

installation and servicing

isar

Your Ideal installation and servicing guide

m30100

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.

i *ldeal* BOILERS
ENGINEERED FOR PEACE OF MIND

GENERAL

Table 1 - General Data

Gas supply		2H - G20 - 20mbar
Gas Supply Connection		22mm copper
Injector size		Stereomatic 5.6mm dia.
Inlet Connection	Domestic Hot Water	15mm copper
Outlet Connection	Domestic Hot Water	15mm copper
Flow Connection	Central Heating	22mm copper
Return Connection	Central Heating	22mm copper
Flue Terminal Diameter	mm (in)	100 (4)
Average flue temp/mass flow rate	(DHW)	74°C / 20.3g/s
Maximum Working Pressure (Sealed Systems)	bar (lb/in ²)	2.65 (38.5)
Maximum Domestic Hot Water Inlet Pressure	bar (lb/in ²)	10.0 (145)
Minimum Domestic Hot Water Inlet Pressure	bar (lb/in ²)	0.5 (7)
Electrical Supply / Power consumption		230 V ~ 50 Hz. / 148 W
Fuse Rating		External : 3A Internal : 3.15A TL250 V
Water content	Central Heating litre (gal)	2.0 (.44)
	Domestic Hot Water	0.5 (0.11)
Packaged Weight	kg (lb)	50 (110)
Maximum Installation Weight	kg (lb)	43 (95)
Boiler Casing Size	Height mm (in)	687 (27)
	Width mm (in)	390 (15 3/8)
	Depth mm (in)	278 (11)

Table 2 - Performance Data - Central Heating m30100

Boiler Input :		Max.	Min.
Nett CV	kW (Btu/h)	24.4 (83 300)	9.1 (31 000)
Gross CV	kW (Btu/h)	27.1 (92 500)	10.1 (34 400)
Gas Consumption	l/s (ft ³ /h)	0.70 (89.1)	0.26 (33.2)
Boiler Output :			
Non Condensing	kW (Btu/h)	23.4 (80 000)	8.8 (30 000)
Condensing	kW (Btu/h)	25.1 (85 700)	9.6 (32 800)
Seasonal efficiency (SEDBUK)*	Band A [90.1]%		
NOx Classification	Class 4		

Table 3 - Performance Data - Domestic Hot Water m30100

Maximum DHW Input :		
Nett CV	kW (Btu/h)	30.2 (103 000)
Gross CV	kW (Btu/h)	33.5 (114 400)
Gas Consumption	l/s (ft ³ /h)	0.87 (110)
Maximum DHW Output	kW (Btu/h)	29.3 (100 000)
DHW Flow Rate at 35°C temp. rise.	l/min (gpm)	12.0 2.6
DHW Specific Rate	l/min (gpm)	13.9 3.1

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

Note. Gas consumption is calculated using a calorific value of 38.7 MJ/m³ (1038 Btu/ft³) gross or 34.9 MJ/m³ (935 Btu/ft³) nett

To obtain the gas consumption at a different calorific value:

- For l/s - divide the gross heat input (kW) by the gross C.V. of the gas (MJ/m³)
- For ft³/h - divide the gross heat input (Btu/h) by the gross C.V. of the gas (Btu/ft³)

Key to symbols

IE = Ireland, **GB** = United Kingdom (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

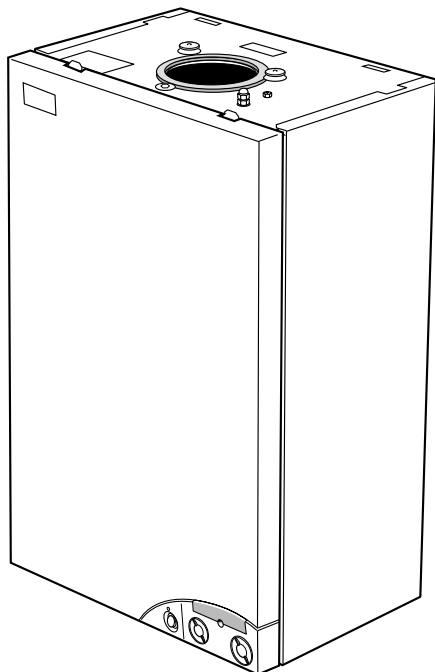
isar

Natural Gas only

G.C. Appliance No. 47-348-15

PI No.0063BL9811

Destination Countries: UK, IE



BENCHMARK LOG BOOK DETAILS

Boiler	Page
Make and model	3
Appliance Serial No. on Data Badge	3
Controls	as applicable
For all boilers	
Flushing to BS.7593	10 & 33
Inhibitor	10
Gas inlet working pressure	7
Burner operating pressure	not applicable
Heat input	to be calculated
Temperature differential	measure and record
For combination boilers	9
For domestic hot water mode	10
For condensing boilers	24
For all boilers: complete, sign & hand over to customer	
For assistance see Technical Helpline on the back page	

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



INTRODUCTION

The **isar m30100 combi boiler** is a fully automatically controlled, wall mounted, low water content, fanned flue combination condensing gas boiler.

Note.

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

Central heating (CH) output is fully modulating with a range of:

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

Instantaneous Domestic hot water (DHW) output is also fully modulating with a maximum of:

29.3kW (100,000 Btu/h)

The boiler is supplied fully assembled with DHW plate heat exchanger, diverter valve, circulating pump, pressure gauge, safety valve and CH expansion vessel.

Variable CH and DHW temperature controls are fitted on the user control and the boiler features a DHW preheat facility.

The boiler casing is of white painted zintec coated mild steel.

The boiler temperature controls are visible at the bottom RHS of the front panel.

The heat exchanger is of cast aluminium.

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

The system pipework MUST include drain cocks in appropriate places.

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

With no demand for CH the boiler fires only when DHW is drawn off, or periodically for a few seconds without any DHW draw-off, in order to maintain the DHW calorifier in a heated condition.

When there is a demand for CH, the heating system is supplied at the selected temperature of between 42 °C and 82 °C, until DHW is drawn off. The full output from the boiler is then directed via the diverter valve to the plate heat exchanger to supply a maximum DHW draw-off of 12 l/min at 35 °C temperature rise.

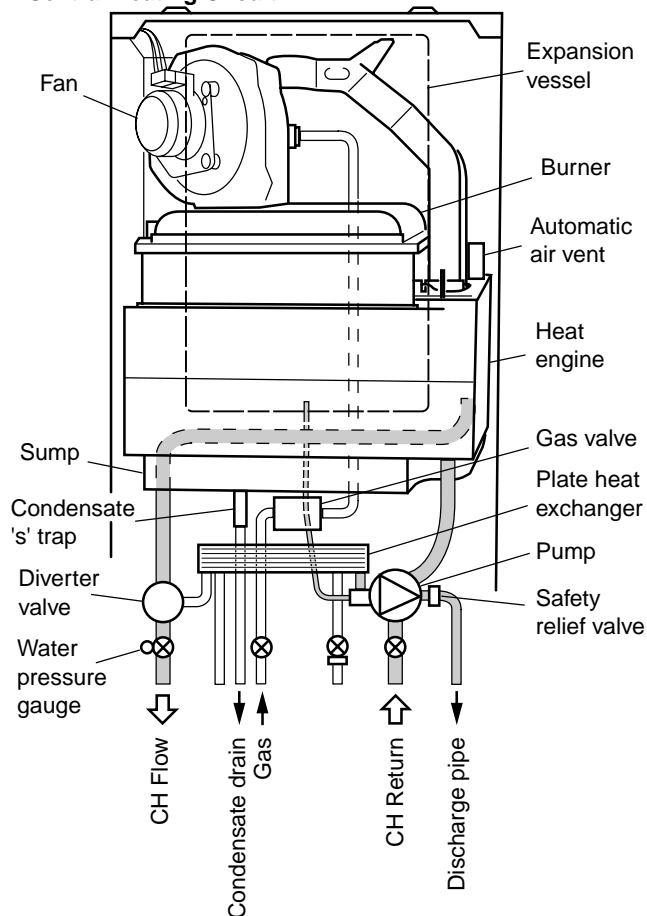
At low DHW draw-off rate the maximum temperature is limited to 65 °C by the modulating gas control.

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

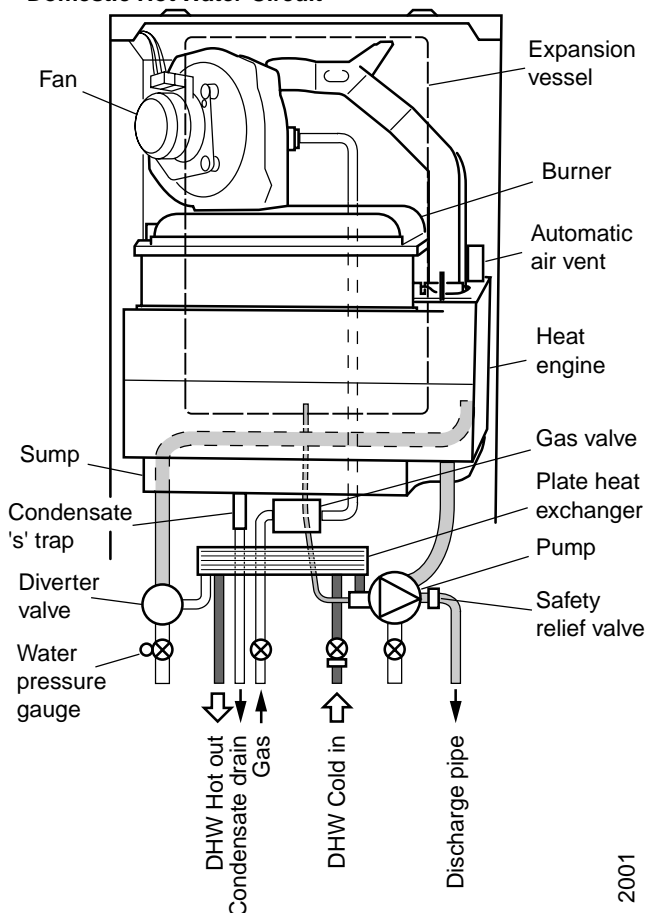
The boiler features a comprehensive diagnostic system which gives detailed information on the boiler status when operating, and performance of key components to aid commissioning and fault finding.

1 BOILER WATER CIRCUIT DIAGRAMS

Central Heating Circuit



Domestic Hot Water Circuit



OPTIONAL EXTRA KITS

- **Flue Extension Ducts** Pack D up to 3m (122in).
- **90° Elbow Kit** (maximum 2 per installation).
- **45° Elbow Kit** (maximum 2 per installation).
- **Powered Vertical Flue Kit** (to a maximum primary flue length of 4m + a maximum secondary flue length of 5m)
- **Roof Flue Kit** (to a maximum of 5m)
- **Boiler Stand-off Kit**
- **Concealment Panel Kit**
- **Flue Finishing Kit**
- **Siphon Kit**
- **Remote User Controls Kit**

SAFETY

Current Gas Safety (installation and use) regulations or rules in force:

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

The installation of the boiler MUST also be in accordance with the latest I.E.E (BS.7671) Wiring Regulations, local building regulations, bye-laws of the local water authority, the building regulations and the Building Standards (Scotland) and any relevant requirements of the local authority.

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 60 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 **Caradon Ideal Limited** in writing. If in doubt please enquire.

Any direct connection of a control device not approved by **Caradon Ideal Limited** 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 AND FLUE OUTLET

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.

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

Compartment Installations

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

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

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

- BS 6798 (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 Frame 17.

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

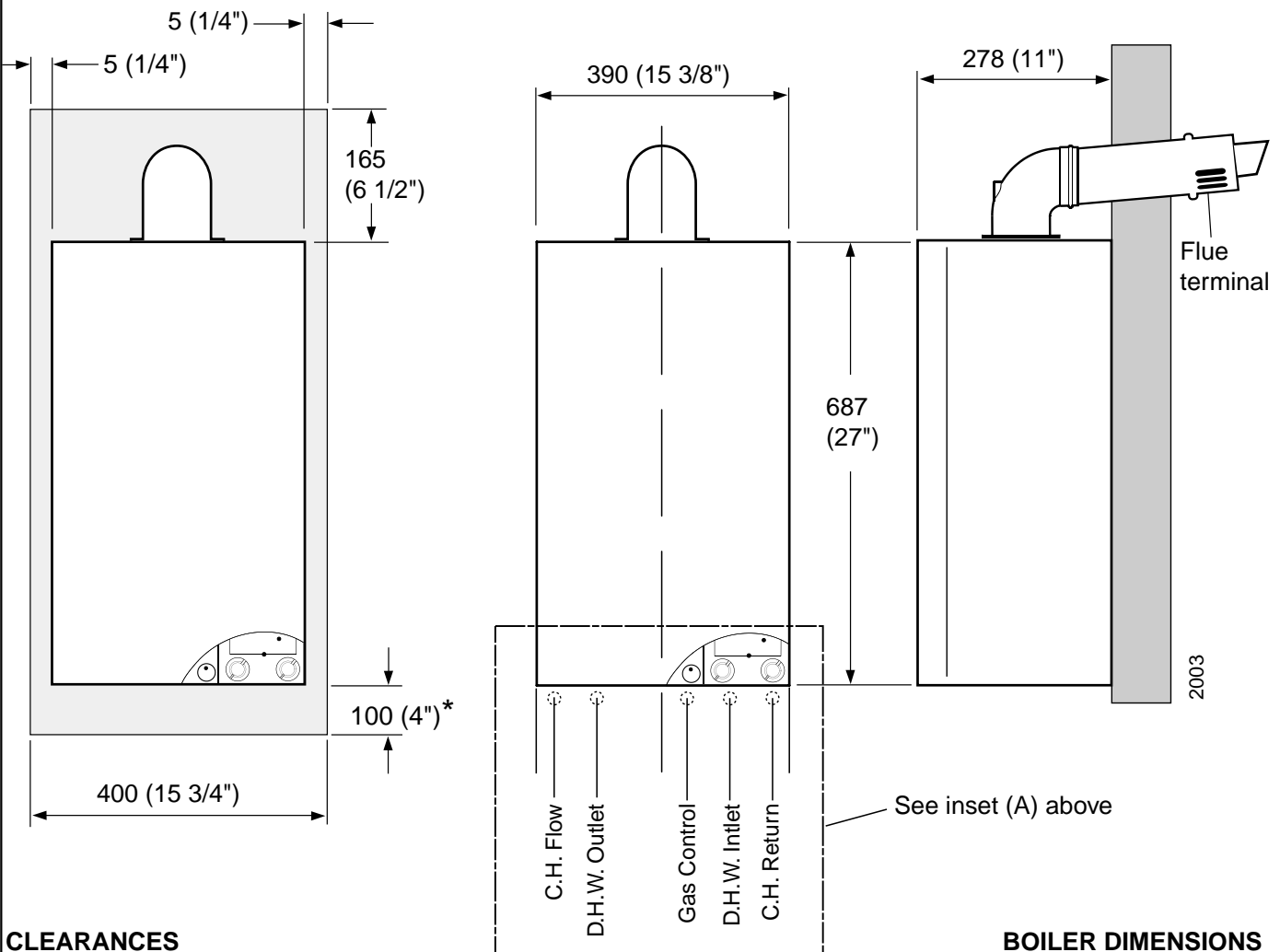
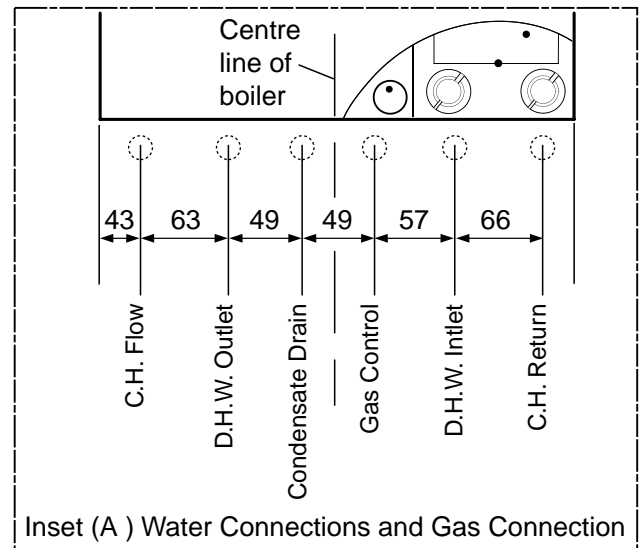
Additional space will be required for installation, depending upon site conditions.

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

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.

* Bottom clearance

Bottom clearance after installation can be reduced to 5mm. However, 100mm must be available for servicing.

BOILER DIMENSIONS

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 registered CORGI engineer.

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

Do not use pipes of a smaller size than the boiler inlet gas connection.

IMPORTANT.

Installation pipes MUST be fitted in accordance with BS. 6891. Pipework from the meter to the boiler MUST be 22mm O.D.

The complete installation MUST be tested for gas soundness 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: Part 1, 2000.

The following notes are intended for general guidance:

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

Table 4 - Balanced flue terminal position

Terminal Position	Minimum Spacing
1. Directly below or alongside an opening window, air vent or other ventilation opening	300 mm (12")
2. Below guttering, drain pipes or soil pipes	75 mm (3")
3. Below eaves	200 mm (8")
4. Below balconies or a car port roof	200 mm (8")
5. From vertical drain pipes or soil pipes	150 mm (6")
6. From internal or external corners	300 mm (12")
7. Above adjacent ground, roof or balcony level	300 mm (12")
8. From a surface facing the terminal	600 mm (24")
9. From a terminal facing a terminal	1200 mm (48")
10. From an opening in a car port (e.g. door or window) into dwelling	1200 mm (48")
11. Vertically from a terminal on the same wall	1500 mm (60")
12. Horizontally from a terminal on the wall	300 mm (12")

2. It is important that the position of the terminal allows the free passage of air across it at all times.
3. Minimum acceptable spacing from the terminal to obstructions and ventilation openings are specified in Table 4.
4. Where the lowest part of the terminal is fitted less than 2m (6'6") above a balcony, above ground or above a flat roof to which people have access then the terminal MUST be protected by a purpose designed guard.

Terminals guards are available from boiler suppliers. In case of difficulty seek advice from:

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

Ensure that the guard is fitted centrally.

5. Where the terminal is fitted within 850mm (34") of a plastic or painted gutter or 450mm (18") of painted eaves then an aluminium shield at least 750mm (30") long should be fitted to the underside of the gutter or painted surface fitted centrally above the flue.
6. The air inlet/products outlet duct and the terminal of the boiler MUST NOT be closer than 25mm (1") to combustible material. Detailed recommendations on the protection of combustible material are given in BS. 5440: Part 1, 2000.

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 8 - Unpacking.

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.

WATER CIRCULATION SYSTEM

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

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

WATER TREATMENT - see Frame 6

GENERAL

THERMOSTATIC RADIATOR VALVES (TRV)

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

When thermostatic radiator valves are used, the space heating temperature control over a living 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 - however this is NOT recommended as a large proportion of TRVs can restrict water circulation and inhibit the condensing mode of condensing boilers, reducing fuel economy.

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: 01923 664258.

ELECTRICAL SUPPLY

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

The point of connection to the mains should be readily accessible and adjacent to the boiler.

CONDENSATE DRAIN - Refer to Frames 29, 50

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 3/4in (21.5mm) overflow pipe.

3 SYSTEM REQUIREMENTS - Central Heating

Notes

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

b. *Antifreeze fluid, corrosion and scale inhibitor fluids suitable for use with boilers having 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

4 SYSTEM REQUIREMENTS - CH (continued) and HOT WATER

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. A 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.

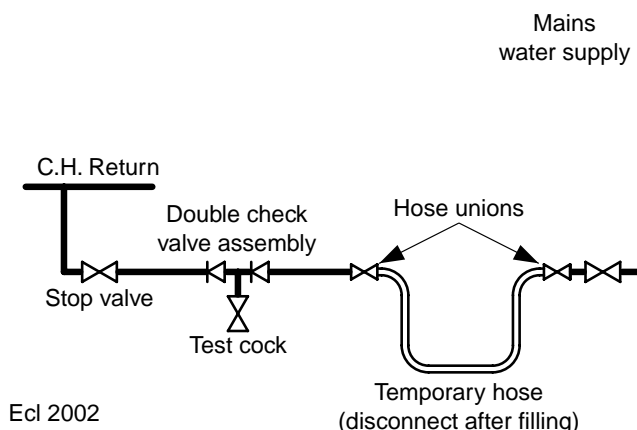
Guidance on vessel sizing is given above.

Water Flow Rate and Pressure Loss

		100
Max CH Output	kW	23.4
	(Btu/h)	(80 000)
Water flow rate	l/sec	0.37
	(gal/min)	4.8
Temperature Differential	°C	15
	(°F)	(27)
Head available for system pump.	m.w.g.	2.3
	(ft.w.g.)	7.5

5. **Filling.** The system may be filled by one of the following methods:

- a. Through a temporary hose connection from a 'draw-off' tap, supplied from a service pipe under mains pressure. Where the mains pressure is excessive, a pressure reducing valve must be used to facilitate filling.
 - i. Thoroughly flush out the whole system with cold water.
 - ii. Fill and vent the system until the pressure gauge registers 1.5 bar, 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.



DOMESTIC HOT WATER

Domestic Hot Water Requirements

1. The domestic hot water service must be in accordance with BS 5546 and BS 6700.
2. Refer to Table 1 for minimum and maximum working pressures.
3. The boilers are suitable for connection to most types of washing machine and dishwasher appliances.
4. When connecting to suitable showers, ensure that:
 - a. The cold inlet to the boiler is fitted with an approved anti-vacuum or syphon non-return valve.
 - b. Hot and cold water supplies to the shower are of equal pressure.
5. **Hard Water Areas**
Where the water hardness exceeds 200mg/litre, it is recommended that a proprietary scale reducing device is fitted into the boiler cold supply within the requirements of the local water company.

IMPORTANT

Provision **MUST** be made to accommodate the expansion of DHW contained within the appliance, if a non-return valve is fitted to the DHW inlet.

INSTALLATION

5 SYSTEM BALANCING

The boiler does not normally need a bypass but at least some radiators on the heating circuit, of load of 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 8.

Note.

Systems incorporating zone valves which could completely cut off the flow through the system, must be wired such that the boiler will not fire or continue to fire when this occurs.

BALANCING

1. Set the programmer to ON.

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. Adjust the room thermostat and programmer to NORMAL settings.

6 WATER TREATMENT

The isar boiler has an ALUMINIUM alloy heat exchanger

IMPORTANT.

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

If water treatment is used **Caradon Ideal Limited** recommend only the use of FERNOX-COPAL or SENTINEL X100 water treatment products, which must be used in accordance with the manufacturers' instructions. For further information contact:

Fernox Manufacturing Co. Ltd.
Tandem House, Marlowe Way, Croydon, Surrey, CRO 4XS.
Tel: 0870 5601 5000

Sentinel Division
Betz Dearborn Ltd., Widnes, Cheshire, WA8 8UD
Tel: 0151 424 5351

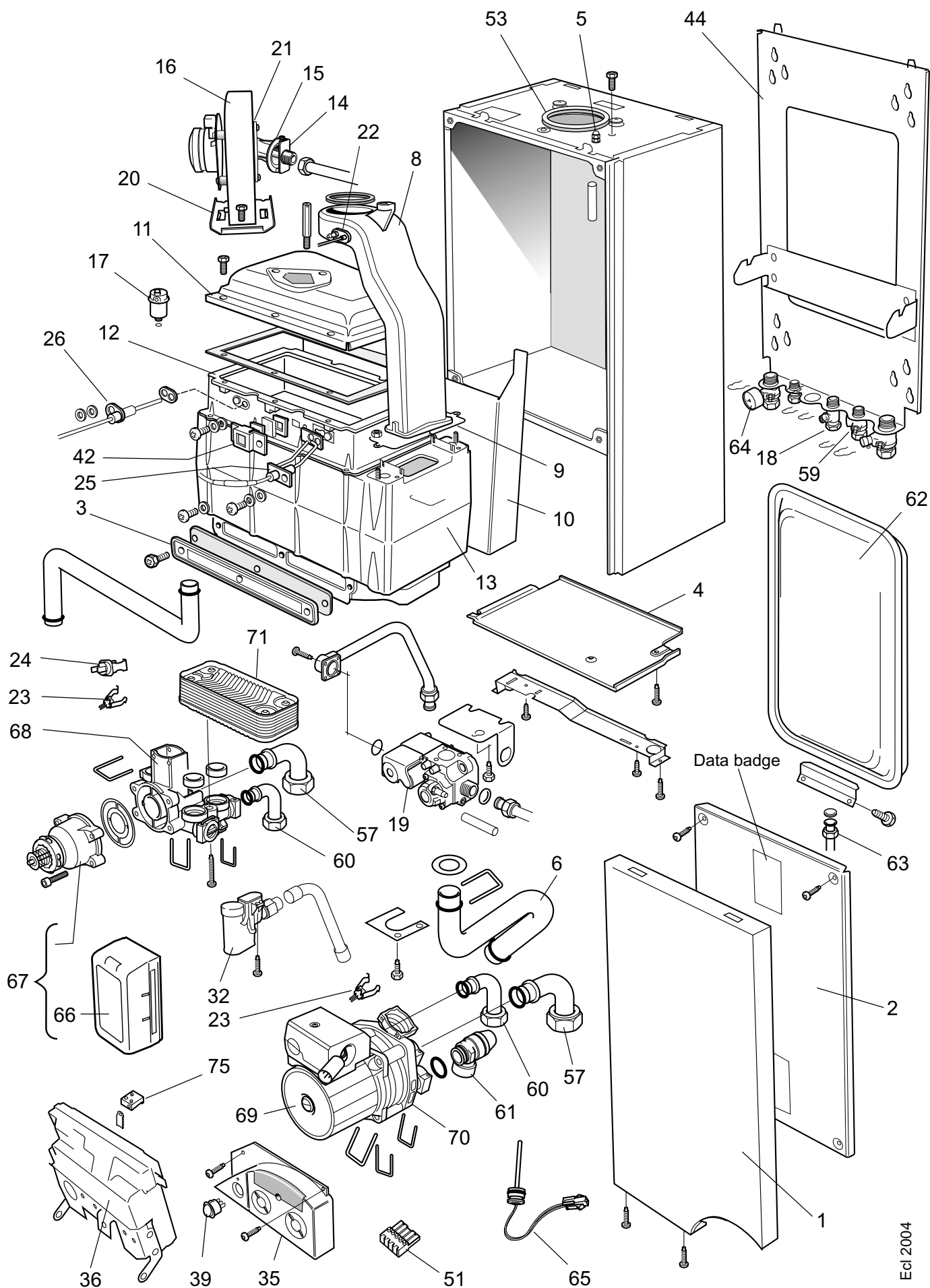
Notes.

1. It is most important that the correct concentration of the water treatment product 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. BS. 7593:1992 details the steps necessary to clean a domestic central heating system.
3. In hard water areas, treatment to prevent lime scale 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 panel. | 19. Gas valve. | 59. Flow restrictor. |
| 2. Boiler sealing panel. | 20. Fan bracket. | 60. DHW inlet/outlet pipe. |
| 3. Sump cover. | 21. Orifice plate. | 61. Pressure relief valve. |
| 4. Bottom panel. | 22. Dry fire thermostat. | 62. Expansion vessel. |
| 5. Flue sensing nipple. | 23. Thermistor. | 63. Exp. vessel pipe. |
| 6. Return pipe. | 24. Overheat thermostat. | 64. Pressure gauge. |
| 8. Flue manifold. | 25. Ignition electrode. | 65. DHW thermistor. |
| 9. Flue manifold fixing. | 26. Flame sensing electrode. | 66. Diverter valve head. |
| 10. Interpanel. | 32. Condensate 's' trap. | 67. Diverter valve. |
| 11. Burner. | 35. User control. | 68. Diverter valve manifold. |
| 12. Comb. Chamb insulation. | 36. Primary controls (PCB). | 69. Pump. |
| 13. Heat engine. | 39. Mains switch. | 70. Pump manifold. |
| 14. Injector assembly. | 42. Sightglass. | 71. DHW plate heat exchanger. |
| 15. Venturi assembly. | 44. Piping frame. | 75. Control box clamp. |
| 16. Fan assembly. | 51. Mains connector. | |
| 17. Automatic air vent. | 53. Turret seal. | |
| 18. Gas service cock. | 57. CH stub pipe. | |

7 BOILER ASSEMBLY - Exploded View



Ecl 2004

INSTALLATION

8 UNPACKING

The boiler is supplied fully assembled in one Pack A, together with a standard flue assembly for lengths up to 460mm, rear or side flue outlet, in Pack B. Optional extras, If ordered, are available in separate boxes.

Unpack and check the contents.

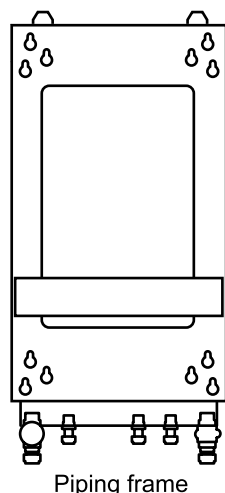
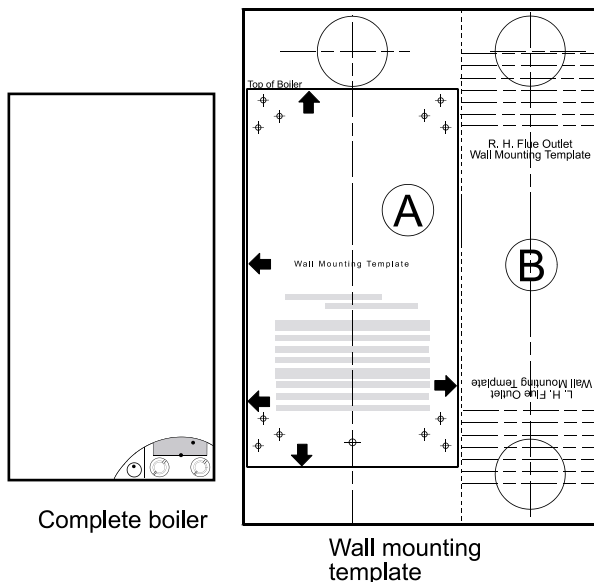
Pack A Contents

Also contained in Pack A:

- Hardware Pack (listed below).
- These Installation & Servicing Instructions.
- The User's Instructions.
- The User Control.
- Benchmark book.

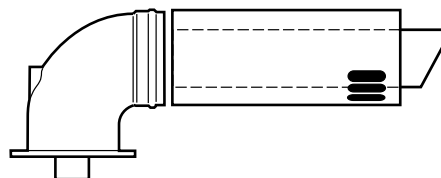
Hardware Pack

- 50mm x No.10 wood screws - 3 off.
- Wall plugs (TP2B) - 3 off.
- Water treatment warning label.
- Turret clamp.
- M5 x 10 pozi Hex screw.
- 22mm compression nut and olive - 2 off.
- 15mm compression nut and olive - 2 off.
- Safety drain pipe nut and olive.
- CH Flow isolating valve c/w pressure gauge.
- 22mm fibre washers - 2 off.
- 15mm fibre washers - 2 off.



Pack B Contents

- Flue turret.
- Flue terminal.
- Flue support cutting aid - 1 off.

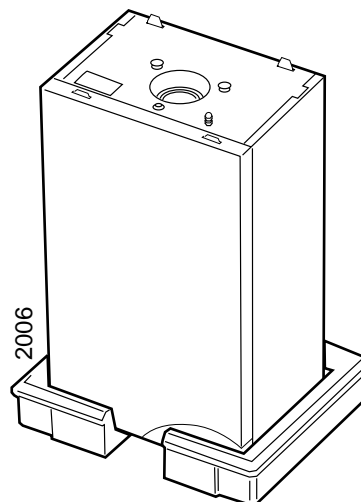


Flue turret assembly

Flue terminal

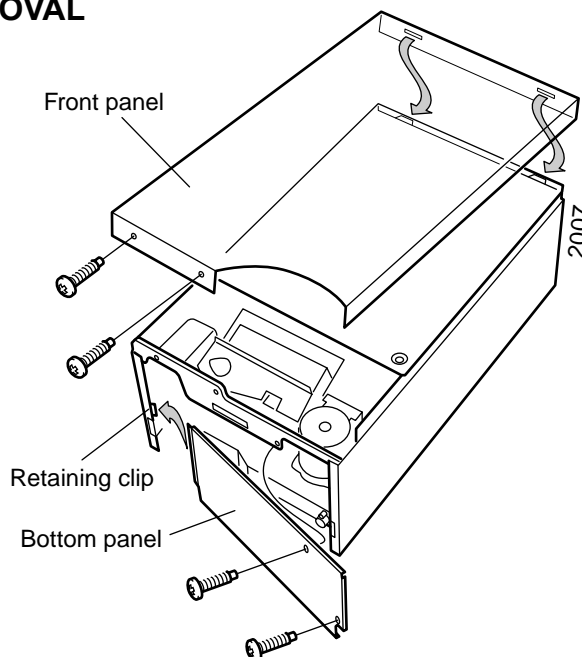
9 PACKAGING REMOVAL

1. Ensure the boiler is stood correctly as marked on the carton.
2. Remove the strapping.
3. Fold back the top flaps to gain access to the wall mounting plate, instructions, hardware pack and user control .
4. Remove the instructions and read thoroughly before unpacking the product. Unpack the user control and hardware pack and retain in a safe place.
5. When ready for installation lift off the cardboard carton.
6. Dispose of packaging.



10 BOTTOM PANEL AND FRONT PANEL REMOVAL

1. Undo the 4 retaining screws.
2. Allow the RHS of the bottom panel to lower slightly.
3. Withdraw the LHS of the bottom panel from the retaining clips.
4. Lift front panel and remove.
5. Place bottom and front panel to one side to avoid damage.



11 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 - Upward routing pipework frame depth = 33mm

FLUE KITS

Pack B - supplied as standard

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

Refer to 'Flue Extension Ducts'

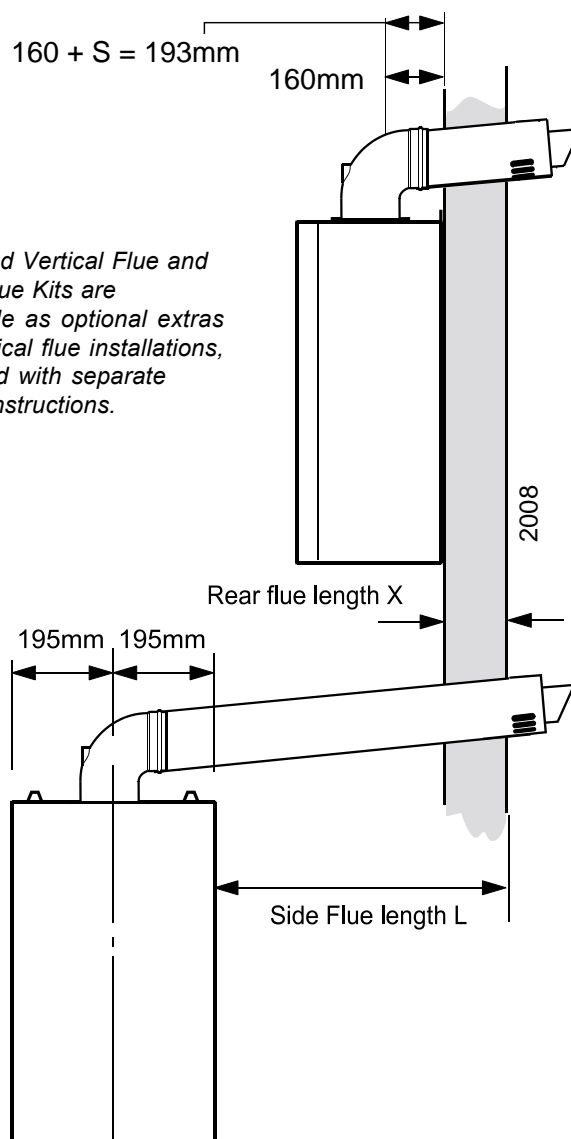
Total Flue length dimension		Flue
Rear flue dim. X+160	Side flue dim. L+195	Extra packs required
Up to 480 mm	Up to 480 mm	none
Up to 1430 mm	Up to 1430 mm	Pack D - 1 off
Up to 2380 mm	Up to 2380 mm	Pack D - 2 off
Up to 3000 mm	Up to 3000 mm	Pack D - 3 off

Notes.

1. 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.
2. 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 wall to suit this condition.

Note.

Powered Vertical Flue and Roof Flue Kits are available as optional extras for vertical flue installations, supplied with separate fitting instructions.



INSTALLATION

12 FLUE ASSEMBLY - Exploded View

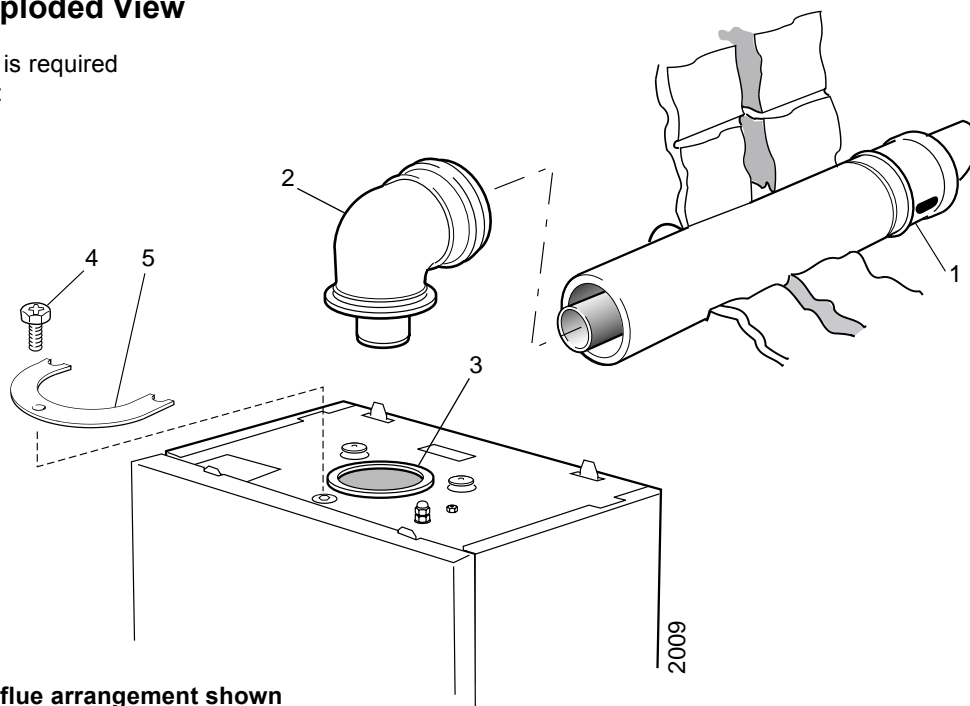
1. An optional flue duct extension kit is required for wall thicknesses greater than :

Side 300mm (11 3/4").

Rear 345mm (13 1/2").

LEGEND

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



Rear flue arrangement shown

13 WALL MOUNTING TEMPLATE

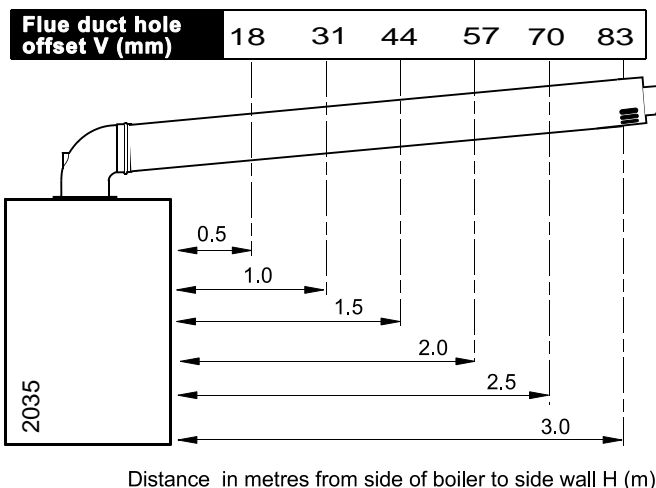
Note.

The template shows the positions of the fixing holes and the flue hole centres for standard installation and for using the stand-off. Care Must be taken to ensure the correct holes are drilled.

1. Tape template into the selected position.
2. Ensure squareness by hanging a plumbline as shown. If fitting a side flue extend the flue centre line onto the side wall.
3. Mark onto the wall the following:
 - a The piping frame screw positions (choose one from each group).
 - b. The position of the flue duct hole.

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

4. Remove the template from the wall.
See wall mounting plate



Note.

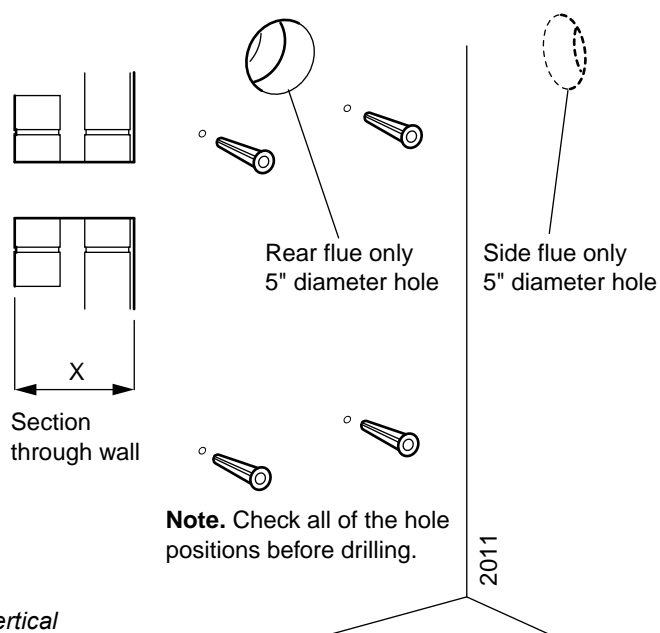
Side flue only. If the system pipework is to be routed up behind the boiler, the upward routing pipework frame supplied as a separate kit MUST be used secured to the piping frame. It is essential to use the wall mounting template to mark the holes to be drilled. Care MUST be taken to ensure the correct holes are drilled.

INSTALLATION

14 PREPARING THE WALL

WARNING. 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 7mm (1/4") masonry drill and insert the plastic plugs provided, for the piping frame.
3. Locate 4 No.10 x 2" screws in the wall mounting plate (one at each side, in any of the 3 holes provided at each side) and screw home.



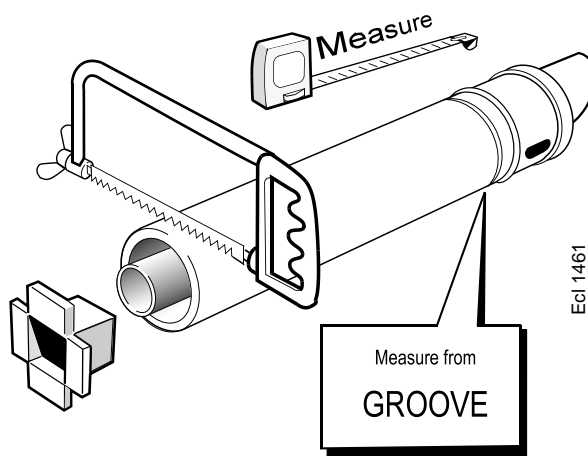
Note. If the terminal is to be sited within 25-40mm of a corner or vertical pipe then the hole **MUST** be accurately cut.

15 CUTTING THE FLUE - REAR Wall thicknesses of 114 to 345 mm

Note.

- a. If using the extension ducts go to Frame 21.
- b. If the upward routing pipe stand off brackets are used it is essential add 33mm to 'X' the measured wall thickness when marking the flue (this will allow for the fitted brackets).

1. Measure and note wall thickness X - Refer to Frame 11
2. Add 75mm (3") to dimension X and, measuring from the groove, cut the outer tube only.
3. To ensure the tube is cut square, mark the flue all the way round. Use the cardboard support.
4. Cut the inner tube to a length 20mm (3/4") longer to aid engagement.



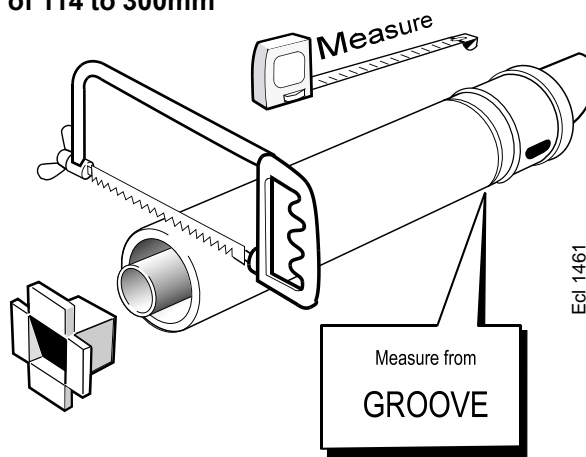
Ecl 1461

16 CUTTING THE FLUE - SIDE Wall thicknesses of 114 to 300mm

Note.

If using the extension ducts go to Frame 21.

1. Measure and note wall thickness X - Refer to Frame 11
2. Add 115mm (4 1/2") to dimension X and, measuring from the groove, cut the outer tube only.
3. To ensure the tube is cut square, mark the flue all the way round. Use the cardboard support.
4. Cut the inner tube to a length 20mm (3/4") longer to aid engagement.



Ecl 1461

INSTALLATION

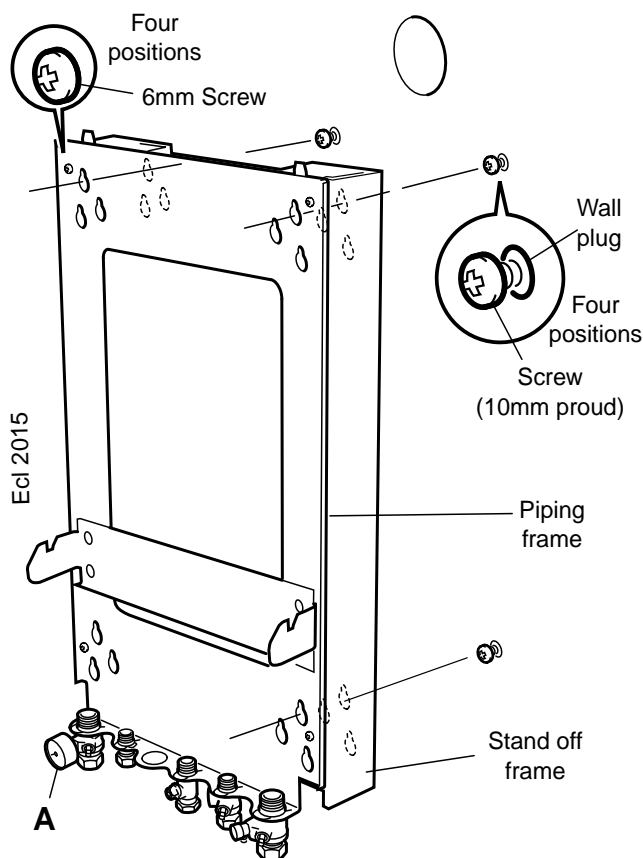
17 FITTING THE PIPING FRAME (Rear Flue outlet shown)

Note. The CH Flow isolating valve(A), pressure gauge, is supplied separately in the hardware pack. Fit to the piping frame BEFORE mounting the boiler.

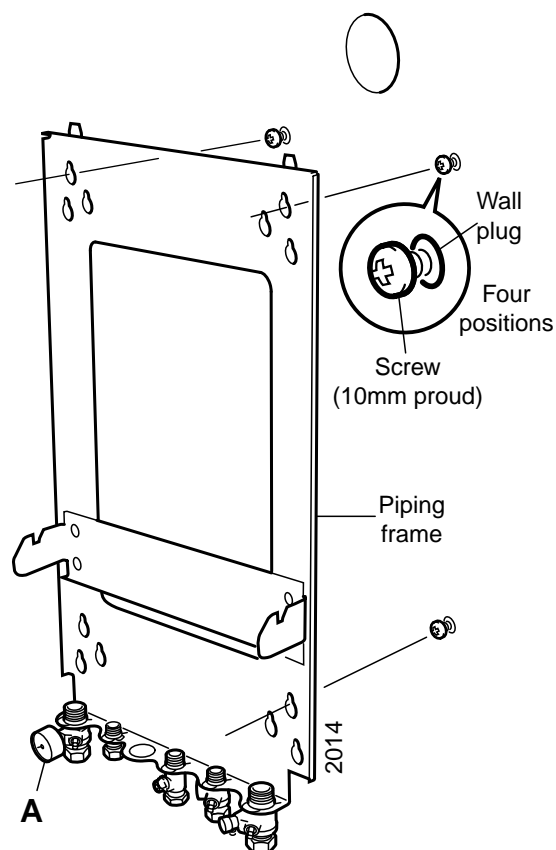
Fit the wall mounting frame either:

a. 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.



Service connections may be made now, before mounting the boiler, if required- refer to Frames 24 to 27.



or

b. Use stand-off frame

(To allow pipework to be taken upwards).

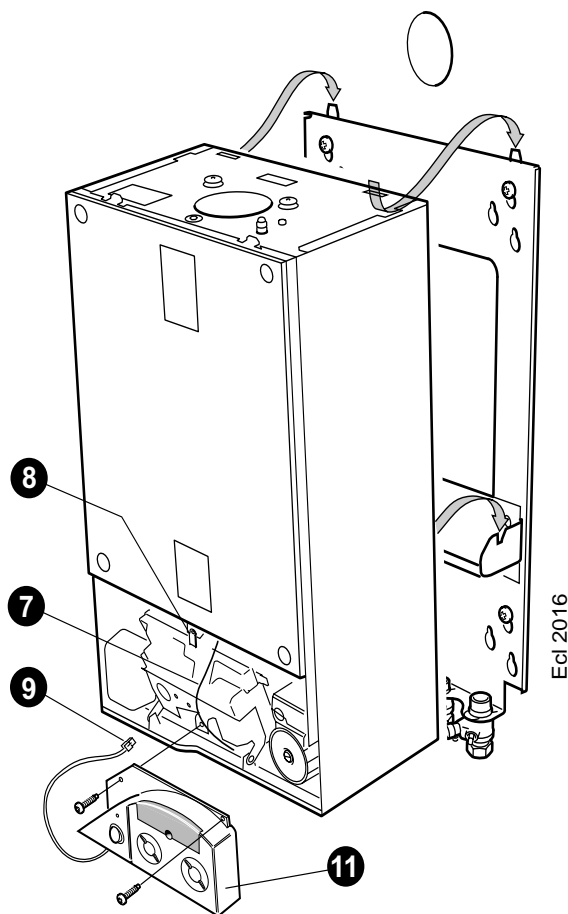
- Insert wall plugs.
- Put the screws into the wall plugs and leave 10mm proud.
- Hang the stand-off frame onto the screws and tighten up.
- Fasten the piping frame to the stand-off frame with the 6mm screws provided.

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.

18 MOUNTING THE BOILER

1. Ensure that the plastic plugs are removed from both the DHW and CH pipes before mounting.
- N.B.** Some spillage of water may occur from the pipework when mounting the boiler to the frame.
2. Lift the boiler onto the wall mounting frame, locating it over the tabs at the top of the frame.
3. Lower the boiler into position.
4. Using the correctly sized fibre washers supplied in the hardware pack, engage and then tighten the 4 water unions.
5. Engage and tighten the gas union, ensuring that the rubber seal is in place. **DO NOT** overtighten.
6. Connect a pipe to the safety drain outlet using the nut and olive supplied in the boiler hardware pack.
7. Disconnect the spark lead from the control box.
8. Turn the control box clamp and swing the box into the servicing position.
9. Plug the user control (supplied in the Pack A) into the control box. Refer to Frame 34.
10. Swing the control box back into its working position and secure.
11. Screw the user control into position.



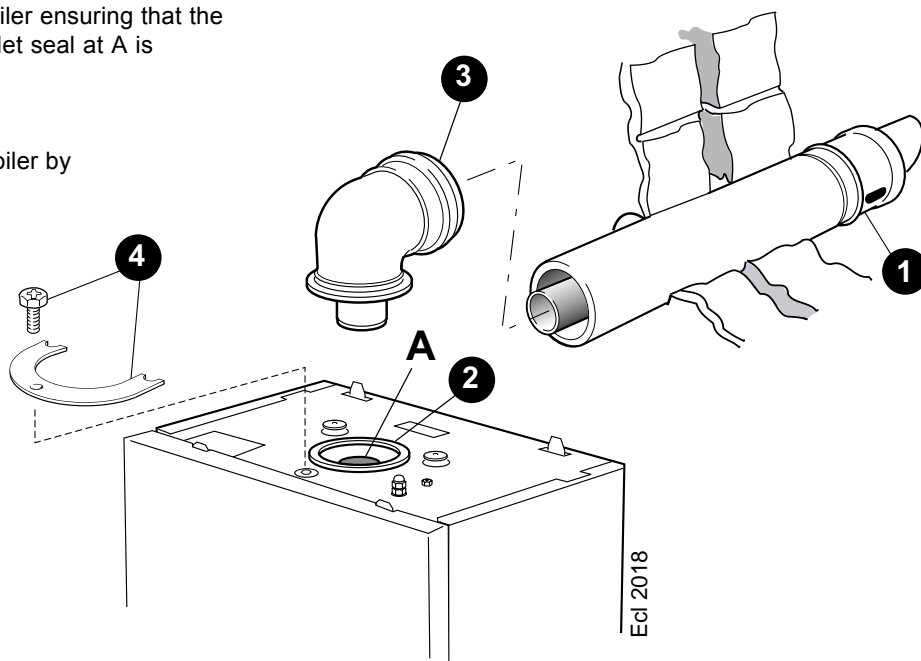
Ecl 2016

19 CONNECTING THE FLUE TO THE BOILER

Note.

- a. *BEFORE fitting the flue turret, fill the condensate trap within the boiler by pouring a cupful of water into the flue outlet A.*
- b. *Take care to ensure that the water is only poured into the flue outlet, and does not spill into the boiler casing.*

1. Insert the flue assembly through the prepared hole in the wall.
2. Fit the flue turret on the top of the boiler ensuring that the seal is in place, and that the flue outlet seal at A is correctly located.
3. Locate the flue into the turret.
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.**



Ecl 2018

Fix the flue support bracket to the wall, using the wall plug and wood screw. For standard installations use the short wood screw.

If the stand-off option is used, secure the support bracket using the spacer bracket and long wood screw.

INSTALLATION

20 TERMINAL WALL PLATE (optional)

This plate is supplied in the Flue Finishing Kit (together with one inner and one outer flue seal) it allows neat concealment and full compression of the outer seal (if fitted). Its use is not essential if the flue hole and flue ducts have been accurately cut and the outside wall face is flat.

1. Position the terminal wall plate over the terminal.

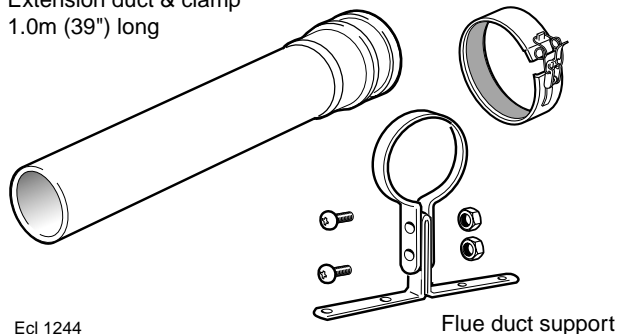
2. Drill 4 fixing holes with a 7mm (1/4") masonry drill.
3. Insert the 4 plastic plugs provided.
4. Secure the plate with 4 of the No.10 x 2" screws provided.

Note. If the terminal is less than 2m (6' 6") above ground level, an approved terminal guard should be fitted. Refer to the Flue Installation, Page 8.

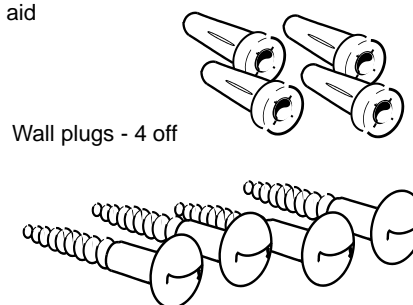
21 FLUE EXTENSION DUCTS - For flue lengths greater than 480mm

Pack D Flue extension duct kit contents.

Extension duct & clamp
1.0m (39") long



Flue support cutting aid
(shown folded up)



Wall plugs - 4 off

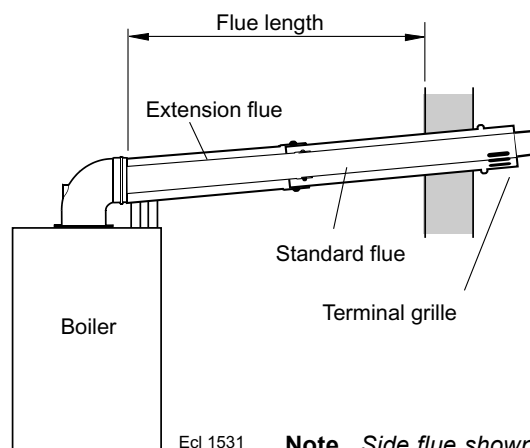
No. 10 x 2" wood screw - 4 off

22 FLUE EXTENSION DUCTS - continued

Use a maximum of 3m extended flue ONLY

General arrangement

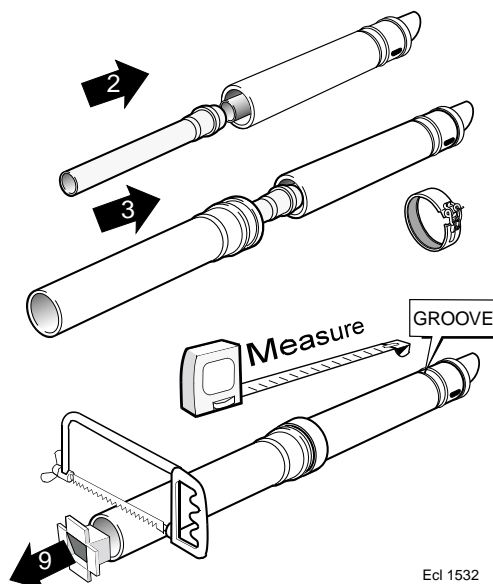
1. A **maximum** of 3 extension ducts (one suitably cut) plus the standard flue duct may be used together.
2. Flue extensions of greater length than 1m (39") should be supported with the bracket provided, suitably adjusted - refer to Frame 21.



Note. Side flue shown

23 FITTING THE KIT

1. Remove the cardboard support aid from the flue and place safely to one side.
2. Fit the inner flue extension duct onto the inner flue duct.
3. Fit the outer flue extension duct onto the outer air duct.
4. Using the clamp provided clamp the flue lengths together.
5. Repeat steps 1-4 if a second flue extension is required.
6. Measure and mark the flue length required onto the flue, measuring from the groove near the terminal.
7. To ensure a square cut, mark the flue all the way round.
8. Cut to length using the cardboard support aid.
9. Remove the cardboard off-cut and deburr the metal edges.



24 SERVICE CONNECTIONS

General Notes

1. Fitting the Piping Frame, top entry pipework is an option, as well as mounting from the bottom or through the wall.
2. Horizontal connecting pipes, where used, must be run outside the limits of the boiler casing.

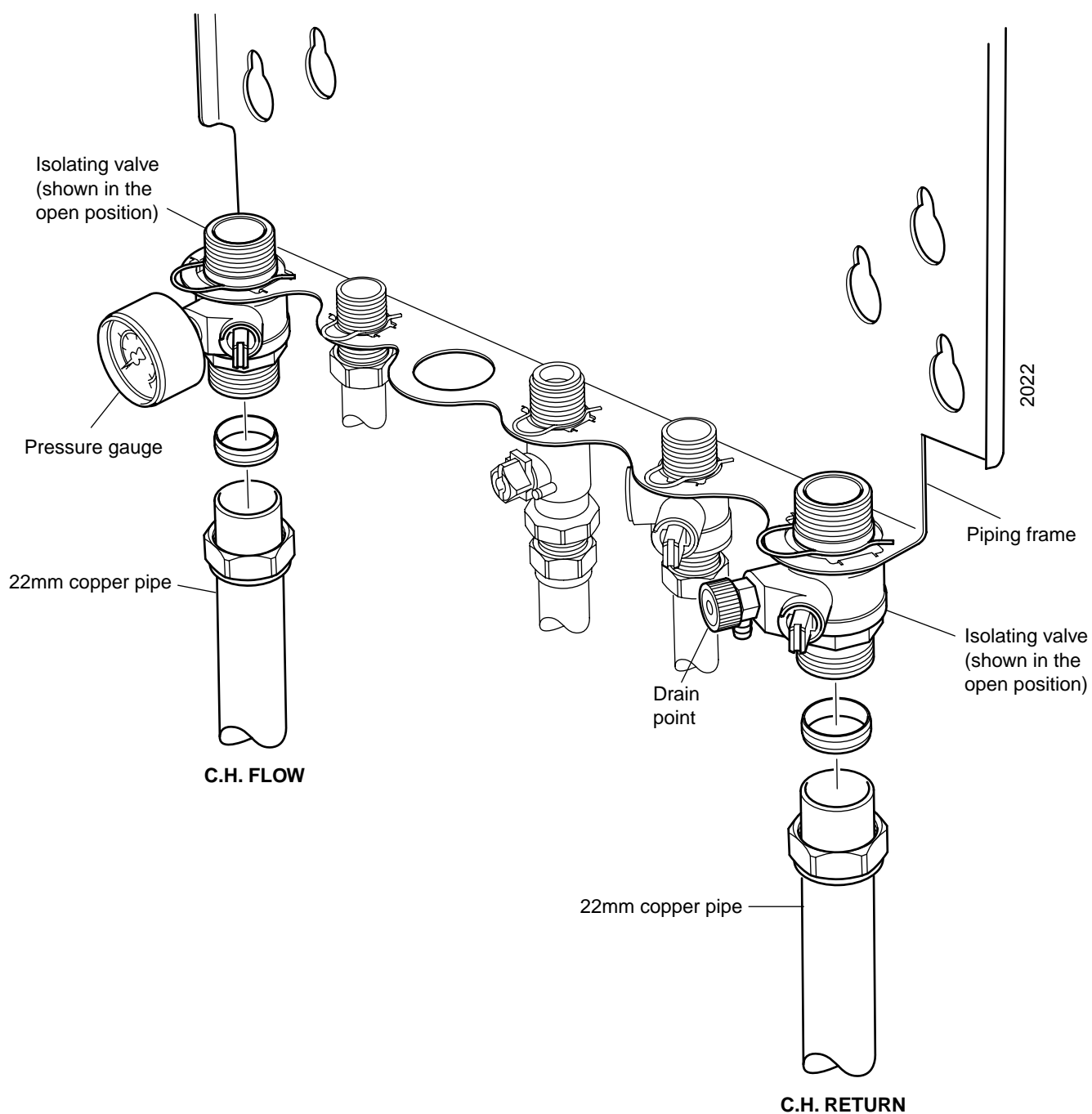
If pipes are run vertically within the boiler back space provided by optional stand-off frame positions they must avoid any obstructions imposed by the channels and by a rear facing flue, should this position be selected.

25 WATER CONNECTIONS

CH CONNECTIONS

Refer to General Note, Frame 24, for guidance.

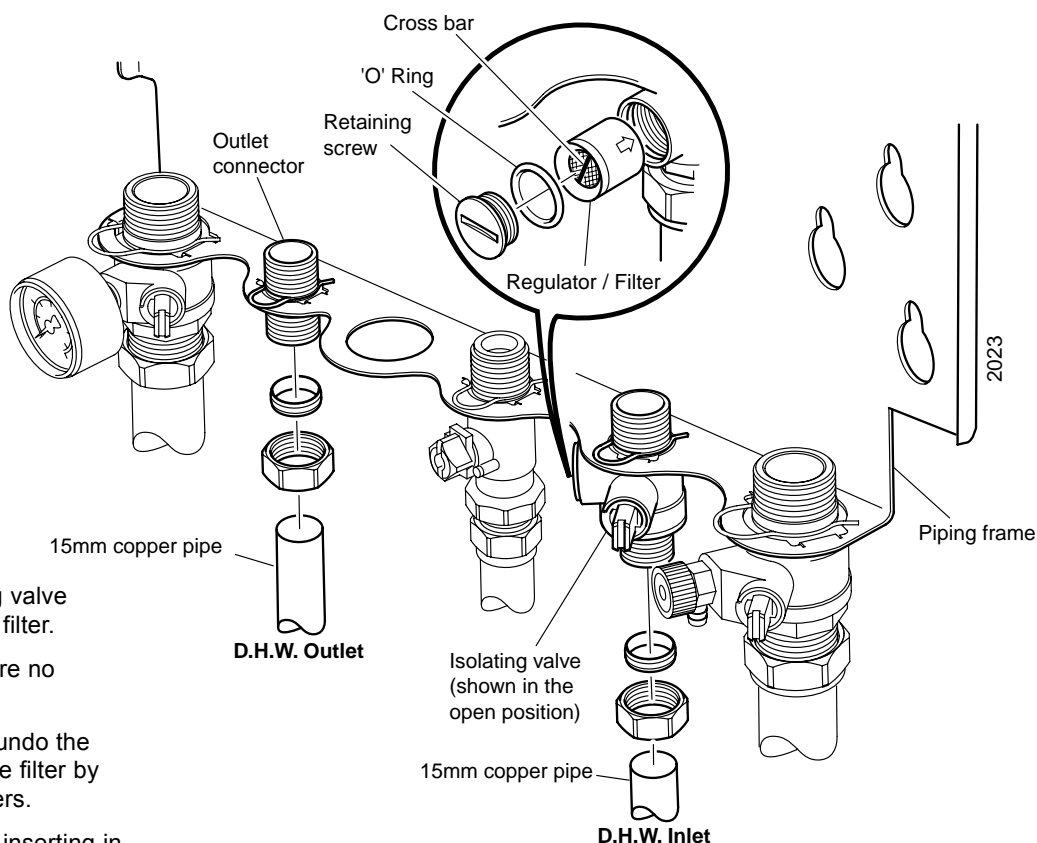
Note. Do not subject any of the isolating valves to heat as the seals may be damaged.



INSTALLATION

26 WATER CONNECTIONS - continued

DHW CONNECTIONS



Note. The DHW inlet isolating valve incorporates a flow regulator / filter.

It should be inspected to ensure no blockage is evident.

To remove, turn off the valve, undo the retaining screw and pull out the filter by grasping the crossbar with pliers.

Re-assemble in reverse order inserting in the direction of the arrow.

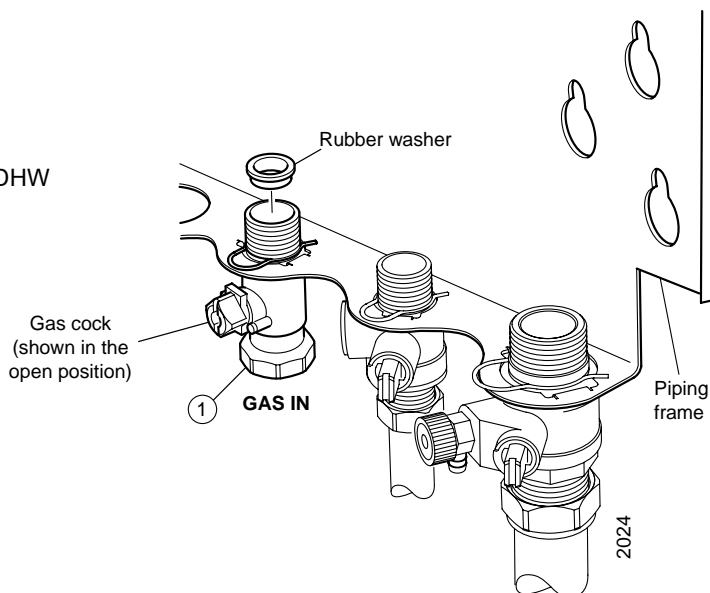
27 GAS CONNECTION

1. Extend a gas supply pipe of not less than 15mm O.D. copper to the boiler.

A working gas pressure of 20mbar (8" w.g) should be available at the boiler inlet, with the boiler firing at full DHW output.

IMPORTANT.

The gas service cock contains a non-metallic seal so must not be overheated when making capillary connections.



28 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.

29 CONDENSATE DRAIN

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

The condensate drain provided on the boiler must be connected to a drainage point, preferably within the building.

Ensure that the condensate trap is full of water before commissioning the boiler - refer to Frame 19.

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.

Any external runs must be insulated.

Excessive external pipe runs should be avoided 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.

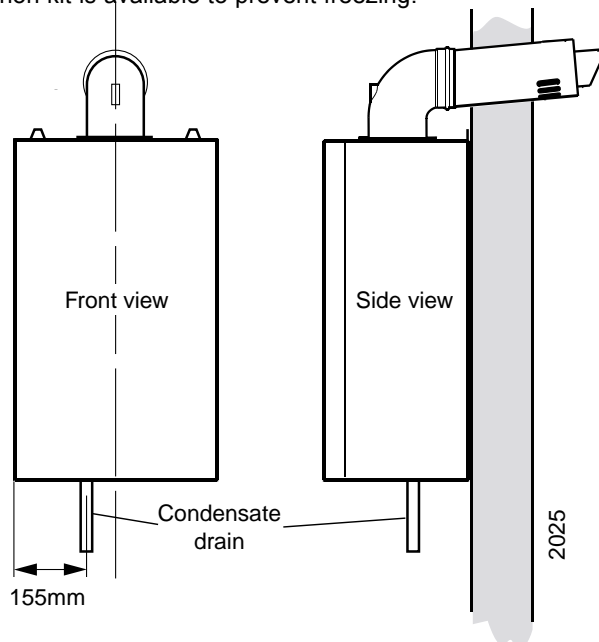
The drain outlet on the boiler is standard 21.5mm overflow pipe. This size must not be reduced in any part of its length.

Any external pipework should be a minimum of 32mm internal diameter.

In order to defer the onset of freezing of the condensate drain when the pipe is run externally the pipe should be run as far as possible within the building.

The boiler condensate drain connection is suitable for Marley 'Terrain' tubing.

A siphon kit is available to prevent freezing.



30 FILLING

Central Heating

1. Swing the control panel down into the servicing position. Refer to Frame 47.
2. Remove the boiler sealing panel. Refer to Frame 46.
3. Ensure that the CH isolating valves are open.
4. Fill and vent the system. Check for water soundness.

IMPORTANT - when filling:

- a. Remove the diverter valve actuator (refer to Frame 64) and depress the spindle several times during filling. Replace diverter valve actuator.
- b. The cap on the automatic air vent (refer to Frame 72) MUST be loose at all times.

When filling, there may be a slight water leak from the vent therefore electrical connections should be protected.

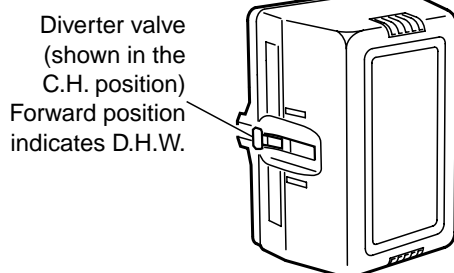
- c. Bleed any air from the pump and ensure that it is free to rotate.
 - i. Remove the vent plug
 - ii. Using a screwdriver, rotate the shaft several times
 - iii. Replace the vent plug.

Note. Some slight water leakage will occur.

Domestic Hot Water

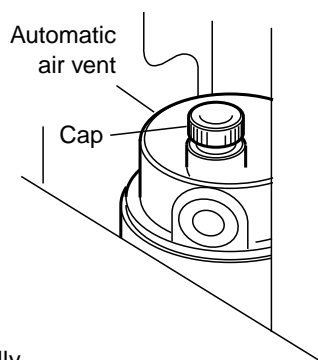
1. Fully open all DHW taps and ensure that water flows freely from them.
2. Close all taps except the one furthest from the boiler.
3. Turn off the DHW tap.

a.

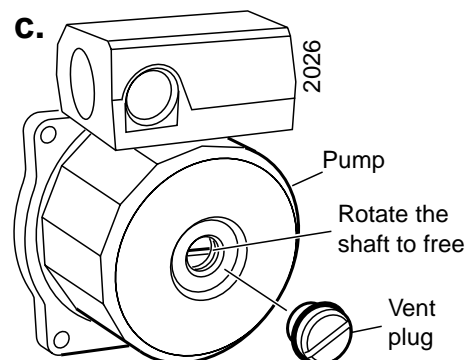


Note. The domestic hot water flow rate is automatically regulated to a maximum of 12 l/min (2.6 gpm).

b.



c.



INSTALLATION

31 ELECTRICAL CONNECTIONS

WARNING. This appliance MUST be earthed.

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

The fuse rating should be 3A.

Wiring external to the boiler MUST be in accordance with the current I.E.E. (BS7671) Wiring Regulations and any local regulations.

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

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

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.

32 INTERNAL WIRING

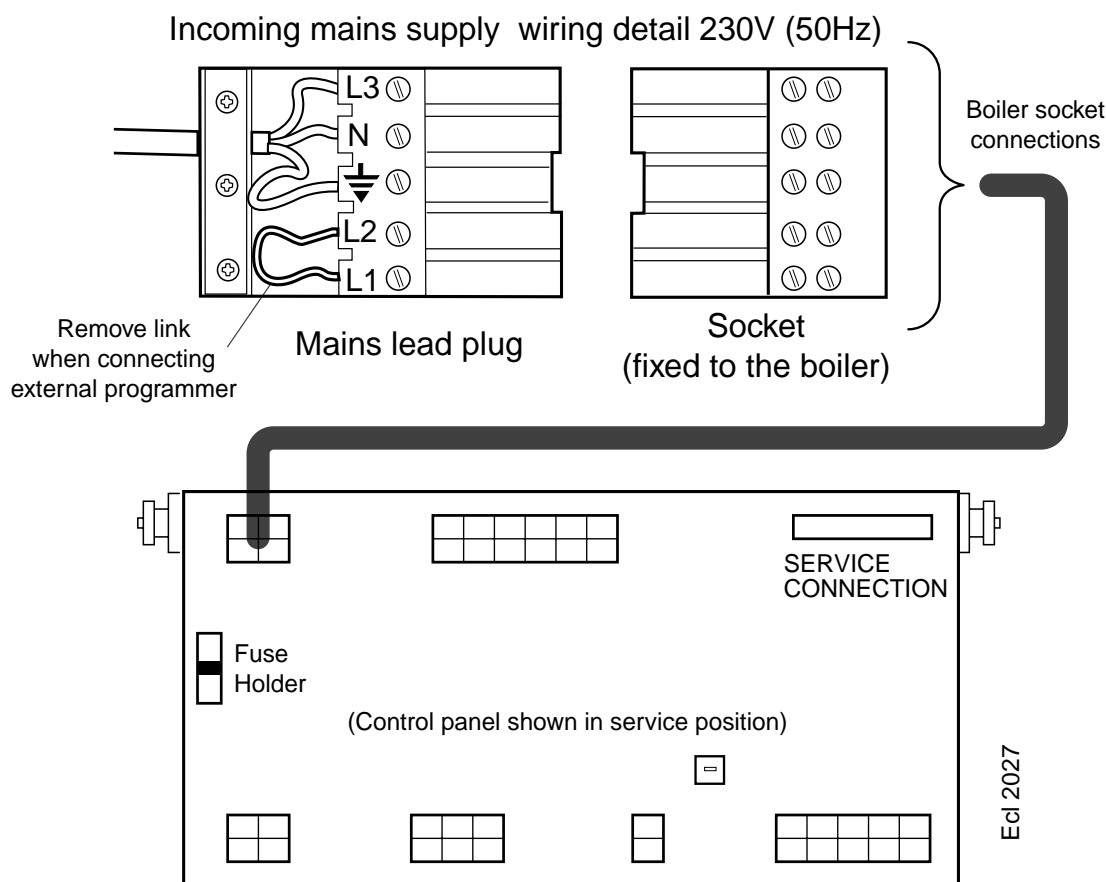
1. Route the mains cable into the bottom rear centre of the boiler.
2. Wire the permanent live supply into the 5-way remote plug terminals, L3, N & $\frac{1}{2}$.

3. Wire any switched live supply into terminal L2.

4. Secure the mains lead with the cable clamp.

5. Reconnect the mains lead plug. 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.



33 EXTERNAL ELECTRICAL CONTROLS

Wiring External to the Boiler

The fuse rating should be 3A.

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

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.

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

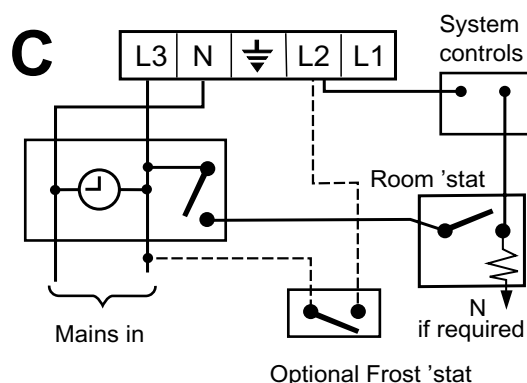
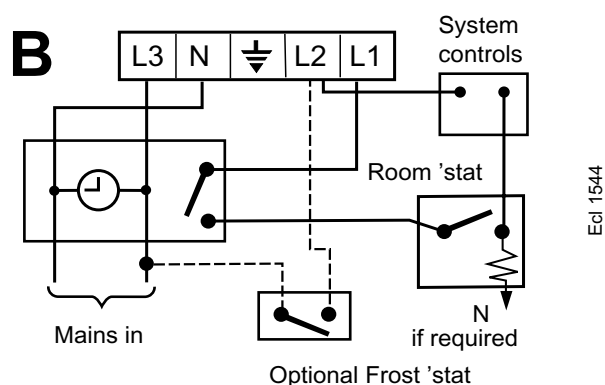
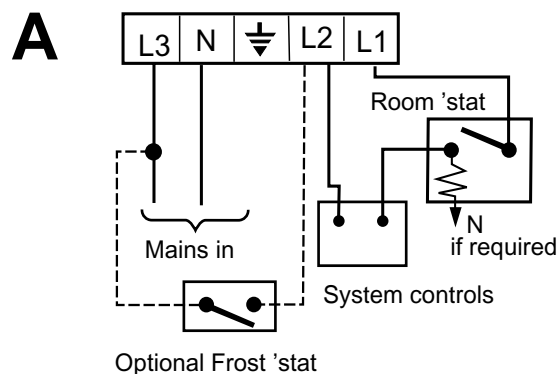
Wiring should be as shown, with minimal disturbance to other wiring of the programmer.

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

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.

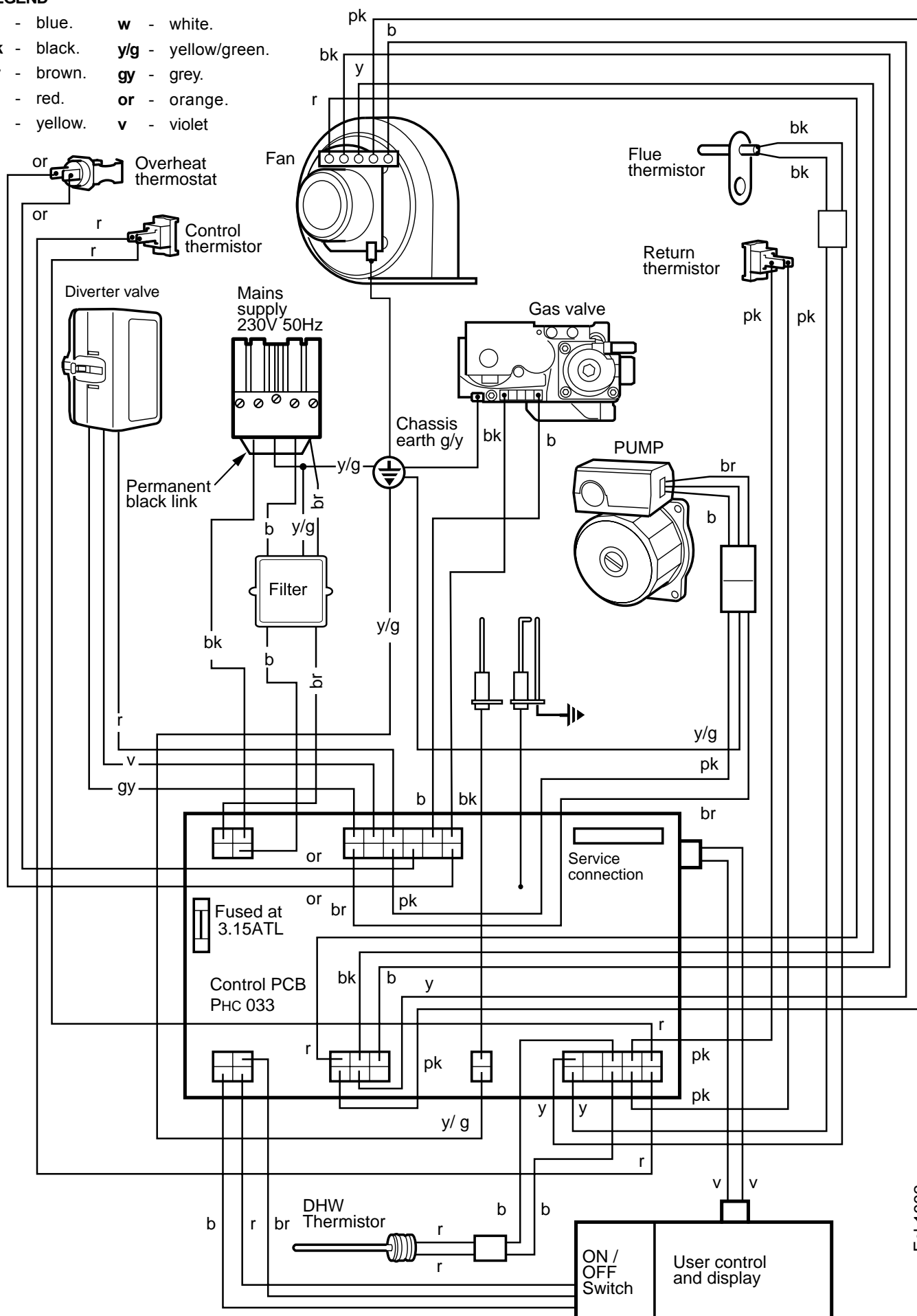


INSTALLATION

34 PICTORIAL WIRING DIAGRAM

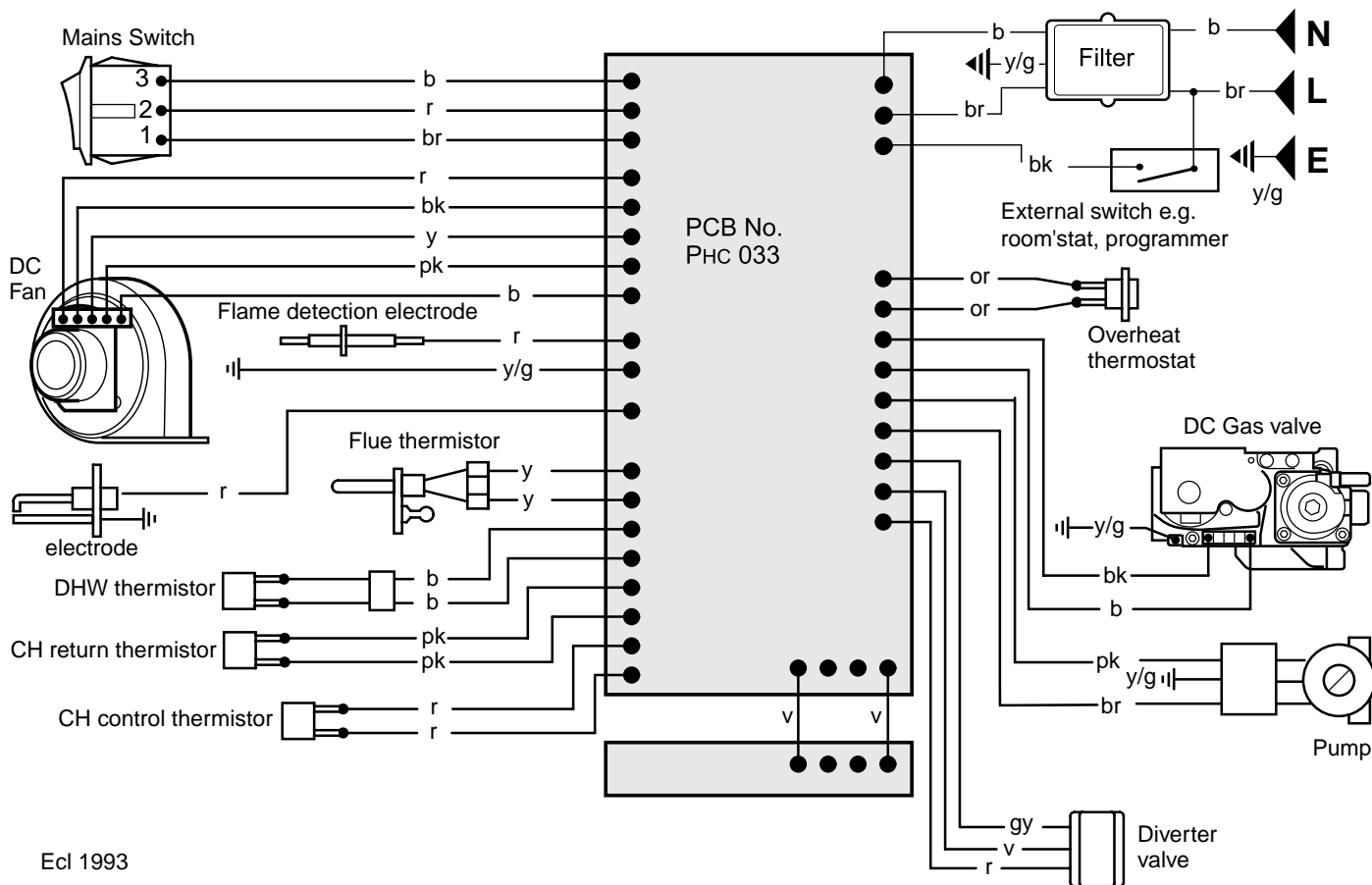
LEGEND

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



Ecl 1992

35 FUNCTIONAL FLOW WIRING DIAGRAM



LEGEND

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

36 COMMISSIONING AND TESTING

A. Electrical Installation

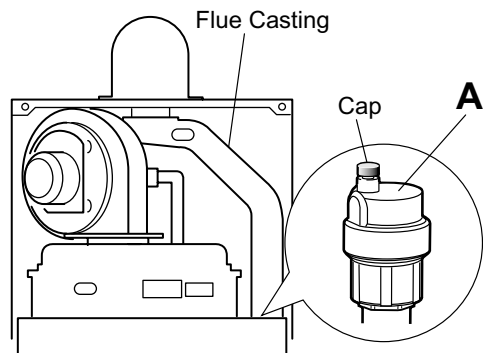
1. Checks to ensure electrical safety should be carried out by a competent person.
2. ALWAYS carry out the preliminary electrical system checks, i.e. earth continuity, polarity, resistance to earth and short circuit, using a suitable test meter.

B. Gas Installation

1. The whole of the gas installation, including the meter, should be inspected and tested for soundness and purged in accordance with the recommendations of BS. 6891.
2. Purge air from the gas installation by approved methods only.
3. Retighten the union and test for gas soundness.

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

37 INITIAL LIGHTING



LEGEND

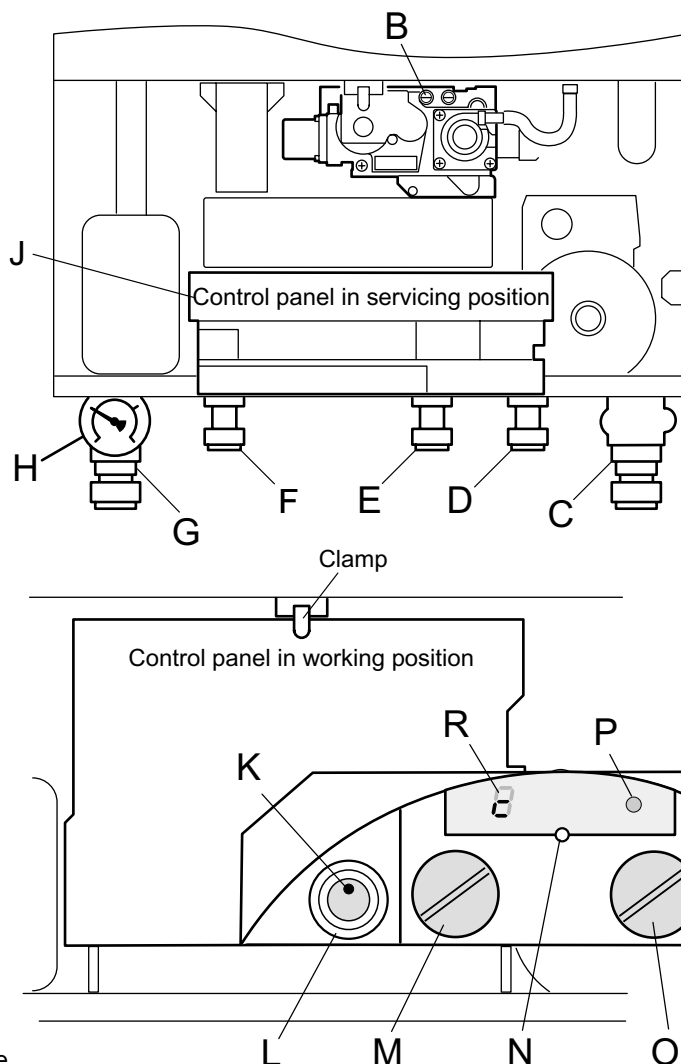
- | | |
|---------------------------------------|-------------------------|
| A. Automatic air vent. | K. Mains On neon |
| B. Inlet pressure test point | L. Boiler On/Off switch |
| C. CH return isolating valve | M. DHW thermostat knob |
| D. DHW inlet isolating valve | N. Reset button |
| E. Gas service cock | O. CH thermostat knob |
| F. DHW outlet | P. LED |
| G. CH flow isolating valve | R. Display |
| H. Pressure gauge | |
| J. Control panel (Servicing position) | |

1. Check that the system has been filled and that the boiler is not airlocked. Ensure the automatic air vent cap (A) is open.
2. Refit the boiler sealing panel. Refer to Frame 46.
3. Check that all the drain cocks are closed and that the CH and DHW isolating valves (C, D and G) are OPEN.
4. Check that the electrical supply is OFF.
5. Check that the boiler ON/OFF switch (L) is off.
6. Check that the gas service cock (E) is OPEN.
7. Slacken the screw in the inlet pressure test point (B) and connect a gas pressure gauge via a flexible tube.
8. Swing the control panel to the working position and secure with the clamp.
9. Reconnect the spark lead to the control box.
10. Connect the low voltage electrical lead from the user control to the control box (refer to Frame 47) and screw the control into position.
11. Switch the electricity supply ON and check all external controls are calling for heat.

12. CENTRAL HEATING

Set the boiler thermostat knob to maximum and set the boiler ON - OFF switch to ON. The RED mains ON neon (K) should now be illuminated. The boiler control should now go through its ignition sequence until the burner is established.

13. If the boiler does not light after 3 attempts the fault code \mathcal{L} will be displayed, Press the reset button (N) and the boiler will repeat its ignition sequence.



Ecl 2031

When the burner is established the GREEN 'Burner On' LED (P) will be illuminated, the display (R) will show status \mathcal{C} .

The display

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


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

- \mathcal{O} Standby, no demand for heat present.
- \mathcal{C} Boiler is active for central heating.
- \mathcal{d} Boiler is active for domestic hot water.
- \mathcal{L} Boiler is heating up the plate heat exchanger.
- \mathcal{H} Boiler is in lockout for a specific error, display will be blinking alternating with a number or letter to show what kind of error is detected.
- \mathcal{L} Boiler is in lockout for a specific error, display will be blinking alternating with a number or letter to show what kind of error is detected.

38 INITIAL LIGHTING - continued

14. DOMESTIC HOT WATER

With the boiler firing, set the DHW thermostat knob (M) to maximum and fully open a DHW tap.

The boiler should continue to run and the display (R) should show status .

15. Ensure that with the boiler operating the dynamic gas pressure is 20 mbar.

Note. *The boiler is designed to vary the heat input depending on the system load. The gas pressure and fan signal CANNOT be altered.*

16. Turn off the DHW tap.

17. Set the boiler ON/OFF switch (L) to OFF.

18. Swing the control panel into servicing position. Refer to Frame 47.

19. Remove the pressure gauge and tube. Tighten the sealing screw in the pressure test point. Ensure a gas tight seal is made.

20. Test for gas soundness around ALL boiler gas components, using leak detection fluid.

21. Swing the control panel back into its working position and secure. Reconnect the spark lead.

22. Refit the user control.

23. Refit the boiler front and bottom panels.

24. Switch the boiler on again.

39 GENERAL CHECKS

Make the following checks for correct operation in: DOMESTIC HOT WATER (DHW) MODE

1. With no call for CH or DHW the boiler should fire for a short period to preheat the DHW plate heat exchanger.

The display should read

 returning to



when the burner switches off.


Notes.

- a. *If no DHW is drawn off, the boiler will fire periodically for a short time, to maintain the plate heat exchanger temperature.*


- b. *The DHW preheat operates 24 hours a day .*

2. Fully open all DHW taps in turn and ensure that water flows freely from them.

The display should read:

 flashing

then

 when the burner lights.

3. Close all taps except the furthest one from the boiler and check that the boiler is firing at maximum rate.

This is factory set to give a DHW temperature rise of approximately 35°C at the following flow rate:-

12.0 l/min (2.6 gpm)

4. Reduce the DHW draw-off rate to about 3 l/min (0.7 gpm) and check that the boiler modulates to deliver DHW at approximately 65°C.

5. Close the DHW tap and check that the main burner extinguishes.

The pump should overrun for a few seconds and the display sequence should read:



When the pump stops the display sequence should read:



Note. On systems in excess of 2 bar inlet pressure a water pressure governor may be required to prevent water noise.

Make the following checks for correct operation in: CENTRAL HEATING (CH) & DOMESTIC HOT WATER (DHW) MODE.

1. Ensure that the CH external controls are calling for heat. The display should read:



after first satisfying DHW preheat if necessary. ()

2. Fully open a DHW tap and check that hot water is delivered.

The display should read:



3. Gas Rate

Check the boiler gas rate when the boiler is at full DHW output.

The gas rate will normally be between:

51.9 to 57.4 litres per minute

1.8 to 2.0 cu/ft per minute

checked at the gas meter, with no other appliance in use.

Note. Long flue will reduce air flow, reducing the gas rate, slightly. If these rates are not obtainable consult the fault finding section.

4. Close the DHW tap. The burner should go off and the pump continue to run.

The display should read:

 flashing

then

 flashing

After 15 seconds the burner should relight, to supply central heating.

The display should read:





INSTALLATION

40 GENERAL CHECKS - continued

- Set the central heating external controls to OFF. The burner should go off and the pump continue to run for a few seconds.

The display should read:

 returning to
 when the pump stops.

- Check the correct operation of the programmer (if fitted) and all other system controls. Operate each control separately and check that the main burner corresponds.

WATER TEMPERATURES

The design water output temperatures are as follows:

Central Heating 82 °C maximum
Domestic Hot Water 65 °C maximum

Lower temperatures can be selected via the CH and DHW thermostats (O and M).

Knob Setting	CH Flow Temp °C (°F)	DHW Outlet Temp °C (°F)
Max	82 (180)	65 (150)
Min	42 (110)	

WATER CIRCULATION SYSTEM

- 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.

- 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.
- 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.

- 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.

- Reset the system initial pressure to the design requirement.

- Balance the system. Refer to Frame 5.

- Check the condensate drain for leaks and check that it is discharging correctly.

- Finally, set the controls to the User's requirements.

Note. The pump will operate briefly as a self-check, once every 24 hours regardless of system demand.

41 HANDING OVER

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

- Hand the User Instructions to the householder and explain his/her responsibilities under the relevant national regulations.
- Explain and demonstrate the lighting and shutting down procedures.
- 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 both heating and hot water consumption.

Advise the User of the precautions necessary to prevent damage to the system and to the building, in the event of the system remaining inoperative during frosty conditions.

- Explain the function and the use of the boiler heating and domestic hot water controls.
- Explain the function of the boiler fault mode.
Emphasise that if a fault is indicated, the boiler should be turned off and a registered local heating installer consulted.
- Explain and demonstrate the function of time and temperature controls, radiator valves etc., for the economic use of the system.

- If a programmer is fitted then draw attention to the Users Instructions and hand them to the householder.

8. Loss of system water pressure

Explain that the dial on the control panel 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. In this event a registered local heating installer should be consulted.

WARNING.

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

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

10. IMPORTANT

A comprehensive service should be carried out ANNUALLY.

Stress the importance of regular servicing by a Corgi registered installer.

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

42 SERVICING SCHEDULE

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

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

Note. *Some aluminium oxide build-up on the heat engine fins is usual with this type of condensing boiler. Though removal is recommended annually, the heat engine MUST be inspected and cleaned after a MAXIMUM of 2 years operation.*

1. Remove the boiler bottom panel. Refer to Frame 45.
2. Light the boiler and carry out a pre-service check, noting any operational faults.
3. Relight the boiler and operate for at least 10 minutes. Check the gas consumption.
4. Connect a suitable gas analyser to the sampling point on the top of the boiler (refer to Frame 43) 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. If this is the case, and the gas input is at least 90% of the nominal, then no further action need be taken. If not, proceed to Step 5 but see note above.
5. Clean the main burner.
6. Clean the heat engine.

Note. *This must be done with the heat engine and deposits in a dry condition. Refer to Frame 51.*

7. Check the main injector for blockage or damage.
8. Wherever possible remove and clean the condensate trap (refer to Frame 50) and check the drain for blockage.
9. Check that the flue terminal is unobstructed and that the flue system is sealed correctly.
10. Check the DHW filter for blockage. Refer to Frame 26.

The servicing procedures are covered more fully in Frames 43 to 52 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 44 and 46.*

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.

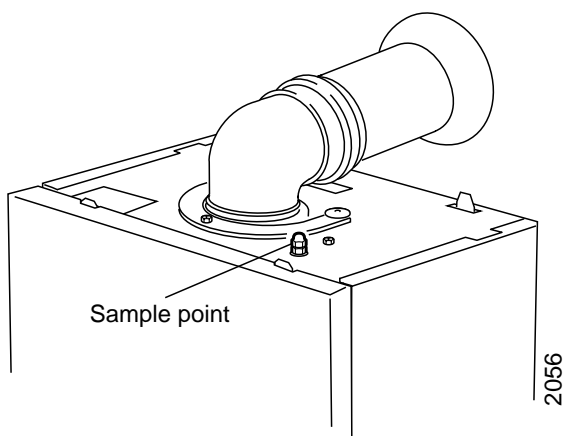
IMPORTANT.

11. After completing the servicing or exchange of components always test for gas soundness and carry out functional checks in 3 and 4 above.
12. 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

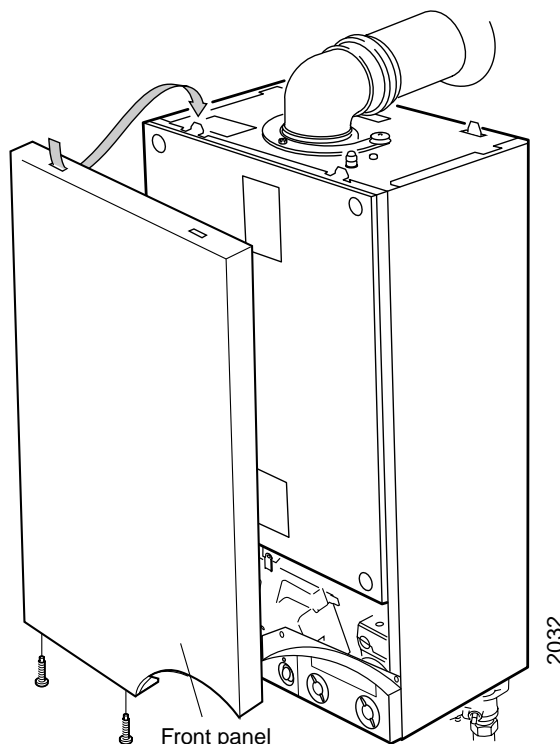
13. If, for any reason, the condensate trap has been removed. Ensure that the trap is re-filled with water before re-assembly.
14. Complete the service section in the Benchmark log book.

43 SAMPLING POINT



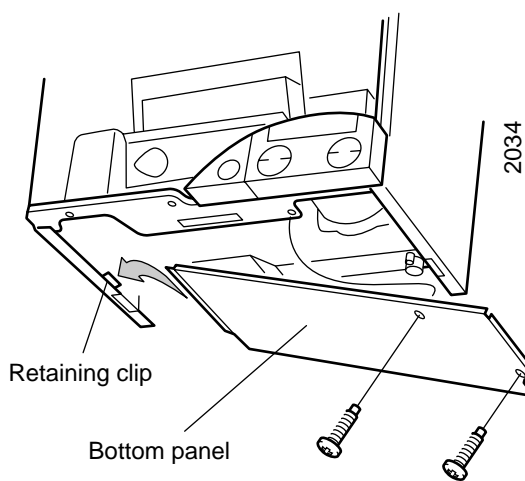
44 BOILER FRONT PANEL REMOVAL

1. Remove the 2 securing screws.
2. Pull the panel forward at the bottom and lift to disengage it from the top lugs.



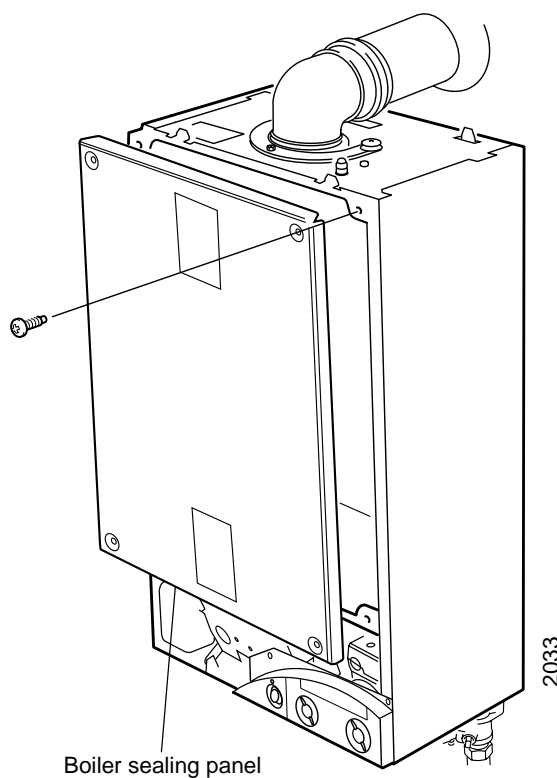
45 BOILER BOTTOM PANEL REMOVAL

1. Remove the 2 securing screws.
2. Pull the right hand side of the panel down, slide it to the right and withdraw.



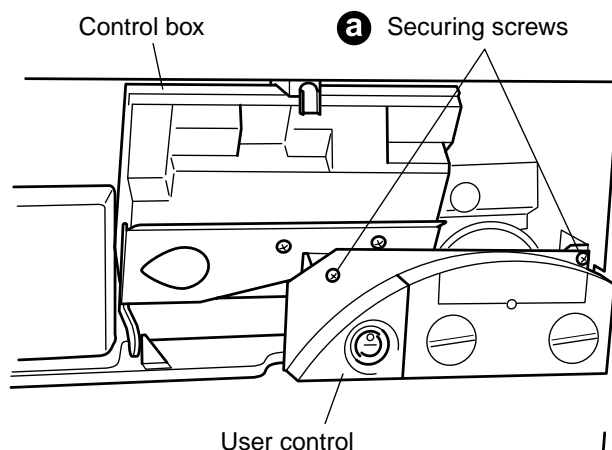
46 BOILER SEALING PANEL REMOVAL

1. Turn off the gas supply at the gas service cock and disconnect the electricity supply.
2. Remove the 4 securing screws and lift off the panel.

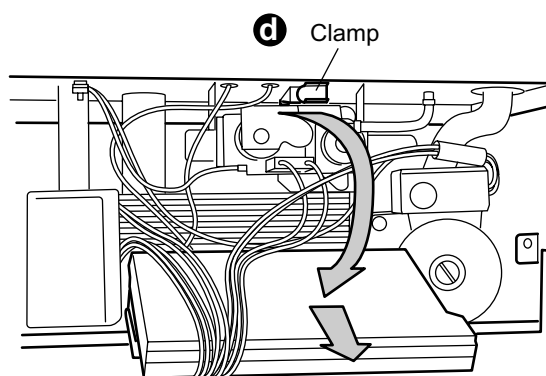


47 THE CONTROL PANEL IN THE SERVICING POSITION

1. Swing the control panel down into the servicing position
 - a. Remove the 2 securing screws and withdraw the user control.
 - b. Unplug the low voltage electrical lead from the back of the user control.
 - c. Unplug the spark lead from the bottom of the control box.
 - d. Turn the clamp, swing the control box down and pull slightly forward.

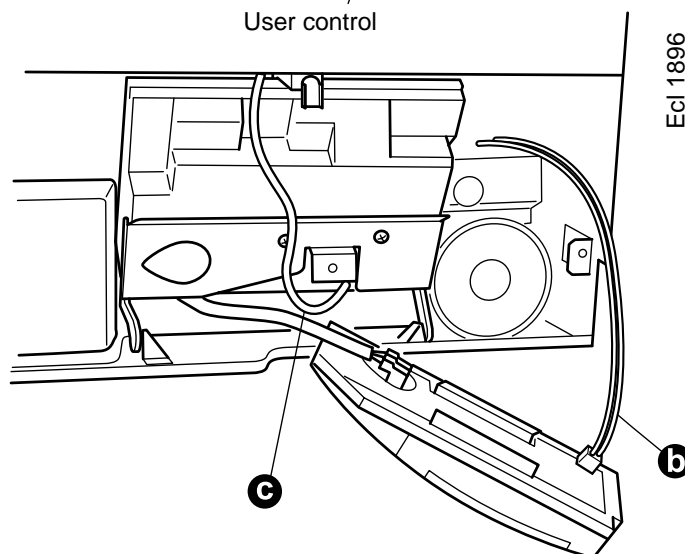


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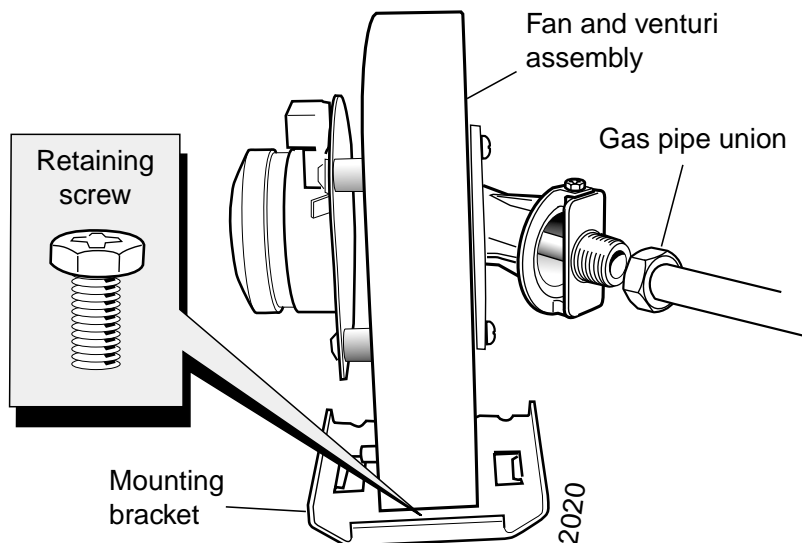
Ecl 1753

Swing control panel down and forward into service position



48 FAN, GAS INJECTOR 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 single retaining screw on the fan mounting bracket.
4. Remove the mounting bracket.
5. Lift off fan and venturi assembly.



49 BURNER REMOVAL AND CLEANING

1. Undo and 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.

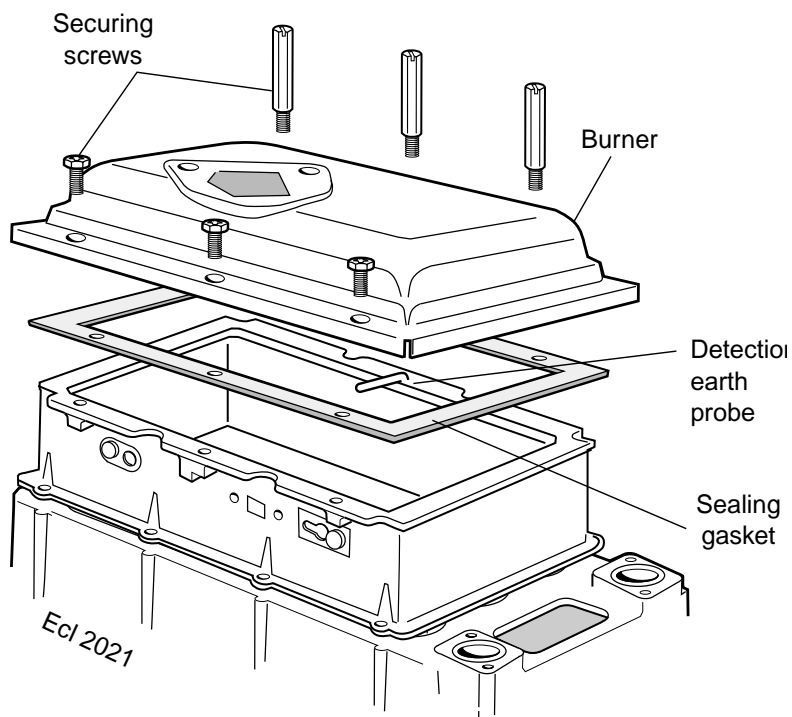
WARNING

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 for any signs of damage. Replace if necessary.

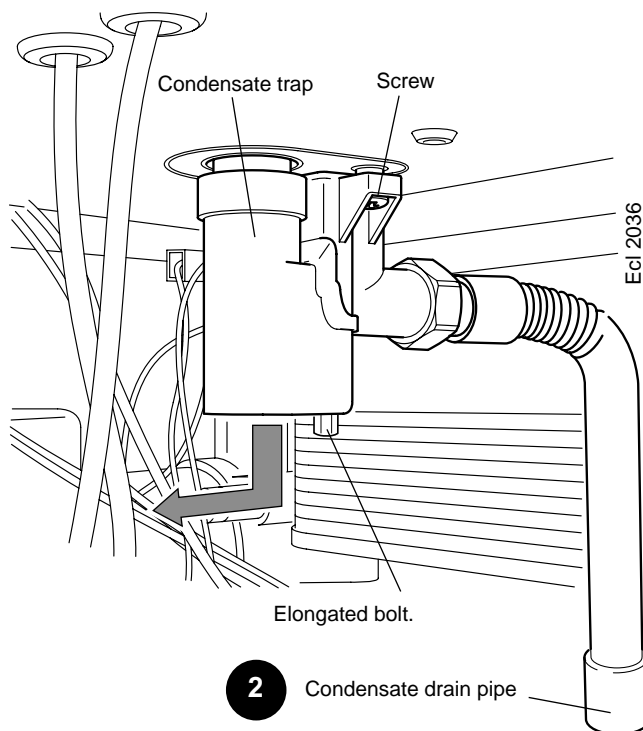
Note.

Take care not to disturb the detection earth probe at the rear of the combustion chamber.



50 CLEANING THE CONDENSATE 'S' TRAP

1. Swing the control panel down into the servicing position. Refer to Frame 47.
2. Disconnect the condensate drain pipe.
3. Remove the securing screw and elongated bolt, pull the trap down and forwards to remove.
4. Flush out any deposits with clean water.
5. When re-assembling ensure that the trap is full of water.

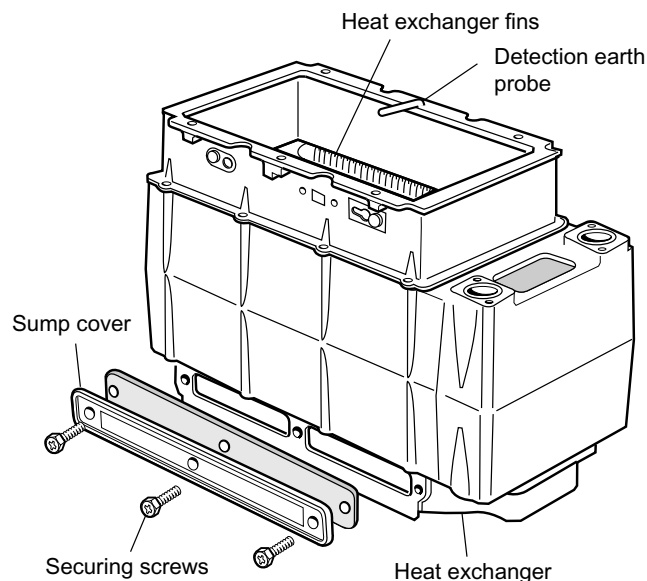


51 CLEANING THE HEAT EXCHANGER

1. Remove ignition and sensor electrodes (Frames 60 & 61).
2. Remove the 3 screws securing 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 spark and detection electrodes. Ensure that they are clean and in good condition - replace if necessary.
6. Check that the spark and detection gaps are correct.
7. Check the spark and detection leads are in good condition and renew as necessary.

Note.

Take care not to disturb the detection earth probe at the rear of the combustion chamber.



52 RE-ASSEMBLY

Re-assemble the boiler in the following order:

1. Refit the condensate trap.
 2. Refit the sump cover.
 3. Refit the electrodes. (Check dimensions, see Frames 60 & 61).
 4. Refit the burner, renewing any damaged or deteriorating sealing gaskets.
 5. Refit the fan / venturi assembly.
 6. Reconnect the fan electrical lead.
 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 panel back into its working position and secure.
 9. Refit the display unit.
 10. Refit the boiler casing.
 11. Turn on the gas supply at the gas service cock.
 12. Reconnect the electrical supply.

53 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 44.

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

IMPORTANT.

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

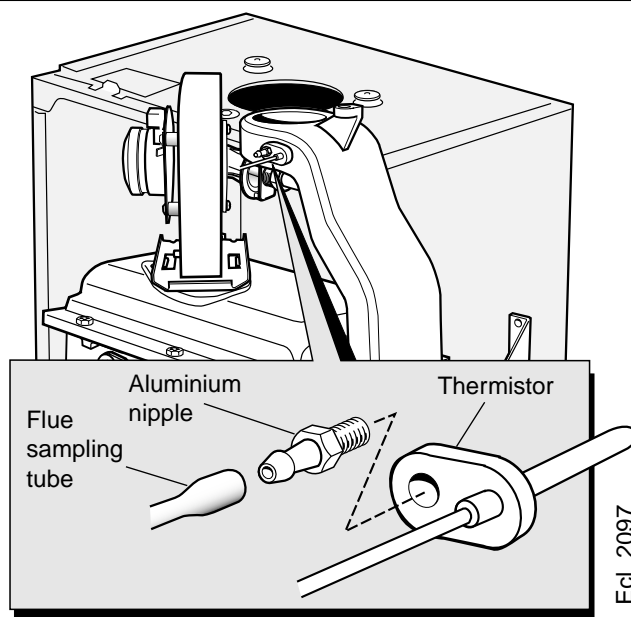
Notes.

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 80.
2. In order to replace components in Frames 70 to 78 it is necessary to drain the boiler. Refer to Frame 73.

THE BOILER MUST NOT BE OPERATED IF THE SEALING PANEL IS NOT FITTED

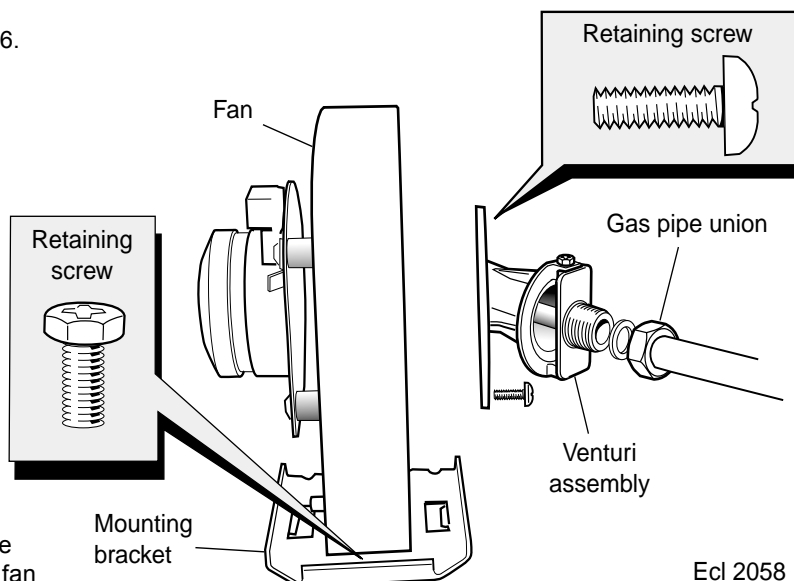
54 FLUE THERMISTOR REPLACEMENT

1. Refer to Frame 53.
2. Remove the boiler sealing panel. Refer to Frame 46.
3. Unplug the electrical lead.
4. Disconnect the flue sampling tube from the thermistor housing.
5. Remove the aluminium nipple securing the thermistor to the flue manifold.
6. Withdraw the thermistor.
7. Fit the new flue thermistor, using the gasket supplied.
8. Re-assemble in reverse order.
9. Check the operation of the boiler. Refer to Frame 53.



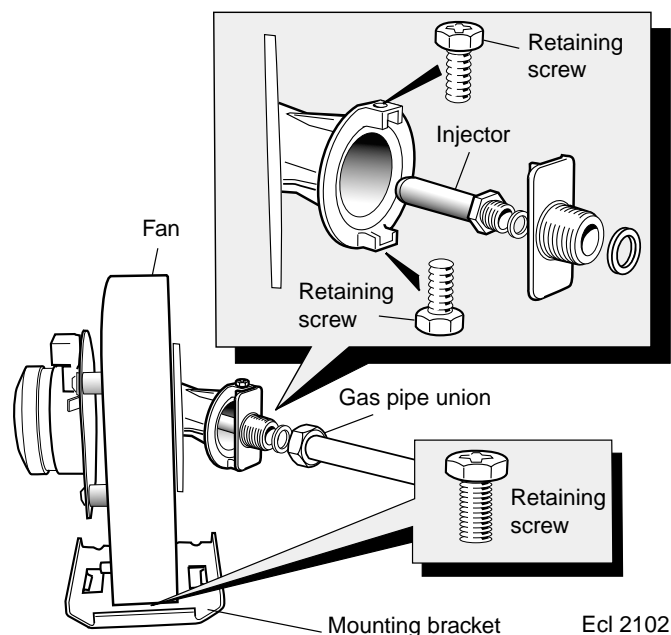
55 FAN REPLACEMENT

1. Refer to Frame 53.
2. Remove the boiler sealing panel. Refer to Frame 46.
3. Disconnect the electrical leads from the fan.
4. Undo the gas pipe union connection to the injector housing.
5. Remove the retaining screw and pull off the mounting bracket.
6. Remove the fan and venturi assembly.
7. Remove the 3 retaining 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. Re-assemble the boiler in reverse order taking care not to overtighten the single retaining screw on the fan mounting bracket.
11. Check the operation of the boiler. Refer to Frame 53.



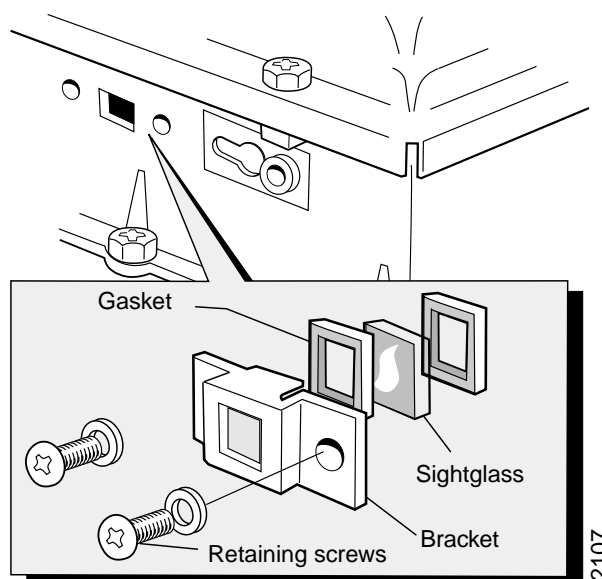
56 BURNER INJECTOR REPLACEMENT

1. Refer to Frame 53.
2. Remove the boiler sealing panel. Refer to Frame 46.
3. Disconnect the electrical leads from the fan.
4. Undo the gas pipe union connection to the injector housing.
5. Remove the retaining screw and pull off the mounting bracket.
6. Remove the fan and venturi assembly.
7. Remove the 2 injector housing retaining screws.
8. Withdraw the injector housing.
9. Fit the new injector housing complete with injector.
10. Re-assemble 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 53.



57 SIGHT GLASS REPLACEMENT

1. Refer to Frame 53.
2. Remove the boiler sealing panel. Refer to Frame 46.
3. Unscrew the 2 sight glass retaining screws.
4. Remove the sight glass, gasket and bracket.
5. Fit new sight glass, using the new bracket and gasket supplied.
6. Re-assemble in reverse order.
7. Check operation of the boiler. Refer to Frame 53.

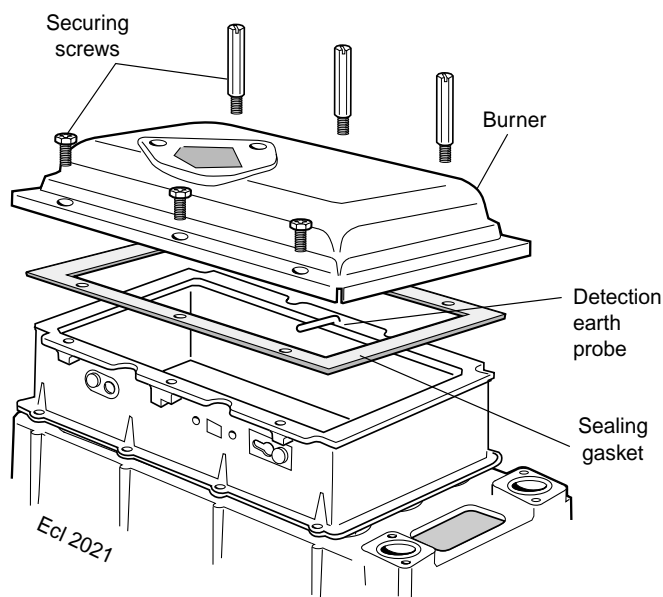


58 BURNER REPLACEMENT

1. Refer to Frame 53.
2. Remove the boiler sealing panel. Refer to Frame 46.
3. Remove the fan. Refer to Frame 55.
4. Remove the 6 securing screws and lift the burner off the combustion chamber.
5. Fit the new burner, replacing any damaged or deteriorating sealing gasket.
6. Re-assemble in reverse order.
7. Check the operation of the boiler. Refer to Frame 53.

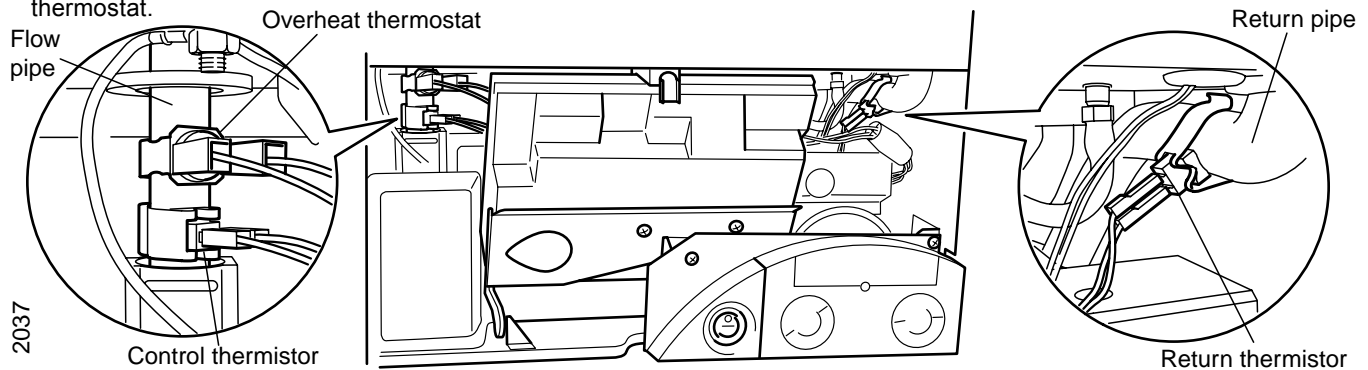
Note.

Take care not to disturb the detection earth probe at the rear of the combustion chamber.



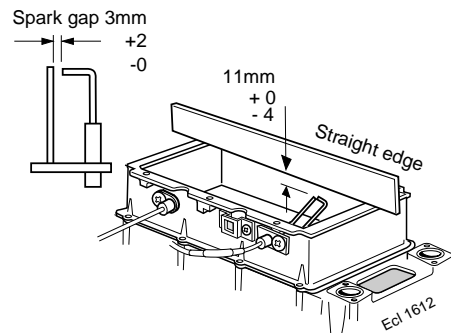
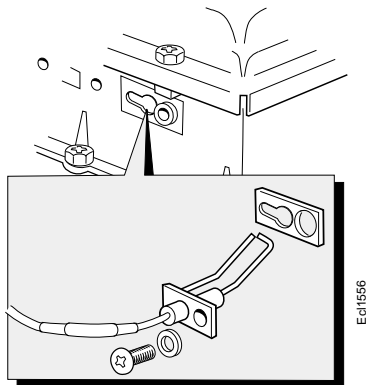
59 CONTROL THERMISTOR, RETURN THERMISTOR AND OVERHEAT THERMOSTAT REPLACEMENT

1. Refer to Frame 53.
2. Unclip the thermistor / thermostat from the flow / return pipe and withdraw it from the controls compartment.
3. Disconnect the electrical leads from the thermistor / thermostat.
4. Re-connect the electrical leads and re-assemble in reverse order ensuring that the spring clip is securely on the pipe.
5. Check the operation of the boiler. Refer to Frame 53.



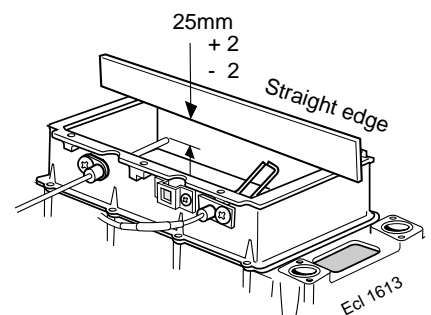
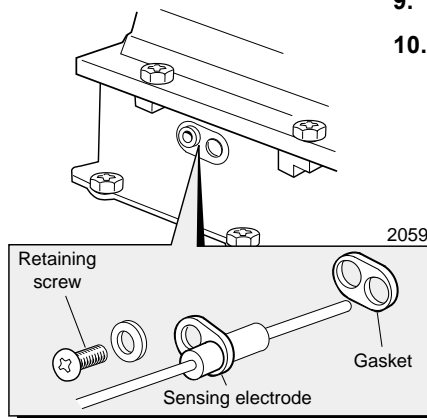
60 IGNITION ELECTRODE REPLACEMENT

1. Refer to Frame 53.
2. Remove the boiler sealing panel. Refer to Frame 46.
3. Swing the control panel down into the servicing position. Refer to Frame 47.
4. Unplug the spark electrode lead from the control box.
5. Undo the single retaining screw holding the spark electrode to the combustion chamber.
6. Remove the electrode, taking care not to dislodge the grommet from the casing.
7. Fit the new ignition electrode, using the new gasket supplied, check dimensions as shown.
8. Re-assemble in reverse order.
9. Check the operation of the boiler. Refer to Frame 53.



61 FLAME SENSING ELECTRODE REPLACEMENT

1. Refer to Frame 53.
2. Remove the boiler sealing panel. Refer to Frame 46.
3. Swing the control panel down into the servicing position. Refer to Frame 47.
4. Unplug the sensing electrode lead from the control box.
5. Undo the single retaining screw holding the sensing electrode to the combustion chamber.
6. Unbolt the sensing electrode earth lead from the earth point beneath the boiler.
7. Remove the electrode, complete with grommet.
8. Fit the new sensing electrode, using the new gasket supplied, check dimensions as shown.
9. Re-assemble in reverse order.
10. Check the operation of the boiler. Refer to Frame 53.



62 COMBUSTION CHAMBER INSULATION REPLACEMENT

The insulation boards used in the combustion chamber of this product are made of high temperature glass fibres with a binder of organic and inorganic materials.

Caradon Ideal Limited recommend that, for your own comfort and safety and to comply with good working practice, the procedure described below is followed:

1. Refer to Frame 53.
2. Remove the boiler sealing panel. Refer to Frame 46.
3. Remove the fan / venturi assembly. Refer to Frame 48.
4. Remove the burner. Refer to Frame 49.
5. Undo the retaining screw from the ignition electrode and withdraw it from the combustion chamber
6. Undo the retaining screw from the detection electrode and withdraw it from the combustion chamber.
7. Remove the detection earth probe.

Prior to removal of the board 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 boards.

9. Remove the split pin and washer from the RHS of the combustion chamber.
10. Remove the insulation boards. The replacement boards are supplied in a plastic bag. This bag should be retained and the discarded boards should now be placed into it.
11. Sweep any dampened particles and place in the plastic bag.

12. Fit new insulation boards.

Note.

The boards are designed to be interlocking and should be fitted as shown.

13. Fit the new split pin and washer in RHS.

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

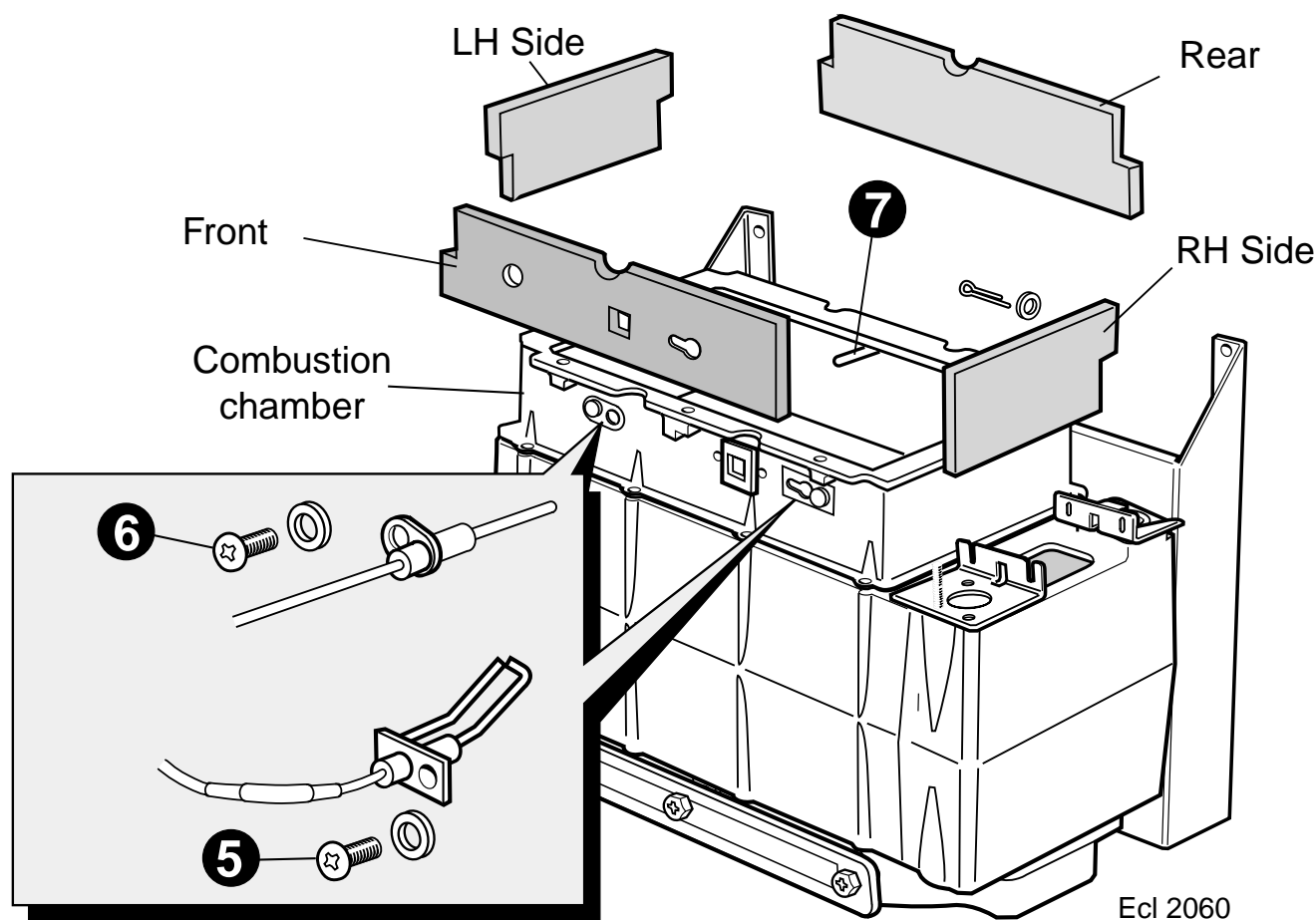
15. Wash your hands and any areas of skin which may have come into contact with any of the particles from the insulation board.

Note.

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

16. Reassemble in reverse order.

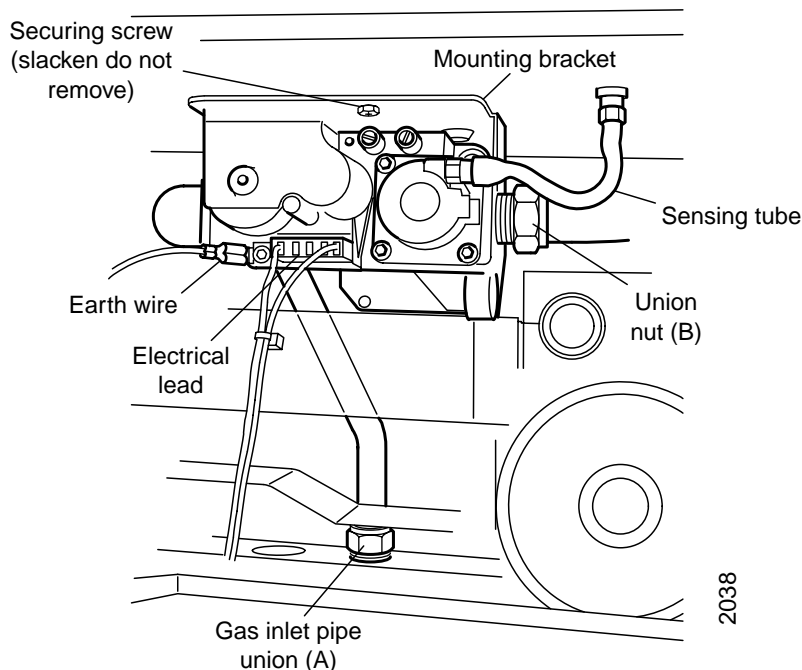
17. Check operation of the boiler. Refer to Frame 53.



Fit in the following order: Front, LHS, Rear, RHS.

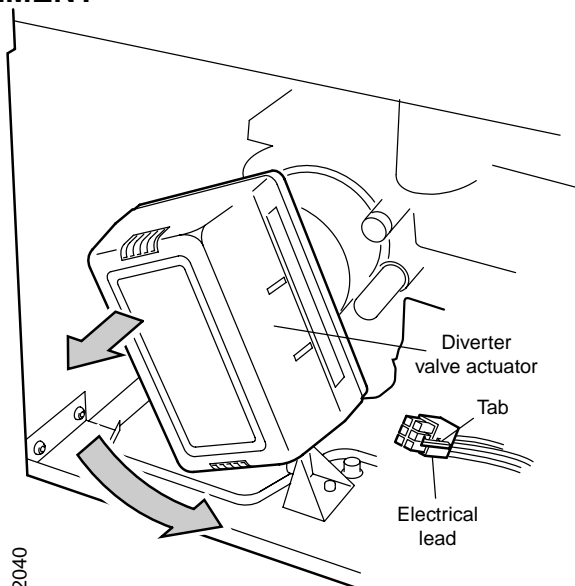
63 GAS CONTROL VALVE REPLACEMENT

1. Refer to Frame 53.
2. Remove the casing bottom panel. Refer to Frame 45.
3. Swing the control panel down into the servicing position. Refer to Frame 47.
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 (A) at the gas service cock.
7. Undo the union nut (B) on the RHS 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. Fit the new valve and re-assemble in reverse order.
10. Check operation of the boiler. Refer to Frame 53.



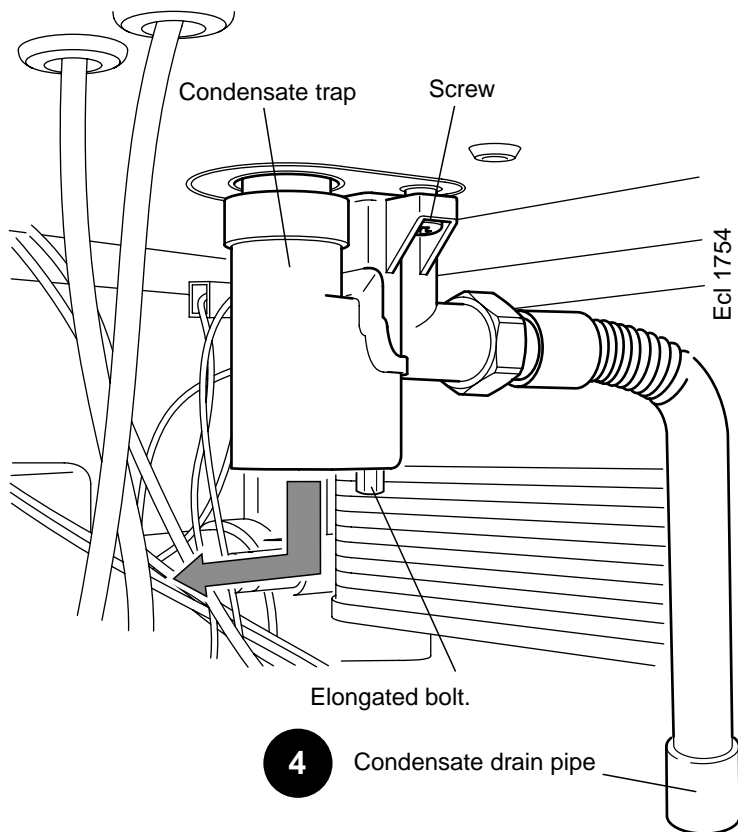
64 DIVERTER VALVE ACTUATOR REPLACEMENT

1. Refer to Frame 53.
2. Remove the casing bottom panel. Refer to Frame 45.
3. Squeeze the tab and unplug the electrical lead from the valve actuator.
4. Rotate the actuator anticlockwise and pull forward to remove.
5. Fit the new actuator and re-assemble in reverse order.
6. Check operation of the boiler. Refer to Frame 53.



65 CONDENSATE 'S' TRAP REPLACEMENT

1. Refer to Frame 53.
2. Remove the casing bottom panel. Refer to Frame 45.
3. Swing the control panel down into the servicing position. Refer to Frame 47.
4. Disconnect the condensate drain pipe.
5. Remove the securing screw and elongated bolt, pull the trap down and forwards to remove.
6. Transfer the drain pipe to the new trap and re-assemble in reverse order.
7. When re-assembling ensure that the trap is full of water.
8. Check operation of the boiler. Refer to Frame 53.



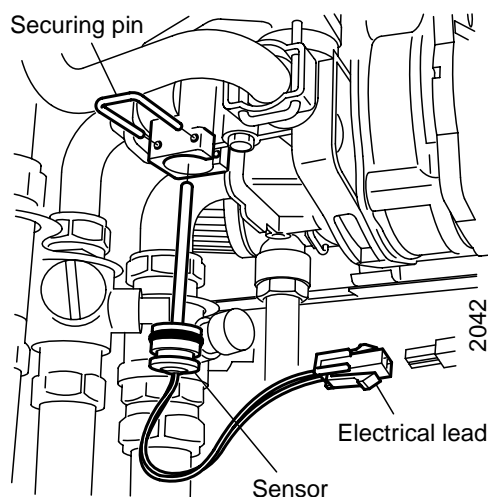
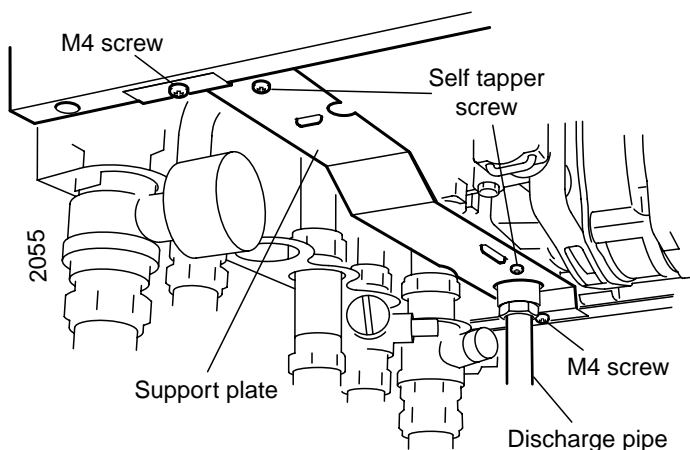
66 DHW THERMISTOR REPLACEMENT

1. Refer to Frame 53.
2. Remove the casing bottom panel. Refer to Frame 45.
3. Remove the 4 screws securing the support plate and withdraw the plate.

Note The M4 screws fit the casing and the self tapping screws fit the plastic pump and valve housings.

4. Withdraw the securing pin.
5. Disconnect the electrical lead.

6. Ease out the sensor and discard.
7. Fit the new sensor ensuring silicone grease is applied to the 'O' ring.
8. Refit the securing pin.
9. Re-assemble in reverse order ensuring correct location of screws in support plate, and that tabs on the pump and valve housings engage in slots.
10. Check operation of the boiler. Refer to Frame 53.

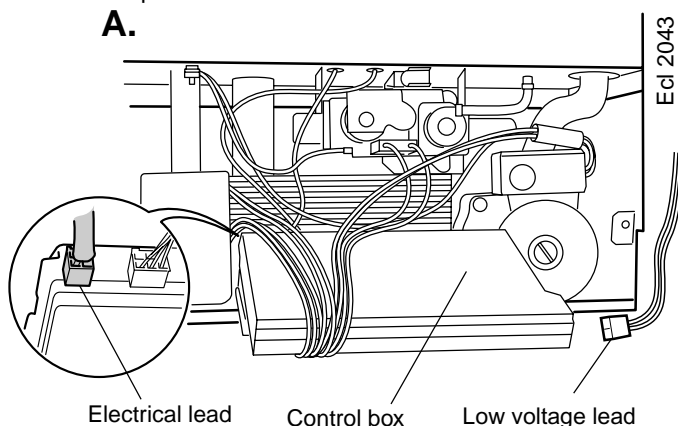


67 CONTROL BOX REPLACEMENT

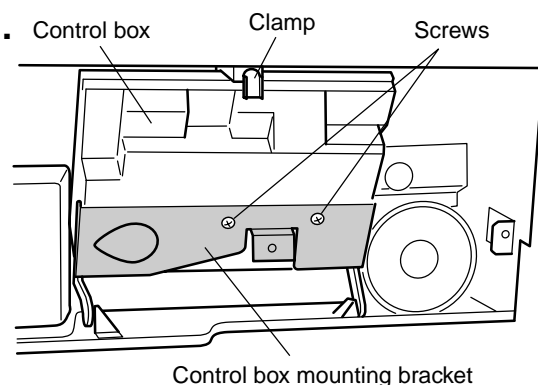
1. Refer to Frame 53.
2. Swing the control panel down into the servicing position. Refer to Frame 47.
3. Unplug the user control electrical lead and low voltage lead from the control box and remove the control. Refer to diagram A.
4. Return the control box to the working position and secure with the clamp. Remove the mounting bracket securing screws to remove the bracket. Refer to diagram B.
5. Release the clamp and carefully remove the control box from the hinge arms. Refer to diagram C.
6. Unplug all the electrical wiring from the control box and remove.

7. Re-assemble in reverse order, ensuring that the control box is located correctly in the housing before reconnecting the electrical wiring.
8. Check operation of the boiler. Refer to Frame 53.

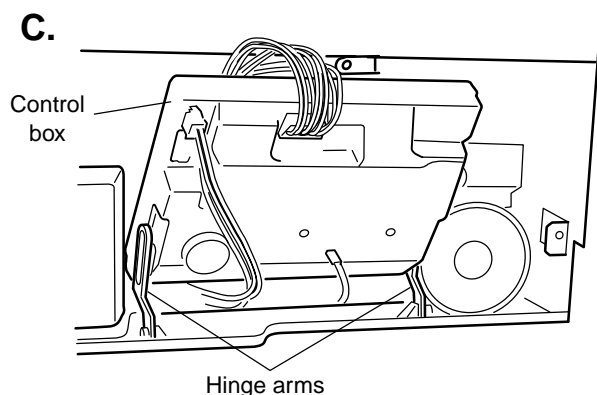
A.



B.

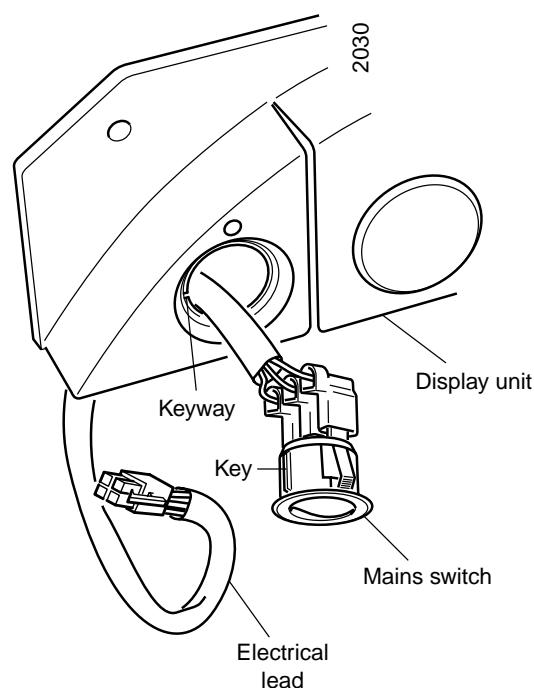
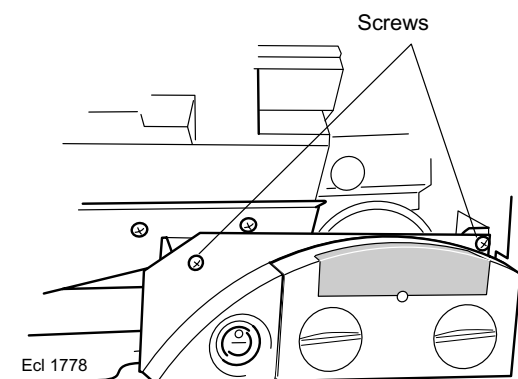


C.



68 MAINS SWITCH REPLACEMENT

1. Refer to Frame 53.
2. Remove the 2 securing screws and allow the user control to lower.
3. Push out the mains switch from the rear, as shown.
4. Fit the new switch, ensuring that the electrical leads are replaced on the correct terminals (refer to Frame 35) and the key on the switch is correctly aligned with the keyway in the plastic moulding.
5. Re-assemble in reverse order.
6. Check operation of the boiler. Refer to Frame 53.

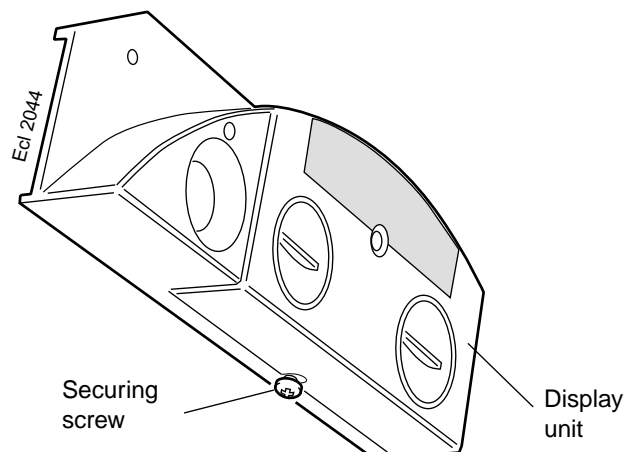
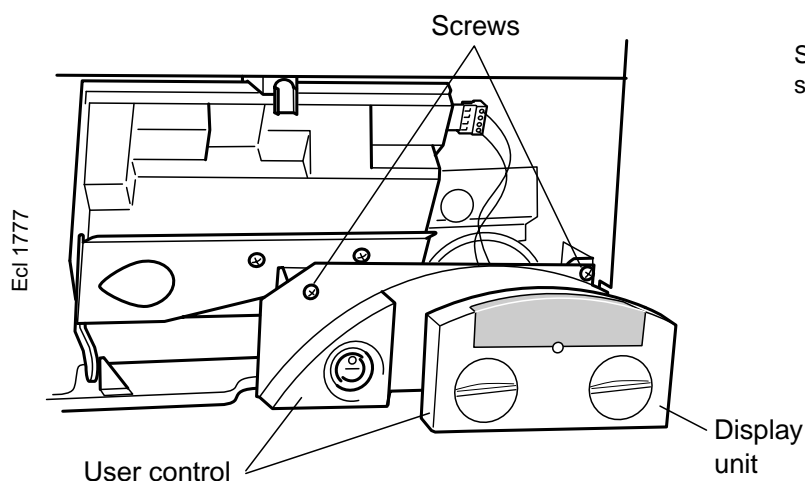


69 USER CONTROL REPLACEMENT

Note.

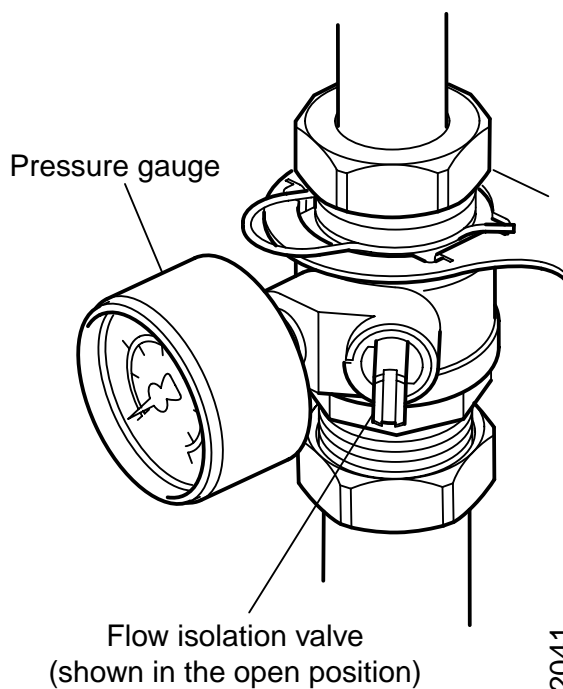
Only the display unit is replaced.

1. Refer to Frame 53.
2. Loosen the securing 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. Re-assemble in reverse order.
6. Check operation of the boiler. Refer to Frame 53.



70 PRESSURE GAUGE REPLACEMENT

1. Refer to Frame 53.
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 30.
6. Check operation of the boiler. Refer to Frame 53.

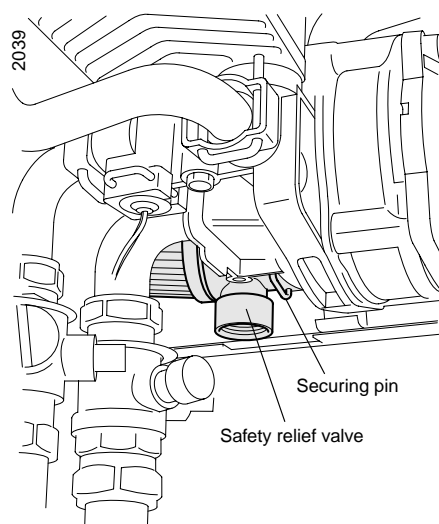
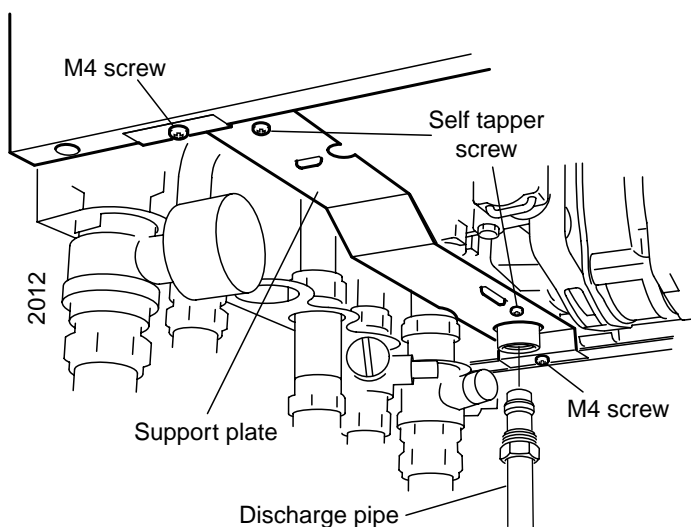


71 SAFETY RELIEF VALVE REPLACEMENT

1. Refer to Frame 53.
2. Remove the casing bottom panel. Refer to Frame 45.
3. Drain the boiler. Refer to Frame 73.
4. Remove the discharge pipe.
5. Remove 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 housings.

6. Withdraw the securing pin.
7. Remove the safety valve.
8. Fit the new safety valve and refit the securing pin.
9. Re-assemble 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. Check operation of the boiler. Refer to Frame 53.



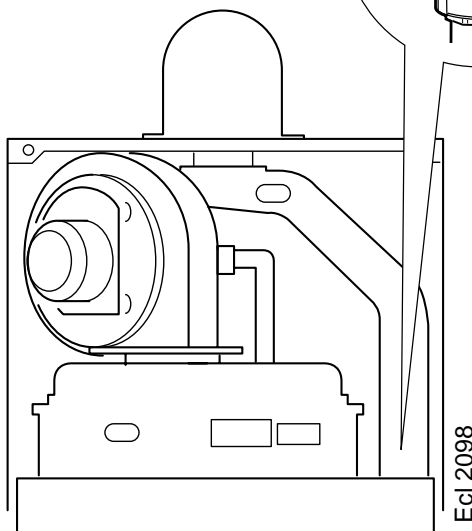
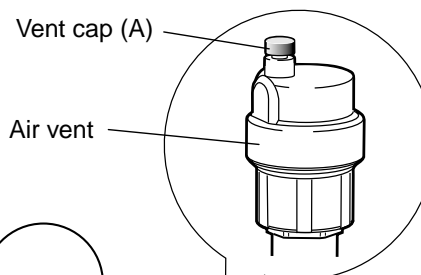
72 AUTOMATIC AIR VENT REPLACEMENT

1. Refer to Frame 53.
2. Remove the boiler sealing panel. Refer to Frame 46.
3. Drain the boiler. Refer to Frame 73.
4. Unscrew the air vent from the extension pipe on the boiler boss.
5. Fit the new air vent, complete with 'O' ring provided, and re-assemble in reverse order.

Note. In the event that the extension pipe is removed at the same time as the air vent, remove it from the air vent and refit it into the heat exchanger before fitting the new air vent, ensuring that its 'O' ring seal is in place.

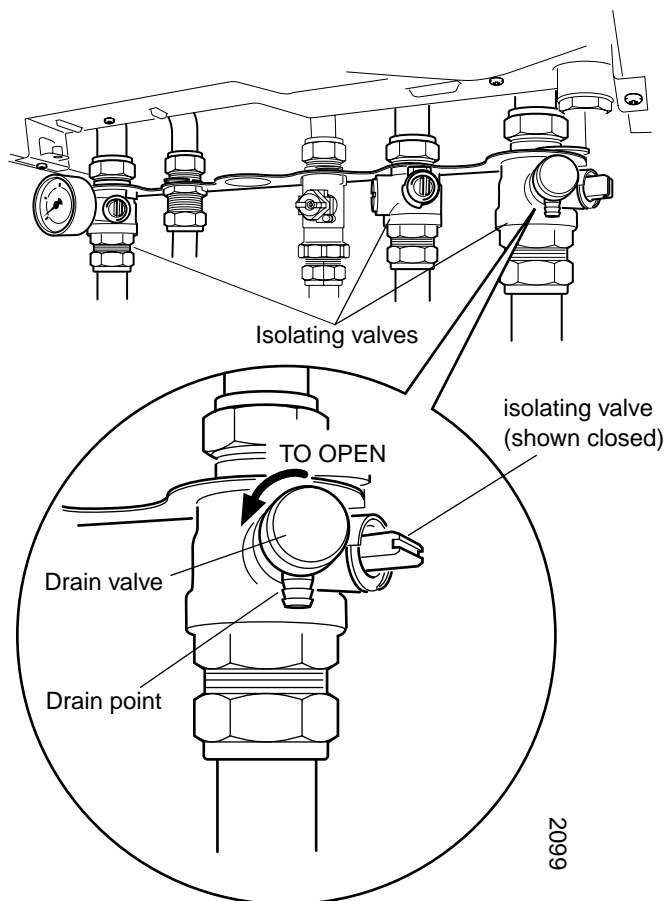
IMPORTANT.

Ensure that the vent cap is loose (A).



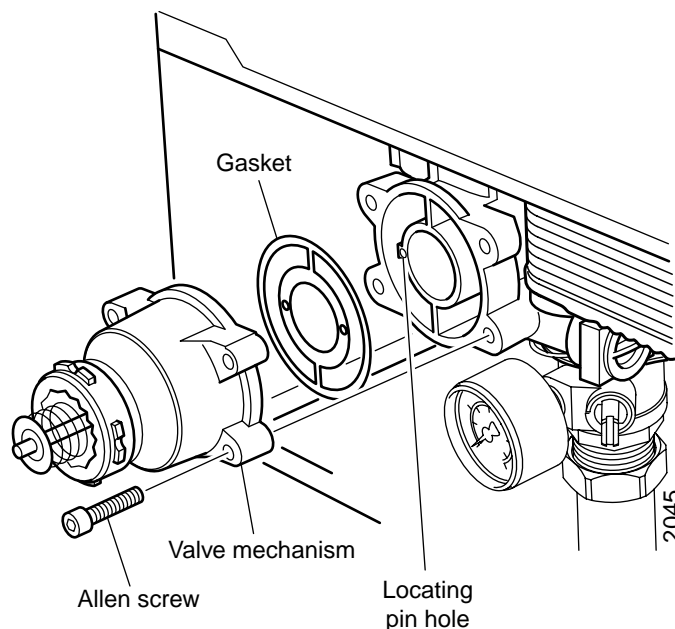
73 DRAINING THE BOILER

1. Refer to frame 53.
2. Remove the boiler bottom panel. Refer to Frame 45.
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 before proceeding to check operation of the boiler.**



74 DIVERTER VALVE MECHANISM REPLACEMENT

1. Refer to Frame 53.
 2. Remove the boiler bottom panel. Refer to Frame 45.
 3. Drain the boiler. Refer to Frame 73.
 4. Remove the 4 screws securing the rear support plate and withdraw the plate. Refer to Frame 66.
- Note.** The M4 screws fit the casing and the self tapping screws fit the plastic pump and valve housings.
5. Remove the valve actuator head. Refer to Frame 64.
 6. Undo the 4 Allen screws and remove the valve mechanism.
 7. Fit the new valve mechanism and gasket ensuring correct fit over the location pin.
 8. Reassemble in reverse order ensuring correct location of screws in the support plate and that tabs on the pump and valve housings engage in slots.
 9. Check operation of the boiler. Refer to Frame 53.

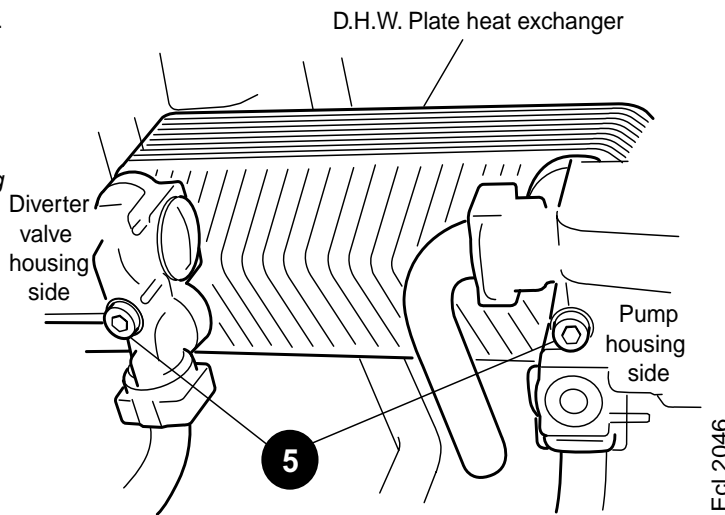


75 DHW PLATE HEAT EXCHANGER REPLACEMENT

1. Refer to Frame 53.
2. Remove the boiler bottom panel. Refer to Frame 45.
3. Drain the boiler. Refer to Frame 73.
4. Remove the 4 screws securing the rear support plate and withdraw the plate - Refer to Frame 66.

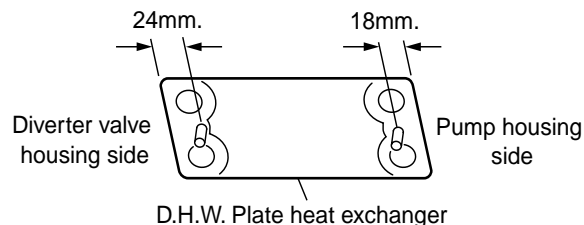
Note. The M4 screws fit the casing and the self tapping screws fit the plastic pump and valve housings.

5. Remove the 2 Allen screws securing the plate heat exchanger from the valve and pump housings.
6. Raise the RH side of the heat exchanger and lower the LH side through the bottom of the boiler and remove.
7. Fit the new heat exchanger using the new gaskets supplied.
8. Re-assemble in reverse order ensuring correct location of screws in the support plate and that tabs on the pump and valve housings engage in slots.
9. Check operation of the boiler. Refer to Frame 53.



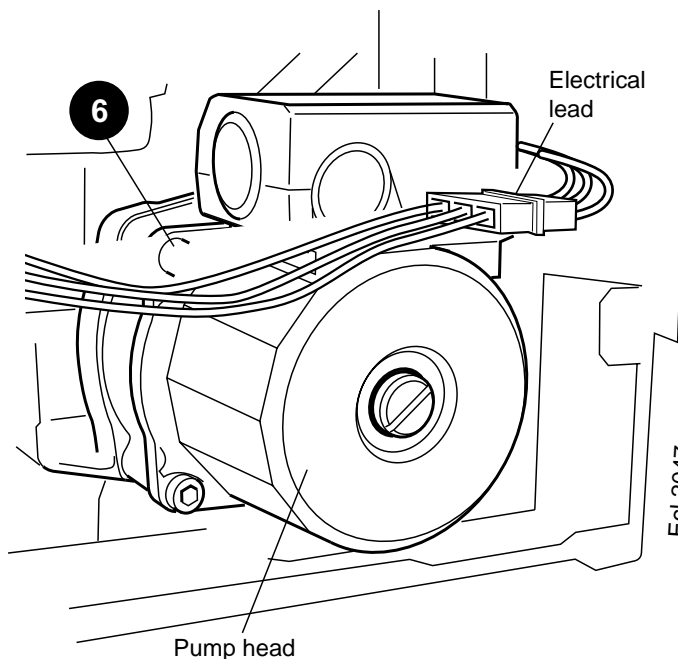
Ecl 2046

Note. The D.H.W. plate heat exchanger will only fit one way



76 PUMP HEAD REPLACEMENT

1. Refer to Frame 53.
2. Remove the boiler bottom panel. Refer to Frame 45.
3. Drain the boiler. Refer to Frame 73.
4. Swing the control panel down into the servicing position. Refer to Frame 47.
5. Disconnect the electrical lead from the pump.
6. Remove the 4 Allen screws securing the pump head..
7. Remove the pump head.
8. Fit the new pump head.
9. Re-assemble in reverse order.
10. Check operation of the boiler. Refer to Frame 53.



Ecl 2047

77 HEAT ENGINE REPLACEMENT

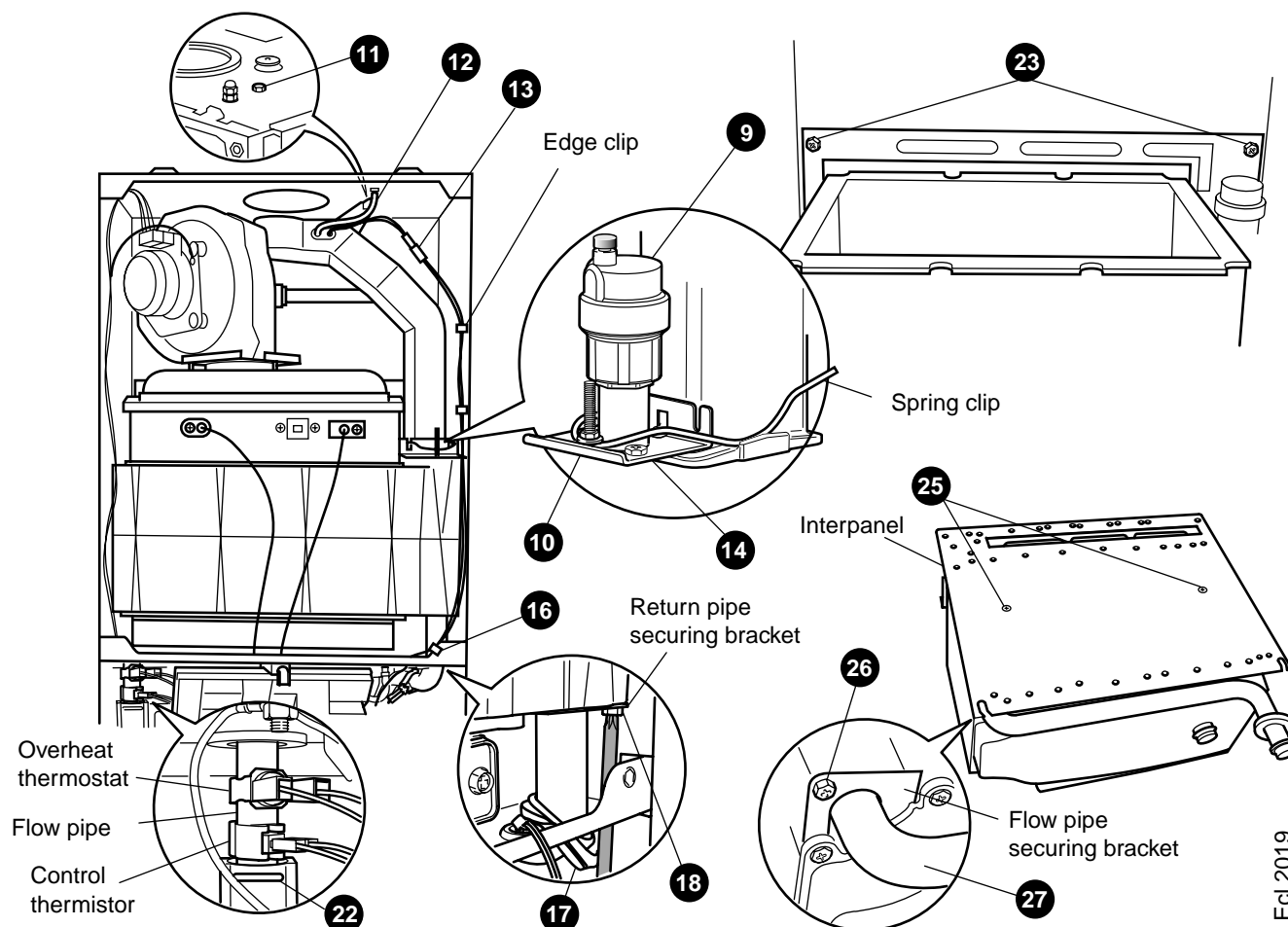
Refer also to Frame 7 - 'Boiler exploded view'.

IMPORTANT

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

1. Refer to Frames 53 and 45.
2. Remove the control box and place on one side. Refer to Frame 67.
3. Drain the boiler. Refer to Frame 73.
4. Remove the fan / venturi assembly and place on one side. Refer to Frame 48.
5. Remove the burner and place on one side. Refer to Frame 49.
6. Remove the ignition and detection electrodes. Refer to Frames 60 and 61.
7. Release the flue from the turret. Refer to Frame 19.
8. Remove the turret from the boiler. Refer to frame 19.
9. Unscrew and remove the automatic air vent complete with the adapter.
10. Release the M5 nut retaining the flue casting spring clip and remove the spring clip.
11. Remove the M5 x 10 screw retaining the flue casting.
12. Release the silicone tubing from the sampling point.
13. Release the electrical connection to the flue sensor.
14. Undo the 2 M5 x 10 flue spring clip retaining bracket screws and remove the bracket.

15. Remove the flue.
 16. Remove the edge clip securing the flue sensor wiring.
 17. Remove the blind grommet to gain access to the return pipe securing bracket.
 18. Undo the M5 screw and remove the return pipe securing bracket by sliding forwards.
 19. Remove the overheat thermostat.. Refer to Frame 59.
 20. Remove the control thermistor. Refer to Frame 59.
 21. Remove the return thermistor. Refer to Frame 59.
 22. Remove the securing pin to release the return pipe.
 23. Undo the 2 M5 screws securing the interpanel to the back panel.
 24. Slide the heat engine and interpanel assembly upwards to disengage and remove from the casing complete with the return pipe.
 25. Undo the 2 M6 countersunk screws, remove the interpanel and transfer to the new heat engine.
 26. Undo the M5 screw and remove the flow pipe securing bracket.
 27. Remove the flow pipe and transfer to the new heat engine.
 28. Reassemble in reverse order, replacing gaskets or seals if any sign of damage or deterioration is evident.
- Note.** The heat engine is supplied with new combustion chamber insulation boards. These should be fitted (refer to Frame 62) before the burner and fan / venturi assembly and before the ignition and detection electrodes are replaced.
29. Check operation of the boiler. Refer to Frame 53.



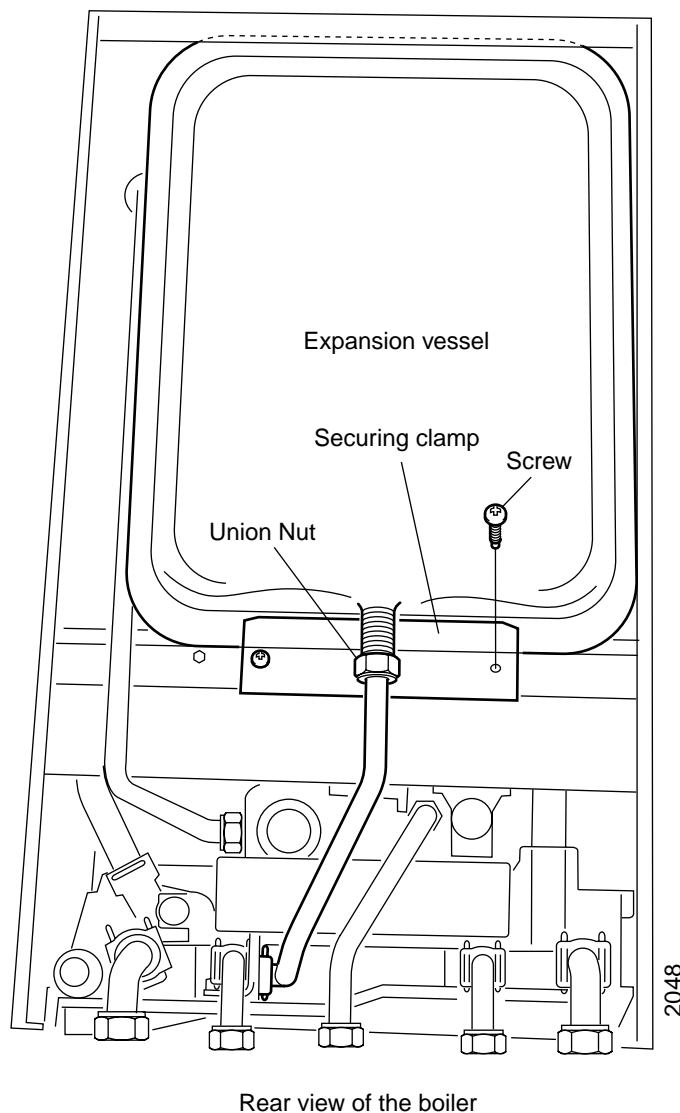
Ecl 2019

78 EXPANSION VESSEL REPLACEMENT

1. Refer to Frame 53.
2. Drain the boiler. Refer to Frame 73.
3. Undo all the gas and water connection unions on the boiler side of the valves.
4. Remove the turret screw and remove the turret clamp.
5. Remove the turret.
6. Lift the complete boiler from the wall mounting frame and place on a flat surface, face down, to expose the expansion vessel.
7. Undo the union nut on the vessel water connection pipe.
8. Remove the 2 screws and remove the securing clamp.
9. Remove the expansion vessel.
10. Fit the new expansion vessel.
11. Re-assemble in reverse order.
12. Check operation of the boiler. Refer to Frame 53.

Note.

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



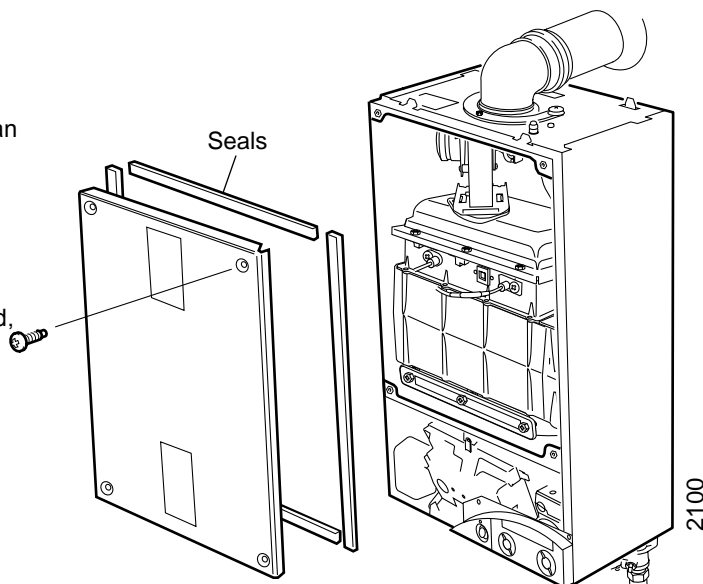
Rear view of the boiler

79 BOILER SEALING PANEL SEAL REPLACEMENT

1. Refer to Frames 53 and 46.
2. Remove the old seal from the casing and thoroughly clean the casing surfaces.
3. Fit the new adhesive seals, note that they are supplied to the correct length for the relevant sides.
4. Reassemble in reverse order.

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

5. Check operation of the boiler.



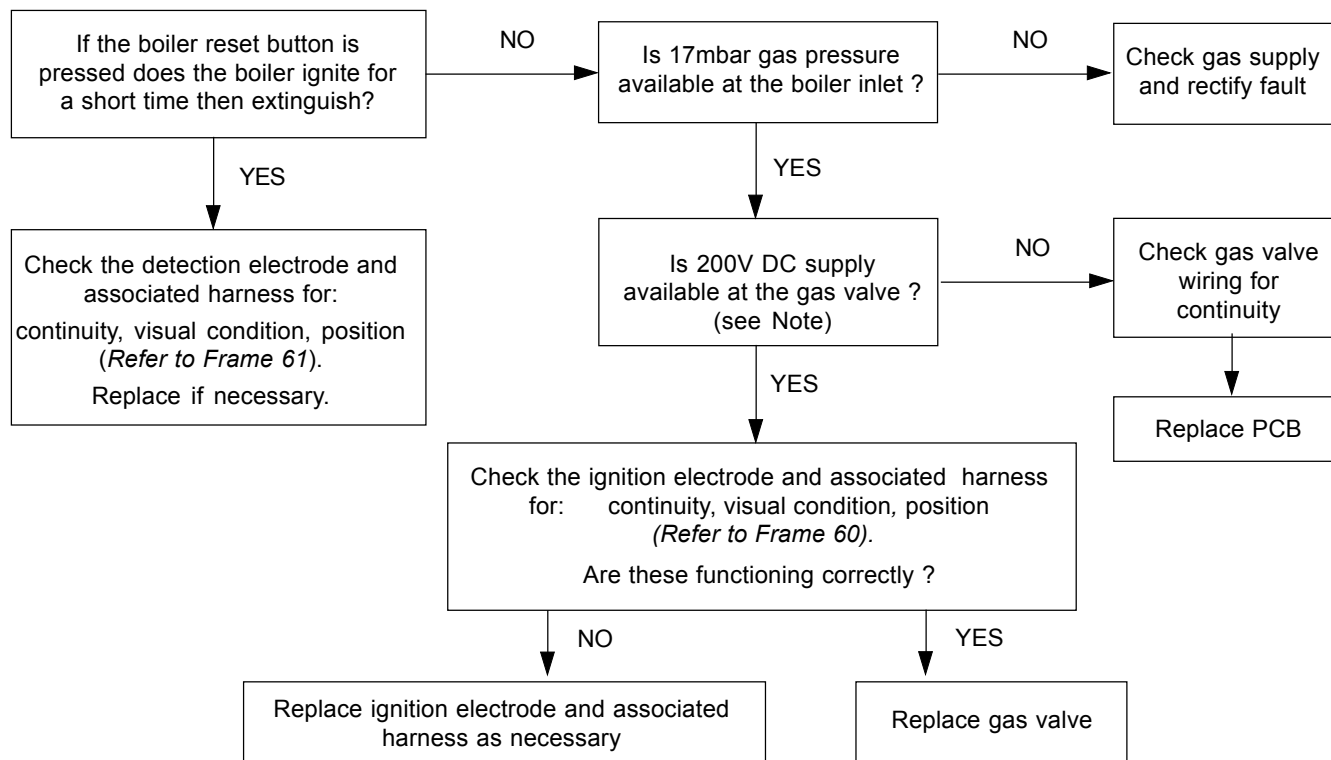
80 FAULT FINDING CHART MAIN MENU

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 81
ALTERNATING 'L' 'E'	GO TO FRAME 82
ALTERNATING 'L' 'A'	GO TO FRAME 83
ALTERNATING 'L' '8'	GO TO FRAME 84
ALTERNATING 'H' '1'	GO TO FRAME 85
ALTERNATING 'H' '2'	GO TO FRAME 86
ALTERNATING 'H' '3'	GO TO FRAME 87
ALTERNATING 'H' '4'	GO TO FRAME 88
ALTERNATING 'H' 'F'	GO TO FRAME 89
ALTERNATING 'H' 'n'	GO TO FRAME 90
ALTERNATING 'H' 'E'	GO TO FRAME 82

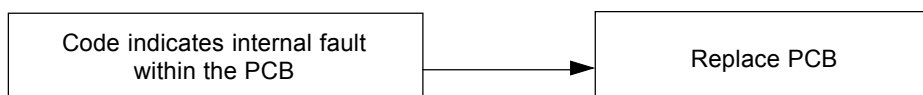
FAULT FINDING

81 L.....F..... (FLAME DETECTION)



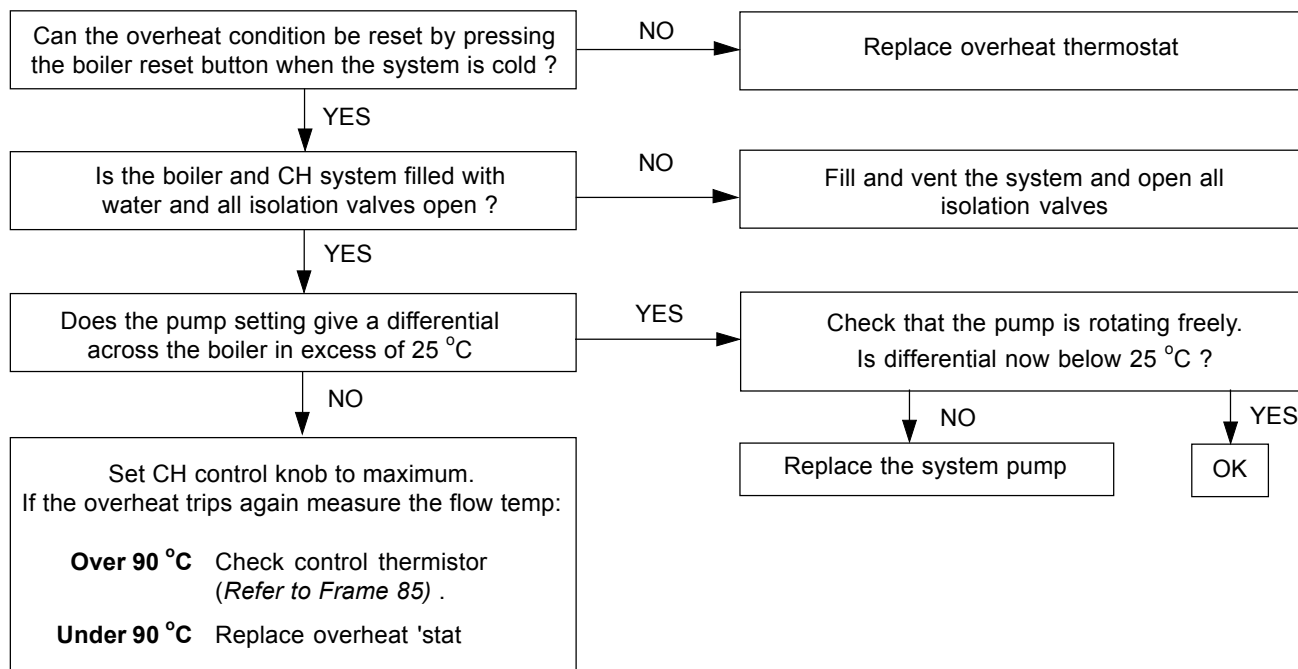
Note. Due to the wave form of the rectified voltage, the reading will vary depending on the type of meter used to measure the value (some may measure the possible peak voltage of 339V). In general terms a reading greater than 150V indicate that the correct voltage is supplied to the gas valve.

82 L.....E or H.....E..... (PCB)

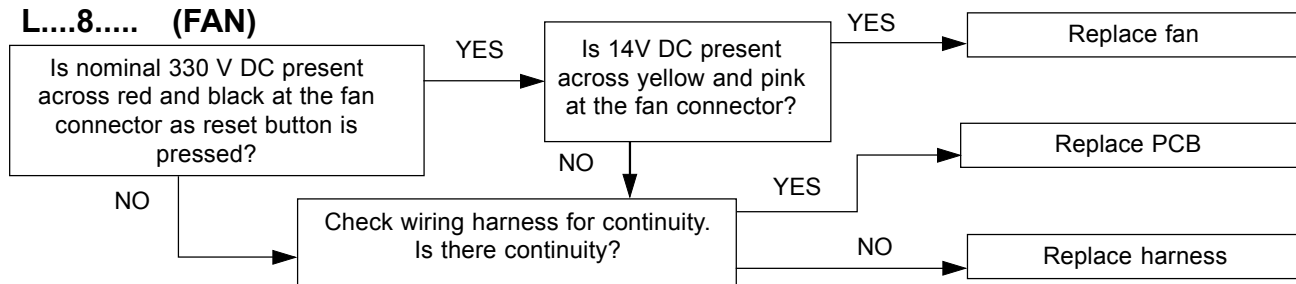


FAULT FINDING

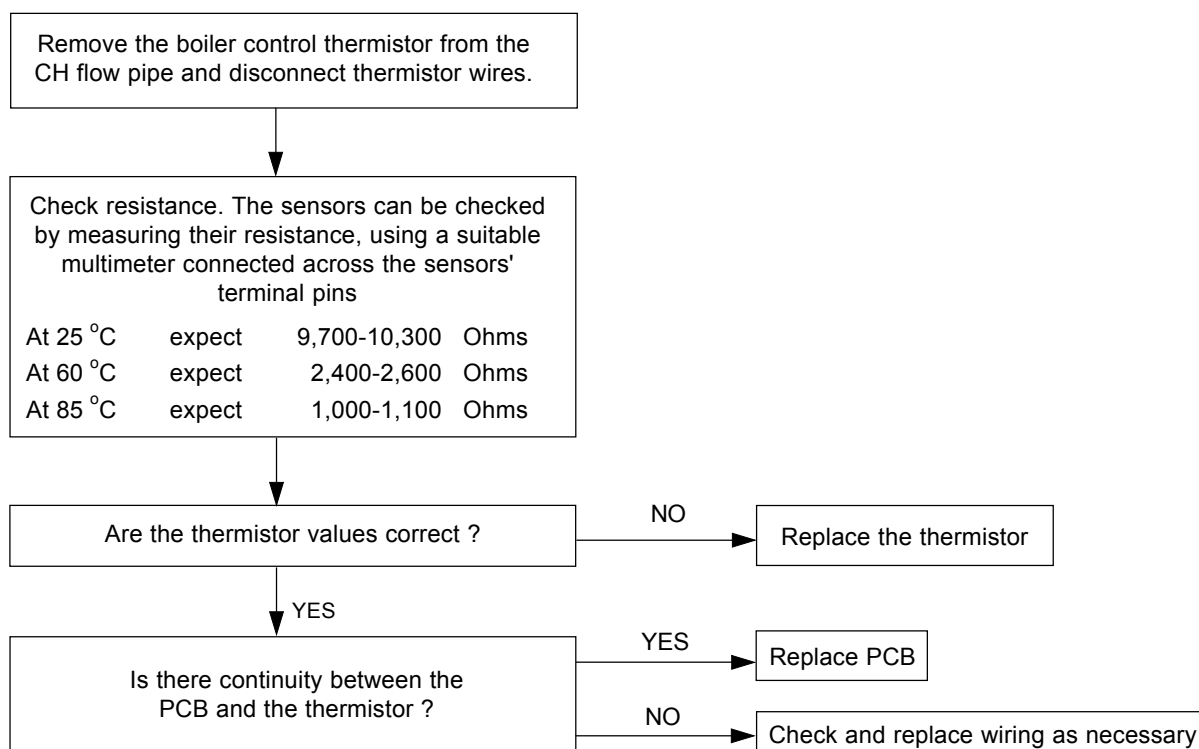
83 L.....A..... (OVER HEAT SENSOR)



84 L....8.... (FAN)

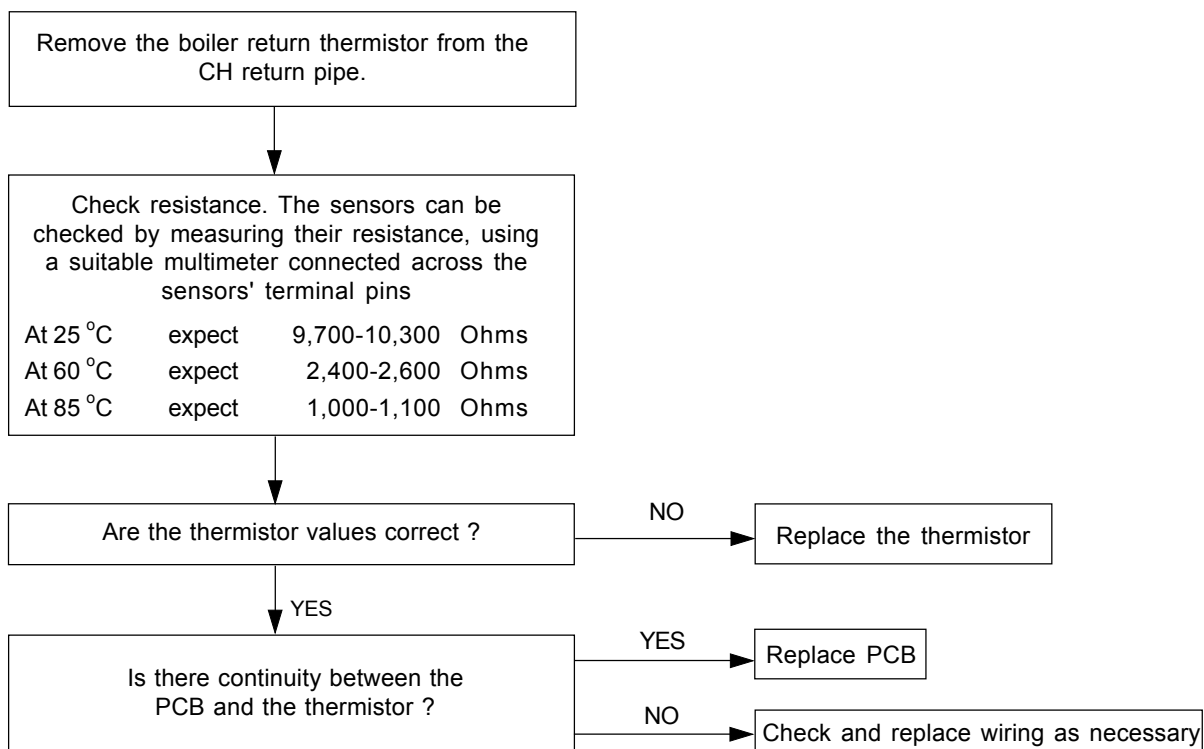


85 H.....1..... (CONTROL TEMPERATURE SENSOR)

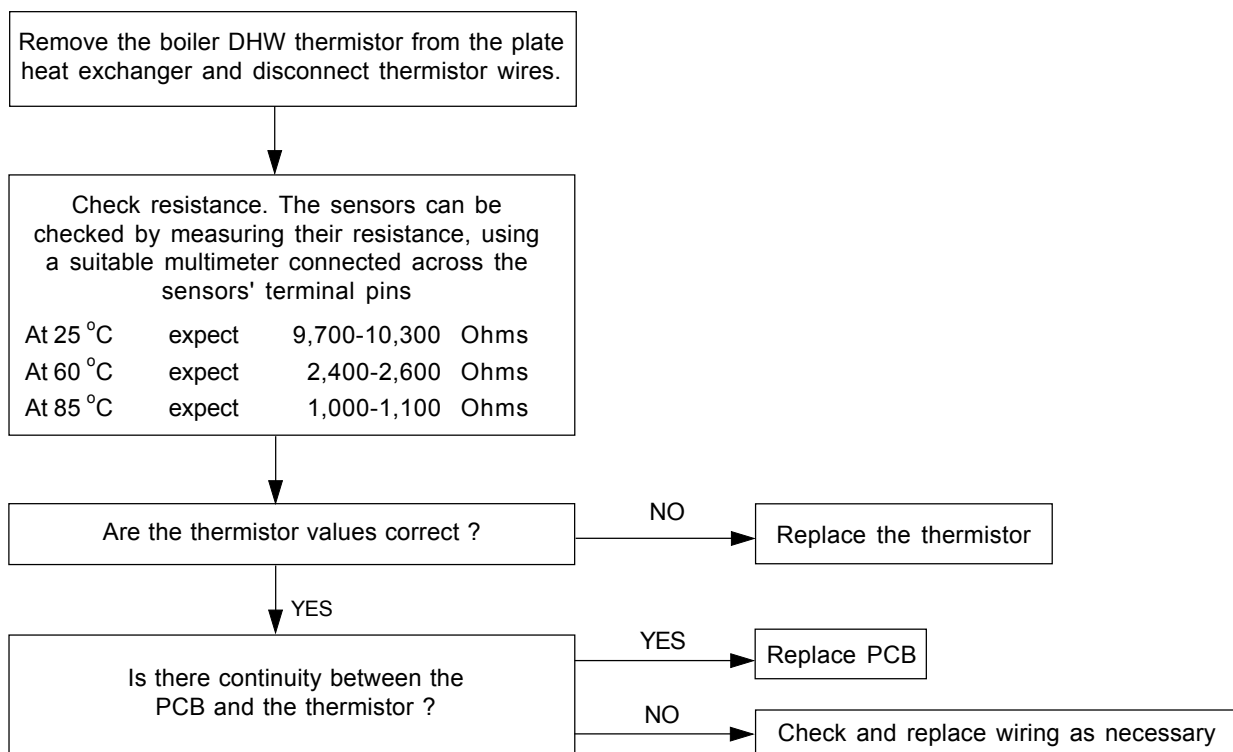


FAULT FINDING

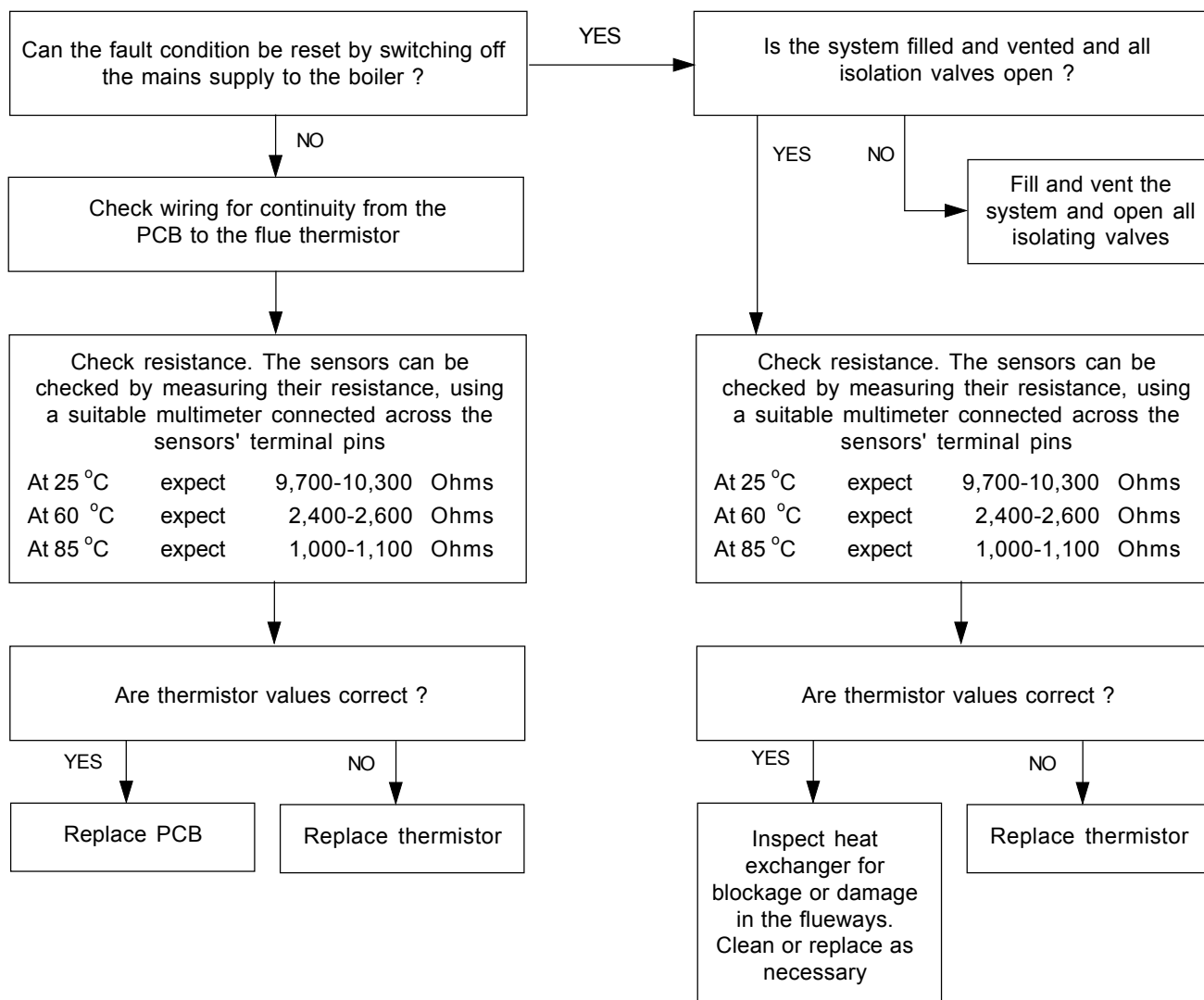
86 H.....2..... (RETURN TEMPERATURE SENSOR)



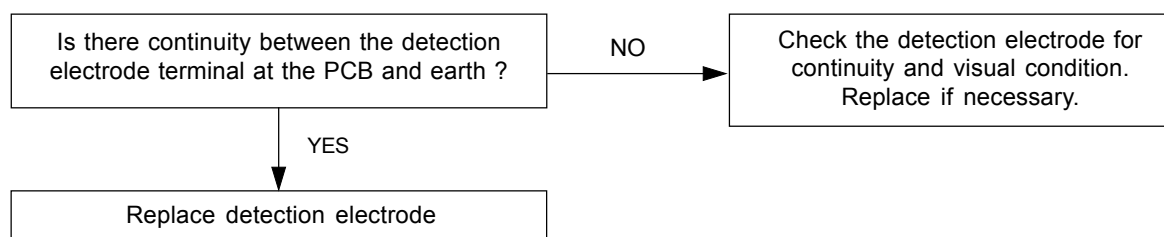
87 H.....3..... (DHW TEMPERATURE SENSOR)



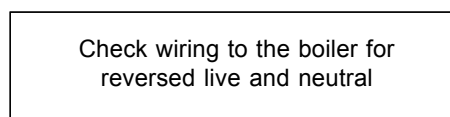
88 H.....4..... (FLUE SENSOR)



89 H.....F..... (FLAME DETECTION)



90 H.....n..... (PHASE REVERSAL)



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 lists is held by British Gas Services, **Caradon Ideal Limited** distributors and merchants.

When ordering spares please quote:

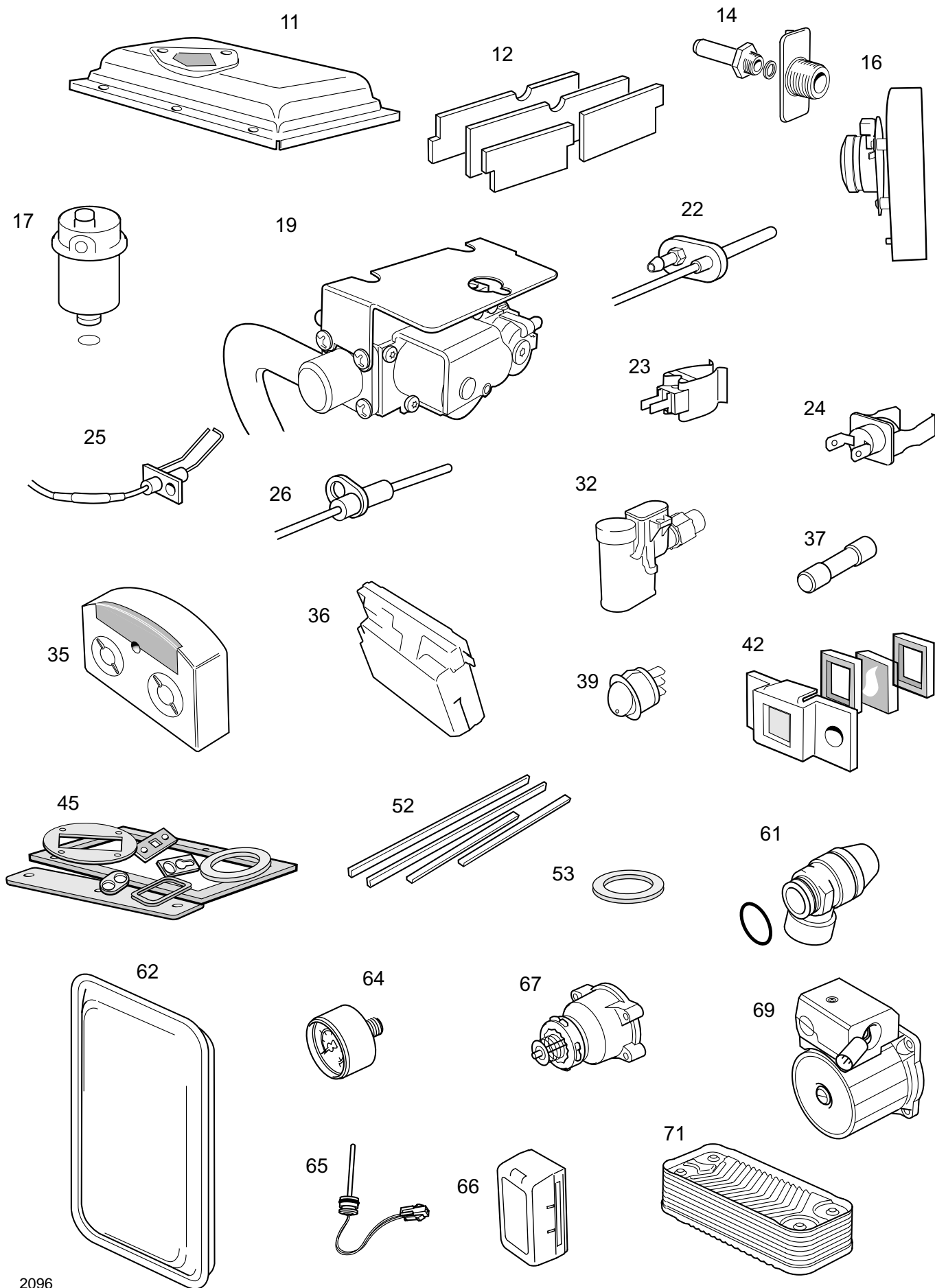
1. Boiler model - isar m30100.
2. Appliance G.C. No. - 47-348-15.
3. Description.
4. Quantity.
5. Product number.

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

Key No.	G.C. Part No.	Description	Qty.	Product Number
1		Front casing panel	1	170 994
4		Bottom casing panel	1	170 987
11		Burner	1	170 905
12		Combustion chamber insulation	1	170 906
14		Injector and housing	1	170 908
16		Fan assembly	1	170 909
17		Automatic air vent	1	170 988
19		Gas control valve Honeywell VK4115V	1	170 913
22		Flue thermistor	1	170 916
23		Control/Return thermistor	2	170 917
24		Overheat thermostat	1	170 918
25		Ignition electrode and gasket	1	170 985
26		Flame detection electrode and gasket	1	170 984
32		Condensate 'S' trap	1	170 926
35		User control (display unit)	1	170 993
36		PCB primary controls (includes plastic housing)	1	170 930
37		Fuse PCB (T3.15AT L250V)	1	170 931
39		Mains switch	1	170 933
42		Sight glass	1	170 949
45		Gasket kit (servicing)	1	170 938
52		Seal kit (sealing panel)	1	171 014
61		Pressure relief valve	1	170 992
62		Expansion vessel	1	170 989
64		Pressure gauge	1	170 991
65		DHW thermistor	1	170 996
66		Diverter valve motor head	1	170 997
67		Diverter valve body	1	170 998
69		Pump	1	170 990
71		Plate heat exchanger	1	170 995

SHORT LIST OF PARTS

91 SHORT PARTS LIST

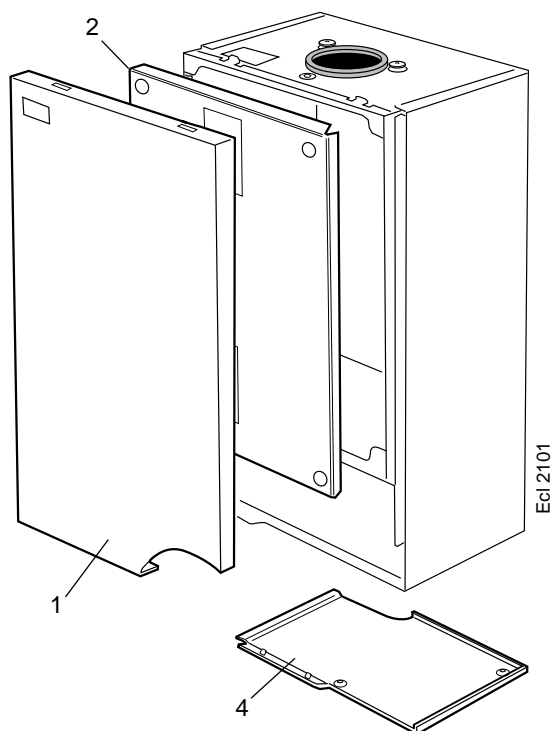


2096

SHORT LIST OF PARTS

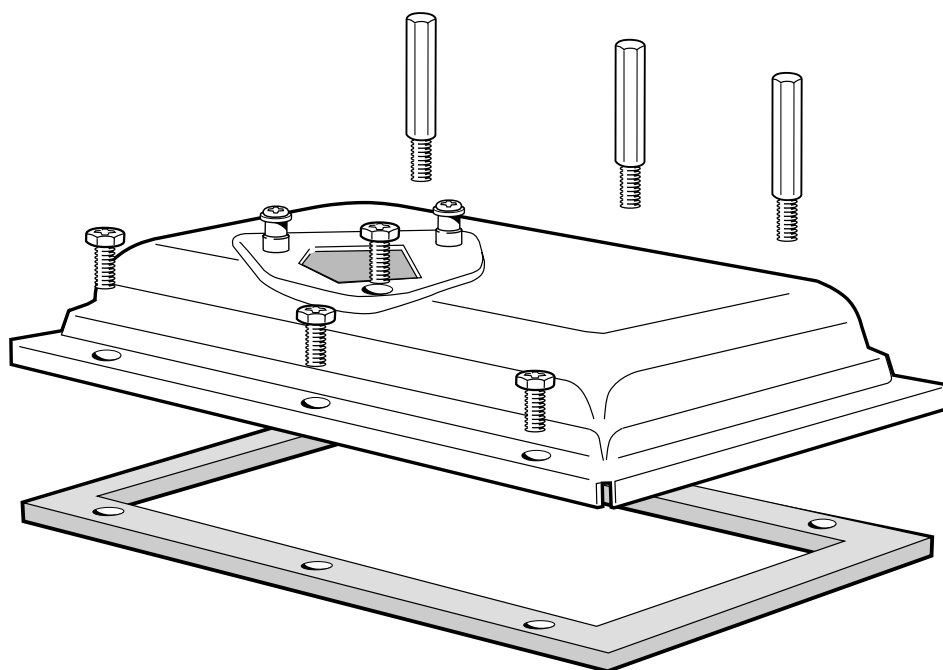
92 BOILER CASING ASSEMBLY

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



93 BURNER ASSEMBLY

11. Burner assembly with screws and gasket.



Ecl 1598

NOTES



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

Technical Training

The Ideal Boilers Technical Training Centre offers a series of first class training courses for domestic, commercial and industrial heating installers, engineers and system specifiers.

For details of courses please ring: 01482 498 432



CERTIFIED PRODUCT

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

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

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



i Ideal BOILERS
ENGINEERED FOR PEACE OF MIND

October 2001

156 412 A04

Caradon
Ideal Limited

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

users guide

isar

Your Ideal users guide

m30100

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.

i Ideal BOILERS
ENGINEERED FOR PEACE OF MIND

isar m30100 (Natural Gas Only)

G.C. Appliance No. 47-348-15

Destination Countries: GB, IE

Introduction

The **isar** is a wall mounted, room sealed, condensing combination boiler, featuring full sequence automatic spark ignition and fan assisted combustion.

Due to the high efficiency of the boiler, condensate is produced from the flue gases and this is drained to a suitable disposal point through the plastic waste pipe at the lower rear of the boiler. A condensate 'plume' will also be visible at the flue terminal.

The **isar** is a combination boiler providing both central heating and instantaneous domestic hot water.

Safety

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

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

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

Electricity Supply

This appliance must be earthed.

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

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

Important Notes

- This appliance must not be operated without the casing correctly fitted and forming an adequate seal.
- If the boiler is installed in a compartment then the compartment MUST NOT be used for storage purposes.
- If it is known or suspected that a fault exists on the boiler then it MUST NOT BE USED until the fault has been corrected by a CORGI registered installer.
- Flammable materials must not be placed in close proximity to the appliance. Materials giving off flammable vapours must not be stored in the same room as the appliance.
- Under NO circumstances should any of the sealed components on this appliance be used incorrectly or tampered with.

In cases of repeated or continuous shutdown a CORGI registered installer should be called to investigate and rectify the condition causing this and carry out an operational test. Only the manufacturers original parts should be used for replacement.

Minimum Clearances

Clearances of **165mm (6 1/2")** above, **100mm (4")** below, **5mm (1/4")** at the sides and **450mm (17 3/4")** at the front of the boiler casing must be allowed for servicing.

The minimum front and bottom clearance allowed when built into a cupboard is 5mm.

To light the boiler. Refer to Frame 1

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

1. CHECK THAT THE ELECTRICITY SUPPLY TO THE BOILER IS OFF.
2. Set the mains ON/OFF switch (A) to OFF and the DHW thermostat knob (J) and CH thermostat knob (F) to maximum.
3. Ensure that all DHW taps are turned off.
4. Switch ON the electricity supply to the boiler and check that all external controls, e.g. programmer, room thermostat etc., are ON.

All CORGI Registered Installers carry a CORGI ID card, and have a registration number. Both should be recorded in your **Benchmark** Log Book. You can check your installer by calling CORGI direct on 0156 372 300.

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



5. Set the mains ON/OFF switch to ON.

The mains on neon (B) will illuminate and the boiler will commence the ignition sequence, first supplying heat to preheat the domestic hot water and then to the central heating, if required.

Note. In normal operation the control unit display (G) will show codes:

⏏ Standby - no demand for heat.

c CH being supplied.

d DHW being supplied.

⏏ DHW preheat.

During ignition, the LED (E) will flash.

During normal running the LED (E) will remain illuminated.

Note. If the boiler fails to light after 3 attempts the fault code L-F will be displayed.

Press the reset button (D) for 2 seconds then release. The boiler will repeat the ignition sequence. If the boiler still fails to light consult a CORGI registered installer.

Operation

Winter conditions - i.e. CH and DHW required.

The boiler will fire and supply heat to the radiators but will give priority to DHW on demand.

The DHW preheat will operate as described under 'Summer conditions' during periods when there is no call for CH.

Summer conditions - i.e. DHW only required.

Set the CH external controls to OFF, or turn the CH thermostat knob (F) to minimum.

The boiler will fire periodically for a few seconds to maintain the DHW calorifier in a preheated condition and whenever there is a demand for DHW.

Note. The pump will operate briefly as a self-check once every 24 hours, regardless of system demand.

Control of water temperature

Domestic Hot Water

The DHW temperature is limited by the boiler controls to 65°C maximum at low draw-off rate, adjustable via the DHW thermostat knob (J).

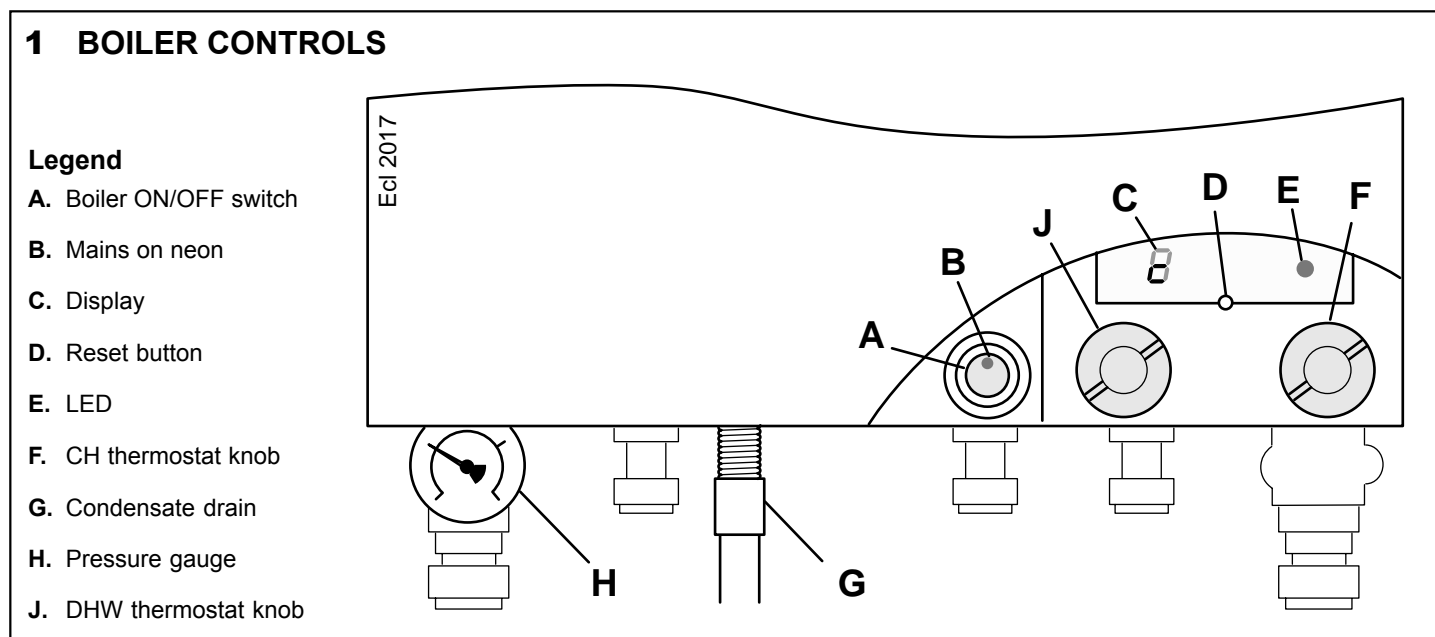
Additionally, the temperature can be controlled by the user via the draw-off tap : the lower the rate the higher the temperature, and vice versa.

Central Heating

The boiler controls the central heating radiator temperature to a maximum of 82°C, adjustable via the CH thermostat knob (F).

Approx. flow temperatures for the boiler thermostat settings are:

Knob Setting	Flow Temperature	
	°C	°F
Minimum	42	110
Maximum	82	180



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.

To shut down the boiler

1. For short periods

Set the mains ON/OFF switch (A) to OFF

2. For longer periods

Set the mains ON/OFF switch (A) to OFF, and switch the electricity supply to OFF. For longer periods the entire system should be drained.

To relight the boiler

Repeat the procedure detailed in 'To light the boiler'.

Frost protection

If no frost protection is provided and frost is likely during a short absence from home, leave the heating controls (if fitted) at a reduced temperature setting. For longer periods, the entire system should be drained.

If the system includes a frost thermostat then, during cold weather, the boiler should be turned OFF at the time switch (if fitted) ONLY. The mains supply should be left switched ON, with the boiler thermostat left in the normal running position.

Boiler overheat thermostat

This thermostat will shut down the boiler in the event of overheating. Should this occur a fault code $L\ E$ will be displayed. Press the reset button (D) and the boiler will relight.

If the fault recurs, turn off the boiler and consult a CORGI registered installer.

Flame failure

Should this occur a fault code $L-F$ will be displayed. Press the reset button (D) and the boiler will relight. If the fault recurs, turn off the boiler and consult a CORGI registered installer.

Loss of system water pressure

The gauge (H) indicates the central heating system pressure. If the pressure is seen to fall below the original installation pressure of 1-2 bar over a period of time then a water leak is indicated. In this event a CORGI registered installer should be consulted.

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

Condensate Drain

The condensate drain (G) must not be modified or blocked.

Blockage of the condensate drain, caused by debris or freezing, can cause automatic shutdown of the boiler.

If freezing is suspected and the pipe run is accessible an attempt may be made to free the obstruction by pouring hot water over the exposed pipe and clearing any blockage from the end of the pipe. If this fails to remedy the problem the assistance of a CORGI registered installer should be sought.

Escape of gas

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

Do NOT search for gas leaks with a naked flame.

Cleaning

For normal cleaning simply dust with a dry cloth.

To remove stubborn marks and stains, wipe with a damp cloth and finish off with a dry cloth.

DO NOT use abrasive cleaning materials.

Maintenance

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



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

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

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