

Trianco

OIL

TRO MK3 RANGE CONVENTIONAL FLUE AND L.L.D. BOILERS

INSTALLATION AND COMMISSIONING INSTRUCTIONS

Introduction

Trianco TRO Mk3 Conventional Flue Boilers feature the latest design of pressure jet oil burners and are suitable for all conventional types of heating systems.

A range of Low Level Discharge Flue Kits is available to allow the boiler to be installed in a wide variety of installation arrangements from low level to high level and also for roof top discharge. (See separate leaflet)

The boilers are constructed from welded steel plate suitably braced for a system working pressure of up to 30 p.s.i. (70 ft. head) and are provided with a pair of flow and return tappings on each side for connection of the DHW and central heating systems: An additional tapping is provided at the front for fitting the circulating pump within the casing if required.

The matched pressure jet oil burner has been selected for its ability to operate with a Conventional Flue System or a Low Level Discharge Terminal and is fully automatic in operation under the control of the boiler thermostat and incorporates all necessary safety controls and indicator lights in the boiler/burner unit to ensure reliable and safe operation.

The top flue-cover incorporates a flame viewing glass to facilitate burner commissioning and the complete cover is removable for easy access to the flue baffles and heat exchanger surfaces for cleaning.

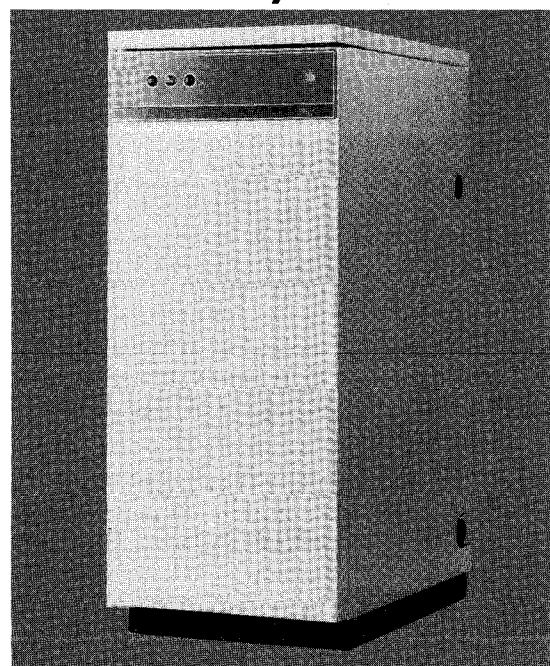
A top outlet socket is provided for either a Conventional Flue Pipe Connection or a Low Level Discharge Kit. Space is provided inside the boiler casing for fitting a circulating pump.

Provision is made in the control-panel for fitting a plug-in programmer, obtainable from Trianco Redfyre as an optional extra.

The recommended fuel is 28 Seconds Kerosene (BS 2869 1983 Class 2).

It is essential to use Kerosene in order to meet the Building Regulations requirements for Low Level Flue Discharge.

To be retained by householder



**TRO 12/14 MK3 CF (12 TO 14 kW)
TRO 15/19 MK3 CF (15 TO 19 kW)
TRO 20/25 MK3 CF (20 TO 25 kW)
TRO 28/32 MK3 CF (28 TO 32 kW)**

General Requirements

Installation 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 : Pt.1 1977 Forced Circulation Hot Water Systems

Current Building Regulations

Current I.E.E. Regulations

Local Water Undertakings by-laws

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

Health and Safety at Work Act 1974

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

SITING THE BOILER

As the boiler base temperature meets the requirements of the Building Regulations for floor temperatures of less than 100°C no special hearth is required, however the boiler should stand on a rigid, impermeate sheet of non-combustible material such as a steel sheet if the floor covering is liable to soften due to warmth.

When siting the boiler adequate space should be allowed to permit pipe and flue connections and servicing from top and front.

The following minimum clearances are recommended:

Front — 600mm (24in)

Top — 450mm (18in)

Sides— Sufficient to make flow and return connections

Note: The casing door is supplied hinged on the left hand side. If installation space is restricted the door may be hung on the right hand side by changing over the hinge-brackets.

Combustion Air

To ensure an adequate supply of fresh air necessary for efficient combustion, a low level inlet must be provided. This inlet should be approximately 300mm (12") from the floor and not liable to obstruction or blocking. To keep draughts to a minimum, it should be as near to the boiler as possible.

Combustion Air Minimum FREE Inlet Area.

Model	sq. cm.	sq. in.
TRO 12/14	130	20
TRO 15/19	180	28
TRO 20/25	225	35
TRO 28/32	290	45

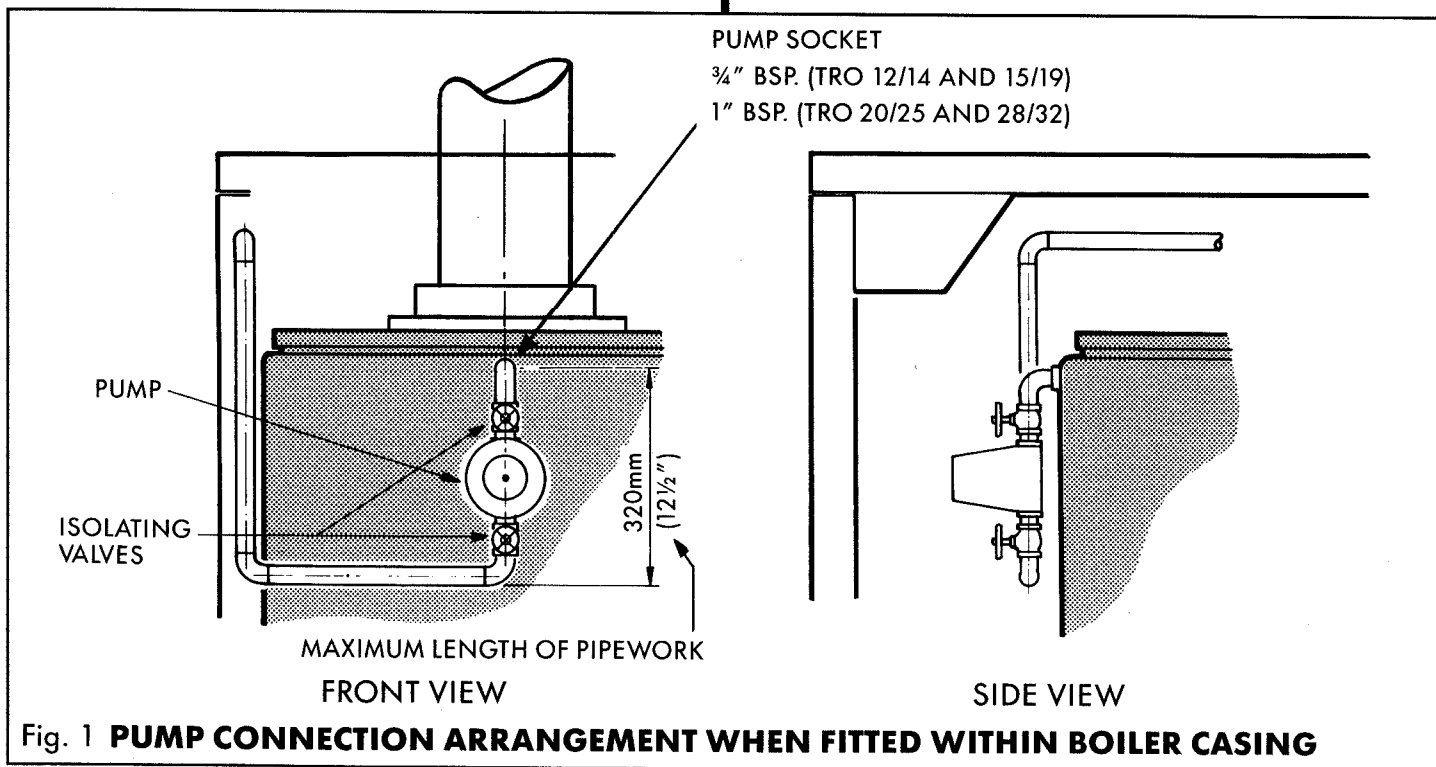
Ventilation

A ventilation grille should be provided at a high level, having a free area of at least half that of the combustion air inlet.

An extractor fan must not be used in the same room as the appliance.

FLUE SYSTEM

To evacuate the products of combustion safely and thoroughly from the boiler, an efficient flue system is necessary. The following notes have been compiled for guidance, but reference should be made to BS. 5410 PARTS 1 or 2.



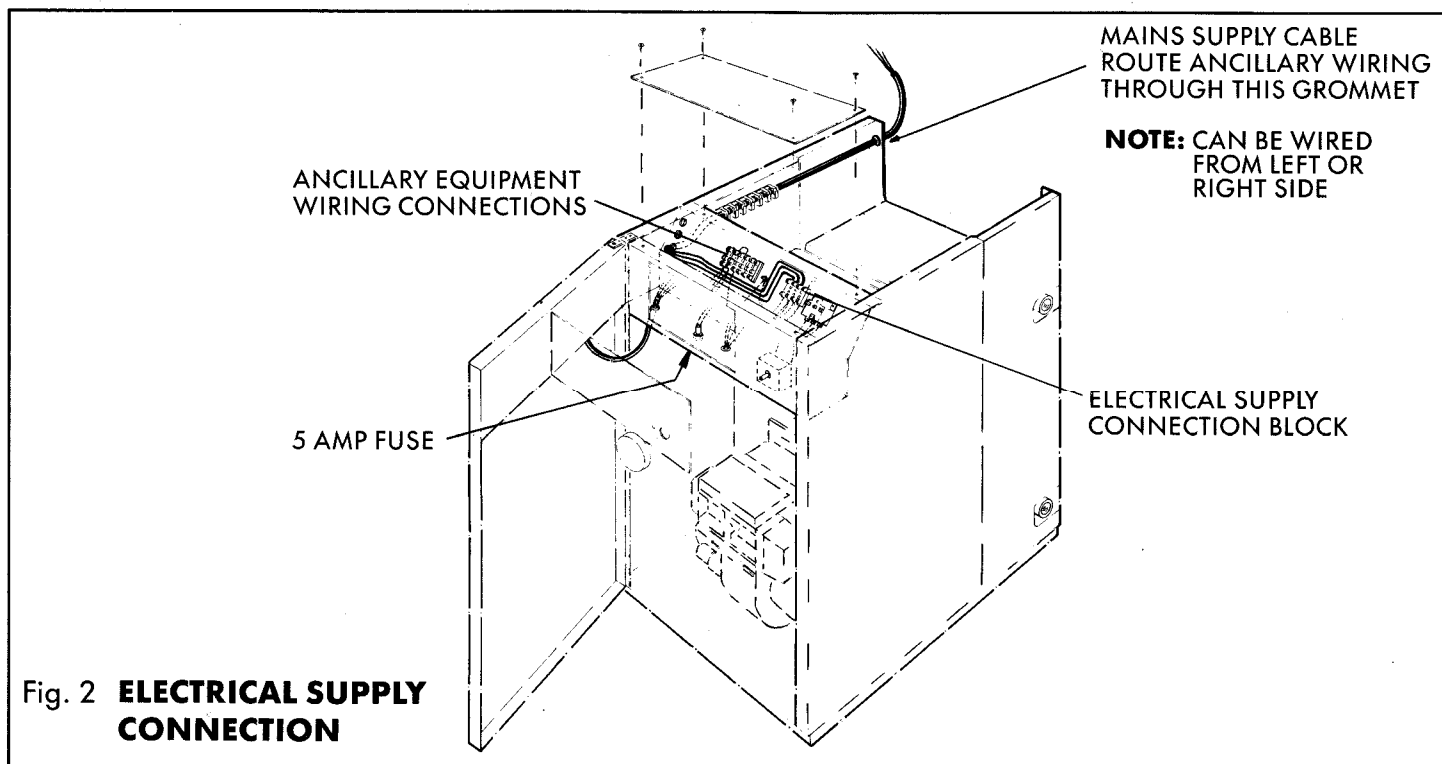


Fig. 2 **ELECTRICAL SUPPLY CONNECTION**

Conventional Flues

1. The flue should rise as near vertically as possible to terminate at a point which is not affected by down-draught or wind eddies, nor be in a pressure zone.
2. If possible, the flue should rise within the house and be lined. If an external flue is used, it should be of the twin-wall insulated type to BS. 4543 Part 3.
3. Horizontal runs and right-angled bends must be avoided. If it is necessary for a horizontal section to be included in the flue, an increase in flue height may be required.
4. The average flue should provide flue draught of approximately 20 N/m^2 (0.08" w.g.) when hot, but the boiler will function equally well on draughts as low as 10 N/m^2 (0.04" w.g.) or as high as 45 N/m^2 (0.18" w.g.).
5. A draught stabilizer is not normally required nor is desirable, but where flue draughts are in excess of 50 N/m^2 (0.20" w.g.) a stabilizer may be necessary.
6. No part of the flue run should have a cross sectional area less than that of the boiler flue outlet.
7. Provision must be made for draining whenever condensation is likely.
8. The flue pipe connection between the boiler and chimney must be sealed with fire cement.

Low Level Flue-Gas Discharge

The TRO Mk3 boilers can also be used with any of the Trianco Redfyre Flue Terminal Kits, provided that the boilers are fired with Kerosene Class C2 oil.

Refer to separate literature for further information on

the Flue Terminal Kits.

WATER CONNECTIONS

The water connections should be made to British Standards Code of Practice. BS. 5449 Pt.1 Forced Circulation Hot Water Systems.

Position the boiler on its prepared base and make water connections to flow and return sockets. When using only one flow and return tapping connect to diagonally opposite sockets. If it is required to fit the circulating pump within the casing, use the socket at the top front of boiler and run flow pipe along top of body (see Fig. 1). **MAKE SURE ALL UNUSED TAPPINGS ARE PLUGGED BEFORE FILLING THE BOILER WITH WATER.**

Fill the system with water and make a thorough check for leaks. Also flush out the system to remove any swarf or residues before fitting the circulating pump.

Where the boiler is also used for providing domestic hot water a double feed indirect cylinder to BS. 1566 Part 1 must be used. No responsibility will be accepted by Trianco Redfyre Ltd. if connected otherwise.

ELECTRICAL SUPPLY

All electrical wiring must be carried out by a qualified electrician in accordance with current I.E.E. Regulations and any Local Regulations that may apply.

The electrical supply to the boiler must be 240 Volts A.C. single phase 50 Hz and this may be supplied from a convenient fused three pin plug and socket. The boiler is fitted with a 5 amp fuse protection.

Any ancillary equipment should be suitably protected. See Fig. 2.

The supply wiring to the boiler should be made with heat resisting cable and connected to the 4 way terminal-block. Ensure the green/yellow wire is connected to the terminal marked 'E' in the control-panel with the cable being run in the side panel duct and retained with the strain bush provided.

Terminal connections are also provided for ancillary equipment.

A wiring diagram is provided with these instructions (see Fig. 7.) and also on the top of the control-panel cover.

In parts of the country where there is a significant risk of high or low voltage the start up of the oil burner shall be prevented by the use of a voltage sensitive device if the applied voltage drops or increases sufficiently to endanger the installation.

Thermostats

The boiler is fitted with a variable setting control thermostat and a pre-set limit thermostat. Should the boiler thermostat become inoperative the limit thermostat will take over control of the boiler and provide protection but at a higher temperature setting. The AMBER light on the door panel will come ON and OFF indicating the boiler is operating on the limit thermostat only.

Before attempting to replace the control thermostat check that the limit thermostat has not tripped out as a result of a rise in water temperature due to the pump switching off or a valve closing down.

Programmer (Optional Kit)

A programmer is available for plugging directly into the boiler control panel (See separate instructions for fitting).

OIL SUPPLY

Oil

The recommended fuel is 28 Seconds Kerosene (BS. 2869 : 1983 Class C2).

Oil Storage Tank

The oil storage tank should comply with the requirements of BS. 799 : Part 5 : 1987.

Galvanised tanks and pipes must not be used.

It is important that a filter is fitted in the oil supply line. Should this be omitted no responsibility can be accepted by Trianco Redfyre for failure of the burner pump.

Oil Supply Pipe (See diagrams Figs. 5 and 6)

The oil supply should be run in copper pipe and be free from bends that could trap air.

A combined shut-off/fire valve should be fitted as near to the burner as practicable to enable the burner to be disconnected without undue loss of oil.

The burner pump is suitable for use with either single or two pipe oil supply systems and the pipe(s) can be run from the back of the boiler inside the base tray for connection to this burner via the shut-off valve and flexible hose.

COMMISSIONING

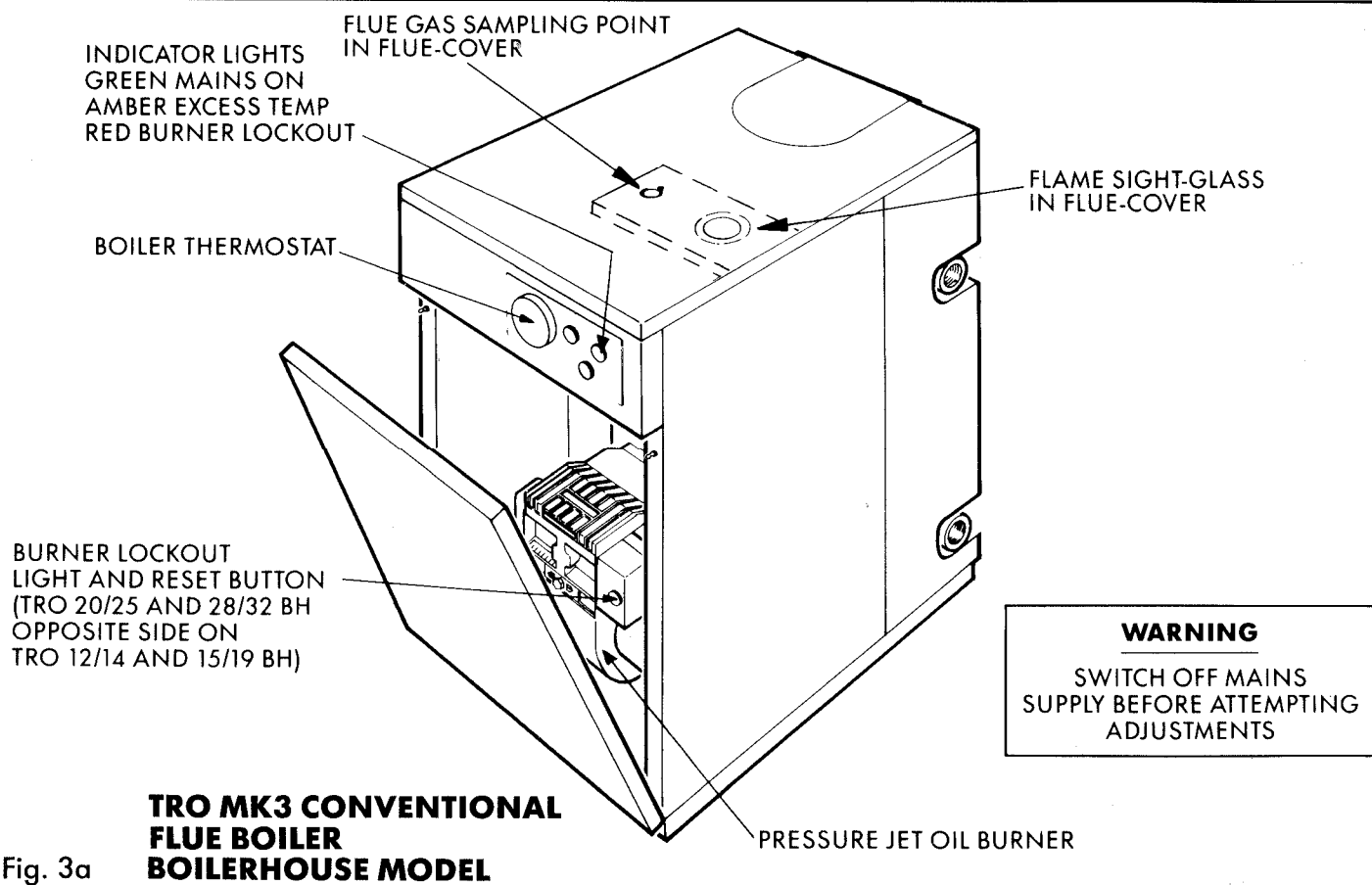
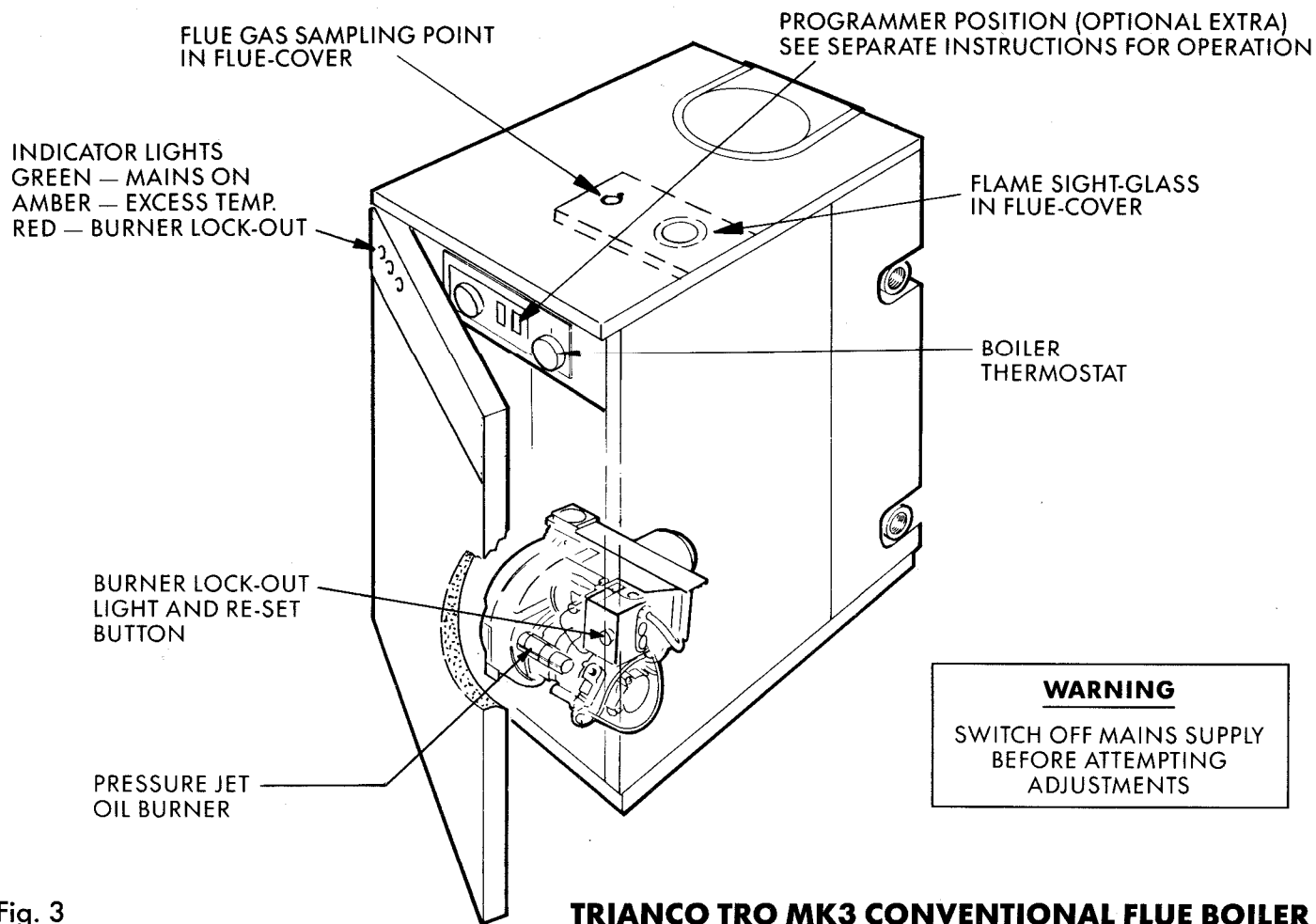
Note: Burner details see User Instructions.

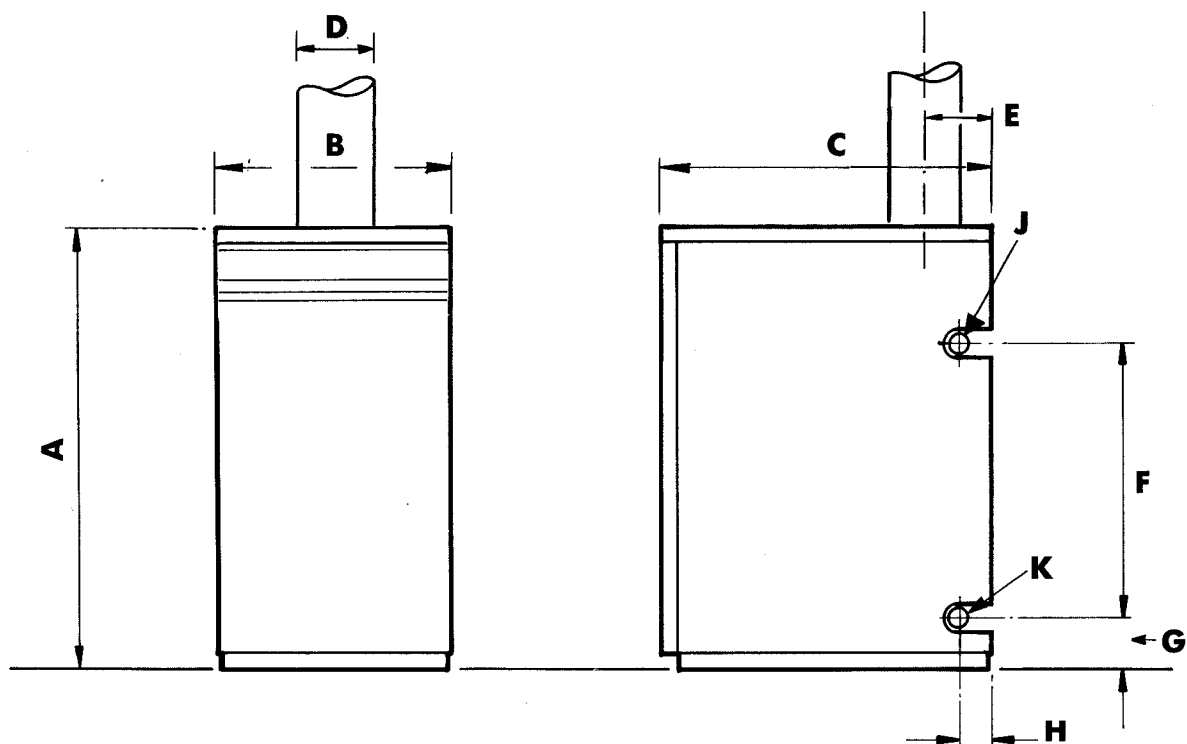
1. Remove top casing and flue-cover and check that all flue baffles are correctly located on their support brackets.
Replace flue-cover.
2. Switch off the electricity supply to the boiler.
3. Slacken off the two fixing screws on burner fixing flange, pull out wiring plug from underneath control-panel and remove burner from boiler.
4. Check electrode settings and nozzle size by reference to the burner details and ensure nozzle is centrally positioned in blast tube.
5. Check that the photo cell is firmly located in its socket.
6. Re-fit burner in boiler ensuring the blast tube is pushed in up to the fixing flange and secure with the two screws. Also plug-in wiring lead.
7. Set air control to the position indicated in burner details in the User Instructions.
8. Ensure boiler is full of water and all valves are fully open.
9. Check all oil and electrical connections are made.
10. With a single pipe system disconnect the hose from oil pump and open shut-off valve slowly to run off some oil into a container to establish a clean and air free supply of oil then reconnect hose.
11. Vent air from oil pump through bleed ports provided (See burner diagram for position).
12. Check that any room thermostat, time clock etc. is in the ON position and also the boiler thermostat.
13. Switch on mains electrical supply and the burner should start.
Note: The flame may be unstable until all air is purged from the oil line causing the burner to lock-out. If this happens wait about a minute before pressing reset button on control-box.
14. View flame through sight-glass. Adjust air slide if necessary to obtain a light orange flame without visible smoke.
15. Start and stop the burner several times until the flame cuts off sharply indicating any remaining air has been dispersed.
16. After 15 minutes running take smoke and CO₂ reading through sampling hole in top of flue cover. Make further air adjustments if necessary to obtain a Smoke of 0 to 1 and a CO₂ of 11 to 11½%.
17. Replace top casing.

Handing Over

After completing the installation of the boiler the installer should make a thorough check of the system to ensure it is completely satisfactory and demonstrate to the user the operation of the boiler and its control.

All instructions should be handed to the user for retention and advice given regarding the need for annual servicing by a qualified engineer.





DIMENSIONS — MM

APPLIANCE	A	B	C	D	E	F	G	H	J Flow Connection	K Return Connection
TRO 12/14	900	367	600	4"	110	555	118	55	2 × 1" BSP	2 × 1" BSP
TRO 15/19	900	367	600	4"	110	555	118	55	2 × 1" BSP	2 × 1" BSP
TRO 20/25	900	462	650	5"	110	550	118	59	2 × 1¼" BSP	2 × 1¼" BSP
TRO 28/32	900	462	650	5"	110	550	118	59	2 × 1¼" BSP	2 × 1¼" BSP

INSTALLATION DIMENSIONS

Fig. 4 TRO MK3 CONVENTIONAL FLUE BOILER AND BOILER HOUSE MODEL

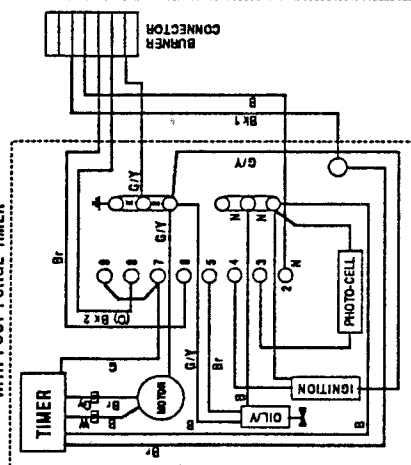


WIRING DIAGRAM

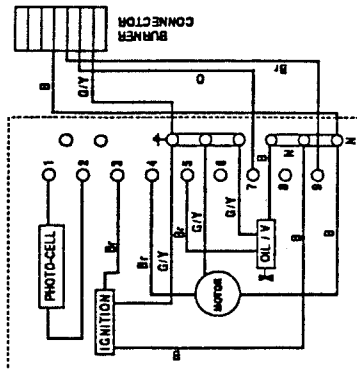
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BOILER CONTROL BOX WIRING

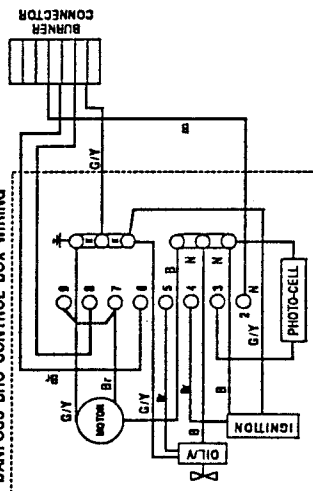
DANFOSS BHO CONTROL BOX WIRING
WITH POST PURGE TIMER



SATRONIC TF 830 CONTROL BOX WIRING

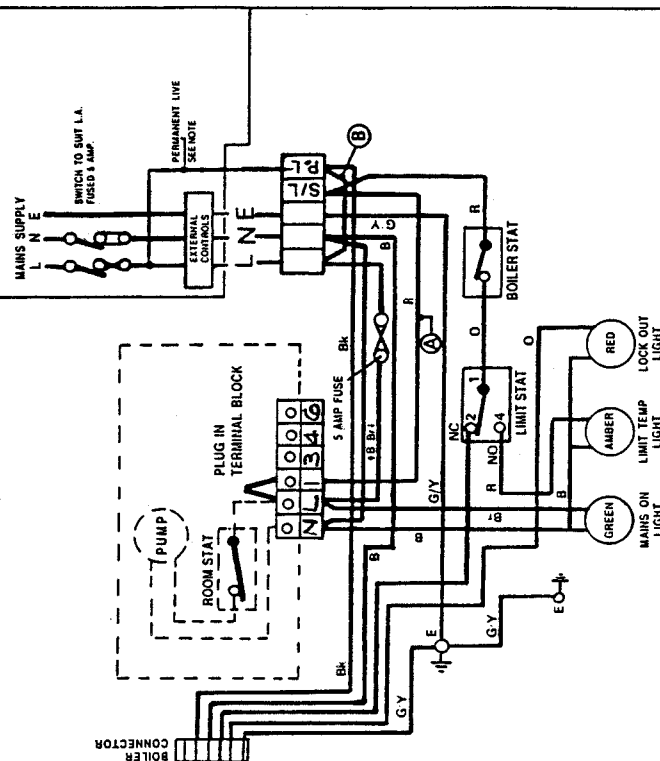


DANFOSS BHO CONTROL BOX WIRING



COLOUR CODE

B BLUE
Bk BLACK
Br BROWN
Gy GREY
O ORANGE
R RED
W WHITE
G/Y GREEN/YELLOW
G GREEN



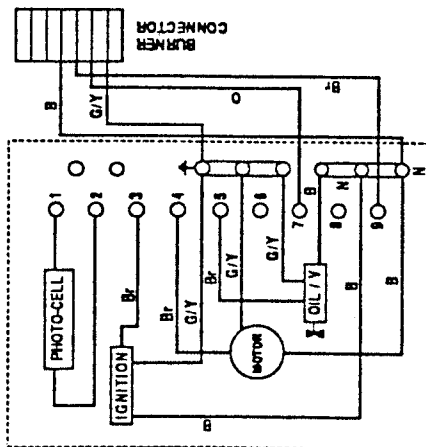
NOTE: BURNERS WITH POST PURGE TIMER
WHERE EXTERNAL CONTROLS ARE FITTED,
LINK WIRE 'B' TO BE REMOVED AND PERMANENT
LIVE SUPPLY WIRED INTO TERMINAL P.L.

Fig. 7 WIRING DIAGRAM KITCHEN MODEL

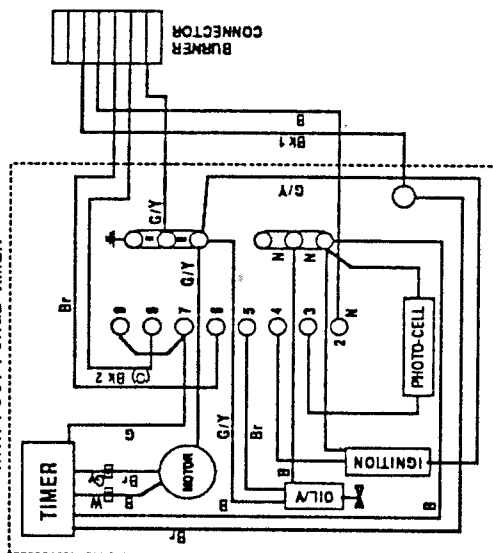
WIRING DIAGRAM BOILERHOUSE

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SATRONIC TF 830 CONTROL BOX WIRING



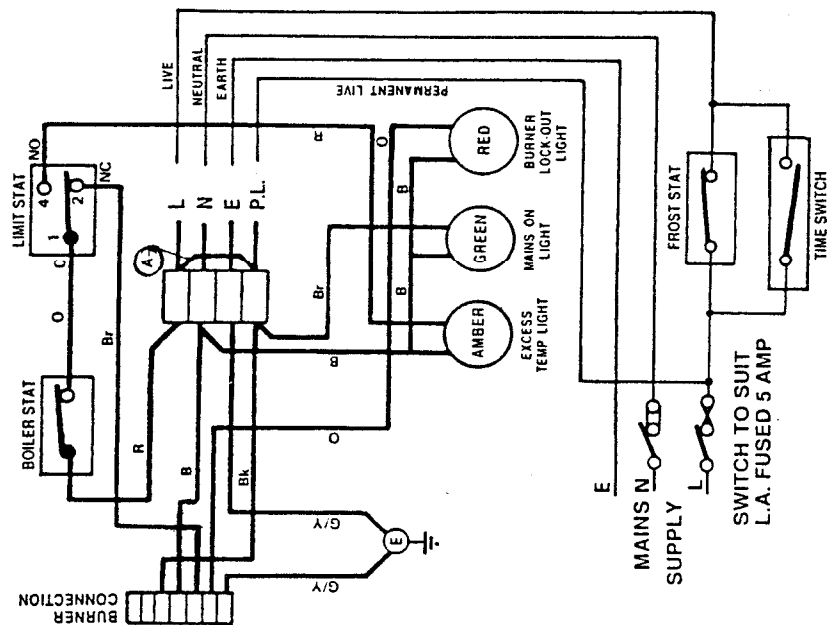
DANFOSS BHO CONTROL BOX WIRING WITH POST PURGE TIMER



COLOUR CODE

B	BLUE
Bk	BLACK
Br	BROWN
Gy	GREY
O	ORANGE
R	RED
W	WHITE
G/Y	GREEN/YELLOW
G	GREEN

BOILER CONTROL BOX WIRING



NOTE: BURNERS WITH POST PURGE TIMER WHERE EXTERNAL CONTROLS ARE FITTED, LINK WIRE 'A' TO BE REMOVED AND PERMANENT LIVE SUPPLY WIRED INTO TERMINAL P.L.

Fig. 7a WIRING DIAGRAM BOILERHOUSE MODEL

TECHNICAL SPECIFICATION

Boiler Model		TRO 12/14 MK3 CF	TRO 15/19 MK3 CF	TRO 20/25 MK 3 CF	TRO 28/32 MK3 CF
Heat Output	kW Btu/h.	12 to 14 41 to 48,000	15 to 19 51 to 65,000	20 to 25 68 to 85,000	28 to 32 95 to 110,000
Pressure Jet Oil Burner	SEE SEPARATE BURNER SHEETS				
Radiator Surface Based 160 Btu/h. 1ft ² (100°F diff.)	m ² ft ²	23.8 to 27.9 256 to 300	29.6 to 37.7 318 to 406	39.5 to 49.4 425 to 531	55.2 to 63.9 593 to 687
Water Content	litres gals.	18.0 4.0	21.6 4.8	30.2 6.7	35.6 7.9
Weight	kg. lbs.	95 210	102 225	134 294	144 317
Flow and Return Connections Pump Connections	ins. in	4×1 BSP ¾ BSP	4×1 BSP ¾ BSP	4×1½ BSP 1 BSP	4×1½ BSP 1 BSP
Max. Working Head	20.5m. (70 ft.)				
Control Thermostat	Adjustable between 50°C and 86°C. (122 to 187°F)				
Limit Thermostat	Factory set to break at 100°C (212°F) Auto reset on fall of 20°C.				
Casing Finish	Stove enamelled white with grey facia				
Insulation	Boiler shell enclosed with glass fibre panels				
Indicator Lights	GREEN (Mains ON) RED (Burner lock-out) AMBER (Excess temp.)				
Optional Extras	Plug-in programmer L.L.D. Kits.				

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.
	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.



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

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