
Wall hung, fanflue, roomsealed, high efficiency gas boiler

Service manual

RINNOVA ADAPTIVE

Product name

Models

G.C. Appl. No.

RINNOVA ADAPTIVE 30S

M300V.30 SR

41-583-39

Leave this manual adjacent to the gas meter

Warning:

Service / repairs must be carried out, only by a qualified Gas Safe Registered Engineer, who will be responsible for the current Regulations for gas appliances.

Note:

After servicing, complete the relevant Service Interval Record section of the Benchmark Checklist of the user and installation manual.



TABLE OF CONTENTS

1 OVERALL INFORMATION	4	10 PRIMARY CIRCUIT PRESSURE SWITCH	30
1.1 Overall View	4	10.1 Function.....	30
1.2 Hydraulic diagram	4	10.2 Removal	30
2 GENERAL ACCESS AND EMPTYING HYDRAULIC CIRCUITS	5	11 EXPANSION VESSEL AND PRESSURE GAUGE	31
2.1 Nomenclature	5	11.1 Function.....	31
2.2 Case panels.....	5	11.2 Checks.....	31
2.3 Control panel	5	11.3 Removal of the expansion vessel	31
2.4 Main electronic p.c.b. box	6	12 NTC HEATING DELIVERY PROBE - NTC MAXIMUM TEMPERATURE, C.H. TEMPERATURE RETURN PROBE NTC	32
2.5 Emptying the primary circuit	7	12.1 Function.....	32
3 DIAGRAMS	8	12.2 Checks.....	32
3.1 Wiring diagram M300V SM	8	12.3 Removal of the NTC heating delivery probe - NTC maximum temperature.....	32
3.2 Circuit voltages	9	12.4 Removal of the C.H. temperature return probe NTC.....	32
4 FAULT FINDING	10	13 BY-PASS VALVE	34
4.1 Display diagnostic	13	13.1 Function.....	34
4.2 Error history (view only).....	13	13.2 Removal	34
4.3 Programming the maintenance period	13	14 FAN AND AIR BOX	35
5 CONDENSING HEAT EXCHANGER	15	14.1 Function.....	35
5.1 Function.....	15	14.2 Removal of the Air box and the Fan	35
5.2 Removal	15	15 IGNITION / DETECTION ELECTRODE AND BURNER ..	36
5.3 Cleaning	16	15.1 Function.....	36
6 PUMP	17	15.2 Removal of the ignition / detection electrode.....	36
6.1 Function.....	17	15.3 Removal of the front insulation panel	36
6.2 Removal pump head	17	15.4 Removal of the burner.....	36
7 MAIN ELECTRONIC CONTROL/IGNITION P.C.B.	18	15.5 Removal of the rear insulation.....	37
7.1 Function.....	18	15.6 Checks.....	37
7.2 Selection and adjustment devices.....	18	16 FLUE TEMPERATURE PROBE NTC AND SAFETY THERMAL FUSE	39
7.3 Checking the temperature.....	19	16.1 Function.....	39
7.4 Setting the boiler control function modes	19	16.2 Removal	39
7.5 Checks.....	21	16.3 Checks.....	39
7.6 Removal of the electronic control p.c.b.....	21	17 CONDENSATE TRAP	41
7.7 Thermal control in the III mode.....	22	17.1 Function.....	41
8 CONTROL PANEL ELECTRONIC P.C.B.	23	17.2 Check the cleanness of the trap	41
8.1 Function.....	23	17.3 Removal	41
8.2 Normally information	23	18 SHORT SPARE PARTS LIST	42
9 GAS VALVE	26		
9.1 Function.....	26		
9.2 Description of the parts	26		
9.3 Adjustment - Chimney Sweep Function	26		
9.4 Automatic calibration of the gas valve.....	27		
9.5 Checks.....	28		
9.6 Removal of the gas valve	28		

OVERALL INFORMATION

1 OVERALL INFORMATION

1.1 Overall View

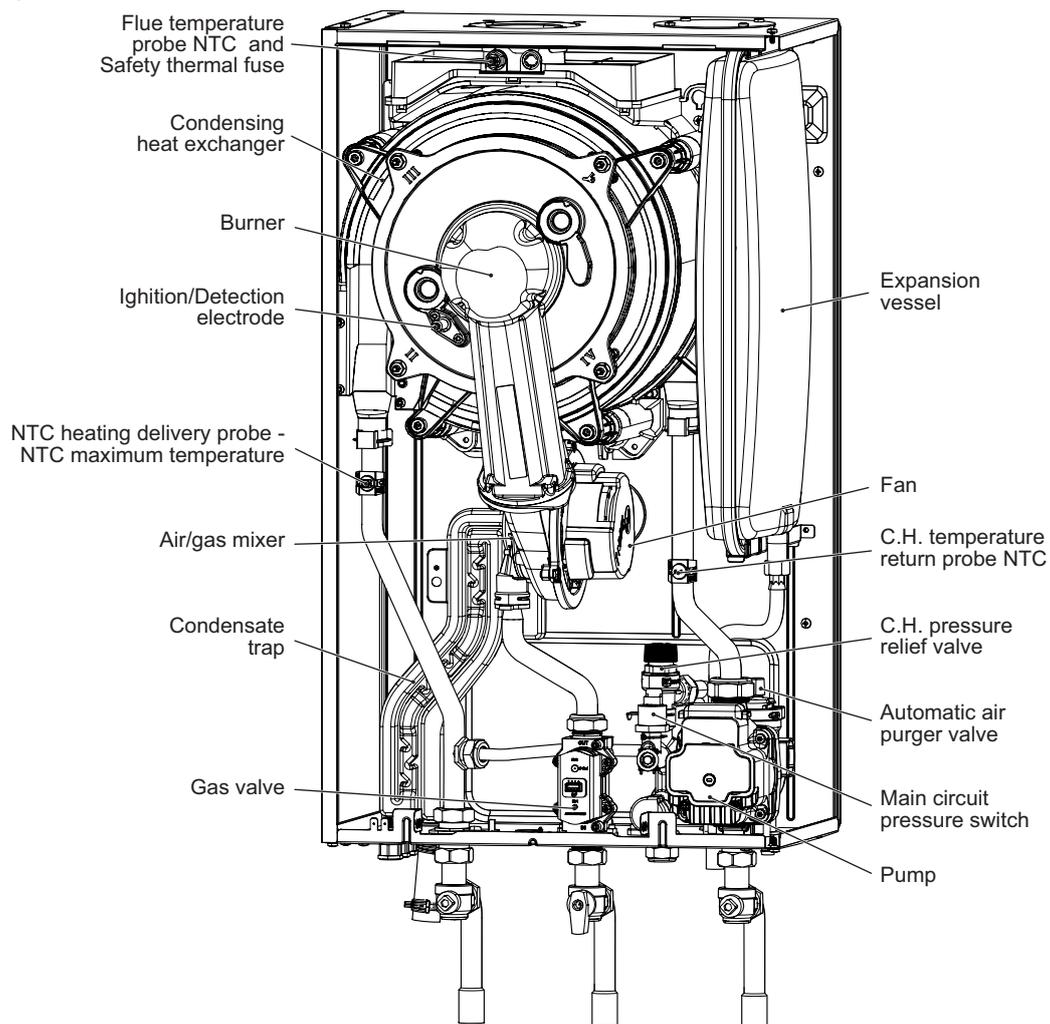


Figure 1.1

1.2 Hydraulic diagram

Central heating (C.H.) operation

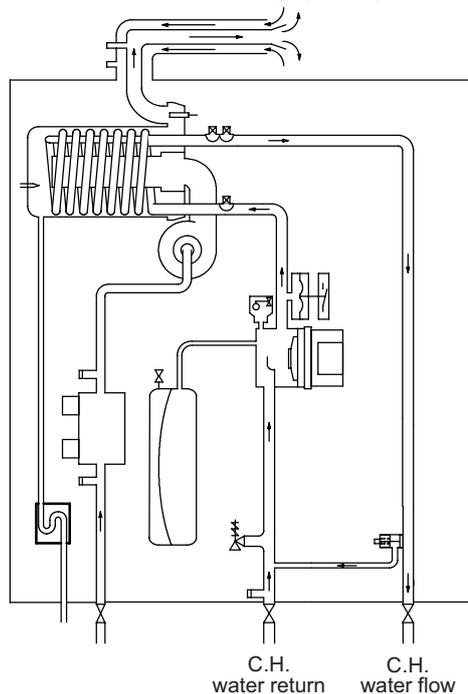


Figure 1.2

GENERAL ACCESS AND EMPTYING HYDRAULIC CIRCUITS

2 GENERAL ACCESS AND EMPTYING HYDRAULIC CIRCUITS

2.1 Nomenclature

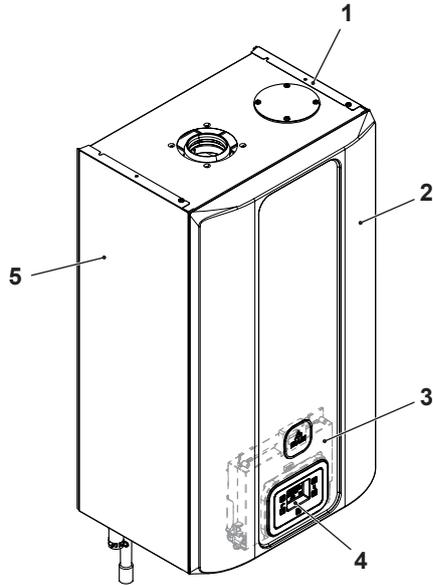


Figure 2.1

- 1 Right side panel
- 2 Front panel
- 3 Main electronic p.c.b. box
- 4 Control panel
- 5 Left side panel

2.2 Case panels



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

For the most part of the check and maintenance operations it is necessary to remove one or more panels of the case.

The side panels can be removed only after the removal of the front panel.

To remove the front panel loosen screws "6" (Figure 2.2), lift the panel and remove it.

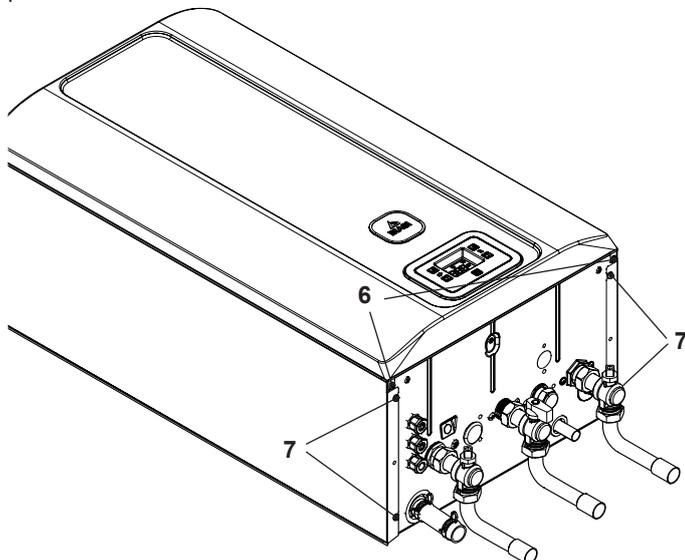


Figure 2.2 - Bottom view of the boiler

Pull the lower part of the front panel and lift it upwards (Figure

2.3).

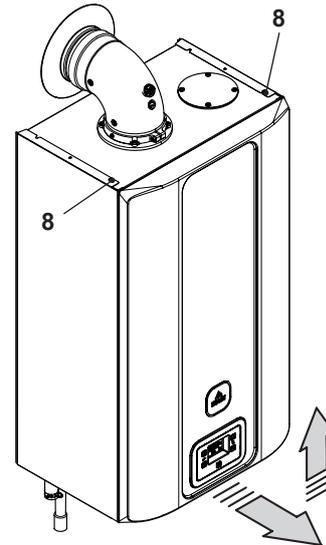


Figure 2.3

To remove the side panels loosen the screws "7" (Figure 2.2) and "8" (Figure 2.3).

Pull the side panels towards the outside.

To Fit the case panels

Fit the side case panels.



Warning: Fit the front panel hooking it on the upper side.

Fit the side panels and the front panel in the reverse order to that described above.

2.3 Control panel



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

To gain access to the parts located inside the control panel proceed as follows:

- 1 Remove the front panel of the case
- 2 Unscrew the screw "9" and turn the control panel "10" (Figure 2.4).

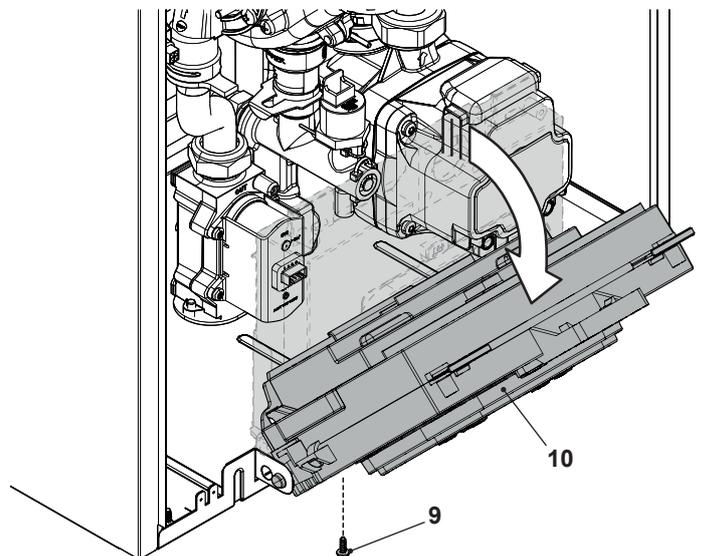


Figure 2.4

GENERAL ACCESS AND EMPTYING HYDRAULIC CIRCUITS

2.4 Main electronic p.c.b. box



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

Terminal block lid removal

To gain access to the parts located inside the control panel proceed as follows:

- 1 Remove the front panel of the case.
- 2 Turn the control panel "11" (see section "2.3 Control panel" on page 5).
- 3 Unscrew the screw "12" and lift the cover "13" to access the electric power supply terminal block, remote and external sensor (Figure 2.5).

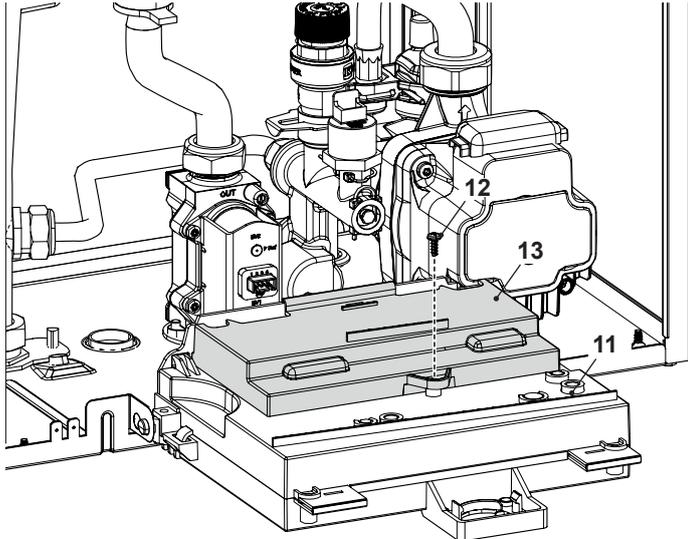


Figure 2.5

- 4 Rotate the lid (Figure 2.6).

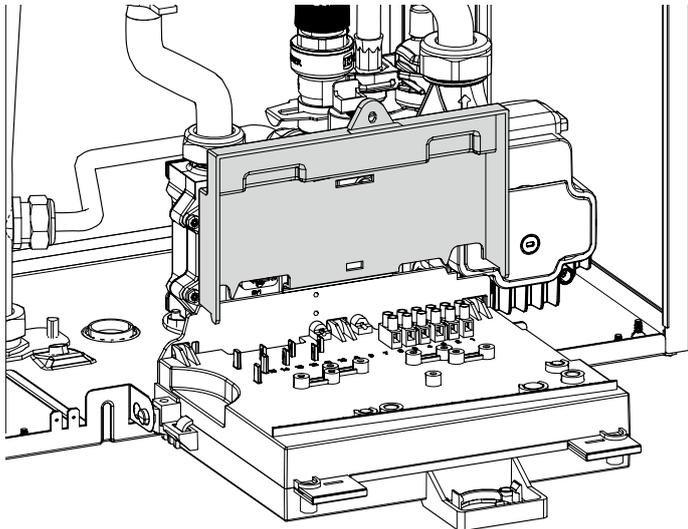


Figure 2.6

Main electronic p.c.b. lid removal

To get access to the main electronic p.c.b.:

- 5 Unscrew the screw "14" (Figure 2.7).

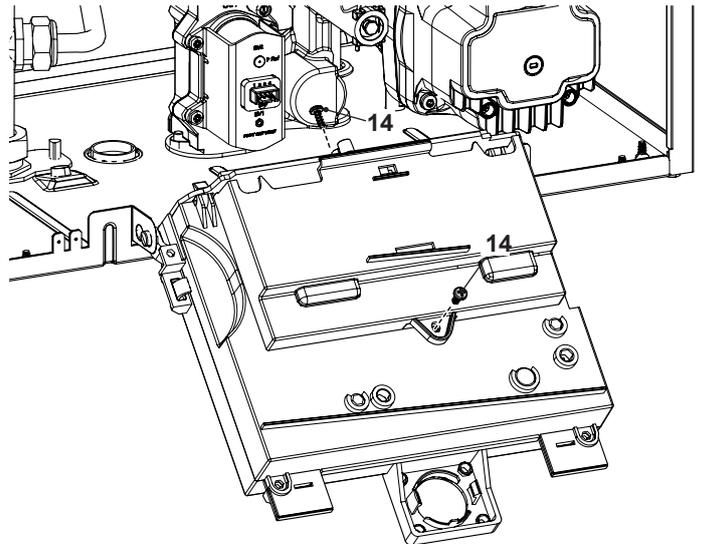


Figure 2.7

- 6 Free the hooks indicated and rotate the cover "16" and the lids "15" (Figure 2.8).

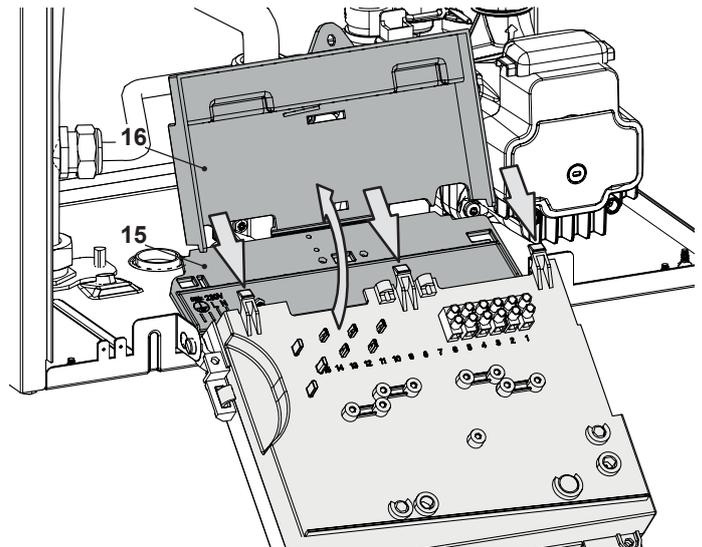


Figure 2.8

- 7 Free the hooks indicated and rotate the cover "17" (Figure 2.9).

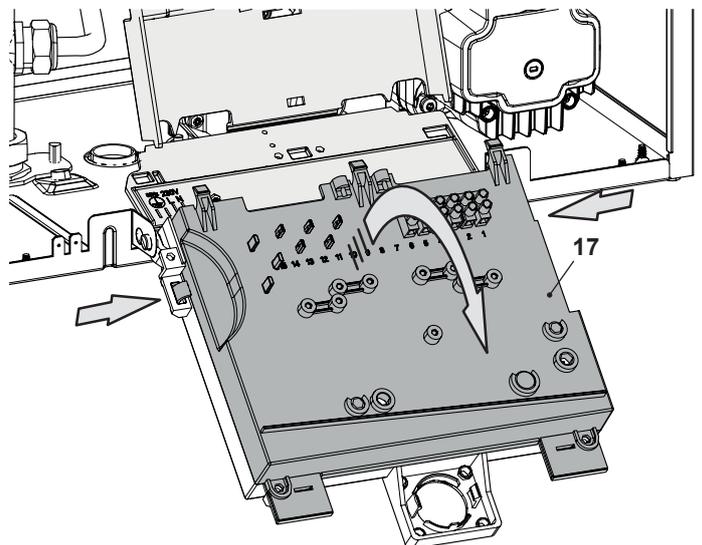


Figure 2.9

GENERAL ACCESS AND EMPTYING HYDRAULIC CIRCUITS

2.5 Emptying the primary circuit

- 1 Close the C.H. circuit flow and return cocks "18" (Figure 2.10).

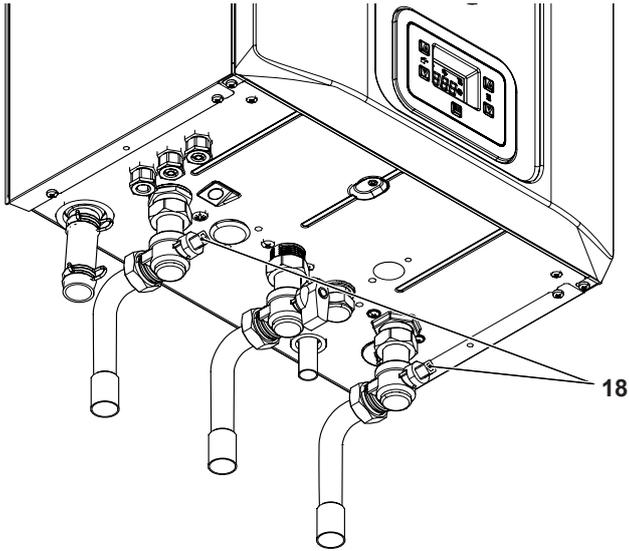


Figure 2.10

- 2 Remove the front and right panels of the boiler.
- 3 Loosen the central heating drain cock "19" (Figure 2.11) until the boiler is completely emptied.

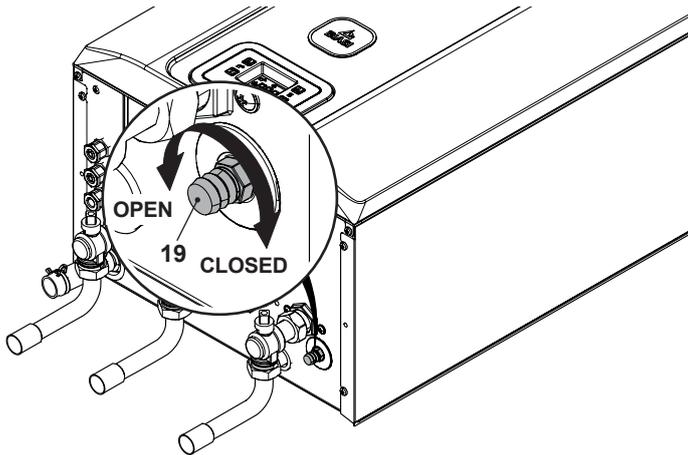


Figure 2.11

- 4 To make draining easier, lift the plug "20" of the automatic relief valve in Figure 2.12.

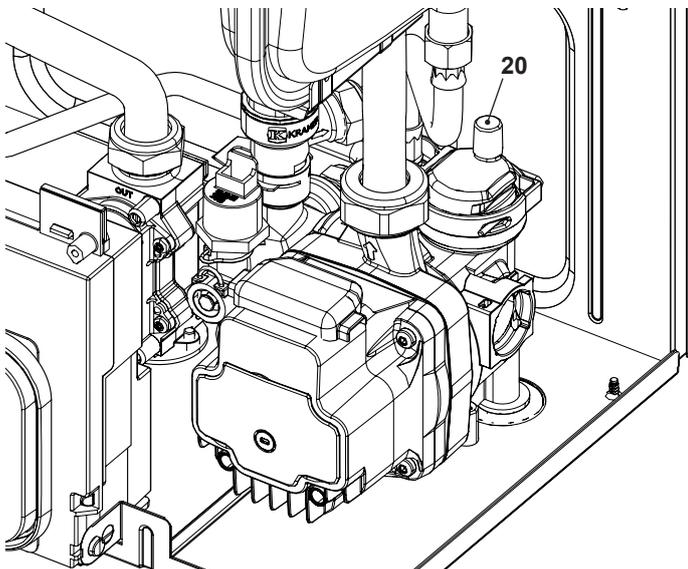


Figure 2.12

DIAGRAMS

3 DIAGRAMS

3.1 Wiring diagram M300V SM

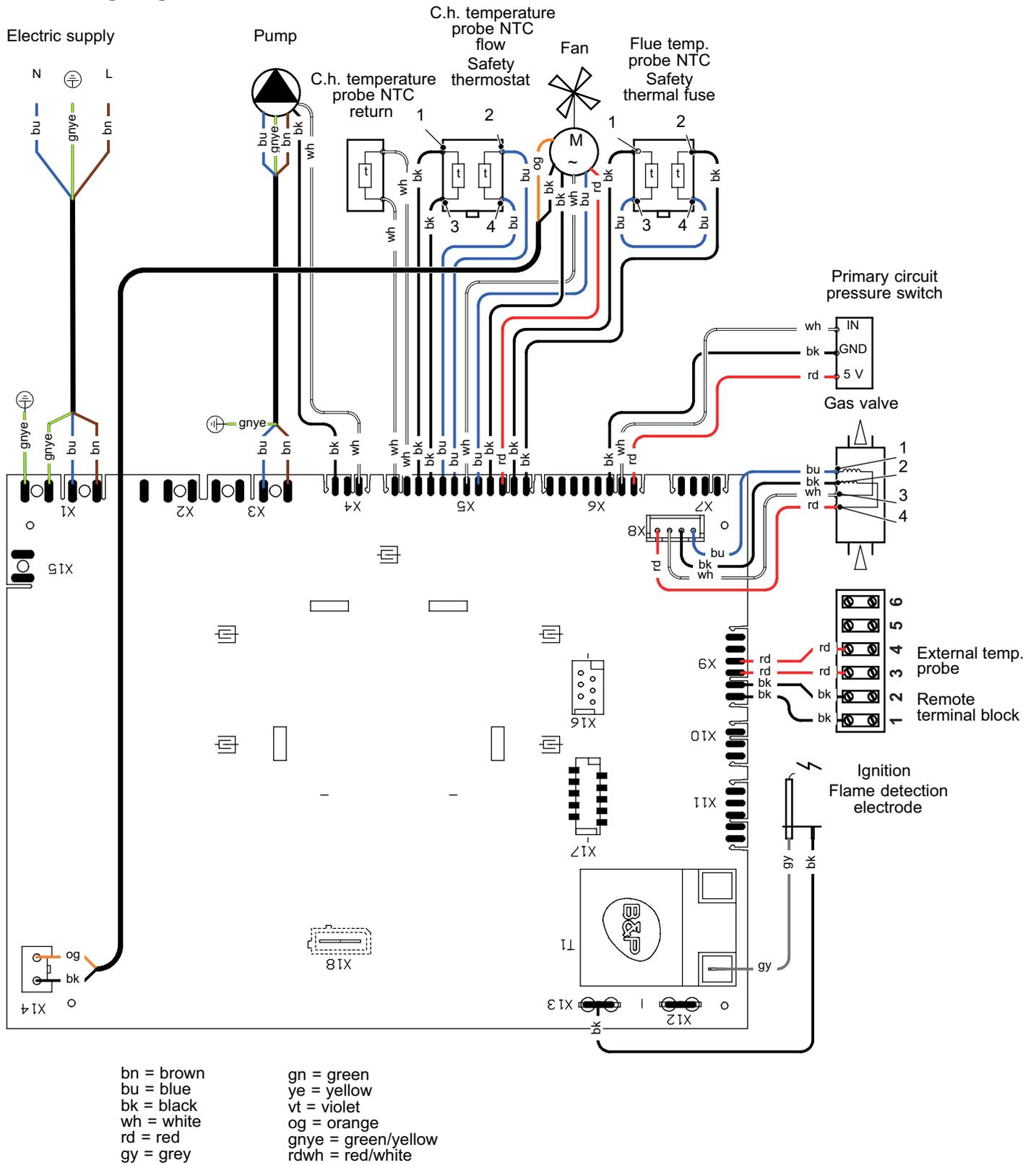


Figure 3.1

DIAGRAMS

3.2 Circuit voltages

Electrical voltages or frequency
with burner on

————— ○ only during C.H. operation

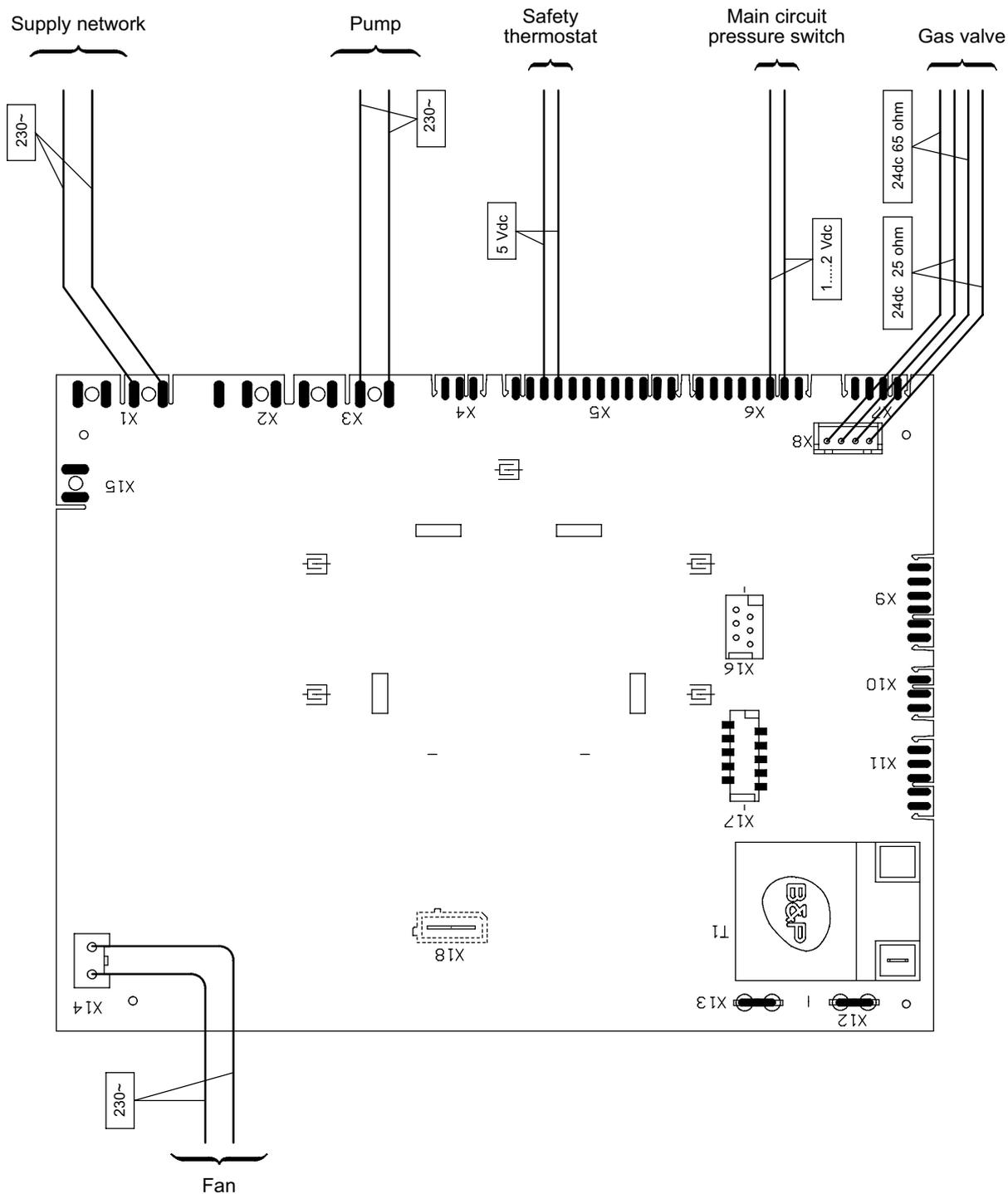


Figure 3.2

FAULT FINDING

4 FAULT FINDING

FAULT FINDING

Section of the manual → (note ref. in brackets)	Components to check																							
	(1)	(2)	(3)	21.1	(4)	5	7.2	Fuses (Electronic p.c.b.)	Main electronic p.c.b.	Boiler settings	10	11.4	12.2	15.2	16	17	18.4	19.2	19.2	20.1	(7)	-	-	
Appliance lock-out (*)	Power supply line	Gas supply line	Flue pipes	Cond. drain pipe and trap	C.H. circuit	Condensing heat exchanger	Pump				Control panel electr. p.c.b.	Gas valve	Main circuit pressure switch	Main circuit temp. probe	By-pass valve	Fan / air restrictor	Ignition / Detection electrode	Safety thermostat	Gas restrictor	Flue temp. probe NTC	Expansion vessel	Safety valve	Pressure gauge	External temp. probe
E01 + RESET	A			B		C						D					C	B						
E02 + RESET													A											
E03 + RESET																								
E04 + 							B		A							A						A		
E05 + 																								
E06 + 																								
E07 + 																								
E08 + 																								A
E10 + 			A																	B				
E11 + RESET																								
E12 + 														A										
E13 + 					A		B																	
E14 + RESET					A	C	B																	
E14 + 					A		B																	
E18 + RESET						B	A																	
E19 + 													A											
E20 + RESET																								
E21 + RESET																								
E22 + RESET																								

Display indicates "E"

The letter in the cells indicates the possible fault cause.

A.....Z indicates the most probably (A) to less probably (...Z)

FAULT FINDING

FAULT FINDING

Section of the manual → (note ref. in brackets)	Components to check																							
	(1)	(2)	(3)	21.1	(4)	5	7.2	Fuses (Electronic p.c.b.)	Main electronic p.c.b.	Boiler settings	10	11.4	12.2	15.2	16	17	18.4	19.2	19.2	20.1	(7)	()		
Appliance lock-out (*)	Power supply line	Gas supply line	Flue pipes	Cond. drain pipe and trap	C.H. circuit	Condensing heat exchanger	Pump				Control panel electr. p.c.b.	Gas valve	Main circuit pressure switch	Main circuit temp. probe	By-pass valve	Fan / air restrictor	Ignition / Detection electrode	Safety thermostat	Gas restrictor	Flue temp. probe NTC	Expansion vessel	Safety valve	Pressure gauge	External temp. probe
E23 +			A				B		A			B								B				
E24 +			A																					
E25 + RESET		C															B							
E26 +							B		C					A										
E40 +	A																							
E42 +									A															
E44 + RESET		D										C					A							
E50 +																								
E62 +																								
E65 +																								
E68 +		A																						
E77 +																		A						
E79 +																		A						
E78 +		A																						
E89 + RESET	A																							
E91 + RESET																								
E97 +	A																							
E99 +																								
L1																								

Display indicates "E"

The letter in the cells indicates the possible fault cause.
A.....Z indicates the most probably (**A**) to less probably (**...Z**)

FAULT FINDING

FAULT FINDING

Section of the manual → (note ref. in brackets)	Components to check																						
	(1)	(2)	(3)	(4)	5	7.2	9.5	10	11.4	12.2	15.2	16	17	18.4	19.2	19.2	20.1	(7)	-				
Appliance lock-out (*) ↓ Defect	Power supply line	Gas supply line	Flue pipes	Cond. drain pipe and trap	C.H. circuit	Condensing heat exchanger	Pump	Fuses (Electronic p.c.b.) Main electronic p.c.b.	Control panel electr. p.c.b.	Gas valve	Main circuit pressure switch	Main circuit temp. probe	By-pass valve	Fan / air restrictor	Ignition electrode / Detection electrode	Safety thermostat	Gas restrictor	Flue temp. probe NTC	Expansion vessel	Safety valve	Pressure gauge	External temp. probe	
The boiler does not start in C.H. mode. The control panel display OFF Fan still.	•							•	•														
On C.H. mode the temperature of the main circuit reaches 90°C and the C.H. system does not heat.							•	•															
Incorrect modulation.							•			•				•									
Noisy boiler.		•	•							•													
Poor C.H. temperature (8).		•	•														•						
Water leaks from the safety valve during operation on C.H.																					•	•	•
Water leaks from the safety valve when the boiler is off.																						•	•

* Lock out is indicated as "E" on the display.

Note

Useful information can be obtained also from the optical indication given by the appliance display (see section 4.1).

- 1 Check for 230V~ between line (L) and neutral (N).
Verify the integrity of supply cable, plug and external fuses.
Check the polarity of line and neutral connection.

- 2 Check the gas supply pipe and isolation tap for gas tightness.
- 3 Check for soundness and absence of obstructions. Verify that the flue terminal is correctly installed (see clearances) and ensure that exhaust gas is not sucked back by the boiler.
- 4 Check for soundness of the circuit and verify its correct filling (see also installation manual).
- 5 A jammed by-pass could cause the over-heating of the main circuit and the intervention of the safety thermostat.

- 6 Using the flue analyser, check the CO₂ value of the flue gases.
- 7 This reading is a reference value for the gas valve setting. Check the pressurization of the expansion vessel. Refer to the installation manual for proper values.
- 8 The boiler doesn't reach the nominal heat input.

FAULT FINDING

4.1 Display diagnostic

The display indications provide help in the diagnosis of fault finding.

The control panel display gives other information for the user. The following table gives fault code, error and the reason for the fault.

E01 + RESET	Safety lockout due to failed ignition.
E02 + RESET	Lockout due to safety thermostat.
E03 + RESET	Generic lockout.
E04 + 	Pump circulation failure, insufficient system pressure or water pressure sensor not connected.
E05 + 	Control anomaly: fan.
E06 + 	NTC heating delivery probe failure.
E07 + 	D.H.W. NTC probe failure / Hot water tank sensor failure.
E08 + 	External NTC probe failure.
E10 + 	Lockout due to tripping of the flue gas probe and thermal fuse.
E11 + RESET	Parasite flame.
E12 + 	Return NTC probe failure.
E13 + 	Delta T M-R > 40K.
E14 + 	Temperature gradient circulation failure (>2K/s).
E14 + RESET	Pump fault or primary temperature above 105°C.
E18 + RESET	No ΔT heating at startup.
E19 + 	Auxiliary Input Probe Anomaly.
E20 + RESET	EVG lockout (valve piloting hardware failure).
E21 + RESET	EVG lockout (valve control Relay Failure).
E22 + RESET	EVG lockout (flame after closing valve Ref. EVG).
E23 + 	Gas valve modulator disconnected.
E24 + 	Anomaly due to probable chimney obstruction.
E25 + RESET	Flame loss for more than 6 consecutive times.
E26 + 	Maximum deviation fault between the 2 heating NTC probes.
E40 + 	Detection of incorrect mains frequency.
E42 + 	Buttons fault.
E44 + RESET	Fault of cumulative gas valve timeout without flame.
E50 + 	OT communication fault.
E62 + 	Calibration request.
E65 + 	System fails to control combustion and exits modulator control parameters.
E68 + 	Probably low gas pressure.
E77 + 	System out modulator control parameters.
E79 + 	System out modulator control parameters.
E78 + 	Possible low gas pressure.
E89 + RESET	Internal error (usually hardware) or problems with the mains electrical supply (excessive distortion of waveform).
E91 + RESET	Maximum number of lockouts reached.
E97 + 	Power supply voltage low.
E99 + 	Card not configured.

L01	Primary limitation in D.H.W. mode.
	Maintenance required. The wrench symbol is flashing (without showing any error).

4.2 Error history (view only)

- 1 To enter in the parameters setting mode press at the same time the 2 keys "A" and "C" (Figure 4.1) and hold in for 5 second until the LCD display indicates the letters **HiS** Figure 4.2.

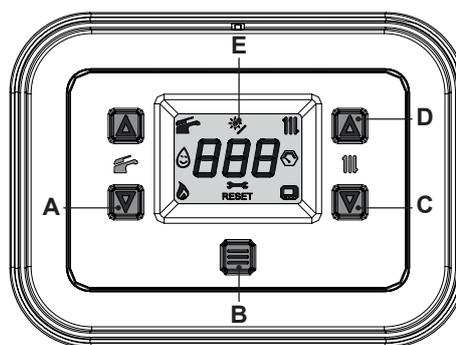


Figure 4.1



Figure 4.2

- 2 To enter the selected menu press key "B" (Figure 4.1) for 1 second.
- 3 Scroll the various fault code using keys "A" or "C" (Figure 4.1).
- 4 To exit the parameters menu.
 - wait 15 minutes without pressing any key;
 - switch off the electric power supply;
 - press the "A" and "C" keys simultaneously for 5 seconds (Figure 4.1) (return to previous level).

4.3 Programming the maintenance period

- 1 To enter in the parameters setting mode press at the same time the 2 keys "A" and "C" (Figure 4.3) and hold in for 5 second until the display shows Figure 4.4.

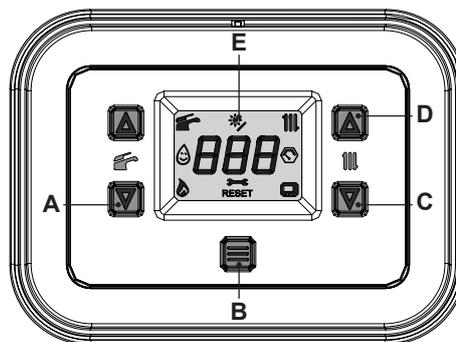


Figure 4.3

FAULT FINDING



Figure 4.4

- 2 Scroll the various menus using keys "A" or "C" (Figure 4.3) until the LCD display indicates the letters **PAr** (Figure 4.5).
- 3 To enter the selected menu press key "B" (Figure 4.3) for 1 second.



Figure 4.5

- 4 Scroll the various menus using keys "A" or "C" (Figure 4.3) until the LCD display indicates the letters **P34** until the LCD display indicates the value of parameter 34 (e.g. **12** default value) Figure 4.6.



Figure 4.6

- 5 To enter the selected parameter press key "B" (Figure 4.3) for 1 second. The display will show the following (Figure 4.7).



Figure 4.7

- 6 Pressing keys "A" or "C" makes it possible to change the value of parameter 34 from **0** to **48** months. It is possible to set parameter 34 to **99** thereby disabling the maintenance request (symbol  will disappear from the display).
- 7 By pressing key "B" (Figure 4.3) confirmation of the inserted value is obtained. The display will show the following (Figure 4.8) for 5 seconds, then move up to the next level.



Figure 4.8

8 To exit the parameters menu.

- wait 15 minutes without pressing any key;
- switch off the electric power supply;
- press the "A" and "C" keys simultaneously for 5 seconds (Figure 4.3) (return to previous level).

CONDENSING HEAT EXCHANGER

5 CONDENSING HEAT EXCHANGER

5.1 Function

The Condensing heat exchanger "1" in Figure 5.1 has the function of transferring heat produced from combustion of the gas and from the flue exhausted gas to the water circulating in it.

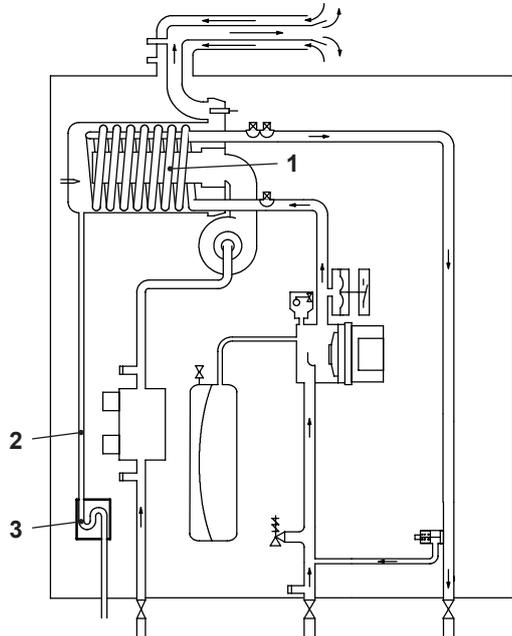


Figure 5.1

By reducing the combustion products temperature, the latent heat of the vapour is transferred to the water circuit, allowing an extra gain of useful heat.

The condensed vapour is then drained through the condensate trap "3" and the draining pipe "2".

5.2 Removal



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Disconnect the flue system from the boiler.
- 2 Remove the fan group (rubber pipe, gas pipe) following the instructions from 1 to 6 in section "14.2 Removal of the Air box and the Fan" on page 35.
- 3 Disconnect the detection / ignition electrode connector "4".
- 4 Disconnect the fan connector "5" by pressing the plastic hook placed on the side of the connector (Figure 5.2).
- 5 Unscrew the nuts "6" (Figure 5.2).
- 6 Remove the fan-burner group "7".
- 7 Empty the primary circuit of the boiler.
- 8 Remove the clips "8" (Figure 5.2).
- 9 Loosen the connection "10" and slightly move the pipe "9" upwards, turn it towards left (Figure 5.2) and then move the pipe downwards freeing it from the Condensing heat exchanger.
- 10 Loosen the connection "11" and slightly move the pipe "12" upwards, turn it towards left (Figure 5.2) and then move the pipe downwards freeing it from the Condensing heat exchanger.

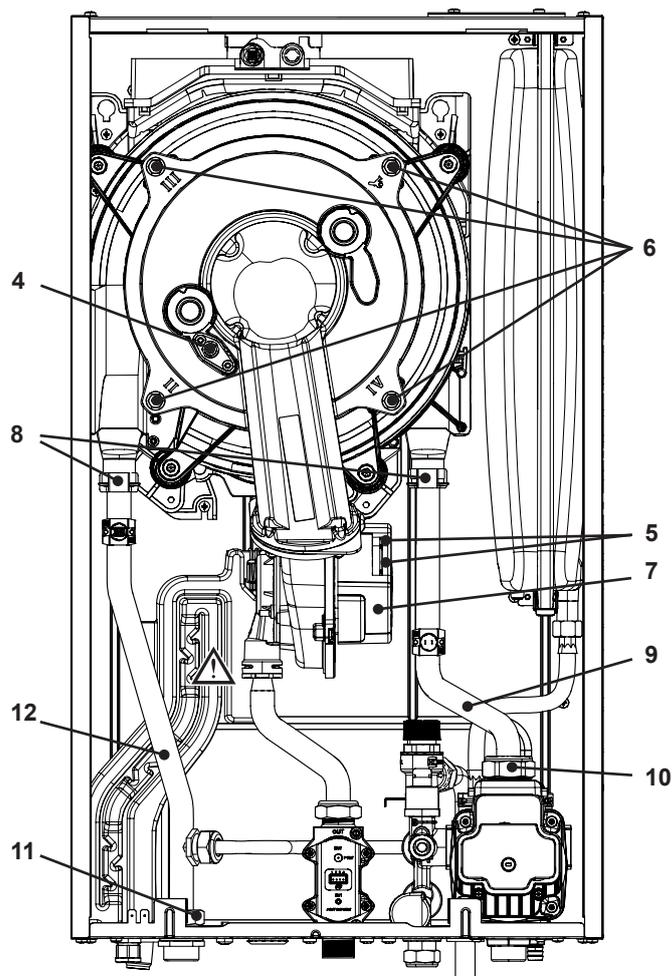


Figure 5.2

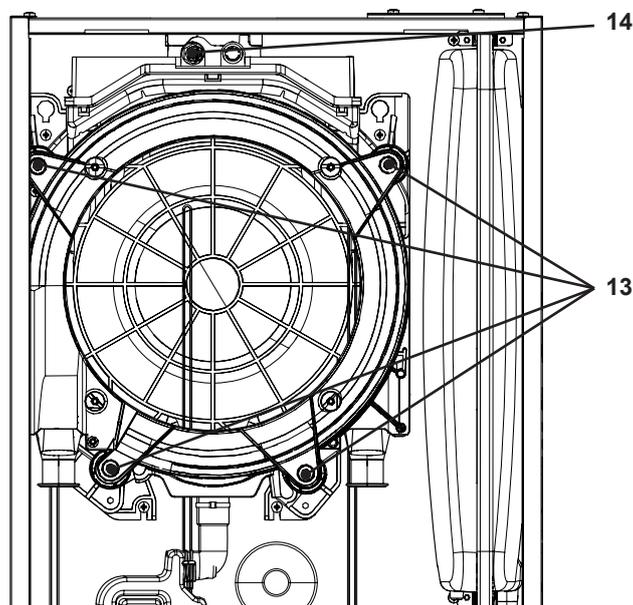


Figure 5.3

- 11 Unscrew the screws "13" and remove the clamps (Figure 5.3).
- 12 Disconnect the connector "14" by pressing the plastic hook placed on the side of the connector (Figure 5.3).
- 13 Remove the Condensing heat exchanger by levering it and sliding it forwards.
- 14 Reassemble the Condensing heat exchanger carrying out the removal operations in reverse order.

CONDENSING HEAT EXCHANGER

Ensure to tighten the nuts "6" - Figure 5.2 firmly.

5.3 Cleaning

If there are deposits of dirt on the coil of the Condensing heat exchanger, clean with a bristle paintbrush and remove the dust with a Hoover.



Warning: After cleaning or replacement as detailed above, it is deemed necessary to undertake a combustion analysis as detailed in chapter "9.3 Adjustment - Chimney Sweep Function" on page 26.

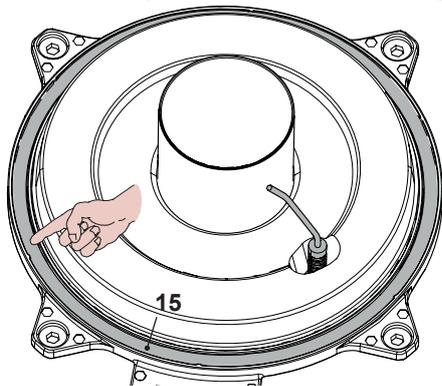


Figure 5.4

Caution:

After any periodical servicing or disturbance the combustion chamber silicon seal "15" Figure 5.4 must be fully inspected and replaced at the discretion of the service engineer.

After any disturbance to the chamber door seal the appliance must undergo a full analytical combustion performance check.



Remove any limescale from the detection electrode and replace it if worn.

6 PUMP

6.1 Function

The pump "1" in Figure 6.1 and Figure 6.2 has the function of making the water in the main circuit circulate through the main condensing heat exchanger and therefore through the C.H. system (during the C.H. function).

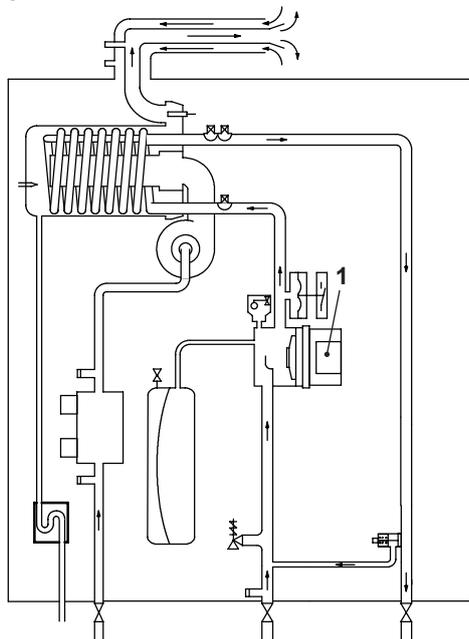


Figure 6.1

 **Warning: isolate the boiler from the mains electricity supply before removing any covering or component.**

✓ Check that the pump is not seized and that the movement of the rotor is not subject to mechanical impediments.

With the boiler off, remove the front panel. Remove the air release plug of the pump and turn the rotor with a screwdriver.

✓ Check that the impeller is correctly connected to the rotor shaft and that the rotor moves freely.

With the boiler off remove the front and right hand side case panels, lower the control panel and empty the primary circuit. Remove the pump head by undoing the screws which hold it to the pump body and check that the impeller is firmly joined to the rotor.

6.2 Removal pump head



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the front case panel.
- 2 Empty the primary circuit of the boiler.
- 3 Disconnect the connector "2" (Figure 6.2).
- 4 Unscrew the four screws "3" and remove the pump head "1".

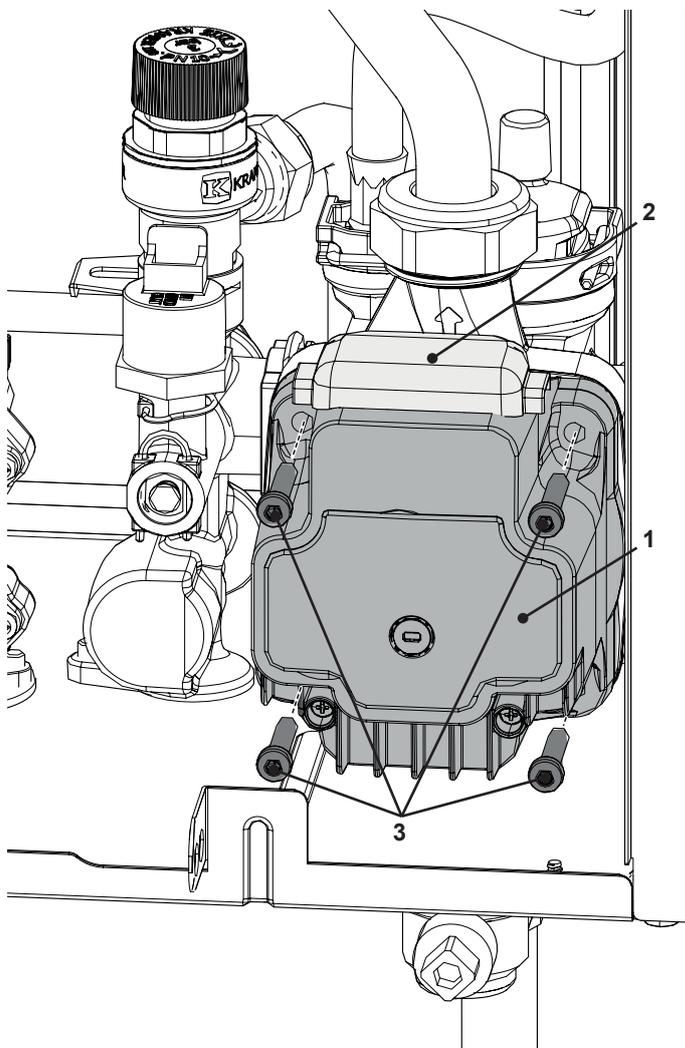


Figure 6.2

Reassemble the pump head carrying out the removal operations in the reverse order. When reassembling the pump head, check the correct position of the gasket and tighten the screws "3" proceeding diagonally around the pump.

MAIN ELECTRONIC CONTROL/IGNITION P.C.B.

7 MAIN ELECTRONIC CONTROL/IGNITION P.C.B.

7.1 Function

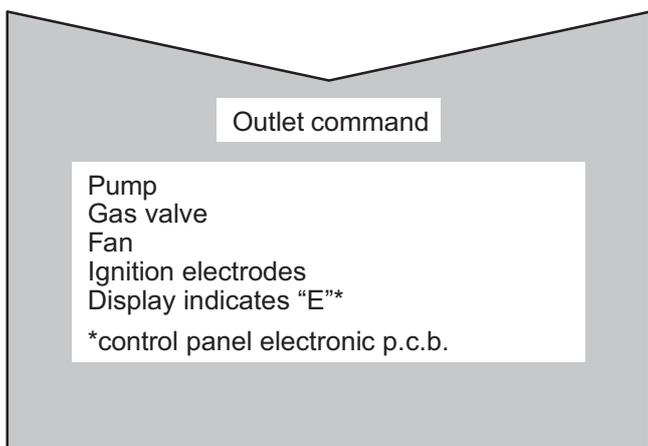
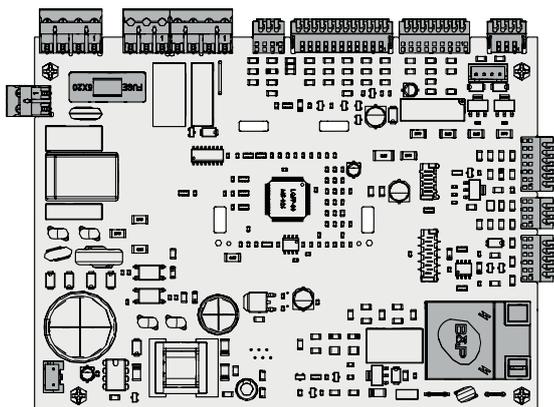
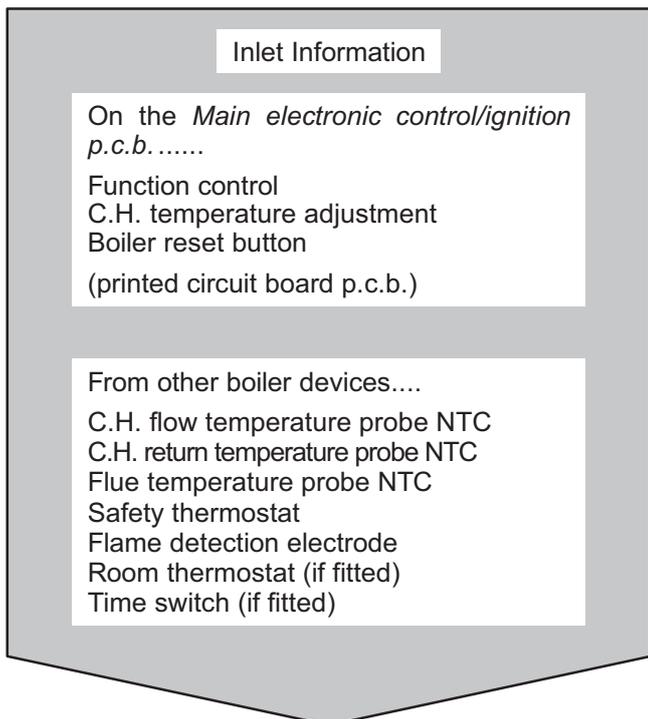


Figure 7.1

The fundamental function of the Main electronic control/ignition p.c.b. is that of controlling the boiler in relation to the external needs (i.e. heating the dwelling) and operating in order to keep the temperature of the hydraulic circuits constant.

This is obviously possible within the useful power and maximum working temperature limits foreseen.

Generally, the *Main electronic control/ignition p.c.b.* receives inlet

information coming from the boiler (the sensors) or from the outside (printed circuit board p.c.b., room thermostat, etc.), processes it and consequently acts with outlet commands on other components of the boiler (Figure 7.1).

The *Main electronic control/ignition p.c.b.* is also a full sequence ignition device and does a sequence of operations (ignition cycle) which lead to the ignition of the gas at the burner.

It checks the presence of the flame during the entire period in which it is activated and supplies the fan regulating its speed.

The *Main electronic control/ignition p.c.b.* has a safety function and any incorrect interventions or tampering can result in conditions of dangerous functioning of the boiler.

The *Main electronic control/ignition p.c.b.* can lock the functioning of the boiler (lock state) and stop its functioning up to the resetting intervention. The lock-out is signalled on the display of the printed circuit board p.c.b. and can be reset only by using the boiler reset button placed on the control panel electronic p.c.b. (see section "8.1 Function" on page 23).

Some components which are connected to the device can activate the lock state. The causes of a lock state could be:

- The intervention of the safety thermostat (overheat of the primary circuit).
- The intervention of the flue temperature probe (overheat of the combustion products).
- A fault on gas supply.
- Faulty ignition (faulty ignition electrodes, their wiring or connection).
- Faulty flame detection (faulty detection electrode, its wiring or connection).
- Faulty condensate drainage.
- Faulty gas valve (faulty on-off operators or not electrically supplied).
- Faulty *Main electronic control/ignition p.c.b.*

Other components like the primary circuit pressure switch can temporarily stop the ignition of the burner but allow its ignition when the cause of the intervention has stopped.

Figure 7.11 show the sequence of the operations that are carried out at the start of every ignition cycle and during normal functioning.

7.2 Selection and adjustment devices

On the *Main electronic control/ignition p.c.b.* several selection, adjustment and protection devices are located. (Figure 7.2).

Some of these devices are directly accessible by the user (function control, temperature adjustment etc.) others, like the fuses, are accessible by removing the main electronic p.c.b. lid.

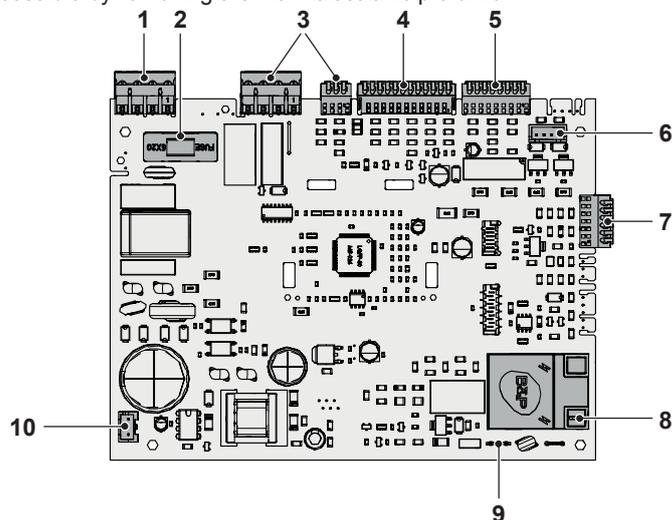


Figure 7.2

MAIN ELECTRONIC CONTROL/IGNITION P.C.B.

- 1 Connector - electric supply p.c.b.
- 2 Fuse F1 3,15 AF
- 3 Connector - pump
- 4 Connector - controller fan, flue temperature probe NTC, safety thermostat and C.H. temperature probe NTC
- 5 Connector - primary circuit pressure switch
- 6 Connector - gas valve
- 7 Connector - external temperature probe and remote control (optional)
- 8 Connector - ignition / detection electrode
- 9 Connector - ground reference for ignition / detection electrode
- 10 Connector - fan

7.3 Checking the temperature

The *Main electronic control/ignition p.c.b.* makes it possible to separately adjust the C.H. water flow temperature.

The temperature of the water is converted into an electric signal by means of temperature probes.

The user, setting the desired temperature with the control panel p.c.b. key   .

If the power requested is lower than 40% of the maximum power output then control is achieved by switching ON the burner at minimum power, then switching OFF (ON/OFF function). If the power requested is higher, then the burner is switched ON at maximum power and will control by modulating to 40% of the maximum power output.

During the C.H. operation (Figure 7.3), the signal coming from the C.H. temperature probe is compared to the signal given by the control panel through the adjustment made by the user (key   ). The result of such a comparison operates the fan speed thus regulating the gas flow rate and consequently changing the useful output of the boiler.

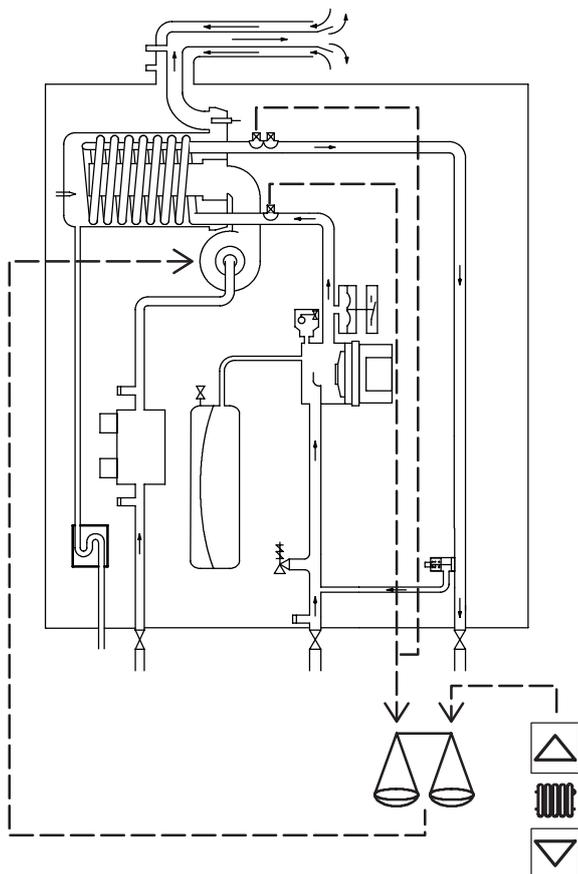


Figure 7.3

The control sequences in function  in function are illustrated in detail in sections "7.7 Thermal control in the  mode" on page 22.

7.4 Setting the boiler control function modes

It is possible to select the various boiler control function modes hereafter named "parameters" by using the keys of the control panel p.c.b.

- 1 To enter in the parameters setting mode press at the same time the 2 keys "A" and "C" (Figure 7.4) and hold in for 5 second until the display shows Figure 7.5.

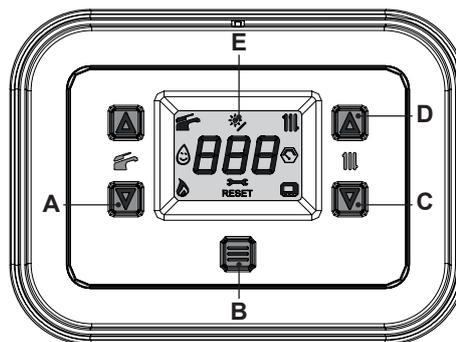


Figure 7.4



Figure 7.5

- 2 Scroll the various menus using keys "A" or "C" (Figure 7.4) until the LCD display indicates the letters **PAr** (Figure 7.6).
- 3 To enter the selected menu press key "B" (Figure 7.4) for 1 second.



Figure 7.6

- 4 To enter the selected parameter press key "B" (Figure 7.4) for 1 second. The display will show the following (Figure 7.7).



Figure 7.7

- 5 To enter the selected parameter press key "B" (Figure 7.4) for 1 second. The display will show the following (Figure 7.8).

MAIN ELECTRONIC CONTROL/IGNITION P.C.B.

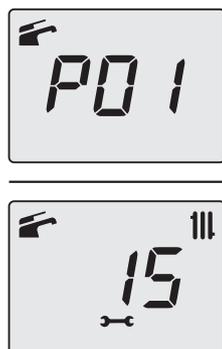


Figure 7.8

- 6 Pressing keys "A" or "C" makes it possible to change the value of parameter.
- 7 By pressing key "B" (Figure 7.4) confirmation of the inserted value is obtained. The display will show the following (Figure 7.9) for 5 seconds, then move up to the next level.
- 8 By pressing the keys "A" and "C" simultaneously (Figure 7.4) exits the level without changing the value (return to the previous level Figure 7.9).



Figure 7.9

- 9 Scroll through the various parameters by pressing the keys "A" (back) or "C" (forward), until **P02**, which alternates with the parameter value, appears on the LCD display.
- 10 Repeat the previous steps to display the value and proceed to the next parameter.
- 11 To exit the parameters menu.
 - wait 15 minutes without pressing any key;
 - switch off the electric power supply;
 - press the "A" and "C" keys simultaneously for 5 seconds (Figure 7.4) (return to previous level).

Important: at the end of the setting operation it is important to fill/update the table in the installation manual see chapter COMMISSIONING section: Setting record.

PARAMETER	DIGIT	VALUES
Boiler model/type	P01	15
Type of gas	P02	G20 = 00 G31 = 01
User interface	P03	00
Type of domestic hot water exchanger	P04	01
Type of primary circuit control device	P05	03
Type of D.H.W. flow control device	P06	00
Maximum Temperature heating delivery (°C)	P07	80 °C
Minimum heating delivery temperature (°C)	P08	25 °C
Maximum heating output (%)	P09	90%
Re-ignition frequency in heating mode (*10 sec.)	P10	6x60s
Adjusting the minimum pump speed (%)	P11	70%
Pump post-circulation (*10 sec.)	P12	6x60s

PARAMETER	DIGIT	VALUES
Pump mode operation	P13	0
Value of the external sensor K (K*10)	P14	0
Correct heating system pressure (*10 bar)	P15	10
Maximum heating system pressure limit	P16	00
ΔT heating delivery/return due to reduction of pump speed	P17	20
Adjusting maximum domestic hot water temperature	P18	55°C
Adjusting minimum temperature of domestic hot water	P19	35°C
Minimum closing flow rate of the D.H.W. flow switch (ON)	P20	20 l/min*10
Minimum opening flow rate of the D.H.W. flow switch (OFF)	P21	15 l/min*10
Ignition delay in D.H.W. mode	P22	00
Burner shut-off as a function of D.H.W. temperature	P23	0 -> 65°C
Burner ignition as a function of D.H.W. temperature	P24	2°C
D.H.W. pre-heating mode	P25	0
D.H.W. post-heating mode (at end of D.H.W.) (M300V.30 SR)	P26	00
Adjusting output power in D.H.W. mode (%)	P27	90%
Adjusting maximum D.H.W. temperature in anti-legionella function (°C) (only for boilers with a sensor)	P28	0°C
Anti-legionella function activation frequency (days)	P29	3
Reset (restores factory settings)	P30	0
Chimney sweep	P31	0
Adjusting the minimum power in D.H.W. mode (%)	P32	0%
Regulation of the minimum power in heating mode (%)	P33	0%
Maintenance intervals (months)	P34	12
Antifreeze activation temperature	P35	5 °C
Antifreeze deactivation temperature	P36	35 °C
Antifreeze activation temperature with external sensor	P37	11 °C
External relay operating mode 1 (0=OFF, 1=Zone by remote, 3=Alarm)	P38	0
External relay operating mode 2 (0=OFF /TA2=OFF, 1=Zone heat. 2 / TA2 active, 2= EVG ext / TA2 Active, 3= Anomaly / TA2 Active, 4 =Remote filling / TA2 active)	P39	0
Size shown on the display during operation (0=T.CH or T.DHW, 1=only T.CH, 2=only T.DHW, 3=CH pressure, 4=T.ext, 10=CH Pressure in standby mode)	P40	10
Messages display (0=all, 1=boiler status and errors, 2=boiler status only)	P41	0
Primary temperature flow	P42	25
CH flow temperature set for zone #2 controlled by TA2	P43	45
CH delivery temperature set management mode in case of concurrent requests	P44	01
Not used	P45	—

MAIN ELECTRONIC CONTROL/IGNITION P.C.B.

PARAMETER	DIGIT	VALUES
Not used	P46	_____
Not used	P47	_____
Maximum pump speed in heating mode (%)	P48	100
Maximum pump speed in D.H.W. mode (%)	P49	100
CN2 input configuration	P50	00
DHW Set Increment value for off - threshold	P51	10
Chimney diaphragm (The nominal fan rpm reference value accordint to boiler model (P01) are increased or decreased according to the value set: 1=-200 rpm, 2=-150 rpm, 3=-100 rpm, 4=-50 rpm, 5=0 rpm, 6=+50 rpm, 7=+100 rpm, 8=+150 rpm, 9=+200rpm.)	P52	5
Fan speed at maximum	P53	232
Fan speed at minimum	P54	40
Ignition power	P55	132
Gas valve management (0=standard mode, 1=reduced noise at minimum power rate)	P56	0
Type of external sensor (0=external probe not active, 1=external probe type NTC 12K, B = 3760, 2=external probe type NTC 10K, B = 3435)	P57	0

Tab 9.1

7.5 Checks

✓ Check that the fuses are complete

If the Main electronic control/ignition p.c.b. does not supply any device (pump, fan, etc.) check that the fuses 2 (Figure 7.2) are complete.

If a fuse has blown replace it with one that has the same characteristics after having identified the reason for failure.

✓ Lock sequence

Start the boiler until the burner is ignited.

With the burner firing, interrupt the gas supply. The Main electronic control/ignition p.c.b. must carry out four complete ignition cycles and then, after about 4 minutes, goes to lock-out state.

Switch off and on the electricity supply to the boiler, by means of the fused spur isolation switch, the device must not unlock and the burner must not turn on.

7.6 Removal of the electronic control p.c.b



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

When replacing the Main electronic control/ignition p.c.b. all parameters must be correctly checked / adjusted accordingly with the values noted in table in the installation manual see chapter COMMISSIONING section: Setting record (for information on parameters see also section "7.4 Setting the boiler control function modes" on page 19).

- 1 Remove all the body panels (see section "2.2 Case panels" on page 5).
- 2 Gain access to the parts located inside the Main electronic p.c.b. box as explained in the section "2.4 Main electronic p.c.b. box"

on page 6 of this manual.

- 3 Unscrew the screws "1" (Figure 7.10).
- 4 Delicately flex the hooks "2" in the directions indicated (Figure 7.10) in order to release the circuit from the box.
- 5 Remove all the wiring connected to the *Main electronic control/ignition p.c.b.*
- 6 Remove the *Main electronic control/ignition p.c.b.*

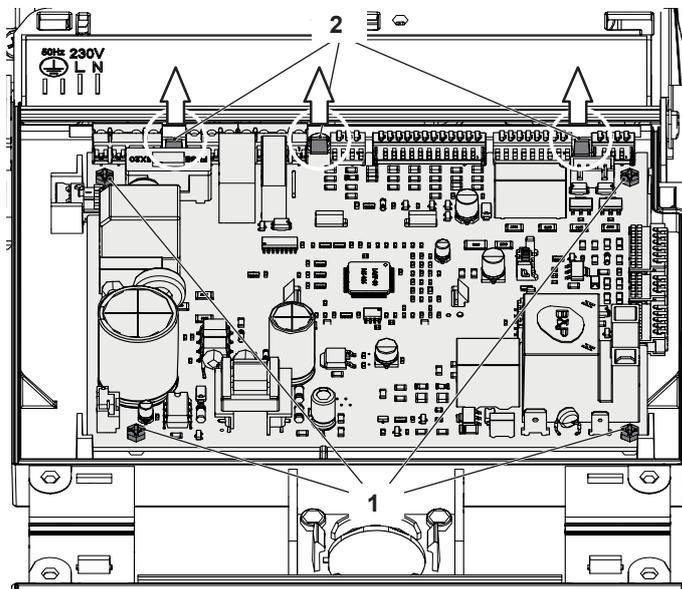


Figure 7.10

- 7 Re-assemble the *Main electronic control/ignition p.c.b.* following the removal procedures in the reverse order.

Important

When re-assembling the *Main electronic control/ignition p.c.b.*:

- 8 It is not necessary to utilise static protections but it is advisable to ensure that the p.c.b. is handled with care and held at the edges and with clean dry hands.

Attention

After installing the *Main electronic control/ignition p.c.b.* properly set the parameters.



Warning: After cleaning or replacement as detailed above, it is deemed necessary to undertake a combustion analysis as detailed in section "9.3 Adjustment - Chimney Sweep Function" on page 26.

MAIN ELECTRONIC CONTROL/IGNITION P.C.B.

7.7 Thermal control in the III mode

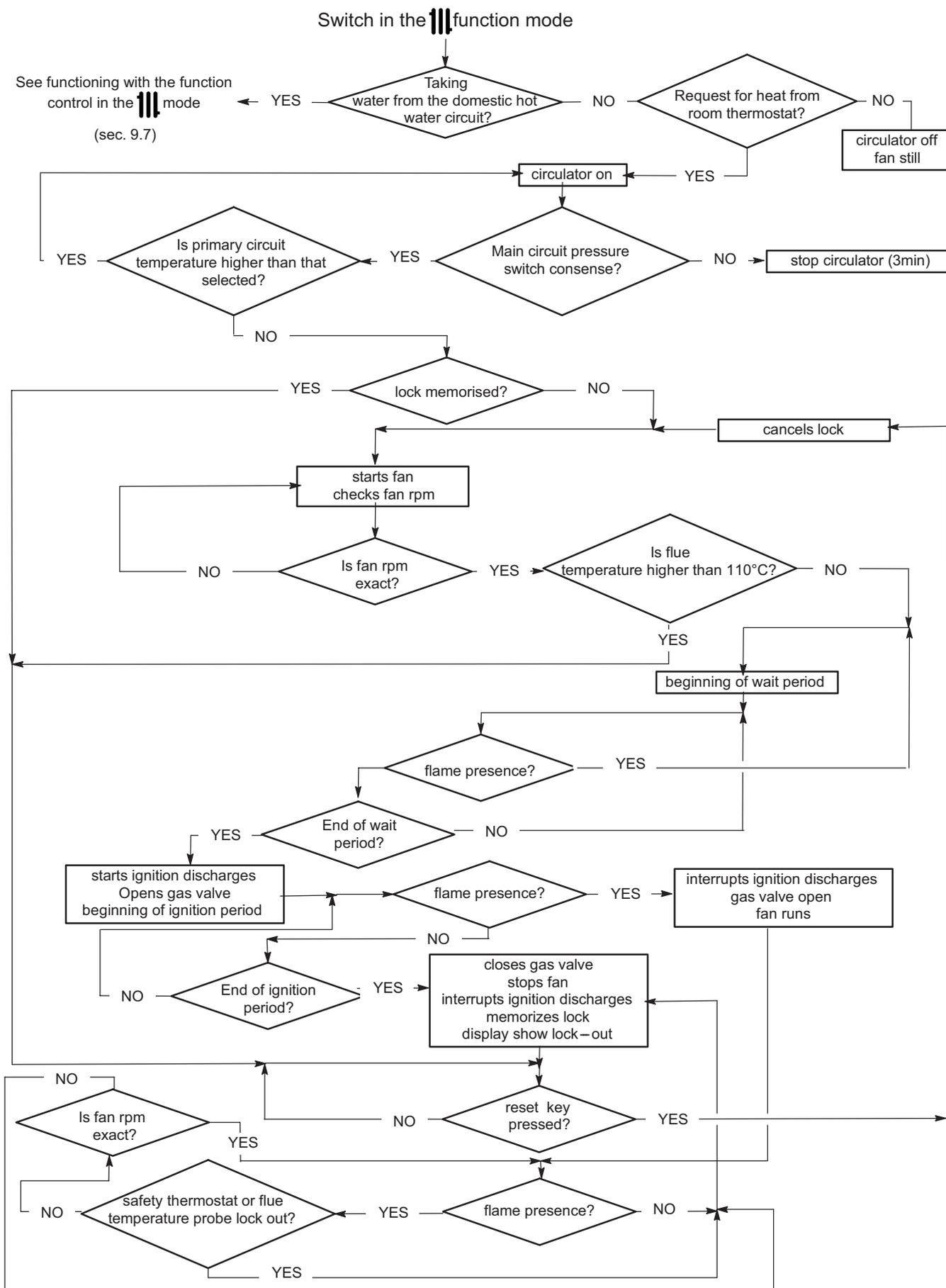


Figure 7.11

CONTROL PANEL ELECTRONIC P.C.B.

8 CONTROL PANEL ELECTRONIC P.C.B.

8.1 Function

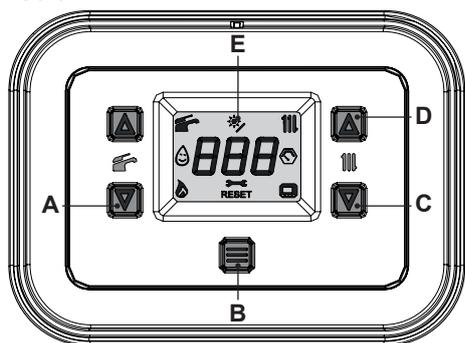


Figure 8.1

- A Programming key
- B Reset/Stand-by/Winter/Summer key
- C C.H. temperature reduce key
- D C.H. temperature increase key
- E Display

The Control panel electronic p.c.b. can give to the service 3 levels of informations:

- Normally information
- Info modality
- Function modes setting modality

8.2 Normally information

KEY

	All symbols with lines radiating from them indicate that the symbol is flashing.
	Stays on: D.H.W. function enabled. Flashing: D.H.W. function in progress.
	Constantly illuminated: solar control unit connected. Flashing: solar pump operating.
	Stays on: heating function enabled (winter). Flashing: heating function in progress.
	Constantly illuminated: 3 star preheating function active. Flashing: 3 star preheating function in progress.
	Stays on: for 15s only after system loading. Flashing: in the case of low system pressure or if viewing the pressure from the INFO menu.
	Stays on: flame present Flashing: drain upon ignition in progress.
	Stays on: maintenance due pre-warning. Flashing: maintenance required or maintenance due.
RESET	Stays on: lockout error. The boiler can be restarted by the user, by pressing the reset button.
	Stays on: remote control connected. Flashing: request from remote control in progress.

SIGNAL DISPLAYED BY THE LCD

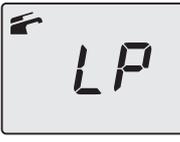
LCD	FUNCTION
E01 + RESET	Safety lockout due to failed ignition.
E02 + RESET	Lockout due to safety thermostat.
E03 + RESET	Generic lockout.
E04 +	Pump circulation failure, insufficient system pressure or water pressure sensor not connected.
E05 +	Control anomaly: fan.
E06 +	NTC heating delivery probe failure.
E07 +	D.H.W. NTC probe failure / Hot water tank sensor failure.
E08 +	External NTC probe failure.
E10 +	Lockout due to tripping of the flue gas probe and thermal fuse.
E11 + RESET	Parasite flame.
E12 +	Return NTC probe failure.
E13 +	Delta T M-R > 40K.
E14 + RESET	Pump fault or primary temperature above 105°C.
E14 +	Temperature gradient circulation failure (>2K/s).
E18 + RESET	No ΔT heating at start-up.
E19 +	Auxiliary Input Probe Anomaly.
E20 + RESET	EVG lockout (valve piloting hardware failure).
E21 + RESET	EVG lockout (valve control Relay Failure).
E22 + RESET	EVG lockout (flame after closing valve Ref. EVG).
E23 +	Gas valve modulator disconnected.

CONTROL PANEL ELECTRONIC P.C.B.

LCD	FUNCTION
E24 + 	Anomaly due to probable chimney obstruction
E25 + RESET	Flame loss for more than 6 consecutive times.
E26 + 	Maximum deviation fault between the 2 heating NTC probes.
E40 + 	Incorrect mains frequency detected
E42 + 	Buttons fault.
E44 + RESET	Fault of cumulative gas valve timeout without flame.
E50 + 	OT communication fault.
E62 + 	Calibration request.
E65 + 	System fails to control combustion and exits modulator control parameters
E68 + 	Probably low gas pressure
E77 + 	System out modulator control parameters
E78 + 	Possible low gas pressure
E79 + 	System out modulator control parameters
E89 + RESET	Internal error (usually hardware) or problems with the mains electrical supply (excessive distortion of waveform).
E91 + RESET	Maximum number of lockouts reached.
E96	Incorrect network frequency.
E97	Power supply voltage low.
E99	Card not configured.
L1	Primary limitation in D.H.W. mode.
- - -	Boiler stand-by, the dashes light up in sequence to simulate a scrolling motion (antifreeze protection activated).
	When powering ON the boiler, all icons and digits light up (for 2 seconds) to check operation of the LCD.

LCD	FUNCTION
	If the pressure is not correct the value is displayed with the flashing symbol.
	Next maintenance due date (factory setting 12 months). In the event of an error, this has greater priority than maintenance due date.
	Maintenance overdue. In the event of an error, this has greater priority than maintenance due date.
	Pump active for the post-circulation phase (flashing PO + flashing temperature).
	
	Boiler in antifreeze phase (flashing bP + flashing temperature).
	
	Boiler with D.H.W. power request. The D.H.W. temperature is displayed.
	Boiler with central heating request via room thermostat.
	Boiler with central heating power request with connected remote.
	Heating set temperature (all other symbols are disabled).
	D.H.W. set temperature (all other symbols are disabled).

CONTROL PANEL ELECTRONIC P.C.B.

LCD	FUNCTION
	<p>Delay burner ignition due to system setting (flashing uu + flashing temperature).</p>
	
	<p>Boiler in chimney sweep function. To activate the chimney sweep function, set "parameter P32=1 ... 4". The following is displayed:</p>
	<p>LP = minimum D.H.W. hP = minimum output in heating mode cP = maximum output in heating mode dP = maximum D.H.W.. The transition occurs with buttons "D" (increase) and "A" (decrease) D.H.W. temperature.</p>
	<p>3 star preheating function active. When the symbol ☺ flashes, the function is in process.</p>
	<p>Constantly illuminated: solar control unit connected. When the symbol ☀ flashes, the solar circuit pump is in operation.</p>

9 GAS VALVE

9.1 Function

The gas valve "1" in Figure 9.1 controls the gas inflow to the boiler burner.

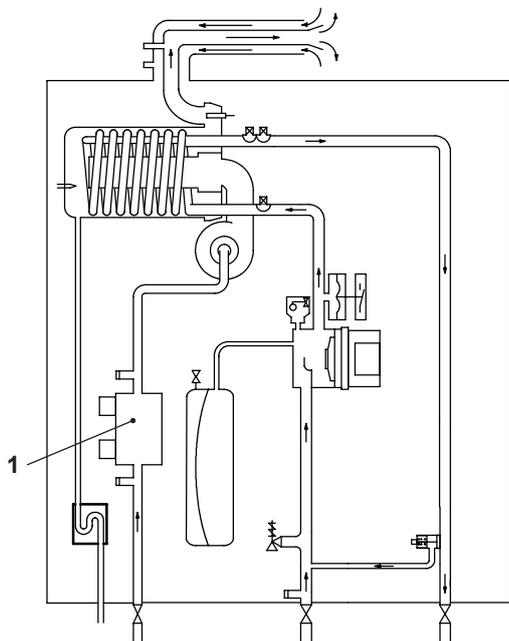


Figure 9.1

By means of an electric command given to the on-off operators the passage of the gas through the Gas valve can be opened or closed.

9.2 Description of the parts

(Figure 9.2)

- 2 Gas valve outlet pressure test point
- 3 On-off operators electric connector
- 4 Gas valve inlet pressure test point

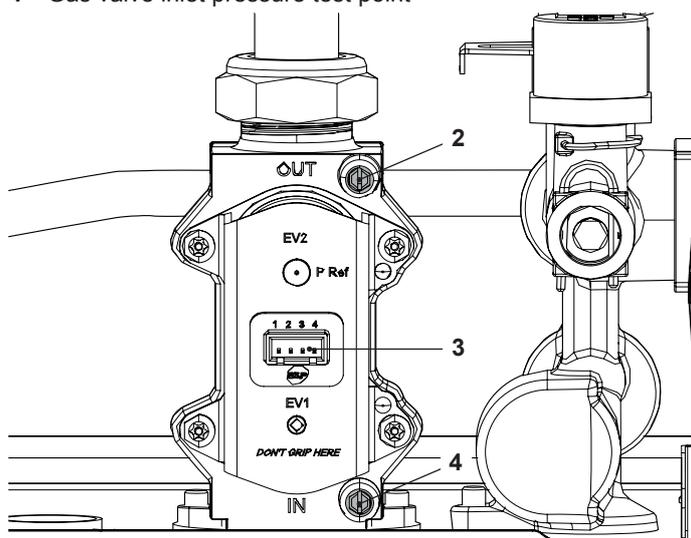


Figure 9.2

9.3 Adjustment - Chimney Sweep Function



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.



Each time after measuring the gas pressure, fully close all tapping points that were used. After each gas adjustment, the valve adjustment components must be sealed.



Warning: risk of electrocution. The boiler is live during the operations described in this section. Never touch any electrical parts.

Check the supply pressure before making any adjustment to the gas valve.

- 1 Close the gas inlet valve.
- 2 Remove the front panel of the case and lower the control panel (see sections "2.2 Case panels" on page 5 and "2.3 Control panel" on page 5).
- 3 Loosen the internal screw on the Inlet Pressure Test Point "4" (Figure 9.2) of the Gas valve and connect a pressure gauge using a suitable hose.
- 4 Open the gas inlet valve.
- 5 Read the inlet pressure value and ensure that it is within the limits given in the table *Gas supply pressures*, of the user/installation manual. If it does not comply with the required pressure check the gas supply line and governor for faults and/or correct adjustment.
- 6 Switch off the boiler **close the gas inlet valve**.
- 7 Disconnect the pressure gauge and close the Inlet Pressure Test Point "4" (Figure 9.2).

Gas valve adjustment



The person carrying out a combustion measurement should have been assessed as competent in the use of a flue gas analyser and the interpretation of the results. The flue gas analyser used should be one meeting the requirements of BS7927 or BS-EN50379-3 and be calibrated in accordance with the analyser manufacturers' requirements, and have a current calibration certificate.

- 8 Fit the probe of the flue analyser in the flue exhaust sampling point located on the exhaust pipes of the boiler (Figure 9.3).

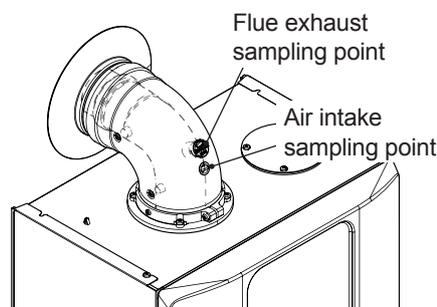


Figure 9.3

- 9 Turn on the boiler, switching on the fused spur isolation switch.
- 10 Open the gas inlet valve.
- 11 Turn on the boiler and operate for 2 minutes to pre-heat the flue, before commencing any adjustments.
- 12 Make sure that the room thermostat is in the "heat request" position.

GAS VALVE

13 Open at least one hot water tap fully.

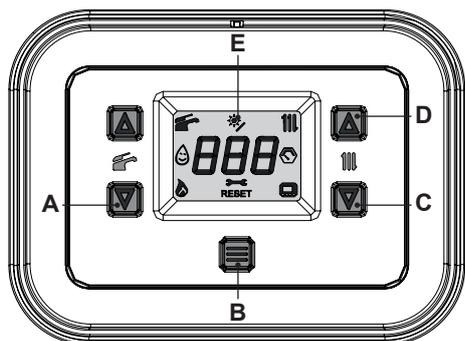


Figure 9.4

14 To enter in the parameters setting mode press at the same time the 2 keys "A" and "C" (Figure 9.4) and hold in for 5 second until the display shows Figure 9.5.



Figure 9.5

15 Scroll the various menus using keys "A" or "C" (Figure 9.4) until **Ch5** (Chimney sweep) appears on the LCD display (Figure 9.6).



Figure 9.6

17 The letters **LP**, alternating with the minimum heating water temperature (e.g. **45**), appear on the screen indicating the activation of the "chimney sweep function" at minimum power (Figure 9.7).

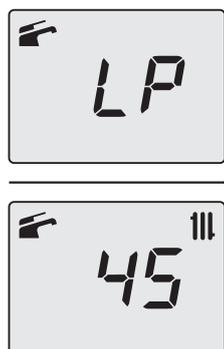


Figure 9.7

18 Allow the analyser to give a stable reading.

19 Read the CO₂ % value. It should be between:

Model RINNOVA	Type gas	CO ₂ % value (range)
ADAPTIVE 30S	Natural (G20)	8,5 - 9,5
	Propane (G31)	9,5 - 10,5

Checking the maximum gas valve setting

20 Press key "C" to vary the output in chimney sweep mode: when the display shows the letters **dP** (chimney sweep active in maximum C.H. mode) that alternate with the heating water

temperature value (e.g. **60**), the "chimney sweep function" is at maximum output in C.H. mode (Figure 9.8).



Warning: If the boiler has a correct CO₂ reading in LP but is incorrect CO₂ in dP before adjusting the boiler ensure the supply pressure is within acceptable limits!

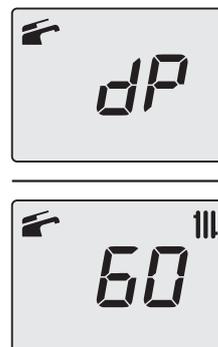


Figure 9.8

21 Allow the analyser to give a stable reading.

22 Read the CO₂ % value. It should be between:

Model RINNOVA	Type gas	CO ₂ % value (range)
ADAPTIVE 30S	Natural (G20)	8,5 - 9,5
	Propane (G31)	9,6 - 10,6

If the two values do not coincide with the value shown in the table Gas supply pressures, of the user/installation manual, exit programming mode by pressing the "B" key for 5 seconds and carry out the "Automatic calibration of the gas valve" page 27.

23 Switch off the boiler and turn off the hot water tap(s).

24 Close the air-flue sampling points.

Important: after the gas pressure checks and any adjustment operations, all of the test points must be sealed.

9.4 Automatic calibration of the gas valve

When replacing the panel board, the fan or gas valve, or parameter **P01** on the control board is changed, the gas valve must be calibrated in order to carry out CO₂ calibration at maximum boiler output.

- 1 Turn on the boiler and operate for 2 minutes to pre-heat the flue, before commencing any adjustments.
- 2 Make sure that the room thermostat is in the "heat request" position.
- 3 Open at least one hot water tap fully.

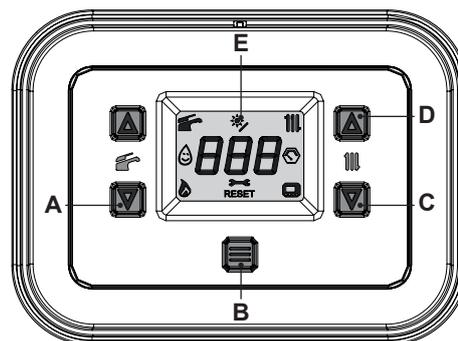


Figure 9.9

4 To enter in the parameters setting mode press at the same

GAS VALVE

time the 2 keys "A" and "C" (Figure 9.9) and hold in for 5 second until the display shows Figure 9.10.



Figure 9.10

- 5 Scroll the various menus using keys "A" or "C" (Figure 9.9) until **CAF** appears on the LCD display (Figure 9.11).



Figure 9.11

- 6 Press the key "B" (Figure 9.9) until the **StF** (Start Full), alternating with **34** (calibration value), appears on the LCD display (Figure 9.12).

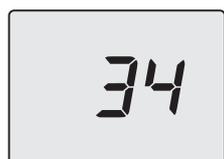


Figure 9.12

- 7 Allow the program to perform the entire process, at the end of which **FuF** (Full Finish) will be displayed (Figure 9.13).



Figure 9.13

- 8 To exit the parameters menu either:
 - wait 15 minutes without pressing any key;
 - switch off the electric power supply;
 - press the "A" and "C" keys simultaneously for 5 seconds (Figure 9.9) (return to previous level).

9.5 Checks

Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- ✓ Check the on-off operators coils
- 1 Remove the front panel of the case.
 - 2 Disconnect the electrical connector "3" (Figure 9.2).
 - 3 Measure the electrical resistance between the connector pins of the on-off operators as illustrated in Figure 9.14.

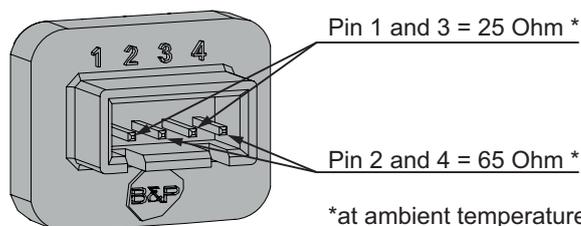


Figure 9.14

*at ambient temperature.

9.6 Removal of the gas valve

Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the front panel of the case as explained in the section "2.3 Control panel" on page 5, of this manual.
- 2 Disconnect the connector "6" (Figure 9.15), see also connector "3" (Figure 9.2).

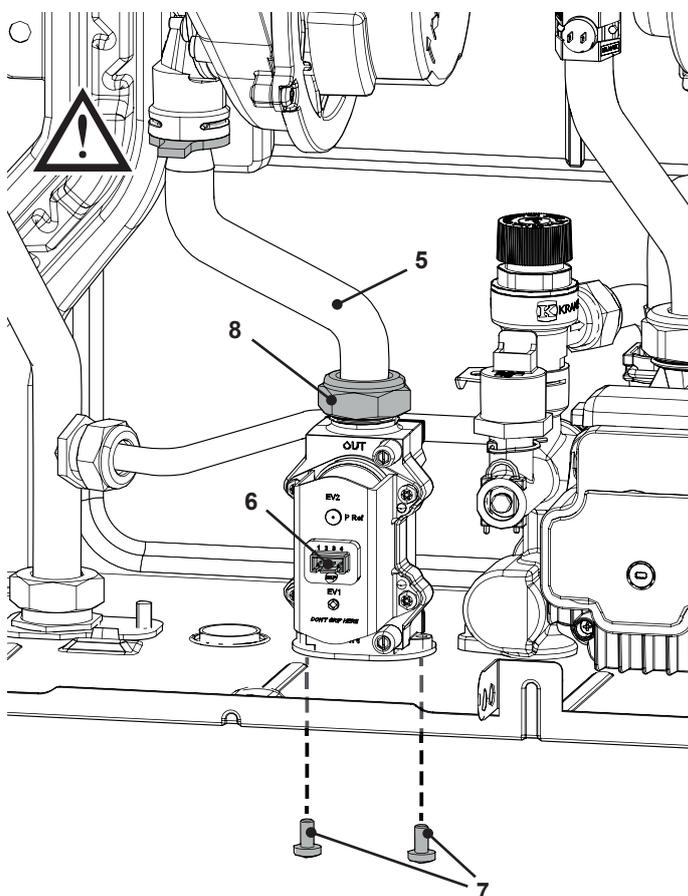


Figure 9.15

- 3 Turn off the gas supply and disconnect the gas isolation cock connector from the inlet port of the gas valve.
- 4 Unscrew the connector "8" (Figure 9.15) and remove the pipe "5".
- 5 Unscrew the screws "7" and remove the valve (Figure 9.15).
- 6 Reassemble the valve carrying out the removal operations in reverse order.

Warning: Be careful not to damage the OR gasket of the gas pipe when inserting the pipe in the air box (air/gas mixer).

- 7 Adjust the gas valve using the flue analyser as described in section "9.4 Automatic calibration of the gas valve" on page

27.

After any service operation on the components of the gas circuit check all the connections for gas leaks.



Warning: After cleaning or replacement as detailed above, it is deemed necessary to undertake a combustion analysis as detailed in section "9.3 Adjustment - Chimney Sweep Function" on page 26.

PRIMARY CIRCUIT FLOW SWITCH

10 PRIMARY CIRCUIT PRESSURE SWITCH

10.1 Function

The Primary circuit pressure switch ("1" in Figure 10.1) function is to check the presence of water in the primary hydraulic circuit and that the pressure is above the minimum.

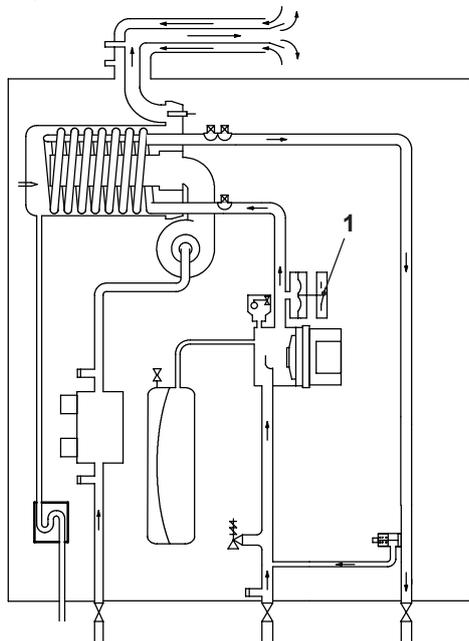


Figure 10.1

This device is connected to the main electronic control p.c.b. and if, it does not activate the control board will indicate that a fault condition (see section "4.1 Display diagnostic" on page 13 of this manual) has occurred.

10.2 Removal



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the front and right hand side panels of the case, turn off the flow and return isolation valves and empty the primary circuit.
- 2 Remove the fixing spring "3" (Figure 10.2) and remove the primary circuit pressure switch "4".
- 3 Disconnect the connector "2" (Figure 10.2).

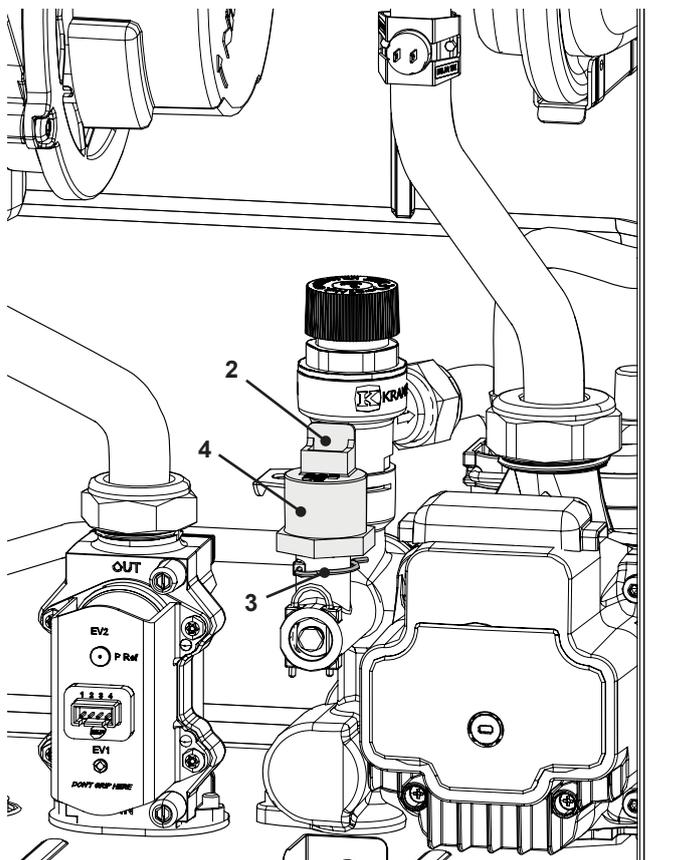


Figure 10.2

- 4 Reassemble the primary circuit pressure switch in reverse order of removal.



Warning: to lubricate the O-ring gaskets exclusively use a silicone base grease compatible to be in contact with foods and approved by the local water Authorities.

EXPANSION VESSEL AND PRESSURE GAUGE

11 EXPANSION VESSEL AND PRESSURE GAUGE

11.1 Function

The Expansion vessel ("1" in Figure 11.1) function is to allow for the volume expansion of the C.H. circuit water due to the temperature rise.

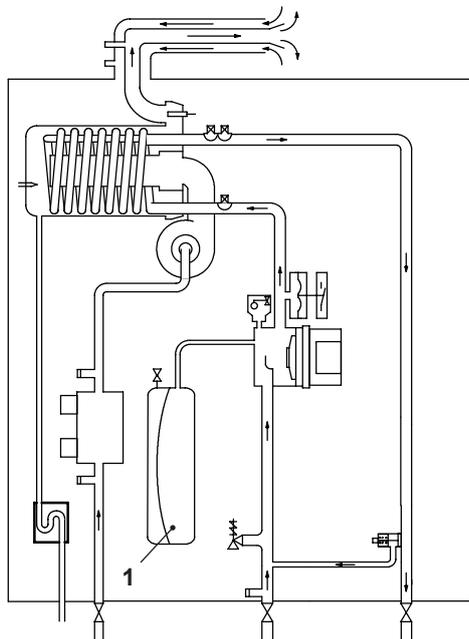


Figure 11.1

11.2 Checks

- 1 Turn off the flow and return isolation valves and empty the primary circuit of the boiler.
- 2 Remove the protective cap "2" in Figure 11.2 from the valve on the top of the expansion vessel and connect a suitable air pressure gauge.

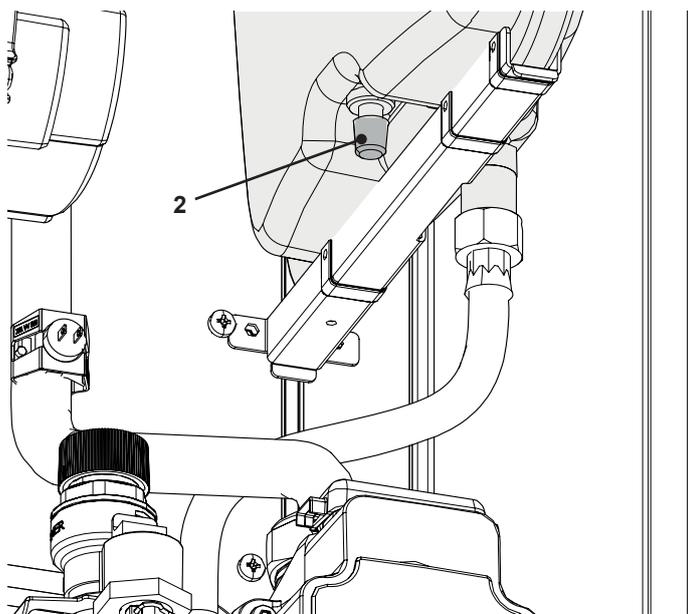


Figure 11.2

- 3 Check the pre-load pressure and refer to the section *Expansion vessel* in the *User manual and installation instructions* for the correct value.

11.3 Removal of the expansion vessel



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the front and right hand side panels of the case, turn off the flow and return isolation valves and empty the primary circuit.
- 2 Completely unscrew the connection "5" (Figure 11.3).
- 3 Unscrew the screws "4" and "3" (Figure 11.3).
- 4 Remove the expansion vessel from the front of the boiler.

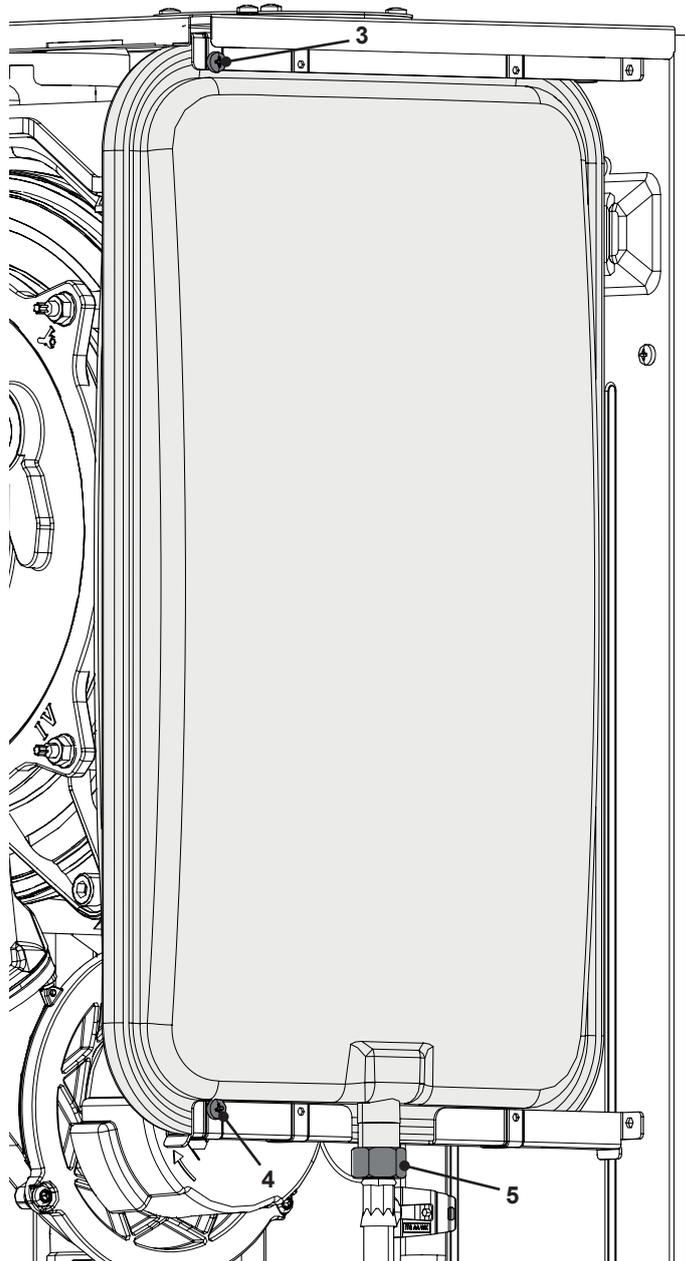


Figure 11.3

- 5 Re-assemble the parts in reverse order of removal.

TEMPERATURE PROBE

12 NTC HEATING DELIVERY PROBE - NTC MAXIMUM TEMPERATURE, C.H. TEMPERATURE RETURN PROBE NTC

12.1 Function

The NTC probe has the function of converting the temperature of the water in the hydraulic circuit where it is installed into an electrical signal (resistance).

The relation between temperature and electrical resistance is stated in Figure 12.1.

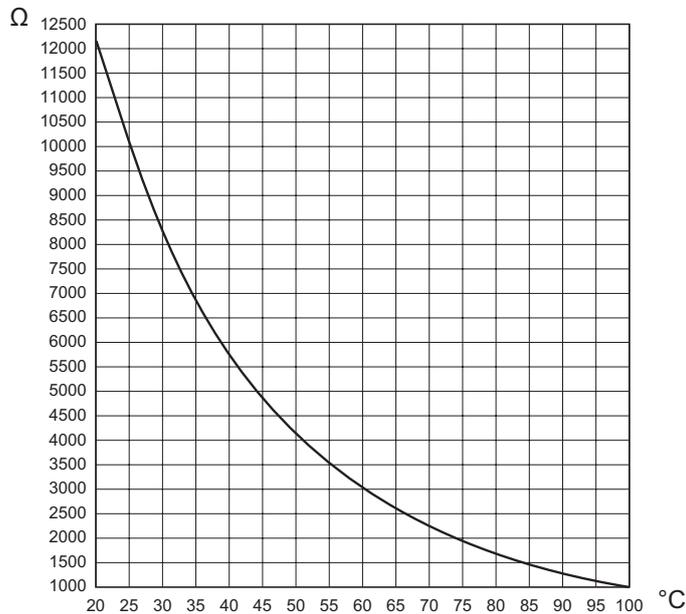


Figure 12.1

On the boiler there are three temperature probes. One on the output of the primary condensing heat exchanger (NTC heating delivery probe - NTC maximum temperature) "1" in Figure 12.2 and Figure 12.3, one on the return of the primary condensing heat exchanger (C.H. temperature return probe NTC) "2" in Figure 12.2 and Figure 12.4.

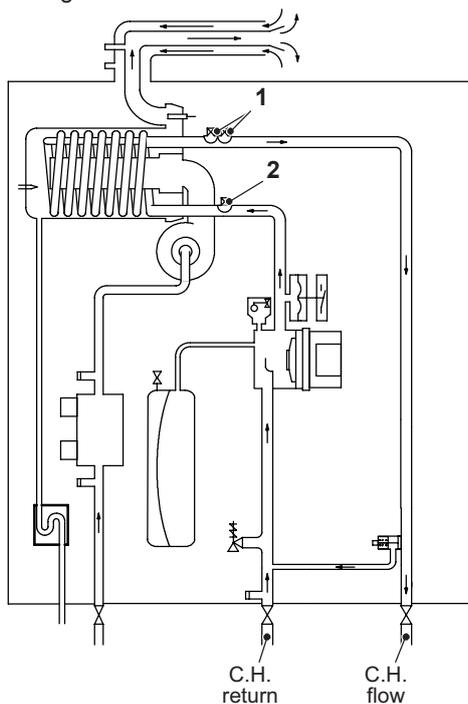


Figure 12.2

12.2 Checks

- ✓ Temperature-resistance relationship



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

Disconnect the cable from the Temperature probe. Measure the temperature of the pipe "3" (only NTC heating delivery probe - NTC maximum temperature) where the Temperature probe is located and check the electrical resistance according to the graph in Figure 12.1.

12.3 Removal of the NTC heating delivery probe - NTC maximum temperature



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove all the case panels and the sealed chamber lid.
- 2 Remove the electric connector "4" and the NTC probe "1" (Figure 12.3).
- 3 Reassemble the NTC probe carrying out the removal operations in reverse order.

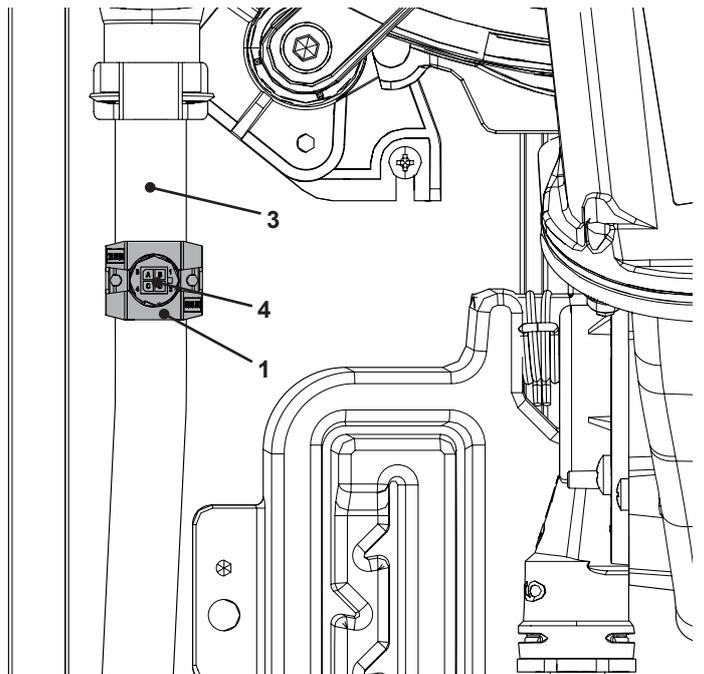


Figure 12.3

12.4 Removal of the C.H. temperature return probe NTC



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the front panel of the case and lower the control panel.
- 2 Remove the electric connector "2" and the NTC probe "5" (Figure 12.4)
- 3 Reassemble the NTC probe carrying out the removal operations in reverse order.



Warning: to lubricate the O-ring gaskets exclusively use a silicone base grease compatible to be in contact with foods and approved by the local water Au-

TEMPERATURE PROBE

thorities.

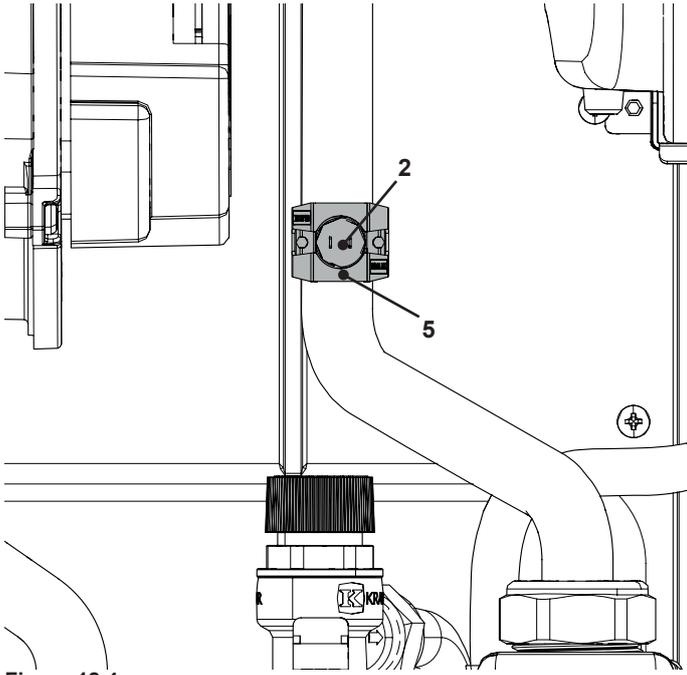


Figure 12.4

BY-PASS VALVE

13 BY-PASS VALVE

13.1 Function

The By-pass valve "1" in Figure 13.1 is located between the C.H. water flow and return and its function is that of guaranteeing a minimum flow across the primary heat exchanger if the circulation across the C.H. system is completely closed.

The By-pass valve is fitted on the rear side of the diverter group.

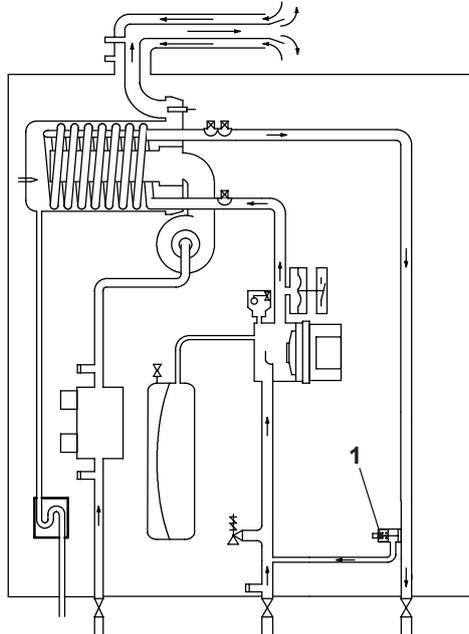


Figure 13.1

13.2 Removal



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove all the case panels.
- 2 Empty the primary circuit of the boiler.
- 3 Unscrew the connector "2", rotate the pipe "3" and pull the by-pass valve "1" (Figure 13.2).

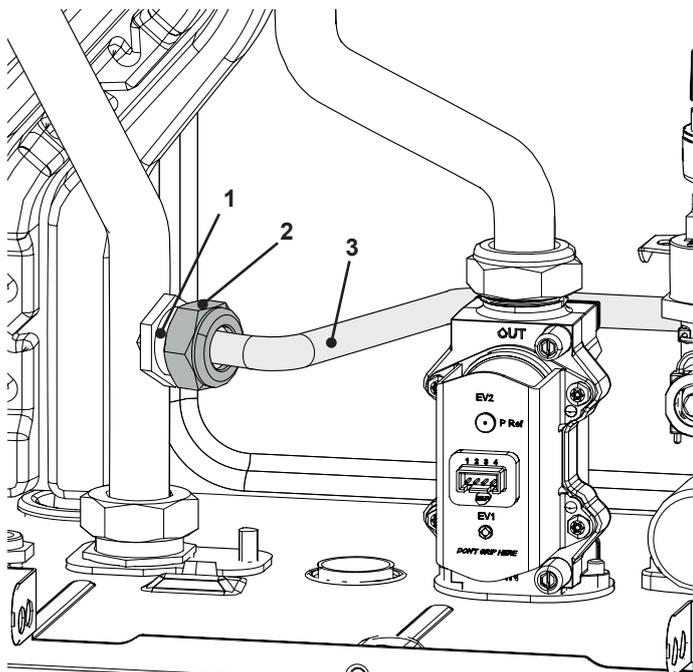


Figure 13.2

- 4 Reassemble the by-pass valve as illustrated in Figure 13.2 reversing the order of removal.



Warning: to lubricate the O-ring gaskets exclusively use a silicone base grease compatible to be in contact with foods and approved by the local water Authorities.

14 FAN AND AIR BOX

14.1 Function

The function of the Fan "1" (Figure 14.1) is to force the mixture of air and gas into the burner.

The function of the Air box "2" is to mix the gas and the air in the right proportion.

The flow rate of the air-gas mixture and consequently the input power of the boiler is proportional to the speed of the fan that is controlled by the electronic control p.c.b.

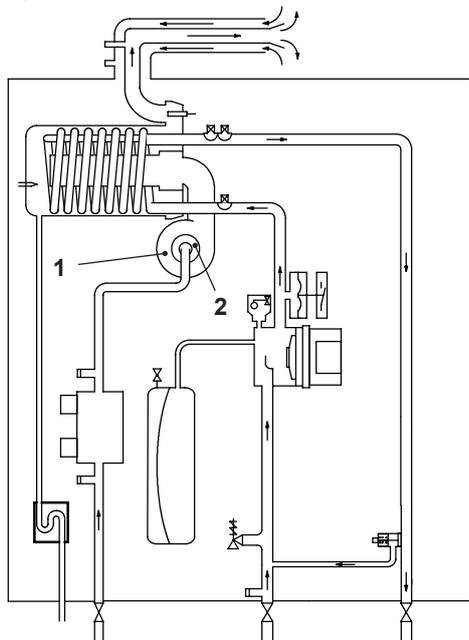


Figure 14.1

14.2 Removal of the Air box and the Fan



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Turn off the gas supply.
- 2 Remove all the case panels (see section "2 General access and emptying hydraulic circuits" on page 5).
- 3 Unscrew the gas connector "4" and remove the gas pipe "5" (Figure 14.2).
- 4 Disconnect the connectors "3".
- 5 Unscrew the nuts "6".
- 6 Remove the fan "1" with the air box "2".

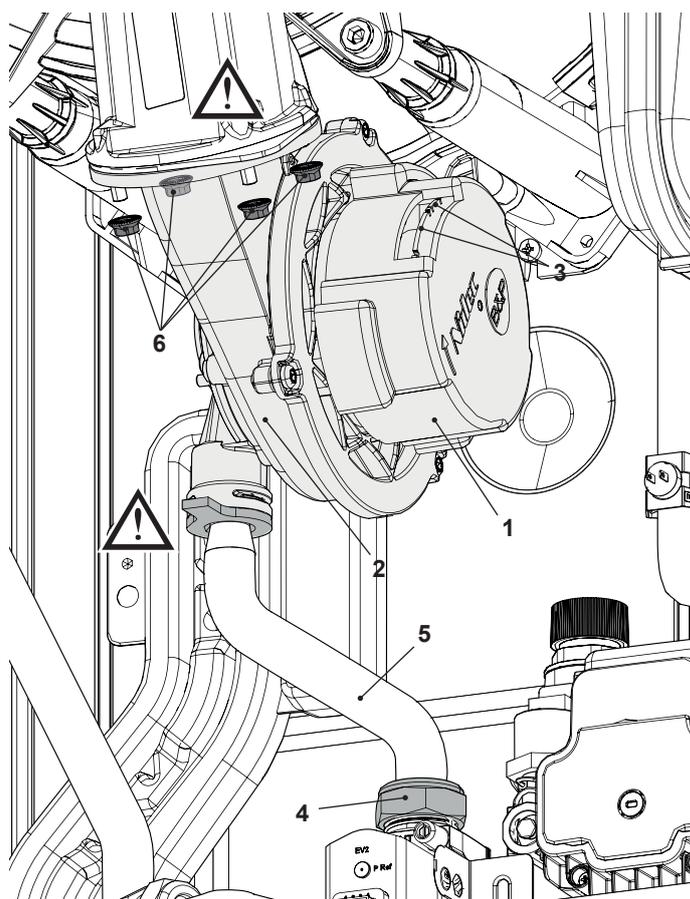


Figure 14.2

- 7 Assemble the Fan carrying out the removal operations in reverse sequence.

Before reassembling ensure the fan gasket (Figure 14.2) is correctly mounted.



Warning: Place the seal on the pipe and offer the pipe with O'ring pre fitted into the manifold rather than inserting the O'ring into the manifold and offering the pipe into it.

After any service operation on the components of the gas circuit check all the connections for gas leaks.



Warning: After cleaning or replacement as detailed above, it is deemed necessary to undertake a combustion analysis as detailed in section "9.3 Adjustment - Chimney Sweep Function" on page 26.

IGNITION AND DETECTION ELECTRODES

15 IGNITION / DETECTION ELECTRODE AND BURNER

Electrodes disclaimer.

Note to service engineers: It is required that the burner seal, lip seal and mixing chamber seal along with the flame detection electrode are inspected every year and replaced every 24 months. Failure to inspect the flame detection probe, seals and replace as required may render the guarantee void.

15.1 Function

The ignition / detection electrode "1" is fitted on the left side of the fan-burner group "4".

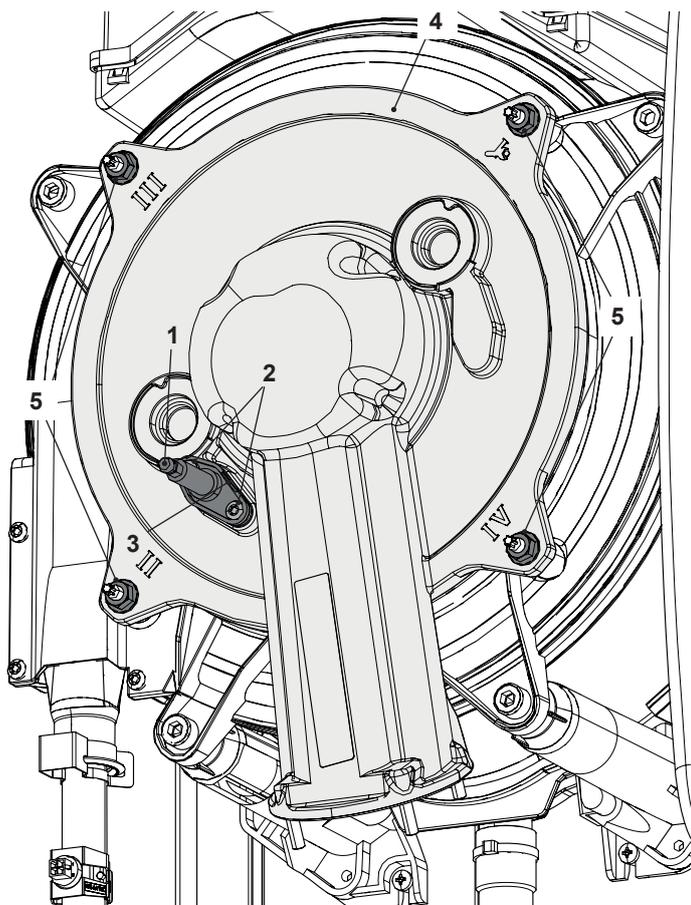


Figure 15.1

The burner "6" is fitted on the rear of the fan-burner group "4".

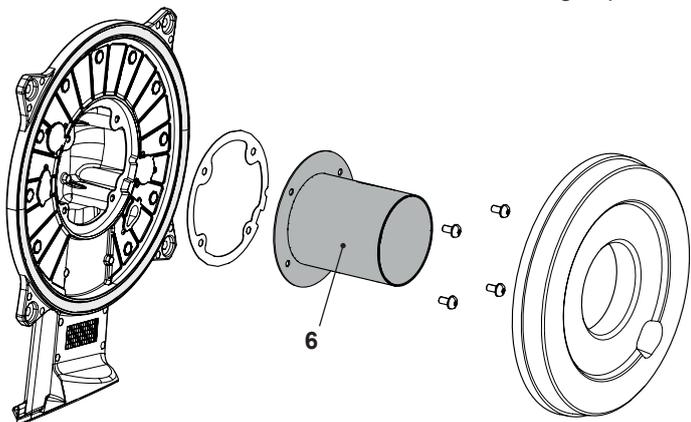


Figure 15.2

15.2 Removal of the ignition / detection electrode



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove all the case panels (see section "2 General access and emptying hydraulic circuits" on page 5).
- 2 Disconnect the electrode connector "1" and the earth wire "3" (Figure 15.1).
- 3 Unscrew the screws "2" and remove the electrode "1".
- 4 Assemble the ignition / detection electrode carrying out the removal operation in reverse order.



Warning: A new sealing gasket must be used during refitting of the electrodes on all occasions of removal.

15.3 Removal of the front insulation panel

See warning note at the end of this chapter before to remove this part.

- 1 Remove the ignition / detection electrode (see section "15.2 Removal of the ignition / detection electrode" on page 36).
- 2 Remove the front insulation panel by sliding it forward (Figure 15.3).
- 3 Assemble the new front insulation carrying out the removal operation in reverse order. When fitting the new panel ensure that the electrode hole coincide with the hole of the combustion chamber.

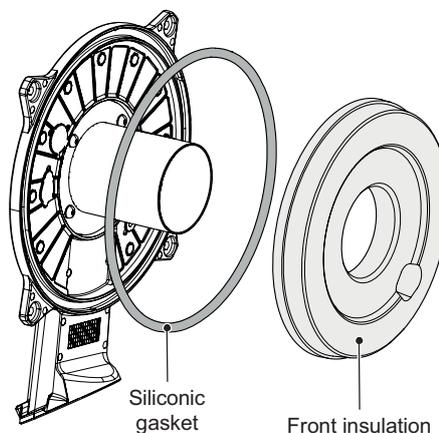


Figure 15.3

Caution:

After any periodical servicing or disturbance the combustion chamber silicon seal (Figure 15.3) must be fully inspected and replaced at the discretion of the service engineer. After any disturbance to the chamber door seal the appliance must undergo a full analytical combustion performance check.

15.4 Removal of the burner



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the air box and the fan (see section "14.2 Removal of the Air box and the Fan" on page 35).
- 2 Remove the Ignition and detection electrodes (see section "15.2 Removal of the ignition / detection electrode" on page 36).

IGNITION AND DETECTION ELECTRODES

- 3 Unscrew the nuts "5" (Figure 15.1) and remove the cover of the combustion chamber.
- 4 Remove the front insulation panel (see section "15.3 Removal of the front insulation panel" on page 36).
- 5 Unscrew the screws "7" (Figure 15.4) and remove the burner.
- 6 Assemble the burner carrying out the removal operation in reverse order. Ensure the burner is correctly located by lining up the locating tab (Figure 15.4).

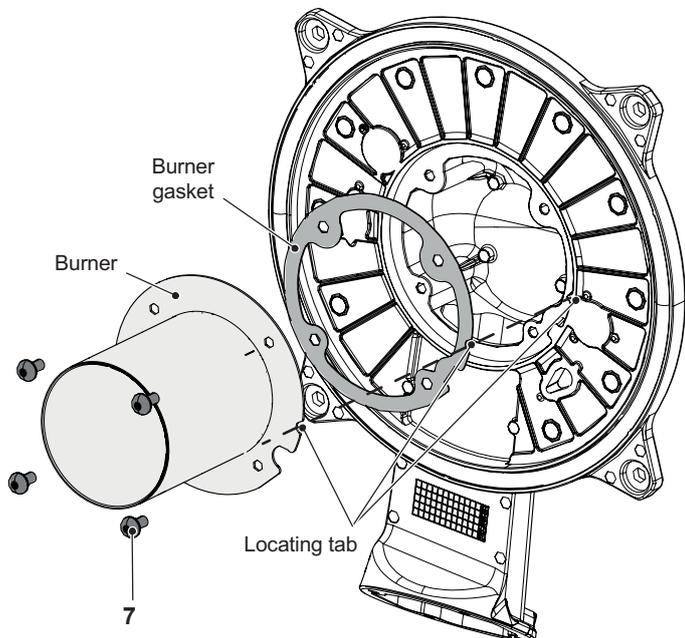


Figure 15.4

Before reassembling ensure the burner gasket is correctly located.



Warning: After cleaning or replacement as detailed above, it is deemed necessary to undertake a combustion analysis as detailed in section "9.3 Adjustment - Chimney Sweep Function" on page 26).

15.5 Removal of the rear insulation

See warning note at the end of this chapter before to remove this part.



Attention: Cover the inner of the condensing heat exchanger to avoid that dirt and debris fall in the coil.

- 1 Do the operations of section "15.4 Removal of the burner" on page 36 from step 1 to step 3.
- 2 Remove the insulation "8" by pulling it towards the boiler front (Hung it with a screwdriver tip) (Figure 15.5).

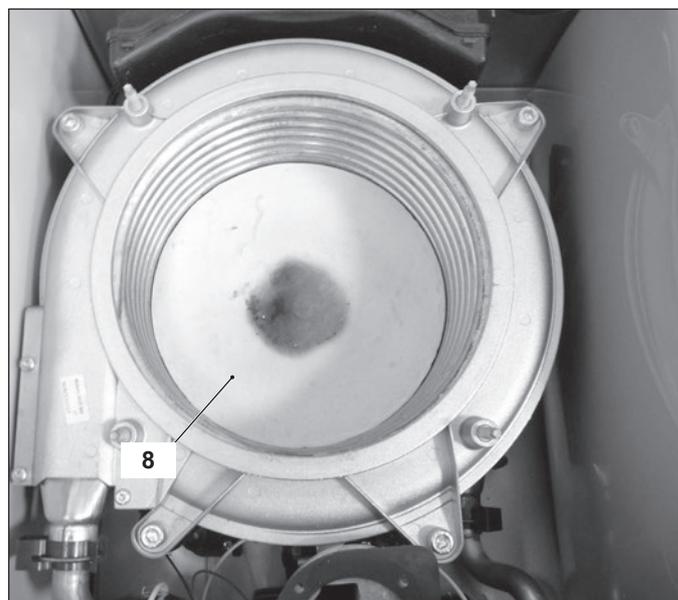


Figure 15.5

15.6 Checks

- ✓ Check of the spark generator.



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

There is not a significant way to verify the integrity of the spark generator. When the fan turns but the burner does not light a possible cause is a faulty spark generator on the main PCB. It would be advisable to replace the Main PCB to rectify the fault.

- ✓ Check the position of the electrode edges.



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Check for the correct distance between the metallic edge of the electrode and burner (see Figure 15.6).

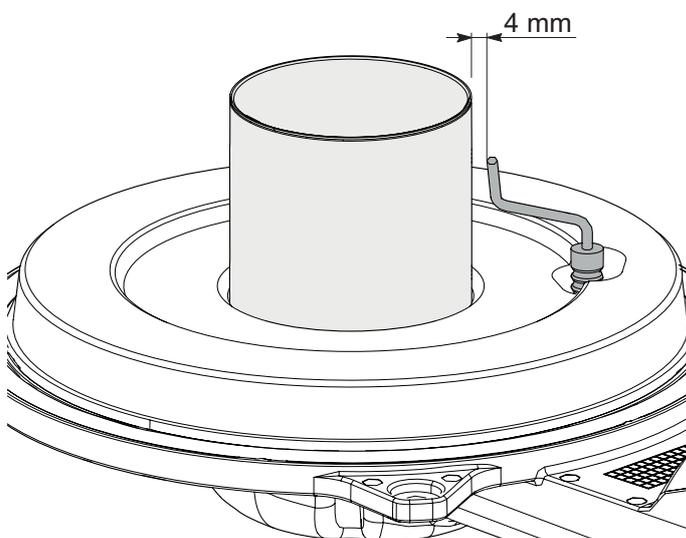


Figure 15.6

IGNITION AND DETECTION ELECTRODES

✓ Check the connection wires



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove all the case panels and the sealed chamber lid.
- 2 Check for the integrity of the insulation of wires which connect the electrode.

The electrode in Figure 15.6 also functions as a sensor for the correct drainage of the condensate.

Should the mentioned electrode come into contact with the condensate water present within the combustion chamber it sends the boiler into safety lockout.

Remove any encrustations and dirt from the detection electrode or replace it if damaged.



**In any case, it must be replaced every 2 years.
The ignition/detection electrode is not under warranty because it is consumable part.**

Warning - Insulation panels material handling care.

Mineral fibres are used in this appliance for the insulation panels of the combustion chamber

Excessive exposure to these materials may cause temporary irritation to eyes, skin and respiratory tract.

Known hazards - Some people can suffer reddening and itching of the skin. Fibre entry into the eye will cause foreign body irritation, which can cause severe irritation to people wearing contact lenses. Irritation to respiratory tract.

Precautions - Dust goggles will protect eyes. People with a history of skin complaints may be particularly susceptible to irritation. High dust levels are only likely to arise following harsh abrasion. In general, normal handling and use will not present high risk, follow good hygiene practices, wash hands before, touching eyes, consuming food, drinking or using the toilet.

First aid - Medical attention must be sought following eye contact or prolonged reddening of the skin.

FLUE TEMPERATURE PROBE NTC AND SAFETY THERMAL FUSE

16 FLUE TEMPERATURE PROBE NTC AND SAFETY THERMAL FUSE

16.1 Function

The Flue temperature probe NTC and Safety thermal fuse "1" in Figure 16.1 and Figure 16.2 senses the temperature of the combustion products that flow through the condensing heat exchanger.

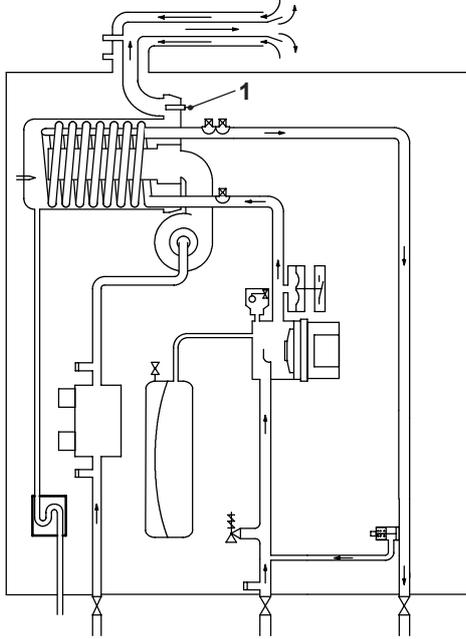


Figure 16.1

If the temperature of the combustion products circuit reaches the limit temperature, the Flue temperature probe NTC reduces the gas flow rate to the burner. The temperature of the combustion products should decrease to a safe value temperature. In the case that the temperature of the combustion products reaches a potentially dangerous value, the Safety thermal fuse stops the boiler operation (lock-out). The use of kits different from the original isn't however allowed, since the flue pipes are integral parts of the boiler.

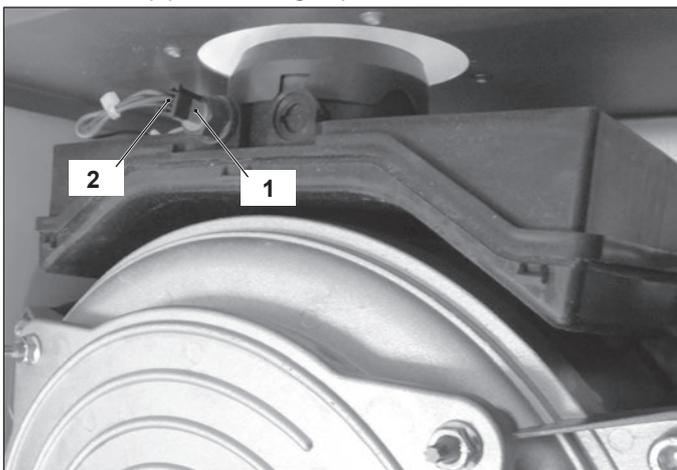


Figure 16.2

A Flue temperature probe NTC and Safety thermal fuse "1" in Figure 16.1 and Figure 16.2 is also connected in series with the Flue temperature probe NTC and acts as a safety device in extreme case of incorrect operation of the Flue temperature control system.

Reaching the breakdown temperature it opens the circuit and locks out the boiler.

In case of intervention of this safety device the heat exchanger (part shown in Figure 16.3) may be damaged and must be re-

placed.

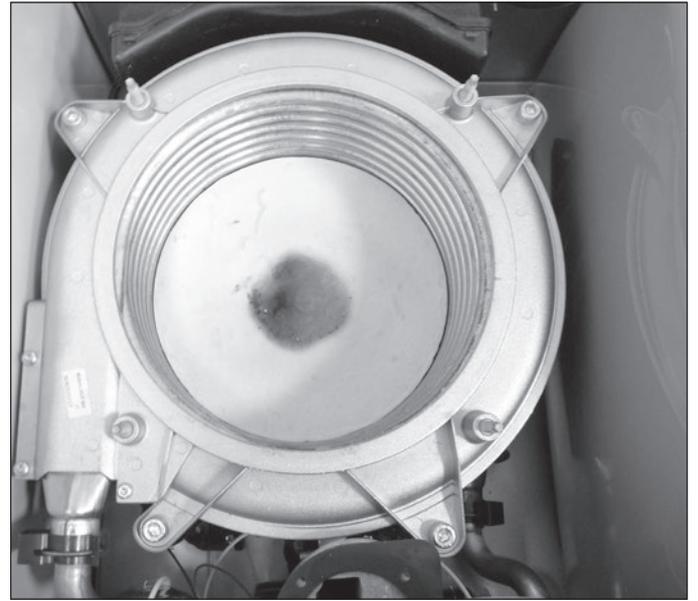


Figure 16.3

16.2 Removal



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove all the case panels.
- 2 Disconnect the connector "2" from the Flue temperature probe NTC and Safety thermal fuse by pressing the plastic hook placed on the side of the connector (Figure 16.2).
- 3 Unscrew and remove the Flue temperature probe NTC and Safety thermal fuse "1" (Figure 16.2) from the condensing heat exchanger.
- 4 Assemble the Flue temperature probe NTC and Safety thermal fuse carrying out the removal operations in reverse sequence.
- 5 Ensure the probe seal is in a good serviceable condition to avoid POC and condensate leakage.

16.3 Checks

✓ Overheat temperature value

- 1 Set the temperature control knobs to their max. position and run the boiler in C.H.
- 2 Allow the boiler to reach its maximum operating temperature (monitor the temperature gauge on the instrument panel). The boiler should maintain a temperature below that of the Flue temperature probe NTC and Safety thermal fuse and no overheat intervention should occur.

✓ Temperature-resistance relationship.

- 1 Remove the Flue temperature probe NTC and Safety thermal fuse (see section "16.2 Removal" on page 39).
- 2 Measure the Flue temperature probe NTC and Safety thermal fuse electrical resistance at the ambient temperature and check it according to the graph in (Figure 16.4).

FLUE TEMPERATURE PROBE NTC AND SAFETY THERMAL FUSE

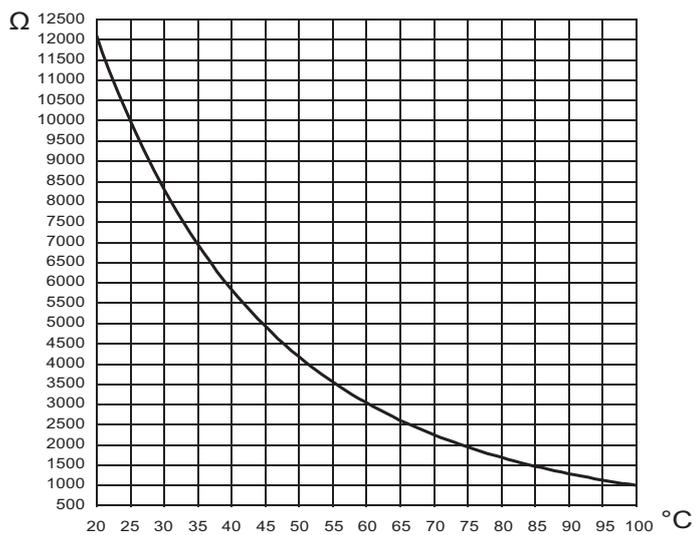


Figure 16.4

CONDENSATE TRAP

17 CONDENSATE TRAP

17.1 Function

The condensate trap "1" in Figure 17.1 and Figure 17.2 allows the discharge of the condensate via the condensate drain pipe avoiding in the mean time the escape of combustion products. A plastic ball closes the trap outlet in case that the trap is empty.

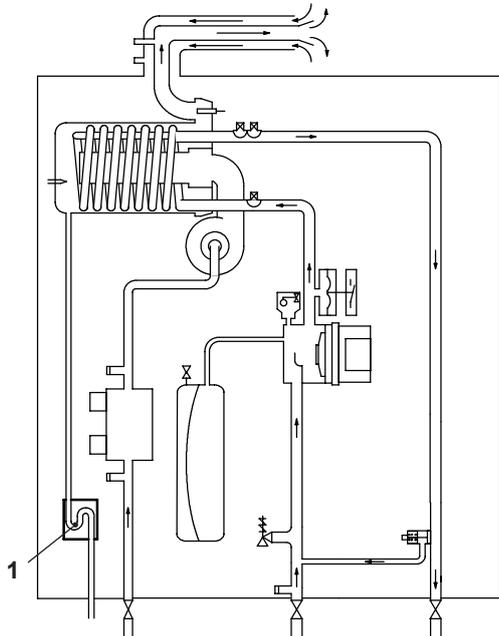


Figure 17.1

If the drain pipe becomes blocked, or condensate cannot drain, the condensate level in the trap rises until it affects the flame detection probe, this will cause the boiler lock-out.

17.2 Check the cleanness of the trap

The condensate drain pipe "1" (Figure 17.2) does not require any particular maintenance but just check:

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

To clean the inside of the siphon, remove it and turn it upside down to remove any dirt (see section "17.3 Removal" on page 41).

17.3 Removal



Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the front and right case panels.
- 2 Using pliers, remove the spring "2" moving it to the left.
- 3 Remove the pipe "3" from the trap "1".
- 4 Remove the trap "1", moving it upwards; from the grommet "4".

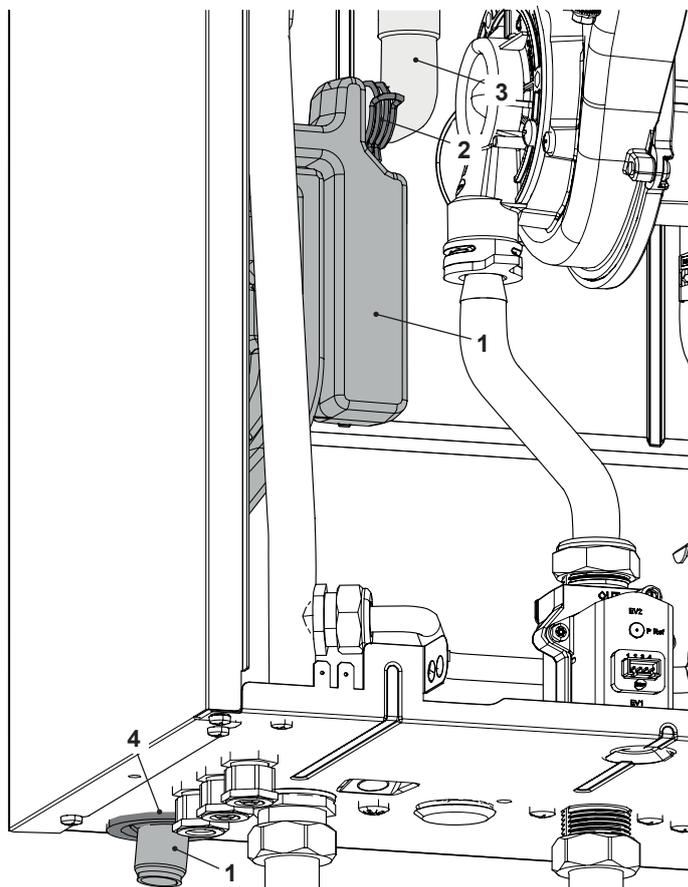


Figure 17.2

- 5 Reassemble carrying out the removal operations in reverse order.

Figure 17.3

SHORT SPARE PARTS LIST

18 SHORT SPARE PARTS LIST

Key	G.C. part no.	Description	Q.ty	Manufacturer part no.
1		Burner (mod. M300V.30 SR)	1	BI1713 101
2		Expansion vessel	1	BI1462 100
3		Condensing heat exchanger (mod. M300V.30 SR)	1	BI2112 100
4		Fan	1	BI1713 102
5		Gas valve	1	BI1713 112
6		Safety valve	1	BI1621 101
7		Main electronic control p.c.b	1	BI2675 108
8		Motor pump	1	BI2112 103
9		Pump	1	BI2112 104
10		C.H. temperature flow probe NTC - Safety Thermostat	1	BI1442 117
11		Primary circuit pressure switch	1	BI1592 115
12		Condensate trap	1	BI1782 107
13		Flue temperature probe NTC and safety thermal fuse	1	BI1782 103
14		Fuse 3,15 AF 250VAC 5x20	1	BI1295 108
15		C.H. temperature return probe NTC	1	BI1442 106
16		Ignition / detection electrode	1	BI1713 107

SHORT SPARE PARTS LIST

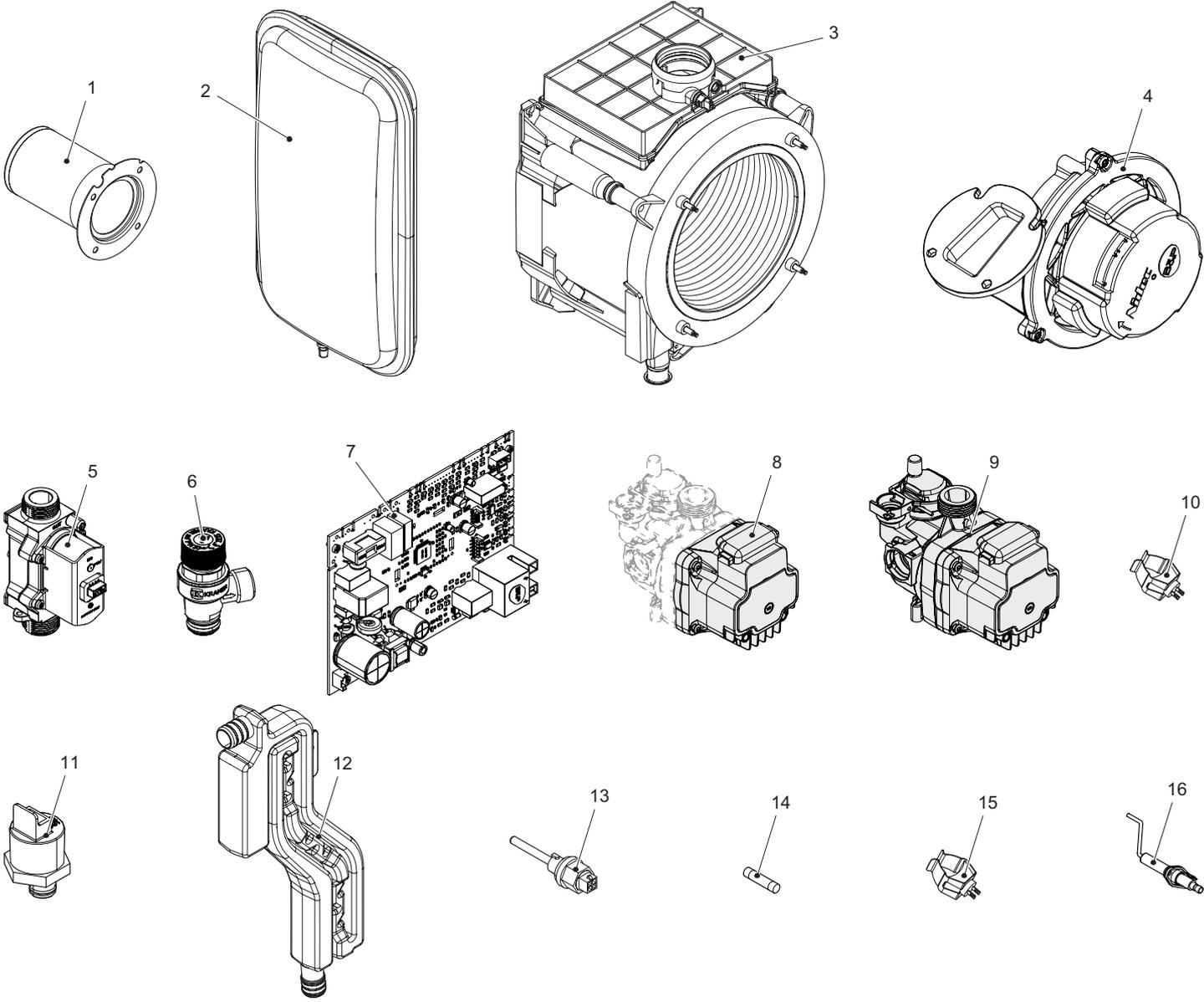


Figure 18.1



17962.3483.0 2422 44A4 UK

Biasi UK Ltd
Commercial Road
Leamore Enterprise Park
WALSALL

WS2 7NQ

Sales Tel. 01922 714600
Tech. Service Tel. 01922 714636
www.biasi.co.uk

