

Trianco

OIL

TRO 80 WALL MOUNTED COMBI

INSTALLATION AND COMMISSIONING INSTRUCTIONS

The TRO 80 W.M. COMBI is a fully packaged wall mounted boiler, incorporating a compact heat exchanger capable of converting the total boiler output to domestic hot water at mains pressure. The boiler also features an automatic non-electric three-way valve for diverting the output to either the heating system or domestic hot water, with priority always being given to the latter. A circulating pump, expansion tank, safety valve and all ancillary components are supplied fully connected for use on a SEALED WATER SYSTEM.

The boiler is fired with the latest design of pressure jet oil burner which is fully automatic in operation and features electric spark ignition with photo-electric sensing of the flame.

The unique design of the boiler's flue baffle arrangement ensures effective flue gas scrubbing of all the heat transfer surfaces and a high thermal efficiency.

Flue gas condensation is avoided by internal waterway baffling which ensures the return water is pre-heated before it comes into contact with the boiler heating surfaces.

The boiler can be mounted in virtually any position between floor and ceiling and installation is particularly easy — a lightweight mounting frame is bolted to the wall onto which the boiler is simply hooked complete with all pre-made pipework and controls, with the water connections being made to the mounting frame manifold.

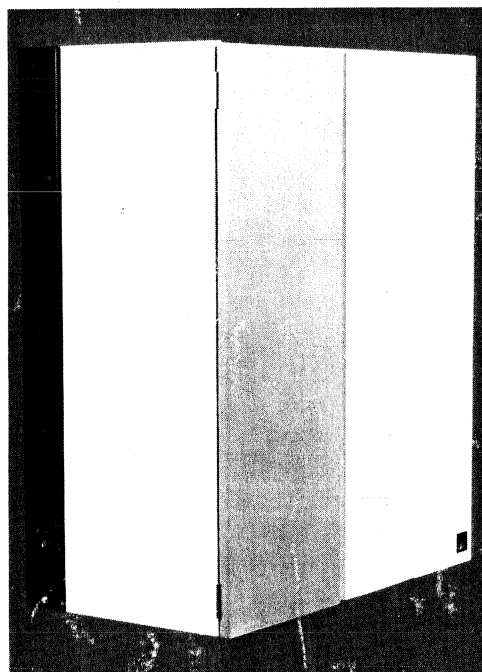
The mounting frame permits the system pipe connections to be pre-made up to the manifold before the boiler is fitted, thus allowing the boiler to be stored in a secure place before use. This feature is particularly useful for estate developments where new houses are often left unoccupied for a long period.

A hinged casing door provides access to the thermostat and pressure gauge. For convenience of servicing, the complete casing lifts off to allow the burner to be swung out on its hinged door to give access for maintenance.

Operation of the boiler is completely automatic. The burner fires until the required temperature is reached and, thereafter cycles ON and OFF to match the heating and hot water demands.

Boiler Siting

The TRO 80, because of its wall mounting design concept can be sited virtually anywhere in the house or in an outbuilding and at any height between floor and ceiling; however, the actual location will usually be determined by the position of the chimney or the low level flue discharge from a Trianco Terminal Silencer Kit.



TRO 80 W.M.COMBI

Air Supply and Ventilation

Check that the room or area where the boiler is to be installed has adequate ventilation for supply of combustion air and cooling of boiler controls.

To ensure adequate supply of air for efficient operation of the burner it is recommended that an air inlet opening of 160cm² (25in²) free area is provided at low level and a ventilation grille of at least half this area is allowed at high level.

Additional ventilation must be provided if an extractor fan is used in the same room.

Chimney

The boiler must be connected to a flue no smaller than the outlet diameter of the socket on the boiler ie. 5" dia. and the gases exhausted safely to atmosphere. Alternatively a Trianco Low Level Discharge Terminal Silencer Kit can be used. (See separate leaflet).

General Requirements

Installations of the boiler must be in accordance with the following British Standard Codes of Practice and Regulations:

BS.5410 : Pt 1 1977 Code of Practice for Oil Firing
BS.5449 1990 Forced Circulation Hot Water
Current Building Regulations
Current I.E.E. Regulations
Local Water Undertakings by-laws

Health and Safety at Work Act 1974

In the interest of safety, the installation of the appliance should be carried out by a competent installer.

The installer should be aware of his responsibilities under this Act and provide, where necessary, appropriate protection for persons carrying out the installation.

Boiler Installation

1. Remove casing and disconnect the four pipes from the mounting-plate manifold.
To reduce lifting weight, the burner expansion vessel and control-panel can be removed.
2. Select a position on the wall for boiler mounting, allowing a minimum clearance of 100mm all round for installation, servicing and ventilation. (See Fig. 1).
3. Mark out and drill five holes for securing the mounting-plate to the wall with the "Rawlbolts" provided, using the mounting-plate as a template.

NB. The wall must be of sound construction to ensure secure fixing of mounting plate for supporting the installed weight of the boiler.

4. Place the mounting-plate on the wall and firmly bolt up.
5. Lift the boiler body into position, hooking the support bars over the lugs projecting from the mounting plate and secure body by bolting bottom retaining plate.
6. Re-connect boiler pipework to mounting-plate manifold.
7. Make flue connection between boiler and chimney with a 5" dia. flue-pipe and ensure a gas tight seal. Alternatively, fit a Trianco Low Level Discharge Terminal Silencer Kit. (See separate instructions).
8. Make water connections (see Fig. 2) — two 22mm connections for flow and return to heating system and two 15mm inlet and outlet connections for domestic hot water. Also make oil pipe connections for a one or two pipe system as required.
9. Re-fit oil burner and connect flexible hose(s) to the 1/4" sockets on mounting-plate manifold.
10. Re-fit expansion vessel and control-panel (if removed) ensuring the thermostat phials are retained in their pockets with the split-pins.

Domestic Hot Water

The three-way valve fitted to the hot water heat exchanger ensures priority is always given to domestic hot water. A draw-off from the taps or showers automatically changes the valve position and starts the pump to allow hot water to flow through the heat exchanger where it indirectly heats the draw-off water.

A minimum cold water pressure of 2 bar is required at the inlet to the valve to achieve the designed flow rate of 9.6 litres/min.

Notes:

- (a) All taps, showers and mixing valves used with this appliance must be suitable for operation at mains water pressure.
- (b) Care must be taken when drawing off water from the taps as the initial flow could be very hot, thereafter the water will run at a lower temperature.
- (c) To ensure a comfortable temperature for showering a thermostatically controlled shower should be used which has a fast acting valve such as the "Aqualisa" (or equivalent).
- (d) As the flow of water to hot and cold outlets comes from the same mains supply, it may not be possible to use all outlets at the same time.

Heating-Systems

To avoid gravity circulation when the pump is off, a non-return valve should be fitted in the flow-pipe.

Drain Cock A drain-off cock is provided for draining the boiler but it is also necessary to fit an additional cock for draining the system at its lowest point.

Safety Valve A safety-valve is fitted to the boiler which is factory set to a blow-off pressure of 3 bar ± 0.3 bar. It is recommended that a discharge pipe is fitted to the valve and terminated in position such that if water or steam is discharged it would not cause a hazard.

Expansion Vessel

The 10 litre expansion vessel fitted to this appliance is factory charged with air to a pressure of 0.5 bar.

This pressure is suitable for a static head of up to 17ft. measured from the expansion vessel to the highest point of the system. If the head is greater than this then the vessel charge pressure must be increased to equal the system head.

A schraider type tyre valve is provided on the expansion vessel for increasing the air pressure, using a tyre pump and pressure gauge. The maximum charge should not exceed 1.5 bar.

Note: 1 ft. head = 0.434 p.s.i.
1 bar = 14.5 p.s.i.

System Filling and Make-Up

Provision must be made for initial filling of the system and subsequent make-up.

A suitable filling system designed to comply with the Water Authorities' requirements should be fitted close to the boiler's heating return connection and in a position that allows filling control whilst viewing the boiler's pressure gauge.

Fig. 3 shows a schematic diagram of a suitable filling and make-up arrangement via a temporary hose connection from the mains water supply.

Note: The filling hose must be removed from the mains supply when not in use.

Suitable proprietary filling and make-up kits are available such as "Abifil", "Robofil" and Flexcon "Unifil".

The initial filling should include an allowance for make-up and this is achieved by pre-pressurizing the system above the expansion vessel charge by about 0.5 bar (7.2 p.s.i.). Thus if the standard vessel charge pressure of 0.5 bar is used, then the cold fill pressure indicated on the boiler gauge will be 1 bar. The red pointer on the gauge should, therefore, be set to the 1 bar position to indicate the cold fill pressure.

When the system water is heated, the pressure will rise dependent upon the system volume and operating temperature. However, if the gauge pressure exceeds 2.5 bar when operating at maximum temperature, then an additional expansion vessel must be fitted in the system close to the heating return connection.

The expansion vessel fitted to this appliance is suitable for a system volume of 105 litres (23 gals) when cold filled to a pressure of 1 bar.

When checking the system water content to determine if an additional expansion vessel is required, remember to include the boiler's water content of 18.5 litres.

Refer to BS.7074 Part 1 if information is required on the sizing of an additional expansion vessel.

Oil

The recommended fule is 28 sec. Kerosene to BS.2869 : 1983 Class 2.

One Pipe Installation

A single pipe oil supply can be used where the bottom of the storage tank is above the burner. (See Fig.5).

Two pipe installation

A two pipe suction lift system must be used where the tank is below the burner. (See Fig. 6).

Note: The oil pump is supplied for use with a two pipe system. If a one pipe system is used, remove the bypass plug beneath the end cap of the pump.

ELECTRICAL SUPPLY — A single phase electrical supply 240 volv A.C. 50 Hz fused 5 AMP is required to the control panel. All wiring should be in accordance with the requirements of the Local Authority and the latest I.E.E. Wiring Regulations (see wiring diagram Fig. 4).

SYSTEMS CONTROLS — A double circuit time-switch, room thermostat and thermostatic radiator valves should be used with this boiler so as to provide a closely controlled and efficient heating and hot water system.

COMMISSIONING

1. Switch off electricity supply to the boiler.
2. Remove casing.
3. Remove burner securing nut and hinge burner open. Check the burner head settings, electrodes and nozzle size by reference to the Burner diagram.
4. Remove burner cover and set air damper to position 4 (loosen screws to adjust then lock).
5. Insert pressure gauge in pump.
6. Swing burner back into boiler and tighten securing screw.
7. Ensure that the boiler is full of water and that all valves are fully open.
8. Check that all oil and electrical connections are made.
9. Check that the room thermostat and time switch, etc. are in the 'ON' position, and the boiler thermostat is set to position 6.
10. Switch on mains electrical supply and the burner will start.
NB. Until all air is purged from the oil lines the flame may be unstable, causing the burner to lock out. If so, wait one minute then press re-set button on control box.
11. Start and stop the burner several times until the flame shuts off sharply indicating that any remaining air bubbles have been dispersed. Check pump pressure reading is 130 p.s.i. — adjust pressure if necessary.
12. After 10 minutes running take smoke and CO₂ readings through sampling hole in top of boiler. Make further adjustments of the air if necessary to obtain Smoke No. 0-1 and CO₂ 10-11%.
13. Switch off electrical supply to boiler. Swing open burner and remove pressure gauge. Replace burner cover and re-tighten burner to boiler.
14. **Note:** This boiler operates under a slight positive flue pressure and as such it is important that all flue seals are gas tight otherwise there could be a leakage of combustion fumes into the room. The following joints should be checked when the burner is firing:
 - i) Burner fixing-flange to boiler body.
 - ii) Flue-cover to boiler.
 - iii) Flue-pipe to boiler.Tighten or re-seal any joints found to be leaking.

15. **Domestic Hot Water — Flow Rate Adjustment (See Fig. 8)**

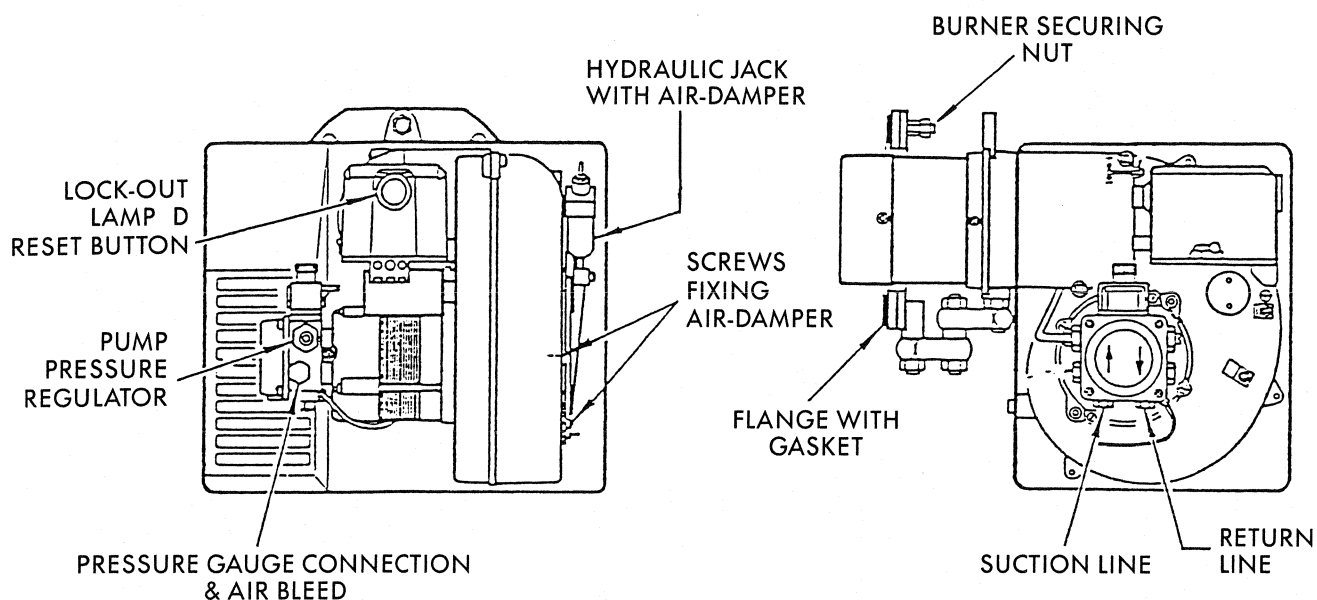
Fully open a D.H.W. tap furthest from the boiler and allow the boiler to run for a few minutes then adjust the Flow Rate Screw until there is a rise of 35°C above the cold water temperature. This corresponds to a flow rate of 9.6 litres/min. (2.1 gal/min).

Note: This flow rate assumes an incoming mains water temperature of 10°C which when raised through 35°C gives a useful hot water temperature of 45°C . However, there are two factors that could reduce this temperature at the draw-off points:-

- (1) The incoming mains water may be less than 10°C particularly in mid-winter.
- (2) Heat losses from pipe-work between boiler and draw-off points could be excessive, particularly if the pipe runs are long and un-insulated.

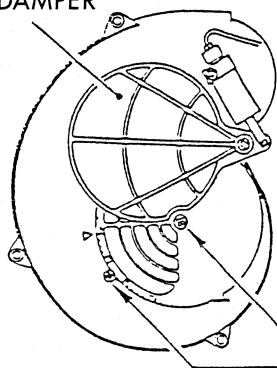
To compensate for any temperature loss the Flow Rate Screw should be screwed in a few turns to slow down the flow rate and thereby allow hotter water to be drawn off.

16. After completing the installation, the Installer should bleed all air from the boiler and heating system (top-up if necessary) and make a thorough check of the system to ensure that it is completely satisfactory. The boiler controls and system operation should be explained and demonstrated to the user.



RIELLO BURNER-MECTRON G5

AIR DAMPER

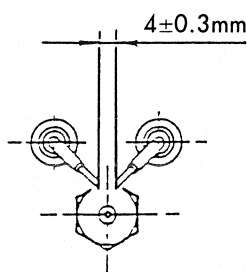


LOOSEN
SCREWS
TO ADJUST

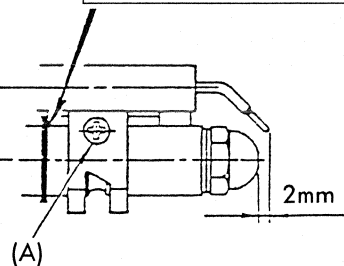
AIR DAMPER ADJUSTMENT

ATTENTION:

Before assembling or removing the nozzle, loosen the screw (A) and move the electrodes ahead.



MOVE THE ELECTRODE
HOLDER BACKWARDS
TO THE END



ELECTRODE SETTING

BOILER MODEL	RATED	OUTPUT	BURNER MODEL	BURNER HEAD	DANFOSS NOZZLE	PUMP PRESSURE P.S.I.	KEROSENE FIRING RATE ml/min.	AIR SETTING
	kW	Btu/h						
TRO 80 W.H. COMBI	23.4	80,000	RIELLO G5	STD. 3005775	0.75×80°S	130	47	4

SPARES LIST					
DESCRIPTION	No. OFF	TRIANCO PART No.	DESCRIPTION	No. OFF	TRIANCO PART No.
OIL PUMP	1	204345	ELECTRODE	1	204346
OIL PUMP SOLENOID COIL	1	27937	PHOTOCELL	1	27944
MOTOR	1	27932	CONTROL BOX	1	204342
BURNER HEAD	1	27992	NOZZLE	1	203473

TECHNICAL DATA

Heat Output	23.4kW (80,000 Btu/h) to heating system or D.H.W.
Pressure Jet Oil Burner	Riello Mectron G5
Maximum Firing Rate	47 ml/min. Kerosene 28 sec.
Maximum Boiler Pressure	2.5 bar (36 p.s.i.)
Water Connections	22mm Central heating flow and return, 15mm Cold water feed and supply
Water Content	18.5 litres (4 gal.)
Flue Connection	For 5in dia. flue
Domestic Hot Water Heat Exchanger	For direct mains operation — 9.6 litres/min. \times 35°C rise (2.1 gal./min. \times 63°F rise) C/W three-way valve and switch.
Circulating Pump	Grundfos 3 speed Selectric Mk.2
Expansion Tank	10 litre. (factory set at 0.5 bar)
Safety Valve	½" BSP (set at 3 bar)
Thermostats	Control — 50°C to 86°C
Casing	Limit — 100°C cut off (manual reset)
Insulation	Stove enamelled white with grey door
Weight	Glass fibre panels inside casing provide thermal and acoustic insulation
Temp./Press. Gauge	137 kg. complete (300lbs)
Indicator Light	Temp. range 0-120°C
	Press range 0-6 bar
	Burner LOCK-OUT

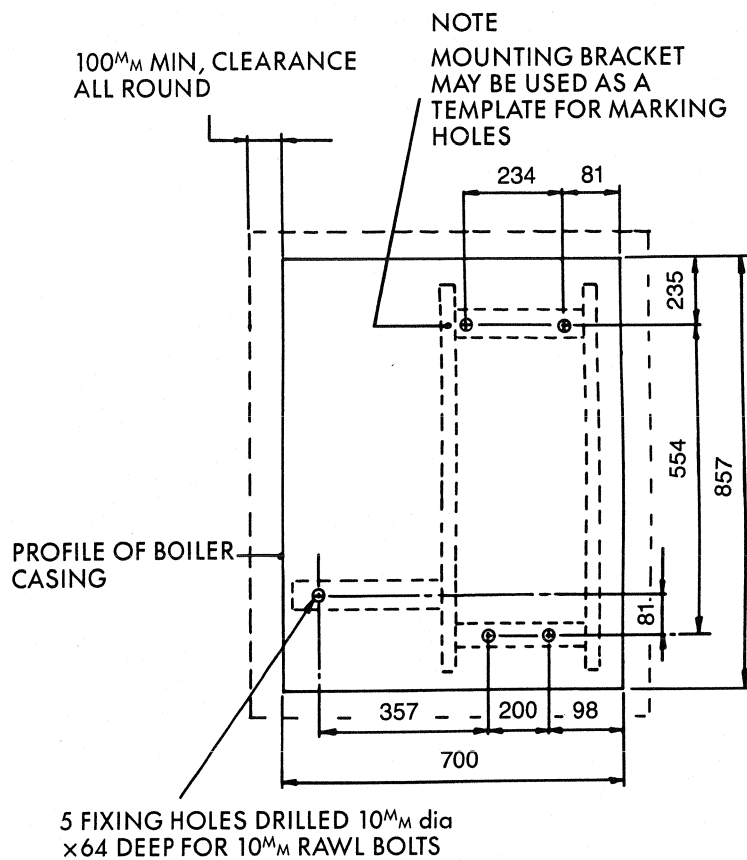


Fig. 1 **WALL MOUNTING DETAILS AND SPACE FITTING**

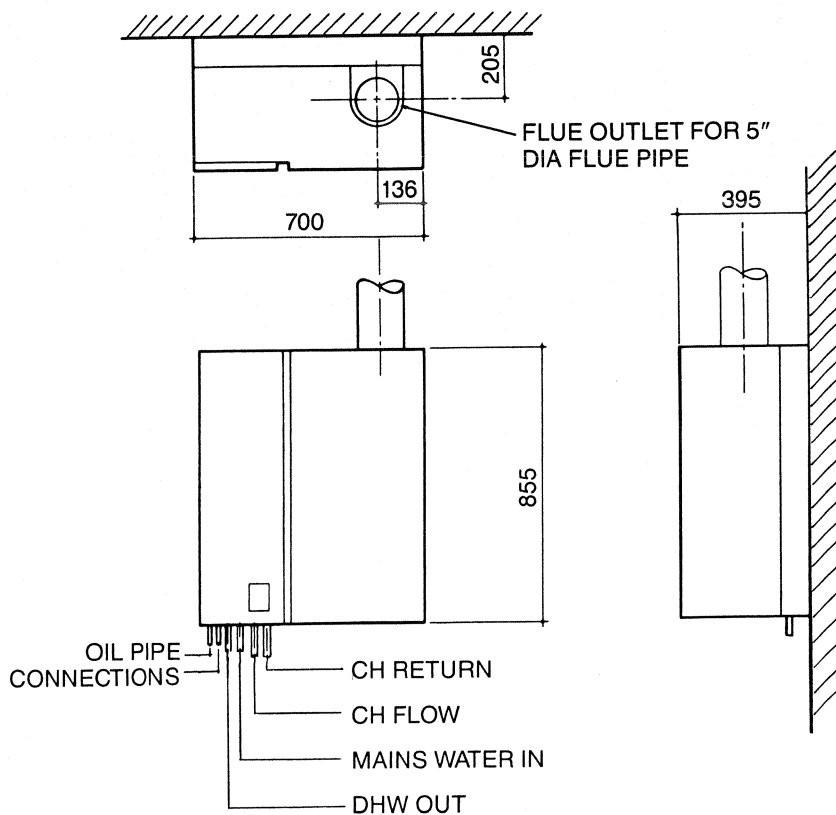


Fig. 2

Note: Wiring of the time-switch or programmer should be carried out in accordance with individual manufacturer's instructions.

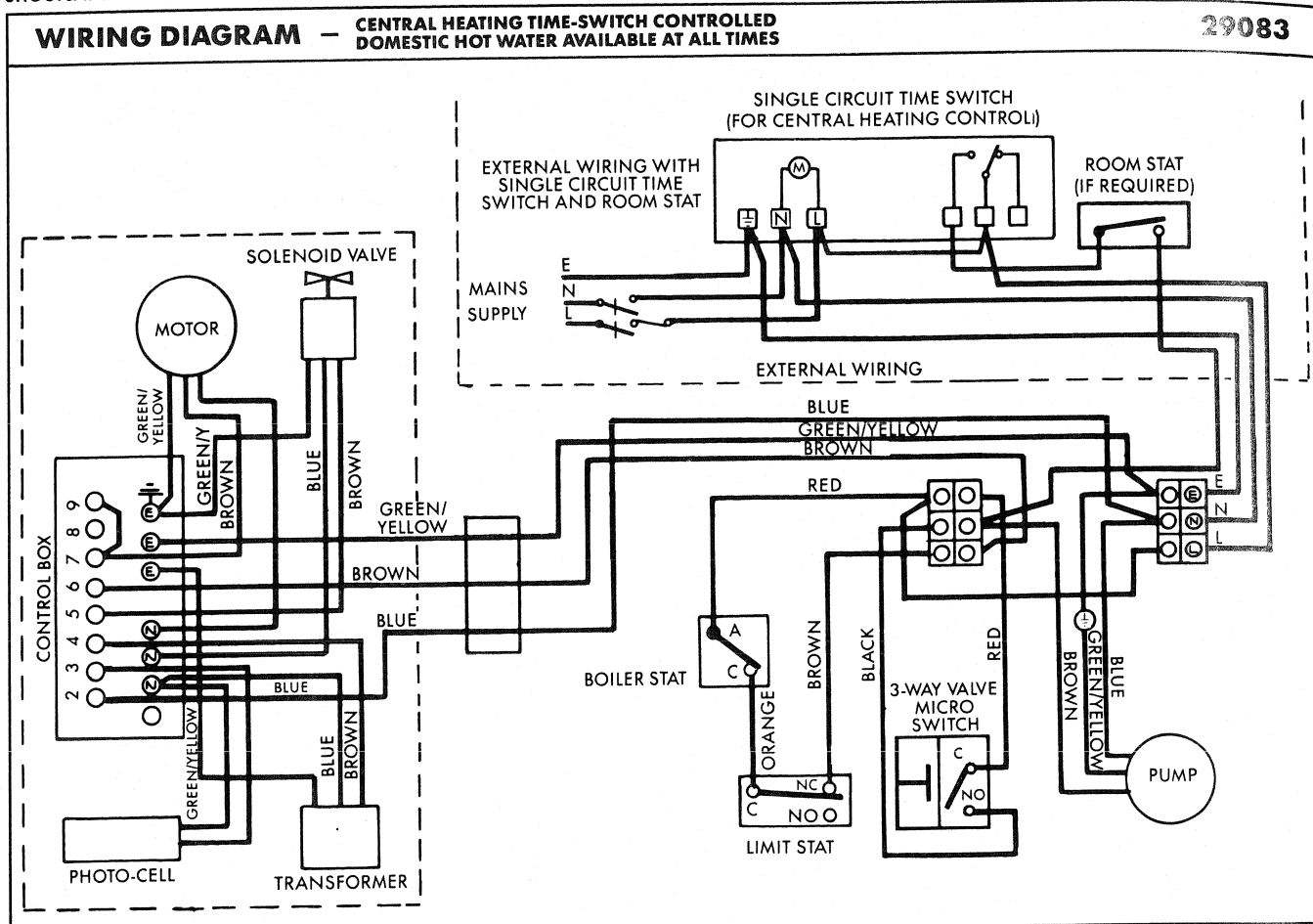


Fig. 3

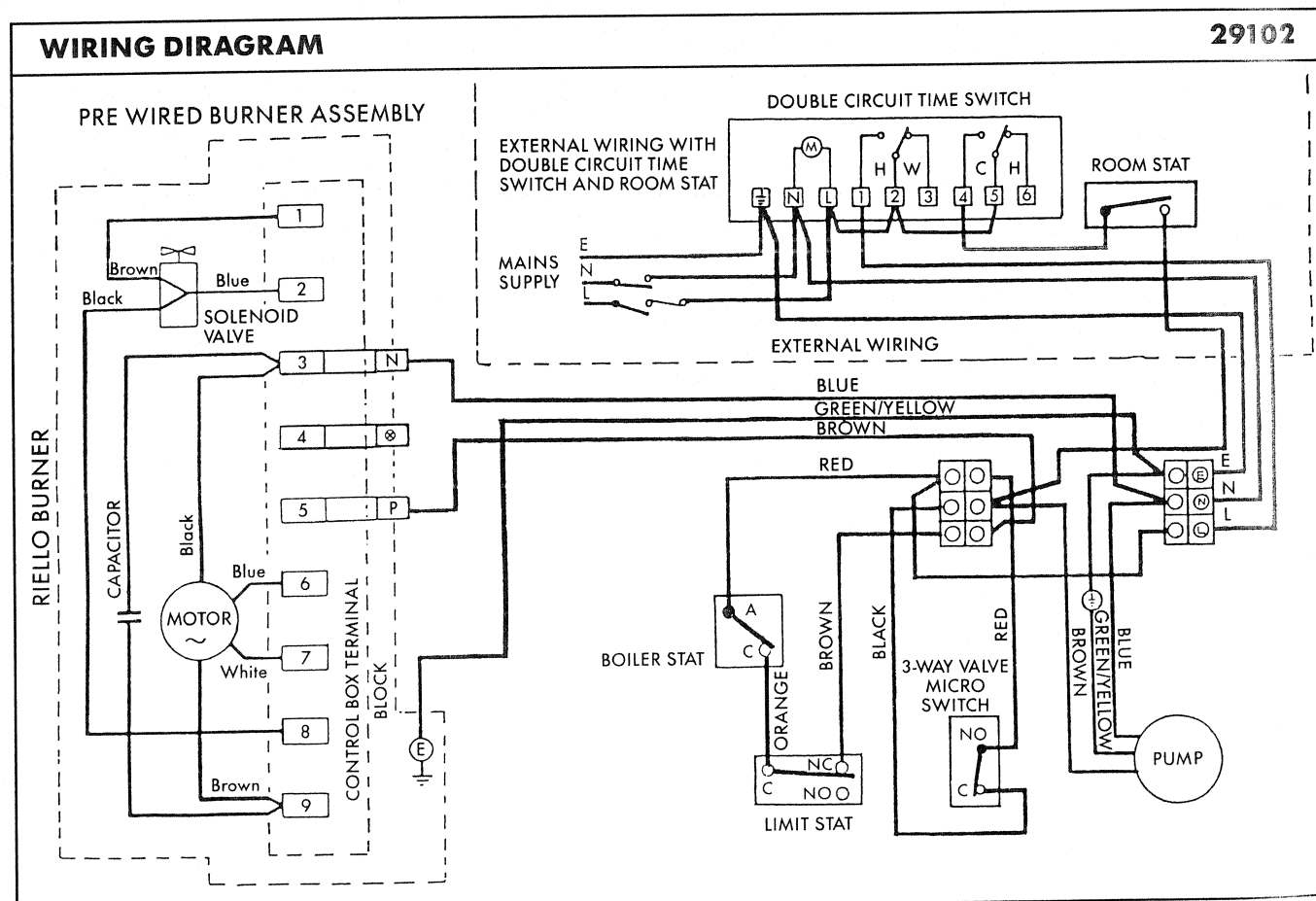
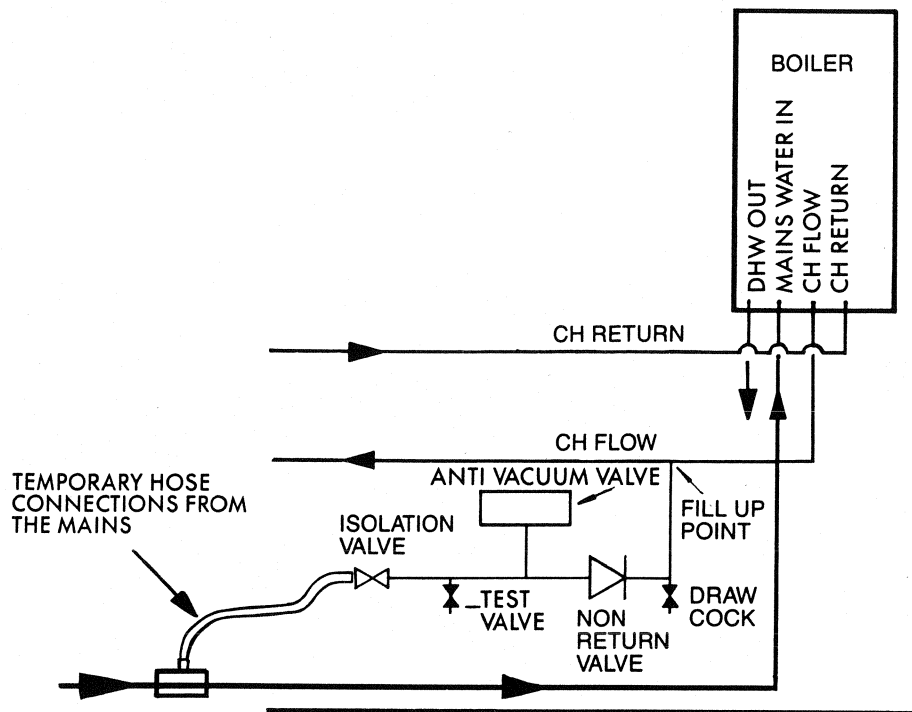


Fig. 4



NOTE: FILLING A SEALED SYSTEM WITH A FLEXIBLE HOSE FROM THE MAINS IS ONLY ALLOWED WHERE ACCEPTABLE TO THE LOCAL WATER AUTHORITY.

Fig. 5 **METHOD OF FILLING AND TOPPING UP SYSTEM — SCHEMATIC DIAGRAM**

H: HEAD		MAX ALLOWABLE PIPE RUN	
METRES	FEET	10mm O/D METRES	15mm O/D METRES
NIL	NIL	29.5	45.8
0.3	1	39.6	45.8
0.6	2	45.8	45.8
0.9	3	45.8	45.8
1.2	4	45.8	45.8
1.5	5	45.8	45.8

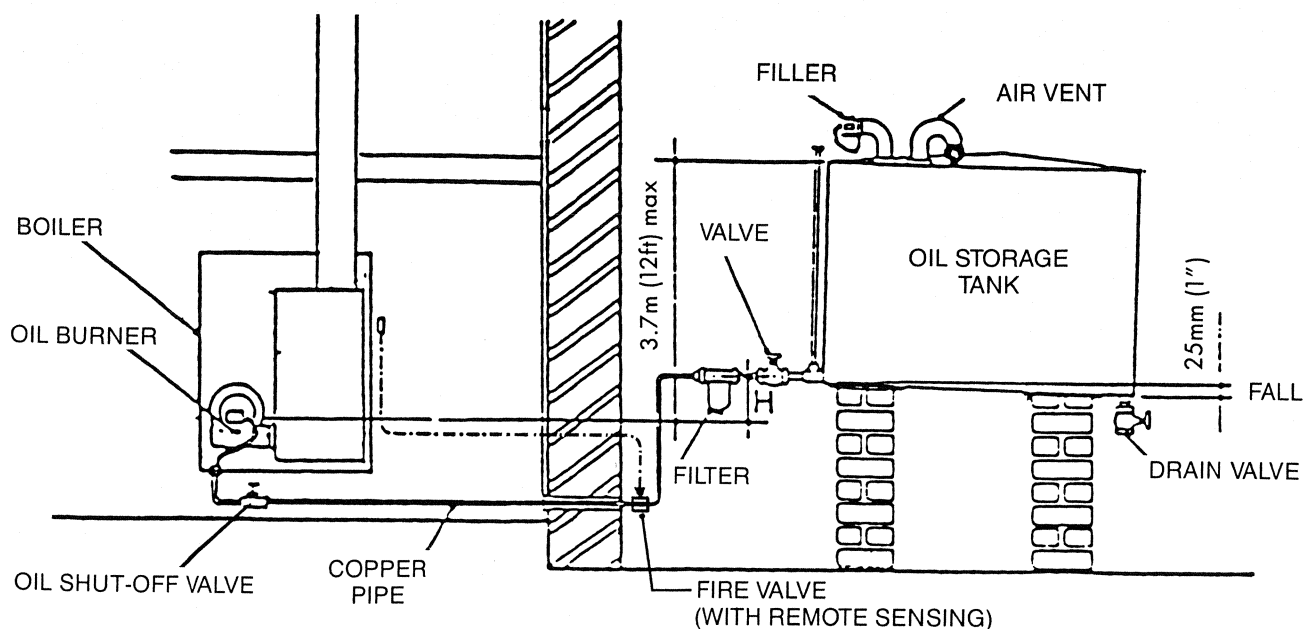


Fig. 6. **OIL INSTALLATION — ONE PIPE GRAVITY SYSTEM**

H: HEAD		MAX ALLOWABLE PIPE RUN	
		10mm O/D	15mm O/D
METRES	FEET	METRES	METRES
NIL	NIL	18.3	61
0.3	1	16.8	51
0.6	2	15.6	51
0.9	3	14.4	51
1.2	4	12.8	55.2
1.5	5	11.6	45.1
1.8	6	10.4	40.8
2.1	7	8.8	85.1
2.4	8	7.8	30.4
2.7	9	6.1	24.8
3.0	10	4.9	19.5

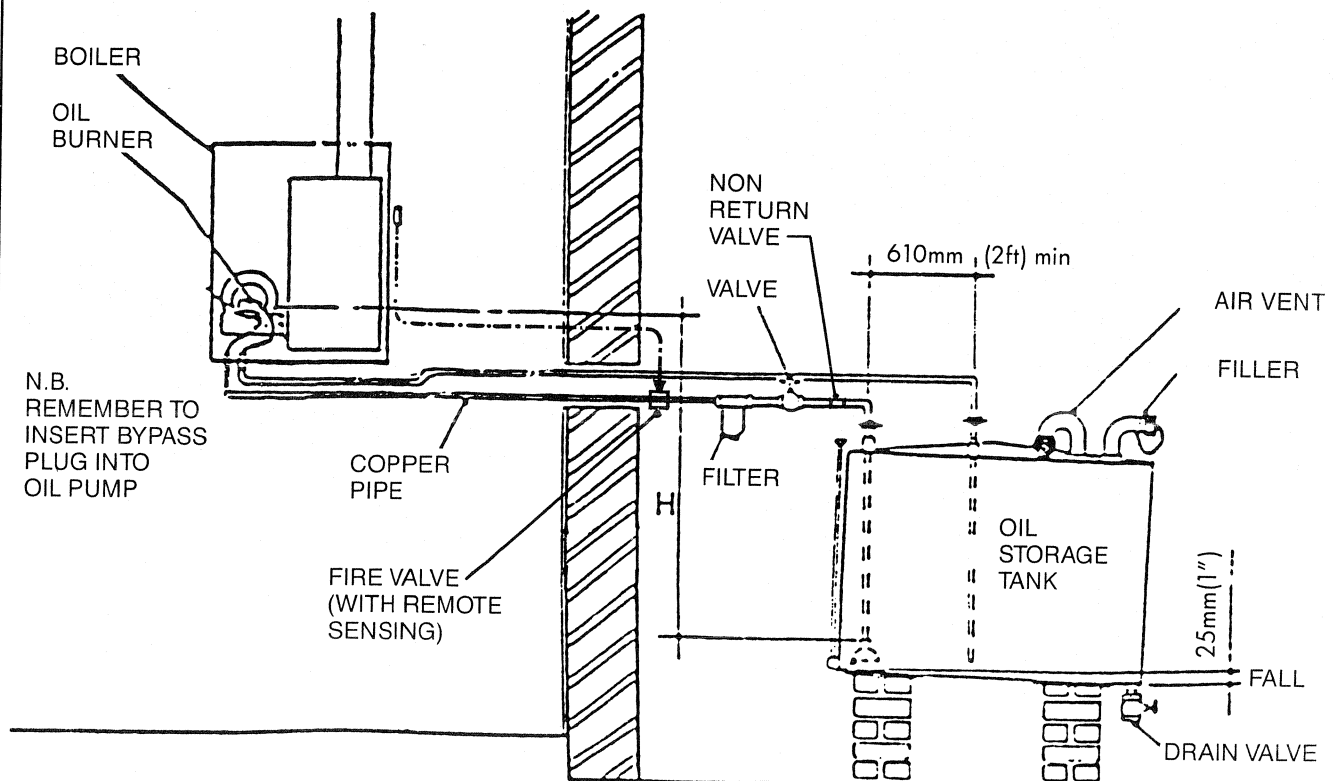


Fig. 7. OIL INSTALLATION — TWO PIPE SUCTION LIFT SYSTEM

FAULT FINDING CHART

FAULT	POSSIBLE CAUSE	ACTION
THE BURNER WILL NOT START WHEN THE LOCK-OUT RESET BUTTON IS PUSHED.	The fuse has blown.	Fit new fuse (5 amp.) to boiler.
	Thermostat or other controls.	Wait until boiler water temperature drops, or raise thermostat setting.
	No current through motor or transformer.	Control box faulty — replace. Light on photo-cell — check cell position.
BURNER STOPS AND STARTS WITHOUT FLAME WHEN RESET BUTTON IS PUSHED.	The burner is not getting oil. Air in oil line, shut-off valve closed.	Check oil tank is full, clean oil filter, vent oil line and pump, check oil shut-off valve is open, check fire valve.
	Ignition fault.	Check electrodes are clean and correctly set. Check H.T. leads for breaks or burns.
	Nozzle fault.	Change nozzle.
	Pump fault.	Check with gauge that pressure is correct.
	Coupling between fan or motor and pump is broken or slipping.	Fit new coupling.
	Solenoid valve not operating.	Check power supply to coil; if faulty change Solenoid valve coil. If fault persists, change oil pump.
BURNER STARTS BUT FAILS TO ESTABLISH FLAME.	Dirty photo-cell.	Clean photo-cell, use soft dry rag.
	Faulty photo-cell.	Change photo-cell.
	Faulty control box.	Change control box.
FLAME BURNS ONE SIDED.	Nozzle, partially blocked or damaged.	Replace nozzle.
DOMESTIC WATER NOT HOT ENOUGH.	Incoming mains water temperature very low.	Screw in Flow Rate Screw a few turns to slow the flow and allow water to heat up.

Note: If the boiler has been off as a result of a power failure it will be necessary to reset any time switches after power has been restored. If after carrying out above checks the burner still fails to fire call your service engineer.

Hydraulic Diverter Valve

If the valve fails to start the pump when domestic hot water is drawn off, this is probably due to water borne deposits fouling the sensing mechanism inside the valve.

To overcome the problem, the following procedure should be carried out:-

1. Switch off electrical supply to boiler.

2. Remove micro-switch assembly by pulling off circlip.

3. Fully open hot water tap.

4. Push button on end of spindle and hold for about 10 seconds then release.

5. Repeat this operation 3 or 4 times to thoroughly flush out deposits.

6. Close hot tap.

7. Replace micro-switch assembly and switch on electrical supply.

8. Check operation of valve by turning on hot tap again — pump and burner should now run.

Note: The diverter valve requires a minimum flow rate of approx. 3 litres/min in order to operate the micro-switch and start the pump.



TRIANCO REDFYRE LIMITED

Thorncliffe, Chapeltown, Sheffield S30 4PZ

Tel: Sheffield (0742) 461221 Telex: 54476

Fax: (0742) 453021



By appointment to H. M. Queen Elizabeth
The Queen Mother
Manufacturers of Domestic Boilers

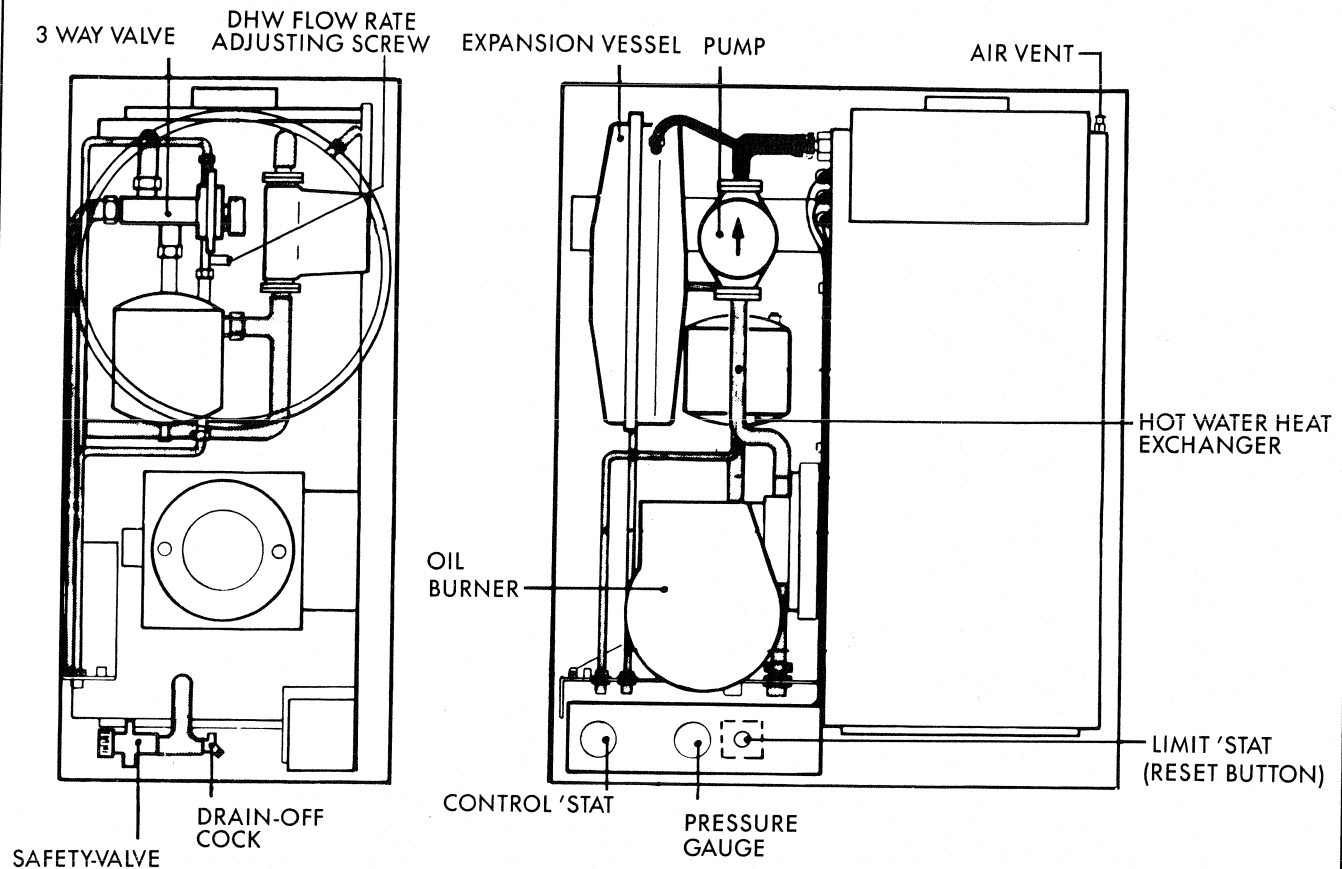


Fig. 8 **OPERATIONAL FEATURES**

©Trianco Redfyre Limited 1992. Copyright in this brochure and the drawings or illustrations contained in it is vested in Trianco Redfyre Limited and neither the brochure nor any part thereof may be reproduced without prior written consent.

Trianco Redfyre policy is one of continuous research and development. This may necessitate alterations to this specification.

