

Mikrofill Ethos
Condensing combination boiler



Maintenance Instructions
24cc

IMPORTANT

“Benchmark” Installation, Commissioning and Service Record Log Book is enclosed in your customer information pack.

“This record must be completed and left with the end user”

CE Mark

Mikrofill gas appliances comply with the requirements contained in CE Mark documents contained with European directives applicable to them. In particular, these appliances comply with the CE directives and technical specifications contained within them :

- ? Gas Appliances directive 90/396
- ? Efficiencies directive 92/42
- ? Low tension directive 73/23 (modified from 93/68)
- ? Electromagnetic Compatibility directive 89/396 (modified from 93/68)

IMPORTANT !

The manual must be read thoroughly, so that you will be able to use the boiler in a safe way. And it must be kept for reference in the future.

Installation and first lighting must be carried out by a competent person.

Repairs must be carried out only by a competent person, using genuine spare parts. Do no more than switching off the boiler yourself.

The boiler allows heating up of water to a temperature less than the boiling point.

The boiler can be used only for those purposes for which it has been specially designed.

The boiler must not be touched by children or by an unfamiliar person to its operation.

The manufacturer disclaim all liability for any translations of the present manual from which incorrect interpretation may occur.

The manufacturer accepts no responsibility for unsatisfactory performance of the appliance and flue due to failure to comply the instructions.

This appliance complies with the EN 483 and EN 625 Standards.

The appliance is build to comply with the regulation now in force regarding gas appliance's safety and the European regulation now in force relative to safety of household and similar electrical appliances.

The manufacturer, in the continuous process to improve his products, reserves the right to modify the data expressed in the present documentation at any time and without prior notice.

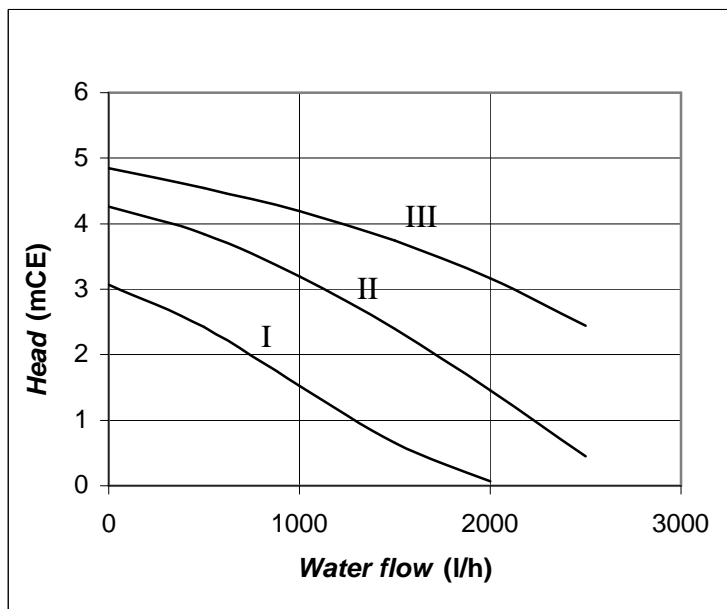
The present documentation is an informative support and it cannot be considered as a contract towards third parties.

CONTENTS

1. TECHNICAL AND DIMENSIONAL CHARACTERISTICS	4
1.1. Pump Characteristics.....	4
1.2. Burner Pressure Adjustment.....	4
1.3. Hydroblock diagrams.....	5
2. SAFETY DEVICES.....	7
3. SETTINGS.....	8
4. ROUTINE CLEANING and INSPECTION.....	10
5. REPLACEMENT OF PARTS	13
6. FAULT FINDING	21
6.1. Fault codes on LED display diagnostic panel.....	21
6.2. Fault Finding Charts.....	22
7. SERVICE PROCEDURE.....	26
7.1. Appliance Checks.....	26
7.2. Service Operation.....	26
7.3. Recommission System.....	26
7.4. Soundness Test.....	26
8. WIRING DIAGRAM.....	27
9. SHORT PARTS LIST	28

1. TECHNICAL AND DIMENSIONAL CHARACTERISTICS

1.1. Pump Characteristics



The pump has 3 different speeds. According to these speeds pump performance curve is given at the diagram on the left.

- I : first speed
- II : second speed
- III : third speed

The factory speed setting of the pump is III. The pump is a SALMSON NBL 53/15 O series.

Diagram 1

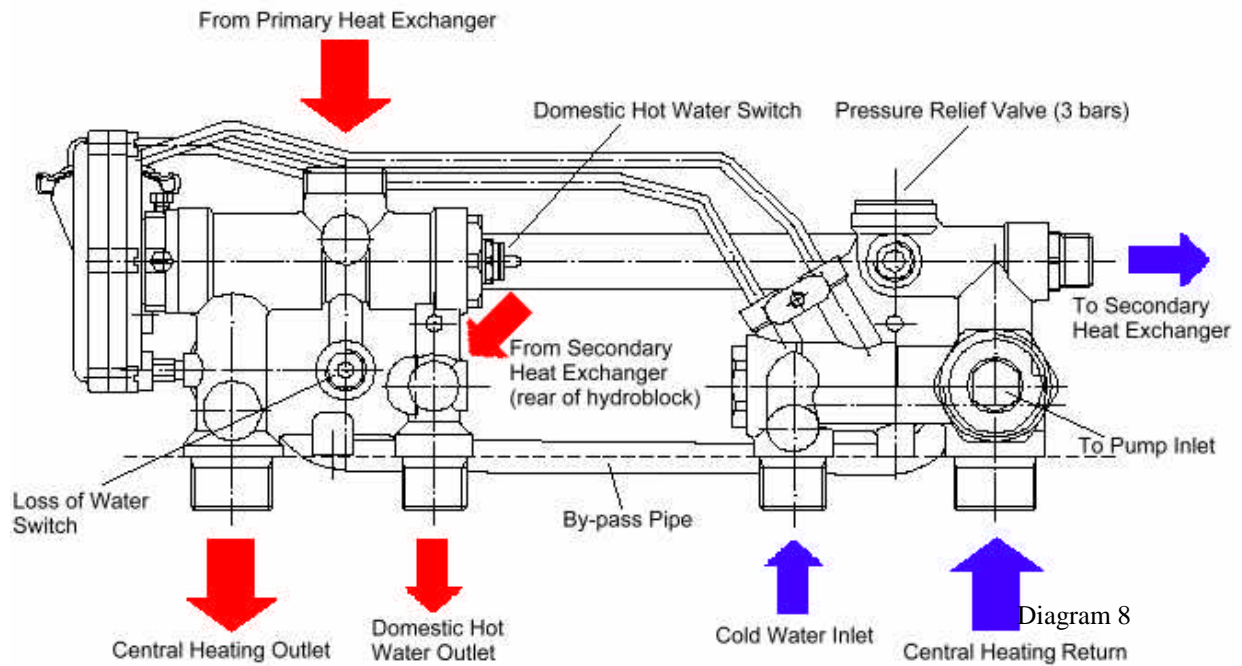
1.2. Burner Pressure Adjustment

Burner Pressure	Nominal Output	
1.2 mbar	8,9 kW	30400 Btu/h
3.7 mbar	12.98 kW	40980 Btu/h
6.9 mbar	13.75 kW	44400 Btu/h
12.1 mbar	23.2 kW	78530 Btu/h
12.3 mbar	23.3 kW	79555 Btu/h

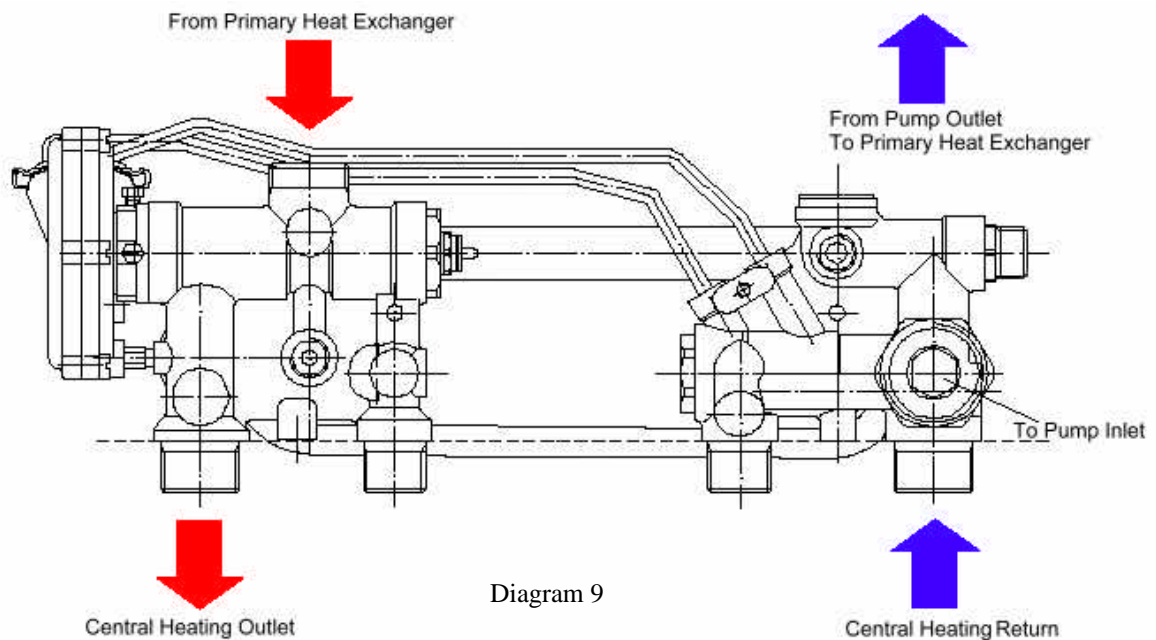
Table 1

1.3. HYDROBLOCK DIAGRAMS

1.3.1. Connections

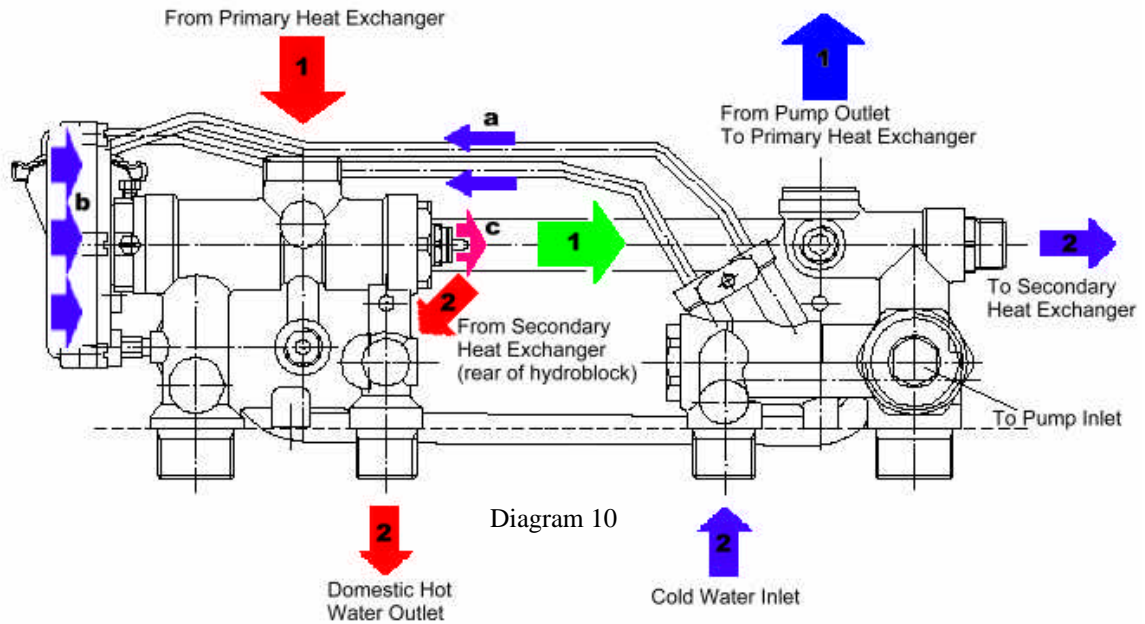


1.3.2. Central Heating Mode



? When the system is operating in Central Heating Mode, cold water which comes from Central Heating Return pipe is directed to pump inlet. Water reaches to inlet of primary heat exchanger from outlet of pump. With heat transfer in primary heat exchanger, hot water is supplied. Hot water that comes from primary heat exchanger is directed to Central heating outlet.

1.3.3.Domestic Hot Water Mode



- ? Switching to Domestic Hot Water System: When a tap is opened, cold water reaches to hydroblock from Cold Water Inlet. The pressure is sensed by the diaphragm by means of pressure connection pipes (shown as “a”). The diaphragm (b) moves with the difference in pressures. The pin which is connected to diaphragm moves to right (as shown with arrow “c”) and operates the domestic water flow switch. This switch gives signals to control card and lets the system control the domestic hot water system.
- ? For Domestic Hot Water system (shown as “2”): Cold water which is supplied from Cold Water Inlet reaches to secondary heat exchanger inlet. The heat is transferred between primary and secondary heat exchangers. (The secondary heat exchanger is installed inside primary heat exchanger.) The hot water which is supplied from Secondary heat exchanger outlet is directed to Domestic Hot Water Outlet.
- ? For Central Heating system (shown as “1”): There is no flow in whole system, the flow is only inside the boiler. Cold central heating water is pumped to primary heat exchanger. In primary heat exchanger, heat is transferred from primary heat exchanger to secondary heat exchanger. The water that comes from primary heat exchanger outlet, is directed to pump inlet by a connection pipe (shown by green arrow).

2. SAFETY DEVICES

The combination boiler incorporates a visual led display that indicates fault conditions, should they occur. In the event of a fault, the display will indicate, by means of leds, exactly in which area the fault lies. Should the boiler fail to operate during Commissioning, the most likely fault is that the gas supply to the boiler has not been turned on or purged sufficiently or that there is no pressure in the heating system. These are indicated as follows :

No gas supply

? This will be indicated by illuminating light of the reset button

To rectify this, proceed as follows:

? Rectify the gas supply problem.

? Restart the boiler by turning the selector knob and then press the reset button.

Insufficient system pressure

This will be indicated on the led display as blinking warning led 3. pressure is low.

To rectify this the system must be re-filled, refer to 'Commissioning'.

Other faults

These are indicated on the led display by a blinking led. Further information on the fault codes can be found in the 'Servicing Instructions'.

General safety devices

Air flow rate safety device

If an obstruction, even partial, of the flue occurs, for any reason whatsoever, the built in safety system of the boiler will turn the boiler OFF and the fan will continue to run.

The boiler will be ready to operate when the fault has been cleared.

Overheat safety

In case of boiler overheating, the overheat thermostat will turn the boiler off. The thermostat, located on the heat exchanger outlet pipe, will need to be manually reset.

In case of power supply failure

The boiler no longer operates.

As soon as power supply is restored, the boiler will be automatically restarted.

Frost protection

The combination boiler has a built in frost protection device that protects the boiler from freezing. If the boiler is to be left and there is a risk of frost, ensure that the gas and electrical supplies are left connected. The frost protection device will light the boiler when the temperature of the boiler water falls below 5°C When the temperature reaches 30°C, the boiler stops.

Note : This device works irrespective of any room thermostat setting and will protect the complete heating system.

3. SETTINGS

Gas valve setting

All boilers are tested and factory set during manufacture. Should it be necessary to reset a gas valve, for example, after replacement, proceed as follows:

- ? Shut down boiler.

Minimum setting (See values on table A)

- ? Remove electrical connectors from the modulating gas valve coil, see diagram 32.
 - ? Connect a suitable pressure gauge to the pressure outlet on valve, see diagram 33.
 - ? Turn the OFF/Summer/Winter switch to the 'Winter' position.
 - ? Turn the central heating temperature adjuster to maximum setting.
 - ? Remove the protective cover from the gas valve adjuster.
 - ? Connect the gas valve adjustment tool to adjustment nut and screw, see diagram 34.
 - ? Turn inner part, see diagram 35:
CLOCKWISE: To increase the pressure.
ANTICLOCKWISE: To decrease the pressure.
- After adjustment, connect electrical connector, protective cover.

Maximum setting (See values on table A)

- ? Remove the protective cover from the gas valve adjuster.
- ? Push the grey rod on tool.
- ? Turn outer part, see diagram 36:
CLOCKWISE: To increase the pressure.
ANTICLOCKWISE: To decrease the pressure. After adjustment, refit the cover to the gas valve adjuster.

By-pass

The combination boiler has a built-in automatic bypass.



Diagram 2

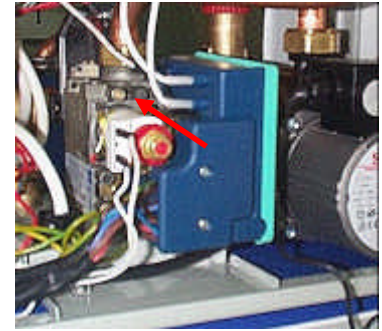


Diagram 3



Diagram 4



Diagram 5



Diagram 6

Gas pressure adjustment values

Gas	Gas inlet pressure (mbar)	Burner pressure		Diam. of injector nozzle mm.
		Min.	Max.	
NG (G20)	20	1.2	12.3	1.2

Table 2

On board adjustments: potentiometers and trimmers.

MAX RISC: maximum heating mode trimmer, 0 -100 %.

0 % corresponds to the minimum value mechanically set on the MFC: 30 mA with NG, 50 mA with LPG. To set MAX RISC to minimum, turn it counter-clockwise. To increase the maximum heating value, turn it clockwise.

RLA: step opening level trimmer, 0 -100 %.

When the RLA trimmer is put to the very minimum by turning counter-clockwise, the step opening duration is forced to 20 s. in order to help the setting operation. The 3 minute delay is cancelled. By turning clockwise, step opening duration is increased. Factory setting is 100%. Do not change its setting.

On board adjustments: jumpers.

JP 1: NG/LPG. When fit in, the modulating current range varies from 30 – 230 mA (NG) to 50 -310 mA (LPG)

JP 2: when fit in, the pump is not powered when working in Heating mode. This feature addresses to systems with external pumps.

JP 3: when fit in, the heating temperature range changes to 30 – 40 °C, for underfloor systems.

JP 4: when fit in, the three minute delay on restarting after a cut-out due to the primary water temperature set being exceeded, is excluded.

Setting the maximum heating temperature

The maximum heating temperature can be preset at commissioning stage to suit the type of heating system.

For example, for use with underfloor heating, the maximum heating temperature can be set to 40°C. To adjust the maximum temperature, proceed as follows:

? Remove the jumper cap from the rear of the control panel to gain access to jumper JP3 (see diagram A).

Note: To adjust the maximum heating temperature it is only necessary to fit JP3. DO NOT touch any other jumpers.

? Refit the jumper cap.

JP 3 is fitted ? 40°C. Maximum.

JP 3 is not fitted ? 90°C. Maximum.

Factory setting 90°C. Maximum.

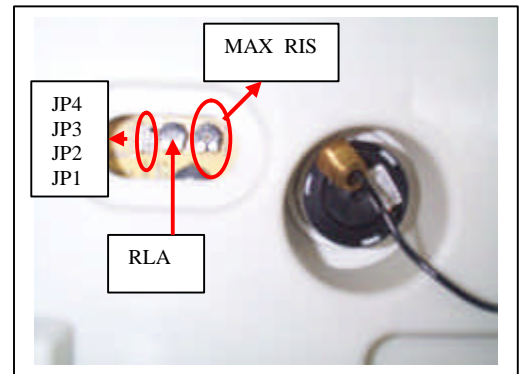


Diagram A

Temperature (°C)	Resistance (k?)
0.....	27.21
5.....	22.02
10.....	17.92
15.....	14.67
20.....	12.08
25.....	10.00
30.....	8.315
35.....	6.948
40.....	5.834
45.....	4.917
50.....	4.161
55.....	3.565
60.....	3.014
65.....	2.586
70.....	2.228
75.....	1.925
80.....	1.699
85.....	1.452
90.....	1.268
95.....	1.110
100.....	0.974

4. ROUTINE CLEANING AND INSPECTION

To ensure the continued efficient and safe operation of the boiler it is recommended that it is checked and serviced at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage, but in general once a year should be enough.

It is the law that any servicing is carried out by a competent person.

4.1. Service Check and Preparation.

? Operate boiler and check for any faults that need to be put right.

? Isolate boiler from the gas and electrical supplies.

? On completion check all gas carrying parts for soundness with leak detection fluid.

? Remove boiler casing as follows:

Side panels

? Unscrew and remove the two screws of side panels from bottom side of the boiler, see diagram 7.

? Lift each side panel up and remove.

4.2. Front control panel

? Open the cover of control panel by pressing the push catch.

? Turn the screws at two sides of panel in correct direction for gain access to lower part of boiler, see diagram 8.

Upper front panel

? Turn the plastic clips at two lower sides of panel in correct direction at 90° angle for gain access to combustion chamber of boiler, see diagram 9.

? Remove panel by lifting up and forward.

WARNING: Because risk of burning, **DO NOT TOUCH** flame inspection window or its immediate surroundings.

Combustion chamber cover

? Unclip two toggle clips and loose two nut securing combustion chamber cover to combustion chamber, see diagram 10.

? Remove combustion chamber cover from boiler.

? Undo, but do not remove, two cover support pins at two sides.

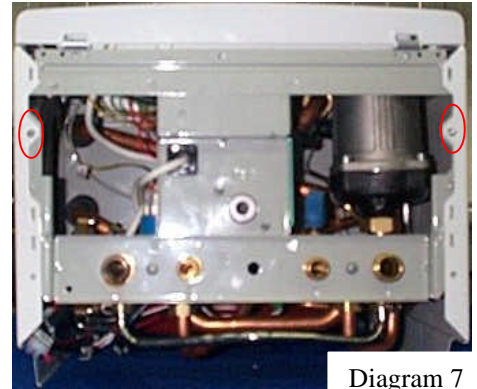


Diagram 7



Diagram 8



Diagram 9

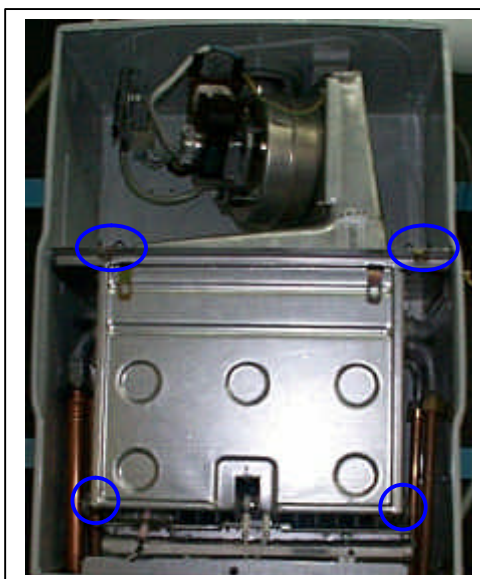


Diagram 10

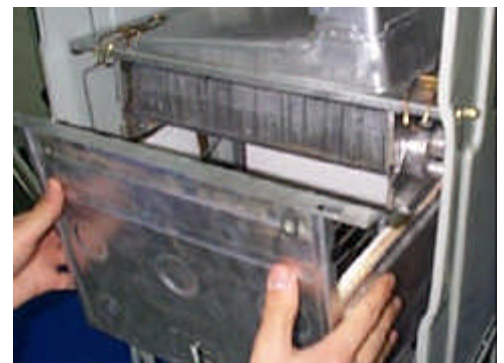


Diagram 11

4.3. Heat exchanger

? Disconnect power supply leads and earth lead from fan.

? Remove combustion chamber cover as described in 6.3.

? **To empty only heating system by turning central heating safety valve's tap (red) to the left.**

? Remove pipe clips on the left pipes of heat exchanger, see diagram 12.

? Unscrew nuts on the right pipes of heat exchanger, see diagram 13. The washers must be kept for reassembly.

? To remove heat exchanger easily, undo pipes from hydraulic kit and pump, see diagrams 14 and 15.

? Pull the heat exchanger as shown in diagram 16.

? Examine heat exchanger for any blockages or build up of deposits.

? Clean heat exchanger with soft brush or vacuum cleaner. Do not use any tool likely to damage painted finish of heat exchanger.

Reassembly of parts removed for servicing

All parts are replaced in reverse order to removal.



Diagram 12



Diagram 13

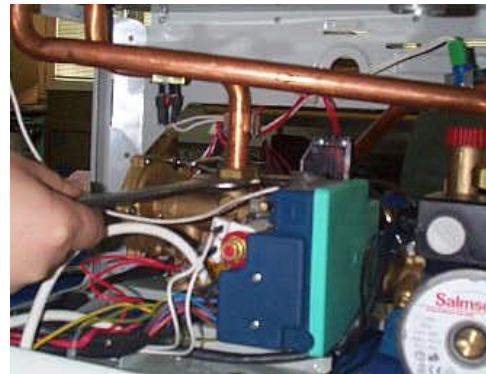


Diagram 14



Diagram 15



Diagram 16

4.4. Burner

? Undo main gas supply nut and pressure check point screw and nut from burner, see diagram 17.

Note: The washers between burner and the chamber lower part and between burner and the gas valve must be kept for use on reassembly.

? Undo gas supply pipe between gas valve and burner, see diagram 18.

? Pull off the ignition and flame sense leads from the gas valve remove burner from boiler by lifting up and pulling forwards from keyhole slots.

Note: The washer between main burner and main burner gas supply must be kept for use on reassembly.

? Remove ignition and flame sense electrodes from burner.

? Unscrew and remove injector bar retaining screws and separate injector bar from burner.

? Examine and clean injectors as necessary.

Note: DO NOT use a wire or sharp instrument on the holes.

Clean burner by washing in soapy water. Dry thoroughly before re-fitting.



Diagram 17



Diagram 18



Diagram 19



Diagram 20

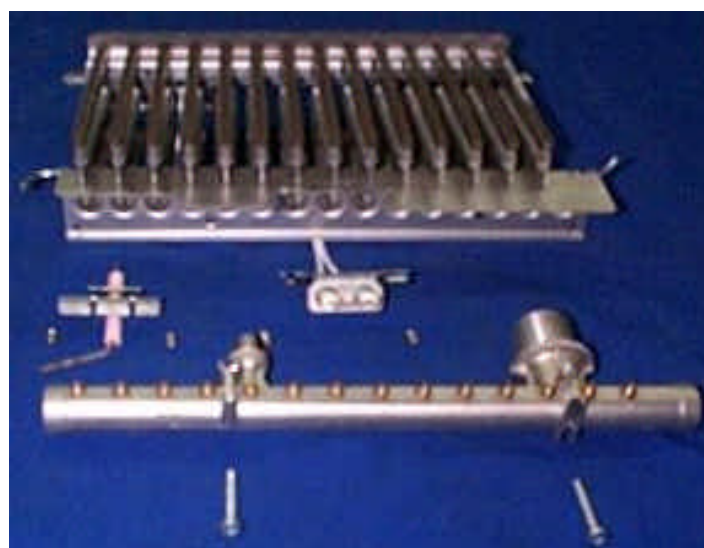


Diagram 21

ROUTINE CLEANING AND INSPECTION

4.5. Flue system

- ? Check externally to make sure that flue is not blocked
- ? Inspect flue system to make sure that all fittings are secure.

4.6. Operation of fan

- ? Switch on electrical supply and turn on gas.
- ? Light burner by opening a hot water tap.
- ? Without upper cover in place, burner should be automatically prevented from lighting by air flow detection system.
- ? Refit upper cover.

Check that fan operates when burner lights and stops when it goes out.

5. REPLACEMENT OF PARTS

5.1. Before replacement of any part

Make sure that electric connection is disconnected and gas service cock is closed.

For replacement of the following components it will be necessary to remove boiler casing panels as described in '**Routine Cleaning and Inspection**'.

WARNING: Before commencing the replacement of any component, isolate appliance from electrical supply and turn off gas at service cock.

To empty entire central heating system:

- ? Turn the red tap of central heating safety valve to the left when all isolation valves are open.

To empty only heating system of boiler:

- ? Close all isolation valves and turn the red tap of central heating safety valve to the left.

To empty domestic hot water system:

- ? Close all isolation valves except domestic hot water outlet. Open one or more hot water tap.

5.2. To replace domestic hot water thermistor

- ? Locate domestic hot water thermistor on hot water flow pipe on left hand side of boiler. (Diagram 22)
- ? Unclip thermostat from pipe, see diagram 23.
- ? Disconnect leads from thermistor.
- ? Fit replacement thermistor.
- ? Fit leads to replacement thermistor, the polarity is not important.

5.3. To replace central heating thermistor

- ? Locate central heating thermistor on heating pipe on left hand side of boiler. (Diagram 25)
- ? Unclip thermostat from pipe.
- ? Disconnect leads from thermistor.
- ? Fit replacement thermistor.
- ? Fit leads to replacement thermistor, the polarity is not important.



Diagram 22



Diagram 23



Diagram 24

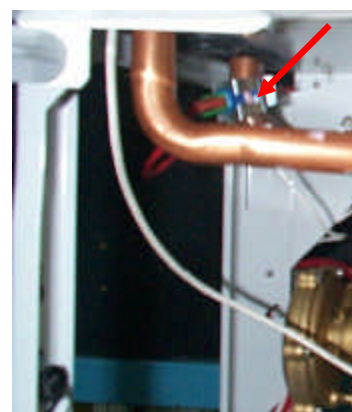


Diagram 25

5.4. To replace fan

- ? Remove electrical leads of fan.
- ? Unscrew the screws of fan as shown on diagram 26.
- ? Remove the fan, see diagram 27.
- ? Fit replacement fan in reverse order to removal.
- ? Reconnect electrical leads.

WARNING: Earth cable must be connected.

5.5. To replace air pressure switch

- ? Locate air pressure switch situated inside sealed chamber on top left hand side.
- ? Remove air pressure switch tube from air pressure switch.
- ? Disconnect air pressure switch electrical connections.
- ? Undo screws on top of boiler securing air pressure switch to boiler and remove switch.
- ? Fit replacement switch to boiler in reverse order to removal, noting that pressure sensing tube fits to left hand connection on switch.

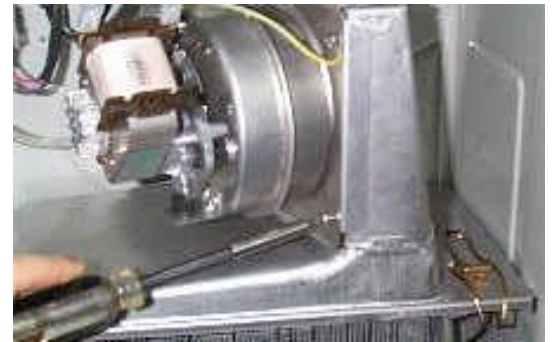


Diagram 26



Diagram 27

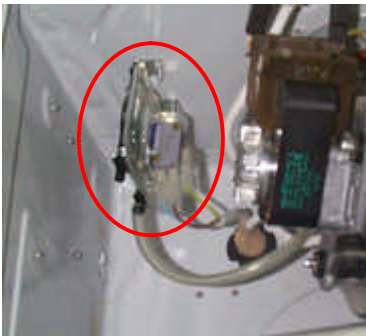


Diagram 28



Diagram 29

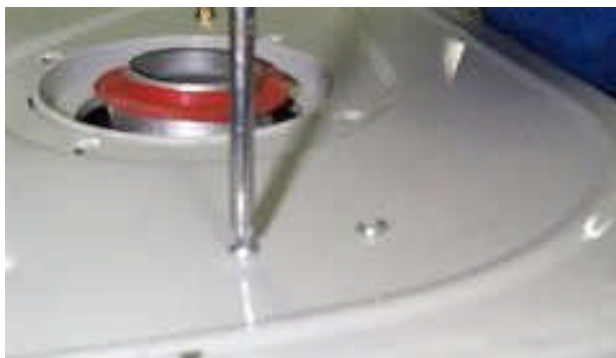


Diagram 30

5.6. To replace printed circuit board (PCB)

- ? Gain access to rear of control panel.
- ? Unscrew and remove external controls/mains connection access cover.
- ? Unscrew the screws around the PCB plastic cover to gain access to PCB, see diagram 31.
- ? Carefully pull off electrical connections to PCB.
- ? Unscrew the screws fit the PCB to the control panel and lift out PCB.
- ? Fit replacement PCB in reverse order to removal.

Note: 1) Make sure that PCB connections are fully pushed onto replacement PCB.

2) Set the heating temperature option to the same value as the old PCB, refer to **‘Installation and User’** instructions.



Diagram 31

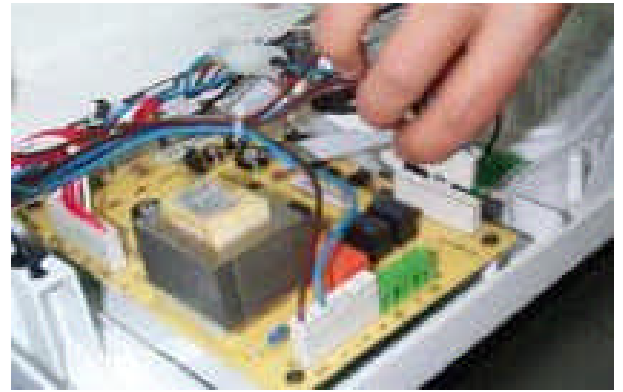


Diagram 32

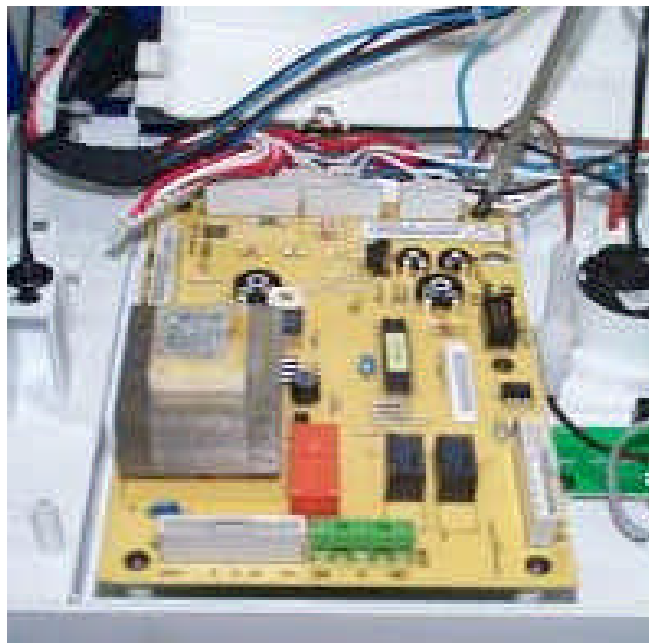


Diagram 33

5.7. To replace pump

? Drain down heating circuit of the boiler only, as described previously.

Note : It is not necessary to drain down entire heating system to carry out this work.

? Undo the two fixing nut at rearside and upside of the pump.

? Disconnect electrical connection from cable box of pump, see diagram 36.

? Re-connect electrical connection by take care of cable phase, neutral and earth line to cable box of new pump.

? Fit replacement pump in reverse order to removal.

Note : all washers must be fitted.

? Open isolating valves on flow and return connections; refill, vent and pressurise boiler.

? Check for leaks.

5.8. To replace loss of water sensor

? Drain down heating circuit of boiler only as described previously.

Note : It is not necessary to drain down entire heating system to carry out this work.

? Locate system pressure sensor at front left handside of boiler, see diagram 9.

? Remove electrical connections from sensor, see diagram 37.

? Remove the sensor by turning it in anticlockwise.

? Fit replacement sensor in reverse order of removal.



Diagram 34



Diagram 35



Diagram

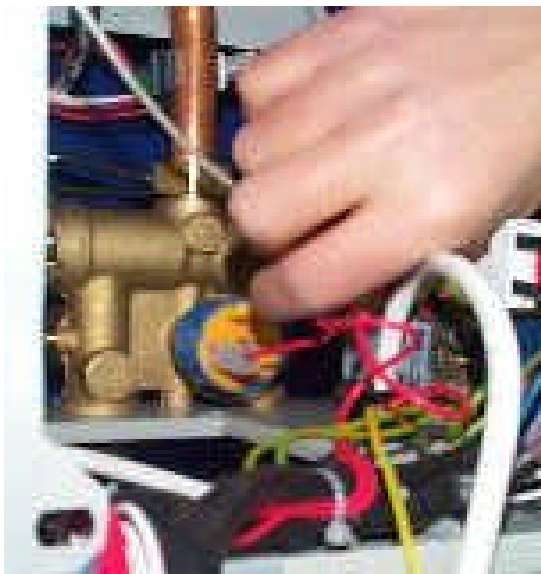


Diagram 37

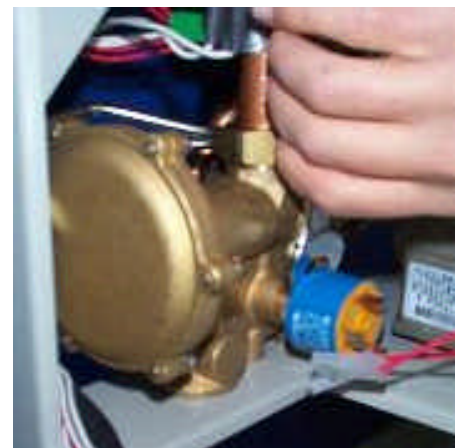


Diagram 38

5.9. To replace gas valve ignition module

- ? Locate ignition module attached to side of gas valve.
- ? Remove screws securing cover onto ignition module, see diagram 39.
- ? Disconnect ignition and flame sense leads from module.
- ? Remove cover and disconnect 12 pin and 2 pin multi-plug from module.
- ? Withdraw module from gas valve, see diagram 41.
- ? Fit replacement module, ensuring it is of the correct type for the boiler, in reverse order removal.
- ? Re-connect ignition and flame sense leads, the connections are uniquely sized to ensure correct replacement.
- ? Re-connect 2 pin and 12 pin multi-plug onto module.
- ? Refit cover ensuring all sealing grommets are correctly located in module body.
- ? Tighten screws securing cover onto ignition module.

5.10. To replace gas valve

- ? Ensure that gas supply to boiler is turned off at gas cock.
- ? Remove ignition module as described previously.

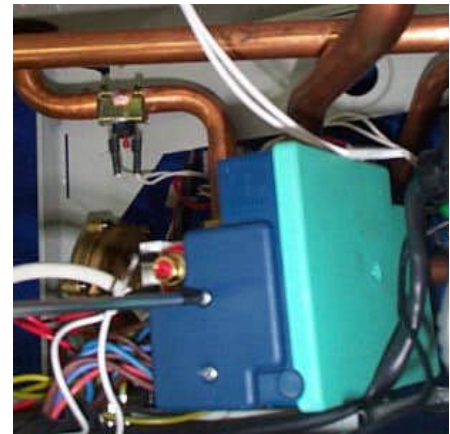


Diagram 39



Diagram 40

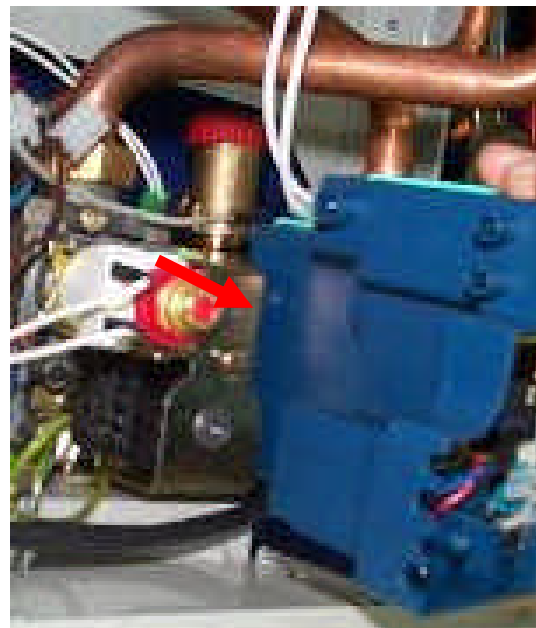


Diagram 41

? Disconnect electrical connections to gas valve modulating coil.

? Undo main gas supply tube nut from gas valve, see diagram 43.

Note : The washer must be kept for use on reassembly.

? Undo main gas connection nut between gas valve supply tube and gas inlet valve.

Note : The washer must be kept for use on reassembly.

? Remove the two fitting screw and washers of gas valve from the bottom side of boiler.

? Withdraw gas valve assembly.

? Using the old gas valve as a guide, transfer old connections to replacement gas valve.

? Refit electrical connections in reverse order to removal, the polarity of the wires to the modulating coil is not important. See diagram 11.

5.11. To replace central heating safety valve

If safety valve seating is damaged, it will be necessary to replace safety valve as a complete unit, repair is not possible.

? Drain down heating circuit of boiler only, as described previously.

? Disconnect discharge pipe from safety valve.

? To reach the valve easier, remove the right side panel as shown in diagram 7.

? Remove safety valve, see diagram 45.

? Fit replacement safety valve in reverse order to removal.

Note : The washer must not be forgotten for use on reassembly.

5.12. To replace heat exchanger

? Drain down heating circuit of boiler only, as described previously.

Note : It is not necessary to drain down entire heating system to carry out this work.

? Replace the heat exchanger as described in **'Routine Cleaning and Inspection'**

Note : The washer must not be forgotten for use on reassembly.

? Open isolating valves on flow and return connections: refill, vent and pressurise boiler.

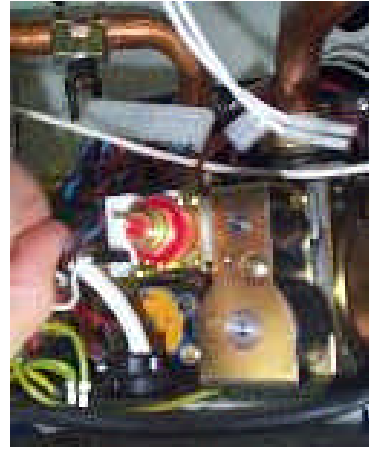


Diagram 42



Diagram 43

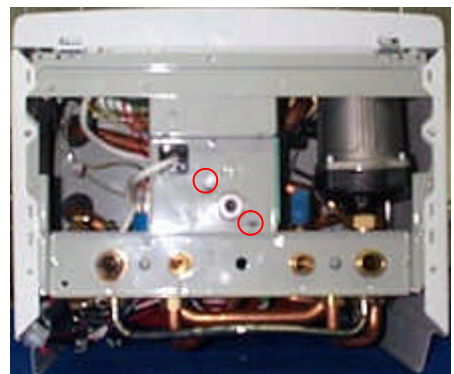


Diagram 44



Diagram 45

5.13. To replace central heating expansion vessel

? Replacement of the expansion vessel is not possible with the boiler on the wall.

? Drain down heating and hot water circuit of boiler, as follows:

? Close all isolating valves.

Note : All valves are closed when slots or lever are at the right angles to direction of flow.

? Open one or more hot water taps to drain boiler circuit.

? Disconnect the flue system.

? Disconnect all the pipes between the boiler and the system.

? Disconnect mains cable and any external control cables.

? Remove boiler from the wall.

? Undo pipe coupling on expansion vessel, see diagram 46.

? Supporting expansion vessel, undo and remove nut securing expansion vessel to boiler.

? Lift vessel out of boiler.

? Fit replacement vessel to boiler in reverse order to removal, ensuring that sealing washer is fitted to pipe connection before tightening.

? Ensure that expansion vessel charge pressure is 0.5 bar (7.5psi) using a pressure gauge.

? Refit boiler, tighten all connections ensuring that all sealing washers are fitted before tightening.

? Reconnect flue making sure that all joints are properly connected.

? Open isolating valves on flow and return connections, refill, vent and pressurise boiler.

? Check for leaks.

? Reconnect all electrical connections and restore electrical supply.

? Open gas cock, operate boiler and recheck all joints for soundness.

5.14. To replace overheat safety thermostat

? Locate overheat safety thermostat on heating flow pipe on left handside of boiler, see diagram 48.

? Disconnect electrical connection from thermostat.

? Unclip thermostat from heating flow pipe.

? Fit replacement thermostat in reverse order to removal.

? Refit connection to thermostat.



Diagram 46

Securing
nut



Diagram 47

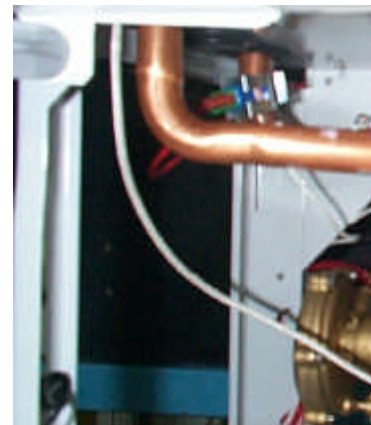


Diagram 48

5.15. To replace combustion chamber insulation

- ? Remove upper front panel as described in ‘**Routine Cleaning and Inspection**’.
- ? Remove heat exchanger as described previously.

5.16. Front panel of the combustion chamber:

Lift front insulation panel free from retaining lugs on combustion chamber cover. Loose the two nuts at the two lower sides of the combustion chamber front panel.

- ? Remove front panel of the combustion chamber by pulling forward.
- ? Fit replacement insulation panels in reverse order to removal.
- ? Refit upper front panel.

5.17. To replace burner:

- ? Remove burner as described in ‘**Routine Cleaning an inspection**’.

Assemble replacement burner, supplied in parts, as follows:

- ? Fit burner injectors to burner injector bar and tighten.

Note: Make sure that injector size, marked on each injector, is the same as that given in ‘**Technical Data**’ for the type of gas being used.

- ? Fit injector bar into burner, secure with retaining rods.
- ? Fit replacement burner into boiler in reverse order to removal.

5.18. To replace burner injectors

- ? Remove burner as described in ‘**Routine Cleaning an inspection**’.
- ? Pull out injector bar retaining rods and separate injector bar from burner.
- ? Unscrew and remove injectors from injector bar
- ? Fit replacement injector to injector bar and tighten

Note: Make sure that injector size, marked on each injector, is the same as that given in ‘**Technical Data**’ for the type of gas being used.

- ? Reassemble burner and fit into boiler in reverse order to removal.

5.19. To replace ignition electrode (See dia. 13)

- ? Remove burner as described in ‘**Routine Cleaning an inspection**’.
- ? Undo and remove screw securing electrode onto burner.
- ? Fit replacement electrode onto burner in reverse order to removal.
- ? Refit burner into boiler in reverse order to removal.

5.20. To replace flame sense electrode (See dia. 13)

- ? Remove burner as described in ‘**Routine Cleaning an inspection**’.
- ? Undo and remove screw securing electrode onto burner.
- ? Fit replacement electrode onto burner in reverse order to removal.

Refit burner into boiler in reverse order to removal.

5.21. To replace manometer

- ? Remove the connection of manometer tube from the hydroblock as shown in diagram 49.
- ? Remove the manometer from control panel as shown in diagram 52.
- ? Replace manometer in reverse order.



Diagram 49



Diagram 50

5.22. To replace hydroblock

- ? Remove gas valve as described in section 5.10.
- ? Remove pump as described in section 5.7.
- ? Remove central heating and domestic hot water pipe connections as described in 'Routine Cleaning an inspection'.
- ? Remove expansion vessel pipe as shown in diagram 46 and 52.
- ? Remove two screws that connects hydroblock to combination boiler as shown in diagram 51
- ? Reassemble hydroblock and fit into boiler in reverse order to removal.



Diagram 51

5.23. To replace filter

- ? Remove the filter assembly as shown in diagram 53.
- ? Replace the filter assembly (diagram 54) and reassemble in reverse order.

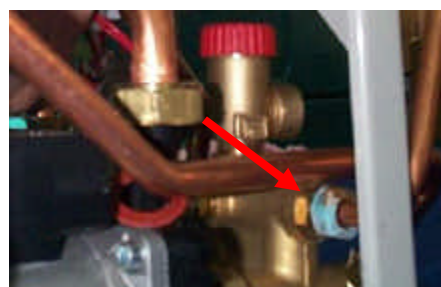


Diagram 52

5.24. To replace diaphragm

- ? To remove the pressure connection tubes, remove the two clips (diagram 55) and the screw (diagram 56).
- ? Remove the diaphragm assembly from the hydroblock by unscrewing two connection screws (diagram 57).
- ? Remove six screws (diagram 58) and open the diaphragm assembly (diagram 59).
- ? Replace the diaphragm or diaphragm cone if necessary and reassembly in reverse order.

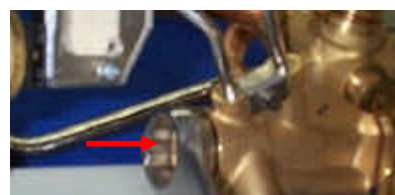


Diagram 53



Diagram 54

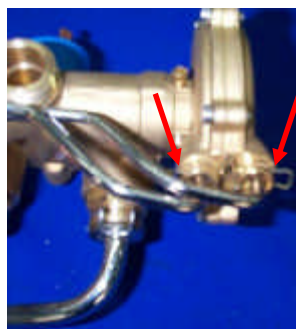


Diagram 55



Diagram 56



Diagram 57



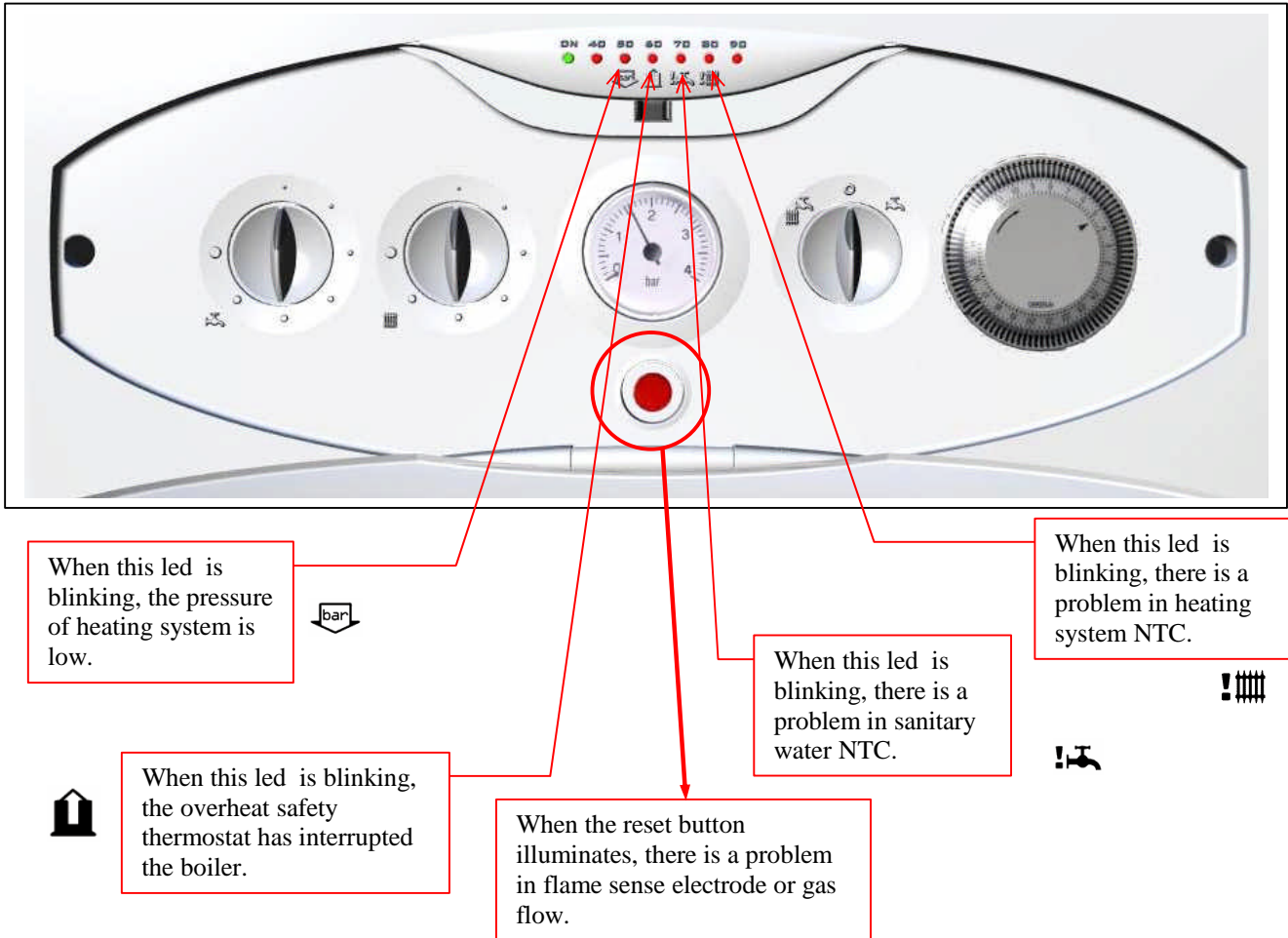
Diagram 58



Diagram 59

6. FAULT FINDING

6.1. FAULT CODES ON LED DISPLAY DIAGNOSTIC PANEL

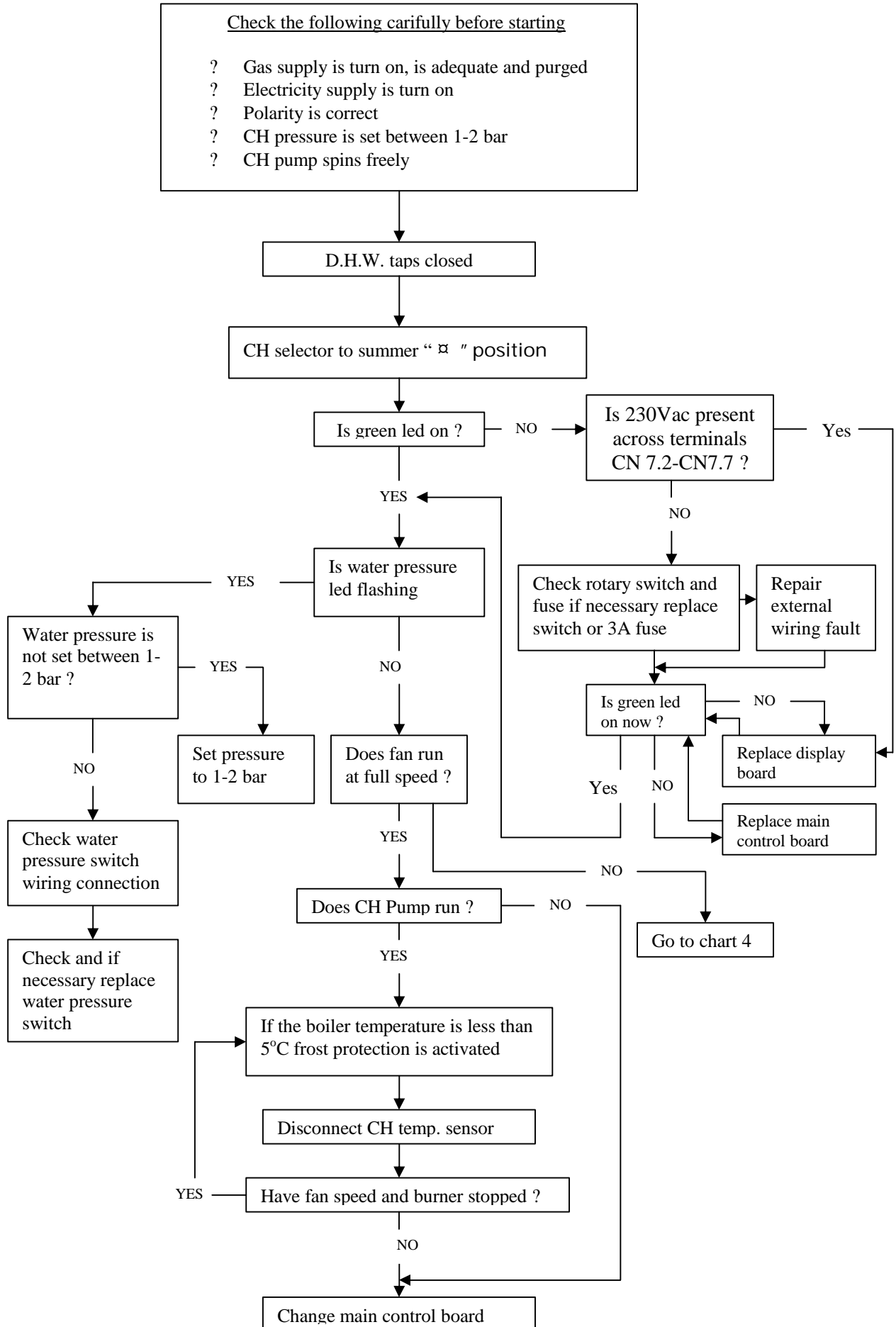


NOTE : If many faults occur, the highest priority one is displayed. Priority in display increases from right to left. Low pressure in heating system has the highest and the heating NTC problem has the lowest priority.

6.2. FAULT FINDING CHARTS

Chart 1

Check electrical supply – C. H. water pressure and frost protection



FAULT FINDING

Chart 2
Check Domestic Hot Water Operation

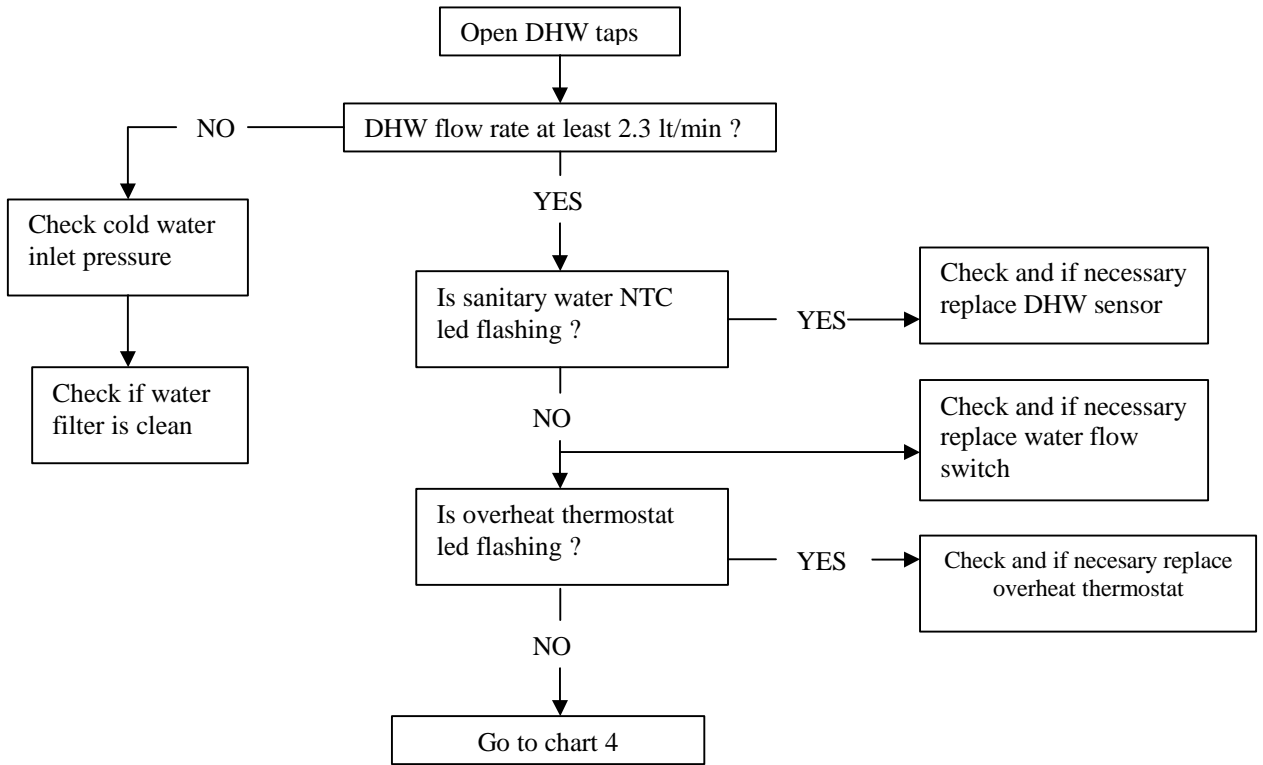
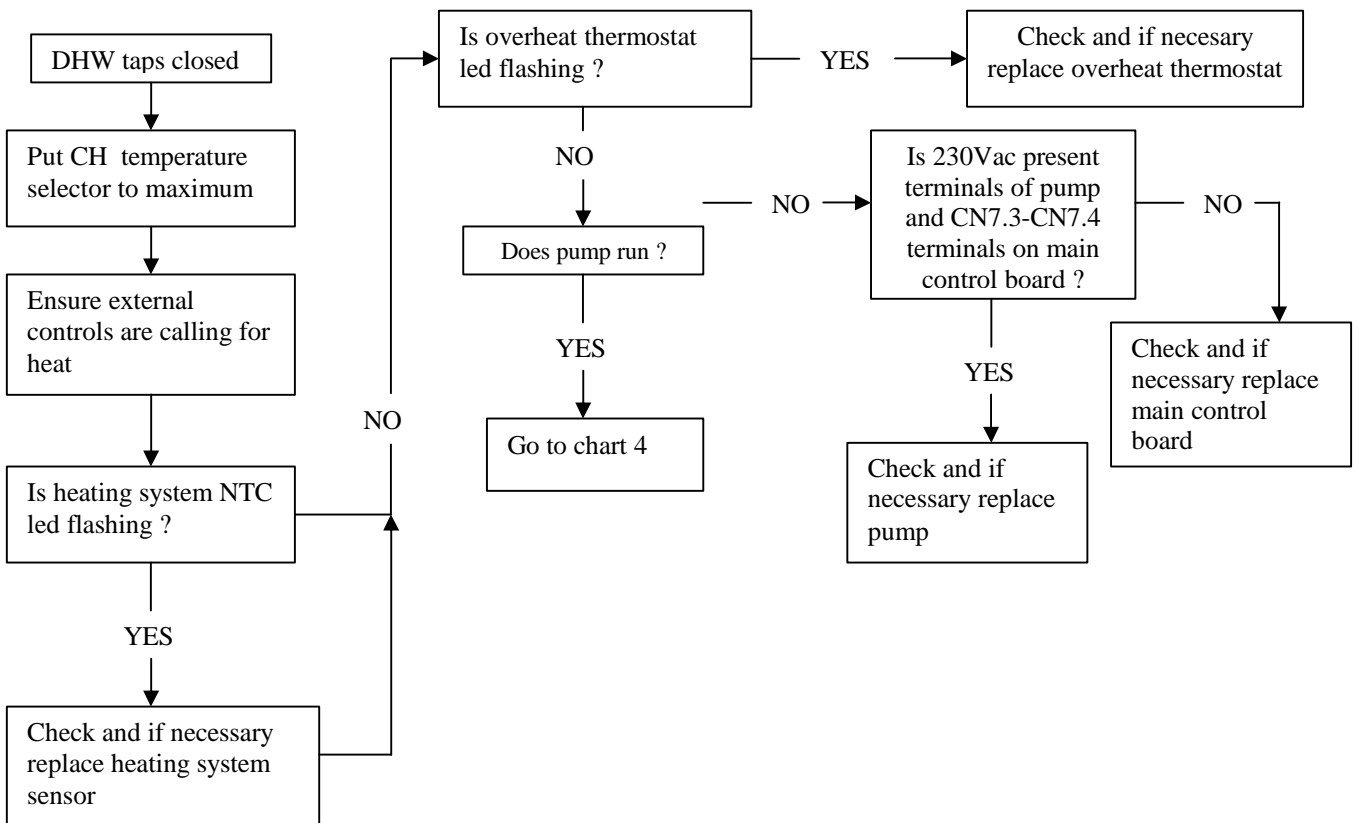


Chart 3
Check Central Heating Operation



FAULT FINDING

Chart 4
Check fan/flue gas system

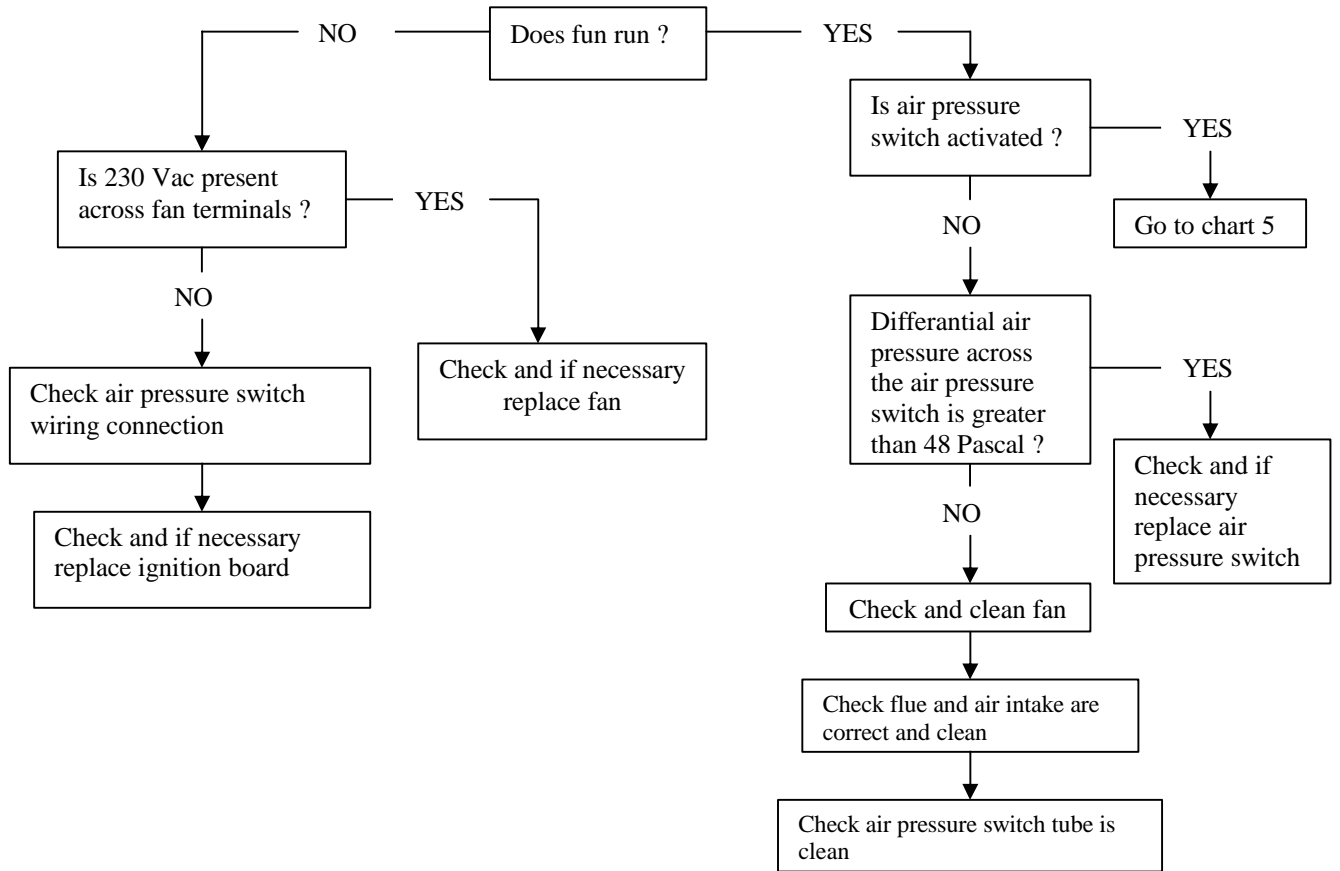
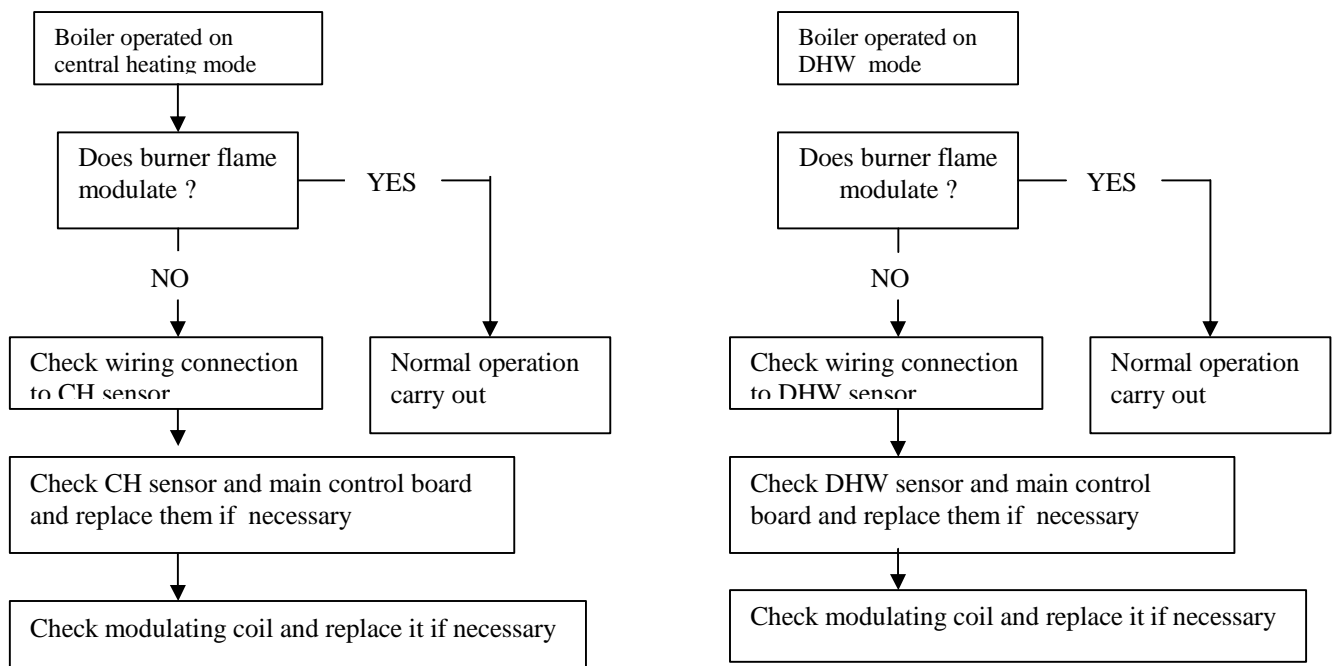
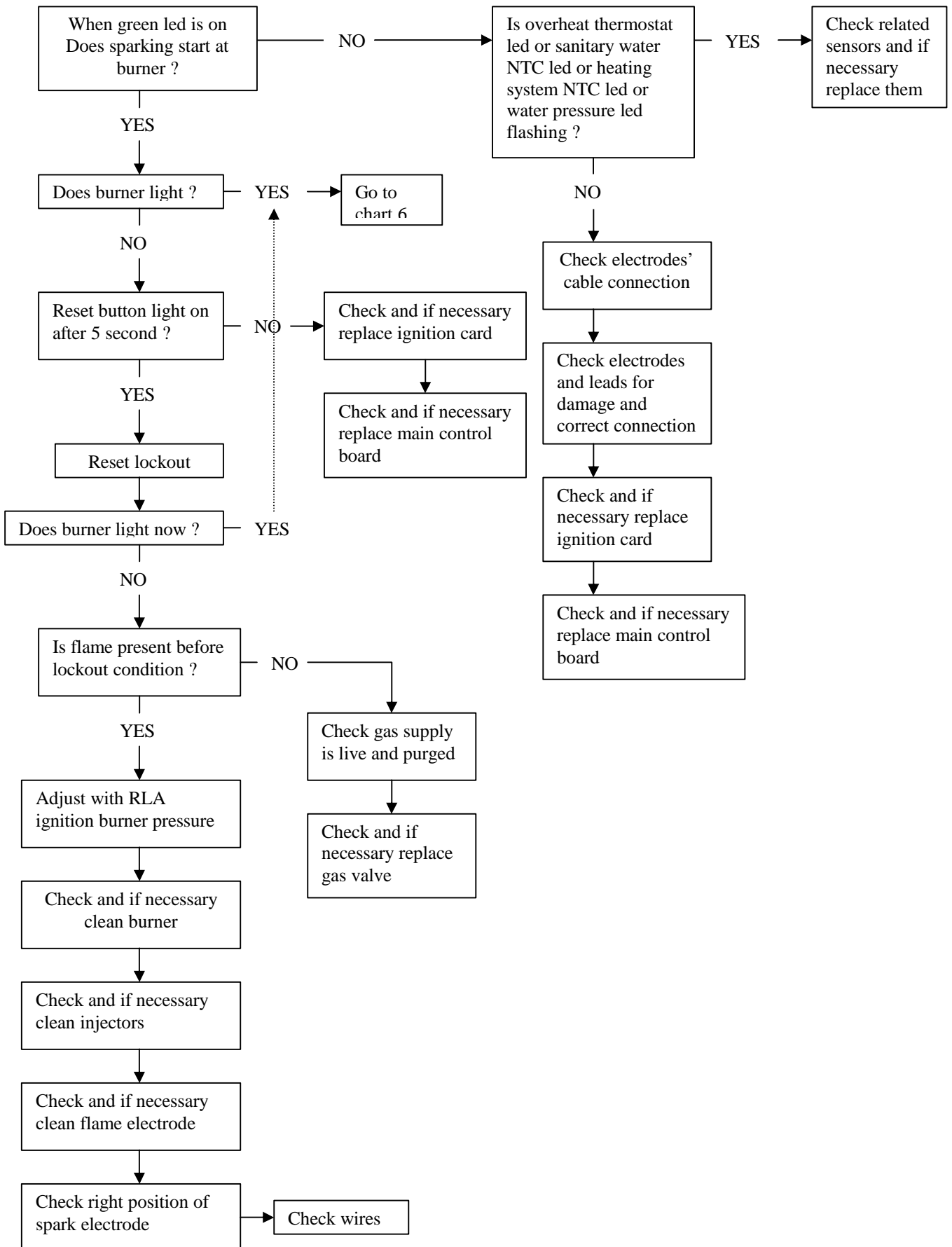


Chart 5
Check D.H.W. and C.H. modulation



FAULT FINDING

Chart 6
Check Ignition Systems



7. SERVICE PROCEDURE

7.1. Appliance Checks

- ? Carry out gas soundness test.
- ? Check appliance is fitted correctly and location is satisfactory.
- ? Check room air ventilation requirements as necessary and check compartment air ventilation requirements necessary.
- ? Check that flue, flue joints and terminations are satisfactory and free from spillage.
- ? Check heat exchanger for any blockage or evidence of shale where applicable.
- ? Check burner top and tray for deposits where applicable.
- ? Check ignition operates satisfactory.
- ? Check flame picture is satisfactory, stable and without distortion.
- ? Check flame failure device operates satisfactory.
- ? Check burner pressure and adjust if necessary to correct appliance rating.
- ? Check that all appliance controls operate correctly.
- ? Check appliance for gas or water leaks.
- ? Check correct operation of flue fans where applicable.
- ? Check system water pressure and pumps are satisfactory.
- ? Check water draw off and temperature is satisfactory.
- ? Carry out performance test (subject to the approval of the Contract Administrator).

7.2. Service Operation

- ? Isolate gas and electrical supplies
- ? Remove boiler case, clean and remove dust and deposits.
- ? Check for signs of damage to electrical connections, cables or components.
- ? Clean burner, injector, ports and combustion chamber.
- ? Clean flue ways including draught diverter and heat exchanger.
- ? Clear and adjust ignition components.
- ? Clean flame failure components.
- ? Operate safety discharge valve and check external discharge outlet.
- ? Re-pressurise system where necessary.
- ? Make sound any gas or water leaks.
- ? Ease and grease any control taps and check operation as necessary.
- ? Check all case and sight glass seals and gaskets are satisfactory.
- ? Clean flue and fan and airways as necessary.
- ? Adjust pump as necessary.
- ? Re-assemble boiler components and case.
- ? Restore gas and electricity supplies complete with 3 amp fuse.
- ? Test all gas joints and connections for soundness.
- ? Carry out repeat performance test (where appropriate).

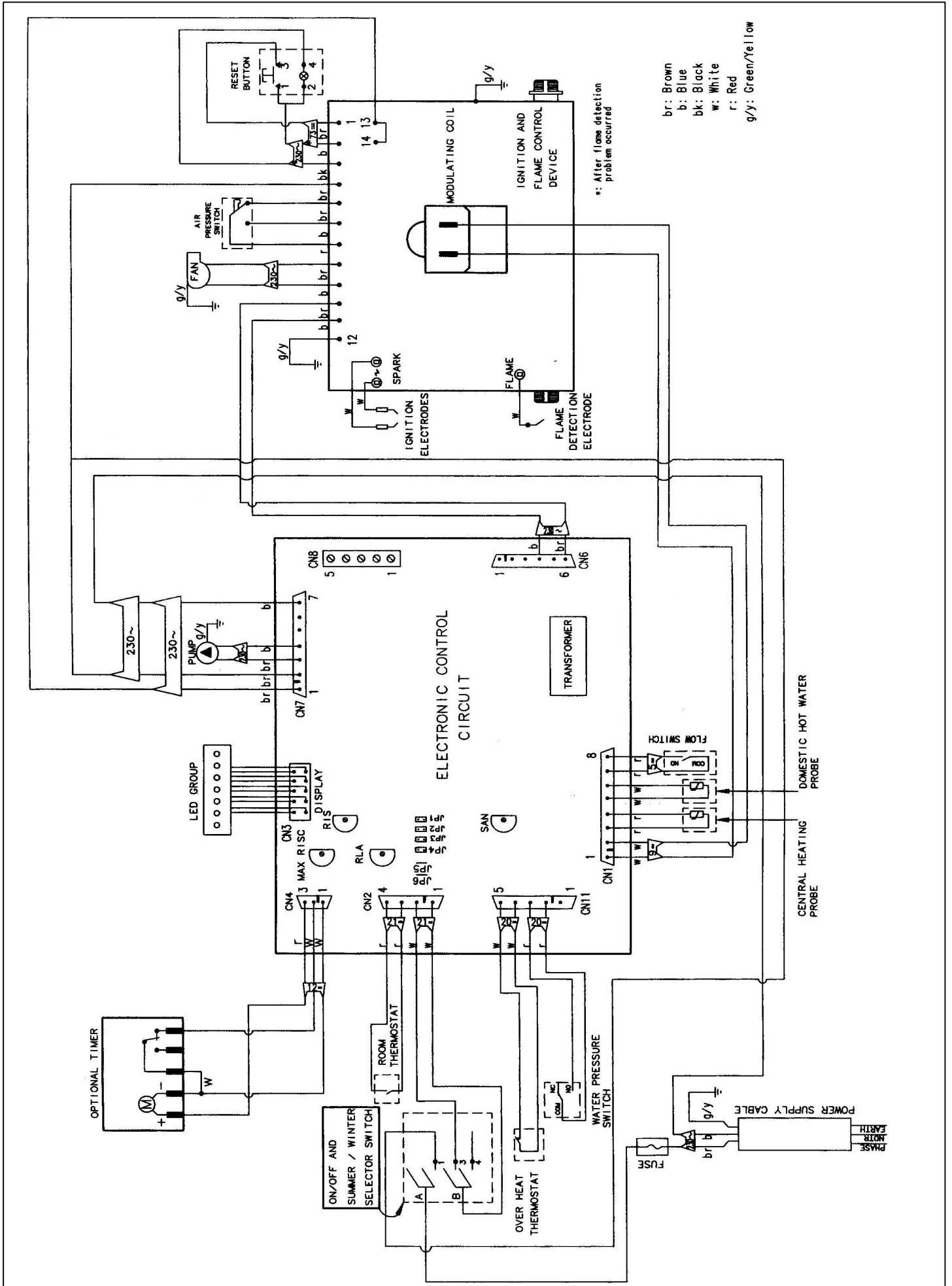
7.3. Recommission System

- ? Test run boiler and set system to customer's requirements. Ensure working pressures and heat inputs are correct (adjust where necessary).
- ? Clear work area and leave appliance in satisfactory working order.
- ? Complete service report records and leave customer satisfaction card.
- ? Fix service label to appliance.

7.4. Soundness Test

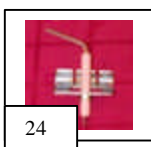
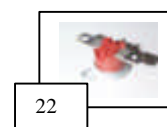
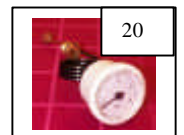
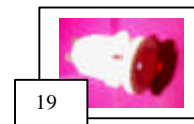
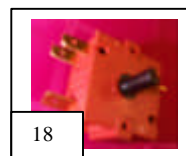
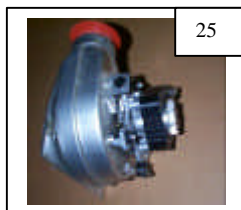
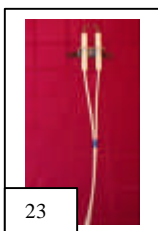
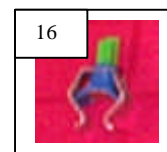
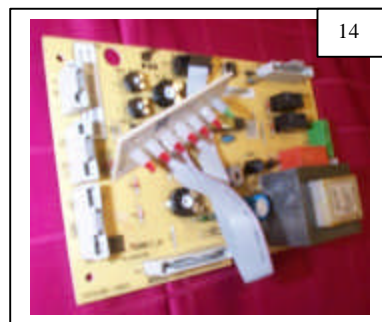
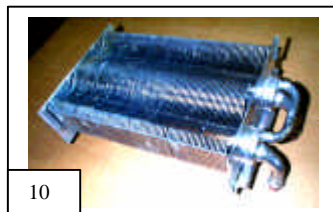
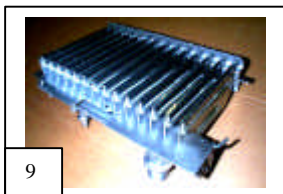
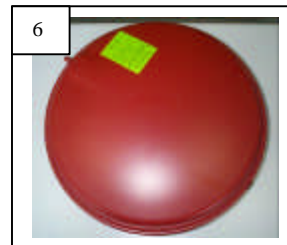
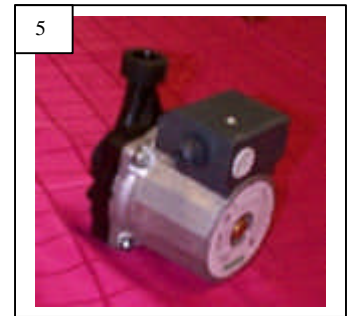
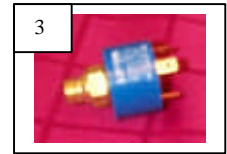
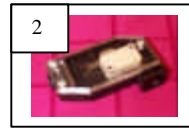
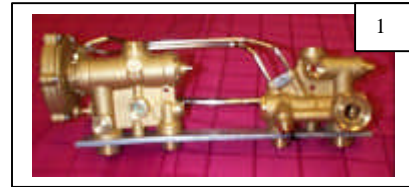
On completion of service and prior to re-commissioning of heating unit, carry out soundness test at the supply meter position on the complete gas installation.

8. WIRING DIAGRAM



9. SHORT PARTS LIST

PART NUMBER	DESCRIPTION	ORDER CODE
1	HYDROBLOCK	3002194576
2	MICROSWITCH	3004090525
3	LOSS OF WATER SENSOR	3002194470
4	SAFETY VALVE	3002192756
5	PUMP	3004090672
6	EXPANSION VESSEL	3002209450
7	AUTOMATIC AIR VENT	3002189946
8	GAS VALVE	3002194930
9	BURNER	3000000250
10	EXCHANGER	3000000251
11	CONTROL PANEL	3002194491
12	COVER	3002194492
13	PCB COVER	3002194493
14	ELECTRONIC CONTROL CARD	3004092615
15	IGNITION MODULE	3004092613
16	DOMESTIC THERMISTOR (NTC)	3002185060
17	HEATING THERMISTOR (NTC)	3002185065
18	WINTER / ON / SUMMER SWITCH	3004090601
19	RESET BUTTON	3004090671
20	WATER PRESSURE GAUGE	3004090673
21	CABLE GROUP	3004004605
22	OVERHEAT SAFETY VALVE	3002185050
23	IGNITION ELECTRODES	3004090120
24	FLAME SENSE ELECTRODE	3004090125
25	FAN	3007005615
26	AIR PRESSURE SWITCH	3002194465
27	FRONT PANEL	3002194439



26