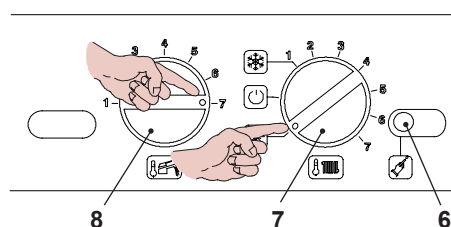


Figure 17.9

- Electrically power the boiler, the following will appear on the LCD display.

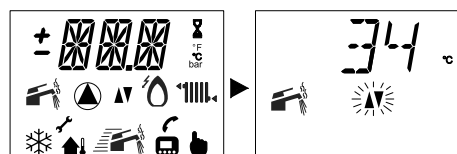


Figure 17.10

- To enter Chimney cleaning mode, enter programming by pressing the reset button 6 in Figure 17.9 for 15 seconds until pa-

## 17. Annual Maintenance Cont.

parameter **P01** appears on the LCD display; the following will appear on the LCD display (the sequence **P01** alternates --- ---).

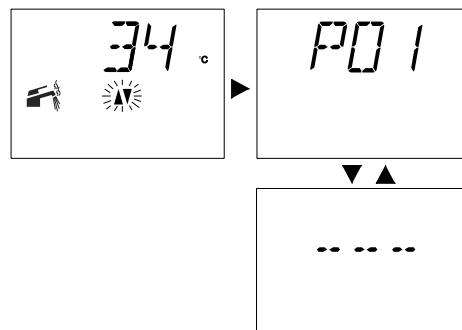


Figure 17.11

- Press the reset button 6 Figure 17.9 to scroll the various parameters until reaching the valid parameter **P09** for the Chimney cleaning mode setting: the following will appear on the LCD display (the sequence **P09** alternates with **00**).

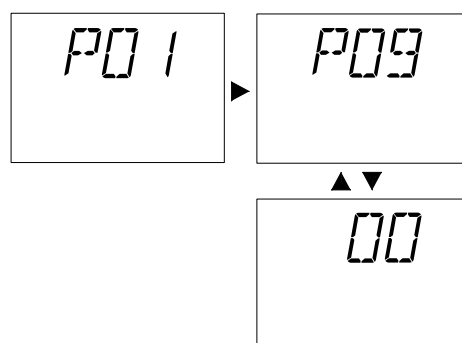


Figure 17.12

- Turn the hot water temperature adjustment knob 8 in Figure 17.14 to the minimum, the following will appear on the LCD display (the sequence **P09** alternates with **01**).

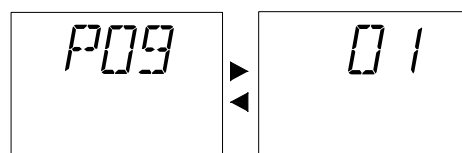


Figure 17.13

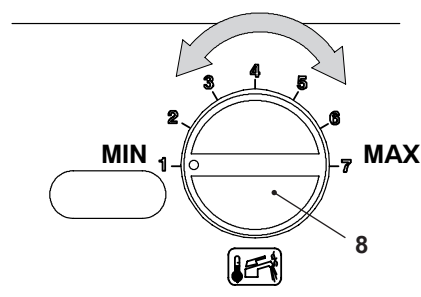


Figure 17.14

- The activation of Chimney cleaning is also indicated on the LCD display by the symbols shown in the following figure turning

## 17. Annual Maintenance Cont.

on alternately.

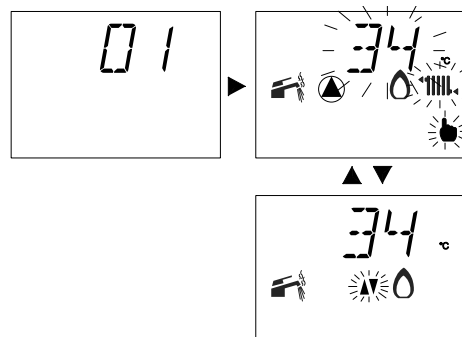


Figure 17.15

- The heating thermal power can be changed by turning the hot water temperature adjustment knob 8 shown in Figure 17.16.

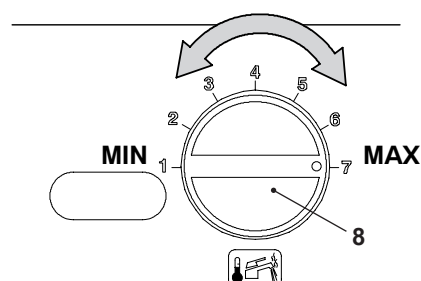


Figure 17.16

- The LCD display signals the variation with the symbols shown in the following figure turning on alternately. (Example: heating thermal power at maximum).

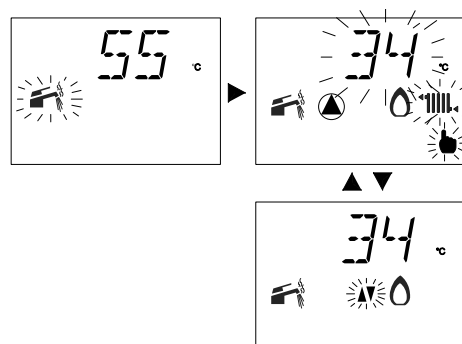


Figure 17.17

- To exit programming, position selector 8 as shown in Figure 17.18.

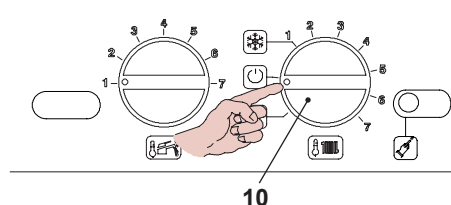


Figure 17.18

After 15 minutes, the boiler exits from the Chimney cleaning setting and returns to its normal settings.

## **17. Annual Maintenance Cont.**

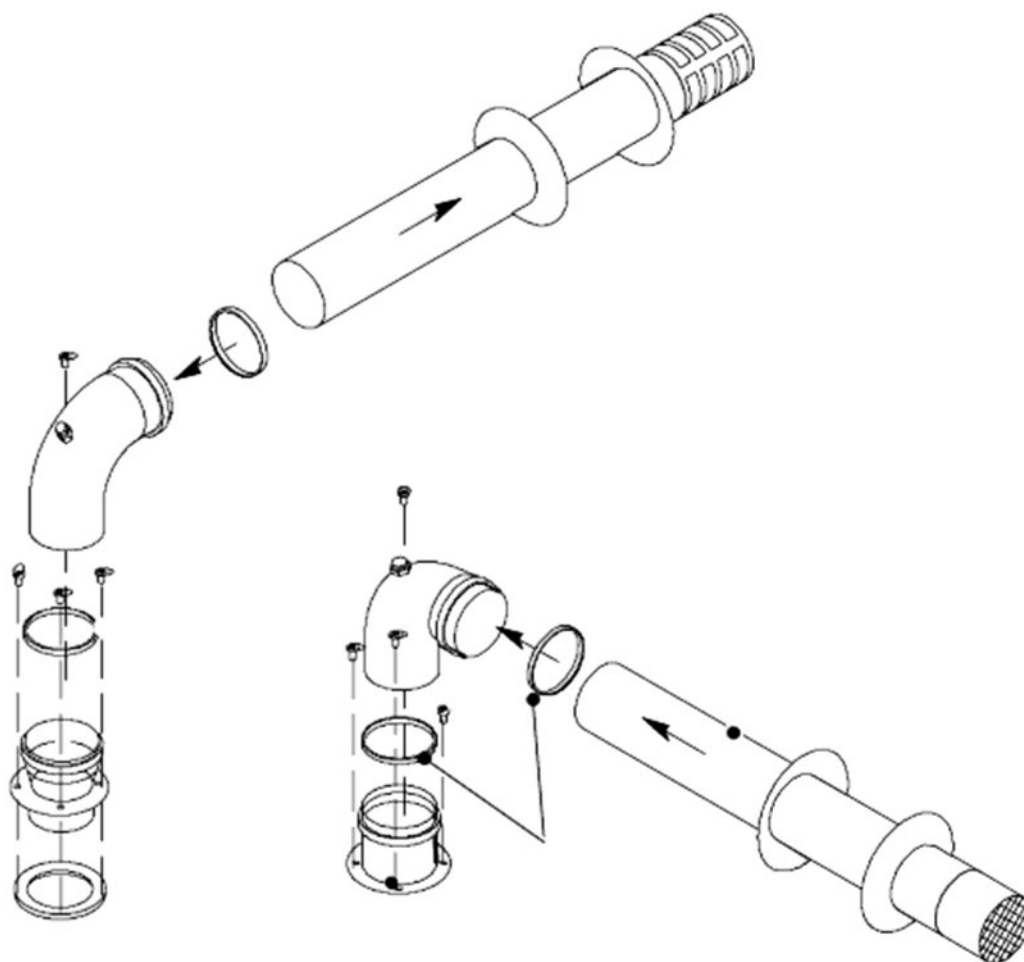
### **17.16 Checking the magnesium anode :**

To guarantee constant protection against the electrochemical corrosion of the hot water tank (if installed), have the magnesium anode checked periodically by the authorised service centre.

## 18. Vent Part Spares

### 18.1 Separate venting:

For any spare parts, please contact QHT Inc. at 800-501-7697.

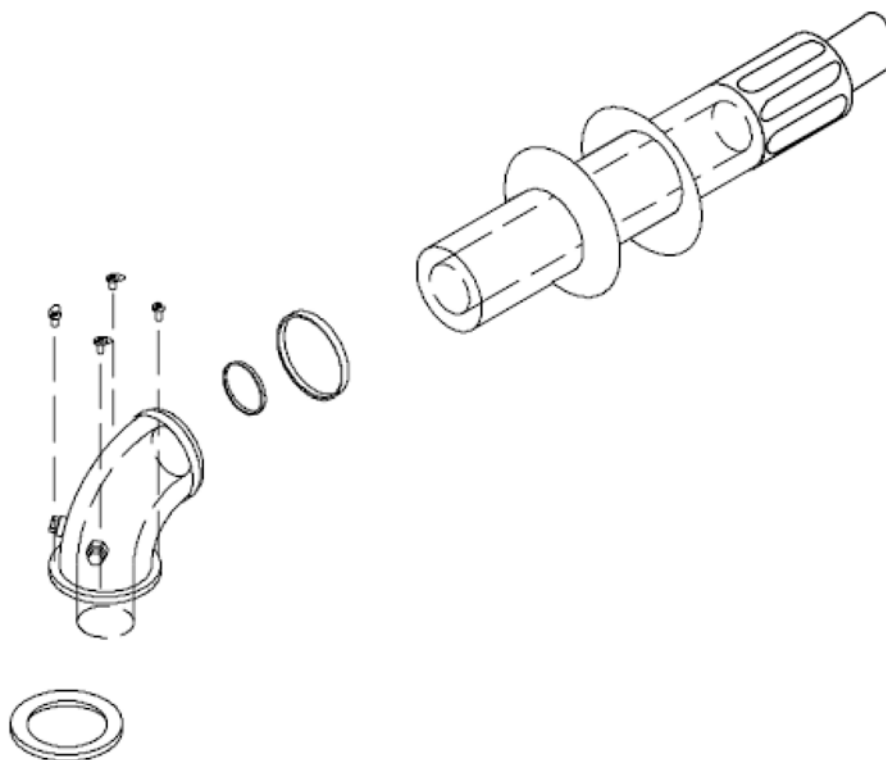


<i>Description</i>	<i>Order Number</i>
Twin pipe kit	10999.0393.0

## 18. Vent Part Spares Cont.

### 18.2 Coaxial venting:

For any spare parts, please contact QHT Inc. at 800-501-7697.

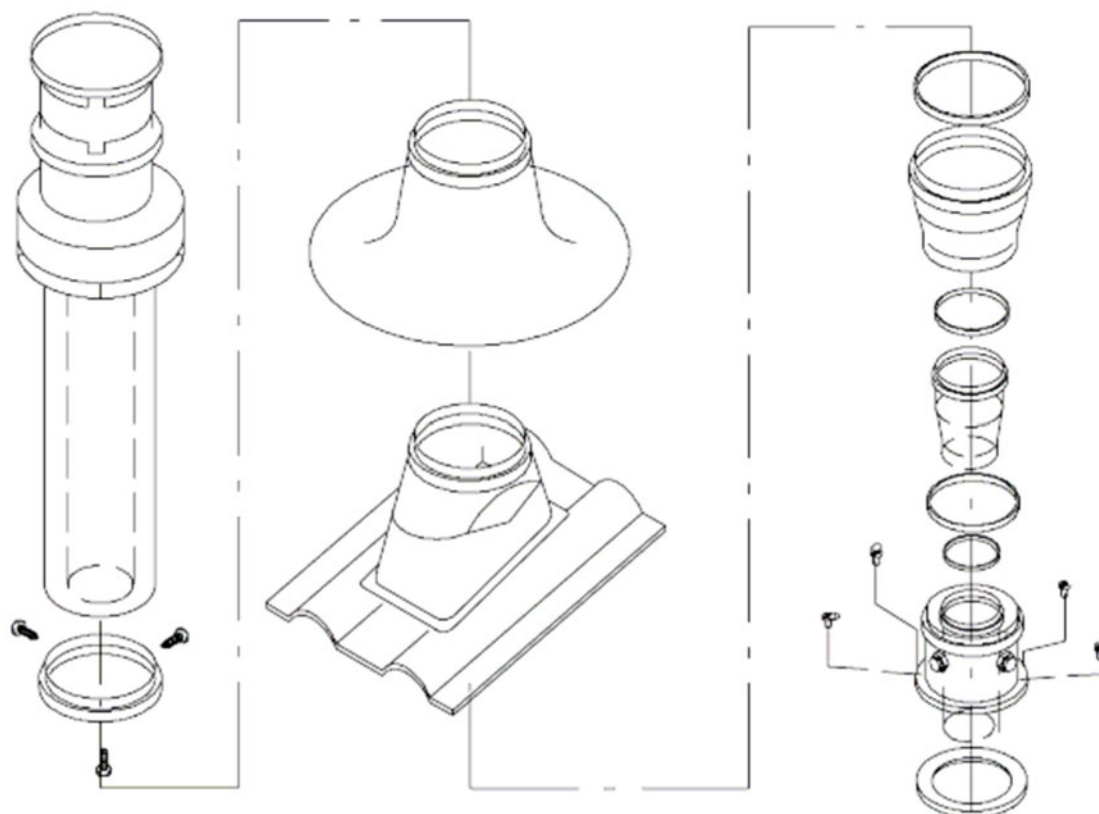


<i>Description</i>	<i>Order Number</i>
Coaxial flue kit	10999.0387.0

## 18. Vent Part Spares Cont.

### 18.3 Roof venting

For any spare parts, please contact QHT Inc. at 800-501-7697.



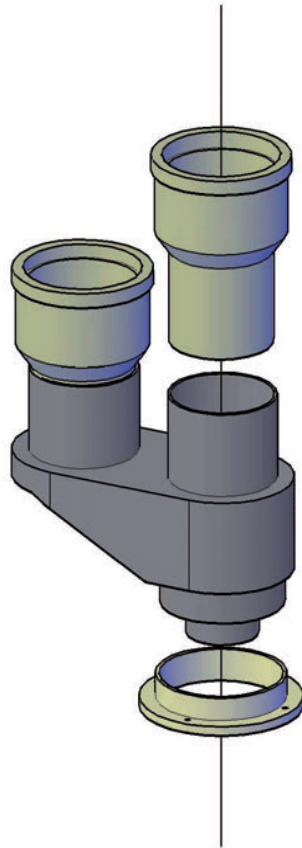
<i>Part</i>	<i>Description</i>	<i>Order Number</i>
A	Roof flue kit	10999.0392.0



## 18. Vent Part Spares Cont.

### 18.4 Separate PVC venting:

For any spare parts, please contact QHT Inc. at 800-501-7697.

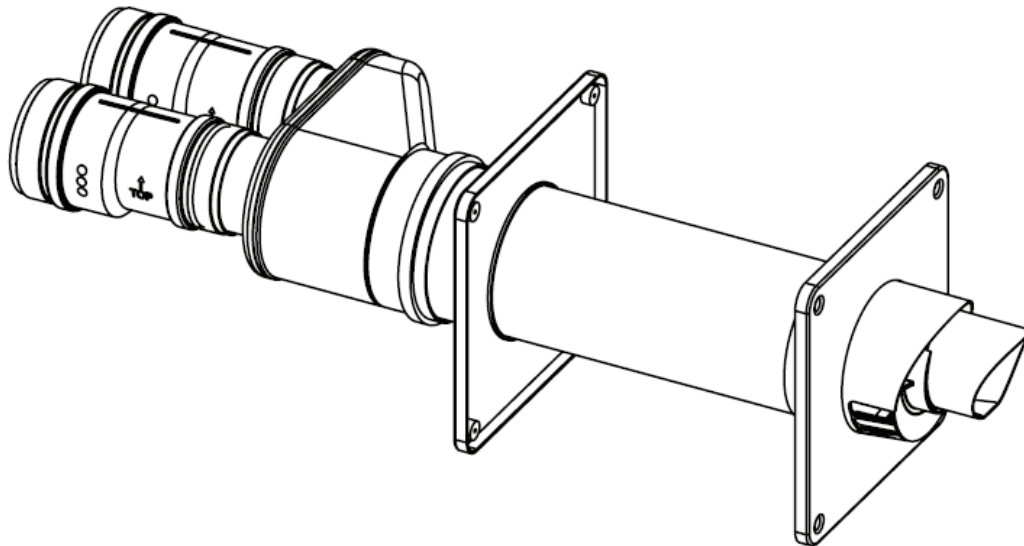


<i>Description</i>	<i>Order Number</i>
PVC Boiler Adapter	PTA5808

## 18. Vent Part Spares Cont.

### 18.5 PVC Sidewall venting:

For any spare parts, please contact QHT Inc. at 800-501-7697.

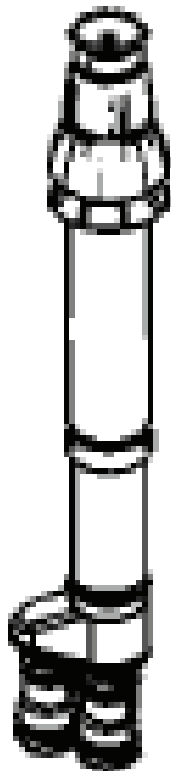


<i>Description</i>	<i>Order Number</i>
PVC Boiler Adapter	RI - 10 0887

## 18. Vent Part Spares Cont.

### 18.6 PVC Roof venting:

For any spare parts, please contact QHT Inc. at 800-501-7697.



<i>Description</i>	<i>Order Number</i>
PVC Boiler Adapter	RI - 10 0885

## 19. Installer Notes

### System Checkout:

Boiler Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

Original Purchaser:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Installer:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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### Performance Tests:

GROSS STACK TEMPERATURE \_\_\_\_\_

ROOM TEMPERATURE (AMBIENT) \_\_\_\_\_

NET STACK TEMPERATURE \_\_\_\_\_

CO<sub>2</sub> \_\_\_\_\_

O<sub>2</sub> \_\_\_\_\_

SMOKE READING \_\_\_\_\_

COMBUSTION EFFICIENCY \_\_\_\_\_

COMMENTS \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**NOTE**

[illegible]

## NOTE

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



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