

NXR3

Installation, Operation & Maintenance Manual



February 2008

POTTERTON
COMMERCIAL

heating specialists

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Fig. 1 – General Data and Dimensions

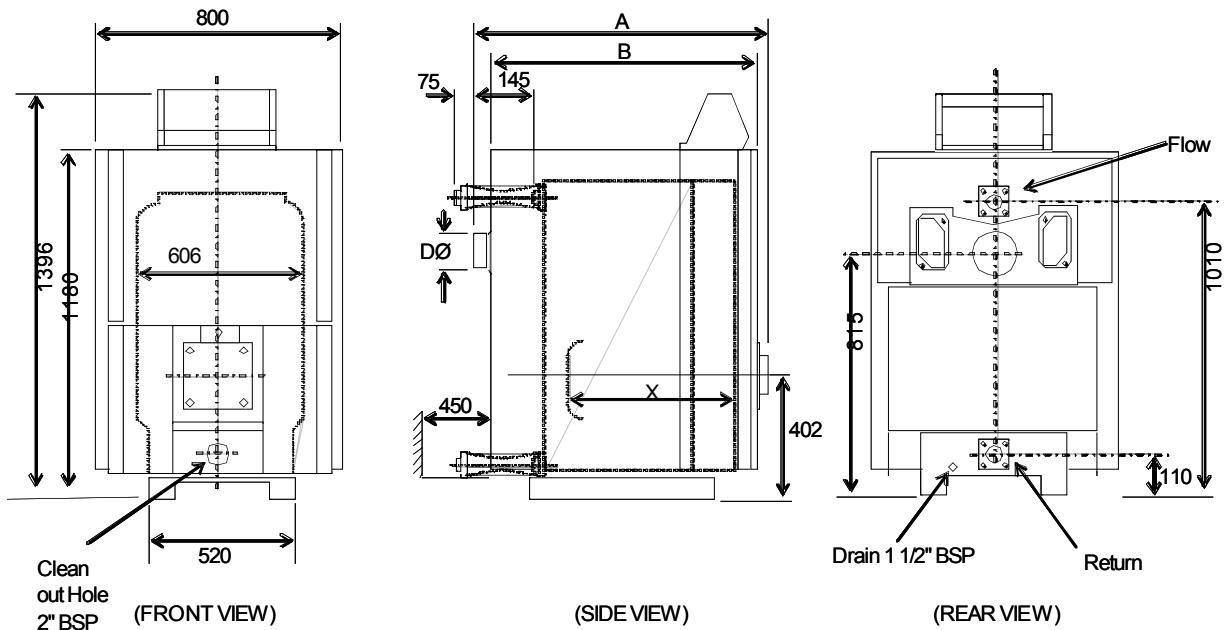


Table 1 – Boiler Dimensions

NXR3	Model	34	35	36	37	38	39	
A	mm	995	1165	1335	1505	1675	1845	
B	mm	900	1070	1240	1410	1580	1750	
∅ D	mm	180				200		
Water Connections	F&R	2½" BSP Screwed Flanges (PN6)						

Table 2 – Combustion Chamber Data

Model		34	35	36	37	38	39	
Mean Diameter	mm	474						
Cross Sectional Area	m ²	0.176						
Length (X)	mm	625	795	965	1135	1305	1475	
Volume	m ³	0.11	0.14	0.17	0.2	0.23	0.26	
Surface Area	m ²	1.11	1.36	1.61	1.87	2.12	2.37	
Resistance	mbar	0.25	0.54	0.95	1.32	2	2.52	
Flue Gas Temperature (Gross)	°C	170			160			
Percentage CO ₂	OIL	13						
	GAS	9.5						

Table 3 – Technical Data

Model	NXR	34	35	36	37	38	39	
Number of Sections		4	5	6	7	8	9	
CE Number		0085AQ0751						
Output	kW	90	130	170	210	250	290	
1 Fuel Consumption	GAS	m ³ /hr	10.04	14.5	18.95	23.51	28.06	32.62
	OIL	Lit/hr	9.97	14.39	18.8	23.33	27.84	32.37
Input (Gross)	GAS	kW	107.7	155.5	203.2	252.1	300.9	349.8
	OIL	kW						
Input (Net)	GAS	kW	97	140	183	227	271	315
	OIL	kW						
Maximum Design Pressure	Bar	6 BAR – ALL MODELS						
2 Minimum Operating Pressure	Bar	1 BAR – ALL MODELS						
3 Nominal Flue Connection Size	mm	180 mm Ø				200mm Ø		
4 Flue Gas Volume	GAS	m ³ /hr	126	182	237	294	351	409
	OIL	m ³ /hr						
Flue Draught Requirements		0-4 mm.w.g. – ALL MODELS						
5 High Level Natural Ventilation to BS 6644	cm ²	194	280	366	454	542	630	
5 Low Level Natural Ventilation to BS 6644	cm ²	388	560	732	908	1084	1260	
6 Mechanical Inlet to BS 6644	m ³ /sec	0.075	0.108	0.142	0.176	0.210	0.245	
7 Water Connection Size (Flow & Return)		2 ½" BSP Screwed Flanges – ALL MODELS						
8 Water Flow at 11°C Δt	lit/sec	1.95	2.81	3.68	4.55	5.41	6.28	
Min water flow at 20°C Δt	lit/sec	1.07	1.55	2.02	2.5	2.98	3.45	
8 Hydraulic resistance at 11°C Δt	kPa	0.9	1.7	2.8	3.9	5.8	9.3	
9 Cold feed size to BS 6644 Minimum Bore	mm	25		32				
9 Open Vent size to BS 6644 Minimum Bore	mm	32		40				
9 Safety Valve Size to BS 6644 Nominal Bore	mm	19					25	
Maximum Flow Temperature	°C	90°C – ALL MODELS						
10 Minimum Return Temperature (Direct Compensation)	°C	55°C – ALL MODELS						
Limit Thermostat Setting	°C	110°C – ALL MODELS						
11 Dry Weight	Kg	612	730	848	966	1068	1184	
Water Content	kg	112	136	160	184	208	232	
Power Requirements (Boiler Control Circuit)		230V 1Ph 50Hz, Fused 6.3A – ALL MODELS						
12 Natural Gas Supply Pressure	Max	25 mbar						
	Min	17.0 mbar						
35 Second Oil Supply Pressure	Max	0.69 mbar						
	Min	0 bar						

See page 3 for explanatory notes

Conversion table on inside back cover.

1. **FUEL CONSUMPTION**

Gas fuel consumption is based on natural gas with a gross calorific value of 38.6 MJ/m³. The gas rate should be corrected for the meter supply pressure particularly on high pressure supplies to prevent overfiring.

Fuel oil consumption is based on Class D (35 second) gas oil with a calorific value of 58.24 MJ/lit and a density of 0.855 kg/lit, Kerosene (Class C2) has a calorific value of 53.22 MJ/lit and a density of 0.795 kg/lit.

2. **MINIMUM OPERATING PRESSURE**

This is the minimum operating pressure of the boilers with pumps operating (NOT static pressure). The requirements of the Health & Safety Executive guidance note PM5 regarding maximum operating temperatures should be observed.

3. **BOILER FLUE CONNECTION**

This is the nominal flue size of the flue connection spigot, for dimensional details of the flue connection spigot see Fig. 1. Actual flue size required to achieve correct draught and operation under all running conditions may need to be increased.

4. **FLUE GAS VOLUME**

Flue gas volumes are given at STP (standard temperature and pressure [15°C and 1013.25 mbar]). Typical flue gas temperatures are given in Table 2.

5. **NATURAL VENTILATION**

The sizes indicated are free grille areas and are based on a single boiler installation.

6. **MECHANICAL VENTILATION**

The volume given is for a single boiler installation.

7. **CONNECTION SIZES**

The boiler water connections are 2 ½" BSP screwed flange PN6. Also supplied 2 ½" welded flanges.

8. **WATER FLOW RATES**

Water flow rates are given for boiler flow and return water temperature differences of 11°C.

9. **COLD FEED/ OPEN VENT/ SAFETY VALVE SIZES**

Sizes indicated are minimum sizes for single boiler installations.

10. **MINIMUM RETURN TEMPERATURE**

If system return temperatures below 55°C are required the contact the Potterton Commercial Technical Department.

11. **WEIGHT**

The dry weight is exclusive of the burner and gas train. Each section measures approximately 1100mm (high) × 606mm (wide) × 180mm (deep) and weighs 106kg (inter), 110kg (front), 125kg (rear).

ANY PERSON OR PERSONS MOVING OR LIFTING SHOULD BE TRAINED IN MANUAL HANDLING TECHNIQUES AND IF NECESSARY USE SUITABLE LIFTING EQUIPMENT TO REDUCE THE RISK OF INJURY TO THEMSELVES OR OTHER PEOPLE.

12. Some burners may require higher than 17.0 mbar inlet pressure, please see relevant burner card for details, or contact the Commercial Technical Office.

CLEARANCES

The minimum boiler room clearances for access, erection and maintenance are given in Fig. 2 and Fig. 3, the dimensions are minimum values. There is no minimum clearance above the boiler, however, it is recommended that clearance is left above the top of the instrument panel to facilitate its removal. At the front of the boiler allow as a minimum the A dimension, this is to allow access to the combustion chamber for maintenance and servicing. For P dimension please refer to relevant burner card.

Fig. 2 – Boiler Clearances

Minimum Clearance(Front)						
Model	Nu-Way Oil	Nu-Way Gas	Riello Oil	Riello gas	EOGB Oil	EOGB Gas
	A (mm)	A (mm)	A (mm)	A (mm)	A (mm)	A (mm)
34	900	900	900	900	900	972
35	1070	1070	1070	1070	1070	1070
36	1240	1240	1240	1240	1240	1240
37	1410	1410	1410	1410	1410	1410
38	1580	1580	1580	1580	1580	1580
39	1750	1750	1750	1750	1750	1750

No special plinth is required for this boiler, a simple dry base is sufficient. Boiler footprint and base clearance details are given in Fig. 3.

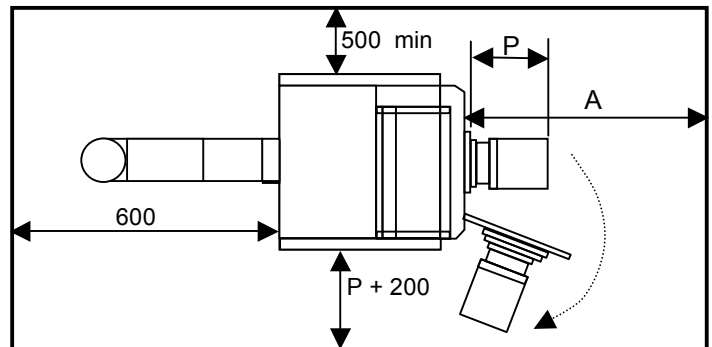
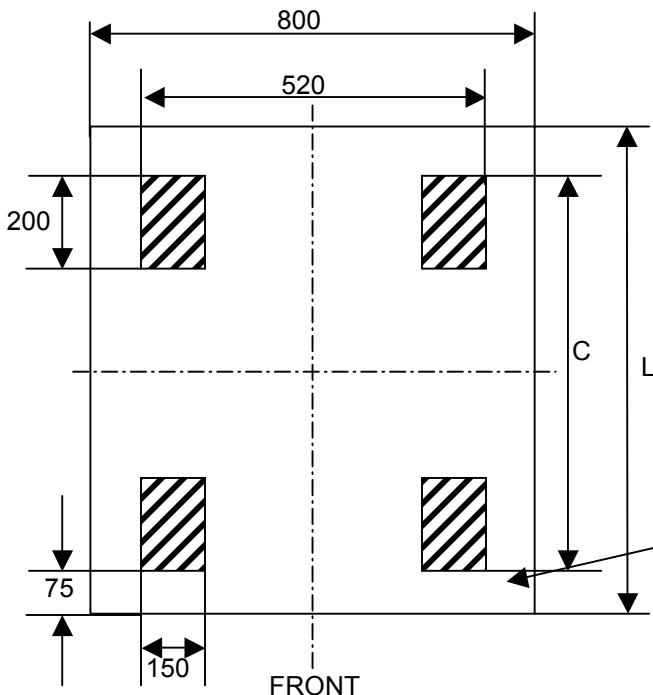


Fig. 3 – Boiler Footprint/Base Details



Boiler Size	34	35	36	37	38	39
C	750	920	1090	1260	1430	1600
L	900	1070	1240	1410	1580	1750

Provision must be made to allow free movement of the boiler on its base.

Flat Plate – 6 mm thick
 (Not supplied by Potterton)

GENERAL

This boiler is **NOT SUITABLE** for installation in a normally occupied area (i.e. kitchen).

A **LIFETIME GUARANTEE** is available on this boiler please refer to our standard terms and conditions for details.

The Potterton NXR3 is a cast iron sectional boiler available in outputs from 90kW (4-section model) to 290kW (9-section model). The heat transfer surfaces of the NXR3 have been specially designed to maximise the boiler efficiency and the large combustion chamber capacity ensures environmentally sound combustion reducing CO and NOx emissions. Specially designed and prewired control panels allow full boiler control and flow and return manifolds have facilities to fit sensor pockets for boiler management systems.

The NXR3 is suitable for running at variable low temperatures under direct compensated control.

The boiler has match tested package burners, available for Natural Gas, LPG, 35 Second & 28 Second Oil. Dual Fuel options are also available.

The NXR3 is suitable for use on fully pumped open vented systems or a sealed system with a maximum design pressure of 6-bar (87 p.s.i.) and a minimum of 1-bar (14.5 p.s.i.).

The NXR3 boiler is of the overpressure type with 5-pass reverse flame design. The first two passes are in the combustion chamber with the other three in the convection tubes where the turbulence to achieve high heat transfer is generated by the extended surface area achieving efficiencies of 93% (net), 84% (gross).

The NXR3 is constructed with BS1452 Grade 220 cast iron heat exchanger, constructed in accordance with EN303.1. The boiler package meets gas and oil requirements of M&E36 and the burners EN676.

The waterway sections are joined by cast taper nipples and secured with tie rods. The combustion chamber joints are sealed by heat resistant cord.

The powder coated mild steel casings have a 50mm fibre insulation in the casing plus a 50mm fibre wrap around the castings, thus reducing fuel consumption and emissions.

The NXR3 is supplied unassembled, assembly tools are provided and a list of the tools is given in Section 4.

STANDARD SUPPLY

- Unassembled cast iron sections (number dependent on boiler output).
- Smoke box, optimising baffles, flueway door, combustion chamber door, burner adaptor plate, flanged flow and return connections.
- Boiler wrap round insulation
- Insulated casing
- Cleaning brush
- Flow manifold complete with sensor pocket, 3/4" screw socket and plug
- Eco control panel

CONTROLS

The NXR3 range is supplied as standard with an integral control panel which is fitted with hours run meters, flue thermometer, on/off, control and high/low thermostats, limit thermostat, water thermostat, reset button, high temperature warning light, mains on/off light and fuse. Two volt free remote status contacts and two hours run meters are included.

OPTIONAL EXTRAS

- 3 phase burners
- Additional volt free contacts
- Fully closing air dampers on burner
- Sequence Control Options

SHIPPING - PACKAGING

The boiler package is delivered unassembled on two pallets with the burner separately either in a carton or on a pallet.

Pallet 1

Unassembled sections and door.

Pallet 2

Casing pack, boiler accessories, boiler fittings, tie rods, baffles, flow and return turrets, control panel.

See Section 7 for breakdown of contents.

It is recommended that Potterton Commercial Division's trained engineers should carry out erection and commissioning, as this will make valid the LIFETIME GUARANTEE. See back page of this manual for service office addresses

INSTALLATION

Before starting work a risk assessment should be carried out in the boiler house and its access to determine and ensure a safe installation and working environment.

Any person installing or working on the boiler must be qualified and competent, and in the case of gas fired boilers attention is drawn to the mandatory requirement of C.O.R.G.I registration and relevant ACS qualifications, they must also be electrically competent and adhere to the IEE regulations.

Manual Handling – Any person or persons moving or lifting the boiler or any part of it, should be trained in manual handling techniques and if necessary use suitable lifting equipment to reduce the risk of injury to themselves or other people.

The installation should comply with relevant British Standard specifications, codes of practice and current building regulations, together with any special regional requirements of the local authorities, gas undertaking and insurance company. All electrical wiring must comply with the IEE regulations for the Electrical Equipment of Buildings.

The installation of the boiler must be in accordance with the relevant requirements of: -

- Health & Safety at Work Act 1974
- Building Regulations 2006
- Electricity at Work Regulations 1989
- Management of H&S at Work Regulations 1992
- Manual Handling Regulations 1992
- Model Water Bye-Laws 1986
- BS 7671: 1992 – Requirements for Electrical Installations, IEE Wiring Regulations 16th Edition
- BS 6644: 2005 – Installation of Gas Fired Hot Water Boilers for Inputs between 60kW and 2MW
- BS 7074: 1989 – Part 2 – Application, Selection & Installation of Expansion Vessels & Ancillary Equipment for Sealed Water Systems
- BS 6880: 1988 – Code of Practice for Low Temperature Hot water Systems
- BS 779: 1989 – Cast Iron Boilers for Central Heating & Indirect Hot Water Supply (Rated Output 44kW and Above)
- CP342.2 – Centralised Hot Water Supply
- Gas Safety (Installation & Use) Regulations 2002
- IM/11 Flues for Commercial & Industrial Gas Fired Boilers & Air Heaters
- IGE/UP/1 – Soundness Testing & Purging Procedure for Non-domestic Installations
- IGE/UP/2 – Gas Installation Pipework, Boosters & Compressors for Industrial & Commercial Premises

- BS EN 303.1 & 303

Manufacturers notes must not be taken in any way as overriding statutory obligations.

BOILER SITING & BASE

The boiler should be sited in accordance with BS 6644: 2005. This includes considerations for protecting the boiler from damage, air for combustion, clearances for service and access, temperatures, noise levels, the disposal of boiler water and the effects of flooding of the boiler house or seepage from a roof top boilerhouse. See Fig. 3 for required boiler clearances for service and access.

A level non-combustible floor capable of supporting the weight of the boiler filled with water, see Table 3, together with any additional weight bearing down on the base from connections, burner, etc, must be provided. This should be of an adequate height above the floor so as to be raised in case of flooding, but also low enough to allow ease of erection. Typically a 50mm concrete plinth with an area equal to that of the plan of the boiler is adequate in most cases.

For certain special installations a sound proof plinth may be necessary and a metal plinth resting on anti-vibration pads is recommended in these instances.

Consideration should also be given to fitting steel strips beneath the boiler feet for boiler base protection, see Fig. 3 for base details.

The boiler has a water-cooled base and no special insulation is required. When preparing a site, reference should be made to Local Authorities and Building regulations 2006.

L.P.G boilers should not be installed in basements/below ground or in a well.

VENTILATION

Safe, efficient and trouble free operation of conventionally flued boilers is vitally dependent on the provision of an adequate supply of fresh air to the room in which the appliance is installed. Account must also be taken of any other fuel burning appliance existing or to be fitted when designing the ventilation and combustion air systems.

IMPORTANT: The use of an extractor fan in the same room as the boiler (or in an adjacent room in communication) can, in certain conditions, adversely affect the safe operation of the boiler and therefore must be avoided.

Further guidance on ventilation for gas appliances is provided by BS 6644: 2005. For oil see relevant Standard.

FLUE

To ensure safe and satisfactory operation the chimney system, which may be individual or common in the case of modular boiler installations, shall be capable of the complete evacuation of combustion products at all times. The effective height of the chimney terminal(s) above the boiler(s) flue outlet(s) shall ensure sufficient buoyancy to overcome the resistance of the bends, tees and runs of the flue pipe involved and shall terminate in a down draught free zone. The number of bends used should be kept to a minimum and runs of flue pipe less than 45° to the horizontal should be avoided in order to comply with the recommendations made in BS 6644: 2005 and British Gas publication IM/11 "Flues for Commercial and Industrial Gas Fired Boilers and Air Heaters". The third edition of the 1956 Clean Air Act Memorandum and the Building Regulations should be strictly observed and approval obtained where applicable, combustion chamber details are given in section 1.

The flue system must be designed to work specifically to remove the products of combustion.

IMPORTANT: 90° square bends must not be used on the flue system, including the boiler flue spigot, a straight length followed by an "easy sweep" or lobster back bend should be used.

FLUE SIZE CONSIDERATIONS

Nominal flue connection sizes are given in Table 3, these sizes refer to the boiler flue connection spigot.

The actual size of the flue system will depend on individual site applications. Below are general considerations on sizing flue systems.

Horizontal Flue Runs

Horizontal flue runs are not recommended particularly over 3m in length, where these are unavoidable advice should be sought from a flue system specialist.

Common Flue Systems

Where multiple boilers are installed on a common flue system then the flue system should be designed to ensure the correct operation of the flue on varying load conditions. In particular that the appliance flue draught is within the operating parameter under full load and partial load conditions. For safe and reliable operation of the boiler plant it is recommended that the variance in flue draught available at each appliance under full and part load operation is designed to a minimum.

(It is essential that the services of a specialist flue system manufacturer are sought for the design of common flue systems).

For further information regarding ventilation and flueing see relevant British Standard publication BS6644: 2005.

THE ABOVE RECOMMENDATIONS ARE FOR GENERAL GUIDANCE ONLY. POTTERTON COMMERCIAL DIVISION CANNOT ACCEPT RESPONSIBILITY FOR FLUE SYSTEM DESIGNS BASED ON THE ABOVE RECOMMENDATIONS.

WATER CIRCULATION SYSTEMS

The water circulation system should be indirect and installed in accordance with the relevant parts of British Standards Codes of Practice CP342.2 and BS 6644: 2005.

The maximum and minimum design temperature differential across the boiler should be 20°C and 10°C and the boiler should be prevented from operating with flow rates giving a temperature difference across the boiler greater than 25°C based on the full boiler output.

Boilers operating under constant flow conditions can be more accurately controlled and are not subject to excessive temperature stresses.

The boilers **MUST NOT** be fired under any circumstances with less than the minimum water flow.

On systems with variable flow rates due to flow reducing devices, ie. TRVs, zone valves, etc, or where the minimum heat demand, ie. summer domestic hot water load, does not achieve the minimum boiler flow rate then consideration shall be given to incorporating a primary loop system.

It is recommended that the system is designed to give a constant boiler flow rate.

BOILER PROTECTION

The provision of pump overrun by a time delay relay or a thermostat situated in the flow pipe close to the boiler is essential to remove residual heat from the boiler, see Fig. 21, section 6.

Unions and isolating valves should be fitted to the flow and return manifolds so that the boiler can be isolated from the system if the need arises. Your legal obligations must be adhered to. (i.e. appropriate safety valves must be fitted).

SYSTEM WATER QUALITY

High efficiency boiler systems require the water quality of the system water to be controlled by the use of inhibitors to maintain a neutral Ph and inhibit corrosion. Additionally the water system should be free of leaks to prevent raw water make up which will dilute any inhibitors, promote corrosion and form lime scale.

Existing Systems

On existing systems where boilers are being replaced due to failure then the cause should be investigated before installing new boilers. This can normally be achieved by cutting open a failed boiler section and examination for system debris or contamination.

Lime scale is a positive indicator of continuous system water make up due to water loss. Evidence of magnetite (black sludge) in the system and the formation of gas in radiators causing air locking is a positive indicator of corrosion.

Where an old system shows evidence of contamination then system cleaning should be carried out before installation of new boilers. The heating system should be chemically flushed to remove any lime scale or corrosion and a corrosion and lime scale inhibitor added. Lime scale descalers if incorrectly

used could cause any remaining system debris to continue to breakdown and contaminate the new boiler causing boiler failure.

Advice on system cleaning and suitable products should be sought from specialist suppliers of system cleaners such as Fernox or Sentinel.

It is important to note that corrosion inhibitor can only be used in an attempt to prevent corrosion from occurring, where a system has an existing corrosion problem, inhibitors will be ineffective and the system requires cleaning.

On existing systems where comprehensive descaling and desludging cannot be carried out then consideration should be given to separating the new boiler system from the existing system pipe work by the use of plate heat exchangers.

New Systems

New pipe work systems should be thoroughly flushed with a suitable cleaning agent to remove debris and flux residues before filling. The system water should be dosed with a suitable corrosion and lime scale inhibitor.

System Water Monitoring

The system water should be monitored as part of a maintenance programme to ensure the following:-

Raw water make up is not occurring.

Corrosion and lime scale Inhibitors are still active
Water Ph is below Ph 8.5 other wise on systems with aluminium content, component failures may occur.

SEALED SYSTEMS

General

Potterton Commercial boilers are suitable for use on sealed systems designed in accordance with BS 6644: 2005 and BS 6880 Part 2. In addition, reference should be made to the Health & Safety Executive guidance note PM5 "Automatically Controlled Steam & Hot Water Boilers".

BOILER ERECTION

A lifetime guarantee is available on this boiler when erection and commissioning is carried out by the Potterton Commercial service department and the system meets with our recommendations. Please refer to our standard terms and conditions for further details.

Risk Assessment

Before starting work a risk assessment should be carried out on the boiler house and its access to determine and ensure a safe installation and working environment.

Regardless of the type of activity being assessed, the principles of risk assessments are the same. The basic steps are: -

- Classify Activity
- Identify Hazards
- Identify Existing Control Measures
- Determine Risk
- Assess Acceptability of Risk
- Prepare a Control Plan
- Implement Plan
- Review Plan
- Record Results

Manual Handling

Any person or persons moving or lifting the boiler or any part of the boiler, should be trained in manual handling techniques and if necessary use suitable lifting equipment to reduce the risk of injury to themselves and other people.

Personal Protective Equipment

When undertaking any work you must comply with the Personal Protective Equipment Regulations 1992.

Confined Spaces

A "confined space" as defined in the Health & Safety Confined Spaces Regulations 1997 ' means any place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well or other similar space in which, by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk.

Precautions should be taken in all areas where by virtue of its even partially enclosed nature, pose a reasonably foreseeable specified risk.

Electrical Safety

Working on appliances can be broken down into two main systems of work.

- 1) Safe systems of work are adapted for all boiler maintenance and repair work undertaken on site.
- 2) The work undertaken does not affect the electrical safety of the appliance. In particular the earth connected to the buildings fixed electrical installation.

In the case of (1) above electrical work should only be undertaken once the boiler has been isolated from the electricity supply and confirmed electrically dead. If this is impractical then suitable precautions must be undertaken to prevent injury.

In the case of (2) above checks are specified to identify any abnormality in the electricity supply to the boiler as well as to confirm that the boiler electrical connections are reinstated correctly where it is necessary to disconnect or reconnect any internal wiring within the boiler.

If it is necessary to disconnect and reconnect the appliance from the site electrical installation other than means of a plug and socket then additional checks shall be undertaken by an approved engineer to check the earth loop impedance in accordance with IEE regulations.

Always carry out preliminary electrical safety checks.

All appliances and central heating systems must be provided with their own means of isolation for safety purposes especially during installation and maintenance.

Packaging Details

A detailed breakdown of the contents of the packages is given in section 7.

Preparation

Preparatory to installation of the boiler a check must be made to ensure that suitable facilities are available for off-loading of the individual waterway sections and conveying them to the boiler room. Each waterway section weighs approximately 110 kg and measures 1100mm x 606mm x 180mm. Ensure all manual handling techniques are followed.

Particular attention must be paid to ensuring cleanliness of the boiler room and waterway sections, dust or moisture may result in imperfect adhesion of the sealants which are applied during the erection of the waterways. All tapped holes should be degreased before making connections.

C.O.S.H.H

During the erection procedure there are a number of items which are subject to the Control Of Substances Hazardous to Health (C.O.S.H.H) Regulations, and may require specialist personal protective equipment (P.P.E) beyond what is normally required. Listed below are the items subject to the C.O.S.H.H regulations and the recommended precautions that should be taken. For a full breakdown of any substances listed below, please contact the Commercial Technical Department.

1. **Refractory Ceramic Fibre Insulation Block** – Wear gloves, overalls and safety glasses. In the case of an irritation rinse the affected area with water and wash gently. In the case of eye contact, flush abundantly with water. If irritation persists seek medical advice.
2. **Refractory Ceramic Fibre Insulation Blanket** – Wear gloves, overalls and safety glasses. In the case of an irritation rinse the affected area with water and wash gently. In the case of eye contact, flush abundantly with water. If irritation persists seek medical advice.
3. **Nipple Sealing Paste** – Wear gloves and overalls. In the case of an irritation rinse the affected area with water and wash gently. In the case of eye contact, flush abundantly with water. If irritation persists seek medical advice.
4. **Sealing Rope** - Wear gloves and overalls. In the case of an irritation rinse the affected area with water and wash gently. In the case of eye contact, flush abundantly with water. If irritation persists seek medical advice.

**Potterton Commercial Customer
Erection/Assembly Check List**

The items listed below have been put together as a guide to what actions should be completed before the erection/assembly of a boiler takes place.

- I. Site access available for persons carrying out the proposed work.
- II. Site managers/personnel aware that work will be taking place.
- III. Risk assessments carried out on possible risks that may effect the persons carrying out the proposed work.
- IV. Sections and fittings boxes should be positioned adjacent to the plinth(s) within the boiler house prior to persons carrying out the proposed work attending site. If this is unable

to be done notice prior to attending site should be given.

- V. When boilers are to be stripped and rebuilt, labour and transport should be provided for moving the sections from the delivery point to the final erection point. If this is unable to be provided notice prior to attending site should be given.
- VI. Sections/casing, etc, should be kept in a clean and dry area prior to erection/assembly.
- VII. Water should be available.
- VIII. A drain off area should be available.
- IX. Power should be available.
- X. A site representative should be available at all times.
- XI. Clear instructions supplied to the persons carrying out the proposed work regarding positioning the boiler.
- XII. Fire evacuation procedures, facilities availability, specific health and safety information, etc, should be provided.

Items VII to X are essential if boilers require pressure testing.

BOILER ERECTION

SECTION ASSEMBLY

The boiler sections are not self-supporting until the boiler block is fully assembled. The sections are connected using a nipple system. To ensure a sound water tight fit the nipple sealing paste provided must be used. Assembly tools are provided for assembling the sections.

IMPORTANT: Ensure the boiler is adequately supported especially when pulling up sections. The Manual Handling Regulations should be followed.

Erect the Boilers as follows:-

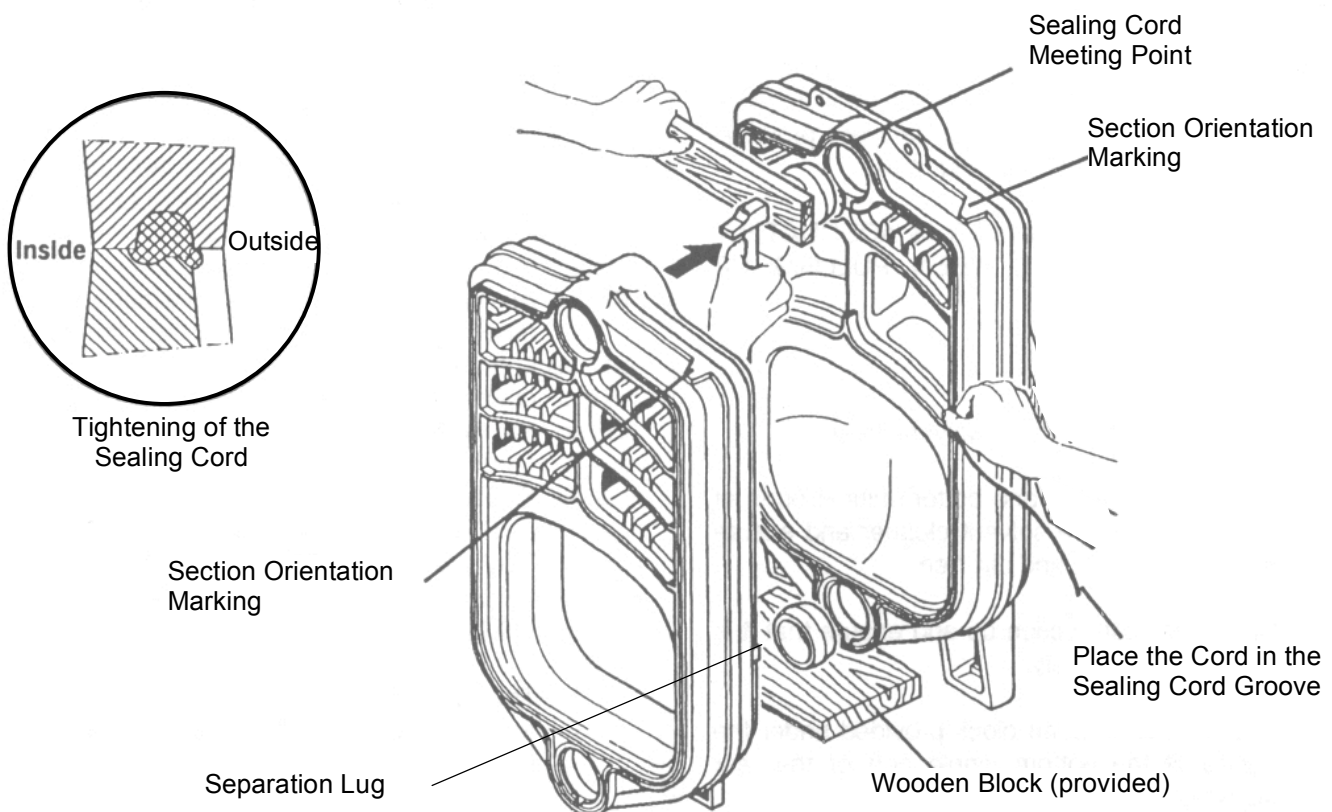
1. Open the boiler fittings box.
2. Clean the nipples using a solvent cleaner removing all traces of protective coating (not supplied), ensuring all guidelines are followed.
3. Clean both the top and bottom nipple ports of **all sections** with a solvent cleaner and ensure that they are rust free, dirt-free and burr free, if necessary clean with emery cloth.

4. Stand the rear section up and ensure that it is supported securely. Ensure correct manual handling techniques are used.
5. Position the wooden block provided under the centre of the bottom nipple port of the rear section (see Fig. 4).
6. Clean the sealing cord groove on the upright section with a solvent cleaner and a wire brush, ensuring any rust or burrs are removed.
7. Starting from the centre of the top nipple port, position the sealing cord without stretching it in the groove around the rear section. Cut to length using due care and attention.
8. Coat a nipple with the sealing paste provided and position in the top nipple port. Repeat for the bottom nipple port. Tap both nipples slightly into the nipple ports using a mallet to ensure nipples are not damaged.

Ensure that the nipples are correctly aligned as an out of line nipple can cause the section to crack when it is pulled up.

Fig. 4 – Section Assembly Showing Installation of Sealing Cord, Nipples & Final Sealing Cord Tightness

BE CAREFUL TO ASSEMBLE THE MIDDLE SECTIONS CORRECTLY



9. Ensure that the intermediate section is correctly aligned (see Fig. 4). Offer up the first intermediate section and mount onto the rear section nipples using the wooden block for support. Using a mallet alternately on the top and bottom nipple ports knock the section into place. Ensure all manual handling techniques are adhered to.

Ensure that the intermediate section is aligned parallel to the rear section.

10. Assemble the top and bottom pulling up bars (see Fig. 5 and Fig. 6) provided through the top and bottom nipple ports and pull up the sections until metal to metal contact is made in the combustion chamber and flueways.

The sections should be pulled up evenly half a turn at a time applying equal pressure to top and bottom pulling up bars. Section alignment should be checked throughout the process.

The sealing cord will be pulled up into place and protrude slightly from the joint (see Fig. 4).

11. Loosen and remove the pulling up bars.
12. Assemble the other sections (one by one) in the same way, while moving the wooden blocks alternately as you go towards the front. Ensure all manual handling techniques are adhered to.

Note: If it was necessary to dismantle one of the boiler sections, and to avoid damaging the sealing groove. It is imperative, when dismantling the sections to place a chisel on the separating lugs as shown in Fig. 4.

Note: Orientation arrow top right hand side of section (looking from front). The arrow must point towards the front of the boiler and all arrows must face the same way.

Boiler Assembly Pulling Up Bars

Assemble the pulling up bars as shown in Fig. 5 and position through the top and bottom nipple ports. Ensure that the plate and bar are positioned centrally through the boiler. Ensure that the threads and bearing surfaces are greased before and during use.

Pull up **ONLY** one section at a time.

A set of pulling up bars is provided as follows:-

- 2 bars: 1260 mm long (4-6 section)
1625 mm long (7-8 section)
1800 mm long (9 section).
- 4 plates
- 4 small washers
- 4 large washers
- 2 short nuts
- 2 long nuts

Fig.5 – Section Orientation

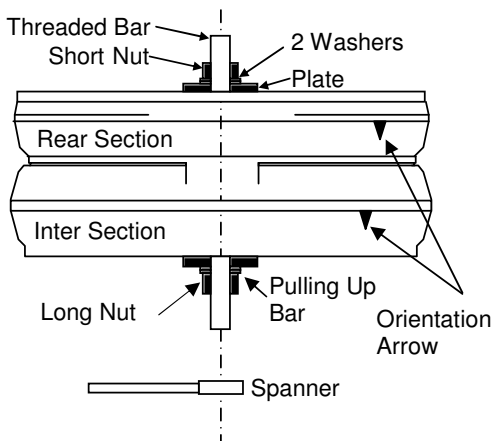
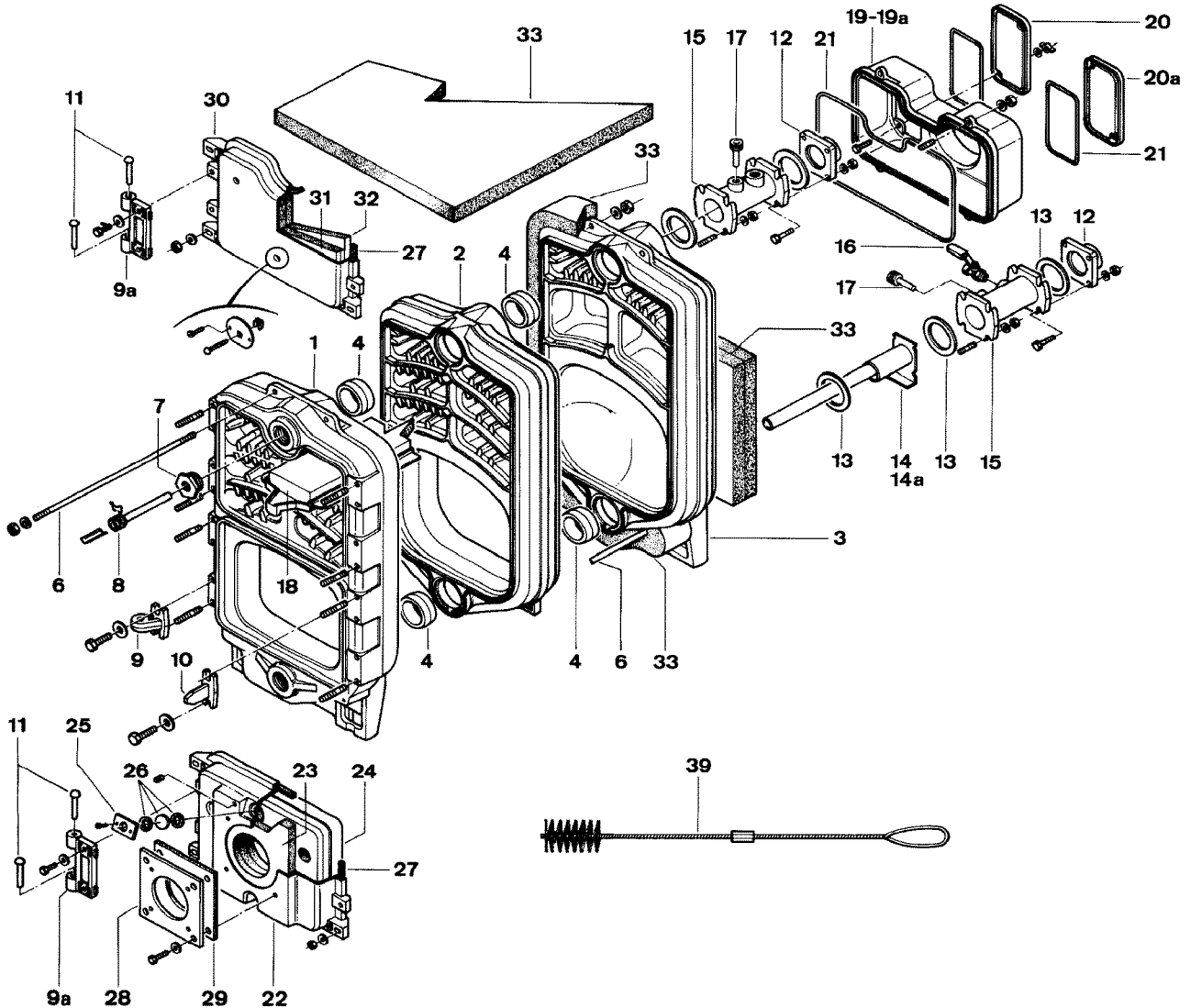


Fig. 6 – Boiler Fittings Assembly



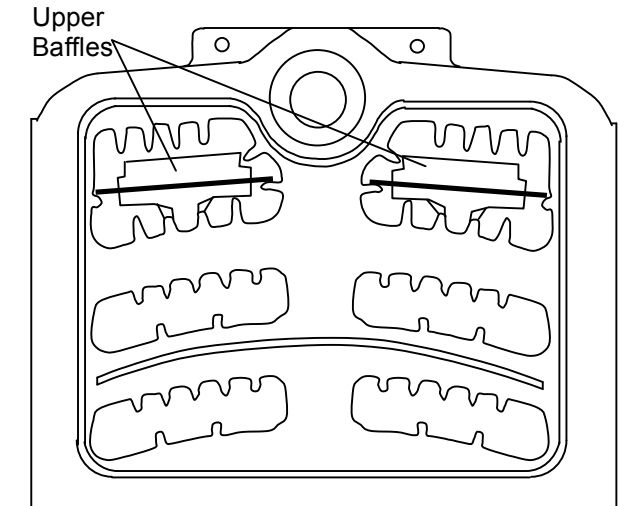
- | | | | | | |
|----|------------------------------|-----|------------------------------|----|----------------------------|
| 1 | Front Section | 14 | Distributor (6&7 section) | 25 | Sight Glass Flange |
| 2 | Intermediate Section | 14a | Distributor (8&9 section) | 26 | Sight Glass & Seal |
| 3 | Rear Section | 15 | Flow and Return Manifold | 27 | Door Seal (Ø16) |
| 4 | Nipple (Ø89) | 16 | Drain Valve | 28 | Burner Plate |
| 5 | Sealing Cord (Ø7) | 17 | Sensor Pocket (100mm length) | 29 | Burner Plate Gasket |
| 6 | Tie Rod | 18 | Upper Baffle | 30 | Cleaning Door |
| 7 | Reducer | 19 | Flue Hood (180mm outlet) | 31 | Internal Insulation |
| 8 | Sensor Pocket (200mm length) | 19a | Flue Hood (200mm outlet) | 32 | External Insulation |
| 9 | Door Hinge | 20 | Flueway Hatch (left) | 33 | Section Insulation Blanket |
| 9a | Door Hinge | 20a | Flueway Hatch (right) | 39 | Cleaning Brush |
| 10 | Door Guide | 21 | Sealing Rope | 40 | Bag of Screws |
| 11 | Door Pin | 22 | Chamber Door | 42 | 2" Blanking Plug |
| 12 | Welding Flange | 23 | Internal Insulation | | |
| 13 | Flange Gasket | 24 | External Insulation | | |

Fittings Assembly

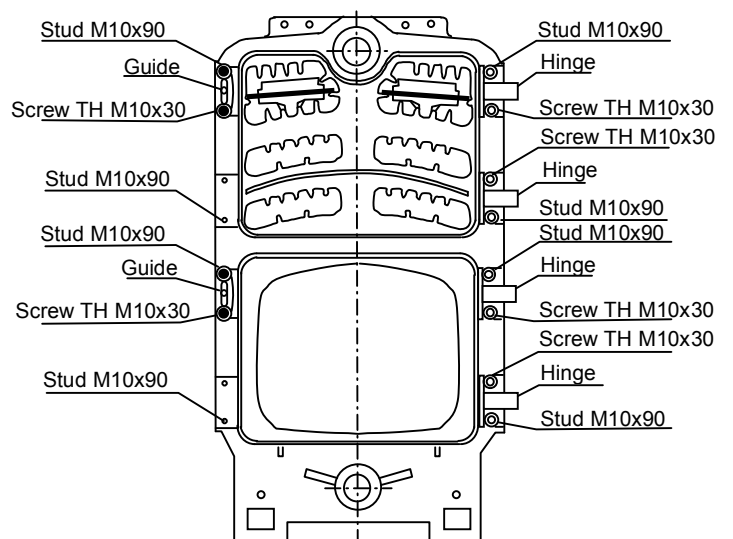
1. **Position Boiler** – Position the boiler block in its final resting position on the boiler plinth (if applicable). Ensure all manual handling techniques are adhered too, also ensure that a risk assessment has been carried out.
2. **Flow & Return Studs** – Fit the 8 off 12 x 65 studs to the flow and return ports in the rear section of the boiler.
3. **Distributor** – (Fig. 6 – items 13, 14 and 14a). Fit the rubber gasket to the distributor and insert the distributor into the rear port. (4 and 5 section models do not require a distributor).
4. **Sensor Pocket** – (Fig. 6 – items 7 and 8). Fit the 2" - ½" reducer and phial pocket into the 2" tapping in the top of the door.
5. **Front Drain Plug** – (Fig. 6 – item 42). Fit the 2" plug to the tapping in the bottom of the front section.
6. **Rear Drain Plug** – Fit the 1 ½" plug to the tapping in the bottom of the rear section.
7. **Flow Turret** – (Fig. 6 – item 17). Fit sensor pocket and ¾" plug into turret tapings. (Fig. 6 – items 12 – 17). Fit turret to flow connection using rubber gasket to make seal.
8. **Return Turret** – Repeat the above operations for the return turret.
9. **Connections** – (Fig. 6 – item 12). Two off 2 ½" BSP screwed flanges PN6, with two off rubber gaskets are provided to make flow and return connections.
10. **Hydraulic Testing** – Blank off all connections then fill the boiler slowly ensuring that all the air is vented and the boiler is completely full of water. Proceed to 9 bar to prove soundness. This facility is available through our Service Offices.
11. **Flue Box** – (Fig. 6 – items 19 to 19a). Screw the short thread of the four off M8 x 40mm studs into tappings in the upper part of the rear section. Check the sealing braid is in place on the flue hood (Fig. 6 – items 19 to 21). Fit the flue hood to the studs on the rear section and secure. (The flueway cleaning door [Fig. 6 – items 20 and 20a] are pre-fitted to the flue hood).

12. **Flue** – Connect the flue to the boiler, ensuring that the requirements of BS 6644: 1991 – Installation of Gas Fired Hot Water Boilers for Inputs Between 60 kW – 2MW are adhered to.

13. **Baffles** - Insert the baffles into the upper flueways (Fig. 7).

Fig. 7 - Baffles

14. **Front Section Hinges** – (Fig. 8) – Screw the short thread of the eight off M8 x 40mm studs into the front section. Mount the hinges (1 screw HM10 x 30mm + 1 nut HM10 + 2 washers L10 for each guide). The door guide is located opposite the hinges, in the upper part.

Fig. 8 - Door Hinge & Guide Assembly

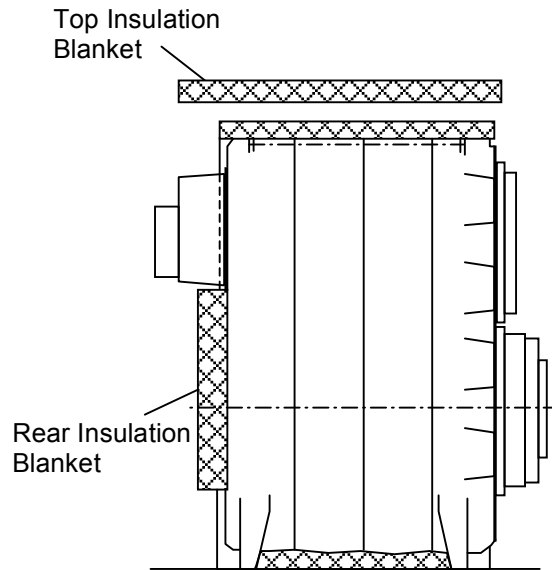
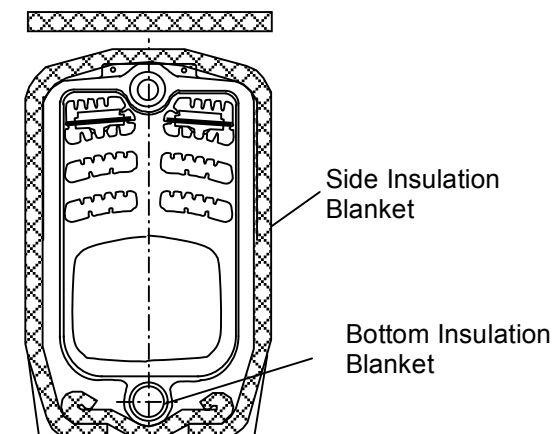
15. **Door Hinges** – (Fig. 6 – items 9 and 9a) Fit the hinges to the combustion chamber door and flueway door using two off M12 washers for each hinge.

16. **Combustion Chamber Door** – (Fig. 6 – items 27, 30, 31 and 32). Fit the door sealing braid in place then mount the combustion chamber door. (Fig. 6 – item 11). Secure using the door hinge pins and fix in place over the door guides securing with HM10 nuts and HM10 x 30 bolts. Ensure all manual handling techniques are adhered to.
17. **Flueway Door** – (Fig. 6 – items 23 to 29). Fit the door sealing braid in place then mount the flueway door (Fig. 6 – item 11). Secure using the door hinge pins and fix in place over the door guides securing with HM10 nuts and HM10 x 30 bolts. Ensure all manual handling techniques are adhered to.
18. **Burner Adaptor Plate** – (Fig. 6 – items 28 and 29). Fit the burner adaptor plate using the four off HM12 x 35 nuts and M12 washers to the combustion chamber door.
19. **Burner** – After fitting the burner adaptor plate to the burner door, it is essential to cut out the burner door insulation to the diameter of the burner draft tube, to allow the burner to pass through without damaging the door insulation.

INSULATION & CASING FRAME ASSEMBLY

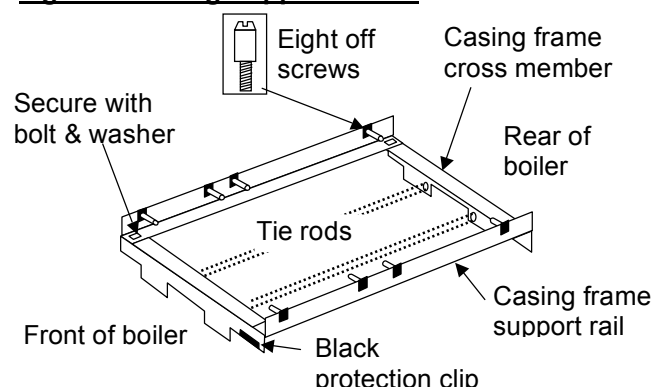
1. **Lower Rear Insulation** – Screw the hexagonal spacers onto the rear section’s three spacer pads and partly screw in a TH M5 x 10 screw to each spacer. Fit the 100mm thick insulation onto the rear section. (There are three holes in the insulation to allow it to fit over the spacers).
2. **Lower Rear Casing** – (Fig. 13 – item 51). Fit the lower rear casing over the three spacers and tighten the three screws.
3. **Bottom Insulation** – (Fig. 9). Place the bottom insulation blanket underneath the boiler and fold around the bottom tie rods to secure. Ensure that all personal protective equipment is worn.

Fig. 9 - Insulation Position



4. **Body Insulation Blanket** – (Fig. 9). Wrap the body insulation blanket around the boiler. Push the ends of the tie rods through the slots in the insulation blanket. Tuck the bottom of the blanket under the bottom of the boiler. **NB: For 38 & 39 models the body insulation blanket is supplied in two parts, to be positioned side by side, the large part towards the front.**
5. **Casing Frame Cross Members** – (Fig. 13 – item 53). Fit the casing frame cross members to the front and rear. They locate on the ends of the tie rods, secure with nuts and washers. Note that the front cross member has a black coloured protection clip (to protect burner wiring which passes close by) which should be at the front right hand side of the boiler – irrespective of the handing of the combustion chamber door.
6. **Casing Frame Support Rail** – (Fig. 13 – items 54 and 55). Fit the left and right casing frame support rails to each side of the boiler (Fig. 10). Ensure that they are correctly orientated. Secure the casing frame support rails to the casing frame cross members with nuts washers and 4 off HM8 x 16 bolts.

Fig. 10 – Casing Support Frame



7. **Top Front Casing Support Bracket** – (Fig. 13 – item 64). Fit the top front casing support bracket (with the fold looking forward and upward) to the front of the casing frame cross member and secure with two screws.
8. **Top Insulation Blanket** – Place the top insulation blanket on the casing support frame. The slits in the insulation should be at the front.
9. **Casing Brackets** – (Fig. 13 – item 52). Fit the two off casing brackets to the lower front of the boiler.

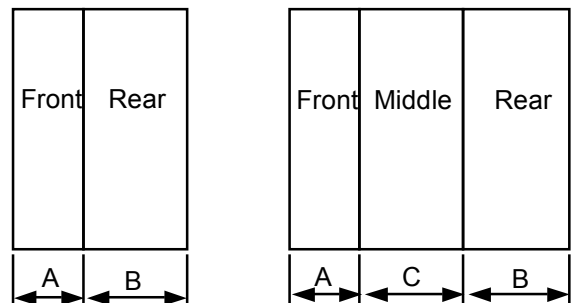
CASING ASSEMBLY

Note: The boiler casing is not load bearing.

1. **Front Side Panels (Black)** – (Fig. 13 – 57 and 58). Hook the front side panels over the casing frame support rails and lower front casing brackets with the clip brackets towards the rear. Clip the brackets onto the bottom tie rods to secure. Screw into place to the casing support frame rails and to the lower front casing brackets.
2. **Middle Side Panels (Models 37, 38 & 39 only)** – (Fig. 13 – item 63). Hook the middle side panels over the casing frame support rails with the clip brackets towards the rear, locating the panel onto the pin on the front side panel. Clip the brackets onto the bottom tie rods to secure.
3. **Rear Side Panels** – Hook the rear side panels over the casing frame support rails and the lower rear panel, locating the panel onto the pin on the front/middle side panel. Screw into place the casing support frame rails and lower rear panel.
4. **Upper Rear Panel** – (Fig. 13 – item 63). Slide upper rear panel into position and locate lugs in holes in rear of side panels. Push down to secure.
5. **Front Top & Instrument Panel** – (SEE CONTROL PANEL FOR CONTROL PANEL ASSEMBLY). Secure instrument panel to front top panel via four off screws. Feed stat phials, burner cables and earth wire through the slit in the top insulation then position front top/control panel inside casing support frame. Push forward to secure.
6. **Middle Top (Models 37, 38 & 39 only)** – Place in between casing support frame rails. Push forward towards front top to secure.
7. **Rear Top Panel** – Position on casing frame support rails and push forward. Fix in position to upper rear panel with two off screws.

8. **Lower Mask** – (Fig. 13 – item 56). Hook the lower mask over the casing brackets.
9. **Lower Front Panels (black)** – (Fig. 13 – items 69 and 70). Locate lower left and right front panels on lugs on side panels and bracket onto lower mask. Push down to secure.
10. **Upper Front Panel** – (Fig. 13 – item 68). Position in locating holes on lower front panels. The upper front panel is secured by two magnets onto the side panels.

Fig. 11 – Casing Side Panel Assembly



No. of Sections	4	5	6	7	8	9	
Front	A	300					
Middle	B	N/A			510		
Rear	C	514	684	854	514	684	854

Fig. 12 – Front Casing Assembly

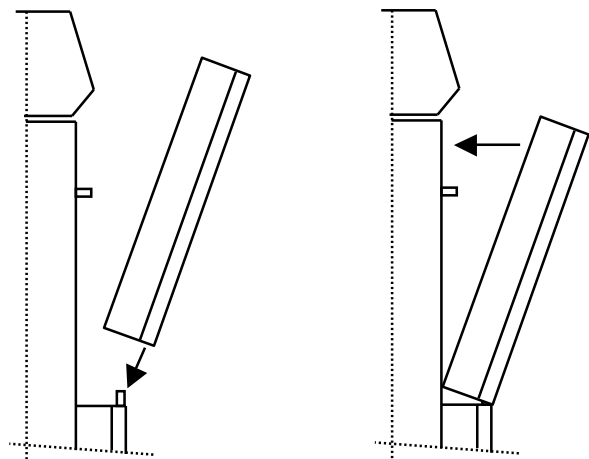
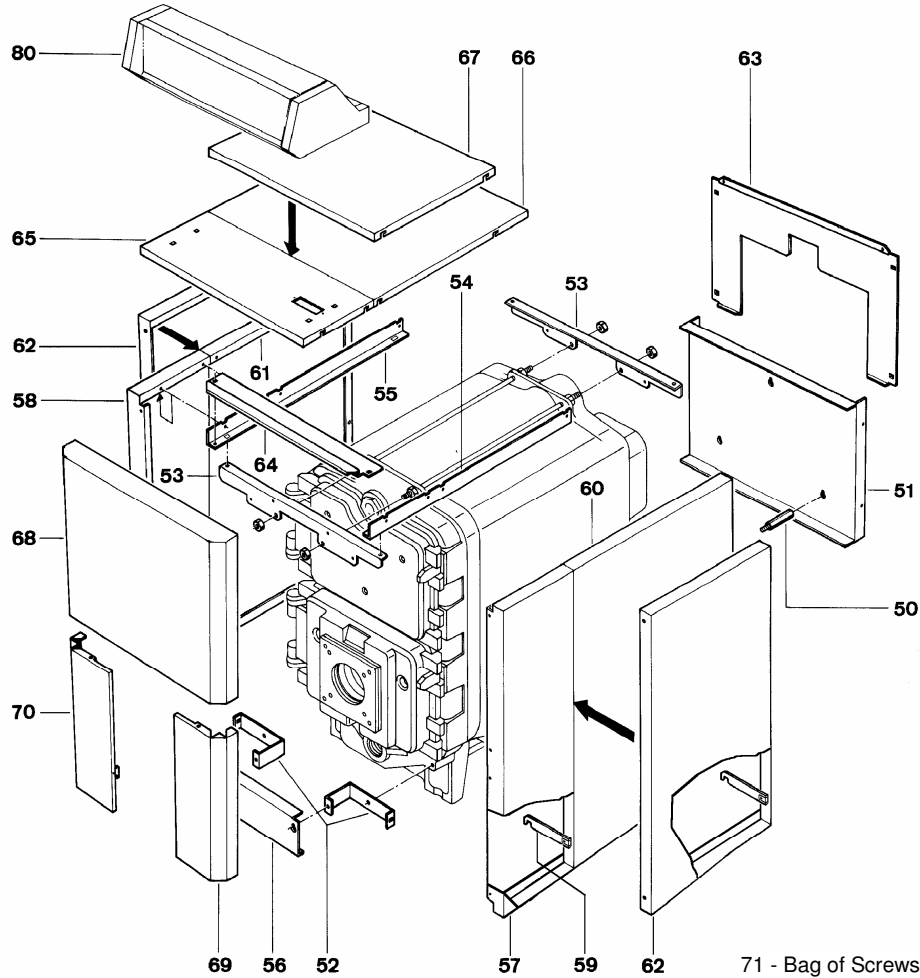


Fig. 13 – Casing Assembly



71 - Bag of Screws

- | | | | |
|----|--------------------------------|----|---|
| 50 | Rear Spacer | 62 | Side Casing – Middle (37/38/39 only) |
| 51 | Lower Rear Panel | 63 | Rear casing – Top panel |
| 52 | Casing Support Brackets | 64 | Top Panel Front Support Strip |
| 53 | Cross Member | 65 | Top Casing – Front Panel |
| 54 | Right Hand Side Support Rail | 66 | Top Casing – Rear Panel |
| 55 | Left Hand Side Support Rail | 67 | Top casing – Middle Panel (37/38/39 only) |
| 56 | Lower Mask | 68 | Front Casing – Top Panel |
| 57 | Side Casing – Right Hand Front | 69 | Front Casing – Lower Right |
| 58 | Side Casing – Left Hand Front | 70 | Front casing – Lower Left |
| 59 | Side Restraint | 71 | Bag of Casing Screws/Fixings |
| 60 | Side Casing – Right Hand Rear | 80 | Control Panel |
| 61 | Side Casing – Left Hand Rear | | |

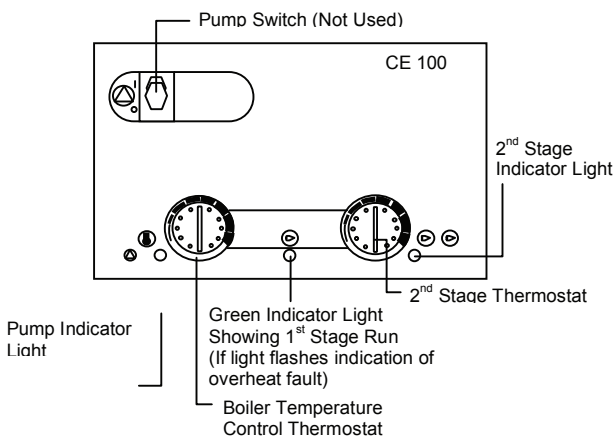
INSTRUMENT PANEL

Fig. 14 - Control Panel Configuration



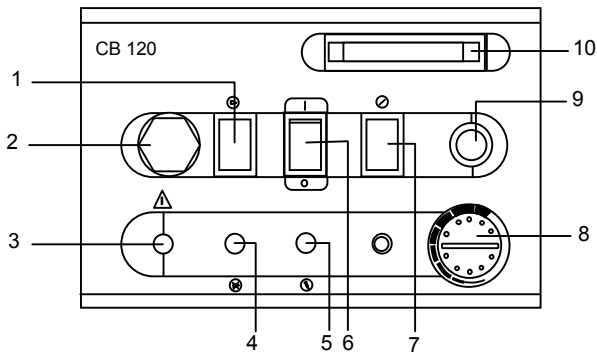
1	Control thermostat	9	2 nd stage time delay
2	1 st Stage indication light	10	1 st stage hours run meter
3	Boiler thermometer	11	2 nd stage indication
4	Overheat thermostat	12	On/off switch
5	Reset button	13	6.3 amp fuse
6	Overheat indicator	14	Over-ride button for safety checks
7	Lockout indicator	15	Over-ride thermostat
8	Flue gas thermometer	16	Mains supply indicator

Fig. 15 - Control Panel Operation



The CE 100 module provides the following functions

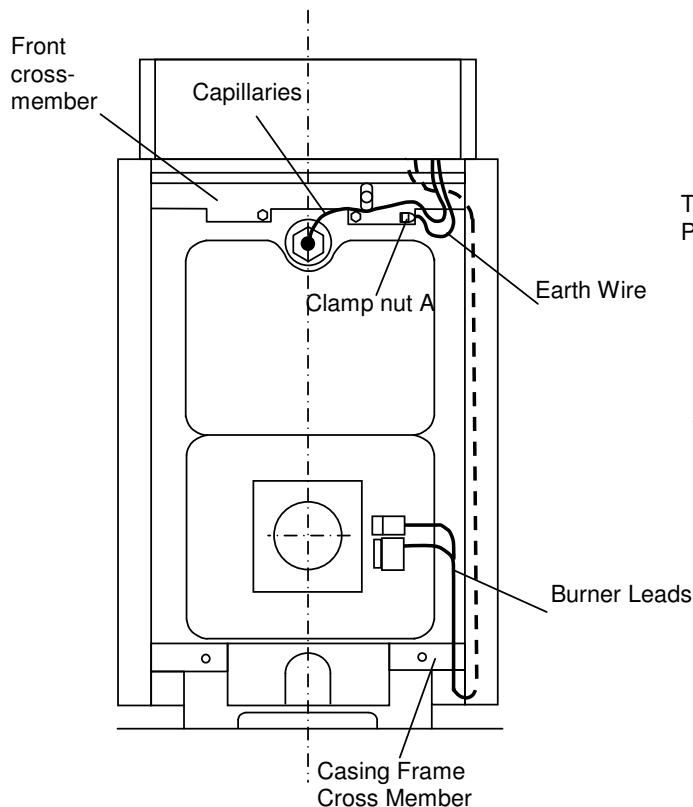
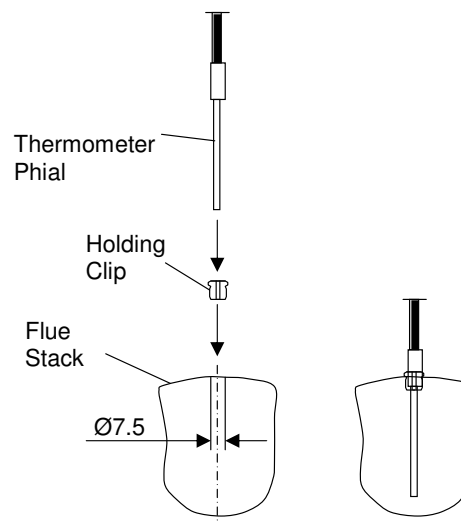
- Operation at 1st Stage
- Detection of boiler overheat, ionisation probe fault
- Ability to restrict max boiler temperature using jumper at back of module
- Indication of the operation mode of the boiler
- Operation of 2nd Stage operation



The CB 120 module provides the following functions:

1. **Reset button** – if during normal operation the flame is lost then the boiler will proceed to go to a lockout condition to reset the lockout press this button. For repeated lockouts please contact your service agent.
2. **Overheat thermostat** – if overheat indicator light is illuminated then the overheat thermostat needs to be reset, this is achieved by removing the hexagonal cap and pressing the reset. The overheat thermostat will operate at 110°C, investigation into the reason of lockout should be carried out.
3. **Overheat indicator** – the indicator light will illuminate to inform you the boiler has gone to an overheat condition and will not re-start until a manual reset has taken place as described above.
4. **Lockout indicator** – if during the burner lighting sequence the control box fails to detect the pilot flame or it goes out during operation then the burner will go to lockout and the light will be illuminated.
5. **Mains supply indicator** – indicates that the power has been turned on to the boiler.
6. **On/Off switch** – turns the burner On or Off. **This is not a boiler isolator switch**, components are still live even when the switch is off (mains inlet to the boiler still requires a suitable 3-pole isolator).
7. **Over-ride button for safety checks** – if this button is depressed it bypasses the control and high/low thermostats and fires the boiler on high fire, it is used to check the operation of the overheat thermostat.
8. **Over-ride thermostat** – (set to the right (maximum position) allowing control by the 1st stage and 2nd stage thermostats).
9. **6.3 Amp Fuse**
10. **Boiler thermometer** – indicates the current boiler temperature.

Also supplied are a 1st Stage & 2nd Stage hours run meters for indication purposes. A flue gas thermometer is also supplied for indication of the flue gas temperature, to fit the flue gas thermometer drill a 7.5mm diameter hole, preferably vertically, in the flue between the flue hood and the stack, insert the thermometer and clip.

Fig. 16 – Cable & Capillary Tubes Routing**Fig. 17 – Fitting Thermometer into Flue****Burner Cables**

The NXR3 is supplied as standard fitted with a 7-pin and a 4-pin Weiland plug for connection to the burner.

High/Low Burner

The 7-pin and 4-pin Weiland plugs should be connected to the respective plugs provided on the burner.

On/Off Burner

The 7-pin Weiland plug should be connected to the respective plug provided on the burner. The 4-pin plug should be disconnected at the terminal connection in the instrument panel and discarded (see wiring diagram).

FITTING THE BURNER

1. Check that the burner which has been supplied is the correct burner for the boiler, by checking the specification on the burner card provided.
2. Fit the burner adaptor plates and boiler gasket to the boiler using the fixing screws provided.
3. Place the burner gasket over the burner fixing studs.
4. Insert the burner draught tube into the firing door aperture with the gasket in position on the mounting flange. Secure in position with the nuts and washers provided.
5. Connect the fuel supply to the burner. The fuel supply pipes should be self supporting and not apply undue pressure on the burner.
6. Connect the burner cable and plug to the Weiland plugs from the control panel.
7. Check that the weight of the burner has not affected the sealing of the door to the front section, especially after the door has been opened and closed several times.
8. Larger burners, especially dual fuel types, should be supported independently with a suitable device whilst still allowing the door to be opened.

CONNECTIONS

Boiler & Burner Power Supply

The NXR3 is supplied with either single phase or three phase burners. The electrical supply to the boiler installation should be connected via a fused isolator.

Single Phase Installation

Install a 230V 50Hz single-phase electrical supply (min cable rating – 6.3A) to the boiler instrument panel. No separate electrical supply for the burner is normally required. The burner is normally powered from the instrument panel lead provided.

Note: the following single phase burners must have a separate mains supply for the burner motor as Fig. 18A

**Nu-Way NGN15, NGN25 & NOL20
 EOGB – BG500, B50 & B55, B45, BG450**

Fig. 18 – Boiler & Burner Power Supply

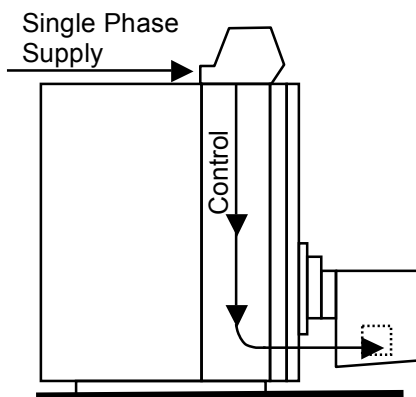
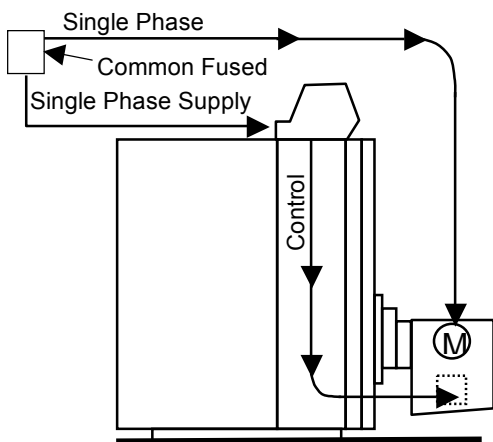


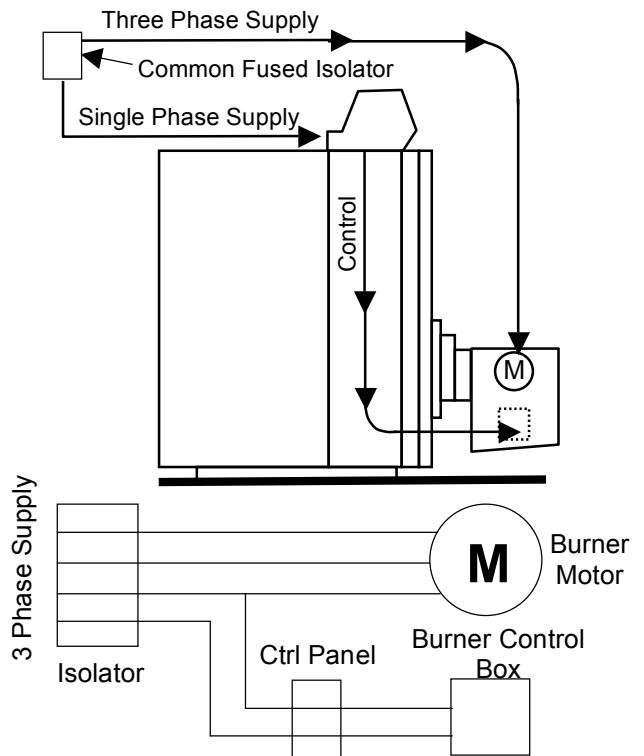
Fig. 18A – Boiler & Burner Single Phase Supply



Three Phase Installation

CAUTION: If the burner motor is supplied with three-phase power, control panel single-phase supply must be taken from one of the phases supplying the burner motor.

Install a three-phase supply direct to the burner via a fused isolator (sized to the burner manufacturers specification), see Fig. 18. Install a separate 220 – 240V 50Hz single-phase electrical supply derived from the three-phase supply to the boiler instrument panel. This is fused 6.3A in the instrument panel.



Volt Free Contacts

Volt free remote status contacts should be taken from the control panel where a 24V signal is provided, see section 6 for further details.

CONNECTING THE GAS SUPPLY

The connection should be made to the burner connection (see burner card enclosed with this manual for size required). A union and isolating valve should be fitted close to the burner to allow disconnection of the burner for maintenance and repair.

The gas supply should be made through a suitable meter and the local gas undertaking should be consulted to determine the suitability of the meter and gas supply to meet existing and additional demands for gas.

The installation should be made in accordance with the requirements of the Gas Safety (Installation & Use) regulations and all other regulations and codes of practice.

In particular a manual valve for isolation of the boiler house shall be fitted in an accessible position and readily identifiable.

The gas supply should be supported adequately.

For large single and multiple installations consideration should be given to the installation of additional gas meters to assist in the monitoring of boiler performance.

Attention is drawn to the need for adequately sized pipework according to the maximum gas demand for multiple boiler installations and each boiler shall be provided with an isolating valve so that it is possible to isolate the boiler from a common gas supply for maintenance purposes.

Boosters are required if the inlet pressure under full load is less than that recommended by the burner manufacturer (see burner card for details).

If a booster is required the local gas undertaking must be consulted and the booster shall be fitted with a low pressure cut off switch upstream of the booster in the event of reduced pressure and to prevent automatic restart on pressure restoration. The cut off pressure shall be decided by the local gas undertaking.

CONNECTING THE OIL SUPPLY

FUEL STORAGE AND HANDLING – The provisions of BS2869 will normally ensure that the fuel will be of adequate performance. As there are winter and summer fuel grades and in order to prevent the fuel waxing under sustained cold and exposed conditions, Class D grade fuel oil should be stored and supplied to the burner at a minimum temperature of 5°C, in line with the fuel suppliers recommendations to suit site conditions.

The supply pipe and, where fitted, the return line should consist of copper tube (galvanised steel must not be used), the final connection to the pump inlet port being made with the length of flexible pipe supplied with the burner. Joints should be made with compression fittings, not by soldering.

When gravity feed is used (the most common system) the maximum head should not exceed 4m (equivalent to a pressure of 35 kPa).

PUMP BLEEDING – If the fuel tank is allowed to drain completely it will be necessary to bleed the oil

pump free of air by slackening the plug in the pressure gauge port allowing oil to run through until air free.

OIL FILTRATION – SEDIMENT REMOVAL – There is an oil strainer inside the body of the fuel pump and a separate oil filter between the oil pipe from the tank and the oil burner. The oil strainer should be removed and cleaned with paraffin during the pre-season check-up. At the same time the oil filter cartridge should be replaced or cleaned, as appropriate for the type fitted. Bleed fuel pump free of air, as described above, to remove any trapped air.

Draw off any accumulation of water or sediment in the fuel tank by opening the sludge cock in the tank bottom, immediately before any new delivery of fuel. Do not run the burner while the tank is being refilled and, if possible, do not restart for one hour after refilling is concluded.

CONNECTING THE WATER SYSTEM

The flow and return connections should be made to the appropriate manifolds, following the recommendations of CP342 and PM5.

It is essential that all pipework connections to the boiler are self supporting, correctly aligned and allow for free expansion of both boiler and pipework.

Care should be taken in the pipework design to prevent strain on the connections. Excessive strain can lead to premature failure of the boiler, which is obviously outside the terms of our warranty.

The use of expansion bellows to take up both axial and lateral movement is recommended.

**Potterton Commercial Customer Commissioning
Check List**

The items listed below have been put together as a guide to what actions should be completed before the commissioning of a boiler takes place.

1. Site access available for persons carrying out the proposed work.
2. Site Managers/Personnel aware that work will be taking place.
3. Boilers correctly erected and cased.
4. Risk assessments carried out on possible risks which may effect the persons carrying out the proposed work.
5. Site wiring complete to boilers.
6. Boilers filled and vented.
7. Controls connected, operable and calling for heat.
8. Sufficient system heating load available to run the boilers in order to complete combustion checks.
9. All system pumps operational and available.
10. Gas supply completed, purged and ready for use (if applicable).
11. Oil supply completed, bled and ready for use (if applicable).
12. Flue system complete, adequate and fully functional.
13. Permanent ventilation complete and adequate.
14. All safety systems fitted and fully operational (e.g. safety valves, fuel shut off devices, flue fans interlocked, etc.)
15. Safe working environment provided.

Contravention of Regulations

PLEASE NOTE THAT SHOULD ANY ITEMS BE INSTALLED ON A TEMPORARY BASIS, E.G. VENTILATION, FLUES ETC, THEN THE COMMISSIONING ENGINEER WILL NOT BE ABLE TO LEAVE THE BOILERS RUNNING UPON COMPLETION OF COMMISSIONING. THE BOILERS WILL NEED TO BE SHUT DOWN MAKING THEM INOPERABLE AND SHUT DOWN AND WARNING NOTICES WILL BE ISSUED.

BOILER COMMISSIONING

A lifetime guarantee is available on this boiler when erection and commissioning is carried out by the Potterton service department. Please refer to our standard terms and conditions for further details.

IMPORTANT: The boiler must be commissioned following completion of the installation. Operation of an uncommissioned appliance may cause injury to personnel and damage to the boiler/burner unit and could invalidate the manufacturers warranties.

Commissioning should only be carried out by personnel approved and competent to do so. This facility is available from Potterton Commercial service offices at the addresses as listed on the back page of this manual.

Commissioning of the burner unit should be carried out in accordance with the burner manufacturers handbook provided with combustion adjustments in accordance with the Potterton burner card also provided.

Before commencing to commission the burner check the following.

1. Electrical supply is of correct voltage and polarity and earthing is available with certification that all electrical checks have been carried out.
2. Fuel supply is tested for leakage and purged of air. Ensure the burner is suitable for the connected fuel supply and pressure, and purging certificates have been filled in.
3. Boiler and system are filled with water and the operating pressure is within the appliance range.
4. Pumps are operational and any flow proving interlocks are functional. The operation of the pump should be checked, particularly on sealed systems, to ensure that operation does not cause a reduction in pressure within the system below the minimum operating pressure.
5. Ventilation is adequate and, in the case of mechanical ventilation systems, operation of the boiler is inhibited unless the ventilation fan is proved.
6. On mechanically assisted flue systems the operation of the boiler plant should be inhibited unless the mechanical flue system is operational and flow proved.

7. The safety valve should be checked to ensure that it is of the correct size and pressure.
8. The cold feed and open vent sizes should be checked.
9. Ensure the burner fitted to the boiler is of the correct specification and size for the boiler and suitable for the fuel supply available (see burner card enclosed with this manual).
10. The burner blast tube has been sealed to the door refractory and the boiler door seal is correct.

Following completion of the above checks the burner should be commissioned in accordance with the burner manufacturers handbook provided with the burner. The commissioning form provided at the back of this manual MUST be completed and returned to Potterton Commercial at the address on the back page.

Typical combustion figures are:

CO ₂	- Gas: 9 – 9.5%	Oil: 12 – 13%
CO	- Gas: 0 – 100ppm	Oil: 0 – 1 Smoke

Flue gas temperature (taken at 600mm from the flue outlet on a clean boiler) should be within the range of 160 – 200°C.

IMPORTANT – SAFETY

It is essential that the following instructions and adjustments are carried out by a qualified engineer who is experienced in blown gas/pressure jet burner commissioning.

In the UK it is a legal requirement that when working on blown gas appliances the engineer must be CORGI registered. The manufacturer cannot be held responsible for any consequential damage, loss or personal injury as a result of customers failing to follow these instructions, or as a result of misuse.

EMERGENCY INSTRUCTIONS

The burners are designed and constructed to meet all of the essential requirements of the GAS APPLIANCE DIRECTIVE 90/396/EEC and under normal circumstances should not give occasion to any hazardous conditions. If such a condition should occur during commissioning or subsequent use of this product, be it a fault of the burner, the boiler or of any instrument, machine or service in the proximity of the burner then the GAS and ELECTRICITY supply to the burner should be **IMMEDIATELY ISOLATED** until such time that the fault has been investigated and rectified.

The commissioning of the appliance can be split into three main categories these being listed below.

Pre-Commissioning Dry Run

This will enable the checks on the safety controls to be done and should include:

Air Control Devices
Control Devices
Control Box

Soundness Testing

This is to check the soundness of the gas train and valves and should include:

Main Gas Pressure Governor
Gas Valve Closure

Commissioning – Live Run

This will enable the burner to be commissioned fully and should include:

Checking Inlet Pressures
Checking Pipework
Checking Pilot Flame
Checking Low/High Flame
Setting Gas Rates
Setting Combustion Figures
Checking Flame Signals
Pressure Switch Settings

IMPORTANT: After each adjustment, gas flow rate and flue gas analysis should be re-checked.

ALWAYS use approved test equipment (continually monitoring electronic equipment is recommended).

NEVER rely on a visual inspection of the flame as a guide to combustion quality.

Following/during commissioning of the burner unit the following additional checks should be carried out.

1. Operation of the control, high/low and high limit thermostats should be checked for correct operation.
2. The flue draught available at the appliance flue outlet should be checked under all operating conditions (hot and cold) and should be within the boiler operating parameters.
3. Checking of lockout of burner on flame failure.
OIL – Cover the photocell.
GAS – Disconnect the ionisation probe in the control box (see manufacturers instructions).
4. Shut down of the boiler plant by external controls does not cause a hazardous condition and pump overrun is provided to remove residual heat from the boiler.

5. Following commissioning the boiler overheat and control thermostats should be set to the required operating setting.

Additional Checks

Where possible the system should be checked to ensure that following purging of air there is no raw water make-up. In particular, when the system is operated in the hot condition, there should be no discharge of water from the safety valve, open vent or cold feed tank overflow that would otherwise lead to unregulated raw water make-up when the system cools down.

FAULT FINDING

General fault finding for burner failure should be in accordance with the burner manufacturers handbook. Set out below are general guidance notes on system fault finding.

Overheat Operation

The boiler control panel has an inbuilt overheat indicator lamp. Operation of the boiler overheat thermostat is associated with a reduction in boiler water flow. Where overheat operation is reported the following should be checked.

- a) The boiler/system pump is adequate for the duty.
- b) Operation of flow reducing devices, ie, TRVs, compensated mixing valves, etc., do not reduce the water flow rate through the boiler below the minimum flow rate.
- c) Pump overrun is incorporated to dissipate residual heat from the boiler on system shut down.
- d) The operation of boiler back end valves incorporate a time delay to allow for removal of residual heat from the boiler.
- e) The boiler is operating at the correct rate and is not overfired.

The use of a primary loop system is highly recommended to provide a constant boiler flow rate under all operating conditions. For further information please refer to the Potterton Technical Bulletin series.

Burner Lockout

The package burners supplied with the boiler unit have an integral safety system to allow the safe and reliable operation of the burner. Failure of the burner to operate correctly will cause the burner control box

to "lockout" and the lockout button on the burner will illuminate to indicate this.

The lockout condition can be manually reset by pushing the reset button and the control box should restart its control sequence in an attempt to light the burner. If the control box lockout will not reset or goes to lockout after being reset then the services of a boiler repair/maintenance company should be sought. This service is available from Potterton Commercial Division service offices at the addresses on the back page of this manual.

WARNING: The lockout reset button should not be repeatedly operated otherwise a hazardous situation may occur.

Should the boiler go to lockout, check the following before attempting to relight the burner.

1. Fuel is available at the burner.
2. The electrical supply to the appliance is of the correct voltage and polarity.

The boiler control boxes in some instances have indicator dials as an aid to fault finding on boiler lockout. In these instances refer to the control box manufacturers data sheet for fault finding details.

BOILER MAINTENANCE

Before starting work a risk assessment should be carried out on the boiler house to determine the safety of the working environment.

It is essential for efficient and trouble free operation that the boiler plant is regularly maintained. This must be carried out by qualified and experienced engineers and in the case of gas fired appliances attention is drawn to the mandatory requirement of CORGI registration of personnel undertaking work on these appliances. This facility is available from Potterton Commercial Division service department, details are available on the rear of this manual.

Before commencing servicing of a boiler a combustion test must be taken.

Boilers should be serviced and re-commissioned as a minimum on an annual basis for gas and twice a year for oil.

It is strongly advised that a maintenance contract be entered into with Potterton Commercial Division to ensure that the boiler/burner unit is correctly and properly maintained.

WARNING: Isolate the electrical and fuel supplies before attempting any maintenance work.

Cleaning of Flue Surfaces

The boilers are supplied with a set of cleaning tools comprising flueway brushes and extension rods for routine cleaning. Boilers may require periodic cleaning with specialist mechanical equipment dependent on boiler conditions, fuel type, etc.

Cleaning of the boiler requires opening of the door and removal of the flue covers, front and rear under the flue cover.

Frequency of boiler cleaning varies and is dependent on site conditions, fuel type, heat load, design of controls and running conditions.

For maximum efficiency and economy in running, it is essential that the combustion chamber and flueway surfaces should be kept clean and free from deposits.

Deposits should be disposed of in a manner not to cause inconvenience to any persons.

A layer of deposits 1.5mm thick will reduce the heat transfer through the tube wall by up to 10%. Not only does this waste fuel but the higher flue gas temperatures that result will increase the thermal

stress within the boiler and may lead to joint leakage or in extreme cases section failure.

Natural Gas & LPG Fired Boilers

We recommend brushing out of the combustion chamber and flueways and the removal of the rear clean out covers to check for deposits in the flue box twice a year.

Class 'D' Fuel Oil & Class 'C2' Kerosene

The boilers should be brushed out thoroughly at least bi-monthly for Class D (35 second) and Class 2 (28 second) during the heating season but more frequent attention may be necessary dependant on the operating conditions to prevent the formation of hard adherent scale on the tube surfaces.

It is essential to ensure that cleaning is carried out throughout the full length of the flue tube passes and that the rear clean out covers are taken off to allow for removal of deposits brushed through into the flue box.

Regular cleaning is essential, as a build up of hard deposits can be extremely difficult to remove.

Sludge Gas

Maintenance of boilers running on these fuels will be required at more frequent intervals, possibly on a weekly basis or even a daily basis dependent on fuel type and quality.

Boiler Ancillaries

Check the sealing the sealing rope on the boiler door is in place and sealing the combustion chamber. Keep a regular check on the condition of the door refractory around the burner draught tube. If there is any deterioration this must be made good immediately to prevent damage to the boiler and burner.

Boiler Controls

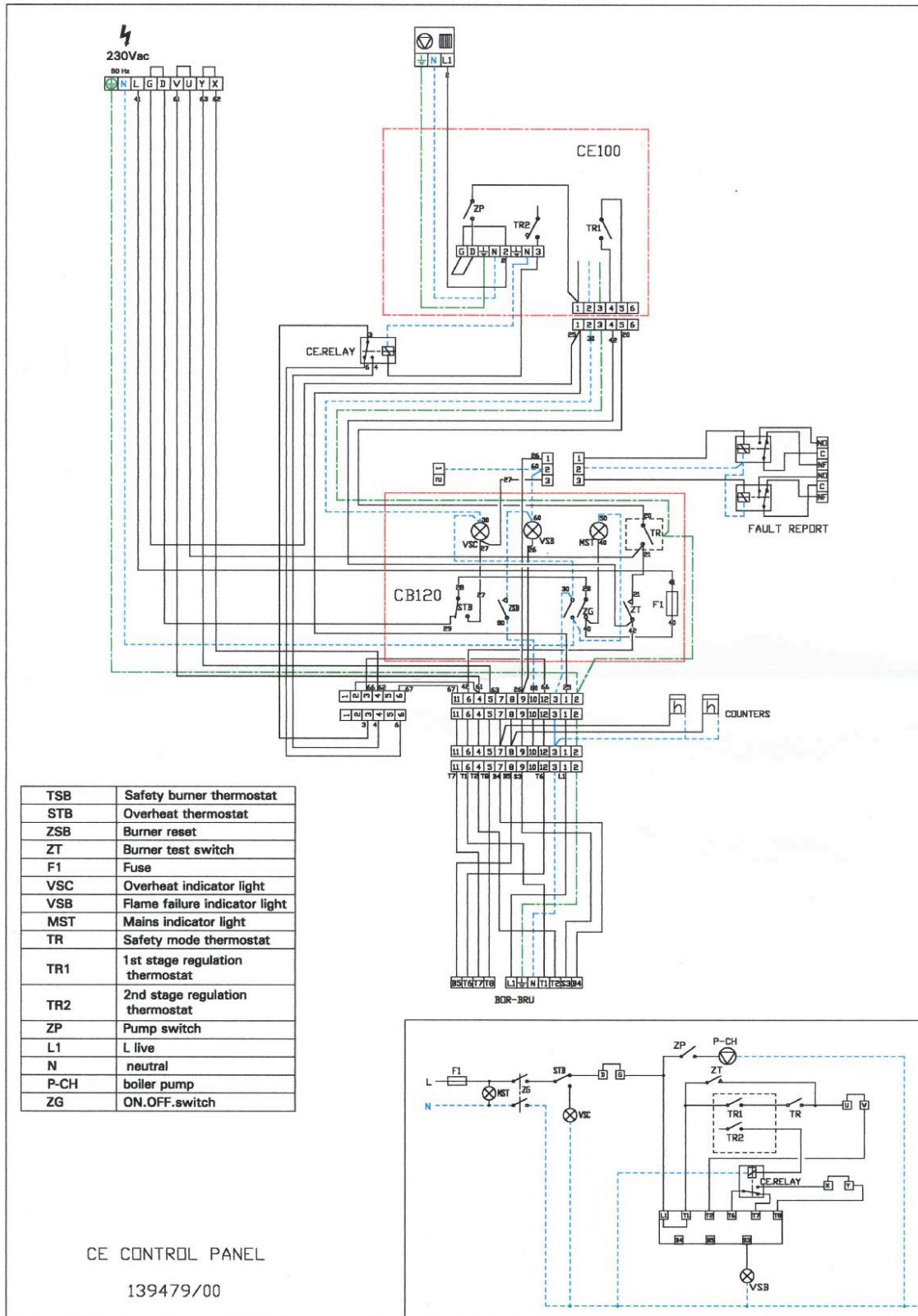
The operation of boiler controls including control thermostat, high/low thermostat and overheat thermostat must be checked every visit.

Safety Interlocks

The operation of safety interlocks such as flow proving on mechanical flue/ventilation systems must be checked to ensure that operation of the boiler is prevented on a fault.

FOLLOWING MAINTENANCE THE BOILERS MUST BE RECOMMISSIONED.

Fig. 19 – Boiler Wiring Diagram



For Further details, please refer to the Control Panel Manual

Wiring Diagram – Notes & Legend

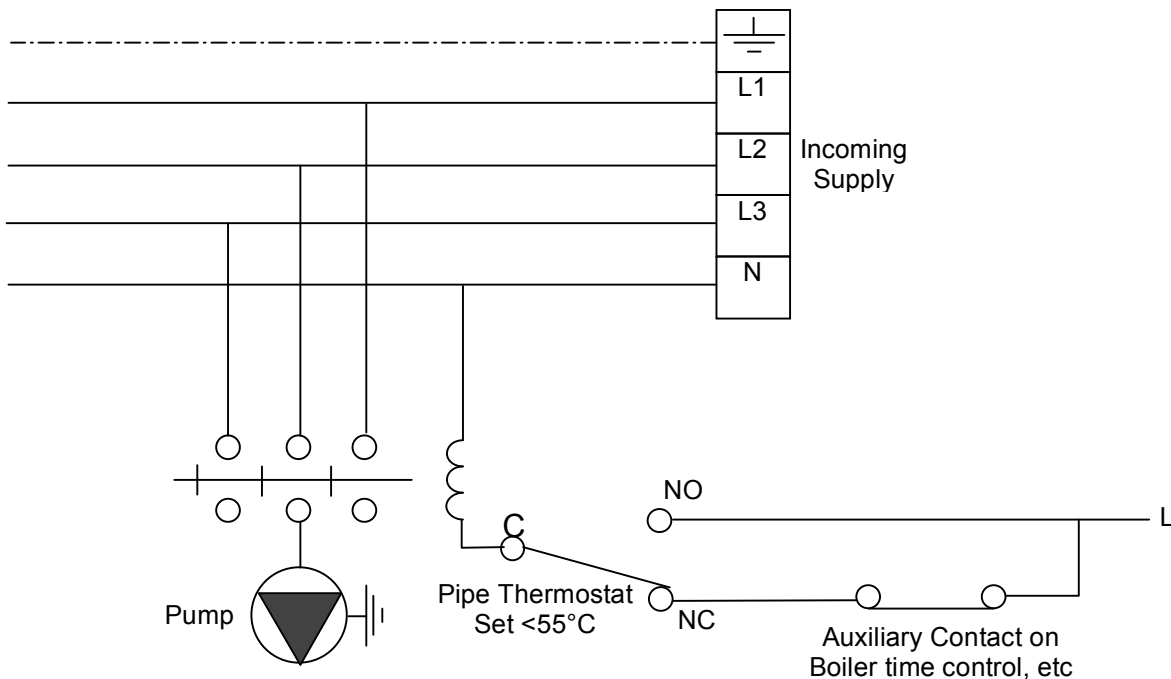
Important: Maximum current rating at each terminal is 2A. Loads greater than 2A require isolating relays or contactors, this particularly applies to pumps and fans.

Legend:

STB	-	Overheat thermostat
ZSB	-	Burner reset
ZT	-	Burner test switch
F1	-	Fuse
VSC	-	Overheat indicator light
MST	-	Mains indicator light
TR	-	Safety mode thermostat
TR1	-	1 st stage regulation thermostat
TR2	-	2 nd stage regulation thermostat
ZP	-	Pump switch (not used)
L	-	Live
N	-	Neutral
ZG	-	On/Off switch
BRU	-	Burner connections
H	-	Hours run counters

External Interlocks:

DG	-	External interlock
UV	-	Safety interlock
XY	-	Safety interlock
Relays	-	Overheat & Fault

Fig. 20 - Pump Overrun Using Changeover Pipe Thermostat

NXR3 BOILER PARTS LIST (See Fig.21, Fig.22, Fig.23)

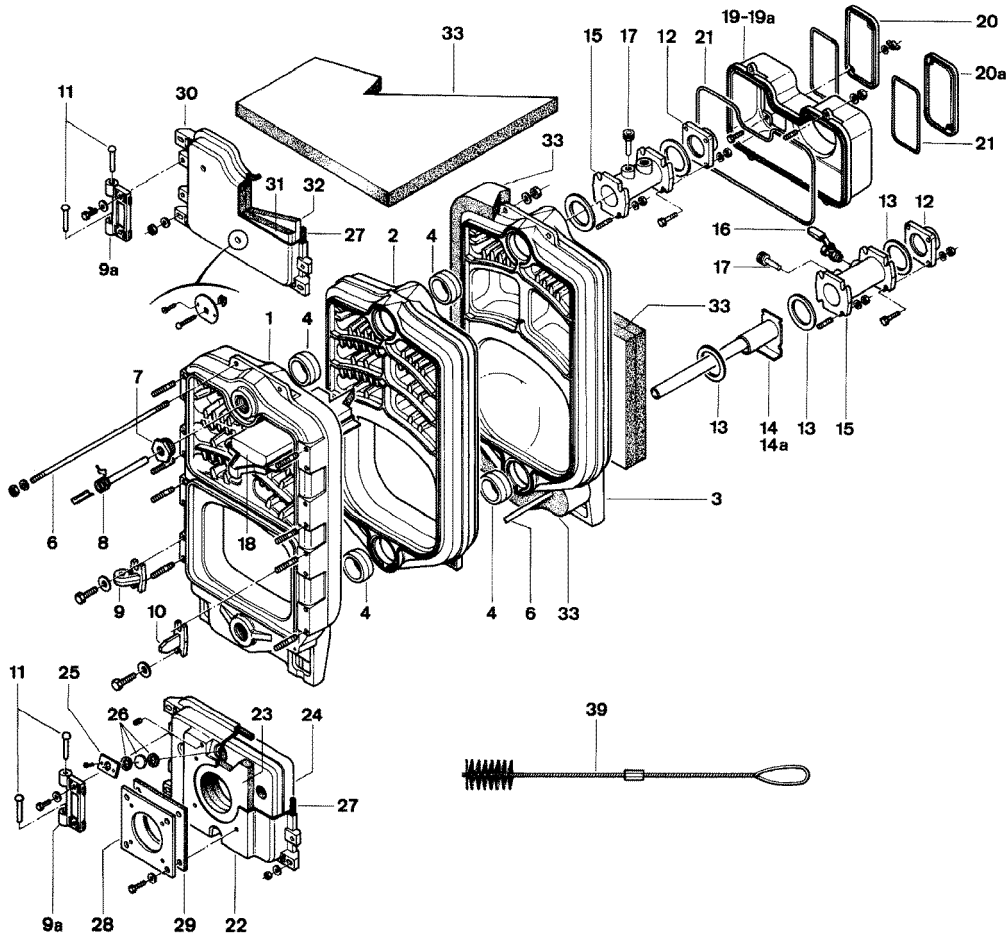
“AS DELIVERED” PACKAGES / PALLETS

Description	NXR34	NXR35	NXR36	NXR37	NXR38	NXR39
	Package Part Number					
A Sections Pallet Front Intermediate Rear	COM17800476 COM17800496 COM17800486					
B Boiler Fittings	COM17326204	COM17326205	COM17326206	COM17326207	COM17326208	COM17326209
C Boiler Accessories	COM17326134		COM17326136		COM17326138	
D Tie Rods (Loose) Size: M12 x (length)	COM17077154 (620mm)	COM17077155 (790mm)	COM17077156 (960mm)	COM17077157 (1130mm)	COM17077158 (1300mm)	COM17077159 (1470mm)
E Baffles (2 per boiler)	COM17300434	COM17300435	COM17300437		COM17300439	
F Flow & Return Turrets	COM17300330					
H Casing Package	COM17221824	COM17221825	COM17221826	COM17221827	COM17221828	COM17221829
J Control Panel	COM17204280, COM17401550 & COM17405437					

CONTENTS OF INDIVIDUAL PACKAGES / PALLETS

A – SECTIONS PALLET	Front Section (x1)	Inter Sections	Rear Section (x1)
B – BOILER FITTINGS	Nipples Reducer Bush	Jointing Paste Sealing Rope	Sensor Pocket Wooden Block
C – BOILER ACCESSORIES	Plate Paste Adaptor Plate Gasket Door Hinges Flueway Door Assy	Weld Flanges Distributor Flue Box Assembly Packet of Fixing Screws	Burner Adaptor Plate Door Guide Comb Chamber Door
D – TIE RODS (LOOSE)	Tie Rods (x4)		
E – BAFFLES (LOOSE)	Upper Baffles		
F – FLOW & RETURN TURRETS	Bolt (x8) Plug (x1) Drain Valve (x1)	Rubber Gasket (x2) Sensor Pocket Clips (x2) Turrets (x2)	Washers (x8) Sensor Pockets (x2)
H – CASING PACKAGE	Boiler Casing & Insulation Panels		
J – CONTROL PANEL	Control/Instrument Panel & Associated Items		
ADDITIONAL ITEMS	Front Drain Plug (x1) M20 Threaded Bar (x2) M20 Nuts (x2) Data Label 2 ½” Screwed Flanges	Rear Drain Plug (x1) Pulling Up Plate (x4) M20 Long Nut (x2) Boiler Manual	2.5” Flange (x2) Large Washers (x2) Small Washers (x2) Burner Card

Fig. 21 – Boiler Components

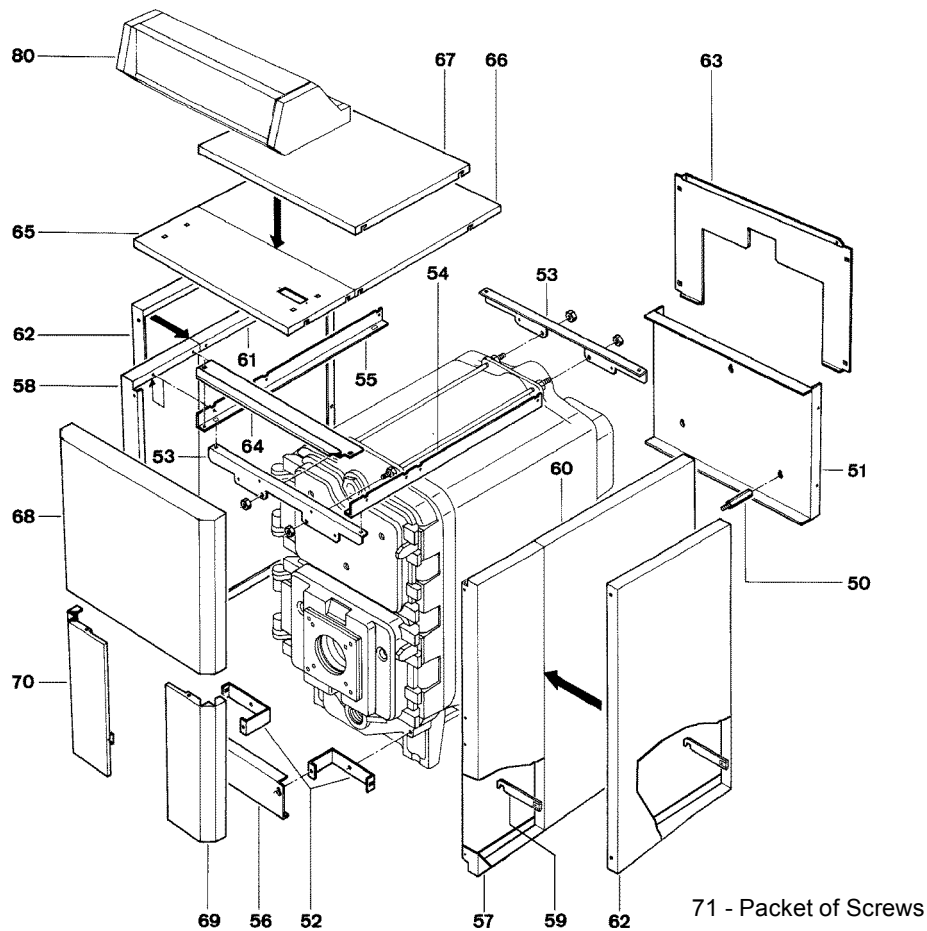


NXR3 BOILER PARTS LIST (See Fig. 21)

ITEM	DESCRIPTION	PART NO	QUANTITY Per Boiler
1	FRONT SECTION	COM17800476	1
2	INTERMEDIATE SECTION – MODEL 34	COM17800469	2
	INTERMEDIATE SECTION – MODEL 35	COM17800469	3
	INTERMEDIATE SECTION – MODEL 36	COM17800469	4
	INTERMEDIATE SECTION – MODEL 37	COM17800469	5
	INTERMEDIATE SECTION – MODEL 38	COM17800469	6
	INTERMEDIATE SECTION – MODEL 39	COM17800469	7
3	REAR SECTION	COM17800486	1
4	NIPPLE (Ø89) – MODEL 34	COM17809407	6
	NIPPLE (Ø89) – MODEL 35	COM17809407	8
	NIPPLE (Ø89) – MODEL 36	COM17809407	10
	NIPPLE (Ø89) – MODEL 37	COM17809407	12
	NIPPLE (Ø89) – MODEL 38	COM17809407	14
	NIPPLE (Ø89) – MODEL 39	COM17809407	16
4A	NIPPLE SEALING PASTE (NOT SHOWN)	COM17002081	1
5	SEALING ROPE (Ø7) – 3 metres per length (NOT SHOWN)	COM17000166	
6	TIE ROD – MODEL 34 – M12 x 620mm	COM17077154	4
	TIE ROD – MODEL 35 – M12 x 790mm	COM17077155	4
	TIE ROD – MODEL 36 – M12 x 960mm	COM17077156	4
	TIE ROD – MODEL 37 – M12 x 1130mm	COM17077157	4

ITEM	DESCRIPTION	PART NO	QUANTITY Per Boiler
6	TIE ROD – MODEL 38 – M12 x 1300mm	COM17077158	4
	TIE ROD – MODEL 39 – M12 x 1470mm	COM17077159	4
7	REDUCING BUSH (2" TO ½")	COM15922659	1
8	½" SENSOR POCKET + CLIP (200mm LENGTH)	COM17880068	1
9	DOOR HINGE (FRONT SECTION FIXING)	COM17845655	4
9A	DOOR HINGE (DOOR FIXING)	COM17845635	2
10	DOOR GUIDE	COM17845625	2
11	DOOR HINGE PIN	COM17000310	
12	WELD FLANGES (2.5" – DN65)	COM17000770	2
13	FLANGE GASKET (PN6 – 118 X 82 X 5 – ECS 560/1000)	COM15601827	3
14	DISTRIBUTOR – MODELS 36 & 37 – LENGTH 360mm	COM17076096	1
14A	DISTRIBUTOR – MODELS 38 & 39 – LENGTH 740mm	COM17076097	1
15	WATER CONNECTION TURRET (FLOW & Return)	COM17864297	2
16	DRAIN VALVE (¾")	COM17006471	2
17	½" SENSOR POCKET + CLIP (100mm LENGTH)	COM17070924	1
	SENSOR POCKET ONLY	COM17002727	2
	SENSOR POCKET CLIP ONLY	COM17001076	2
18	UPPER BAFFLE – MODEL 34	COM17300434	2
	UPPER BAFFLE – MODEL 35	COM17300435	2
	UPPER BAFFLE – MODEL 36 & 37	COM17300437	2
	UPPER BAFFLE – MODEL 38 & 39	COM17300439	2
19	FLUE BOX – MODELS 34, 35, 36, 37 (Ø180mm)	COM17864255	2
19A	FLUE BOX – MODELS 38 & 39 (Ø200mm)	COM17864265	1
20	FLUEWAY CLEANING DOOR – LEFT HAND SIDE	COM17845665	1
20A	FLUEWAY CLEANING DOOR – RIGHT HAND SIDE	COM17845675	1
21	SEALING BRAID	COM17000167	1
22	COMBUSTION CHAMBER DOOR	COM17864279	1
23	COMBUSTION CHAMBER DOOR INSULATION (Internal)	COM17003630	1
	COMBUSTION CHAMBER DOOR INSULATION (Inter)	COM17003631	1
24	COMBUSTION CHAMBER DOOR INSULATION (External)	COM17072173	1
25	SIGHT GLASS FLANGE	COM17845647	1
26	SIGHT GLASS & GASKET	COM17078080	1
27	COMBUSTION CHAMBER DOOR SEAL	COM17000198	1
28	BURNER ADAPTOR PLATE	COM17005802	1
	BURNER ADAPTOR PLATE (SOLID)	COM17075266	1
29	BURNER ADAPTOR PLATE GASKET	COM17003666	1
30	FLUEWAY DOOR	COM17864289	1
31	FLUEWAY DOOR INSULATION (Internal)	COM17003668	1
32	FLUEWAY DOOR INSULATION (External)	COM17072174	1
33	SECTION BLOCK INSULATION BLANKET	COM14931005	
39	CLEANING BRUSH (LENGTH 1760mm)	COM17002005	1
	CLEANING BRUSH (LENGTH 1260mm)	COM17002018	1
42	2" BLANKING PLUG NOT SHOWN		1

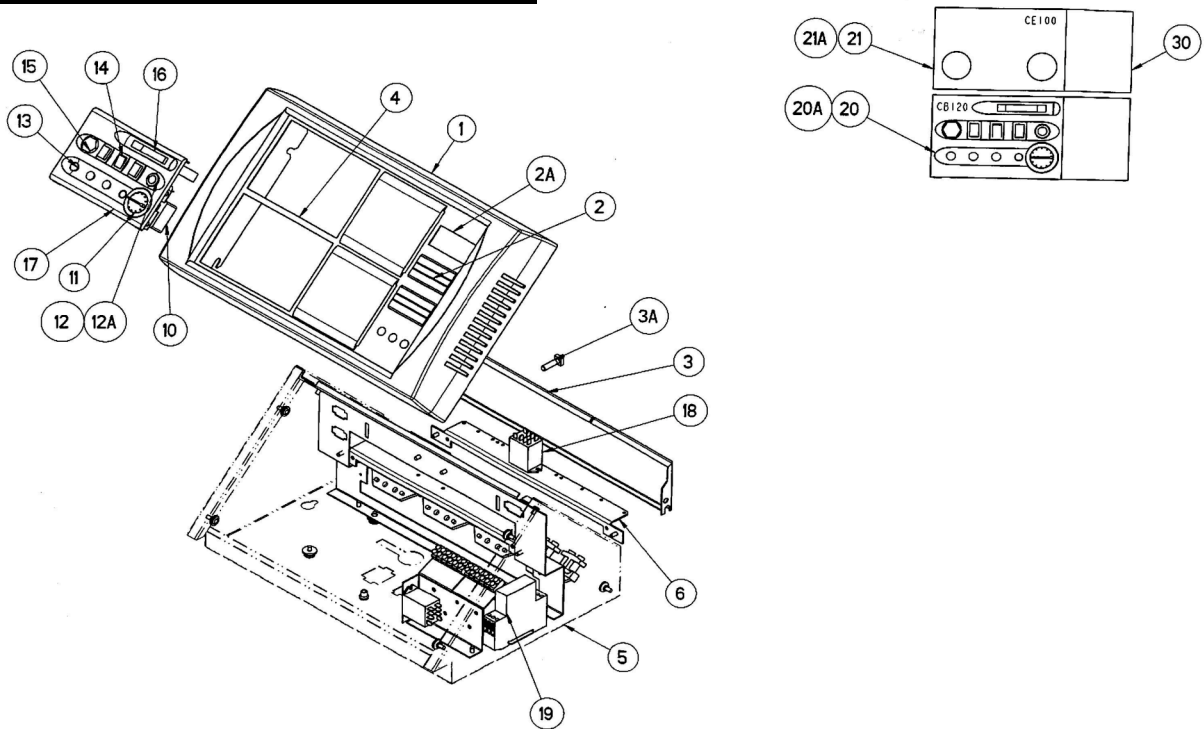
Fig. 22 – Casing Components



NXR3 CASING PARTS LIST (See Fig.22)

ITEM	DESCRIPTION	RED CASING PART NO	WHITE CASING PART NO
50	REAR SPACER	COM17002117	COM17002117
51	REAR CASING – LOWER PANEL	COM17937504	COM17937504
52	CASING SUPPORT BRACKET (FRONT)	COM17937439	COM17937439
53	CASING SUPPORT BRACKET (FRONT)	COM17937364	COM17937364
54	RIGHT HAND SIDE SUPPORT RAIL – MODEL 34	COM17937374	COM17937374
	RIGHT HAND SIDE SUPPORT RAIL – MODEL 35	COM17937384	COM17937384
	RIGHT HAND SIDE SUPPORT RAIL – MODEL 36	COM17937394	COM17937394
	RIGHT HAND SIDE SUPPORT RAIL – MODEL 37	COM17937404	COM17937404
	RIGHT HAND SIDE SUPPORT RAIL – MODEL 38	COM17937414	COM17937414
	RIGHT HAND SIDE SUPPORT RAIL – MODEL 39	COM17937424	COM17937424
55	LEFT HAND SIDE SUPPORT RAIL – MODEL 34	COM17937373	COM17937373
	LEFT HAND SIDE SUPPORT RAIL – MODEL 35	COM17937383	COM17937383
	LEFT HAND SIDE SUPPORT RAIL – MODEL 36	COM17937393	COM17937393
	LEFT HAND SIDE SUPPORT RAIL – MODEL 37	COM17937403	COM17937403
	LEFT HAND SIDE SUPPORT RAIL – MODEL 38	COM17937413	COM17937413
	LEFT HAND SIDE SUPPORT RAIL – MODEL 39	COM17937423	COM17937423
56	LOWER MASK	COM17937586	S134355EE
57	SIDE CASING – RIGHT HAND FRONT (BLACK)	COM17937749	S134321EE
58	SIDE CASING – LEFT HAND FRONT (BLACK)	COM17937748	S134320EE
59	SIDE RESTRAINT (TIE ROD BRACKET)	COM17937454	COM17937454
60	SIDE CASING – RIGHT HAND REAR – MODELS 34 & 37	COM17937789	S506304


ITEM	DESCRIPTION	RED CASING PART NO	WHITE CASING PART NO
60	SIDE CASING – RIGHT HAND REAR – MODELS 35 & 38	COM17937819	S506306
	SIDE CASING – RIGHT HAND REAR – MODELS 36 & 39	COM17937849	S506308
61	SIDE CASING – LEFTT HAND REAR – MODELS 34 & 37	COM17937788	S506305
	SIDE CASING – LEFTT HAND REAR – MODELS 35 & 38	COM17937818	S506307
	SIDE CASING – LEFTT HAND REAR – MODELS 36 & 39	COM17937848	S506309
62	SIDE CASING – MIDDLE – MODELS 37, 38 & 39 ONLY	COM17937499	S506312
63	REAR CASING – TOP PANEL	COM17937514	S501405
64	TOP PANEL FRONT SUPPORT SRTIP	COM17937524	COM17937524
65	TOP CASING – FRONT PANEL	COM17937536	S139165EE
66	TOP CASING – REAR PANEL – MODELS 34 & 37	COM17937546	S120860EE
	TOP CASING – REAR PANEL – MODELS 35 & 38	COM17937556	S120861EE
	TOP CASING – REAR PANEL – MODELS 36 & 39	COM17937566	S120862EE
67	TOP CASING – MIDDLE – MODELS 37, 38 & 39 ONLY	COM17937576	S120997EE
68	FRONT CASING – TOP PANEL	COM17937619	S506636
69	FRONT CASING – LOWER RIGHT	COM17937769	S506302
70	FRONT CASING – LOWER LEFT	COM17937768	S506303
71	MISC CASING FIXINGS (NOT SHOWN)	COM17880141	COM17880141
80	INSTRUMENT PANEL	COM17204280	-
81	MAGNET FASTNER	COM17002395	COM17002395
-	POTTERTON NXR3 BADGE (NOT SHOWN)	-	S139050

Fig. 23 – Instrument Panel Components**NXR3 INSTRUMENT PANEL COMPONENTS LIST (See Fig. 23)**

ITEM	DESCRIPTION	QTY	PART NO
1	Front Panel	1	S137535
1a	Front Panel Cover (Not Shown)	1	S139461
2	Hours Run Meter	1	S17001213
2a	Flue Gas Thermometer	1	S17006951
2b	Hours Run Cabling (Not Shown)	1	S139461
3	Rear Panel	1	S137874A
3a	Bolt DZUS	1	S504314
4	Front Panel Support	1	S137873H
5	Control Panel Casing	1	S504313
6	Cable Terminal Support	1	S136979
10	Thermostat TXA4C 019	1	S17007004
11	Thermostat Lever	1	S17004738
12	Fuse Support	1	S15803999
12a	Fuse TFS 5 x 20 6.3A	1	S15803525
13	Bag of Lights	1	S501970
14	Bag of Switches	1	S503081
15	Thermostat TG400 Cap.2m	1	S17006955
16	Thermometer 68.5 x 14.5 0-120°	1	S134421
17	CB120 Module Front Panel	1	S137158
19	Relay LY2F 220AC	1	S15815049
19a	Alarm Relay	1	S137003
20	Basic CB 129 Module Assembly	1	S137157
20A	Basic CB 120 Module Wiring	1	S136811
21	CE 100 Module Assembly	1	S137160
21A	CE 100 Module Wiring	1	S136412
30	Mask G.M.AVA 30.200/109	1	S17000983

COMMISSIONING REPORT

ALL BOILER TYPES

 Wood Lane, Erdington, Birmingham, B24 9QP. Tel: (08706) 050607 Fax: (08706) 001516	REPORT SENT TO INSTALLER:	YES		NO	
	SITE VISIT (<i>Italics</i>)		COMMISSIONING		
(Office use Only)					
DATE:					
SIGNATURE:					
REPORT No:	INSTALLER NAME & ADDRESS:				
SITE ADDRESS:				
.....				
.....				
COMMISSIONING/SITE VISIT DATE:					

1.0	BOILER						
1.1	Type:						
1.2	No. of Sections:		Boiler N°/Position				
1.3	Serial No.						
1.4	Fuel:	N/Gas	LPG	Class C	Class D		
2.0	BURNER/CONTROLS						
2.1	Type:	Atmospheric	Pre-Mix	Pressure Jet			
2.2	Ionisation Probe:	UV Cell	Thermocouple				
2.3 ^P	Make/Model:						
2.4 ^P	Serial N°:						
2.5 ^P	Spec N°:						
2.6	Control Box Type:						
2.7	Electrical Supply:						
2.8	Main Gas Valve Type & Size:						
2.9	Pilot Gas Valve Type & Size:						
2.10	Gas Booster Type & Size:						
2.11	Gas Booster Serial No:						
3.0	BURNER SETTINGS						
3.1	Main Burner Injector Size				mm		
3.2	Pilot Burner Injector Size				mm		
3.3	Electrode/Ionisation Setting (to manufacturers instructions)						
3.4	Are Burners & Injectors Clean						
3.5 ^o	Oil Nozzles: High Fire				Size: Type:		
	Low Fire				Size: Type:		
4.0	PRE-COMMISSIONING CHECKS (See Notes)				Yes	No	N/A
4.1	Is boiler house ventilation as per the relevant B.S.						
4.2	Electricity supply fused, isolated & earth wire connected.						
4.3	Check external controls allow operation						
4.4	Check boiler/system filled and pumps operational & any isolation valves open						
4.5	Check gas available at burner						
4.6 ^o	Check oil available at burner						
4.7	Check gas meter fitted & sized adequately						
5.0	FLUE SYSTEM CHECKS				Yes	No	N/A
5.1	Flue Type	Conventional					
		Room Sealed					
		Fan Dilution System					
		Balanced Compartment					
		Plant Room Door Interlocked					
5.2	Draught Stabiliser Fitted						
5.3	Is Flue System Clear						
5.4	Flue Header Diameter					mm	
5.5	Stack Diameter					mm	
5.6	Flue Type & Diameter Of Connection To Boiler:-						
	TYPE...../DIAMETER(mm).						
	Where appropriate and for multi boiler installations sketch details of flue system showing length of runs and diameter						
Approximate Overall Height.....m							

6.0	COMBUSTION	Pilot	Low	High	Unit	
6.1	Inlet Gas Supply Pressure (All Boilers running)				mbar	
6.2	Burner Pressure				mbar	
6.3	Gas Rate				m ³ /hr	
6.4 ^o	Oil Pump Pressure				Bar	
6.5*	Ionisation Probe Current				µA	
6.6 ^{op}	Air Shutter Position				----	
6.7	O ₂				%	
6.8	CO ₂				%	
6.9	CO				ppm	
6.10 ^o	Smoke Number				-	
6.11	Nett Flue Gas Temperature				°C	
6.12	Flue Draught				mmwg	
6.13	CO² At Flue Dilution Outlet				%	
6.14	Burner Fan Static Pressure				mmwg	
6.15	Combustion Chamber Resistance				mmwg	
7.0	OPERATIONAL SAFETY CHECKS					
7.1	Check Control Thermostat Operation					
7.2	Check Limit Thermostat Operation					
7.3	Check High/Low Thermostat Operation					
7.4	Check For Gas Leaks					
7.5	Check For Gas Leakage Past Valve Assembly					
7.6 ^o	Check For Oil Leaks					
7.7*	Check Boiler Locks Out On Loss Of Flame Signal					
7.8	Check boiler Locks Out On Air Pressure Switch Operation					
7.9	Check Boiler Inhibits On Gas Inlet Pressure Switch					
7.10	Boiler Locks Out On All Other Safety Functions					
7.11	Check For Flue Spillage					
7.12 ^s	Check Thermocouple Operation					
7.13 ^s	Check Thermocouple Interrupter Operation					
7.14	Check Gas Booster Interlock Operational					
7.15	Record Booster INLET and OUTLET Pressure Switch Settings:-					
	INLET OUTLET.....					
7.16	Record Burner/ Boiler INLET and OUTLET Pressure Switch Settings:-					
	INLET OUTLET.....					
8.0	BOILER/SYSTEM CHECK LIST					
8.1	Control Thermostat Setting				°C	
8.2	High/Low Thermostat Setting				°C	
8.3	Boiler Water Pressure					
8.4	Are Pipework Connections As Per Manual					
8.5	Is Safety Valve Fitted					
	If So, SIZE & MAKE:-.....					
PRESSURE RATING.....						
8.6	Are Water Isolating Valves Fitted			YES	NO	
8.7	Are Water Flow Switches Fitted					
8.8	Are Return Water Shut Off Or Diverter Valves Fitted					
8.9	Is Shunt Pump Fitted					
8.10	Is Pump Overrun Fitted					
SYSTEM WATER QUALITY						
8.11 ^c	PH Value				pH	
8.12	TDS				PPM	

COMMISSIONING REPORT (Continued)

		Yes	No	N/A
8.13	Is The Fan Interlocked With The Boiler?			
8.14	Are Flue Dampers Fitted?			
	If So Are They Interlocked?			
8.15	Fan Assisted Ventilation?			
	If So Interlocked			
8.16	Any Evidence Of Condensate Formation?			
8.17 c	Any Evidence Of Condensate Leakage?			
8.18	Any Evidence Of Water Leakage?			
8.19	Any Evidence Of Flue Gas Leakage?			
8.20	Has Boiler Been Built And Cased Correctly?			
8.21	Is Gas Service Cock Installed?			
	If So Is It Accessible?			
8.22	Is Oil Filter Fitted?			
8.23	Is Fire Valve Fitted?			
8.24	Oil Supply:			
	Single Pipe			
	Two Pipe			
	Ring Main			
9.0	NOTES & COMMENTS BY COMMISSIONING ENGINEER			

10.0	Comments On Accessibility For Maintenance

FINDINGS		
	YES	NO
Is The Installation Safe For Use?		
If The Answer Is NO Has A Warning Label Been Raised?		
Is Any Remedial Work Required?		
Have Warning Labels Been Fitted?		
Has RIDDOR Form Been Raised?		
CUSTOMER SIGNATURE:-		
PRINT NAME:-		
DATE:-		
ENGINEER DETAILS		
NAME		
COMPANY		
SIGNATURE	DATE	

NOTE: 6.7, 6.8 & 6.9 to be measured in secondary flue 600mm up from the flue socket or at the sampling point provided. Normally 6.12 and 6.14 are recorded when tappings provided. Position of measurement to be in accordance with boiler and/or burner manufacturers instructions.

- * Fully Electric Boilers
- \$ Thermo-Electric Boilers
- c Condensing Boilers
- p Pressure Jet
- o Oil

Items in **italics** are MANDATORY

Note: It is the installer's responsibility to ensure that the boiler is correctly commissioned by a competent engineer and that this report is completed as a permanent record. A commissioning service is available from Potterton Commercial at the address listed on the back page of this manual. When a Potterton Commercial engineer commissions the boiler this commissioning report will be filled in and left with the boiler. Commissioning by Potterton Commercial engineers is restricted to equipment of our supply. No responsibility will be accepted for the on site assembly or installation of the equipment unless specifically carried out by Potterton Commercial. The installer must ensure that the boiler is installed in accordance with the manufacturer's instructions and all relevant B.S. Codes of Practice and Regulation (see manufacturers instructions for full details).

CONVERSION CHART

	<u>IMPERIAL TO METRIC</u>	<u>METRIC TO IMPERIAL</u>
<u>HEAT</u> 1 Therm = 100,000 Btu/hr	1 Btu/hr = 0.2931 W 1 Btu = 1055 J 1 Btu/hr = 0.252 kcal/hr	1 kW = 3412 Btu/hr 1 J = 0.0009478 Btu 1 kcal/hr = 3.968 Btu/hr
<u>FUEL CONSUMPTION</u> 1 dm ³ = 1 LITRE 1,000 dm ³ = 1m ³	1 ft ³ = 28.317 dm ³ (litre) 1 UK Gall = 4.546 litre 1 UK Gall = 1.2 U.S. Gallon	1 m ³ = 35.3147 ft ³ 1 litre = 0.2199 Imp. Gallon
<u>PRESSURE</u> 1 PSI = 2.307 FT 1 kPa = 1000 Pa 1 bar = 1000 mbar = 100 kPa	1 lb/in ² = 6895 Pa 1 lb/in ² = 68.95 mbar 1 in.w.g. = 249.1 Pa 1 in.w.g. = 2.491 mbar 1 in.w.g. = 25.4 mm.w.g.	1 bar = 33.45 ft.w.g. 1 kPa = 0.3345 ft.w.g. 1 bar = 14.5 lb/in ² 1 Pa = 0.3858 in.w.g. 1 mm.w.g. = 0.0394 in.w.g. 1 mm.w.g. = 9.8 Pa
<u>LENGTH</u> 1m = 1000mm	1 inch = 25.4mm 1 ft = 0.3048 m 1 yard = 0.9144 m 1 mile = 1.609 km	1 mm = 0.03937 in 1 m = 3.281 ft 1 m = 1.094 yard 1 km = 0.6214 mile
<u>VOLUME</u>	1 ft ³ = 0.02832 m ³ 1 ft ³ = 28.32 litre	1 m ³ = 35.3147 ft ³ 1 litre = 0.03531 ft ³
<u>AREA</u>	1 in ² = 645.2 mm ² 1 in ² = 6.452 cm ² 1 ft ² = 929 cm ² 1 ft ² = 0.0929 m ²	1 mm ² = 0.00155 in ² 1 cm ² = 0.155 in ² 1 m ² = 1550 in ² 1 m ² = 10.76 ft ²
<u>FLOW RATE</u> 1 kg/sec = 1 lit/sec @ 0°C reference temperature	1 gall/min = 0.07577 lit/sec 1 ft ³ /min = 0.4719 lit/sec 1 ft ³ /min = 0.00047 m ³ /sec	1 lit/sec = 13.2 gall/min 1 lit/sec = 2.119 ft ³ /min 1 m ³ /sec = 2119 ft ³ /min
<u>TEMPERATURE</u>	°F to °C = ("X"°F - 32) x 0.5556	°C to °F = ("X" °C x 1.8) + 32
<u>TEMPERATURE DIFFERENCE</u> 1°C = 1°K	"X"°F x 0.5556 = °C	"X" °C x 1.8 = °F
<u>WEIGHT</u>	1 lb = 0.4536 kg 1 cwt = 50.8 kg 1 ton = 1016 kg	1 kg = 2.205 lb 1 tonne = 0.9842 ton 1 tonne = 2204.6 lb

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e-mail: potterton.commercial@baxigroup.com
web site: www.pottertoncommercial.co.uk

Spares

Potterton Commercial spares are available nationwide through the **Interpart** network of approved stockists. Alternatively please contact:

Interpart
Brooks House
Coventry Road
Warwick
CV34 4LL

Tel: (08706) 000454
Fax: (08706) 000545

Applications and Installations

Our experienced technical and applications team are available to offer advice on any aspect of heating system design and boiler installation.

Commercial Service

Our service organisation covers the whole of the U.K. to look after your needs for all Potterton Commercial products. We are also able to offer our services for other manufacturers products.

Our service department offers a wide range of specialised services including:

- Boiler Site Assembly
- Burner Commissioning for all Fuels
- Boiler Maintenance & Maintenance Contracts
- Breakdown & Repair Services
- Boiler Dismantling & Re-Jointing
- Burner & Boiler Replacement
- Oil/Gas Conversions
- System Conditioning
- Water Treatment & Descaling
- Packaged Units

All descriptions and illustrations contained in this leaflet have been carefully prepared but we reserve the right to make changes and improvements in our products which may affect the accuracy of the information contained in this leaflet.

POTTERTON
C O M M E R C I A L

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