

Installation & Maintenance Manual for Camray 5 External Boilers



By Appointment to
H.M. Queen Elizabeth II
Boulter Boilers Limited
Boiler Manufacturers

Heat is our Element

Making the most of your energy¹



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Health & Safety

INFORMATION FOR THE INSTALLER AND SERVICE ENGINEER.

Under the Consumer Protection Act 1987 and the Health and Safety at Work Act 1974, it is a requirement to provide information on substances hazardous to health (COSHH Regulations 1988).

The Company takes every reasonable care to ensure that these products are designed and constructed to meet these general safety requirements, when properly used and installed.

To fulfil this requirement products are comprehensively tested and examined before dispatch.

This appliance may contain some of the materials below.

When working on the appliance it is the Users/Engineers responsibility to ensure that any necessary personal protective clothing or equipment is worn appropriate to parts that could be considered as being hazardous to health and safety.

INSULATION & SEALS

Glass Rope, Mineral Wool, Insulation Pads, Ceramic Fibre, Fibre Glass Insulation.

May be harmful if inhaled. May be irritating to the skin, eyes, nose or throat. When handling avoid inhalation and contact with the skin or eyes. Use (disposable) gloves, face masks and eye protection.

After handling wash hands and other exposed parts. When disposing, reduce dust with water spray, ensure parts are securely wrapped.

GLUES, SEALANTS & PAINT

Glues, Sealants and Paint are used in the product and present no known hazards when used in the manner for which

they are intended.

KEROSENE & GAS OIL FUELS (MINERAL OILS)

1. The effect of mineral oils on the skin vary according to the duration of exposure.
2. The lighter fractions also remove the protective grease normally present on the surface of the skin rendering the skin dry, liable to crack and more prone to damage caused by cuts and abrasions.
3. Skin rashes (oil Acne). Seek immediate medical attention for any rash, wart or sore developing on any part of the body, particularly the scrotum.
4. Avoid as far as possible any skin contact with mineral oil or with clothing contaminated with mineral oil.
5. Never breath any mineral oil vapours. Do not fire the Burner in the open i.e. out of the Boiler as a miss fire will cause unburnt oil vapours.

Barrier cream containing lanolin such as Rosalex Antisolv, is highly recommended together with a strict routine of personal cleansing.

Under no circumstances should mineral oils be taken internally.

OFTEC Code of Practice OCP/1: 1995 For the Safe Installation, Commissioning, Maintenance and Fault Rectification of Oil Firing Equipment should be consulted.

Boulter Buderus Limited
Magnet House, 30 White House Road, Ipswich IP1 5JA
Telephone: (01473) 241555
Fax: (01473) 241321

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SECTION 1 – USERS GUIDE

1:1 INTRODUCTION

Getting to know your new Boulter Buderus Boiler.

Thank you for choosing the Camray 5 External boiler -manufactured in the UK by **Boulter Buderus** who are renowned oil-firing specialists.

Before using your new boiler, we ask that you carefully read the following information.

All **Boulter Buderus** appliances are the result of many years of research, development and experience.

Whilst our boilers are designed with simplicity of operation in mind, there are certain features and benefits which only become obvious when you thoroughly understand how best to use your new boiler.

We trust that you will enjoy many years of reliable service from your new **Boulter Buderus** and, once again, thank you for choosing **Boulter Buderus**.

1:2 IMPORTANT SAFETY NOTES

To obtain the best possible performance and trouble free operation from your boiler, it is important that you read these instructions carefully. Your **Boulter Buderus** Boiler has built-in safety features, which are detailed in the relevant section of this manual.

1:2.1 Heating System

The heating system must comply with the latest editions of British Standards 5410 and the Building Regulations.



(England and Wales only) Please note: Since January 2002, all oil fired appliances must be installed by either an OFTEC Registered Installer or by way of a Local Building Control License. An OFTEC CD 10 document or Building Control Completion Certificate must be obtained prior to commissioning of this appliance.

(England, Wales and Scotland.) The first commissioning of this appliance, and the system that it is connected to, must be undertaken by an O.F.T.E.C. registered engineer. It is the responsibility of the installer to ensure the Boiler can be and is commissioned.



THE BOULTER BUDERUS CAMRAY 5 EXTERNAL BOILER

Page 2

SECTION 1 – USERS GUIDE

If an engineer is not known, Boulter Buderus will be pleased to provide details of a commissioning and servicing engineer from their register.

*The Oil Firing Technical Association for the Petroleum Industry Kesgrave, Suffolk. Tel: 0845 6585080.

- If it is known or suspected that a fault exists on the Boiler, it **MUST NOT** be used until the fault has been corrected by a competent engineer (see Failure to Start).
- It is essential that the instructions in this booklet are strictly followed for safe and economic operation of the boiler. Failure to observe these instructions may invalidate your right to free breakdown cover during the guaranteed period.

We recommend that you keep these instructions in a place near your appliance for easy reference.

1:2.2 Safety notes

Clearances provided at the sides and rear of the appliance for air entry must be kept free of obstruction. For further explanation [please refer to section 4:6](#) of this installation manual.

Your **Boulter Buderus** Boiler should be connected to an electric supply complying with the Electrical Wiring Regulations (BS 7671): as well as an oil supply complying with the BS 5410 Pt.1; and an appropriate flue system.

- ALWAYS SWITCH OFF THE ELECTRICAL SUPPLY before removing any of the covers for cleaning,
- If any part of the Boiler or its flue is modified, then the guarantee/warranty will be invalidated.

1:3 INSTALLATION & COMMISSIONING

After your Boulter Buderus Boiler has been installed it **MUST** be commissioned by a competent O.F.T.E.C. registered engineer, or by one of our registered service engineers. Commissioning involves testing the Boiler to ensure that it is working correctly, and also setting the Burner correctly to ensure the most efficient operation and use of fuel. If the Boiler has not been commissioned, it may not be operating at the maximum efficiency possible for your heating system, and may also invalidate the guarantee

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1:4 BOILER CONTROL PANEL

Boiler Control Panel

1. Boiler Control Thermostat Switch/Mains On Switch.
2. Boiler Overheat/Limit Thermostat reset button.

1:5 OPERATING INSTRUCTIONS

1:5.1 BOILER CONTROL THERMOSTAT

The Boiler Control Thermostat is also the ON/OFF switch for the Boiler. To switch the Boiler off, turn the Thermostat to the 'OFF' position.

The Boiler Control Thermostat controls the water temperature within the Boiler. The recommended Control Thermostat settings are as follows:

WINTER HEATING & HOT WATER 4
SUMMER HOT WATER ONLY 2

The Boiler Control Thermostat automatically switches the Burner ON and OFF to maintain the selected temperature. The Burner is lit by an automatic ignition system and therefore there is no pilot flame.

The Boiler should not be operated below 60°C (Summer position) as this will cause corrosion which will reduce the life of the Boiler.



BOILER CONTROL THERMOSTAT

1:5.2 BOILER OVERHEAT/LIMIT THERMOSTAT

The boiler is fitted with a safety overheat/limit thermostat. This will interrupt the power supply to the Boiler and shut it down completely in the unlikely event of overheating.

Wait for the Boiler to cool, and then reset the thermostat by pressing the limit thermostat reset button located on the Control Panel.

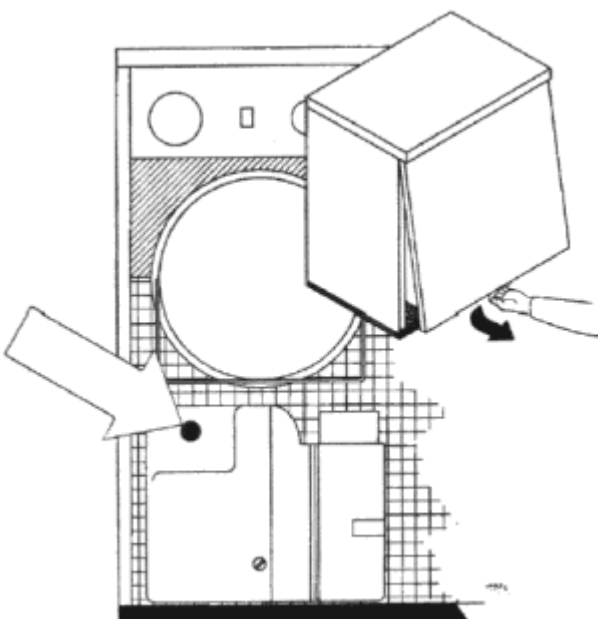
If this problem still persists turn off the Boiler and consult your installer.

1:5.3 LOCKOUT INDICATOR

In the unlikely event of a burner malfunction, it will automatically shutdown, and the red lockout indicator on the Burner Control Box will be lit.

To reset the Burner, wait for a period of at least 45 seconds. Press the lockout reset button located on the front of the Burner. If the Burner immediately goes to lockout again, wait three minutes and then repeat the procedure, once more only, by pressing the reset button again.

If this problem still persists, turn off the Boiler and consult your engineer.



LOCKOUT INDICATOR

1:5.4 STARTING THE BOILER

- 1.Ensure that all external controls, e.g. programmer, timer, room thermostat etc., are turned on and calling for heat.
- 2.Make sure the Boiler Control Thermostat is set within the recommended range and that the mains electricity and oil are turned on.

1:5.5 SWITCHING THE BOILER OFF -TEMPORARILY

The Boiler may be stopped by:

- 1.Turning off the Boiler Thermostat, or turning the programmer (if fitted to the heating system) to its off position.



BOILER CONTROL THERMOSTAT

1:5.6 SHUTTING OFF FOR THE SUMMER

If the Boiler is to be shut off for the summer, it is advisable to have it thoroughly serviced. Thorough cleaning will minimise corrosion during the idle period. Remember, when the Boiler is required, to ensure that the oil supply is open before switching on.

1:5.7 SEALED SYSTEM CENTRAL HEATING

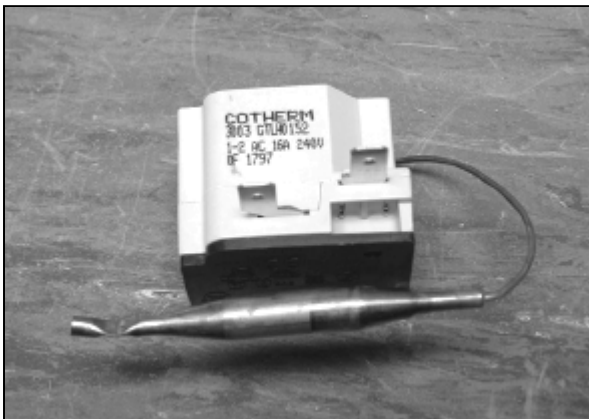
If your Boiler is used on a SEALED SYSTEM, it is important that correct operating system pressure is maintained. Your installer should give you guidance on this.



PRESSURE GAUGE

1:5.8 FROST PROTECTION

A frost thermostat is fitted to the boiler, however if there is any danger that your Boiler may freeze up during very severe weather conditions it is recommended that you consult your installer who will be able to advise you on an appropriate course of action, possibly the addition of system anti-freeze.



FROST THERMOSTAT

1:5.9 OIL DELIVERY

Where possible, it is advisable to temporarily switch the Boiler off when your oil supply is being replenished. This is to allow any sediment to settle and not be drawn into the Boiler. If not this could result in an inconvenient break down.

We advise that you keep your Boiler off for one hour after the oil delivery to your tank. Please ask your supplier, or the driver to notify you before the oil is discharged.

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1:5.10 MAINTENANCE AND TROUBLE SHOOTING GUIDE

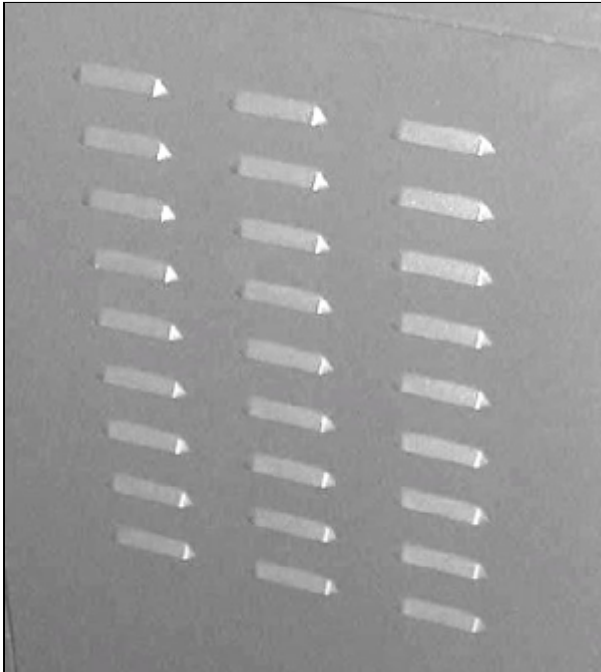
1:5.10.1 Maintenance

For normal cleaning of the outside casing, simply wipe with a damp cloth. To remove stubborn marks and stains, wipe with a damp cloth and finish off with a dry cloth. DO NOT use abrasive cleaning materials.

The Boiler must be serviced at regular intervals by a qualified service engineer. Failure to have the Boiler serviced at the recommended intervals will invalidate the guarantee/warranty.

Using Kerosene Class C2 fuel, the Boiler should be serviced at twelve monthly intervals to ensure that the efficiency and performance of your boiler is maintained.

Please also note that grilles on the casing door must not become blocked. They should be inspected regularly and cleaned if necessary.



FRONT COVER SHOWING LOUVER GRILLS

Flue Terminal Plumbing

Due to the high efficiency of the boiler white water vapour from the flue discharge - called plumbing may be observed from time to time under certain weather conditions. This is perfectly normal and should be no cause for concern.

1:5.10.2 Failure to start

If the Burner fails to start, adopt the following procedure:

1. Check that there is oil in the tank and that the supply valve is open.
2. Check the programmer or time switch to ensure that it is operating and set to the correct time to be "ON".
3. Check that the Boiler Control Thermostat is set high enough to be "ON" or calling for heat.
4. Check for overheat by pressing the reset button once the temperature has dropped sufficiently.
5. Check for burner lockout.

Is there oil in the tank?

Is the programmer 'on'?

Are the thermostats 'calling' for heat?

Has boiler gone out on 'limit'?

Is burner 'locked out'?

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SECTION 2 – INTRODUCTION

2:1 INTRODUCTION

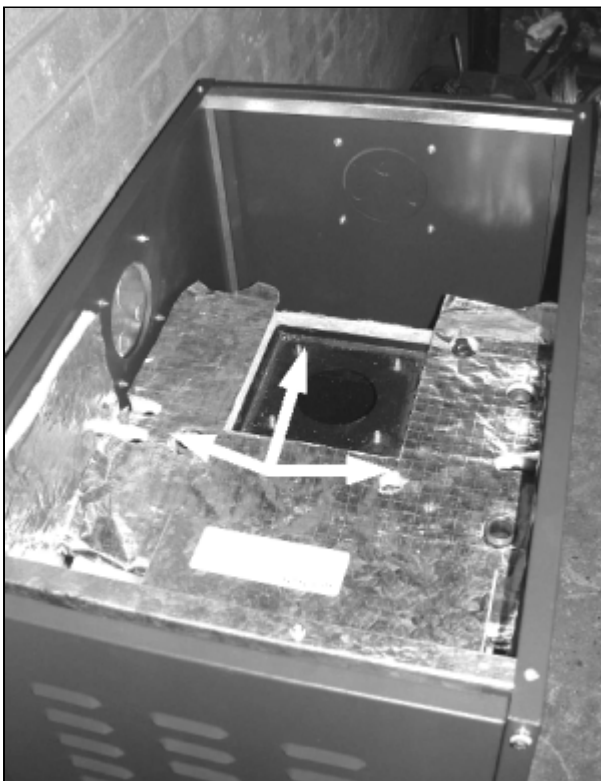
This manual covers installation, Commissioning and Maintenance.

The Boulter External Boiler is:

1. Designed for Central Heating and Hot Water.
2. Suitable for conventional open vented Central Heating systems.
3. Suitable for Sealed Central Heating systems which are within the maximum permitted working pressure. All Boilers are supplied with a manual reset limit thermostat.
4. Suitable for new installations and for replacing existing boilers.
5. **BOULTER BUDERUS** Boilers offer greater freedom to select the most suitable position for siting.

2:2 FLUE OPTIONS

The exhaust flue supplied with the boiler may be sited on either side or rear of the boiler, giving greater installation flexibility. The terminal guard supplied with the boiler **MUST** be fitted.



FLUE OPTIONS AVAILABLE

2:3 COMMISSIONING

It is essential in the interest of Boiler efficiency and reliable performance that once the boiler has been installed it is first commissioned by a qualified engineer.

If an engineer is not known, **Boulter Buderus** will be pleased to provide details of commissioning and servicing engineers from their register.

See OFTEC CD11 form on page 20

See Section 7 for Commissioning Procedure.

IMPORTANT

It is the responsibility of the installer to ensure that the boiler is commissioned by a competent OFTEC* Registered Commissioning Engineer.

*The Oil Firing Technical Association for the Petroleum Industry, Kesgrave, Suffolk, 0845 6585080.

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2:4 SAFETY

**READ HEALTH AND SAFETY
INFORMATION ON INSIDE FRONT
COVER OF THIS MANUAL.**

IMPORTANT

Should you wish to remove or dismantle any covers or parts of the boiler for cleaning or maintenance ALWAYS FIRST SWITCH OFF THE ELECTRIC SUPPLY.

1. On no account should any part of the Boiler or its Flue be modified.

2. The wiring diagram is included in this Manual. Wiring should not be tampered with, modified or changed for any reason.

3. Only use Boulter Buderus replacement parts.

Non compliance with the above will invalidate Guarantee.

SECTION 3 – TECHNICAL DATA

3:1 LIQUID FUELS

The Boiler will burn liquid fuels complying with BS 2869 Part 2 1988 Class C2 as specified in the Code of Practice for Oil Firing BS 5410 Part 1.

Class C2 (Kerosene)

This fuel is suitable for this boiler. Burners are supplied with all appropriate nozzle and pump pressure as standard for this fuel. They are for mid-range output. Details of all nozzle sizes and pump pressure for all outputs are shown on section 3:6.

3:2 BOILER TECHNICAL DETAILS

Maximum Boiler working pressure 3 Bar - 30.6m Water Head.

Minimum recommended return water temperature 60°C.

Maximum hearth temperature Less than 85°C

Maximum side panel temperature will be less than 35°C above room temperature.

Water Resistance Less than 300 m.m.w.g.

With 11°C temperature rise across the boiler.

Class C2 fuel only 'Kerosene'

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3:3 BURNER DETAILS

Burner type - RIELLO 484T50, 483T50.

Pressure Jet -supplied as standard.

Manually adjustable air regulator.

The burner must be set to details given in section 3:6.

For further details of the burner, refer to the burner data sheets supplied in the literature envelope.

See page 27 for exploded diagrams of Riello RDB Burners.

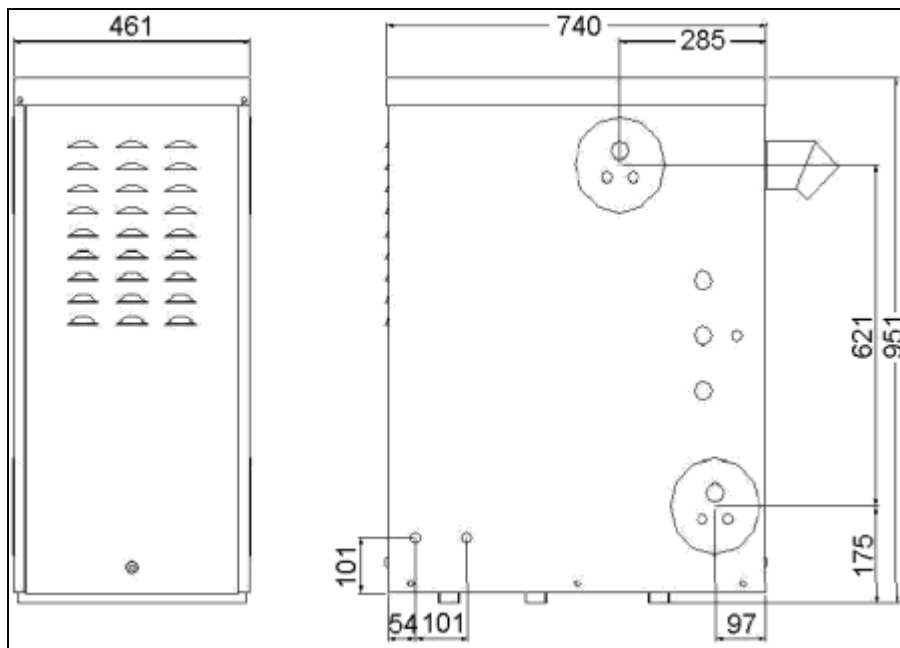
3:4 ELECTRICS

Electrical Supply 230v., 1 ph., 50Hz.

IMPORTANT

The Electrical Installation of this appliance must be performed by a suitably qualified electrical engineer/installer.

3:5 DIMENSIONS



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3:6 COMMISSIONING DATA

3:6.1 Class C2, Kerosene OIL RIELLO BURNER

	Output		Riello	Nozzle	Pump Pressure		Fuel	CO2	Smoke	Flue Exit
Model	kW	Btu/h	RDB	Danfoss	Bar	psi	Rate	%	No.	Temp °C
		x1000	TYPE	Delevan			Kg/h			
				US/GPH						
	11.7	40		0.4x60 °ES	7.0	100	1.08	10	0-1	165-195
40/65	16.1	55	484T50	0.5x60 °ES	8.0	115	1.49	11	0-1	180-225
	19	65		0.6x60 °ES	7.6	110	1.76	12	0-1	180-245
	19	65		0.6x60 °ES	7.6	110	1.76	10	0-1	180
65/90A	23.4	80	483T50	0.75x60 °W	7.2	105	2.17	11	0-1	200
	26.4	90		0.85x60 °W	8.0	115	2.42	12	0-1	204

SECTION 4 - INSTALLATION

4:1 STANDARDS & REGULATIONS

The installation of the Boiler must comply with the latest edition of:

BS 5410 Oil Installations

Pt 1 up to 44kW
Pt 2 and over 44kW

BS 5449 Forced circulation hot water central heating systems for domestic premises.
BS 7593 Code of practice for the treatment of water in domestic hot water central heating systems.
BS 7671 (2001) Electrical Wiring Regulations.

BUILDING REGULATIONS.

Part L & England and Wales
Part F Section III Scotland
Part L Northern Ireland

The Control of Pollution (Oil) Regulations

Oil boilers should be installed in accordance with good practice as recommended by OFTEC ([Ref. 2:3 Commissioning](#)).

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4:2 THE HEATING SYSTEM

This should be installed in accordance with current good practice as advised by HVCA. It is not the purpose of the manual, nor is it possible, to adequately deal with the subject in this manual.

When designing and installing the controls of the heating system, it must be remembered that if the control system is such that the water circulation through the boiler can be totally or substantially reduced whilst the oil burner can still fire, the water in the boiler will reach very high or boiling temperatures before the boiler thermostat can sense it and switch off the Burner.

If this condition is likely wire the controls so that the electrical supply to the burner is switched off simultaneously with the stopping of circulating pumps or the closing motorised valves.

On existing heating systems where a Boiler is replaced, ensure that the system is chemically cleaned.

The system should contain clean water and be free from leaks. Suitable inhibitors against limescale and corrosion should be added to the system. Refer to BS 7593.

Kettling and system noises can be avoided by suitable pre-treatment (i.e. Chemical Cleaning) at the onset. This is essential when fitting a new boiler to an existing system.



IS THE HEATING SYSTEM SUITABLE?

4:3 SITING & POSITIONING

The noise level from **Boulter Buderus** Boilers is quite low and installations have not given rise to complaints. Consideration must be given however, to the following points.

1. Due consideration to the siting of boilers should be given. Further advice from **Boulter Buderus** should be sought where any doubt exists.
2. Some individuals may be particularly sensitive to even low noise levels and this should be discussed before installation.
3. The flue position relative to the building/openings and surroundings.

This Boiler model is serviced from the front. A space of 450mm (18") in front should be available.



FRONT SERVICING

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4:4 THE HEARTH

The **Boulter Buderus** has a Hearth Temperature of less than 85°C. The boiler requires a level hearth on which to stand which should comply with the Building Regulations.

If the Boiler is to stand on a floor made of combustible material then protection between the Boiler and the floor should be provided by means of non combustible material.

Consideration should be given to the weight of the Boiler and the Building Regulations regarding floor loading.

Due to the weight of this appliance, consideration should be given if you intend to site this on decking. If you are in doubt, contact your Local Building Control department for advice.

4:5 THE FLUE

Use only the flue and terminal guard supplied with the boiler.



FITTING THE FLUE GUARD

4:6 AIR SUPPLY

The air enters the boiler through the grilles on the front casing door. These must be free from obstruction.

4:7 OIL STORAGE

4:7.1 Oil Tank

Consideration to the access by fuel delivery lorries should be given when positioning the oil tank. Tank positioning should be in accordance with BS 5410 Part 1 and OFTEC Technical Book 3.

4:8 OIL SUPPLY

All joints in the Oil Lines must be oil tight and the Oil Line should be flushed clean before connecting to the burner.

Flared fittings should be used wherever possible.

Soft soldered joints must not be used.



COMPRESSION OR FLARED FITTINGS ONLY

4:8.1 Oil Filter

It is essential for reliable operation that an Oil Filter is fitted in the Oil Pipe supplying Oil from the Tank to the Burner.

The filter should be fitted as close to the Boiler as practicable but not fitted to or inside the boiler.

It is a condition of the guarantees that a suitable Filter is fitted correctly.

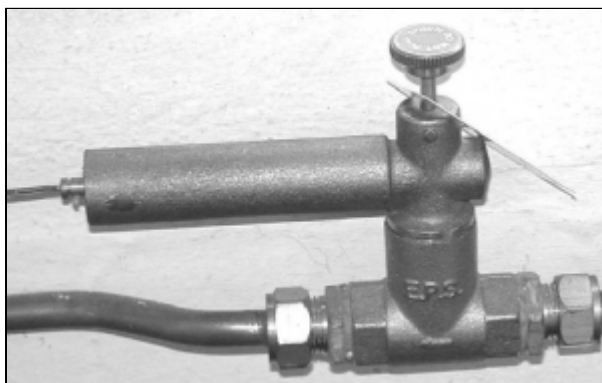
4:8.2 Fire Check Valve (Not Supplied)

A remote acting FIRE VALVE must be fitted in the suction line at the time of installation - see BS 5410 Part 1.

The valve must be fitted external to the Boiler. The sensor should be located above the Burner in the clip provided.



FIRE VALVE SENSOR LOCATION



R.A.F. FIRE VALVE BODY

Remote Acting Fire Valves are available from **Boulter Buderus**, through your merchant or installer.

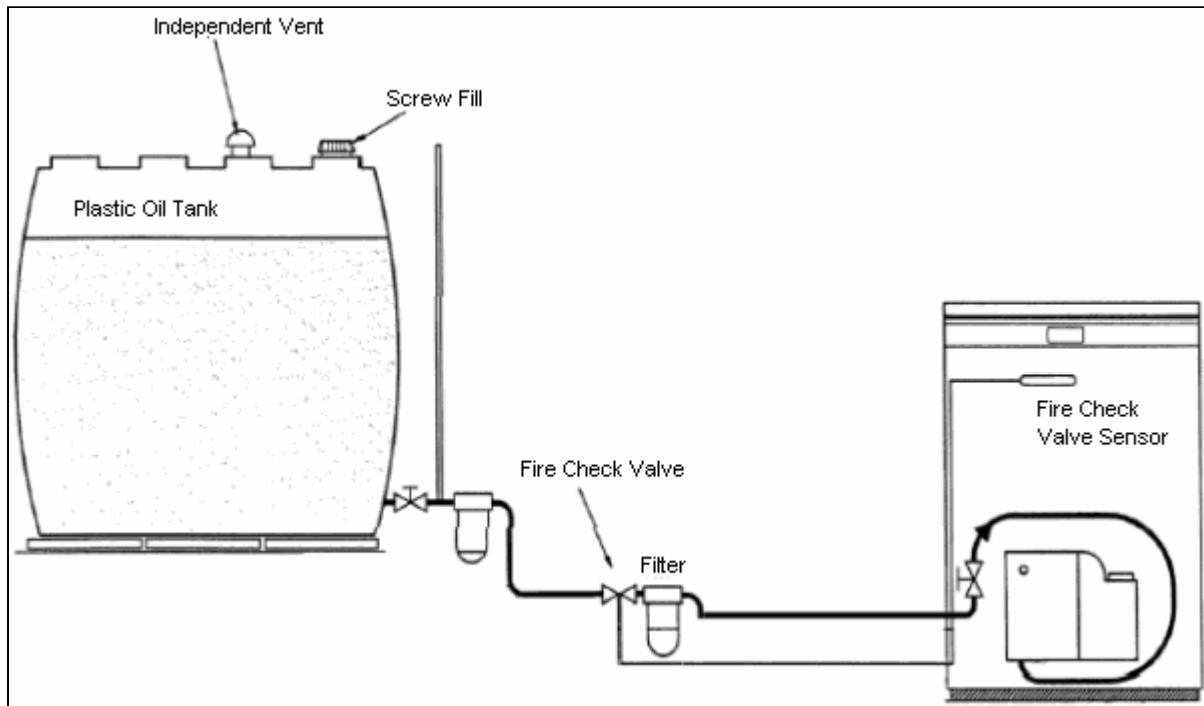
Ref:	Capillary Length	Operating Temperature
RAF9015C	1.5m	90°C
RAF9030C	3.0m	90°C
RAF9060C	6.0m	90°C

RAF9090C	9.0m	90°C
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4:8.3 Single Pipe System

If the bottom of the Oil Tank is above the Oil Burner, install a 10mm copper supply pipe to the Burner incorporating the correct Filter, Shut Off Valve and Fire Check Valve.

Ensure that the Burner Oil Pump is correctly set for 'Single Pipe' operation. The boiler is supplied set for single pipe operation.



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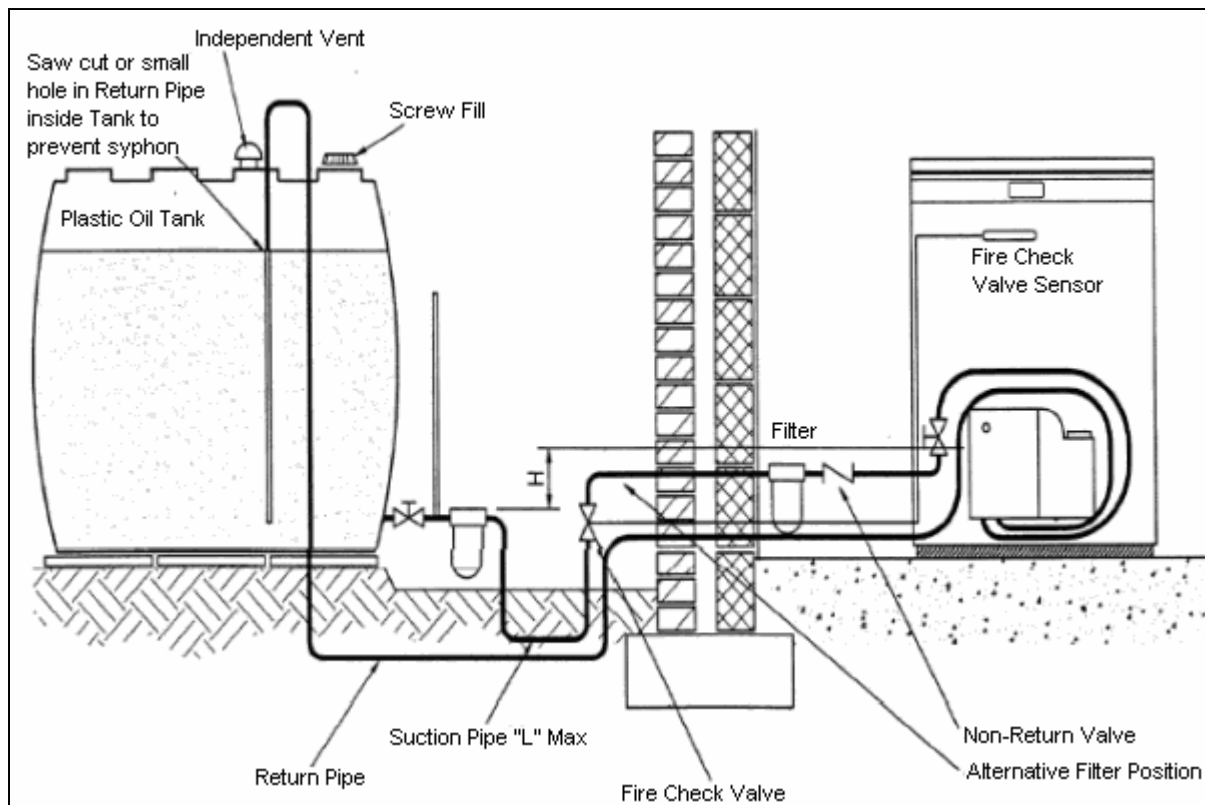
4:8.4 Two Pipe System

When the bottom of the Oil Tank is below the level of the Oil Pump on the Burner it is necessary to install an additional 10mm return pipe.

The Non-Return Valve must be fitted to allow the flow in the correct direction and prevent drain back to the Tank.

Ensure that Valves are NOT fitted in the Return Line. The Return Line must be unobstructed at all times.

Ensure that the Burner Oil Pump is correctly set for 'Two Pipe' operation.



NB: CARE MUST BE EXERCISED WHEN USING A TOP EXIT OIL TANK AS A NON-RETURN VALVE (FOOT VALVE) MAY ALREADY BE FITTED.

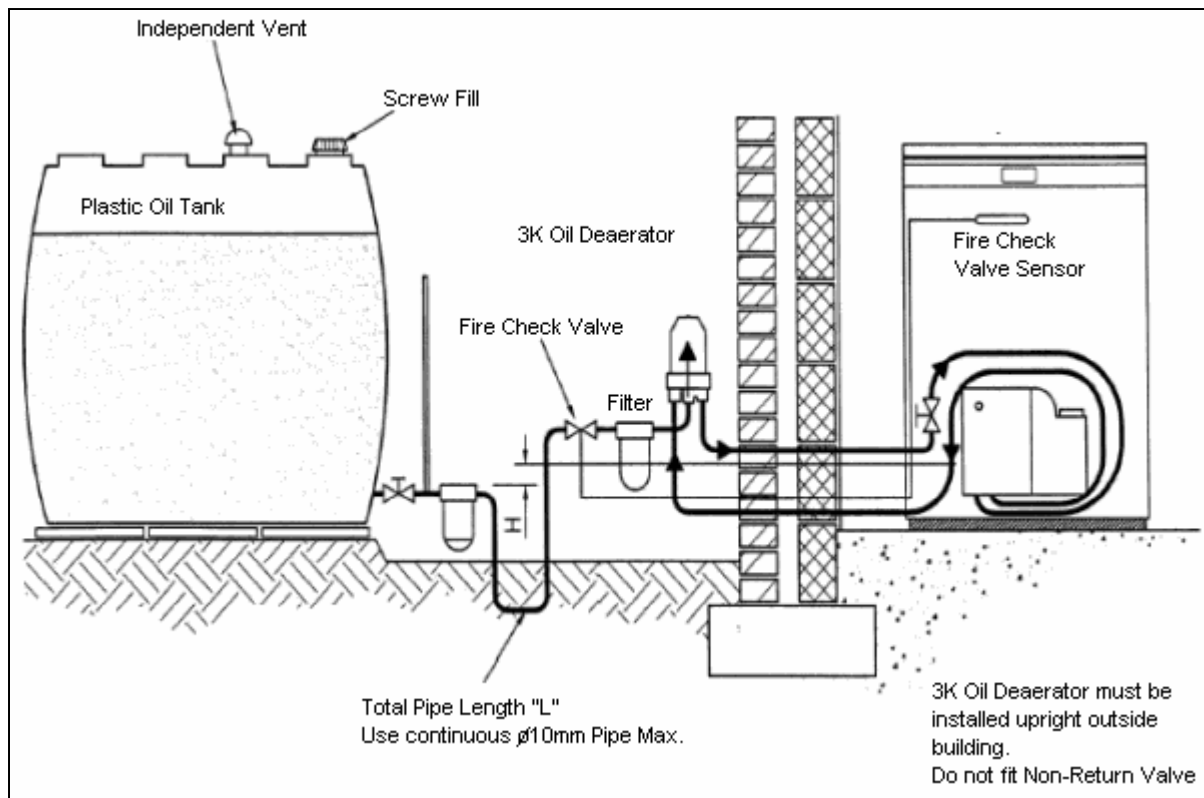
The use of two non-return valves will cause damage to the fuel pump and will invalidate the warranty.

4:8.5 Deaerator Oil Pipe System

An alternative two pipe arrangement can be achieved using a 3K-Oil Loop Deaerator which removes the air from the oil feed on a single pipe lift. The Burner Pump is piped to the Deaerator, which should be positioned close to the burner.

A Non-Return Valve is not required in the return line.

The advantage of this system is gained where a two pipe run from the oil supply tank is long or difficult to achieve. **Boulter Buderus** 3K Deaerators are available from your merchant.



4:8.6 Water Separator Oil Filter

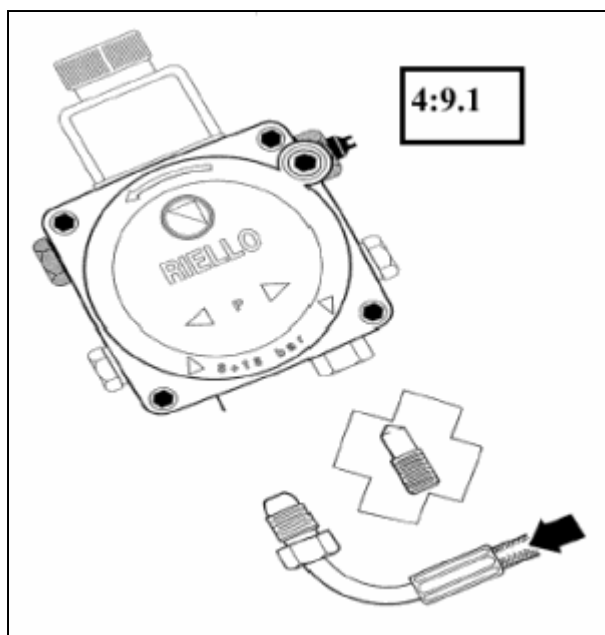
For changeover applications the use of a Water Separator Oil Filter, available from **Boulter Buderus** is recommended (BS 03052).

4:9 OIL BURNER

The Burner makers' technical leaflet is supplied with this manual and provides supplementary information not included in this manual.

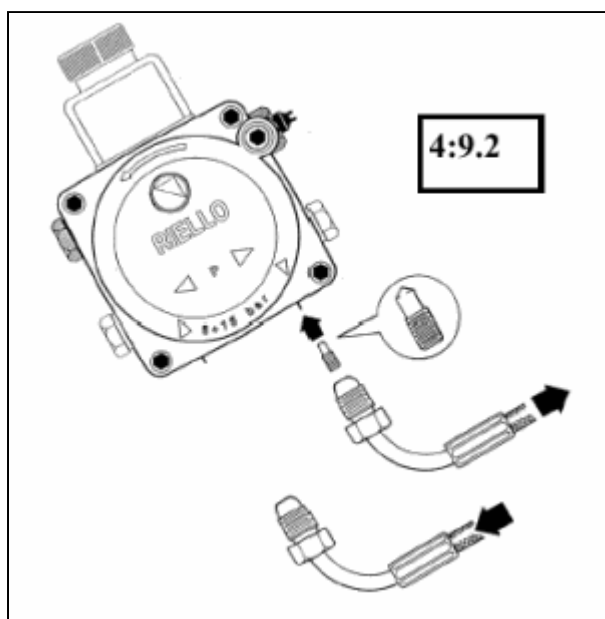
4:9.1 Burner Pump for Single Pipe System

The burner is supplied set for single pipe operation. The return port is plugged and the Bypass Screw is not fitted.



4:9.2 Burner Pump for Two Pipe Deaerator System

For two pipe oil systems the Burner Oil Pump has to be fitted with the Bypass Screw supplied. Boilers are dispatched with the Bypass Screw in a labelled envelope attached to the Burner. This socket screw is inserted into the return port.



4:10 PACKAGING AND ASSEMBLY INSTRUCTIONS

4:10.1 Packaging

The carton contains the boiler burner and flue exhaust and guard.

4:11 CONTROL PANEL

The Control Panel is pre-wired and ready for connection to the system wiring.

4:11.1 Connecting Control Panel

Connect a permanent supply and a switched line as shown in Fig 4:12.

4:11.2 Phial Positions

1. Insert the Boiler Control Stat 8mm Plain Phial into a pocket on the top of the Boiler Heat Exchanger as shown.



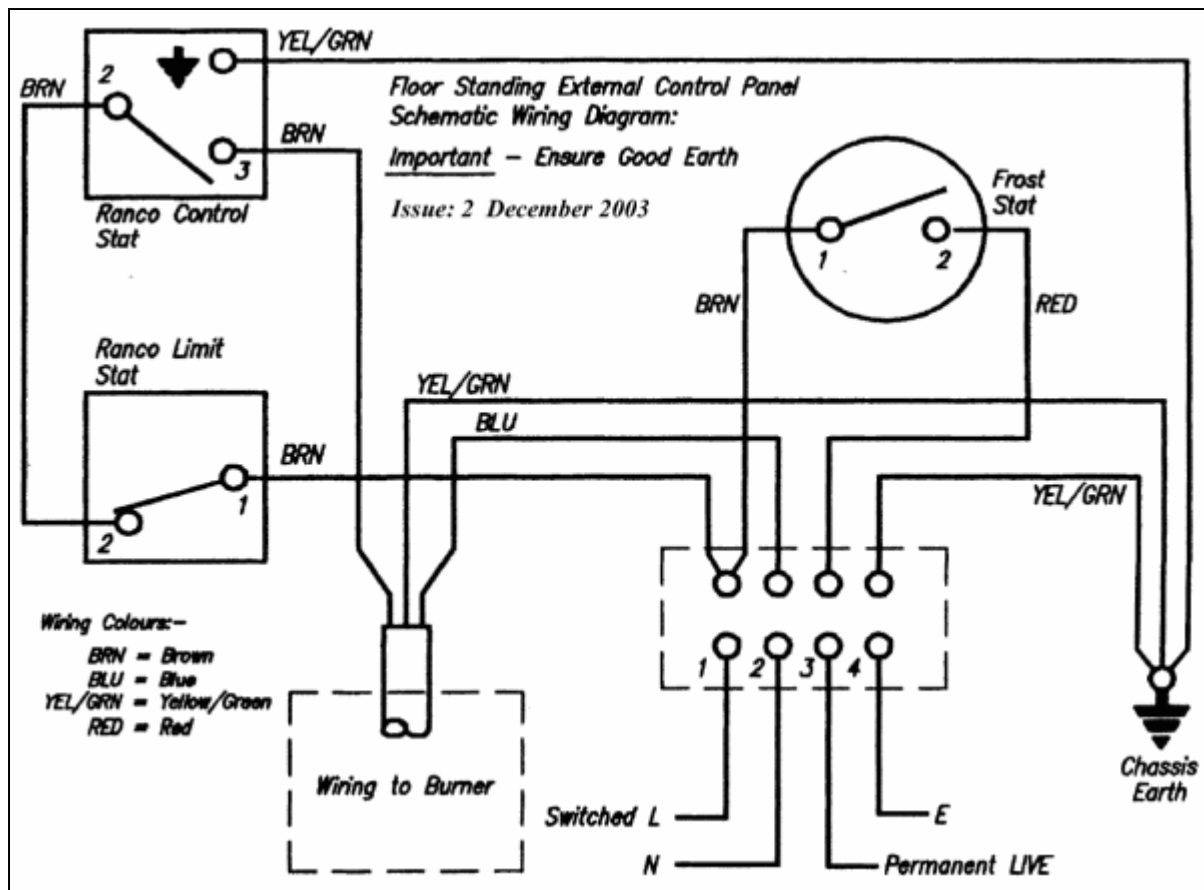
LOCATION OF THERMOSTAT PHIALS

2. Insert the Limit Stat 8mm Coiled Phial into the top of the Boiler Heat Exchanger.



LOCATION OF LIMIT THERMOSTAT PHIAL

4:12 PANEL WIRING DIAGRAM



Pass the flex from the system control panel into the boiler control panel making sure that the grommet provided is fitted.

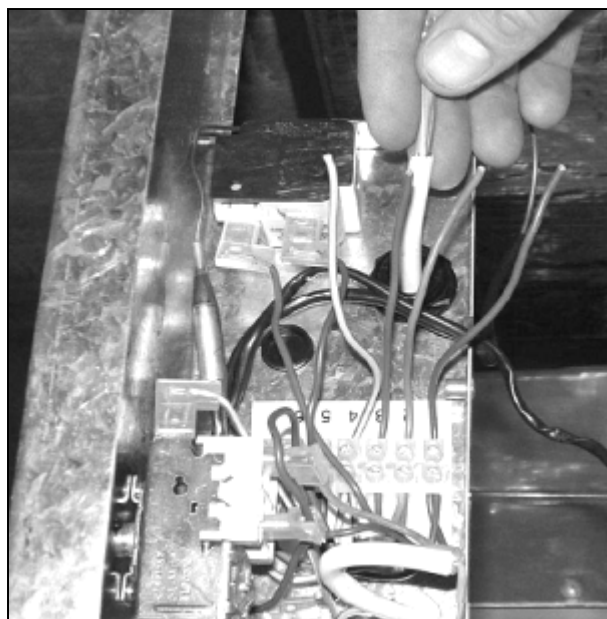
The boiler control panel is fitted with a Frost Protection thermostat.

This control panel requires a PERMANENT live supply as well as a switched live supply from the external system controls.

The permanent supply must be connected to the terminal 3. The switched wire to terminal 1.

The Neutral must only be connected to terminal 2 and the Earth wire must be connected to terminal 4.

Failure to correctly wire this appliance will create an immediate danger to life and will invalidate any warranty.

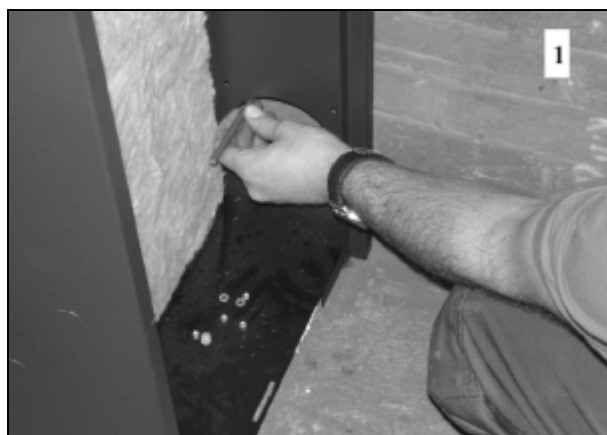
**CONTROL PANEL**

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SECTION 5 - PIPE INSTALLATION

5:1 PIPE DUCT

With the boiler in the desired location, mark the wall where the pipes are to pass through. Using a 100mm core drill, drill through wall taking care not to damage any damp proof membrane. Using the EDPM seal, fix the pipe duct plate to the side panel using the nuts and washers provided. Push the ducting through the seal and into the wall. The duct can be cut if required. The use of a high modulus silicon with provide a very good seal between the brickwork and the duct.





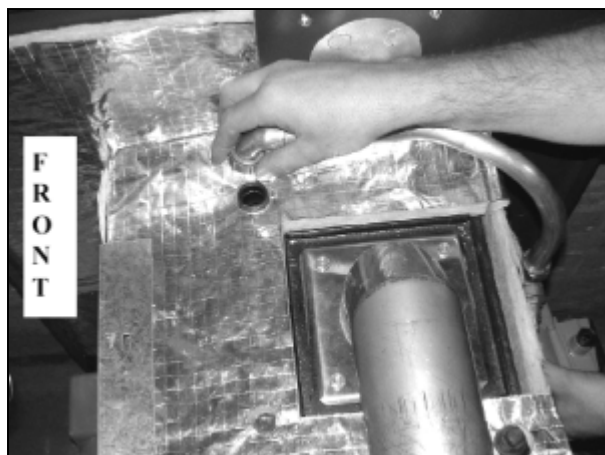
It is possible to route the flow and return pipes through the back panel. To do this you have to remove the door lock and move the complete lock assembly to the opposite end of the door. Invert the door assembly and fix the duct seal and plate using the nuts and washers provided. Make sure the plastic blanking cap is fitted to the hole vacated by the lock assembly.



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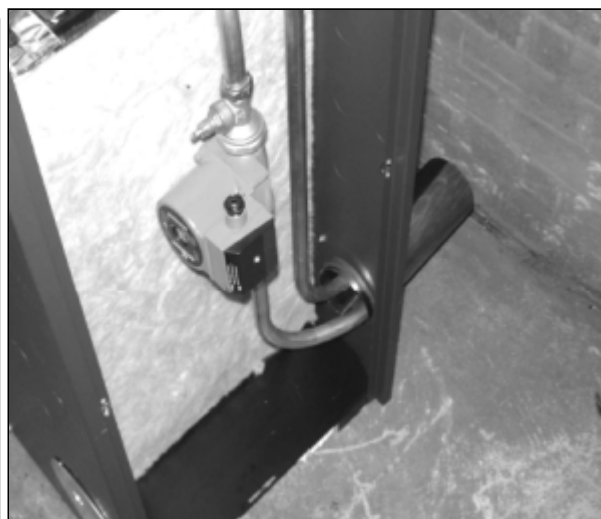
5:2 FLOW PIPE and RETURN PIPE

Standing in front of the boiler, the flow pipe is fitted to the left hand tapping on top of the heat exchanger. The flow pipe (not supplied) can be routed anywhere within the boiler casing but remember to leave room for the flue pipe and any other fittings you may have to install. We have shown the pipe being dressed to the back.

**FLOW PIPE CONNECTION****RETURN PIPE CONNECTION**

5:3 ADDITIONAL COMPONENTS

It is possible to install a circulating pump and/or motorised valve(s) in the space behind the heat exchanger. A possible way of installing a pump is shown below.



SECTION 6 - FLUES

6:1 FLUE SITING

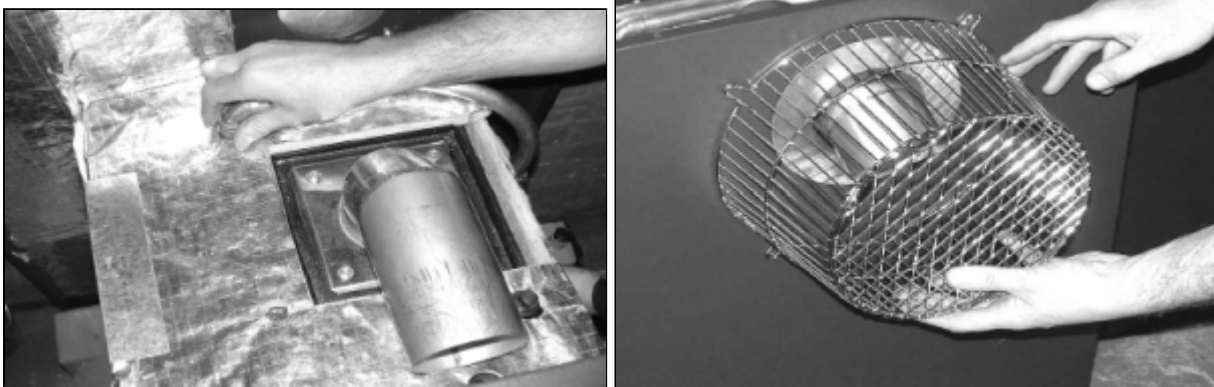
It is important that care is exercised in choosing a suitable location for the Boiler and Flue Exhaust. It is to be expected that with the help of this manual and the application of caring engineering experience and common sense unreasonable liberties will not be taken.

It is mandatory requirement that terminals of flues, which can be touched, are to be fitted with a guard.

Any proposed installation, which deviates from the details provided or gives rise to any doubt, should be referred to **BOULTER BUDERUS LTD** who will be pleased to consider and discuss it.

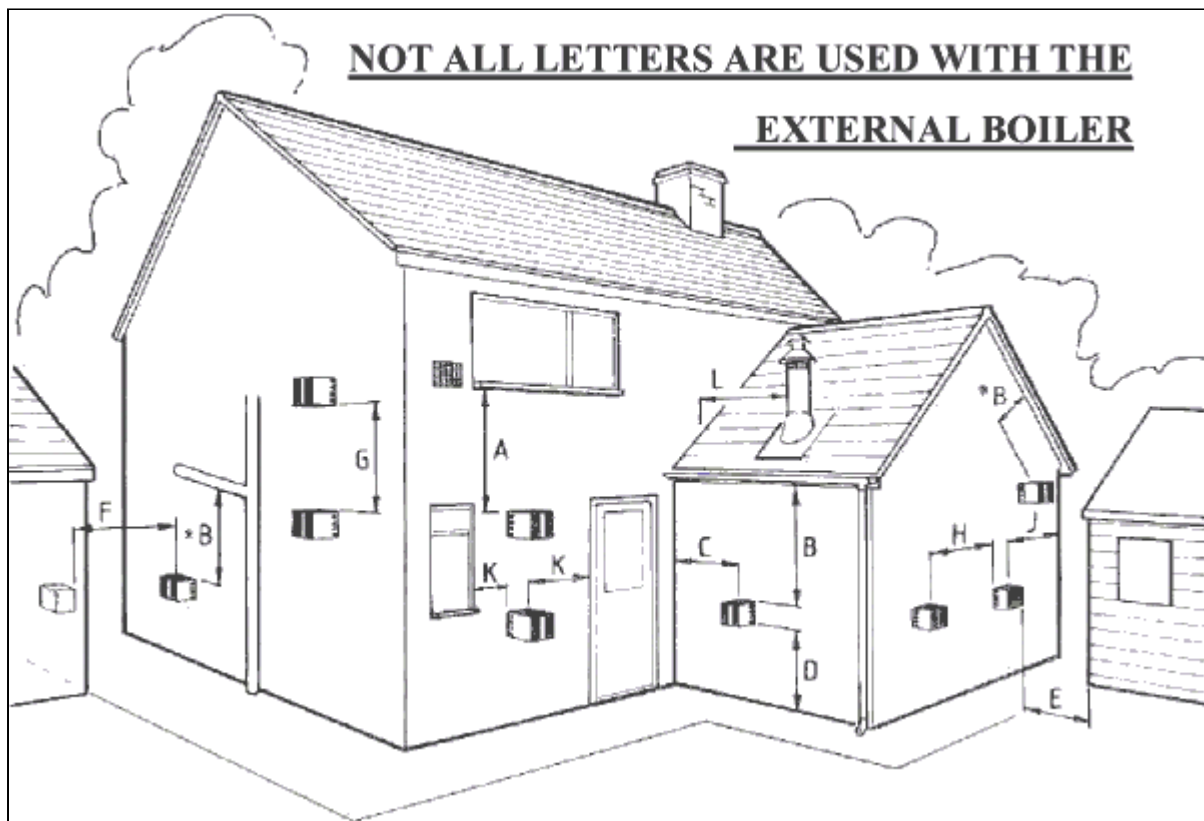
6:2 TERMINAL GUARD

The guard supplied should be fitted to the boiler casing as shown using the self tapping screws supplied.



FLUE LOCATION AND FITTING OF TERMINAL GUARD

6:3 POSITIONING THE BOILER



REF	DESCRIPTION	DISTANCE	REF	DESCRIPTION	DISTANCE
A	Below opening, window, air brick	600	B	Below gutter, eaves, sanitary pipe	75 (600)
C	From Internal Corner	300 (900)	E	From surface facing terminal	600 (1200)
F	From terminal facing Terminal	1200	J	From External Corner	300 (600)
K	Horizontally from Opening, door Window or air brick	600		Local site conditions may require the use of the figures that are in brackets, i.e. BS5410	

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SECTION 7 – COMMISSIONING

7:1 COMMISSIONING

It is essential in the interest of boiler efficiency and reliable performance that once the boiler has been installed it is first commissioned by a competent OFTEC registered commissioning engineer.

If an engineer is not known **Boulter Buderus** will be pleased to provide details of commissioning and servicing engineers from their register.

Commissioning must be carried out at the point of first firing.

Incorrect commissioning can cause premature fouling of the flue ways.

7:2 RESPONSIBILITY

It is the responsibility of the installer to ensure that the boiler is properly commissioned. It is essential that the commissioning procedures detailed in this manual are carried out by a qualified engineer using recognised test equipment.

It is recommended that the relevant section of BS 5410 Part 1:latest edition is carefully read.

It is recommended that you use a report sheet and checklist. Make comments on the report where necessary, and give a copy to whoever has engaged your services, and retain and file your own copy.

A suggested layout is shown over.

7:3 REPORTING

IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENSURE THAT THE BOILER IS COMMISSIONED BY AN OFTEC REGISTERED COMMISSIONING ENGINEER. FAILURE TO DO SO WILL INVALIDATE THE WARRANTY.

OFTEC oil firing installation completion report
PLEASE COMPLETE ALL THE UNSHADED AREAS

Company details
Company OFTEC Reg No. or Building Control Ref No.

Customer (site) address
Technician
Technician OFTEC Reg No. or Building Control Ref No.

Oil storage details
Capacity: litres OFCERT Licence No.
Remote Fill System fitted and pressure tested: ☐ Overfill alarm facility provided: ☐ Tank Type: Metal ☐ Plastic ☐ Bunded ☐
Main: ☐ Serial No.:

Oil supply system Oil supply line OD: mm Metal ☐ Plastic ☐ Pressure tested: ☐
OFTEC TU134 Underground pipe installation complied with: ☐ Remote sensing fire valve fitted and tested: ☐

Appliance details
Appliance type: Boiler: Regular ☐ Combi ☐ Cond. ☐ Cooker ☐ Room heater ☐
Appliance make: Model: OFCERT Licence No.: SE DOK Efficiency: %
Serial No.: OFCERT Licence No.:
Burner make: Model: Type: PJ ☐ VAP(S) ☐ VAP(P) ☐

Flueing arrangements
Flue type: Room sealed balanced flue ☐ Low level discharge ☐ Conventionally open flue ☐
Termination to BS 5410 Part 1: Stainless steel liner fitted: ☐ Diameter: mm
Location and type of flue installed:
Location of Approved Notice Plate:
Number of bends at 45°: Number of access doors fitted: ☐
Flueing arrangement suitable for Oil ☐ Gas ☐ Solid fuel ☐ All ☐

Air supply details
Combustion: room? ☐ Ventilation: mm²
If extract fan has been fitted, has OFTEC TU112 been complied with? ☐

Electrical safety details
Electrical minor works certificate or electrical installation certificate issued to comply with current IEE Regulations: ☐

Control(s) details
Independent time and temperature control to CH ☐ DHW ☐
Controls fitted: Programmer ☐ Room thermostat (programmable) ☐ Cylinder thermostat ☐ TRVs ☐
No. of motorised zone valve(s): Automatic bypass ☐ Boiler and system wired to prevent short cycling ☐

System details
Preparation - was the existing system flushed and cleaned? ☐
Completion - has the completed system been flushed and cleaned? ☐ Has a suitable inhibitor been added? ☐
For combi boilers, has a suitable cold water treatment system been fitted? ☐
Measurements: Differential across appliances flow and return: °C
Sealed system pressure set to: bar Cold water temp: °C DHW temp: °C Flow rate: l/min

Commissioning technician's details OFTEC registered technician: name: or Building Control Reference No.:
Registration No.:

Declaration of Completion
I confirm that the works described above have been installed prior to commissioning, in compliance with the manufacturer's instructions and the appropriate Building and Control of Pollution Regulations and that the operating requirements have been demonstrated to the beneficial user.

Signed: Print name: Date:

OFTEC - providing technical services and technician registration schemes for the Oil Firing Industry
www.oftec.org.uk

OFTEC oil firing servicing & commissioning report
The content of this schedule has been produced in consultation with TOTA
PLEASE COMPLETE ALL THE UNSHADED AREAS. THIS REPORT IS ONLY TO BE USED BY OFTEC REGISTERED TECHNICIANS

Company details
Company OFTEC Reg No.

Customer (site) address
Technician
Technician OFTEC Reg No.

Appliance make Model: Serial No.:
Burner make Model: Type: PJ / VAP(S) / VAP(P) / Wallflame
Tank Type Metal / Plastic / Bunded **Flue Type** CF / BF / LLD **Fuel type** C2 / D

Oil firing service and commissioning schedule

	Tick if passed	Parts fitted	£
A. Pre-commissioning checks			
1. Oil storage			
2. Oil supply system			
3. Air supply			
4. Chimney/flue			
5. Electrical safety			
6. Heat exchanger			
7. Combustion chamber			
8. Pressure jet burner			
9. Vaporising and wallflame burner			
10. Wallflame burner (additional)			
11. Appliance safety devices			
12. Heating system service			
13. Controls check			
14. System check - hot water type			
14. System check - Warm air type			
Labour Total			am/pm
T/Dep			am/pm
Invoice No.			
VAT No.			
		PARTS TOTAL	
		LABOUR TOTAL	
		SUB TOTAL	
		VAT	
		TOTAL	

Important comments The owner/contractor may require additional work necessary to enable the installation to comply with the requirements of the Building Regulations, Control of Pollution and other standards.

Test results It is important to keep a record of the combustion analysis results. If they have been carried out electronically a copy of the printout should be attached to an copies of the service schedule/energy pass.

Pump pressure	psi/bar	Efficiency heat	%	Gross	%
Smoke No.	CO	ppm	SO ₂		Nox
Draught	mm/Hg	Nozzle (size)	(angle)		(pattern)
CO ₂	%	Flow Rate (oil) Low	cc/min	High	cc/min
Flue gas temp.	°C	Flow rate (DHW) Cold	l/min	Hot	l/min

Customer's signature: Date:

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7:4 BOULTER BUDERUS RECOMMENDED COMMISSIONING CHECK LIST

Customer	Appliance Model
Site Address	Serial No
.....	Fuel

Tick off each item

OIL TANK

- ☐ Is the oil supply clean and free of water or other contamination?
- ☐ Is there sufficient oil, and of the correct grade for the appliance?
- ☐ Is the tank adequately supported?
- ☐ Is a damp-proof membrane inserted between the tank and support? (Non plastic tanks.)
- ☐ Does the tank slope at least 20mm per meter of length downwards towards the sludge cock? (Non plastic tanks.)
- ☐ Is the tank painted or suitably protected externally?

Is the tank fitted with the following:

- ☐ Contents gauges
- ☐ Screw fill and independent vent cover or capped fill and vent pipes.
- ☐ Outer valve
- ☐ Filter
- ☐ Sludge cock (Non plastic tanks).

HEIGHT OF TANK

- ☐ Is the bottom of the tank above the oil pump if a single pipe system is installed?

OIL SUPPLY LINE

- ☐ Ensure that galvanised iron has not been used.
- ☐ If black iron has been used, is it protected against corrosion?
- ☐ Ensure that soldered connections on copper pipes have not been used.
- ☐ Is the size of the pipe adequate for the boiler rating?
- ☐ Are all joints leak proof?
- ☐ Is a fire valve fitted?
- ☐ Is a filter fitted? (correct way round)
- ☐ Is the oil line connected to the correct inlet connection of the pump?
- ☐ Disconnect the oil supply as close to the burner as possible and drain approximately a gallon of oil into a very clear container. Inspect the oil for impurities and repeat the process if necessary.
Do not re-connect the oil until water and all impurities have been removed from the oil supply. IF NOT THIS MAY DAMAGE THE PUMP.
- ☐ Clear oil filters and de-sludge the tank if necessary.

TWO PIPE OIL SYSTEMS

- ☐ Is a spring-loaded non-return oil valve fitted in suction line? (or a 3K Oil Deaerator.)
- ☐ Does the return oil line terminate in the tank at the same level as the suction outlet?

BOILER

- ☐ Is the boiler standing on a level incombustible hearth?
- ☐ Are the thermostat phials inserted in their pockets?
- ☐ Are the baffles and bottom insulation (where applicable) correctly located?
- ☐ Is the boiler set for the fuel being supplied?
- ☐ Has the system and boiler been filled with water and inhibitor as required?
- ☐ Is the boiler flueway inspection cover screwed down sufficiently firmly to form a seal?

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BURNERS

- ☐ Is the oil pump by-pass screw fitted, if applicable?
- ☐ Remove the burner. Is the correct nozzle fitted?

NOTE:-Burner operating instructions can conflict because they are intended for general guidance. Since the burner has been specifically matched to the particular boiler, the information in the Boiler manual takes precedence.

COMMISSIONING TESTS

- ☐ Have the manufacturers on-site assembly instructions been followed?
- ☐ BEFORE ATTEMPTING TO START THE BOILER PLEASE THOROUGHLY CHECK ALL ITEMS ON THE COMMISSIONING CHECKLIST. THIS WILL HELP TO AVOID ANY UNNECESSARY CALL-BACKS.
- ☐ ENSURE THAT THE BOILER IS MATCHED MOST CLOSELY TO THE HEATING SYSTEM REQUIREMENTS BY FITTING THE CORRECTLY SIZED NOZZLE AND/OR CHOOSING THE CORRECT OIL PRESSURE.
- ☐ Fit combined air bleed manifold and 0-300psi (0-20 bar) pressure gauge to the appropriate oil pump connection, and replace burner.
- ☐ Set the boiler thermostat to between Summer and Winter positions.
- ☐ Switch on the electric supply to the boiler, checking that programmes are switched to the 'ON' position, and that the room thermostats are calling for heat.

When the burner motor starts, on one pipe systems it may be necessary to temporarily open the air bleed screw on the test manifold.

- ☐ Once the burner is firing check and if necessary adjust the oil pressure.
- ☐ If the burner locks out during ignition attempt, wait 45 seconds before pressing the reset button on the control box. Several attempts on

ELECTRICAL POWER SUPPLY

- ☐ Is the electrical supply to the appliance
- ☐ Are the electrical input connections to the control panel correct?
- ☐ Is the supply fuse correct?
- ☐ Does the wiring comply with the latest IEE regulations?
- ☐ Is the power supply cable to the control panel properly clamped?

GENERAL

- ☐ Has the boiler been installed in accordance with manufacturers instructions?

7:5 BOULTER BUDERUS RECOMMENDED COMMISSIONING TESTS

- ☐ CARRY OUT COMBUSTION CHECKS BY INSERTING PROBES INTO SAMPLING POINTS PROVIDED:
- ☐ Check the Smoke No., if clean wait 10 minutes and measure CO₂.
- ☐ Adjust the air shutter if necessary, open to reduce CO₂, close to increase CO₂.
- ☐ If the shutter is adjusted, re-check the Smoke No.
- ☐ Check the flue gas temperature. The figures should agree with the Boiler Commissioning Data.
- ☐ Check lockout function, either cover the photocell or remove solenoid coil, to simulate flame failure. Reinstall components and press the lockout button.
- ☐ Check the operation of the limit thermostat.
- ☐ Complete commissioning report (OFTEC CD 11) and enter the details on to the guarantee form which should be returned to BOULTER BUDERUS through Berry, Birch and Noble in the envelope provided.
- ☐ Instruct the user on the operation of the appliance and leave this manual with the customer.

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8:1 MAINTENANCE

A boiler fired with Class C Oil should only require attention once a year.

8:1.1 General Inspection

With the Boiler operating, inspect for signs of unsatisfactory operation, i.e. leakage of combustion products,

leakage of oil, or unusual noises from the pump or motor.

Check the commissioning list if it is your attendance to the appliance. Is there a reason why the Boiler might fail after you leave?

It is useful to measure the combustion data, i.e.CO₂, Smoke No. and flue gas temperature, and a check on the oil pressure, prior to carrying out maintenance work.

Maintenance Procedure

Switch off electrical supply at the MAINS ISOLATING SWITCH.

OIL TANK

De-sludge oil tank (if necessary), and draw off any accumulated water.

Check the correct grade of oil is being used.

FILTERS

Inspect and clean all oil filters. Change paper elements for new.

BOILER

This boiler is serviced from the front.

Remove flue inspection cover, and baffles, and clean all heat transfer surfaces and baffles. Replace any damaged or unserviceable parts with manufacturers proprietary parts.

FINAL CHECKS

Check lockout function, either remove photocell and cover it, or remove solenoid coil, to simulate flame failure. Reinstate components and press lockout reset button.

Check that the control thermostat is operating when the set temperature is reached.

Check the operation of the limit thermostat if possible.

Reset Limit Thermostat once appliance temperature has dropped sufficiently.

Complete a maintenance report and give the customer

BURNERS

Turn off the oil cock and disconnect the flexible oil hose from the oil cock.

Remove burner and clean thoroughly, the burner draught tube, the electrodes and generally the head assembly. CHANGE the nozzle for one with the specified make, oil rate, spray pattern and angle.

Inspect the ignition electrodes for crazing in the porcelain. Replace if there are signs of deterioration.

A dirty fan impeller can impair the performance of a burner, inspect and clean if necessary.

Inspect photocell, if badly discoloured, change it.

Inspect the flexible oil hose for leaks or discoloration. Use only replacement flexible oil hoses that are detailed in the spare parts section of this manual.

COMBUSTION TESTS

Fit combined air bleed manifold and 0-300psi (0-20 bar) pressure gauge to the appropriate oil pump connection, and replace burner.

Switch on the electric supply to the boiler.

When the burner motor starts, on one pipe systems, it may be necessary to temporarily open the air bleed screw on the test manifold.

Once the burner is firing check and if necessary adjust the oil pressure.

Carry out combustion checks by inserting probes into sampling points provided or at the flue outlet.

Check Smoke No., if clean wait 10 minutes and measure CO₂.

Adjust the air shutter (see Fig 8.2a), if necessary, open to reduce CO₂, close to increase CO₂.

If the air shutter is adjusted, re-check the Smoke No.

Check the flue gas temperature.

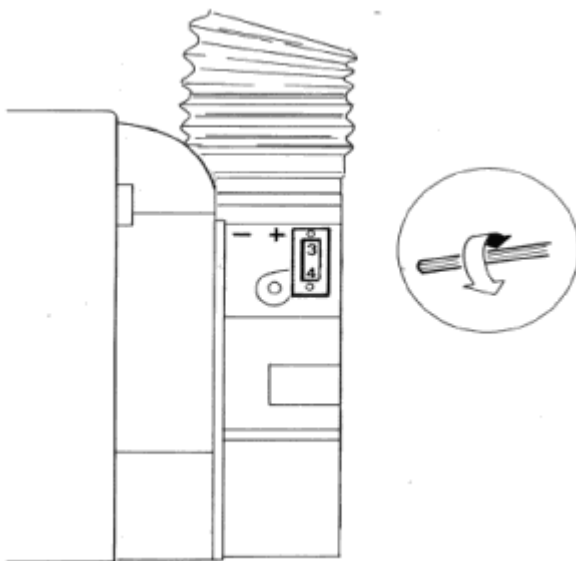
The figures should agree with data in Boiler Commissioning Data, Section 3.

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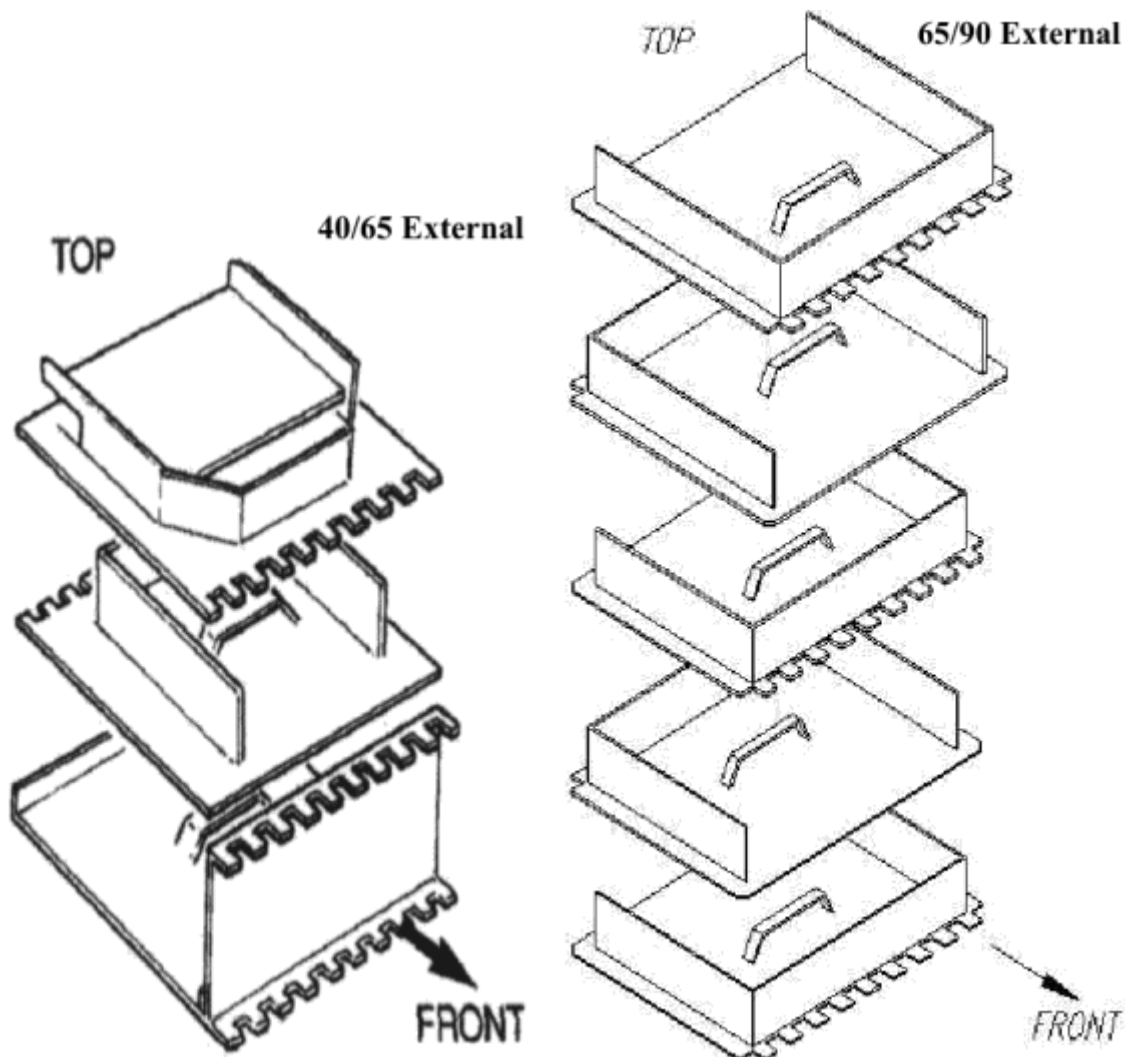
8:2 AIR SHUTTER ADJUSTMENT

The burner has a fixed Air Shutter with manual adjustment.

To adjust the CO₂ at the Air Shutter use a 3mm Allen key as shown. To increase the setting turn the air shutter clockwise (+) and to decrease turn anti-clockwise (-).



8.3 BAFFLE ARRANGEMENT



SECTION 10 – FAULT FINDING

10:1 FAULT FINDING

If the Boiler fails to start, make the following checks before calling a service engineer:-

Is there sufficient fuel in the storage tank?

Are all fuel supply valves open (turned fully anti-clockwise) and ball valves open?

Is the mains electricity supply switched on?

Is the programmer (or Boiler Operating Switch) set to call for heat?

Is the Boiler Thermostat set to the desired temperature?

Is the Lock-out Reset Button on the Control Box and Control Panel neon illuminated? If so, press to reset Burner.

Check the fuse which should have been fitted to the mains electricity supply to the programmer/boiler operating switch. If the fuse has blown, replace it. If it blows again, call a Service Engineer.

IMPORTANT - Electrical Safety

IT IS ESSENTIAL THAT BEFORE ANY PANELS OR COMPONENTS ARE REMOVED FROM THE BOILER, THAT THE MAINS ISOLATOR IS SWITCHED OFF.

10:2 FAULT FINDING CHART

	<i>Trouble or Complaint</i>	<i>Possible Cause</i>	<i>Action</i>
1.	Suspect oil supply	No oil in tank	Check and arrange for tank to be filled if necessary.
		Supply valves closed	Open all supply valves.
		Blockage in oil supply (Gravity head feed)	Shut off the burner isolating valve. Disconnect the oil supply at the pump entry. Place receptacle under the pipe. Slowly open the valve, note if the flow is unrestricted, restricted or blocked.
		Wrong grade of oil	Check for correct grade of fuel (see Technical Data).
		Water contamination	Open tank, drain valve and check.
		Tank vent blocked	Check.
		Filter blocked	Check or water or blockage.
		Air locks in supply pipe	Check for high points in main oil supply.
		Air lock in pump	Bleed pump, check flexible oil line.
2.	Burner will not start	Interruption or absence of electrical supply at burner (check this at Control Box mains terminal with test lamp)	Check mains switch on. Check fuse in switched spur or plug. Check that time switch or programmer is closed. Check that the auxiliary stat is closed. Check boiler stat, cylinder stat, room stat are calling for heat.
		Control Box is locked out, refer to symptom 4	Press reset button on the burner box.
		Photo-resistor receiving false light	Check that the photo-resistor is fully home in its housing. Burner will not start with illuminated cell.
		Faulty control box	Replace.

	Trouble or Complaint	Possible Cause	Action
3.	Burner lights up but locks out after 15 sec	No oil supply	Check oil in the tank.
		Photo-electric cell not receiving light from flame	Check that photo-electric cell is clean and fully home in housing.
		Photo-electric cell connections loose	Check and tighten if necessary.
		Control Box photo-electric cell circuit faulty	Replace control box.
		Flame instability	Check combustion setting out and reset if necessary.
4.	Burner starts but will not light up	This can be due either to absence of oil or ignition.	
		Oil pump air locked (repeat air locking may be due to poor pipe joints or defective gland packings)	Pump should be self-venting with two pipe system only. If a one pipe gravity feed is employed it must be purged through the vent port.
		Motor not driving pump shaft	Check that flexible drive is functioning correctly and not slipping.
		Blocked atomiser nozzle	Remove and replace nozzle.
		Oil pressure abnormally low	Check oil pressure on gauge and set to the correct pressure (see Technical Data).
		Solenoid valve faulty	Break union at outlet to check presence of oil. Check that seat is clear. Check coil for continuity. Inspect coil feed wiring to control box.
		Pump rotation incorrect	Check.
	Ignition failure:	Electrodes dirty	Inspect and clean if necessary.
		Electrodes miss-set	Inspect and reset gap 3 to 4mm between tips. 2mm in front of nozzle face.
		Cracked electrode insulator	Check and replace if cracked or crazed.
		Electrode leads	Check for proper connections.
5.	Burner lights up, runs continuously and emits visible smoke or shows excess smoke on combustion check	Air shutter closed	Reset to correct position.
		Wrong nozzle	Check make, type and spray angle.
		Worn atomiser nozzle	Replace if necessary.
		Oversize nozzle fitted in error	Check size and replace with correct

		size if necessary.
	Nozzle incorrectly stamped	Replace with correct nozzle.
	Burner air supply inadequate	Inspect air intake and fan for fouling of impeller with dirt.
	Burner oil pressure excessive	Check pressure and reset to correct pressure (see Technical Data).

	Trouble or Complaint	Possible Cause	Action
6.	Burner lights up, runs normally but flame cuts off slowly on shut down (possibly with smoke or pulsation)	Air in nozzle	Should self-correct; if air repeatedly present; check for leaks on oil line and flexible.
		Magnetic valve not operating correctly	Inspect and replace if necessary.
		Shut off piston in pump sticking	Check pressure and reset to correct pressure (see Technical Data)
7.	Burner Pulsates	Air supply setting incorrect or fan inlet blocked.	Inspect and reset or remove blockage.
	(a) continuously	Grossly oversized nozzle	Checked and replace with correct size and type (see Technical Data)
		Air supply inadequate	Check fan operation and cleanliness.
		Worn nozzle with excess throughout or uneven spray pattern	Replace with nozzle of correct type and size (see Technical Data)
	(b) at initial firing	Air supply line	Purge at pump to remove.
		Blocked flue ways	Clean boiler and flue.
8.	Burner locks out on morning starts then runs perfectly for rest of day	Localised low voltage supply in early morning	Check with local Electricity Board to fit recorder. Enlist aid of the Board.
		Air present in oil supply	Restart burner several times - press lockout reset button repeat 7(b) above.
		Bottom of oil tank below level of oil pump	Raise tank or install a two pipe oil supply from tank.
		Non-return valve faulty or air leak in two pipe oil supply system.	Renew non-return valve. Rectify air leak.
9.	Burner fails due to blown fuse	Short circuit in wiring	Inspect wiring, sheathing and inter-

			component connections for broken or damaged leads. Replace if necessary.
		Motor seized	Check by hand and replace if necessary.
		Breakdown of insulation of motor windings	Replace motor.
10.	Burner runs normally but will not reach desired temperature	Oil throughput insufficient	Check nozzle size and pressure against rating.
		Boiler has become undersized due to heating system expansion	Check with heating installer.
		Low efficiency and CO2	Check combustion readings, reset air.
		Low efficiency due to high flue gas temperature	Clean heat exchanger surfaces.
		Faulty boiler stat.	Replace, check and clean.

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	Trouble or Complaint	Possible Cause	Action
11.	Poor combustion readings	Low CO2	Check: CO2, oil pressure, nozzle size (see Technical Data)
		High CO2	Check: CO2, oil pressure, nozzle size (see Technical Data)
		High smoke	Check: CO2, oil pressure, nozzle size (see Technical Data). Check all baffles are in place and correctly located.
		High flue gas temperature	Check: air shutter, nozzle size (see Technical Data), clean heat exchanger surfaces.
12.	Oil odour	Leaking joints	Break all leaking joints and re-make.
13.	High operating temperature	Control stat failed and operating on limit stat	Replace control stat and reset Limit Thermostat.
14.	Fumes in Boiler Room	Inadequate draught due to unsatisfactory chimney or blockage of boiler flue ways or flue pipe	Take necessary corrective action.
15.	Unstable flame, some puffing, ignition cuts in intermittently	Air damage on burner improperly adjusted or faulty nozzle or unsatisfactory draught conditions or faulty in oil supply	Set up burner as for commissioning using oil pressure gauge, smoke pump, CO2 indicator and draught gauge, adjust settings as necessary, replace nozzle if necessary. See Commissioning

			Check List and Servicing Notes.
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Buderus is one of the largest heating groups world-wide and enjoys a market-leading position in sales of hi-efficiency gas condensing boilers in Europe. Boulter Boilers was acquired by Buderus in December 2002, which brought together two organisations with a reputation for experience and quality in their respective markets. The new organisation, Boulter Buderus can be summed up by three points; **reliability, quality and hi-efficiency.**

Boulter Boilers has over twenty years of experience in the oil-fired boilers market and Buderus has been involved in the manufacture of condensing boilers for over twenty-two years.

Our philosophy is to provide products designed to meet the needs of our customers, which means that we lead the way in the development of new features for oil-fired boilers and build on Buderus' success with hi-efficiency condensing boilers.

Our oil-fired boilers are manufactured in Ipswich, Suffolk and the condensing boilers are imported from the Dutch organisation, Nefit Buderus.

All products are approved to meet exacting European standards relating to quality, safety, efficiency and the environment. Our design, manufacturing, delivery and after sales service is certified and accredited by the ISO 9000 approval system.

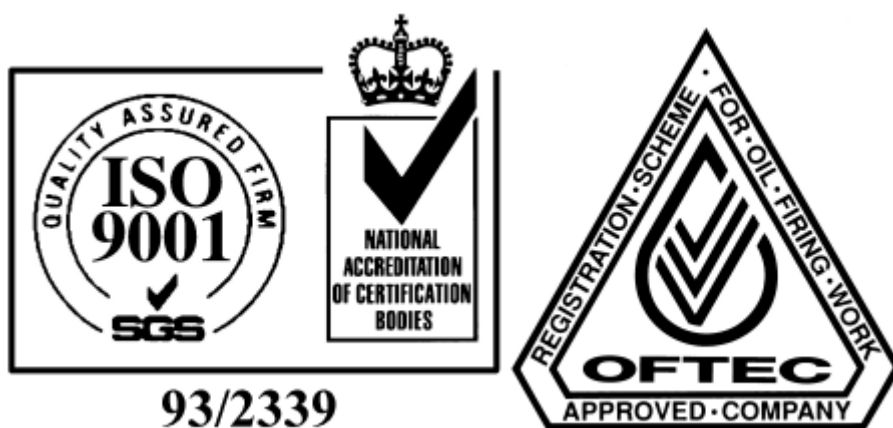
To contact us...

Boulter Buderus Ltd,
Magnet House,
30 White House Road,
Ipswich IP1 5JA.

Tel: +44 (0) 1473 241555
Sales Boilers: +44 (0) 1473 243780
Product Support: +44 (0) 1473 243770
Fax: +44 (0) 1473 241321
Email: sales@boulter-buderus.co.uk
www.boulter-buderus.co.uk

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