installation and servicing

Classic

Your Ideal installation and servicing guide

FF 330 - 3100

When replacing any part on this appliance use only spare parts that you can be assured conform to the safety and performance specification that we require. Do not use reconditioned or copy parts that have not been clearly authorised by Ideal Boilers.

BOILERS Ideal

ENGINEERED FOR PEACE OF MIND

GENERAL

Table 1 - General Data

Boiler Size			FF 330	FF 340	FF 350	FF 360	FF 370	FF 380	FF 3 100
Gas supply connection		(in. BSP)	Rc 1/2 (1/2) 1/2" (BSP Female)						
Flow connection			22mm copper				28mm copper (FEMALE)		
Return connection			22mm copper				28mm copper (FEMALE)		
Maximum static water head		m (ft.)	30.5 (100)						
Minimum static water head		m (ft.)	0.45 (1.5)						
Electrical supply			230 V 50 Hz Boiler power consumption; 100W						
Fuse rating			External; 3A Internal; F1A to BS.4265						
Water content		litre (gal.)	2.7 (0.6)		3.65 (0.8)		4.65 (1.0)		4.65(1.0)
Dry Weight		kg (lb)	40.9 (90.3)		46.6 (102.8)		52.6 (116.0)		52.6(116)
Maximum installation weight		kg (lb)	31.4 (69.3)		37.4 (82.5)		43.1 (95)		43.1(95)
Boiler size	Height	mm (in.)	700 (27.5)						
	Width	mm (in.)	380 (15.0)						
	Depth	mm (in.)	300 (11.8)						
Flue duct diameter		mm (in.)	100 (4.0)						
Flue duct length (max)		m (ft)	3 (9.8)						0.6 (2)

Table 2 - Performance Data

Boiler Size		FF 330	FF 340	FF 350	FF 360	FF 370	FF 380	FF 3 100
Boiler input	kW	10.8	14.5	17.85	21.9	25.3	29.1	36.5
	Btu/h x 1000	36.8	49.3	61.0	74.7	85.6	99.3	124.7
Gas consumption	l/s	0.275	0.375	0.458	0.567	0.652	0.755	0.947
	ft^3/h	35.4	47.5	58.7	72.0	83.3	95.6	120.7
Boiler output	kW	8.8	11.7	14.7	17.6	20.5	23.4	29.3
	Btu/h x 1000	30	40	50	60	70	80	100
Burner Setting pressure (HOT)	mbar (in.w.g.)	12.4 (5.0)	11.0 (4.4)	12.7(5.0)	13.7 (5.5)	12.1 (4.8)	12.9 (5.2)	14.0 (5.6)
Seasonal Efficiency (SEDBUK)*	(Band D)	[79.6]%	[78.7]%	[79.8]%	[78.2]%	[78.5]%	[78.2]%	[78.0]%

* The value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated have been certified by a notified body.

Note. *Gas consumption is calculated using a calorific value of 38.7 MJ/m^3 (1038 Btu/ft^3) gross or 34.9 MJ/m^3 (935 Btu/ft^3) nett*

To obtain the gas consumption at a different calorific value:-

a. FOR L/S *- divide the gross heat input (kW) by the gross C.V. of the gas (MJ/m^3)*

b. FOR FT^3/H *- divide the gross heat input (Btu/h) by the gross C.V. of the gas (Btu/ft^3)*

Classic FF

B.G. Certified - P.I. No. 87AP107

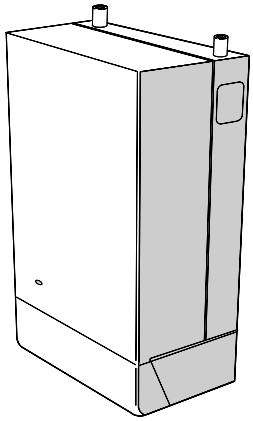
Data Badge: on top of the controls support

Destination Countries: GB and IE

Natural Gas only

Appliance Type	Boiler size
C_{12} & C_{32}	FF 330, 340, 350, 370
C_{72}	FF 360 & 380 only
C_{12}	FF 3 100 only

Models	G.C. Appliance No
Classic FF 330	41 391 54
Classic FF 340	41 391 95
Classic FF 350	41 391 96
Classic FF 360	41 391 97
Classic FF 370	41 391 98
Classic FF 380	41 391 99
Classic FF 3 100	41 391 01



Key to symbols

IE = Ireland

GB = United Kingdom (Countries of destination)

PMS = Maximum operating pressure of water

C_{12} & C_{32} =
A room sealed appliance designed for connection via ducts to a horizontal or vertical terminal, which admits fresh air to the burner and discharges the products of combustion to the outside through orifices which, in this case, are concentric. The fan is down stream of the combustion chamber.

C_{72} =
A room sealed appliance designed for connection via concentric vertical ducts and a draught diverter located in the roof space to a secondary flue. The combustion air is taken from the roof space. The fan is down stream of the combustion chamber.

I_{2H} = An appliance designed for use on 2nd Family gas, Group H only.

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BENCHMARK LOG BOOK DETAILS

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For all boilers	
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Heat input	to be calculated
Temperature differential	measure and record
For combination boilers only	Not applicable
For domestic hot water mode	Not applicable
For condensing boilers	Not applicable

For all boilers: *complete, sign & hand over to customer*

For assistance see Technical Helpline on the back page

CAUTION. To avoid the possibility of injury during the installation, servicing or cleaning of this appliance, care should be taken when handling edges of sheet steel components.

INTRODUCTION

The Classic FF330-3100 is a range of automatically fully controlled, wall mounted, balanced flue, fanned gas boilers.

The heat exchanger is cast iron. The boiler casing is of white enamelled mild steel.

The boiler casing has a removable controls pod containing a drop-down door. The boiler thermostat is located behind the drop- down door.

Note. *These boilers cannot be used on systems which include gravity circulation.* If gravity circulation is required the **Classic RS** range of boilers is suitable.

See Frame 1 for details of the correct boiler tappings to use.

The boilers are supplied with a standard flue kit suitable for rear or side outlet applications from 114 mm (4 1/2") to 600 mm (23 1/2").

The boilers are suitable for connection to the following open vented or sealed systems:

- Fully pumped CH and indirect DHW
- Pumped heating only.
- Pumped indirect DHW only.

OPTIONAL EXTRA KITS

Downward Piping Kit.
Programmer Kit.
Vertex Flue Kit * - for vertical flue connection
Roof Flue Kit *
90° Flue Elbow Kit *
Sealed System Unit* - this fits on top of the appliance.
Extension ducts * - up to 3m (118").
Turret Outlet Kit.*

* ***not available for FF3 100***

Current Gas Safety (Installation and Use) Regulations or rules in force.

It is law that **all** gas appliances are installed by a CORGI registered installer in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution. It is in your own interest, and that of safety, to ensure the law is complied with.

The installation of the boiler MUST also be in accordance with the latest I.E.E (BS.7671) Wiring Regulations, local building regulations, bylaws of the local water authority, the Building Regulations and Building Standards (Scotland) and any relevant requirements of the local authority. Detailed recommendations are contained in the following British Standard Codes of Practice:

BS.6891 Low pressure installation pipes.

BS.6798 Installation of gas fired hot water boilers of rated input not exceeding 60 kW.

BS.5449 Forced circulation hot water systems.

BS.5546 Installation of gas hot water supplies for domestic purposes (2nd Family Gases).

BS.7593 Treatment of water in domestic hot water central heating systems.

BS.5440.1 Flues for gas appliances of rated input not exceeding 60 kW.

BS.5440.2 Ventilation for gas appliances of rated input not exceeding 60 kW.

Health & Safety Document No. 635

The Electricity at Work Regulations, 1989.

Manufacturer's notes must NOT be taken in any way as overriding statutory obligations.

IMPORTANT. These appliances are certificated by the British Standards Institution for safety and performance. It is, therefore, important that no external control devices, e.g. flue dampers, economisers etc., are directly connected to these appliances - unless covered by these Installation and Servicing instructions or otherwise recommended by **Caradon Ideal Limited** in writing. If in doubt please enquire.

Any direct reconnection of a control device not approved by **Caradon Ideal Limited** could invalidate the BSI Certification and the normal appliance warranty. It could also infringe the Gas Safety Regulations and the above regulations.

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 this boiler.

LOCATION OF BOILER

The boiler must be installed on a flat and vertical wall, capable of adequately supporting the weight of the boiler and any ancillary equipment.

The boiler may be fitted on a combustible wall and insulation between the wall and the boiler is not necessary - unless required by the local authority. **The boiler must not be fitted outside.**

Timber Framed Buildings

If the boiler is to be fitted in a timber framed building it should be fitted in accordance with the Institute of Gas Engineering document IGE/UP/7:1998.

Bathrooms

This range of appliances is rated **IP 1XB.**

The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current I.E.E. (BS.7671) Wiring Regulations and, in Scotland, the electrical provisions of the building regulations applicable in Scotland with respect to the installation of the boiler in a room or internal space containing a bath or shower.

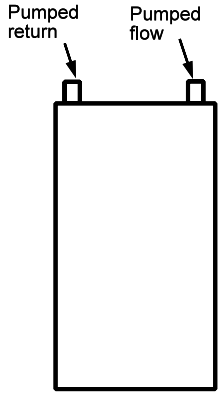
If the appliance is to be installed in a room containing a bath or shower then, providing waterjets are not going to be used for cleaning purposes (such as communal baths/showers), the appliance can be installed in Zone 3, as detailed in BS.7671.

Where installation will be in an unusual location, special procedures may be necessary and BS.6798 gives detailed guidance on this aspect.

.....continued on page 6

NOTE TO THE INSTALLER: LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER. ALSO COMPLETE THE BENCHMARK LOG BOOK AND GIVE THIS TO THE CUSTOMER.

1 BOILER WATER CONNECTIONS



This appliance in NOT suitable for use in a direct hot water system or for gravity circulation.

FF 370, FF 380 & FF3 100 ONLY

must be fitted with the 22mm x 28mm copper sockets, provided in the Hardware Pack, (or equivalent 22mm x 28mm compression fittings) and the pumped flow and return pipes run in 28mm pipe.

2 BOILER CLEARANCES

The following minimum clearances must be maintained for operation and servicing.

Additional space will be required for installation, depending upon site conditions.

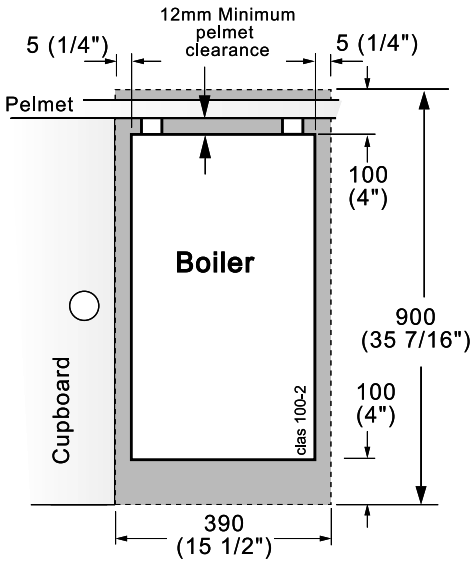
Side and Rear Flue

a. Provided that the flue hole is cut accurately, e.g. with a core drill, the flue can be installed from inside the building.

Installation from inside ONLY

b. If a core boring tool is to be used inside the building; the space in which the boiler is to be installed must be at least wide enough to accommodate the tool.

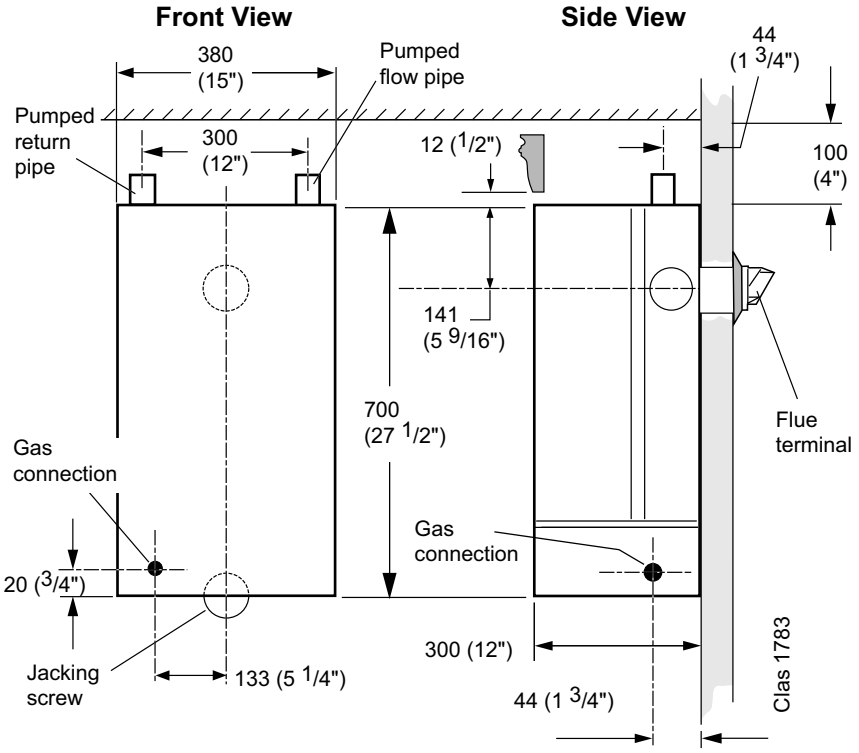
c. If using the Complete Sealed System Unit then refer to the instructions packed with the unit for the necessary clearances.



Front clearance: 533mm (21") from the front of the boiler casing.

Minimum front clearance when built in to cupboard is 75 mm (3").

Front View **Side View**



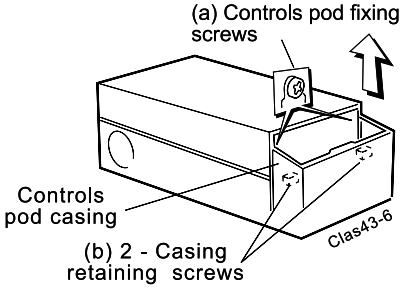
Pelmet restrictions.

If the ability to fit or remove the casing during installation and subsequent servicing is impaired by pelmets etc. this operation can be made easier by first removing the controls pod casing in line with the following instructions:

a. Release the controls pod casing fixing screws (a) 3 full turns only. Remove the pod by pulling it forward to disengage from the keyhole slots.

b. Undo the 2 screws (b) retaining casing to the back panel.

c. The casing can now be removed in the direction of the arrow, first lifting the casing slightly to disengage the casing top return from the back panel. (For this purpose a minimum clearance of 12mm is required between the top of the boiler and pelmet or other similar obstruction.



Compartment Installations

A compartment used to enclose the boiler MUST be designed and constructed specially for this purpose.
An existing cupboard or compartment may be used, provided it is modified for the purpose.

In both cases details of essential features of cupboards/ compartment design, including airing cupboard installation, are to conform to the following :

- BS. 6798.
- The position selected for installation MUST allow adequate space for servicing in front of the boiler and for air circulation around the boiler. Refer to 'Air Supply'.
- For the minimum clearances required for safety and subsequent service refer to the wall mounting diagram, Frame 2. In addition, sufficient space may be required to allow lifting access to the wall mounting plate.

GAS SUPPLY

The local 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 local gas supplier.

The boiler is to be installed only on a gas supply with a governed meter.

A gas meter can only be connected by the local gas supplier or by a local regional contractor.

An existing meter should be checked, preferably by the gas supplier, to ensure that the meter is adequate to deal with the rate of gas supply required. A MINIMUM pressure of 20 mbar MUST be available at the boiler inlet with the boiler operating.

Installation pipes MUST be fitted in accordance with BS. 6891. Pipework from the meter to the boiler MUST be of an adequate size. FF3100 models should be piped in 22mm minimum. The final 1 metre may be run in 15mm if it is visible.

The complete installation MUST be tested for gas soundness and purged as described in the above code.

FLUE INSTALLATION

Pluming may occur at the terminal so terminal positions which would cause a nuisance should be avoided.

The flue must be installed in accordance with the recommendations of BS. 5440-1:2000.

The following notes are intended for general guidance:-

1. The boiler MUST be installed so that the terminal is exposed to external air.

2. It is important that the position of the terminal allows the free passage of air across it at all times.

3. Minimum acceptable spacing from the terminal to obstructions and ventilation openings are specified in Table 3.

4. Where the lowest part of the terminal is fitted less than 2m (6'6") above a balcony, above ground or above a flat roof to which people have access then the terminal MUST be protected by a purpose designed guard. The minimum spacing in Table 3, Nos. 2,3, 4, 5 and 6 would be 75mm in order to allow a terminal guard to be fitted.

Terminals guards are available from boiler suppliers - ask for TFC Flue Guard, Model K1. In case of difficulty seek advice from:

Table 3 - Balanced flue terminal position Approved Manufacturer's Clearances

Terminal Position	Minimum Spacing
1a. Directly BELOW an opening, air brick, opening window, etc.	300 mm (12")
1b. Directly ABOVE an opening, air brick, opening window, etc.	300 mm (12")
1c. HORIZONTALLY to an opening, air brick, opening window, etc.	300 mm (12")
2. Below guttering, drain pipes or soil pipes	25 mm (1")
3. Below eaves	25 mm (1")
4. Below balconies or a car port roof	25 mm (1")
5. From vertical drain pipes or soil pipes	25 mm (1")
6. From internal or external corners	25 mm (1")
7. Above adjacent ground, roof or balcony level	300 mm (12")
8. From a surface facing the terminal	600 mm (24")
9. From a terminal facing a terminal	1200 mm (48")
10. From an opening in a car port (e.g. door or window) into dwelling	1200 mm (48")
11. Vertically from a terminal on the same wall	1500 mm (60")
12. Horizontally from a terminal on the wall	300 mm (12")

Grasslin (UK) Ltd., Tower House,
Vale Rise, Tonbridge, Kent TN9 1TB
Telephone No. 01732 359 888

Ensure that the guard is fitted centrally.

5. The flue assembly shall be so placed or shielded as to prevent ignition or damage to any part of any building.

6. The air inlet/products outlet duct and the terminal of the boiler MUST NOT be closer than 25mm (1") to combustible material. Detailed recommendations on the protection of combustible material are given in BS.5440-1:2000.

7. Where it is essential that the terminal wall plate is fitted, i.e. wall thicknesses over 600mm (23 1/2") or with an inaccurately cut hole, the minimum spacing in Table 3 Nos. 2,3, 4, 5 and 6 would be 60mm (2 1/2") in order to allow the terminal wall plate to be fitted.

IMPORTANT. It is absolutely ESSENTIAL to ensure, in practice, 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.

If this should occur, the appliance MUST be turned OFF, labelled 'unsafe' and corrective action taken.

TERMINAL

The terminal assembly can be adapted to accommodate various wall thicknesses. Refer to Frame 10.

AIR SUPPLY

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

1. It is NOT necessary to have a purpose provided air vent in the room or internal space in which the boiler is installed.

2. If the boiler is to be installed in a cupboard or compartment, permanent air vents are required (for cooling purposes) in the cupboard/compartment, at both high and low levels. The air vents must either communicate with room/internal space, or be direct to outside air. The minimum effective areas of the permanent air vents, required in the cupboard/ compartment, are specified in Table 4 and are related to maximum rated heat input.
3. Both air vents MUST communicate with the same room or internal space or MUST be on the same wall to outside air.
4. In siting the air vents care must be taken to avoid the freezing of pipework.

Table 4 - High and low vent areas

Boiler	Air from room/internal space, cm (in^2)		Air direct from outside, cm (in^2)	
FF330	102	(16)	51	(8)
FF340	135	(21)	68	(11)
FF350	170	(26)	83	(13)
FF360	198	(31)	102	(16)
FF370	231	(36)	116	(18)
FF380	264	(41)	132	(21)
FF3100	340	(52)	170	(26)

WATER CIRCULATION SYSTEM

The boiler must NOT be used for direct hot water supply. For the types of system and correct piping procedure refer to 'Introduction' and Frame 1.

The central heating system should be in accordance with BS.6798 and, in addition, for Smallbore and Microbore systems, BS. 5449.

The domestic hot water system, if applicable, should be in accordance with the relevant recommendations of BS. 5546. Copper tubing to BS. 2871:1 is recommended for water carrying pipework.

The hot water storage cylinder MUST be of the indirect type and should preferably be manufactured of copper.

Single feed, indirect cylinders are not recommended and MUST NOT be used on sealed systems.

The appliances are NOT suitable for gravity central heating, nor are they suitable for the provision of gravity domestic hot water.

The hot water cylinder and ancillary pipework, not forming part of the useful heating surface, should be lagged to prevent heat loss and any possible freezing - particularly where pipes run through roof spaces and ventilated under floor spaces.

Boilers not fitted to a sealed system must be vented.

IMPORTANT

A minimum length of 1m of copper pipe MUST be fitted to both flow and return connections from the boiler before connection to any plastic piping. **This applies to ALL types of installation.**

Draining taps MUST be located in accessible positions, which permit the draining of the whole system - including the boiler and hot water storage vessel. They should be at least 1/2" BSP nominal size and be in accordance with BS. 2879.

The boiler is fitted with a special drain plug, which is provided, to drain the BOILER ONLY, in the event of the system drain plug being unable to do so. The hydraulic resistance of the boilers, at MAXIMUM OUTPUT with an 11°C (20°F) temperature differential, are shown in Table 5.
Maximum boiler operating temperature should be 82 °C (180 °F).

Table 5 - Water flow rate and pressure loss

Boiler Size	FF	330	340	350	360	370	380	3100
Boiler Output	kW	8.8	11.7	14.6	17.6	20.5	23.4	29.3
	Btu/h x 1000	30	40	50	60	70	80	100
Water Flow Rate	l/min	11.4	15.2	19.0	22.8	26.5	30.3	38.0
	gal/h	150	200	250	300	350	400	500
Pressure Loss	mbar	22.0	20.4	31.5	41.7	54.8	77.0	106
	in wg	8.9	8.3	12.6	16.7	22.0	30.9	42.5

WATER TREATMENT

These boilers incorporate a cast iron heat exchanger. As part of the installation the central heating system should be thoroughly flushed with appropriate water treatment in order to comply with BS7593:1992.

Caradon Ideal Limited recommend the use of **Fernox or G E Betz** water treatment products, which must be used in accordance with the manufacturers instructions. For further information contact:-

Fernox Manufacturing Co. Ltd, c/o Cookson Electronics, Forsyth Road, Sheerwater, Woking, Surrey. GU21 5RZ. Tel. 01799 550811
or
Sentinel Division,G E Betz Ltd, Foundry Lane, Widnes, Cheshire, WA8 8UD. Tel. 0151 420 9563

IMPORTANT. Any other treatment for this product may render the guarantee of **Caradon Ideal Limited** INVALID.

Notes.

1. *If an inhibitor is used, and in hard water areas where treatment to prevent lime deposits is necessary, it is most important that the water treatment MUST be maintained at the correct concentrations recommended by the treatment manufacturer.*
2. *Artificially softened water must not be used in the system, under any circumstances.*

THERMOSTATIC RADIATOR VALVES

Caradon Ideal Limited recommend that heating systems utilising full thermostatic radiator valve control of temperature in individual rooms should also be fitted with a room thermostat controlling the temperature in a space served by radiators not fitted with such a valve as stated in BS. 5449.

When thermostatic radiator valves are used, the space heating temperature control over a living / dining area or hallway having a heating requirement of at least 10% of the boiler heat output should be achieved using a room thermostat, whilst other rooms are individually controlled by thermostatic radiator valves. However, if the system employs thermostatic radiator valves on all radiators, or two port valves without end switches, then a bypass must be fitted to ensure a flow of water should all valves be in the closed position.

ELECTRICAL SUPPLY

WARNING. The appliance MUST be efficiently earthed.
Wiring external to the appliance MUST be in accordance with the current I.E.E. (BS.7671) Wiring Regulations and any local regulations which apply.

The point of connection to the mains should be readily accessible and adjacent to the boiler, except that for bathroom installations; the point of connection to the mains MUST be situated outside of the bathroom.

Note. *Where a room sealed appliance is installed in a room containing a bath or shower then the appliance and any electrical switch or appliance control utilising mains electricity should be so situated that it cannot be touched by a person using the bath or shower. See Frame 38 for details.*

3 OPEN VENT SYSTEM REQUIREMENTS - FULLY PUMPED.

The system should be vented directly off the boiler flow pipe, as close to the boiler as possible. The cold feed entry should be inverted and MUST be positioned between the pump and the vent, and not more than 150mm (6") away from the vent connection.

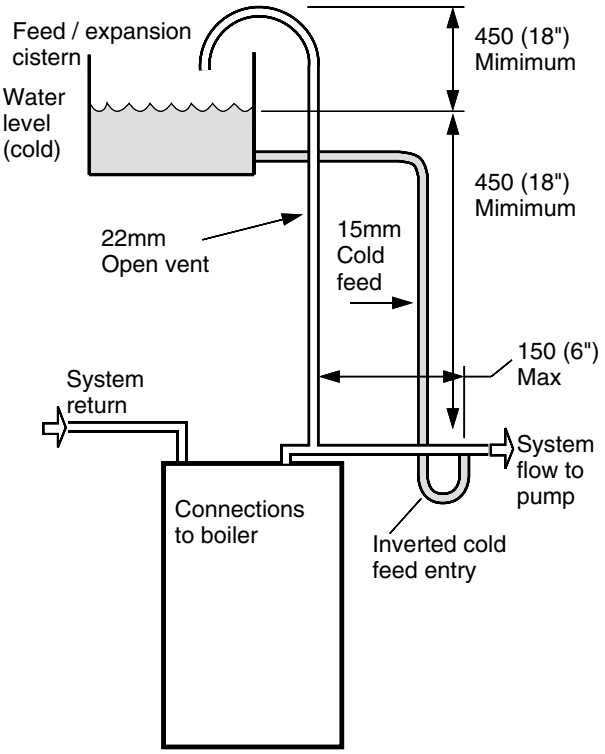
There should be a minimum height - 450mm (18") - of open vent above cistern water level. If this is impossible refer below.

The vertical distance between the highest point of the system and the feed/expansion cistern water level MUST not be less than 450mm (18").

The pump MUST be fitted on the flow side of the boiler.

A suitable pump is a domestic circulator capable of providing an 11°C (20°F) temperature differential (e.g. Grundfos UPS 15/50 or equivalent). The vertical distance between the pump and feed/expansion cistern MUST comply with the pump manufacturers minimum requirements to avoid cavitation. Should these conditions not apply, either lower the pump position or raise the cistern above the minimum requirement specified by **Caradon Ideal Limited.**

Note. *A cold water feed must be available back to the boiler, when all automatic valves are in the closed position (refer to BS. 6798) and when close coupled the feed must not be in a vertical leg.*



4 LOW HEAD INSTALLATIONS

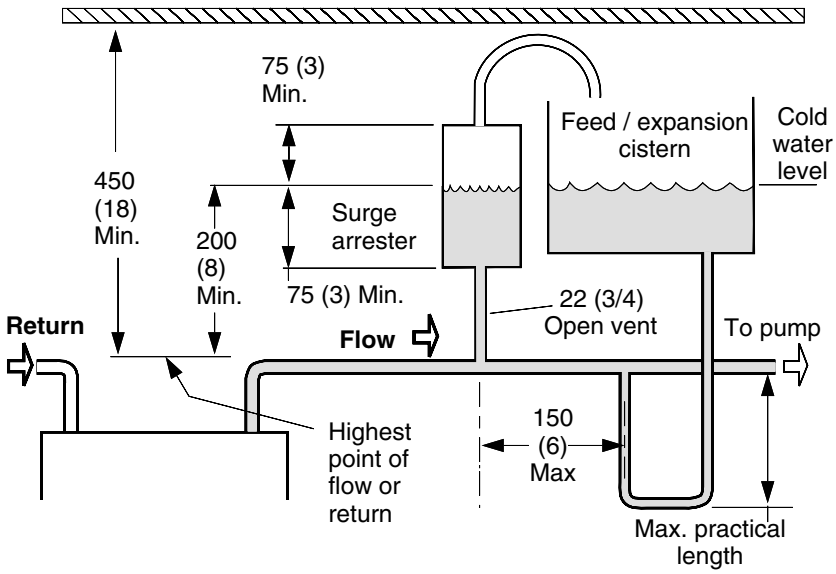
The **Classic** range of boilers can be installed in low head situations by fitting a 'surge arrester' in the expansion pipe as shown.

The following conditions MUST be observed:

1. The surge arrester must be at least 42mm in diameter x 150mm long, thus ensuring a MINIMUM air gap and a MINIMUM depth of water below the static water level (cold) of 75mm.
2. The static water level (cold) must be at least 200mm above the top of the horizontal flow pipe, fitted as shown. The vent connection MUST NOT be made immediately off the top of the boiler, as venting is made less efficient.
3. The maximum practical length of 15mm cold feed pipe should be used in order to reduce the effective volume of system water expanding into the feed/expansion cistern to a minimum.

   Note. *The pump manufacturers minimum requirements must be complied with.*

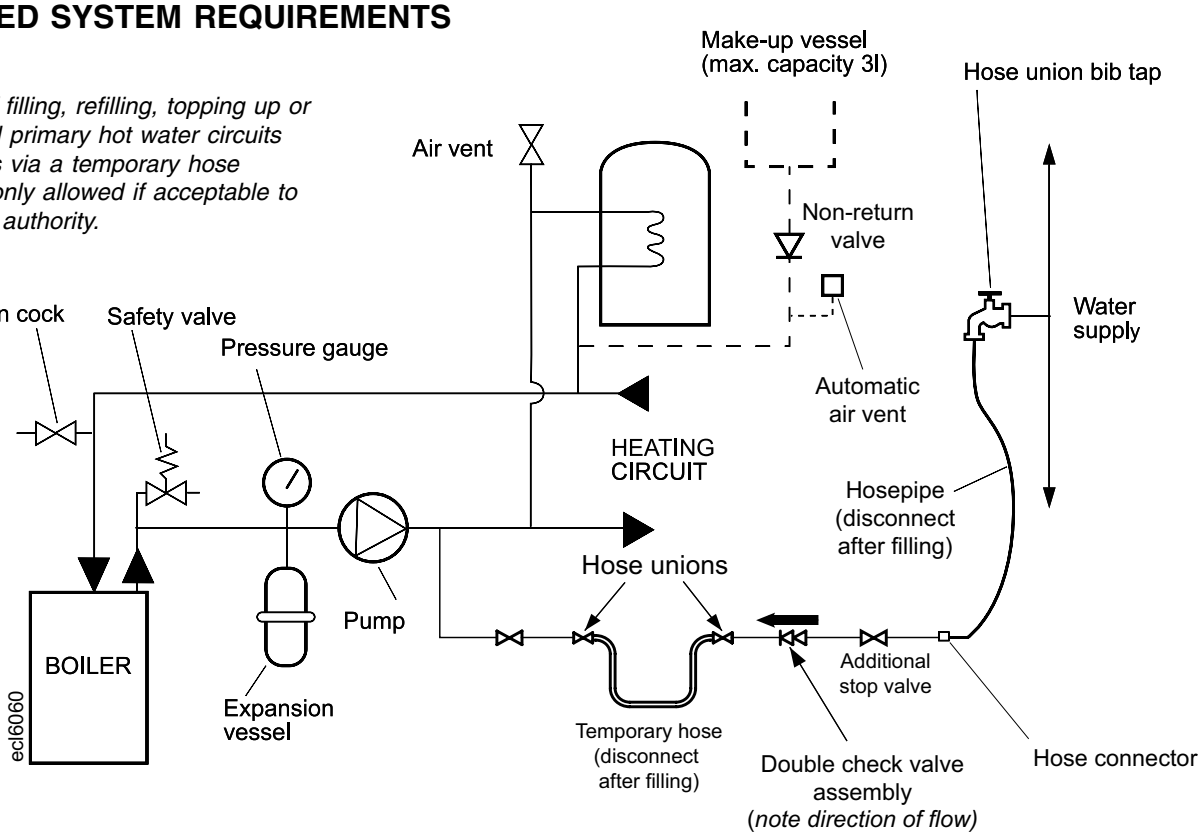
Minimum Requirements



All dimensions in mm (in.). **N.B.** *Imperial dimensions are approximate*

5 SEALED SYSTEM REQUIREMENTS

Note.
The method of filling, refilling, topping up or flushing sealed primary hot water circuits from the mains via a temporary hose connection is only allowed if acceptable to the local water authority.



Note.

The method of filling, refilling, topping up or flushing sealed primary hot water circuits from the mains via a temporary hose connection is only allowed if acceptable to the local water authority.

1. General

a. The installation must comply with the requirements of BS.6798 and BS.5449.

b. The installation should be designed to work with flow temperatures of up to 82°C.

c. All components of the system, including the heat exchanger of the indirect cylinder, must be suitable for a working pressure of 3 bar (45 lb/in²) and temperature of 110°C. Care should be taken in making all connections so that the risk of leakage is minimised.

2. Safety Valve

A spring loaded safety valve complying with the relevant requirements of BS.6759 must be fitted in the flow pipe, as close to the boiler as possible and with no intervening valve or restriction. The valve should have the following features:

a. A non-adjustable pre-set lift pressure not exceeding 3 bar (45 lb./in²)

b. A manual testing device.

c. Provision for connection of a discharge pipe. *The valve or discharge pipe should be positioned so that the discharge of water or steam cannot create a hazard to the occupants of the premises or cause damage to electrical components and wiring.*

3. Pressure Gauge

A pressure gauge covering at least the range 0-4 bar (0-60 lb./in²) must be fitted to the system. The gauge should be easily seen from the filling point and should preferably be connected at the same point as the expansion vessel.

4. Expansion Vessel

a. A diaphragm type expansion vessel must be connected at a point close to the inlet side of the pump, the connecting pipe being not less than 15mm (1/2" nominal) size and not incorporating valves of any sort.

b. The vessel capacity must be adequate to accept the expansion of the system water when heated to 110°C (230°F)

c. The charge pressure must not be less than the static water head above the vessel The pressure attained in the system when heated to 110°C (230°F) should be at least 0.35 bar (5lb/in²) less than the lift pressure of the safety valve.

For guidance on vessel sizing refer to the table in Frame 6. For further details refer to BS.5449 and the British Gas Corporation publication : Material and Installation Specifications for Domestic Central Heating & Hot Water.

5. Cylinder

The cylinder must be either of the indirect coil type or a direct cylinder fitted with an immersion calorifier which is suitable for operating on a gauge pressure of 0.35 bar (5lb./in²) in excess of the safety valve setting. *Single feed indirect cylinders are not suitable for sealed systems.*

6. Make-up Water

Provision must be made for replacing water loss from the system, either:

a. From a manually fitted make-up vessel with a readily visible water level. The vessel should be mounted at least 150mm (6") above the highest point of the system and be connected through a non-return valve to the system, fitted at least 300mm (12") below the make-up vessel on the return side of the domestic hot water cylinder or radiators.

b. Where access to a make-up vessel would be difficult by pre-pressurisation of the system. Refer to 'Filling.'

6 SEALED SYSTEM REQUIREMENTS - continued

7. Mains Connection

There must be no direct connection to the mains water supply or to the water storage tank supplying domestic water, even through a non-return valve, without the approval of the local water authority.

8. Filling

The system may be filled by one of the following methods:

a. Through a cistern, used for no other purposes, via a ball valve permanently connected directly to a service pipe and / or a cold water distributing pipe.

The static head available from the cistern should be adequate to provide the desired initial system design pressure. The cold feed pipe from the cistern should include a non-return valve and a stop valve with an automatic air vent connected between them, the stop valve being located between the system and the automatic air vent. The stop valve may remain open during normal operation of the system if automatic water make-up is required.

b. Through a self-contained unit comprising a cistern, pressure booster pump (if required) and, if necessary, an automatic pressure reducing valve and flow restrictor. The cistern should be supplied through a temporary connection from a service pipe or cold water distributing pipe.

This unit may remain permanently connected to the heating system to provide limited automatic water make-up. Where the temporary connection is supplied from a service pipe or distributing pipe which also supplies other draw-off points at a lower level then a double check valve shall be installed upstream of the draw-off point.

c. Through a temporary hose connection from a draw-off tap supplied from a service pipe under mains pressure. Where the mains pressure is excessive a pressure-reducing valve shall be used to facilitate filling.

The following fittings shall form a permanent part of the system and shall be fitted in the order stated:

A stop valve complying with the requirements of BS. 1010, Part 2 (the hose from the draw-off tap shall be connected to this fitting).

A test cock.

A double check valve of an approved type.

- Thoroughly flush out the whole of the system with cold water, without the pump in position.
- With the pump fitted, fill and vent the system until the pressure gauge registers 1.5 bar (21.5lb/in^2).

  Examine for leaks.
- Check the operation of the safety valve by manually raising the water pressure until the valve lifts. This should occur within ± 0.3 bar (± 4.3lb/in^2.) of the pre-set lift pressure.
- Release water from the system until the initial system design pressure is reached.
- Light the boiler and heat the system to the maximum working temperature. Examine for leaks.
- Turn off the boiler and drain the system while still hot.
- Refill and vent the system.

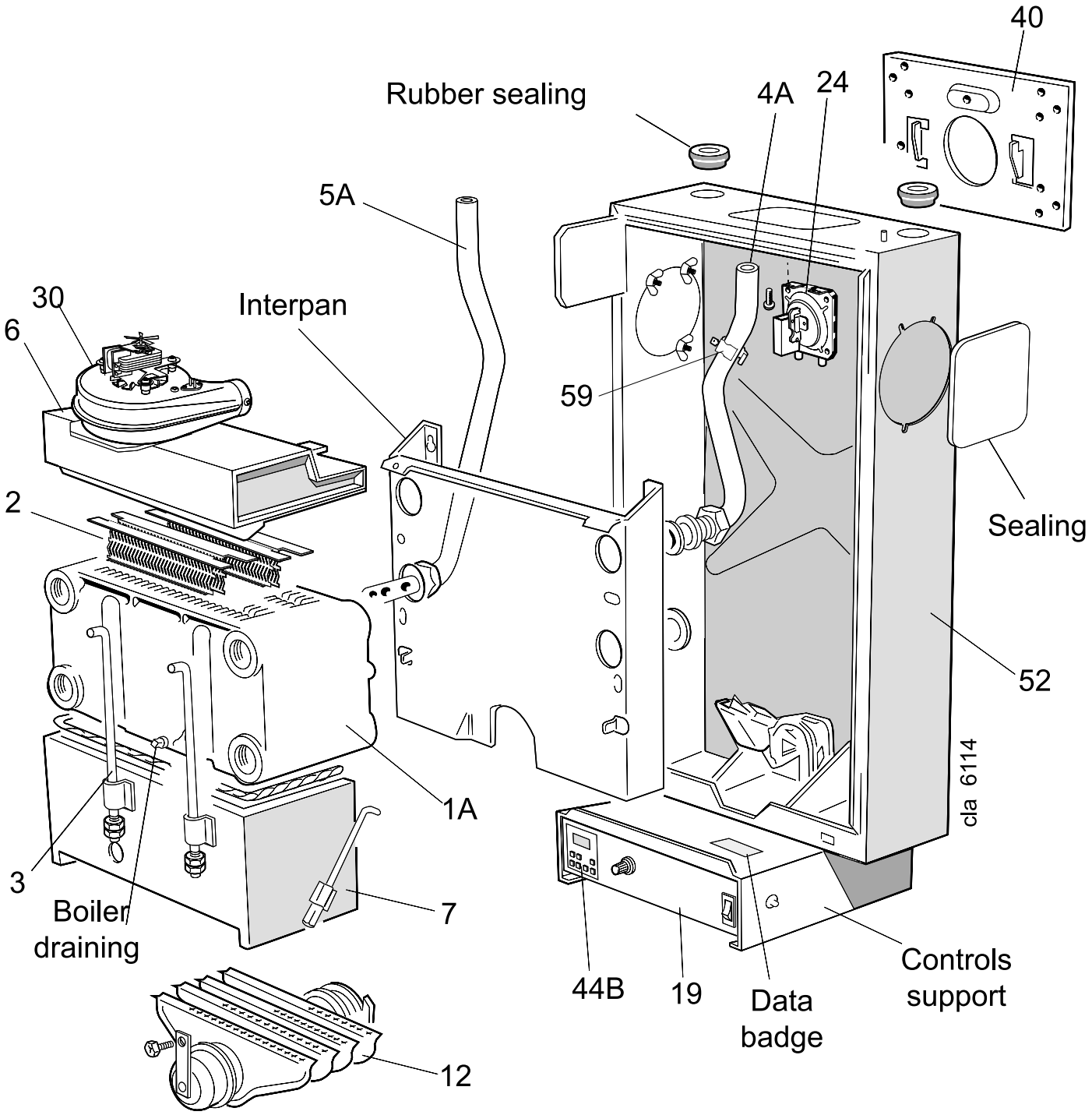
Sizing procedure for expansion vessels: The volume of the expansion vessel (litres) fitted to a sealed system shall not be less than that given by Table 6, multiplied by a factor of 0.8 (for flow temperatures of less than 88 °C).

Table 6

Safety valve setting	**3.0 bar**			**2.5 bar**			**2.0 bar**	
Vessel charge and initial system pressure	0.5 bar	1.0 bar	1.5 bar	0.5 bar	1.0 bar	1.5 bar	0.5 bar	1.0 bar
Total water content of system (litres)	**Expansion vessel volume (litres)**							
25	2.1	2.7	3.9	2.3	3.3	5.9	2.8	5.0
50	4.2	5.4	7.8	4.7	6.7	11.8	5.6	10.0
75	6.3	8.2	11.7	7.0	10.0	17.7	8.4	15.0
100	8.3	10.9	15.6	9.4	13.4	23.7	11.3	20.0
125	10.4	13.6	19.5	11.7	16.7	29.6	14.1	25.0
150	12.5	16.3	23.4	14.1	20.1	35.5	16.9	30.0
175	14.6	19.1	27.3	16.4	23.4	41.4	19.7	35.0
200	16.7	21.8	31.2	18.8	26.8	47.4	22.6	40.0
225	18.7	24.5	35.1	21.1	30.1	53.3	25.4	45.0
250	20.8	27.2	39.0	23.5	33.5	59.2	28.2	50.0
275	22.9	30.0	42.9	25.8	36.8	65.1	31.0	55.0
300	25.0	32.7	46.8	28.2	40.2	71.1	33.9	60.0
Multiplying factors for other system volumes	0.0833	0.109	0.156	0.094	0.134	0.237	0.113	0.20

7 BOILER ASSEMBLY - Exploded view

Classic FF 330 shown



LEGEND

1A. Heat exchanger.
2. Flue baffles.
3. Tie rods.
4A. Pumped flow pipe.
5A. Pumped return pipe.
6. Collector hood assembly.
7. Combustion chamber.
12. Main burner.
19. Control box .
24. Pressure switch.
30. Fan.
40. Wall mounting plate.
44B. Programmer (optional).
52. Back panel.
59. Limit thermostat

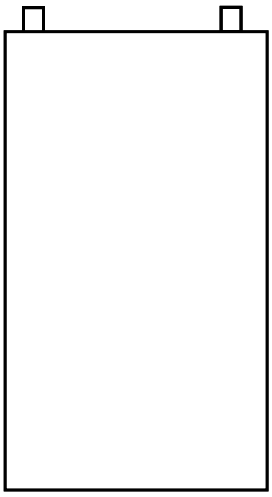
8 UNPACKING

The boiler is supplied fully assembled in **Pack A,** together with a standard flue assembly for lengths up to 600mm (23 1/2"), rear or side flue outlet, in **Pack B.**

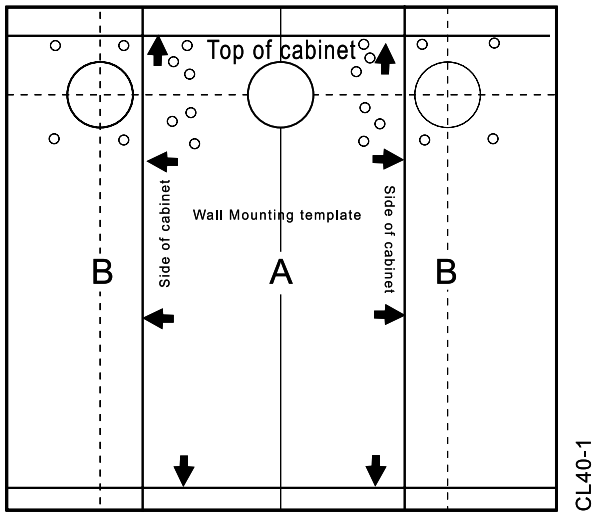
Unpack and check the contents.

Pack A Contents

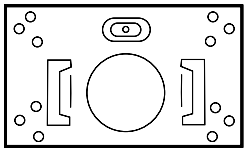
- The complete boiler
- Installation & Servicing Instructions
- User's Instructions
- Hardware Pack (listed below)
- Wall mounting template
- Wall mounting plate
- Side outlet terminal mounting plate
- Flue extension tube - 1 off
- Boiler sealing ring - 1 off



Complete boiler



Wall mounting template



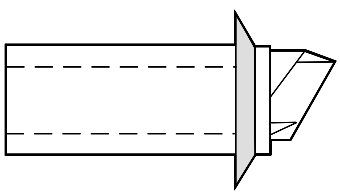
Wall mounting plate

Hardware Pack Contents

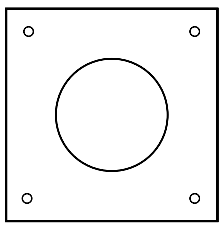
- 50mm x No. 14 wood screw, 4 off
- 50mm x No. 10 wood screw, 8 off
- Wall plug, 12 off
- M8 washer, 1 off
- 22mm x 28mm copper reducing socket (FF 370, FF 380 and FF 3100 ONLY), 2 off
- M5 wing nut, 3 off
- Sealing plate, 1 off
- M8 x 12 Hx. Hd. screw, 1 off

Pack B Contents

- Duct cutting support, 2 off (cardboard)
- Terminal wall plate, 1 off.
- Terminal grille assy., 1 off.
- Polyurethane foam seal 400 lg., 1 off.
- No. 8 x 8 lg. Pozi pan hd. screws, 3 off.



Flue terminal



Terminal wall plate

9 PACKAGING AND CASING REMOVAL

1. Unpack the boiler.

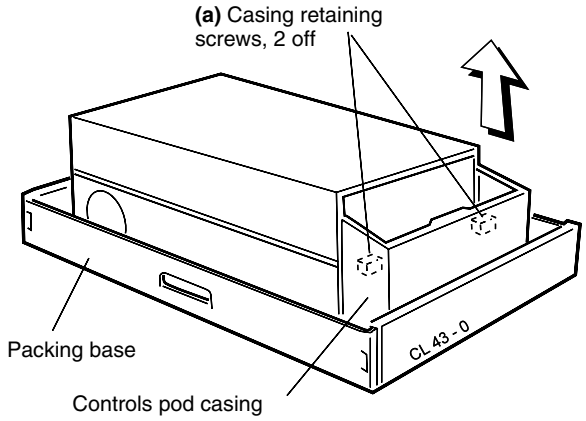
2. Remove the casing as follows and place to one side to avoid damage.

a. Undo the 2 casing retaining screws (a) retaining the casing to the back panel.

b. Swing the bottom of the boiler casing up until the controls pod casing has cleared the controls then unhook the top from the back panel.

3. Remove the boiler from its packaging base. The boiler may now be stood upright on its controls support protection frame to ease handling and installation.

4. Unpack the boiler terminal box and, if applicable, the extension flue box(es).

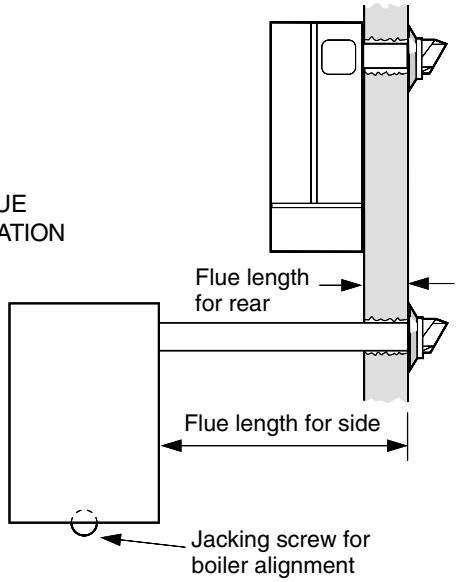


10 DETERMINING THE FLUE LENGTH

It is MOST IMPORTANT that the boiler is installed in a vertical position.

REAR FLUE INSTALLATION

SIDE FLUE INSTALLATION



FLUE KITS

Pack B: supplied as standard.

Pack D*: optional extension kit for side flue or rear flue outlet. Refer to Frame 33.

1. A maximum of 2 extension ducts (plus the standard flue duct) may be used together.

2. Flue extensions of greater than 1m (39") should be supported with the bracket provided. If the stand-off brackets have been used it is necessary, in order to keep the flue aligned, to use the spacer bracket with the support bracket.

Note.
Vertex and roof flue kits are available as optional extras for vertical flue installation, supplied with separate fitting instructions.

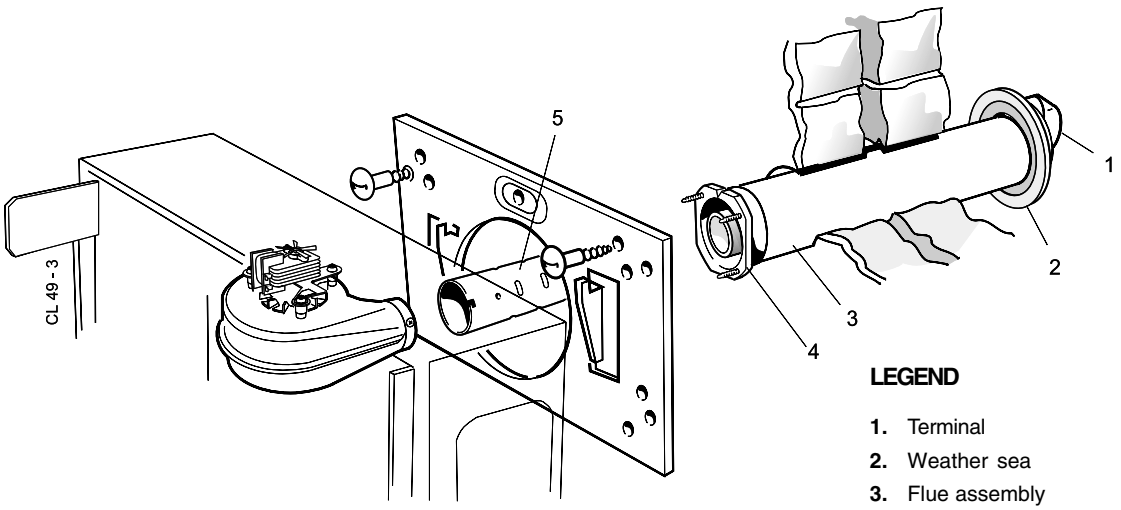
Flue length mm	Accessories	Product No.
Up to 600	B Pack 1 off	150308
600 to 1550*	B Pack 1 off + D Pack, 1 off	150308+153883
1550 to 2500*	B Pack 1 off + D Pack, 2 off	150308+ 153883, 2 off
2500 to 3000*	B Pack 1 off + D Pack, 3 off	150308+ 153883, 3 off

* Not for FF 3 100 model

11 FLUE ASSEMBLY - Exploded View

1. An optional flue duct extension kit is required for wall thicknesses greater than 600mm (23 1/2") Refer to Frame 10.

2. When cutting the ducts, always use the cardboard support rings provided.



LEGEND

1. Terminal
2. Weather sea
3. Flue assembly
4. Boiler sealing ring
5. Flue extension tube

12 WALL MOUNTING TEMPLATE

Note. *The template shows the positions for the fixing holes and the flue hole centres for standard installation. Care must be taken to ensure the correct holes are drilled.*

1. Separate the templates.

2. Tape the templates into the selected position.

3. Ensure squareness by hanging a plumb line as shown.

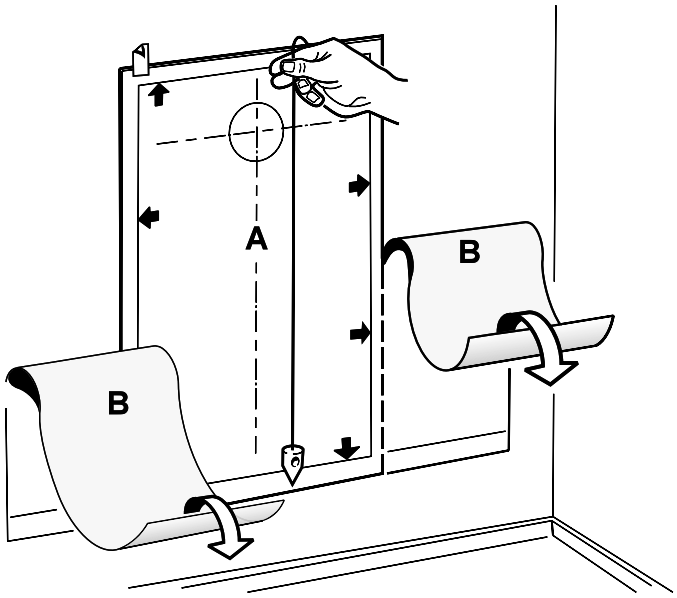
4. Mark onto the wall (if required) the following:

a. The wall mounting plate screw positions (choose one from each group). **Note.** *Mark the centre of the flue hole as well as the circumference.*

b. The position of the flue duct hole.

c. Downward pipe routing bracket screw positions.

5. Remove the templates from the wall.



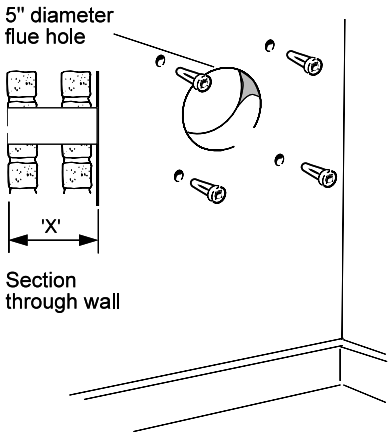
13 PREPARING THE WALL

IMPORTANT. Ensure that, during the cutting operation, masonry falling outside of the building does not cause damage or personal injury.

1. Cut the flue hole, preferably with a 125mm (5") core boring tool, ensuring that the hole is square to the wall. If the hole has been quite accurately cut with a drill then making good the wall faces is not essential as seals are provided at both ends of the flue. However, both wall faces immediately around the cut hole should be flat; make good if necessary. For less accurate holes make good to approximately 125mm (5") diameter at the two wall faces.

2. Drill 4 holes for the wall mounting plate with an 8mm (5/16") masonry drill. If the stand-off brackets are used ensure the correct holes are chosen.

3. Insert the plastic plugs provided.



Note. *Check all of the hole positions BEFORE drilling*

Note. *If the terminal is to be sited within 25-40mm of a corner or vertical pipe (refer to Table 3) then the hole MUST be accurately cut and the rubber weather seal trimmed around the groove provided. The terminal wall plate need not be fitted.*

14 CUTTING THE FLUE - wall thicknesses of 114 to 600mm

Note. *If the stand-off brackets are used it is essential that 30mm is added to the measured wall thickness when marking the flue (to allow for the thickness of the brackets).*

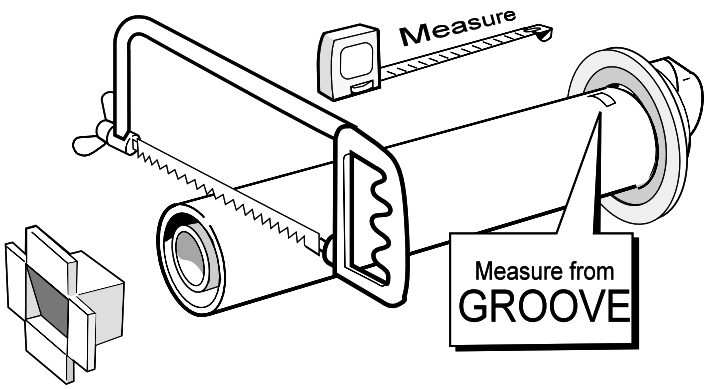
1. Measure and note the wall thickness X.

2. Mark the wall thickness onto the flue.

3. To ensure the tube is cut square, mark the flue all the way round.

4. Cut to length X, using the cardboard ring for support.

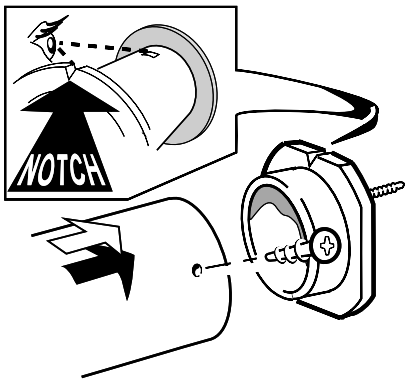
5. Remove cardboard ring and remove any burrs.



15 FITTING THE BOILER SEALING RING TO THE FLUE

1. Fit the boiler sealing ring inside the outer flue duct. Ensure the boiler sealing ring is fully engaged.

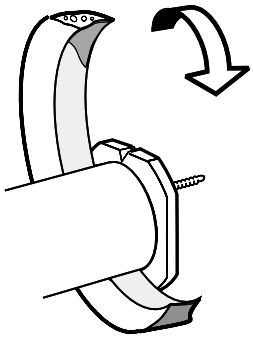
Ensure the notch aligns with the groove on the outer flue duct. This ensures correct alignment of the flue terminal.



2. Drill 3 holes 3.2mm (1/8") dia. through the outer flue duct and boiler sealing ring. **Do NOT drill the inner flue duct.**

3. Insert the self-tapping screws, provided, in order to fix the boiler sealing ring in position.

4. Stick the self-adhesive foam strip, provided in the hardware pack, onto the flue immediately behind the boiler sealing ring.

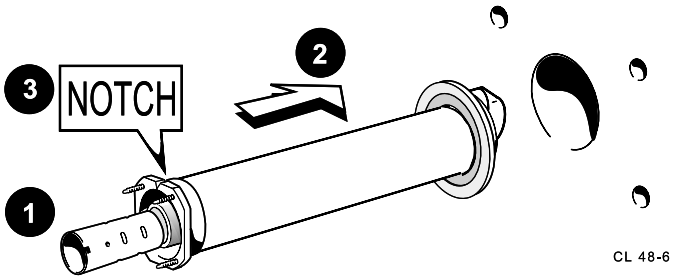


16 FITTING THE FLUE ASSEMBLY

1. Insert the flue extension tube into the flue assembly.

2. Insert the flue assembly through the hole far enough to allow the rubber seal to unfold completely and form an adequate seal on the outside wall.

3. Ensure the notch is at the top. This will aid the location of the studs into the boiler back panel.



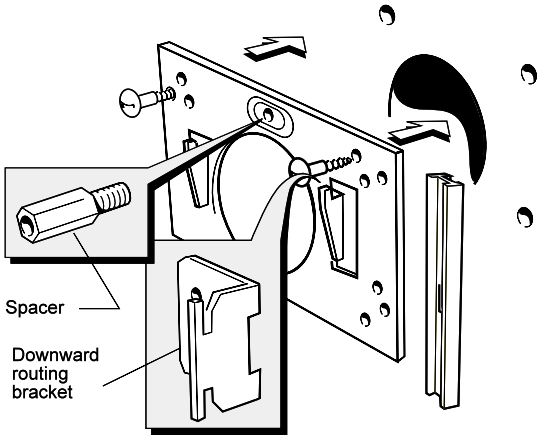
17 WALL MOUNTING PLATE

1. Fix the mounting plate to the wall with the No.14 x 50mm wood screws.

2. If downward routing of pipes is required then the downward routing pipe brackets and M8 spacer (supplied in the Downward Piping Kit) should be fitted to the wall mounting plate now.

3. Fit the bottom 2 screws to secure the bracket(s) to the wall, through the wall mounting plate.

4. Check with a spirit level that the plate is vertical.



REAR FLUE OUTLET

18 MOUNTING THE BOILER

Note. *Have ready to hand the M8 screw, washer and rectangular plate supplied in the hardware pack. For downward routing of pipes the M5 spacer (supplied in the Downward Piping Kit) should now be fitted to the back of the boiler.*

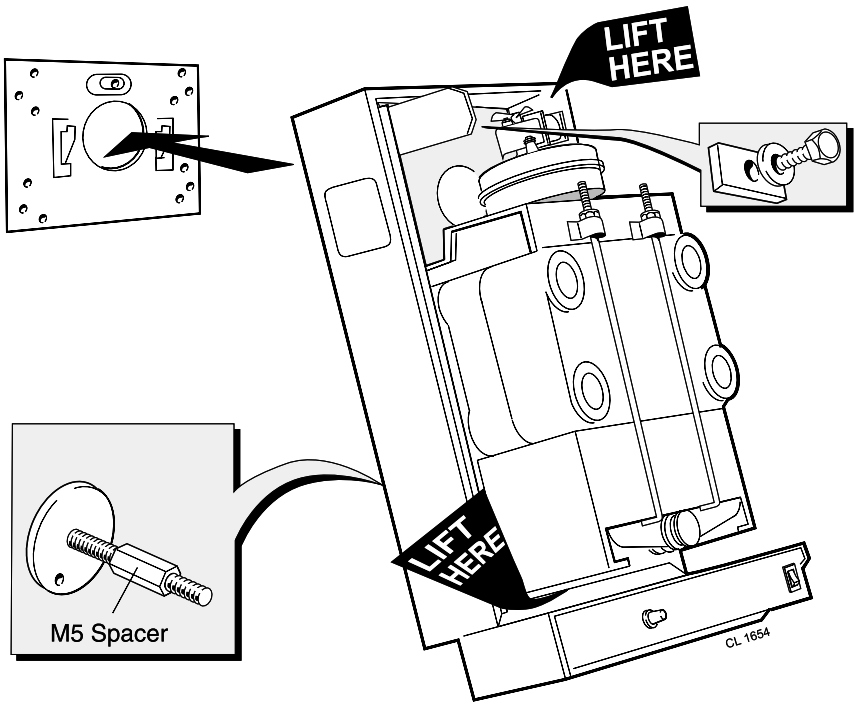
1. Lift the boiler onto the wall mounting plate hooks as shown.

   Do not use the burner / controls for lifting

2. Fit the M8 screw, washer and rectangular plate to retain the boiler.

Note.

Before fully tightening the M8 screw, check the boiler alignment, using a spirit level, and adjust as necessary with the jacking screw.

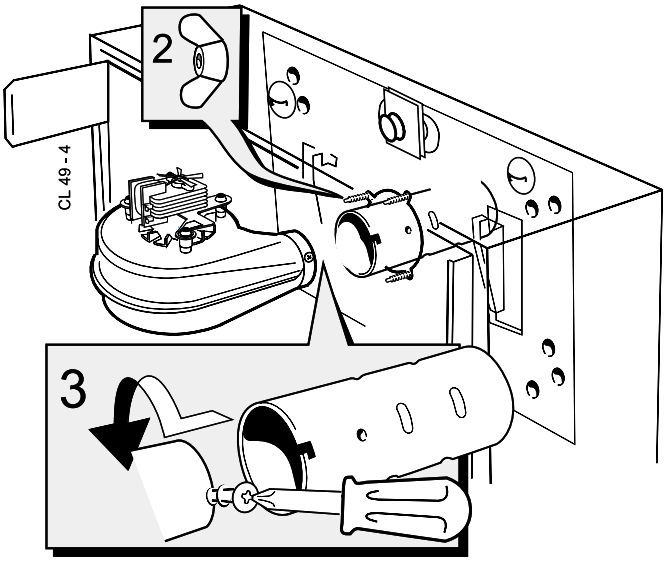


19 CONNECTING THE FLUE TO THE BOILER

1. Pull the flue through the wall mounting plate and locate the 3 studs in the holes in the back panel.
2. Secure the flue to the boiler using the three M5 wing nuts provided.
3. Pull the flue extension tube and engage onto the fan. Locate and secure with the M4 screw attached to the fan.

Note.

The sealing ring studs will locate in the back panel one way only. This will ensure that the terminal grille is correctly aligned.

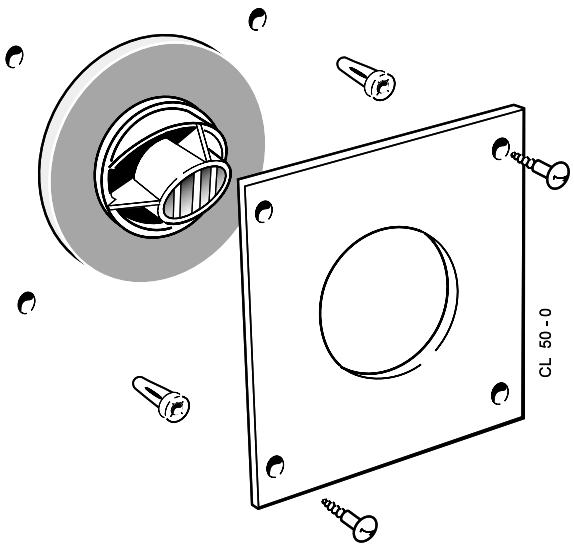


20 TERMINAL WALL PLATE

This plate allows neat concealment and full compression of the rubber seal. Its use is not essential if the flue hole and flue ducts have been accurately cut and the outside wall face is flat.

1. Position the terminal wall plate over the terminal.
2. Mark and drill 4 fixing holes with an 7mm (9/32") masonry drill.
3. Insert the 4 plastic plugs provided.
4. Secure the plate with 4 of the No.10 x 2" screws provided.

Note. *If the terminal is less than 2m (6' 6") above ground level, an approved terminal guard should be fitted. Refer to the Contents List on Page 3.*

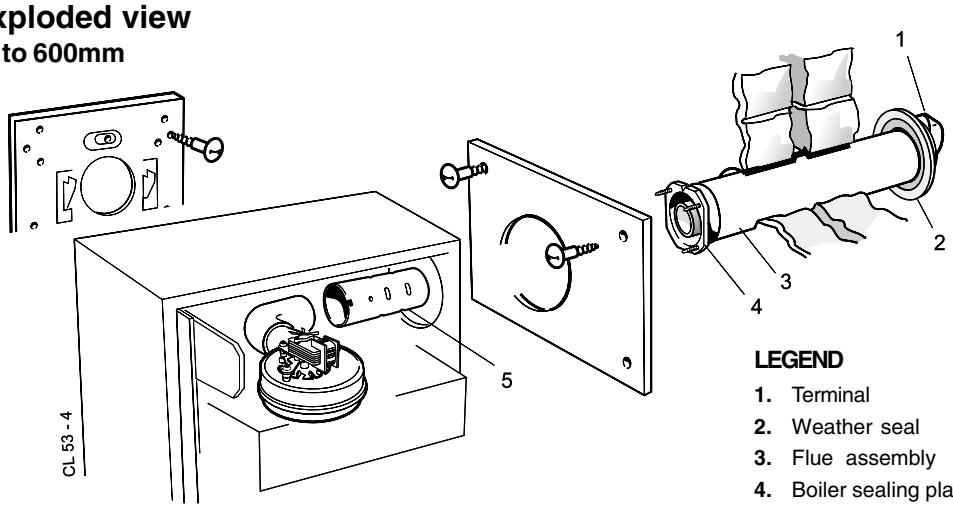


21 FLUE ASSEMBLY - Exploded view

For wall thickness 114mm to 600mm

1. An optional flue duct extension kit is required for lengths (distance from the outside wall to the relevant side of the boiler casing) greater than 600mm (23 1/2"). Refer to Frame 10.

2. When cutting the ducts always use the cardboard support provided.



LEGEND

1. Terminal
2. Weather seal
3. Flue assembly
4. Boiler sealing plate
5. Flue extension tube

22 WALL MOUNTING TEMPLATE

Note. *The template shows the positions for the fixing holes and the flue hole centres for standard installation.*
If the flow and return pipes are to be routed down behind the boiler the downward routing pipe brackets, supplied with the Downward Piping Kit, must be used. These brackets are secured to the wall mounting plate and it is essential to use only those holes as shown on the wall mounting template.
Care MUST be taken to ensure the correct holes are drilled.

1. Separate the templates.

2. Tape both templates into the selected position locating template B through an extended centre line as shown.

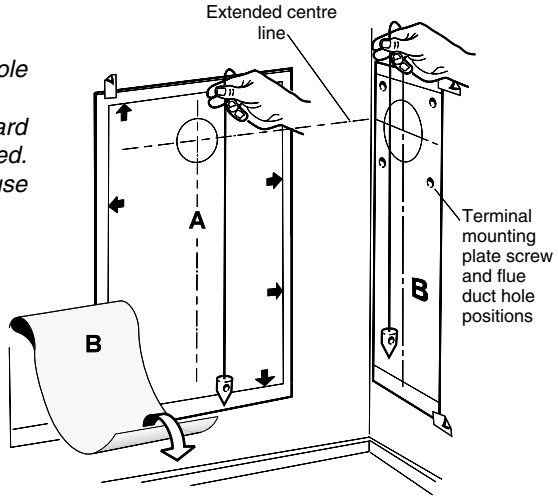
3. Ensure squareness by hanging a plumb line as shown.

4. Mark onto the wall (if required) the following:

a. The 4 wall mounting plate screw positions (choose one from each group). If the downward routing pipe brackets are used ensure the correct holes are chosen.

b. The 4 screw positions for the side outlet plate.

c. The position of the flue duct hole (ensure that the correct centre is marked, depending on whether the downward routing pipe brackets are used or not).



Note. *Mark the centre of the hole as well as the circumference.*

d. The side of the casing nearest the flue outlet.

5. Remove both templates from the wall.

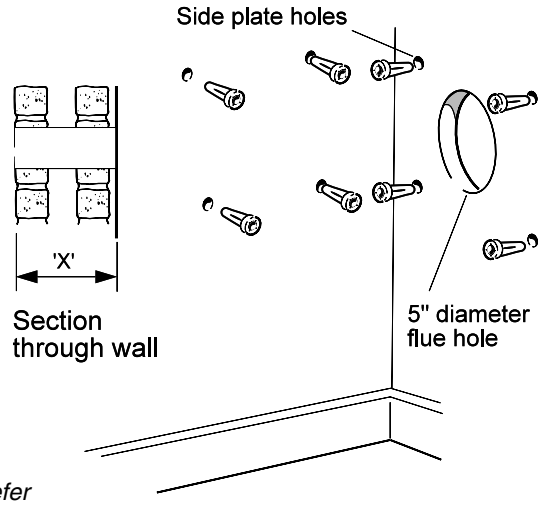
23 PREPARING THE WALL

IMPORTANT. Ensure that, during the cutting operation, masonry falling outside of the building does not cause damage or personal injury.

1. Cut the flue hole, preferably with a 125mm (5") core boring tool, ensuring that the hole is square to the wall. If the hole has been accurately cut with a drill then making good the wall faces is not essential as seals are provided at both ends of the flue. However, both wall faces immediately around the cut hole should be flat; make good if necessary. For less accurate holes make good to approximately 125mm (5") diameter at the 2 wall faces.

2. Drill 4 holes with an 8mm (5/16") masonry drill and insert the plastic plugs provided, for the wall mounting plate.

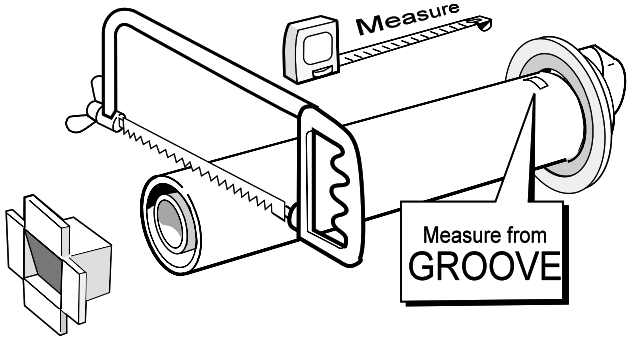
3. Drill 4 holes with a 7mm (9/32") masonry drill and insert the plastic plugs provided, for the side mounting plate.



Note. *If the terminal is to be sited within 25-40mm of a corner or vertical pipe (refer to Table 3) then the hole MUST be accurately cut and the rubber weather seal trimmed around the groove provided. The terminal wall plate need not be fitted.*

24 CUTTING THE FLUE
For flue lengths 114 to 600mm ONLY

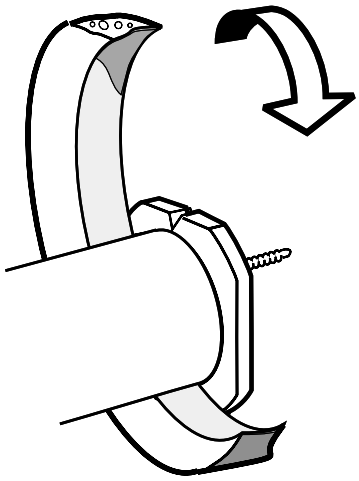
1. Measure the flue length required (i.e. the distance from the side of the boiler to the outside face of the wall). Refer to Frame 10.
2. Mark the flue length required onto the flue, measuring from the groove near the terminal.
3. To ensure the tube is cut square, mark the flue all the way round.
4. Insert the cardboard duct ring for support and cut to length.
5. Remove cardboard duct ring and remove any burrs.



For flue lengths greater than 600mm refer to Frames 33 & 34 - Flue extension ducts.

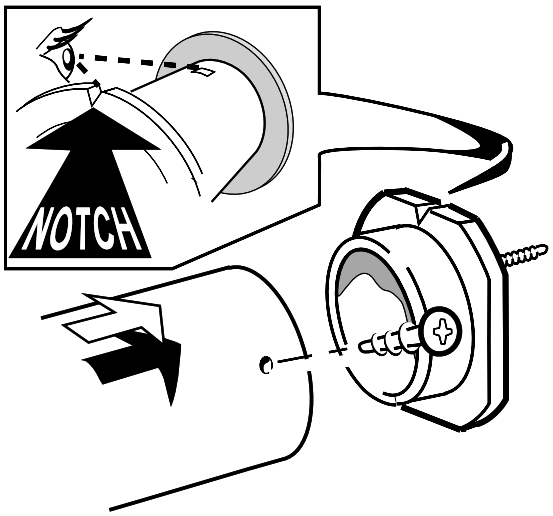
25 FITTING THE FOAM SEAL

1. To determine the position for the foam seal measure the wall thickness and mark it onto the flue, measuring from the groove near the terminal.
2. Wrap the self-adhesive foam strip round the flue, ensuring that the foam is on the terminal side of the line. This seals the gap between the flue and the wall.



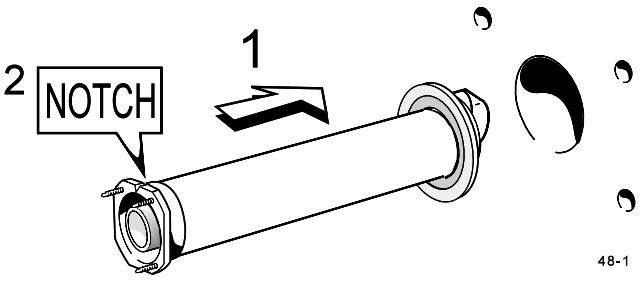
26 FITTING BOILER SEALING RING TO THE FLUE

1. Fit the boiler sealing ring inside the outer flue duct. Ensure the boiler sealing ring is fully engaged. Ensure the notch aligns with the groove on the outer flue duct. This ensures correct alignment of the flue terminal.
2. Drill 3 holes 3.2mm (1/8") dia. through the outer flue duct and boiler sealing ring. *Do not drill the inner flue duct.*
3. Insert the self tapping screws, provided, in order to fix the boiler sealing ring in position.



27 FITTING THE FLUE ASSEMBLY

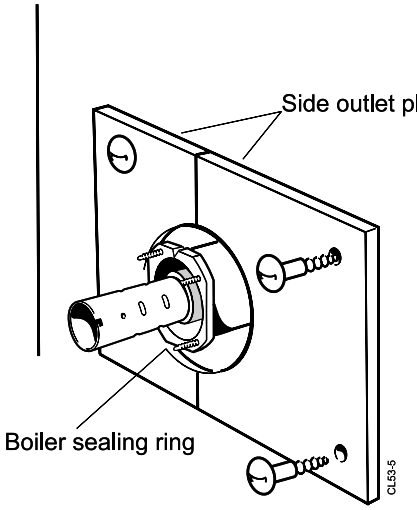
1. Insert the flue assembly through the hole far enough to allow the rubber seal to unfold completely and form an adequate seal on the outside wall. This will also ensure the correct alignment of the flue terminal.
2. Ensure the notch is at the top. This will aid the location of the studs into the boiler back panel.



28 FITTING THE SIDE OUTLET PLATES

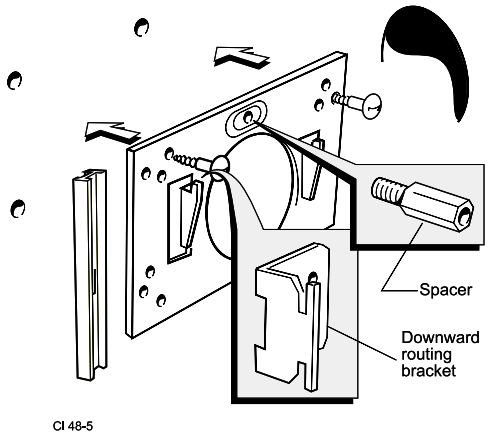
Note. *If the boiler is fitted closer than 25mm to the side wall the side outlet plate must be fitted now.*

1. Split the side outlet plate into 2 down the split line.
2. Fit the 2 halves of the side outlet plate to the wall, ensuring they are behind the boiler sealing ring.



29 WALL MOUNTING PLATE

1. Fix the mounting plate to the wall with the No.14 x 50mm wood screws.
2. If downward routing of pipes is required then the downward routing pipe brackets and M8 spacer (supplied in the Downward Piping Kit) should be fitted to the wall mounting plate now.
3. Fit the bottom 2 screws to secure the bracket(s) to the wall, through the wall mounting plate.
4. Check with a spirit level that the plate is vertical.



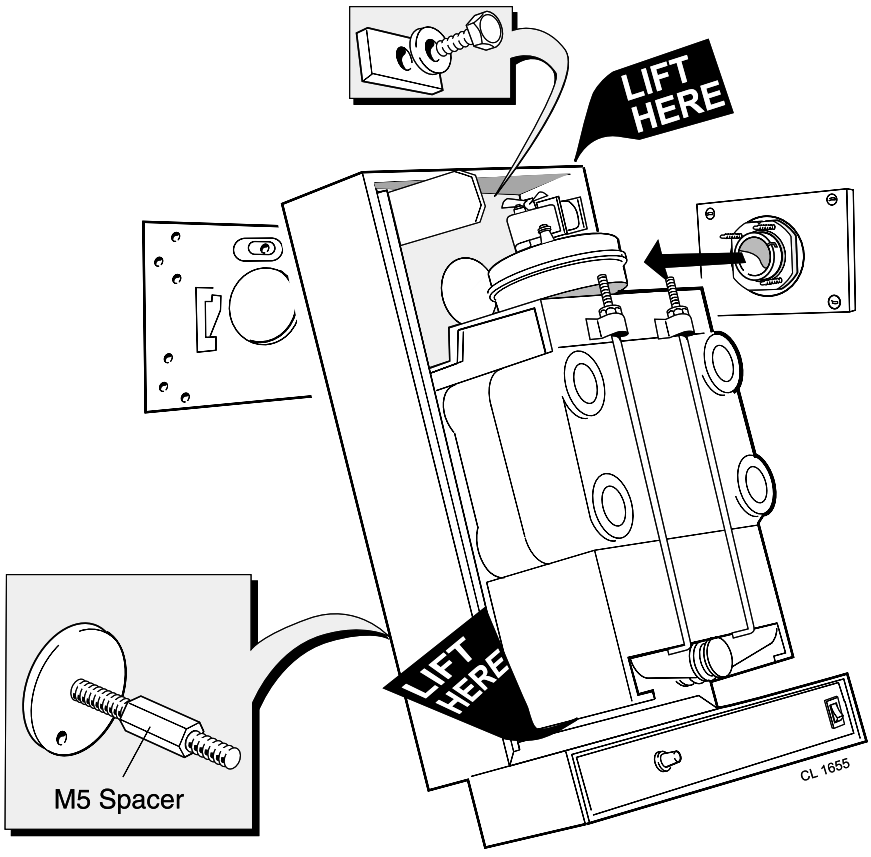
30 MOUNTING THE BOILER

Notes **1.** *Have ready to hand the M8 screw, washer and rectangular plate supplied in the hardware pack.*
2. *For downward routing of pipes the M5 spacer (supplied in the Downward Piping Kit) should now be fitted to the back of the boiler.*

1. The boiler is supplied for rear outlet installation. Remove the blanking plate from the direction required and use this to blank off the rear outlet.
2. Lift the boiler onto the wall mounting plate hooks as shown.

   Do not use the burner/ controls for lifting.
3. Fit the M8 screw, washer and rectangular plate to retain the boiler.

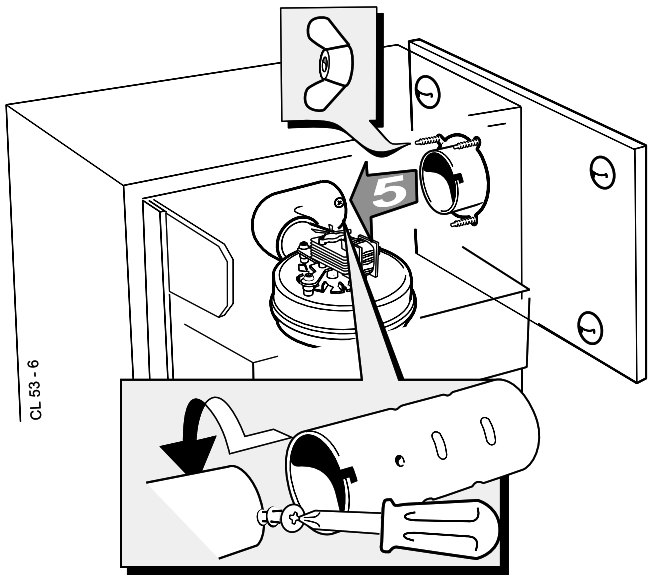
Note. *Before fully tightening the M8 screw check the boiler alignment using a spirit level and adjust as necessary with the jacking screw.*



31 CONNECTING THE FLUE TO THE BOILER

1. Pull the flue through the side outlet plate and locate the 3 studs in the hole in the side of the boiler.
2. Secure the flue to the boiler using the three M5 nuts provided.
3. Insert the flue extension tube into the flue.
4. Fit the 90° flue elbow, supplied with the boiler, onto the fan in the direction required, after first removing the underside screw, which is not required. Secure in position with the screw attached to the fan.
5. Pull the flue extension tube and engage onto the fan elbow and secure with the screw attached to the elbow.

Note. *The sealing ring studs will locate in the back panel one way only. This will ensure that the terminal grille is correctly aligned.*

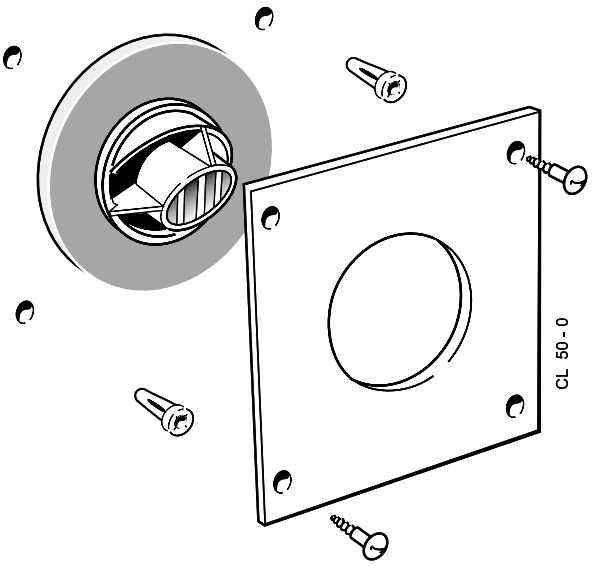


32 TERMINAL WALL PLATE

This plate allows neat concealment and full compression of the rubber seal. Its use is not essential if the flue hole and flue ducts have been accurately cut and the outside wall face is flat.

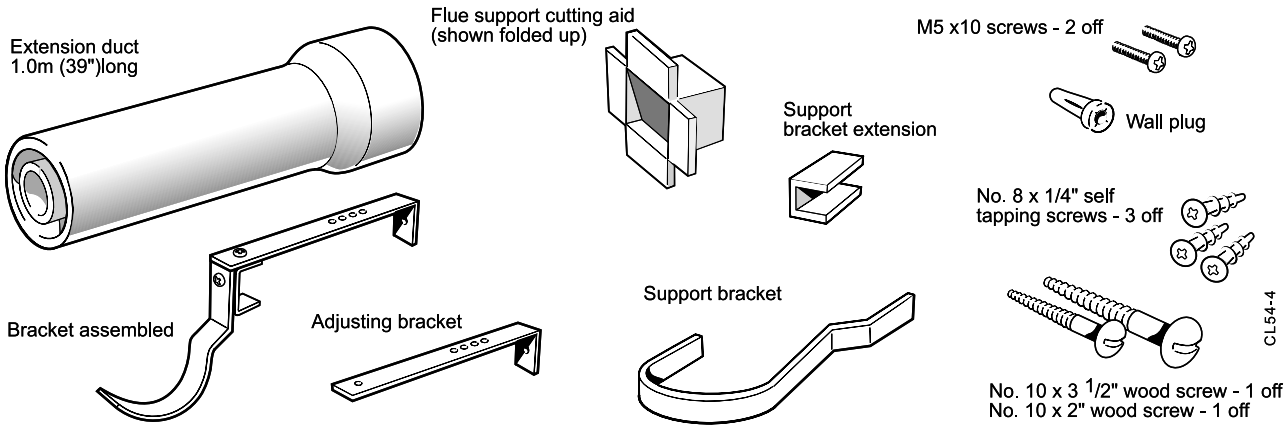
1. Position the terminal wall plate over the terminal.
2. Drill 4 fixing holes with a 7mm (9/32") masonry drill.
3. Insert the 4 plastic plugs provided.
4. Secure the plate with 4 of the No.10 x 2" screws provided.

Note. *If the terminal is less than 2m (6' 6") above ground level, an approved terminal guard should be fitted. Refer to the contents list on Page 3.*



33 FLUE EXTENSION DUCTS - For flue lengths greater than 600mm (Not for FF 3 100 model)

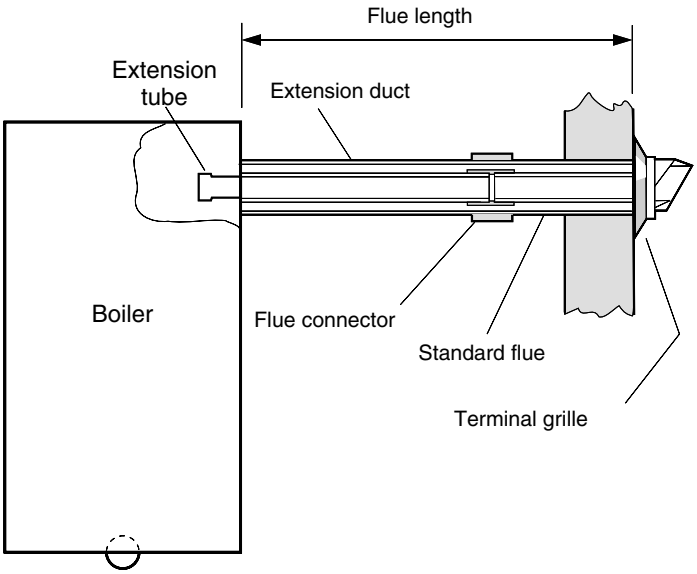
PACK D Flue extension duct kit contents.



34 FLUE EXTENSION DUCTS - continued

General arrangement

Note. *Side flue shown.*

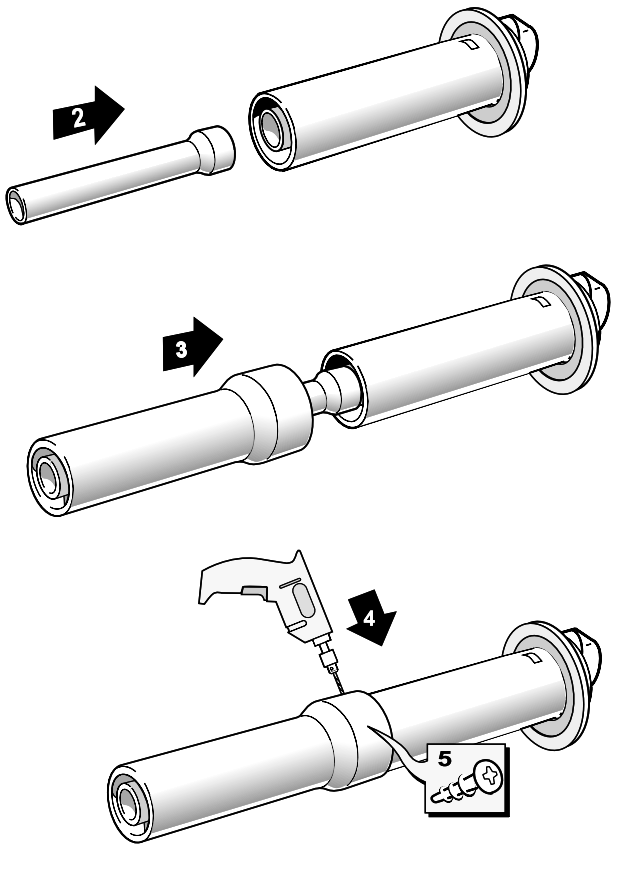


1. A *maximum* of 2 extension ducts (plus the standard flue duct) may be used together.
2. Flue extensions of greater length than 1m (39") should be supported with the bracket provided. If the stand-off brackets have been used it is necessary, in order to keep the flue aligned, to use the spacer bracket with the support bracket.

Flue length	Accessories	Product No.
Up to 600	B Pack 1 off	see Frame 8
600 to 1550 *	B Pack 1 off + D Pack, 1 off	see Frame 8
1550 to 2500 *	B Pack 1 off + D Pack, 2 off	see Frame 8
2500 to 3000 *	B Pack 1 off + D Pack, 3 off	see Frame 8

* Not for FF 3 100 model

35 FITTING THE KIT



1. Remove the cardboard support aid from the flue and place safely to one side.
2. Fit the inner flue extension duct onto the inner flue duct.
3. Fit the outer flue extension duct onto the outer air duct.
4. Drill 3 - 3.2mm (1/8") dia. holes through the outer air duct. ***Do not drill the inner flue duct.***
5. Insert the self tapping screws provided to fix the air duct in position.
6. Repeat steps 1-5 if a second flue extension is required.

36 GAS CONNECTION

Refer to 'Gas Supply ', page 6.
Refer to Frame 2 for gas inlet service dimensions.

A **minimum** pressure of 20 mbar MUST be available at the boiler inlet with the boiler operating. The main gas cock is on the left hand side of the gas control valve, as shown. To facilitate connection the gas cock may be removed from the gas control valve.

37 WATER CONNECTIONS

1. Remove the plastic plugs from the flow and return pipes.
2. Make all water connections and check for water soundness.

38 ELECTRICAL CONNECTIONS

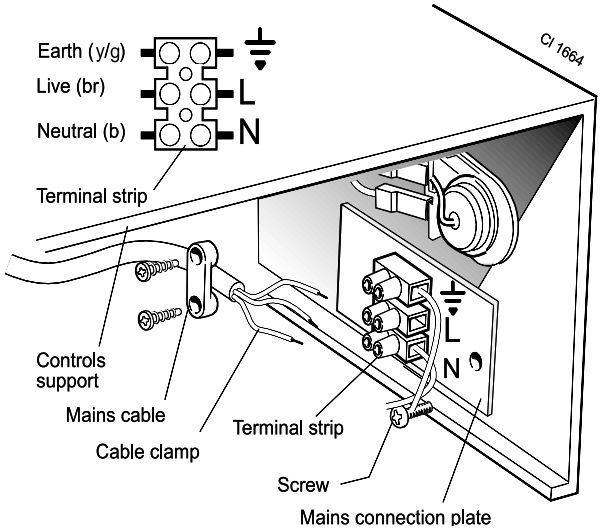
WARNING. The appliance must be efficiently earthed.

A mains supply of 230 V ~ 50 Hz is required.

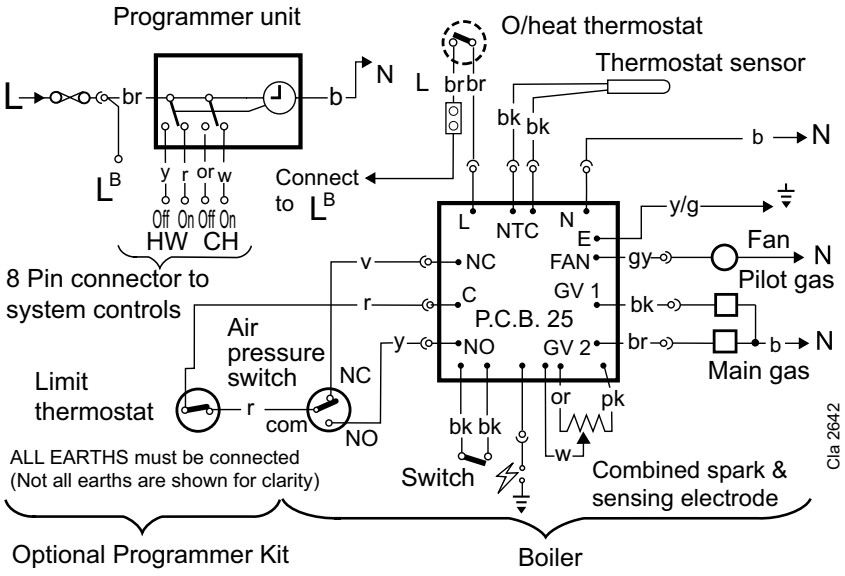
All external controls and wiring must be suitable for mains voltage. Wiring should be in 3-core PVC insulated & sheathed cable, not less than 0.75mm² (24 x 0.2mm) to BS. 6500 Table 16 Wiring Regulations and local regulations.

Connection must be made in a way that allows complete isolation of the electrical supply - such as a double pole switch, having a 3mm (1/8") contact separation in both poles or a plug and socket, serving only the boiler and system controls. The means of isolation must be accessible to the user after installation.

LEGEND					
b	blue	**br**	brown	**pk**	pink
bk	black	**gy**	grey	**r**	red
		or	orange	**v**	violet
				w	white
				y/g	yellow/green



Flow wiring diagram



Note. *If the optional Programmer Kit is to be fitted refer to the instructions provided with the kit and Frame 39.*

1. Remove the control box securing screws. Swing the box down into the servicing position. Refer to Frame 46.
2. Route the mains cable into the box from the RHS of the boiler.
3. Connect the live, neutral and earth wires into the terminal strip as shown.
4. Secure the mains lead with the cable clamp.
5. On completion of all wiring connections, relocate the control box and secure.

39 EXTERNAL CONTROLS

The wiring diagrams illustrated in Frames 41-43 cover the systems most likely to be fitted to this appliance.

For wiring external controls to the Classic FF boiler, reference should be made to the system wiring diagrams supplied by the relevant manufacturer, in conjunction with the wiring diagrams shown in Frames 41-43.

Difficulty in wiring should not arise, providing the following directions are observed:

1. Controls that switch the system on or off, e.g. a time switch, must be wired, in series, in the live mains lead to the boiler.
2. Controls that override an on/off control, e.g. frost thermostat, must be wired into the mains lead, in parallel, with the control(s) to be overridden. Refer to Frame 43.
3. If a proprietary system is used, follow the instructions supplied by the manufacturer.
4. System designs featuring controls or wiring arrangements which allow the boiler to fire when there is no pump circulation taking place should not be fitted.

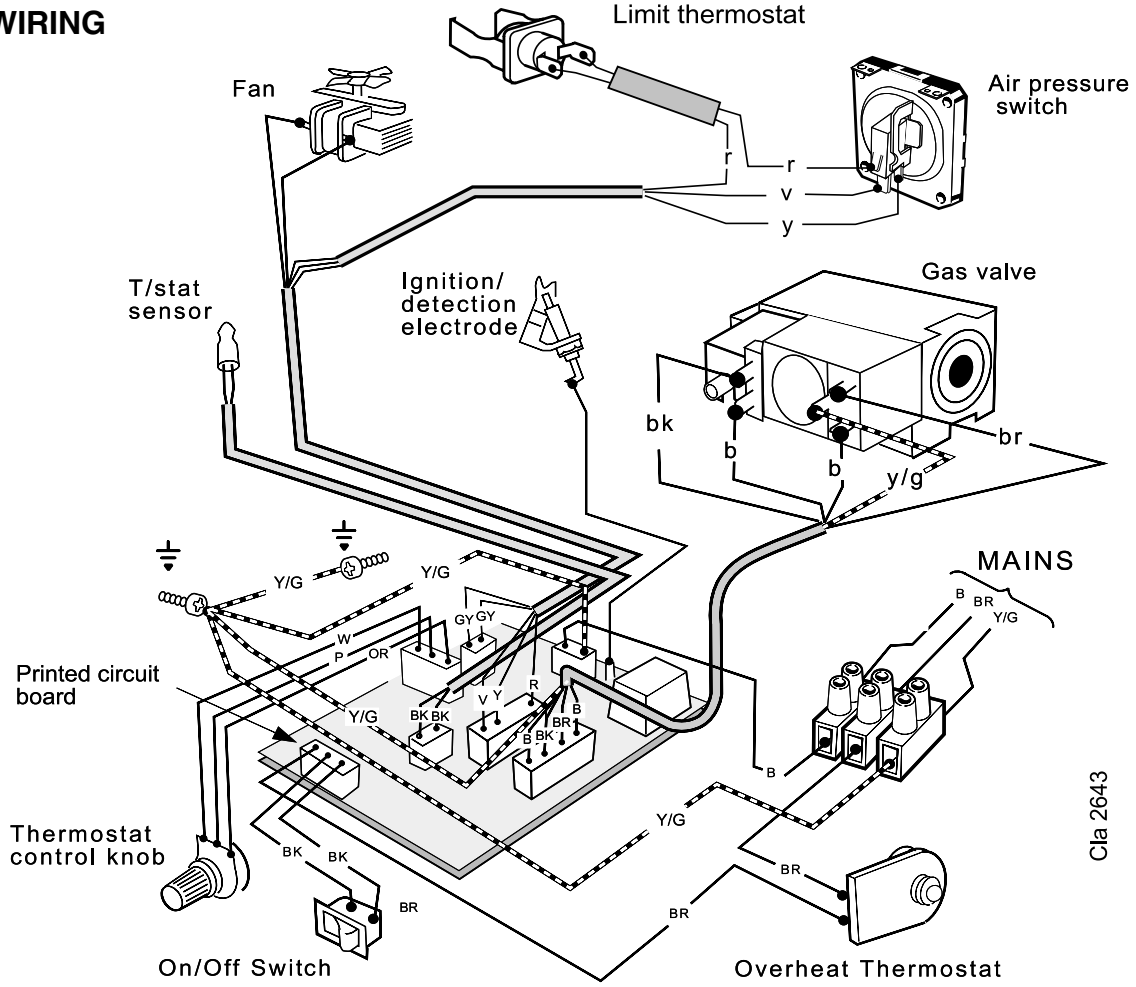
Advice on required modifications to the wiring may be obtained from the component manufacturers.

Notes.

1. *Connection between a frost thermostat and the time control should be made without disturbing other wiring.*
2. *A frost thermostat should be sited in a cool place in the house, but where it can sense heat from the system.*

40 PICTORIAL WIRING

LEGEND
b - blue
bk - black
br - brown
gy - grey
or - orange
pk - pink
r - red
v - violet
w - white
y - yellow
y/g - yellow/green

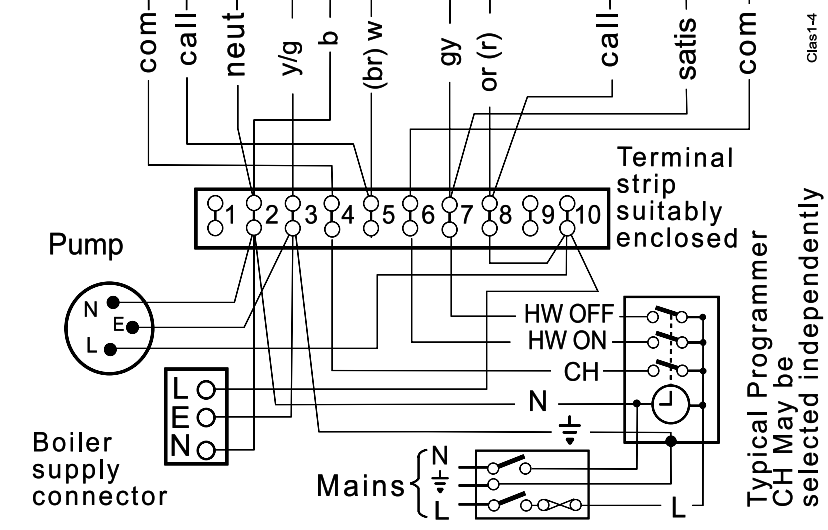


41 MID POSITION VALVE **Pumped only**

Notes.

1. *Some earth wires are omitted for clarity. Ensure proper earth continuity when wiring.*
2. *Numbering of terminals on thermostats is specific to the manufacturer.*
3. *This is a fully controlled system - set the boiler thermostat to maximum.*
4. *Switchmaster 'Midi' is similar in operation but the wiring differs slightly - see the manufacturer's literature.*

	Room Thermostat Terminals			Mid Position valve details	Cylinder Thermostat Terminals		
	1	3	2	HONEYWELL Y PLAN V4073H 1039	1	2	c
TLX 2259 or2284	3	1	4	PEGLER 'Unishare' DT 1701 etc.	1	2	3
	1	2	4	LANDIS & GYR 'LGM' SK3 - LT2701	2	3	1
	1	3	-	A. C. L. 679. H. 340.30.UO	1 bk	2 y	3 r
RTE RTM/RTC	1 3	2 1	4 N	DRAYTON Flowshare 2	2	3	1
	1	3	4	SOPAC Centra Share ZV20 - EB MID	1	2	c
	2	1	4	DANFOSS DMV - 3M	n. c.	n. o.	com.
				SWITCHMASTER			



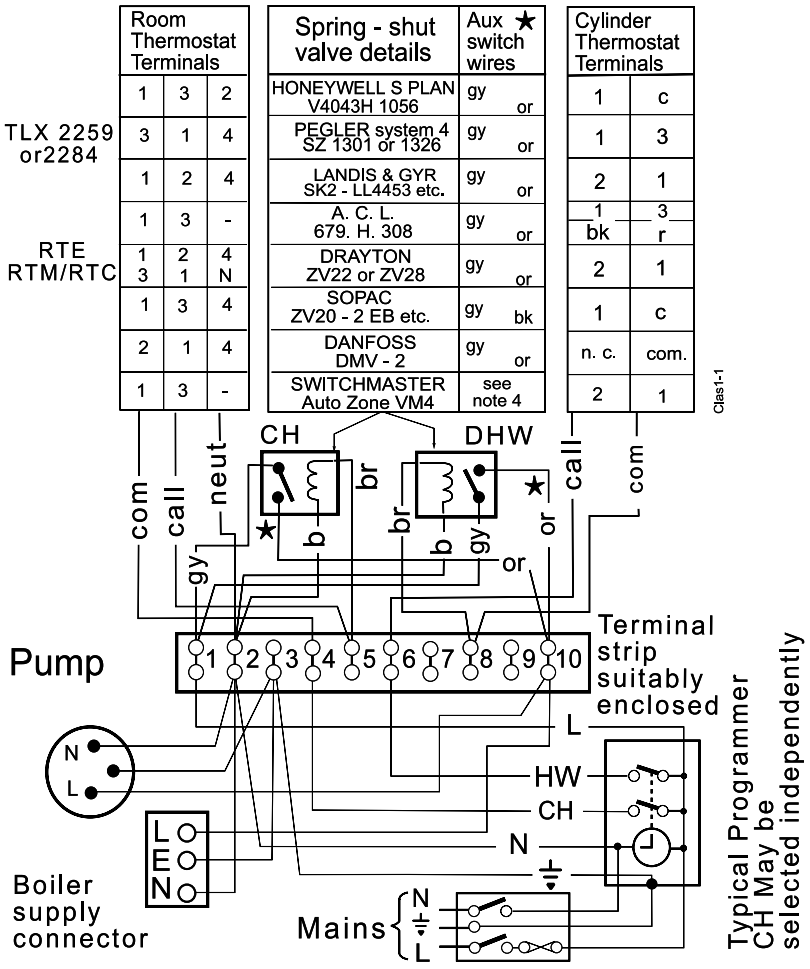
LEGEND
b - blue
bk - black
br - brown
gy - grey
or - orange
pk - pink
r - red
v - violet
w - white
y - yellow
y/g - yellow/green

42 TWO SPRING CLOSED VALVE

Pumped only

Notes.

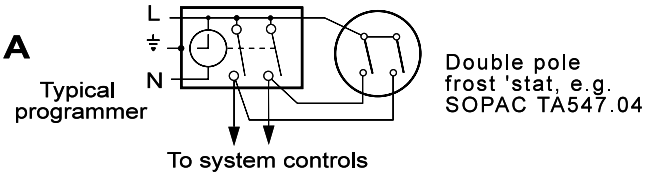
1. *Some earth wires are omitted for clarity. Ensure proper earth continuity when wiring.*
2. *Numbering of terminals on thermostats is specific to the manufacturer.*
3. *This is a fully controlled system - set the boiler thermostat to maximum.*
4. *Switchmaster valve has grey and orange auxiliary switch leads but the grey wire must be connected to the live supply.*

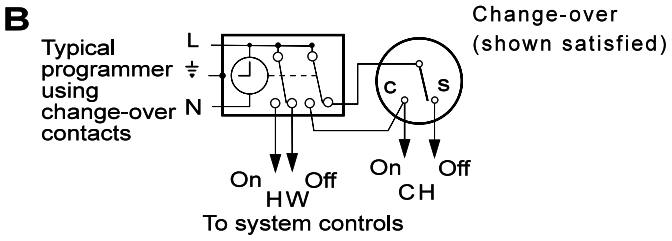


LEGEND

b	blue	**w**	white
bk	black	**gy**	grey
br	brown	**y/g**	yellow/green
r	red	**or**	orange
y	yellow	**v**	violet
		pk	pink

43 FROST PROTECTION





Central heating systems fitted wholly inside the house do not normally require frost protection as the house acts as a 'storage heater' and can normally be left at least 24 hrs. without frost damage. However, if parts of the pipework run outside the house or if the boiler will be left off for more than a day or so, then a frost thermostat should be wired into the system.

This is usually done at the programmer, in which case the programme selector switches are set to OFF and all other controls MUST be left in the running position.

The frost thermostat should be sited in a cold place but where it can sense heat from the system.

Wiring should be as shown, with minimal disturbance to other wiring of the programmer.

Designation of the terminals will vary but the programmer and thermostat manufacturer's leaflets will give full details.

If a boiler is installed in a garage it may be necessary to fit a pipe thermostat.

Diagram A shows a double pole frost thermostat, which should suffice for all systems which do not use the OFF terminals of the programmer.

Diagram B shows a 'change-over' frost 'stat, which will cover most systems which do use CH OFF. If, however, on such a system the HW pipework is in an isolated part of the house, a second frost 'stat may be used to protect it. If in doubt, ask your installer for advice.

44 COMMISSIONING AND TESTING

(a) Electrical Installation

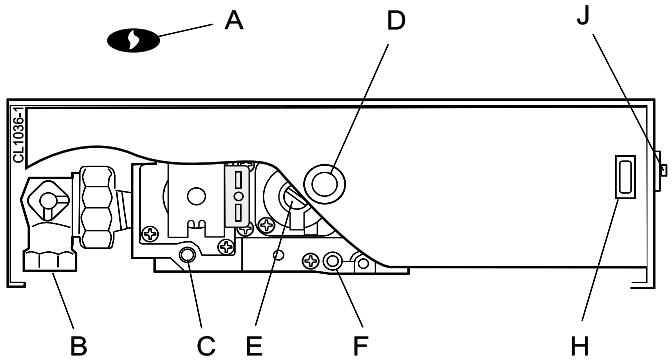
1. Checks to ensure electrical safety should be carried out by a competent person.
2. ALWAYS carry out preliminary electrical system checks, i.e. earth continuity, polarity, resistance to earth and short circuit using a suitable test meter.

(b) Gas Installation

1. The whole of the gas installation, including the meter, MUST be inspected and tested for soundness, and purged in accordance with the recommendations of BS. 6891.
2. Purging air from the gas installation may be expedited by loosening the union on the gas service cock on the boiler and purging until gas is detected.
3. Retighten the union and check for gas soundness.

WARNING. Whilst effecting the required gas soundness test and purging air from the gas installation open all windows and doors, extinguish naked lights and **DO NOT SMOKE.**

45 INITIAL LIGHTING



LEGEND

A Sightglass.
B Gas service cock.
C Inlet pressure test point.
D Thermostat knob
E Main burner pressure adjuster
F Burner pressure test point.
H Boiler mains on/off switch.
J Overheat thermostat reset button.

TO LIGHT THE BOILER

1. Check that all the drain cocks are closed, and any valves in the flow and return are open.
2. Check that the gas service cock (B) is OPEN and the boiler mains On/Off switch is OFF.
3. **Fitting the Boiler Casing**

   The boiler casing must be refitted with the controls support casing attached for alignment purposes. Lift the boiler casing up to the boiler assembly, with the casing top angled forward. Hook the top edge of the boiler casing into the channel on the top of the boiler assembly. Swing the bottom of the casing down and secure with the 2 captive screws.

   The casing must seat correctly and compress the sealing strip to make an airtight joint.
   Visually check the side seals but, if side clearances are limited, then check that the top and bottom edges of the casing are correctly located.

   If the Sealed System Unit is fitted remove the unit casing in order to inspect the top casing seal.

   To gain access to the gas valve:

   a. Remove the controls support casing. Release the controls support front fixing screws 3 turns only. Remove the pod by pulling it forward to disengage from the keyhole slots.

   b. Remove the control box securing screws and swing it down into the servicing position. See diagram B.
4. Slacken the screw in the burner pressure test point (F) and connect a gas pressure gauge via a flexible tube.
5. Swing the control box back into its working position.
6. Press the overheat thermostat reset button (J).
7. Switch the electricity supply ON and check that all external controls are calling for heat.
8. Set the boiler thermostat knob (D) to position 6 and the boiler Mains On/Off switch to ON. The fan will start. After the fan has run for a few seconds the pilot solenoid valve should open and the intermittent spark commence, continuing until the pilot is established. The main burner will then cross-light smoothly. If this sequence does not occur, refer to the Fault Finding section.
9. Test for gas soundness around ALL boiler gas components using leak detection fluid.
10. Operate the for 10 minutes to stabilise the burner temperature.
11. The boiler is pre-set at the factory to its nominal rating. If the burner pressure measured is incorrect it may be reset using the following procedure. Refer to Table 2 (page 2):

    a. Set the mains On/Off switch to OFF.

    b. Switch the electricity supply OFF.

    c. Swing the control box down into the servicing position.

    d. Remove the main burner adjuster cover.

    e. Turn the adjusting screw *clockwise* to INCREASE the pressure, or *anticlockwise* to DECREASE the pressure.

    f. Swing the control box back into its working position.

    g. Switch the electricity supply ON.

    h. Set the mains On/Off switch to ON and check the new setting pressure.
12. If necessary repeat steps 12a to h until the required pressure is achieved. Record this value in the Benchmark log book.
13. Set the main On/Off switch to OFF.
14. Switch the electricity supply OFF.
15. Swing the control box down into the servicing position.
16. Refit the main burner pressure adjuster cover.
17. Remove the pressure gauge and tube. Retighten the sealing screw in the pressure test point. Ensure a gas tight seal is made.

46 INITIAL LIGHTING - continued

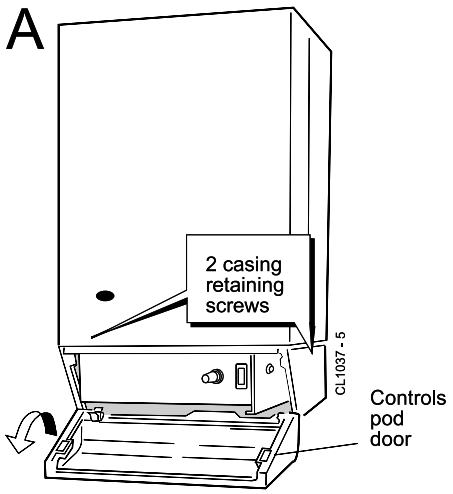
18. Swing the control box back into its working position and secure.

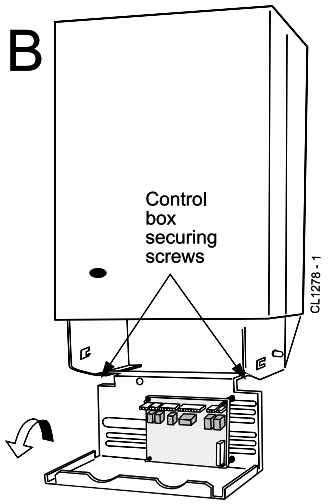
19. Remove the boiler casing.

20. Refit the controls pod to the boiler casing and tighten the 2 front fixing screws.

21. Refit the complete casing to the boiler.

22. Close the pod door.





47 GENERAL CHECKS

Make the following checks for correct operation:

1. Set the boiler thermostat knob to position 6 and operate the mains on/off switch. Check that the main burner lights and extinguishes in response.

2. The correct operation of ANY programmer and all other system controls should be proved.
Operate each control separately and check that the main burner or circulating pump, as the case may be, responds.

3. Check that the casing is sealed correctly and compressing the sealing strip all around the casing.

4. Water Circulating System

a. With the system HOT, examine all water connections for soundness.

b. With the system still hot, turn off the gas, water and electricity supplies to the boiler and drain down, in order to complete the flushing process.

c. Refill and vent the system, clear all air locks and again check for water soundness.

d. Balance the system.

5. Finally, set the controls to the user's requirements.

The temperatures quoted below are approximate and vary between installations.

Knob Setting	Flow Temperature °C	°F
1	54	130
2	60	140
3	66	150
4	71	160
5	77	170
6	82	180

WARNING.
The boiler MUST NOT be operated with the casing removed.

48 HANDING OVER

After completing the installation and commissioning of the system the installer should hand over to the householder by the following actions:

1. Hand the User's Instructions to the Householder and explain his or her responsibilities under the current Gas Safety (Installation and Use) Regulations or rules in force.

2. Draw attention to the Lighting Instruction label affixed to the controls pod door.

3. Explain and demonstrate the lighting and shutting down procedures.

4. The operation of the boiler and the use and adjustment of ALL system controls should be fully explained to the Householder, to ensure the greatest possible fuel economy, consistent with household requirements of both heating and hot water consumption.
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 frosty conditions.

5. Explain the function and the use of the boiler thermostat and external controls.

6. Explain the function of the boiler overheat thermostat and emphasise that if cutout persists, the boiler should be turned off and a registered CORGI installer consulted.

7. Explain and demonstrate the function of time and temperature controls, radiator valves etc., for the economic use of the system.

8. If any programmer is fitted draw attention to the Programmer User's Instructions and hand them to the Householder.

9. After installation, commissioning and customer hand-over, please complete the benchmark appliance log book and leave this with the customer.

10. Stress the importance of regular servicing by a CORGI registered installer and that a comprehensive service should be carried out AT LEAST ONCE A YEAR.

49 SCHEDULE

To ensure the continued safe and efficient operation of the appliance it is recommended that it is checked at regular intervals and serviced as necessary.
The frequency of servicing will depend upon the installation condition and usage, but should be carried out at least annually. It is the law that any service work must be carried out by CORGI registered installer**.**

As the installer you may wish to undertake the service contract yourself or alternatively offer to the customer the benefits of the **Ideal Care Scheme**, details of which are outlined in the household pack supplied with this boiler.

a. Light the boiler and carry out a pre-service check, noting any operational faults. Operate the boiler for at least 20 minutes. Check the gas consumption.

b. Connect a suitable gas analyser to the sampling point on the top RHS of the back panel. For correct boiler operation the CO/CO_2 content of the flue gas should not be greater than 0.004 ratio. If this is the case and the gas input is at least 90% of the nominal, then no further action need be taken. If not, proceed to paragraph **c**.

c. Clean the main burner. Refer to Frame 53.

d. Clean the heat exchanger. Refer to Frame 52.

e. Clean the main and pilot injectors. Refer to Frame 53.

f. Remove any debris from inside the base of the casing.

g. Check that the flue terminal is unobstructed and that the flue system is sealed correctly.

h. If the appliance has been installed in a compartment, check that the ventilation areas are clear.

The servicing procedures are covered more fully in Frames 50 to 54 and must be carried out in sequence.

WARNING.
Disconnect the electrical supply and turn off gas supply.

IMPORTANT. After completing the servicing or exchange of components always test for gas soundness and carry out functional checks as appropriate.

When work is complete the casing MUST be correctly refitted, ensuring that a good seal is made.

The boiler must NOT be operated if the casing is not fitted.

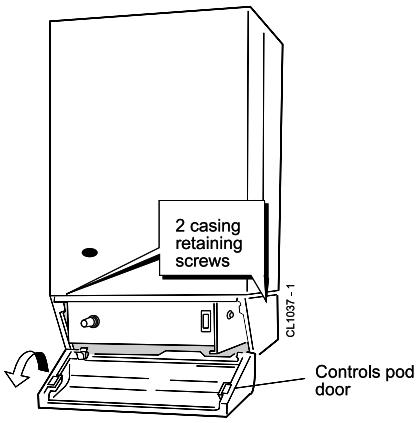
Note. *In order to carry out either servicing or replacement of components, the boiler casing must be removed. Refer to Frame 50.*

50 BOILER CASING REMOVAL

1. If the Classic Sealed System Unit is fitted lift off the casing.

2. Open the controls pod door and release the 2 captive screws at the bottom of the casing. Swing the bottom of the boiler casing out until the controls pod casing has cleared the controls, then unhook the casing top from the pack panel. Retain the casing in a safe place. Where the removal of the casing is impaired by a pelmet, the instruction in Frame 2 should be followed.

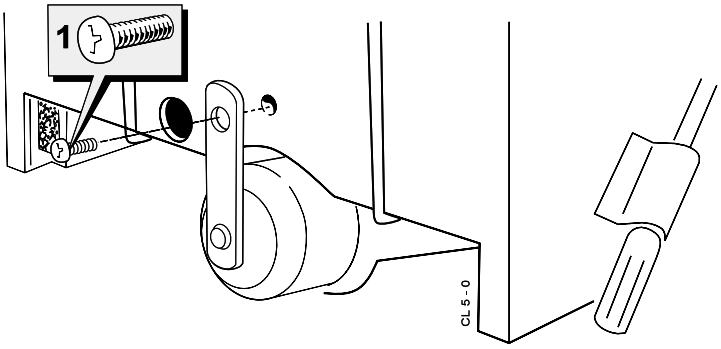
3. Isolate the gas supply at the service cock fitted to the boiler.



51 BURNER AND AIR BOX REMOVAL

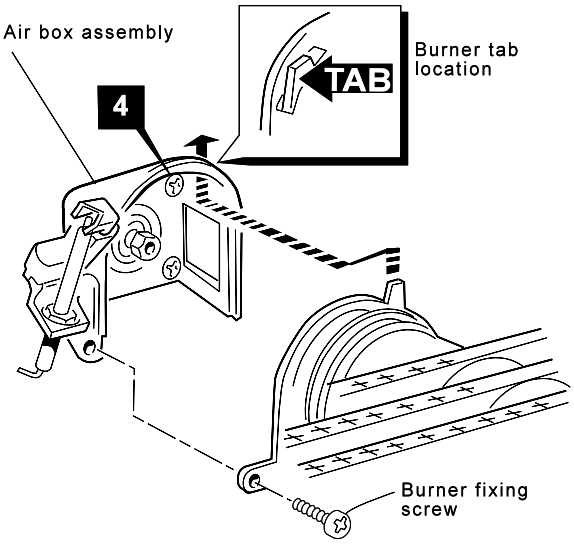
1. Remove the screw retaining the front burner support strap to the combustion chamber. Remove the M5 pozi situated at the LH bottom rear of the burner and pull the burner downwards to disengage the retention tab. Remove the burner to a safe place for inspection and cleaning.

2. Remove the control box fixing screw. Pull the box forward and downward to disengage.



3. Pull the HT lead connection off the printed circuit board and pull the lead upwards through the bottom panel grommet.

4. Remove the 4 screws retaining the air box/pilot assembly to the vertical manifold and carefully remove the assembly.



52 CLEANING THE FAN ASSEMBLY / THE FLUEWAYS

1. Remove the 2 silicon rubber tubes from the fan sensing points.

2. Disconnect the fan leads.

3a. Rear flue
Slacken the M4 screw securing the flue connector to the fan. Disconnect the connector from the fan and slide into the flue.

3b. Side or top flue
Slacken off two M4 screws securing the flue elbow and flue connector. Disconnect the flue connector from the elbow and slide into the flue. Remove the flue elbow.

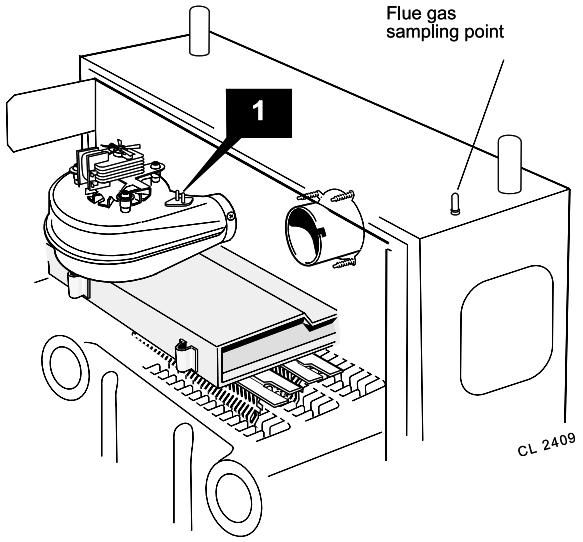
4. Disconnect the silicon rubber tube from the rear of the collector hood.

5. Slacken the two M5 nuts on the front tie rods, releasing the tie rods from the combustion chamber.

6. Remove the M5 central fixing screw at the rear of the collector hood and remove collector hood/fan assembly.

7. Check that the fan impeller runs freely. Remove any debris from the impeller with a soft brush.

8. Remove the flue baffles.



9. Remove all loose deposits from the heat exchanger, particularly between the fins, using a suitable brush.

10. Reassemble in reverse order, ensuring the fan leads and 3 sensing tubes are reconnected.

53 CLEANING THE BURNER AND PILOT ASSEMBLY

1. Brush off any deposits that may have fallen on to the burner head (ensuring the flame ports are unobstructed) and remove any debris that may have collected.
Note. *Brushes with metallic bristles must not be used.*

2. Remove the main burner injector and ensure there is no blockage or damage. Clean or renew as necessary.

3. Refit the injector, using an approved jointing compound sparingly.

4. Inspect the pilot burner and ignition / detection electrode. Ensure that they are clean and in good condition.

Check that:

a. The pilot burner injector is not blocked or damaged. Refer to Frame 61 for removal details.

b. The pilot burner is clean and unobstructed.

c. The ignition / detection electrode is clean and undamaged.

d. The ignition / detection lead is in good condition.

e. The spark gap is correct (refer to Frame 61) Clean or renew as necessary.

Note. *The pilot shield is located around the pilot assembly bracket and is located by the electrode retaining nut.*

54 REASSEMBLY

Reassemble the boiler in the following order.

1. Refit the flue baffles.

2. Inspect the collector hood rope gasket and replace, if necessary, ensuring that the self adhesive rope is fitted centrally on to the lip of the collector hood / fan assembly. The boiler efficiency will be adversely affected if incorrectly fitted. Refit the collector hood and retain with the 2 front tie rods and the rear central fixing screw. Tighten the nuts and screw. Ensure that the sealing gasket is compressed. Refit the pressure pipe.

3. Refit the positive pressure tubes on the top of the fan housing. Reconnect the electrical leads.

4. Refit the air box assembly and burner. Ensure that the burner front fixing is refitted.

5. Reconnect the gas supply and the electrical wiring. Refer to Frames 36 & 38.

6. Check the sightglass in the boiler casing. Clean or renew as necessary. Refer to Frame 57.

7. Check for gas soundness. Check the gas service cock and pressure test point.

8. Refit the boiler casing (refer to Frame 46). Note that it is not necessary to disturb the controls casing pod.

9. Close the controls pod door.

55 GAS PRESSURE ADJUSTMENT

PILOT

The pilot is factory set to maximum and no further adjustment is possible. If, after removing and checking the injector (as detailed in Frame 61) and ensuring that there is an inlet pressure of 20 mbar available, the pilot does not light then contact **Caradon Ideal Limited.**

Relight in accordance with 'Initial Lighting', Frame 45.

MAIN BURNER

After any servicing, reference should be made to Table 2 which quotes details of the rated output with the related burner setting pressure and the heat input. Any required adjustments should be made by using the pressure adjustment screw.

Refer to 'initial Lighting', Frame 45.

REPLACEMENT OF PARTS

56 GENERAL

When replacing any component:

1. Isolate the electricity supply.

2. Turn OFF the gas supply.

3. Remove the boiler casing. Refer to Frame 50.

IMPORTANT. When work is complete the casing must be correctly refitted, ensuring that a good seal is made.

Note. *In order to assist fault finding, the control box printed circuit board is fitted with 2 indicator lights which represent the following boiler conditions:*

Neon I3. Mains electricity ON.

Neon SG1. Flashes to indicate ignition operation (stops after detection).

The boiler MUST NOT be operated if the casing is not fitted.

57 SIGHTGLASS REPLACEMENT

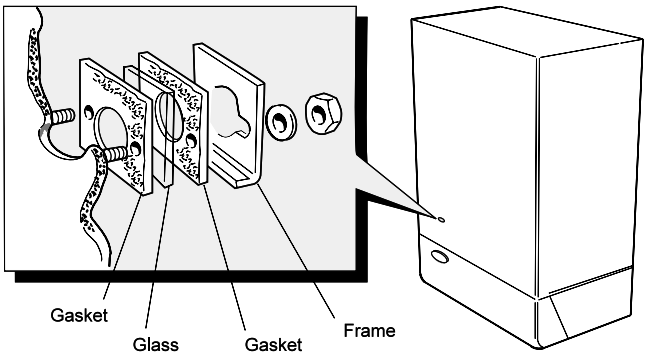
1. Refer to Frame 56.

2. Unfasten the 2 nuts and washers holding the sightglass assembly to the casing front panel.

3. When fixing the new assembly ensure that the parts are in the correct order. The frame must have the return edge at the bottom.

4. Retighten the 2 nuts to ensure an airtight seal. Do NOT overtighten.

6. Replace the boiler casing. Refer to Frame 54.



58 OVERHEAT THERMOSTAT REPLACEMENT

1. Refer to Frame 56.

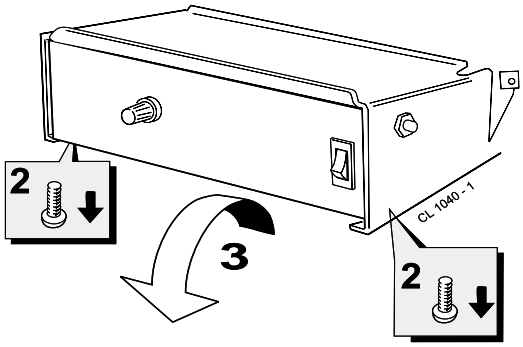
2. Remove the control box fixing screws.

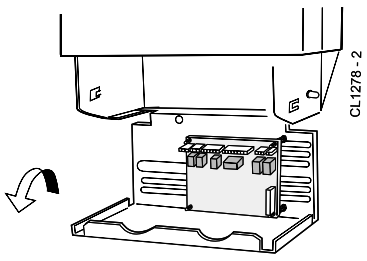
3. Swing the control box down into the servicing position.

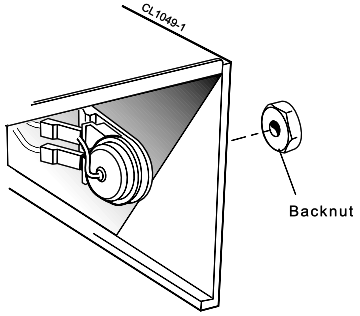
4. Pull off the electrical connections at the thermostat. Remove the backnut retaining the thermostat to the bracket. Withdraw the thermostat phial from the heat exchanger pocket.

5. Fit the new thermostat and reassemble in reverse order.

6. Check the operation of the boiler.





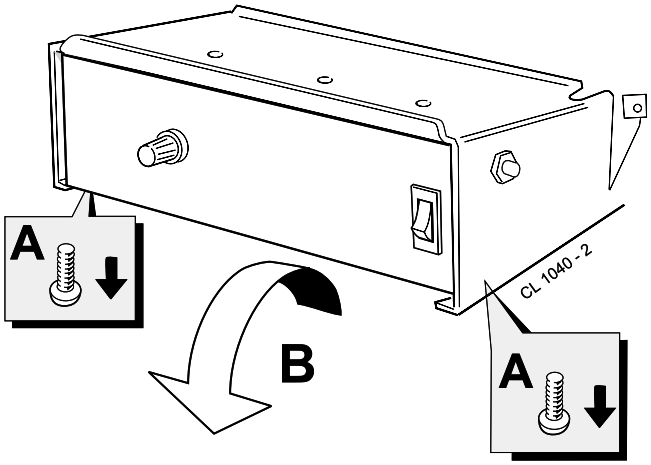


59 THERMOSTAT CONTROL, THERMISTOR SENSOR LEAD & ON/OFF SWITCH REPLACEMENT

Refer also to Frame 56.

A. Remove the fixing screws

B. Swing the control box down into the servicing position.



Thermostat control

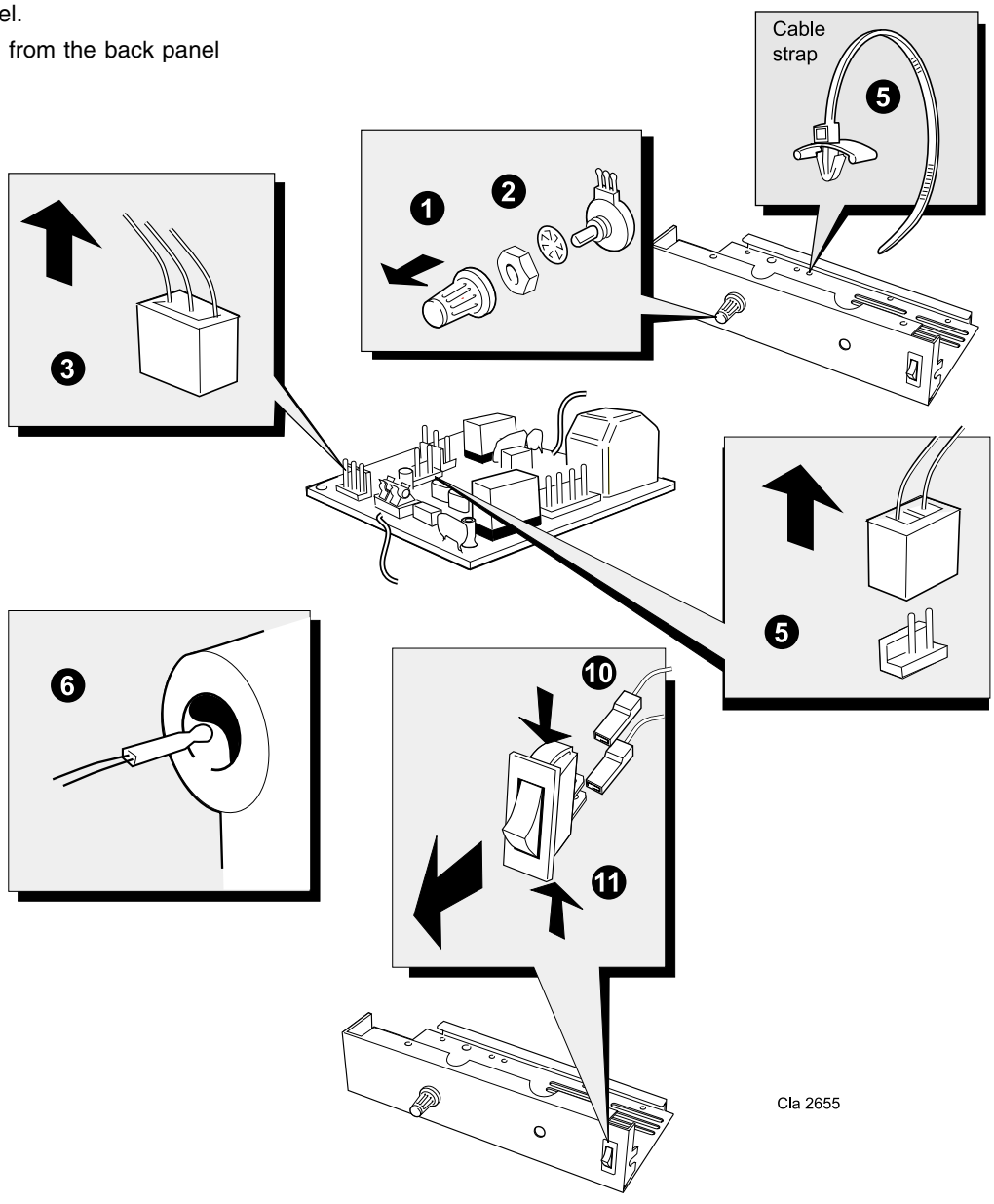
1. Pull the knob off the shaft.
2. Remove the backnut securing the thermostat control to the control box.
3. Pull off the Molex connector from the printed circuit board.
4. Replace and reassemble in reverse order.

Thermistor sensor lead

5. Pull the sensor lead connector off the printed circuit board and cut the cable strap securing the thermistor harness to the bottom panel of the control box (if fitted) and remove the strap.
6. Remove the sensor from the heat exchanger pocket and unclip from the back panel.
7. Remove the strain relief bush from the back panel base.
8. Remove the sensor lead through the grommet in the control box.
9. Replace and reassemble in reverse order, ensuring the new cable strap is fitted and securing the thermistor harness.

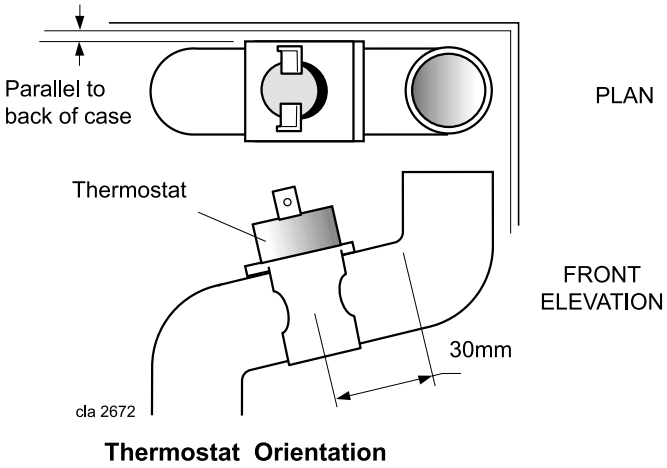
On/off switch

10. Disconnect the electrical connectors from the rear of the switch.
11. Press in the 2 side retaining clips and remove the switch.
12. Reassemble in reverse order.

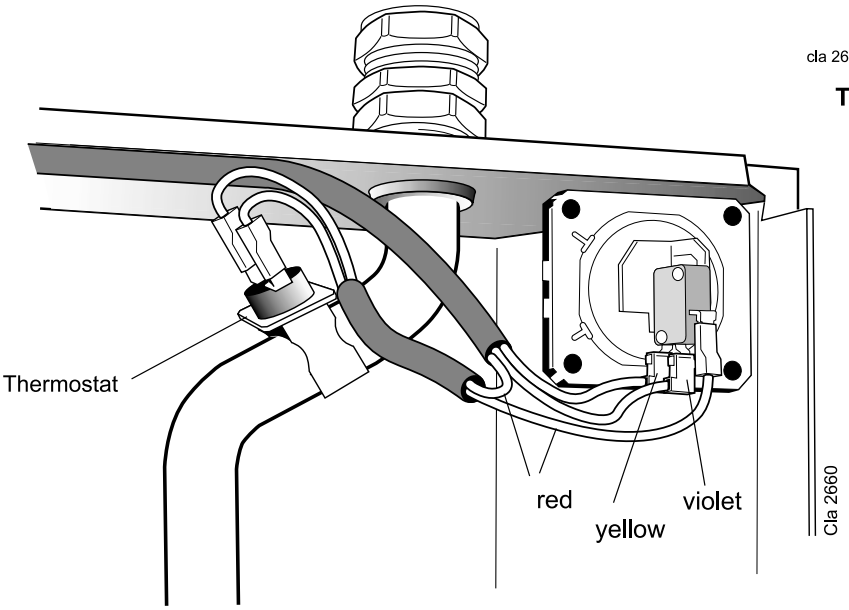


60 LIMIT THERMOSTAT REPLACEMENT

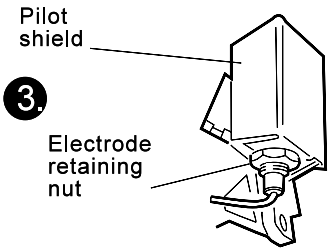
1. Refer to Frame 56.
2. Remove the limit thermostat assembly from the boiler flow pipe.
3. Disconnect the electrical connectors
4. Replace and reassemble in reverse order, taking care to correctly position the limit thermostat as shown in the orientation diagram opposite.

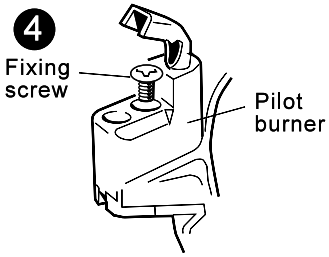


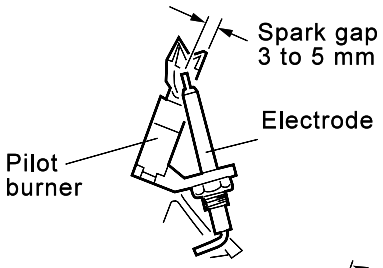
Thermostat Orientation

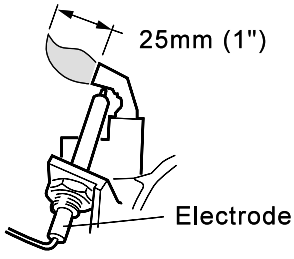


61 PILOT BURNER REPLACEMENT





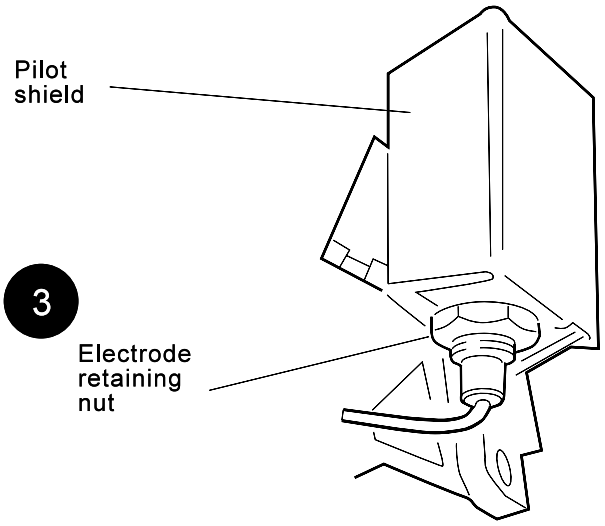




1. Refer to Frame 56.
2. Remove the burner and air box assembly. Refer to Frame 51.
3. Remove the electrode retaining nut and remove the pilot shield and electrode.
4. Unscrew the central pilot fixing screw and lift the pilot clear of the pilot injector. The pilot injector may now be unscrewed if required.
5. Replace the pilot burner (injector if necessary) and retain with the M4 screw previously removed. Ensure the copper sealing washer is replaced when refitting the pilot injector.
6. Replace the electrode and pilot shield, retaining both with the electrode nut. Check the spark gap.
7. Reassemble in reverse order.
8. Check the operation of the boiler.
9. The pilot is factory set to maximum and no further adjustment is possible. Ensure there is an inlet pressure of 20 mbar available. Also check burner ignition and cross-lighting.

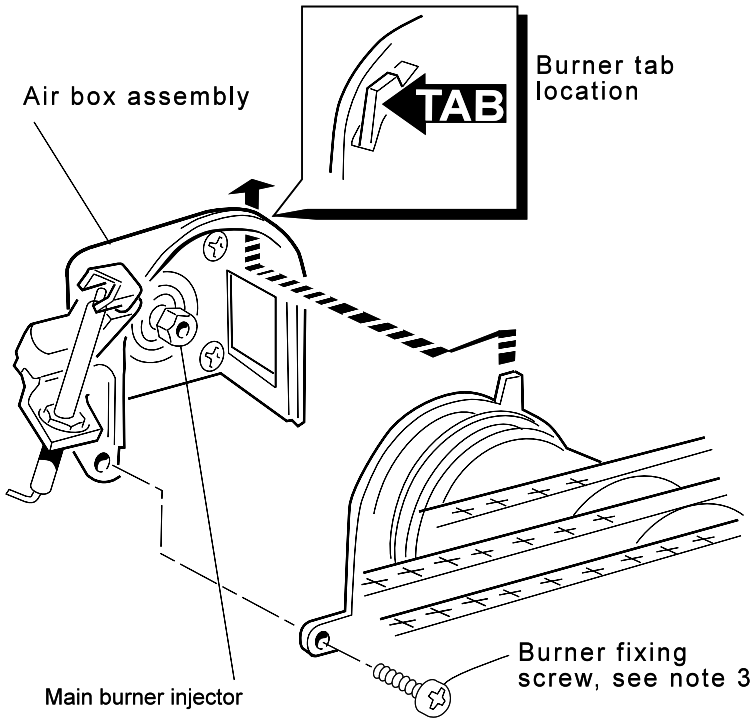
62 IGNITION ELECTRODE AND LEAD REPLACEMENT

1. Refer to Frame 56.
2. Remove the burner and air box assembly. Refer to Frame 51.
3. Remove the electrode retaining nut.
4. Remove the pilot shield.
5. Remove the ignition electrode and integral lead.
6. Refit the new electrode and lead in reverse order. Ensure that the pilot shield is replaced.
7. Check the spark gap. Refer to Frame 61.
8. Reassemble in reverse order.
9. Check the operation of the boiler.



63 MAIN BURNER AND MAIN BURNER INJECTOR REPLACEMENT

1. Refer to Frame 56.
2. Remove the screw retaining the front burner support strap to the combustion chamber.
3. Remove the M5 pozi screw, situated at the left hand bottom rear of the burner. Pull the burner downward to disengage the retention tab and remove the burner.
4. At this stage the main burner injector can be removed, checked, cleaned or replaced as required. Ensure that a new copper sealing washer is used.
5. Fit the new burner, ensuring that the retention tab is correctly located in the air box slot and reassemble in reverse order.
6. Check the burner for cross-lighting and flame stability.



64 GAS CONTROL VALVE REPLACEMENT

Note. *Refer also to Frame 75 of 'Exploded Views' for illustration of the procedure detailed below.*

1. Refer to Frame 56.
2. Remove the burner and air box assembly. Refer to Frame 51.
3. Remove the fixing screws. Swing the control box down into the servicing position.
4. Disconnect the gas control valve electrical leads.
5. Undo the gas cock union .
6. Whilst supporting the gas control valve, remove the 2 screws retaining the manifold to the back panel.
7. Remove the gas control / manifold assembly.
8. Remove the 4 screws retaining the manifold to the gas control valve, and fit the manifold to the new valve. Ensure that the new control is fitted the correct way round (an arrow engraved on back indicates the direction of flow).
9. Transfer the gas cock union to the new gas control valve, using an approved jointing compound.
10. Reassemble in reverse order.
11. Check the operation of the boiler.

65 FAN REPLACEMENT

1. Refer to Frame 56

2. Remove the 2 silicon rubber tubes from the fan sensing points.

3. Disconnect the fan leads.

4a. Rear flue. Slacken the M4 screw securing the flue connector to the fan. Disconnect the connector from the fan and slide into the flue.

4b. Side or top flue. Slacken off two M4 screws securing the flue elbow and flue connector. Disconnect the flue connector from the elbow and slide into the flue. Remove the flue elbow.

5. Disconnect the silicon rubber tube from the rear of the collector hood.

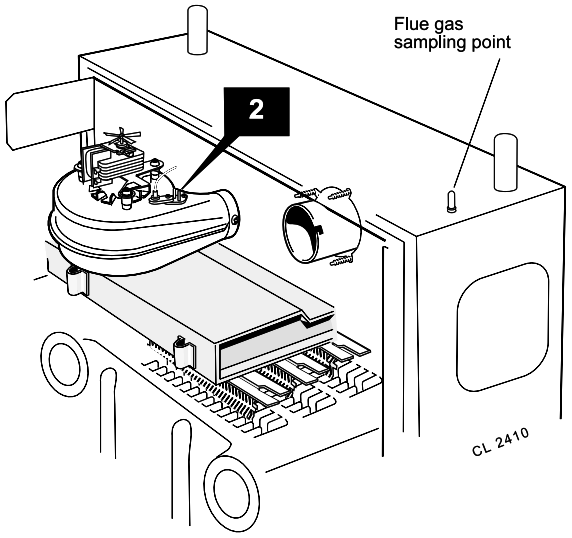
6. Slacken the two M5 nuts on the front tie rods, releasing the tie rods from the combustion chamber.

7. Remove the M5 central fixing screw at the rear of the collector hood and remove collector hood / fan assembly.

8. Remove the three M4 screws retaining the fan to the collector hood.

9. Fit the new fan and reassemble in reverse order, ensuring the fan leads and 3 sensing tubes are reconnected.

10. Check the operation of the boiler.



66 AIR PRESSURE SWITCH (APS) REPLACEMENT

1. Refer to Frame 56.

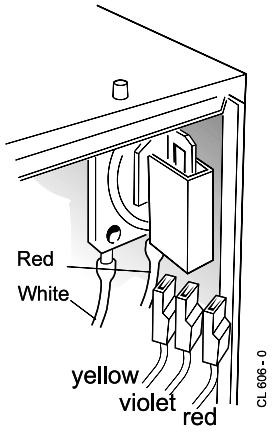
2. Remove the APS fixing screw.

3. Remove both sensing tubes from the APS.

4. Remove the 3 electrical connections from the APS.

5. Fit the new APS and reassemble in reverse order.

6. Check the operation of the boiler.



67 PRINTED CIRCUIT BOARD (PCB) REPLACEMENT

Note. *Refer to Frame 74 of 'Exploded Views' for illustration of the procedure detailed below.*

1. Refer to Frame 56.

2. Remove the fixing screws and swing the control box down into the servicing position.

3. Disconnect the detection lead from the PCB.

4. Unplug all the Molex connectors from the PCB.

5. Disengage the PCB from the mounting posts and withdraw from the control box.

6. Fit the new PCB and reassemble in reverse order.

7. Check the operation of the boiler.

Fuse.

To change the fuse, prise it out of the holder and disengage the fuse. Refer to Frame 74 for fuse location.

68 COMBUSTION CHAMBER INSULATION REPLACEMENT

1. Refer to Frame 56.

2. Remove the burner and air box assembly. Refer to Frame 51.

3. Remove the 4 tie rods.

4. Remove the combustion chamber.

5. Remove the 2 side panel retaining brackets.

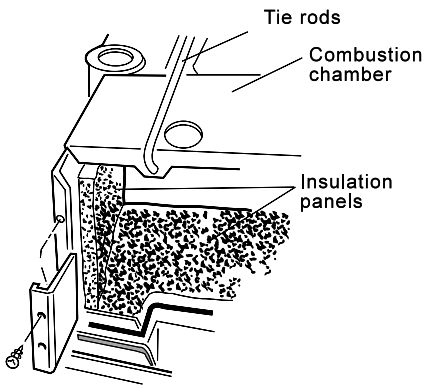
6. Remove the side insulation panels.

7. Remove the front and rear insulation panels.

8. Fit the new front and rear insulation panels.

9. Fit the new side panels and retain with the brackets and screws previously removed.

10. Reassemble in reverse order.



69 HEAT EXCHANGER REPLACEMENT

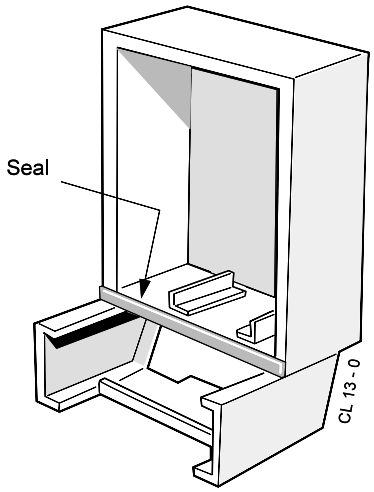
Note. *Refer to Frame 7 (Boiler assembly - Exploded view) for illustration of the procedure detailed below.*

1. Refer to Frame 56.
2. Remove the burner / air box assembly. Refer to Frame 51.
3. Drain the system.
4. Disconnect the water connections. If compression fittings are used then cut the pipes both above and below the fittings in order to allow the heat exchanger assembly to be removed. Remove the heat exchanger drain plug and drain the residual water into a suitable receptacle.
5. Remove the fan / collector hood assembly. Refer to Frame 52.
6. Remove the combustion chamber by unscrewing the 4 tie rods.
7. Remove the thermostat sensors from the pockets on the heat exchanger by removing the M3 screws and plates.
8. Slacken 3 turns only the 4 heat exchanger / interpanel retaining screws.
9. Lift the heat exchanger / interpanel assembly upward and forward to disengage key hole fixings. Pull the assembly downwards to clear the water pipes from the back panel.
10. Remove the 2 rubber sealing grommets from the top of the back panel to facilitate fitting the new assembly.
11. Fit the new heat exchanger assembly, complete with water pipes, and hang it on the key hole slots and screws. Retighten the screws.
12. Replace the 2 rubber sealing grommets.
13. Reassemble in reverse order.
14. Remake all water connections, ensuring that the compression fittings (if used) are correctly refitted.
15. Fully test all functions, including water and gas soundness.

70 CASING SEAL REPLACEMENT

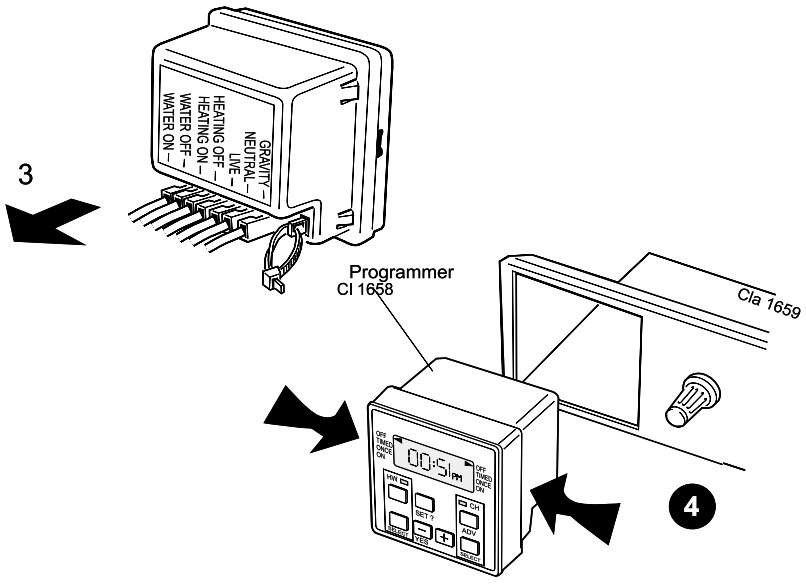
1. Refer to Frame 56.
2. Remove the old seal from the casing surround and thoroughly clean the casing surfaces.
3. Fit the new self adhesive seals.
4. Replace the boiler casing.

Note.
Model FF 3 100 *does not have air deflector baffles fitted to casing bottom.*

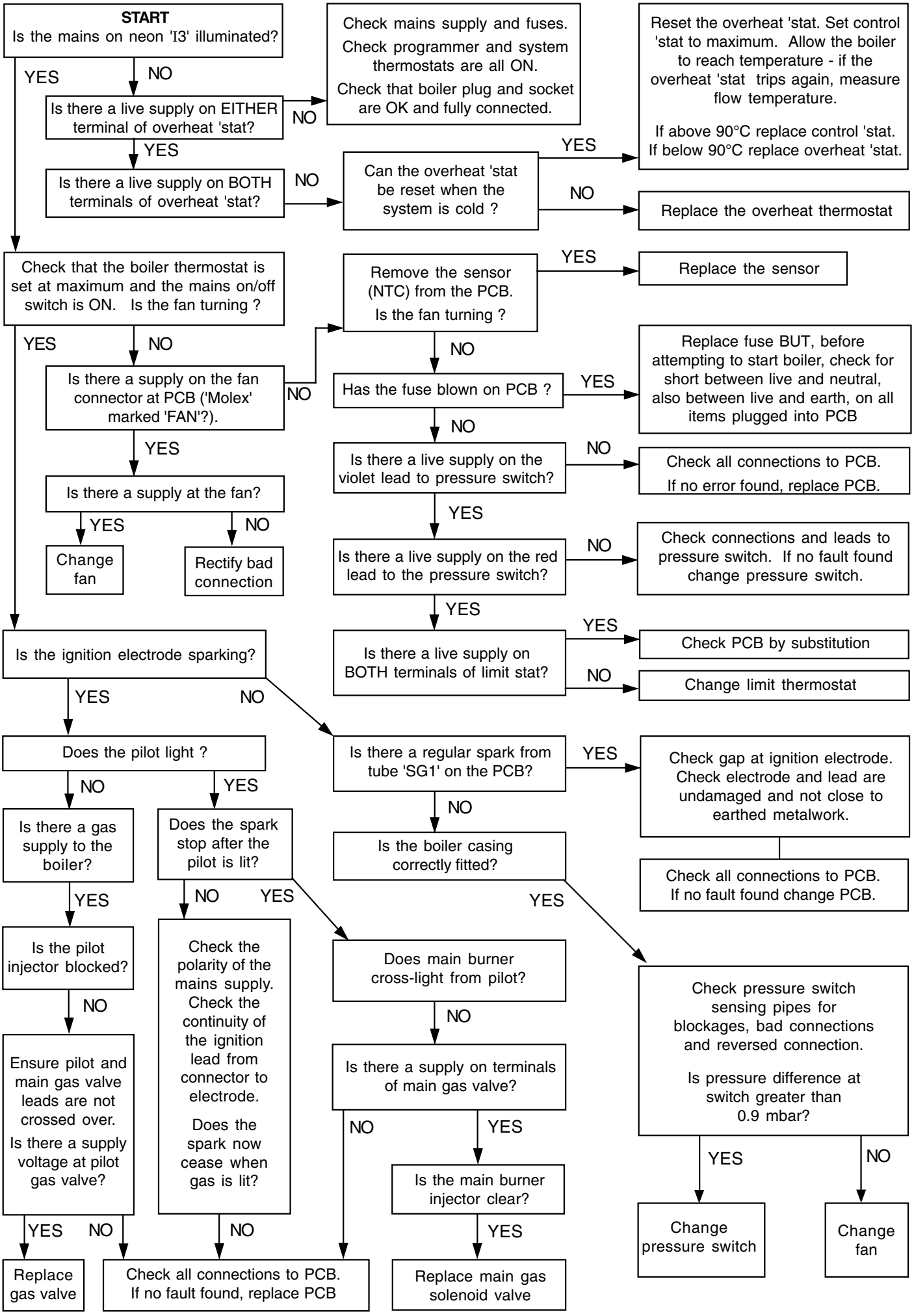


71 PROGRAMMER REPLACEMENT (IF FITTED)

1. Refer to Frame 56.
2. Remove the fixing screws and swing the control box down into the servicing position.
3. Pull off the terminal connections from back of programmer.
4. Compress the lugs at each side of the programmer and withdraw it from the control panel.
5. Fit the new programmer in reverse order.
6. Set the programmer to the desired programme and check the operation of the boiler.



FAULT FINDING



SHORT LIST OF PARTS

The following are parts commonly required due to damage or expendability. Their failure or absence is likely to affect safety or performance of this appliance.

The list is extracted from the British Gas List of Parts, which contains all available spare parts.

The full list is held by British Gas, **Caradon Ideal Limited** distributors and merchants.

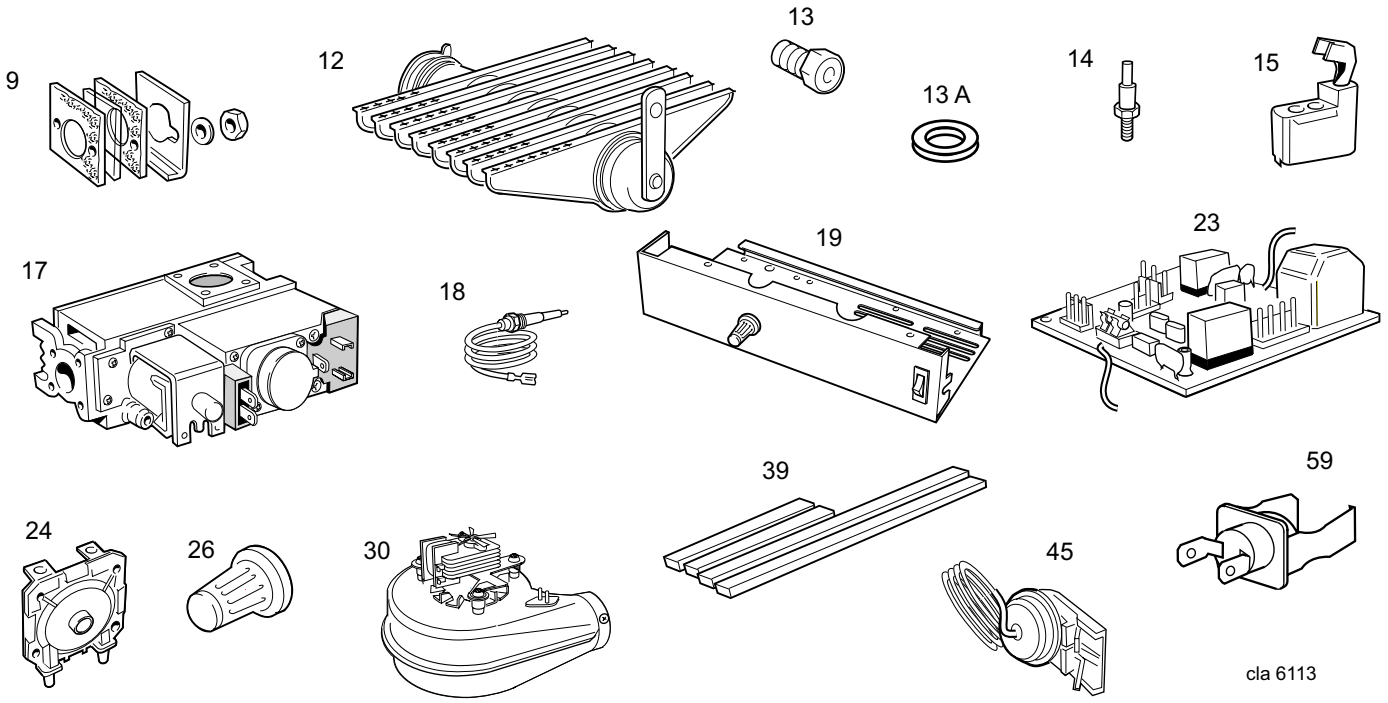
When ordering spares please quote:

1. Boiler Model
2. Appliance G.C. Number
3. Description
4. Quantity
5. Product Number

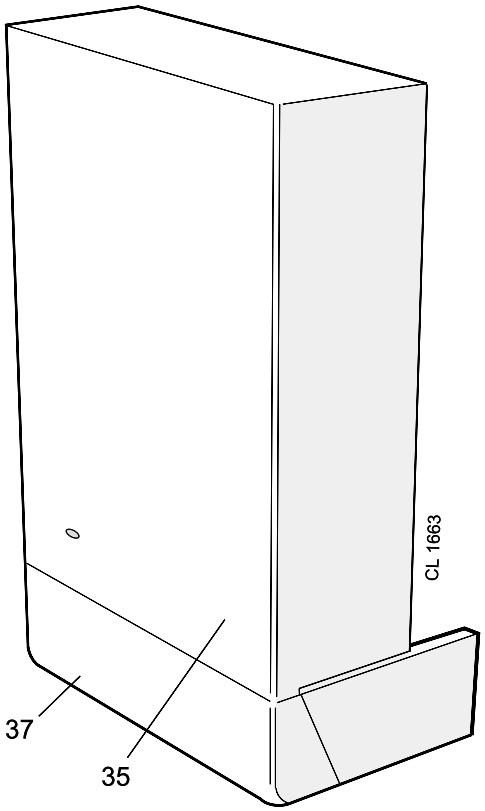
When replacing any part on this appliance use only spare parts that you can be assured conform to the safety and performance specification that we require. Do not use reconditioned or copy parts that have not been clearly authorised by **Ideal Boilers.**

Key No.	GC Part No.	Description	Qty.	Product No.
9	E83-619	Sightglass assembly kit	1	171 414
12		Main burner		
		FF 330 & FF 340	1	171 012
		FF 350 & FF 360	1	171 013
		FF 370, FF 380 & FF 3100	1	171 416
13		Main burner injector		
	E85-308	FF 330	1	171 424
	E83-624	FF 340	1	171 425
	E83-625	FF 350		171 426
	E83-626	FF 360	1	171 427
	E87-010	FF 370	1	171 428
	E87-013	FF 380	1	171 429
	E87-016	FF 3100	1	171 430
		Pilot burner injector:		
14	E83-627	FF 330-380	1	171 434
	E80-493	FF 3100	1	171 435
15		Pilot burner head Q359A with:		
	E83-630	injector FF 330-380	1	171 438
	E87-018	injector FF 3100	1	171 439
17	E83-633	Gas valve kit	1	171 441
18	308 549	Ignition electrode complete with lead and backnut 410 mm lg.	1	171 442
19		Control box assembly, including PCB	1	171 894
23		Automatic ignition printed circuit board	1	171 450
24	E83-653	Pressure switch:	1	171 454
26	308 283	Thermostat knob	1	171 929
30		Fan assembly:		
	E83-665	FF 330-380	1	171 461
	E87-032	FF 3100	1	171 462
35		Boiler casing assembly complete with sightglass assy, insulation and M5 x 16 dogpoint pozi pan hd:		
		FF 330-380	1	171 471
		FF 3100	1	171 472
37		Controls casing door with Lighting Instructions	1	171 475
39	E85-313	Casing seal pack complete with screws	1	171 479
45	E83-682	Overheat thermostat	1	171 950
59		Limit thermostat	1	173 353

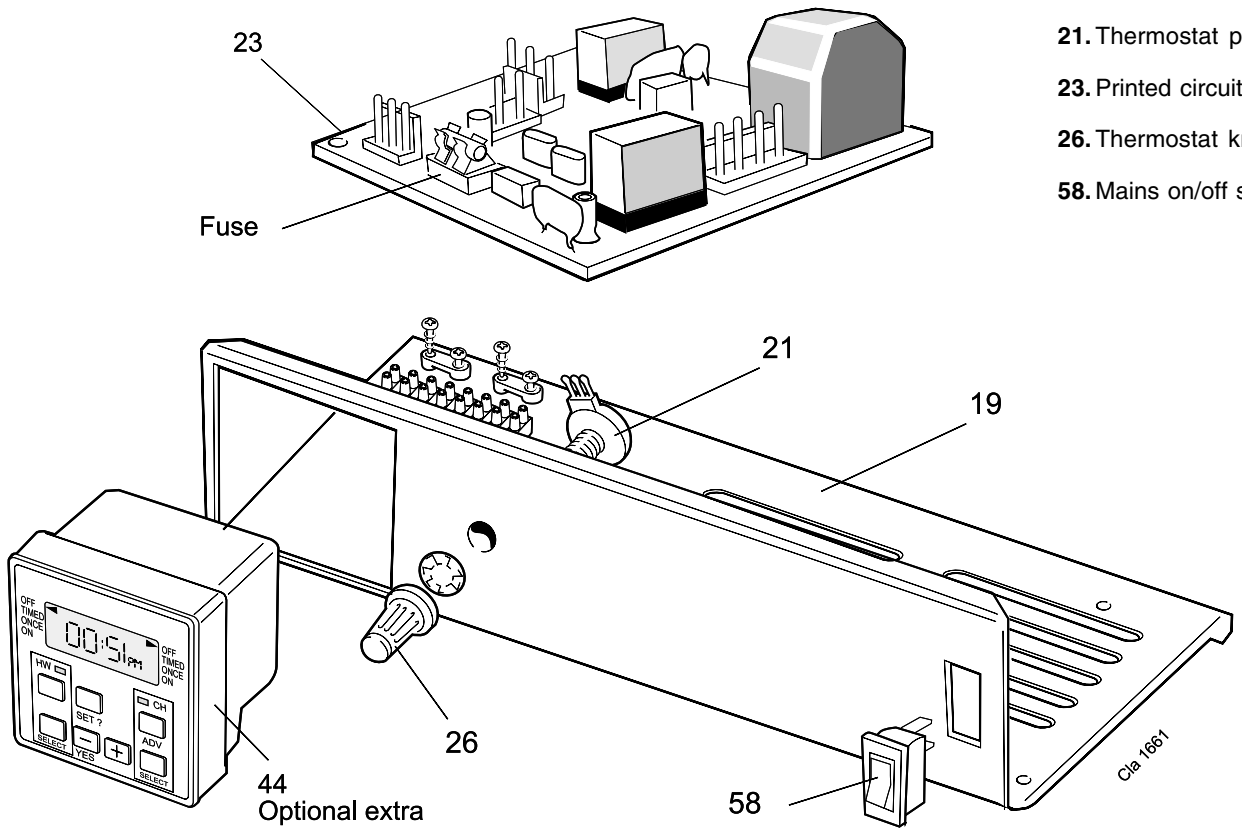
72 SHORT PARTS LIST



73 BOILER CASING ASSEMBLY



74 CONTROL BOX - Exploded View



LEGEND

19. Control box.

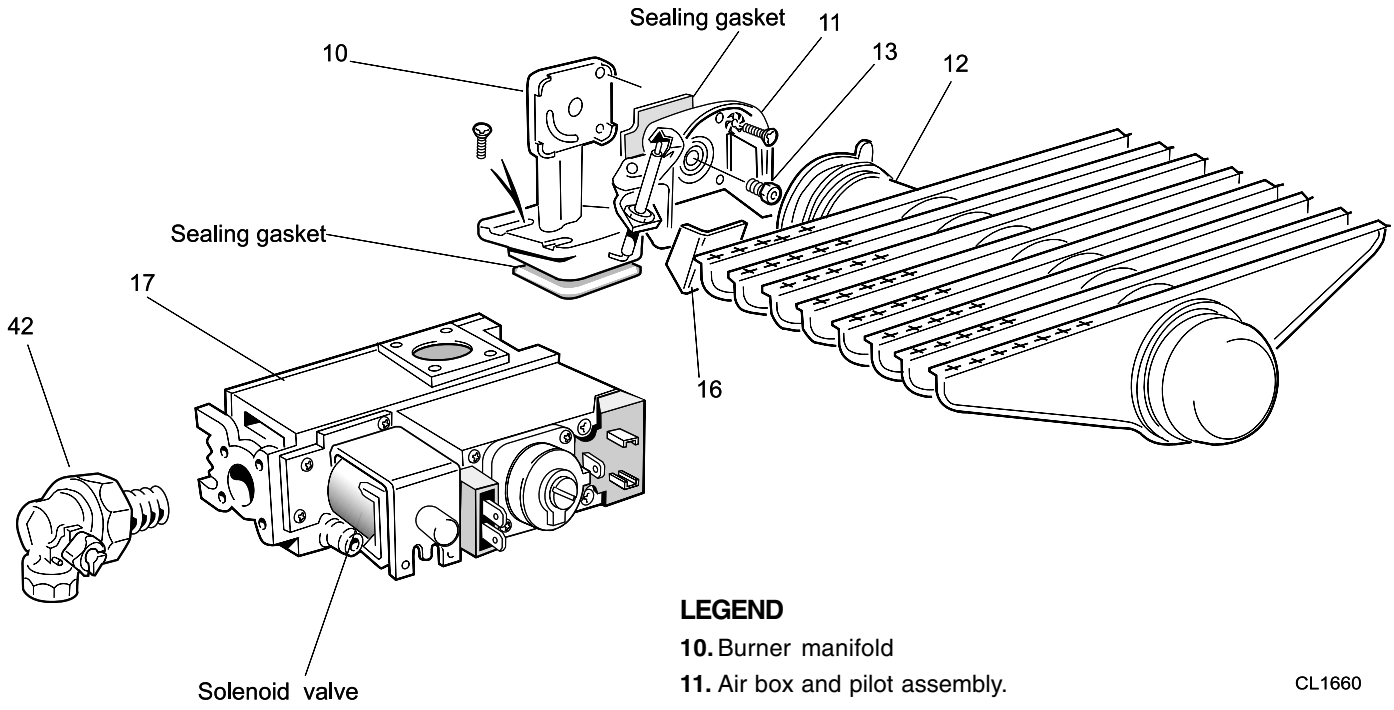
21. Thermostat potentiometer.

23. Printed circuit board.

26. Thermostat knob.

58. Mains on/off switch.

75 BURNER ASSEMBLY - Exploded View



LEGEND

10. Burner manifold

11. Air box and pilot assembly.

12. Main burner.

13. Main burner injector.

16. Pilot shield.

17. Gas control valve.

42. Gas service cock.

CL1660

NOTES

benchmark™

The code of practice for the installation, commissioning & servicing of central heating systems

Technical Training

The Ideal Boilers Technical Training Centre offers a series of first class training courses for domestic, commercial and industrial heating installers, engineers and system specifiers.
For details of courses please ring: 01482 498 432

CERTIFIED TO BRITISH STANDARDS BS6332 BS5258

THIS SYMBOL IS YOUR ASSURANCE OF QUALITY

These appliances are designed for use with Natural Gas only. They have been tested and conform with the provisions of BS. 6332 and BS. 5258.

CERTIFIED PRODUCT
Manufactured under a BS EN ISO 9001: 1994 Quality System accepted by BSI

Ideal Boilers, P.O. Box 103, National Ave, Kingston upon Hull, HU5 4JN. Telephone: 01482 492 251 Fax: 01482 448 858. Registration No. London 322 137.

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iIdeal BOILERS
ENGINEERED FOR PEACE OF MIND

December 2002 UIN 157018 A04

Caradon
Ideal Limited

Ideal Installer/Technical Helpline: 01482 498663

www.idealboilers.com

users guide

Classic

Your Ideal users guide

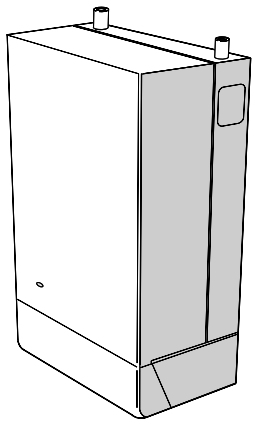
FF 330 - 3 100
FF 340 - 360 LF

When replacing a part on this appliance, use only spare parts that you can be assured conform to the safety and performance specification that we require. Do not use reconditioned or copy parts that have not been clearly authorised by Ideal Boilers.

Ideal BOILERS

ENGINEERED FOR PEACE OF MIND

Classic FF (Natural Gas Models Only)



Classic FF 330 ..... G.C. No. 41 391 54
Classic FF 340 ..... G.C. No. 41 391 95
Classic FF 350 ..... G.C. No. 41 391 96
Classic FF 360 ..... G.C. No. 41 391 97
Classic FF 370 ..... G.C. No. 41 391 98
Classic FF 380 ..... G.C. No. 41 391 99
Classic FF 3 100 ..... G.C. No. 41 392 01

Classic FF 340 LF ..... G.C. No. 41 392 90
Classic FF 350 LF ..... G.C. No. 41 392 91
Classic FF 360 LF ..... G.C. No. 41 392 92

Introduction

It is essential that the instructions in this booklet are strictly followed, for safe and economic operation of the boiler.

Current Gas Safety (Installation & Use) Regulations or rules in force.

In your own interest, and that of safety, it is the law that this boiler must be installed by a registered installer, in accordance with all national and local regulations.

Electricity Supply

This appliance must be efficiently earthed.

Supply: 230 V ~ 50 Hz. The fusing should be 3A.

Connection must be made in a way that allows complete isolation of the electrical supply such as a double pole switch having a 3mm (1/8") contact separation in both poles, or a plug and socket, serving only the boiler and system controls. The means of isolation must be accessible to the user after installation.

Important notes

a. *This appliance must not be operated without the casing correctly fitted and forming an adequate seal.*

b. *If the boiler is installed in a compartment then the compartment MUST NOT be used for storage purposes.*

c. *The ventilation provided for the boiler during installation MUST NOT be blocked, and a check should be made periodically that the ventilation areas are free from any obstruction.*

d. *If it is known or suspected that a fault exists on the boiler then it MUST NOT be used until the fault has been corrected by a CORGI registered installer.*

e. *Flammable materials must not be placed in close proximity to the appliance. Materials giving off flammable vapours must not be stored in the same room as the appliance.*

f. *Where the boiler is fitted with a Vertex flue system with a draught diverter in the loft the loft space MUST NOT be used as a dwelling area.*

g. *Under NO circumstances should any of the sealed components on this appliance be used incorrectly or tampered with.*

Minimum clearances

A clearance of 533mm (21") MUST be available at the front of the boiler for servicing.

The minimum clearances given below MUST be complied with in order to maintain the safe running of the boiler .

Above the boiler	100 mm	(4")
At each side of the boiler	5 mm	(1/4")
Underneath the boiler	100 mm	(4")
In front of the boiler	75 mm	(3")

To light the boiler. ***Refer to Frame 1***

If a programmer is fitted, refer to separate instructions for the programmer before continuing.

1. CHECK THAT THE ELECTRICITY SUPPLY TO THE BOILER IS OFF.

2. Open the controls access door by hinging downwards.

3. Ensure that the gas inlet cock (D) is OPEN.

4. Press the overheat reset button (E), located as shown in Frame 1.

5. Ensure that the mains on/off switch (C) is in the OFF position.

6. Switch ON the electricity supply to the boiler. Check that all external controls, e.g. room thermostat etc., are ON.

7. Turn the boiler thermostat knob (B) to position 6 and the mains on/off switch (C) to ON. After about 15 seconds the boiler will light automatically - this can be viewed through the sight glass (A).
Set the boiler thermostat to the desired position.

8. Close the controls access door.

CAUTION. To avoid the possibility of injury during the installation, servicing or cleaning of this appliance care should be taken when handling edges of sheet steel components

In **winter conditions**, i.e. central heating and domestic hot water, the thermostat should be set at position 5 or 6.

For **summer conditions**, i.e. domestic hot water only, the thermostat should be set at position 3.

These settings, however, are offered for general guidance only and other settings may be found preferable, dependent upon the type of system installed or as recommended by the installer.

Control of water temperature

1. Adjust the boiler thermostat (B) to give the required temperature of central heating.
2. The boiler thermostat automatically switches the main burner OFF and ON to maintain the selected temperature.

Approximate flow temperatures for the boiler thermostat settings are:

Knob Setting	Flow Temperature	
	°C	°F
1	56	133
2	61	142
3	66	152
4	72	161
5	77	170
6	82	180

To shut down the boiler

1. **For short periods**
   Turn the boiler on/off switch (C) to OFF.
   When heating is again required, restore the switch to ON.
2. **For longer periods**
   Turn the boiler ON/OFF switch (C) to OFF.
   Switch the electricity supply to OFF.

To relight the boiler

Repeat the procedure 1 - 8, detailed in 'To light the boiler'.

Frost protection

If no frost protection is provided and frost is likely during a short absence from home, leave the heating controls at a reduced temperature setting.

For longer periods, the entire system should be drained - including the domestic water supply. If the system includes a frost thermostat then, during cold weather, the boiler should be turned OFF at the time switch(es) ONLY. The mains supply should be left switched ON, with the boiler thermostat left in the normal running position.

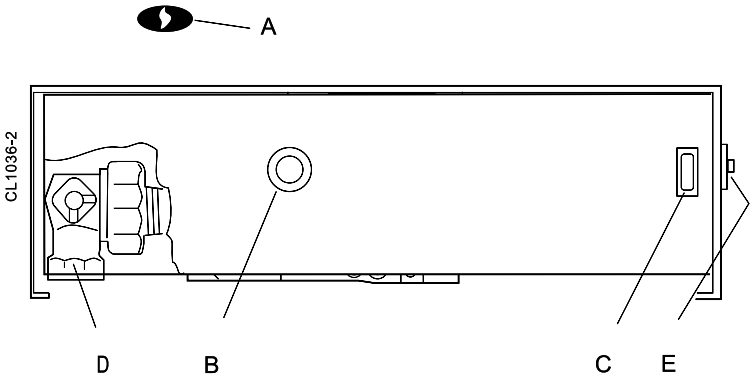
Boiler Overheat Thermostat

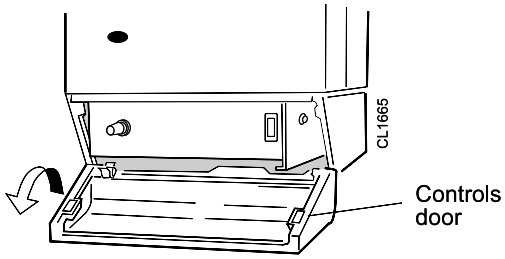
The boiler is fitted with a safety 'cutout' thermostat. This will shut down the boiler in the event of overheating. Should this occur allow the boiler to cool, press the reset button (E) then relight as detailed in steps 1-8 in 'To light the boiler'.

If the cutout condition still persists turn off the boiler and consult a CORGI registered installer.

1 BOILER CONTROLS

View inside boiler controls area





LEGEND

- **A** Sightglass.
- **B** Thermostat knob.
- **C** Mains on/off switch.
- **D** Gas service cock (shown in the OPEN position).
- **E** Overheat thermostat reset button.

All CORGI registered installers carry a CORGI ID card, and have a registration number. Both should be recorded in your **Benchmark** Log Book. You can check your installer by calling CORGI direct on 01563 72300

THE LOG BOOK SHOULD BE COMPLETED AFTER EACH SERVICE AND KEPT WITH THESE INSTRUCTIONS

Loss of system water pressure

Boilers fitted with Classic Sealed System Units only

If the red arrow on the unit pressure gauge is set above zero and the system pressure is seen to fall below this value over a period of time then a water leak is indicated. In this event a CORGI registered installer should be consulted.

DO NOT OPERATE THE BOILER IF THE PRESSURE HAS REDUCED TO ZERO FROM THE ORIGINAL SETTING.

Escape of gas

Should a gas leak be suspected, contact your local gas supplier without delay.

Do NOT search for gas leaks with a naked flame.

Cleaning

For normal cleaning simply dust with a dry cloth.
To remove stubborn marks and stains, wipe with a damp cloth and finish off with a dry cloth.

Do NOT use abrasive cleaning materials.

Maintenance

The appliance should be serviced at least once a year by a CORGI registered installer.

benchmark™

The code of practice for the installation, commissioning & servicing of central heating systems

Caradon Ideal Limited is a member of the Benchmark initiative and fully supports the aims of the programme. Benchmark has been introduced to improve the standards of installation and commissioning of central heating systems in the UK and to encourage the regular servicing of all central heating systems to ensure safety and efficiency.

CERTIFIED TO BRITISH STANDARDS BS6332 BS5258

THIS SYMBOL IS YOUR ASSURANCE OF QUALITY

These appliances are designed for use with Natural Gas only. They have been tested and conform with the provisions of BS. 6332 and BS. 5258.

Natural Gas appliances are service listed by British Gas

CERTIFIED PRODUCT
Manufactured under a BS EN ISO 9001:1994 Quality System accepted by BSI.

Ideal Boilers, P.O. Box 103, National Ave., Kingston upon Hull, HU5 4JN. Telephone: 01482 492 251.
Fax: 01482 448 858.
Registration No. London 322 137.

Caradon Ideal Limited pursues a policy of continuing improvement in the design and performance of its products. The right is therefore reserved to vary specification without notice.

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BOILERS Ideal
ENGINEERED FOR PEACE OF MIND

Aug 2001 UIN 157 019 A01

Caradon
Ideal Limited

Ideal Consumer Helpline Tel: 01482 498 660

www.idealboilers.com

installation and servicing

Classic

Your Ideal installation and servicing guide

FF 340 - 360LF

When replacing any part on this appliance, use only spare parts that you can be assured conform to the safety and performance specification that we require. Do not use reconditioned or copy parts that have not been clearly authorised by Ideal Boilers.

Ideal BOILERS

ENGINEERED FOR PEACE OF MIND

GENERAL DATA

Table 1 - General Data

Boiler Size			**FF 340 LF**	**FF 350 LF**	**FF 360 LF**
Gas supply connection		(in. BSP)	Rc 1/2 (1/2) 1/2" (BSP Female)		
Flow connection			22mm copper		
Return connection			22mm copper		
Maximum static water head		m (ft.)	30.5 (100)		
Minimum static water head		m (ft.)	0.45 (1.5)		
Electrical supply			230 V 50 Hz Boiler power consumption; 100W		
Fuse rating			External; 3A Internal; F1A to BS.4265		
Water content		litre (gal.)	2.7 (0.6)	3.65 (0.8)	3.65 (0.8)
Dry Weight		kg (lb)	40.9 (90.3)	46.6 (102.8)	46.6 (102.8)
Maximum installation weight		kg (lb)	31.4 (69.3)	46.6 (102.8)	46.6 (102.8)
Boiler size	Height	mm (in.)	700 (27.5)		
	Width	mm (in.)	380 (15.0)		
	Depth	mm (in.)	300 (11.8)		
Flue duct diameter		mm (in.)	100 (4.0)		
Flue duct length (max)		m (ft)	4.5 (14.7)		

Table 2 - Performance Data

Boiler Size			**FF 340 LF**	**FF 350 LF**	**FF 360 LF**
Boiler input		kW	14.5	17.85	21.9
		Btu/h x 1000	49.3	61.0	74.7
	Gas consumption	l/s	0.375	0.45	0.567
		ft^3/h	47.5	58.7	72.0
Boiler output		kW	11.7	14.7	17.6
		Btu/h x 1000	40	50	60
Burner Setting pressure (HOT)		mbar (in.w.g.)	11.0 (4.4)	12.7 (5.0)	13.7 (5.5)
Seasonal Efficiency (SEDBUK) *		Band D	[79.1]%	[78.4]%	[79.0]%

* The value is used in the UK Government's Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated have been certified by a notified body.

Note. *Gas consumption is calculated using a calorific value of 38.7 MJ/m^3 (1038 Btu/ft^3) gross or 34.9 MJ/m^3 (935 Btu/ft^3) nett*

To obtain the gas consumption at a different calorific value:-

a. FOR L/S *- divide the gross heat input (kW) by the gross C.V. of the gas (MJ/m^3)*

b. FOR FT^3/H *- divide the gross heat input (Btu/h) by the gross C.V. of the gas (Btu/ft^3)*

Classic FF LF Natural Gas only

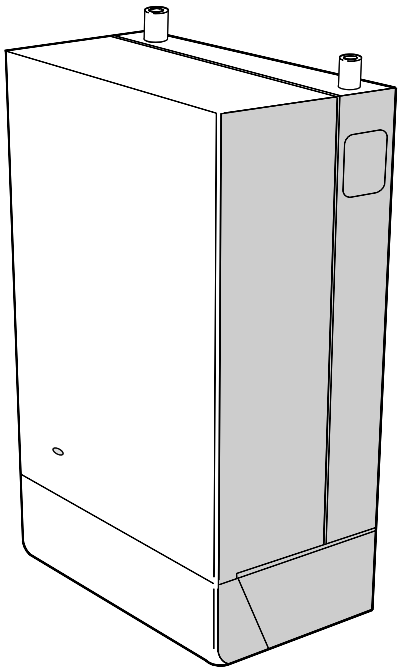
B.G. Certified - P.I. No. 87 AP 107 94

Data Badge: on top of the controls support

Destination Countries: GB and IE

Appliance type: C_{12}

Models	G.C. Appliance No.
Classic FF 340 LF	41 392 90
Classic FF 350 LF	41 392 91
Classic FF 360 LF	41 392 92



Key to symbols

I E = Ireland

G B = United Kingdom (Countries of destination)

PMS = Maximum operating pressure of water

C_{12} =

A room sealed appliance designed for connection via ducts to a horizontal terminal, which admits fresh air to the burner and discharges the products of combustion to the outside through orifices which, in this case, are concentric. The fan is down stream of the combustion chamber.

I_{2H} = An appliance designed for use on 2nd Family gas, Group H only.

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BENCHMARK LOG BOOK DETAILS

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Make and model	3
Appliance Serial No. on Data Badge	11
Controls	as applicable
For all boilers	
Flushing to BS.7593	7
Inhibitor	7
Gas inlet working pressure	6
Burner operating pressure	2
Heat input	to be calculated
Temperature differential	measure and record
For combination boilers only	Not applicable
For domestic hot water mode	Not applicable
For condensing boilers	Not applicable

For all boilers: *complete, sign & hand over to customer*

For assistance see Technical Helpline on the back page

CAUTION. To avoid the possibility of injury during the installation, servicing or cleaning of this appliance, care should be taken when handling edges of sheet steel components

INTRODUCTION

The Classic FF340-360 LF are automatically fully controlled, wall mounted, fanned gas boilers.

The heat exchanger is cast iron. The boiler casing is of white enamelled mild steel.

The boiler casing has a removable controls pod containing a drop-down door. The boiler thermostat is located behind the drop-down door.

Note. *These boilers cannot be used on systems which include gravity circulation.* If gravity circulation is required the **Classic RS** range of boilers is suitable.

See Frame 1 for details of the correct boiler tappings to use.

The boiler is supplied with a standard flue kit suitable for rear or side outlet applications from 2.5m (98 1/2") to 4.5m (176") with the necessary extension ducts.

The boilers are suitable for connection to the following open vented or sealed systems:

- Fully pumped CH and indirect DHW
- Pumped heating only.
- Pumped indirect DHW only.

OPTIONAL EXTRA KITS

Downward Piping Kit.

Programmer Kit.

90° Flue Elbow Kit

Ideal Sealed System Unit - this fits on top of the appliance. Suitable for standard boiler only.

Extension ducts - up to 4.5m (176").

Turret Outlet Kit.

Current Gas Safety (Installation and Use) Regulations or rules in force.

It is law that **all** gas appliances are installed by a CORGI registered installer in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution. It is in your own interest, and that of safety, to ensure the law is complied with.

The installation of the boiler MUST also be in accordance with the latest I.E.E (BS.7671) Wiring Regulations, local building regulations, bylaws of the local water authority, the Building Regulations and Building Standards (Scotland) and any relevant requirements of the local authority. Detailed recommendations are contained in the following British Standard Codes of Practice:

BS.6891 Low pressure installation pipes.

BS.6798 Installation of gas fired hot water boilers of rated input not exceeding 60 kW.

BS.5449 Forced circulation hot water systems.

BS.5546 Installation of gas hot water supplies for domestic purposes (2nd Family Gases).

BS.7593 Treatment of water in domestic hot water central heating systems.

BS.5440.1 Flues for gas appliances of rated input not exceeding 60 kW.

BS.5440.2 Ventilation for gas appliances of rated input not exceeding 60 kW.

Health & Safety Document No. 635

The Electricity at Work Regulations, 1989.

Manufacturer's notes must NOT be taken in any way as overriding statutory obligations.

IMPORTANT. These appliances are certificated by the British Standards Institution for safety and performance. It is, therefore, important that no external control devices, e.g. flue dampers, economisers etc., are directly connected to these appliances - unless covered by these Installation and Servicing instructions or otherwise recommended by **Caradon Ideal Limited** in writing. If in doubt please enquire.

Any direct reconnection of a control device not approved by **Caradon Ideal Limited** could invalidate the BSI Certification and the normal appliance warranty. It could also infringe the Gas Safety Regulations and the above regulations.

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 this boiler.

LOCATION OF BOILER

The boiler must be installed on a flat and vertical wall, capable of adequately supporting the weight of the boiler and any ancillary equipment.

The boiler may be fitted on a combustible wall and insulation between the wall and the boiler is not necessary - unless required by the local authority. **The boiler must not be fitted outside.**

Timber Framed Buildings

If the boiler is to be fitted in a timber framed building it should be fitted in accordance with the Institute of Gas Engineering document IGE/UP/7:1998.

Bathrooms

This range of appliances is rated **IP 1XB.**

The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current I.E.E. (BS.7671) Wiring Regulations and, in Scotland, the electrical provisions of the building regulations applicable in Scotland with respect to the installation of the boiler in a room or internal space containing a bath or shower.

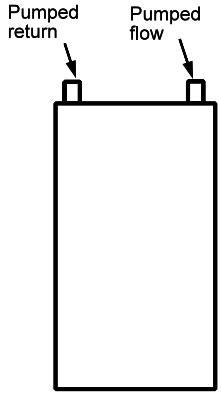
If the appliance is to be installed in a room containing a bath or shower then, providing water jets are not going to be used for cleaning purposes (such as communal baths/showers), the appliance can be installed in Zone 3, as detailed in BS.7671.

Where installation will be in an unusual location, special procedures may be necessary and BS.6798 gives detailed guidance on this aspect.....*continued on page 6*

NOTE TO THE INSTALLER: LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER. ALSO COMPLETE THE BENCHMARK LOG BOOK AND GIVE THIS TO THE CUSTOMER.

1 BOILER WATER CONNECTIONS

This appliance in NOT suitable for use in a direct hot water system or for gravity circulation.



2 BOILER CLEARANCES

The following minimum clearances must be maintained for operation and servicing.

Additional space will be required for installation, depending upon site conditions.

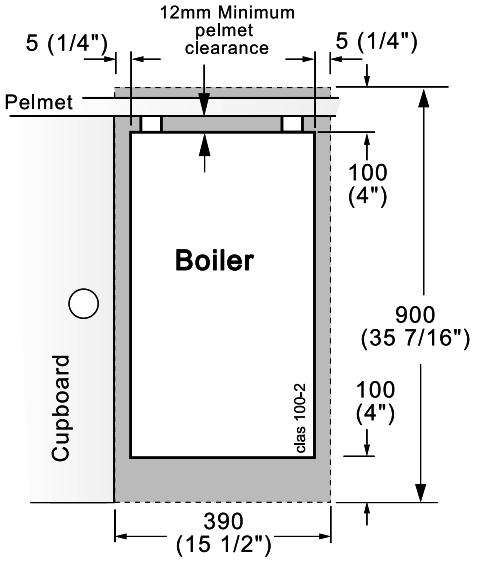
Side and Rear Flue

a. Provided that the flue hole is cut accurately, e.g. with a core drill, the flue can be installed from inside the building.

Installation from inside ONLY

b. If a core boring tool is to be used inside the building; the space in which the boiler is to be installed must be at least wide enough to accommodate the tool.

c. If using the Complete Sealed System Unit then refer to the instructions packed with the unit for the necessary clearances.



Front clearance: 533mm (21") from the front of the boiler casing.

Minimum front clearance when built in to cupboard is 75 mm (3").

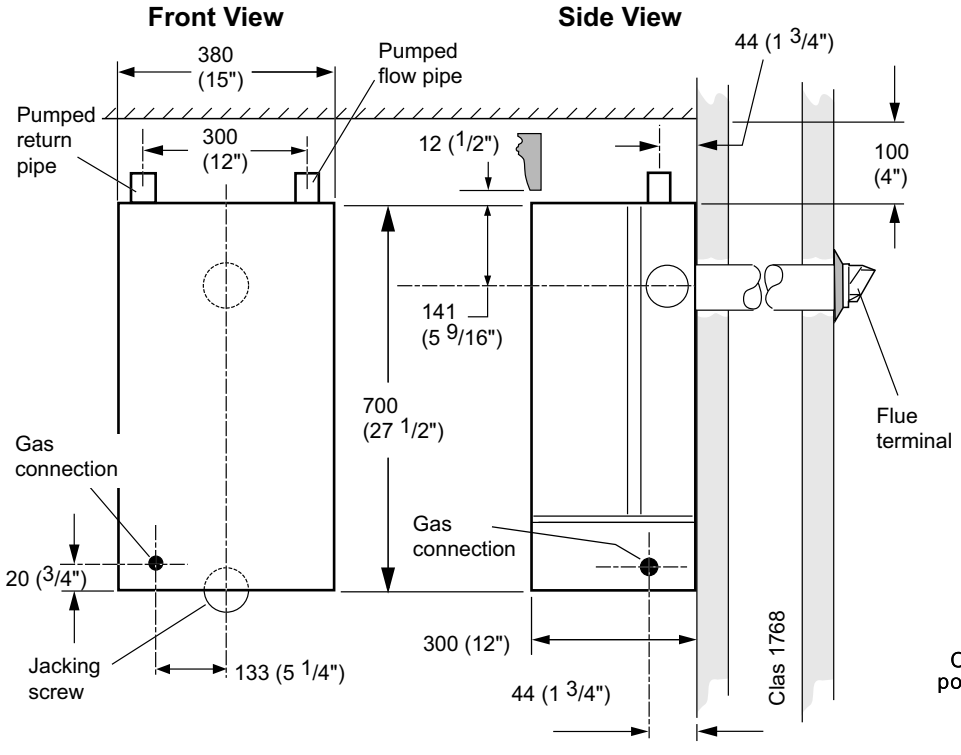
Pelmet restrictions.

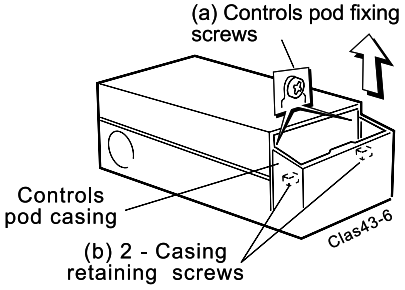
If the ability to fit or remove the casing during installation and subsequent servicing is impaired by pelmets etc. this operation can be made easier by first removing the controls pod casing in line with the following instructions:

a. Release the controls pod casing fixing screws (a) 3 full turns only. Remove the pod by pulling it forward to disengage from the keyhole slots.

b. Undo the 2 screws (b) retaining casing to the back panel.

c. The casing can now be removed in the direction of the arrow, first lifting the casing slightly to disengage the casing top return from the back panel. (For this purpose a minimum clearance of 12mm is required between the top of the boiler and pelmet or other similar obstruction.





Compartment Installations

A compartment used to enclose the boiler MUST be designed and constructed specially for this purpose.
An existing cupboard or compartment may be used, provided it is modified for the purpose.

In both cases details of essential features of cupboards/compartment design, including airing cupboard installation, are to conform to the following :

- BS. 6798.
- The position selected for installation MUST allow adequate space for servicing in front of the boiler and for air circulation around the boiler. Refer to 'Air Supply' on page 7.
- For the minimum clearances required for safety and subsequent service refer to the wall-mounting diagram, Frame 2. In addition, sufficient space may be required to allow lifting access to the wall mounting plate.

GAS SUPPLY

The local 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 local gas supplier.

The boiler is to be installed only on a gas supply with a governed meter.

A gas meter can only be connected by the local gas supplier or by a local regional contractor.

An existing meter should be checked, preferably by the gas supplier, to ensure that the meter is adequate to deal with the rate of gas supply required. A MINIMUM pressure of 20 mbar MUST be available at the boiler inlet with the boiler operating.

Installation pipes MUST be fitted in accordance with BS. 6891. Pipework from the meter to the boiler MUST be of an adequate size.

The complete installation MUST be tested for gas soundness and purged as described in the above code.

FLUE INSTALLATION

Pluming may occur at the terminal so terminal positions which would cause a nuisance should be avoided.

The flue must be installed in accordance with the recommendations of BS.5440-1: 2000.

The following notes are intended for general guidance:-

1. The boiler MUST be installed so that the terminal is exposed to external air.

2. It is important that the position of the terminal allows the free passage of air across it at all times.

3. Minimum acceptable spacing from the terminal to obstructions and ventilation openings are specified in Table 3.

4. Where the lowest part of the terminal is fitted less than 2m (6'6") above a balcony, above ground or above a flat roof to which people have access then the terminal MUST be protected by a purpose designed guard. The minimum spacing in Table 3, Nos. 2,3, 4, 5 and 6 would be 75mm in order to allow a terminal guard to be fitted.

Table 3 - Balanced flue terminal position
Approved Manufacturer's Clearances

Terminal Position	Minimum Spacing
1a. Directly BELOW an opening, air brick, opening window, etc.	300 mm (12")
1b. Directly ABOVE an opening, air brick, opening window, etc.	300 mm (12")
1c. HORIZONTALLY to an opening, air brick, opening window, etc.	300 mm (12")
2. Below guttering, drain pipes or soil pipes	25 mm (1")
3. Below eaves	25 mm (1")
4. Below balconies or a car port roof	25 mm (1")
5. From vertical drain pipes or soil pipes	25 mm (1")
6. From internal or external corners	25 mm (1")
7. Above adjacent ground, roof or balcony level	300 mm (12")
8. From a surface facing the terminal	600 mm (24")
9. From a terminal facing a terminal	1200 mm (48")
10. From an opening in a car port (e.g. door or window) into dwelling	1200 mm (48")
11. Vertically from a terminal on the same wall	1500 mm (60")
12. Horizontally from a terminal on the wall	300 mm (12")

Terminals guards are available from boiler suppliers - ask for TFC Flue Guard, Model K1. In case of difficulty seek advice from:

Grasslin (UK) Limited, Tower House,
Vale Rise, Tonbridge, Kent TN9 1TB
Telephone 01732 359 888.
Fax: 01732 354445
www.tfc-group.co.uk

Ensure that the guard is fitted centrally.

5. The flue assembly shall be so placed or shielded as to prevent ignition or damage to any part of any building.

6. The air inlet/products outlet duct and the terminal of the boiler MUST NOT be closer than 25mm (1") to combustible material. Detailed recommendations on the protection of combustible material are given in BS.5440-1:2000.

7. Where it is essential that the terminal wall plate is fitted, i.e. wall thicknesses over 600mm (23 1/2") or with an inaccurately cut hole, the minimum spacing in Table 3 Nos. 2,3, 4, 5 and 6 would be 60mm (2 1/2") in order to allow the terminal wall plate to be fitted.

IMPORTANT. It is absolutely ESSENTIAL to ensure, in practice, 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.

If this should occur, the appliance MUST be turned OFF, labelled 'unsafe' and corrective action taken.

TERMINAL

The terminal assembly can be adapted to accommodate various wall thicknesses. Refer to Frame 10.

AIR SUPPLY

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

1. It is NOT necessary to have a purpose provided air vent in the room or internal space in which the boiler is installed.
2. If the boiler is to be installed in a cupboard or compartment, permanent air vents are required (for cooling purposes) in the cupboard/compartment, at both high and low levels. The air vents must either communicate with room/internal space, or be direct to outside air. The minimum effective areas of the permanent air vents, required in the cupboard/compartment, are specified in Table 4 and are related to maximum rated heat input.
3. Both air vents MUST communicate with the same room or internal space or MUST be on the same wall to outside air.
4. In siting the air vents care must be taken to avoid the freezing of pipework.

Table 4 - High and low vent areas

Boiler	Air from room/internal space, cm (in^2)		Air direct from outside, cm (in^2)	
FF 340 LF	135	(21)	68	(11)
FF 350 LF	170	(26)	83	(11)
FF 360 LF	198	(31)	102	(16)

WATER CIRCULATION SYSTEM

The boiler must NOT be used for direct hot water supply. For the types of system and correct piping procedure refer to 'Introduction' and Frame 1.

The central heating system should be in accordance with BS.6798 and, in addition, for Smallbore and Microbore systems, BS. 5449.

The domestic hot water system, if applicable, should be in accordance with the relevant recommendations of BS. 5546. Copper tubing to BS. 2871:1 is recommended for water carrying pipework.

The hot water storage cylinder MUST be of the indirect type and should preferably be manufactured of copper.

Single feed, indirect cylinders are not recommended and MUST NOT be used on sealed systems.

The appliances are NOT suitable for gravity central heating, nor are they suitable for the provision of gravity domestic hot water.

The hot water cylinder and ancillary pipework, not forming part of the useful heating surface, should be lagged to prevent heat loss and any possible freezing - particularly where pipes run through roof spaces and ventilated under floor spaces.

Boilers not fitted to a sealed system must be vented.

IMPORTANT

A minimum length of 1m of copper pipe MUST be fitted to both flow and return connections from the boiler before connection to any plastic piping. **This applies to ALL types of installation.**

Draining taps MUST be located in accessible positions, which permit the draining of the whole system - including the boiler and hot water storage vessel. They should be at least 1/2" BSP nominal size and be in accordance with BS. 2879.

The boiler is fitted with a special drain plug, which is provided, to drain the BOILER ONLY, in the event of the system drain plug being unable to do so. The hydraulic resistance of the boilers, at MAXIMUM OUTPUT with an 11°C (20°F) temperature differential, are shown in Table 5.

Maximum boiler operating temperature should be 82 °C (180 °F).

Table 5 - Water flow rate and pressure loss

Boiler Size		FF 340 LF	FF 350 LF	FF 360 LF
Boiler	kW	11.7	14.7	17.6
Output	Btu/h x 1000	40	50	60
Water Flow	l/min	15.2	19.0	22.8
Rate	gal/h	200	250	300
Pressure	mbar	20.4	31.5	41.7
Loss	in wg	8.3	12.6	16.7

WATER TREATMENT

These boilers incorporate a cast iron heat exchanger. As part of the installation the central heating system should be thoroughly flushed with appropriate water treatment in order to comply with BS7593:1992.

Caradon Ideal Limited recommend the use of Fernox or G E Betz water treatment products which must be used in accordance with the manufacturers instructions. For further information contact:-

Fernox Manufacturing Co. Ltd, c/o Cookson Electronics, Forsyth Road, Sheerwater, Woking, Surrey. GU21 5RZ.. Tel. 01799 550811 *or*

Sentinel Division,G E Betz Ltd, Foundry Lane, Widnes, Cheshire, WA8 8UD. Tel. 0151 420 9563

IMPORTANT. Any other treatment for this product will render the guarantee of **Caradon Ideal Limited** INVALID.

Notes.

1. *If an inhibitor is used, and in hard water areas where treatment to prevent lime deposits is necessary, it is most important that the water treatment MUST be maintained at the correct concentrations recommended by the treatment manufacturer.*
2. *Artificially softened water must not be used in the system, under any circumstances.*

THERMOSTATIC RADIATOR VALVES

Caradon Ideal Limited recommend that heating systems utilising full thermostatic radiator valve control of temperature in individual rooms should also be fitted with a room thermostat controlling the temperature in a space served by radiators not fitted with such a valve as stated in BS. 5449.

When thermostatic radiator valves are used, the space heating temperature control over a living / dining area or hallway having a heating requirement of at least 10% of the boiler heat output should be achieved using a room thermostat, whilst other rooms are individually controlled by thermostatic radiator valves. However, if the system employs thermostatic radiator valves on all radiators, or two port valves without end switches, then a bypass must be fitted to ensure a flow of water should all valves be in the closed position.

ELECTRICAL SUPPLY

WARNING. The appliance MUST be efficiently earthed.
Wiring external to the appliance MUST be in accordance with the current I.E.E. (BS.7671) Wiring Regulations and any local regulations which apply.

The point of connection to the mains should be readily accessible and adjacent to the boiler, except that for bathroom installations; the point of connection to the mains MUST be situated outside of the bathroom.

Note. *Where a room sealed appliance is installed in a room containing a bath or shower then the appliance and any electrical switch or appliance control utilising mains electricity should be so situated that it cannot be touched by a person using the bath or shower. See Frame 39 for details.*

3 OPEN VENT SYSTEM REQUIREMENTS - FULLY PUMPED.

The system should be vented directly off the boiler flow pipe, as close to the boiler as possible. The cold feed entry should be inverted and MUST be positioned between the pump and the vent, and not more than 150mm (6") away from the vent connection.

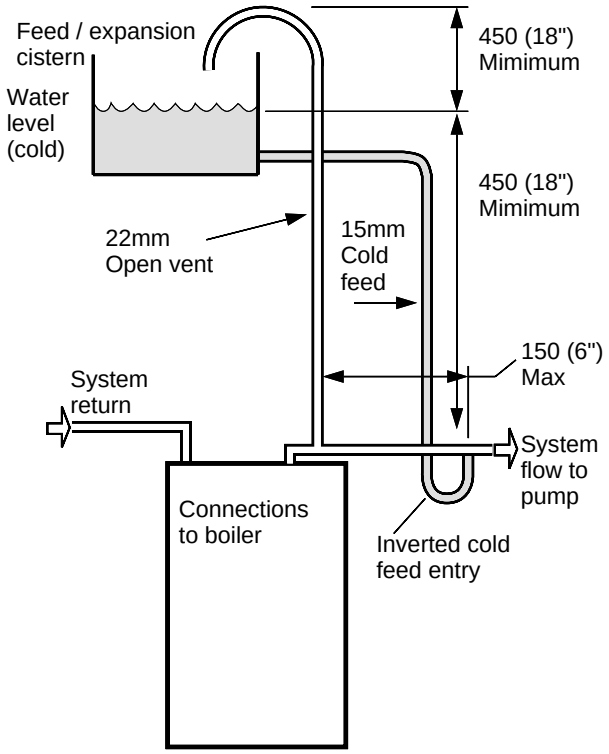
There should be a minimum height - 450mm (18") - of open vent above cistern water level. If this is impossible refer below.

The vertical distance between the highest point of the system and the feed/expansion cistern water level MUST not be less than 450mm (18").

The pump MUST be fitted on the flow side of the boiler.

A suitable pump is a domestic circulator capable of providing an 11°C (20°F) temperature differential (e.g. Grundfos UPS 15/50 or equivalent). The vertical distance between the pump and feed/expansion cistern MUST comply with the pump manufacturers minimum requirements to avoid cavitation. Should these conditions not apply, either lower the pump position or raise the cistern above the minimum requirement specified by **Caradon Ideal Limited.**

Note. *A cold water feed must be available back to the boiler, when all automatic valves are in the closed position (refer to BS. 6798) and when close coupled the feed must not be in a vertical leg.*



4 LOW HEAD INSTALLATIONS

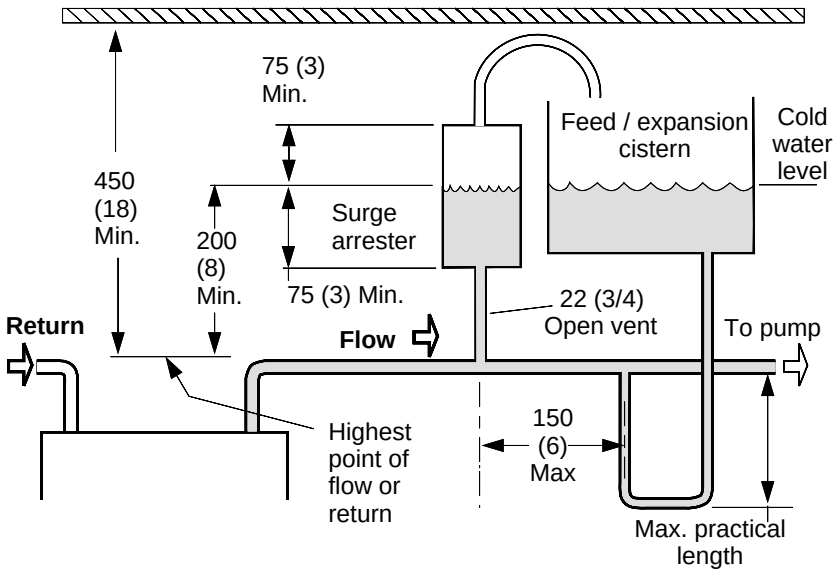
The **Classic** range of boilers can be installed in low head situations by fitting a 'surge arrester' in the expansion pipe as shown.

The following conditions MUST be observed:

1. The surge arrester must be at least 42mm in diameter x 150mm long, thus ensuring a MINIMUM air gap and a MINIMUM depth of water below the static water level (cold) of 75mm.
2. The static water level (cold) must be at least 200mm above the top of the horizontal flow pipe, fitted as shown. The vent connection MUST NOT be made immediately off the top of the boiler, as venting is made less efficient.
3. The maximum practical length of 15mm cold feed pipe should be used in order to reduce the effective volume of system water expanding into the feed/expansion cistern to a minimum.

Note. *The pump manufacturers minimum requirements must be complied with*

Minimum Requirements

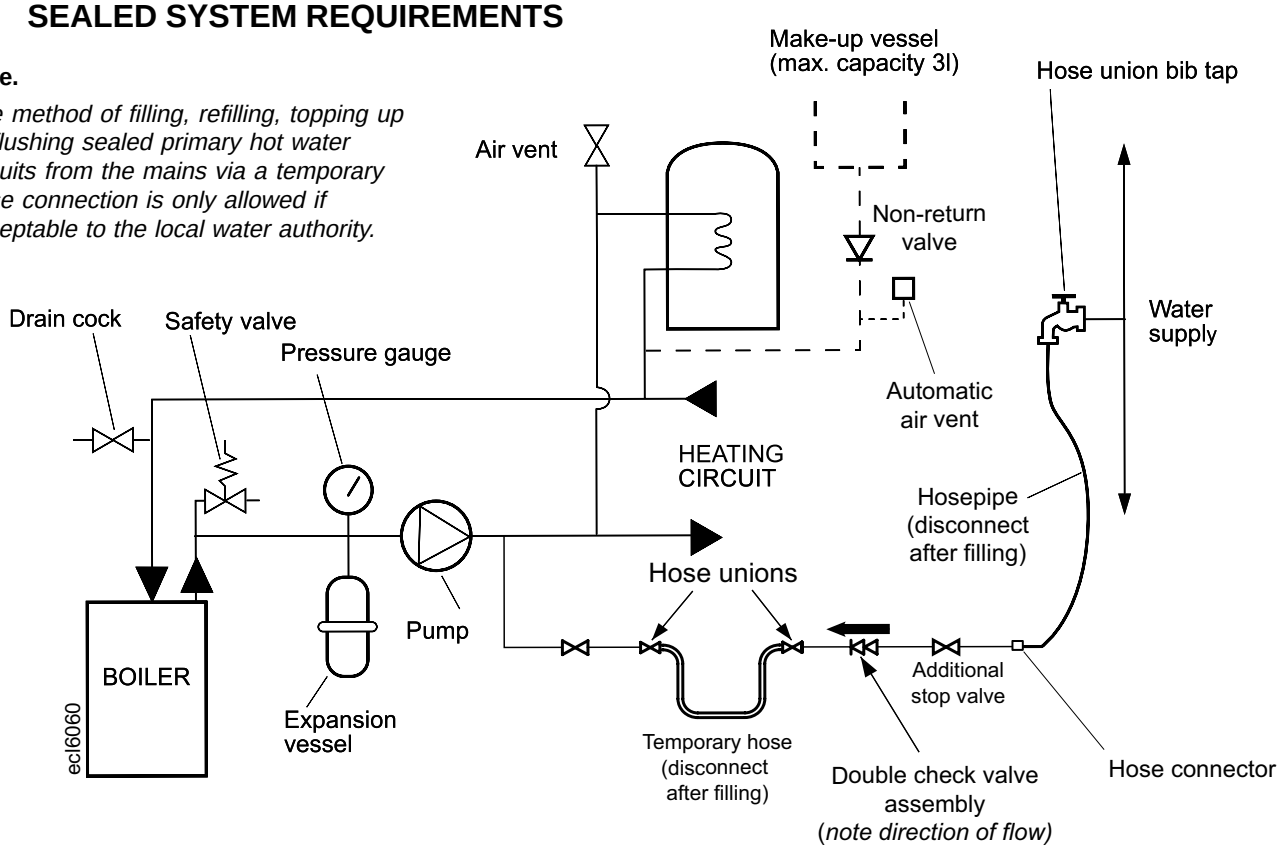


All dimensions in mm (in.). **N.B.** Imperial dimensions are approximate

5 SEALED SYSTEM REQUIREMENTS

Note.

The method of filling, refilling, topping up or flushing sealed primary hot water circuits from the mains via a temporary hose connection is only allowed if acceptable to the local water authority.



Note.

The method of filling, refilling, topping up or flushing sealed primary hot water circuits from the mains via a temporary hose connection is only allowed if acceptable to the local water authority.

1. General

a. The installation must comply with the requirements of BS.6798 and BS.5449.

b. The installation should be designed to work with flow temperatures of up to 82°C.

c. All components of the system, including the heat exchanger of the indirect cylinder, must be suitable for a working pressure of 3 bar (45 lb/in²) and temperature of 110°C. Care should be taken in making all connections so that the risk of leakage is minimised.

2. Safety Valve

A spring loaded safety valve complying with the relevant requirements of BS.6759 must be fitted in the flow pipe, as close to the boiler as possible and with no intervening valve or restriction. The valve should have the following features:

a. A non-adjustable preset lift pressure not exceeding 3 bar (45 lb./in²)

b. A manual testing device.

c. Provision for connection of a discharge pipe. *The valve or discharge pipe should be positioned so that the discharge of water or steam cannot create a hazard to the occupants of the premises or cause damage to electrical components and wiring.*

3. Pressure Gauge

A pressure gauge covering at least the range 0-4 bar (0-60lb./in²) must be fitted to the system. The gauge should be easily seen from the filling point and should preferably be connected at the same point as the expansion vessel.

4. Expansion Vessel

a. A diaphragm type expansion vessel must be connected at a point close to the inlet side of the pump, the connecting pipe being not less than 15mm (1/2" nominal) size and not incorporating valves of any sort.

b. The vessel capacity must be adequate to accept the expansion of the system water when heated to 110°C (230°F)

c. The charge pressure must not be less than the static water head above the vessel The pressure attained in the system when heated to 110°C (230°F) should be at least 0.35 bar (5lb/in²) less than the lift pressure of the safety valve.

For guidance on vessel sizing refer to Table 6, Frame 6. For further details refer to BS.5449 and the British Gas Corporation publication : Material and Installation Specifications for Domestic Central Heating & Hot Water.

5. Cylinder

The cylinder must be either of the indirect coil type or a direct cylinder fitted with an immersion calorifier which is suitable for operating on a gauge pressure of 0.35 bar (5lb./in²) in excess of the safety valve setting. *Single feed indirect cylinders are not suitable for sealed systems.*

6. Make-up Water

Provision must be made for replacing water loss from the system, either:

a. From a manually fitted make-up vessel with a readily visible water level. The vessel should be mounted at least 150mm (6") above the highest point of the system and be connected through a non-return valve to the system, fitted at least 300mm (12") below the make-up vessel on the return side of the domestic hot water cylinder or radiators.

b. Where access to a make-up vessel would be difficult by pre-pressurisation of the system. Refer to 'Filling.'

6 SEALED SYSTEM REQUIREMENTS - continued

7. Mains Connection

There must be no direct connection to the mains water supply or to the water storage tank supplying domestic water, even through a non-return valve, without the approval of the local water authority.

8. Filling

The system may be filled by one of the following methods:

a. Through a cistern, used for no other purposes, via a ball valve permanently connected directly to a service pipe and / or a cold water distributing pipe.

The static head available from the cistern should be adequate to provide the desired initial system design pressure. The cold feed pipe from the cistern should include a non-return valve and a stop valve with an automatic air vent connected between them, the stop valve being located between the system and the automatic air vent. The stop valve may remain open during normal operation of the system if automatic water make-up is required.

b. Through a self-contained unit comprising a cistern, pressure booster pump (if required) and, if necessary, an automatic pressure reducing valve and flow restrictor. The cistern should be supplied through a temporary connection from a service pipe or cold water distributing pipe.

This unit may remain permanently connected to the heating system to provide limited automatic water make-up. Where the temporary connection is supplied from a service pipe or distributing pipe which also supplies other draw-off points at a lower level then a double check valve shall be installed upstream of the draw-off point.

c. Through a temporary hose connection from a draw-off tap supplied from a service pipe under mains pressure. Where the mains pressure is excessive a pressure-reducing valve shall be used to facilitate filling.

The following fittings shall form a permanent part of the system and shall be fitted in the order stated:

A stop valve complying with the requirements of BS. 1010, Part 2 (the hose from the draw-off tap shall be connected to this fitting).

A test cock.

A double check valve of an approved type.

- Thoroughly flush out the whole of the system with cold water, without the pump in position.
- With the pump fitted, fill and vent the system until the pressure gauge registers 1.5 bar (21.5lb/in^2).

  Examine for leaks.
- Check the operation of the safety valve by manually raising the water pressure until the valve lifts. This should occur within ± 0.3 bar (± 4.3lb/in^2.) of the pre-set lift pressure.
- Release water from the system until the initial system design pressure is reached.
- Light the boiler and heat the system to the maximum working temperature. Examine for leaks.
- Turn off the boiler and drain the system while still hot.
- Refill and vent the system.

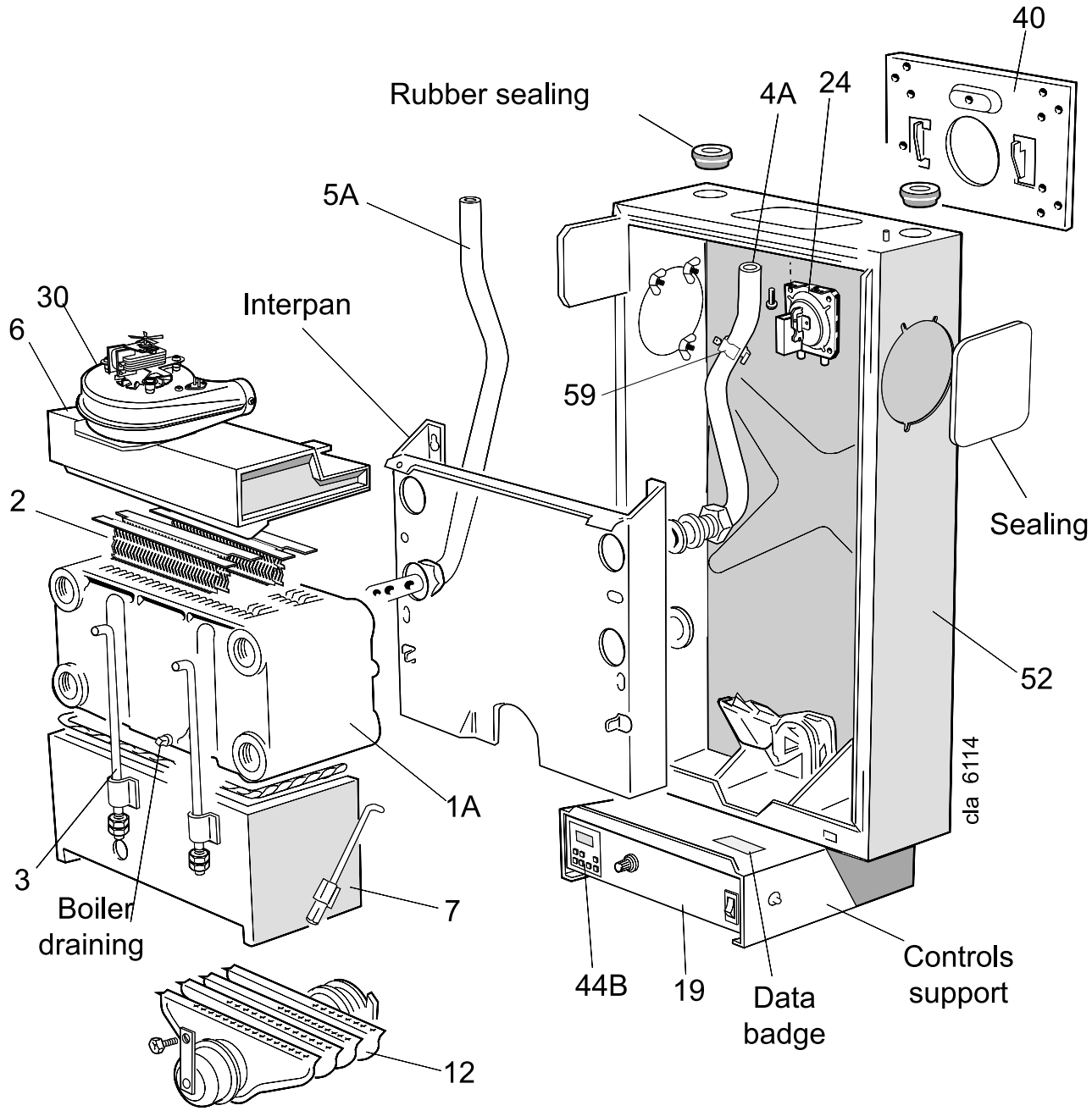
Sizing procedure for expansion vessels: The volume of the expansion vessel (litres) fitted to a sealed system shall not be less than that given by Table 6, multiplied by a factor of 0.8 (for flow temperatures of less than 88 °C).

Table 6

Safety valve setting	**3.0 bar**			**2.5 bar**			**2.0 bar**	
Vessel charge and initial system pressure	0.5 bar	1.0 bar	1.5 bar	0.5 bar	1.0 bar	1.5 bar	0.5 bar	1.0 bar
Total water content of system (litres)	**Expansion vessel volume (litres)**							
25	2.1	2.7	3.9	2.3	3.3	5.9	2.8	5.0
50	4.2	5.4	7.8	4.7	6.7	11.8	5.6	10.0
75	6.3	8.2	11.7	7.0	10.0	17.7	8.4	15.0
100	8.3	10.9	15.6	9.4	13.4	23.7	11.3	20.0
125	10.4	13.6	19.5	11.7	16.7	29.6	14.1	25.0
150	12.5	16.3	23.4	14.1	20.1	35.5	16.9	30.0
175	14.6	19.1	27.3	16.4	23.4	41.4	19.7	35.0
200	16.7	21.8	31.2	18.8	26.8	47.4	22.6	40.0
225	18.7	24.5	35.1	21.1	30.1	53.3	25.4	45.0
250	20.8	27.2	39.0	23.5	33.5	59.2	28.2	50.0
275	22.9	30.0	42.9	25.8	36.8	65.1	31.0	55.0
300	25.0	32.7	46.8	28.2	40.2	71.1	33.9	60.0
Multiplying factors for other system volumes	0.0833	0.109	0.156	0.094	0.134	0.237	0.113	0.20

7 BOILER ASSEMBLY - Exploded view

Classic FF 340 LF shown



LEGEND

1A. Heat exchanger.
2. Flue baffles.
3. Tie rods.
4A. Pumped flow pipe.
5A. Pumped return pipe.
6. Collector hood assembly.
7. Combustion chamber.
12. Main burner.
19. Control box .
24. Pressure switch.
30. Fan.
40. Wall mounting plate.
44B. Programmer (optional).
52. Back panel
59. Limit thermostat

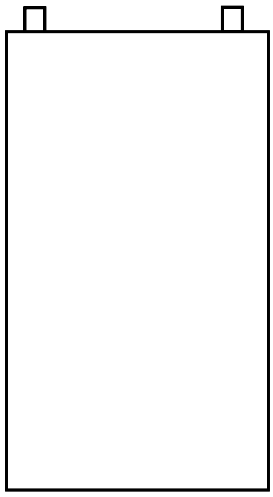
8 UNPACKING

The boiler is supplied fully assembled in **Pack A,** together with a standard flue assembly for rear or side flue outlet, in **Pack B.**

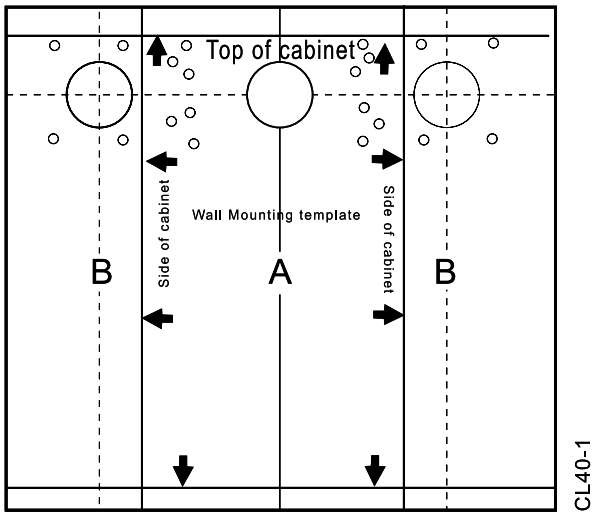
Unpack and check the contents.

Pack A Contents

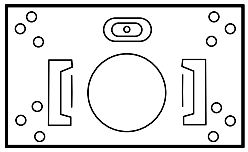
- The complete boiler
- Installation & Servicing Instructions
- User's Instructions
- Hardware Pack (listed below)
- Wall mounting template
- Wall mounting plate
- Side outlet terminal mounting plate
- Flue extension tube - 1 off
- Boiler sealing ring - 1 off



Complete boiler



Wall mounting template



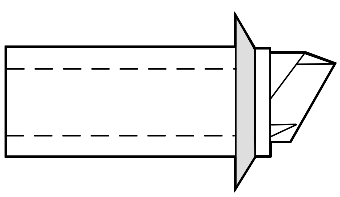
Wall mounting plate

Hardware Pack Contents

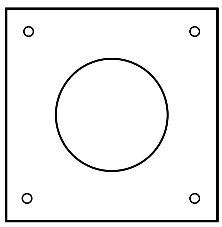
- 50mm x No. 14 wood screw, 4 off
- 50mm x No. 10 wood screw, 8 off
- Wall plug, 12 off
- M8 washer, 1 off
- M5 wing nut, 3 off
- Sealing plate, 1 off
- M8 x 12 Hx. Hd. screw, 1 off

Pack B Contents

- Duct cutting support, 2 off (cardboard)
- Terminal wall plate, 1 off.
- Terminal grille assy., 1 off.
- Polyurethane foam seal 400 lg., 1 off.
- No. 8 x 8 lg. Pozi pan hd. screws, 3 off.



Flue terminal



Terminal wall plate

9 PACKAGING AND CASING REMOVAL

1. Unpack the boiler.

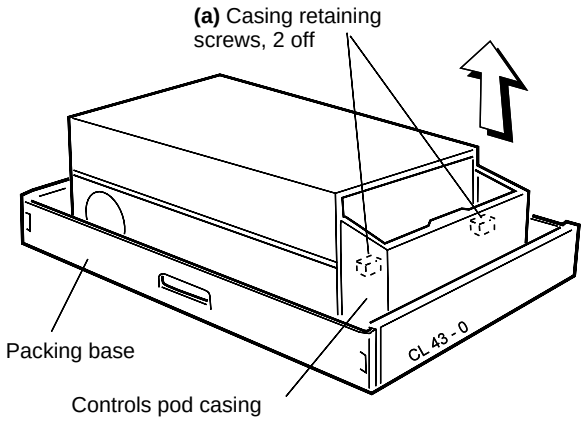
2. Remove the casing as follows and place to one side to avoid damage.

a. Undo the 2 casing retaining screws (a) retaining the casing to the back panel.

b. Swing the bottom of the boiler casing up until the controls pod casing has cleared the controls then unhook the top from the back panel.

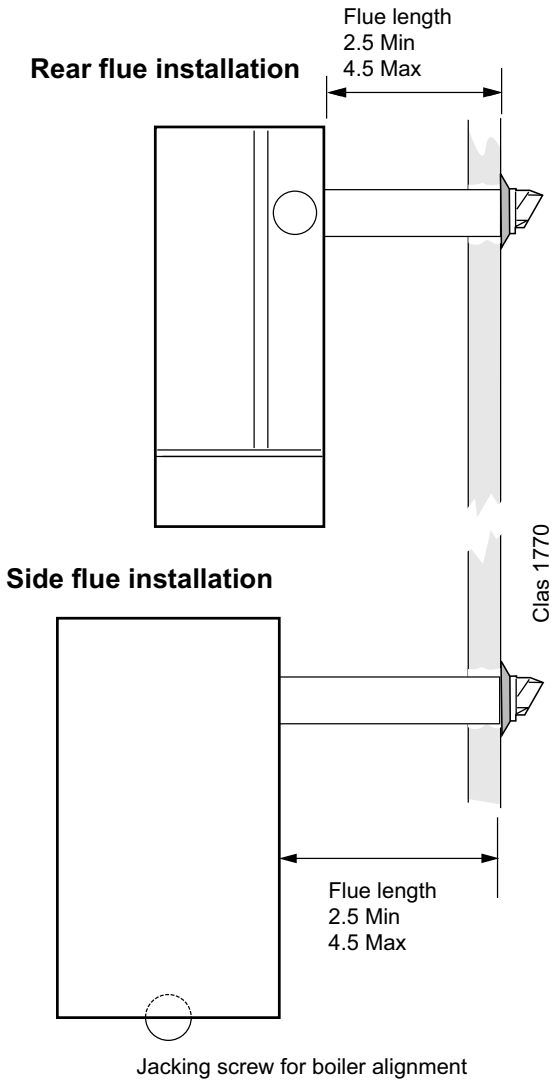
3. Remove the boiler from its packaging base. The boiler may now be stood upright on its controls support protection frame to ease handling and installation.

4. Unpack the boiler terminal box and, if applicable, the extension flue box(es).



10 DETERMINING THE FLUE LENGTH

It is MOST IMPORTANT that the boiler is installed in a vertical position.



FLUE KITS

Pack B: supplied as standard.

Pack D*: optional extension kit for side flue or rear flue outlet. Refer to Frame 34 'Flue Extension Ducts'

1. A maximum of 5 extension ducts (plus the standard flue duct) may be used together.

2. Flue extensions of greater than 1m (39") should be supported with the bracket provided. If the stand-off brackets have been used it is necessary, in order to keep the flue aligned, to use the spacer bracket with the support bracket.

Flue length mm	Accessories	Product No.
2500 to 3450	B Pack 1 off + D Pack, 3 off	150308+ 153883, 3 off
3450 to 4400	B Pack 1 off + D Pack, 4 off	150308+ 153883, 4 off
4400 to 4500	B Pack 1 off + D Pack, 5 off	150308+ 153883, 5 off

11 INSTALLING THE CONVERSION KIT

To convert your existing **Classic FF** into a **Classic FF LF** you will need the contents of the kit, detailed below:

Contents	UIN	No. off
Collector hood and restrictor plate assy. FF340 LF	157 066	1
Collector hood and restrictor plate assy. FF350 LF	157 874	1
Collector hood and restrictor plate assy. FF360 LF	157 882	1
M4 TapTite 10mm long	004059	3
M4 shakeproof washer	003040	3
Data plate Classic FF340 LF	156 997	1
Data plate Classic FF350 LF	157 878	1
Data plate Classic FF360 LF	157 886	1
Installation & Servicing Manual	157 026	1

To remove the original collector hood

1. Remove the 2 silicon rubber tubes from the fan sensing points.
2. Disconnect the fan leads.
3. Disconnect the silicon rubber tube from the rear of the collector hood.
4. Slacken the two M5 nuts on the front tie rods, releasing the tie rods from the combustion chamber.
5. Remove the M5 central fixing screw at the rear of the collector hood and remove collector hood / fan assembly.
6. Remove the three M4 screws (from the inside) retaining the fan to the collector hood.

   Keep the fan safe at one side and discard the old collector hood.

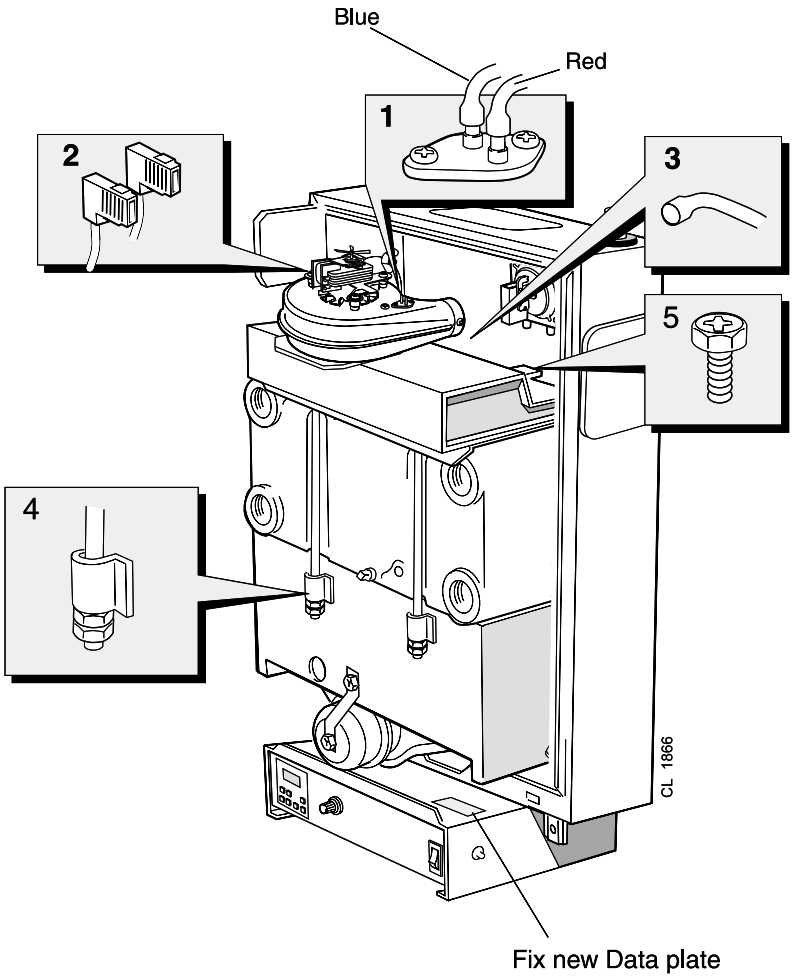
Installing the new collector hood

Fasten the fan with the 3 new screws and washers, provided, to the new collector hood assembly.

Assemble reverse order, ensuring the fan leads, and 3 sensing tubes are reconnected.

Affixing the data plate

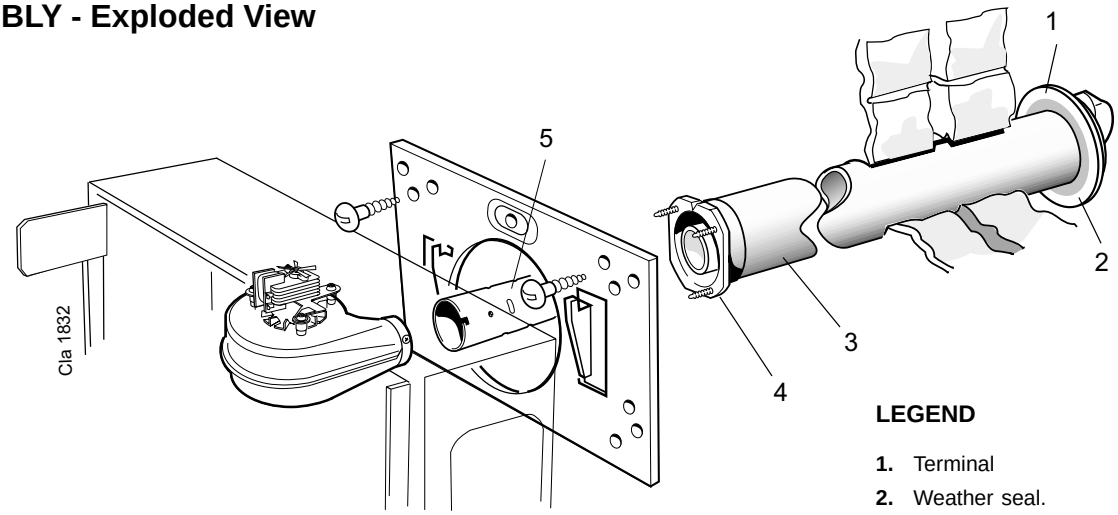
Before applying the data plate you must first cut it so that when it's applied over the original data plate the bottom line of information is still showing. Once cut, peel off the back to show the adhesive side and carefully stick over the original data plate (on top of the controls support; see below).



12 FLUE ASSEMBLY - Exploded View

1. An optional flue duct extension kit is required for wall thicknesses greater than 600mm (23 1/2") Refer to Frame 10.

2. When cutting the ducts, always use the cardboard support rings provided.



LEGEND

1. Terminal
2. Weather seal.
3. Flue assembly
4. Boiler sealing ring
5. Flue extension tube

13 WALL MOUNTING TEMPLATE

Note. *The template shows the positions for the fixing holes and the flue hole centres for standard installation. Care must be taken to ensure the correct holes are drilled.*

1. Separate the templates.

2. Tape the templates into the selected position.

3. Ensure squareness by hanging a plumb line as shown.

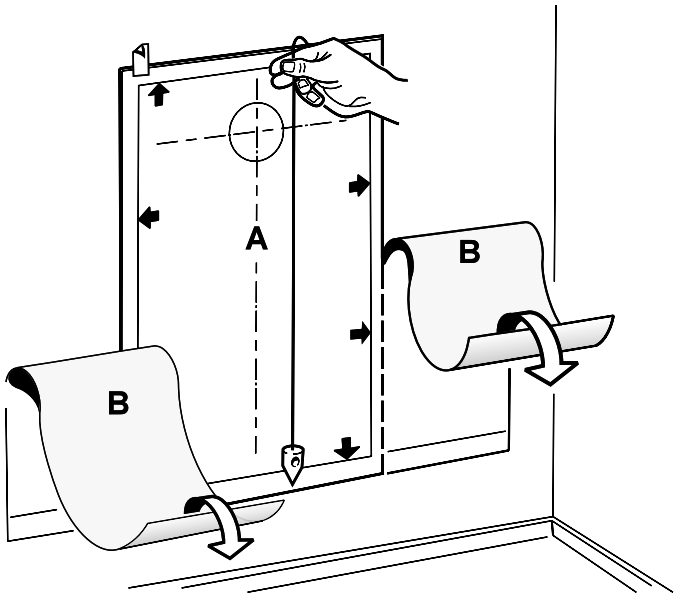
4. Mark onto the wall (if required) the following:

a. The wall mounting plate screw positions (choose one from each group). **Note.** *Mark the centre of the flue hole as well as the circumference.*

b. The position of the flue duct hole.

c. Downward pipe routing bracket screw positions.

5. Remove the templates from the wall.



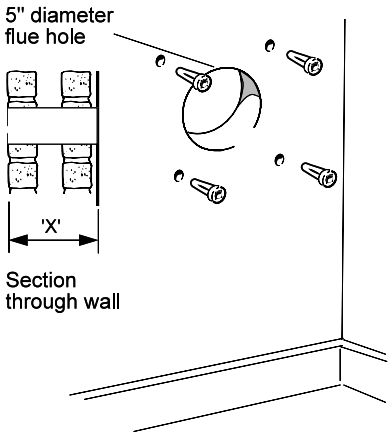
14 PREPARING THE WALL

IMPORTANT. Ensure that, during the cutting operation, masonry falling outside of the building does not cause damage or personal injury.

1. Cut the flue hole, preferably with a 125mm (5") core boring tool, ensuring that the hole is square to the wall. If the hole has been quite accurately cut with a drill then making good the wall faces is not essential as seals are provided at both ends of the flue. However, both wall faces immediately around the cut hole should be flat; make good if necessary. For less accurate holes make good to approximately 125mm (5") diameter at the two wall faces.

2. Drill 4 holes for the wall mounting plate with an 8mm (5/16") masonry drill. If the stand-off brackets are used ensure the correct holes are chosen.

3. Insert the plastic plugs provided.



Note. *Check all of the hole positions BEFORE drilling*

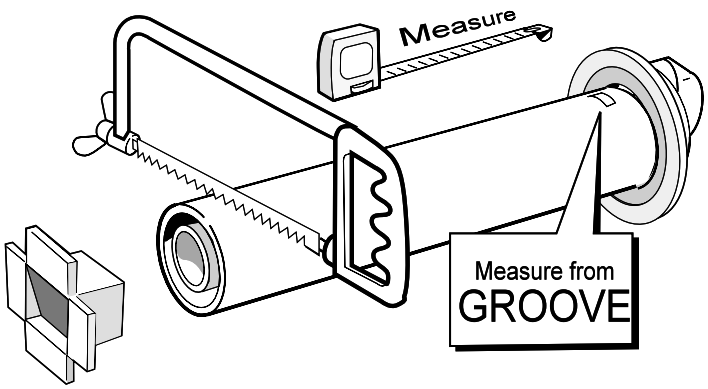
Note. *If the terminal is to be sited within 25-40mm of a corner or vertical pipe (refer to Table 3) then the hole MUST be accurately cut and the rubber weather seal trimmed around the groove provided.*
The terminal wall plate need not be fitted.

REAR FLUE OUTLET

15 CUTTING THE FLUE - wall thicknesses of 114 to 600mm

Note. *If the stand-off brackets are used it is essential that 30mm is added to the measured wall thickness when marking the flue (to allow for the thickness of the brackets).*

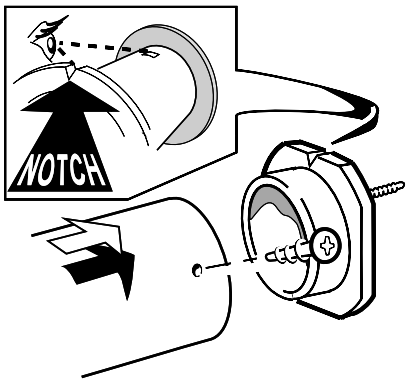
1. Measure and note the wall thickness X.
2. Mark the wall thickness onto the flue.
3. To ensure the tube is cut square, mark the flue all the way round.
4. Cut to length X, using the cardboard ring for support.
5. Remove cardboard ring and remove any burrs.



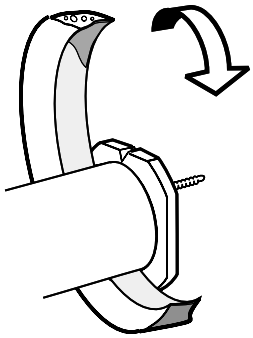
16 FITTING THE BOILER SEALING RING TO THE FLUE

1. Fit the boiler sealing ring inside the outer flue duct. Ensure the boiler sealing ring is fully engaged.

   Ensure the notch aligns with the groove on the outer flue duct. This ensures correct alignment of the flue terminal.

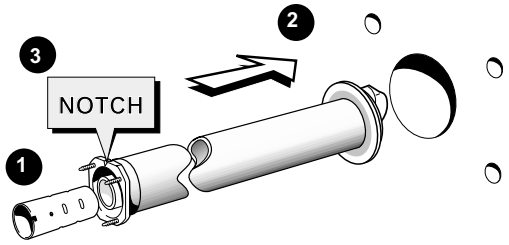


2. Drill 3 holes 3.2mm (1/8") dia. through the outer flue duct and boiler sealing ring. **Do NOT drill the inner flue duct.**
3. Insert the self-tapping screws, provided, in order to fix the boiler sealing ring in position.
4. Stick the self-adhesive foam strip, provided in the hardware pack, onto the flue immediately behind the boiler sealing ring.



17 FITTING THE FLUE ASSEMBLY

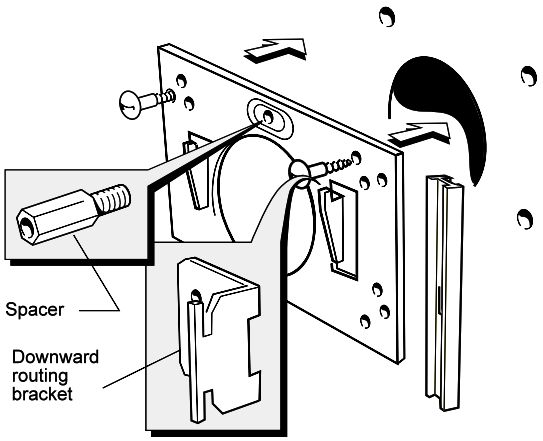
1. Insert the flue extension tube into the flue assembly.
2. Insert the flue assembly through the hole far enough to allow the rubber seal to unfold completely and form an adequate seal on the outside wall.
3. Ensure the notch is at the top. This will aid the location of the studs into the boiler back panel.



Cla 1831

18 WALL MOUNTING PLATE

1. Fix the mounting plate to the wall with the No.14 x 50mm wood screws.
2. If downward routing of pipes is required then the downward routing pipe brackets and M8 spacer (supplied in the Downward Piping Kit) should be fitted to the wall mounting plate now.
3. Fit the bottom 2 screws to secure the bracket(s) to the wall, through the wall mounting plate.
4. Check with a spirit level that the plate is vertical.



19 MOUNTING THE BOILER

Note. *Have ready to hand the M8 screw, washer and rectangular plate supplied in the hardware pack. For downward routing of pipes the M5 spacer (supplied in the Downward Piping Kit) should now be fitted to the back of the boiler.*

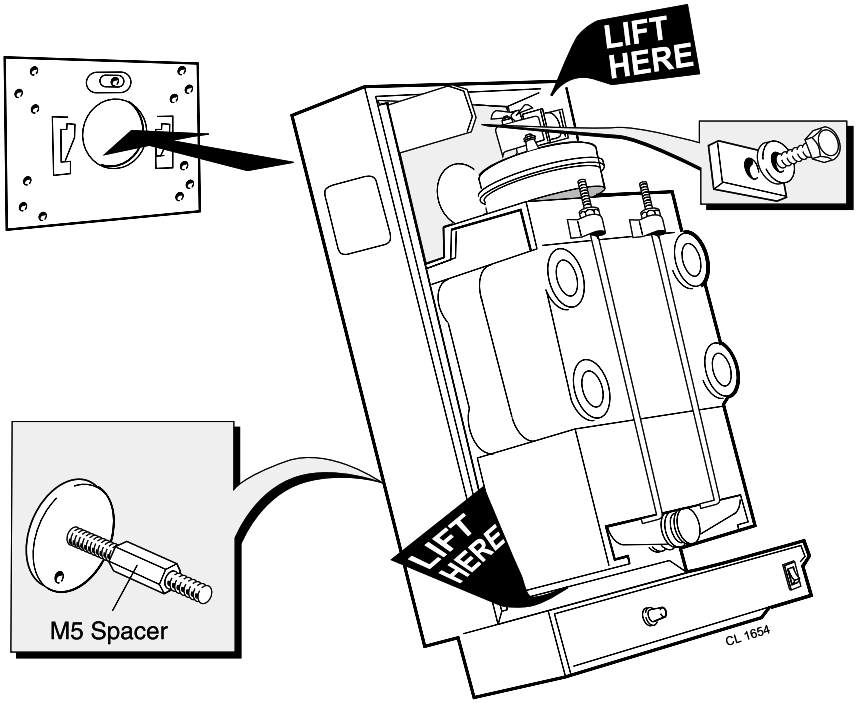
1. Lift the boiler onto the wall mounting plate hooks as shown.

Do not use the burner / controls for lifting

2. Fit the M8 screw, washer and rectangular plate to retain the boiler.

Note.

Before fully tightening the M8 screw, check the boiler alignment, using a spirit level, and adjust as necessary with the jacking screw.



20 CONNECTING THE FLUE TO THE BOILER

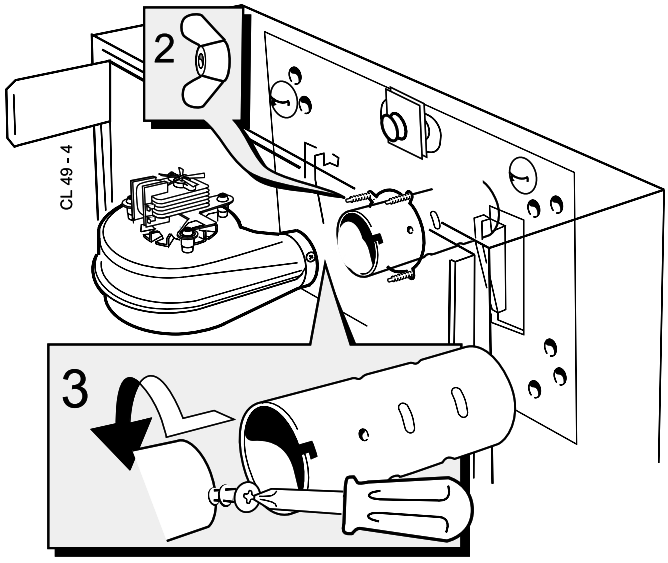
1. Pull the flue through the wall mounting plate and locate the 3 studs in the holes in the back panel.

2. Secure the flue to the boiler using the three M5 wing nuts provided.

3. Pull the flue extension tube and engage onto the fan. Locate and secure with the M4 screw attached to the fan.

Note.

The sealing ring studs will locate in the back panel one way only. This will ensure that the terminal grille is correctly aligned.



21 TERMINAL WALL PLATE

This plate allows neat concealment and full compression of the rubber seal. Its use is not essential if the flue hole and flue ducts have been accurately cut and the outside wall face is flat.

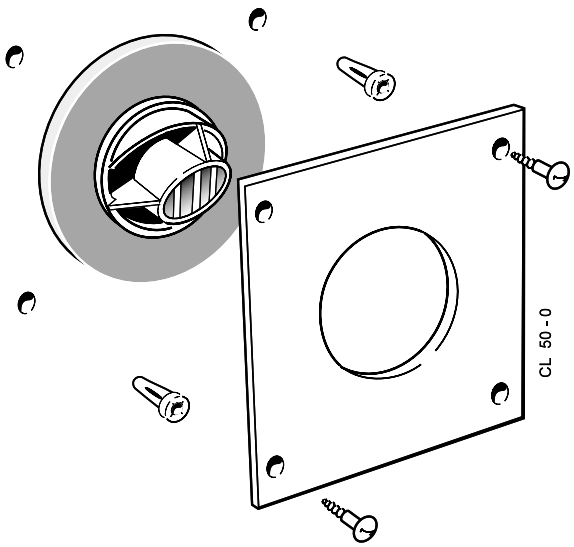
1. Position the terminal wall plate over the terminal.

2. Mark and drill 4 fixing holes with an 7mm (9/32") masonry drill.

3. Insert the 4 plastic plugs provided.

4. Secure the plate with 4 of the No.10 x 2" screws provided.

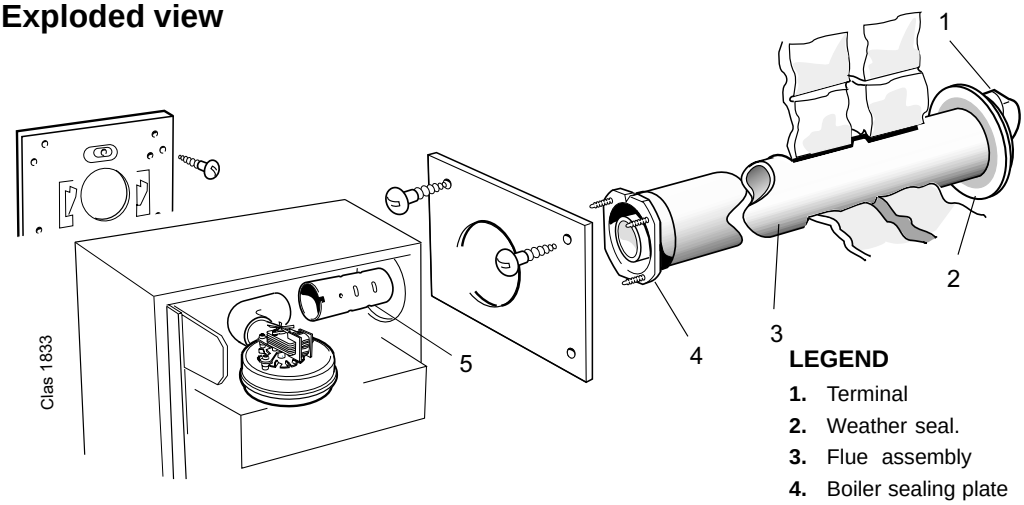
Note. *If the terminal is less than 2m (6' 6") above ground level, an approved terminal guard should be fitted. Refer to the Contents List on Page 3.*



REAR FLUE OUTLET

22 FLUE ASSEMBLY - Exploded view

1. An optional flue duct extension kit is required for lengths (distance from the outside wall to the relevant side of the boiler casing) greater than 600mm (23 1/2") Refer to Frame 10 .
2. When cutting the ducts always use the cardboard support provided.



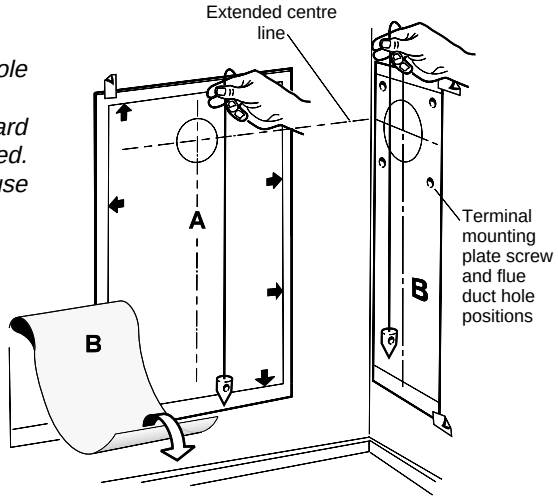
LEGEND

1. Terminal
2. Weather seal.
3. Flue assembly
4. Boiler sealing plate
5. Flue extension tube

23 WALL MOUNTING TEMPLATE

Note. *The template shows the positions for the fixing holes and the flue hole centres for standard installation.*
If the flow and return pipes are to be routed down behind the boiler the downward routing pipe brackets, supplied with the Downward Piping Kit, must be used. These brackets are secured to the wall mounting plate and it is essential to use only those holes as shown on the wall mounting template.
Care MUST be taken to ensure the correct holes are drilled.

1. Separate the templates.
2. Tape both templates into the selected position locating template B through an extended centre line as shown.
3. Ensure squareness by hanging a plumb line as shown.
4. Mark onto the wall (if required) the following:
   - **a.** The 4 wall mounting plate screw positions (choose one from each group). If the downward routing pipe brackets are used ensure the correct holes are chosen.
   - **b.** The 4 screw positions for the side outlet plate.
   - **c.** The position of the flue duct hole (ensure that the correct centre is marked depending on whether the downward routing pipe brackets are used or not).



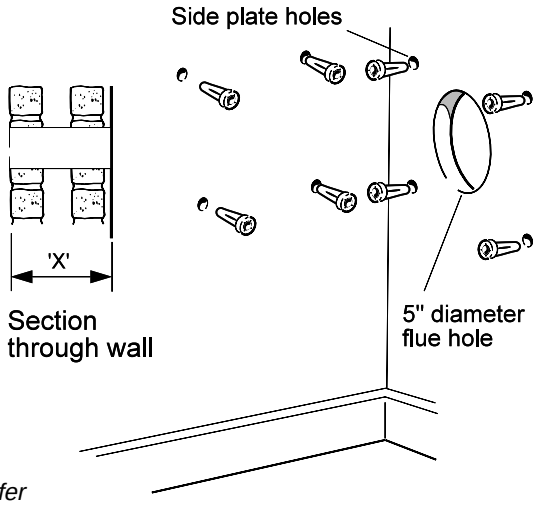
Note. *Mark the centre of the hole as well as the circumference.*

   - **d.** The side of the casing nearest the flue outlet.
5. Remove both templates from the wall.

24 PREPARING THE WALL

IMPORTANT. Ensure that, during the cutting operation, masonry falling outside of the building does not cause damage or personal injury.

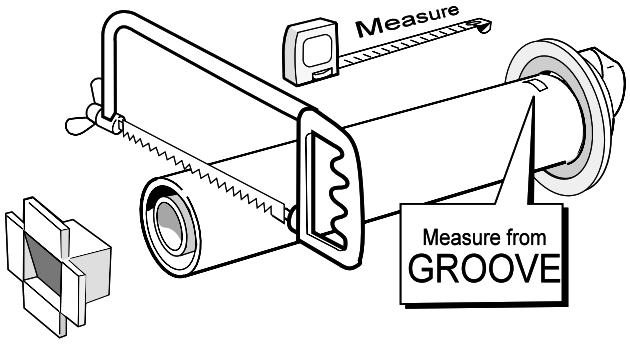
1. Cut the flue hole, preferably with a 125mm (5") core boring tool, ensuring that the hole is square to the wall. If the hole has been accurately cut with a drill then making good the wall faces is not essential as seals are provided at both ends of the flue. However, both wall faces immediately around the cut hole should be flat; make good if necessary. For less accurate holes make good to approximately 125mm (5") diameter at the 2 wall faces.
2. Drill 4 holes with an 8mm (5/16") masonry drill and insert the plastic plugs provided, for the wall mounting plate.
3. Drill 4 holes with a 7mm (9/32") masonry drill and insert the plastic plugs provided, for the side mounting plate.



Note. *If the terminal is to be sited within 25-40mm of a corner or vertical pipe (refer to Table 3) then the hole MUST be accurately cut and the rubber weather seal trimmed around the groove provided. The terminal wall plate need not be fitted.*

25 CUTTING THE FLUE
For flue lengths 114 to 600mm ONLY

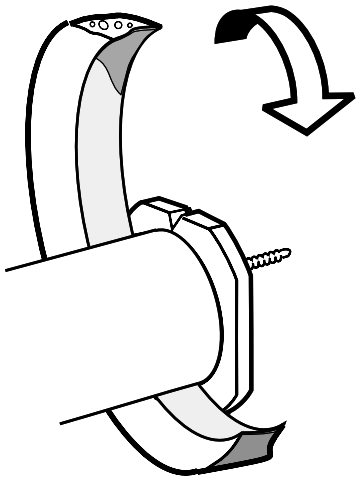
1. Measure the flue length required (i.e. the distance from the side of the boiler to the outside face of the wall). Refer to Frame 10.
2. Mark the flue length required onto the flue, measuring from the groove near the terminal.
3. To ensure the tube is cut square, mark the flue all the way round.
4. Insert the cardboard duct ring for support and cut to length.
5. Remove cardboard duct ring and remove any burrs.



For flue lengths greater than 600mm refer to Frames 34 & 35 - Flue extension ducts.

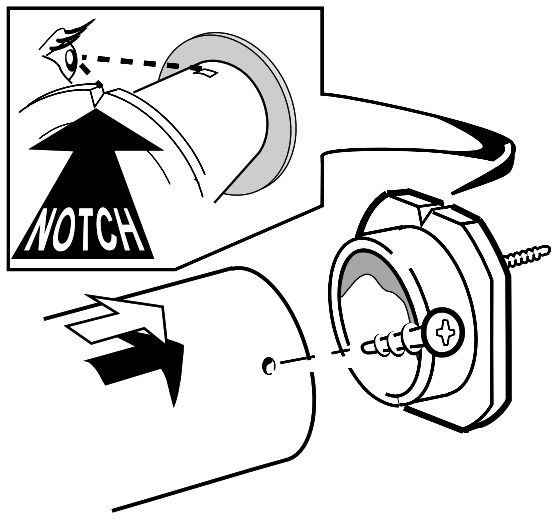
26 FITTING THE FOAM SEAL

1. To determine the position for the foam seal measure the wall thickness and mark it onto the flue, measuring from the groove near the terminal.
2. Wrap the self-adhesive foam strip round the flue, ensuring that the foam is on the terminal side of the line. This seals the gap between the flue and the wall.



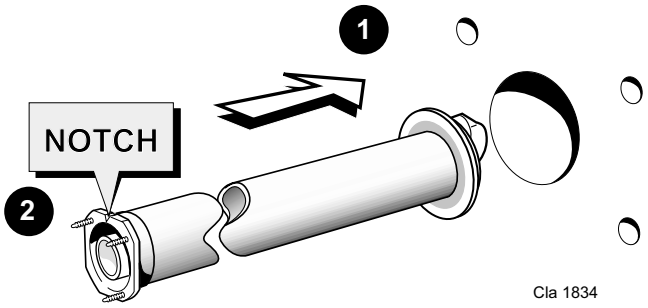
27 FITTING BOILER SEALING RING TO THE FLUE

1. Fit the boiler sealing ring inside the outer flue duct. Ensure the boiler sealing ring is fully engaged. Ensure the notch aligns with the groove on the outer flue duct. This ensures correct alignment of the flue terminal.
2. Drill 3 holes 3.2mm (1/8") dia. through the outer flue duct and boiler sealing ring. *Do not drill the inner flue duct.*
3. Insert the self tapping screws, provided, in order to fix the boiler sealing ring in position.



28 FITTING THE FLUE ASSEMBLY

1. Insert the flue assembly through the hole far enough to allow the rubber seal to unfold completely and form an adequate seal on the outside wall. This will also ensure the correct alignment of the flue terminal.
2. Ensure the notch is at the top. This will aid the location of the studs into the boiler back panel.

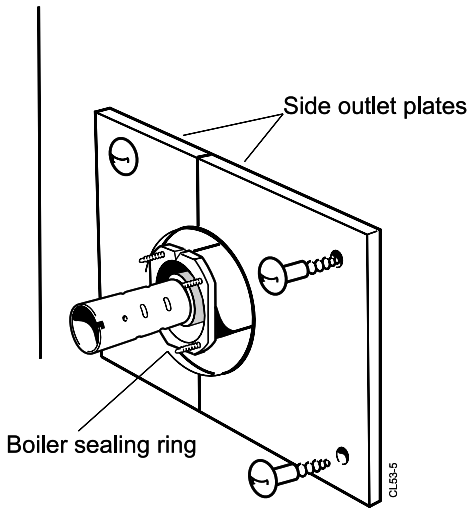


Flue assembly

29 FITTING THE SIDE OUTLET PLATES

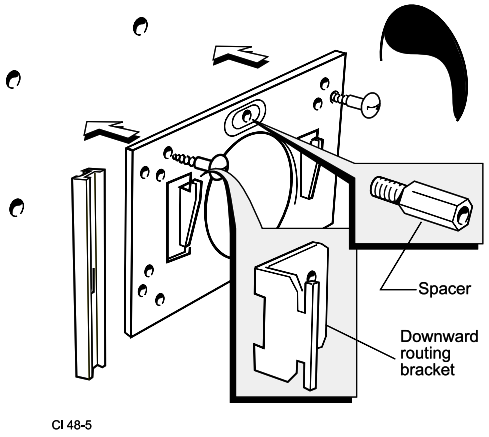
Note. *If the boiler is fitted closer than 25mm to the side wall the side outlet plate must be fitted now.*

1. Split the side outlet plate into 2 down the split line.
2. Fit the 2 halves of the side outlet plate to the wall, ensuring they are behind the boiler sealing ring.



30 WALL MOUNTING PLATE

1. Fix the mounting plate to the wall with the No.14 x 50mm wood screws.
2. If downward routing of pipes is required then the downward routing pipe brackets and M8 spacer (supplied in the Downward Piping Kit) should be fitted to the wall mounting plate now.
3. Fit the bottom 2 screws to secure the bracket(s) to the wall, through the wall mounting plate.
4. Check with a spirit level that the plate is vertical.



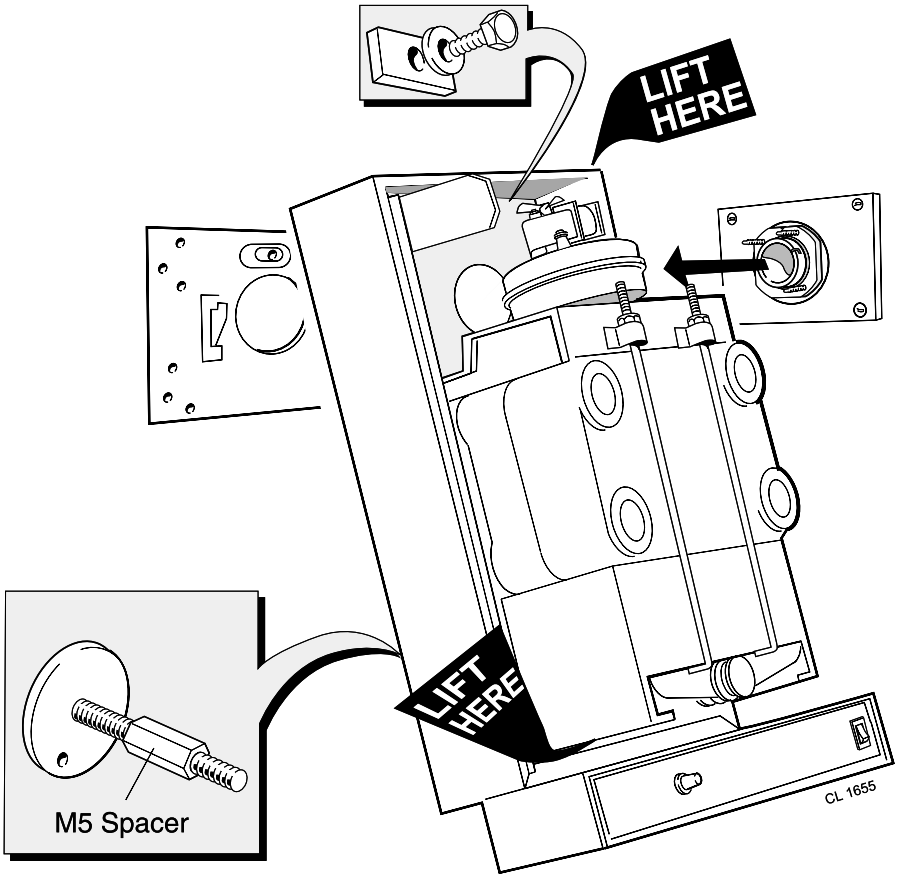
31 MOUNTING THE BOILER

Notes **1.** *Have ready to hand the M8 screw, washer and rectangular plate supplied in the hardware pack.*
2. *For downward routing of pipes the M5 spacer (supplied in the Downward Piping Kit) should now be fitted to the back of the boiler.*

1. The boiler is supplied for rear outlet installation. Remove the blanking plate from the direction required and use this to blank off the rear outlet.
2. Lift the boiler onto the wall mounting plate hooks as shown.

   Do not use the burner/ controls for lifting.
3. Fit the M8 screw, washer and rectangular plate to retain the boiler.

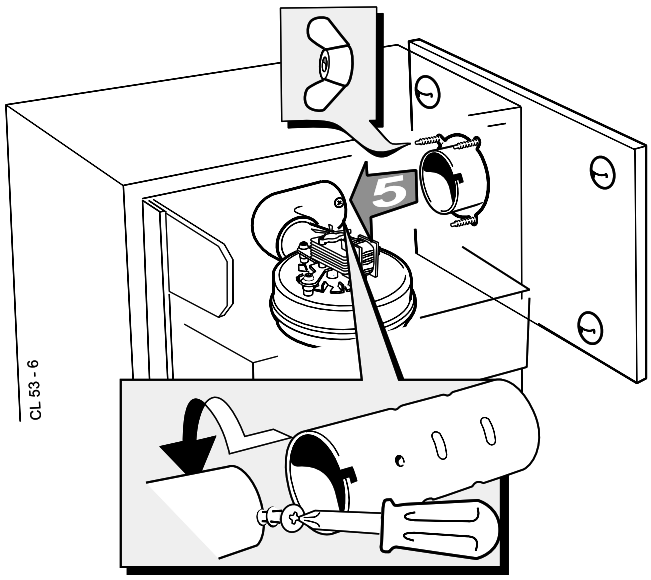
Note. *Before fully tightening the M8 screw check the boiler alignment using a spirit level and adjust as necessary with the jacking screw.*



32 CONNECTING THE FLUE TO THE BOILER

1. Pull the flue through the side outlet plate and locate the 3 studs in the hole in the side of the boiler.
2. Secure the flue to the boiler using the three M5 nuts provided.
3. Insert the flue extension tube into the flue.
4. Fit the 90° flue elbow, supplied with the boiler, onto the fan in the direction required, after first removing the underside screw, which is not required. Secure in position with the screw attached to the fan.
5. Pull the flue extension tube and engage onto the fan elbow and secure with the screw attached to the elbow.

Note. *The sealing ring studs will locate in the back panel one way only. This will ensure that the terminal grille is correctly aligned.*

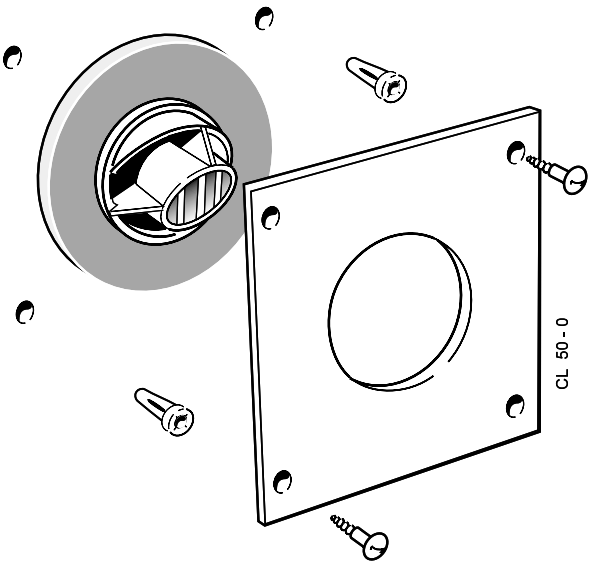


33 TERMINAL WALL PLATE

This plate allows neat concealment and full compression of the rubber seal. Its use is not essential if the flue hole and flue ducts have been accurately cut and the outside wall face is flat.

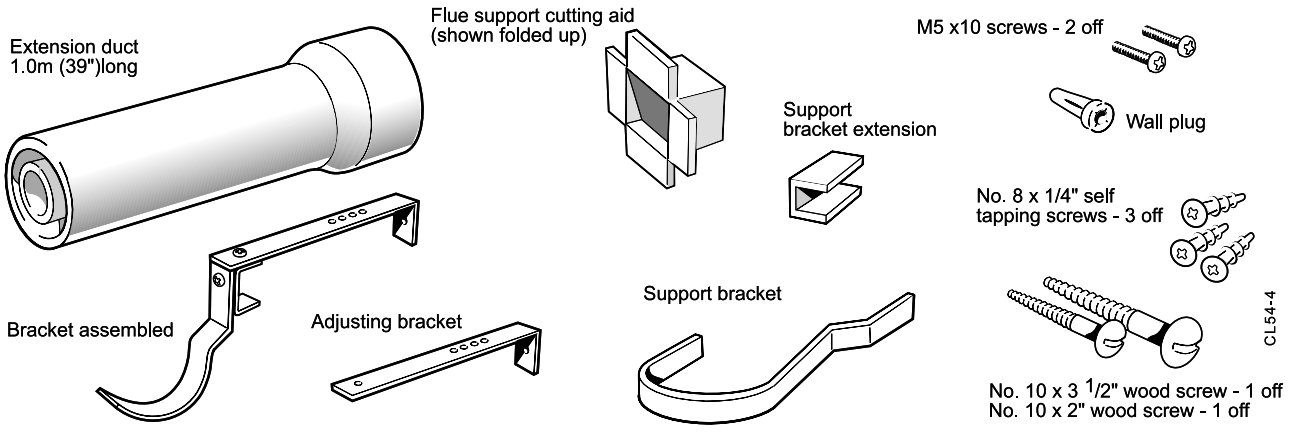
1. Position the terminal wall plate over the terminal.
2. Drill 4 fixing holes with a 7mm (9/32") masonry drill.
3. Insert the 4 plastic plugs provided.
4. Secure the plate with 4 of the No.10 x 2" screws provided.

Note. *If the terminal is less than 2m (6' 6") above ground level, an approved terminal guard should be fitted. Refer to the contents list on Page 3.*



34 FLUE EXTENSION DUCTS - For flue lengths greater than 600mm

PACK D Flue extension duct kit contents.



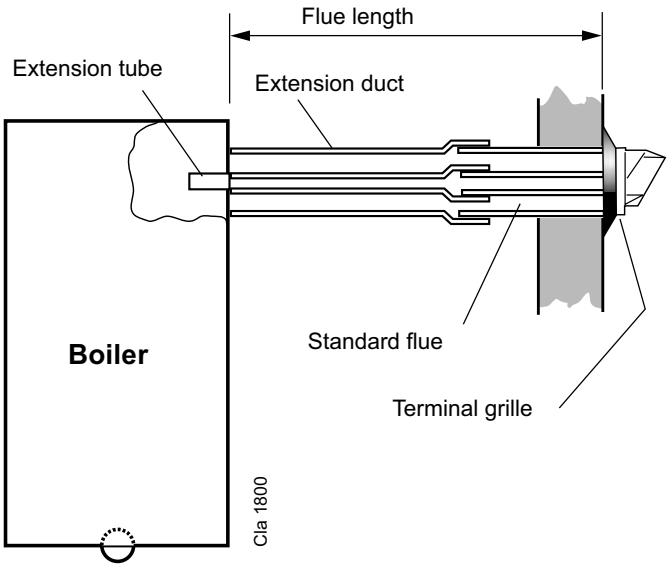
35 FLUE EXTENSION DUCTS - continued

General arrangement

Note. *Side flue shown.*

1. A *maximum* of 5 uncut extension ducts (plus the standard flue duct) may be used together.
2. Flue extensions of greater length than 1m (39") should be supported with the bracket provided. If the stand-off brackets have been used it is necessary, in order to keep the flue aligned, to use the spacer bracket with the support bracket.

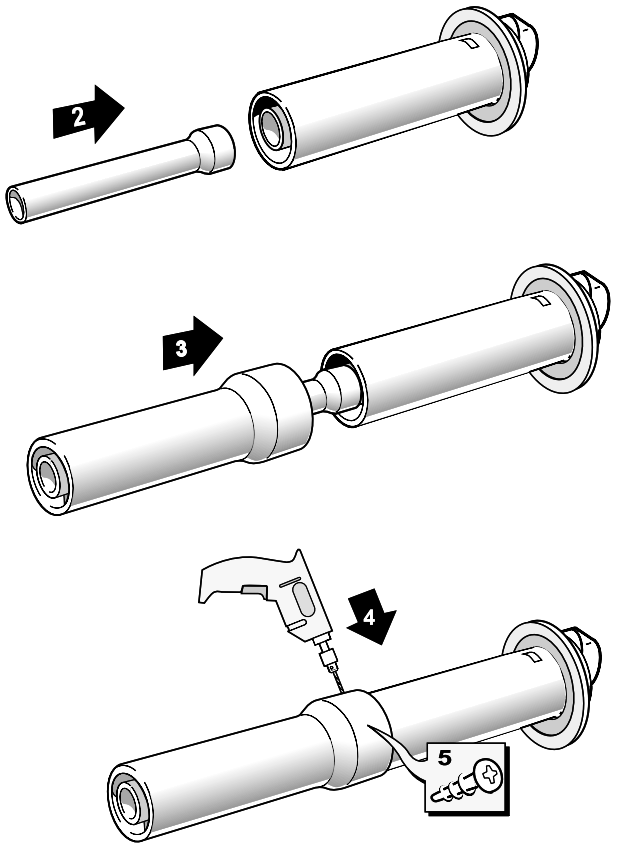
Flue length	Accessories	Product No.
2500 to 3450	B Pack 1 off + D Pack, 3 off	see Frame 10
3400 to 4400	B Pack 1 off + D Pack, 4 off	see Frame 10
4400 to 4500	B Pack 1 off + D Pack, 5 off	see Frame 10



LEGEND

b	blue	**br**	brown	**pk**	pink		
bk	black	**gy**	grey	**r**	red	**w**	white
		or	orange	**v**	violet	**y/g**	yellow/green

36 FITTING THE KIT



REP932 - 2

1. Remove the cardboard support aid from the flue and place safely to one side.
2. Fit the inner flue extension duct onto the inner flue duct.
3. Fit the outer flue extension duct onto the outer air duct.
4. Drill one - 3.2mm (1/8") dia. holes through the outer air duct. ***Do not drill the inner flue duct.***
5. Insert the self tapping screw provided to fix the air duct in position.
6. Repeat steps 1-5 if a second flue extension is required.

37 GAS CONNECTION

Refer to 'Gas Supply ', page 6.
Refer to Frame 2 for gas inlet service dimensions.

A **minimum** pressure of 20 mbar MUST be available at the boiler inlet with the boiler operating. The main gas cock is on the left hand side of the gas control valve, as shown. To facilitate connection the gas cock may be removed from the gas control valve.

38 WATER CONNECTIONS

1. Remove the plastic plugs from the flow and return pipes.
2. Make all water connections and check for water soundness.

39 ELECTRICAL CONNECTIONS

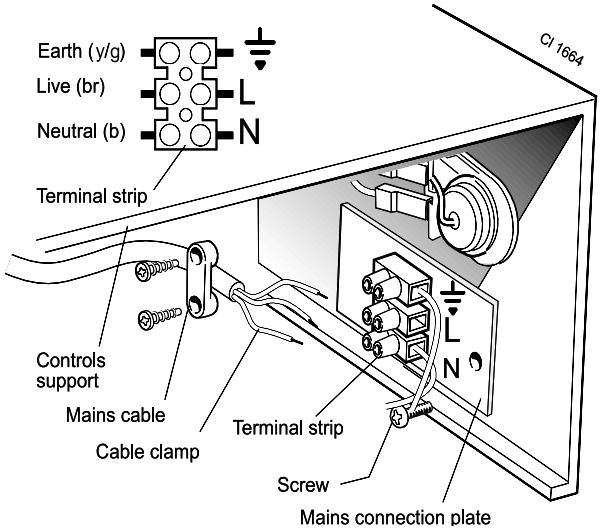
WARNING. The appliance must be efficiently earthed.

A mains supply of 230 V ~ 50 Hz is required.

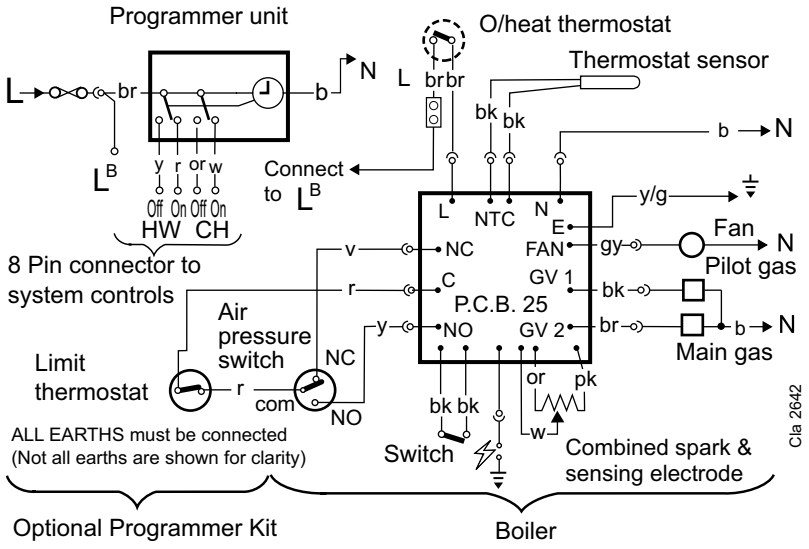
All external controls and wiring must be suitable for mains voltage. Wiring should be in 3-core PVC insulated & sheathed cable, not less than 0.75mm² (24 x 0.2mm) to BS. 6500 Table 16 Wiring Regulations and local regulations.

Connection must be made in a way that allows complete isolation of the electrical supply - such as a double pole switch, having a 3mm (1/8") contact separation in both poles or a plug and socket, serving only the boiler and system controls. The means of isolation must be accessible to the user after installation.

LEGEND		**br**	brown	**pk**	pink		
b	blue	**gy**	grey	**r**	red	**w**	white
bk	black	**or**	orange	**v**	violet	**y/g**	yellow/green



Flow wiring diagram



Note. *If an optional programmer is to be fitted refer to the instructions provided with the kit and Frame 40.*

1. Remove the control box securing screws. Swing the box down into the servicing position. Refer to Frame 47.
2. Route the mains cable into the box from the RHS of the boiler.
3. Connect the live, neutral and earth wires into the terminal strip as shown.
4. Secure the mains lead with the cable clamp.
5. On completion of all wiring connections, relocate the control box and secure.

40 EXTERNAL CONTROLS

The wiring diagrams illustrated in Frames 42-44 cover the systems most likely to be fitted to this appliance.

For wiring external controls to the Classic FF boiler, reference should be made to the system wiring diagrams supplied by the relevant manufacturer, in conjunction with the wiring diagrams shown in Frames 42-44.

Difficulty in wiring should not arise, providing the following directions are observed:

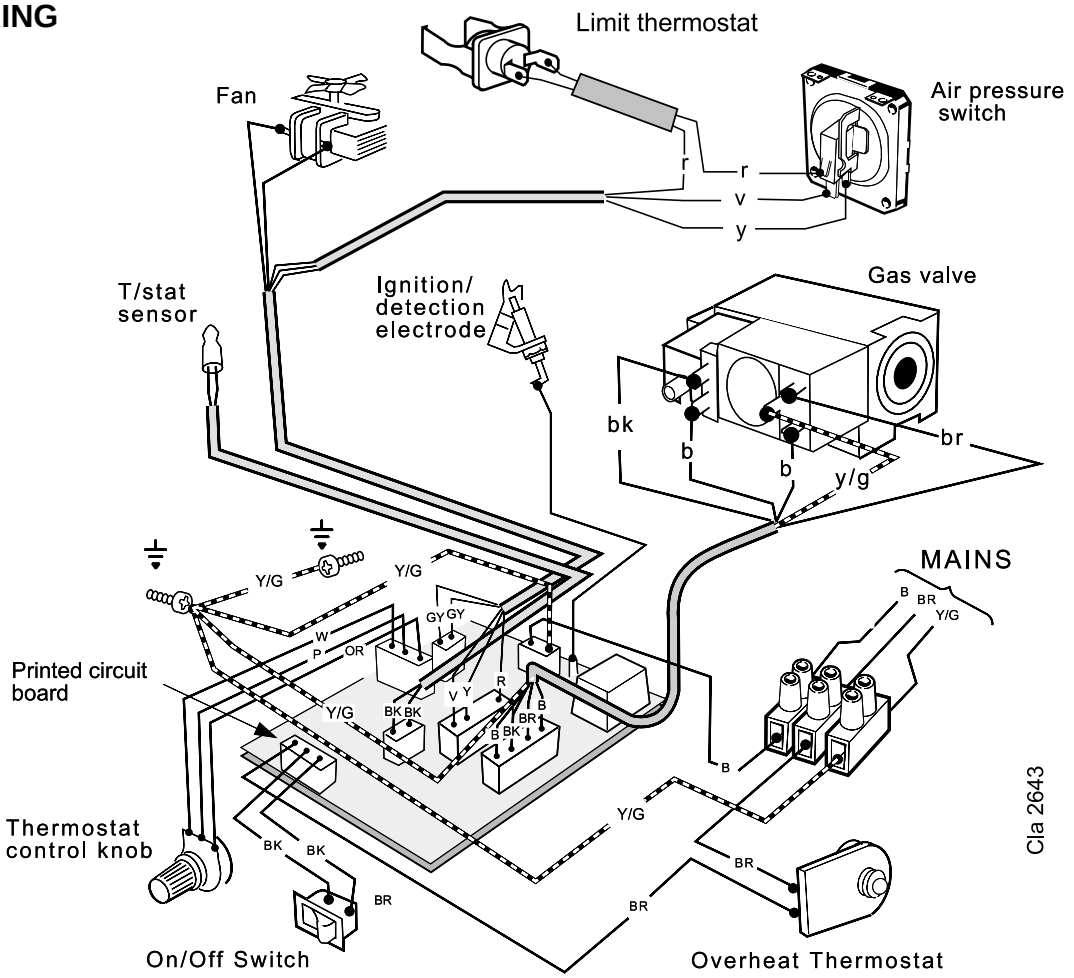
1. Controls that switch the system on or off, e.g. a time switch, must be wired, in series, in the live mains lead to the boiler.
2. Controls that override an on/off control, e.g. frost thermostat, must be wired into the mains lead, in parallel, with the control(s) to be overridden. Refer to Frame 44.
3. If a proprietary system is used, follow the instructions supplied by the manufacturer.
4. System designs featuring controls or wiring arrangements which allow the boiler to fire when there is no pump circulation taking place should not be fitted.

Advice on required modifications to the wiring may be obtained from the component manufacturers.

Notes.

1. *Connection between a frost thermostat and the time control should be made without disturbing other wiring.*
2. *A frost thermostat should be sited in a cool place in the house, but where it can sense heat from the system.*

41 PICTORIAL WIRING



LEGEND

b blue
bk black
br brown
gy grey
or orange
pk pink
r red
v violet
w white
y/g yellow/green

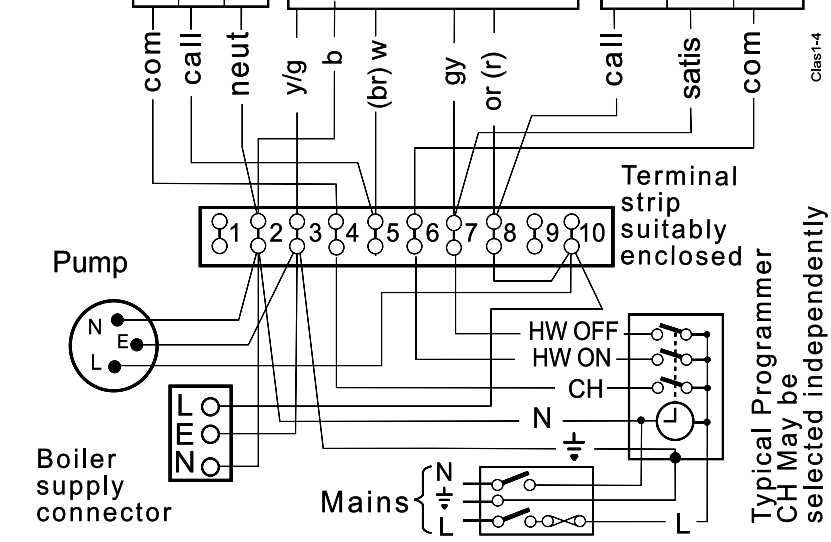
42 MID POSITION VALVE

Pumped only

Notes.

1. *Some earth wires are omitted for clarity. Ensure proper earth continuity when wiring.*
2. *Numbering of terminals on thermostats is specific to the manufacturer.*
3. *This is a fully controlled system - set the boiler thermostat to maximum.*
4. *Switchmaster 'Midi' is similar in operation but the wiring differs slightly - see the manufacturer's literature.*

	Room Thermostat Terminals			Mid Position valve details	Cylinder Thermostat Terminals		
	1	3	2	HONEYWELL Y PLAN V4073H 1039	1	2	c
TLX 2259 or2284	3	1	4	PEGLER 'Unishare' DT 1701 etc.	1	2	3
	1	2	4	LANDIS & GYR 'LGM' SK3 - LT2701	2	3	1
	1	3	-	A. C. L. 679. H. 340.30.UO	1 bk	2 y	3 r
RTE RTM/RTC	1 3	2 1	4 N	DRAYTON Flowshare 2	2	3	1
	1	3	4	SOPAC Centra Share ZV20 - EB MID	1	2	c
	2	1	4	DANFOSS DMV - 3M	n. c.	n. o.	com.
				SWITCHMASTER			



LEGEND

b blue
bk black
br brown
gy grey
or orange
pk pink
r red
v violet
w white
y/g yellow/green

43 TWO SPRING CLOSED VALVE

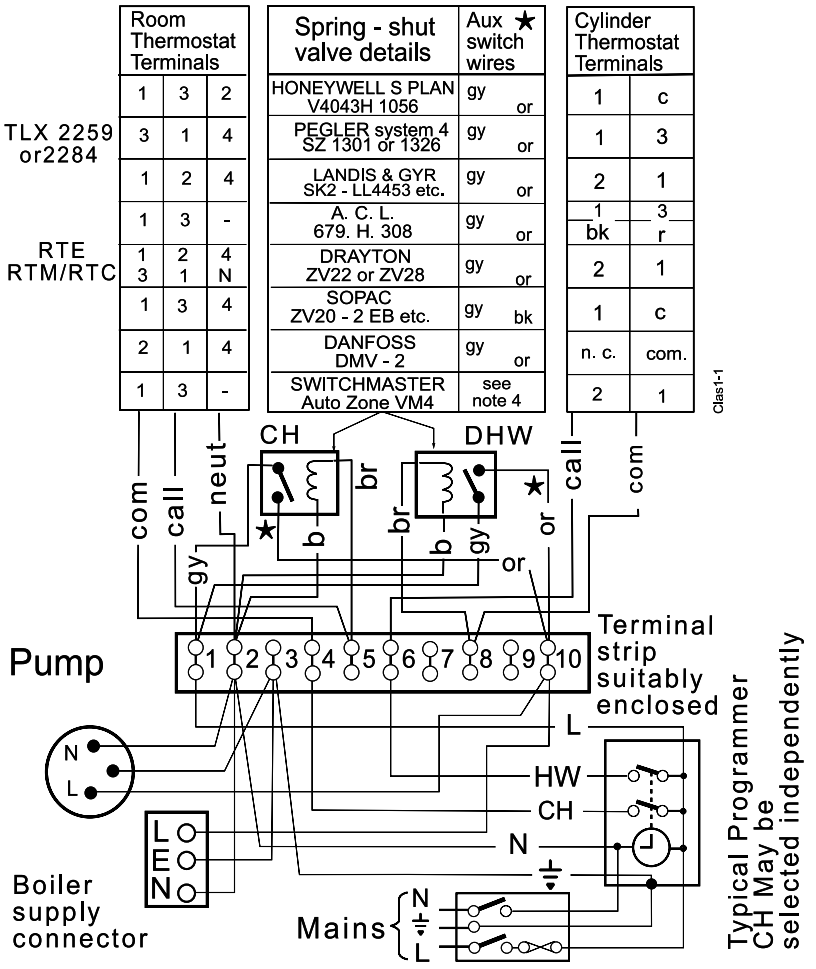
Pumped only

Notes.

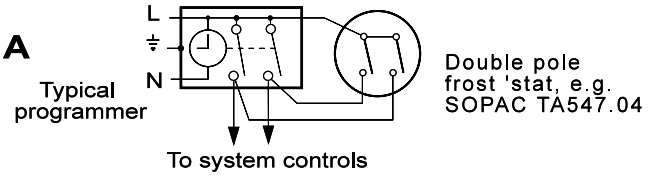
1. *Some earth wires are omitted for clarity. Ensure proper earth continuity when wiring.*
2. *Numbering of terminals on thermostats is specific to the manufacturer.*
3. *This is a fully controlled system - set the boiler thermostat to maximum.*
4. *Switchmaster valve has grey and orange auxiliary switch leads but the GREY wire must be connected to the incoming live supply.*

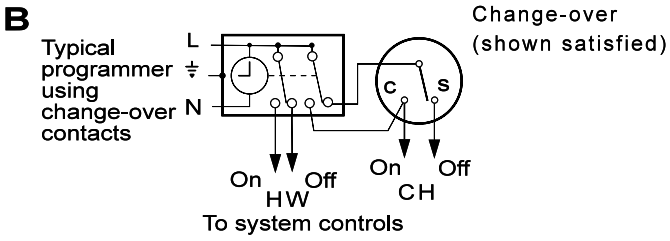
LEGEND

b blue
bk black
br brown
gy grey
or orange
pk pink
r red
v violet
w white
y/g yellow/green



44 FROST PROTECTION





Central heating systems fitted wholly inside the house do not normally require frost protection as the house acts as a 'storage heater' and can normally be left at least 24 hrs. without frost damage. However, if parts of the pipework run outside the house or if the boiler will be left off for more than a day or so, then a frost thermostat should be wired into the system.

This is usually done at the programmer, in which case the programme selector switches are set to OFF and all other controls MUST be left in the running position.

The frost thermostat should be sited in a cold place but where it can sense heat from the system.

Wiring should be as shown, with minimal disturbance to other wiring of the programmer.

Designation of the terminals will vary but the programmer and thermostat manufacturer's leaflets will give full details.

If a boiler is installed in a garage it may be necessary to fit a pipe thermostat.

Diagram A shows a double pole frost thermostat, which should suffice for all systems which do not use the OFF terminals of the programmer.

Diagram B shows a 'change-over' frost 'stat, which will cover most systems which do use CH OFF. If, however, on such a system the HW pipework is in an isolated part of the house, a second frost 'stat may be used to protect it. If in doubt, ask your installer for advice.

45 COMMISSIONING AND TESTING

(a) Electrical Installation

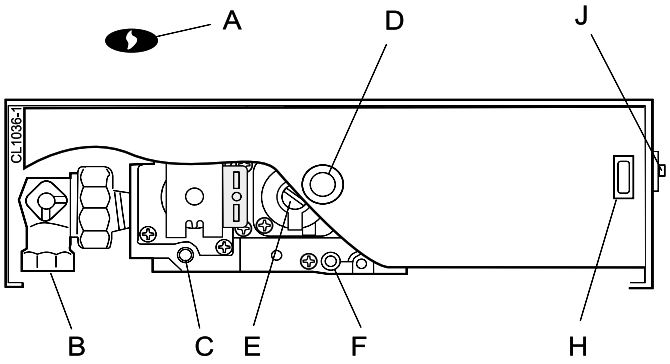
1. Checks to ensure electrical safety should be carried out by a competent person.
2. ALWAYS carry out preliminary electrical system checks, i.e. earth continuity, polarity, resistance to earth and short circuit using a suitable test meter.

(b) Gas Installation

1. The whole of the gas installation, including the meter, MUST be inspected and tested for soundness, and purged in accordance with the recommendations of BS. 6891.
2. Purging air from the gas installation may be expedited by loosening the union on the gas service cock on the boiler and purging until gas is detected.
3. Retighten the union and check for gas soundness.

WARNING. Whilst effecting the required gas soundness test and purging air from the gas installation open all windows and doors, extinguish naked lights and **DO NOT SMOKE.**

46 INITIAL LIGHTING



LEGEND

- **A** Sightglass.
- **B** Gas service cock.
- **C** Inlet pressure test point.
- **D** Thermostat knob
- **E** Main burner pressure adjuster.
- **F** Burner pressure test point.
- **H** Boiler mains on/off switch.
- **J** Overheat thermostat reset button.

TO LIGHT THE BOILER

1. Check that all the drain cocks are closed, and any valves in the flow and return are open.
2. Check that the gas service cock (B) is OPEN and the boiler mains On/Off switch is OFF.
3. **Fitting the Boiler Casing**
   The boiler casing must be refitted with the controls support casing attached for alignment purposes. Lift the boiler casing up to the boiler assembly, with the casing top angled forward. Hook the top edge of the boiler casing into the channel on the top of the boiler assembly. Swing the bottom of the casing down and secure with the 2 captive screws.

   The casing must seat correctly and compress the sealing strip to make an airtight joint.
   Visually check the side seals but, if side clearances are limited, then check that the top and bottom edges of the casing are correctly located.

   If the Sealed System Unit is fitted remove the unit casing in order to inspect the top casing seal.

   To gain access to the gas valve:

   a. Remove the controls support casing. Release the controls support front fixing screws 3 turns only. Remove the pod by pulling it forward to disengage from the keyhole slots.

   b. Remove the control box securing screws and swing it down into the servicing position. See diagram B.
4. Slacken the screw in the burner pressure test point (F) and connect a gas pressure gauge via a flexible tube.
5. Swing the control box back into its working position.
6. Press the overheat thermostat reset button (J).
7. Switch the electricity supply ON and check that all external controls are calling for heat.
8. Set the boiler thermostat knob (D) to position 6 and the boiler Mains On/Off switch to ON. The fan will start. After the fan has run for a few seconds the pilot solenoid valve should open and the intermittent spark commence, continuing until the pilot is established. The main burner will then cross-light smoothly. If this sequence does not occur, refer to the Fault Finding section.
9. Test for gas soundness around ALL boiler gas components using leak detection fluid.
10. Operate the for 10 minutes to stabilise the burner temperature.
11. The boiler is preset at the factory to its nominal rating.
    a. Set the mains On/Off switch to OFF.
    b. Switch the electricity supply OFF.
    c. Swing the control box down into the servicing position.
    d. Remove the main burner adjuster cover.
    e. Turn the adjusting screw *clockwise* to INCREASE the pressure, or *anticlockwise* to DECREASE the pressure.
    f. Swing the control box back into its working position.
    g. Switch the electricity supply ON.
    h. Set the mains On/Off switch to ON and check the new setting pressure.
12. If necessary repeat steps 11a to h until the required pressure is achieved. Record this value in the Benchmark log book.
13. Set the main On/Off switch to OFF.
14. Switch the electricity supply OFF.
15. Swing the control box down into the servicing position.
16. Refit the main burner pressure adjuster cover.
17. Remove the pressure gauge and tube. Retighten the sealing screw in the pressure test point. Ensure a gas tight seal is made.

47 INITIAL LIGHTING - continued

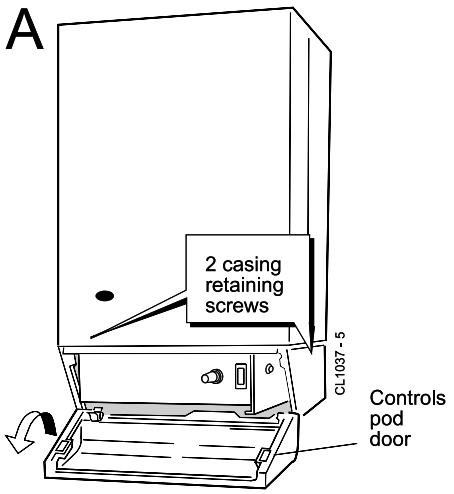
18. Swing the control box back into its working position and secure.

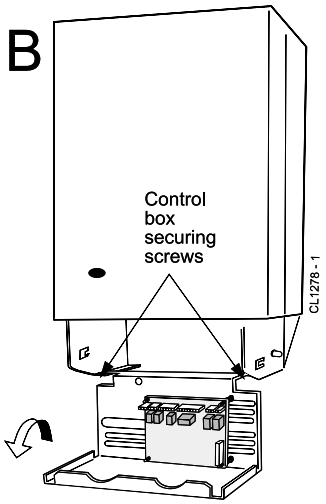
19. Remove the boiler casing.

20. Refit the controls support to the boiler casing and tighten the 2 front fixing screws.

21. Refit the complete casing to the boiler.

22. Close the pod door.





48 GENERAL CHECKS

Make the following checks for correct operation:

1. Set the boiler thermostat knob to position 6 and operate the mains on/off switch. Check that the main burner lights and extinguishes in response.

2. The correct operation of ANY programmer and all other system controls should be proved.
Operate each control separately and check that the main burner or circulating pump, as the case may be, responds.

3. Check that the casing is sealed correctly and compressing the sealing strip all around the casing.

4. Water Circulating System

a. With the system HOT, examine all water connections for soundness.

b. With the system still hot, turn off the gas, water and electricity supplies to the boiler and drain down, in order to complete the flushing process.

c. Refill and vent the system, clear all air locks and again check for water soundness.

d. Balance the system.

5. Finally, set the controls to the user's requirements.

The temperatures quoted below are approximate and vary between installations.

Knob Setting	Flow Temperature °C	°F
1	54	130
2	60	140
3	66	150
4	71	160
5	77	170
6	82	180

WARNING. The boiler MUST NOT be operated with the casing removed.

49 HANDING OVER

After completing the installation and commissioning of the system the installer should hand over to the householder by the following actions:

1. Hand the User's Instructions to the Householder and explain his or her responsibilities under the current Gas Safety (Installation and Use) Regulations or rules in force.

2. Draw attention to the Lighting Instruction label affixed to the controls pod door.

3. Explain and demonstrate the lighting and shutting down procedures.

4. The operation of the boiler and the use and adjustment of ALL system controls should be fully explained to the Householder, to ensure the greatest possible fuel economy, consistent with household requirements of both heating and hot water consumption.
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 frosty conditions.

5. Explain the function and the use of the boiler thermostat and external controls.

6. Explain the function of the boiler overheat thermostat and emphasise that if cutout persists, the boiler should be turned off and a registered CORGI installer consulted.

7. Explain and demonstrate the function of time and temperature controls, radiator valves etc., for the economic use of the system.

8. If any programmer is fitted draw attention to the Programmer User's Instructions and hand them to the Householder.

9. After installation, commissioning and customer hand-over, please complete the benchmark appliance log book and leave this with the customer.

10. Stress the importance of regular servicing by a CORGI registered installer and that a comprehensive service should be carried out AT LEAST ONCE A YEAR.

11. As the installer you may wish to undertake the service contract yourself or alternatively offer to the customer the benefits of the Caradon Ideal Services scheme, details of which are outlined in the household pack supplied with this boiler.

50 SCHEDULE

To ensure the continued safe and efficient operation of the appliance, it is recommended that it is checked at regular intervals and serviced as necessary.
The frequency of servicing will depend upon the installation condition and usage, but should be carried out at least annually. It is the law that any service work must be carried out by CORGI registered installer**.**

a. Light the boiler and carry out a pre-service check, noting any operational faults. Operate the boiler for at least 20 minutes. Check the gas consumption.

b. Connect a suitable gas analyser to the sampling point on the top RHS of the back panel. For correct boiler operation the CO/CO_2 content of the flue gas should not be greater than 0.004 ratio. If this is the case and the gas input is at least 90% of the nominal, then no further action need be taken. If not, proceed to paragraph **c**.

c. Clean the main burner. Refer to Frame 54.

d. Clean the heat exchanger. Refer to Frame 53.

e. Clean the main and pilot injectors. Refer to Frame 54.

f. Remove any debris from inside the base of the casing.

g. Check that the flue terminal is unobstructed and that the flue system is sealed correctly.

h. If the appliance has been installed in a compartment, check that the ventilation areas are clear.

The servicing procedures are covered more fully in Frames 51 to 55 and must be carried out in sequence.

WARNING.
Disconnect the electrical supply and turn off gas supply.

IMPORTANT. After completing the servicing or exchange of components always test for gas soundness and carry out functional checks as appropriate.

When work is complete the casing MUST be correctly refitted, ensuring that a good seal is made.

The boiler must NOT be operated if the casing is not fitted.

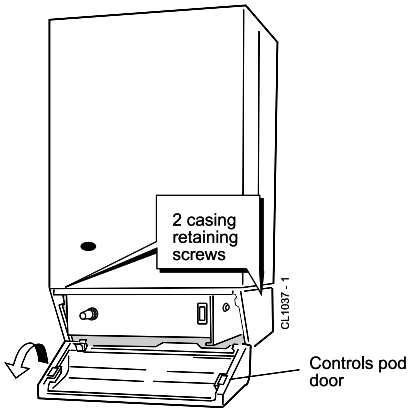
Note. *In order to carry out either servicing or replacement of components, the boiler casing must be removed. Refer to Frame 51.*

51 BOILER CASING REMOVAL

1. If the **Classic Sealed System Unit** is fitted lift off the casing.

2. Open the controls pod door and release the 2 captive screws at the bottom of the casing. Swing the bottom of the boiler casing out until the controls pod casing has cleared the controls, then unhook the casing top from the pack panel. Retain the casing in a safe place. Where the removal of the casing is impaired by a pelmet, the instruction in Frame 2 should be followed.

3. Isolate the gas supply at the service cock fitted to the boiler.



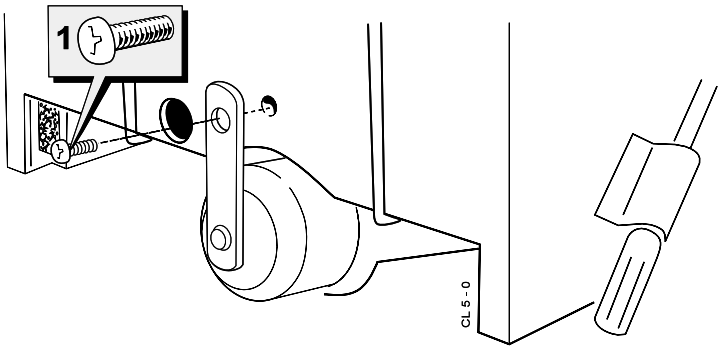
52 BURNER AND AIR BOX REMOVAL

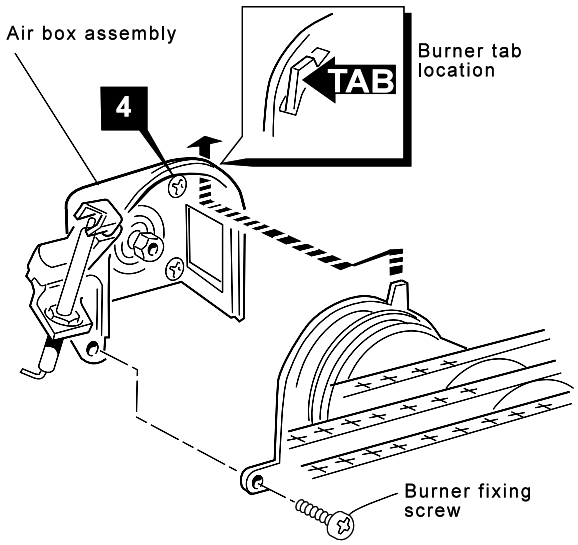
1. Remove the screw retaining the front burner support strap to the combustion chamber. Remove the M5 pozi situated at the LH bottom rear of the burner and pull the burner downwards to disengage the retention tab. Remove the burner to a safe place for inspection and cleaning.

2. Remove the control box fixing screw. Pull the box forward and downward to disengage.

3. Pull the HT lead connection off the printed circuit board and pull the lead upwards through the bottom panel grommet.

4. Remove the 4 screws retaining the air box/pilot assembly to the vertical manifold and carefully remove the assembly.





53 CLEANING THE FAN ASSEMBLY / THE FLUEWAYS

1. Remove the 2 silicon rubber tubes from the fan sensing points.

2. Disconnect the fan leads.

3a. Rear flue
Slacken the M4 screw securing the flue connector to the fan. Disconnect the connector from the fan and slide into the flue.

3b. Side or top flue
Slacken off two M4 screws securing the flue elbow and flue connector. Disconnect the flue connector from the elbow and slide into the flue. Remove the flue elbow.

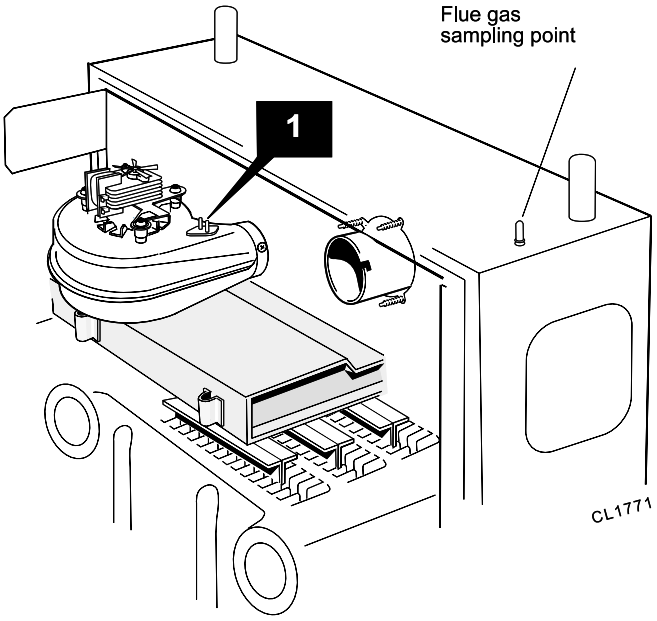
4. Disconnect the silicon rubber tube from the rear of the collector hood.

5. Slacken the two M5 nuts on the front tie rods, releasing the tie rods from the combustion chamber.

6. Remove the M5 central fixing screw at the rear of the collector hood and remove collector hood/fan assembly.

7. Check that the fan impeller runs freely. Remove any debris from the impeller with a soft brush.

8. Remove the flue baffles.



9. Remove all loose deposits from the heat exchanger, particularly between the fins, using a suitable brush.

10. Reassemble in reverse order, ensuring the fan leads and 3 sensing tubes are reconnected.

54 CLEANING THE BURNER AND PILOT ASSEMBLY

1. Brush off any deposits that may have fallen on to the burner head (ensuring the flame ports are unobstructed) and remove any debris that may have collected.
Note. *Brushes with metallic bristles must not be used.*

2. Remove the main burner injector and ensure there is no blockage or damage. Clean or renew as necessary.

3. Refit the injector, using an approved jointing compound sparingly.

4. Inspect the pilot burner and ignition / detection electrode. Ensure that they are clean and in good condition.

Check that:

a. The pilot burner injector is not blocked or damaged. Refer to Frame 62 for removal details.

b. The pilot burner is clean and unobstructed.

c. The ignition / detection electrode is clean and undamaged.

d. The ignition / detection lead is in good condition.

e. The spark gap is correct (Frame 62). Clean or renew as necessary.

Note. *The pilot shield is located around the pilot assembly bracket and is located by the electrode retaining nut.*

55 RE-ASSEMBLY

Reassemble the boiler in the following order.

1. Refit the flue baffles.

2. Inspect the collector hood rope gasket and replace, if necessary, ensuring that the self adhesive rope is fitted centrally on to the lip of the collector hood / fan assembly. The boiler efficiency will be adversely affected if incorrectly fitted. Refit the collector hood and retain with the 2 front tie rods and the rear central fixing screw. Tighten the nuts and screw. Ensure that the sealing gasket is compressed. Refit the pressure pipe.

3. Refit the positive pressure tubes on the top of the fan housing. Reconnect the electrical leads.

4. Refit the air box assembly and burner. Ensure that the burner front fixing is refitted.

5. Reconnect the gas supply and the electrical wiring. Refer to Frames 37 & 39.

6. Check the sightglass in the boiler casing. Clean or renew as necessary. Refer to Frame 58.

7. Check for gas soundness. Check the gas service cock and pressure test point.

8. Refit the boiler casing (Refer to Frame 46, item 3). Note that it is not necessary to disturb the controls casing pod.

9. Close the controls pod door.

56 GAS PRESSURE ADJUSTMENT

PILOT

The pilot is factory set to maximum and no further adjustment is possible. If, after removing and checking the injector (as detailed in Frame 61) and ensuring that there is an inlet pressure of 20 mbar available, the pilot does not light then contact **Caradon Ideal Limited.**

Relight in accordance with 'Initial Lighting', Frame 46.

MAIN BURNER

After any servicing, reference should be made to Table 2 which quotes details of the rated output with the related burner setting pressure and the heat input. Any required adjustments should be made by using the pressure adjustment screw.

Refer to 'initial Lighting', Frame 46.

REPLACEMENT OF PARTS

57 GENERAL

When replacing any component:

1. Isolate the electricity supply.

2. Turn OFF the gas supply.

3. Remove the boiler casing. Refer to Frame 51.

IMPORTANT. When work is complete the casing must be correctly refitted, ensuring that a good seal is made.

Note. *In order to assist fault finding, the control box printed circuit board is fitted with 2 indicator lights which represent the following boiler conditions:*

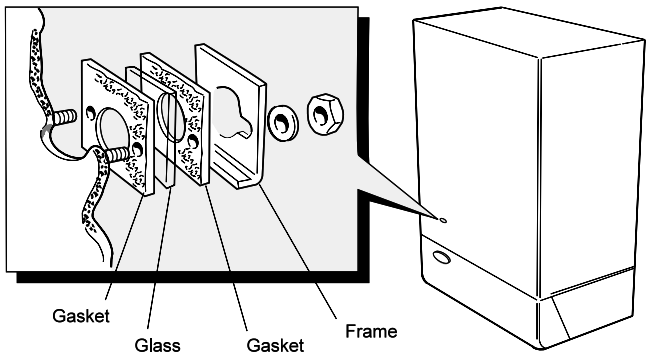
Neon I3. Mains electricity ON.

Neon SG1. Flashes to indicate ignition operation (stops after detection).

The boiler MUST NOT be operated if the casing is not fitted.

58 SIGHTGLASS REPLACEMENT

1. Refer to Frame 57.
2. Unfasten the 2 nuts and washers holding the sightglass assembly to the casing front panel.
3. When fixing the new assembly ensure that the parts are in the correct order. The frame must have the return edge at the bottom.
4. Retighten the 2 nuts to ensure an airtight seal. Do NOT overtighten.
6. Replace the boiler casing. Refer to Frame 55.



59 OVERHEAT THERMOSTAT REPLACEMENT

1. Refer to Frame 57.

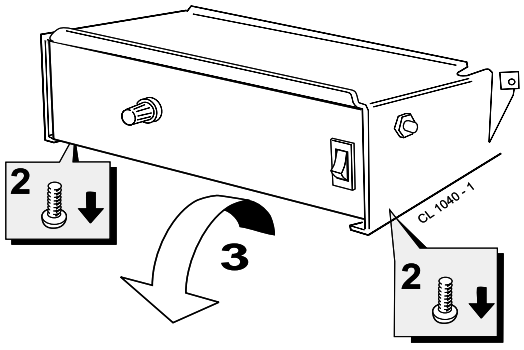
2. Remove the control box fixing screws.

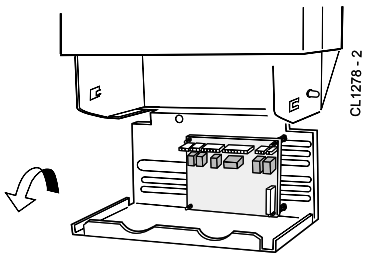
3. Swing the control box down into the servicing position.

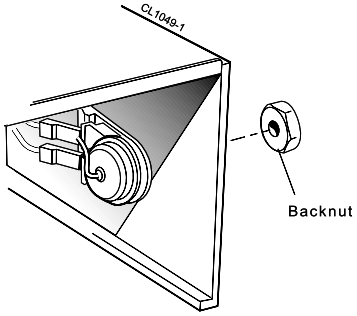
4. Pull off the electrical connections at the thermostat. Remove the backnut retaining the thermostat to the bracket. Withdraw the thermostat phial from the heat exchanger pocket.

5. Fit the new thermostat and reassemble in reverse order.

6. Check the operation of the boiler.





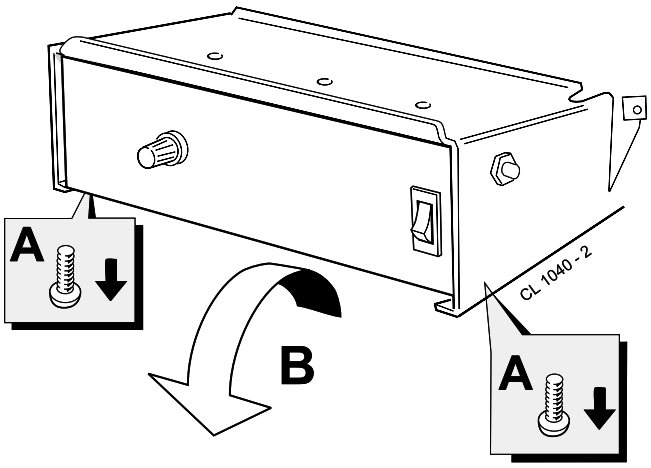


60 THERMOSTAT CONTROL, THERMISTOR SENSOR LEAD and ON/OFF SWITCH REPLACEMENT

Refer also to Frame 57.

A. Remove the fixing screws

B. Swing the control box down into the servicing position.



Thermostat control

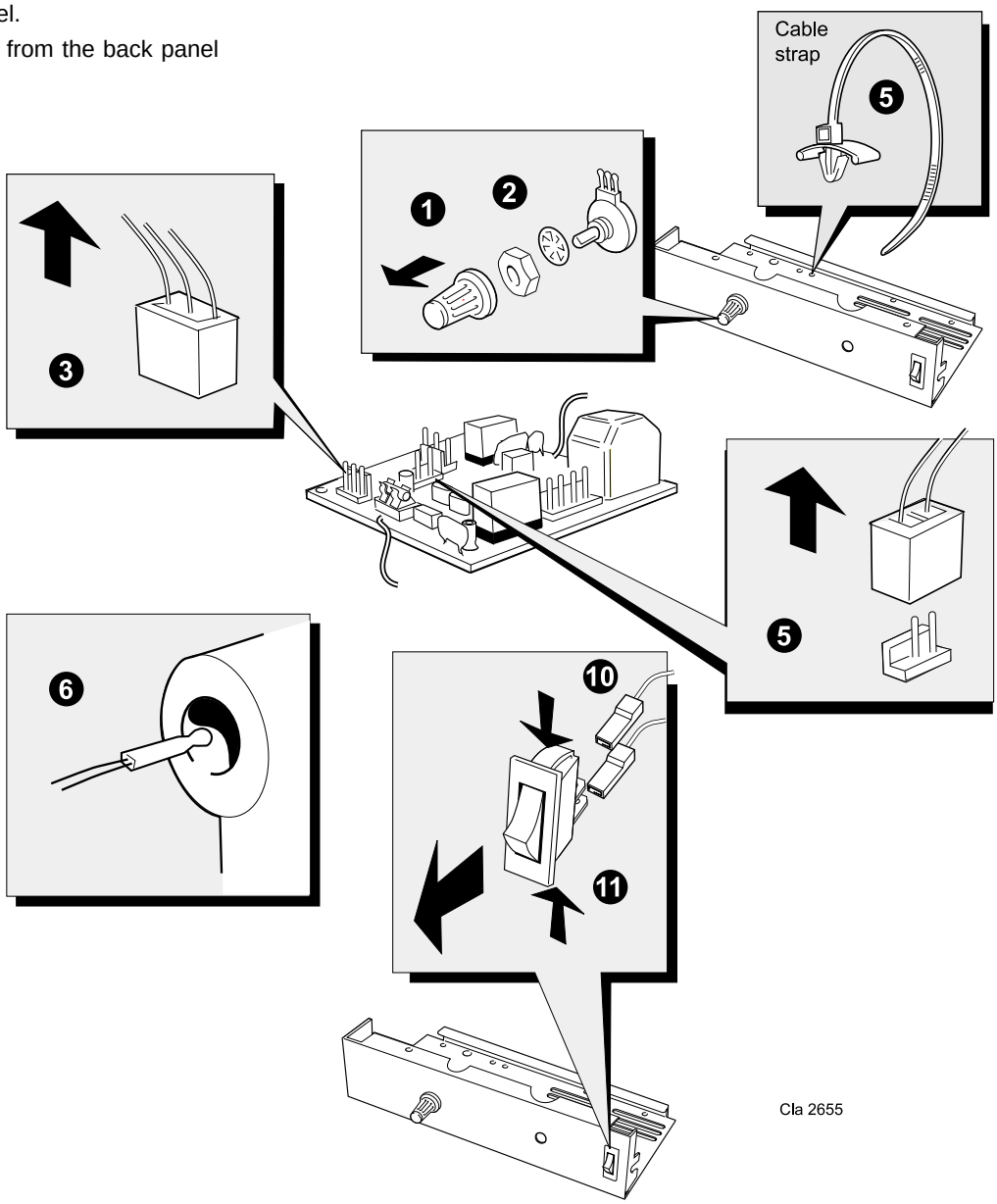
1. Pull the knob off the shaft.
2. Remove the backnut securing the thermostat control to the control box.
3. Pull off the Molex connector from the printed circuit board.
4. Replace and reassemble in reverse order.

Thermistor sensor lead

5. Pull the sensor lead connector off the printed circuit board and cut the cable strap securing the thermistor harness to the bottom panel of the control box (if fitted) and remove the strap.
6. Remove the sensor from the heat exchanger pocket and unclip from the back panel.
7. Remove the strain relief bush from the back panel base.
8. Remove the sensor lead through the grommet in the control box.
9. Replace and reassemble in reverse order, ensuring the new cable strap is fitted and securing the thermistor harness.

On/off switch

10. Disconnect the electrical connectors from the rear of the switch.
11. Press in the 2 side retaining clips and remove the switch.
12. Reassemble in reverse order.



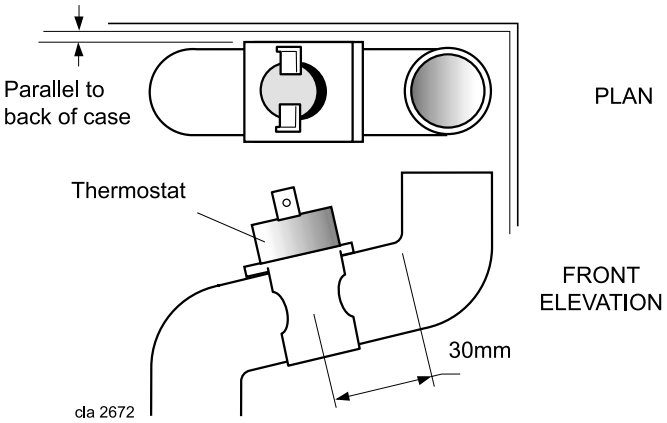
61 LIMIT THERMOSTAT REPLACEMENT

1. Refer to Frame 57.

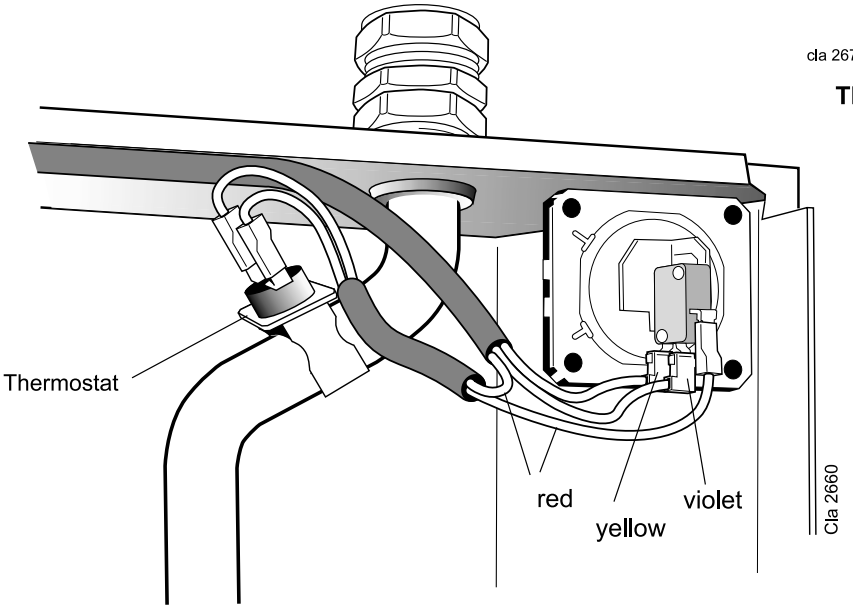
2. Remove the limit thermostat assembly from the boiler flow pipe.

3. Disconnect the electrical connectors

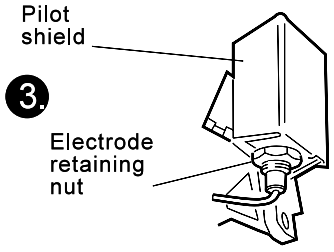
4. Replace and reassemble in reverse order, taking care to correctly position the limit thermostat as shown in the orientation diagram opposite.

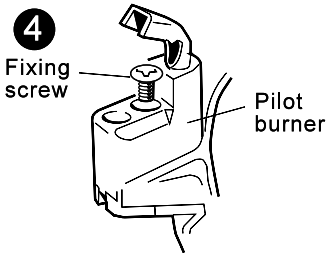


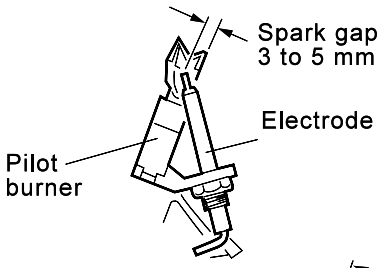
Thermostat Orientation

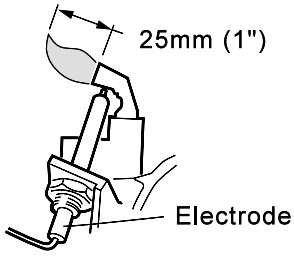


62 PILOT BURNER REPLACEMENT









1. Refer to Frame 57.

2. Remove the burner and air box assembly. Refer to Frame 52.

3. Remove the electrode retaining nut and remove the pilot shield and electrode.

4. Unscrew the central pilot fixing screw and lift the pilot clear of the pilot injector. The pilot injector may now be unscrewed if required.

5. Replace the pilot burner (injector if necessary) and retain with the M4 screw previously removed. Ensure the copper sealing washer is replaced when refitting the pilot injector.

6. Replace the electrode and pilot shield, retaining both with the electrode nut. Check the spark gap.

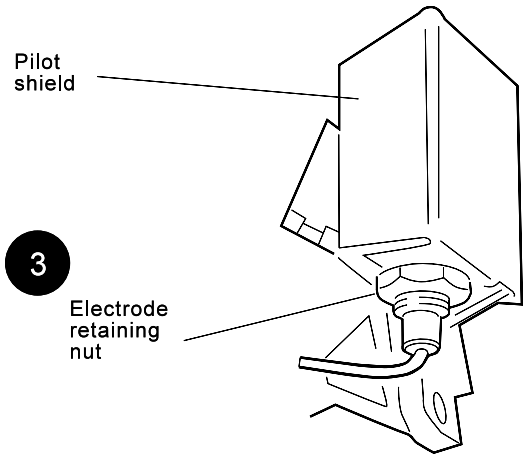
7. Reassemble in reverse order.

8. Check the operation of the boiler.

9. The pilot is factory set to maximum and no further adjustment is possible. Ensure there is an inlet pressure of 20 mbar available. Also check burner ignition and cross-lighting.

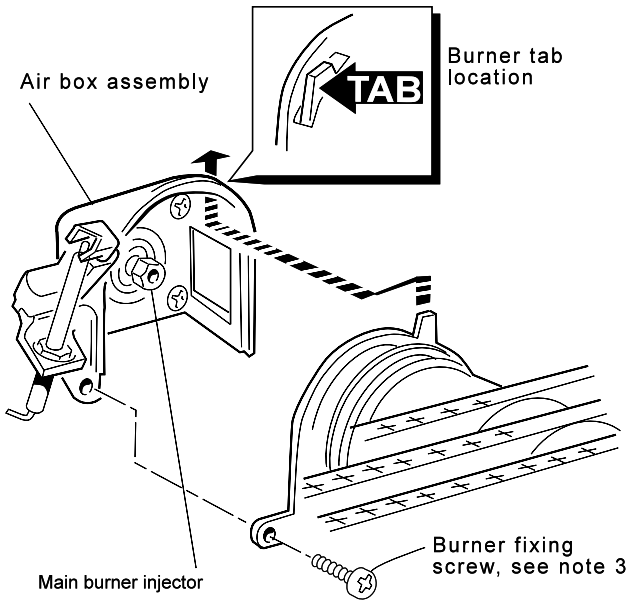
63 IGNITION ELECTRODE AND LEAD REPLACEMENT

1. Refer to Frame 57.
2. Remove the burner and air box assembly. Refer to Frame 52.
3. Remove the electrode retaining nut.
4. Remove the pilot shield.
5. Remove the ignition electrode and integral lead.
6. Refit the new electrode and lead in reverse order. Ensure that the pilot shield is replaced.
7. Check the spark gap. Refer to Frame 62.
8. Reassemble in reverse order.
9. Check the operation of the boiler.



64 MAIN BURNER AND MAIN BURNER INJECTOR REPLACEMENT

1. Refer to Frame 57.
2. Remove the screw retaining the front burner support strap to the combustion chamber.
3. Remove the M5 pozi screw, situated at the left hand bottom rear of the burner. Pull the burner downward to disengage the retention tab and remove the burner.
4. At this stage the main burner injector can be removed, checked, cleaned or replaced as required. Ensure that a new copper sealing washer is used.
5. Fit the new burner, ensuring that the retention tab is correctly located in the air box slot and reassemble in reverse order.
6. Check the burner for cross-lighting and flame stability.



65 GAS CONTROL VALVE REPLACEMENT

Note. *Refer also to Frame 76 of 'Exploded Views' for illustration of the procedure detailed below.*

1. Refer to Frame 57.
2. Remove the burner and air box assembly. Refer to Frame 52.
3. Remove the fixing screws.
   Swing the control box down into the servicing position.
4. Disconnect the gas control valve electrical leads.
5. Undo the gas cock union .
6. Whilst supporting the gas control valve, remove the 2 screws retaining the manifold to the back panel.
7. Remove the gas control / manifold assembly.
8. Remove the 4 screws retaining the manifold to the gas control valve, and fit the manifold to the new valve. Ensure that the new control is fitted the correct way round (an arrow engraved on back indicates the direction of flow).
9. Transfer the gas cock union to the new gas control valve, using an approved jointing compound.
10. Reassemble in reverse order.
11. Check the operation of the boiler.

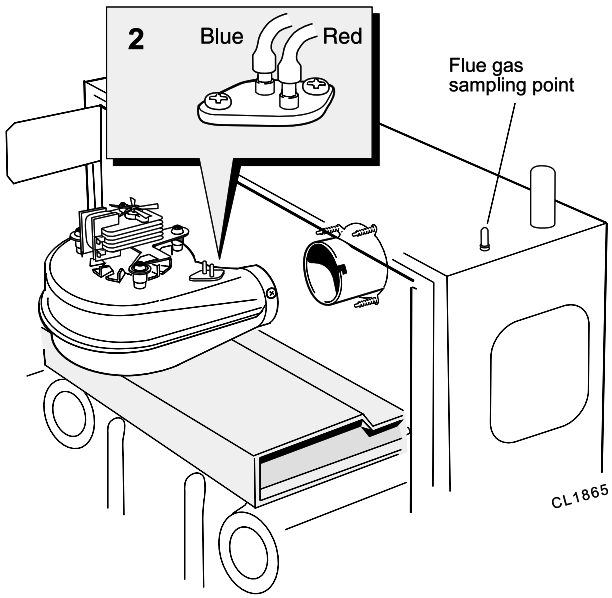
66 FAN REPLACEMENT

1. Refer to Frame 57
2. Remove the 2 silicon rubber tubes from the fan sensing points.
3. Disconnect the fan leads.

4a. **Rear flue.** Slacken the M4 screw securing the flue connector to the fan. Disconnect the connector from the fan and slide into the flue.

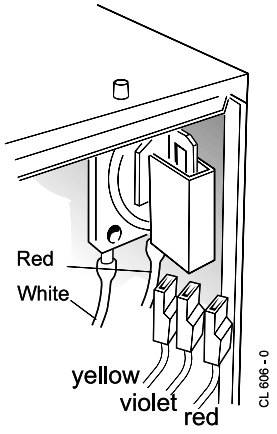
4b. **Side or top flue.** Slacken off two M4 screws securing the flue elbow and flue connector. Disconnect the flue connector from the elbow and slide into the flue. Remove the flue elbow.

5. Disconnect the silicon rubber tube from the rear of the collector hood.
6. Slacken the two M5 nuts on the front tie rods, releasing the tie rods from the combustion chamber.
7. Remove the M5 central fixing screw at the rear of the collector hood and remove collector hood / fan assembly.
8. Remove the three M4 screws retaining the fan to the collector hood.
9. Fit the new fan and reassemble in reverse order, ensuring the fan leads, and 3 sensing tubes are reconnected.
10. Check the operation of the boiler.



67 AIR PRESSURE SWITCH (APS) REPLACEMENT

1. Refer to Frame 57.
2. Remove the APS fixing screw.
3. Remove both sensing tubes from the APS.
4. Remove the 3 electrical connections from the APS.
5. Fit the new APS and reassemble in reverse order.
6. Check the operation of the boiler.



68 PRINTED CIRCUIT BOARD (PCB) REPLACEMENT

Note. *Refer to Frame 75 of 'Exploded Views' for illustration of the procedure detailed below.*

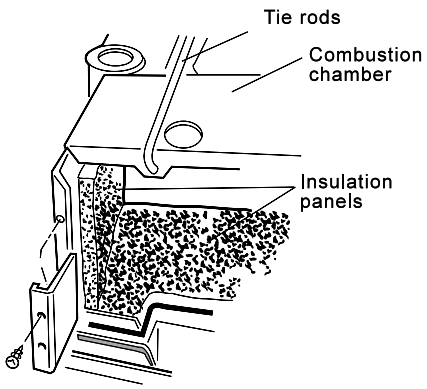
1. Refer to Frame 57.
2. Remove the fixing screws and swing the control box down into the servicing position.
3. Disconnect the detection lead from the PCB.
4. Unplug all the Molex connectors from the PCB.
5. Disengage the PCB from the mounting posts and withdraw from the control box.
6. Fit the new PCB and reassemble in reverse order.
7. Check the operation of the boiler.

Fuse.

To change the fuse, prise it out of the holder and disengage the fuse. Refer to Frame 75 for fuse location.

69 COMBUSTION CHAMBER INSULATION REPLACEMENT

1. Refer to Frame 57.
2. Remove the burner and air box assembly. Refer to Frame 52.
3. Remove the 4 tie rods.
4. Remove the combustion chamber.
5. Remove the 2 side panel retaining brackets.
6. Remove the side insulation panels.
7. Remove the front and rear insulation panels.
8. Fit the new front and rear insulation panels.
9. Fit the new side panels and retain with the brackets and screws previously removed.
10. Reassemble in reverse order.



70 HEAT EXCHANGER REPLACEMENT

Note. *Refer to Frame 7 (Boiler assembly - Exploded view) for illustration of the procedure detailed below.*

1. Refer to Frame 57.

2. Remove the burner / air box assembly. Refer to Frame 52.

3. Drain the system.

4. Disconnect the water connections. If compression fittings are used then cut the pipes both above and below the fittings in order to allow the heat exchanger assembly to be removed. Remove the heat exchanger drain plug and drain the residual water into a suitable receptacle.

5. Remove the fan / collector hood assembly. Refer to Frame 53.

6. Remove the combustion chamber by unscrewing the 4 tie rods.

7. Remove the thermostat sensors from the pockets on the heat exchanger by removing the M3 screws and plates.

8. Slacken 3 turns only the 4 heat exchanger / inter-panel retaining screws.

9. Lift the heat exchanger / inter-panel assembly upward and forward to disengage key hole fixings. Pull the assembly downwards to clear the water pipes from the back panel.

10. Remove the 2 rubber sealing grommets from the top of the back panel to facilitate fitting the new assembly.

11. Fit the new heat exchanger assembly, complete with water pipes, and hang it on the key hole slots and screws. Retighten the screws.

12. Replace the 2 rubber sealing grommets.

13. Reassemble in reverse order.

14. Remake all water connections, ensuring that the compression fittings (if used) are correctly refitted.

15. Fully test all functions, including water and gas soundness.

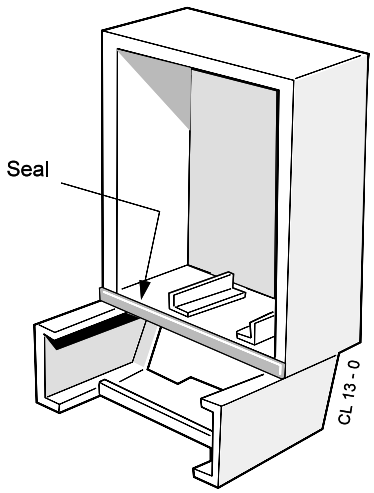
71 CASING SEAL REPLACEMENT

1. Refer to Frame 57.

2. Remove the old seal from the casing surround and thoroughly clean the casing surfaces.

3. Fit the new self adhesive seals.

4. Replace the boiler casing.



72 PROGRAMMER REPLACEMENT (IF FITTED)

1. Refer to Frame 57.

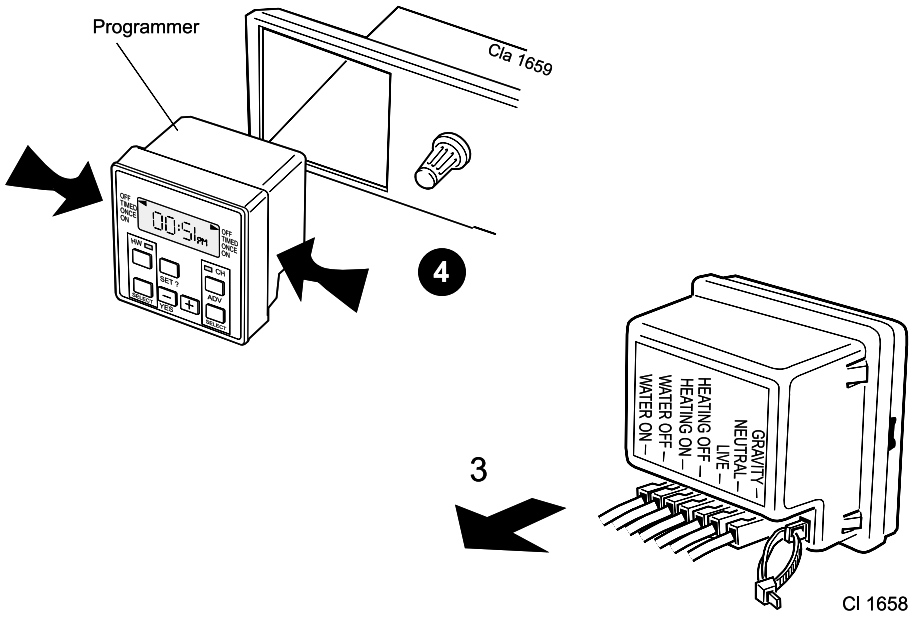
2. Remove the fixing screws and swing the control box down into the servicing position.

3. Pull off the terminal connections from back of programmer.

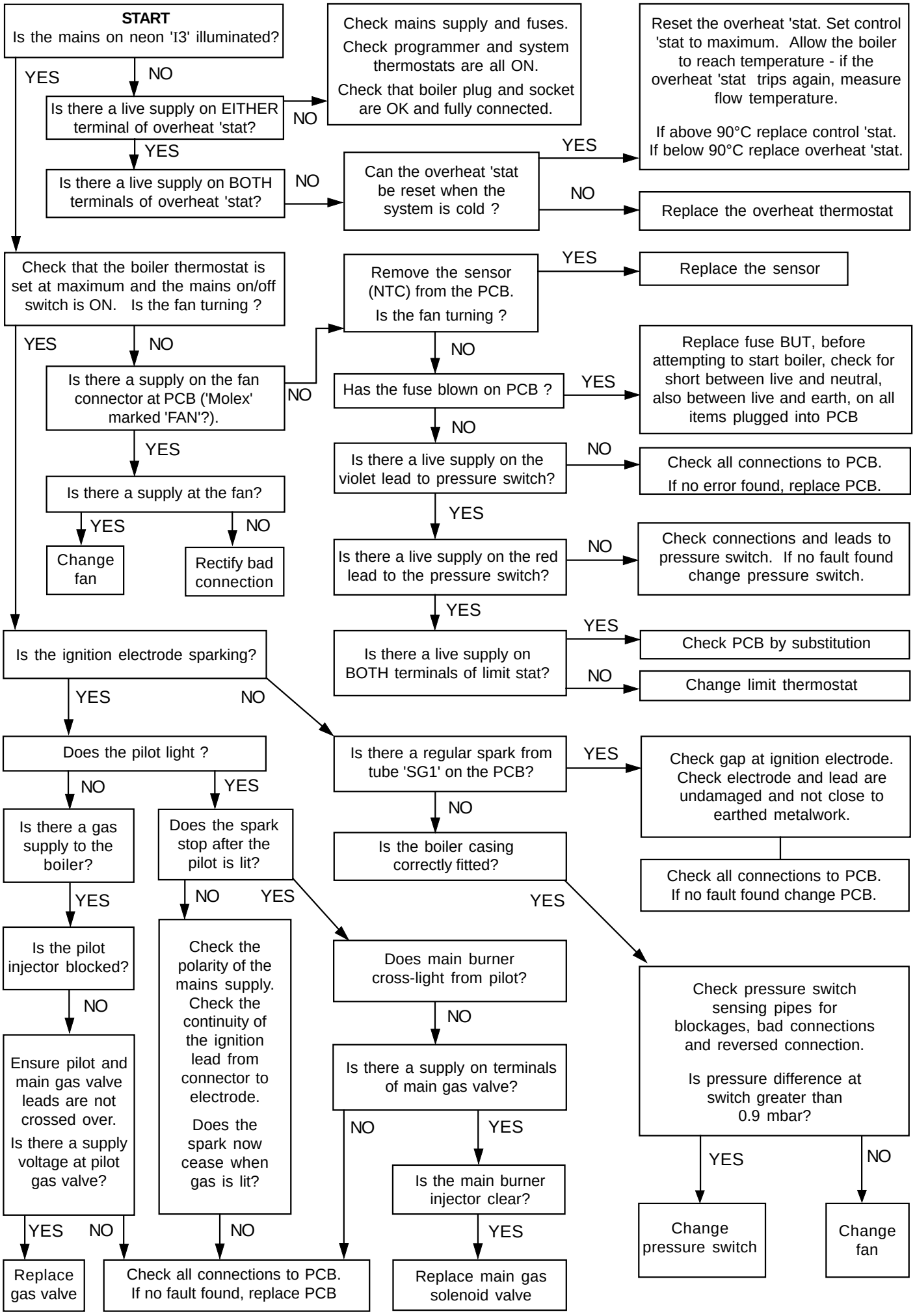
4. Compress the lugs at each side of the programmer and withdraw it from the control panel.

5. Fit the new programmer in reverse order.

6. Set the programmer to the desired programme and check the operation of the boiler.



FAULT FINDING



SHORT LIST OF PARTS

The following are parts commonly required due to damage or expendability. Their failure or absence is likely to affect safety or performance of this appliance.

The list is extracted from the British Gas List of Parts, which contains all available spare parts.

The full list is held by British Gas, **Caradon Ideal Limited** distributors and merchants.

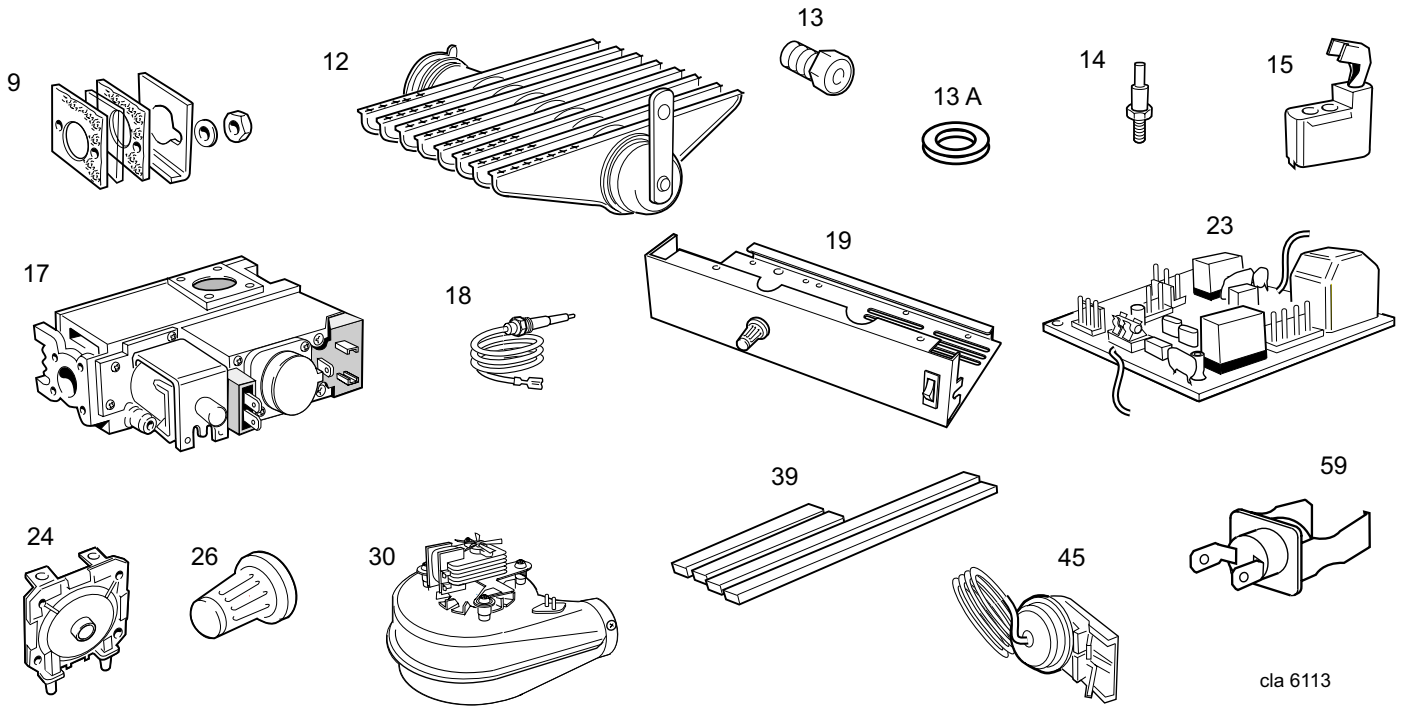
When ordering spares please quote:

1. Boiler Model
2. Appliance G.C. Number
3. Description
4. Quantity
5. Product Number

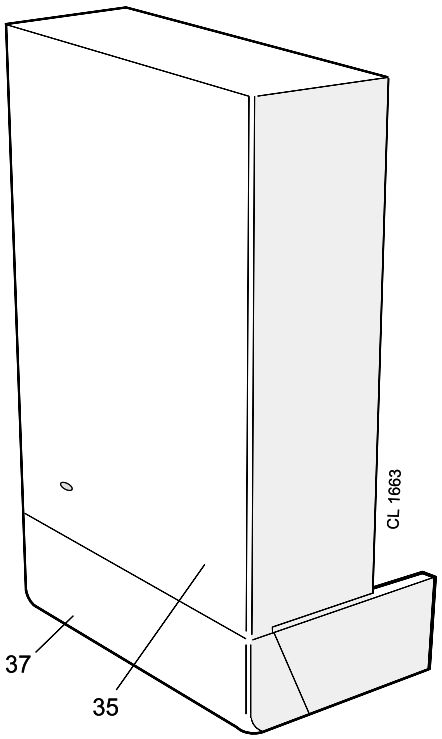
When replacing any part on this appliance use only spare parts that you can be assured conform to the safety and performance specification that we require. Do not use reconditioned or copy parts that have not been clearly authorised by **Ideal Boilers**.

Key No.	GC Part No.	Description	Qty.	Product No.
9	E83-619	Sightglass assembly kit	1	079602
12		Main burner		
		AEROMATIC No.AC 19/123 306; FF 340 LF	1	155396
		Aeromatc no. AC19/123305 FF 350 LF & FF360 LF	1	155397
13		Main burner injector		
		Injector 044-01-344 300 FF 340 LF	1	155399
		Injector 044-01-344 330 FF 350 LF	1	155400
		Injector 044-01-344 359 FF 360 LF	1	155401
13A		Copper washer (for injector)	1	152426
14	E83-627	Pilot burner injector	1	171434
15	E83-630	Pilot burner head with injector	1	171438
17	E83-633	Gas valve kit	1	171441
18	G308 549	Ignition electrode complete with lead and backnut 410 mm lg.	1	171442
19	308 522	Control box assembly, including thermostat, knob, PCB, potentiometer and on/off switch	1	111973
23	386 149	Automatic ignition printed circuit board	1	079716
24	E83-653	Pressure switch	1	171454
26		Thermostat knob	1	
30	E83-665	Fan assembly	1	171461
35		Boiler casing assembly complete with sightglass assy, insulation & M5 x 16 dogpoint pozi pan hd	1	171471
37		Controls casing door with Lighting Instructions	1	171475
39	E85-313	Casing seal pack complete with screws	1	171479
45	E83-682	Overheat thermostat	1	171950
59		Limit thermostat	1	173353

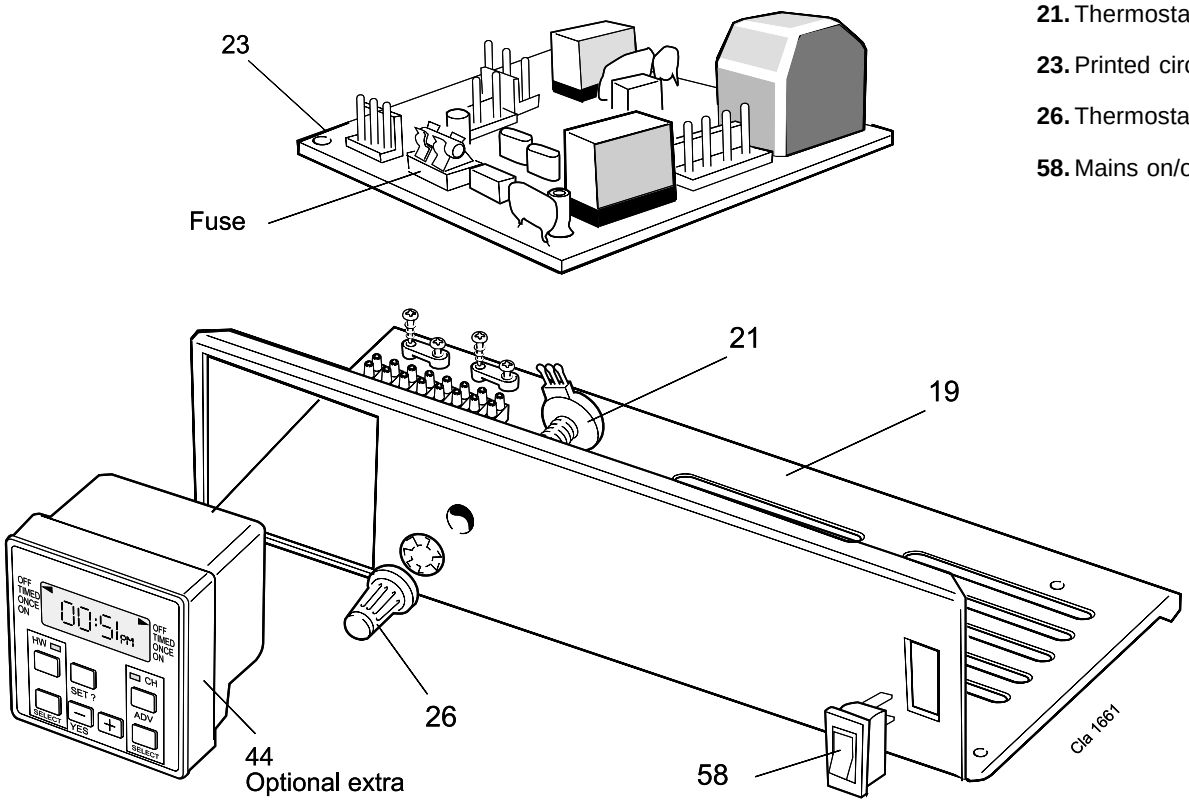
73 SHORT PARTS LIST



74 BOILER CASING ASSEMBLY



75 CONTROL BOX - Exploded View



LEGEND

19. Control box.

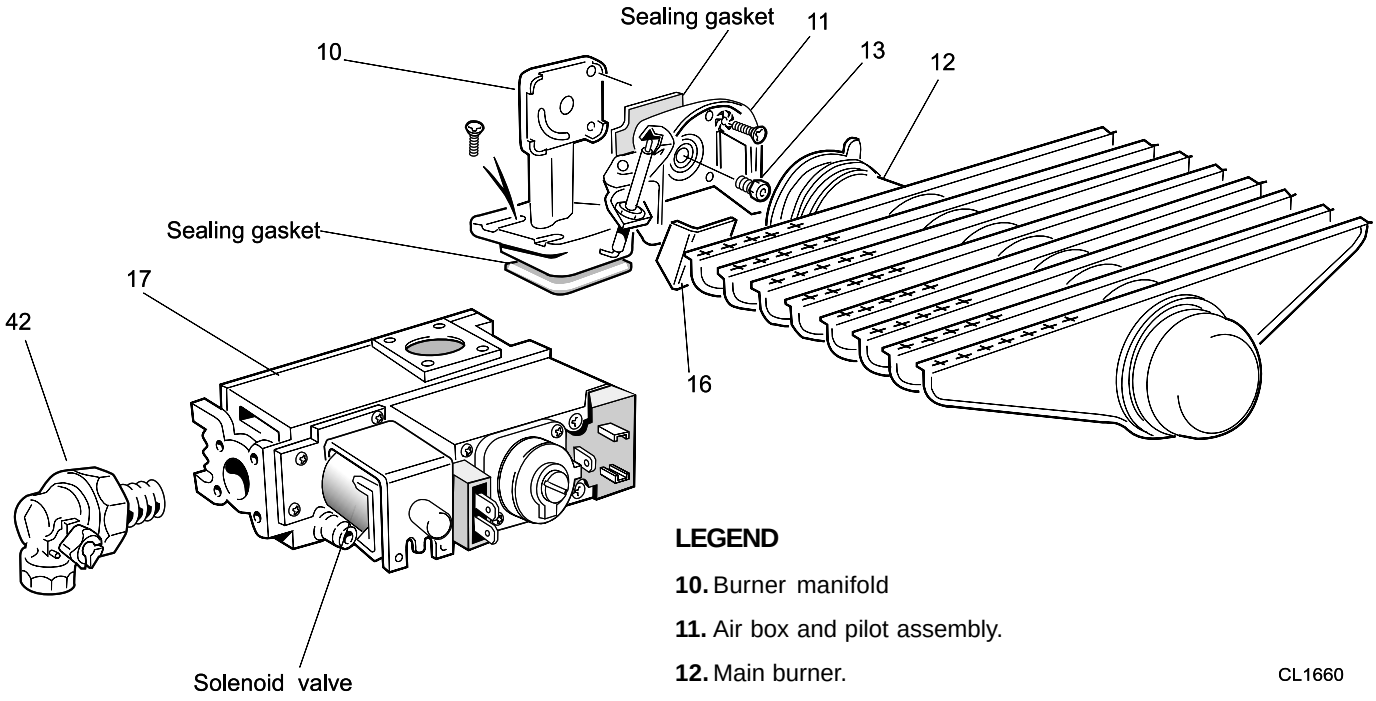
21. Thermostat potentiometer.

23. Printed circuit board.

26. Thermostat knob.

58. Mains on/off switch.

76 BURNER ASSEMBLY - Exploded View



LEGEND

10. Burner manifold

11. Air box and pilot assembly.

12. Main burner.

13. Main burner injector.

16. Pilot shield.

17. Gas control valve.

42. Gas service cock.

CL1660

benchmark™

The code of practice for the installation, commissioning & servicing of central heating systems

CERTIFIED TO BRITISH STANDARDS BS6332 BS5258

THIS SYMBOL IS YOUR ASSURANCE OF QUALITY

These appliances are designed for use with Natural Gas only. They have been tested and conform with the provisions of BS. 6332 and BS. 5258.

Technical Training

The Ideal Boilers Technical Training Centre offers a series of first class training courses for domestic, commercial and industrial heating installers, engineers and system specifiers. For details of courses please ring:..... 01482 498 432

CERTIFIED PRODUCT
Manufactured under a BS EN ISO 9001: 1994 Quality System accepted by BSI

Ideal Boilers, P.O. Box 103, National Ave, Kingston upon Hull, HU5 4JN. Telephone: 01482 492 251 Fax: 01482 448 858. Registration No. London 322 137.

Caradon Ideal Limited pursues a policy of continuing improvement in the design and performance of its products. The right is therefore reserved to vary specification without notice.

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Ideal BOILERS
ENGINEERED FOR PEACE OF MIND

December 2002 UIN157026 A02

Caradon
Ideal Limited

Ideal Installer/Technical Helpline: 01482 498663
www.idealboilers.com

users guide

Classic

Your Ideal users guide

FF 330 - 3 100
FF 340 - 360 LF

When replacing a part on this appliance, use only spare parts that you can be assured conform to the safety and performance specification that we require. Do not use reconditioned or copy parts that have not been clearly authorised by Ideal Boilers.

Ideal BOILERS

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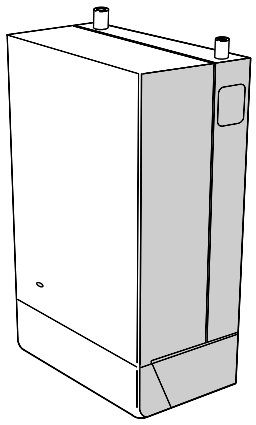
Classic FF (Natural Gas Models Only)



Classic FF 330 ..... G.C. No. 41 391 54
Classic FF 340 ..... G.C. No. 41 391 95
Classic FF 350 ..... G.C. No. 41 391 96
Classic FF 360 ..... G.C. No. 41 391 97
Classic FF 370 ..... G.C. No. 41 391 98
Classic FF 380 ..... G.C. No. 41 391 99
Classic FF 3 100 ..... G.C. No. 41 392 01

Classic FF 340 LF ..... G.C. No. 41 392 90
Classic FF 350 LF ..... G.C. No. 41 392 91
Classic FF 360 LF ..... G.C. No. 41 392 92

Introduction

It is essential that the instructions in this booklet are strictly followed, for safe and economic operation of the boiler.

Current Gas Safety (Installation & Use) Regulations or rules in force.

In your own interest, and that of safety, it is the law that this boiler must be installed by a registered installer, in accordance with all national and local regulations.

Electricity Supply

This appliance must be efficiently earthed.

Supply: 230 V ~ 50 Hz. The fusing should be 3A.

Connection must be made in a way that allows complete isolation of the electrical supply such as a double pole switch having a 3mm (1/8") contact separation in both poles, or a plug and socket, serving only the boiler and system controls. The means of isolation must be accessible to the user after installation.

Important notes

a. *This appliance must not be operated without the casing correctly fitted and forming an adequate seal.*

b. *If the boiler is installed in a compartment then the compartment MUST NOT be used for storage purposes.*

c. *The ventilation provided for the boiler during installation MUST NOT be blocked, and a check should be made periodically that the ventilation areas are free from any obstruction.*

d. *If it is known or suspected that a fault exists on the boiler then it MUST NOT be used until the fault has been corrected by a CORGI registered installer.*

e. *Flammable materials must not be placed in close proximity to the appliance. Materials giving off flammable vapours must not be stored in the same room as the appliance.*

f. *Where the boiler is fitted with a Vertex flue system with a draught diverter in the loft the loft space MUST NOT be used as a dwelling area.*

g. *Under NO circumstances should any of the sealed components on this appliance be used incorrectly or tampered with.*

Minimum clearances

A clearance of 533mm (21") MUST be available at the front of the boiler for servicing.

The minimum clearances given below MUST be complied with in order to maintain the safe running of the boiler .

Above the boiler	100 mm	(4")
At each side of the boiler	5 mm	(1/4")
Underneath the boiler	100 mm	(4")
In front of the boiler	75 mm	(3")

To light the boiler. ***Refer to Frame 1***

If a programmer is fitted, refer to separate instructions for the programmer before continuing.

1. CHECK THAT THE ELECTRICITY SUPPLY TO THE BOILER IS OFF.

2. Open the controls access door by hinging downwards.

3. Ensure that the gas inlet cock (D) is OPEN.

4. Press the overheat reset button (E), located as shown in Frame 1.

5. Ensure that the mains on/off switch (C) is in the OFF position.

6. Switch ON the electricity supply to the boiler. Check that all external controls, e.g. room thermostat etc., are ON.

7. Turn the boiler thermostat knob (B) to position 6 and the mains on/off switch (C) to ON. After about 15 seconds the boiler will light automatically - this can be viewed through the sight glass (A).
Set the boiler thermostat to the desired position.

8. Close the controls access door.

CAUTION. To avoid the possibility of injury during the installation, servicing or cleaning of this appliance care should be taken when handling edges of sheet steel components

In **winter conditions**, i.e. central heating and domestic hot water, the thermostat should be set at position 5 or 6.

For **summer conditions**, i.e. domestic hot water only, the thermostat should be set at position 3.

These settings, however, are offered for general guidance only and other settings may be found preferable, dependent upon the type of system installed or as recommended by the installer.

Control of water temperature

1. Adjust the boiler thermostat (B) to give the required temperature of central heating.
2. The boiler thermostat automatically switches the main burner OFF and ON to maintain the selected temperature.

Approximate flow temperatures for the boiler thermostat settings are:

Knob Setting	Flow Temperature	
	°C	°F
1	56	133
2	61	142
3	66	152
4	72	161
5	77	170
6	82	180

To shut down the boiler

1. **For short periods**
   Turn the boiler on/off switch (C) to OFF.
   When heating is again required, restore the switch to ON.
2. **For longer periods**
   Turn the boiler ON/OFF switch (C) to OFF.
   Switch the electricity supply to OFF.

To relight the boiler

Repeat the procedure 1 - 8, detailed in 'To light the boiler'.

Frost protection

If no frost protection is provided and frost is likely during a short absence from home, leave the heating controls at a reduced temperature setting.

For longer periods, the entire system should be drained - including the domestic water supply. If the system includes a frost thermostat then, during cold weather, the boiler should be turned OFF at the time switch(es) ONLY. The mains supply should be left switched ON, with the boiler thermostat left in the normal running position.

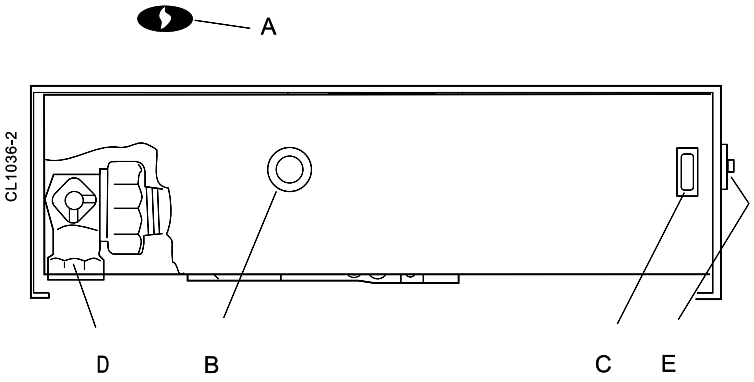
Boiler Overheat Thermostat

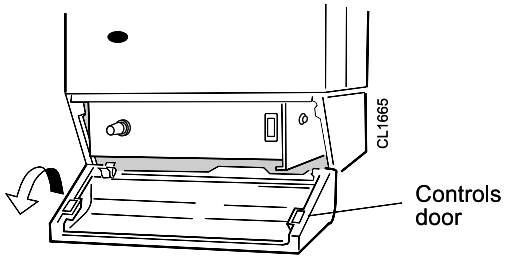
The boiler is fitted with a safety 'cutout' thermostat. This will shut down the boiler in the event of overheating. Should this occur allow the boiler to cool, press the reset button (E) then relight as detailed in steps 1-8 in 'To light the boiler'.

If the cutout condition still persists turn off the boiler and consult a CORGI registered installer.

1 BOILER CONTROLS

View inside boiler controls area





LEGEND

- **A** Sightglass.
- **B** Thermostat knob.
- **C** Mains on/off switch.
- **D** Gas service cock (shown in the OPEN position).
- **E** Overheat thermostat reset button.

All CORGI registered installers carry a CORGI ID card, and have a registration number. Both should be recorded in your **Benchmark** Log Book. You can check your installer by calling CORGI direct on 01563 72300

THE LOG BOOK SHOULD BE COMPLETED AFTER EACH SERVICE AND KEPT WITH THESE INSTRUCTIONS

Loss of system water pressure

Boilers fitted with Classic Sealed System Units only

If the red arrow on the unit pressure gauge is set above zero and the system pressure is seen to fall below this value over a period of time then a water leak is indicated. In this event a CORGI registered installer should be consulted.

DO NOT OPERATE THE BOILER IF THE PRESSURE HAS REDUCED TO ZERO FROM THE ORIGINAL SETTING.

Escape of gas

Should a gas leak be suspected, contact your local gas supplier without delay.

Do NOT search for gas leaks with a naked flame.

Cleaning

For normal cleaning simply dust with a dry cloth.
To remove stubborn marks and stains, wipe with a damp cloth and finish off with a dry cloth.

Do NOT use abrasive cleaning materials.

Maintenance

The appliance should be serviced at least once a year by a CORGI registered installer.

benchmark™

The code of practice for the installation, commissioning & servicing of central heating systems

Caradon Ideal Limited is a member of the Benchmark initiative and fully supports the aims of the programme. Benchmark has been introduced to improve the standards of installation and commissioning of central heating systems in the UK and to encourage the regular servicing of all central heating systems to ensure safety and efficiency.

CERTIFIED TO BRITISH STANDARDS BS6332 BS5258

THIS SYMBOL IS YOUR ASSURANCE OF QUALITY

These appliances are designed for use with Natural Gas only. They have been tested and conform with the provisions of BS. 6332 and BS. 5258.

Natural Gas appliances are service listed by British Gas

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Ideal Boilers, P.O. Box 103, National Ave., Kingston upon Hull, HU5 4JN. Telephone: 01482 492 251.
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Aug 2001 UIN 157 019 A01

Caradon
Ideal Limited

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www.idealboilers.com

Classic Combi FF 280

Installation & Servicing

Wall Mounted, Fanned, Balanced Flue Gas Boilers

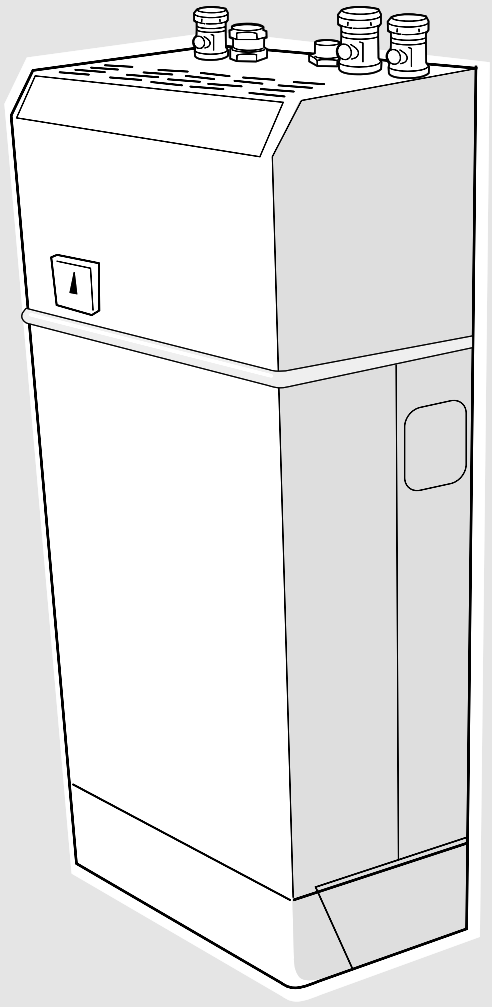
Natural Gas Models Only

Classic Combi **G.C. Appliance No.**

FF 280 .....47 415 08

CAUTION.

To avoid the possibility of injury during the installation and servicing of this appliance, care should be taken when handling edges of sheet components.



NOTE TO THE INSTALLER: LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER

BOILERS Ideal

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INTRODUCTION

The new Classic Combi FF280 is a cast iron, balanced flue, fanned gas boiler.

Central heating (CH) output is spot rated at 23.4 kW (80 000 Btu/h) with on/off thermostatic control and is suitable for use with heating loads down to 4.4 kW (15 000 Btu/h).

Maximum instantaneous domestic hot water (DHW) output is also 23.4kW (80 000 Btu/h).

The boiler is designed for use with fully pumped sealed water systems but can also be connected to open water systems if required.

The boiler casing is of white enamelled mild steel with a removable controls pod. A drop-down door gives access to the control box.

Note. *This boiler can only be used on fully pumped systems.*

The boiler is supplied fully assembled, with a domestic hot water calorifier, diverter valve, circulating pump, pressure gauge, safety valve and CH expansion vessel (contained in a module on top of the boiler).

Fixed temperature CH and DHW controls are fitted and the boiler incorporates a DHW 'preheat' facility.

The module also includes a CH thermostatic valve and bypass. *No external bypass is required.*

The domestic hot water and central heating pipe connections may be made at the top or bottom of the boiler as required.

The boiler is supplied with a standard flue kit suitable for rear or side outlet applications up to 600mm (23 1/2"). Optional extra extension ducts up to 3m (118"), rear or side outlet, are available.

Note. *A Vertex Flue Kit with a side outlet may be used - see the Vertex Flue Kit Installation Instructions for details.*

OPERATION

Domestic Hot Water (DHW)

With no call for either DHW or CH the boiler will periodically fire at low gas rate for a few seconds, in order to maintain the DHW calorifier in a preheated condition.

Note. *The DHW 'preheat' operates 24 hours a day unless an external programmer is fitted, when it can be timed.*

When there is demand for DHW the boiler fires at full gas rate, the diverter valve remains de-energised and the full output from the boiler is directed to the DHW calorifier, providing a maximum DHW draw-off of 9.6 l/m (2.1 gpm) at 35° C. temperature rise.

At DHW draw-off rates below approximately 6 l/m (1.3 gpm) the boiler reduces to low gas rate when the DHW temperature reaches about 60°C and maintains the low draw-off temperature between 50°C and 75°C. When the demand for DHW is satisfied the 'preheat' cycle resumes, unless there is a CH demand, which takes priority.

Central Heating (CH)

When there is demand for CH, the boiler fires at full output, to supply the demand. The CH circuit within the module incorporates a thermostatic valve which operates to maintain a high boiler temperature during periods of cold CH start-up, necessary for the instantaneous delivery of DHW , if there is a demand at this time. Water is not released to the system until a temperature of 60°C. is reached within the boiler.

Refer also to 'Boiler Water Circuit Diagrams'.

Table 1 - General Data

Boiler size			**FF 280**
Gas supply connection			Rc 1/2 (1/2" BSP/t)
Inlet connection	Domestic Hot Water		15mm compression union
Outlet connection	Domestic Hot Water		15mm compression union
Flow connection	Central Heating		22mm compression union
Return connection	Central Heating		22mm compression union
Safety valve drain pipe connection			15mm copper (female)
Flue terminal diameter		mm (in.)	100 (4)
Maximum working pressure (sealed systems)		bar (psi)	2.5 (36.3)
Maximum static water head		m (ft.)	25 (82)
Minimum static water head - open water systems		m (ft.)	1.5 (5.0)
Maximum domestic hot water inlet pressure		bar (psi)	10.0 (145.0)
Minimum domestic hot water inlet pressure		bar (psi)	0.9 (13.1)
Electrical supply			230 V ~ 50 Hz
Maximum power consumption			160W
Fuse rating			External; 3A Internal; 2A (F)
Water content	Central Heating	litre (gal.)	4.65 (1.0)
	Domestic Hot Water	litre (gal.)	0.55 (0.12)
Dry weight (total)		kg (lb)	78.7 (173)
Maximum installation weight		kg (lb)	Combi module - 11.4 (25.1) Boiler module - 52.6 (116)
Boiler casing size	Height	mm (in.)	1045 (41 1/4)
	Width	mm (in.)	380 (15.0)
	Depth	mm (in.)	Top water connections - 300 (11 3/4) Bottom water connections - 345 (13 1/2)

Table 2 - Performance Data - Central Heating

Central Heating		**Maximum**
Burner setting pressure (hot)	mbar (in.w.g.)	16.0 (6.4)
Output	kW (Btu/h)	23.4 (80 000)
Input	kW (Btu/h)	29.3 (100 000)
Gas consumption (hot)	l/s (ft^3/h)	0.76 (96.3)

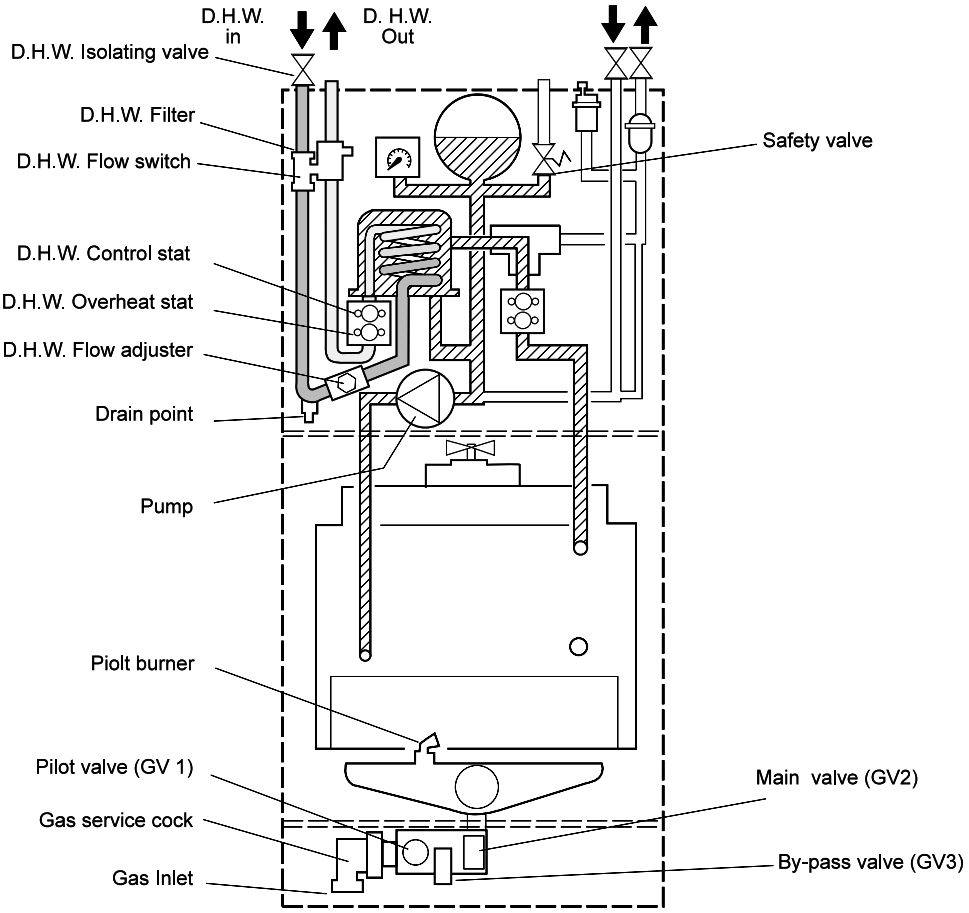
Table 3 - Performance Data - Domestic Hot Water

Domestic Hot Water		**Maximum**
Burner setting pressure (hot)	mbar (in.w.g.)	16.0 (6.4)
DHW output	kW (Btu/h)	23.4 (80 000)
DHW input	kW (Btu/h)	29.3 (100 000)
Gas consumption (hot)	l/s (ft^3/h)	0.76 (96.3)
Domestic hot water flow rate at 35°C. temp. rise	l/m (gpm)	9.6 (2.1)

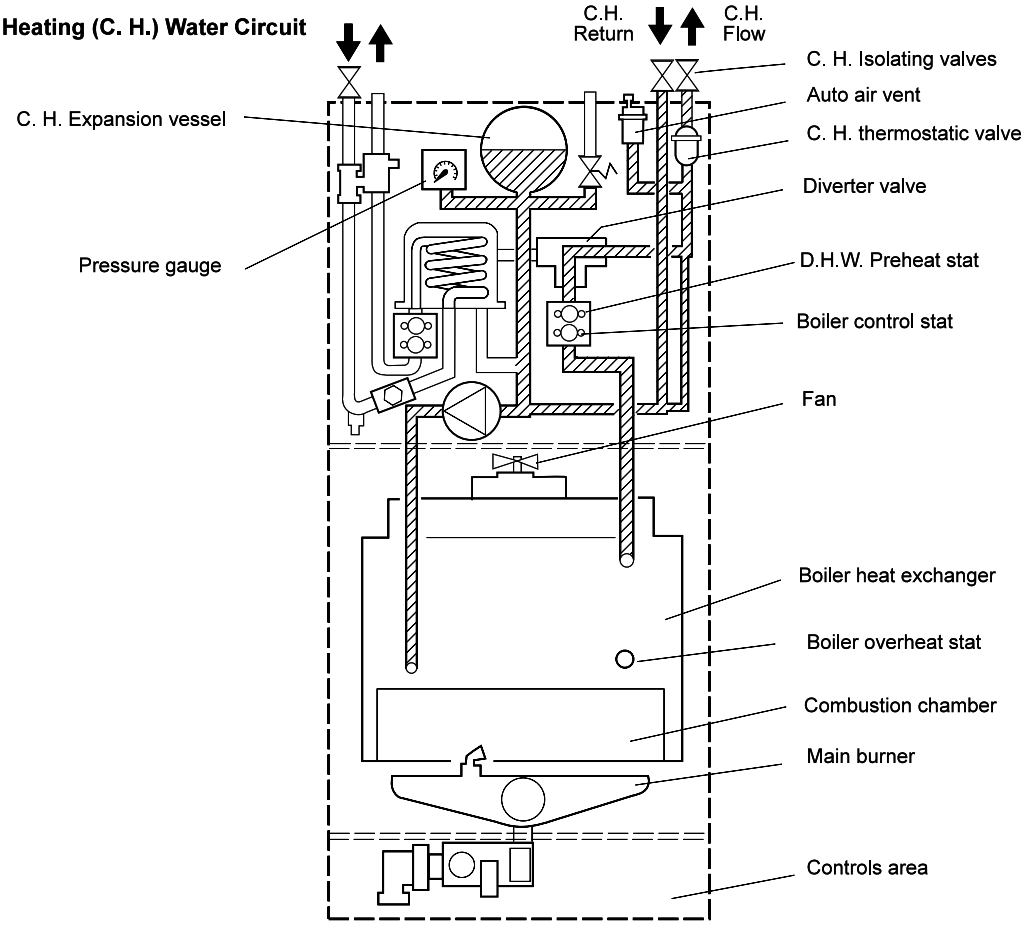
Note. *Gas consumption is calculated using a calorific value of 38.7 MJ/m^3 (1038 Btu/ft^3)*

1 BOILER WATER CIRCUIT DIAGRAMS

Domestic Hot Water (D.H.W.) Circuit



Central Heating (C. H.) Water Circuit



OPTIONAL EXTRA KITS

A Programmer Kit

A 90° Flue Elbow Kit

Extension ducts up to 3 m (118").

GAS SAFETY (INSTALLATION AND USE) REGULATIONS, 1994.

It is law that **all** gas appliances are installed by a CORGI registered installer (identified by ❀) in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution. It is in your own interest, and that of safety, to ensure the law is complied with.

The installation of the boiler MUST also be in accordance with the latest I.E.E Wiring Regulations, local building regulations, bylaws of the local water authority, the Building Regulations and Building Standards (Scotland) and any relevant requirements of the local authority.

Detailed recommendations are contained in the following British Standard Codes of Practice:

BS.6891	Low pressure installation pipes.
BS.6798	Installation of gas fired hot water boilers of rated input not exceeding 60 kW.
BS.5449	Forced circulation hot water systems.
BS.5546	Installation of gas hot water supplies for domestic purposes (2nd Family Gases).
BS.5440:1	Flues for gas appliances of rated input not exceeding 60 kW.
BS.5440:2	Ventilation for gas appliances of rated input not exceeding 60 kW.
BS.7593:1992	Treatment of water in domestic hot water central heating systems

HEALTH & SAFETY DOCUMENT NO 635

The Electricity at Work Regulations, 1989.

Manufacturer's notes must NOT be taken in any way as overriding statutory obligations.

IMPORTANT.

This appliance is certificated by the British Standards Institution for safety and performance. It is, therefore, important that no external control devices, e.g. flue dampers, economisers etc., are directly connected to this appliance - unless covered by these Installation and Servicing Instructions or otherwise recommended by **Caradon Ideal Ltd.** in writing.
If in doubt please enquire.

Any direct connection of a control device not approved by **Caradon Ideal Ltd.**, could invalidate the BSI Certification and the normal appliance warranty. It could also infringe the Gas Safety Regulations and the above regulations.

LOCATION OF BOILER

The boiler must be installed on a flat and vertical wall, capable of adequately supporting the weight of the boiler and any ancillary equipment.

The boiler may be fitted on a combustible wall. Insulation between the wall and the boiler is not necessary, unless required by the local authority. **The boiler must not be fitted outside.**

Timber Framed Buildings
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', reference DM2.

Bathrooms
The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current I.E.E. (BS. 7671) Wiring Regulations and, in Scotland, the electrical provisions of the building regulations applicable in Scotland with respect to the installation of the boiler in a room or internal space containing a bath or shower.

Where a room-sealed appliance is installed in a room containing a bath or shower then the appliance and any electrical switch or appliance control utilising mains electricity should be so situated that it cannot be touched by a person using the bath or shower.

Where installation will be in an unusual location special procedures may be necessary and BS.6798 gives detailed guidance on this aspect.

Compartment Installations
A compartment used to enclose the boiler should be designed and constructed specially for this purpose.
An existing cupboard or compartment may be used, provided that it is modified for the purpose.

In both cases details of essential features of cupboard / compartment design, including airing cupboard installation, are to conform to the following:

- BS. 6798.
- The position selected for installation MUST allow adequate space for servicing in front of the boiler and for air circulation around the boiler - see section on 'Air Supply'.
- For the minimum clearances required for safety and subsequent service see the wall mounting template and Frame 2. In addition, sufficient space may be required to allow lifting access to the wall mounting plate.

GAS SUPPLY

The local 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 local gas supplier.

A gas meter can only be connected by the local gas supplier or by a local regional contractor.

An existing meter should be checked, preferably by the gas supplier, to ensure that the meter is adequate to deal with the rate of gas supply required. A MINIMUM pressure of 20mbar MUST be available at the boiler inlet, with the boiler operating.

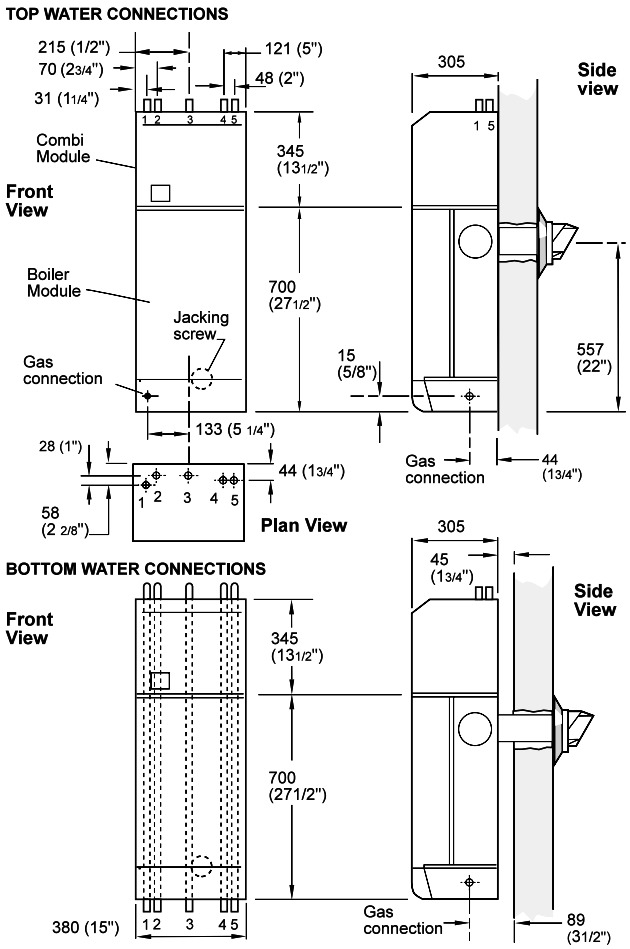
Installation pipes MUST be fitted in accordance with BS. 6891. Pipework from the meter to the boiler MUST be of an adequate size.

The complete installation MUST be tested for gas soundness and purged as described in the above code.

2 BOILER DIMENSIONS / SERVICES

LEGEND

1. DHW inlet
2. DHW outlet
3. Safety valve drain
4. CH return
5. CH flow



BOILER CLEARANCES

The following minimum clearances must be maintained for operation and servicing (see diagram).

Additional space will be required for installation, depending upon site conditions.

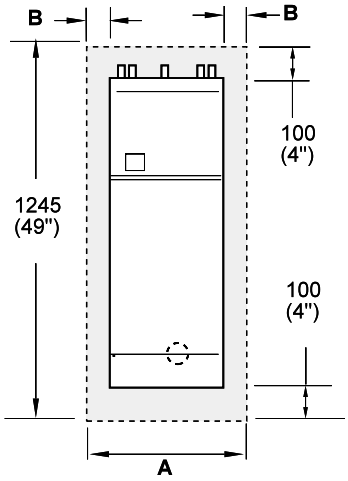
Dimension	Side Flue	Rear Flue
A	425mm	390mm
B	25mm flue side 40mm non-flue side	5mm both sides

Side Flue only

Provided that the flue hole is cut accurately, e.g. with a core drill, the flue can be installed from inside the building, up to 610mm (24") but, with flue lengths greater than the width of the boiler, the space in which the boiler is to be installed must be at least equal to the flue length plus the length of the terminal grille.

Installation from inside ONLY

If a core boring tool is to be used inside the building the space in which the boiler is to be installed must be at least wide enough to accommodate the tool.



All installations

Once the boiler has been installed, the side clearances may be reduced to 5mm.

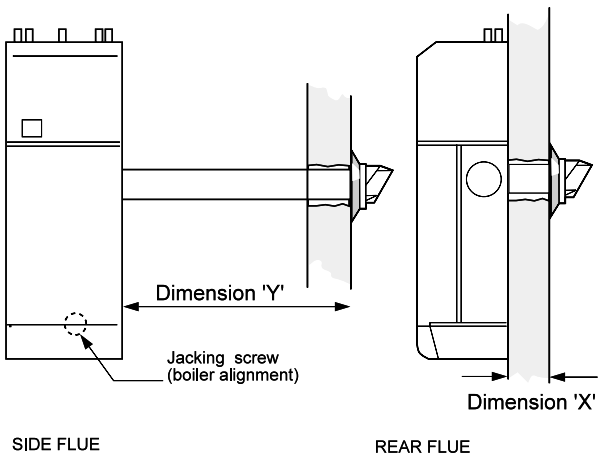
Front clearance; 450mm (17 3/4") from the front of the boiler casing. Minimum front clearance when built in to cupboard is 75mm (3")

3 DETERMINING THE FLUE LENGTH

It is MOST important that the boiler is installed in a vertical position.

Dimension **X:** Wall thickness (top water connections)
or
X plus 45mm (bottom water connections)

Dimension **Y:** Wall thickness plus boiler spacing



All dimensions in mm (in.)

IMPORTANT. The direction of the water connections, i.e. to the top or bottom of the boiler, must be decided BEFORE determining the flue length and position.

FLUE KITS

Pack B: supplied as standard.

Pack D: optional extension kit for side flue or rear flue outlet. Refer to 'Flue Extension Ducts'

1. A maximum of 2 extension ducts (plus the standard flue duct) may be used together.
2. Flue extensions of greater than 1m (39") should be supported with the bracket provided. If the stand-off brackets have been used it is necessary, in order to keep the flue aligned, to use the spacer bracket with the support bracket.

Flue length	Accessories	Product no.
Up to 600	B pack 1 off	111 492
600 to 1800	B pack 1 off + D pack 1 off	111 492 + 111 493
1800 to 3000	B pack 1 off + D pack 2 off	111 492 + 111 493, 2 off

FLUE INSTALLATION

The flue must be installed in accordance with the recommendations of BS. 5440:1.

The following notes are intended for general guidance:

1. The boiler MUST be installed so that the terminal is exposed to external air.

2. It is important that the position of the terminal allows the free passage of air across it at all times.

3. Minimum acceptable spacing from the terminal to obstructions and ventilation openings are specified in Table 4.

4. Where the lowest part of the terminal is fitted less than 2m (6'6") above a balcony, above ground or above a flat roof to which people have access then the terminal MUST be protected by a purpose designed guard. The minimum spacing in Table 4; Nos. 2, 3, 4, 5 and 6 would be 75mm in order to allow a terminal guard to be fitted.

Terminals guards are available from:

Tower Flue Components Ltd.,
Vale Rise, Tonbridge, Kent TN9 1TB

Telephone No. 01732 351 555

Ensure that the guard is fitted centrally.

5. Where the terminal is fitted within 1000mm (39 1/2") of a plastic or painted gutter or 500mm (19 1/2") of painted eaves then an aluminium shield at least 1000mm (39 1/2") long should be fitted to the underside of the gutter or painted surface.

6. The air inlet/products outlet duct and the terminal of the boiler MUST NOT be closer than 25mm (1") to combustible material. Detailed recommendations on the protection of combustible material are given in BS.5440: Part 1.

7. Where it is essential that the terminal wall plate is fitted, i.e. wall thicknesses over 600mm (23 5/8") or with an inaccurately cut hole, the minimum spacing in Table 4, Nos. 2,3, 5 and 6 would be 60mm in order to allow the terminal wall plate to be fitted.

IMPORTANT

It is absolutely ESSENTIAL to ensure, in practice, 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.

If this should occur, the appliance MUST be turned OFF immediately, labelled 'unsafe' and corrective action taken.

TERMINAL

The terminal assembly can be adapted to accommodate various wall thicknesses - refer to Frame 6 'Unpacking'.

Table 4 - Balanced flue terminal position

Terminal Position	Minimum Spacing
1. Directly below or alongside an openable window, air vent or other ventilation opening	300 mm (12")
2. Below guttering, drain pipes or soil pipes	25 mm (1")
3. Below eaves	25 mm (1")
4. Below balconies or a car port roof	25 mm (1")
5. From vertical drain pipes or soil pipes	25 mm (1")
6. From internal or external corners	25 mm (1")
7. Above adjacent ground, roof or balcony level	300 mm (12")
8. From a surface facing the terminal	600 mm (24")
9. From a terminal facing a terminal	1200 mm (48")
10. From an opening in a car port (e.g. door or window) into dwelling	1200 mm (48")
11. Vertically from a terminal on the same wall	1500 mm (60")
12. Horizontally from a terminal on the wall	300 mm (12")

AIR SUPPLY

Detailed recommendations for air supply are given in BS.5440:2.

The following notes are for general guidance:

1. It is NOT necessary to have a purpose provided air vent in the room or internal space in which the boiler is installed.

2. If the boiler is to be installed in a cupboard or compartment, permanent air vents are required (for cooling purposes) at both high and low levels. The air vents must either communicate with room/internal space or be direct to outside air. The minimum effective areas of the permanent air vents required in the cupboard/compartment are specified as follows and are related to maximum rated heat input.

3. Both air vents MUST communicate with the same room or internal space or MUST be on the same wall to outside air.

4. In siting the air vents care must be taken to avoid the freezing of pipework.

Refer to Table 5 for details of air vent position and sizing.

Table 5 - Air supply

Position of air vent	Air from room/ internal space	Air direct from outside
High level cm^2 (in^2)	264 (41)	132 (21)
Low level cm^2 (in^2)	264 (41)	132 (21)

WATER CIRCULATION SYSTEM

The boiler is designed for connection to sealed water central heating systems but connection may be made to open water systems, if required. The domestic hot water (DHW) calorifier is incorporated within the boiler casing and only requires connection to the mains water supply.

Water connections maybe made at the top of, or to the bottom of the boiler.

IMPORTANT

Ensure that the mains water supply pressure is adequate to provide the required DHW flow rate. Refer to Tables 1 and 3 on page 3.

The central heating system should be in accordance with BS. 6798 and, in addition, for smallbore and microbore systems, BS. 5449.

The domestic hot water system should be in accordance with the relevant recommendations of BS. 5546.

Copper tubing to BS. 2871:1 is recommended for water-carrying pipework, and MUST be used for pipework carrying potable water.

Ancillary pipework not forming part of the useful heating surface should be lagged to prevent heat loss and any possible freezing - particularly where pipes run through roof spaces and ventilated underfloor spaces.

IMPORTANT

Draining taps MUST be located in accessible positions, which permit the draining of the whole system. They should be at least 1/2" BSP nominal size and be in accordance with BS. 2879.

Maximum recommended system hydraulic losses are given in Table 6 below:

Table 6 - Water flow rate and pressure loss

System load	kW (Btu/h)	23.4 (80 000)	19.0 (65 000)	4.4 (15 000)
Water flow rate	l/min (gal/h)	22.5 (297)	24.8 (327)	5 (75)
Temperature differential	°C (°F)	15 (27)	11 (20)	11 (20)
Pressure available for system	mbar (in. w.g.)	157 (63)	118 (47)	391 (157)

THERMOSTATIC RADIATOR VALVES

Caradon Ideal Ltd. recommend that heating systems utilising full thermostatic radiator valve control of temperature in individual rooms should also be fitted with a room thermostat controlling the temperature in a space served by radiators not fitted with such a valve, as stated in BS. 5449.

When thermostatic radiator valves are used the space heating temperature control over a living / dining area or hallway having a heating requirement of at least 10% of the boiler heat output should be achieved using a room thermostat, whilst other rooms are individually controlled by thermostatic radiator valves. However, if the system employs thermostatic radiator valves on all radiators or 2 port valves without end switches then a bypass must be fitted to ensure a flow of water, should all valves be in the closed position.

ELECTRICAL SUPPLY

Wiring external to the appliance MUST be in accordance with the current I.E.E. (BS.7671) Wiring Regulations and any local regulations which apply.

The point of connection to the mains should be readily accessible and adjacent to the boiler, except that for bathroom installations; the point of connection to the mains MUST be situated outside of the bathroom.

Note. *Where a room sealed appliance is installed in a room containing a bath or shower then the appliance and any electrical switch or appliance control utilising mains electricity should be so situated that it cannot be touched by a person using the bath or shower.*

4 SYSTEM REQUIREMENTS - CENTRAL HEATING

Notes.

a. *The method of filling, refilling, topping up or flushing sealed primary hot water circuits from the mains via a temporary hose connection is only allowed if acceptable to the local water authority.*

b. *Antifreeze fluid, corrosion and scale inhibitor fluids suitable for use with boilers having cast iron heat exchangers may be used in the central heating system. For further information contact:*

Fernox Manufacturing Co. Ltd.,
Britannic Works, Clavering, Essex. CB11 4QZ.

Tel: 01799 550 811

or

Grace Service Chemicals
Grace Dearborn Ltd.,
Widnes, Cheshire. WA8 8UD.

Tel: 0151 424 5351

1. General

a. The installation must comply with the requirements of BS.6891:1988 and BS.5449:1.

b. The installation should be designed to work with flow temperatures of up to 82^{0}C.

c. All components of the system must be suitable for a working pressure of 3 bar (45psi) and temperature of 110^{0}C. Care should be taken in making all connections so that the risk of leakage is minimised.

The following components are incorporated within the appliance:

- Circulating pump
- Safety valve, with a non-adjustable pre-set lift pressure of 3bar (45 psi)
- Pressure gauge, covering a range of 0-6 bar.
- 8-litre expansion vessel, with an initial charge pressure of 0.75 bar.

For further details refer to BS. 5449:1 and British Gas publication 'Specifications for Domestic Central Heating and Hot Water'.

2. Make-up Water

Provision must be made for replacing water loss from the system, either:

a. From a manually filled 'make-up' vessel with a readily visible water level.
The vessel should be mounted at least 150mm (6") above the highest point of the system, and be connected through a non-return valve to the system, fitted at least 150mm (6") below the make-up vessel on the return side of the domestic hot water cylinder or radiators.

b. Where access to a make-up vessel would be difficult by pre-pressurisation of the system. Refer to note 4 'Filling'. The maximum cold water capacity of the system should not exceed 127 litres if not pressurized. However, if the system is to be pressurized the efficiency of the expansion vessel will be reduced and a larger vessel (or smaller system volume) may be necessary. If the capacity of the vessel is not considered sufficient for this, or for any other reason, an additional vessel MUST be installed on the return to the boiler. Guidance on vessel sizing is given in the table shown and also in BS.7074:1 and BS.5449:1.

3. Mains Connection

There must be no direct connection to the mains water supply or to the water storage tank supplying domestic water, even through a non-return valve, without the approval of the local water authority.

4. Filling

The system may be filled by one of the following methods:

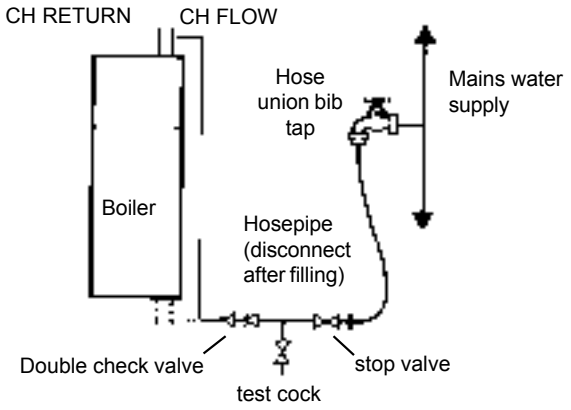
a. Through a temporary hose connection from a draw-off tap supplied from a service pipe under mains pressure. Where the mains pressure is excessive a pressure reducing valve must be used to facilitate filling.

i. Thoroughly flush out the whole system with cold water.

ii. Fill and vent the system until the pressure gauge registers 1.5 bar (21.5 psi) and examine for leaks.

iii. Check the operation of the safety valve by raising the water pressure until the valve lifts. This should occur within 0.3 bar (4.3psi) of the pre-set lift pressure.

iv. Release water from the system until the minimum system design pressure is reached - 1.0bar (14.5 psi) if the system is to be pre-pressurised.

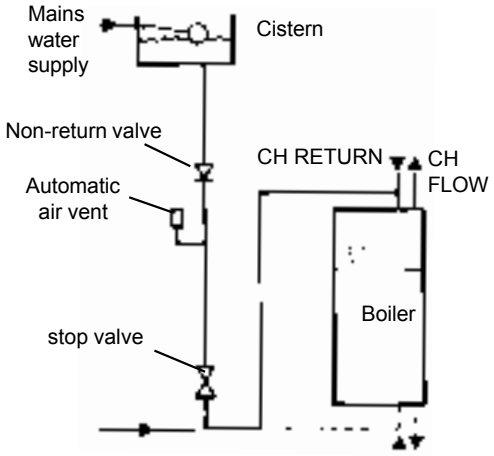


Safety valve setting	bar	3.0	
Vessel charge pressure	bar	0.5 to 0.75	
System pre-charge pressure	bar	None	1.0
System volume (litres)		**Expansion vessel volume (litres)**	
25		1.6	1.8
50		3.1	3.7
75		4.7	5.5
100		6.3	7.4
125		7.8	9.2
150		9.4	11.0
175		10.9	12.9
190		11.9	14.0
200		12.5	14.7
250		15.6	18.4
300		18.8	22.1
Multiplying factors for other system volumes		0.063	0.074

5 SYSTEM REQUIREMENTS - CENTRAL HEATING - *continued*

The following fittings shall form a permanent part of the system and shall be fitted in the order stated:

- A stop valve complying with the requirements of BS. 1010:2 (the hose from the draw-off tap shall be connected to this fitting).
- A test cock.
- A double check valve of an approved type.



b. Through a cistern, used for no other purposes, via a ball valve permanently connected directly to a service pipe and/or a cold water distributing pipe.
The static head available from the cistern should be adequate to provide the desired initial system design pressure.

Note. *The stop valve may remain open during normal operation of the system if automatic water make-up is required.*

5. The maximum recommended system hydraulic losses are given below:

System load	kW (Btu/h)	23.4 (80 000)	19.0 (65 000)	4.4 (15 000)
Water flow rate	l/min (gal/h)	22.5 (297)	24.8 (327)	5.7 (75)
Temperature differential	°C (°F)	15 (27)	11 (20)	11 (20)
Pressure available for system	mbar (in. w.g.)	157 (63)	118 (47)	391 (157)

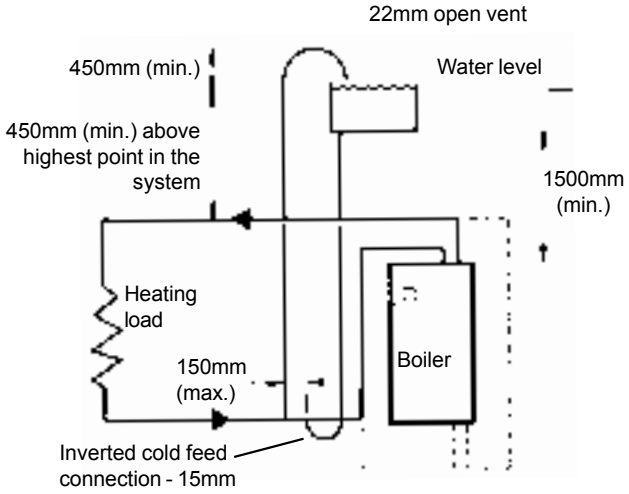
6. Thermostatic radiator valves

Caradon Ideal Ltd., support the recommendations made by leading manufacturers of domestic heating controls that heating systems utilising full thermostatic radiator valve control of temperature in individual rooms should also be fitted with a room thermostat controlling the temperature in a space served by radiators not fitted with such a valve. Such an arrangement will provide for a more efficient control of the environment and will also avoid the continuous running of the circulation pump during programmed heating ON periods, saving electrical energy. It is therefore strongly recommended that, when thermostatic radiator valves are used, the space heating temperature control over a living / dining area or a hallway having a heating requirement of at least 10% of the boiler output is achieved using a room thermostat, whilst other rooms are individually controlled by thermostatic radiator valves.

7. Open vented systems

The **Classic Combi FF280** is designed for use with sealed systems but can also be connected to open vented systems if required.

Note. *To comply with the relevant requirements of BS.5449:1 and BS.6798 the positions of the cold feed and vent must be as shown.*



DOMESTIC HOT WATER REQUIREMENTS

The **Classic Combi FF280** is suitable for connection to most types of washing machine and dish washing appliances.

When connecting to suitable showers ensure that:

- The cold inlet to the boiler is fitted with an approved anti-vacuum or syphon non-return valve.
- Hot and cold water supplies to the shower are of equal pressure.

IMPORTANT.

Provision must be made to accommodate the expansion of DHW contained within the appliance if a non-return valve is fitted to the DHW inlet. Refer to Frame 4.

6 UNPACKING

The appliance is supplied as 2 separate modules (i.e. boiler module and Combi module) together with wall mounting plate (**Pack A1**) in one **Pack A.**

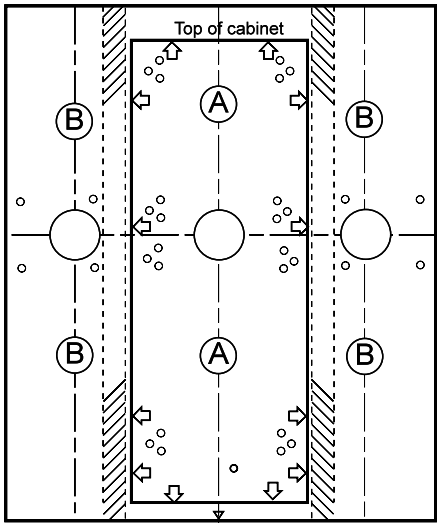
Also supplied is a standard flue assembly for lengths up to 600mm (23 1/2"), rear or side flue outlet, in **Pack B**.

Optional extras, if ordered (Extension Duct Kit D, Vertex Flue Kit G, Roof Flue Kit H and 90° Flue Elbow Kit) are available in separate boxes.

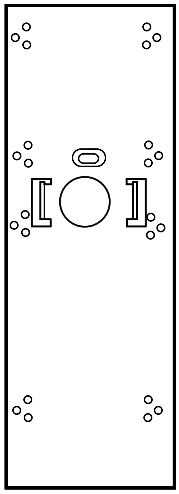
Unpack and check the contents.

Pack A Contents

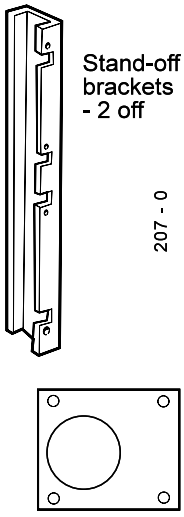
- Combi module
- Boiler
- Pack A1



Wall mounting template



Wall mounting plate



Side outlet terminal mounting plate

Pack A1 Contents (contained within Pack A)

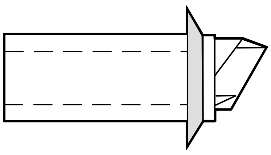
- Installation & Servicing Instructions
- User's Instructions
- Hardware Pack (listed below)
- Wall mounting template
- Wall mounting plate
- Stand-off brackets - 2 off
- Side outlet terminal mounting plate

Hardware Pack Contents

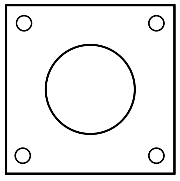
- No.14 x 50mm wood screws - 8 off (for wall mounting plate)
- No.10 x 50mm wood screws - 8 off (for side outlet plate and terminal wall plate)
- Wall plugs - 16 off
- M6 nuts - 8 off (for stand-off brackets)
- M6 screws - 8 off (for stand-off brackets)
- M6 washers - 8 off (for stand-off brackets)
- Sealing plate - 1 off (for back panel)
- M8 x 12mm screw - 1 off (for sealing plate)
- M8 washer - 1 off (for sealing plate)
- 22mm compression elbow - 1 off (for boiler / combi RETURN)
- 22mm brass elbow - 1 off (for boiler / combi FLOW)
- Plastic elbow extractor - 1 off
- 7/8" sealing washers - 2 off (for CH flow and return)
- 3/4" sealing washer - 1 off
- 1/2" sealing washers - 3 off (for DHW inlet & outlet and CH expansion vessel)
- 2 1/2" pozi-screw - 1 off (for Combi module cover)
- Rubber gasket and screw - 1 off (bypass valve)
- Terminal strip cover - 1 off
- M5 washer - 1 off
- M5 extended nut - 1 off
- Flue extension tube - 1 off
- M5 wing nut - 3 off
- IEC mains plug
- Boiler sealing plate

Pack B Contents:

- Flue cutting support (cardboard) - 1 off
- Terminal wall plate - 1 off
- Terminal grille assembly - 1 off
- Polyurethane foam seal 400 lg - 1 off
- No. 8 x 8 lg. Pozi pan screw hd. screws - 3 off



Flue terminal



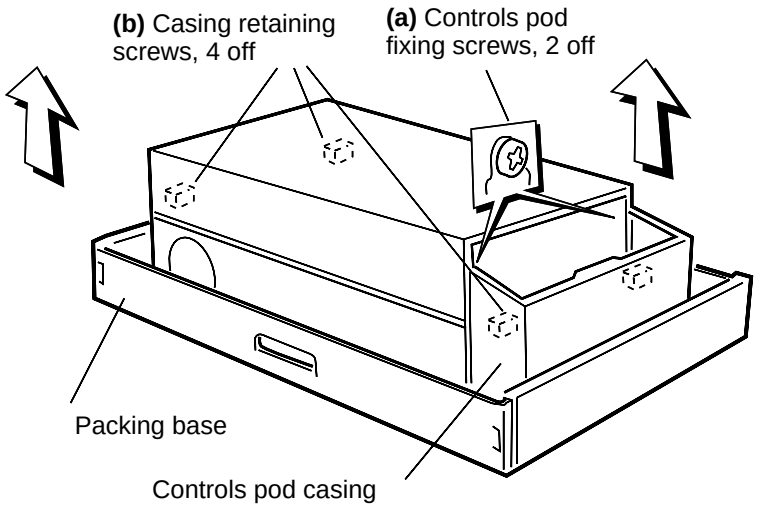
Terminal wall plate

7 PACKAGING AND CASING REMOVAL

1. Unpack the boiler.

2. Remove the casing as follows and place to one side to avoid damage:

a. Release controls pod fixing screws (a) 3 full turns only. Remove the pod by pulling it forward to disengage from the keyhole slots.



b. Undo the 4 screws (b) retaining the casing to the back panel.

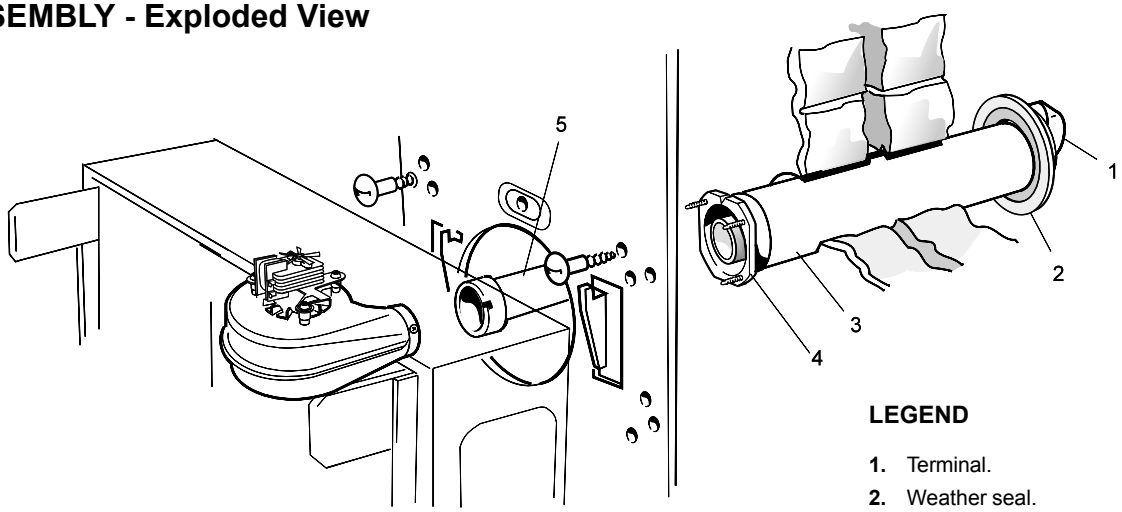
c. Remove the casing in the direction of the arrows.

3. Remove the boiler from its packaging base. The boiler may now be stood upright on its controls support protection frame to ease handling and installation.

4. Unpack the flue assembly / extension flue box(es).

8 FLUE ASSEMBLY - Exploded View

1. An optional flue duct extension kit is required for wall thicknesses greater than 600mm (23 1/2") Refer to Frame 36.



LEGEND

1. Terminal.
2. Weather seal.
3. Flue assembly.
4. Boiler sealing plate.
5. Flue extension tube.

9 WALL MOUNTING TEMPLATE

Note. *The template shows the positions for the fixing holes and the flue hole centres for standard installation. Care must be taken to ensure the correct holes are drilled.*

1. Discard both sections B of the template.

2. Tape the template into the selected position.

3. Ensure squareness by hanging a plumb line as shown.

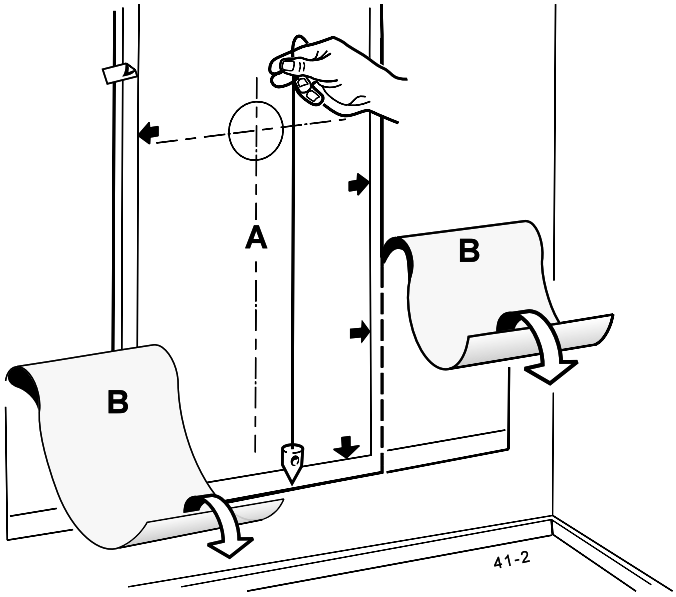
4. Mark onto the wall (if required) the following:

a. The 8 wall mounting plate screw positions and the lower fixing screw positions.

b. The position of the flue duct.

Note. *Mark the centre of the flue hole as well as the circumference.*

5. Remove the template from the wall.



10 PREPARING THE WALL

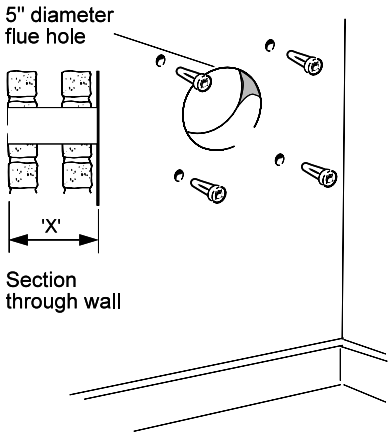
IMPORTANT.

Ensure that, during the cutting operation, masonry falling outside of the building does not cause damage or personal injury.

1. Cut the flue hole preferably with a 125mm (5") core boring tool, ensuring that the hole is square to the wall. If the hole has been quite accurately cut with a drill, then making good the wall faces is not essential as seals are provided at both ends of the flue. However, both wall faces immediately around the cut hole should be flat; make good if necessary. For less accurate holes make good to approximately 125mm (5") diameter at the 2 wall faces.

2. Drill 9 holes for the wall mounting plate with an 8mm (5/16") masonry drill.

3. Insert the plastic plugs provided.



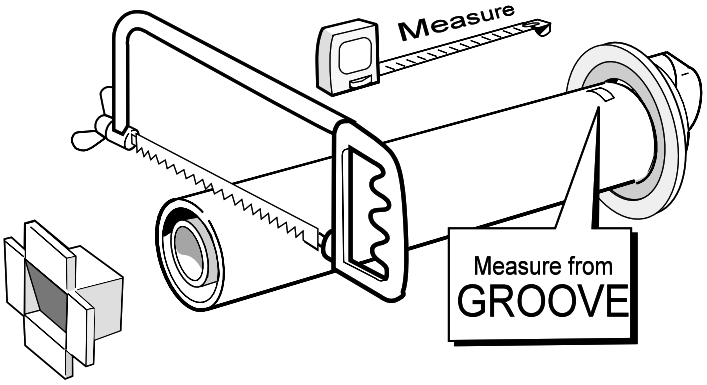
Note. *Check all of the hole positions BEFORE drilling*

Note. *If the terminal is to be sited within 25-40mm of a corner or vertical pipe (refer to Table 4) then the hole MUST be accurately cut and the rubber weather seal trimmed around the groove provided.*
The terminal wall plate need not be fitted.

11 CUTTING THE FLUE - wall thicknesses of 114 to 600mm

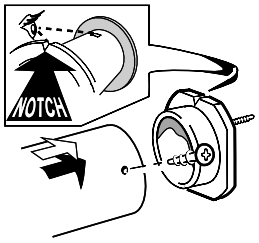
Note.

If the stand-off brackets are used it is essential that 45mm is added to the measured wall thickness when marking the flue, to allow for the thickness of the brackets.

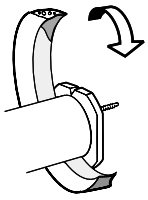


1. Measure and note the wall thickness X.
2. Mark the wall thickness onto the flue.
3. To ensure the tube is cut square, mark the flue all the way round.
4. Cut to length X, using the cardboard ring for support.
5. Remove the cardboard ring and remove any burrs.

12 FITTING THE BOILER SEALING RING TO THE FLUE



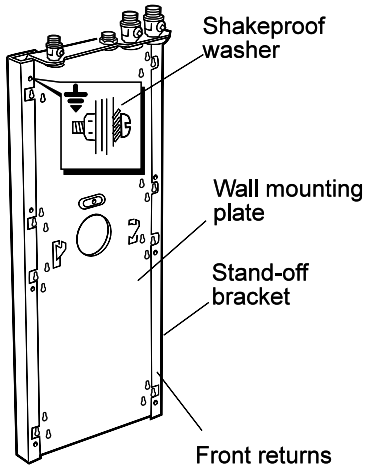
1. Fit the boiler sealing ring inside the outer flue duct. Ensure the boiler sealing ring is fully engaged.
   Ensure the notch aligns with the groove on the outer flue duct. This ensures correct alignment of the flue terminal.
2. Drill 3 holes 3.2mm (1/8") dia. through the outer flue duct and boiler sealing ring. **Do NOT drill the inner flue duct.**
3. Insert the self tapping screws, provided, in order to fix the boiler sealing ring in position.
4. Stick the self adhesive foam strip, provided in the hardware pack, onto the flue immediately behind the boiler sealing ring.



13 FITTING THE STAND-OFF BRACKETS

Installations with bottom water connections

Secure the 2 stand-off brackets to the wall mounting plate, using the eight M6 nuts, screws and shakeproof washers provided so that the plate is located BEHIND the front returns of the brackets, as shown.

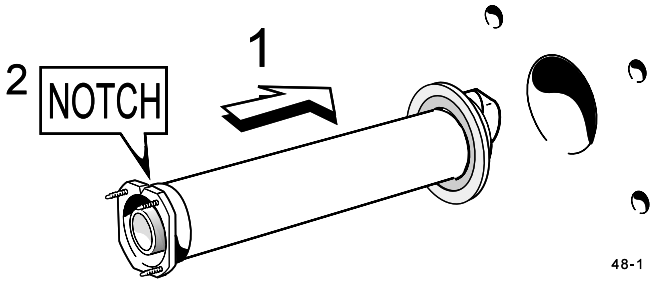


Note. *If the clearances above and below the boiler are less than the length of the pipes to be fitted behind the wall mounting plate, then refer to Frame 16.*

IMPORTANT. To ensure earth continuity, securing screws MUST be fitted in the top holes (marked with the ⏚ symbol) with the shakeproof washers positioned under the screw heads.

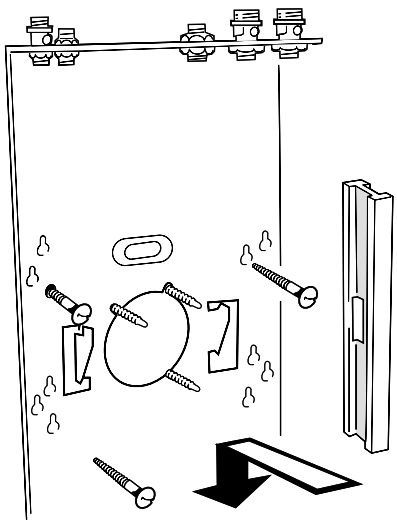
14 FITTING THE FLUE ASSEMBLY

1. Insert the flue extension tube into the flue assembly.
2. Insert the flue assembly through the hole far enough to allow the rubber seal to unfold completely and form an adequate seal on the outside wall.
3. Ensure the notch is at the top - this will aid the location of the studs into the boiler back panel.



15 WALL MOUNTING PLATE

1. Engage the plate (or plate and stand-off brackets) on the top fixing screws.
2. Locate six No.14 x 2" screws in the lower fixing holes and drive home all screws.
3. Check with a spirit level that the plate is vertical.



16 PRE-PIPING

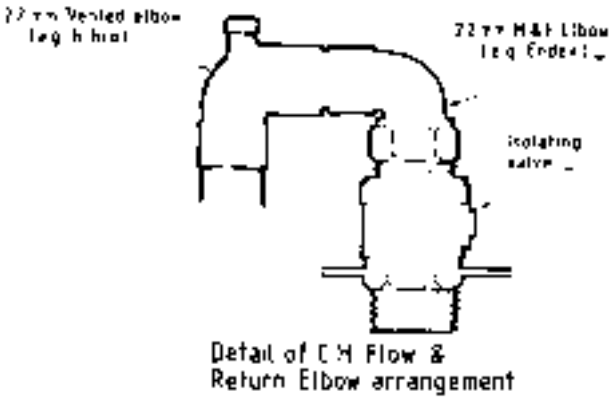
IMPORTANT.

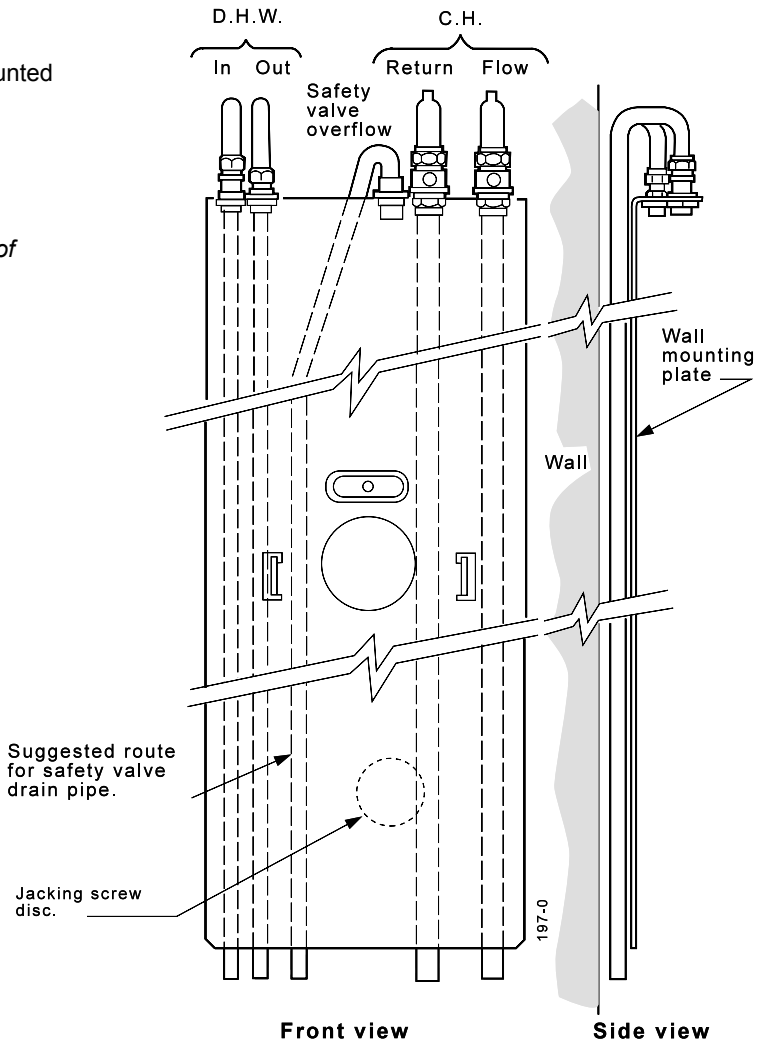
For installations with bottom water connections only; the following pipe runs must be made before the boiler is mounted on the wall.

1. Make the connections to the fittings on top of the wall mounting plate, as shown.

Note. *For installations with a minimum top clearance of 100mm (4") the following fittings should be used.*

- 22mm vented elbow (e.g. NIBCO)
- 22mm M & F elbow (e.g. ENDEX)





2. Extend the pipes down the wall, as shown, ensuring that:

a. They terminate at least 50mm (2") below the bottom of the wall mounting plate.

b. The CH flow and return pipes are vented to aid filling.

Note. *If the clearances above and below the boiler are less than the length of the pipes it will be necessary to position the pipe runs behind the wall mounting plate BEFORE the plate is screwed to the wall.*

FOR BOTH TOP AND BOTTOM WATER CONNECTIONS

If required, connection to the system pipework may now be made BEFORE the boiler is mounted on the wall.

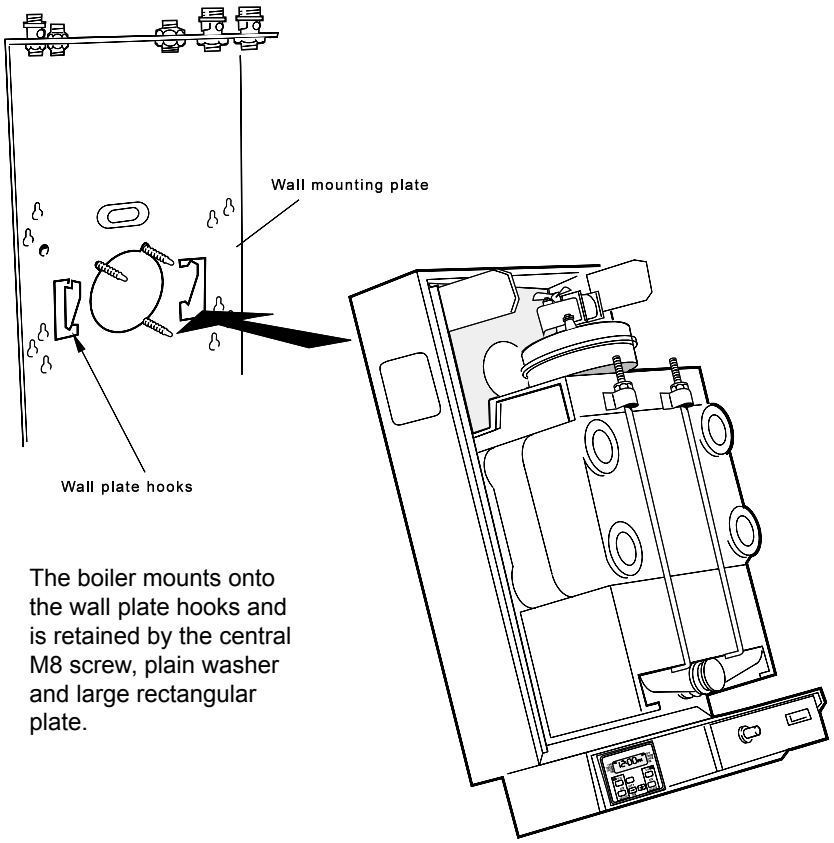
PROCEED TO FRAME 42

17 PRE-WIRING

The mains supply and other external wiring may now be made, if required, BEFORE the boiler and Combi modules are mounted on the wall - refer to Frames 46 to 49.

REAR & SIDE FLUE OUTLET

18 MOUNTING THE BOILER



The boiler mounts onto the wall plate hooks and is retained by the central M8 screw, plain washer and large rectangular plate.

Note. *Have ready to hand the M8 screw, plain washer and rectangular plate supplied in the hardware pack.*

1. Lift the boiler onto the wall mounting plate hooks as shown.

DO NOT USE THE BURNER / CONTROLS ASSEMBLY FOR LIFTING

IMPORTANT.

The boiler module MUST be positioned CENTRALLY on the wall mounting plate. Refer to the index mark on the back panel.

2. Fit the M8 screw, washer and rectangular plate to retain the boiler.

Note.

Before fully tightening the M8 screw, check the boiler alignment using a spirit level, and adjust as necessary with the jacking screw - refer to Frame 3.

DO NOT USE THE BURNER / CONTROLS ASSEMBLY FOR LIFTING

19 CONNECTING THE FLUE TO THE BOILER

1. Pull the flue through the wall mounting plate and locate the 3 studs in the holes in the back panel.

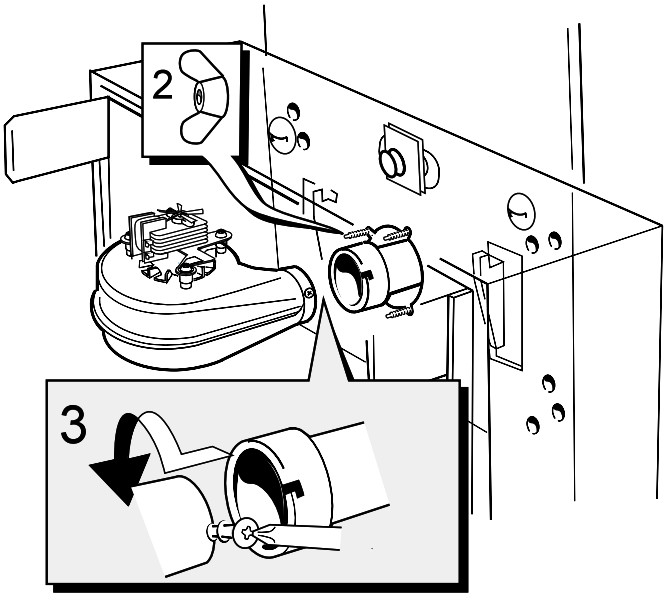
2. Secure the flue to the boiler using the three M5 wing nuts provided.

3. Pull the flue extension tube and engage onto the fan, locate and secure with the M4 screw attached to the fan.

4. If a terminal wall plate is to be fitted proceed to Frame 34.

Note.

The sealing plate studs will locate in the back panel one way only. This will ensure that the terminal grille is correctly aligned.

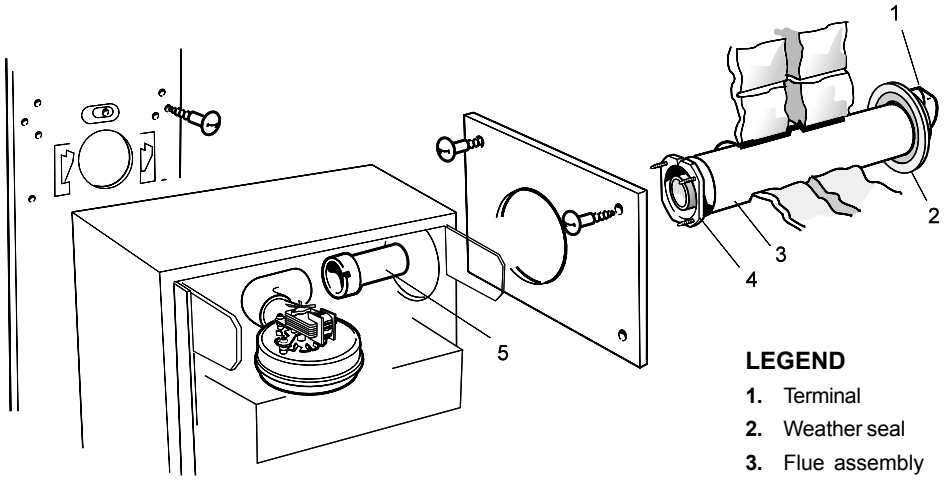


APPLIANCES FITTED WITH A REAR OUTLET FLUE: *PROCEED DIRECTLY TO FRAME 38*

20 FLUE ASSEMBLY - Exploded View

For wall thickness 114mm to 600mm

1. An optional flue duct extension kit is required for lengths (distance from the outside wall to the relevant side of the boiler casing) greater than 600mm (23 1/2") Refer to Frame 3 .



LEGEND

1. Terminal
2. Weather seal
3. Flue assembly
4. Boiler sealing plate
5. Flue extension tube

21 WALL MOUNTING TEMPLATE

Note. *The template shows the positions for the fixing holes and the flue hole centres for standard installation.*

Installations with top water connections only:
Tear off and discard the shaded portion of template B (refer to Frame 6)

Care MUST be taken to ensure the correct holes are drilled.

1. Separate the templates.

2. Tape both templates into the selected position, locating template B through an extended centre line, as shown.

3. Ensure squareness by hanging a plumb line as shown.

4. Mark onto the wall the following:

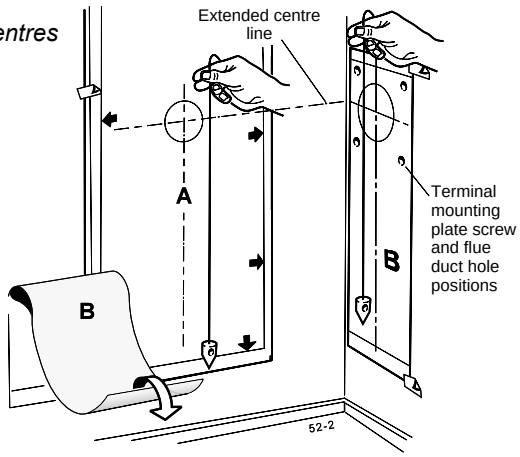
a. The wall mounting plate screw positions (choose one from each group).

b. The 4 screw positions for the side outlet plate.

c. The position of the flue duct hole. (Ensure that the correct centre is marked, depending upon whether the brackets are used or not)

Note. *Mark the centre of the hole as well as the circumference.*

d. The side of the casing nearest the flue outlet.



5. Remove both templates from the wall.

22 PREPARING THE WALL

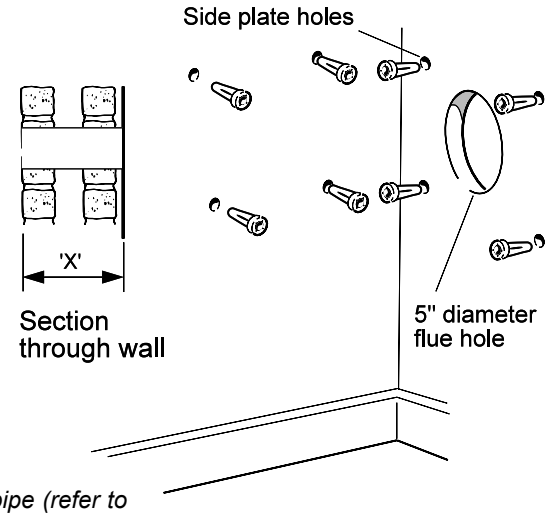
IMPORTANT. Ensure that, during the cutting operation, masonry falling outside of the building does not cause damage or personal injury.

1. Cut the flue hole preferably with a 125mm (5") core boring tool, ensuring that the hole is square to the wall. If the hole has been accurately cut with a drill then making good the wall faces is not essential as seals are provided at both ends of the flue. However, both wall faces immediately around the cut hole should be flat; make good if necessary. For less accurate holes make good to approximately 125mm (5") diameter at the 2 wall faces.

2. Drill 8 holes with an 8mm (5/16") masonry drill and insert the plastic plugs provided, for the side mounting plate and the wall mounting plate.

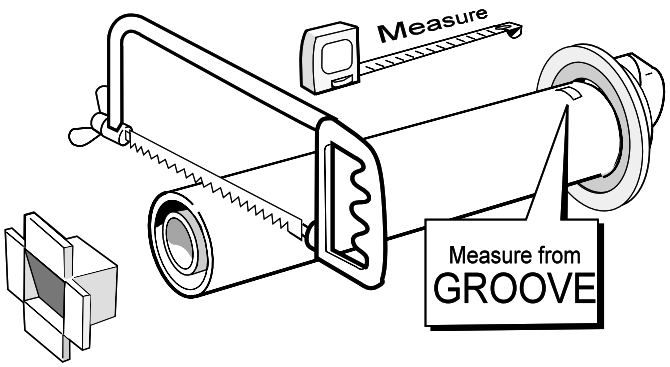
3. Drill 4 holes with a 7mm (9/32") masonry drill and insert the plastic plugs provided for the side mounting plate.

Note. *If the terminal is to be sited within 25-40mm of a corner or vertical pipe (refer to Table 4) then the hole MUST be accurately cut and the rubber weather seal trimmed around the groove provided. The terminal wall plate need not be fitted.*



23 CUTTING THE FLUE
For flue lengths 114 to 600mm ONLY

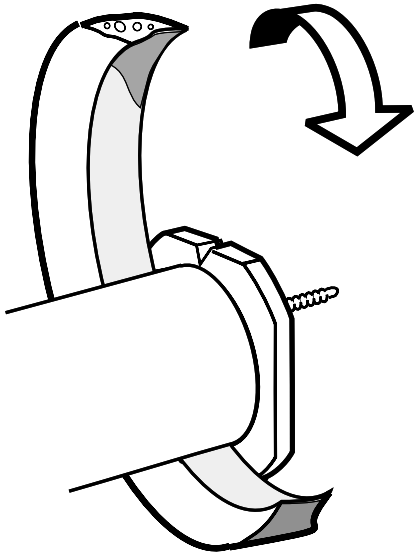
1. Measure the flue length required (i.e. the distance from the side of the boiler to the outside face of the wall) - refer to Frame 3.
2. Mark the flue length required on to the flue, measuring from the groove near the terminal.
3. To ensure the tube is cut square, mark the flue all the way round.
4. Insert the cardboard duct ring for support and cut to length.
5. Remove cardboard duct ring and remove any burrs.



For flue lengths greater than 600mm, refer to Frames 36 and 37- Flue extension ducts.

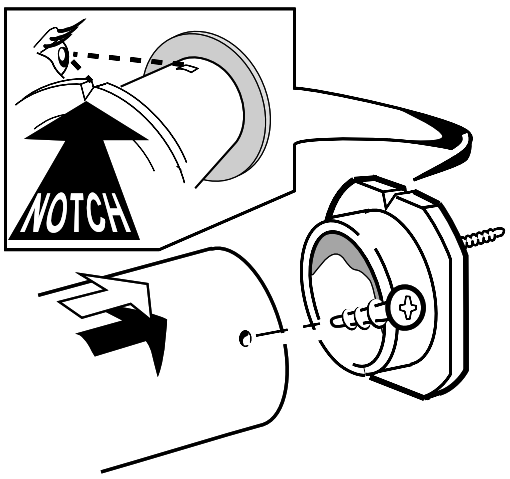
24 FITTING THE FOAM SEAL

1. To determine the position for the foam seal, measure the wall thickness and mark it onto the flue, measuring from the groove near the terminal.
2. Wrap the self adhesive foam strip round the flue, ensuring that the foam is on the terminal side of the line. This seals the gap between the flue and the wall.



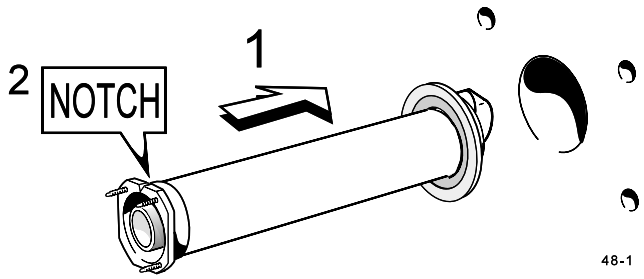
25 FITTING THE BOILER SEALING RING TO THE FLUE

1. Fit the boiler sealing ring inside the outer flue duct. Ensure the boiler sealing ring is fully engaged. Ensure the notch aligns with the groove on the outer flue duct. This ensures correct alignment of the flue terminal.
2. Drill 3 holes 3.2mm (1/8") dia. through the outer flue duct and boiler sealing ring. ***Do not drill the inner flue duct.***
3. Insert the self tapping screws, provided, in order to fix the boiler sealing ring in position.



26 FITTING THE FLUE ASSEMBLY

1. Insert the flue assembly through the hole far enough to allow the rubber seal to unfold completely and form an adequate seal on the outside wall. This will also ensure the correct alignment of the flue terminal.
2. Ensure the notch is at the top. This will aid the location of the studs into the boiler back panel.



Flue assembly

27 FITTING THE STAND-OFF BRACKETS

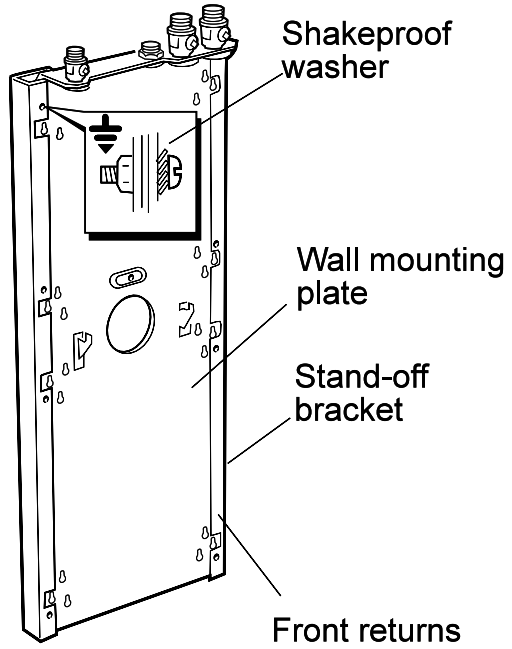
Installations with bottom water connections only

Secure the 2 stand-off brackets to the wall mounting plate, using the eight M6 nuts, screws and shakeproof washers provided, so that the plate is located BEHIND the front returns of the brackets, as shown.

Note.
If the clearances above and below the boiler are less than the length of the pipes to be fitted behind the wall mounting plate then refer to Frame 16.

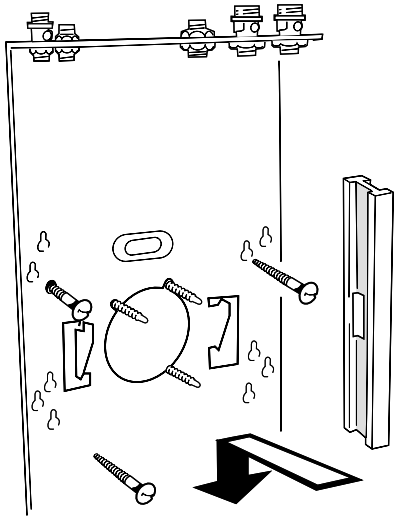
IMPORTANT.

To ensure earth continuity, securing screws MUST be fitted in the top holes (marked with the ⏚ symbol) with the shakeproof washers positioned under the screw heads.



28 WALL MOUNTING PLATE

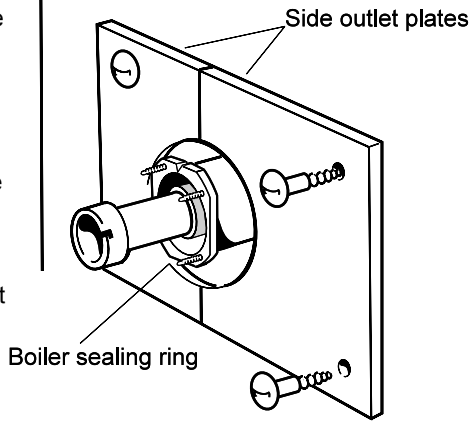
1. Locate two No.14 x 2" screws in the wall mounting plate top fixing holes and screw home to within 6mm (1/4") of the wall surface.
2. Engage the plate (or plate and stand-off brackets) on the screws.
3. Locate six No.14 x 2" screws in the lower fixing holes and drive home all 8 screws.
4. Check with a spirit level that the plate is vertical.



29 FITTING THE SIDE OUTLET PLATES

Note. *If the boiler is fitted closer than 25mm to the side wall the side outlet plate must be fitted now.*

1. Split the side outlet plate into 2 down the split line.
2. Fit the 2 halves of the side outlet plate to the wall, ensuring that they are behind the boiler sealing ring.



30 PRE-PIPING

IMPORTANT.

For installations with bottom water connections only

The pipe runs shown in Frame 16 must be made before the boiler is mounted on the wall.

For installations with both top and bottom water connections

If required, connection to the system pipework may now be made before the boiler is mounted on the wall - proceed to 'Water Connections', Frame 42.

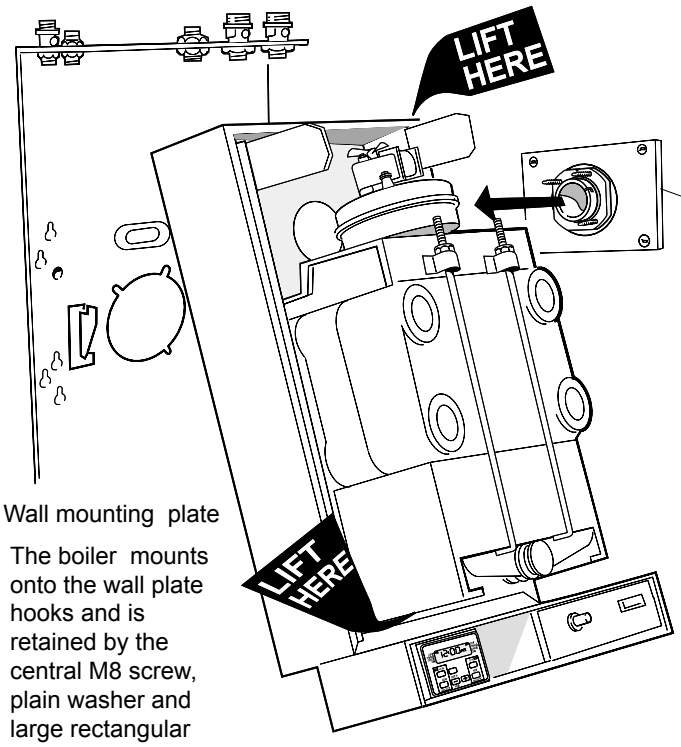
31 PRE-WIRING

The mains supply and other external wiring may now be made, if required, before the boiler and Combi modules are mounted on the wall.

Refer to Frames 46 to 49.

32 MOUNTING THE BOILER MODULE

Note. *Have ready to hand the M8 screw, plain washer and rectangular plate supplied in the hardware pack.*



Wall mounting plate

The boiler mounts onto the wall plate hooks and is retained by the central M8 screw, plain washer and large rectangular plate.

1. Lift the boiler onto the wall mounting plate hooks as shown.

DO NOT USE THE BURNER / CONTROLS ASSEMBLY FOR LIFTING

Terminal mounting plate

The air duct spigot engages in the hole in the side panel.

IMPORTANT.

The boiler module MUST be positioned CENTRALLY on the wall mounting plate. Refer to the index mark on the back panel

2. Fit the M8 screw, plain washer and rectangular plate to retain the boiler.

Note.
Before fully tightening the M8 screw, check the boiler alignment using a spirit level, and adjust as necessary with the jacking screw - refer to Frame 3.

DO NOT USE THE BURNER / CONTROLS ASSEMBLY FOR LIFTING

33 CONNECTING THE FLUE TO THE BOILER

1. Pull the flue through the side outlet plate and locate the 3 studs in the hole in the side of the boiler.

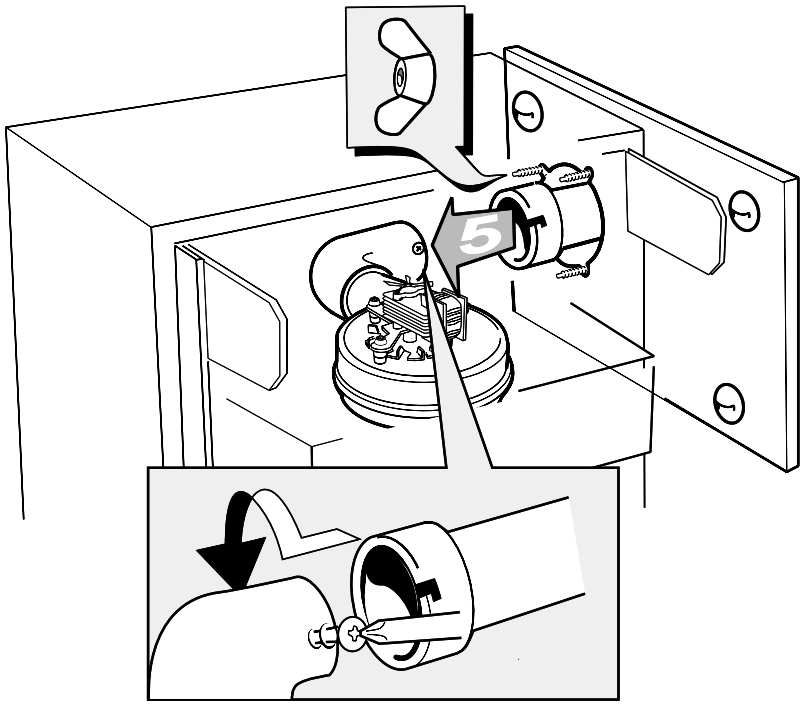
2. Secure the flue to the boiler using the three M5 nuts, provided.

3. Insert the flue extension tube into the flue.

4. First remove the underside screw which is not required then fit the 90^0 flue elbow, supplied with the boiler, onto the fan in the direction required. Secure in position with the screw.

5. Pull the flue extension tube and engage onto the fan elbow and secure with the screw.

Note.
The sealing plate studs will locate in the back panel one way only. This will ensure that the terminal grille is correctly aligned.



34 TERMINAL WALL PLATE

This plate allows neat concealment and full compression of the rubber seal. Its use is not essential if the flue hole and flue ducts have been accurately cut and the outside wall face is flat.

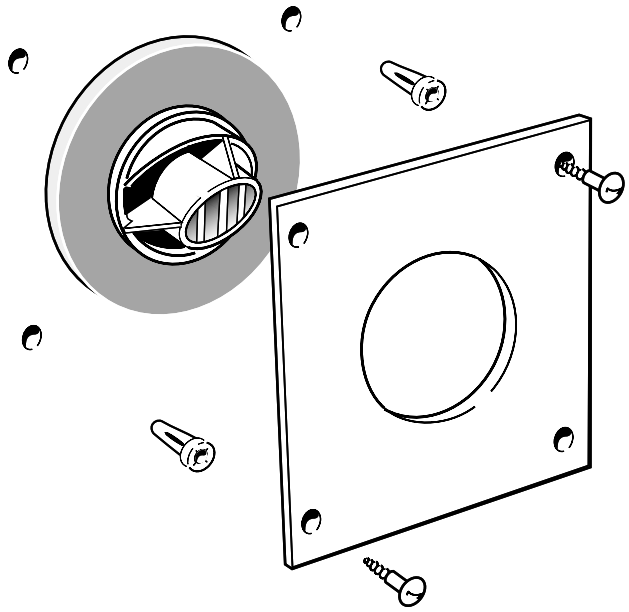
1. Position the terminal wall plate over the terminal.

2. Drill 4 fixing holes with an 7mm (9/32") masonry drill.

3. Insert the 4 plastic plugs provided.

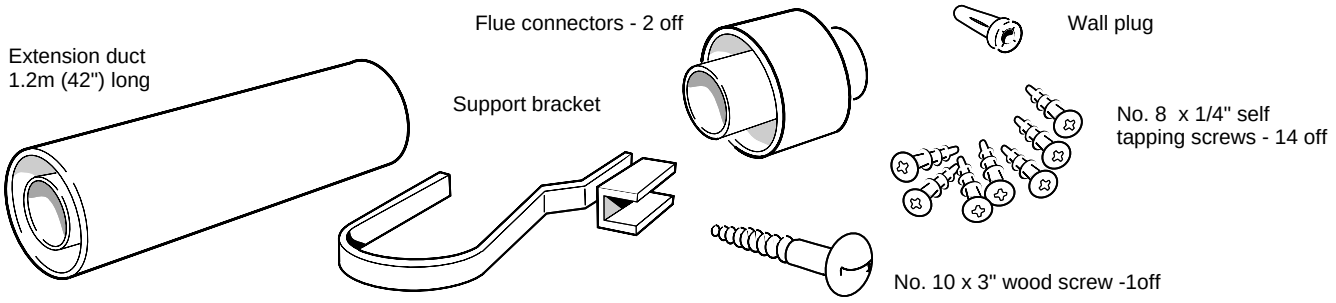
4. Secure the plate with 4 of the No.10 x 2" screws provided.

Note.
If the terminal is less than 2m (6' 6") above ground level, an approved terminal guard should be fitted. Refer to the contents list on Page 2.



35 FLUE EXTENSION DUCTS - For flue lengths greater than 600mm

PACK D Flue Extension Duct Kit contents



36 FLUE EXTENSION DUCTS - continued

Use a maximum of two extension ducts only

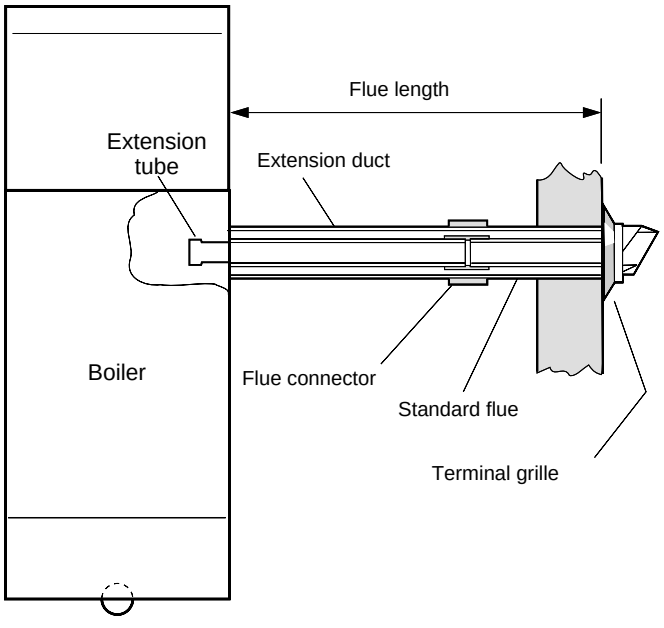
General arrangement

Note. *Side flue shown.*

1. A ***maximum*** of 2 extension ducts (plus the standard flue duct) may be used together.

2. Flue extensions of greater length than 1m (39") should be supported with the bracket provided. If the stand-off brackets have been used it is necessary, in order to keep the flue aligned, to use the spacer bracket with the support bracket.

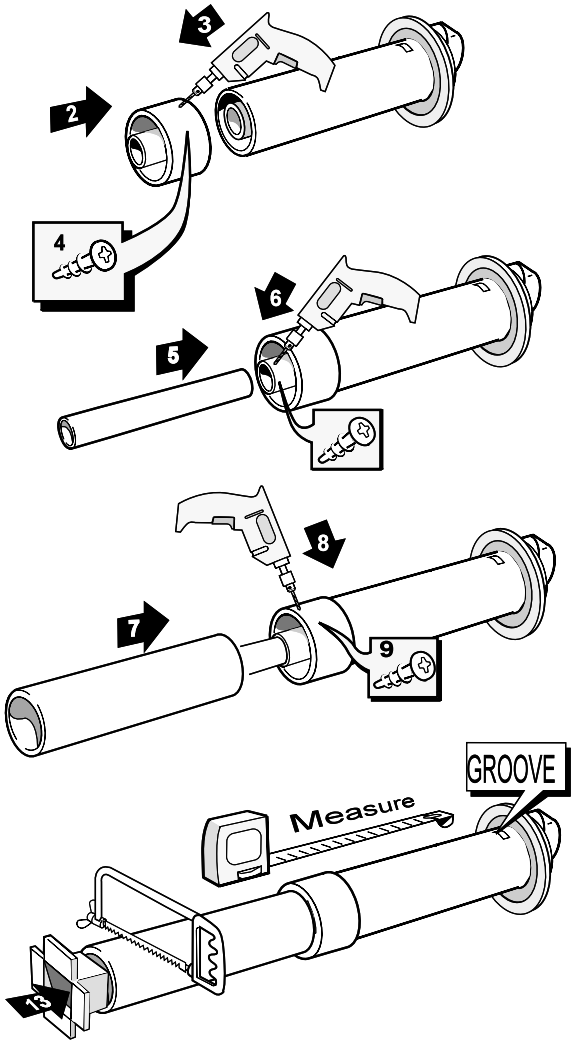
Flue length	Accessories	Product No.
Up to 600	B Pack 1 off	see Frame 3
600 to 1800	B Pack 1 off + D Pack, 1 off	see Frame 3
1800 to 3000	B Pack 1 off + D Pack, 2 off	see Frame 3



37 FITTING THE KIT

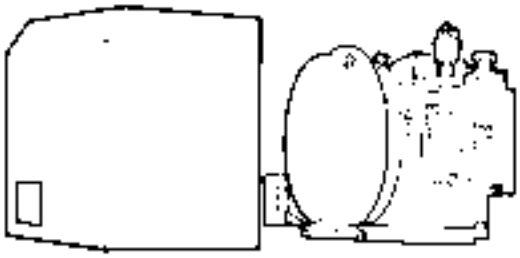
Note. *Remove the cardboard duct ring from the end of the standard flue duct (Pack B).*

1. Remove the flue extension tube from the flue and place safely to one side.
2. Fit the flue connector onto the standard flue duct.
3. Drill three 3.2mm (1/8") dia. equally spaced holes through the flue connector and the outer flue duct. **Do NOT drill the inner flue duct.**
4. Insert the self tapping screws, provided, in order to fix the connector in position.
5. Fit the inner flue duct into the connector.
6. Drill one 3.2mm (1/8") hole through the flue connector and inner flue duct, and secure in position with a self tapping screw.
7. Fit the outer flue duct into the connector.
8. Drill three 3.2mm (1/8") dia equally spaced holes through the flue connector and the outer flue duct. **Do NOT drill the inner flue.**
9. Insert the self tapping screws, provided, in order to fix the connector in position.
10. Repeat steps 5 - 9 if a second flue extension duct is required.
11. Measure and mark the flue length required onto the flue, measuring from the groove near the terminal.
12. To ensure the tube is cut square, mark the flue all the way round.
13. Using the cardboard ring for support, cut to length.
14. Remove cardboard ring and remove any burrs.
15. For rear outlet flue: follow the procedure from Frame 8.
    For side outlet flue: follow the procedure from Frame 20.

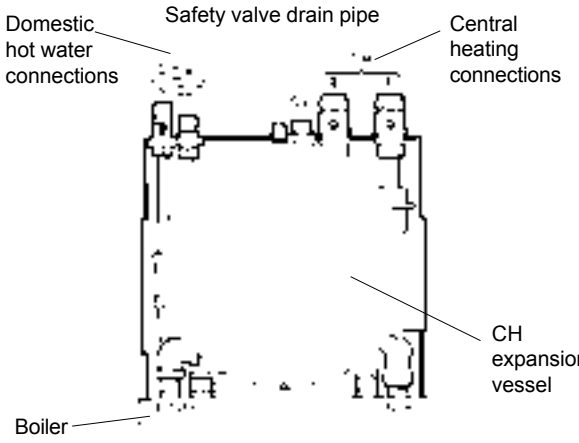


38 MOUNTING THE COMBI MODULE

1. Remove the Combi module from its box.
2. Lift off the Combi module cover, as shown.



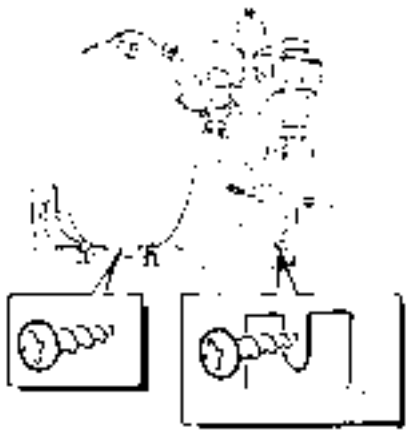
View of Combi module with cover removed



3. Slacken the retaining screw, lift out the CH expansion vessel and place safely to one side.
4. Remove the transit packing
5. Slacken the 2 retaining screws, lift out the CH expansion vessel support bracket (complete with the pressure gauge) and place safely to one side.
6. Fit the brass compression elbow (A), provided, on to the boiler RETURN pipe and angle it approximately 60^0 , as shown in Frame 39 - *do not tighten.*
7. Push-fit the brass elbow (B), provided, on to the boiler FLOW pipe, facing forwards, as shown. Apply soap solution to ease fitting.

   Note. *Ensure that the elbow is pushed fully home onto the pipe.*

8. Offer the Combi module on top of the boiler and engage the Combi module RETURN pipe within the brass compression elbow (A).

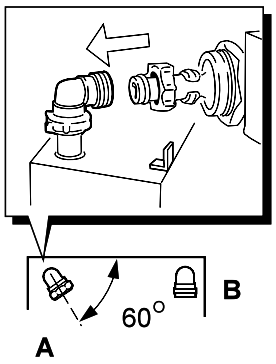


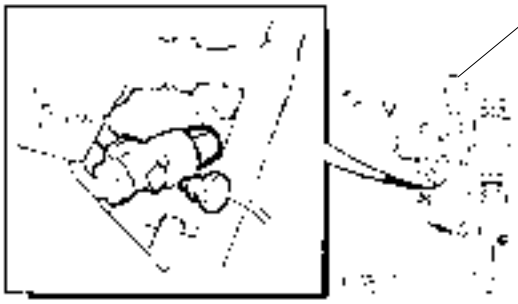
39 MOUNTING THE COMBI MODULE - continued

9. Swing the Combi module into position, as shown, and snap the Combi module FLOW pipe into the brass elbow (B), ensuring that it is pushed fully home to the index mark on the Combi module flow pipe.

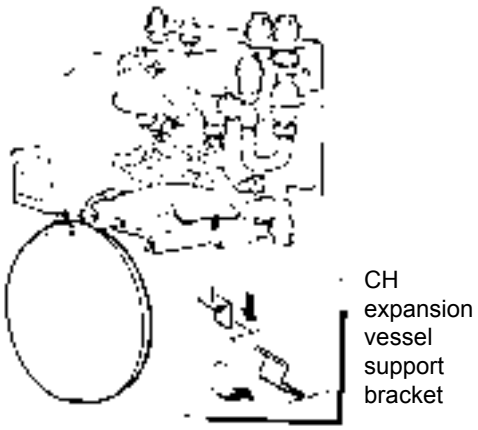
Note. *Should it be necessary to realign the brass push-fit elbow on the boiler flow pipe elbow, this can be done using the plastic extractor supplied in the hardware pack.*

DO NOT TIGHTEN THE BRASS COMPRESSION ELBOW UNIONS





10. Connect the DHW inlet and outlet pipes, safety valve drain pipe and the CH flow and return pipes to the bulkhead fittings on top of the wall mounting plate, using the 5 sealing washers provided. Fully tighten. Refer to the view opposite.



View of boiler module with CH expansion vessel in the servicing position

Notes.

a. *Make the 2 outside connections first, i.e. DHW inlet and CH flow. Tighten and draw the assembly up.*

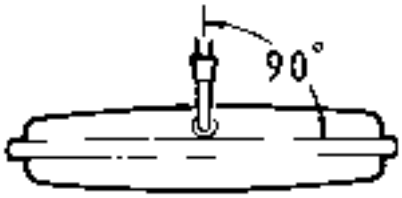
b. *The automatic air vent may be removed, to gain better access to the CH union connections.*

11. Tighten the union nuts of the brass compression elbow (A).

12. Fit the CH expansion vessel support bracket.

13. Connect the pressure gauge capillary to the safety valve.

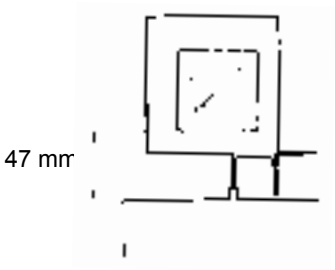
14. Hang the CH expansion vessel in the servicing position and connect the flexible pipe, using the sealing washer provided. Ensure that the pipe is positioned at 90^0 to the vessel, as shown.



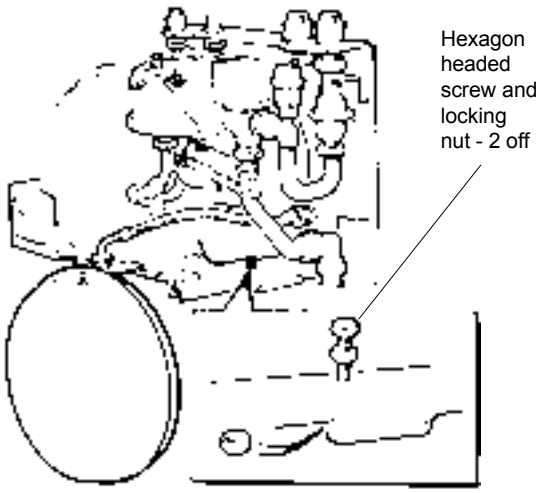
40 PRESSURE GAUGE HEIGHT ADJUSTMENT

It may be found necessary to adjust the position of the pressure gauge in order for it to locate centrally in the aperture provided in the module casing. This can be eased by checking the dimension from the bottom of the pressure gauge bezel and the top of the boiler casing, at the point when the expansion vessel is fitted.

Refer to diagram.



If adjustment is found to be necessary undo the 2 locking nuts provided, adjust the hexagon headed screws until the 47mm dimension is achieved and tighten the locking nuts.



41 GAS CONNECTION

Refer to 'Gas Supply' (page 5), for gas inlet service dimensions (Frame 2).

A **minimum** pressure of 20mbar MUST be available at the boiler inlet, with the boiler operating.

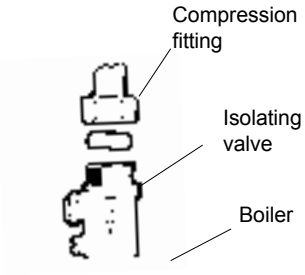
The main gas cock is on the left hand side of the gas control valve.

To facilitate connection the gas cock may be removed from the gas control valve.

42 WATER CONNECTIONS

CENTRAL HEATING

- When the CH load exceeds 20.5 kW (70 000 Btu/h) then 28mm (1 1/10") pipes should be used, both to and from the boiler, as soon as is practicable after the initial 22mm connection.
- For methods of filling refer to Frame 4.



1. Connect the CH flow and return pipes to the boiler, as shown, or to the pipework previously fitted (**Installations with bottom connections only** -refer to Frame 16).

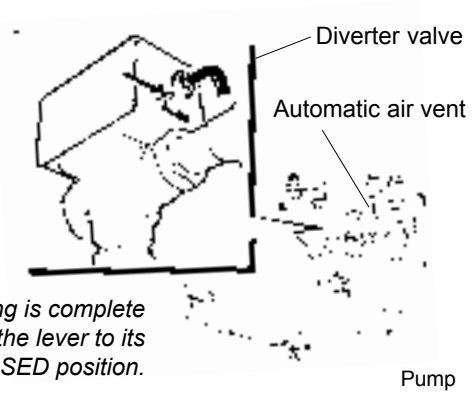
2. Ensure that the CH isolating valves are open.

3. Fill and vent the system. Check for water soundness.

IMPORTANT. When filling:

a. Set the diverter valve manual lever to the OPEN position.

Note. *The manual lever is shown in the CLOSED position*



When filling is complete return the lever to its CLOSED position.

b. The cap on the automatic air vent MUST be loose at all times.
When filling there may be a slight water leak from the vent therefore electrical connections should be protected.

c. Vent the DHW calorifier circuit via the manual air vent on top of the calorifier.

4. Ensure that the pump selector switch is set to No.3 and that the pump is free to rotate.

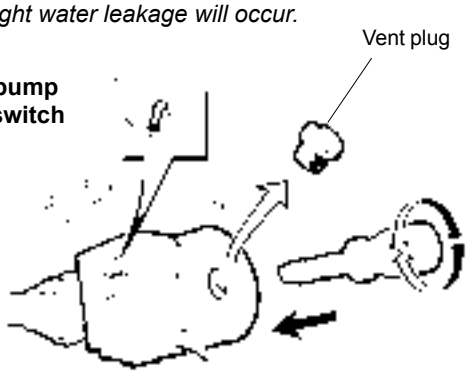
a. Remove the vent plug.

b. Using a screwdriver, rotate the shaft several times.

c. Replace the vent plug.

Note. *Some slight water leakage will occur.*

Detail of pump selector switch



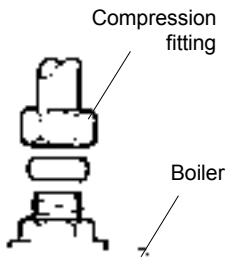
DOMESTIC HOT WATER SUPPLY

- The DHW supply pipe must be thoroughly flushed BEFORE connecting to the boiler.
- The boiler incorporates a DHW filter therefore no external device is necessary.
- It is recommended that a water softening device is fitted on the cold water inlet supply, particularly in hard water areas.
- Ensure that the mains supply pressure is sufficient to provide the maximum delivery of domestic hot water (approximately 0.9 bar, minimum). In areas where the mains water pressure is known to be high (greater than 10 bar) it is recommended that a water governor is fitted on the cold inlet supply to the boiler.

IMPORTANT. Devices incorporating non-return valves MUST NOT be fitted to the DHW inlet, unless provision is made to accommodate the expansion of the DHW contained within the appliance. A suitable expansion vessel of the 'Zilmet' or 'WMP' type should be fitted, externally to the boiler, between the non-return valve and the boiler.

1. Connect the hot and cold water supply pipes to the boiler, as shown, or to the pipework previously fitted (**Installations with bottom connections only** - refer to Frame 16).

2. Open the domestic hot water draw-off taps, clear air locks and check for water soundness.



43 WATER CONNECTIONS - continued

3. **Domestic hot water flow rate setting:**

   a. Fully open all DHW taps in turn and ensure that water flows freely from them.

   b. Close all taps, except the furthest from the boiler, and check that the boiler is firing at maximum rate.

   c. Turn the DHW flow adjuster CLOCKWISE, to reduce the DHW flow rate, until a rate of approximately 9.6 l/min (2.1gpm) is obtained at the tap.

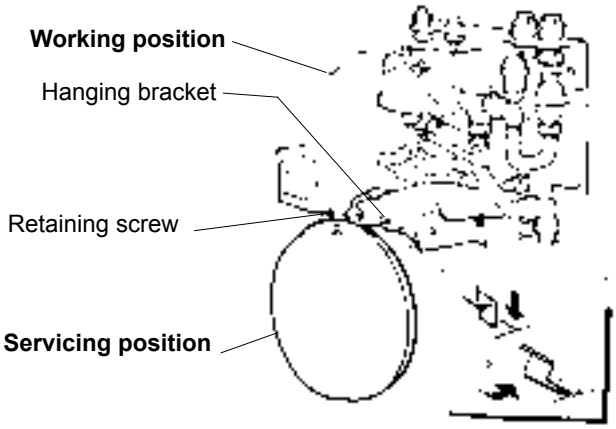
   d. Turn off the DHW tap.

44 SAFETY VALVE OVERFLOW

Route a 15mm pipe from the safety valve overflow connection, on top of the wall mounting plate, to a position outside of the building so that any discharge of water or steam from the valve cannot create a hazard to the occupants or damage to electrical components and wiring.

45 CH EXPANSION VESSEL LOCATION

Fit the CH expansion vessel in its working position and secure with the retaining screw.



Note.
Ensure that the expansion vessel is orientated as shown, to facilitate the fitting of the Combi module cover.

46 ELECTRICAL CONNECTIONS

WARNING.

The appliance must be efficiently earthed.

A mains supply of 230 V ~ 50 Hz is required.

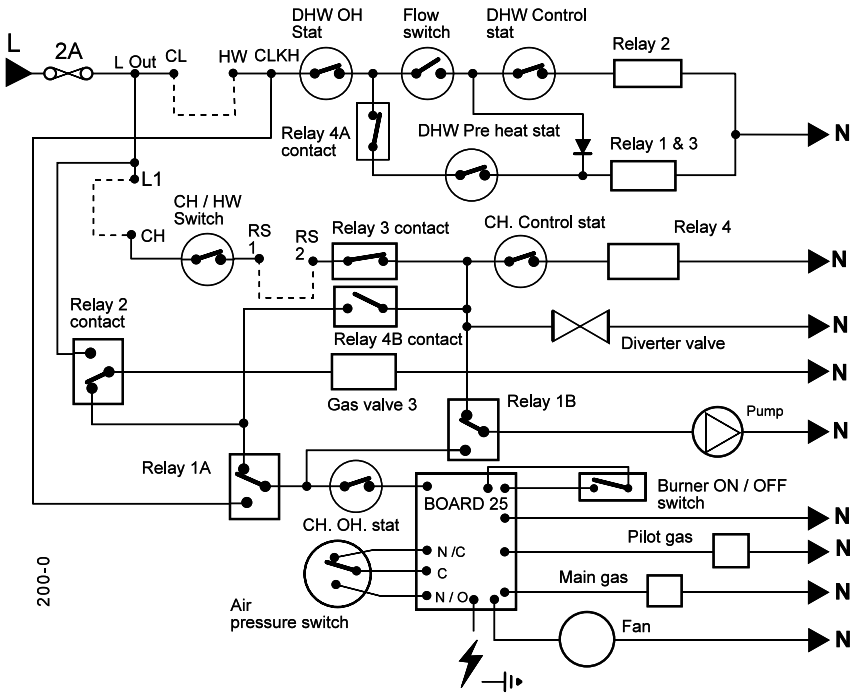
All external controls and wiring must be suitable for mains voltage.

Wiring should be in 3-core PVC insulating cable, not less than 0.75mm² (24 x 0.2mm) to BS. 6500 Table 16 and 70°C 'T' rating.

The supply connection must be made via a double-pole switch, fused at 3 Amps, having a 3mm contact separation in both poles, serving only the boiler and system controls.

Pictorial and schematic wiring diagrams are shown in Frames 49 and 50.

Note.
If the optional Programmer Kit is to be fitted, refer to the instructions provided with the kit and Frame 48 .

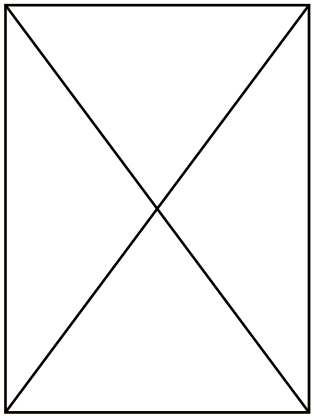


Flow wiring diagram

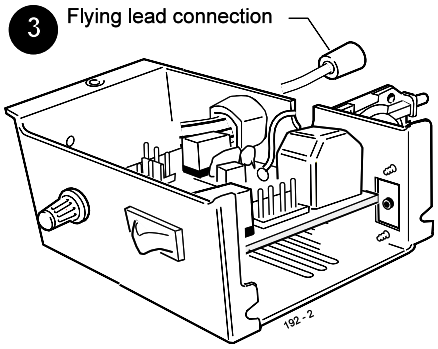
47 WIRING THE BOILER

1. Plug the wall plate wiring harness lead into the PCB (Board No.27) as shown.

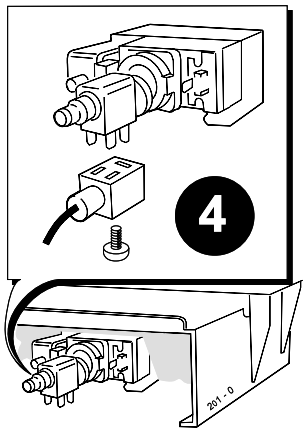
2. Connect the earth lead from the wall plate wiring harness to the earth post on the underside of the boiler control support.



3. Connect the lead from the wiring harness to the flying lead connection outside the control box.



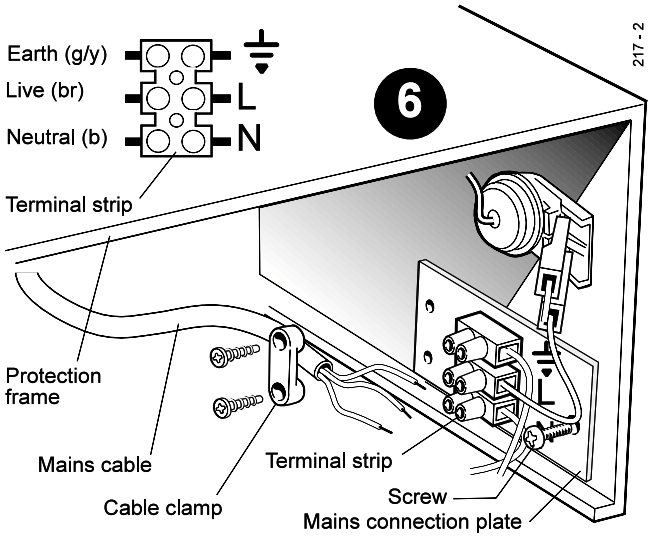
4. Plug in the lead to the gas valve



Connecting the mains supply

5. Wire the mains lead into the supply terminals marked L, N and ⏚. Secure with the cable clamp.

6. Wire the control box cable into the terminal at the side of the protection frame.

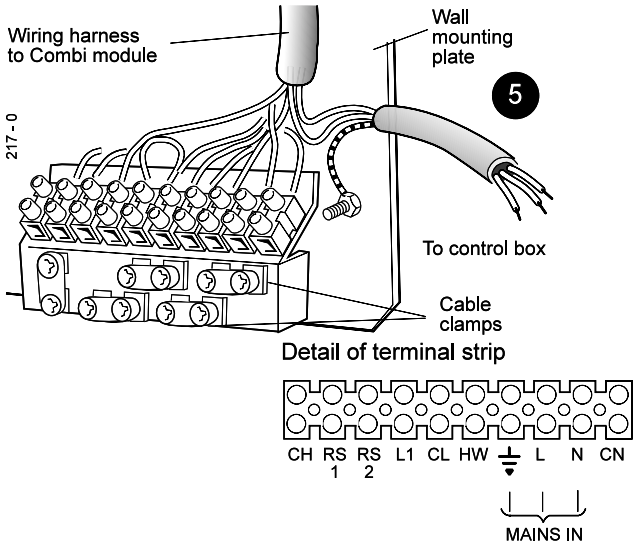


Notes.

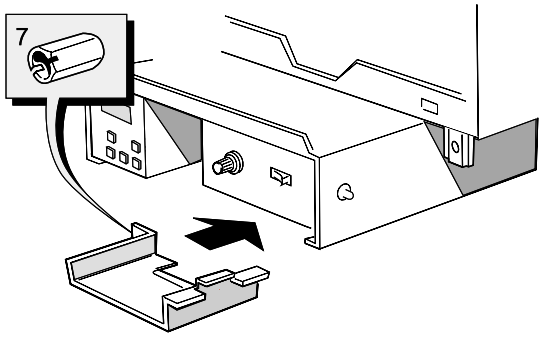
a. *The mains lead connection MUST be made in such a way that, should the lead slip from the anchorage, the current conductors become taut before the earthing conductor.*

b. *The 'T' rating of the mains lead should be 70 °C.*

c. *Ensure that no basic insulation is accessible outside of the terminal box and that the cable is secured into the clamp on its supplementary insulation.*



7. Fit the terminal strip cover under the control box and secure it to the wall mounting plate with the extended nut as shown.



48 EXTERNAL CONTROLS

External wiring must be in accordance with the current I.E.E. (BS.7671) Wiring Regulations. Difficulty in wiring should not arise, providing the following directions are observed. Refer to the Pictorial and Schematic Wiring Diagrams (Frames 49 and 50).

a. Room thermostat
Remove the link between terminals RS1 and RS2. Wire in the room thermostat. (Reference should be made to the manufacturer's instructions).

b. Programmer
Remove the link between terminals CH and L1, and CL and HW. Wire in the time switch according to Diagrams 1 and 2.

Note.
Wire the programmer and the room thermostat neutrals into terminal CN

c. Frost protection

Central heating systems fitted wholly inside the house do not normally require frost protection as the house acts as a 'storage heater' and can normally be left at least 24 hrs. without frost damage.

However, if parts of the pipework run outside the house or if the boiler will be left off for more than a day or so, then a frost thermostat should be wired into the system.

This is usually done at the programmer, in which case the programme selector switches are set to OFF - all other controls MUST be left in the running position. The frost thermostat should be sited in a cold place but where it can sense heat from the system.

Wiring should be as shown, with minimal disturbance to other wiring of the programmer. Designation of the terminals will vary but the programmer and thermostat manufacturer's leaflets will give full details.

Diagram A shows a double pole frost thermostat, which should suffice for all systems which do not use the OFF terminals of the programmer.

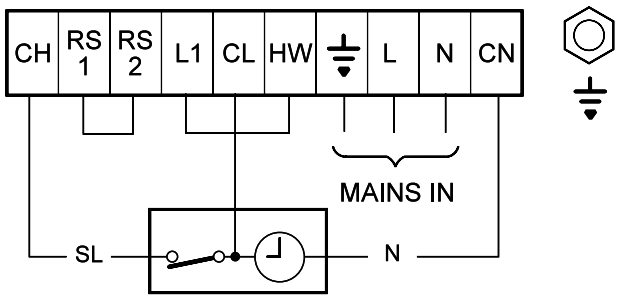
Diagram B shows a 'changeover' frost thermostat, which will cover most systems which do use CH OFF. If, however, on such a system the HW pipework is in an isolated part of the house, a second frost thermostat may be used to protect it.

If in doubt, ask your installer for advice.

Note.
Secure any leads with the cable clamps provided.
Refit the terminal box cover.

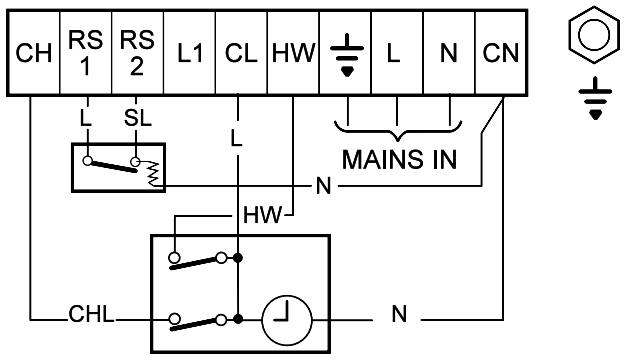
1. CLOCK CONTROL OF HEATING ONLY

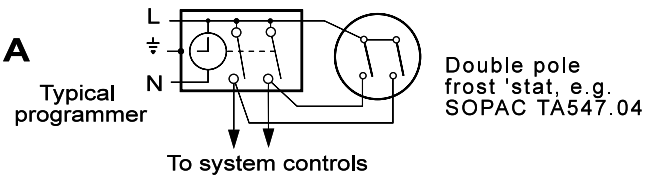
24 hr. DHW Preheat

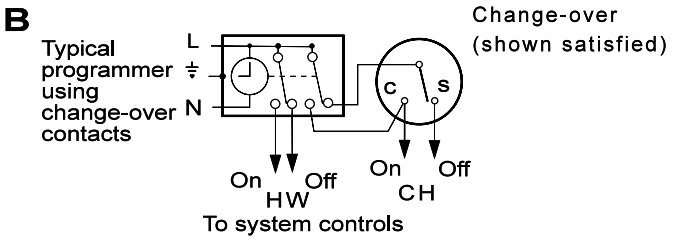


2. FULL CONTROL WITH PROGRAMMER & ROOM THERMOSTAT

Timed DHW Preheat



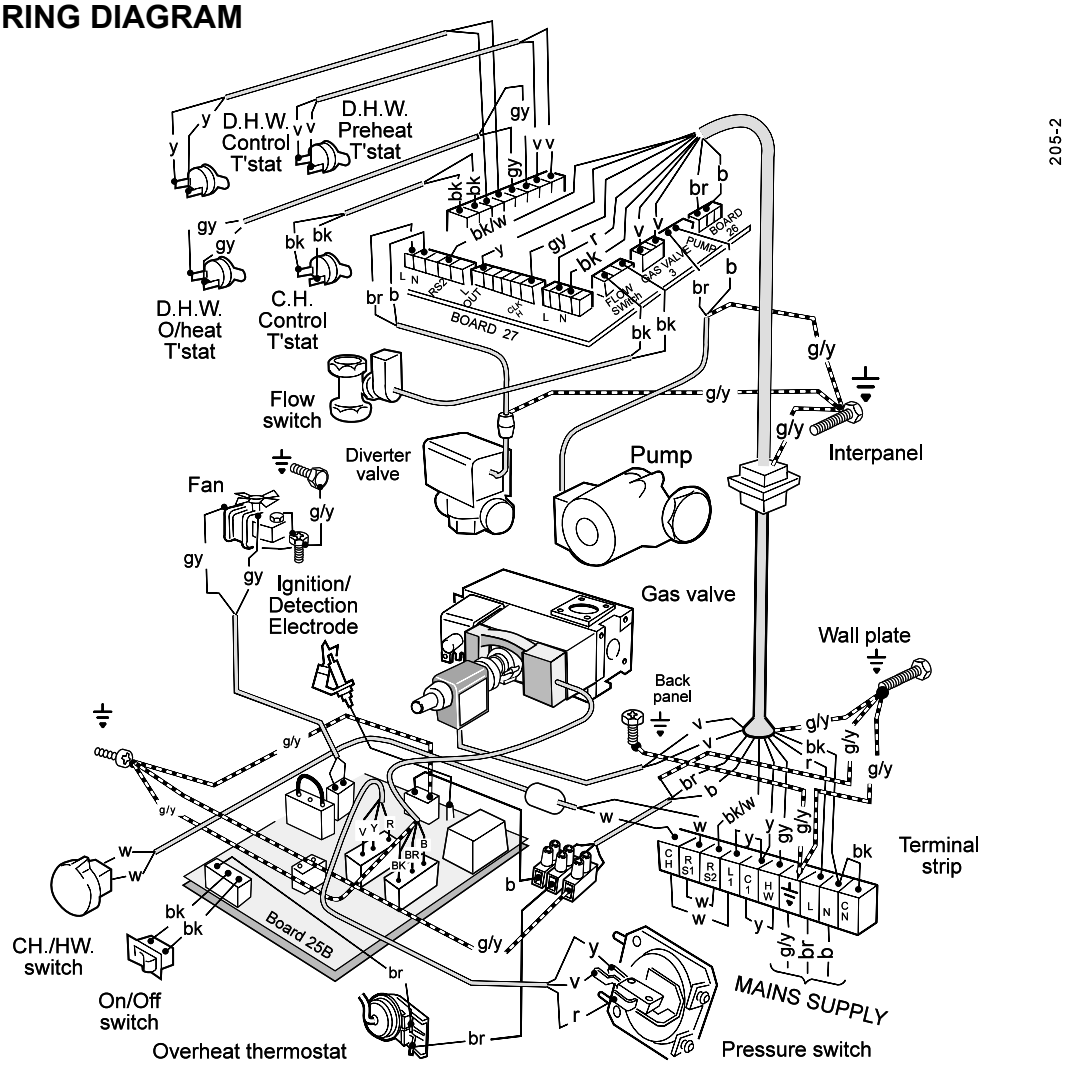




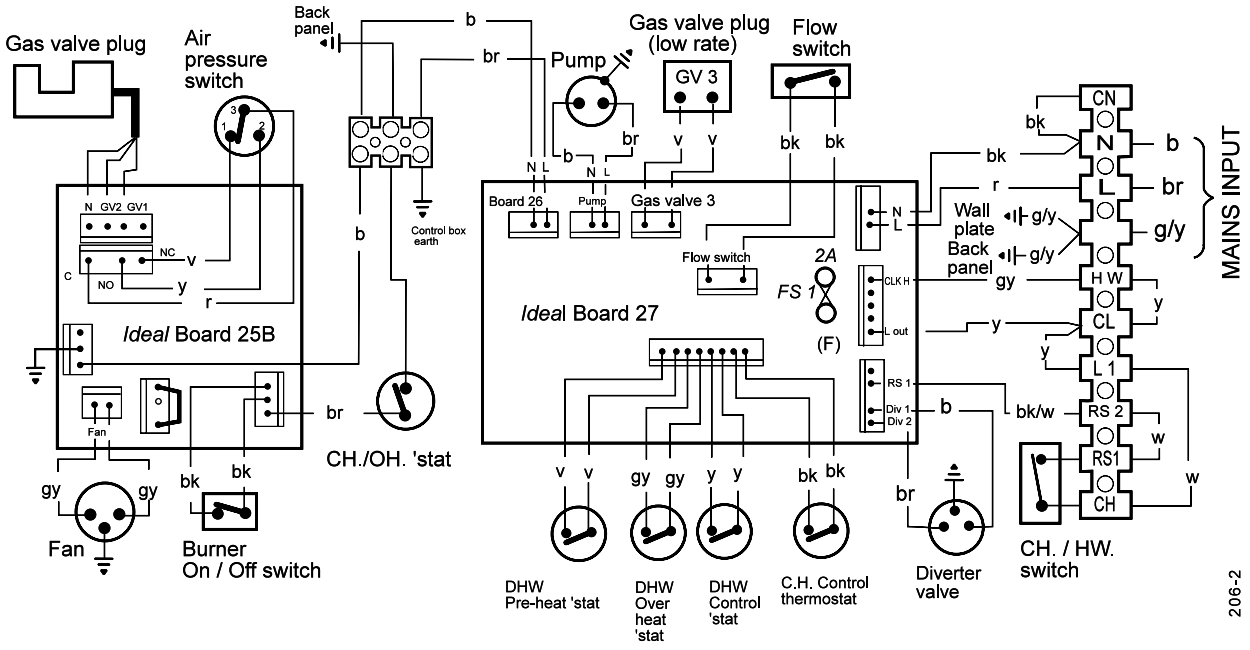
49 PICTORIAL WIRING DIAGRAM

LEGEND

b blue
bk black
br brown
r red
y yellow
w white
g/y green/yellow
bk/w black/white
v violet
gy grey



50 SCHEMATIC WIRING DIAGRAM



LEGEND

b	blue	**br**	brown	**y**	yellow	**g/y**	green/yellow	**v**	violet
bk	black	**r**	red	**w**	white	**bk/w**	black/white	**gy**	grey

51 COMMISSIONING AND TESTING

(a) Electrical Installation

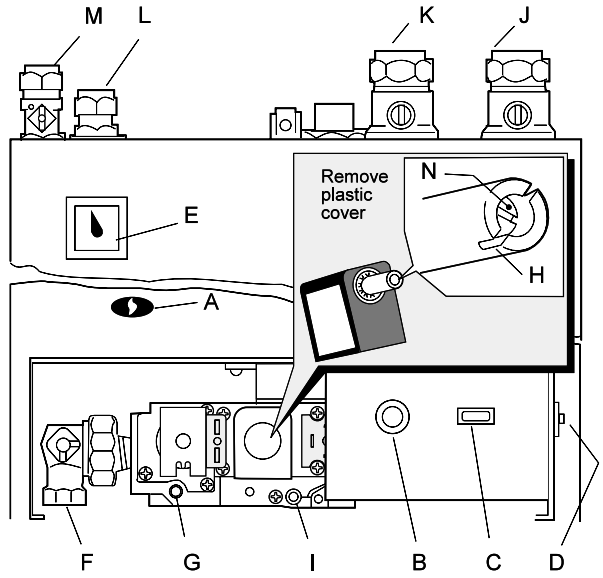
1. Checks to ensure electrical safety should be carried out by a competent person.
2. ALWAYS carry out preliminary electrical system checks, i.e. earth continuity, polarity, resistance to earth and short circuit using a suitable test meter.

(b) Gas Installation

1. The whole of the gas installation, including the meter, MUST be inspected and tested for soundness and purged in accordance with the recommendations of BS. 6891.
2. Purging air from the gas installation may be expedited by loosening the union on the gas service cock on the boiler and purging until gas is detected.
3. Retighten the union and check for gas soundness.

WARNING. Whilst effecting the required gas soundness test and purging air from the gas installation open all windows and doors, extinguish naked lights and **DO NOT SMOKE.**

52 INITIAL LIGHTING



LEGEND

- **A** Sightglass
- **B** CH / HW switch
- **C** Burner on/off switch
- **D** Overheat thermostat reset button
- **E** CH pressure gauge
- **F** Gas service cock.
- **G** Inlet pressure test point
- **H** Main burner pressure adjuster (outer)
- **I** Burner pressure test point
- **J** CH flow isolating valve
- **K** CH return isolating valve
- **L** DHW outlet
- **M** DHW inlet isolating valve.
- **N** Low rate adjusting screw (inner)

1. Check that the electricity supply is OFF.
2. Check that all the drain cocks are closed and the central heating isolating valves (J and K) and the domestic hot water isolating valve (M) are OPEN. Check that the diverter valve manual lever is in the CLOSED position. Refer to Frame 42.
3. Check that the gas service cock (F) is OPEN. Also check that the CH switch (B) and burner on/off switch (C) are OFF.
4. Fit the boiler casing but do not fit the Combi module cover or the controls casing pod.

WARNING. **Do NOT operate the boiler with the casing removed as damage to the control box may result**

5. Slacken the screw in the burner pressure test point (I) and connect a gas pressure gauge via a flexible tube.
6. Switch the electricity supply ON and check that all external controls are calling for heat: The pump will start.

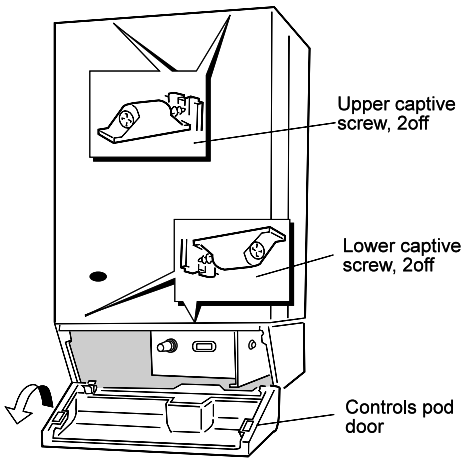
TO LIGHT THE BOILER

7. Set the burner on/off switch to ON and the fan (and pump) will start. After the fan has run for a few seconds the pilot solenoid valve will open and the intermittent spark commence, continuing until the pilot is established. The main burner will then light at low rate, approximately 6.0mb (2.4 in.w.g.) burner pressure. If this sequence does not occur refer to the Fault Finding section.
8. Check that the pilot flame envelops the ignition / detection electrode. If the pilot flame appears incorrect refer to 'Pilot Burner Replacement' in the Servicing section.
9. Test for gas soundness around ALL boiler gas components, using leak detection fluid. Particularly check gas valve flanges.
10. Set the burner on/off switch to OFF.

FITTING THE BOILER CASING

Boiler module

- Lift the boiler casing up to the boiler assembly and secure with 4 captive screws.
- The casing must seat correctly and compress the sealing strip to make an airtight joint. Visually check the side seals but if side clearances are limited then check that the top and bottom edges of the casing are correctly located.

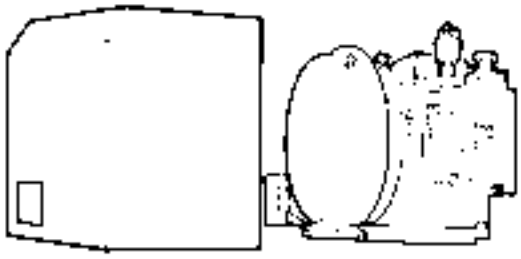


Controls casing pod

- Locate the pod on the 2 fixing screws. Push the pod forward to engage in the keyhole slots and tighten the fixing screws.

Combi module cover

- Lift the cover up to the module and push forward to engage in the keyhole slots. Secure with the 2 1/2" pozi screw provided.



53 INITIAL LIGHTING - continued

CENTRAL HEATING

1. Set the CH/HW switch (B) to CH & HW, and the burner on/off switch (C) to ON. Check that:
   - **a.** The pump is running.
   - **b.** The diverter valve energises - no resistance should be felt when the manual lever is moved by hand.
   - **c.** The fan starts and the main burner cross-lights smoothly at maximum rate.
     Note. *The burner may fire initially at low rate but should increase to maximum rate after 1-2 minutes.*
2. Operate the boiler for 10 minutes to stabilise the burner temperature.
3. The boiler CH control operates at a burner pressure of 16.0mb (6.4 in.w.g.). Should it be necessary to adjust the burner pressure remove the plastic cover (refer to Frame 52) then turn the outer adjusting screw (H) in either direction until the correct pressure is achieved.

Note. *Burner setting pressures and boiler performance details are given in Tables 2 & 3 and on the data plate, located on the control support frame.*

DOMESTIC HOT WATER

1. With the burner firing as above, fully open a DHW tap and set the CH/HW switch (B) to HW ONLY. Check that:
   - **a.** The pump continues to run.
   - **b.** The diverter valve de-energises.
   - **c.** The burner continues to fire at maximum rate.
2. Reduce the DHW draw-off rate to the minimum required to keep the boiler firing. The DHW control operates at a burner pressure of 6.0mb (2.4 in.w.g.). Should it be necessary to adjust the burner pressure turn the inner adjusting screw (N) in either direction until the desired burner pressure is achieved. Refer to Frame 52.

   Note. *Recheck the maximum burner pressure (CH) after setting the minimum burner pressure (HW) and adjust as necessary.*
3. Turn off the DHW tap and set the burner on/off switch to OFF.

54 GENERAL CHECKS

DOMESTIC HOT WATER MODE

1. Set the CH/HW switch (B) to HW ONLY and the burner on/off switch (C) to ON. The pump should start circulating water through the DHW calorifier and the burner should fire at minimum rate for about 3 minutes, preheating the DHW calorifier.
   - **a.** If no DHW is drawn off the boiler will fire periodically for a short time to maintain the calorifier temperature.
   - **b.** The DHW preheat operates 24 hours a day unless a programmer is fitted, when it can be timed.
2. Fully open a DHW tap. Check that the pump starts and the main burner fires at maximum rate. Check that DHW is delivered.
3. Reduce the DHW draw-off rate to the minimum required to keep the boiler firing and check that the burner pressure reduces to low rate in response to DHW temperature rise.
4. Close the DHW tap and check that the main burner extinguishes and the pump stops.

CENTRAL HEATING AND DOMESTIC HOT WATER MODE

1. Set the CH/HW switch (B) to CH & HW. Check that the main burner fires at the maximum rate.
2. Fully open a DHW tap and check that the hot water is delivered.
3. Close the DHW tap and turn off the CH/HW switch (B). Check that the main burner extinguishes and the pump stops.
4. Check the correct operation of the programmer, if fitted, and all other system controls. Operate each control separately and check that the main burner responds.
5. Remove the pressure gauge and tube. Tighten the sealing screw in the pressure test point, ensuring that a gas-tight seal is made.

WATER CIRCULATING SYSTEM

1. With the system COLD, check that the initial pressure is correct to the system design requirements. For pre-pressurised systems this should be 1.0 bar (14.5 psi).
2. Set the RED fill pressure indicator on the pressure gauge (E) to the initial system pressure. Refer to Frame 4 'Filling'.
3. With the system still hot, examine all water connections for soundness. The system pressure will increase with temperature rise but should not exceed 2.5 bar (36.6 psi).
4. With the system still hot, turn off the gas, water and electricity supplies to the boiler and drain down, in order to complete the flushing process.
5. Refill and vent the system, as described in 'Guide to System Requirements', clear all air locks and again check for water soundness.
6. Reset the system initial pressure to the design requirement.
7. Balance the system.

FINALLY

1. Fit the Combi module cover. Refer to Frame 52.
2. Refit the controls casing pod and tighten the 2 front fixing screws.
3. Set the controls to the user's requirements and close the pod door.
   - The design water output temperatures are as follows:

Central Htg	82^{0}C maximum
Domestic Hot Water	70^{0}C approx at 3.5 l/min (nominal) draw-off 35^{0}C temperature rise at 9.6 l/min draw-off

   - If a programmer is fitted refer to the programmer instructions.
4. Check that the casing is seated correctly and is compressing the sealing strip all around the casing.

IMPORTANT.

It is absolutely essential to ensure, in practice, 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.

If this should occur the appliance must be TURNED OFF IMMEDIATELY and the local gas supplier called to investigate.

WARNING. Do not operate the boiler with the casing removed.

55 HANDING OVER

After completing the installation and commissioning of the system the installer should hand over to the householder by the following actions:

1. Hand the User's Instructions to the Householder and explain his or her responsibilities under the Gas Safety (Installation and Use) Regulations 1994.
2. Draw attention to the Lighting Instruction label affixed to the controls pod door.
3. Explain and demonstrate the lighting and shutting down procedures.
4. The operation of the boiler and the use and adjustment of ALL system controls should be fully explained to the Householder, to ensure the greatest possible fuel economy consistent with household requirements of both heating and hot water consumption.
   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 frosty conditions.
5. Explain the function and the use of the boiler heating and domestic hot water controls.
6. Explain the function of the boiler overheat thermostat and emphasise that if cutout occurs, the boiler should be turned off and a CORGI registered installer consulted.
7. Explain and demonstrate the function of time and temperature controls, radiator valves etc., for the economic use of the system.
8. If any Programmer Kit is fitted, then draw attention to the Programmer Kit User's Instructions and hand them to the Householder.
9. **Loss of system water pressure**

   Explain that the dial on the Combi module indicates the central heating system pressure and that if the normal COLD pressure of the system (indicated by the red arrow in the dial) is seen to decrease over a period of time then a water leak is indicated. In this event a CORGI registered installer should be consulted.

   DO NOT FIRE THE BOILER IF THE PRESSURE HAS REDUCED TO ZERO FROM THE ORIGINAL SETTING
10. Stress the importance of regular servicing by a CORGI registered installer and that a comprehensive service should be carried out AT LEAST ONCE A YEAR.

56 SCHEDULE

To ensure the continued safe and efficient operation of the appliance it is recommended that it is checked at regular intervals and serviced as necessary. The frequency of servicing will depend upon the installation condition and usage, but should be carried out at least annually. It is the law that any service work must be carried out by a CORGI registered installer.

a. Light the boiler and, using the flue sampling point (provided on the top RH side of the back panel), carry out a pre-service check, noting any operational faults.

b. Clean the main burner.

c. Clean the heat exchanger.

d. Clean the main and pilot injectors.

e. Remove any debris from inside the base of the casing.

f. Check that the flue terminal is unobstructed and that the flue system, including the inner cover, is sealed correctly.

g. If the appliance has been installed in a compartment, check that the ventilation areas are clear.

The servicing procedures are covered more fully in Frames 57 to 63 and must be carried out in sequence.

WARNING. Disconnect the electrical supply and turn off the gas supply.

IMPORTANT. After completing the servicing or exchange of components always test for gas soundness and carry out functional checks as appropriate.

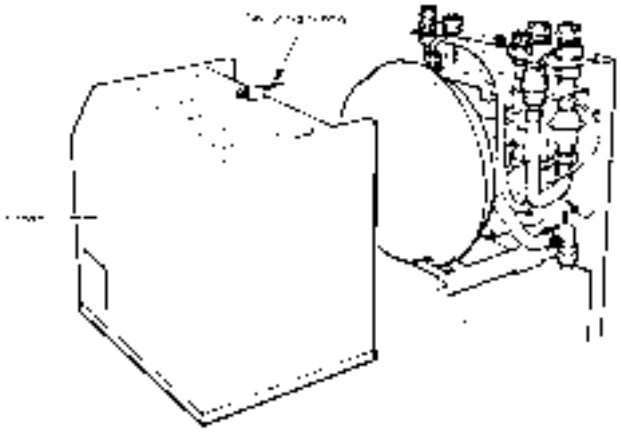
When work is complete the casing MUST be correctly refitted, ensuring that a good seal is made.
The boiler must NOT be operated if the casing is not fitted.

Note. *In order to carry out either servicing or replacement of components, the boiler casing must be removed (Frame 57).*

57 BOILER CASING REMOVAL

Combi Module Cover

Release the securing screw and withdraw the cover.

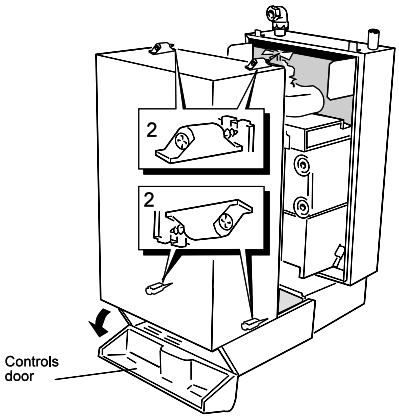


Boiler Casing

1. Open the controls pod door.

2. Release the 4 captive screws at the top and bottom of the casing. Lift the casing off the boiler and retain in a safe place .

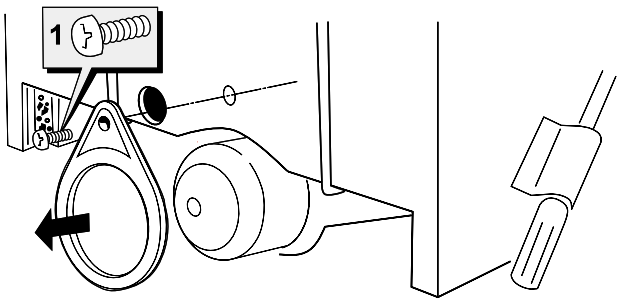
3. Isolate the gas supply at the service cock fitted to the boiler. Refer to Frame 64.



58 BURNER AND AIR BOX REMOVAL

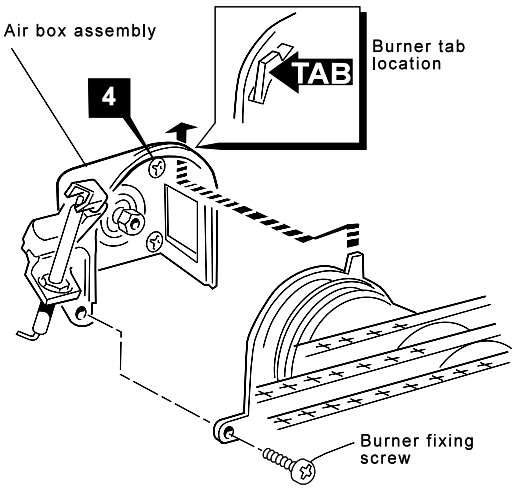
1. Remove the screw retaining the front burner support bracket to the combustion chamber. Remove the M5 pozi-screw situated at the LH bottom rear of the burner and pull the burner downward to disengage the retention tab. Remove burner to a safe place for inspection and cleaning.

2. Remove the control box fixing screw. Pull the box forward and downward to disengage.



3. Pull the HT lead connection off the printed circuit board and pull the lead upwards through the bottom panel grommet.

4. Remove the 4 screws retaining the air box /pilot assembly to the vertical manifold and carefully remove the assembly.



59 CLEANING THE FAN ASSEMBLY / THE FLUEWAYS

1. Remove the 2 silicon rubber tubes from the fan sensing points.

2. Disconnect the fan leads and the fan earth connection.

3a. Rear flue
Slacken the M4 screw securing the flue connector to the fan. Disconnect the connector from the fan and slide into the flue.

3b. Side flue
Slacken off two M4 screws securing the flue elbow and flue connector. Disconnect the flue connector from the elbow and slide into the flue. Remove the flue elbow.

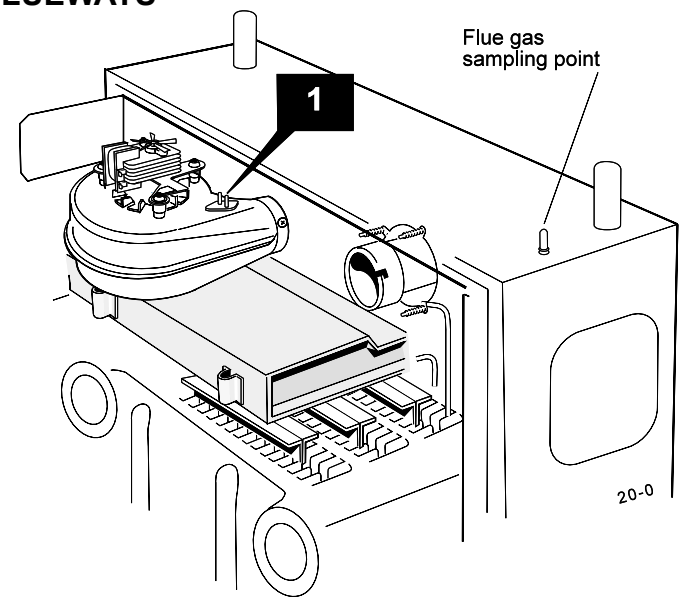
4. Disconnect the silicon rubber tube from the rear of the collector hood.

5. Slacken the two M5 nuts on the front tie rods, releasing the tie rods from the combustion chamber.

6. Remove the M5 central fixing screw at the rear of the collector hood and remove collector hood/fan assembly.

7. Check that the fan impeller runs freely. Remove any debris from the impeller with a soft brush.

8. Remove the flue baffle clips and remove the flue baffles.



9. Remove all loose deposits from the heat exchanger, particularly between the fins, using a suitable brush.

10. Reassemble in reverse order, ensuring that the fan leads, fan earth connection and 3 sensing tubes are reconnected.

60 CLEANING THE BURNER AND PILOT ASSEMBLY

1. Brush off any deposits that may have fallen on to the burner head, ensuring the flame ports are unobstructed, and remove any debris that may have collected.
Note. *Brushes with metallic bristles must not be used.*

2. Remove the main burner injector and ensure there is no blockage or damage. Clean or renew as necessary.

3. Refit the injector, using an approved jointing compound sparingly.

4. Inspect the pilot burner and ignition / detection electrode. Ensure that they are clean and in good condition. Check that:

a. The pilot burner injector is not blocked or damaged. Refer to Frame 68 for removal details.

b. The pilot burner is clean and unobstructed.

c. The ignition / detection electrode is clean and undamaged.

e. The ignition / detection lead is in good condition.

f. The spark gap is correct (Frame 68). Clean or renew as necessary.

Note. *The pilot shield is located around the pilot assembly bracket and is located by the electrode retaining nut.*

61 RE-ASSEMBLY

Reassemble the boiler in the following order:

1. Refit the flue baffles.

2. Inspect the collector hood rope gasket and replace, if necessary, ensuring that the self adhesive rope is fitted centrally onto the lip of the collector hood /fan assembly.

The boiler efficiency will be adversely affected if incorrectly fitted.

Refit the collector hood and retain with the 2 front tie rods and the rear central fixing screws. Tighten the nuts and screw. Ensure that the sealing gasket is compressed.

3. Refit the 3 sensing tubes and reconnect the electrical leads.

4. Refit the air box assembly and burner. Ensure that the burner front fixing is refitted.

5. Refit the control box.

6. Reconnect the gas supply and the electrical wiring. Refer to Frames 41 and 46.

7. Check the sightglass in the boiler casing. Clean or renew as necessary. Refer to Frame 65.

8. Check for gas soundness. Check the gas service cock and pressure test point.

9. Refit the boiler casing and tighten the 4 captive screws.

IMPORTANT.

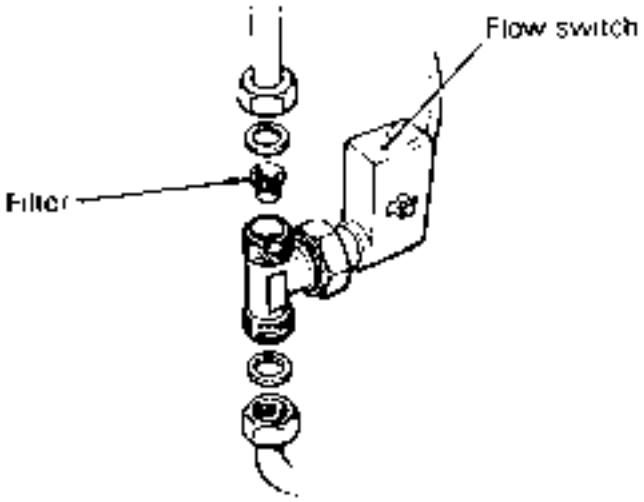
When work is complete the casing must be correctly refitted. Ensure that a good seal is made.

10. Close the controls pod door.

62 CLEANING THE DOMESTIC HOT WATER (DHW) FILTER

1. Remove the DHW flow switch. Refer to Frame 79.

2. Prise the filter from the housing in the flow switch inlet and clean or renew as necessary.



63 GAS PRESSURE ADJUSTMENT

PILOT

Light the boiler and check that the pilot flame envelops the ignition / detection electrode.

The pilot is factory set to maximum and no further adjustment is possible. If, however, the pilot flame length is incorrect then remove and inspect the pilot injector. Refer to Frame 68.
Relight in accordance with 'Initial lighting', Frames 52 and 53.

MAIN BURNER

After any servicing, reference should be made to Table 2, which quotes details of the rated output with the related burner setting pressure and the heat input.

Any required adjustments should be made by using the pressure adjustment screw.

Refer to 'Initial Lighting', Frame 52.

64 GENERAL

When replacing any component:

1. Isolate the electricity supply.
2. Turn OFF the gas supply.
3. Remove the boiler casings. Refer to Frame 57.

IMPORTANT. When work is complete the casing must be correctly refitted, ensuring that a good seal is made.

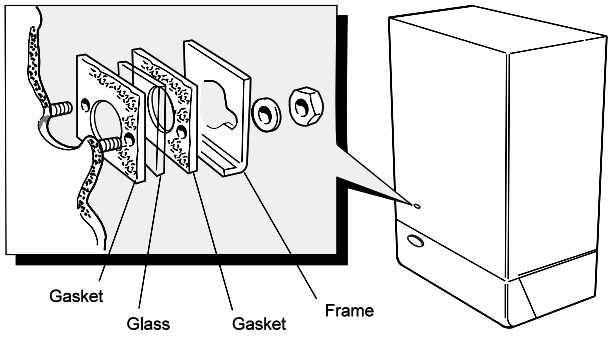
Note. *In order to assist fault finding, the control box printed circuit board is fitted with 4 indicator lights which represent the following boiler conditions:*

Neon I_1	Air pressure switch made.
Neon I_2	Fan voltage indication
Neon I_3	Main supply to PCB 25B.
Neon SGI	Flashes to indicate spark operation (stops after detection).

THE BOILER MUST NOT BE OPERATED IF THE CASING IS NOT FITTED

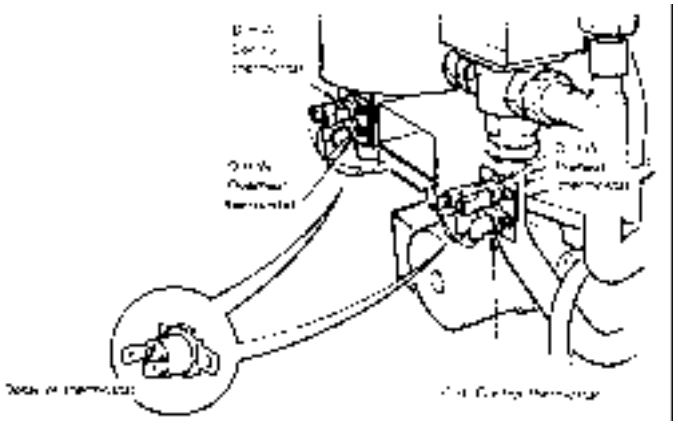
65 SIGHTGLASS REPLACEMENT

1. Refer to Frame 64.
2. Unfasten the 2 nuts and washers holding the sightglass assembly to the casing front panel.
3. When fixing the new assembly ensure that the parts are in the correct order. The frame must have the return edge at the bottom.
4. Retighten the 2 nuts to ensure an airtight seal. DO NOT OVERTIGHTEN.
5. Replace the boiler casing. Refer to Frame 52.



66 DHW PREHEAT, CONTROL, OVERHEAT AND CH CONTROL THERMOSTAT REPLACEMENT

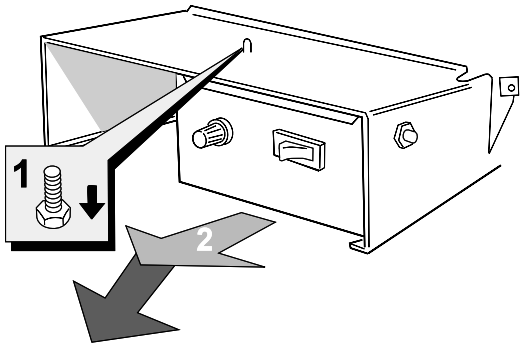
1. Refer to Frame 64.
2. Release the retaining screw and hang the CH expansion vessel in the servicing position. Refer to Frame 45.
3. Remove the 2 securing screws and withdraw the faulty thermostat.
4. Pull off the 2 electrical leads from the thermostat.
5. Fit the new thermostat and re-assemble in reverse order (polarity is immaterial).



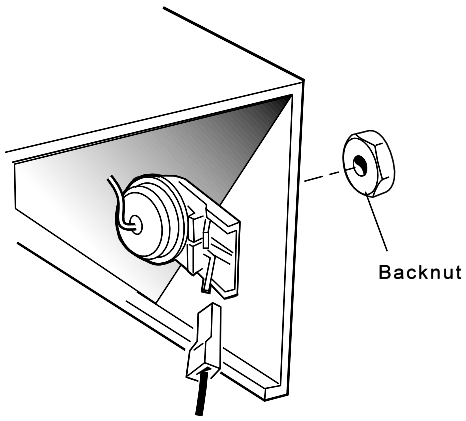
67 CH OVERHEAT THERMOSTAT REPLACEMENT

Refer also to Frame 64

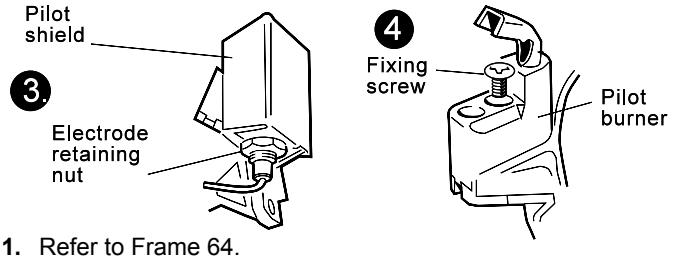
1. Remove the control box fixing screw.

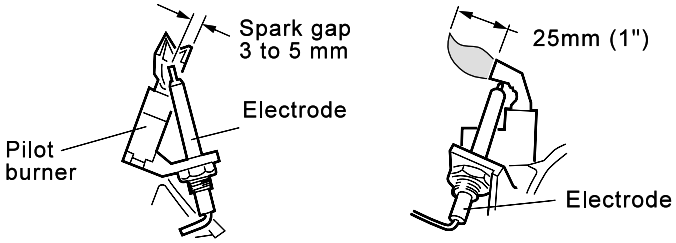


2. Pull the box forward and downward to disengage.
3. To remove the overheat thermostat pull off the electrical connections at the thermostat. Remove the backnut retaining the thermostat to the bracket. Remove the thermostat from the heat exchanger pocket.
4. Reassemble in reverse order.



68 PILOT BURNER REPLACEMENT

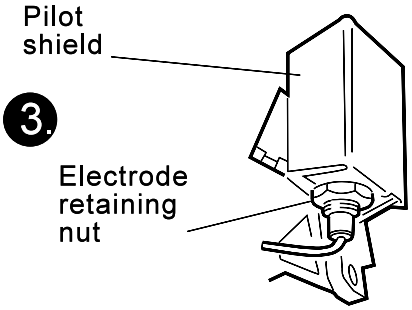




1. Refer to Frame 64.
2. Remove the burner and air box assembly. Refer to Frame 58.
3. Remove the electrode retaining nut and remove the pilot shield and electrode.
4. Unscrew the central pilot fixing screw and lift the pilot clear of the pilot injector. The pilot injector may now be unscrewed if required.
5. Replace the pilot burner and retain with the M4 screw previously removed. Ensure that the copper sealing washer is replaced when refitting the pilot injector.
6. Replace the electrode and pilot shield, retaining both with the electrode nut. Check the spark gap.
7. Replace the box assembly.
8. Replace the burner.
9. Replace the boiler casing.
10. The pilot is factory set to maximum and no further adjustment is possible. Ensure that there is an inlet pressure of 20 mbar available. Also check burner ignition and cross-lighting.

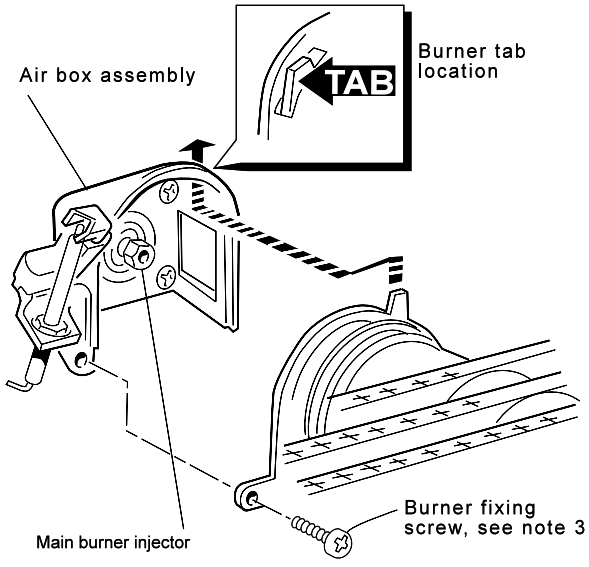
69 SPARK ELECTRODE AND LEAD REPLACEMENT

1. Refer to Frame 64.
2. Remove the burner and air box assembly. Refer to Frame 58.
3. Remove the electrode retaining nut.
4. Remove the pilot shield.
5. Remove the spark electrode and integral lead.
6. Fit the new electrode and lead in reverse order. Ensure that the pilot shield is replaced.
7. Check the spark gap. Refer to Frame 68.
8. Replace the boiler casing.
9. Check the pilot ignition.



70 MAIN BURNER & MAIN BURNER INJECTOR REPLACEMENT

1. Refer to Frame 64
2. Remove the screw retaining the front burner support bracket to the combustion chamber.
3. Remove the M5 pozi screw and washer, situated at the left hand bottom rear of the burner. Pull the burner downward to disengage the retention tab and remove the burner.
4. At this stage the main burner injector can be removed, checked, cleaned or replaced as required. Ensure that an approved jointing compound is used sparingly.
5. Fit the new burner, ensuring that the retention tab is correctly located in the air box slot.
6. Refit the M5 retaining screw and washer.
7. Refit the boiler casing.
8. Check the burner for cross-lighting and flame stability.



71 COMBUSTION CHAMBER INSULATION REPLACEMENT

1. Refer to Frame 64

2. Remove the burner and air box assembly. Refer to Frame 58.

3. Remove the tie rods and combustion chamber.

4. Remove the 2 side panel retaining brackets.

5. Remove the side insulation panels.

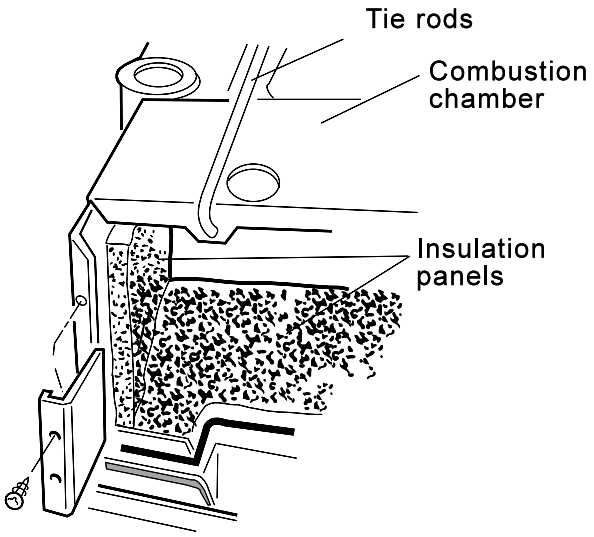
6. Remove the front and rear insulation panels.

7. Fit the new front and rear insulation panels.

8. Fit the new side panels and retain with the brackets and screws previously removed.

9. Refit the combustion chamber and tie rods.

10. Re-assemble the rest of the appliance in reverse order.



72 GAS CONTROL VALVE REPLACEMENT

Note. *Also refer to Frames 93 & 94, 'Exploded Views' , for illustration of the procedure detailed below.*

1. Refer to Frame 64.

2. Remove the burner support bracket, burner and air box assembly. Refer to Frame 58.

3. Remove the control box fixing screw. Pull the box forward and downward to disengage.

4. Remove the gas control valve electrical connections.

5. Disconnect and remove the gas union from the gas control valve.

6. Whilst supporting the gas control valve, remove the 2 screws retaining the manifold to the back panel.

7. Remove the gas control / manifold assembly.

8. Remove the 4 screws retaining the manifold to the gas control valve and fit the manifold to the new gas control valve. Ensure that the new control is fitted the correct way round (an arrow engraved on the back indicates the direction of flow).

Note. *Remove the gas cock stub and refit into the new gas control valve. Use an approved jointing compound on the pipe stub.*

9. Reassemble in reverse order.

10. Replace the boiler casing.

11. Check the gas valve operation / gas soundness.

73 FAN REPLACEMENT

1. Remove the 2 silicon rubber tubes from the fan sensing points.

2. Disconnect the fan leads and the fan earth connection.

3a. Rear flue: Slacken the M4 screw securing the flue connector to the fan. Disconnect the connector from the fan and slide into the flue.

3b. Side flue: Slacken off two M4 screws securing the flue elbow and flue connector. Disconnect the flue connector from the elbow and slide into the flue. Remove the flue elbow.

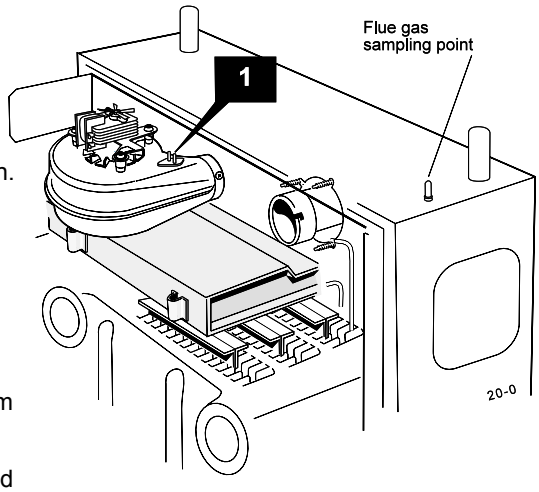
4. Disconnect the silicon rubber tube from the rear of the collector hood.

5. Slacken the two M5 nuts on the front tie rods, releasing the tie rods from the combustion chamber.

6. Remove the M5 central fixing screw at the rear of the collector hood and remove collector hood/fan assembly.

7. Remove the three M4 screws retaining the fan to the collector hood.

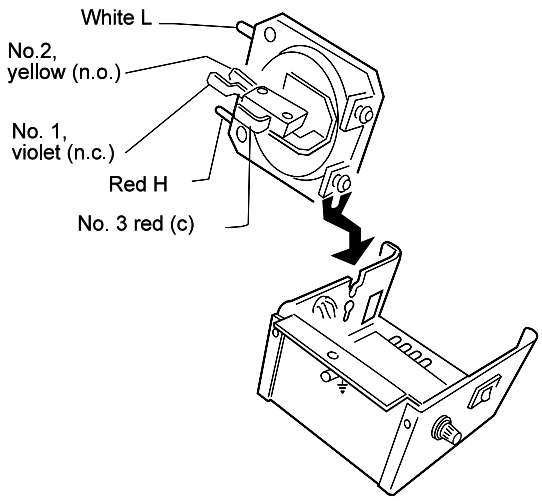
8. Reassemble in reverse order, ensuring the fan leads, fan earth connection and 3 sensing tubes are reconnected.



9. Refit the boiler casing.

10. Check the boiler operation.

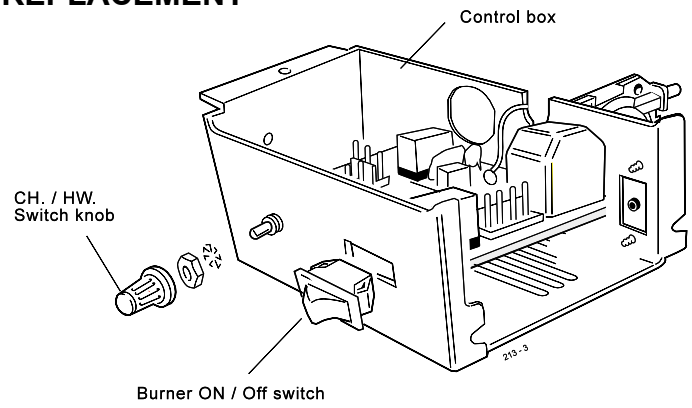
74 AIR PRESSURE SWITCH (APS) REPLACEMENT



1. Refer to Frame 64.
2. Remove the control box fixing screw. Pull the box forward and downward to disengage.
3. Pull off both sensing tubes from the APS and remove the cover.
4. Remove the 3 electrical connections from the APS.
5. Remove the switch from the controls box.
6. Connect the new switch in reverse order.
7. Refit the control box.
8. Refit the boiler casing.
9. Check the boiler operation.

75 BURNER ON/OFF AND CH/HW SWITCH REPLACEMENT

1. Refer to Frame 64.
2. Remove the control box fixing screw, pull the box forward and downward to disengage.
3. Disconnect the 2 electrical leads from the switch.
4. **BURNER ON/OFF SWITCH ONLY**
   Compress the retaining clips and prise the defective switch out of the front panel.
   CH / HW SWITCH ONLY
   a. Pull off the knob.
   b. Remove the backnut and withdraw the switch.
5. Connect the new switch in reverse order. Ensure that the switch is the correct way round, i.e. with the terminals towards the right, as shown (burner on/off switch) or that the switch is correctly orientated (CH/HW switch). Polarity is immaterial

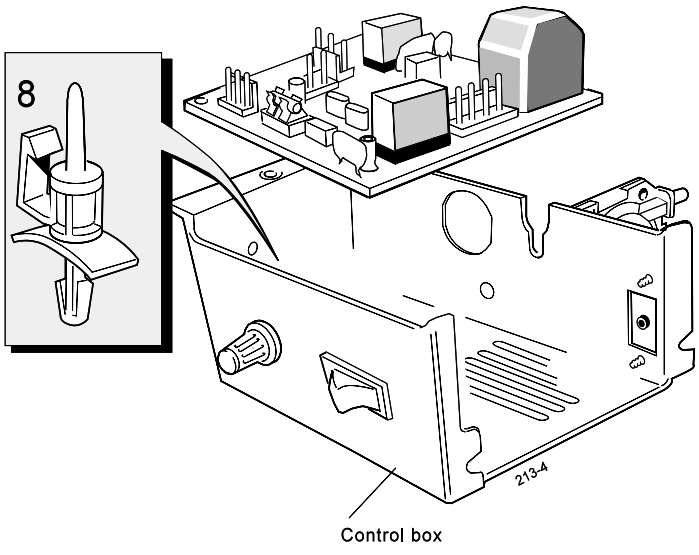


6. Refit the boiler casing.
7. Check the switch operation.

76 PRINTED CIRCUIT BOARD (PCB) REPLACEMENT

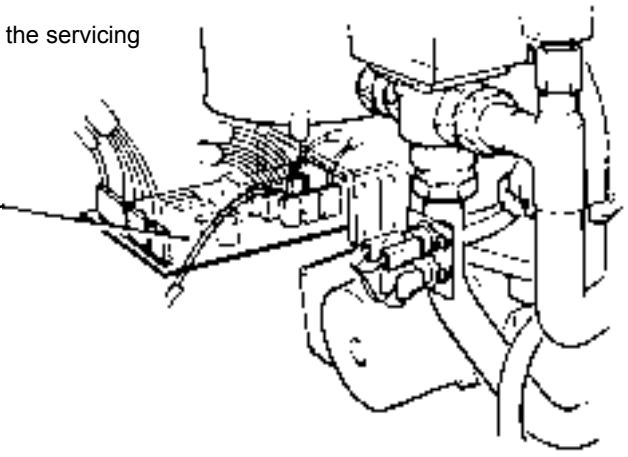
Note. *Refer to Frames 93 and 94, 'Exploded Views' for illustration of the procedure detailed below.*

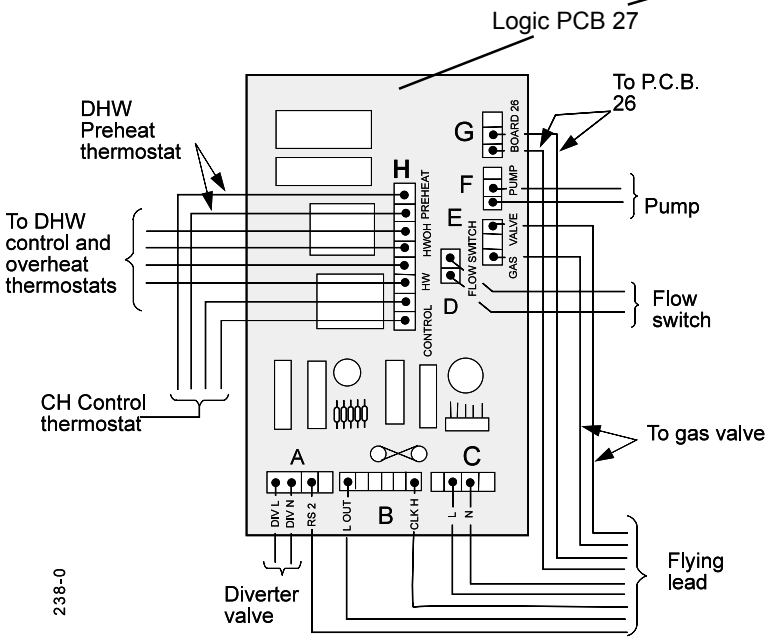
1. Refer to Frame 64.
2. Remove the control box fixing screw. Pull the box forward and downward to disengage.
3. Remove the HT lead from the PCB
4. Remove the 4 push-in electrical connectors from the PCB.
5. Remove the neutral wire on the PCB from its connection to the back of the socket inside the control box.
6. Remove the earth wire on the PCB from its connection to the earth stud inside the control box.
7. Remove the 2 connections from the on/off switch and remove the switch.
8. Compress the barbs on the PCB stand-offs to release the PCB from the box.
9. Fit the new PCB and reassemble in reverse order.
10. Refit the boiler jacket.
11. Check the operation of the boiler.
12. Check the ignition operation.



77 LOGIC PCB 27 REPLACEMENT

1. Refer to Frame 64 (The Combi module cover only need be removed.)
2. Release the retaining screw and hang the CH expansion vessel in the servicing position. Refer to Frame 45.
3. Withdraw the PCB and unplug the 8 electrical leads (A to H).
4. Fit the new PCB 27 and re-assemble in reverse order.

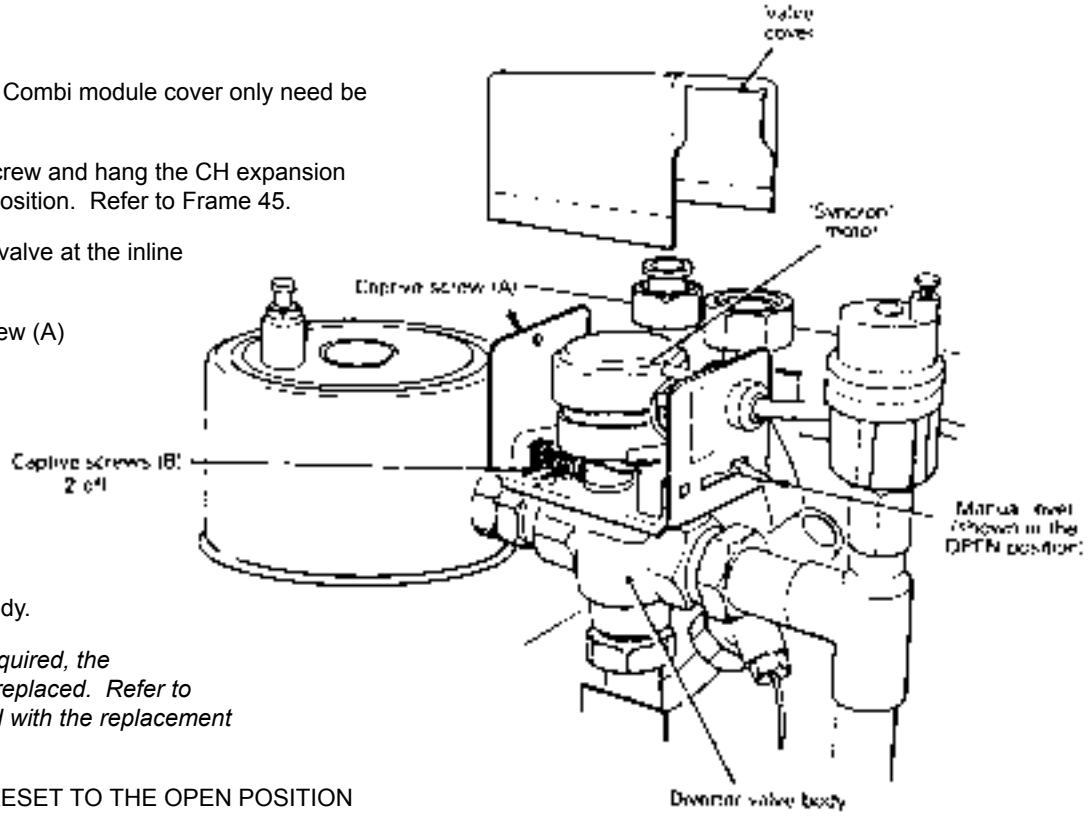




78 DIVERTER VALVE ACTUATOR REPLACEMENT

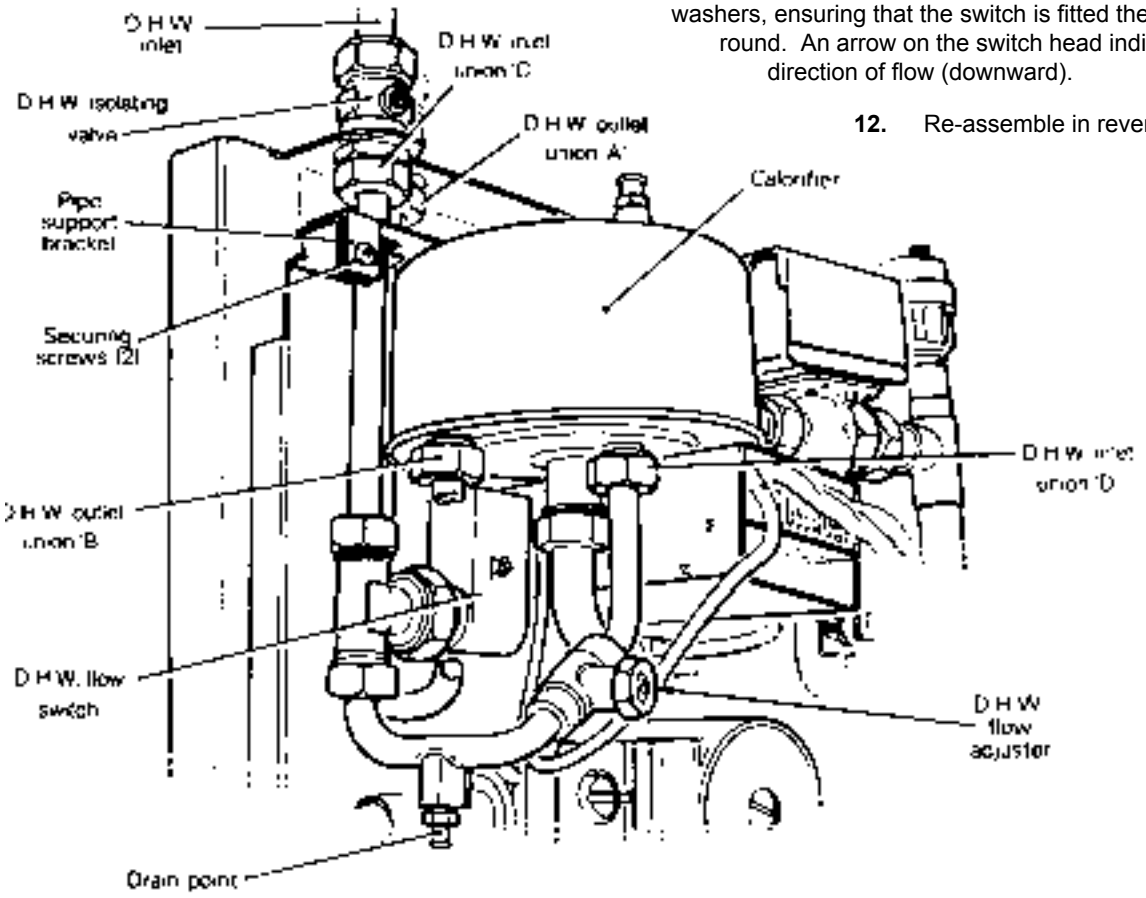
1. Refer to Frame 64 (The Combi module cover only need be removed.)
2. Release the retaining screw and hang the CH expansion vessel in the servicing position. Refer to Frame 45.
3. Disconnect the diverter valve at the inline connector.
4. Release the captive screw (A) and lift off the valve cover.
5. SET THE MANUALLY OPERATED VALVE LEVER TO *OPEN.*
6. Release the 2 captive screws (B) and lift the actuator off the valve body.

   Note. *At this stage, if required, the Syncron motor may be replaced. Refer to the instructions supplied with the replacement motor.*
7. Fit the new actuator. PRESET TO THE OPEN POSITION and reassemble in reverse order.



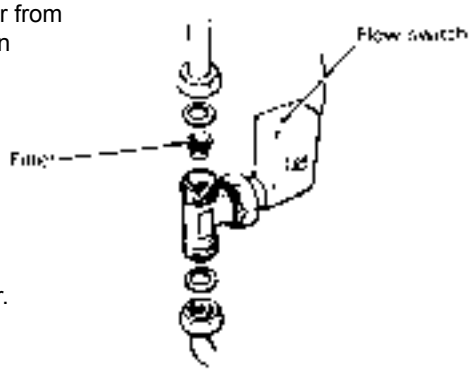
79 DHW FLOW SWITCH REPLACEMENT

1. Refer to Frame 64 (the Combi module cover only need be removed).
2. Release the retaining screw and hang the CH expansion vessel in the servicing position. Refer to Frame 45.
3. Disconnect the flow switch lead from the Logic PCB 27.
4. Remove the 2 securing screws and withdraw the pipe support bracket.
5. Close the DHW isolating valve.
6. Open the lowest DHW draw-off tap.
7. Drain any residual water into a receptacle via the DHW drain point.
8. Undo the DHW outlet pipe union nuts A & B and move the pipe aside.
9. Undo the DHW inlet pipe union nuts C & D and withdraw the switch assembly.
10. Transfer the pipes and DHW filter. Refer to Frame 80.
11. Fit the new flow switch complete with new sealing washers, ensuring that the switch is fitted the right way round. An arrow on the switch head indicates the direction of flow (downward).
12. Re-assemble in reverse order.



80 DHW FILTER REPLACEMENT

1. Refer to Frame 64 (The Combi module cover only need be removed).
2. Remove the DHW flow switch. Refer to Frame 79.
3. Prise the filter from the housing in the flow switch inlet, and clean or renew as necessary.
4. Re-assemble in reverse order.



81 DRAINING THE BOILER

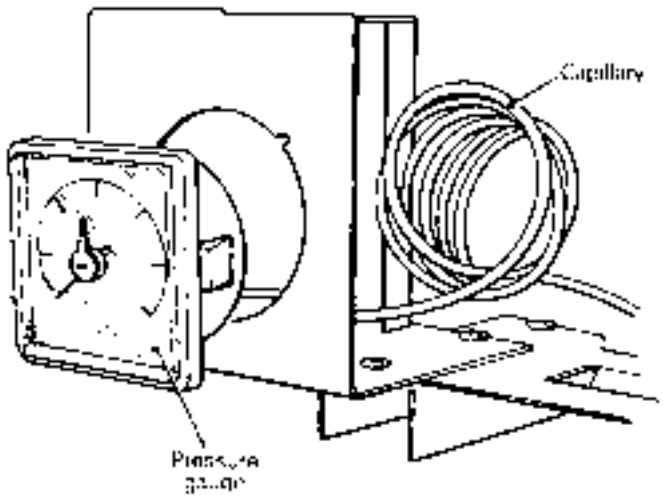
IMPORTANT.
In order to replace the components in Frames 82 to 90 it is necessary to drain the boiler.

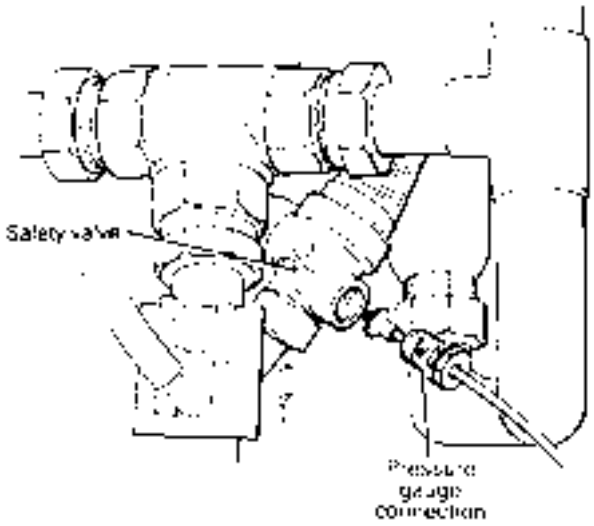
Note. *Refer to Frames 92 and 93 (Boiler and Combi modules - exploded views) for illustration of the procedure detailed below:*

1. Refer to Frame 64.
2. Close the CH isolating valves.
3. Remove the heat exchanger drain plug, using a 3/16" Allen key, and drain the water into a suitable receptacle.
4. Refit the drain plug, using a suitable jointing compound.
5. In order to refill the boiler refer to Frame 4.

82 PRESSURE GAUGE REPLACEMENT

1. Refer to Frame 64.
2. Drain the boiler. Refer to Frame 81.
3. Release the retaining screw and hang the CH expansion vessel in the servicing position. Refer to Frame 45.
4. Disconnect the pressure gauge capillary from the safety valve.
5. Compress the 2 retaining lugs and withdraw the gauge from the bracket.

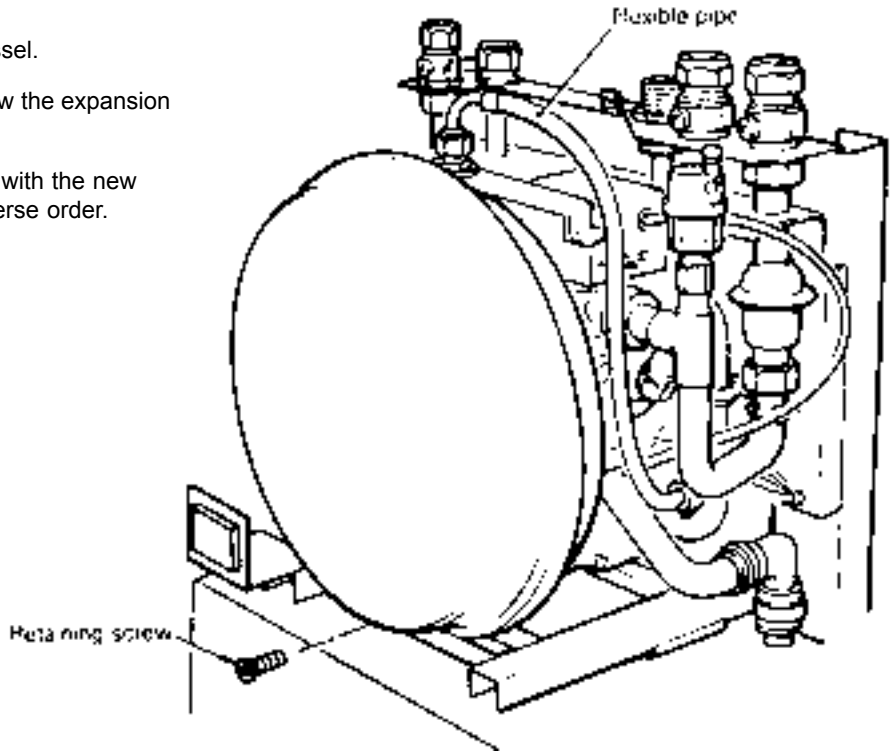




6. Fit the new gauge and re-assemble in reverse order, ensuring that:
   - **a.** The capillary is carefully and neatly routed, as previously.
   - **b.** The gauge is correctly orientated within the housing.

83 CH EXPANSION VESSEL REPLACEMENT

1. Refer to Frame 64.
2. Drain the boiler. Refer to Frame 81.
3. Disconnect the flexible pipe from the vessel.
4. Release the retaining screw and withdraw the expansion vessel.
5. Fit the new expansion vessel, complete with the new sealing washer, and re-assemble in reverse order.



84 DHW CALORIFIER REPLACEMENT

1. Refer to Frame 64.
2. Drain the boiler. Refer to Frame 81.
3. Remove the CH expansion vessel. Refer to Frame 45.
4. Remove the 2 securing screws and withdraw the pipe support bracket.
5. Close the DHW inlet isolating valve.
6. Open the lowest DHW draw-off tap.
7. Drain any residual water into a receptacle via the DHW drain point.
8. Undo the unions on the DHW inlet pipe and move the pipe aside.
9. Slacken diverter valve union nut C.
10. Undo calorifier union nut D.
11. Undo calorifier unions A and B and withdraw the calorifier from the boiler.
12. Fit the new calorifier, complete with the new sealing washers provided, and re-assemble in reverse order.

TO DESCALE THE CALORIFIER:

a. Remove the calorifier from the boiler as described above.

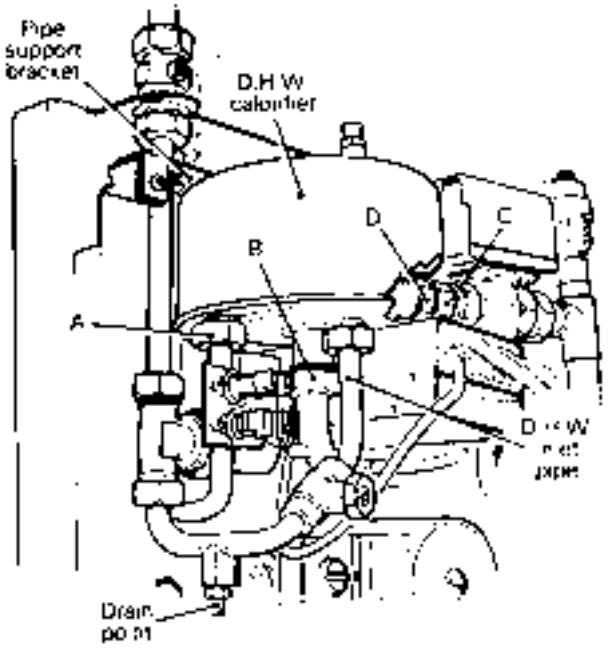
b. Descale the domestic hot water coil, using a proprietary descaling agent.

c. Rinse thoroughly with clean water.

d. Re-assemble in reverse order.

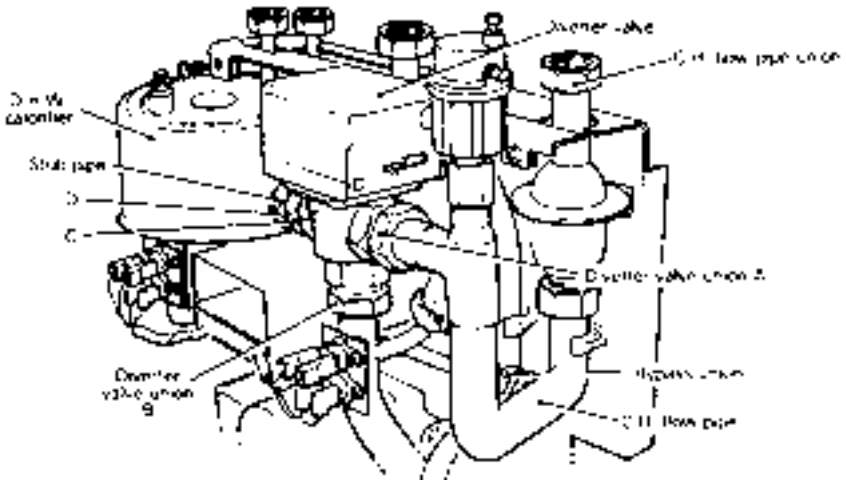
WARNING. The agents are highly corrosive - ingestion or contact with skin, eyes and clothing MUST be avoided. Protective clothing should be worn and the descaling operation conducted out of doors in a well ventilated area.

Note. *The names and addresses of suppliers of suitable descaling agents are given in Frame 4.*



85 DIVERTER VALVE (COMPLETE) REPLACEMENT

1. Refer to Frame 64.
2. Drain the boiler. Refer to Frame 81.
3. Remove the CH expansion vessel. Refer to Frame 45.
4. Remove the automatic air vent. Refer to Frame 88.
5. Disconnect the diverter valve lead at the inline connector.
6. Undo diverter valve union A and the bypass union.
7. Slacken the CH flow pipe union.
8. Undo diverter valve union B.
9. Slacken diverter valve union nut C as far back as possible.
10. Prevent union nut C from turning and undo calorifier union nut D. This will jack the diverter valve towards the right and permit its withdrawal from the boiler, complete with stub pipe.
11. Transfer the stub pipe to the new valve.
12. Fit the new diverter valve and re-assemble in reverse order.



86 PUMP REPLACEMENT

1. Refer to Frame 64.
2. Drain the boiler. Refer to Frame 81.
3. Remove the CH expansion vessel. Refer to Frame 45.
4. Disconnect the pressure gauge capillary from the safety valve. Refer to Frame 82.
5. Slacken the 2 securing screws and remove the CH expansion vessel support bracket. Refer to Frame 45.
6. Remove the pump terminal box cover and disconnect the electrical leads.
7. Slide the cable entry out and withdraw the cable from the terminal box.

Note. ***If required, the PUMP HEAD ONLY may now be replaced.***

   a. Remove the 4 socket screws and withdraw the pump head.

   b. Fit the new head and re-assemble in reverse order.

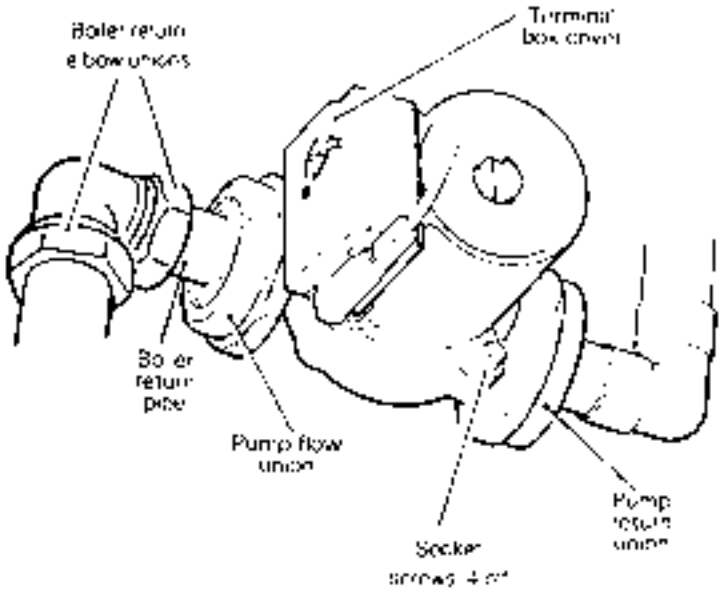
To remove the COMPLETE pump, proceed as follows:

8. Undo the boiler return elbow unions.
9. Undo the pump return union.
10. Swing the pump to disengage the boiler return pipe from the clip and withdraw the pump, complete with return pipe.
11. Undo the pump flow union and, using one of the new gaskets provided, transfer the boiler return pipe to the new pump.
12. Fit the new pump and re-assemble in reverse order, ensuring that:

    a. The new sealing gasket provided is fitted at the pump return union.

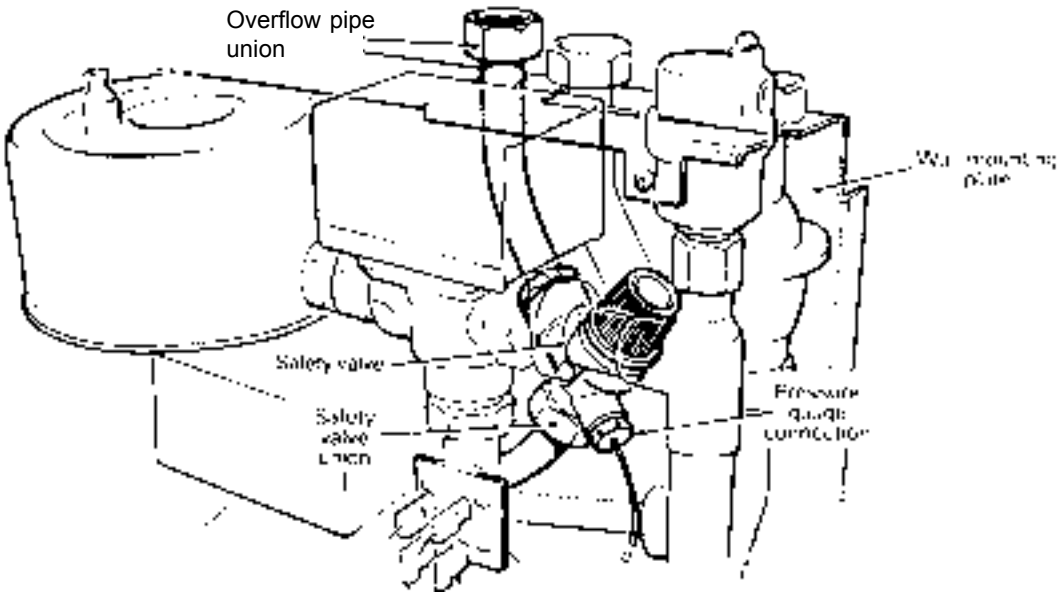
    b. The electrical connections are correctly remade. (Refer to the diagram inside the terminal box cover).

    c. The pump selector switch cover is correctly fitted and that the switch is set at position 3.



87 SAFETY VALVE REPLACEMENT

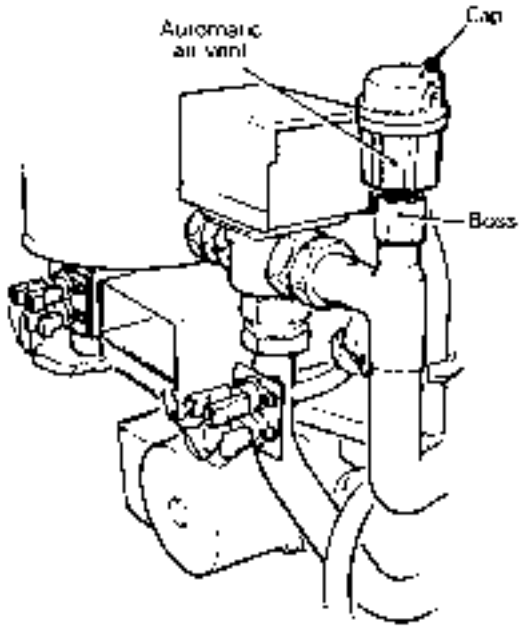
1. Refer to Frame 64.
2. Drain the boiler. Refer to Frame 81.
3. Remove the CH expansion vessel. Refer to Frame 45.
4. Remove the 2 securing screws and withdraw the pipe support bracket. Refer to Frame 45.
5. Disconnect the pressure gauge capillary from the safety valve.
6. Disconnect the overflow pipe at the bulkhead fitting on top of the wall mounting plate.
7. Undo the safety valve union and withdraw the valve, complete with the overflow pipe.
8. Transfer the overflow pipe to the new valve, ensuring that its orientation is the same as that of the previous assembly (use the arrow engraved on the side of the valve to aid realignment).
9. Fit the new safety valve, complete with the new sealing washers provided, and re-assemble in reverse order.



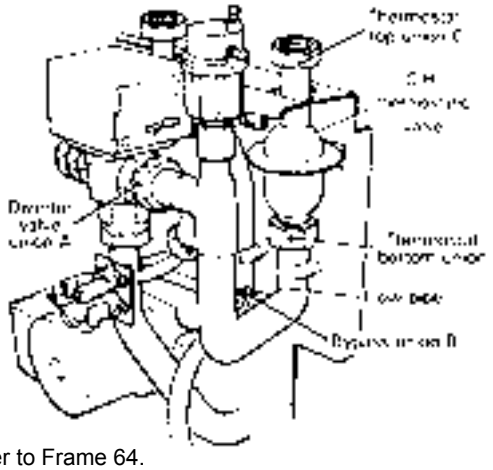
88 AUTOMATIC AIR VENT REPLACEMENT

1. Refer to Frame 64.
2. Drain the boiler. Refer to Frame 81.
3. Unscrew the automatic air vent from the boiler flow header, applying an appropriate counter-force to the boss, in order to prevent damage.
4. Fit the new air vent, using the 'O' ring provided, and re-assemble in reverse order.

IMPORTANT. Ensure that the vent cap is loose.



89 CH THERMOSTATIC VALVE REPLACEMENT



1. Refer to Frame 64.
2. Drain the boiler. Refer to Frame 81.
3. Remove the CH expansion vessel. Refer to Frame 45.
4. Remove the automatic air vent. Refer to Frame 88.
5. Remove the 2 securing screws and withdraw the pipe support bracket. Refer to Frame 79.
6. Undo the diverter valve union A, the bypass union B and the thermostat top union C.
7. Swing the flow pipe to the right to clear the diverter valve union, unclip and withdraw the pipe, complete with thermostat.
8. Transfer the flow pipe to the new thermostat and re-assemble in reverse order, using the new sealing washers provided.

90 BOILER HEAT EXCHANGER REPLACEMENT

IMPORTANT.
Before starting the removal procedure, protect the gas and electrical controls with a waterproof sheet or similar.

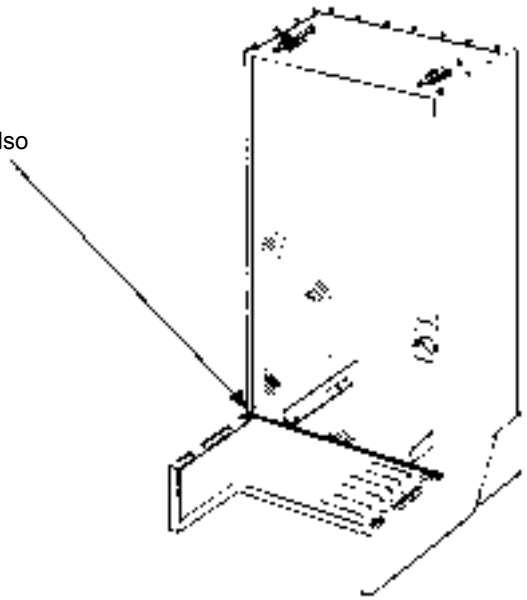
Note. *Refer to Frame 93 'Boiler Assembly - Exploded View' for illustration of the procedure detailed below.*

1. Drain the boiler.
2. Remove the CH expansion vessel. Refer to Frame 83.
3. Disconnect the electrical lead.
   Remove the Combi module - following the procedure (in reverse order) described in Frame 38.

   Note. An extraction tool is provided (in the Hardware Pack) to remove the push-fit brass elbow from the boiler and Combi module.
4. Remove the burner / air box assembly. Refer to Frame 58.
5. Remove the fan assembly. Refer to Frame 73.
6. Remove the combustion chamber by unscrewing the 4 tie rods.
7. Remove the thermostat sensors from the pockets on the heat exchanger.
8. Slacken 3 turns only the 4 heat exchanger / inter-panel retaining screws.
9. Lift the heat exchanger / inter-panel assembly upward and forward to disengage key hole fixings. Pull the assembly downward to clear the water pipes from the back panel.
10. Remove the 2 rubber sealing grommets from the top of the back panel to facilitate fitting the new assembly.
11. Fit the new heat exchanger assembly, complete with water pipes, and hang it on the key hole slots and screws.
12. Retighten the screws.
13. Replace the 2 rubber sealing grommets.
14. Re-assemble in reverse order.
15. Remake all water connections, ensuring that the compression fittings (if used) are correctly refitted.
16. Fully test all functions, including water and gas soundness.

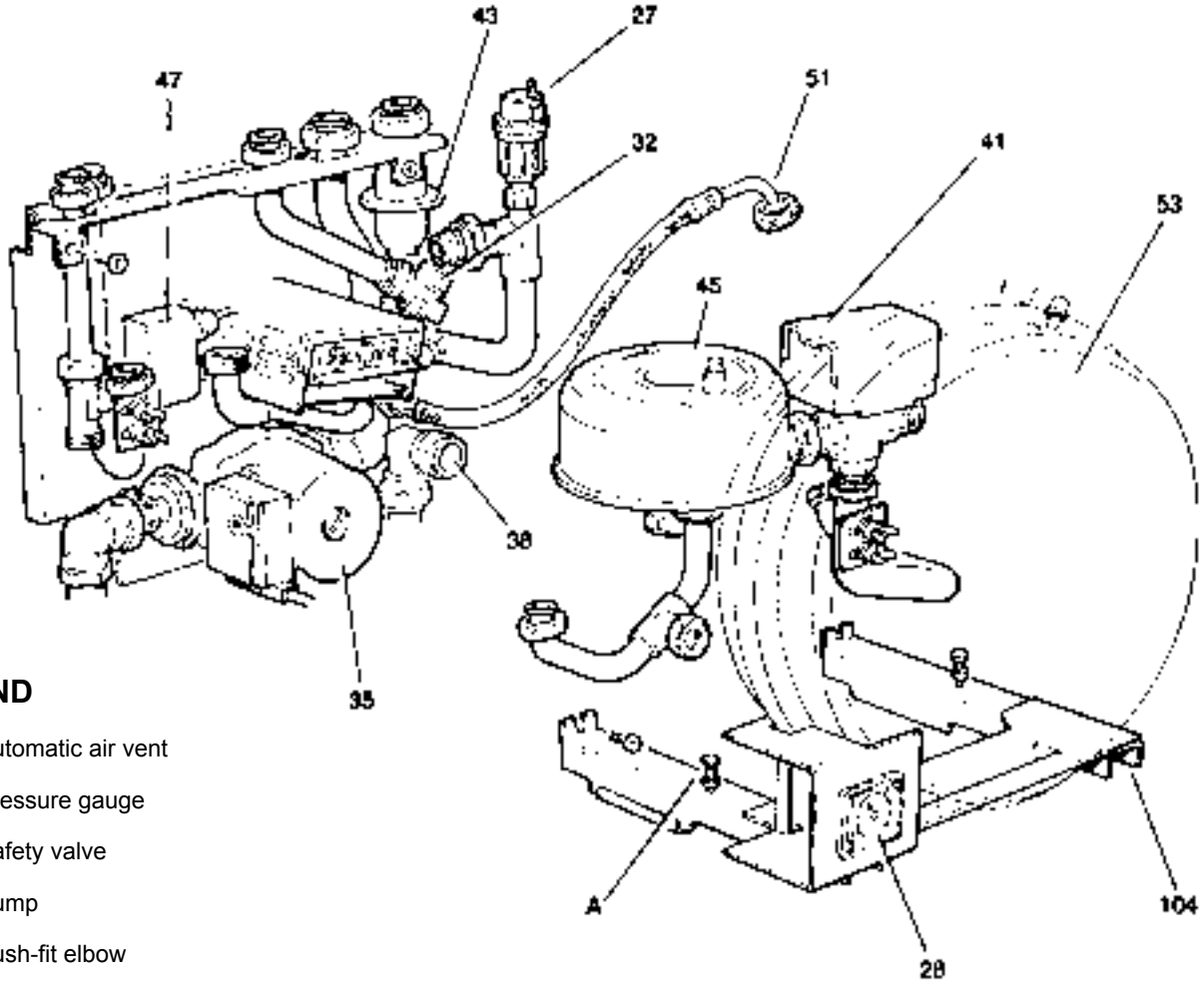
91 BOILER CASING SEAL REPLACEMENT

1. Refer to Frame 64.
2. Remove the old seal from the bottom edge of the casing and also from the edges of the boiler back panel.
3. Fit the new self-adhesive seals.



INNER VIEW OF BOILER CASING

92 COMBI MODULE - Exploded View



LEGEND

27. Automatic air vent

28. Pressure gauge

32. Safety valve

35. Pump

38. Push-fit elbow

41. Diverter valve

43. CH thermostatic valve

45. Calorifier

47. DHW flow switch

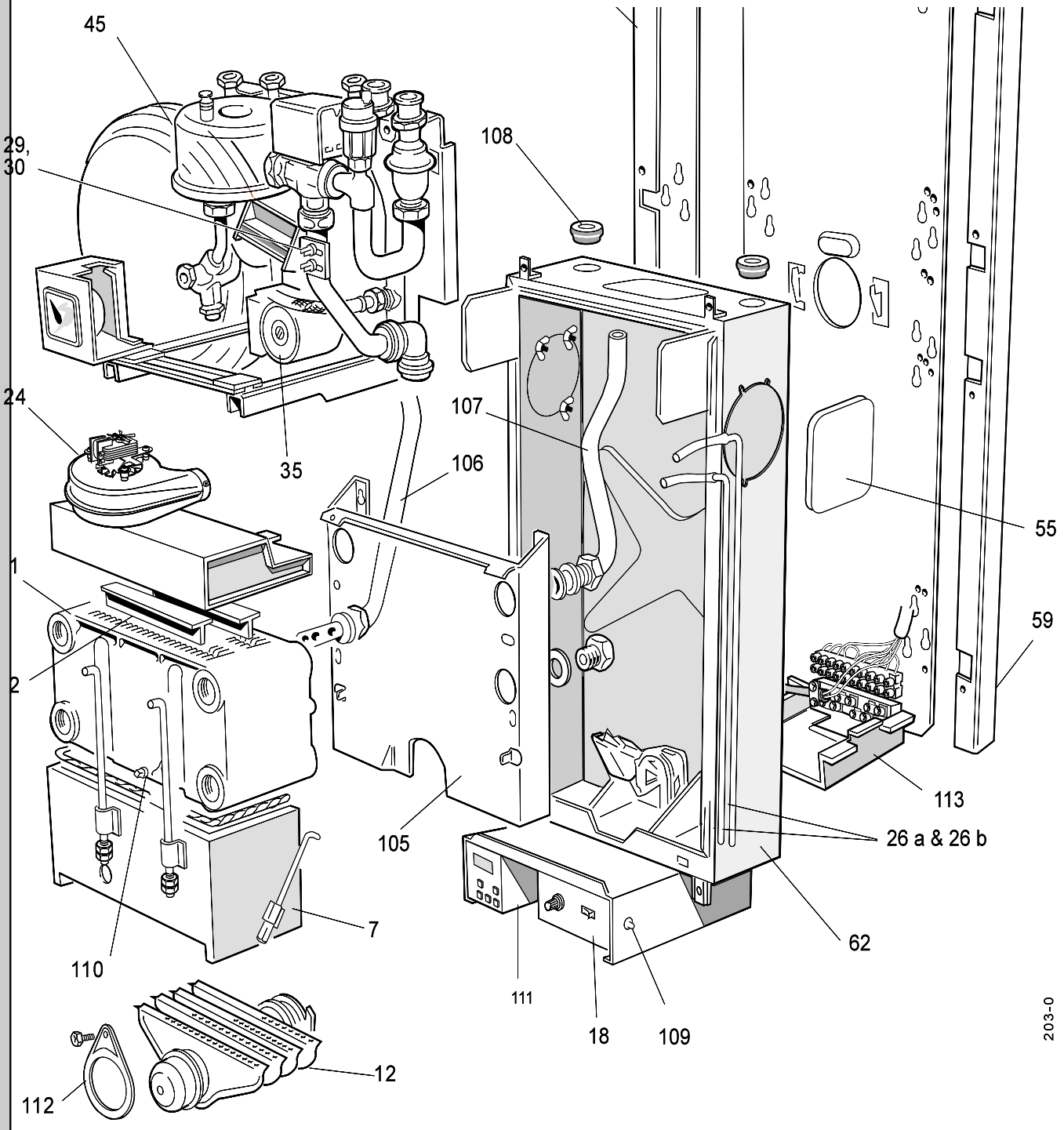
51. Flexible hose

53. CH expansion vessel

104. CH expansion vessel support bracket

A. Pressure gauge height adjustment screws and locking nuts - 2 off.

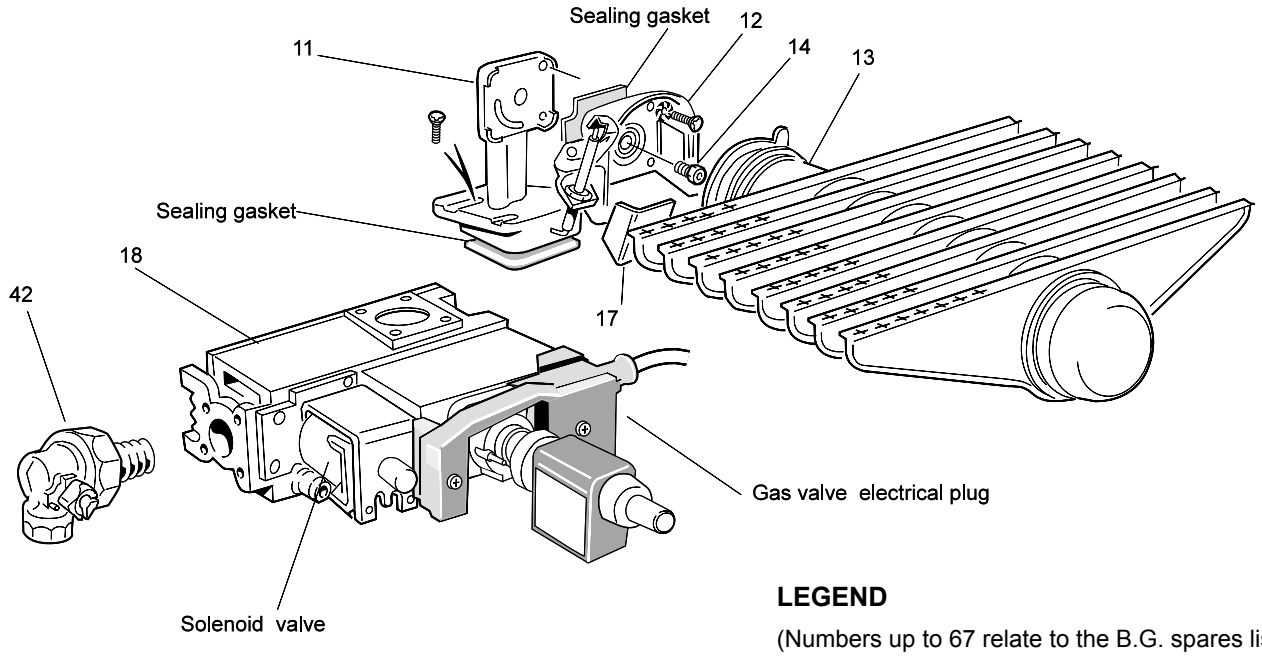
93 BOILER ASSEMBLY - Exploded View



LEGEND

1. Heat exchanger
2. Flue baffles
7. Combustion chamber
12. Main burner
18. Control box
24. Fan / collector hood assembly
26a & 26b. Pressure sensing pipes
29. CH control thermostat
30. DHW preheat thermostat
35. Pump
45. Calorifier
55. Sealing plates, 2 off
58. Wall mounting plate
59. Stand-off brackets (LH & RH side)
62. Back panel
100. DHW inlet isolating valve
101. DHW outlet connection
102. Safety valve drain connection
103. CH flow and return isolating valves
105. Inter-panel
106. Pumped return pipe
107. Pumped flow pipe
108. Rubber sealing grommets
109. Overheat thermostat
110. Boiler drain point
111. Programmer (if fitted)
112. Burner support bracket
113. Terminal strip cover

94 BURNER ASSEMBLY - Exploded View



LEGEND

(Numbers up to 67 relate to the B.G. spares list)

11. Burner manifold

12. Air box and pilot assembly

13. Main burner

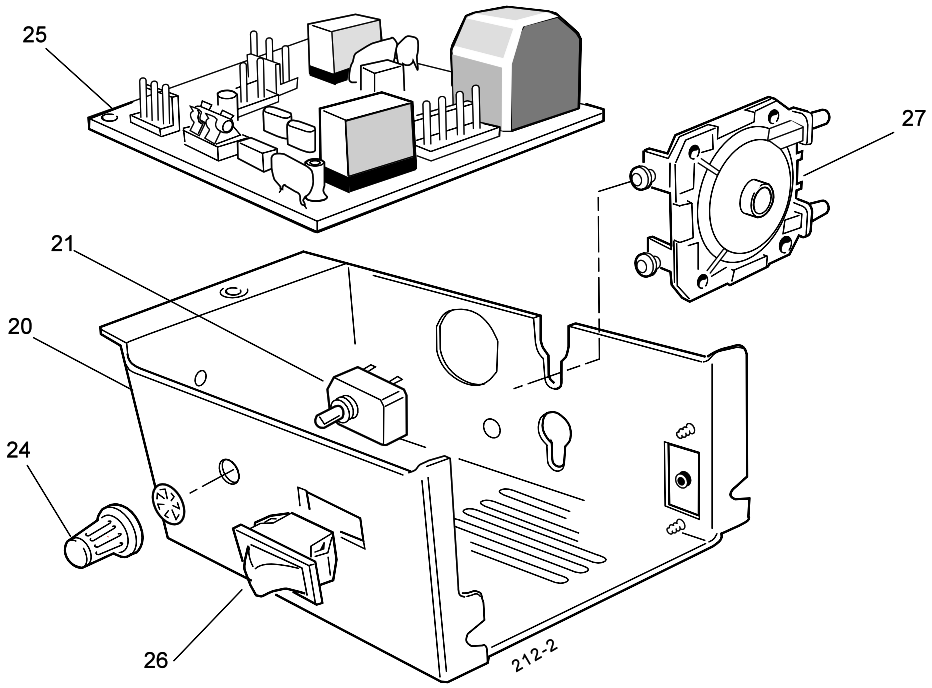
14. Main burner injector

17. Pilot shield

18. Gas control valve

42. Gas service cock

95 CONTROL BOX - Exploded View



LEGEND

(Numbers up to 67 relate to the B.G. spares list)

20. Control box

21. CH/HW switch

24. CH/HW switch knob

25. Printed circuit board

26. Mains on/off switch

27. Air pressure switch

FAULT FINDING

Before attempting to rectify any electrical fault ALWAYS carry out the preliminary electrical system checks, using a suitable test meter. Detailed instructions on the replacement of faulty parts are contained within the 'Servicing' section of this publication.

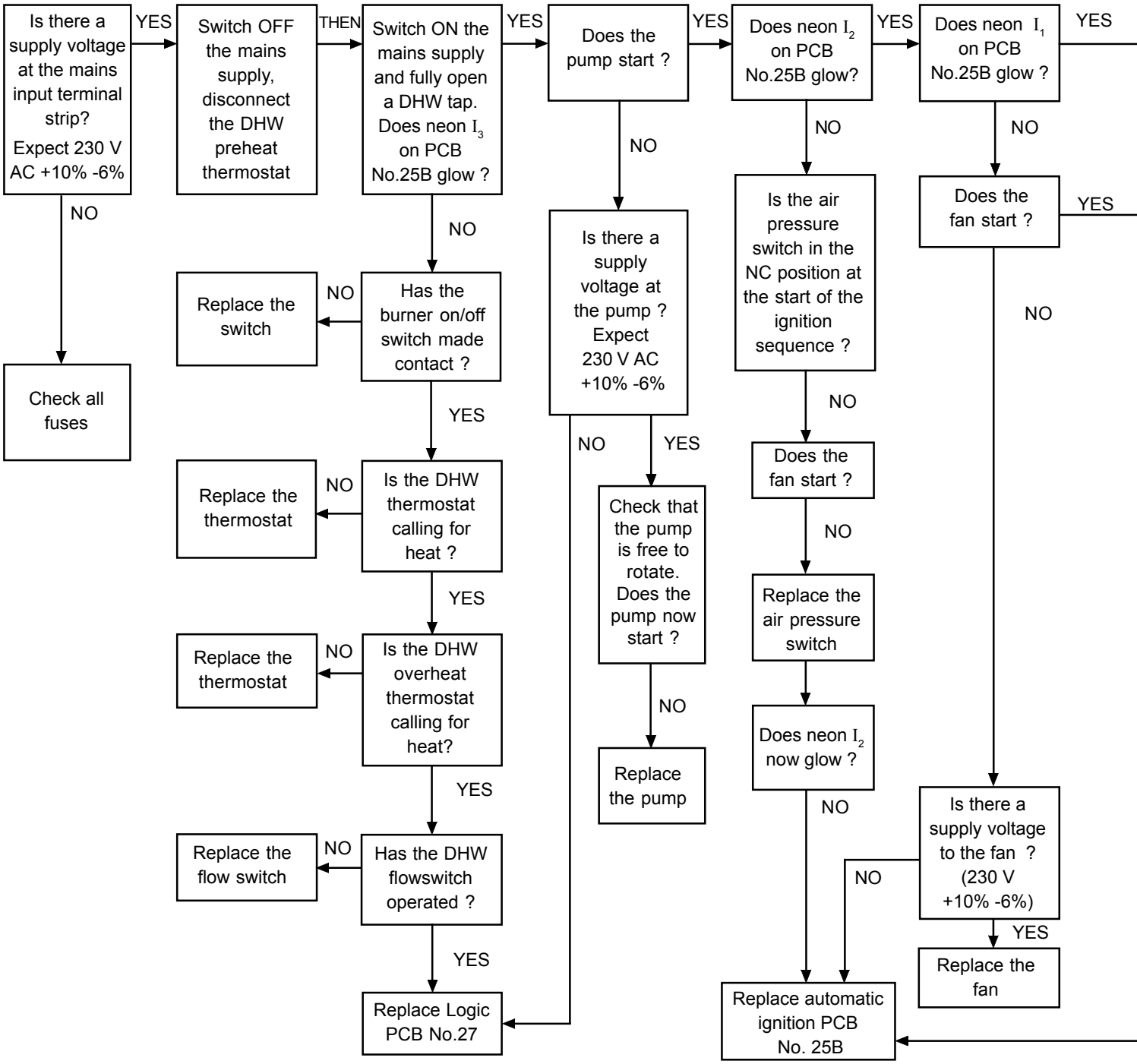
Notes.

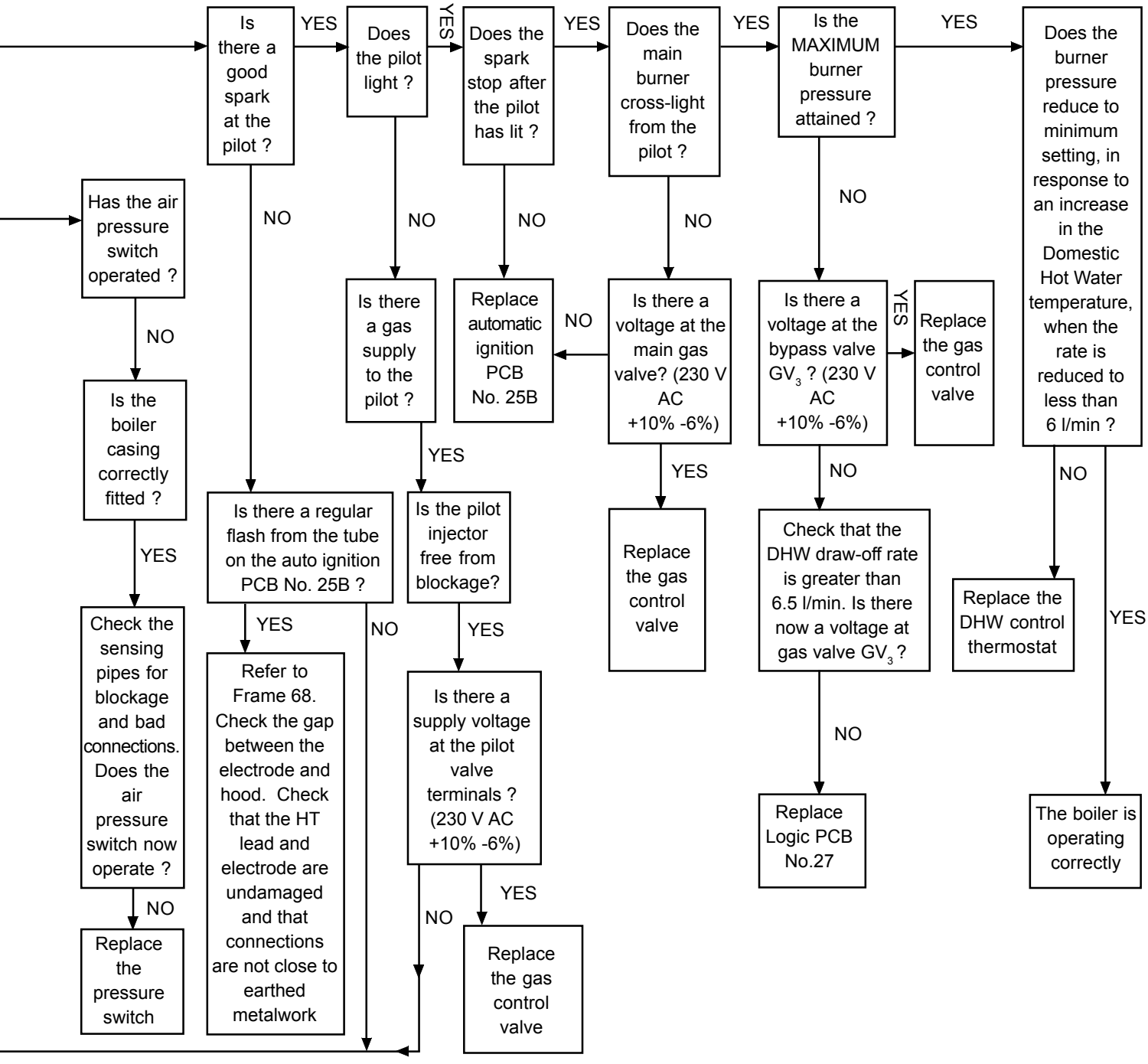
1. *Ensure that the boiler and system is full of water, free from air locks and that the pump is running.*
2. *Press the overheat thermostat reset button and continue with the fault finding procedure. Replace the thermostat if it operates before the normal working temperature is reached.*
3. *In order to assist fault finding, the control box printed circuit board is fitted with 4 indicator lights:*

Neon I_1	*Air pressure switch made*
Neon I_2	*Fan voltage indication*
Neon I_3	*Mains supply to PCB 25B.*
Neon SGI	*Flashes to indicate spark operation (stops after detection)*

96 DOMESTIC HOT WATER MODE

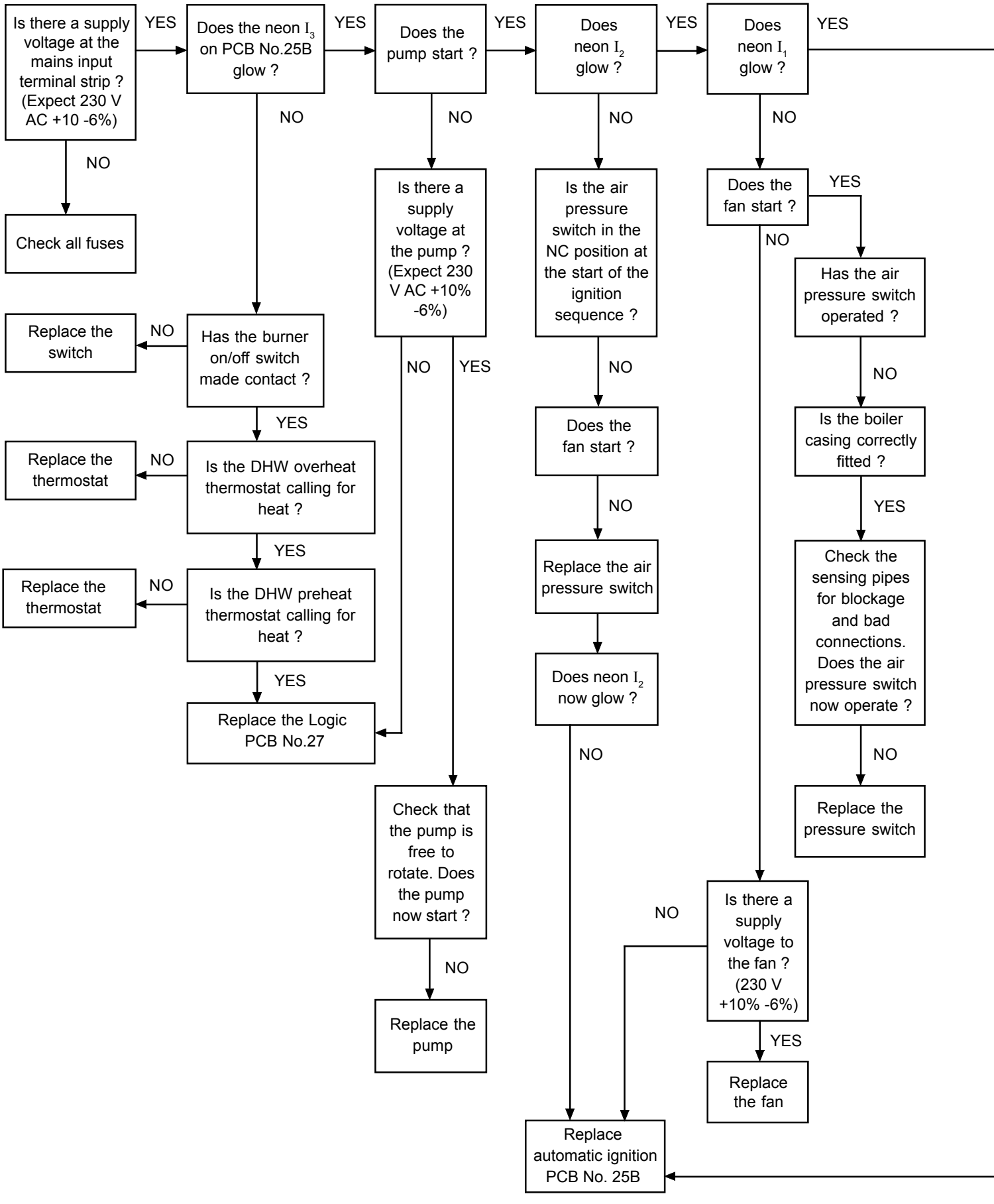
Start from cold. Turn the CH / HW switch to HW ONLY and the burner ON/OFF switch to ON. Also turn any time clock ON and switch ON the mains electricity supply.

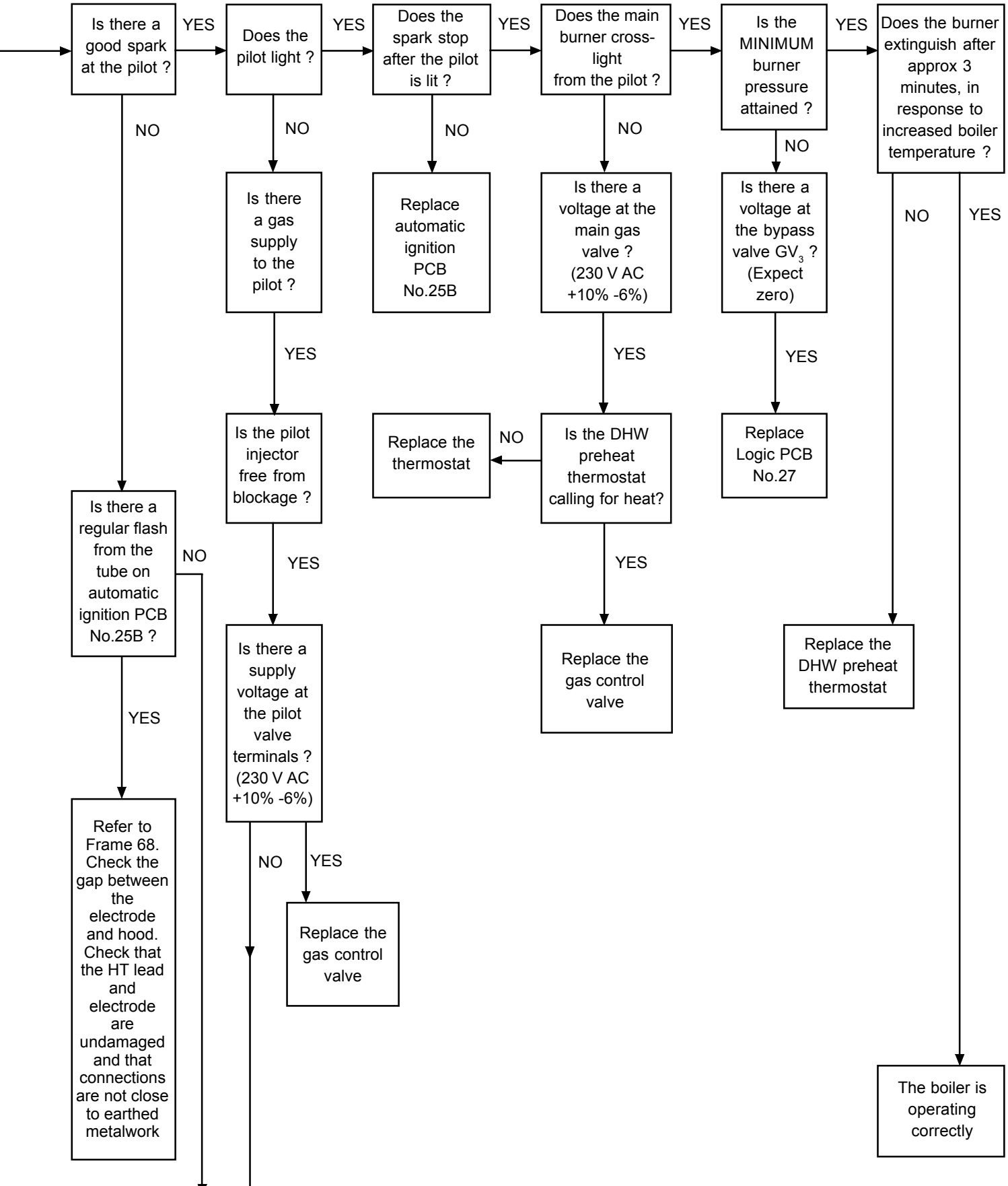



Has the air pressure switch operated ?
NO
Is the boiler casing correctly fitted ?
YES
Check the sensing pipes for blockage and bad connections. Does the air pressure switch now operate ?
NO
Replace the pressure switch
Is there a good spark at the pilot ?
YES
NO
Is there a regular flash from the tube on the auto ignition PCB No. 25B ?
YES
Refer to Frame 68. Check the gap between the electrode and hood. Check that the HT lead and electrode are undamaged and that connections are not close to earthed metalwork
NO
Does the pilot light ?
YES
NO
Is there a gas supply to the pilot ?
YES
Is the pilot injector free from blockage?
YES
Is there a supply voltage at the pilot valve terminals ? (230 V AC +10% -6%)
YES
Replace the gas control valve
NO
Does the spark stop after the pilot has lit ?
YES
NO
Replace automatic ignition PCB No. 25B
Does the main burner cross-light from the pilot ?
YES
NO
Is there a voltage at the main gas valve? (230 V AC +10% -6%)
YES
Replace the gas control valve
Is the MAXIMUM burner pressure attained ?
YES
NO
Is there a voltage at the bypass valve GV3 ? (230 V AC +10% -6%)
YES
Replace the gas control valve
NO
Check that the DHW draw-off rate is greater than 6.5 l/min. Is there now a voltage at gas valve GV3 ?
NO
Replace Logic PCB No.27
Does the burner pressure reduce to minimum setting, in response to an increase in the Domestic Hot Water temperature, when the rate is reduced to less than 6 l/min ?
NO
Replace the DHW control thermostat
YES
The boiler is operating correctly

97 PREHEAT MODE

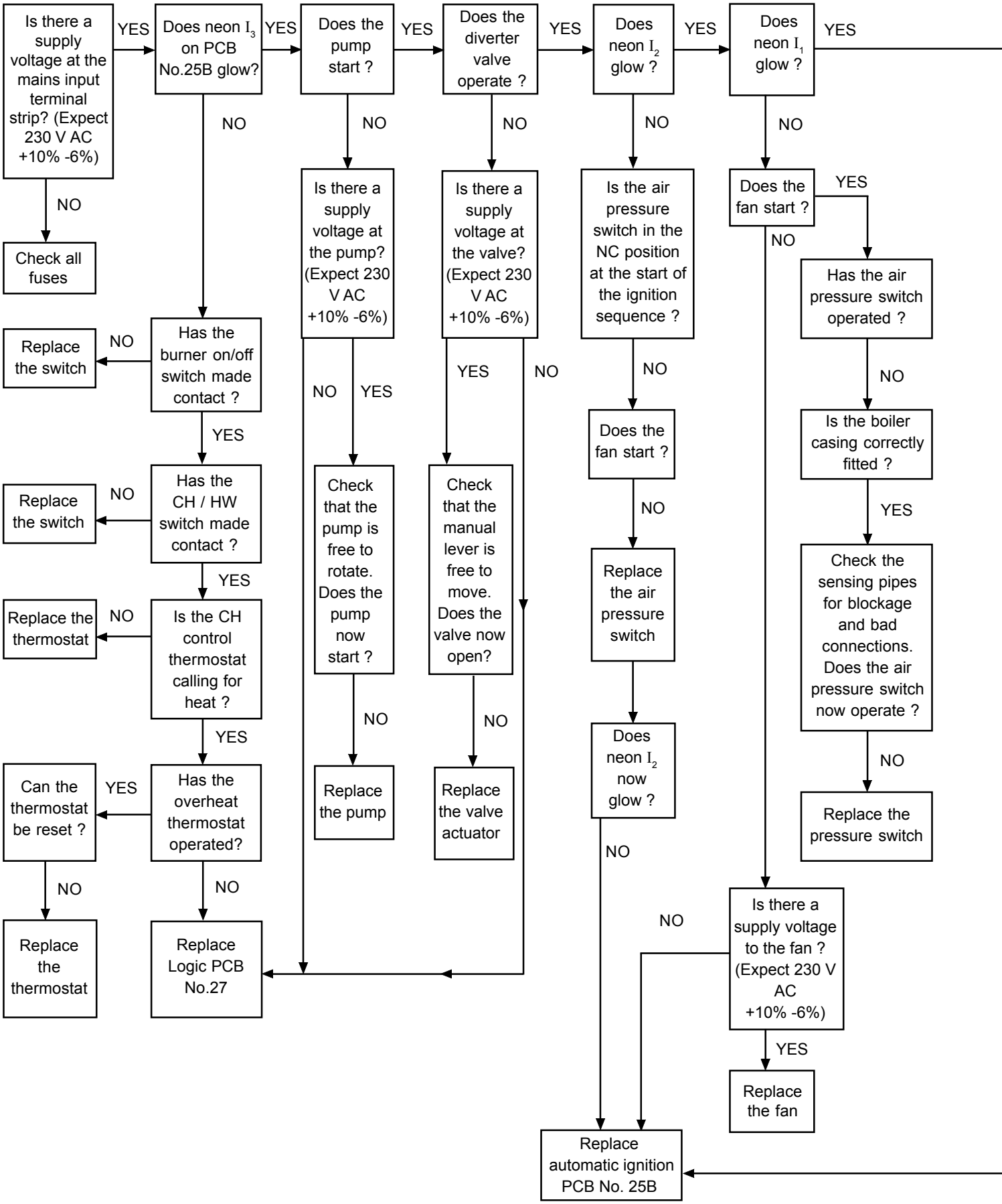
Start from cold. Turn the CH/HW switch to HW ONLY and any time clock ON. Ensure that all DHW taps are OFF. Turn the burner on/off switch ON. Switch ON the mains supply.

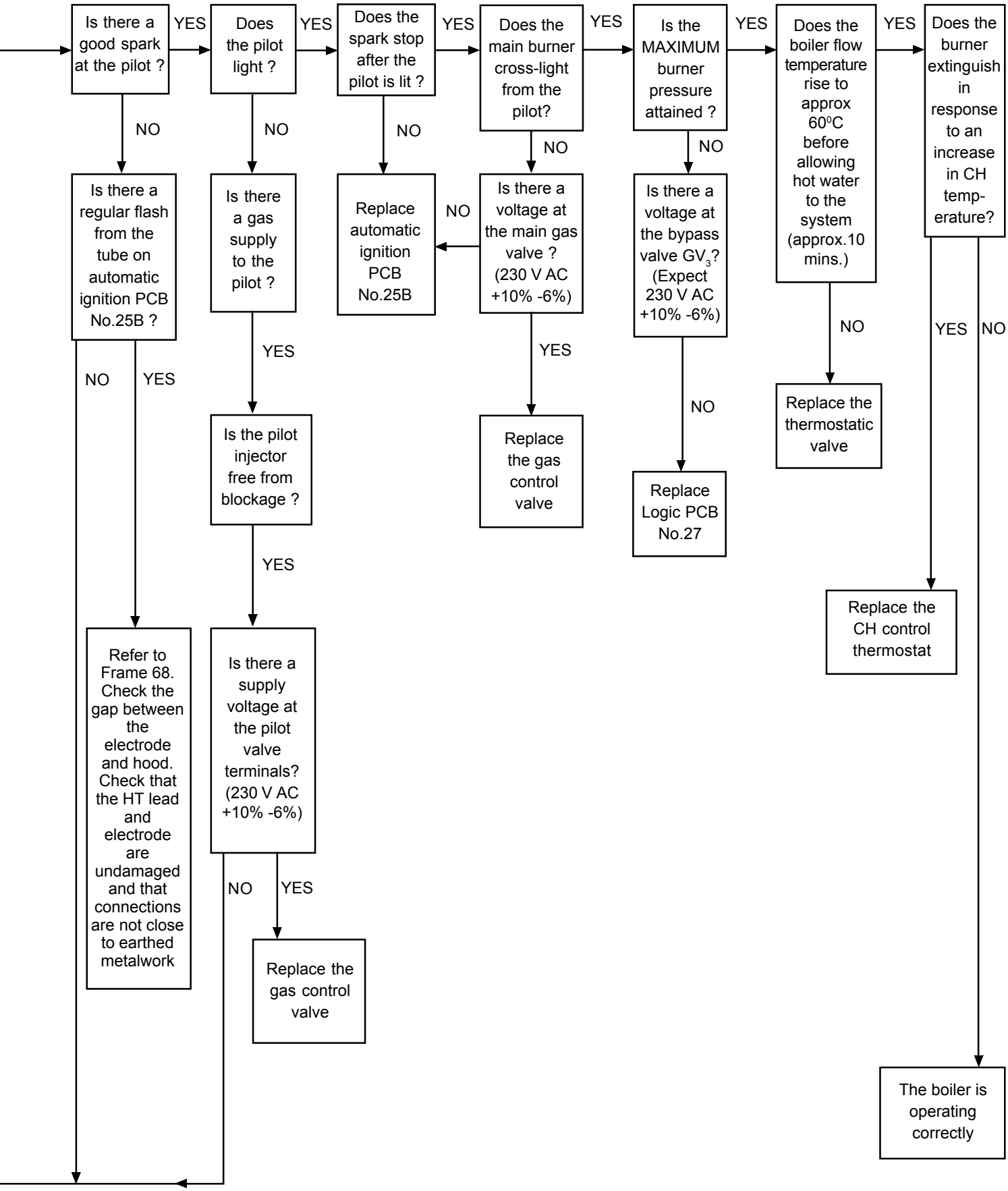



Is there a good spark at the pilot ?
YES
Does the pilot light ?
YES
Does the spark stop after the pilot is lit ?
YES
Does the main burner cross-light from the pilot ?
YES
Is the MINIMUM burner pressure attained ?
YES
Does the burner extinguish after approx 3 minutes, in response to increased boiler temperature ?
NO
YES
NO
NO
NO
NO
NO
Is there a gas supply to the pilot ?
Replace automatic ignition PCB No.25B
Is there a voltage at the main gas valve ? (230 V AC +10% -6%)
Is there a voltage at the bypass valve GV3 ? (Expect zero)
YES
YES
YES
Is the pilot injector free from blockage ?
Replace the thermostat
NO
Is the DHW preheat thermostat calling for heat?
Replace Logic PCB No.27
Is there a regular flash from the tube on automatic ignition PCB No.25B ?
NO
YES
YES
YES
Is there a supply voltage at the pilot valve terminals ? (230 V AC +10% -6%)
Replace the gas control valve
Replace the DHW preheat thermostat
Refer to Frame 68. Check the gap between the electrode and hood. Check that the HT lead and electrode are undamaged and that connections are not close to earthed metalwork
NO
YES
Replace the gas control valve
The boiler is operating correctly

98 CENTRAL HEATING MODE

Start from cold. Turn the CH/HW switch to CH & HW, and any time clock and room thermostat ON. Ensure that all DHW taps remain OFF. Turn the burner ON/OFF switch ON. Switch ON the mains supply.




Is there a good spark at the pilot ?
YES
Does the pilot light ?
YES
Does the spark stop after the pilot is lit ?
YES
Does the main burner cross-light from the pilot?
YES
Is the MAXIMUM burner pressure attained ?
YES
Does the boiler flow temperature rise to approx 60°C before allowing hot water to the system (approx.10 mins.)
YES
Does the burner extinguish in response to an increase in CH temp-erature?
NO
Is there a regular flash from the tube on automatic ignition PCB No.25B ?
NO
YES
Refer to Frame 68. Check the gap between the electrode and hood. Check that the HT lead and electrode are undamaged and that connections are not close to earthed metalwork
Is there a gas supply to the pilot ?
YES
Is the pilot injector free from blockage ?
YES
Is there a supply voltage at the pilot valve terminals? (230 V AC +10% -6%)
NO
YES
Replace the gas control valve
Replace automatic ignition PCB No.25B
NO
Is there a voltage at the main gas valve ? (230 V AC +10% -6%)
YES
Replace the gas control valve
Is there a voltage at the bypass valve GV3? (Expect 230 V AC +10% -6%)
NO
Replace Logic PCB No.27
Replace the thermostatic valve
Replace the CH control thermostat
YES
NO
The boiler is operating correctly

SHORT LIST OF PARTS

The following are parts commonly required due to damage or expendability. Their failure or absence is likely to affect safety or performance of this appliance.

The list is extracted from the British Gas List of Parts, which contains all available spare parts.

The full list is held by British Gas, **Caradon Ideal** distributors and merchants.

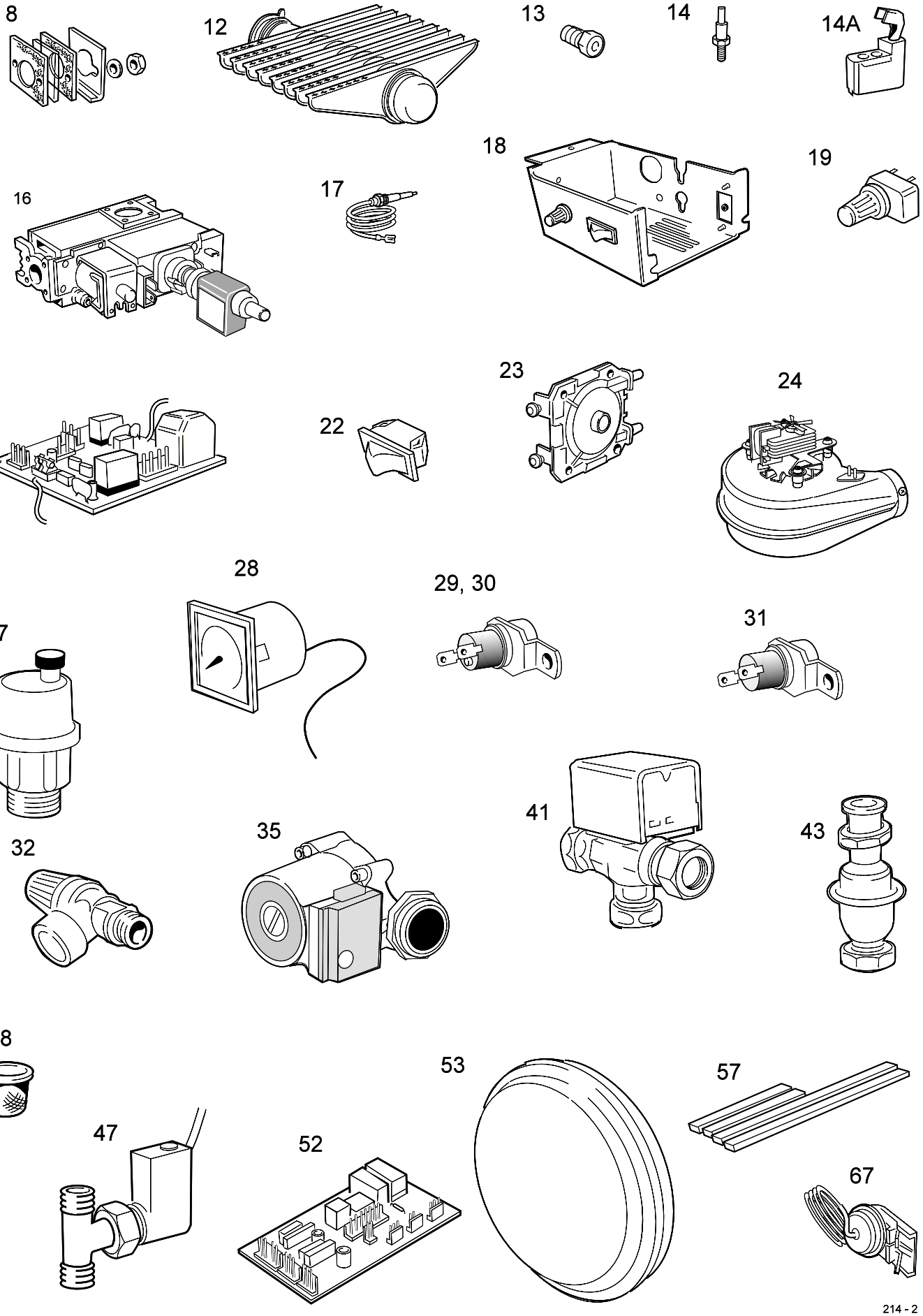
Classic Combi FF 280
Gas Boilers

When ordering spares please quote:

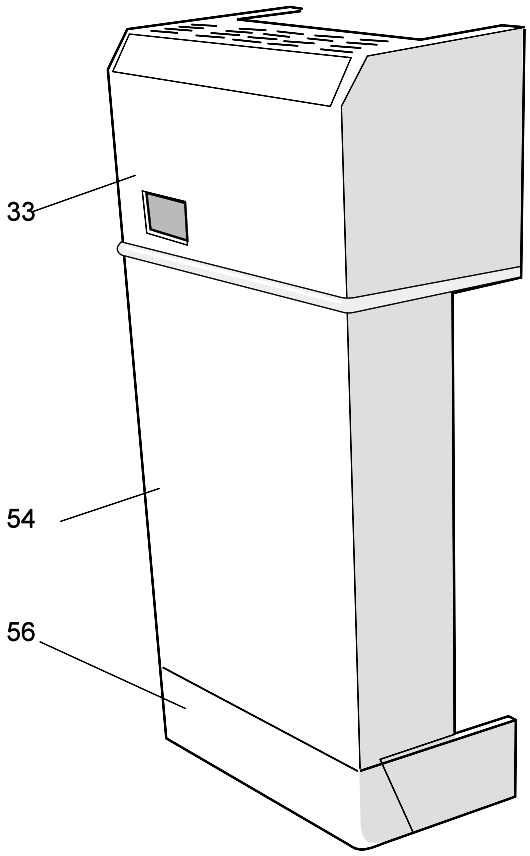
1. Boiler Model
2. Appliance G.C. Number
3. Description
4. Quantity
5. Product Number

Key No.	GC Part No.	Description	Qty.	Product No.
8	308 365	Sightglass assembly kit	1	079 602
12	379 919	Main burner: AEROMATIC No. AC 19/123 292	1	111 709
13	398 065	Main burner injector: BRAY Cat. 10 - size 2300;	1	004 444
14	397 943	Pilot burner injector: HONEYWELL 4580	1	004 982
14A	308 358	Pilot burner: HONEYWELL Q359 A 1124	1	079 599
16	--	Gas control valve: HONEYWELL VR 4601 PA 2020	1	111 075
17	308 536	Ignition electrode complete with lead and backnut	1	111 881
18	--	Control box assembly	1	150 615
19	374 073	Rotary on/off switch	1	005 823
21	386 149	Automatic ignition printed circuit board - PACTROL PCB No. 25B	1	079 716
22	386 802	Burner on/off switch: ARROW HART Cygnet Series No. 100 0 11 E (A)	1	004 882
23	--	Pressure switch: HONEYWELL YAMATAKE C6065 A 1010	1	137 990
24	308 536	Fan assembly	1	111 947
27	386 830	Automatic air vent: CALEFFI 5030	1	113 116
28	374 088	Pressure gauge	1	113 089
29	392 921	Thermostat - high setting	1	079 634
30	378 074	DHW preheat thermostat: ELMWOOD 2455 R - 192 / 940 (green dot)	1	079 635
31	378 075	DHW control thermostat ELMWOOD 2455 R - 192 / 941 (yellow dot)	1	079 636
32	374 045	Safety valve: CALEFFI 3141	1	113 026
33	374 074	Combi module cover (with fixing screw)	1	079 637
35	374 076	Pump: GRUNDFOS 15 - 50	1	005 595
41	374 081	Diverter valve assy: HONEYWELL 4044 C 1536	1	005 871
43	374 083	CH thermostatic valve	1	005 803
47	374 086	DHW flow switch assy: HONSBERG Fluvatest UM 15 MA	1	005 856
48	378 085	DHW filter: GASCON G - C 901	1	005 810
52	378 076	Logic PCB No.27, PACTROL	1	005 632
53	374 100	CH 8 -litre expansion vessel	1	113 205
54	--	Boiler casing assembly	1	079 947
56	--	Controls casing door	1	079 948
57	308 331	Boiler sealing pack	1	079 605
67	378 087	CH overheat thermostat, RANCO LM7 - P 8508	1	005 900

99 SHORT PARTS LIST



100 BOILER CASING ASSEMBLY



THIS SYMBOL IS YOUR ASSURANCE OF QUALITY

These appliances are designed for use with Natural Gas only. They have been tested and conform with the provisions of BS. 6332 and BS. 5258.

CERTIFIED PRODUCT
Manufactured under a BS EN ISO 9001:1994 Quality System accepted by BSI.

Technical Training

The Caradon Ideal Technical Training Centre offers a series of first class training courses for domestic, commercial and industrial heating installers, engineers and system specifiers. For details of courses please ring:

..... *Alexa Beadle on 01482 498 432*

CARADON IDEAL Ltd. pursues a policy of continuing improvement in the design and performance of its products. The right is therefore reserved to vary specification without notice.

CE NO. FF.87/AQ/41

Customer Care & Technical Support

Please use the following numbers for speedy assistance.

Ideal Parts ..... *Tel: 01482 498 665*

..... *Fax: 01482 498 489*

Customer Care & Technical Support.

Scotland/N. England/Midlands ..... Tel: 01482 498 636

Southern England/S. Wales ..... Tel: 01482 498 660

..... *Fax: 01482 498 666*

Publications/literature. ..... *Tel: 01482 498 467*

CARADON IDEAL Ltd.,
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Telephone: 01482 492 251 Fax: 01482 448 858.
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Registered Office; National Avenue,
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A subsidiary of Caradon p.l.c

March 1997 112 228 A05

Ideal BOILERS

Printed in England

Classic Combi FF 280

User's Instructions

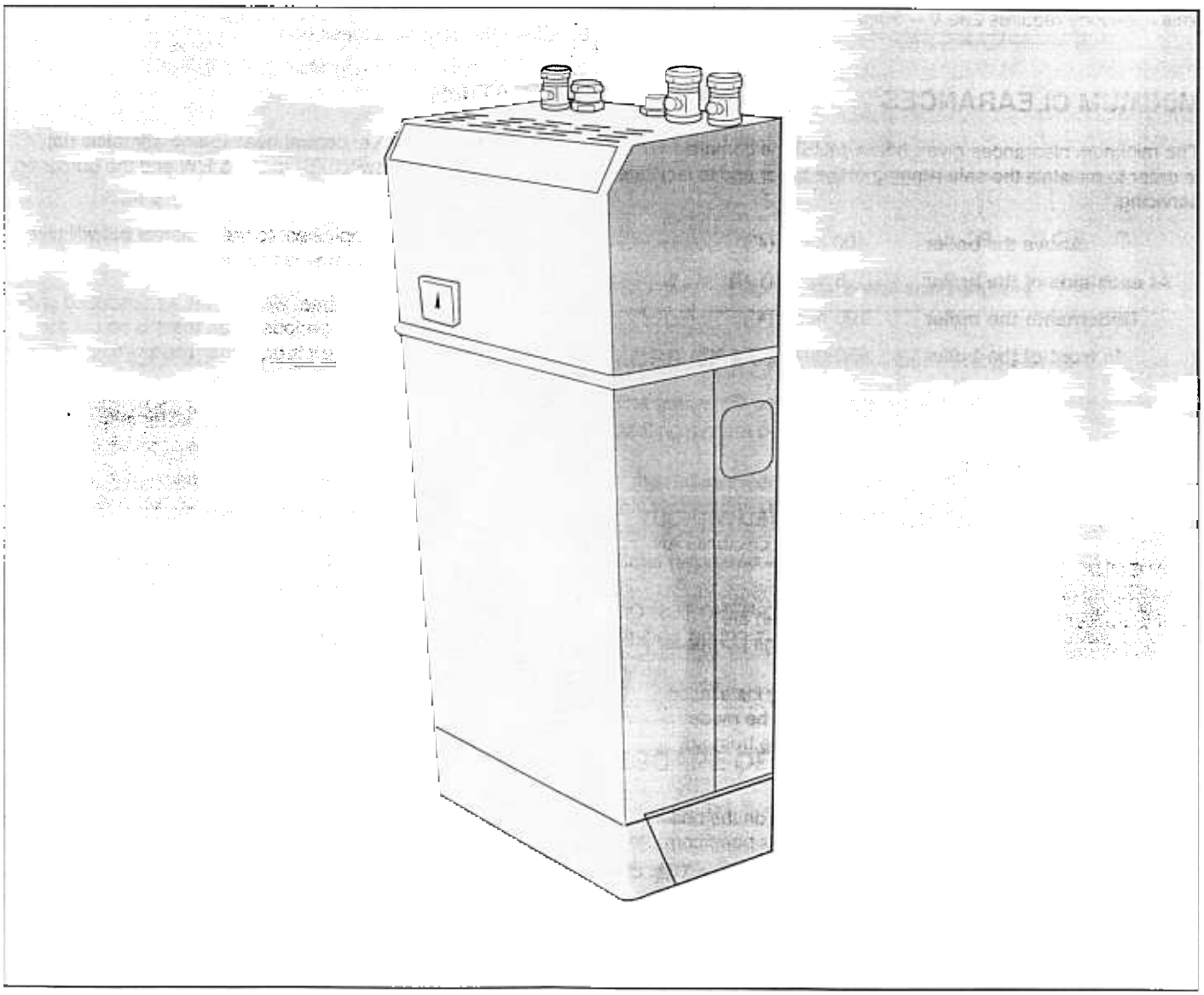
Wall Mounted, Fanned, Balanced Flue Gas Boiler

Natural Gas Model

Classic	G.C. Appliance No.
FF 280	47 415 08

CAUTION

To avoid the possibility of injury during the cleaning of this appliance care should be taken when handling the edges of sheet steel components.



NOTE TO THE INSTALLER: LEAVE THESE INSTRUCTIONS ADJACENT TO THE GAS METER

Ideal BOILERS

GAS SAFETY (INSTALLATION AND USE) REGULATIONS, 1994.

It is law that **all** gas appliances are installed by a CORGI registered installer (identified by ✿) in accordance with the above regulations.

Failure to install appliances correctly could lead to prosecution. It is in your own interest, and that of safety, to ensure the law is complied with.

ELECTRICITY SUPPLY

This appliance must be connected to the supply via a double pole switch fused at 3 Amps, having a 3mm (1/8") contact separation in both poles, serving only the boiler and system controls.

This appliance must be efficiently earthed

This appliance requires 230 V ~ 50Hz.

MINIMUM CLEARANCES

The minimum clearances given below MUST be complied with, in order to maintain the safe running of the boiler and to facilitate servicing.

Above the boiler	100 mm	(4")
At each side of the boiler	5 mm	(1/4")
Underneath the boiler	100 mm	(4")
In front of the boiler	450 mm	(17 3/4")

IMPORTANT NOTES

a. THIS APPLIANCE MUST NOT BE OPERATED WITHOUT THE CASING CORRECTLY FITTED AND FORMING AN ADEQUATE SEAL.

b. If the boiler is installed in a compartment then the compartment MUST NOT be used for storage purposes.

c. The ventilation provided for the boiler during installation MUST NOT be blocked and a check should be made periodically that the ventilation areas are free from any obstruction.

d. If it is known or suspected that a fault exists on the boiler then it MUST NOT be used until the fault has been corrected by a CORGI registered installer.

It is essential that the instructions in this booklet are strictly followed, for safe and economical operation of the boiler.

The **Classic Combi FF 280** is a combination boiler providing both central heating and instantaneous domestic hot water.

TO LIGHT THE BOILER.
Refer to the illustration on page 3

1. CHECK THAT THE ELECTRICITY SUPPLY TO THE BOILER IS OFF.
2. Open the controls access door by hinging downwards.
3. Ensure that the burner on/off switch (C) is OFF and the CH/HW switch (B) is set to HW ONLY. Also ensure that all hot water taps are turned OFF.
4. Switch ON the electricity supply to the boiler and check that all external controls, e.g. programmer, room thermostat, etc. are ON.
   If a programmer is fitted then refer to the instructions provided.
5. Set the burner on/off switch (C) to ON and the CH/HW switch (B) to the desired position. After about 15 seconds the boiler will light automatically - this can be viewed through the sight glass (A).
6. Close the controls access door.

OPERATION

In **winter conditions**, i.e. central heating and domestic hot water, set the CH/HW switch (B) to CH & HW and the burner on/off switch (C) to ON.

The boiler will fire and supply heat to the radiators but will give priority to domestic hot water when required.

The domestic hot water pre-heat will operate as described under ' summer conditions', during periods when there is no call for central heating, i.e. when the programmer and/or room thermostat is OFF - unless it is also timed.

For **summer conditions**, i.e. domestic hot water only, set the CH/HW switch (B) to HW ONLY and the burner on/off switch (C) to ON.

The boiler will fire for approximately 3 minutes at low rate, to pre-heat the domestic hot water calorifier. Thereafter it will fire periodically for a few seconds in order to maintain the temperature. This will occur 24 hours a day unless a programmer is fitted, allowing the pre-heat to be timed - refer to the separate Programmer Instructions.

Note.
With timed domestic hot water pre-heat, the domestic hot water may take longer to attain maximum temperature at the beginning of the ON periods.

CONTROL OF WATER TEMPERATURE

DOMESTIC HOT WATER

The domestic hot water draw-off temperature is limited by the low rate gas control to approximately 70°C at the minimum water draw-off rate of about 3.5 litre/min. (0.8 gpm).

Additionally, the draw-off temperature is controlled by adjusting the flow rate at the tap - the lower the draw-off rate, the higher the temperature, and vice versa.

At higher domestic hot water draw-off rates (greater than 6.0 litre/min. - 1.3 gpm) the boiler will fire at full gas rate.

CENTRAL HEATING

The boiler control, firing at full gas rate, automatically maintains the central heating radiator temperature at approximately 80°C.

BOILER CONTROLS

LEGEND

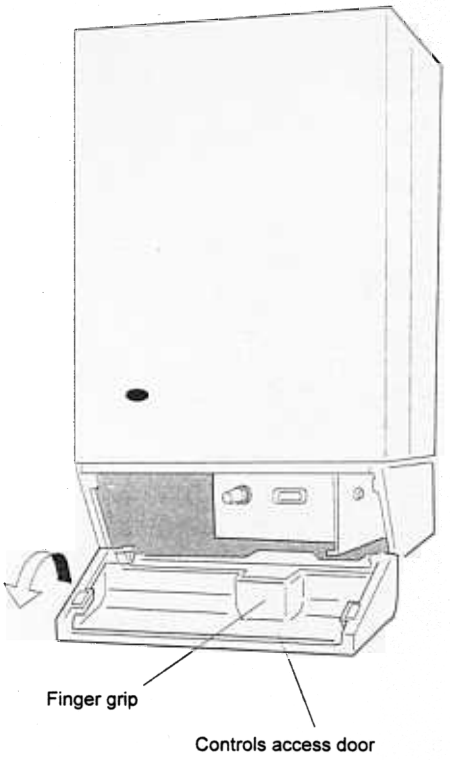
A Sightglass

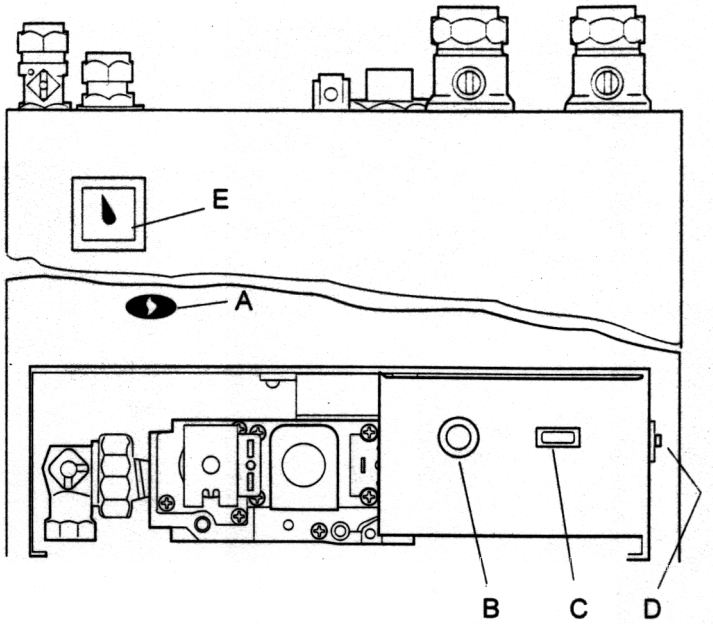
B CH. /HW. Switch

C Burner On / Off switch

D Overheat thermostat reset button

E Central heating pressure gauge





View inside boiler controls area

TO SHUT DOWN THE BOILER

1. **For short periods**

   Set the burner on/off switch (C) to OFF.
   When heating is again required, reset the switch to ON.

2. **For longer periods**

   Set the burner on/off switch (C) to OFF.
   Switch the electricity supply to OFF.

WARNING.

If no frost protection is provided and frost is likely during a short absence from home, leave the heating controls (if fitted) at a reduced temperature setting.

For longer periods, the entire system should be drained - including the domestic water supply. If the system includes a frost thermostat then, during cold weather, the boiler should be turned OFF at the time switch(es) ONLY. The mains supply should be left switched ON, with the boiler thermostat left in the normal running position.

BOILER OVERHEAT THERMOSTAT

The boiler is fitted with a safety 'cutout' thermostat. This will shut down the boiler in the event of overheating. Should this occur allow the boiler to cool, press the overheat reset button (D) then relight as detailed in steps 1-5 in 'To light the boiler'.

If the cutout condition still persists turn off the boiler and consult a Corgi registered installer.

LOSS OF SYSTEM WATER PRESSURE

The gauge (E) on the Combi module indicates the central heating system pressure.

If the red arrow on the pressure gauge (E) is set above zero and the system pressure is seen to fall below this value over a period of time then a water leak is indicated. In this event a Corgi registered installer should be consulted.

DO NOT OPERATE THE BOILER IF THE PRESSURE HAS REDUCED TO ZERO FROM THE ORIGINAL SETTING.

ESCAPE OF GAS

Should a gas leak be suspected, contact your local gas supplier without delay.

Do NOT search for gas leaks with a naked flame.

CLEANING

For normal cleaning simply dust with a dry cloth.
To remove stubborn marks and stains, wipe with a damp cloth and finish off with a dry cloth.

Do NOT use abrasive cleaning materials.

MAINTENANCE

The appliance should be serviced at least once a year by a Corgi registered installer.

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September 1995 112 226 A02

BOILERS Ideal

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