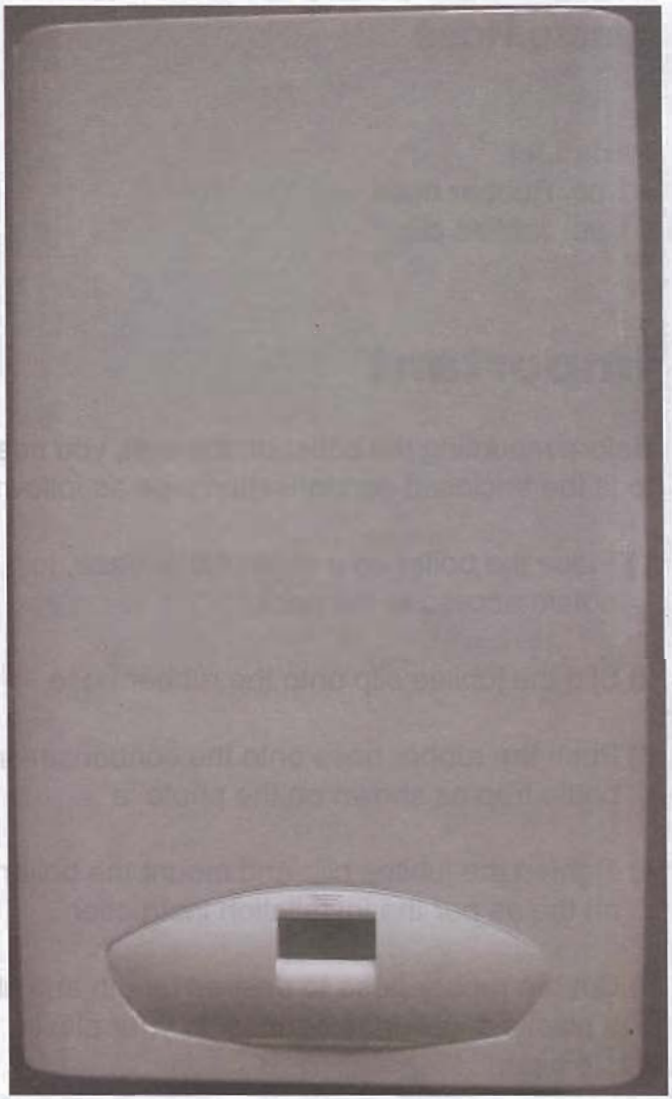
HEAT™ LINE

SOLARIS 24PC/30PC PRE-MIX CONDENSING COMBINATION BOILER

Installation, Servicing and User Instructions



Installation of the Condensation Waste Hose

Parts List
- 1 pc. Rubber hose
- 1 pc. Jubilee clip

Important

Before mounting the boiler on the wall, you need to fit the enclosed condensation pipe as follows:

1) Place the boiler on a clean flat surface, to obtain access to the back.

2) Slid the jubilee clip onto the rubber hose

3) Push the rubber hose onto the condensation bottle trap as shown on the photo 'a'.

4) Tighten the jubilee clip and mount the boiler on the as per the installation instruction

5) Cut the rubber hose to desired length and fit a plastic coupling to connect to your plastic waste pipe.

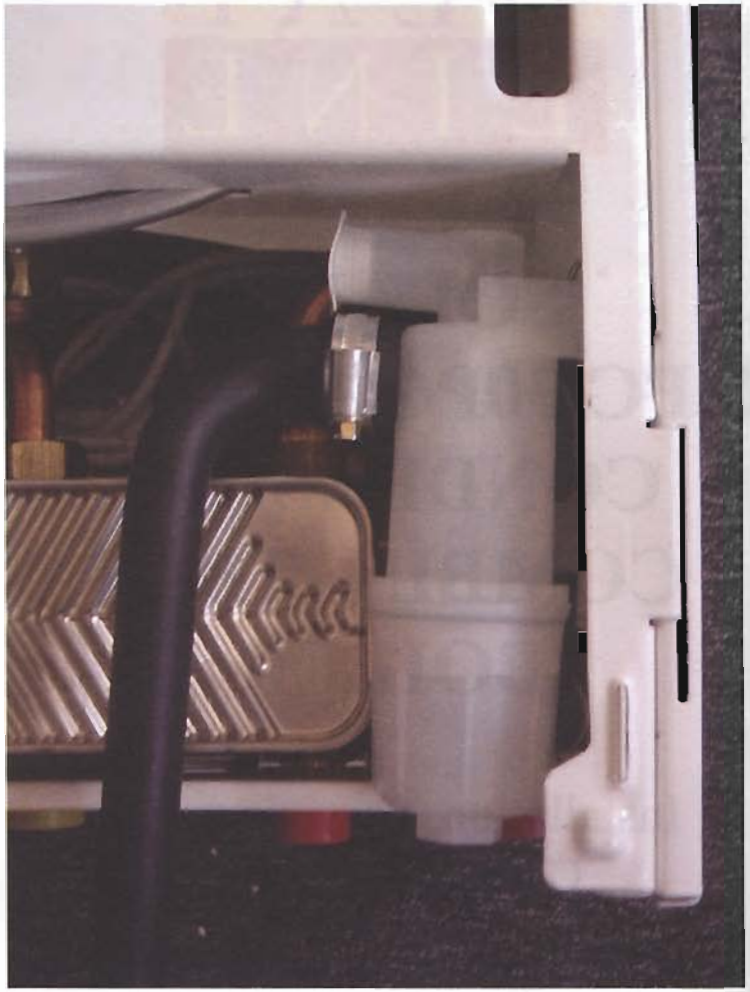


Photo 'a'

Natural Gas

Heat Line Solaris 24PC/30PC Pre-mix Condensing Combination Boiler

British Gas Service Listing
Solaris 24PC G.C.No 47-157-04
Solaris 30PC G.C.No 47-157-05

The Heat Line™ range of heating boiler are manufactured from high quality materials, enabling reliability and optimum performance.

Heat Line™ are committed to the continual development of their appliances to ensure their customers benefit from the latest advances in combustion technology and energy savings.

Notified Body IMQ 51BP2750 CE directives 90/396/CEE
51BP2751DR CE directives 92/42/CEE

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.

'Benchmark' Log Book

As part of the industry-wide initiative the boiler comes complete with an Installation, Commissioning and Service Record Log Book. Please read the Log book carefully and complete all sections relevant to the appliance.and installation. The details within the Log Book will be required in the event of any warranty work.

On completion the Log Book must be left with the end user and the relevant sections completed on each subsequent Service visit.

The Benchmark Log Book is included in the installation section of the manual on page 46 and 47.

Contents

Preface

The Heat Line™ Gas fired combination boiler meets the requirements of Statutory Instrument 'The Boiler (Efficiency) Regulations' and is deemed to meet the requirements of:

- ❑ Gas Appliance Directive 90/396 EEC
- ❑ Efficiency Directive 92/42/ EEC
- ❑ Low Voltage Directive 73/23 EEC (modified from 93/68) and;
- ❑ Electromagnetic Compatibility Directive 89/396 EEC (modified from 93/68)

Heat Line™ declare that the materials used in the manufacturer of this appliance are non-hazardous and that no substances harmful to health are contained within the appliance.

The boiler must be installed in accordance with these instructions and the regulations currently in force. Read these instructions fully before installing or using the appliance.

Heat Line™ accepts no responsibility for unsatisfactory performance of the appliance or flue arising from the failure to comply with the installation and user instructions.

If the boiler is sold or installed to another customer, all of the documents must be transferred from existing customer to the new one.

The Signs on Box

The sign of quality

Boiler must be avoided from taking damage by falling etc.

Boiler can be stored up to 5 boiler in one column.

No pressure from sides of the box must be applied.

This Way Up: The box must be stored in the position that this arrow shows up.

The Signs on Boiler

Room Thermostat: This picture shows the room thermostat terminal on the left side on the control panel cover.

Warning! High Voltage: This sign is placed on the rear side of control panel plastic and describes that there is high voltage on main PCB. If servicing will be carried out on main PCB by opening the cover, electric supply must be turned OFF.

Potentiometer Cover: This sign is placed on the rear side of control panel plastic and shows that the potentiometers can be reached by removing this cover to make further adjustments.

1. Installation Regulations

1.1. A qualified C.O.R.G.I. registered engineer in accordance with the Gas Safety (Installation and Use) Regulations; October 1994 must only install this appliance. Failure to install appliances correctly could lead to prosecution.

1.2. All C.O.R.G.I. Registered Installers carry a C.O.R.G.I. ID card and have a registration number, which should be recorded and entered on your benchmark log book. You can check your Installer registration by contacting C.O.R.G.I. on 0870 401 2300

1.3. The manufactures instructions must not be taken as overriding statutory requirements.

1.4. The installation of this appliance must be in accordance with the relevant requirements of the Gas Safety (Installation and Use) Regulations 1984 as amended, Building Regulations, Building Standards (Scotland), IEE Wiring Regulations (BS 7671), Health and Safety Document No.635 (Electricity at Work Regulations) and Local Water Authority bye laws.

1.5. It should also be in accordance with the relevant recommendations contained within the current versions of the following British Standards.

- ❑ BS 6798 Specification for installation of gas fired hot water boilers of rated input not exceeding 60 kW.
- ❑ BS 5449 Central Heating for Domestic Premises.
- ❑ BS 5546 Installation of gas hot water supplies for domestic purposes.
- ❑ BS 5440 Flues and Ventilation for gas appliances of rated input not exceeding 60 kW. (Part 1 Flues).
- ❑ BS 5440 Flues and Ventilation for gas appliances of rated input not exceeding 60 kW (Part 2 Air Supply).
- ❑ BS 6891 Installation of low pressure gas pipework installations up to 28mm (R1).

Reference should also be made to British Gas Guidance Notes for the Installation of Domestic Gas Boilers.

1.6. To ensure that the installation will perform to the highest standards, the system and components should conform to any other relevant British Standards in addition to those mentioned in the instructions.

1.7. For Installation in Ireland the appliance must be installed in compliance with I.S.813 'Installation of gas appliances'.

1.8. Your boiler comes with a standard 1 year warranty to claim your free second year warranty you must return your completed guarentee card within 1 month of installation or ring the telephone number on the sticker on the front of your boiler.

In order to maintain your warranty your boiler must be serviced every 12 months by a competent C.O.R.G.I. registered engineer.

For further advice or information contact Heat Line™ Service & Technical Enquiries by telephone on **0870 777 8318** or e-mail at our web site www.heatline.co.uk

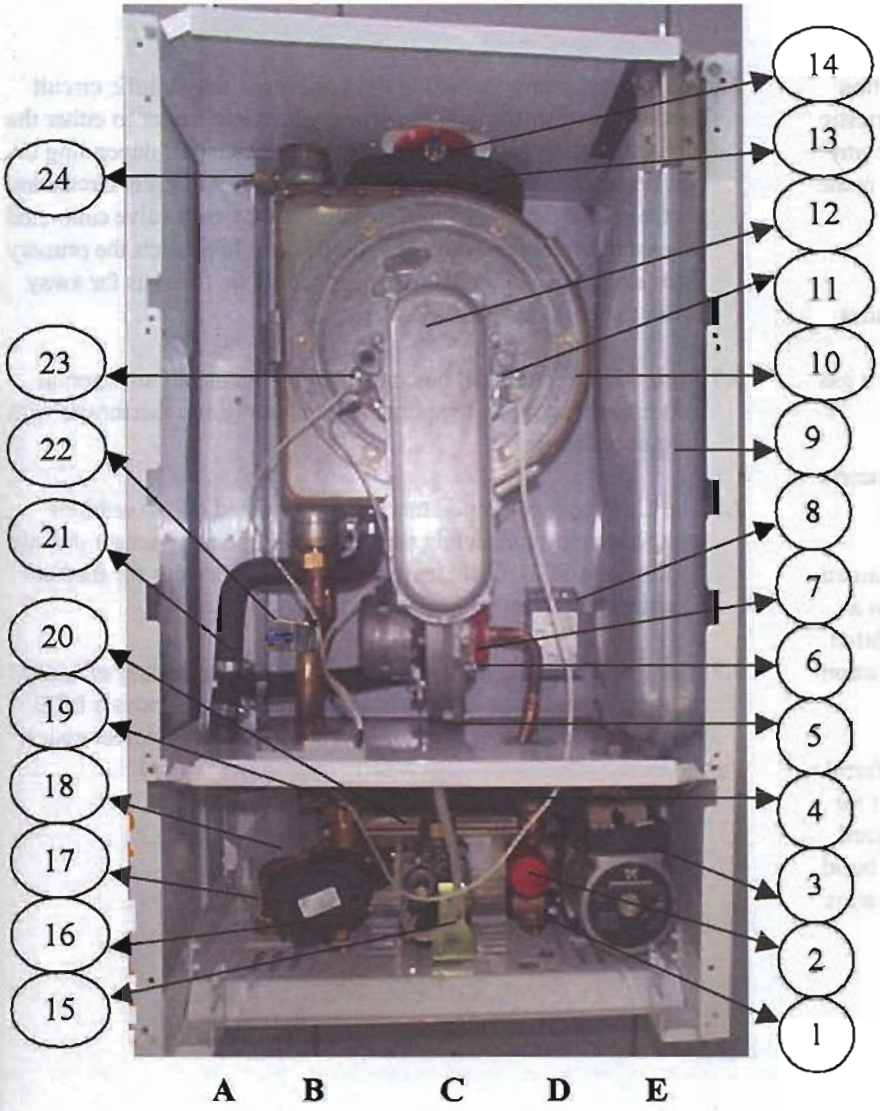
2. Technical Data

		24PC	30PC
Gas Category		II_{2H3+}	
Gas inlet pressure G20	mbar	20	
Heat Input (Q_{max}) (CH)	kW (Btu/h)	25.03	30.5
Heat Output (P_{max}) (CH)	kW (Btu/h)	24.42	29.8
Heat Input (Q_{max}) (DHW)	kW (Btu/h)	31.05	35.8
Heat Output (P_{max}) (DHW)	kW (Btu/h)	30.3	35.01
Heat Input (Q_{min}) (CH / DHW)	kW (Btu/h)	9.26	10.00
Heat Output (P_{min}) (CH / DHW)	kW (Btu/h)	9.35	10.09
Useful efficiency at 100% load	%	97.6	97.8
Useful efficiency at 30% load	%	107.4	107.5
Inlet Pressure (Natural Gas)	mbar	20	
Gas Rate (Natural Gas)	m^3/h	Max 2.65	Max 3.2
Power supply	Input	230V 50 Hz	
Gas diaphragm	mm	6.5	7.0
Air diaphragm	colour	Red	Red

		24PC	30PC
Max. power consumption	Watts	140	
Level of protection		IPX4D	
Maximum heating temperature	°C	85°	
Max. domestic hot water temperature	°C	64°	
Operating pressure (Bar)	PMS (Min)	3 (0.8)	
Domestic water supply pressure (Bar)	PMS (Min)	8 (0.25)	
Domestic Water Supply Output (litres/min)	35°C ΔT 30°C ΔT 25°C ΔT	12.20 14.24 17.08	14.35 16.73 20.1
Expansion Vessel	Capacity (litres)	7	
Expansion Vessel	Pre-Charge (bar)	0·5	
Air Intake Pipe	Diameter (mm)	100	
Flue Pipe	Diameter (mm)	60	

		24PC	30PC
CO_2% at Max. Input +/-0.1 %		9	
Nitrogen oxide (NOx) Emissions at Max. Input (NOx Class 5)	ppm	20.6	22
Nitrogen oxide (NOx) Emissions at Min. Input (NOx Class 5)	ppm	22.6	26
Combustion products temparature (max.)	°C	70	72
Case Dimensions	mm	330dx430wx720h	
Shipping weight	kg	44	45
Dry weight	kg	41	42
G30/G31 VERSION			
Gas inlet pressure	mbar	28-30/37	28-30/37
Gas diaphragm	mm	4.70	5.35
Air diaphragm	colour	Orange	Red
Gas rate (LPG)	kg/h	1.29	1.52
CO_2% at Min. Input +/-0.1 %		10	

Figure 1.



Key

1 - D.H.W. Sensor
2 - Water Pressure Sensor
3 - Pump
4 - Heating Safety Valve
5 - Fan
6 - Air/gas mixer
7 - Air/gas mixer ring
8 - Supply transformer
9 - Expansion Vessel
10 - Heat exchanger
11 - Ionisation electrode
12 - Burner
13 - Plastic flue pipe
14 - Plastic flue pipe ntc sensor
15 - Gas valve
16 - Electrical three-Port Valve
17 - DHW ntc sensor
18 - Condensation trap
19 - Overheat Safety Thermostat
20 - Secondary Heat Exchanger
21 - Condensation pipe
22 - Central heating ntc sensor
23 - Ignition electrode
24 - Manual air vent

A - Heating Flow	(22mm)
B - D.H.W. Outlet	(15mm)
C - Gas Inlet	(22mm)
D - Cold Water Inlet	(15mm)
E - Heating Return	(22mm)

3. Boiler Characteristics.

3.1 The Heat Line boiler is a fan flued, wall-mounted combination boiler that supplies both central heating and mains fed domestic hot water. Being room sealed the boiler may be installed in any room or internal compartment without the need for purpose made ventilation. A functional diagram of the boiler's principal components is given as ***figure 1***.

3.2 An electronic control unit, consisting of a PCB which includes ignition module provides direct burner ignition and flame supervision along with continuous modulation of the burner's gas supply.

3.3 A interface unit, which includes boiler adjustment potentiometers and fault display provides easy service ability to the boiler.

3.4 Heat transfer to the boiler's primary hydraulic circuit is obtained via a primary, gas to water heat exchanger contained within a hermetically sealed combustion chamber. A 24 volt, modulated speed fan expels the products of combustion from the combustion chamber to outside air via an associated flue system.

3.5 A secondary heat exchanger allows the instantaneous transferral of heat from the primary hydraulic circuit to water destined for domestic hot water use. The secondary heat exchanger is sized so as to minimise thermal shock and is protected against the build up of lime scale by limiting the D.H.W. outlet water temperature to a maximum of 64°C.

3.6 An integral pump located in the boilers main hydraulic circuit circulates water through the primary heat exchanger to either the central heating circuit or D.H.W. heat exchanger, depending on the demand. In the event of reduced or interrupted water circulation in the central heating circuit, an automatic by-pass valve calibrated to ensure a minimum flow of 500-600 litres/hr protects the primary heat exchanger. A system by-pass should be fitted as far away from the boiler as possible.

3.7 Room temperature can be controlled by the use of an external room thermostat or a temperature regulator (timer thermostat with output contact).

3.8 The C.H. system temperature can be adjusted due to outdoor temperature by connecting an Outdoor Temperature sensor directly to the main PCB. Call Heatline Technical Services for further assistance.

3.9 Along with an integral time control to allow the setting of central heating periods, the boiler's control panel incorporates a LCD display for indicating state of operation, fault and defect codes.

4. Operation

4.1 By means of a manual function switch, the boiler can be set to operate in one of two operating modes, domestic hot water only or domestic hot water and central heating.

4.2 Depending on demand, water in the primary hydraulic circuit is diverted to either the central heating system or internal circulation for heating the D.H.W. through the secondary heat exchanger via an electric motor driven three port valve situated on the boilers hydraulic block.

4.3 DOMESTIC HOT WATER MODE:

❑ When hot water demand is requested the boiler will fire automatically. An integral pump is energised and hot water from the boilers primary circuit is circulated through the secondary heat exchanger, allowing the instantaneous transferral of heat to the incoming cold water. The boiler's electronic control unit automatically modulates the burner's output to maintain the required temperature of the domestic hot water. Hot water will continue to flow through the tap until no longer required. When the demand for hot water ceases the integral pump will continue to run for a short while (10 seconds) to dissipate any excess heat within the boiler.

4.4 DOMESTIC HOT WATER AND CENTRAL HEATING MODE:

❑ When heating demand is requested the boiler will fire automatically. An integral pump is then energised and hot water from the boilers primary circuit is circulated around the central heating system pipework and radiators. The boiler's electronic control unit automatically modulates the burner's output to match the heating demand. As the water temperature of the heating system increases the gas input to the burner decreases, conserving energy and increasing efficiency. When the demand for central heating is no longer present the burner will shut down and the boiler will revert to stand-by, waiting to respond to the next heating demand. The pump will operate for a while to dissipate any excess heat within the boiler.

Note.

A demand for domestic hot water will override the central heating mode for the period of the request. When domestic hot water is no longer required the boiler will automatically return to the central heating mode of operation with or without a delay. NB A 45 second delay will occur before boiler switches back into central heating function if the No.3 dip switch is set to OFF position.

5. General Installation

5.1 Installer Testing & Commissioning Tips

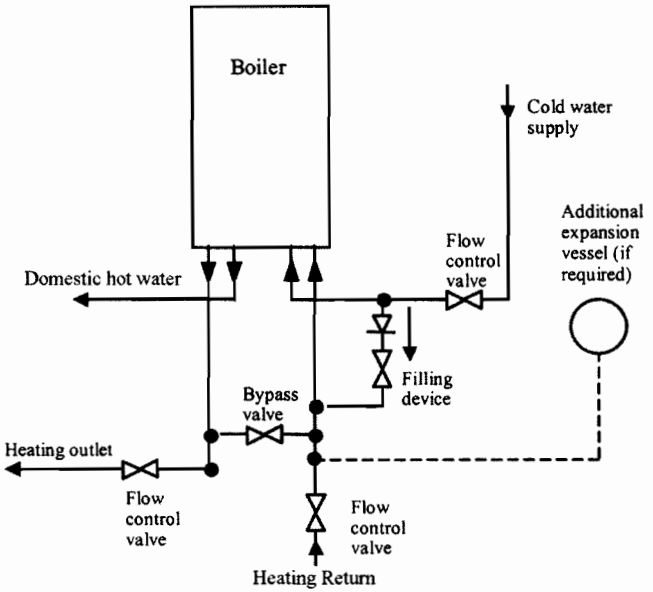
- Installer shall instruct the user in the operation of the boiler and the safety devices and shall give the installation, servicing and user instructions to the user after installation of the boiler.
- The user should be instructed to keep the servicing instructions in a safe place.
- It is important to keep the boiler clear of dust during the installation. In particular, do not allow debris to enter the top of the boiler where the flue connection is made. This may cause the fan outlet to get blocked or combustion chamber to fill with debris and will, of course, cause the boiler to fail to ignite on first ignition. It is recommended that you check the fan outlet before you light the boiler.
- Before you fit the boiler ensure that the pipe work that you are installing is connected to the appropriate connections on the boiler i.e. cold water pipe to cold water inlet, hot water outlet to the hot water tap.
- Because the boiler is live tested, at the end of each production stage, a small amount of water will remain within the boiler. Please ensure that you spin the pump rotor manually before ignition.
- Remember to flush out the system, both cold and hot, in order to remove the debris from the system. This should be done particularly where boilers are being fitted to existing radiator circuits.
- Refer to BS 7593:1992 for the details to clean DHW and Central heating system.
- **This boiler has been factory set and does not require any adjustments to the gas valve or fan speed.**
- Remember to release the small cap on top of the auto air purge device on the pump, 1 turn, before filling. This will ensure that air is removed as the system starts up.
- Do not use the pressure relief valve as a means of flushing the system, please use the valve at the bottom of the pump. Discharging water from the system from the pressure relief valve may allow water to seep after you have left the job, so this may cause the boiler to lose pressure and debris to collect on the seating.
- The boiler is fitted with a cold water inlet filter on the inlet side of the hydraulic block. If the central heating works but you are unable to obtain or even fire the boiler in hot water mode, it is highly likely this filter is blocked. If you are able to obtain hot water but no central heating, then it is advisable, in first instance, to check the clock connections, the room stat is turned up fully and the clock has been set to call for heat.
- Do not forget that when water has been requested and if No.3 dip switch is set to OFF position, a 45-second time delay will elapse before the central heating fires.
- When commissioning remember that the boiler requires 20 mbar gas working pressure at the inlet of the appliance gas valve.
- Between two central heating demands, Anti Cycling Time adjustment trimmer can adjust the time.

If you are in any doubt, please refer to the installation and commissioning guidelines contained within the boiler instruction manuals. If necessary, please contact Heat LineTM Service Enquires for further advice and assistance on **0870 777 8318** in UK.
DO NOT FORGET IT IS A REQUIREMENT TO FULLY COMPLETE YOUR BENCHMARK CODE OF PRACTICE LOG BOOK IN ALL INSTANCES.

5.2 The boiler is suitable for use only on fully pumped, pressurised, sealed systems operating with a maximum design flow temperature of 85°C.

5.3 The boiler's integral expansion vessel is pre-charged to a pressure of 0.5 bar and will accommodate a system volume up to 125 litres for an average water temperature of 75°C and maximum system pressure of 3 bar. If, when operating at maximum design flow temperature, the system pressure is greater than 3 bar then an additional expansion vessel must be fitted to the system. A typical installation of an additional expansion vessel is given as ***figure 2***.

Figure 2



5.4 The system pipe work layout must be sized and an average of 20°C across the boiler flow and return temperatures must be achieved.

5.5 Existing heating systems must be thoroughly flushed in accordance with the recommendations of BS7593 prior to installing the boiler.

5.6 The system and boiler should be protected by a suitable anti corrosion inhibitor.

5.7 On installation it must be ensured that the boiler's heat exchanger is not a natural collecting point for air and where possible, the system pipe work should have a gradient to ensure air is carried naturally to other purpose made, air release points.

5.8 The system's water must always be allowed to circulate whenever the circulation pump is running. A return by-pass or a non-thermostatic radiator must always be provided in zoned systems and systems with thermostat-controlled radiator valves.

5.9 In high water capacity systems or under floor heating systems where prolonged operation of the boiler is expected at temperatures below 60°C, a by-pass must be installed on the boiler outlet in order to prevent condensation forming inside the boiler body. Failure to install a by pass will invalidate the boiler's guarantee.

5.10 The relief valve discharge must be directed away from any electrical component or where it could cause a hazardous situation.

5.11 To enable correct drainage of the system drain cocks to BS2879 must be fitted to the lowest points in the system pipe work.

5.12 For correct domestic hot water application the incoming water supply connection to the boiler should be the first from the main and capable of delivering a minimum inlet pressure of 0.25 bar and flow rate of 2·5 litres/minute. Where inlet pressures exceed 8 bar, a pressure regulator must be fitted to the cold water supply.

5.13 Where cold water mains are fitted with a water meter, check valve(s) or loose jumper stopcock, a domestic hot water mini-expansion vessel may need to be fitted.

5.14 Although the boiler is designed to inhibit the formation of scale, in hard water areas above 200mg/litre, a proprietary scale reducer should be fitted in the cold water supply to the boiler.

5.15 To ensure economic use of domestic hot water, it is recommended that pipe runs between the boiler and taps be in 15mm copper, as short as possible and where practical, be insulated to reduce heat loss.

5.16 If the boiler will not be used for a long period and there is risk of freezing, the electric supply must be left ON and all the central heating isolation valves must be open. Then the boiler will perform frost protection system. Otherwise, if the electrical supply is to be turned off, central heating system and domestic hot water system must be drained.

6. Appliance Siting

6.1 If the boiler is to be installed in any room or internal compartment, it requires no purpose made ventilation for combustion air. If the boiler is to be sited in a room containing a bath or shower then particular reference is drawn to the current I.E.E. Wiring Regulations and Building Regulations.

6.2 The boiler is not suitable for external installation unless protected by a purpose made building such as a boiler house.

6.3 For maintenance purposes it is recommended that the boiler be installed with a minimum clearance of 200mm above, 300mm below, 600mm to the front and 20mm to each side of the boiler case. It is however, permissible to install the boiler with smaller clearances **PROVIDING** that consideration is given for Servicing/Repairs at a later date. If in doubt, contact Heat Line for further guidance.

6.4 The boiler must be sited at least 1m away from flammable materials and heat sensitive walls must be protected by appropriate insulation.

6.5 The boiler must only be mounted on a wall that is capable of supporting the boiler's weight.

6.6 The condensate drain pipe must be fitted to allow the discharge of condensate to a drain.

Where possible condensate should be discharged into the household internal drainage system. If this is not practical, discharge can be made into an external drain. If neither of the above are possible then discharge into a purpose designed soakway is another option.

It is recommended that any external condensate pipe is insulated, and also increased in diameter to 32 mm. This is to prevent the risk of freezing.

6.7 For compartment installation the requirements of BS6798 and BS5440: Part2 must be met in particular:

- ❑ The compartment must be of sufficient size to permit access for inspection and servicing or the removal of the boiler and any ancillary equipment.
- ❑ Any space used for airing clothes or storage must be separated from the appliance by a non-combustible partition. Where the partition is formed from perforated material, then the major dimension of the apertures shall not exceed 13 mm.
- ❑ Where the boiler's flue pipe passes through the airing space, it must be protected by a non-combustible sleeve or fire stop having a minimum clearance of 20 mm between the flue pipe and sleeve. In addition, the clearance gap of the flue pipe or its guard through the partition must not exceed 13 mm.
- ❑ No combustible surface must be within 20 mm of the boiler casing without protection.
- ❑ A minimum clearance of 20 mm must exist between the compartment door and boiler front.

6.8 Where the boiler is intended for use on **Propane gas** the boiler must not be installed in a room or internal space below ground level.

7. Flue Terminal Location

7.1 The flue terminal must be sited with minimum clearance distances as specified in ***Figure 3***.

7.2 Where the lowest part of the flue terminates below 2m above a balcony, flat roof or ground level, then an appropriate terminal guard should be fitted in accordance with standard EN483 and BS 5440.

7.3 Where the flue terminates within 1m of a plastic or painted gutter or within 500mm of painted eaves then protection should be provided in the form of an aluminium shield at least 1m in length, fitted to the underside of the gutter or painted surface.

7.4 The flue terminal should not be sited where condensate 'plume' may give rise to a nuisance factor under certain weather conditions.

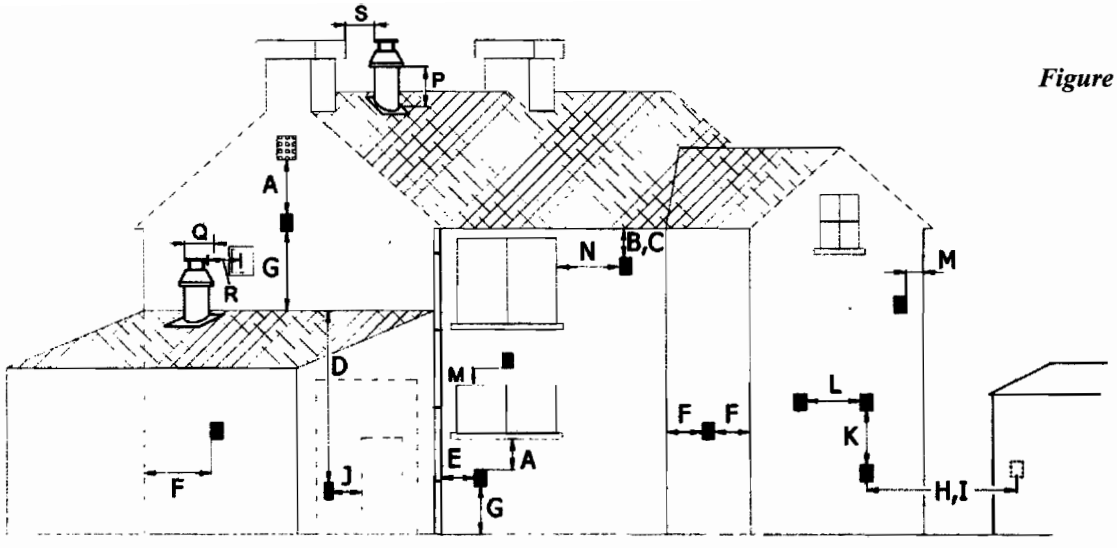
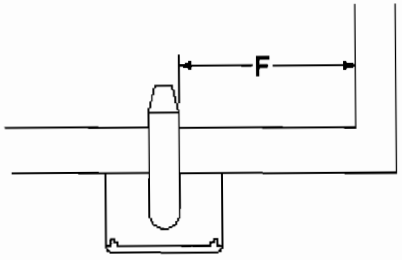
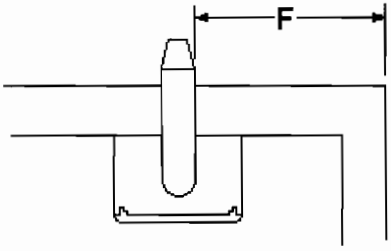


Figure 3

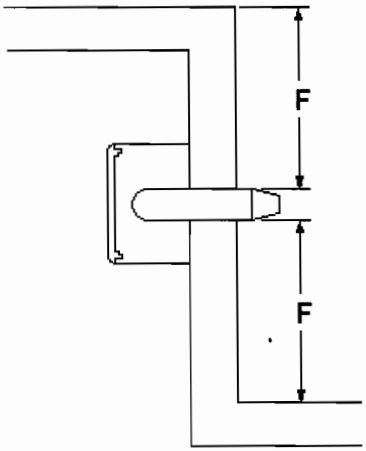
TERMINAL POSITION		MINIMUM DISTANCE
A-	Directly below an openable window or other opening e.g. air brick	300 mm
B-	Below gutters, soil pipes or drain pipes	75 mm
C-	Below eaves	200 mm
D-	Below balconies or car front roofs	200 mm
E-	From vertical drain pipes and soil pipes	150 mm
F-	From internal or external corners	300 mm
G-	Above ground, roof or balcony level	300 mm
H-	From a surface facing a terminal	600 mm
I-	From a terminal discharging towards another terminal	1200 mm
J-	From an opening in a car port (e.g. door, window) into a dwelling	1200 mm
K-	Vertically from a terminal on the same wall	1500 mm
L-	Horizontally from a terminal on the same wall	300 mm
M-	Above an opening, air brick, opening windows, etc.	300 mm
N-	Horizontally to an opening, air brick, opening windows, etc.	300 mm
P-	Above roof level (to base of terminal)	300 mm
Q-	From adjacent wall to flue	300 mm
R-	From an adjacent opening window	1000 mm
S-	From another terminal	600 mm



Internal Corner



Extarnal Corner



Double Corners

8. Flue (General)

8.1 The boiler employs a concentric flue arrangement consisting of a 60mm-diameter inner flue duct and 100mm-diameter outer air inlet duct.

8.2 A standard 700 +/- 5 mm flue kit (***figure 4***) is supplied with the boiler which can be routed to the rear, left or right of the appliance by means of a 90 degree bend (***figure 5***). The bend is connected to the boiler by means of connection screws.

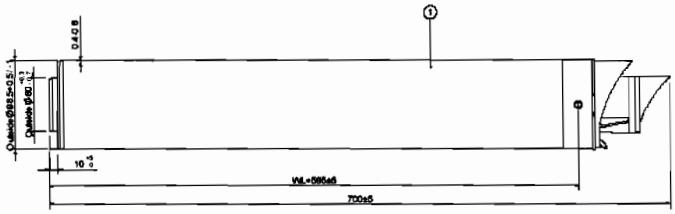


Figure 4

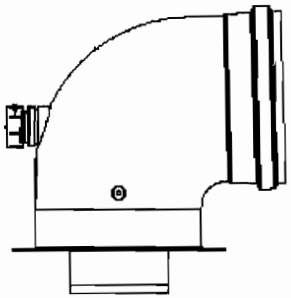


Figure 5

8.3 The flue may be lengthened, by means of extensions (available as an optional extra), to a maximum horizontal length of 8 metres using 60/100 flue pipe.

8.4 An optional vertical flue kit (***figures 6a and 6b***) is available to a maximum length of 9 metres using 60/100 flue pipe. The roofterminal is appropiate for flat and pitched roof.

8.5 The connection of vertical flue system is similar to the Horizontal flue connection. The system is connected via connection screws. The vertical extension pipes and roof terminal is connected by a clip shown as item 3 on ***figure 6b***.

Note. For each additional 90° elbow (or two 45° elbows) used the maximum flue length must be reduced by 1.5 m.

WARNING !

ONLY A HEATLINE APPROVED FLUE IS TO BE USED WITH THIS PRODUCT

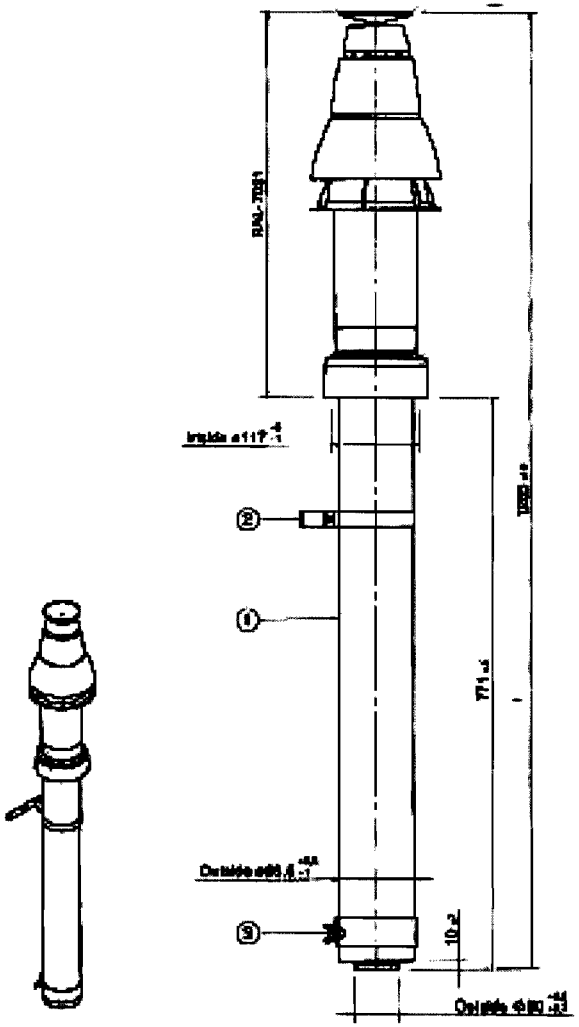


Figure 6a

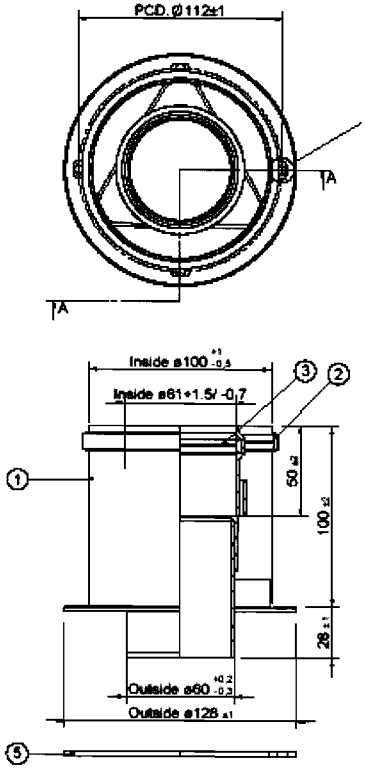


Figure 6b

9. Electrical Connections

9.1 The boiler is supplied factory wired complete with 1.5 m of mains fly lead. All electrical connections to the mains supply must be made in full accordance with the current I.E.E. regulations. Specially prepared mains fly lead can be replaced with a mains fly lead (spare part order code is specified at Appendices) by means of X15 and X3 connectors on electronic control board up to 1.5 m by installer.

9.2 The boiler must be correctly earthed. Ensure that the boiler can be isolated by either using a double poled isolating switch with at least 3mm separation and fused at 3amp, or using a 3amp fused three pin plug and unswitched shuttered socket unless the boiler is installed in a room containing a bath or shower when disconnection must use a double pole switch as above.

9.3 The point of connection must be readily accessible, adjacent to the appliance and provide complete electrical isolation for the boiler and control system no further than 1.5 m.

9.4 The low voltage room thermostat terminal block is located to the left side of third plastic cover. On connection of a room thermostat to the boiler, the factory fitted bridge across the room thermostat terminal connectors (*figure 7*) must be removed.

9.5 In case of reversed polarity connection, the appliance might not work properly. For this reason it is essential that correct polarity on connection to the electrical mains supply is observed.

9.6 While the boiler's main PCB, pump, fan, three-way valve and gas valve are supplied with 230V AC, all other components and associated circuits are supplied on extra low voltage.
NOTE As this boiler incorporates a pump over-run it must have a permanently live 230V supply.

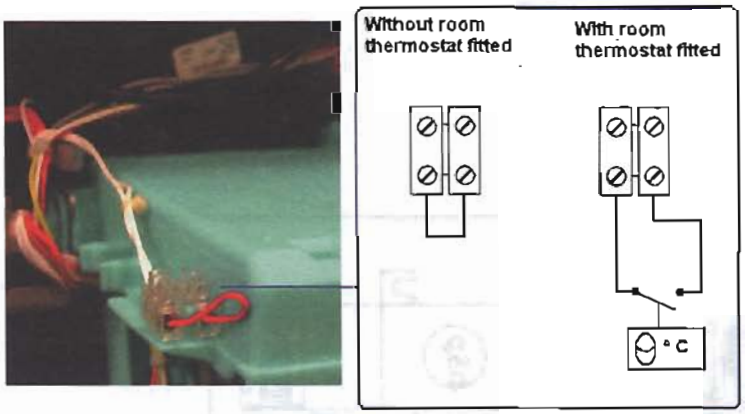


Figure 7

9.7 On connecting the mains electrical supply to the boiler, it is essential to ensure that electrical safety checks for earth continuity, earth resistance, polarity and short circuit are carried out prior to making the final connection. A diagram of the boiler's electrical circuit is given as *figure 8*.

Warning: On no account must any external voltage be applied to any of the terminals on the heating control connection plug.

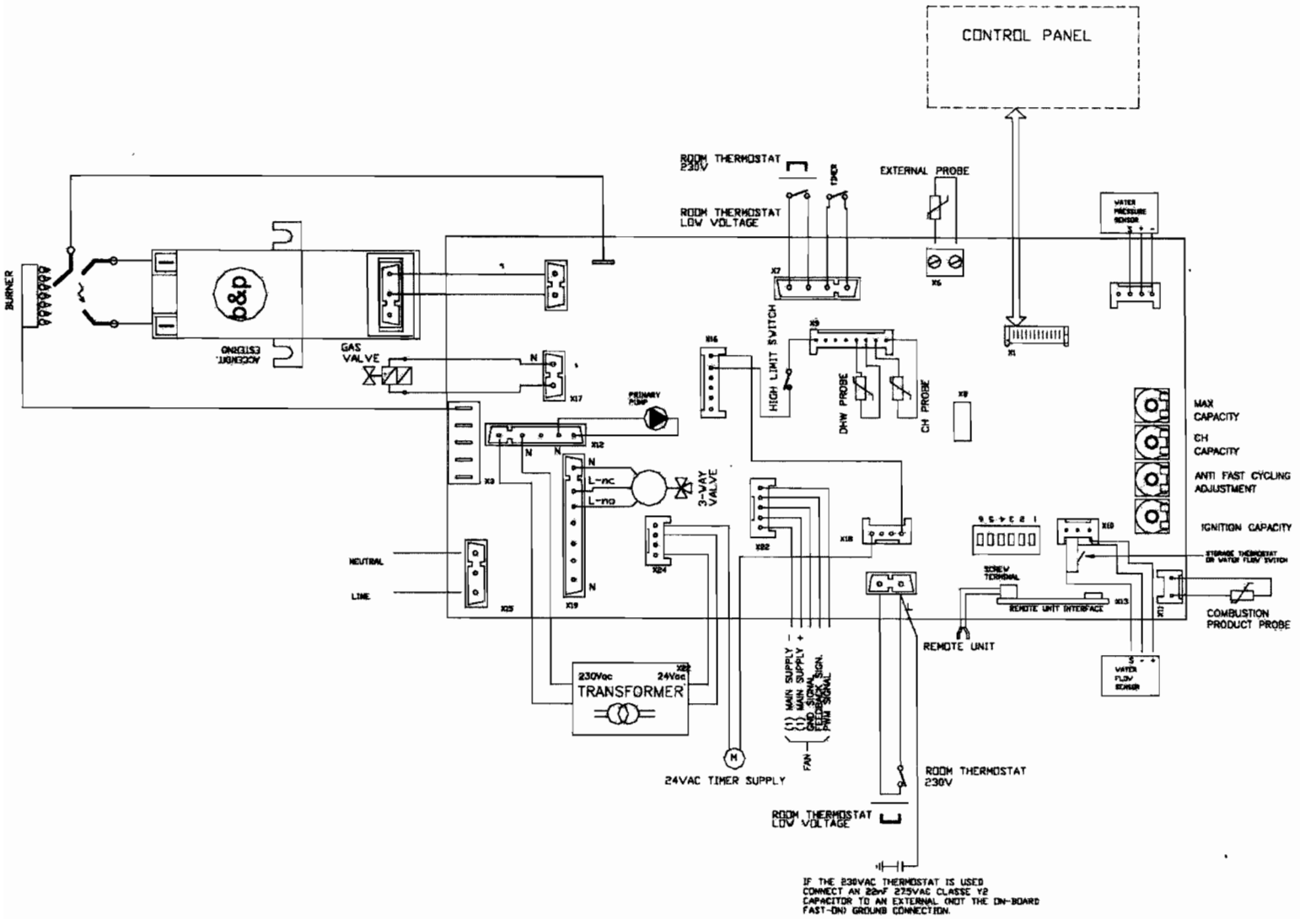

CONTROL PANEL
ROOM THERMOSTAT 230V
ROOM THERMOSTAT LOW VOLTAGE
EXTERNAL PROBE
TIMER
WATER PRESSURE SENSOR
BURNER
GAS VALVE
ACCENSIONE ESTERNO
PRIMARY PUMP
HIGH LIMIT SWITCH
DHW PROBE
CH PROBE
MAX CAPACITY
CH CAPACITY
ANTI FAST CYCLING ADJUSTMENT
IGNITION CAPACITY
3-WAY VALVE
L-mc
L-mo
NEUTRAL
LINE
230Vac
24Vac
TRANSFORMER
(-) MAIN SUPPLY
(+) MAIN SUPPLY
FEEDBACK SIGN.
PWM SIGNAL
FAN
24VAC TIMER SUPPLY
SCREW TERMINAL
REMOTE UNIT INTERFACE
REMOTE UNIT
STORAGE THERMOSTAT OR WATER FLOW SWITCH
COMBUSTION PRODUCT PROBE
WATER FLOW SENSOR
ROOM THERMOSTAT 230V
ROOM THERMOSTAT LOW VOLTAGE
IF THE 230VAC THERMOSTAT IS USED CONNECT AN 22nF 275VAC CLASSE Y2 CAPACITOR TO AN EXTERNAL ONLY THE ON-BOARD FAST-ON GROUND CONNECTION.

Figure 8

Important Note.

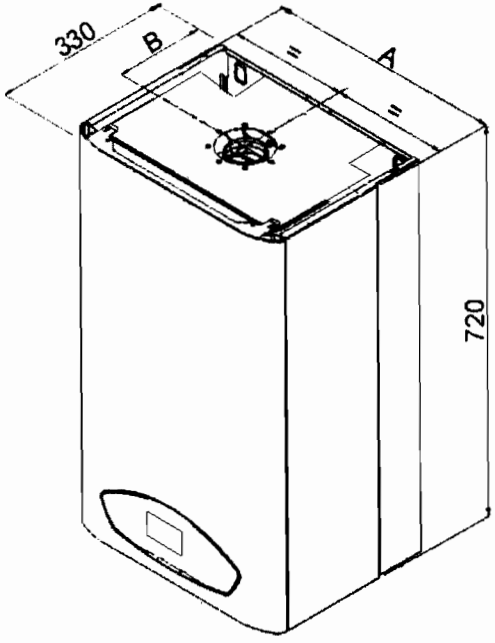
The mains electrical supply to the boiler must be maintained at all times in order to provide domestic hot water and frost protection. Ensure that the boilers electrical supply is not interrupted by any external controls.

10. Boiler Installation

10.1 Prior to installing the boiler check that the appliance carton contains: Appliance, Service, Installation and User Manual, Guarantee Card and Benchmark Log Book. The fixing jig, wall hanging bracket, mounting template are packed in a different box. The boiler dimensions are given in ***figure 9***.

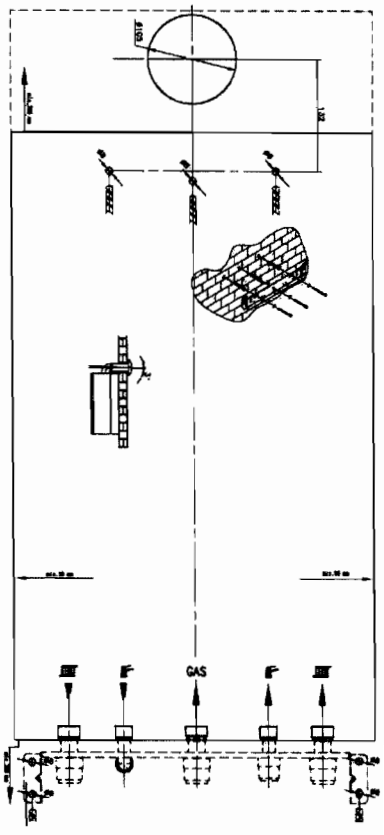
10.2 Ensure that the boiler is suitable for the gas supply by checking the data plate situated on the inside of the control panel door, and that the system and chosen boiler position is in accordance to Sections 1, 5, 6 and 7 of these instructions.

Figure 9



A: 430 mm
B: 128 mm

Figure 10



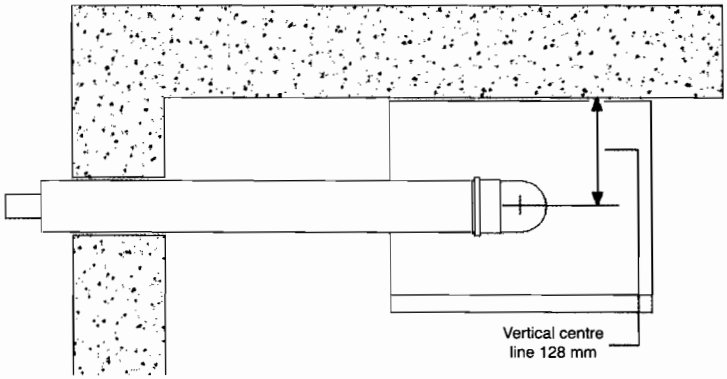
Fixing Jig

10.3 Position the supplied template on the wall, ensuring it is level both vertically and horizontally (***figure 10***). Mark the boiler fixing jig and wall bracket fixing positions and flue outlet position.

❑ For flue run to rear of boiler - Mark the flue centre position direct from template.

❑ For flue run to side of boiler - Mark the horizontal flue centre line on the rear wall. Extend the horizontal line to the side wall allowing a 3% incline towards the point of termination. Mark the flue centre vertical line. (***figure 11***)

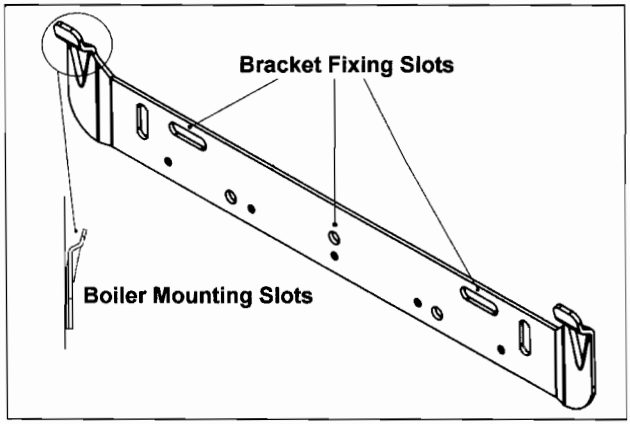
Figure 11



10.4 When cutting the flue hole it is recommended that a 105mm diameter core drill is used where both internal and external access for the flue installation is available. Where only internal access is available a 125mm diameter core drill should be used. (NB. Please take adequate precautions to prevent debris entering boiler via flue connection).

10.5 According to template, using an 8·5mm drill bit, drill the holes for fixing jig and hanging bracket. Locate and secure the supplied wall mounting bracket and fixing jig in position. (***figure 12***)

Figure 12



10.6 Mount the boiler onto the fixing bracket via the boiler mounting slots.

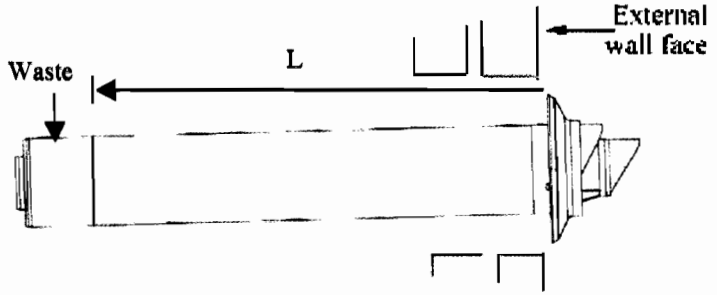
10.7 Connect isolation valves assembled on the fixing jig to boiler ensuring washers are fitted properly.

10.8 On installing the flue, determine the required length of the **outer air duct** by measuring the distance 'L' from the face of the external wall to the back of boiler's elbow connecting collar. The measurement for the **inner flue duct** will be 'L' + 20mm

10.9 Measuring from the back of the terminal connection, mark distance 'L' onto the outer air duct. (***figure 13***)

10.10 Cut the **outer air duct only** to the required length ensuring that. the cut is square and free from burrs.

Figure 13



10.11 Measuring from the back of the terminal connection, mark distance 'L' + 20mm onto the inner flue duct and cut the duct to size, ensuring that the cut is square and free from burrs (***figure 14***).

10.12 Pass the flue assembly through the wall and connect the assembly to the boiler, ensuring that both the air and flue duct joints are fully pushed home into the connecting elbow's collar.

10.13 With the flue and joints secured fit the flue trim to the external wall surface using a suitable mastic. **Note.** Where internal access only is available, the flue trim must be attached to the flue assembly prior to passing the assembly through the wall.

10.14 The vertical system diagram is shown in ***figure 15a*** and ***15b***. Maximum vertical flue length is 9 metres using 60/100 flue pipe.

Figure 14

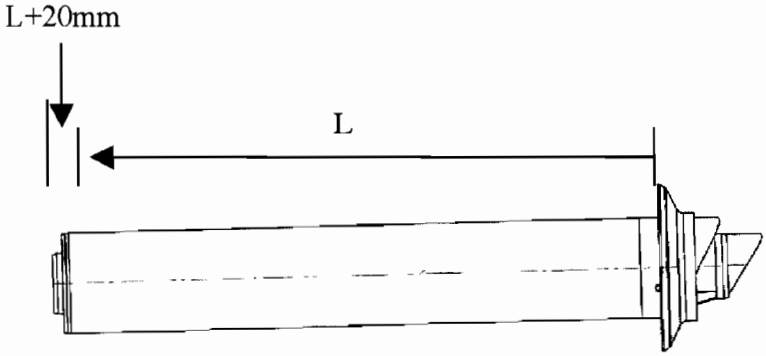


Figure 15 b

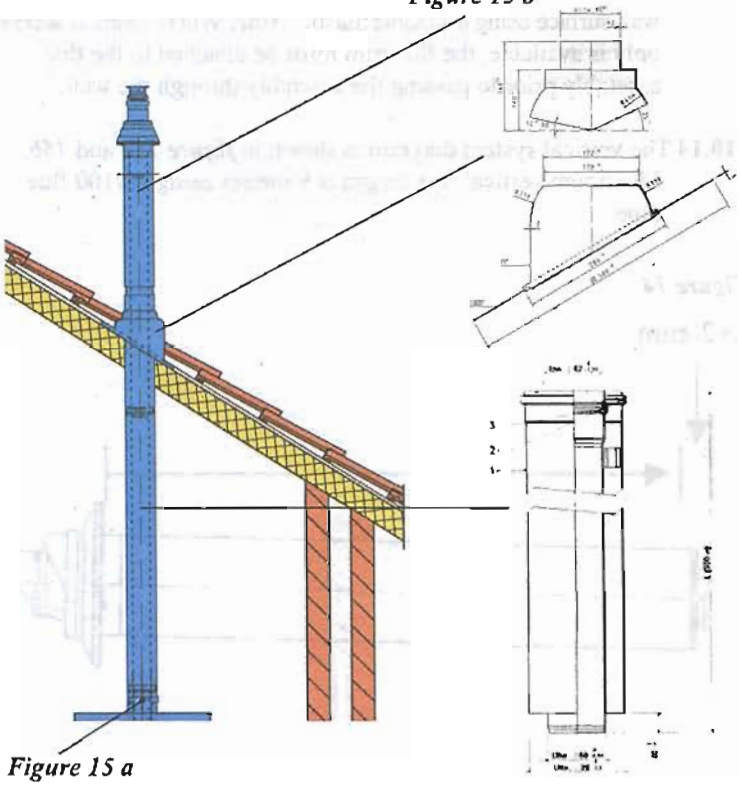


Figure 15 a

10.15 Provisions to fill the boiler and system must be made by the Installer, using an approved filling loop. The valves on fixing jig must be in accordance to water byelaws and fitted as close to the boiler as practicable.

10.16 Connect the domestic hot water, cold water inlet, heating system flow & return and pressure relief valve pipework to the supplied boiler fittings, ensuring that the pipework has been correctly flushed before final connection.

10.17 The electrical connections to the boiler must be in accordance to Section 9 of these instructions.

10.18 The condensate drain pipe must be fitted to allow the discharge of condensate to a drain.

Where possible condensate should be discharged into the household internal drainage system. If this is not practical, discharge can be made into an external drain. If neither of the above are possible then discharge into a purpose designed soakaway is another option.

It is recommended that any external condensate pipe is insulated, and also increased in diameter to 32 mm. This is to prevent the risk of freezing.

11. Gas Supply

11.1 The gas supply pipe must be capable of supplying the quantity of gas required by the boiler (see Technical Data section 2) in addition to the demand of any other gas appliances being serviced from that supply.

11.2 The internal diameter of the gas supply from the meter to the boiler's gas inlet connection must not be less than 22mm.

11.3 The meter governor must be capable of delivering a working pressure of 20mbar for natural gas.

11.4 On final connection of the gas supply to the boiler, the complete gas installation including the gas meter, must be tested for soundness and purged.

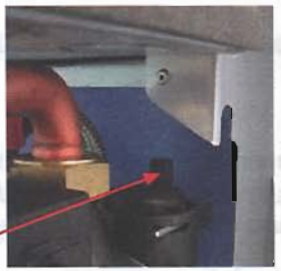
12. Filling the System

12.1 The boiler must not be operated in a waterless condition.

12.2 On completion of the boiler installation and ensuring that all water connections are correctly made and tight the boiler may be filled with water by fitting a filling loop (not supplied with the boiler) and opening the two manual feed valves and boiler isolation valves.

12.3 Release the cover cap of the boiler's automatic air vent situated on top of the pump. (***figure 16***)

Figure 16



12.4 The manual feed valves must be closed and the filling loop removed once the pressure sensor sited on the boiler's control panel, indicates a system pressure of 1.5 bar.

12.5 Check that all the water connections throughout the system are sound and bleed each of the heating systems radiators in turn.

12.6 Air must be vented from the boiler's pump by unscrewing the pump's integral vent plug and allowing water to bleed for a few seconds taking care not to allow water to splash onto the electric parts.

12.7 Test the operation of the system's outlet safety valve by turning the valve knob anti-clockwise until water is released. Then the valve must be closed and re-set.

12.8 The system must be filled until the pressure LCD display indicates a system pressure of 1.5 bar.

12.9 The water should be allowed to discharge by opening discharge valve until the system's designed operation pressure (nominally 1·5bar) is obtained, at which point the valve must be closed and re-set.

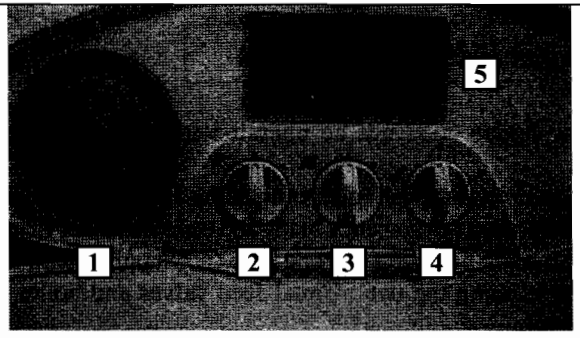
Important Note.

In order to maintain the appliance warranty after initial filling the heating system must be thoroughly flushed using a propriety cleanser to remove foreign material and contaminants.

13. Control Panel Functions

13.1 Central heating and D.H.W. temperature controls: The boiler's integral control unit monitors and adjusts both the boiler's hydraulic circuit and D.H.W. water outlet temperatures by means of sensors located on the C/heating and D.H.W. flow outlets. The sensors convert the water temperature into an electrical resistance that is relayed back to the control potentiometers located on the control panel. The respective potentiometer control dial allows manual setting of the maximum required temperature (reference value) being between 30° to 85°C for C/heating and 35° to 64°C for D.H.W. When the boiler functions in heating or D.H.W. mode, the resistance received is compared to the manually set reference value. The results of the comparison operates the modulation of the gas valve adjusting the useful heat output generated and stabilising the temperature to within ±1°C

Figure 17



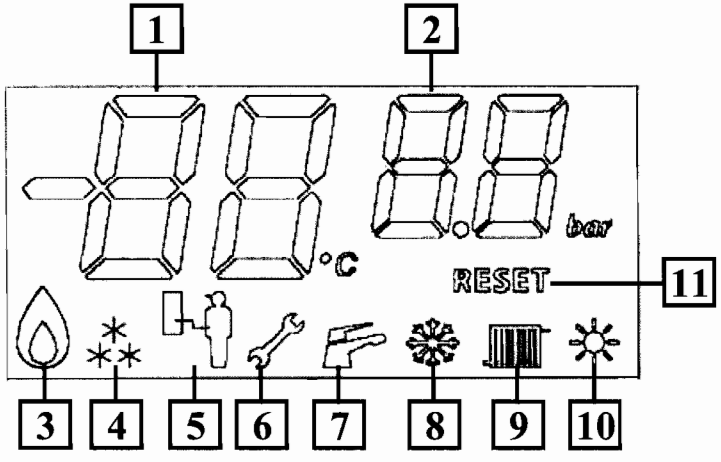
1- Timer
2- D.H.W. temperature control
3- C/Heating temperature control
4- Function switch
5- LCD display

13.2 Re-set function: Should boiler lock out occur, please check gas supply and ionisation probe position, the boiler may be re-started by switching to standby "0" position and switching back to its previous position once the fault has been eliminated.

13.3 Function switch: The three position switch allows the boilers operation to be set to Stand-by (centre position) 'Heating + D.H.W.' (left hand position) or 'D.H.W. only' (right hand position)

13.4 LCD display: While giving the operational status of the boilers burner and water temperature, to aid in fault diagnostics the control unit has a built in facility that automatically indicates a fault status. If more than one fault simultaneously occurs, then only the highest priority fault is displayed.

Figure 18



1- C.Heating/D.H.W. water temperature and failure code indicator
2- C.Heating water pressure value indicator
3- Ionisation indicator
4- Frost protection indicator
5- Service computer connection indicator
6- Failure indicator
7- D.H.W. mode indicator
8- Winter mode indicator
9- C. Heating mode indicator
10- Summer mode indicator
11- Reset indicator

Failure Codes:
F0 - No water pressure
F1 - lockout for overheating
F2 - D.H.W. temperature probe damage
F3 - Primary temperature probe damage
F4 - lockout for ionisation problem
F5 - Combustion product (flue) temperature probe damage
F6 - External probe damage
F7 - Problem with fan feedback signal
F8 - Fan speed out of range
F9 - Fan is moving, if fan must be stopped
OC - External sensor is connected and OTC enabled
CC - External sensor is disconnected and OTC disabled

Service mode function: Turn selector control knob 3 times between C/H setting and the off position (no more than 2 seconds between each turn) the boiler is now in service mode and will stay there for 15mins, turn both C/H & DHW controls to max, this sets the boiler to max output and will not modulate, turn both the controls to min to set the boiler on min without modulation during setting up.

14. Commissioning

14.1 The boilers have been tested and calibrated at the factory and is dispatched with its on board controls set to provide a maximum central heating and D.H.W. output of 24 kW for 24PC, and 30kW for 30PC. Consequently, once all the connections have been made and the boiler has been filled with water to the designed system operating pressure, the boiler may be fired prior to adjusting its on board parameters to match the heating systems requirements.

14.2 Prior to firing, check that the electrical supply to the boiler is 'On' (some segments are sbown on lcd display) and the gas service cock is in the open position.

❑ Set the boiler's central heating and domestic hot water temperature controls to maximum by turning them fully clockwise.

❑ Set service mode function by means of selector switch on plastic front panel.

❑ Set the external room thermostat (if fitted) to maximum and set thermostatic radiator valves to maximum.

14.3 Switch the boilers function switch to the central heating and domestic hot water position. The boiler's control unit will now automatically carry out pre-ignition safety checks before igniting the burner.

14.4 On burner ignition check the integrity of the boiler's flue for soundness and correct operation.

14.3a During the 10 second ignition attempt, visually check that **all** of the burner blades ignite correctly.
If necessary, adjustments to the ignition rate may be made using potentiometer P4. Turning P4 **clockwise increases** the ignition rate and **anti-clockwise decreases** the rate.

14.3a During the 10 second ignition attempt, visually check

14.5 Check the boiler for correct domestic hot water operation by opening and closing the household domestic hot water draw off taps.

14.6 In order to maintain the appliance warranty after initial filling the heating system must be throughly flushed using a propriety cleanser to remove foreign material and contaminants.

14.7 Restart the boiler and again allow the central heating system to reach maximum operating temperature. Check that all the water connections throughout the system are sound and bleed each of the heating systems radiators and purpose made air release points in turn.

14.8 Check the manual bleed point and vent any air trapped in the heat exchanger by means of screw on manual air vent.

14.9 Check the system pressure and top up if necessary.

14.10 Reset the central heating & domestic hot water temperature controls and room thermostat to the desired temperature settings.

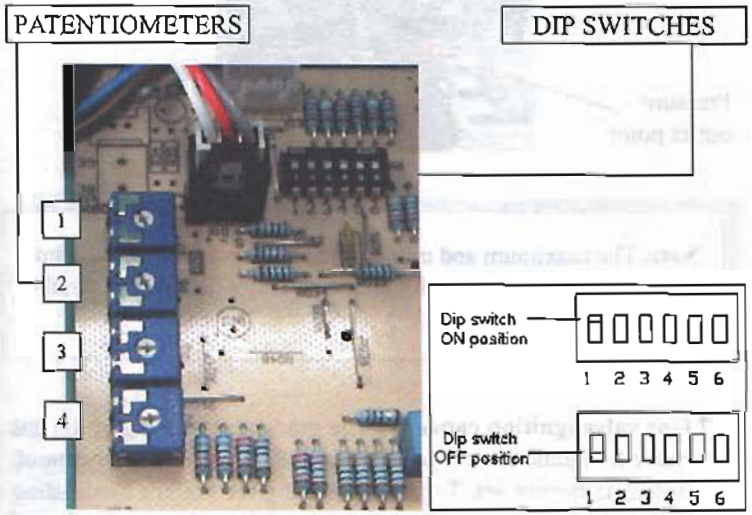
Important Notice.

Failure to thoroughly flush the boiler and heating system or to add an anti corrosion inhibitor to the system water will invalidate the boiler's warranty.
Condensing trap must be filled with water, before operation of the combination boiler. Condensing trap's plastic discharging pipe must be installed also before operation of the combination boiler.

15. Onboard Adjustments

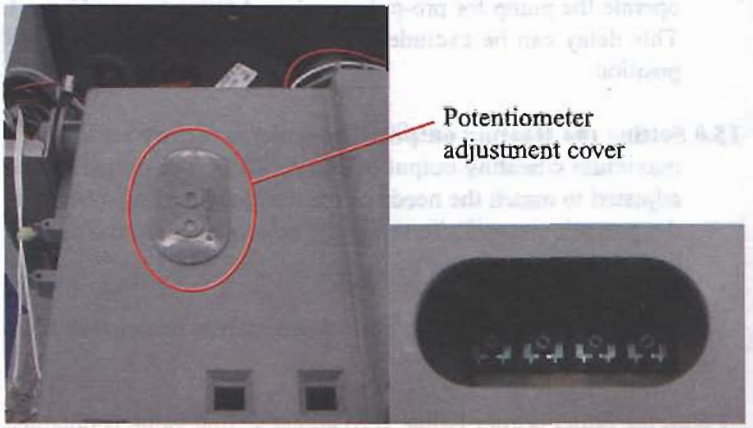
15.1 The boiler accommodates adjustments to its onboard settings via potentiometers and dip switches situated on the rear of the control panel. (*figure 19*)

Figure 19



The potentiometers can be reached by removing the cover on the rear of control panel (*Figure 20*). But to reach the dip switches, the control panel must be opened.

Figure 20



15.2 Setting the maximum c/heating flow temperature: The boiler is dispatched with a maximum flow temperature factory set to 90°C. Where a lower maximum temperature is required such as in the case of underfloor heating, the factory setting can be altered between a maximum of 50°C and a minimum of 30°C, by fitting dip switch '6' into ON position.

15.3 Setting the 45 seconds delay: The boiler has a factory set to include a delay of 45 seconds before re-ignition following closing a tap and CH mode start. To exclude this function change dip switch 3 into the on position.

15.4 255 seconds delay setting: The boiler has a factory set to exclude a delay of 255 seconds (anti cycling time) before re-ignition following burner shut down on the primary hydraulic water reaching its set temperature. This delay can be increased up to 255 seconds by turning potentiometer 2 clockwise.

15.5 Pump working mode setting: The boiler has a factory set to operate the pump for pre-purge and post-purge times (45 sec.). This delay can be excluded by fitting dipswitch '2' into ON position.

15.6 Setting the Heating output: The boiler is factory set to give a maximum c/heating output of 24kW/30kW. The output can be adjusted to match the needs of the designed heating system by the potentiometer '3'. To re-set the boilers maximum c/heating heat output:

- ❑ Attach a manometer to the boilers gas valves outlet test point (*figure 21*)
- ❑ With the boiler burner firing, zero adjust setting value is obtained for natural gas.

	Zero Adjust Setting	Air/gas mixer ring colour	Diaphragm Diameter
24 kW	0.037 mbar	Red colour	6.5 mm
30 kW	0.068 mbar	Red colour	6.6 mm

Figure 21

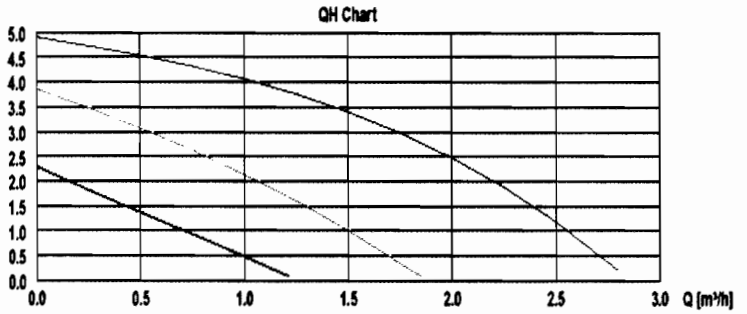
Note. The maximum and minimum heat output for **domestic hot water** is pre-set on potentiometer 4. It is not necessary to make further adjustments.

15.7 Gas valve ignition capacity: The graduated opening of the gas valve for ignition rate is governed by the 1st potentiometer control, which is factory set. To assist in setting the boiler's modulating gas rate perimeters the ignition rate of the valve can be forced from minimum to maximum rate by setting the potentiometer clockwise.

Important

Dip Switch 4 and Dip Switch 5 is factory set and must not be adjusted.

Figure 22



15.8 The boilers integral pump is factory set to its maximum speed setting to give a 1000 l/hr flow on a nominal 4m head. The pump may be adjusted to a lower speed to match the designed c/heating system requirements. (***figure 22***)

16. Safety Devices

16.1 An hydraulically operated primary pressure sensor monitors for low pressure or water shortage in the primary hydraulic circuit and will switch the boiler off if the pressure is below 0.3 bar. Intervention by this switch will not allow the boiler to operate until the circuit has been re-pressurised.

16.2 The temperature of the water flowing from the primary heat exchanger is monitored by an overheat thermostat located on its outlet pipe. If the temperature control system of the boiler fails the sensor switch opens, cutting of the electrical supply to the gas valve and the boiler goes to 'thermal lock out.' On activation the thermostat has to be manually re-set via a dedicated reset button sited on the thermostats body.

16.3 The boiler's control unit has in-built frost protection device that fires the boiler's burner when the temperature of primary hydraulic water falls below 6°C. The device works irrespective of any room thermostat setting and will protect the appliance. On reaching a water temperature of 16°C the boiler reverts back to normal operation.

16.4 If there is a fault on DHW sensor, system continues operation by controlling DHW outlet temperature by flow sensor and CH sensor which limits the temperature up to 65°C during DHW operation. If such failure occurs and displays on LCD display, please contact service department.

17. Routine Servicing

17.1 To ensure the continued efficient and safe operation of the boiler it is recommended that it is checked and serviced at regular intervals. The servicing must be carried out by a competent person. The frequency of servicing will depend upon the particular installation conditions and usage, but in all cases the boiler must be serviced at least once a year.

17.2 Following servicing of the boiler the relevant sections of the 'Benchmark' Installation, Commissioning and Servicing Log Book must be completed.

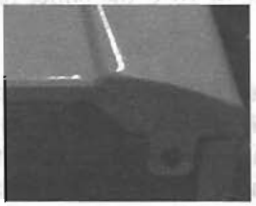
17.3 Prior to servicing a check of the flue operation and terminal guard (if fitted) along with a preliminary check of the boilers operation must be undertaken.

17.4 Ensure that both the electrical and gas supplies to the boiler are isolated before commencing to service the boiler.

17.5 Remove the boiler casing as follows:

❑ Open the front panel by removing two screw at the bottom of the boiler.

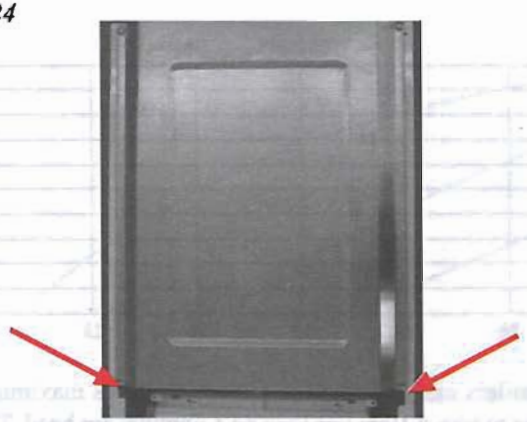
Figure 23



❑ Release the hermetic chamber cover by removing two screws on both sides and by lifting them to release from their retaining hooks. (*figure 24*)

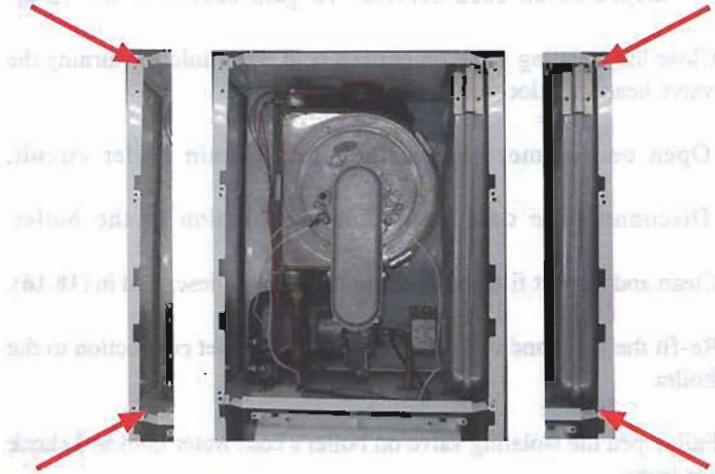
❑ Release the side panels by removing the screws on the upper and lower sides. Remove the panels by moving on sides and up.

Figure 24



17.6 Remove the combustion chamber cover by removing four screws on sides. (*figure 25*)

Figure 25



17.7 Disconnect the electrical leads and gas valve pipe connection from fan –gas valve side-, remove the screws of fan.

Figure 26

Figure 27

17.8 Remove the burner assembly from the combustion chamber as follows:

❑ Disconnect and remove gas supply pipe between gas valve and fan. Disconnect and remove silicon feedback pipe connection

Figure 28

❑ Pull off the ignition and flame electrode leads from PCB and ignition transformer, and remove the wires with gasket on hermetic chamber lower part.

❑ Remove burner-retaining screws on sides and remove burner.

Figure 29

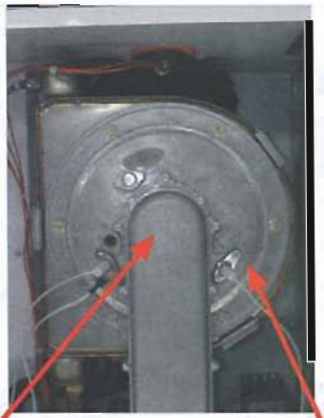
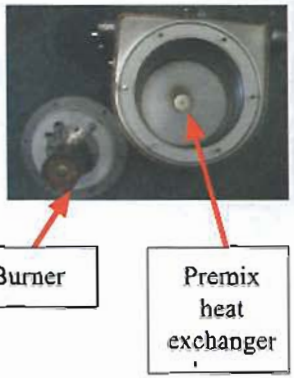


Figure 30



17.9 Visually check for debris/damage and clean or replace as necessary the following:

⇨ Heat exchanger
⇨ Burner
⇨ Fan/compartment
⇨ Electrodes
⇨ Insulation/gaskets

Important.

❖ Clean the heat exchanger using a soft brush or vacuum cleaner. **Do not** use any tool likely to damage painted finish of heat exchanger.

❖ Clean burner by washing in soapy water. Allow drying thoroughly before re-fitting.

❖ **Do not** use wire or a sharp instrument to clean burner.

❖ Ensure ignition electrode gap is set to 4 mm.

17.10 The boiler is fitted with a cold water inlet filter which must be inspected on each service. To gain access to the filter:

❑ Close the isolating valve on boiler's cold water inlet by turning the valve head full clockwise.

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

❑ Disconnect the cold water inlet connection to the boiler.

❑ Clean and inspect filter, replace if necessary as described in (**18.16**).

❑ Re-fit the filter and reinstate the cold water inlet connection to the boiler.

❑ Fully open the isolating valve on boiler's cold water inlet and check for leaks.

17.11 On completion of service reassemble the boiler components in reverse order to removal ensuring that all component joints and gaskets are sound. Any damage gasket must be replaced.

17.12 Reinstate the boiler's electrical and gas supplies and check for gas soundness and correct boiler operation.

18. Component Replacement

Caution.

While no substances harmful to health are contained in the appliance, some components parts of the boiler (insulation pads, gaskets and rope seals) are manufactured from man made fibres. When damaged or broken these fibres can cause temporary irritation or rash to skin. High dust levels may irritate eyes and upper respiratory system. It is important therefore, that sensible precautions are applied when exchanging components.

18.1 Ensure that both the electrical and gas supplies to the boiler are isolated before commencing to replace any component part.

18.2 To prevent the need to drain the entire heating system when replacing the boiler's integral pump, expansion vessel, safety relief valve and pressure sensor, the boiler's hydraulic circuit may be isolated from the central heating circuit by closing the boilers isolation valves. Opening the discharge valve will then drain the boiler's hydraulic circuit.

18.3 For replacement of the following components it will be necessary to remove the boiler casing panels as described in Section 17.

18.4 Domestic hot water sensor

- ❑ The domestic hot water sensor is located on the left of hydraulic kit's hot water side. (*figure 31*)
- ❑ Disconnect leads from sensor.
- ❑ Remove the sensor by using 13 spanner from kit.
- ❑ Fit replacement sensor ensuring washer is fitted properly.
- ❑ Fit leads to replacement sensor

Figure 31

18.5 Central heating and Flue sensor

- ❑ The Central heating is located on pipe. Flue sensor is located on plastic.
- ❑ Disconnect leads from sensors
- ❑ Remove sensors from pipe/plastic flue.
- ❑ Fit replacement sensors.
- ❑ Fit leads to replacement sensors.

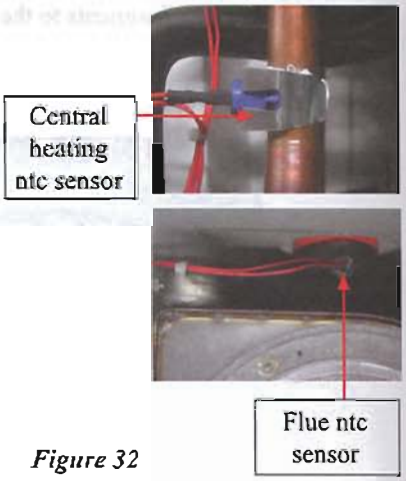


Figure 32

18.6 Fan Unit

❑ Remove electrical leads of fan.

❑ Release gas pipe, the fan units fixing screws and remove fan unit as described in **17.7**.

❑ Fit replacement fan unit in reverse order and reconnect electrical leads.

18.7 Printed circuit board (PCB)

❑ Turn off and isolate electrical supply.

❑ Remove interface cover by lifting two latches. (*figure 33*)

❑ Remove the electrical connections to the PCB by pulling carefully.

❑ Release the screws securing the PCB to the control panel and lift out PCB.

❑ Fit replacement PCB in reverse order to removal, ensuring that the PCB electrical connections are fully pushed home.

❑ Set the on board adjustments to the same value as the old PCB.

Figure 33

18.8 Pump

❑ The order of removal is different between the failures in motor or in plastic body.

In case of motor failure:

❑ Drain the boiler's hydraulic circuit as detailed in **(18.2)**.

❑ Disconnect the screws connecting pump motor to the body.

Figure 34

❑ Pull out the motor and disconnect electrical connection from cable box of pump.

Figure 35

❑ Fit replacement motor in reverse order ensuring that the correct polarity of the electrical connections are observed.

❑ Open isolating valves on flow and return connections, refill, vent and re-pressurise system ensuring the pump union joints are sound.

In case of body damage:

❑ Remove motor as described above.

❑ Remove secondary heat exchanger as detailed in **(18.9)**.

❑ Remove the expansion vessel pipe by removing clip on pump body.

❑ Remove the pressure sensor connection as detailed in **(18.15)**.

❑ Disconnect electrical leads of low pressure sensor as detailed in **(18.15)**.

❑ Disconnect the pumps outlet fitting.

Figure 36

❑ Remove the fixing screws of pump and hydraulic kit right part at the bottom of the boiler. ***(figure 37)***

Figure 37

❑ Remove pump body together with the kit part.

❑ Remove pump body from the hydraulic kit by removing clip.

❑ Fit replacement body in reverse order ensuring that the pump washers are fitted and correct polarity of the electrical connections are observed.

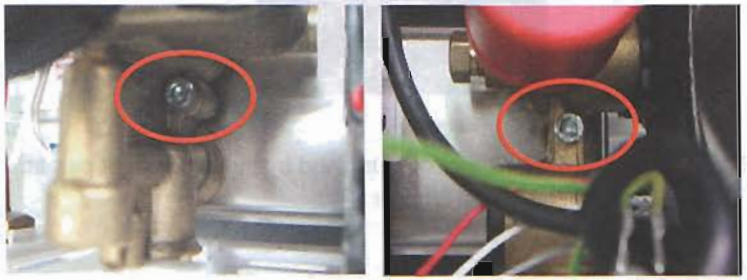
❑ Open isolating valves on flow and return connections, refill, vent and re-pressurise system ensuring the pump union joints are sound.

18.9 Secondary Heat Exchanger

❑ Drain the boiler's hydraulic circuit as detailed in (18.2)

❑ Remove the two screws which connects heat exchanger to hydraulic kit. (*figure 38*)

Figure 38



❑ Remove exchanger from the gap on the left hand side.

Figure 39

❑ Fit new heat exchanger and reassemble boiler in reverse order ensuring all washers are fitted.

❑ Open isolating valves on flow and return connections, refill, vent and re-pressurise system ensuring the all joints are sound.

18.10 Primary Heat Exchanger and Burner

❑ Drain the boiler's hydraulic circuit as detailed in **(18.2)**

❑ Remove pipes of heat exchanger.

❑ Release union connections on the pump and hydraulic kit, retaining washers for re-assembly.

❑ Remove pump-exchanger and exchanger-three way valve connection pipes.

❑ Remove burner as detailed in **(17.8)**

❑ Remove fixing points on exchanger. ***(figure 40)***

Figure 40

❑ Remove the heat exchanger and burner by pulling forward.

❑ Fit new heat exchanger and reassemble boiler in reverse order ensuring all washers are fitted.

❑ Open isolating valves on flow and return connections, refill, vent and re-pressurise system ensuring the all joints are sound.

❑ Check manual purger, and take air of heat exchanger by means of screw on manual purger.

18.11 Gas valve

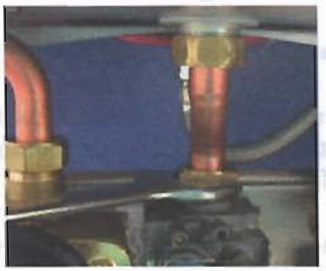
❑ Ensure that gas supply to boiler is turned off.

❑ Ensure the electrical supply is isolated and disconnected safely.

❑ Disconnect the electrical connections to gas valve, and feedback silicone pipe.

❑ Release the main gas supply tube connection from gas valve and manifold inlet, replace washers.

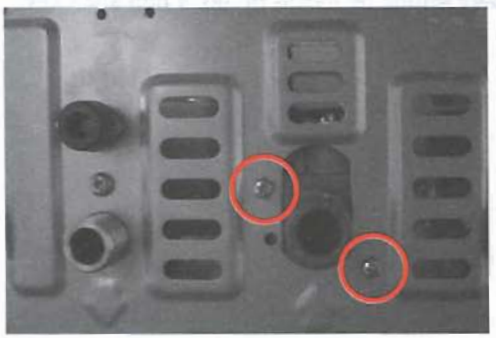
Figure 41



❑ Release the main gas connection between the gas valve supply tube and gas inlet valve, replace washer.

❑ Remove the gas valve's two securing screws and washers from the bottom side of boiler.

Figure 42



❑ Rotate the gas pipe and withdraw gas valve assembly.

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

❑ Refit in reverse order to removal.

❑ Check for gas soundness and correct boiler operation.

❑ Where necessary the gas valve settings may be re-calibrated by the following method:

18.11.1 Zero adjusment setting

❑ Remove protection brass screw (***Figure 43***)

❑ Connect a suitable manometer's positive probe to the pressure outlet on valve, and negative probe must be connected to feedback silicone pipe by means of T-connection.

❑ Turn the boiler's function switch to the 'winter' position

❑ Turn the central heating temperature control to maximum setting

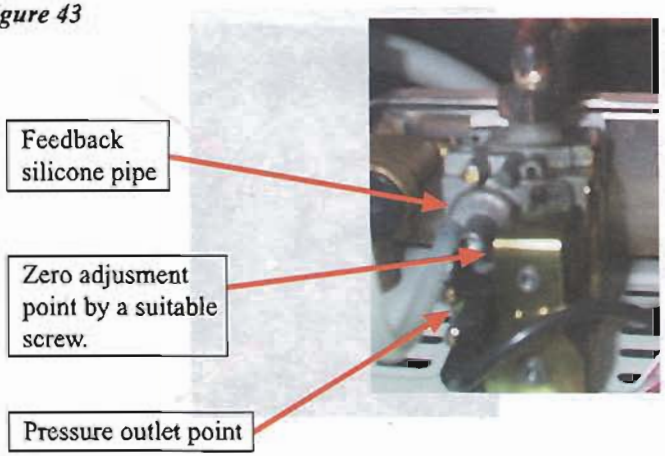
❑ Turn the maximum capacity (P4) and central heating capacity (P2) potentiometers to minimum setting

❑ **clockwise:** to increase the pressure setting, **anticlockwise:** to decrease the pressure setting by means of no. 4 mm allen key.

❑ After adjustment, install protective cover.

❑ Set P2 and P4 potentiometers to maximum levels.

Figure 43



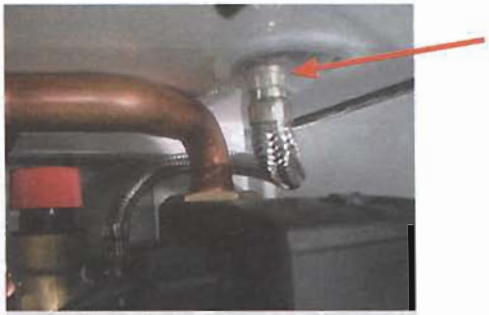
18.12 Expansion vessel

❑ Drain the boiler's hydraulic circuit as detailed in **(18.2)**.

❑ Disconnect pipe coupling on expansion vessel.

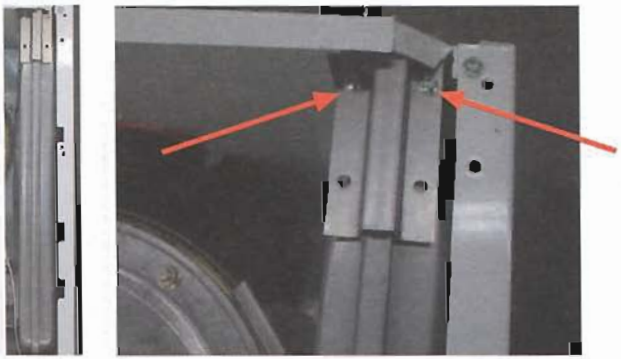
❑ Release and remove nut securing expansion vessel to the boiler.

Figure 44



❑ Remove side panels.

Figure 45



❑ Lift vessel out of boiler from the gap over the chasis and fit replacement vessel to boiler in reverse order to removal, ensuring that sealing washer is fitted to pipe connection before tightening.

❑ Using a pressure sensor, ensure that expansion vessel charge pressure is 0·5bar (7·5psi)

❑ Open isolating valves on flow and return connections, refill, vent and pressurise boiler ensuring all joints are sound.

18.13 Overheat safety thermostat

❑ Remove front panel.

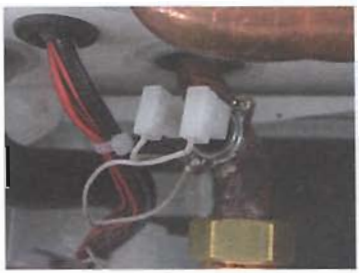
❑ Locate overheat safety thermostat on up side of electrical three way valve.

❑ Disconnect electrical connection from thermostat.

❑ Unscrew thermostat from pipe.

❑ Fit replacement thermostat in reverse order to removal.

Figure 46



18.14 Pressure relief valve.

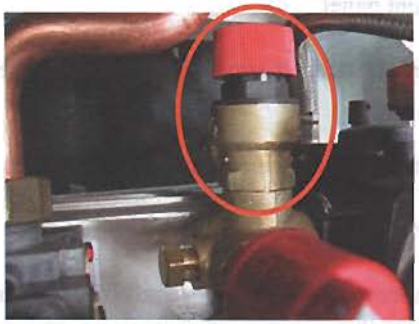
❑ Drain the boiler's hydraulic circuit as detailed in **(18.2)**.

❑ Disconnect discharge pipe on outlet of safety valve.

❑ Remove safety valve from hydraulic kit and retain o-ring for use on reassembly.

❑ Fit replacement safety valve in reverse order to removal and refill, vent and pressurise boiler ensuring all joints are sound.

Figure 47



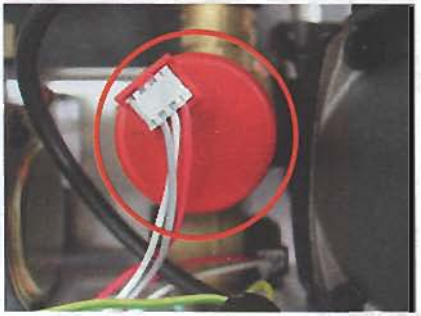
18.15 Pressure sensor

❑ Drain the boiler's hydraulic circuit as detailed in **(18.2)**.

❑ Disconnect and remove sensor cable and sensor from the hydroblock. *(figure 48)*

❑ Fit replacement pressure sensor in reverse order ensuring the gasket is in place.

Figure 48



18.16 Hydroblock

❑ Drain the boiler's hydraulic circuit as detailed in **(18.2)**.

❑ Remove secondary heat exchanger in **(18.9)**

❑ Remove pump (motor and body with right part of hydroblock) as detailed in **(18.8)**

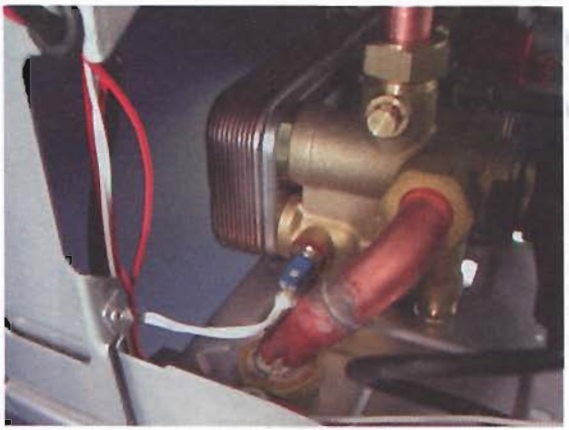
❑ Remove right part of hydroblock from pump by releasing the clip.

❑ Release exchanger outlet pipe nut and rotate the pipe for easy removal of hydroblock left part as described in **(18.2)**

❑ Disconnect the three way valve motor electrical connection and remove motor by releasing clip as described in **(18.19)**

❑ Release the nut connecting CH outlet connection to hydroblock.

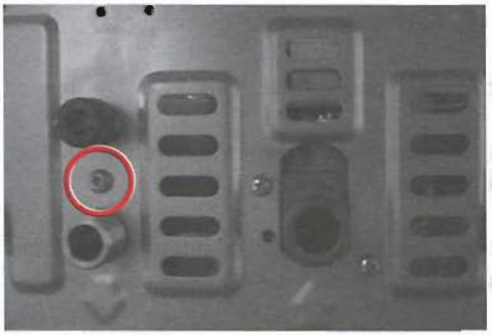
Figure 49



❑ Disconnect DHW sensor as described in **(18.4)**.

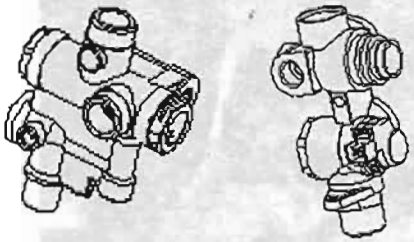
❑ Remove the screw securing left part of hydroblock to combination boiler.

Figure 50



❑ Fit replacement hydroblock parts in reverse order to removal ensuring all other components are fitted properly.

Figure 51



❑ Open isolating valves on flow and return connections, refill, vent and pressurise boiler ensuring all joints are sound.

18.17 Filter.

❑ Drain the boiler's hydraulic circuit as detailed in **(18.2)**.

❑ Remove right part of hydroblock as described in **(18.8)**.

❑ Remove the filter on the inlet of hydroblock.

❑ Clean or fit replacement filter.

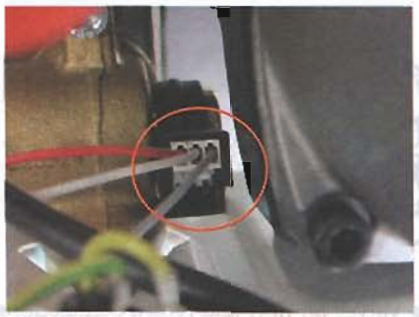
❑ Fit parts in reverse order to removal ensuring all other components are fitted properly.

❑ Open isolating valves on flow and return connections, refill, vent and pressurise boiler ensuring all joints are sound.

18.18 Flow sensor

❑ Remove the flow sensor by using pliers.

Figure 52



❑ Fit replacement sensor in reverse order to removal.

18.19 Three way valve

❑ Ensure that the electric supply to boiler is OFF.

❑ Remove the electrical connection of valve.

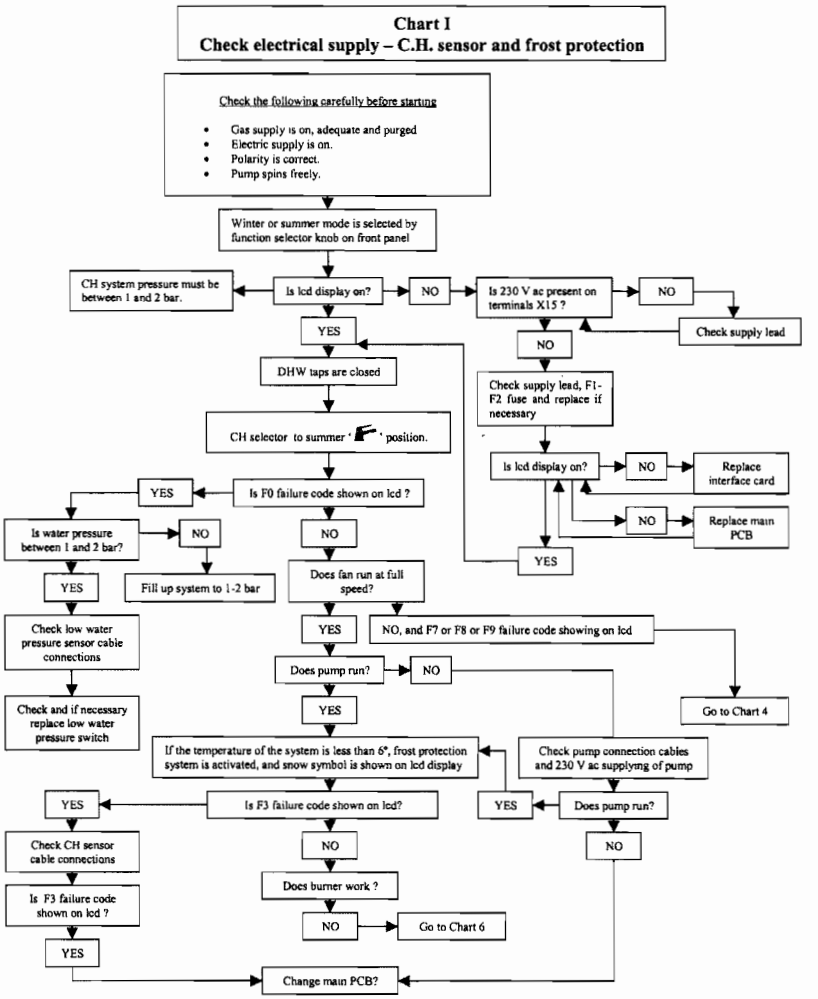
Figure 53

❑ Remove the clips connecting valve to hydroblock.

Figure 54

❑ Fit replacement valve in reverse order ensuring the valve is fitted properly.

19. Fault Finding Chart



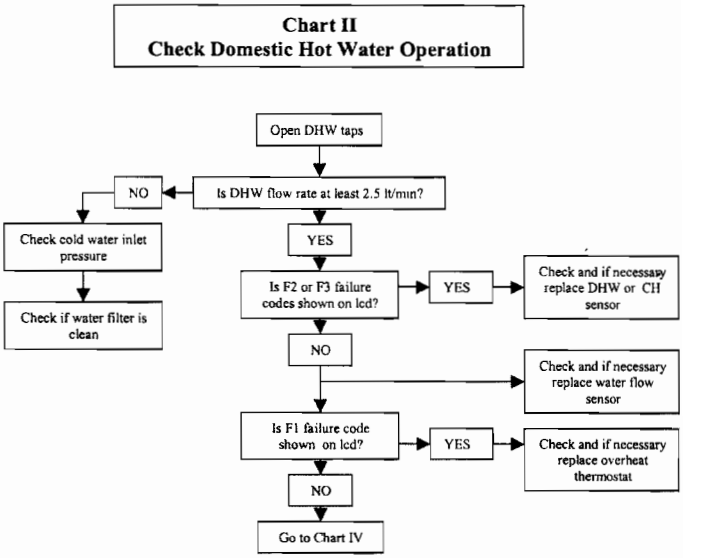


Chart III
Check Central Heating Operation

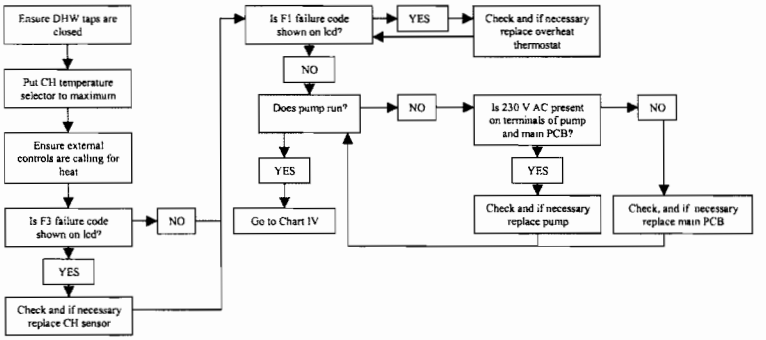


Chart IV
Fan Operation

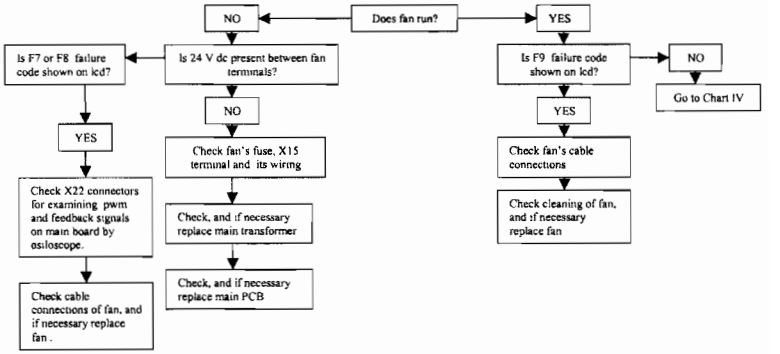


Chart V
Check DHW and CH modulation

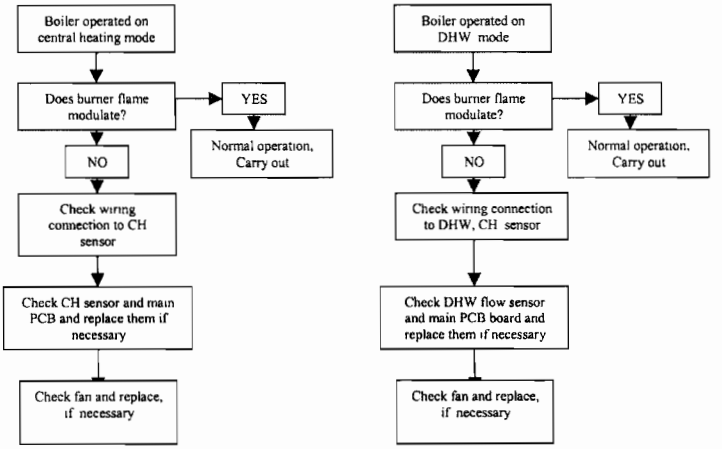
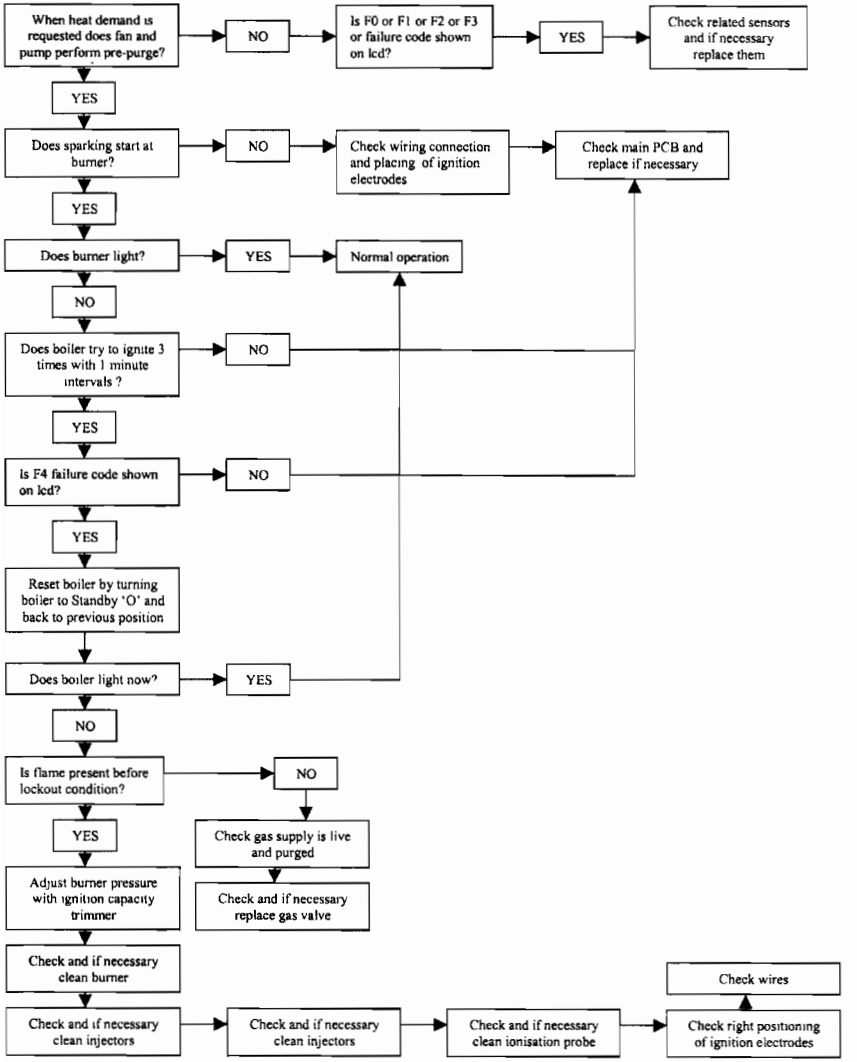


Chart VI
Check Ignition System



20. Benchmark Log Book

benchmark™

BENCHMARK No. | | | | | | |

GAS BOILER COMMISSIONING CHECKLIST

BOILER SERIAL No. _____ **NOTIFICATION No.** _____

***CONTROLS** To comply with the Building Regulations, each section must have a tick in one or other of the boxes*

TIME & TEMPERATURE CONTROL TO HEATING	ROOM T/STAT & PROGRAMMER/TIMER ☐	PROGRAMMABLE ROOMSTAT ☐
TIME & TEMPERATURE CONTROL TO HOT WATER	CYLINDER T/STAT & PROGRAMMER/TIMER ☐	COMBI BOILER
HEATING ZONE VALVES	FITTED ☐	NOT REQUIRED
HOT WATER ZONE VALVES	FITTED ☐	NOT REQUIRED
THERMOSTATIC RADIATOR VALVES	FITTED ☐	
AUTOMATIC BYPASS TO SYSTEM	FITTED ☐	NOT REQUIRED

FOR ALL BOILERS CONFIRM THE FOLLOWING

THE SYSTEM HAS BEEN FLUSHED IN ACCORDANCE WITH THE BOILER MANUFACTURER'S INSTRUCTIONS?	
THE SYSTEM CLEANER USED	
THE INHIBITOR USED	

FOR THE CENTRAL HEATING MODE, MEASURE & RECORD

GAS RATE	m^3/hr	ft^3/hr
BURNER OPERATING PRESSURE (IF APPLICABLE)	N/A	mbar
CENTRAL HEATING FLOW TEMPERATURE		°C
CENTRAL HEATING RETURN TEMPERATURE		°C

FOR COMBINATION BOILERS ONLY

HAS A WATER SCALE REDUCER BEEN FITTED?	YES ☐ NO ☐
WHAT TYPE OF SCALE REDUCER HAS BEEN FITTED?	

FOR THE DOMESTIC HOT WATER MODE, MEASURE & RECORD

GAS RATE	m^3/hr	ft^3/hr
MAXIMUM BURNER OPERATING PRESSURE (IF APPLICABLE)	N/A	mbar
COLD WATER INLET TEMPERATURE		°C
HOT WATER OUTLET TEMPERATURE		°C
WATER FLOW RATE		lts/min

FOR CONDENSING BOILERS ONLY CONFIRM THE FOLLOWING

THE CONDENSATE DRAIN HAS BEEN INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS?	YES ☐

FOR ALL INSTALLATIONS CONFIRM THE FOLLOWING

THE HEATING AND HOT WATER SYSTEM COMPLIES WITH CURRENT BUILDING REGULATIONS	
THE APPLIANCE AND ASSOCIATED EQUIPMENT HAS BEEN INSTALLED AND COMMISSIONED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS	
IF REQUIRED BY THE MANUFACTURER, HAVE YOU RECORDED A CO/CO_2 RATIO READING? N/A ☐	YES ☐ CO/CO_2 RATIO
THE OPERATION OF THE APPLIANCE AND SYSTEM CONTROLS HAVE BEEN DEMONSTRATED TO THE CUSTOMER	
THE MANUFACTURER'S LITERATURE HAS BEEN LEFT WITH THE CUSTOMER	

COMMISSIONING ENG'S NAME PRINT _____ CORGI ID No _____

SIGN _____ DATE _____

SERVICE INTERVAL RECORD

It is recommended that your heating system is serviced regularly and that you complete the appropriate Service Interval Record Below.

Service Provider. Before completing the appropriate Service Interval Record below, please ensure you have carried out the service as described in the boiler manufacturer's instructions. Always use the manufacturer's specified spare part when replacing all controls.

SERVICE 1 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 2 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 3 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 4 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 5 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 6 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 7 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 8 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 9 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 10 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

APPENDICES

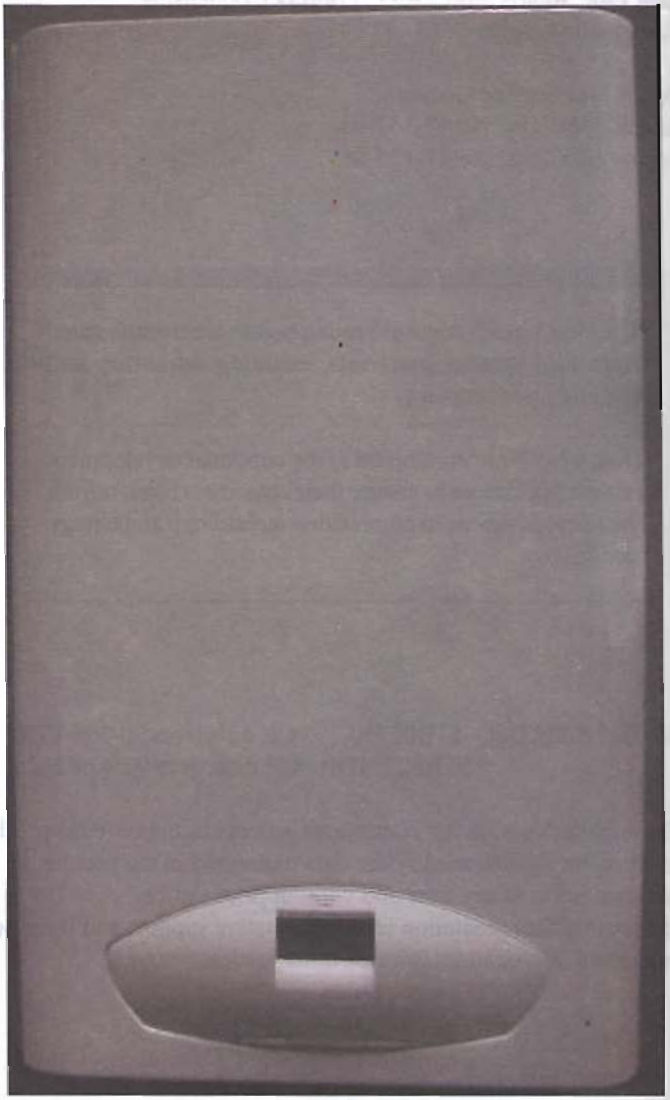
Appendix 1 Spare Parts List

PART No.	DESCRIPTION	ORDER CODE
1	BURNER & HEAT EXCHANGER GROUP (24 kW)	3003200952
2	BURNER & HEAT EXCHANGER GROUP (30 kW)	3003200954
3	SAFETY VALVE	3003200019
4	PUMP	3003200022
5	EXPANSION VESSEL	3002209497
6	GAS VALVE	3003200657
7	AIR/GAS MIXER	3003200658
8	RING OF AIR/GAS MIXER (RED)	3003200659
9	CONTROL PANEL	3003200179
10	PCB COVER	3003200084
11	ELECTRONIC CONTROL CARD	3003200601
12	INTERFACE BOARD	3003200662
13	CABLE GROUP WITH TIMER	3003200905
14	MAIN FLY LEAD	3003200915
15	SECONDARY HEAT EXCHANGER (30kW)	3003200897
16	SECONDARY HEAT EXCHANGER (24kW)	3003200896
17	DHW/FLUE SENSOR (NTC)	3003200031
18	CH SENSOR (NTC)	3003200152
19	FAN	3003200660
20	LIMIT THERMOSTAT	3003200781
21	MAIN TRANSFORMER	3003200661
22	IGNITION TRANSFORMER	3003200663
23	IGNITION ELECTRODE	3003200902
24	IGNITION CABLE	3003200903
25	IONISATION ELECTRODE	3003200904
26	THREE WAY VALVE MOTOR	3003200039
27	HYDROBLOCK – PUMP PART	3003200018
28	HYDROBLOCK – THREE WAY VALVE PART	3003200017
29	FRONT PANEL	3003200177

HEAT™ LINE

SOLARIS 24PC/30PC PRE-MIX CONDENSING COMBINATION BOILER

User Instructions



Natural Gas

Heat Line Solaris 24PC/30PC Pre-mix Condensing Combination Boiler

British Gas Service Listing
Solaris 24PC G.C.No 47-157-04
Solaris 30PC G.C.No 47-157-05

The Heat Line™ range of heating boilers are manufactured from high quality materials, enabling reliability and optimum performance.

Heat Line™ are committed to the continual development of their appliances to ensure their customers benefit from the latest advances in combustion technology and energy savings.

Notified Body IMQ 51BP2750 CE directives 90/396/CEE
51BP2751DR CE directives 92/42/CEE

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.

WRAS APPROVED PRODUCT

benchmark

Heating & Hotwater Information Council

'Benchmark' Log Book

As part of the industry-wide initiative the boiler comes complete with an Installation, Commissioning and Service Record Log Book. Please read the Log book carefully and complete all sections relevant to the appliance and installation. The details within the Log Book will be required in the event of any warranty work.

On completion the Log Book must be left with the end user and the relevant sections completed on each subsequent Service visit.

The Benchmark Log Book is included in the installation section of the manual on page 46 and 47.

IMPORTANT INFORMATION.

The Heat Line™ boiler is a high efficiency gas fired boiler and represents the highest level of technology found in today's gas boiler market.

Your boiler comes with a standard 1 year warranty to claim your free second year warranty you must return your completed guarantee card within 1 month of installation or ring the telephone number on the sticker on the front of your boiler.

In order to maintain your peak efficiency and performance your boiler must be serviced annually. This should be undertaken by a competent C.O.R.G.I. registered engineer. Failure to undertake this service work may invalidate your warranty. For Heatline recommended engineers, please contact Heatline Technical Services on 0870 777 8318.

All C.O.R.G.I. Registered Installers carry a C.O.R.G.I. ID card and have a registration number, which should be recorded and entered on your benchmark log book. You can check your Installer registration by contacting C.O.R.G.I. on 0870 401 2300

The boiler's **'Log Book'** must be completed at each Service visit.

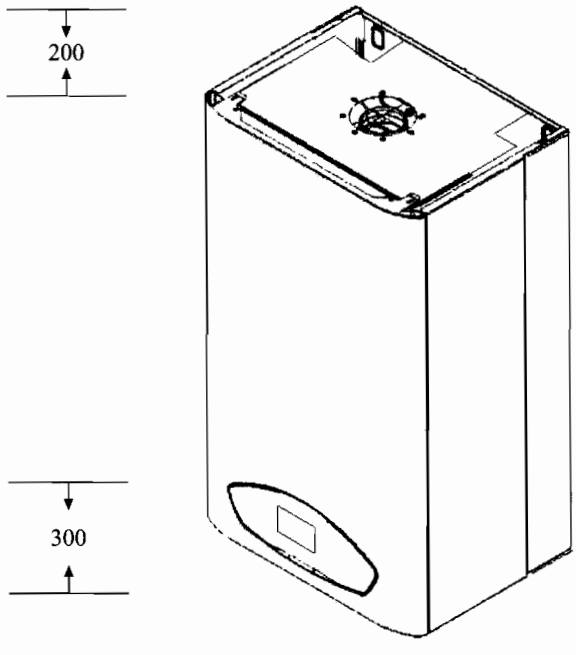
GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1994

It is a legal requirement that all gas appliances must be installed and serviced by a competent or C.O.R.G.I. registered person in accordance with the above regulations. Failure to install or service gas appliances correctly could lead to prosecution. It is in your interest and that of safety to ensure compliance with the law.

For electrical safety the boiler must be earthed and protected by a **5 -amp fuse.**

Note. In the event of a fault the appliance should not be used until a competent person has corrected the fault.

Figure 1



VENTILATION.

For maintenance and safety purposes, the boiler has been installed with a minimum space of 200mm above, 300mm below, 600mm to the front and 20mm to either side of the boiler case. It is essential that this space is not restricted by the addition of shelves etc. fitted above or below the boiler, or to the boiler sides.

GENERAL DESCRIPTION OF BOILER

The boiler is a combined domestic hot water and central heating appliance. Its internal control unit electronically provides direct burner ignition and combustion supervision along with continuous modulation of the burner's gas supply.

By means of a manual switch the boiler can be set to operate in one of two operating modes, domestic hot water only or domestic hot water and central heating.

DOMESTIC HOT WATER MODE:

When hot water demand is requested the boiler will fire automatically. An integral pump is then energised and hot water from the boilers primary circuit is circulated through the secondary heat exchanger, allowing the instantaneous transferral of heat to the incoming cold water. The secondary heat exchanger is protected against an internal build up of lime scale by limiting the hot water temperature at the tap to a maximum 64°C. Hot water will continue to flow through the tap until no longer required. When the demand for hot water ceases the integral pump may continue to run for a short while to dissipate any excess heat within the boiler.

DOMESTIC HOT WATER AND CENTRAL HEATING MODE:

When heating demand is requested the boiler will fire automatically. An integral pump is then energised and hot water from the boilers primary circuit is circulated around the heating systems pipework and radiators. The heat output from the boiler is automatically adjusted by the boiler's internal control unit to match the heating demand. As the water temperature of the heating system increases the gas input to the burner decreases, conserving energy and increasing efficiency. When the demand for heating no longer exists the burner will shut down and the boiler will revert to stand-by, waiting to respond to the next heating demand. The integral pump may continue to run after shut down for a short while to dissipate any excess heat within the boiler.

Please Note. When domestic hot water is called for during the heating mode, the boiler will automatically revert to domestic hot water mode until the demand for hot water ceases.

ACCESS TO THE BOILER CONTROLS.

The boiler controls are found behind the control panel door, sited at the bottom of the boiler's front case. To open: press the doors retaining push catch. (***figure 2***)

Figure 2

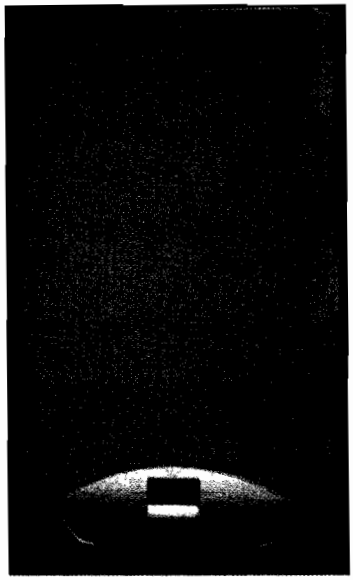


Figure 3

BOILER CONTROLS

The function and operation of the main controls located on the control panel fascia (***figure 3***) is as follows:

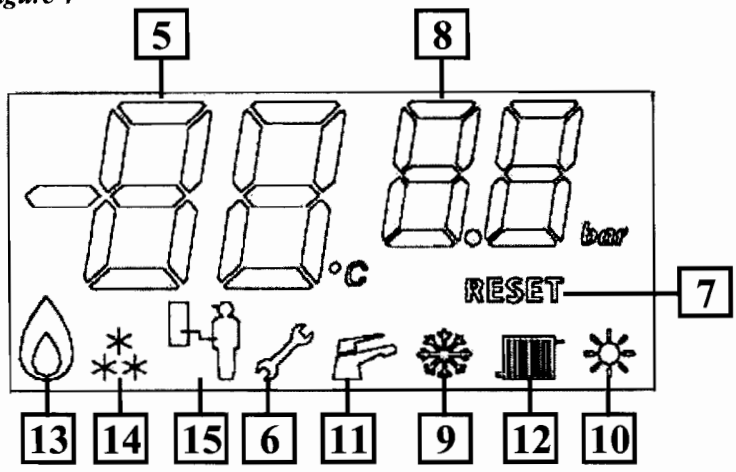
1. **(Function switch.)** This is the boilers main operating switch. In the O position the boiler is in stand-by mode and power supply is ON. For the boiler to operate to give the switch must be in the position.
   When switched to the position the boiler will operate only to supply domestic hot water. (Summer use) For the boiler to operate to give both central heating and domestic hot water the switch must be in the position. (Winter use)

2. **(Central Heating temperature control.)** The position of this control dial will determine the temperature of the water delivered to the radiators. The water temperature can be set from a minimum of 30°C (anticlockwise stop position) to a maximum of 85°C (clockwise stop position.)

3. **(D.H.W. temperature control)** The position of this control dial will determine the temperature of the domestic hot water delivered to the taps or shower unit. The water temperature can be set from a minimum of 35°C (anticlockwise stop position) to a maximum of 64°C (clockwise stop position.)

4. **(Clock)** A time clock to allow the automatic switching 'On' and 'Off' for central heating operating periods is available for the boiler.

Figure 4



5. **(Water Temperature Digits)** Two digit segments (5) indicators give the temperature of the water leaving the boiler.

6. **(Fault Indicator)** Control unit has an in-built fault diagnostic function. When a fault occurs the type of fault codes indicated by two digit segments (5) appropriately 'flashing ' the blue colour back light with wrench symbol (6). A listing of the display lights and meanings can be found in Section 13.4 of the Installation and Servicing Instructions.

7. **(Boiler Lockout)** When reset symbol (7) is showed with fault code, the boiler will need to be put back into operation. To put the boiler back into operation, the function switch must be switched to ⏻ position and after a few seconds back to its previous (summer or winter) position.

8. **(Pressure Digits)** Two digit segments (8) shows the pressure value within the boiler and central heating system and should, when the water is cold, read between 1and 2 bar.

9. **(Winter Mode)** When selecting winter mode, winter symbol (9) is shown.

10. **(Summer Mode)** When selecting summer mode, summer symbol (10) is shown.

11. **(DHW Mode)** When opening tap, system works at DHW mode and shows tap symbol (11).

12. **(CH Mode)** When selecting winter mode and working at CH mode, system shows radiator symbol (12).

13. **(Flame Indicator)** When flame occurs, flame symbol (13) is shown.

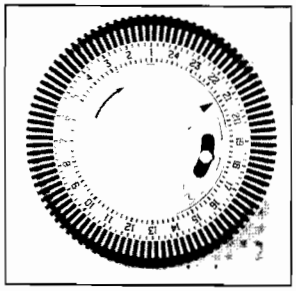
14. **(Anti Frost Function)** When enabling of anti frost function, snow (14) symbol is shown.

15. **(Service connection)** When connecting of computer to combination boiler, service man (15) is shown.

If the pressure sensor falls below 1bar the system and boiler must be re-pressurised.

Note. A Service Engineer must be contacted if boiler shutdown continues to occur.

Figure 5



The operational time periods may be set as follows:

- ❑ Rotate the clock actuator mechanisms clockwise, by hand, until the arrow indicates the current time, see ***figure 5***. In ***figure 5***, current time is 21:05.
- ❑ The time is set in 24 hour format, e.g. the time for 1pm would be 13
- ❑ Select the "On" times by pushing the black tappets to the outside.
- ❑ Select the 'Off' times by pushing the black tappets towards the centre of the clock.

The clock shown in diagram 2 is set as follows:
The clock operation can be chosen by a selection switch.
The switch has 3 positions:
1 (Up) position: The boiler is in the **constant** position and will override the timed settings.
⏲ **(Mid) position:** The boiler is in the **timed mode** and is controlled by both functin switch and clock tappets.
0 (Down) position: The boiler is **off** independent from function switch.

FROST PROTECTION

The 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 6°C. When the temperature reaches 15°C, the boiler stops.

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

SYSTEM PRESSURE.

On installation your installer will have filled the boiler and system to its effective working pressure. The boiler's pressure sensor should be regularly checked on lcd to ensure that this pressure is maintained between 1 and 2 bar. If there is a significant or frequent drop in pressure then your installer should be consulted.

OPERATING THE BOILER

Prior to operating the boiler check that the pointer on the boiler's pressure sensor is showing a pressure of between 1 and 2bar.

Set the boiler's 'Central Heating' and 'Domestic Hot Water' temperature controls to maximum by turning fully clockwise and set the external 'Room Thermostat' (if fitted) to maximum. (To set the room thermostat refer to its manufacturer's supplied user instructions.)

Switch the boilers functional switch to the position. The boiler's integral control unit will now automatically carry out pre-ignition safety checks before finally igniting the burner.

The 'Central Heating' and 'Domestic Hot Water' temperature controls and 'Room Thermostat' can now be set to the desired temperature settings.

When a demand for heat no longer exists, the burner will automatically shut down and the green 'Boiler Stand by' indicator will still light.

The boiler will be ready for a new heating demand.

CLEANING

The boiler casing may be cleaned with a damp cloth followed by a dry cloth to polish. **Do not** use abrasive or solvent cleaners.

FURTHER ADVICE

For further advice or information contact Heat Line ™ Service & Technical Enquiries by telephone on **0870 777 8318** or e-mail at our web site www.heatline.co.uk