

installation and servicing



PACKAGED BOILER CONTENTS HAVE BEEN CHECKED BY OPERATOR No.....	
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icos system (V3 Flue System)

Your Ideal installation and servicing guide

For details of document amendments, refer to page 3

HE15, HE24

For users guide see reverse of book

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.

October 2009 UIN 203320 A05

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

i Ideal BOILERS
The High Efficiency Pioneers

DOCUMENT AMENDMENTS

Relevant Installation changes implemented in this book from Mod LevelA04 (Oct 08) to A05 (Oct 09)

Ideal Stelrad Group reserve the right to vary specification without notice

GENERAL

Table 1 - General Data

Boiler Size			HE15	HE24
Gas supply			2H-G20-20mbar	
Gas Supply Connection			Rc1/2 (1/2" BSP Female)	
Injector size			Stereomatic 5.6mm dia.	
Flow Connection	Central Heating		22mm copper compression	
Return Connection	Central Heating		22mm copper compression	
Flue Terminal Diameter		mm (in)	100 (4)	
Maximum Working Pressure (Sealed Systems)		bar (lb/in ²)	2.5 (36.3)	
Electrical Supply / Power consumption			230 V ~ 50 Hz. / 148 W	
Fuse Rating			External : 3A Internal : T3.15A L 250V	
Water content	Central Heating	litre (gal)	2.0 (0.44)	
Packaged Weight		kg (lb)	50 (110)	
Maximum Installation Weight		kg (lb)	40 (88)	
Boiler Casing Size	Height	mm (in)	687 (27)	
	Width	mm (in)	390 (15 3/8)	
	Depth	mm (in)	278 (11)	

Table 2 - Performance Data

Boiler Size			HE15 Max	HE24 Max	HE15, HE24 Min
Boiler input 'Q' =	Nett CV	kW	15.1	24.4	9.1
		Btu/h	51,500	83,300	31,000
	Gross CV	kW	16.8	27.1	10.1
		Btu/h	57,200	92,500	34,400
Boiler output 'P' =	Gas consumption	l/s (cu.ft/h)	0.43 (54.7)	0.70 (89.0)	0.26 (33.2)
	70 °C Mean water temperature	kW	14.6	23.4	8.8
		Btu/h	50,000	80,000	30,000
	40 °C Mean water temperature	kW	15.5	25.1	9.6
Btu/h		53,000	85,700	32,800	
Seasonal efficiency (SEDBUK) *	Band A		[90.4]%	[90.2]%	
NOx classification			Class 5		

* 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:

- a. For l/s - divide the gross heat input (kW) by the gross C.V. of the gas (MJ/m³)
- b. 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

C₁₃ C₃₃ C₅₃ = 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 up 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.

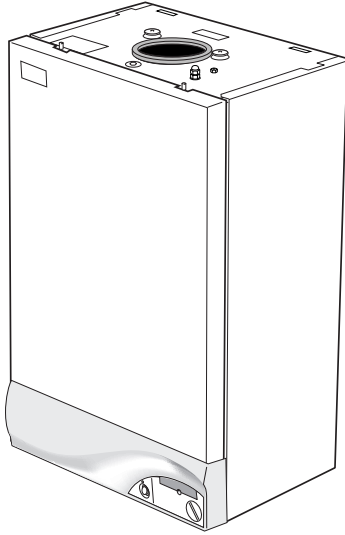
GENERAL

icos system HE15 & HE24

Natural Gas only

Boiler size	G.C. Appliance No. (Benchmark No.)	PI No.
HE15	41 421 99	87 BP 34
HE24	41 397 82	87 BP 34

Destination Countries: GB, IE



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For GB, to comply with Building Regulations Part L1 (Part 6 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.

Before installing this boiler, read the Code of Practice sheet at the rear of this book.

BENCHMARK COMMISSIONING CHECKLIST DETAILS

Boiler	Page	Page	
Make and model	5	Burner operating pressure	n/a
Appliance serial no. on data badge	Front Cover	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	32	Scale reducer	n/a
Time and temperature control to hot water	32	<i>Hot water mode</i>	
Heating zone valves	n/a	Heat input	n/a
TRV's	10	Max. operating burner pressure	n/a
Auto bypass	10	Max. operating water pressure	n/a
Boiler interlock	10	Cold water inlet temp.	n/a
For all boilers		Hot water outlet temp.	n/a
Flushing to BS.7593	12	Water flow rate at max. setting	n/a
Inhibitor	12	For condensing boilers only	
<i>Central heating mode</i>		Condensate drain	22
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 **icos system HE range** is a cast aluminium wall mounted, full sequence, automatic spark ignition, low water content, fanned flue, high efficiency, condensing system gas boiler.

Note. Due to the high efficiency of the boiler a plume of water vapour will form at the terminal during operation.

The output is fully modulating with a range of:

8.8 to 23.4 kW (30,000 to 80,000 Btu/h)

The boiler is supplied fully assembled with circulating pump, pressure gauge, safety valve and expansion vessel.

Variable temperature control is fitted on the user control.

The boiler casing is of white painted coated mild steel with the user controls capable of being mounted remotely from the boiler if the option is required.

The heat exchanger is of cast aluminium.

The boiler is suitable for connection to fully pumped, sealed water systems ONLY.

Adequate arrangements for completely draining the system by provision of drain cocks MUST be provided in the installation pipework.

Pipework from the boiler is routed downwards as standard, but may be routed upwards behind the boiler using the stand-off frame (supplied in a separate kit).

OPERATION

When there is a demand for heat, the heating system is supplied at the selected temperature of between 30°C and 82°C.

Refer also to Frame 1 - 'Boiler Water Circuit Diagram'

The boiler features a comprehensive diagnostic system which gives detailed information on the boiler status when operating, and performance of key components to aid commissioning and fault finding.

SAFE HANDLING

This boiler may require 2 or more 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.

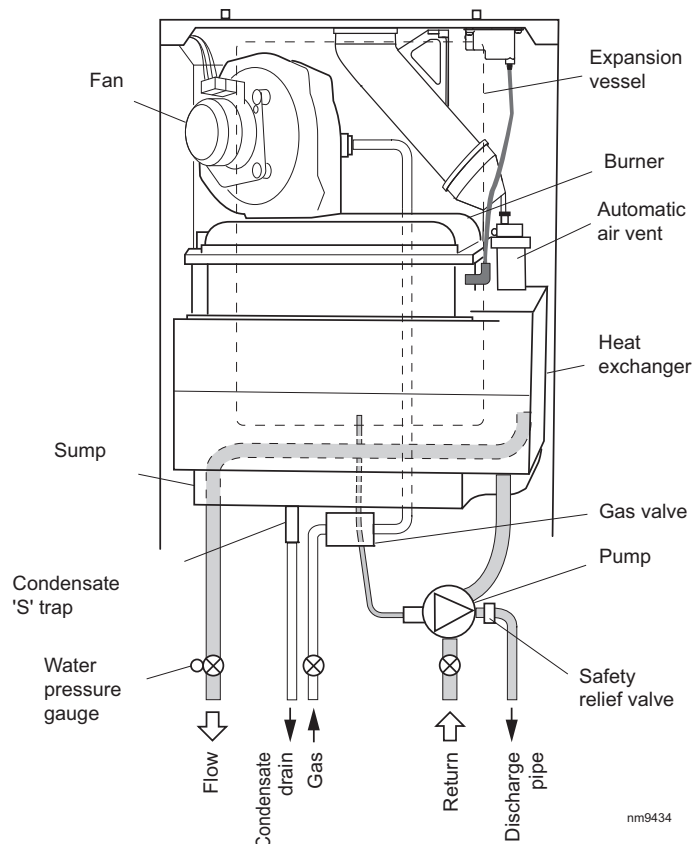
Operatives should be knowledgeable in handling techniques when performing these tasks and the following precautions should be considered:

- Grip the boiler at the base.
- 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.

1 BOILER WATER CIRCUIT DIAGRAM



OPTIONAL EXTRA KITS

- **Flue Extension Ducts** (1000mm long, up to 6m)
- **Flue Finishing Kit**
- **90° Elbow Kit** (Maximum 4 elbows / installation)
- **45° Elbow Kit** (Maximum 4 elbows / installation)
- **Concentric Flue Screw Retaining Kit**
- **Powered Vertical Flue Kit** 5m primary and 17m secondary is a typical maximum length. For alternative maximum lengths refer to Powered Vertical Instructions
- **Roof Flue Kit** (to a maximum of 7.5m)
- **High Level Flue Outlet Kits**
- **Flue Deflector Kit**
- **Weather Collar**
- **Horizontal flue terminal** 600mm long
- **Adjustable Flue Support Bracket**
- **Remote User Controls Kit**
- **Boiler Stand-off Kit**
- **Siphon Kit**
- **Valve Cover Kit**
- **Condensate Pump Kit**

SAFETY

Current Gas Safety (Installation & 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 Gas Safe Registered Engineer. It must be carried out in accordance with the relevant requirements of the:

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

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

In IE, the installation must be carried out by a Registered Gas Installer (RGI) 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. 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).
- BS. 5449** Forced circulation hot water systems.
- BS. 5546** Installation of gas hot water supplies for domestic purposes (2nd Family Gases)
- BS. 6798** Installation of gas fired hot water boilers of rated input not exceeding 70 kW.
- BS. 6891** Low pressure installation pipes.

Health & Safety Document No. 635.

The Electricity at Work Regulations, 1989.

The manufacturer's notes must NOT be taken, in any way, as overriding statutory obligations.

IMPORTANT. These appliances are CE certificated 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 as otherwise recommended by **Ideal Stelrad Group** in writing. If in doubt please enquire.

Any direct connection of a control device not approved by **Ideal Stelrad Group** could invalidate the 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 the boiler or its manufacture.

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.

For electrical safety reasons there must be no access available from the back of the boiler.

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.

Bathroom Installations

This appliance is rated **IP20**.

The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current IEE (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 water jets are not going to be used for cleaning purposes (as in communal baths/showers), the appliance **MUST** be installed in Zone 2, as detailed in BS.7671.

Compartment Installations

A compartment used to enclose the boiler should be designed and constructed specially for this purpose.

An existing cupboard or compartment may be used, provided that it is modified for the purpose.

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

- BS. 6798 (No cupboard ventilation is required - see 'Air Supply' for details).
- The position selected for installation **MUST** allow adequate space for servicing in front of the boiler.
- For the minimum clearances required for safety and subsequent service, see the wall mounting template and Frame 2. In addition, sufficient space may be required to allow lifting access to the wall mounting plate.

GENERAL

2 BOILER DIMENSIONS, SERVICES & CLEARANCES

all dimensions in mm (in)

The boiler connections are made on the boiler piping frame. Refer to Frames 34 & 32.

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

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

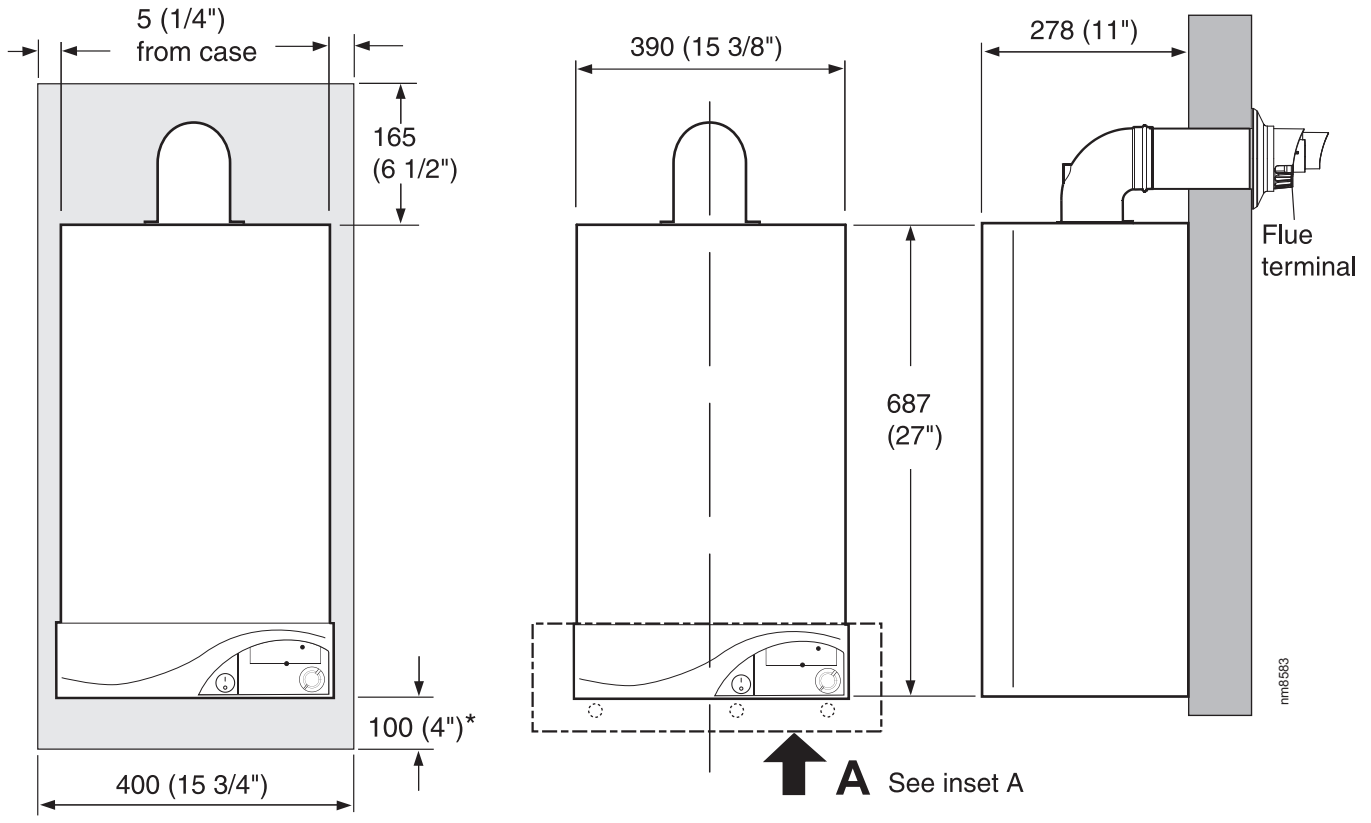
Side and Rear Flue

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

where wall thicknesses do not exceed 600mm (24"). Where the space into which the boiler is going to be installed is less than the length of flue required the flue must be fitted from the outside.

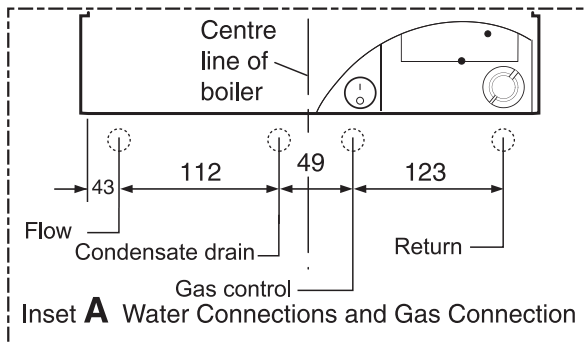
Installation from inside ONLY

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.



CLEARANCES

BOILER DIMENSIONS



Front clearance

The minimum front clearance when built in to a cupboard is 5mm (1/4") from the cupboard door but 450mm (17 3/4") overall clearance is still required, with the cupboard door open, to allow for servicing.

N.B. The boiler will not fit into a standard depth wall unit. In order for it to do so the plastic fascia should be removed. See Frame 43.

* Bottom clearance

After installation can be reduced to 5mm in an adequately ventilated enclosed cupboard. However, 100mm must be available for servicing.

SIDE FLUE ONLY	
Horizontal length of flue from centre line of boiler to outside wall	Top clearance required (MIN.) Dim. A
0.5 m	160 mm (6 5/16")
1.0 m	170 mm (6 11/16")
1.5 m	185 mm (7 1/4")
2.0 m	200 mm (7 7/8")
2.5 m	210 mm (8 1/4")
3.0 m	225 mm (8 7/8")
3.5 m	250 mm (9 7/8")
4.0 m	260 mm (10 1/4")
4.5 m	265 mm (10 7/16")
5.0 m	275 mm (10 13/16")
5.5 m	290 mm (11 3/8")
6.0 m	300 mm (11 13/16")

REAR FLUE ONLY MIN. Top clearance required = 145 mm (5 3/4")
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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 MUST be installed on a gas supply with a governed meter only.

A gas meter can only be connected by the local gas supplier or by a Gas Safe Registered Engineer. In IE by a Registered Gas Installer (RGI).

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.

It is the responsibility of the Gas Installer to size the gas installation pipework in accordance with BS6891:2005. Whilst the principle of the 1:1 gas valve ensures the icos system range is able to deliver its full output at inlet pressures as low as 14mb, other gas appliances in the property may not be as tolerant. When operating pressures are found to be below the minimum meter outlet of 19mb these should be checked to ensure this is adequate for correct and safe operation.

Allowing for the acceptable pressure loss of 1mb across the installation pipework, it can be assumed that a minimum permitted operating pressure of 18mb will be delivered to the inlet of the appliance. (Reference BS 6400-1 Clause 6.2 Pressure Absorption).

The integral appliance isolation valve and boiler pipework could further reduce the operating pressure by up to 1.5mb when measured at the inlet test point on the appliance gas valve. Therefore it has been identified that an operating pressure as low as 16.5mbar could be measured at the appliance inlet pressure test point on the gas valve.

IMPORTANT.

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 tightness and purged as described in the above code.

FLUE INSTALLATION

Plumbing will occur at the terminal, so where possible, terminal positions where this could 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.

Terminal guards are available from boiler suppliers. (ask for TFC flue guard model no. K6 - round, plastic coated). In case of difficulty contact:

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.

Table 3 - Balanced Flue Terminal Position

Flue Terminal Positions	Min. Spacing*
1. Directly below, above or alongside an opening window, air vent or other ventilation opening.	300mm (12")
2. Below guttering, drain pipes or soil pipes. <i>BS5440-1 2000</i>	25mm (1")* 75mm (3")
3. Below eaves. <i>BS5440-1 2000</i>	25mm (1")* 200mm (8")
4. Below balconies or a car port roof. <i>BS5440-1 2000</i>	25mm (1")* 200mm (8")
5. From vertical drain pipes or soil pipes. <i>BS5440-1 2000</i>	25mm (1")* 150mm (6")
6. From an internal or external corner or to a boundary along side the terminal. <i>BS5440-1 2000</i>	25mm (1")* 300mm (12")
7. Above adjacent ground, roof or balcony level.	300mm (12")
8. From a surface or a boundary facing the terminal.	600mm (24")
9. From a terminal facing a terminal.	1,200mm (48")
10. From an opening in a car port (e.g. door or window) into dwelling.	1,200mm (48")
11. Vertically from a terminal on the same wall.	1,500mm (60")
12. Horizontally from a terminal on the wall.	300mm (12")
Vertical Terminals	
13. Above the roof pitch with roof slope of all angles. Above flat roof.	300mm (12") 300mm (12")
14. From a single wall face. From corner walls.	300mm (12") 300mm (12")
15. Below velux window	2000mm (79")
16. Above or side of velux window	600mm (24")

* Only one reduction down to 25mm is allowable per installation otherwise BS5440-1 2000 dimensions must be followed.

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 as 'unsafe' until corrective action can be taken.

TERMINAL

The terminal assembly can be adapted to accommodate various wall thicknesses. Refer to Frame 12.

AIR SUPPLY

It is NOT necessary to have a purpose-provided air vent in the room or internal space in which the boiler is installed. Neither is it necessary to ventilate a cupboard or compartment in which the boiler is installed, due to the low surface temperatures of the boiler casing during operation; therefore the requirements of BS.6798, Clause 12, and BS 5440:2 may be disregarded. In IE the requirements of I.S.813:2002 may be disregarded.

GENERAL

WATER CIRCULATION SYSTEM

IMPORTANT.

A minimum length of 1metre of copper pipe **MUST** be fitted to both flow and return connections from the boiler before connection to any plastic piping.

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

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

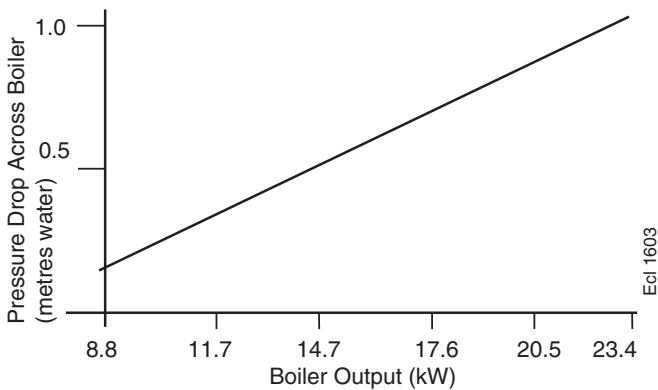
Single feed, indirect cylinders **MUST NOT** be used. The appliances are **NOT** suitable for gravity central heating nor are they suitable for the provision of gravity domestic hot water.

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 underfloor spaces.

WATER TREATMENT - see Frame 6

The hydraulic resistance of the boilers, at **MAXIMUM OUTPUT**, with an 11°C (20°F) temperature differential, is shown in Graph 1.

Graph 1 - Water flow rate and pressure loss



BOILER CONTROL INTERLOCKS

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

When thermostatic radiator valves are used, the space heating temperature control over a living area having a heating requirement of at least 0.9kW (3000Btu/h) of the boiler heat output should be achieved using a room thermostat whilst other rooms are individually controlled by thermostatic radiator valves. A higher proportion of TRVs may be used, provided that a bypass between the boiler flow and return is fitted, to ensure adequate flow when all TRVs are closed.

For further information refer to the 'Good Practice Guide 143', a publication of the Energy Efficiency Office, available from the Building Research Establishment, Garston, Watford WD2 7JR. Tel: +44 (0) 1923 664258.

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.

Note. The fan voltage is **325V DC**.

CONDENSATE DRAIN - Refer to Frames 22-24

A condensate drain 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 SYSTEM REQUIREMENTS

Notes

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

b. *Antifreeze fluid, corrosion and scale inhibitor fluids suitable for use with boilers having aluminium heat exchangers may be used in the central heating system.*

Advice should be sought from a local water treatment company.

Safety valve setting	bar	3.0	
Vessel charge pressure	bar	0.5 to 0.75	
System pre-charge pressure	bar	None	1.0
System volume (litres)		Expansion vessel volume (litres)	
25		1.6	1.8
50		3.1	3.7
75		4.7	5.5
100		6.3	7.4
125		7.8	9.2
150		9.4	11.0
175		10.9	12.9
190		11.9	14.0
200		12.5	14.7
250		15.6	18.4
300		18.8	22.1
For other system volumes multiply by the factor across		0.063	0.074

GENERAL

4 SYSTEM REQUIREMENTS - continued

General

1. The installation must comply with all relevant national and local regulations.
2. The installation should be designed to work with flow temperatures of up to 82 °C.
3. All components of the system must be suitable for a working pressure of 3 bar and temperature of 110 °C. Extra care should be taken in making all connections so that the risk of leakage is minimised.

The following components are incorporated within the appliance:

- a. Circulating pump.
 - b. Safety valve, with a non-adjustable preset lift pressure of 3 bar.
 - c. Pressure gauge, covering a range of 0 to 6 bar.
 - d. An 8-litre expansion vessel, with an initial charge pressure of 0.75 bar.
4. **'Make-up' Water.** Provision must be made for replacing water loss from the system, either :
- a. From a manually filled 'make-up' vessel with a readily visible water level. The vessel should be mounted at least 150mm above the highest point of the system and be connected through a non-return valve to the system, fitted at least 150mm below the 'make-up' vessel on the return side of the radiators.
- or*
- b. Where access to a 'make-up' vessel would be difficult, by pre-pressurisation of the system.

The maximum cold water capacity of the system should not exceed 143 litres, if not pressurized. However, if the system is to be pressurized, the efficiency of the expansion vessel will be reduced and a larger vessel (or smaller system volume) may be necessary. If the capacity of the vessel is not considered sufficient for this, or for any other reason, an additional vessel **MUST** be installed on the return to the boiler.

Guidance on vessel sizing is given in Frame 3.

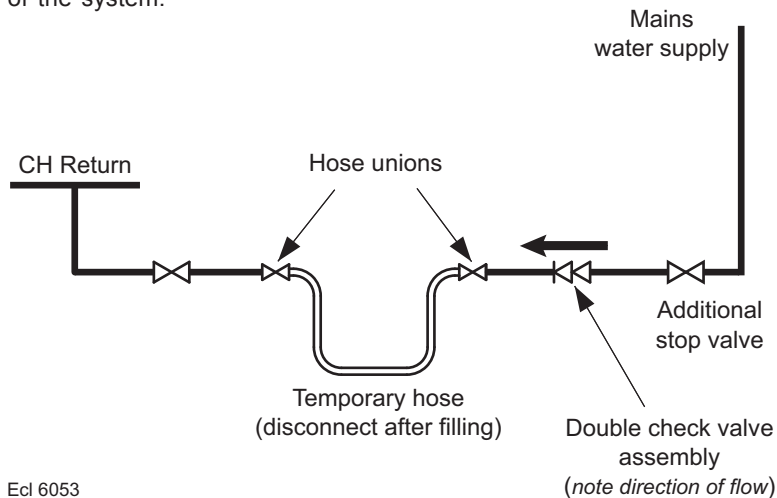
5. **Filling.** The system may be filled by the following method:

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

When installing the filling device, it must be connected as below to fully comply with the water regulations.

This may involve the fitting of an additional WRAS approved isolator valve to the mains supply.

- i. Thoroughly flush out the whole system with cold water.
- ii. Fill and vent the system until the pressure gauge registers 1.5 bar, and examine for leaks.
- iii. Check the operation of the safety valve by raising the water pressure until the valve lifts. This should occur within 0.3 bar of the preset lift pressure.
- iv. Release water from the system until the minimum system design pressure is reached; 1.0 bar if the system is to be pre-pressurised.



5 SYSTEM BALANCING

The boiler does not normally need a bypass but at least some radiators on the heating circuit, of load at least 10% of the minimum boiler output, must be provided with twin lockshield valves so that this minimum heating load is always available. See note regarding thermostatic radiator valves on page 10.

Note.

Systems incorporating zone valves which could completely cut off the flow through the system, must also include a bypass.

BALANCING

1. Set the programmer to ON, for both CH and DHW. Turn the cylinder thermostat down.
Close the manual or thermostatic valves on all radiators, leaving the twin lockshield valves (on the radiators referred to above) in the OPEN position.

Turn up the room thermostat and adjust these lockshield valves to give boiler flow and return temperatures not more than 20 °C apart.

These valves should now be left as set.

2. Open all manual or thermostatic radiator valves and adjust the lockshield valves on the remaining radiators, to give around 15 °C temperature drop at each radiator.
3. Turn up the cylinder thermostat and adjust the cylinder balancing valve so that the cylinder achieves a maximum flow consistent with adequate flow to the radiators. Check that with only the domestic hot water loop in circuit a differential temperature of 20 °C across the boiler is not exceeded.
4. Adjust the room and cylinder thermostat and programmer to NORMAL settings.

GENERAL

6 WATER TREATMENT

The icos system HE range has an ALUMINIUM alloy heat exchanger.

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

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

Ideal Stelrad Group recommend the use of Fernox Copal or MB1 or GE Betz Sentinel X100 inhibitors and associated water treatment products, which must be used in 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

Sentinel Performance Solutions
The Heath Business & Technical Park
Runcorn
Cheshire WA7 4QX
Tel: 0800 389 4670
www.sentinel-solutions.net or

Salamander Engineering Ltd,
The Heath Business & Technical
Runcorn
Cheshire
WA7 4QX
Tel. +44 (0) 121 378 0952

Notes.

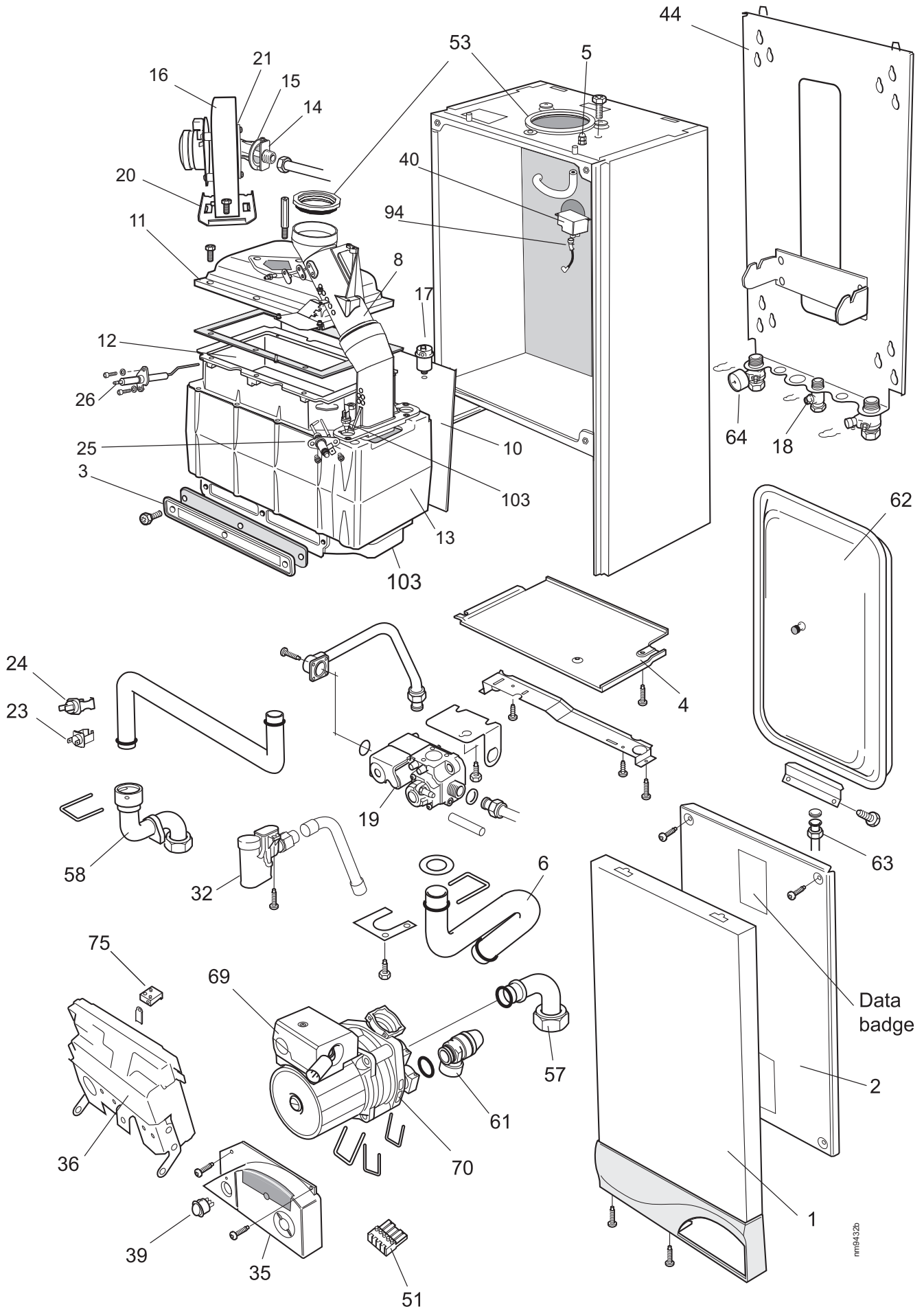
1. *It is most important that the correct concentration of the water treatment products is maintained in accordance with the manufacturers' instructions.*
2. *If the boiler is installed in an existing system any unsuitable additives MUST be removed by thorough cleansing. BS7593:2006 details the steps 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.*

7 BOILER ASSEMBLY - Exploded View Legend

- | | | |
|------------------------------------|--------------------------------|---------------------------------|
| 1. Front casing panel. | 17. Automatic air vent. | 44. Piping frame. |
| 2. Sealing panel. | 18. Gas service cock. | 51. Mains connector. |
| 3. Sump cover. | 19. Gas control valve. | 53. Turret gasket kit. |
| 4. Bottom casing panel. | 20. Fan bracket. | 57. CH return stub. |
| 5. Flue sensing nipple. | 21. Orifice plate. | 58. CH flow stub. |
| 6. Return pipe. | 23. Control thermistor. | 61. Pressure relief valve. |
| 8. Flue manifold. | 24. Overheat thermostat. | 62. Expansion vessel. |
| 10. Interpanel. | 25. Ignition electrode. | 63. Expansion vessel pipe assy. |
| 11. Burner. | 26. Flame detection electrode. | 64. Pressure gauge. |
| 12. Combustion chamber insulation. | 32. Condensate 'S' trap. | 69. Pump. |
| 13. Heat exchanger | 35. User control. | 70. Pump manifold. |
| 14. Injector & housing. | 36. Primary controls (PCB). | 75. Control box clamp. |
| 15. Venturi assembly. | 39. Mains switch. | 94. Ignition lead. |
| 16. Fan assembly. | 40. Spark generator. | 103. Dry fire thermistor. |

INSTALLATION

8 BOILER ASSEMBLY - Exploded View



INSTALLATION

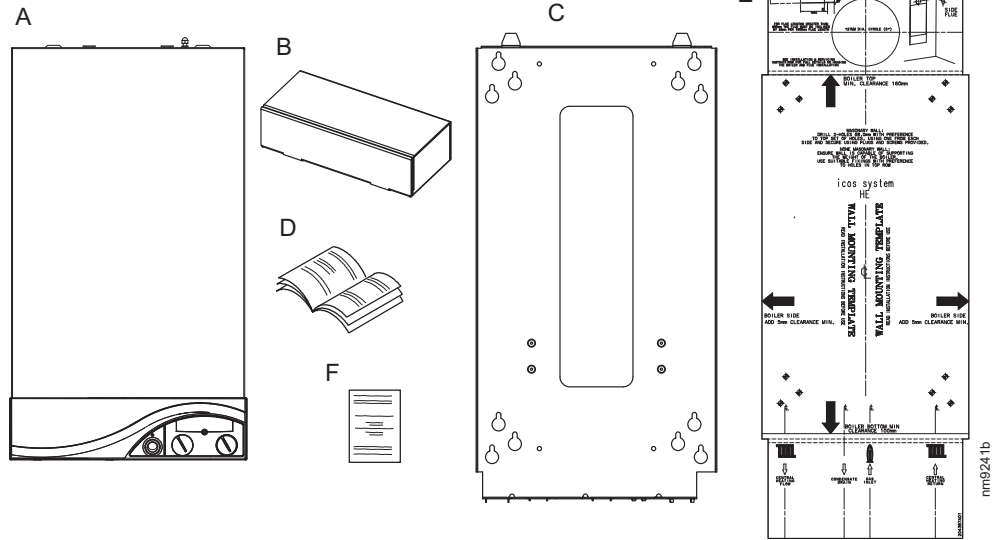
9 UNPACKING

The boiler is supplied fully assembled in one Pack A, together with a telescopic flue assembly for lengths up to 595mm, rear or side flue outlet, in Pack B.

Unpack and check the contents.

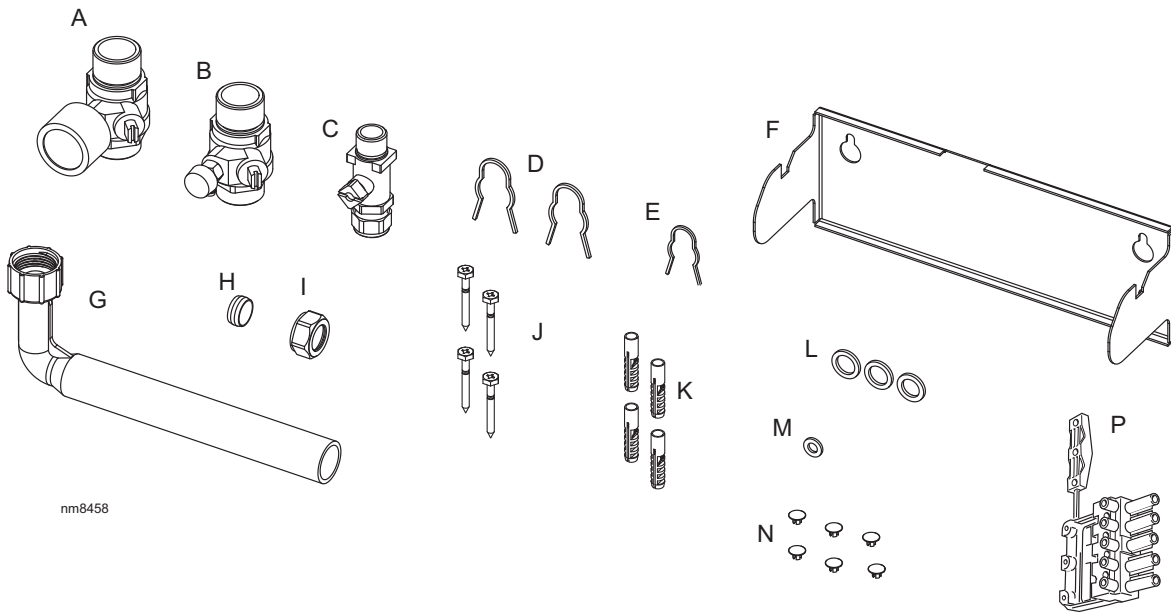
Pack A Contents

- A Boiler
- B Hardware Pack Box
- C Pre-piping Frame
- D These Installation/Users Instructions
- E Wall Mounting Template (located on internal protective packaging)
- F 1 Year Guarantee



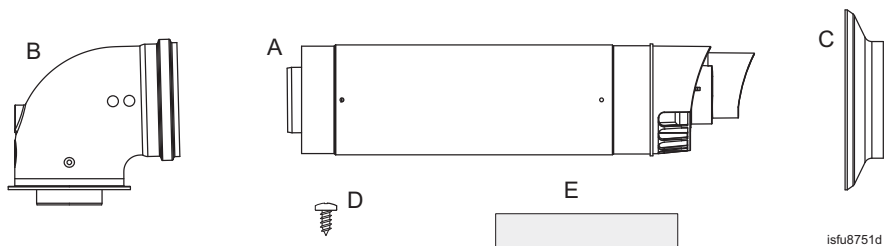
Hardware Pack Contents

- | | | |
|--|--|--------------------------------------|
| A Isolation valve c/w pressure gauge - 1 off | F Pre-piping frame support bracket - 1 off | K Wallplug - 4 off |
| B Isolation valve c/w drain - 1 off | G S-trap hose - 1 off | L Fibre washer 19 ID x 26 OD - 3 off |
| C Compression gas cock - 1 off | H 15mm olive - 1 off | M Gas line sealing washer - 1 off |
| D Valve securing clip 22mm - 2 off | I Pressure relief valve nut - 1 off | N Hole plug white - 6 off |
| E Valve securing clip 15mm - 1 off | J No. 14x2in woodscrew - 4 off | P Mains connector - 1 off |



Pack B Contents

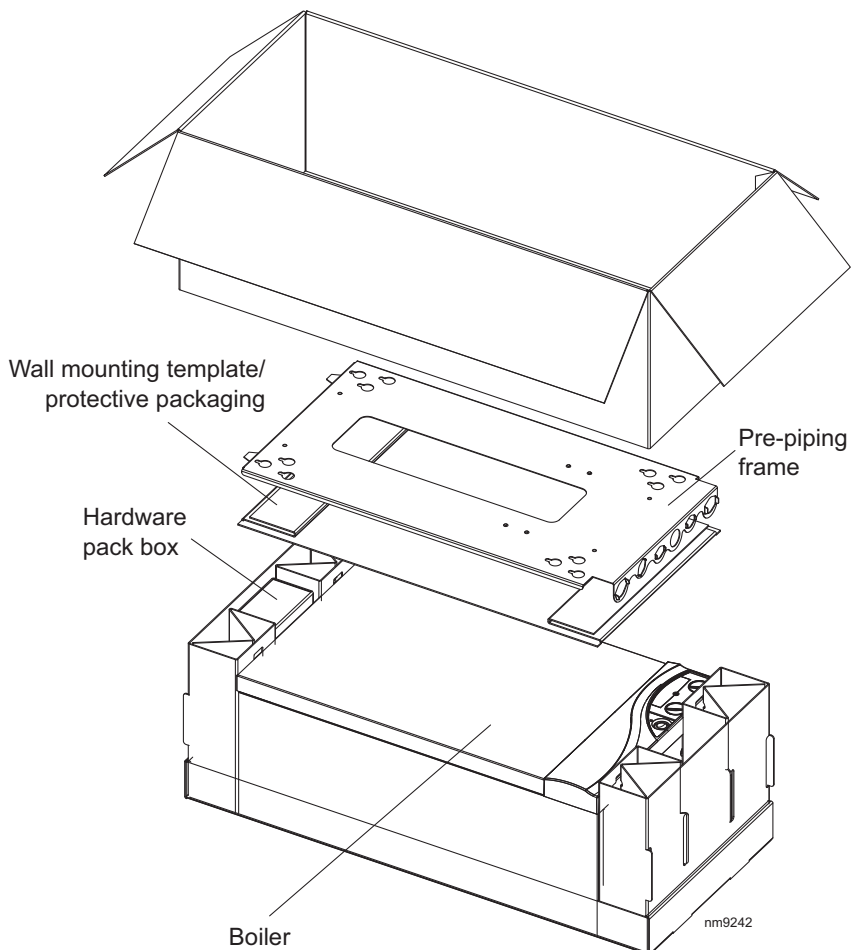
- A Telescopic flue terminal
- B Flue turret
- C Rubber Terminal Wall Seal
- D Screw
- E Sealing tape



INSTALLATION

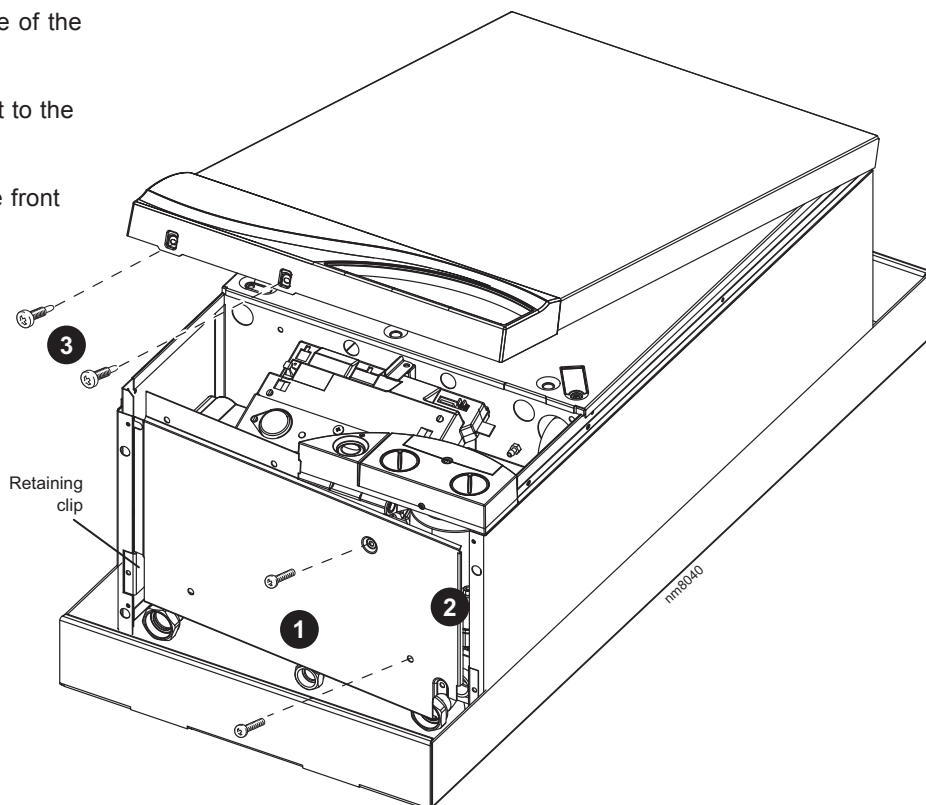
10 PACKAGING REMOVAL

1. Ensure the boiler is on a sound flat surface.
2. Carefully remove the strapping.
3. Fold back the top flaps to gain access to:
 - Instructions
 - 1 year guarantee
 - Pre-piping frame
 - Wall mounting template.(located under pre-piping frame on protective packaging).
4. Remove the instructions and read thoroughly before unpacking the product.
5. When ready for installation lift off the cardboard carton.



11 BOTTOM PANEL REMOVAL

1. Remove the screws from the underside of the boiler.
2. Pull the RHS of the panel down, slide it to the right and withdraw.
3. Remove the screws from bottom of the front panel.
4. Lift panel up and off top pegs.



INSTALLATION

12 DETERMINING THE FLUE LENGTH AND FLUE PACKS REQUIRED

IMPORTANT. The boiler MUST be installed in a vertical position

Dimension X - Wall thickness.

Dimension L - Wall thickness plus boiler spacing.

Dimension S - Stand-off frame depth = 33mm.

FLUE KITS

Pack B - supplied as standard.

Finishing Kit - supplied as an optional extra.

Screw Kit - Optional kit for mechanical fixing of flue joints.

Pack D - optional extension kit for side flue or rear flue outlet.

Refer to 'Flue Extension Ducts'

Note. **MAXIMUM FLUE LENGTHS PERMISSABLE:**

HORIZONTAL FLUE - 6M

ROOF FLUE KIT - 7.5M

POWERED VERTICAL FLUE KIT - 5M PRIMARY AND 17M SECONDARY IS A TYPICAL MAXIMUM LENGTH

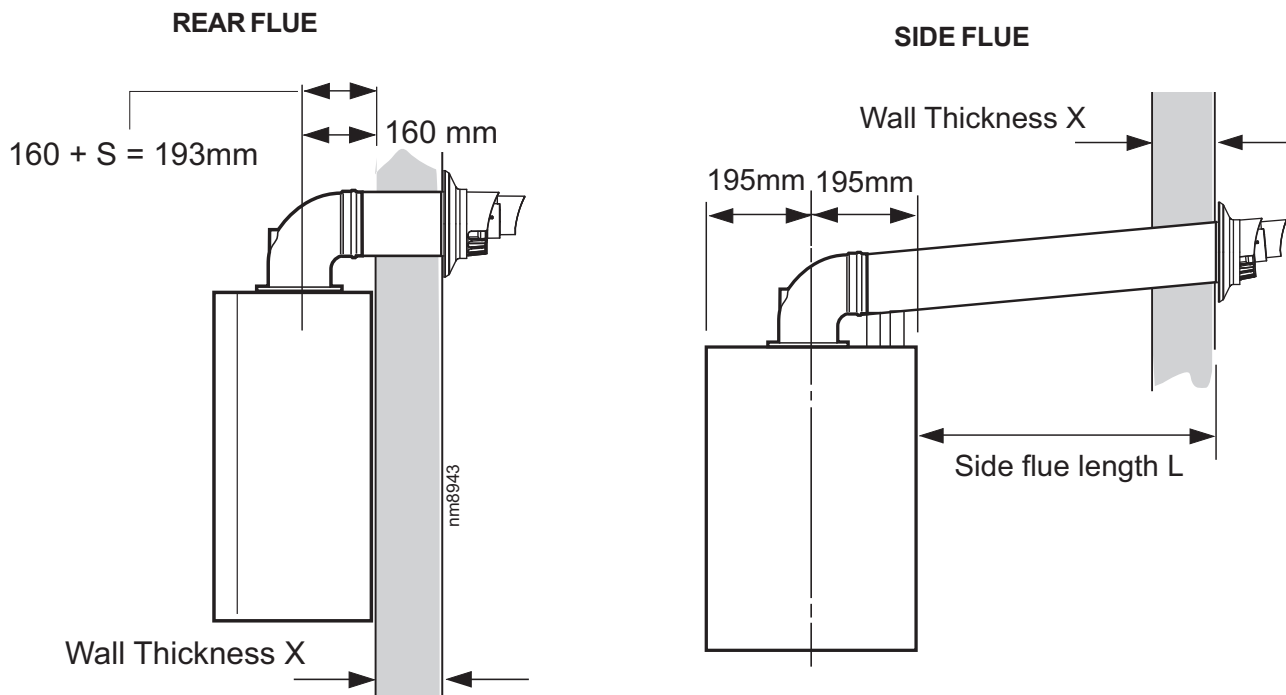
For alternative maximum lengths refer to powered vertical instructions.

90° ELBOW KIT 60/100 (EQUIVALENT FLUE LENGTH RESISTANCE = 1M)

45° ELBOW KIT 60/100 (EQUIVALENT FLUE LENGTH RESISTANCE = 0.6M)

MINIMUM HORIZONTAL FLUE LENGTHS - **TELESCOPIC TERMINAL = 370MM**

(Centre Line of turret to outside of wall terminal) - **ONE PIECE TERMINAL = 285MM**



INSTALLATION

12A DETERMINING THE FLUE LENGTH AND FLUE PACKS REQUIRED, CONT'D

Notes.

1. It is recommended that a support bracket is fitted for every 1 meter of extension pipe used and a bracket should be used at every joint, to ensure pipes are held at the correct angle.

If a slip joint coupling is to be used then a bracket should be used to secure the collar.

2. When extension 'D' packs are used 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.

3. If the telescopic 'B' pack, or horizontal flue terminal (600 long) only are used, they may be mounted horizontally. The 1.5 degrees is taken care of by the inclination of the flue within the air pipe.

4. If the boiler is to be installed with upward piping routed behind the boiler then the optional stand-off kit should be used. Care must be taken when cutting the ducts and marking the wall to suit this condition.

5. Only use water as a lubricant during assembly. Do not use mineral based oils.

Total Flue length dimension (measuring from CL of turret to outside wall)		Flue
Rear flue dim. X+160	Side flue dim. L+195	Extra packs required
Up to 595 mm	Up to 595 mm	none
Up to 1545 mm	Up to 1545 mm	Pack D - 1 off
Up to 2495 mm	Up to 2495 mm	Pack D - 2 off
Up to 3445 mm	Up to 3445 mm	Pack D - 3 off
Up to 4395 mm	Up to 4395 mm	Pack D - 4 off
Up to 5345 mm	Up to 5345 mm	Pack D - 5 off
Up to 6000 mm	Up to 6000 mm	Pack D - 6 off

13 FLUE ASSEMBLY - Exploded View

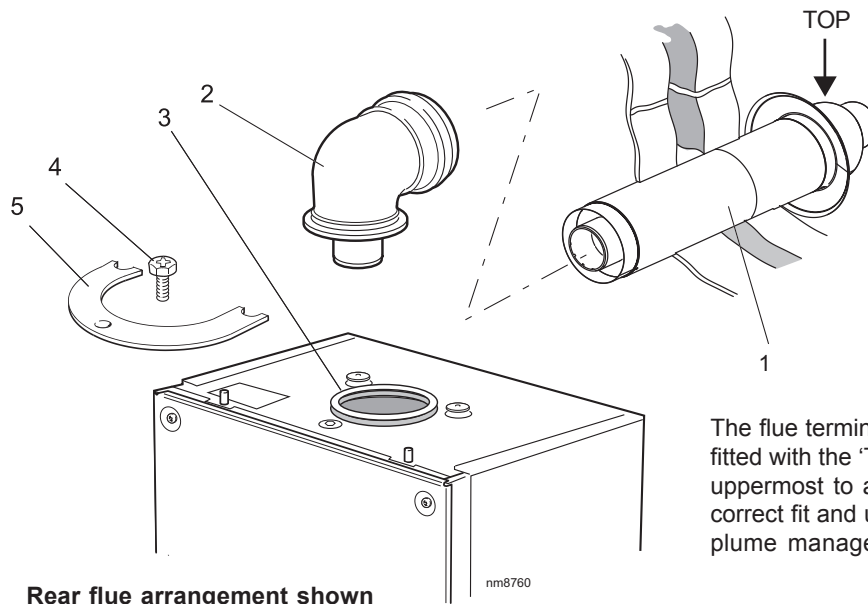
An optional flue duct extension kit is required for wall thicknesses greater than :

Side 395mm

Rear 435mm

LEGEND

- 1. Duct assembly.
- 2. Flue Turret.
- 3. Turret gasket.
- 4. M5 x 10 pozi screw.
- 5. Turret clamp.



The flue terminal **MUST** be fitted with the 'TOP' uppermost to allow the correct fit and use of the plume management system.

INSTALLATION

14 WALL MOUNTING TEMPLATE

The wall mounting template is located on the internal protective packaging.

Note.

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

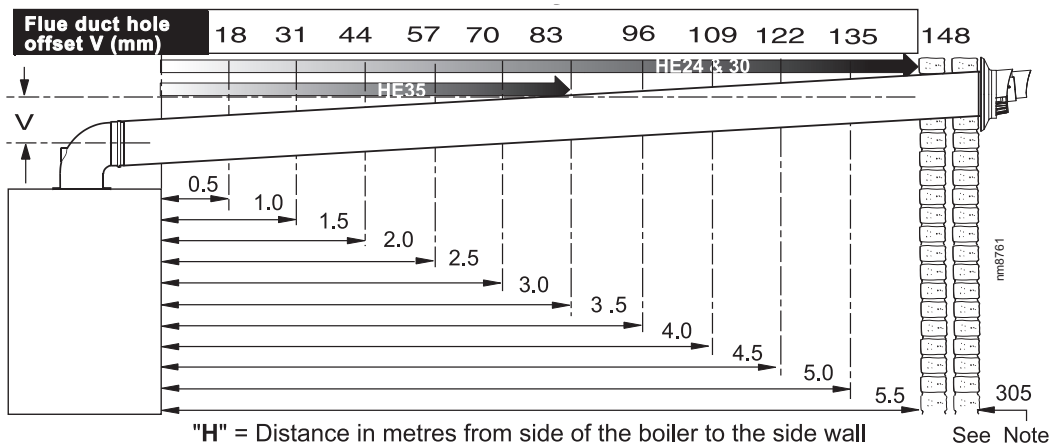
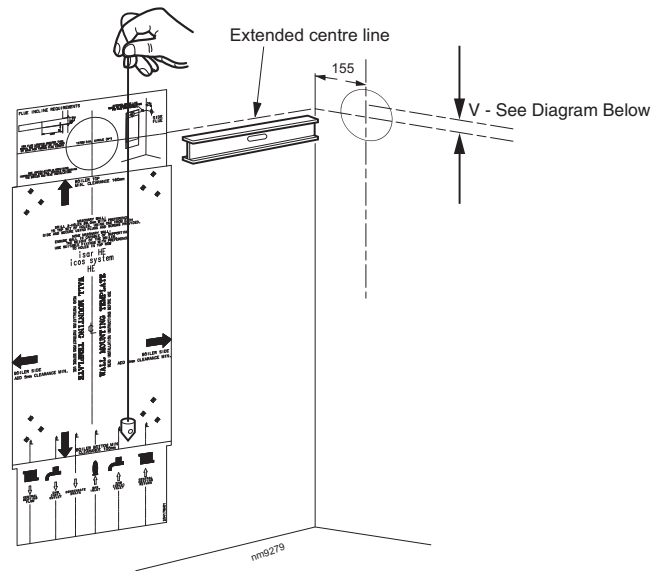
1. Tape template into the selected position. Ensure squareness by hanging a plumbline as shown.
2. If fitting a side flue extend the flue centre line onto the side wall and measure in 155mm for standard installation.

Note. If using stand-off kit distance increases to 188mm.

3. Mark onto the wall the following:
 - a. The wall mounting plate screw positions (choose one from each group).
 - b. The position of the flue duct hole (see diagram below).

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

4. Remove the template from the wall.



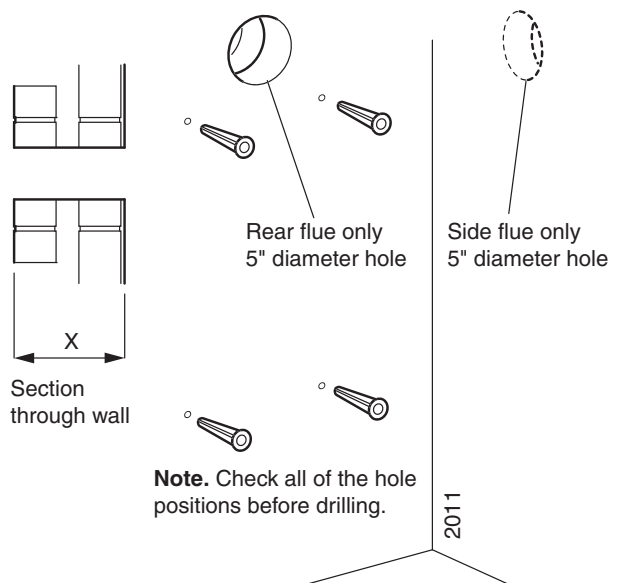
"H" = Distance in metres from side of the boiler to the side wall
Note. If wall thickness is greater than 305mm then dimension "H" must be reduced by the same amount and the offset may be adjusted accordingly.

15 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 5" core boring tool), ensuring that the hole is square to the wall. Both wall faces immediately around the cut hole should be flat.
2. Drill 4 holes with a 7.5mm / 8mm masonry drill and insert the plastic plugs provided, for the piping frame.
3. Locate 4 No.14 x 50mm screws in the piping frame (one at each side, in any of the 3 holes provided at each side) and screw home.



Note. Check all of the hole positions before drilling.

INSTALLATION

16 TERMINAL WALL SEAL ASSEMBLY / POSITIONING

Prior to fitting the flue, the rubber terminal wall seal provided in the flue pack **MUST** be fitted to the flue terminal as shown below in Figure 1.

Once the flue is installed it is **IMPORTANT** that the rubber terminal wall seal is pressed against the outside wall to create an adequate seal between the flue and wall as shown in Figure 2.

FIGURE 1

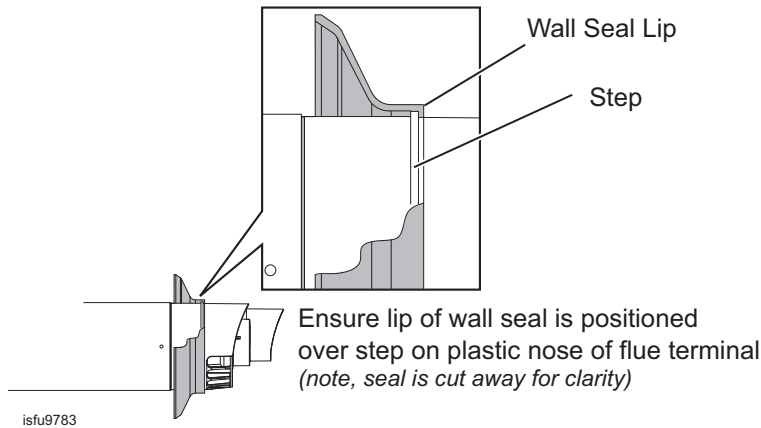
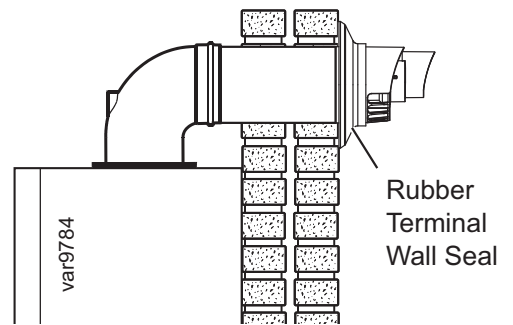


FIGURE 2

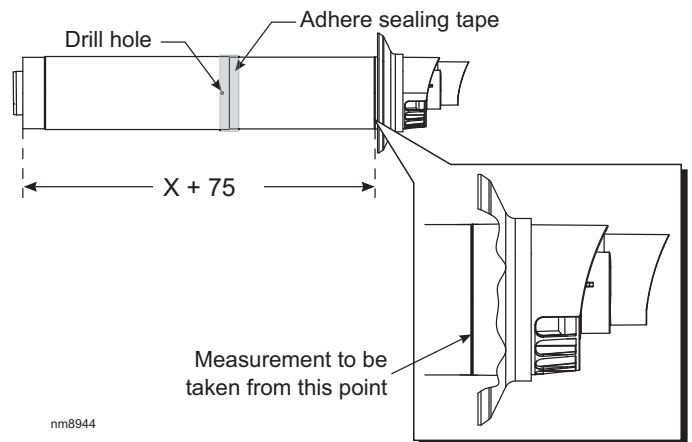


17A SETTING THE FLUE - REAR Wall thicknesses of 210 to 435mm

Notes.

- a. If using the extension ducts go to Frame 18.
- b. If the stand-off frame is used it is essential to add 33mm to dimension X.
- c. For shorter flue requirements less than 210mm, use non telescopic B Pack.

1. Measure and note wall thickness X. Refer to Frame 12.
2. Add 75mm to dimension X and set telescopic flue length as indicated in drawing.
3. Using a 3.5mm drill bit, drill one hole in outer air duct taking care not to pierce plastic inner flue.
4. Fix to length using self tappers provided.
5. Seal outer air duct using the tape provided.



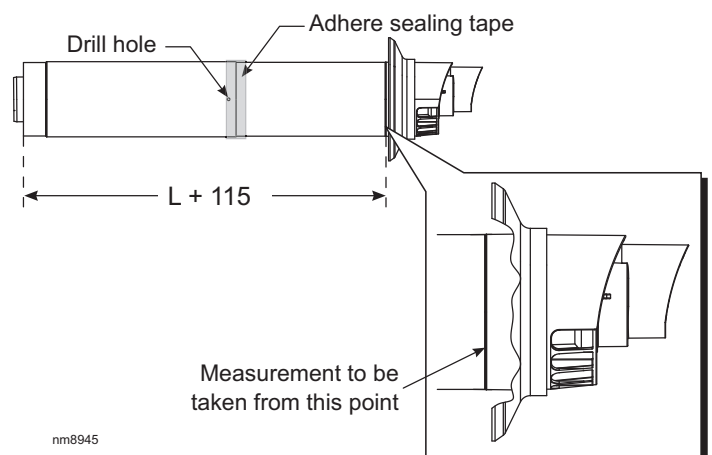
17B SETTING THE FLUE - SIDE

Wall thicknesses of 170 to 395mm

Notes.

- a. If using the extension ducts go to Frame 18.
- b. For shorter flue requirements use non telescopic B Pack.

1. Measure and note wall thickness X. Refer to Frame 12.
2. Measure distance from side of boiler to inside of wall and add to wall thickness $X=L$. Refer to Frame 12.
3. Add 115mm to dimension L and set telescopic flue length as indicated in drawing.
4. Using a 3.5mm drill bit, drill one hole in outer air duct taking care not to pierce plastic inner flue.
5. Fix to length using self tappers provided.
6. Seal outer air duct using the tape provided.

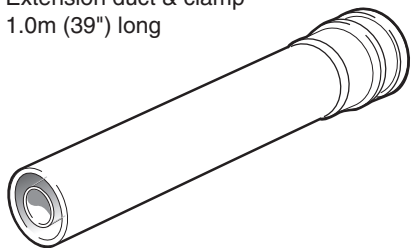


INSTALLATION

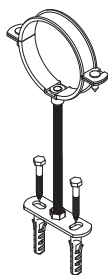
18 FLUE EXTENSION DUCTS - For total flue lengths greater than 595mm

Pack D Flue extension duct kit contents.

Extension duct & clamp
1.0m (39") long

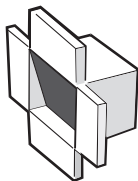


nm8732

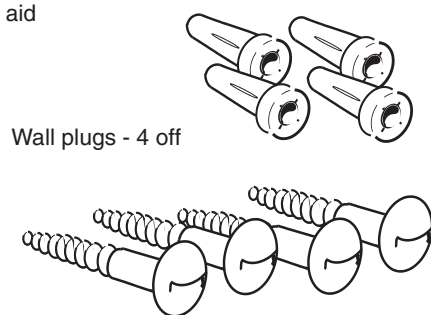


Flue duct support

Flue support cutting aid
(shown folded up)



No. 10 x2" wood screw - 4 off



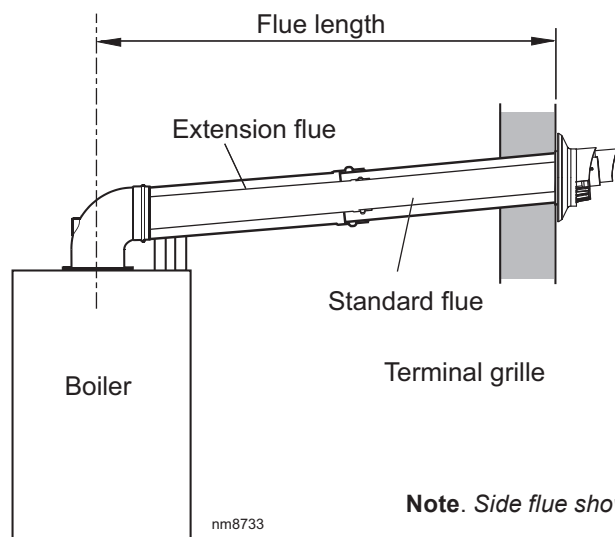
Wall plugs - 4 off

19 FLUE EXTENSION DUCTS - continued

Use a maximum of 6m extended flue ONLY

General arrangement

1. A **maximum** of 6 extension ducts (one suitably cut) plus the standard flue duct may be used together.
2. Flue extensions of greater length than 1m (39") should be supported with the bracket provided, suitably adjusted. Refer to Frames 18 & 25.
3. Only use water as a lubricant during assembly. Do not use mineral based oils.



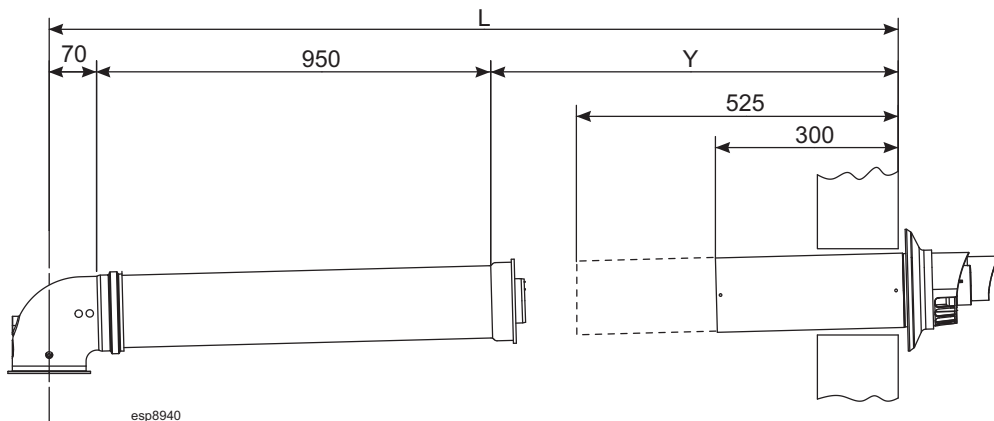
nm8733

20 FITTING THE KIT

Because of the flexibility of the telescopic flue terminal it is not always necessary to cut an extension pack.

1. Measure the total flue length from the centre of the boiler outlet to the outside wall.
2. Subtract 70mm from this dimension.
3. Subtract 950mm for each 'D' pack to be used.
4. If the remainder Y is 300mm - 525mm this can be taken up by the adjustment in the telescopic flue.
5. If the remainder Y is 525mm - 950mm it will be necessary to cut a 'D' pack to 400mm.

6. If the remainder Y is less than 300mm, shorten the previous 'D' pack to 400mm and adjust the telescopic terminal.
7. Measure and mark the length on the flue, to ensure a square cut mark the flue all the way around and cut to length.



esp8940

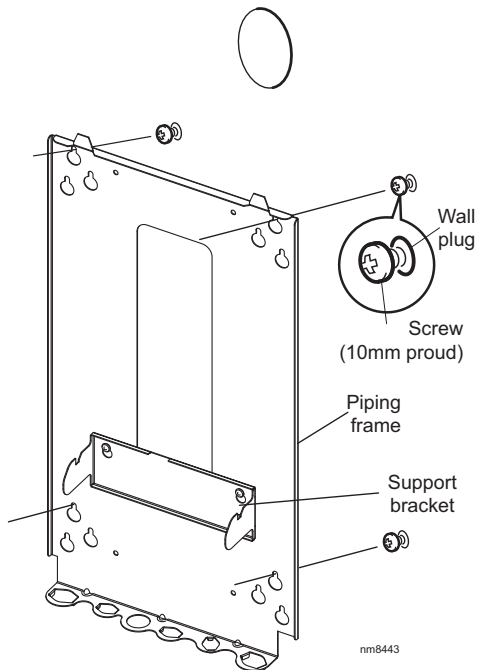
INSTALLATION

21 FITTING THE PIPING FRAME AND VALVES (Rear Flue outlet shown)

Note. Isolating valves are supplied separately in the hardware pack box.
Fit to the piping frame BEFORE mounting the boiler.

TO FIT THE PRE-PIPING FRAME DIRECTLY TO THE WALL

- Insert wall plugs.
- Put the screws into the wall plugs and leave 10mm proud
- Hang the frame onto the screws (take care to use the same hole position from each group as previously chosen with the wall template) and tighten up.
- Locate the support bracket on the piping frame.

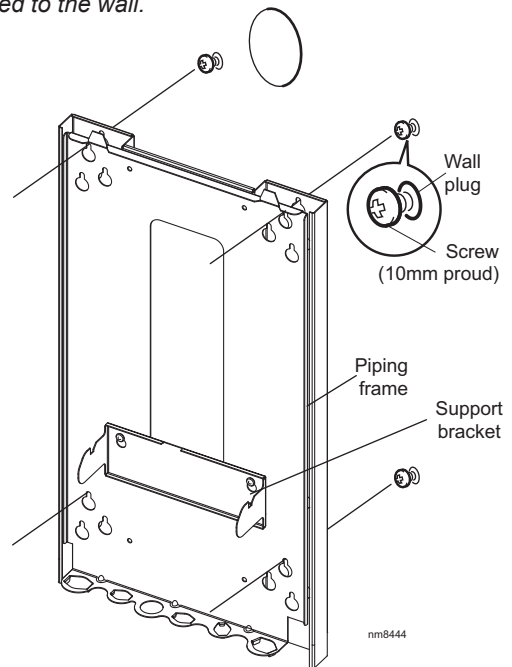


TO FIT THE PRE-PIPING FRAME USING THE STAND-OFF FRAME OPTION KIT (To allow pipework to be taken upwards)

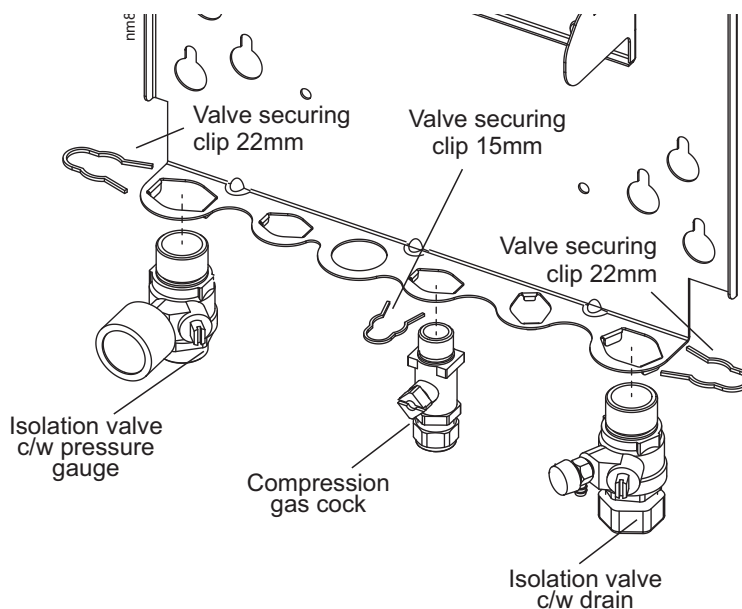
- Put the screws into the wall plugs and leave 10mm proud.
- Hang the stand-off frame onto the screws and tighten up.
- Fasten the piping frame to the stand-off frame with the 6mm screws provided.
- Locate the support bracket on the piping frame.

Note.

If the clearances above and below the boiler are less than the length of the pipes it will be necessary to position the pipes behind the wall mounting plate BEFORE the plate is screwed to the wall.



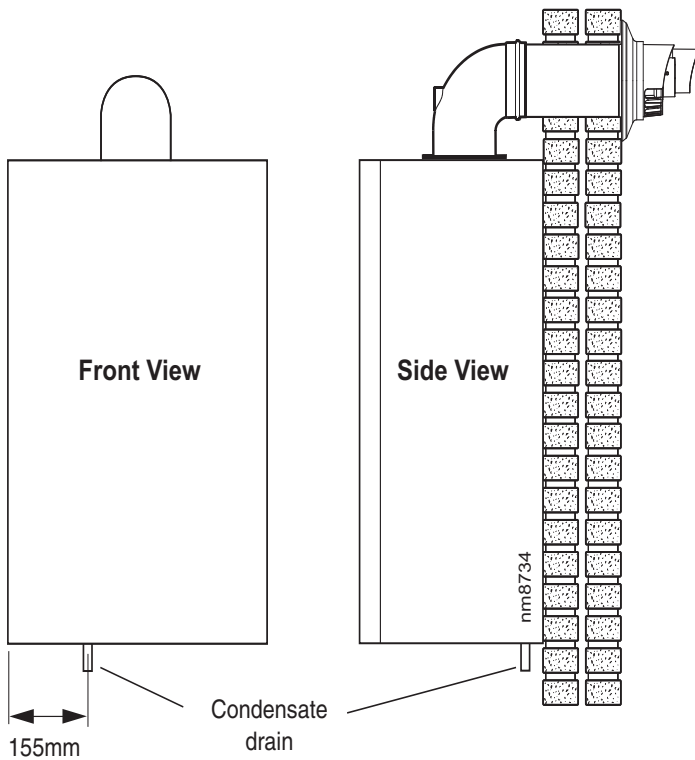
1. Remove valves and clips from the hardware pack box.
2. Assemble valves to the frame and secure in place with clips provided.
3. Make sure to fit valves in correct order shown.



Note. Service connections may be made now, before mounting the boiler, if required. Refer to Frames 27-29.

INSTALLATION

22 CONDENSATE DRAIN



Before mounting the boiler on the wall, the condensate drain (provided in the h/ware pack) must be connected from the boiler 'S' trap to a drainage point, preferably within the building.

Ensure that the condensate trap is full of water before commissioning the boiler. Refer to Frame 25.

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 pipe does not give rise to spillage within the dwelling.

IMPORTANT.

If excessive external pipework cannot be avoided, an additional siphon kit and insulation are recommended, in order to prevent possible freezing.

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

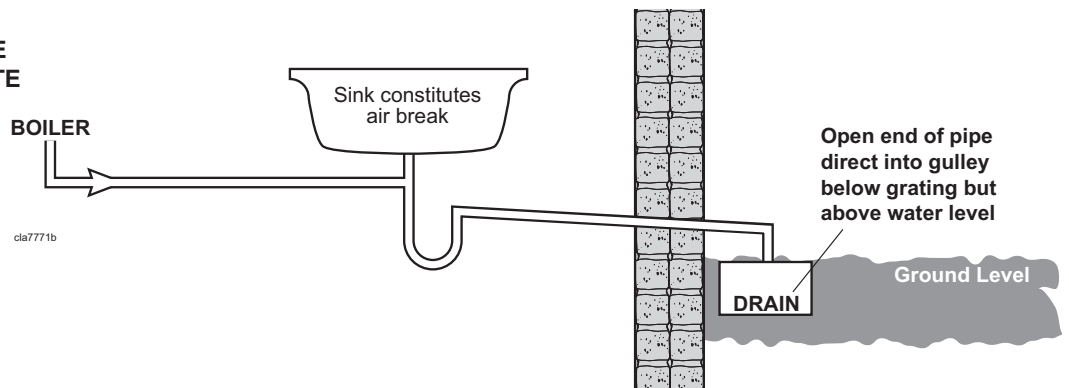
The drain outlet on the boiler is standard 21.5 mm overflow pipe. This size must not be reduced in any part of its length.

If external condensate pipe run is greater than 3m then pipe must be 32mm nominal diameter. Consideration must be given to insulating external condensate pipe runs.

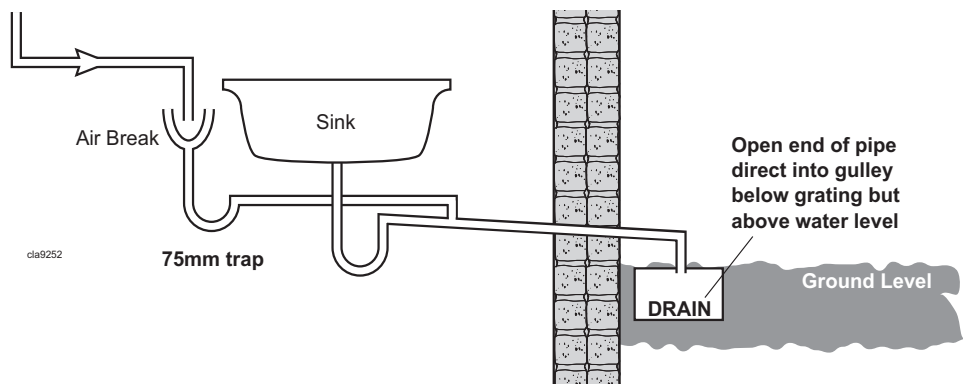
23 CONDENSATE PIPE TERMINATION CONFIGURATIONS

Note. ALL EXTERNAL PIPE RUNS MUST BE IN ACCORDANCE WITH BS6798

1. INTERNAL TO SINK WASTE UPSTREAM OF SINK WASTE TRAP



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



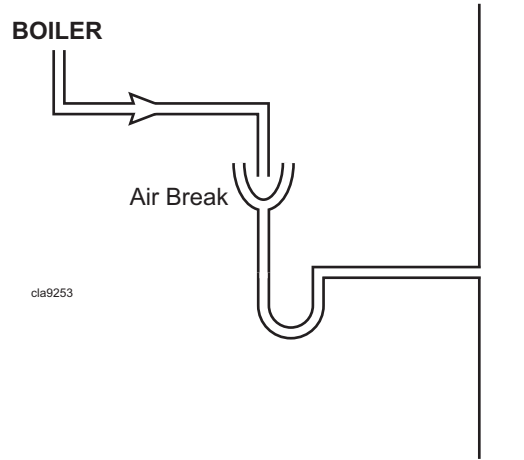
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24 CONDENSATE PIPE TERMINATION CONFIGURATIONS . . . *continued*

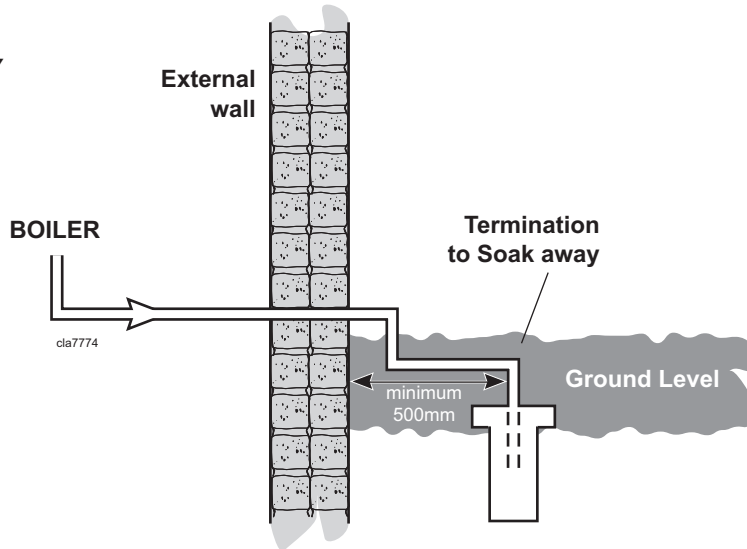
3. INTERNAL CONNECTION TO SOIL AND VENT STACK

Termination into a down pipe can take place providing it can be confirmed that the down pipe is part of a combined waste and rain water system.

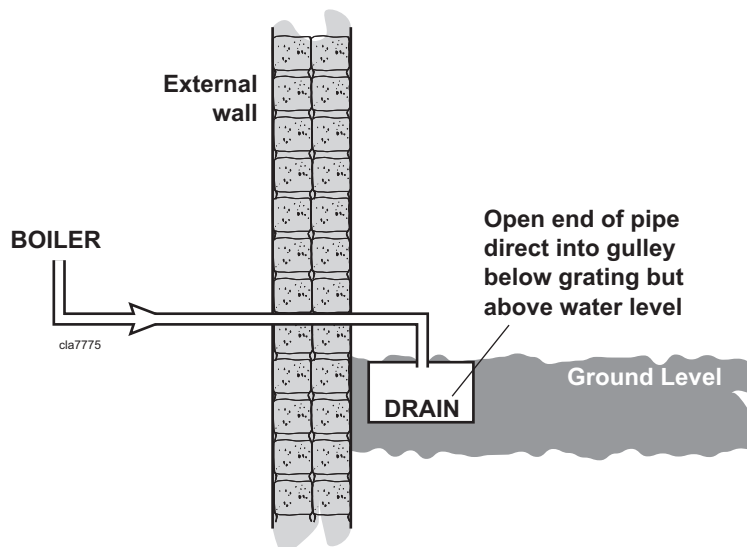
* Make connection to SVP using a solvent welded saddle



4. TERMINATION TO SOAK AWAY



5. TERMINATION TO DRAIN / GULLEY



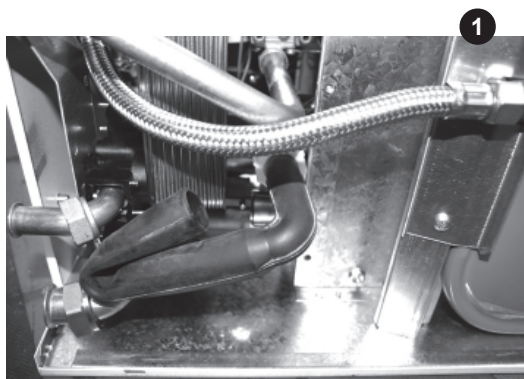
INSTALLATION

25 MOUNTING THE BOILER

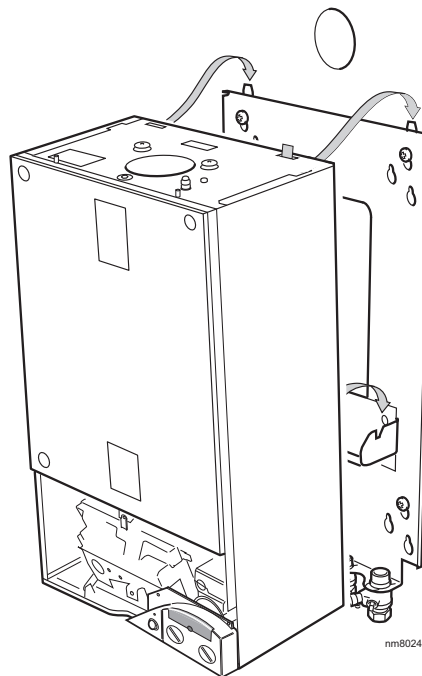
IMPORTANT.

1. Before mounting the boiler on the wall place it on its left hand side, fit the 'S' trap hose moulding/nut and fold the hose to facilitate fitting into pre-piping frame.
2. Ensure that the plastic plugs are removed from both the CH and DHW pipes before mounting. **N.B.** Some spillage of water may occur from the pipework when mounting the boiler to the frame.
3. Lift the boiler onto the wall mounting frame, locating it over the tabs at the top of the frame.
4. Lower the boiler into position, engaging it onto the support bracket.

Note. Ensure the condensate drain pipe is correctly positioned through the hole in the pre-piping frame before continuing.



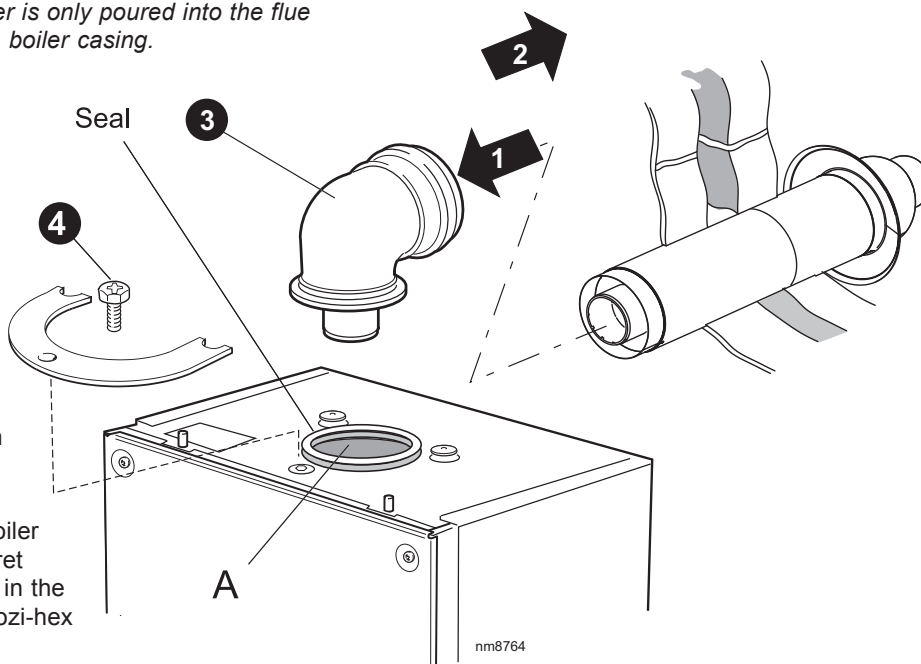
5. Using the fibre washers supplied in the hardware pack box, engage and then tighten the 4 water unions.
6. Engage and tighten the gas union, ensuring that the blue fibre washer is in place. **DO NOT** overtighten.
7. Connect a pipe to the safety drain outlet using the nut and olive supplied in the boiler hardware pack box.



26 CONNECTING THE FLUE TO THE BOILER

Note. Before fitting the flue turret fill the condensate 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. Locate the flue into the turret.
2. Insert the flue assembly through the prepared hole in the wall. Push through and pull back to seal against outside wall face.
3. Locate the flue turret on the top of the boiler, ensuring that the turret gasket is in place. Also ensure the turret is located concentric with the flue aperture on the boiler top panel. Check that the flue seal 'A' located in the top of the flue manifold is secure and giving an effective seal.
4. Secure the flue turret on top of the boiler by inserting the open ends of the turret clamp under the 2 studs and fixing it in the middle with the single M5 x 10mm pozi-hex screw provided.



5. Flues over 1 metre long.

Fix the flue support bracket to the wall, using the 4 wall plugs and wood screws.

NB. The space bracket will utilise one fixing hole only whilst used in conjunction with the stand-off option.

INSTALLATION

27 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 both a separately supplied vertical connector and a 80/125 adaptor.

WEATHER PROOFING

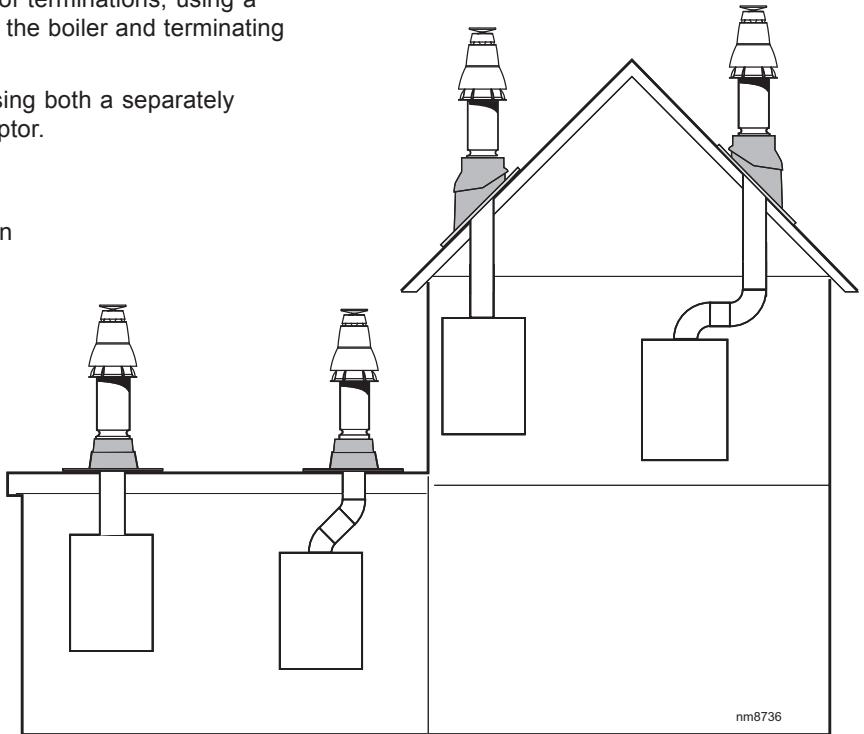
Where the flue passes through the roof line an adequate seal must be made. This is achieved by using either:

- Flat roof weather collar
- or
- Universal weather collar.

ACCESSORIES

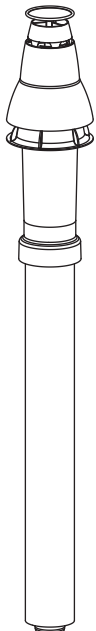
Flue Duct Extension Kits are available for flue lengths extending beyond 1m. These packs contain 1m extension ducts and may be cut to the desired length.

If the offset vertical option is used an elbow Kit is required. For a full accessories list refer to page 7, Optional Extras and Frame 31, Flue Arrangement.

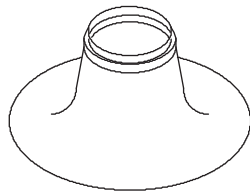


28 ROOF FLUE KIT CONTENTS / OPTIONS

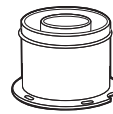
Flue Terminal
UIN 203132



Weather Collar - Flat Roof
UIN 152259



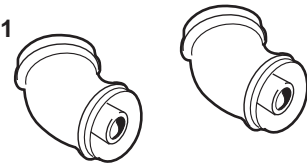
Vertical connector
UIN 203135



90° elbow
UIN 203130



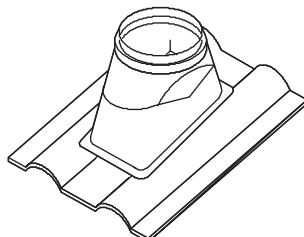
45° elbow
UIN 203131



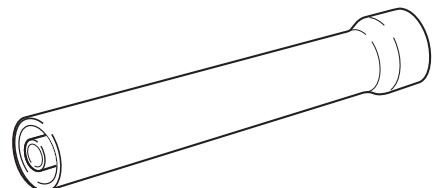
Flue duct support



Weather Collar - Tile Roof
UIN 152258



Roof Flue Extension Duct
UIN 203129



nm8735

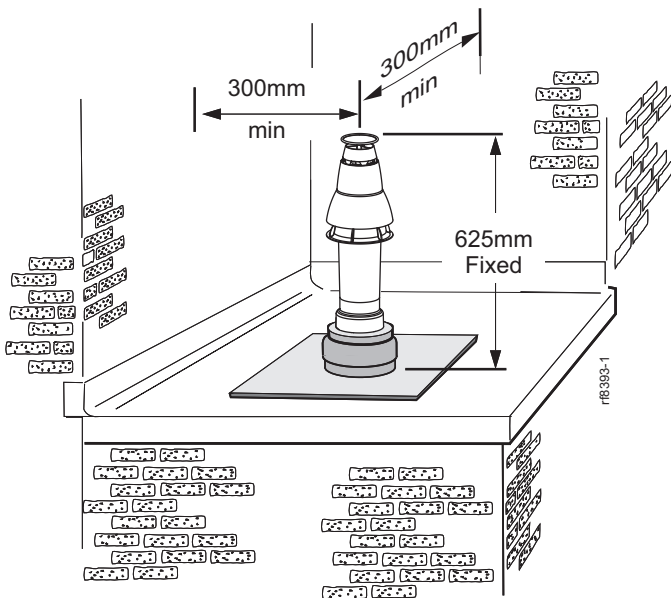
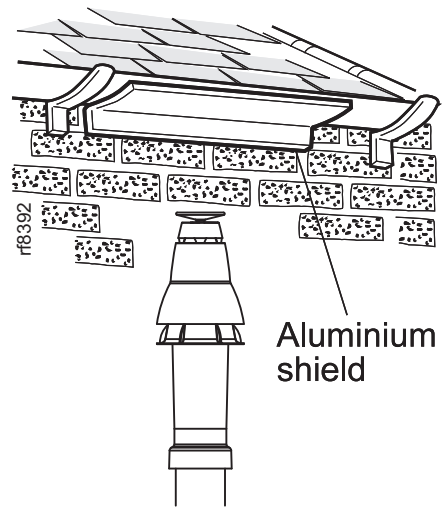
INSTALLATION

29 FLUE TERMINAL POSITION

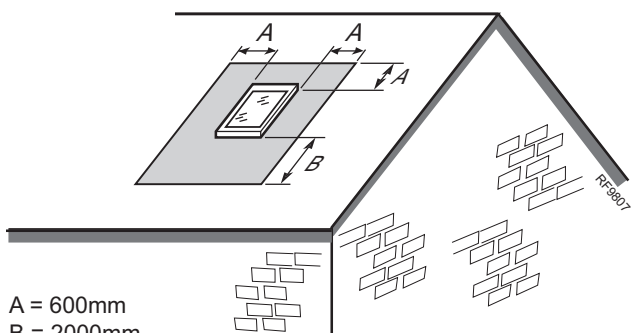
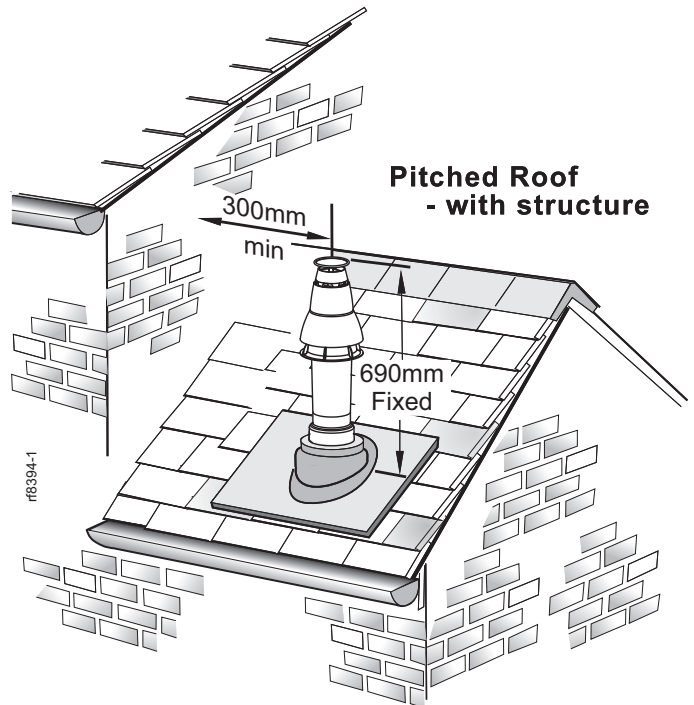
The terminal should be positioned so that products of combustion can safely disperse at all times.

Pluming 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



A = 600mm
B = 2000mm

The flue terminal shall not penetrate the shaded area of the roof

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
Below velux window	2000 mm
Above or side of velux window	600 mm

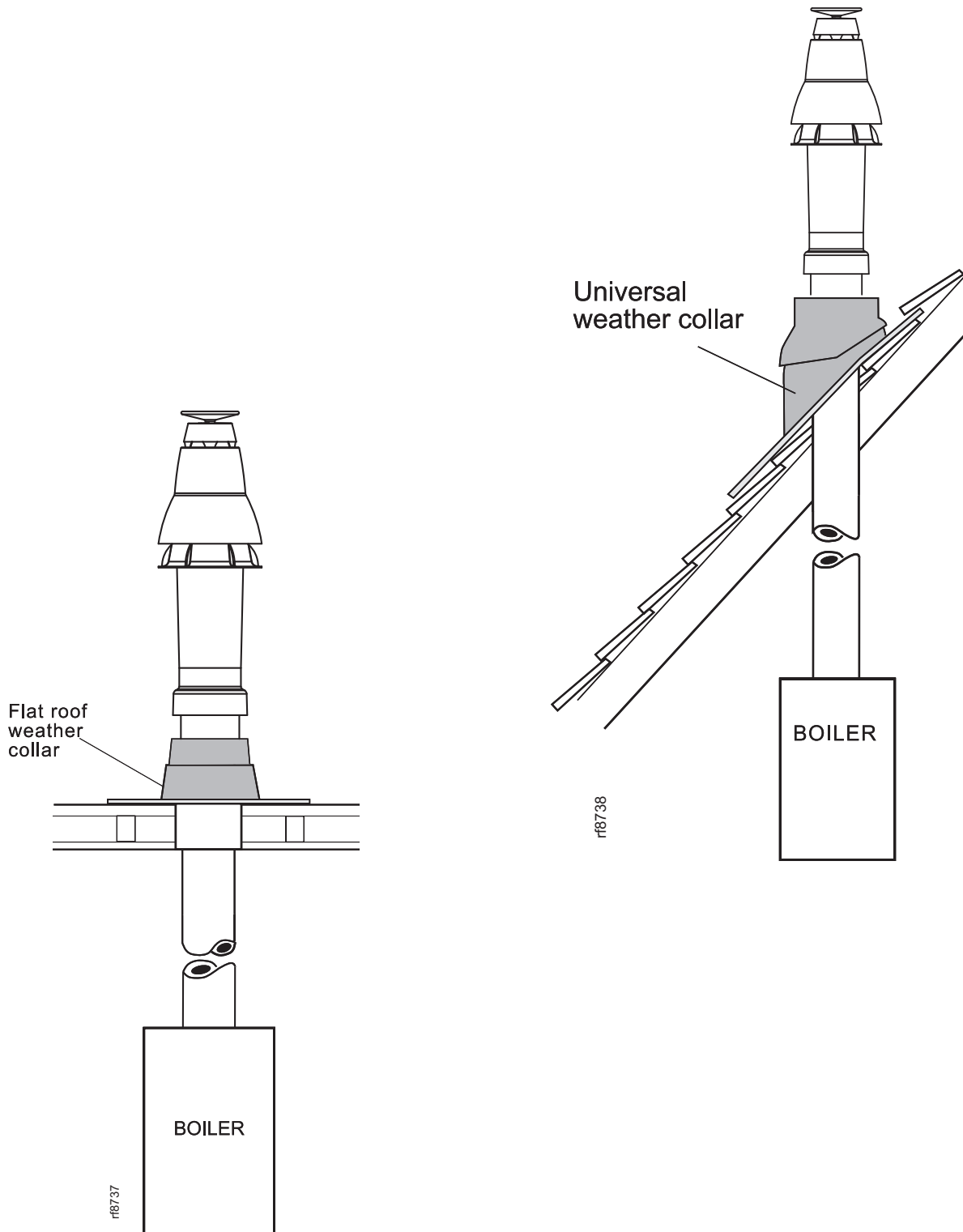
30 FLUE ARRANGEMENT

Note.

The equivalent flue length resistance of the elbow kits are:

90° elbow kit = 1m

45° elbow kit = 0.6m



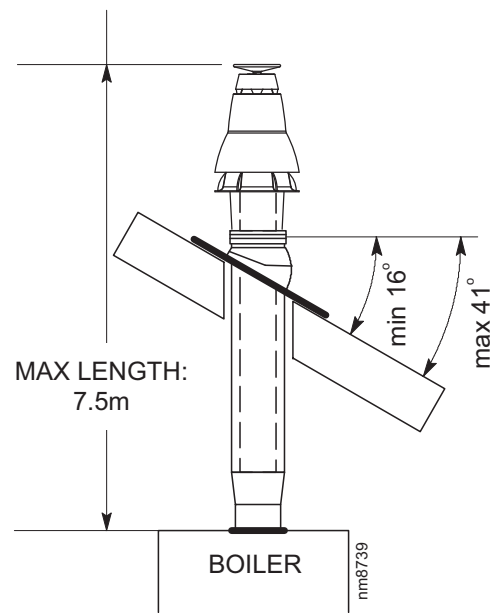
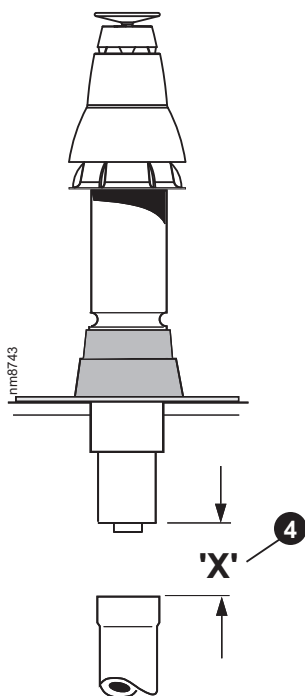
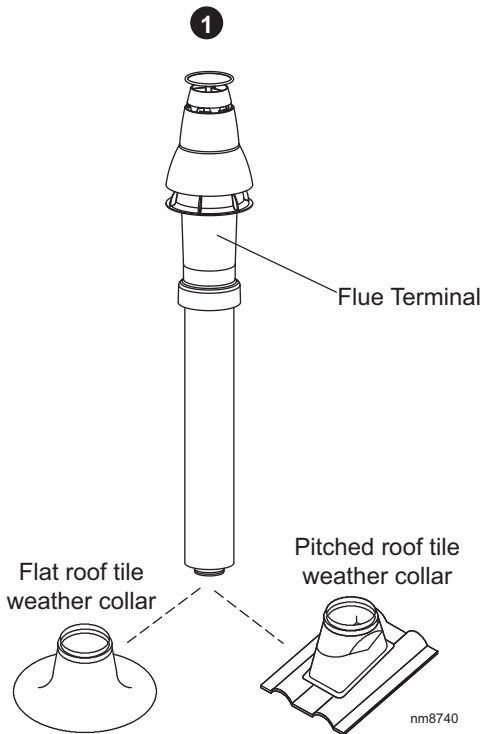
INSTALLATION

31 ASSEMBLING THE ROOF FLUE KIT

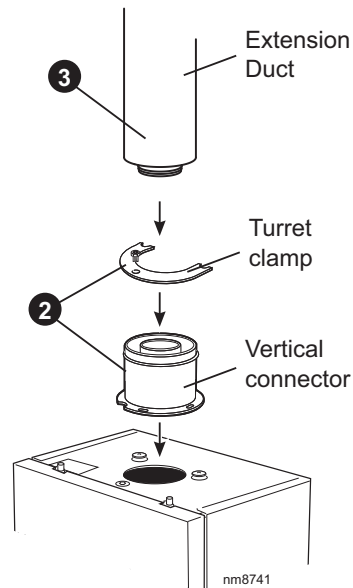
Determine the correct height that the flue should terminate above the roof. If after calculating or measuring the overall flue height from the top of the boiler, it is necessary to cut both pipes of assembly A, then ensure they are cut equally leaving the inner flue tube longer than the outer air tube as supplied.

Ensure the cut pipe ends are free from any burrs.

1. Position the roof flashing plate (supplied separately) over the hole cut in the roof and insert flue terminal from the roof end.



2. Push fit the vertical connector (supplied separately) into the boiler flue connection and retain with the retention flange and securing screw (supplied with the boiler). **ENSURING THE GASKETS IN THE BOILER FLUE OUTLET ARE CORRECTLY FITTED.**
3. "Push" fit extension duct (if required (supplied separately)) into vertical connector.



4. If the last extension duct requires cutting, measure 'X', 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.

5. Finally ensure the roof flashing plate is correctly sealed to the roof.

INSTALLATION

32 GAS CONNECTION

IMPORTANT. The gas service cock is sealed with a non-metallic blue fibre washer so must not be overheated when making capillary connections.

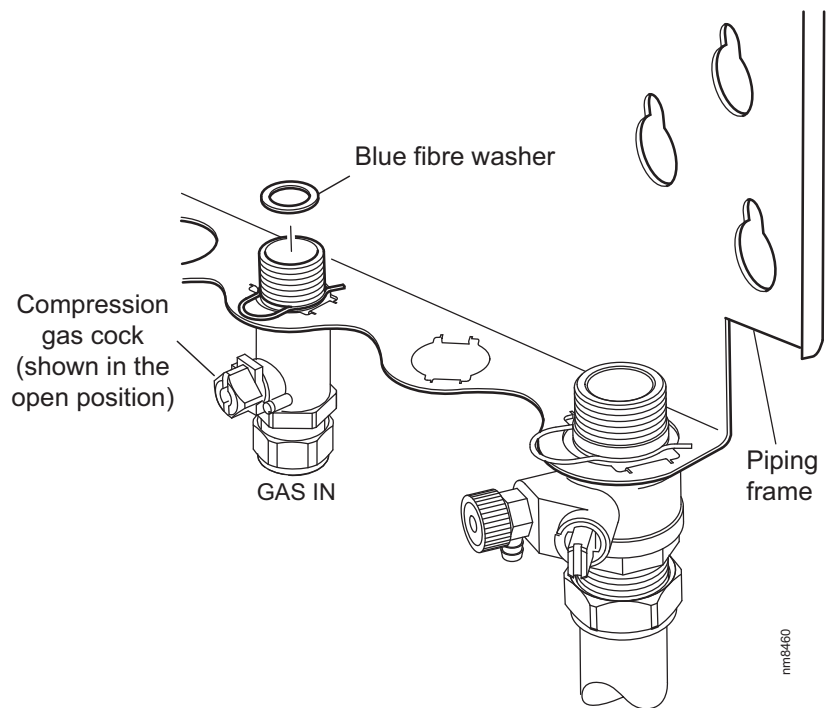
Refer to Frame 2 for details of the position of the gas connection.

A boiler gas supply pipe length of 20m and not less than 15mm O.D. can be connected to the boiler via the gas service cock union.

Ensure that the gas supply pipe does not foul the boiler casing.

Refer to Frame 42 or 'Servicing' for details of the pressure test point position.

For additional gas supply information refer to "Gas Supply" on Page 9.

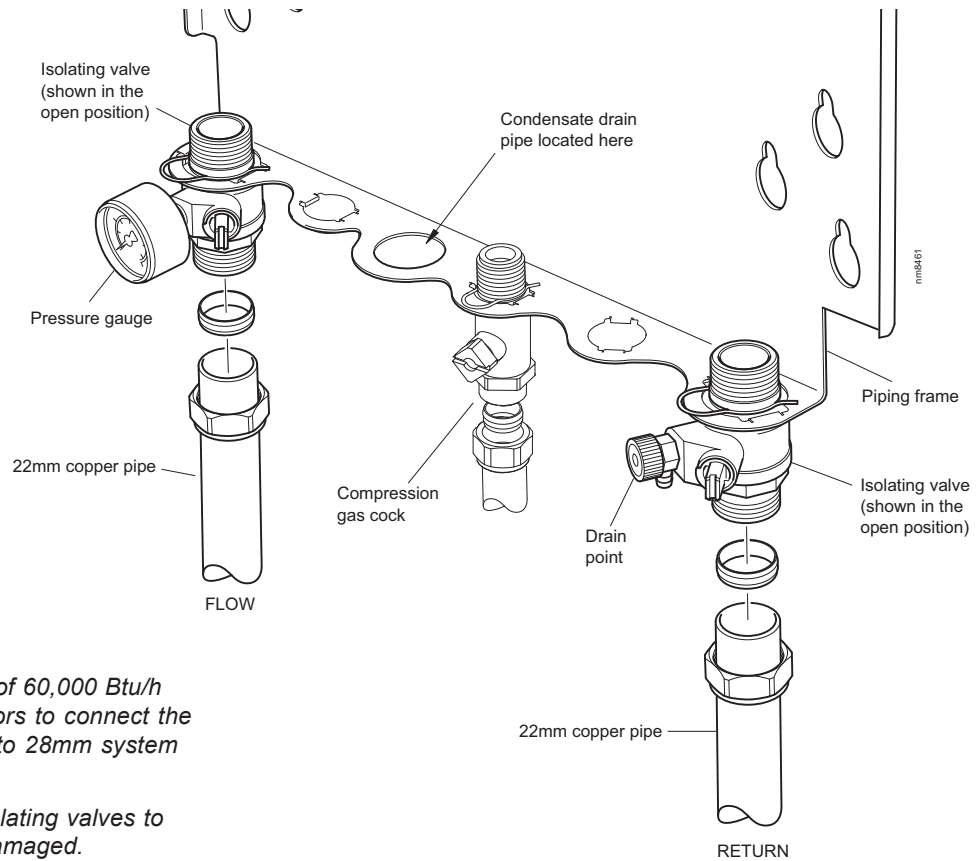


33 SAFETY VALVE DRAIN

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

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

34 WATER CONNECTIONS



Notes.

1. For heating loads in excess of 60,000 Btu/h use 28mm x 22mm connectors to connect the boiler flow and return pipes to 28mm system pipework.
2. Do not subject any of the isolating valves to heat as the seals may be damaged.

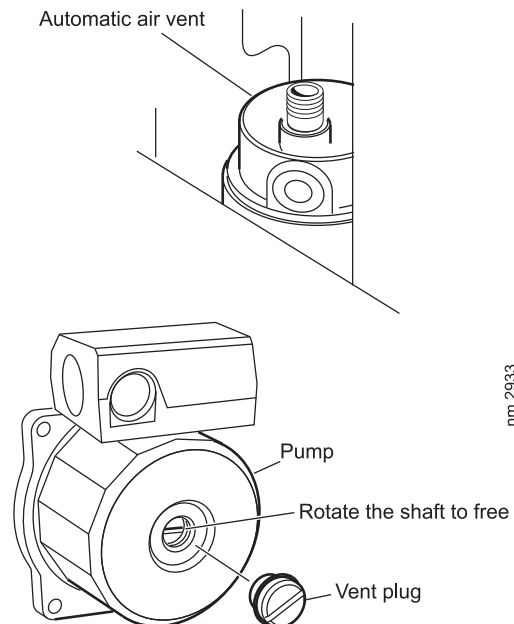
35 FILLING

1. Remove the boiler front and sealing panels. Refer to Frames 47 & 48.
2. Swing the control box down into the servicing position - Refer to Frame 49.
3. Ensure that the isolating valves are open.
4. Fill and vent the system. Check for water soundness.

IMPORTANT - when filling:

- a. When filling, there may be a slight water leak from the vent therefore electrical connections should be protected.
- b. Bleed any air from the pump and ensure that it is free to rotate.
 - i. Remove the vent plug
 - ii. Using a screwdriver, rotate the shaft several times
 - iii. Replace the vent plug.

Note. Some slight water leakage will occur.



nm 2933

36 ELECTRICAL CONNECTIONS

WARNING. This appliance MUST be earthed.

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

The fuse rating should be 3A.

All external controls and wiring must be suitable for mains voltage.

Wiring external to the boiler MUST be in accordance with the current I.E.E. (BS.7671) Wiring Regulations and any local regulations.

Wiring should be 3 core PVC insulated cable, not less than 0.75 mm² (24 x 0.2mm), and to BS 6500 Table 16. 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.

37 INTERNAL WIRING

A pictorial wiring diagram is shown in Frame 39.

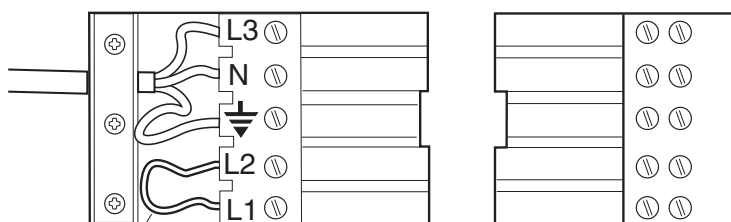
1. Route the mains cable into the bottom rear centre of the boiler.
2. Wire the permanent live supply into the 5-way remote plug terminals, L3, N & \perp .

IMPORTANT. The permanent live is ESSENTIAL in order for the advanced diagnostic controls to function correctly.

3. Wire the switched live supply into terminal L2 or connect L1 and L2 via external control switching, as shown in Frame 33. In either case, remove the wire link fitted to L1 and L2.
4. Secure the mains lead with the cable clamp.
5. Connect the mains lead connector. Ensure it is fully located.

Note.

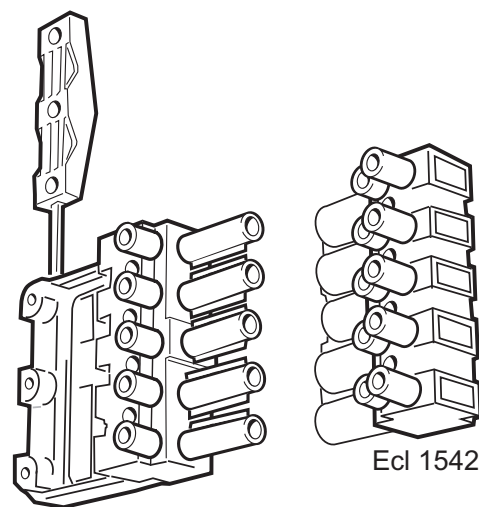
Ensure that the lengths of the current carrying conductors are shorter than the earth conductor so that if the cable slips in its anchorage the current carrying conductors become taut before the earth conductor.



Remove link when connecting external programmer.

Mains Connector
(supplied in hardware pack)

Socket
(fixed to boiler)



Ecl 1542

38 EXTERNAL ELECTRICAL CONTROLS

Wiring external to the boiler MUST be in accordance with the current I.E.E. (BS.7671) Wiring Regulations and any local regulations. For IE reference should be made to the current ETCI rules for electrical installations.

The fuse rating should be 3A.

Room Thermostat

If the thermostat has a neutral connection, use it (it provides for more energy efficient operation by reducing switching temperature differentials).

Frost Protection

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 programmer selector switches are set to OFF and all the 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.

If the boiler is installed in a garage it may be necessary to fit a pipe thermostat, preferably on the return pipework.

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

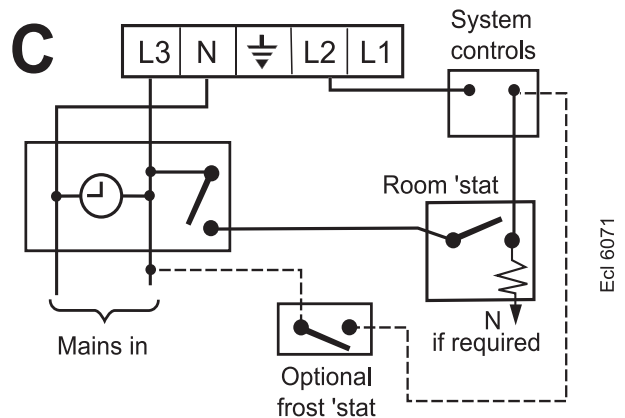
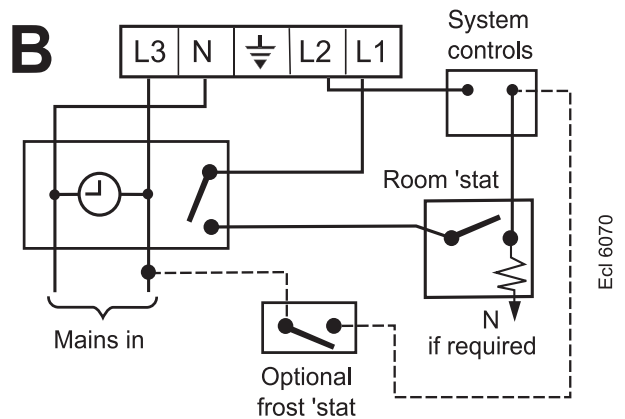
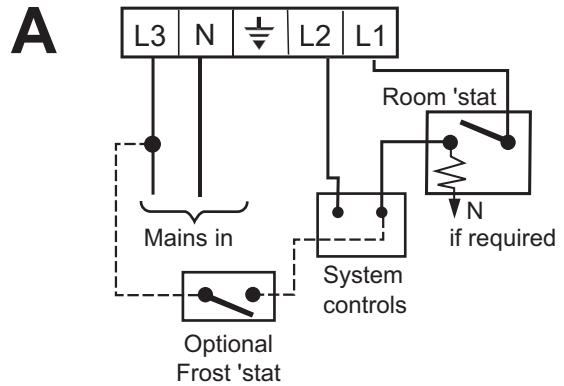
IMPORTANT.

Ensure that the frost thermostat is wired so that the system pump and / or external flow control valve is energised as appropriate.

Diagram A shows an application to boilers fitted with a room thermostat only.

Diagrams B & C show applications to boilers fitted with alternative time controls.

Earths are not shown for clarity but must never be omitted.

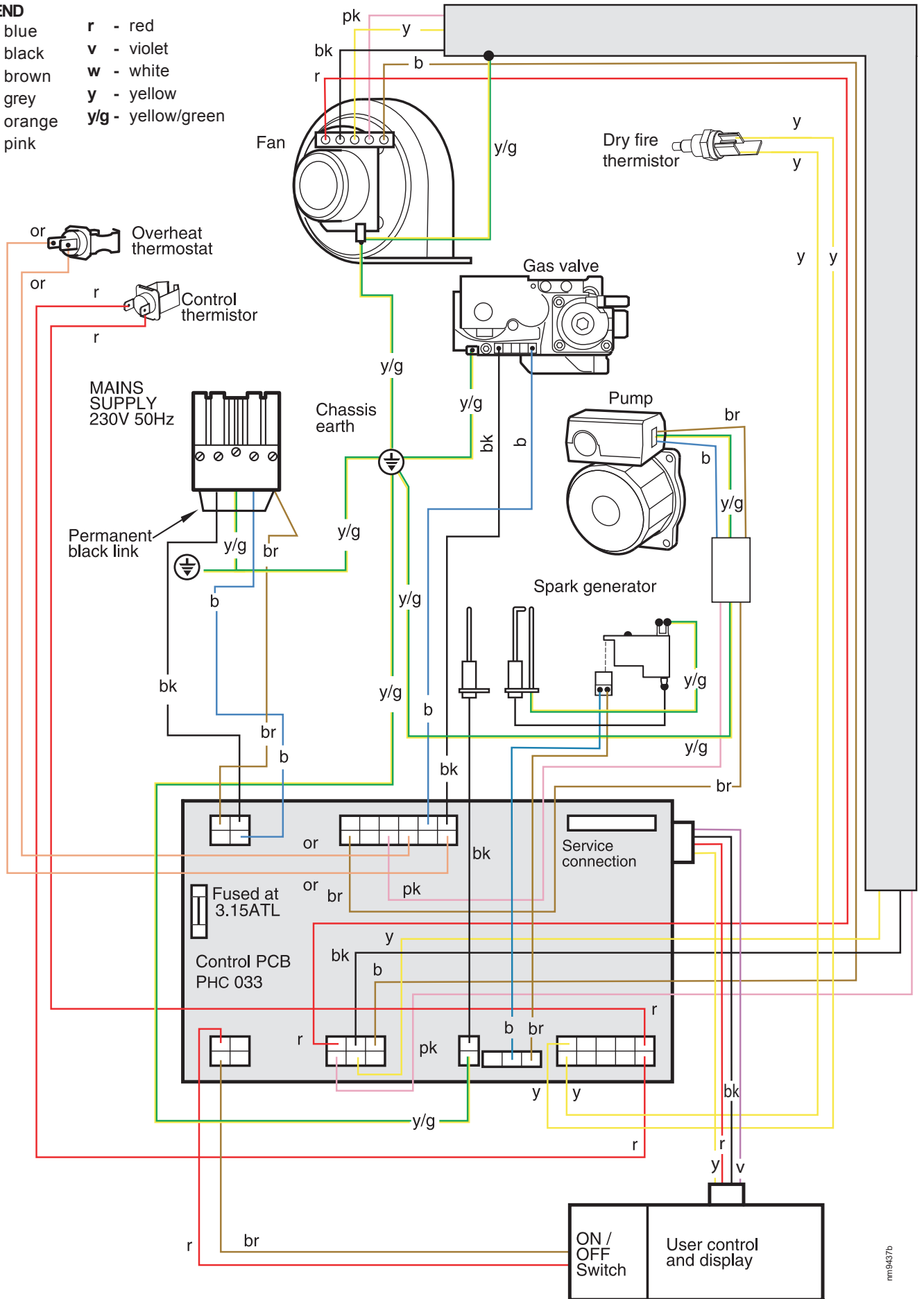


INSTALLATION

39 PICTORIAL WIRING DIAGRAM

LEGEND

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

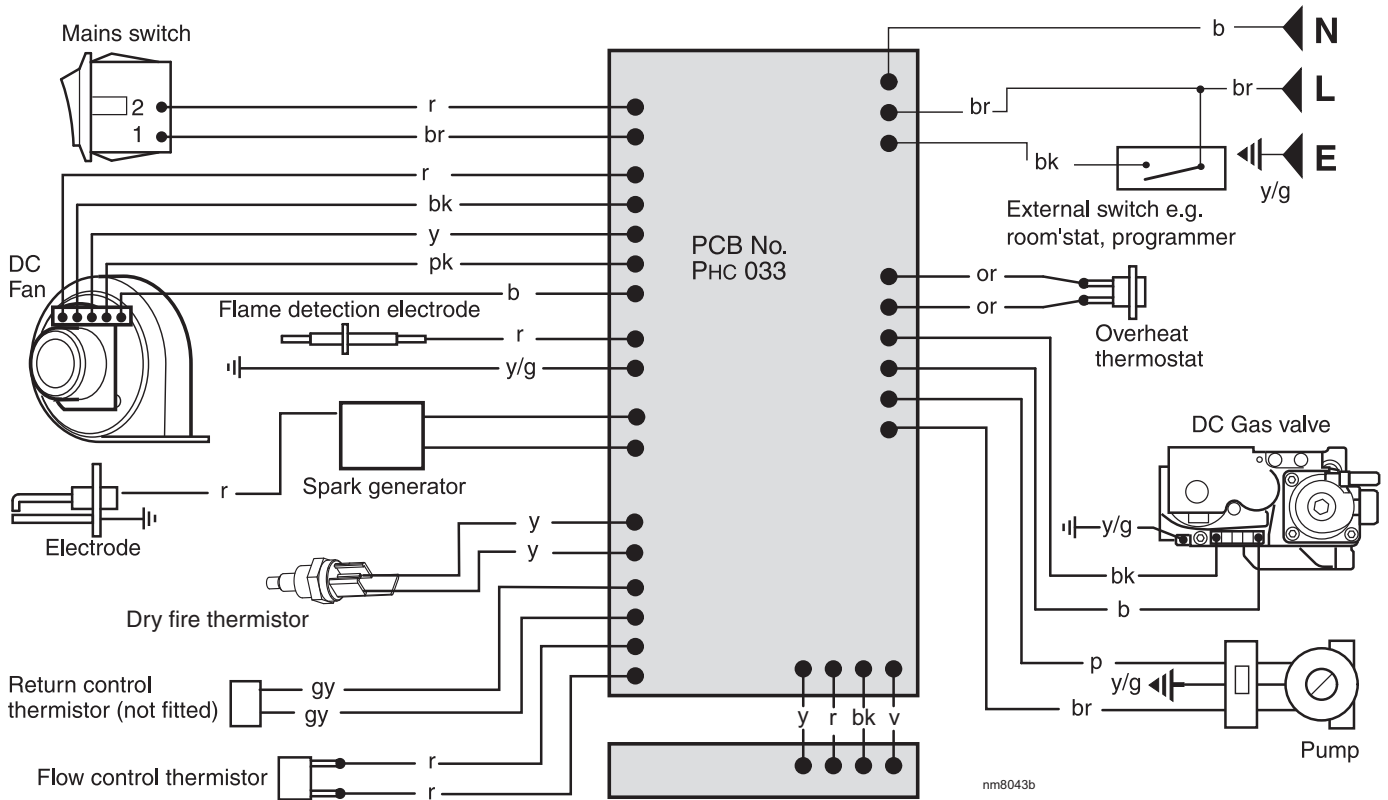


INSTALLATION

nm9437b

INSTALLATION

40 FUNCTIONAL FLOW WIRING DIAGRAM



LEGEND

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

41 COMMISSIONING AND TESTING

A. Electrical Installation

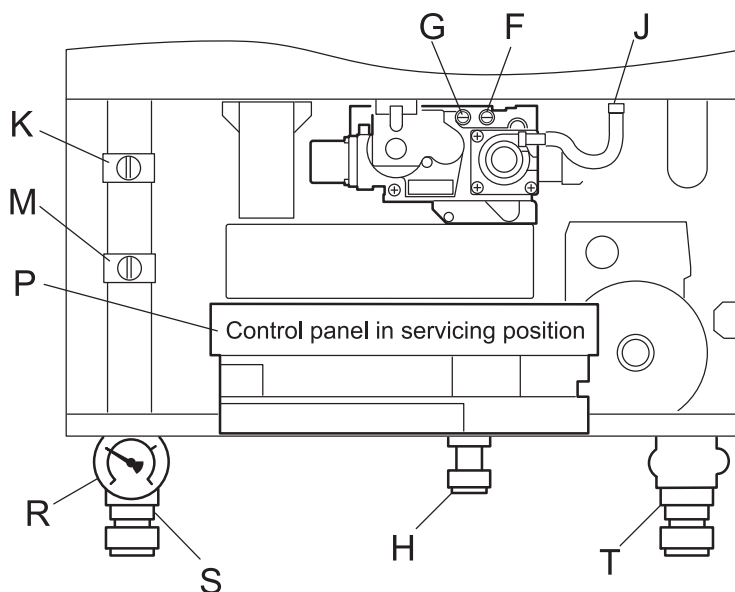
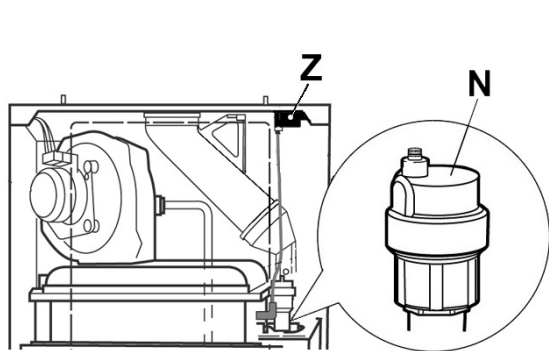
1. Checks to ensure electrical safety should be carried out by a competent person.
2. ALWAYS carry out the preliminary electrical system checks, i.e. earth continuity, polarity, resistance to earth and short circuit, using a suitable test meter.

B. Gas Installation

1. The whole of the gas installation, including the meter, should be inspected and tested for tightness and purged in accordance with the recommendations of BS. 6891. In IE refer to I.S.813:2002.
2. Purge air from the gas installation by the approved methods only.

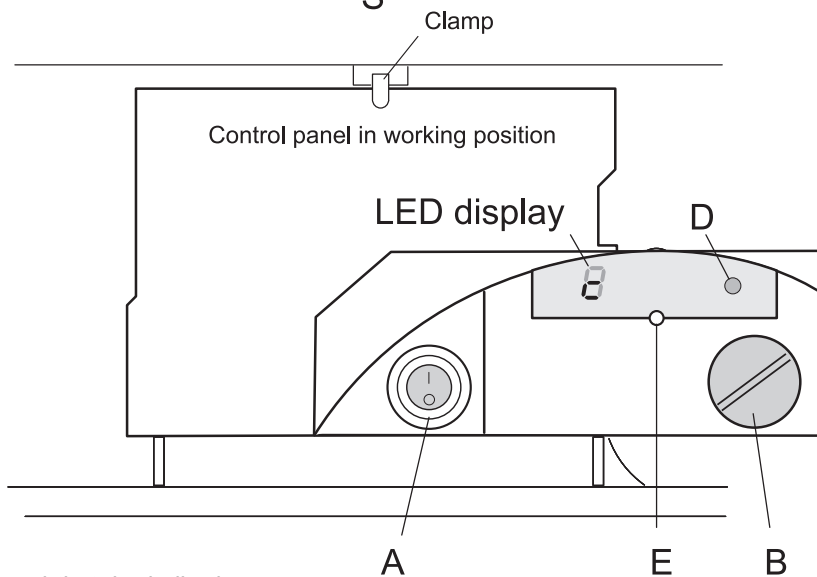
WARNING. Whilst effecting the required gas tightness test and purging air from the gas installation, open all windows and doors, extinguish naked lights and **DO NOT SMOKE.**

42 INITIAL LIGHTING



LEGEND

- A. Boiler On/Off switch.
- B. Thermostat knob.
- D. Burner On Neon
- E. Reset button.
- F. Injector pressure test point.
- G. Inlet pressure test point.
- H. Gas service cock.
- J. Casing pressure test point.
- K. Overheat thermostat.
- M. Flow thermistor.
- N. Automatic air vent.
- P. Control panel (Servicing position).
- R. Pressure gauge.
- S. Flow isolating valve.
- T. Return isolating valve.
- Z. Spark generator.



1. Check that the system has been filled and that the boiler is not airlocked. Ensure the automatic air vent cap (N) is open.

Note.

It is important the burner is not operated before the system is fully vented of air. If it is necessary to operate the appliance pump to assist venting of the air this must be done with the gas service cock turned off.

2. Refit the boiler sealing panel. Refer to Frame 48.
3. Check that all the drain cocks are closed and that the isolating valves (T and S) are OPEN.
4. Check that the electrical supply is OFF.
5. Check that the boiler on/off switch (A) is off.
6. Check that the gas service cock (H) is OPEN.
7. Carefully align the user control and push gently into place. Secure with the single screw located underneath.
8. Slacken the screw in the inlet pressure test point (G) and connect a gas pressure gauge via a flexible tube.
9. Swing the control panel to the working position and secure with the clamp.
10. Connect the low voltage electrical lead from the user control to the control box (refer to Frame 49).

11. Screw the control into position.

12. Switch the electricity supply ON and check all external controls are calling for heat.

The display

The user control has one neon and one display to inform the user about the status. The display will show the status of the boiler. The neon will show the status of the flame. If no flame is detected the neon is blinking. When the flame is detected the neon will be lit permanently.

Below is a list with the display function in normal operation.

- Standby, no demand for heat present.
- Boiler is active for central heating.
- Boiler Frost Protection.
- Boiler is in lockout for a specific error. Display will be blinking, alternating with a number or letter to show which error is detected.
- Boiler in lockout for a specific error. Display will be blinking, alternating with a number or letter to show which is detected.

Note: Boiler Frost Protection occurs under the following condition:

1. If the temperature is less than 3 degrees the boiler will fire.

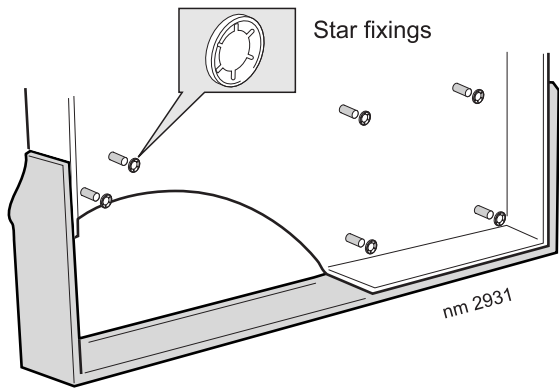
mm9436

INSTALLATION

43 INITIAL LIGHTING - continued

13. Set the boiler thermostat knob (B) to position 6 and switch the boiler on/off switch (A) to ON. The boiler control should now go through its ignition sequence until the burner is established.
14. If the boiler does not light after 3 attempts, fault code will be displayed. Press the reset button (E) and the boiler will repeat its ignition sequence.

When the burner is established the WHITE 'Burner On' neon (D) will be illuminated and the LED display will show status .
15. Ensure that with the boiler operating the dynamic gas pressure is able to obtain maximum output. Refer to Table 2.



For additional gas supply information refer to "Gas Supply" on page 9.

IMPORTANT.

The gas input to the burner is regulated by the gas valve according to the air flow produced by the fan. It is NOT user-adjustable. Any interference to sealed settings on the gas valve will adversely affect operation and render our warranty void.

16. Set the boiler on/off switch (A) to OFF.
17. Swing the control box into the servicing position. Refer to Frame 49.
18. Remove the pressure gauge and tube. Tighten the sealing screw in the pressure test point. Ensure a gas tight seal is made.
19. Swing the control box back into its working position and secure.
20. Refit the user control.
21. Refit the boiler front and bottom panels.
22. **THE FASCIA**
 - a. To remove the plastic fascia, prise off the retaining star washers using a pair of pliers and place to one side.
 - b. Fill the remaining fixing holes with the white push in caps provided.
23. Switch the boiler on again.

44 GENERAL CHECKS

Make the following checks for correct operation:

1. Ensure that the external controls are calling for heat. After ignition the display should read:
 c white neon on.
2. **Gas Rate**
 Check the boiler gas rate when the boiler is at full output checked at the gas meter, with no other appliance in use.
 Refer to Table 2 for gas rates.
3. Set the external controls to OFF. The burner should go off and the pump continue to run for a few seconds.
 The display should read:
 c returning to
 d when the pump stops.
4. Check the correct operation of the programmer (if fitted) and all other system controls. Operate each control separately and check that the main burner responds.

Water circulation system

5. With the system COLD, check that the initial pressure is correct to the system design requirements. For pre-pressurised systems, this should be 1.0 bar.
6. With the system HOT, examine all water connections for soundness. The system pressure will increase with temperature rise but should not exceed 2.5 bar.
7. With the system still hot, turn off the gas, water and electricity supplies to the boiler and drain down to complete the flushing process.

Note. A flushing solution should be used during the flushing procedure: Flushing solutions Fernox Superfloc, Sentinel X300 (new systems) or X400 (existing systems). Refer to Frame 6.

8. Refill and vent the system, add inhibitor (see Frame 6), clear all air locks and again check for water soundness.
 Affix the water treatment warning label, supplied in the hardware pack, in a *prominent position* on the system, to prevent the use of incorrect water treatment additives.
9. Reset the system initial pressure to the design requirement.
10. Balance the system. Refer to Frame 5.
11. Check the condensate drain for leaks and check that it is discharging correctly.
12. Finally, set the controls to the User's requirements.

Note.

The pump will operate briefly as a self-check once every 24 hours in the absence of any system demand.

WATER TEMPERATURE

Water temperature can be selected via the thermostat (B)

Knob Setting	Flow Temp °C (°F)
Max	82 (180)
Min	30 (86)

45 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 Instructions to the householder and explain his/her responsibilities under the relevant national regulations.
2. Explain and demonstrate the lighting and shutting down procedures.
3. 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 the household requirements of heating.

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.
4. Explain the function and the use of the boiler heating controls.
5. Explain the function of the boiler fault mode.

Emphasise that if a fault is indicated, the boiler should be turned off and a Gas Safe Registered Engineer consulted. In IE contact Registered Gas Installer (RGII).
6. Explain and demonstrate the function of time and temperature controls, radiator valves etc., for the economic use of the system.
7. If any programmer is fitted then draw attention to the Programmer Users Instructions and hand them to the householder.

8. Loss of system water pressure

Explain that the dial underneath the boiler indicates the central heating system pressure and that if the normal COLD pressure of the system is seen to decrease over a period of time then a water leak is indicated. Explain the re-pressurising procedure and if unable to re-pressurise or if the pressure continues to drop a Gas Safe Registered Engineer should be consulted. In IE consult a Registered Gas Installer (RGII).

WARNING.

Do not fire the boiler if the pressure has reduced to zero from the original setting.

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. IMPORTANT

Stress the importance of regular servicing by a Gas Safe Registered Engineer and that a comprehensive service should be carried out AT LEAST ONCE A YEAR. In IE servicing work must be carried out by a Registered Gas Installer (RGII)

11. 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 householder pack supplied with this boiler.

46 SERVICING SCHEDULE

For the very latest copy of literature for specification & maintenance practices, visit our website www.idealboilers.com, where you will be able to download the relevant information. N.B. Technical Bulletins are also available on www.idealboilers.com.

WARNING. Always turn OFF the gas supply at the gas service cock, and switch OFF and disconnect the electricity supply to the appliance before servicing.

To ensure the continued safe and efficient operation of the appliance it is recommended that it is checked at regular intervals and serviced as necessary. The frequency of servicing will depend upon the installation condition and usage but should be carried out at least annually.

It is the law that any service work must be carried out by a Gas Safe Registered Engineer. In IE service work must be carried out by a Registered Gas Installer (RGI).

1. Light the boiler and carry out a pre-service check, noting any operational faults.
2. Clean the main burner.
3. Clean the heat exchanger and 'S' trap.
4. Check the condition of the combustion chamber insulation. Any cracked, damaged or displaced pieces should be replaced. Ionisation probes are a servicable component and require inspecting annually. Replace if distorted.
5. Check the main injector for blockage or damage.
6. Wherever possible remove and clean the condensate 'S' trap (refer to Frame 52) and check the drain for blockage.
7. Check that the flue terminal is unobstructed and that the flue system is sealed correctly.

The servicing procedures are covered more fully in Frames 47 to 54 and MUST be carried out in sequence.

Note. In order to carry out either servicing or replacement of components the boiler front panel and sealing panel must be removed. Refer to Frames 47 and 48.

IMPORTANT.

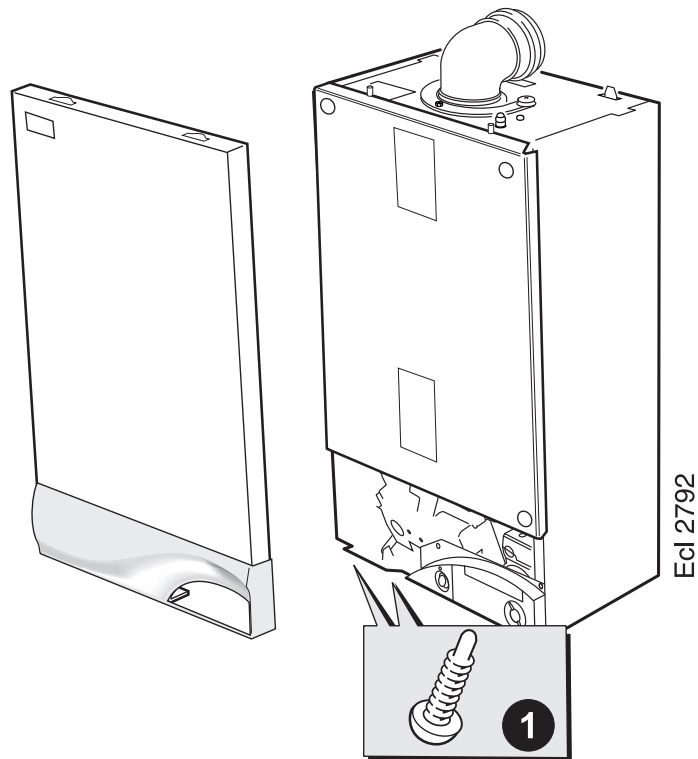
8. After completing the servicing or exchange of components always test for gas tightness.
9. When work is complete the sealing panel MUST be correctly refitted, ensuring that a good seal is made.

Do NOT OPERATE the boiler if the sealing panel is not fitted

10. If, for any reason, the condensate trap 'S' has been removed ensure that the trap is refilled with water before reassembly.
11. Check the gas consumption.
12. Connect a suitable gas analyser to the sampling point on the top of the boiler (refer to Frame 48) or into the flue terminal if access is possible (optional test). For correct boiler operation the CO/CO₂ content of the flue gas should not be greater than 0.004 ratio.
13. Complete the service section in the Benchmark Commissioning Checklist.

47 BOILER FRONT PANEL REMOVAL

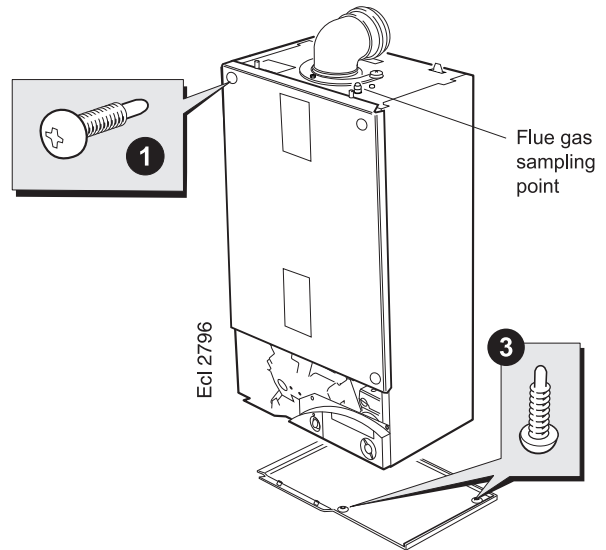
1. Remove the 2 retaining screws from the underside of the boiler.
2. Pull the panel forward at the bottom and lift to disengage it from the top lugs.



SERVICING

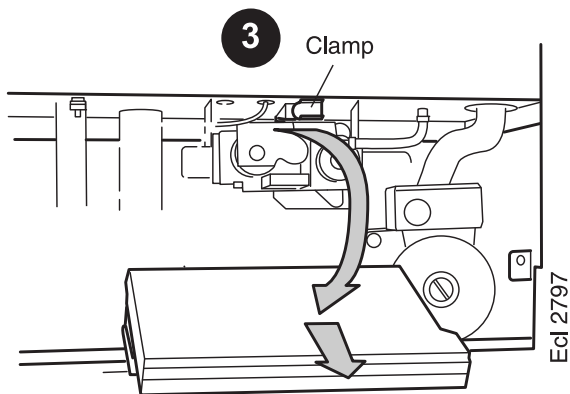
48 BOILER SEALING PANEL / BOTTOM PANEL REMOVAL

1. To remove the sealing panel remove the 4 screws.
2. Remove the panel.
3. To remove the bottom panel remove the 2 screws.
4. Pull the right hand side of the panel down. Slide it to the right and withdraw.

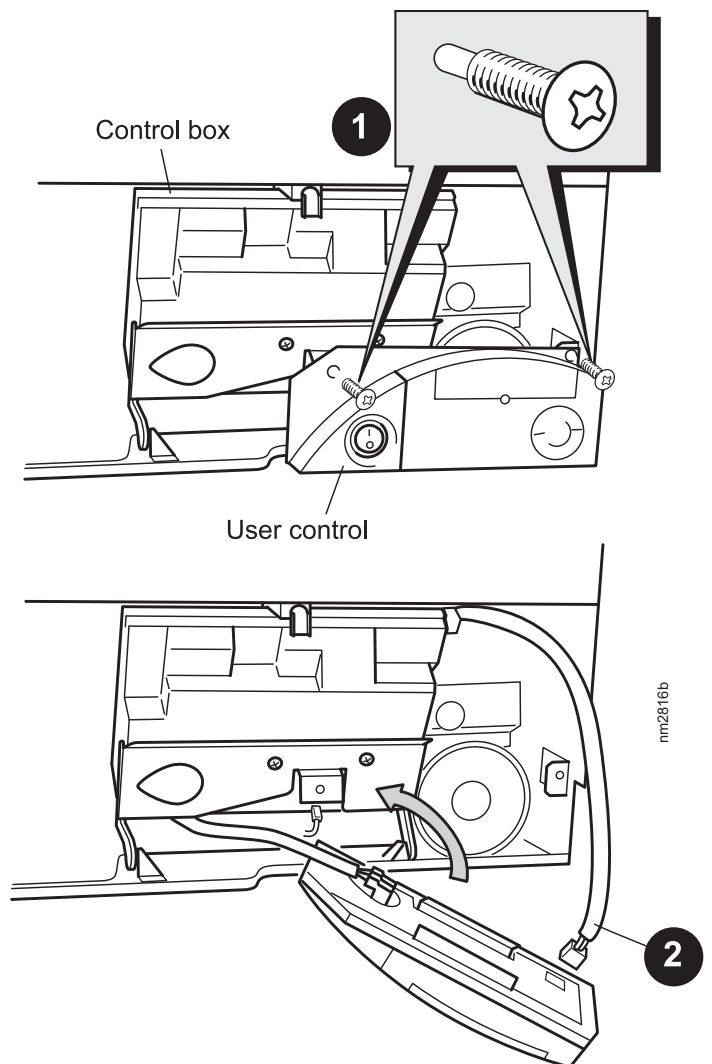


49 THE CONTROL BOX IN THE SERVICING POSITION

1. Remove the 2 screws and withdraw the user control.
2. Unplug the low voltage electrical lead from the back of the user control.
3. Turn the clamp, swing the control box down and pull slightly forward.



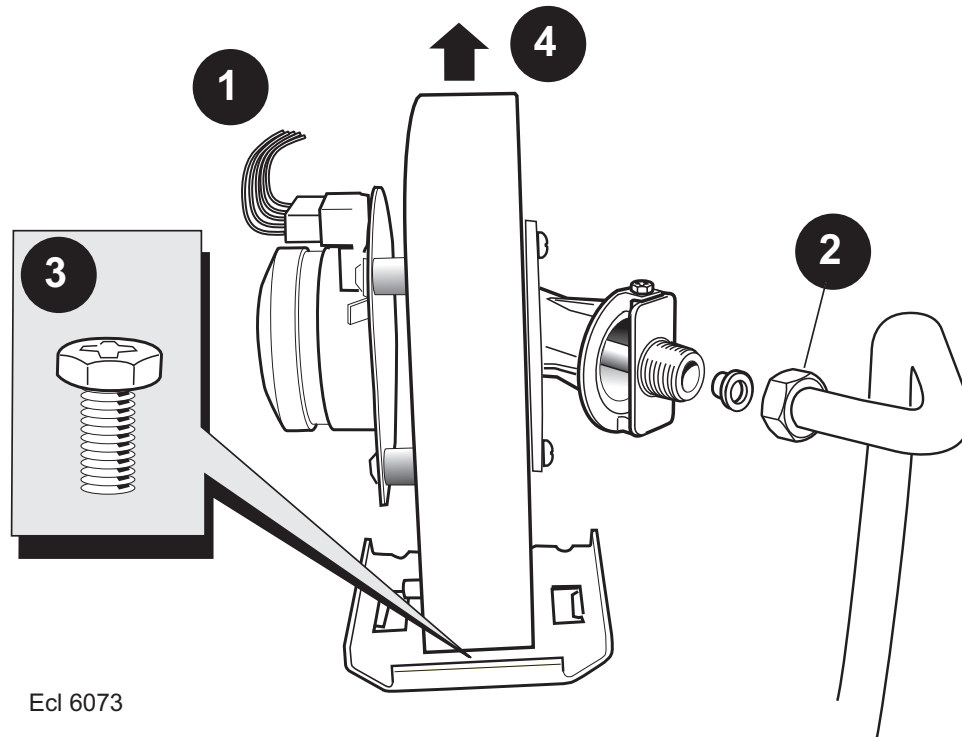
Swing control panel down and forward into service position



SERVICING

50 FAN AND VENTURI ASSEMBLY REMOVAL AND CLEANING

1. Disconnect the electrical leads from the fan.
2. Undo the gas pipe union connection to the injector housing.
3. Undo the screw on the fan mounting bracket.
4. Lift off fan and venturi assembly.
5. Inspect the injector for blockage or damage.



51 BURNER REMOVAL AND CLEANING

1. Remove the 6 screws securing the burner (the 3 screws at the rear are extended to ease access).
2. Lift off the burner from the combustion chamber.

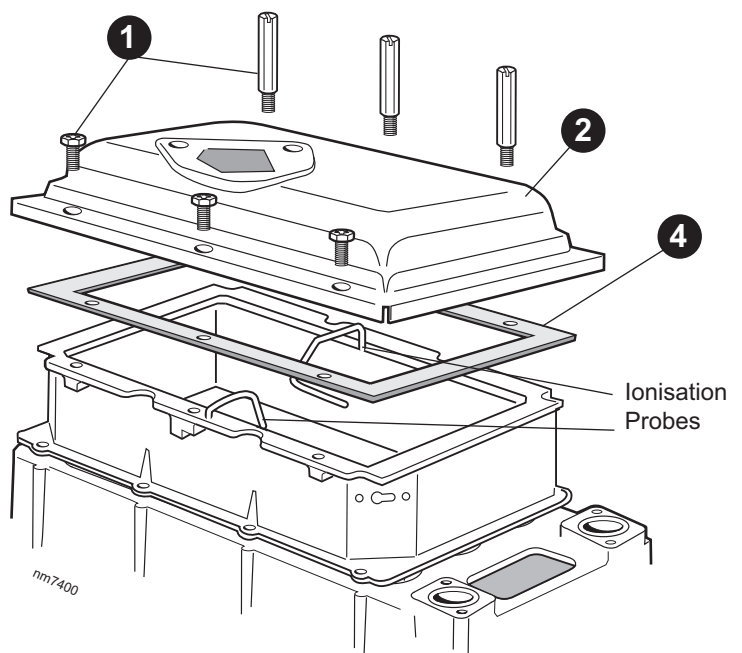
IMPORTANT

The burner head is a ceramic plaque construction. Care must be taken to ensure that **the burner is not placed down upon its face** as this may cause damage to the ceramic.

3. Brush off any deposits that may be on the ceramic with a SOFT brush.
4. Inspect the sealing gasket around the burner and combustion chamber insulation for any signs of damage. Replace as necessary.

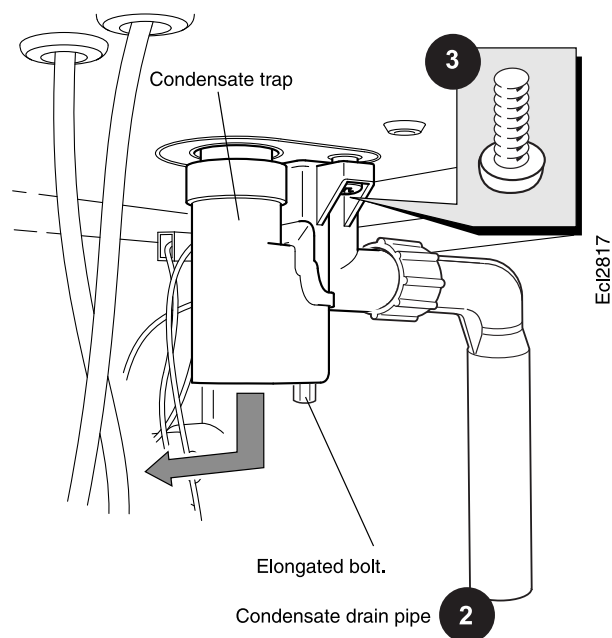
Note.

Take care not to disturb the ionisation probes at the front and rear of the combustion chamber.



52 CLEANING THE CONDENSATE 'S' TRAP

1. Swing the control box down into the servicing position. Refer to Frame 49.
2. Disconnect the condensate drain pipe.
3. Remove the screw and elongated bolt, pull the trap down and forward to remove.
4. Flush out any deposits with clean water.

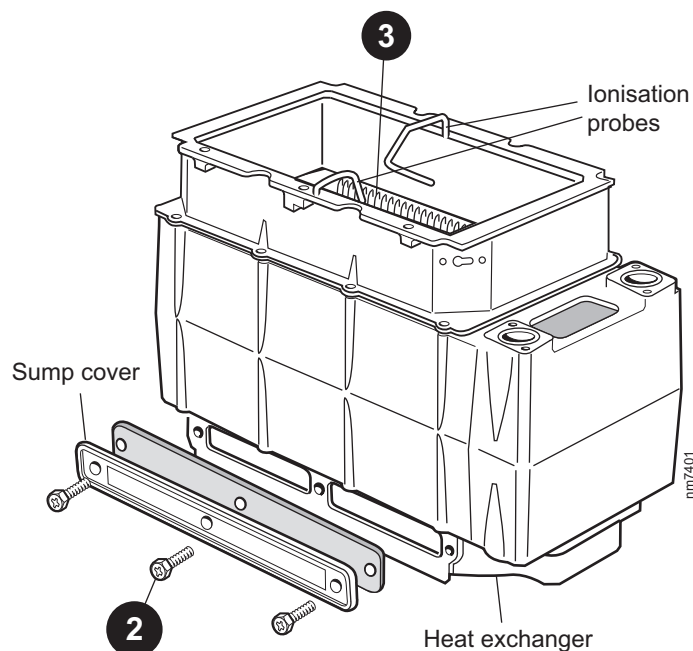


53 CLEANING THE HEAT EXCHANGER

1. Remove ignition and flame detection electrodes. Refer to Frames 61 & 62.
2. Remove the 3 screws retaining the sump cover and remove.
3. Using a suitable tool as supplied in the standard British Gas Flue brush kit, clean between the heat exchanger fins from the top of the heat exchanger.
4. Access to the base of the heat exchanger is now possible. Brush clean any deposits from the base of the heat exchanger and remove any loose deposits from the sump.
5. Inspect the ignition and detection electrodes. Ensure that they are clean and in good condition - replace if necessary.
6. Check the condition of the combustion chamber insulation. Any cracked or damaged pieces must be replaced.

Note. Take care not to disturb the ionisation probes at the front and rear of the combustion chamber.

7. Check that the ignition and detection gaps are correct. Refer to Frames 61 & 62.



54 REASSEMBLY

Reassemble the boiler in the following order:

1. Refit the condensate 'S' trap, ensuring that it is full of water.
2. Refit the sump cover.
3. Refit the electrodes. (Check dimensions; Frames 61 & 62).
4. Refit the burner.
5. Refit the fan / venturi assembly.
6. Reconnect the fan electrical leads.
7. Refit the boiler sealing panel.

IMPORTANT.

Ensure that the boiler sealing panel is correctly fitted and that a good seal is made.

8. Swing the control box back into its working position and secure.
9. Refit the display unit.
10. Refit the boiler front and bottom panels.
11. Turn on the gas supply at the gas service cock.
12. Reconnect the electrical supply.

SERVICING

55 REPLACEMENT OF COMPONENTS

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 42.

After replacing ANY component check operation of the boiler including gas soundness, gas rate and combustion test.

IMPORTANT.

When work is complete, the sealing panel, if removed, must be correctly refitted - ensuring that a good seal is made.

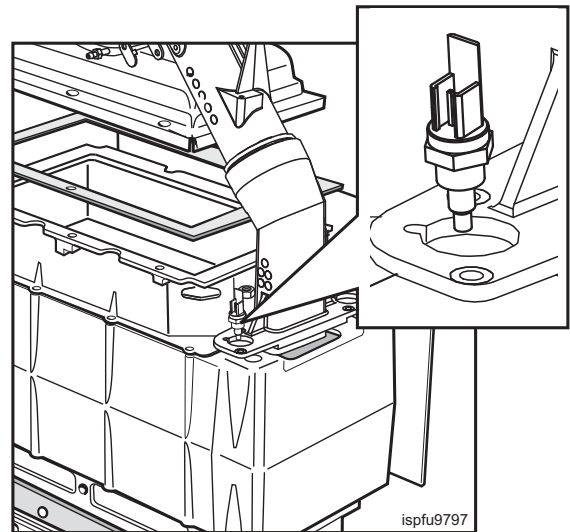
Notes.

1. In order to assist fault finding, the control panel has an LED diagnostic display. The key to boiler fault conditions is shown in Frame 73.
2. In order to replace components in Frames 65-71 it is necessary to drain the boiler. Refer to Frame 68.

THE BOILER MUST NOT BE OPERATED WITHOUT THE SEALING PANEL FITTED

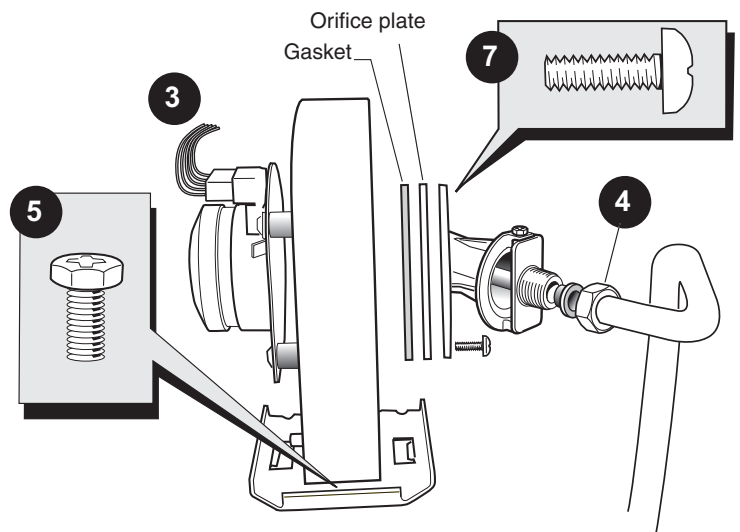
56 DRY FIRE THERMISTOR REPLACEMENT

1. Refer to Frame 55.
2. Remove the boiler front and sealing panels. Refer to Frames 47 & 48.
3. Drain down the boiler. Refer to Frame 73.
4. Unplug the electrical lead.
5. Unscrew the thermistor.
6. Fit the new thermistor using the sealing washer provided.
7. Reassemble in the reverse order.
8. Check the operation of the boiler. Refer to Frame 55.



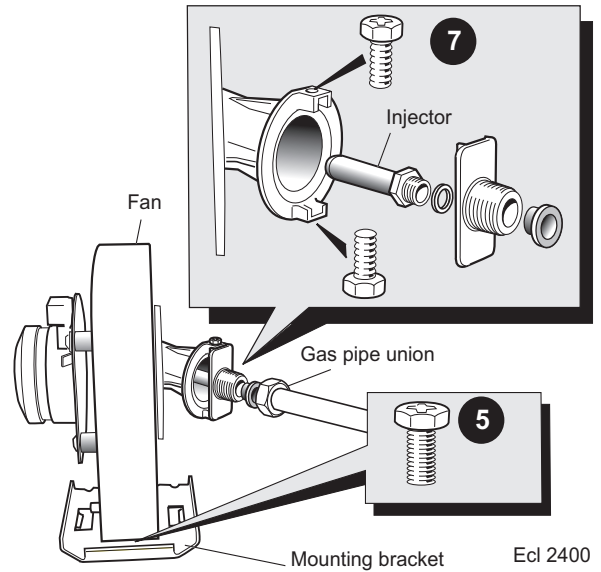
57 FAN REPLACEMENT

1. Refer to Frame 55.
2. Remove the boiler front and sealing panels. Refer to Frames 47 & 48.
3. Disconnect the electrical leads from the fan.
4. Undo the gas pipe union connection to the injector housing.
5. Remove the screw retaining the fan mounting bracket.
6. Remove the fan and venturi assembly. Refer to Frame 50.
7. Unscrew the 3 screws and remove the venturi assembly, *noting the orientation of the venturi in relation to the fan body.*
8. Transfer the venturi assembly to the new fan, replacing the gasket if evidence of damage or deterioration is visible.
9. Fit the new fan / venturi assembly.
10. Reassemble the boiler in reverse order, taking care not to overtighten the screw on the fan mounting bracket.
11. Check the operation of the boiler. Refer to Frame 55.



58 BURNER INJECTOR REPLACEMENT

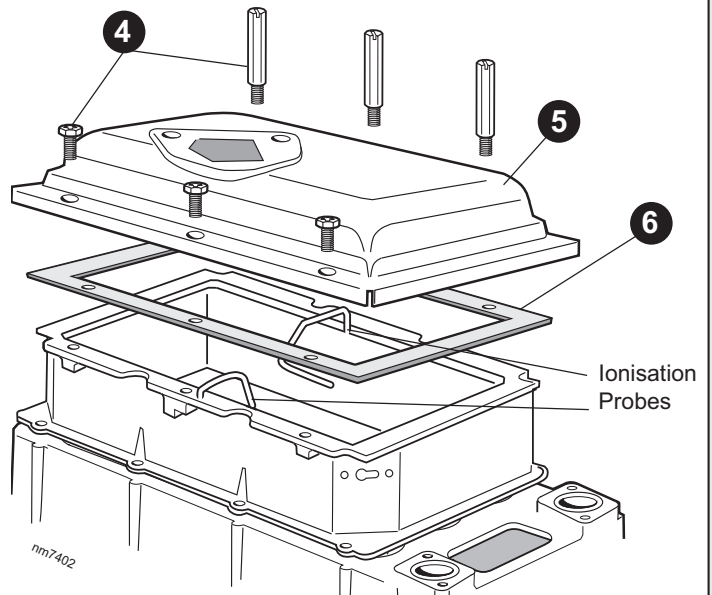
1. Refer to Frame 55.
2. Remove the boiler front and sealing panels. Refer to Frames 47 & 48.
3. Disconnect the electrical leads from the fan.
4. Undo the gas pipe union connection to the injector housing.
5. Remove the screw retaining the fan mounting bracket.
6. Remove the fan and venturi assembly. Refer to Frame 50.
7. Remove the 2 injector housing screws.
8. Withdraw the injector housing.
9. Fit the new injector housing, complete with injector.
10. Reassemble in reverse order, ensuring that the new gas seal supplied is located correctly in the injector housing.
11. Check operation of the boiler. Refer to Frame 55.



59 BURNER REPLACEMENT

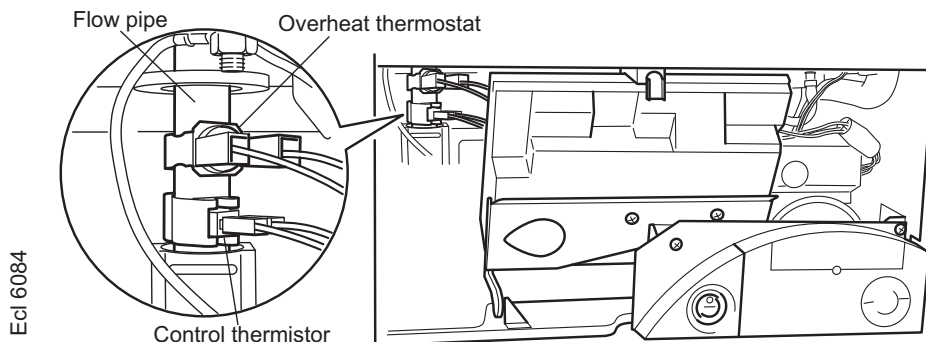
1. Refer to Frame 55.
2. Remove the boiler front and sealing panels. Refer to Frames 47 & 48.
3. Remove the fan assembly. Refer to Frame 50.
4. Remove the 6 screws securing the burner (the 3 screws at the rear are extended to ease access).
5. Lift off the burner from the combustion chamber.
6. Fit the new burner, replacing any damaged or deteriorating sealing gasket.
7. Reassemble in reverse order.
8. Check the operation of the boiler. Refer to Frame 55.

Note. Take care not to disturb the ionisation probes at the front and rear of the combustion chamber.



60 CONTROL THERMISTOR AND OVERHEAT THERMOSTAT REPLACEMENT

1. Refer to Frame 55.
2. Remove the boiler front and sealing panels. Refer to Frames 47 & 48.
3. Unclip the thermistor / thermostat from the flow pipe and withdraw it from the controls compartment.
4. Disconnect the electrical leads from the thermistor/ thermostat.
5. Reconnect the electrical leads and reassemble in reverse order, ensuring the spring clip is securely on the pipe.
6. Check the operation of the boiler. Refer to Frame 55.

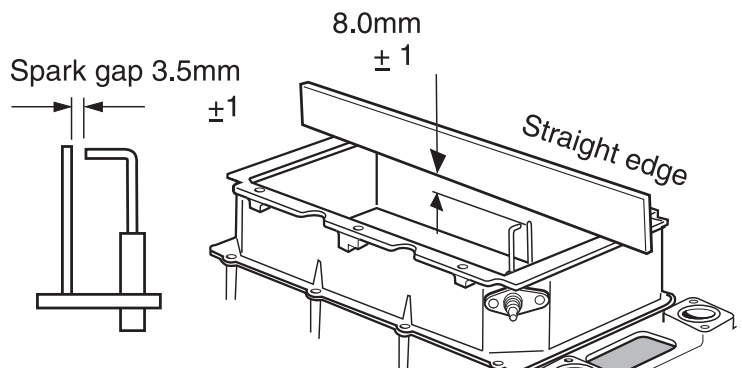
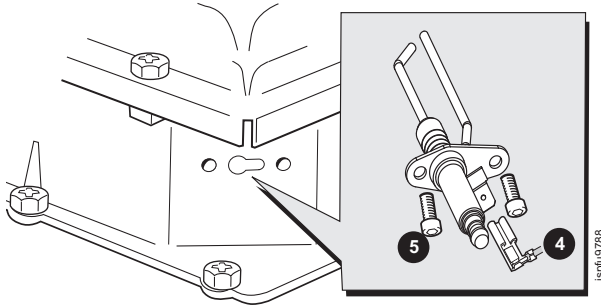


SERVICING

61 IGNITION ELECTRODE REPLACEMENT

1. Refer to Frame 55.
2. Remove the boiler front and sealing panels. Refer to Frames 47 & 48.
3. Unplug the ignition lead from the electrode.
4. Remove earth lead from the ignition electrode.

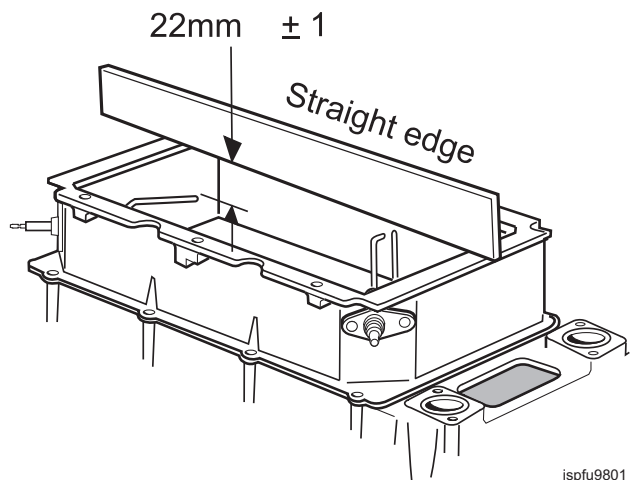
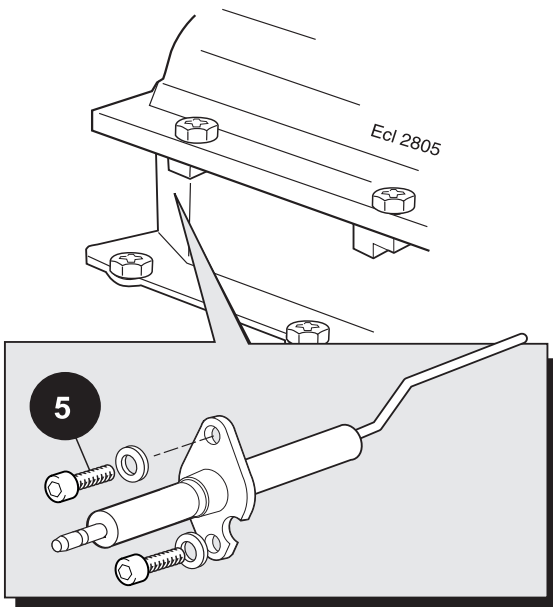
5. Remove the remaining screw holding the ignition electrode to the combustion chamber.
6. Remove the electrode.
7. Fit the new ignition electrode, using the new gasket supplied. Check dimensions as shown.
8. Reassemble in reverse order and check that no damage to the combustion chamber insulation has occurred during the electrode replacement.
9. Check the operation of the boiler. Refer to Frame 55.



62 FLAME DETECTION ELECTRODE REPLACEMENT

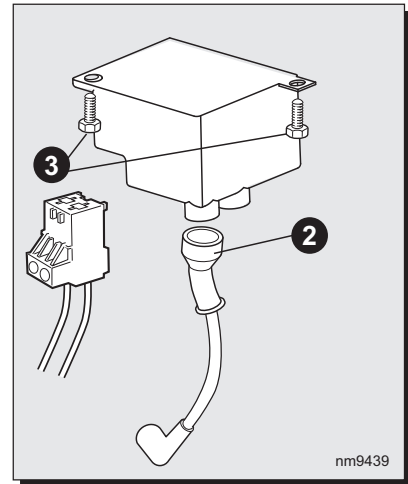
1. Refer to Frame 55.
2. Remove the boiler front and sealing panels. Refer to Frames 47 & 48.
3. Unplug the flame detection lead from the electrode.
4. Remove the 2 screws holding the flame detection electrode to the combustion chamber.

5. Remove the electrode.
6. Fit the new flame detection electrode, using the new gasket supplied. Check dimensions as shown.
7. Reassemble in reverse order and check that no damage to the combustion chamber insulation has occurred during the electrode replacement.
8. Check the operation of the boiler. Refer to Frame 55.



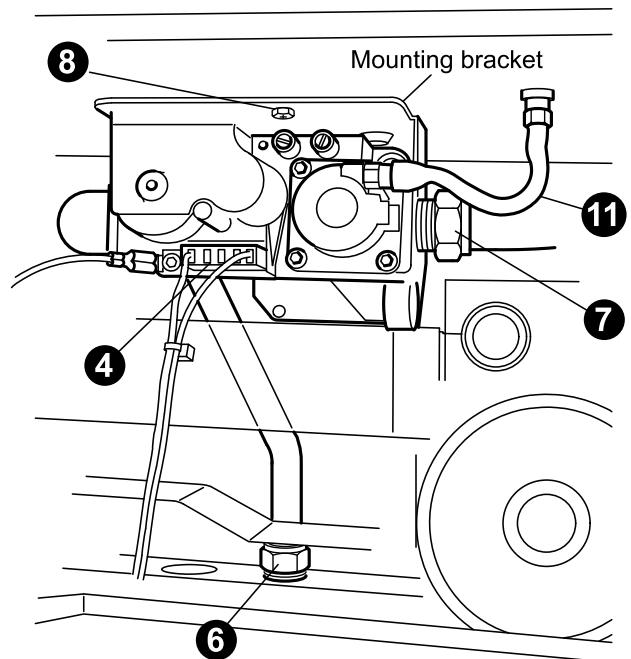
63 SPARK GENERATOR REPLACEMENT

1. Refer to Frame 55.
2. Disconnect the lead from the spark generator and bracket.
3. Remove the 2 M4 screws securing the spark generator to the chassis.
4. Fit the new spark generator and re-assemble in reverse order.
5. Check operation of the boiler. Refer to Frame 55.



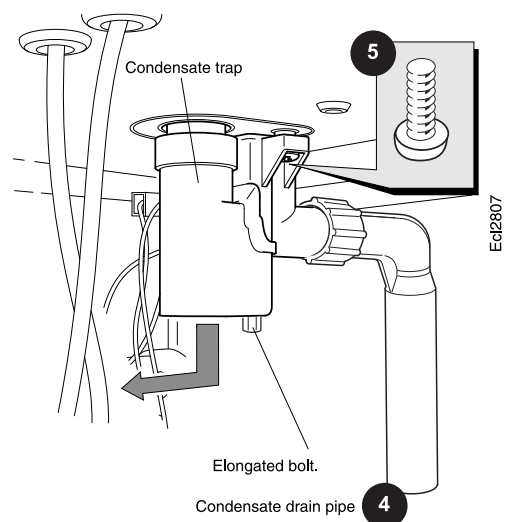
64 GAS CONTROL VALVE REPLACEMENT

1. Refer to Frame 55.
2. Remove the boiler front and bottom panels. Refer to Frames 47 & 48.
3. Swing the control box down into the servicing position. Refer to Frame 49.
4. Unplug the electrical lead from the gas control valve and disconnect the earth wire.
5. Remove the sensing tube from the gas control valve.
6. Undo the gas inlet pipe union at the gas service cock.
7. Undo the union nut on the outlet of the gas control valve.
8. Slacken the screw securing the valve mounting bracket and withdraw the valve, complete with bracket and inlet pipe.
9. Transfer the mounting bracket and gas inlet pipe to the new gas control valve.
10. Fit the new gas control valve, ensuring that any seals showing damage or deterioration are replaced. Reassemble in reverse order.
11. Ensure the sensing tube is correctly replaced and not kinked or blocked in any way.
12. Check operation of the boiler. Refer to Frame 55.



65 CONDENSATE 'S' TRAP REPLACEMENT

1. Refer to Frame 55.
2. Remove the boiler front and bottom panels. Refer to Frames 47 & 48.
3. Swing the control box down into the servicing position. Refer to Frame 49.
4. Disconnect the condensate drain pipe.
5. Remove the screw and elongated bolt, pull the trap down and forward to remove.
6. Transfer the drain pipe to the new trap and reassemble in reverse order.
7. When reassembling ensure the trap is full of water.
8. Check operation of the boiler. Refer to Frame 55.



66 COMBUSTION CHAMBER INSULATION REPLACEMENT

Ideal Stelrad Group recommends that, for your own comfort and safety and to comply with good working practice, the procedure described below is followed:

1. Refer to 'Replacement of Components' Frame.
2. Remove the boiler front and sealing panels. Refer to 'Boiler Front Panel Removal' and 'Boiler Sealing Panel Removal' Frame.
3. Remove the fan / venturi assembly. Refer to 'Fan and Venturi Assembly removal and cleaning' Frame.
4. Remove the burner. Refer to 'Burner removal and cleaning' Frame.
5. Remove the ignition electrode. Refer to 'Ignition Electrode replacement' Frame.
6. Remove the flame detection electrode. Refer to 'Flame Detection electrode replacement' Frame.
7. Remove the front and rear ionisation probes and discard.

Prior to removal of the insulation piece the following protective equipment should be worn:

- Face mask supplied with the spare part.
- Gloves supplied with the spare part.

8. Damp down the combustion chamber area containing the insulation piece.
9. Remove the insulation piece. The replacement one piece insulation is supplied in a plastic bag, this bag should be retained and the discarded insulation should now be placed into it.
10. Sweep any dampened particles and place in the plastic bag.

11. Fit new insulation piece -

- (a) Locate and align the insulation with the electrode holes and position the insulation into the combustion chamber.
- (b) Push the flexible material into the corners of the combustion chamber ensuring it is flat and flush against the combustion chamber wall.
- (c) Interlock the insulation piece along the back wall of the combustion chamber.
- (d) Again push the flexible material into the corners of the combustion chamber ensuring it is flat and flush against the combustion chamber wall.
- (e) Secure the insulation by replacing the ionisation probes with those supplied in the kit. Note that ionisation probes are a serviceable component and require inspecting annually.

Note. The insulation is designed to be interlocking and should be fitted as shown.

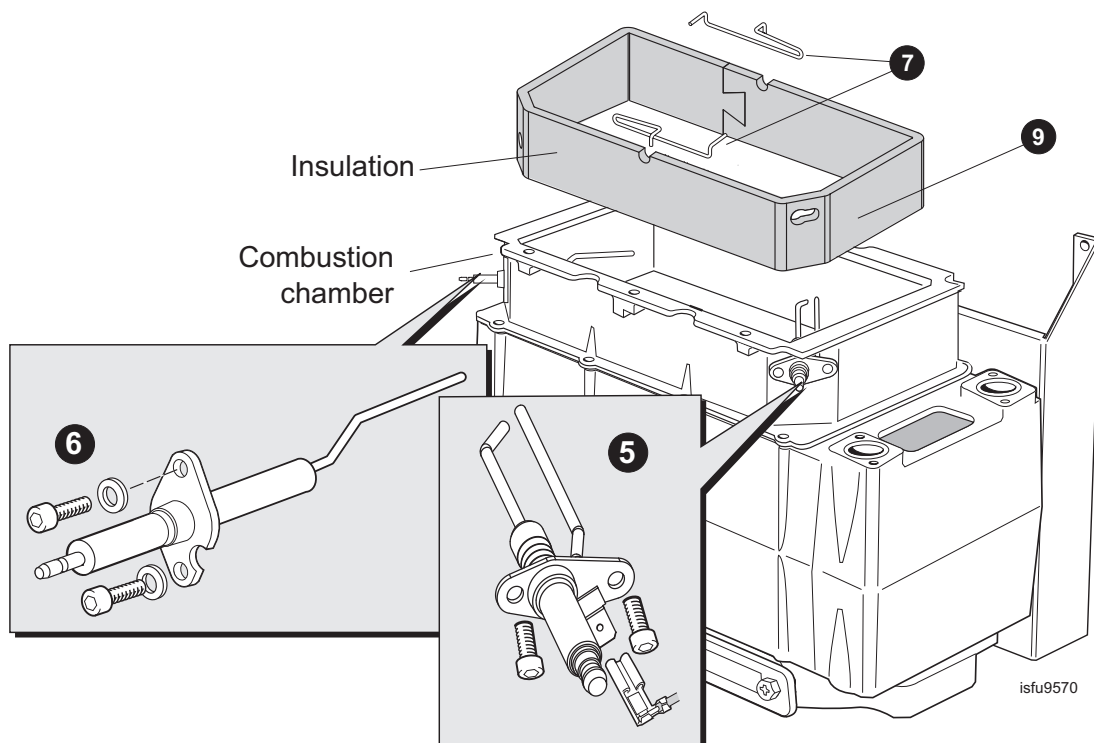
12. Remove the gloves and face mask and place them in the plastic bag.

13. Wash your hands and any areas of skin which may have come into contact with any of the particles from the insulation piece.

Note. Seal the plastic bag and dispose of it and its contents into a commercial tip.

14. Reassemble in reverse order.

15. Check operation of the boiler. Refer to 'General Checks' Frames.

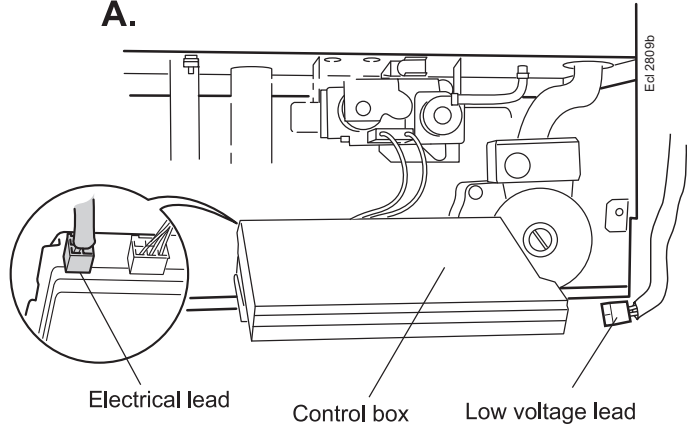


67 CONTROL BOX REPLACEMENT

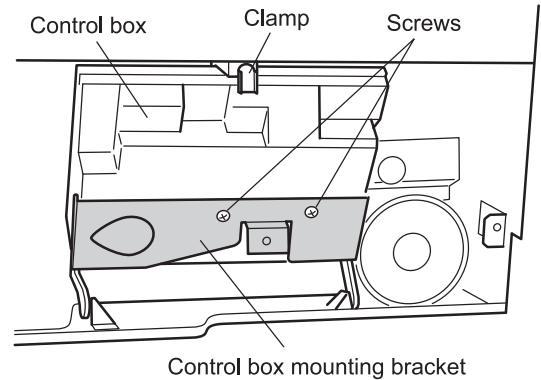
1. Refer to Frame 55.
2. Remove the boiler front and bottom panels. Refer to Frames 47 & 48.
3. Swing the control panel down into the servicing position. Refer to Frame 49.
4. Unplug the user control electrical lead and low voltage lead from the control box and remove the control. Refer to diagram A.
5. Return the control box to the working position and secure with the clamp. Unscrew the mounting bracket screws to remove the bracket. Refer to diagram B.
6. Release the clamp and carefully remove the control box from the hinge arms. Refer to diagram C.
7. Unplug all the electrical wiring from the control box and remove.
8. Transfer mounting bracket and hinge screws to the new control box.

9. Reassemble in reverse order, ensuring that the control box is located correctly in the housing before reconnecting the electrical wiring.
10. Check operation of the boiler. Refer to Frame 55.

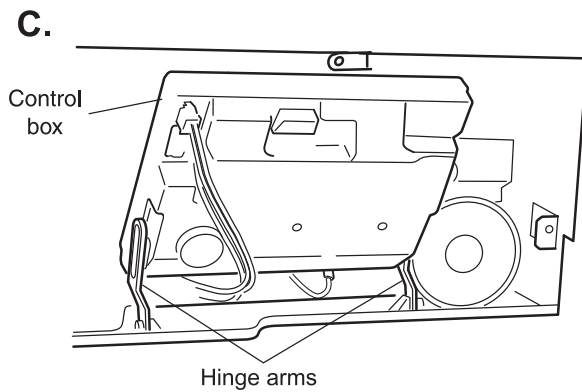
A.



B.



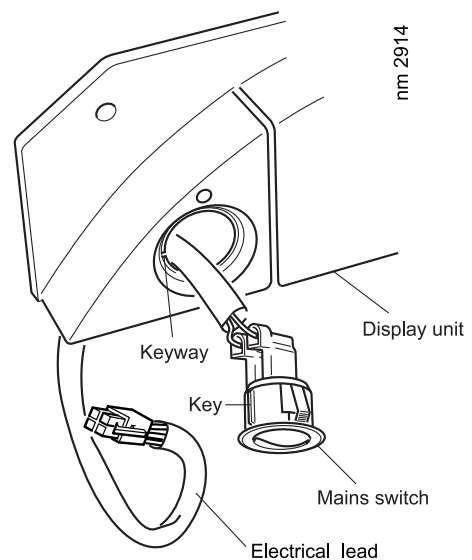
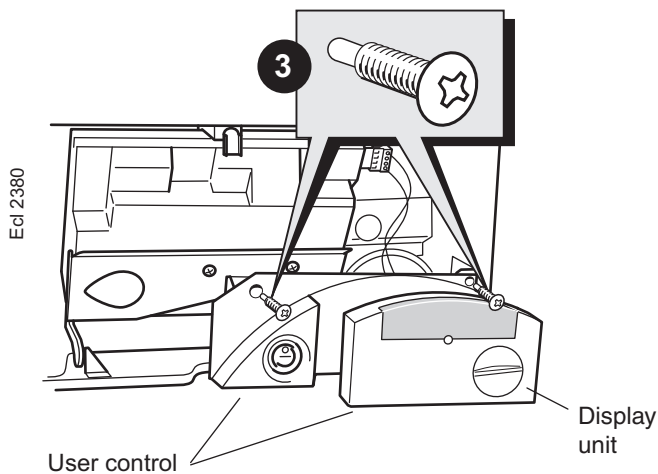
C.



68 MAINS SWITCH REPLACEMENT

1. Refer to Frame 55.
2. Remove boiler front and bottom panels. Refer to Frames 47 & 48.
3. Remove the 2 screws and allow the user control to lower.
4. Push out the mains switch from the rear, as shown.

5. Fit the new switch, ensuring that the electrical leads are replaced on the correct terminals (refer to Frame 40) and the key on the switch is correctly aligned with the slot in the plastic moulding.
6. Reassemble in reverse order.
7. Check operation of the boiler. Refer to Frame 55.

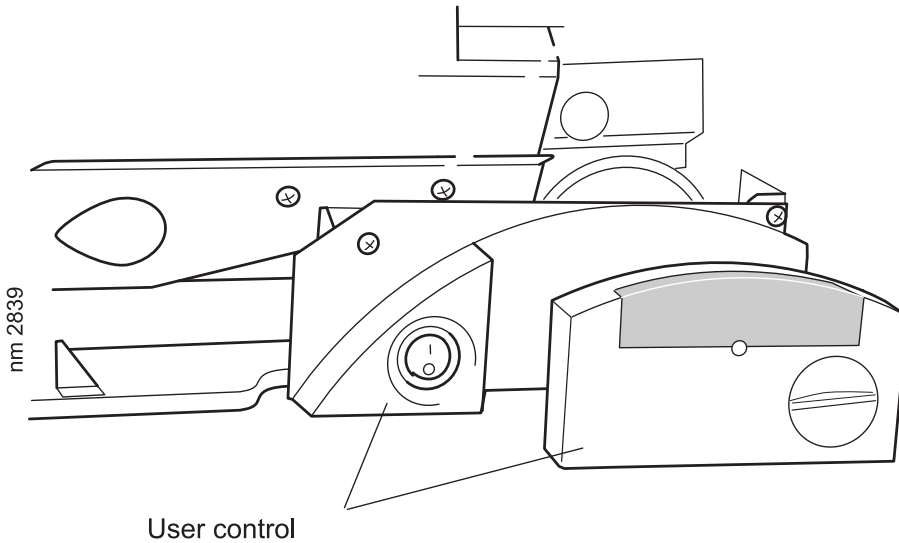
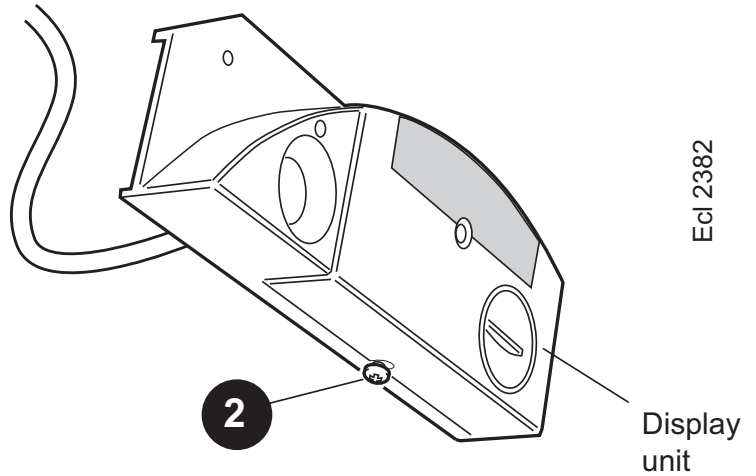


SERVICING

69 USER CONTROL REPLACEMENT

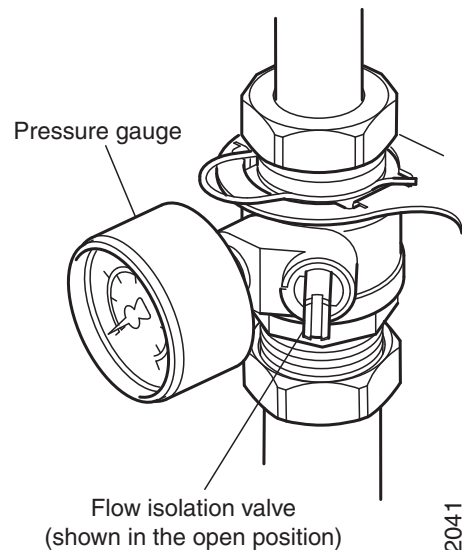
Note. Only the display unit is replaced.

1. Refer to Frame 55.
2. Loosen the screw on the underside of the user control.
3. Pull the display unit forward to remove.
4. Push the new display unit into position.
5. Reassemble in reverse order.
6. Check operation of the boiler. Refer to Frame 55.



70 PRESSURE GAUGE REPLACEMENT

1. Refer to Frame 55.
2. Drain the boiler. Refer to Frame 73.
3. Unscrew the pressure gauge and discard.
4. Fit the new pressure gauge, using a suitable jointing compound.
5. Refill the boiler. Refer to Frame 35.
6. Check operation of the boiler. Refer to Frame 55.

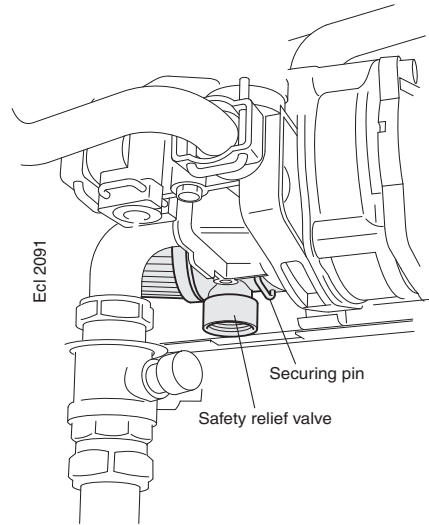
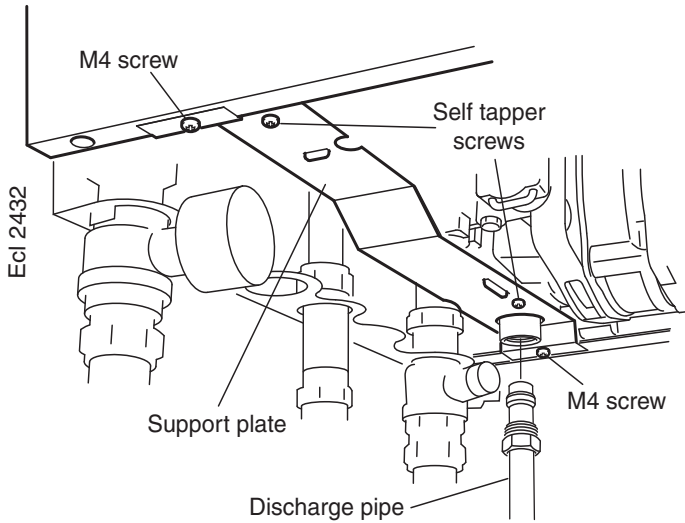


71 SAFETY RELIEF VALVE REPLACEMENT

1. Refer to Frame 55.
2. Remove the boiler front and bottom panels. Refer to Frame 47 & 48.
3. Drain the boiler. Refer to Frame 73.
4. Remove the discharge pipe.
5. Unscrew the 4 screws securing the rear support plate and withdraw the plate.

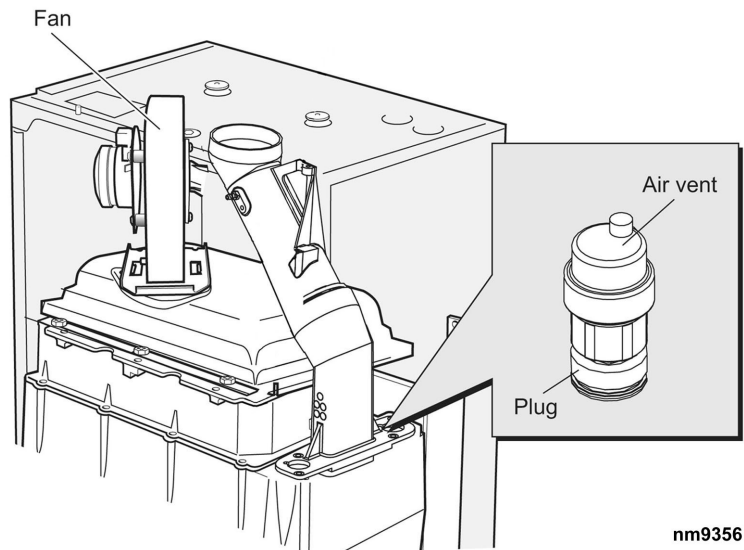
Note. *The M4 screws fit the casing and the self-tapping screws fit the plastic pump and valve housing as shown .*

6. Withdraw the securing pin.
7. Remove the safety valve.
8. Fit the new safety valve and refit the securing pin.
9. Reassemble in reverse order, ensuring correct location of screws in support plate and that tabs on the pump and valve housings engage in slots.
10. Reconnect the discharge pipe.
11. Refill the boiler. Refer to Frame 35.
12. Check operation of the boiler. Refer to Frame 55.



72 AUTOMATIC AIR VENT REPLACEMENT

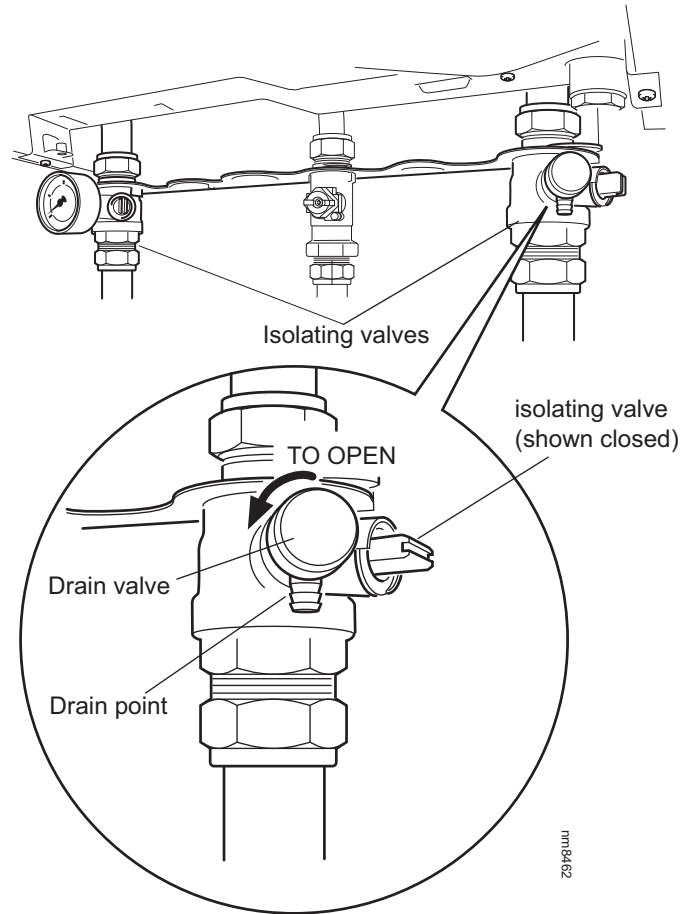
1. Refer to Frame 57.
2. Remove the boiler front and sealing panels. Refer to frames 49 and 50.
3. Drain the boiler. Refer to frame 77.
4. Remove the turret from the boiler. Refer to frame 26.
5. Release the silicon tubing from the sample point.
6. Release the electrical connections from the dry fire thermistor.
7. Release the electrical connections from the spark generator.
8. Remove the M5 x 10 screw retaining the top flue manifold casting.
9. Remove the casting.
10. Remove the fan from the boiler. Refer to Frame 57.
11. Remove the burner from the heat exchanger. Refer to Frame 59.
12. Unscrew the air vent from its heat exchanger mount and replace.
13. Re assemble the boiler in reverse order.
14. Refill the boiler. Refer to frame 35. Check for leaks around the new air vent joint.
15. Check the operation of the boiler. Refer to frame 57.



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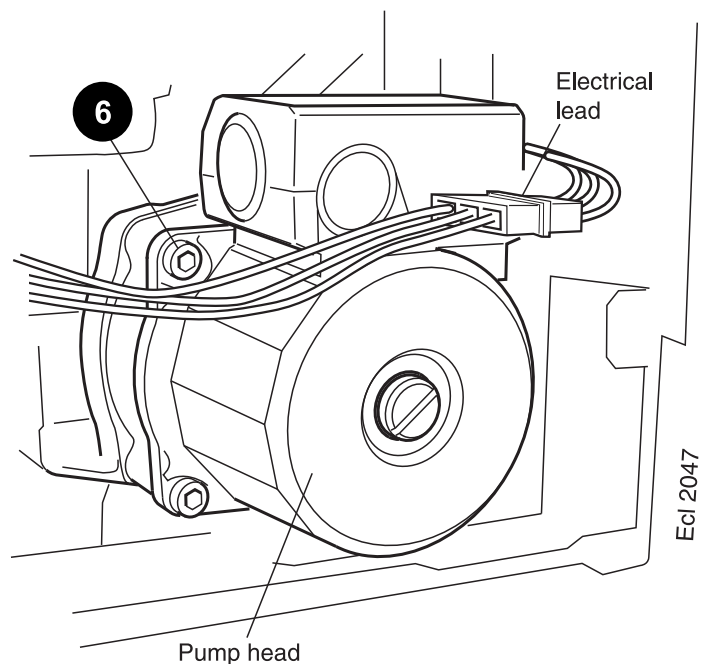
73 DRAINING THE BOILER

1. Refer to Frame 55.
2. Remove the boiler front and bottom panels. Refer to Frame 47 & 48.
3. Close all the water isolating valves on the piping frame.
4. Attach a length of hose to the drain point and open the drain valve.
5. **After replacing any component on the boiler, close the drain valve, remove the hose and open all system isolating valves, (and re-pressurise as appropriate) before proceeding to check operation of the boiler.**
6. Check operation of the boiler. Refer to Frame 55.



74 PUMP HEAD REPLACEMENT

1. Refer to Frame 55.
2. Remove the boiler front and bottom panels. Refer to Frame 47 & 48.
3. Drain the boiler. Refer to Frame 73.
4. Swing the control box down into the servicing position. Refer to Frame 49.
5. Disconnect the electrical lead from the pump.
6. Remove the 4 Allen screws retaining the pump head.
7. Remove the pump head.
8. Fit the new pump head.
9. Reassemble in reverse order.
10. Refill the boiler. Refer to Frame 35.
11. Check operation of the boiler. Refer to Frame 55.



75 HEAT EXCHANGER REPLACEMENT

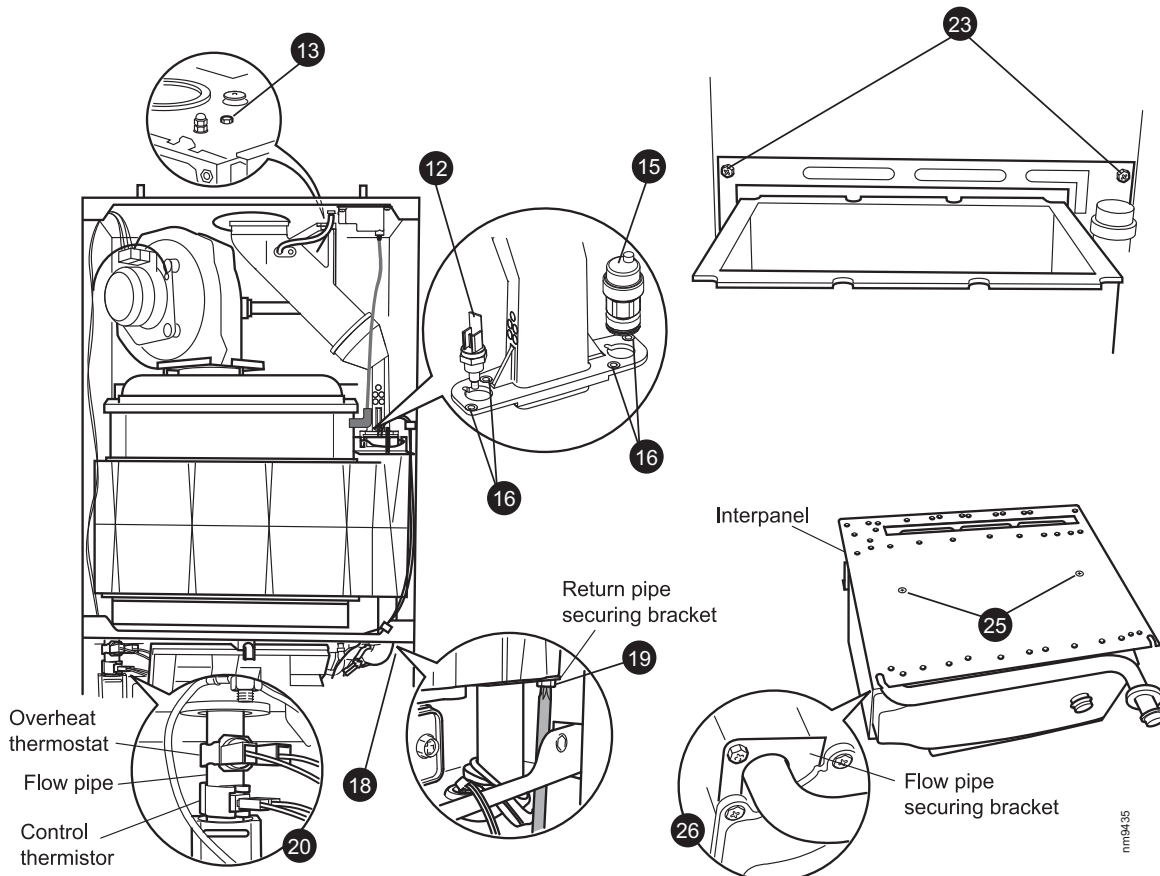
Refer also to Frame 8 - 'Boiler Exploded View'.

IMPORTANT

Before starting the removal procedure, protect the gas and electrical controls with a waterproof sheet or plastic bag.

1. Refer to Frame 55.
2. Remove the boiler front, bottom and sealing panels. Refer to Frames 47 & 48.
3. Drain the boiler. Refer to Frame 73.
4. Remove the control box and place on one side. Refer to Frame 67.
5. Remove the fan / venturi assembly and place on one side. Refer to Frame 57.
6. Remove the burner and place on one side. Refer to Frame 59.
7. Remove the ignition and detection electrodes. Refer to Frames 61 & 62.
8. Remove the spark generator. Refer to Frame 63.
9. Release the flue from the turret. Refer to Frame 26.
10. Remove the turret from the boiler. Refer to Frame 26.
11. Release the silicone tubing from the sampling point.
12. Release the electrical connection to the dry fire thermistor.
13. Remove the M5 x 10 screw retaining the top flue manifold casting.
14. Remove the top casting of the flue manifold from the appliance.
15. Remove the automatic air vent. Refer to Frame 72.
16. Undo the 4 M x 10 screws securing the bottom flue manifold casting and remove.

17. Remove the edge clip securing the dry fire thermistor wiring.
 18. Remove the blind grommet to gain access to the return pipe securing bracket.
 19. Remove the M5 screw and remove the return pipe securing bracket by sliding forwards.
 20. Remove the overheat thermostat and the control thermistor. Refer to Frame 60.
 21. Remove the securing pin to release the flow pipe.
 22. Remove the condensate 'S' trap. Refer to Frame 65.
 23. Remove the 2 M5 screws securing the interpanel to the back panel.
 24. Slide the heat exchanger and interpanel assembly upward to disengage and remove from the casing, complete with the flow pipe.
 25. Remove the 2 M6 countersunk screws, remove the interpanel and transfer to the new heat exchanger.
 26. Remove the M5 screw and remove the flow pipe securing bracket.
 27. Remove the flow pipe and transfer to the new heat exchanger.
 28. Reassemble in reverse order, replacing gaskets or seals if any sign of damage or deterioration is evident.
- Note.** *The heat exchanger is supplied with new combustion chamber insulation boards. These should be fitted (refer to Frame 66 before the burner and fan / venturi assembly and before the ignition and detection electrodes are replaced).*
29. Refill the boiler. Refer to Frame 35.
 30. Check operation of the boiler. Refer to Frame 55.

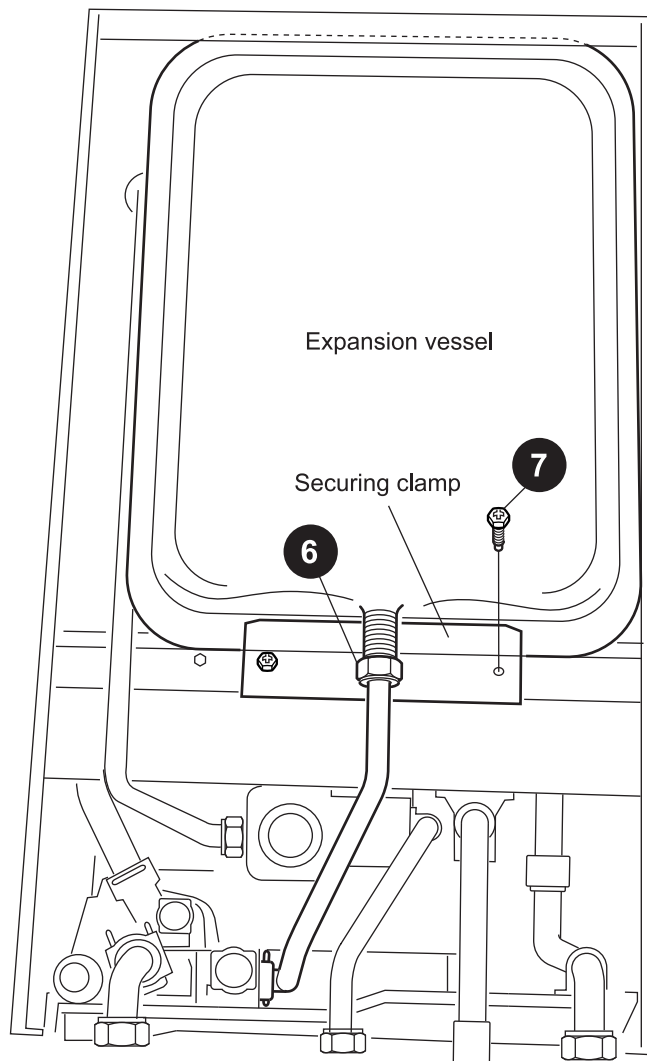


76 EXPANSION VESSEL REPLACEMENT

1. Refer to Frame 55.
2. Drain the boiler. Refer to Frame 73.
3. Unscrew all the gas and water connection unions on the boiler side of the valves.
4. Remove the screw from the turret clamp and remove the turret.
5. Lift the complete boiler from the wall mounting frame and place on a flat surface, face down, to expose the expansion vessel.
6. Unscrew the union nut on the vessel water connection pipe.
7. Unscrew the 2 screws from the securing clamp and remove.
8. Remove the expansion vessel.
9. Fit the new expansion vessel.
10. Reassemble in reverse order.
11. Refill the boiler. Refer to Frame 35.
12. Check operation of the boiler. Refer to Frame 55.

Note.

If preferred and for convenience, a new expansion vessel may be installed elsewhere in the heating system, providing it ensures equivalent system protection.



Rear view of the boiler

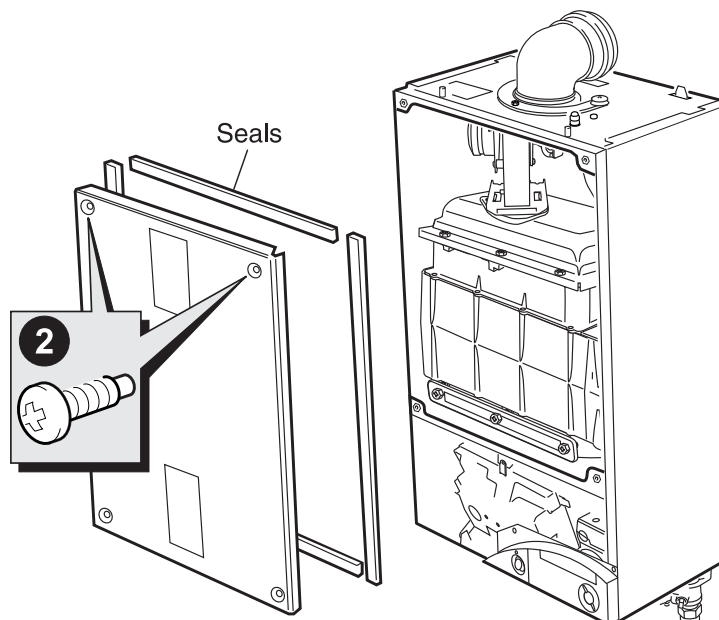
Ecl 2537

77 BOILER SEALING PANEL SEAL REPLACEMENT

1. Refer to Frames 55.
2. Remove the boiler front and sealing panels. Refer to Frames 47 & 48.
3. Remove the old seal from the casing and thoroughly clean the casing surfaces.
4. Fit the new adhesive seals, noting that they are supplied to the correct length for the relevant sides.
5. Reassemble in reverse order.

Note. *Ensure that the boiler sealing panel is correctly seated, compressing the seal to make an airtight joint.*

6. Check operation of the boiler. Refer to Frame 55.



Ecl 2812

FAULT FINDING

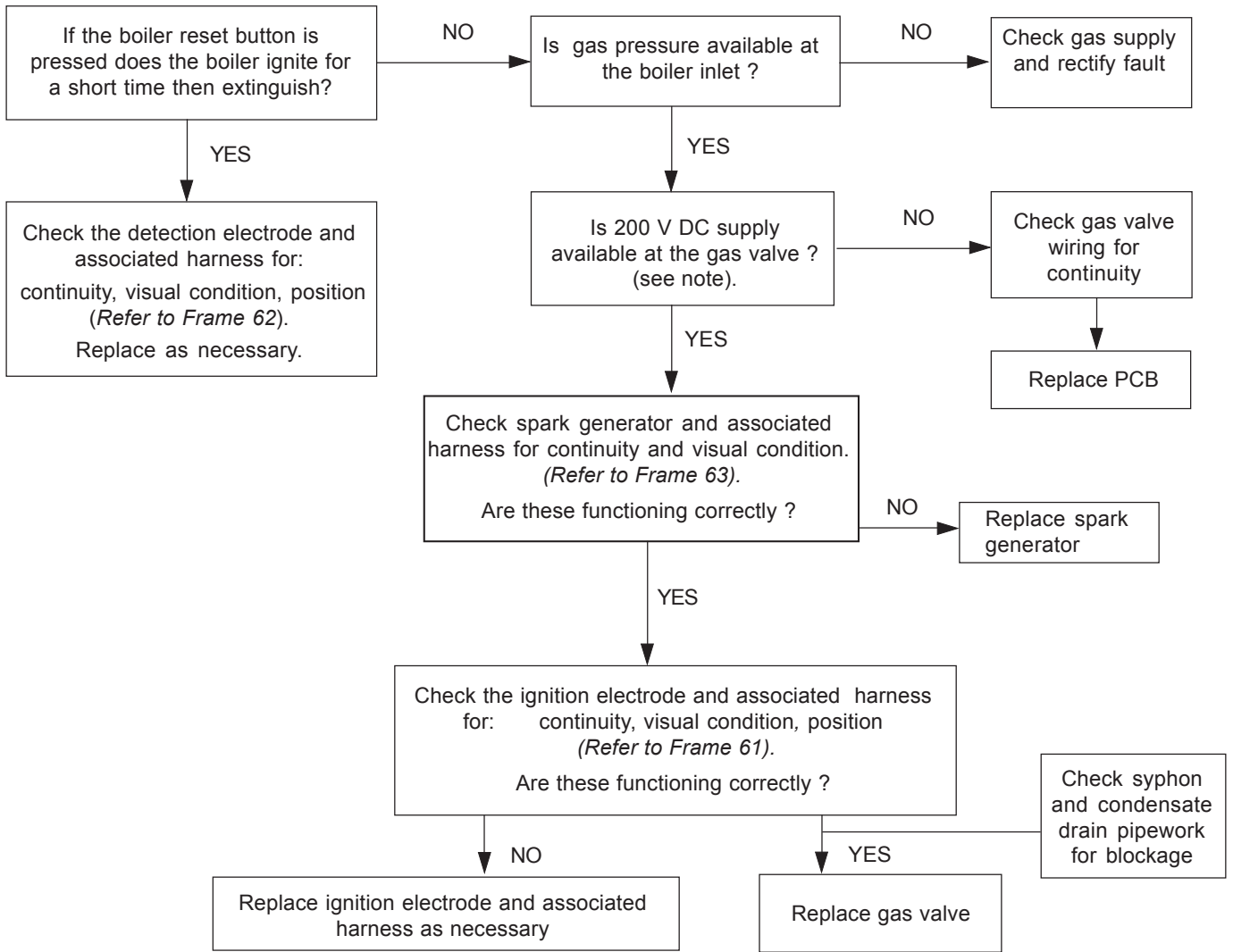
78 FAULT FINDING CHART MAIN MENU

In order to assist fault finding the boiler has an LED diagnostic display. The key to the display codes is as follows:

ALTERNATING 'L' 'F'	GO TO FRAME 79
ALTERNATING 'L' 'E'	GO TO FRAME 80
ALTERNATING 'L' 'A'	GO TO FRAME 81
ALTERNATING 'L' '8'	GO TO FRAME 82
ALTERNATING 'H' '1'	GO TO FRAME 83
ALTERNATING 'H' '4'	GO TO FRAME 84
ALTERNATING 'H' 'F'	GO TO FRAME 85
ALTERNATING 'H' 'n'	GO TO FRAME 86
ALTERNATING 'H' 'E'	GO TO FRAME 80
ALTERNATING 'H9'	GO TO FRAME 84
ALTERNATING 'L9'	GO TO FRAME 84

FAULT FINDING

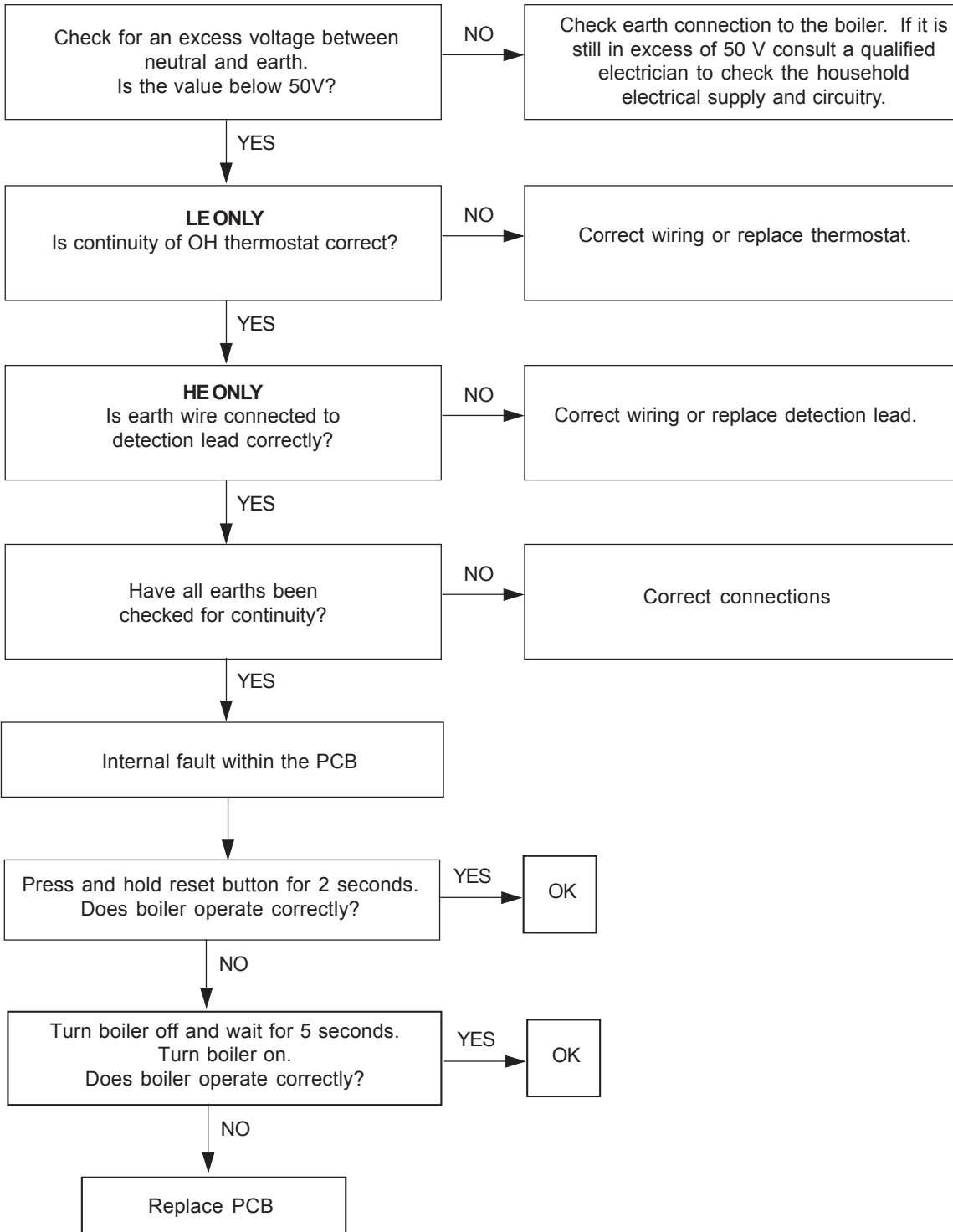
79 L.....F.... (FLAME DETECTION ERROR)



Note. Due to the wave form of the rectified voltage, the reading will vary depending on the type of meter used to measure the value (some may measure the possible peak voltage of 339V). In general terms a reading greater than 150V indicate that the correct voltage is supplied to the gas valve. As an alternative to a multimeter, a mains voltage checking device may be used. E.g. an electrical screwdriver or a mains tester.

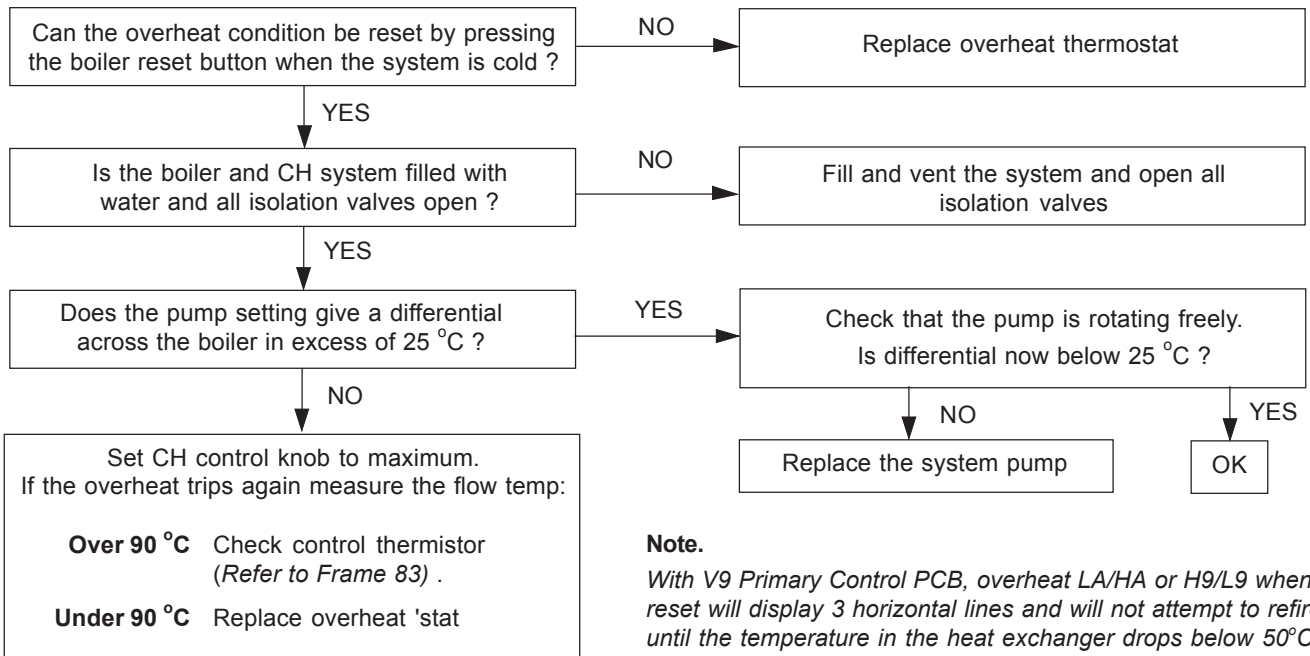
FAULT FINDING

80 L.....E..... or H.....E..... (PCB ERROR)

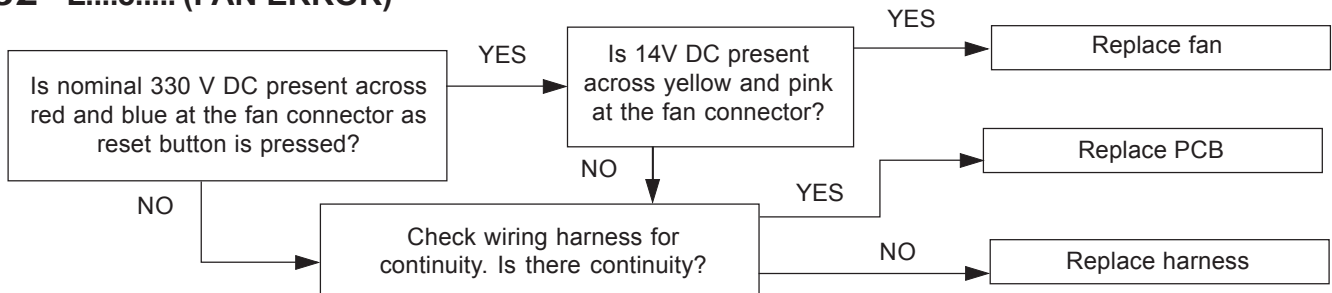


FAULT FINDING

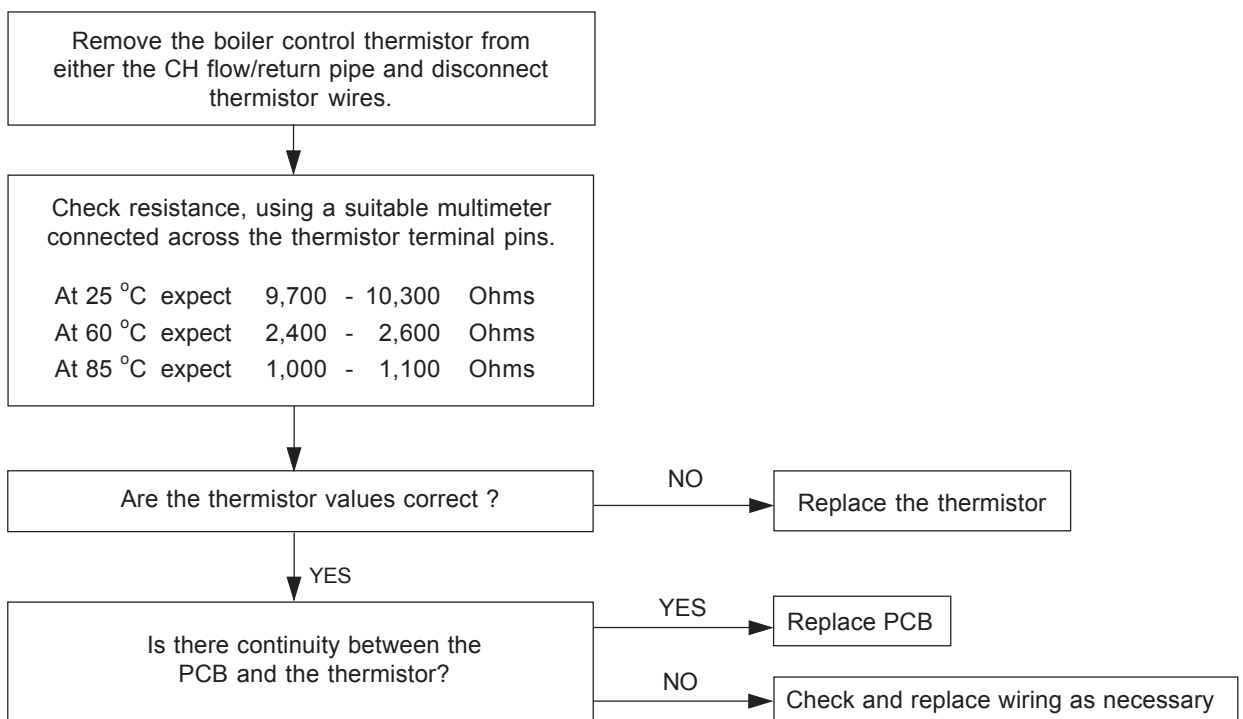
81 L.....A..... (OVERHEAT ERROR)



82 L....8..... (FAN ERROR)

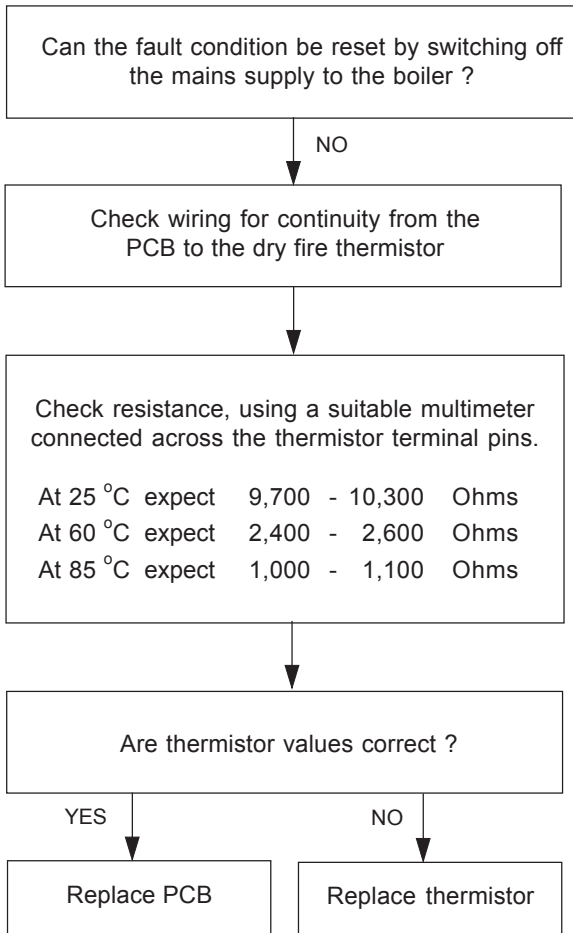


83 H.....1..... (CONTROL THERMISTOR ERROR)

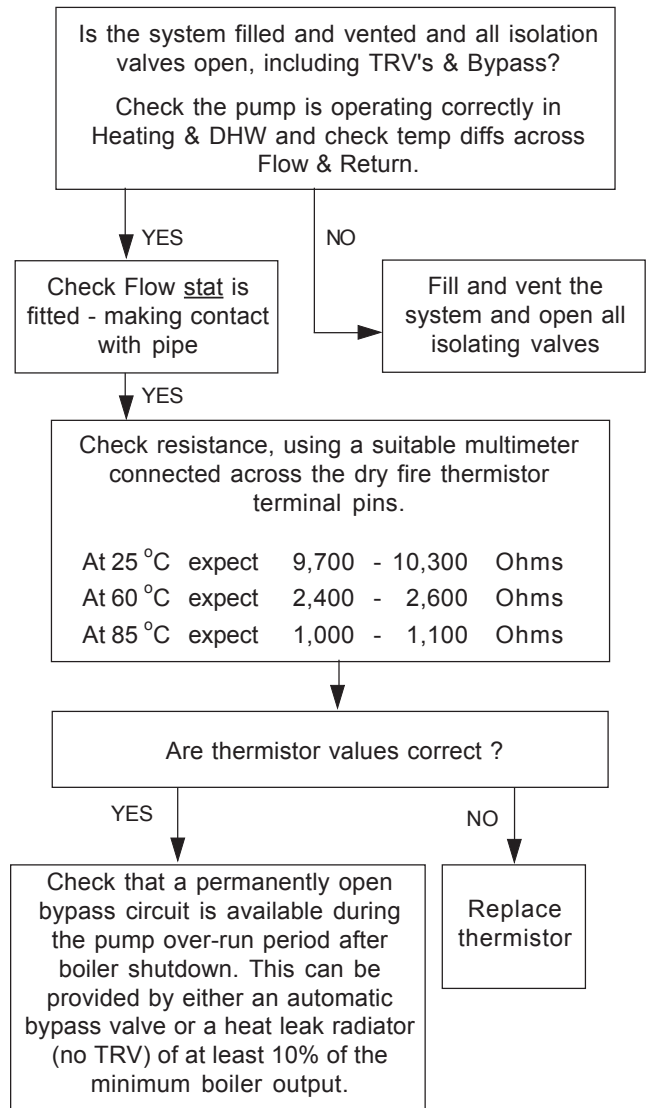


FAULT FINDING

84 H.....4.... (DRY FIRE THERMISTOR ERROR)



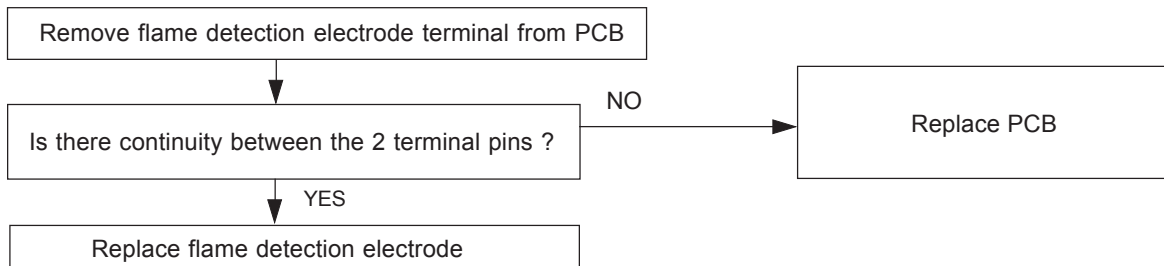
H9/L9 (HEAT EXCHANGER OVERHEAT)



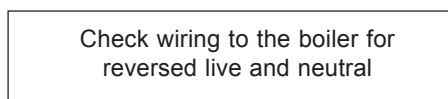
Note.

With V9 Primary Control PCB, overheat LA/HA or H9/L9 when reset will display 3 horizontal lines and will not attempt to re-fire until the temperature in the heat exchanger drops below 50°C.

85 H.....F..... (FLAME DETECTION ERROR)



86 H.....n..... (PHASE REVERSAL ERROR)



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 Services, Ideal Stelrad Group distributors and merchants.

When ordering spares please quote:

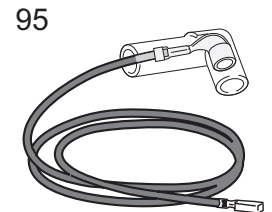
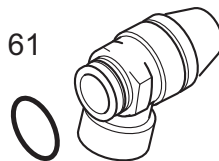
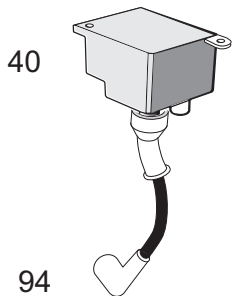
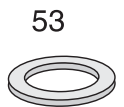
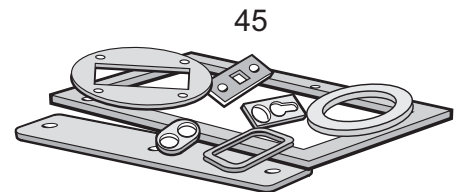
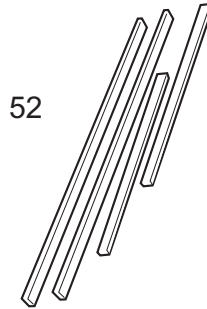
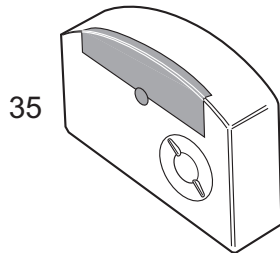
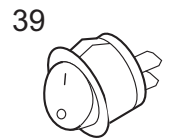
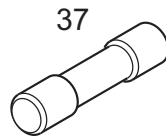
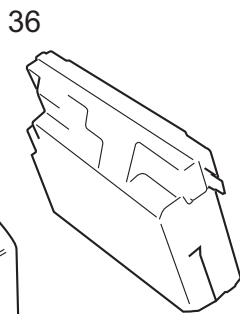
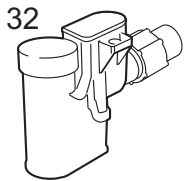
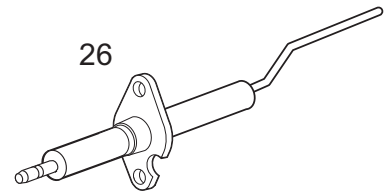
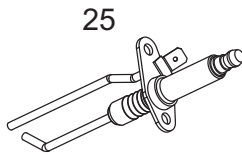
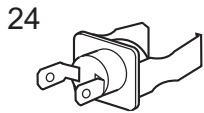
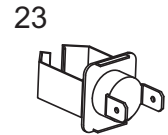
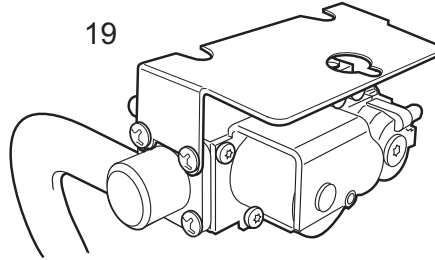
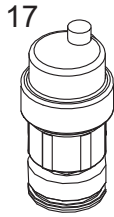
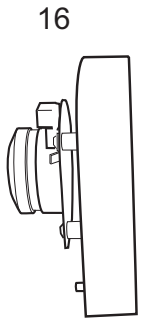
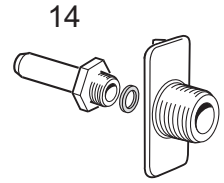
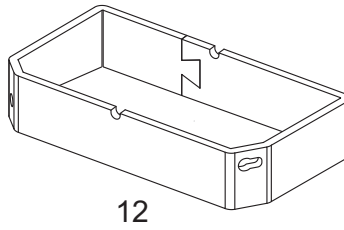
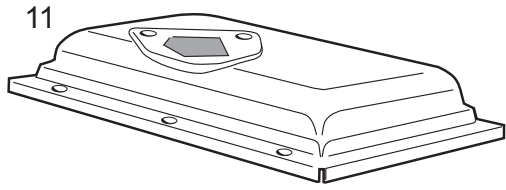
1. Boiler model
2. Appliance G.C. No.
3. Description.
4. Quantity.
5. Product number.

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 Stelrad Group.

Key No.	G.C. Part No.	Description	Qty.	Product Number
1		Front casing panel	1	173 509
4	E69-384	Bottom casing panel	1	171 027
11	E67-489	Burner	1	170 905
12		Combustion chamber insulation	1	173 520
14	E67-492	Injector and housing	1	170 908
16	E85-097	Fan assembly	1	172 625
17	E69-286	Automatic air vent	1	170 988
19	E69-288	Gas control valve	1	171 035
23	E67-501	Control thermistor	1	170 917
24	E67-502	Overheat thermostat	1	170 918
25		Ignition electrode kit	1	175 406
26		Flame detection electrode kit	1	173 529
32	E67-511	Condensate 'S' trap	1	170 926
35		User control (display unit)	1	173 532
36		PCB primary controls kit (V9)	1	174 486
37	E67-519	Fuse PCB (3.15AT L250V)	1	170 931
39	E67-521	Mains switch c/w harness	1	173 537
40		Spark generator assy	1	173 538
45	E67-527	Gasket kit (servicing)	1	170 938
52	E68-376	Seal kit (sealing panel)	1	171 014
53	E68-380	Turret gasket	1	171 022
61	H28-061	Pressure relief valve	1	173 977
62	E69-339	Expansion vessel	1	173 066
64	E69-341	Pressure gauge	1	170 991
69	E69-342	Pump	1	170 990
94		Ignition lead	1	175 424
95		Detection lead	1	173 512
103		Dry fire thermistor	1	174 087

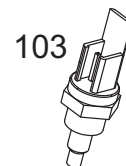
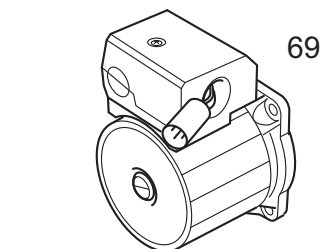
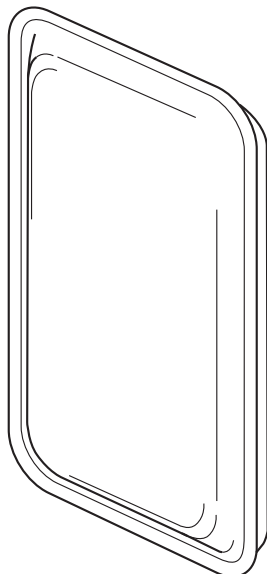
SHORT LIST OF PARTS

87 SHORT LIST



94

62

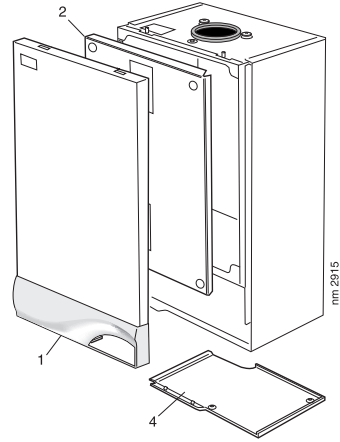


nm8046b

LIST OF PARTS

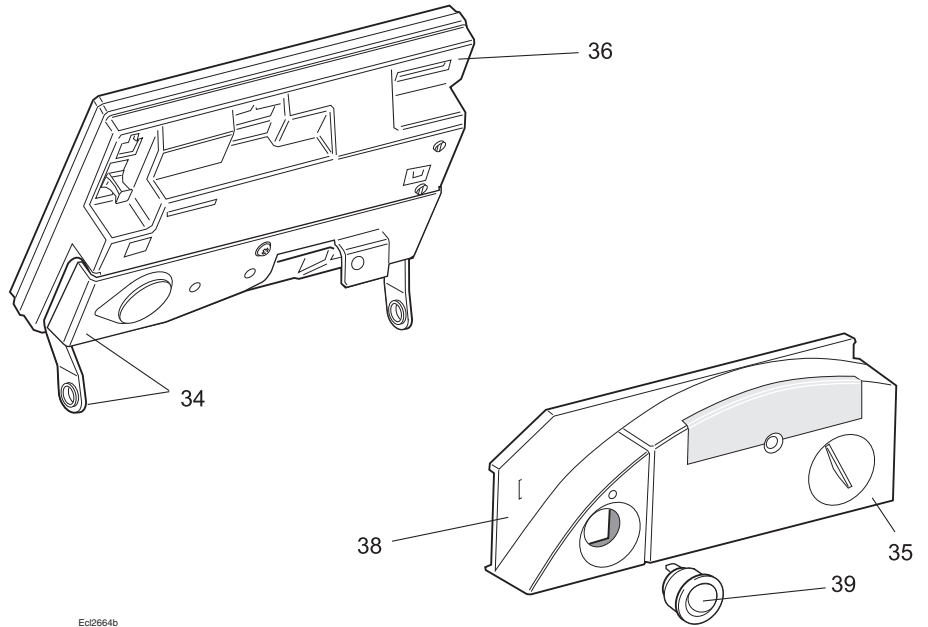
88 BOILER CASING ASSEMBLY

1. Front casing panel with screws.
2. Sealing panel with screws.
4. Bottom panel with screws.



89 CONTROLS ASSEMBLY

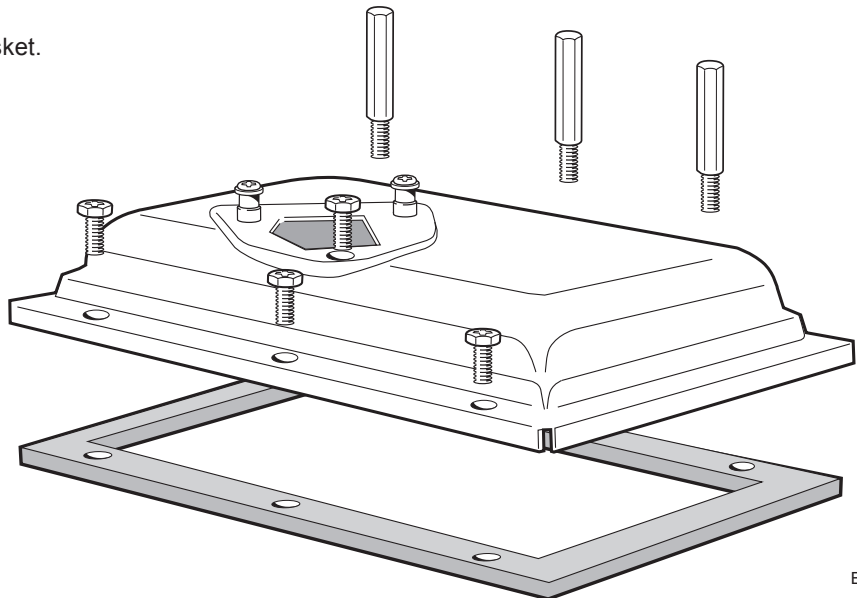
33. Controls assy with screws.
34. Controls hinge bracket.
35. User controls (without item 38).
36. PCB (primary controls).
38. User controls housing
39. Mains switch.
54. Jumper link (not shown)



Ecl2664b

90 BURNER ASSEMBLY

11. Burner assembly with screws and gasket.



Ecl 1598

NOTES

NOTES

NOTES

Code Of Practice

For the installation, commissioning and servicing of domestic heating and hot water products

Benchmark places responsibilities on both manufacturers and installers.* The purpose is to ensure that customers** are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. Installers are required to carry out work in accordance with the following:

Standards of Work

- Be competent and qualified to undertake the work required.
- Install, commission, service and use products in accordance with the manufacturer's instructions provided.
- Ensure that where there is responsibility for design work, the installation is correctly sized and fit for purpose.
- Meet the requirements of the appropriate Building Regulations. Where this involves notifiable work be a member of a Competent Persons Scheme or confirm that the customer has notified Local Authority Building Control (LABC), prior to work commencing.
- Complete all relevant sections of the Benchmark Checklist/Service Record when carrying out commissioning or servicing of a product or system.
- Ensure that the product or system is left in a safe condition and, whenever possible, in good working order.
- Highlight to the customer any remedial or improvement work identified during the course of commissioning or servicing work.
- Refer to the manufacturer's helpline where assistance is needed.
- Report product faults and concerns to the manufacturer in a timely manner.

Customer Service

- Show the customer any identity card that is relevant to the work being carried out prior to commencement or on request.
- Give a full and clear explanation/demonstration of the product or system and its operation to the customer.
- Hand over the manufacturer's instructions, including the Benchmark Checklist, to the customer on completion of an installation.
- Obtain the customer's signature, on the Benchmark Checklist, to confirm satisfactory demonstration and receipt of manufacturer's instructions.
- Advise the customer that regular product servicing is needed, in line with manufacturers' recommendations, to ensure that safety and efficiency is maintained.
- Respond promptly to calls from a customer following completion of work, providing advice and assistance by phone and, if necessary, visiting the customer.
- Rectify any installation problems at no cost to the customer during the installer's guarantee period.

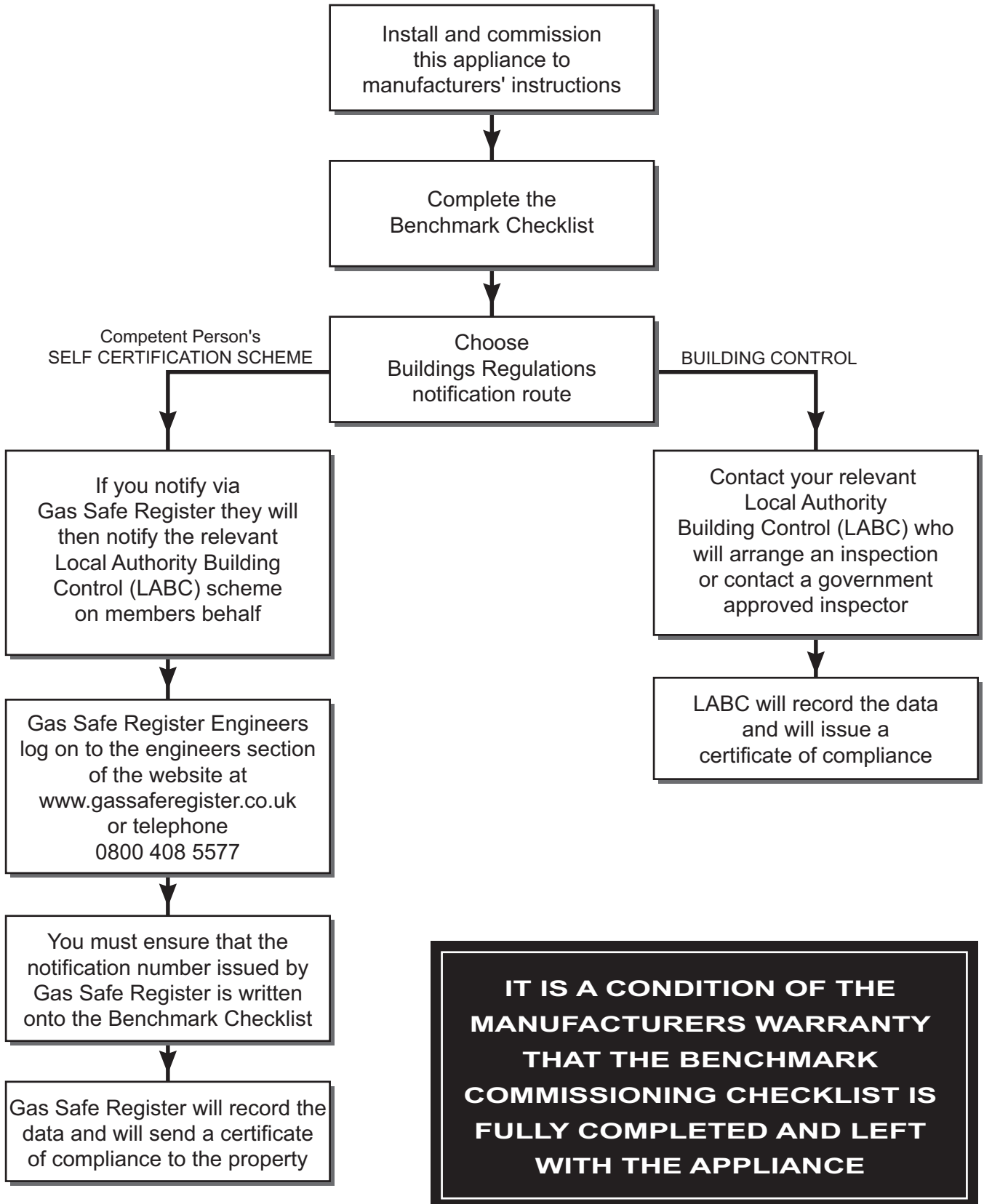


*The use of the word "installer" is not limited to installation itself and covers those carrying out installation, commissioning and/or servicing of heating and hot water products, or the use of supporting products (such as water treatment or test equipment).

**Customer includes householders, landlords and tenants.

INSTALLER NOTIFICATION GUIDELINES

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



SERVICE RECORD

It is recommended that your heating system is serviced regularly and that the appropriate Service Record is completed.

Service Provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions.

Always use the manufacturer's specified spare part when replacing controls.

SERVICE 1

Date _____

Energy Efficiency Checklist completed? Yes No

Engineer Name _____

Company Name _____

Telephone Number _____

Gas Safe Register ID Number _____

Comments _____

Signature _____

SERVICE 2

Date _____

Energy Efficiency Checklist completed? Yes No

Engineer Name _____

Company Name _____

Telephone Number _____

Gas Safe Register ID Number _____

Comments _____

Signature _____

SERVICE 3

Date _____

Energy Efficiency Checklist completed? Yes No

Engineer Name _____

Company Name _____

Telephone Number _____

Gas Safe Register ID Number _____

Comments _____

Signature _____

SERVICE 4

Date _____

Energy Efficiency Checklist completed? Yes No

Engineer Name _____

Company Name _____

Telephone Number _____

Gas Safe Register ID Number _____

Comments _____

Signature _____

SERVICE 5

Date _____

Energy Efficiency Checklist completed? Yes No

Engineer Name _____

Company Name _____

Telephone Number _____

Gas Safe Register ID Number _____

Comments _____

Signature _____

SERVICE 6

Date _____

Energy Efficiency Checklist completed? Yes No

Engineer Name _____

Company Name _____

Telephone Number _____

Gas Safe Register ID Number _____

Comments _____

Signature _____

SERVICE 7

Date _____

Energy Efficiency Checklist completed? Yes No

Engineer Name _____

Company Name _____

Telephone Number _____

Gas Safe Register ID Number _____

Comments _____

Signature _____

SERVICE 8

Date _____

Energy Efficiency Checklist completed? Yes No

Engineer Name _____

Company Name _____

Telephone Number _____

Gas Safe Register ID Number _____

Comments _____

Signature _____

SERVICE 9

Date _____

Energy Efficiency Checklist completed? Yes No

Engineer Name _____

Company Name _____

Telephone Number _____

Gas Safe Register ID Number _____

Comments _____

Signature _____

SERVICE 10

Date _____

Energy Efficiency Checklist completed? Yes No

Engineer Name _____

Company Name _____

Telephone Number _____

Gas Safe Register ID Number _____

Comments _____

Signature _____



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



Manufactured under an ISO 9001 registered quality management system

FM 59915

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.

Ideal Stelrad Group 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
The High Efficiency Pioneers



Ideal Stelrad Group

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