Installation & servicing
DOCUMENT AMENDMENTS

Relevant Installation changes implemented in this book from Mod Level.............4204 to 1405

● Page 53 to 55
   The Installer Notification Guidelines, Benchmark Commissioning Checklist and Service Interval Record have been added.

Caradon Ideal Limited reserve the right to vary specification without notice
# GENERAL

## Table 1 — Boiler Data

<table>
<thead>
<tr>
<th></th>
<th>europa 224</th>
<th>europa 228</th>
<th>europa 232</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas supply type &amp; connection</td>
<td></td>
<td>G20 20mbar, G31 37mbar, 22 mm copper</td>
<td></td>
</tr>
<tr>
<td>Inlet / Outlet connection – Domestic Hot Water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow &amp; return connection – Central Heating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flue terminal diameter (mm (in.))</td>
<td>100 (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max working pressure (sealed system) bar (lb/in²)</td>
<td>3.0 (43.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max DHW water inlet pressure bar (lb/in²)</td>
<td>10.0 (145.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min DHW water inlet pressure bar (lb/in²)</td>
<td>0.3 (4.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical supply</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max power consumption</td>
<td>150</td>
<td>170</td>
<td>180</td>
</tr>
<tr>
<td>External fuse rating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal fuse rating</td>
<td>T 2A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water content – CH (litre (gal.))</td>
<td>1.0 (0.22)</td>
<td>1.1 (0.242)</td>
<td></td>
</tr>
<tr>
<td>Water content – DHW (litre (gal.))</td>
<td>0.2 (0.044)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry weight (kg (lb.))</td>
<td>37 (81.6)</td>
<td>39 (86.0)</td>
<td>39 (86.0)</td>
</tr>
<tr>
<td>Size: Height / Width / Depth (mm (in.))</td>
<td>703 (27 11/16&quot;) / 400 (15 3/4&quot;) / 325 (12 3/4&quot;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lift weight (kg (lb.))</td>
<td>35.5 (78.4)</td>
<td>36.5 (80.6)</td>
<td>36.5 (80.6)</td>
</tr>
</tbody>
</table>

## Table 2 — Performance Data — Central Heating

<table>
<thead>
<tr>
<th></th>
<th>europa 224</th>
<th>europa 228</th>
<th>europa 232</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burner pressure (Hot) G20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G31 (in.w.g.)</td>
<td>11.7 (4.7)</td>
<td>11.7 (4.7)</td>
<td>11.7 (4.7)</td>
</tr>
<tr>
<td>Input based on nett CV kW (btu/h)</td>
<td>26.60 (90 759)</td>
<td>31.10 (106 113)</td>
<td></td>
</tr>
<tr>
<td>Input based on gross CV kW (btu/h)</td>
<td>29.52 (100 732)</td>
<td>34.52 (117 773)</td>
<td></td>
</tr>
<tr>
<td>Output kW (btu/h)</td>
<td>24.30 (82 912)</td>
<td>28.40 (96 901)</td>
<td></td>
</tr>
<tr>
<td>Gas consumption (Hot) G20 G31 l/s (ft³/h)</td>
<td>0.763 (97.0) / 0.309</td>
<td>0.892 (113.5) / 0.361</td>
<td></td>
</tr>
<tr>
<td>Seasonal efficiency* (SEDBUK) %</td>
<td>Band D 78.2</td>
<td>Band D 78.3</td>
<td></td>
</tr>
<tr>
<td>NOx classification</td>
<td>Class 3</td>
<td>Class 2</td>
<td>Class 3</td>
</tr>
</tbody>
</table>
| Note: the gas consumption is calculated using a calorific value of 38.7 MJ/m³ (1038 Btu/ft³) gross or 34.9 MJ/m³ (935 Btu/ft³) nett. To obtain the gas consumption at different calorific values: a. FOR L/S – divide the gross heat input (kW) by the gross C.V. of the gas (MJ/m³). b. FOR FT³/H – divide the gross heat input (Btu/h) by the gross C.V. of the gas (Btu/ft³).

*The value is used in the UK Government’s Standard Assessment Procedure (SAP) for energy rating of dwellings. The test data from which it has been calculated have been certified by a notified body.

## Table 3 — Performance Data — Domestic Hot Water

<table>
<thead>
<tr>
<th></th>
<th>europa 224</th>
<th>europa 228</th>
<th>europa 232</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burner pressure (Hot) G20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G31 (in.w.g.)</td>
<td>11.7 (4.7)</td>
<td>11.7 (4.7)</td>
<td>11.7 (4.7)</td>
</tr>
<tr>
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<td></td>
</tr>
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<td>Input based on gross CV kW (btu/h)</td>
<td>29.52 (100 732)</td>
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</tr>
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<td></td>
</tr>
<tr>
<td>Gas consumption (Hot) G20 G31 l/s (ft³/h)</td>
<td>0.763 (97.0) / 0.309</td>
<td>0.892 (113.5) / 0.361</td>
<td></td>
</tr>
<tr>
<td>Flow 35 ° C temp. rise l/m (gpm)</td>
<td>10.0 (2.2)</td>
<td>11.6 (2.6)</td>
<td></td>
</tr>
<tr>
<td>Domestic hot water specific rate l/m (gpm)</td>
<td>11.6 (2.6)</td>
<td>13.6 (3.0)</td>
<td></td>
</tr>
</tbody>
</table>

Note: the gas consumption is calculated using a calorific value of 38.7 MJ/m³ (1038 Btu/ft³) gross or 34.9 MJ/m³ (935 Btu/ft³) nett. To obtain the gas consumption at different calorific values: a. FOR L/S – divide the gross heat input (kW) by the gross C.V. of the gas (MJ/m³). b. FOR FT³/H – divide the gross heat input (Btu/h) by the gross C.V. of the gas (Btu/ft³).

**Key to Symbols:**
- IE = Ireland, GB = United Kingdom (Countries of destination)
- PMS = Maximum operating pressure of water
- C₁₂O₂₃₃C₅₂ = a room sealed appliance designed for connection via concentric ducts to a horizontal or vertical terminal or twin flue system.
- II₄H₃₀₅ = appliance designed for use on 2nd family gas group H or 3rd family gas group 3P

**CAUTION:** To avoid the possibility of injury during the installation, servicing or cleaning of this appliance care should be taken handling edges of sheet steel components.
For GB, to comply with Building Regulations Part L1 (Part J in Scotland) the boiler should be fitted in accordance with the manufacturer’s instructions. Self-certification that the boiler has been installed to comply with Building Regulations can be demonstrated by completing and signing the Benchmark log book.

### BENCHMARK COMMISSIONING CHECKLIST DETAILS

<table>
<thead>
<tr>
<th>Boiler</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make and model</td>
<td>5</td>
</tr>
<tr>
<td>Appliance serial no. on data badge</td>
<td>13</td>
</tr>
<tr>
<td>SEDBUK No. %</td>
<td>4</td>
</tr>
</tbody>
</table>

**Controls**

| Time and temperature control to heating | 22/23 |
| Time and temperature control to hot water | 22 |
| Heating zone valves | 22 |
| TRV’s | 11 |
| Auto bypass | 11 |
| Boiler interlock | 11 |

**For all boilers**

| Flushing to BS.7593 | 9 |
| Inhibitor | 9 |
| Central heating mode | to be calculated |
| Heat input | to be calculated |

**For combination boilers only**

| Scale reducer | 11 |
| Hot water mode | |
| Heat input | to be calculated |
| Max. operating burner pressure | measure and record |
| Max. operating water pressure | measure and record |
| Cold water inlet temp | measure and record |
| Hot water outlet temp | measure and record |
| Water flow rate at max. setting | measure and record |

**For condensing boilers only**

| Condensate drain | n/a |

For all boilers: complete, sign & hand over to customer

For assistance see Technical Helpline on the back page.
1  **BOILER WATER CONNECTION**

<table>
<thead>
<tr>
<th>Pipe size</th>
<th>O.D. mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH flow</td>
<td>22</td>
</tr>
<tr>
<td>CH return</td>
<td>22</td>
</tr>
<tr>
<td>Gas inlet</td>
<td>22</td>
</tr>
<tr>
<td>DHW cold inlet</td>
<td>15</td>
</tr>
<tr>
<td>DHW hot outlet</td>
<td>15</td>
</tr>
</tbody>
</table>

2  **BOILER CLEARANCES**

All dimensions in mm (in.)

The following minimum clearances must be maintained for operation and servicing. Additional space will be required for installation, depending upon site conditions.

**Bottom clearance**

The bottom clearance, after installation, can be reduced to 20mm. However, 200mm must be available for servicing.

**Front clearance**

The minimum front clearance when built into a cupboard is 50mm (2") from the cupboard door. However 450mm

(17 3/4") overall clearance is still required, with the cupboard door open, to allow for servicing.

**Side and Rear Flue**

a. Provided that the flue hole is cut accurately, e.g. with a core drill, the flue can be installed from inside the building where wall thickness does not exceed 600 mm (24").

Where the space into which the boiler is going to be installed is less than the length of flue required the flue must be fitted from the outside.

**Installation from inside ONLY**

b. If a core boring tool is to be used inside the building the space in which the boiler is to be installed must be at least wide enough to accommodate the tool.
INTRODUCTION

europa 224, europa 228 and europa 232 are wall mounted, low water content, balanced flue combination gas boilers.

Central heating (CH) output and domestic hot water (DHW) output (on combination versions) are both fully modulating:
- between 9.10 (31 049) and 24.30 (82 912) kW (btu/h) for model europa 224;
- between 11.00 (37 532) and 28.00 (95 536) kW (btu/h) for model europa 228;
- between 12.73 (43 435) and 32.00 (109 184) kW (btu/h) for model europa 232.

The boilers are suitable for connection to fully pumped, pressurised sealed water systems ONLY.

A system bypass is not required when TRV’s are fitted to all radiators (see Frame 5). The boiler incorporates an automatic bypass.

A circulating pump, pressure gauge, safety valve and heating expansion vessels are provided.

The CH flow temperature is controlled by an electronic thermostat. In DHW mode the boiler modulates to sustain a nominal adjustable water flow temperature of 55 °C.

The boiler casing is of white painted mild steel with a drop-down controls access door.

The boiler temperature control is located behind the control panel door.

The main heat exchanger is made of copper.

The DHW heat exchanger is stainless steel.

The system pipework must include drain cocks in appropriate places. Pipework may be taken downwards.

For upwards pipework installation an additional frame (optional) must be used (see frame 18).

OPTIONAL EXTRA KITS

Horizontal Concentric Extension Ducts

Up to 4 m (13’ 1”) for models: europa 224, europa 228.

Up to 2.7 m (8’ 10”) for model europa 232

Other available kits are listed in frame 9.

DHW OPERATION (combi versions)

With no call for CH the boiler fires only when DHW is drawn off. When there is a call for CH, the heating system is supplied at the selected temperature until DHW is drawn off. The output is then directed by the diverter valve to heat the secondary heat exchanger and supply a maximum draw-off of:

- europa 224. 10.0 (2.2) l/min (gpm) at 35 degree rise.
- europa 228 11.6 (2.6) l/min (gpm) at 35 degree rise.
- europa 232 13.1 (2.9) l/min (gpm) at 35 degree rise.

The nominal DHW temperature is 55 °C, but water drawn off when the boiler has been on for central heating may be hotter than this, for a short period of time.

GAS SAFETY

Current Gas Safety (Installation and Use) Regulations or rules in force

The appliance is suitable only for installation in GB and IE and should be installed in accordance with the rules in force.

europa Installation & Servicing
Timber Framed Buildings

If the boiler is to be fitted in a timber framed building it should be fitted in accordance with the Institute of Gas Engineers document IGE/UP/7, 1998.

Bathroom Installations

The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current I.E.E. (BS.7671) Wiring Regulations and, in Scotland, the electrical provisions of the building regulations applicable in Scotland with respect to the installation of the boiler in a room or internal space containing a bath or shower.

For Ireland reference should be made to the current ETCI rules for electrical installations and I.S.813:2002

Where a room sealed appliance is installed in a room containing a bath or shower then the appliance and any electrical switch or appliance control utilising mains electricity should be so situated that it cannot be touched by a person using the bath or shower.

Note. It is not permissible to install a mains socket in a bathroom.

Where installation will be in an unusual location, special procedures may be necessary and BS 6798 gives detailed guidance on this aspect.

Compartment Installations

A compartment used to enclose the boiler should be designed and constructed specially for this purpose. An existing cupboard or compartment may be used, provided that it is modified for the purpose.

In both cases details of essential features of cupboard / compartment design, including air cupboard installation, are to conform to the following:

- BS 6798 (No cupboard ventilation is required – see “Air supply” for details)
- The position selected for installation MUST allow adequate space for servicing in front of the boiler.
- For the minimum clearances required for safety and subsequent service, see the wall mounting template and frame 2. In addition, sufficient space may be required to allow lifting access to the wall mounting plate.

GAS SUPPLY

The local gas supplier should be consulted, at the installation stage, in order to establish the availability of an adequate supply of gas. A gas meter must NOT be used without prior consultation with the local gas supplier.

Natural gas boilers must be installed on a gas supply with a governed meter. A gas meter can only be connected by the local gas supplier or by a registered CORGI engineer.

Propane gas boilers MUST be installed with pipes, cylinders and pressure regulators fitted in accordance with BS.5482.1. Bulk tank installations MUST comply with the Home Office code of practice for storage of liquefied petroleum gas at fixed installations. The complete installation MUST be tested for gas soundness and purged as described in the above code.

The boiler is adjusted at the factory for use with the relevant supply gas. A working gas pressure equal to that stated in Table 1 MUST be available at the boiler inlet.

Where applicable, the appliance can be converted for G20 – Natural Gas or G31 – Propane Gas by using the appropriate conversion kit.

IMPORTANT Installation pipes MUST be fitted in accordance with BS. 6891. In IE refer to I.S. 813.2002. Pipework from the meter to the boiler MUST be of an adequate size, i.e. not less than 22 mm O.D. copper or 3/4” BSP iron.

** Table 1 – Minimum spacing

<table>
<thead>
<tr>
<th>Position description</th>
<th>Minimum spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Directly below, above or along side of an openable window, air vent or other ventilation opening</td>
<td>300 mm (12&quot;)</td>
</tr>
<tr>
<td>2. Below guttering, drain pipes or soil pipes</td>
<td>75 mm (3&quot;) **</td>
</tr>
<tr>
<td>3. Below eaves</td>
<td>200 mm (8&quot;) **</td>
</tr>
<tr>
<td>4. Below balconies or a car port roof</td>
<td>300 mm (12&quot;) **</td>
</tr>
<tr>
<td>5. Below drain pipes or soil pipes*</td>
<td>60 mm (2 1/2&quot;) **</td>
</tr>
<tr>
<td>6. From an internal or external corner or to a boundary along side the terminal</td>
<td>150 mm (6&quot;) **</td>
</tr>
<tr>
<td>7. Above adjacent ground, roof or balcony level</td>
<td>300 mm (12&quot;)</td>
</tr>
<tr>
<td>8. From a surface or a boundary facing the terminal.</td>
<td>600 mm (24&quot;)</td>
</tr>
<tr>
<td>9. From a terminal facing a terminal</td>
<td>1200 mm (48&quot;)</td>
</tr>
<tr>
<td>10. From an opening in a car port (e.g. door or window) into dwelling</td>
<td>1200 mm (48&quot;)</td>
</tr>
<tr>
<td>11. Vertically from a terminal on the same wall</td>
<td>1500 mm (60&quot;)</td>
</tr>
<tr>
<td>12. Horizontally from a terminal on the wall</td>
<td>300 mm (12&quot;)</td>
</tr>
</tbody>
</table>

* If the terminal is within 150mm of any vertical soil or drain pipe, an aluminium shield at least 400mm (15 3/4") long should be fitted equi—distant from the terminal and close to the pipe.

** If a reduction down to 25mm(1") is required in any of the indicated positions, horizontal flue kit no. 200889 MUST be used. Only 1 reduction down to 25mm is allowable per installation.
The domestic hot water system should be in accordance with BS. 5449. Copper tubing to BS 2871:1 is recommended for water carrying pipework and MUST be used for pipework carrying potable water. Any soldered joints on potable water pipework MUST NOT be made with solder containing lead.

Central heating systems should be in accordance with BS. 5440:2 and in IE I.S. 813:2002 may be disregarded. Neither is it necessary to ventilate a cupboard or compartment in which the boiler is installed, due to the low surface temperatures of the boiler casing during operation; therefore the requirements of BS6798, Clause 12, BS 5440:2 and in IE I.S. 813:2002 may be disregarded.

The boilers are designed for connection to pressurised, fully pumped, sealed water central heating systems ONLY. The domestic hot water (DHW) calorifier is incorporated within the combi boiler and only requires connection to the mains water supply.

Additional Pumps.

The boiler is supplied with an integral circulating pump. If the boiler is to be used in conjunction with any additional circulating pumps, please contact the Technical Helpline for advice on application.

IMPORTANT

A minimum length of 1m of copper pipe MUST be fitted to both flow and return connections from the boiler before connection to any plastic piping.

Ensure that the mains water supply pressure is adequate to provide the required DHW flow rate. Refer to Table 1 on page 4.

The central heating system should be in accordance with BS. 6798 and, in addition, for smallbore and microbore systems BS. 5449.

The domestic hot water system should be in accordance with BS. 5546 and BS. 6700.

Copper tubing to BS 2871:1 is recommended for water carrying pipework and MUST be used for pipework carrying potable water.

Any soldered joints on potable water pipework MUST NOT be made with solder containing lead.

<table>
<thead>
<tr>
<th>Vertical Terminals</th>
<th>300 mm (12&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 Above the roof pitch with roof slope of all angles.</td>
<td>300 mm (12&quot;)</td>
</tr>
<tr>
<td>Above flat roof</td>
<td>600 mm (24&quot;)</td>
</tr>
<tr>
<td>14 From single wall face</td>
<td>1000 mm (40&quot;)</td>
</tr>
<tr>
<td>From corner wall faces</td>
<td>120mm (5’’)</td>
</tr>
</tbody>
</table>

Twin Flue Applications

15 Centre distance between air inlet and flue outlet ducts

Terminals guards are available from boiler suppliers – ask for Tower Flue Guard, Model K6. In case of difficulty seek advice from:

Grasslin UK Ltd., Tower house, Vale Rise, Tonbridge, Kent TN9 1TB Tel. +44 (0) 1732 359 888 Fax No. +44 (0) 1732 354 455 www.tfc-group.co.uk

IMPORTANT It is absolutely ESSENTIAL to ensure, in practice, that products of combustion discharging from the terminal cannot re-enter the building or any other adjacent building through ventilators, windows, doors other sources of natural air infiltration, or forced ventilation / air conditioning.

If this should occur the appliance MUST be turned OFF, labelled as “unsafe” until corrective action taken.

AIR SUPPLY

It is NOT necessary to have a purpose—provided air vent in the room or internal space in which the boiler is installed. Neither is it necessary to ventilate a cupboard or compartment in which the boiler is installed, due to the low surface temperatures of the boiler casing during operation; therefore the requirements of BS6798, Clause 12, BS 5440:2 and in IE I.S. 813:2002 may be disregarded.

WATER CIRCULATION SYSTEM

The boilers are designed for connection to pressurised, fully pumped, sealed water central heating systems ONLY. The domestic hot water (DHW) calorifier is incorporated within the combi boiler and only requires connection to the mains water supply.

Water Treatment

The boilers are supplied with an integral circulating pump. If the boiler is to be used in conjunction with any additional circulating pumps, please contact the Technical Helpline for advice on application.

IMPORTANT

A minimum length of 1m of copper pipe MUST be fitted to both flow and return connections from the boiler before connection to any plastic piping.

Ensure that the mains water supply pressure is adequate to provide the required DHW flow rate. Refer to Table 1 on page 4.

The central heating system should be in accordance with BS. 6798 and, in addition, for smallbore and microbore systems BS. 5449.

The domestic hot water system should be in accordance with BS. 5546 and BS. 6700.

Copper tubing to BS 2871:1 is recommended for water carrying pipework and MUST be used for pipework carrying potable water.

Any soldered joints on potable water pipework MUST NOT be made with solder containing lead.

Central Heating

Antifreeze fluid, corrosion and scale inhibitor fluids suitable for use with boilers having copper heat exchangers may be used in the central heating system.

IMPORTANT

The application of any other treatment to this product may render the guarantee of the boiler manufacturer INVALID.

The boiler manufacturer recommend Water Treatment in accordance with the Benchmark Guidance Notes on Water Treatment in Central Heating Systems.

The boiler manufacturer recommend the use of Fernox, GE Betz Sentinel or Salamander water treatment products, which must be used in accordance with the manufacturers instructions.

Notes.

1. It is most important that the correct concentration of the water treatment products is maintained in accordance with the manufacturers’ instructions.

2. If the boiler is installed in an existing system any unsuitable additives MUST be removed by thorough cleansing. BS 7593:1992 details the steps necessary to clean a domestic heating system.

3. In hard water areas, treatment to prevent lime scale may be necessary – however, the use of artificially softened water is NOT permitted.

4. Under no circumstances should the boiler be fired before the system has been thoroughly flushed.

Domestic Hot Water

In hard water areas where mains water can exceed 200ppm Total Hardness (as defined by BS 7593:1993 Table 2) a scale reducing device should be fitted into the boiler cold supply within the requirements of the local water company. The use of artificially softened water, however, is NOT permitted.

The boiler manufacturer recommend the use of Fernox Qantomat, GE Betz Sentinel Combiguard and Calmag CalPhos I scale reducing devices, which must be used in accordance with the manufacturers instructions.

For further information contact:

<table>
<thead>
<tr>
<th>Fernox</th>
<th>Calmag Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cookson Electronics</td>
<td>Unit 4–6 Crown Works</td>
</tr>
<tr>
<td>Forsyth Road</td>
<td>Bradford Road</td>
</tr>
<tr>
<td>Sheerwater</td>
<td>Keighley</td>
</tr>
<tr>
<td>Woking</td>
<td>West Yorkshire</td>
</tr>
<tr>
<td>Surrey</td>
<td>BD20 5LN</td>
</tr>
<tr>
<td>GU21 5RZ</td>
<td>+44 (0) 1799 550811</td>
</tr>
<tr>
<td>+44 (0) 1535 210320</td>
<td></td>
</tr>
<tr>
<td>Salamander (Eng) Ltd</td>
<td>GE Betz</td>
</tr>
<tr>
<td>Reddicap Trading Estate</td>
<td>Sentinel Division</td>
</tr>
<tr>
<td>Sutton Coldfield</td>
<td>Foundry Lane</td>
</tr>
<tr>
<td>West Midlands</td>
<td>Widnes</td>
</tr>
<tr>
<td>B75 7BY</td>
<td>Cheshire</td>
</tr>
<tr>
<td>+44 (0) 121 378 0952</td>
<td>WA8 8UD</td>
</tr>
<tr>
<td>+44 (0) 151 420 9563</td>
<td></td>
</tr>
</tbody>
</table>
GENERAL

3 ELECTRICAL SUPPLY

Warning. This appliance must be efficiently earthed.

Wiring external to the appliance MUST be in accordance with the current I.E.E. (BS.7671) Wiring Regulations and any local regulations which apply. For Ireland reference should be made to the current ETCI rules for electrical installations.

4 SEALED SYSTEM REQUIREMENTS

Central Heating

Note. europa boilers are suitable for fully pumped pressurised sealed systems only.

REQUIREMENTS

1 General
The installation must comply with the requirements of BS. 6798 and BS. 5449.

2 Flow Temperature
The installation should be designed to work with flow temperatures of up to 90 °C.

3 Working Pressure
All components of the system must be suitable for a working pressure of 3 bar (45 lb/in²) and temperature of 110 °C. Extra care should be taken in making all connections so that the risk of leakage is minimised.

The following components are incorporated within the appliance:

a. Circulating pump.
b. Safety valve; with a non-adjustable pre-set lift pressure of 3 bar (45lb/in²).
c. Pressure gauge; covering a range of 0–4 bar.
d. 6 litre expansion vessel; with an initial charge pressure of 0.7 bar (10.5 lb/in²).

For further details refer to BS.5449:1 and the British Gas Corporation publication ‘Specifications for Domestic Central Heating and Hot Water’.

4 Filling the system

Fill the system through a temporary hose connection from a draw-off tap supplied from a service pipe under mains pressure. Where the mains pressure is excessive a pressure reducing valve shall be used to facilitate filling.

When installing the filling connection provided with the boiler an additional WRAS approved valve must be fitted to the mains water supply upstream of the double check valve to fully comply the Water Regulations.

Thoroughly flush out the whole of the system with cold water before fitting the boiler.

<table>
<thead>
<tr>
<th>System charge pressure (bar)</th>
<th>0.5</th>
<th>0.7</th>
<th>1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety valve setting</td>
<td></td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Vessel pre–charge pressure (bar)</td>
<td>0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System volume (litres)</td>
<td>Volume of expansion vessel in addition to 6 litre unit fitted to boiler</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>100</td>
<td>0.3</td>
<td>0.8</td>
<td>1.4</td>
</tr>
<tr>
<td>125</td>
<td>1.8</td>
<td>2.5</td>
<td>3.2</td>
</tr>
<tr>
<td>150</td>
<td>3.4</td>
<td>4.2</td>
<td>5.0</td>
</tr>
<tr>
<td>175</td>
<td>5.0</td>
<td>6.0</td>
<td>7.0</td>
</tr>
<tr>
<td>200</td>
<td>6.5</td>
<td>7.6</td>
<td>8.7</td>
</tr>
<tr>
<td>225</td>
<td>8.1</td>
<td>9.3</td>
<td>10.6</td>
</tr>
<tr>
<td>250</td>
<td>9.6</td>
<td>11.1</td>
<td>12.4</td>
</tr>
<tr>
<td>275</td>
<td>11.2</td>
<td>12.8</td>
<td>14.3</td>
</tr>
<tr>
<td>300</td>
<td>12.8</td>
<td>14.5</td>
<td>16.1</td>
</tr>
<tr>
<td>Multiply this factor by system volume and deduct 6 litres to obtain size of additional vessel for other system volumes.</td>
<td>0.063</td>
<td>0.069</td>
<td>0.074</td>
</tr>
</tbody>
</table>

5 Size of expansion vessel

For the system water expansion to be contained by the 6 litre expansion vessel fitted to the following models:

europa 224, europa 228

the cold system volume must not exceed:

- 96 litres when pressurised to 0.5 bar (cold)
- 88 litres when pressurised to 0.7 bar (cold)
- 81 litres when pressurised to 1.0 bar (cold)

If the pressure exceeds 2.65 bar when the boiler is up to temperature with all radiators in use then an additional expansion vessel MUST be installed on the return pipework.

For expansion volumes see Table 5.
Table 6 europa 232

<table>
<thead>
<tr>
<th>System charge pressure (bar)</th>
<th>0.5</th>
<th>0.7</th>
<th>1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety valve setting</td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vessel pre-charge pressure (bar)</td>
<td>0.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System volume (litres)</th>
<th>Volume of expansion vessel in addition to 7 litre unit fitted to boiler</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>–</td>
</tr>
<tr>
<td>100</td>
<td>–</td>
</tr>
<tr>
<td>125</td>
<td>0.8</td>
</tr>
<tr>
<td>150</td>
<td>2.5</td>
</tr>
<tr>
<td>175</td>
<td>4.0</td>
</tr>
<tr>
<td>200</td>
<td>5.6</td>
</tr>
<tr>
<td>225</td>
<td>7.2</td>
</tr>
<tr>
<td>250</td>
<td>8.8</td>
</tr>
<tr>
<td>275</td>
<td>10.3</td>
</tr>
<tr>
<td>300</td>
<td>11.9</td>
</tr>
<tr>
<td>300</td>
<td>0.063</td>
</tr>
<tr>
<td>300</td>
<td>0.069</td>
</tr>
<tr>
<td>300</td>
<td>0.074</td>
</tr>
</tbody>
</table>

Multiply this factor by system volume and deduct 7 litres to obtain size of additional vessel for other system volumes.

For the system water expansion to be contained by the 7 litre expansion vessel fitted to the following model:

**europa 232**

the cold system volume must not exceed:

111 litres when pressurised to 0.5 bar (cold)
101 litres when pressurised to 0.7 bar (cold)
95 litres when pressurised to 1.0 bar (cold)

If the pressure exceeds 2.65 bar when the boiler is up to temperature with all radiators in use then an additional expansion vessel MUST be installed on the return pipework.

For expansion volumes see Table 6.

Guidance on vessel sizing is given in BS 7074:1 and BS 5449
For IE refer to the current edition of I.S. 813.

### 6 Hydraulic Loss

**Remaining pump capacity**

<table>
<thead>
<tr>
<th>Flow rate l/hour</th>
<th>m H₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>200</td>
<td>2.0</td>
</tr>
<tr>
<td>400</td>
<td>4.0</td>
</tr>
<tr>
<td>600</td>
<td>6.0</td>
</tr>
<tr>
<td>800</td>
<td>8.0</td>
</tr>
<tr>
<td>1000</td>
<td>10.0</td>
</tr>
<tr>
<td>1200</td>
<td>12.0</td>
</tr>
<tr>
<td>1400</td>
<td>14.0</td>
</tr>
</tbody>
</table>

### 7 Draining the system

Draining taps MUST be located in accessible positions to permit the draining of the whole central heating system, including the central heating side of the boiler. The taps should be at least 1/2” BSP nominal size and be in accordance with BS 2879.

### 5 BOILER CONTROL INTERLOCKS

**Thermostatic radiator valves.**

The boiler manufacturer support the recommendations made by leading manufacturers of domestic heating controls that heating systems utilising full thermostatic radiator valve control of temperature in individual rooms should also be fitted with a room thermostat controlling the temperature in a space served by radiators not fitted with such a valve as stated in BS5449. Such an arrangement will provide for a more efficient control of the environment and will also avoid the continuous running of the circulation pump during programmed heating ON periods, saving electrical energy.

It is therefore strongly recommended that, when thermostatic radiator valves are used, the space heating temperature control over a living/dining area or a hallway, having a heat requirement of at least 10% of the boiler output, is achieved using a room thermostat whilst other rooms are individually controlled by thermostatic radiator valves as stated in BS5449.

### 6 DOMESTIC HOT WATER REQUIREMENTS

1. The domestic hot water service must be in accordance with BS 5546 and BS 6700.
2. For the minimum and maximum working pressures of the europa, domestic hot water circuit refer to Table 1, page 4.
3. The cold water supply pipe should be flushed before fitting the boiler.
4. The boilers are suitable for connection to most types of washing machine and dishwashing appliances.
5. When connecting to suitable showers, i.e. those designed for modulating domestic hot water, ensure that:
   a. The cold inlet to the boiler is fitted with an approved anti-vacuum or syphon non-return valve.
   b. Hot and cold supplies are of equal pressure.
6. Hard water areas

In areas where the water is ‘hard’ it is recommended that a proprietary scale-reducing device is fitted into the boiler cold supply, within the requirements of the local water company.

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**europa Installation & Servicing**
7  BOILER WATER CIRCUIT DIAGRAM

europa 224 – europa 228 – europa 232

1. Domestic hot water (DHW) heat exchanger
2. Domestic hot water (DHW) flow switch
3. Domestic hot water (DHW) outlet pipe
4. Domestic cold water inlet cock
5. Three-way diverter valve
6. Main circuit drainage cock
7. Central heating flow cock
8. By-pass valve
9. Central heating (CH) return cock
10. 3 bar pressure relief valve
11. Gas cock
12. Expansion vessel
13. Gas valve inlet pressure tap
14. Modulating gas valve
15. Burner pressure tap
16. Flame detection electrode
17. Ignition electrodes
18. Burner
19. Combustion chamber
20. Primary heat exchanger
21. Fan
22. Air pressure switch
23. Venturi device
24. Flue outlet pipe
25. Air intake pipe
26. Automatic air vent
27. Overheat thermostat
28. Pump
29. Pump vent plug
30. Water circuit temperature probe
31. CH flow switch
32. DHW temperature probe
33. CH circuit temperature/pressure gauge
8  BOILER ASSEMBLY –
Exploded View

1  Venturi
2  Fan
3  Flue hood
4  Flame detection electrode
5  Overheat thermostat
6  Primary heat exchanger
7  Inner case cover
8  Ignition electrodes
9  Heat exchanger return pipe
10  Thermistor
11  Main circuit drainage cock
12  Auto air vent
13  Pump
14  Ignition pcb
15  3 bar pressure relief valve
16  Return manifold
17  DHW flow switch
18  Right hand panel
19  Boiler front panel
20  Appliance data badge (inside)
21  Left hand panel
22  CH circuit pressure gauge
23  Model identification & instructions
24  Control panel door
25  Main control pcb
26  CH flow switch
27  3 way diverter valve
28  Heat exchanger flow pipe
29  DHW heat exchanger
30  Bypass pipe
31  Gas valve
32  Gas valve outlet pipe
33  Injector manifold
34  Burner
35  Air pressure switch
36  Expansion vessel
9 UNPACKING

The boiler is supplied fully assembled in one pack A, together with a standard flue assembly for lengths up to 960 mm (37" 3/4), rear or side flue outlet, in pack B.

Unpack and check the contents.

Pack A contents
A The boiler.
B Hardware pack
C Wall mounting plate
D Wall mounting template
E Installation & Servicing instructions.
F The User’s Instructions.
G Filling loop assembly
H Restrictor pack

Pack B contents
I Air intake pipe ø 100 mm (4”)
J Flue pipe ø 60 mm (2” 3/8) with terminal grille assembly
K Band
L Turret–air pipe gasket
M Flue pipe gaskets – 2 off
N Boiler–turret gasket
O Flue turret
P Self tapping screws 4,8x13 – 4 off
Q Self tapping screw 4,2x13 – 2 off
R Wall finishing gaskets – 2 off

Hardware pack contents
- 22 mm CH connection pipe – 2 off.
- 22 mm Gas supply connection pipe – 1 off.
- 15 mm DHW cold inlet connection pipe – 1 off.
- 15 mm DHW hot outlet connection pipe – 1 off.
- 1/2” connection nut – 2 off.
- 1/2” sealing washer – 3 off.
- 3/4” sealing washer – 6 off.
- 3/4” Gas supply isolating valve – 1 off.
- 3/4” CH circuit isolating valve – 2 off.
- 1/2” DHW cold inlet isolating valve – 1 off.

10 PACKAGING

To unpack the boiler refer to the instructions on carton end flap.

Optional extras, if ordered, are available in separate boxes.
- Extension duct kit pack D (ø 60/100)
- Flue support kit
- Vertical outlet flue kit with elbow (ø 60/100)
- 90° Elbow kit (ø 60/100)
- 45° Elbow kit (ø 60/100)
- Roof flue kit (ø 80/125)
- Pitched roof tile (for roof flue kit)
- Flat roof tile (for roof flue kit)
- Extension duct kit (ø 80/125)
- 90° Elbow kit (ø 80/125)
- 45° Elbow kit (ø 80/125)
- Condense drain (ø 80/125)
- Twin pipe kit (ø 80) with air and flue terminals
- Extension duct kit (ø 80)
- 90° Elbow kit (ø 80) female–female
- 90° Elbow kit (ø 80) male–female
- 45° Elbow kit (ø 80) male–female
- Condense drain (ø 80)
- Condense trap
- Stand–off bracket
- Pre–piping frame
- Natural gas to LPG conversion kit
- LPG to natural gas conversion kit
11 FITTING THE FLUE SYSTEM

The maximum total equivalent lengths are given in Table 7 and Table 8 for co-axial pipes ø 60—100 mm, Table 9 for co-axial pipes ø 80—125 mm and in the diagrams for the ø 80 mm twin pipes air-flue systems.

Refer to the assembly instructions contained within the chosen flue kit packaging for the correct assembly and installation.

Condensate Collection

When a length of vertical pipe is used in the system and the length of flue exceeds the following, a condensate drain and trap must be fitted to the lowest point of the system. The trap must be connected to a suitable waste pipe.

ø80—125mm co-axial pipes — 3 metres
ø80 twin flue pipes — 7 metres

Flue Restrictors

Two different sized restrictors are supplied with the europa 224, europa 228 boilers. A 44 mm size is fitted to the boiler and a 47 mm size is supplied in a separate bag.

Two different sized restrictors are supplied with the europa 232 boiler. A 47 mm size is fitted to the boiler and a 50 mm size is supplied in a separate bag.

The appropriate restrictor, when necessary, must be fitted in the flue outlet elbow as indicated in following picture.

For the correct use of the restrictors with co-axial pipes ø 60/100 mm refer to:
Table 7 for models europa 224, europa 228,
Table 8 for model europa 232

For the correct use of the restrictors with vertical roof kit ø 80/125 mm refer to:
Table 9 for models europa 224, europa 228
Table 10 for model europa 232

<table>
<thead>
<tr>
<th>Pipe length (ø 60/100)</th>
<th>Restrictor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between 0,3 (11.8&quot;) and 1 m (39&quot;)</td>
<td>ø 44 mm</td>
</tr>
<tr>
<td>More than 1 m (39&quot;) up to 2 m (78.5&quot;)</td>
<td>ø 47 mm</td>
</tr>
<tr>
<td>More than 2 m (78.5&quot;) up to 4 m (157&quot;)</td>
<td>no restrictor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pipe length (ø 60/100)</th>
<th>Restrictor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between 0,3 (11.8&quot;) and 1 m (39&quot;)</td>
<td>ø 47 mm</td>
</tr>
<tr>
<td>More than 1 m (39&quot;) up to 2,7 m (8’ 10&quot;)</td>
<td>no restrictor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pipe length (ø 80/125)</th>
<th>Restrictor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between 0,5 (19.5&quot;) and 1,5 m (59&quot;)</td>
<td>ø 44 mm</td>
</tr>
<tr>
<td>More than 1,5 m (59&quot;) up to 6,5 m (21’ 4&quot;)</td>
<td>ø 47 mm</td>
</tr>
<tr>
<td>More than 6,5 m (21’ 4&quot;) up to 8,5 m (27’ 10&quot;)</td>
<td>no restrictor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pipe length (ø 80/125)</th>
<th>Restrictor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between 0,5 (19.5&quot;) and 4 m (13’ 1&quot;)</td>
<td>ø 47 mm</td>
</tr>
<tr>
<td>More than 4 m (13’ 1&quot;) up to 6 m (19’ 8&quot;)</td>
<td>no restrictor</td>
</tr>
</tbody>
</table>

For the correct use of the restrictors with twin pipes refer to the following diagram for the models europa 224, europa 228.

Refer to the following diagram for the model europa 232.
11 FITTING THE FLUE SYSTEM (cont.)

Co-axial Flue kits.

Horizontal.
For calculation of total flue length, the distance MUST be measured from the centreline of the concentric elbow to the end of the terminal grille.

Vertical outlet
For calculation of total flue length, the distance MUST be measured from the centreline of the outlet connector at the boiler top panel to the end of the terminal grille.

For each additional 45° and 90° flue bend used, the maximum permissible length of flue system must be reduced by 1m or 1,5m respectively.

Horizontal and Vertical Outlet kits (60 – 100) have a minimum 300mm length, up to a maximum shown in tables 7 & 8.

Cutting lengths of flue and air ducts

Measure the wall thickness and, when using a side outlet, the gap between the inner wall and the boiler side casing. Use the following chart to calculate the cutting length of air duct.

Completely insert the flue duct in the air duct. Mark and cut the flue duct so it protrudes 27 mm from the air duct edge.

<table>
<thead>
<tr>
<th>Vertical outlet</th>
<th>Rear outlet + Stand-off</th>
<th>Side Outlet – LH</th>
<th>Side Outlet – RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall thickness + 67 mm</td>
<td>Wall thickness + 102 mm</td>
<td>Wall thickness + Gap + 83 mm</td>
<td>Wall thickness + Gap + 120mm</td>
</tr>
</tbody>
</table>

12 REAR FLUE ASSEMBLY

Legend
1 Wall finishing gaskets
2 Self tapping screw 4,2x13
3 Self tapping screws 4,8x13
4 Flue turret
5 Boiler – turret gasket
6 Flue pipe gaskets
7 Turret – air pipe gasket
8 Band
9 Flue pipe ø 60 mm with terminal grille assembly
10 Air intake pipe ø 100 mm

Twin pipe flue kits

For calculation of total flue length, the distance MUST be measured from the centreline of the flue duct/air duct connection to the end of the flue outlet grille/air inlet duct.

For each additional 45° M&F and 90° M&F flue bend used, the maximum permissible length of flue system must be reduced by 0,9m or 1,65m respectively.

For each additional 90° F&F Flue bend used, the maximum permissible length of flue system must be reduced by 2,75m.

Lengths of allowable equivalent flue outlet and air inlet ducts are indicated in the graphs within this frame.

Cutting lengths of flue and air ducts

Measure the wall thickness and, when using a side outlet, the gap between the inner wall and the boiler side casing. Use the following chart to calculate the cutting lengths of both flue and air ducts.

<table>
<thead>
<tr>
<th>Vertical outlet</th>
<th>Rear outlet + Stand-off</th>
<th>Side Outlet – LH &amp; RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall thickness + 215 mm</td>
<td>Wall thickness + 250 mm</td>
<td>Wall thickness + 278mm</td>
</tr>
<tr>
<td>Wall thickness + 225 mm</td>
<td>Wall thickness + 260 mm</td>
<td>Wall thickness + 278mm</td>
</tr>
</tbody>
</table>

When installing a horizontal flue system, Co-axial or Twin Pipe, all ducts MUST have a fall of 3% AWAY from the boiler.
13 WALL MOUNTING TEMPLATE (rear flue)

IMPORTANT
Detailed installation steps are given directly on the wall mounting template
1 Tape the template into the selected position.
2 Ensure squareness by hanging a plumbine.
3 Mark onto the wall the following:
   a. the wall mounting plate screw positions
   b. the position of the flue duct.
      (Mark the centre of the hole as well as the circumference)
4 Remove the template from the wall

14 WALL MOUNTING TEMPLATE (side flue)

IMPORTANT
Detailed installation steps are given directly on the wall mounting template
1 Tape the template into the selected position.
2 Ensure squareness by hanging a plumbine.
3 Mark onto the wall the following:
   a. the wall mounting plate screw position
   b. Extended the centre line as shown.
      Mark the flue duct centre from the corner (see diagram and template)
   
   Note. mark the centre of the hole as well as the circumference.

4 Remove the template from the wall

15 DRILLING THE WALL
Rear flue shown

IMPORTANT
Ensure that, during the cutting operation, masonry falling outside the building does not cause damage or personal injury.
1 Cut the flue hole (preferably with a 5" core boring tool), ensuring that the hole is square to the wall.
2 Drill the fixing holes with an 8mm (5/16") masonry drill. Fit suitable wall plugs (not provided).
   
   Note. If the terminal is to be sited within 25—40 mm of a corner or vertical pipe (refer to Table 4) then the hole MUST be accurately cut and the rubber weather seal trimmed around the groove provided.

5" diameter flue hole
Section through wall

Note: Check all of the hole positions before drilling.
16 FITTING THE WALL MOUNTING PLATE
Refer to frame 18 for service connections.
Fit the wall mounting plate

Directly to the wall
- Offer up wall mounting plate.
- Screw through the fixing holes using 3 off no. 14x2” screws (not provided).
- Check alignment with spirit level.
- Tighten screws.

17 MOUNTING THE BOILER
Lift the boiler onto the wall mounting plate locating the bar at the rear of the back panel assembly into the bracket.

As added protection, the boiler should be lifted with the lower polystyrene packaging in place.

Lower the boiler into position.

Remove the lower packaging. Remove the front and side panels (refer to frame 21) and strip off the protective coating. The panels may be placed to one side and re-fitted when the installation is complete.

Fit the horizontal flue system referring to the instructions contained with the kit.

Make good the internal wall surface using the seal provided.

18 CONNECTIONS
Fit the service valves washers and tail pipes as shown.

Connect to the tail pipes by proprietary fittings.

The pipework may be directed down or through the rear wall as required.

The pipework may be directed upwards by using an optional additional frame available in separate box. See illustration for upward pipework routing.
19 SAFETY VALVE DRAIN

The discharge pipe should be positioned so that the discharge of water or steam cannot create a hazard to the occupants of the premises or damage to electrical components and wiring.

20 ELECTRICAL CONNECTIONS

Warning. This appliance MUST be efficiently earthed

A mains supply of 230 V ~ 50 Hz is required.

Mains wiring should be 3 core PVC insulated flexible cord NOT LESS than 0.75 mm² (24 x 0.2mm) and to BS. 6500, Table 16. (0.5mm² flex is not acceptable – for mechanical, not electrical reasons.)

Mains wiring external to the boiler MUST be in accordance with the current I.E.E. (BS7671) Wiring Regulations and any local regulations.

For Ireland reference should be made to the current ETCI rules for electrical installations.

The supply connection is intended to be made via a double pole switch having a 3 mm (1/8") contact separation in both poles, serving only the boiler and system controls. A 3 pin UNSWITCHED socket may, alternatively, be used.

The fuse rating should be 3 A.

For external controls wiring see frame 24.

Note: the switch contacts of any external programmer, room or frost thermostat must be volt free.

Connecting a switched live feed to external controls terminal block may be dangerous and will result in serious damage to the boiler.

21 ELECTRICAL CONNECTIONS

Incoming mains wiring detail

To gain access to the power supply and external controls terminal blocks:

1. Remove the screws A and the front panel of the case.

2. Remove the screws B.

3. Loosen the screws C.

4. Remove the side panels or move the lower part of the side panels and pull the control panel.

When completely pulled out, the panel can rotate 45° downwards to facilitate the operations on the internal parts.

5. Loosen the screws D and remove the service panel.

Note: Ensure that the lengths of the current conductors are shorter than the earth conductor so that if the cable slips in its anchorage the current carrying conductors become taut before the earth conductor.
Wiring diagram for boiler equipped with full sequence ignition device type: Bertelli & Partners FM30

Electronic control p.c.b.

External controls terminal block

Electric supply terminal block

Safety thermostat

Fan

Air pressure switch

Ignition electrodes

Flame detection electrode

External controls

Pin position ref. numbering

P.C.B. #1

P.C.B. #2

DHW temperature probe NTC

DHW flow switch

Primary circuit flow switch

CH temperature probe NTC

Three way diverter valve

Pump

Modulating gas valve

Time switch

Electronic control p.c.b.

Pin position ref. numbering
Wiring diagram for boiler equipped with full sequence ignition device type: Honeywell FPLD

- External controls terminal block
- Electric supply terminal block
- Safety thermostat
- Fan
- Air pressure switch
- Ignition electrodes
- Flame detection electrode
- Full sequence ignition device
- Electronic control p.c.b.
- Electronic control p.c.b. (Pin position ref. numbering)
- P.C.B. #1
- P.C.B. #2
- DHW temperature probe NTC
- DHW flow switch
- Primary circuit flow switch
- CH temperature probe NTC
- Three way diverter valve
- Pump
- Modulating gas valve
- Time switch

Pin positions:
- bn = brown
- bu = blue
- bk = black
- wh = white
- rd = red
- gy = grey
- gn = green
- ye = yellow
- vt = violet
- og = orange
- gnye = green/yellow

Wiring diagram for boiler equipped with full sequence ignition device type: Honeywell FPLD
23 FUNCTIONAL FLOW DIAGRAM
europa 224, europa 228, europa 232

24 EXTERNAL ELECTRICAL CONTROLS

Wiring external to the boiler MUST be in accordance with the current I.E.E. (BS.7671) Wiring Regulations.

For Ireland reference should be made to the current ETCI rules for electrical installations.

The fuse rating should be 3A.

Route the electrical supply flexible cord and the external control flexible cord as illustrated.

Lock the flexible cords in place with the clamps provided.

ELECTRICAL CONNECTIONS FOR A COMBI BOILER

Programmer

For the models europa 224, europa 228 and europa 232 a digital programmer kit is fitted with its relevant instructions included with the boiler.

Note: the switch contacts of any external programmer, room or frost thermostat must be volt free.

Connecting a switched live feed to external controls terminal block may be dangerous and will result in serious damage to the boiler.

Room Thermostat

This should be wired as shown in diagrams A.

Frost protection

Central heating systems fitted wholly inside the house do not normally require frost protection as the house acts as a 'storage heater' and can normally be left at least 24 hours without frost damage.

However, if parts of the pipework run outside the house or if the boiler will be left off for more than a day or so then a frost thermostat should be wired into the system.

To maintain frost protection with the programmer selector switches set to OFF, all the controls MUST be left in the running position.

The frost thermostat should be sited in a cold place but where it can sense heat from the system.
Wiring should be as shown, with minimal disturbance to other wiring.

**External Programmers**

On the combi boilers, this should be of the single channel type (as this boiler does not incorporate a pre-heat facility for the instantaneous hot water service).

Programmers with room thermostat – see diagram B.

*Note. If the boiler is installed in a garage it may be necessary to fit a pipe thermostat, preferably on the return pipework. Earths are not shown for clarity but must never be omitted.*

---

**25 INITIAL LIGHTING**

Legend
A Appliance On lamp
B Domestic hot water temperature control
C Main switch and radiator temperature control
D Boiler reset button
E Lock – out signal lamp
F Programmer
G System pressure and temperature gauge

**IMPORTANT Before lighting the boiler you should note especially that:**

1. Check that all the drain cocks are closed and any valves in the flow and return are open.
2. Check that the system has been filled and pressurised and that the boiler is not air locked.
3. Remove boiler front panel.
4. Ensure that the pump is free to rotate
   - i. Remove the vent plug
   - ii. Using a screwdriver, rotate the shaft several times
   - iii. Replace the vent plug
   *Note. Some slight water leakage will occur*
5. Remove the screw in the burner pressure test point indicated on the following picture and connect a gas pressure gauge via a flexible tube.

Be sure to select the correct pressure test point. Refer to Tables for pressures.
INSTALLATION

6 Check that the gas service cock is ON.
7 Switch the electricity supply ON and check that all external controls are calling for heat.
8 Set the main switch C to 'ON'. Following a pre-purge period the gas control solenoid valve should open and the spark commence, continuing until the burner is established.
9 Check that the burner lights smoothly. If this does not occur within 20 seconds, turn the main switch to 'O' position, wait for 5 seconds then try again by pressing the reset button 'D'. If the burner still does not light, refer to the 'Fault Finding' section.
10 Test for gas soundness around ALL boiler gas components, using leak detection fluid.
11 Operate the boiler for 10 minutes to stabilise the burner temperature.
12 Check that the burner pressures are correct. The boiler is factory pre-set and should not need adjustment. However if adjustment is required refer to frame 26.
13 Set the boiler main switch to 'O'.
14 Remove the pressure gauge and tube. Replace the sealing screw in the pressure test point. Ensure a gas tight seal is made.
15 Refit the boiler front panel using the screws previously removed.
16 Switch the boiler on again.

26 TO ADJUST PRESSURES

Nomenclature of the parts on the gas valve
A Modulation operator’s electric connectors
B Minimum gas pressure adjustment
C Maximum gas pressure adjustment
D Gas valve inlet pressure test point
E Burner pressure test point

1 Remove the front panel of the case.
2 Open the gas valve inlet pressure test point D at the valve input, connect a suitable pressure gauge and check the gas pressure of the supply network.
3 Remove the gauge and close the pressure test point D.
4 Open the burner pressure test point E and connect the gauge.
5 Remove the protection cap from the mechanical pressure adjustment components (B and C)
6 Start the boiler at its maximum power. Operate the boiler in DHW mode or ensure that the boiler is not range rated if the test is carried out in CH mode.

Maximum valve setting
7 If necessary, rotate the maximum gas pressure adjustment C using a spanner until you obtain the required pressure as indicated on Table 1 at page 4 (burner pressure). By rotating clockwise the pressure increases.

Minimum valve setting
8 Disconnect one of the two connectors A.
9 If necessary, rotate the minimum gas pressure adjustment B using a pozidrive screwdriver until you obtain the required pressure as indicated on Table 1 at page 4

Important: after the gas pressure checks and any adjustment operations, all of the test points must be sealed.

Ignition rate adjustment
1 Turn on the boiler.
2 Check that the boiler lights up uniformly and adjust the ignition gas pressure, if necessary.

To adjust the ignition gas pressure:
3 Open the gas valve outlet pressure test point E and connect the gauge.
4 Loosen the screws F and remove the service panel

5 Set dip-switch "3" to the OFF position and adjust potentiometer marked "ACC" with a screwdriver until correct ignition gas pressure is obtained.

Suggested ignition pressures:
Natural gas G20 = 6 (2,4) mbar (in w.g.)
Propane G31 = 13 (5,3) mbar (in w.g.)
27 ANTI CYCLING SETTING
If the dipswitch number 4 on the main P.C.B. is set to the 'ON' position it will activate the re-ignition delay period of approximately 3 minutes. When dipswitch number 4 is set to the 'OFF' position there will be approximately 30 seconds re-ignition delay period.

28 COMMISSIONING AND TESTING
The benchmark Logbook or equivalent self certification should be completed and signed to demonstrate compliance with Building Regulations.

A. Electrical Installation
Checks to ensure electrical safety should be carried out by a competent person.
ALWAYS carry out the preliminary electrical system checks, i.e. earth continuity, polarity, resistance to earth and short circuit, using a suitable test meter.

B. Gas Installation
1 The whole of the gas installation, including the meter, should be inspected and tested for soundness and purged in accordance with the recommendations of BS 6891. In IE refer to I.S. 813:2002.
2 Purge air from the gas installation by loosening the gas cock union and purge until gas odour is detected.
3 Retighten the union and test for gas soundness.
WARNING. Whilst effecting the required gas soundness test and purging air from the gas installation, open all windows and doors, extinguish naked lights and DO NOT SMOKE.

29 GENERAL CHECKS
Make the following checks for correct operation:
1 Hot water.
   a. Fully open all DHW taps in turn and ensure that water flows freely from them.
   b. Close all taps except the furthest one from the boiler and check that the boiler is firing at maximum rate.
   c. Ensure that DHW temperature of approximately 35 °C rise is obtained at the tap. This corresponds to a flow rate of about 10.0 (2.2) l/min (gpm) europa 224
      11.6 (2.6) l/min (gpm) europa 228
      13.1 (2.9) l/min (gpm) europa 232
   d. Turn off the DHW tap.
2 Central heating (all models)
   Operate each control separately and check that the main burner or circulating pump, as the case may be, responds.
3 Gas rate
   Check the boiler gas rate when the boiler is at full output.
   The gas rate will normally be
   45.8 (1.62) litres/min (ft³/min) for the models europa 224
   53.5 (1.89) litres/min (ft³/min) for the models europa 228
   62.1 (2.19) litres/min (ft³/min) for the model europa 232
   checked at the gas meter, with no other appliance in use.
   If this check is not possible, ensure that the burner pressure is:
   11.7 (4.7) mbar (in. w.g.) for the models europa 224, europa 228,
   10.5 (4.2) mbar (in. w.g.) for the model europa 232.
4 Water circulation system
   Note. Fernox Superfloc flushing solution should be used during the flushing procedure.
   a. With the system HOT examine all water connections for soundness.
   b. With the system still HOT, turn off the gas, water and electricity supplies to the boiler and drain down, to complete the flushing process.
   c. Refill the system, adding inhibitor (see 'Water Treatment'), if required.
   Vent as necessary to clear all air and, again, check for water soundness. After venting, repressurise as required.
   d. Balance the system. It is suggested that, initially, all radiator handwheel valves (or TRVs if fitted) be set fully open, that all lockshield valves be set a half-turn open.
   Make minor adjustments to each radiator to achieve the same differential on all.
5 Flue system
   Check the integrity of the flue outlet and air inlet system to the boiler ensuring no leaks are evident from piping joints or flue/air sampling points.
   Finally, set the system controls to the users requirements.
30 GAS CONVERSION
1 Disconnect the electrical supply.
2 Replace the burner injectors as explained in frame 42.
3 Re-assemble the burner, the front panel of the combustion chamber and the lid of the sealed chamber.
4 Remove the service panel (frame 26 step 4).
5 Set correctly the dip-switch “2” to the correct position in accordance with the following table and drawing.

<table>
<thead>
<tr>
<th>Gas supply</th>
<th>Position of dip-switch 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas</td>
<td>On</td>
</tr>
<tr>
<td>Propane</td>
<td>Off</td>
</tr>
</tbody>
</table>

6 Adjust the burner pressures according to the indications given in frame 26.
7 Stick the self-adhesive label (included with the conversion kit, indicating the type of gas, and the gas pressures to which the appliance has been set) over the existing label on the bottom of the control panel.
8 Replace the service panel and the front and side panels of the case.
9 Check the correct operation of the boiler.

31 HANDING OVER
After completing the installation and commissioning of the system, the installer should hand over to the householder by the following actions:

1 Hand the User’s Instructions to the householder and explain his or her responsibilities under the Gas Safety (Installation and Use) Regulations 1994 and amendments 1996 or rules in force.
2 Draw attention to the Lighting Instruction label affixed to the inside of the lower front door.
3 Explain and demonstrate the lighting and shutting down procedures.
4 The operation of the boiler and the use and adjustment of ALL system controls should be fully explained to the householder, to ensure the greatest possible fuel economy consistent with household requirements of both heating and hot water consumption.
5 Advise the user of the precautions necessary to prevent damage to the system and to the building, in the event of the system remaining inoperative during frosty conditions.
6 If a programmer is fitted, draw attention to the Programmer Instructions and hand them to the householder.
7 After installation and commissioning please complete the Commissioning Checklist before handover to the customer.
   For IE, it is necessary to complete a “Declaration of Conformity” to indicate compliance to I.S. 813:2002.
8 Stress the importance of regular servicing by a CORGI registered installer and that a comprehensive service should be carried out AT LEAST ONCE A YEAR.
   In IE, servicing work must be carried out by a competent person.

Emphasise to the user that the boiler may stop working if the system pressure is lowered by draining radiators to decorate behind them. In particular, explain to the user how the domestic hot water temperature varies with flow rate. This is especially important when water is drawn off while the boiler is already running for central heating.
32 SERVICING SCHEDULE

To ensure the continued safe and efficient operation of the appliance it is recommended that it is checked at regular intervals and serviced as necessary.

The frequency of servicing will depend upon the installation condition and usage but should be carried out at least annually.

It is the law that any service work must be carried out by a registered CORGI installer.

In IE, servicing work must be carried out by a competent person.

1. Turn the heating controls to maximum so that the boiler lights and remains running. Check that no other gas appliances in the house are in use or likely to be used.

2. When the boiler has settled down check the gas rate at the meter (if the meter is of the pointer type you should time only complete revolutions of the pointer). Check the gas rate against the figures given in Table 2 for CH operation.

3. For a combination boiler, fully open a hot water tap. When the boiler has settled down check the gas rate, as in step 2, checking the measured rate against the figures given in Table 3 for HW operation.

4. Run the boiler and check the percentage of CO and CO\textsubscript{2} in the flue gasses at the sampling point indicated in the following drawing.

   ![Diagram of sampling points](image)

   **Note.** If your meter reads CO in parts per million the figure must be divided by 10,000 to convert it to a percentage.

5. If the ratio of CO/CO\textsubscript{2} is less than .004 and the gas rates measured in steps 3 and 4 are close to nominal then no further action need be taken. If not, proceed to step 6.

6. Clean the main burner.

7. Clean the heat exchanger.

8. Check the injectors for blockage or damage.

9. Check that the flue terminal is unobstructed.

The servicing procedures are covered more fully in Frames 33 to 35 and MUST be carried out in sequence.

**WARNING.**

ALWAYS turn off the gas supply at the gas service cock, and switch off and disconnect the electricity supply to the appliance before servicing.

Switching the boiler on/off switch ‘off’ does not fully isolate the boiler.

ALWAYS test for gas soundness and carry out functional checks on reassembly.

**IMPORTANT.** When work is complete the boiler inner front sealing panel MUST be correctly refitted, making a good seal.

**DO NOT OPERATE THE BOILER IF THE SEALING PANEL IS NOT FITTED.**

Complete the service section in the Benchmark Commissioning Checklist.
33 REMOVAL OF OUTER AND INNER CASING

1. Turn off the gas supply at the gas service cock and disconnect the electricity supply.
2. Remove the screws A and lift off the boiler front panel.
3. Loosen the screws B.
4. Bring the base of the panels away from the boiler and lift them, freeing them from the top hooks.
5. Remove the screws C and remove the boiler inner casing.
34 BURNER REMOVAL AND CLEANING
1 Disconnect the electrical supply.
2 Remove outer and inner casing (refer to frame 33).
3 Undo the screws A and remove the combustion chamber panel B.
4 Disconnect the electrodes leads.
5 Undo the four screws C placed at the right and left sides of the burner and extract it.
6 Brush off any deposits that may have collected on the burner, ensuring that the flame ports are unobstructed. Note: brushes with metallic bristles MUST NOT be used.
7 Inspect the spark and detection electrodes. Ensure they are clean and in good condition; replace if necessary.
8 Check the spark electrodes gap is correct.

35 BURNER PRESSURE CHECK
After any servicing, reference should be made to:

- Table 2 and Table 3 (or the data plate) which quote details of the burner pressures.

36 CLEANING THE HEAT EXCHANGER
1 Open the combustion chamber as explained in steps 1 to 3 of frame 34.
2 Place a plastic sheet or similar beneath the heat exchanger and remove all visible loose deposits from the heat exchanger fins, using a suitable brush.
37 **RE-ASSEMBLY**

Re-assemble the boiler in the following order:

3. Refit the burner.
4. Reconnect the electrodes to the ignition pcb. See frame 34 for correct connectors.
5. Refit the combustion chamber panel.

6. Refit the inner case cover.

**IMPORTANT.** Ensure the boiler sealing panel is correctly fitted and that a good seal is made.

7. Refit the boiler side and front panels.
8. Turn on the gas supply at the gas service cock.
9. Reconnect the electrical supply.

38 **FAN AND VENTURI REMOVAL AND CLEANING**

1. Disconnect the electrical supply.
2. Remove outer and inner casing.
3. Disconnect the connectors A and the earth connection B.

4. Disconnect the pipe which connects the venturi device to the air pressure switch.
5. Unscrew the screws C and remove the clamp D.

6. If the right clearance is at least 50 cm (20")....
   - Unscrew the 3 screws E and remove the fan and skip to step 9

7. If the right clearance is less than 50 cm (20")....
   - Remove the combustion chamber panel (see frame 33)
   - Remove the 3 screws F and remove the flue hood with the fan.
   - Unscrew the 3 screws E and remove the fan.
   - Check that the impeller runs freely. Clean with a soft brush or renew as necessary. Refer to frame 49 for replacement.

**Note:** Always take care when handling the fan, in order to preserve the balance of the impeller.

8. Check the venturi G for cleanliness.

9. Re-assemble in reverse order.

To correctly connect the venturi device to the air pressure switch, refer to the following illustration.
39 GENERAL
When replacing any component:
1. Isolate the electricity supply at the switched spur.
   N.B. Turning the boiler “ON/OFF” switch does not isolate the live supply to the boiler.
2. Turn off the gas supply.
   IMPORTANT: When work is complete the inner case cover must be correctly fitted, ensuring that a good seal is made.

THE BOILER MUST NOT BE OPERATED IF THE INNER CASE COVER IS NOT FITTED.
If the CH and/or the DHW circuits have been emptied:
3. Open the hydraulic circuit cocks, refill / re-pressurise pipeworks and vent the system.
4. Test fire the boiler
5. Disconnect the filling loop.

40 SPARK AND DETECTION ELECTRODE REPLACEMENT
1. Disconnect the electrical supply.
2. Remove outer and inner casing (refer to frame 33).
3. Open the combustion chamber and disconnect the electrodes leads.
4. Remove the burner. Refer to frame 34.
5. Undo the screws that hold the electrodes and remove.
6. For models europa 224, europa 228, fit new electrodes as necessary following the sequence illustrated.
7. Check the spark gap.
8. Re-assemble in reverse order.
9. Check the ignition and operation of the burner.

41 BURNER REPLACEMENT
1. Remove the burner as explained in frame 34
2. Remove the spark and detection electrodes. Refer to frame 40.
3. Fit the electrodes on the new burner and check the spark gap.
4. Re-assemble in reverse order.
5. Check the operation of the boiler.
42 BURNER INJECTORS REPLACEMENT

1. Remove the burner. Refer to frame 34.
2. Unscrew the injectors from the gas manifold.
3. Check that the new injectors are of the correct size and fit it using new gaskets.
4. Reassemble in reverse order.
5. Check the operation of the boiler.

43 OVERHEAT THERMOSTAT REPLACEMENT

1. Remove outer and inner casing (refer to frame 33). For models europa 228 and europa 232 remove the screw A and the plate B.
2. Disconnect the wiring C.
3. Remove the spring D which holds the overheat thermostat on the pipe of the primary heat exchanger and remove it.
4. Reassemble in reverse order.
5. Apply an adequate quantity of heat conducting compound between the pipe and the thermostat.
44  THERMISTOR REPLACEMENT

1  Disconnect the electrical supply.
2  Remove the front and right hand side casing panels (refer to frame 33).
3  Close off the isolating cocks of the CH circuit at the bottom of the boiler.
4  Release system pressure by opening the main circuit drainage cock.
   Do not release CH pressure using the pressure relief valve. It may cause debris within the system to foul the valve.
5  Disconnect the leads from the thermistors to be replaced and unscrew it.
6  Screw in the new sensor, using a new gasket, reconnect and re-assemble in reverse order.

45  GAS VALVE ON–OFF OPERATOR COILS REPLACEMENT

Check

1  Disconnect the electrical supply.
2  Remove the front casing panel.
3  Disconnect the connector A and check the electrical resistance of the coils referring to the following diagram

   Upper on–off operator approx. 6 400 Ω*

   Lower on–off operator approx. 920 Ω*

* at ambient temperature.

4  If the resistance of either of the coils is different from the value stated by ±10% or greater, replace the unit as described below.

Replacement

5  Remove the screw B, withdraw the coils unit C.
6  Replace it and re-assemble in reverse order.
46 GAS VALVE REPLACEMENT

1. Turn off the gas supply at the gas service cock and disconnect the electricity supply.
2. Remove the front casing panel (refer to frame 33).
3. Disconnect the connectors A and B.
4. Disconnect the earth wiring from the gas valve.
5. Unscrew the connectors C and remove the pipe D
6. Unscrew the inlet connector.
7. Unscrew the screws E and remove the valve.
8. Fit the new gas valve in reverse order ensuring new gaskets are fitted and check for gas soundness.
9. Check the operation of the boiler.

47 WATER TEMPERATURE–PRESSURE GAUGE REPLACEMENT

1. Disconnect the electrical supply.
2. Remove the front and right hand side casing panels (refer to frame 33).
3. Release system pressure by opening the main circuit drainage cock A
   Do not release CH pressure using the pressure relief valve. It may cause debris within the system to foul the valve.
4. Remove the fork B and the probe holder spring C.
5. Pull out the control panel (see frame 21).
6. Squeeze the tabs D to release the temperature–pressure gauge E and remove it.
7. Re–assemble in reverse order.

48 EXPANSION VESSEL REPLACEMENT

If the CH expansion vessel is faulty, there are 2 options:

A. If it has a punctured diaphragm, but is otherwise leak free, then it can be left in place and a new vessel added to the return side of the system, external to the boiler, provided it is of adequate capacity and pre–charge pressure.

B. If there is at least 400 mm (16”) clearance above the boiler, the expansion vessel can be changed without removing the boiler (rear exit flues will have to be disturbed).

For option B, proceed as follows:
1. Disconnect the electrical supply.
2. Gain access to the controls area by removing the boiler front panel (refer to frame 33).
3. Close off the isolating cocks of the CH circuit at the bottom of the boiler.
4. Release system pressure by opening the main circuit drainage cock.

Do not release CH pressure using the pressure relief valve. It may cause debris within the system to foul the valve.
5. Completely unscrew the connection A, the locknut B and remove the expansion vessel from the top of the boiler.
6. Re–assemble in reverse order.
49  FAN REPLACEMENT

1 Disconnect the electrical supply.
2 Remove outer and inner casing.
3 Disconnect the connectors A and the earth connection B.

4 Disconnect the pipe which connects the venturi device to the air pressure switch.
5 Unscrew the screws C and remove the clamp D.

If the right clearance is at least 50 cm (20")....
6 Unscrew the 3 screws E and remove the fan.

7 Re-assemble in reverse order.

If the right clearance is less than 50 cm (20")....
6 Remove the combustion chamber lid (see frame 34)
7 Remove the 3 screws F and remove the flue hood with the fan.
8 Unscrew the 3 screws E and remove the fan.
9 Re-assemble in reverse order.

To correctly connect the venturi device to the air pressure switch, refer to the following illustration.

50  VENTURI REPLACEMENT

1 Remove the fan (see frame 49).
2 Remove and replace the venturi device A by unscrewing the screw B.
3 Re-assemble in reverse order.
51 AIR PRESSURE SWITCH REPLACEMENT

Two different types of air pressure switch may be used in the boiler. Refer to the following drawings in accordance with the type of air pressure switch used.

1. Disconnect the electrical supply.
2. Remove outer and inner casing as explained in frame 33.
3. Disconnect the pressure sensing pipe from the air pressure switch.
4. Disconnect the electrical harness from the air pressure switch.
5. Undo the two screws which hold the air pressure switch to the chassis and remove it.
6. Replace the switch.
7. Re-assemble in reverse order.

To correctly connect the venturi device to the air pressure switch, refer to the illustration of frame 49 and to the following illustrations in accordance with the type of pressure switch used.

52 PUMP REPLACEMENT COMPLETE

1. Disconnect the electrical supply.
2. Remove the front and right hand side casing panels (refer to frame 33).
3. Release system pressure by opening the main circuit drainage cock. Do not release CH pressure using the pressure relief valve. It may cause debris within the system to foul the valve.
4. Disconnect the connector A.
5. Unscrew the locknut B and move the pipe upwards freeing it from the outlet port of the pump.
6. Remove the fork C and the capillary pipe.
7. Remove the locking plate D right.
8. Loosen the connection E, remove the fork F and remove the pipe G.
9. Unscrew the two screws H that hold the pump on the frame.
10. Remove the pump towards the front of the boiler.

Re-assemble in reverse order.

When reassembling the pump, check the correct location of the O-ring gasket in the inlet port of the pump that seals the connection between the pump and the brass group.

If the motor only needs replacing, disconnect the connector A, unscrew the 4 screws I and remove the pump motor forwards.
53 MAIN CONTROL PCB REPLACEMENT

1. Disconnect the electrical supply.
2. Gain access to the controls area by removing the boiler front panel and pulling the control panel (refer to frame 21).
3. Remove the screws A and remove the service panel.
4. To gain access to the main control p.c.b. and the ignition p.c.b. remove the screws B and remove the control panel lid.
5. Remove all the wiring connected to the main control p.c.b. To disconnect the connectors indicated, delicately flex the hook present on one side of each socket.
6. Remove the spindles of the CH and DHW temperature adjustment knobs by delicately pulling them with pliers in the direction shown by the arrow.
7. Unscrew the four screws that hold the main control p.c.b. on to the control panel.
8. Remove it by lifting its rear edge and freeing it from any of the wiring.
9. Re-assemble in reverse order.

Setting jumpers

Two setting jumpers C are fitted on the main control p.c.b.

Refer to the illustration 1 for the position of the jumpers when the main control p.c.b. is fitted on a europa 224, europa 228 or europa 232 boiler.

The numbers refer to the marking printed on the circuit board.

Important

When re-assembling the electronic control p.c.b.:

10. Fit the p.c.b. into the control panel by first inserting the front lower edge under the control knob shafts. Lower the rear edge and ensure that no wiring is trapped beneath.
11. Insert the spindles in the control panel knobs until the notch D reaches the potentiometer edge. It is not necessary to force them in the knob.
12. While tightening the screws that fix the main control p.c.b. on the control panel, keep the p.c.b. towards the control panel fascia making sure of the contact between the boiler reset button E and the tab F. Replace the wiring connections ensuring correct engagement in the sockets.

Attention

After installing the main control p.c.b.:

13. Make sure the CH ( ) and DHW ( ) temperature adjustment knobs can move freely for the complete range. If not, remove the spindle again as described at step 6, turn the knob half a turn and re-insert the spindle.
14. Operate the boiler and close the gas inlet cock so that the boiler goes into the safety lock-out state. Verify the correct operation of the boiler reset button by pressing and releasing it.
15. Open the gas inlet cock and check the boiler operates correctly.
54  IGNITION PCB REPLACEMENT
1. Gain access to the parts located inside the control panel as explained in the frame 53.
2. Remove all the wiring connected to the ignition p.c.b. To disconnect the connectors indicated, delicately flex the hook present on one side of each socket.
3. Unscrew the two screws A that hold the ignition p.c.b. on the panel and remove the component.
4. Reassemble in reverse order.
5. Check the boiler operates correctly.

55  CH FLOW SWITCH REPLACEMENT
1. Disconnect the electrical supply.
2. Remove the front casing panel.
3. Remove the fork A.
4. Open the box B and disconnect the switch.
5. Reassemble in reverse order. Refer to the following illustration for the correct wiring connectors on the switch.

Looking through the switch box B it is possible to verify the position of the spindle C.

56  CH FLOW SWITCH MEMBRANE REPLACEMENT
1. Disconnect the electrical supply.
2. Remove front casing panel (refer to frame 33).
3. Close off the isolating cocks of the CH circuit at the bottom of the boiler.
4. Release system pressure by opening the main circuit drainage cock. Do not release CH pressure using the pressure relief valve. It may cause debris within the system to foul the valve.
5. Remove the CH circuit flow switch (see frame 55).
6. Unscrew the four screws A, open the hydraulic operator and remove the membrane B.
7. Reassemble in reverse order. When assembling the membrane, ensure to place the concave side of the membrane towards the actuator plate C and locate the reference hole in the membrane over the pressure transfer nipple D.
57 DHW FLOW SWITCH REPLACEMENT

1. Disconnect the electrical supply.
2. Remove the front panel of the case (refer to frame 33).
3. Disconnect the connector A and remove the sensor by pulling it towards the front of the boiler (the sensor is held in place by means of a spring).
4. Replace the sensor and reassemble in reverse order.

58 DHW FILTER AND FLOW LIMITER REPLACEMENT

1. Disconnect the electrical supply.
2. Remove the front panel of the case and empty the DHW circuit.
3. Remove the flow switch A (see frame 57).
4. Remove the gas valve (see frame 46).
5. Unscrew the plug B and extract the flow switch group.
6. To remove the filter C from the flow switch group separate the body D from the plug B by unscrewing it.
7. Reassemble in reverse order.

Attention: the magnetic ring has a magnetic polarity and must be correctly coupled with the spindle of the float. To determine the correct orientation of the ring proceed as follows:

1. Set the function selector of the boiler in standby mode.
2. Restore the mains electricity supply to the boiler.
3. Hold the flow switch sensor and bring the ring in contact with the sensor as illustrated in the following drawing.
4. Observe if the lamp fitted in the sensor body is lit. If not reverse the ring and repeat the previous operation.
5. Fit the ring on the spindle of the float in the way that lights the lamp. Ensure filter is correctly positioned and that plug “B” and the threaded ring are screwed tight into the body “D”.
6. Isolate the boiler from the mains electricity supply and reassemble the parts following the removing sequence in reverse order.

Flow limiter

The europa 224 model is factory fitted with a 10 litre/min. flow limiter.
The europa 228 model is factory fitted with a 12 litre/min. flow limiter.
The europa 232 model is factory fitted with a 14 litre/min. flow limiter.

Table 11

<table>
<thead>
<tr>
<th>Nominal flow rate (litres/min)</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Yellow</td>
</tr>
<tr>
<td>12</td>
<td>Brown</td>
</tr>
<tr>
<td>14</td>
<td>Pink</td>
</tr>
</tbody>
</table>

1. Disconnect the electrical supply.
2. Remove the front panel of the case and empty the DHW circuit.
3. Remove the flow switch A (see frame 57).
4. Remove the gas valve (see frame 46).
5. Remove the flow switch group (see frame 58 above)
6. Unscrew the threaded ring and extract the flow limiter.
7. Fit the correct colour coded limiter (see Table 11 above) and screw the threaded ring tight into the body ‘D’.
8. Reassemble in reverse order.
59 PRIMARY HEAT EXCHANGER REPLACEMENT
1 Disconnect the electrical supply.
2 Remove outer and inner casing as explained in frame 33.
3 Close off the isolating cocks of the CH circuit at the bottom of the boiler.
4 Release system pressure by opening the main circuit drainage cock.
   Do not release CH pressure using the pressure relief valve. It may cause debris within the system to foul the valve.
5 Remove the combustion chamber panel A by unscrewing the screws B. For models europa 228 and europa 232 only, remove the screw C and the plate D.
6 Remove the clips E and the safety thermostat F. It is not necessary to disconnect it from the wiring.
7 Unscrew the locknut G, lift the pipe H and rotate it right then move it downwards freeing it from the heat exchanger connection.
8 Completely unscrew the connection I.
9 Move the pipe J downwards freeing it from the heat exchanger connection.
10 Remove the heat exchanger by sliding it forwards.
11 Reassemble in reverse order.

60 DHW HEAT EXCHANGER REPLACEMENT
1 Disconnect the electrical supply.
2 Remove outer casing (refer to frame 33).
3 Close the isolating cocks of the CH circuit and DHW supply at the bottom of the boiler.
4 Release system pressure by opening the main circuit drainage cock.
   Do not release CH pressure using the pressure relief valve. It may cause debris within the system to foul the valve.
5 Release the pressure of the DHW circuit by opening a hot tap.
6 Remove the diverter valve actuator (see frame 61).
7 Completely unscrew the two Allen key screws A which hold the exchanger to the brass groups.
8 Move the exchanger towards the rear of the boiler and extract it.
9 Reassemble in the reverse order.
10 Remove the heat exchanger by sliding it forwards.
11 Reassemble in reverse order.

Attention. When reassembling the exchanger be sure to put the off center location/secure pin indicated towards the left side of the boiler.
61  DIVERTER VALVE ACTUATOR REPLACEMENT

1 Disconnect the electrical supply.
2 Remove front casing panel (refer to frame 33)
3 Disconnect the connectors A.
4 Remove the fixing spring B and remove the actuator C.

Reassemble in reverse order.

When reassembling the actuator, refer to the wiring diagram in frame 22 for the correct wiring connection.

62  DIVERTER VALVE INTERNAL PARTS REPLACEMENT

1 Disconnect the electrical supply.
2 Remove front and left hand casing panels (refer to frame 33)
3 Close the isolating cocks of the CH circuit and DHW supply at the bottom of the boiler.
4 Release system pressure by opening the main circuit drainage cock.
Do not release CH pressure using the pressure relief valve. It may cause debris within the system to foul the valve.
5 Release the pressure of the DHW circuit by opening a hot tap.
6 Remove the diverter valve actuator (see frame 61).
7 Remove the fork D and remove the primary circuit flow switch E.
8 Disconnect the thermistor F.
9 Unscrew the connector G, disconnect the CH flow and DHW outlet isolator valves.
10 Remove the DHW heat exchanger (see frame 60).
11 Remove the fork H and move away the pipe I.
12 Unscrew the screw J and remove the diverter (flow) group.

13 Refer to the following exploded view to remove the internal parts of the three way diverter valve.

14 Reassemble in reverse order.
63 PROGRAMMER REPLACEMENT
1 Disconnect the electrical supply.
2 Gain access to the main control p.c.b. (steps 1 to 4 of frame 53).
3 Disconnect the wiring at the programmer.
4 Squeeze the hooks that hold the programmer on the control panel fascia and withdraw the faulty programmer.
5 Re-assemble in reverse order. When reassembling the new programmer, refer to the wiring diagram in frame 22 for the correct wiring connection.
6 Replace the panels and check the operation of the new programmer.

64 CH DRAIN COCK REPLACEMENT
1 Disconnect the electrical supply.
2 Remove front and right hand casing panels (refer to frame 33).
3 Close off the isolating cocks of the CH circuit at the bottom of the boiler.
4 Release system pressure by opening the main circuit drainage cock. Do not release CH pressure using the pressure relief valve. It may cause debris within the system to foul the valve.
5 Remove the CH drain cock A from the return body.
6 Re-assemble in reverse order.
65 MAIN CONTROL P.C.B.
OPTICAL INFORMATION

The main control p.c.b. is provided with three lamps (L.E.D. indicators) that give optical information during the normal operation of the boiler or for service and fault finding purpose.

Normal operation

The green lamp on the left is directly visible on the control panel fascia and it gives information during the normal operation of the boiler. The other two lamps are normally switched off.

The following table gives the relationship between the visible lamp indication and its meaning.

<table>
<thead>
<tr>
<th>Lamp Combination</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>A short pulse every 4 seconds</td>
<td>Boiler in stand--by condition. (function control in position). Anti--freeze system active.</td>
</tr>
<tr>
<td>1 second ON 1 second OFF</td>
<td>Boiler ON condition (function control in position)</td>
</tr>
</tbody>
</table>
| Very fast pulses (4 per second) | Faulty boiler or irregular operation as:  
- Empty primary circuit  
- No primary circuit flow  
- Lack of burner ignition  
- Excessive temperature in the primary circuit.  
- Dip--switch 3 left in the OFF position  
- Faulty temperature probe |

The following table gives a summary of the relationship between each of the possible lamp combinations and their meaning.

<table>
<thead>
<tr>
<th>Lamp Combination</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal operating boiler</td>
<td>Normally operating boiler</td>
</tr>
<tr>
<td>CH operation</td>
<td>CH operation</td>
</tr>
<tr>
<td>DHW operation</td>
<td>DHW operation</td>
</tr>
<tr>
<td>Frost protect operation</td>
<td>Frost protect operation</td>
</tr>
<tr>
<td>DHW operation Excessive temperature on primary circuit</td>
<td>DHW operation Excessive temperature on primary circuit</td>
</tr>
<tr>
<td>Faulty CH temperature probe NTC</td>
<td>Faulty CH temperature probe NTC</td>
</tr>
<tr>
<td>Faulty DHW temperature probe NTC</td>
<td>Faulty DHW temperature probe NTC</td>
</tr>
<tr>
<td>Faulty primary circuit (no water or absence of flow)</td>
<td>Faulty primary circuit (no water or absence of flow)</td>
</tr>
<tr>
<td>Lack of burner ignition (no ignition signal from the full sequence ignition device)</td>
<td>Lack of burner ignition (no ignition signal from the full sequence ignition device)</td>
</tr>
<tr>
<td>Ignition gas pressure adjustment</td>
<td>Ignition gas pressure adjustment</td>
</tr>
<tr>
<td>Minimum gas pressure adjustment</td>
<td>Minimum gas pressure adjustment</td>
</tr>
</tbody>
</table>

66 DIVERTER VALVE ACTUATOR
SPINDLE POSITION

To remove the diverter valve actuator refer to frame 61.

The following illustrations indicate the relationship between the electric command coming from the main control p.c.b. and the position of the brass spindle when the boiler operates in either DHW mode or CH mode.

In both figures the relationship between the position of the actuator and the resistance of the motor windings (the motor must be disconnected from the wiring) is also given.
67 FAULT FINDING

WARNING

Care must be taken when conducting fault finding tests to guard against the risk of electric shock.

230 Vac is the nominal UK supply voltage. This may vary between 253 Vac and 196 Vac.

When checking continuity ensure power is off to the appliance.

With a fast pulse showing on LED 1 the boiler will continue to operate with a reduced performance in some fault conditions.

Before commencing fault finding please check the following:

Are all wiring connections OK?
Are the function selector settings correct
(Refer to frame 26, 27 and 30)
Are the p.c.b. jumpers correctly placed (Refer to frame 53)

START

Ensure the room thermostat (if fitted) and programmer are calling for heat
Also that all services are on and the selector switch is set to heating*

Is the green LED on front facia flashing?
(1 Second on, 1 Second off)

With the boiler in heating mode, is the maximum burner pressure 11.7 mbar (10.5 for europa 232) with boiler and system cool)

Does the heating flow pipe become warm quickly?

Is the green LED on front facia flashing 4 times per second?

Is there 230V between Live and Earth at the mains connection in the control box?

Is there 230V at the Live connection to PCB #1 pin 4?

Is there 16V dc at Grey and Black connections on modulator coil?

Is there 230V between Blue and Brown at the 3-way valve connection?

Is the gas inlet pressure > 17 mbar?

Adjust the burner pressure, refer to frame 26. Can 11.7 mbar be achieved? (10.5 mbar for europa 232)

Is there 230V between Blue and Brown at the 3-way valve connection?

Is there continuity across the fuse on the PCB #1?

Is modulator harness continuity O.K?

Adjust max 'stop' on Gas Valve to achieve 11.7 mbar (10.5 mbar for europa 232)

Replace faulty PCB #1

Replace faulty external fuse and check for wiring fault

Rectify external wiring fault

Replace faulty PCB #1

Replace faulty wiring

Repair or replace faulty wiring

Is it a system boiler?

Close DHW tap

Disconnect DHW flow sensor wiring. Does the heating flow pipe now become warm?

Is there continuity of the 3-way valve harness O.K?

Replace faulty PCB #1

Remove the motor assembly, with 230V at the connections is the spindle visible? Refer to frame 66.

Replace faulty motor assembly

Replace the DHW flow detector sensor body. Does the heating flow become warm?

Replace faulty valve body assembly

Dismantle the DHW detector valve. Refer to frame 58 and clean. When re-assembled with DHW taps closed, does the heating flow pipe become warm?

Replace the faulty DHW detector valve

Faulty sensor now replaced

Replace the motor assembly, with 230V at the connections is the spindle visible? Refer to frame 66.

Replace faulty motor assembly

Faulty sensor now replaced

Replace the DHW flow detector sensor body. Does the heating flow become warm?

Replace faulty valve body assembly

Dismantle the DHW detector valve. Refer to frame 58 and clean. When re-assembled with DHW taps closed, does the heating flow pipe become warm?

Replace the faulty DHW detector valve

Faulty sensor now replaced

Replace the motor assembly, with 230V at the connections is the spindle visible? Refer to frame 66.

Replace faulty motor assembly

Faulty sensor now replaced

Replace the DHW flow detector sensor body. Does the heating flow become warm?

Replace faulty valve body assembly

Dismantle the DHW detector valve. Refer to frame 58 and clean. When re-assembled with DHW taps closed, does the heating flow pipe become warm?

Faulty sensor now replaced

Replace the motor assembly, with 230V at the connections is the spindle visible? Refer to frame 66.

Replace faulty motor assembly

Faulty sensor now replaced

Replace the DHW flow detector sensor body. Does the heating flow become warm?

Replace faulty valve body assembly

Dismantle the DHW detector valve. Refer to frame 58 and clean. When re-assembled with DHW taps closed, does the heating flow pipe become warm?

Faulty sensor now replaced

Replace the motor assembly, with 230V at the connections is the spindle visible? Refer to frame 66.
With the boiler and heating circuit warm does the burner pressure reduce if the heating temperature setting is reduced to minimum?

- yes
- no

**Combination boilers only Continued below**

When a DHW tap is opened and the DHW temperature is set to maximum, does the water become hot?

- yes
- no

**Continued from page 44 of fault finding**

Is there between 0V dc and 16V dc at the Grey and Black connections on the modulating coil? (0=min, 16=max)

- yes
- no

Is the continuity of the modulator harness O.K?

- yes
- no

Repair or replace faulty wiring

Is there 230V ac between Blue and Black at the 3-way valve connection?

- yes
- no

Remove the motor assembly, with 230V at the connections is the spindle fully retracted? Refer to frame 66.

- yes
- no

Replace the sensor, is red LED illuminated?

- yes
- no

Dismantle the DHW detector valve and clean. Refer to frame 58. Reassemble. Does the DHW water become hot?

- yes
- no

Replace faulty sensor now replaced

Faulty sensor now replaced

Repair faulty PCB #1

Is there continuity O.K?

- yes
- no

Repair faulty PCB #1

Is there 5V dc between Red and Blue on connecting harness?

- yes
- no

Repair or replace faulty wiring

Is there 230V ac between Blue and Black at the 3-way valve connection?

- yes
- no

Remove the motor assembly, with 230V at the connections is the spindle fully retracted? Refer to frame 66.

- yes
- no

Replace faulty motor assembly

Replace faulty valve body assembly

Replace faulty gas valve

Repair faulty PCB #1

Repair faulty gas valve

Repair faulty PCB #1

Continued on page 50 of fault finding
Continued from page 44 of fault finding. Is the green LED on front fascia flashing 4 times per second?

Access the 4 dip switches on p.c.b. #1. Move the #1 dip switch off then ‘on’. This activates p.c.b. service mode. Refer to fault code frame 65. Is LED 1 flashing with LED 2 on ?

Are LED2 and LED 3 flashing?

Check resistance of CH thermistor. Is it between 12 kΩ and 1.5 kΩ ?

Check resistance of DHW thermistor. Is it between 12 kΩ and 1.5 kΩ ?

Are LED2 flashing LED 3 on?

Check resistance of DHW thermistor. Is it between 12 kΩ and 1.5 kΩ ?

Replace faulty thermistor

Replace faulty thermistor

Re–pressurise system and vent

Repair or replace faulty wiring

Repair or replace faulty wiring

Remove the pump nut. Does the pump rotate freely when turned)

When the pump runs does the spindle of the water flow detector extend to operate the micro switch? Refer to frame 55.

Is the heating circuit pressurised to at least 1 bar and fully vented of air?

Is LED1 flashing with LED 2 on?

Yes

No

No

Yes

Yes

No

No

Yes

Yes

No

Yes

No

Replace faulty pump

Replace faulty diaphragm and clean housing of debris, if any, refer to frame 56.

Replace faulty micro switch

Replace faulty micro switch

Repair or replace faulty wiring

Repair or replace faulty wiring

Replace faulty PCB #1

Is the continuity of the micro switch harness O.K?

Is there continuity between C and NO contacts on micro switch when the switch is operated?

Continued on page 47 of fault finding
Continued from page 46 of fault finding

Are LED 1 and LED 3 flashing with LED 2 on, plus LED 4 on the facia on?

no

Is there > 17 mbar at the gas valve inlet?

yes

no

Press reset button. Is there 230V across the Black and Blue gas valve connection during ignition?

yes

no

Is there 230V at Black and Blue at gas valve harness connector on PCB #2?

yes

no

Is there 230V at pin 101 Brown on PCB connecting harness at PCB #2?

yes

no

Is there 230V at pin 11 Brown on PCB connecting harness at PCB #1?

no

Replace faulty PCB #1

no

Replace fuse

Replace faulty PCB #2

Is there a burner pressure during ignition period?

no

Has the main overheat thermostat operated? (Check continuity)

yes

no

Is there continuity of overheat thermostat wiring at PCB connection?

yes

no

Repair or replace damaged wiring

Is there ignition at the burner?

yes

no

Is a spark visible at the burner during ignition?

yes

no

Are the ignition leads disconnected or damaged and sparking to earth?

yes

no

Rectify faulty connection

Replace faulty PCB #2

no

Replace fuse

no

Repair or replace faulty wiring

Is fuse continuity O.K. on PCB #2?

yes

no

Replace faulty PCB #2

Is fuse continuity O.K. on PCB #2?

yes

no

Replace fuse

Is there > 17 mbar at the gas valve inlet?

no

Rectify gas supply fault.

Is the ignition burner pressure correct? Refer to frame 26.

no

yes

Ensure the ignition electrode position and spark gaps are correct. Rectify or replace. Refer to frame 40.

Continued on page 48 of fault finding
Continued from page 47 of fault finding

Does the burner remain alight?
  yes
  no

Is the position of the detection electrode correct, and electrode undamaged? Refer to frame 40.
  yes
  no

Rectify electrode position or replace faulty electrode.

Is the resistance of the detection electrode assembly < 5Ω from tip to connector?
  yes
  no

Is the polarity of the mains correct?
  yes
  no

Replace faulty detection lead assy.

Replace faulty PCB #2

Is the lead connected?
  yes
  no

Rectify wiring fault

Adjust burner pressure. Refer to frame 26.

Connect lead correctly

Refer back to page 44 of fault finding to continue.
Continued from page 47 of fault finding

Is the fan running?

- Yes: Switch to on position.
- No: Is there 230V at the fan connections?
  - Yes: Replace faulty fan.
  - No: Is there continuity between NC and C at the Air Pressure Switch?
    - Yes: Repair or replace faulty wiring.
    - No: Is there continuity of the Air Pressure Switch harness?
      - Yes: Replace faulty PCB #2
      - No: Replace faulty PCB #1

Is there continuity across C and NO on the Air Pressure Switch?

- Yes: Are the sensing pipes undamaged and connected?
  - Yes: Is the flue clear and venturi O.K.?
    - Yes: Clear flue
    - No: Repair or replace faulty Air Pressure Switch
  - No: Replace sensing pipes.
- No: Repair or replace Air Pressure Switch harness O.K.
  - Yes: Is the burner on?
    - Yes: Repair or replace faulty flame detection signal connection harness. Refer to frame 40.
    - No: Replace faulty PCB #2
Is there a temperature rise of 35 °C across the DHW circuit at:
10.0 L/min 24 kW models
11.6 L/min 28 kW models
13.1 L/min 32 kW model?

Is there 11.7 mbar (10.5 mbar for europa 232) burner pressure when the boiler first lights?

Is there > 17 mbar gas pressure at the gas inlet?

Adjust the max setting on the gas valve. Refer to frame 26. Check that 11.7 mbar (10.5 mbar for europa 232) can be achieved

Is the cold water supply adequate? refer to frame 6 and Table 1 at page 4.

Check the DHW inlet filter. Remove debris and clean or replace filter.

Is the maximum water flow correct
10.0 L/min 24 kW models
12.0 L/min 28 kW models
14.0 L/min 32 kW model?

Is there between 0V dc and 16V dc at the Grey and Black connections on the modulating coil? (0=min, 16=max)

Is the continuity of the modulator harness O.K?

Replace faulty gas valve.

Rectify water supply fault.

Rectify gas supply fault.

Rectify water supply fault.

Boiler Operating Correctly

Is there a temperature rise of 35 °C across the DHW circuit at:
10.0 L/min 24 kW models
11.6 L/min 28 kW models
13.1 L/min 32 kW model?

Is there 11.7 mbar (10.5 mbar for europa 232) burner pressure when the boiler first lights?

Is there > 17 mbar gas pressure at the gas inlet?

Adjust the max setting on the gas valve. Refer to frame 26. Check that 11.7 mbar (10.5 mbar for europa 232) can be achieved

Is the cold water supply adequate? refer to frame 6 and Table 1 at page 4.

Check the DHW inlet filter. Remove debris and clean or replace filter.

Is the maximum water flow correct
10.0 L/min 24 kW models
12.0 L/min 28 kW models
14.0 L/min 32 kW model?

Is there between 0V dc and 16V dc at the Grey and Black connections on the modulating coil? (0=min, 16=max)

Is the continuity of the modulator harness O.K?

Replace faulty gas valve.

Rectify water supply fault.

Rectify gas supply fault.

Rectify water supply fault.

Boiler Operating Correctly

Is there a temperature rise of 35 °C across the DHW circuit at:
10.0 L/min 24 kW models
11.6 L/min 28 kW models
13.1 L/min 32 kW model?

Is there 11.7 mbar (10.5 mbar for europa 232) burner pressure when the boiler first lights?

Is there > 17 mbar gas pressure at the gas inlet?

Adjust the max setting on the gas valve. Refer to frame 26. Check that 11.7 mbar (10.5 mbar for europa 232) can be achieved

Is the cold water supply adequate? refer to frame 6 and Table 1 at page 4.

Check the DHW inlet filter. Remove debris and clean or replace filter.

Is the maximum water flow correct
10.0 L/min 24 kW models
12.0 L/min 28 kW models
14.0 L/min 32 kW model?

Is there between 0V dc and 16V dc at the Grey and Black connections on the modulating coil? (0=min, 16=max)

Is the continuity of the modulator harness O.K?

Replace faulty gas valve.

Rectify water supply fault.

Rectify gas supply fault.

Rectify water supply fault.

Boiler Operating Correctly
The following are parts commonly required as replacements, due to damage or expendability. The failure or absence is likely to affect the safety and/or performance of this appliance.

The list is extracted from the British Gas List of Parts which contains all available spare parts.

The full list is held by British Gas, **Caradon Plumbing Ltd.**

When ordering spares please quote:
1. Boiler model (see Data Plate)
2. Appliance G.C. number (see Data Plate)
3. Description
4. Quantity
5. Product No.

<table>
<thead>
<tr>
<th>Key No.</th>
<th>G.C. No.</th>
<th>Description</th>
<th>No. Off/Boiler</th>
<th>Product No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>173–148</td>
<td>Burner (mod. <strong>europa 224</strong>)</td>
<td>1</td>
<td>075427</td>
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<tr>
<td></td>
<td>173–149</td>
<td>Burner (mod. <strong>europa 228</strong>)</td>
<td>1</td>
<td>075535</td>
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<tr>
<td></td>
<td>H05–182</td>
<td>Burner (mod. <strong>europa 232</strong>)</td>
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<td>173141</td>
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<tr>
<td>2</td>
<td>H05–180</td>
<td>Injectors for natural gas (mod. <strong>europa 228</strong>)</td>
<td>16</td>
<td>173142</td>
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<tr>
<td></td>
<td>169–069</td>
<td>Injectors for natural gas (mod. <strong>europa 224</strong>)</td>
<td>12</td>
<td>075962</td>
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<tr>
<td></td>
<td>169–070</td>
<td>Injectors for LPG (mod. <strong>europa 224</strong>)</td>
<td>12</td>
<td>172530</td>
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<tr>
<td></td>
<td>H06–596</td>
<td>Injectors for LPG (mod. <strong>europa 232</strong>)</td>
<td>14</td>
<td>153905</td>
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<tr>
<td>3</td>
<td>H03–691</td>
<td>Air pressure switch (mod. <strong>europa 224</strong>)</td>
<td>1</td>
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<td></td>
<td>H03–700</td>
<td>Air pressure switch (mod. <strong>europa 228</strong>)</td>
<td>1</td>
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<tr>
<td></td>
<td>H08–605</td>
<td>Air pressure switch (mod. <strong>europa 232</strong>)</td>
<td>1</td>
<td>173136</td>
</tr>
<tr>
<td>4</td>
<td>H03–713</td>
<td>Main heat exchanger + 'O' rings (mod. <strong>europa 224</strong>)</td>
<td>1</td>
<td>173238</td>
</tr>
<tr>
<td></td>
<td>H03–715</td>
<td>Main heat exchanger + 'O' rings (mod. <strong>europa 228, europa 232</strong>)</td>
<td>1</td>
<td>173240</td>
</tr>
<tr>
<td>5</td>
<td>E90–627</td>
<td>Gas valve + gaskets</td>
<td>1</td>
<td>172611</td>
</tr>
<tr>
<td>6</td>
<td>H03–699</td>
<td>Fan (mod. <strong>europa 224</strong>)</td>
<td>1</td>
<td>173266</td>
</tr>
<tr>
<td></td>
<td>H03–700</td>
<td>Fan (mod. <strong>europa 228</strong>)</td>
<td>1</td>
<td>173249</td>
</tr>
<tr>
<td>7</td>
<td>H08–608</td>
<td>Fan (mod. <strong>europa 232</strong>)</td>
<td>1</td>
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<tr>
<td>8</td>
<td>E83–013</td>
<td>Safety valve</td>
<td>1</td>
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<tr>
<td>9</td>
<td>E83–154</td>
<td>Electronic regulation p.c.b.</td>
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<td>E83–142</td>
<td>Full sequence ignition device</td>
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<td>E00–684</td>
<td>Primary circuit flow switch</td>
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<td>E83–082</td>
<td>DHW flow switch (mod. <strong>europa 224, europa 228, europa 232</strong>)</td>
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<td>E00–688</td>
<td>Main. flow switch membrane</td>
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<tr>
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<td>Overheat thermostat</td>
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<tr>
<td>15</td>
<td>H22–544</td>
<td>DHW heat exchanger + 'O' rings (mod. <strong>europa 224</strong>)</td>
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<td>E57–048</td>
<td>DHW heat exchanger + 'O' rings (mod. <strong>europa 228</strong>)</td>
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<td>E57–049</td>
<td>DHW heat exchanger + 'O' rings (mod. <strong>europa 232</strong>)</td>
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<td>173785</td>
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<td>16</td>
<td>H20–987</td>
<td>Automatic air purger valve</td>
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<td>H23–008</td>
<td>Pump + 'O' rings</td>
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<td>18</td>
<td>E83–145</td>
<td>Temperature – pressure gauge</td>
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<td>19</td>
<td>E83–086</td>
<td>Three way diverter valve (electric actuator) (mod. <strong>europa 224, europa 228, europa 232</strong>)</td>
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<td>20</td>
<td>H05–083</td>
<td>Fuse 1.6 A T</td>
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<td>21</td>
<td>E83–026</td>
<td>Temperature probe (main or DHW circuit)</td>
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<td>E83–176</td>
<td>Sealed chamber gaskets kit</td>
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<td>23</td>
<td>E83–081</td>
<td>Magnetic flow switch and filter (mod. <strong>europa 224, europa 228, europa 232</strong>)</td>
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<td>E69 – 243 Window (glass + rubber frame)</td>
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<td>28</td>
<td>169 – 141 1/2” flat gasket</td>
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<tr>
<td>29</td>
<td>169 – 033 3/4” flat gasket</td>
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<td>30</td>
<td>E83 – 171 Side case panel</td>
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<td>31</td>
<td>H23 – 018 Control panel door</td>
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<td>32</td>
<td>H23 – 020 Front case panel</td>
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</table>
INSTALLER NOTIFICATION GUIDELINES

IT IS A REQUIREMENT OF CORGI MEMBERSHIP TO REGISTER EVERY GAS APPLIANCE

In addition a change to Building Regulations (England and Wales) requires the installer to notify when installing a heating appliance, as from 1st April 2005.

Install and commission this appliance to manufacturers’ instructions

Complete the Benchmark Checklist

Choose Buildings Regulations notification route

Competent Person’s SELF CERTIFICATION SCHEME

If you notify via CORGI Scheme, CORGI will then notify the Building Control (LABC) who relevant Local Authority Building Control (LABC) scheme on members behalf

Scheme members only: Call CORGI on 0870 88 88 777 or log onto: www.corgi.notify.com within 10 days

You must ensure that the notification number issued by CORGI is written onto the Benchmark Checklist

CORGI will record the data and will send a certificate of compliance to the property

Contact your relevant Local Authority Building Control (LABC) who will arrange an inspection or contact a government approved inspector

LABC will record the data and will issue a certificate of compliance

IT IS A CONDITION OF THE MANUFACTURERS WARRANTY THAT THE BENCHMARK COMMISSIONING CHECKLIST IS FULLY COMPLETED AND LEFT WITH THE APPLIANCE
To comply with the Building Regulations, each section must have a tick in one or other of the boxes

<table>
<thead>
<tr>
<th>CONTROLS</th>
<th>BOILER SERIAL No.</th>
<th>NOTIFICATION No.</th>
<th>TIME &amp; TEMPERATURE CONTROL TO HEATING</th>
<th>ROOM T/STAT &amp; PROGRAMMER/TIMER</th>
<th>PROGRMMABLE ROOMSTAT</th>
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<td></td>
<td>TIME &amp; TEMPERATURE CONTROL TO HOT WATER</td>
<td>CYLINDER T/STAT &amp; PROGRAMMER/TIMER</td>
<td>COMBI BOILER</td>
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<td></td>
<td>AUTOMATIC BYPASS TO SYSTEM</td>
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FOR ALL BOILERS CONFIRM THE FOLLOWING

THE SYSTEM HAS BEEN FLUSHED IN ACCORDANCE WITH THE BOILER MANUFACTURER'S INSTRUCTIONS?

THE SYSTEM CLEANER USED

THE INHIBITOR USED

FOR THE CENTRAL HEATING MODE, MEASURE & RECORD

<table>
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<tr>
<th>GAS RATE</th>
<th>m³/hr</th>
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<tr>
<td>BURNER OPERATING PRESSURE (IF APPLICABLE)</td>
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<tr>
<td>CENTRAL HEATING FLOW TEMPERATURE</td>
<td>°C</td>
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<tr>
<td>CENTRAL HEATING RETURN TEMPERATURE</td>
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FOR COMBINATION BOILERS ONLY

HAS A WATER SCALE REDUCER BEEN FITTED?

WHAT TYPE OF SCALE REDUCER HAS BEEN FITTED?

FOR THE DOMESTIC HOT WATER MODE, MEASURE & RECORD

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<tr>
<th>GAS RATE</th>
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<th>ft/hr</th>
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<tr>
<td>CENTRAL HEATING FLOW TEMPERATURE</td>
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</tr>
<tr>
<td>CENTRAL HEATING RETURN TEMPERATURE</td>
<td>°C</td>
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<tr>
<td>WATER FLOW RATE</td>
<td>lts/min</td>
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FOR CONDENSING BOILERS ONLY CONFIRM THE FOLLOWING

THE CONDENSATE DRAIN HAS BEEN INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS?

FOR ALL INSTALLATIONS CONFIRM THE FOLLOWING

THE HEATING AND HOT WATER SYSTEM COMPLIES WITH PARTS 4 & 7 OF THE BUILDING REGULATIONS

THE APPLIANCE AND ASSOCIATED EQUIPMENT HAS BEEN INSTALLED AND COMMISSIONED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS

IF REQUIRED BY THE MANUFACTURER, HAVE YOU RECORDED A CO/CO₂ RATIO READING? N/A YES CO/CO₂ RATIO

THE OPERATION OF THE APPLIANCE AND SYSTEM CONTROLS HAVE BEEN DEMONSTRATED TO THE CUSTOMER

THE MANUFACTURER'S LITERATURE HAS BEEN LEFT WITH THE CUSTOMER

COMMISSIONING ENG’S NAME PRINT ___________________________ CORGI ID No. ___________________________ SIGN ___________________________ DATE ___________________________
SERVICE INTERVAL RECORD

It is recommended that your heating system is serviced regularly and that you complete the appropriate Service Interval Record Below.

**Service Provider:** Before completing the appropriate Service Interval Record below, please ensure you have carried out the service as described in the boiler manufacturer’s instructions. Always use the manufacturer’s specified spare part when replacing all controls.

<table>
<thead>
<tr>
<th>SERVICE 1</th>
<th>DATE</th>
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<tbody>
<tr>
<td>ENGINEER NAME</td>
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<td>TEL No.</td>
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<tr>
<td>CORGI ID CARD SERIAL No.</td>
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<td>COMMENTS</td>
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</table>
Technical Training

The Ideal Boilers Technical Training Centre offers a series of first class training courses for domestic, commercial and industrial heating installers engineers and system specifiers.

For details of courses please ring: 01482 498 432

Manufactured for the seller;
Aldwych House,
81 Aldwych
London, WC2B 4HQ

The boiler manufacturer pursues a policy of continuing improvement in the design and performance of its products. The right is therefore reserved to vary specification without notice.

europa Installer/Technical Helpline: 01482 498 663