



# FINEST PLATINUM

## INSTALLATION AND SERVICING INSTRUCTIONS

TO BE GIVEN TO THE USER



0086

EC 0087/BO/33

G.C. Appliance No. 47-260-02 (Finest Platinum)

G.C. Appliance No. 47-260-03 (Finest Platinum Propane)

PREMIUM PERFORMANCE COMBI BOILER

## CONTENTS

<b>1</b>	<b>GENERAL DESCRIPTION</b>	
<b>2</b>	<b>TECHNICAL SPECIFICATIONS</b>	<b>1</b>
2.1	Gas Categories	1
2.2	Performance data	1
2.3	Minimum clearances	1
2.4	General specifications	1
2.5	Appliance overall dimensions	1
2.6	Concentric air/flue duct specifications	2
2.7	Exploded diagram	4
2.8	Hydraulic circuit	5
<b>3</b>	<b>INSTALLATION REQUIREMENTS</b>	<b>6</b>
3.1	Statutory requirements	6
3.2	Boiler location	6
3.3	Flue terminal position	7
3.4	Ventilation requirements	7
3.5	Gas supply	7
3.6	Central heating system	7
3.7	Domestic hot water systems	8
3.8	Electricity supply	8
3.9	External controls	8
<b>4</b>	<b>INSTALLING THE APPLIANCE</b>	<b>10</b>
4.1	Unpacking the appliance	10
4.2	Preparing the wall	10
4.3	Mounting the boiler	11
4.4	Service connections	11
4.5	Gas connections	12
4.6	Pressure relief valve connection	12
4.7	Air/flue duct installation	12
4.8	Wiring instructions	16
<b>5</b>	<b>COMMISSIONING AND TESTING</b>	<b>17</b>
5.1	Filling the water system	17
5.2	Commissioning the appliance	18
5.3	DHW flow rate	18
5.4	Final checks	18
5.5	Ignition lockout	18
5.6	Overheat thermostat	18
5.7	Frost protection	18
5.8	Other features	18
5.9	User's instructions	18
<b>6</b>	<b>ROUTINE SERVICING INSTRUCTIONS</b>	<b>20</b>
<b>7</b>	<b>INTERNAL WIRING DIAGRAMS</b>	<b>22</b>
7.1	Functional flow diagram	22
<b>8</b>	<b>FAULT FINDING</b>	<b>23</b>
8.1	General	23
8.2	Diagnostic indicator LEDs	23
8.3	Ignition faults	23
8.4	DHW fault finding	24
8.5	Central heating fault finding	24
<b>9</b>	<b>REPLACEMENT OF PARTS</b>	<b>24</b>
9.1	Combustion chamber insulation	24
9.2	Fan assembly	24
9.3	Burner	24
9.4	Ignition and detection electrodes	24
9.5	Gas control valve	24
9.6	Air pressure switch	25
9.7	Diverter valve actuator	25
9.8	PCB	25
9.9	CH micro-switch	26
9.10	DHW flow switch	26
9.11	Clock	26
9.12	Draining the boiler	26
9.13	CH/O'heat and DHW thermistors	26
9.14	DHW heat exchanger	26
9.15	Water flow regulator	26
9.16	Pump	26
9.17	Pressure relief valve	27
9.18	Pressure gauge	27
9.19	Auto air vent	27
9.20	Main heat exchanger	27
<b>10</b>	<b>SHORT PARTS LIST</b>	<b>28</b>
<b>11</b>	<b>SUPPLEMENTARY INSTRUCTIONS FOR VERTICAL FLUE SYSTEMS</b>	<b>29</b>

The **Halstead Finest Platinum** and **Finest Platinum Propane** are fully automatic, wall mounted, fan-assisted, balanced flue gas combination appliance for use with natural gas (G20) and LPG (G31). They incorporate a microprocessor based, fully modulating gas control system with direct burner ignition. The appliances incorporate a domestic hot water (DHW) pre-heat feature which can automatically adjust to the user's habitual requirements. Thus during long stand still periods, eg overnight, no pre-heat is provided.

The **Halstead Finest Platinum** features an attractive white stove enamelled casing with an inset control panel. The flue elbow and air ducts are also white stove enamelled to give a clean, attractive appearance to the Installation.

Central heating (CH) output is fully modulating with a range 14.6 kW (49,747 Btu/h) to 24.9 kW (85,000 Btu/h). DHW output is also fully modulating with a maximum of 32.2 kW (110,000 Btu/h) - nat gas, 29.3 kW (100,000 Btu/h) - propane. The appliance always gives priority to DHW demand.

The appliances are supplied with a standard telescopic concentric air and flue duct system suitable for flue lengths of up to 820 mm (32in). The duct assembly is connected to the boiler via a turret which can exit the boiler in any horizontal direction. Extension ducts may be fitted in accordance with and up to the maximum dimensions stated in these instructions.

A vertical outlet kit is also available for installations where an outside wall is not accessible and it is desired to fit the kit 'through the roof'. Installation using the standard flue kit is described in the main text of these instructions and supplementary instructions at the rear of this booklet describe installation involving the vertical outlet kit. **NO OTHER FLUE KITS OR EXTENSIONS MAY BE USED WITH THESE APPLIANCES.**

The appliances can be installed from inside the room without access to the external wall provided that a wall liner is fitted and that the wall thickness is less than 0.5 m (19 in). The wall liner is available as an optional extra. See section 4 for further details. (Note: If the vertical outlet kit is to be used, access to the roof is necessary).

The appliances are designed for use with sealed primary water systems and incorporates a circulating pump, diverter valve assembly, pressure gauge, flow switch, safety valve and system expansion vessel. A separate DHW expansion vessel is not required. Isolation valves are fitted to the service connections and an automatic heating by-pass is fitted to maintain an adequate flow rate through the boiler.

If thermostatic radiator valves are installed it is recommended that one radiator is fitted with lockshield valves (normally in the bathroom) to allow pump overrun circulation. Internal frost protection is fitted as standard equipment. The boiler may be used with any certified mains voltage room thermostat. An electro-mechanical 24 hour time clock is fitted as standard.

**NOTE: British Standard BS7593: 1992 stresses the importance of cleansing and flushing of the system to ensure it continues to run efficiently with the minimum of maintenance necessary. Halstead Boilers fully support this professional approach and recommend that the system is cleansed with an effective chemical cleanser and protected long term with a suitable inhibitor. Such products are available from Fernox and Sentinal.**

Gas Consumer Council

The Gas Consumer Council (GCC) is an independent organisation which protects the interests of gas users. If you need advice, you will find the telephone number in your local directory under 'Gas'

# 2 TECHNICAL SPECIFICATIONS

## 2.1 GAS CATEGORIES AND APPLIANCE CLASSIFICATION

The appliance is certified to comply with the requirements of EN 483 and EN 625 for use in GB and IE (Great Britain and Ireland) using the following gas categories:

Finest Platinum: I<sub>2</sub>H (G20 with a governed gas supply at 20 mbar (8 in.wg) inlet pressure).

Finest Platinum Propane: II<sub>2</sub>H<sub>3</sub>P (G31 [Propane] with a regulated supply at 37 mbar (14.9 in.wg) inlet pressure)

The appliance classification (as defined in EN 483) may be any of the following depending on the chosen flue option: C<sub>12</sub> or C<sub>32</sub>.

## 2.2 PERFORMANCE DATA

The Seasonal Efficiency is 78.7 %, The efficiency value is used in the UK Government Standard Assessment (SAP) for energy rating of dwellings.

### HALSTEAD Finest Platinum

MODE	RATE	OUTPUT		INPUT Net		INPUT Gross		BURNER PRES	
		kw	(Btu/h)	kw	(Btu/h)	kw	(Btu/h)	mbar	(in.wg)
Central Heating	Max	24.9	(85000)	27.4	(93455)	30.4	(103725)	9.0	(3.61)
	Min.	14.6	(49,747)	16.4	(55,957)	18.2	(62098)	3.0	(1.2)
DHW	Max	32.2	(110000)	35.7	(121740)	39.6	(135115)	15.5	(6.23)
	Min.	9.0	(30844)	10.7	(36577)	11.9	(40603)	1.0	(0.4)

#### GENERAL

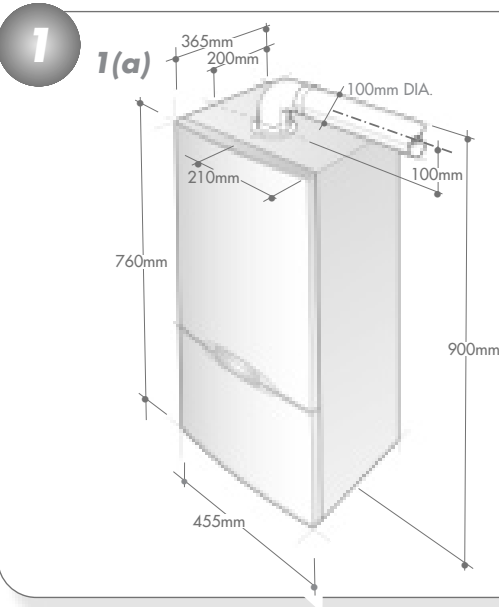
CH	Max. gas rate (after 10 mins operation i.e. hot)	2.90 m <sup>3</sup> /h	(102.3 ft <sup>3</sup> /h)
DHW	Min. domestic hot water flow rate	2.1 l/min	(0.46 gpm)
	Design domestic hot water performance	13.2 l/min	(2.9 gpm) raised 35°C
	Specific DHW flowrate [EN625]	15.4 l/min	
	Max. domestic hot water temperature	60 °C	
	Max. mains water inlet pressure	10 bar	(146 psi)
	Min. mains water inlet pressure for operation	0.3 bar	(4.4 psi)
	Min. mains water inlet pressure for max heat output	1.0 bar	(14.6 psi)
	Max. gas rate (after 10 mins operation i.e. hot)	3.77 m <sup>3</sup> /h	(133 ft <sup>3</sup> /h)

### HALSTEAD Finest Platinum Propane

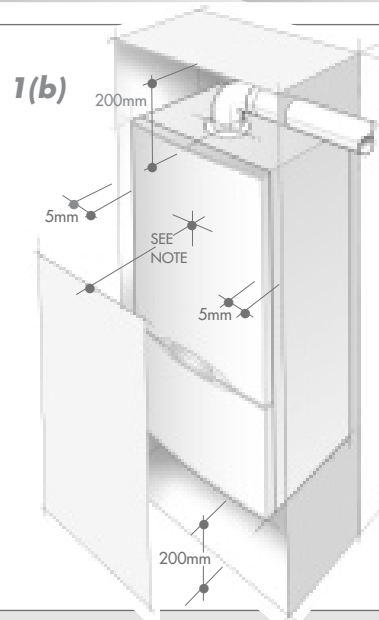
As natural gas appliances except where stated below

The Seasonal Efficiency is 80.5 %, The efficiency value is used in the UK Government Standard Assessment (SAP) for energy rating of dwellings.

## 2.5 OVERALL DIMENSIONS AND MINIMUM CLEARANCES



NOTE:  
10mm for normal operation  
450mm for installation and servicing



MODE	RATE	OUTPUT		INPUT Net		INPUT Gross		BURNER PRES	
		kw	(Btu/h)	kw	(Btu/h)	kw	(Btu/h)	mbar	(in.wg)
Central Heating	Max	24.9	(85000)	27.4	(93455)	29.8	(101678)	17.0	(6.83)
	Min.	14.6	(49,747)	16.4	(55,957)	17.8	(60734)	5.8	(2.33)
DHW	Max	29.3	(100000)	32.4	(110480)	35.2	(120068)	23.4	(9.40)
	Min.	9.0	(30844)	10.7	(36577)	11.7	(39750)	2.3	(0.92)

#### GENERAL

CH	Max. gas rate (after 10 mins operation i.e. hot)	1.12 m <sup>3</sup> /h	(39.6 ft <sup>3</sup> /h)
DHW	Min. domestic hot water flow rate	2.1 l/min	(0.46 gpm)
	Design domestic hot water performance	12.0 l/min	(2.6 gpm) raised 35°C
	Specific DHW flowrate [EN625]	14.0 l/min	
	Max. domestic hot water temperature	60 °C	
	Max. mains water inlet pressure	10 bar	(146 psi)
	Min. mains water inlet pressure for operation	0.3 bar	(4.4 psi)
	Min. mains water inlet pressure for max heat output	1.0 bar	(14.6 psi)
	Max. gas rate (after 10 mins operation i.e. hot)	1.33 m <sup>3</sup> /h	(47.0 ft <sup>3</sup> /h)

## 2.3 MINIMUM CLEARANCES

Minimum clearances for installing and servicing the appliance refer to Fig. 1(b) below.

## 2.4 GENERAL SPECIFICATIONS

Main burner injector (NG)	1.35 mm Ø x 13
Main burner injector (Propane)	0.90 mm Ø x 13
Total water capacity	1 litre
Minimum CH system pressure (static head) – Cold	0.5 bar
Maximum CH system pressure (static head) – Hot	3.0 bar
Empty weight	49.1 kg
Max. lift weight	37.3 kg
Total weight (full)	50.1 kg
Electrical supply	230V 50Hz Fuse at 3A
Internal fuses	T4H 4A 250V
Maximum power consumption	190 W
Max. CH flow temperature	80 °C 176°F
Integral expansion vessel capacity	8 l
Flue products mass flow rate (NG)	18.3 g/s
Flue products mass flow rate (Propane)	18.8 g/s
Average flue gas temperature (NG)	155 °C
Average flue gas temperature (Propane)	145 °C
CO <sub>2</sub> value (CO)% (max CH output) (NG)	5.6 ± 6% (0.002 ± 10%)
CO <sub>2</sub> value (CO)% (max CH output) (Propane)	6.8 ± 6% (0.001 ± 10%)
CO <sub>2</sub> value (CO)% (max DHW value) (NG)	7.5 ± 8% (0.008 ± 50%)
CO <sub>2</sub> value (CO)% (max DHW value) (Propane)	7.4 ± 8% (0.003 ± 50%)

## CONNECTION SIZES

Gas	15 mm compression
CH flow	22 mm compression
CH return	22 mm compression
DHW inlet	15 mm compression
DHW outlet	15 mm compression
Pressure relief valve outlet	15 mm tail

The appliance is supplied complete with a standard telescopic flue kit. This comprises a standard duct and a terminal duct and can be used for flue lengths between 506 mm and 820 mm without cutting the ducts. To use terminal duct for flue length between 300 and 506 mm the ducts need cutting. Avoid swarf and sharp edges to maintain telescopic function

The following additional concentric kits are available as optional extras.

**Extension duct** (each extension extends the flue length by up to 767 mm)

**90° Extension Elbow** (Allows an additional bend in the flue and has an 'equivalent length' of 767 mm.) This elbow is mechanically different from the flanged elbow supplied as standard with the appliance, but has the same equivalent length of 767 mm.

**45° Extension Elbow** Allows an additional bend in the flue and has an equivalent length of 384 mm.

**Vertical Turret Socket** For use with elevated horizontal flues and vertical cowls.

**Vertical Roof Terminal** For use where an external wall is not available. For installation details, refer to Supplement 1 at the rear of this booklet.

These optional kits may be used with the standard flue kit to produce an extensive range of flue options. Examples are illustrated in Figures 2 and 3. Variations upon these illustrations may be used providing that the following rules are strictly obeyed.

**a)** The maximum/minimum permissible allowable length of the flue system is:

Horizontal flue terminal (Right and Left)	- maximum 2500 mm (99 in)
Horizontal flue terminal (Rear)	- maximum 2000 mm (79 in)
Horizontal flue terminal	- minimum 300 mm (12 in)
Vertical flue terminal	- maximum 4000 mm (158 in)
Vertical flue terminal	- minimum 565 mm (22 in)

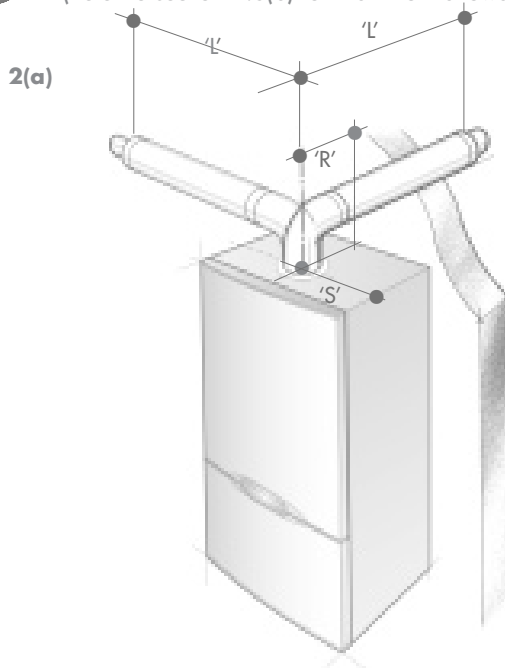
**b)** The standard terminal must always be fitted horizontally. The vertical terminal must always be used if a vertical outlet is required.

**c)** The flue must only terminate in a horizontal or vertical position. However, 90° flue elbows may be used to drop the height of the flue system by 500 mm.

2

## SPECIFICATION FOR STANDARD AND SIDE HORIZONTAL FLUES

(Refer to section 2.6(b) for maximum allowable lengths)



**Fig 2a - Standard flue assembly using either side or rear outlet.**

L measured from the centre line of boiler flue outlet to outside wall face = max 820 mm

R measured from the centre line of boiler flue outlet to rear of boiler = 201 mm

S measured from the centre line of boiler flue outlet to side of boiler = 226 mm

(Allow for minimum clearance of 5 mm at side of boiler)

**No flue restrictors should be used if the flue length exceeds 620 mm.**

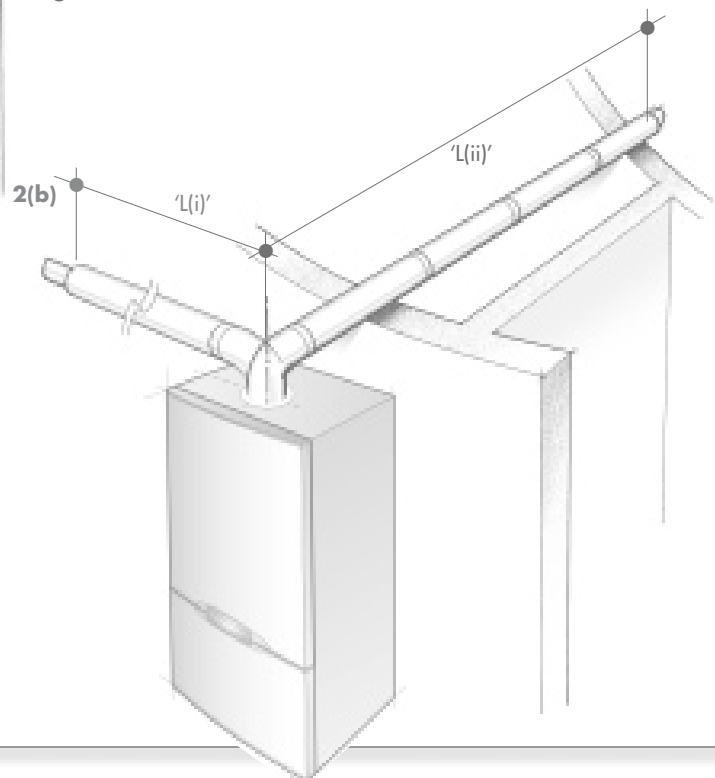
**Fig 2b - Standard flue assembly with optional straight extensions using either side or rear outlet**

Maximum flue length 'L(i)' (measured from the boiler outlet centre line to the outside wall face).

Finest Platinum = 2500mm (99in)

Maximum flue length 'L(ii)' (measured from the boiler outlet centre line to the outside wall face).

Finest Platinum = 2000mm (79in)



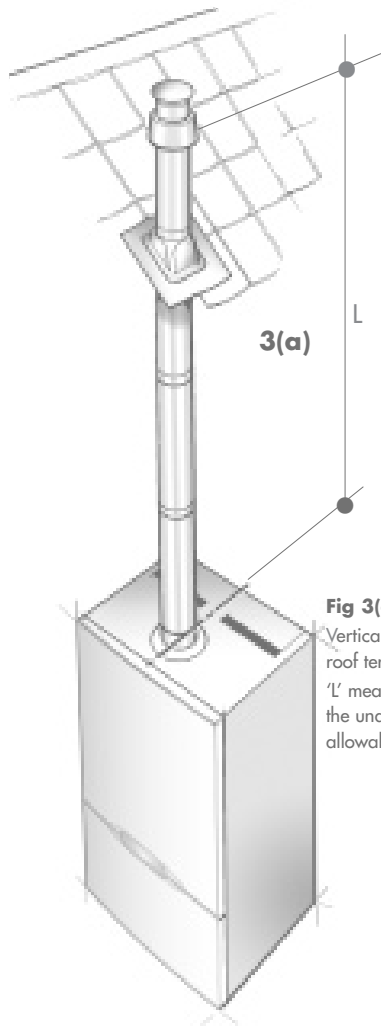
d) The flue system must use either a flanged elbow or a vertical flue turret socket at the entry/exit to the appliance.

e) All joints must be correctly made and secured in accordance with the installation instructions.

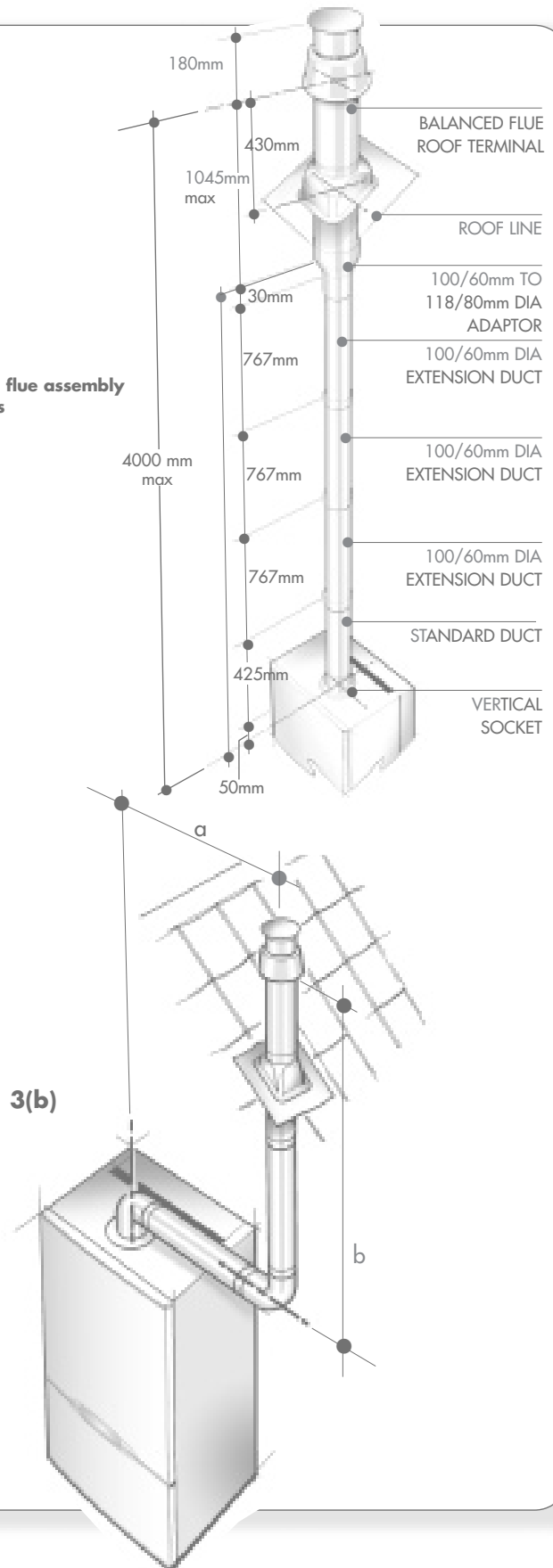
Installation instructions for installing the appliance with a standard flue and straight extension ducts (Fig. 2) are included in the main text of these instructions (section 4.7).

Additional instructions for flue systems incorporating a vertical outlet (Fig. 3) are given in the supplements at the rear of this booklet.

### 3 SPECIFICATION FOR VERTICAL FLUE SYSTEMS

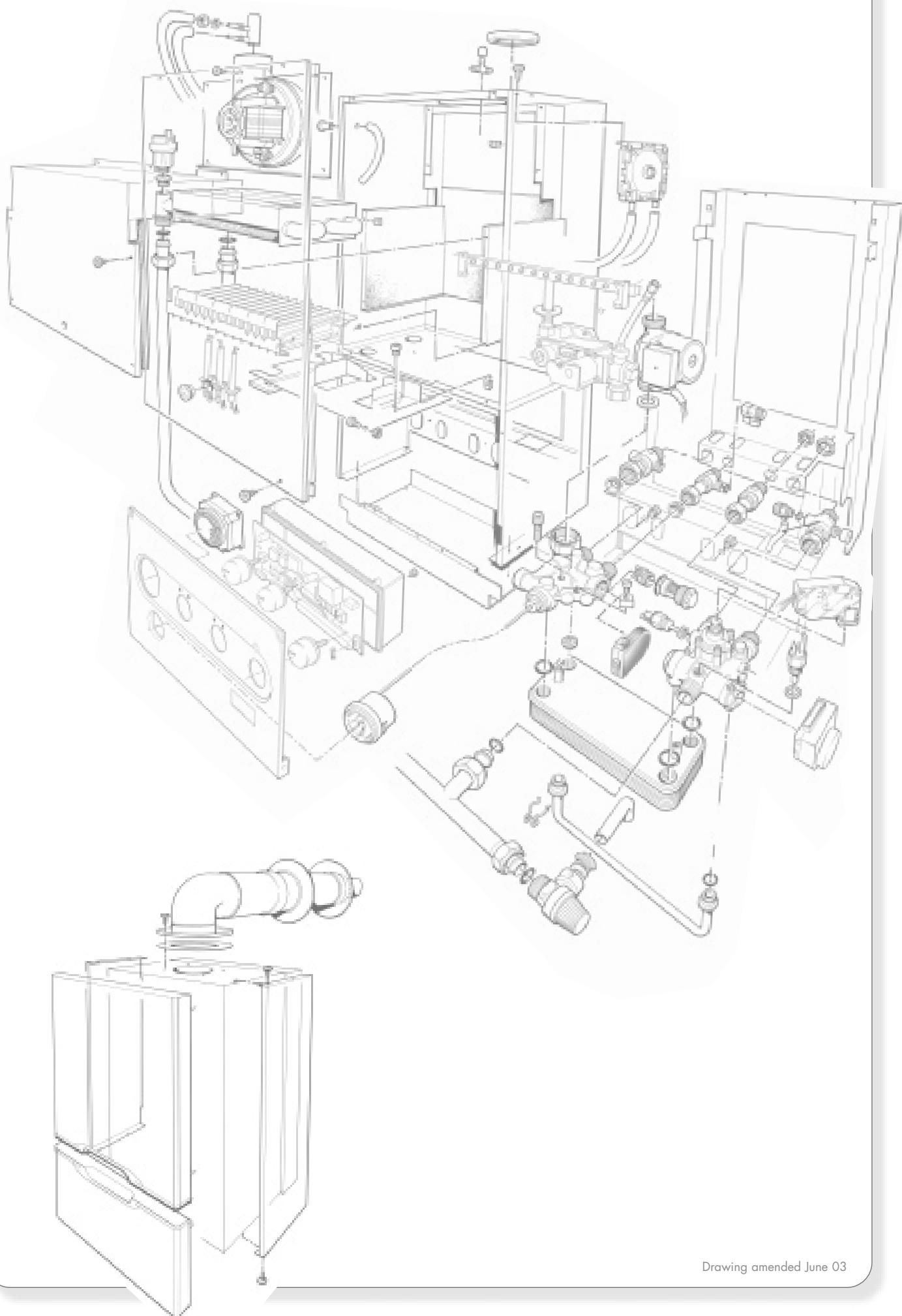


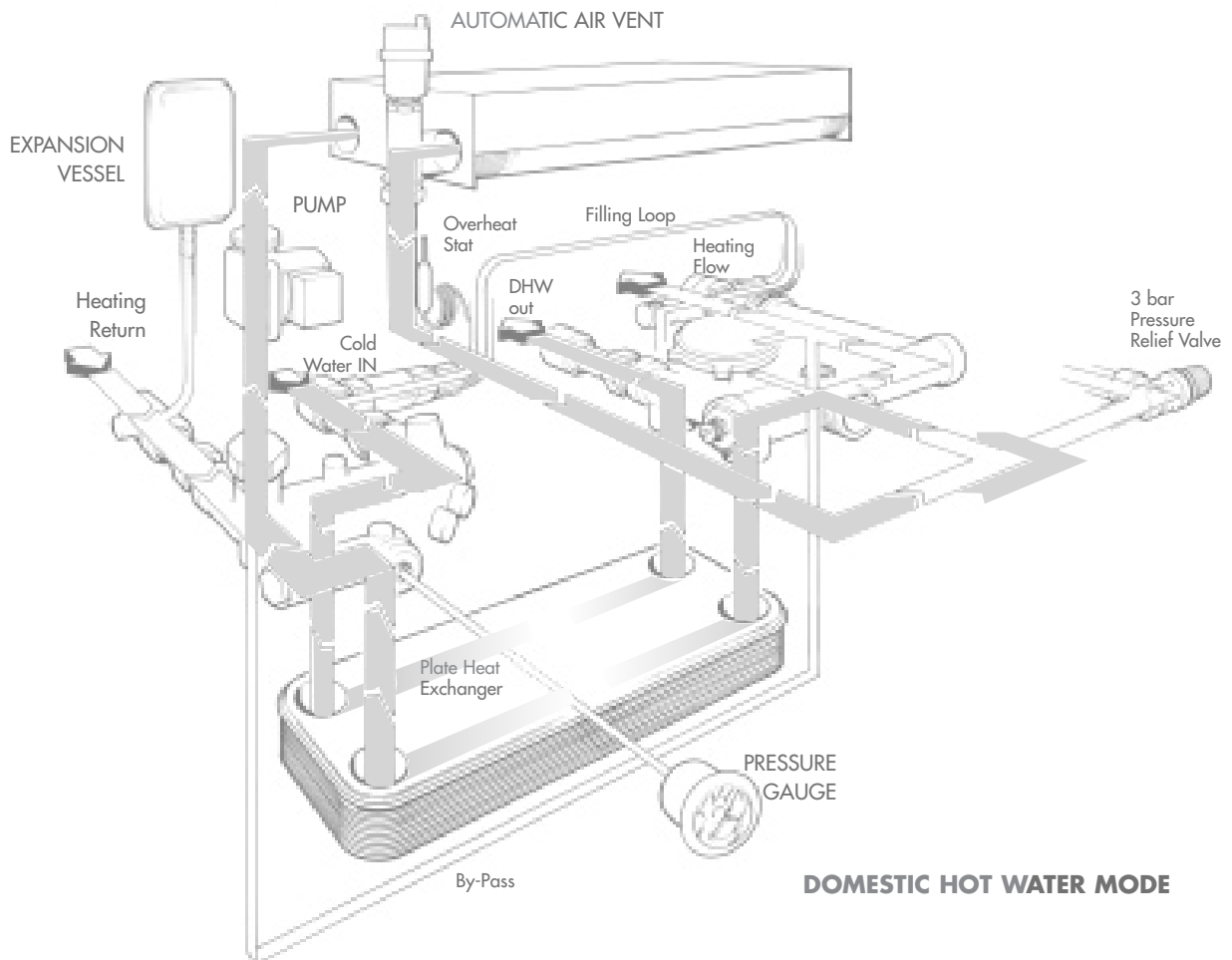
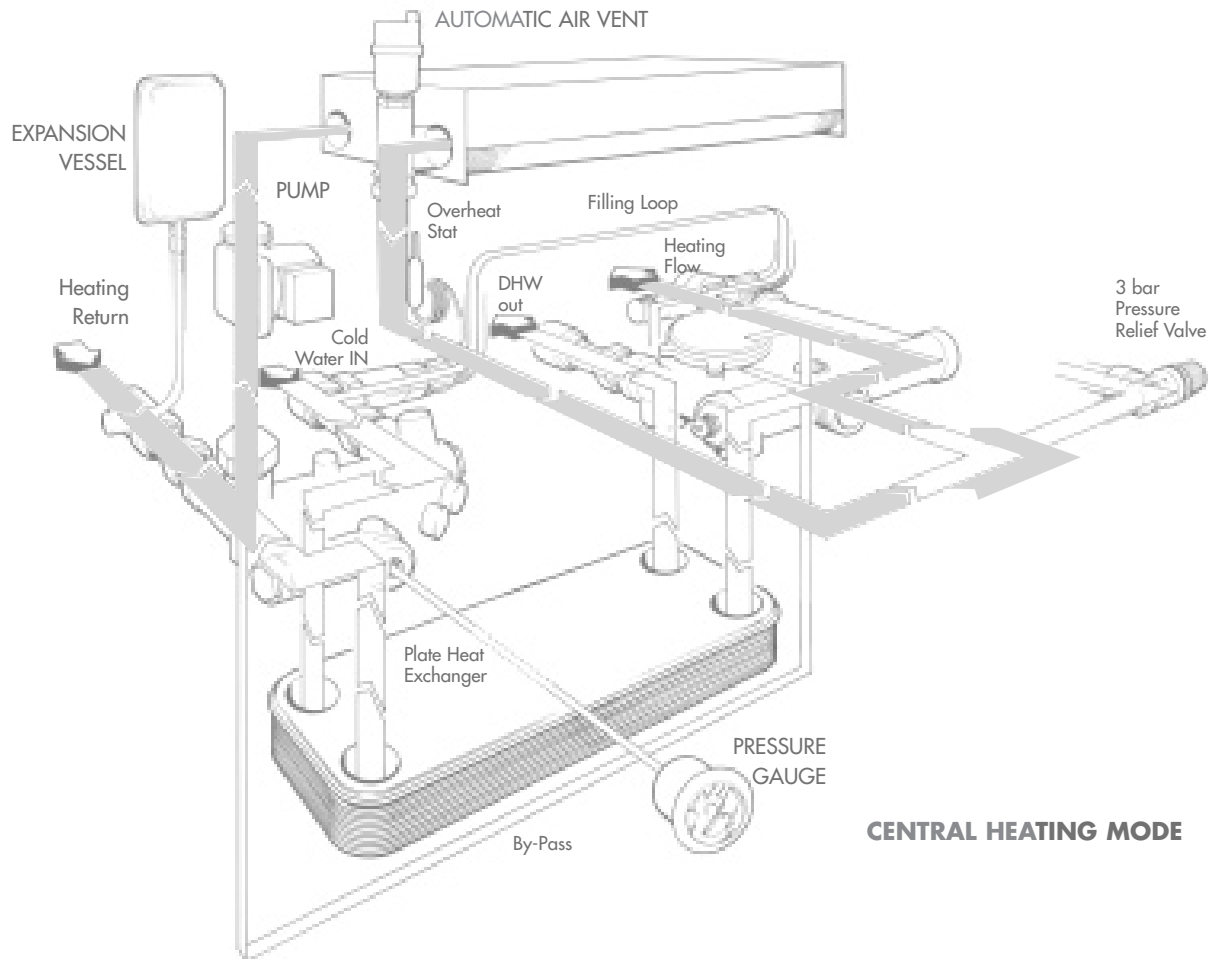
**Fig 3(a) Vertical flue assembly with:**  
Vertical turret socket, standard duct, vertical roof terminal and extension(s) where required. 'L' measured from the top of the boiler casing to the underside of the air cowl. Maximum allowable length of L = 4000 mm



**Fig 3(c) Vertical flue assembly and dimensions**

**Fig 3(b) - Offset vertical flue**  
'a' measured from the boiler centre line to the centre line of the extension elbow  
'b' measured from the centre line of the extension elbow to the underside of the air cowl  
Maximum allowable length of a + b = 2400 mm





# 3

## INSTALLATION REQUIREMENTS

### 3.1 STATUTORY REQUIREMENTS

#### GAS SAFETY (INSTALLATION AND USE) REGULATIONS 1996 (AS AMENDED)

The appliance is suitable only for installation in GB and IE and should be installed in accordance with the rules in force. In GB, the installation must be carried out by a CORGI Registered Installer. It must be carried out in accordance with the relevant requirements of the:

Gas Safety (Installation and Use) Regulations

The appropriate Building Regulations either The Building Regulations, The Building Regulations (Scotland), Building Regulations (Northern Ireland).

The Water Fittings Regulations or Water byelaws in Scotland.

The Current I.E.E. Wiring Regulations

Where no specific instructions are given, reference should be made to the relevant British Standard code of Practice.

In IE, the installation must be carried out by a Competent Person and installed in accordance with the current edition of I.S.813 "Domestic Gas Installations", the current Building Regulations and reference should be made to the current ETCI rules for electrical installation.

It should also be in accordance with the relevant recommendations in the current editions of the following British Standards and Codes of Practice: BS5449, BS5546, BS5440:1, BS5440:2, BS6798, BS6891, Institute of Gas Engineer document IGE/UP-7, BS7074 (expansion vessel), BS5482 (propane installations) and IS813 for IE.

**IMPORTANT NOTE:** Manufacturer's instruction must NOT be taken in any way as overriding statutory obligations.

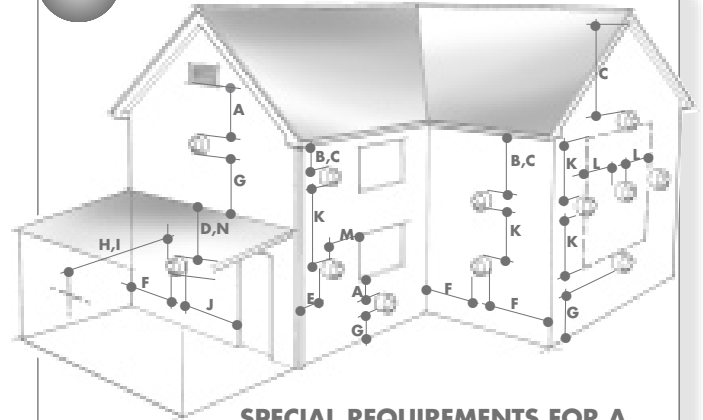
### 3.2 BOILER LOCATION

The following limitations MUST be observed when siting the boiler:

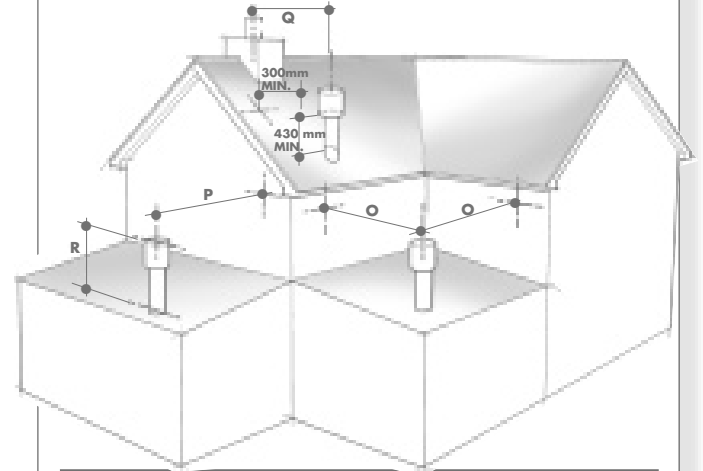
- The boiler is not suitable for external installations. The position selected for installation should be within the building, unless otherwise protected by a suitable enclosure, and MUST allow adequate space for installation, servicing and operation of the appliance, and for air circulation around it (Section 2.3 and 3.4).
- This position MUST allow for a suitable flue system and terminal position. The boiler must be installed on a flat vertical wall which is capable of supporting the weight of the appliance and any ancillary equipment.
- If the boiler is to be fitted in a timber framed building it should be fitted in accordance with the British Gas publication 'Guide for Gas Installations In Timber Frame Housing', Institute of Gas Engineers document IGE/UP-7. If in doubt, advice must be sought from the Local Gas Supplier.
- The appliance is approved to a protection rating of IP20. Therefore if the appliance is to be installed in a room containing a bath or a shower, any electrical switch or control utilising mains electricity must be so situated that it cannot be touched by a person using the bath or a shower. Attention is drawn to the requirements of the current BS7671 (I.E.E Wiring Regulations, and in Scotland the electrical provisions of the Building regulations applicable in Scotland.

### 8

#### FLUE TERMINAL POSITION



#### SPECIAL REQUIREMENTS FOR A VERTICALLY BALANCED FLUE



#### Position Minimum spacing

<b>A</b>	Directly below and above an openable 300mm window, air brick, or any other ventilation opening	12in
<b>B</b>	Below gutter, drain/soil pipe	75mm 3in
<b>C</b>	Below eaves	200mm 8in
<b>D</b>	Below a balcony	200mm 8in
<b>E</b>	From vertical drain pipes and soil pipes	150mm 6in
<b>F</b>	From internal or external corners	300mm 12in
<b>G</b>	Above adjacent ground or balcony level	300mm 12in
<b>H</b>	From a surface facing the terminal	600mm 24in
<b>I</b>	Facing terminals	1200mm 48in
<b>J</b>	From opening (door/window) in carport into dwelling	1200mm 48in
<b>K</b>	Vertically from a terminal on the same wall	1500mm 60in
<b>L</b>	Horizontally from a terminal on the same wall	300mm 12in
<b>M</b>	Adjacent to opening	300mm 12in
<b>N</b>	Below carport	600mm 24in
<b>O</b>	From adjacent wall	300mm 12in
<b>P</b>	From adjacent opening window	1000mm 40in
<b>Q</b>	From another terminal	600mm 24in
<b>R</b>	Minimum height	300mm 12in



### 3.3 FLUE TERMINAL POSITION

Detailed recommendations for flue installation are given in BS 5440:1. The following notes are for general guidance.

- The boiler **MUST** be installed so that the terminal is exposed to the external air.
- It is important that the position of the terminal allows free passage of air across it at all times.
- It is **ESSENTIAL TO ENSURE** that products of combustion discharging from the terminal cannot re-enter the building, or any other adjacent building, through ventilators, windows, doors, other sources of natural air infiltration, or forced ventilation/air conditioning.
- The minimum acceptable dimensions from the terminal to obstructions and ventilation openings are specified in Fig.8.
- If the terminal discharges into a pathway or passageway check that combustion products will not cause nuisance and that the terminal will not obstruct the passageway.
- Where the lowest part of terminal is fitted less than 2000 mm (78 ins) above the ground, above a balcony or above a flat roof to which people have access, the terminal **MUST** be protected by a purpose designed terminal guard (optional extra; Part No.951505).
- The air inlet / flue outlet duct **MUST NOT** be closer than 25mm (1in) to combustible material.
- In certain weather conditions the terminal may emit a plume of steam. This is normal but positions where this would cause a nuisance should be avoided.

### 3.4 VENTILATION REQUIREMENTS

Detailed recommendations for air supply are given in BS 5440:2. The following notes are for general guidance.

- It is not necessary to have a purpose provided air vent in the room or internal space in which the appliance is installed.
- If the boiler is to be installed in a wall cupboard permanent air vents are required for cooling purposes in the cupboard at both high and low levels. Both air vents must communicate with either the same internal room / space or be on the same wall to external air. Each air vent communicating with another room or internal space must have a minimum effective area of: 362 cm<sup>2</sup> (56 in<sup>2</sup>)

If the ventilation is direct to air from outside the building, the necessary areas quoted above may be halved.

**If the cupboard or compartment height is 2000 mm min then NO purpose made ventilation is required.**

### 3.5 GAS SUPPLY

- The Gas Supplier should be consulted at the installation planning stage in order to establish the availability of an adequate supply of gas.
- An existing service pipe **MUST NOT** be used without prior consultation with the Gas Supplier.
- A gas meter can only be connected by the Gas Supplier or by their contractor.

- An existing meter and/or pipework should be of sufficient size to carry the maximum boiler input plus the demand of any other installed appliance. (BS 6891: 1988).

**A minimum of 22 mm dia. pipework is required to within 1 metre of the appliance gas cock.**

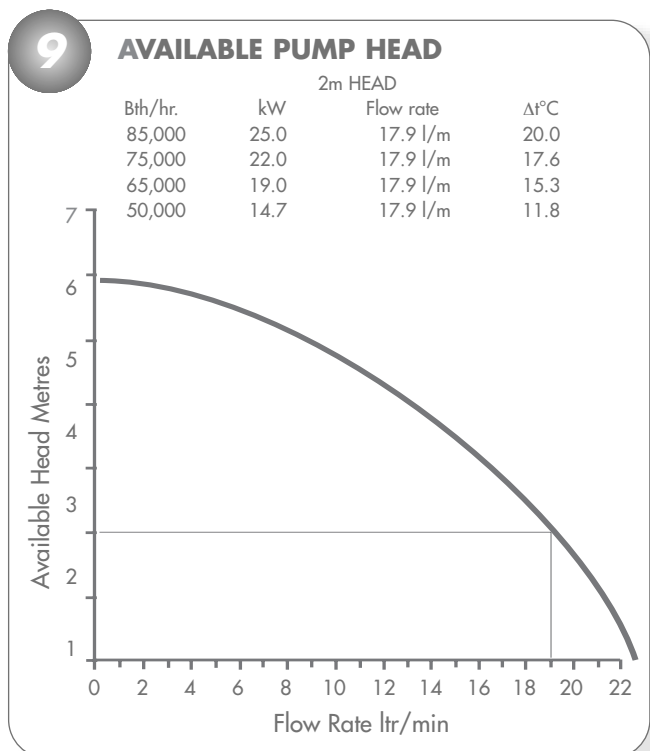
- Natural gas appliances:** The governor at the meter must give a constant outlet pressure of 20 mbar (8 in.wg) when all appliances on the system are running.  
**Propane appliances:** The regulator must give a constant outlet pressure of 37 mbar (14.9 in.wg) when all appliances on the system are running.
- The gas supply line should be purged. **WARNING:** Before purging open all doors and windows, also extinguish any cigarettes, pipes, and any other naked lights.
- The complete installation must be tested for gas soundness

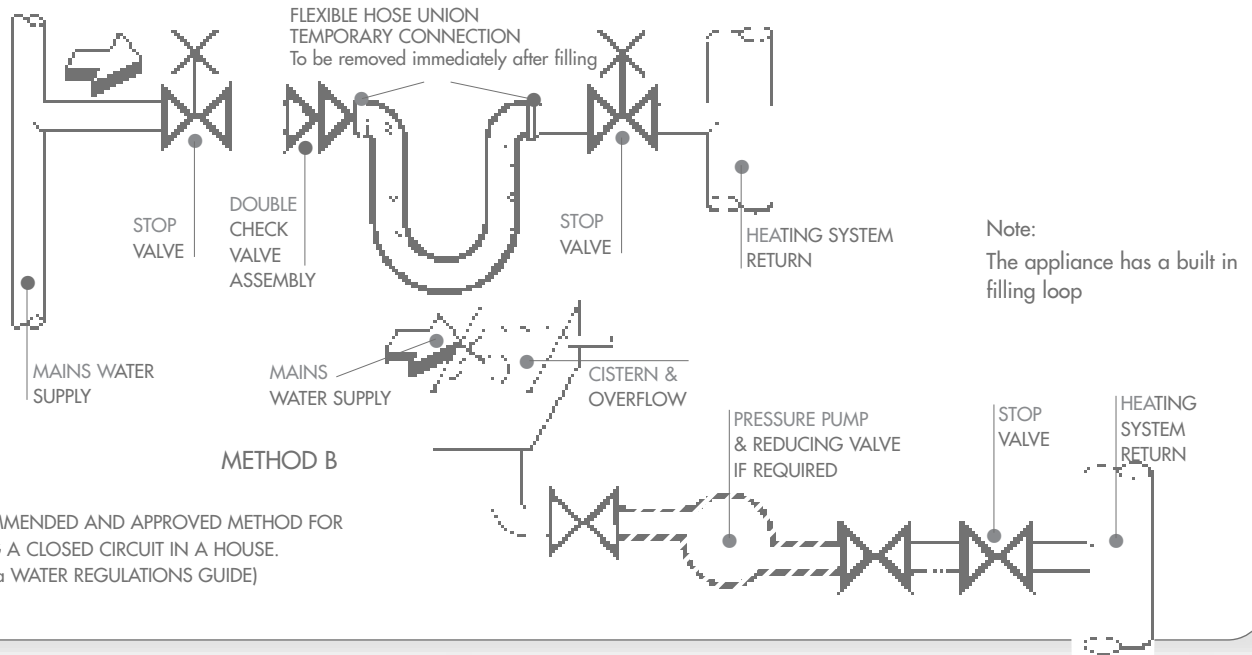
### 3.6 CENTRAL HEATING SYSTEMS

- This appliance is designed for connection to sealed central heating water systems. Refer to Fig. 11 for a typical system design.
- A sealed system must only be filled by a competent person.
- The available pump head is given in Fig. 9.
- A minimum heating flow rate corresponding to a heating differential of 15°C must be obtained at all times.
- An automatic heating bypass is fitted within the appliance. However if thermostatic radiator valves are fitted, a radiator must be fitted with two lockshield valves.
- The following paragraphs outline the specifications of the items fitted to the boiler.

#### PUMP

The available head shown in Fig. 9 is that in excess of the appliance hydraulic resistance, i.e. that available for the system.





RECOMMENDED AND APPROVED METHOD FOR FILLING A CLOSED CIRCUIT IN A HOUSE. (R24-2a WATER REGULATIONS GUIDE)

**EXPANSION VESSEL**

The table below shows the maximum system volume that the integral expansion vessel can sustain under different charge pressure conditions. If the system volume exceeds that shown, an additional expansion vessel must be fitted and connected to the heating system primary return pipe as close as possible to the appliance. If an extra vessel is required, ensure that the total capacity of both vessels is adequate. Further details are available in the current issues of BS5449 and BS6798.

**NOTE:** If the pressure gauge indicates 2.65 bar or greater when the appliance is at maximum temperature with all radiators in circulation an extra expansion vessel is required.

**PRESSURE GAUGE** A pressure gauge is situated on the appliance control panel. This can be viewed by lowering the bottom front panel.

**PRESSURE RELIEF VALVE** A pressure relief valve set at 3 bar (43.5 psi) is supplied with the appliance.

EXPANSION VESSEL REQUIREMENTS					
Vessel charge and initial system pressure	bar	0.5	0.75	1.0	1.5
	psi	7.3	11	14.5	21.8
Total water content of system using 8ltr. (1.54gal) capacity expansion vessel supplied with appliance		96ltr	84ltr	73ltr	50ltr
		21gal	18gal	16gal	11gal
For systems having a larger capacity multiply the total system capacity in litres (gallons) by the factor to obtain the total minimum expansion vessel capacity required litres (gallons)		0.0833	0.093	0.109	0.156

**3.7 DOMESTIC HOT WATER SYSTEM**

- a) Check that the mains water pressure is sufficient (as stated in 2.4 "General Specification") to produce the required DHW flow rate, but does not exceed the maximum DHW pressure (10 bar). If necessary, a pressure reducing valve must be fitted to the mains supply before the DHW inlet connection.
- b) The final 600mm (24in) of the mains supply pipe to the boiler must be copper.
- c) Avoid long DHW pipe runs and several hot water draw off points
- d) Insulate the Hot water pipes if accessible to minimise the heat losses within the pipes to keep the water hot longer.
- e) A domestic hot water regulator is fitted within the group set to control the maximum water flow rate. This may be removed to

obtain higher flow rates. Higher flow rates will not damage the appliance but may reduce the water temperature below an acceptable level.

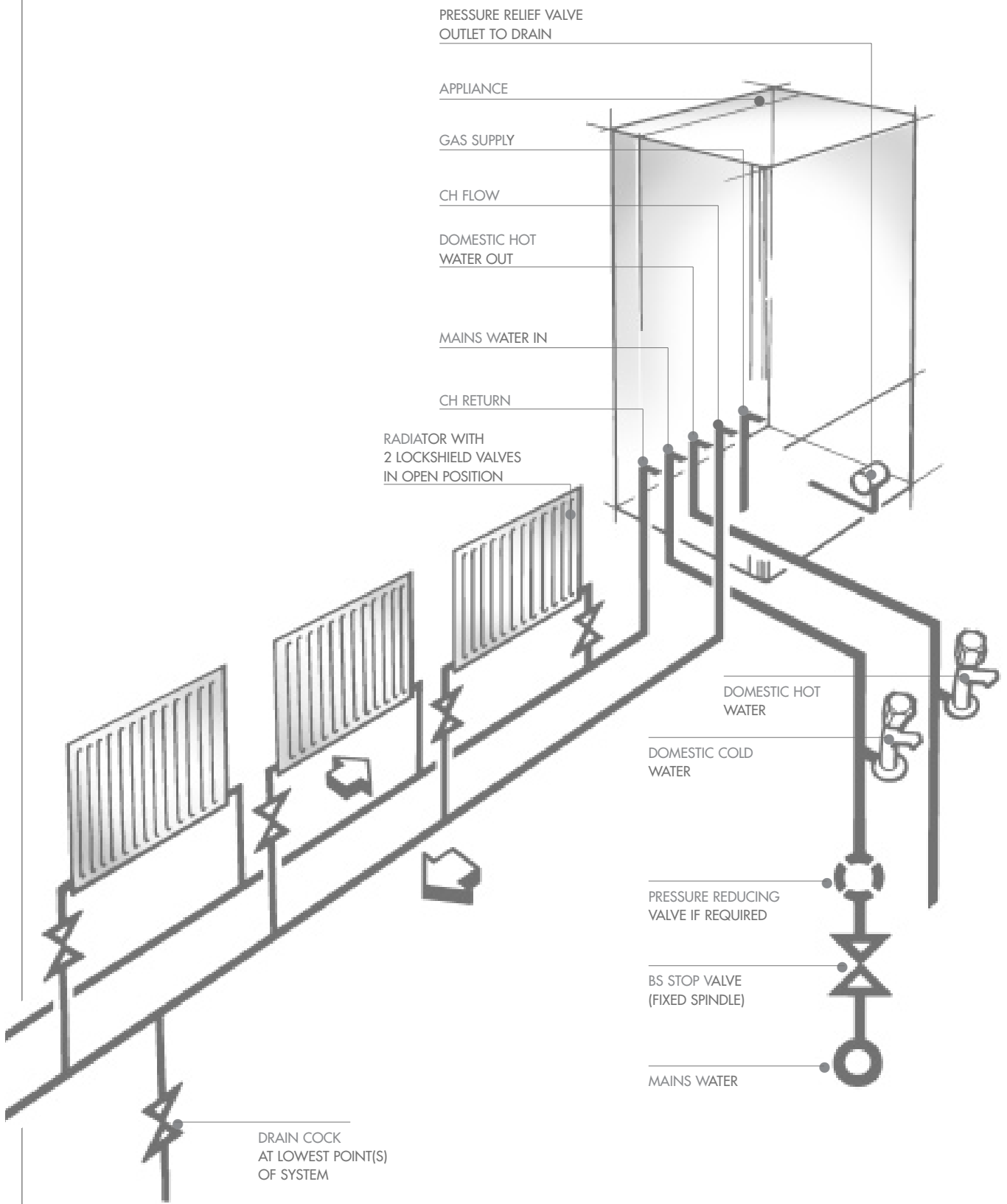
- f) If the appliance is installed in an area where the temporary hardness of the water supply is high, say over 150ppm, the fitting of an in-line scale inhibitor may be an advantage. Consult the Local Water Supplier if in doubt.
- g) For specific information relating to fittings (eg. Showers, Washing Machines etc) suitable for connection in the DHW circuit, consult the Local Water Supplier. However the following information is given for guidance:  
**DOMESTIC HOT/COLD WATER SUPPLY TAPS AND MIXING TAPS.** All equipment designed for use at mains water pressure is suitable.  
**SHOWERS & BIDETS.** Any mains pressure shower or bidet complying with the Local Water Undertaking bylaws is suitable.
- h) Consider IRN 116 and Byelaw 90 + 91. Ensure that necessary action have been carried out to account for thermal expansion of water. If thermal expansion is not provided then high water pressure may result in damaging to fittings and devices.

**3.8 ELECTRICITY SUPPLY**

- a) Wiring external to the appliance must be in accordance with the current I.E.E. Wiring Regulations (BS 7671) for electrical installation and any local regulations which apply.
- b) The mains cable must be at least 0.75mm<sup>2</sup> (24/0.2mm) PVC Insulated to BS6500 table 16.
- c) **THIS APPLIANCE MUST BE EARTHED.** (Failure to provide a satisfactory Earth connection will result in appliance malfunction)
- d) The method of connection to the mains supply must facilitate complete electrical isolation of the appliance. Either a 3A Fused three pin plug and unswitched shuttered socket outlet, both complying with BS1363, or a 3A fused double pole switch having a 3mm contact separation in both poles and serving only the boiler (and its external controls) may be used.

**3.9 EXTERNAL CONTROLS**

The appliance may be used with any certificated mains voltage room thermostat as described in section 4.



**Note:** The boiler incorporates an automatic bypass, hence no other system bypass is necessary. However, it is recommended to fit TRV's on all radiators except in rooms with a room thermostat.

# 4

## INSTALLING THE APPLIANCE

Before installing the appliance, check that the chosen location is suitable (section 3.2) and that the requirements for flue position (section 3.3) and minimum clearances (Fig. 1b) are satisfied.

### 4.1 UNPACKING THE APPLIANCE

The appliance and standard flue kit are supplied in a single box. In addition, various optional flue kits are available as described in section 2.6. If the appliance is to be installed without access to an external wall, a wall liner kit is also required.

Unpack and check the contents:

- Complete boiler
- Standard flue kit
- Paper wall mounting template
- Wall mounting plate
- Piping frame
- Installation and Servicing Instruction
- User's Instructions
- Benchmark book
- Hardware pack containing:
  - 50mm x No 10 wood screws – 4 off
  - Wall plugs – 4 off
  - 22 mm copper compression elbows – 2 off
  - 15 mm copper compression elbows – 2 off

**Manual Handling Note: During the appliance installation it will be necessary to employ caution and assistance whilst lifting, as the appliance exceeds the recommended weight for a one man lift.**

**Take care to avoid trip hazards, slippery or wet surfaces.**

### 4.2 PREPARING THE WALL

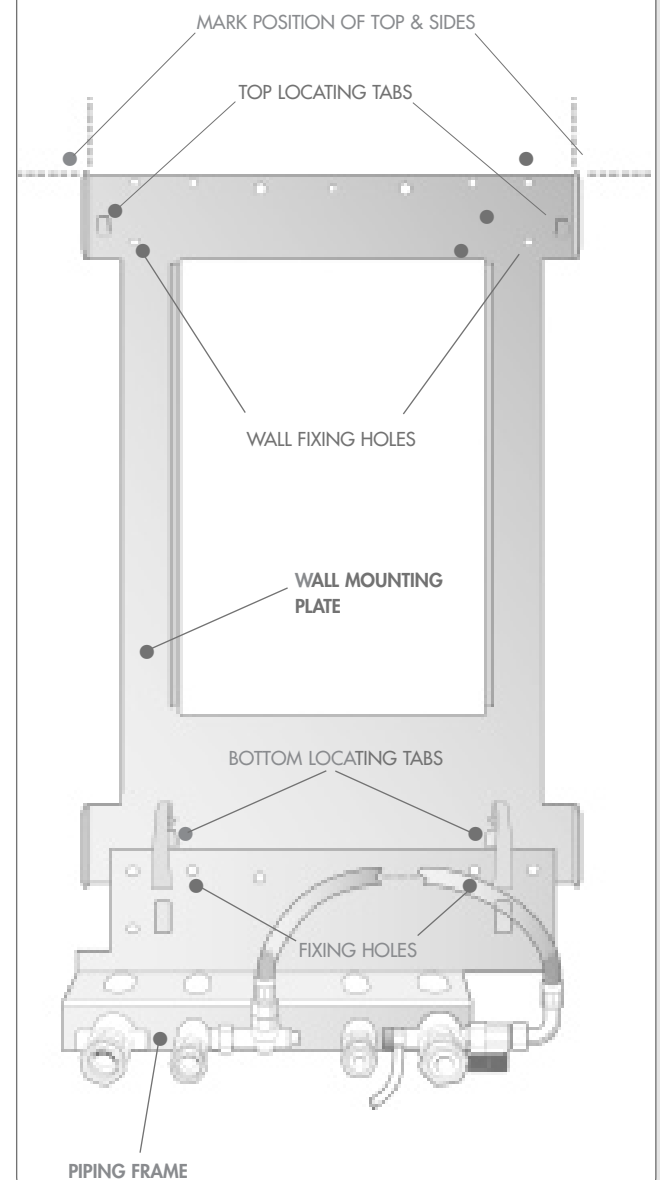
- Fix the paper template in the required position (ensuring that the necessary clearances are achieved). Ensure squareness by hanging a plumbline
- Mark the position of the wall mounting plate fixing holes (4). Select one from each group. Refer to Fig. 12.
- Mark the position of the flue outlet. For side flue installation extend the flue centre line on to the side wall. Refer to Fig. 18. Remove the paper template.
- Cut the hole in the wall for the air/flue duct (preferably with a core-boring tool). The hole must be horizontal and not be less than 100 mm in diameter.

If the hole is not accessible from outside, its minimum diameter must be sufficient to allow insertion of the wall liner (130 mm, 5 1/4in). The wall liner is available as an optional extra and must be sealed in position with mortar (or equivalent). It is recommended that the flue assembly slopes slightly downwards away from the boiler.

- Drill the four fixing holes using an 8 mm drill and insert the wall plugs provided.
- Enter the top two fixing screws ONLY into the wall plugs, leaving 10 mm proud.
- Hang the wall mounting plate on the screws. Hook the piping frame onto the two bottom locating tabs of the wall mounting plate. Refer to Fig. 12.
- Enter the bottom two fixing screws into the wall plugs and tighten up all four screws.

## 12

### MULTIFUNCTIONAL BOILER CHASSIS

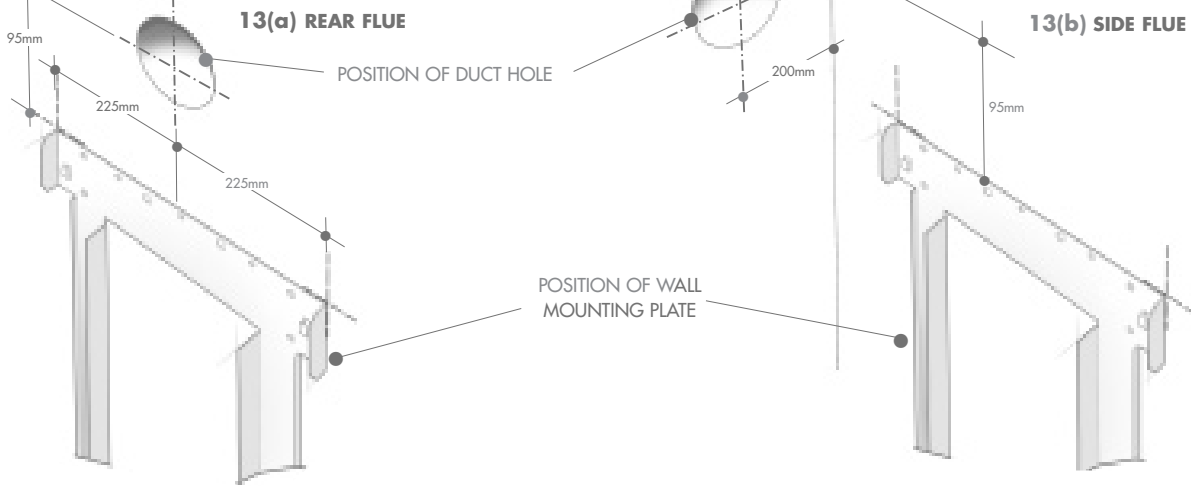


If required, service connections may be made now before mounting the boiler – Refer to section 5.

**NOTE: Pipe work may be routed from above or below the boiler as required.**

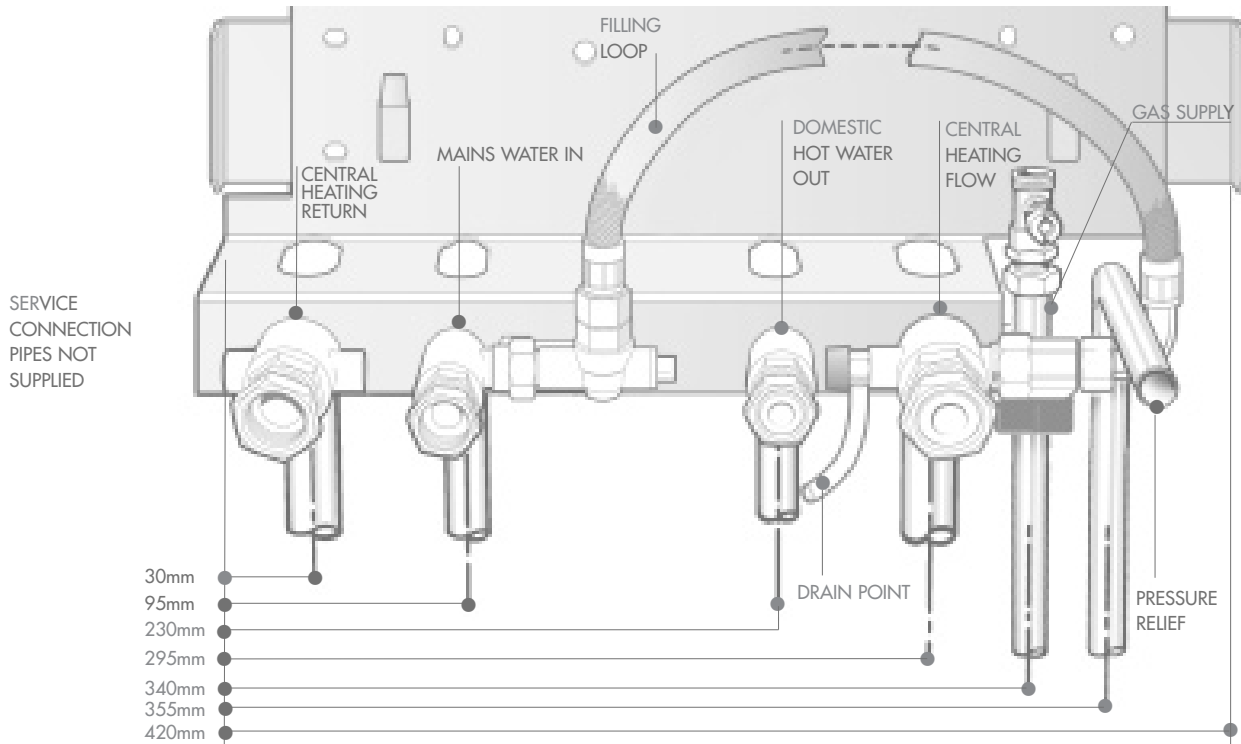
# 13

## DETERMINING THE POSITION OF THE AIR/FLUE DUCT HOLE



# 14

## SERVICE CONNECTIONS



### 4.3 MOUNTING THE BOILER

Refer to Fig 15

- Lift the boiler into position using the lifting points shown in Fig 15. Position the top of the boiler approximately 10 mm above the top of the wall mounting plate and use the side wings on the plate to locate the boiler in a horizontal direction. Then carefully lower the boiler, ensuring that the two top locating tabs are securely engaged.
- Locate and tighten the water valves to the boiler. (Seals are prefitted) Using the fittings supplied in the hardware pack:
- Connect the central heating system to the boiler flow and return isolating valves.

- Connect the mains water supply to the boiler DHW inlet isolating valve.
- Connect the DHW supply pipe to the boiler DHW outlet connection.

### 4.4 SERVICE CONNECTIONS

Commission the central heating system as described in section 5.1 and then proceed to Section 4.5.

## 4.5 GAS CONNECTION

### Refer to Fig 14.

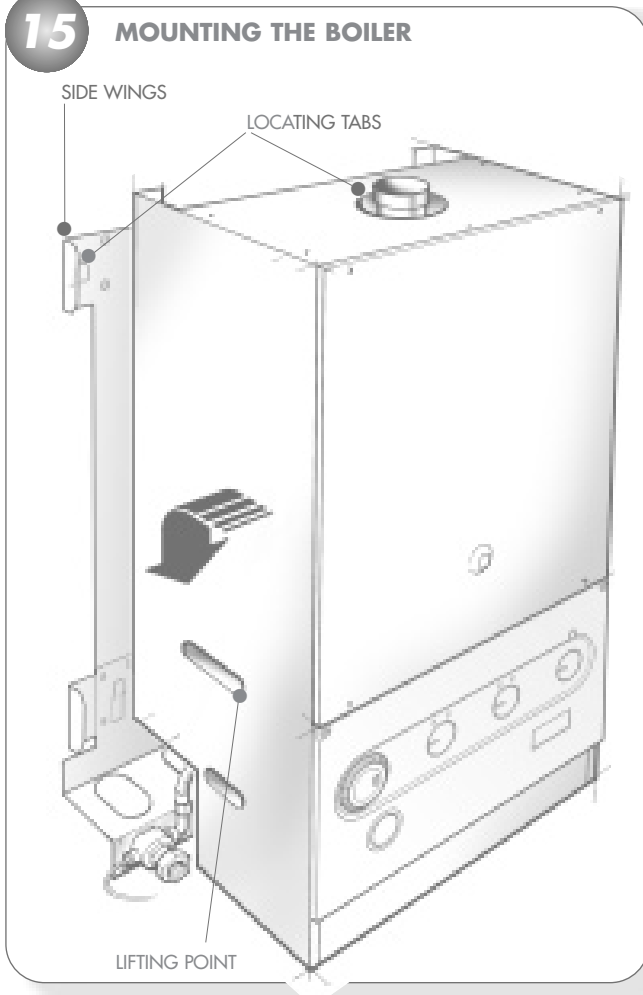
Extend a gas supply pipe of not less than 15 mm OD copper to the boiler and connect to the gas service cock.

#### Note:

**Natural Gas:** A working gas pressure of 20 mbar (8 in wg) should be available at the boiler inlet with the boiler firing at full DHW output.

**Propane:** A working gas pressure of 37 mbar (14.9 in wg) should be available at the boiler inlet with the boiler firing at full DHW output.

## 15 MOUNTING THE BOILER



## 4.6 PRESSURE RELIEF VALVE PIPE CONNECTION

The safety valve is located at the bottom RHS of the boiler.

Connect a copper discharge pipe of not less than 15 mm diameter to the safety valve outlet.

The pipe should be positioned so that the discharge of water or steam can be noticed, but cannot create a hazard to the occupants of the premises or damage electrical components or wiring.

## 4.7 AIR FLUE DUCT INSTALLATION

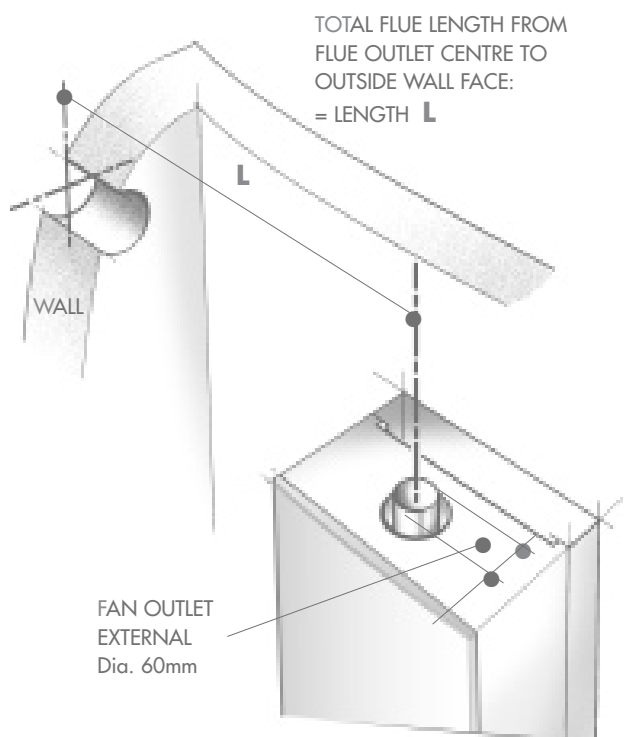
If the wall thickness is less than 800mm (31 in) the air/flue duct may be fitted without access to the external wall providing that the optional wall liner is used. (This is necessary to seal any cavity and to allow the sealing ring to pass through from inside but still open and provide an adequate seal). The wall liner is a tube diameter 130mm with a wall thickness of 0.8mm.

## 4.7.1 PREPARING THE AIR/FLUE DUCTS

- Measure the required flue length as shown in Figure 16. Refer to section 2.5 to determine whether any extension kits are required. Installations using only the standard ducts or standard ducts with straight extensions are described in this section. Installation instructions for all other flue systems are described in the supplements at the rear of this booklet.
- Fit the external sealing ring to the terminal and assemble the air/flue ducts as shown in Figure 17. The standard duct is always used at the entry/exit to the boiler and the sliding (telescopic) terminal is always slid into the end of the standard or extension duct (where appropriate).
- Achieve the correct flue length using Figure 18 as a guide. Note that the flue length is measured to the inside of the external wall sealing ring. In most cases it will be possible to achieve the required flue length without cutting the ducts, however where necessary the plain ends of the extension ducts may be cut. **Never cut the swaged end**, and always ensure that the cut is square and free of burrs or debris. The minimum overlap of the telescopic section is 50mm (2 in).
- Assemble the flue using Figure 19 as a guide. It is important that the steps are carried out in the order stated in Figure 19. When securing the ducts in position always drill two 3.3 mm diameter holes in each extension air duct joint and use the self tapping screws provided to secure each joint.

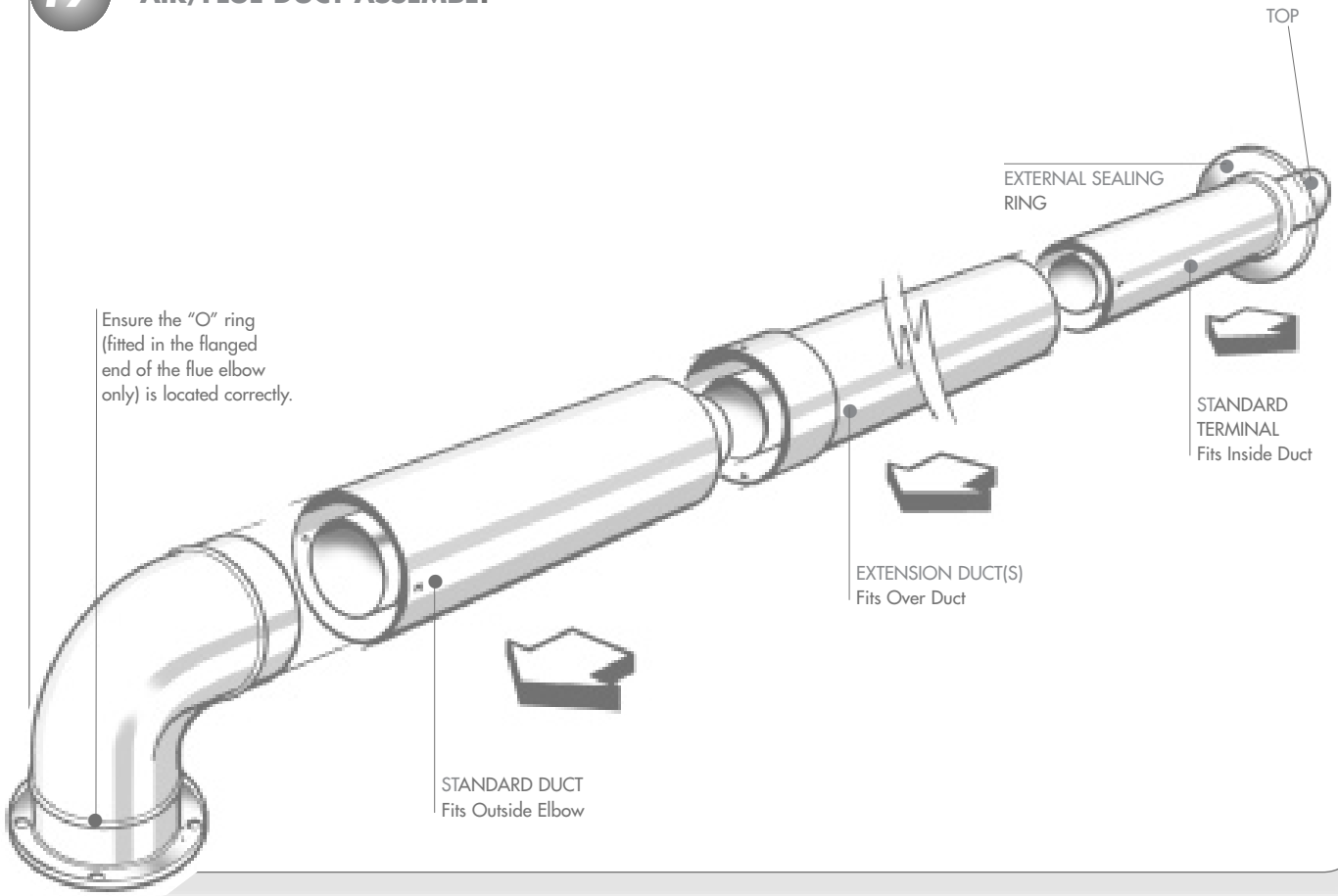
**NOTE IT IS ESSENTIAL THAT THE TERMINAL IS FITTED THE CORRECT WAY UP See Fig 17 (i.e. rainshield at the top).**

## 16 MEASURING THE EXACT FLUE LENGTH



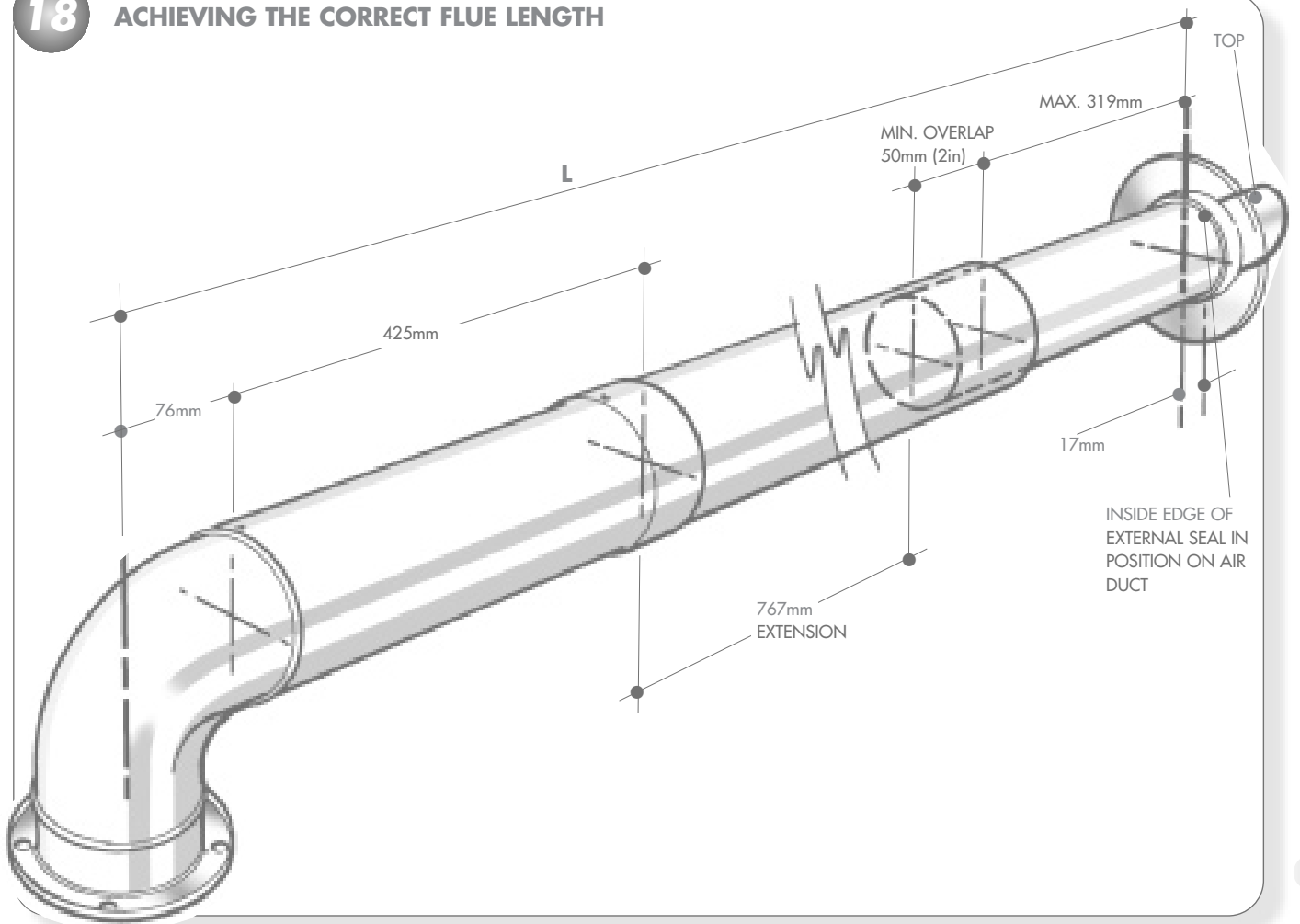
# 17

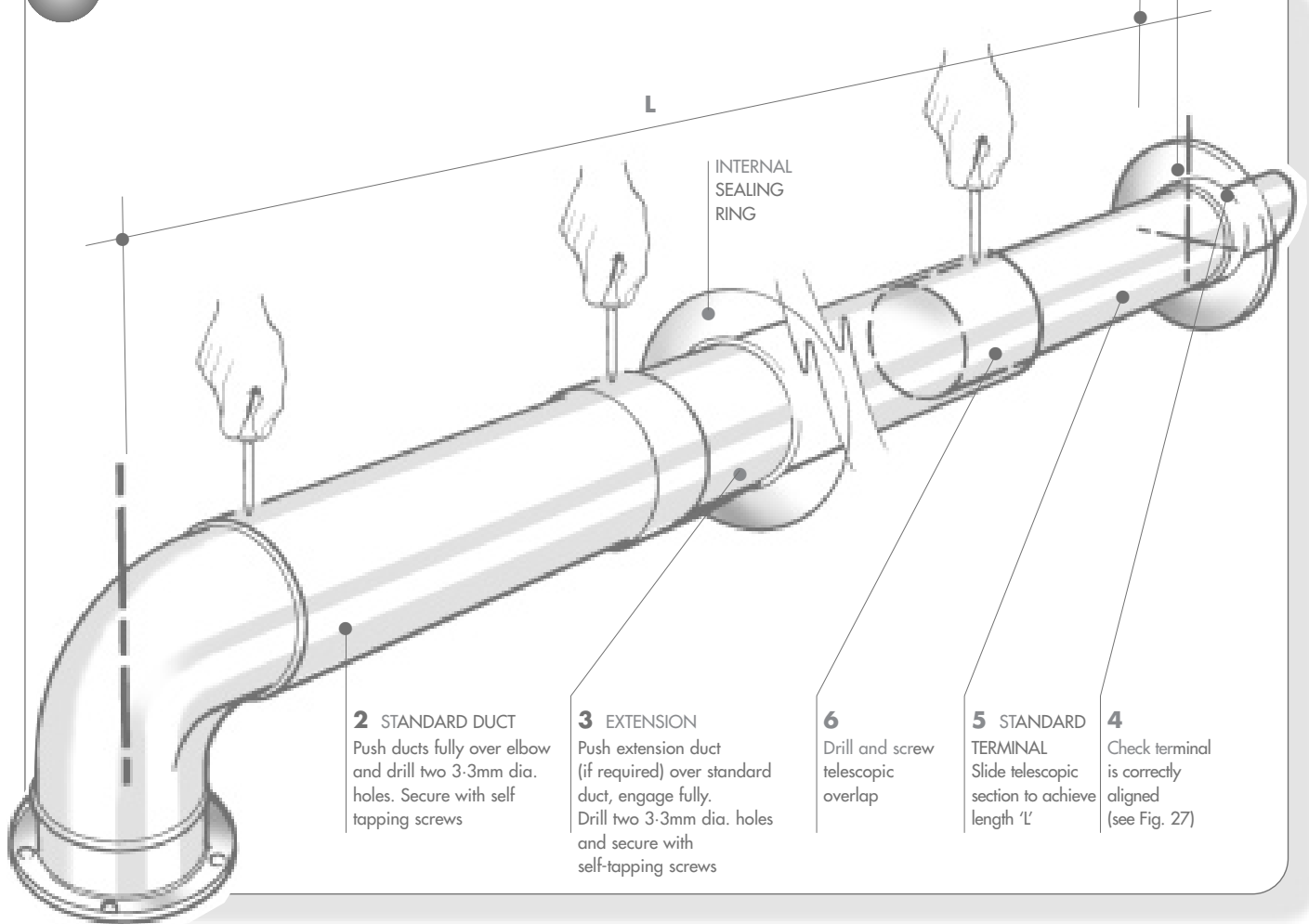
## AIR/FLUE DUCT ASSEMBLY



# 18

## ACHIEVING THE CORRECT FLUE LENGTH





**2 STANDARD DUCT**  
Push ducts fully over elbow and drill two 3-3mm dia. holes. Secure with self tapping screws

**3 EXTENSION**  
Push extension duct (if required) over standard duct, engage fully. Drill two 3-3mm dia. holes and secure with self-tapping screws

**6**  
Drill and screw telescopic overlap

**5 STANDARD TERMINAL**  
Slide telescopic section to achieve length 'L'

**4**  
Check terminal is correctly aligned (see Fig. 27)

**4.7.2 FLUE RESTRICTOR**

A flue restrictor (47 mm Ø NG, 43 mm Ø propane) is supplied with the appliance for use only if the horizontal flue length does not exceed 620 mm, if a vertical flue is fitted refer to supplement 1 for further guidance on the use of flue restrictors.

If any extensions ducts or additional elbows etc are to be used, proceed to section 4.7.3.

If only the standard flue components (i.e those packed in the same carton as the appliance) are to be used fit the restrictor as follows:

**a)** Note the position of the flue restrictor ring. This is fitted on top of the appliance and is secured by the air pressure switch bracket screws (fig 24). Loosen the air pressure switch screw by 1/2 turn only, to release the ring and tighten the two screws.

**b)** Fit the restrictor ring inside the flue elbow bottom as shown in figure 25 ensuring that it is the correct way round.

**NOTES**

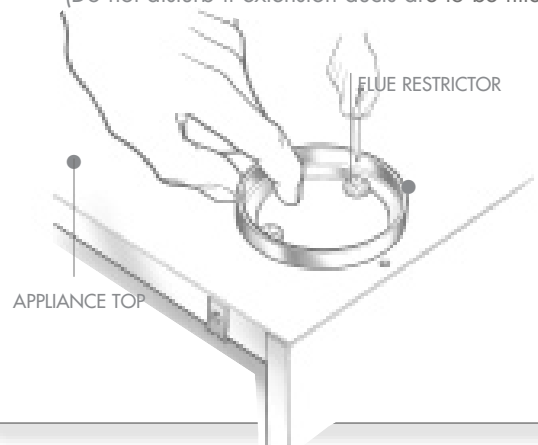
**1)** Failing to fit the restrictor when installing the appliance with a standard flue system will not provide optimum performance.

**2) Fitting the restrictor on horizontal flue system incorporating extensions or additional bends and fitting a restrictor on vertical flues greater than 2300 mm will adversely affect performance and may constitute a safety hazard.**

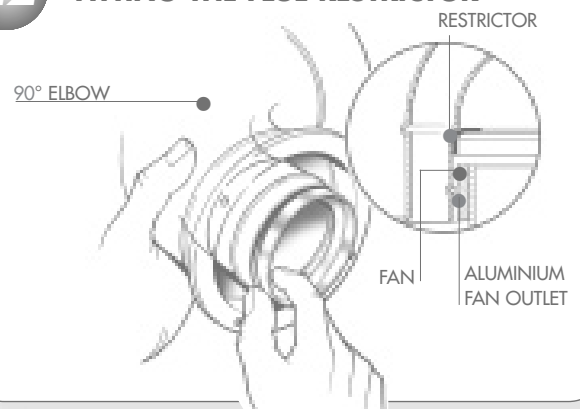
**3)** Failure to comply with these instructions will invalidate the appliance Certification and therefore may contravene the appropriate EC legislation and local statutory requirements.

**FLUE RESTRICTOR LOCATION**

(Do not disturb if extension ducts are to be fitted)



**FITTING THE FLUE RESTRICTOR**



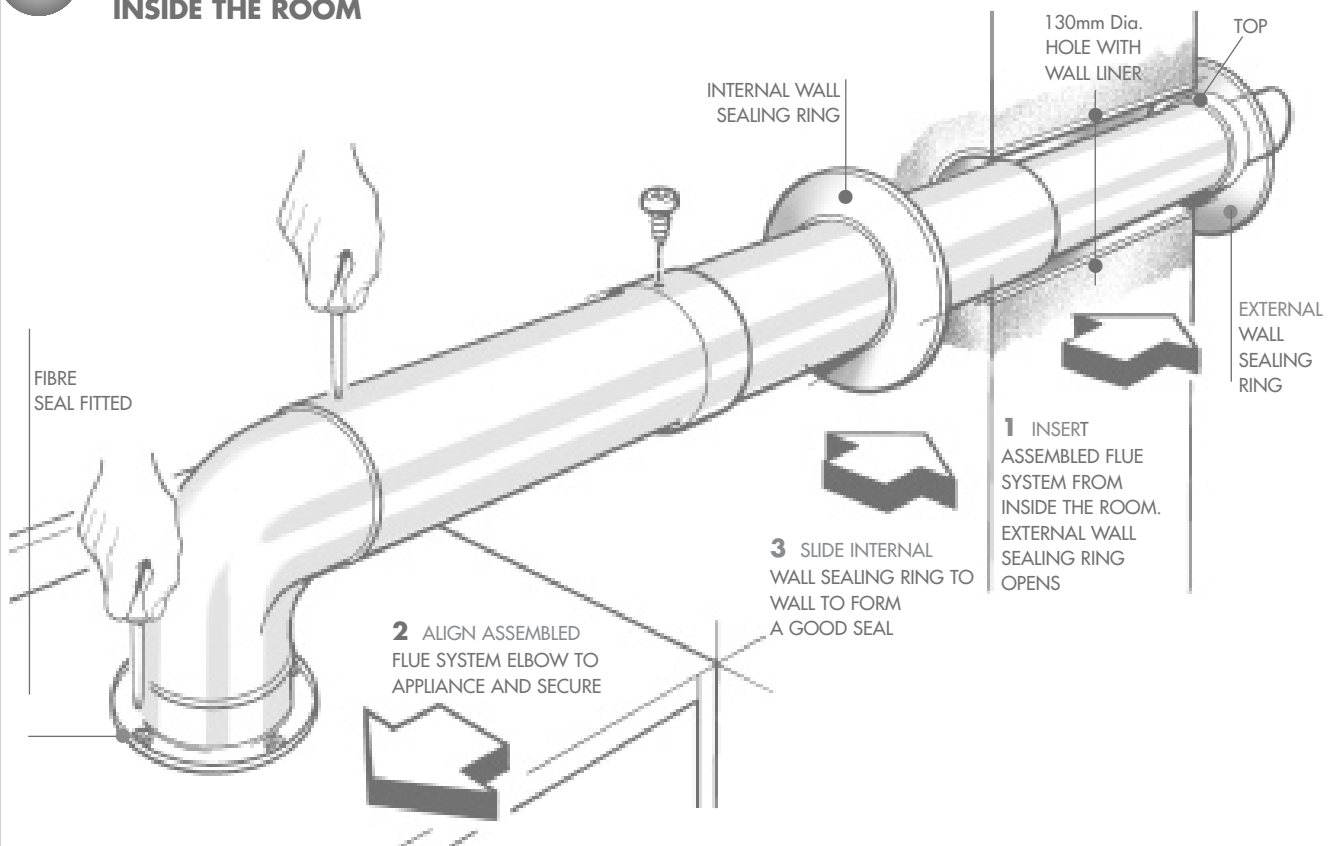


### 4.7.3 INSTALLING THE AIR/FLUE DUCT FROM INSIDE THE ROOM

Wall thickness up to 800 mm (31in) only.

- Push the terminal through the wall liner taking care to ensure that the terminal is the correct way round and the external wall sealing ring does not become dislodged.
- Pull the flue system towards the boiler to seat the external sealing ring against the outside wall and secure the elbow to the boiler using the two screws provided.
- Finally use the internal sealing ring to make good the internal hole, and check that the terminal is correctly located on the outside wall (Where possible this should be visually checked from outside the building.) Figure 26 shows a view of the flue system, correctly installed.
- Assemble as shown in Figure 26

### 21 INSTALLING THE FLUE SYSTEM FROM INSIDE THE ROOM

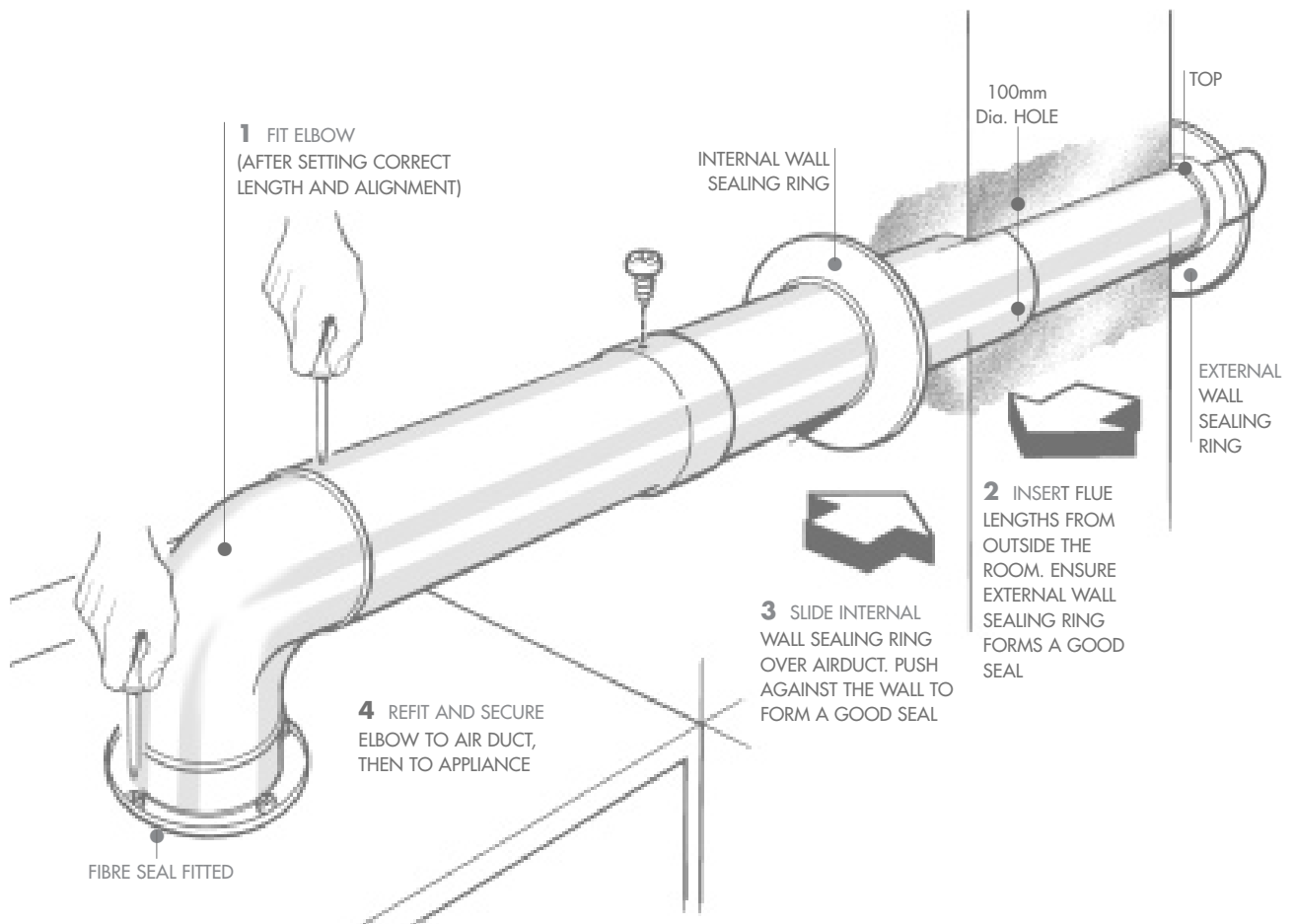


### 4.7.4 INSTALLING THE AIR/FLUE DUCT FROM OUTSIDE THE BUILDING

(Flue hole diameter 100mm - wall liner not necessary)

- Secure the flue elbow with seal to the appliance using 4 screws.
- Fit external wall sealing ring over flue and then from outside the building, push the flue system through the wall taking care to ensure that the terminal is the correct way around.
- Fit the internal wall sealing ring over the inside end of the flue, then fit the air duct to the elbow, drill and secure with the two screws.
- Pull the flue system towards the boiler to seat the external sealing ring against the outside wall and secure the air duct to the elbow using the two screws provided.
- Finally use the internal sealing ring to make good the internal hole. Check that the external wall sealing ring is correctly located, on the outside wall from outside the building.

Figure 27 shows a view of the flue system, correctly installed.



#### 4.8 WIRING INSTRUCTIONS

Connect the electricity supply and external controls (using suitable mains cable) as follows:

Wire the cable(s) into the appropriate connections in the electrical plug provided (Figure 28). Live supply to L1, Neutral and Earth as indicated. Check that L2 and L3 are linked.

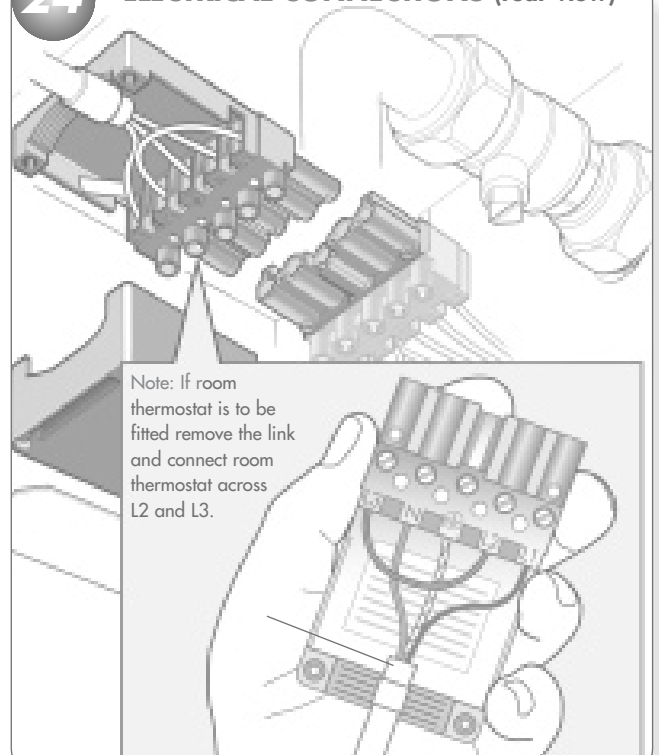
To provide correct cable retention, fit the piece of tubing supplied over the cable as it passes through the clamping arrangement. The cable will be held in position as the plug cover is fitted.

If a room thermostat is to be fitted remove the red link between L2 and L3 and connect the thermostat across these terminals. Any external controls fitted must be rated at 230V 50Hz and have volt-free contacts.

**NOTE:** Assuming that the appliance is to be commissioned immediately after installation it is not necessary to fit the casing panels at this stage.

## 24

#### ELECTRICAL CONNECTIONS (rear view)



# 5

## COMMISSIONING AND TESTING

Before commissioning the appliance, the whole gas installation including the meter **MUST** be purged and tested for gas tightness in accordance with BS 6891: 1988.

**IMPORTANT:** *Open all doors and windows, extinguish naked lights, and DO NOT SMOKE whilst purging the gas line.*

Before commencing the commissioning procedure, ensure that the gas service cock is turned on, the electricity supply is isolated, and that the DHW and CH pipework is complete.

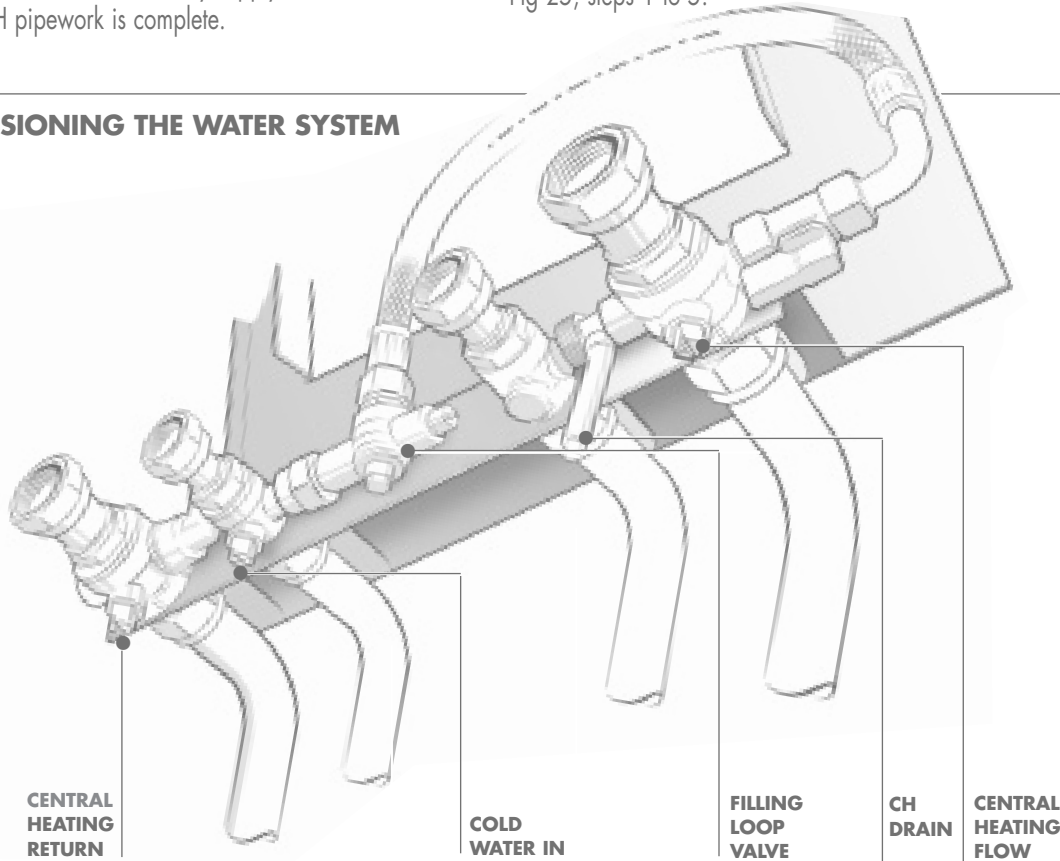
### 5.1

### FILLING THE WATER SYSTEMS

A special feature of the Finest and Finest Gold is that the water systems can be completely filled prior to fitting the boiler. It is recommended that this procedure is followed even when the boiler is to be fitted immediately after filling the system.

Fill the water systems by following the procedure detailed below Fig 25, steps 1 to 5.

## 25 COMMISSIONING THE WATER SYSTEM



**Note:** It is recommended, where possible, to flush the CH system without the boiler fitted, to avoid debris and flux blocking the plate heat exchanger.

- 1) Check that the CH flow and return isolating valves are in the open position.
- 2) Fill the system with water using one of the approved methods described in section 3.6 to about 2.0 bar. Vent the system via the radiator valves and system air vents in accordance with normal practice. Ensure that all system air vents are closed.

**NOTE:** The boiler is supplied with a filling loop and fittings.

- 3) Check the system for soundness.
- 4) Check the operation of the pressure relief valve (Fig. 32) by rotating the plastic head anticlockwise 1/4 of a turn and checking that water is discharged. Ensure that the valve seats correctly and does not leak. If the valve leaks or is stuck closed replace it.
- 5) Drain the entire system to flush out any debris, and refill to 0.2 bar above the system design pressure (between 0.5 and 1.5 bar) by repeating the above procedure. Follow the

commissioning procedure described below, then repeat this instruction with the system hot. It is recommended that the system is cleaned with a recognised system cleaner such as Fernox or Sentinell.

- 6) Open the DHW inlet valve and open and close each hot water tap in turn to clear all the air from the pipes and the boiler.
- 7) Remove the pump vent cap to bleed any air from the pump. Using a screwdriver, rotate the pump shaft. Replace the cap.

**Note:** When bleeding the pump, the flow switch, situated beneath the pump, must be protected from water leakage, either by covering it or temporarily removing it from the manifold – Refer to section 9.10.

- 8) If the filling loop has been used, disconnect it from the system.
- 9) Prior to lighting the boiler to check the gas rates, the Central Heating and Boiler system should be checked for circulation by running the boiler and pump with the gas turned off, to ensure no air locks occur.

Boiler may go into ignition lock-out and require resetting.

## 5.2 COMMISSIONING THE APPLIANCE

### Refer to Fig. 25


**Note:** If, at any time during the commissioning procedure, it is required to prevent the boiler from modulating, set the CH temperature control knob to the Service position.

- Check that the gas supply is turned ON and the gas service cock is OPEN.
- Slacken the screw in the burner pressure test point and connect a suitable manometer. Refer to Fig. 30.
- Set the DHW and CH temperature control knobs fully anti-clockwise to the standby positions.
- Turn on the electrical supply and set the ON/OFF switch to ON (I). The **Reset** LED will briefly show red, then blue, then extinguish. The fan will start briefly and then stop. The LEDs 1-4 (yellow) will illuminate briefly.
- Turn the DHW temperature control knob to the desired temperature position and fully open any DHW tap. LED 1 will show yellow (**Economy** mode). The ignition sequence will commence and when flame is detected the **Reset** LED will show blue. If the burner fails to light after five attempts, ignition lock-out occurs. In this event the **Reset** LED will show RED. To re-set the appliance and initiate a further ignition sequence, press the **Reset** button.

**Note:** If the **Reset** LED show RED, to establish the cause press and hold the **Reset** button for three seconds. The **Reset** LED will flash RED and the error code will be displayed via the LED's 1-4.

- After ignition, allow the boiler to run for at least 10 minutes and check that the burner pressure is as stated on the data badge  $\pm 10\%$ . (Nat. gas 15.5 mbar 39.6 kW or 135115 Btu/h gross heat input, Propane 23.4 mbar or 120068 Btu/h). The DHW burner pressure is factory set and should not require adjusting. If the burner pressure is low, check that the appliance has not started to modulate (This will occur if the DHW flow rate is low. If modulation is suspected, open all DHW taps to maximise the flow and re-check the burner pressure). If it is necessary to adjust the burner pressure the method is described in section 9.5 'Gas valve replacement'.

**Note:** To select **Comfort** DHW control, ie with pre-heat, turn the DHW temperature control knob fully clockwise and then back to the desired temperature setting. LED 2 will then illuminate and LED 1 extinguish.

- Close the DHW tap and ensure that the burner goes out (BLUE light off) and the pump stops after an over-run period of 5 minutes.
- Ensure that the room thermostat (if fitted) is calling for heat. Turn the clock override switch to the 'I' position Turn the CH temperature control knob to the '+' position. The boiler will perform a series of self-checks, light and then go to minimum rate burner pressure (Nat. gas 3 mbar, propane 5.8 mbar). After ignition, the burner pressure will remain at this for about ten minutes, before ramping up to the factory set burner pressure, or to a modulated value if the system is hot. The **Reset** LED will show BLUE and LEDs 3 and 4 will show YELLOW.
- Set the clock to the desired times by setting the tabs.
- Slide the clock override switch to the 'timed' position  and check the operation of the clock and room thermostat (If fitted)

**Caution:** With the CH temperature control knob in the Service position, the boiler will fire continuously at full output and LEDs 3 and 4 will flash. This setting is for the convenience of the Service Engineer ONLY.

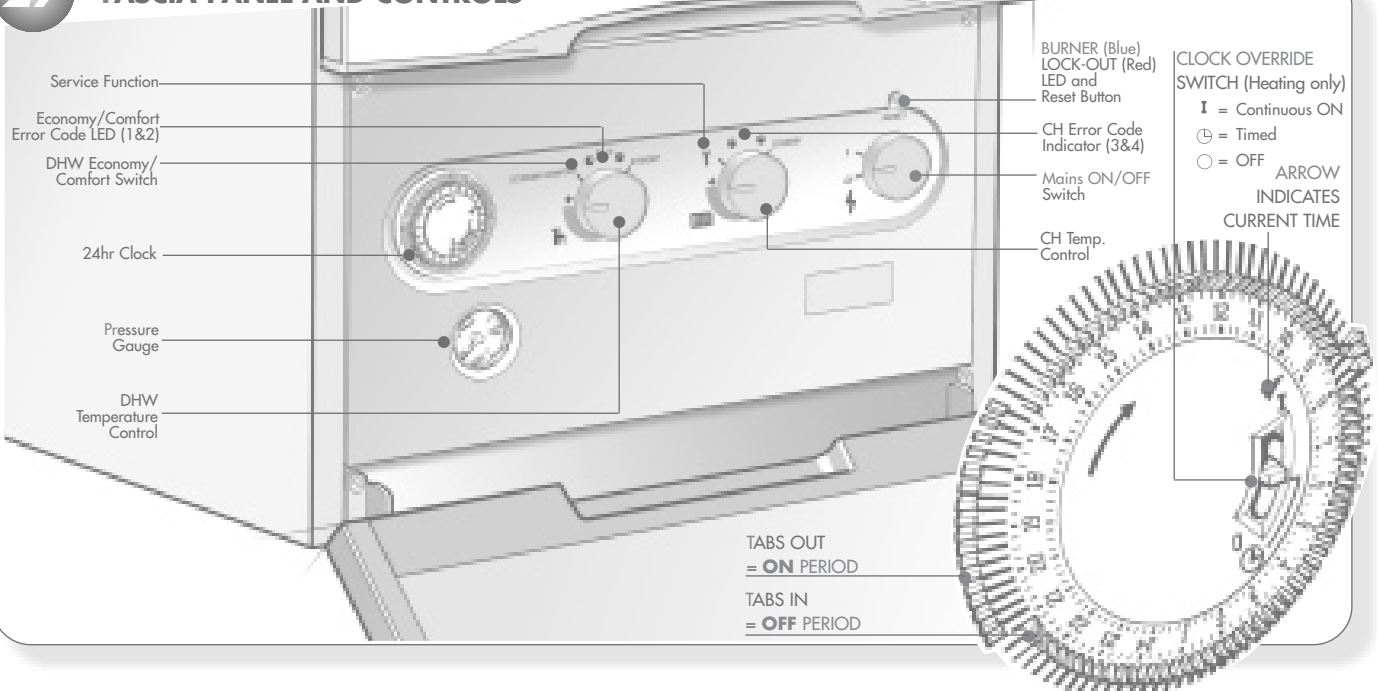
## 5.3 DOMESTIC HOT WATER FLOWRATE

A flow regulator is supplied factory fitted to the appliance to ensure that no adjustment is necessary. Should the mains flow rate be below the minimum required, it is possible to remove the flow regulator from the appliance as instructed in section 9. The nominal pre-adjusted flow rate may vary by  $\pm 5\%$  due to factory tolerances and mains water pressure fluctuation.

## 5.4 FINAL CHECKS

- Turn both the DHW and CH temperature control knobs to standby.
- Turn the appliance on/off switch to the off (o) position, remove the manometer and tighten the burner pressure test point screw. Relight the burner and test for gas tightness.
- Fit the boiler casing as described and illustrated in Figure 28: Fit each side panel with two screws at the top and bottom of each panel. Position and fit controls cover in place using screws provided. Ensure it hinges correctly. Fit the front panel in position using locating studs and ensure correctly seated by pressing.
- Set the heating and hot water controls to the required settings. Ensure that the clock override switch is in the timed position and check that the time clock is set at the desired time periods. Set the room thermostat (if fitted) to the required setting.

## 27 FASCIA PANEL AND CONTROLS



## 5.5 IGNITION LOCKOUT

In the event of failure during an ignition sequence, (5 attempts) the **Reset** LED will show steady RED. By pressing and holding the **Reset** button 3 seconds the Reset LED will flash RED and LEDs 1 to 4 will display the error code (0011). To **Reset** the appliance and initiate a further ignition attempt, press the **Reset** button.

**NOTE:** In the event of failure during normal running, the Reset LED will show steady RED.

To access the relevant error codes, press the **Reset** button for three seconds. The **Reset** LED will flash RED. To reset the appliance press the **Reset** button.

## 5.6 OVERHEAT THERMOSTAT

The appliance is fitted with an overheat thermostat (integral with the CH control thermistor). In the event of overheating, the boiler will go to lockout and the **Reset** button show steady RED if the error codes are accessed the LED 4 (Code 0001) will illuminate. Allow the boiler to cool, then press the **Reset** button to clear.

## 5.7 FROST PROTECTION

The appliance is fitted with a frost protection device. In the event of very cold conditions, the pump may operate and the boiler light for a few minutes to protect the appliance and system from potential frost damage. This can only function if the gas and electricity supplies are maintained and the ON/OFF switch on the appliance is left ON. (1) The clock can be switched to the OFF setting.

## 5.8 OTHER FEATURES

The following additional features are included in the appliance specification:

**ANTI-CYCLE DEVICE:** When the appliance cycles on its central heating control thermostat, a slow cycle device operates. The timer (set to 3 mins) is activated after the end of burn cycle to prevent rapid cycling of the burner.

### ANTI PUMP SEIZURE DEVICE:

Providing that a power supply is maintained and the appliance ON/OFF switch is ON, the pump will operate for at least 20 seconds every 23 hours (regardless of heat demand) to prevent pump seizure during periods where the appliance is not used.

### WATER FLOW SWITCH:

This device prevents the burner from firing if there is inadequate water flow through the main heat exchanger.

### DHW PRE-HEAT:

DHW **Comfort** selected: With no demand for DHW the boiler will fire periodically for a few seconds to maintain the DHW plate heat exchanger in a heated condition. This feature will automatically adjust to the user's habitual requirements. Thus during long periods of no DHW draw-off, eg overnight, no pre-heat is provided. DHW **Economy** selected: No pre-heat is provided.

## 5.9 USERS INSTRUCTIONS

Upon completion of commissioning and testing the system, the installer must instruct the user in how to operate the appliance by drawing the user's attention to the following.

- Give the 'Users Instructions' to the householder and emphasise their responsibilities under the 'Gas Safety (Installation and Use) Regulations or rules in force.
- Explain and demonstrate the lighting and shutdown procedures.
- Advise the householder on the efficient use of the system, including the use and adjustment of all system controls for both CH and DHW.
- Advise the user of the precautions necessary to prevent damage to the system, and to the building, in the event of the system remaining inoperative during frost conditions.

- Explain the function of the boiler overheat thermostat, and how to reset it. Emphasise that if cut-out persists, the boiler should be turned off and the installer or service engineer consulted.
- Stress the importance of an annual service by a registered heating engineer.
- The electrical mains supply to the appliance must remain ON and the ON/OFF switch must be left ON for the frost protection circuit to operate.

## 5.10 BOILER LOGBOOK

A logbook is supplied with this appliance to record installation and commissioning details and to make future servicing of the appliance easier.

This logbook forms part of the industry's Benchmark code of practice for the installation, commissioning and servicing of central heating systems.

Please ensure that the logbook is fully completed and left with the customer for future reference, along with Users Instructions and this Installation and Servicing Instruction manual.

## 5.11 CONVERSION INSTRUCTIONS

Appliance conversion from one gas group to another is only possible for category II<sub>2H3P</sub> appliances; these may be converted between Propane and natural gas by use of conversion kits. The kits comprise the following.

Propane to Natural Gas - Kit Number: 955095

- Main Burner Injectors 1.35 mm Ø x 13
- Gas Control Valve
- Boiler Chip Card Nat. Gas
- Flue Restrictor Ring 47 mm Ø
- Data Badge (Nat. Gas)
- Conversion Instructions

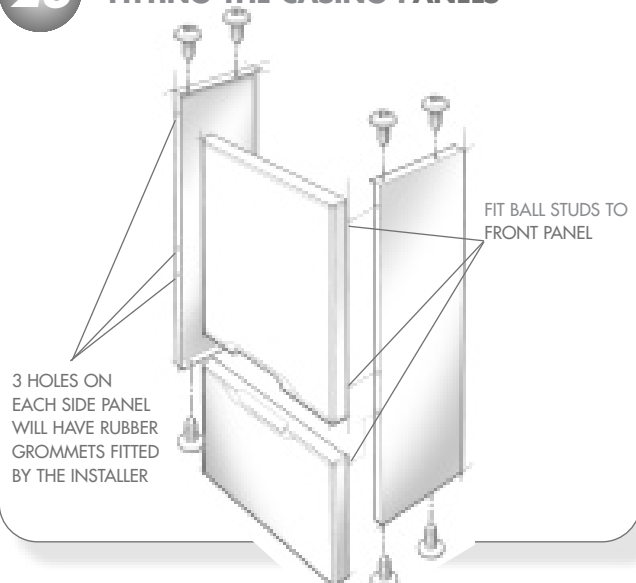
Natural Gas to Propane

- Main Burner Injectors 0.9 mm Ø x 13
- Gas Control Valve
- Boiler Chip Card Propane
- Flue Restrictor Ring 43 mm Ø
- Data Badge (Propane)
- Conversion Instructions

Instructions on how to convert the appliance is given in the conversion instructions supplied with these kits. However, particular attention should be given to the fitting of flue restrictors and to the use of the Boiler Chip card.

For further information contact: Halstead Boilers Ltd, Service Help Line, 01926 834 834

## 28 FITTING THE CASING PANELS



# 6 ROUTINE SERVICING

To ensure continued efficient operation of the appliance, it is recommended that it is checked and serviced as necessary at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage, but in general once a year should be adequate. It is the law that any service work must be carried out by a competent person, such as British Gas or other CORGI registered personnel.

The boiler incorporates a flue sampling point on the top panel in front of the flue outlet. If the service engineer has suitable equipment to analyse the flue gas, the plastic cap may be removed and a 6mm inside diameter sample tube fitted. Check CO<sub>2</sub>/CO values and compare with figure stated in section 2.4. Do not forget to replace the plastic cap after use. Before commencing any service operation, ISOLATE the mains electrical supply, and TURN OFF the gas supply at the main service cock.

Service the appliance by following the full procedure detailed below:

## 6.1 MAIN BURNER ASSEMBLY

Refer to Figs. 29 and 30

- Remove the casing front panel. Refer to Fig. 31.
  - Remove the sealed chamber front panel (4 screws).
  - Remove the combustion chamber front panel (9 screws). Take care not to damage the insulation.
- Do not attempt to light the burner with Front Panel removed.
- Remove the two securing screws and lower the controls fascia panel.
  - Disconnect the three leads from the spark and detection electrodes and disengage the grommets from the combustion chamber bottom panel.
  - Remove the 4 screws securing the burner to the gas manifold and slide the burner out of the combustion chamber.
  - Inspect, and if necessary clean the main burner ports using a soft brush or vacuum cleaner. Do not use a wire brush or any abrasive material.

## 6.2 BURNER INJECTOR

Check that the injectors fitted in the gas manifold are free from dirt and debris. If necessary, clean the injector orifices carefully using a soft brush or vacuum cleaner. Do not use a wire brush or any abrasive material.

**It is not necessary to remove the injectors.** If there are signs of injector(s) being blocked please call the Halstead Service Department.

## 6.3 IGNITION AND DETECTION ELECTRODES

- Inspect the ignition and detection electrodes in situ. If necessary, clean using a soft brush. If either the electrode or the ceramic insulation show signs of damage or wear, replace the electrode(s).
- Check that the alignments of the ignition and detection electrodes are correct. Refer to Fig. 34. Adjust by carefully bending the tip of the electrode rod whilst supporting the base of the rod. Do not put any pressure on the ceramic insulation.

## 6.4 FAN ASSEMBLY

- Remove combustion chamber front panel. Refer to 6.1.
- Carefully disconnect the two electrical leads from the fan.
- Disconnect the air pressure switch sensing pipes from the fan, noting their positions
- Remove the fan assembly by unscrewing the three screws, lowering the assembly and lifting it forwards.
- Inspect the fan assembly (especially the impeller and the venturi) for dirt, damage, or signs of wear. If necessary clean the impeller and/or venturi using a soft brush or vacuum cleaner. Spin the impeller and check that it rotates freely, without noise, and without imbalance. If there is any sign of deterioration or damage, replace the fan.

29

### LOCATION OF SERVICEABLE COMPONENTS

FAN ASSEMBLY BASE  
PLATE SCREWS

AUTO AIRVENT

COMBUSTION CHAMBER  
FRONT PANEL FIXING  
SCREWS (9)

PUMP

GROUP SET

PRESSURE  
GAUGE

CONTROL PANEL

AIR PRESSURE  
SWITCH & PIPES

FAN ASSEMBLY

IGNITION ELECTRODES

DETECTION ELECTRODE

BURNER

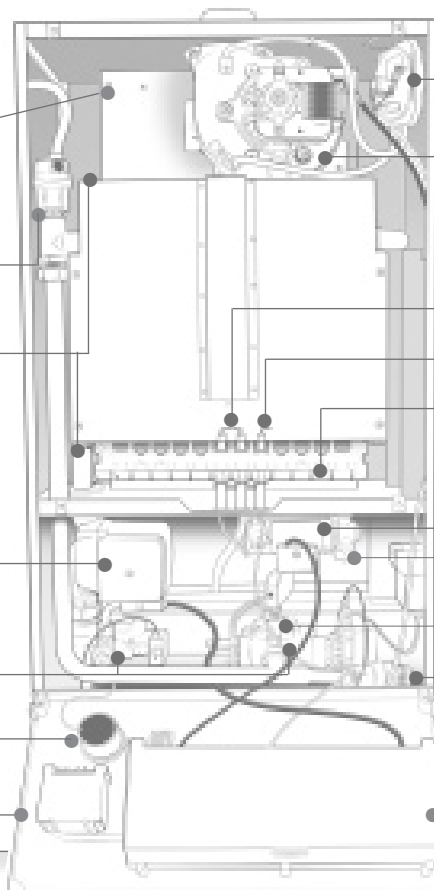
GAS CONTROL VALVE

GAS COCK

OVERHEAT THERMOSTAT

PRESSURE RELIEF  
VALVE

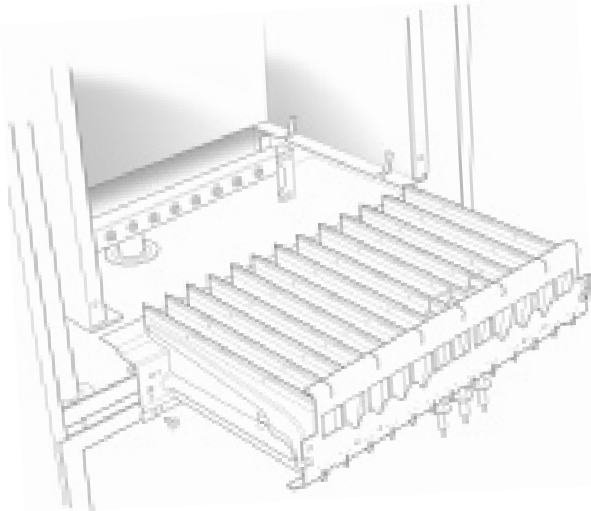
CONTROL  
BOX



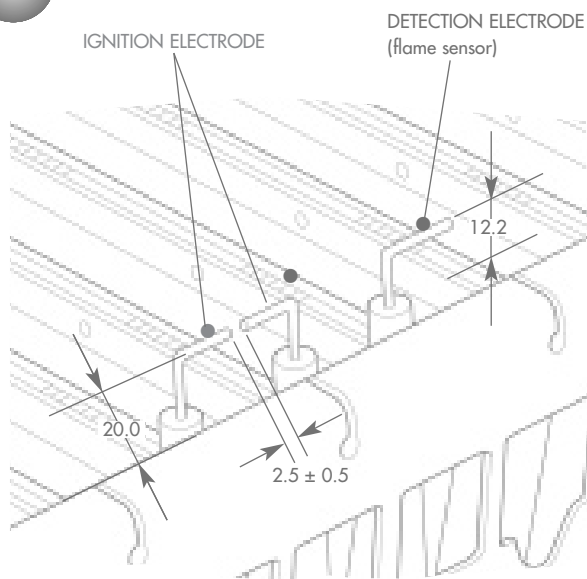
## 6.5 AIR PRESSURE SWITCH PIPES

Check that the pressure switch sensing pipes are not blocked or damaged. It is not necessary to remove the air pressure switch which is not adjustable and does not require any servicing.

### 30 BURNER REMOVAL



### 31 ELECTRODE ALIGNMENT



## 6.6 HEAT EXCHANGER

Inspect the heat exchanger from both above and below the fins. If necessary, clean the fins with a soft, non-metallic brush.

## 6.7 GENERAL

### NOTE: Safe handling of substances.

Care should be taken when handling the boiler insulation panels, which can cause irritation to the skin. No asbestos, mercury or CFCs are included in any part of the boiler or its manufacture.

- Check that the combustion chamber insulation is not damaged.
- Clean the inside of the sealed chamber using a soft brush or, preferably, a vacuum cleaner.
- Check that the sealed chamber front panel seal is intact and in good condition. Replace if necessary.
- Always wear a protective mask when cleaning the appliance.

## 6.8 RE-ASSEMBLY

Re-assemble all components in reverse order, but do not swing the fascia panel back into position or fit the casing front panel until servicing has been completed.

When re-fitting the burner, it is essential to ensure that it is level and that it is correctly assembled into the injector. Refer to Fig. 30. Check that all joints and seals are correctly fitted.

Note that fan polarity is immaterial.

## 6.9 RE-COMMISSIONING

- Slacken the screw in the burner pressure test point and connect a suitable manometer. Refer to Fig. 31. Turn on the gas and electricity supply and light the boiler as described in section 5.2
- Check the operation of the appliance in both CH and DHW modes. Ensure that the DHW maximum and minimum burner pressures after ten minutes running are as stated on the data badge.
- Remove the manometer and tighten the sealing screw. Re-light the appliance and test for gas soundness.

## 6.10 SEALED WATER SYSTEMS

- Check the operation of the pressure relief valve as described in section 5.1.
- Check the correct operation of the pressure gauge by noting the reading when cold and check that the pressure increases with temperature. Replace the gauge if readings are suspect.
- Check that the system is at its original (cold) design pressure. If necessary, re-pressurise the system as described in section 5.1 and search for and rectify any leaks causing loss of water.
- In case of heavy pressure fluctuations during the heat and cool down cycle, check the pre-charge pressure of the expansion vessel. If the air pressure is less than 0.75bar recharge vessel with an air pump.

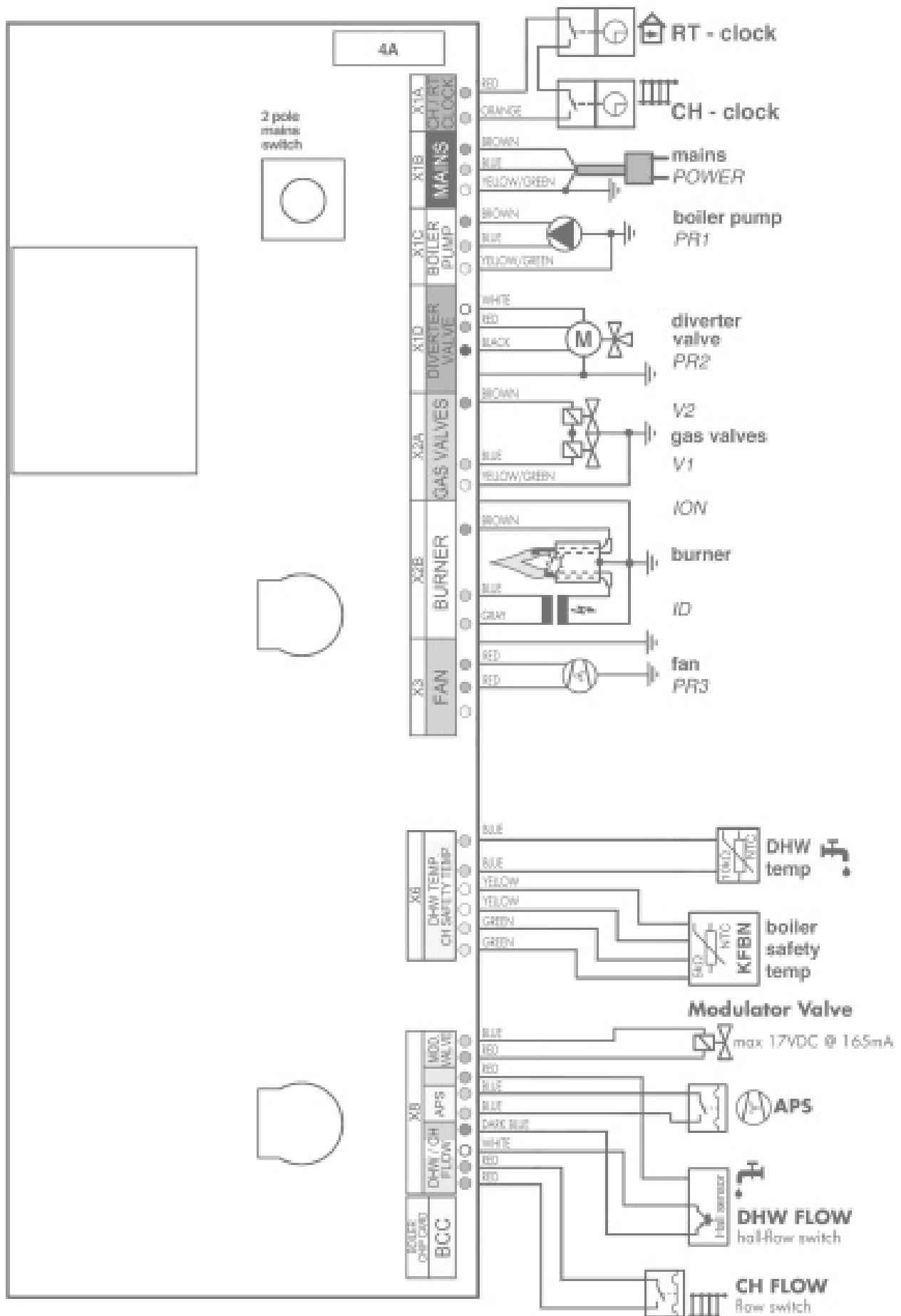
## 6.11 FINAL CHECKS

- Swing the fascia panel into the upright position and secure with the two screws.
- Re-fit the front casing panel. Refer to Fig. 28.
- Return all appliance and external controls (if fitted) to their original settings.

# 7

## INTERNAL WIRING DIAGRAMS

7.1 : FUNCTIONAL FLOW WIRING DIAGRAM





# 8

## FAULT FINDING

### 8.1 GENERAL

Before looking for a fault condition, check that:

- The mains electrical supply is turned on.
- The clock and/or room thermostat (if fitted) are calling for heat (CH 'faults' only)
- The gas service cock is open.
- The CH and DHW isolation cocks are open.
- The system is at design pressure.

Before attempting any electrical fault finding, always conduct the preliminary electrical system checks as described in the Instructions for the British Gas Multimeter, or other similar instrument.

On completion of any service or fault finding operation involving making or breaking electrical connections, always check for EARTH CONTINUITY, POLARITY and RESISTANCE TO EARTH.

Detailed procedures for replacing faulty components are described in section 9 (Parts Replacement).

For further information contact: Halstead Boilers Ltd.,  
Service Help line : 01926 834834

### 8.2 DIAGNOSTIC INDICATOR LED'S

#### FASCIA PANEL

The **Reset** LED shows steady RED in a lockout condition.

To access the error codes, press the **Reset** button for three seconds and the LED will begin to flash.

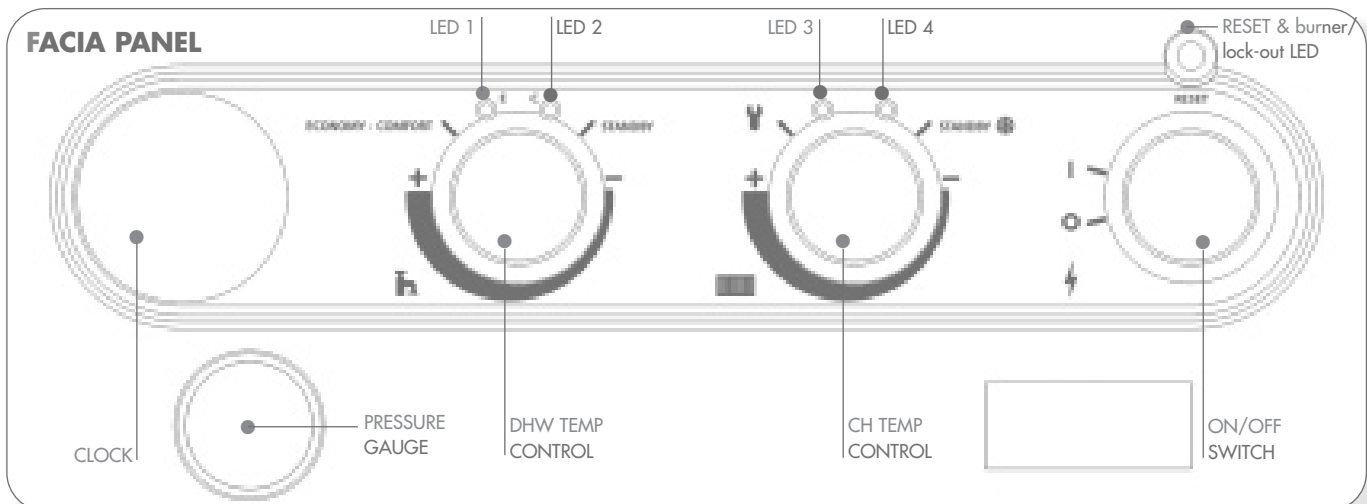
For fault finding, refer to the diagnostic chart shown below, together with the notes given in sections 8.3, 8.4 and 8.5

### 8.3 IGNITION FAULT FINDING

In the event of the boiler failing to light, refer to the Diagnostics Chart.

● = LED ON ○ = LED OFF

LED CODE 1 2 3 4	FAULT	REASON	ACTION
● ○ ● ○	Water pressure switch inoperative	Low water pressure	<ul style="list-style-type: none"> <li>• Check water pressure (&gt; 0.5 bar)</li> <li>• Check CH pump/ expansion vessel</li> <li>• Check switch</li> </ul>
○ ○ ● ●	Lockout flame signal	No flame signal on ignition, or loss of signal during operation	<ul style="list-style-type: none"> <li>• Check detection electrode/lead</li> <li>• Check gas supply</li> <li>• Check gas valve and lead</li> <li>• Check PCB/spark generator</li> </ul>
○ ● ● ●	Erroneous APS signal	Missing or defective APS signal	<ul style="list-style-type: none"> <li>• Check APS</li> <li>• Check pipe connections for blockage</li> <li>• Check fan</li> <li>• Check PCB</li> <li>• Check flue condition</li> </ul>
○ ○ ○ ●	Overheat thermostat activated	Boiler temperature > 105°C	<ul style="list-style-type: none"> <li>• Check CH/O'heat thermistor</li> <li>• Check wires to sensor</li> <li>• Check no air is in CH system</li> <li>• Check PCB</li> <li>• Check pump</li> </ul>
○ ● ○ ●	No DHW temperature control	Defective DHW sensor	<ul style="list-style-type: none"> <li>• Check DHW sensor</li> <li>• Check wires to sensor</li> </ul>
○ ● ● ○	5 sec flame signal after burner is switched off	Defective gas valve	<ul style="list-style-type: none"> <li>• Check gas valve and lead</li> <li>• Check PCB</li> </ul>
● ● ○ ○	BCC error	Wrong/missing BCC	• Burner off
● ● ● ○	Activate BCC	New BCC, press reset to activate	• Burner off
● ○ ○ ●	Error in power supply	Low mains voltage	• Check mains voltage
● ○ ○ ○	CRC error	Internal Eprom data error	• Check PCB
● ● ● ●	Safety system failure	Failure of internal self checking system	• Check PCB



## 8.4 DHW FAULT FINDING

When the hot water tap is turned on, the controls should carry out a set of start up checks followed by an ignition sequence. Refer to section 5.2

If the control has powered up correctly but does not respond to a DHW demand.

Check operation of fan and air pressure switch. Check if Red LED on DHW flow switch is on or off. If off, check DHW hall effect sensor and condition of sanitary flow detector in hydraulic group set. If on, check wires to flow switch, check DHW thermistor and wires. If fan, air pressure switch, DHW flow switch, thermistor and wires are OK replace PCB.

Guidance notes (Refer to section 7.1):

If DHW temperature heavily fluctuates during a long draw off and occasionally goes to an overheat Lock-out condition, check the secondary plate heat exchanger for debris and replace.

# 9 PARTS REPLACEMENT

Before commencing any service operation, ISOLATE the mains electrical supply and TURN OFF the gas supply at the main service cock.

It is the law that any service work must be carried out by a registered person.

## 9.1 COMBUSTION CHAMBER INSULATION

The design of the appliance is such that the combustion chamber insulation should not require replacement unless mechanically damaged. It is recommended that to prevent dust, the insulation is dampened prior to removal.

- Remove the retaining screw and lift off the casing front panel. Refer to Fig.28
- Remove the sealed chamber front panel (4 screws).
- Remove the combustion chamber front panel (9 screws).

The front insulation may now be replaced, but to replace the side and rear insulation, the heat exchanger must be removed. Refer to section X

- Fit the new insulation and re-assemble in reverse order.
- Ensure that all joints and seals are correctly re-fitted and re-commission the system (if necessary) using the procedure in section 5.1.

**It is recommended that a protective mask is worn when changing or handling the insulation material.**

## 9.2 FAN ASSEMBLY

Refer to Fig. 29

- Ensure supply voltage is isolated.
- Remove the casing front panel, sealed chamber panel and combustion chamber panel. Refer to section 9.3
- Carefully disconnect the two electrical leads from the fan.
- Disconnect the air pressure switch sensing pipes from the fan, noting their position.
- Remove the fan assembly (3 screws) and withdraw the assembly by lowering and lifting it forwards.
- Fit the new fan assembly and re-assemble in reverse order.

Ensure that all joints and seals are correctly re-fitted. (Polarity is immaterial on the fan connections.)

## 8.5 CENTRAL HEATING FAULT FINDING

Upon a demand for Central Heating, (closure of the time switch and room thermostat, if fitted), the controls should carry out a set of start up checks, followed by an ignition sequence. Refer to Section 5.2.

If the control has powered up correctly but does not respond to a CH demand. Check voltage between pin 2 plug X1A (orange wire) and pin 2 X13 (blue wire). If 0V ac, check room thermostat and clock. If 230 V ac, check operation of fan and air pressure switch. Check operation of gas valve. If room thermostat clock, fan, air pressure switch and gas valve are OK replace PCB.

Guidance notes (Refer to section 7.1):

1) Whenever a CH demand is removed, either by the timer, the room thermostat or the boiler internal temperature control, an anti cycle mode is initiated which prevents the boiler from firing in CH mode for 3 minutes. Ensure that the control is not in this mode by removing power from the control and restoring it after a delay of 10 seconds.

## 9.3 BURNER

- Remove the casing front panel. Refer to Fig. 31
- Remove the sealed chamber front panel (4 screws).
- Remove the combustion chamber front panel (9 screws). Take care not to damage the insulation.
- Lower the controls front cover panel and remove the two securing screws and lower the controls fascia panel.
- Disconnect the three leads from the spark and detection electrodes and disengage the grommets from the combustion chamber bottom panel.
- Remove the four screws securing the burner to the gas manifold and slide the burner out of the combustion chamber.
- Transfer the ignition and detection electrodes to the new burner and check their alignment. Refer to Fig.34.
- Fit the new burner and reassemble in reverse order. Ensure that all joints and seals are correctly re-fitted.

## 9.4 IGNITION & DETECTION ELECTRODES

Refer to Fig. 29

- Ensure supply voltage is isolated. Remove the burner. Refer to section 9.3.
- Fit the new ignition and /or detection electrode(s) and check that both electrodes are aligned as detailed in Fig.34.
- Re-assemble in reverse order. Ensure that all joints and seals are correctly re-fitted.

## 9.5 MULTIFUNCTIONAL GAS CONTROL

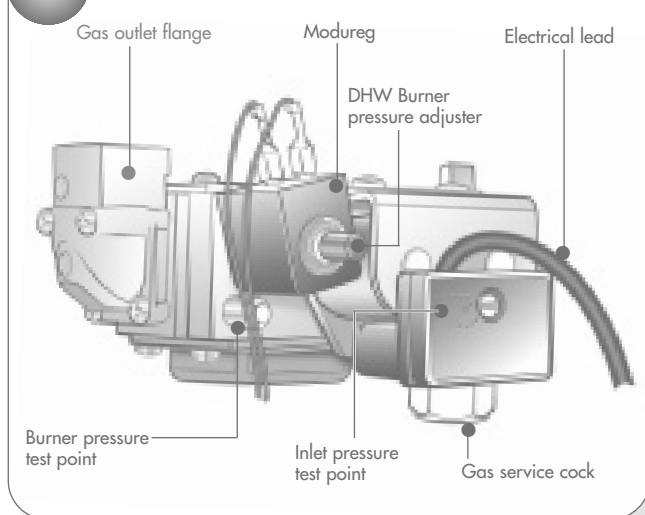
### 9.5. GAS CONTROL REPLACEMENT

Refer to Figs. 32 and 35

- Ensure supply voltage is isolated.
- Lower the controls front cover panel and remove the casing front panel. Refer to section 9.3
- Remove the two retaining screws and lower the controls fascia panel.
- Release the screw and unplug the electrical lead from the gas control.

- e) Disconnect the two electrical leads from the Modureg.
- f) Ensure that the gas supply is turned OFF and remove the four socket screws securing the gas service cock to the gas control.
- g) Remove the four screws securing the gas outlet flange to the gas control.
- h) Withdraw the gas control from the boiler.
- i) Fit the new control and re-assemble in reverse order, ensuring that the 'O' rings are correctly fitted.

## 32 MULTIFUNCTIONAL GAS CONTROL



## 9.5.3 GAS CONTROL BURNER PRESSURE SETTING PROCEDURE

### Refer to Figs. 32

- a) Connect a suitable manometer to the burner pressure test point. Turn on the gas supply.

Check for gas tightness taking the precautions described in section 5 and re-commission the appliance in accordance with section 5.3.

**Note:** It is only possible to set the DHW heat inputs because the CH heat inputs are electronically set by the control.

A 2mm and 3mm Allen key are required for this adjustment.

- a) Turn the DHW temperature control knob fully clock-wise to the Comfort position and fully open any DHW tap to ensure that the boiler fires at full rate.
- b) Remove the cap from the pressure adjuster and insert the Allen key.
- c) Turn the small diameter shaft clockwise to increase, or anti-clockwise to decrease the burner pressure. Set to 15.5 mbar (6.2 in wg) Nat. Gas, 23.4 mbar (9.4 in wg) Propane.
- d) Disconnect one of the low voltage electrical leads from the Modureg to reduce the rate to minimum.
- e) Turn the large diameter shaft clockwise to increase, or anti-clockwise to decrease the burner pressure. Set to 1.0 mbar (0.4 in wg) Nat. Gas, 2.3 mbar 0.92 in wg Propane.
- f) Reconnect the Modureg lead and replace the adjuster cap.
- g) Close the DHW tap and ensure that the burner is extinguished and the pump stops after a brief overrun period. Remove the pressure gauge and tighten pressure test point screw, open the DHW tap to re-light the burner and test for gas tightness screw.
- h) Close the DHW tap, re-assemble in reverse order and ensure the plastic cap is refitted and a blob of paint re-applied to seal it.

## 9.6 AIR PRESSURE SWITCH

### Refer to Fig. 29

- a) Ensure supply voltage is isolated.
- b) Remove the casing front panel and sealed chamber front panel. Refer to section 9.3.
- c) Disconnect the sensing pipes from the pressure switch. Note that the short pipe from the flue gas sampling point is connected to the rear (-ve) connection on the pressure switch.
- d) Disconnect the electrical leads from the pressure switch, noting their positions.
- e) Remove the two securing screws and withdraw the switch from the boiler.
- f) Fit the new pressure switch and re-assemble in reverse order, referring to the wiring diagrams (section 7) if necessary.

## 9.7 DIVERTER VALVE ACTUATOR

### Refer to Fig. 33

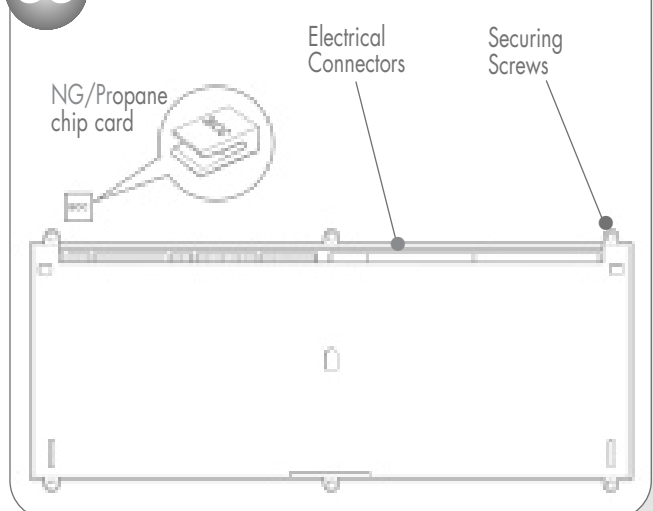
- a) Ensure supply voltage is isolated.
- b) Remove the casing front panel and lower the controls fascia panel. Refer to section 9.3.
- c) Unplug the electrical lead from the actuator.
- d) Withdraw the retaining clip to release the actuator from the head of the diverter valve.
- e) Fit the new actuator and re-assemble in reverse order.

## 9.8 PCB

### Refer to Fig. 29 and 33

- a) Ensure supply voltage is isolated.
- b) Lower the controls front panel and lower the control fascia panel. Refer to section 9.3.
- c) Unplug the electrical leads from the PCB. Refer to section 7.
- d) Remove the PCB plastic cover.
- e) Unclip the PCB and withdraw.
- f) Carefully remove the three control knobs, noting their position and fit onto new PCB.
- g) Fit the new PCB and re-assemble in reverse order. Ensuring control knobs are free to move and reset button operates.

## 33 PCB HOUSING



## 9.9 CH MICROSWITCH

Refer to Fig. 34

- a) Ensure supply voltage is isolated.
- b) Remove the casing front panel and lower the controls fascia panel. Refer to section 9.3.
- c) Withdraw the retaining spring clip to release the microswitch assembly from the spindle
- d) Remove the three screws securing the halves of the plastic housing and slide the microswitch forwards to release it from the housing.
- e) Disconnect the electrical leads from the micro switch.
- f) Fit the new micro switch and re-assemble in reverse order.

## 9.10 DHW FLOW SWITCH (Hall Effect)

Refer to Fig. 34

- a) Ensure supply voltage is isolated.
- b) Remove the casing front panel and lower the controls fascia panel. Refer to section 9.3.
- c) Draw the switch forward to unclip it from the brass manifold.
- d) Disconnect the electrical lead from the switch.
- e) Fit the new switch and re-assemble in reverse order.

**Note:** The Hall effect magnet is housed within the DHW sanitary flow detector and should not normally need replacement.

## 9.11 TIME CLOCK

Refer to section 7.2.

- a) Ensure supply voltage is isolated.
- b) Remove the casing front panel and lower the controls fascia panel. Refer to section 9.3.
- c) Unplug the four electrical leads from the back of the clock.
- d) Remove the four retaining screws and withdraw the clock from the control panel.
- e) Fit the new clock and re-assemble in reverse order.

## 9.12 DRAINING THE BOILER

To replace components in sections 9.13 to 9.21 it is necessary to drain the boiler and/or the DHW circuit. There may be some slight water spillage, so electrical components should be protected.

Refer to section 5.

- a) CH: Close the CH flow and return isolating valves. Attach a hose to the drain point and open the drain valve.
- b) DHW: Close the cold water inlet valve and open all DHW taps to empty the DHW circuit.

## 9.13 CH/OVERHEAT OR DHW THERMISTORS

Refer to Fig. 34

- a) Ensure supply voltage is isolated.
- b) Remove the casing front panel and lower the controls fascia panel. Refer to section 9.3.
- c) Isolate the boiler from the system. Refer to section 5:

DHW thermistor: Close the cold water inlet valve and open all DHW taps to empty the DHW circuit.

CH/O'Heat thermistor: Close the boiler flow and return isolating valves and drain the boiler's CH circuit, refer to section 9.12.

- d) Disconnect the electrical lead from the thermistor.
- e) Unscrew the thermistor from the manifold.
- f) Fit the new thermistor and re-assemble in reverse order. Ensure that the copper washers are correctly fitted to provide a sealed joint.
- g) Re-commission the system. Refer to section 5.

## 9.14 DHW HEAT EXCHANGER

Refer to Fig. 34

- a) Remove the casing front panel and lower the controls fascia panel, refer to section 9.3.
- b) Remove boiler bottom panel, refer to section 9.14.
- c) Drain both the boiler and DHW circuits, refer to section 9.12.
- d) Remove the two spring clips securing the bypass pipe and pull out the pipe.
- e) Remove the two socket screws securing the heat exchanger to the water manifolds and push the heat exchanger downwards to release it.
- f) Remove the water flow regulator, noting its position and orientation.
- g) Fit the water flow regulator to the new heat exchanger.
- h) the new heat exchanger and re-assemble in reverse order.
- i) Re-commission the heating and hot water systems. Refer to section 5.

## 9.15 WATER FLOW REGULATOR

Refer to Fig. 34

- a) Remove the casing front panel and lower the controls fascia panel. Refer to section 9.3.
- b) Remove the DHW heat exchanger. Refer to section 9.14. The plastic regulator is located in the top LH entry port of the heat exchanger
- c) Fit the new regulator, ensuring that it is the correct way round.
- d) Re-assemble in reverse order and re-commission the DHW circuit. Refer to section 5.

## 9.16 PUMP

Refer to Fig. 34

- a) Remove the casing front panel and lower the controls fascia panel. Refer to section 9.3.
- b) Drain the boiler. Refer to section 9.12.
- c) Remove the pump terminal box cover and disconnect the electrical leads.
- d) Either undo the two pump unions and remove the entire pump (using new sealing gaskets), OR remove the four socket screws and remove the pump head only.
- e) Fit the new pump (or pump head) and re-assemble in reverse order.
- f) Re-commission the system. Refer to section 5.

## 9.17 PRESSURE RELIEF VALVE

Refer to Fig. 34

- a) Remove the casing front panel and lower the controls fascia panel. Refer to section 9.3.
- b) Drain the boiler. Refer to section 9.12.
- c) Undo the two union connections and remove the valve.
- d) Fit the new valve and re-assemble in reverse order.
- e) Re-commission the system. Refer to section 5.

## 9.18 PRESSURE GAUGE

Refer to Fig. 29

- a) the casing front panel and lower the controls fascia panel. Refer to section 9.3.
- b) Drain the boiler. Refer to section 9.12.
- c) Disconnect the pressure gauge capillary from the water manifold.
- d) Disengage the pressure gauge from the fascia panel, and remove the gauge.
- e) Fit the new pressure gauge and re-assemble in reverse order.
- f) Re-commission the system. Refer to section 5.

## 9.19 AUTO AIR VENT

Refer to Fig. 29

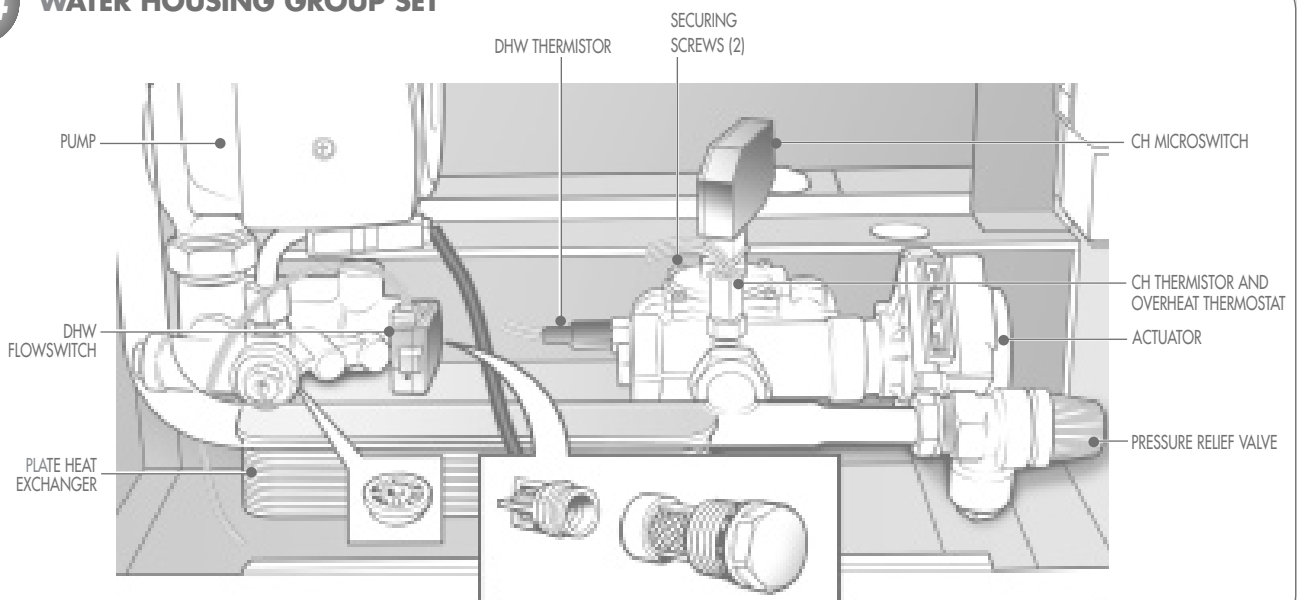
- a) Remove the casing front panel and sealed chamber front panel. Refer to section 9.3.
- b) Drain the boiler. Refer to section 9.12.
- c) Disconnect the plastic pipe from the top of the air vent, and unscrew the vent from the heat exchanger header.
- d) Fit the new air vent and re-assemble in reverse order.
- e) Re-commission the system. Refer to section 5.

## 9.20 MAIN HEAT EXCHANGER

Refer to Fig. 29

- a) Remove the casing front panel. Refer to Fig. 31
- b) Remove the sealed chamber front panel (4 screws).
- e) Remove the combustion chamber front panel (9 screws). Take care not to damage the insulation.
- f) Remove the two securing screws and lower the controls fascia panel.
- g) Disconnect the three leads from the spark and detection electrodes and disengage the grommets from the combustion chamber bottom panel.
- h) Remove the four screws securing the burner to the gas manifold and slide the burner out of the combustion chamber.
- i) Close the CH flow and return isolating valves and drain the appliance.
- j) Disconnect the plastic pipe from the automatic air vent.
- k) Bend the retaining clips down and carefully remove the LH combustion chamber insulation panel to reveal an access hole to the heat exchanger union connections.
- l) Using a suitable spanner, undo the heat exchanger union connections from inside the combustion chamber.
- m) Lift the heat exchanger clear of the two pipes and remove by sliding it forwards.
- n) Transfer the automatic air vent to the new heat exchanger.
- o) Fit the new heat exchanger and re-assemble in reverse order. Ensure that all joints and seals are correctly re-fitted and re-commission the system using the procedure in section 5.1.

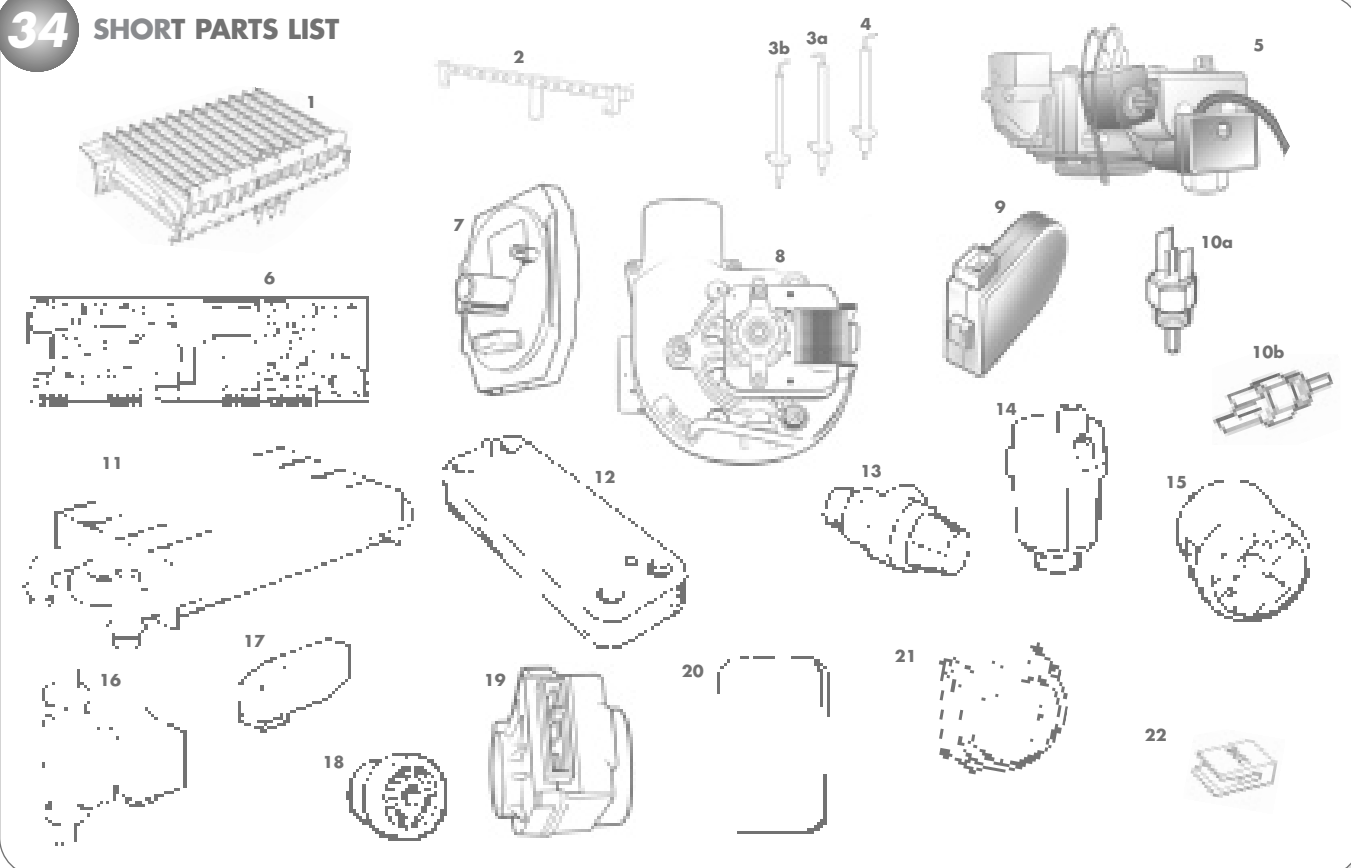
## 34 WATER HOUSING GROUP SET



# 10 SHORT PARTS LIST

Key	G C Part No.	Description	No off	Makers Pt No.
1		BURNER (Nat gas)	1	700563
1		BURNER (Propane)	1	700562
2		MANIFOLD SET(Nat gas)	1	700564
3a		IGNITION ELECTRODE L/H	1	500620
3b		IGNITION ELECTRODE R/H	1	500621
4		DETECTION ELECTRODE	1	500622
5		GAS CONTROL (Nat gas)	1	500632
5		GAS CONTROL (Propane)	1	500636
6		PCB	1	988455
7		AIR PRESSURE SWITCH	1	500592
8		FAN ASSEMBLY	1	601012
9		DHW FLOWSWITCH (Hall effect Sensor)	1	500641
10a		CH/O'HEAT THERMISTOR	1	550530
10b		DHW THERMISTOR	1	500590
11		MAIN HEAT EXCHANGER	1	450984
12		DHW HEAT EXCHANGER	1	451011
13		PRESSURE RELIEF VALVE	1	450987
14		AUTO AIR VENT	1	450908
15		PRESSURE GAUGE	1	450961
16		PUMP 6M	1	851213
17		MICROSWITCH ASSEMBLY	1	500593
18		WATER FLOW REGULATOR	1	300717
19		DIVERTER VALVE ELECTRONIC ACTUATOR & CLIP	1	500642
19a		DIVERTER VALVE SERVICE KIT	1	500643
20		EXPANSION VESSEL	1	450986
21		HEATING CLOCK	1	600520
22		BCC (Boiler control Chip)	1	500637

## 34 SHORT PARTS LIST



# 11 SUPPLEMENT 1

## Supplementary instructions for flue systems with a vertical outlet.

Vertical flue terminal length - max 4000mm (158 in)  
min 565 mm (22 in)

**IMPORTANT: The equivalent flue length must not exceed 4000mm'**

**Extension duct** (each extension extends the flue length by up to 767 mm)

**90° Extension Elbow** (Allows an additional bend in the flue and has an 'equivalent length' of 767 mm.) This elbow is mechanically different from the flanged elbow supplied as standard with the appliance, but has the same equivalent length of 767mm.

**45° Extension Elbow** Allows an additional bend in the flue and has an equivalent length of 384 mm.

### NOTE: FLUE RESTRICTOR

**A flue restrictor (Ref No. VF 90) is supplied with the boiler kit. This MUST ONLY be fitted to the boiler if the equivalent vertical flue height is to be 2300 mm or less. For fitting instructions refer to Fig 22. The flue restrictor supplied with the appliance must not be used and should be discarded.**

- a) Read the installation requirements and flue specifications described in section 3.
- b) Follow the installation procedure described in section 4 up to section 4.7 (but making the necessary hole(s) in the ceiling/roof instead of the wall). Use the following instructions in place of section 4.7.
- c) Measure the vertical distance from the top of the boiler case to the roof line (Fig. 3). Use this length to calculate the number of extension ducts required.
- d) Starting at the boiler, fit the vertical socket, standard duct and extensions required. Then fit the adaptors. Ensure that they are in line (level).
- e) Now working from outside fit the balanced flue roof terminal, ensuring the roof flashing and sealing components are secured to the roof.
- f) Ensure the inner and outer ducts are correctly fitted to the adaptor.

**Note: All the joints should be secured using the self-tapping screws supplied.**



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