221474C.02.00

Glow-worm

Instructions for Use Installation and Servicing

To be left with the user

Swift flow

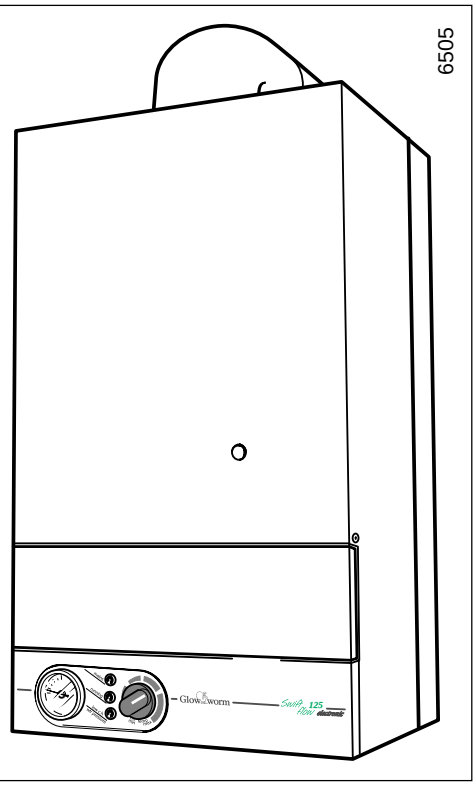
125 electronic

G.C. No. 47 313 19

Fanned Flue Combination Boiler

CE benchmark™

This is a Cat I_{2H} Appliance



The instructions consist of three parts, User, Installation and Servicing Instructions, which includes the Guarantee Registration Card. The instructions are an integral part of the appliance and must, to comply with the current issue of the Gas Safety (Installation and Use) Regulations, be handed to the user on completion of the installation.

Guarantee Registration

Thank you for installing a new Glow-worm appliance in your home.

Glow-worm appliances' are manufactured to the very highest standard so we are pleased offer our customers' a Comprehensive First Year Guarantee.

In the center pages are to be found your Guarantee Registration Card, which we recommend you complete and return as soon as possible.

If this card is missing you can obtain a copy or record your registration by telephoning the Heatcall Customer Service number 01773 828100.

Our Guarantee gives you peace of mind plus valuable protection against breakdown by covering the cost of:

- ***All replacement parts***
- ***All labour charges***
- ***All call-out charges***

REGISTER YOUR GLOW-WORM APPLIANCE FOR 1ST YEAR GUARANTEE PROTECTION

CALL 0181 380 2555

HEATCALL
One Contact Local Service
Customer Services:
Tel: (01773) 828100
Fax: (01773) 828070

Hepworth Heating Ltd.,
Nottingham Road, Belper, Derbyshire. DE56 1JT
General/Sales enquiries:
Tel: (01773) 824141 Fax: (01773) 820569

Important Information

Testing and Certification

This boiler is tested and certificated for safety and performance. It is therefore important that no alteration is made to the boiler, without permission, in writing, from Hepworth Heating Ltd.

Any alteration not approved by Hepworth Heating Ltd., could invalidate the certification, boiler warranty and may also infringe the current issue of the Statutory Requirements, see Section 1.4.

CE Mark

This boiler meets the requirements of Statutory Instrument No. 3083 The boiler (Efficiency) Regulations, and therefore is deemed to meet the requirements of Directive 92/42/EEC on the efficiency requirements for new hot water boilers fired with liquid or gaseous fuels.

Type test for purposes of Regulation 5 certified by: Notified body 0087.

Product/production certified by: Notified body 0086.

The CE mark on this appliance shows compliance with:

1. Directive 90/396/EEC on the approximation of the laws of the Member States relating to appliances burning gaseous fuels.

2. Directive 73/23/EEC on the harmonization of the Laws of the Member States relating to the electrical equipment designed for use within certain voltage limits.

3. Directive 89/336/EEC on the approximation of the Laws of the Member States relating to electromagnetic compatibility.

Substances Hazardous to Health

The adhesives and sealants used in this appliance are cured and give no known hazard in this state.

INSULATION PADS/CERAMIC FIBRE, GLASSYARN, MINERAL WOOL
These can cause irritation to skin, eyes and the respiratory tract.
If you have a history of skin complaint you may be susceptible to irritation. High dust levels are usual only if the material is broken.
Normal handling should not cause discomfort, but follow normal good hygiene and wash your hands before eating, drinking or going to the lavatory.
If you do suffer irritation to the eyes or severe irritation to the skin seek medical attention.

Instructions for Use

Introduction

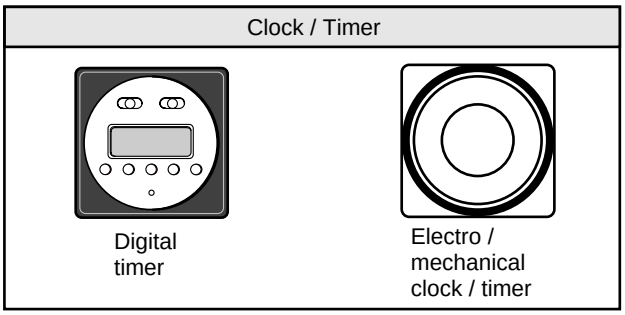
Please read these instructions and follow them carefully for the safe and economical use of your Combination boiler.

This boiler must have been installed by a competent person in accordance with the rules in force in the countries of destination.

Once the pilot has been lit and the controls set, the boiler is automatic in operation.

The Swift-flow combination boiler is able to provide room heating as part of a central heating system and domestic hot water direct from the cold water supply, without the need for secondary storage.

The boiler can be fitted with one of two makes of clock, which look like this:-



IMPORTANT NOTICE:

This boiler is for use only on G20 gas.

Gas Leak or Fault

If a gas leak or fault exists or is suspected, turn the boiler off and consult your local gas company or your local installation/servicing company.

Domestic Hot Water Temperature

NOTE. The mains water temperature in the winter is lower than in the summer.

The nominal temperature setting for the Domestic Hot Water is 60^0C (140^0F) at a flow rate of 5litre per minute (1.1gal/min)

The specific water rate is 16.8litre per minute based on a 30^0C temperature rise.

The water temperature can be increased or reduced by adjusting the flow rate at the hot water draw off tap.

Boilers Installed in Compartments

If the boiler has been fitted into a compartment or cupboard, do not obstruct the compartment air supply vents.

Do not use the compartment for storage.

Electrical Supply

WARNING. The boiler must be earthed.

The boiler must be connected to a 230V~50Hz permanent supply.

Connection of the whole electrical system of the boiler and any heating system controls to the electrical supply, must be through one common isolator.

Isolation should preferably be by a double pole switched fused spur box. The fused spur box should be readily accessible and preferably adjacent to the appliance.

It should be identified as to its use.

A fused three pin plug and shuttered socket outlet may be used instead of the fused spur box.

PVC flexible cable must be used within the boiler casing to connect to the boiler.

The colours of three core flexible cable are,

Brown - Live, Blue - Neutral,

Green and Yellow - Earth.

As the markings on your plug may not correspond with these colours, continue as follows:

The cable coloured blue must be connected to the plug terminal marked “N” or “Black”.

The cable coloured brown must be connected to the plug terminal marked “L” or “Red”.

The cable coloured green and yellow must be connected to the plug terminal marked “E” or “Green” or the earth symbol ⏚ .

Electrical Supply Failure

The boiler will not work without an electrical supply.

Normal operation of the boiler should resume when the electrical supply is restored.

Note. The boiler safety cutoff may have operated, please refer to the following section to reset.

Reset any external controls, to resume normal operation of the central heating.

The digital timer, has a lithium battery back up and will not need resetting.

Boiler Safety Cutoff Reset Button

The boiler is fitted with a safety cutoff device to prevent damage through overheating.

Should the main burner go out during a demand the red neon on the Reset Button will light.

In certain circumstances the red neon light may not come on, due to no system demand. It is suggested that a hot water draw off tap be opened to create a demand, the neon should then come on.

Allow the boiler and system to cool down waiting at least a minimum of four minutes before pressing the Reset button.

If the problem persists, turn the boiler off and consult the local gas company or your installation/servicing company.

Instructions for Use

Setting Instructions for Electro/mechanical Clock - if fitted

This clock has a twenty four hour dial, that is, 1pm is 13.

To set the time, turn the whole face clockwise until the pointer is against the time of day.

To set any “Off” time, push the tappets outwards.

To set any “On” time, push the tappets inwards.

Time can be set either “On” or “Off” in fifteen minute segments.

Note. The clock supplied could be fitted with an override device, see diagram 1, which switches the clock programme “On” or “Off” permanently.

The switch will need to be repositioned to resume programmed working.

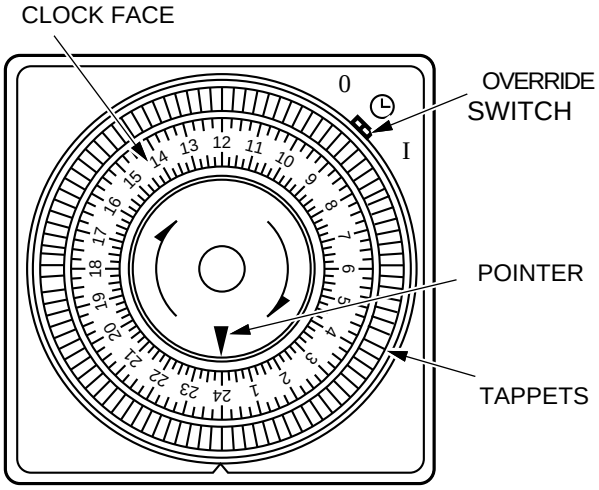


Diagram 1

Setting Instructions for the 7 Day Digital Clock/Timer

This is a 24 hour clock/timer, that is 1pm is 13:00, and has 8 “ON” and 8 “OFF” daily switching actions.

It is fitted with a lithium battery back up which protects the programme in the event of an electrical failure. The battery should have a life of several years.

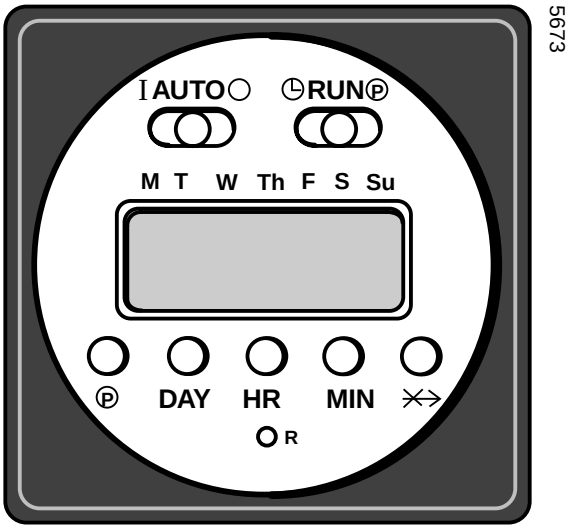


Diagram 2

Setting the Clock

1. With both AUTO and RUN switches set to the central position, press R reset button, the display will flash.

2. Set RUN switch to ◷ .

3. Set day of week by pressing button DAY.

4. Set time of day by pressing buttons HR and MIN.

5. Set RUN switch to the central position, colon will flash, this indicates the clock is set.

With the clock set, the factory preset programme shown below will operate.

MON/FRI		SAT/SUN	
ON	06:30	ON	07:00
OFF	08:30	OFF	09:00
ON	16:30	ON	16:00
OFF	22:30	OFF	23:00

Setting Timed Programmes

With the clock set to the correct time, see SETTING THE CLOCK paragraphs 1-4, and then continue as follows:

1. Set RUN switch to Ⓟ, the display will indicate the 1st (ON) preset programme and the symbol ☼.

2. Set day of week to be programmed by pressing the DAY button.

   Note. The days can be selected individually or as groups:

   Mon-Fri., Mon-Sat., Mon-Sun., Sat/Sun.

   An arrow will be displayed under the day or days selected.

3. Set time of day by pressing the buttons HR and MIN.

4. Press button Ⓟ to confirm programmes, the display will indicate the 2nd (OFF) preset programme and subsequently, 3rd, 4th, 5th, 6th. 7th, 8th.

5. Repeat procedures 2, 3 and 4 until desired programmes are set.

   Note. It is not a requirement to use the 8 on/off programmes.

6. Set the RUN switch the central position, your appliance will now operate at the programmed times.

General Notes.

With the AUTO switch in the I position the central heating will operated constantly ON.

With the AUTO switch in the O position the central heating will not operate.

Soft Override button indicated by the symbol ⤫⟷ , this function will override the current central heating programme for the next available.

ON time programmes are indicated by the symbol ☼ .

Instructions for Use

User Indicator Lights

Identify the lights be reference to diagram 3.

The Orange - Mains light - shows that the electrical supply to the boiler is on.

The Green - Running light - shows that the boiler is working normally, in either the central heating or hot water modes.

If the Red - Low Central Heating water pressure light flashes continually it is warning of a loss of pressure in the central heating system.

During this time the red light will continue to flash and the boiler will not work.

If this happens you MUST call your installation or servicing company.

To Operate the Boiler

1. Check that all five isolating valves are open, the slots in line with the length of the valve, see diagram 4.

2. Open the door, by pushing at the side opposite to the hinge.

3. CAUTION. A sealed pressurised system must be filled and pressurised by a competent person.

Only operate the boiler when you are sure that the system has been filled and pressurised. Check this by looking at the pressure gauge “A”, diagram 3, it should read 0.7bar minimum.

4. Check reset button neon, refer to previous instructions on page 3.

5. Open a hot water tap, check that water flows, then close it.

6. If you are in any doubt about the boiler being filled with water contact your installation/servicing company or the local gas company.

7. Check that the electrical supply to the boiler is ON at the external isolator.

8. Set switch “C”, clock/timer (if fitted) and any remote controls as required.

Close the door.

In certain circumstances, a surge in water pressure may cause the appliance to operate momentarily, this will be indicated by the pump starting and the fan speed increasing. This is quite normal.

Central Heating Selector Switch

For central heating set switch “C” to “On” as shown in diagram 3.

The main burner will light to provide central heating.

Note, when the central heating is also controlled by a room thermostat, clock/timer or other remote control these controls must be calling for heat for the boiler to operate.

The user central heating temperature control enables you to control the temperature of the central heating water. The knob can be set between Minimum, about 55^{O}C and Maximum, about 80^{O}C.

If a hot water tap is opened while the boiler is on for heating, the burner flame will increase in size and priority will be given to hot water. When the hot water tap is closed, the main burner flames will decrease in size but will remain alight until the boiler controls or any heating controls switch it off.

For domestic hot water only, set switch “C” to “Off”, as shown in diagram 3.

The main burner will then light when any domestic hot water tap is opened and go out when the tap is closed.

Which ever position switch “C” is in domestic hot water will be available.

To Turn the Central Heating Off

To turn the heating off for short periods, set switch “C” to “Off” as shown in diagram 3 and make sure all the domestic hot water draw off taps are closed.

Set switch “C” to “On” as shown in diagram 3 to turn the central heating on again..

To Turn the Boiler Off

To turn the boiler off, isolate the boiler from the electrical supply.

To turn on again following the operating instructions.

Domestic Hot Water Temperature

NOTE. The mains water temperature in the winter is lower than in the summer.

The water temperature can be increased or reduced by adjusting the flow rate at the hot water draw off.

Maintenance and Servicing

To ensure the continued efficient and safe operation of the appliance it is recommended that it is checked and serviced as necessary at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage, but in general once a year should be enough.

If this appliance is installed in a rented property there is a duty of care imposed on the owner of the property by the current issue of the Gas Safety (Installation and Use) Regulations, Section 35.

Servicing/maintenance should be carried out by a competent person in accordance with the rules in force in the countries of destination.

To obtain service, please call your installer or Heatcall (Glow-worm’s own service organisation) using the telephone number behind the controls access door, see diagram 3.

Please be advised that the ‘Benchmark’ logbook should be completed by the installation engineer on completion of commissioning and servicing.

All CORGI Registered Installers carry a CORGI ID card, and have a registration number. Both should be recorded in your boiler Logbook. You can check your installer is CORGI registered by calling CORGI direct on :- 01256 372300.

Clearances

The boiler requires a clearance in front, below and at the sides of the casing for safety, servicing and maintenance access, see diagram 5.

Protection Against Freezing

If the boiler is to be out of use for any long periods during severe weather, it is recommended that the whole system, including the combination boiler, should be drained to avoid the risk of freezing.

If in doubt, contact you installation/servicing company for advice.

Draining and Filling

CAUTION. This boiler works in a pressurised system which must only be drained, refilled and pressurised by a competent person.

Note: If the pressure gauge indicates a loss of system pressure, that is, less than 0.7bar, YOU MUST CONTACT YOUR INSTALLER.

Pressure Relief Safety Valve

CAUTION. A pressure relief safety valve and discharge pipe is fitted to the boiler. This valve must not be touched. Should there be any discharge from the pipe, turn the boiler off, isolate from the electrical supply and contact your installation/servicing company.

Cleaning

WARNING. This appliance contains metal parts (components) and care should be taken when handling and cleaning with particular regard to edges.

The boiler casing can be cleaned using a mild liquid detergent with a damp cloth, then a dry cloth to polish.

Do not use any form of abrasive or solvent cleaner as you may damage the paint work

Boiler Casing

CAUTION. Do not remove or adjust the casing in any way, as incorrect fitting may result in incorrect operation or failure to operate at all. If in doubt seek advice from the local gas company or your installation/ servicing company.

Replacement Parts

If replacement parts are required apply to your local supplier or British Gas.

Please quote the name of the appliance.

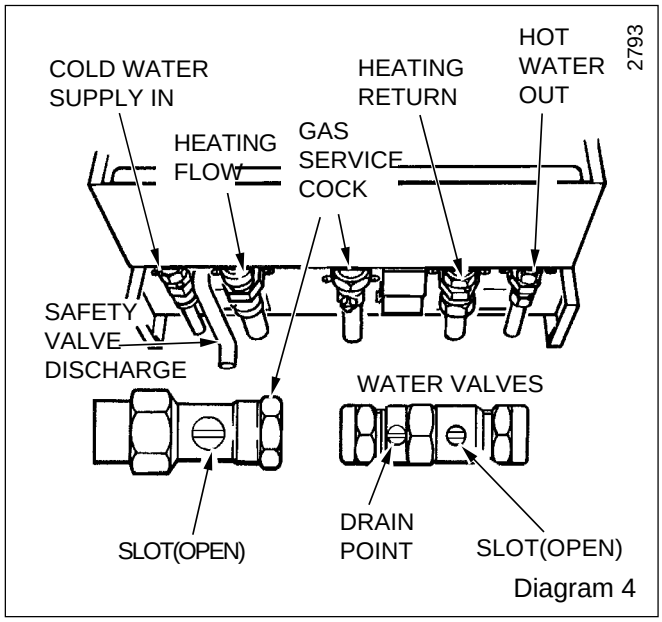
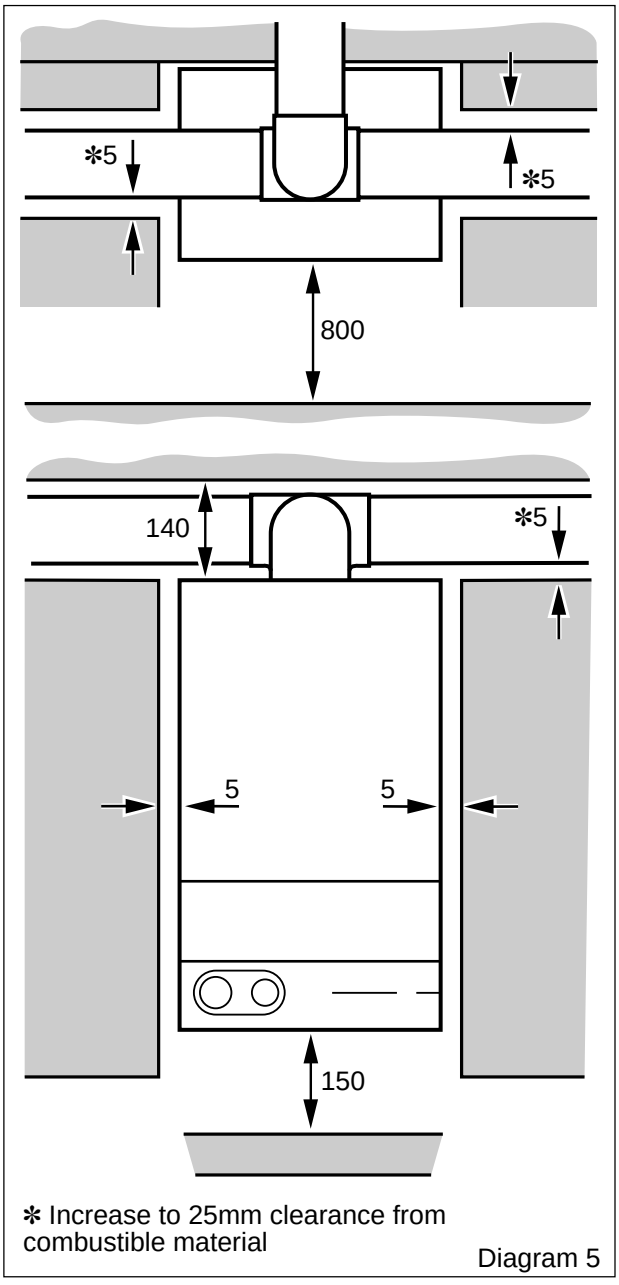


Diagram 4



✻ Increase to 25mm clearance from combustible material

Diagram 5

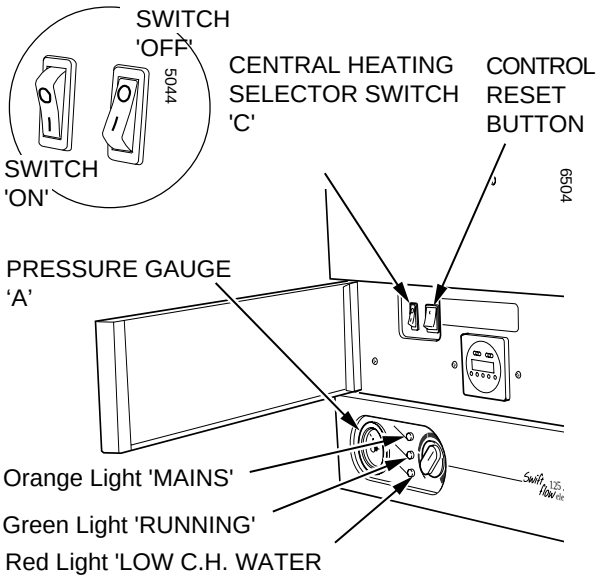


Diagram 3

1 General Data

1.1 Important Notice

This boiler is for use only on natural gas (G20).

1.2 Sheet Metal Parts

WARNING. When installing the boiler, care should be taken to avoid any possibility of injury when handling sheet metal parts.

1.3 Notes for Information

The instructions consist of three parts, Installation, Servicing and Instructions for Use, which includes the Guarantee Registration Card. The instructions are an integral part of the appliance and must be handed to the user on completion of the installation.

Materials and equipment should be fit for their purpose and of suitable quality and workmanship.

1.4 Statutory Requirements

The installation of the boiler must be carried out by a competent person in accordance with the relevant requirements of the current issue of:-

Manufacturer's instructions, supplied.

The Gas Safety (Installation and Use) Regulations, The Building Regulations, The Local Water Company Byelaws, The Building Standards (Scotland) Regulations (applicable in Scotland), The Health and Safety at Work Act, Control of Substances Hazardous to Health (COSHH), The Electricity at Work Regulations and any local regulations which may apply.

Detailed recommendations are contained in the current issue of the following British Standards and Codes of Practice:-

BS5440 Part 1 and 2, BS6798, BS5449, BS6700, BS5546, BS6891, BS4814, BS7074 Part 1 and 2, BS7478, BS7593, BS7671.

Manufacturer's instructions must not be taken as overriding statutory requirements.

1.5 Data Label

The data label is on the inner case cover.

1.6 Data

See Tables 1 and 2.

All dimensions are given in millimetres (except as noted).

1.7 Gas Supply

The gas installation must be in accordance with the rules in force in the countries of destination.

The supply from the governed gas meter must be of adequate size to provide a steady inlet working pressure of 20mbar (8in wg) at the boiler.

1.8 Electrical Supply

WARNING: The boiler must be earthed.

The installation must be in accordance with the rules in force in the countries of destination.

All system components shall be of an approved type.

Connection of the whole electrical system of the boiler and any heating system controls to the electrical supply, must be through one common isolator.

Isolation should preferably be by a double pole switched 3A fused spur box, with a minimum separation of 3mm in both poles. The fused spur box should be readily accessible and preferably adjacent to the appliance. It should be identified as to its use.

A fused 3A three pin plug and shuttered socket outlet may be used instead of the fused spur box, provided that they are not used in a room containing a fixed bath or shower.

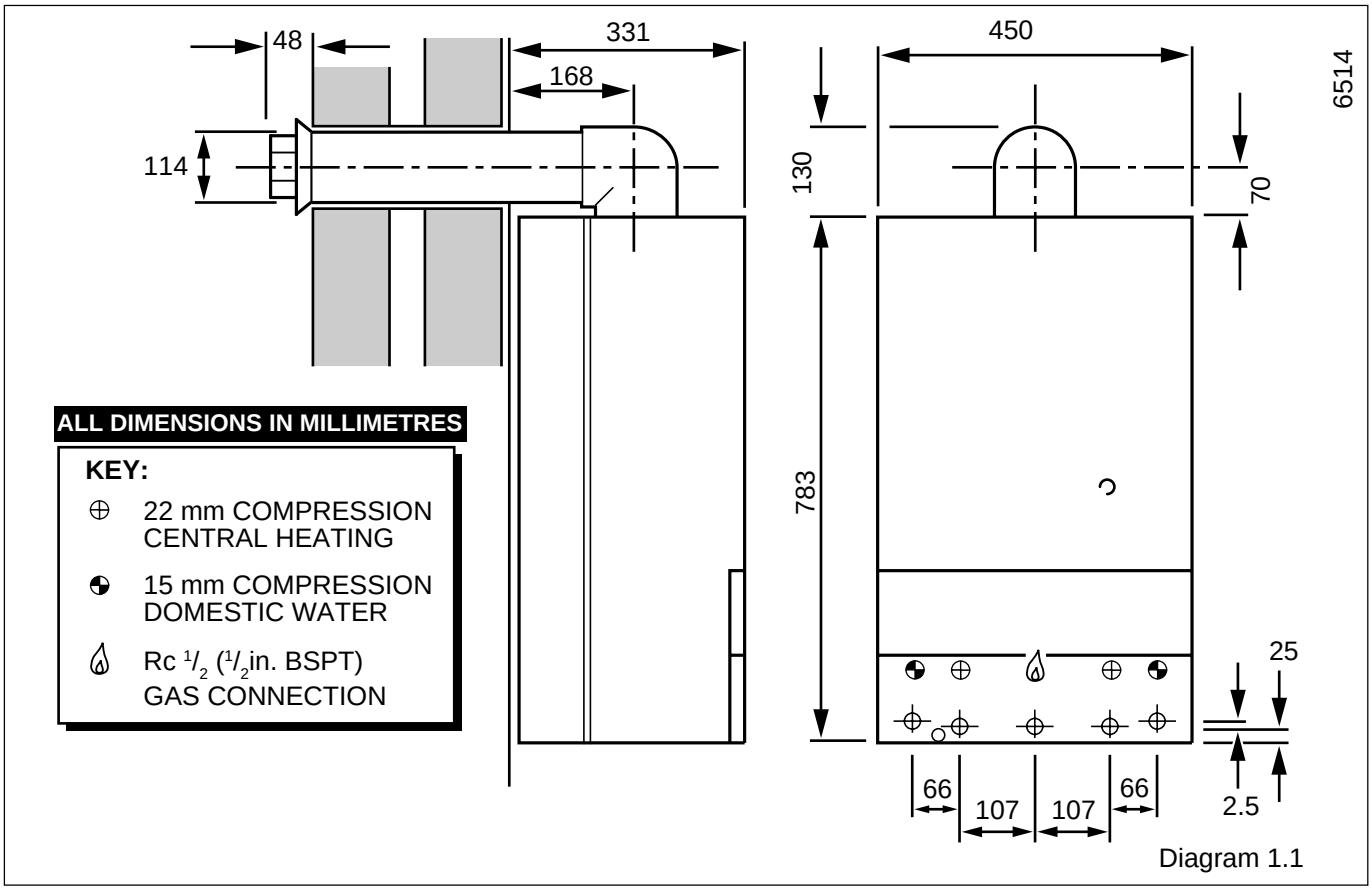
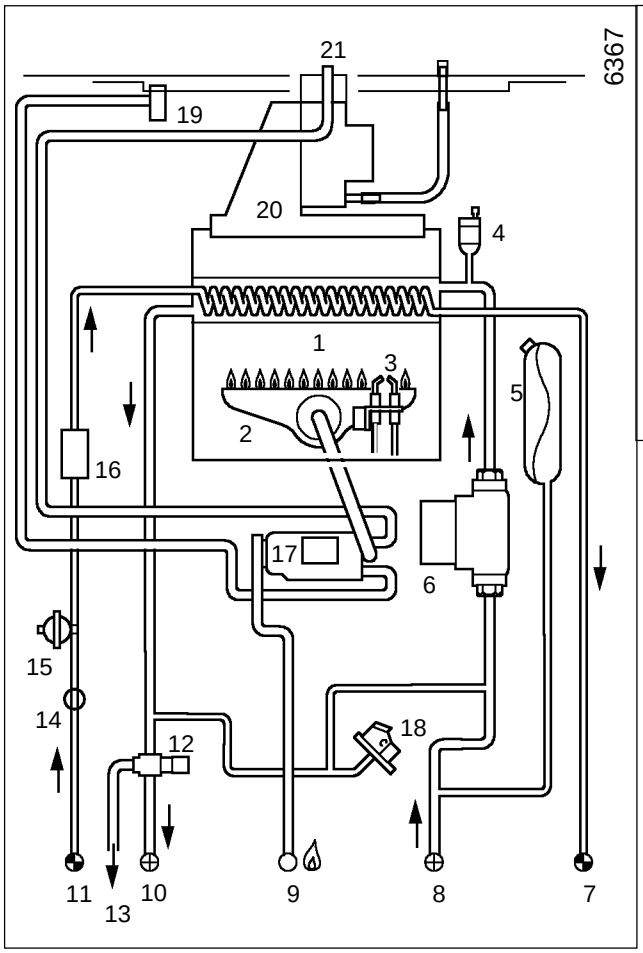


Diagram 1.1

1 General Data



KEY

1 - Heat Exchanger
2 - Main Burner
3 - Ignition Electrode
4 - Automatic Air Vent
5 - Expansion Vessel
6 - Pump
7 - D.H.W. Hot Outlet
8 - C.H. Return
9 - Gas Supply
10 - C.H. Flow
11 - D.H.W. Cold Inlet
12 - Safety Valve
13 - Safety Valve Discharge
14 - Water Throttle
15 - Mini Expansion Vessel
16 - Flow Sensor
17 - Multi-Functional Control incorporating Gas/Air Ratio Unit
18 - Pressure Switch-Water
19 - Venturi
20 - Flue Collector
21 - Pressure Sensing Probe

Diagram 1.2

TABLE 1	D.H.W Max	C.H. Max	MIN
NOMINAL kW HEAT INPUT(NET)	39.2	26.2	10.2
NOMINAL kW HEAT OUTPUT	35.2	23.5 †	8.8
BURNER mbar PRESSURE Δp	16.8	8.0 ††	1.2
APPROX. m^3/h GAS RATE	4.1	2.8	1.0

† FACTORY PRESET TO 17.6 kW

†† FACTORY PRESET TO 2.7 mbar

TABLE 2

Lift Weight	39.0 kg (85.98 lb)
Total Weight	52.8 kg (116.40 lb)
● **Gas connection**	Rc$^1/_2$ ($^1/_2$in BSPT)
● **Heating and return**	22mm compression
● **Domestic hot water**	15mm compression
Safety valve	Preset 3bar (43.5lbf/in^2)
Safety valve discharge	15mm copper
Water content	1.74 litres (0.38 gallon)
■ **Expansion vessel capacity**	8 litres (1.76 gallons)
Heating cold fill pressure minimum	0.7bar (10.1lbf/in^2)

✻ **D.H.W working pressure**	0.6 to 10bar (8.70 to 188lbf/in^2)
■ **Maximum Heating system water content using fitted expansion vessel.**	119 litres (26.2 gallons) with a cold fill pressure of 0.7bar
Domestic hot water flow rate for a temperature rise of:	**30^{0}C** 16.8 litres/min.(3.7 gals) **35^{0}C** 14.4 litres/min.(3.17 gals)
Electrical supply	230V~50Hz
Electrical rating	130W
Internal Fuse rating:	Fuse 1 Type 2AT Fuse 2 Type 3.15AT

● Ball valves are fitted in water and gas connections, plus a drain point on all water connections.

✻ Boiler starts at an inlet pressure of 0.6bar but requires 0.8bar for maximum output.

■ For larger systems use an additional expansion vessel, see Section 4.

2 Boiler Position

2.1 Boiler Position

The boiler must be installed in accordance with the rules in force of the countries of destination.

The boiler is not suitable for outside installation.

Any electrical switch or boiler control using mains electricity must be positioned so that it cannot be touched by a person using a bath or shower.

The boiler must be mounted on a flat wall which is sufficiently robust to take its weight, refer to Table 2.

If the boiler is to be fitted into a cupboard, compartment or unusual location, special procedures are necessary.

Make sure that the cupboard or compartment air vents are positioned to be clear of obstructions at all times, refer to Section 3.7.

2.2 Clearances

The boiler should be positioned so that at least the minimum operational and servicing clearances are provided, see diagram 2.1.

Installation Clearances

For rear flue installation the dimension between the boiler mounting wall and a permanent facing wall must be a minimum of “X”, see diagram 3.1 and 3.3, plus 272mm.

For side flue installation the dimension between any adjacent permanent walls must be a minimum of “Y”, see diagram 3.2 and 3.3, plus 332mm.

For flue installations where internal clearances are not practicable, then external installation will be necessary.

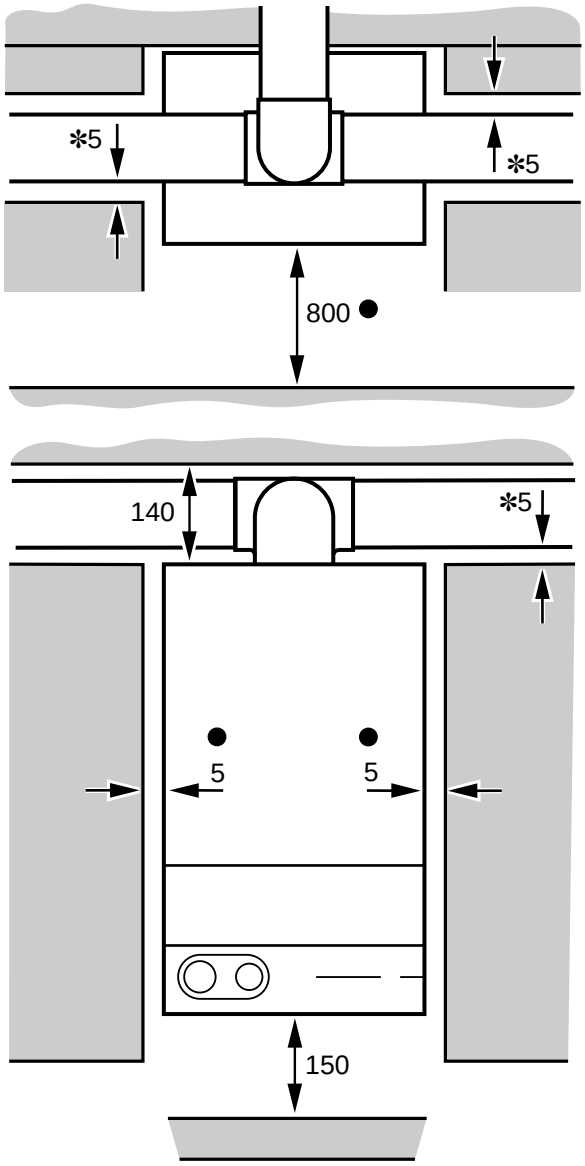
Note: If the appliance is to be installed in a building where access to the outside is not possible, due to height or other restriction a internal flue installation kit is available. Part No. 452481.

This includes a larger wall sleeve (150mm dia.) which allows the flue terminal to be inserted through the wall to the outside of the building.

For a wall thickness up to 300mm, provided there is sufficient space available, the flue can be fully installed from the inside.

For a wall thickness over 300mm the external flue hole will need to be made good from the outside.

If there is insufficient clearance the flue can be installed from outside.



* Increase to 25mm clearance from combustible material
● Refer to text, Section 2.2 Clearances, "Installation Clearances"

Diagram 2.1

3 Flue and Ventilation

3.1 Flue

The flue must be installed in accordance with the rules in force in the countries of destination. For UK, see current issue of BS5440 Part 1.

3.2 Flue Position and Length

The air and flue ducting connect to the top of the boiler using a flue elbow and can be positioned in one of three directions:

rearward, left or right.

The standard flue will provide the range shown in diagram 3.1 for a rear flue or diagram 3.2 for a side flue.

If a longer flue duct is required, do not extend the ductings. A 1, 2 or 3metre flue system and elbow/terminal kit must be used and can be supplied. This will provide the range shown in diagram 3.3 for a rear flue, diagram 3.4 for a side flue.

A Flue Bend Kit or Vertical Flue Kit can be supplied, with instructions.

3.3 Terminal Position

The minimum acceptable siting dimensions for the terminal from obstructions, other terminals and ventilation openings are shown in diagram 3.5.

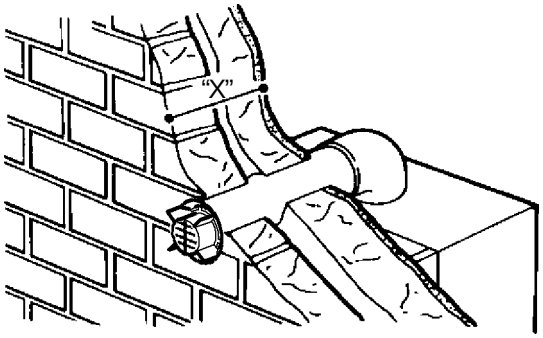
The terminal must be exposed to the external air, the position allowing free passage of air across it at all times.

Car ports or similar extensions of a roof only, or a roof and one wall, require special consideration with respect to any openings, doors, vents or windows under the roof. Care is required to protect the roof if made of plastic sheeting. If the car port comprises of a roof and two or more walls, seek advice from the local gas undertaking before installing the boiler.

If the terminal is fitted within 600mm below plastic guttering, an aluminium shield 1500mm long should be fitted immediately beneath the guttering or eaves. If the terminal is fitted within 450mm below painted eaves or a painted gutter, an aluminium shield 750mm long should be fitted immediately beneath the guttering or eaves.

WALL THICKNESS 'X': 75 to 400mm

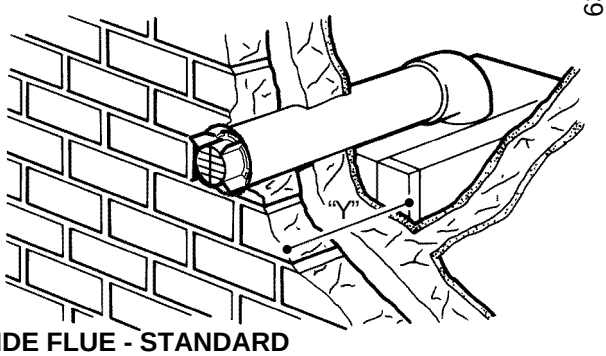
6385



REAR FLUE - STANDARD Diagram 3.1

DISTANCE 'Y': 80 to 338mm

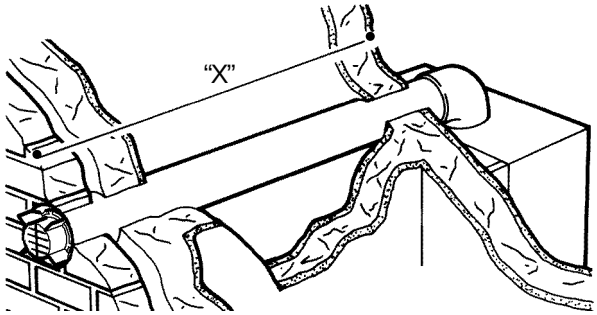
6382



SIDE FLUE - STANDARD
Left or Right Diagram 3.2

1m FLUE DISTANCE 'X': 75 to 880mm
2m FLUE DISTANCE 'X': 75 to 1880mm
3m FLUE DISTANCE 'X': 75 to 2880mm

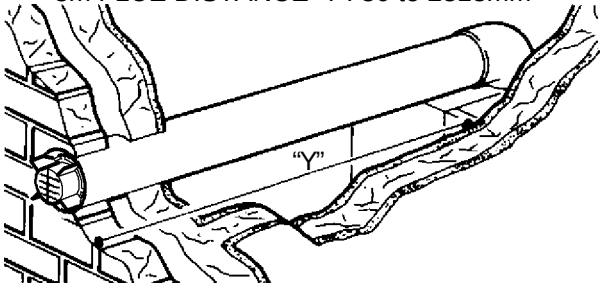
6383



REAR FLUE 1,2 and 3 metre Diagram 3.3

1m FLUE DISTANCE 'Y': 80 to 818mm
2m FLUE DISTANCE 'Y': 80 to 1818mm
3m FLUE DISTANCE 'Y': 80 to 2818mm

6384



SIDE FLUE 1,2 and 3 metre
Left or Right Diagram 3.4

3.4 Terminal Guard

A terminal guard is required if persons could come into contact with the terminal or the terminal could be subject to damage.

If a terminal guard is required, it must be positioned to provide a minimum of 50mm clearance from any part of the terminal and be central over the terminal.

The guard should be similar to that shown in diagram 3.5, and can be bought from:

Tower Flue Components Ltd
Morley Road
Tonbridge
Kent
TN9 1RA

their type K3.

3.5 Timber Frame Buildings

If the boiler is to be installed in a timber frame building it should be fitted in accordance with the Institute of Gas Engineers document IGE/UP/7/1998. If in doubt seek advice from the local gas undertaking or Hepworth Heating Ltd.

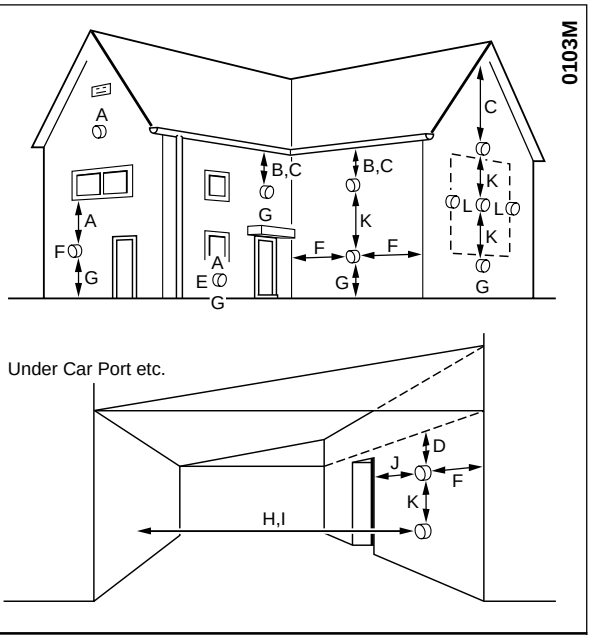
3.6 Room Ventilation

The boiler is room sealed, so when it is installed in a room or space, a permanent air vent is not required.

3.7 Cupboard or Compartment Ventilation

If the boiler is to be fitted in a cupboard or compartment, permanent high and low level air vents must be provided The vents must have at least the effective areas as given in Table 3.

TABLE 3		
Position of Air Vent	**Air from Room or Internal space**	**Air Direct from Outside**
High Vent	392cm² (60.8in²)	196cm² (30.4in²)
Low Vent	392cm² (60.8in²)	196cm² (30.4in²)



MINIMUM SITING DIMENSIONS FOR FANNED FLUE TERMINALS POSITION		MINIMUM SPACING in mm
A	DIRECTLY BELOW AN OPENABLE WINDOW, AIR VENT, OR ANY OTHER VENTILATION OPENING	300
B	BELOW GUTTER, DRAIN/SOIL PIPE	75
C	BELOW EAVES	200
D	BELOW A BALCONY OR CAR PORT	200
E	FROM VERTICAL DRAIN PIPES AND SOIL PIPES	75
F	FROM INTERNAL OR EXTERNAL CORNERS	300
G	ABOVE ADJACENT GROUND OR BALCONY LEVEL	300
H	FROM A SURFACE FACING THE TERMINAL	600
I	FACING TERMINALS	1200
J	FROM OPENING (DOOR/WINDOW) IN CAR PORT INTO DWELLING	1200
K	VERTICAL FROM A TERMINAL	1500
L	HORIZONTALLY FROM A TERMINAL	300

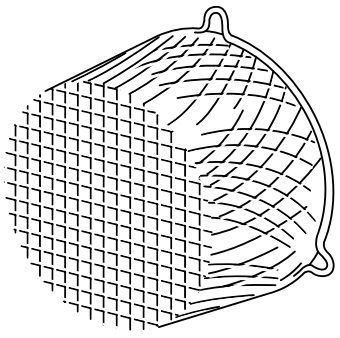


Diagram 3.5

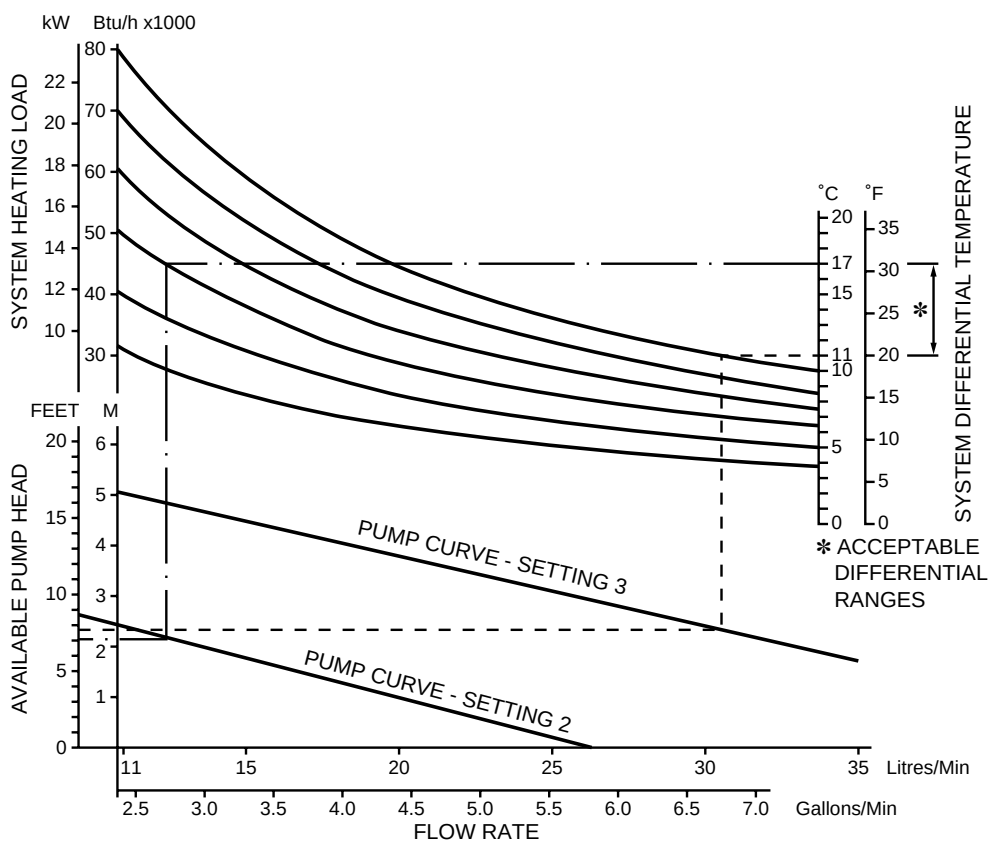


Diagram 4.1

4.1 General Notes

The boiler is for use in sealed water systems only.

4.2 Safety Valve

The safety valve is an integral part of the boiler and it cannot be adjusted.

4.3 Pressure Gauge

A pressure gauge is incorporated into the boiler to indicate the system pressure.

4.4 Pump

The pump is integral with the boiler.

The remaining circulating pressure head available from the pump is shown in diagram 4.1.

4.5 Expansion Vessel

The boiler has an integral expansion vessel with a capacity of 8Litres (1.76gallons), with a charge pressure of 0.75bar.

The maximum heating system water content using the fitted expansion vessel ranges from 119Litres with a cold fill pressure of 0.7bar, to 98Litres with a cold fill pressure of 1.05bar. If, due to a high static head, the cold fill pressure is higher, then the expansion vessel pre-fill pressure must be increased, and the maximum system volume decreased.

4.6 Flow Rate

A valve must be incorporated in the main flow or return of the system, valve "A" shown in the flow in diagram 4.2. This valve must be lockable and positioned so that inadvertent closure or unauthorised interference is not possible. The design differential can be between 11°C (20°F) and 17°C (30°F), dependent on the system resistance and the available pump head. The pump adjuster should normally be left at maximum (3) but in some cases it is permissible to adjust the pump to a lower setting (2). See diagram 4.1.

To use diagram 4.1 start with the required heating system load.

In the example shown the maximum boiler output has been chosen, 23.5kW (80,000Btu/h).

Draw a horizontal line from the required system differential temperature axis to intersect the curve. In the example 11°C (19.8°F) has been chosen, shown - - - -. At the point of intersection draw a vertical line to cross the pump curve. From this point draw a further horizontal line to determine the available pump head. In the example 2.4m (7ft9in) is available. A greater pump head can be achieved by choosing a higher system differential temperature, up to a maximum of 3.8m (12ft 6in) at a system differential of 17°C (30.6°F). The system must be designed such that the available pump head is not exceeded.

If the heating system load is less than 14.7kW (50,000Btu/h) then it is permissible to adjust the pump setting to (2), shown — - — - — This results in an available pump head of 2.1m (7ft). This is the maximum that can be achieved with the pump at this setting.

4.7 Bypass

It is ESSENTIAL that a bypass of 22mm od minimum is fitted to all installations. The bypass must have a lockable valve, "B" in diagram 4.2, incorporated in a position so that inadvertent closure is not possible.

The bypass MUST be fitted before any system control. A radiator bypass is NOT recommended.

4.8 Make Up

Provision can be made for replacing water lost from the system using a make up bottle mounted in a position higher than the top point of the system, connected through a non-return valve to the return side of the heating circuit, see diagram 4.2.
Alternatively, provision for make up can be made by pre-pressurisation of the circuit.

4 Heating System

4.9 Filling Sealed Systems

Provision for filling the system at a low level must be made. Three methods of filling are shown in diagram 4.3. There must be no permanent connection to the mains water supply, even through a non-return valve. NOTE: It is important that fittings used for connection to potable water comply with the water undertakers requirements.

4.10 Corrosion Inhibitor

If an inhibitor is to be used in the system, contact a manufacturer so that they can recommend their most suitable product.

When fitting the boiler into an existing system, special care should be taken to drain the entire system, including radiators, then thoroughly cleaning out before fitting the boiler whether or not adding an inhibitor.

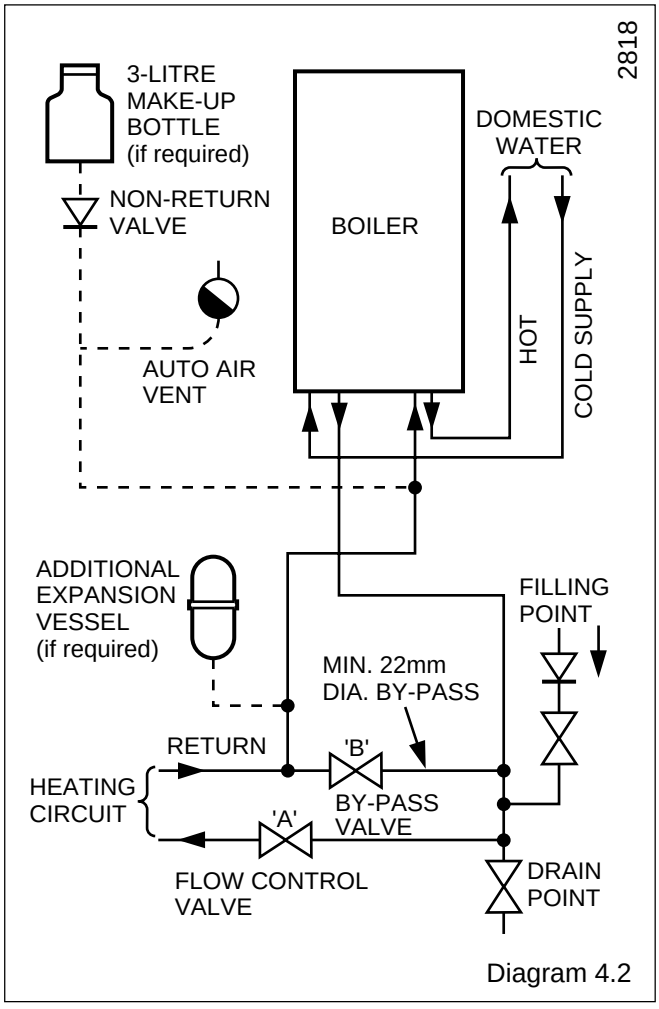


Diagram 4.2

4.11 Draining Tap

A draining tap must be provided at the lowest points of the system, which will allow the entire system to be drained. An additional draining tap MUST be fitted close to the boiler.

The flow and return isolation valves are provided with drain points for boiler heat exchanger drainage.

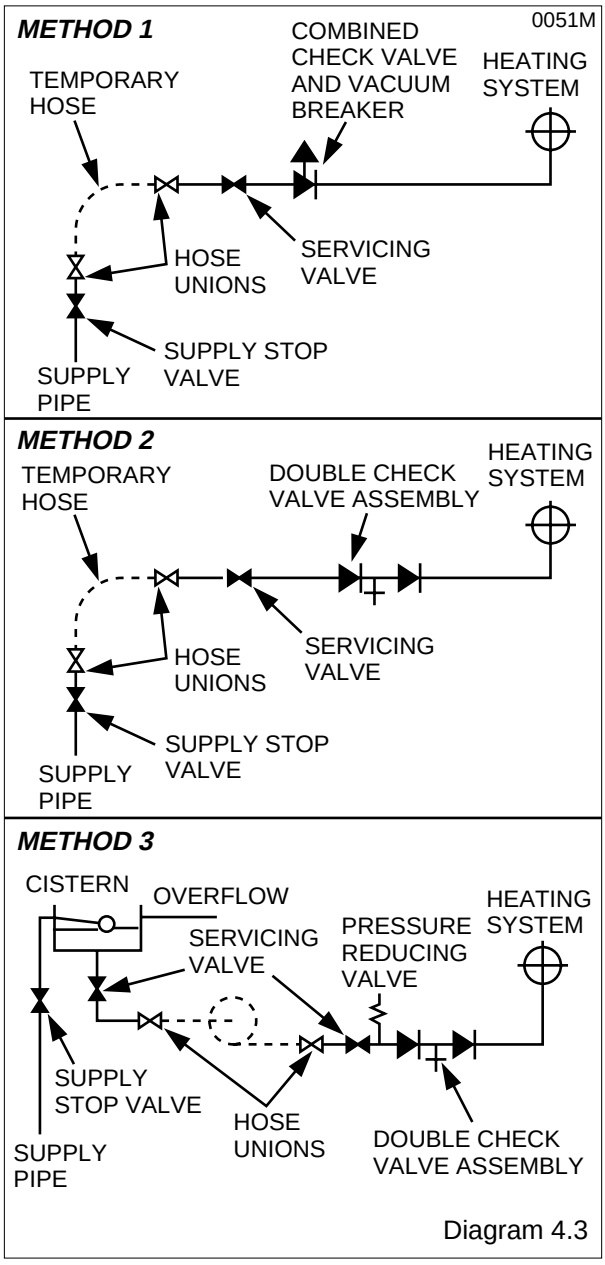


Diagram 4.3

5 Domestic Hot Water System

5.1 General

The domestic hot water service must be in accordance with the rules in force in the countries of destination.

5.2 Water Pressure

For the minimum and maximum working pressures of the domestic hot water circuit of the boiler, refer to Section 1.6. If the cold water supply pressure exceeds the maximum, a pressure reducing valve must be fitted in the supply to the boiler to reduce the pressure to within the limits given.

5.3 “Hard” Water Areas

In areas where the water is “hard”, that is, more than 200mg/litre, it is recommended that a proprietary scale reducer is fitted in the cold supply to the boiler. Check the total water “hardness” using the kit supplied, in the door, following the instructions given. Consult the local water company for additional advice.

A double check valve assembly must be fitted upstream of the scale reducer. For the relative position of the scale reducer and pressure reducing valve, if required, refer to the manufacturer’s instructions.

6 Appliance and Flue Preparation

6.1 Unpacking

Remove the top carton and cut out the flue template from the inner flap.

Open the control door, see diagram 6.1.

Remove the two screws securing the outer case and then lift it at the top and pull it forwards and off, see diagram 6.1.

Remove the cover of the inner case, secured with four screws, see diagram 6.2

Slacken flue collector thumb screws.

Remove the fan securing screws.

Disconnect the electrical plug connector and air pressure tube from the fan, see diagram 6.3.

Pull the fan forwards, at the bottom and rotate to disengage the fan outlet from rear bracket.

Take care not to damage the seal.

Tilt the fan and withdraw.

Disconnect the gas cock union and the front unions of the isolation valves, see diagram 6.4.

Slightly loosen the clips of the gas service cock and the isolating valves.

Remove the two boiler securing screws then remove the boiler from the mounting frame, by pulling the studs from the clips and unhooking it at the top.

6.2 Marking

The boiler mounting frame is the same width as the boiler case. The flue connection is on the top.

IMPORTANT: Should internal flue installation kit (Part No. 452481) which will enable the flue terminal to be inserted through the wall to the outside of the building be used, provision should be made to prevent any injury or damage due to falling debris.

Place the boiler mounting frame on the wall in the required position, see diagram 2.1, to maintain minimum clearances. Make sure that the isolation valves are at the bottom facing forward and that the frame top is horizontal, then mark the four wall fixing points through the holes in the two horizontal straps.

Position the flue template on the wall, the arrow points on the centres of the two upper fixing points previously marked, see diagram 6.5 which also gives dimensions.

For a rear flue, mark the position as required.

For a side flue, mark the horizontal flue centre line at the sides of the template. Extend the flue centre line horizontally left or right to the internal corner where the flue is required to exit to outside.

Mark the position of the circular hole, on the flue exit wall, using the dimensions given in diagram 6.6.

From the flue position marks, check that the flue terminal will be in a suitable position, see diagram 3.5.

6.3 Flue Hole Cutting

Having marked out the flue centre, cut a hole for the flue, using, preferably, a 130mm minimum core drill.

Note: If using the internal flue installation kit, the hole should be 150mm diameter.

Cut the hole horizontally in the wall, making sure that it does not slope down towards the boiler.

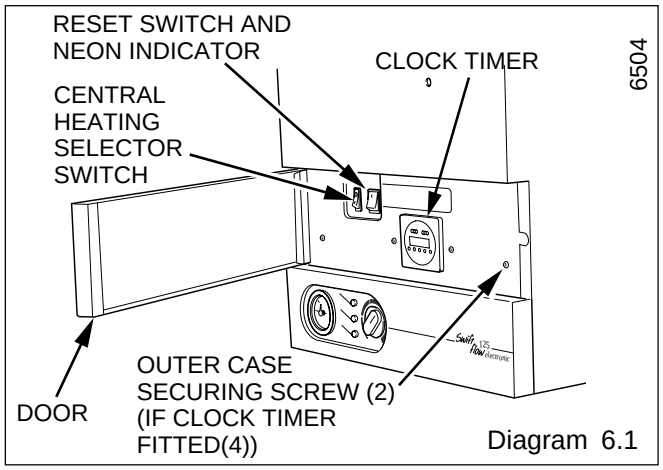


Diagram 6.1

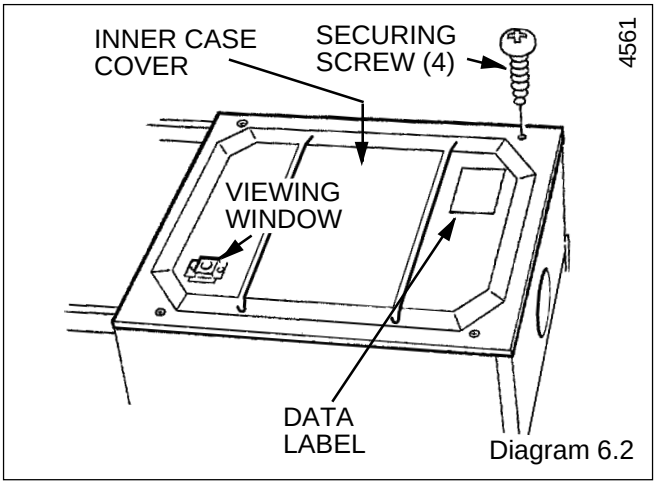


Diagram 6.2

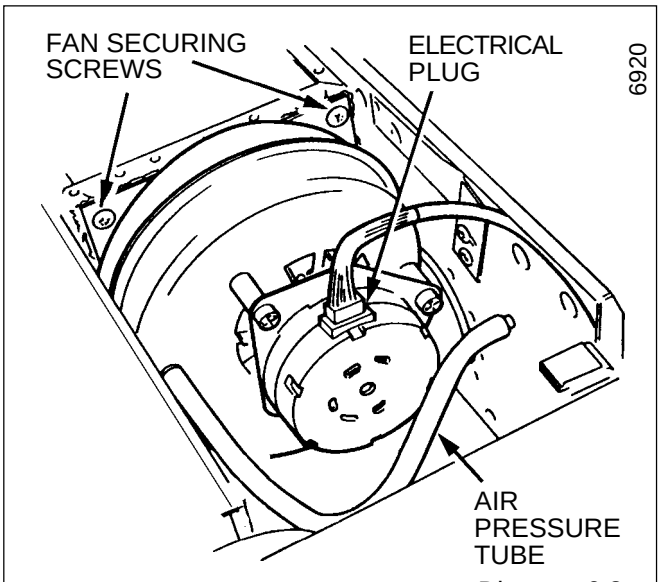


Diagram 6.3

6.4 Wall Sleeve

Note: If required, an optional Wall Liner Kit, Part No. 900861, is available, complete with fixing instructions.

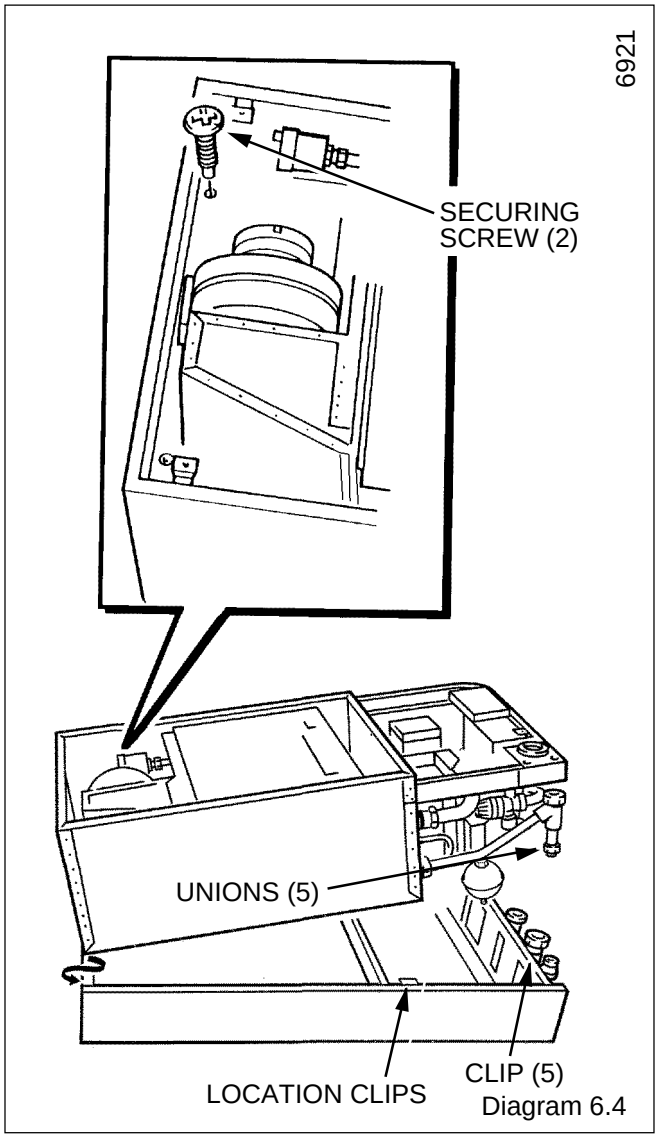


Diagram 6.4

6.5 Boiler Mounting Frame Fixing

Position the flue template over the flue hole and check the position of the wall fixing points. Mark the position of the fixing holes again, if required.

Drill the four fixing holes and insert wall plugs to suit No.10x50mm screws.

Secure the boiler mounting frame to the wall using No.10x50mm screws.

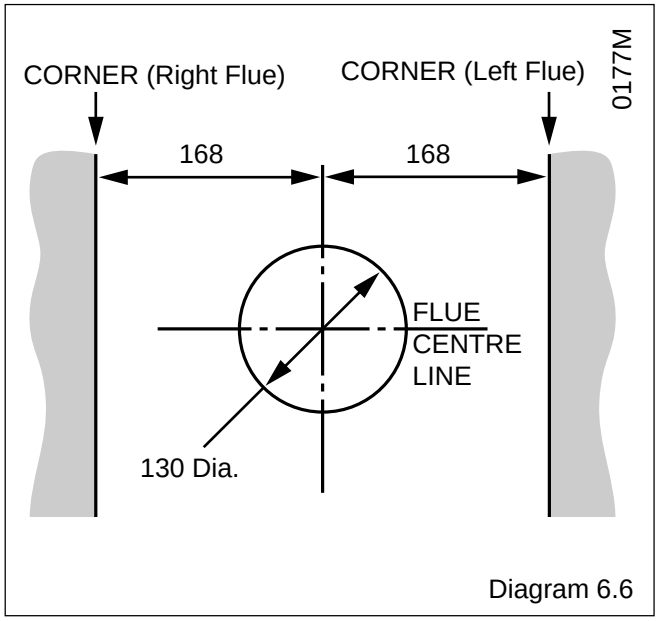


Diagram 6.6

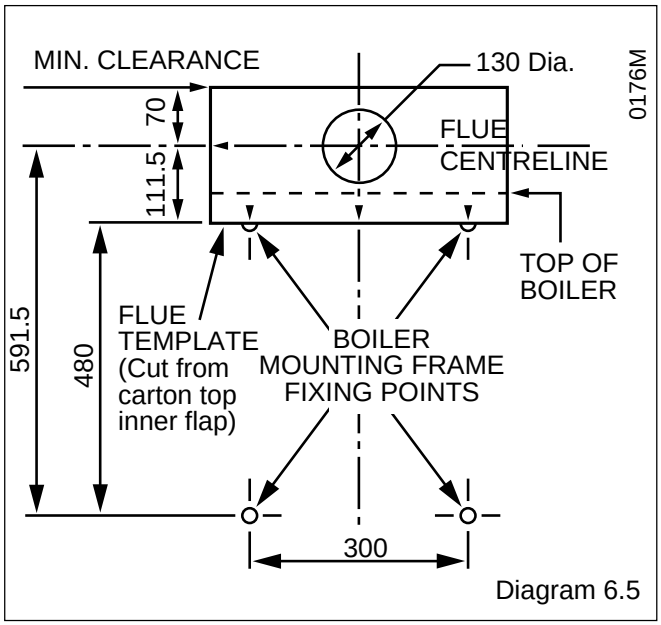


Diagram 6.5

7 Flue Preparation

7.1 Flue Length

For a rear flue, measure the distance from the outside wall face to the boiler mounting wall. Check that the flue length will be suitable, see diagram 3.1 for a standard flue system or diagram 3.3 for a 2 or 3metre flue system.

For a side flue, measure the distance from the outside wall face to the side of the boiler mounting frame. Check that the flue length will be suitable, see diagram 3.2 for a standard flue system or diagram 3.4 for a 2 or 3metre flue system.

7.2 Rear Flue

Note. Do not cut the flue duct at the pre-drilled end.

Mark the air duct/terminal assembly and the flue duct at the lengths shown in diagram 7.1 then cut to length, cutting square and removing any burrs.

7.3 Side Flue

Note. Do not cut the flue duct at the pre-drilled end.

Mark the air duct/ terminal assembly and the flue duct at the lengths shown in diagram 7.2 then cut to length, cutting square and removing any burrs.

7.4 Flue Assembly

Locate the flue duct, drilled end, onto the flue elbow and secure with screw supplied in loose items pack, see diagram 7.3.

Slide the spacer onto the flue duct.

Locate the flue duct/elbow into the air duct/terminal spigot and the air duct/terminal into the flue elbow making sure of the correct alignment of top. Drill the air duct and secure/seal (external fixing, do not seal) as shown in diagram 7.3.

7.5 Wall Liner

If a wall liner is used, fit self adhesive seal as follows:

For wall thickness up to 300mm fit the self adhesive seal to the air duct, see diagram 7.5, make sure the joint is on top.

For wall thickness over 300mm see diagram 7.4.

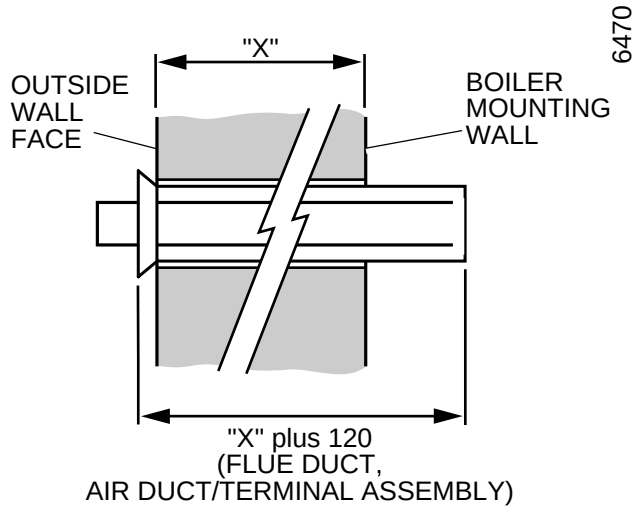


Diagram 7.1

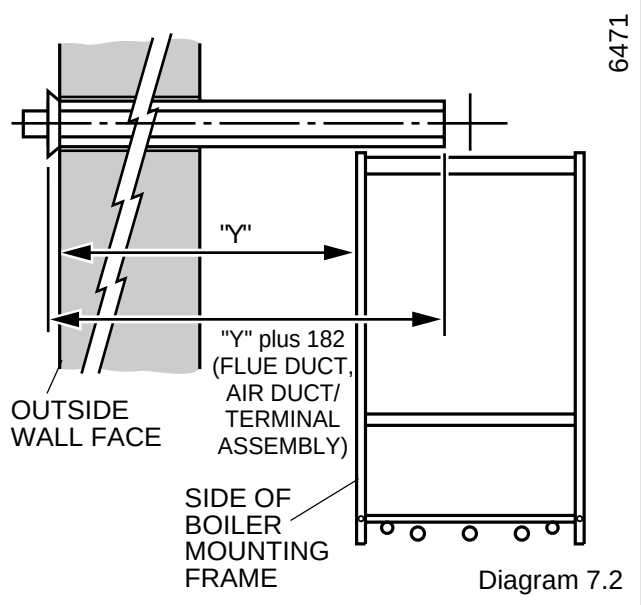


Diagram 7.2

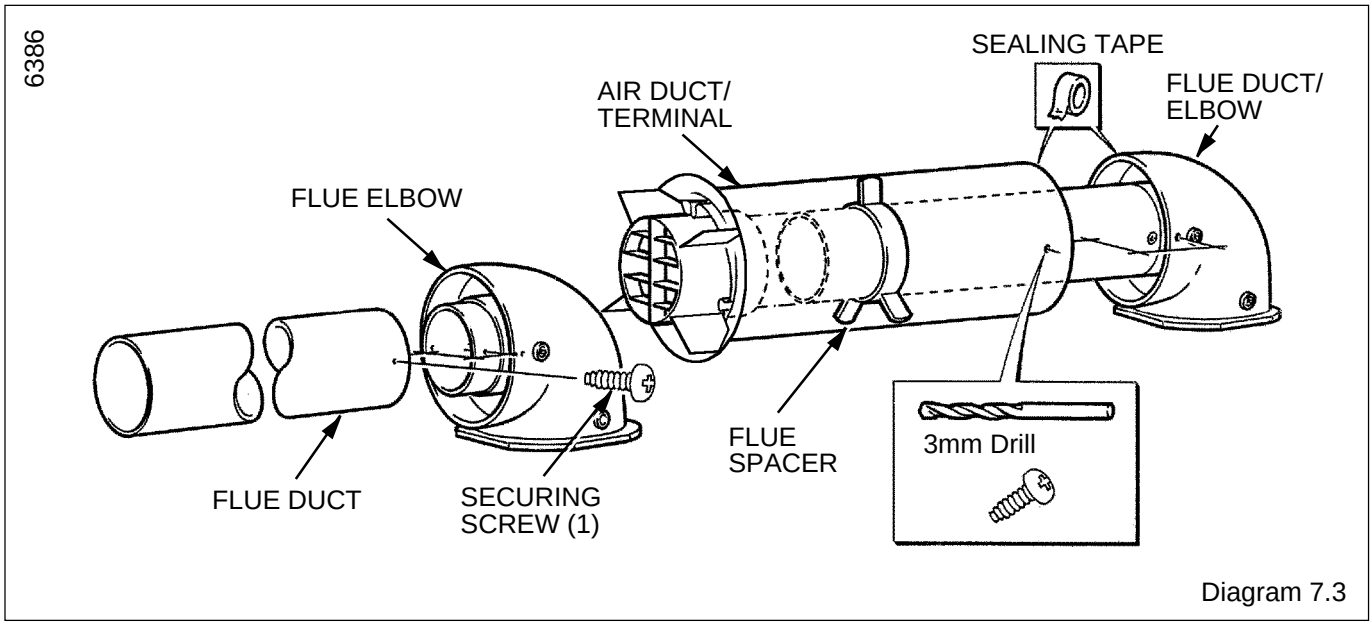


Diagram 7.3

7.6 Internal Flue Assembly

Note: This requires the use of the internal flue installation kit.

Place the flue assembly into the flue hole to make sure that the flue terminal is correctly positioned and is the correct distance from the outside wall face, see diagram 7.6 and the appropriate diagram 7.1 or 7.2.

7.7 External Flue Assembly

Remove the flue elbow from the air/terminal duct and the flue duct.

From outside place the flue/air duct assembly into and through the wall.

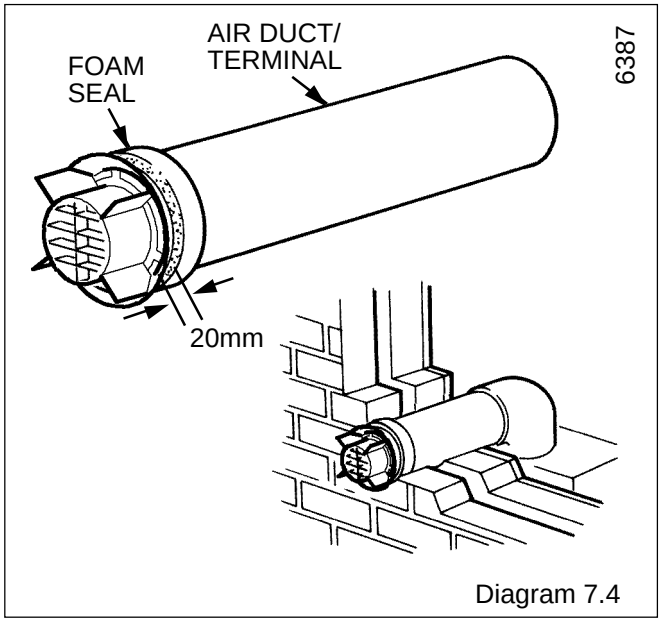


Diagram 7.4

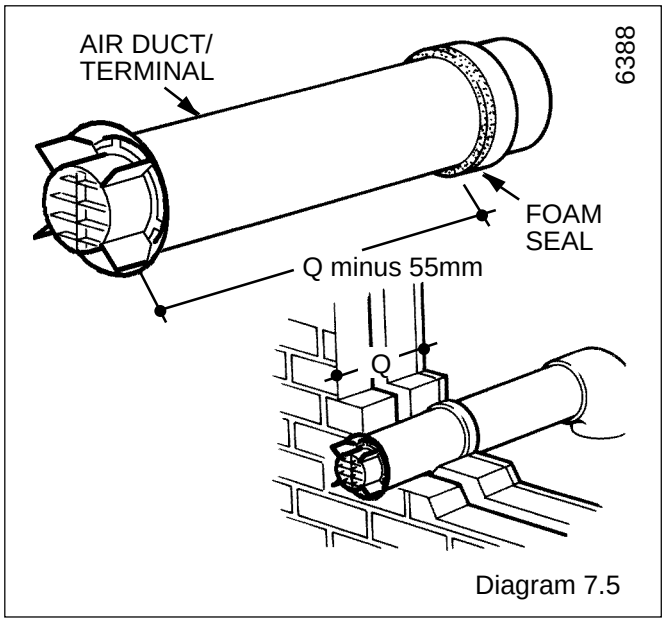


Diagram 7.5

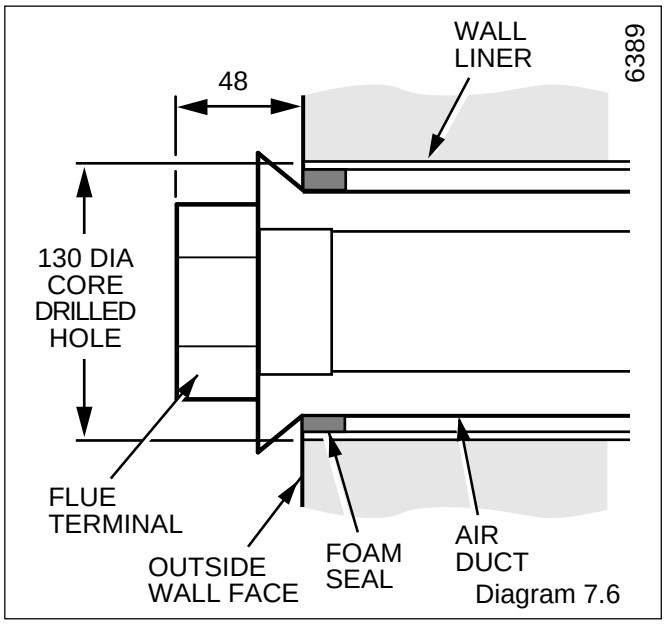


Diagram 7.6

8 Gas and Water Connections

8.1 Gas Connection

The gas supply can be connected from below or through the wall at the rear of the boiler, see diagram 8.1 for position.

Refer also to Section 1.7.

Make the gas supply connection to the gas service cock. Slacken or remove the clip, as desired, whilst making the connection. Do not subject the gas service cock to heat.

8.2 Water Connections

Provision is made for the water connections to be made from below or through an internal wall at the rear of the boiler, see diagram 8.1 for position.

Provision is made for the domestic hot water outlet and heating flow and return pipes to be connected from above, if desired, passing down either side of the boiler, see diagram 8.2 for clearances. Take care that any pipework connected from above, within the boiler mounting frame will clear the expansion vessels.

Flush out the domestic hot water and the heating systems before connecting to the boiler.

Make the connections to the domestic hot water outlet by straight connector and heating systems by way of the isolating valves, see diagram 8.1.

Slacken or remove the clips, as desired, while making the connections. Do not subject any of the isolating valves to heat.

Make sure that the drain points on the isolating valves are positioned towards the front of the boiler, also that the drain and operating screw heads are accessible.

8.3 Safety Valve Discharge

WARNING. It must not discharge above an entrance or window or any type of public access area.

A short discharge pipe is supplied loose with the boiler, which when fitted to the safety valve, will end below the boiler at the mark between the cold water inlet and the heating flow, for position and dimension see diagram 8.1.

This must be extended, using not less than 15mm od pipe, to discharge, in a visible position, outside the building, facing downward, preferably over a drain. The pipe must have a continuous fall and be routed to a position so that any discharge of water, possibly boiling, or steam cannot create any danger to persons, damage to property or external electrical components and wiring.

Note. To make future servicing easier it is advisable to use a compression type fitting to extend the discharge pipe.

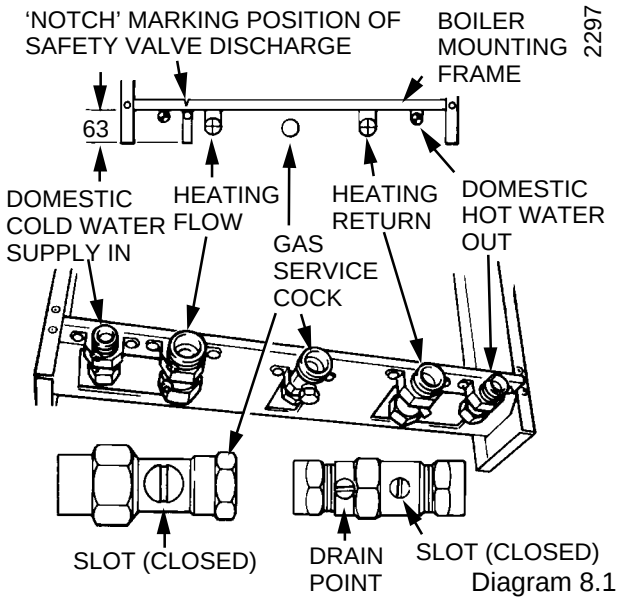
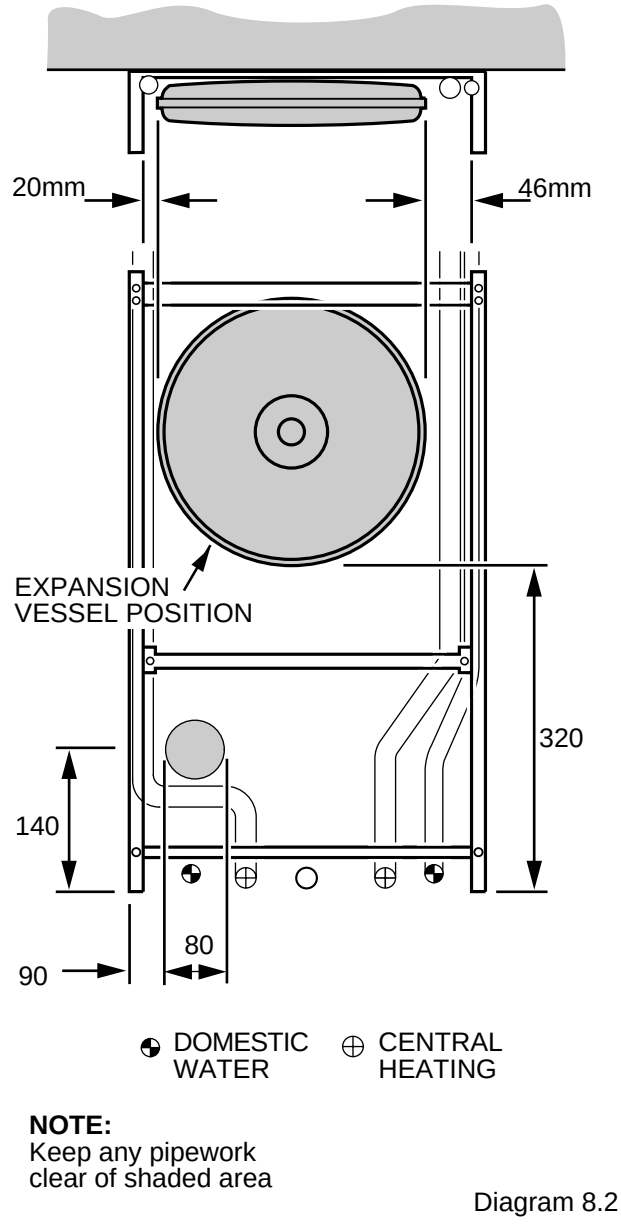


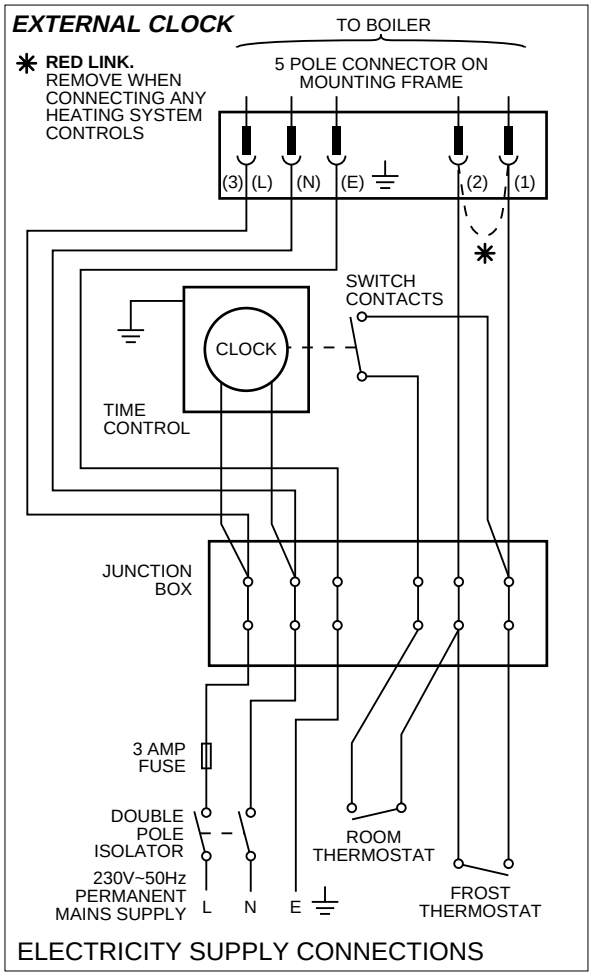
Diagram 8.1

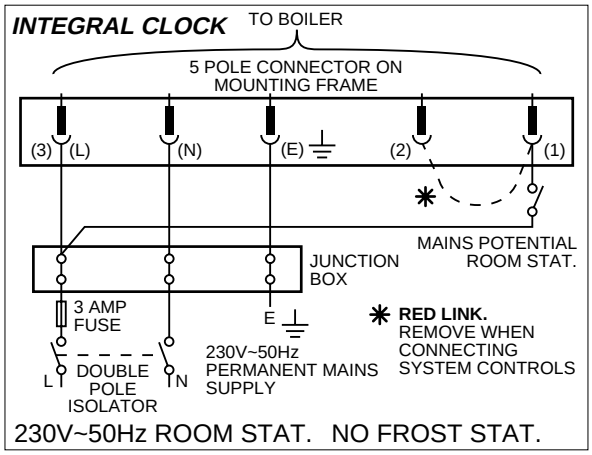


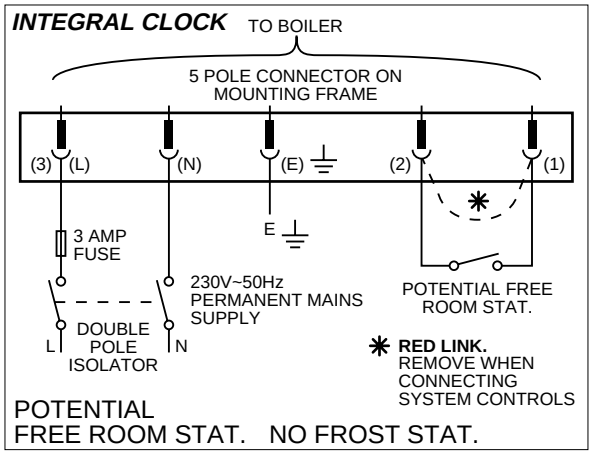
NOTE:
Keep any pipework clear of shaded area

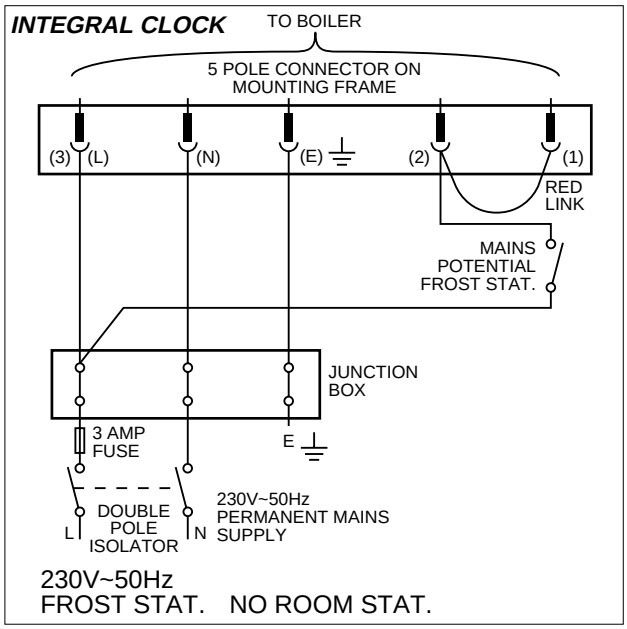
Diagram 8.2

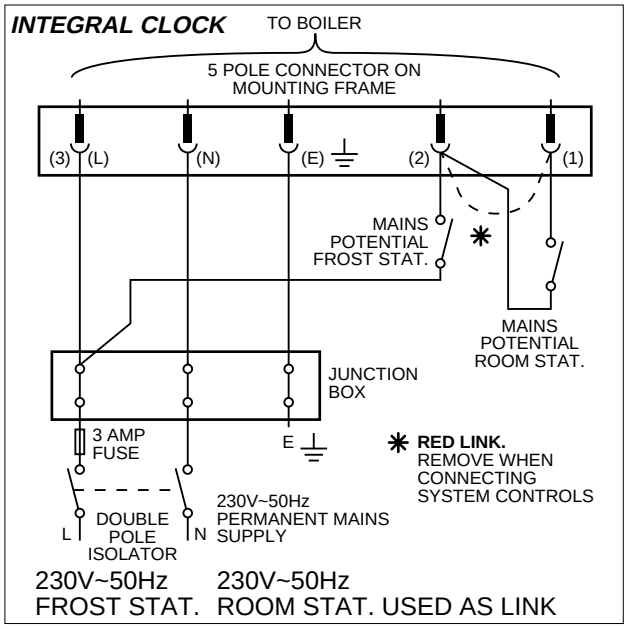
9 Electrical Connections











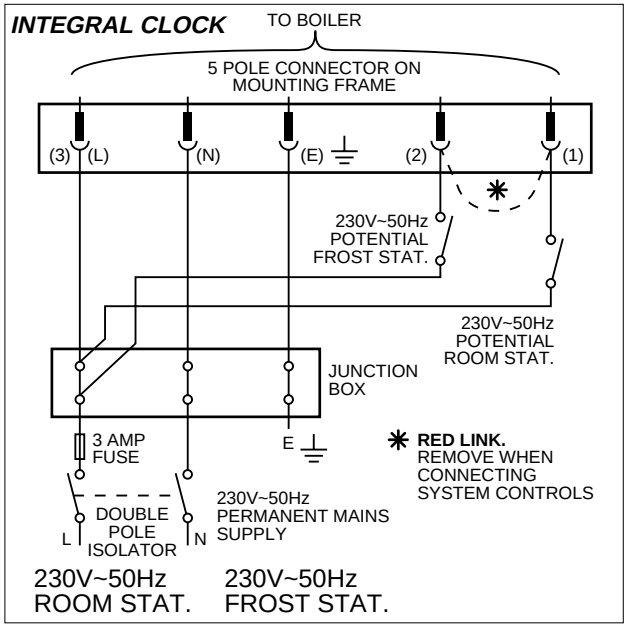


Diagram 9.1

9 Electrical Connections

9.1 Supply Cable Connection

The boiler requires a permanent mains supply through an isolator which must also isolate any heating system controls, see diagram 9.1.

Any heating system controls must not interrupt the permanent mains supply to the boiler.

Remove the electrical connector from the loose items pack.

Remove the two screws and cover from the connector, see diagram 9.2.

Using PVC cable of suitable length and rating as stated in Section 1.8, connect the mains supply cable to the appropriate terminals of the connector, see diagram 9.1.

Standard colours are, Brown - Live; Blue - Neutral; Green and Yellow - Earth.

The mains cable outer insulation must not be cut back external to the plug, see diagram 9.2.

Make the earth cable of a greater length so that if the cable is strained the earth would be the last to become disconnected.

CAUTION. It is essential that the polarity is correct.

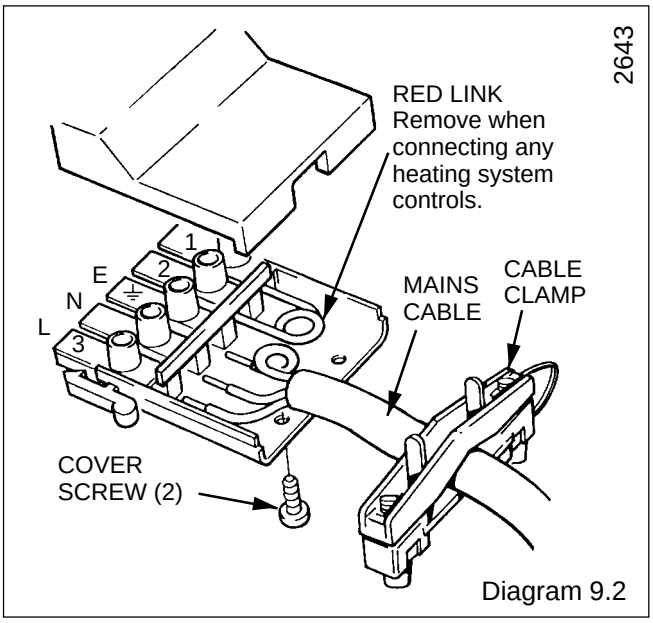


Diagram 9.2

9.2 Heating System Controls

CAUTION: To prevent an induced current from switching the central heating on, when not required, it is important that the heating system control cables are separated from the other mains supply cables.

The heating system should have installed: a programmer and room thermostat controlling the boiler.

Thermostatic radiator valves may be installed in addition to the room thermostat.

Note: For further information, see The Building Regulations 1991 - Conservation of fuel and power, 1995 edition - Appendix G, table 4b.

If electrical controls are not to be used to regulate the heating system, do not disturb the red link cable.

When any form of electrical control is being used to regulate the heating system, remove the red link cable and connect heating system controls in series.

The mains cable outer insulation must not be cut back external to the plug.

9.3 Clock/Timer

An internal clock/timer kit can be supplied, refer to the literature supplied with it.

9.4 Frost Thermostat

If the installation requires protection by a "frost thermostat", connect a single pole type, to the appropriate terminals of the connector.

9.5 Cable and Connector Securing

After completing all the connections to the boiler, secure the cable(s) with the cover, using the two screws previously removed, see diagram 9.2.

10 Boiler Fixing

10.1 Mounting the Boiler

After installing the flue, boiler mounting frame, gas, domestic and heating systems, making the electrical connections and preparing the flue components, continue as below:

Lift the boiler into position, hooking it onto the boiler mounting frame at the top, fully push the boiler back to the mounting frame, locating the studs into the clips, then loosely fit the two boiler securing screws at the top, see diagram 10.1.

10.2 Internal Flue Fixing

Fit gasket to flue elbow.

Secure the flue assembly to the boiler, see diagram 10.1.

Fit the fan to the flue elbow spigot making sure the fan sealing ring is fitted correctly and secure with the previously removed screws.

Secure the flue collector screws.

Make good internally and externally around flue.

10.3. External Flue Fixing

Fit gasket to flue elbow.

Locate flue elbow onto the boiler.

Fit the fan to the flue elbow spigot making sure the fan sealing ring is fitted correctly and secure with the previously removed screws.

Secure the flue collector screws.

Pull the flue/air duct(s) forward and engage onto the flue elbow, see diagram 10.2. Check the wall face to terminal dimension, see diagram 7.6.

Push the air duct back into the wall, whilst holding the flue duct onto the flue elbow, then secure the flue duct to the elbow, see diagram 10.2.

Pull the air duct back into engagement with the flue elbow and secure/seal.

Make good internally and externally around flue.

10.4 Gas and Water Connections

Locate the boiler water pipes into the isolation valves and the gas service into the gas cock union halves.

Make the compression joint on the isolating valves and join the gas service cock union. Secure all of the valves and gas service cock with the clips.

10.5 Boiler Securing

Secure the boiler by tightening the two boiler securing screws at the top.

10.6 Discharge Pipe

Remove the control housing cover front securing screw and the two control housing securing screws, see diagram 10.3.

Note. When removing and replacing the control box make sure you protect the cables from damage.

Remove the control housing and support as shown in diagram 10.4. If this is not possible, place on a surface, making sure that the control knob is protected.

Remove the pressure gauge complete with bracket, see diagram 10.5.

Fit the short discharge pipe to the safety valve using the nut and olive supplied loose, see diagram 10.6.

Extend the discharge, refer to Section 8.3.

Refit the pressure gauge.

10.7 Clock/timer Kit (if applicable)

Fit the clock/timer kit following the appropriate sections of the instructions supplied with it.

10.8 Electrical Connector

Connect the two halves of the electrical connector together.

Clip the connector into position on the boiler mounting frame and secure the cables with cable clamp immediately behind the connector.

Carry out preliminary electrical system checks using a suitable Multimeter and its instructions.

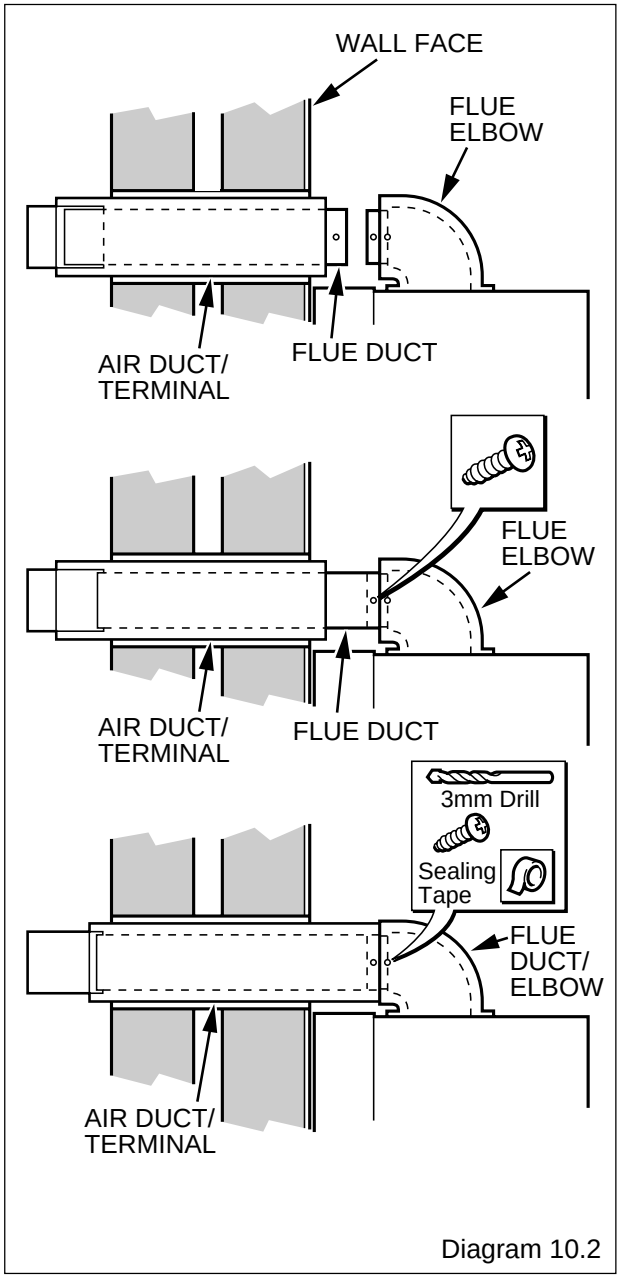


Diagram 10.2

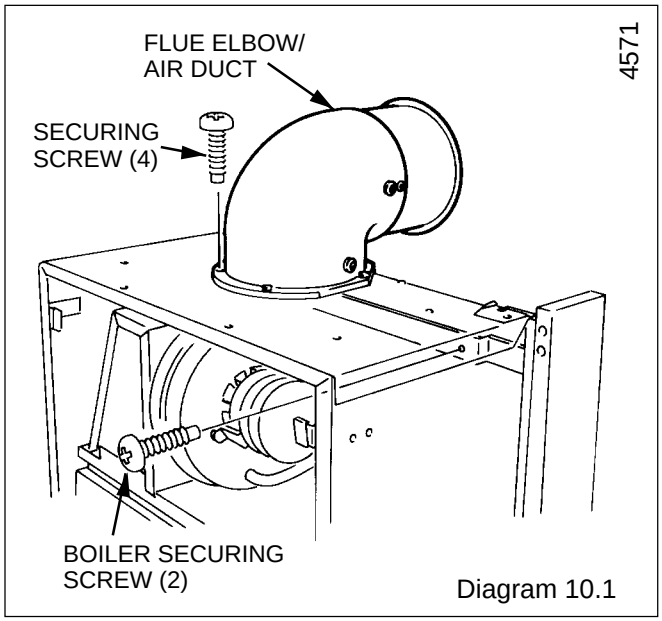


Diagram 10.1

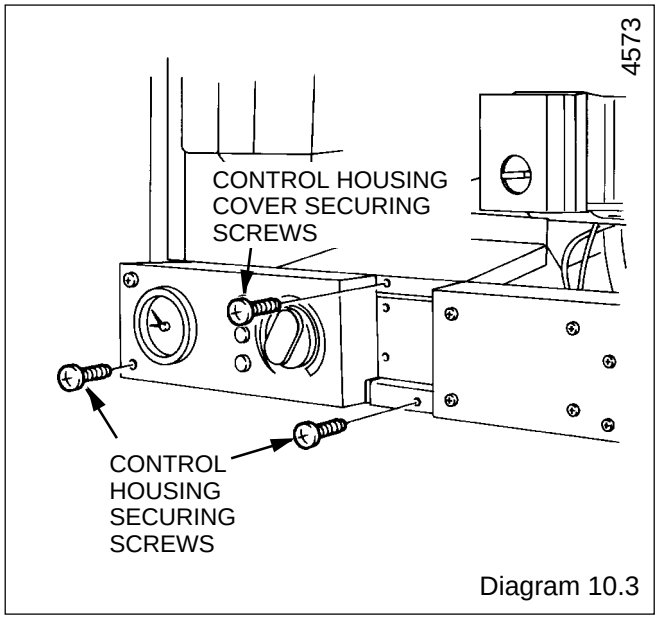


Diagram 10.3

10 Boiler Fixing

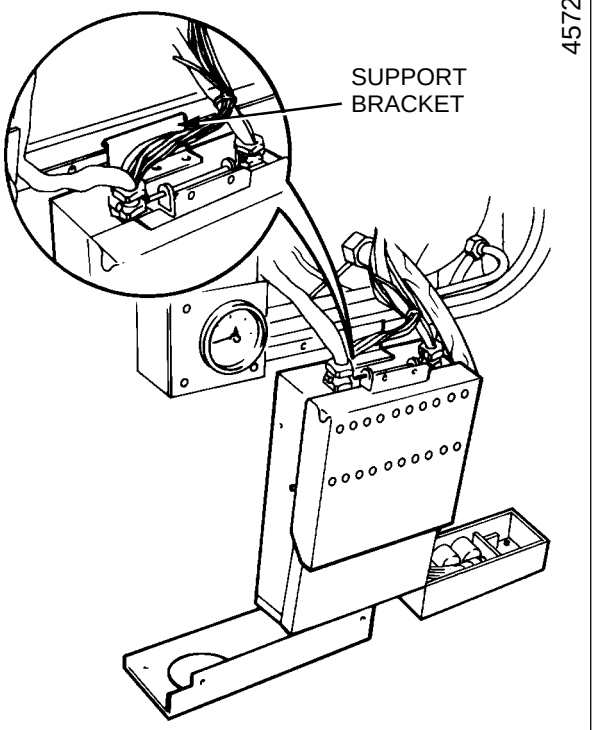


Diagram 10.4

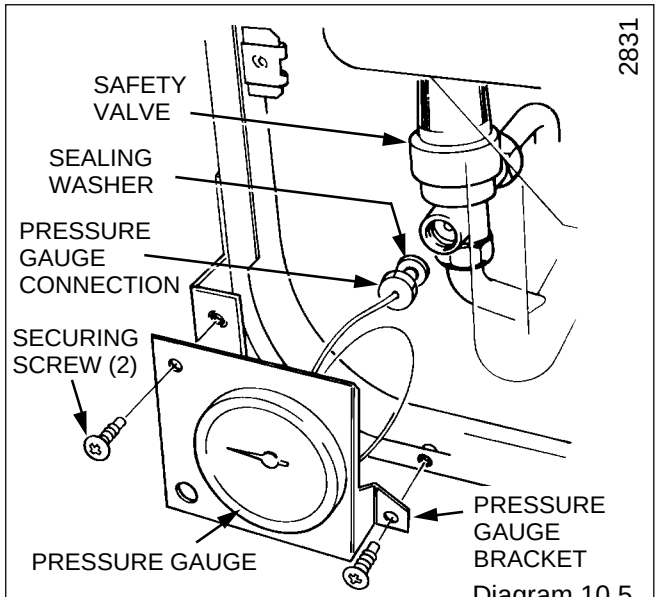


Diagram 10.5

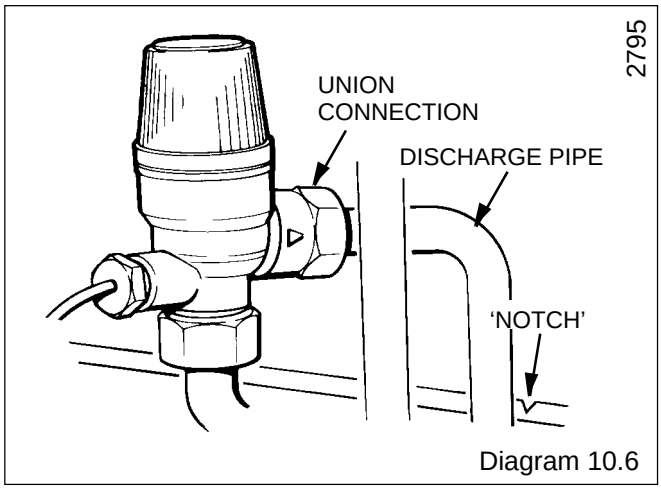


Diagram 10.6

11 Commissioning

11.1 Filling Domestic Water Circuit

Check that the boiler is isolated from the electrical supply, at the external isolator.

Fully open the domestic water supply stop cock or valve in the supply to the boiler.

Open the two domestic water isolation valves, slots in line with the length of the valve, see diagram 8.1.

Open all hot water draw-off taps and close them when the water flows. Check for water soundness of the complete domestic water system.

11.2 Filling the Heating Circuit

REMINDER: It is essential that a bypass is fitted in all installations, refer to Section 4.7.

Open the two central heating isolating valves, slots in line with the length of the valve, see diagram 8.1.

Flush, fill and vent the system refer to Section 4.9.

WARNING. Several components operate on mains voltage and with THE OUTER CASE REMOVED THEY BECOME EXPOSED.

To assist in filling and venting, the pump may be used.

IMPORTANT: Make sure that the gas supply is still isolated at this stage

Turn on the electrical supply, if red lockout neon is lit press reset switch, wait 15 seconds between attempts, set switch "C" to "ON" (see diagram 11.1) any remote heating system controls, time switch and room thermostat, for duty, see diagram 11.1.

Note. If the clock/timer kit is to be fitted, refer to the setting instructions in the Instructions for Use.

Make sure that the automatic air vent is operating correctly, see diagram 1.2.

Alternate the position of switch "C" between "ON" and "OFF" to make sure that water flows through all parts of the boiler and air is not trapped in the boiler internal bypass.

Pressurise the system until the pressure is 1.5bar (21.5lbf/in^2), pressure gauge "A", see diagram 11.1.

Check the heating system and boiler for water soundness.

11.3 Preparation for Lighting

Isolate the boiler from the mains electrical supply at the external isolator.

Test for soundness and purge air from the gas supply in accordance with the rules in force in the countries of destination. Turn on the gas service cock, slot in line with the length of the cock.

Remove the burner pressure test point screw and connect a suitable pressure gauge, see diagram 11.2.

Remove the combustion chamber negative pressure test point screw and connect to the pressure gauge as above, see diagram 11.1.

Note: The resultant readings given are differential pressures

11.4 Burner Pressure - Hot Water

The burner pressure will always require checking and in the majority of installations will require adjustment. Provision for this is made in the form of a potentiometer on the main P.C.B.

Note: All adjustments to be made while the appliance is hot.

The pressures are to be measured as a Δ p (differential pressure). It is therefore essential that one side of the manometer is connected to the valve test point, and the other side is connected to the negative pressure test point, see diagrams 11.1 and 11.2.

Connect the electrical supply, the pump will operate for about 30 seconds, then the pump stops.

Fully open the largest hot water draw off tap whereby the main burner will light, the flames gradually increasing to maximum.

Check the soundness of the boiler gas joints, with the main burner on, using leak detection fluid. Take care not to splash any of the electrical components.

Fully open the hot water throttle, (clockwise), see diagram 11.4. Check that the water flow rate is not less than 14Litre/min (3.1gall/min) to prevent any modulation of the gas pressure. This is equivalent to 4.3 seconds to fill a 1Litre container (2.4 seconds for 1pint).

To achieve this flow rate a water pressure of at least 0.8bar is required during commissioning, although subsequently the appliance will work at a minimum pressure of 0.5bar.

This flow rate should prevent any modulation of the gas pressure.

Check the burner pressure is within +/-0.2mbar of 16.8mbar, the hot water burner pressure. If this is incorrect, the burner pressure may be adjusted to the correct setting by turning the hot water gas pressure adjuster (potentiometer), using an insulated screwdriver, see section 11.5.

NOTE: If any adjustments have to be made, set the minimum pressure first.

Close the hot water draw off.

11.5 Gas Rate Modulation

ALWAYS CHECK HOT WATER BURNER PRESSURE FIRST - REFER TO SECTION 11.4.

Note: All adjustments to be made while the appliance is hot.

Check the minimum gas pressure.

First, make sure that the boiler is isolated from the electrical supply at the external isolator. Remove the jumper, see diagram 11.3, taking care not to mislay it

Note: This will lock the appliance at minimum gas rate

Switch on the electrical supply.

Half open a hot water draw off tap and the main burner will light at minimum gas rate.

Check that the burner pressure is 1.2mbar +/-0.2mbar. If this is incorrect, it may be adjusted by turning the minimum pressure potentiometer with a insulated screwdriver (anticlockwise to decrease pressure), see diagram 11.3.

Disconnect the electrical supply, and replace the jumper.

Switch on the electrical supply.

If the above adjustment was necessary, it will be essential to check that the maximum pressure can still be obtained.

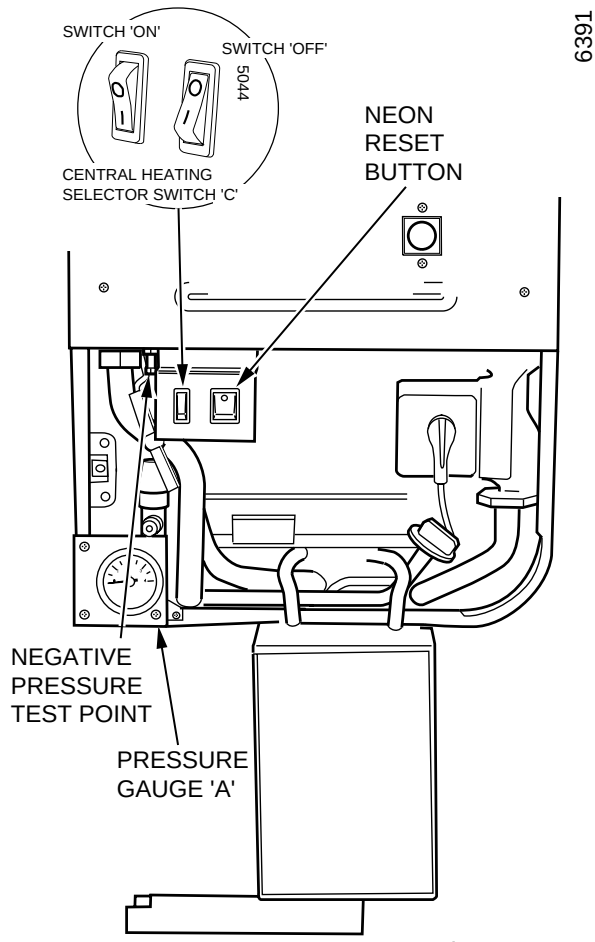
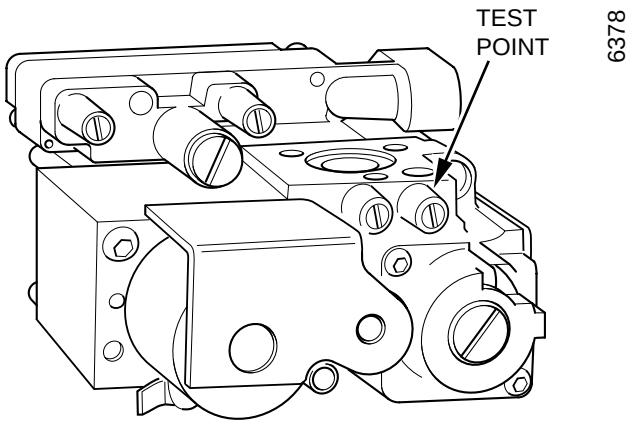


Diagram 11.1



To measure gas pressure as Δp a second test point is located in the bottom of the combustion chamber.

Diagram 11.2

Fully open a hot water draw off tap.

Check that the burner pressure is 16.8mbar. If this is incorrect, it may be adjusted by turning the hot water gas pressure potentiometer with a insulated screwdriver (clockwise to increase pressure), see diagram 11.3.

Check minimum pressure again.

If the maximum pressure is unobtainable, check that the gas supply is of adequate size, refer to Section 1.7. Put right as necessary.

11.6 Domestic Water Flow Rate

Adjust the water throttle to obtain a flow rate of 12Litre a minute (2.6gall/min), clockwise to increase, see diagram 11.4. This is equal to 5.0 seconds to fill a 1Litre container, 2.8 seconds to fill a 1pint container.

Close the tap when adjustment is satisfactory.

The minimum water flow rate for operation of the boiler is 3.6Litre a minute, (0.8gall/min), equal to 16.5 seconds to fill a 1Litre container, 9.5 seconds for 1pint. If this flow rate cannot be achieved, check that there is no blockage and that the supply pressure is adequate.

Refer to Table 2.

Close the hot water draw off tap.

11.7 Burner Pressure - Heating

Check that all remote heating system controls, room thermostats, time switches and the like are switched on/programmed and calling for heat.

Set switch “C” to “ON”, white flash showing, see diagram 11.1.

The pump will circulate water through the boiler and the main burner will light.

Check that the burner pressure, with the heating system cold and temperature control knob at maximum, to prevent any modulation of the gas pressure, is within +/-0.2mbar, of 8.0mbar. If the burner pressure is incorrect, it may be adjusted to the correct setting by turning the central heating gas pressure adjuster (potentiometer) using an insulated screwdriver, see diagram 11.3. Turn the adjuster slowly, always making adjustment by reducing below the required pressure then increasing up to the required setting, turn clockwise to increase.

Isolate the boiler from the electrical supply.

Remove the pressure gauge and replace the test point screws on gas valve and combustion chamber, see diagrams 11.1 and 11.2.

Test for gas soundness around the burner pressure test points with the main burner alight, using a suitable leak detection fluid.

Refit the cover of the control housing and refit the housing to the boiler.

11.8 Temperature Settings

The domestic hot water outlet and central heating flow temperatures are factory preset and sealed.

The nominal temperature setting for the Domestic Hot Water outlet is 60°C (140°F) at a flow rate of 5Litre a minute (1.1gal/min).

The specific water rate is 16.8litre per minute based on a 30°C temperature rise.

The nominal flow temperature setting for central heating is 80°C (176°F), with the user central heating temperature control set to maximum.

11.9 Heating System Commissioning

Check that all remote system controls and integral clock are calling for heat.

Fully open radiator valves, flow control valve “A” and bypass valve “B”, see diagram 4.2.

Set the heating system in operation and balance the radiators.

Adjust the flow control valve “A” to achieve the required system differential temperature between the boiler flow and return.

Turn off all radiators, then adjust bypass valve “B” to achieve the same temperature difference between the boiler flow and return.

Refer to Section 4.6 and diagram 4.1.

Allow the system to reach maximum temperature then switch off, isolate the boiler from the electrical supply and drain the system rapidly whilst hot, using the external drain tap at the lowest point of the system.

Fill and vent the system as described previously in Section 11.2. Add the inhibitor, if required, refer to Section 4.10.

Lower the pressure to the initial cold fill design pressure, using the draining tap, close to the boiler, refer to Table 2 and 4 Section 4.11.

Set pointer on the pressure gauge to this pressure.

Lock or remove the handles from the spindles of flow control valve “A” and bypass valve “B” to prevent unauthorised adjustment.

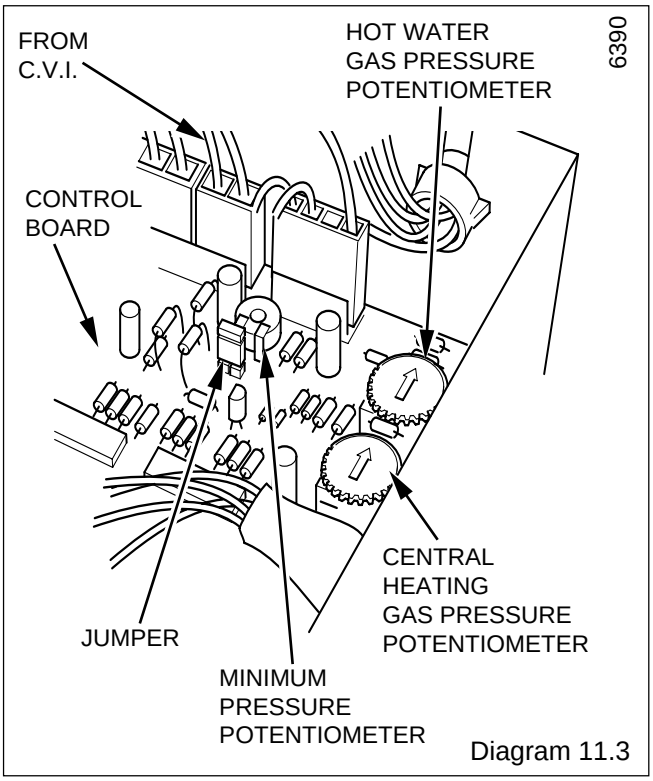


Diagram 11.3

11.10 Completion

The user control door is designed for left or right hand hinging. If required the hinge can be moved to the other side to that supplied, as follows:

Remove the hinge pin bracket securing screw then remove the hinge pin retaining bracket and, holding the door, remove the hinge pin. Prise out the hinge pin bushes and fit on to the opposite side of the door, see diagram 11.5.

Remove the screw and nut and fit to the opposite side of the case. After removing the other hinge pin retaining bracket refit the door and hinge pin. Refit the hinge pin retaining bracket and fit the securing screw.

Fit the catch assembly, supplied on the loose items pack, see diagram 11.5.

If required, fit the plastic covers to hide the bracket securing screw.

Change the position of the “Push” label to suit new door opening.

Clock/timer, if fitted, remove the screws, nuts and washers to release the cover plate, see diagram 11.5.

Stick the casing label to the right hand side of the clock/timer.

Fit the outer case, secure with the four screws, see diagram 11.5.

Note: Secure with the two outer screws only if there is no clock/timer fitted.

Set the boiler and any remote heating control to the desired settings, then close the door.

11.11 Instruct the User

Instruct and demonstrate the lighting procedure and advise the user on the safe and efficient operation of the boiler.

Instruct on and demonstrate the operation of any heating system controls.

Advise the user on the use and maintenance of any scale reducer and pass on any relevant instructional documents.

Advise that to ensure the continued efficient and safe operation of the boiler it is recommended that it is checked and serviced at regular intervals. The frequency of servicing will depend upon the installation conditions and usage, but in general, once a year should be enough.

Draw attention, if applicable, to the current issue of the Gas Safety (Installation and Use) Regulations, Section 35, which imposes a duty of care on all persons who let out any property containing a gas appliance.

It is the Law that all gas appliances are serviced by a competent person.

Advise the user of the precautions necessary to prevent damage to the system, boiler and the building, in the event of the heating system being out of use during frost or freezing conditions.

Advise the user that the permanent mains electrical supply must not be switched off whilst the pilot flame is alight.

Reminder, leave the Installation and Servicing Instructions with the user.

Advise the user that the ‘Benchmark’ logbook should be completed by the installation engineer on completion of commissioning or servicing.

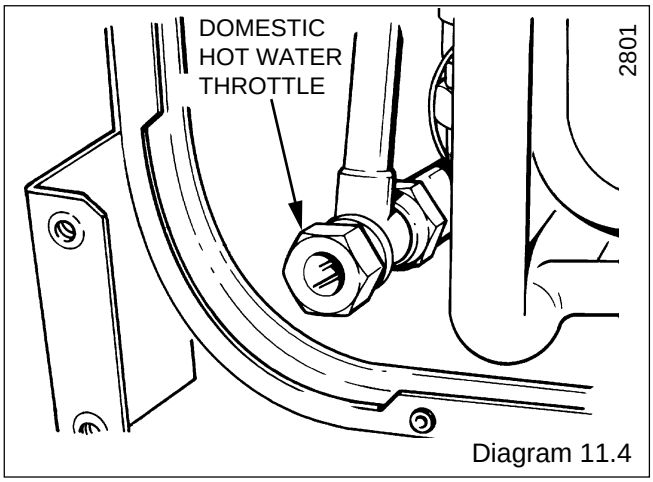


Diagram 11.4

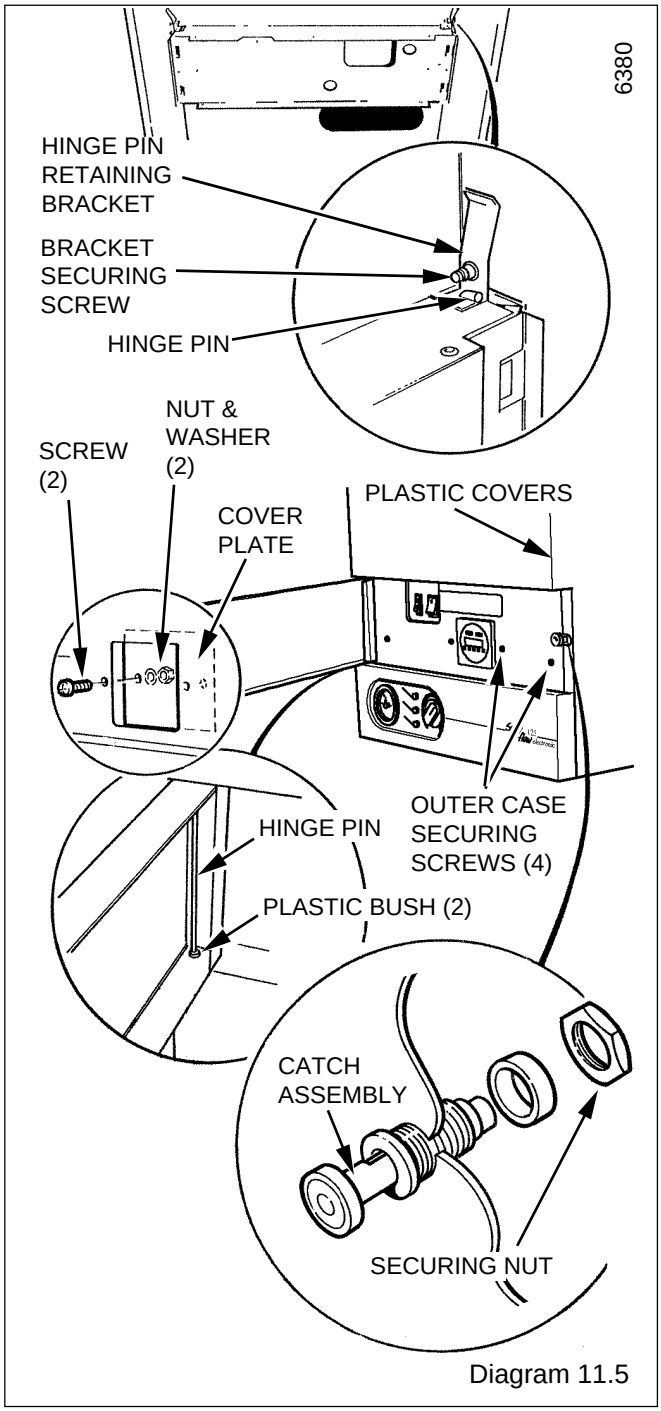


Diagram 11.5

1 General Data

1.1 Servicing or Replacing Parts

To ensure the continued efficient and safe operation of the boiler it is recommended that it is checked and serviced as necessary at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage, but in general once a year should be enough.

The servicing of this boiler must be carried out by a competent person in accordance with the rules in force in the countries of destination.

Unless stated otherwise, parts removed or renewed during servicing should be fitted in the reverse order to removal.

After completing any servicing, or renewing of gas carrying components, ALWAYS test for gas soundness and carry out functional checks of controls.

Discard all used sealing washers, gaskets and “O” rings when renewing components.

Use the new ones supplied with the replacement.

An Aid to Servicing

To obtain a products of combustion reading, make sure that the main burner is alight. Remove the plastic cap, see diagram 1.2 and connect the analyser probe to the tube, replace cap after use.

1.2 Data Label

The data label is positioned on the front of the inner case cover, see diagram 1.1.

1.3 Isolation of Boiler

Before commencing any servicing or the replacement of parts, isolate the boiler from the electrical supply at the external isolator and close the gas service cock, see diagram 4 User Instructions.

BEFORE DRAINING THE BOILER, REFER TO SECTION 1.6.

1.4 Outer Case Removal

The door opens to the left or right hand side. The door catch is spring loaded, to open, push the side opposite to the hinge then pull.

Remove the two screws securing the outer case then unhook the case at the top and pull it forward and off, see diagram 6.1 Installation Instructions.

Note: Remove the four securing screws if there is a clock/timer fitted.

1.5 Cover - Inner Case

Remove the cover of the inner case, secured by four screws, see diagram 1.1.

1.6 System Pressures and Draining

WARNING. All parts containing water of the central heating circuit within the boiler, are under the system pressure. Before any parts of this circuit are disconnected, reduce the system pressure at the external draining tap. Turn the central heating isolating valves off and drain at the drain points on the appropriate valves, see diagram 4 User Instructions.

All water containing parts of the domestic hot water circuit of the boiler will be under the supply water pressure. Before any parts of this circuit are disconnected, turn the domestic cold water isolating valve off, open the hot water taps to reduce the water pressure in the boiler, and drain the boiler at the valves, see diagram 4 User Instructions.

After replacing any water containing part of the central heating circuit, make up the water loss, vent all air and pressurise the system. Refer to “Commissioning” in the Installation Instructions.

Check for water soundness.

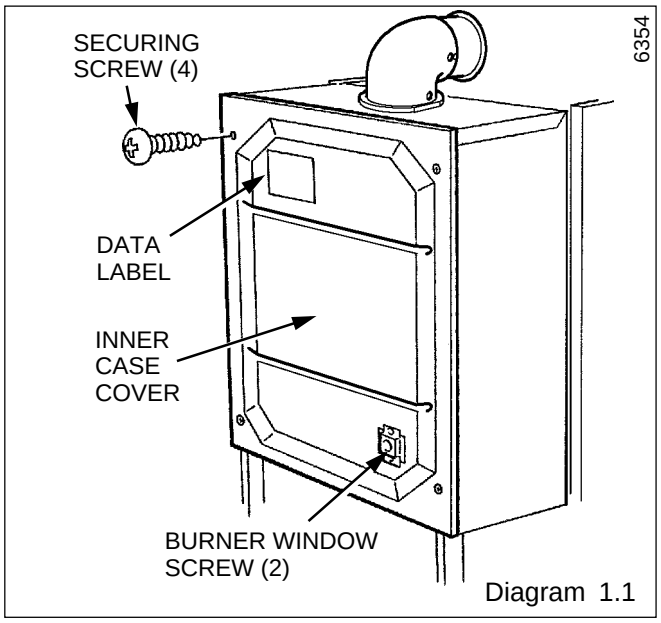


Diagram 1.1

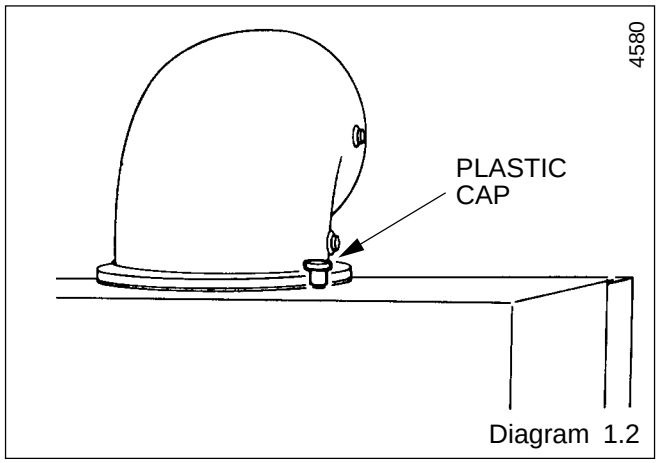


Diagram 1.2

2.2 Isolation and Access

Before starting, refer to Section 1.1.

Isolate the boiler from the electrical supply and close the gas service cock, refer to Section 1.3.

Remove the outer case and the inner case cover, refer to Sections 1.4 and 1.5.

Disconnect the electrical plug connector from the fan, see diagram 2.1.

Remove the flue collector securing screws, see diagram 2.1.

Remove the fan securing screws.

Pull the fan forwards, at the bottom and rotate to disengage the fan outlet to flue elbow and rear bracket.

Take care not to damage the seal.

Tilt the fan and withdraw.

Remove the flue collector, note, this may be a tight fit.

Remove the combustion chamber front panel, secured with four screws, see diagram 2.2.

Remove the spark electrode assembly from the burner, secured by 2 nuts, see diagram 2.3 and carefully lay it down in the combustion chamber.

Remove the burner support bracket wing nut and securing screw, see diagram 2.4.

NOTE: The sensing lead is connected to the burner. Disconnect the lead when the burner is being removed.

Remove the main burner from the main injector at the rear, see diagram 2.4. Raise the burner up and forwards. Take care not to damage the combustion chamber insulation.

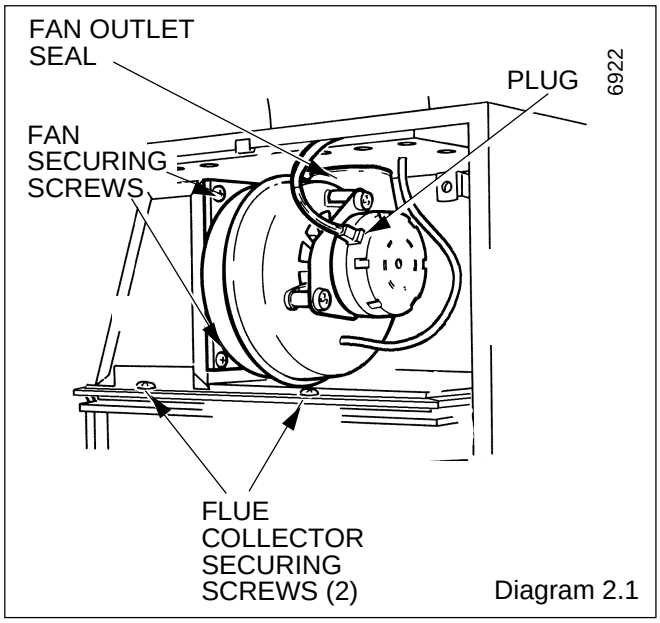


Diagram 2.1

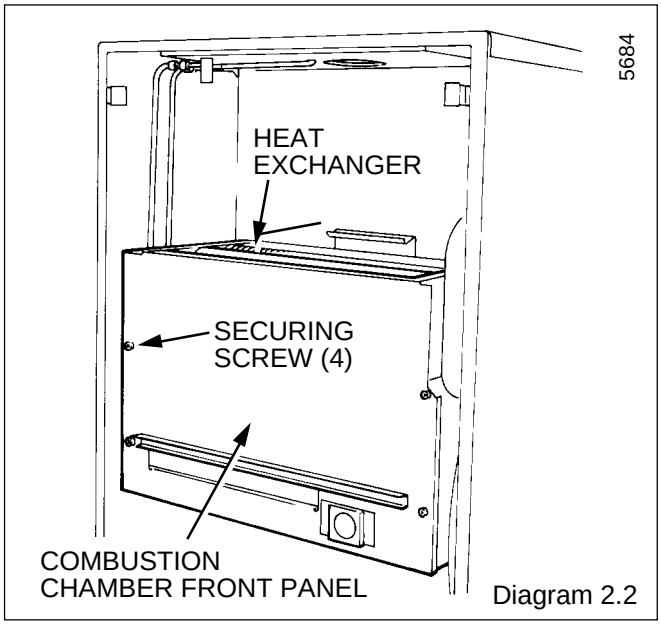


Diagram 2.2

2.3 Heat Exchanger

Place a sheet of paper or similar in the combustion chamber, to act as a collector for deposits removed.

Brush the heat exchanger with a suitable brush, remove paper together with any debris.

2.4 Main Injector

Inspect the injector and clean as necessary.

Do not use wire or a sharp instrument on the hole.

2.5 Main Burner

Use a vacuum cleaner or suitable brush to clean the burner thoroughly, making sure that all burner ports are clear and free from obstructions.

Do not use a brush with metallic bristles.

2.6 Service Checks

Before replacing any parts removed during servicing, inspect the condition of all seals and joints, renewing them as necessary.

Check the condition of the combustion chamber insulation.

Check that the spark and sensing gaps are as shown in diagram 2.3.

2.7 Note. Reassembly

Make sure the sensing lead is reconnected and the main burner is fitted correctly on assembly, located on the main injector and horizontal, the tips of the rearmost blade under the two burner guides, see diagram 2.4.

Locate the combustion chamber front panel under the front edge of the flue hood on assembly, then secure all screws and wing nuts.

The combustion chamber front panel should be fitted loosely, then the flue collector also fitted loosely, make sure that it is seated onto the heat exchanger and over the top edge of the front panel.

To fit the fan, locate it into the rear bracket and ease the flue elbow onto the fan outlet, making sure that the fan outlet seal is correctly positioned. Secure with the two screws, see diagram 2.1.

Refit electrical connector making sure that the red spots are aligned.

Refit the sensing tube.

Secure the flue collector and combustion chamber front panel by tightening the securing screws, see diagram 2.1 and 2.2.

Refit the inner case cover, see diagram 1.1.

2.8 Operational Checks

Light the boiler, carry out operational checks and any necessary adjustments as described in “Commissioning” in the Installation Instructions.

2.9 Completion

Hook the outer case on at the top and secure with the screws previously removed, see diagram 6.1 Installation Instructions. Close the door.

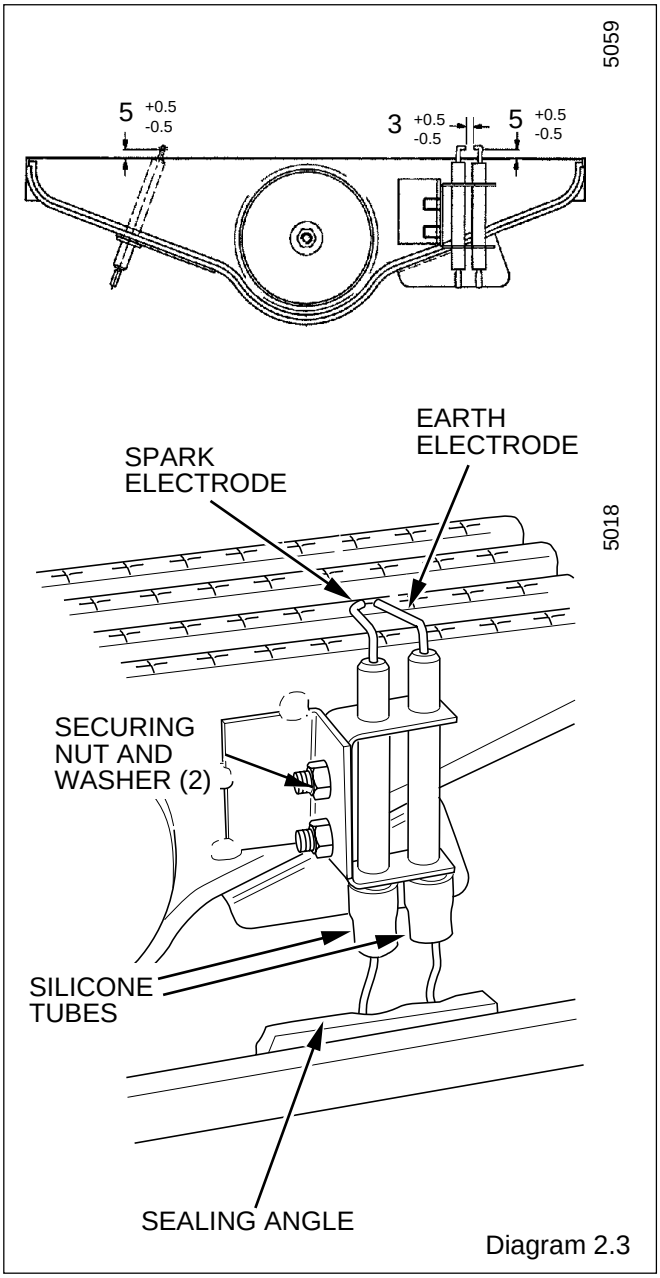
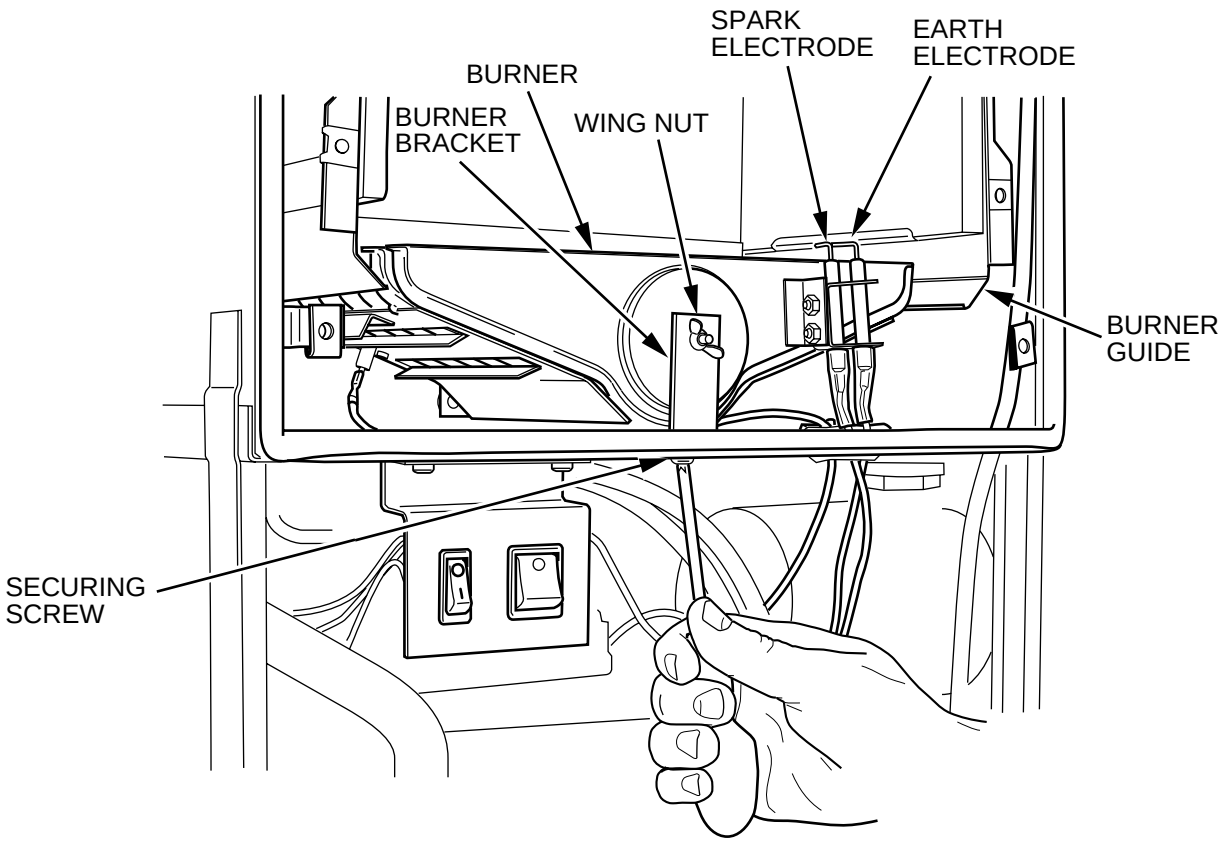


Diagram 2.3


5695
SPARK ELECTRODE
EARTH ELECTRODE
BURNER
BURNER BRACKET
WING NUT
BURNER GUIDE
SECURING SCREW

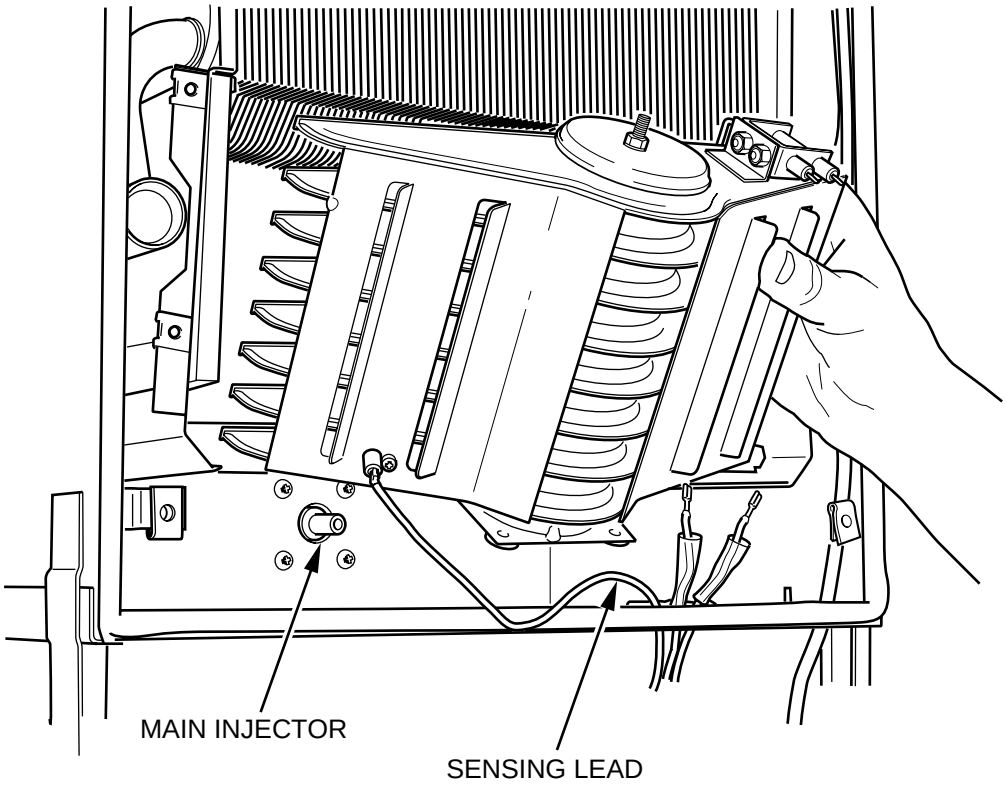

5697
MAIN INJECTOR
SENSING LEAD

Diagram 2.4

3 Fault Finding

3.1 Initial Checks

If the boiler fails to operate, first check the following:

1) That the electrical supply is available at the boiler and the fuses are in order.

NOTE: THE BOILER CONTROL BOARDS CAN BE DAMAGED BY INCORRECT TESTING WITH THE POWER ON.

2) Make sure that the system pressure gauge registers 0.7bar, minimum, and that the automatic air vent works. Refer to Installation Instructions, Section 11.2.

3) That the gas supply is available at the boiler and purged of air.

4) That the boiler is set for the required service.

5) With the boiler central heating selector switched “Off”, see diagram 6.1 Installation Instructions, check that the domestic water supply is available and water flows freely from the hot taps. Close the taps.

6) With the boiler central heating selector switched “ON”, see diagram 6.1 Installation Instructions, check that all heating system controls, if fitted, are working correctly and calling for heat. If not isolate the boiler from the electrical supply. Disconnect the rear multipole connector at the base of the boiler and release the cable from the clamp.

Remove the connector cover and dependent on the type of control fitted test for continuity of mains at terminals 1 and 2, see diagram 3.1.

7) Check reset button - if red neon is lit press button. In certain circumstances the red neon light may not come on, due to no system demand. Turn on a domestic hot water draw off tap to create a demand, the light should come on, if reset is required.

Allow the boiler and system to cool down waiting at least a minimum of four minutes before pressing the reset button.

If this is satisfactory proceed with the detailed fault finding as Section 3.3.

3.2 Clock/Timer

If the clock has failed it can be bypassed by isolating electrical supply and gaining access to the control box. Refer to Section 4.14, disconnect the clock wiring harness from the 4 way terminal block. Fit a yellow link between the terminals Y1 and Y2.

This is a temporary measure and the clock should be repaired or replaced as soon as possible.

3.3 Electrical

Preliminary electrical system checks, as outlined in a Multimeter Instruction book, are the first checks to be carried out during a fault finding procedure.

WARNING: Should fault finding have to be carried out on the CVI box, see diagram 4.13. Precautions should be taken as this box carries high voltage.

Isolate the boiler from the electrical supply, refer to Section 1.3.

Gain access to the boiler controls by removing the outer case, refer to Section 1.4. Check that all cables and connectors are secure.

Gain access to the control board, refer to Section 4.14. Check all cables at the multipin connectors on the board.

Test the two fuses on the main control board and renew as necessary. Fuse 1 type (2AT), Fuse 2 type (3.15 AT). If a fuse fails repeatedly or the initial fault-finding checks described in Section 3.1 indicate a boiler fault, check the boiler electrical circuits and follow the fault finding procedures, see diagram 3.2, 3.3, 3.4, 3.5 and for clock/timer fault finding, diagram 3.6 and 3.7.

On completion of a fault finding task that has required the disconnection and making of electrical connections then checks, for earth continuity, polarity and resistance to earth must be carried out.

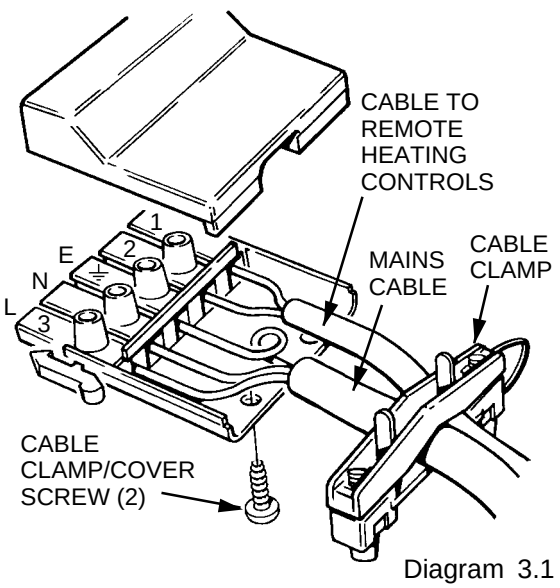


Diagram 3.1

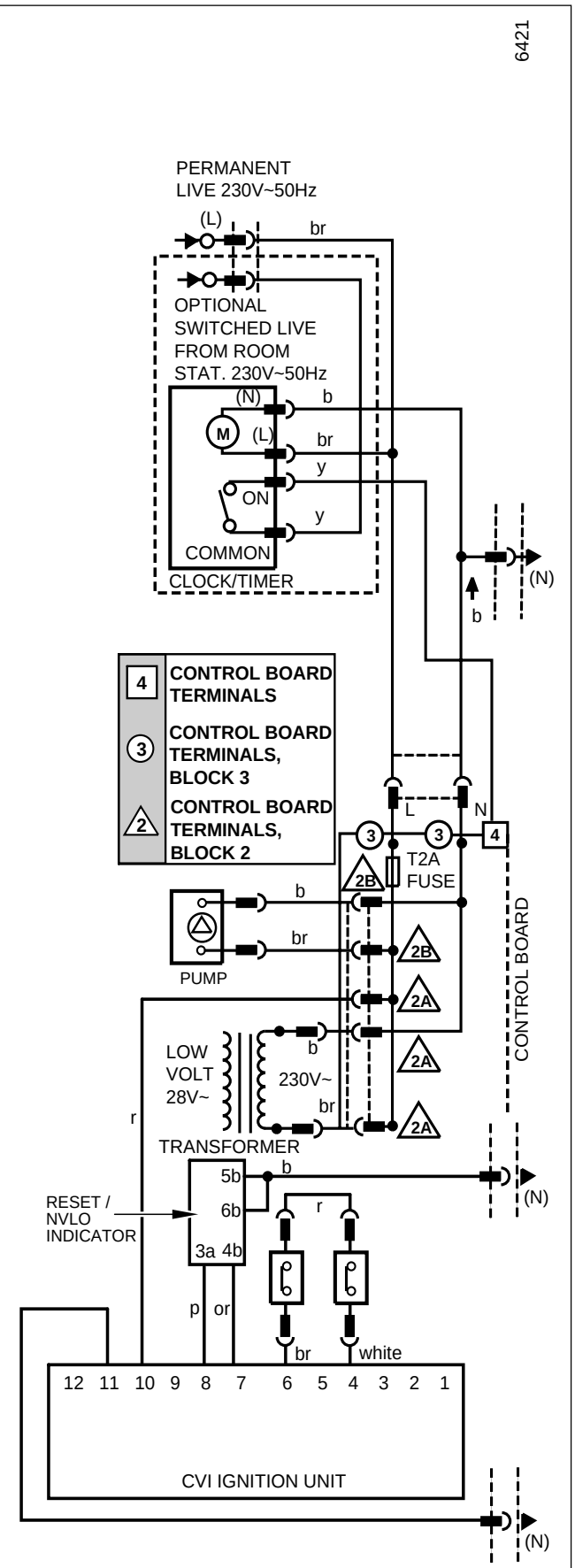


Diagram 3.2

KEY

br	**BROWN**	**y**	**YELLOW**
b	**BLUE**	**or**	**ORANGE**
r	**RED**		
p	**PURPLE**		
v	**VIOLET**		

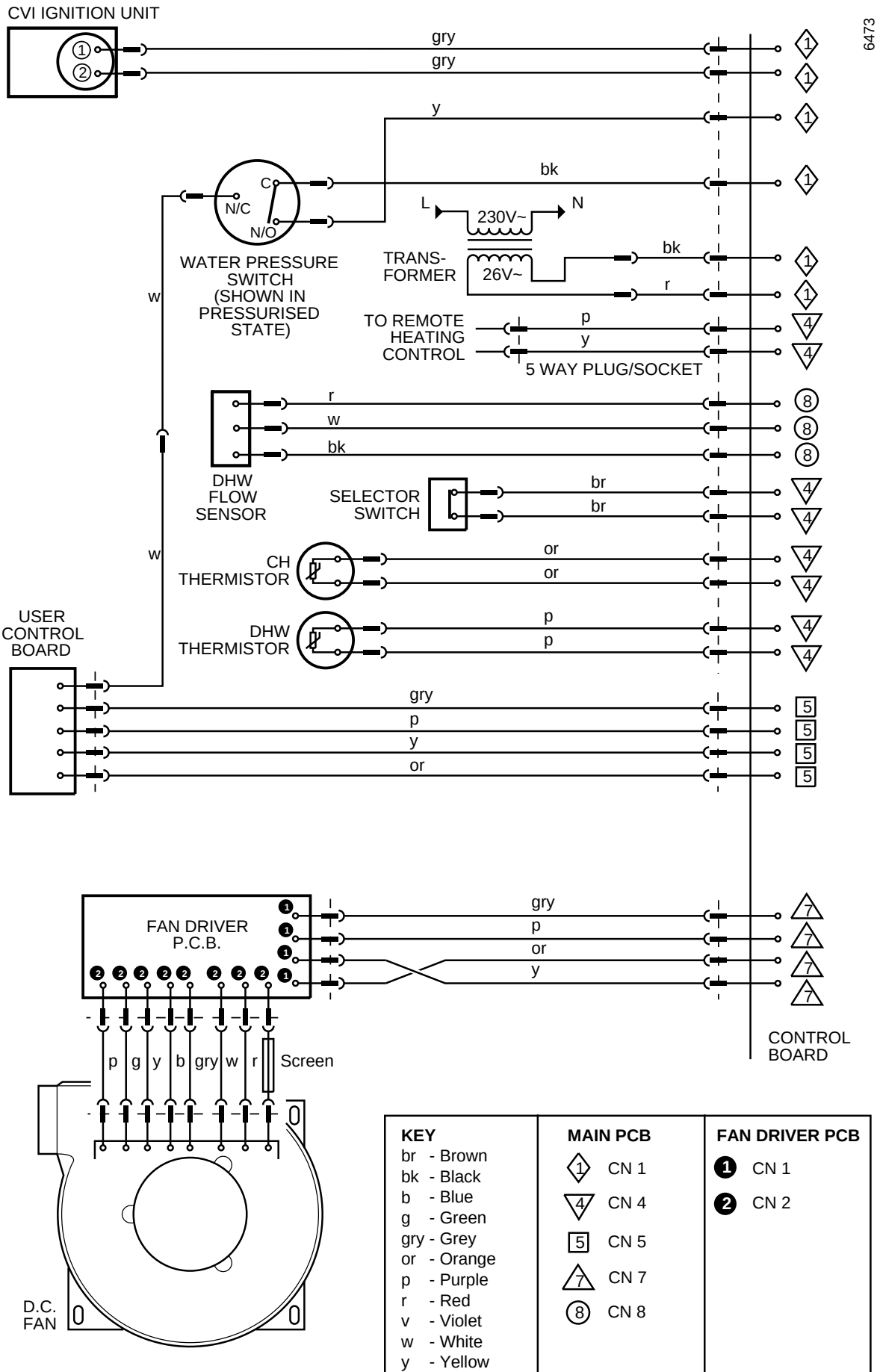

CVI IGNITION UNIT
6473
gry
gry
y
bk
C
N/C
N/O
L
230V~
N
WATER PRESSURE SWITCH (SHOWN IN PRESSURISED STATE)
TRANS-FORMER
26V~
bk
r
w
TO REMOTE HEATING CONTROL
p
y
5 WAY PLUG/SOCKET
r
w
bk
DHW FLOW SENSOR
SELECTOR SWITCH
br
br
CH THERMISTOR
or
or
DHW THERMISTOR
p
p
USER CONTROL BOARD
gry
p
y
or
FAN DRIVER P.C.B.
gry
p
or
y
p g y b gry w r Screen
D.C. FAN
CONTROL BOARD
KEY
br - Brown
bk - Black
b - Blue
g - Green
gry - Grey
or - Orange
p - Purple
r - Red
v - Violet
w - White
y - Yellow
MAIN PCB
CN 1
CN 4
CN 5
CN 7
CN 8
FAN DRIVER PCB
CN 1
CN 2

Diagram 3.3

6420

Carry out initial Fault Finding checks described in Section 3.1 and 3.4. Check that gas, water and electricity are available at the boiler.
Before starting the test, isolate the boiler from the electrical supply, ensure that the remote controls are not calling for duty. Refer to the functional flow diagrams in conjuction with the following fault finding.

START

Remove outer case control housing, control housing cover, user control knob and the cover. Check all connections on the controls boards. Rectify or renew as necessary.

Restore power to the appliance. Is the Orange 'Mains' light illuminated?
NO → Faulty 'User Control' Replace
YES

Does Pump run?
NO → Refer to Electrical Control Fault Finding
YES

Turn on DHW tap Does DHW work OK?
NO → Refer to Fault Finding
YES

Is green LED lit?
NO → Faulty 'User Control' Replace
YES

With central heating demand on. Can the temperature be varied by rotating the control knob?
NO → Faulty 'User Control Replace
YES

Turn off C.H. and D.H.W demand. Simulate a leak on Central Heating Circuit by draining the appliance. As pressure approaches 'ZERO' does the Red 'Low Pressure' light flash?
NO → See Electrical Controls fault finding for 'Water Pressure Switch', if in order replace faulty user control
YES

User Control board in order To stop Red 'Low Pressure' light flashing. Refill C.H circuit to 0.7 bar then switch the electrical supply to the appliance off and then on. Proceed to Electrical Controls fault finding if fault persists.

Diagram 3.4

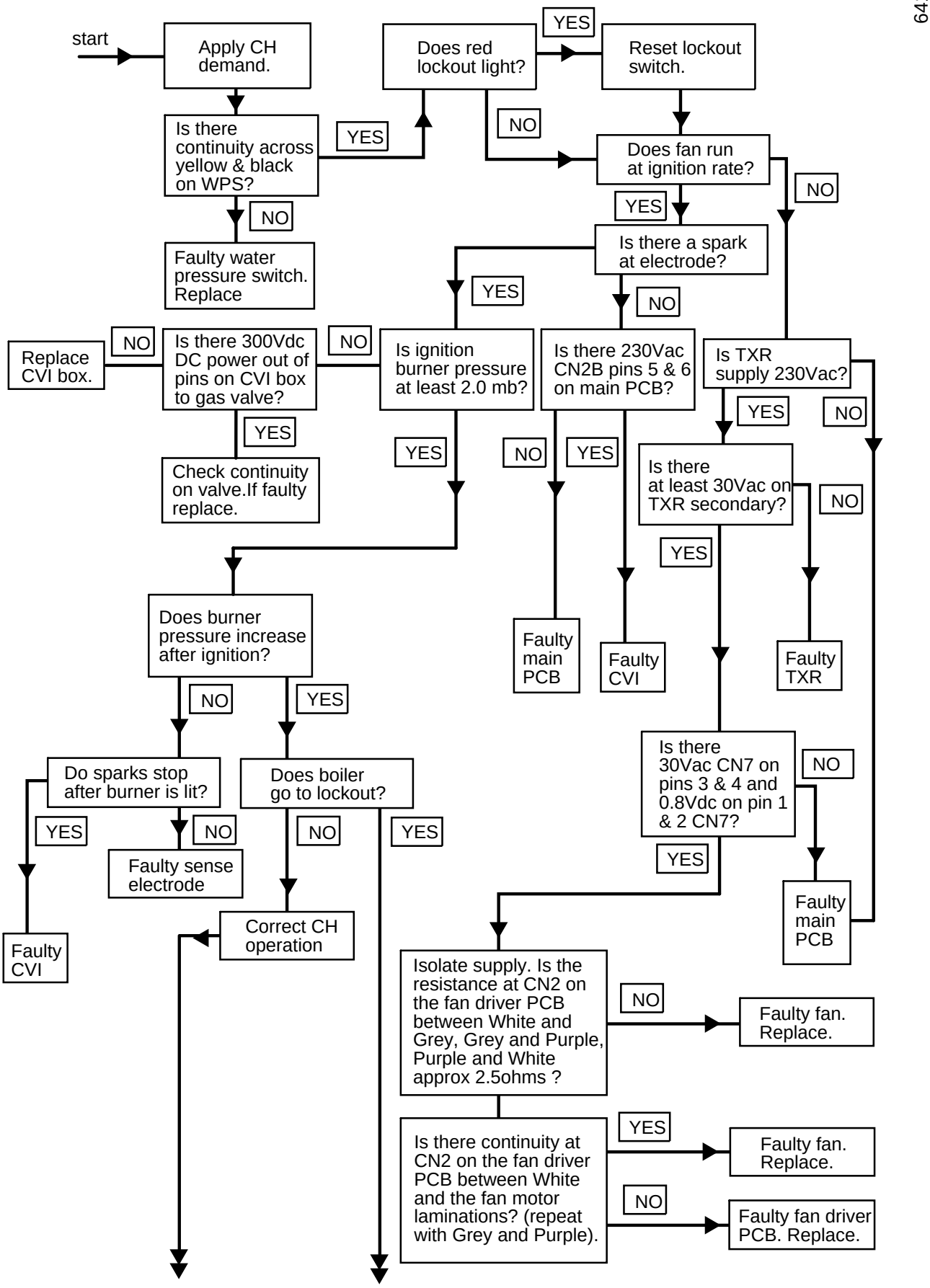

6418
start
Apply CH demand.
Is there continuity across yellow & black on WPS?
YES
NO
Faulty water pressure switch. Replace
Does red lockout light?
YES
Reset lockout switch.
NO
Does fan run at ignition rate?
NO
YES
Is there a spark at electrode?
YES
NO
Is there 300Vdc DC power out of pins on CVI box to gas valve?
NO
NO
Replace CVI box.
YES
Check continuity on valve.If faulty replace.
Is ignition burner pressure at least 2.0 mb?
YES
Is there 230Vac CN2B pins 5 & 6 on main PCB?
NO
YES
Faulty main PCB
Faulty CVI
Is TXR supply 230Vac?
YES
NO
Is there at least 30Vac on TXR secondary?
NO
YES
Faulty TXR
Does burner pressure increase after ignition?
NO
YES
Do sparks stop after burner is lit?
YES
NO
Faulty sense electrode
Faulty CVI
Does boiler go to lockout?
NO
YES
Correct CH operation
Is there 30Vac CN7 on pins 3 & 4 and 0.8Vdc on pin 1 & 2 CN7?
NO
YES
Faulty main PCB
Isolate supply. Is the resistance at CN2 on the fan driver PCB between White and Grey, Grey and Purple, Purple and White approx 2.5ohms ?
NO
Faulty fan. Replace.
Is there continuity at CN2 on the fan driver PCB between White and the fan motor laminations? (repeat with Grey and Purple).
YES
Faulty fan. Replace.
NO
Faulty fan driver PCB. Replace.

Diagram 3.5

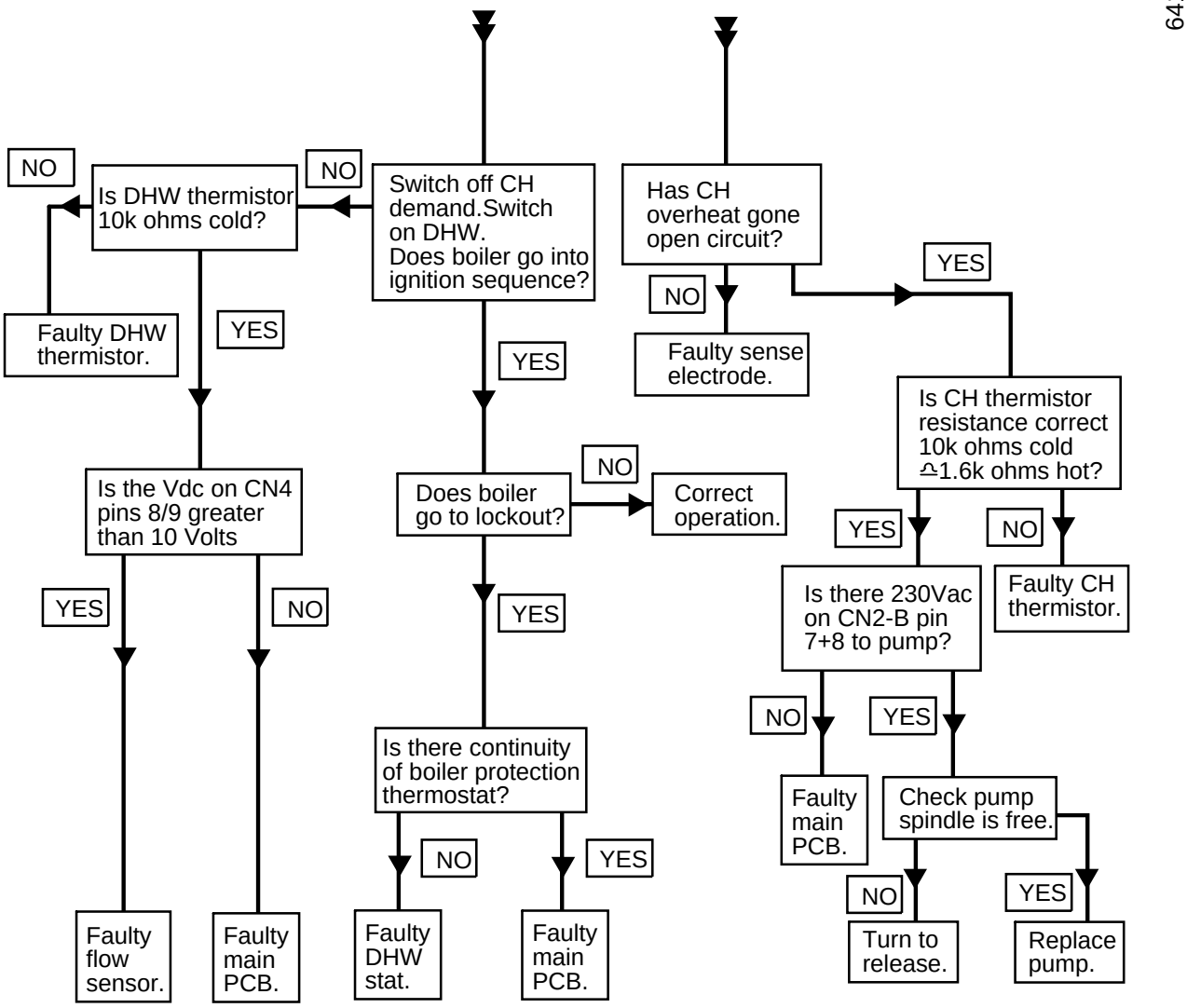
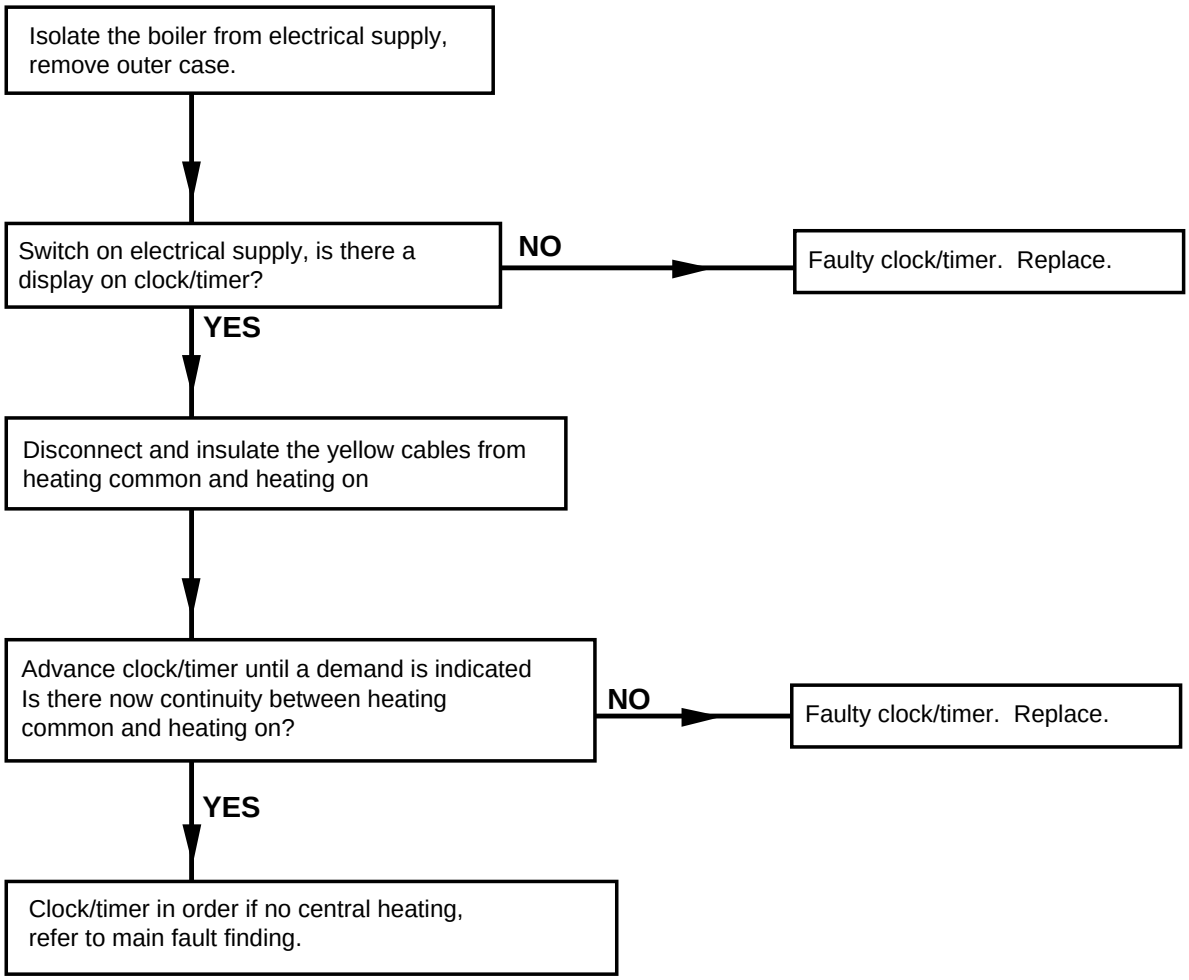

6419
Switch off CH demand.Switch on DHW. Does boiler go into ignition sequence?
NO
Is DHW thermistor 10k ohms cold?
NO
Faulty DHW thermistor.
YES
Is the Vdc on CN4 pins 8/9 greater than 10 Volts
YES
NO
Faulty flow sensor.
Faulty main PCB.
YES
Does boiler go to lockout?
NO
Correct operation.
YES
Is there continuity of boiler protection thermostat?
NO
YES
Faulty DHW stat.
Faulty main PCB.
Has CH overheat gone open circuit?
NO
Faulty sense electrode.
YES
Is CH thermistor resistance correct 10k ohms cold ≙1.6k ohms hot?
YES
NO
Faulty CH thermistor.
Is there 230Vac on CN2-B pin 7+8 to pump?
NO
YES
Faulty main PCB.
Check pump spindle is free.
NO
YES
Turn to release.
Replace pump.

Diagram 3.5

5665

If mains potential room thermostat is connected, make sure that the switch live is connected to Pin 1 in the 5 pole connector.
Check continuity of clock/timer harness, make sure an electrical supply is available, make sure that remote controls are calling for heat.

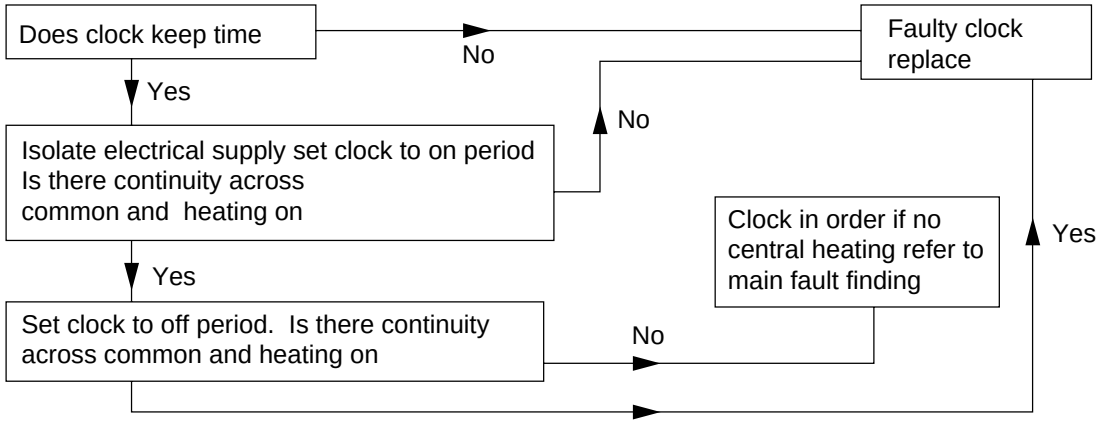


DIGITAL CLOCK/TIMER

Diagram 3.6

5666

If a mains potential room thermostat is connected, make sure that the switch line is connected to pin 1 the 5 pole connector.
Check continuity of clock harness, make sure an electrical supply is available make sure that remote controls are calling for heat.



ELECTRO/MECHANICAL CLOCK/TIMER FAULT FINDING

Diagram 3.7

4 Replacement of Parts

Before replacing any part please read points below:-

Replacement of parts must only be carried out by a competent person.

Unless stated otherwise all parts are refitted in the reverse order to removal.

1. Refer to Section 1.1.

2. Always isolate the boiler from the electrical and as required the gas supply as Section 1.3.

3. Unless stated otherwise, gain access as appropriate parts of Sections 1.4 and 1.5.

4. On completion, make good any water loss and pressurise the system to initial design pressure, refer to “Commissioning” in the Installation Instructions.

If the red light “flashes”, momentarily interrupt the electrical supply.

4.1 Fan

Refer to the appropriate parts of Section 2.2.

After fan has been fitted, check the burner pressure and if necessary adjust, refer to Installation Instructions, section 11.4.

4.2 Main Burner

Refer to the appropriate parts of Section 2.2.

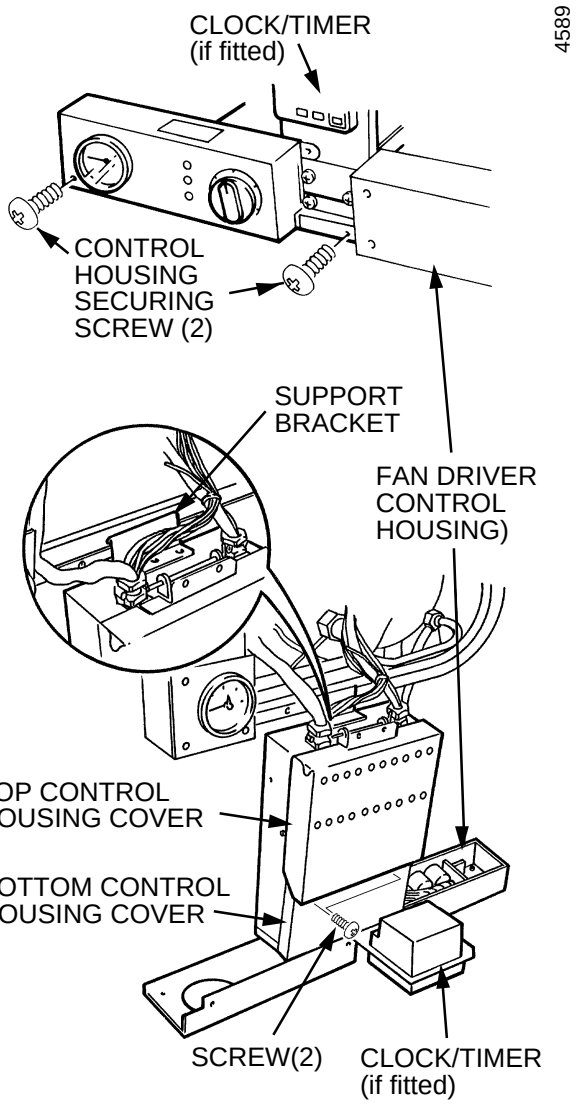


Diagram 4.1

Note. There is no need to remove the fan or flue collector assemblies.

4.3 Main Injector

Refer to the appropriate parts of Section 2.2.

Note. There is no need to remove the fan or the flue collector assemblies.

4.4 Spark Electrode

Remove the inner case as Section 1.5.

Slacken the two screws securing the flue collector, see diagram 2.1.

Remove the combustion chamber front panel, secured with four screws.

Remove the spark and earth electrode assembly leads and silicone tubes, securing nuts and washers

Disconnect the leads and silicone tubes.

NOTE: the ignition lead is black and the earth lead is white

4.5 Sensing Electrode

Remove the main burner refer to Section 4.2.

4.6 Ignition Lead

Remove inner case as Section 1.5.

Disconnect spark electrode assembly, and lead as described in Section 4.4.

Disconnect lead at the ignition unit on gas valve. Remove silicone tube, slacken sealing angle and withdraw lead.

Refer to diagram 4.13.

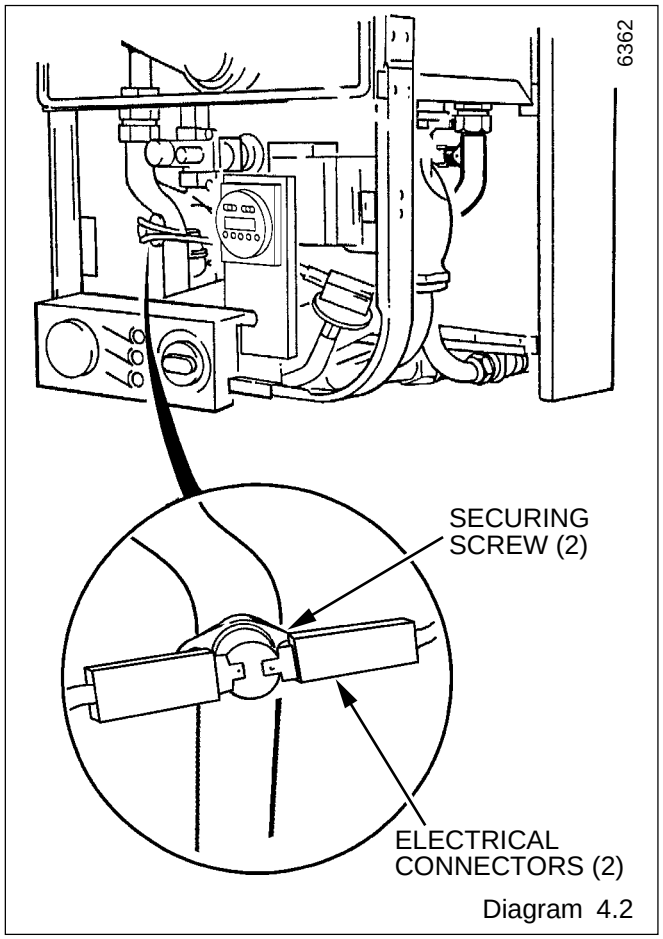


Diagram 4.2

4.7 Sensing Lead

Remove main burner as described in Section 4.2. Disconnect the lead from sensing electrode.

Disconnect lead at the ignition unit on gas valve.

Slacken sealing angle and withdraw lead.

Refer to diagram 4.13.

4.8 Earthing Lead

Refer to section 4.6, and diagram 4.13.

4.9 Boiler Overheat Cutoff

Remove user control switch bracket by slackening securing screws, disconnect electrical connectors, see diagram 4.3.

Disconnect the boiler overheat cutoff electrical connectors, see diagram 4.2.

Remove the overheat cutoff, secured with two screws, see diagram 4.2.

Use the heat sink compound supplied, between the mounting plate and the cutoff, when fitting it.

When refitting the electrical connections to the boiler overheat cut off, the polarity is not important.

4.10 Water Pressure Switch

Release the water pressure and drain the central heating circuit of the boiler, refer to Section 1.3 and 1.6.

Remove the control housing as Section 4.13.

Disconnect the electrical connectors at the pressure microswitch, see diagram 4.4.

Remove pressure switch, see diagram 4.4.

Replace the “O” ring seal with the new seal provided.

Make sure that the switch terminals are facing diagonally forwards to give access, as shown in diagram 4.4.

Reconnect the electrical connections, refer to diagram 4.11.

4.11 Pump

Release the water pressure and drain the central heating circuit of the boiler, refer to Section 1.3 and 1.6.

Disconnect the electrical connectors at the water pressure microswitch. Remove the water pressure switch, refer to Section 4.10.

Remove the terminal cover from the pump and disconnect the cable, see diagram 4.5.

Disconnect the pump at the unions.

Discard the sealing washers.

Make sure that the flow direction arrow is pointing upward when fitting and use the new sealing washers.

Refit water pressure switch, refer to Section 4.10.

The flow adjuster on the new pump should be set to that of the original, refer also to Section 4.6 in the Installation Instructions.

The flow rate should be controlled by means of a valve in the heating flow, refer to Section 11.9 in the Installation Instructions.

Note: Should the pump fail to operate, refer to diagram 3.5. If all is in order, but the pump still does not operate, remove the end screw, see diagram 4.5. Access to the end screw will be aided if the ignition unit is first removed. See section 4.17 for details. Then turn the pump spindle to release any temporary seizure.

DO NOT HIT THE SPINDLE.

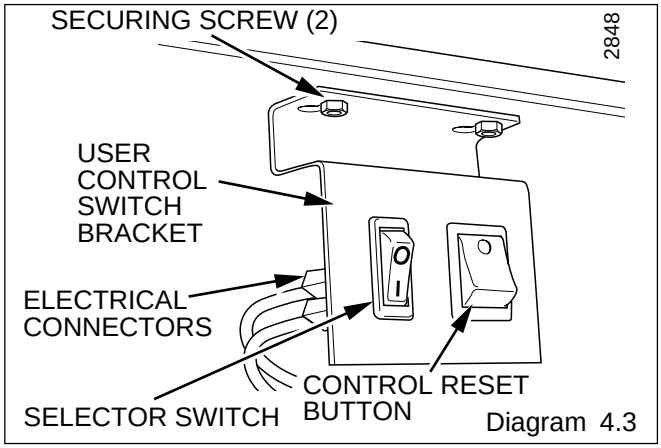


Diagram 4.3

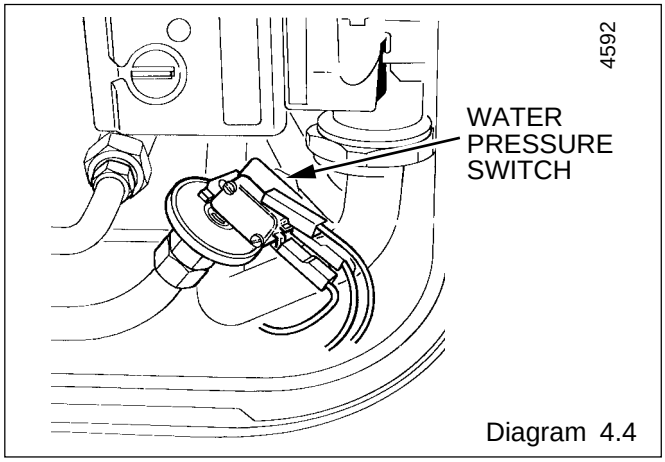


Diagram 4.4

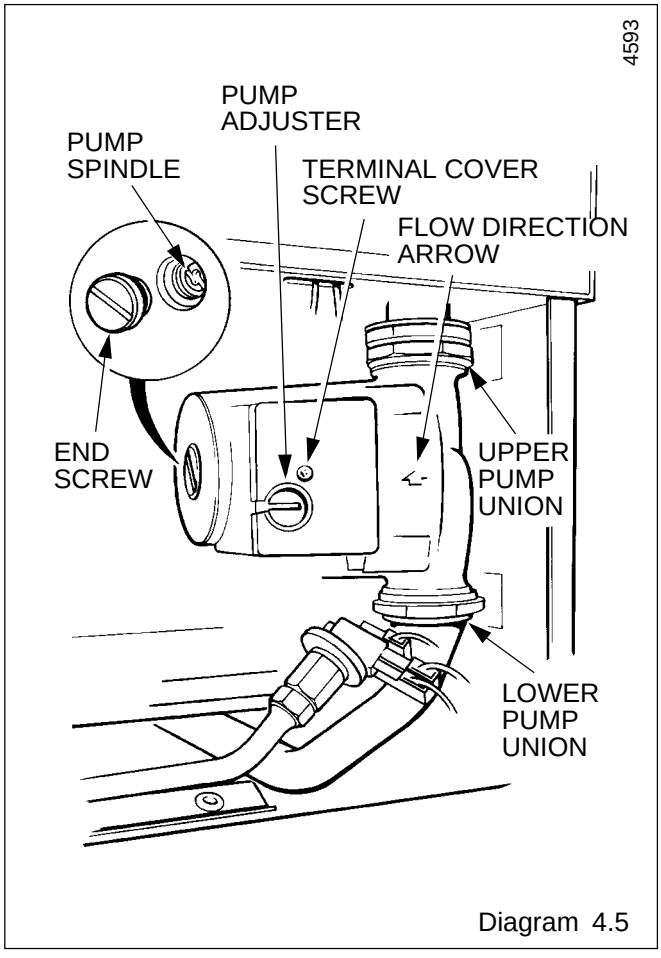


Diagram 4.5

4.12 Boiler Protection Thermostat

Remove the pump, see Section 4.11.

Disconnect the electrical connectors at the domestic hot water high limit control, see diagram 4.6.

Remove the high limit control from the flow pipe, secured with two screws.

When refitting the electrical connections to the high limit control the polarity is not important, see diagram 4.11.

Use the heat sink compound supplied, between the mounting plate and the control.

4.13 Pressure Gauge

Remove the control housing assembly, see diagram 4.1.

Release the water pressure and drain the central heating circuit of the boiler, refer to Section 1.3 and 1.6.

Remove the pressure gauge bracket.

Disconnect the pressure gauge connection from the safety valve, discard the washer, see diagram 4.7.

Remove the pressure gauge secured with the retaining tabs.

Locate the supplied new washer under the pressure gauge connection when refitting the safety valve.

4.14 Control Boards

CAUTION. Great care must be taken when handling any control board.

THE MAIN CONTROL BOARD MUST BE KEPT IN THE ANTI STATIC HOLDER UNTIL NEEDED.

Note. Timer/clock may be removed to improve access, see Section 4.32 or the control housing bottom half can be removed.

Main Control Board

Remove control housing cover securing screw, see diagram 4.8.

Remove the control housing assembly as shown in diagram 4.1.

Lift the control housing cover to gain access to the board.

Disconnect all multipin connectors, see diagram 4.8.

Remove the control board from the support posts.

To reconnect the multipin connectors correctly, see diagram 4.11.

When replacing the main control board check and adjust the main burner gas pressure in both the domestic hot water and central heating modes. Check also minimum burner pressure. Refer to "Commissioning" in the Installation Instructions.

Fan Driver Board

Remove the fan driver control housing assembly securing screws.

Remove the multipin connectors, see diagram 4.9.

Release the board from its support posts then remove the nut and screw securing the board to the cover, see diagram 4.9.

User Control Board

Remove the fascia, see diagram 4.8.

Remove the multipin connector.

Remove the control board from the supports posts.

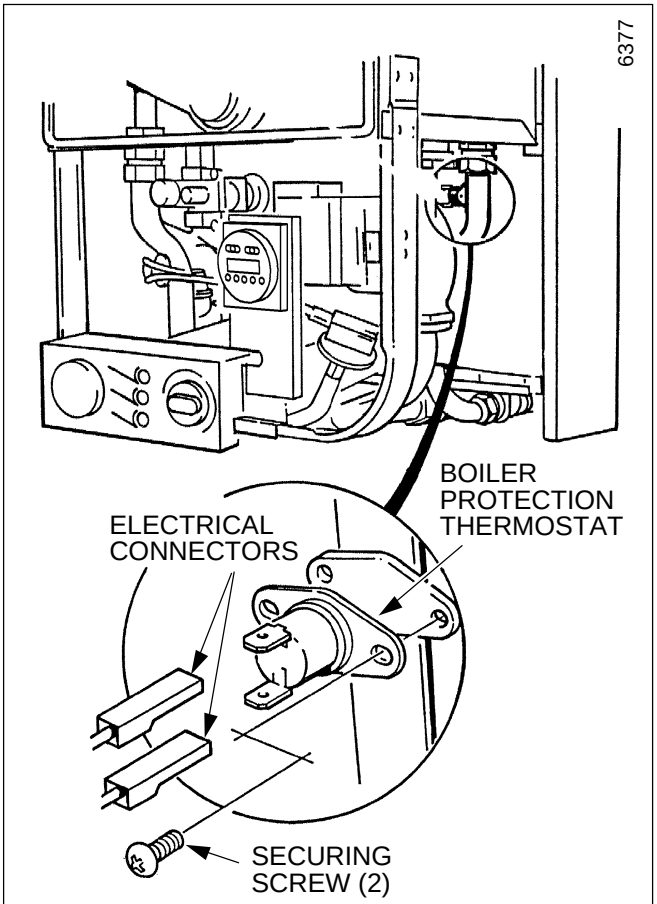


Diagram 4.6

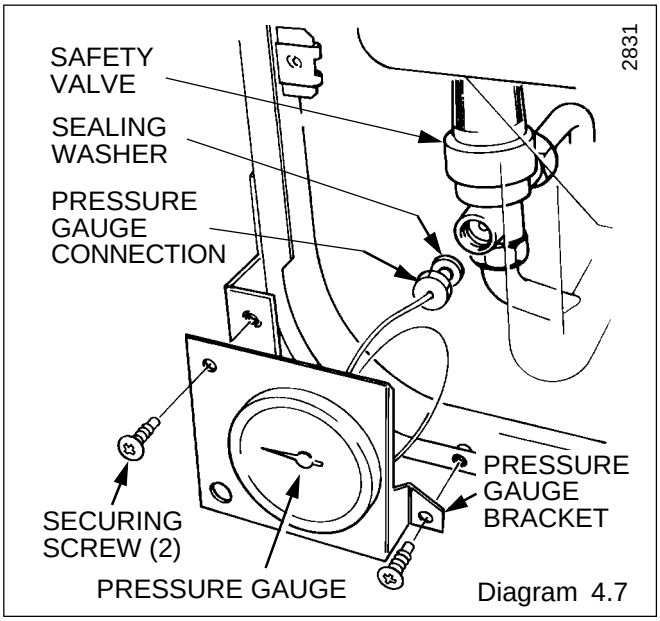


Diagram 4.7

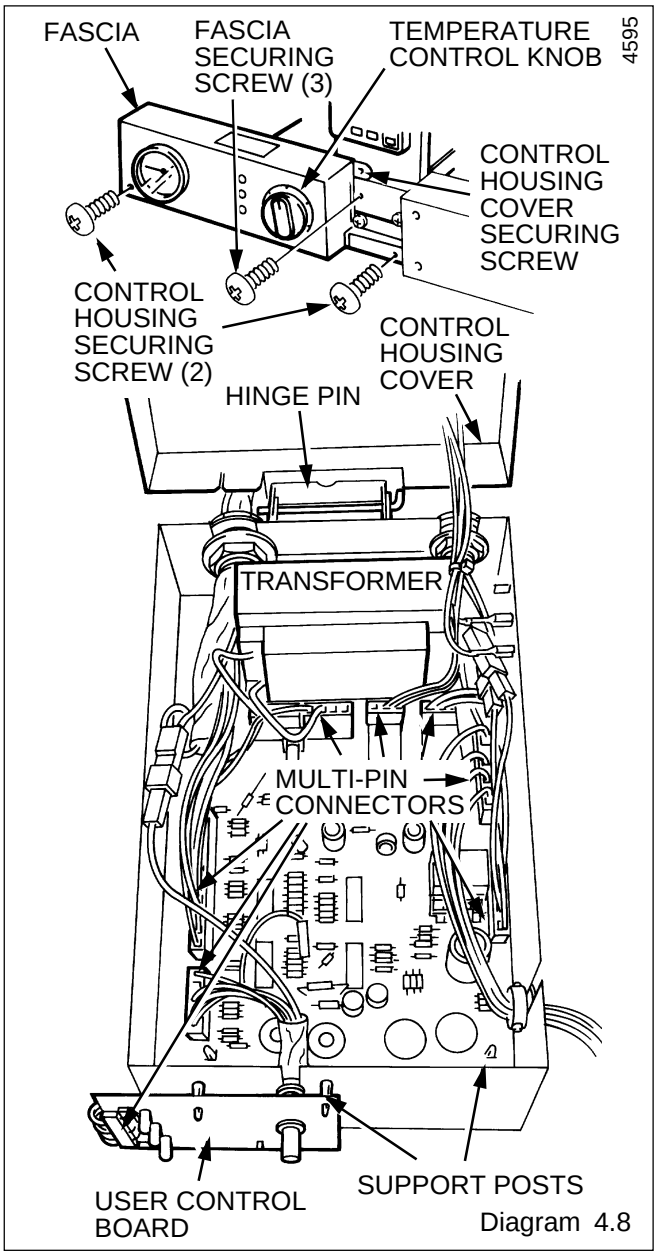


Diagram 4.8

4.15 Transformer

Note. Timer/clock may be removed to improve access, see Section 4.32 or the control housing bottom half can be removed.

Remove the control housing cover screw, see diagram 4.8.

Remove control housing assembly, see diagram 4.1.

Remove the control housing cover and disconnect the electrical connectors from the transformer, see diagram 4.8.

Remove the transformer securing screws (2 off) from beneath the control housing, remove the transformer and insulation.

To connect the transformer cables correctly, refer to diagram 4.11.

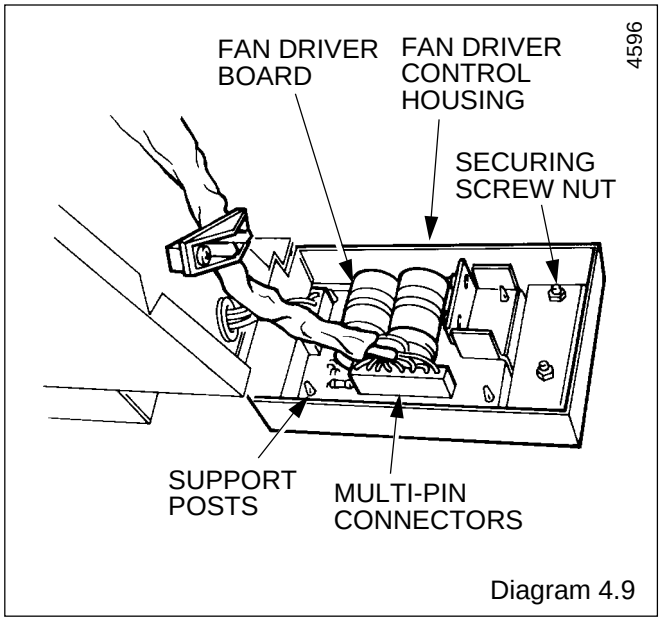


Diagram 4.9

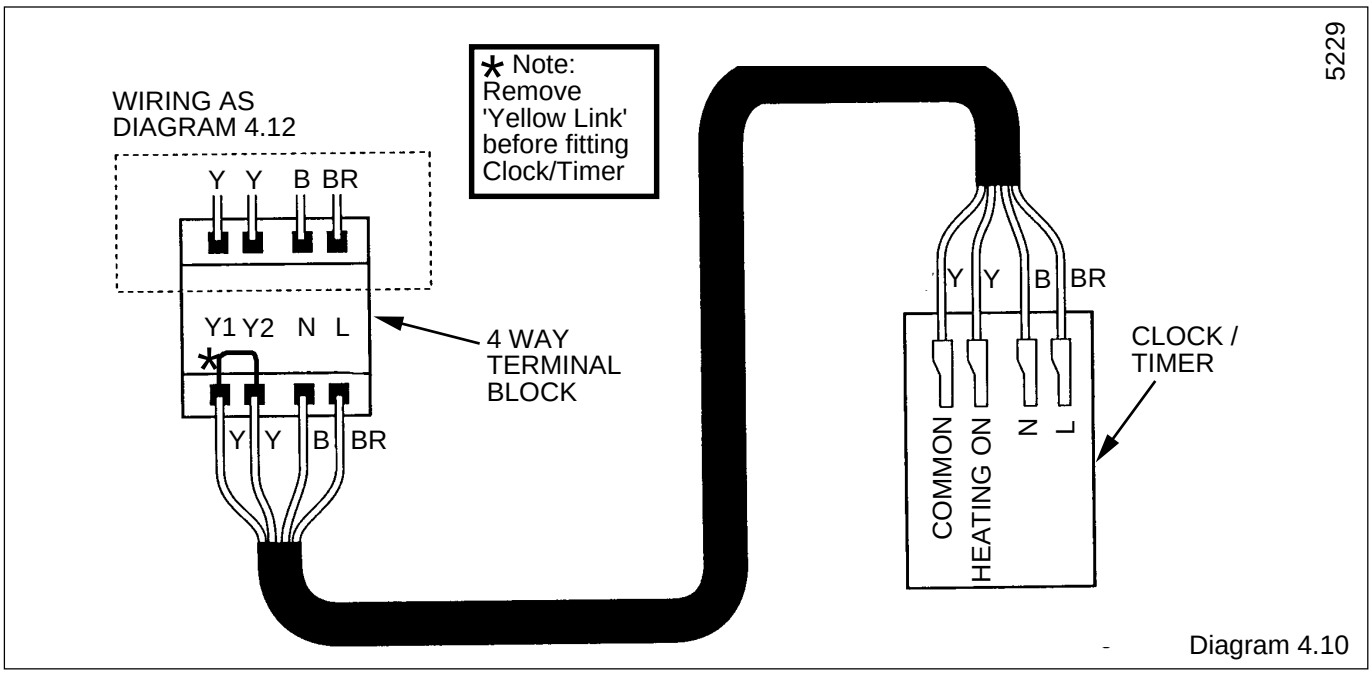


Diagram 4.10

6368

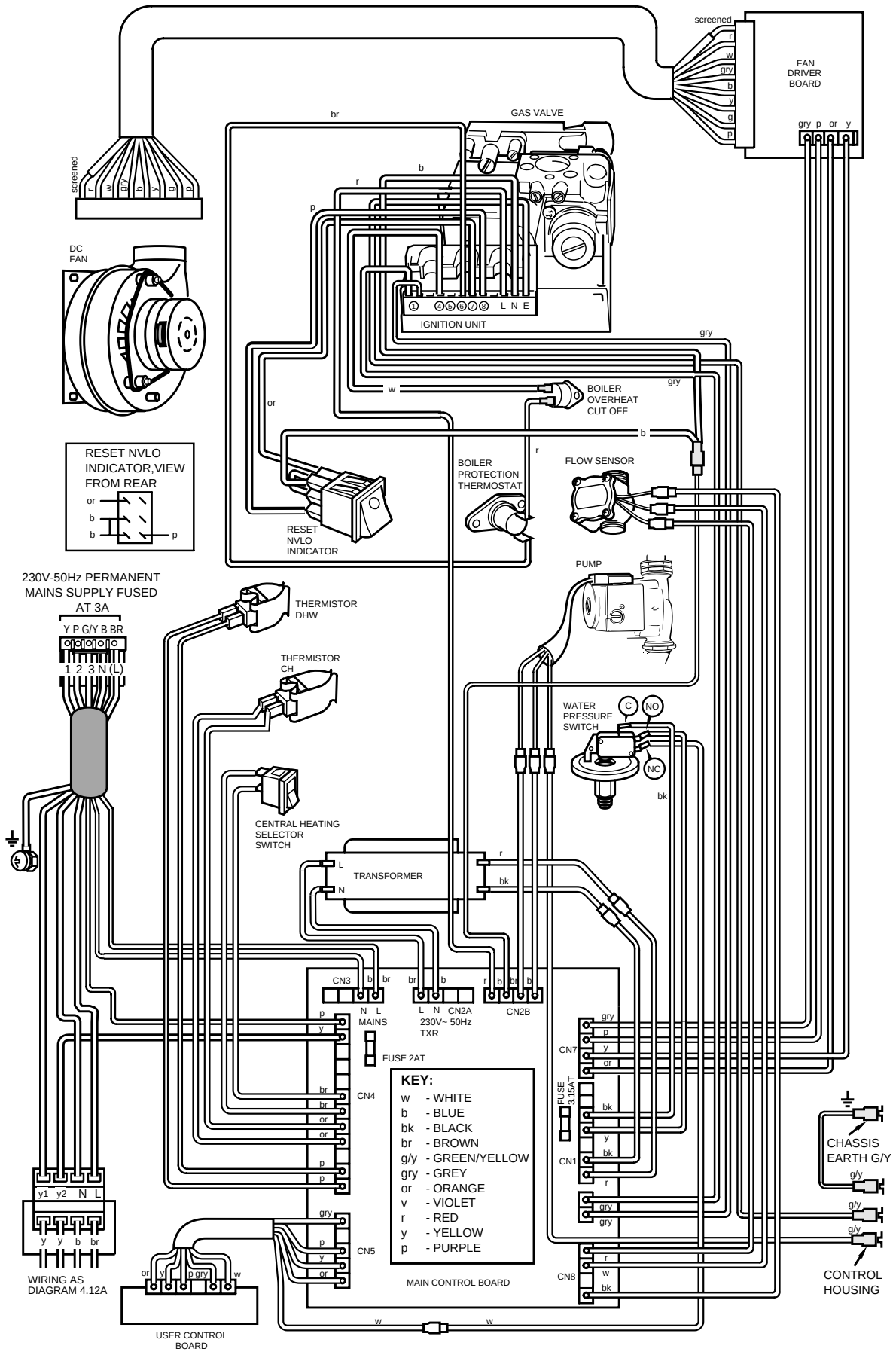


Diagram 4.11

4.16 Gas Valve

Remove control box housing, see diagram 4.1.

Remove the user control switch bracket, see diagram 4.3.

Remove the ignition unit securing screws, see diagram 4.12.

Remove ignition unit.

Disconnect sensing tubes noting which way they fit.

Remove the four extended hexagon screws at the right hand side of the gas valve,

Support the gas valve, disconnect the union nut at the gas service cock and remove the valve complete with the inlet pipe.

Separate the valve from the pipe, noting the fitted position.

Discard the “O” rings and fit the new ones supplied.

Fit gas valve cables. The polarity is not important.

Check and adjust the main burner gas pressure in the hot water and central heating modes, refer to “Commissioning” in the Installation Instructions.

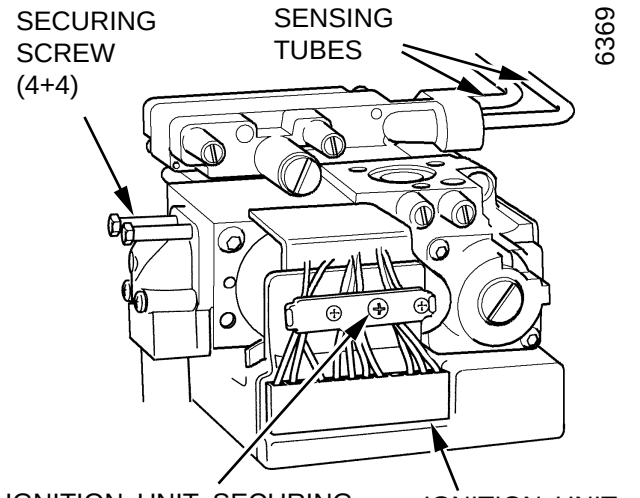


Diagram 4.12

4.17 Ignition unit

Remove control box housing, see diagram 4.1.

Remove the user control switch bracket, see diagram 4.3.

Remove the ignition unit securing screws. see diagram 4.13.

Disconnect the electrical connector and the three electrode leads.

Remove ignition unit.

Note: when re-fitting make sure the electrode leads are fitted to the correct terminals, see diagram 4.13.

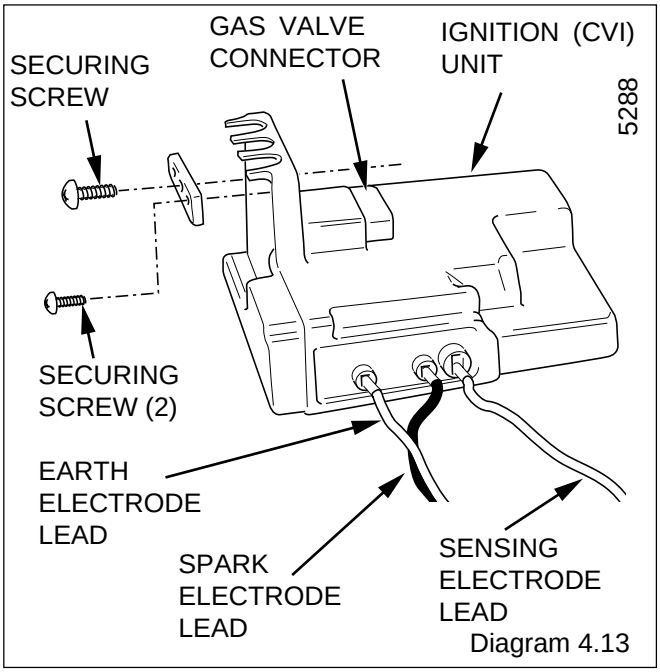


Diagram 4.13

4.18 Domestic Hot Water Flow Sensor

Before commencing refer to Section 1.1

Isolate the boiler from the electrical supply, refer to Section 1.3.

Remove the outer case, refer to Section 1.4.

Isolate the domestic hot water inlet, release the domestic water pressure and drain, refer to Section 1.3 and 1.6.

Remove the control housing, refer to Section 4.14.

Remove the user control switch bracket, see diagram 4.14.

Remove the pressure gauge bracket, see diagram 4.7.

Disconnect the flow sensor cables at the inline connectors.

Remove the flow sensor by disconnecting the union nuts, see diagram 4.15, noting the fitted position.

Slacken or remove the clip securing the isolating valve, to ease removal.

Discard the sealing washers and use the new ones supplied.

It is recommended that the water inlet filter is cleaned or renewed at this stage.

Make sure that the sensor is positioned correctly, with the flow arrow pointing upwards.

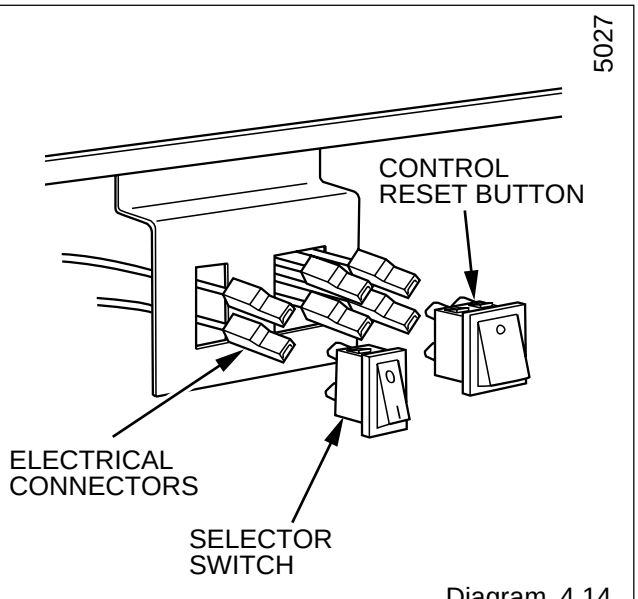


Diagram 4.14

4.19 Thermistor - Heating

Gain access, by removing the user control switch bracket, see diagram 4.3.

Disconnect the cables from the thermistor, see diagram 4.16.

IMPORTANT: Do not remove cable retaining strap.

Unclip the thermistor.

NOTE: When the thermistor is replaced, it must be repositioned at the same location as before.

The polarity of the electrical connections is not important.

4.20 Thermistor - Domestic Hot Water

Disconnect the cables from the thermistor, see diagram 4.16.

IMPORTANT: Do not remove cable retaining strap.

Unclip the thermistor.

NOTE: When the thermistor is replaced, it must be repositioned at the same location as before.

The polarity of the electrical connections is not important.

4.21 Safety Valve

Release the water pressure and drain the central heating circuit of the boiler, refer to Section 1.3 and 1.6.

Remove the pressure gauge, refer to Section 4.13.

Disconnect the union nuts to release the safety valve, see diagram 4.17.

4.22 Water Inlet Filter

Refer to the appropriate parts of Section 4.18.

4.23 Domestic Hot Water Throttle

Release the water pressure and drain the domestic hot water circuit of the boiler, refer to Section 1.3 and 1.6.

Refer to Section 4.18 to gain access to the throttle.

Remove the cap nut and carefully remove the throttle adjuster, by unscrewing, it may be necessary to push the throttle adjuster out from the rear, see diagram 4.18.

Clean if necessary, taking care not to damage the throttle body.

Reset the domestic hot water flow rate refer to Section 11.6 in the Installation Instructions.

4.24 Mini Expansion Vessel

Release the water pressure and drain the domestic hot water circuit at the boiler, refer to Sections 1.3 and 1.6

Remove the control housing as diagram 4.1 .

Note. It may be possible, in some circumstance, to remove the mini expansion vessel by hand.

When refitting use the new sealing washer supplied, see diagram 4.19.

4.25 Automatic Air Vent

Release the water pressure and drain the central heating circuit of the boiler, refer to Sections 1.2 and 1.6.

Remove the automatic air vent, see diagram 4.20.

SLACKEN THE SMALL CAP ON THE AIR VENT. THIS MUST NOT BE RETIGHTENED.

When refitting use the new washer supplied.

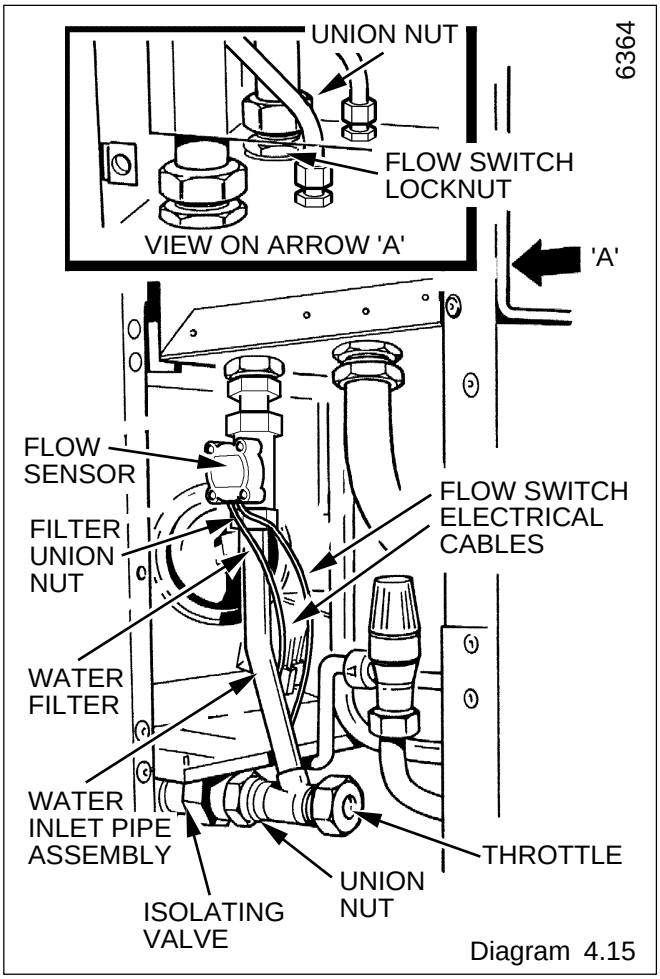


Diagram 4.15

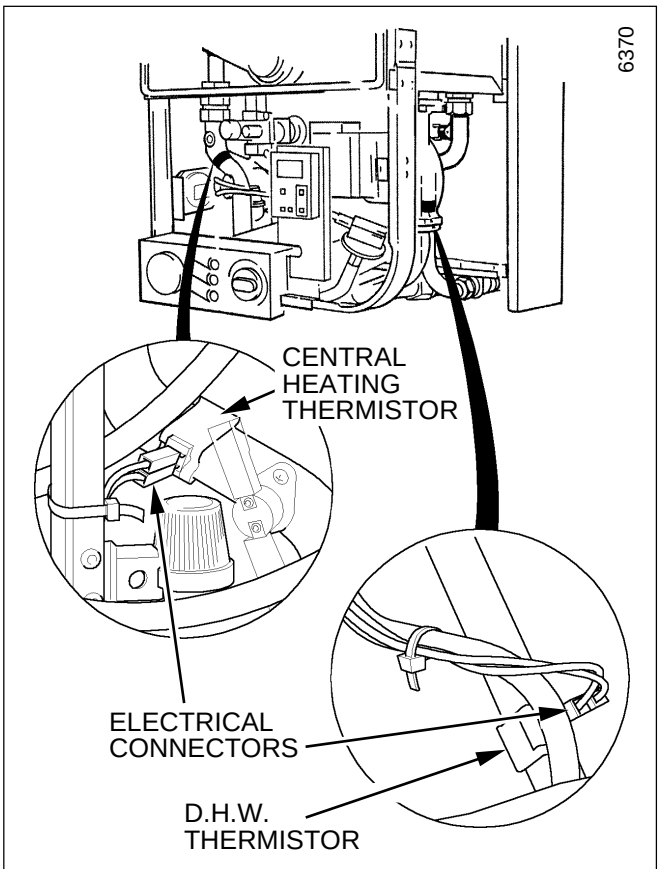


Diagram 4.16

4.26 Heat Exchanger

Release the water pressure and drain the central heating and domestic hot water circuits refer to Section 1.3 and 1.6.

Remove the fan from the flue collector, refer to Section 2.2.

Remove the flue collector, refer to Section 2.2.

Remove the main burner, refer to Section 2.2.

Remove the automatic air vent, refer to Section 4.25. If renewing the heat exchanger, transfer the air vent, using the new sealing washers provided.

Disconnect the front gas/air ratio sensing tube, see diagram 4.20. Make sure that no water enters the tube.

Disconnect the union nuts of the heat exchanger to remove it, see diagram 4.20.

Reassembly Notes.

Locate the raised location tabs on the combustion chamber sides into the slots on the heat exchanger, see diagram 4.20.

Make sure that the main burner baffle has located in the side guides and that the burner is located on the main injector.

The combustion chamber front panel should be fitted loosely, then the flue collector also fitted loosely, make sure that it is seated correctly on the heat exchanger and over the top edge of the front panel.

4.27 Combustion Chamber Insulation

Note: Before handling the insulation panels, it is advisable to dampen them with water to prevent dusting and consequently avoid any inhalation or skin irritation.

Remove the combustion chamber front panel secured with four screws, see diagram 4.21.

Remove the front insulation piece, secured with a clip, see diagram 4.22.

Slide out both side insulation pieces.

Remove the burner as in Section 2.2.

Pull the lower rear insulation forward, then slide the upper rear insulation down from behind the heat exchanger, see diagram 4.22.

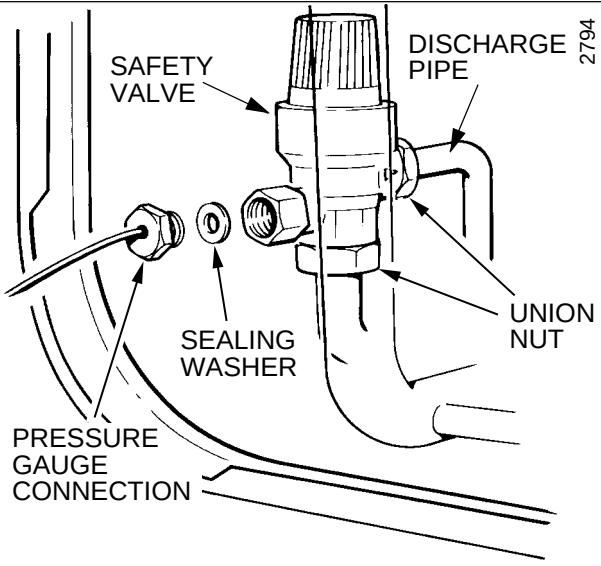


Diagram 4.17

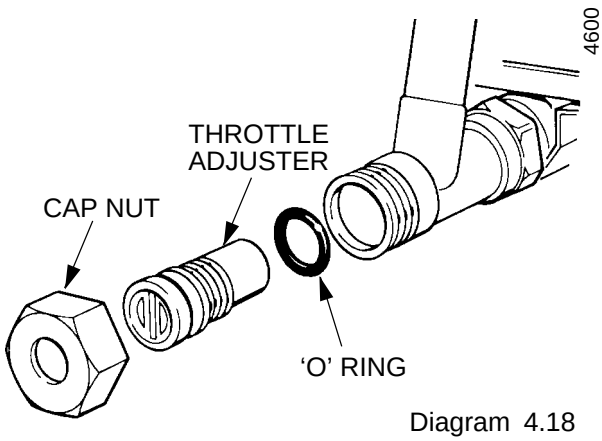


Diagram 4.18

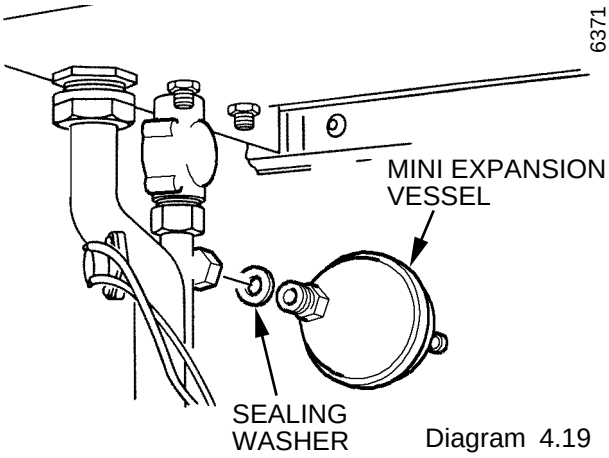


Diagram 4.19

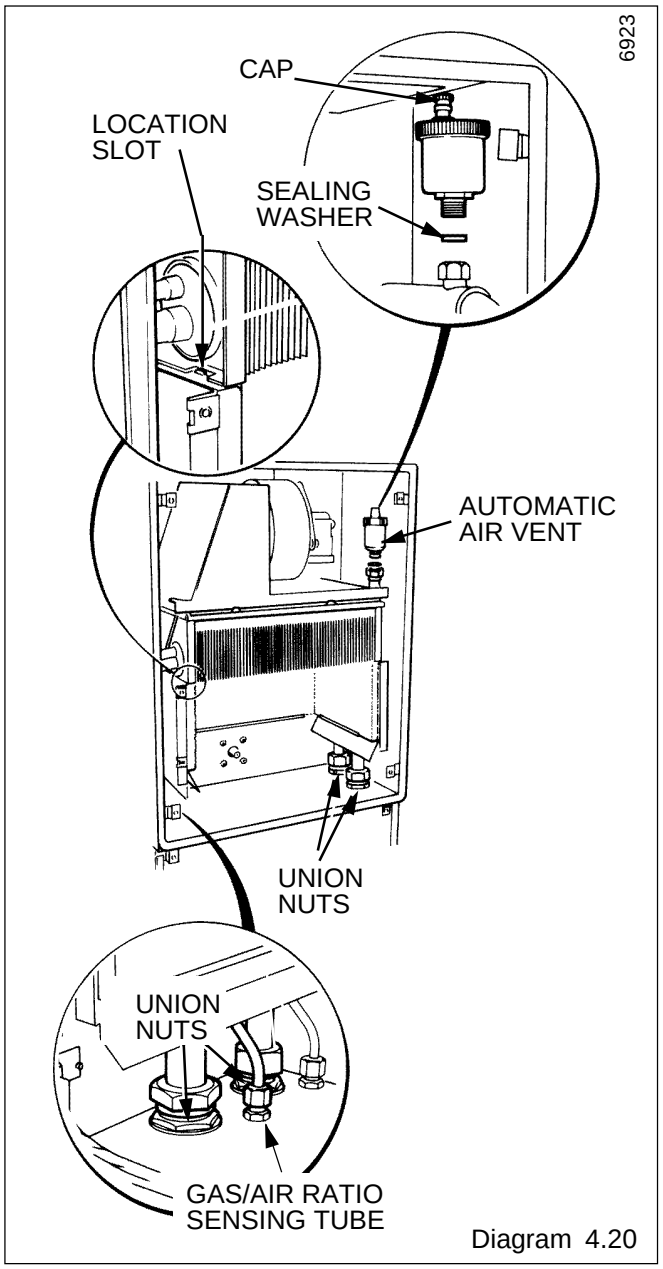


Diagram 4.20

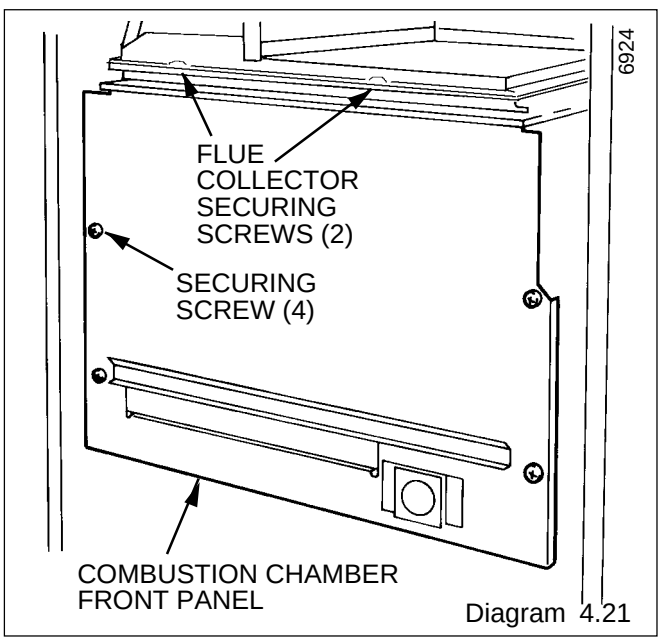


Diagram 4.21

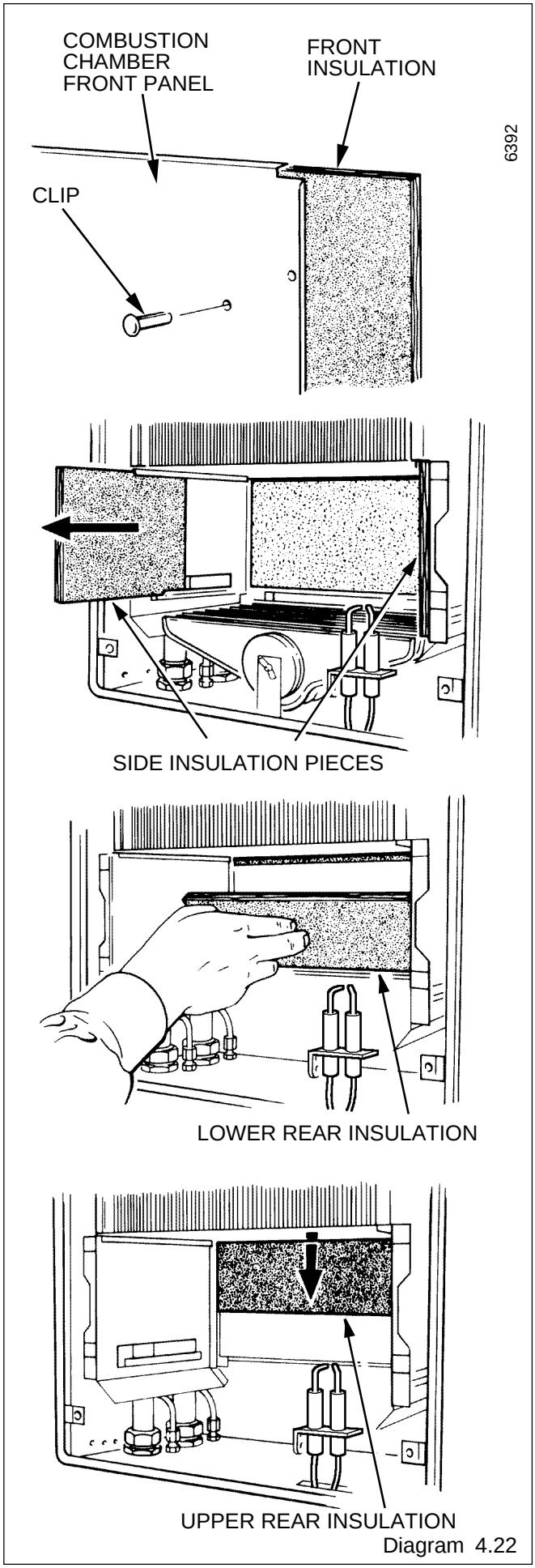


Diagram 4.22

4.28 Expansion Vessel

Renewal of the expansion vessel requires the boiler to be removed from the wall. As an alternative, a separate expansion vessel of the same specification may be connected as close as possible to the boiler, leaving the original in position, refer to Section 4.5 in the Installation Instructions.

Release the water pressure and drain the central heating and domestic water circuits, refer to Section 1.3 and 1.6.

Remove the fan from the flue collector, refer to Section 2.2.

Remove the flue elbow, refer to Section 10 of the Installation Instructions.

Disconnect the boiler water connection union nuts at the front of the isolating valves, see diagram 1.1.

Disconnect the gas service cock union.

Disconnect the safety valve discharge pipe from the boiler, see diagram 1.1.

Separate the two parts of the boiler multi-pole electrical connector.

Slacken the clips of the gas service cock and the water isolating valves.

Remove the boiler from the mounting frame, secured with two screws at the top, see diagram 4.23. Pull the boiler from the isolating valves. Unhook the boiler at the top and lift off.

Carefully lay the boiler down on its side for access to the expansion vessel.

Disconnect the union nut connection, see diagram 4.24 and discard the sealing washer.

Remove the expansion vessel, secured with three clamping screws.

Connect the union nut, when fitting the expansion vessel, before clamping it.

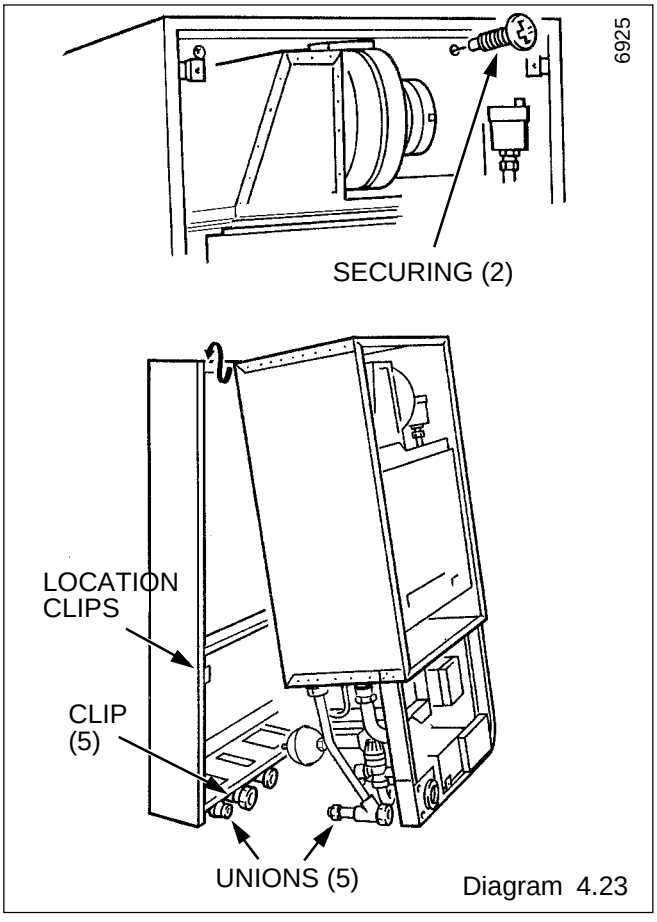


Diagram 4.23

4.29 Burner Viewing Window

Remove the burner viewing window, secured with two screws. When fitting a new window use the gasket provided, see diagram 4.25.

4.30 Inner Cover Case Seal

Remove the old seal, clean out the old adhesive.

Glue the new seal into place, make sure that there are no breaks in it.

4.31 Air/Gas Ratio Sensing Venturi

Remove the fan assembly and flue collector, refer to Section 2.2.

Disconnect the tube nut and screw to release the sensing venturi, see diagram 4.26.

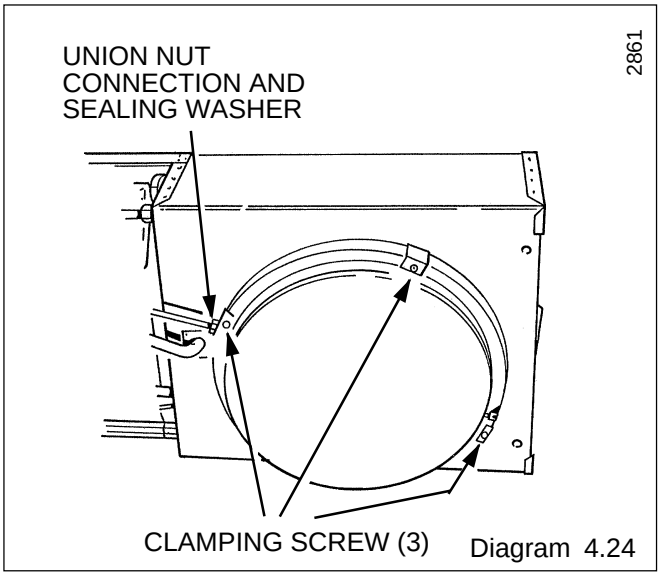


Diagram 4.24

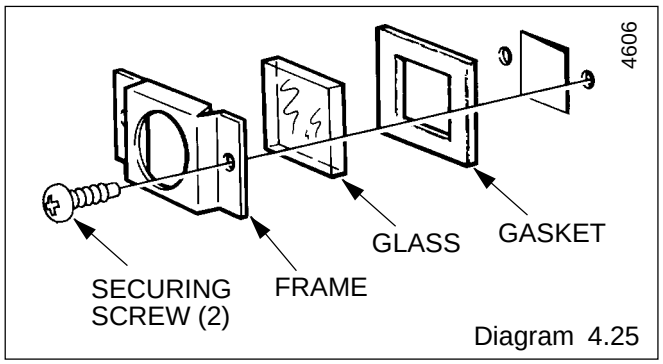


Diagram 4.25

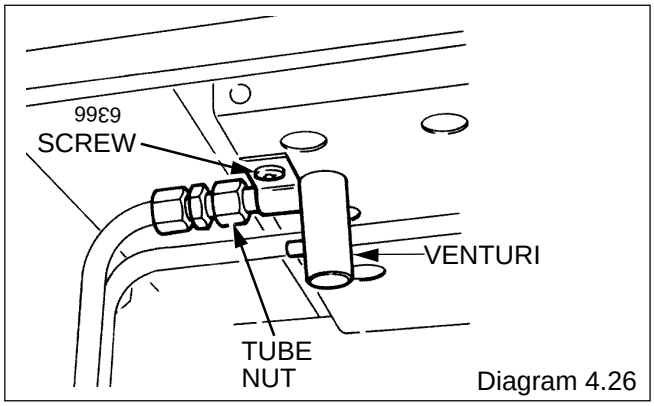


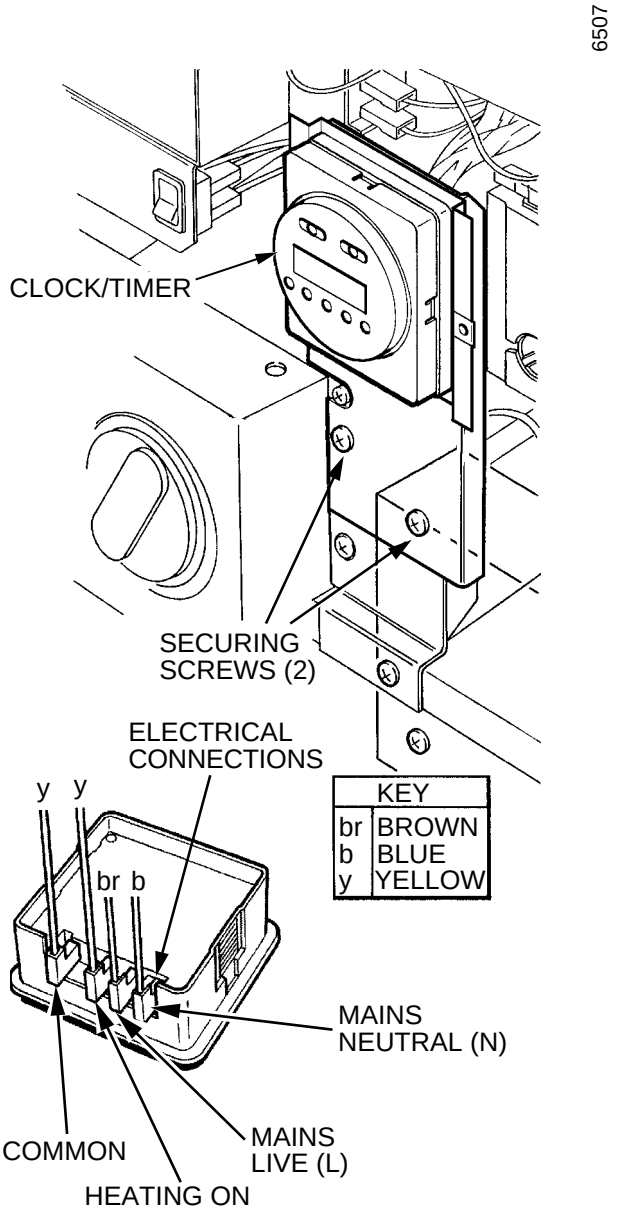
Diagram 4.26

4.32 Clock/Timer - if fitted

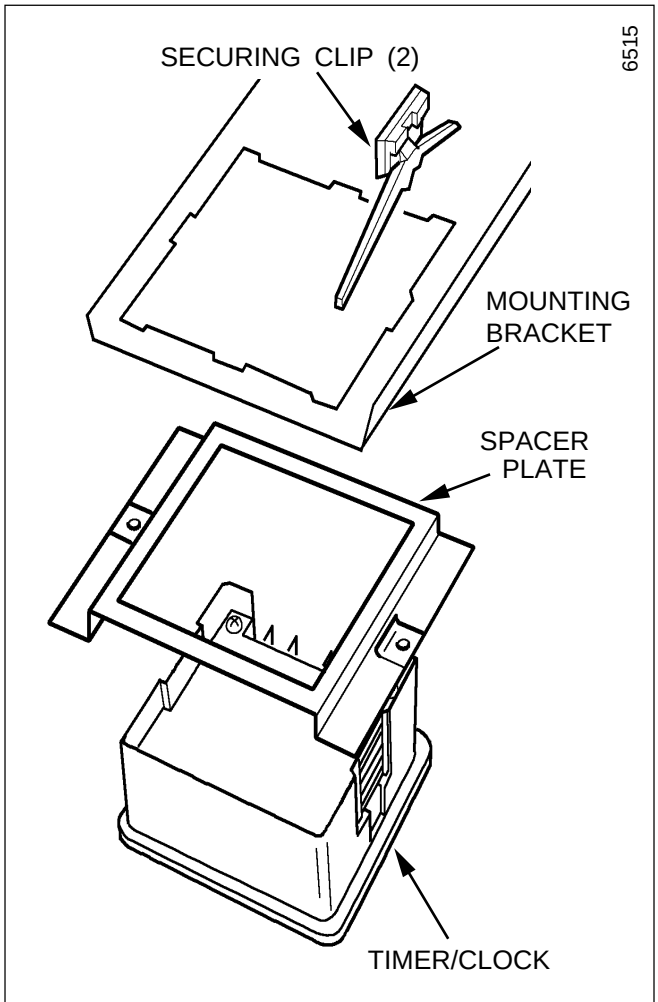
ELECTRO/MECHANICAL and DIGITAL clock/timer - Release the mounting bracket securing screws, see diagram 4.27.

Note: Care should be taken here, as these screws also retain the fan driver control housing in position, see diagram 4.1.

Disconnect electrical cables, release securing clip to remove the clock/timer spacer plate, see diagram 4.28.



DIGITAL CLOCK/TIMER Diagram 4.27



ELECTRO/MECHANICAL and DIGITAL CLOCK/ TIMER Diagram 4.28

5 Spare Parts

5.1 Part Identification

The key number in diagram 5.1 and the first column of the list will help identify the spare part.

5.2 Ordering

When ordering any spare part, please quote the part number and the description from the list together with the model name and serial number information from the data label. The data label is positioned on the inner case cover, see diagram 1.1.

Because of our constant endeavour for improvement details may vary slightly from those shown in these instructions.

Key No	Part No	Description	GC No
1	800512	Fan assembly	278 129
2	205754	Main injector assembly	
3	202631	Spark electrode	278 420
4	202632	Sensing electrode	278 421
5	800745	Boiler over heat cut off assy	278 413
6	202576	Boiler Protection Thermostat	
7	800134	Pressure gauge assembly	313 294
8	227001	Control board	
9	800513	Transformer	
10	202250	Central heating selector switch	382 813
10A	202251	Control reset switch	375 735
11	227003	Thermistor (DHW)	
11A	227004	Thermistor (Heating)	
12	227002	Flow Sensor	
13	202240	Fuse 2 type (3.15AT) - not illustrated	
14	202226	Fuse 1 type (2AT) - not illustrated	278 136
15	800150	Water pressure switch assembly	397 862
16	202218	User PCB	278 141
17	208214	Water inlet filter	281 359
18	800153	Automatic air vent assembly	313 285
19	800149	Safety valve assembly	397 677
20	230506	Gas valve	
21	227000	C.V.I. Ignition module	
22	800515	Fan driver board	278140

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