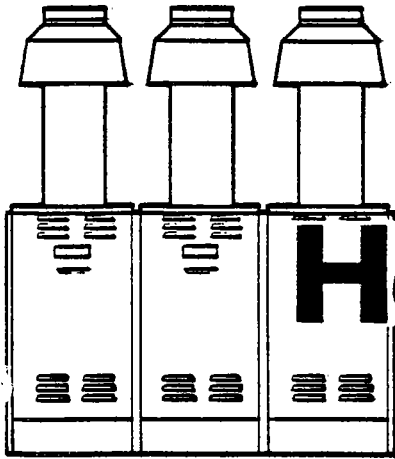
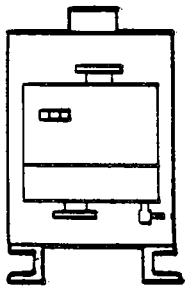


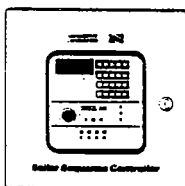
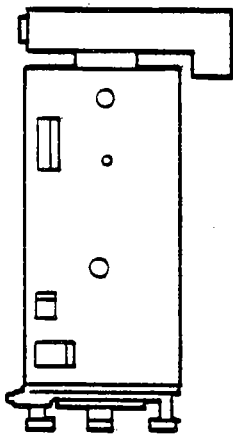
HAMWORTHY
heating products



Hamworthy Heating Products



**UR. 110 and UR. 150
Gas Fired Hot Water Boilers
Installation, Commissioning
and Maintenance Manual**



2. General

- 2.1 The gas-fired special boilers type UR 110 and 150 are low-pressure hot water generators and are used for the heating of water in closed circuits. They can be installed into plant whose flow temperature is limited to max. 110° C and operated with a maximum permissible total gauge pressure of 4 bar.

For the installation of the boilers it is necessary to comply with the regulations of the official Building Inspectorate, especially in regard of the heating chamber, the ventilation and aeration and the flue connection.

The plant installer shall draw up operating instructions for the overall plant and shall attach these in a permanent way and in an easily visible position in the heating room.

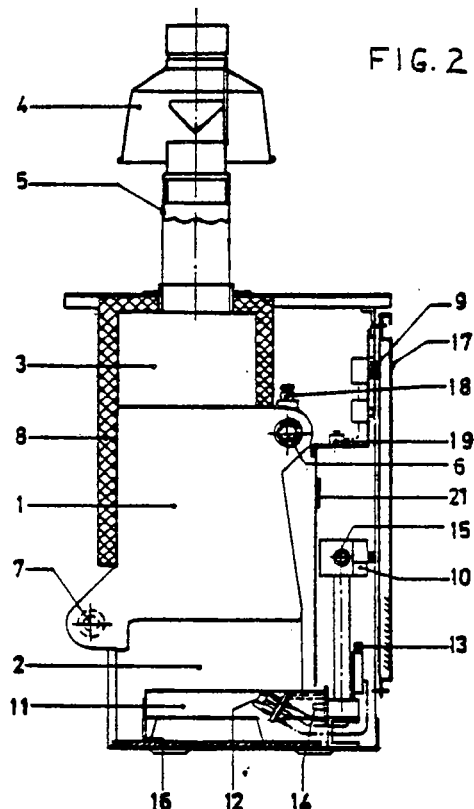
- 2.2 The inner boiler consists of individual elements of high-grade special cast iron, which are connected to each other, free from stress, by diagonal nipple connections. The surface of the boiler elements is provided with cast-on ribs to obtain satisfactory heat transfer. The waste gases are conducted to the waste gas line through the mounted draught diverter.

The high-grade insulation of the boiler body prevents heat losses and causes the surface temperatures at the housing to be kept low.

- 2.3 The heating is effected by an atmospheric all-gas high-grade steel burner. When changing to another type of gas, it is only required to change the nozzles.
- 2.4 The burner fitting with the safety and control instruments is located at the front of the boiler and is easily accessible through the housing door.
- 2.5 A pilot flame gas failure safety device monitors the burner on the thermoelectrical principle.
- 2.6 The thermometer indicates the water temperature in the boiler.
- 2.7 The max. permissible time constant of the temperature control and temperature limiting instruments is 40 seconds.
- 2.8 The temperature control and temperature limiting instruments and the boiler flow thermometer are fitted into the instrument panel of the boiler (Fig. 2, item 9).

The temperature sensors for these three instruments are located in an immersion tube fitted into the water chamber of the boiler.

1. Cast Iron Boiler Sections.
2. Combustion Chamber.
3. Flue Gas Collector.
4. Draught Diverter.
5. Primary Flue.
6. Flow Connection.
7. Return Connection.
8. Insulation.
9. Instrument Panel.
10. Gas Control Valve.
11. Allgas Stainless Steel Burner.
12. Pilot Burner.
13. Piezo Spark Generator.
14. Main Burner Injector.
15. Gas Connection.
16. Floor Pan Insulation.
17. Casing Door.
18. Air Vent.
19. Terminal Block.
21. Rating Label.



3. Installation

- 3.1 It is required to comply with the legal building regulations.
- 3.2 In selecting the site it is required to allow for the dead weight including the water filling. The room must be frost-proof. The location shall be as near as possible to the chimney. A special base (min. height 5 cm) is recommended.
- 3.3 There must be sufficient space available for cleaning. Generally, the free headroom resulting from the height of the boiler with the draught diverter including the insulated waste gas elbow with an allowance for the pipe rise, is sufficient. For the removal of the burner sufficient space corresponding to the depth of the boiler shall be provided in front of the boiler.
- 3.4 For draining, a frost-proof water drain shall be provided.
- 3.5 The boiler casing is provided on the outside with a removable plastic foil for the protection of the lacquer. This should not be removed until the boiler is put into operation.

4. Water installation

- 4.1 The installation and the primary putting into operation may only be carried out by an authorised installer.
- 4.3 To drain the boiler or the heating system, a $\frac{1}{2}$ " BSP connection is provided at the back at the bottom left-hand side.

5. Gas installation

- 5.1 The installation and the primary putting into operation may only be carried out by an authorised installer.
- 5.3 The gas supply line is passed on the left-hand side of the boiler through the aperture provided for this purpose in the side panel and connected to the gas fitting.
- 5.4 The equipment connection tap shall have at least the same nominal bore as the gas connection of the boiler.
- 5.5 It is required to fit a gas filter.
- 5.6 The gas pressure controller in the combination valve is designed for an inlet pressure of max. 500 mm WG.
For the liquid gas type, the pressure controller is replaced at the works by a blank flange.
- 5.7 Before the connection is made, the equipment supply line shall be thoroughly blown through and once the connection has been made, it shall be checked for leakage.

6. Connection to the waste gas system

- 6.2 The waste gas system shall be designed to ensure that the waste gases are removed satisfactorily. It shall be reliable and fire-proof.
- 6.3 The chimney shall be checked for its suitability before the connection of the boiler. Its cross-section and loading must be in accordance with the British Gas requirements.
- 6.4 The draught diverter specified for each gas boiler and the associated primary flue are integral functional parts of the boiler and must not be altered.

7. Electrical installation

7.1 The installation may only be carried out by an authorised electrical installer. The local regulations shall be observed.

7.2 The connections are made to a non-screwed terminal board fitted into the instrument panel.

For this purpose, the instrument panel can be tilted forward, once the two upper fixing screws have been released and the panel has been shifted a little to the right.

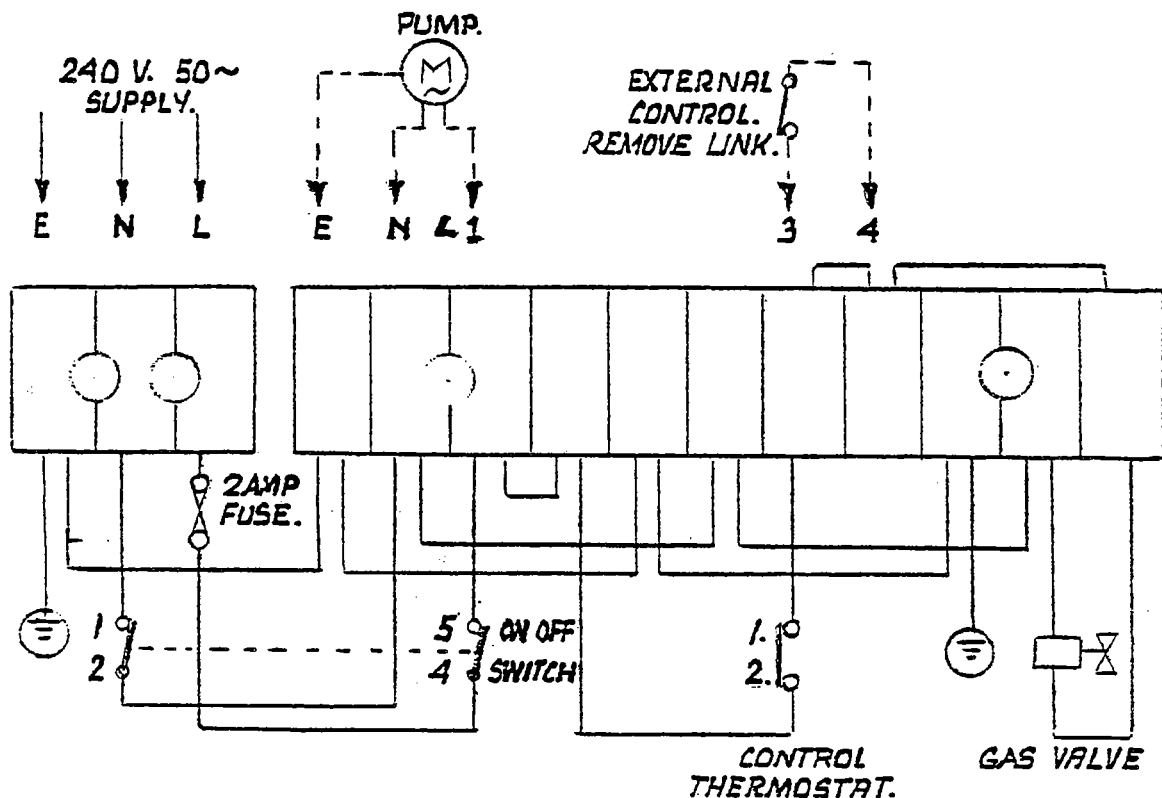
Strip 7 mm of the insulation from the single-core wires and push these fully into the wire guide. The clamping is automatic.

Check for secure clamping by pulling the wires slightly.

To release the wires, it is necessary to release the clamping spring by depressing the associated insulated trigger. This is done by inserting a screwdriver (size 1) into the slot provided for this purpose.

7.3 The connection to the single-phase a.c. power supply of 240 V, 50 Hz, must be a rigid connection.

7.4 When connecting an external control (room temperature controller or weather-controlled flow temperature control) remove the link 3-4 shown in the circuit diagram fig. 3. Then make the connection in accordance with the associated circuit diagram.



WIRING DIAGRAM FIG. 3

8. Automatic control

- 8.1 The boiler is controlled fully automatically by the boiler temperature controller or, respectively (when existing) by an external control. Both are connected in series; the burner is switched on and off by that controller whose set value is reached first. The required flow temperature is set by means of the rotary knob of the controller behind the housing door.
- 8.2 Via an external control the heating system can also be arranged for automatic timing by means of an electric timer with temperature reduction during the night and with a weekend programme.
- 8.3 If the boiler is used only to operate a hot water preparation system, the room temperature controller is replaced by a service water temperature controller in the hot water preparation unit.
- 8.4 If the boiler water exceeds the maximum permissible temperature, the temperature limit interrupts the thermal circuit of the pilot burner. This causes the combination valve to close and the gas supply is stopped.
- The operation can only be re-started by means of a re-ignition.
- 8.5 If the pilot flame is extinguished, the gas supply is stopped within 30 seconds. To re-start operation, follow the operating instructions.
- 8.6 A power failure stops the operation only for the duration of the power failure. The pilot flame continues to burn and keeps the boiler ready for operation.

9. Equipment adjustment

- 9.1 The whole of the circulating system must be filled with water and bled. Check the hydrometer or the water sightglass of the expansion vessel for open-circuit systems or the pressure gauge for closed-circuit systems.
- 9.2 Check whether the unit has been set to the existing type of gas, otherwise change over in accordance with the conversion instructions (Par. 13).
- 9.3 Release but do not remove the screw in the pressure pick-up nipple D and connect a U-tube pressure gauge (fig. 7).
- 9.4 Start-up the unit in accordance with the operating instructions, par. 10.
- 9.5 Remove the screw plug G from the pressure controller of the gas fitting to expose the adjusting screw H underneath and set the required nozzle pressure in accordance with the rating label, with that screw. Clockwise rotation = increase in pressure, anti-clockwise rotation = reduction of pressure (fig. 7).
- 9.6 Close the gas shut-off tap, remove the U-tube pressure gauge and fully tighten the screw in the pressure pick-up nipple.
- 9.7 Release but do not remove the screw in the pressure pick-up nipple K, connect the U-tube pressure gauge and re-commission the unit.
- 9.8 Now determine the supply pressure; this shall have the following values:-
Min. 7.5 mbar for town gas (first gas family);
min. 18.0 mbar for natural gas (second gas family). If the supply pressure is less, ascertain the reason (supply line too small, gas filter dirty, etc.) and eliminate the fault. If this is not possible, advise the gas supply undertaking.

If the variations from the set-point are greater no adjustment and no operation are permissible.

For liquid gas the gas flow adjustment is deleted. In this case the pressure controller is blocked before dispatch.

The supply pressure for liquid gas shall be $37 \text{ mbar} \pm 5 \text{ mbar}$ for Propan
28 mbar \pm 5 mbar for Butane
The flames shall burn properly, faultlessly and with a limited green core and must not flash back.

- 9.9 Fit the screw plug G to the gas fitting.

- 9.10 The pilot burner is only pre-set and must therefore be checked for a stable burning behaviour to ensure the satisfactory ignition of the main burner and adequate heating of the thermocouple.
The pilot flame shall burn without a yellow tip and must not go out when slightly blown upon. If necessary, remove the screw plug O and re-adjust the pilot gas flow on the gas fitting with the adjusting screw P.
- 9.11 Close the gas shut-off tap, remove the U-tube pressure gauge and fully tighten the screw in the pressure pick-up nipple.
- 9.12 For closed-circuit systems re-check the operating pressure after the heating-up process and re-bleed.
- 9.13 Set the boiler temperature controller to the required disconnection temperature.
- 9.14 The temperature limit is set at the works to 110°C for closed-circuit systems. If the boiler water exceeds the max. permissible temperature, the gas supply is inhibited by the temperature limit. It is only when the fault has been eliminated that the boiler may be re-started.

The temperature limit is located in the thermal circuit of the pilot burner and also inhibits the latter. A re-ignition is therefore necessary when the fault has been eliminated.

Particularly important:-

For open-circuit systems the temperature limiter must be re-set to 100°C .

To do so, release the two fixing screws, push the instrument panel a little to the right and tilt out. Release the temperature limit (see fig. 6) then turn the black disc which has now become visible downwards to the mark 100°C . Then re-tighten the temperature limit and the instrument panel.

- 9.15 For the initial putting into operation the installer shall ensure the proper operation of the safety and control facilities and instruct the user in the handling of the system.

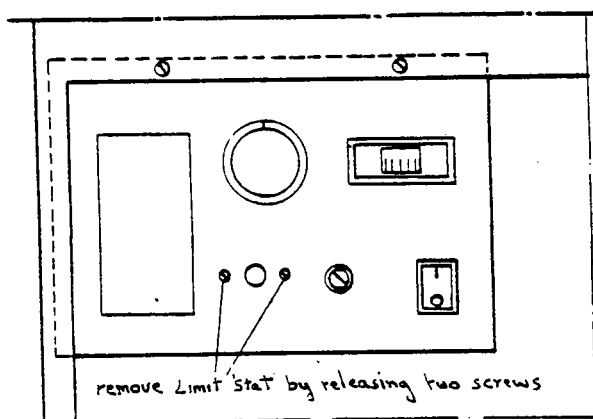


FIG. 6

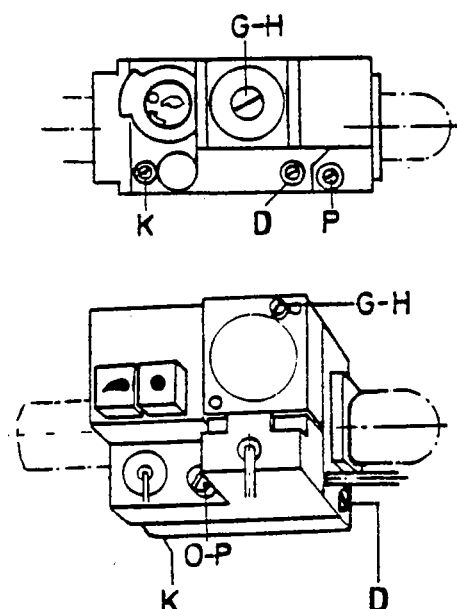


FIG. 7

Operating instructions

Boiler UR110 and 150 Natural gas and liquid gas Fig. 8a

Putting into operation

1. Open the gas supply tap (a) ! Turn on the power supply with switch (b).
2. Set the boiler temperature selector (d) and, if existing, the room temperature controller to the required temperature.
3. Depress the operating knob (e) of the combination valve and hold down; operate the Piezo ignitor (f) until the pilot flame (g) is established.
4. Release the operating knob slowly after approx. 20 seconds, the pilot flame must continue to burn.
5. If the pilot flame goes out accidentally, wait a few minutes before re-starting, to allow the boiler to be ventilated after the thermal safety device has closed.

Operation

1. The burner is switched on and off automatically.
2. Adjust the controller (d) in accordance with the table as dictated by the outside temperature.

<u>Outside temperature</u>	<u>Boiler temperature</u>
+ 15° C and more	50° C
+ 14° C down to 0° C	50° C to 70° C
0° C and below	70° C to 90° C

Brief interruption

Re-set the boiler temperature selector or, respectively, the room temperature controller, the pilot flame will continue to burn.

Stopping operation

Turn the operating knob (e) of the combination valve clockwise in the direction of the arrow and release. Disconnect the power supply by switch (b). Close the gas supply tap (a).

Boiler UR110 and 150 for use on Towns gas and liquid gas/Air mixtures

FIG. 8b.

Putting into operation

1. Open the gas supply tap (a) ! Turn on the power supply with switch (b).
2. Set the boiler temperature selector (d) and, if existing, the room temperature controller to the required temperature.
3. Depress the start button (e) of the combination valve and hold down; operate the Piezo ignitor (f) until the pilot flame (g) is established.

4. Release the operating knob slowly after approx. 20 seconds, the pilot flame must continue to burn.
5. If the pilot flame goes out accidentally, wait a few minutes before re-starting, to allow the boiler to be ventilated after the thermal safety device has closed.

Operation

1. The burner is switched on and off automatically.
2. Adjust the controller (d) in accordance with the table as dictated by the outside temperature.

<u>Outside temperature</u>	<u>Boiler temperature</u>
+ 15° C and more	50° C
+ 14° C down to 0° C	50° C to 70° C
0° C and below	70° C to 90° C

Brief interruption

Re-set the boiler temperature selector or, respectively, the room temperature controller, the pilot flame will continue to burn.

Stopping operation

Depress the stop button (h) of the combination valve. Disconnect the power supply by switch (b). Close the gas supply tap (a).

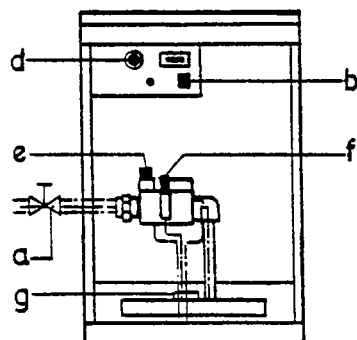


FIG. 8 a

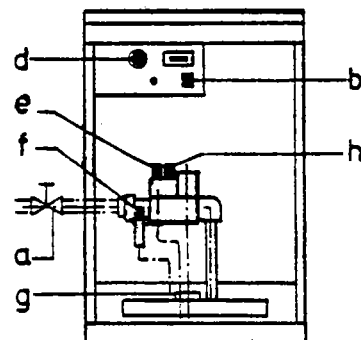


FIG. 8 b

11. Maintenance

- 11.1 It is required, that the gas firing system is checked at least once a year.
- 11.2 To check the safety device of the gas firing system, close the equipment supply tap or blow out the pilot flame on the pilot burner. The valve of the thermal safety device must audibly close within about 30 seconds. Then re-start the firing system in accordance with the operating instructions.
- 11.3 The thermocouple is subject to natural wear; it may therefore fail! It is therefore advisable to keep a thermocouple in stock.
- 11.4 The regular cleaning of the waste gas paths is recommended.
- Isolate the gas and power supply before cleaning!
- For cleaning, remove the draught diverter and lift the housing cover out of the quick-stop devices. Then remove the waste gas collecting hood having first released the fixing screws.
- The boiler interior is cleaned from the top by means of a brush. The cleaning operation should only be done with the burner removed. After cleaning, re-assemble in the reverse order.
- 11.5 The flame outlet apertures of the burner shall be cleaned with a metal wire brush.
- If the gas side is badly contaminated, blow out the individual burners and nozzles with compressed air.
- 11.6 Before re-fitting the burner, clean the bottom tray of the boiler.
- 11.7 With the burner operating at full power all the flames must burn steadily, uniformly and without sooting. If the flames flicker check for an obstruction in the boiler or in the waste gas path or in the chimney.
- If it is found that the waste gas path and the chimney are in order, then the boiler should be cleaned as described above.
- 11.9 If the cause of a fault cannot be ascertained contact the appropriate customer service, the representative or the factory, indicating the faults observed. In this connection it is absolutely essential to quote the serial number of the boiler and the technical data on the nameplate.
- 11.10 It is recommended to conclude a Maintenance Service Contract.

13. Conversion instructions

For conversion kits see table

1. Stop the boiler in accordance with the operating instructions (disconnect power, stop gas supply).
2. Release the coupling A (fig. 12) between the gas supply line and the gas fitting.
3. Release the fixing screws B (fig. 12) of the distribution (manifold) tube and remove the gas fitting complete with burner.
4. Release the ignition gas coupling E and replace the ignition gas nozzle F (fig. 13).
5. Replace the injector nozzles C (fig. 12) in the distribution (manifold) tube.
6. Re-fit the gas fitting complete with burner and the pilot burner.
7. When changing over to liquid gas (propane/butane) replace the gas pressure controller fitting M (fig. 14) by a blank flange N (fig. 15).
When changing over from liquid gas to town or natural gas, proceed in the reverse order.
8. Connect a U-tube pressure gauge to the pressure pick-up nipple D (fig. 14 or 15).
9. Set the boiler and room temperature controller to high temperature.
10. Open the gas tap and switch on the power supply.
11. Remove the screw plug G (fig. 14), then set the gas pressure controller to the required burner pressure by means of the adjusting screw H (does not apply for liquid gas).
Clockwise rotation = increase in burner pressure
Anti-clockwise rotation = reduction in burner pressure.
12. Set the pilot burner in accordance with par. 9.10
13. Check the load set on the gas meter and re-adjust the gas pressure controller, if necessary.
14. Check the gas supply pressure by means of the U-tube pressure gauge for compliance with the minimum supply pressure and the maximum permissible value of 500 mm WG. If different, advise the Gas Supply Undertaking.
15. Check the gas fitting for leakage, then test the boiler and the existing temperature control for correct operation.
16. Enter the new type of gas on the gas label.

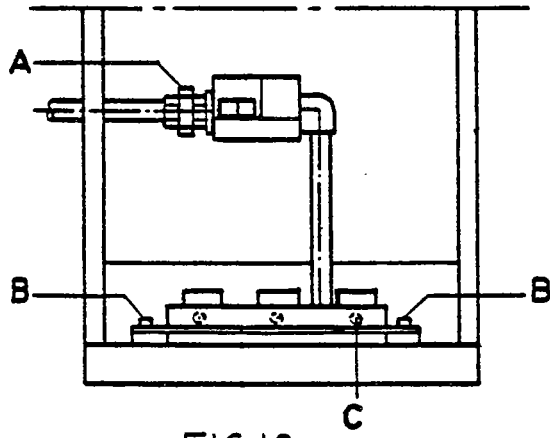


FIG. 12

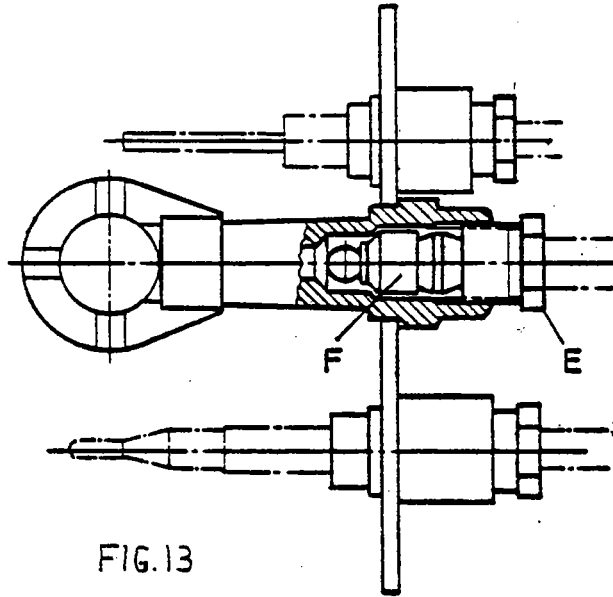


FIG. 13

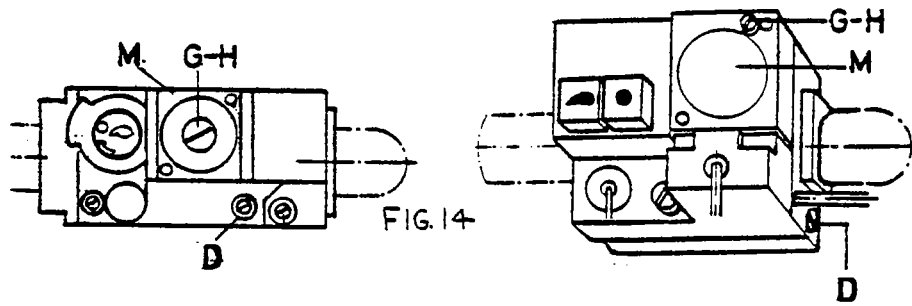


FIG. 14

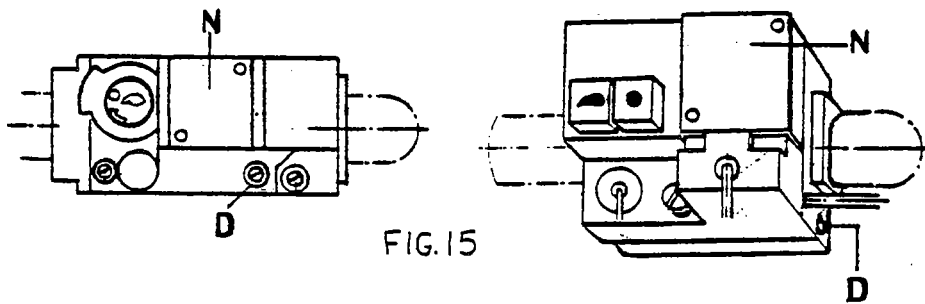


FIG. 15



Customer Services

CUSTOMER SERVICES

APPLICATION

To supplement the detailed Technical Information Booklets, technical advice on the application and use of the Hamworthy Heating Product Range is available from Poole and through the regional Sales offices and Accredited Agents.

COMMISSIONING

A commissioning service is offered for all the Hamworthy Heating Products. Commissioning by the manufacturer ensures the most efficient performance is achieved safely and ensures correct operation.

Hamworthy commissioning reports are detailed and definitive. Such information reports on the original status of the plant are essential for future routine maintenance and fault finding situations.

ROUTINE SERVICE

Hamworthy offer routine service contracts for all products. Planned maintenance of equipment by routine servicing reduces operational costs considerably below that associated with repair or breakdown approach. Regular servicing by Hamworthy trained staff ensures that all equipment is operating to optimum efficiency.

The frequency of visits to maintain installations up to required level is variable depending upon the equipment type and usage.

BREAKDOWN SERVICE, REPAIR, REPLACEMENT

Even when the commissioning and routine servicing has been carried out to the highest standard there are always occasions when the unexpected breakdowns occurs. Hamworthy provide a rapid response breakdown, repair or replacement service through its regional offices and Accredited Agents located throughout the UK.

SPARE PARTS

A comprehensive spares parts service is operated from our head office at Poole providing delivery, even for out of date items in most cases. In some instances spares may be available from regional offices and Accredited Agents.

Delivery of parts and components is normally from stock within 7 days. However, a 24 hour service is available for breakdowns and emergencies for the additional cost of the courier.

For your spares enquiries and orders please contact Carol Miller on 0202 665566.

To help Carol and her staff help you, please give as much detail as possible of the product type, serial number or any other identifying marks or codes.



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