Wall hung, fanflue, roomsealed, high efficiency gas boiler

Service manual

ANTARES

Product name	Models	G.C. Appl. No.
ANTARES 30S	**M300V.30 SR**	**41-583-41**

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.

BIASI

TABLE OF CONTENTS

1 OVERALL INFORMATION

1.1 Overall View

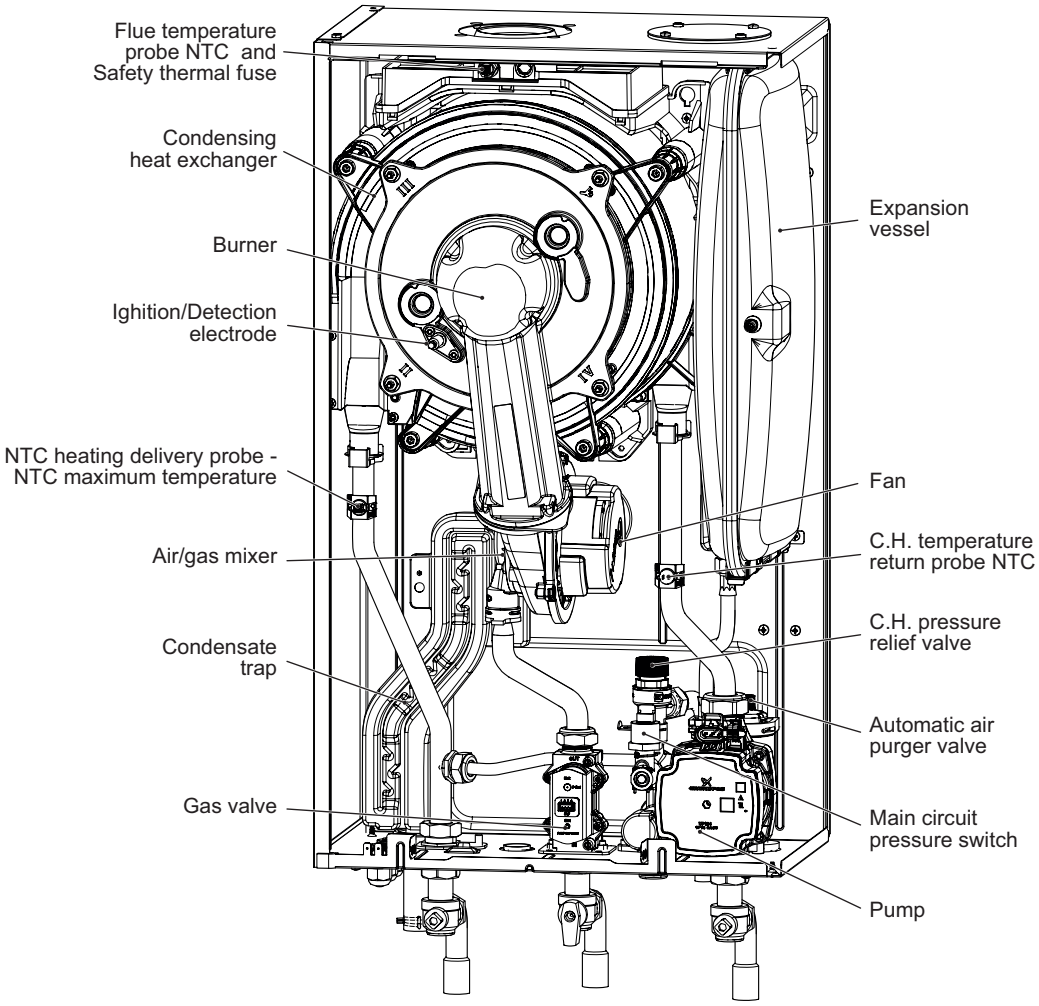


Figure 1.1

1.2 Hydraulic diagram

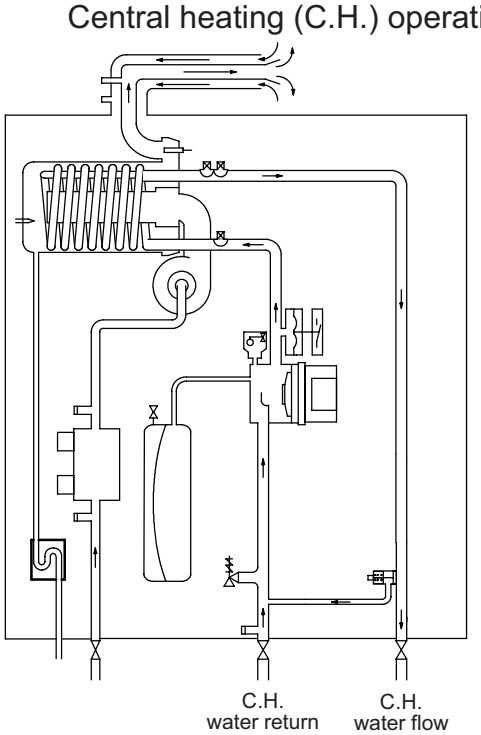


Figure 1.2

2 GENERAL ACCESS AND EMPTYING HYDRAULIC CIRCUITS

2.1 Nomenclature

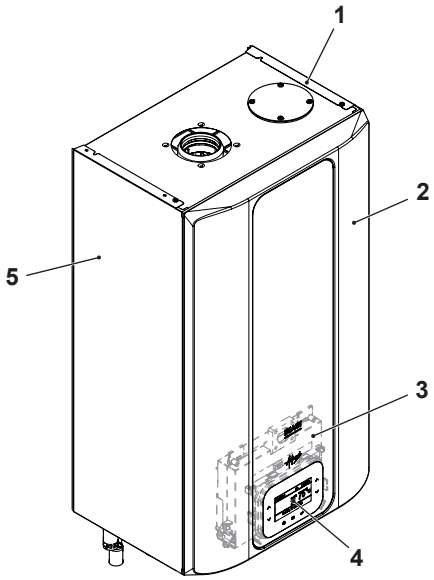


Figure 2.1

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.

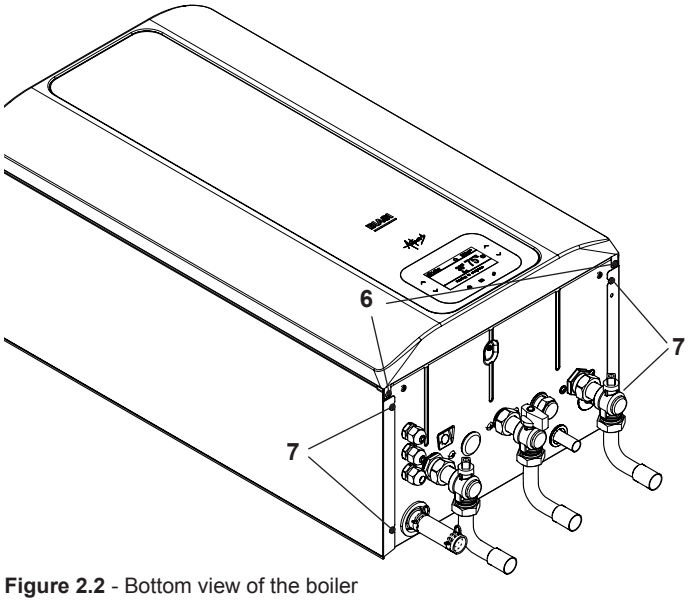


Figure 2.2 - Bottom view of the boiler

Pull the lower part of the front panel and lift it upwards (Figure 2.3).

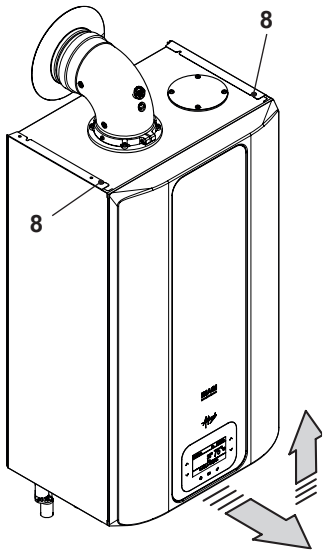


Figure 2.3

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).

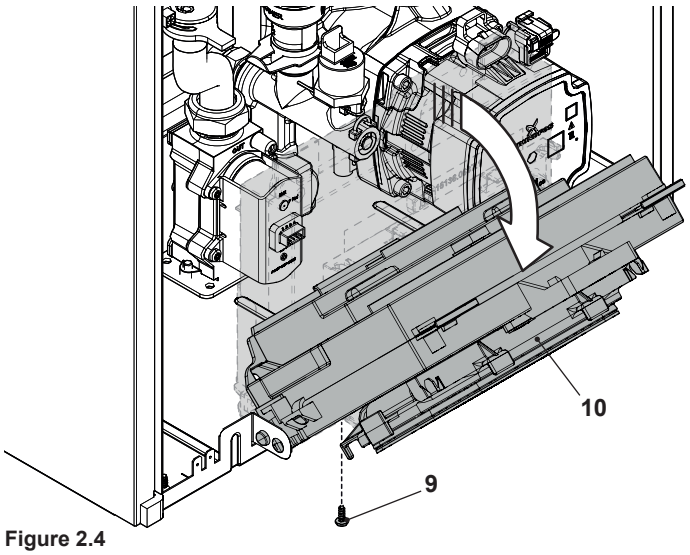


Figure 2.4

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).

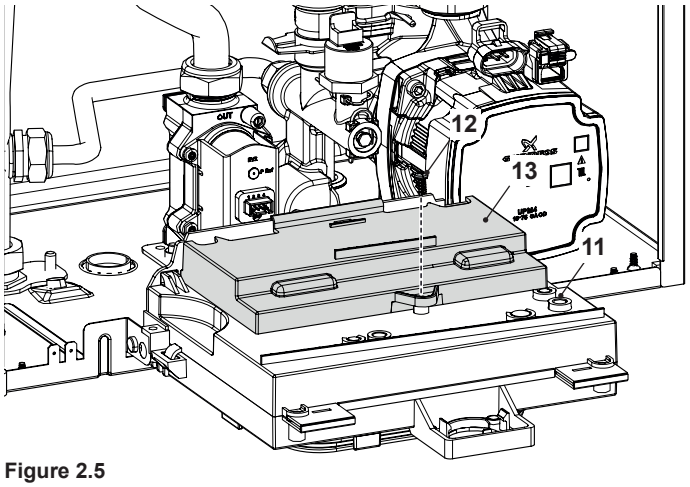


Figure 2.5

4 Rotate the lid (Figure 2.6).

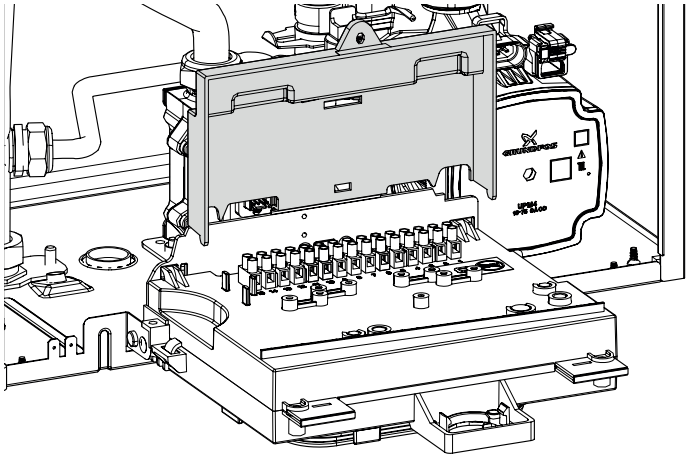


Figure 2.6

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).

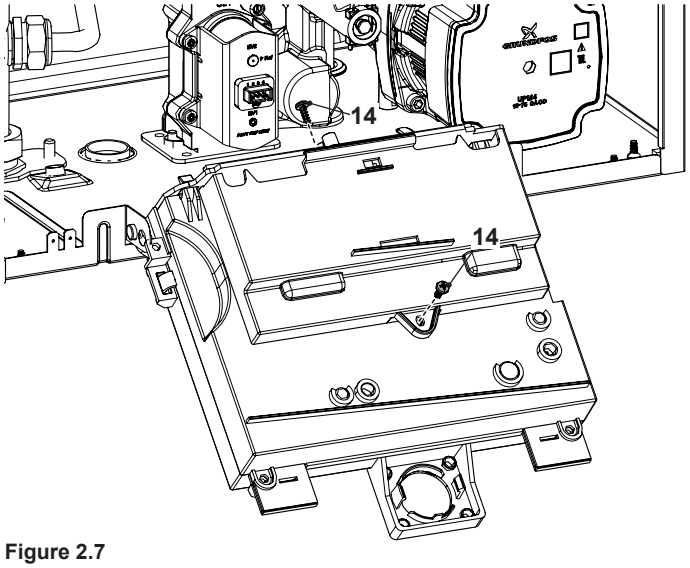


Figure 2.7

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

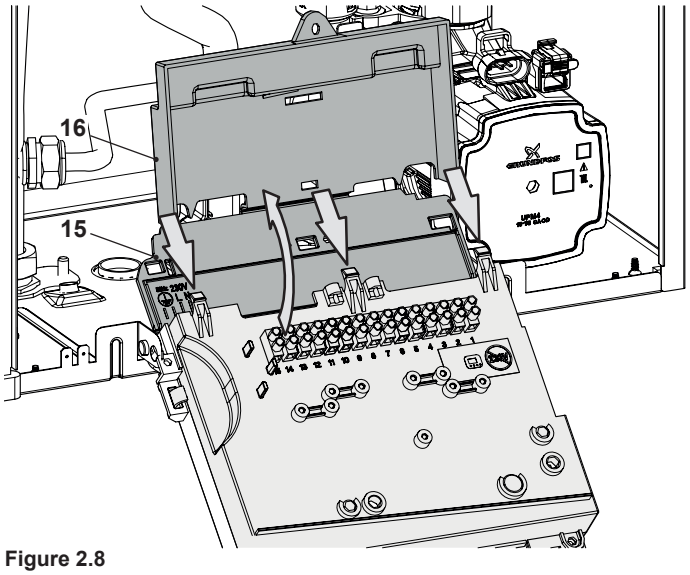


Figure 2.8

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

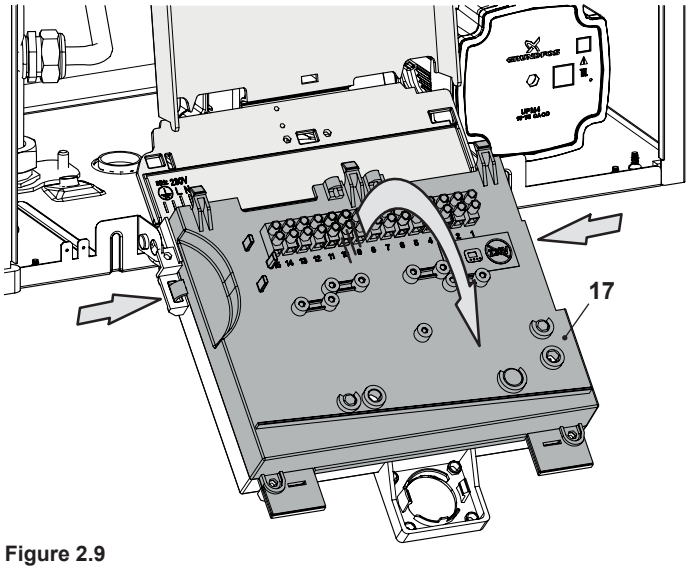


Figure 2.9

2.5 Emptying the primary circuit

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

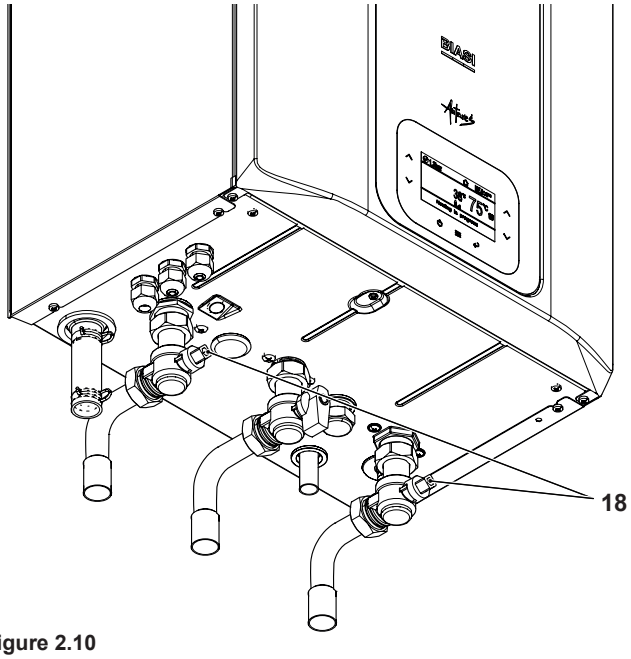


Figure 2.10

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.

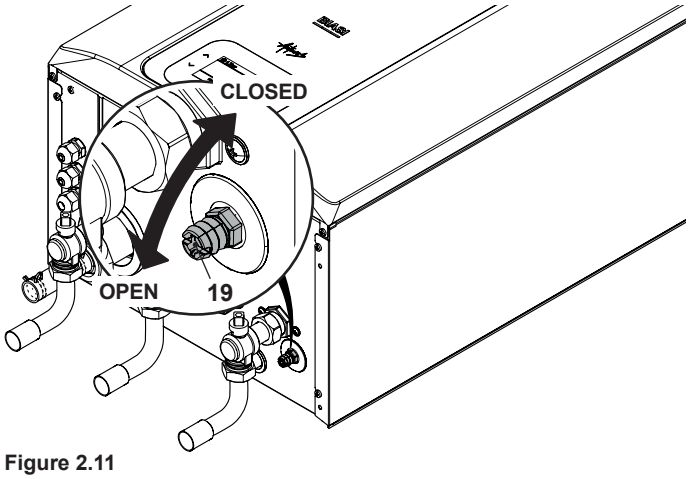


Figure 2.11

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

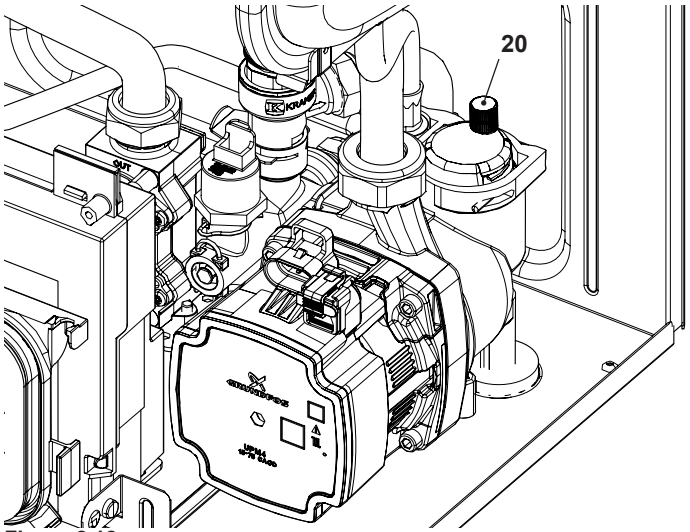
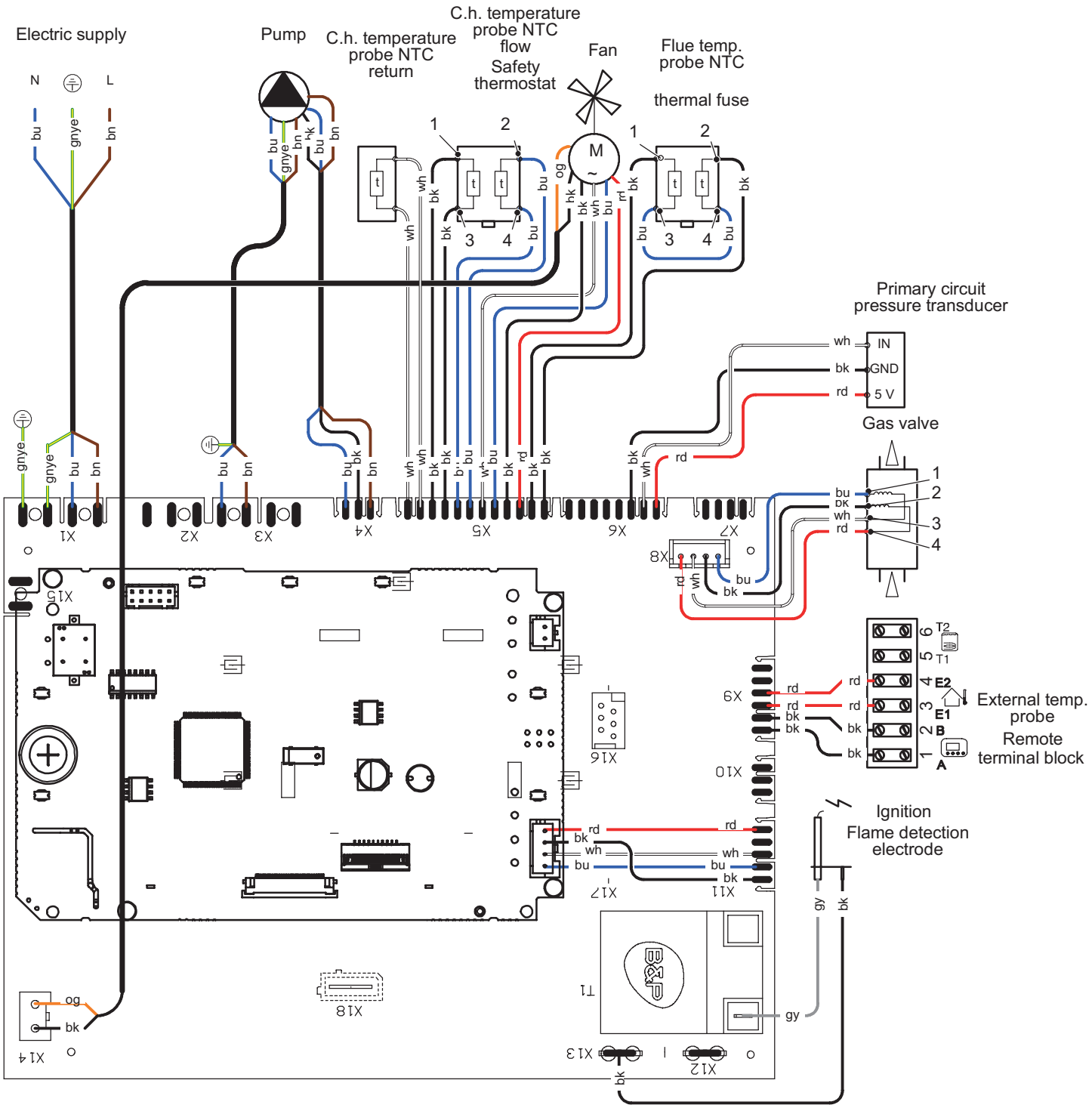


Figure 2.12

3 DIAGRAMS

3.1 Wiring diagram M300V SR



bn = brown
bu = blue
bk = black
wh = white
rd = red
gy = grey

gn = green
ye = yellow
vt = violet
og = orange
gnye = green/yellow
rdwh = red/white

Figure 3.1

3.2 Circuit voltages

Electrical voltages or frequency with burner on ——— ⬭ only during C.H. operation

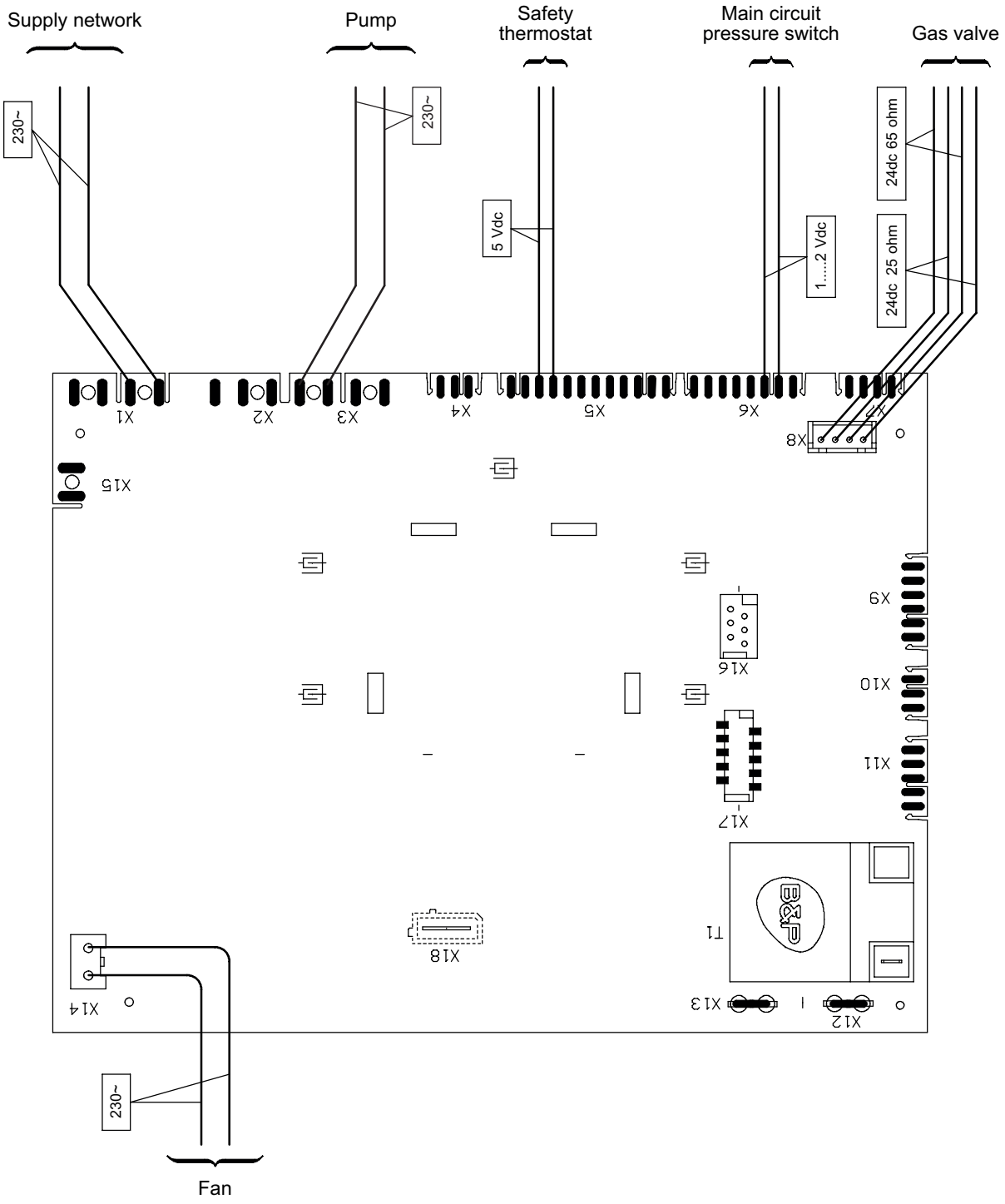


Figure 3.2

FAULT FINDING

FAULT FINDING

		Components to check																						
Section of the manual → (note ref. in brackets)		– (1)	– (2)	– (3)	21.1	– (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.	Boiler settings	Control panel electr. p.c.b.	Gas valve	Main circuit pressure transducer	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
Display indicates "E"	**E01** + RESET		**A**		**B**								**D**					**C**							
	E02 + RESET						**C**							**A**					**B**						
	E03 + RESET									**A**															
	E04 + 🔧							**B**																**A**	
	E05 + 🔧																**A**								
	E06 + 🔧														**A**										
	E07 + 🔧																								
	E08 + 🔧																								**A**
	E10 + 🔧			**A**																	**B**				
	E11 + RESET									**C**								**B**							
	E12 + 🔧														**A**										
	E13 + 🔧					**A**		**B**																	
	E14 + RESET					**A**	**C**	**B**																	
	E14 + 🔧					**A**		**B**																	
	E15 + 🔧																								
	E16 + 🔧																								
	E18 + RESET						**B**	**A**																	
	E19 + 🔧													**A**											
	E20 + RESET									**A**			**B**												
	E21 + RESET									**A**			**B**												
	E22 + RESET									**B**			**A**												

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

		Components to check																							
Section of the manual → (note ref. in brackets)		– (1)	– (2)	– (3)	21.1	– (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.	Boiler settings	Control panel electr. p.c.b.	Gas valve	Main circuit pressure transducer	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
Display indicates "E"	**E23** +									**A**			**B**												
	E24 +			**A**																	**B**				
	E25 + RESET		**C**							**A**								**B**							
	E26 +							**B**		**C**					**A**										
	E40 +	**A**																							
	E42 +									**A**															
	E44 + RESET		**D**							**B**			**C**					**A**							
	E50 +									**A**															
	E62 +									**A**															
	E65 +									**A**															
	E68 +		**A**							**B**															
	E77 +									**B**								**A**							
	E78 +		**A**							**B**															
	E79 +									**B**								**A**							
	E89 + RESET	**A**								**B**															
	E91 + RESET									**A**								**B**							
	E96																								
	E96 + RESET																								
	E97 +	**A**																							
	E99 +									**A**															
	L1																								

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

FAULT FINDING

		Components to check																							
Section of the manual → (note ref. in brackets)		– (1)	– (2)	– (3)	21.1	– (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.	Boiler settings	Control panel electr. p.c.b.	Gas valve	Main circuit pressure transducer	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
No "E" indication on display	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 bolier.		●	●				●					●			●	●								
	Poor C.H. temperature (8).		●	●						●							●				●				
I	Water leaks from the safety valve during operation on C.H.					●																●	●	●	●
I	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.

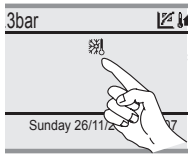
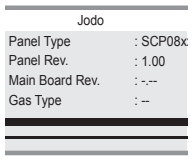
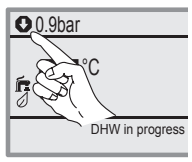
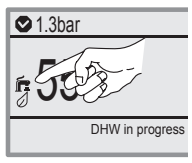
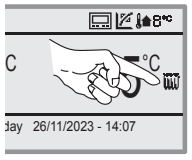
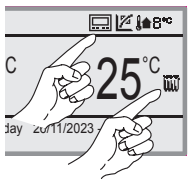
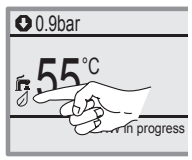
6 Using the flue analyser, check the CO_2 value of the flue gases.
This reading is a reference value for the gas valve setting.

7 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.

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.

LCD	FUNCTION
1 +	Safety lockout due to failed ignition.
2 +	Lockout due to safety thermostat.
3 +	Generic lockout.
4 +	Pump circulation failure, insufficient system pressure or pressure above 3 bar, water pressure sensor not connected.
5 +	Control fault: fan.
6 +	NTC heating delivery probe failure.
7 +	D.H.W. NTC probe failure / Hot water tank sensor failure.
8 +	External NTC probe failure.
10 +	Lockout due to tripping of the flue gas probe and thermal fuse.
11 +	Parasite flame.
12 +	Return NTC probe failure.
13 +	Delta T M-R > 40K.
14 +	Pump fault or primary temperature above 105°C.
14 +	Temperature gradient circulation failure (>2K/s).
15 +	Probable insufficient circulation.
16 +	Flue gas overheating detected by NTC.
18 +	No ΔT heating at start-up.
19 +	Auxiliary Input Probe Anomaly.
20 +	EVG lockout (valve piloting hardware failure).
21 +	EVG lockout (valve control Relay Failure).
22 +	EVG lockout (flame after closing valve Ref. EVG).
23 +	Gas valve modulator disconnected.
24 +	Anomaly due to probable chimney obstruction.
25 +	Flame loss for more than 6 consecutive times.
26 +	Maximum deviation fault between the 2 heating NTC probes.
40 +	Incorrect mains electrical supply frequency.
42 +	Keys fault.
44 +	Fault of cumulative gas valve timeout without flame. Heating water low pressure fault, pressure below minimum.
50 +	OT communication fault.
62 +	Calibration request.
65 +	System fails to control combustion and exits modulator control parameters.
68 +	Probable low gas pressure.
77 +	System out modulator control parameters.
78 +	Probable low gas pressure.
79 +	System out modulator control parameters.
89 +	Internal error (usually hardware) or problems with the mains electrical supply (excessive distortion of waveform).
91 +	Maximum number of lockouts reached.
96	Incorrect network frequency.
96 +	After 5 E02 - E14 - E04 - E15 - E16 error events, the boiler goes into lockout.
97	Power supply voltage low.
99	Card not configured.
L1	Primary limitation in D.H.W. mode.
	Boiler in Stand-By, the symbol shown in the figure appears (antifreeze protection active).
	When powering ON the boiler, this sequence appears (for 2 seconds).
	The symbol shown in the figure appears if the pressure is incorrect.
	Boiler with D.H.W. power request.
	Boiler with central heating request via room thermostat.
	Boiler with central heating power request with connected remote.
	Eco function NOT active.

4.2 Error history (view only)

In this menu it is possible to view the last 10 faults occurring on the system (no. 1 being the most recent). In the case of a boiler

malfunction, provide this information to the service centre so that they can identify the cause.

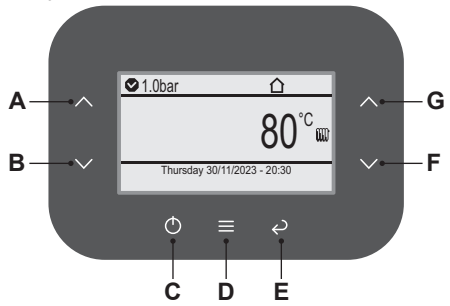


Figure 4.1

1 Press key "D" (Figure 4.1) to access the main menu (Figure 4.2).

Menu	
Clock and programmes	[...]
Information	[...]
Fault history	[...]
General settings	[...]
DHW settings	[...]
Zones	[...]

Figure 4.2

2 Press key " A" or " B" (Figure 4.1) to select the desired menu (Figure 4.3).

Menu	
Clock and programmes	[...]
Information	[...]
Fault history	[...]
General settings	[...]
DHW settings	[...]
Zones	[...]

Figure 4.3

3 Press key "D" (Figure 4.1) to access the selected menu (Figure 4.4).

4 Press key "D" (Figure 4.1) again to highlight the value to be changed (Figure 4.4).

Fault history	
Boiler	[...]

Figure 4.4

5 Press key "D" (Figure 4.1) again to highlight the value to be changed (Figure 4.5).

Boiler	
Display alarms	[...]

Figure 4.5

6 Press key "D" (Figure 4.1) again to highlight the value to be changed.

7 Press key "F" or "G" (Figure 4.1) to select the alarm history index (Figure 4.6).

Boiler	
History index	1
Fault code:	62
Fault 062	
at 05:34 on 3 Dec 2023	

Figure 4.6

8 Press key "E" (Figure 4.1) repeatedly to return to the previous levels.

4.3 Displaying in INFO mode

The INFO mode allows the display of some information on the boiler functioning status. In case of malfunctioning of the boiler, it may be useful to communicate such information to the Authorised Service Centre Engineer so that the causes can be understood.

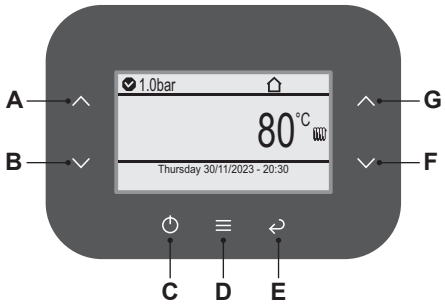


Figure 4.7

1 Press key "D" (Figure 4.7) to access the main menu (Figure 4.8).

Menu	
Clock and programmes	[...]
Information	[...]
Fault history	[...]
General settings	[...]
DHW settings	[...]
Zones	[...]

Figure 4.8

2 Press key "A" or "B" (Figure 4.7) to select the desired menu (Figure 4.9).

Menu	
Clock and programmes	[...]
Information	[...]
Fault history	[...]
General settings	[...]
DHW settings	[...]
Zones	[...]

Figure 4.9

3 Press key "D" (Figure 4.7) to access the selected menu.

4 Press key "A" or "B" (Figure 4.7) the scroll through the list (Figure 4.10).

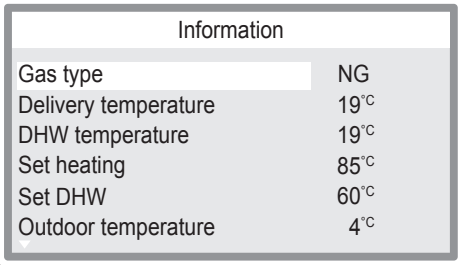


Figure 4.10

5 Press key "E" (Figure 4.7) repeatedly to return to the previous levels.

The table summarises the possible values visible in INFO mode.

Menu Item	Description
Type of gas	Displays gas type: NG (0:Methane), LG (1:L.P.G.)
Delivery temperature	Displays delivery temperature
DHW temperature	Displays D.H.W. output temperature
Set heating	Displays set heating temperature
DHW set	Displays set D.H.W. temperature
Outdoor temperature	Displays outdoor temperature if external sensor fitted (optional)
DHW input temperature	Displays D.H.W. input temperature
Return temperature	Displays return temperature
Delivery temperature 2	Displays safety delivery probe
System delivery temp.	Displays the temperature read by the system delivery probe (optional)
Pump flow rate	Displays system flow rate
DHW flow rate	Displays the D.H.W. flow rate measured by the flow meter
Fan speed	Displays fan speed (rpm)
Flue gas temperature	Displays flue gases temperature
Maintenance within	Displays the number of days within which maintenance must be carried out (*)
Main board. SW rev.	Displays boiler board SW version
Firmware version	Displays display board SW version

(*) The row is not displayed after the number of days or if the function is deactivated.

4.4 Accessing the "Service" menu (Installer)

Access restricted to authorised and appropriately trained technicians.

To access the "Service" menu, restricted to authorised and appropriately trained technicians, proceed as follows:

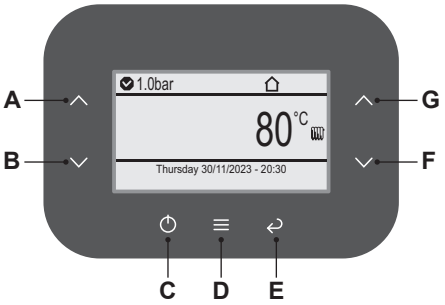


Figure 4.11

1 Press key "D" (Figure 4.11) to access the main menu (Figure 4.12).

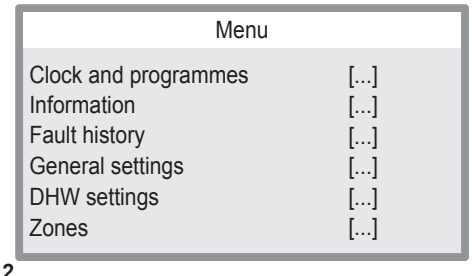


Figure 4.12

2 Press key "A" or "B" (Figure 4.11) to select the desired menu (Figure 4.13).

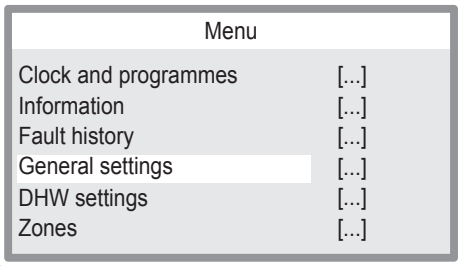


Figure 4.13

3 Press key "D" (Figure 4.11) to access the selected menu (Figure 4.14).

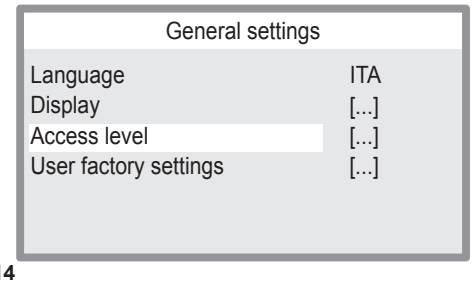


Figure 4.14

4 Press key "D" (Figure 4.11) again and enter the password (6683). Use key "F" or "F" to enter the corresponding value and key "A" or "B" to move to the next value. Press key "D" again to confirm the password (Figure 4.15).

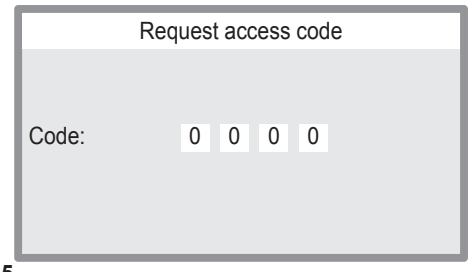


Figure 4.15

5 Press key "F" or "G" (Figure 4.11) to select "Service" (Figure 4.16).

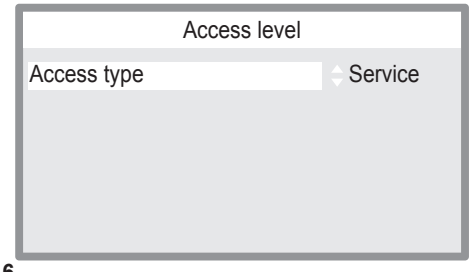


Figure 4.16

6 Press key "D" (Figure 4.11) again to confirm access to the

"Service" level or key "E" to exit (return to previous level).

"Service" level remains active while browsing the menus and for 4 more minutes after returning to the main screen.

If the appliance is switched off and back on, the menu automatically returns to User level.

4.5 Programming the maintenance period

Following the procedure described in paragraph "Accessing the "Service" menu (Installer)" page 15.

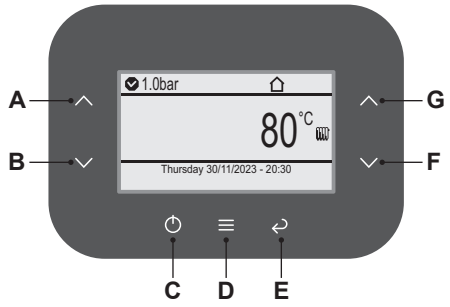


Figure 4.17

1 Press key "D" (Figure 4.17) to go to the main menu (Figure 4.18).

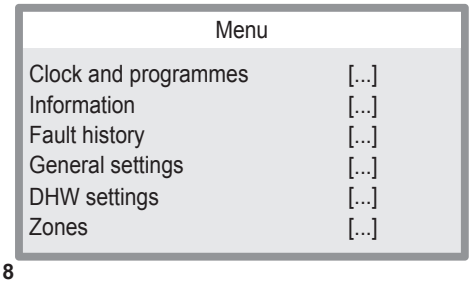


Figure 4.18

2 Press key "A" or "B" (Figure 4.17) to select the desired menu (Figure 4.19).

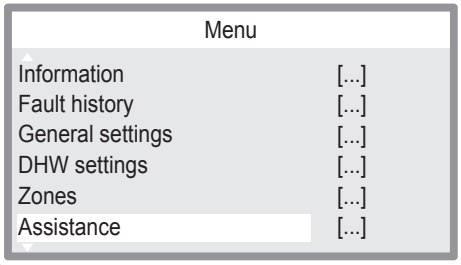


Figure 4.19

3 Press key "D" (Figure 4.17) to access the selected menu (Figure 4.20).

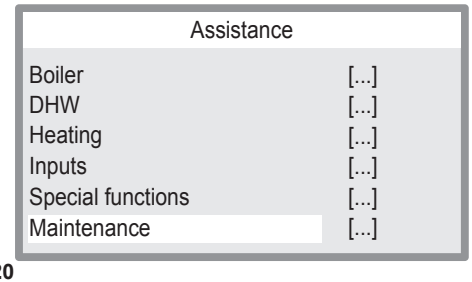


Figure 4.20

4 Press key "A" or "B" (Figure 4.17) to select the desired menu from those available (Figure 4.21).

5 Press key "D" (Figure 4.17) again to highlight the value to be changed.

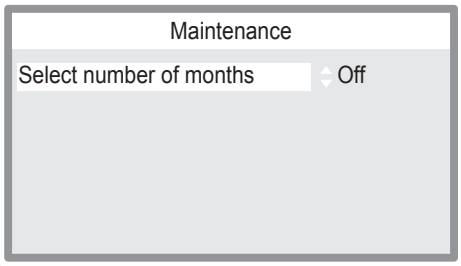


Figure 4.21

6 Use key "F" or "G" to set the number of months until the next maintenance date (Figure 4.22).

Select number of months			
Setting for the number of months until scheduled maintenance			
Default	**Min**	**Max**	**Unit**
Off	Off	36	months

Figure 4.22

7 Press key "D" (Figure 4.17) to confirm the change or key "E" to exit without changing the value (return to previous level).

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.

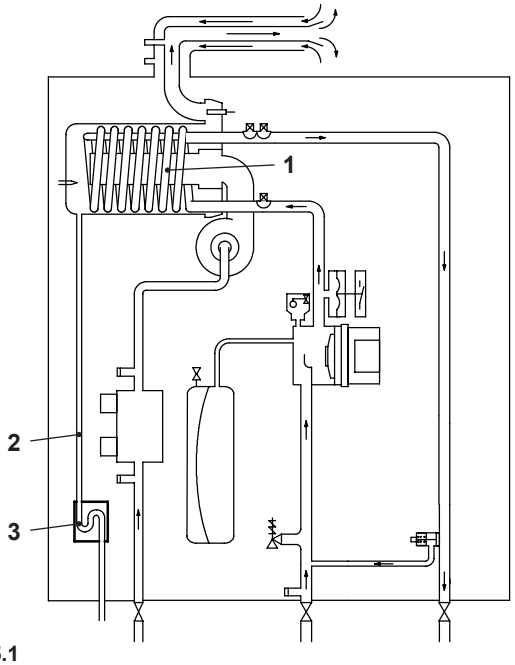


Figure 5.1

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 38.

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.

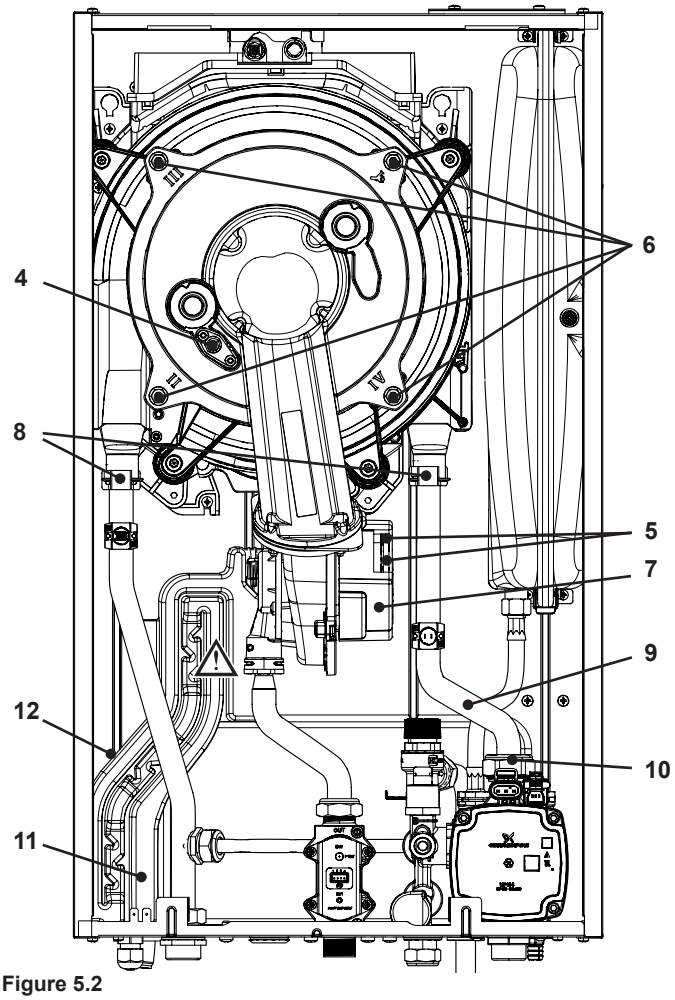


Figure 5.2

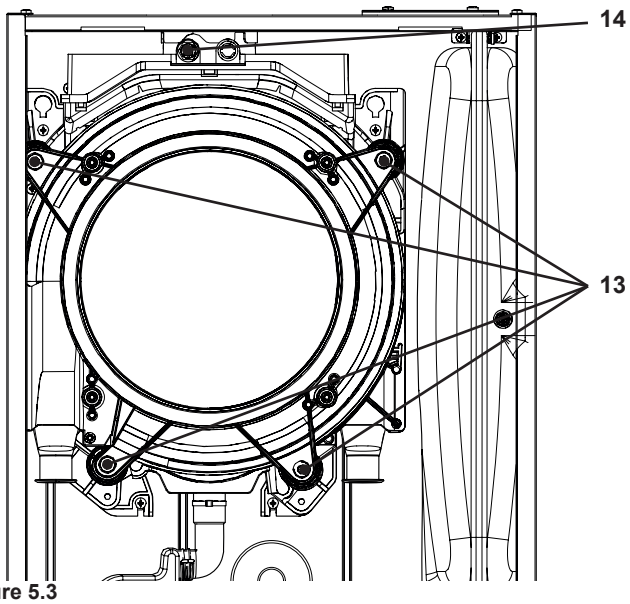


Figure 5.3

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.

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 29.

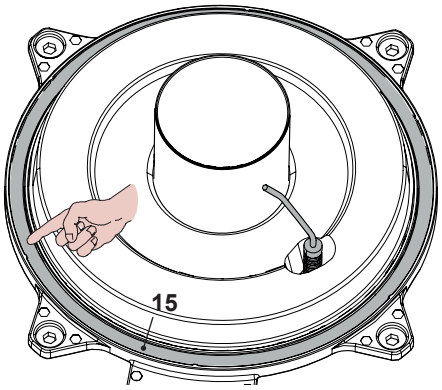


Figure 5.4

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).

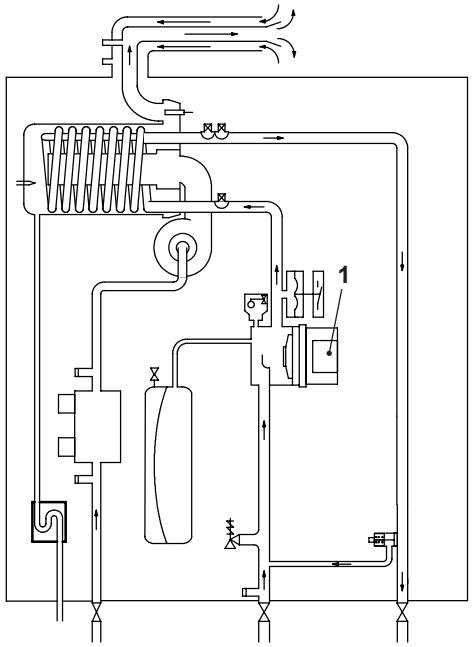


Figure 6.1

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 connectors "2" (Figure 6.2).
4 Unscrew the four screws "3" and remove the pump head "1".

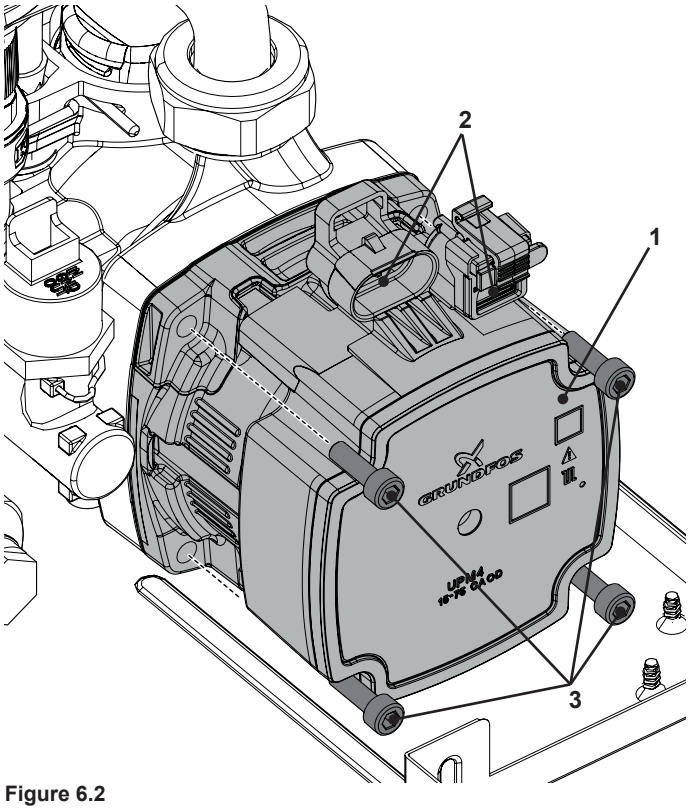


Figure 6.2

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.

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

7.1 Function

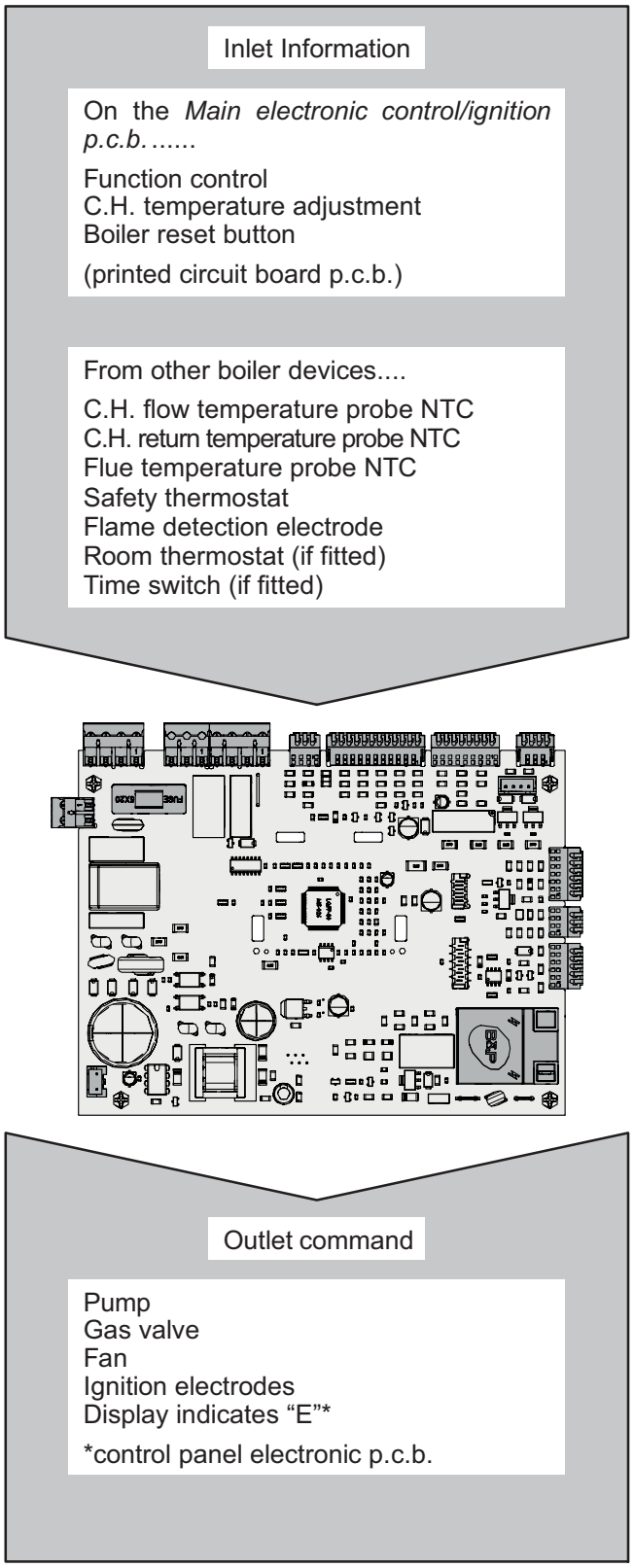


Figure 7.1

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 27).

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 7.14 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.

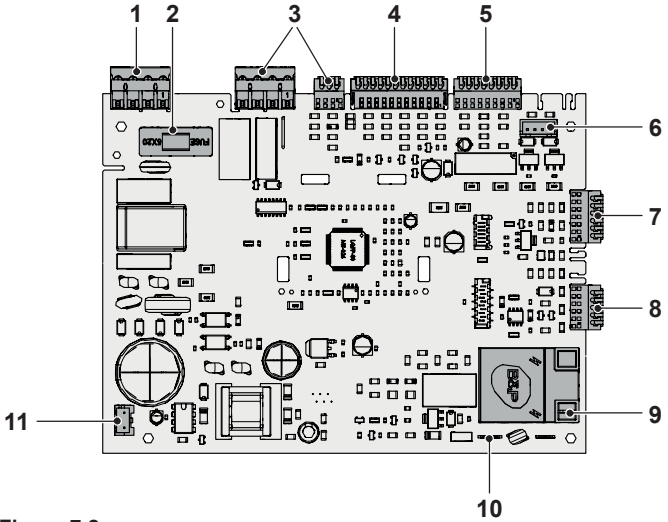


Figure 7.2

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 - display board
9 Connector - ignition / detection electrode
10 Connector - ground reference for ignition / detection electrode
11 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.

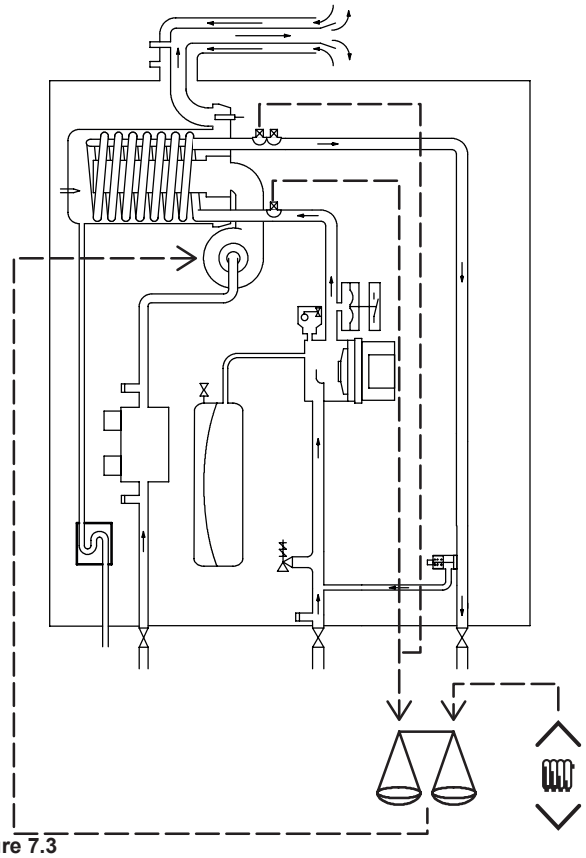


Figure 7.3

The control sequences in function ▥ are illustrated in detail in sections "7.9 Thermal control in the ▥ mode" on page 26.

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 Go to the "Service" area following the procedure described in paragraph "Accessing the "Service" menu (Installer)" page 15.

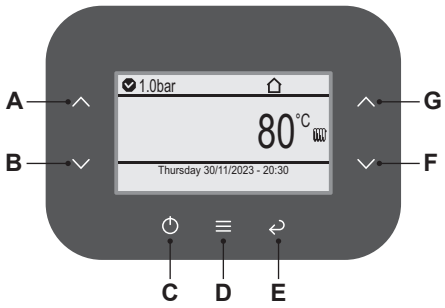


Figure 7.4

2 Press key "D" (Figure 7.4) to go to the main menu (Figure 7.5).

Menu	
Clock and programmes	[...]
Information	[...]
Fault history	[...]
General settings	[...]
DHW settings	[...]
Zones	[...]

Figure 7.5

3 Press key "A" or "B" (Figure 7.4) to select the desired menu. See parameter list in section "Parameters setting" on page 24
4 Press key "D" (Figure 7.4) to access the selected menu.
5 Use key "F" or "G" (Figure 7.4) to change the value of the parameter.
6 Press key "D" (Figure 7.4) to confirm the change or key "E" to exit without changing the value (return to previous level).
7 To exit the parameters menu:
- wait 15 minutes without pressing any key;
- switch off the electric power supply.

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.

7.5 Reset / "Service" factory settings (installer)

The "Service factory settings" function is used to restore all parameters set by the installer to factory settings.
To do this:
Following the procedure described in paragraph "Accessing the "Service" menu (Installer)" page 15.

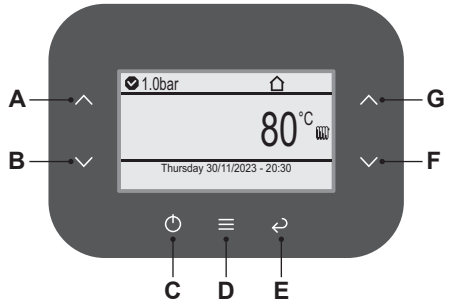


Figure 7.6

1 Press key "D" (Figure 7.6) to go to the main menu (Figure 7.7).

Menu	
Clock and programmes	[...]
Information	[...]
Fault history	[...]
General settings	[...]
DHW settings	[...]
Zones	[...]

Figure 7.7

2 Press key "A" or "B" (Figure 7.6) to select the desired menu (Figure 7.8).

Menu	
Information	[...]
Fault history	[...]
General settings	[...]
DHW settings	[...]
Zones	[...]
Assistance	[...]

Figure 7.8

3 Press key "D" (Figure 7.6) to access the selected menu (Figure 7.9).

Assistance	
Boiler	[...]
DHW	[...]
Heating	[...]
Inputs	[...]
Special functions	[...]
Maintenance	[...]

Figure 7.9

4 Press key "A" or "B" (Figure 7.6) to select the desired menu (Figure 7.10).

5 Press key "D" (Figure 7.6) again to highlight the value to be changed.

Boiler	
External relays	[...]
Flue system	[...]
Timers	[...]
Anti-freeze function	[...]
Pump	[...]
Factory settings	[...]

Figure 7.10

6 Press key "D" (Figure 7.6) to access the selected menu (Figure 7.11).

General settings	
Language	ITA
Display	[...]
Access level	[...]
User factory settings	[...]
Service factory settings	[...]

Figure 7.11

7 Press key "D" (Figure 7.6) to access the selected menu (Figure 7.12).

8 Press key "D" (Figure 7.6) again to confirm the RESET.

Only confirm the "Request for confirmation" if you are sure you want to restore all user parameters to factory settings!

Request for confirmation
⚠
Confirm the operation?

Figure 7.12

9 Press key "D" (Figure 7.6) to confirm the change or key "E" to exit without changing the value (return to previous level).

7.6 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.

7.7 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 21).

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 7.13).

4 Delicately flex the hooks "2" in the directions indicated (Figure 7.13) 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*.

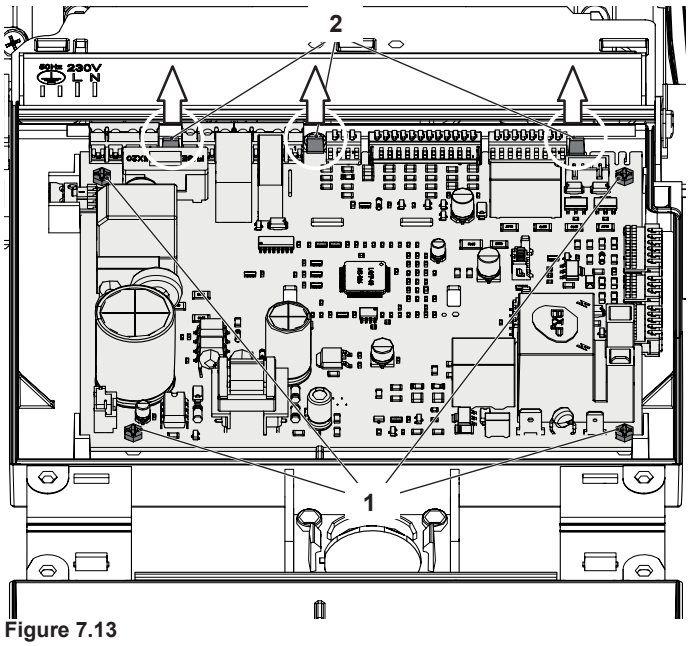


Figure 7.13

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 29.

7.8 Parameters setting

PARAMETER	MENU ITEM	MODEL	VALUE
P01	Menu > Assistance > Boiler > Combustion > Model	ANTARES 30S (M300V.30 SR)	15
P02	Menu > Assistance > Boiler > Combustion > Gas type		NG (CH4)
			LG (G31)
P04	Menu > Assistance > Boiler > Hydraulic		Stor. tank
P05	Menu > Assistance > Inputs > Configurable input		transduc.2
P06	Menu > Assistance > DHW > Storage tank control input		No
P07	Menu > Assistance > Heating > Heating set max		80 °C
P08	Menu > Assistance > Heating > Heating set min		25 °C
P09	Menu > Assistance > Boiler > Power > CH max power	ANTARES 30S (M300V.30 SR)	90 %
P10	Menu > Assistance > Boiler > Timers > Heating anti-cycling		6x60s
P11	Menu > Assistance > Boiler > Pump > Minimum speed		70 %
P12	Menu > Assistance > Boiler > Timers > Heating post-circulation		6x60s
P13	Menu > Assistance > Boiler > Pump > Mode		2
P14	Menu > Zones > Zone 1 > Configuration > Adjustment > Offset climatic curve		CH
P15	Menu > Assistance > Boiler > Set primary pres. min		1.0bar
P16	Menu > Assistance > Boiler > Timers > Heating ramp		0 min
P17	Menu > Assistance > Boiler > Pump > Delta t		20 °C
P18	Menu > Assistance > DHW > Set DHW max		55 °C
P19	Menu > Assistance > DHW > Set DHW min		35 °C
P20	Menu > Assistance > DHW > DHW ON flow rate thres.		2.0 l/min
P21	Menu > Assistance > DHW > DHW OFF flow rate thr.		1.5 l/min
P22	Menu > Assistance > Boiler > Pump > DHW activ. delay		0 sec
P23	Menu > Assistance > DHW > DHW hysteresis OFF		0 °C
P24	Menu > Assistance > DHW > DHW hysteresis ON		2 °C
P25	Menu > Assistance > DHW > Pre-heating function	ANTARES 30S (M300V.30 SR)	0
P26	Menu > Assistance > DHW > Post-heating function		0
P27	Menu > Assistance > Boiler > Power > DHW max power	ANTARES 30S (M300V.30 SR)	90 %
P28	Menu > Assistance > DHW > Anti-legionella > Set Anti-legionella		0 °C
P29	Menu > Assistance > DHW > Anti-legionella > Anti-legionella period		3 gg
P30	Menu > Assistance > Boiler > Factory settings		0
P31	Menu > Assistance > Special functions > Chimney sweep function > Chimney sweep fun.active		0
P32	Menu > Assistance > Special functions > Chimney sweep function > DHW min power		0 %
P33	Menu > Assistance > Special functions > Chimney sweep function > CH min power		0 %
P34	Menu > Assistance > Maintenance > Select number of months		12
P35	Menu > Assistance > Boiler > Anti-freeze function > Anti-freeze activ. temp.		5 °C
P36	Menu > Assistance > Boiler > Anti-freeze function > Anti-freeze deactiv. temp.		35 °C
P37	Menu > Assistance > Boiler > Anti-freeze function > Anti-fr.activ.outdoor temp		11 °C
P38	Menu > Assistance > Boiler > External relays > Relay 1		0
P39	Menu > Assistance > Boiler > External relays > Relay 2		0
P40	Menu > General settings > Display > Display current value		CH
P42	Menu > Assistance > DHW > Delivery temp. delta		25 °C
P43	Menu > Assistance > Heating > Max set Zone2		45 °C
P44	Menu > Assistance > Heating > Set management mode		1
P45	Menu > DHW settings > Comfort function		OFF
P46	Menu > Assistance > Boiler > System min. press. set		0.4 bar

MAIN ELECTRONIC CONTROL/IGNITION P.C.B.

PARAMETER	MENU ITEM	MODEL	VALUE
P47	Menu > Assistance > Special functions > Deaeration function > Vent enabled		1
P48	Menu > Assistance > Boiler > Pump > CH maximum speed		100 %
P49	Menu > Assistance > Boiler > Pump > DHW maximum speed		100 %
P50	Menu > Assistance > Inputs > Configure CN2		0
P51	Menu > Assistance > DHW > Set incr. DHW for off		10 °C
P52	Menu > Assistance > Boiler > Flue system > Length		0
P53	Menu > Assistance > Boiler > Combustion > Fan rpm max		6800 rpm
P54	Menu > Assistance > Boiler > Combustion > Fan rpm min		1000 rpm
P55	Menu > Assistance > Boiler > Combustion > Fan rpm acc.	ANTARES 30S (M300V.30 SR)	3300 rpm
P56	Menu > Assistance > Boiler > Noise reduction		OFF
P57	Menu > Assistance > Inputs > External sensor type		beta 3760
P58	Menu > General settings > Display > Brand		Biasi
P59	Menu > General settings > Language		ITA
			ENG
			POL
			SPA
			HU
P60	Menu > Assistance > Boiler > Three-way valve > Control		0
P61	Menu > Assistance > Boiler > Primary flow rate min. set		32
P62	Menu > Assistance > Boiler > Flue gas offset		15

7.9 Thermal control in the mode

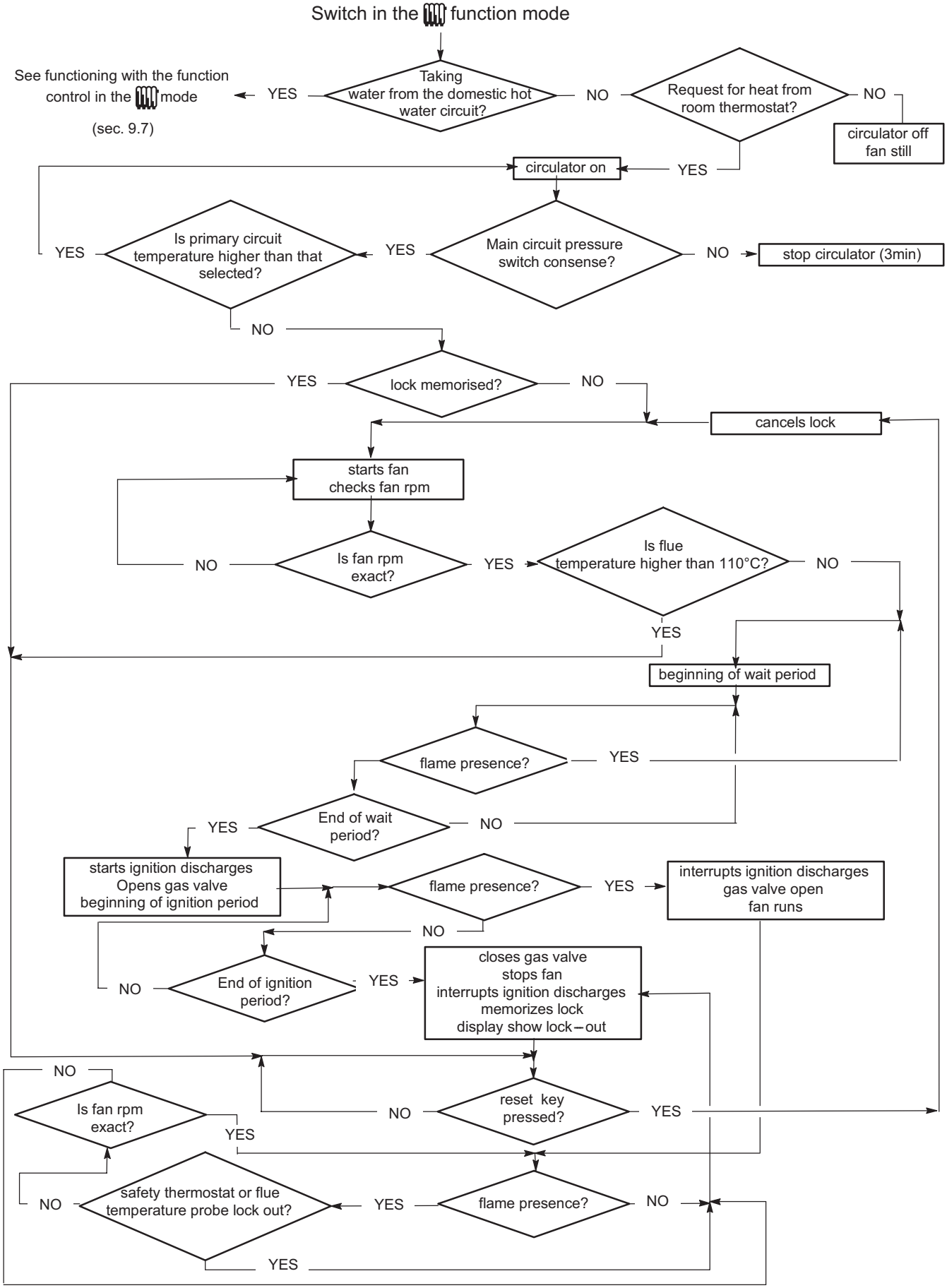


Figure 7.14

8 CONTROL PANEL ELECTRONIC P.C.B.

8.1 Function

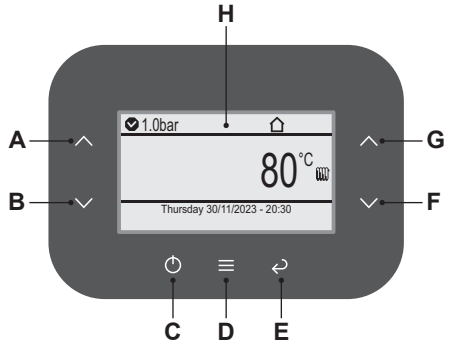


Figure 8.1

A Programming key
B Programming key
C Reset/Stand-by/Winter/Summer key
D Confirm / Menu key
E Back / Exit key
F C.H. temperature reduce key
G C.H. temperature increase key
H 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

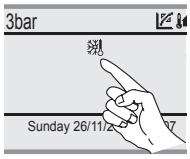
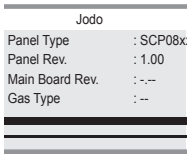
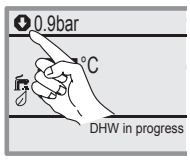
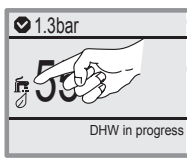
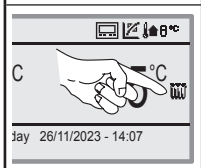
KEY

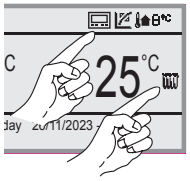
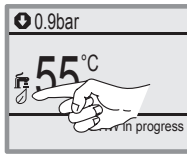
	Modbus communication BUS connection.
	Icon showing zone remote panel presence.
	Connecting the external probe.
	Water pressure within correct range.
	System water pressure below minimum.
	Heating function enabled (winter).
	Heating function in progress.
8 °C	Outdoor temperature.
	Zone identification icon.
	Zone identification icon with request in progress.
	OFF mode.
	Stand-by mode.
	Anomaly detected icon.

SIGNAL DISPLAYED BY THE LCD

LCD	FUNCTION
1 +	Safety lockout due to failed ignition.
2 +	Lockout due to safety thermostat.
3 +	Generic lockout.
4 +	Pump circulation failure, insufficient system pressure or pressure above 3 bar, water pressure sensor not connected.
5 +	Control fault: fan.
6 +	NTC heating delivery probe failure.
7 +	D.H.W. NTC probe failure / Hot water tank sensor failure.
8 +	External NTC probe failure.
10 +	Lockout due to tripping of the flue gas probe and thermal fuse.
11 +	Parasite flame.
12 +	Return NTC probe failure.
13 +	Delta T M-R > 40K.
14 +	Pump fault or primary temperature above 105°C.
14 +	Temperature gradient circulation failure (>2K/s).
15 +	Probable insufficient circulation.
16 +	Flue gas overheating detected by NTC.
18 +	No ΔT heating at start-up.
19 +	Auxiliary Input Probe Anomaly.
20 +	EVG lockout (valve piloting hardware failure).
21 +	EVG lockout (valve control Relay Failure).
22 +	EVG lockout (flame after closing valve Ref. EVG).
23 +	Gas valve modulator disconnected.
24 +	Anomaly due to probable chimney obstruction.
25 +	Flame loss for more than 6 consecutive times.
26 +	Maximum deviation fault between the 2 heating NTC probes.
40 +	Incorrect mains electrical supply frequency.
42 +	Keys fault.

CONTROL PANEL ELECTRONIC P.C.B.

LCD	FUNCTION
44 + 	Fault of cumulative gas valve timeout without flame. Heating water low pressure fault, pressure below minimum.
50 + 	OT communication fault.
62 + 	Calibration request.
65 + 	System fails to control combustion and exits modulator control parameters.
68 + 	Probable low gas pressure.
77 + 	System out modulator control parameters.
78 + 	Probable low gas pressure.
79 + 	System out modulator control parameters.
89 + 	Internal error (usually hardware) or problems with the mains electrical supply (excessive distortion of waveform).
91 + 	Maximum number of lockouts reached.
96	Incorrect network frequency.
96 + 	After 5 E02 - E14 - E04 - E15 - E16 error events, the boiler goes into lockout.
97	Power supply voltage low.
99	Card not configured.
L1	Primary limitation in D.H.W. mode.
	Boiler in Stand-By, the symbol shown in the figure appears (antifreeze protection active).
	When powering ON the boiler, this sequence appears (for 2 seconds).
	The symbol shown in the figure appears if the pressure is incorrect.
	Boiler with D.H.W. power request.
	Boiler with central heating request via room thermostat.

LCD	FUNCTION
	Boiler with central heating power request with connected remote.
	Eco function NOT active.

9 GAS VALVE

9.1 Function

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

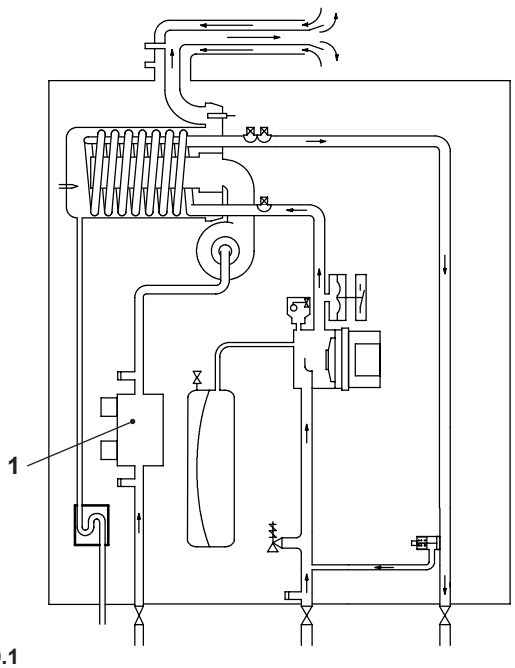


Figure 9.1

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

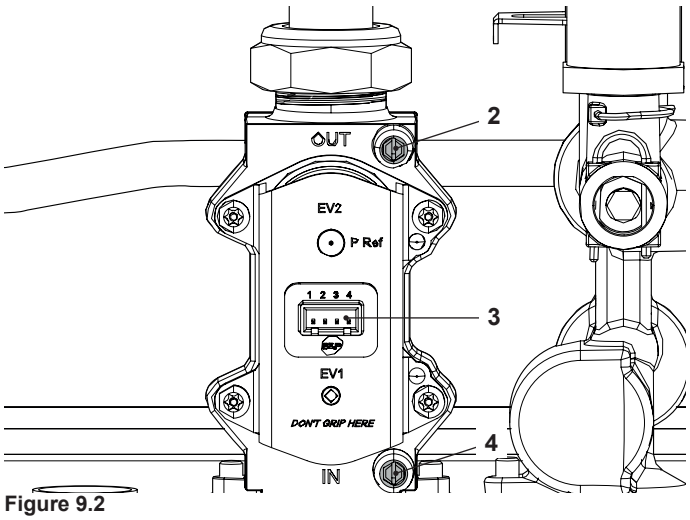


Figure 9.2

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).

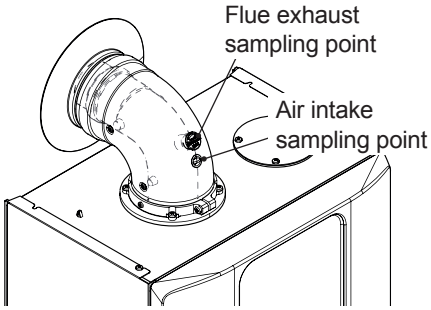


Figure 9.3

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 minuets to pre-heat the flue, before commencing any adjustments.
12 Make sure that the room thermostat is in the "heat request" position.
13 Go to the "Service" area following the procedure described in paragraph "Accessing the "Service" menu (Installer)" page 15.

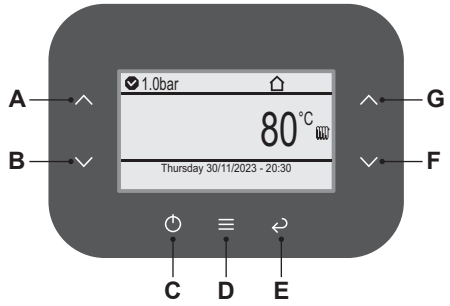


Figure 9.4

14 Press button "D" (Figure 9.4) to go to the main menu (Figure 9.5).

Menu	
Clock and programmes	[...]
Information	[...]
Fault history	[...]
General settings	[...]
DHW settings	[...]
Zones	[...]

Figure 9.5

15 Press button "A" or "B" (Figure 9.4) to select the desired menu (Figure 9.6).

Menu	
Information	[...]
Fault history	[...]
General settings	[...]
DHW settings	[...]
Zones	[...]
Assistance	[...]

Figure 9.6

16 Press button "D" (Figure 9.4) to access the selected menu (Figure 9.7).

Assistance	
Boiler	[...]
DHW	[...]
Heating	[...]
Inputs	[...]
Special functions	[...]
Maintenance	[...]

Figure 9.7

17 Press button "A" or "B" (Figure 9.4) to select the desired menu from those available (Figure 9.8).

18 Press button "D" (Figure 9.4) again to highlight the value to be changed.

Special functions	
Deaeration	[...]
Chimney sweep function	[...]
Calibration complete	[...]
Fast calibration	[...]

Figure 9.8

19 Press button "A" or "B" (Figure 9.4) to select the desired menu from those available (Figure 9.9).

20 Press button "D" (Figure 9.4) again to highlight the value to be changed.

Chimney sweep function	
Chimney sweep fun.active	--
CH max power	100%
CH min power	0%
DHW max power	100%
DHW min power	0%
Fan speed	0prm

Figure 9.9

21 Use button "F" or "G" to modify the value of the parameter according to the type of check to be run (Figure 9.10).

Chimney sweep fun.active			
Activates the chimney sweep function, where: 0 = Off, 1 = DHW minimum output, 2 = heating minimum output, 3 = heating maximum output, 4 = DHW maximum output			
Default	**Min**	**Max**	**Unit**
0	0	4	coefficient

Figure 9.10

22 Press button "D" (Figure 9.4) to confirm the change or button "E" to exit without changing the value (return to previous level).

Check minimum burner pressure

1 = DHW minimum output

23 Allow the analyser to give a stable reading.

24 Read the CO_2 % value. It should be between:

Model ANTARES	**Type gas**	**CO_2 % value (range)**
ANTARES 30S	Natural (G20)	8,5 - 9,5
	Propane (G31)	9,5 - 10,5

Check maximum burner pressure

4 = DHW maximum output

25 Allow the analyser to give a stable reading.

26 Read the CO_2 % value. It should be between:

Model ANTARES	**Type gas**	**CO_2 % value (range)**
ANTARES 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 "C" key for 5 seconds and carry out the "Automatic calibration of the gas valve" page 31.

27 Switch off the boiler.

28 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, fan or gas valve, the gas valve must be calibrated in order to carry out CO_2 calibration at maximum boiler output.

1 Turn on the boiler and operate for 2 minuets to pre-heat the flue, before commencing any adjustments.

2 Make sure that the room thermostat is in the “heat request” position.

3 Go to the "Service" area following the procedure described in paragraph "Accessing the "Service" menu (Installer)" page 15.

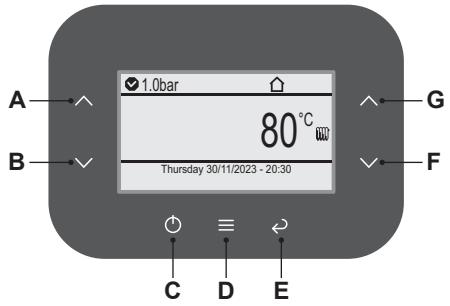


Figure 9.11

4 Press button "D" (Figure 9.11) to go to the main menu (Figure 9.12).

Menu	
Clock and programmes	[...]
Information	[...]
Fault history	[...]
General settings	[...]
DHW settings	[...]
Zones	[...]

Figure 9.12

5 Press button "A" or "B" (Figure 9.11) to select the desired menu (Figure 9.13).

Menu	
Information	[...]
Fault history	[...]
General settings	[...]
DHW settings	[...]
Zones	[...]
Assistance	[...]

Figure 9.13

6 Press button "D" (Figure 9.11) to access the selected menu (Figure 9.14).

Assistance	
Boiler	[...]
DHW	[...]
Heating	[...]
Inputs	[...]
Special functions	[...]
Maintenance	[...]

Figure 9.14

7 Press button "A" or "B" (Figure 9.11 to select the desired menu from those available (Figure 9.15).

8 Press button "D" (Figure 9.11) again to activate the function.

Special functions	
Deaeration	[...]
Chimney sweep function	[...]
Calibration complete	[...]
Fast calibration	[...]

Figure 9.15

On activating the "Fast calibration" function, the appliance runs the sequence of operations to set up nominal, intermediate and minimum output.

The display will show the following:

Fast calibration	
Procedure phase	max ...
Set combustion	--
Perc. power	45%
Delivery temperature	28°C
Flame	On
Heating in progress	

Figure 9.16

Where:

Procedure phase
Indicates the current setup phase: Max procedure phase; Med procedure phase; Min procedure phase.
Set combustion
Value not compiled during the fast calibration procedure.
Perc. power
Indicates the power generated by the burner (0 - 100%)
Delivery temperature
Indicates the water temperature produced by the boiler.
Flame
Indicates flame presence (i.e. burner is on).
Heating in progress
"Heating in progress".

Figure 9.17

9 At the end of "Fast calibration", the display shows "Calibration completed".

If "max err." appears next to "Procedure phase", it means that something went wrong during the process. In this case the operation must be repeated.

10 Check the precise gas calibration of the boiler, referring to section "Adjustment - Chimney Sweep Function" page 29.

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 9.18.

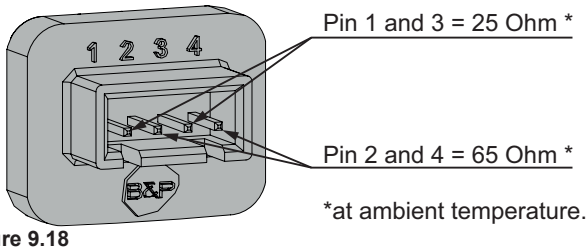


Figure 9.18

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 9.19), see also connector "3" (Figure 9.2).

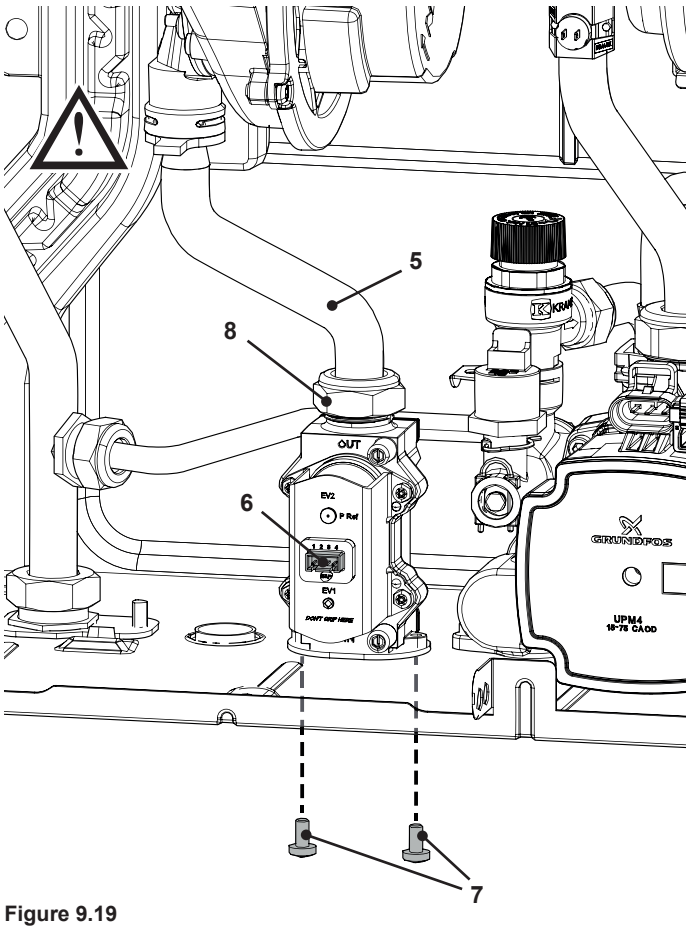


Figure 9.19

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 9.19) and remove the pipe "5".
5 Unscrew the screws "7" and remove the valve (Figure 9.19).
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 31.

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 29.

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.

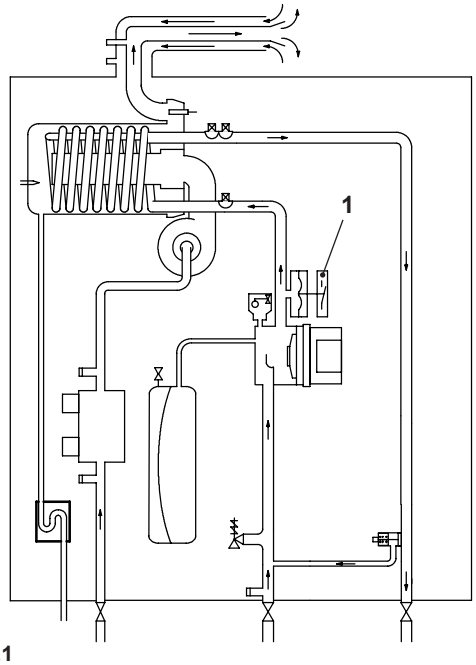


Figure 10.1

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).

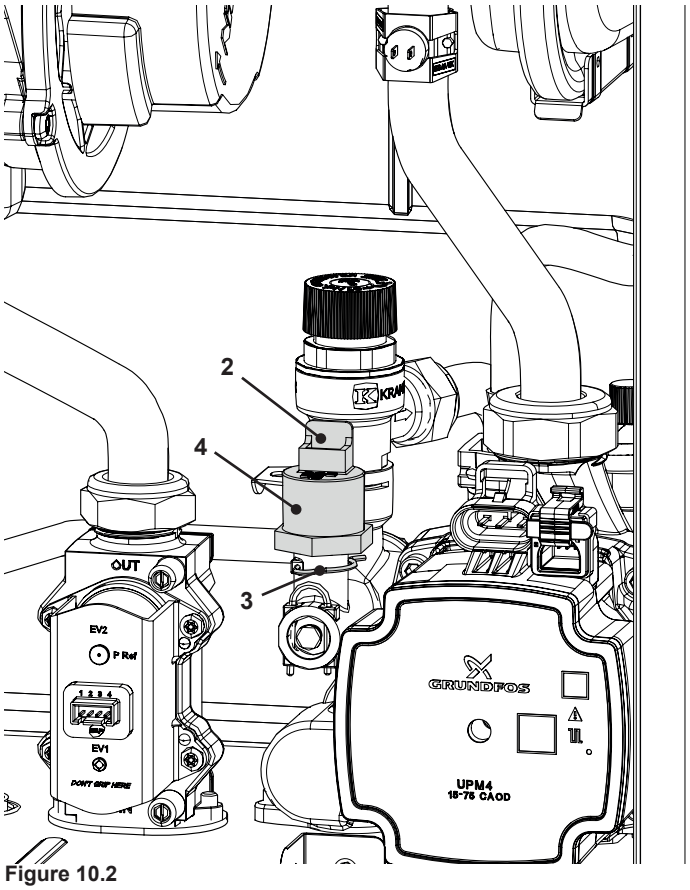


Figure 10.2

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.

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.

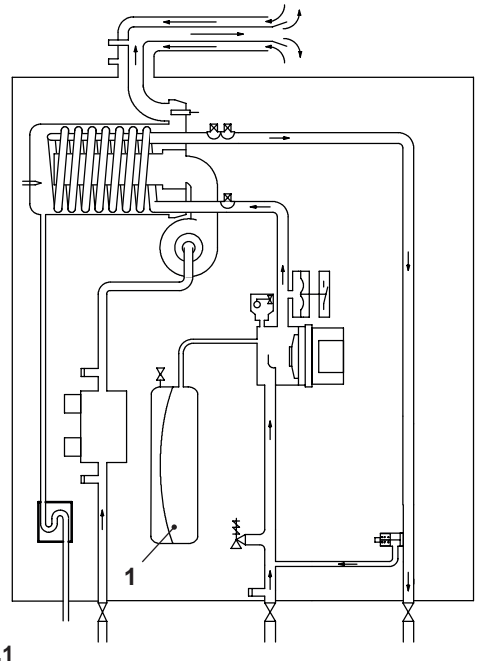


Figure 11.1

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.

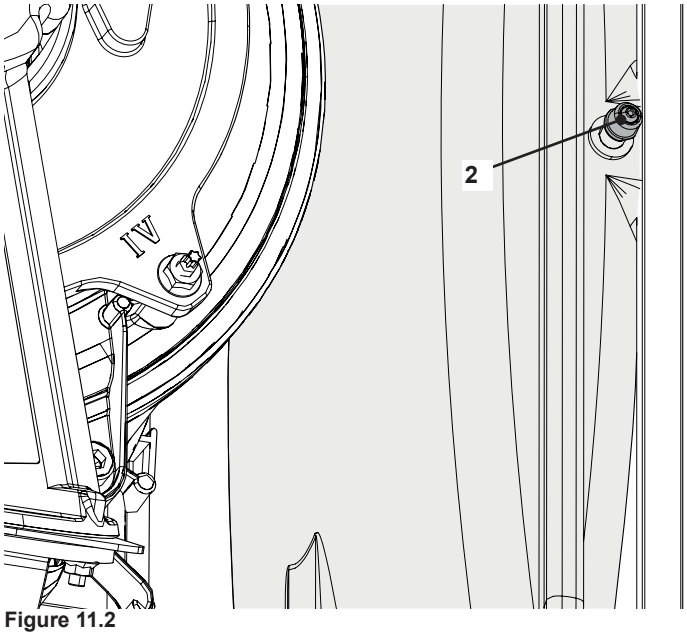


Figure 11.2

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.

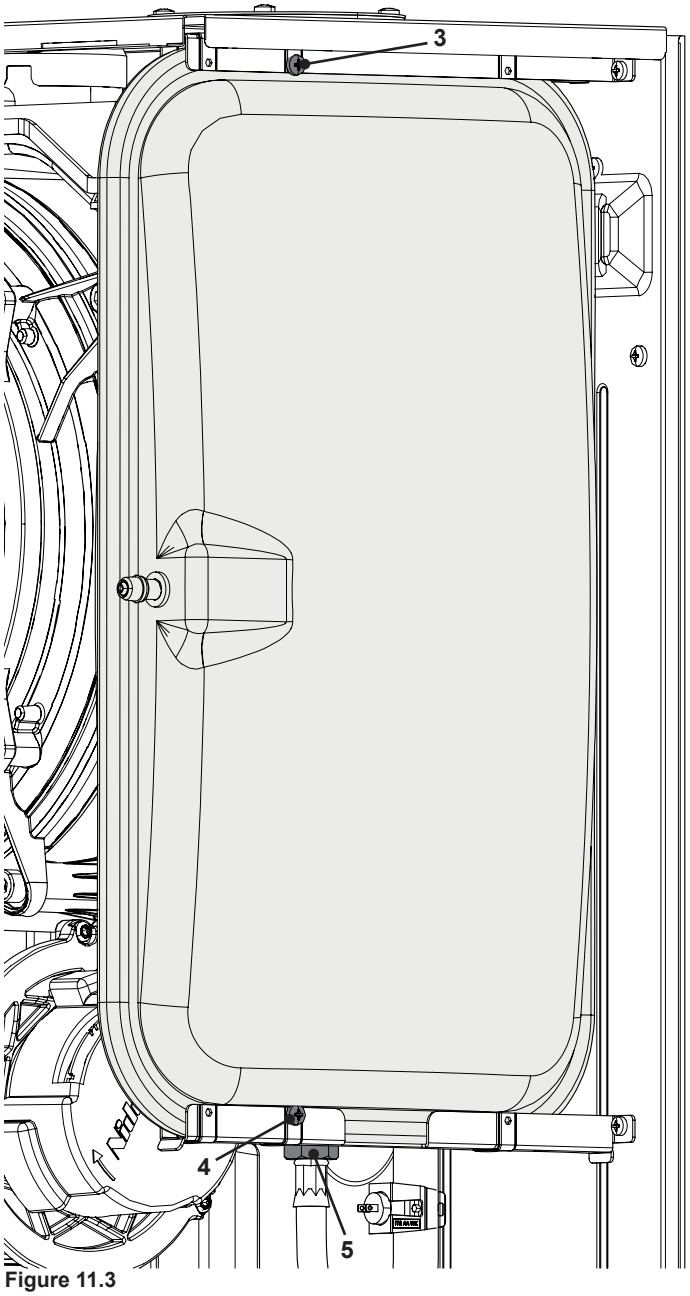


Figure 11.3

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

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.

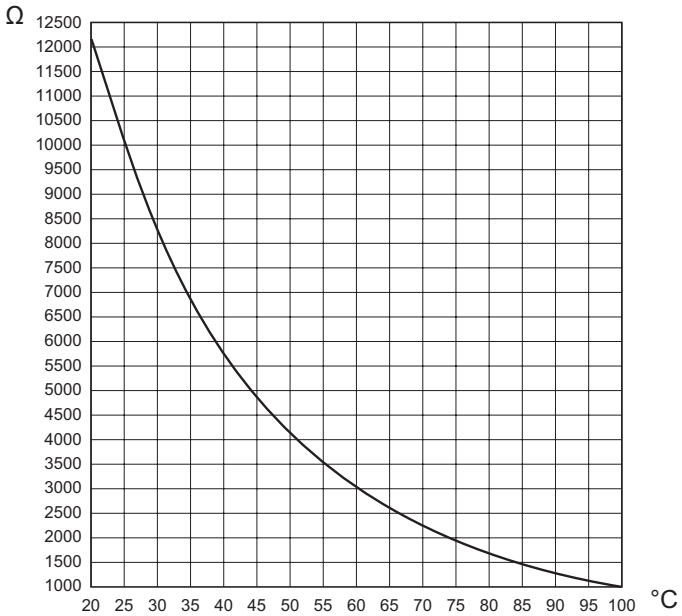


Figure 12.1

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.

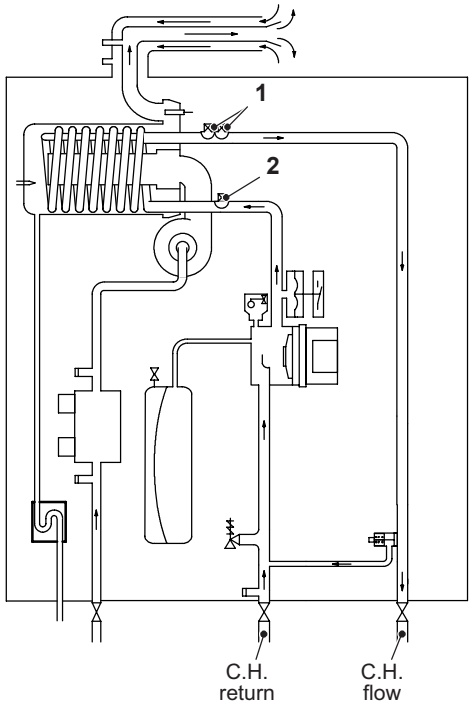


Figure 12.2

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.

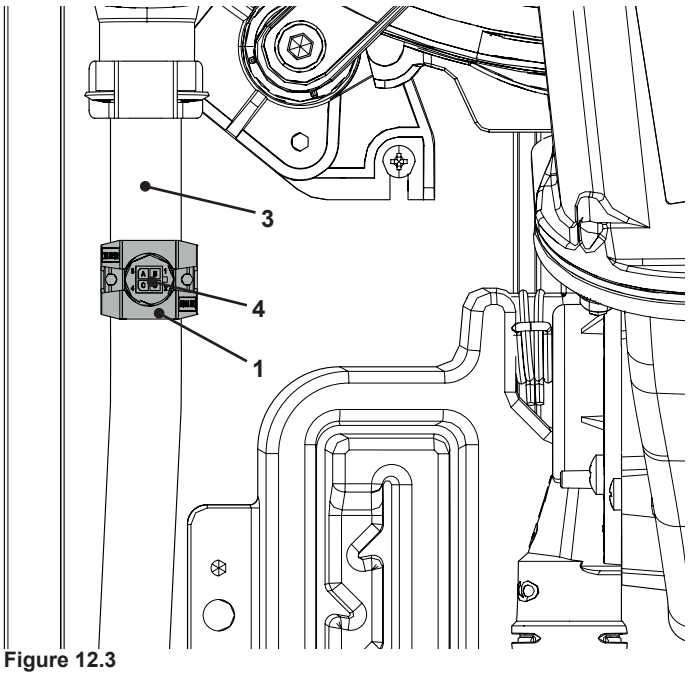


Figure 12.3

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 Authorities.

TEMPERATURE PROBE

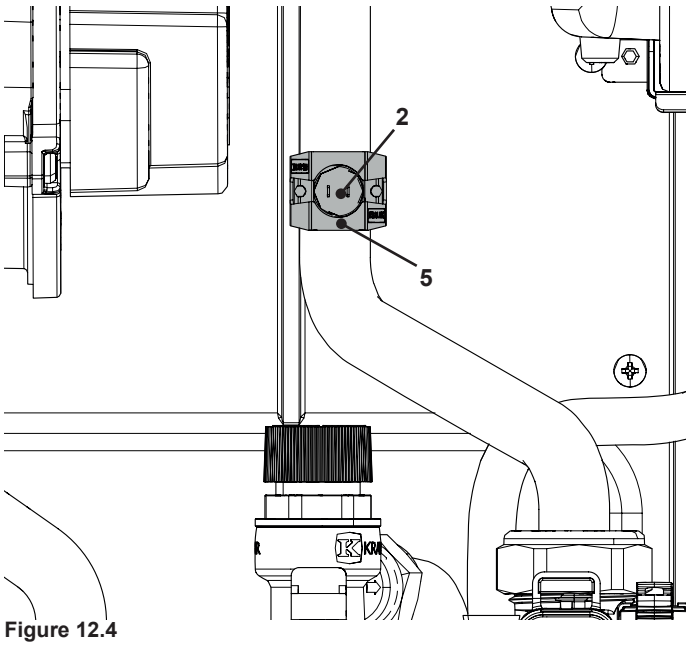


Figure 12.4

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.

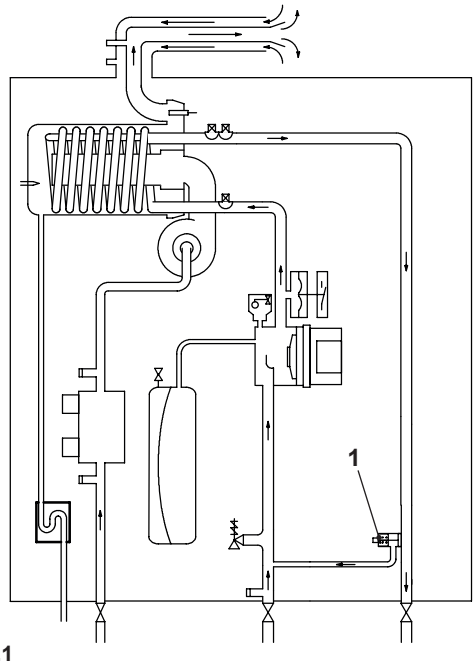


Figure 13.1

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).

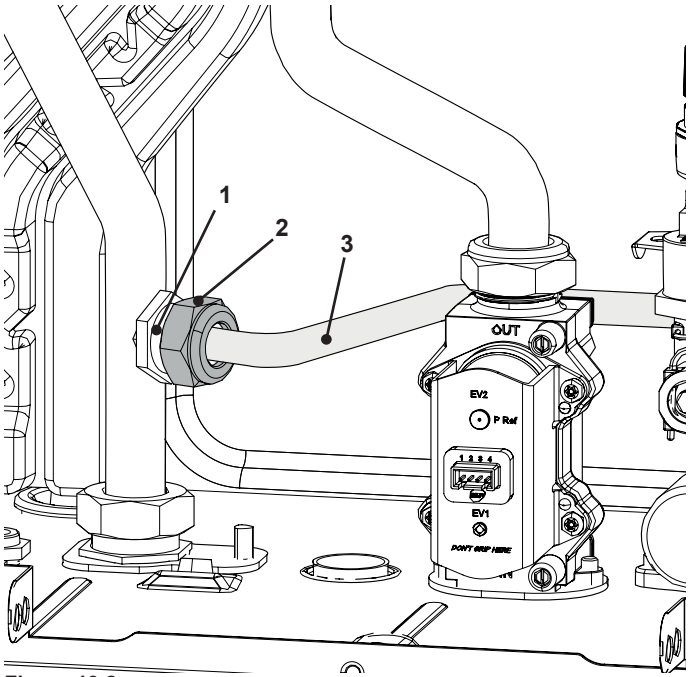


Figure 13.2

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.

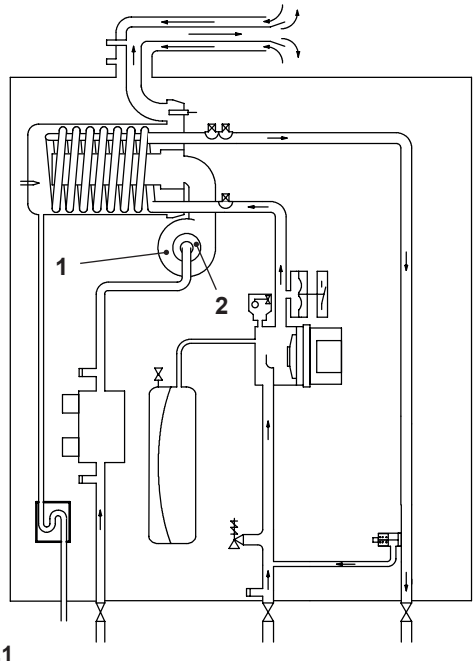


Figure 14.1

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".

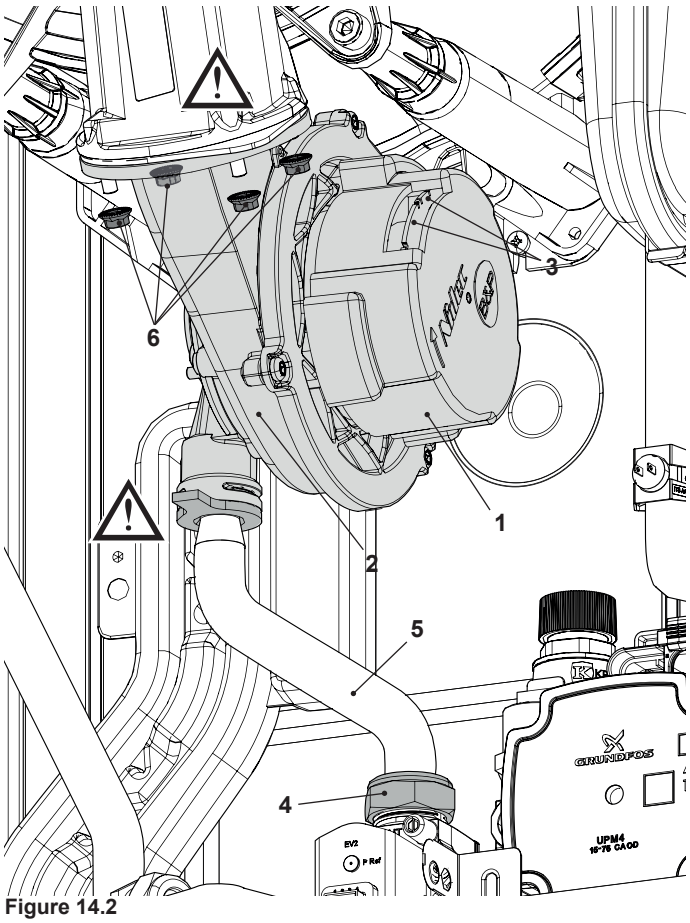


Figure 14.2

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 29.

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".

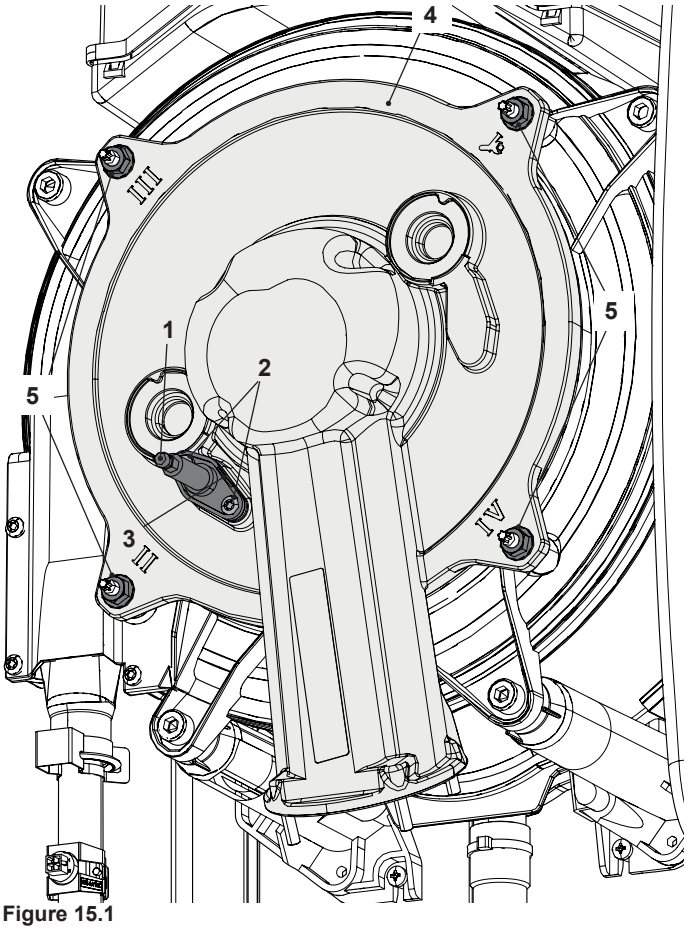


Figure 15.1

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

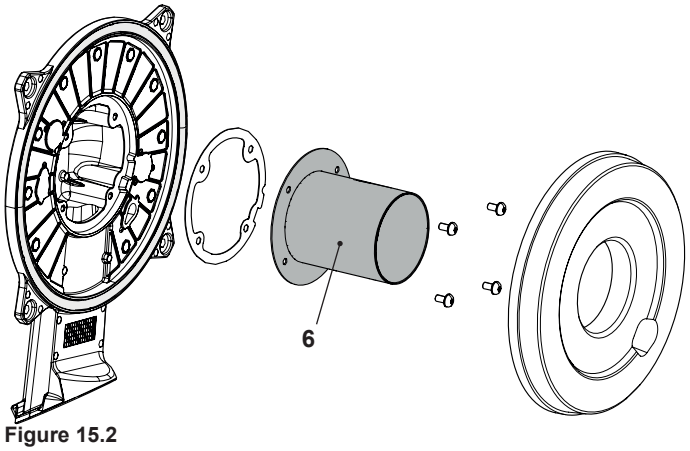


Figure 15.2

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 39).
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.

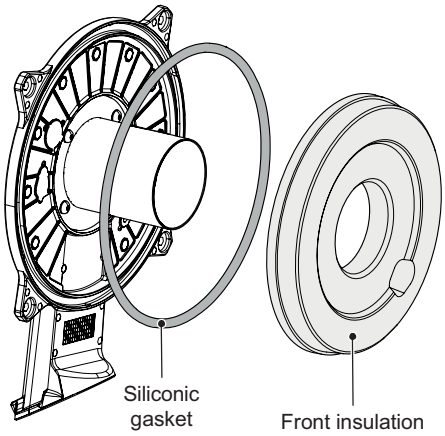


Figure 15.3

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 38).
2 Remove the Ignition and detection electrodes (see section "15.2 Removal of the ignition / detection electrode" on page 39).

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 39).

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).

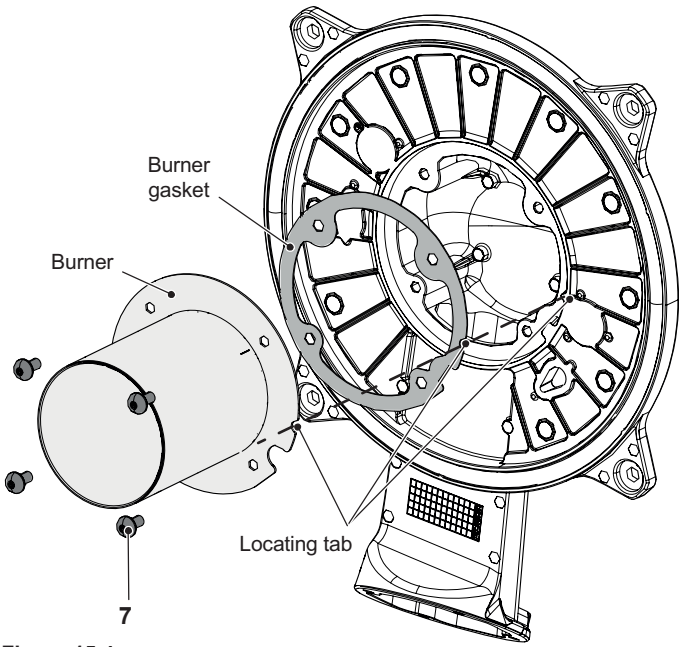


Figure 15.4

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 29).

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 39 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).

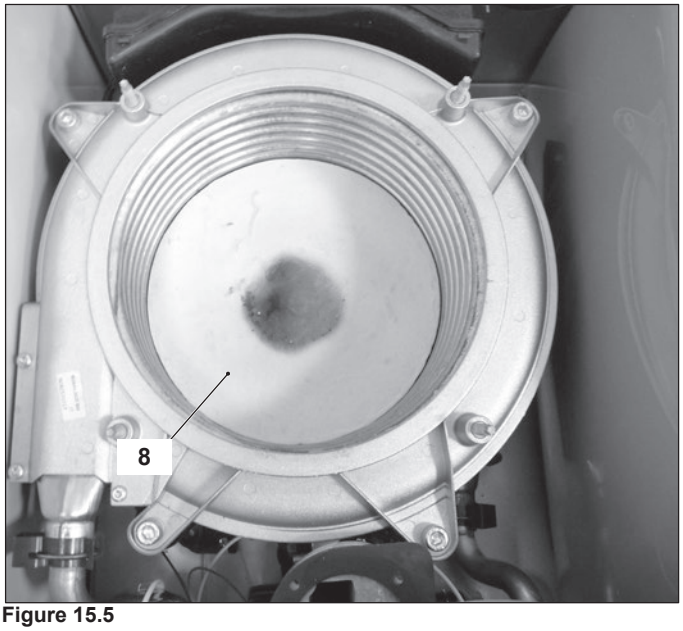


Figure 15.5

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).

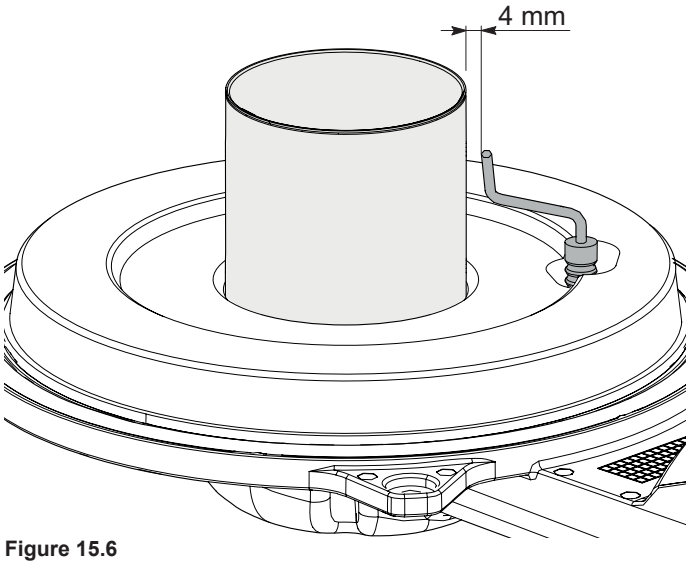


Figure 15.6

Check the connection wires

IGNITION AND DETECTION ELECTRODES

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.

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.

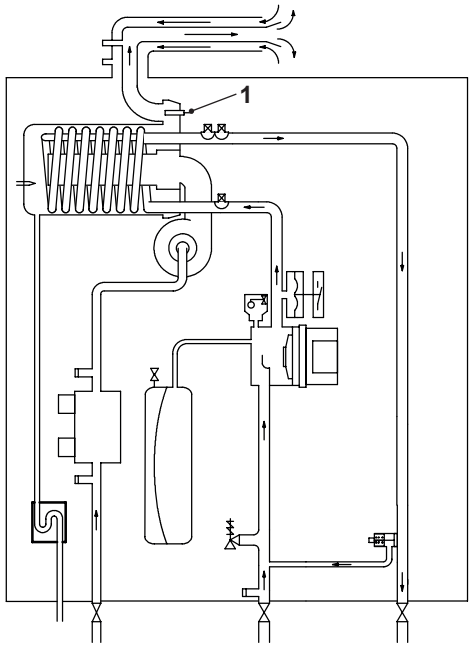


Figure 16.1

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.

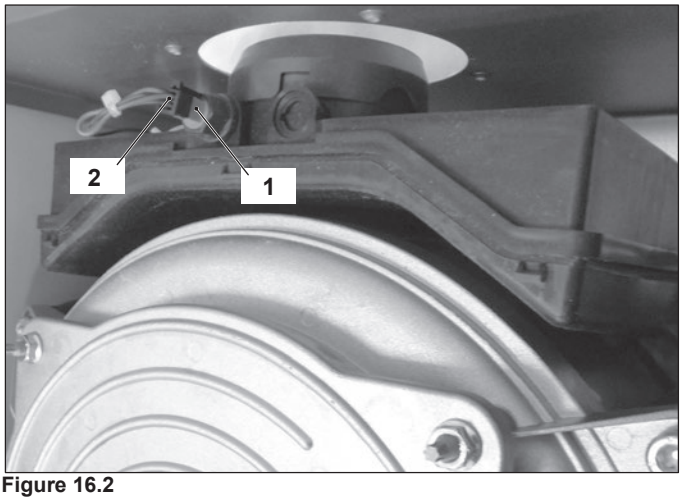


Figure 16.2

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 replaced.

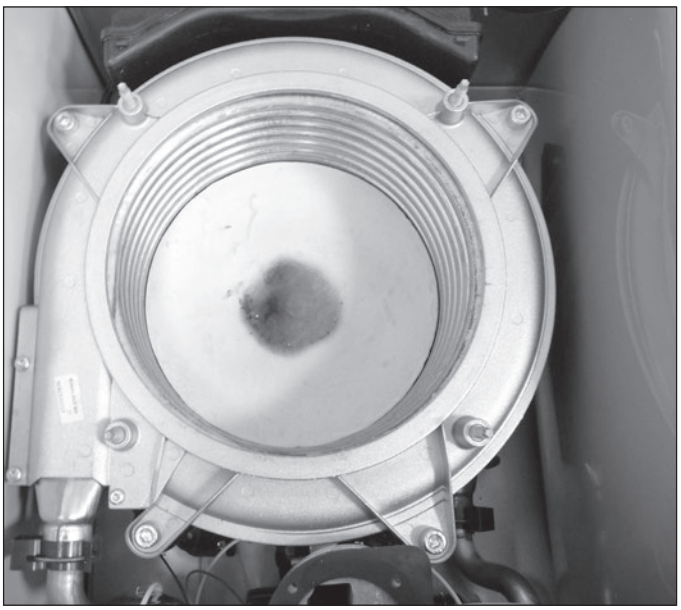


Figure 16.3

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.
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 42).
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

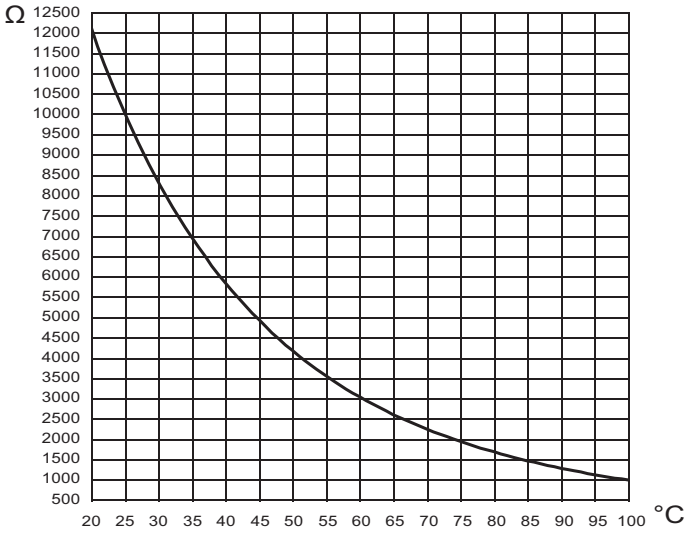


Figure 16.4

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.

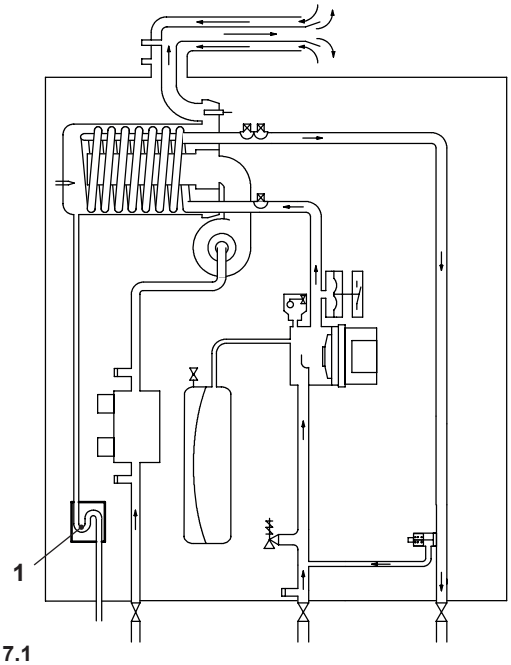


Figure 17.1

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 44).

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".

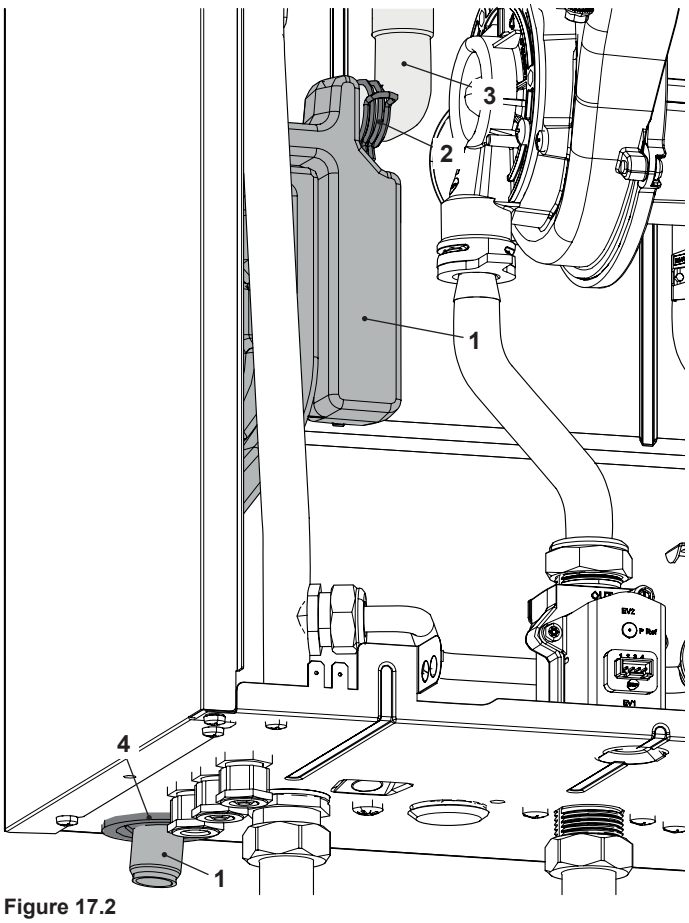


Figure 17.2

5 Reassemble carrying out the removal operations in reverse order.

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	BI2262 108
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 121
8		Pump	1	BI2262 106
9		C.H. temperature flow probe NTC - Safety Thermostat	1	BI1442 117
10		Primary circuit pressure transducer	1	BI1592 115
11		Condensate trap	1	BI1782 107
12		Flue temperature probe NTC and safety thermal fuse	1	BI1782 103
13		Fuse 3,15 AF 250VAC 5x20	1	BI1295 108
14		C.H. temperature return probe NTC	1	BI1442 106
15		Ignition / detection electrode	1	BI1713 107
16		Display board with LCD	1	BI2675 118

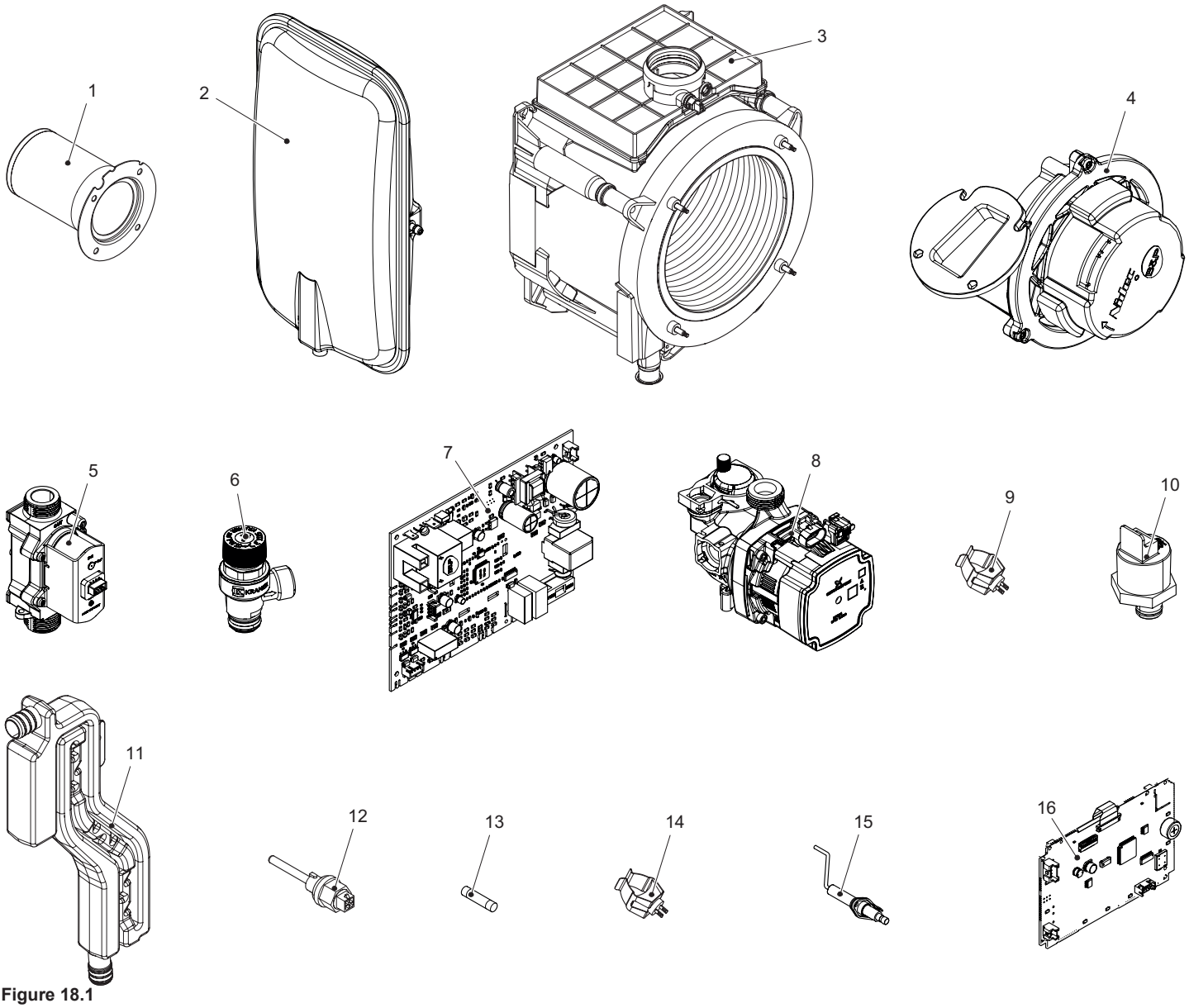


Figure 18.1

NOTE

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