

RAPIDO f210

INSTALLATION, OPERATION & MAINTENANCE MANUAL



APRIL 2003

POTTERTON
COMMERCIAL

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Fig.1 – General Data and Dimensions

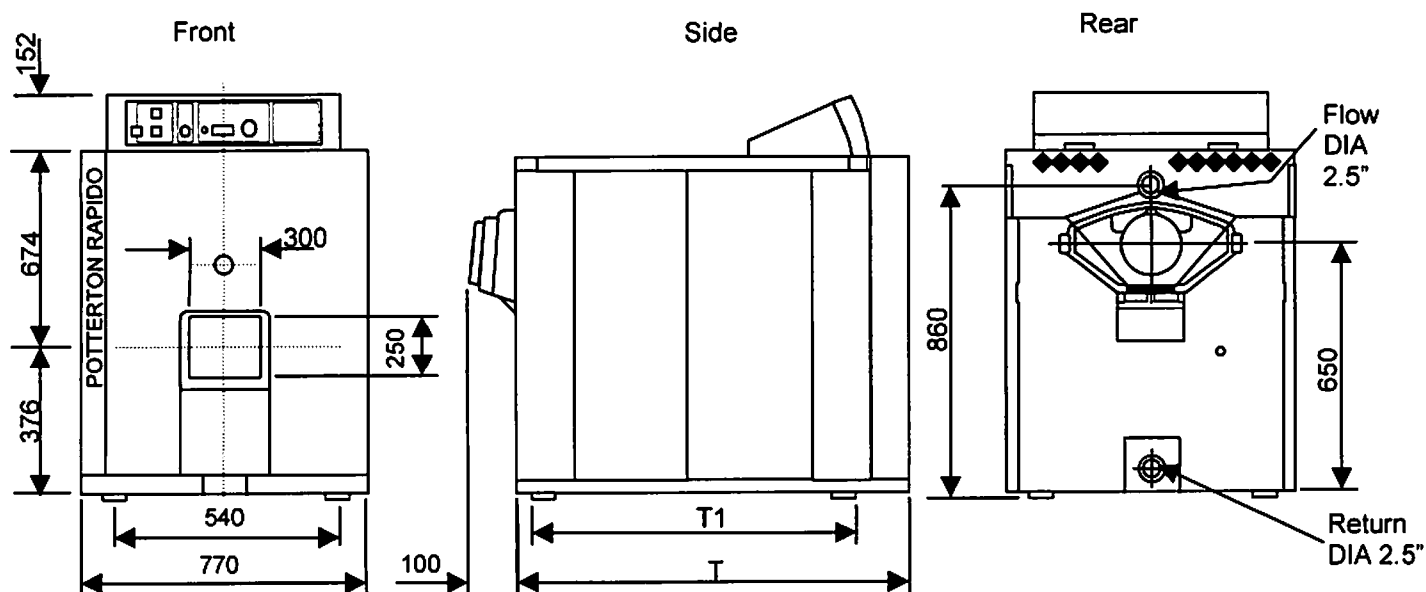


Table 1 – Boiler Dimensions

No of Sections		5	6	7	8	9	10	11	12
D (Diameter)	mm	180				225			
T1 (Length)	mm	580	710	840	970	1100	1230	1360	1490
T (Length)	mm	835	965	1095	1225	1335	1485	1615	1745

Fig.2 – Flue Spigot

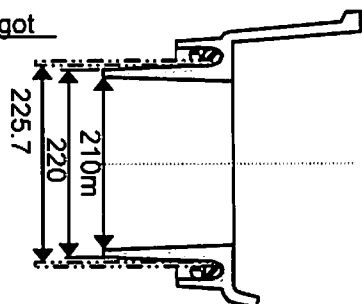


Table 2 Combustion Chamber Data

Combustion Chamber Data		5	6	7	8	9	10	11	12
Model									
Mean Diameter	mm	420							
Cross Sectional Area	m ²	0.513							
Length (X)	mm	565	615	825	955	1085	1215	1345	1475
Volume	m ³	0.08	0.09	0.11	0.13	0.15	0.17	0.19	0.20
Surface Area	m ²	5.7	6.28	6.87	7.45	8.04	8.62	9.21	9.79
Resistance	mm	0.05	0.10	0.15	0.24	0.33	0.44	0.55	0.68
Flue Gas Temperature (Gross)	°C	220							
Efficiency (Nett)	%	92							
(Gross)	%	82							
Percentage CO2	Oil	12							
	Gas	9							
Heat Release	kW/ m ²	20.31	22.32	23.96	26.19	28	30.42	32.43	34.88

Table 3 – Technical Data

Number of Sections			5	6	7	8	9	10	11	12	
CE Number			0085AQ1191								
Output			kW	95	115	135	160	185	215	245	280
Fuel	Gas	m ³ /hr	10.8	13.1	15.3	18.2	21	24.5	27.9	31.9	
Consumption	Oil	lit/hr	10.7	12.9	15.2	18	20.8	24.2	27.6	31.6	
Input (Gross)	Gas	kw	115.8	140.2	164.6	195.1	225.2	262.2	298.7	341.5	
	Oil	kW	115.6	139.4	164.2	194.5	224.8	261.5	298.2	341.5	
Input (Net)	Gas	kW	104.3	126.6	147.8	175.8	202.9	236.6	269.5	308.2	
	Oil	kW	108.5	130.8	154.1	182.5	210.8	245.4	279.8	320.3	
Maximum Design Pressure			Bar	4 Bar All Models							
Minimum Operating Pressure			Bar	0.3 Bar All Models							
Nominal Flue Connection Size				180 mm dia.				225 mm dia.			
Flue Gas Volume			m ³ /hr	142	172	201	239	275	321	366	418
Flue Draught Requirements				0 - 4 mm All Models							
High Level Natural Ventilation to BS6644			cm ²	395	450	505	574	642	724	807	903
Low Level Natural Ventilation to BS6644			cm ²	791	901	1010	1148	1285	1449	1614	1806
Mechanical Inlet to BS6644			m ³ /sec	0.104	0.126	0.148	0.175	0.203	0.236	0.269	0.307
Water Connection Size			BSP	2.5"							
Minimum Water Flow at 25°C Δ t			lit/sec	0.9	1.1	1.28	1.52	1.76	2.04	2.33	2.66
Water Flow at 11°C Δ t			lit/sec	2	2.5	2.9	3.4	4	4.6	5.3	6
Hydraulic Resistance at 11°C Δ t			IPa	1.56	2.28	3.12	4.12	5.25	6.85	8.67	10.71
Cold Feed Size to BS 6644 Minimum Bore			mm	25		32				38	
Open Vent Size to BS 6644 Minimum Bore			mm	32		38				50	
Safety Valve Size to BS6644 Nominal Size			mm	19					25		
Maximum Flow Temperature			°C	90°C							
Minimum Return Temperature			°C	55°C							
Dry Weight			kg	470	540	610	665	735	805	875	945
Water Content			kg	73	88	103	118	133	148	163	178
Power Requirements				Standard 240V 1Ph – See Burner Card For Running Currents							
Gas Supply Supply mbar			Min Max	17 25							
Oil Supply bar			Min Max	0 0.69							
Efficiency			Net	90							

1. FUEL CONSUMPTION

Gas fuel consumption is based on natural gas with a gross calorific value of 38.6 MJ/m³,

Oil fuel consumption is based on Class D (35 second) gas oil with a gross calorific value of 45.5 MJ/kg, Kerosine has a C.V. of 46.5 MJ/lit.

NOTE: The fuel and heat inputs are maximum values and may be reduced during commissioning to achieve the stated heat output depending on operating efficiency measured.

2. MINIMUM OPERATING PRESSURE

This is the minimum operating pressure of the boiler 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 Table 1, page 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 220°C (gross) at CO₂ levels of 9% and 12% respectively on gas and oil.

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. WATER CONNECTION SIZES

The boiler water connections are flanged with 2.5" BSP screwed counter flanges provided.

8. WATER FLOW RATES

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

9. COLD FEED/OPEN VENT/SAFETY VALVE SIZES

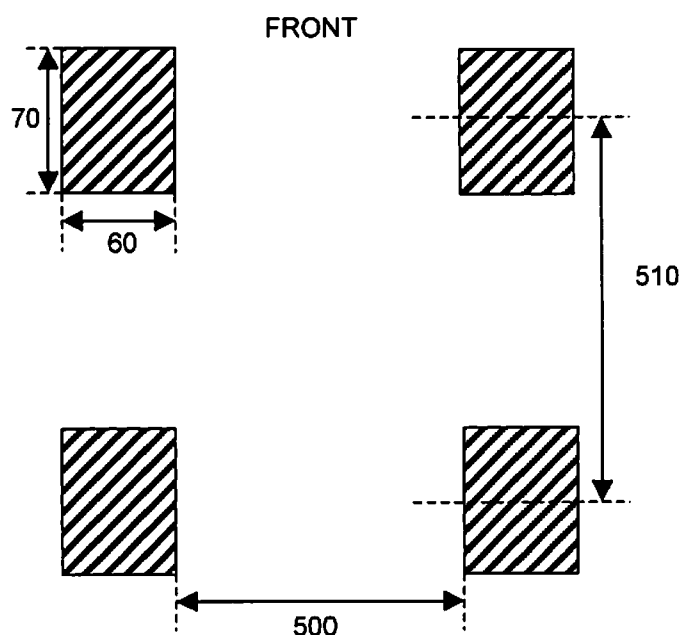
Sizes indicated are minimum sizes for single boiler installations.

10. MINIMUM RETURN TEMPERATURE

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

11. WEIGHT

The dry weight is exclusive of the burner and gas train, see burner card for relevant burner weights. Each section measure approximately 613 mm x 130 mm x 905 mm and the weights are 77 Kg (front and inters) 92 kg (rear).

Fig. 3 – Boiler Feet Details

Feet details shown are for a 5-section boiler. For larger models additional intermediate section feet are added on 130mm spacing.

CLEARANCES

The minimum boiler room clearances for access, erection and maintenance are as follows: -

REAR - 750mm or sufficient to make flue and water connections.

SIDES - 300mm + burner projection on one side, 500mm on the other side.

FRONT - The length of the boiler to allow for cleaning, 1100mm minimum.

BURNER INFORMATION

For general dimensions and specification see Potterton F210 burner data sheets. These publications are enclosed with the burners and also available from the Sales & Administration office (address on back page).

The burner should be fitted in accordance with the instructions in section 4.

The burner unit should be commissioned in accordance with the manufacturers instructions supplied with the burner to obtain the combustion figures see section 5. Burner commissioning requires specialist knowledge and equipment, we therefore strongly recommend that the services of the Potterton Service Department should be used

SPARGE PIPE DETAIL

Table 4 – Sparge Pipe Dimensions

No. of Sections		5	6	7	8	9	10	11	12
Total Length mm		595	725	855	985	1115	1245	1375	1505
Length A	mm	-	-	510	510	510	510	510	510
Length B	mm	-	-	345	475	605	735	520	520
Length C	mm	-	-	-	-	-	-	345	475
Diameter of Holes	mm	14.5	14.5	14	12	11	10.5	10	10

Fig 4 – Sparge Pipe Configuration

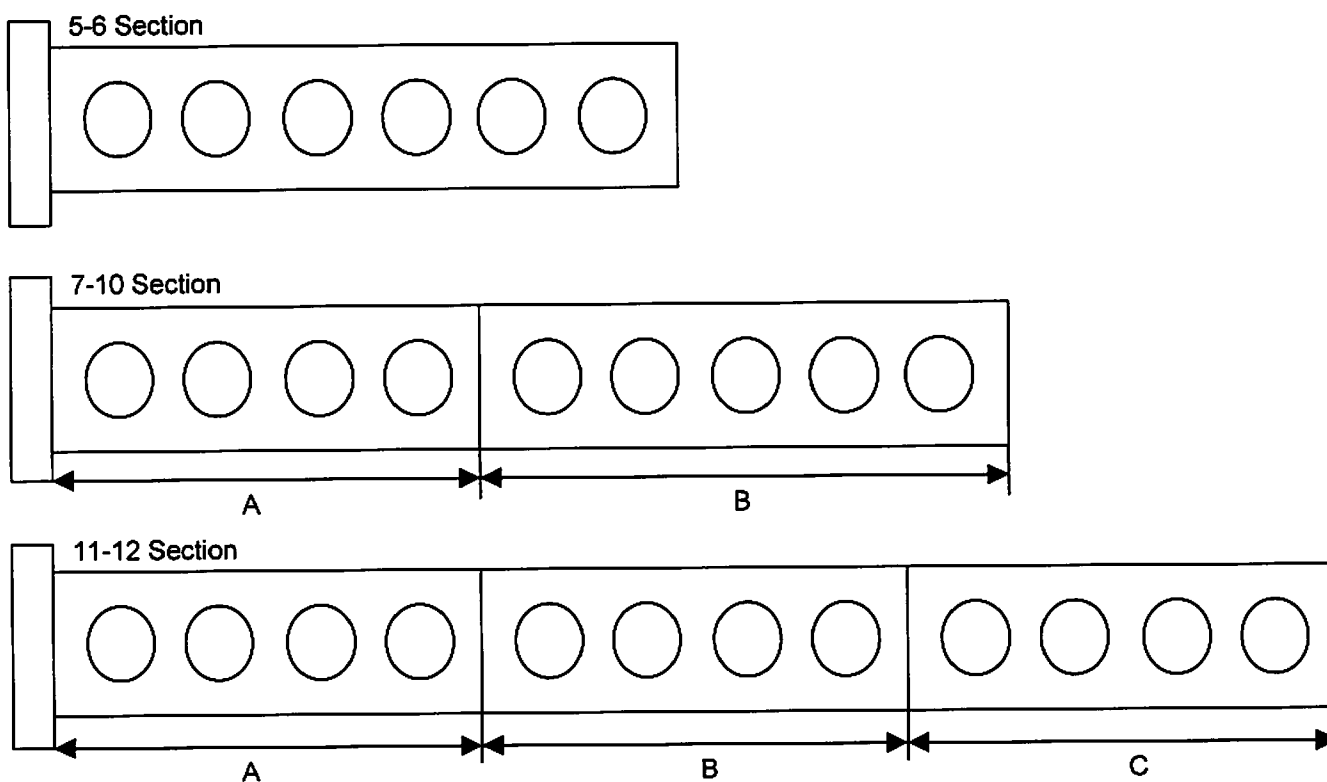
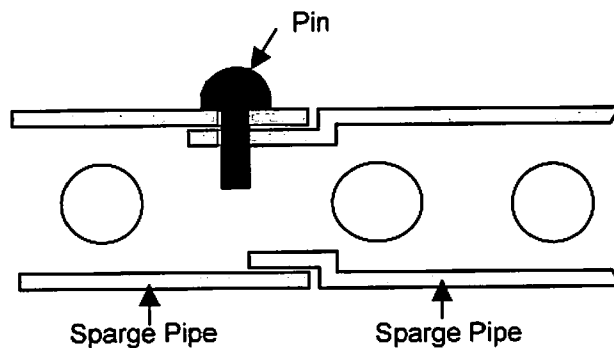


Fig.5 – Sparge Pipe Jointing



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 F210 is a cast iron sectional boiler available in outputs from 95kW (5-section model) to 280Kw (12-section model). The heat transfer surfaces of the F210 have been specially designed to maximise the boiler efficiency and the combustion chamber capacity ensures environmentally sound combustion reducing CO and Nox emissions. Specially designed and prewired control panels allow full boiler control.

The boiler has match tested package burner, available to Natural Gas, LPH, 35 Second and 28 Second Oil. The package burner is supported by the front water section to which is supported by the front waterway section to which it is attached by hinges on one side and locking nuts on the other. Hinge points are interchangeable allowing for left or right hand door opening by turning the door assembly through 180° at erection stage.

The F210 is suitable for use on fully pumped open vented systems or a sealed system with a maximum design pressure of 4-bar (60 p.s.i.).

The F210 boiler is an overpressure type with 3-pass reverse flame design. The first two passes are in the combustion chamber, the third 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 F210 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&E3 and the burners EN767.

The waterway sections are joined by steel taper nipples and secured with tie rods. The combustion chamber is sealed by ceramic fibre rope.

The powder coated mild steel casings have an 80-mm fibre wrap around the castings, thus reducing fuel consumption and emissions.

The F210 is supplied unassembled.

Standard Supply

- Sections
- Cleaning Tools
- Casing
- Control Panel
- Burner

Controls

The F210 range is supplied as standard with an integral control panel, which is fitted with, control thermostat, high/low thermostat, thermometer and burner on/off switch.

A 240V single phase supply is taken to the control panel. A 415V three phase supply should be taken to the burner motor connections.

Option Extras

- Volt free contacts

Shipping – Packaging

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

It is recommended that the manufacturer's trained engineers should carry out erection and commissioning, as this will make valid the LIFETIME GUARANTEE, details on the rear of this manual.

Installation

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

Any persons 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 qualified to A.C.O.P's element 16. Also they must be electrically competent and adhere to the IEE regulations.

Manual Handling – Any persons or person 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 and Safety at Work Act 1974.

Building Regulations 1991.

Electricity at Work Regulations 1989.

Management of H & S at Work Regulations 1992.

Manual Handling Regulations 1992.

Model Water By-Laws 1986.

BS 7671: 1992 – Requirements for Electrical Installations, IEE Wiring Regulations 16th Edition.

BS 6644: 1991 – Installation of Gas Fired Hot Water Boilers for Inputs between 60kW and 2MW.

BS 7074: 1989 – Part 2 – Application Selection and Installation of Expansion Vessels and Ancillary Equipment for Sealed Water Systems.

BS 6880: 1988 – Codes of Practice for Low Temperature Hot Water Systems.

BS 779: 1989 – Cast Iron Boilers for Central Heating and Indirect Hot Water Supply (Rated Output 44kW and above).

CP 342.2 – Centralised Hot Water Supply

Gas Safety (Installation & Use) Regulations 1994.

IM/11 Flues for Commercial and Industrial Gas Fired Boilers and Air Heaters.

IGE/UP/1 – Soundness Testing & Purging Procedure for Non-domestic Installations.

IGE/UP/2 – Gas Installation Pipework, Boosters and Compressors for Industrial and Commercial Premises.

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

Boiler Siting and Base.

The boiler should be sited in accordance with BS 6644: 1991 with respect to protecting the boiler from damage, air for combustion, clearances for service and access, temperature, 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 technical data table, together with any additional weight bearing down on the base from connections, burner etc., must be provided. This should be of an adequate height of the floor so as to be raised in case of flooding, but also low enough to allow ease of erection. This should be typically a 50 mm concrete plinth with an area equal to that of the plan of the boiler.

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 1992.

Before any work takes place Risk Assessments should be carried out, to determine what possible risks are associated with the work which is taking place.

LPG boilers should not be installed in basements/below ground or in a well.

For further advice on Installations, refer to Technical Bulletins 1 - 4.

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: 1991. 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 boilers installations, shall be capable of the complete evacuation of combustion products at all times. The effective height of the chimney terminal(s) above boiler(s) flue outlet(s) shall ensure sufficient buoyancy to overcome the resistance of the bends, tees and runs of the flue pipe installed 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: 1991 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 Potterton Technical Bulletin No.4, current issue or see relevant British Standard publication BS6644: 1991.

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: 1991.

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. For further information on water circulation systems see Potterton Technical Bulletin No. 1 current issue.

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.15, 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).

IMPORTANT: The water level in the cistern or expansion tank should be minimal on cold charge to allow expansion without discharge from the overflow between cold and hot operating conditions.

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: 1991 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.

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 92 kg and measures 613mm x 130mm x 905mm. 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.

Before commencing erection ensure that all parts shown on the packing list are on site.

ERECTION PROCEDURE

WARNING: THE SECTIONS ARE NOT SELF-SUPPORTING UNTIL SEVERAL SECTIONS HAVE BEEN ASSEMBLED TOGETHER. THEREFORE WHEN STARTING TO BUILD THE BOILER THE REAR SECTION AND ADJACENT INTERMEDIATE SECTIONS SHOULD BE ADEQUATELY SUPPORTED TO PREVENT INJURY OR DAMAGE.

Waterways

1. Stand the rear section upright and prop it up with a block of wood with the two water connection flanges facing to the rear.
2. Thoroughly clean the nipples and the nipple sockets. Remove any rough burrs with a file if necessary taking care not to damage the nipple bearing faces. Wipe both nipples and nipple sockets clean and apply the nipple compound (Bosswhite) to the outside face of each nipple and insert into the top and bottom nipple sockets on the rear section.
3. Apply a bead of sealing adhesive (Reda) in the outer groove around the section and apply the ceramic rope into the grooves, see Fig.6.
4. Clean the nipple sockets on both faces of the first intermediate section as described in 2 above.
5. Position the intermediate section adjacent to the rear section and engage the upper nipple socket on to the nipple already fitted to the rear section then gently engage the lower socket over the lower nipple (a flat bar under the section may have to be used to engage the lower nipple in the socket). Ensure sections are installed the correct way round.

The nipples should fit sufficiently into the nipple sockets to support the intermediate section.
6. Insert the assembly rods through each of the top and bottom nipple sockets and fit nuts and clamps where they protrude at the rear of the boiler. The rear projection should be no more than 150mm (6").
7. Fit the clamp and nuts to the other end of the assembly rod and screw down until they tighten against the clamp which in turn tightens against the intermediate section, see Fig 7.
The final tightening to pull the two sections

together must be done evenly so that uniform pressure is applied to the nipples and the section faces remain parallel. Tighten sufficiently so that there is a metal to metal contact between the sections. This can be achieved without straining on the assembly tools.

WARNING: WHEN TIGHTENING THE ASSEMBLY RODS DO NOT STAND DIRECTLY IN FRONT OF THE NUT OR AT THE REAR OF THE BOILER. THIS IS ESPECIALLY IMPORTANT WHEN TIGHTENING THE FINAL SECTIONS.

8. Smooth over any of the adhesive sealing compound that has squeezed out from between the sections. This will have to be repeated after tightening of each section in turn. It is essential that there are no leaks from the flue gas side.
 9. Check that the two sections are upright and that the rear section is aligned with the flow/return pipework and flue system where applicable.
 10. Unscrew the assembly nuts and withdraw the rods from the top and bottom nipple sockets.
 11. Prepare the next intermediate section as before and then position against the already assembled sections and locate as previously described.
- NOTE:** ENSURE THAT THE NIPPLES AND SOCKETS ARE CLEAR OF BURRS AND ARE ADEQUATELY COATED WITH NIPPLE COMPOUND (BOSSWHITE). SIMILARLY IT IS ESSENTIAL TO CORRECTLY FIT THE ROPE FLUE GAS SEAL, INCORRECT FITTING WILL MEAN A STRIP DOWN AND REBUILD.
12. Always erect and tighten one section at a time taking care to tighten evenly. Pulling up more than one section is NOT recommended.
 13. The front section is fitted in the same way as the intermediate sections.
 14. When all sections have been erected and the assembly rods have been withdrawn, the tie bars are fitted. These are located one at the top and one at the bottom of the boiler section block next to the nipple ports.

Fig. 6 – Section Sealing

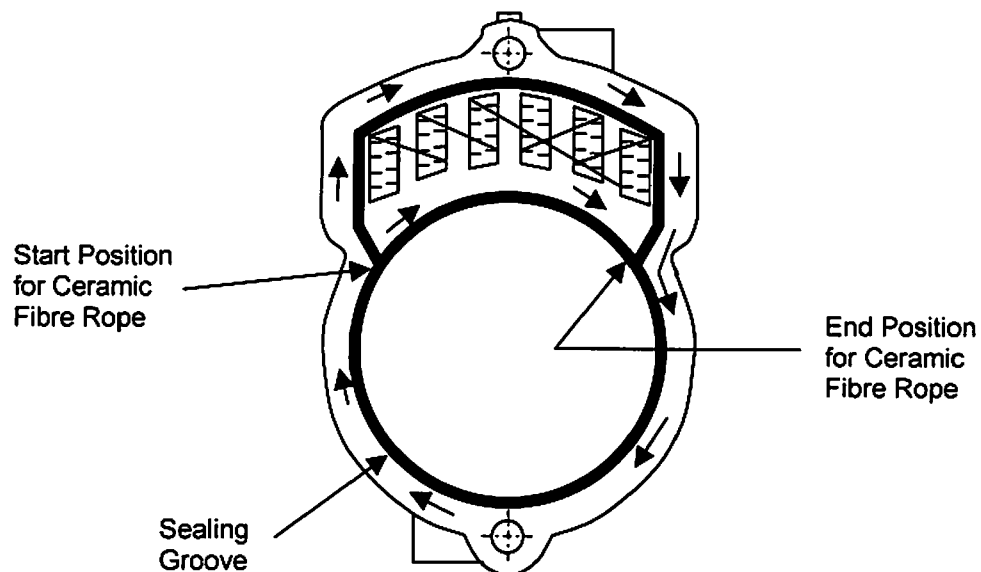
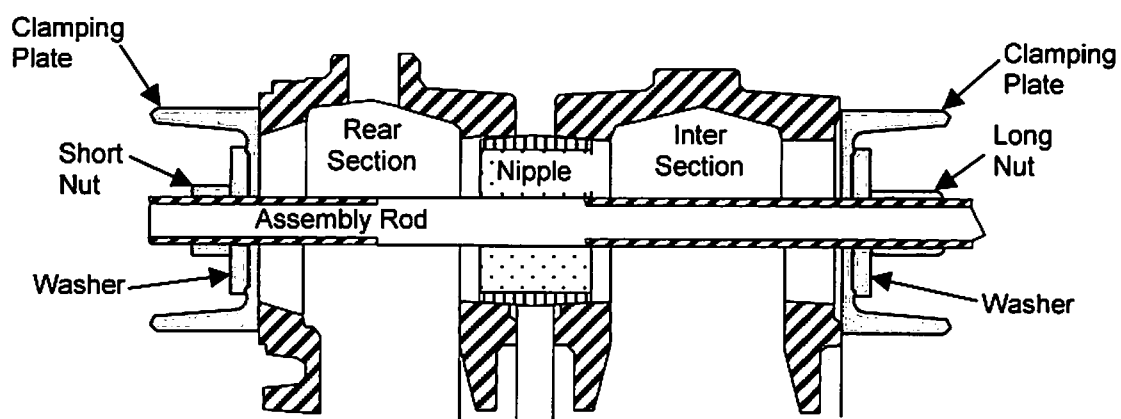


Fig.7 – Assembly Rod



Pass the rods through the lugs on the front and rear sections and secure with the nuts and washers provided. Tightening of the rods is usually carried out from the front of the boiler once the two nuts at the rear have been tightened.

CAUTION: IT IS ESSENTIAL TO TIGHTEN THE RODS PROGRESSIVELY IN SEQUENCE TO ENSURE EVEN TIGHTENING. A TORQUE WRENCH, ALTHOUGH NOT ESSENTIAL, WILL ENSURE EVEN TIGHTENING OF THE RODS AND A MAXIMUM TORQUE OF 80 Nm (60 lb/ft) SHOULD BE APPLIED. DO NOT STRAIN OR OVERTIGHTEN.

15. When the boiler has been erected and the tie rods fitted check to ensure that all sections are sealed and the boiler is level. Position a spirit level on the rods to check this.

BOILER DISMANTLING

IMPORTANT: THE BOILER SECTIONS ARE NOT SELF SUPPORTING PARTICULARLY WHEN THERE ARE ONLY TWO OR THREE SECTIONS LEFT IN SITU. THEREFORE DURING DISMANTLING THE SECTIONS SHOULD BE SUPPORTED TO PREVENT INJURY TO OPERATIVES.

Dismantling of the boiler is a reversal of the erection procedure as detailed on page 12. Care should be taken during dismantling due to the weight of the sections and should be carried out by two operators one section at a time.

BOILER DOOR

The door can be fitted on the left or right hand side as necessary.

1. On the front section there are four lugs provided for the door to be fixed to.
2. Take two hinge pins and thread an M12 nut and washer onto the door hinge thread and then pass it through the lugs. From the front of the boiler fit the door onto the hinges with the fixing pins provided.
3. Take the M12 pins and place these through the lugs with the thread protruding through the front section. Secure using M12 nuts and washers.
4. Close the door and tighten the nuts and washers until the door is sealed.

SPARGE PIPE

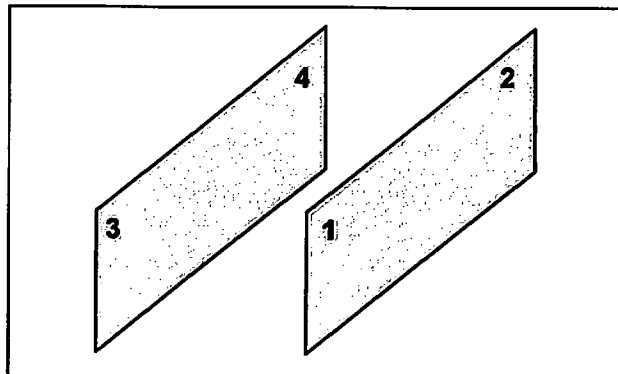
1. Fit four M12 x 35mm (1.5") studs into the four tapped holes adjacent to the flow and return tapings at the top and bottom of the rear section.
2. Insert the sparge pipe into the return tapping taking care that the holes in the sparge pipe run along the side of the pipe (not along the top or bottom). The gasket supplied should be fitted between the rear section and the sparge pipe flange.
3. Fit the screwed counterflange and gasket using the M12 nuts and washers provided.
4. Fit the counterflange and gasket on the flow connection in the same way.
5. On larger size boilers the sparge pipe is supplied in either two or three pieces, which should be connected using the pins provided, see Fig.5, page 5.

BAFFLE PLATES

Baffles are only fitted on the 5, 6 and 7 section boilers.

1. Insert the flue baffles according to Fig 8 below with the numbers on the baffles corresponding to those on the sections, i.e. 1 to 1, 3 to 3, etc.
2. The number on the baffle should be placed towards the front of the boiler.

Fig 8 - Flue Baffles

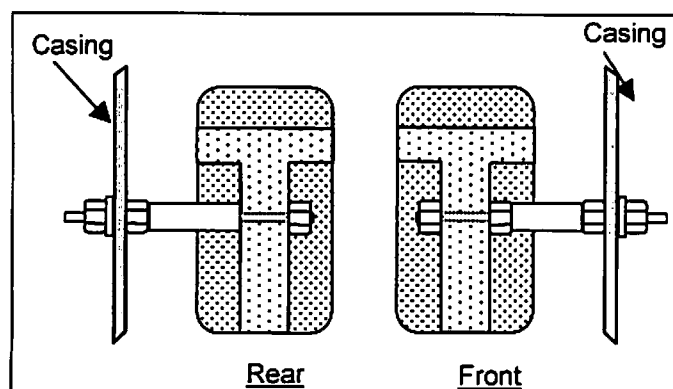


FITTING THE CASING

1. Fit insulation jacket around sections.
2. Fit the four M8 x 60mm bolts into the holes provided in the casing support bracket on the front section, top and bottom. Insert bolt through hole from the back and then fit the spacer provided and tighten nut up to spacer

3. On the rear section fit the four M8 x 60mm bolts into the holes provided in the casing support brackets. Insert bolt through hole from back then using nut tighten up the section. Wind the second nut onto the thread leaving about one nut width thread protruding to allow fixing of casing, see Fig 9.

Fig 9 - Casing Fixing



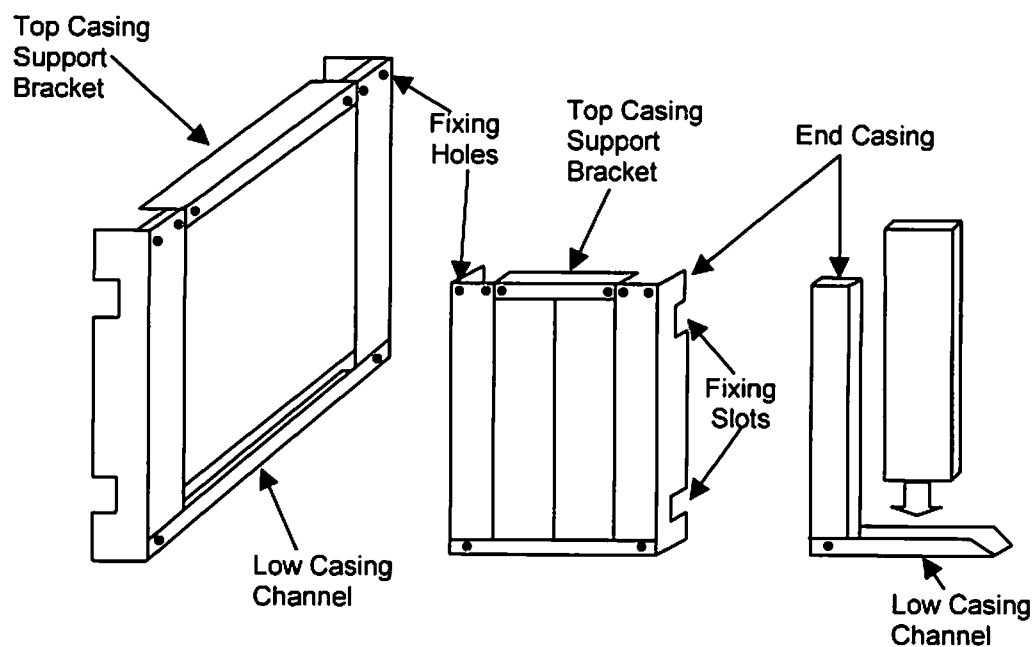
4. Take top casing side support fixing panel and fit with self-tapping screws provided into the third hole from the front. Repeat for rear side casing panel. Repeat on other side of boiler.
5. Fit rear casing locating pins into the return edge of the side panels.
6. Place the lower casing side support channel on the floor in the approximate fixing position. Take the front side panel and locate into channel matching the fixing holes and secure with self-tapping screws provided. Repeat for rear side casing panel. Repeat on other side of boiler.
7. Take side casing and locate front fixing lip with slots provided onto the M8 bolt as previously positioned in 2 above. Repeat on the rear edge. Repeat on other side of boiler.
8. Take front casing top panel (this can be identified by four plastic clips which the four fixings on the control panel clip into) and pass the capillaries and cables from the control panel behind it.
9. Take the rear section insulation and fit it around the rear section with the aluminium foil towards the boiler sections.
10. Take top rear casing and fix using the self tapping screws provided into the fixing holes in the side panel.

11. Take rear section casing (aluminium plate) and slide it upwards behind the top casing and locate bottom of panel onto locating pins (see paragraph 5) then fix using self tapping screws into top rear casing panel.
12. Fit side panels (from packs 2 and 3 - one of each). Take the larger panel (width) and position over side casing support rail and lower into bottom channel. Repeat this process for the smaller panel. See Fig 10 Repeat on other side of boiler.
13. Fit top casing support bracket between side casing support brackets with the return edge towards the back of the boiler and secure with self tapping screws.
14. Place the two top casing panels in position.
15. Take front base tray and align with fixing holes and secure with self-tapping screws provided. There are two levelling screws at the front of the base tray.
16. Place top front insulation around the top of boiler sections and take front panel and position by placing on top of panel onto fixing lip provided.
17. Fit lower blanking plate which is secured by a magnetic fixing on the base tray.

BURNER FITTING

1. Fit the burner mounting plate to the hinged boiler front door using the M8 nuts provided. The burner mounting plate fitting will be dependent on the burner used.

Plug the burner electrical connection into the socket at the rear of the boiler control panel.

Fig. 10 – Side Casing Fixing

CONNECTIONS

Boiler & Burner Power Supply

The F210 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. 12.

Nu-Way NGN15, NGN25 & NOL20
EOGB – BG500, B50 & B55, B45, B450

Fig.11 – Boiler & Burner Power Supply

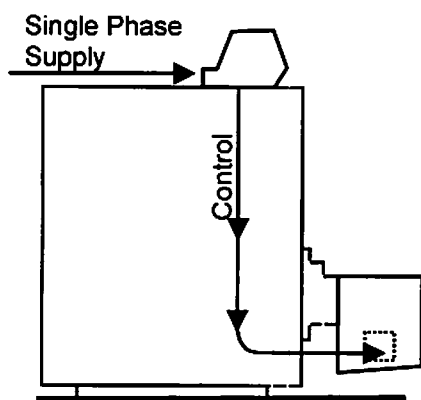
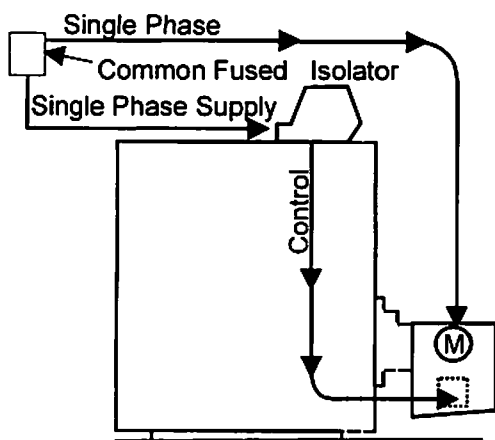


Fig. 12 – Boiler and Burner Single Phase Supply

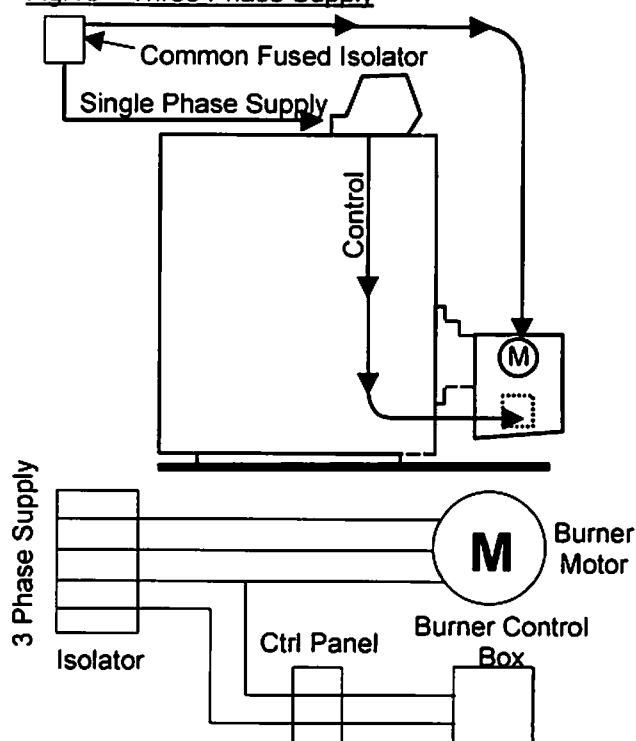


Three Phase Installation

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.13. 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.

Fig.13 – Three Phase Supply



BOILER MAINTENANCE

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 (Confederation of Registered Gas Installers) registration of personnel undertaking work on these appliances. This facility is available from Potterton Commercial Division, details are available from regional offices listed on the back page back of this manual.

Boilers should be serviced and re-commissioned as a minimum on an annual basis.

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 flueway brush for routine cleaning procedures. 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, removal of the boiler baffles, these should be removed and re-installed as detailed in Section 4.

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

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

A layer of deposit 1/16" 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 cover to check for deposits in the flue box twice a year.

Class 'D' Fuel Oil

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 dependent on the operating conditions to prevent the formation of hard adherent scale on the flueway surfaces.

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

Should a heavy or tough adherent deposit become formed, which is too hard for the standard brush to remove, it may be necessary to wash out the tubes with water followed by a thorough brushing - this may have to be repeated several times.

Sludge Gas

Maintenance for 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 of the boiler door against the front section. There should be a uniform depression about 3/32" (2mm) deep from the sealing grooves of the front section in the braiding. If this is not uniform, the sealing may be adjusted by the locknuts on the hinge pins. Make sure the locknuts are fully tightened after adjustment is complete.

Keep a regular check on the condition of the door refractory. If there is any deterioration this must be made good immediately to prevent damage to the boiler and burner.

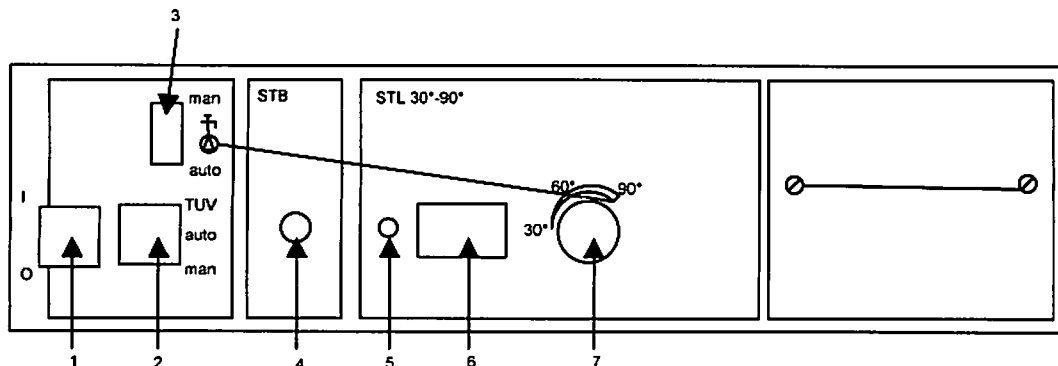
Boiler Controls

The operation of boiler controls including control thermostat, high/low thermostat and overheat thermostat should be checked on an annual basis and the burner recommissioned as detailed below.

Safety Interlocks

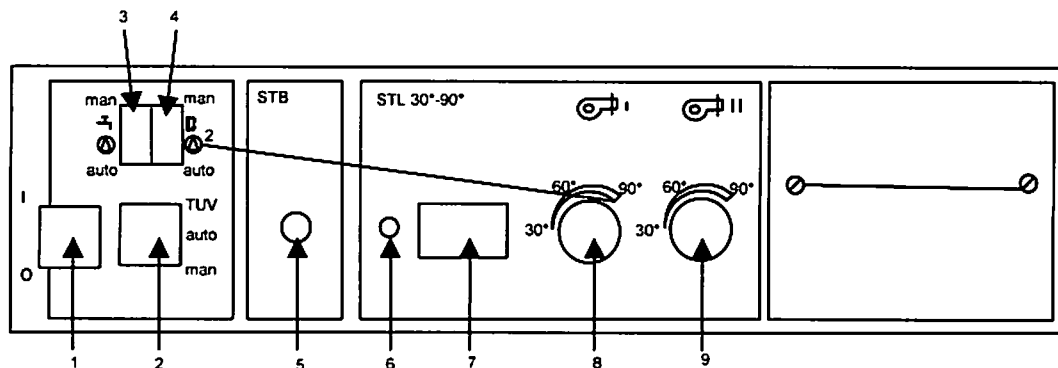
The operation of safety interlocks such as flow proving on mechanical flue/ventilation systems should be checked to ensure that operation of the boiler is prevented on a fault.

Fig. 14 – Boiler Control Panel Layout (Model SP.1.1).



- | | |
|-----------------------------------|-----------------------|
| 1. Boiler on/off switch | 5. Overheat LED |
| 2. Manual/auto/test switch | 6. Temperature gauge |
| 3. Auto/manual charge pump switch | 7. Control thermostat |
| 4. Overheat button | |

Fig. 15 – Boiler Control Panel Layout (Model SP 2.2)



- | | | |
|--|------------------------|------------------------|
| 1. Boiler on off switch | 5. Overheat button | 9. High/low thermostat |
| 2. Manual/auto/test switch | 6. Overheat LED | |
| 3. Auto/manual charge pump switch | 7. Temperature gauge | |
| 4. Auto.manual/circulation pump switch | 8. Control thermostat. | |

COMMISSIONING

IMPORTANT: The boiler must be commissioned following completion of 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 data sheet also provided.

Before commencing to commission the burner check the following.

1. Electrical supply is of correct voltage and polarity and earthing is available.
2. Fuel supply is tested for leakage and purged of air. Ensure the burner is suitable for the connected fuel supply and pressure.
3. Boiler and system are fully flooded 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. See Section 3 for further details on water circulation systems.
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. See Section 3 for further details.
8. The cold feed and open vent sizes should be checked. See Section 3 for further details.
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.
10. The boiler baffles have been correctly fitted, see Section 4.

Following completion of the above checks the burner should be commissioned in accordance with the burner manufacturers handbook provided with the burner. Typical combustion figures for relevant burners are detailed below. The combustion figures, etc. should be completed on the commissioning form provided with this manual and returned to Potterton Commercial at the address on the back page.

<u>OIL</u>	CO ₂	- 11 - 12%
	Smoke	- 0 - 1 Bacharach
	Flue Gas Temp	- 220°C (428°F)
	Draught	- 1 mm negative

<u>GAS</u>	CO ₂	- 8 - 9%
	O ₂	- 4 - 5%
	CO	- Nil
	Flue Gas Temp	- 220°C (428°F)
	Draught	- 1 mm negative

IMPORTANT: The boiler/burner units are supplied in accordance with Potterton Commercial Quality Assurance plan registered to meet the requirements of BS 5750 Part 2. A condition of the supply of the appliance for compliance with this Quality Assurance plan is the return of the appliance commissioning report.

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

14. Operation of the control, high/low and high limit thermostats should be checked for correct operation.
15. 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, see Table 3.
16. The fuel supply to the appliance should be isolated and the burner operated to ensure safety shut down and lockout of the burner on flame failure.
17. 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.

18. Following commissioning the boiler overheat and control thermostats should be set to the required operating setting. See Section 3 for maximum operating temperature.

19. Following completion of commissioning the soundness of all automatic fuel valves should be checked for leakage.

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

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, i.e., TRVs, compensated mixing valves, etc., do not reduce the water flow rate through the boiler below the minimum flow rate. See Water Circulation Systems in Section 3 for boiler flow rates.
- 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.
- f) Check sparge pipe for blockage.

To reset the overheat thermostat allow the boiler to cool down, remove the overheat thermostat knob and press the reset button.

The use of a primary loop system is highly recommended to provide a constant boiler flow rate under all operating conditions. For further information refer to Potterton Publication Technical Bulletin No.1 Issue 2.

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.

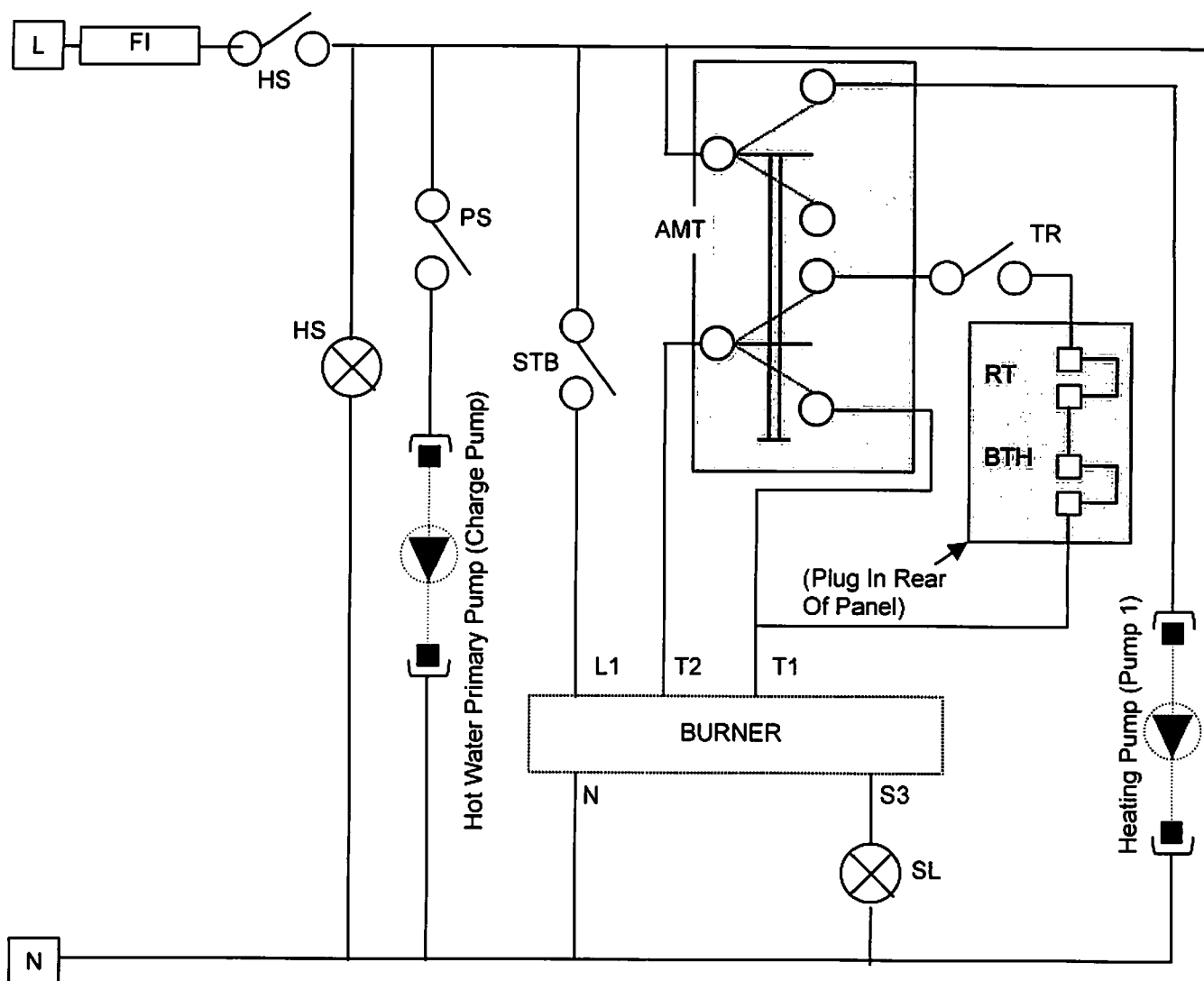
WARNING: The lockout reset button should not be repeatedly operated otherwise a hazardous situation may occur.

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.

Fig 16 -Schematic Wiring Diagram Model SP 1.1

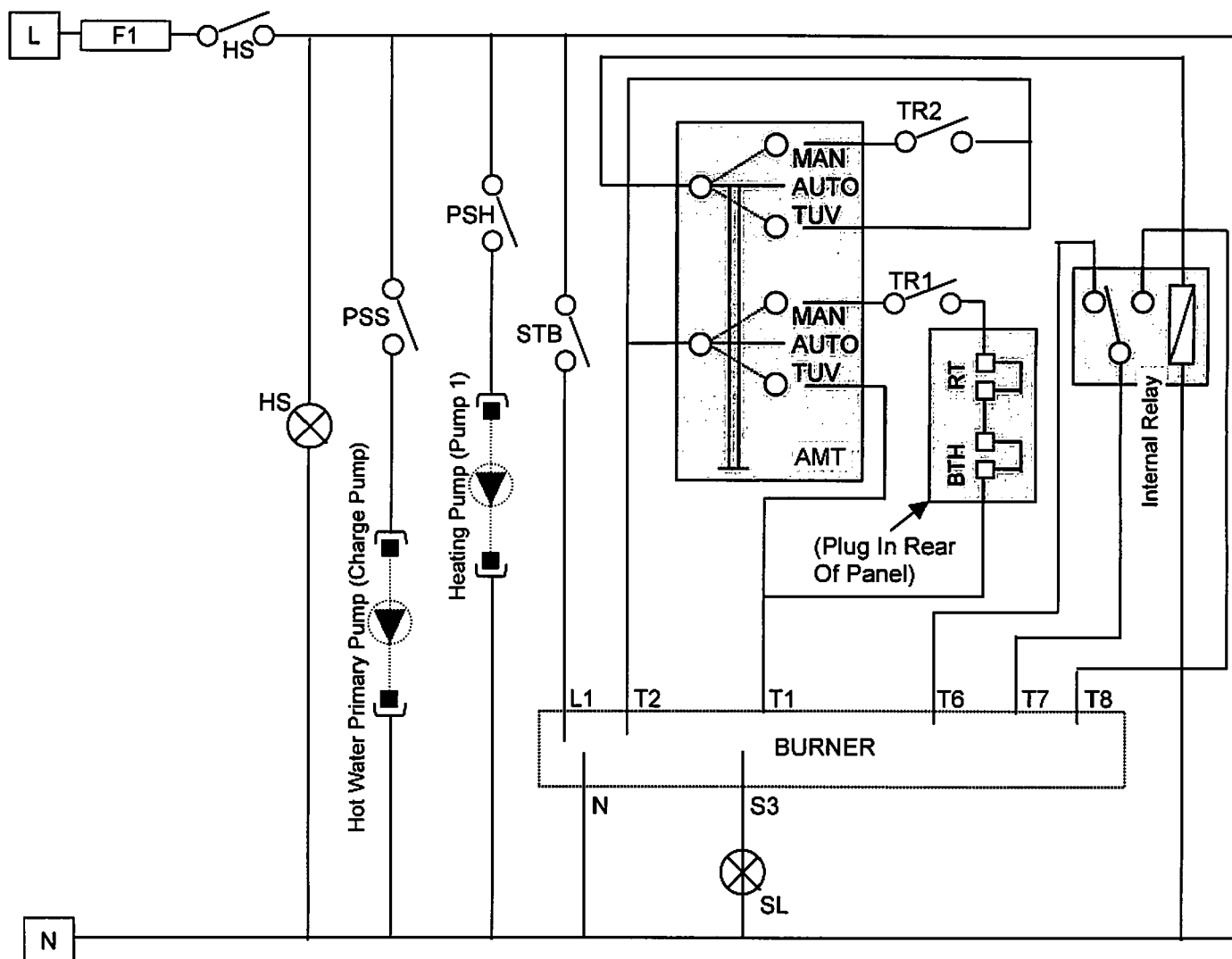
**LEGEND**

F1 - Delayed Action 6.3A Fuse
 PS - Manual/Auto/TUV Switch for
 Storage Hot Water Pump
 TR - Control Thermostat
 SL - Fault Warning Light

HS - Mains Switch & Lamp
 STB - High Limit Thermostat
 AMT - Manual/Auto/TUV Switch
 BTH -) Not required in UK
 RT -) Room Stat, Time Clock

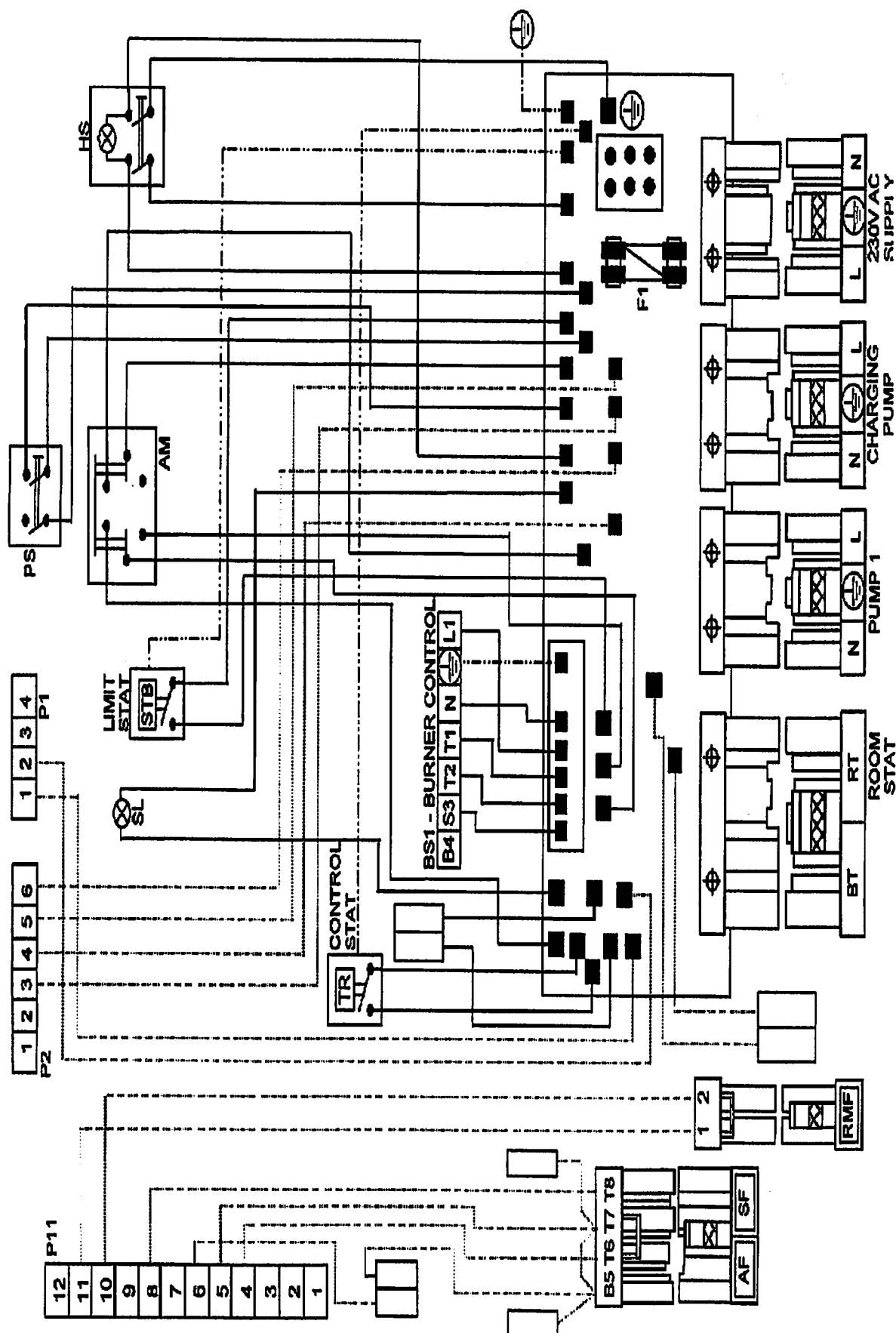
Auto/Manual/TUV Switch: In the MANUAL position the boiler will work normally in conjunction with any other external controls (i.e. thermostats, control systems). The AUTO position should not be used on this boiler as it is only to be used with special controls which are not available in the UK. The TUV (test) position by-passes the control and high/low thermostats and fires the boiler on full rate, this can be used to check the operation of the overheat thermostat

Fig 17 -Schematic Wiring Diagram Model SP 2.2



LEGEND	F1	-	Delayed Action 6.3A Fuse	HS	-	Mains Switch & Lamp
	PSS	-	Auto/Manual Switch for Hot Water Circuit Pump	PSH	-	Auto/Manual Switch for Heating Circuit Pump
	AMT	-	Manual/Auto/TUV Switch	SL	-	Fault Warning Light
	TR1	-	Control Thermostat	BTH	-) Not required in UK
	TR2	-	High/Low Thermostat	RT	-) Room Stat., Time Clock
	STB	-	High Limit Thermostat			

Auto/Manual/TUV Switch: In the MANUAL position the boiler will work normally in conjunction with any other external controls (i.e. thermostats, control systems). The AUTO position should not be used on this boiler as it is only to be used with special controls which are not available in the UK. The TUV (test) position by-passes the control and high/low thermostats and fires the boiler on full rate, this can be used to check the operation of the overheat thermostat



..... Denotes wiring supplied but not required for use in UK market

Fig.18 – Boiler Control Panel Wiring Diagram (SP1.1)



Fig 19. Wiring Diagram Model (SP2.2)

Legend for Wiring Diagram

AF	-	[NOT REQUIRED FOR UK]
AMT	-	Automatic/Manual/TUV Switch
BR1	-	Burner stage 1 (external)
BR2	-	Burner Stage 2 (external)
BS1	-	Burner Plug Stage 1
BS2	-	Burner Plug Stage 2
BTH	-	[NOT REQUIRED IN UK]
F1	-	Delayed Action 6.3A Fuse
HS	-	Mains switch
KF	-	[NOT REQUIRED FOR UK]
Mixing Valve 1	-	Mixing Valve Motor – Heating Circuit No.1 (green)
Mixing Valve 2	-	Mixing Valve Motor – Heating Circuit No.2 (red)
PSH	-	Auto/ Manual Switch – Circuit No.1 Heat Circulating Pump (red)
PSS	-	Auto/ Manual Switch – Storage Charging Pump
P1,P2, etc	-	[NOT REQUIRED FOR UK]
Pump 1	-	Heating Circuit No.1 Heating Circulation Pump (green)
Pump 2	-	Heating Circuit No.2 Heating Circulation Pump (red)
RT	-	Connection for Room Thermostat/Interlock
RMF	-	[NOT REQUIRED FOR UK]
RLF	-	[NOT REQUIRED FOR UK]
SF	-	[NOT REQUIRED FOR UK]
STB	-	Safety Temperature Limiter
TR	-	Temperature Control
VF-MK1	-	[NOT REQUIRED FOR UK]
VF-MK2	-	[NOT REQUIRED FOR UK]

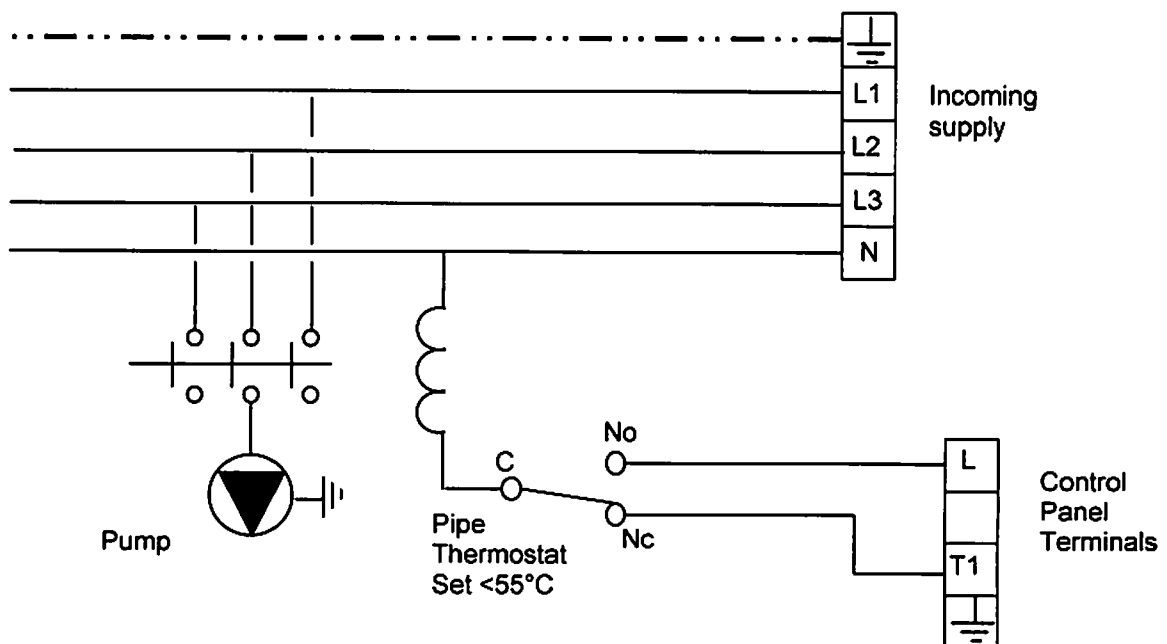
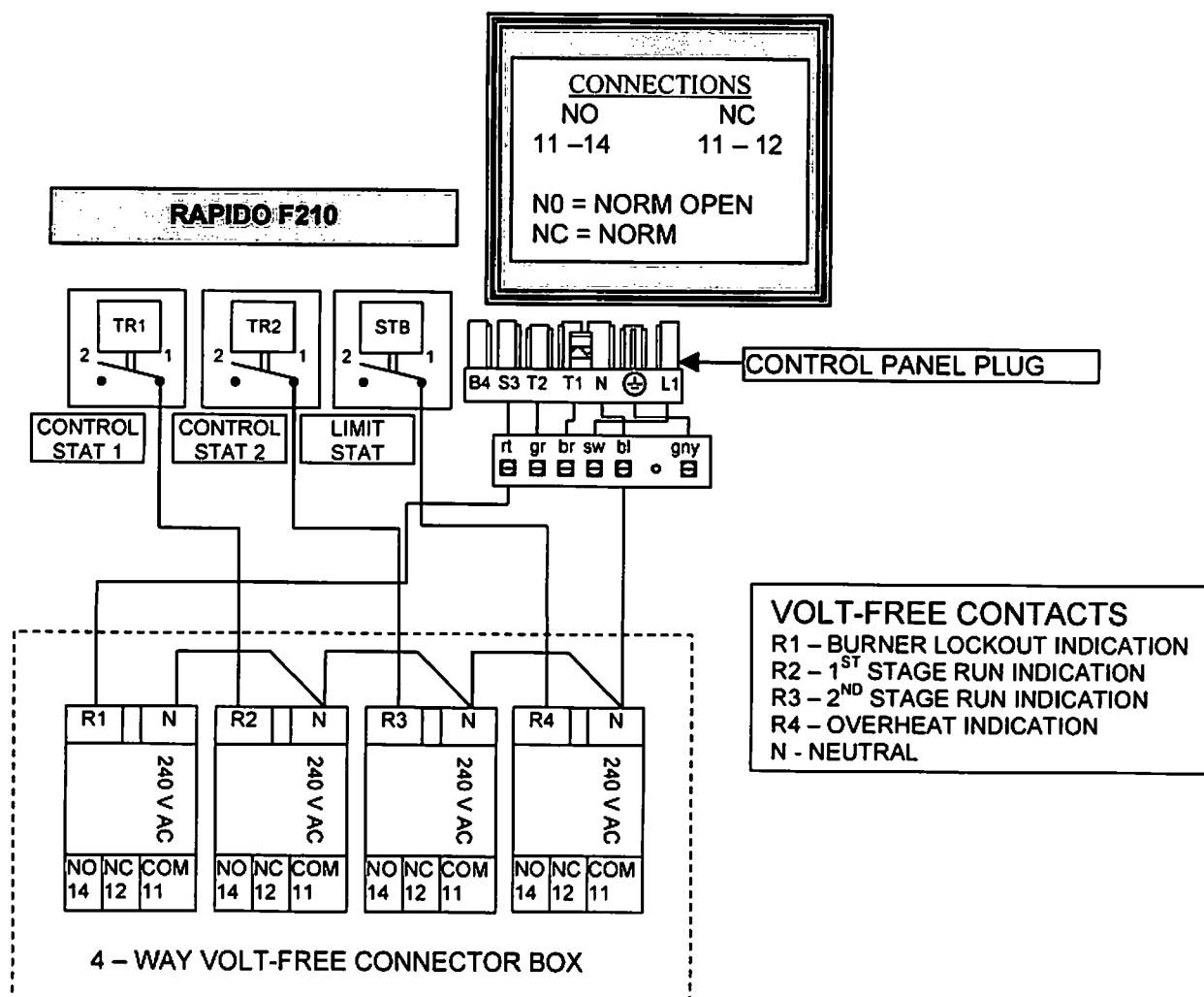
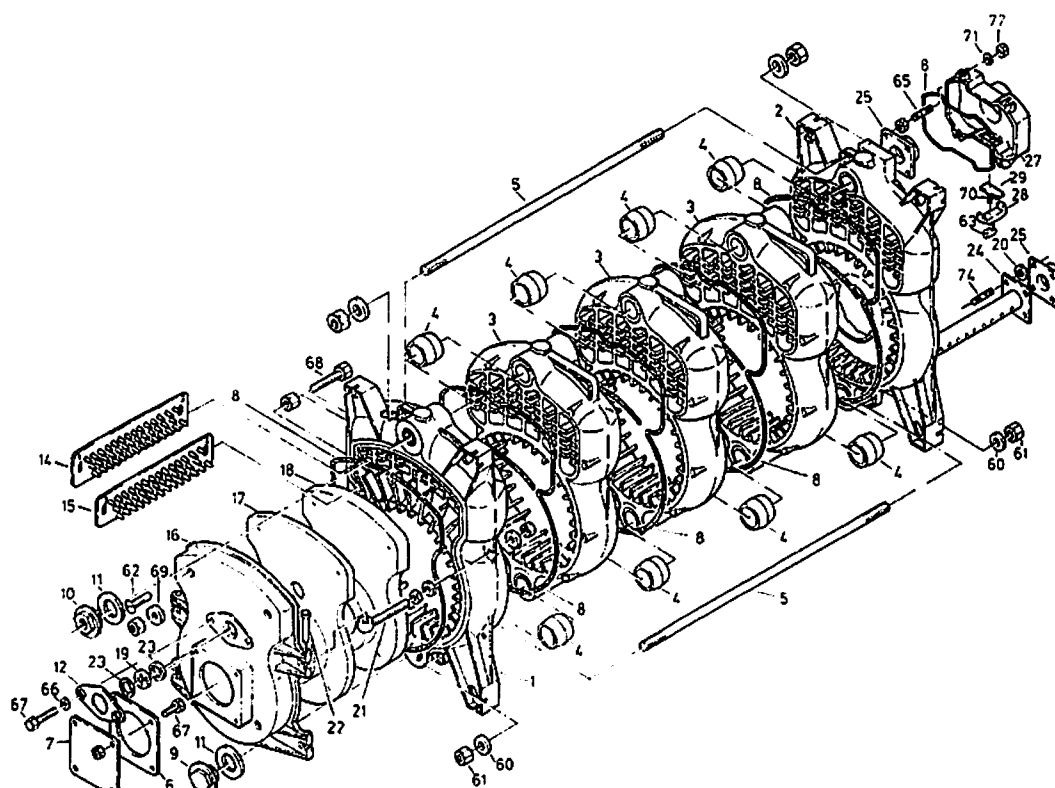
Fig.20 – Pump Overrun Using Changeover Pipe Thermostat (not available from Potterton)

Fig 21 – Volt Free Contacts



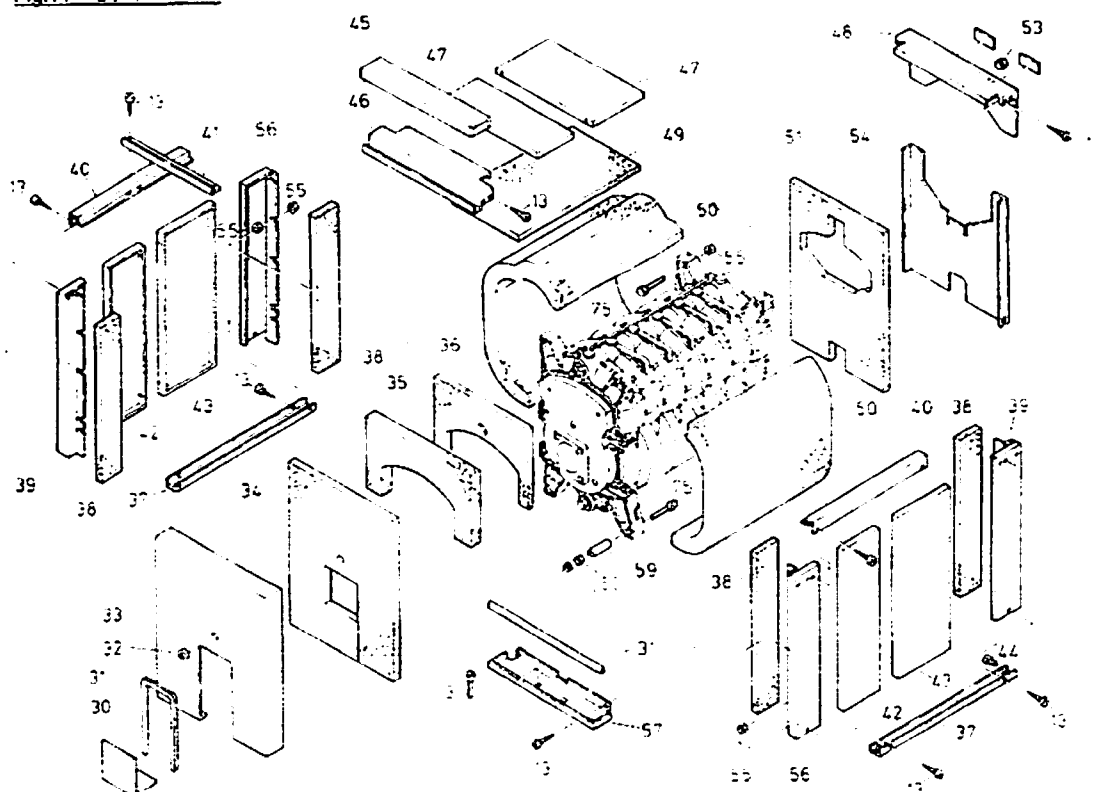
RAPIDO F210 TECHNICAL DATA**Spare Parts Numbers**

Description	QTY	Potterton Part No.
1. Front Section	1	358614
2. Rear Section	1	358615
3. Intermediate Section		358527
4. Boiler Nipple		358528
5. Tie Rod F210/5	8	358618
Tie Rod F210/6	10	358619
Tie Rod F210/7	12	358620
Tie Rod F210/8	14	358621
Tie Rod F210/9	16	358622
Tie Rod F210/10	18	358623
Tie Rod F210/11	20	358624
Tie Rod F210/12	22	358625
6. Burner Mounting Plate Gasket	1	358626
7. Burner Mounting Plate	1	358627
8. Isoceramic Section Sealing strip		358628
9. Front Section End Plug	1	358629
10. Front Section Reducer Bush	1	358630
11. Front Section End Plug Washer	2	358631
12. Sight Glass Manifold	1	358632
14. Baffle F210/5	2	358633
Baffle F210/6	2	358634
Baffle F210/7	2	358635

RAPIDO F210 TECHNICAL DATA

Spare Parts Numbers

15. Baffle F210/5	2	358636
Baffle F210/6	2	358637
Baffle F210/7	2	358638
16. Burner Door	1	358639
17. Inner Door Refractory	1	358643
18. Burner Door Insulation	1	358644
19. Sight Glass (Ø55 x 5)	1	358645
20. Sparge Pipe Gasket	2	358646
21. Door Hinge (M12 x 80)	2	358647
22. Door Hinge Pin (12 x 60)	2	358648
23. Sight Glass Gasket	1	358649
24. Sparge Pipe F210/5	1	358650
Sparge Pipe F210/6	1	358651
Sparge Pipe F210/7	1	358652
Sparge Pipe F210/8	1	358653
Sparge Pipe F210/9	1	358654
Sparge Pipe F210/10	1	358655
Sparge Pipe F210/11	1	358656
Sparge Pipe F210/12	1	358657
25. Rear Section Flange	2	358658
27. Rear Flue Hood F210/5 to F210/8	1	358659
Rear Flue Hood F210/9 to F210/12	1	358660
28. Rear Flue Hood Clean Out Clamp	1	358662
29. Rear Flue Hood Clean Out Door	1	358661
60. Tie Rod Washer (A14 - D.216)	4	358664
61. Tie Rod Nut (M12 D.934-8)	4	358663
62. Front Door Refractory Pin	2	358665
63. Flue Fastener (M8 Din.315)	1	358666
65. Sight Glass Stud (M8 x 50)	2	358668
66. Sight Glass Washer	2	358669
67. Burner Mounting Bolt (M8 x 50)	4	358670
68. Door Fastening Bolt (M12 x 30)	2	358671
69. Door Fastener Washer	4	358672
70. Flue Fastener Stud (M8 x 40)	1	358673
71. Flue Hood Washer	4	358795
72. Flue Hood Nut (M8)	4	358796
74. Sparge Pipe Fixing Stud (M12)	4	358797
75. Flue Hood Stud (M8 x 60)	4	358798

RAPIDO F210 TECHNICAL DATA**Spare Parts Numbers**

Description	QTY	Potterton Part No.
13. Self Tapping Screws	24	358779
30. Front Plate Cover	1	358735
31. Edge Protection - Black	1	358736
32. Handle - Black	1	358737
33. Front Casing Panel	1	358738
34. Front Panel Insulation Jacket	1	358739
35. Front Top Insulation Jacket	1	358740
36. Front Top Boiler	1	358741
37. Side Casing Lower Support F210/5	2	358749
Side Casing Lower Support F210/6	2	358748
Side Casing Lower Support F210/7	2	358747
Side Casing Lower Support F210/8	2	358746
Side Casing Lower Support F210/9	2	358745
Side Casing Lower Support F210/10	2	358744
Side Casing Lower Support F210/11	2	358743
Side Casing Lower Support F210/12	2	358742
38. Corner Panel Insulation	4	358750
39. Corner Casing Panel	2	358751
40. Side Casing Upper Support F210/5	2	358759
Side Casing Upper Support F210/6	2	358758
Side Casing Upper Support F210/7	2	358757
Side Casing Upper Support F210/8	2	358756
Side Casing Upper Support F210/9	2	358755
Side Casing Upper Support F210/10	2	358754
Side Casing Upper Support F210/11	2	358753

Spare Parts Numbers

Description	QTY	Potterton Part No.
Side Casing Upper Support F210/12	2	358752
41. Top Front Casing Clamping Strip	1	358760
42. Side Casing Panel (Size 2)	2	358761
43. Side Casing Panel (Size 3)		358762
44. Locating Screw (M6 x 10 Din.927)	4	358763
45. Front Top Plate	1	358764
46. Front Top Panel (Control Panel Mounting)	1	358765
47. Top Casing Panel (Size 2)		358766
Top Casing Panel (Size 3)		358767
48. Rear Top/Top Rear Casing Panel	1	358768
49. Top Casing Panel Insulation	1	358769
50. Boiler Insulation Jacket	1	358770
51. Rear Casing Insulation Panel	1	358771
53. Cable Grommet (D17)	1	358772
54. Rear Casing Panel	1	358773
55. Hexagonal Nut Casing Fixing (M8 Din.934-B)	18	358774
56. Corner Casing	2	358775
57. Front Base Tray	1	358776
59. Spacer (Casing Fixing)	2	358777
75. Hexagonal Screw (M8 x 60 Din.933)	4	358778
76. Flange/Sparge Pipe Gasket	3	924015
77. Boiler Flue Brush - F210/5 - F210/8	1	358800
78. Boiler Flue Brush - F210/9 - F210/12	1	358781
Control Panel		
1. Control Panel Complete (ON/OFF SP1.1)	1	5103183
(HIGH/LOW SP2.2)	1	5103192
4. Charge Pump Switch	1	358847
5. Blanking Plate	1	358850
7 Control Thermostat Knob	1	358848
9. Control Board	1	358851
10. Temperature Gauge	1	358849
12. Main Control Board	1	358852
14. Clips	1	358853
16. Control Panel Front	1	358854
17. Control Panel Cover	1	358855
19. Base Panel	1	358856
20. Overheat Thermostat	1	358857
21. Overheat LED	1	358858
22. Control & High/Low Thermostats	1 Each	358859
23 On/Off Switch	1	500115
24. Test Switch	1	358861

Pulling Up Tools

Boiler Size	Rod Length	Rod Diameter
5	920	20
6		
7		
8	1260	
9		
10		
11	1620	
12		

Description	Dimensions mm	Qty / Boiler
F210 Clamping Plate	90 x 90 mm (20 mm Centre Hole)	2
F210 Special Nut	20 mm	4
F210 Large Spacer Washer	60mm(O.D) / 20mm(I.D)	4
F210 Washer	20mm	4

Boiler Sealant (REDA)

Boiler Size	Quantity	Potterton Part Number
F210/5 - 8 Section	1 Tin	924042
F210/9 - 12 Section	2 Tins	

Nipple Compound (BOSSWHITE)

Boiler Size	Quantity	Potterton Part Number
F210/5 - 12 Section	1 x 400g Tub	705013



COMMERCIAL
Brooks House, Coventry Road, Warwick CV34 4LL
Tel: 08706-050607 Fax: 08706-001516

REPORT SENT TO INSTALLER:	YES	NO
SITE VISIT	COMMISSIONING	
Date:.....		
Signature:		
INSTALLER NAME & ADDRESS:.....		
.....		
.....		
COMMISSIONING DATE:		

REPORT No:

SITE ADDRESS:

.....

.....

.....

1.0	BOILER					
1.1	Type:					
1.2	No of Sections:					
1.3	Boiler No/Position:		RH		LH	Centre
1.4	Serial No:					
1.5	Fuel:					
2.0	BURNER					
2.1	Type:					
2.2	Serial Number:					
2.3	Spec Number:					
2.4	Control Box Type:					
2.5	Electrical Supply:					
2.6*	Gas Train Type & Size:					
2.7*	Gas Train Serial No:					
2.8*	Gas Booster Type & Size:					
2.9*	Gas Booster Serial No:					
3.0	BURNER SETTINGS					
3.1	Draught Tube Diameter				mm	
3.2	Draught Tube Projection				mm	
3.3	Diffuser Diameter				mm	
3.4	Diffuser Setting (Distance from end of draught tube)				mm	
3.5*	Gas Nozzle:	Side	No of Holes			
			Diameter	mm		
	End		No of Holes			
			Diameter	mm		
3.5¶	Oil Nozzles:	High Fire	Size			
			Type			
	Low Fire		Size			
			Type			
3.6	Electrode Settings? (to burner card/manufacturers instructions?)					
3.7	Burner to Specification? (to burner card/manufacturers instructions?)					
4.0	PRE-COMMISSIONING CHECKS (See Note)					
4.1	Is boiler house ventilation as per manual?					
4.2	Electric supply fused, isolated & earth wire connected?					
4.3	Check external controls allow operation					
4.4	Check boiler/system flooded and pumps operational and any isolation valves open					
4.5*	Check gas available at burner					
4.5¶	Check oil available at burner					
4.6*	Check gas meter sizing adequate					
4.7	Check flue system clear					
5.0	COMBUSTION	Pilot	Low	High	Unit	
5.1*	Gas rate				m³/hr	
5.2*	Burner Head Pressure				mmwg	
5.3*	Ionisation Probe/UV Cell Current				uA	
5.4	Air Shutter Position				-	
5.5¶	Oil Pump Pressure				bar	
5.6	CO2 or O2				%	
5.7*	CO				ppm	
5.8¶	Smoke Number				-	
5.9	Gross Flue Gas Temperature				°C	
5.10	Ambient Temperature				°C	
5.11	Flue Draught				mmwg	
5.12*	Inlet Gas Pressure (high fire). If multi boiler installation, inlet gas pressure all boilers high fire.				mmwg	
5.13	Combustion Chamber Resistance				mmwg	
5.14	Burner Fan Static Pressure				mmwg	

NOTE: Normally 5.13 and 5.14 only recorded when tapplings provided. Position of measurement to be in accordance with boiler and/or burner manufacturers instructions.

* GAS FIRED INSTALLATIONS ONLY
¶ OIL FIRED INSTALLATIONS ONLY

NOTE: It is the installers responsibility to ensure that the boiler is correctly commissioned by a competent engineer and that this report is completed and kept as a record. A commissioning service available from Potterton at the address listed on the back page of this manual. When a Potterton engineer commissions, this completed report will be sent to the installer. it is the installers responsibility to action any points arising. Commissioning by Potterton engineers is restricted to equipment of our supply. No responsibility is accepted for the on site assembly or installation of the equipment unless specifically carried out by Potterton. The installer must ensure that the boiler is installed in accordance with the manufacturers instructions and all relevant BS Codes of Practice and Regulations (see manufacturers instructions for full details). Items 4.1 to 4.6 are related to the boiler installation and as such these pre-commissioning checks should be carried out in the presence of the installer.

Potterton is a Member of the Boiler & Radiator Manufacturers Association (BARMA), and the terms of this Commissioning Document follow the generally agreed conditions of the Association. Potterton, in line with it's policy of continuous product development, reserves the right to alter and amend this Document as is deemed necessary at any time.

6.0	OPERATIONAL SAFETY CHECKS	
6.1	Check control stat operation	
6.2	Check limit stat operation	
6.3	Check high/low stat operation	
6.4*	Check for gas leaks	
6.5*	Check for gas leakage past valve assembly	
6.5¶	Check for oil leaks	
6.6	Check boiler locks out on loss of flame signal	
6.7	Check boiler locks out on air pressure switch operation	
6.8	Check boiler locks out on all other safety functions	
6.9*	Check gas booster interlocks operational	
6.10	Record INLET and OUTLET pressure switch settings:- INLET OUTLET	
7.0	BOILER/SYSTEM CHECK LIST	
7.1	Control stat left at	°C
7.2	Limit stat left at	°C
7.3	High/low stat left at	°C
7.4	Maximum flow temperature recorded	°C
7.5	Maximum return temperature recorded	°C
7.6	Boiler water pressure	
7.7	Are pipework connections as per manual?	
7.8	Is safety valve fitted? If so, SIZE PRESSURE RATING	
7.9	Are water isolating valves fitted?	
7.10	Are water flow switches fitted?	
7.11	Are return water shut off or diverter valves fitted?	
7.12	Is shunt pump fitted?	
7.13	Is pump overrun fitted?	
7.14	Flue type and 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 diameters. Conventional <input type="checkbox"/> Fan Assisted <input type="checkbox"/> Flue Dilution <input type="checkbox"/> Approximate overall height m Is the fan interlocked with the boiler? YES / NO	
7.15	Are flue dampers fitted?	YES / NO
	If so, interlocked?	YES / NO
7.16	Fan assisted ventilation?	YES / NO
7.17	Any evidence of condensate formation?	YES / NO
7.18	Any evidence of water leakage?	YES / NO
7.19	Any evidence of flue gas leakage?	YES / NO
7.20	Has boiler been built and cased correctly?	YES / NO
7.21*	Is gas service cock installed?	YES / NO
	If so, accessible?	YES / NO
7.22¶	Is oil filter fitted?	YES / NO
7.23¶	Is fire valve fitted?	YES / NO
7.24¶	Oil supply:	Single Pipe Two Pipe Ring Main

8.0	COMMENTS ON ACCESSIBILITY FOR MAINTENANCE	

9.0	NOTES & COMMENTS BY COMMISSIONING ENGINEER	

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	

Document ID Ref: PCF/029/3

Registered Office
 Pentagon House, Sir Frank Whittle Road,
 Derby DE21 4XA
 Registered in England No.3879156

CONVERSION TABLE

	<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 dm³ = 1 LITRE 1,000 dm³ = 1m³	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

For further details on Potterton Commercial boiler products contact the following:-

COMMERCIAL SALES & TECHNICAL ENQUIRIES

Potterton Commercial Products Division
Brooks House
Coventry Road
WARWICK
CV34 4LL

Tel: (08706) 050607
Fax: (08706) 001516
Sales Direct Line: (08706) 001991
Technical Direct Line: (08706) 002322
e-mail: commercialboilers@potterton.co.uk
Web Site: www.potterton.co.uk/commercial

COMMERCIAL SERVICE OFFICES

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.

SOUTHERN REGION

Potterton Commercial Service Dept
Unit 2, Borehamwood Enterprise Centre
Theobald Street
BOREHAMWOOD
Herts WD6 4RQ
Tel: (08702) 412759
Fax: (02082) 072466

NORTHERN REGION

Potterton Commercial Service Dept
Unit 102, Batley Enterprise Centre
513 Bradford Road
BATLEY
West Yorkshire WF17 8JY
Tel: (08702) 412759
Fax: (01924) 420276

Our service offices offer 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

SPARES

Potterton Commercial spares are available nationwide through the Potterton Myson Interpart Division at:-

Baxi Parts
Brooks House, Coventry Road
WARWICK
Warwickshire CV34 4LL
Tel: (08706) 000454
Fax: (08706) 000545

OR Curzon Components
National Spares Hotline
08705 10 30 30

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



A Baxi Group Company

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