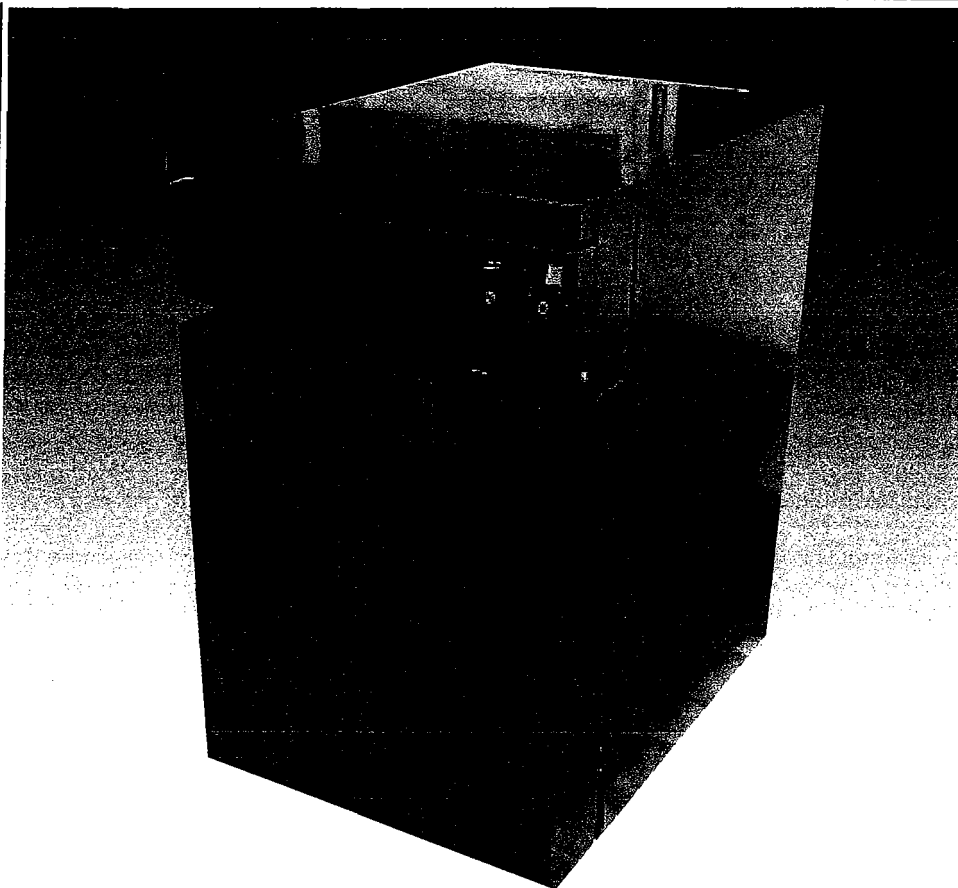


Derwent compact

INSTALLATION, OPERATION & MAINTENANCE MANUAL



JANUARY 2002

POTTERTON
C O M M E R C I A L

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DERWENT COMPACT

Fig.1 - General Data & Dimensions (mm) (NOT TO SCALE)

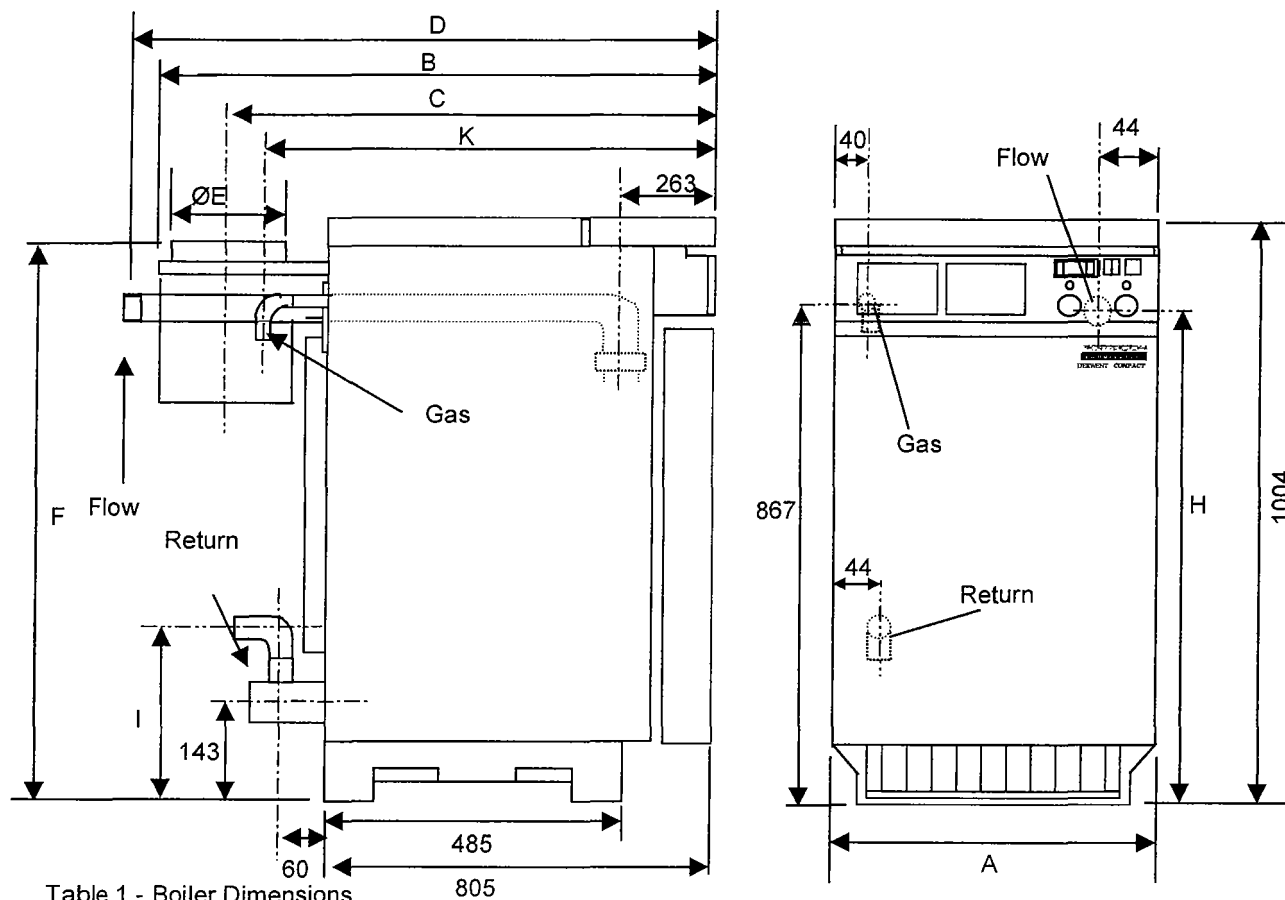


Table 1 - Boiler Dimensions

Sections	4	5	6	7	8
Output kw	48	64	80	96	112
A mm	374	446	527	608	689
B mm	1080		1100		1160
C mm	962		972		997
D mm	1140		1193		
ØE mm	181		201		251
F mm	987				1012
H mm	862	867			
I mm	237	244			
J mm	867				
K mm	905		910		

Table 2 - Connections

	4	5	6	7	8
Water	1 ¼" BSP		1 ½" BSP		
Drain	½" BSP				
Gas	¾" BSP		1 ¼" BSP		

TABLE 3 - Technical Data

		Permanent Pilot or Fully Electric				
	Number of Sections	4	5	6	7	8
	CE Certification Number					
	Output kW	46.4	63	79	94	112
1	Fuel Consumption m ³ /hr	5.5	7.3	9.1	11.0	12.9
	Input (Nett) kW	52.9	70.6	88.2	105.9	125
	Input (Gross) kW	58.7	78.4	97.9	117.6	137.1
2	Nominal Gas Inlet Pressure mbar	20				
	Burner Manifold Pressure mbar	16.5				
	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 Draught Requirements	1 – 4 mm All Sizes				
6	High Level Natural Ventilation to BS 6644 or BS5440 cm ²	270	312	355	400	444
6	Low Level Natural Ventilation to BS 6644 or BS5440 cm ²	540	624	710	800	888
7	Mechanical Inlet to BS 6644 or BS5440 m ³ /sec	0.064	0.086	0.108	0.129	0.151
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	40				
	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				

See Page 3 for explanatory notes

Conversion Tables on inside of back page

DERWENT COMPACT

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 & 4 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 140°C at 6.5% 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

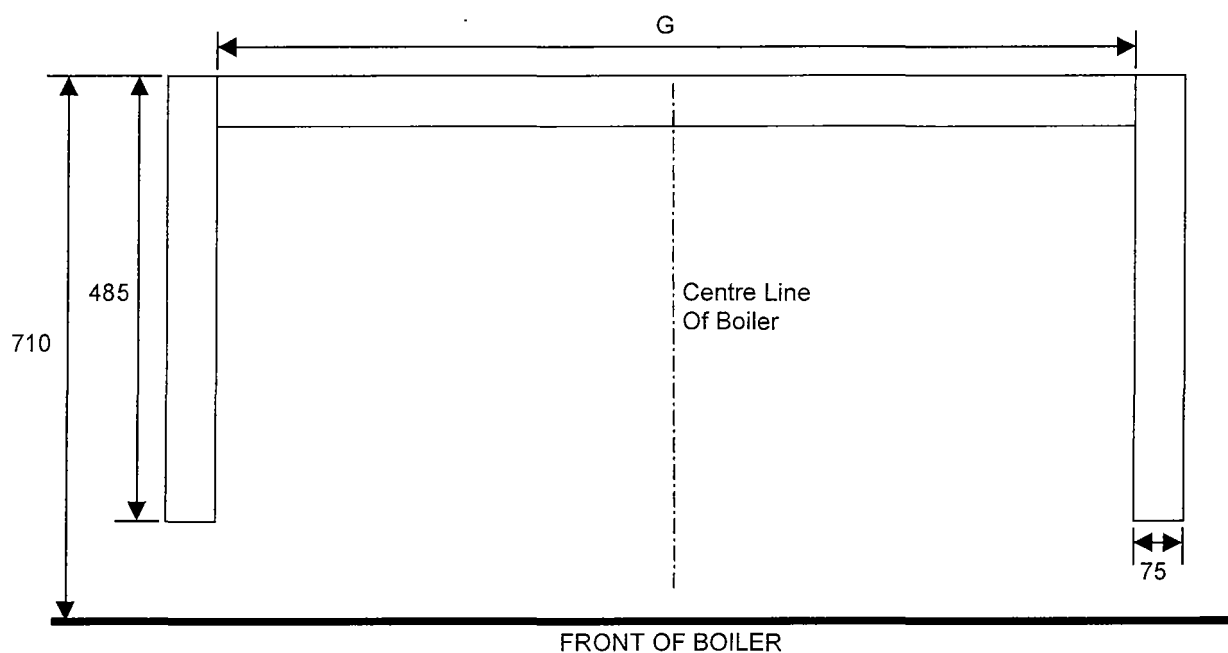
This is the minimum operating return temperature to prevent condensation within the boiler system. This should be achieved within 20 minutes if not back end protection should be considered. Minimum temperature for continuous running should be above 60°C to prevent condensation.

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 - 500mm from rear of flue hood
- SIDES - 10mm
- FRONT - 1000mm (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.

DERWENT COMPACT

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 cast iron sectional boiler is available in five sizes. Table 3 (page 2) gives kW outputs and technical data for each model. Each size is available in automatic or permanent pilot versions.

The Derwent Compact 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 2) 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 version 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 permanent pilot version incorporates full safety features including control and high limit thermostats, thermometer and on/off mains switch with lamp and thermoelectric flame failure protection.

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

- Additional volt-free contacts
- Sequence control
- Flue header for 2, 3 & 4 boilers
- Flow and return header for 2, 3 & 4 boilers

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. (ACOPS 16) 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 1991

Electricity at work Regulations 1989

Management of H&S at Work Regulations 1992

Manual Handling Regulations 1992

Model Water By-Laws 1986

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

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

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

BS 6644: 1991 – 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: 1991 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.

For further advice on installation refer to Potterton technical bulletins 1- 4.

DERWENT COMPACT

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: 1991 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: 1991 and British Gas publication IM/11 "Flues for Commercial and Industrial Gas Fired Boilers and Air Heaters". The third edition of the 1956 Clean Air Act Memorandum and the Building Regulations should be strictly observed and approval obtained where applicable, combustion chamber details are given in Section 1.

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

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

FLUE SIZE CONSIDERATIONS

Nominal flue connection sizes are given in 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 Technical Bulletin No.4, current issue or see relevant British Standard publication BS6644: 1991.

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

WATER CIRCULATION SYSTEMS

The water circulation system should be indirect and installed in accordance with the relevant parts of British Standards Codes of Practice CP342.2 and BS 6644: 1991.

The maximum and minimum design temperature differential across the boiler should be 20°C and 10°C and the boiler should be prevented from operating with flow rates giving a temperature difference across the boiler greater than 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 Publication Technical Bulletin No.1 Issue 2.

It is recommended that the system is designed to give a constant flow rate. For further information on water circulation systems see Potterton publication Technical Bulletin No.1 and Technical Bulletin No.3 current issue.

BOILER PROTECTION

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

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 Filling

The system must be clean, as debris regress will damage the boiler. Derwent Compact boilers are modern, low inertia boilers which react quickly. As they only have a limited water capacity, the water circulating must be clean. The following precautions should be taken before connecting the boiler.

- New installation: Clean and then flush, under pressure before boiler is installed if possible.
- Old Installation: All systems should be flushed through with a flushing agent to ensure all systems are free from any deposits which may harm the boiler before the new boiler is installed.

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

SEALED SYSTEMS

General

Potterton Commercial boilers are suitable for use on sealed systems designed in accordance with BS 6644: 1991 and BS 6880 Part 2. In addition, reference should be made to the Health & Safety Executive guidance note PM5 "Automatically Controlled Steam & Hot Water Boilers".

Noise Level

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

DERWENT COMPACT

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.

DERWENT COMPACT

- 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

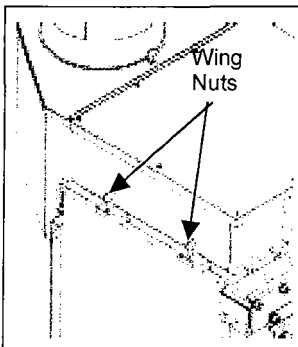
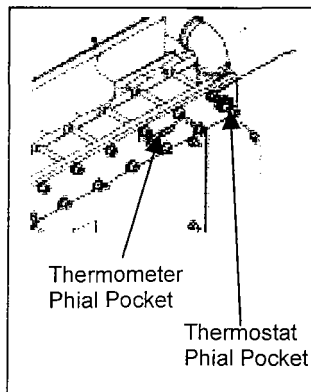


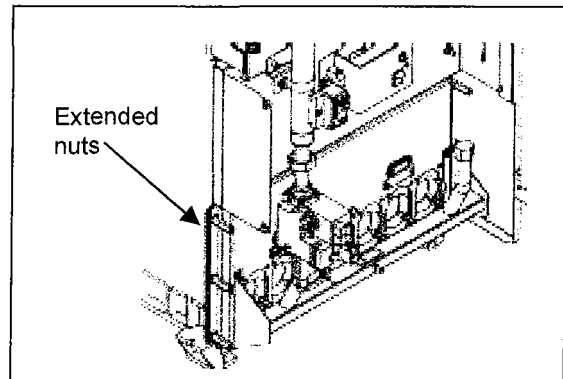
Fig. 3 – Thermostat & Thermometer Pockets



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 ½" holes (C)) to the right hand section using one of the assembly plates (A) (Figs 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

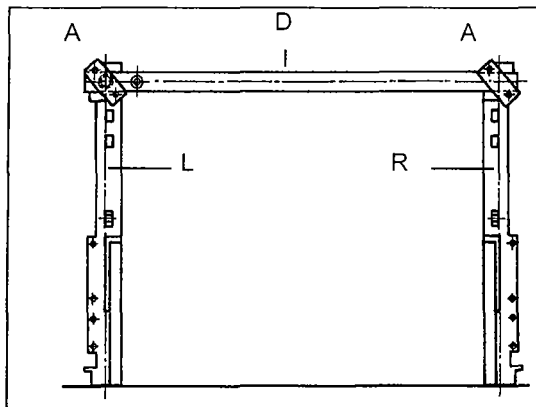


Fig. 7

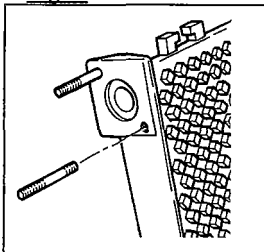


Fig. 8

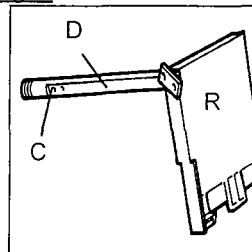


Fig. 9

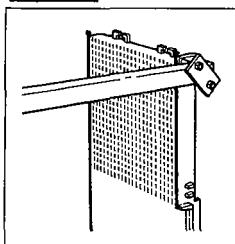


Fig. 10

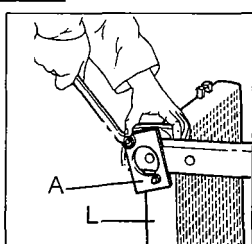


Fig. 11

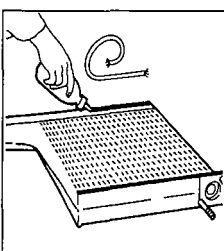
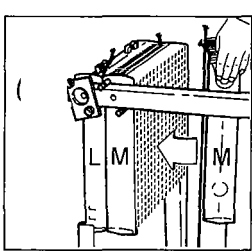


Fig. 12



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 -

- SKIN** – then resin removing cream should be used and not a solvent to remove it.
- EYES** – the eye should be irrigated with water and medical treatment sought.
- 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.

DERWENT COMPACT

Fig. 13

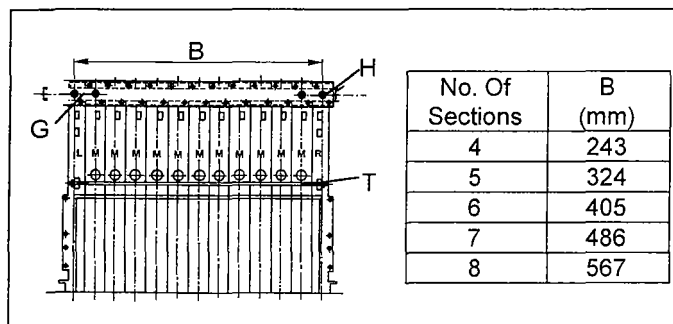


Fig. 14

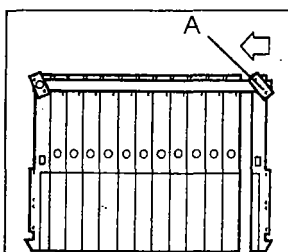


Fig. 15

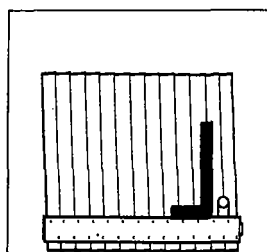


Fig. 16

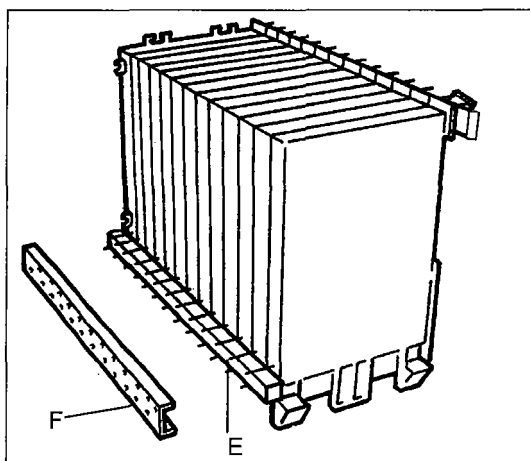


Fig. 17

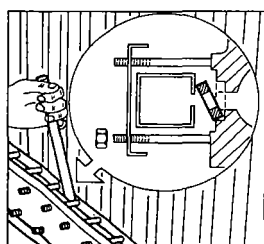
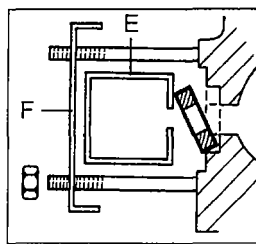


Fig. 18



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:

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

Tighten all the nuts on the manifolds evenly.

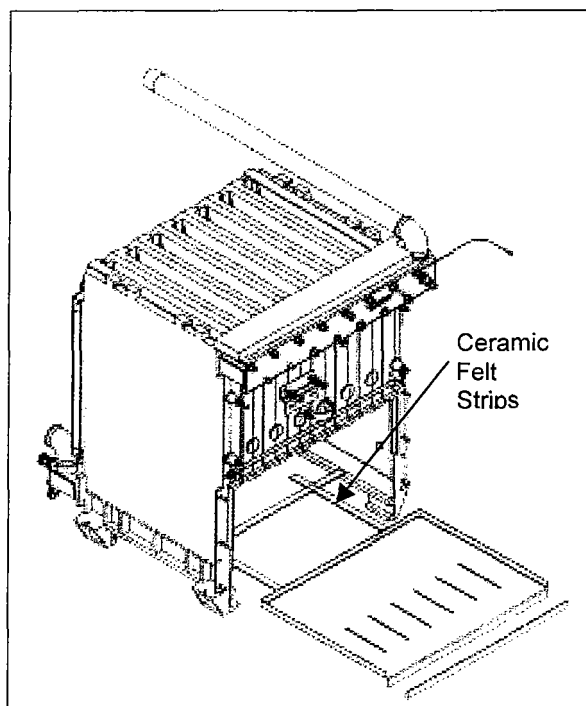
Fit the temperature monitoring sleeve in the 1/2" hole (H) in the section (8) nearest the outlet.

Fit the drain tap to $\frac{3}{4}$ " hole in the return manifold.

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



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.

Connecting the Electrical Supply

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 to 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 pages 28 & 29 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.

DERWENT COMPACT

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 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,

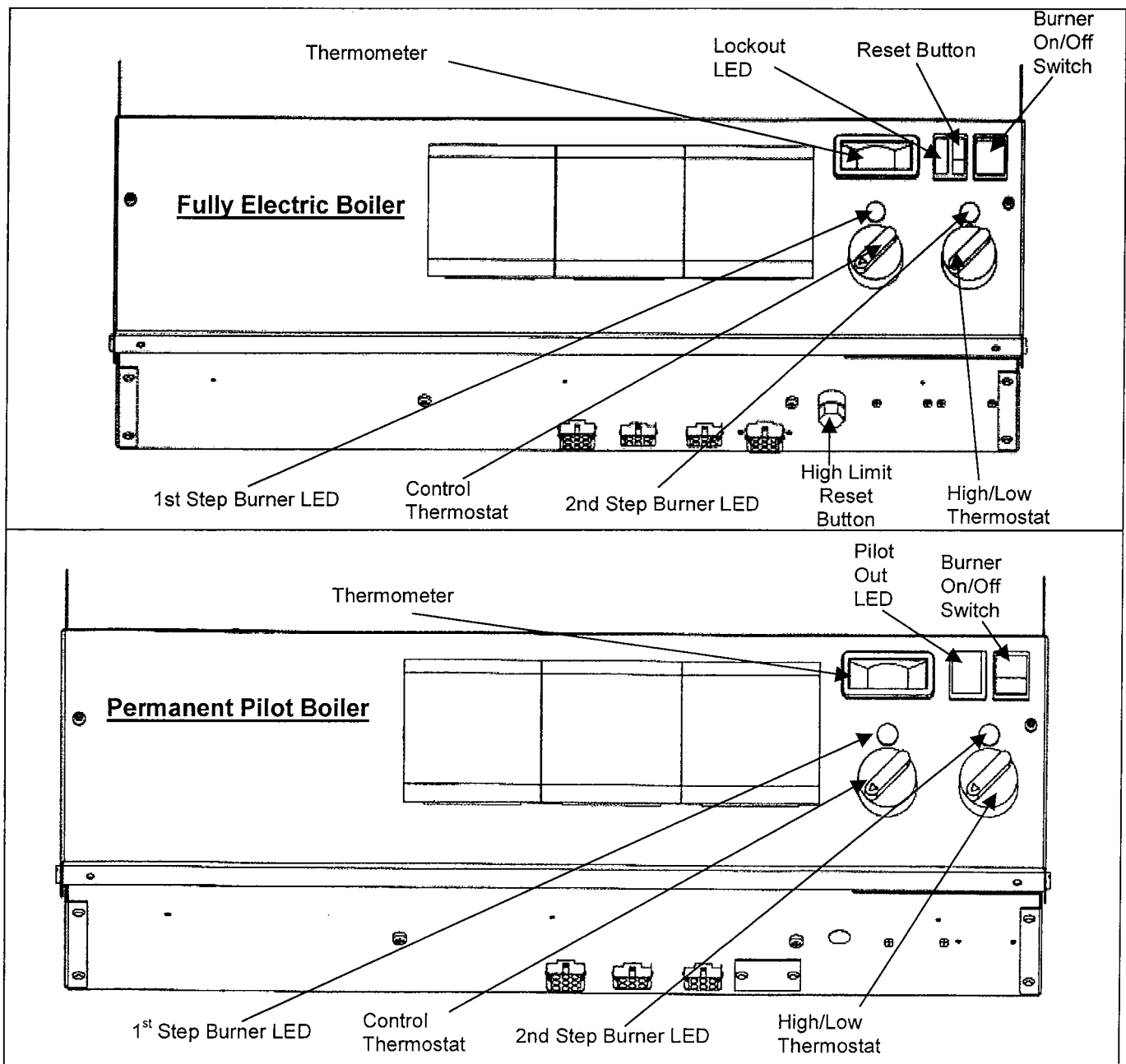
provided with an isolating valve so that it is possible to isolate the boiler from a common gas supply for maintenance purposes.

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.

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 pages 28 and 29.

Fig. 20 - Control Panel Configurations



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

DERWENT COMPACT

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 pages 23 and 24.

Commissioning Live Run (Fully Electric)

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, (see below for details).

- 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.

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. (see Fig.21A)

- 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.

DERWENT COMPACT

Fig. 21 – Gas Valve Arrangement

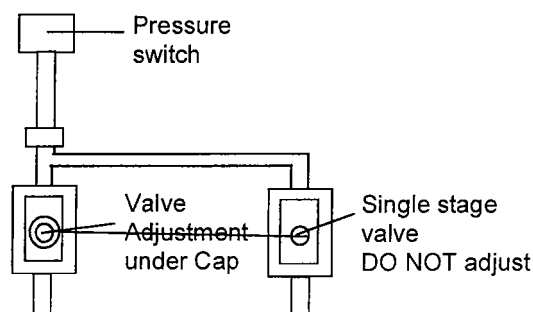
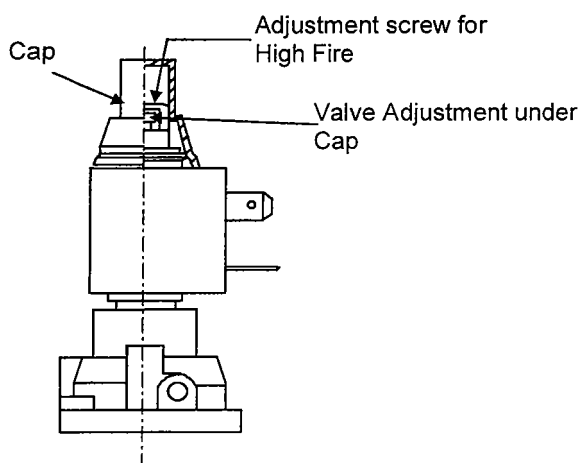


Fig. 21A – Honeywell VR4601Q Gas Valve



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 - 4 μ A.

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

Commissioning Live Run (Permanent Pilot)

- 1 Turn on the appliance isolation valve.
- 2 Connect a pressure gauge to the burner manifold pressure test point.
- 3 Ensure that the electrical supply to the boiler is turned off.
- 4 Depress and hold the pilot ignition button on the gas valve and light the pilot using the piezo ignitor. Keep pressing the pilot ignition button

for approximately 30 seconds. Slowly release the pilot ignition button. The pilot should remain alight. If the pilot goes out re-light the pilot following the same procedure keeping the button depressed for a little longer.

If the pilot still goes out check that there is no air in the pilot gas line and re-light the pilot.

- 5 Once the pilot is established turn on the electrical supply to the boiler. Set any external control systems to call for heat. Set the boiler control thermostats to 80°C. The main gas burner will now ignite.
- 6 Check the gas pressure at the burner manifold and adjust to 16.5mbar at the gas regulator on the gas valve if necessary.
- 7 Check the flue for spillage as described below.
- 8 Test the gas connection between the appliance isolation valve and the burner manifold for soundness with a soap solution or other approved method and seal any leakages.
- 9 Check the reliability of ignition of the boiler by switching the boiler off using the ON/OFF switch on the boiler control panel. After 2 minutes turn the switch back to ON. The boiler will now relight. Check that the pilot has a stable flame and that the main burners light smoothly.
- 10 Turn the appliance isolation valve off. The main and pilot burners should go off. Turn the appliance isolation valve on and attempt to relight the pilot. There should be no gas supply at the pilot. Re-light the pilot by following the instructions above after 1 minute.

High/Low Operation

To set the low fire gas rate (see Fig.21).

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.

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

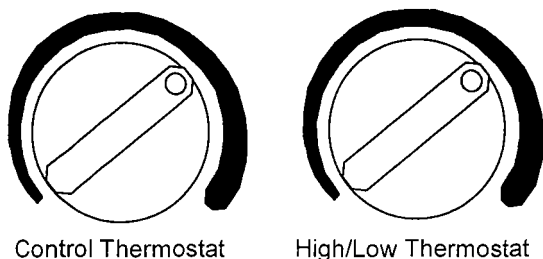
1. Temporarily - Switch the on/off switch to "OFF". Switch off the electrical supply.
2. Long Periods - As above but in addition turn off the service cock at the gas meter.

Setting The Flow Temp: (Fully Electric)

The required flow setting should be set by the control thermostats. The temperatures, which correspond to the positions on this scale, are given Fig.22. The boiler thermometer should be used to check and adjust the setting as necessary.

NOTE: The high/low operation works with two thermostats. Low fire should be adjusted at a temperature 5°C below the high fire temperature.

Fig.22 - Control Thermostat (Fully Electric)



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.

DERWENT COMPACT

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.**

- 1 Remove the boiler door by lifting forward and upwards (disconnect earth wiring and chain).
- 2 Disconnect the gas union, which is located above the gas valve.
- 3 Unscrew the 6 nuts on the burner fixing plate on the right and left hand sides.
- 4 Disconnect the spark ionisation and earth wires to the pilot burner.
- 5 Pull the burner assembly forward and clean the burner, pilot burner and combustion chamber of dust and debris
- 6 Remove the boiler top panel by loosening the rear locking plate and pushing the panel towards the back before removing.
- 7 Remove the top insulation and remove the screws securing the flueway clean out cover and remove the cover.
- 8 With the flue brushes provided clean the flueways of the cast iron heat exchanger if necessary.

Following completion remove the debris from the bottom of the boiler.

- 9 Following completion of the above the boiler should be reassembled. The integrity of the gaskets and insulation should be checked and replaced if necessary during re-assembly.
- 10 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.
- 11 After reassembly 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 23 for details of control box lockout conditions.

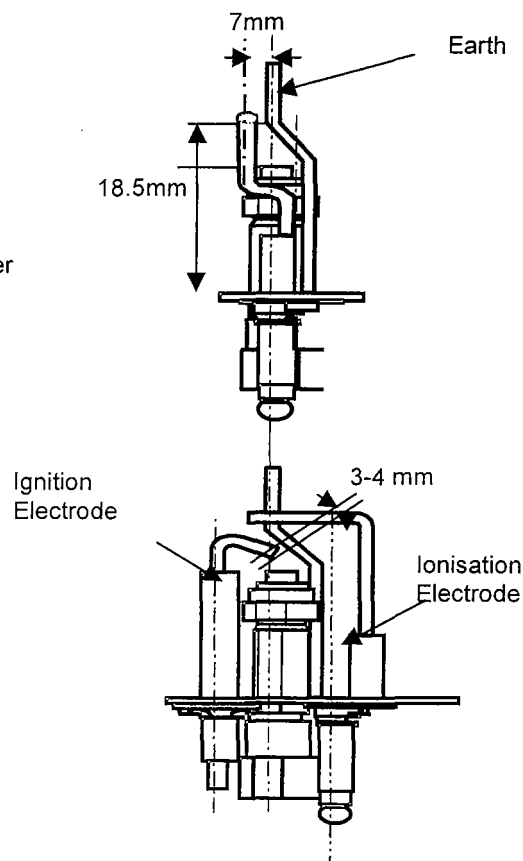
Burner Fails to Light (Permanent Pilot)

The Derwent Compact has an integral safety system to allow safe and reliable operation of the burner.

Protection against flame failure is provided by a thermocouple, which controls the pilot burner. Should the pilot burner fail then the thermocouple will shut down the supply of gas to both the pilot and main gas burners, safely shutting down the boiler.

If difficulty is experienced trying to light the pilot check that the pilot flame is playing on the thermocouple and check that the thermocouple is properly connected to the gas valve.

Fig.23 – General Arrangement of Pilot Burner
(Fully Electric)



DERWENT COMPACT

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>	<ul style="list-style-type: none"> a) Check electricity supply is available to boiler and mains LED is illuminated. b) Check the boiler is being called to operate. c) Check overheat cut off device has not operated. d) Check power supply is available to control box (see wiring diagram). Replace box if faulty.
<p><u>Stage 2</u></p> <p>No ignition spark.</p> <p>Pilot does not light.</p> <p>Control box goes to lockout.</p>	<ul style="list-style-type: none"> a) Check ignition electrode continuity for earth fault, check the ignition wire. b) Check power supply is available to electronic ignitor during ignition period c) Check operation of ignitor. Replace if necessary.
<p><u>Stage 3</u></p> <p>Ignition sparks.</p> <p>Pilot burner does not light.</p> <p>Control box locks out.</p>	<ul style="list-style-type: none"> a) Check gas supply is available at the pilot burner at the correct pressure. b) Check gas supply is purged of air. c) Check pilot injector. d) Check ignition electrode position.
<p><u>Stage 4</u></p> <p>Pilot burner lights.</p> <p>Control box goes to lockout after 5 seconds.</p>	<ul style="list-style-type: none"> a) Check electrical supply polarity. b) Check earth continuity to pilot burner. c) Check pilot burner pressure is correct. d) Check there is no earth leakage on ionisation probe circuit. 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><u>Stage 5</u></p> <p>Pilot burner lights.</p> <p>Main burner does not light.</p> <p>Control box does not lockout.</p>	<ul style="list-style-type: none"> a) Check main burner gas valve is open. b) Check electrical continuity to main gas valve. c) Check operation of gas valve and replace if necessary. d) Check control box. Replace if necessary.
<p><u>Stage 6</u></p> <p>Pilot burner lights.</p> <p>Main burner lights.</p> <p>Control box locks out.</p>	<ul style="list-style-type: none"> a) Check ignition of main flame is smooth and reliable. b) Check voltage supply for interference.

Fault Finding (Permanent Pilot)

<u>Stage 1</u> Difficulty lighting the pilot and main burner	a) Air in the gas line – ensure that the gas pipe has been properly purged and contains no residual air. b) Check that the pilot flame is heating the thermocouple. c) Check that the electrical connections on the high limit thermostat and thermocouple are correct.
<u>Stage 2</u> Pilot is lit but main burner will not light	a) Check that the valve is properly switched on. b) Check that the control thermostat is set to a heating position.
<u>Stage 3</u> The boiler cuts off and needs to be completely re-ignited after cooling down.	a) Ensure that the control thermostat is operating correctly. b) Check the water level in the boiler. c) Check that the central heating pump is working.
<u>Stage 4</u> Overheat thermostat tripped	a) The high limit thermostat will trip and cut the burner in the event of an abnormal rise in boiler water temperature. Before re-setting the thermostat the cause of the temperature rise should be investigated.
<u>Stage 5</u> Pilot found un-lit.	Check to see if the pilot has gone off due to:- a) An interruption in the gas supply. b) An abnormal drop in gas pressure. c) Blockage of the gas supply. d) A worn thermocouple. e) A weak pilot flame. f) High draught – blowing the pilot away from the thermocouple.
<u>Stage 6</u> Reduced heating or domestic hot water service.	a) Check the operation and position of the control thermostat. b) Ensure that the high limit thermostat has not tripped.
<u>Stage 7</u> Poor flame picture (yellow, loose flame)	a) Incorrect gas pressure. b) Poor/insufficient ventilation. c) Boiler requires servicing. d) Check flue for spillage. IF THE PROBLEM CANNOT BE RECTIFIED IMMEDIATELY THE BOILER SHOULD BE <u>SWITCHED OFF, DISCONNECTED AND A WARNING NOTICE FITTED.</u>

DERWENT COMPACT

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 in 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.

**COMPONENT REPLACEMENT
(PERMANENT PILOT)**

Before connecting 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.

Main Burner Bar

- 1 Remove the boiler door (remembering to disconnect the earth cable).
- 2 Disconnect the gas supply to the gas valve.
- 3 Remove the thermocouple from the gas valve and then remove the pilot interrupter cables.
- 4 Disconnect the electrical supply to the gas valve.
- 5 Remove six M8 nuts that secure the front combustion chamber cover mounted above the burner assembly and remove the panel.
- 6 Remove the four screws, which secure the burner to the boiler combustion chamber and remove the burner.

Pilot Burner & Electrode

- 1 Remove boiler door (remembering to disconnect the earth cable).
- 2 Disconnect the pilot supply pipe from the gas valve.
- 3 Disconnect the ignition lead from the piezo ignitor.
- 4 Disconnect the thermocouple from the gas valve.
- 5 Remove the two screws, which secure the pilot burner assembly and remove the complete assembly.
- 6 Fit new pilot burner & check the electrode position as shown in 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.

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.

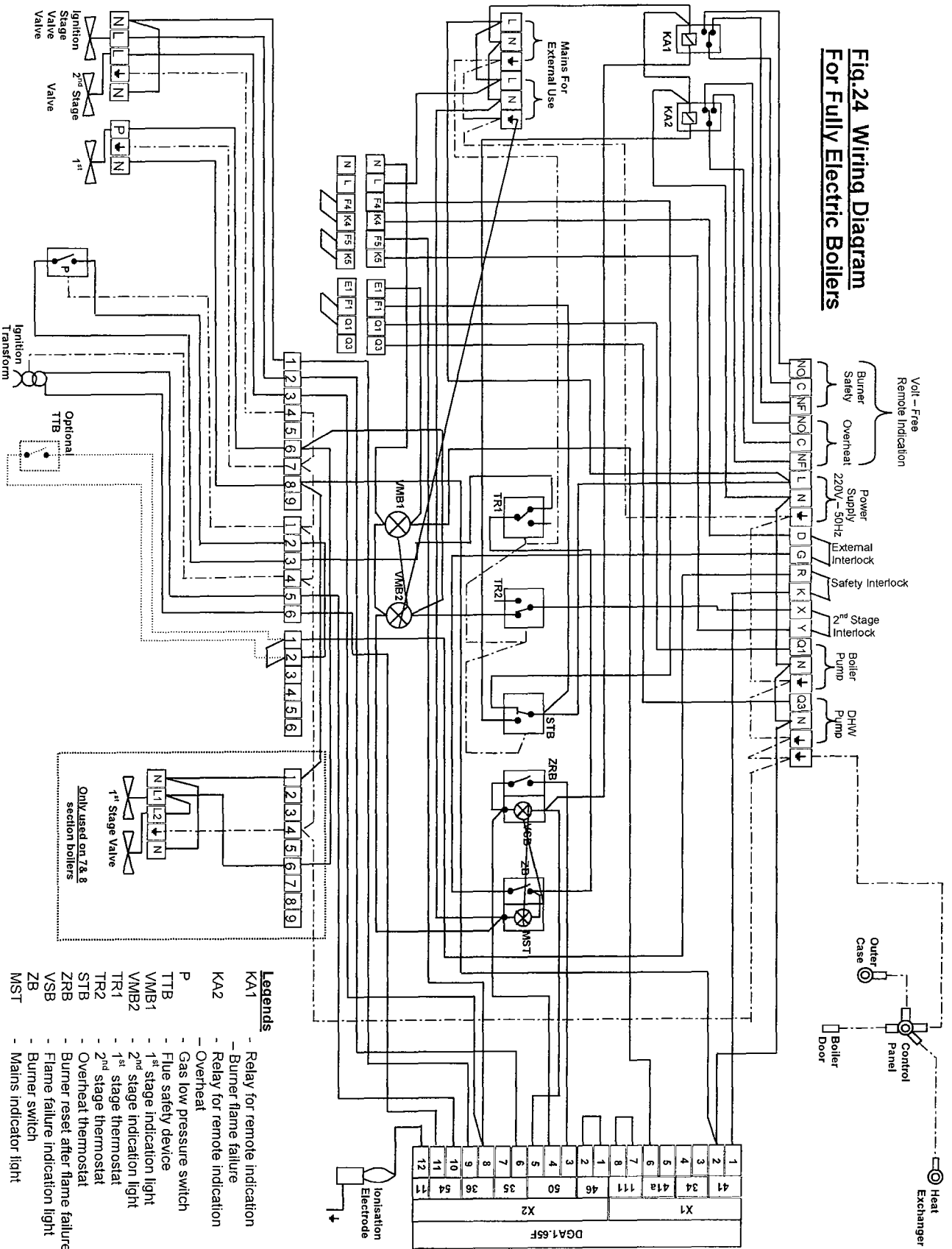
DERWENT COMPACT

Main Gas Valve

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

NOTE: When replacing the door make sure that the earth cable is re-connected.

**Fig.24 Wiring Diagram
 For Fully Electric Boilers**



- Legends**
- KA1 - Relay for remote indication
 - KA2 - Relay for remote indication
 - P - Gas low pressure switch
 - TTB - Flue safety device
 - VMB1 - 1st stage indication light
 - VMB2 - 2nd stage indication light
 - TR1 - 1st stage thermostat
 - TR2 - 2nd stage thermostat
 - STB - Overheat thermostat
 - ZRB - Burner reset after flame failure
 - VSB - Flame failure indication light
 - ZB - Burner switch
 - MST - Mains indicator light

**Fig.25 Wiring Diagram For
Permanent Pilot**

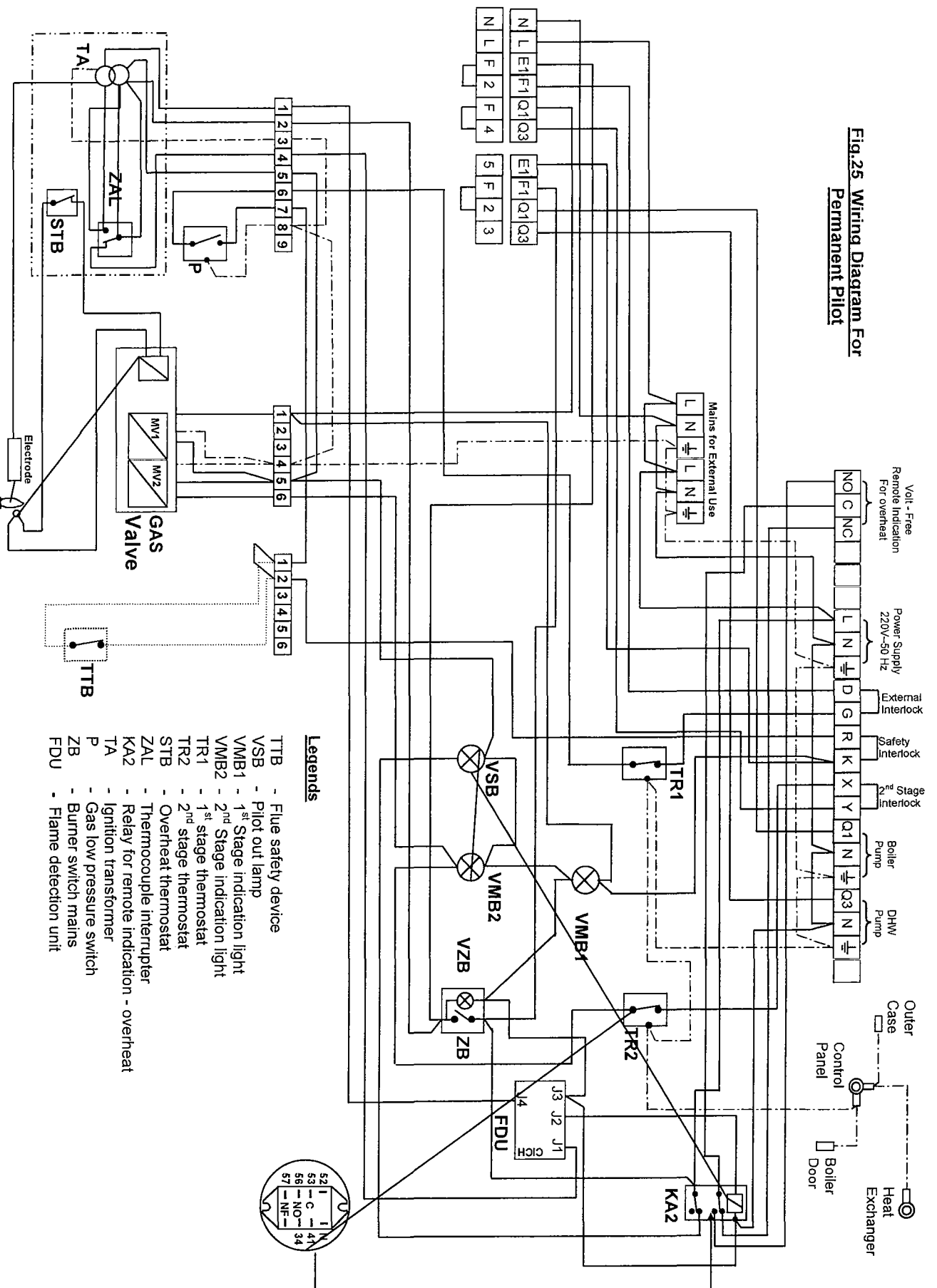
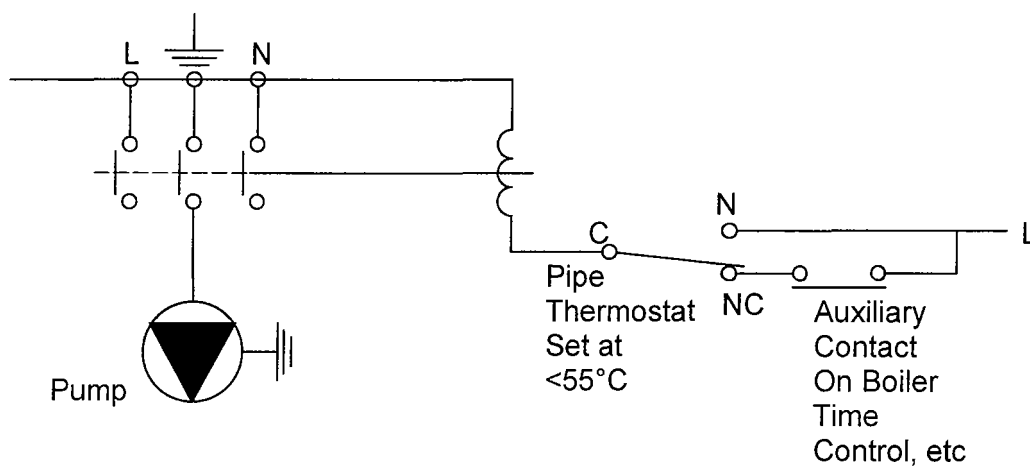
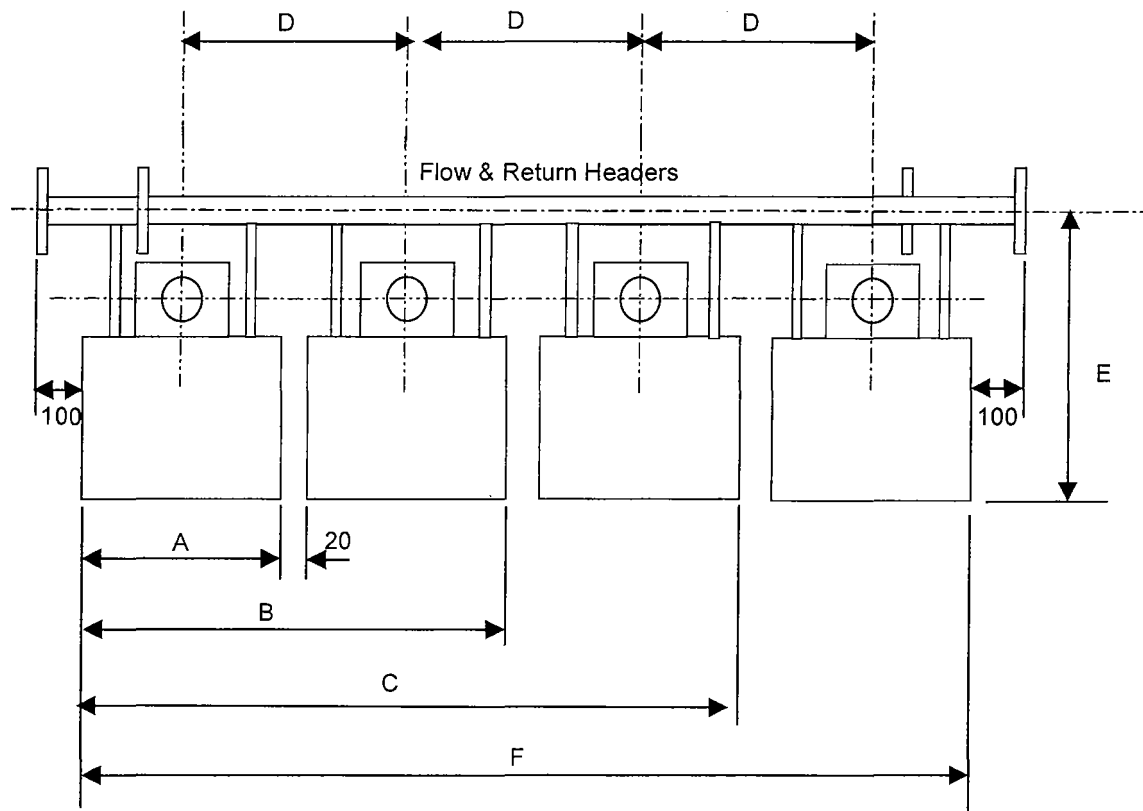


Fig.26 - Pump Overrun Using Changeover Pipe Thermostat

DERWENT COMPACT

Header Kit Instructions

Fig.27 – Header Details



Number of Sections	4	5	6	7	8
A	374	446	527	608	689
B	768	912	1074	1236	1398
C	1162	1342	1621	1864	2107
D	394	466	547	628	709
E	1234	1240	1298		
F	1556	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	96	144	192	128	192	256	160	240	320	192	288	384	224	336	448
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	2.2	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

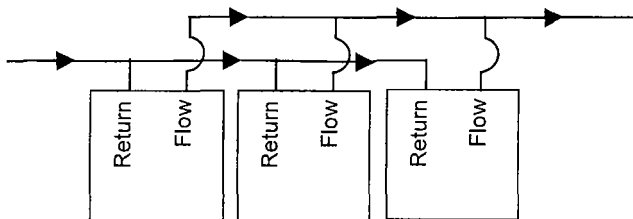
GENERAL INSTRUCTIONS FOR HEADER KIT

Potterton Compact gas fired atmospheric boilers are available in 15 modules of two, three or four boilers ranging from a two boiler module of 96kW to a four boiler module of 448kW output. They are suitable for use on open vented or sealed systems with a maximum design pressure of 5bar.

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. 28 – 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.

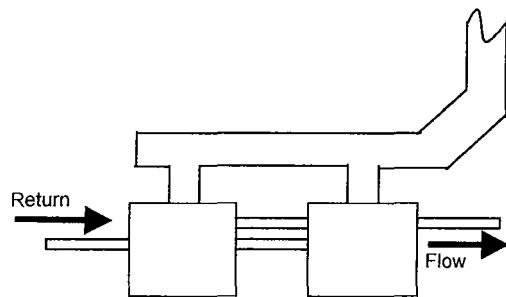
As the Compact boilers are each supplied with individual draught diverters no other draught diverter should be fitted in the system. The integral draught diverters are not load bearing and flues should be supported by other means. Facilities should be included in the flue system to disconnect the boilers 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. 29 – 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.

DERWENT COMPACT

Fig. 30 – Modular Header Assembly

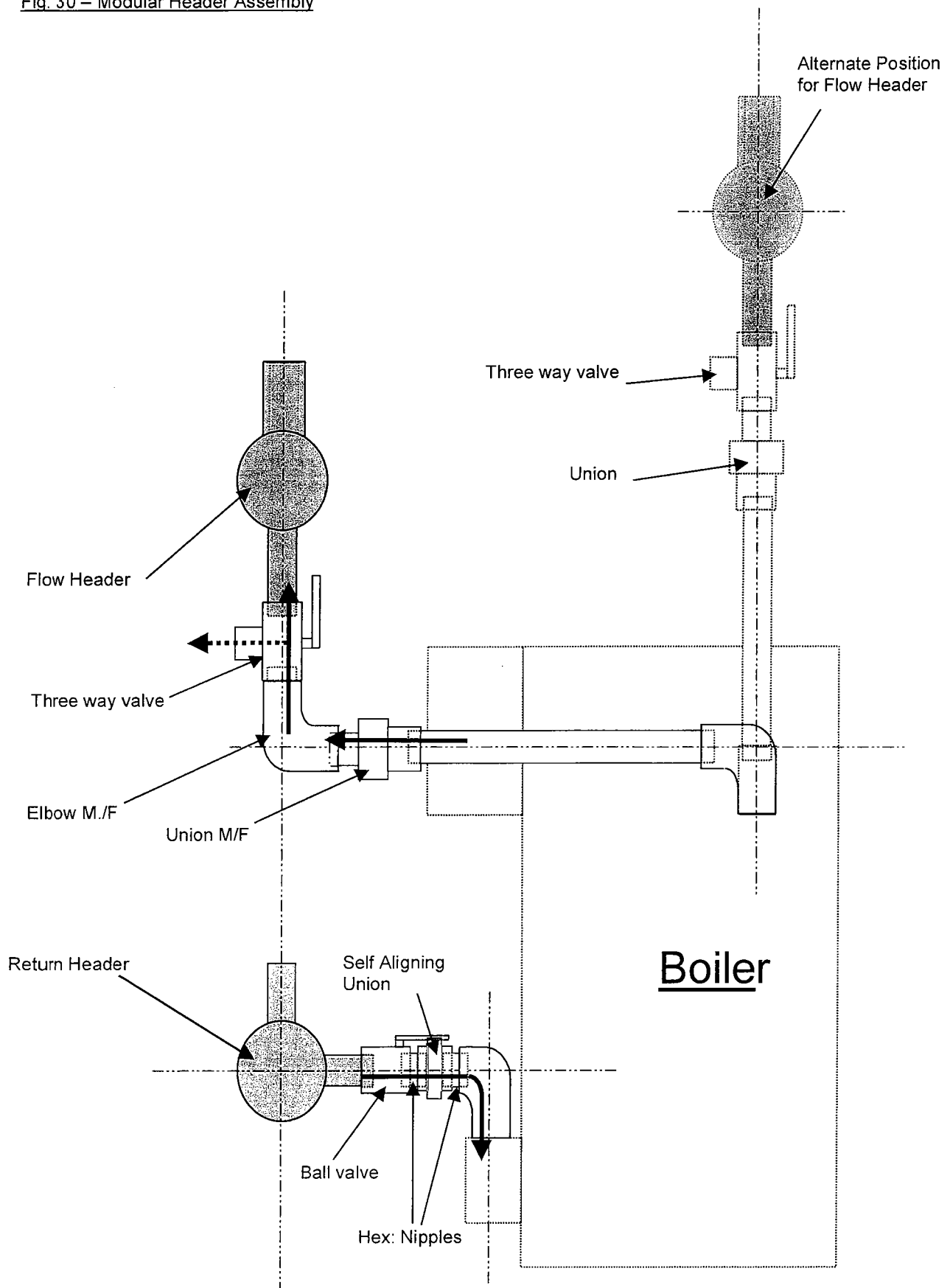
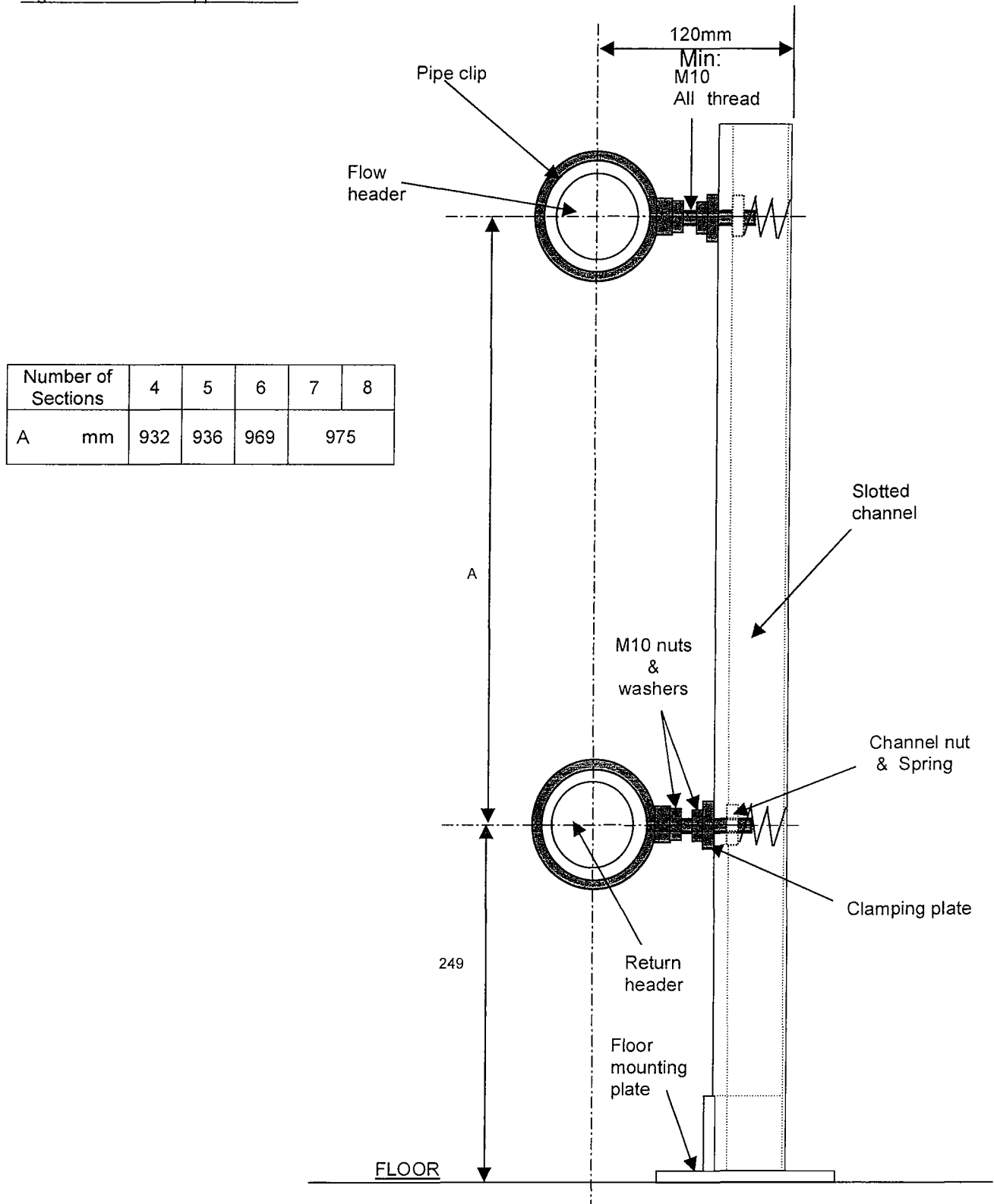


Fig. 31 – Unistrut Support Details



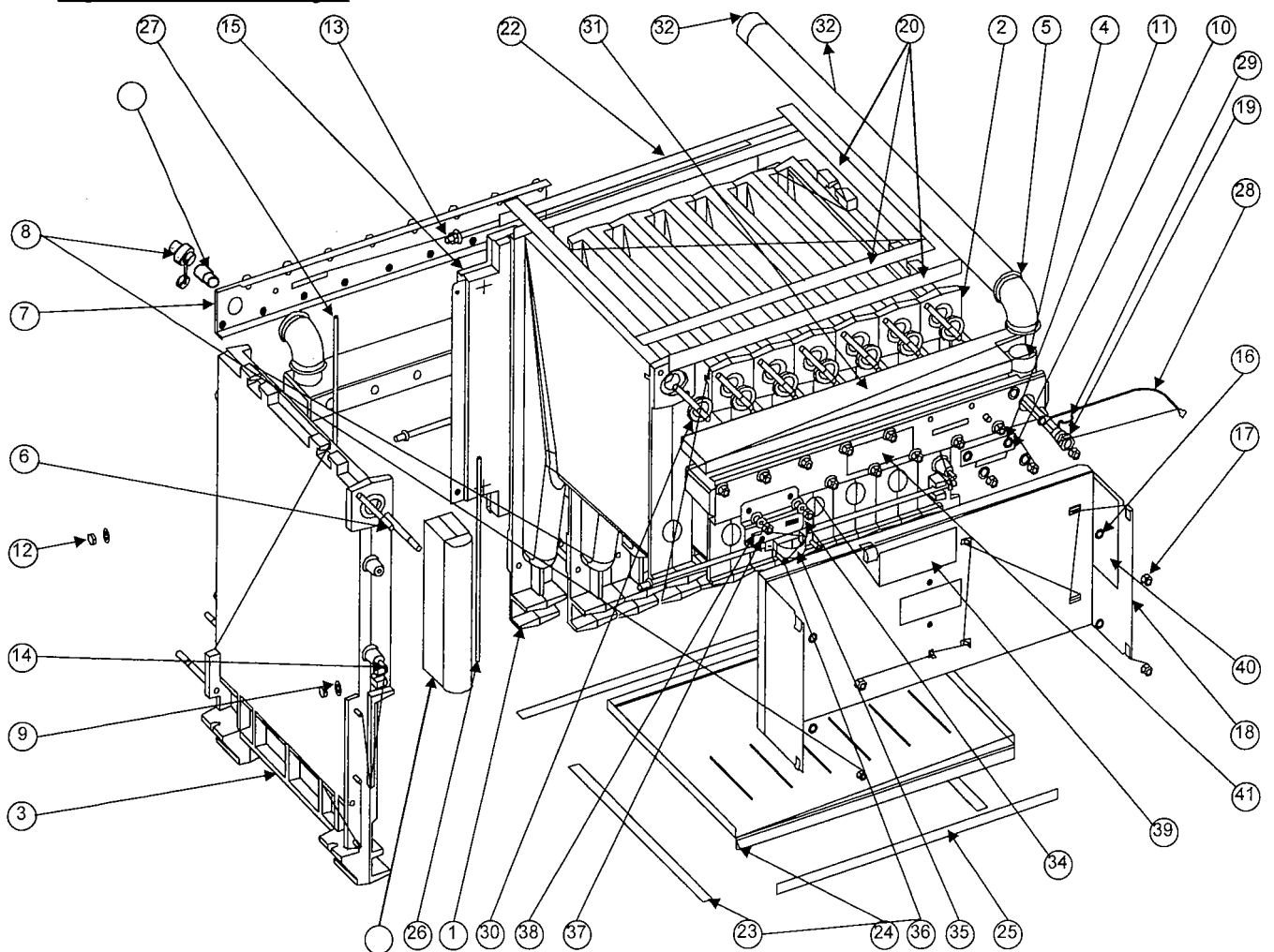
DERWENT COMPACT

Derwent Compact Heat Exchanger Parts List

Item No	Description	Part No
1	Intermediate Sections	COMC17804057
2	Right Hand End Section	COMC17800847
3	Left Hand End Section	COMC17800857
4	Flow Header (4 section)	COMC17000685
4	Flow Header (5 section)	COMC17000686
4	Flow Header (6 section)	COMC17000687
4	Flow Header (7 section)	COMC17000688
4	Flow Header (8 section)	COMC17000689
5	1.25BSP Elbow (4 & 5 section)	COMC15923012
5	1.5BSP Elbow (6,7 & 8 section)	COMCN9125780
6	Studs	COMC15245372
7	Manifold Clamp Plate (4 section)	COMC131164
7	Manifold Clamp Plate (5 section)	COMC131165
7	Manifold Clamp Plate (6 section)	COMC131166
7	Manifold Clamp Plate (7 section)	COMC131167
7	Manifold Clamp Plate (8 section)	COMC131168
8	0.5BSP Drain Cock	COMC17006472
10	Thermometer Phial Clamping Plate	COMC130928
13	Tie Bar M10 (4 section)	COMC15243610
13	Tie Bar M10 (5 section)	COMCN9170980
13	Tie Bar M10 (6 section)	COMCN9170990
13	Tie Bar M10 (7 section)	COMCN9171000
13	Tie Bar M10 (8 section)	COMCN9171010
15	Rear Panel (4 section)	COMC132415
15	Rear Panel (5 section)	COMC132414
15	Rear Panel (6 section)	COMC132413
15	Rear Panel (7 section)	COMC132412
15	Rear Panel (8 section)	COMC132411
18	Side Case Fixing Panel (4 section)	COMC132420
18	Side Case Fixing Panel (5 section)	COMC132419
18	Side Case Fixing Panel (6 section)	COMC132418
18	Side Case Fixing Panel (7 section)	COMC132417
18	Side Case Fixing Panel (8 section)	COMC132416
19	Thermostat Pocket	COMC17001781
20	Top Ceramic Felt Strip 2000mm Long	COMC500779
22	Top Ceramic Felt Strip 560mm Long	COMC500780
23	Bottom Ceramic Felt Strip 2000mm Long	COMC500777
24	Base Panel (4 section)	COMC500203
24	Base Panel (5 section)	COMC500201
24	Base Panel (6 section)	COMC500200
24	Base Panel (7 section)	COMC500196
24	Base Panel (8 section)	COMC500195
26	Ceramic Sealing Strip 440mm Long	COMC17000167
27	Ceramic Sealing Strip 790mm Long	COMC17000168
28	Earth Wire	COMC17071647

29	Phial Fixing Clip	COMC17006459
30	"O" Ring Seals	COMCN9195220
31	Insulation strip (4 section)	COMC132568
31	Insulation strip (5 section)	COMC132567
31	Insulation strip (6 section)	COMC132566
31	Insulation strip (7 section)	COMC132565
31	Insulation strip (8 section)	COMC132564
32	Flow Pipe 1.25" BSP (4 & 5 section)	COMC17004722
32	Flow Pipe 1.5" BSP (6-7-8 section)	COMC17004723
34	Pipe Clip Retaining Plate	COMC132735
35	Pipe Clip	COMC132814
36	0.5" BSP Adapter	COMC15922705
37	Black Ceramic Strip	COMC133107
38	Flue Brush	COMCN9000350
39	Bag Of Fixings (nuts, screws etc.)	COMC500684

Fig.32 Heat Exchanger

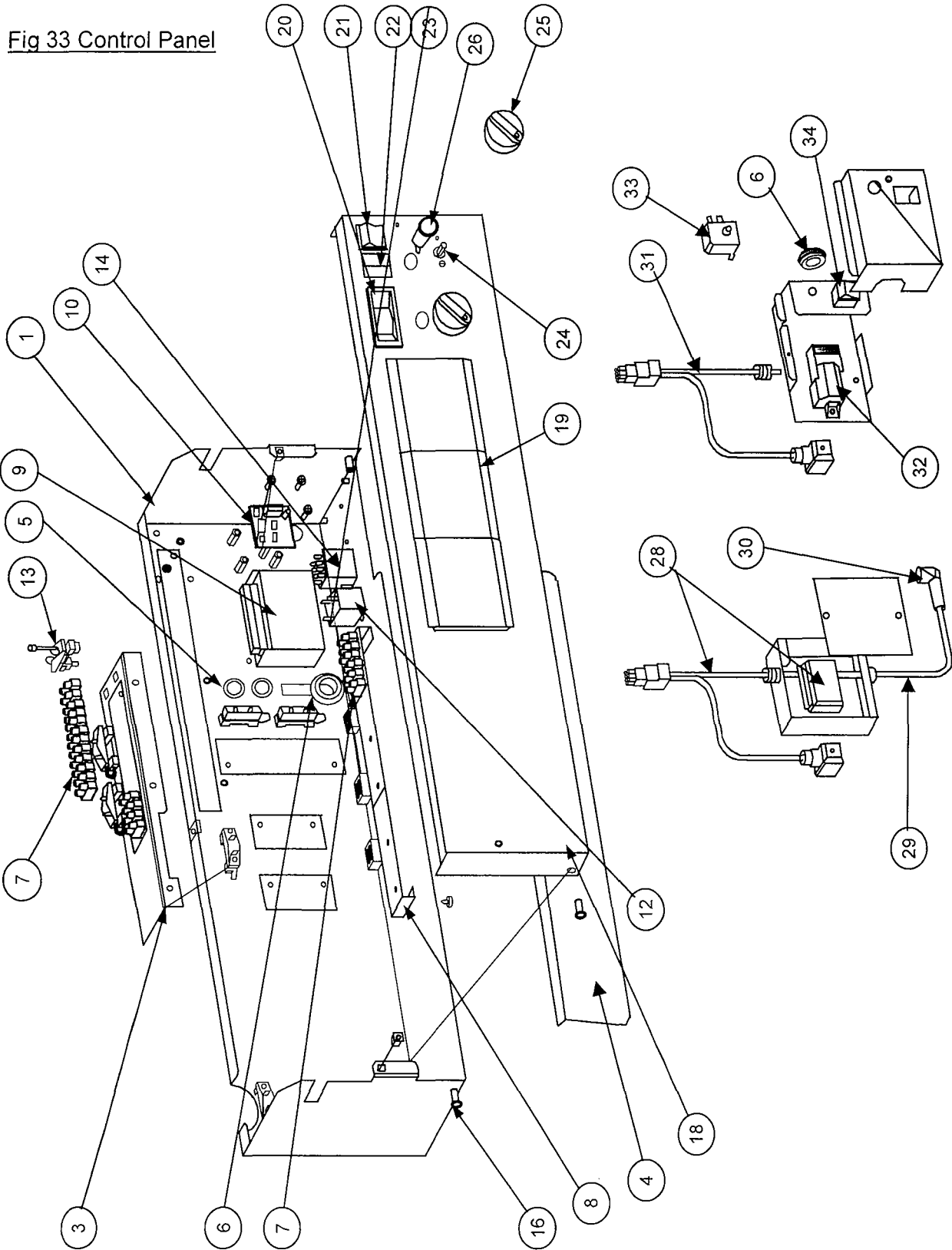


DERWENT COMPACT

Derwent Compact Control Panel List

Item No	Description	Part No
2	Control Panel Housing (4 section)	COMC131404H
2	Control Panel Housing (5 section)	COMC131403H
2	Control Panel Housing (6 section)	COMC131402H
2	Control Panel Housing (7 section)	COMC131401H
2	Control Panel Housing (8 section)	COMC131400H
3	Mains Inlet support Bracket	COMC131784
4	Infill Panel Below Fascia (4 section)	COMC132813H
4	Infill Panel Below Fascia (5 section)	COMC132812H
4	Infill Panel Below Fascia (6 section)	COMC132811H
4	Infill Panel Below Fascia (7 section)	COMC132810H
4	Infill Panel Below Fascia (8 section)	COMC132809H
5	Grommet (13.5mm)	COMC15806550
6	Grommet	COMC15806522
7	Terminal Block	COMC15802618
8	Terminal Block Support Bracket (4 & 5 section)	COMC131797
8	Terminal Block Support Bracket (6, 7 & 8 section)	COMC131796
13	Mains Inlet Cable Clamp	COMC15800630
16	M5 Fixing	COMC15238135
18	Control Panel Fascia (4 Section)	COMC500506
18	Control Panel Fascia (5 Section)	COMC500340
18	Control Panel Fascia (6 Section)	COMC500339
18	Control Panel Fascia (7 Section)	COMC500338
18	Control Panel Fascia (8 Section)	COMC500235
19	Control Panel Blanking Plate	COMC17000983
20	Thermometer	COMC17007061
21	Mains Switch	COMC15804072
24	High / Low Control Thermostat	COMC17007004
25	Control Knob	COMC17004739
26	Neon	COMC15838262
Auto Version		
1	Control Panel Assembly (4 section)	COMC131414
1	Control Panel Assembly (5 section)	COMC131413
1	Control Panel Assembly (6 section)	COMC131412
1	Control Panel Assembly (8 section)	COMC131411
1	Control Panel Assembly (4 section)	COMC131410
9	Dungs Controller (DGA165 F 10.3TCL)	COMC17001084
12	High Limit Thermostat	COMC17006955
14	Relay	COMC15815049
22	Combined Lockout LED & Reset Button	COMC158314FA
28	Ignition Transformer and Mains Lead	COMC132406
29	Ignition Lead	COMC15825230
30	Ignition Cap	COMC500483
Permanent Pilot Version		
1A	Control Panel Assembly (4 section)	COMC132356
1A	Control Panel Assembly (5 section)	COMC132355
1A	Control Panel Assembly (6 section)	COMC132354
1A	Control Panel Assembly (7 section)	COMC132353
1A	Control Panel Assembly (8 section)	COMC132352
10	Flame Detection Board	COM500290
23	Blanking Plate	COMCN9061310
31	Ignition Unit Mains Lead	COMC131873
32	Ignition Unit & Flame Detection Unit	COMC170271FA
33	Thermocouple Interrupter	COMC170C56FA
34	Ignition Switch	COMC158040092

Fig 33 Control Panel



DERWENT COMPACT

Derwent Compact Burner Parts List

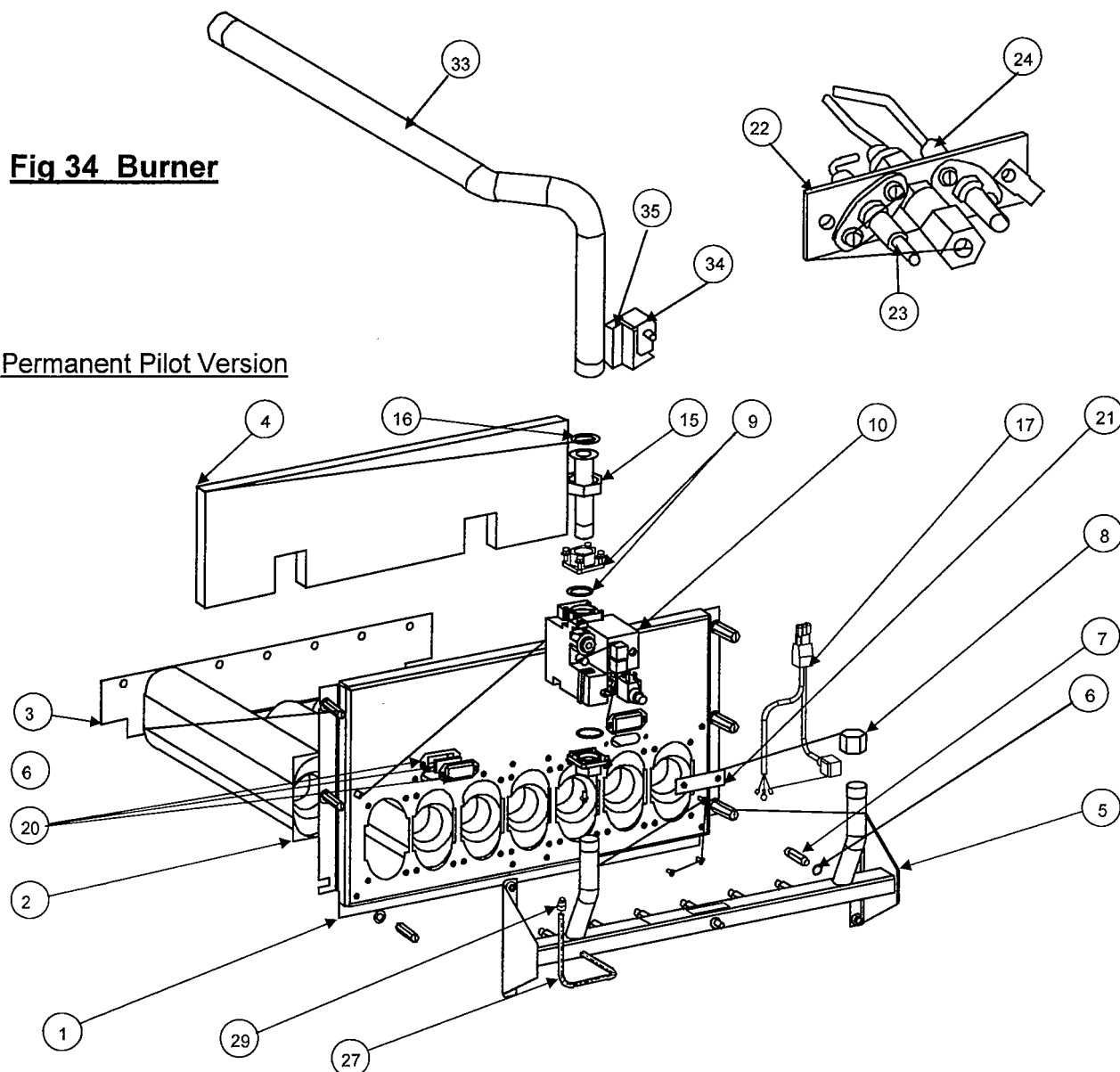
Item No	Description	Part No
1	Burner Mounting Plate (4 section)	COMC131536
1	Burner Mounting Plate (5 section)	COMC132985
1	Burner Mounting Plate (6 section)	COMC132801
1	Burner Mounting Plate (7 section)	COMC132799
1	Burner Mounting Plate (8 section)	COMC132765
2	Burner Bar	COMCN9020400
3	Burner Back Plate (4 section)	COMC132465
3	Burner Back Plate (5 section)	COMC133201
3	Burner Back Plate (6 section)	COMC132806
3	Burner Back Plate (7 section)	COMC132805
3	Burner Back Plate (8 section)	COMCN9254014
4	Insulation (4 section)	COMC132588
4	Insulation (5 section)	COMC17070792
4	Insulation (6 section)	COMC17070793
4	Insulation (7 section)	COMC17070794
4	Insulation (8 section)	COMC17070795
5	Gas Manifold (4 section)	COMC17006493
5	Gas Manifold (5 section)	COMC17006494
5	Gas Manifold (6 section)	COMC17006495
5	Gas Manifold (7 section)	COMC17006496
5	Gas Manifold (8 section)	COMC17006497
6	Injector Washer	COMC17006504
7	Burner Injector	COMC17003180
8	Gas Manifold Blanking Cap	COMCN9126090
9	Gas Valve Flange & Gas Valve Seal	COMC17006302
10	Gas Valve (Honeywell V4400) (PP Version)	COMC17007654
11	Gas Valve (Honeywell VR4601QB) (Auto Version 4,5 & 6 section)	COMC500461
12	Gas Valve (Honeywell VR4605QB) (Auto Version 7 & 8 section)	COMC500433
13	"O" Ring (25mm ϕ)	COMC15630110
14	Gas Manifold (8 section Auto Version)	COMC131731
14	Gas Manifold (7 section Auto Version)	COMC131732
15	Gas Pipe (4,5 & 6 section Auto Version)	COMC133004
15	Gas Pipe (PP Version)	COMC17007195
16	Sealing Washer	COMC133221
17	Gas Valve Electrical Wiring (PP Version)	COMC131933
18	Gas Valve Electrical Wiring (Auto Version)	COMC132391
19	Gas Valve Electrical Wiring (7 & 8 section Auto Version)	COMC500280
20	Viewing Window Assembly	COMCN9022010
21	Pilot Blanking Plate	COMCN9083824
22	Pilot Burner (Auto Version)	COMC17007169
22	Pilot Burner (PP Version)	COMC500434
23	Ignition Electrode (Auto Version)	COMC1700759
23	Ignition Electrode (PP Version)	COMC17002051
24	Ionisation Probe (Auto Version)	COMC17000758

25	Thermocouple (PP Version)	COMCN9050020
27	Pilot Pipe (4 section PP Version)	COMC132629
27	Pilot Pipe (5 section PP Version)	COMC132628
27	Pilot Pipe (6 section PP Version)	COMC132627
27	Pilot Pipe (7 section PP Version)	COMC132626
27	Pilot Pipe (8 section PP Version)	COMC132625
27	Pilot Pipe (4 section Auto Version)	COMC132431
27	Pilot Pipe (5 section Auto Version)	COMC132432
27	Pilot Pipe (6 section Auto Version)	COMC132433
27	Pilot Pipe (7 section Auto Version)	COMC132434
27	Pilot Pipe (8 section Auto Version)	COMC132435
28	Pilot Pipe (Auto Version)	COMC132401
29	Pilot Tube Nut	COMC500450
30	Pilot Tap	COMC17006461
31	Elbow	COMCN9120220
32	Pilot Tap Nut	COMC15929249
33	Gas Supply Pipe	COMC132686
34	Pressure Switch	COMC17006025
35	Pressure Switch Mounting Bracket	COMC133230
37	Thermocouple Cables (PP Version)	COMCN7261460

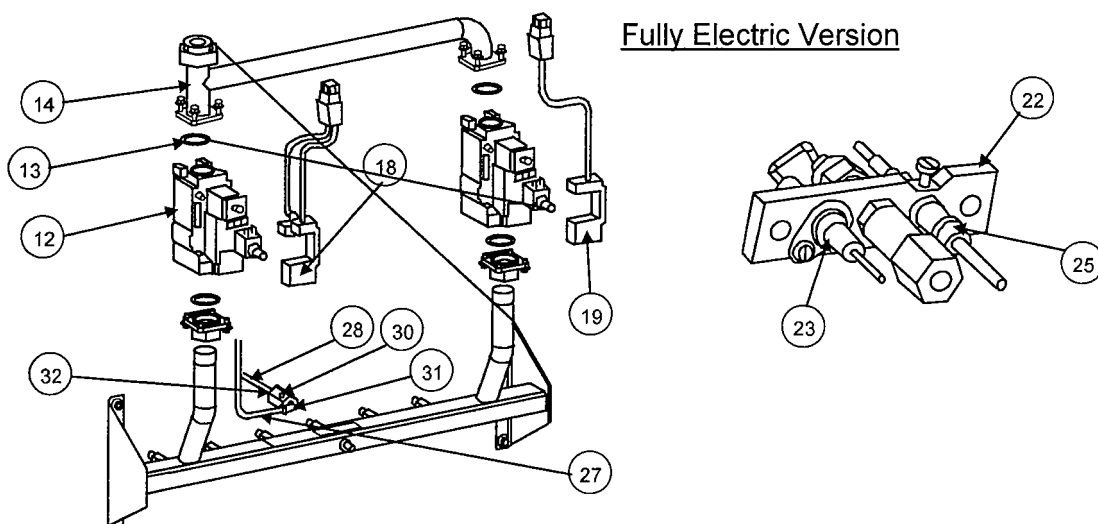
DERWENT COMPACT

Fig 34 Burner

Permanent Pilot Version

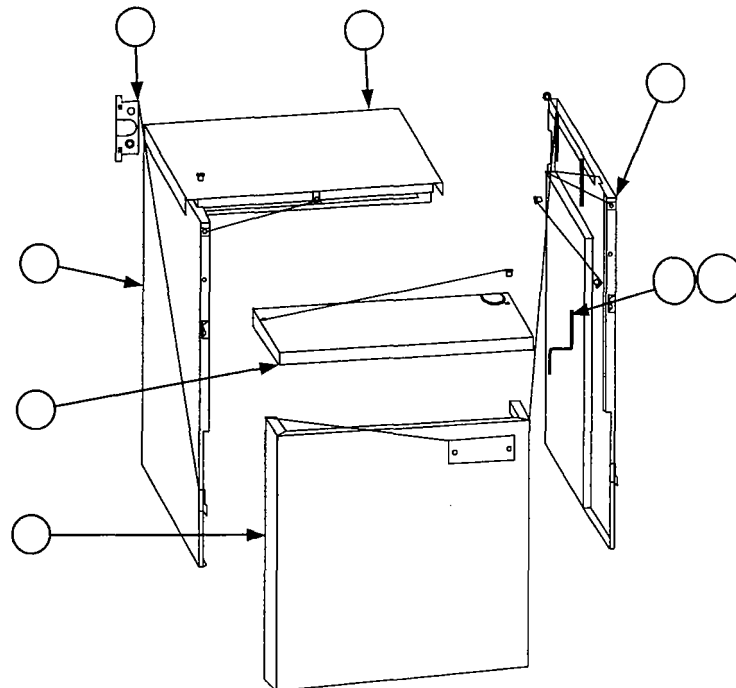


Fully Electric Version



Derwent Compact Casing Parts List

Item No	Description	Part No
1	Right Hand Side Panel	COMC132340A
2	Left Hand Side Panel	COMC132341A
3	Rear Top Panel (4 section)	COMC132350A
3	Rear Top Panel (5 section)	COMC132349A
3	Rear Top Panel (6 section)	COMC132348A
3	Rear Top Panel (7 section)	COMC132347A
3	Rear Top Panel (8 section)	COMC132346A
4	Front Top Panel (4 section)	COMC131423A
4	Front Top Panel (5 section)	COMC131422A
4	Front Top Panel (6 section)	COMC131421A
4	Front Top Panel (7 section)	COMC131420A
4	Front Top Panel (8 section)	COMC131419A
5	Door (4 section)	COMC131512A
5	Door (5 section)	COMC131513A
5	Door (6 section)	COMC131514A
5	Door (7 section)	COMC131515A
5	Door (8 section)	COMC131516A
9	Gas Pipe Support	COMC132740
12	Earth Wire	COMC17071662
12A	Earth Wire	COMC132732
13	Bag Of Fixings (nuts, screws etc.)	COMC500728

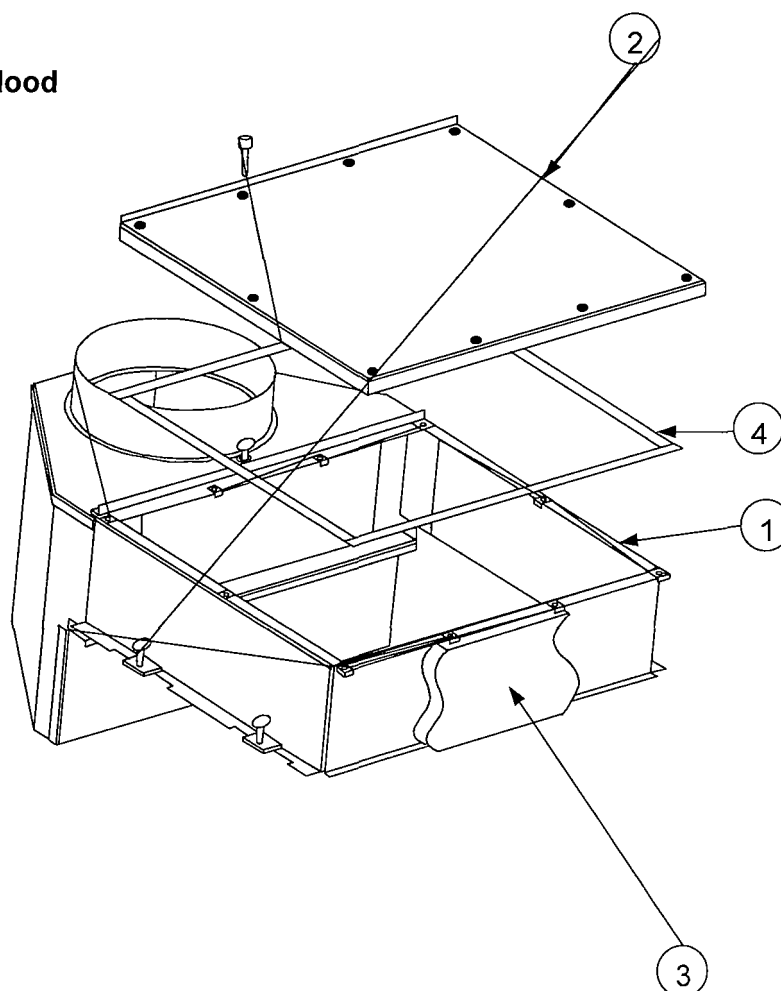
Fig 35 Casing

DERWENT COMPACT

Derwent Compact Flue Hood Parts List

Item No	Description	Part No
1	Flue Box (4 section)	COMC17000690
1	Flue Box (5 section)	COMC17000691
1	Flue Box (6 section)	COMC17000692
1	Flue Box (7 section)	COMC17000693
1	Flue Box (8 section)	COMC17000694
2	Flue Box Top (4 section)	COMC131384
2	Flue Box Top (5 section)	COMC131385
2	Flue Box Top (6 section)	COMC131386
2	Flue Box Top (7 section)	COMC131387
2	Flue Box Top (8 section)	COMC131388
3	Flue Box Insulation	COMC132557
4	Ceramic Felt Flue Seal	COMC500777
5	Bag Of Fixings (nuts, screws etc.)	COMC500723

Fig 36 Flue Hood



 <p>Brooks House, Coventry Road Warwick CV34 4LL Telephone 08706 050607 Fax 08706 001516</p>	REPORT SENT TO INSTALLER: YES <input type="checkbox"/> NO <input type="checkbox"/>	
	SITE VISIT <input type="checkbox"/>	COMMISSIONING <input type="checkbox"/>
	Date: Signature:	
REPORT No: SITE ADDRESS:	INSTALLER NAME & ADDRESS: VISIT/COMMISSIONING DATE:	

1.0	BOILER				
1.1	Type:				
1.2	No of Sections:				
1.3	Boiler No/Position:	RH	LH	Centre	
1.4	Serial No:				
1.5	Fuel: N/Gas	LPG			
2.0	BURNER				
2.1	Type: Standard	Low NOx	Ultimate		
2.2	Flame Detection Probe:	UV Cell	Thermocouple		
2.3*	Control Box Type:				
2.4	Electrical Supply:				
2.5	Main Gas Valve Type & Size:				
2.6	Pilot Gas Valve Type & Size:				
2.7	Gas Train Serial Number:				
3.0	BURNER SETTINGS				
3.1	Main Burner Injector Size:	mm			
3.2	Pilot Burner Injector Size:	mm			
3.3	Are Burners & Injectors Clean?:				
3.4	Kanthal Bars Fitted? (Modified & Ultimate only):				
3.5*	Is the Probe of the Correct Type?				
3.6	Electrode Settings as Manual?				
4.0	PRE-COMMISSIONING CHECKS (See Note)				
4.1	Is boiler house ventilation as per manual?				
4.2	Electric supply fused, isolated & earth wire attached?				
4.3	Check external controls allow operation				
4.4	Check boiler/system flooded and pumps operational and any isolation valves open				
4.5	Check gas available at burner				
4.6c	Check condensate trap fitted, filled and connected to drain with air break				
4.7	Check gas meter sizing adequate				
4.8	Check flue system clear				

5.0	COMBUSTION	Pilot	Low	High	Unit
5.1	Gas rate				m³/hr
5.2	Main Burner Pressure				mmwg
5.3	Pilot Burner Pressure				mmwg
5.4*	Ionisation Probe/UV Cell Current				uA
5.5c	Air Shutter Position				-
5.6	CO2 or O2				%
5.7	CO				ppm
5.8	Gross Flue Gas Temperature				°C
5.9	Ambient Temperature				°C
5.10	Flue Draught				mmwg
5.11	Inlet Gas Pressure (Main Burner). If multi-boiler installation, inlet gas pressure all boilers high fire)				mmwg

NOTE: 5.5 to 5.9 TO BE MEASURED IN SECONDARY FLUE 600mm UP FROM THE FLUE SOCKET OR AT THE SAMPLING POINT PROVIDED (CONDENSING BOILERS ONLY). THESE MEASUREMENTS ARE INTENDED AS SAFETY CHECKS ONLY. LEVELS ARE DEPENDENT ON FLUE DRAUGHT AND SITE CONDITIONS AND HENCE CANNOT BE USED FOR COMBUSTION EFFICIENCY DETERMINATION.

* FULLY ELECTRIC BOILERS ONLY
 ¶ THERMO-ELECTRIC BOILERS ONLY
 c CONDENSING BOILERS ONLY
 § CONVENTIONAL ATMOSPHERIC BOILERS ONLY

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

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

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

Baxi Heating Ltd Reg. Office: Sceptre Way,
Bamber Bridge, Preston PR5 6AW Reg No. 3879156

8.0	COMMENTS ON ACCESSIBILITY FOR MAINTENANCE

9.0	NOTES & COMMENTS BY COMMISSIONING ENGINEER

FINDINGS		
	YES	NO
Is the installation safe for use?		
If the answer is NO, has a warning label been raised?		
Is any remedial work required?		
Have warning labels been fitted?		
Has RIDDOR form been raised?		
Customer Signature:		
Print Name:		
Date:		

ENGINEER DETAILS
NAME
COMPANY
SIGNATURE
DATE

Document ID Ref: PCF/029/4

CONVERSION TABLE

	IMPERIAL TO METRIC	METRIC TO IMPERIAL
<u>HEAT</u> 1 Therm = 100,00 Btu/hr	1 Btu/hr = 0.291 W 1 Btu = 1055 J 1 Btu/hr = 0.252 kcal/hr	1 KW = 3412Btu/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

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

COMMERCIAL SALES & TECHNICAL ENQUIRIES

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

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

COMMERCIAL SERVICE OFFICES

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

SOUTHERN REGION

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

NORTHERN REGION

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

Our service offices offer a wide range of specialised services including:-

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

SPARES

Potterton Commercial spares are available nationwide through the Potterton Interpart network. Alternatively please contact:-

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

OR
Curzon Components
National Spares Hotline
0990 10 30 30

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

POTTERTON
COMMERCIAL

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