

Derwent Compact plus

Installation, Operation & Maintenance Manual

Automatic Ignition



Working towards
a cleaner future

INDEX

<u>Section 1</u>	<u>Page</u>		<u>Page</u>
Fig. 1 - General Data & Dimensions	1	Fig. 19 - Fitting of Base Sealing Strip	15
Clearances	1	- Fitting the Burner Assembly	15
Table 1 - Boiler Dimensions	1	- Fitting the Casing	15/16
Table 2 - Connections	1	- Hydraulic Test of Boiler	17
Table 3 - Technical Data	2	- Connecting the Water System	17
Technical Data	3	- Connecting the Electrical Supply	18
Fig. 2 - Steel Base Strip Details	4	- Cable Paths	18
- Clearances	4	- Connecting the Flue	19
		- Connecting the Gas Supply	19
		- Boiler Controls	19
<u>Section 2</u>		Fig. 20 - Control Panel Configurations	20
- General Information	5		
- Installation	5		
- Boiler Siting & Base	6		
<u>Section 3</u>		<u>Section 5</u>	
- Ventilation	7	- Commissioning Check List	21
- Flue	7	- Contravention of Regulations	21
- Flue Size Considerations	7	- Commissioning	21
- Horizontal Flue Run	7	- Important Safety	22
- Common Flue Systems	7	- Emergency Instructions	22
- Water Circulation Systems	7	- Additional Checks	22
- Boiler Protection	8	- Pre-Lighting	22
- System Water Quality	8	- Commissioning Live Run	23
- Sealed Systems	8	Fig. 21 - Gas Valve Arrangement	24
		Fig. 21A - Honeywell Valve Settings	24
		- Ionisation Current Check	24
		- High/Low Operation	24
		- Flue Spillage Test	24
		- Ventilation Checks	25
		- Boiler Maintenance	25
		- Boiler Cleaning	25
		- Removing the Burner	26
		- Water Flow Switch	27
		- Fault Finding	27
		- Overheat Operating	27
		- Burner Lockout	27
		- Fault Finding Table	28
		- Component Replacement	29
<u>Section 4</u>		<u>Section 6</u>	
- Boiler Installation	9	Fig. 22 - Wiring Diagram	30
- Risk Assessment	9	Fig. 23 - Pump Overrun	31
- Manual Handling	9		
- Personal Protective Equipment	9	<u>Section 7</u>	
- Confined Spaces	9	- Header Kit Instructions	32
- Electrical Safety	9	Fig. 24 - Header Details	32
- Preparation	9	Table 4 - Technical Data	32
- COSHH	9	- General Instructions	33
- Customer Checklist	10	Fig. 25 - Reverse Return	33
- Unpacking Boiler	10	- Flue System	33
- Casing Removal	10	Fig. 26 - Boiler Flueing	33
- Flue Hood Removal	11	- Header Installation	33
Fig. 3 - Thermostat & Thermometer Pockets	11	- Commissioning & Operation	33
Fig. 4 - Flue Hood Fixings	11	Fig. 27 - Modular Header Assembly	34
- Burner Removal	11	Fig. 28 - Unistrut Support Details	35
Fig. 5 - Burner Fixings	11		
- Dismantling Heat Exchanger	11	<u>Section 8</u> – Spare Parts	
- Re-Assembling Heat Exchanger	11	Fig. 29 - Casing Assembly	36
Fig. 6 - Section Assembly	12	Fig. 30 - Waterway Assembly	38
Fig. 7 - Section Assembly	12	Fig. 31 - Burner Assembly	41
Fig. 8 - Section Assembly	12	Fig. 32 - Control Panel	44
Fig. 9 - Section Assembly	12	Fig. 33 - Flue Hood	45
Fig. 10 - Section Assembly	12		
Fig. 11 - Section Assembly	12		
Fig. 12 - Section Assembly	12		
Fig. 13 - Section Assembly	13		
Fig. 14 - Section Assembly	13		
Fig. 15 - Section Assembly	13		
Fig. 16 - Fitting Manifold	13		
Fig. 17 - Fitting Seals	13		
Fig. 18 - Fitting Seals	13		
- Fitting Seals	13		
- Connecting the Draught Hood and and Front Inside Panel	14		
- Combustion Chamber Base Plate	15		

All dimensions in mm unless stated.

Fig. 1

Clearances:

Top	1000mm
Rear	300mm from rear of fluehood
Sides	10mm
Front	700mm

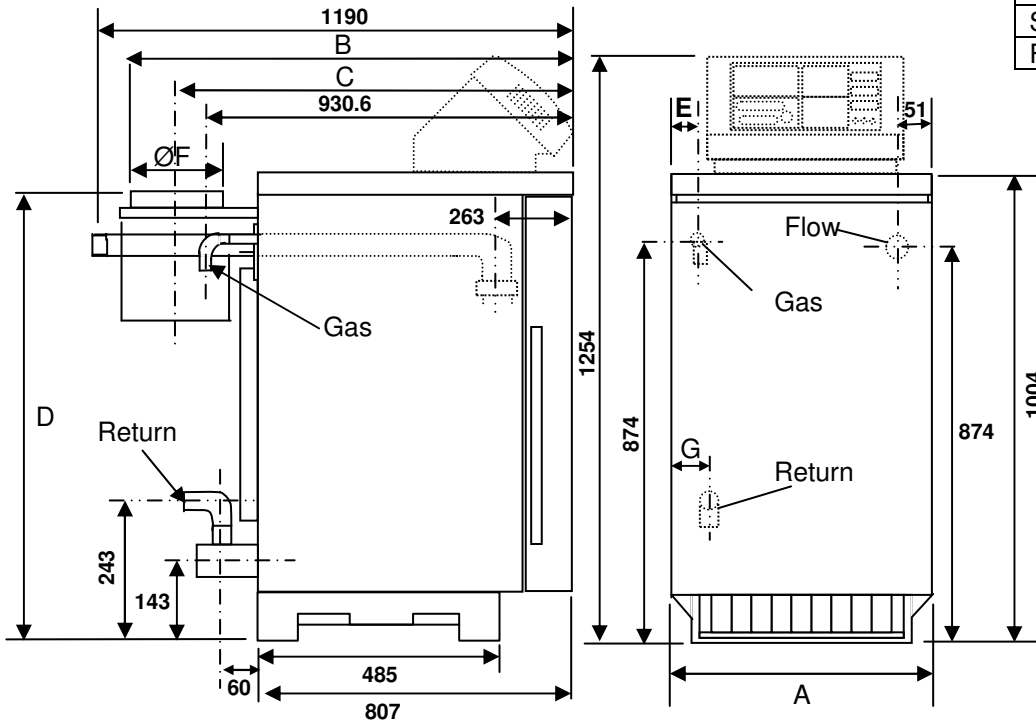


Table 1 – Boiler Dimensions

Sections	4	5	6	7	8
A mm	456		537	612	699
B mm	1080		1100		1160
C mm	965		975		1000
D mm		1003			1013
ØF mm Flue Connection Size	182		202		252
E mm	87		51		
G mm	81		45		

Table 2 – Connections

Water	1 ¼" BSP	1 ½" BSP
Drain		½" BSP
Gas		1 ¼" BSP

TABLE 3 - Technical Data

		Fully Electric				
Number of Sections		4	5	6	7	8
CE Certification Number		0063BN3368				
	Output kW	48.7	66.2	82.8	99.4	115.9
1	Fuel Consumption m ³ /hr	5.5	7.3	9.1	11.0	12.9
	Input (Nett) kW	52.9	72	90	108	126
	Input (Gross) kW	58.7	80	100	120	140
2	Nominal Gas Inlet Pressure mbar	20				
	Burner Manifold Pressure mbar	High Fire 16.5 Low Fire 10.6				
	Burner Injector Size mm	3.2				
	Maximum Design Pressure Bar	5				
3	Minimum Operating Pressure Bar	0.5 (0.1 available on request)				
4	Nominal Flue Connection Size mm	180		200		250
5	Flue Gas Volume m ³ /hr	95.6	126.9	158.2	191.2	222.5
	Flue Gas Temperature	150 °C				
	Flue Draught Requirements	1 – 4 mm All Sizes				
6	High Level Natural Ventilation to BS 6644 or BS5440 cm ²	106	144	180	216	252
6	Low Level Natural Ventilation to BS 6644 or BS5440 cm ²	212	288	360	432	504
7	Mechanical Inlet to BS 6644 or BS5440 m ³ /sec	0.044	0.056	0.07	0.084	0.098
8	Water Flow at 11 °C Δt lit/sec	1.04	1.39	1.74	2.08	2.43
	Min Water Flow at 20 °C Δt lit/sec	0.57	0.76	0.95	1.15	1.34
8	Hydraulic Resistance at 11 °C Δt kPa	7	10.5	11.5	15.5	20
9	Cold Feed Size to BS 6644 or BS5440 Minimum Bore mm	19	25			
9	Open Vent Size to BS 6644 or BS5440 Minimum Bore mm	25	32			
	Safety Valve Size to BS 6644 or BS5440 Nominal Size mm	19				
3	Maximum Flow Temperature °C	90				
10	Minimum Return Temperature °C	55				
	Limit Thermostat Setting °C	110				
11	Dry Weight kg	240	285	330	375	415
	Water Content kg	25	30	35	40	45
	Power Requirements	230V 50Hz 1Ph - Isolator and 6.3A fuse required				
12	CO ₂ %	4-6%				
	CO ppm	0-50 ppm				

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.

2 **GAS PRESSURE**

The boiler will operate safely between 17mbar and 25mbar but nominal rate can only be achieved with an inlet gas pressure of 20mbar under full load conditions.

3 **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.

4 **BOILER FLUE CONNECTION**

A spun aluminium flue adaptor is included for convenience that is designed to accommodate BS835 twin wall flue pipe. It is not obligatory to use this adaptor but always ensure that the internal diameter of the flue used is no smaller than the connection on the flue collector hood (see Table 3 for nominal flue connection size).

5 **FLUE GAS VOLUME**

Flue gas volumes are given at STP (standard temperature and pressure [15°C and 1013.25 mbar]). Typical flue gas temperatures for flue sizing are 150°C at 4-6% CO₂ with 1mm draught at the boiler flue connection.

6 **NATURAL VENTILATION**

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

7 **MECHANICAL VENTILATION**

The volume given is for a single boiler installation.

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.

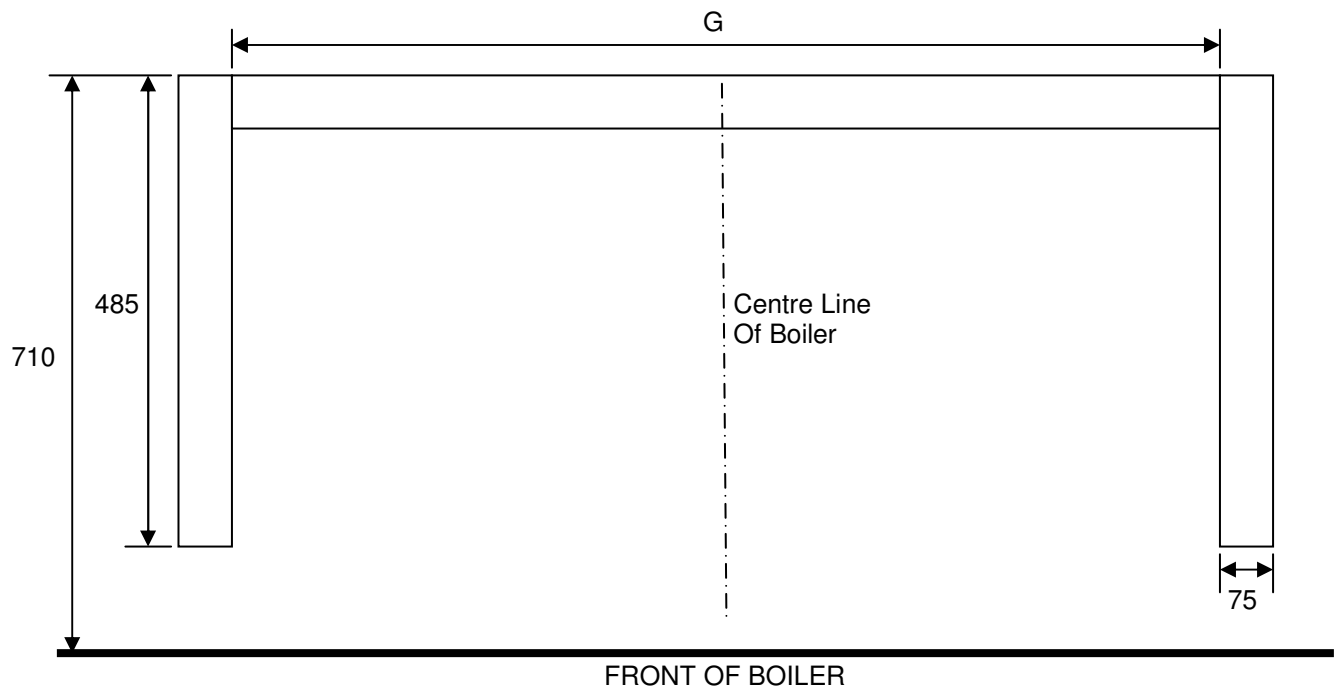
10 **MINIMUM RETURN TEMPERATURE**

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

11 **WEIGHT**

The dry weight is inclusive of the gas train. Each section measures approximately 813mm (high) x 501mm (wide) x 80mm (deep) and weighs approximately 35 kg.

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.

Fig. 2 - Steel Base Strip Details – (see Section 2 – Boiler Siting and Base)

The boiler feet **MUST NEVER** be fixed in position (this is to allow for expansion).

Sections	4	5	6	7	8
G mm	171	243	324	405	486

CLEARANCES

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

- REAR - 300mm from rear of flue hood
- SIDES - 10mm
- FRONT - 700mm (to allow for burner removal)
- TOP - 1000mm (to allow for cleaning)

Flammable products should **never** be stored in the space around the boiler. Any walls that are sensitive to heat should be protected by an appropriate insulation.

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 Derwent Compact *plus* cast iron sectional boiler is available in five sizes. Table 3 (page 2) gives kW outputs and technical data for each models

The Derwent Compact *plus* is suitable for use on fully pumped open vented systems or a sealed system with a maximum design pressure of 5 bar (72.5 p.s.i.).

These boilers are delivered fully assembled on one pallet with burner, flue hood, gas train, control panel and case fitted.

For sites with restricted access the boiler block, with drain off cock removed, will pass through a 660 mm doorway.

If necessary the boiler block can be easily stripped down into individual sections. (For section weights see page 3). Our Service Office can offer this facility.

All boilers have the gas inlet on the left hand side.

The boiler sections are constructed with BS 1452 grade 220 cast iron heat exchanger manufactured in accordance with EN 303.1.

The fully electric boiler has a control system, which incorporates full safety features, which includes control and high limit thermostats, thermometer and burner on/off switch. All models have automatic ignition with a sequential control box and an ionisation flame failure device fitted to an interrupted 400W pilot burner.

The boiler sections are insulated by 25mm glass fibre insulation to front and rear and 50mm glass fibre insulation on the sides and top. The case is finished in a powder coat paint.

RED – RAL 3001

GREY – (Non standard but closest match RAL 7024)

OPTIONAL EXTRAS

- Sequence control
- Flow and return header for 2, 3 & 4 boilers
- LPG Option

It is recommended that the Potterton Commercial Division's trained engineers should carry out commissioning, as this will make the LIFETIME GUARANTEE valid.

See back page of the manual for the addresses of the Service Offices.

INSTALLATION

The boiler should be installed in a clean boiler house free of dust and corrosive vapours. During insulation of system pipework and heavy building construction work around the boiler, the boiler has to be switched off to avoid damage.

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

Any person installing or working on the boiler **must** be qualified and attention is drawn to the mandatory requirements of CORGI. (ACS qualifications) registration for all Gas Installers. They must also be electrically competent and adhere to IEE regulations.

Manual Handling:- Any person or persons moving or lifting the boiler or any part thereof 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 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 By-Laws 1986

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

BS 5440: 1990: Part 1 – Specification for Installation of Flues

BS 5440: 2000: Part 2 – Specification for Installation of Ventilation for Gas Appliances

BS 6644: 2005 – Installation of Gas Fired Hot Water Boilers for Inputs Between 60 kW and 2MW

BS 7074: 1989: Part 2 – Application Selection & Installation of Expansion Vessels & 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 & Indirect Hot Water Supply (Rated Output 44 kW and Above)

CP342:2 – Centralised Hot Water Supply

Gas Safety (Installation & Use) Regulations 1998

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 & Compressors for Industrial & 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: 2005 with respect to protecting the boiler from damage, air for combustion and ventilation, discharge of products of 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 boiler house. See page 4 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, etc, must be provided.

The Derwent Compact is designed to be installed directly on the boiler house floor provided it is adequate but we would recommend that a base of adequate height off the floor so as to be raised in case of flooding, but also low enough to allow ease of erection is used. This should typically be a 50mm concrete plinth with an area equal to that of the plan of the boiler.

Heating systems must be installed so that water cannot be returned from the heating system to the drinking water system to which it is connected to prevent the drinking water being contaminated by the heating water or chemicals used in the heating water.

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

When preparing a site reference should be made to Local Authorities and Building Regulations 1991.

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

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 effect the safe operation of the boiler and therefore must be avoided.

Further guidance on ventilation for gas appliances is provided by BS 6644: 2005 and BS 5440 1989 Part 2.

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 technical data 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. These notes

are for guidance only and Potterton Commercial Division cannot accept responsibility for any flue system designs.

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 Application Guide or 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 20°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. For further information see Potterton Application Guide.

It is recommended that the system is designed to give a constant flow rate. For further information on water circulation systems see Potterton Application Guide.

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.

The boiler and system should be protected by suitable frost thermostats.

Never fill a hot boiler with cold water. Sudden cooling may cause the cast iron to fracture under the stress.

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.

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".

Noise Level

Derwent Compact atmospheric boilers are regarded as being 'commercially quiet', ie < NR63 under typical operating conditions.

BOILER INSTALLATION

A Lifetime Guarantee is available on this boiler when the Potterton Commercial Service Department carries out Erection & Commissioning 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 in 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 undertaken any work you must comply with the Personal Protective Equipment Regulations 1992.

Confined Spaces

A "confined space" as defined in the Health and 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 to two main systems of work.

1. Safe systems of work are adapted for all boiler maintenance & 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 the boiler and moving it into its final position ensuring all Manual Handling Techniques are followed. Particular attention must be paid to ensuring cleanliness of the boiler room.

COSHH

During the erection procedure there are a number of items which are subject to the Control Of Substances Hazardous to Health (COSHH) Regulations, and may require specialist Personal Protective Equipment (PPE) beyond what is normally required. Listed below are the items subject to the COSHH 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** –
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. **High Temperature Glass Fibre Insulation** –
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. **Adhesive** – Wear gloves, 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, and if irritation persists seek medical advice. Inhalation – continued exposure should be prevented.
4. **Sealing Rope** - Wear gloves, 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, and if irritation persists seek medical advice.

Potterton Commercial Customer Check List

The items listed below have been put together as a guide to actions that should be completed before the erection/assembly 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. Risk Assessments carried out on possible risks which may effect the persons carrying out the proposed work.
4. 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.
5. Sections/casing etc, should be kept in a clean and dry area prior to erection/assembly.
6. Water should be available.
7. A drain off area should be available.

8. Power should be available.
9. A site representative should be available at all times.
10. Clear instructions supplied to the persons carrying out the proposed work regarding positioning the boiler.
11. Fire evacuation procedures, facilities availability, specific Health & Safety information, etc, should be provided.

Items 7 to 10 are essential if boilers require pressure testing.

UNPACKING BOILER

For all boiler sizes remove the wooden box, shrink wrap polythene and the cardboard protecting the boiler. The boiler block is held to the pallet by fixing brackets on the iron feet.

Before removing the boiler from the pallet a risk assessment should be carried out to ensure safe removal. This should take into account that any person or persons moving or lifting boilers or any part there of 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.

When moving the boiler block into position the burner assembly should be removed if there is any likelihood of damage occurring. To remove burner see burner removal on page 11.

Jacks and crowbars should not be used against the flow and return manifolds.

CASING REMOVAL

1. Lift off and remove the front door taking care to remove the earth wire before completely removing the door.
2. Remove the two screws from the top of the top front panel and pull it forward then lift it off.
3. Remove the two screws from the rear of the top panel push backwards and lift off.
4. Control Panel Removal:-
 - i Disconnect the plugs from the base of the control panel.
 - ii Disconnect the earth wires to the control panel which are located at the rear of the control panel.

- iii Disconnect the ionisation lead from the control box.
 - iv Remove the thermostat phial retaining clip and remove the three thermostat phials, then remove the thermometer phial from the front of the flow header, (see Fig. 3 for assembly).
 - v Remove the two screws from the top rear corners of the control panel and lift the control panel off the lugs.
5. Remove the two screws from the front of the side panels and the two screws from the rear of the side panels. Remove the earth wire from the right hand side panel remove the side panels.

FLUE HOOD REMOVAL

1. Remove the top and side panels.
2. Remove the four wing nuts (Fig. 4) and lift the flue hood off.

Fig. 4 – Flue Hood Fixings

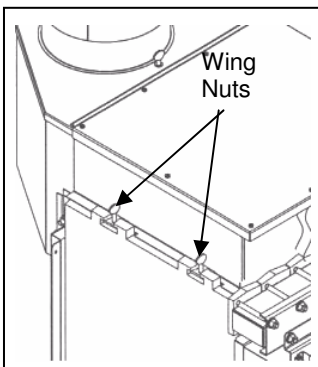
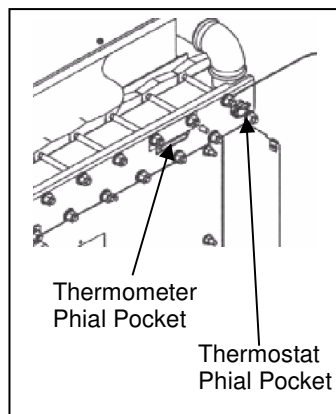


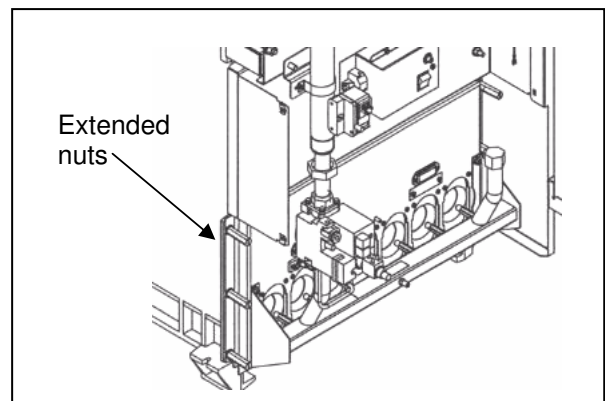
Fig. 3 – Thermostat & Thermometer Pockets



BURNER REMOVAL

1. Remove boiler front door.
2. Disconnect union above gas valve.
3. Remove plugs from the base of the control panel
4. Disconnect the ionisation lead, ignition lead and the earth wire.
5. Remove the six extended nuts three on each side of the burner and gently pull burner forward and remove. (Fig. 5)

Fig. 5 – Burner Fixings



DISMANTLING OF THE HEAT EXCHANGER

WARNING: THE BOILER MAY COLLAPSE IF THE FLOW AND RETURN HEADERS ARE REMOVED AT THE SAME TIME

To disassemble the heat exchanger proceed as follows -

1. Remove the boiler casing, control panel, insulation, draft diverter, gas train and burner assembly to leave the heat exchanger exposed.
2. Loosen and remove the tie rods.
3. Remove the flow manifold, fixed to each section by 2 studs/nuts.
4. Prise apart the first intermediate section and remove by sliding it forward. The section should come away complete with the return manifold O ring. Remove the other intermediate sections in the same way.
5. Support the end sections then undo the nuts holding one of the end sections in place and remove the section.

RE-ASSEMBLING HEAT EXCHANGER

To re-assemble the heat exchanger you will require glue, vaseline, ceramic rope and a clean dry rag.

Clean the sealing ring ports on the sections with a dry rag, DO NOT use oil or any other compound. Check that the sections are clear of swarf, sand or any other debris.

The heat exchanger consists of three types of sections these being the left-hand section (L), the middle section (M) and the right hand section (R). (Fig 6 & 18).

Fit the M10 studs (shorter thread) into the tapped holes in the sections (Fig. 7).

Fix the outlet manifold (D) (it has four 1/2" holes (C)) to the right hand section using one of the assembly plates (A) (Fig. 8 & 9).

Note: Ensure that the outlet is on the correct side (always the same side as the gas train).

Fix it to the left-hand section in the same way (Fig. 10).

Fig. 6

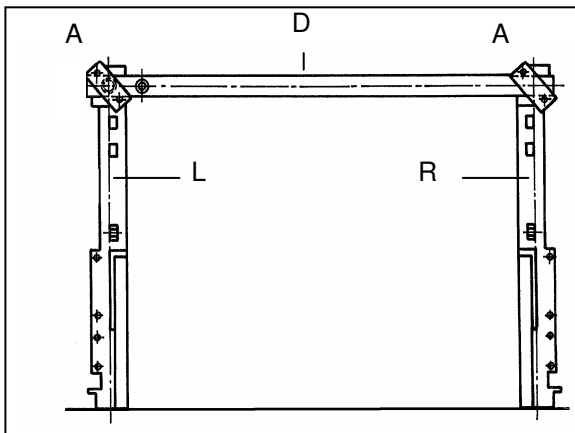


Fig. 7

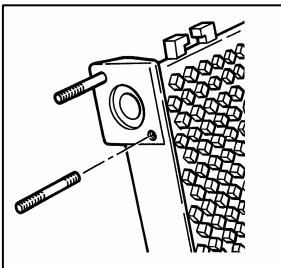


Fig. 8

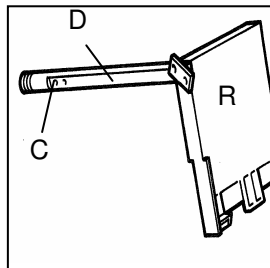


Fig. 9

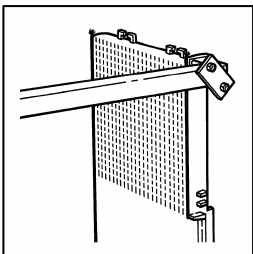


Fig. 10

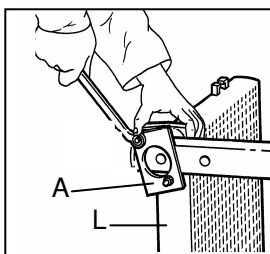


Fig. 11

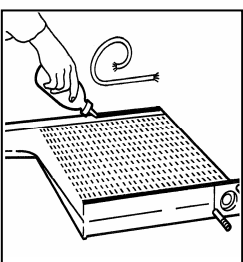
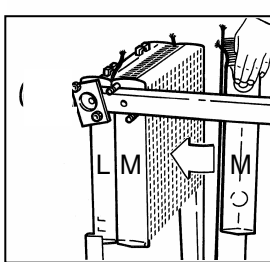


Fig. 12



Add the sealing rope to the left hand side of the sections. The rope is pre-cut to two different lengths, one for the front and one for the back and should be glued with the adhesive provided and trimmed to length if necessary (Fig. 11 & 12).

WARNING: The adhesive gives off a flammable vapour, skin and eye contact should be avoided.

If the adhesive comes into contact with -

- a) **SKIN** – then resin removing cream should be used and not a solvent to remove it.
- b) **EYES** – the eye should be irrigated with water and medical treatment sought.
- c) **INHALATION** – continued exposure should be prevented and the user should be removed to open air and if necessary medical advice sought.

The adhesive should be used sparingly as it is only used to keep the rope in position until the sections are clamped together.

The end sections should be at right angles to the floor and sitting on steel strips required under the section feet (see Fig. 2 page 4).

The sections should be spaced so that the distance between the centres of the end sections are as Dimension B + 20mm in Fig. 11, it is essential that this dimension is maintained at the top and bottom, otherwise the bottom feet of the end sections may toe in and this will make fitting the base tray difficult. The boiler should now be sitting in its final position to avoid further movement when fully assembled.

Take an intermediate section and hang it on to the front manifold against the left-hand end section taking care not to snag and pull off the sealing rope. Add all of the intermediate sections until the last one is in place.

While maintaining continuous pressure on the right hand section in the direction shown by the arrow (Fig. 14) slacken the assembly plate "A" slightly to enable the final section to be moved up then retighten the clamping plate.

Fig. 13

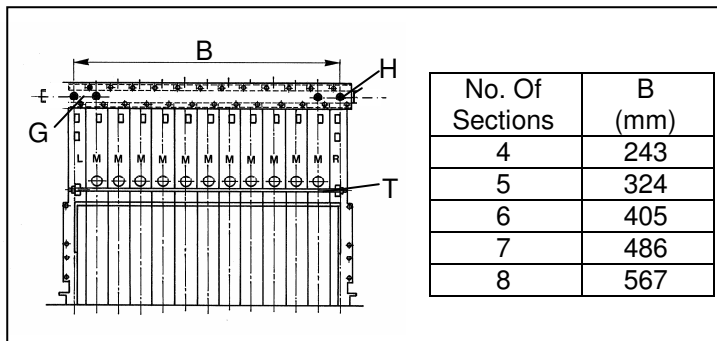


Fig. 14

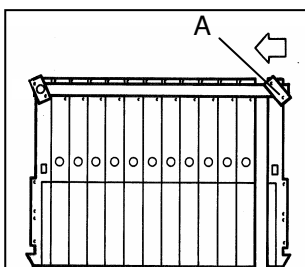


Fig. 15

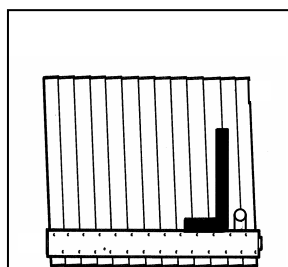


Fig. 16

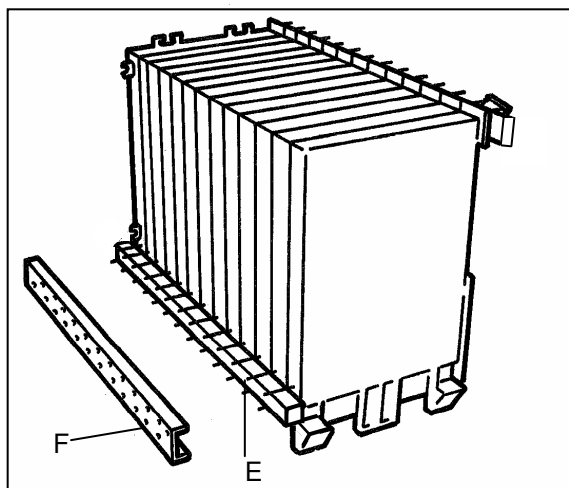


Fig. 17

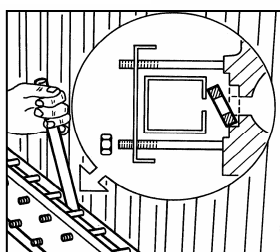
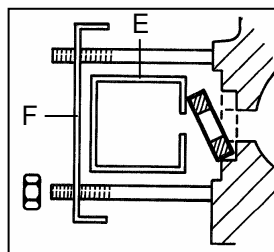


Fig. 18



Fit the 3 tie bars, one at the front and two at the back. Loosen the two clamping plates, fit the base tray in position and then fit the insulation pads between the legs on the 4, 5 and 6 section boilers only then tighten the tie rods on the boiler up to dimension B Fig. 13.

Check this dimension carefully and check that the sections are at right angles as shown in (Fig. 15).

Fit the return manifold (E) (Fig. 16). Position the U channel capping so that the hole in it lines up with the drain off cock tapping.

Fit the clamping plate using 2 nuts at each end.

Fitting the Seals

Pull the return manifold about 15 to 20mm away from the cast iron heat exchanger using a lever (chisel or screwdriver). Insert the seals at an angle, locating the bottom in the recess and letting the top rest against the manifold (Fig. 16 & 18).

NOTE: Do not use glue or mineral grease that might attack the EPDM seals. Only the Vaseline supplied should be used in contact with the seal.

Fit the washers and nuts and tighten until the seals are in contact, but without clamping the manifold.

Ensure that the tie rods (T) are taking the strain and then remove the assembly plates "A" from the outlet manifold and fit the clamping plate (G Fig. 13).

Fit the seals in the same way for the outlet manifold (Fig. 17 & 18).

Once the heat exchanger has been assembled, but not clamped, the sections can be shaken down by tapping repeatedly on the sides.

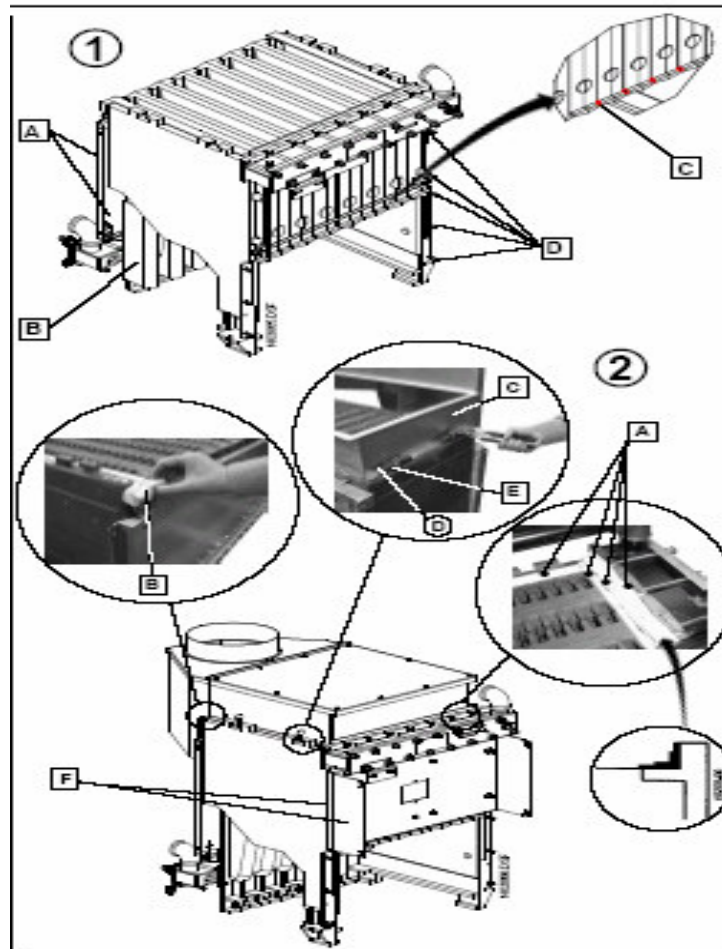
Check Once Again:

- a) That length B at the tie rods is correct.
- b) That the manifolds are correctly positioned (holes centred in the clamping plates)
- c) That the return manifold is at right angles to the sections.

Tighten all the nuts on the manifolds evenly.

Fit the temperature monitoring sleeve in the 1/2" hole (H) in the section (8) nearest the outlet.

Fit the drain tap to 3/4" hole in the return manifold.

Connecting the Draught Hood and Front Inside Panel**1**

- A** – Fit the rear panel with its insulation before fitting the draught hood.
- B** – Insert the heat insulation between the bottom of the waterway sections.
- C** – Apply a dot of silicone on the front edge of the waterway block.
- D** – Screw the studs into the right and left end sections

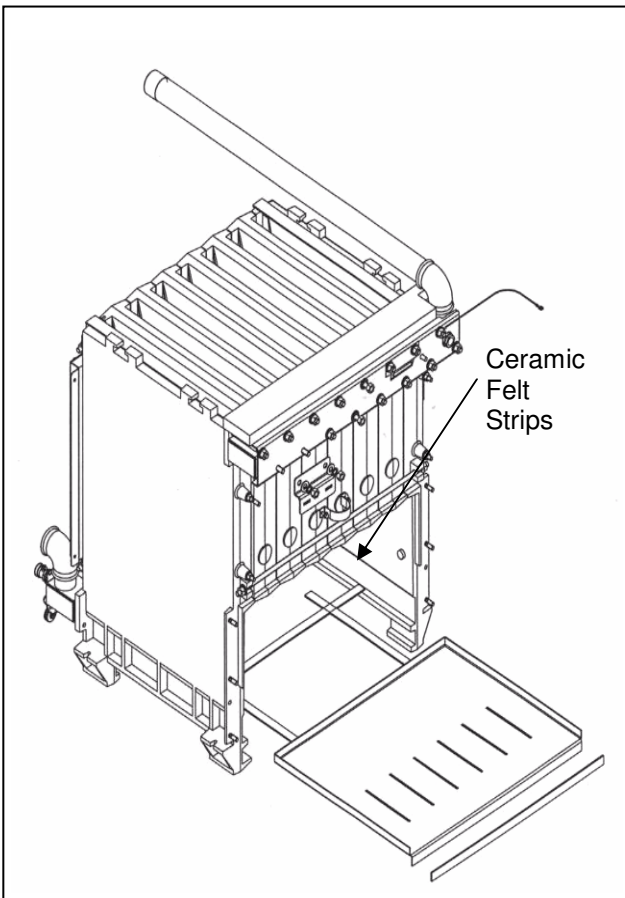
2

- A** – Place the sealing insulation strips onto the waterway block (one horizontal, one vertical and one folded at 90°)
- B** – Place the 2 insulating pads on the right and left end sections/
- C** – Fit the draught hood on the sealing strips to ensure it is between the embossings **D**.
- E** – Fit the draught hood using the wing nuts and ensure a good seal is made
- F** – Fit the front panel with its insulation and secure with the 4 nuts and washer

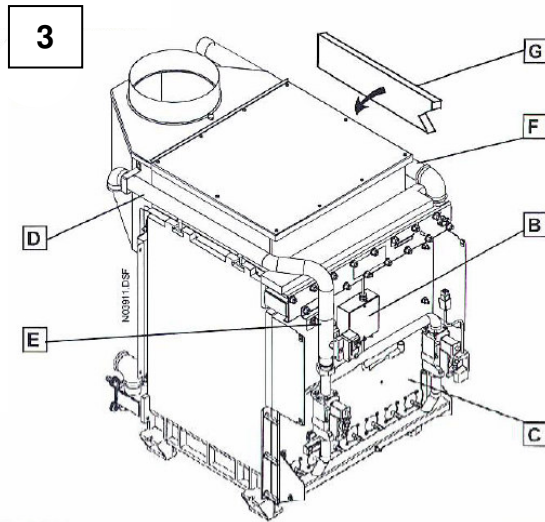
Combustion Chamber Base Plate

Put an insulating sealing strip on the bottom right and left edges of the combustion chamber (Fig. 19) and put an insulation strip on top at the back edge. Insert the base plate with the front fold downwards, being careful not to damage the seals and ensure a good seal.

Fig. 19 – Fitting of Base Sealing Strip

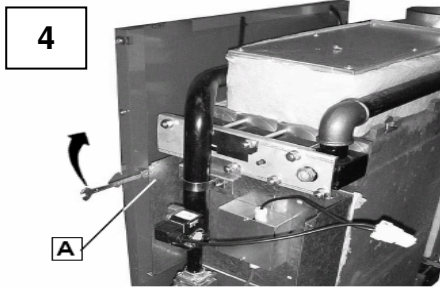


Fitting the Burner Assembly

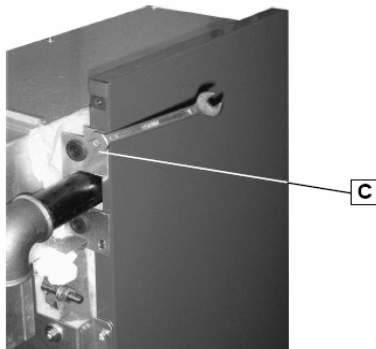
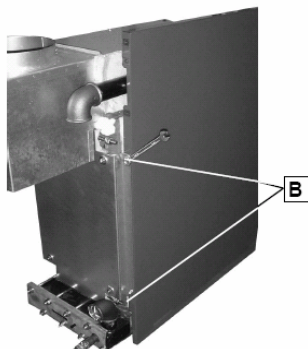


3

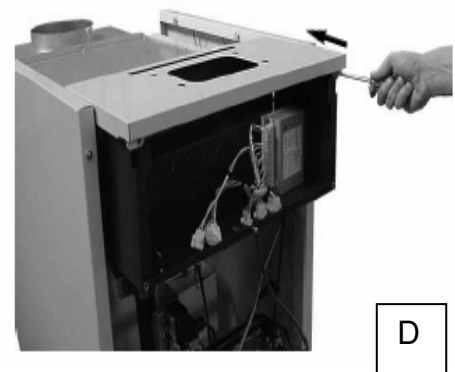
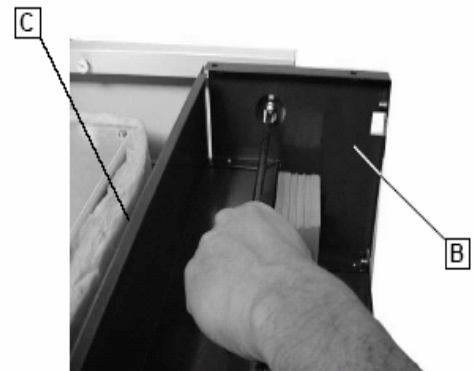
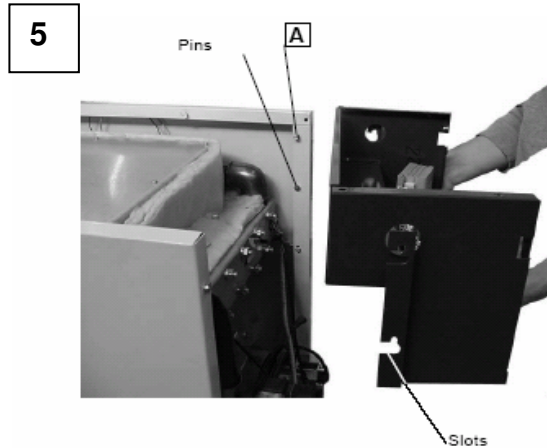
- B** – The ignition transformer is fitted on the inside of the panel with 2 x M5 self tapping screws.
- C** - Fit the burner assembly using the 6 long nuts and washers.
- D** – Fit the gas line as shown
- E** – Fit the gas line on the inside of the panel using the collar and 2 x screws.
- F** – Fit the water sleeve on the flow elbow.
- G** – Fit the heat insulation around the draught hood.

Fitting the Casing

- 4**
A – Fit the right and left side panels using the M5 screws
B – Fit the rear panel to the sides using the M5 screws provided.

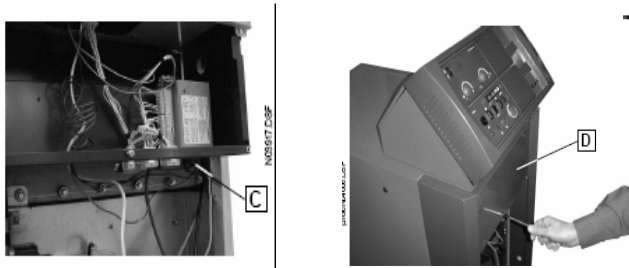
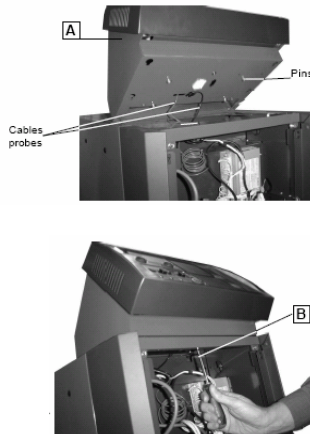


- C** – Fit the gas supply bracket with 2 x M5 screws.



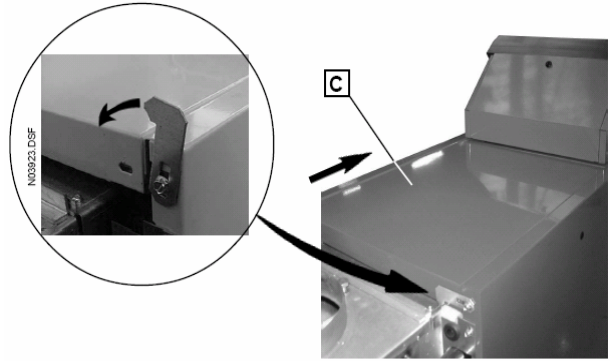
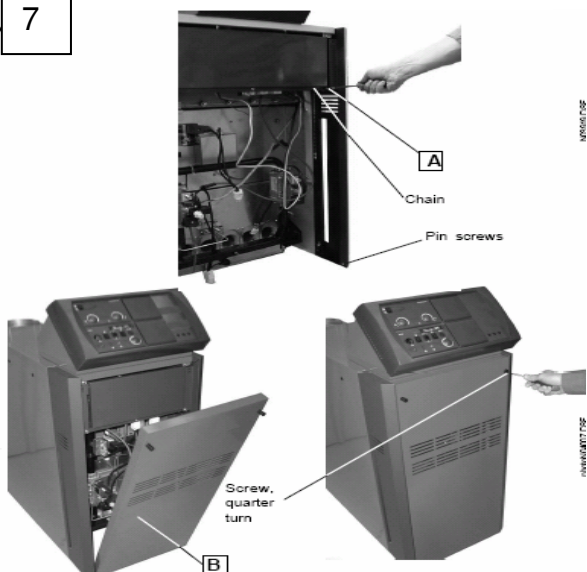
- 5**
A – Pre-fit the M5 screws on the left and right hand panels (without tightening them completely) Position the panel slots on the 2 x M5 screws and the 2 pins.
B – Tighten the 2 x M5 screws
C – Check that clearance is allowed for the 3-channel connector and spacer.
D – Assemble the front top with the 2 x M5 screws

6



- 6**
A – Fit control panel to the top casing panel ensuring that all probes are routed correctly.
B – Locate the pins under the panel towards you. Lock in place using an M5 screw on the top front.
C - Route the sensor cables into the caisson and insert the phials into the thermostat pocket.
D - Fit the caisson panel using an M5 screw.

7



- 7**
A – Fit the right and left front panels on the pins and fit with M5 screws.
B – Locate the front panel to the pin screws and hook the door chain in the hole located under the ¼ turn quick release screw. Lock the front panel by turning the ¼ turn quick release screw.
C – Slide the top rear panel forwards and lock it in place with the stop legs.

HYDRAULIC TEST OF BOILER

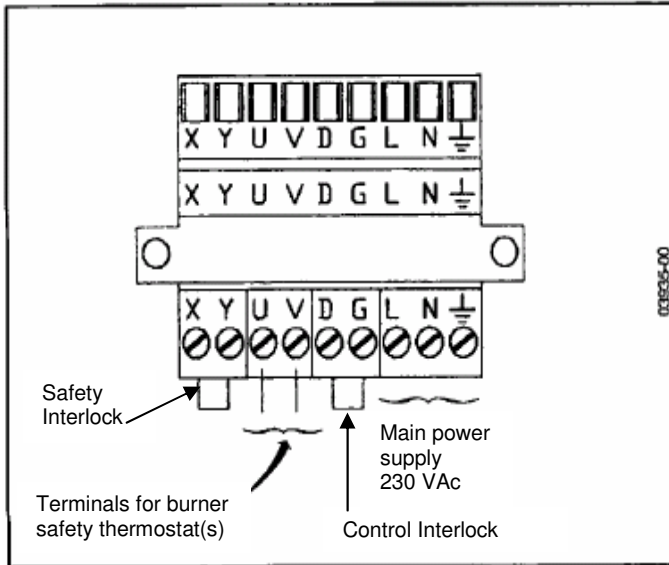
This is to be carried out on boilers assembled on site or where water manifolds have been disturbed.

Fit a hydraulic test pump to the return manifold and fit a valve to vent air from the flow connection.

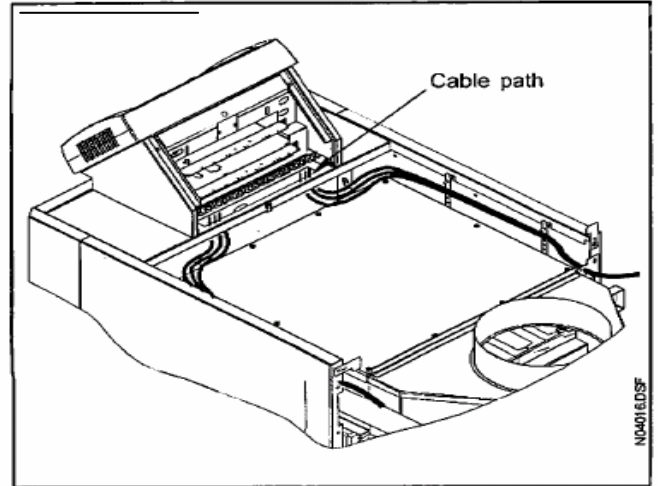
Fill the boiler with cold water and, in accordance with BS 779: 1976, pressurise up to 1.5 times the design pressure, ie. 7.5 bar maximum, and observe for 30 minutes.

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.

Connecting the Electrical Supply**Control panel supply connection terminal strip****Cable paths**

 Prevent any contact between the wiring and the draft hood



The electrical supply should be 230V 1Ph 50Hz. A 6.3A fuse and a suitable two pole isolator having a contact separation of at least 3mm in all poles has to be provided by the installer for isolation of the boiler. All on site wiring shall conform to IEE Regulations.

The live and neutral connections should be made the control panel terminal block. The earth connection should be made 50mm longer. The length of the conductors between the cord anchorage and the terminals must be such that the current carrying conductors become taut before the earth conductor if the cable or cord slips out of the cord anchorage. The wiring diagrams are included in this manual on page 30 and also on the door panel of the boiler.

For multiple boiler installations each boiler shall have an isolator and fuse as detailed above to protect the boiler and allow for maintenance.

Connecting the Flue

The fluehood has a vertical female outlet into which the flue should be fitted and sealed fitted (dimensions given in General Data). It is recommended that twin walled flue is used.

Connecting the Gas Supply

The connection should be made to the male connection (size given in Table 2). A union and isolating valve should be fitted close to the boiler to allow disconnection of the boiler controls 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, before connecting the boiler, ensure that the gas supply has been purged of air and a manual valve for isolation of the boiler is fitted in an accessible position, readily identifiable, adjacent to the boiler.

The gas supply should be supported adequately.

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

The gas train is fitted with a low pressure switch, which is set to operate at a minimum gas pressure of 12mbar.

Boiler Controls

The operation of the boiler is under the control of it's own control box, boiler thermostats and overheat thermostat.

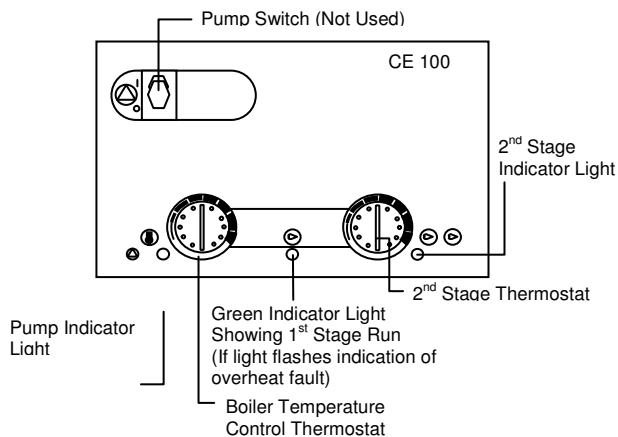
In addition, the boiler should be controlled by a time switch, frost thermostat, pump overrun facility and, for multiple boiler installations, a boiler sequence controller. The boiler can be controlled externally by removing link D to G and providing a switch across these terminals to control the boiler.

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.

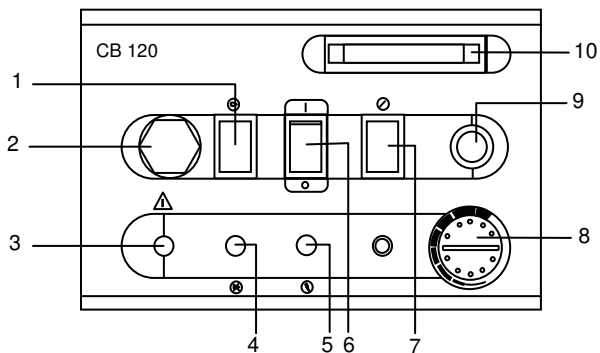
The high limit thermostat and burner lock out signals can be picked up from terminals marked remote indication. These are volt free contacts.

See boiler wiring diagram on page 30.

Fig. 20 – Control Panel Configurations

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
2. Overheat thermostat
3. Overheat indicator
4. Lockout indicator
5. Mains supply indicator
6. On/Off switch
7. Over-ride button for safety checks
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 thermostat.

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 & 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.
11. Flue system complete, adequate and fully functional.
12. Permanent ventilation complete and adequate.
13. All safety systems fitted and fully operational (e.g. safety valves, fuel shut off devices, flue fans interlocked, etc.).
14. 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 COMMISSION THE BOILER

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 manufacturer's 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.

Before commencing to commission 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. Gas supply is tested for soundness and purged of air. Ensure that the burner is suitable for connected gas supply and pressure.
3. Test for gas soundness of gas trains.
4. Appliance gas cocks are all turned off.
5. Gas supply is turned on at the meter.
6. Boiler and system are filled with water and operating pressure is within appliance range.
7. Flow and return valves are open.
8. Any external controls and the on/off switch are in the "ON" position.
9. The circulating pumps are operational. Check that the pump is scheduled to run and not on pump overrun if the boiler has previously been fired. Check that any flow proving interlocks are functional.
10. Check that the high limit thermostat has not tripped by pressing the green reset button underneath the hexagon cap nut on the fascia.
11. Ventilation is adequate and, in the case of mechanical ventilation systems, operation of the boiler is inhibited unless the ventilation fan is proved.
12. On mechanically assisted flue systems the operation of the boiler plant should be inhibited unless the mechanical flue system is operational and flow proved.
13. The safety valve should be checked to ensure that it is the correct size and pressure.
14. The cold feed and open vent sizes should be checked.

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

Commissioning figures should be taken with the boiler at high fire and a flow temperature of 80°C. The combustion measurements should be taken in the secondary flue at a minimum of 600mm above the draught diverted.

<u>GAS</u>	CO ₂	-	4 - 6%
	CO	-	0 - 50 ppm
	Flue Gas Temp		130 – 160 °C

IMPORTANT: The boiler/burner units are manufactured in accordance with ISO 9002. A condition of the supply of the appliance for compliance with this Quality Assurance plan is the return of the appliance commissioning report.

Important – Safety

In the U.K. it is a legal requirement that when working on 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 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.

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 limit

thermostats should be checked for correct

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, see Table 3.
3. 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.
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. See Section 3 for maximum operating temperature.
6. 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.

Pre-Lighting

Before attempting to light the boiler start the circulating pump and check that it is scheduled to run and not on pump overrun if the boiler has been fired previously.

Check that the main and pilot gas cocks and electrical supply are turned off.

Set the boiler control thermostat to the required position and the time clock to the 'ON' position. Check that the high limit thermostat has not been tripped by removing the hexagon cap nut and pressing the button beneath it.

Start the boiler by switching on the main isolator and the on/off switch on the boiler control panel fascia and the boiler will attempt to light. After a delay of approximately 15 seconds the ignition spark should be

heard and after 5 seconds the control box should lock out.

If the ignition spark is not detected or the control box does not lock out see Fault Finding on page 28.

Commissioning Live Run

The 7 & 8 section boilers have two valves fitted. Only the two stage valve with the yellow cap must be adjusted DO NOT adjust the single stage valve. (see Fig. 21)

1. Turn on the appliance isolation valve.
2. Check the inlet pressure, which should be at least 20mbar, on the inlet test pressure point and note the value.
3. Close the pilot supply gas cock and check that the pilot pressure is zero and not moving.
4. Turn on the electricity supply at the main isolator and at the on/off switch on the control panel fascia, (ensuring that time clocks and any other external controls are made or are in the ON position) also turn on the pilot isolating valve.
5. Approximately 15 seconds after switching on the ignition a spark should appear followed by ignition of the pilot burner. If the pilot flame is not established the control box will lockout in approximately 5 seconds, the red lockout light on the control box will illuminate. This may initially occur due to air in the pilot line.
6. The control box may be reset after a delay of five seconds by pressing the reset button on the control panel and the red light will go out. When the pilot flame is established check the gas pressure on the gas manifold pressure nipple and adjust the regulator if necessary (located on the gas valve) to give a pressure of 16.5 mbar. Turn off the pilot check valve and pull off the ionisation probe and check that the pilot and main burner shuts down.
7. Re-connect the ionisation probe and tune on the pilot check valve and the pilot burner will relight followed 10-15 seconds later by the main gas burners.
8. Observe the main gas flame through the viewing port above the pilot burner, the flames should be blue and well defined 'V' shaped flame. Then check the main gas manifold gas pressure and adjust to give a burner pressure of 16.5 mbar if necessary.

9. For high/low operation the high fire rate must be set first.

With a pressure gauge fitted to the burner manifold, turn the boiler on and set the gas valve as detailed below. (see Fig. 21A for valve details).

Before any adjustment can be made the yellow cap must first be removed.

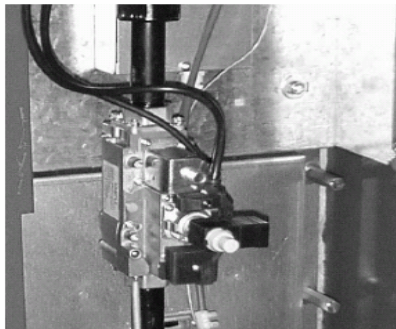
Adjust the high fire adjustment screw using an 8mm spanner to turn the adjustment screw, clockwise to increase and anti-clockwise to reduce until a high fire burner pressure of 16.5 mbar is reached.

The low fire rate can now be adjusted by adjusting the low fire adjustment screw using a screwdriver (clockwise increases and anti-clockwise reduces the low fire burner pressure) until a low fire burner pressure of 10.6 mbar is reached.

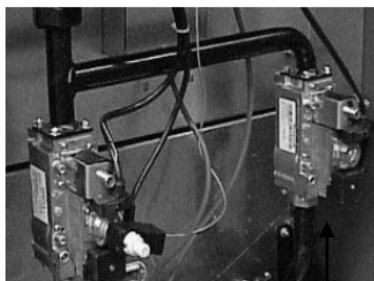
Operate the boiler at high and low fire checking that the burner manifold pressure is correct and that the flame is stable and blue.

10. Test the gas connection between the ignition valve and the pilot burner for soundness with a soap solution or other approved method and seal any leakages. Switch off the electrical supply and check that the burner has extinguished. Remove the pressure gauge from the burner manifold and replace the sealing screw.
11. Check the reliability of ignition of the boiler by switching the boiler off using the burner on/off switch on the boiler control panel. After two minutes turn the switch back on. The boiler will now relight. Check that the pilot has a stable flame and that the main burners light smoothly.
12. With the boiler switched on test for soundness between the gas valve and the burner manifold with a soap solution or any other approved method and seal any leaks.
13. Turn the appliance isolation valve off. The main and pilot burners should go off. The boiler will attempt to relight. Check that the ignitor starts and that the boiler locks out.

Fig. 21 – Gas Valve Arrangement



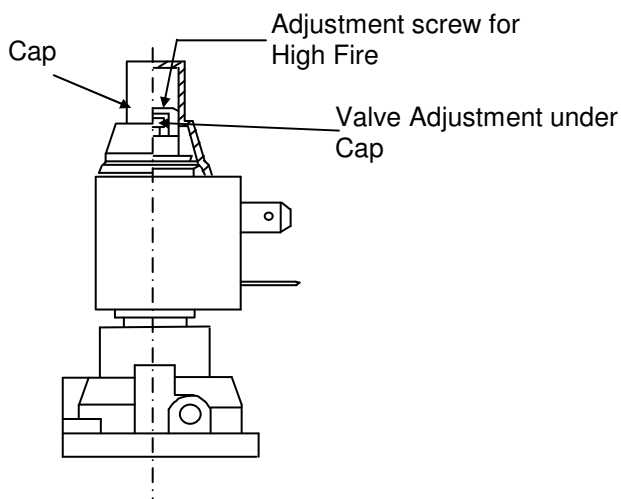
Models with 4 to 6 section



Models with 7 and 8 section

Single Stage Valve **Do not adjust**

Fig. 21A – Honeywell VR4601Q Gas Valve



Ionisation Current Check

Switch the boiler off at its on/off switch and at the main isolator. Connect a micro ammeter into the ionisation cable in between the electrode and cable. Switch on the main isolator and the burner on/off

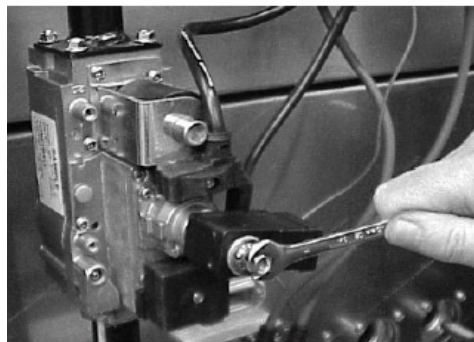
switch and after 15 seconds the ignition spark should be heard followed by lighting of the pilot burner. The micro ammeter should read approximately 3 - 4µA.

Switch off the main isolator and the on/off switch and remove the micro ammeter connections.

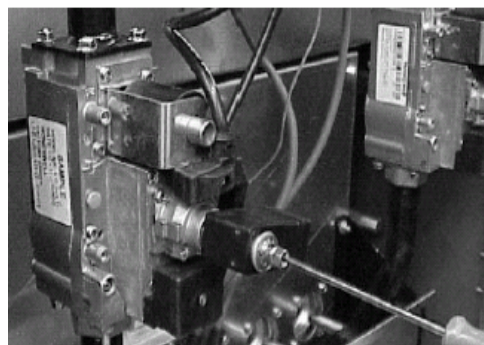
High/Low Operation

To adjust the high and low fire rates loosen the screw on top of the valve. This will loosen the two knurled high-fire and low fire nuts. Move the nuts clockwise or anti-clockwise to adjust the valve. Once adjusted to the correct position retighten the securing screw.

The low fire rate should be adjusted to give a burner manifold pressure of 10.6 mbar.



Setting the adjustment screw for high fire pressure level.



Setting the adjustment screw for low fire pressure level.

Flue Spillage Test

With the boiler hot and cold check for spillage of combustion products with a smoke bomb or smoke wand. Check that air is moving onto the front of the

boiler and that combustion products are not spilling out of the draught diverter at the back. The flue draught should be checked with a draught gauge and a draught of 1 mm.w.g. (0.04 in.w.g.) is required and should be measured at a suitable test point in the flue above the flue adapter socket.

Ventilation Checks

For boiler houses with natural ventilation, the area of the grilles should be checked against the notes given on Ventilation in Section 3.

For boiler houses with mechanical ventilation, the suitability of the ventilation and extract system should be checked against the notes given on Mechanical Ventilation in Section 3.

In addition, the installer must check that it is not possible for the boiler to operate if either the ventilation or extract fans are not running.

THE BOILER SHOULD NOT BE OPERATED WITHOUT ADEQUATE VENTILATION.

Operation Of Ancillary Controls

After lighting the boiler the operation of the above mentioned controls, eg. clock and thermostats, should be checked.

To Shut Down Boiler

1. Temporarily - Switch the on/off switch to "OFF". Switch off the electrical supply.
2. Long Periods - As above but in addition turn off the service cock at the gas meter.

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 but frequency may depend on usage and application of the boiler.

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.

Following completion of maintenance on the boiler the boiler should be re-commissioned as detailed on page 16 of this section.

Boiler Cleaning

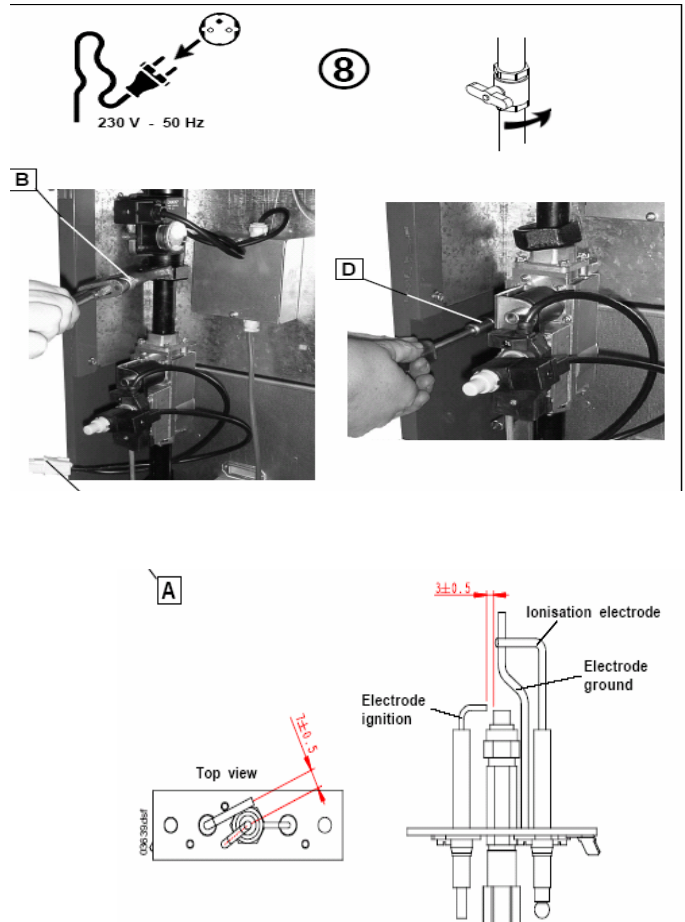
At every service visit the boiler should be cleaned as detailed below and the soundness of the gas control assembly must be checked. The boiler should be fully re-commissioned as described below with attention also paid to -

1. The effectiveness of natural and mechanical ventilation and in particular the safe operation of an air flow switch on a mechanical ventilation system.
2. That the chimney system is sound and adequately evacuating the products of combustion and that there is no spillage of flue products.
3. That the burner gas pressure is correct and that the boiler is still on rate.
4. That the low pressure switch on a booster system, if fitted, is operating correctly.
5. That the water flow switch, if fitted, is operating correctly.

To clean the boiler it will be necessary to remove the boiler flue hood cover and burner assembly as detailed below. **Ensure boiler is isolated from all supplies.**

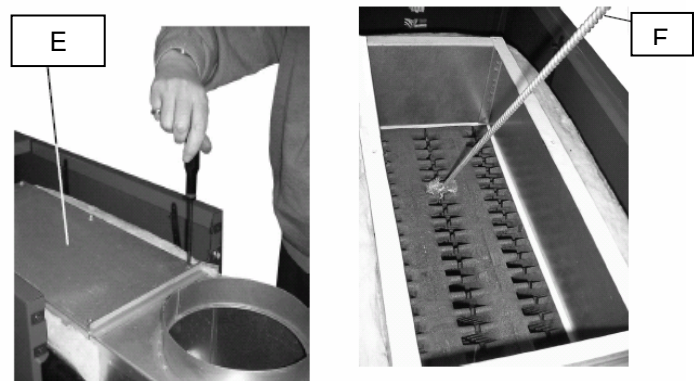
8 Removing the burner

- 1 Disconnect the power supply and isolate the gas. Remove the front panel and the 2 side panels.
- 2 A - Disconnect the gas valve from the control panel (white plug)
- 3 B - Unscrew the gas valve union nut (beware of the sealing gasket).
- 4 C - Remove the base plate.
- 5 D - Unscrew the burner plate long nuts.
- 6 Pull the burner assembly out horizontally.
- 7 Check the condition of the burner surface, clean the burner.
- 8 Check the condition and positioning of the electrodes (see diagram).
- 9 Before re-fitting the burner clean out the waterway section as follows:
- 10 It is recommended that the boiler is cleaned once a year.
- 11 Remove the top rear panel
- 12 E - remove the top draught hood.
- 13 F - Using the brush provided clean the flueways of the cast iron heat exchanger.
- 14 Refit the draught hood and check the sealing
- 15 Refit the top panel.



Following completion remove the debris from the bottom of the boiler

- 16 Following the completion of the above the boiler should be re-assembled. The integrity of the gaskets and insulation should be checked and replaced if necessary during re-assembly.
- 17 Clean the burner bars and ensure that the holes/slots are clear. If necessary blow the slots and internals clear with compressed air or soft brush and vacuum. On no account should the burners be wire brushed.
- 18 After re-assembly test for gas soundness as detailed under Commissioning and check the burner manifold union and pilot burner union for gas leaks.



WATER FLOW SWITCH

For boilers fitted with a water flow switch, the installer should check that it is not possible for the boiler to flow when there is no water flow. This may be done by checking the boiler closes down when the pumps are switched off or the water flow is gated off. Always restore the water flow before completing commissioning.

FAULT FINDING

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 has not tripped.
- b) Pump overrun is operational to dissipate residual heat from the boiler on system shut down.
- c) System valves are open.
- d) The boiler is operating at the correct rate and is not overfired.

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.

Burner Lockout (Fully Electric)

The boilers 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. The gas meter pressure is above 18 mbar.
2. The electrical supply to the appliance is of the correct voltage and polarity.

The control box controls the safe start up of the burner in sequence. See Fault Finding Table on page 28 for details of control box lockout conditions.

Fault Finding (FULLY Electric)

<p><u>Stage 1</u></p> <p>Boiler does not attempt to light.</p> <p>Control box does not lockout.</p>	<p>a) Check electricity supply is available to boiler and mains LED is illuminated.</p> <p>b) Check the boiler is being called to operate.</p> <p>c) Check overheat cut off device has not operated.</p> <p>d) Check power supply is available to control box (see wiring diagram). Replace box if faulty.</p>
<p><u>Stage 2</u></p> <p>No ignition spark.</p> <p>Pilot does not light.</p> <p>Control box goes to lockout.</p>	<p>a) Check ignition electrode continuity for earth fault, check the ignition wire.</p> <p>b) Check power supply is available to electronic ignitor during ignition period</p> <p>c) Check operation of ignitor. Replace if necessary.</p>
<p><u>Stage 3</u></p> <p>Ignition sparks.</p> <p>Pilot burner does not light.</p> <p>Control box locks out.</p>	<p>a) Check gas supply is available at the pilot burner at the correct pressure.</p> <p>b) Check gas supply is purged of air.</p> <p>c) Check pilot injector.</p> <p>d) Check ignition electrode position.</p>
<p><u>Stage 4</u></p> <p>Pilot burner lights.</p> <p>Control box goes to lockout after 5 seconds.</p>	<p>a) Check electrical supply polarity.</p> <p>b) Check earth continuity to pilot burner.</p> <p>c) Check pilot burner pressure is correct.</p> <p>d) Check there is no earth leakage on ionisation probe circuit.</p> <p>e) Check ionisation probe circuit for correct flame current. This is achieved by connecting a DC micro ammeter in series. A reading of at least 3 to 4µA DC should be obtained. If this is obtained and the control box continues to lock out then replace the control box.</p>
<p><u>Stage 5</u></p> <p>Pilot burner lights.</p> <p>Main burner does not light.</p> <p>Control box does not lockout.</p>	<p>a) Check main burner gas valve is open.</p> <p>b) Check electrical continuity to main gas valve.</p> <p>c) Check operation of gas valve and replace if necessary.</p> <p>d) Check control box. Replace if necessary.</p>
<p><u>Stage 6</u></p> <p>Pilot burner lights.</p> <p>Main burner lights.</p> <p>Control box locks out.</p>	<p>a) Check ignition of main flame is smooth and reliable.</p> <p>b) Check voltage supply for interference.</p>

COMPONENT REPLACEMENT (FULLY ELECTRIC)

Before commencing any component replacement, isolate the electrical and gas supplies to the boiler. After every service visit the soundness of the gas control assembly must be checked as described on page 14.

Main Burner Bar

1. Remove the main burner assembly as described on page 11.
2. Refitting the burners is the reverse of the above procedure.

Pilot Burner & Electrodes

1. Release the pilot burner by undoing the two screws.
2. Release the electrodes and fit new electrodes if necessary.
3. Fit the pilot burner and check the electrode position as shown if Fig. 23.

High Temperature Thermostat

1. Lift off boiler door.
2. Remove the two screws from the front of the control panel and hinge front down.
3. Remove the high limit thermostat phial from the thermostat pocket and thread it through the grommet into the control panel.
4. Remove the electrical connections to the thermostat, which are made by push on female connections.
5. Remove the nut securing the thermostat to the base of the control panel and remove the thermostat.
6. Fitting the new thermostat is the reversal of the above procedure.

Thermometer

1. Remove the two screws from the front of the control panel and hinge the front down.
2. Remove the thermometer phial from the thermostat pocket and thread it through the grommet into the control panel.
3. Push the thermometer from the inside to the outside by pressing the two clamps on the sides of the thermometer.
4. Fit the new thermometer as the reversal of the above procedures.

Control Box (Dungs DGA1.65F)

1. Remove the two screws from the front of the control panel and hinge the front down.
2. Remove the two screws, which secure the control box and remove.
3. Disconnect the wiring to the control box.
4. Fit the new control box as a reversal of the above, (see Fig. 24 for wiring details).

Spark Generator

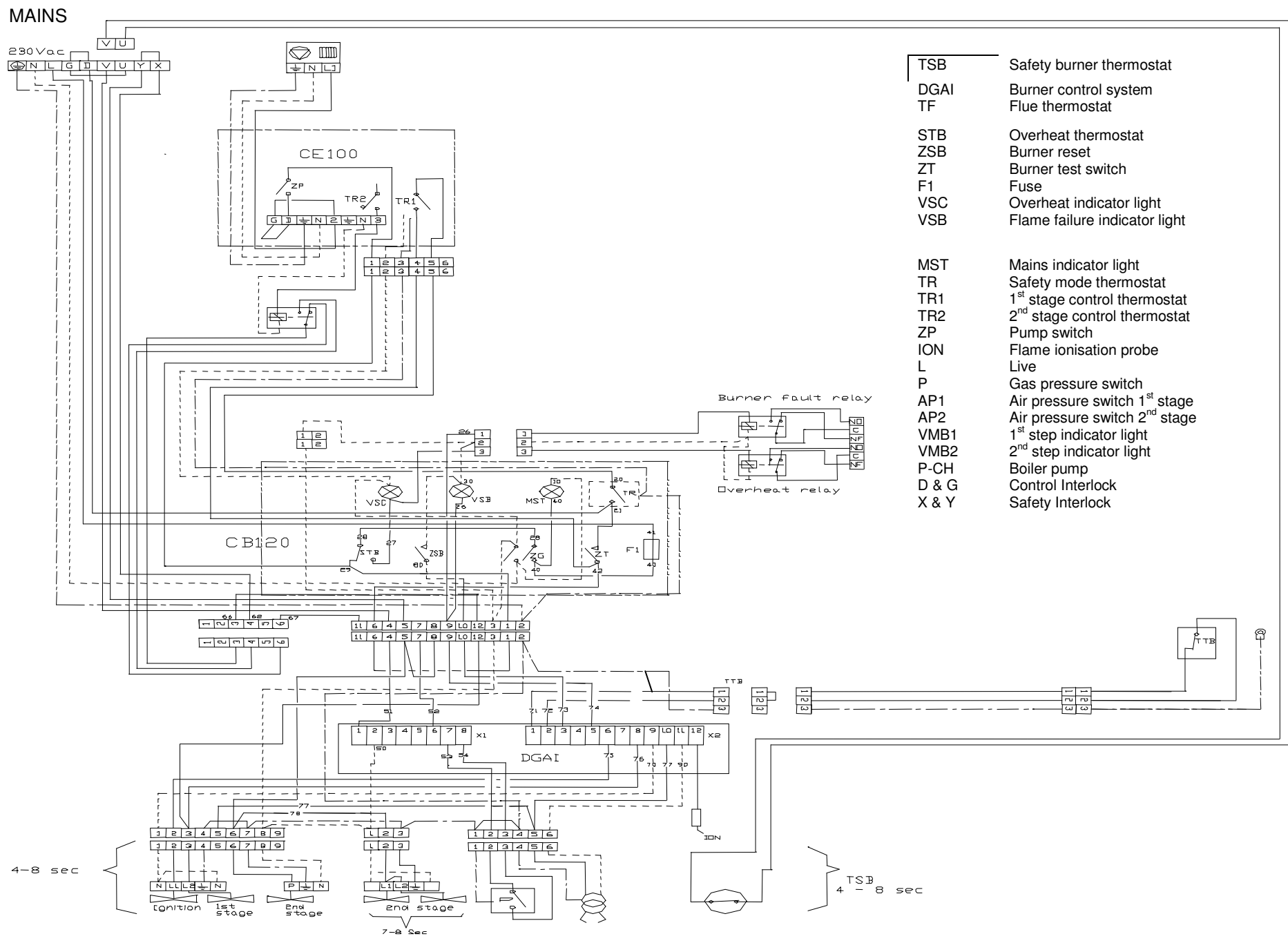
1. To change the spark generator disconnect the mains to the spark generator.
2. Remove the two nuts securing the ignitor to the front panel.
3. Replace the spark generator as a reversal of the above procedure.
4. Recommission the boiler as described on Page 16.

Main Gas Valve

1. Lift off boiler door.
2. Unplug the electrical connection to the gas valves.
3. Release the burner manifold union and the pilot line connection to the pilot burner.
4. Remove the four screws from the top and the four screws from the bottom of the gas valve and remove the gas valve.
5. Replace the gas valve as a reversal of the above procedure and remake the electrical connections and replace the pilot line and main gas line.
6. After replacing the complete gas valve check for gas soundness as described below.

On/Off Switch

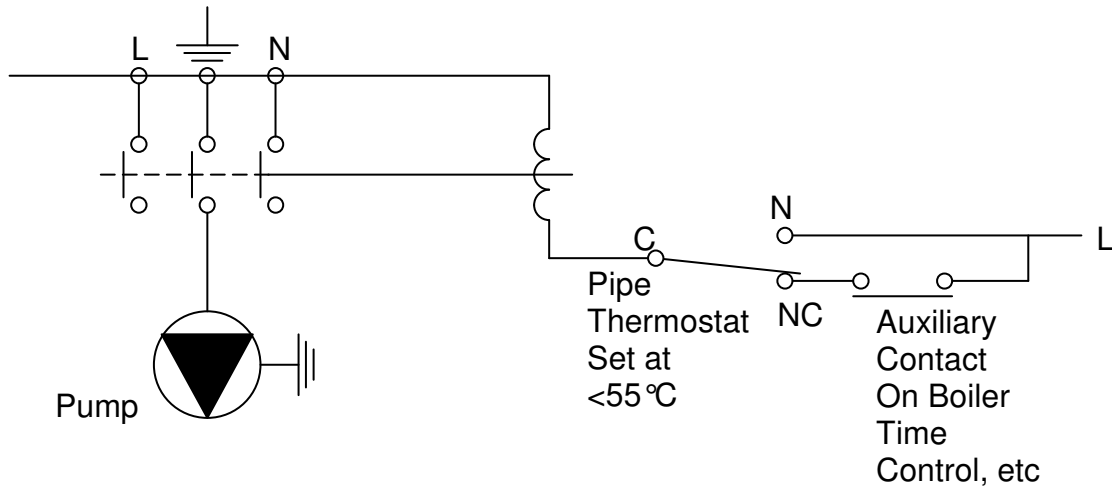
1. Remove the two screws securing the control panel fascia and hinge it forward. This will require removal of the boiler door.
2. Remove the electrical connections, which are made by female push on connectors.
3. Push the switch out through the control panel fascia.
4. Fit the new switch as the reverse of the above procedure.



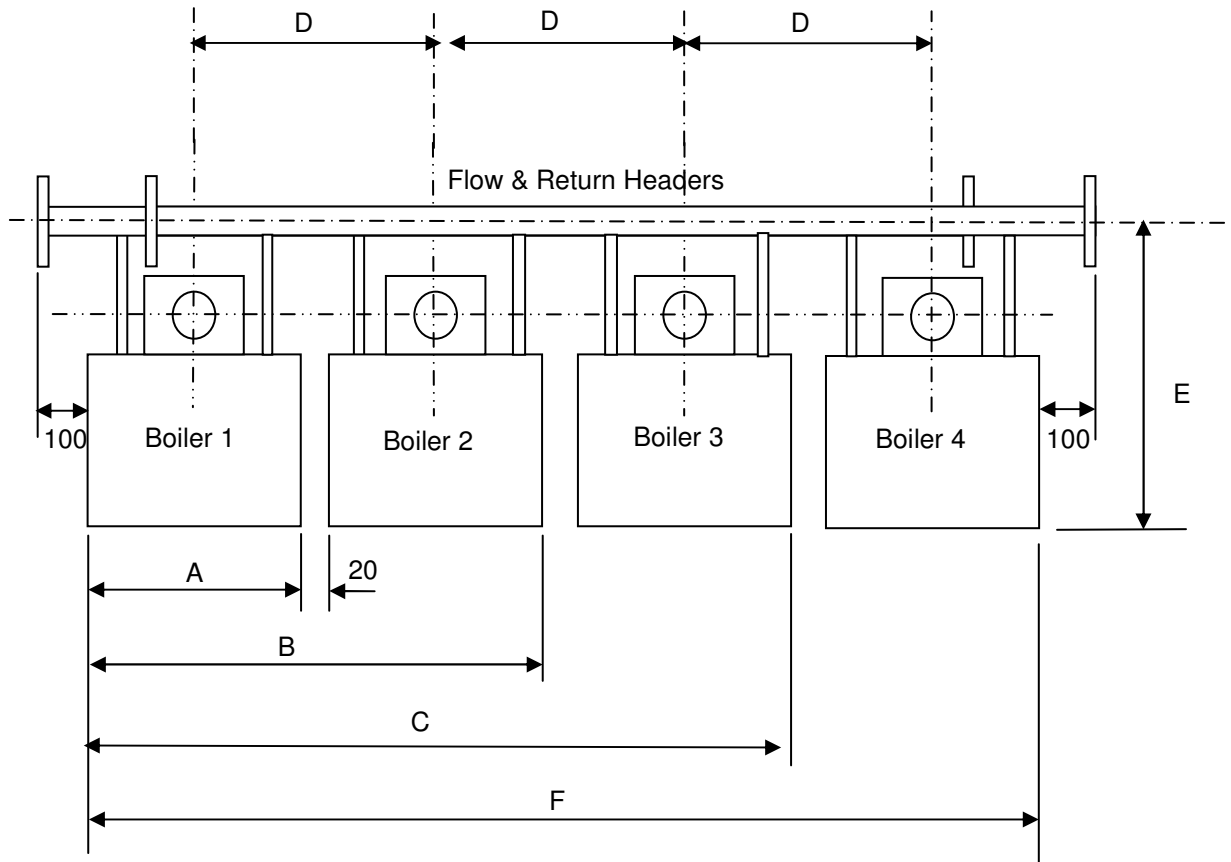
- TSB Safety burner thermostat
- DGAI Burner control system
- TF Flue thermostat
- STB Overheat thermostat
- ZSB Burner reset
- ZT Burner test switch
- F1 Fuse
- VSC Overheat indicator light
- VSB Flame failure indicator light
- MST Mains indicator light
- TR Safety mode thermostat
- TR1 1st stage control thermostat
- TR2 2nd stage control thermostat
- ZP Pump switch
- ION Flame ionisation probe
- L Live
- P Gas pressure switch
- AP1 Air pressure switch 1st stage
- AP2 Air pressure switch 2nd stage
- VMB1 1st step indicator light
- VMB2 2nd step indicator light
- P-CH Boiler pump
- D & G Control Interlock
- X & Y Safety Interlock

Fig. 22

Fig. 23 - Pump Overrun Using Changeover Pipe Thermostat



Please be aware that the new control box used on the Derwent Range of products energises the fault indication on start up. If the volt-free connection for remote fault indication is used then a time delay must be incorporated on the BEMS side.

Header Kit Instructions**Fig. 24 – Header Details**

Number of Sections	4	5	6	7	8
A	446	446	527	608	689
B	912	912	1074	1236	1398
C	1342	1342	1621	1864	2107
D	466	466	547	628	709
E	1240	1240	1298		
F	1844	1844	2168	2492	2816

Table 4 – Technical Data

Number of Sections		4			5			6			7			8		
Number of Boilers		2	3	4	2	3	4	2	3	4	2	3	4	2	3	4
Output	kW	97	146	199	132	199	266	166	248	331	199	298	398	232	348	464
Input (nett)	kW	106	159	212	141	212	282	176	265	353	212	318	424	247	370	494
Fuel Consumption	m ³ /h	11	16.5	22	14.6	22.2	29.2	18.2	27.3	36.4	22	33	44	25.6	38.4	51.2
Nominal Boiler Flue Size	mm	180						200						250		
Nominal Flue Header Size	mm	250	300	350	250	300	350	300	350	450	300	350	450	350	450	450
Total Flue Gas Volume		191	287	382	254	381	508	316	475	633	382	574	765	445	668	890
Water Flow Rate @ 11°Δt	l/s	2.1	3.1	4.2	2.8	4.2	5.6	3.5	5.2	7.0	4.2	6.2	8.3	4.9	7.3	9.7
Low Level Natural Ventilation to BS6440	cm ²	800	1062	1326	976	1328	1682	1152	1592	2032	1328	1858	2386	1504	2120	2738
High Level Natural Ventilation to BS6440	cm ²	400	531	663	488	694	841	576	796	1016	664	929	1193	752	1060	1369
Dry Weight	kg	480	720	960	570	855	1140	660	990	1320	750	1125	1500	830	1245	1660
Water Contents	lit	50	75	100	60	90	120	70	105	140	80	120	160	90	135	180
Water Connection Size of Header	BSP	1.5	1.5	1.5	2	2	2	2.5	2.5	2.5	3	3	3	3	3	3

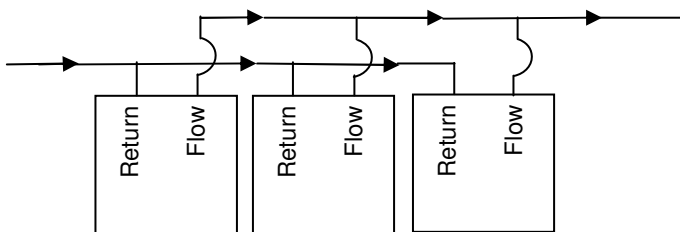
GENERAL INSTRUCTIONS FOR HEADER KIT

Potterton Compact *plus* a gas fired atmospheric boilers are available in modular combinations of two, three or four boilers ranging from a two boiler module of 97kW to a four boiler module of 464kW output. They are suitable for use on open vented or sealed systems with a maximum design pressure of 5 bar.

Reverse Return Header

We would recommend that the header is piped up as a reverse return to reduce the need to balance the water flow through each boiler.

Fig. 25 – Reverse Return



Flue System

To allow safe and satisfactory operation the flue system, which may be common or individual and shall be capable of the complete evacuation of combustion products at all times. The effective height of the chimney above the boilers shall ensure sufficient buoyancy to overcome the resistance of the bends, tees and runs of the flue pipe involved and shall terminate in a downdraught free zone.

For normal installations it is recommended that the number of boilers connected to a common horizontal header is kept to a minimum. Where it is required that more than four boilers are connected to a common horizontal header then the recommendations in British gas publication IW/11 should be incorporated in the flue design.

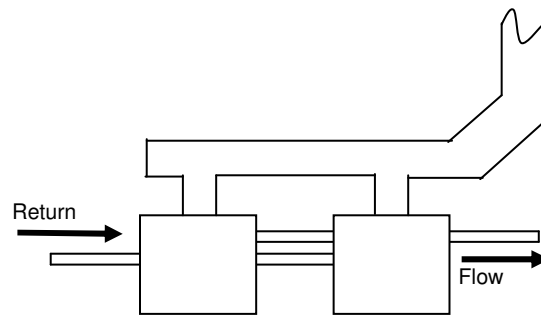
As the Compact *plus* boilers are each supplied with individual draught diverters no other draught diverter should be fitted in the system. The integral draught diverters are not load bearing and flues should be supported by other means. Facilities should be included in the flue system to disconnect the boilers from the flue should it ever be necessary. The flue header, which connects into the main flue or chimney, should be independently supported and the connection soundly made.

Drainage points positioned at the bottom of all vertical chimney sections should be provided. Drain points

should be no less than 25mm ID and manufactured from stainless steel.

A draught of at least 1mm wg should be provided at the flue outlet under full or part load conditions. The flue should be designed to evacuate the products of combustion when all boiler modules are firing.

Fig. 26 – Boiler Flueing



Header Installation

The boilers are delivered on one pallet and the fully assembled headers are delivered on a separate pallet. Each pallet is clearly marked with the size of the modular header.

- Position the boilers next to each other leaving a gap of 20mm between each boiler.
- Connect the flow header to each to each boiler with the BSP unions provided. The flow header can either be positioned above the boiler or at the rear of the boiler. (see fig. 30 for details)
- If the flow header is to be positioned at the rear of the boiler fit two pipe clips on either end of the flow header and fit two pipe clips on either end of the return header.
- Using the unistrut provided connect the headers together leaving a gap between the headers. (see fig. 31 for details)
- Connect the return header via the flexible hose unions to the return connect on the boiler.

Commissioning & Operation

Follow the commissioning instructions in this manual

Fig. 27 – Modular Header Assembly

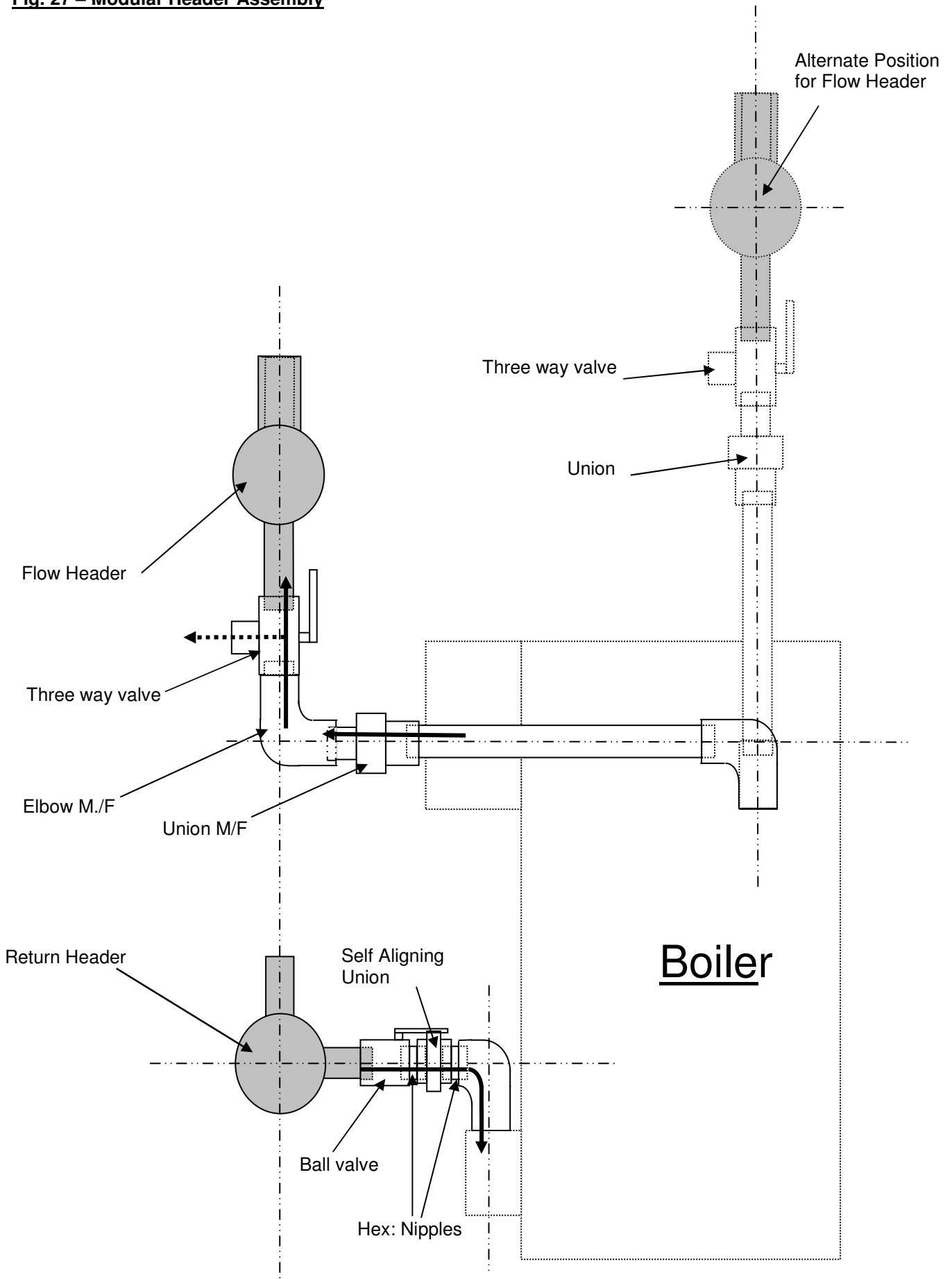
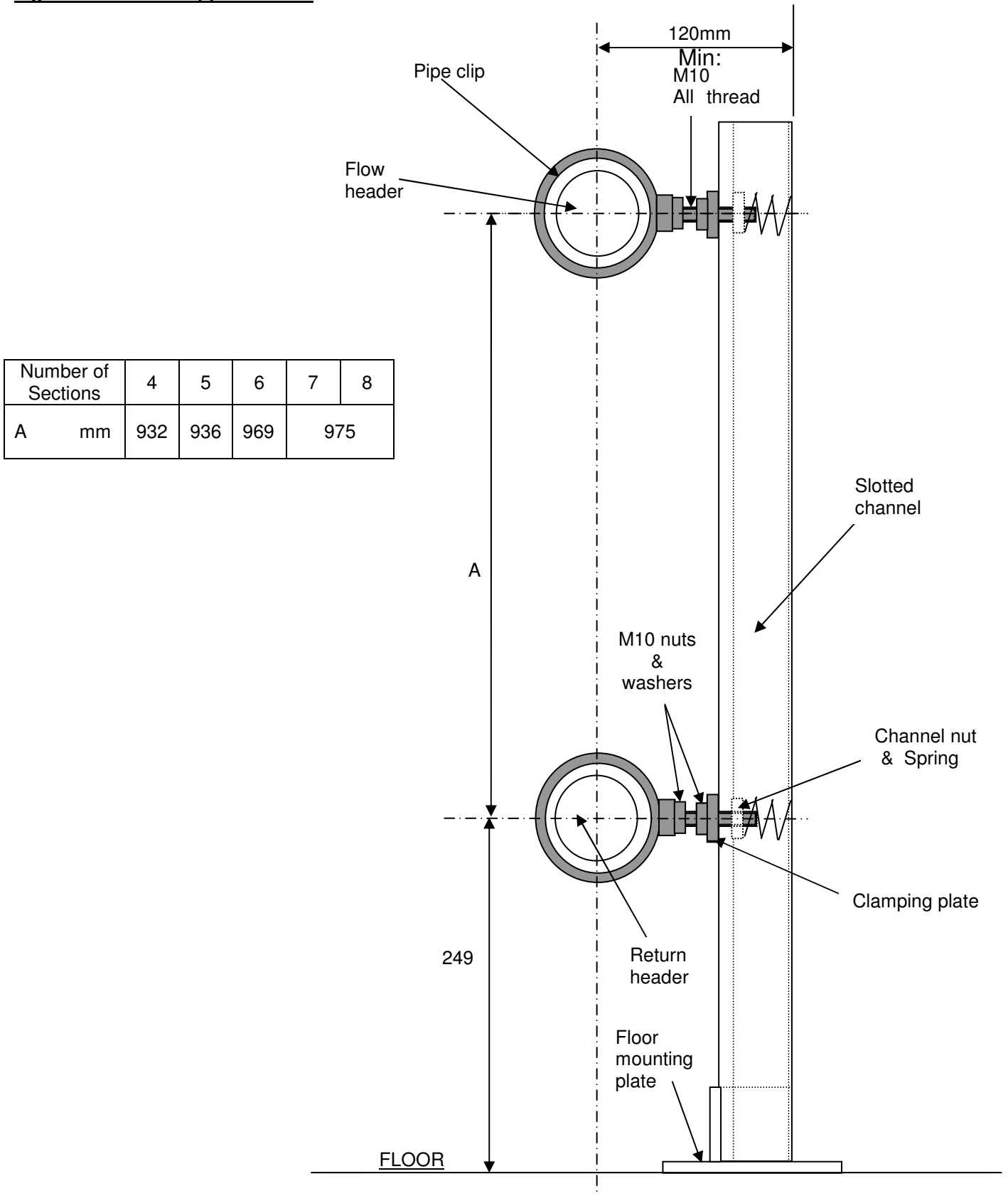
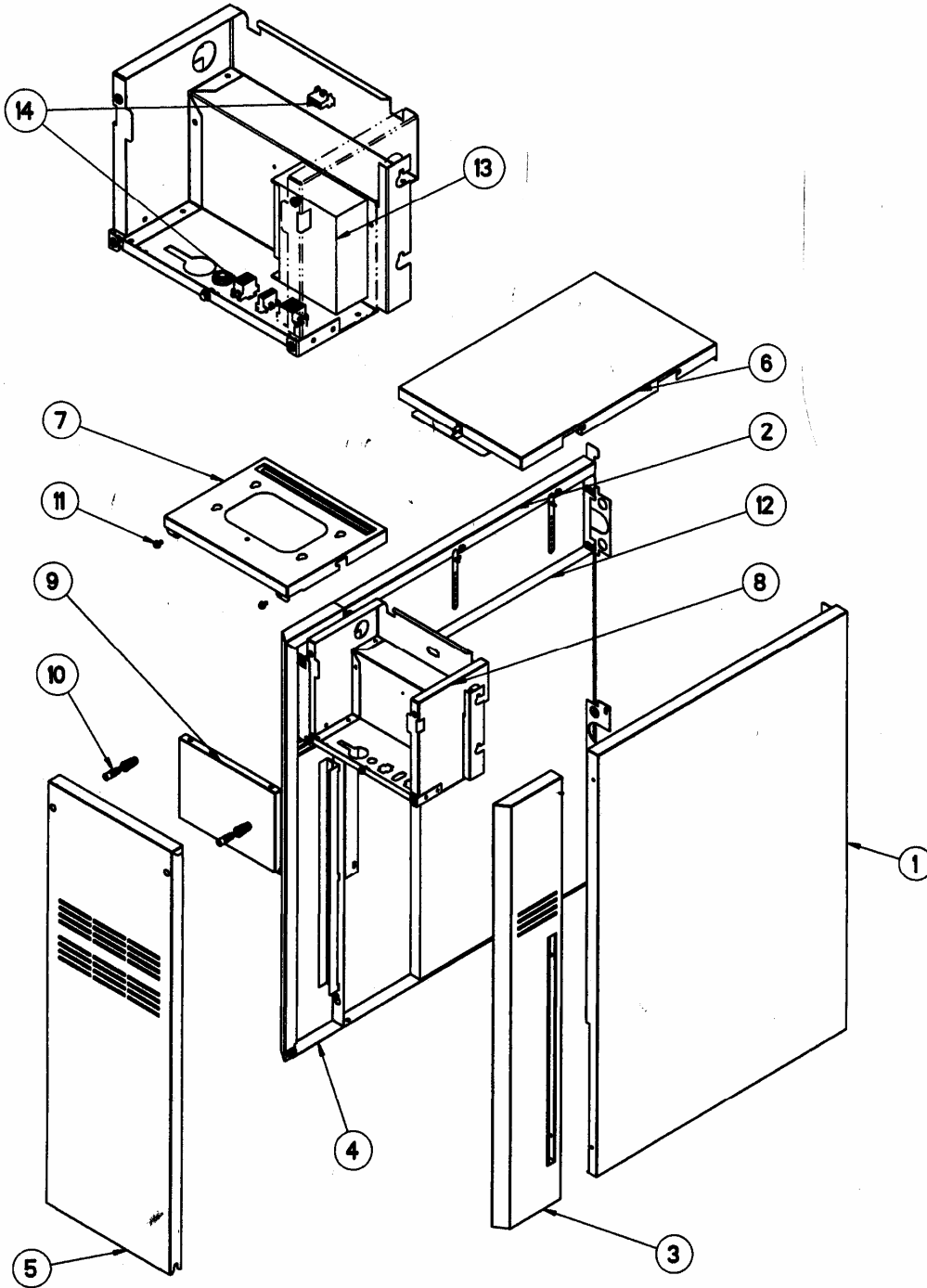


Fig. 28 – Unistrut Support Details



Number of Sections	4	5	6	7	8
A mm	932	936	969	975	

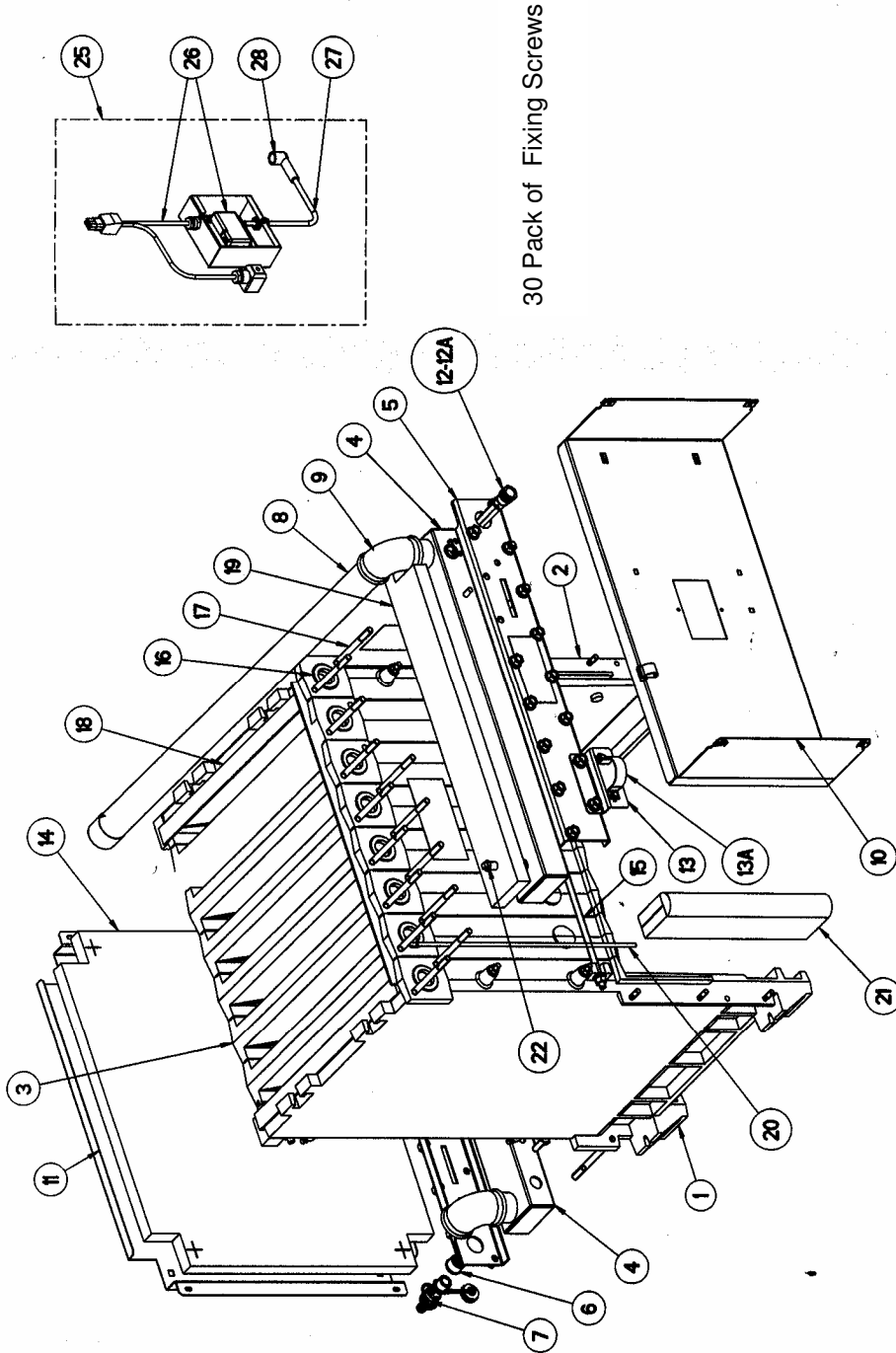
Fig. 29 - Casing Assembly



Casing Assembly (Items 1 – 14)

Item	Description	Red Casing Part No.	White Casing Part No.
1	Side Casing Right	S136808A	S136808EE
2	Side Casing Left	S136807A	S136807EE
3	Front Side Casing Right	S136416BB	S136416BB
4	Front Side Casing Left	S136415BB	S136415BB
5	Front Panel 4 & 5 Section	S136423A	S136423EE
	Front Panel 6 Section	S136424A	S136424EE
	Front Panel 7 Section	S136425A	S136425EE
	Front Panel 8 Section	S136426A	S136426EE
6	Top Rear Panel 4 & 5 Section	S136926A	S136926EE
	Top Rear Panel 6 Section	S136927A	S136927EE
	Top Rear Panel 7 Section	S136928A	S136928EE
	Top Rear Panel 8 Section	S136929A	S136929EE
7	Top Front Panel 4 & 5 Section	S136431A	S136431EE
	Top Front Panel 6 Section	S136432A	S136432EE
	Top Front Panel 7 Section	S136433A	S136433EE
	Top Front Panel 8 Section	S136434A	S136434EE
8	Case Assy 4 & 5 Section	S136920H	S136920H
	Case Assy 6 Section	S136921H	S136921H
	Case Assy 7 Section	S136922H	S136922H
	Case Assy 8 Section	S136923H	S136923H
9	Front Door 4 & 5 Section	S136449H	S136449H
	Front Door 6 Section	S136450H	S136450H
	Front Door 7 Section	S136451H	S136451H
	Front Door 8 Section	S136452H	S136452H
10	¼ Turn Quicklock Screw	S17002478	S17002479
11	Bag of Fixings	S503042	S503043
12	Insulation Panel	S131804	S131805
13	Dungs Control Box - DGAI	COM17001084	COM17001084
14	Controller Plugs	S136405	S136406
-	Compact Plus Badge (Not Shown)	S139056	S139057

Fig. 30 - Waterway Assembly

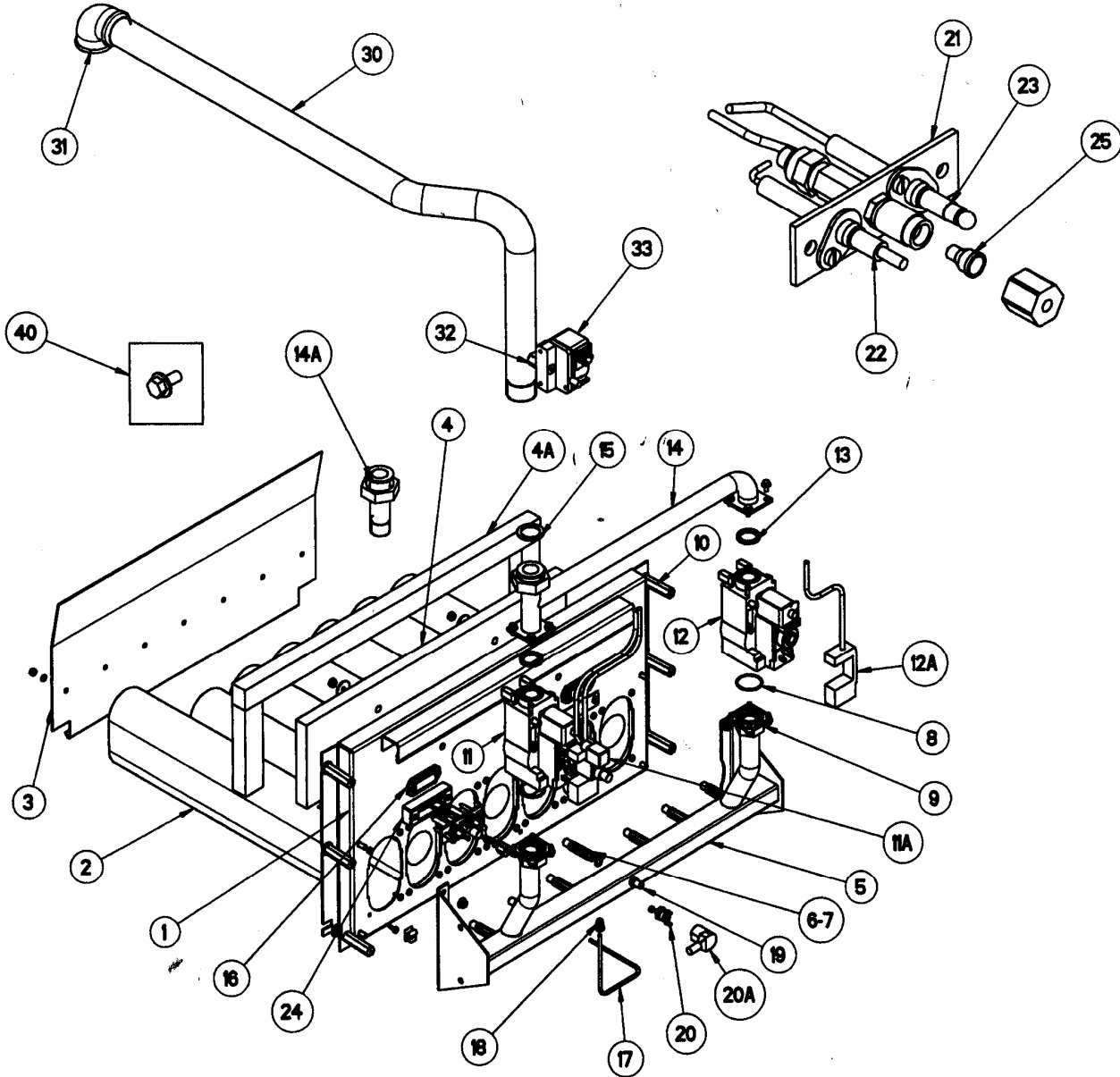


Waterway Assembly (Items 1 –34)

Item	Description	Part No.
1	Left Hand End Section	COM17800856
2	Right Hand End Section	COM17800846
3	Intermediate Section	COM17804056
4	Flow and Return Header (4 Section)	S501407
	Flow and Return Header (5 Section)	S501408
	Flow and Return Header (6 Section)	S501409
	Flow and Return Header (7 Section)	S501410
	Flow and Return Header (8 Section)	S501411
5	Flow and Return Header Clamp Plate (4 Section)	COMC131164
	Flow and Return Header Clamp Plate (5 Section)	COMC131165
	Flow and Return Header Clamp Plate (6 Section)	COMC131166
	Flow and Return Header Clamp Plate (7 Section)	COMC131167
	Flow and Return Header Clamp Plate (8 Section)	COMC131168
6	1/2" BSP Adaptor	COMC15922705
7	1/2" BSP Drain Cock	COMC17006472
8	Flow Pipe 1 1/4" BSP (4 & 5 Section)	COMC17004722
	Flow Pipe 1 1/2" BSP (6 ,7 & 8 Section)	COMC17004723
9	1 1/4" BSP Elbow (4 & 5 Section)	COMC15923012
	1 1/2" BSP Elbow (6, 7 & 8 Section)	COMCN9125780
10	Front Panel 4 Section	S137922
	Front Panel 5 Section	S131318
	Front Panel 6 Section	S131317
	Front Panel 7 Section	S131316
	Front Panel 8 Section	S131326
11	Rear Panel 4 Section	S138228
	Rear Panel 5 Section	S131322
	Rear Panel 6 Section	S131321
	Rear Panel 7 Section	S131320
	Rear Panel 8 Section	S131325
12	Thermostat Pocket	COMC17001781
12A	Thermostat Phial Fixing Clip	COMC17006459
	Thermostat Spacer	S17077719
13	Gas Pipe Clip Retaining Plate	COMC132735
13A	Gas Pipe Clip	COMC132814
14	Rear Insulation 4 Section	S138229
	Rear Insulation 5 Section	S131809
	Rear Insulation 6 Section	S131808
	Rear Insulation 7 Section	S131807
	Rear Insulation 8 Section	S131806
15	Tie Bar M10 4 Section	COMC15243610
	Tie Bar M10 5 Section	COMN9170980
	Tie Bar M10 6 Section	COMN9170990
	Tie Bar M10 7 Section	COMN9171000
	Tie Bar M10 8 Section	COMN9171010
15A	Tie Bar Nut and Washer M10	Supplied with Item 15
16	Flow/Return Header 'O' Ring	COMN9195220
17	Flow/Return Header Securing Studs	COMC15245372
18	0.56m Ceramic Felt Strip	COMC500780
	1m Ceramic Felt Strip	COMN9205320
	2m Ceramic Felt Strip	COMC500779

19	Insulation Strip 4 Section	COMC132568
	Insulation Strip 5 Section	COMC132567
	insulation Strip 6 Section	COMC132566
	Insulation Strip 7 Section	COMC132565
	Insulation Strip 8 Section	COMC132564
20	Ceramic Section Sealing Rope 440mm Long	COMC17000167
	Ceramic Section Sealing Rope 790mm Long	COMC17000168
	Ceramic Section Sealing Rope 1.5 m Long	COMN9195370
21	Section Rear Insulation – per strip	COMC133107
22	Cap ¼”	S15926004
25	Ignition Transformer Assembly	S131777
26	Transformer and Lead	S132406
27	Ignition Lead	COMC15825230
28	Ignition Cap	COMC500483
29	Bag of Fixings (not shown)	COMC500684
30	Flue Brush (not shown)	COMCN9000350
31	Combustion Chamber Fixing Studs M8 x 20 mm	COMN9171150
32	Earth Wire (not shown)	COMC17071647
33	Bottom Ceramic Felt Strip 2200mm Long Inc Adhesive (not shown)	COMC500777
34	Base Panel 4 Section (not shown)	COMC500203
	Base Panel 5 Section (not shown)	COMC500201
	Base Panel 6 Section (not shown)	COMC500200
	Base Panel 7 Section (not shown)	COMC500196
	Base Panel 8 Section (not shown)	COMC500195

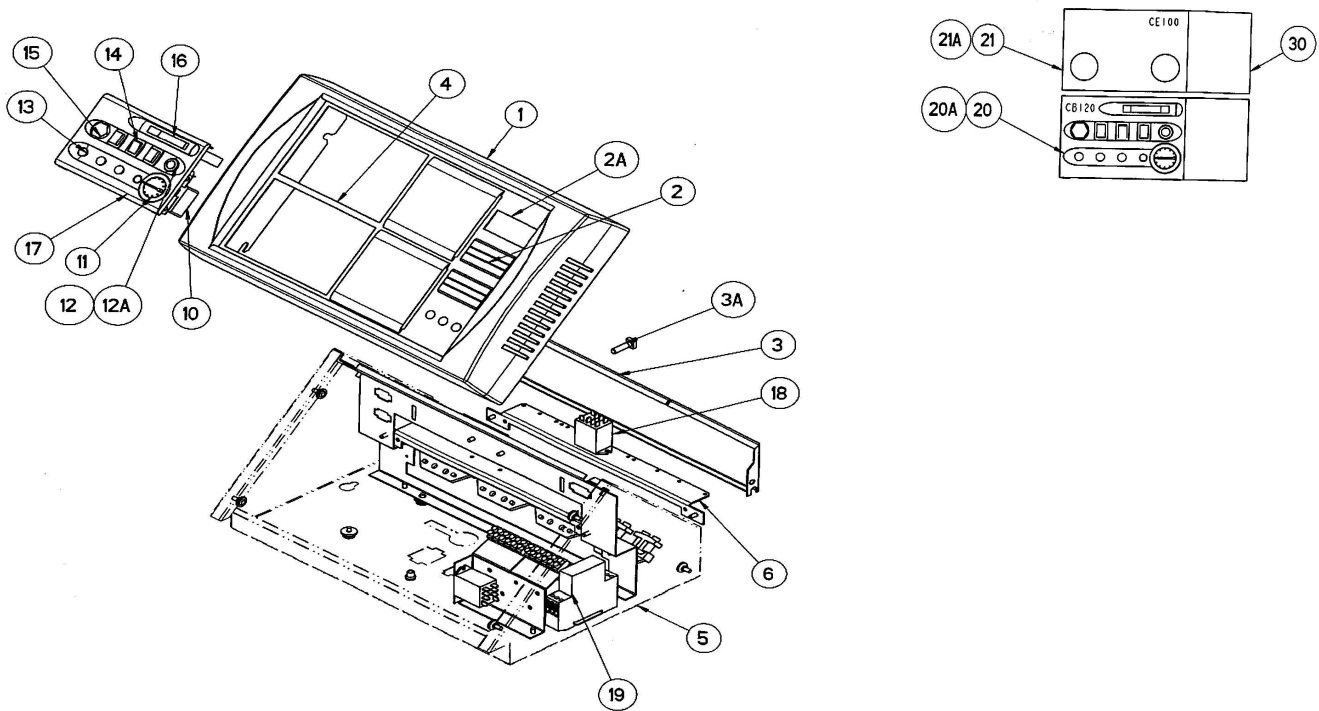
Fig. 31 - Burner Assembly



Burner Assembly (Items 1 – 40)

Item	Description	Part No.
1	Burner front Plate 4 Section	COMC131536
	Burner front Plate 5 Section	S137178
	Burner front Plate 6 Section	S137179
	Burner front Plate 7 Section	S137180
	Burner front Plate 8 Section	S137181
2	Burner Bar	COMN9020400
3	Burner Back Plate 4 Section	COMC132465
	Burner Back Plate 5 Section	COMC133201
	Burner Back Plate 6 Section	COMC132806
	Burner Back Plate 7 Section	COMC132805
	Burner Back Plate 8 Section	S133742
4	Insulation 4 Section	COMC132588
	Insulation 5 Section	S137033
	Insulation 6 Section	S137034
	Insulation 7 Section	S137035
	Insulation 8 Section	S137030
4A	Insulating Band 4 Section	S135626
	Insulating Band 5 Section	S135626
	Insulating Band 6 Section	S135627
	Insulating Band 7 Section	S135628
	Insulating Band 8 Section	S135629
	Lateral Insulating Board Burner	S137100
5	Gas Manifold 4 Section	COMC17006493
	Gas Manifold 5 Section	COMC17006494
	Gas Manifold 6 Section	COMC17006495
	Gas Manifold 7 Section	COMC17006496
	Gas Manifold 8 Section	COMC17006497
6	Burner Injector	COMC17003180
7	Burner Injector Washer	COMC17006504
8	Gas Valve Manifold O-ring	COMC15630110
9	Gas Valve Flange & Gas Valve Seal	COMC17006302
9A	Gas Manifold Blanking Cap (4-6 Section) (Not Shown)	COMCN9126090
10	Combustion Chamber Securing Bolts	S15236109
11	Gas Valve (Honeywell VR4601QB) * Auto version: Note 7 and 8 section also require additional valve item 12 below.	COMC500461
11A	Gas Valve Electrical Wiring	COMC132391
12	Right Hand Gas Valve (Honeywell VR4605CB) Auto 7 & 8 section only)	COMC500433
12A	Gas Valve Electrical Wiring (7 & 8 Section only)	S136465
13	"O" Ring (Ø25mm)	COMC15630110
14	Gas Manifold (7 Section Auto)	COMC131732
	Gas Manifold (8 Section)	COMC131731
14A	Gas Pipe (4,5 & 6 Section)	COMC133004
15	Sealing Washer	COMC133221
16	Viewing Window Assembly	COMCN9022010

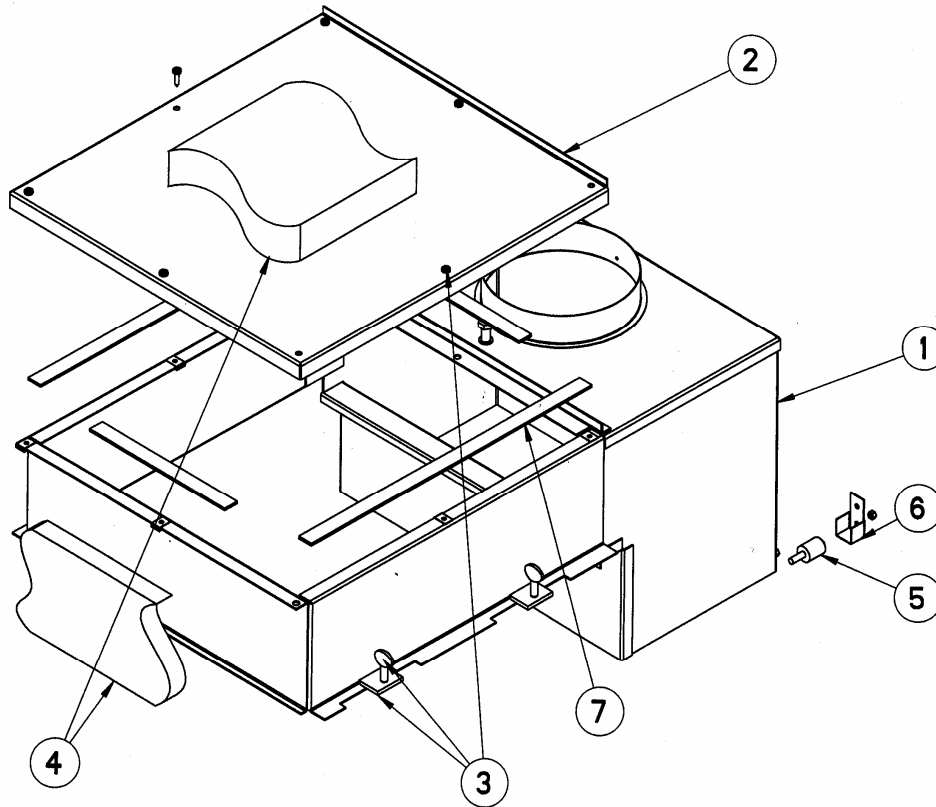
17	Pilot Pipe (4 Section)	COMC132431
	Pilot Pipe (5 Section)	S137151
	Pilot Pipe (6 Section)	S137152
	Pilot Pipe (7 Section)	S137153
	Pilot Pipe (8 Section)	S137154
18	Pilot Tube Nut & Olive	S502835
19	Pressure test Nipple	COM17006201
20	Klixon	S502259
20A	Cap	S136818
21	Pilot Plate	S137131
22	Ignition Electrode	S134257
23	Ionisation Electrode	S133965
24	Pilot Housing	COM17002110
25	Natural Gas Pilot Injector	COMN5590360
	LPG Pilot Injector	S500249
30	Gas Supply Pipe	COMC132686
31	Gas Supply Pipe Elbow	S15923012
32	Gas Pressure Switch	COMC133230
33	Gas Pressure Switch Mounting Bracket	S17006025
40	Bag of Fixings	S503294

Fig. 32 - Control Panel

Control Panel

Item No.	Description	Part No
1	Front Panel	S137535
2	Blank Plate	COM17002268
2a	Thermometer Blank Plate	COM17002281
3	Rear Panel	S137874A
3a	Bolt DZUS	S504314
4	Front Panel Support	S137873H
5	Control Panel Casing	S504313
6	Cable Terminal Support	S136979
10	Thermostat	COM17007004
11	Thermostat Knob	S17004738
12	Fuse Housing	COM15803999
12a	Fuse TFS 5 x 20 6.3A	COM15803525
13	Bag of Lights	S501970
14	Bag of Switches	S503081
15	Limit Thermostat - TG400 Cap.2m	COM17006955
16	Thermostat 68.5 x 14.5 0-120°	S134421
17	CB120 Module Front Panel	S137158
18	Relay LY2F 220AC	COM15815049
19	Time Delay Relay OMRON H3DS-AL	S503756
20	Basic CB 129 Module Assembly	S137157
20A	Basic CB 120 Module Wiring	S136811
21	CE 100 Module Assembly	S137160
21A	CE 100 Module Wiring	S136412
30	Blanking Panel	COM17000983

Fig. 33 - Flue Hood




Flue Hood

Item No.	Description	Part No
1	Flue Box (4 Section)	COMC501412
	Flue Box (5 Section)	COMN7462140
	Flue Box (6 Section)	COMN7462150
	Flue Box (7 Section)	COMN7462760
	Flue Box (8 Section)	COMN7462170
2	Flue Box Top (4 Section)	COMC131384
	Flue Box Top (5 Section)	COMN9078944
	Flue Box Top (6 Section)	COMN9078954
	Flue Box Top (7 Section)	COMN9078964
	Flue Box Top (8 Section)	COMN9078974
3	Bag of Fixings	S503295
4	Flue Box Insulation (4 Section)	S132561
	Flue Box Insulation (5 Section)	S17070903
	Flue Box Insulation (6 Section)	S17070904
	Flue Box Insulation (7 Section)	S17070905
	Flue Box Insulation (8 Section)	S17070906
5	Flue Spillage Stat	S500540
5A	Flue Spillage Stat Adaptor – not shown	S136611
6	Flue Spillage Stat Support	S136917
7	Ceramic Felt Flue Seal	COMN9205320

COMMISSIONING REPORT

ALL BOILER TYPES

 Wood Lane, Erdington, Birmingham, B24 9QP Tel: 08702 412759 Fax: 08701 653000	REPORT SENT TO INSTALLER:	YES		NO
	SITE VISIT	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		
		Fan Assisted		
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 ^{cp}	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.....							
					YES	NO	
8.6	Are Water Isolating Valves Fitted						
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)

PLANT ROOM		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 manufacturer's 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 Baxi Commercial Heating at the address listed on the back page of this manual. When a Baxi Commercial Heating engineer commissions the boiler this commissioning report will be filled in and left with the boiler. Commissioning by Baxi Commercial Heating 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 Baxi Commercial Heating. 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 manufacturer's instructions for full details).

CONVERSION TABLE

	IMPERIAL TO METRIC	METRIC TO IMPERIAL
<u>HEAT</u> 1 Therm = 100,000 Btu/hr	1 Btu/hr = 0.291 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 = 1 m 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 1 U.S. Gallon = 0.83 UK 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 = 0.358 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 = 25.4 mm 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 = 0.7577 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

Commercial sales technical & service enquiries

Tel: 0845 070 1055
Fax: 0845 070 1059
Sales hotline: 0845 070 1056
Technical helpline: 0845 070 1057
Service hotline: 0845 070 1058
e-mail: potterton.commercial@baxicommercialdivision.com
web: 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: 0844 871 1540

Applications & Installations

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

Please contact: 0845 070 1057

Commercial service offices

Our service organisation covers the whole of the UK to look after your needs for all Potterton Commercial products.

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

- Burner commissioning for all fuels
- Boiler service contracts
- Breakdown and repair services
- Burner and boiler replacement
- Oil/gas conversions
- Water treatment and descaling
- Packaged units

All descriptions and illustrations contained within 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 in this leaflet.

PART OF BDR THERMEA

Baxi Commercial Division
Wood Lane, Erdington,
Birmingham B24 9QP

Sales:

0845 070 1056

Technical:

0845 070 1057

Email: potterton.commercial@baxicommercialdivision.com
www.pottertoncommercial.co.uk



POTTERTON
C O M M E R C I A L

heating specialists