



Internal & External Combi-Boilers

Installation & Users Guide

INTRODUCTION	Page
- WARRANTY	2
USER INSTRUCTIONS	
- BOILER OPERATION	3
- SWITCHING THE BOILER ON	3
- BOILER CONTROLS	4
- BUILT IN TIME SWITCH (SENATOR COMBI ONLY)	5
- SWITCHING THE BOILER OFF	6
- BURNER LOCKOUT	6
- RESTARTING AFTER LOCKOUT	6
- RESTART	7
INSTALLATION	
- REGULATIONS	8
- PROTECTION OF DOMESTIC HOT WATER	8
- WATER CONNECTIONS	8
- BOILER LOCATION	9
- SERVICE REQUIREMENTS	10
- THE HEARTH	10
- CONTROL PANEL	10
- PREFORMED PIPE WORK	11
- SEALED SYSTEM	11
- PLASTIC PIPE	11
- CAPACITIES OF EXPANSION VESSEL	12
- EXPANSION VESSEL SIZING	12
- WARNING SEALED SYSTEM	12
- FILLING SYSTEM	12
- CONVENTIONAL FLUE INSTALLATION	13
- BALANCED FLUE INSTALLATION (INTERNAL BOILER ONLY)	14-22
- CONNECTING OIL SUPPLY	22-23
- ELECTRICAL CONNECTION (INTERNAL BOILER)	24
- ELECTRICAL CONNECTION (EXTERNAL BOILER)	25
- WIRING DIAGRAM (INTERNAL & EXTERNAL BOILER)	26
TECHNICAL DATA	
- BOILER SPECIFICATIONS	27-28
- COMMISSIONING INSTRUCTIONS	29
- SERVICING INSTRUCTIONS	30
- FAULT FINDING COMBUSTION	31
- FAULT FINDING COMBI	32-33
- PARTS LIST	34
- BURNER SETTINGS	35

INTRODUCTION

Thank you for choosing the INTERNAL OR EXTERNAL oil boiler please read the following carefully.

To the installer

This manual must be left with the householder by the installer who will instruct the user on the boiler operation.

To the user

Please read the user section of this manual to familiarize yourself with the boiler operation.

WARRANTY

WARRANTY FOR YOUR BOILER MUST MEET THE FOLLOWING CONDITIONS OR YOUR WARRANTY MAY BE INVALID

Warranty on the Heat Exchanger: 5 Years

Warranty on Burner and Controls: 2 years

CONDITIONS OF WARRANTY:

1. Boiler MUST BE **installed** by an OFTEC registered engineer, if not permission will be required by building control.
2. Boiler MUST BE **commissioned** after installation by an OFTEC registered engineer.
3. Boiler MUST BE **serviced** every 12 months after installation by an OFTEC registered engineer.
4. Installer MUST COMPLETE an **Installation/Commissioning Form**, which will be found along with your manual and this must then be returned to the address on the warranty form. Failure to return this form, may invalidate your warranty.

USER INSTRUCTIONS

BOILER CONTROL THERMOSTAT



BOILER OPERATION

The Boiler Control Thermostat responds to the temperature of the water within the boiler and switches power to the burner when heat is required.

The burner has an independent control system which regulates the firing and (shut-off) of the burner.

Automatic firing of the burner will occur when the water temperature within the boiler falls below the control thermostat set point. This will continue to run until the water temperature rises to the temperature (recommended) set on the boiler control thermostat.

SWITCHING THE BOILER ON

- Check there is water in the system.
- Check radiator valves are on.
- Turn on oil supply.
- Switch electrical supply to the boiler on (including time clock) and then set the boiler control thermostat to recommended setting.

BOILER CONTROLS

BOILER CONTROL THERMOSTAT

The temperature of the water within the boiler and the store when in heating mode is controlled and maintained by the **Boiler Control Thermostat** which is located on the boiler control panel. When the heating is off the boiler and store are controlled and maintained by the **Boiler Thermal Store Thermostat** located at the rear of the boiler control panel.

Mixer Valve - The mixer valve can be adjusted to the desired hot water temperature setting, which the householder requires. The valve is graduated between 1 to 5, the greater the number the hotter the water.

TEMPERATURE SETTINGS:

The Boiler Control Thermostat has a range of 50°C to 80°C.

The Boiler Thermal Store Thermostat has a range of between 5°C and 90°C.

BUT THE BOILER CONTROL THERMOSTAT MUST BE SET AT 80°C AT ALL TIMES

The thermal store stat is factory set at 65°C this may need adjusting to suit site conditions.

PLEASE NOTE A ROOM STAT MUST BE FITTED

MAINS INDICATOR : GREEN

The mains indicator will illuminate when the mains supply to the boiler is on and system charge is above 0.5 bar, the boiler is protected by a low pressure cut off switch.

HIGH LIMIT STAT INDICATOR : ORANGE

The high limit indicator will illuminate when the water within the boiler is or has overheated e.g. reached a temperature above that set on the high limit thermostat.

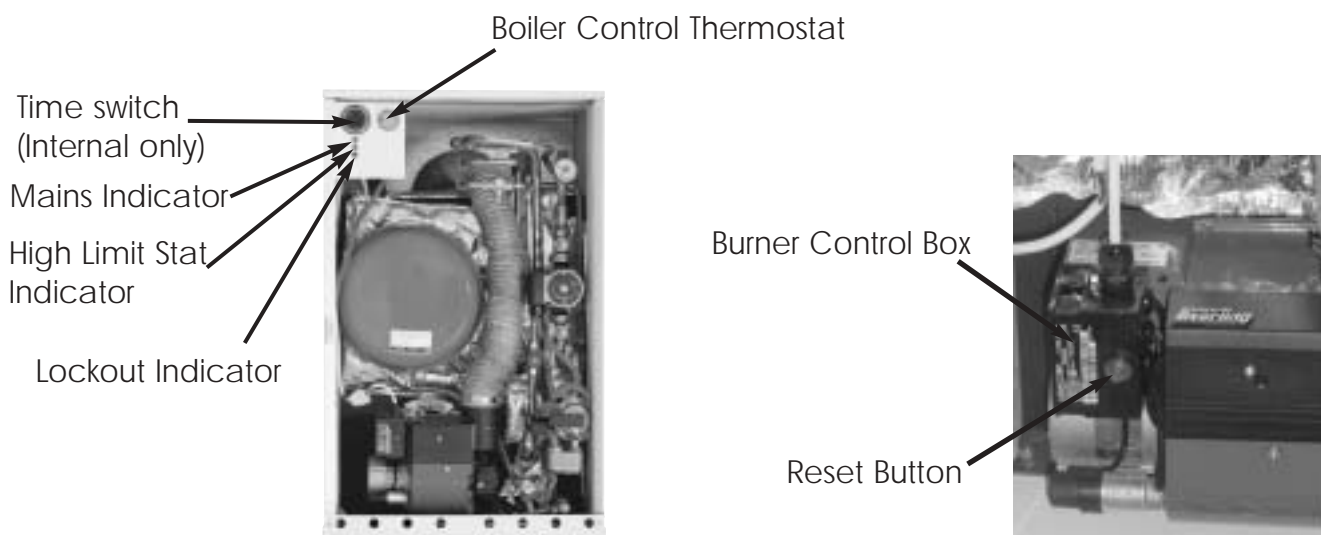
THIS INDICATES THAT THE THERMOSTAT NEEDS TO BE RESET TO RESET THE BOILER

When the boiler has had time to cool, the manual reset button (coloured red) on the control panel will need to be pressed in, to reset. If the high limit thermostat continues to trip, contact your installer, as there may be a fault with the central heating system.

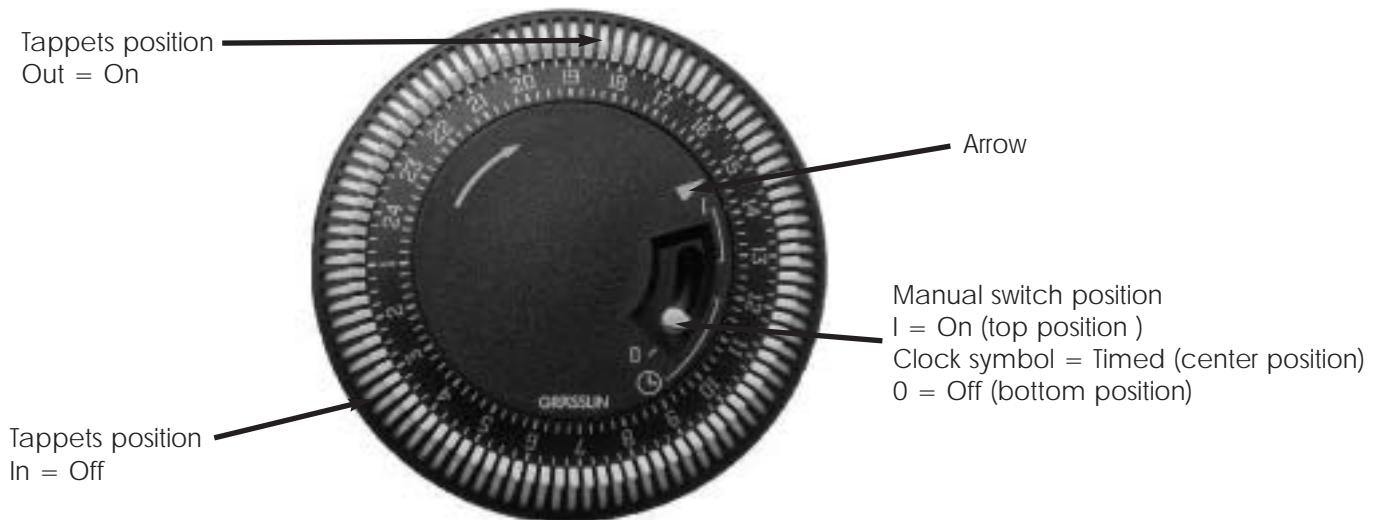
LOCKOUT INDICATOR: RED

The lock out indicator will illuminate when the burner has failed to fire, e.g. No fuel or an electrical fault.

PLEASE NOTE: The reset button on the burner will illuminate on the burner control box at the same time. Reset by pressing the reset button on the burner control box.



BUILT IN TIME SWITCH (INTERNAL COMBI BOILER ONLY)



SETTING TIME SWITCH UP

The outer dial should be set to the current time. Rotate the dial slowly in a clock wise direction, until the correct hour is approaching the arrow marked on the dial.

MANUAL SWITCH OPERATION

The manual switch will provide On/Timed/ Off control, thereby allowing manual control of the heating without disrupting the timed (tappet) settings.

PROGRAMMING SWITCH TIMES

One tappet is equal to 15 minutes, set the number of tappets to the outer edge of the dial, equal to the duration of time heating is required to be switched on.

SWITCHING THE BOILER OFF

The boiler can be turned off by turning the rocker switch, located on the underside of control panel, to the OFF position.

PLEASE NOTE: For longer periods of shutdown e.g. While away on holiday, switch **OFF** the mains (electrical supply) and turn **OFF** the OIL supply.

If shutdown occurs during cold weather ensure boiler is protected against frost damage.

BURNER LOCKOUT

The burner has an independent control system (Burner Control Box); this includes a flame detector (Photocell) which senses the presence of a flame. In the event of flame failure, the burner Control Box activates a second re-ignition sequence. Should the Photocell not detect a flame presence within 15 seconds the burner goes to LOCKOUT and shuts down.

Continued **LOCKOUTS** are a result of a fault in the operation of the boiler and can be attributed to following examples:

- An interruption of the fuel supply .
- Electrical Supply fault e.g. Extreme low voltage.
- Failure of a Burner component.
- A fault within the heating system .
- Burner combustion not being correct.

The Burner Reset button on the Control Box and the red Lockout Indicator on the boiler control panel illuminates to indicate that a lockout has occurred.

In the event of the Burner locking out, do not attempt to restart the Burner by pressing the Reset Button on the Burner Control Box for at least 2 minutes. A Bi-metallic timer within the Control Box has a minimum cooling time of 45 seconds thus the 2 minute interval will ensure that this Bi-metallic timer has cooled and is therefore in a position where it may be reset

RESTARTING AFTER LOCKOUT

When lockout has occurred, inspect for any obvious causes e.g. oil leaks.

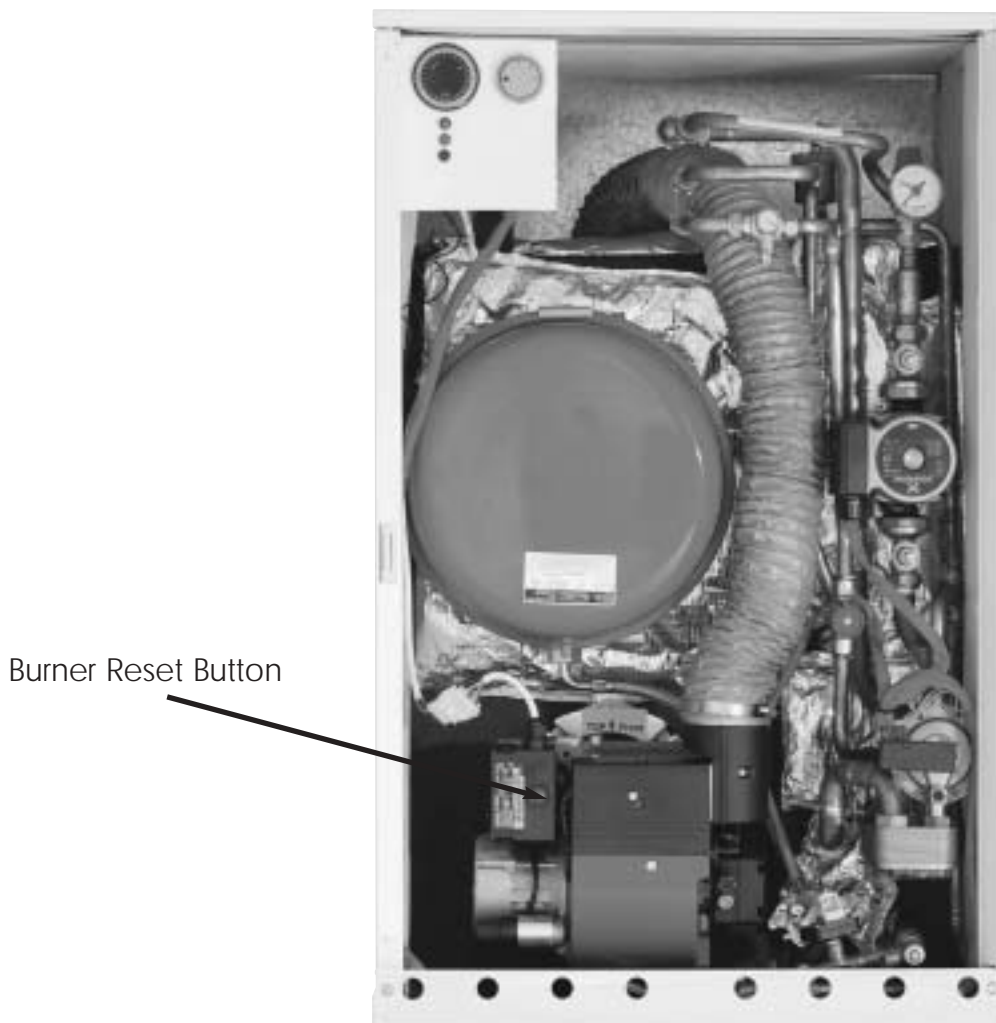
Also check the fuel line from the tank to the boiler and that any oil shut off valve has not been inadvertently closed.

RESTART

- Check there is adequate oil in the storage tank.
- Check oil supply valves are open.
- Switch on heating system (e.g. Time clock).
- Depress the red Burner Reset Button on the burner Control Box, which will be illuminated. Both Burner Reset Button (illuminated) and the lockout Indicator on the Control Panel will go out and the burner will commence the ignition start sequence. After 15 seconds the Burner should fire normally.

PLEASE NOTE: Should the Burner not start, both lockout indicator, on the Control Panel and Burner Reset Button will illuminate again.

- Wait at least 3 minutes and depress the Burner Rest Button again. Failure to start a second time indicates a fault requiring attention. In the event of a second failure to start:
 - Switch off electrical supply.
 - Call service engineer.



REGULATIONS

The installation of oil fired boilers should comply with the following standards and codes of practice.

- BS5449 Forced circulation hot water heating systems for domestic use
- BS5410-Part1 Oil installations up to 45kw.
- BS7593 Water treatment of hot water central heating systems.
- BS7671 Electrical Regulations.
- BS7074 Code of practice for sealed systems
- Building Regulations Part L1 and J 2002 England and Wales, Part F Scottish Regulations and Technical Booklet L Northern Ireland.
- OFTEC Codes of Practice Published or Recommended.

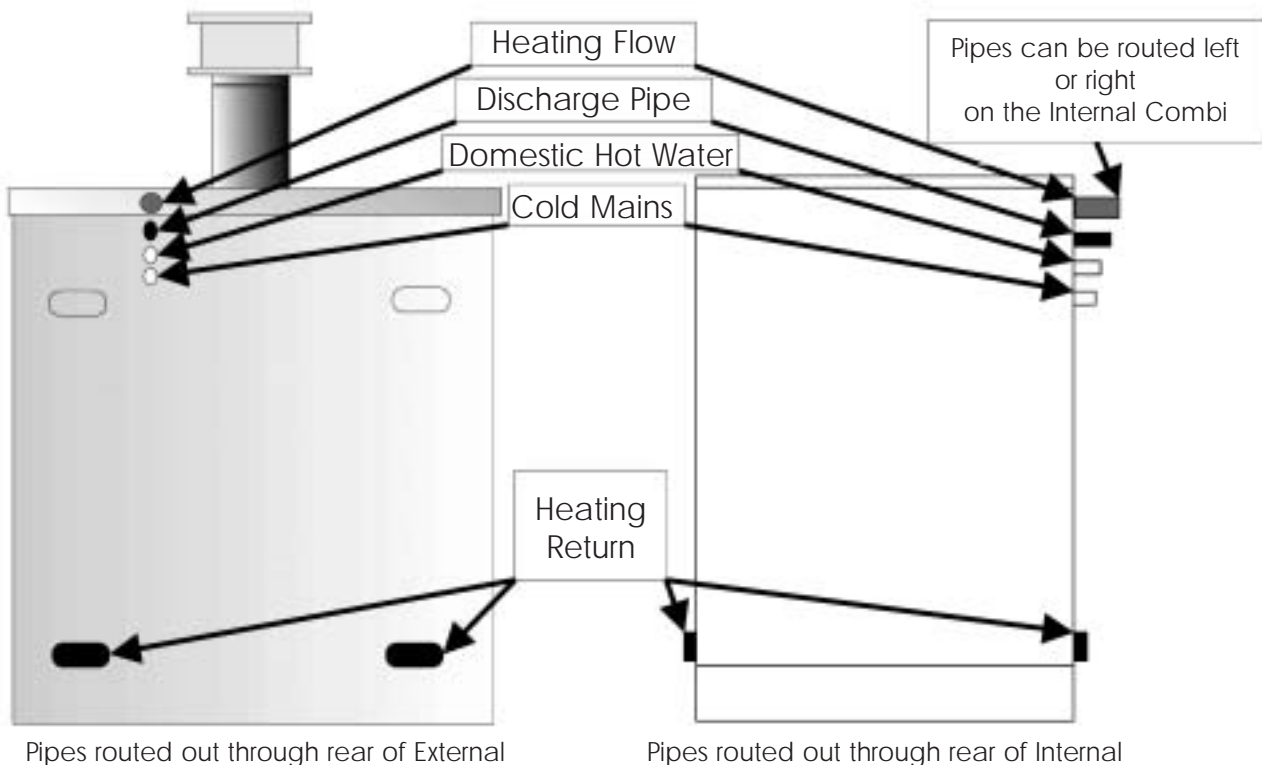
After installing the system, it needs to be flushed with a cleanser like Fernox Heavy Duty Restore, for fast-acting removal of lime scale, black sludge (magnetite) and other deposits from the boiler and the central heating system. Then add a Fernox protector to give long term protection of the central heating system against internal corrosion and lime scale formation.

PROTECTION OF DOMESTIC HOT WATER

We recommend that appropriate water softening equipment is fitted in hard water areas. Check with local water authority if in doubt.

WATER CONNECTIONS

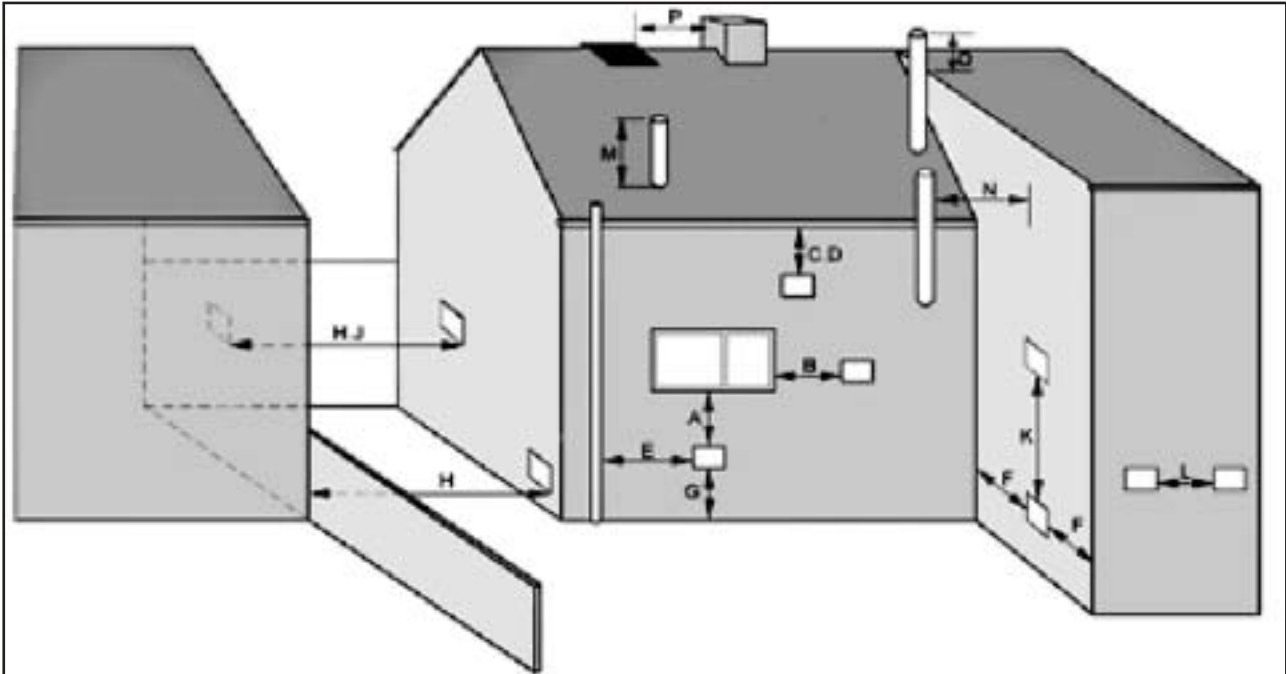
The boiler is supplied with one flow and two return connections. Diagrams below show pipe configurations.



BOILER LOCATION

Sound levels should be discussed with the householder, as some people may be sensitive to low noise levels in a small room, as it may appear more annoying than in a larger room. Please Note installation should take into account of flue position (see diagram).

RECOMMENDED FLUE POSITION



Please Note where the terminal is within 1 metre of any plastic material, such material should be protected from the effects of the combustion products of the fuel.

IMPORTANT 35 SECOND CLASS D GAS OIL MUST NOT BE USED FOR BALANCED FLUES.

Ref	Min. Position	mm
A	Directly below an opening, air brick, opening window etc.	600
B	Horizontally to an opening , air brick, opening window etc.	600
C	Below a gutter, eaves or balcony with protection.	75
D	Below a gutter or a balcony without protection.	600
E	From vertical sanitary pipework.	600
F	From an internal or external corner.	600
G	Above ground or balcony level.	600
H	From a surface or a boundary facing the terminal.	600
J	From a terminal facing the terminal.	1200
K	Vertically from a terminal on the same wall.	1500
L	Horizontally from a terminal on the same wall.	750
M	Above the highest point of an intersection with the roof.	600
N	From a vertical structure on the side of the terminal.	750
O	Above a vertical structure less than 750mm.	600
P	From a ridge terminal to a vertical structure on the roof.	1500

INSTALLATION

SERVICE REQUIREMENTS

The boilers are serviced through an access panel at the front. A service access space of least 700mm should be made available at the front of the boiler.

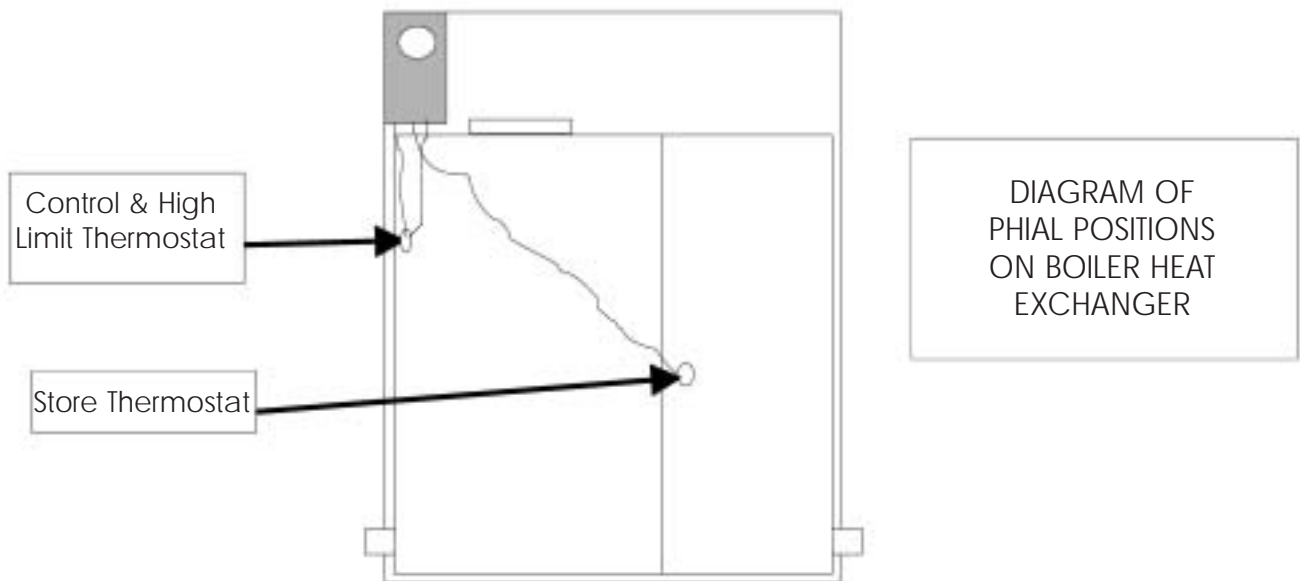
THE HEARTH

The temperature of the surface below the boiler is less than 85°C. If the floor under the boiler is of combustible material, then protection such as steel should be fitted between the boiler and the floor.

Consideration should be given to the weight of the filled boiler, the floor must provide adequate support. Please consult the building regulations for safe floor loadings.

CONTROL PANEL

The boiler control panel is factory fitted prior to despatch. The phials of the Control and High Limit Thermostat are inserted into the horizontal pocket situated on the left hand side of the boiler heat exchanger. And the phial of the Thermal Store Thermostat is inserted into the horizontal pocket, situated near to the middle of the store, on the left hand side.



ELECTRICAL ENTRY

The electrical supply to the boiler must be 230 volts, 50 Hz, fused at 5A. Connection of the appliance and any system controls, to the mains supply, must be a common isolator and must be fused at 5A maximum.

This must be fixed wired to a double pole isolating switch, that has a maximum contact separation of 2mm in both poles. The Isolator should be clearly marked showing its purpose, and preferably positioned close to the boiler.

PREFORMED PIPE WORK

The preformed pipework kit is packed inside the boiler casing.

The kit consists of the following pipes -

- 1 Of 22 mm section labeled Heating Flow
- 1 Of 15 mm section labeled Mains
- 1 Of 15 mm section labeled Hot Water
- 1 Of 15 mm section labeled Over Flow

Preformed pipes, on the Senator combi, can exit on the left or right hand side of the casing. Please ensure that if flueing low level balanced flue from the side of the casing of the boiler, that the preformed pipes are exiting on the opposite side to which the flue is exiting.

The preformed pipe on the Countryman combi exits at the rear of the casing
For diagrams on pipe layout go page 8.

The heating return pipe (22mm) can be connected to either the left or right hand side with the tapping at the bottom rear of the boiler. The unused tapping must be blanked off.

These tappings are 1" B.S.P.

SEALED SYSTEM

This boiler operates on a sealed system. A pressure relief valve operating at 3 bar is fitted.

The over flow pipe must terminate in compliance with current building regulations.

This boiler is supplied with a 12 litre expansion vessel. It is the installers responsibility to ensure adequate provision is made for expansion within the heating system and to install extra capacity if required. Damage to components caused by over expansion, may not be covered by warranty.

Unsuitable pipework and fittings and factors such as sediment or residue left in the system, may cause damage to your boiler and its components and may not be covered by warranty.

PLASTIC PIPE

PLEASE NOTE: When using plastic pipe on heating system, a minimum of 2 metres of copper pipe must be used off the boiler, before connecting to plastic pipe.

PLASTIC PIPE MUST NOT IN ANY CIRCUMSTANCES BE CONNECTED DIRECTLY TO THE BOILER

CAPACITIES OF EXPANSION VESSELS

Safety Valve Setting @	3	3	3
Vessel charge and Initial System Pressure (BAR GAUGE)	0.5	1	1.5
LITRES	LITRES	LITRES	LITRES
5	2.1	2.7	3.9
50	4.2	5.4	7.8
75	6.3	8.2	11.7
100	8.3	10.9	15.6
125	10.4	13.6	19.5
150	12.5	16.3	23.4
175	14.6	19.1	27.3
200	16.7	21.8	31.2
225	18.7	24.5	35.1
250	20.8	27.2	39.0
275	22.9	30.0	42.9
300	25.0	32.7	46.8
325	27.0	35.7	50.7
350	29.1	38.1	54.6
375	31.2	40.9	58.5
400	33.3	43.6	62.4
425	35.4	46.3	66.3
450	37.5	49.0	70.2
500	41.6	54.5	78.0
Multiplying Factors for other system Volumes	0.0833	0.109	0.156

EXPANSION VESSEL SIZING

Bs7074:Part1:1989 gives full details of accurate method of calculating the required expansion vessel capacity, assuming that full and accurate design information is available, particularly total system water content.

However, in practice, it is often not possible to calculate the system water contents with any certainty, and therefore estimates must be made.

The following volume approximations can be used to give a reasonable estimate of total system volume.

70/90 COMBI	61.5 Litres
KW RATING 20.5-26.4	
SMALL BORE PIPEWORK	1 Litre Per Kw of System Output
STEEL PANEL RADIATORS	8 Litres Per Kw of System Output
LOW WATER CAPACITY RADIATORS MODERN TYPE	2 Litres Per Kw of System Output
HOT WATER CYLINDER	2 Litres

Note: As an approximation, BS7074: Part 1 suggests that figure of 12 litres/kw of boiler output could be used to estimate total system water content-this would be generous for most systems.

EXPANSION VESSEL SIZING

Having determined the total system water content, expansion vessel sizing can be considered. Taking into account the other system design factors.

Full details of expansion vessel sizing and Altecnic models available are given in the expansion vessel data sheet.

However, Altecnic expansion vessels are supplied pre-charged at 1bar (suitable for system static heads up to 15 metres) and the safety valve normally pre-set at 3 bar (British Specification).

For standard conditions therefore, the following table can be used to select the required expansion vessel volume.

NB: Please note the above information (EXPANSION VESSEL SIZING) is only a guide therefore we do not accept responsibility for sizing of systems and this does not over rule British Standards always refer back to BS7074: Part 1 if in doubt.

WARNING SEALED SYSTEM

This boiler operates on a sealed system up to a maximum pressure of 3 bar. It is the responsibility of the installer to ensure all pipework and fittings are suitable for use under these circumstances. This boiler is supplied with a 12 litre expansion vessel. It is the installers responsibility to ensure adequate provision is made for expansion within the system and to install extra capacity if required.

Damage to components caused by over expansion may not be covered by warranty. Unsuitable pipework and fittings and factors such as sediment or residue left in the system, may cause damage to your boiler and its components this will not be covered by warranty.

FILLING THE SYSTEM

Prior to filling, the system must be thoroughly flushed using a cleaning agent. The system must then be vented of all air and recharged to maximum of 1.5 bar.

INTERNAL CONVENTIONAL FLUE INSTALLATION

The boiler is supplied as standard for use with conventional flue.

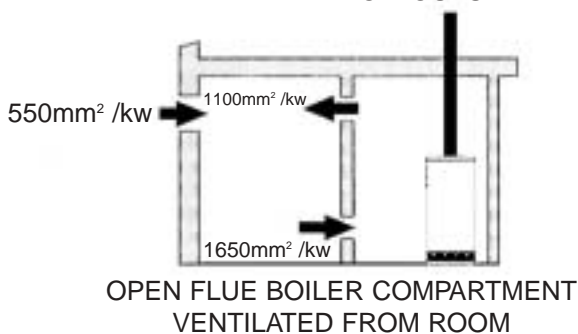
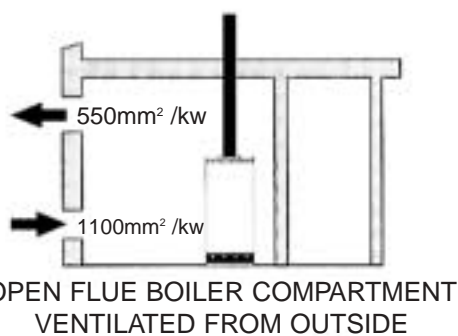
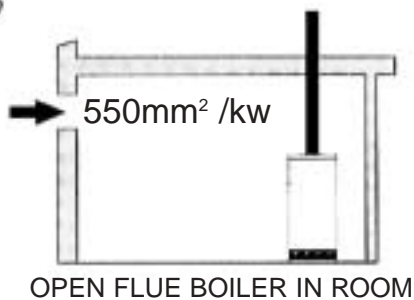
The chimney must comply with building regulations and B S 5410. Factory made insulated chimneys are covered by B S 4543 Parts 2 & 3.

Notes on Conventional Flue

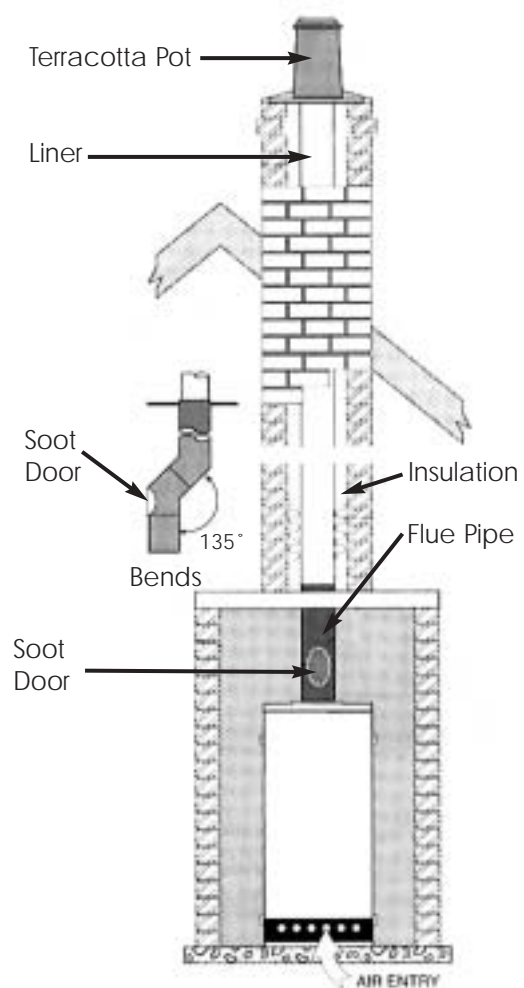
1. **Liner** A stainless steel flue liner of diameter to suit the boiler is recommended.
2. **Flue pipe** can be of vitreous enamel or stainless steel.
3. **Bends** Bends in the flue pipe should not be greater than 135 degrees.
4. **Insulation** Insulation between the flue pipe and brick chimney, is recommended to minimize the occurrence of condensation.
5. **Cowls** Cowls and pots that may restrict the flue should not be used.
6. **Draught Stabiliser** Chimneys over 6 metres high may produce excessive draught (over 4mm w.g.). Draught stabilizers may be required.
7. **Length** Before bends are applied, length of flue must be at least 600mm.

COMBUSTION AIR SUPPLY - CONVENTIONAL FLUE

INFORMATION SUPPLIED BY OFTEC



Conventional Flue - Typical Arrangement

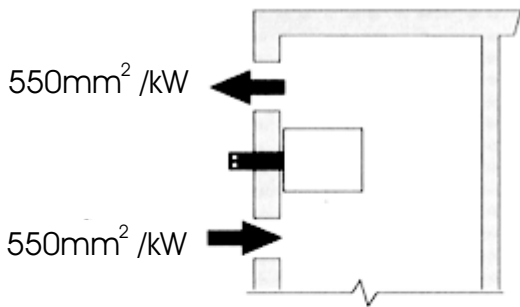


BALANCED FLUE INSTALLATION

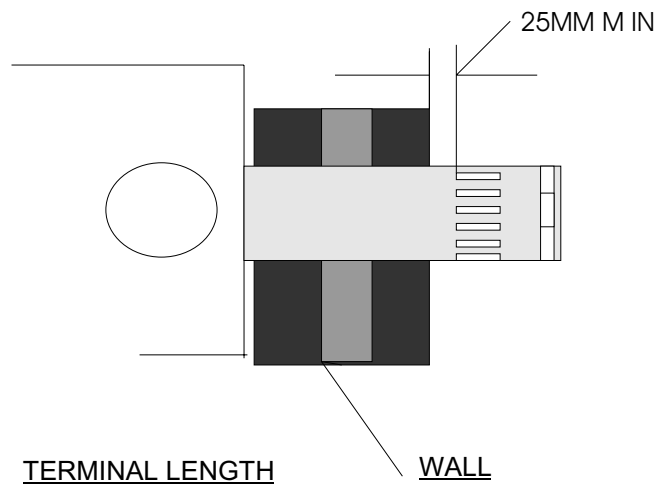
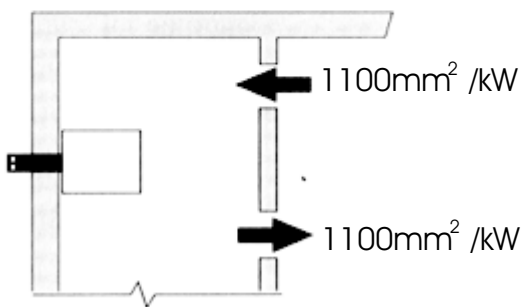
VENTILATION AIR SUPPLY

Air ventilation for balanced flue boilers is only required if the boiler is installed in a confined space e.g. a cupboard. This is to prevent over heating of components.

BALANCED FLUE BOILERS



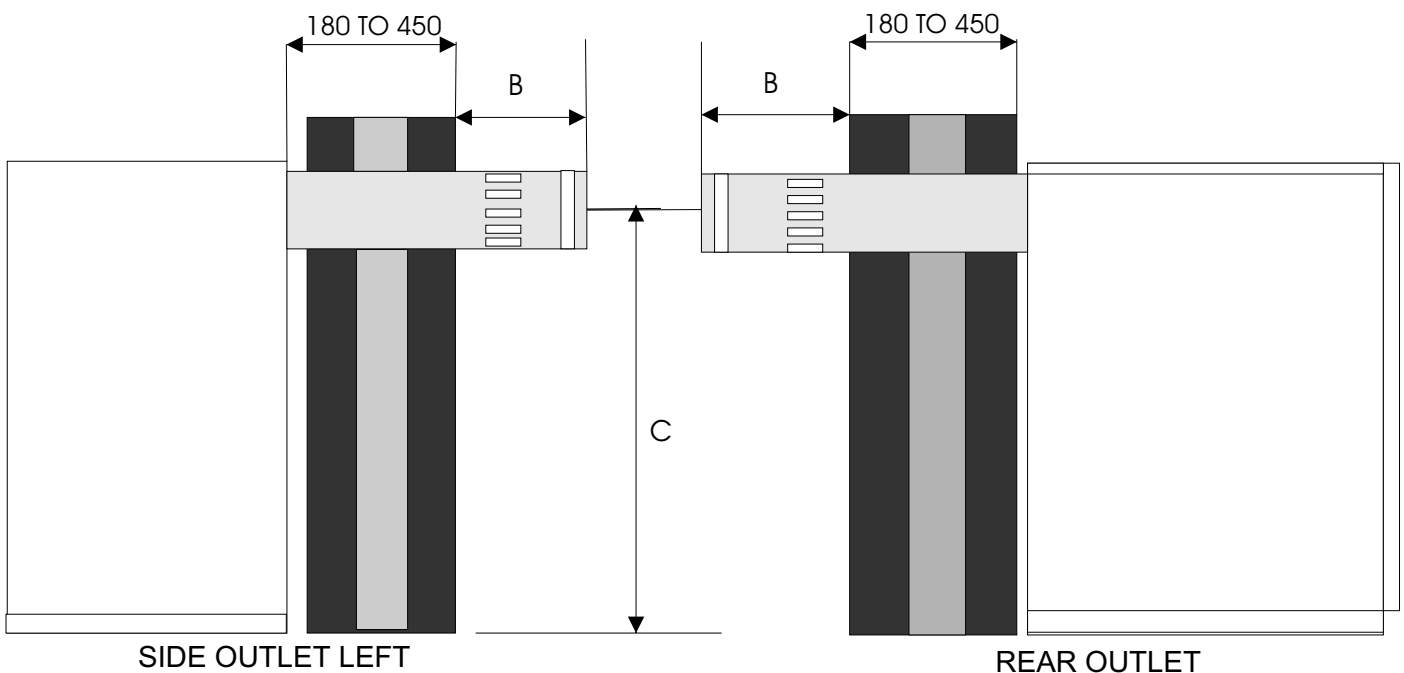
BOILER IN COMPARTMENT
VENTED FROM OUTSIDE



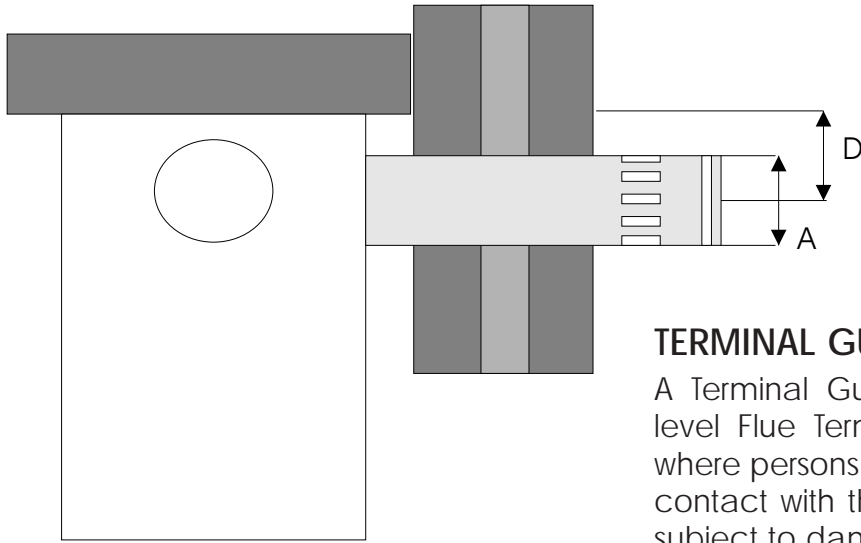
LOW LEVEL BALANCED FLUE

NOTE If flueing from the side of the boiler. Combi preformed pipes must go opposite to the side on which the flue is flueing from.

NOTE If flueing from the right hand side of the boiler when looking from the front of the boiler, then a flue extension maybe required.



LOW LEVEL BALANCED FLUE



TERMINAL GUARD

A Terminal Guard must be fitted to low level Flue Terminal below 2 metres and where persons or animals could come into contact with the terminal or if it could be subject to damage.

MODEL	Flue	A	B	C	D
70/90	3"	125	176	765	130
90/115	3"	125	176	803	130

LOW LEVEL BALANCED FLUE SIDE AND REAR ASSEMBLY INSTALLATION



REMOVE CASING LID

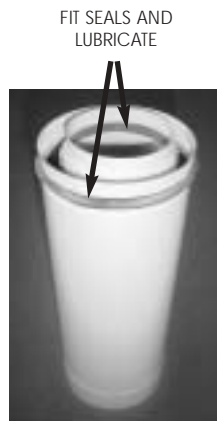
1. Cut hole in wall. Remember measure, mark, CHECK then cut.
2. Remove Conventional Flue ring from top of boiler.
3. Fit Red inner seal and Black out Seal to flue connector and extension if required.
4. Apply lubricant included in kit. To the inner and outer seal taken care to only lubricant the lip of the seal.



REMOVE FOIL



REMOVE FLUE RING



FIT SEALS AND LUBRICATE



FIT SQUARE GASKET



FIT BOLTS

5. With boiler in position pass the flue assembly through the wall and bolt the bottom section of the flue to the boiler, insuring that square gasket is in between the boiler and the flue.
6. Attached the snorkel tube with clips to the flue.
7. Make sure that flue terminal protrudes through the wall a minimum of 176mm.

FLUE EXTENSION

The maximum horizontal flue level is 1450mm this can be achieved using the following extension kits:

- 3 x kit 3 300mm extension
- OR
- 1 x kit 6 950mm extension



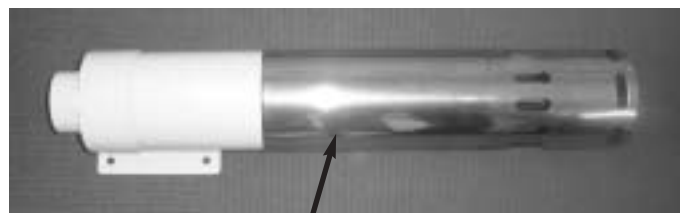
FIT SNORKEL TUBE

8. Remove CF adaptor from burner and discard.
9. Fit the gasket and B F adaptor and connect snorkel Tube.

N.B. Kit 8 45 degree bends must not be used on low level balanced flue kits.

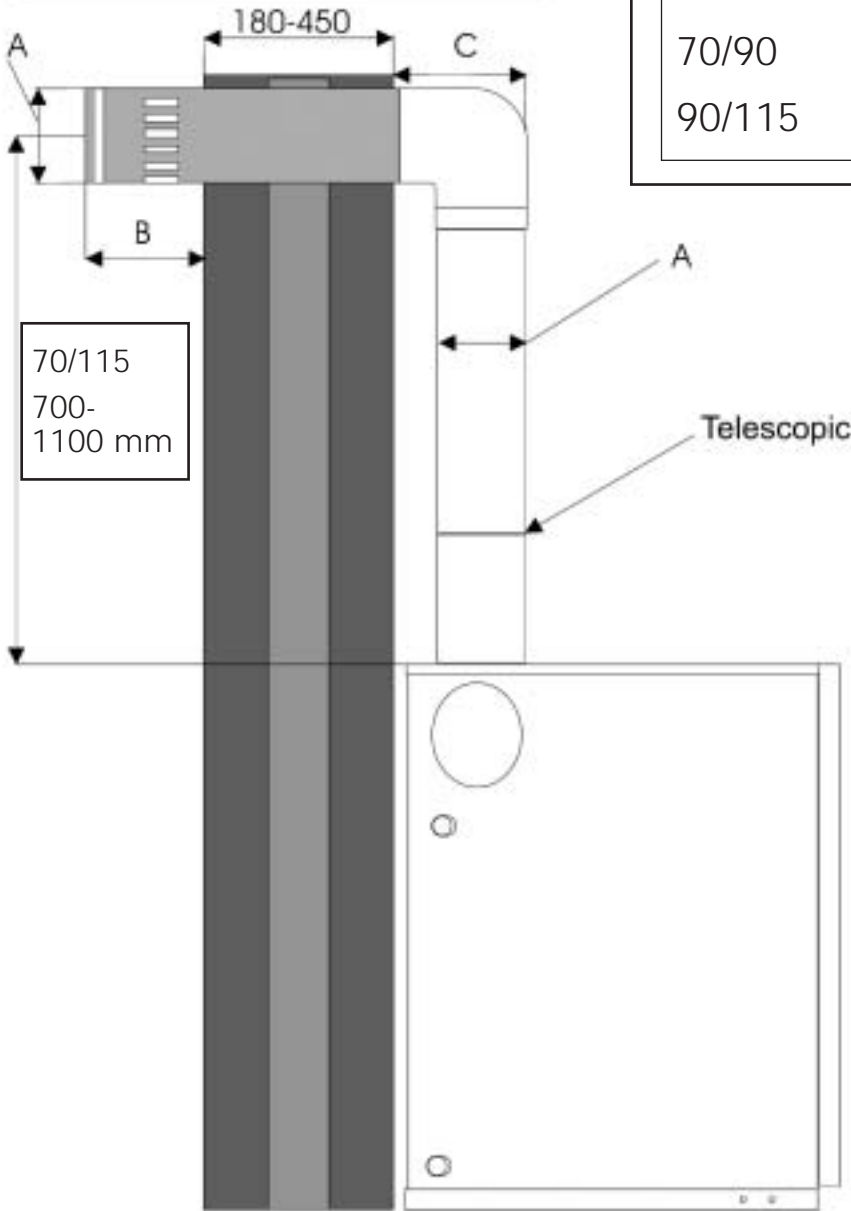


INTERNAL VIEW



HORIZONTAL FLUE

HIGH LEVEL BALANCED FLUE



MODEL	Flue	A	B	C
70/90	3"	125	176	200
90/115	3"	125	176	200

HIGH LEVEL ROOM SEALED BALANCED FLUE DIMENSIONS



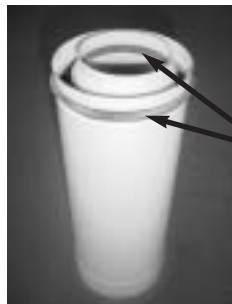
REMOVE CASING LID



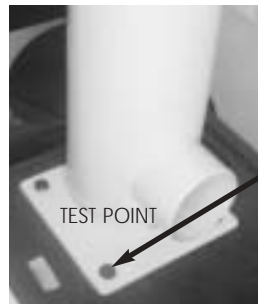
REMOVE FOIL



REMOVE FLUE RING



FIT SEALS AND LUBRICATE

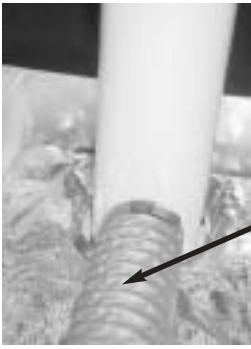


BOLT BOTTOM SECTION TO BOILER

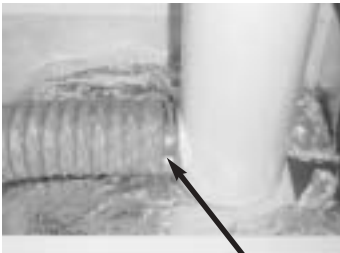
TEST POINT

INSTALLATION OF HIGH LEVEL BALANCED FLUE

1. Position boiler and Cut Hole in wall. Remember measure, mark, CHECK then cut.
2. Remove Conventional flue ring from top of boiler.



FIT SNORKEL TUBE



FIT CLIP



FIT LID

3. Fit Red inner seal and Black outer seal to flue connectors and extensions if required.
4. Apply lubricant to the inner and outer seals. Taken care to only lubricant the lip of the seals.
5. Bolt bottom section of the flue to the boiler insuring the square gasket is fitted in between the boiler and the flue.
6. Attached snorkel to the flue with the clip.
7. Refit boiler top panel insure the knock out in the panel has been removed.
8. Assemble second vertical flue section and any vertical extension.
9. Assemble horizontal section and pass through the wall. Making sure that the terminal protudes through the wall a minimum of 176mm.
10. Connect vertical and horizontal section together.
11. Secure vertical section with the screws provided.
12. Seal around the flue terminal in wall using mastic.
13. Remove CF adaptor from burner and discard.
14. Fit BF adaptor connect snorkeltube with clip.

NOTE: Expanding foam can be used to fill/insulate the gap between flue parts and wall.



INTERNAL VIEW

FLUE EXTENSIONS

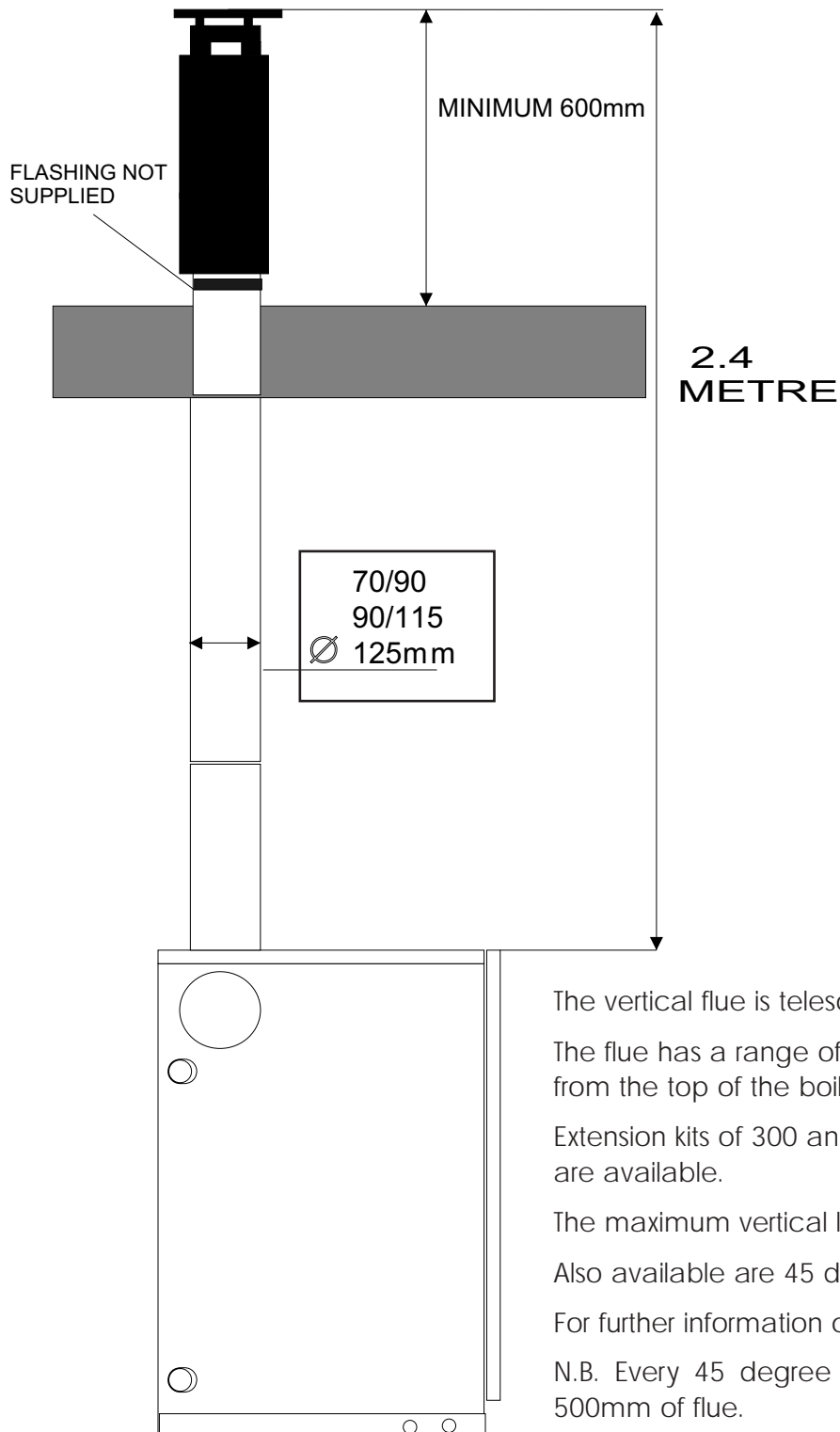
Please note a maximum of one kit 6 950mm or 3 x kit 3 300mm extension can be used on the high level.

Kit 8 45 degree bends must not be used on low level balanced flue kits.



FIT HORIZONTAL SECTION

VERTICAL BALANCED FLUE



The vertical flue is telescopic as supplied.

The flue has a range of 1020-2400mm from the top of the boiler to the flashing.

Extension kits of 300 and 950mm are available.

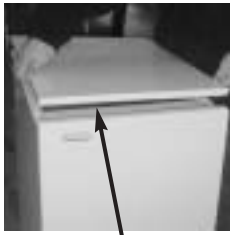
The maximum vertical length is 4800mm.

Also available are 45 degree bends.

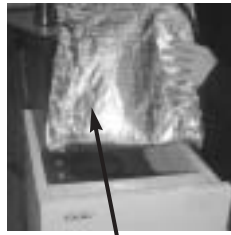
For further information contact our sales office.

N.B. Every 45 degree elbow is equivalent to 500mm of flue.

VERTICAL BALANCED FLUE DIMENSIONS



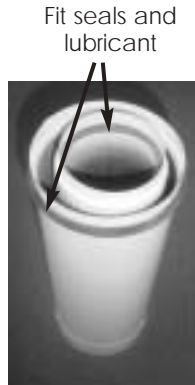
Remove lid



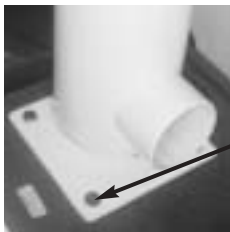
Remove lid



Remove flue ring



Fit seals and lubricant



Bolt bottom section



Fit Snorkel Tube



Fit Clip



Vertical Terminal



Internal View

INSTALLATION OF VERTICAL FLUE

1. Position boiler and cut hole/s in ceiling and roof. Remember measure mark ,CHECK then cut.
2. Remove conventional flue ring from top of boiler.
3. Fit Red inner seal and Black outer seal to flue connectors and extensions if required.
4. Apply lubricant to the inner and the outer seals. Taking care to only lubricant the lip of the seals.
5. Bolt bottom section of the flue to the boiler insuring the square gasket is fitted in between the boiler and the flue.
6. Attached snorkel to the flue with the clip.
7. Refit boiler top panel insure the knock out in the panel has been removed.
8. Assemble second vertical flue section and any vertical extension.
9. Fit the roof flashing and flue terminal.
10. Secure the terminal to a roof joist with clamps provided.
11. Fit flue elbows if required and secure vertical section with the screws provided
12. Seal around the flue terminal in wall using mastic
13. Remove CF adaptor from burner and discard
14. Fit BF adaptor connect snorkel tube with clip.

NOTE: Expanding foam can be used to fill/insulate the gap between flue parts and wall.

FITTING OF BF ADAPTOR



Disconnect Burner Plug



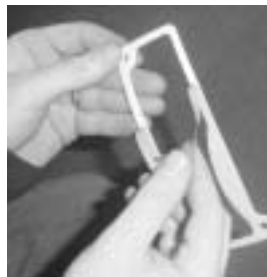
Loosen Bolt



Remove Burner



Remove C F Adaptor



Peel backing sticky from B F adaptor Gasket



Fit B F Adaptor Gasket



Fit B F Adaptor



Tighten bolt on burner



Fit snorkel tube



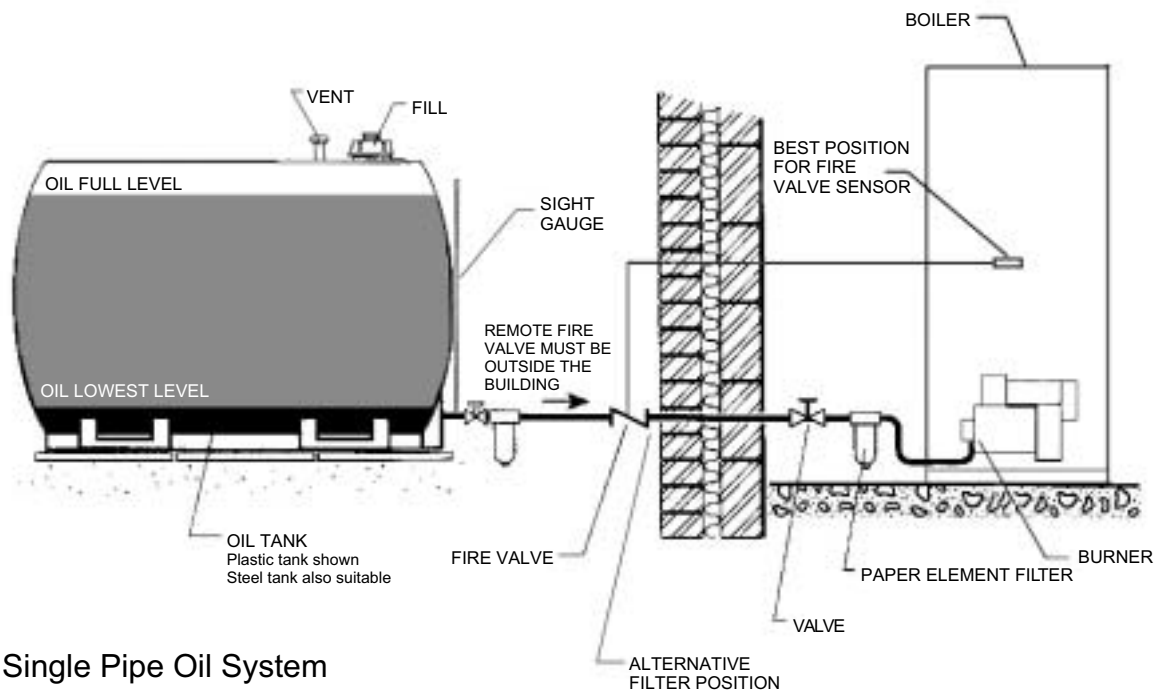
Internal view

FLUE KIT DESCRIPTION AND PART NUMBERS

DESCRIPTION	PART NUMBER
	70-115,000BTU
1. LOW LEVEL BALANCED FLUE STANDARD WALL THICKNESS FROM 150-450mm	KIT1-80mm
2. LOW LEVEL BALANCED FLUE EXTENDED WALL THICKNESS FROM 260-600mm	KIT2-80mm
3. 300mm FLUE EXTENSION	KIT3-80mm
4. HIGH LEVEL HORIZONTAL FLUE	KIT4-80mm
5. VERTICAL FLUE	KIT5-80mm
6. 950 MM FLUE EXTENSION	KIT6-80mm
7. 45 DEGREE BENDS	KIT8-80mm

N.B. Kit 8 (45 degree bends) must only be used on kit 5 vertical flue kits.

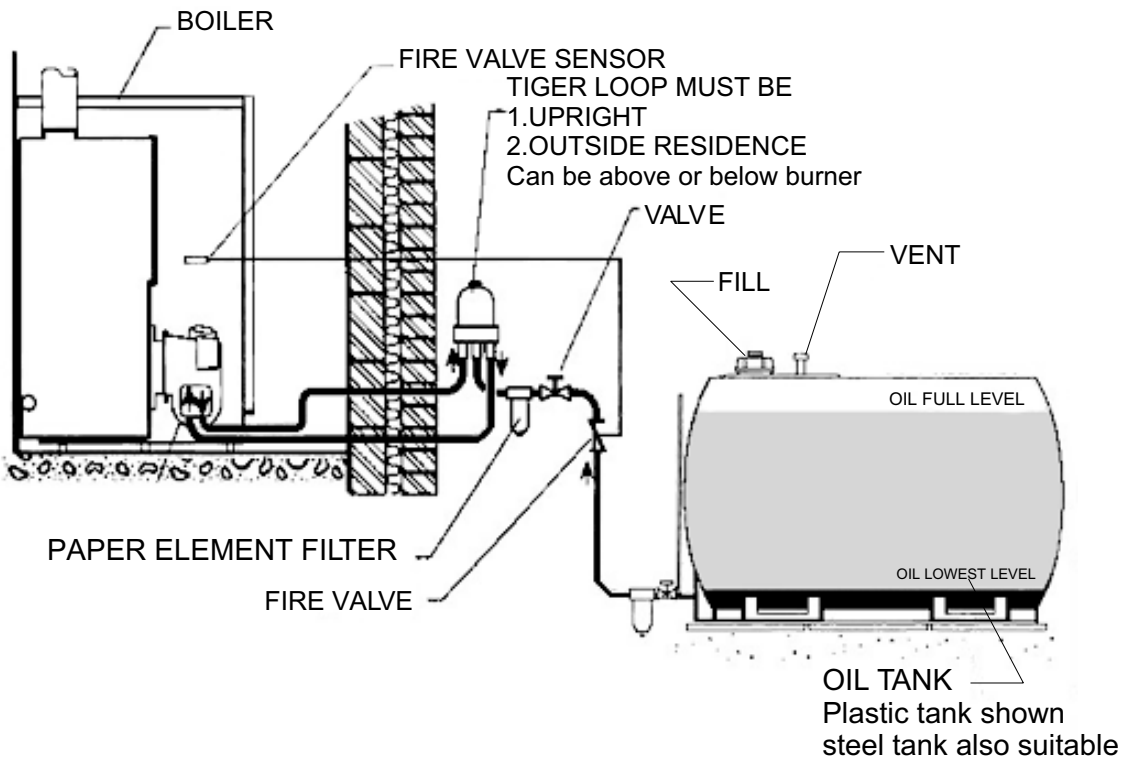
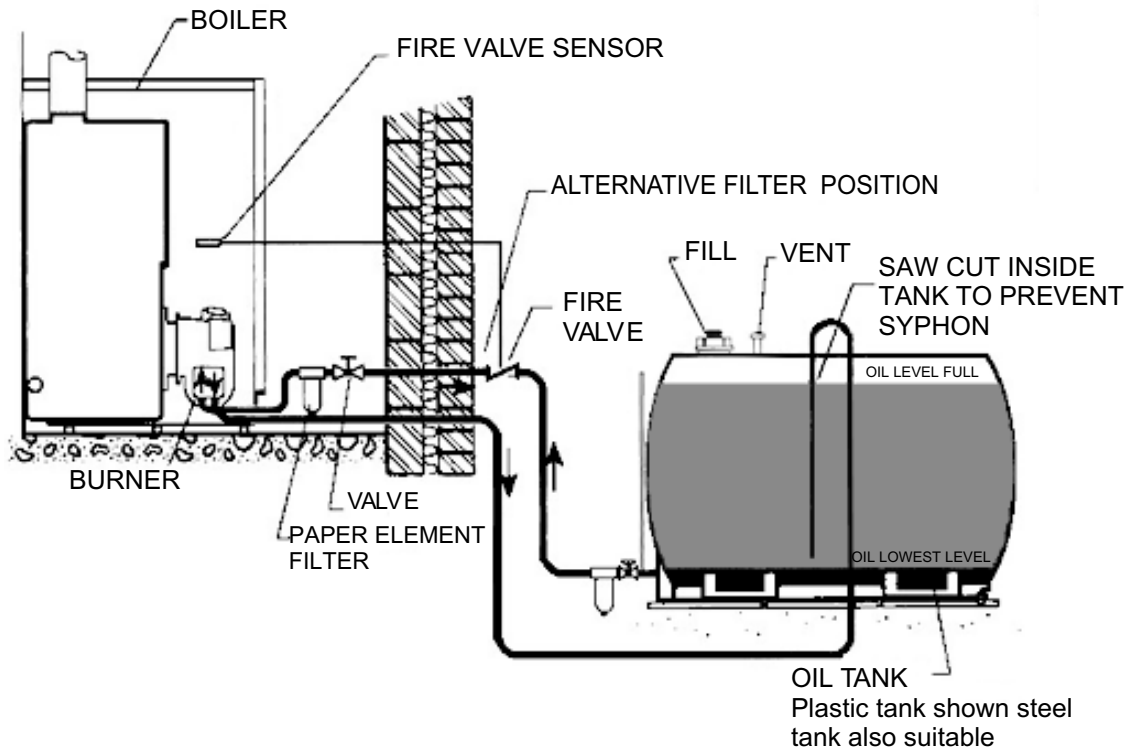
OIL SUPPLY



TYPICAL SYSTEM SHOWN

OIL SUPPLY

Diagrams of twin pipe oil supply systems



A flexible oil pipe is supplied to connect the burner to the incoming oil supply pipe.

IMPORTANT NOTES

- If siting oil tank above burner height, use single supply pipe only.
- If siting oil tank below burner height, use twin pipe supply or Tiger loop.
- Please refer to Burner Manual for conversion to oil pump for two pipe system.

ELECTRICAL CONNECTION (INTERNAL COMBI)

The electrical supply to the boiler must be wired using a double pole - isolating switch 240v/50hz fused at 5 amps. A multi 3 pin plug is included with the boiler, which connects with the boiler control panel.

The burner is supplied with 4 wire cable plug, which allows disconnection for maintenance.

CONTROL OPTIONS

A Room Thermostat must be fitted for the boiler to work correctly.

A Frost Thermostat may be required this should be assessed when installing the boiler.

INTEGRAL TIME CLOCK ((INTERNAL COMBI ONLY)

The integral time clock controls the heating function. The domestic hot water function is permanently on. This is controlled by the store thermostat when heating is off. It's controlled by a heating control thermostat when the heating is on.

INSTALLATION OF A ROOM THERMOSTAT

Connect a room thermostat to terminal 3 and 4 on the 8 way connect strip inside the boiler control panel and discard link wire. If neutral wire is required for room thermostat, connect neutral wire to terminal 6 on the 8 way connect strip.

INSTALLATION OF A TIME CLOCK OR PROGRAMMABLE ROOM STAT

Connect a remote time clock or programmable room stat to 3 and 4 on the 8 way connect strip, inside the boiler control panel and then disregard link wire.

The internal time clock can be switched to continuously on, or a link wire can be connected to 4 and 5 on the 8 way connect strip to disable integral time clock.

INSTALLATION OF FROST THERMOSTAT

Connect a frost thermostat to terminal 5 and 3 on the 8 way connect strip inside the boiler control panel. If neutral wire is required for frost thermostat, connect to terminal 6 on the 8 way connect strip.

ELECTRICAL CONNECTION (EXTERNAL COMBI)

The electrical supply to the boiler must be wired using a double pole -isolating switch 240v/50hz fused at 5 amps. A multi 6 pin plug is included with the boiler , which connects with the boiler control panel. The burner is supplied with a 4 wire cable plug, which allows disconnection for maintenance.

CONTROL OPTIONS

A Room Thermostat must be fitted for the boiler to work correctly.

A Frost Thermostat may be required, this should be assessed when installing the boiler.

FITTING TIME CLOCK OR PROGRAMMABLE ROOM THERMOSTAT (EXTERNAL COMBI ONLY)

Installation of external time clock or programmable room thermostat to External Combi. The boiler comes with a multi 6 pin plug. The electrical supply must be sent directly to the boiler, off the fused spur and not interrupted by any forms of control i.e. time switch or programmable room thermostat. The electrical supply to the time switch or programmable room thermostat is supplied from the boiler. The connections to the multi pin plug are as follows;

PIN 1 = Earth

PIN 2 = Neutral

PIN 3 = Live

PIN 4 = Electrical supply out from boiler to time switch or programmable room thermostat.

PIN 5 = Switch supply back from time switch or programmable room thermostat.

The External time clock controls the heating function. The domestic hot water function is permanently on. And is controlled by the store thermostat when heating is off. And controlled by heating control thermostat when heating is on.

INSTALLATION OF A ROOM THERMOSTAT

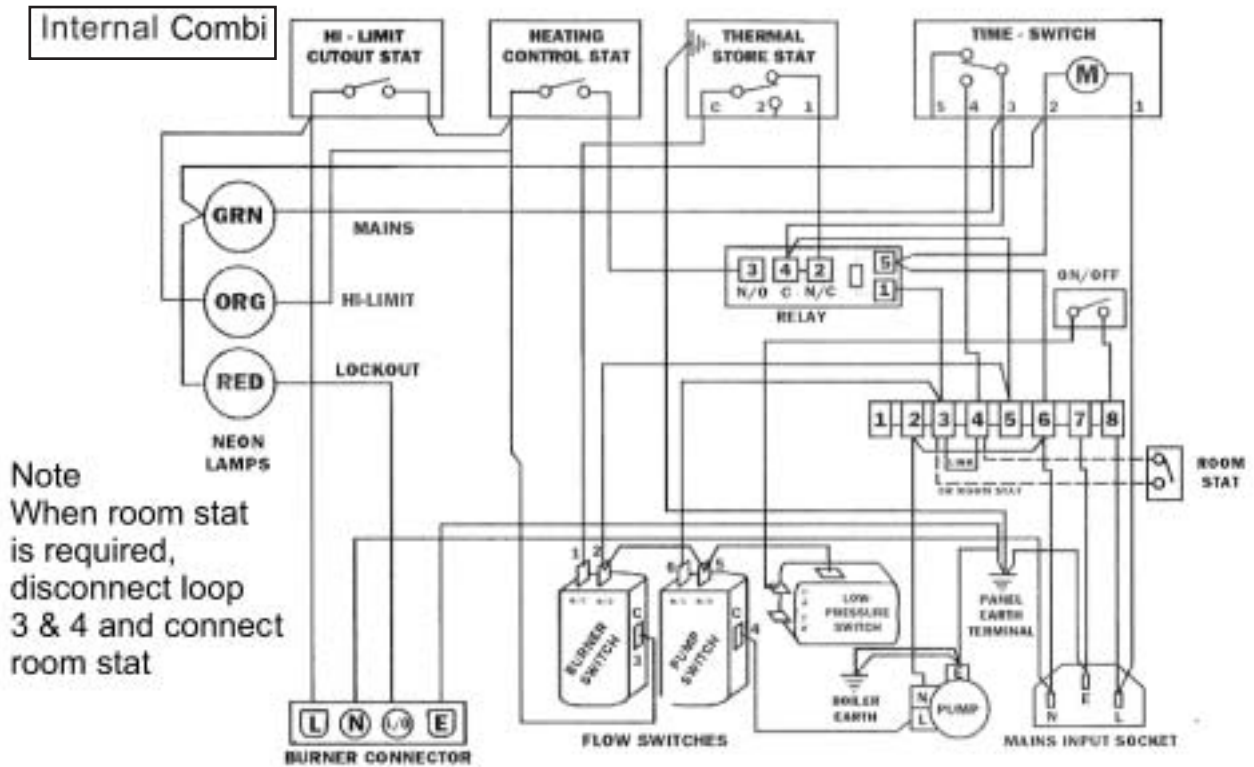
Connect a room thermostat to terminal 3 and 4 on the 8 way connect strip inside the boiler control panel and discard link wire. If neutral wire is required for room thermostat, connect neutral wire to terminal 6 on the 8 way connect strip.

INSTALLATION OF FROST THERMOSTAT

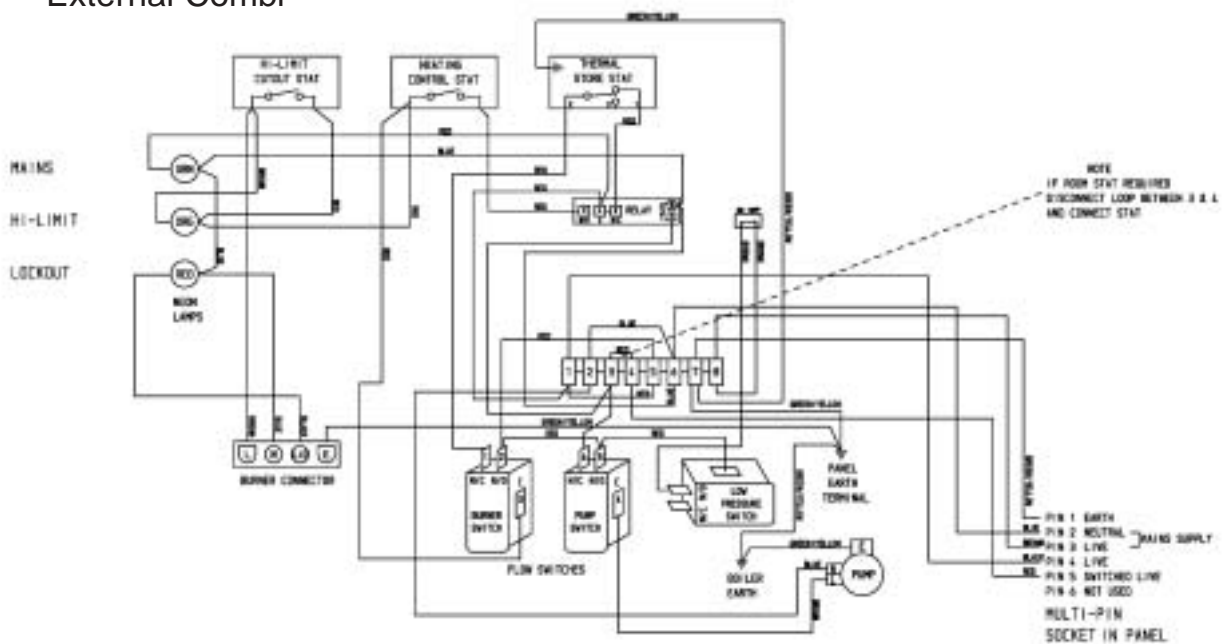
Connect a frost thermostat to terminal 5 and 3 on the 8 way connect strip inside the boiler control panel. If neutral wire is required for frost thermostat, connect to terminal 6 on the 8 way connect strip.

WIRING DIAGRAM

Internal Combi



External Combi



Internal Combi Models Technical Specification

	70/90 COMBI	90/115 COMBI
	BTU	BTU
A	860	950
B	590	630
C	555	585
D	140	140
E	93	93
F	22	22
G	15	15
H	15	15
I	15	15
J	1" BSP	1" BSP
Water Content	61.5Ltr	70Ltr

General Data

Electrical Supply: 240v ~50Hz

Fuel: 28 second or 35 second

Maximum Control Thermostat Setting 85 °C

Expansion Vessel Capacity 12 Litres

Conventional Size 100-125 mm

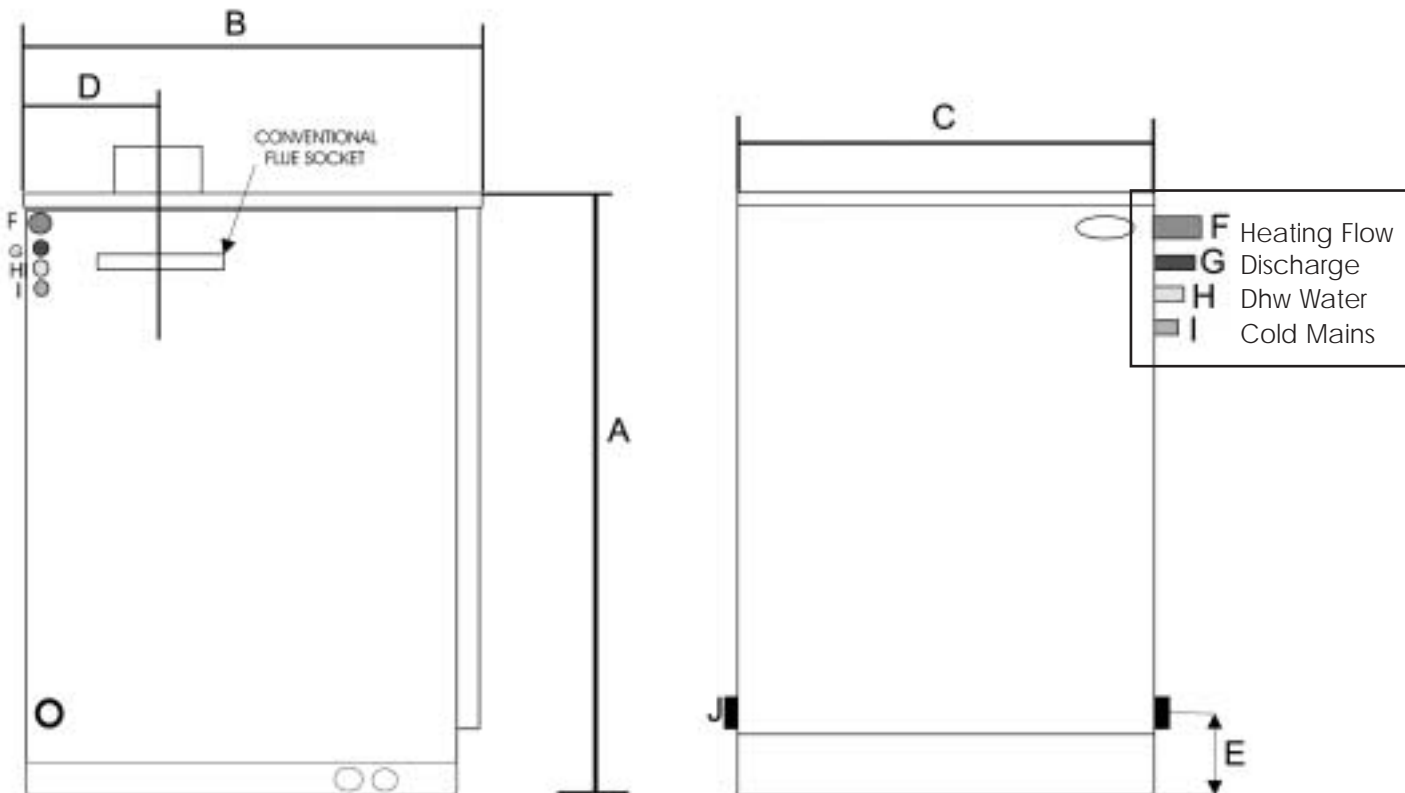
Oil Supply Connection ¼" BSP

High Limit Stat: Manual Reset

Maximum Operating Pressure

Spring Safety Valve @ 3Bar

Thermostatic Mixer Valve 30 °C-70 °C



DIMENSIONS IN (MM)

Combi External Models Technical Specification

	70/90 COMBI	90/115 COMBI
	BTU	BTU
A	878	916
B	630	630
C	765	765
D	160	160
E	93	93
F	22	22
G	15	15
H	15	15
I	15	15
J	1" BSP	1" BSP
Water Content	61.5Ltr	70Ltr

General Data

Electrical Supply: 240v ~50Hz

Fuel: 28 second

Maximum Control Thermostat Setting 85°C

Expansion Vessel Capacity 12 Litres

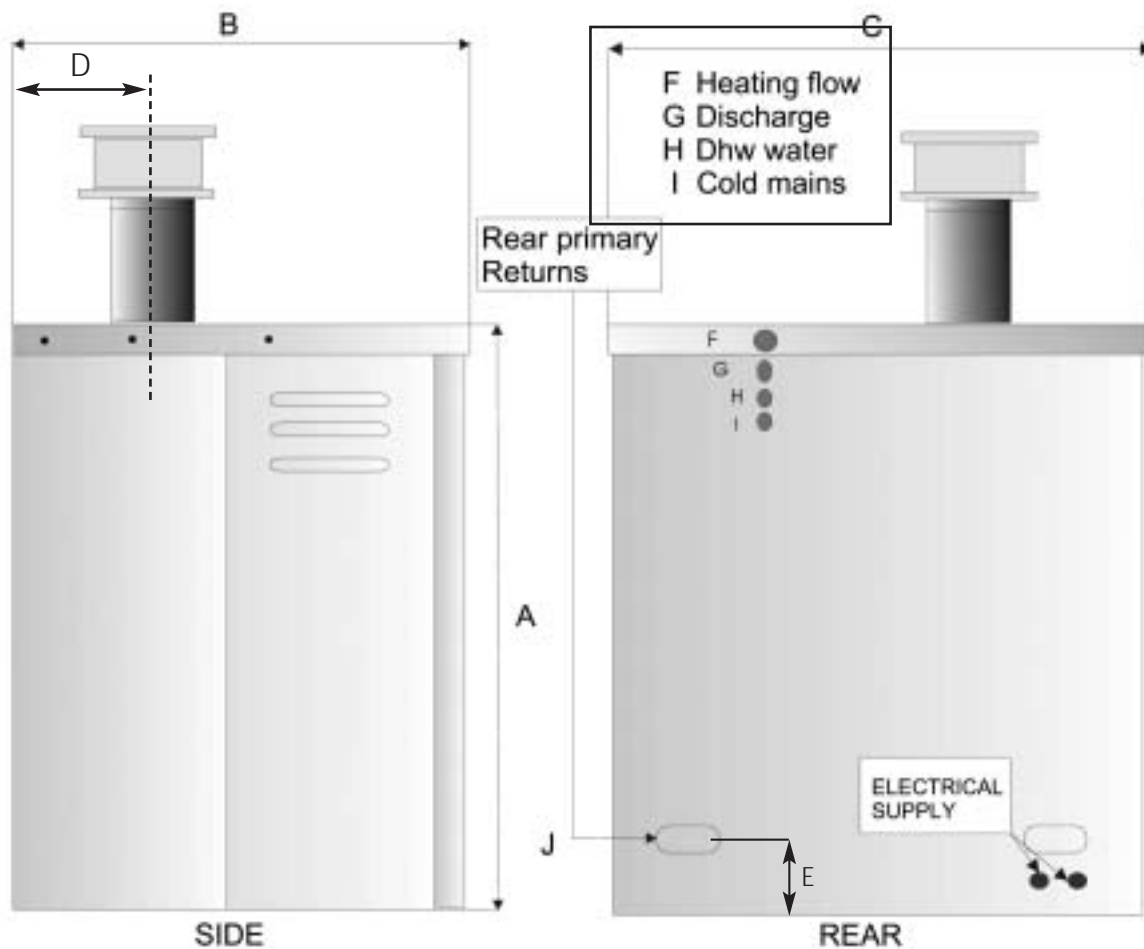
Thermostatic Mixer Valve 30°C-70°C

Oil Supply Connection ¼" BSP

High Limit Stat: Manual Reset

Maximum Operating Pressure

Spring Safety Valve @ 3Bar



DIMENSIONS IN (MM)

COMMISSIONING INSTRUCTIONS

A competent service engineer OFTEC registered should be appointed on an annual basis.

- Insure heating system has been flushed and treated with inhibitor.
- De-pressurise heating system and check expansion vessel pre-charge is the same as the cold fill pressure of the heating system. Expansion vessel pre-charge must not exceed 1.5 bar.
- Remove inspection door and check baffle arrangement.
- Remove Burner and check electrode settings and also check settings between face of nozzle to diffuser plate.
Please refer to Burner technical manual for correct settings.
- Fit manifold pressure gauge to the gauge port of the burner.
- Turn electrical supply, to the boiler, to ON.
- Set the central heating controls so they are calling for heat. .
- Set the boiler control thermostat to 80°C.
- Purge air from the oil supply system .
- Set burner pump pressure.
- Allow time for the boiler to reach normal operating temperature.
- Check the smoke reading.
- Measure the Co².
- Measure net flue gas temperature.
- Check domestic hot water flow and hot temperature is acceptable to the householder.

Please Note:

Reducing the air supply into the burner air inlet shutter, decreases the flue gas temperature and increases the Co².

SERVICING INSTRUCTIONS

A competent service engineer OFTEC registered should be appointed on an annual basis.

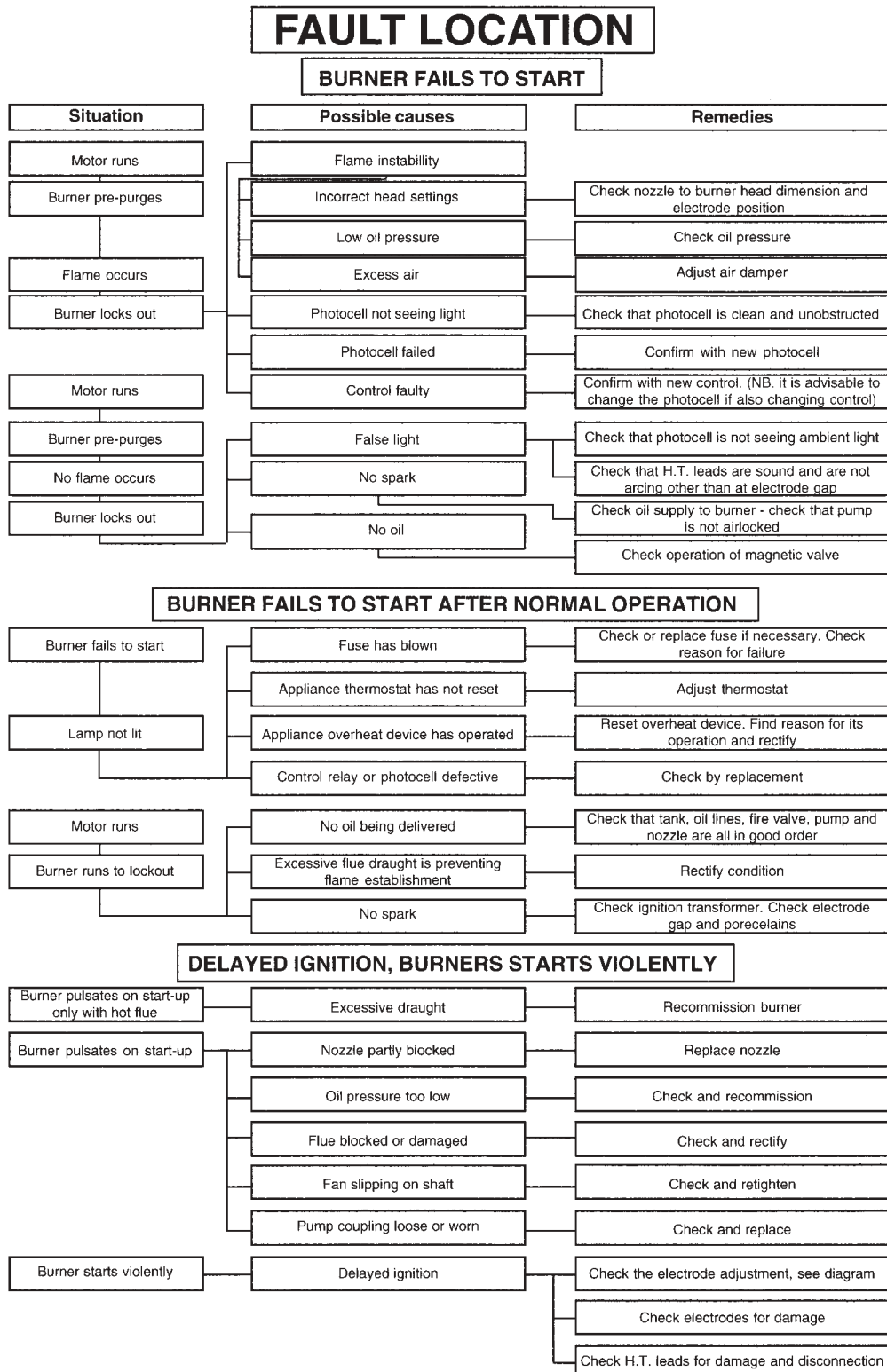
- Isolate Power to the boiler.
- De-pressurise heating system and check expansion vessel pre-charge is the same as the cold fill pressure, of the heating system. Expansion vessel pre-charge must not exceed 1.5 bar.
- Remove inspection door, Burner and baffle assembly.
- Brush down the inside of the heat exchanger and vacuum out debris .
- Clean Baffle Assembly.
- Inspect and clean burner assembly, and replace nozzle and change flexi oil line if required.
- Renew insulation e.g. inspection door or inside base of heat exchanger, if required.
- Reassemble baffle assembly and replace inspection door.
- Fit manifold pressure gauge, to the gauge port of the burner
- Turn electrical supply, to the boiler, to ON.
- Set central heating controls so they are calling for heat. .
- Set burner pump pressure.
- Allow time for the boiler to reach normal operating temperature.
- Check the smoke reading
- Measure the Co^2 .
- Measure net flue gas temperature.
- Check domestic hot water flow and hot temperature is acceptable to the householder.

Please Note:

Reducing the air supply into the burner air inlet shutter, decreases the flue gas temperature and increases the Co^2 .

BOILER WILL NOT START

Check if mains electricity supply is reaching boiler control panel, making sure control thermostat is turned on and time clock is calling for heat. Mains indicator green should be illuminated. If green light is not illuminated and fuse has been checked, then heating system charge may be low, check black needle on pressure, located inside boiler cabinet (top right hand side) is reading 1 bar or more. If not repressurize, refer to fault diagnosis on page 32



FAULT DIAGNOSIS

NO HEATING OR HOT WATER

- Check there is power to the boiler, has fuse blown. If yes replace and test, if fuse continues to blow check circulation pump is not passing heating water into circulation pump electrical box.
- Is the system pressure below 1 bar on black needle on pressure gauge. If yes recharge system pressure by opening the filling loop valve slowly, until black needle indicator reads (approx 1 bar).
- Green neon illuminated but boiler not firing. Place rocker switch to the ON position located on the underside sloping face of the control panel.
- Green and Orange neons illuminated. Reset stat by pushing red button in, next to the On/Off rocker switch on the control panel. Vent air from the system. Re-check system pressure charge.
- Orange neon illuminates regularly, when the heating has been off for long intervals.
Check Thermal store stat settings, if too high it will require reducing settings by 1 or 2 degrees (store stat located on the rear of the control panel).
- Orange neon illuminates regularly when in heating mode, check calibration of control stat and replace if out of range.
- Green and red neons illuminated, refer to page 31, burner diagnosis.

NO D.H.W, BUT SOME WHEN HEATING ON

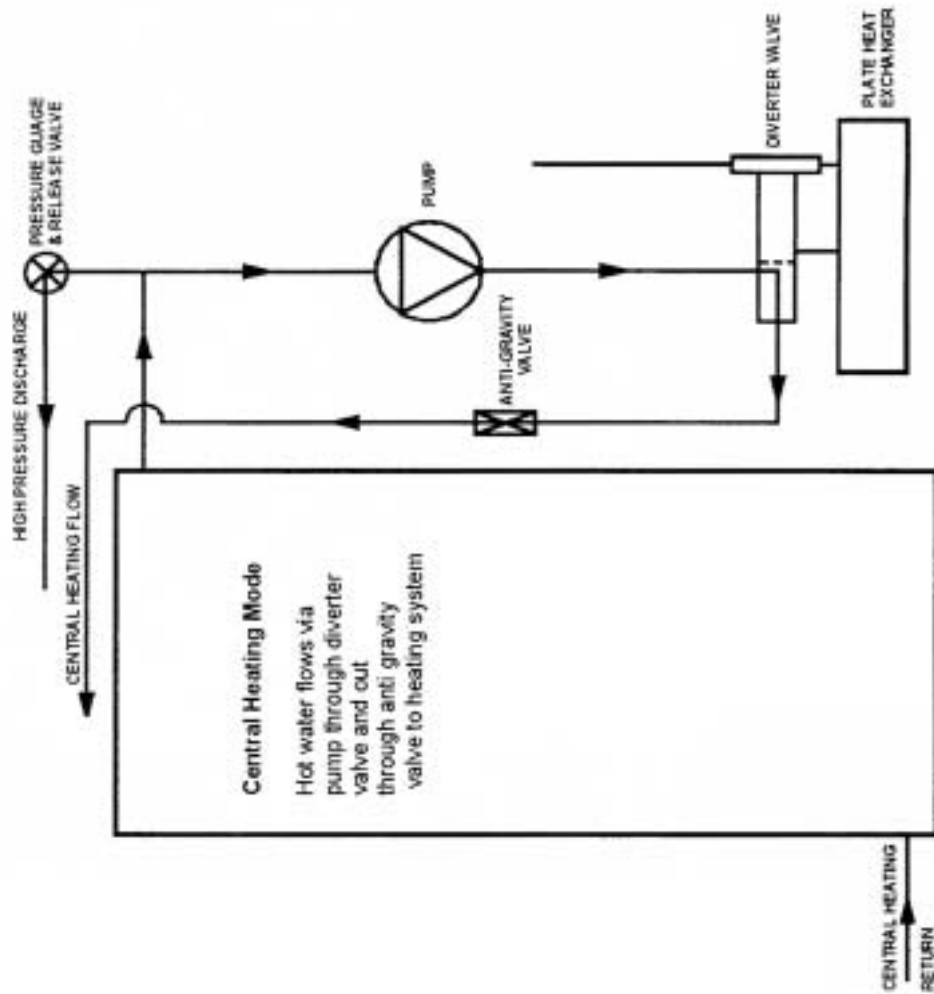
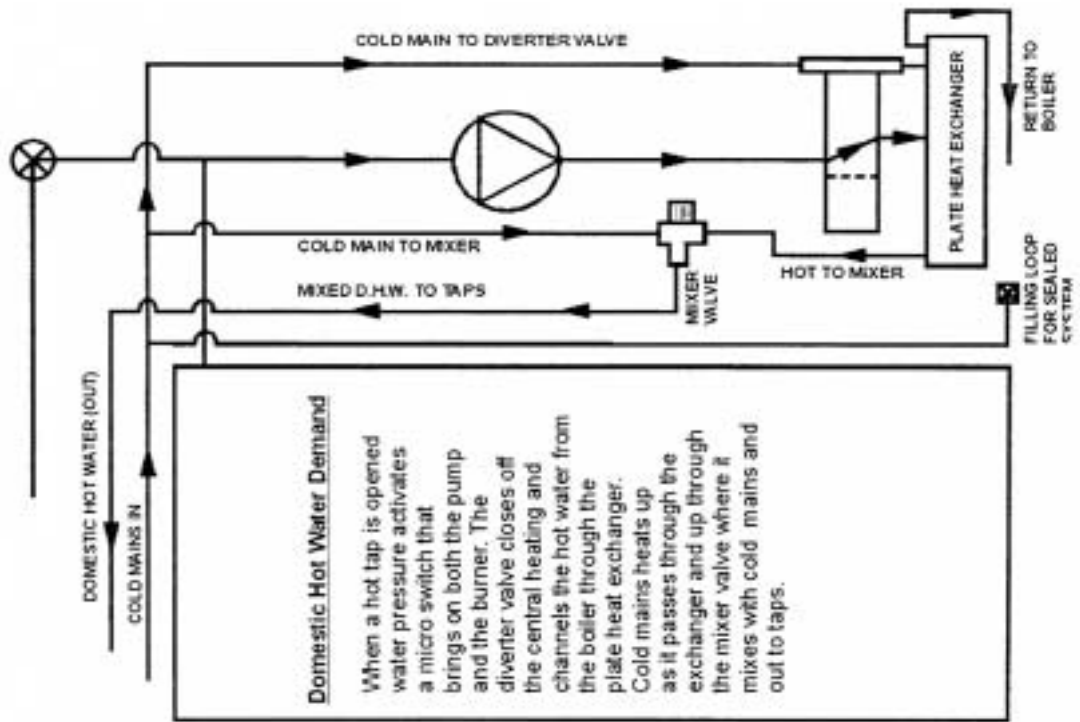
- Turn time switch to the OFF position and open hot tap. If boiler doesn't fire up within a few seconds, remove micro switch from diverter valve, by remove circlip located at the bottom of the switch (if micro switch is not attached to the diverter valve, they could be damaged, this would prevent burner and circulation pump coming on). When micro switch is removed push the two switches to check that burner and circulation pump are coming on. If not check electrical connection to switches and replace if faulty. If micro switches are working correctly, check that cap is on plunger, if cap is not and has been dislodged refit cap and check that plunger is moving out, when tap is open, if not replace diaphragm.

NO D.H.W, HEATING FUNCTION CORRECTLY

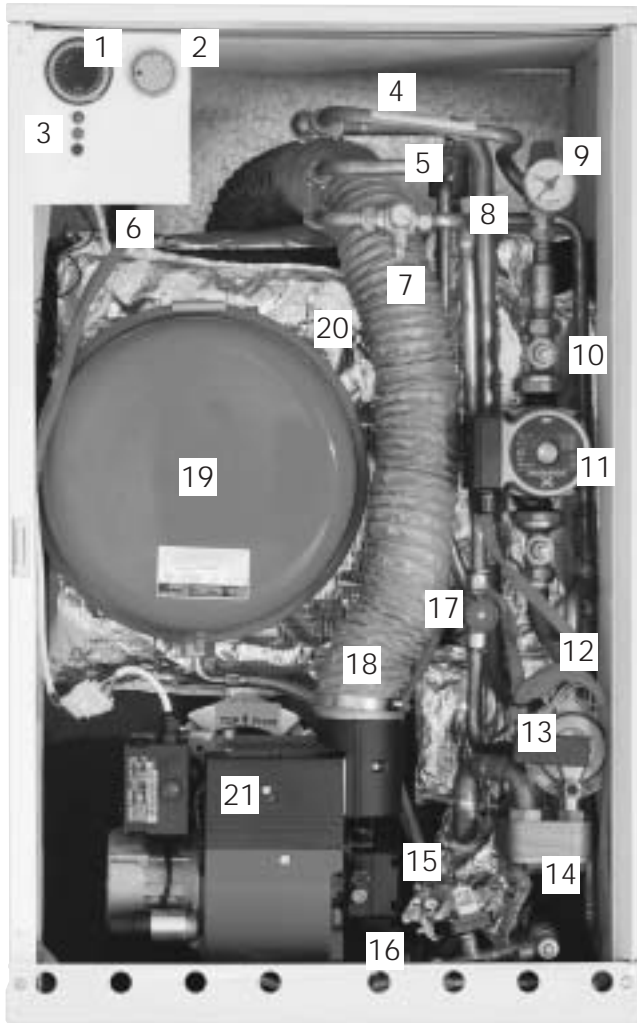
- Turn the heating to the OFF position and turn tap on. If the boiler doesn't fire within a few seconds check calibration of control stat. If correct, set thermal store stat with a thermometer, on the top of the thermal store, so that the temperature is reading around 75-76 C.
- Check 15mm pipe coming off plate heat exchanger, that goes to the mixer valve is hot. If not there could possibly be a blockage in the plate heat exchanger i.e. lime scale. If this is the case descale if possible, or replace and check appropriate water softening equipment has been fitted.
- Check 15mm pipe coming off plate heat exchanger going to mixer valve is hot. But 15mm coming out of mixer valve is not hot. Rotate mixer valve control knob in and out, as valve may have stuck. If this does work remove and clean and replace if faulty.

HOW BOILER WORKS

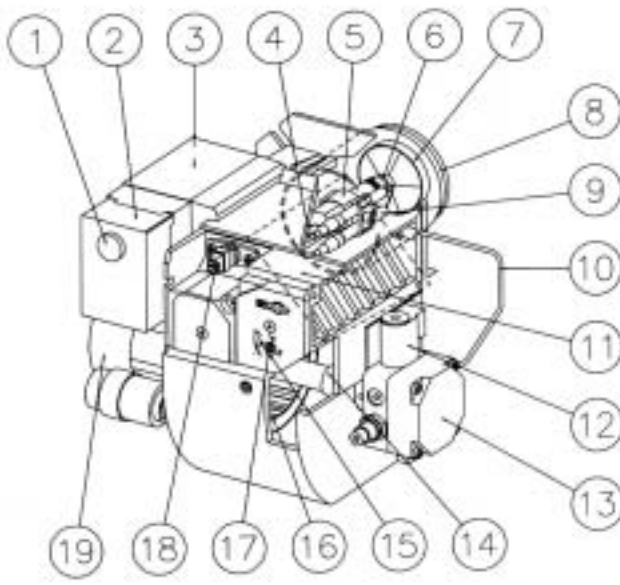
Flow Chart



PARTS LIST



ITEM	DESCRIPTION
1	Internal Time Switch
2	Control Thermostat
3	Green Neon Orange Neon Red Neon
4	Toggle switch
5	High Limit Thermostat
6	Store Thermostat
7	Flow Regulator
8	Auto Air Vent
9	Safety Relief Valve
10	Gate Valves
11	Grundfos 25-50
12	Diverter Valve Diaphragm
13	Micro Switches
14	Plate Heat Exchanger
15	Low Pressure Switch
16	Filling Loop
17	Thermostat Mixer Valve
18	Expansion Vessel Hose
19	12 Litre Expansion Vessel
20	Door Insulation Kit 70 Combi Baffle 90 Combi Baffle 115Combi Baffle
21	Burner See Burner Parts List



ITEM	DESCRIPTION
1	Reset Button
2	Control Box
3	Ignition Transformer
4	Ignition Cables
5	Nozzle Assembly
6	Nozzle
7	Brake Plate
8	Blast Tube Blast Tube
9	Ignition Electrodes
10	Connecting Pipe
11	Air Damper
12	Solenoid Valve
13	Pump
14	Drive Coupling
15	Indication Air Damper
16	Fan Wheel ST40 Fan Wheel ST50
17	Adjustment, Air Damper
18	Photo Resistor
19	Motor

BURNER SETTINGS

BOILER MODEL		70/90	90/115
OUTPUT	Btu/h x 100	90	115
OUTPUT	kw	26.4	33.7
NOZZLE SIZE AND TYPE	US/GPH	0.65	0.85
		80 S	80 S
OIL PRESSURE	BAR	10	8.5
FIRING RATE	Kg/hr	2.44	3.2
AIR SETTING APPROX.	SCALE No.	14	12
SMOKE	Bacharach Scale	0	0
Co ²	%	12.5	12
FLUE GAS TEMP.	Less Ambient C	Mini Temp. 160°C MaxTemp. 260°C	

These figures are to be used as a guide.

Site conditions may require adjustment to achieve most efficient combustion.

NOTES

THERMSAVER

1, Croftsbank Crescent, Uddington, Glasgow G71 7JD

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Fax: 01698 327776



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