Boulter

Boulter Bonus

INSTALLATION &
MAINTENANCE MANUAL
for the
BOULTER BONUS
Oil Fired Boiler

NOTE :- IF FITTING AN EXTERNAL GRP CASING SET - PLEASE SEE ADDITIONAL INSTRUCTIONS SUPPLIED WITH THE GRP CASING SET

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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 despatch.

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.

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

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CONTENTS

1:1 INTRODUCTION

Getting to Know your New Boulter Bonus Boiler.

Thank you for choosing the Boulter Bonus - manufactured in the UK by Boulter Boilers who are renowned oil-firing specialists. Before using your new Boiler, we ask that you carefully read the following information.

All Boulter 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 Bonus and, once again, thank you for choosing Boulter.

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 Boiler has built-in safety features, which are detailed in the relevant section of this manual.

1:2.1

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

Please note: It is essential in the interest of the Boiler efficiency and reliable performance that once the Boiler has been installed it is first commissioned by a competent and preferably an O.F.T.E.C.* registered engineer. It is the responsibility of the Installer to ensure that the Boiler is commissioned.

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

**The Oil Firing Technical Association for the Petroleum Industry - Banstead, Surrey 01737 373311.*

◆ 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 guarantee period.

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

1:2.2 Air Supply to Boiler - Conventional Flue

Where your Boiler is used on an open conventional flue system, a permanent air supply is required for combustion. 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 Boiler should be connected to an electrical supply complying with the Electrical Wiring Regulations (BS7671): as well as an oil supply complying with BS5410 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 Boiler has been installed it MUST be commissioned by a competent engineer preferably an 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.

1:4 BOILER CONTROL PANEL

Boiler Control Panel (see fig 4:10a)

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 as this will cause corrosion which will reduce the life of the Boiler (Summer position).

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 BURNER RUNNING INDICATOR

Not fitted on this appliance.

1:5.4 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 restart the Burner, wait for a period of at least 45 seconds. Press the lockout reset button located on the front of the Burner (see fig 1:5). 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.

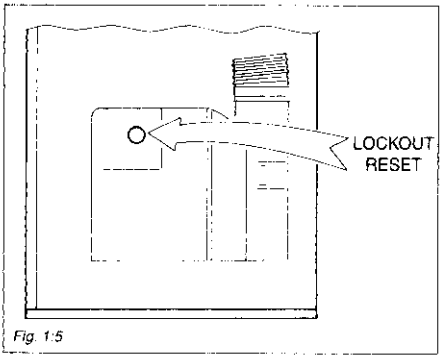


Fig. 1:5

1:5.5 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.

1:5.6 SWITCHING THE BOILER OFF - TEMPORARILY

The Boiler may be stopped by:

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

1:5.7 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.

1:5.8 SEALED SYSTEM CENTRAL HEATING

If your Boulter Bonus is used on a SEALED SYSTEM, it is important that the correct operating system pressure is maintained. Your Installer should give guidance on this.

1:5.9 FROST PROTECTION

If there is any danger that your Boiler may freeze up during severe weather conditions, it is recommended that you consult your installer who will be able to advise you on an appropriate course of action, either by installing a frost thermostat or the addition of system anti-freeze.

1:5.10 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 is delivered to your tank. Please ask your supplier, or the driver to notify you before the oil is discharged.

1:5.11 MAINTENANCE AND TROUBLE SHOOTING GUIDE

1:5.11.1 MAINTENANCE

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

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 Kerosine 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 on conventional flue models, it is possible for the air intake to become blocked with household debris. This air intake must remain clear at all times and so it is advisable to inspect and clean this area regularly. Please refer to section 1:2.2 in this booklet.

Flue Terminal Pluming

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

1:5.11.2 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.

2:1 INTRODUCTION

This Manual covers Installation, Commissioning and Maintenance.

The Boulter Bonus 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.

BOULTER Boilers offer greater freedom to select the most suitable position for siting and the opportunity to install the boiler in a suitable outbuilding if required.

2:2 FLUE OPTIONS

BOULTER Boilers are designed to operate with high efficiency, clean combustion and low noise level. They offer unique versatility and can be used in the following modes:

1. Low level rear side outlet balanced flue.
2. For connection to a conventional chimney (via conventional Flue Kit, Part No. FC4CF,
3. Other options may be available. Please contact Boulter Boilers.

The tested balanced flue terminals and connections afford an adequate supply of air for combustion and equalisation of pressure between exhaust and intake as required for operation under unfavourable wind conditions.

Balanced flues are supplied in a carton which includes ALL parts for balanced flue installation.

The horizontal terminals are designed to avoid the possibility of staining outer walls through which they pass.

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 Boilers will be pleased to provide details of commissioning and servicing engineers from their register.

See Section 7 for Commissioning Procedure.

IMPORTANT

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

*The Oil Firing Technical Association for the Petroleum Industry. Banstead, Surrey
☎ (01737) 373311.

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 ELECTRICITY SUPPLY.

1. On no account should any part of the Boiler or its Flue be modified with the exception of flues which require adjusting to length to suit site conditions, as detailed in this manual.

2. The wiring of the control panel should be as the wiring diagrams included in this Manual. Wiring should not be tampered with, modified or changed for any reason.

3. Only use Boulter replacement parts.

Non compliance with the above will invalidate the Guarantee.

3:1 LIQUID FUELS

The boiler will burn liquid fuels complying with BS2869 Part 2 1988 Class C2 as specified in the Code of Practice for Oil Firing BS5410 Part 1.

Class C2 (Kerosine)

This fuel is suitable for this boiler. Burners are supplied with the appropriate nozzle and pump pressure as standard for this fuel. They are set 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	less than 35°C above room temperature.
Minimum Conventional flue draught at boiler flue outlet	0.035"w.g. (8.75N/m²).
Maximum Conventional flue draught at boiler flue outlet	0.15"w.g. (37.5N/m²).
Water Resistance	Less than 300 m.m.w.g. with 11°C temperature rise across the boiler.

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.

3:4 ELECTRIC'S

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

IMPORTANT

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

All wiring to supply and all system components external to boiler must comply with the latest edition of BS7671:1992 formerly IEE Wiring Regulations.

This appliance must be effectively earthed and connection to the supply must be through a double pole isolating switch fused 5 amp.

The isolating switch must have all pole contact separations at least 3mm

3:5 DIMENSIONS

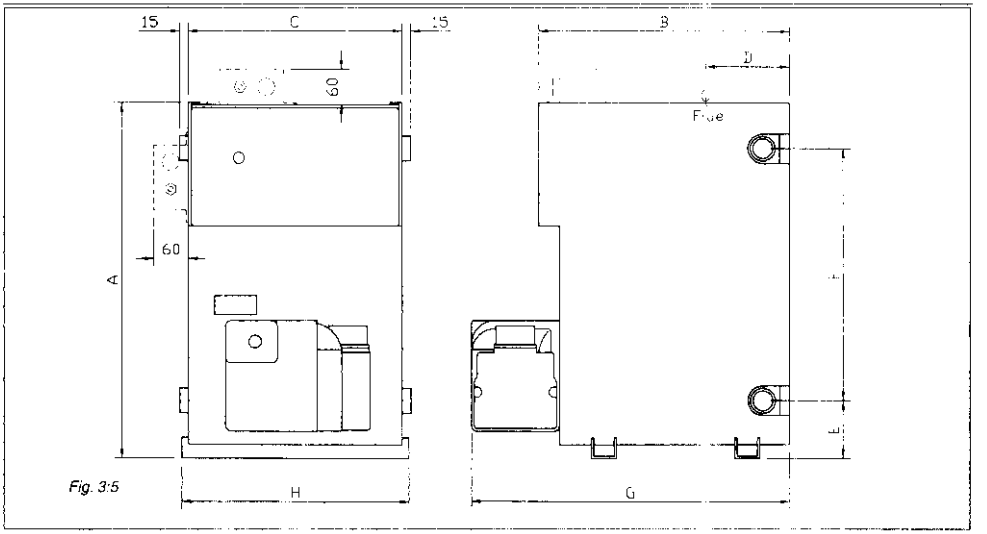


Fig. 3:5

Model	Output		A	B	C	D	E	F	G	H	Flue K	L	Weight Empty	Water Content	Filled Weight
	kW	Btu/h x 1000	mm	mm	mm	mm	mm	mm	mm	mm	ø ins	ø ins	Kgs	Litres	Kgs
40/65	11.7/ 19	40/65	697	397	446	130	118	540	549	456	4"	1 BSP	94	17.5	114
65/90A	19/26.4	65/90	697	397	446	130	118	540	549	456	4	1	21	99	119

3:6 COMMISSIONING DATA

3:6.1 Class C2, Kerosene Oil RIELLO BURNER

Model Boulter Bonus	Output		Riello R D B TYPE	Nozzle Danfoss Delevan US/GPH	Pump Pressure		Fuel Rate Kg/h	C02 %	Smoke No.	Flue Exit Temp °C Gross	Boiler Test Point Temp °C
	kW	Btu/h x1000			BAR	psi					
40/65	11.7	40	484T50	0.4x60°ES	7.0	100	1.08	10	0-1	165-195	215-245
	16.1	55		0.5x60°ES	8.0	115	1.49	11	0-1	180-225	260-285
	19	65		0.6x60°ES	7.6	110	1.76	12	0-1	180-245	295-320
65/90A	19	65	483T50	0.6x60°ES	7.6	110	1.76	10	0-1	180	280
	23.4	80		0.75x60°W	7.2	105	2.17	11	0-1	200	304
	26.4	90		0.85x60°W	8.0	115	2.42	12	0-1	204	335

1. There are two columns in the table for combustion gas temperature:-
FLUE EXIT temperature, and
BOILER TEST POINT temperature.
2. Where possible CO2, smoke and flue gas temperatures should be sampled from the FLUE EXIT (i.e. external balanced flue discharge, or from the test point provided in the conventional flue adaptor)
3. These figures may be used to calculate combustion efficiency.
4. Alternatively (where the forgoing is impractical such as vertical BF) gases can be sampled at the BOILER TEST POINT inside the casing.
Because the gas temperatures at this point are significantly higher it should **not** be used to calculate or measure efficiency.
5. If the BOILER TEST POINT temperature agrees with the data in Table **3:6.1**, then use the appropriate FLUE EXIT temperature from the table to calculate the combustion efficiency.
6. On conventional flue only - flue draught should be measured at the flue exit test point.

	40/65	65/90A
Maximum Temperature of Adjustable Controls	Control Stat 85°C +/- 2°C Limit Stat 110°C +0/-6°C	
Maximum Emissions Limit (Class 1)	NOx 250 mg/kWh-CO 125 mg/kWh	
Range of Temperature Control	Control Stat 0 - 85°C	
Exit Flue Gas Mass Flow Kg/Sec x 10^{-3} LOW MID HIGH	6.69 8.46 9.24	9.61 11.84 13.50
Heat Input (Full Load) kW (based on Net efficiency of 91%)	22.1	30.9
Heat Output (Full Load) kW	19	27.8

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 4543 Pt. 1 & 3 Factory made insulated chimneys.

BS 7593 Code of practice for the treatment of water in domestic hot water central heating systems.

BS 7671 (1992) Electrical Wiring Regulations.

BUILDING REGULATIONS.

Part L & J 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 page 6).

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 temperature 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 of 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.

4:3 SITING & POSITIONING

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

1. Noise may be accentuated by the installation in small rooms or recesses with hard or hollow stud wall surfaces. Due consideration to the siting of boilers should be given.

Further advice from BOULTER BOILERS 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 type of chimney, position relative to the boiler and whether a draught stabiliser is to be fitted may affect sound level in the room.

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

4:4 THE HEARTH

The Boulter Bonus 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.

The filled Boiler weight can be found in 3:5.

Advice should be sought from your local Building Control Office if there are any doubts regarding the floor supporting the Boiler.

4:5 THE CHIMNEY - (FLUE Ø 4")

CONVENTIONAL CHIMNEY INSTALLATION ONLY.

VERY IMPORTANT

To connect this boiler to a conventional chimney you must use The Conventional Flue adaptor (Part No. FC4CF,).

This includes all parts necessary to make the connection to the boiler. A test point is also provided for ease of installation and commissioning.

The use of this adaptor is essential for safe performance and is a condition of the guarantee that this must be fitted (see fig 4:11).

The boiler requires a minimum stable draught of 0.1 mbar (0.04w.g.).

If the chimney exceeds 6m (20 feet) in length, it may produce a draught exceeding 0.37 mbar (0.15" w.g.) and a draught stabiliser should be fitted.

The chimney should comply with the latest edition of the Building Regulations and BS 5410: Part 1.

Factory built chimneys must comply with the Building Regulations and BS 4543 Parts 1 and 3.

Compliance with the Building Regulations does not indicate that the chimney is satisfactory in respect of draught conditions, or is positioned so that 'down draughts' will not occur.

Special pots and cowls which might restrict the flow

of gases must not be fitted and should be removed.

A brick chimney must be fitted with a suitable stainless steel liner. Insulation between the liner and an exposed chimney may be necessary to avoid condensation.

A flexible liner should be the same diameter as the Flue Offtake size of the boiler - 4"(100mm).

The Flue pipe, connecting the boiler to the chimney adaptor should be the same diameter as the Boiler Flue Offtake and should not be more than 1.8m (6'-0") long. Flue Pipes when fitted should satisfy or be 'deemed to satisfy' the Building Regulations.

Flue pipe bends - 90° bends must not be used - use 135° bends. Bends with soot doors should be used where necessary

FOR BALANCED FLUE INSTALLATIONS SEE SECTION 6.

4:6 AIR SUPPLY

CONVENTIONAL CHIMNEY INSTALLATION ONLY

A permanent adequate supply of air is required for combustion and correct operation of a draught stabiliser, if fitted.

This air enters the Boiler through the back panel. At least 15mm clearance is required at the rear of all boilers.

When the boiler is situated in a confined space or chamber a permanent adequate supply of air is required for ventilation to prevent over heating.

4:6.1 Opening Sizes

The clear opening required for combustion only should be based on a requirement of 550mm²/kW, (or 1in² per 4000 Btu/h) above 5kW

When a draught stabiliser is fitted to the flue pipe or chimney in the room in which the boiler is situated the clear air intake should be 1100mm²/kW.

When the boiler is situated in a confined space with Combustion or Ventilation air from outside - Allow 550mm²/kW at low level and in addition 550mm²/kW at high level;

When Combustion and Ventilation air is taken from a heated adjoining space the allowance should be 1650mm²/kW at low level and in addition 1100mm²/kW at high level. Ensure that the heated adjoining space itself has an adequate supply of air.

When the Boiler is installed in a basement or low level boiler house where air can enter only from high level, the incoming air supply for Combustion and Ventilation should be ducted to low level. A high level outlet should be provided for ventilation.

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.

Soft soldered joints should not be used.

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. It should be fitted as close to the Boiler as practicable.

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, preferably at point where the Oil Pipe enters the building. The sensor should be located above the Burner in the clip provided (see fig 4:8).

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

Ref:	Operating Temperature	Capillary Length
RAF9015C	90°C	1.5m
RAF9030C	90°C	3.0m
RAF9060C	90°C	6.0m
RAF9090C	90°C	9.0m

4:8.3 Single Pipe System

Fig. 4:8a

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. (See 4:9).

4:8.4 Two Pipe System

Fig. 4:8b

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, see fig. 4:8b.

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. (See 4:9)

4:8.5 Deaerator Oil Pipe System

Fig. 4:8c

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 3K Deaerators are available as an optional extra from your merchant (Part No. BS 03060).

4:8.6 Water Separator Oil Filter

For changeover applications, the use of a Water Separator Oil Filter, available from BOULTER BOILERS is recommended (BS03052).

SINGLE PIPE OIL SYSTEM - TANK OUTLET ABOVE BURNER

DO NOT FIT PUMP BYPASS SCREW TO BURNER - SEE 4.9.2

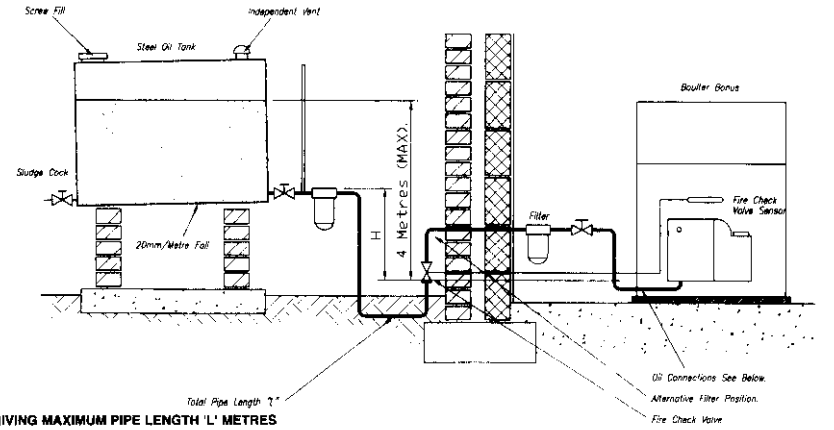


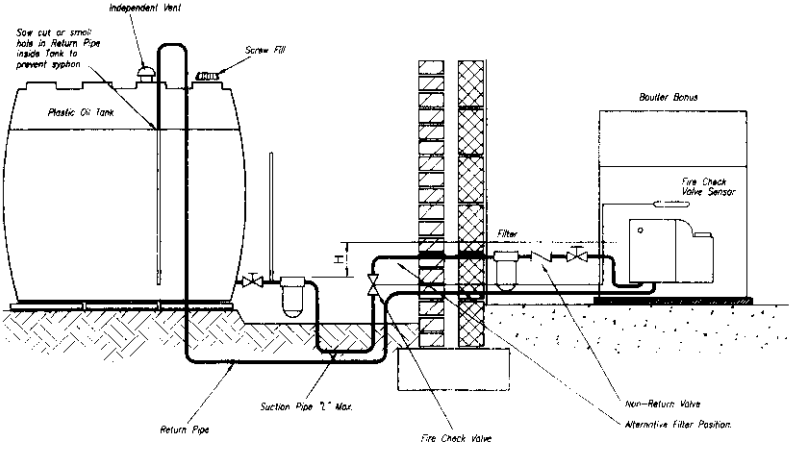
TABLE GIVING MAXIMUM PIPE LENGTH 'L' METRES

	H METRES	0.5	1.0	1.5	2.0
KEROSENE 10mm OD PIPE	Burner to supply	20	40	80	100

Fig. 4:8a Single Pipe Oil System.

TWO PIPE OIL SYSTEM - TANK OUTLET BELOW BURNER

FIT PUMP BYPASS SCREW TO BURNER



	H METRES	0	0.5	1.0	1.5	2.0
KEROSENE 10mm OD PIPE	Burner to supply	100	100	100	90	70

Fig. 4:8b Schematic Oil Pipe Connectors

TWO PIPE OIL SYSTEM - TANK OUTLET BELOW BURNER

FIT PUMP BYPASS SCREW TO BURNER

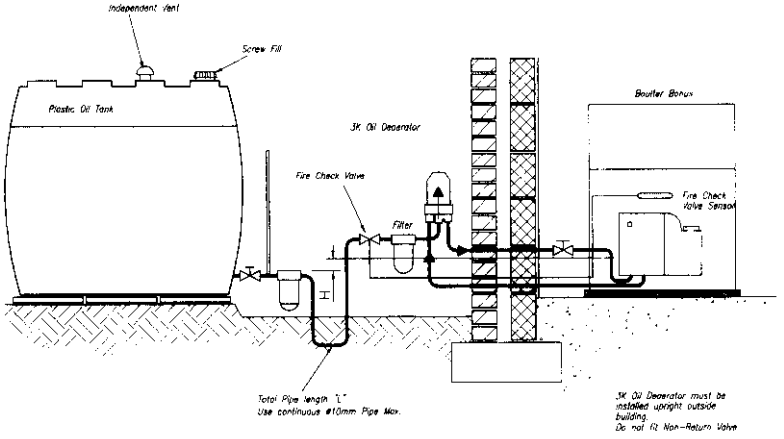


TABLE GIVING MAXIMUM PIPE LENGTH 'L' METRES

	H METRES	0.5	1.0	1.5	2.0
KEROSENE 10mm OD PIPE	Burner to supply	100	100	90	70

Fig. 4.8c Deaerator Oil Systems

4:9 OIL BURNER

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

4:9.2 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. See Fig. 4:9b.

4:9.1 Burner Pump for Two Pipe and Deaerator System

For two pipe oil systems the Burner Oil Pump has to be fitted with the Bypass Screw supplied. Boilers are despatched with the Bypass Screw in a labelled envelope attached to the Burner. This socket screw is inserted into the return port as shown in Fig. 4:9a.

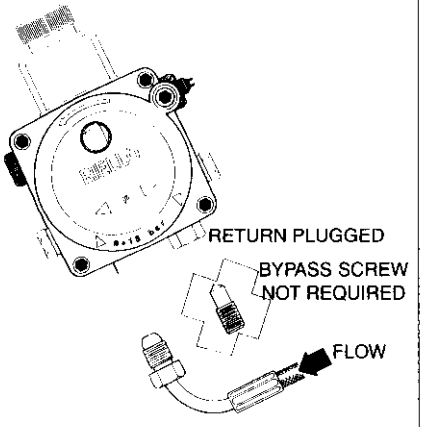


Fig. 4.9b Burner Pump for Single Pipe Operation

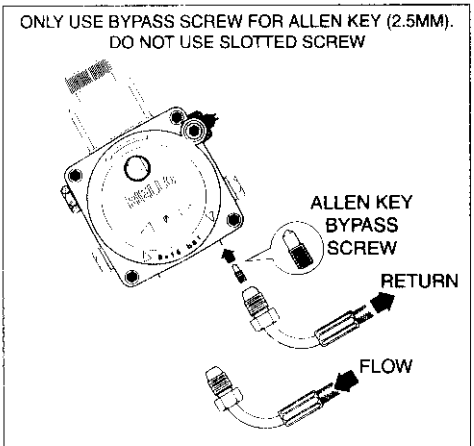


Fig. 4.9a Burner Pump for Two Pipe Operation

4:10 CONTROL PANEL

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

4:10.1 Connecting Control Panel

Connect the switched line to L, neutral to N and earth to E, as shown in fig 4:12.

4:10.2 Phial Positions

1. Insert the Boiler Control Stat 8mm Plain Phial into a pocket on the top of the Boiler Heat Exchanger as shown in Fig. 4:10b

2. Insert the Limit Stat 8mm Coiled Phial into the second pocket on the top of the Boiler Heat Exchanger. See Fig. 4:10b

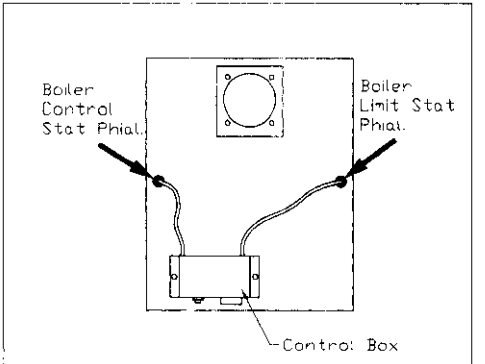


Fig. 4.10b Phial Positioning

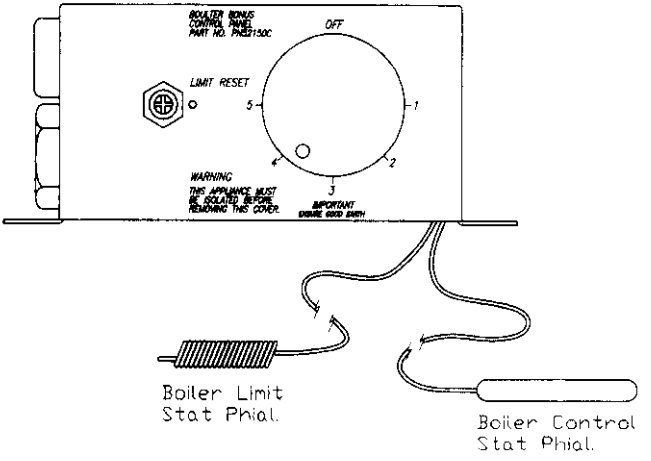


Fig. 4.10a Control Panel

4:11 PACKAGING AND ASSEMBLY INSTRUCTIONS

4:11.1 PACKAGING

The outer carton contains the boiler and burner carton.

The burner carton contains the burner, pre-wired control panel, flexible air supply duct, the convention flue air inlet grill and the literature envelope.

A balanced flue kit or conventional flue adapter kit must be obtained and used with this appliance.

4:11.2 Assembly

When the boiler is connected to the system and the flue is installed:-

1. Check that base insulation and baffles are located correctly.
2. Fit the burner to the boiler (1nut).
3. Select top OR left side for the control panel location.
4. Connect supply cable to the control panel, and fix (2 screws).
5. Insert thermostat phials into the pockets.

6a. On Balanced flue, connect the flexible duct from the burner to the flue using the two jubilee clips provided.

NOTE: One jubilee clip is supplied with the Balanced flue kit and one with the burner. The air duct may be shortened to suit the flue kit supplied.

6b. On conventional flue, discard the clip supplied with the CF adapter kit, and the flexible air duct, and replace the circular air intake with the plastic air intake grill. (see fig. 4:11).

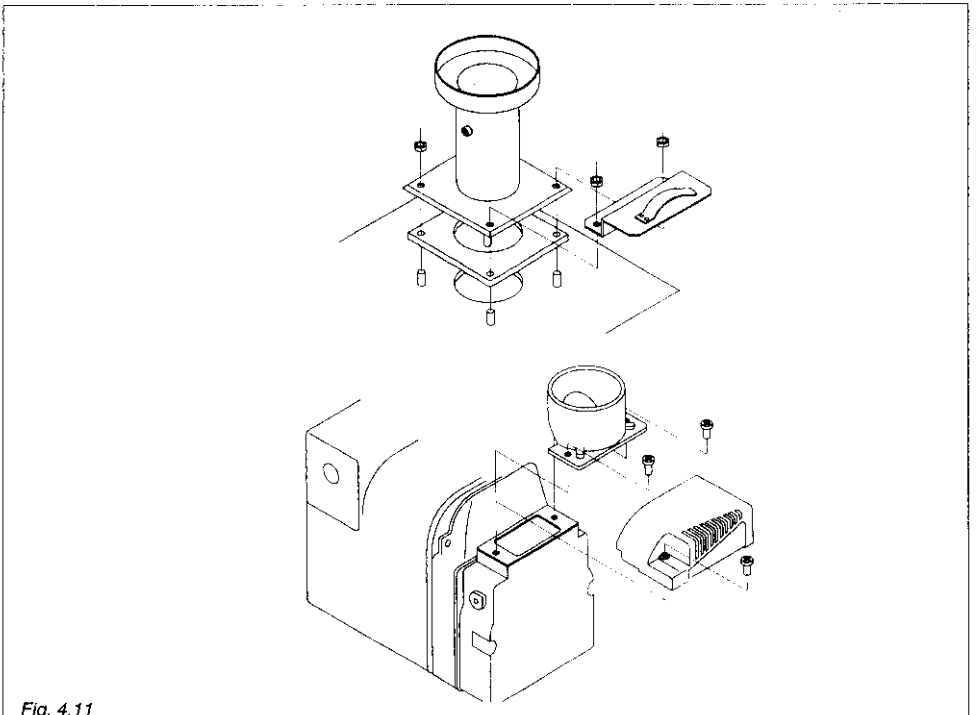


Fig. 4.11

IMPORTANT
ENSURE GOOD EARTH

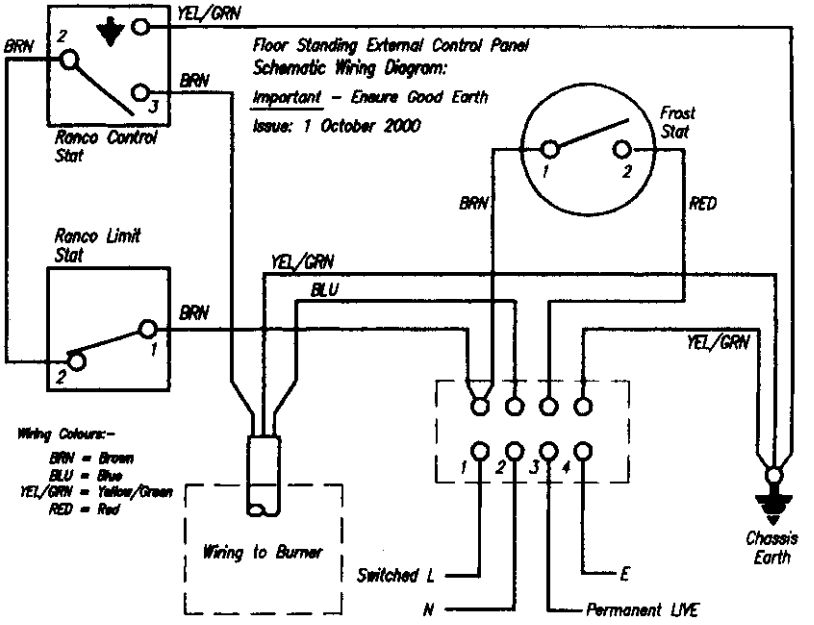


Fig 4:12

5:1 BALANCED FLUE BOILERS

A range of Balanced Flue Kits are available as optional extras for this boiler.

Balanced Flues permit considerable choice of siting of the Boiler. Boilers may be installed in situations where no chimney exists, where the chimney is unsatisfactory or in outhouses.

It is important that care is exercised in choosing a suitable location for the Boiler and Flues. 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 a mandatory requirement that:-

1. The terminals of balanced 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 BOILERS LTD. who will be pleased to consider and discuss it.

5:1.1 Balanced Flue Types

Low Level Horizontal - Rear & Side

5:2 HORIZONTAL BALANCED FLUES

The Terminals of Horizontal Balanced Flues should be installed on a plain surface of wall preferably not less than 900mm from internal corners of the building and away from any recesses and any projections on the wall face that could affect wind flow across it.

Listed are the general restrictions as to the positioning of Horizontal Balanced Flue Terminals. Refer to Fig 5:4a

1. Positions should be avoided where the exhaust of combustion products could cause nuisance.

2. Terminals must be situated more than 600mm distance from any opening in the building.

3. Avoid close proximity to internal corners where products of combustion may not freely disperse and may enter the air intake to the boiler.

4. Avoid positions such as narrow passageways, especially with a closed end, where easy dispersion could be adversely affected.

5. Avoid positions where the terminal may be discharging close to and in the direction of a near neighbouring dwelling or exhausting immediately over adjoining property.

6. Avoid positioning immediately under openable windows.

7. Care should be taken to ensure that there is clearance between the outer surface of the flue and any combustible material.

8. Positioning the Flue terminal within a CAR PORT is not recommended.

5:3 OTHER BALANCED FLUE OPTIONS

Other options of balanced flue may be taken from the Camray 5 range. (ie high level & vertical kits plus extensions).

5:4 POSITIONING THE BOILER

Read Sections 5:2 & 5:3

Some combustion noise occurs at the Exhaust Terminal of Balanced Flues and care should be exercised to ensure that the position of the exhaust is not near doors or opening windows of the house it serves, or doors or windows of any neighbouring house. See Fig. 5:4a.

RECOMMENDED FLUE TERMINAL POSITION

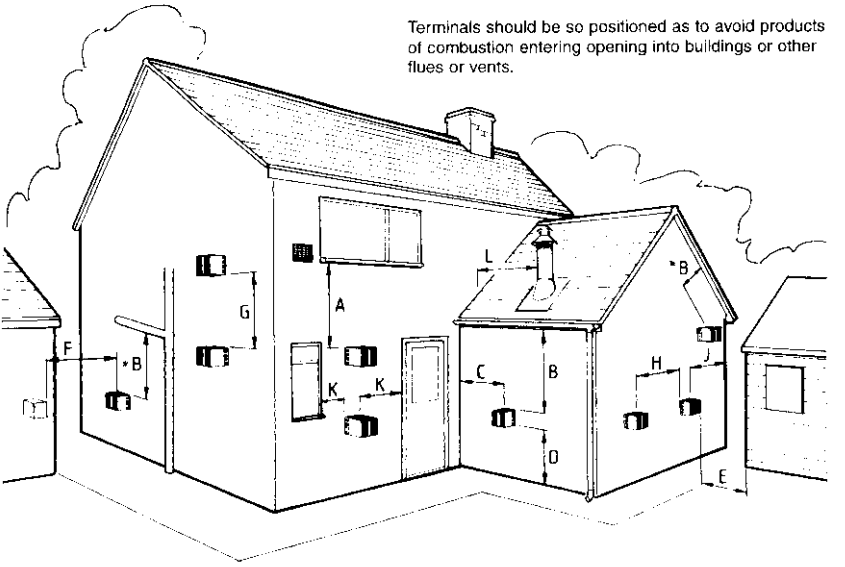


Table to above Flue Terminal Positions - MINIMUM dimensions

REF	DESCRIPTION	DISTANCE IN MM	
A	Directly below an Opening, Air Brick or Window	600	
B	Below a Gutter, Sanitary Pipework or Eaves	75	(600*)
C	From any Internal Corner	300	(900)
D	Above Ground	300	(600)
E	From a surface facing the Terminal	600	(1200)
F	From a Terminal facing a Terminal	1200	
G	Vertically between Two Terminals on the same wall	1500	
H	Horizontally between Two Terminals on the same wall	750	(1200)
J	From any External Corner	300	(600)
K	Horizontally from any Opening, Air Brick, Window or Door	600	
L	Vertical Flue from Wall (Flat or Pitched Roof)	750	

*Where the terminal is within 1m of any plastic material, such material should be shielded from the effects of the combustion products of the flues

NOTE:- Whilst the dimensions in BS 5410 are shown in the table, it is stressed that possible variances in local site conditions may not always be obvious and that if in any doubt the dimensions in brackets should be observed.

BOULTER BOILERS would be pleased to advise on any difficult positioning

Fig. 5.4a Balanced Flue Terminal Positions

5:5 TERMINAL GUARDS

When the terminal is positioned where there is the possibility of accidental contact by persons, or of damage to the terminal, an approved guard is necessary (Boulter Code FL26160).

Generally, exhaust 2 metres above ground level alleviates the necessity for a guard.

A suitable guard is available from BOULTER BOILERS as shown below.

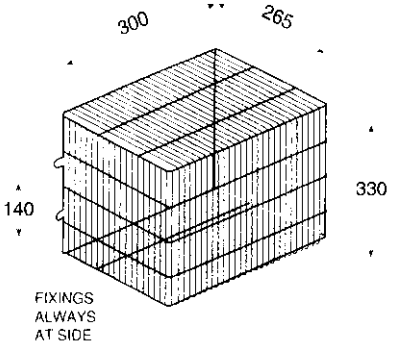


Fig. 5:5a

5:6 HORIZONTAL FLUE TERMINAL

The Terminal for Horizontal Balanced Flue is secured to the wall by means of four screws. The terminal should have its four edges siliconed to the outside wall to provide a weather seal.

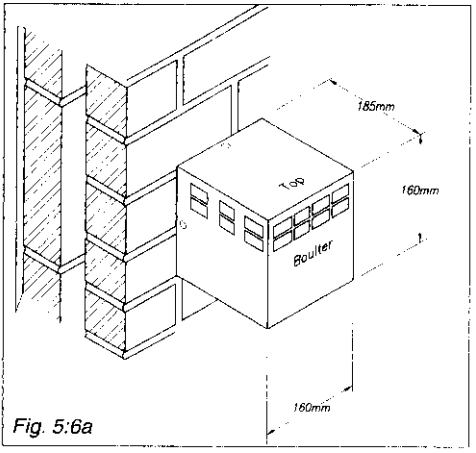


Fig. 5:6a

6:1 NOTES ON INSTALLATION

1. The Terminal must be slightly angled down to ensure correct operation of the boiler. Due to the efficiency levels of Boulter Bonus pluming from the terminals may occur under certain conditions. Any condensation may be acidic due to the fuel characteristics and it is advisable not to install the flue in any position where the condensation could cause damage to paint surfaces etc.

2. The Terminal should be sealed to the external wall using silicon sealant or other impervious material to prevent water ingress.

3. Ensure that the outlet of the Terminal points downward (TOP upper-most and Boulter correct way up).

4. Ensure that the boiler to offtake gasket is fitted (foil face upwards) and the clamp is made with four nuts and washers securely fixed.

5. Ensure that the 'Sealing Rings' are fitted in the correct groove. Use a mild detergent as a lubricant to ease assembly.

6. The Flue is telescopic and no cutting of the flue pipes is necessary.

7. 500mm and 1000mm flue extension kits are available. Do not exceed the maximum flue lengths recommended.

8. The flexible air duct is an integral part of the appliance and must be used on all balanced flue kits. Ensure that it is not damaged and that either end is connected via the jubilee clip provided to ensure correct boiler operation.

9. Overlap of telescopic terminal must be at least 50mm

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 engineer, preferably an OFTEC registered commissioning engineer.

If an engineer is not known Boulter Boilers 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 emissions 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.

7:3 REPORTING

It is recommended that you use a report sheet and check list. 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.

IMPORTANT

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

7:4 BOULTER BOILERS RECOMMENDED COMMISSIONING CHECK LIST - SHEET 1 OF 2

Customer.....
Site Address.....
.....

Appliance Model.....
Serial No.....
Fuel.....

Tick off each item

OIL TANK

❒ 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 metre 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 indepentant 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?

❒ Is the oil supply clean and free of water or other contamination?

❒ 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 line 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 the suction line? (or a 3K Oil Deaerator).

❒ Does the return oil line terminate in the take at the same level as the suction outlet?

❒ Has an anti-syphon cut been made in the return oil line (inside the tank)?

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?

7:4 BOULTER BOILERS RECOMMENDED COMMISSIONING CHECK LIST - SHEET 2 OF 2

BURNER

❒ 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.

FLUE AND CHIMNEY

❒ Is the flue adequately sized for the appliance rating?

❒ Is the flue free of any obstruction?

❒ Has the chimney been adequately lined and insulated?

NOTE:- Lining the flue and back filling will help prevent condensate problems

BALANCED FLUE APPLIANCES

❒ Is the correct flue kit fitted?

❒ Is the Flue off take correctly secured to the boiler by four nuts and washers. Is the gasket provided fitted correctly?

❒ Can leakage from flues tubes or air ducts occur? All seals fitted correctly?

❒ Is the sampling test point (on high level or vertical kits) resealed?

VENTILATION

CONVENTIONAL FLUED BOILERS

❒ Is the ventilation opening from the outside to the boiler room adequate?

❒ Is there sufficient clearance for air entry to the boiler?

❒ Will any ventilation fans prevent adequate supply of combustion air?

❒ Is the CF adaptor fitted correctly to the boiler with all nuts and gaskets?

❒ Is the sampling test point resealed?

ELECTRICAL POWER SUPPLY

❒ Is the electrical supply to the appliance appropriate?

❒ 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 accorandance with manufacturers instructions?

7:5 BOULTER BOILERS RECOMMENDED COMMISSIONING TESTS

❒ Have the manufacturers on-site assembly instructions been followed?

COMMISSIONING TESTS

❒ BEFORE ATTEMPTING TO START THE BOILER PLEASE THOROUGHLY CHECK ALL ITEMS ON THE COMMISSIONING CHECK LIST. THIS WILL HELP TO AVOID 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, see fig. 1.

❒ Switch on the electrical supply to the boiler, checking that programmers 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.

If the burner locks out during the ignition attempt, wait 45 seconds before pressing the reset button on the control box. Several attempts on first firing may be necessary.

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

❒ CARRY OUT COMBUSTION CHECKS BY INSERTING PROBES INTO SAMPLING POINTS PROVIDED:

Low level balanced flue, rear or side - end of terminal.

Conventional flue - hole provided via screw in vertical offtake section.

❒ Check the Smoke No., if clean wait 10 minutes and measure CO_2.

❒ Adjust the air shutter if necessary, open to reduce CO_2, close to increase CO_2.

If the air 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. Reinstate components and press lockout button.

❒ Check the operation of the limit thermostat

❒ Complete commissioning report and enter the details on to the guarantee form which should be returned to BOULTER BOILERS in the envelope provided.

❒ Instruct the user on the operation of the appliance and leave this manual with the customer.

A boiler fired with Class C Oil should only require attentions once each 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 date, i.e. CO2, Smoke No. and flue gas temperature, and a check on the oil pressure, prior to carrying out maintenance work.

8:1.2 Maintenance Procedure

Switch off electrical supply at the MAINS ISOLATING SWITCH.

OIL TANK

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

Check the correct grade of oil is being used.

FILTERS

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

BURNER

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 discolouration. Use only replacement flexible oil hoses that are detailed in the spare parts section of this manual.

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.

Inspect flue and air ducts for deterioration of seals, and repair if necessary. Re-lubricate with a mild detergent when refitting.

Refit parts and inspect seals etc. which should be replaced if required.

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 the Smoke No., if clean wait 10 minutes and measure CO_2.

Adjust the air shutter (see fig 8.2a), if necessary, open to reduce CO_2, close to increase CO_2.

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.

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 a copy, retaining a copy for your records.

8:2 AIR SHUTTER ADJUSTMENT

The Burner has a fixed Air Shutter with manual adjustment.

To adjust the CO_2 at the Air Shutter use a 3mm allen key as shown. To increase the setting turn the airshutter clockwise (+) and to decrease turn anti-clockwise (-).

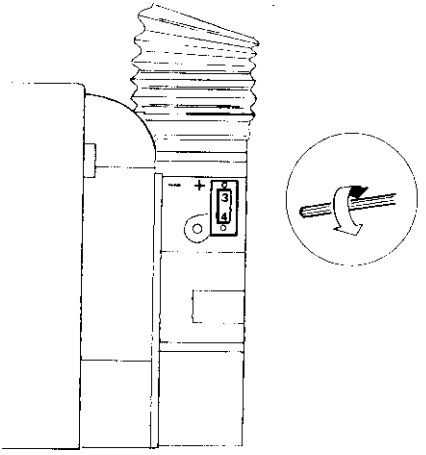
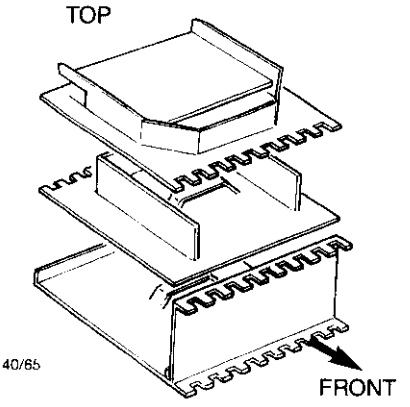
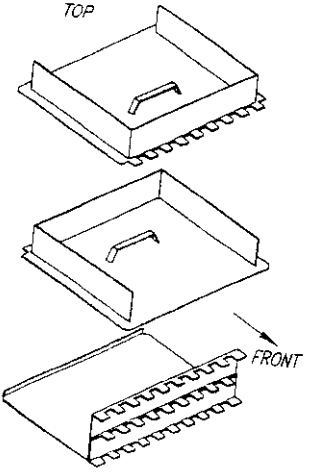


Fig. 8:2a Air Shutter Adjustment

8:3 BAFFLE ARRANGEMENT



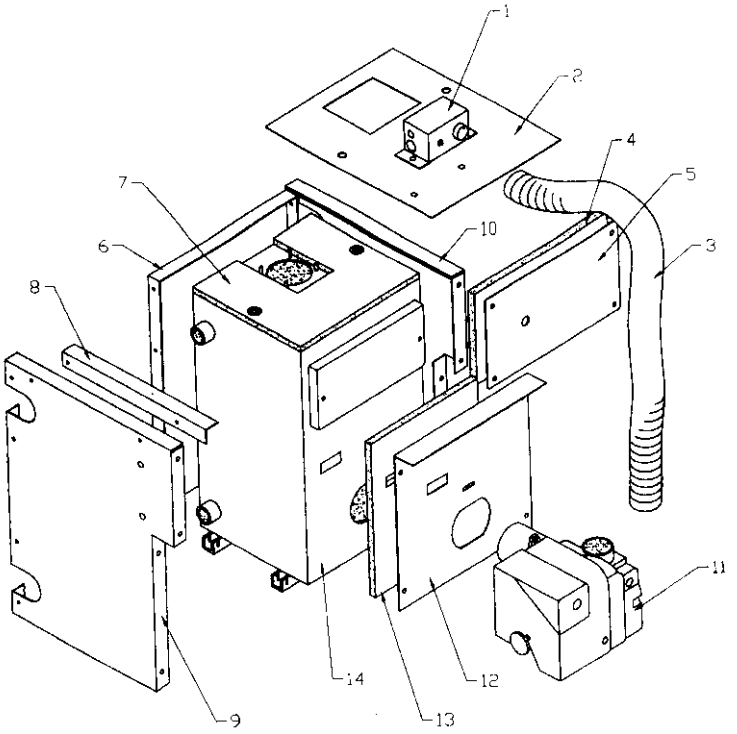


65/90A

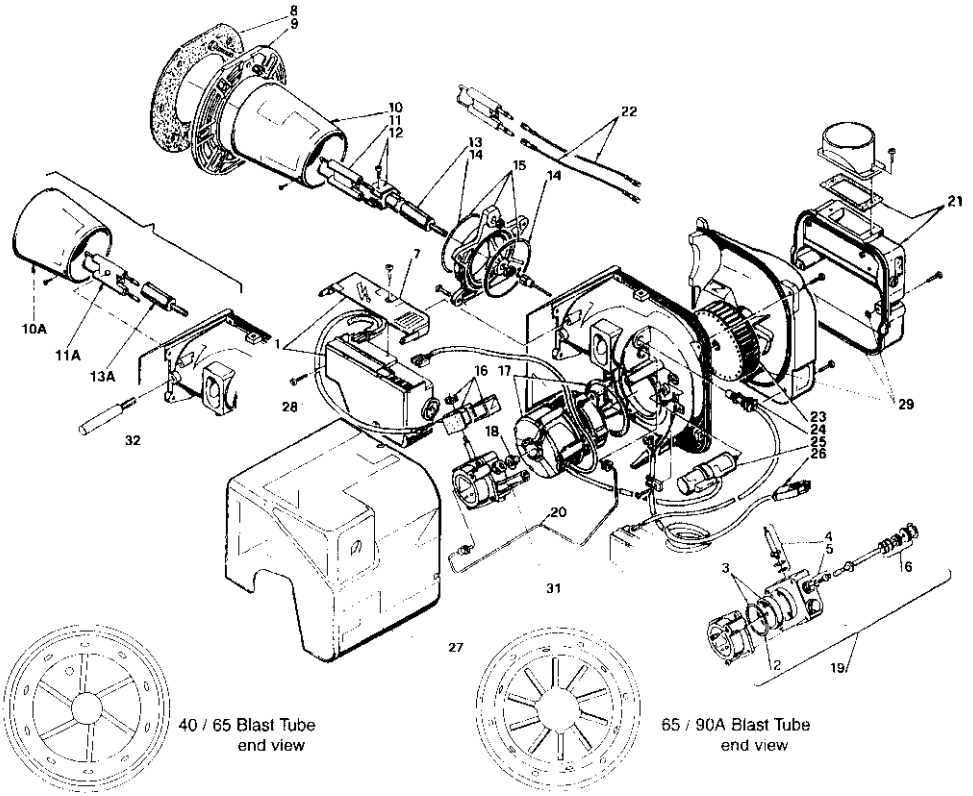
To ensure correct placement of baffles ensure that:

1. All baffles are horizontal
2. All baffle handles are in the forward position.

Fig. 8.3a Baffle Arrangement



Item	Description	Part Number	
1	Control Panel (Complete)	PN52150C	
2	Top Panel	PN52206	
3	Burner Hose	RP52001	
4	Inspection Cover Insulation	IN47216	
5	Inspection Door Panel	PN52209	
6	Back Panel	PN52202	
7	Top Insulation	IN49210	
8	Top Support	PN52208	
9	LHS Panel	PN52203	
10	RHS Panel	PN52204	
11	Burner (484 T50)		
12	Burner Door Panel	PN52205	
13	Front Face Insulation	IN49212	
14	Bonus Heat Exchanger (40/65)	HE52101C	
14	Bonus Heat Exchanger (65/90A)	HE52201C	
15	Ranco Control Stat	EL00230	Not Shown
16	Ranco 110° Limit Stat	EL00215	Not Shown



40 / 65 Blast Tube end view

65 / 90A Blast Tube end view

Item	Part No.	Description
1	3008652	Control Box 535RSE/LD
2	3007162	O Ring
3	3008653	Filter O Ring
4	3007582	Needle Valve
5	3008651	Regulator
6	3000439	Pump Seal
7	3008649	Protection Cover
8	3005787	Gasket
9	3006384	Flange
10	3008768	Blast Tube
10A	3008859	Blast Tube (484T50)
11	3007513	Electrode Assembly
11A	3008860	Electrode Assembly (484T50)
12	3006552	Electrode Bracket
13	3008642	Nozzle Holder
13A	3008861	Nozzle Holder (484T50)
14	3007178	O Ring
15	3008543	Collar (Includes O Rings)
15A	3008862	Collar (484T50)

Item	Part No.	Description
16	3008648	Coil
17	3008650	Motor
18	3000443	Joint
19	3008654	Pump
20	3008644	Tube
21	3008647	Air Damper Assembly
22	3008794	High Voltage Lead
23	3005708	Fan
24	3008646	Photo Electric Cell
25	3007479	Capacitor 4µF
26	3008863	Burner Lead
27	3008879	Burner Cover
28	3008877	Solenoid Lead
29	3008878	Air Box Seal } KIT
29	3008878	Fan Box Seal } KIT
29	3008878	O Ring Seal } KIT
31	3008876	Pressure Gauge Extension
32	3008875	Electrode Clamp (484T50)
33		

10:1 FAULT FINDING

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

1. Is there sufficient fuel in the storage tank?
2. Are all fuel supply valves open (turned fully anti-clockwise) and ball valves open?
3. Is the mains electricity supply switched on?
4. Is the programmer (or Boiler Operating Switch) set to call for heat?
5. Is the Boiler Thermostat set to the desired temperature?
6. Is the Lock-out Reset Button on the Control Box and Control Panel Neon illuminated? If so, press to reset Burner.
7. 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

	Trouble or Complaint	*Possible Cause*	*Action*
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, not is 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 for 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 contacts are 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.
3.	Burner lights up but locks out after 15 seconds	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 of 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 mis-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 of 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).
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; for leaks on oil line and flexible.
	Magnetic valve not operating correctly	Inspecting and replace if necessary.
	Shut off piston in pump sticking	Replace pump.
7. Burner Pulsates (a) continuously	Air shutter setting incorrect or fan inlet blocked	Inspect and reset or remove blockage.
	Grossly oversized nozzle	Checked and replace with correct size and type (see Technical Data)
	Air supply inadequate	Check fan operation and cleanliness.

7. Burner pulsates (a) continuously	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 in 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 CO_2	Check combustion readings, reset air.
	Low efficiency due to high flue gas temperature	Clean heat exchanger surfaces
	Faulty boilerstat. Partially blocked filter	Replace, check and clean.
11. Poor combustion readings	Low CO_2	Check: CO_2, oil pressure, nozzle size (see Technical Data
	High CO_2	Check: CO_2, oil pressure, nozzle size (see Technical Data
	High smoke	Check: CO_2, 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 damper on burner improperly adjusted or faulty nozzle or unsatisfactory draught conditions or fault in oil supply	Set up burner as for commissioning using oil pressure gauge, smoke pump, CO_2 indicator and draught gauge, adjust settings as necessary, replace nozzle if necessary. See Commissioning Check List and Servicing Notes.

Boulter Bonus

BOULTER BOILERS

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