

installation and servicing

classic

Your Ideal installation and servicing guide

See reverse for **classic** users guide

For details of document amendments, refer to page 3

HE9, HE12, HE15, HE18

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.

April 2005 UIN 201 850 A02

For the very latest copy of literature for specification purposes please visit our website www.idealboilers.com where you will be able to download the relevant information in pdf format.

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DOCUMENT AMENDMENTS

Relevant Installation changes implemented in this book from Mod LevelA01 (Feb 05) to A02 (Apr 05)

- **Page 7, Frame 2 - Boiler Clearances**
New side clearance of 40mm when built behind a concealed panel.
- **Page 8, Flue Installation**
Termianl Guard reference changed from K1 to K6.
- **Page 13, Frame 7 - Boiler Assembly**
New orientation of Air Pressure Switch.
- **Page 14, Frame 8 - Unpacking**
Reference to minimum flue length.
- **Page 15, Frame 10 - Determining the Flue Lengths**
Reference to minimum flue length.
- **Page 17, Frame 14 - Cutting the Flue**
Change to minimum wall thickness.
- **Page 19, Frame 20 - Flue Assembly**
Change to minimum wall thickness.
- **Page 20, Frame 23 - Cutting the Flue**
Change to minimum wall thickness.
- **Page 24, Frame 34 - Flue Arrangement**
New flue arrangement figures confirmed in table.
- **Page 25, Frame 35 - Assembling the Roof Kit**
Minimum / Maximum flue length figures confirmed.
- **Page 28, Frame 41 - Electrical Connections**
Control pod to be removed.
- **Page 31, Frame 48 - Initial Lighting**
Reference to gas adjustment sealing added (item 18).
- **Page 39, Frame 72 - Air Pressure Switch (APS) Replacement**
New orientation of Air Pressure Switch.
- **Page 41, Frame 77 - Siphon Replacement**
Heat shield added.
- **Page 43, Short List of Parts**
Item 17 & 19, new product numbers.

Caradon Ideal Limited reserve the right to vary specification without notice

GENERAL

Table 1 - General Data

Boiler Size		HE9	HE12	HE15	HE18
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.)	3.0 (0.67)		3.95 (0.87)	
Packaged Weight	kg (lb)	45 (99)		50 (110)	
Maximum installation weight	kg (lb)	40 (88)		45 (99)	
Boiler size	Height mm (in.)	700 (27.5)			
	Width mm (in.)	380 (15.0)			
	Depth mm (in.)	280 (11.25)			
Flue duct diameter	mm (in.)	100 (4.0)			
Flue duct length (max)	m (ft)	3 (9.8)			

Table 2 - Performance Data

Boiler Size		HE9	HE12	HE15	HE18
Input 'Q'	Nett CV kW (Btu/h)	9.4 (32,100)	12.6 (43,000)	15.7 (53,600)	18.9 (64,500)
	Gross CV kW (Btu/h)	10.5 (35,800)	14.0 (47,800)	17.4 (59,400)	20.9 (71,300)
	Gas Consumption l/s (cu.ft/h)	0.27 (34.3)	0.36 (45.8)	0.45 (57.2)	0.54 (68.7)
Output 'P'	70°C Mean Water temp. kW (Btu/h)	9.0 (30,700)	12.0 (40,900)	15.0 (51,200)	18.0 (61,400)
	40°C Mean Water temp. kW (Btu/h)	9.8 (33,400)	13.1 (44,700)	16.2 (55,300)	19.4 (66,200)
Burner Setting Pressure (Hot)	mbar (in w.g.)	12.0 (4.8)	10.4 (4.2)	12.3 (4.9)	12.7 (5.1)
Seasonal efficiency (SEDBUK) *	Band B	[87.2]%	[87.2]%	[86.8]%	[86.8]%
NOx classification		Class 3	Class 2	Class 1	Class 1

* 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/m³ (1038 Btu/ft³) gross or 34.9 MJ/m³ (935 Btu/ft³) nett

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

- FOR L/S** - divide the gross heat input (kW) by the gross C.V. of the gas (MJ/m³)
- FOR FT³/H** - divide the gross heat input (Btu/h) by the gross C.V. of the gas (Btu/ft³)

Key to symbols

GB = United Kingdom **IE** = Ireland (Countries of destination)

PMS = Maximum operating pressure of water

C₁₂ C₃₂ = 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.

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

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

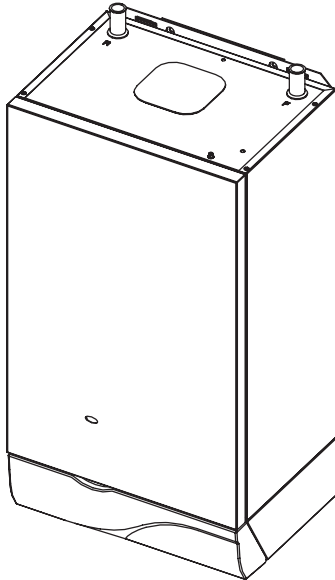
GENERAL

classic HE

Natural Gas only

Boiler size	G.C. Appliance No. (Benchmark No.)	PI No.
HE9	41-415-58	87 BQ 10
HE12	41-415-59	87 BQ 10
HE15	41-421-45	87 BQ 10
HE18	41-421-46	87 BQ 10

Destination Countries: GB, IE



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For GB, to comply with Building Regulations Part L1 (Part J in Scotland) the boiler should be fitted in accordance with the manufacturer's instructions. Self-certification that the boiler has been installed to comply with Building Regulations can be demonstrated by completing and signing the Benchmark Commissioning Checklist.

BENCHMARK COMMISSIONING CHECKLIST

Boiler	Page	Page	
Make and model	5	Burner operating pressure measure and record	
Appliance serial no. on data badge	13	Central heating flow temp. measure and record	
SEDBUK No. %	4	Central heating return temp. measure and record	
Controls		For combination boilers only	
Time and temperature control to heating	29/30	Scale reducer	n/a
Time and temperature control to hot water	29/30	<i>Hot water mode</i>	
Heating zone valves	29/30	Heat input	n/a
TRV's	9	Max. operating burner pressure	n/a
Auto bypass	9	Max. operating water pressure	n/a
Boiler interlock	9	Cold water inlet temp	n/a
For all boilers		Hot water outlet temp.	n/a
Flushing to BS.7593	9	Water flow rate at max. setting	n/a
Inhibitor	9	For condensing boilers only	
<i>Central heating mode</i>		Condensate drain	26
Heat input	to be calculated	For all boilers: complete, sign & hand over to customer	
		For assistance see Technical Helpline on the back page	

NOTE TO THE INSTALLER: COMPLETE THE BENCHMARK COMMISSIONING CHECKLIST AND LEAVE THESE INSTRUCTIONS WITH APPLIANCE



INTRODUCTION

The classic HE 9, 12, 15 and 18 are a range of automatically fully controlled, wall mounted, balanced flue, fanned, high efficiency, condensing gas boilers.

The primary heat exchanger is cast iron. The secondary heat exchanger is aluminium. 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.*

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

The boilers are supplied with a standard flue kit suitable for rear outlet from 114 mm (4 1/2") to 705 mm (30 1/2").

Side outlet applications require the optional extra side outlet kit.

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.

SAFE HANDLING

This boiler may require 2 operatives to move it to its installation site, remove it from its packaging base and during movement into its installation location. Manoeuvring the boiler may include the use of a sack truck and involve lifting, pushing and pulling.

Caution should be exercised during these operations.

Operatives should be knowledgeable in handling techniques when performing these tasks and the following precautions should be considered:

- Grip the boiler. Refer to Frame 18.
- Split the boiler down to reduce the weight, e.g. remove casing and hardware pack. Refer to Frame 9.
- Be physically capable.
- Use PPE as appropriate, e.g. gloves, safety footwear.

During all manoeuvres and handling actions, every attempt should be made to ensure the following unless unavoidable and/or the weight is light.

- Keep back straight.
- Avoid twisting at the waist.
- Avoid upper body/top heavy bending.
- Always grip with the palm of the hand.
- Use designated hand holds.
- Keep load as close to the body as possible.
- Always use assistance if required.

OPTIONAL EXTRA KITS

FLUING:

- **Flue Extension Ducts.** (1000mm long) up to 3m
- **90° Elbow Kit** (60/100 dia maximum no. per installation) up to 2 elbows
- **45° Elbow Kit** (60/100 dia maximum no. per installation) up to 2 elbows
- **Side Outlet Kit**
- **Vertical Connector Kit**
- **Flue Finishing Kit**

OTHER OPTIONAL KITS:

- **Downward Piping Kit**
- **Condensate Pump Kit**

CURRENT GAS SAFETY (INSTALLATION AND USE) REGULATIONS OR RULES IN FORCE.

The appliance is suitable only for installation in GB and IE and should be installed in accordance with the rules in force.

In GB, the installation must be carried out by a CORGI Registered Installer. It must be carried out in accordance with the relevant requirements of the:

- Gas Safety (Installation and Use) Regulations
- The appropriate Building Regulations either The Building Regulations, The Building Standards (Scotland), Building Regulations (Northern Ireland).
- The Water Fittings Regulations or Water byelaws in Scotland.
- The Current I.E.E. Wiring Regulations.

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

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

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 70 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 70 kW.
- BS.5440.2** Ventilation for gas appliances of rated input not exceeding 70 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.**

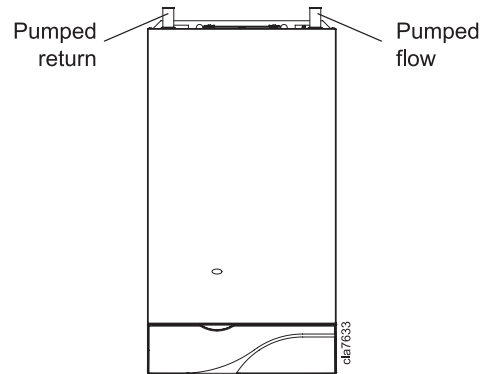
Timber Framed Buildings

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.

continued on page 8

1 BOILER WATER CONNECTIONS

This appliance is 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.

Front clearance: 450mm (17 3/4") from the front of the boiler casing.

Minimum front clearance when built behind a concealed panel is 5mm (1/4") provided that the top and bottom of the casing is not enclosed and the side clearance is 40mm (2") at both sides.

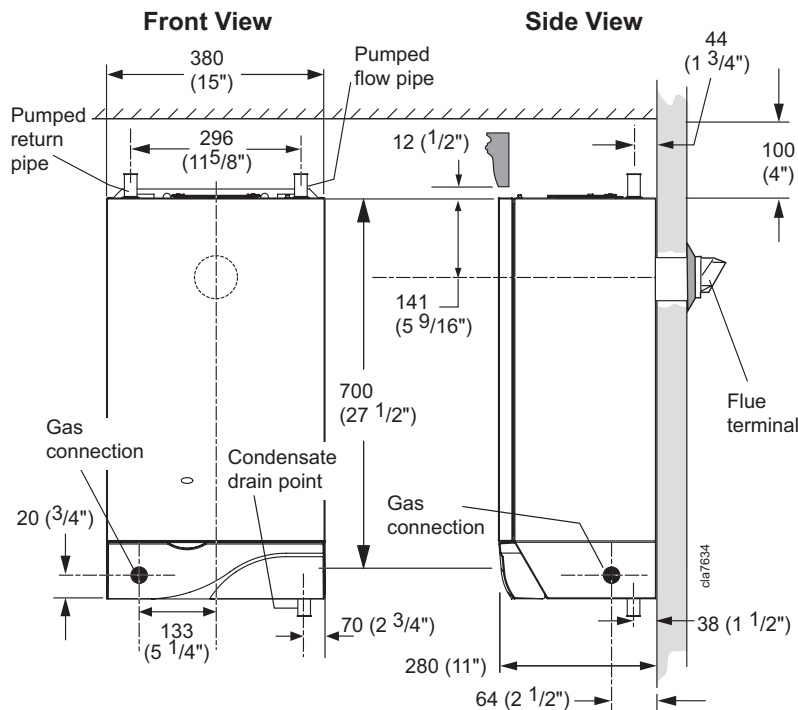
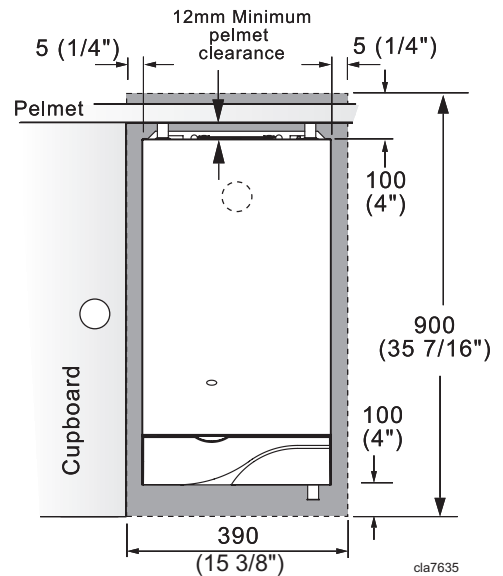
See also Table 4.

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.



GENERAL

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. For Ireland reference should be made to the current ETCI rules for electrical installations and I.S.813:2002.

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.

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. In IE refer to I.S. 813:2002. 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

Plumbing 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. In IE refer to I.S. 813:2002.

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.

Terminals guards are available from boiler suppliers - ask for TFC Flue Guard, Model No. K6-round, plastic coated. In case of difficulty seek advice from:

Grasslin (UK) Ltd., Tower House, Vale Rise, Tonbridge, Kent TN9 1TB.

Tel: +44 (0) 1732 359 888. Fax: +44 (0) 1732 354 445
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. In IE refer to I.S. 813:2002.

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.

**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	75 mm (3")
3. Below eaves	200 mm (8")
4. Below balconies or a car port roof	200 mm (8")
5. From vertical drain pipes or soil pipes	150 mm (6")
6. From an internal or external corner or to a boundary alongside the terminal	300 mm (12")
7. Above adjacent ground, roof or balcony level	300 mm (12")
8. From a surface or a boundary 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")

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. In IE refer to I.S. 813:2002.

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.

Table 4 - High and low vent areas

Boiler	Air from room/internal space, cm (in ²)	Air direct from outside, cm (in ²)
HE9	102 (16)	51 (8)
HE12	135 (21)	68 (11)
HE15	170 (26)	83 (13)
HE18	198 (31)	102 (16)

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. Water circulation system.

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	HE	9	12	15	18
Boiler Output	kW Btu/h x 1000	9.0 30.7	12 40.9	15 50.2	18 60.4
Water Flow Rate	l/min gal/h	11.7 155	15.6 206	19.5 258	23.4 309
Pressure Loss	mbar in wg	54.0 21.6	93.5 37.4	98.4 39.3	142.5 57

WATER TREATMENT

These boilers incorporate a cast iron heat exchanger and an aluminium heat exchanger.

IMPORTANT. The application of any other treatment to this product may render the guarantee of **Caradon Ideal Limited** INVALID.

Caradon Ideal Limited recommend Water Treatment in accordance with the *Benchmark* Guidance Notes on Water Treatment in Central Heating Systems.

Caradon Ideal Limited recommend the use of Fernox, GE Betz Sentinel or Salamander water treatment products, which must be used on accordance with the manufacturers instructions.

For further information contact:

Fernox Manufacturing Co. Ltd, Cookson Electronics, Forsyth Road, Sheerwater, Woking, Surrey. GU21 5RZ. Tel. +44 (0) 1799 521133
or

G E Betz Ltd, Sentinel Division, Foundry Lane, Widnes, Cheshire, WA8 8UD. Tel. +44 (0) 151 424 5351
or

Salamander Engineering Ltd, Unit 24, Reddicap Trading Estate, Sutton Coldfield, West Midlands B75 7BU. Tel. +44 (0) 121 378 0952

Notes.

1. It is most important that the correct concentration of the water treatment products is maintained in accordance with the manufacturers' instructions.
2. If the boiler is installed in an existing system any unsuitable additives MUST be removed by thorough cleansing. BS7593:1992 details the steps necessary to clean a domestic heating system.
3. In hard water areas, treatment to prevent limescale may be necessary - however the use of artificially softened water is NOT permitted.
4. Under no circumstances should the boiler be fired before the system has been thoroughly flushed.

BOILER CONTROL INTERLOCKS

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.

continued

GENERAL

Central heating systems controls should be installed to ensure the boiler is switched off when there is no demand for heating or hot water.

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 circuit must be fitted with an automatic bypass valve 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. For Ireland reference should be made to the current ETCI rules for electrical installations.

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 41 for details.

CONDENSATE DRAIN Refer to Frames 38, 39 and 40

A condensate drain siphon is provided on the boiler. This drain must be connected to a drainage point on site. All pipework and fittings in the condensate drainage system MUST be made of plastic- no other materials may be used.

IMPORTANT.

Any external runs must be insulated.

The drain outlet on the boiler is standard 21.5mm (3/4") overflow pipe.

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.

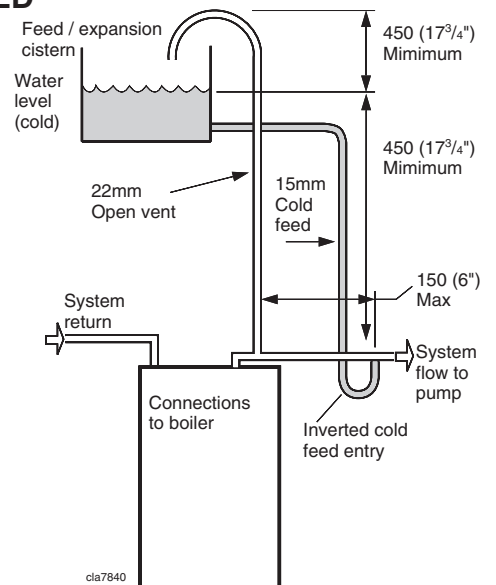
There should be a minimum height - 450mm (17³/₄") - of open vent above cistern water level. If this is impossible refer below.

The vertical distance between the highest point of the system and the feed/expansion cistern water level MUST not be less than 450mm (17³/₄").

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.



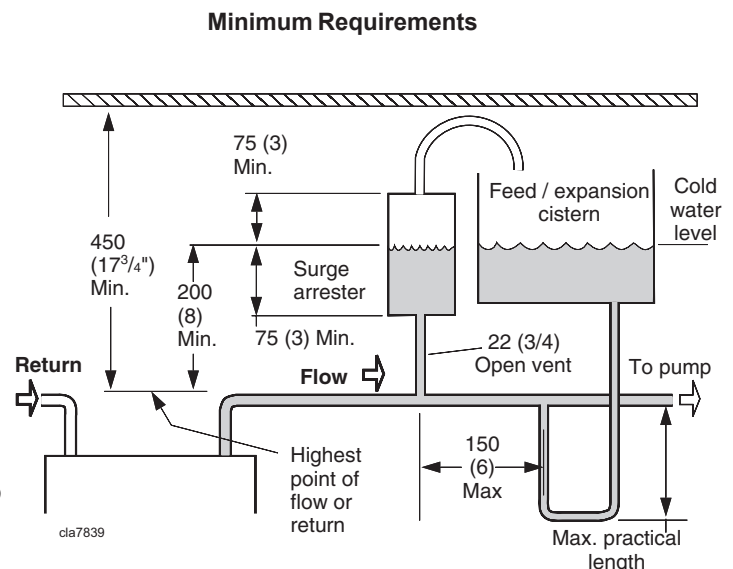
4 LOW HEAD INSTALLATIONS

The **classic HE** 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:

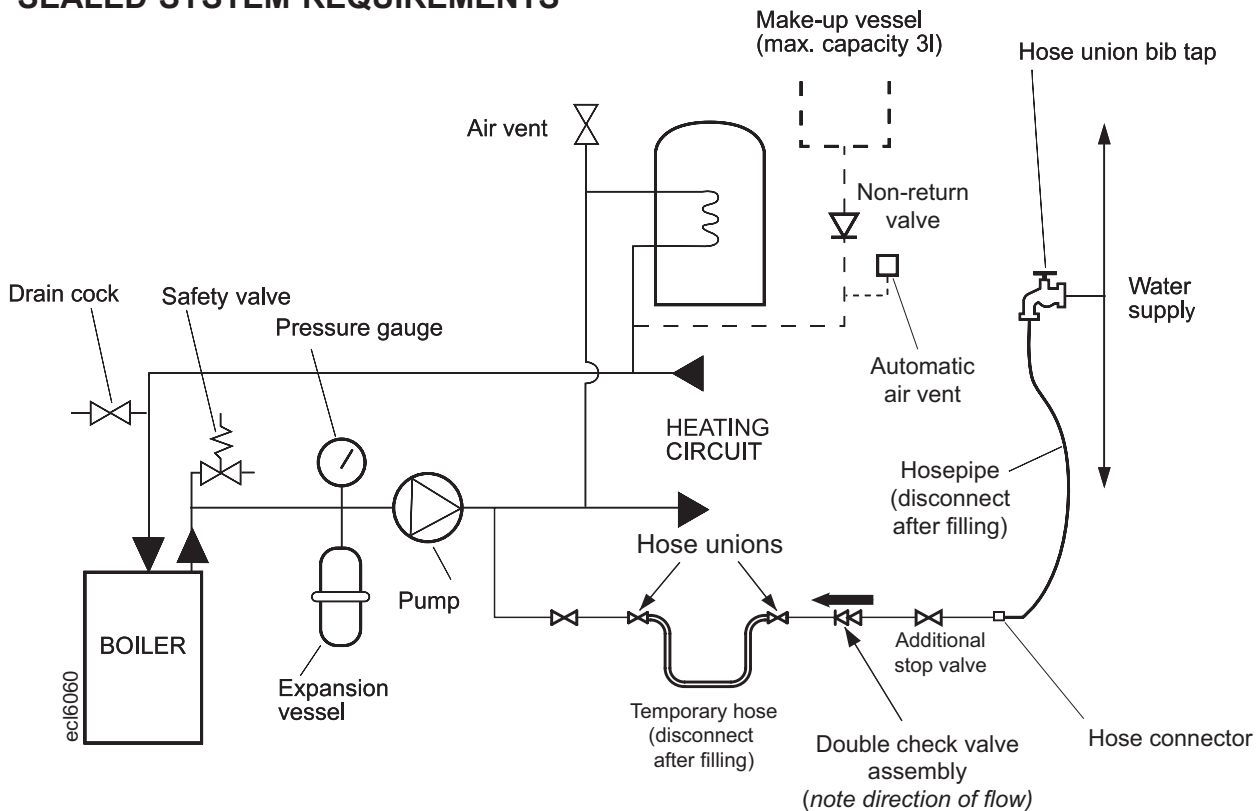
1. The surge arrester must be at least 42mm in diameter x 150mm long, thus ensuring a MINIMUM air gap and a MINIMUM depth of water below the static water level (cold) of 75mm.
2. The static water level (cold) must be at least 200mm above the top of the horizontal flow pipe, fitted as shown. The vent 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.



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.

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. For IE refer to the current edition of I.S. 813.

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.'

GENERAL

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/in²).

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 (± 4.3 lb/in²) 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.

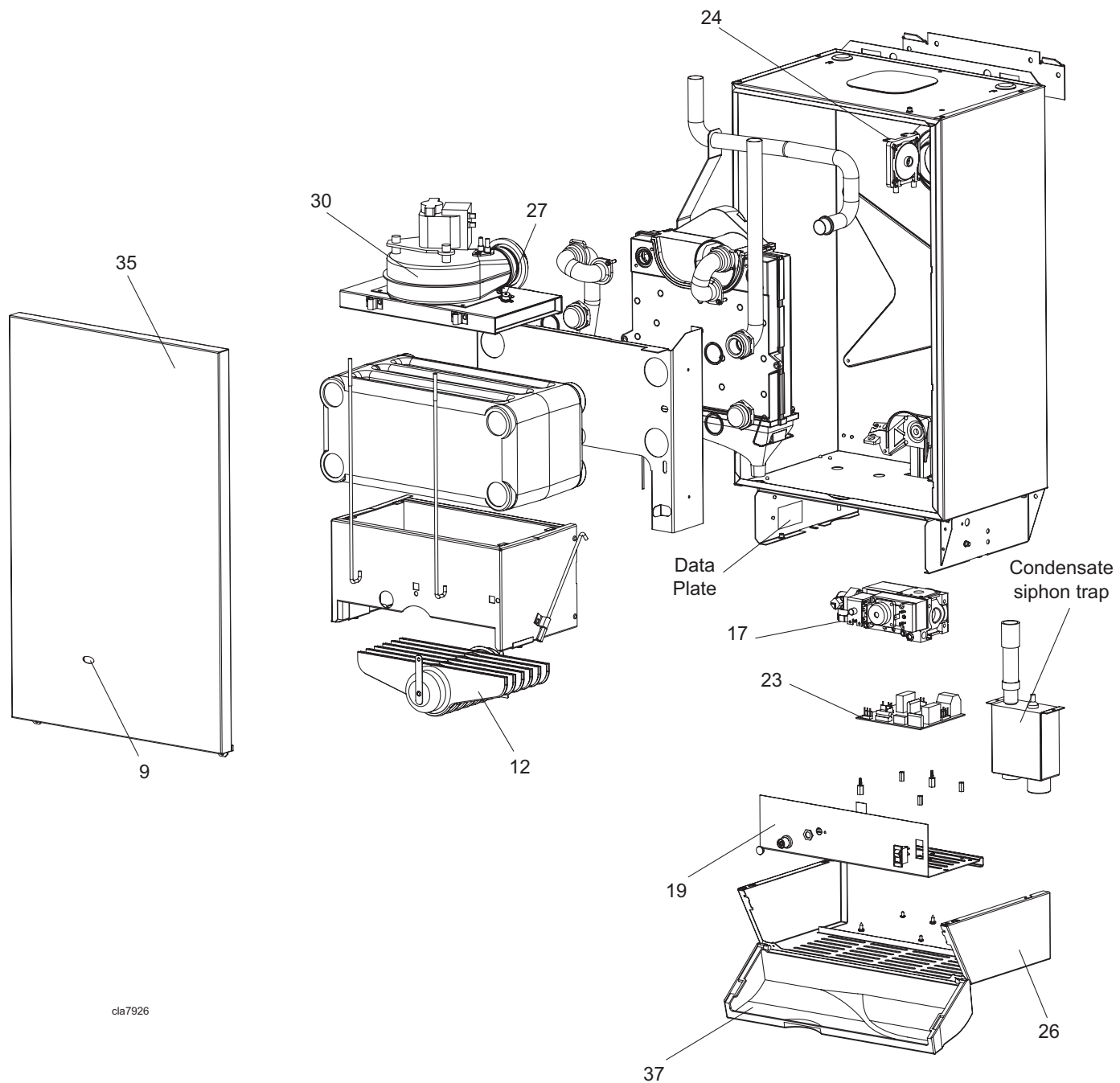
Sizing procedure for expansion vessels: The volume of the expansion vessel (litres) fitted to a sealed system shall not be less than that given by Table 6, multiplied by a factor of 0.8 (for flow temperatures of less than 88 °C).

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

INSTALLATION

7 BOILER ASSEMBLY - Exploded view



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LEGEND

- | | | | | | |
|-----|-------------|-----|----------------------------|-----|---------------|
| 9. | Sightglass | 23. | PCB25E | 30. | Fan |
| 12. | Main Burner | 24. | Air pressure switch | 35. | Front Panel |
| 17. | Gas Valve | 26. | Controls Casing | 37. | Controls Door |
| 19. | Control Box | 27. | Flue Protection Thermostat | | |

INSTALLATION

8 UNPACKING

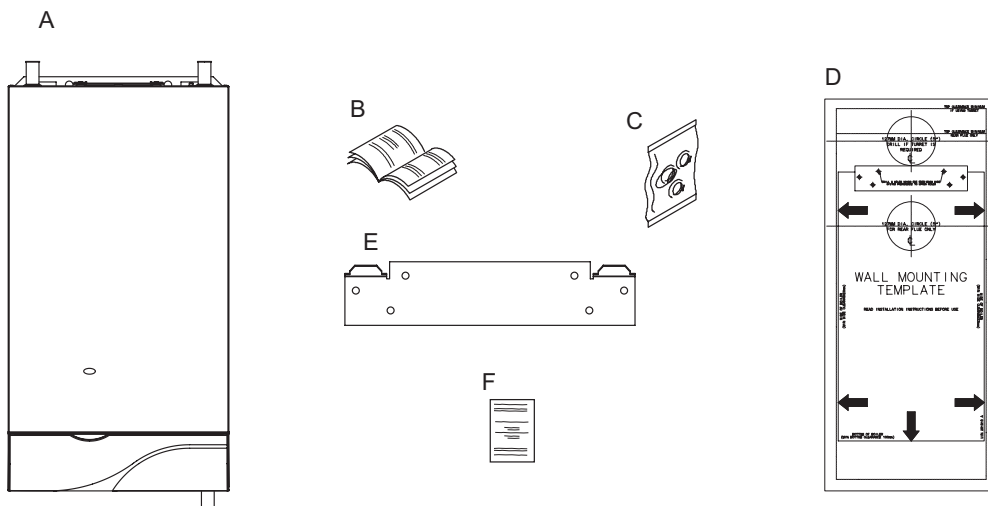
The boiler is supplied fully assembled in **Pack A**, together with a standard flue assembly for lengths from 75mm (3") up to 705mm (27 3/4") rear flue and from 270mm (10 5/8") up to 775mm (30 1/2") side flue in **Pack B**.

Note. For side flue applications the optional extra side outlet kit is required.

Unpack and check the contents.

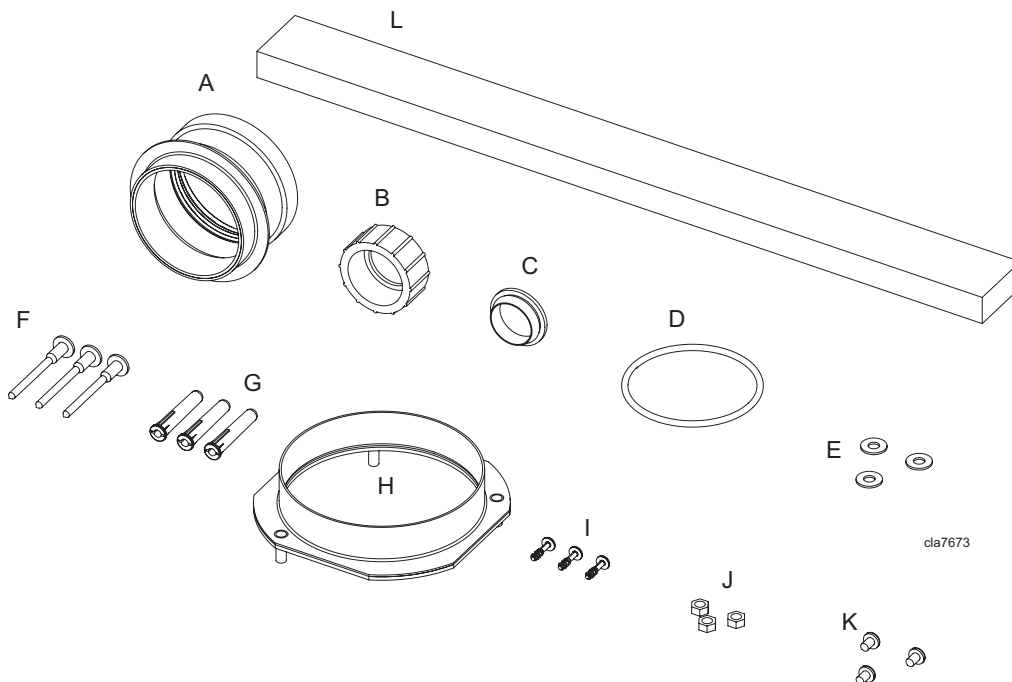
Pack A Contents

- | | |
|--|--------------------------|
| A The complete boiler | D Wall mounting template |
| B Installation & Servicing/
User's Instructions | E Wall mounting plate |
| C Hardware Pack (listed below) | F 1 year guarantee form |



Hardware Pack 1 Contents

- | | | |
|-----------------------------------|---------------------------------------|------------------------------------|
| A Pipe - Flue extension - 1 off | E Washer M4 Form 'C' - 3 off | I Screw M4 x 8 PP Taptite - 3 off |
| B Nut Siphon - 1 off | F No. 14x2" slotted woodscrew - 3 off | J Nut M5 hex - 3 off |
| C Washer - siphon sealing - 1 off | G Wallplug - 3 off | K Screw No. 8 x 8 PP S/tap - 3 off |
| D 'O' ring - 1 off | H Sealing ring - 1 off | L Polyurethane foam seal - 1 off |



Pack B Contents

- Terminal grille assy. - 1 off.

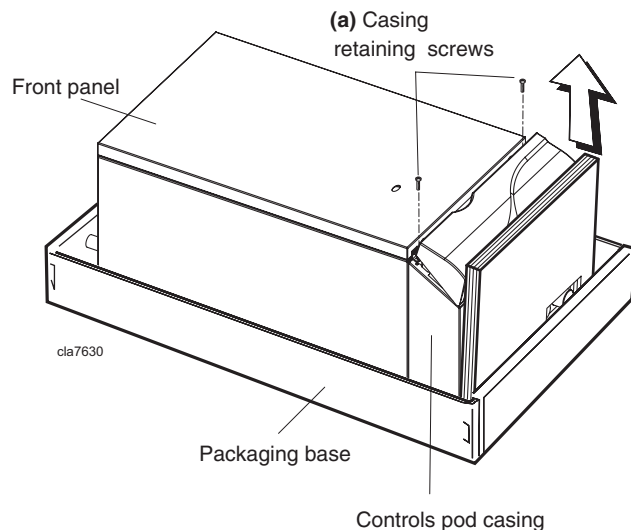


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INSTALLATION

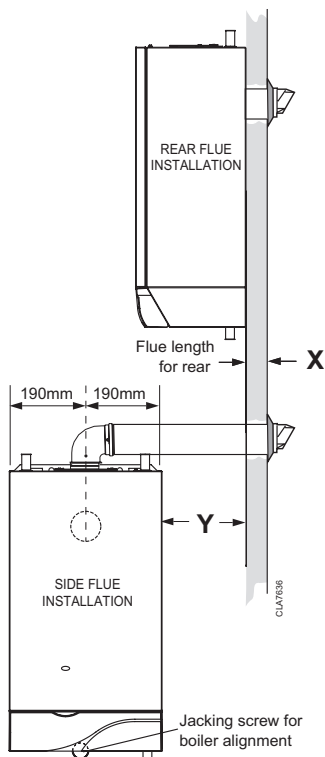
9 PACKAGING AND CASING REMOVAL

1. Cut straps and remove outer carton.
2. Remove packing from top of boiler (Note the wall mounting plate is packed on this packing)
3. Leave bottom packing in place.
4. Slightly open plastic controls door to gain access to the front panel fixing screws.
5. Remove the front casing as follows and place to one side to avoid damage.
 - a. Undo the 2 front casing retaining screws (a) retaining the casing to the back panel.
 - b. Lift the bottom of the front of the boiler casing up slightly then unhook from the top.
6. Remove the hardware pack from the inside of the boiler
7. Remove the boiler from its packaging base. But do not remove bottom packaging. The boiler may now be stood upright on its controls support protection frame to ease handling and installation.
8. Unpack the boiler terminal box (pack 'B') and, if applicable, the extension flue box(es) (pack 'D').



10 DETERMINING THE FLUE LENGTH

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



Note.

A roof flue kit is available as an optional extra for vertical flue installation, supplied with separate fitting instructions. Refer to Frames 31 to 35.

FLUE KITS

Pack B: supplied as standard.

Pack D: optional extension kit for side flue or vertical flue outlet. Refer to Frame 28.

Side Outlet Kit: For side outlet applications. Refer to Frame 20-27.

1. A maximum of 3 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.
 - 90° Elbow kit (equivalent flue length resistance = 1.0m)
 - 45° Elbow kit (equivalent flue length resistance = 0.75m)

Flue length mm*	Accessories
From 75 up to 705 (Rear flue) or From 270 up to 775 (Side flue)	B Pack 1 off
775 to 1680	B Pack 1 off + D Pack, 1 off *
1680 to 2585	B Pack 1 off + D Pack, 2 off *
2585 to 3000	B Pack 1 off + D Pack, 3 off *

B Pack Product No. 201 816

* Side flue only

D Pack Product No. 201 180

Side Outlet Kit Product No. 201 866

* Measured from centre line of boiler to outside of wall.

Note. The flue duct MUST be inclined at 1.5 degrees to the horizontal to allow condensate to drain back into the boiler and out through the condensate drain. (Only necessary if using one or more 'D' extension duct packs)

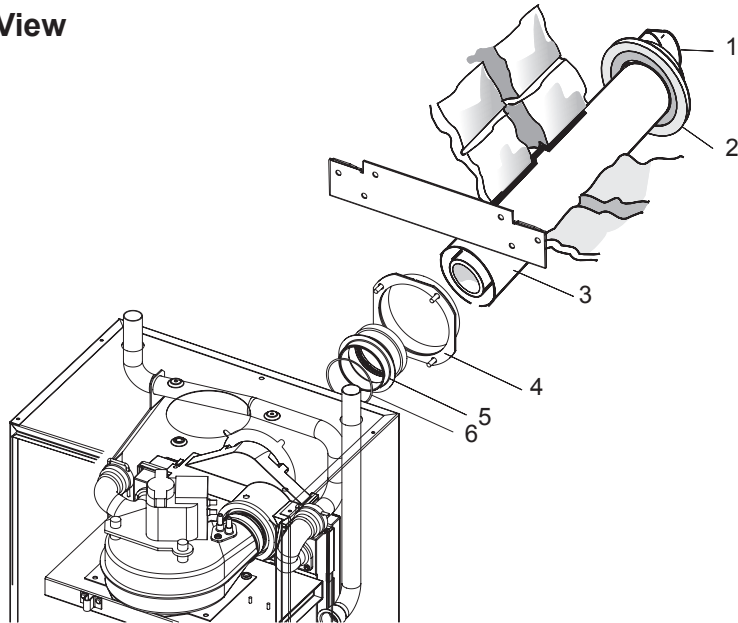
INSTALLATION

11 FLUE ASSEMBLY - Exploded View

1. An optional flue duct extension kit is required for wall thicknesses greater than 775mm (30 1/2") side flue. Refer to Frame 10.

LEGEND

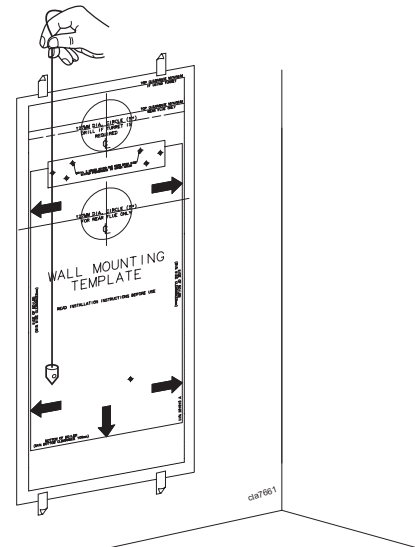
1. Terminal
2. Weather seal (optional extra)
3. Flue assembly
4. Boiler sealing ring
5. Flue extension pipe
6. 'O' ring



12 WALL MOUNTING TEMPLATE

Note. The template shows the positions of the fixing holes and the rear flue outlet hole centre for standard installation. Care MUST be taken to ensure the correct holes are drilled.

1. Tape template into the selected position. Ensure squareness by hanging a plumbline as shown.
2. If fitting a side flue refer to Frame 21.
3. Mark onto the wall 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. The jacking screw fixing hole.
4. Remove the template from the wall.

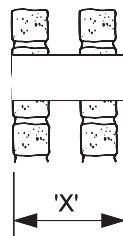


13 PREPARING THE WALL

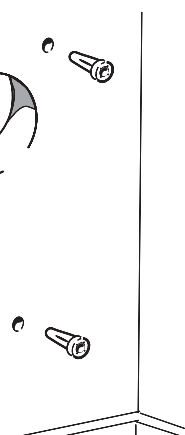
IMPORTANT. Ensure that, during the cutting operation, masonry falling outside of the building does not cause damage or personal injury.

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 3 holes (two for the wall mounting plate and one for the jacking screw) with an 8mm (5/16") masonry drill.
3. Insert the plastic plugs provided.

5" diameter flue hole



Section through wall



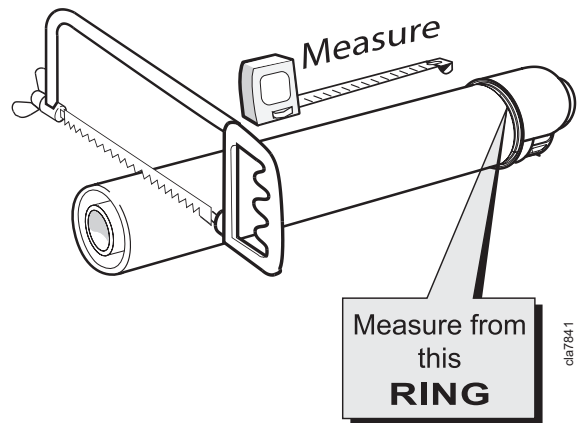
Note. Check all of the hole positions BEFORE drilling

INSTALLATION

14 CUTTING THE FLUE - wall thicknesses of 75 to 705mm

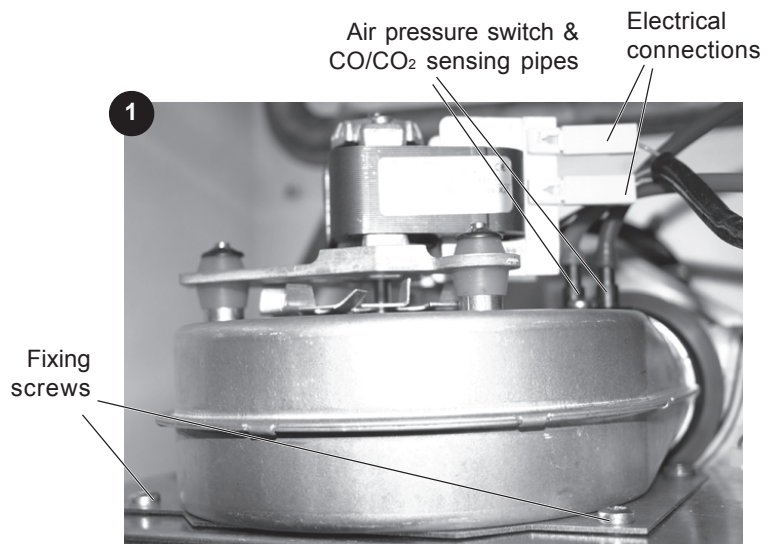
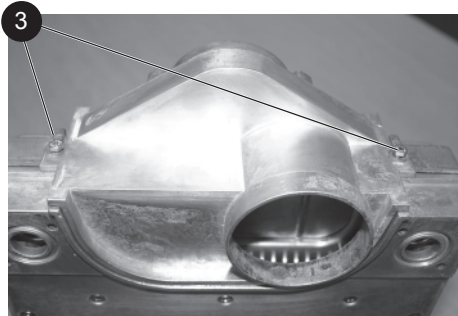
Note. If the downward piping kit bracket is to be used, it is essential that 30mm is added to the measured wall thickness when marking the flue.

1. Measure and note the wall thickness X (Refer to Frame 10).
2. Mark the wall thickness onto the flue.
3. To ensure the tube is cut square, mark the flue all the way around.
4. Position the inner flue spring to support the inner flue during the cutting process.
5. Cut to length X, (refer to Frame 10).
6. Remove any burrs and remove the inner flue support ring.

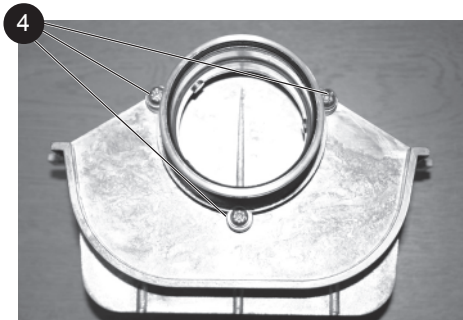


15 FITTING THE FLUE CONNECTING RING AND THE BOILER SEALING RING TO THE FLUE

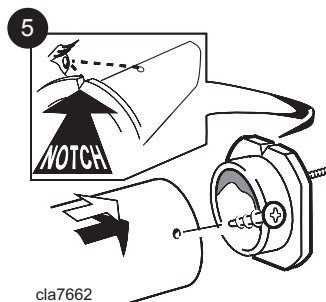
1. Remove the two fan electrical connections, the red pressure sensing pipe, the blue CO/CO₂ sensing pipe and the two fan fixing screws.
2. Pull the fan forward, remove and retain.
3. Remove the two fixing screws retaining the removable top section of the aluminium recuperator and carefully lift the recuperator top section from the main body.



4. Fit the 'O' ring to the flue extension ring and fit the flue extension ring (to be found in the boiler hardware pack) to the rear of the recuperator top section using the three M4 x 10 taptite screws and form C washers also to be found in the boiler hardware pack.

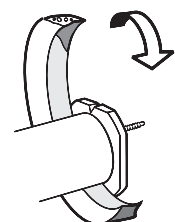


5. If using the flue finishing kit, push the black outer wall seal over the outer flue duct (Refer to Frame 16) prior to fitting the flue ring. Fit the boiler sealing ring inside the terminal 'B' pack outer flue duct. Ensure the boiler sealing ring is fully engaged. Ensure the notch aligns with the label on the outer flue duct. This ensures correct alignment of the flue terminal.



6. Drill 3 holes 3.2mm (1/8") dia. through the outer flue duct and boiler sealing ring. **Do NOT drill the inner flue duct.**
7. Insert the self-tapping screws, provided, in order to fix the boiler sealing ring in position.

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

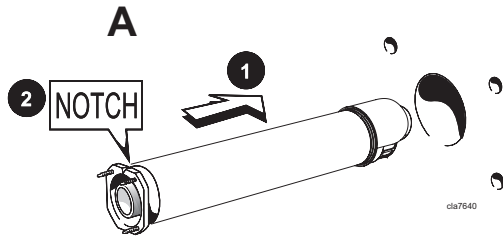


INSTALLATION

16 FITTING THE FLUE ASSEMBLY AND OPTIONAL FLUE FINISHING KIT (if required)

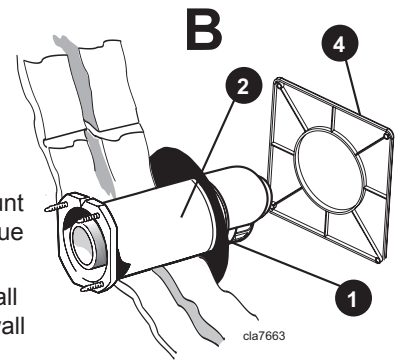
(A) Without Optional Flue finishing Kit

1. Insert the flue assembly through the hole.
2. Ensure the notch is at the top. This will aid the location of the studs into the boiler back panel.



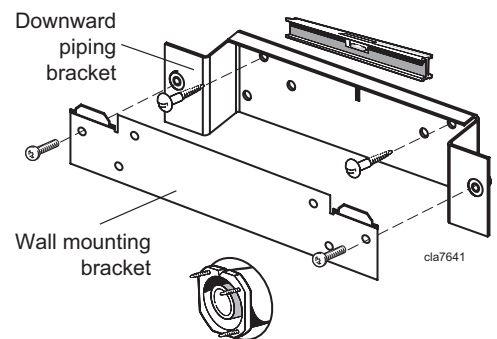
(B) With Optional Flue finishing Kit

1. Fit the black outer wall seal over terminal and ensure the retaining rim is located in the terminal depression.
2. Fit flue pipe assembly through the hole previously cut in wall.
3. Fit wall mounting plate (Frame 17), mount the boiler (Frame 18) and connect the flue to the boiler (frame 19).
4. Fit outer wall sealing plate over outer wall seal and retain with the 4 screws and wall plugs provided.



17 WALL MOUNTING PLATE

1. If downward routing of pipes is required then the downward routing wall bracket supplied in the downward piping kit should be fitted to the wall now.
2. Fix the mounting plate to the wall with the No. 14 x 50mm wood screws or to the downward piping bracket with the M6 x 12 Hex hd screws provided.
3. Check with a spirit level that the plate is horizontal.



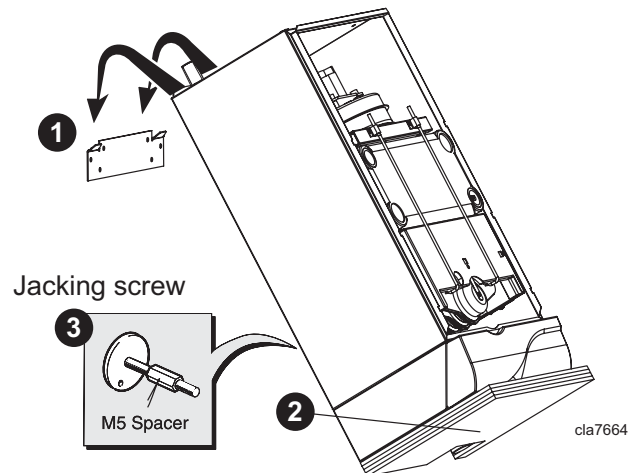
18 MOUNTING THE BOILER

Note.

The boiler may require two men to lift it onto the wall mounting plate.

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.
2. Remove the bottom packaging protection.
3. Check the boiler alignment, using a spirit level, and adjust as necessary with the jacking screw.
4. Line up the hole in the jacking screw with the hole in the wall previously drilled and secure with the No. 14 x 50mm wood screw.

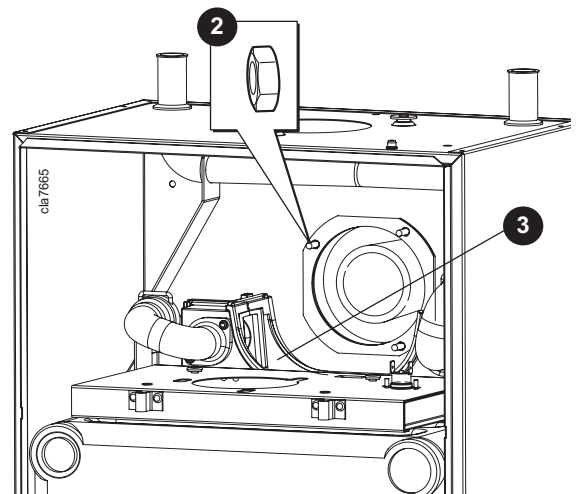


19 CONNECTING THE FLUE TO THE BOILER

1. Locate the 3 sealing ring studs in the holes in the back panel.

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

2. Secure the flue to the boiler using the three M5 nuts provided.
3. Before fitting the flue turret fill the siphon trap within the boiler by pouring a cupful of water into the recuperator outlet. Take care to ensure that the water is only poured into the recuperator outlet, and does not spill into the boiler casing.
4. Re-engage the recuperator top section flue connecting ring into the plastic flue pipe and retain the top section with the two screws previously removed (ensure the top section to main recuperator body sealing gasket is correctly positioned in its retaining groove).
5. Refit the fan, fan electrical connections, the red pressure sensing pipe and the blue CO/CO₂ sensing pipe. Refit the 2 fan fixing screws.



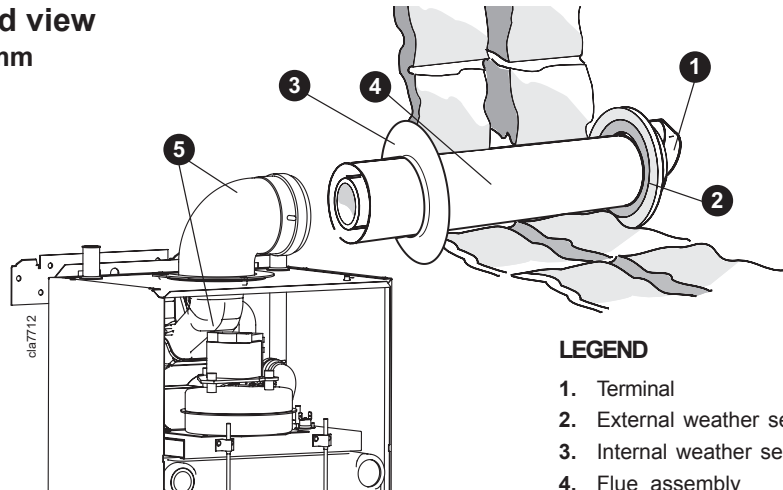
INSTALLATION

20 FLUE ASSEMBLY - Exploded view

For wall thickness 270mm to 775mm

The optional side outlet kit is required for all side flue applications.

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 775mm (30 1/2"). Refer to Frame 10.



LEGEND

1. Terminal
2. External weather seal (optional)
3. Internal weather seal (optional)
4. Flue assembly
5. Side outlet kit (Optional)

21 WALL MOUNTING TEMPLATE

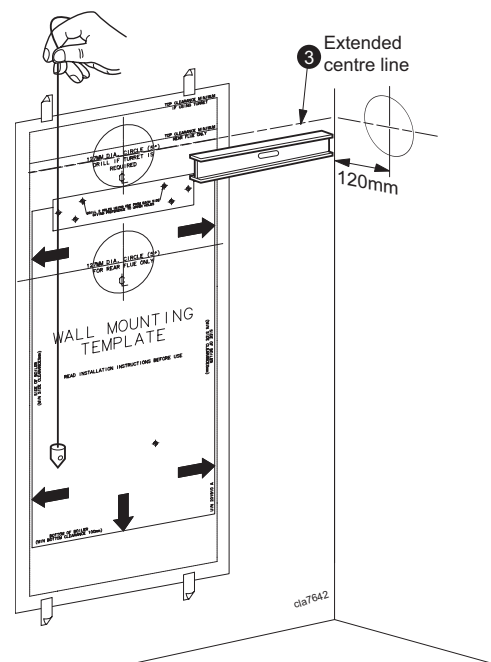
Note. The template shows the positions for the fixing holes and the flue hole centres for standard installation.

If the flow and return pipes are to be routed down behind the boiler the downward routing pipe bracket, supplied with the Downward Piping Kit, must be used. This bracket is secured to the wall 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. Tape the template into the selected position.
2. Ensure squareness by hanging a plumb line as shown.
3. Extend the flue centre line onto the side wall and measure in 120mm for standard installation.
4. Mark onto the wall the following:
 - a. The 2 wall mounting plate screw positions (choose one from each group).
 - b. The fixing hole for the jacking screw.
 - c. The position of the flue duct hole.

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

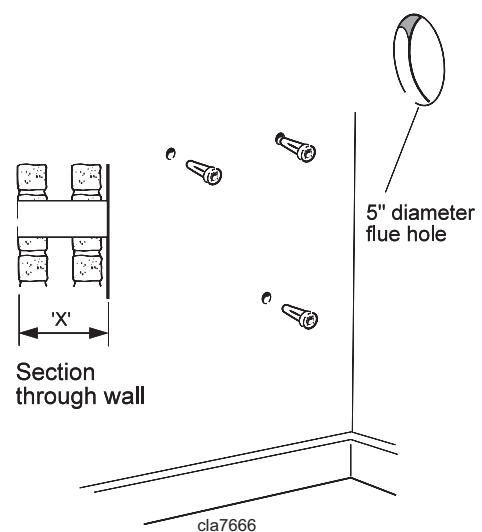
5. Remove template from the wall.



22 PREPARING THE WALL

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

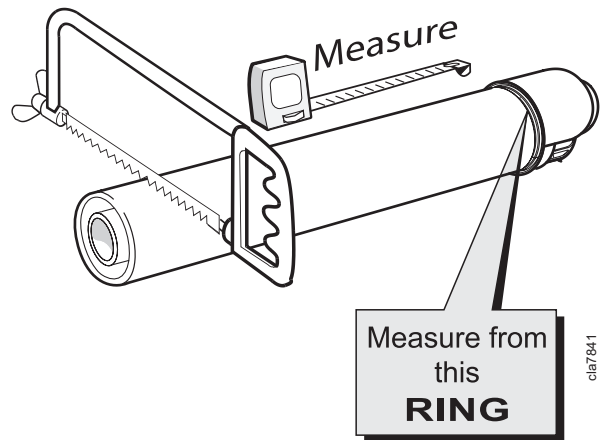
1. Cut the flue hole, preferably with a 125mm (5") core boring tool, ensuring that the hole is square to the wall. If the hole has been accurately cut with a drill then making good the inner wall face is not essential as a seal is provided (an optional extra outer wall seal is required if necessary). 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 3 holes, 2 for the wall mounting plate and 1 for the jacking screw with an 8mm (5/16") masonry drill.



INSTALLATION

23 CUTTING THE FLUE - For flue lengths 270 to 775mm ONLY

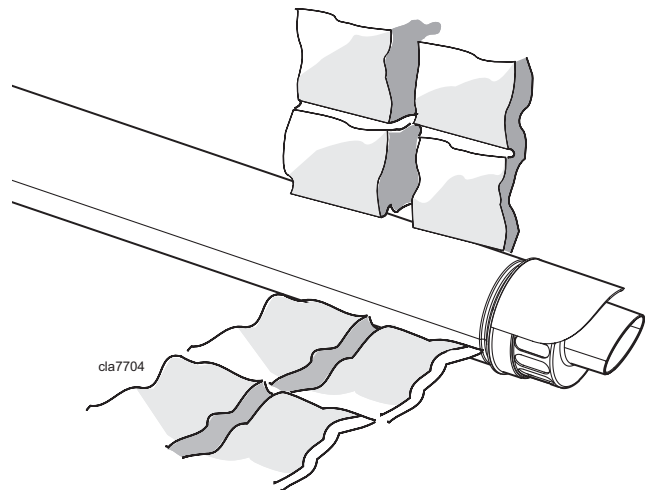
1. Measure and note the side flue length "Y" (refer to Frame 10).
2. Add 143mm (5⁵/₈"") to dimension "Y" and measuring from the ring, cut both outer and inner tube. Ensure support clip is in position to facilitate cutting.
3. To ensure the tube is cut square, mark the flue all the way around.
4. Cut to length and remove any burrs.



For flue lengths greater than 775mm refer to Frames 28, 29 and 30 - Flue extension ducts.

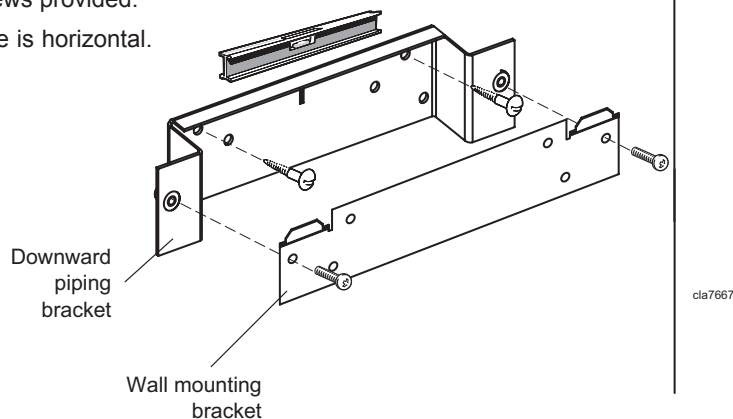
24 FITTING THE FLUE ASSEMBLY

1. Insert the flue assembly through the hole.
2. Ensure the flue terminal is in the correct position.



25 WALL MOUNTING PLATE

1. If downward routing of pipes is required then the downward routing wall bracket supplied in the downward piping kit should be fitted to the wall now.
2. Fix the mounting plate to the wall with the No. 14 x 50mm wood screws or to the downward piping bracket with the M6 x 12 Hex hd screws provided.
3. Check with a spirit level that the plate is horizontal.



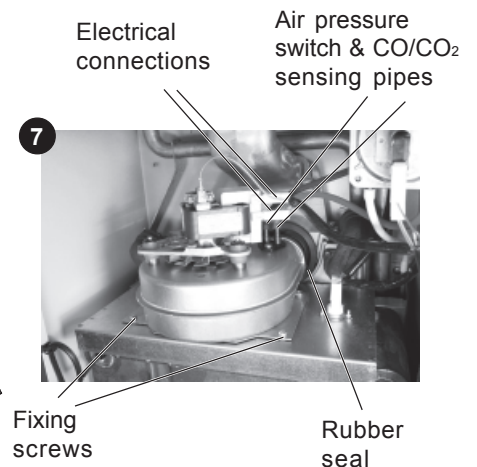
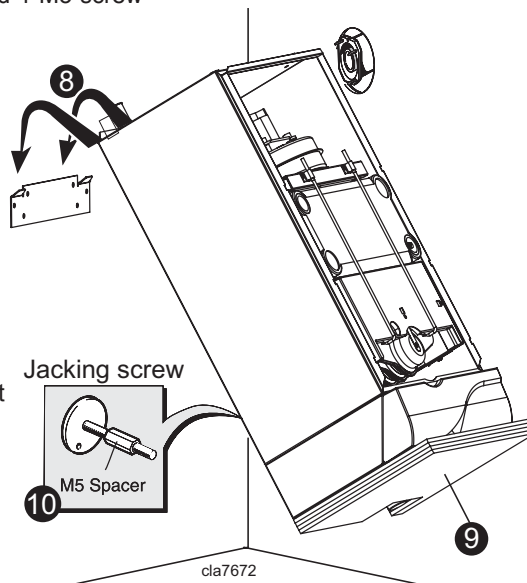
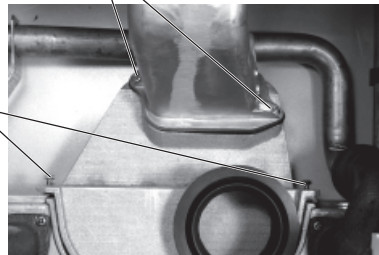
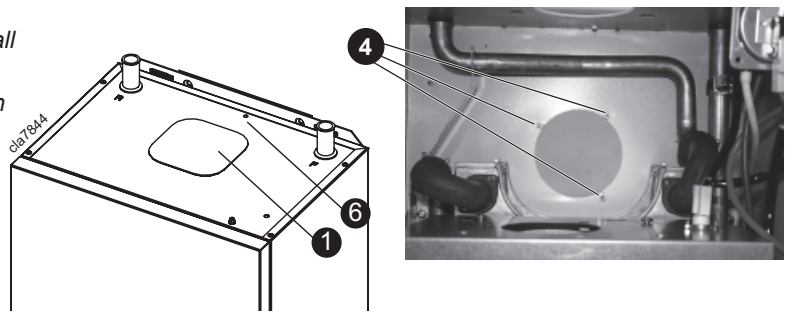
INSTALLATION

26 MOUNTING THE BOILER

Note. The boiler may require two men to lift it onto the wall mounting plate.

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 top outlet and retain.
2. Remove the fan electrical connections, the air pressure switch sensing pipe, the CO/CO₂ sensing pipe and the 2 fan fixing screws and remove the fan. Refer to frame 15.
3. Remove the top section of the recuperator. Refer to Frame 15.
4. Fit the blanking plate and gasket to the rear flue hole with the 3 M5 nuts provided.
5. Fit the recuperator top outlet casting and retain with the two M5 screws previously removed.
6. Remove the plastic sealing plug and fit the top outlet connecting casting and gasket, retaining with the 2 M4 screws and 1 M5 screw provided.
7. Refit the fan into the rubber seal and secure with the 2 fixing screws, replace the fan electrical connections, air pressure switch sensing pipe and CO/CO₂ sensing pipe.
8. Lift the boiler onto the wall mounting bracket.
9. Remove the bottom packaging protection
10. Check the boiler alignment to the wall using a spirit level and adjust as necessary with the jacking screw.
11. Line up the hole in the jacking screw with the hole in the wall previously drilled and secure with the No. 14x50mm wood screw.



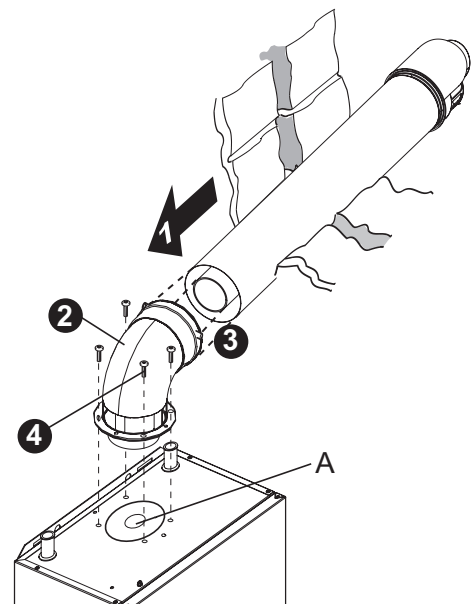
27 CONNECTING THE FLUE TO THE BOILER

Note.

Before fitting the flue turret fill the condensate trap or siphon trap within the boiler by pouring a cupful of water into the flue outlet A.

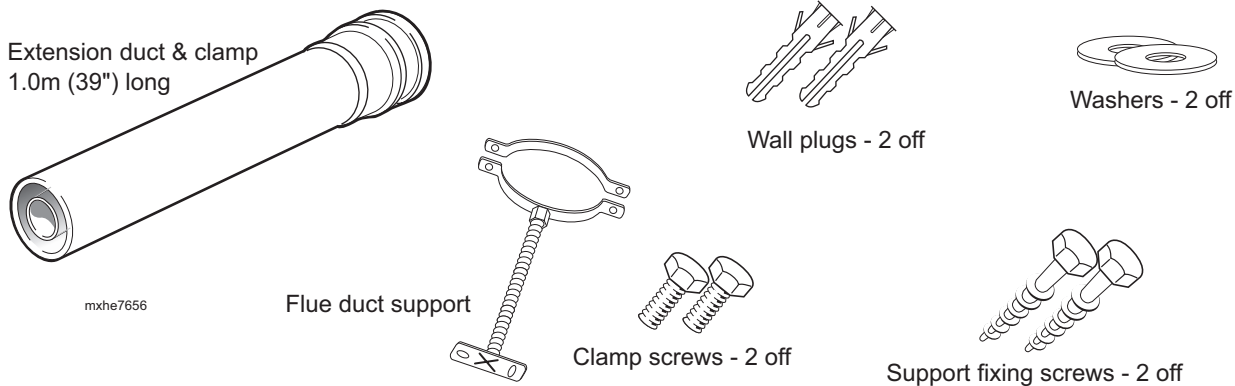
Take care to ensure that the water is only poured into the flue outlet, and does not spill into the boiler casing.

1. Insert the flue assembly through the prepared hole in the wall.
2. Locate the flue turret on the top of the boiler. **CHECK THAT THE FLUE SEAL LOCATED IN THE TOP OF THE FLUE MANIFOLD IS SECURE AND GIVING AN EFFECTIVE SEAL.**
3. Locate the flue into the turret and push to ensure full engagement.
4. Secure the flue turret on top of the boiler with the 4 screws provided.
5. **Flues over 1 metre long.**
Fix the flue support bracket to the wall, using the 2 wall plugs and wood screws.



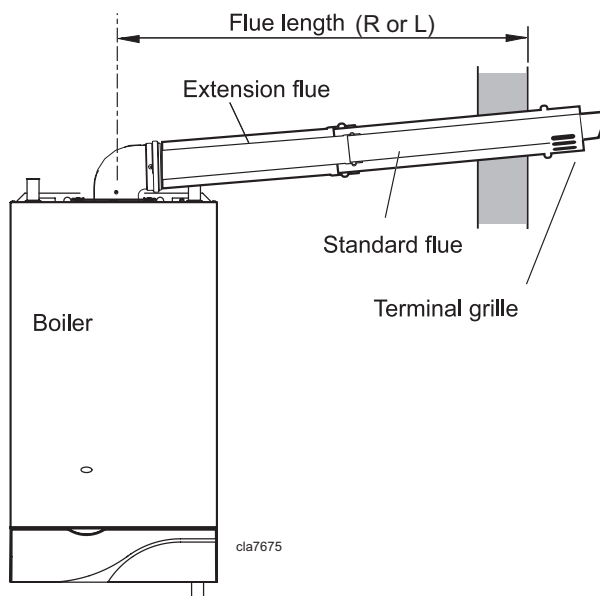
INSTALLATION

28 FLUE EXTENSION DUCTS - For flue lengths greater than 705mm rear flue or 775mm side flue



29 FLUE EXTENSION DUCTS - continued

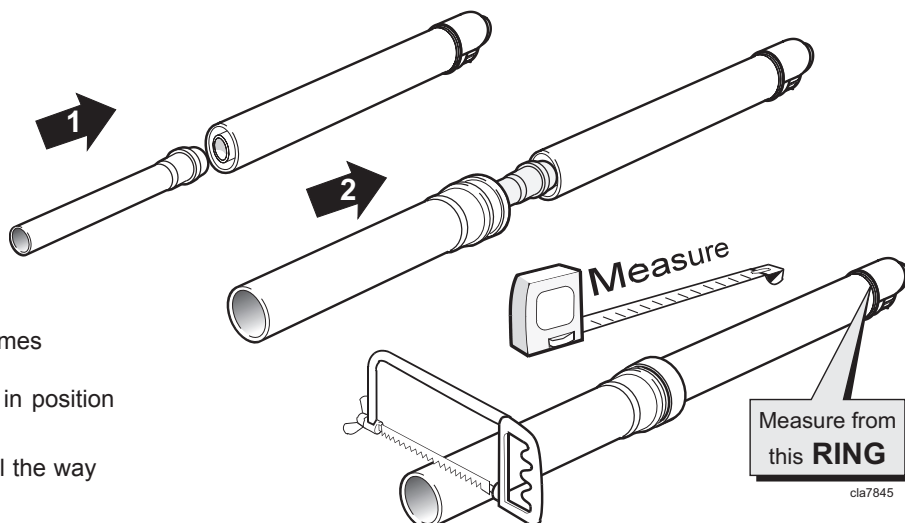
Flue length R or L	Accessories	Product No.
Up to 775	B Pack 1 off	see Frame 10
775 to 1680	B Pack 1 off + D Pack, 1 off	see Frame 10
1680 to 2585	B Pack 1 off + D Pack, 2 off	see Frame 10
2585 to 3000	B Pack 1 off + D Pack, 3 off	see Frame 10



Flue extensions of greater length than 1m (39") should be supported with the bracket provided, suitable adjusted. Refer to Frame 28.

30 FITTING THE KIT

1. Fit the inner flue extension duct onto the inner flue duct.
2. Fit the outer flue extension duct onto the outer air duct.
3. Repeat steps 1 and 2 if a second flue extension is required.
4. Measure and mark the flue length required onto the flue, measuring from the ring near the terminal. (Refer to Frames 10 and 23 for the detail of flue length calculation). Ensure the support clip is in position to facilitate cutting.
5. To ensure a square cut, mark the flue all the way around.
6. De-burr the cut edges.



INSTALLATION

31 FITTING THE OPTIONAL ROOF FLUE KIT (Flat or Pitched)

Note.

A flat or pitched roof flashing plate (not supplied) is required before proceeding with the installation of this kit.

This kit is suitable for both flat and pitched roof terminations, using a concentric flue to run vertically from the top of the boiler and terminating above roof level.

Connection to the top of the boiler is made using a separately supplied vertical connector kit.

WEATHERPROOFING

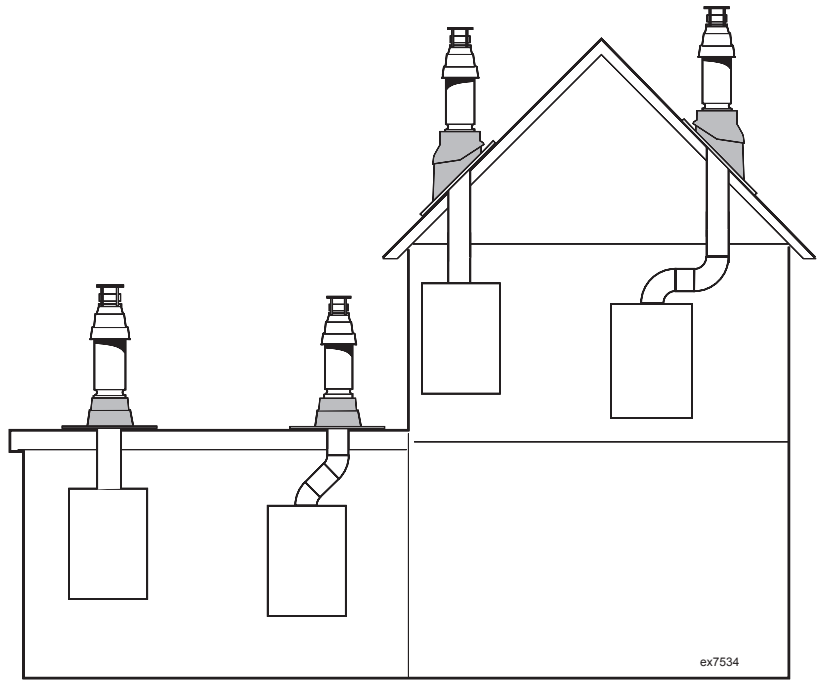
Where the flue passes through the roof line an adequate seal must be made. This is achieved by using either:

Flat roof weather collar or Universal weather collar.

ACCESSORIES

Flue Duct Extension Kits are available for flue lengths extending beyond 1m. These packs contain 1m extension ducts and may be cut to the desired length.

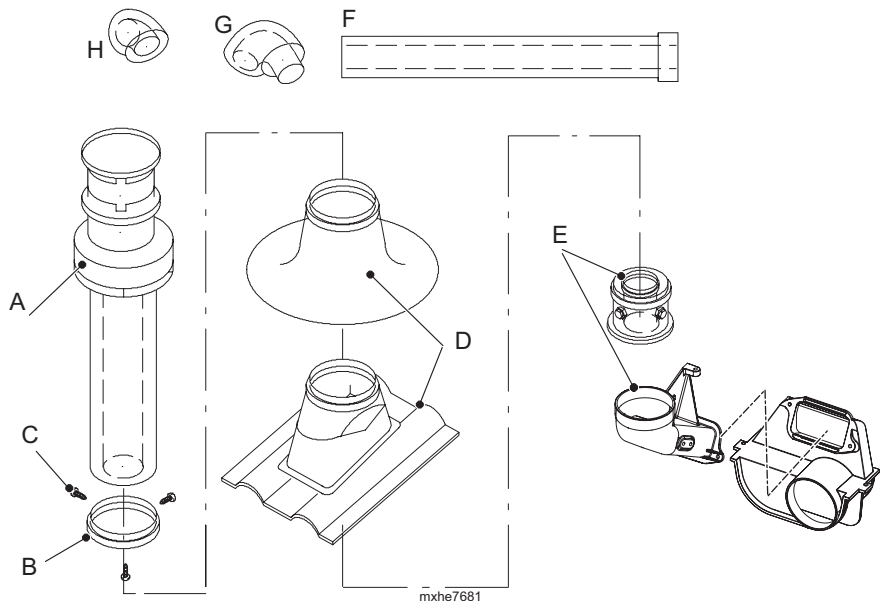
If the offset vertical option is used an elbow Kit is required. For a full accessories list refer to page 6, Optional Extras and Frame 34, Flue Arrangement.



ex7534

32 ROOF FLUE KIT CONTENTS / OPTIONS

- A. Flue assembly with terminal
- B. Flue seal collar
- C. 3,5x13 screw
- D. Pitched roof tile/flat roof tile weather collar
- E. Vertical connector (60/100)/ boiler vertical conversion kit
- F. Roof flue extension duct kit (60/100)
- G. 90° elbow kit (60/100)
- H. 45° elbow kit (60/100)



Note. Items D, E, F, G and H are not supplied with the roof flue kit.

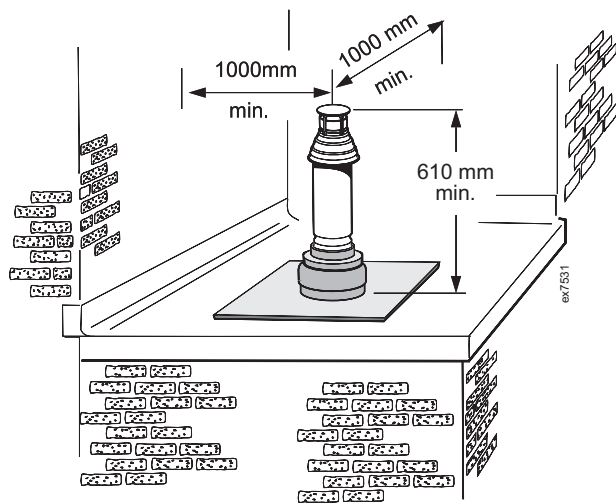
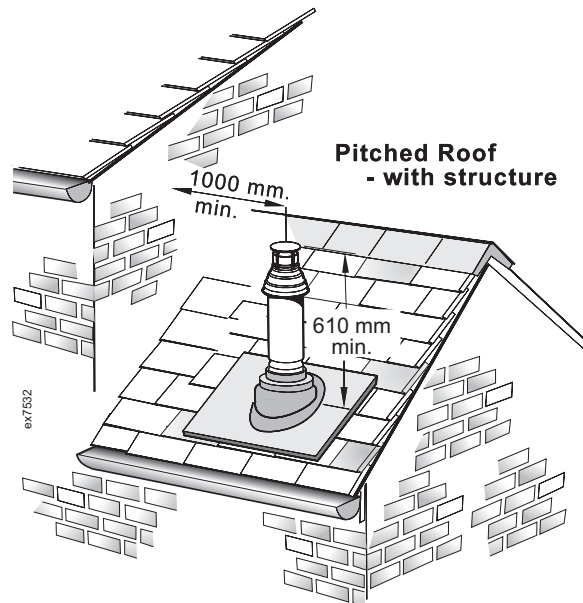
INSTALLATION

33 FLUE TERMINAL POSITION

The terminal should be positioned so that products of combustion can safely disperse at all times.

Plumbing may occur at the termination so, where possible, terminal positions where this could cause a nuisance should be avoided.

Minimum dimensions are shown below

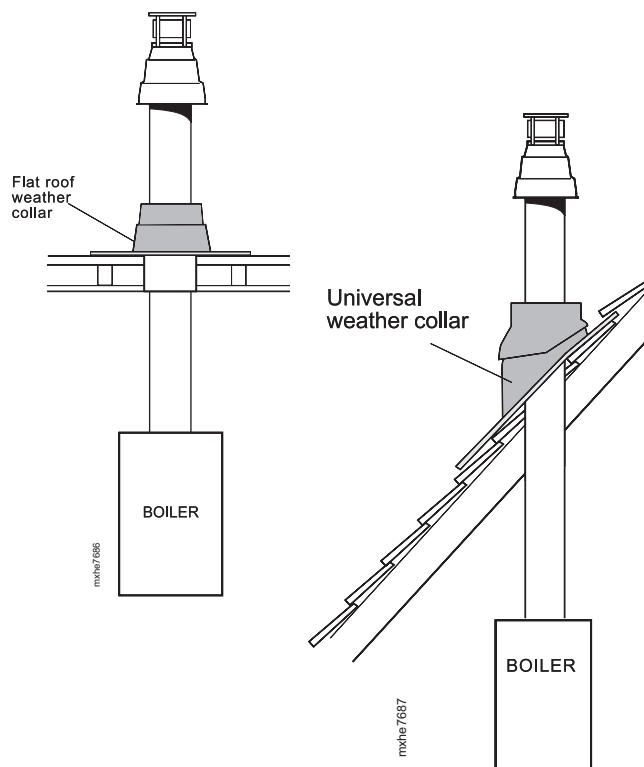


Flat roof - with structure

Terminal Position	Minimum Dimension
Directly below an opening, air brick, windows, etc.	300 mm
Below plastic / painted gutters	300 mm
Painted surface	300 mm
Below eaves or balcony	500 mm

34 FLUE ARRANGEMENT

Part No.	Description	Flue Size			
		HE9	HE12	HE15	HE18
n/a	Maximum Flue Length (m)	4	4	4	4
201 180	Flue ext. 60/100	3	3	3	3
201 189	Terminal Vertical Roof 60/100	1	1	1	1
158 431	Weather Collar Pitched Roof	1	1	1	1
158 432	Weather Collar Flat Roof	1	1	1	1
201 182	90° Elbow Kit (60/100)	2	2	2	2
201 183	45° Elbow Kit (60/100)	2	2	2	2
201 867	Vertical Connector Kit	1	1	1	1



Note.

The equivalent flue length resistance of the 90° elbow kit (60/100) is 1.0m and the 45° elbow kit (60/100) is 0.75m.

INSTALLATION

35 ASSEMBLING THE ROOF FLUE KIT

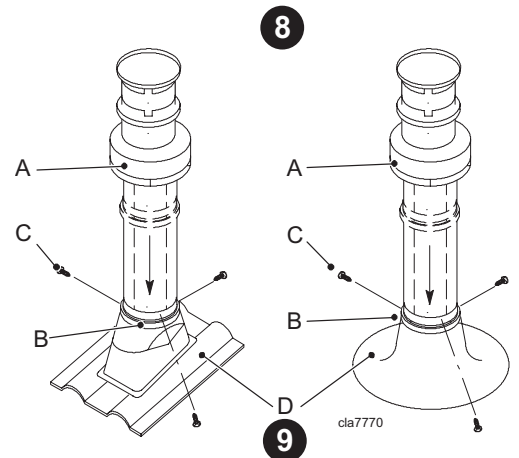
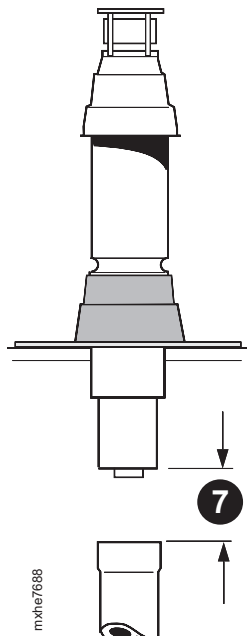
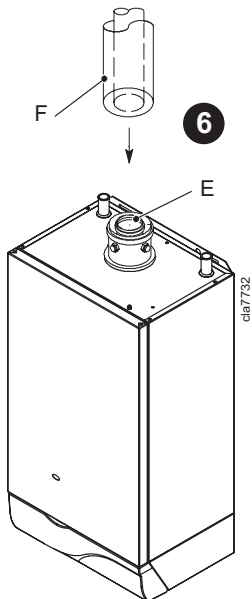
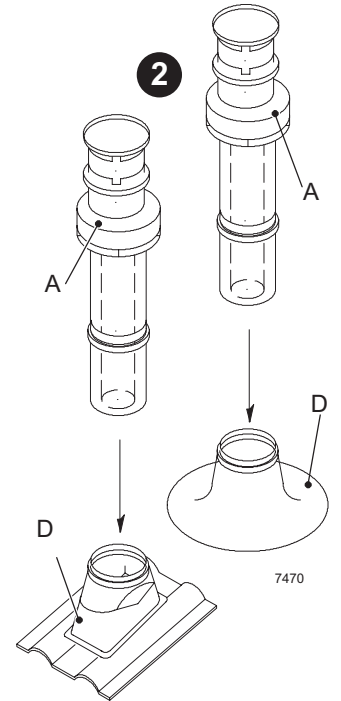
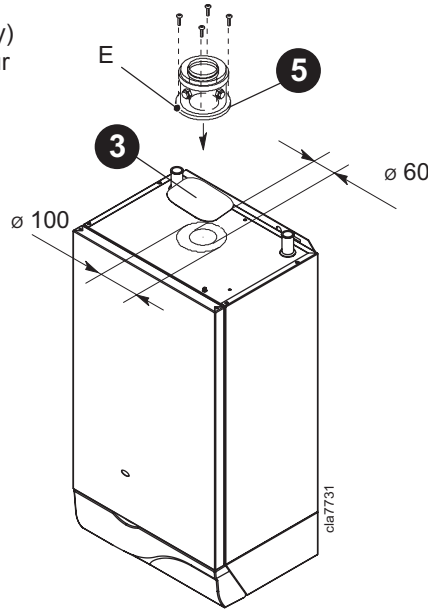
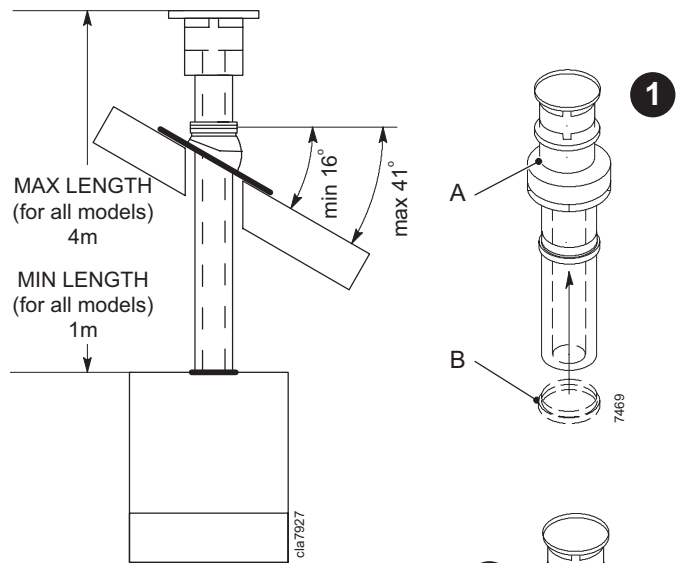
Determine the correct height that the flue should terminate above the roof. If after calculating or measuring the overall flue height from the top of the boiler, it is necessary to cut both pipes of assembly A, then ensure they are cut equally leaving the inner flue tube longer than the outer air tube as supplied. (Refer to No. 7 below)

Ensure the cut pipe ends are free from any burrs.

1. Ensure the flue seal collar B is located onto the flue assembly A.
2. Position the roof flashing plate D (supplied separately) over the hole cut in the roof and insert flue assembly A from the roof end.
3. Remove the casing top blanking plate and gasket and refit to the boiler rear flue hole.
4. Fit the boiler vertical conversion kit (to be found in the vertical connector kit). Refer to Frame 26 No's 2 to 7.
5. Push fit the vertical connector E (supplied separately) into the boiler flue connection and retain with the four securing screws provided.
6. "Push" fit extension duct F (if required (supplied separately)) and the roof flue kit assembly A into the vertical connector E.
7. If the last extension duct requires cutting, measure the distance (outer ducts) between the duct and the terminal and add 100 mm to this dimension. This gives the length of the last extension duct.

Note. Check the position of the inner flue duct relative to the outer duct on the assembled extension duct(s) and ensure the terminal flue duct is cut longer than the air duct to ensure engagement in the final flue duct seal.

8. Slide down and position the flue seal collar B over the roof plate D and secure it with the 3 screws C to the flue assembly A.
9. Finally ensure the roof flashing plate D is correctly sealed to the roof.



INSTALLATION

36 GAS CONNECTION

Refer to 'Gas Supply', page 8.

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 CONDENSATE DRAIN

Refer also to the British Gas document: 'Guidance Notes for the Installation of Domestic Gas Condensing Boilers' (1989).

The boiler comes with a built in condensate siphon trap. The boiler condensate drain must be connected to a drainage point, preferably within the building. This condensate drainage should be run in standard 21.5mm overflow pipe. Connection to the boiler is made by fitting the siphon nut and sealing washer to the threaded siphon outlet.

Ensure that the condensate siphon is full of water before commissioning the boiler. Refer to Frames 19 and 27.

The routing of the drain must be made to allow a minimum fall of 1 in 20 away from the boiler, throughout its length.

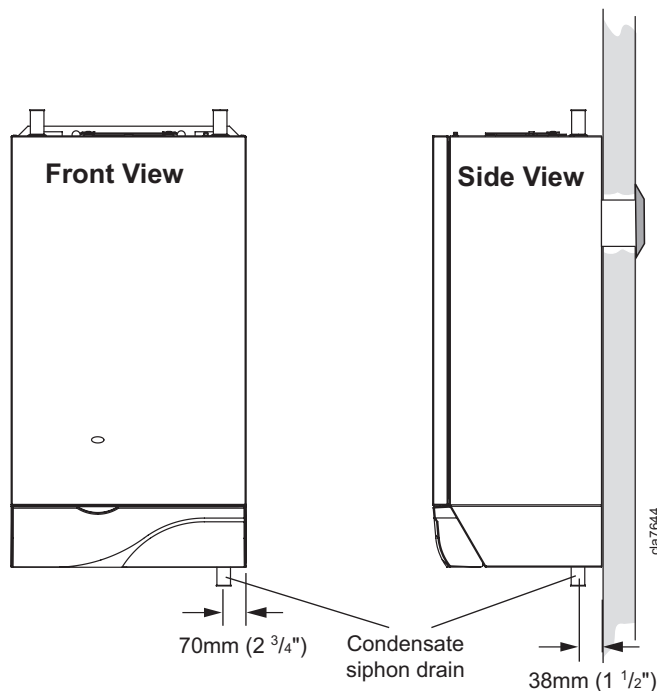
The drainage pipework must be arranged so that obstruction (e.g. through freezing) of external drainage pipes does not give rise to spillage within the dwelling.

IMPORTANT.

If excessive external pipework cannot be avoided a condensate removal pump (available as an option) and insulation are recommended to prevent possible freezing.

All pipework and fittings in the condensate drain system must be made of plastic. No other materials may be used.

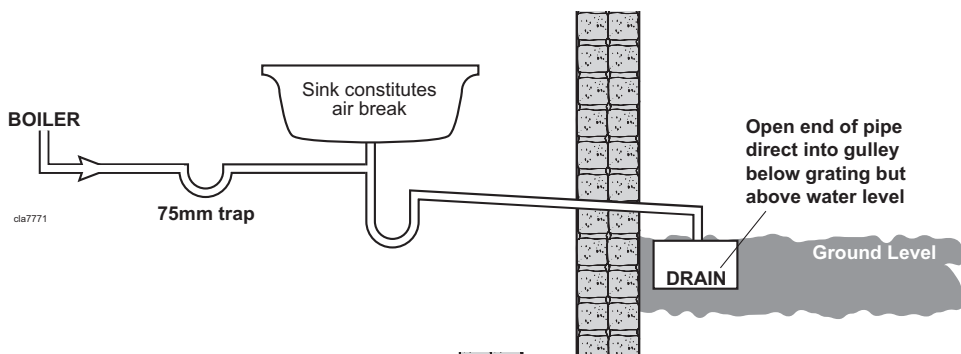
The drain outlet on the boiler is standard 21.5mm overflow pipe. This size must not be reduced in any part of its length.



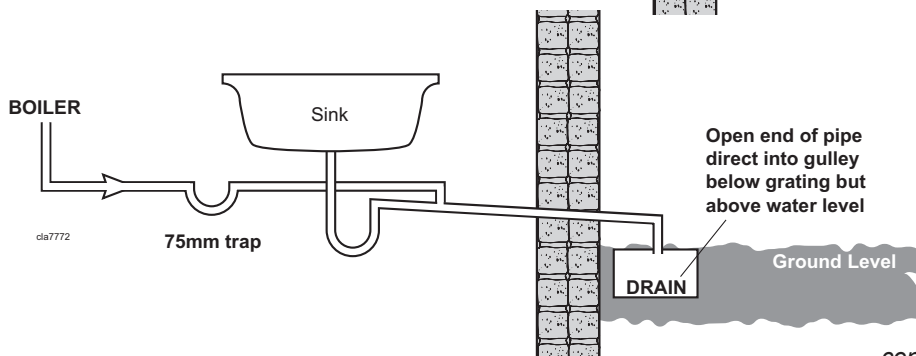
39 CONDENSATE PIPE TERMINATION CONFIGURATIONS

Note. ALL EXTERNAL PIPE RUNS MUST BE INSULATED

1. INTERNAL TO SINK WASTE UPSTREAM OF SINK WASTE TRAP



2. INTERNAL TO SINK WASTE DOWNSTREAM OF SINK WASTE TRAP (PREFERRED METHOD)



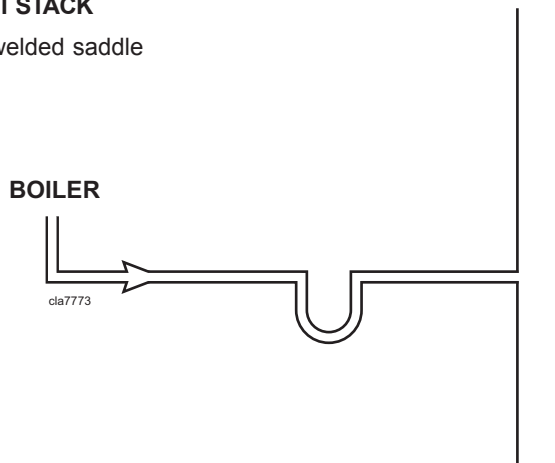
* If drain termination is to soil stack, a 75mm trap will be required

continued . . .

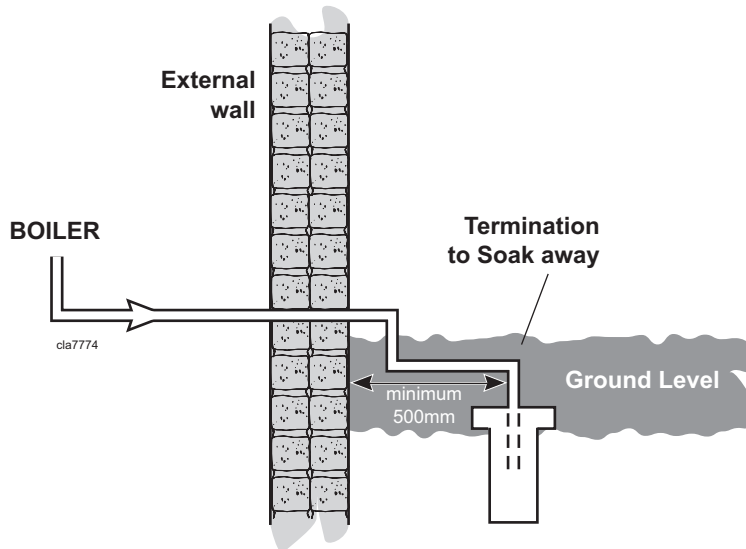
40 CONDENSATE PIPE TERMINATION CONFIGURATIONS . . . *continued*

3. INTERNAL CONNECTION TO SOIL AND VENT STACK

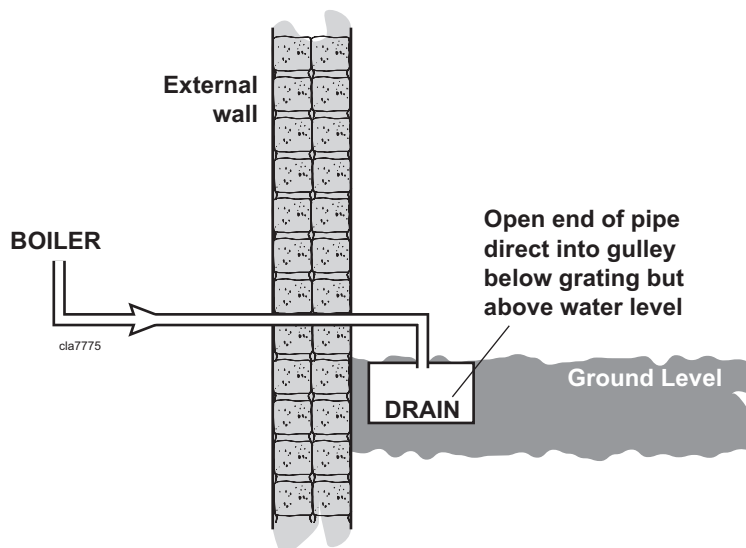
* Make connection to SVP using a solvent welded saddle



4. TERMINATION TO SOAKAWAY



5. TERMINATION TO DRAIN / GULLEY



INSTALLATION

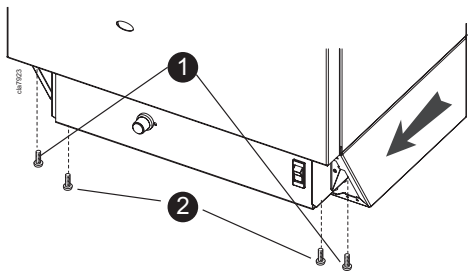
41 ELECTRICAL CONNECTIONS

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. For IE reference should be made to the current ETCI rules for electrical installations.

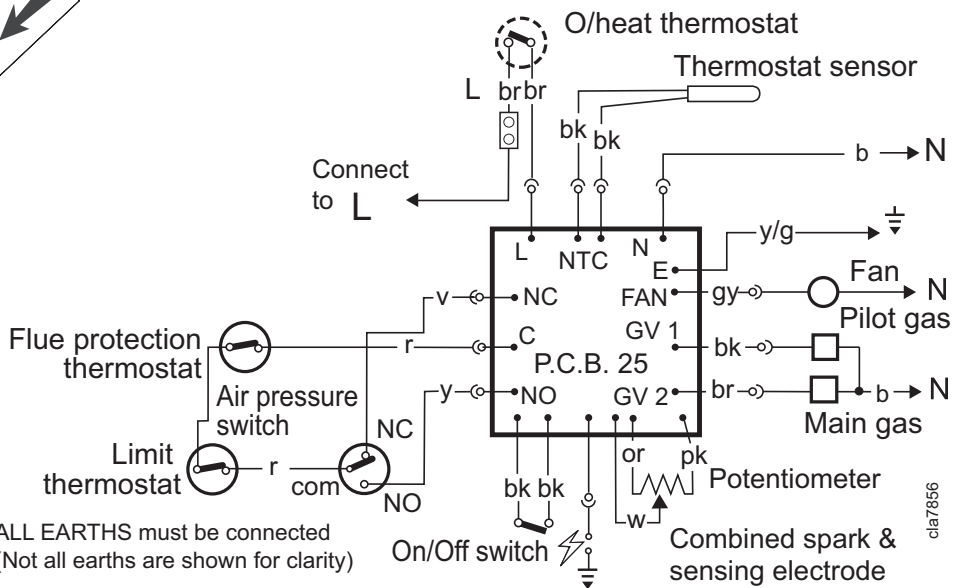
Connection must be made in a way that allows complete isolation of the electrical supply - such as a double pole switch, having a 3mm (1/8") contact separation in both poles or a plug and socket, serving only the boiler and system controls. The means of isolation must be accessible to the user after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

1. Remove controls pod by slackening front fixing screws and pull pod forward (may find it easier to remove the controls pod door).
2. Remove the control box securing screws. Swing the box down into the servicing position. Refer to Frame 49.

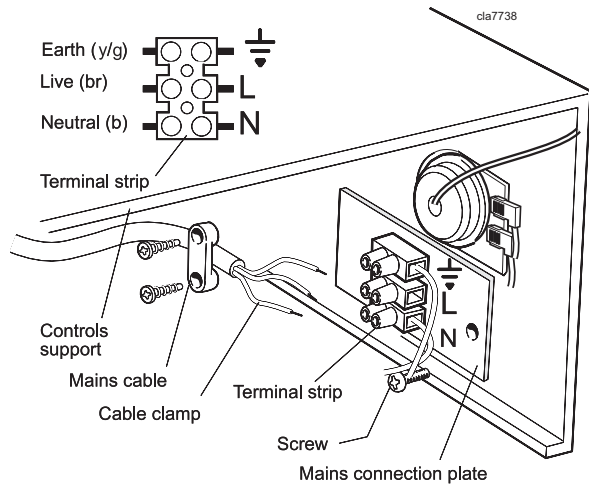


Flow wiring diagram

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



3. Route the mains cable into the box from the RHS of the boiler.
4. Connect the live, neutral and earth wires into the terminal strip as shown.
5. Secure the mains lead with the cable clamp.
6. On completion of all wiring connections, relocate the control box and secure.



42 EXTERNAL CONTROLS

External wiring must be in accordance with the current I.E.E. (BS 7671) Wiring Regulations. For Ireland reference should be made to the current ETCI rules for electrical installations.

The wiring diagrams illustrated in Frames 43-46 cover the systems most likely to be fitted to this appliance.

For wiring external controls to the classic HE boiler, reference should be made to the system wiring diagrams supplied by the relevant manufacturer, in conjunction with the wiring diagrams shown in Frames 43-46.

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 46.

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.

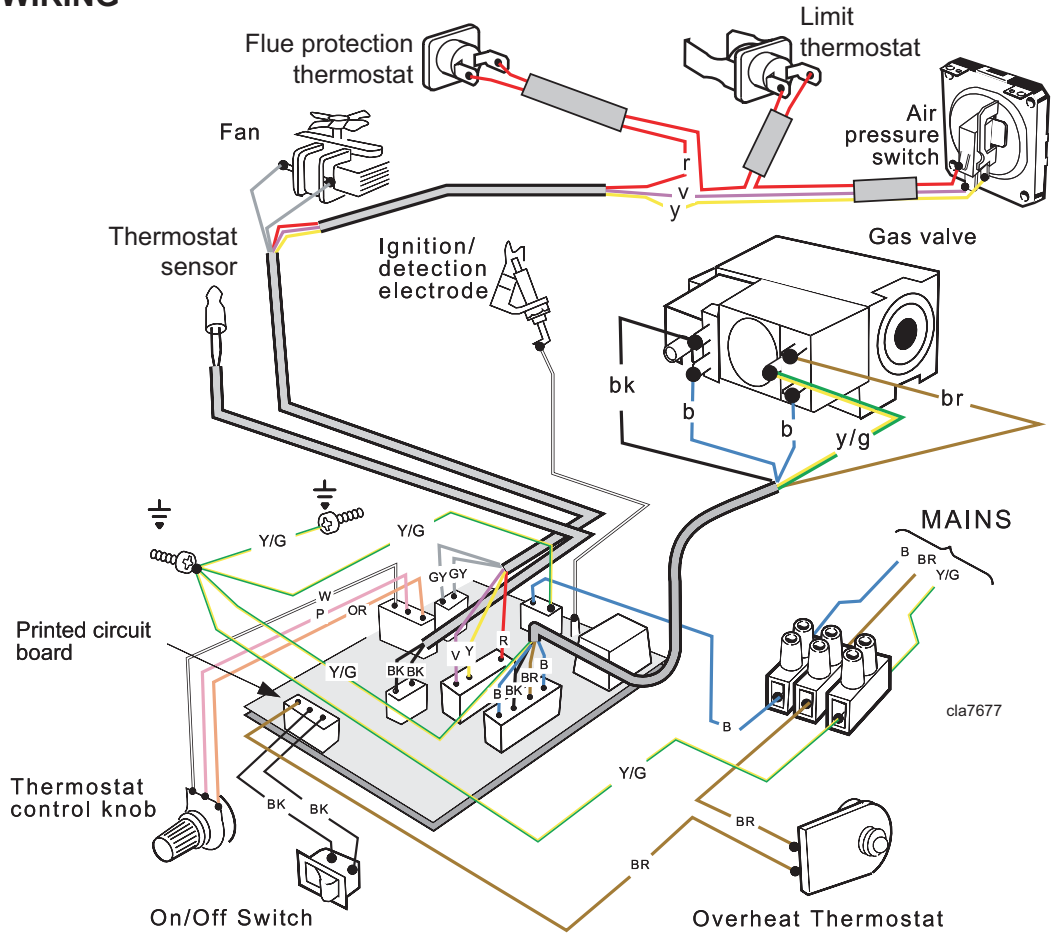
1. Connection between a frost thermostat and the time control should be made without disturbing other wiring.
2. A frost thermostat should be sited in a cool place in the house, but where it can sense heat from the system.

INSTALLATION

43 PICTORIAL WIRING

LEGEND

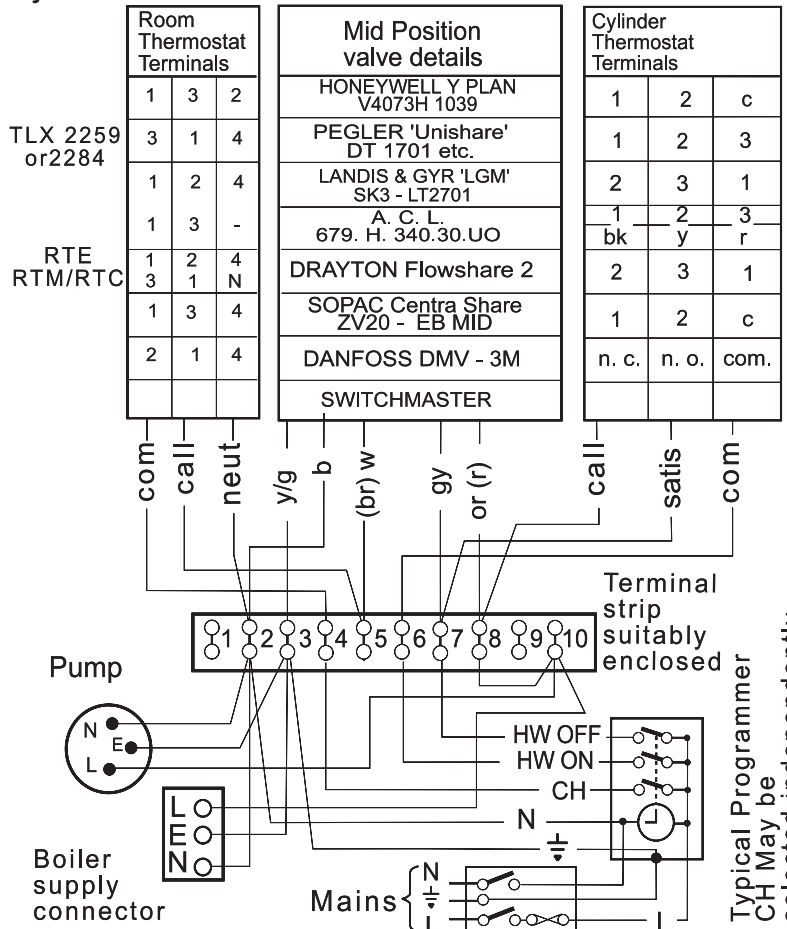
- b - blue
- bk - black
- br - brown
- gy - grey
- or - orange
- pk - pink
- r - red
- v - violet
- w - white
- y - yellow
- y/g - yellow/green



44 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.



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

INSTALLATION

45 TWO SPRING CLOSED VALVE

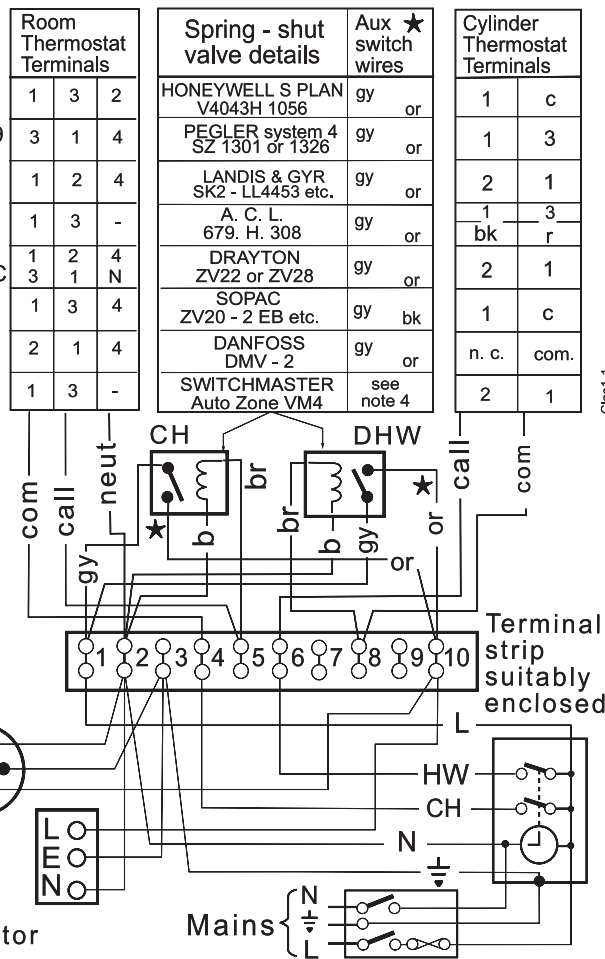
Pumped only

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.

TLX 2259
or 2284

RTE
RTM/RTC

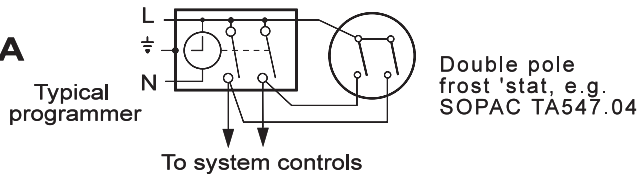


LEGEND

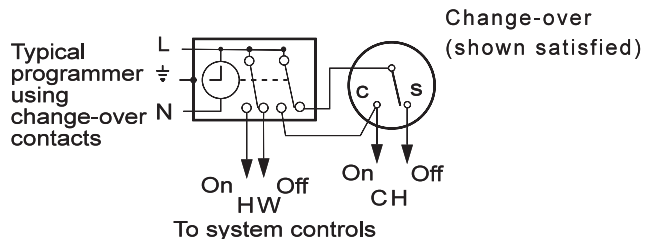
- | | |
|-----|--------------|
| gy | grey |
| b | blue |
| bk | black |
| br | brown |
| r | red |
| y | yellow |
| w | white |
| y/g | yellow/green |
| or | orange |
| v | violet |
| pk | pink |

46 FROST PROTECTION

A



B



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.

47 COMMISSIONING AND TESTING

The Benchmark Log Section of this book or equivalent self certification should be completed and signed to demonstrate compliance with Building Regulations.

A. ELECTRICAL INSTALLATION

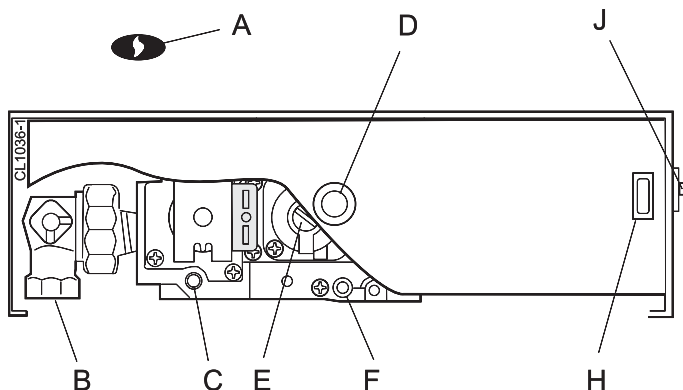
1. Checks to ensure electrical safety should be carried out by a competent person.
2. ALWAYS carry out preliminary electrical system checks, i.e. earth continuity, polarity, resistance to earth and short circuit using a suitable test meter.

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. In IE refer to I.S.813:2002.
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.**

48 INITIAL LIGHTING



LEGEND

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

8. Set the boiler thermostat knob (D) to position 6 and the boiler Mains On/Off switch (H) 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 boiler 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 4):
 - a. Set the mains On/Off switch (H) 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).
 - 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 (H) 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 Commissioning Checklist.
13. Set the main On/Off (H) 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.
18. After the gas pressure checks and any adjustment operations, the adjustment screw cover must be sealed with a suitable paint to highlight unauthorised adjustment.

continued

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 (H) is OFF.
3. **Fitting the Boiler Casing** (See diagram A, Frame 49)

Hook the top edge of the boiler front 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.

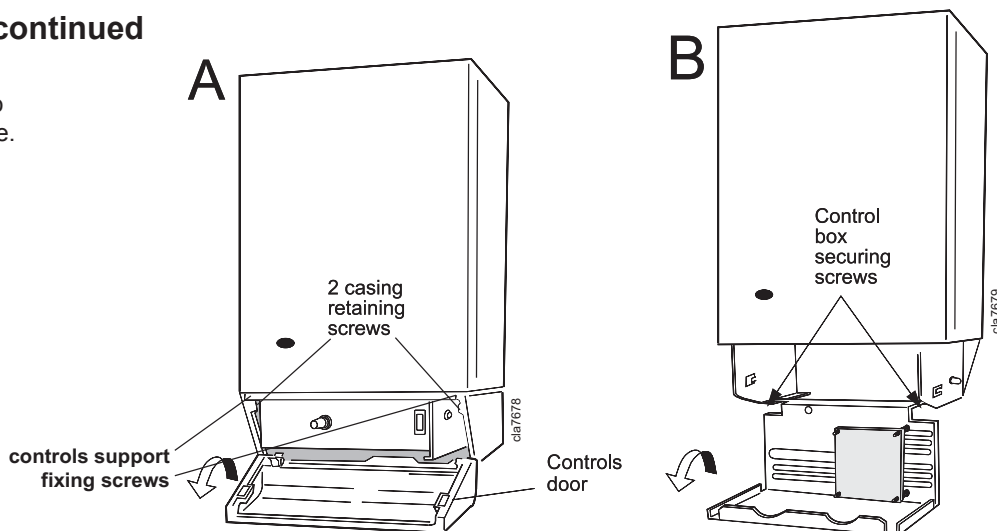
To gain access to the gas valve:

- 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, Frame 49) .
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.

INSTALLATION

49 INITIAL LIGHTING - continued

19. Swing the control box back into its working position and secure.
20. Refit the controls pod to the boiler casing and tighten the 2 front fixing screws.
21. Close the pod door.



50 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.

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.

5. Finally, set the controls to the user's requirements.
The temperatures quoted above are approximate and vary between installations.

51 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. In IE contact a Competent Person.
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 and commissioning please complete the *benchmark* Commissioning Checklist before handover to the customer. For IE, it is necessary to complete a "Declaration of Conformity" to indicate compliance to I.S. 813:2002.**
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. In IE servicing work must be carried out by a Competent Person.

52 SERVICING 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. In IE service work must be carried out by a Competent Person.

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.

1. 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.
2. Connect a suitable gas analyser to the sampling point on the top RHS of the back panel. For correct boiler operation the CO/CO₂ 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 3.
3. Clean the main burner. Refer to Frame 56.
4. Clean the heat exchanger. Refer to Frame 55.

5. Clean the main and pilot injectors. Refer to Frame 56.
6. Clean the recuperator. Refer to Frame 57.
7. Remove and clean the siphon. Refer to Frame 58 and then check the drain for blockage.
8. Remove any debris from inside the base of the casing.
9. Check that the flue terminal is unobstructed and that the flue system is sealed correctly.
10. 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 54 to 60 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. Refer to Frame 48, item 18 for gas adjustment sealing.

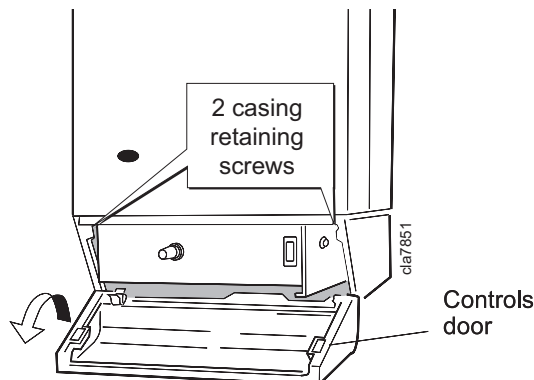
When work is complete the casing **MUST** be correctly refitted, ensuring that a good seal is made.

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

11. Complete the service section of the Benchmark Commissioning Checklist.

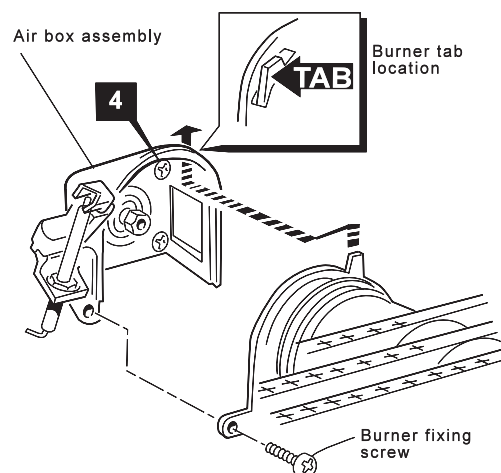
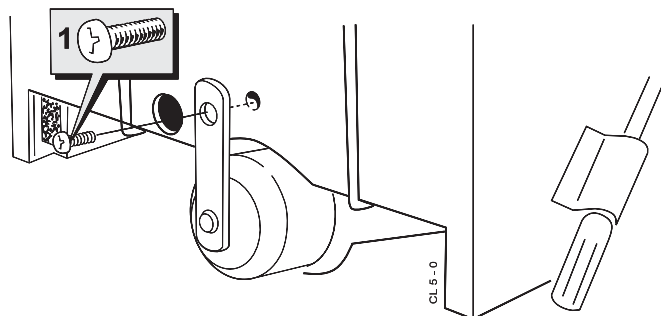
53 BOILER FRONT PANEL REMOVAL

1. Open the controls pod door and release the 2 captive screws at the bottom of the casing, then unhook the casing front panel from the back panel and remove. Retain the front panel in a safe place.
2. Isolate the gas supply at the service cock fitted to the boiler.



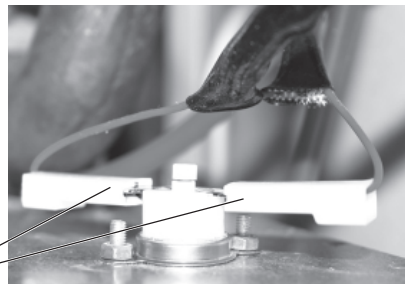
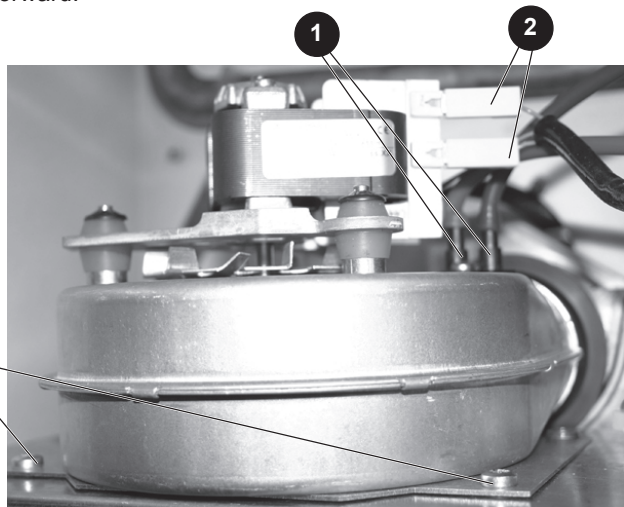
54 BURNER AND AIR BOX REMOVAL

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 2 control box fixing screws. Swing the box downwards 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.



55 CLEANING THE FAN ASSEMBLY / THE FLUEWAYS

1. Remove the air pressure switch and CO/CO₂ sensing pipes.
2. Disconnect the electrical connections.
3. Remove the 2 fan fixing screws and remove the fan by pulling forward.
4. Pull off the two electrical connections to the flue protection thermostat.



5. Slacken the two M5 nuts on the front tie rods, releasing the tie rods from the combustion chamber.
6. Unhook the rear collector hood tags and remove collector hood.
7. Remove the flue baffles.
8. Remove all loose deposits from the heat exchanger, particularly between the fins, using a suitable brush.
9. Check that the fan impellor runs freely. Remove any debris from the impellor with a soft brush.
10. Re-assemble in reverse order.

56 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.

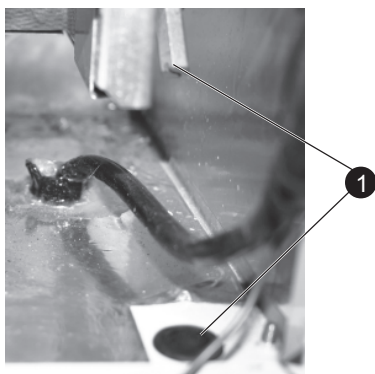
Check that:

- a. The pilot burner injector is not blocked or damaged. Refer to Frame 67 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 67) Clean or renew as necessary.

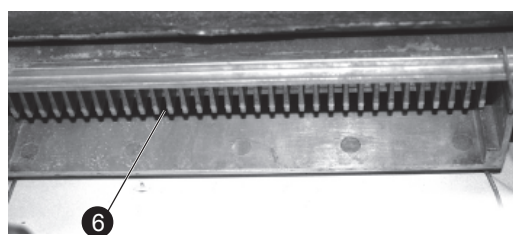
Note. *The pilot shield is located around the pilot assembly bracket and is located by the electrode retaining nut.*

57 CLEANING THE RECUPERATOR

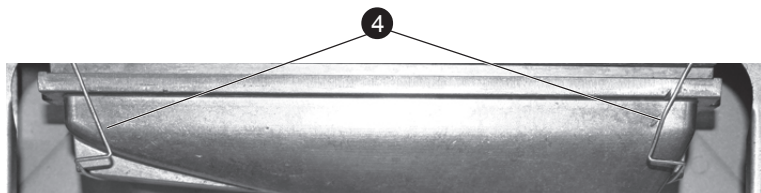
1. Remove the 2 rubber grommets to gain screwdriver access to remove the side tie rods retaining the combustion chamber and remove the tie rods. Also remove the two front tie rods.
2. Remove the combustion chamber.
3. Remove the sump rubber hose connection.
4. Unclip the two side sump retention clips and remove the sump.



5. Clean the sump of any debris.
6. Clean between the recuperator fins with a suitable strip of steel.

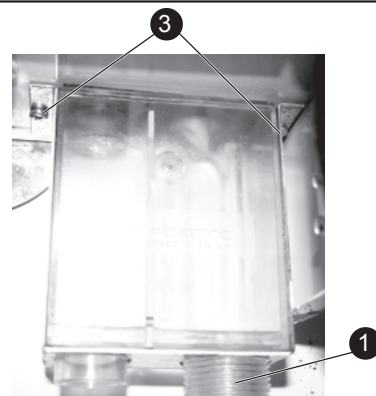
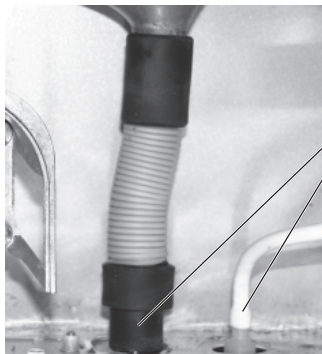


7. Re-assemble in reverse order, ensuring rubber grommets are replaced.



58 CLEANING THE SIPHON

1. Unscrew the siphon union connection.
2. Remove the rubber sump connection pipe and the blockage sensing pipe.
3. Remove the two siphon retaining screws and remove siphon.
4. Thoroughly clean the siphon.
5. Recharge the siphon with water.
6. Re-assemble in reverse order. Ensuring the rubber sump connection pipe and blockage sensing pipe are correctly replaced.



59 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 and side tie rods. Tighten the nuts and screw. Ensure that the sealing gasket is compressed.
3. Refit the fan, fan electrical connections, the thermostat electrical connections, the red pressure sensing pipe, the blue CO/CO₂ sensing pipe and the two fan fixing screws.
4. Refit the air box assembly and burner. Ensure that the

- burner front fixing is refitted.
5. Refit the combustion chamber, (replacing the rope seal if necessary) ensuring the two rubber sealing grommets are replaced.
6. Reconnect the gas supply and the electrical wiring. Refer to Frames 36 & 41.
7. Check the sightglass in the boiler casing. Clean or renew as necessary. Refer to Frame 62.
8. Check for gas soundness. Check the gas service cock and pressure test point.
9. Refit the boiler casing (refer to Frame 49). Note that it is not necessary to disturb the controls casing pod.
10. Close the controls pod door.

60 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 67) 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 48.

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 48.

REPLACEMENT OF PARTS

61 GENERAL

When replacing any component:

1. Isolate the electricity supply.
2. Turn OFF the gas supply.
3. Remove the boiler front panel. Refer to Frame 53.

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:

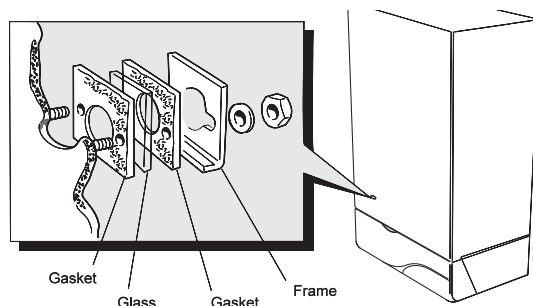
Neon I3. Mains electricity ON.

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

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

62 SIGHTGLASS REPLACEMENT

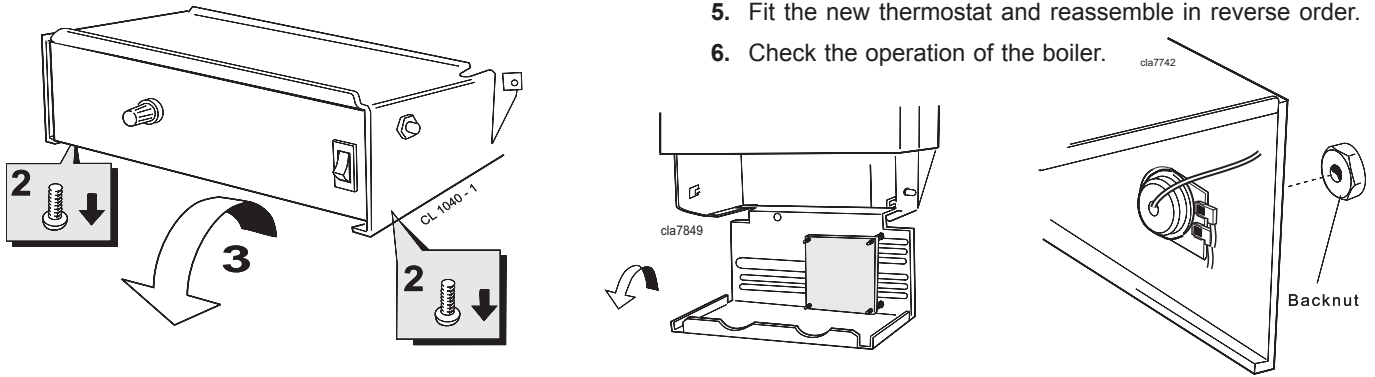
1. Refer to Frame 61.
2. Unfasten the 2 nuts and washers holding the sightglass assembly to the casing front panel.
3. When fixing the new assembly ensure that the parts are in the correct order. The frame must have the return edge at the bottom.
4. Retighten the 2 nuts to ensure an airtight seal. Do NOT overtighten.
5. Replace the boiler front panel. Refer to Frame 49.



SERVICING

63 OVERHEAT THERMOSTAT REPLACEMENT

1. Refer to Frame 61.
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 casing. Withdraw the thermostat phial from the heat exchanger pocket and unclip from the casing.
5. Fit the new thermostat and reassemble in reverse order.
6. Check the operation of the boiler.



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

Refer also to Frame 61.

- A. Remove the control box fixing screws
- B. Swing the control box down into the servicing position.

Thermostat control

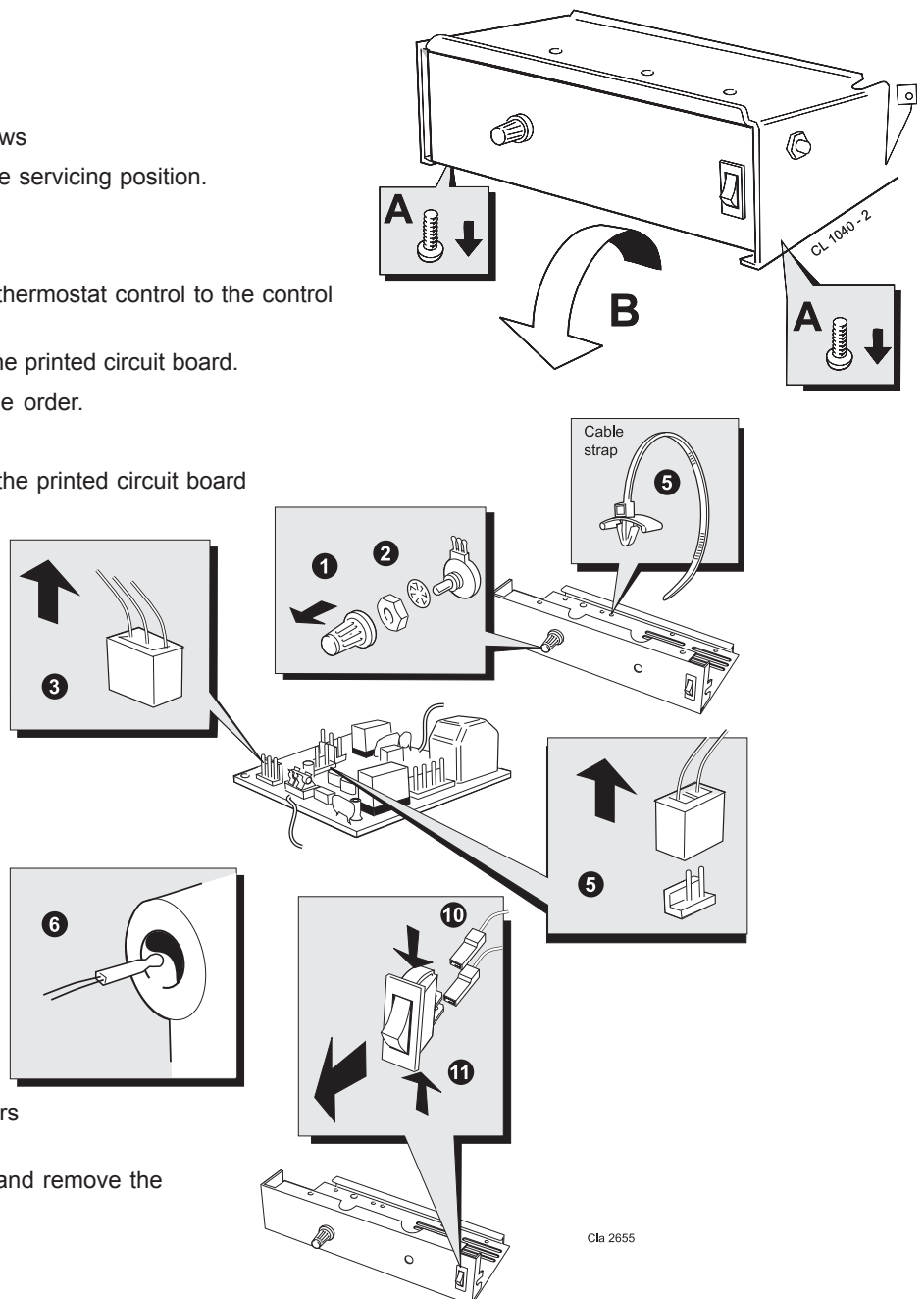
1. Pull the knob off the shaft.
2. Remove the backnut securing the thermostat control to the control box.
3. Pull off the Molex connector from the printed circuit board.
4. Replace and reassemble in reverse order.

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 casing.
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.

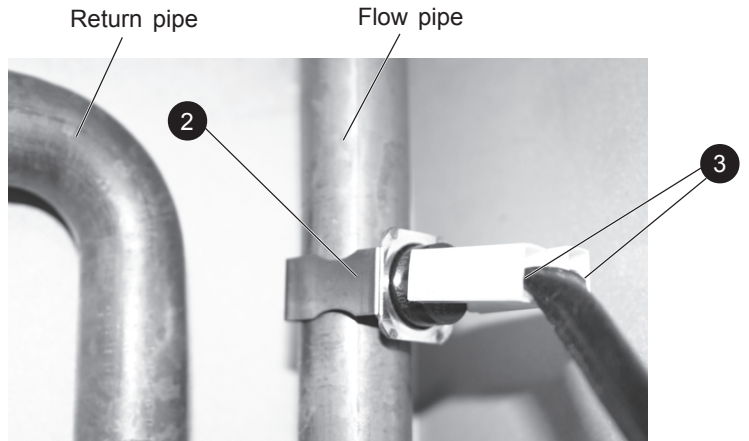


SERVICING

65 LIMIT THERMOSTAT REPLACEMENT

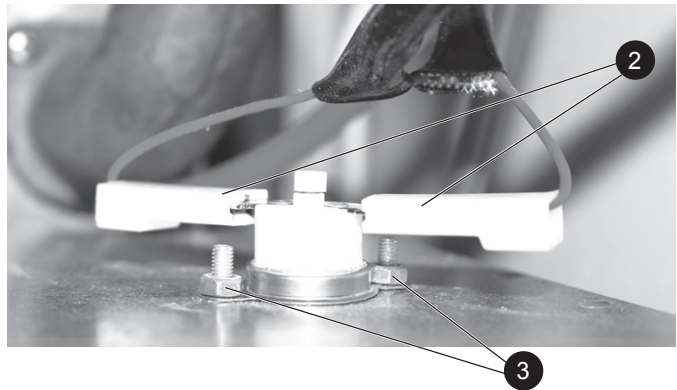
1. Refer to Frame 61.
2. Remove the limit thermostat assembly from the boiler flow pipe.
3. Disconnect the electrical connectors
4. Clip new thermostat onto flow pipe
5. Reassemble in reverse order.

NOTE. UNDER NO CIRCUMSTANCES REFIT THE LIMIT THERMOSTAT ONTO THE RETURN PIPE

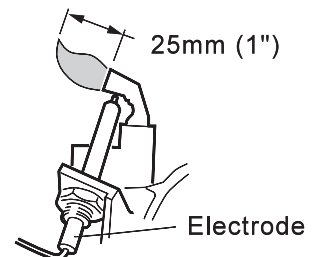
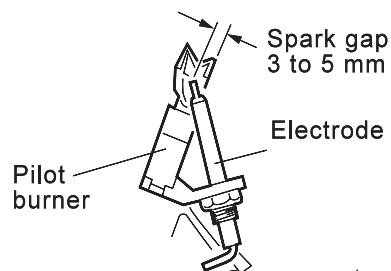
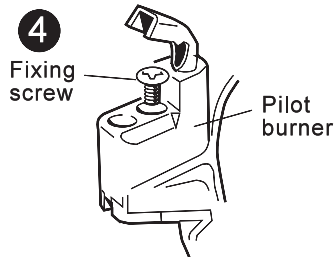
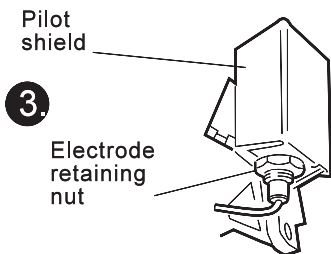


66 FLUE PROTECTION THERMOSTAT REPLACEMENT

1. Refer to Frame 61.
2. Pull off the two electrical connections.
3. Remove the two nuts retaining the flue protection thermostat.
4. Replace the thermostat and re-assemble in reverse order



67 PILOT BURNER REPLACEMENT

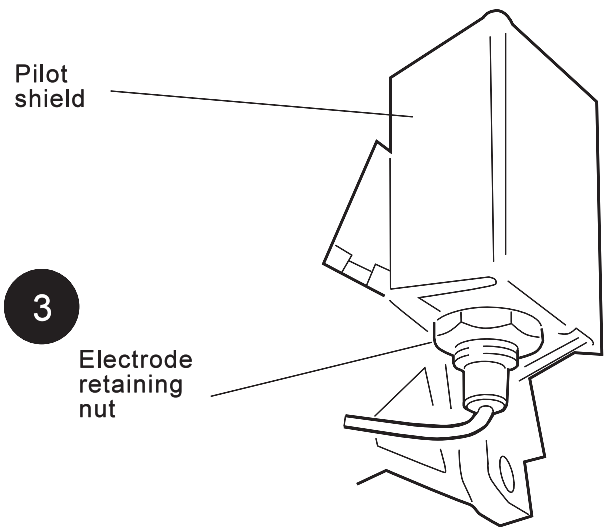


1. Refer to Frame 61.
2. Remove the burner and air box assembly. Refer to Frame 54.
3. Remove the electrode retaining nut and remove the pilot shield and electrode.
4. Unscrew the central pilot fixing screw and lift the pilot clear of the pilot injector. The pilot injector may now be unscrewed if required.
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.

SERVICING

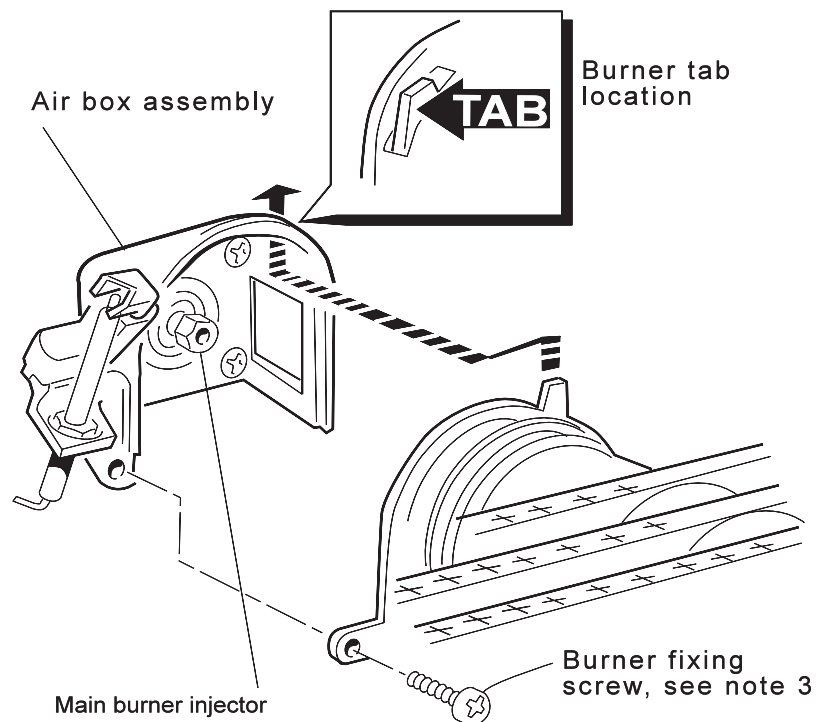
68 IGNITION ELECTRODE AND LEAD REPLACEMENT

1. Refer to Frame 61.
2. Remove the burner and air box assembly. Refer to Frame 54.
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 67.
8. Reassemble in reverse order.
9. Check the operation of the boiler.



69 MAIN BURNER AND MAIN BURNER INJECTOR REPLACEMENT

1. Refer to Frame 61.
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.



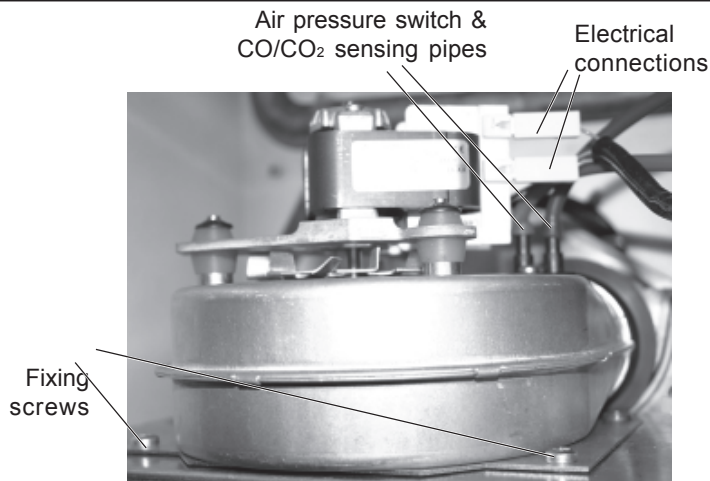
70 GAS CONTROL VALVE REPLACEMENT

1. Refer to Frame 61.
2. Remove the burner and air box assembly. Refer to Frame 54.
3. Remove the control box 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.
12. Refer to Frame 48, item 18 for gas adjustment sealing.

SERVICING

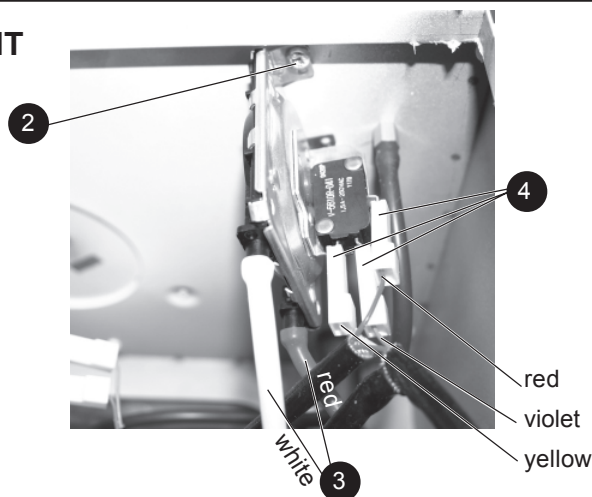
71 FAN REPLACEMENT

1. Refer to Frame 61.
2. Remove the two fan electrical connections, the red pressure sensing pipe, the blue CO/CO₂ sensing pipe and the two fan fixing screws.
3. Pull the fan forward, remove and retain.
4. Fit the new fan and reassemble in reverse order, ensuring the fan leads, 2 sensing tubes and the two fan fixing screws are reconnected.
5. Check the operation of the boiler.



72 AIR PRESSURE SWITCH (APS) REPLACEMENT

1. Refer to Frame 61.
2. Remove the APS fixing screw.
3. Remove the 2 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.



73 PRINTED CIRCUIT BOARD (PCB) REPLACEMENT

1. Refer to Frame 61.
2. Remove the control box 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.

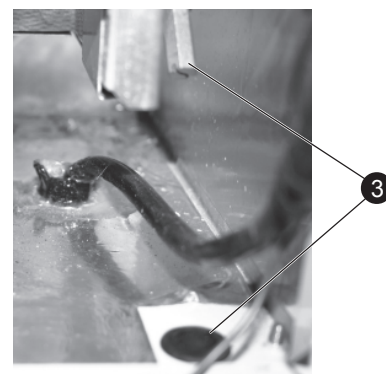
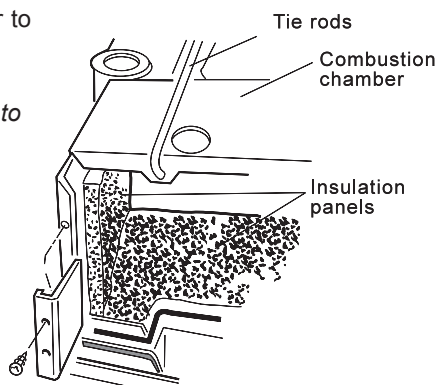
7. Check the operation of the boiler.

Fuse.

To change the fuse, prise it out of the holder and disengage the fuse. Refer to Frame 78 for fuse location.

74 COMBUSTION CHAMBER INSULATION REPLACEMENT

1. Refer to Frame 61.
2. Remove the burner and air box assembly. Refer to Frame 54.
3. Remove the 4 tie rods.
Note. remove rubber grommets to gain access to side tie rod screwdriver slots.
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.



SERVICING

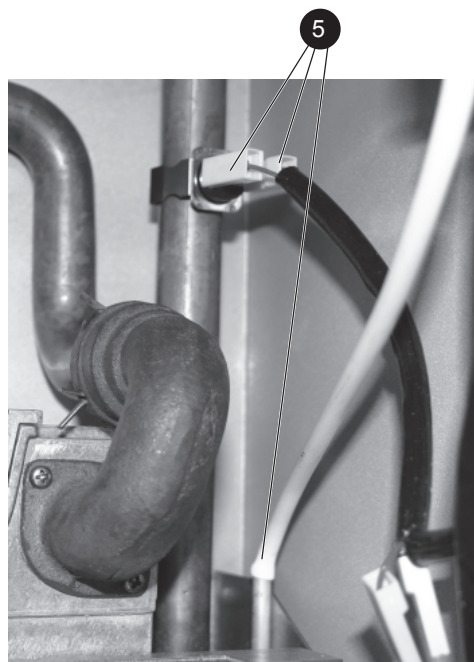
75 HEAT EXCHANGER REPLACEMENT

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

1. Refer to Frame 61.
2. Remove the burner / air box assembly. Refer to Frame 54.
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 55. Pull off the electrical connections from the overheat thermostat and pull off the white rubber tube from the siphon blockage sensing pipe.
6.
 - a. **Rear Flue Outlet** - Remove the two screws retaining the recuperator top section. Pull the recuperator top section to release the flue pipe connection.
 - b. **Side Flue Outlet** - Remove the 3 screws retaining the top outlet connection casting and remove casting. Refer to Frame 26 No. 6.
7. Remove the combustion chamber by unscrewing the 4 tie rods.
8. Remove the thermostat sensors from the pockets on the heat exchanger by removing the M3 screws and plates.
9. Remove the condensate sump. Refer to Frame 57.
10. Slacken 3 turns only the 2 bottom heat exchanger / interpanel retaining screws and remove the top 2 heat exchanger/interpanel retaining screws
11. 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.

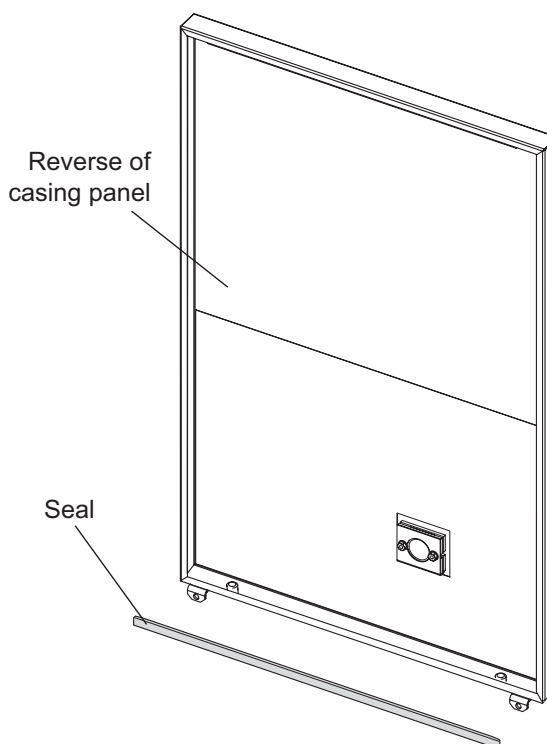
Note. Take care with any residual water held in the heat exchanger/ recuperator.

12. Remove the 2 rubber sealing grommets from the top of the back panel to facilitate fitting the new assembly.
13. Fit the new heat exchanger assembly, complete with water pipes, and hang it on the bottom key hole slots and screws. Refit the top 2 screws and tighten 4 screws.
14. Replace the 2 rubber sealing grommets.
15. Reassemble in reverse order.
16. Remake all water connections, ensuring that the compression fittings (if used) are correctly refitted.
17. Fully test all functions, including water and gas soundness.



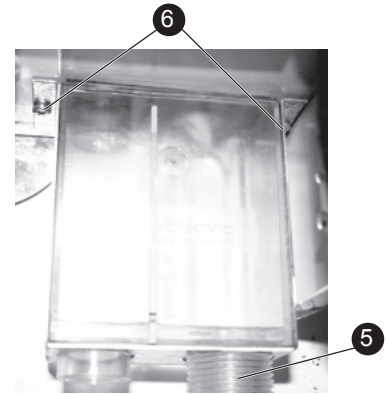
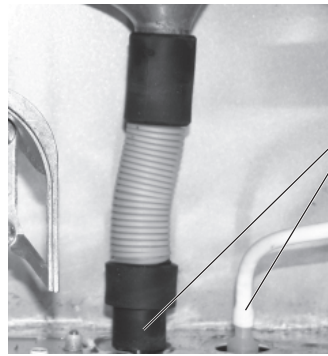
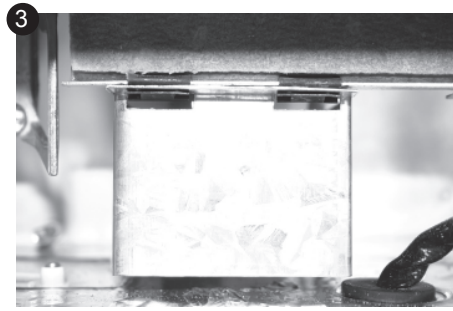
76 CASING FRONT SEAL REPLACEMENT

1. Refer to Frame 61.
2. Remove the old seal from the casing front and thoroughly clean the casing surface.
3. Fit the new self adhesive seal.
4. Replace the boiler casing front.

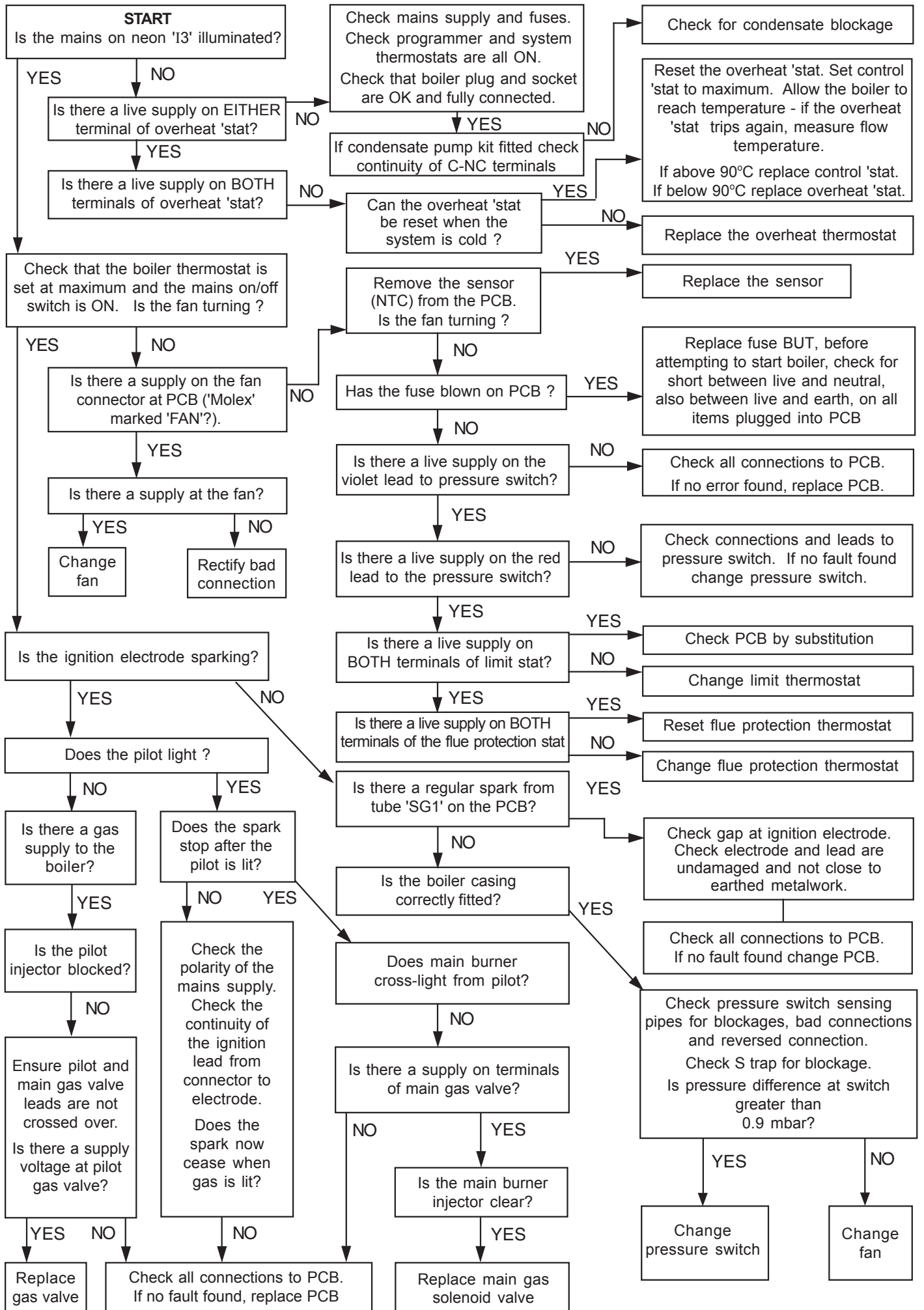


77 SIPHON REPLACEMENT

1. Refer to Frame 61.
2. Remove the burner. Refer to Frame 54.
3. Pull the heat shield forward to remove from clips.
4. Pull off the rubber sump connecting pipe and the blockage sensing pipe.
5. Unscrew the siphon union connection.
6. Remove the two siphon retaining screws and remove siphon.
7. Re-fit the new siphon and gasket and reassemble in reverse order, ensuring the rubber sump connecting pipe and blockage sensing pipe are correctly replaced.
8. Ensure the siphon is charged with water and the heat shield is replaced.



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:

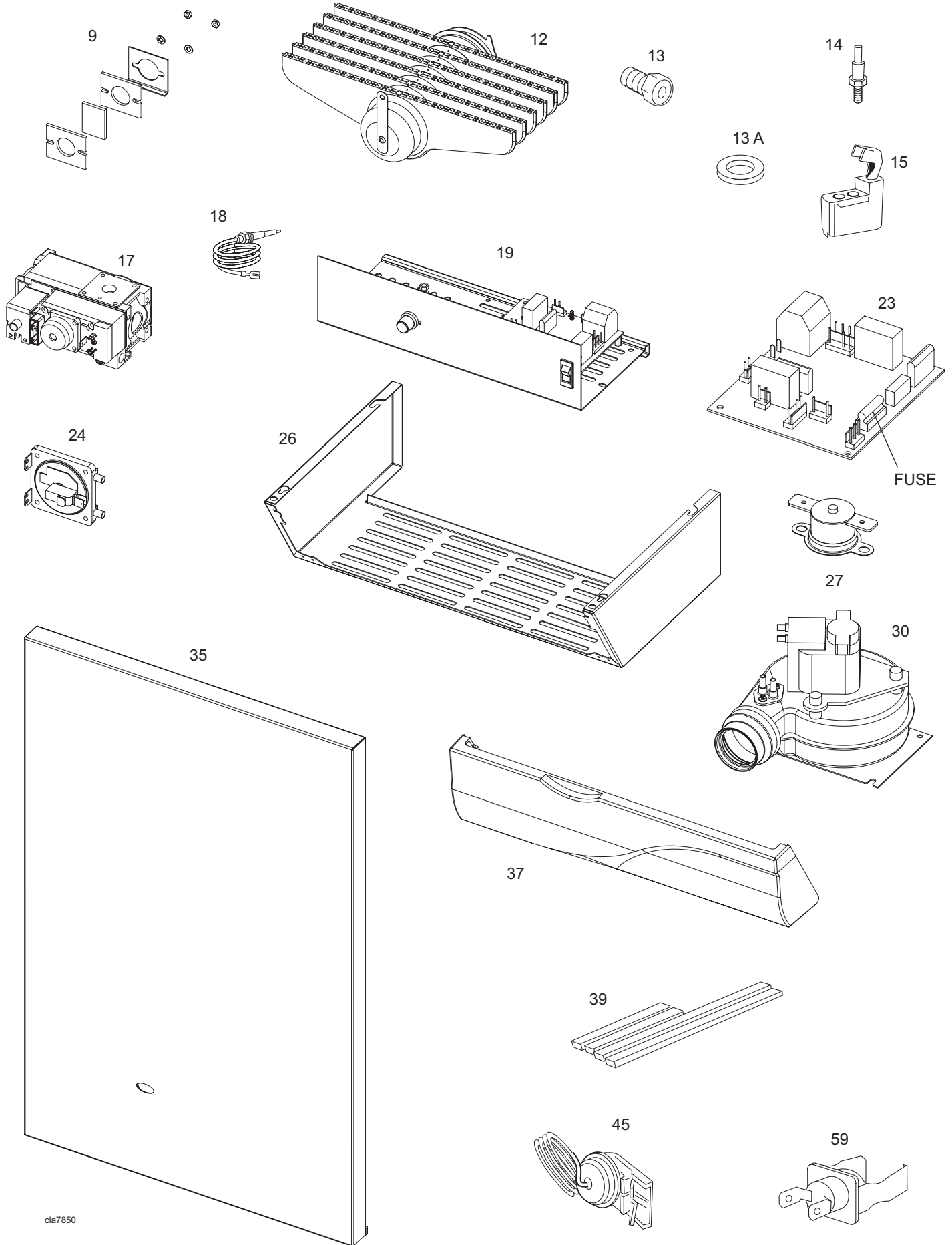
1. Boiler Model
2. Appliance G.C. Number
3. Description
4. Quantity
5. Product Number

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	E72-529	Main Burner Kit	HE9, HE12 HE15, HE18	171 012 174 063
13	E85-308	Main Injector Kit	HE9	171 424
	E83-624		HE12	171 425
	E83-625		HE15	171 426
	E83-626		HE18	171 427
14	E80-493	Pilot Burner Injector Kit	1	171 435
15	E87-018	Pilot Burner Head c/w Injector Kit	1	171 439
17		Gas Valve Kit	1	174 172
18	E83-635	Ignition Electrode Kit	1	171 442
19		Controls Box Kit c/w PCB	1	174 171
23	H20-882	PCB25E	1	173 799
24		Air Pressure Switch Kit	1	174 064
26		Controls Casing Kit	1	174 071
27		Flue Protection Thermostat Kit	1	174 072
30		Fan Assembly Kit	HE9 HE12 HE15 HE18	174 065 174 066 174 067 174 068
35		Front Panel Assembly Kit	1	174 069
37		Control Door Kit	1	173 586
39		Casing Seal and Screws Kit	1	174 070
45	E83-682	Overheat Thermostat (LM7) Kit	1	171 950
59	E97-310	Limit Thermostat Kit	1	173 353

SHORT LIST OF PARTS

78 SHORT PARTS LIST

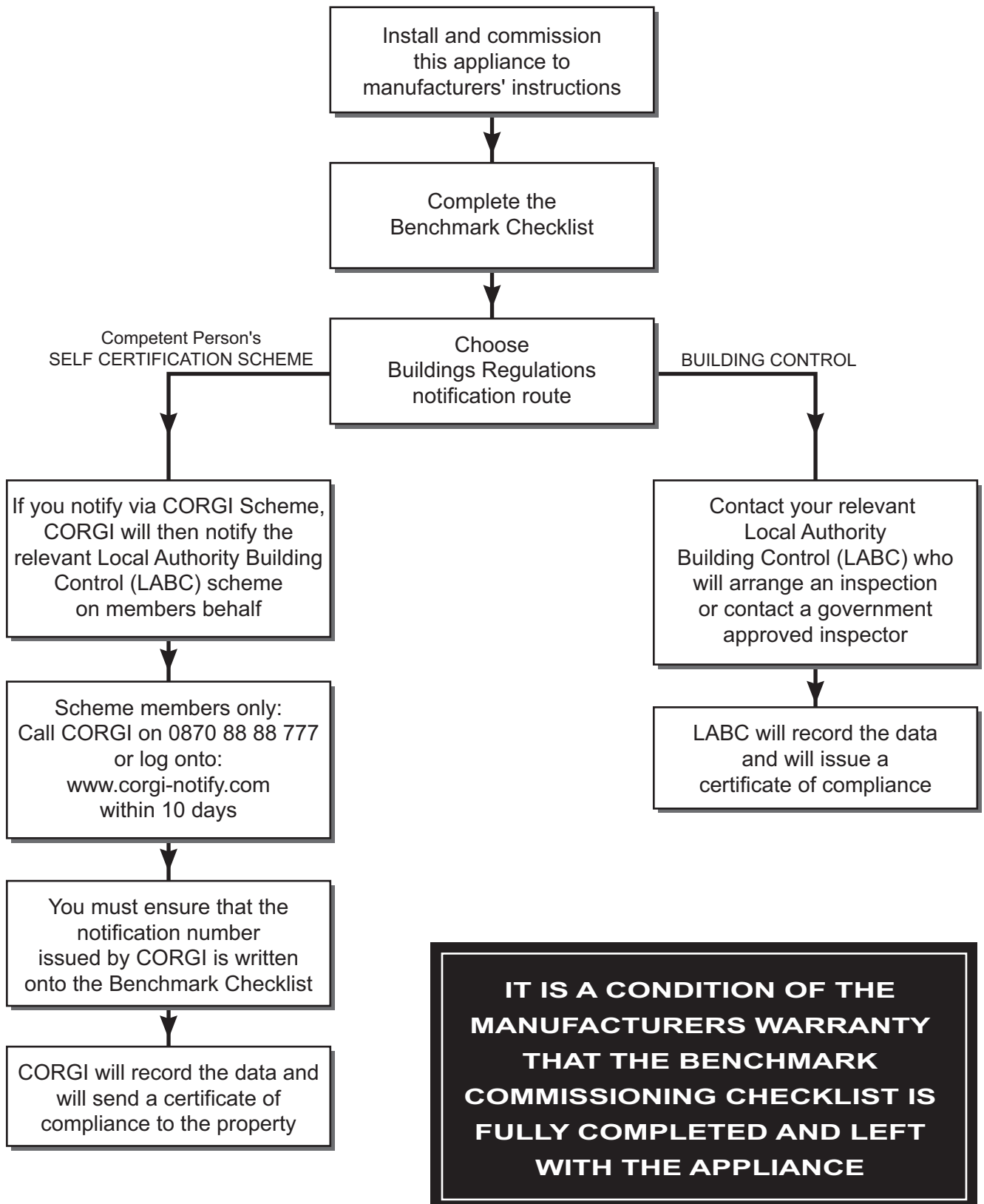


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INSTALLER NOTIFICATION GUIDELINES

IT IS A REQUIREMENT OF CORGI MEMBERSHIP TO REGISTER EVERY GAS APPLIANCE

In addition a change to Building Regulations (England and Wales) requires the installer to notify when installing a heating appliance, as from 1st April 2005.





BENCHMARK No. | | | | | | | |

GAS BOILER COMMISSIONING CHECKLIST

BOILER SERIAL No. _____ NOTIFICATION No. _____

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

TIME & TEMPERATURE CONTROL TO HEATING	ROOM T/STAT & PROGRAMMER/TIMER <input type="checkbox"/>	PROGRAMMABLE ROOMSTAT <input type="checkbox"/>
TIME & TEMPERATURE CONTROL TO HOT WATER	CYLINDER T/STAT & PROGRAMMER/TIMER <input type="checkbox"/>	COMBI BOILER <input type="checkbox"/>
HEATING ZONE VALVES	FITTED <input type="checkbox"/>	NOT REQUIRED <input type="checkbox"/>
HOT WATER ZONE VALVES	FITTED <input type="checkbox"/>	NOT REQUIRED <input type="checkbox"/>
THERMOSTATIC RADIATOR VALVES	FITTED <input type="checkbox"/>	
AUTOMATIC BYPASS TO SYSTEM	FITTED <input type="checkbox"/>	NOT REQUIRED <input type="checkbox"/>

FOR ALL BOILERS CONFIRM THE FOLLOWING

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

THE SYSTEM CLEANER USED _____

THE INHIBITOR USED _____

FOR THE CENTRAL HEATING MODE, MEASURE & RECORD

GAS RATE m³/hr ft³/hr

BURNER OPERATING PRESSURE (IF APPLICABLE) N/A mbar

CENTRAL HEATING FLOW TEMPERATURE °C

CENTRAL HEATING RETURN TEMPERATURE °C

FOR COMBINATION BOILERS ONLY

HAS A WATER SCALE REDUCER BEEN FITTED? YES NO

WHAT TYPE OF SCALE REDUCER HAS BEEN FITTED? _____

FOR THE DOMESTIC HOT WATER MODE, MEASURE & RECORD

GAS RATE m³/hr ft³/hr

MAXIMUM BURNER OPERATING PRESSURE (IF APPLICABLE) N/A mbar

COLD WATER INLET TEMPERATURE °C

HOT WATER OUTLET TEMPERATURE °C

WATER FLOW RATE lts/min

FOR CONDENSING BOILERS ONLY CONFIRM THE FOLLOWING

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

FOR ALL INSTALLATIONS CONFIRM THE FOLLOWING

THE HEATING AND HOT WATER SYSTEM COMPLIES WITH CURRENT BUILDING REGULATIONS

THE APPLIANCE AND ASSOCIATED EQUIPMENT HAS BEEN INSTALLED AND COMMISSIONED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS

IF REQUIRED BY THE MANUFACTURER, HAVE YOU RECORDED A CO/CO₂ RATIO READING? N/A YES CO/CO₂ RATIO

THE OPERATION OF THE APPLIANCE AND SYSTEM CONTROLS HAVE BEEN DEMONSTRATED TO THE CUSTOMER

THE MANUFACTURER'S LITERATURE HAS BEEN LEFT WITH THE CUSTOMER

COMMISSIONING ENG'S NAME PRINT _____ CORGI ID No. _____

SIGN _____ DATE _____

SERVICE INTERVAL RECORD

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

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

SERVICE 1 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 2 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 3 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 4 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 5 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 6 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 7 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 8 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 9 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE

SERVICE 10 DATE

ENGINEER NAME

COMPANY NAME

TEL No.

CORGI ID CARD SERIAL No.

COMMENTS

SIGNATURE



*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 PRODUCT
Manufactured under a BS EN ISO 9001: 2000
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.



i Ideal BOILERS
ENGINEERED FOR PEACE OF MIND

Caradon
Ideal Limited

Ideal Installer/Technical Helpline: 01482 498 663
www.idealboilers.com