

Serial No:

NG

LPG



Operating, Installation and  
Servicing Instructions for

**Certikin**

**MBD200**

**Condensing**

**De-Humidifier Boiler**

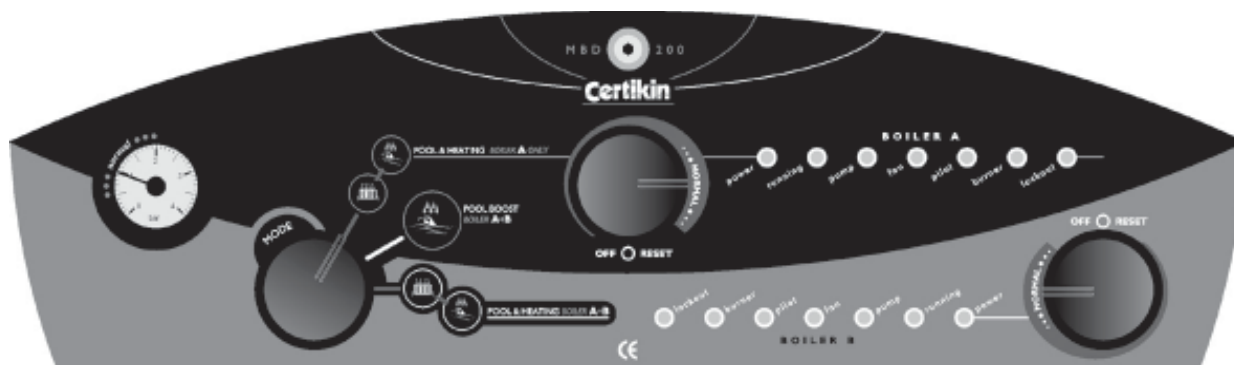
NG: GC No. 47 555 18 Corgi Work Code 1014356

LPG: Corgi Work Code 1014373



Note to the Installer: *Please leave these Instructions adjacent to the meter.*

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## User Instructions

You are the owner of a High Efficiency Condensing Boiler and due to the way it works it will appear to produce a lot of steam from the terminal; this is harmless, low temperature water vapour and quite normal. The boiler requires a drain to be permanently connected and this will have been done by your installer, it must not be disconnected or removed. In freezing conditions ensure this drain is kept free of ice. The Gas Safety (Installations and Use) Regulations makes it illegal for gas appliances to be installed or serviced by persons not Corgi Registered Operatives. All Corgi Registered Operatives carry a Corgi ID card and have a registration number. This can be checked by calling Corgi on 01256 372300.

### IMPORTANT:

#### DO NOT DISTURB THE APPLIANCE CASE

The appliance must be connected to a 230V AC 50 Hz supply with a 5 Amp fuse rating and must be Earthed.

The Certikin MBD 200 appliance is made with two independent condensing boilers that can work together or separately. It is designed to work simply and automatically with your de-humidifier and heating controls. To operate it has to be connected to both gas and electricity, the Front Panel switches in an On position, and the De-Humidifier or Heating controls calling for heat.

### Quick Start

Set the De-Humidifier or Heating Controls to On. Turn both Thermostat Knobs fully clockwise to Normal then select the required service.

**Pool and Heating (A only)**, for periods of light demand, like during the Summer.

**Pool Boost (A & B)**, for rapid pool only heating.

**Pool and Heating (A & B)**, during periods of heavy demand, like during the Winter.

The operation is now fully automatic.

### Indicators (a set for each boiler)

#### Power:

**Off** - Mains not connected.

**On** - The boiler is connected to the Mains.

### Running:

**Off** - There is no demand from the external controls.

**On** - There is a call for a boiler to fire.

**Flashing** - The boiler thermostat is off.

### Fan, Pilot and Burner:

These are diagnostic indicators for fault finding.

### Lockout:

The boiler has shut itself off. Wait for the boiler to cool and then reset by turning the boiler Thermostat Knob Off then On.

### Selector Switch:

**Pool and Heating (A only)** - Only boiler A will be working, heating Pool water, Air, and secondary Space Heating.

**Pool Boost** - Both boilers will be working for Pool water and Air heating.

**Pool and Heating (A & B)** - Both boilers are available for heating the Pool water, Air, and secondary Space Heating.

### To Turn Off for a Short Period

Turn the Thermostat Knobs fully anti-clockwise and set all external controls to Off. In this condition the boilers will protect themselves from freezing by firing if the temperature falls below about 4°C

### To Turn Off for a Long Period

Turn the Thermostat Knobs fully anti-clockwise, set all external controls to Off and the switch off the Mains supply. Please note there is no boiler Frost Protection once the Mains supply is Off. If the appliance is going to be off during the Winter it is recommended that a Frost Thermostat is fitted, the system is drained or it is filled with a suitable anti-freeze.

### Maintenance

There are no user servicable parts. To clean the case wipe with a damp cloth, do not use an abrasive cleaner.

It is recommended that the appliance is serviced twice a year by a CORGI Registered Engineer.

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## Introduction

These Instructions cover the MBD200, a frame mounted, gas fired, condensing boiler which is room sealed and fan assisted on the flue side. The flue systems are Concentric, left, right, or rear, up to 2 metres.

The appliance is two boilers mounted on the frame, which are plumbed to common pipework so that they can work together or independantly.

It is designed to work with a De-humidiifer and an optional sealed heating system. These systems must be pumped and use the pumps integral to the appliance.

The boiler casing is powder coated mild steel.

The boilers include pump overrun devices so it is essential that there is an open circuit for water to flow between the flow and return. An automatic bypass is provided on the Heating circuit.

The boilers also contain integral frost protection, a boiler will fire if the temperature within it approaches 4 to 5 degrees Centigrade. It will do this even when turned to Off, and can only be inhibited by removing the Permanent Live supply to the boiler.

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

## Gas Safety (Installation and Use) Regulations, (as amended).

It is the law that all gas appliances are installed by a competent person (e.g. a CORGI registered operative) in accordance with the above Regulations. Failure to install appliances correctly could lead to prosecution.

It is in your own interest, and that of safety, to ensure that the law is complied with. The installation of the boiler MUST also be in accordance with the current I.E.E.. Wiring Regulations, the Local Building Regulations, Building Standards (Scotland), the Bye Laws of the Local Water Undertaking, any relevant requirements of the Local Authority, and Health and Safety document No 635, "Electricity at Work Regulations".

Detailed recommendations are contained in the following British Standard Codes of Practice.

## Codes of Practice.

BS.6798 Installation of gas fired hot water boilers of rated input not exceeding 70kW.

BS.5449:1 Forced circulation hot water systems (small bore and microbore domestic central heating systems).

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

BS.5440: Part1. Flues (for gas appliances of rated input not exceeding 60kW).

BS 6891 Specification for installation of low pressure gas pipework.

BS 7074:1 Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems.

BS5482:1 Code of practice for domestic butane & propane gas burning installations.

Building Regulations Part L1.

**IMPORTANT.** It is important that no external control devices are directly connected to this appliance - unless covered by these 'Installation and Servicing Instructions' or otherwise recommended by the manufacturer. If in doubt, please enquire.

A 12V DC circuit is provided for system control devices located in wet areas.

Any direct connection of a control device not recommended by the manufacturer could infringe the Gas Safety (Installation & Use) Regulations, the above regulations and the normal appliance warranty.

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

## Location of Boiler

The boiler MUST be fixed to a floor or vertical non-combustible wall, capable of adequately supporting the weight of the boiler and any ancillary equipment.

### **THE BOILER IS NOT SUITABLE FOR EXTERNAL INSTALLATION.**

#### **IMPORTANT NOTICE.**

If the boiler is to be fitted in a timber framed building it should be fitted in accordance with the British Gas publication 'Guide for Gas Installations in Timber Frame Housing', reference DM2. If in doubt, advice must be sought from the Local Gas Region of British Gas.

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

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

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

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

design, including airing cupboard installations are given in BS.6798.

In siting the boiler, the following limitations MUST be observed:

1. The position selected for installation MUST allow adequate space for servicing in front of the boiler and for air circulation around the boiler.
2. This position MUST also permit the provision of a satisfactory balanced flue termination.
3. This position MUST also permit the provision of a satisfactory connection to the condensate drain.

## Gas Supply

An existing meter (NG) and pipework should be checked, preferably by the Gas region, to ensure that they are adequate to deal with the rate of gas supply required.

Supply pipes should be sized to suit installation and obtain a working pressure of 20 mbar (NG) or 37 mbar (Propane). Installation pipes should be fitted in accordance with BS.6891.

A Natural Gas appliance must be connected to a governed meter.

## Conversion

The appliance can be converted from NG to LPG or vice versa by change of the Burner, Main and Pilot Injectors and re-setting the Gas Valve. Contact your supplier for the necessary parts.

## Flueing

Only flue components provided by the Manufacturer should be used with these appliances. Detailed recommendations for flueing are given in BS.5440: 1. The following notes are intended for general guidance.

1. Be aware of the plume from the flue and the wetting effect it has to adjacent property.
2. The flues can be taken left, right or to the rear of the appliance.
3. The appliance is supplied with two standard flue sets. There are two lengths of Concentric Flue. Standard, that will reach 500mm, and Extended that will reach up to 2000mm. (Part No. M3838).
4. The boiler MUST be installed so that the terminals are exposed to external air.
5. It is important that the terminals allow the free passage of air across them at all times.
6. The acceptable spacing from the terminal to obstructions and ventilation openings are specified in Table 1.
7. Because the flue gases and terminal are at very low temperature it is not necessary to fit a Terminal guard to protect against burns. If a guard is required for any other reason the following is recommended.

For the **Concentric** Terminal:  
Model K3 6.5 x 11 (plastic coated) (GC No 393554)

All are available from:

**Tower Flue Components Ltd.**

*Tower House.  
Vale Rise.  
Tonbridge  
KENT  
TN9 1TB  
01732 351555*

<b>Terminal Position</b>	<b>Minimum</b>
Below window or vent	300 mm
Below gutter or pipes	75 mm
Below eaves	200 mm
Below balcony or roof	200 mm
From a window	200 mm
From vertical pipe	75 mm
From corners	300 mm
Above ground, roof or balcony	300 mm
From facing surface	600 mm
From facing terminal	1200 mm
From opening under a car port	1200 mm
Vertically from a terminal	850mm
Horizontally from a terminal	300 mm

**Table 1.**

**IMPORTANT.**

It is absolutely ESSENTIAL to ensure, in practice, that products of combustion discharging from the terminal cannot re-enter the building, or any other adjacent building, through ventilators, windows, doors, other sources of natural air infiltration or forced ventilation/air conditioning.

*If this should occur, the appliance MUST be turned OFF IMMEDIATELY and the Local Gas Region consulted.*

**Air Supply**

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

Where the boiler is installed in a cupboard or compartment no air vents are required. However the User may wish to ensure that is ventilated to provide air circulation.

**Water Supply**

A heating system should be in accordance with the relevant recommendations given in BS.6798, BS 7593:1992 and, in addition, for smallbore and microbore systems - BS.5449:1.

The domestic hot water system, if applicable, should be in accordance with the relevant recommendations of BS.5546.

Copper tubing to BS 2871:1 is recommended for water carrying pipework.

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

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

A Drain Tap is provided and should be installed in an accessible position on an unused end of the Heating manifold. Any other installed Draining taps should be at least ½” nominal size and be in accordance with BS.2879.

**Condensate Drain**

**Refer to Fig. 2, and 12**

A condensate drain is provided on the boiler, this drain must be connected to the household drainage point, or soakaway on site. All pipework and fittings in the condensate drainage system MUST be made of plastic. Refer to British Gas publication “Guidance notes for installation of domestic condensing boilers”

**No other materials may be used.**

The drain outlet on the boiler is :

**Polypipe, 21.5mm pushfit overflow pipe.**

**Sealed Systems**

The sealed system should follow the guidelines given in the Code of Practice BS 7074 :1. The appliance includes a 3 bar (45 lb/in<sup>2</sup>) safety valve to BS 6750

Pt 1. It should be installed on an unused end of the Return manifold and discharge through a pipe to a safe outlet.

A 10l expansion vessel, complying with BS 4814 is also fitted on the return side of the pumps. If additional system pipework is added the size of the vessel should be checked using the table below. If the fitted unit is not large enough the following steps should be taken to determine the required size.

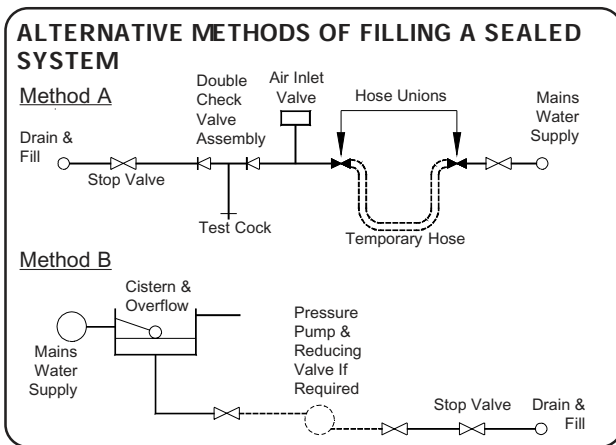


1. Choose a vessel pressure by taking the static head of the system, adding 0.3 bar, and taking the nearest larger size.
2. Select the Vessel Volume from the table below by finding the system volume and vessel pressure.
3. Subtract 10 for the vessel in the appliance then, choose that size or larger from the manufacturers' range.

Vessel Pressure Bar	System Volume Litres				
	50	60	70	100	150
0.5	4	4	8	8	12
1.0	8	8	8	12	18
1.5	8	12	12	18	24

A pressure gauge with a fill pressure indicator and a range of 0-4 bar is fitted on the appliance front panel.

A Filling Loop incorporating a BS 1010 stop valve, a double non-return valve is provided with the appliance. It should be installed on the unused end of the LPHW Flow manifold with the approval of the local Water Undertaking.



## Electricity Supply

Refer to Figs. 3, 3a and 4.

Wiring external to the appliance MUST be in accordance with the current I.E.E. Wiring Regulations and any Local Regulations that apply.

The boiler is supplied for 230V ~ 50Hz. Single phase. Fuse rating is 5A.

The method of connection to the mains electricity supply MUST facilitate complete electrical isolation of the boiler, preferably by the use of a fused double pole switch having a 3mm (1/8in.) contact separation in both poles and servicing only the boiler and system controls.

The point of connection to the mains should be

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

**Note.** Where a room sealed appliance is installed in a room containing a Pool, Bath or Shower, the appliance, any electrical switch or appliance control utilising mains electricity should be so situated that it cannot be touched by a person using the bath or shower.

The appliance incorporates a 12V DC switching circuit for connection to system controls in wet areas. All such system controls MUST be voltage free.

## Installation Of Boiler

**Suggested procedure:**

1. Site to suit system and terminal limitations.
2. Mark & Drill Flue holes. See Fig. 2
3. Fix Boiler Frame to the wall and/or floor.
4. Remove the Electrical tray and the Cases from boiler module.
5. Fit the flues.
6. Plumb to the system and gas.
7. Fit the Filling Loop provided to an unused end of the LPHW manifold.
8. Fit the Drain Tap provided and unused end of the Heating manifold.
9. Fit the Safety Valve provided to an unused end of the Return manifold.
10. Test for leaks.
11. Wire Mains supply and System Controls.
12. Replace the Cases and Electrical tray.

**Space Required for Installation and Service.**

Right or Left	30 mm	1¼ in.
Above	30mm	1¼ in.
Below	25mm	1 in.
In Front	450mm	18 in.

## Removal of the Case

Refer to Fig. 6

1. Remove the Lower Cover by pulling forward.
2. Remove the Electrical Cover. This is detached by pulling the cover towards you and carefully lowering. Care should be taken to prevent strain on the cables and connections.

3. Remove the case by unscrewing the two pozidrive screws located at the bottom and rear of the case, and lifting and pulling forward off the two pegs which are located at the top. The case should be kept vertical as it is removed. Examine the sealing strip for damage and replace if necessary.

**IMPORTANT: FAILURE TO CORRECTLY LOCATE THE APPLIANCE CASE COULD RESULT IN LEAKAGE OF COMBUSTION PRODUCTS INTO THE ROOM**

## Boiler Location

1. Site to suit system and terminal limitations.
2. Secure the frame to the wall and/or floor with the brackets supplied.

## Assembly Of Flue Pipe & Air Duct Pipe to the Boiler

The following is based on the flue tube being supplied with the straight and elbow connectors being pre-assembled, the one NOT required to be cut off during installation.

### Right or Left Outlet

1. Secure the 50mm flue tube with ELBOW connector on the saddle using the Velcro strap. **See Fig. 7**
2. Measure carefully and saw off the 50mm tube to give required projection from wall. **See Fig. 7**
3. Measure carefully and saw off the 110mm Air duct tube to give required projection from wall. The flue pipe must project more than the outer air duct when assembled. **See Fig. 7**

#### Note:

It is acceptable to obtain this dimension by pulling the air duct away from the air duct stop, provided there is a minimum of 10mm (1/2 in.) insertion into the Boiler Mounting Box and that a satisfactory seal is achieved.

4. For extended flues, position the air duct support clips provided every 700mm.

### Rear Outlet

Install as above but using the STRAIGHT connector in the Boiler Mounting Box. Follow the instructions under Right or Left Outlet, points 1,2,3 and 4.

## Terminals

Fix to the outside wall with the 'T' cutout, towards the top face which contains no holes. If a guard is fitted, the terminal should be at its centre.

## Plumbing

If the requirement for Heating exceeds 50,000 Btu/h (15kW), the Flow and Return pipework from the appliance must be 28mm until the heat load allows smaller bore pipework.

The appliance includes a pump overrun devices and there must be a flow path in the system at all times. An automatic bypass has been provided in the Heating circuit for this reason.

New pipework must be flushed through before connecting.

## Gas Connection

The 28m Copper gas connection is shown in **Fig.2**. A minimum of 20mb. (NG), 37mb (LPG) must be available at the boiler inlet, with the boiler and other connected appliances firing. Check for gas soundness (B.S. 6891) in pipework to boiler using a manometer. Open the gas cock. Gas soundness within the boilers should be checked using sense of smell and/or leak detection fluid. Check the burner bar pressures with a manometer connected to the control and adjust if required, with the pressure regulator on the Gas Valve.

## Condensate Connection

The position of the plastic condensate drain pipe is shown in **Fig 2**.

Where possible an internal termination of the Condensate discharge pipework should be used.

Installation pipework must be in plastic to a suitable drain location with a gradient of 2.5° (45mm/ metre run) minimum. If connected to another drainage trap, an air break is required between the boiler drain and that trap. (**see Fig.11**). Internal runs must be in a minimum of 19mm pipe. External runs MUST be made in a minimum of 32mm pipe, starting inside the building, and if possible insulated to defer problems from freezing.

Whichever method is used it should be checked during commissioning to prove there is a leakfree working connection from the boiler to the drain. The simplest way to do this is to carefully pour some water into the boiler flue and check it emerges at the drain.

The British Gas booklet "Guidance for the installation of Domestic Condensing Boilers" should also be referred to.

# Heating Design

## General principals

The system should be designed to conform with the latest requirements of the Building Regulations.

Condensing Boilers give their best performance when the system water temperature is as low as possible and still achieve the desired room temperatures. Oversized radiators make this easier to achieve but are not essential as, even in a standard designed installation, most of the boilers' working hours are spent with the system producing much less than the designed output. This is because the outside temperature is often higher than the figure used for the design, typically -1 to -2° C.

The Manufacturer recommends the use of a voltage free, programable room thermostat, alternatively a separate timeswitch and room thermostat can be used.

The boilers include pump overrun devices so it is essential that there is an open circuit for water to flow between the LPHW flow and return. In some system designs this may require the addition of a bypass, an automatic bypass is recommended.

They also contain integral frost protection, a boiler will fire if the temperature within it approaches freezing. It will do this even when turned to Off, and can only be inhibited by removing the Permanent Live supply to the boiler.

Thermostatic radiator valves can be used. An automatic bypass is incorporated in the appliance for the heating circuit.

The boiler waterside is completely copper so all good corrosion inhibitors are suitable.

## Designs

The following designs are all acceptable:

1. Sealed system to BS.6798 and BS.5449:1
2. Combined Feed and Vent systems.
3. Separate Cold Feed and Vent systems.

The pump is on the return, careful note of its position relative to the feed and vent MUST be made to avoid pumping over, or sucking in air. The design temperature difference across the boiler for optimum operating efficiency is 20°C. If thermostatic valves or zone valves are used ensure the minimum flow shown in the **Technical Data on page 21** is possible.

# Electrical Connections

**WARNING: The appliance MUST be earthed.**

All wiring for the boiler and system controls MUST conform to I.E.E. Wiring Regulations, and work should be tested using a suitable meter, for Earth Continuity, Polarity, Short Circuit and Resistance to Earth.

The supply must be through a common isolator, a double pole 3A fused isolating switch with a contact separation of 3mm minimum on both poles. The cable used should be no less than 0.75mm<sup>2</sup> to BS.6500 PVC, 3 core, and fixed ensuring the earth connection is longer than the Live and Neutral.

Access to the boiler connections is made by withdrawing the Electrical Tray then releasing the screw retaining the cover over the push fit screw terminals. The boiler internal wiring is shown in **Fig.3, Fig.4 and Fig.5.**

Connections are as follows :-

### Supply Connection

⏏	Earth
N	Mains Neutral
L	Permanent Live

### Pump Connections

⏏	Earth
N	Pump Neutral
Lp1	Pump No1 Live
Lp2	Pump No2 Live

### Controls

1	+12 V DC to External controls.
2	+12V DC from Dehumidifier
3	+12V DC from Heating control
E	Earth, 2 Port Valve
N	Neutral, 2 Port Valve
4	2 Port Valve, Br
5	2 Port Valve, Or
6	2 Port Valve, Gy

The appliances includes pump overrun and the Pumps have been factory connected to their respective push-fit connectors.

External controls **MUST BE** voltage free and connected to terminals 1, 2 and 3.

## Commissioning

### General

The elimination of air from systems is essential to minimise the occurrence of heat exchanger and general system noise. It is particularly important for lightweight boilers.

Metal swarf and flux chemicals make a very aggressive mixture, the destructive nature of which can be drastically reduced by flushing. Consequently this is a mandatory step in the commissioning procedure.



Low water content, fabricated boilers are vulnerable to damage by air, particularly when the system water is 'hard'. (Contains a lot of dissolved calcium salts). The result of this damage is evident in noisy boilers and reduced service life.

Removal of air from a system mainly takes place when the water is stopping, starting or not moving at all. It is removed most easily when it is in large bubbles, but the action of the pump is to chop it up so that it becomes a foam, which is extremely difficult to remove.

Two or three second bursts on the pump at the initial stage will reduce the risk of foam formation.

Sloping the pipe runs towards the vent points will greatly aid air removal. Sloping pipes are not just a feature of gravity systems but can greatly aid the pumped system because air can move towards a vent when the pump stops.

Air is dissolved in water but is released when heated. Always run a system at maximum temperature for at least 15 minutes to enable this potential problem to be removed during commissioning.

## Commissioning Procedure

The boiler is fitted with automatic ignition and will start when the gas cock is open, mains is connected to the boiler and the controls calling for heat.

**NOTE:** If the boiler has just been filled with very cold water, the built in Frost Thermostat will attempt to fire it if it has a permanent live and no switched live, this is completely normal. It is recommended that the gas cock is turned off during this early stage. Because of a built in delay, the boiler is always held off for a minimum of 120 seconds. However, for commissioning purposes, switch off using the System Isolating Switch will avoid the delay.

It is strongly suggested that the following stages of commissioning are followed, and not an immediate connection of all services. This procedure prevents substantial amounts of air being dispersed through the system as small bubbles.

*Carry out electrical tests as stated in Electrical Connections if not already done so.*

*With all valves fully open, and the filling loop connected, fill from the mains supply, then follow the procedure below.*

*Check for water soundness and rectify where necessary.*

*Check that there is a leakfree working connection from the boiler to the drain. The simplest way to do this is to carefully pour some water into the boiler flue and check it emerges at the drain.*

## DO NOT TURN ON GAS

*Drain the system by opening all draincocks. This will flush the system of flux and swarf.*

*Pour in all the inhibitor, and fill to required pressure plus 0.3 bar to allow for venting.*

*Switch on the electrical supply to the boiler and switch the Thermostat/Timeswitch ON.*

*Switch off after about five seconds and vent all points again.*

*Repeat this for 5 minutes.*

*Re-pressurise if required.*

*Turn on pump (do not turn on gas) and run for at least 30 minutes with all valves open.*

*Stop pump at five minute intervals and vent until no more air can be removed and air noises are no longer produced at the boiler. While the system is venting check again for water soundness.*

## TURN ON THE GAS

*Check for gas soundness (BS 6891) in pipework to boiler using a manometer.*

*Select each boiler in turn, open the gas cock and after purging the system, the boiler will light automatically.*

*Run system at maximum thermostat setting.*

*Gas soundness within the boiler should be checked using sense of smell and/or leak detection fluid.*

*Continue running for 15 minutes, venting every 5 minutes.*

*The Pilot is factory set.*

*The Main Gas Valve, GV2, gradually raises the pressure to the set point. Allow at least 60 seconds for the final pressure to stabilise.*

**IMPORTANT.** It is essential when setting the burner pressure that the inlet pressure is at least 20 mbar (NG), 37 mbar (LPG) with the boiler and any other connected appliances running.

*Set the burner pressures to the correct pressure by using a manometer connected to the control and adjusting the regulator to the desired input. (see the charts below and Fig.1)*

For designs with a heating system check the operation of the bypass with the system hot. The minimum flow rate through the boiler should be as shown in the **Technical Data on Page 21**.

Set the pump speed to the highest setting that does not provoke unreasonable operational noise within the system.

Re-pressurise to required pressure and set the gauge indicator

With the system hot, check again for water soundness.

Refit the case to the boiler.

For designs with heating circuits, balance the system in the normal way to obtain even heating of all radiators.

If fitted set the cylinder thermostat to 60°C, or lower if preferred.

**Note:** The boiler is fitted with a syphon trap that includes a blocked drain device. This is to safeguard the boiler and help defer the effects from the possible freezing of the condensate pipework in extreme weather.

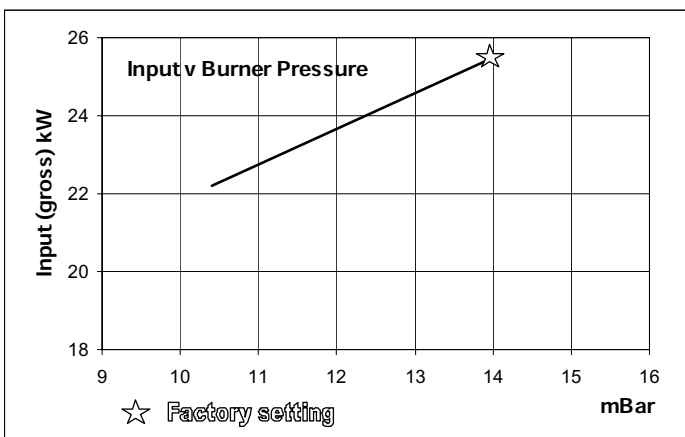
The user should be made aware of this feature and, that in the event of blocked condensate pipework, for example frozen condensate pipework, the boiler will automatically stop functioning. It will start again as soon as the blockage has cleared.

## Commission Check List (hydraulic)

The key points which must be observed closely, are shown below.

- With valves and vents open fill the system.
- **Do not use pump. Do not light gas**
- Check for and rectify leaks.
- Drain to flush system.
- Refill system, adding the inhibitor.
- **Do not light boiler.**
- Vent all radiator and air release points.
- Run pump for 5-10 second bursts and revent.
- **Do not light boiler.**
- Run pump for at least 30 minutes.
- Stop at 5 minute intervals to vent.
- Continue venting until no more air noise can be heard.
- Light boiler and run at max thermostat setting. Continue for 15 minutes, venting every 5 minutes.

## Rating and Setting Pressures for each boiler



**Rating Table (1040 Btu/ft<sup>3</sup>) (38.8 MJ/m<sup>3</sup>)**

kW	Btu/h	sec/ft <sup>3</sup>	m <sup>3</sup> /2 mins
20	68240	54.9	0.0619
22	75064	49.9	0.0680
24	81888	45.7	0.0742
26	88712	42.2	0.0804

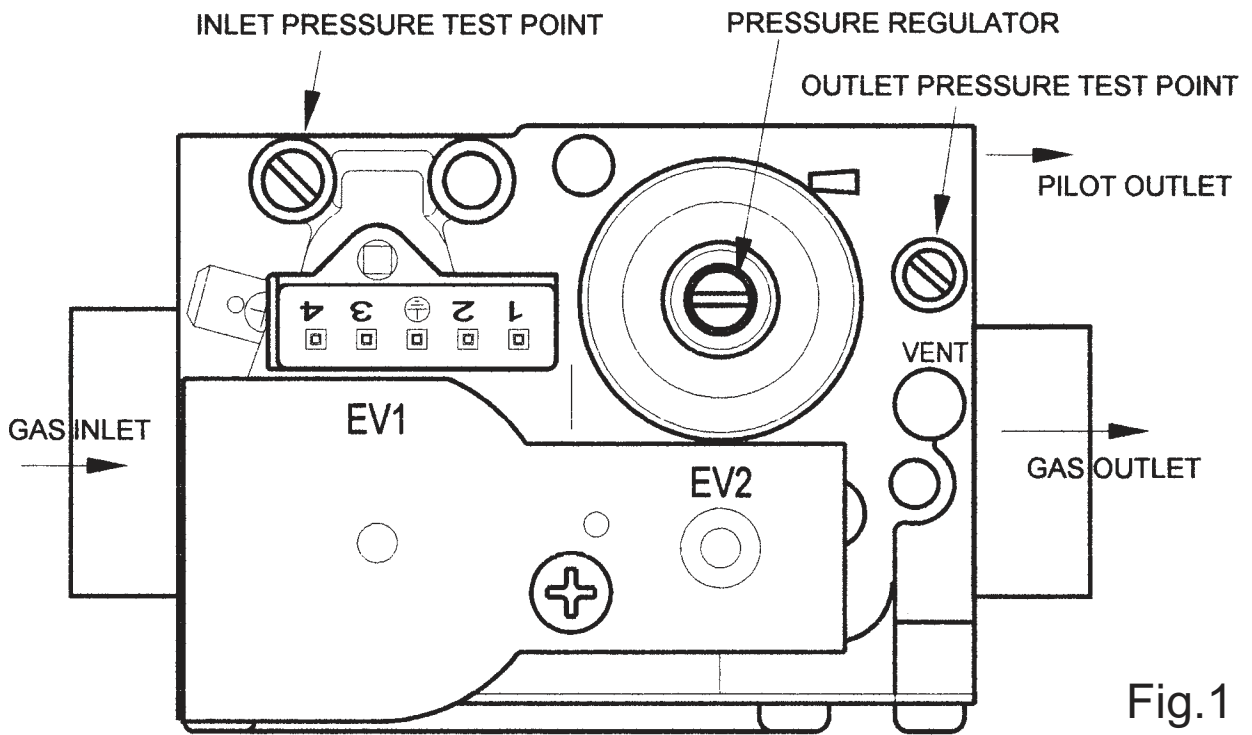


Fig.1

# Installation Dimensions and Service Access

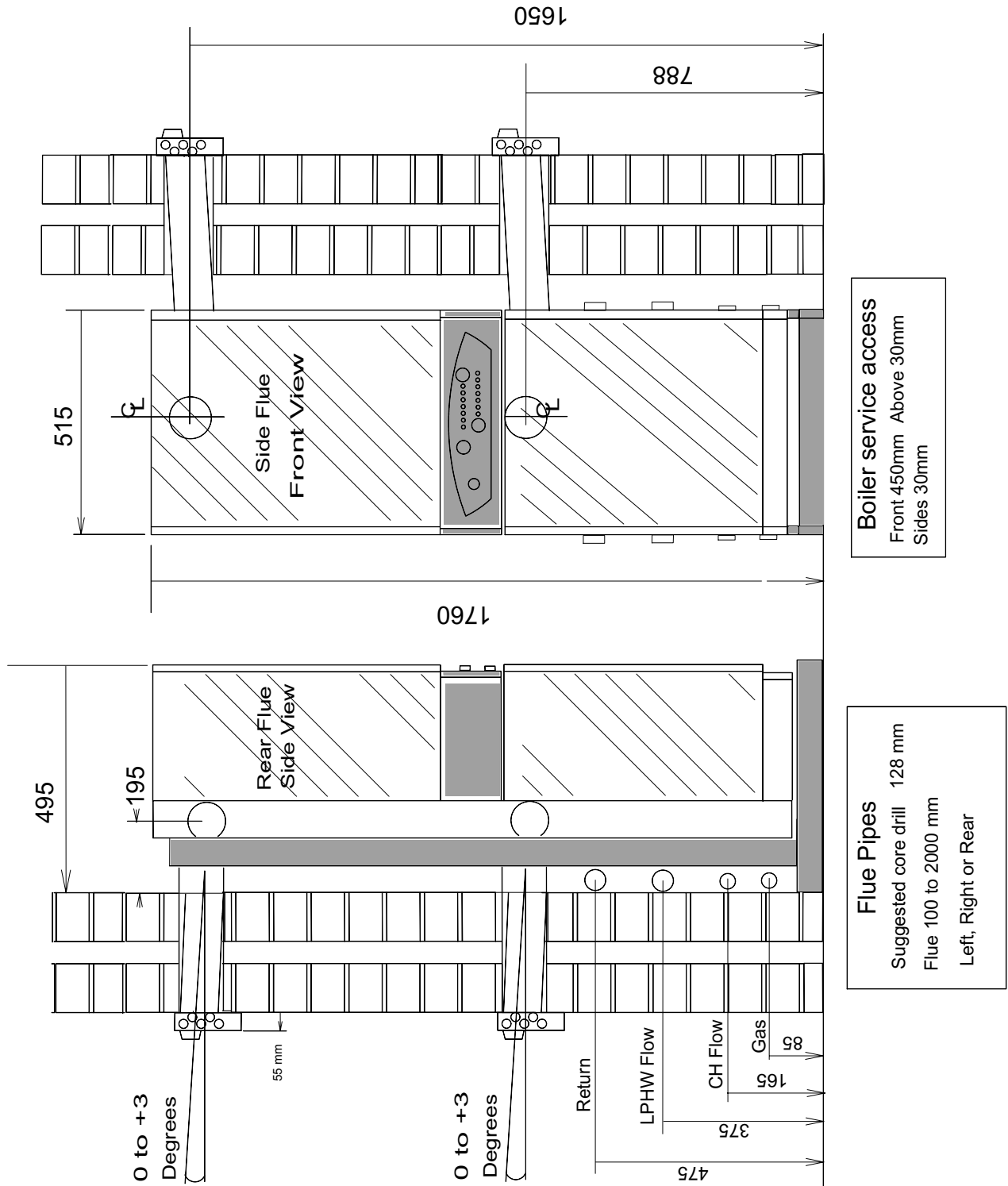


Fig.2

# Pipe Connections & Locations

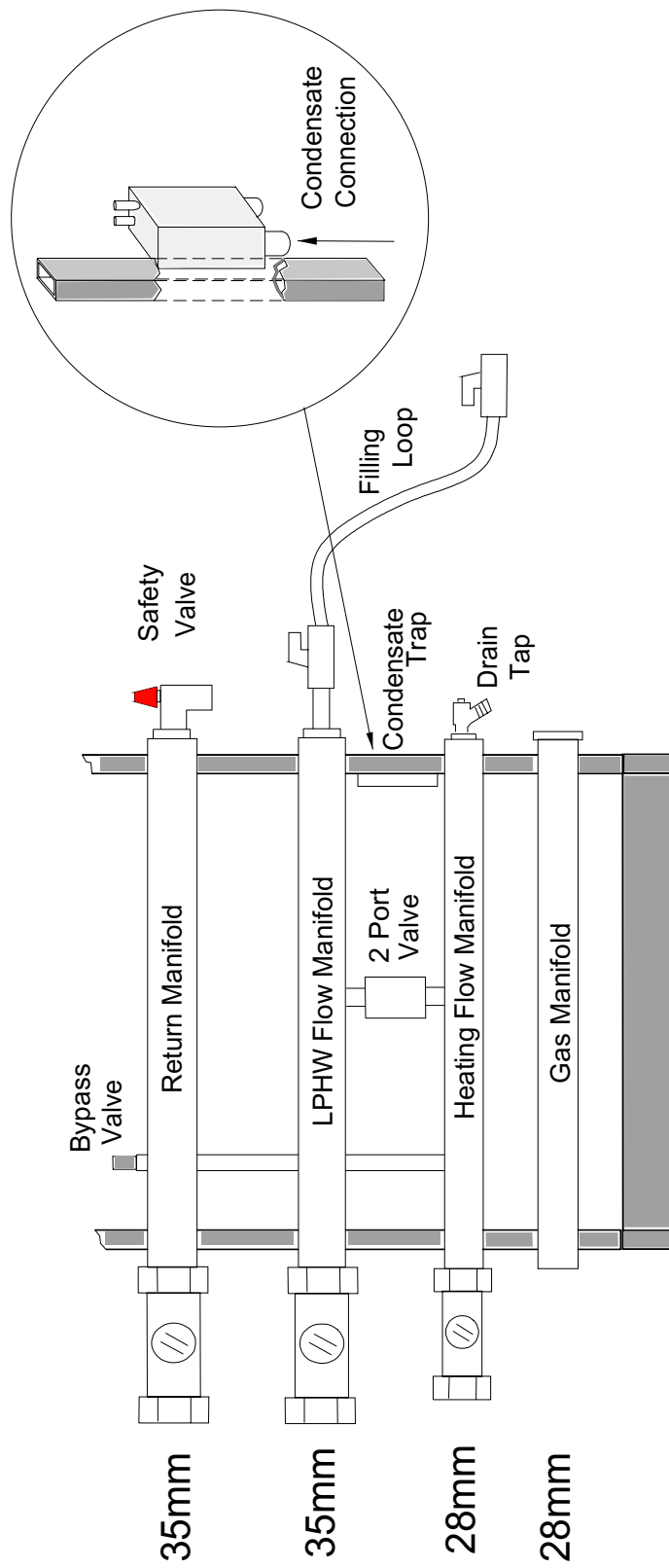


Fig.2a



# Schematic Wiring (one boiler only)

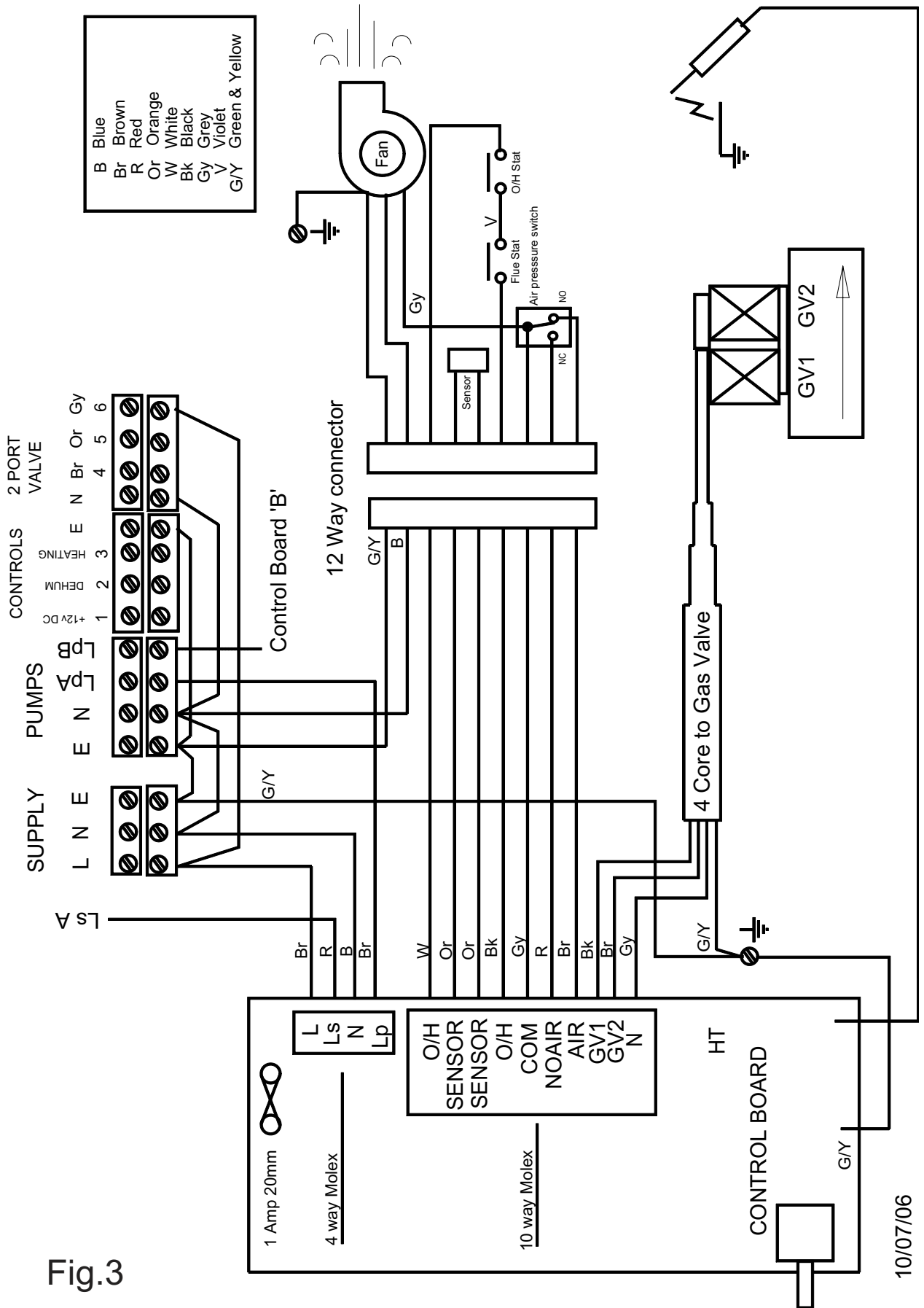


Fig.3

10/07/06

# Physical Wiring Diagram (one boiler only)

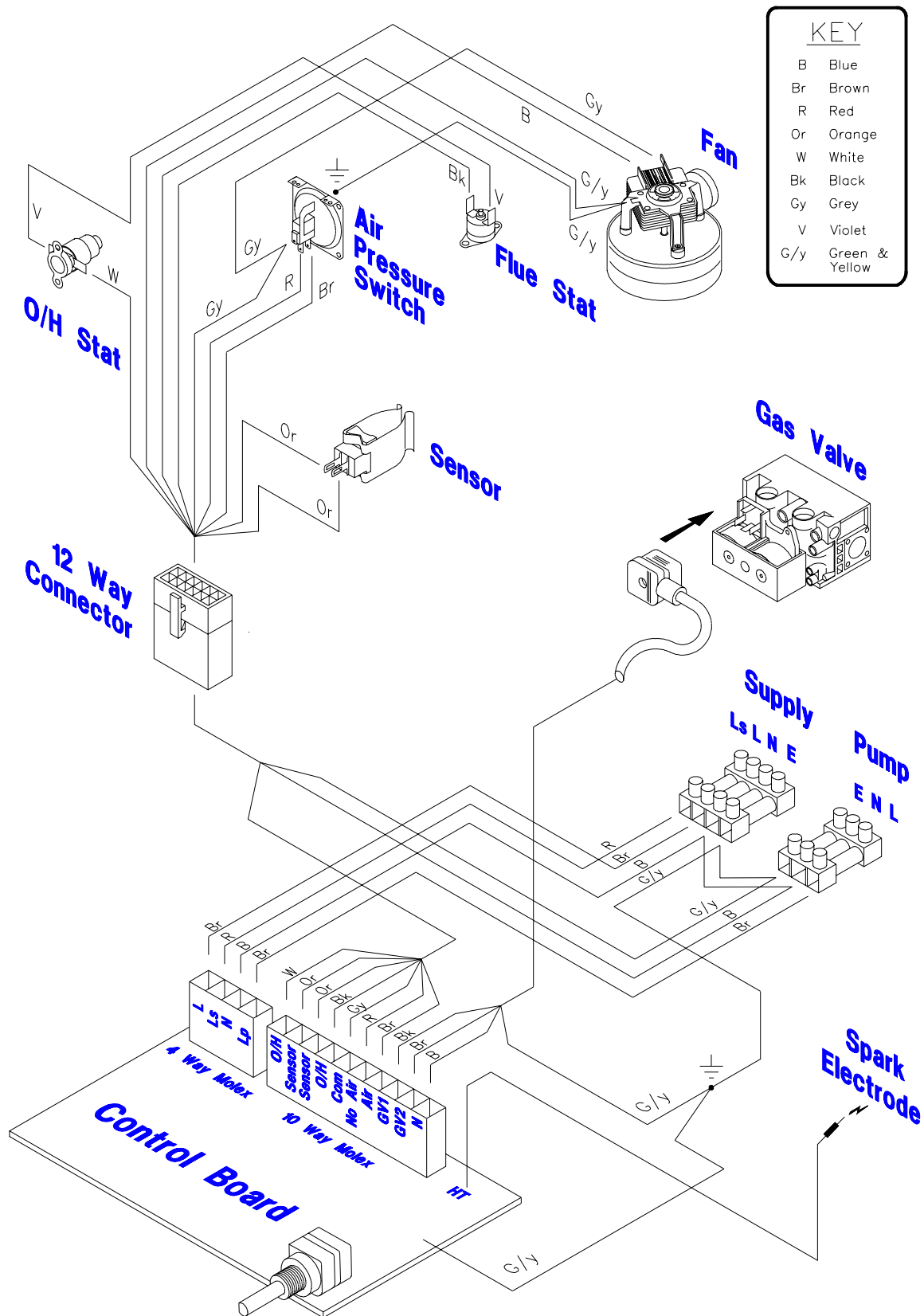
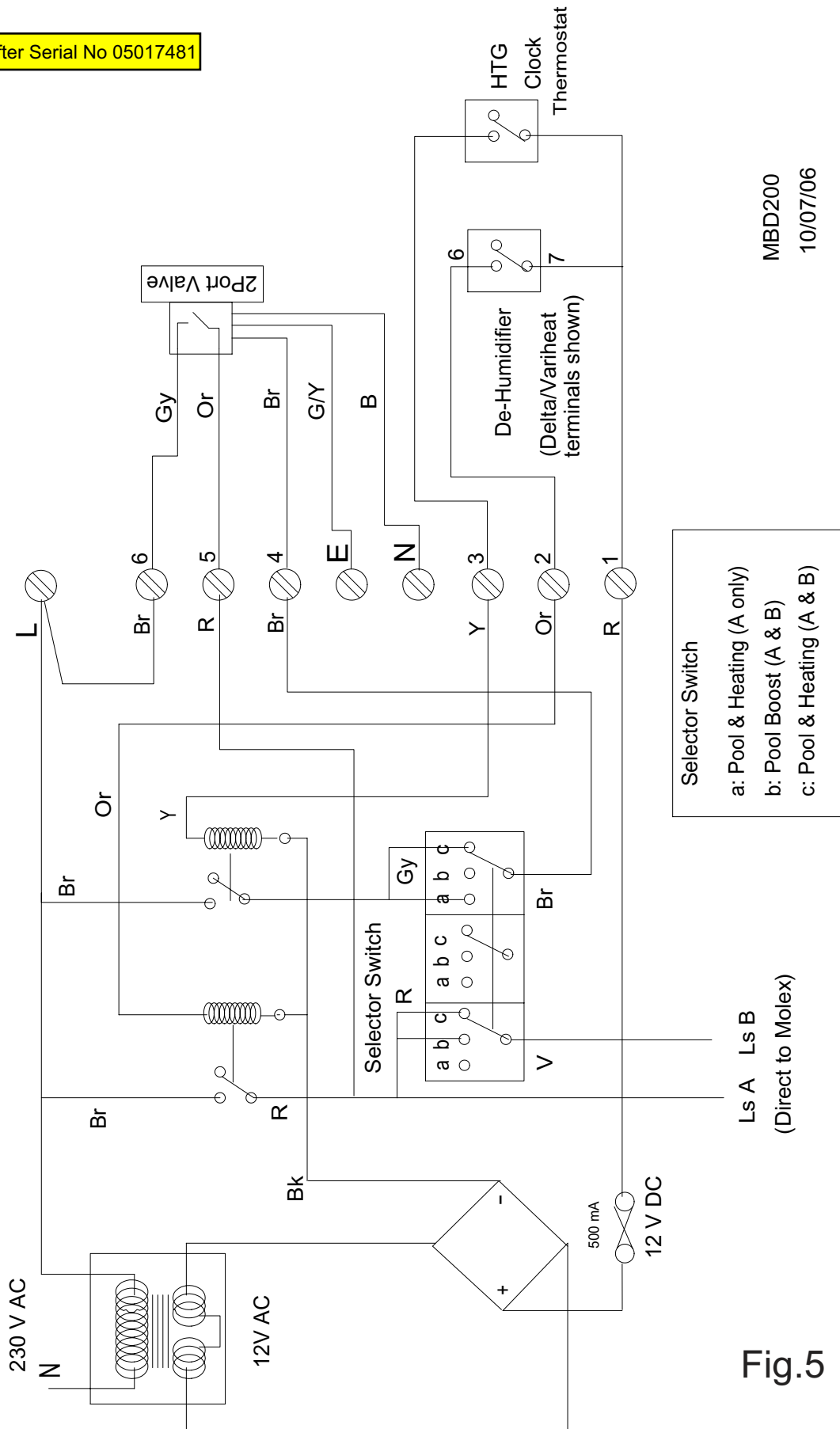


Fig.4



# Low Voltage System Connections

Models after Serial No 05017481



Selector Switch  
 a: Pool & Heating (A only)  
 b: Pool Boost (A & B)  
 c: Pool & Heating (A & B)

Ls A Ls B  
 (Direct to Molex)

MBD200  
 10/07/06

Fig.5

# Boiler Panel Assembly

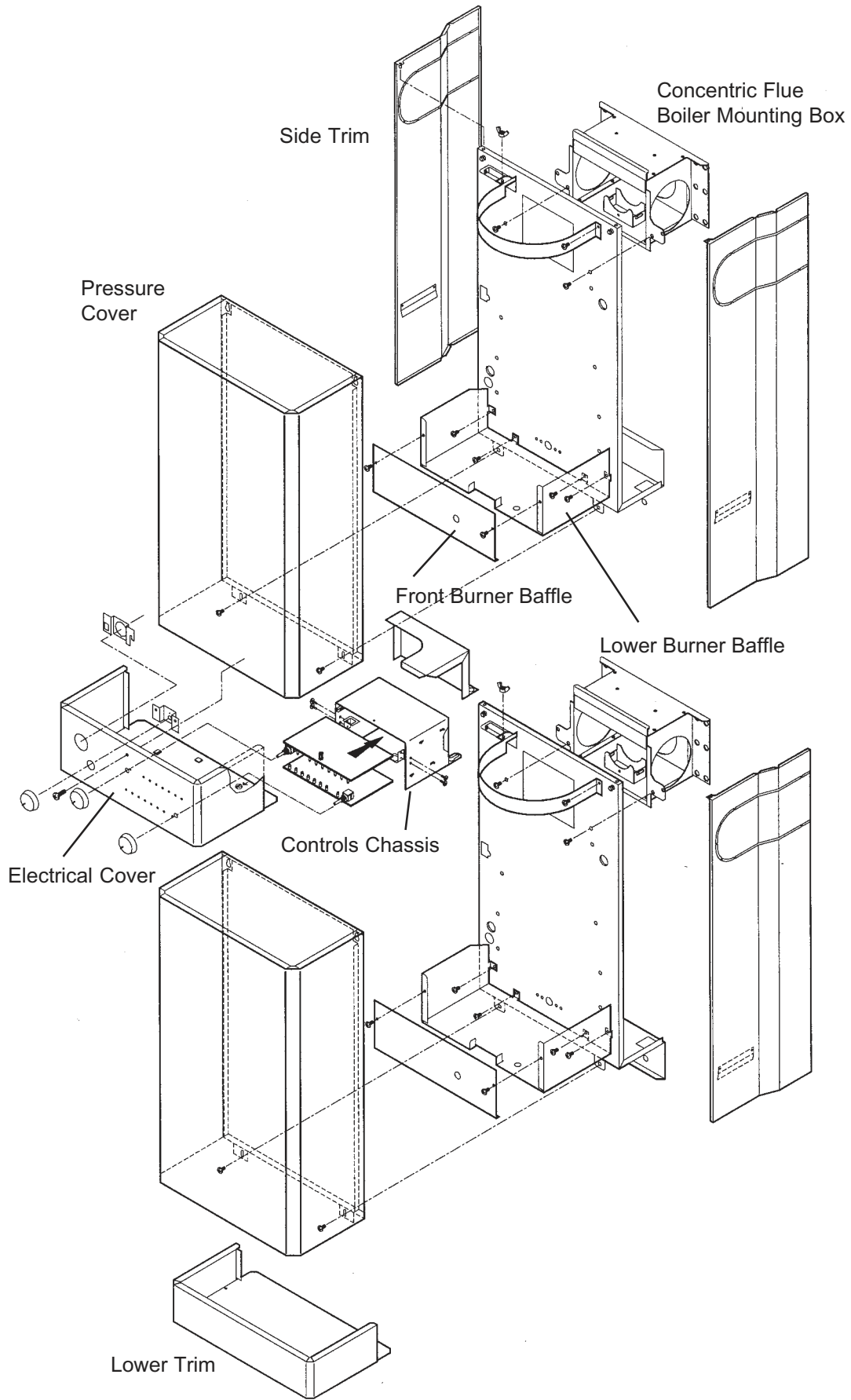


Fig.6



# Fault Diagnosis (one boiler shown)

		Fascia Indicators						Hidden phase reversed
		power	running	pump	fan	pilot	burner	lockout
	<b>Working conditions</b>							
	Normal operation, boiler firing	*	*	*	*	*	*	
	Normal operation, <i>running</i> flashing, boiler upto temperature and in delay mode (120 seconds)	*	*	*				
	Normal operation, system satisfied, pump running on (120 seconds)	*		*				
	Normal operation, no demand	*						
	<b>Fault conditions</b>							
	Live and Neutral reversed	*						*
	Boiler not firing, controls calling							
	No permanent Live							
	Safety thermostat tripped.	*		*				*
	NB: Pump runs continuously							
	Reset Overheat by turning boiler stat to off then on							
	Reset Flue Stat on flue hood.							
	OR							
	Insufficient water flow OR Faulty Overheat Stat							
	Blocked flue OR Faulty Fan OR Faulty Flue Stat.							
	Flow & return reversed.							
	Switched live from controls absent.	*						
	Faulty Control board.	*						
	Air Pressure Switch not satisfied	*		*				
	APS stuck or not pressurised							
	OR							
	Condensate trap blocked.							
	Flue blocked OR Faulty Fan OR APS.							
	Indicating hot when not							
	Boiler cold but not firing	*		*				
	Sensor failed low resistance							
	Stuck in delay mode if more than 120s	*		*				
	Reset by turning Mains off then on.							
	Mains not applied to GV1	*		*				
	Pilot valve not energised	*		*	*	*		
	No gas							
	OR							
	No spark OR No flame sense	*		*	*	*		
	Faulty Control board OR HT lead.							
	Live and Neutral reversed.	*		*	*	*		*

NOTE: There are other combinations of lamps that can take place during a failure.

*	= Lit
*	= Flashing
(*)	= Lit or Not lit

03/07/2003

## Fault Finding (for boiler only)

The electrical sequence in the boiler is very straightforward and faults can easily be tracked down if this simple sequence is followed.

*System Controls - - - - Flue Stat - - - - Overheat Stat - - - - Pressure Switch - - - - Control Board - - - - Ignition*

The lamps on the front panel indicate several of the stages in the ignition sequence.

Firstly a Permanent live has to be connected to the L terminal then the *power* lamp lights.

When the system controls and the programmer are calling for heat, power is fed to the boiler initiating the following sequence.

A call for heat powers the Ls terminal and the *running* and *pump* lamps light.

Provided the Flue Stat, Overheat Stat and boiler are cold, the fan starts up. The pressure switch detects the correct airflow and that the condensate drain is not blocked then, switches over. This is indicated by the *fan* lamp illuminating.

The *pilot* lamp illuminates, the pilot gas valve opens and the Control Board provides a spark at the pilot electrode. (If the L and N supply are reversed the boiler will not progress beyond pilot ignition. This is indicated by the *phase reversed* neon behind the knob lighting.) The pilot flame is detected and the control board stops sparking and then energises the main gas valve and the *burner* lamp is illuminated.

The pilot flame lights the burner, and it stays alight until turned off by the control thermostat, system controls, or in the case of a fault condition a safety thermostat.

The flue thermostat will trip if the flue exceeds a pre-set temperature. The overheat thermostat will trip if the water flow rate is insufficient, both are indicated by the *lockout* lamp illuminating.

**NOTE:** The boiler has a built-in delay timer. It is indicated by the *running* lamp flashing.

For testing, switching the Mains Supply off for a few seconds, then back on again will reset the delay.

**WARNING:** BEFORE COMMENCING OR COMPLETING ANY ELECTRICAL WORK ON THE APPLIANCE, IT IS RECOMMENDED THAT THE BASIC SAFETY CHECKS FOR EARTH CONTINUITY, SHORT CIRCUIT, POLARITY AND RESISTANCE TO EARTH ARE MADE. ALL WORK CARRIED OUT SHOULD FOLLOW GUIDELINES LAID DOWN BY THE I.E.E.

### Fault Diagnosis

The Fault Diagnosis chart shows the normal and fault sequences for the boiler indicator lamps.

To diagnose a fault, use the following procedure.

- Turn off the system Mains supply.
- Set all thermostats and timers to a call for heat position.
- Turn on the system Mains supply and watch the boiler indicator lamps.

Compare the lamps with the diagnosis chart opposite to determine the fault and cause.

# Concentric Flue, positions

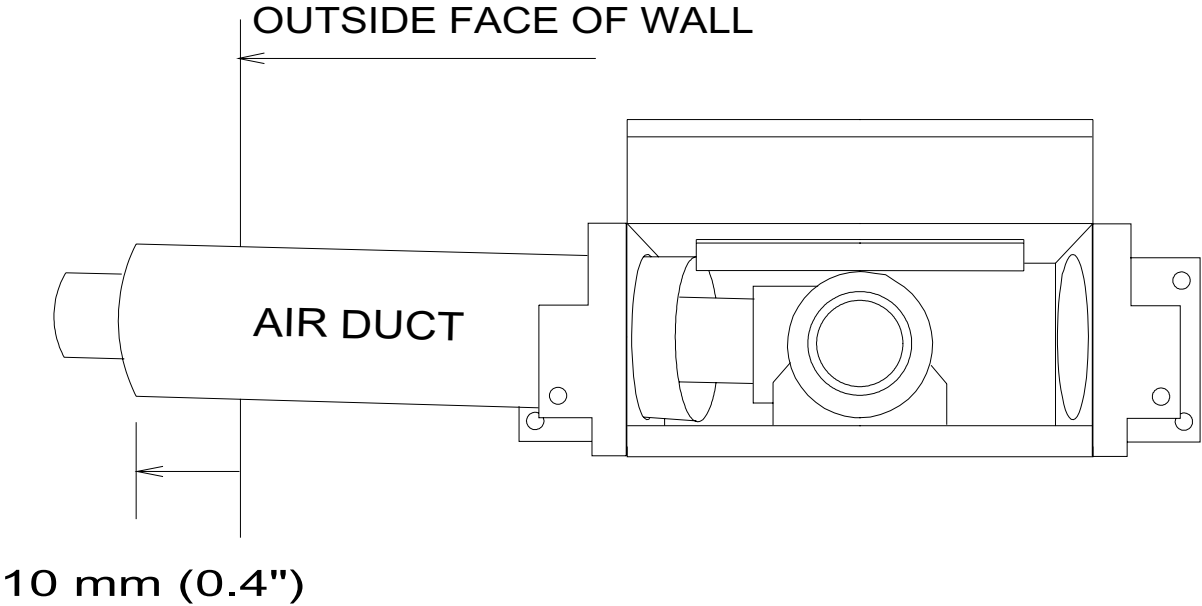
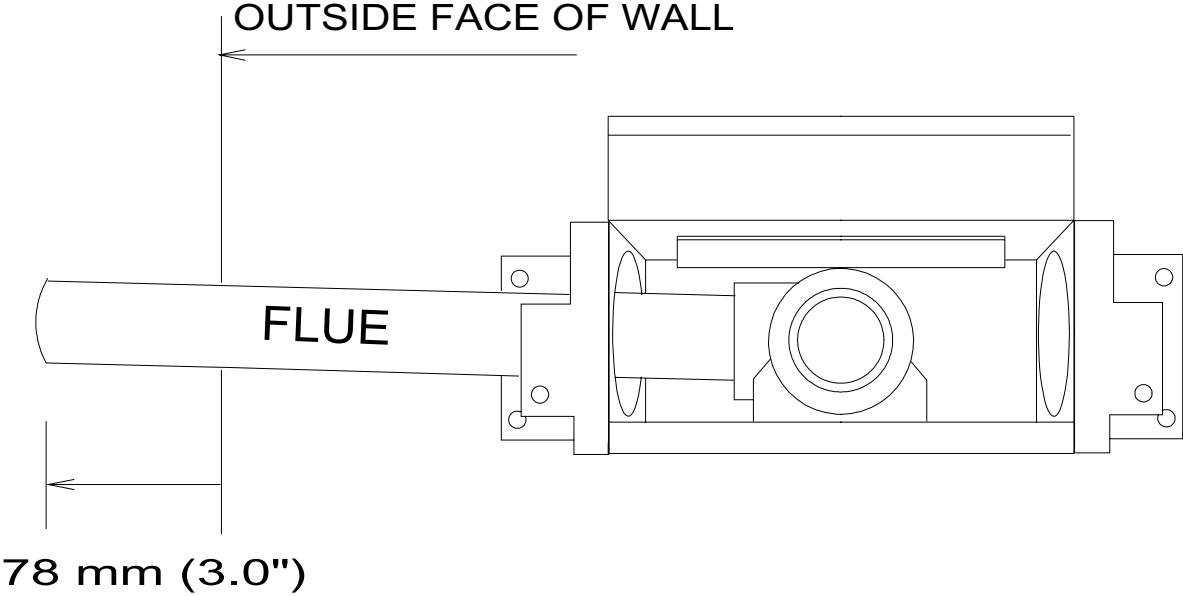


Fig.7

Fig. 7

# Servicing

## Health and Safety Statement :

This product contains no asbestos.

## Routine

To ensure continued efficient operation of the appliance it is recommended that it is checked and serviced at regular intervals.

The frequency of servicing will depend upon the particular installation and usage but in general twice a year will be adequate.

It is law that any service work should be carried out by Corgi registered personnel.

1. Clean burners and combustion chambers.
2. Check pilots and burner gas supply.
3. Check condition of ignition sensing probes.
4. Check boiler pipework joints for leaks.
5. Check the case seals.
6. Check condensate pipework for leaks.
7. Check heat exchangers, and the flue and air ducts are clear of any obstruction, and not leaking.
8. Check the Fans and their seals.
9. Check and clear the Condensate exit on the secondary heat exchangers by removing the Condensate Outlets and the Inspection Cover (Fig. 10).
10. Check and clear the condensate syphon trap.

The following procedures are given for one boiler but apply to both.

## 1.Heat Exchangers

Remove the panel in front of the secondary heat exchanger to gain access to inner inspection panels on the secondary and to view the primary (the lowest inspection panel also gives a view of the primary). Also view from beneath the primary. Clean as required. If in doubt, drain the system and remove for inspection.

## 2.Condensate Syphon

With a suitable bowl to catch the water, unscrew the drain-cap(s) on the underside of the Syphon trap and drain the water. Remove any solids and replace cap(s). (Fig 12)

## CHANGING COMPONENTS

**THERE ARE NO REPAIRABLE ITEMS, IF NOT WORKING AN ITEM MUST BE REPLACED.**

The boiler is in two major sections, the Case, and the Electrical Tray, The Major Components Diagram shows where the items are to be found. (pages 23-24)

## Behind the Electrical Tray

1. Control Boards.
2. Gas Valves.
3. Pumps.
4. Pressure Gauge.
5. Safety Valve.

## Behind the Cases

6. Fan.
7. Air Pressure Switch.
8. Flue Thermostat.
9. Control Sensor.
10. Overheat Cut-off Device.
11. HT Lead.
12. Pilot Assembly.
13. Burner.
14. Main Injector.
15. Combustion Chamber Insulation.
16. Primary Heat Exchanger.
17. Secondary Heat Exchanger.

## Servicing behind the Electrical Tray

### To Remove the Electrical tray

- Disconnect the electrical supply from the boiler and system.
- Slide the Electrical Tray forward a short way, then lower. Remove the cover over the components.

**DO NOT STRAIN THE CABLES, USE THE SUPPORT PROVIDED.**

### 1. Control board

- Remove the Control Knob.
- Lower the Electrical Tray.
- Remove the screw that retains the inner cover.
- Pull off the HT Lead, Multipole plug, and the Gas Valve lead, at the Valve.
- Slide back the Electrical Chassis and remove.
- Undo the Earthing screw and then pull off the 4 and 10 way Molex connectors.
- Remove the bracket for the potentiometer.
- Slide the Control Board out of the chassis.
- Transfer the pcb support to the new board.
- Replace the Control board.
- Re-assembly is the reverse.

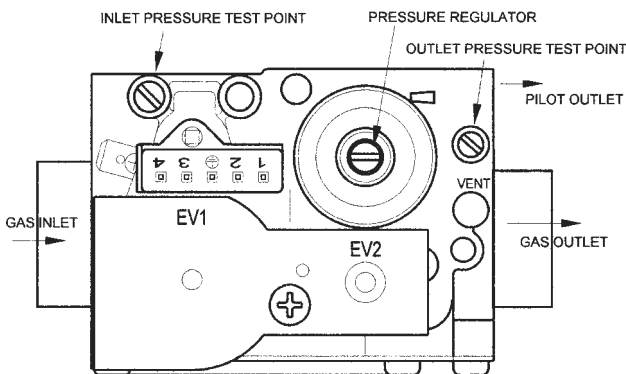
### 2 Gas Valve

- Lower the Electrical Tray.
- Turn the Gas Cock off.
- Pull off the electrical connector from the Gas Valve.
- Release the pilot feed tube.
- Undo the four shoulder bolts at each end of the valve.

**TAKE CARE TO SUPPORT THE VALVE AS IT IS RELEASED.**

- Replacement is the reverse.
- When secure, attach a manometer to the burner pressure tapping on the right hand side of the valve.

- The Pilot Adjuster is factory set.
- Turn on gas and electrical supply.
- The gas valve slowly opens to its setting ensure it has fully opened before adjusting.
- Set burner gas pressure with the governor. (see **Technical Data on page 1 for figure**)



### 3. Pump

- Lower the Electrical Tray.
- Close off the all the Flow and Return Valves.
- Drain the boiler through the Drain Tap.
- Disconnect the cable at the Pump.
- Undo the Set Screws holding the pump head to its base and remove the head.
- Re-assembly is the reverse.

### 4. Pressure Gauge

- Lower the Electrical Tray.
- Close off the all the Flow and Return Valves.
- Release the pressure in the boiler.
- Loosen the Plastic Nut that hold the Gauge retainer.
- Unscrew the sensor end from the Safety Valve, it may need a temporary plug to avoid leaks.
- Re-assembly is the reverse.

### 5. Safety Valve

- Lower the Electrical Tray.
- Close off the all the Flow and Return Valves.
- Drain the boiler through the Drain Tap.
- Remove the Pressure Gauge from the Safety Valve.
- Undo the water connections to the Safety Valve and remove.
- Re-assembly is the reverse.

### Removing the Case

- Lower the Electrical Tray.
- Undo the two M5 screws at the base of the Case.
- Lift the Case straight up about half an inch (12mm).
- Gently pull the Case straight forward off the hidden studs at the top of the boiler. (The cover hangs on two studs in keyhole slots)
- Examine the sealing strip for damage and replace if necessary.
- Place the Case somewhere safe from damage

**IMPORTANT: FAILURE TO CORRECTLY LOCATE THE APPLIANCE CASE COULD RESULT IN LEAKAGE OF COMBUSTION PRODUCTS INTO THE ROOM**

### 6. Fan Assembly

- Lower the Electrical Tray.
- Remove the Case.
- Undo the wing nut holding the Fan Protection Hoop.
- Pull the electrical connectors off the Fan.
- Gently pull the pressure tubing off the tappings on the Flue Hood.
- Undo the two screws holding the Flue Hood and slide forward and away.
- Re-assembly is the reverse.

### 7. Air Pressure Switch

- Lower the Electrical Tray.
- Remove the Case.
- Pull the electrical connectors off the Air Pressure Switch.
- Gently pull the pressure tubing off the both tappings on the switch.
- Undo the M4 nut and wing nut holding the Air Pressure Switch to its bracket on to the Back Panel
- Lift off its studs and rotate out of its bracket.
- Re-assembly is the reverse.

### 8. Flue Thermostat

- Lower the Electrical Tray.
- Remove the Case.
- Pull the electrical connectors off the Flue Thermostat.
- Re-assembly is the reverse.

### 9. Control Sensor

- Lower the Electrical Tray.
- Remove the Case.
- Unclip the sensor.
- Pull the electrical connectors off the Control sensor.
- Re-assembly is the reverse.

### 10. Overheat Cut-off Device

- Lower the Electrical Tray.
- Remove the Case.
- Pull the electrical connectors off the Overheat Cut-off device.
- Unscrew from its mounting.
- Re-assembly is the reverse.
- Lower the Electrical Tray.

### 11. Electrode and HT Lead

- Lower the Electrical Tray.
- Remove the Case
- Pull off the HT lead from the Control board.
- Undo the left and right screws holding the Front Burner Baffle.



- Remove the front baffle.
- Release the tube nut holding the electrode to the Pilot Burner.
- Carefully withdraw the Electrode and HT Lead.
- Re-assembly is the reverse.

## 12. Pilot Assembly

- Lower the Electrical Tray.
- Remove the Case.
- Undo the left and right screws holding the Front Burner Baffle and remove. If access is restricted also remove the lower baffle.
- Release the tube nut holding the electrode to the Pilot Burner.
- Undo the Pilot tube from the Pilot Assembly and gently lever downwards away from the Pilot. It has to be removed and replaced with the injector clipped into position.
- Undo the two screws retaining the Pilot Assembly.
- Re-assembly is the reverse

NB The pilot is **not** adjustable.

## 13. Burner

- Lower the Electrical Tray.
- Remove the Case.
- Remove the Front Baffle.
- Remove the Combustion Chamber front by releasing the four screws.
- Undo the Pilot tube from the Pilot Assembly and gently lever downwards away from the Pilot. It has to be removed and replaced with the injector clipped into position.
- Pull off the HT lead.
- Pull the Burner forward off the two studs at the rear.
- Remove the Pilot Assembly.
- Re-assembly is the reverse.

## 14. Main Injector

- Lower the Electrical Tray.
- Remove the Case.
- Remove the Burner.
- Undo the Main Injector from the manifold.
- Re-assembly is the reverse.

## 15. Combustion Chamber Insulation

- Lower the Electrical Tray.
- Remove the Case.
- Remove the Front Baffle, then undo the four M5 screws holding the lower baffle onto the Back Panel
- Remove the Burner, as in 10.
- Undo the four screws holding the Chamber to the Back Panel and lower downwards and away.
- Replace the Insulation Panels in the Chamber.
- Re-assembly is the reverse.

## 16. Primary Heat Exchanger

- Lower the Electrical Tray.
- Remove the Case.
- Remove the front baffle.
- Remove or cover the Burner.
- Remove the Combustion Chamber.
- Unclip the Control sensor.
- Pull off the wires to the Overheat Cut Out device.
- Drain the Boiler of water.
- Undo the flow and return connections to the Heat Exchanger and lower away.
- Re-assembly is the reverse.

## 17. Secondary Heat Exchanger

- Lower the Electrical Tray.
- Remove the Case.
- Remove the Flue Thermostat.
- Remove the Fan Assembly.
- Drain the Boiler of water.
- Undo the flow and return connections to the secondary Heat Exchanger.
- Release the Condensate connection clamping plate.
- Undo the four screws holding the Secondary Heat Exchanger to the Back Panel and lift away.
- Re-assembly is the reverse.

# Spares

## 1st Line Spares:

Item	Part Number	GC Number
Primary Heat Exchanger (24 kW)	SPMBC049	
Secondary Heat Exchanger (24 kW)	SPMBC048	
Burner (24 kW) NG	SPMBC050	
Burner (24 kW) Propane	M5148	
Ceramic Board Set (24 kW)	SPMBC032	106 404
Fan Assembly (24 kW)	SPMBD002	106 435
Control Board	M3752	
Gas Valve, Sigma 840	SPMBC022	
Air Pressure Switch (Concentric Flues)	SPMBC015	379 091
Main Injector (4.1mm) (24 kW, NG)	M0919	106 386
Main Injector (2.6 mm) (24 kW, Propane)	M5110	
Overheat Thermostat	SPMBC019	379 314
Pilot Injector	SPMBC007	386 673
Pilot Injector (Propane)	M5149	
Electrode	SPMBC005	386 744
Pilot Assembly	SPMBC025	381 865
Flue Thermostat	7717	379 308
HT Lead Assembly	M3895	
Clip-on Sensor (22mm)	SPMBC011	
Condensate Trap	SPMBC042	
Transformer	M5584	
Relay	M5585	
Pump	SPMBC031	

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## Electrical Components

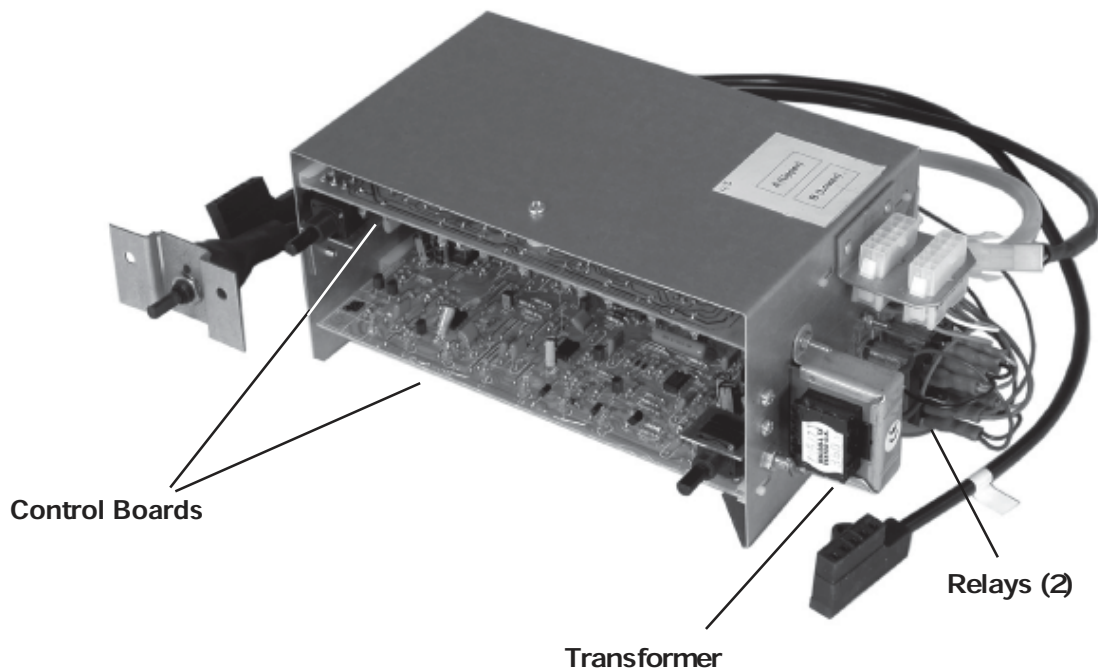


Fig.9

# Major Components

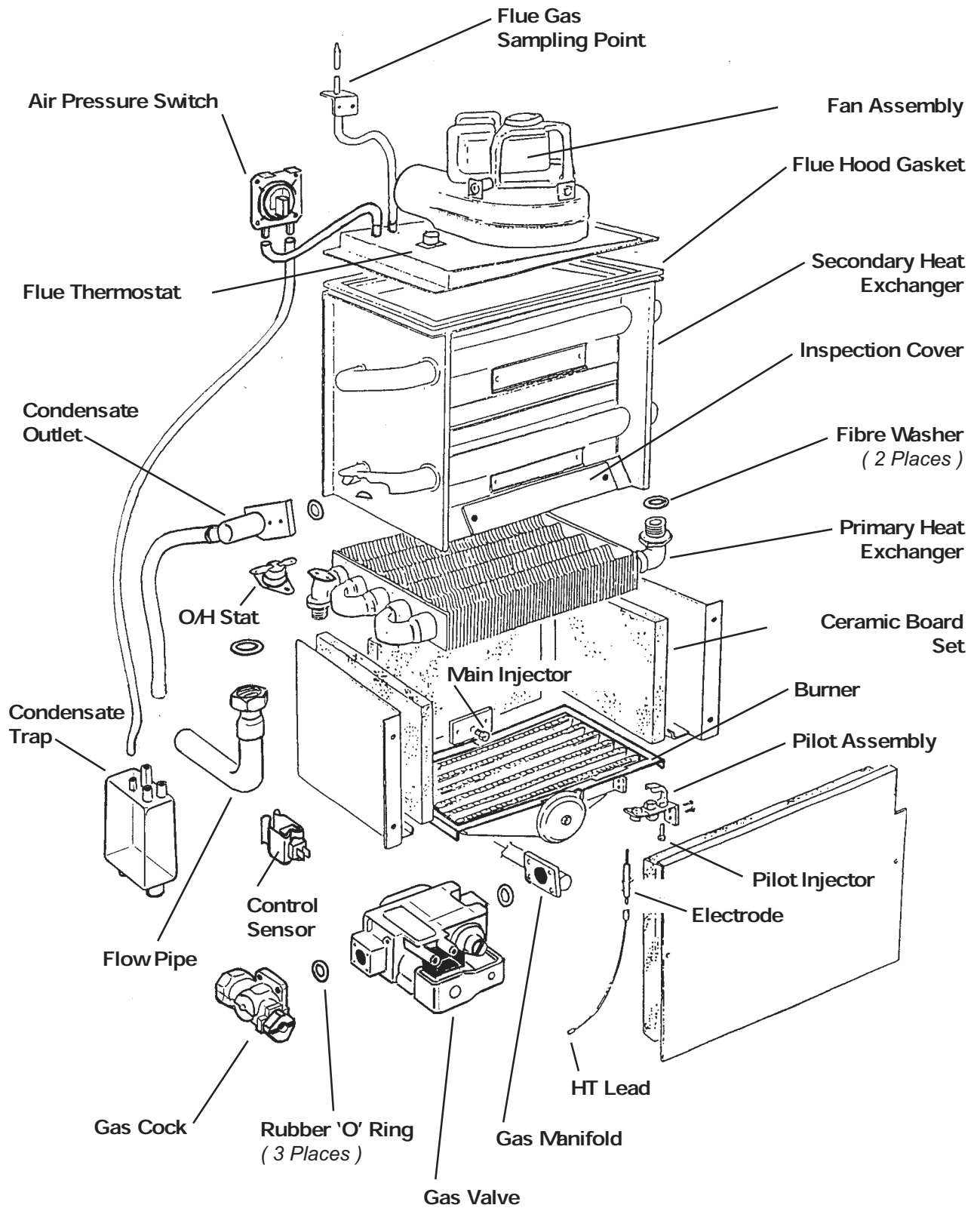


Fig.10

# Example Condensate Disposal Methods

**Note:** Internal - minimum 19mm pipe  
 External - minimum 32mm pipe

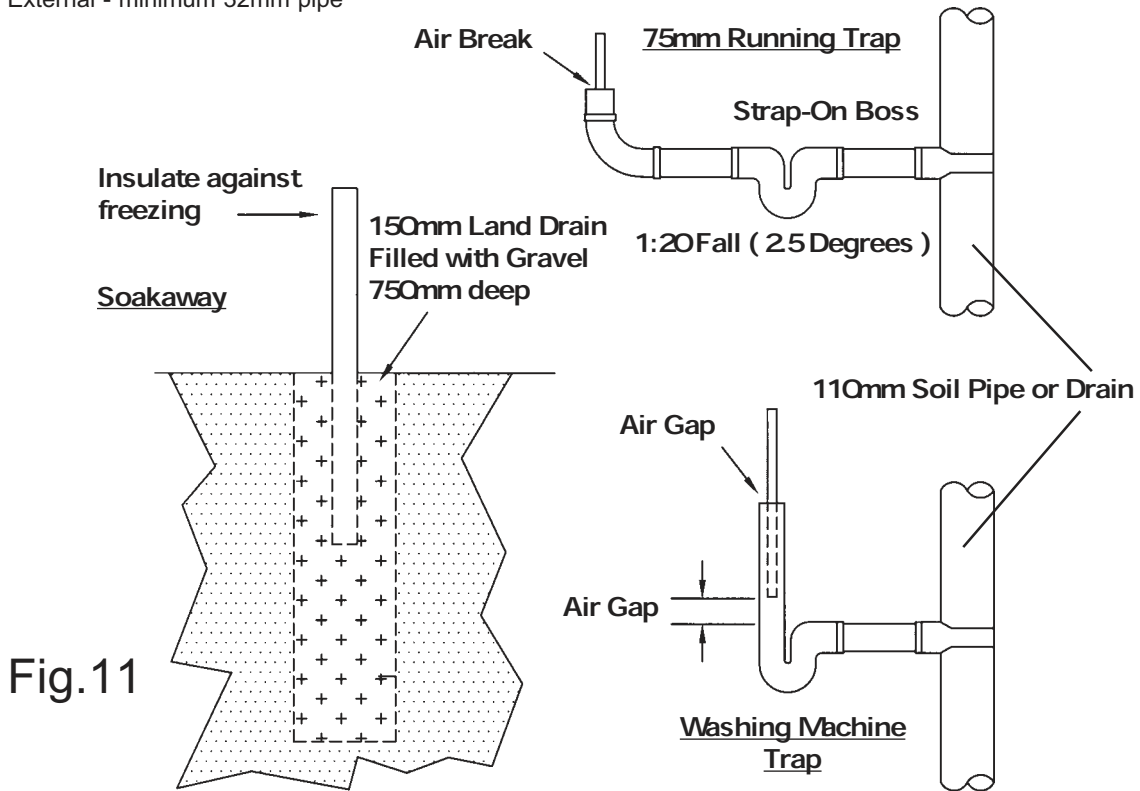


Fig.11

## Condensate Drain Trap

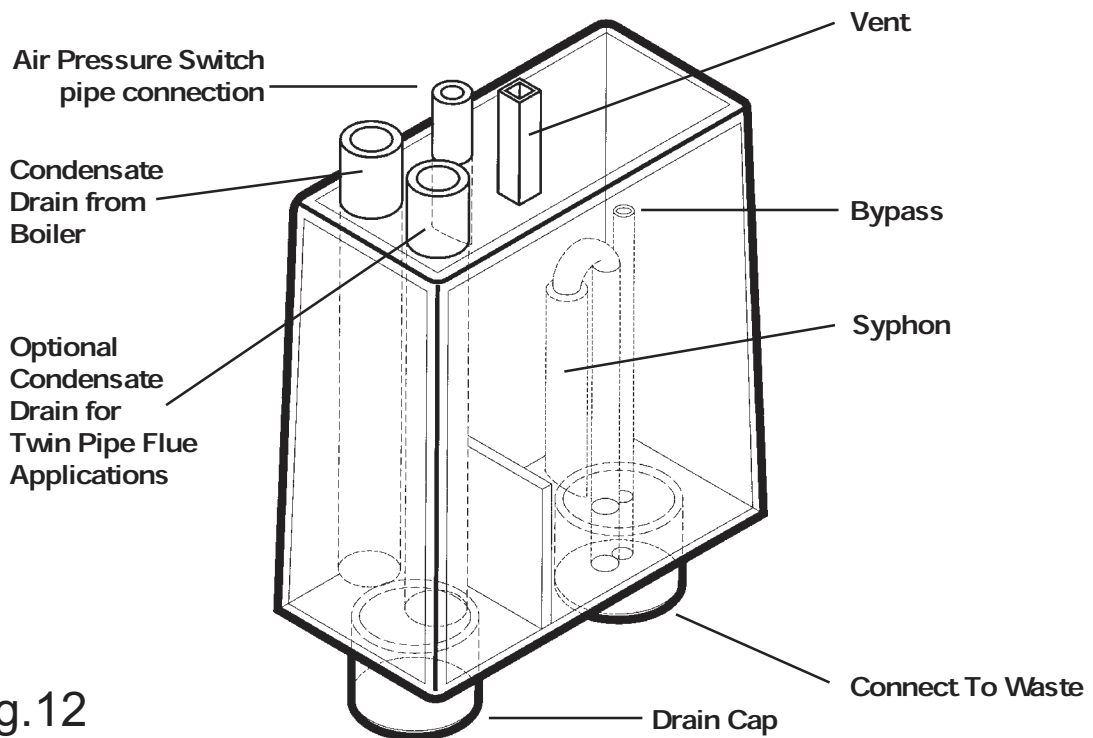
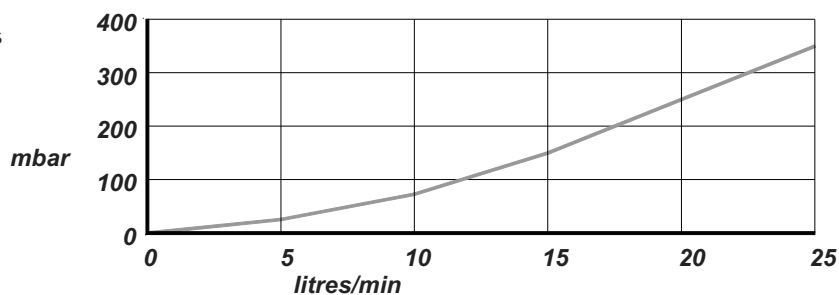


Fig.12

# Technical Data: MBD 200

Flue, Gas Type & Destination	C <sub>12</sub> C <sub>32</sub> C <sub>52</sub> , CAT II 2H3P, U.K. & I.E.
SEDBUK Rating	B
Heat Input, NET	2 x (20.0-23.0 kW (68,250-78,400 Btu/h))
Heat Input, GROSS	2 x (22.2-25.5 kW (75,750-87,000 Btu/h))
Heat Output 80-60°C	2 x (19.1-22.0 kW (65,200-74,800Btu/h))
Heat Output 50-30°C	2 x (20.6-23.5 kW (70,000-80,000Btu/h))
Setting Pressure, NG ( <i>Propane</i> )	10.4 - 14.0 mb (28.4 - 35.8 mb)
Gas Consumption for CV	2 x (2.08 - 2.4 m <sup>3</sup> /h)
39.0MJ/m <sup>3</sup> after 10minutes	2 x ((75.3 - 85.7 ft <sup>3</sup> /h))
Main Burner (Aeromatic)	Aeromatic AC13/ 122557
Gas Control	SIT. 840.026
Burner Injector, NG ( <i>Propane</i> )	Dia. 4.1(2.6 <i>Propane</i> )
Pilot Injector, NG ( <i>Propane</i> )	SIT0.997.142/33 (0.977.150/23 <i>Propane</i> )
Gas Connection	22 mm Copper
Installation Lift Weight	80 kg.
Total Dry Weight	88 kg.
Water Content	5 litres
MAXIMUM Water Pressure	3 bar
MINIMUM Static Water Head	1 m
Boiler Thermostat range	3000 - 82°C
Recommended Water Flow	14 - 32 litres/m
MINIMUM Water Flow	7.5 litres/m
Flow & Return Connections	35mm Copper
Electrical Supply	230V~50Hz 40W
Internal Fuse Rating	2 x (1 Amp (20mm))
External Fuse Rating	5 Amp
Dimensions mm	1760 High, 515 Wide, 495 Deep
Service Clearances mm	450 Front, 30 Above, 25 Below 30 Left & Right
Terminal Dimensions mm	2 X 160 High 160 Wide & 55 Deep,
Flue Dimensions mm	110
Flue Length, min-max, mm	100 - 2000, each

Pressure Loss  
Each boiler



**Certikin**

Station Lane  
Industrial Estate  
Witney  
Oxon.

Tel. 01993 778855  
Fax. 01993 703407