Contractor

WM70 HE INTERNAL

OIL-FIRED CENTRAL HEATING BOILER FOR BALANCED FLUE

TRIANCO

CE BED 92/42 EEC
EMC 89/336 EEC

USER, INSTALLATION, COMMISSIONING & SERVICING INSTRUCTIONS

Please read these instructions carefully before installing, commissioning and using this appliance.

To be retained by the householder

HEALTH AND SAFETY INFORMATION

INFORMATION FOR THE INSTALLER AND SERVICE ENGINEERS

Under the Consumer Protection Act 1987 and the Health and Safety at Work Act 1974, it is a requirement to provide information on substances hazardous to health (COSHH Regulations 1998).

Trianco takes every reasonable care to ensure that these products are designed and constructed to meet these general safety requirements, provided they are properly installed and used.

To fulfil this requirement, products are comprehensively tested and examined before despatch.

When working on the appliance, it is the responsibility of the user/engineer to ensure that any necessary personal protective clothing or equipment is worn appropriate to parts which could be considered hazardous or harmful.

This appliance may contain some of the items below:

Insulation and Seals

Glass rope, mineral wool, insulation pads, ceramic fibre, glass insulation.

May be harmful if inhaled. May be irritating to the skin, eyes, nose and throat. When handling, avoid inhalation and contact with the eyes. Use disposable gloves, face masks and eye protection.

After handling, wash hands and other exposed parts. When disposing, reduce dust with water spray and ensure all parts are securely wrapped.

Glues, Sealants and Paints

Glues, sealants and paints are used in this appliance and present no known hazards when used in the manner for which they are intended.

Kerosene & Gas Oil Fuels (Mineral Oils)

Avoid as far as is possible any skin contact with mineral oils or with materials contaminated with mineral oils. The effects of mineral oils on the skin may vary according to exposure:

1) May remove the protective grease normally present on the surface of the skin, rendering it dry, liable to crack and more prone to damage caused by cuts and abrasions.

2) May result in skin rashes. Seek immediate medical attention for any rash, wart or sore developing on any part of the body, especially the scrotum.

Never breathe any mineral oil vapours. Do not fire the burner in the open (i.e. not properly situated in the boiler) as misfiring may result in unburned oil vapours.

When handling mineral oils, a suitable barrier cream containing lanolin is highly recommended, along with a strict routine of personal cleaning.

Under no circumstances should mineral oils be taken internally.

CONTENTS

1. USER INSTRUCTIONS

Please note, to assist Trianco in improving customer service, it is important that the guarantee/registration card is returned.

INTRODUCTION

The Contractor WM70 HE has been designed and constructed to give years of trouble-free service and these instructions are provided to assist you in obtaining the best performance with the least trouble and cost.

The boiler is designed to provide both domestic hot water and central heating. It is supplied with an adjustable boiler temperature control thermostat and a manual-reset high-limit thermostat, requiring little attention other than the setting of any additional system controls (such as a room thermostat or programmer).

TO FIRE THE BOILER

Before firing the boiler, ensure that the system is full of water, that there is a sufficient level of oil in the storage tank, and that all isolation valves are fully open.

Check that the time-switch/programmer is **on** and that the room thermostat is calling for heat.

Set the boiler thermostat (**fig 1**) to the desired temperature.

Switch on the electrical supply; the burner will fire up and continue to run until the boiler reaches the temperature set on the boiler thermostat.

Set the time-switch/programmer to the times and programme required. The boiler should now operate automatically, cutting in and out according to the heat demand.

TO STOP THE BOILER

The boiler may be switched off by turning off the boiler control thermostat fully anti-clockwise to the **off** position, 'O'.

If the boiler is to be off for a long period of time, it is recommended that the mains supply to the appliance is switched off, or the time-switch/programmer (if fitted) is set to the **OFF** position.

BOILER CONTROL THERMOSTAT

The boiler control thermostat allows you to adjust the temperature of the water leaving the boiler. It is calibrated between High and Low, in five intermediate settings, corresponding to a temperature range between 80°C (High) and 55°C (Low). The thermostat is switched off when the knob is turned fully anti-clockwise to the 'OFF' position.

Experience will tell you which is the most economical setting to suit your household.

HIGH-LIMIT THERMOSTAT

The high-limit thermostat is factory-set and requires no adjustment. Should the boiler thermostat malfunction and the water temperature rise to 110°C, the limit thermostat will take over and shut down the appliance.

The limit thermostat is located on the front of the control box and can be reset by pushing in the red button. If the thermostat operates frequently, consult your service engineer, as there may be a fault in the system.

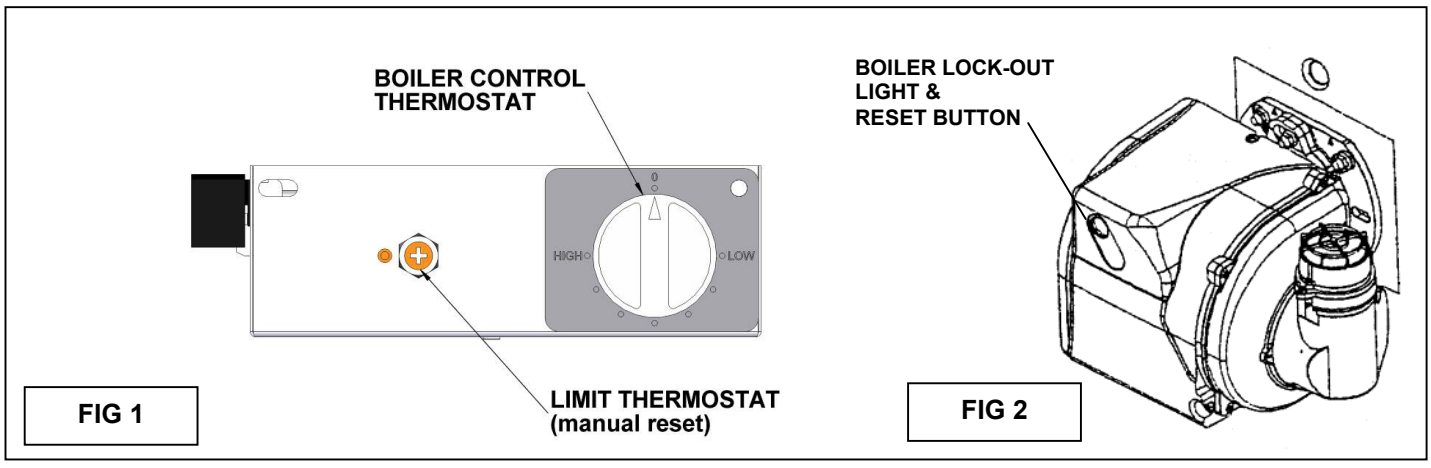
Note: the high-limit thermostat can only be reset when the water temperature has dropped by at least 20°C.

BURNER LOCK-OUT

If the burner fails to light for any reason, the boiler will go into lock-out mode, indicated by the illumination of the reset button on the burner control box (**fig 2**). To reset the burner, press this button. If the burner returns to lock-out, wait for one minute before pressing the button again.

If the burner still fails to light, follow the simple fault-finding guide (**page 5**), before switching off the electrical supply to the boiler and contacting your service engineer if the failure persists.

Important: do not attempt to reset the burner more than twice – constant attempts to do so may cause permanent damage to components within the burner.



SYSTEM CONTROLS

ROOM THERMOSTAT

The room thermostat should not be positioned near a source of heat, such as a radiator, or be exposed to direct sunlight, as this will cause the heating to switch off before the room is up to the correct temperature. Always follow the manufacturer's instructions for the best siting position of the room thermostat.

FROST PROTECTION

If the boiler is to be fitted externally to the property being heated, the water in the system may be in danger of freezing and, as such, it is advisable to protect the installation with a frost thermostat, which will bring the heating on when required.

Where the system is not protected, the heating should be left switched on and the room thermostat left at a low setting (e.g. 7°C) to prevent the building temperature falling too low.

If the system is shut down for a long period during very cold weather, it is also advisable to completely drain the system. However, too frequent draining of the system should be avoided, especially in hard water areas, as this could lead to scaling of the boiler waterways.

See **page 7** for flushing and water treatment.

SHUTTING DOWN FOR LONG PERIODS

If the boiler is shut down for any length of time, it is advisable to have it serviced and thoroughly cleaned as soon as possible to minimise corrosion of the heating surfaces.

OIL

The oil for your boiler is 28 sec. Kerosene class C2 to BS 2869.

Always ensure that the oil storage tank is topped up regularly; do not wait until the tank is nearly empty before refilling, as sludge and water could be sucked into the oil pipe, affecting the operation of the burner and potentially reducing the life of the pump.

After a delivery of oil, it is recommended that it be allowed to settle in the tank for about half an hour before restarting the boiler.

Sludge and water caused by condensation should be drawn off at the drain-cock on the oil tank annually.

SIMPLE FAULT-FINDING

If the boiler fails to start for no apparent reason, carry out the following checks before calling your service engineer:

1. Check for failure in the electrical supply.
2. Check for a blown fuse. If the fuse has blown and the replacement subsequently blows again, switch off the mains electrical supply to the boiler and contact your service engineer.
3. Check that there is adequate oil in the tank and that all isolation valves are fully open.
4. Check for burner lock-out (see **page 4**).
5. Check for excess water temperature (see high-limit thermostat details, **page 4**, for further details).

Note: If the boiler has been shut down due to a failure of the power supply, it may be necessary to reset the time-switch or programmer to the correct time, unless the device has an in-built power reserve.

SERVICING

To ensure the efficient and reliable operation of the boiler it is essential that the burner be **commissioned** immediately after installation, and prior to first use. The boiler requires an annual service thereafter.

IMPORTANT NOTES

1. Only an OFTEC-trained and registered engineer can carry out commissioning and service work.
2. Electrical safety checks should be carried out by a qualified electrical engineer.
3. It is the responsibility of the installer to ensure that the boiler is commissioned immediately after installation.
4. It is a requirement of the guarantee and any extended warranty that an annual service is carried out.
5. The system water **must** always be protected by a corrosion inhibitor.

AFTER-SALES SERVICE INFORMATION

A qualified field service engineer is available to attend a breakdown or manufacturing fault occurring while the appliance is under guarantee.

The appliance must be made available for service during normal working hours, Monday to Friday.

Please note, upon attendance by a Trianco field service engineer, a charge will be made on-site where:

- The field service engineer finds no fault with the appliance
- The cause of the appliance is due to lack of oil, or a fault in the oil supply
- The cause of a breakdown is due to other parts of the system not manufactured by Trianco
- The cause of the breakdown is due to incorrectly fitted spare parts, or third-party spares not designed for specific use with the appliance
- The appliance has not been correctly installed as recommended in these instructions, or by unqualified persons
- The breakdown occurs outside the guarantee period
- The appliance has not been maintained correctly
- The breakdown occurs due to use of the appliance not sanctioned by these instructions
- The breakdown occurs as a direct result of unauthorised third-party work on the appliance

Important:
Invoices for attendance and repair work carried out on this appliance by any third party will not be accepted unless authorised *in advance* by the Trianco service centre.

TECHNICAL ASSISTANCE

A team of trained technical advisors are available to discuss any problem with the appliance which may occur. In many cases, the problem may be solved over the telephone, eliminating the need for a service visit.

HOW TO REPORT A FAULT

Step 1:

Contact your installer or service engineer, who should thoroughly check all recent work before the attendance of our field service engineer is requested.

Step 2:

If your appliance has developed an in-guarantee fault, contact the Trianco service centre for assistance. You will be provided with the name and contact details of our local service agent.

If your own installer/service engineer is unavailable, contact the Trianco service centre. Please be aware that a charge may be made for any visit not covered by the appliance guarantee.

Before contacting either the Trianco service centre or the technical advice line, please have the following information ready:

1) Appliance serial number, or your unique customer identification number (issued upon registration of the appliance with Trianco)
2) Description of fault
3) Date of installation

Boiler Serial No.: _____

Cust. ID No.: _____

Installation Date: ___/___/___

Corrosion Inhibitor Fitted: YES: ___ NO: ___

SERVICE CENTRE AND TECHNICAL SUPPORT
Tel: 0114 257 2300 Fax: 0114 257 2338

Hours of Business
Monday – Thursday: 8:30 – 16:45
Friday: 8:30 – 14:30

INSTALLATION INSTRUCTIONS

2. INTRODUCTION

The Contractor WM70 HE has been designed to conform to European Directive/Standards BED 92/42 EEC LVD EN 73/23 EEC EMC 89/336/EEC.

The matched pressure-jet burner is exceptionally quiet in operation and ensures clean and efficient combustion, with low NOx emissions.

The boiler is designed for sealed systems up to a working pressure of 3 bar, with the appropriate sealed system safety equipment.

To ensure that the boiler is operating at maximum efficiency, the central heating return temperature should be 50°C or above. Maximum performance will be achieved by maintaining a differential of 20°-30°C between the flow and return water temperatures.

This appliance is suitable for sealed, fully pumped systems only.

Routine servicing can be carried out from the front of the boiler.

The boiler is fully automatic in operation and incorporates all necessary safety controls to ensure safe and reliable running.

The boiler is supplied with the burner set for 28 sec. Kerosene Class C2 to BS 2869 fuel to meet the Building Regulation requirements for low-level flue discharge.

BALANCED FLUE KITS

The boiler is supplied equipped for connection to a Trianco balanced flue kit (sold separately). These kits allow the boiler to be installed in a wide variety of site conditions, from low-level discharge through the wall, to high-level and vertical discharge (see **page 19** onwards for details).

The flue kit is available in low-level horizontal, vertical and high level horizontal formats.

As a balanced flue boiler, the Contractor WM70 HE is a room-sealed appliance which conforms to the requirements specified in OFSA100. All flue types are suitable for installation in a garage.

FLUSHING AND WATER TREATMENT

The performance of the appliance could be impaired by system debris or the effects of corrosion. New systems must be thoroughly flushed to remove metal filings, solder, machining oils and any other fluxes or greases before connecting the boiler.

When fitting the appliance to an existing system, it is advisable to clean the system by using an appropriate flushing and descaling agent. Refer to BS 7593 [1992] for guidance.

System additives - corrosion inhibitors and all flushing agents/descalers should be suitable for steel boilers and comply with BS 7593 requirements. It is strongly recommended that a suitable anti-freeze product is applied to the system after flushing.

Always refer to manufacturers' instructions.

Failure to flush and add inhibitors to the system will invalidate the appliance warranty.

The appliance is designed to be fitted to fully-pumped systems only. Failure to do so will invalidate the warranty.

The boiler must not be run without water in the system.

IMPORTANT NOTICE:

To comply with regulations in force, the boiler must be installed and commissioned by an *OFTEC*-registered engineer. The installation must comply with all requirements of current *Building Regulations, Part L.*

Failure to meet the terms of these requirements may invalidate the guarantee.

THE PERSON(S) WHO INSTALLS THIS APPLIANCE, SERVICES OF CARRIES OUT ANY REMEDIAL WORK, i.e. ELECTRICAL FAULT-FINDING, MUST HAVE THE SUITABLE ENGINEERING QUALIFICATIONS.

3. TECHNICAL INFORMATION

ALL DIMENSIONS IN mm.

Required Clearances

Side	5mm
Bottom	60mm
Front[1]	750mm
Top[2]	160mm

[1] required for routine service access
[2] when fitting horizontal balanced flue kit only

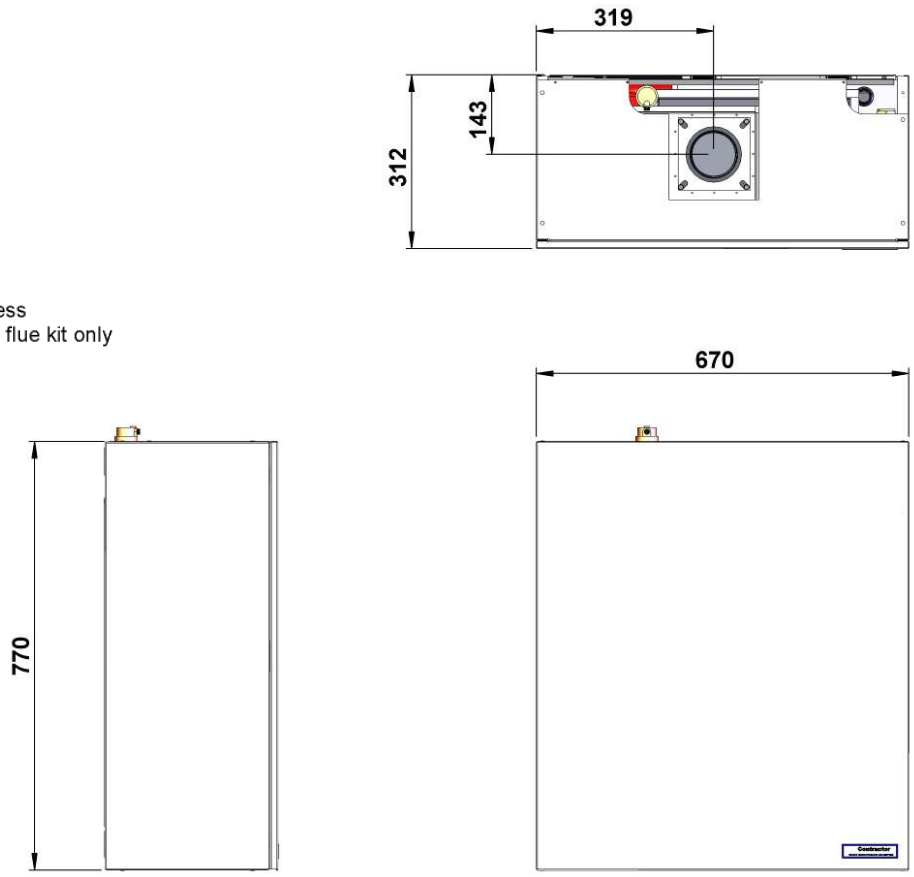


FIG 3
OUTLINE DIMENSIONS

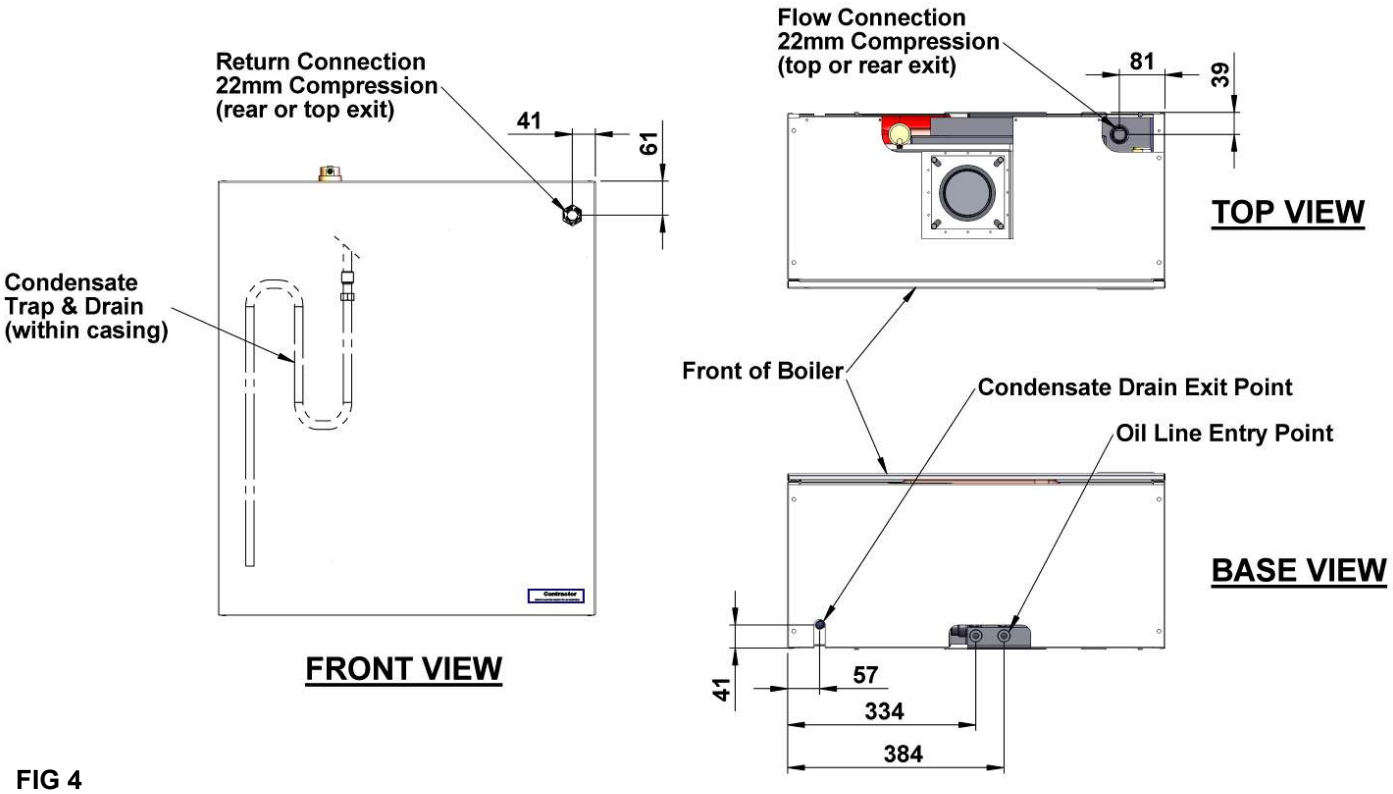


FIG 4
PIPEWORK CONNECTIONS

TECHNICAL DATA

Input (net)	74,723 BTU/h
Output (net)	70,970 BTU/h
SEDBUK Rating	A
Burner	See Burner Details Leaflet
Weight (empty)	91kg
Water Content	16 litres
Flow & Return	22mm Compression
Max. Operating Pressure (HTG)	3 bar (43.5 psi)
Test Pressure	4.5 bar (65.3 psi)
Starting Current	3.5
Running Current	0.77
Electrical Supply	230/240v – 50Hz 220W
Fuse	Fused at 5 amp
Maximum Pressure	3 bar
Fuel	Kerosene 28s BS 2869 Class C2
Hot Water Thermostat	Adjustable between 55°C and 80°C
High Limit Thermostat	Factory-set at 110°C (manual reset)
Casing Finish	Stove enamel painted white
Thermal Insulation	Boiler shell and casings insulated with glass fibre
Optional Extras	Trianco balanced flue kit range (**page 19**)

Model	Input	Output (non condensing)	Output (condensing)	Nozzle	Pump Pressure	CO_2 (%)
50,000	52,247 BTUs	50,000 BTUs	50,784 BTUs	0.45 x 80ºEH	120 psi	11.8
60,000	62,781 BTUs	60,051 BTUs	61,075 BTUs	0.60 x 80ºEH	95 psi	11.5
70,000	74,723 BTUs	70,970 BTUs	72,676 BTUs	0.60 x 80ºEH	135 psi	11.4

4. INSTALLATION

REGULATIONS

Installation of the boiler must comply with the following British Standards and Regulations:

BS 5410: Part 1 – Code of Practise for Oil-Firing.

BS 5449 – Forced Circulation Hot Water Central Heating Systems.

Building Regulations - Part J (England and Wales)
- Part F sect. 111 (Scotland)
- Part L

The Control of Pollution (Oil) Regulations
Current I.E.E. Regulations
Local Water Undertakings Bylaws
OFTEC Installation Requirements for Oil-Fired Boilers and Oil Storage Tanks, OFST 100 & OFST 200.

HEALTH AND SAFETY AT WORK ACT

The installer should be aware of his responsibilities under the Act and provide, where necessary, appropriate protection for all persons carrying out the installation. In the interests of safety, it is required that the appliance is installed, commissioned and serviced by and OFTEC registered technician. A guide to safe working practices for oil-firing technicians is available from OFTEC.

LIFTING

The appliance will require two people to lift into position, or specialised lifting equipment. Do not mount the boiler on the wall unless all necessary precautions have been made.

Electrical work should be carried out in accordance with BS 7671:2001 by a qualified electrical engineer.

SITING THE BOILER

Sound Levels

Despite the low sound levels of the boiler, the following factors should be taken into consideration before installation:

(a) Some people are particularly sensitive to low noise levels – discuss with the householder.

(b) Small rooms tend to amplify noise, particularly if the wall construction is hollow or the surface tiled.

(c) A chimney passing through a bedroom will sometimes transmit noise.

(d) Low-level flue terminals produce some exhaust noise, so care should be taken when siting adjacent to neighbouring property, patios and play areas. Refer to flue details (**page 18** onwards).

(e) Due to the condensing nature of the boiler, a plume of water vapour will be discharged from the flue. This should be taken into account when siting the flue terminal. Refer to section on flue systems.

Clearance and Service Access

When siting the boiler, ensure adequate clearance is allowed for making water and flue connections. Routine servicing can be carried out from the front. See **page 8** for clearance dimensions.

SYSTEM DESIGN

To achieve the maximum system efficiencies, the heating system should be designed to the following parameters:

Boiler Flow Temperature - 50°C to 80°C
Flow Differential Temperature - 20°C to 30°C

HEATING AND DOMESTIC HOT WATER SYSTEMS

The heating system should be installed in accordance with current HVCA Codes of Practice and BS 5449 Part 1 – Forced Circulation Hot Water Central Heating Systems.

Maximum water temperature is 80°C.

The flow and return connections are made via 22mm compression fittings at the top-right of the boiler, and can be run through either the rear or the top.

Where the boiler is also used for providing domestic hot water, a double-feed indirect cylinder to BS 1566 Part 1 must be used.

A drain-off cock is fitted to the underside of the boiler. However, one should always be fitted to the lowest point on the heating circuit.

Flush out the system to remove any residue before filling the system.

CONDENSATE DRAIN CONNECTIONS

The condensate pipe can be fitted after the boiler is positioned and terminates from the base of the boiler casings.

Where possible, connect the condensate pipework to an external waste drain.

If the boiler is to be fitted in a position where the external ground level is higher than the boiler, and there are no internal drains, a condensate pump can be fitted (refer to manufacturers' instructions).

The drain pipe must be installed to allow the condensate to drain naturally from the boiler, on a minimum fall of 1:20.

The drain from the boiler must be 22mm diameter pipework.

The pipework from the condensate trap to the external drain is not supplied with the boiler.

Upon successful installation of the condensate pipework, fill the trap via the fill point on the condensate unit, pouring a small amount of water within, until retained within the 'U' section.

Examine the condensate pipework for any resultant leaks and rectify accordingly.

Failure to fill the trap with water before firing the boiler may result in damage to the drainage pipework and potentially allow the escape of flue gases. Any damage caused as a result of not filling the trap will not be covered by the appliance guarantee.

IMPORTANT NOTES:

When running any external pipework from the trap to the drain, it is essential that the pipework is kept to a minimum and is insulated to prevent the condense from freezing.

MAINTENANCE

The trap should be inspected at regular intervals to ensure correct operation, and should be checked as part of the annual service schedule.

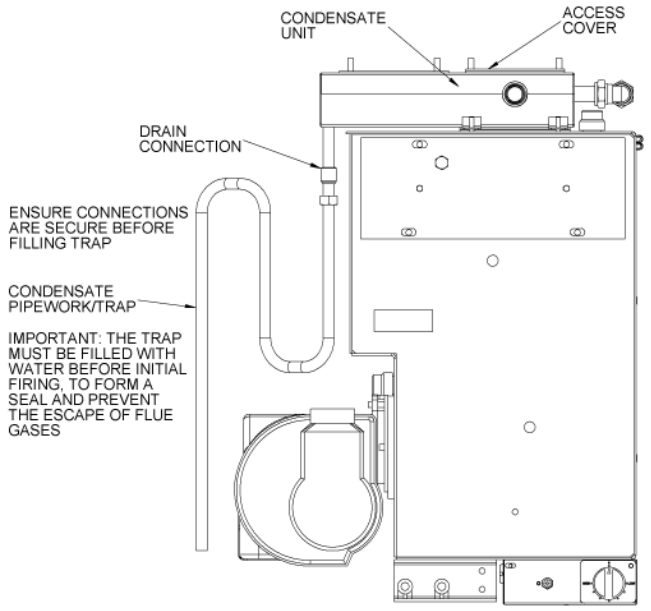


FIG 11 – CONDENSATE PIPEWORK

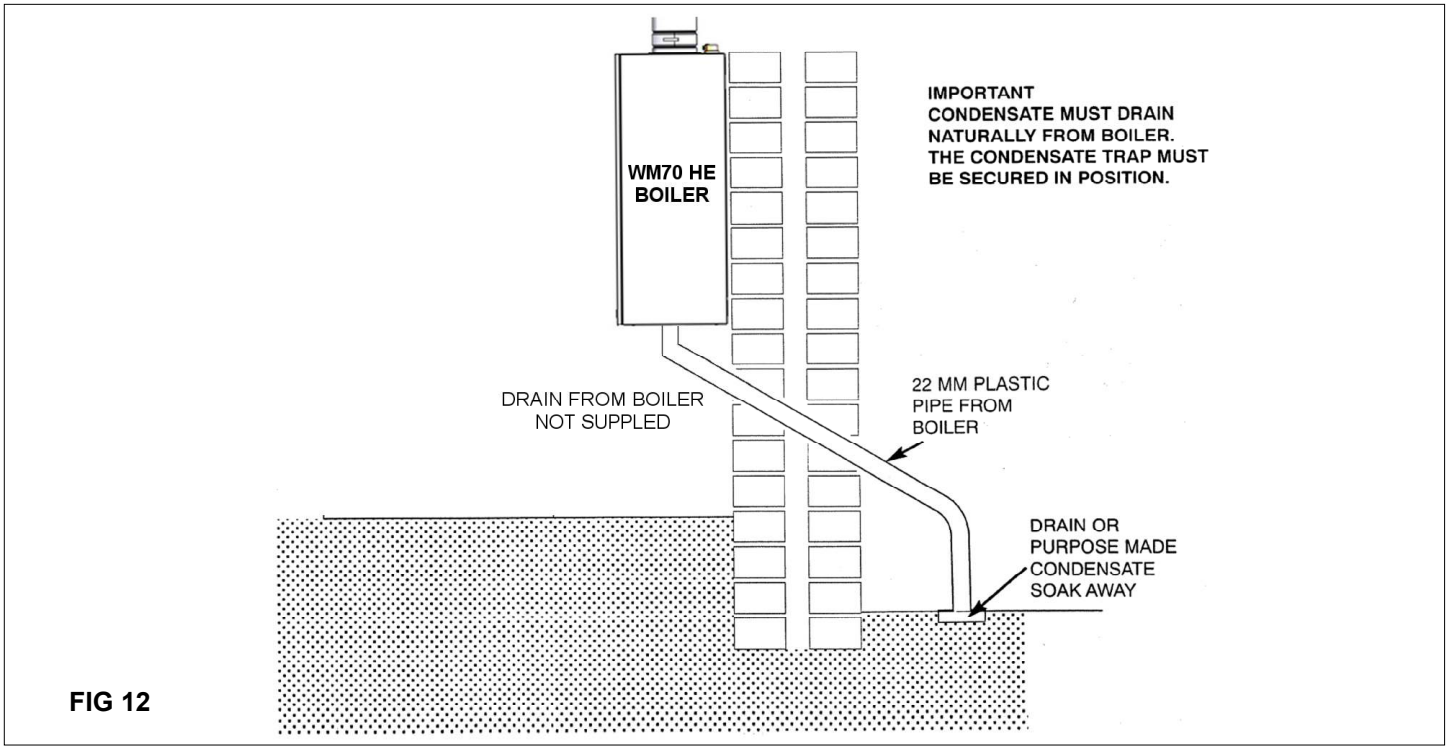


FIG 12

5. OIL SUPPLY

OIL

The burner is factory-set to burn 28 sec. Kerosene Class C2 to BS 2869.

Trianco makes no guarantee as to the satisfactory operation of the boiler using fuels other than that which is stated above.

STORAGE TANK

The tank should be fitted with weather-protected fill and vent connections, a drain-off cock, and an oil level indicator.

Size and Location of Tank

The tank should be large enough to allow for economic deliveries and be located in an unobtrusive position, having regard to the need for safety, filling, maintenance, and head of oil required (see **figs 13, 14, 15**).

Steel Tanks

Steel tanks must comply with the requirements of BS 799 Part 5: 1987 and should be mounted on brick or block piers, with a waterproof membrane fitted between the piers and tank.

Plastic Tanks

Polyethylene tanks may be used, having several advantages over traditional steel tanks:

(a) Pier supports are not required; the tank may be fitted directly onto a flat surface.

(b) They do not corrode; therefore never require repainting.

(c) They are easier to handle because of lower weight.

(d) They are generally supplied with a 10-year manufacturer's guarantee.

Fire Protection

Whilst it is highly unlikely that a fire could start from a domestic oil tank, protection is required from a fire which may originate elsewhere. The tank should be at least 1.8 metres from a building and 750mm from a site boundary. Where it is not feasible to adhere to these limits, the building wall must not have any openings other than those for ventilation, the wall must have at least a half-hour resistance to fire, and must extend 1.8 metres from any part of the tank.

Alternatively, a non-combustible radiation barrier can be employed, which meets all the requirements of BS 5410 Part 1. This standard applies to tanks up to a capacity of 3,500 litres.

See current OFTEC regulations for further details.

To comply with OFTEC regulations, a CD/10 form must be completed and left with the appliance upon installation.

To comply with Building Regulations, **section J5:**

1. Where the tank is close to a dwelling, fire protection must be provided to the eaves, if less than 1.8 metres from the top of the tank.

2. Cladding must extend at least 300mm beyond the tank.

3. The tank must be fitted on a non-combustible base.

Pollution Protection

To comply with Building Regulations, **section J6**, the tank must be bunded (double-walled) if:

1. The tank is less than 10m from a stream

2. The tank is less than 50m from a well, spring, or other source of drinking water.

3. The tank cannot be viewed from the point of delivery.

4. There is risk of oil reaching a manhole cover or drain in the event of a leak.

5. The tank capacity exceeds 2,500 litres.

SUPPLY

A long-life flexible oil hose is supplied with the boiler. A filter and shut-off valve are also required. These should be fitted as shown on **figs 13, 14, 15**.

All oil line joints must be completely sealed and the total pipe run should be flushed thoroughly before connection is made to the burner. No soldered joints are permitted in the oil line.

Fire Valve

A remote-operated fire valve must be fitted in the oil supply line, externally to the boiler, with the sensing phial located at a point within the boiler casings, above the burner.

Single-Pipe Oil Supply (fig 14)

Where the lowermost part of the tank is above the level of the burner, a single-pipe gravity system can be used. The oil supply pipe should be connected to the suction port on the burner pump via the flexible hose supplied.

When using the single-pipe system, it is important to convert the fuel pump on the burner to operate as such: remove the end cover and filter, then remove the bottom screw and insert a 'U'-shaped washer. Replace the screw, making sure it is fully inserted. See the burner details leaflet for further information.

Two-Pipe Oil Supply (fig 15)

Where the lowermost part of the tank is below the level of the burner, a two-pipe suction lift is necessary.

A spring-loaded non-return valve must be fitted in the suction line to prevent the oil running back to the tank. No valves are permitted in the return line. An additional flexible oil line will also be required.

The oil pump is factory-set for use with a two-pipe system.

OIL SUPPLY (cont.)

Notes:

1. The pump suction should not exceed 0.4bar, as dissolved gas may be released from the oil, affecting combustion.

2. The return pipe must end at the same level as the suction outlet to prevent loss of prime.

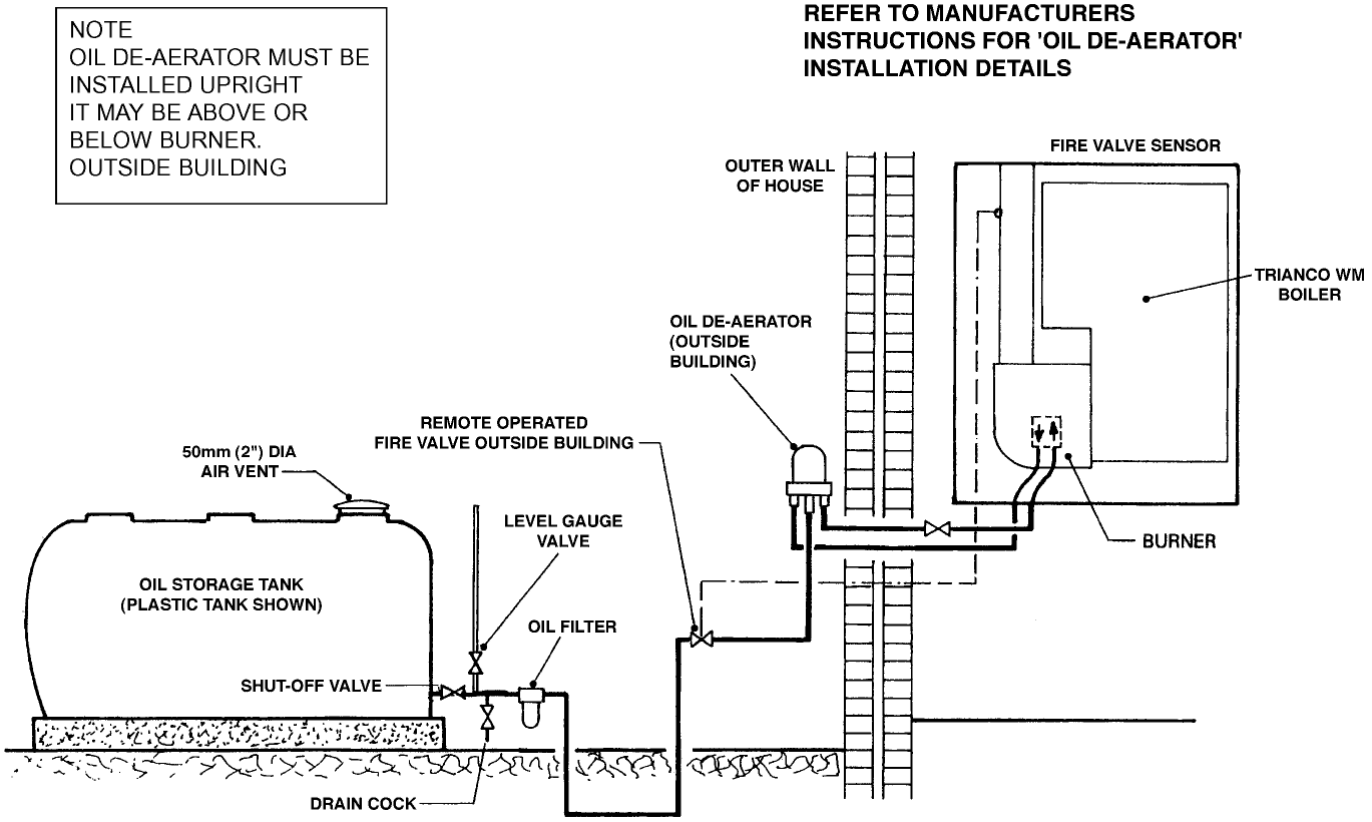
3. The outlet from the tank should be approximately 75mm (3”) above the bottom to prevent sediment and water being drawn into the supply line.

Single-Pipe Oil Supply with De-aerator (fig 13)

Where a two-pipe suction lift is required, but the return pipe requirement is too long, or impractical to run, an oil de-aerator can be used. The burner should be piped as for a two-pipe system, up until the de-aerator, when a single pipe can be taken the remaining distance to the storage tank. The de-aerator should be fitted at the closest point to the boiler, externally to the dwelling.

A non-return valve is not required with this system. The pump is supplied ready for fitting to an oil de-aeration device.

FIG 13
INSTALLATION WITH OIL DE-AERATOR



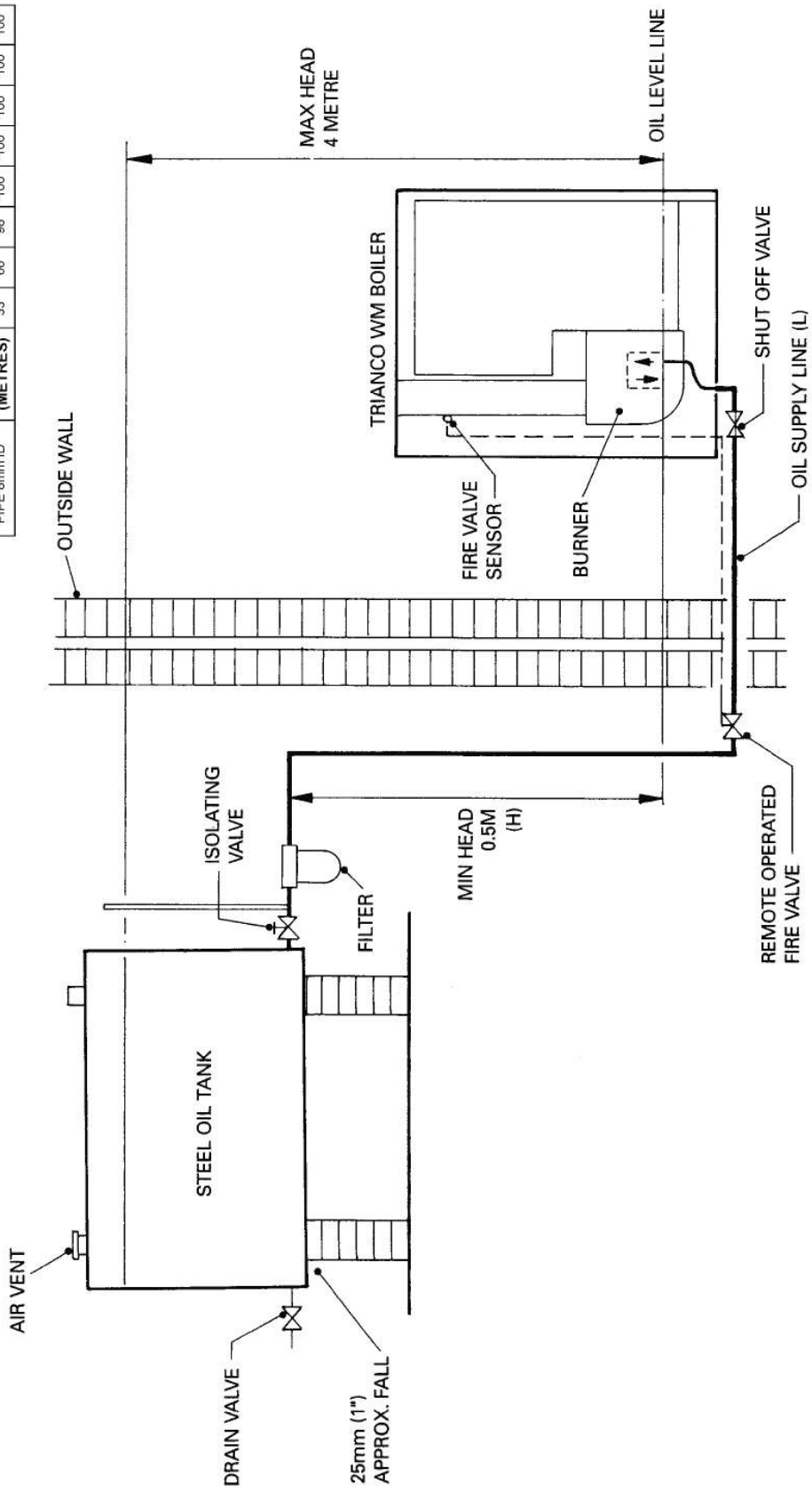


FIG 14
SINGLE-PIPE SUPPLY

MAXIMUM OIL SUPPLY LINE LENGTH 'L'

LIFT 'L' METRES.		.0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
PIPE 6mm ID	MAXIMUM LENGTH (METRES)	48	42	36	30	24	18	11	5
PIPE 8mm ID		100	100	100	94	75	55	36	16
PIPE 10MM ID		100	100	100	100	100	100	88	40

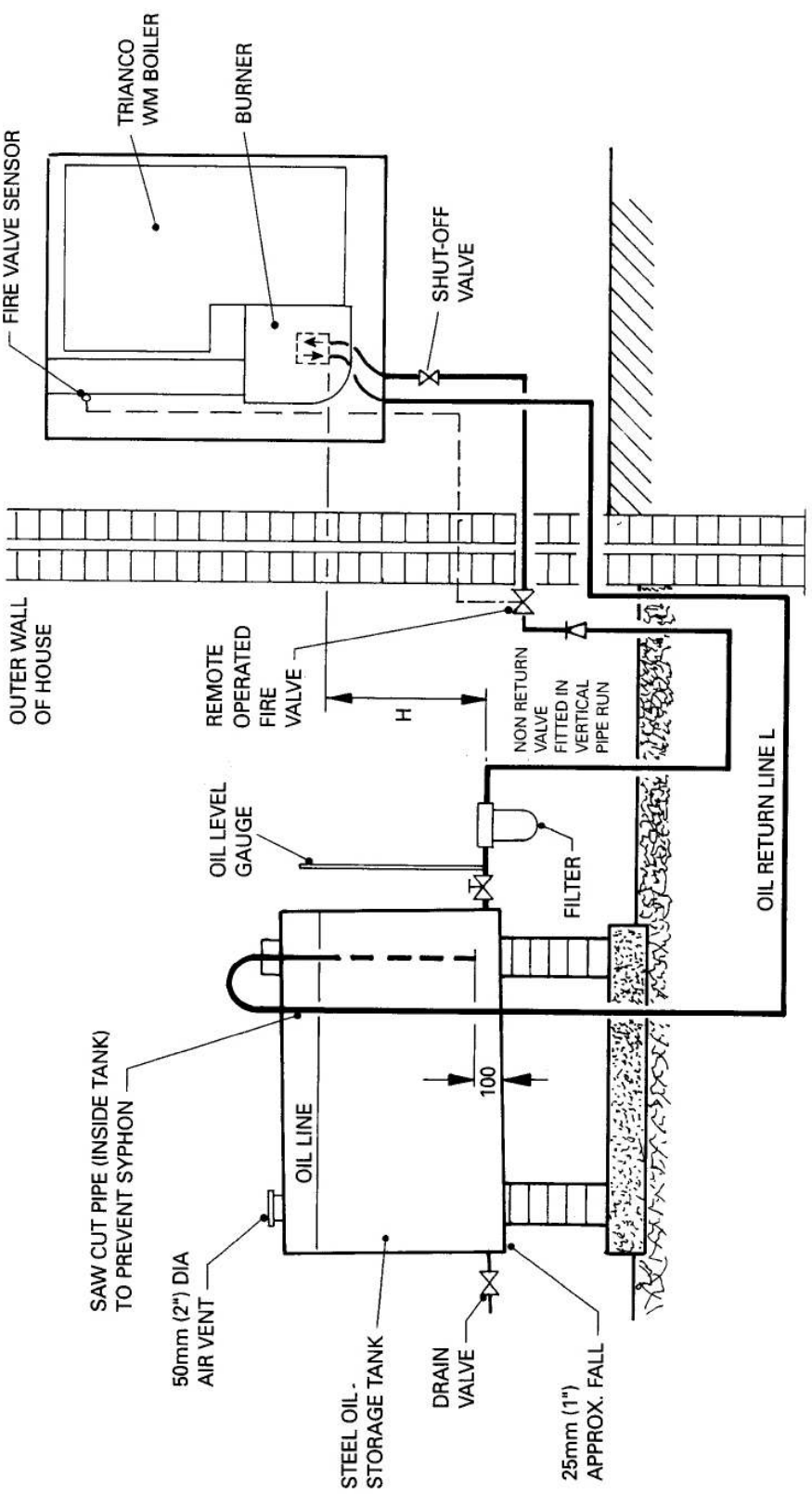


FIG 15
TWO-PIPE SUPPLY

6. ELECTRICAL SUPPLY

230V single-phase 50Hz (fused 5 amp)

Note: this appliance must be earthed and the electrical supply cable must be of a greater length than the current-carrying conductor cables (i.e. live and neutral supply cables).

All electrical wiring must be carried out by a qualified electrician, in accordance with current I.E.E. Regulations and any local regulations which may apply.

The 230V – 50Hz electrical supply must be fused by a double-pole switch, with a contact separation of at least 3mm in both poles, and by a shuttered socket adjacent to the boiler (both devices must meet the requirements of BS 1363).

The minimum requirement for the power supply cable is PVC sheathed flexible cord, 0.75mm² (24x0.2mm, code designation H05 VV-F or H05 VVH2-F), as specified in table 16 of BD 6500.

All cables entering the control box must be secured in position by the use of strain-relief bushes (supplied, see **fig 16** for fitting instructions).

See wiring diagram, **fig 17** for further details.

Important Note:
After wiring in the electrical supply, care must be taken when attaching the control box to ensure no cables are trapped between the boiler and the box.

High and Low Voltage Warning

In certain areas of the country, where there is a known risk of high or low voltage fluctuations, the burner should be prevented from starting by the use of a voltage-sensitive device if the voltage drops or increases sufficiently to endanger the installation.

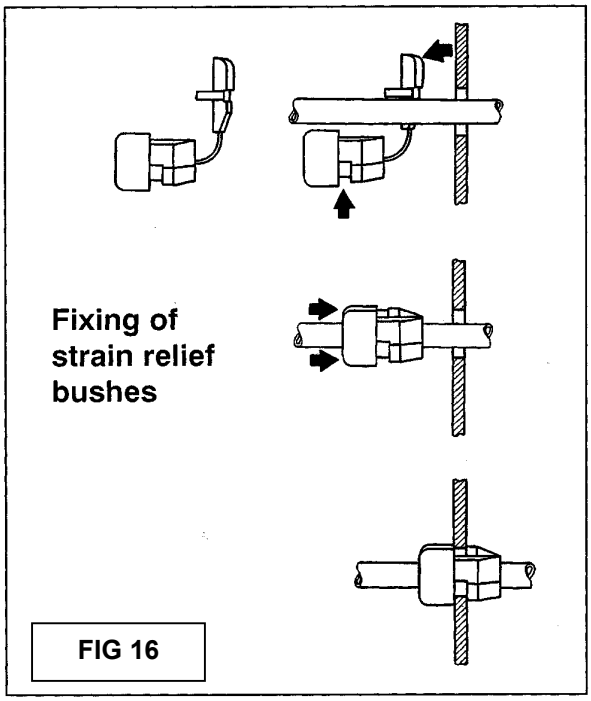
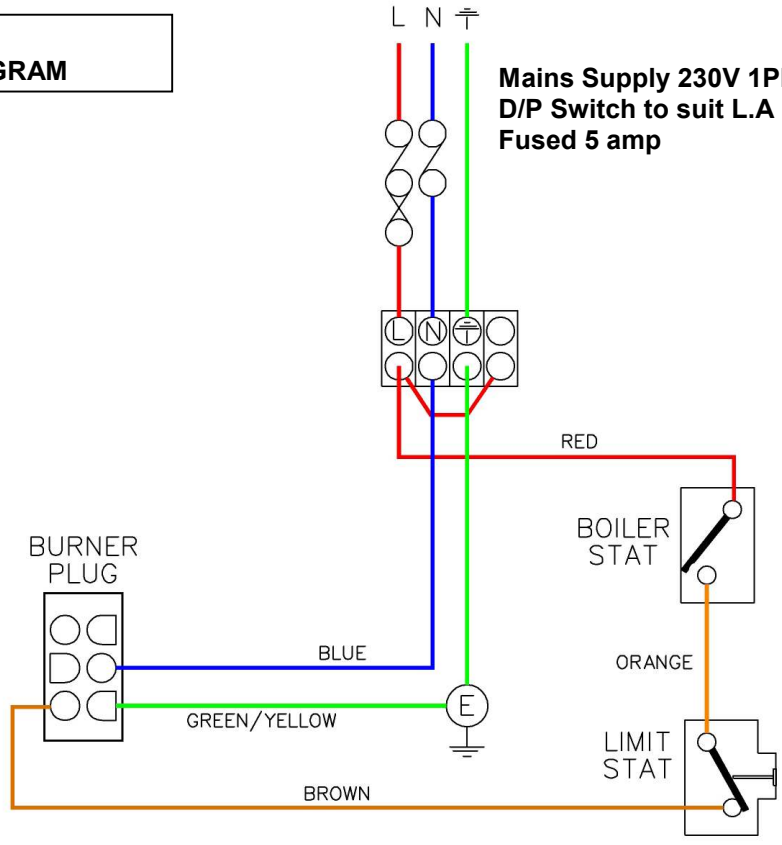


FIG 16

FIG 17
WIRING DIAGRAM



7. MOUNTING

The boiler should be fixed to a suitable load-bearing wall using the fasteners supplied. If these are not appropriate, other fasteners may be used provided they are equally as strong.

Remove the front door and outer casing assembly from the boiler, moving to a place where they will not invite damage. For ease of lifting, it may be useful at this stage to remove the baffles and burner. Ensure all baffles are replaced in the order shown on **page 31**.

Using the template supplied, work out the intended position of the boiler and fix the template to the wall. Drill 6mm holes where indicated and if using a horizontal balanced flue, cut a hole 130mm diameter in the wall.

Remove the wall template and fix the two mounting brackets provided to the wall where indicated.

CAUTION: Uneven Load

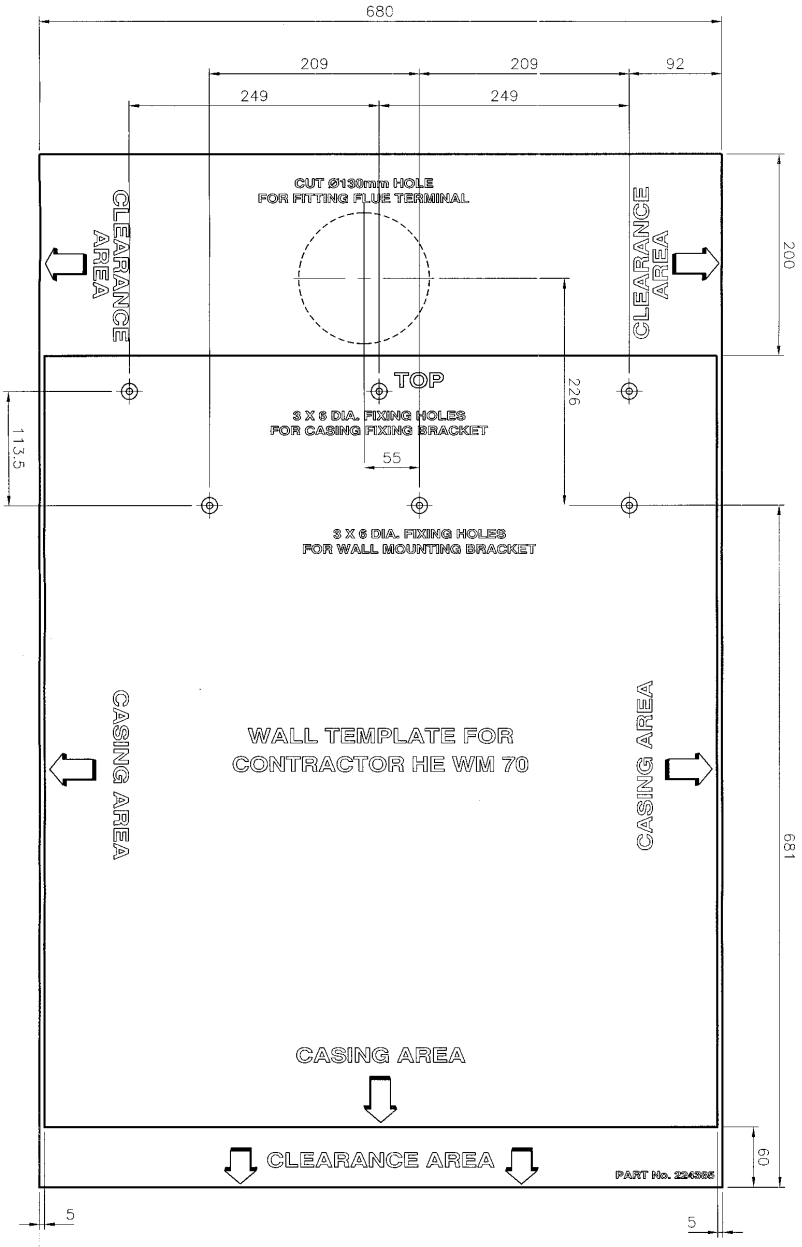
Hang the boiler onto the lugs on the large mounting bracket and drill through one holes in the oil pipe bracket. Fit a plastic wall plug and screw back to the wall.

Fit the casing over the boiler, locating the back top return of the casing over the smaller of the two mounting brackets on the wall. Mark through the holes in the bottom rear of the casing and drill through into the wall. Insert a wall plug and screw the casing back to the wall.

Fit the door casing.

FIG 18 – WALL MOUNTING TEMPLATE

See **fig 3** for flue side exit dimensions



8. FLUES AND VENTILATION

VENTILATION

As the Contractor WM70 HE is a balanced-flue appliance, the provision of an adequate supply of combustion air is not necessary. However, adequate ventilation is required for the cooling of the boiler controls if the appliance is to be installed in a compartment or confined space (see **fig 19**).

The air opening should be positioned so as to cause the least possible draught to the occupants and located so it is not liable to be accidentally blocked.

British Code of Practice BS 5410: Part 1 requires a permanent air inlet opening of 550mm^2 per kW of boiler rated output above 5kW.

The following air openings, shown on **fig 19**, are required for the Contractor WM70 HE.

Output	Detail 'A' (fig 19)
50,000 Btu/h	53cm²
60,000 Btu/h	69cm²
70,000 Btu/h	83cm²

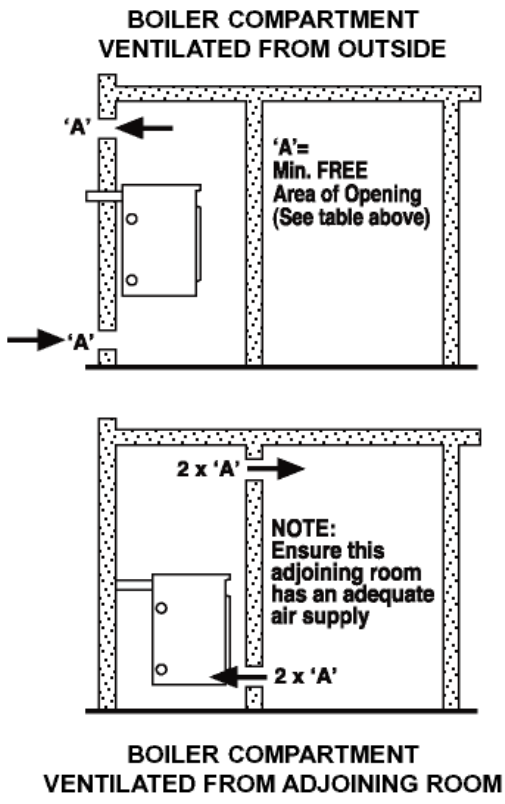


FIG 19
VENTILATION

BALANCED FLUE SYSTEMS

The Trianco balanced flue system offers much greater flexibility for siting the boiler compared with a conventional chimney. The only requirement is for a suitable outside surface, through which to fit the terminal.

In addition to the siting benefit, the performance of balanced flue boilers is virtually unaffected by high wind conditions as the wind pressures are applied equally to both the air intake and discharge points, thus creating a balanced condition.

Whereas some balanced flue boilers rely on case sealing to achieve a room seal, the Contractor WM70 HE has a sealed air duct system which maintains room sealed performance even when the casing is removed for burner commissioning and service.

The use of the balanced flue principle also enhances the overall thermal efficiency of the boiler, as the incoming air extracts waste heat from the flue and returns it as pre-heated air to the burner to aid combustion.

Balanced-flue condensing boilers are designed to operate at low noise levels.

INSTALLATION NOTES

1. At certain times during operation, a plume of condensation will be produced from the terminal. When positioning, this should be taken into consideration to ensure a nuisance is not caused to neighbouring properties.

2. The flue terminal should not be positioned where the products of combustion could enter the building (refer to **fig 20** for guidance).

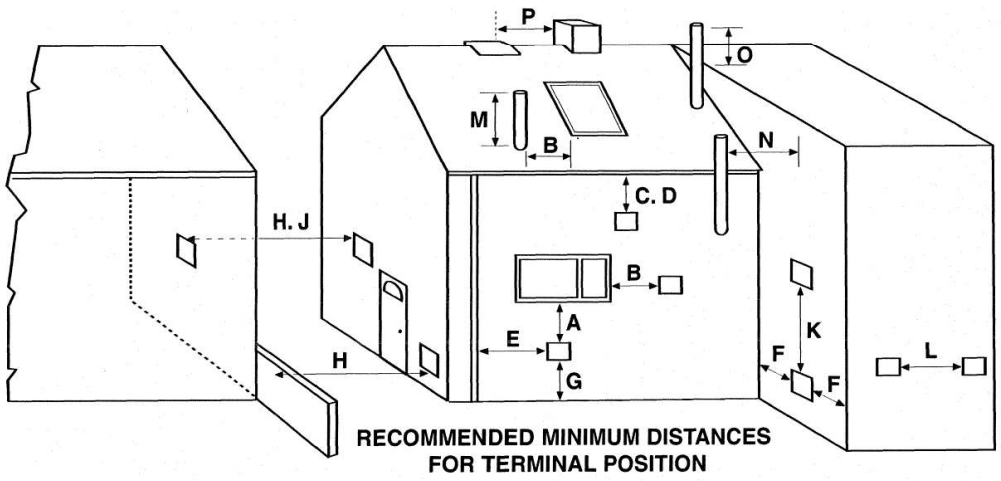
3. Keep the terminal clear of infra-red sensing devices such as those used to control security lighting.

4. Positioning of the terminal below a balcony or carport should be avoided.

5. As the system operates under positive pressure, it is essential that all flue joints are sealed correctly.

6. Only 28. second kerosene class C2 to BS 2869 has been tested for use with this appliance.

Note: Trianco balanced flue kits have been designed and tested exclusively for use with Trianco boilers. As such, compatibility with other makes of boiler cannot be guaranteed.



RECOMMENDED MINIMUM DISTANCES FOR TERMINAL POSITION

Appliance burner type - Pressure Jet Minimum distances to terminals in millimetres as measured from top of chimney or the rim of a low level discharge opening			
A	Directly below an opening, air brick, window etc		600
B	Horizontally to an opening, air brick, window etc		600
C	Below a gutter, eaves or balcony with protection		75
D	Below a gutter or balcony without protection		600
E	From vertical sanitary pipework	(*600)	300
F	From an internal or external corner	(*600)	300
G	Above ground or balcony level	(*600)	300
H	From a surface or boundary facing the terminal		600
J	From a terminal facing the terminal		1200
K	Vertically from a terminal on the same wall		1500
L	Horizontally from a terminal on the same wall		750
M	Above the highest point of an intersection with the roof		600
N	From a vertical structure on the side of the terminal		750
O	Above a vertical structure less than 750mm from the side of the terminal		600
P	From a ridge terminal to a vertical structure on the roof		1500

Note (1) The terminal should be positioned so as to avoid products of combustion entering the building.

Note (2) If the terminal is less than 2 metres above the ground level, balcony or place to which any person has access, the terminal must be protected by a guard.

Note (3) The flue must be positioned so that it does not cause nuisance and permits the dispersal of combustion products.

*Scotland 1990

FIG 20 – TERMINAL POSITIONS

Horizontal Balanced Flue Kits 2358 & 2359

Before commencing assembly, please make sure that you have correctly identified the placement of each pipe section and that all 'O' ring seals are in position and well-lubricated.

Assembly Method (figs 21 to 22)

1. Having decided the position of the boiler, accurately mark out the position of the terminal and cut a circular hole 130mm in diameter through the wall.

2. Secure the air box (**item 1**) and underside gasket (**3**) to the top of the boiler using the nuts provided. Feed the elbow (**4**) through the opening on the air box and fit to the spigot in the top of the boiler, ensuring the open end is directed towards the cutout in the wall.

3. Fit the remaining two gaskets (**3**) and cover (**2**) to the air box, ensuring an air tight seal is made.

4. Ensuring the 'O'-ring seal (**8**) is in position and well-lubricated, slide the flue mid-section (**5**) through the wall and locate over the inner elbow and outer connection on the air box. Secure in position using the clamping strap (**7**) provided.

5. Slide the terminal (**6**) through the wall and locate in the flue mid-section. Adjust the terminal length as required, making sure a minimum distance of 140mm is kept from the end of the terminal from the external face of the wall.

Alternatively, fit the flue terminal to the mid-section before locating through the wall.

6. Connect the hose from the burner to the socket on the internal air chute using the jubilee clip provided.

7. Seal around terminal on the inside and outside wall with an appropriate material.

Important Notes:

(a) To aid assembly, it will be necessary to apply a thin bead of lubricant to all flue joints which incorporate 'O'-rings.

(b) As the flue system operates under positive pressure, all flue joints must be well sealed. All joints which do not incorporate 'O'-rings must be sealed with silicone sealant.

(c) As the boiler produces condensate during normal running, it is important that all seals are made and the correct gaskets used.

(d) To ensure that any condensate produced in the flue drains away, incline the flue slightly upwards from the boiler.

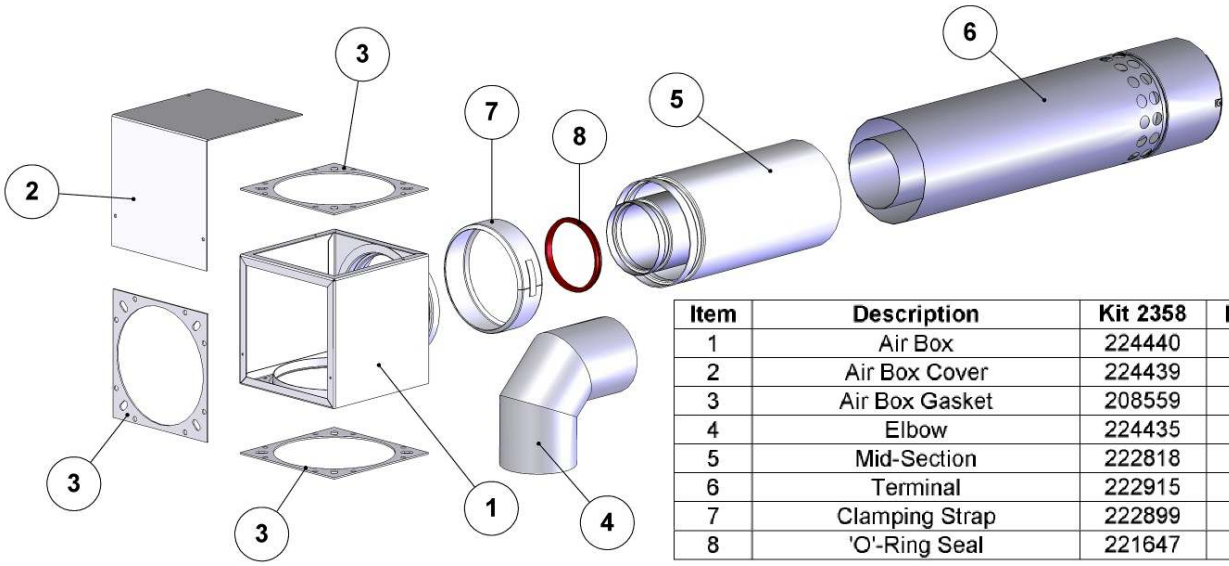
EXTENDING THE FLUE

Should the horizontal length of the standard flues not meet your requirements, additional sections of flue pipe can be purchased to extend the maximum wall thickness limit. 45º and 90º elbows can be purchased in order to offset the flue around obstructions. See **page 29** for details.

TERMINAL GUARD

Where the terminal is positioned in a place where there is the possibility of contact being made by persons, or of damage to the terminal, an approved terminal guard is necessary. Generally, exhaust 2 metres above ground level alleviates the requirement for a terminal guard.

A suitable stainless steel terminal guard is available from Trianco (part code **223920**).



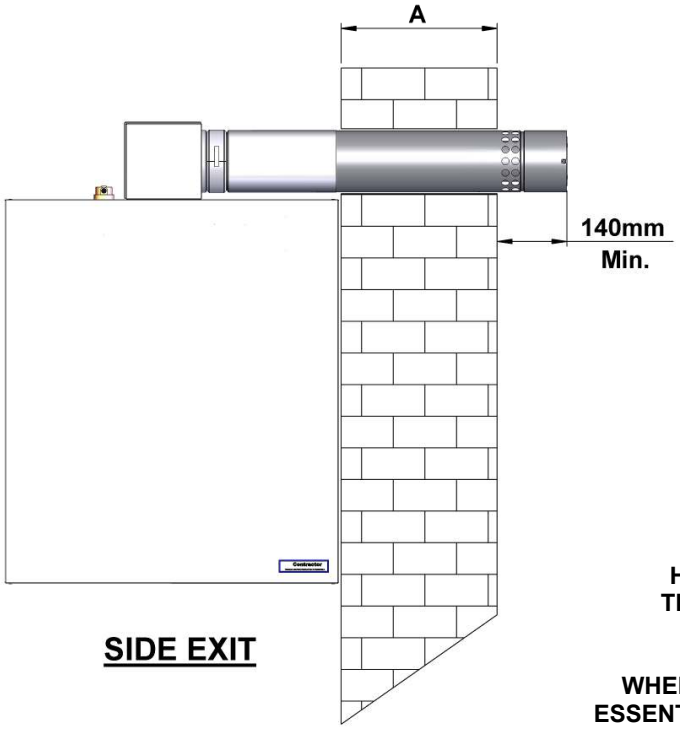
Item	Description	Kit 2358	Kit 2359	Qty
1	Air Box	224440	224440	1
2	Air Box Cover	224439	224439	1
3	Air Box Gasket	208559	208559	3
4	Elbow	224435	224435	1
5	Mid-Section	222818	222818	1
6	Terminal	222915	222920	1
7	Clamping Strap	222899	222899	1
8	'O'-Ring Seal	221647	221647	1

FIG 21
2358 & 2359 HORIZONTAL BALANCED FLUE KITS

FIG 22
2358 & 2359 HORIZONTAL BALANCED FLUE KIT DETAILS

	Dim 'A' Minimum	Dim 'A' Maximum
2358 – Short Horizontal BF Kit	108mm	315mm
2359 – Long Horizontal BF Kit	508mm	715mm

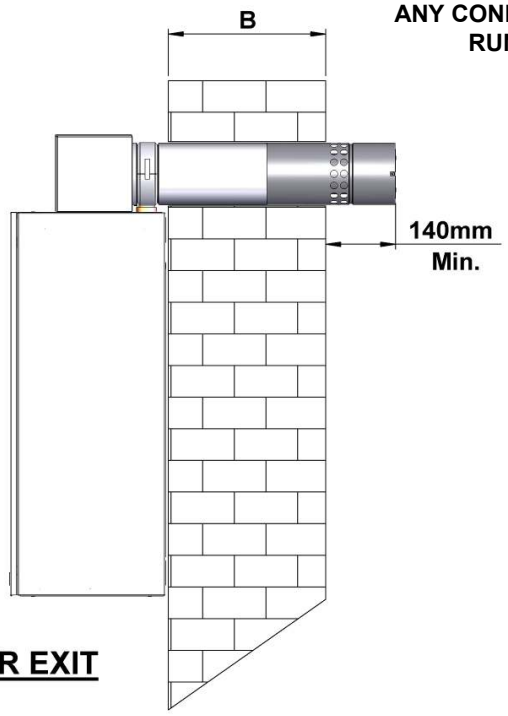
	Dim 'B' Minimum	Dim 'B' Maximum
2358 – Short Horizontal BF Kit	315mm	520mm
2359 – Long Horizontal BF Kit	715mm	920mm



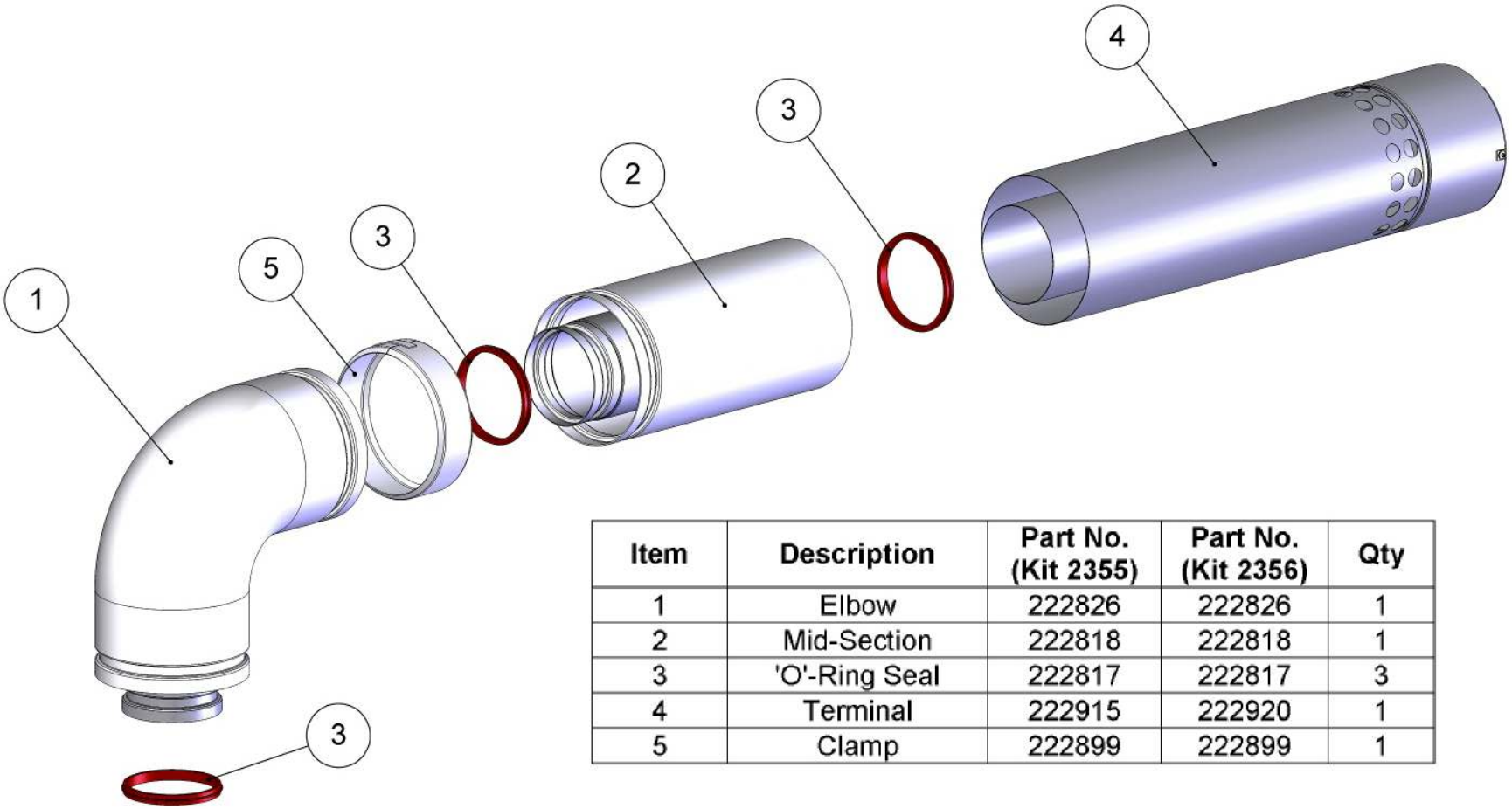
SIDE EXIT

HOLE REQUIRED 130mm DIAMETER THROUGH WALL TO TAKE TERMINAL

IMPORTANT:
WHEN INSTALLING THE FLUE SYSTEM, IT IS ESSENTIAL THAT THE FLUE INCLINES SLIGHTLY FROM THE BOILER. THIS WILL ALLOW ANY CONDENSATION WHICH FORMS IN THE FLUE TO RUN BACK TO THE CONDENSATE DRAIN

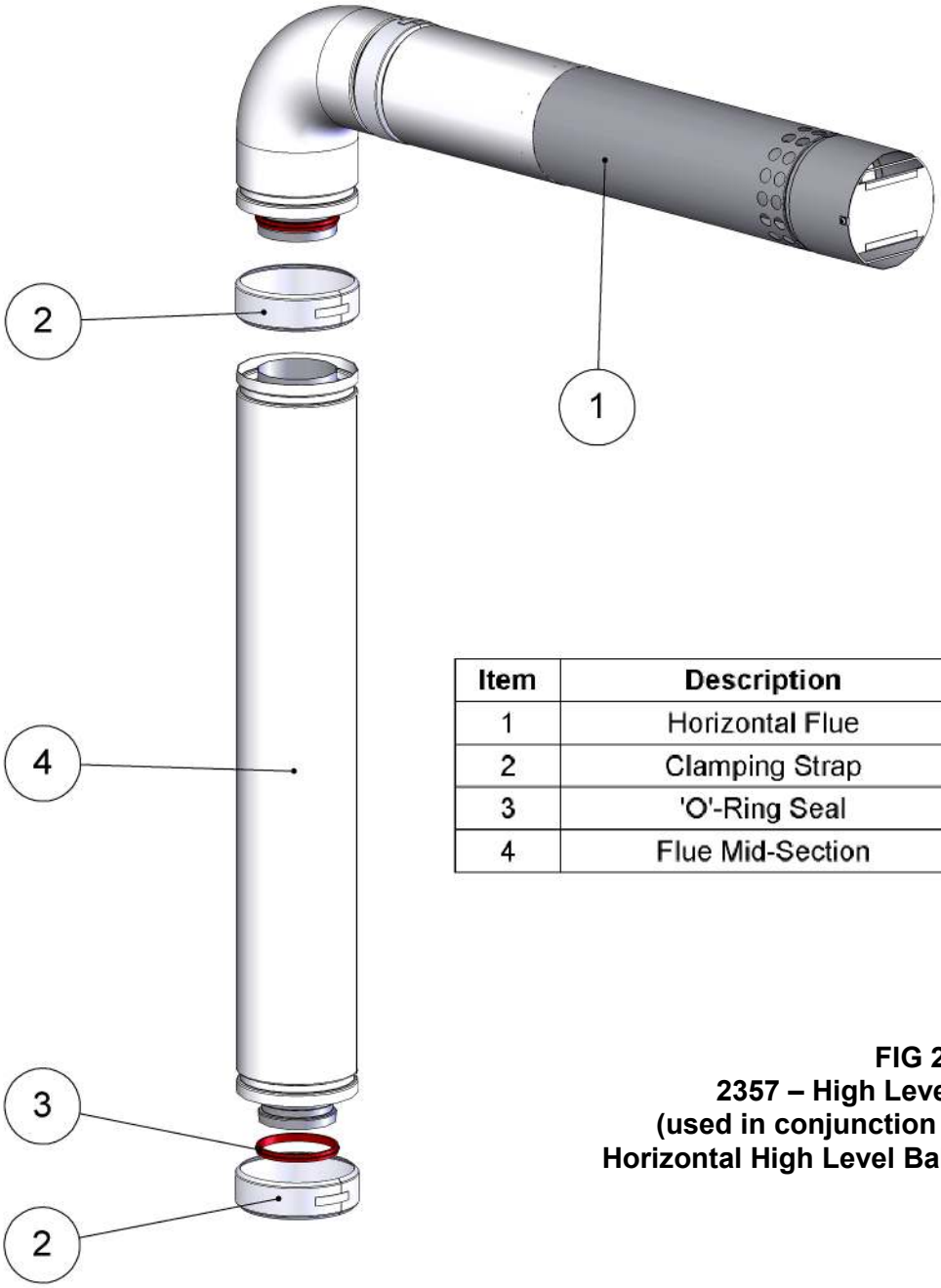


REAR EXIT



Item	Description	Part No. (Kit 2355)	Part No. (Kit 2356)	Qty
1	Elbow	222826	222826	1
2	Mid-Section	222818	222818	1
3	'O'-Ring Seal	222817	222817	3
4	Terminal	222915	222920	1
5	Clamp	222899	222899	1

FIG 23 - 2355 & 2356 Horizontal Balanced Flue
(to be used in conjunction with 2357 High Level Adaptor Kit only)



Item	Description	Part No.	Qty
1	Horizontal Flue	2355 or 2356	1
2	Clamping Strap	222899	2
3	'O'-Ring Seal	222817	1
4	Flue Mid-Section	222867	1

FIG 24
2357 – High Level Adaptor Kit
(used in conjunction with 2355 or 2356
Horizontal High Level Balanced Flue Kits only)

	Dim 'A'		Dim 'B'	
	Min	Max	Min	Max
Kit 2355	370mm	565mm	160mm	355mm
Kit 2356	770mm	965mm	560mm	755mm

Note:
The flue lengths given on this page are for the standard kits only. Please see pages 25 & 29 for details of optional extension pieces.

In addition, the total flue length (horizontal & vertical) must not exceed 6000mm.

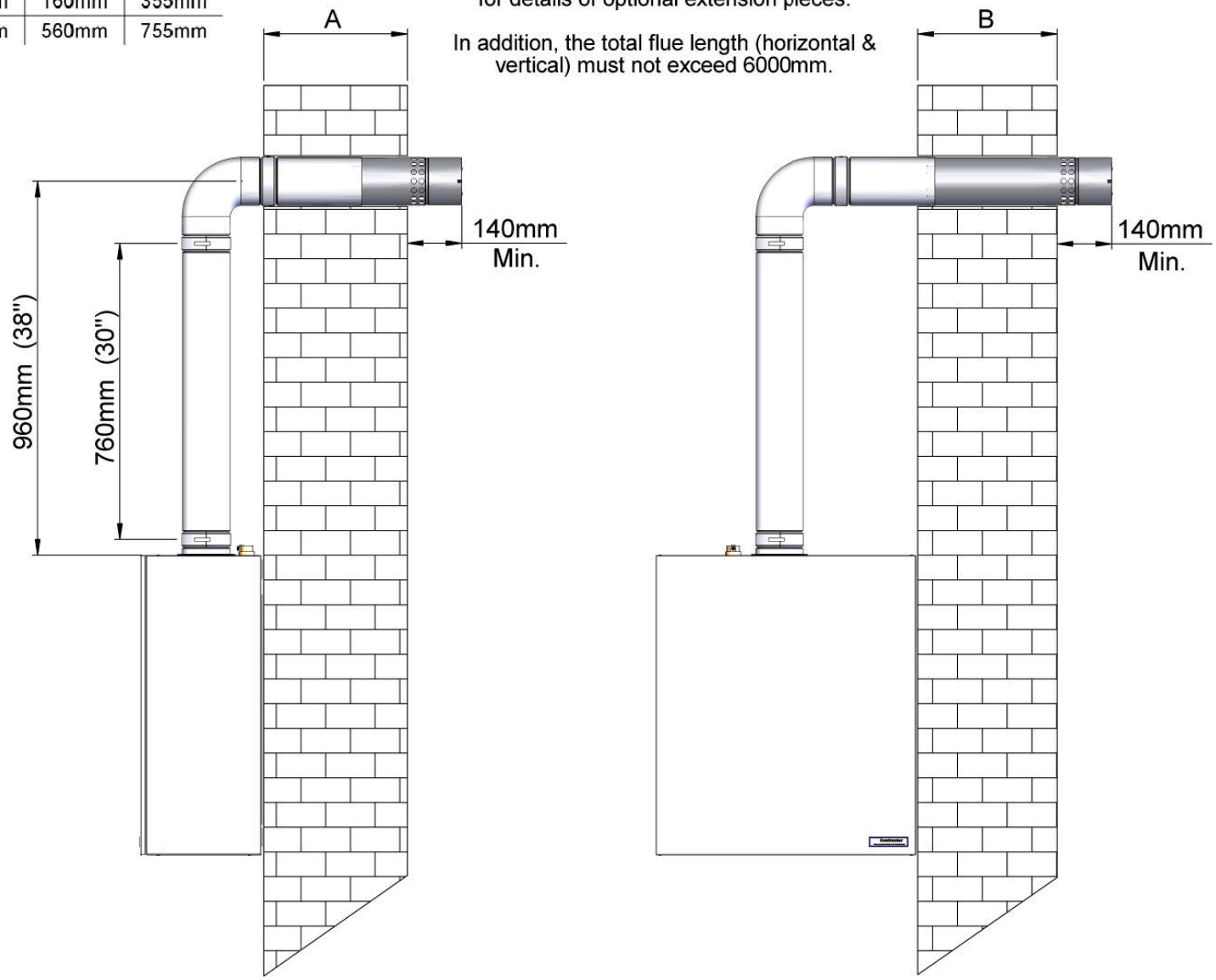


FIG 25
2357 – HIGH LEVEL ADAPTOR KIT
(USED IN CONJUNCTION WITH 2355 AND 2356 FLUE KITS ONLY)

High-Level Balanced Flue Kit (2357)

Before commencing assembly, please make sure that you have correctly identified the placement of each pipe section and that all 'O' ring seals are in position and well-lubricated. Any white pipe exposed to the elements should be protected with a suitable material. Place all weld seams to the rear.

ASSEMBLY METHOD

Before assembly, determine the length of flue required and if necessary discard the mid-section. See "alternative vertical lengths" (adjacent) for details of different flue lengths.

1. Having decided the position of the boiler, cut a hole 130mm diameter in the wall. Refer to **fig 25** and "alternative flue heights" for high level flue positions.

2. Ensuring the 'O'-ring seal (**3**) is in position and well-lubricated, fit the flue mid-section (**4**) into the spigot attached to the boiler, pushing the outer sections of pipe firmly together. Use the clamping strap (**2**) to fasten these items securely to create a seal.

3. Fit the lower flue section (**item 4**) to the spigot (**item 6**), now situated on top of the boiler, ensuring the 'O'-ring creates a good seal.

4. Ensuring that all 'O'-ring seals are in position and well-lubricated, fit the elbow (**item 1**, **fig 23**) from the horizontal balanced flue kit to the top of the flue mid-section, pushing firmly together until the outer sections meet. Use the clamping strap to fasten these items securely together.

5. Decide the length of horizontal run required and slide the terminal (**item 4**, **fig 23**) into the horizontal mid-section (**item 2**, **fig 23**). Once in the required position (and ensuring that at least 140mm will project from the outside wall), seal these items together using a suitable material.

6. Ensuring that all 'O'-rings are in position, slide the completed terminal assembly through the wall and fit to the flue elbow, pushing firmly together until the outer sections meet. Use the remaining clamping strap to fasten these items securely together.

7. Use the clip provided to secure the air hose from the burner to the connection on the air box assembly inside the boiler.

8. Perform a final check of the flue. Ensure all clamping straps are located over all relevant flue joints.

9. Seal any remaining gaps in the wall around the horizontal flue section with a suitable material.

ALTERNATIVE FLUE HEIGHTS

Should the height of the flue (see **fig 25**) not meet your requirements, alternative arrangements can be made by purchasing additional sections of flue pipe to extend the vertical distance. See **page 29** for details.

ALTERNATIVE HORIZONTAL LENGTHS

Should the horizontal length of the standard flues not meet your requirements, an additional section of flue pipe can be purchased to extend the maximum wall thickness limit. See **page 29** for details.

ADDITIONAL ELBOWS

When used in conjunction with additional horizontal lengths of flue, 45º and 90º elbows can be purchased in order to offset the flue on the horizontal plane. See **page 29** for details.

Additional 45º elbows can be purchased to offset the vertical sections of flue. 90º elbows cannot be used on the vertical sections. See **page 29** for details.

IMPORTANT:
The total flue distance, vertical and horizontal, **must not** exceed 6000mm. Any 45º elbows used in the assembly contribute 500mm to the calculation. 90º elbows contribute 1000mm to the calculation.

To ensure that any condensate produced in the flue drains away correctly, incline the flue slightly upwards from the boiler.

TERMINAL GUARD

Where the terminal is positioned in a place where there is the possibility of contact being made by persons, of damage to the terminal, or if it is lower than 2 metres from ground level, an approved terminal guard is necessary.

Generally, exhaust 2 metres above ground level will alleviate the requirement for a terminal guard.

A suitable stainless steel terminal guard is available from Trianco (part code **223920**).

Vertical Balanced Flue Kit (2360)

Before commencing assembly, please make sure that you have correctly identified the placement of each pipe section and that all 'O' ring seals are in position and well-lubricated. Any white pipe exposed to the elements should be protected with a suitable material. Place all weld seams to the rear.

ASSEMBLY METHOD

The flue can either be assembled on the ground before attaching to the boiler, or piece-by-piece in situ. If the former, ensure that all clamping straps (**items 11** & **12**, **fig 26**) are loosely in position over the flue joints. If the latter, ensure that none of the flue joints are situated within the joist space.

The total flue length required should be determined before assembly. If necessary, discard the mid-sections (**item 7**), as their use is not essential. See **fig 27** for details of different flue lengths.

1. Secure the boiler in position and cut a hole 175mm diameter in the ceiling and roof. Ensure the flue will have a minimum clearance of 25mm from any combustible material.

2. Ensure all 'O'-ring seals (**item 5**) are in position on all sections of pipe. Apply a thin bead of lubricant around each 'O'-ring.

3. Fit the first flue mid-section (**item 7**) to the spigot situated on top of the boiler, ensuring the 'O'-ring creates a good seal and pushing firmly down until the outer sections meet. Use the clamping strap (**item 11**) to fasten these items securely together. Fit the second flue mid-section (also **item 7**), and the third flue section (**item 8**) to the previous sections in the same manner.

Note: both instances of **item 7** can be discarded if they are not required. Of the main flue sections, only the use of **items 8** is mandatory. Fit these together in the manner described above.

4. The first terminal section (**item 9**) fits over the preceding section of flue without the use of the clamping strap, and in order to achieve a more accurate fit distance is telescopic in nature. Once the length has been set, drill through the outer pipe and secure with self-tapping screws.

5. If necessary, fit the terminal (**item 10**) to the terminal lower section before it is attached to the last main flue section. Push firmly down until the outer sections meet and use the stainless steel clamping strap (**item 12**) to fasten these securely together.

6. Fit the ceiling plates (**item 13**) centrally over the inner hole, ensuring the outer flue pipe has a minimum clearance of 25mm from any combustible material. Pack the space with glass fibre insulation.

7. Secure the flue to the roof space and fit waterproof flashing (not supplied) around the flue at the roof line.

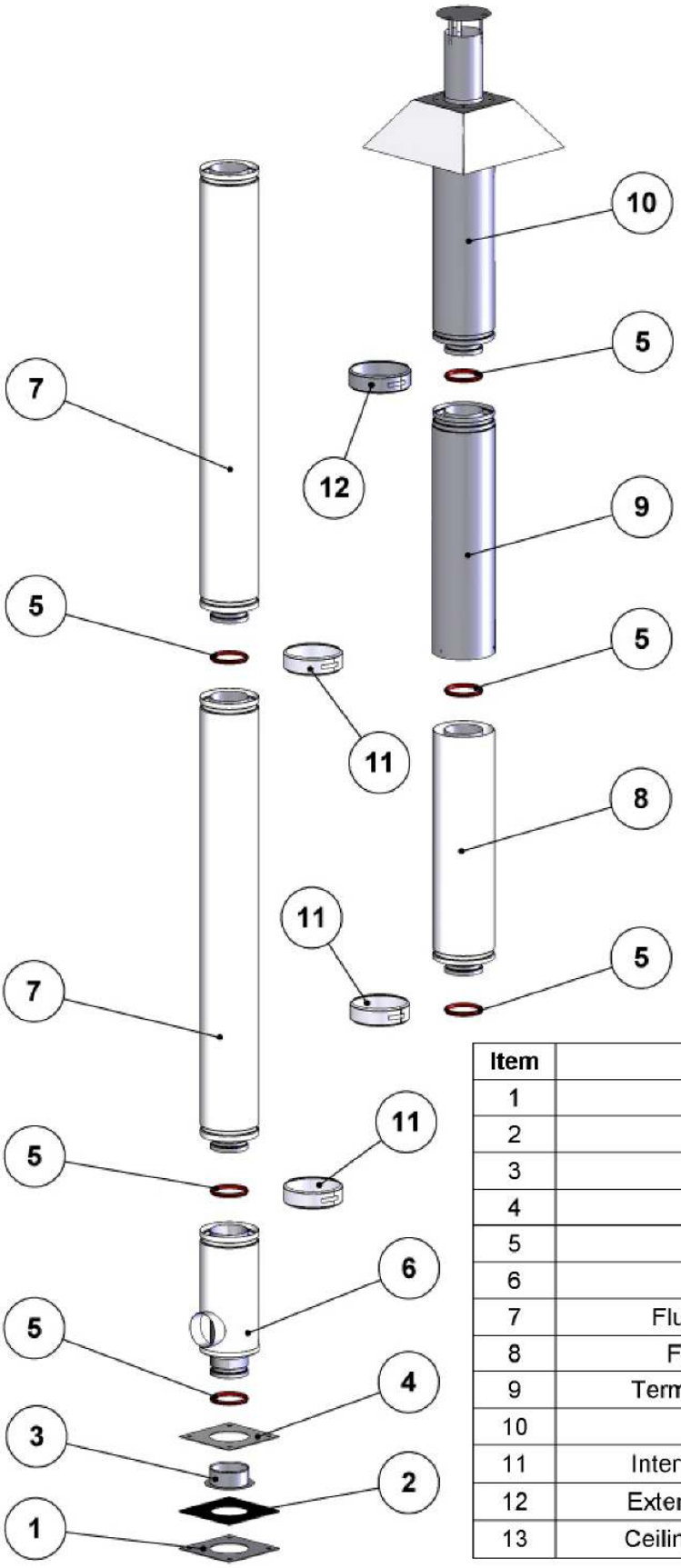
8. Use the clip provided to secure the air hose from the burner to the connection on the air box assembly inside the boiler

ADDITIONAL FLUE HEIGHTS & ELBOWS

Should the maximum height of the flue not meet your requirements, additional sections of flue pipe can be purchased to extend the vertical distance. See **page 29**for details.

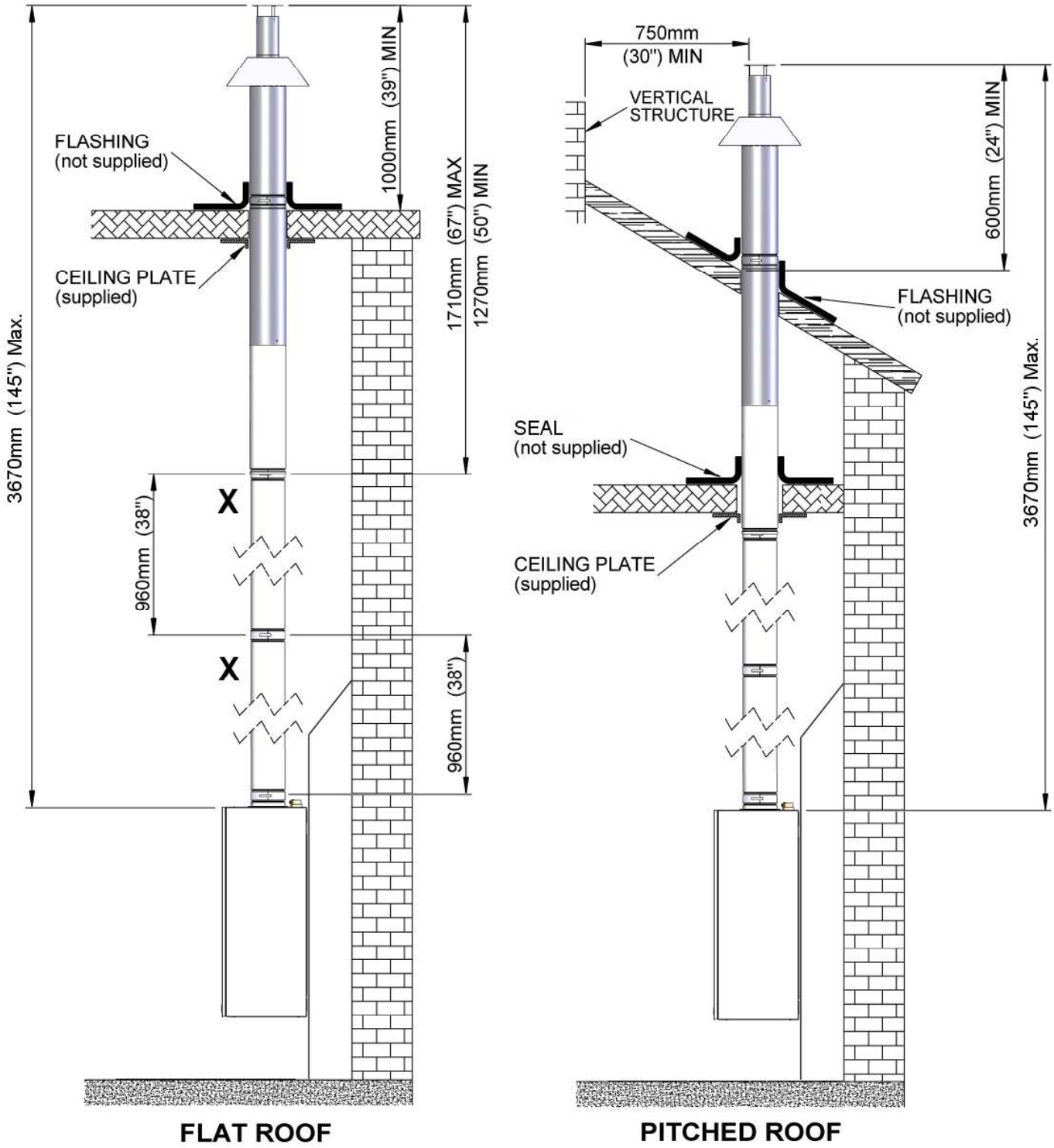
45º elbows can be purchased to offset the flue to keep clear of any permanent obstructions. See **page 29** for details. 90º elbows **cannot** be used with this flue.

IMPORTANT: The total flue distance, vertical and horizontal, **must not** exceed 6000mm. Any 45º elbows used in the assembly contribute 500mm to the calculation.



Item	Description	Part No.	Qty
1	Not Required	N/A	N/A
2	Not Required	N/A	N/A
3	Not Required	N/A	N/A
4	Not Required	N/A	N/A
5	'O'-Ring Seal	222817	6
6	Not Required	N/A	1
7	Flue Middle Section	222829	2
8	Flue Top Section	222877	1
9	Terminal Lower Section	222880	1
10	Terminal	222850	1
11	Internal Clamping Strap	222899	3
12	External Clamping Strap	222894	1
13	Ceiling Plate (not shown)	208583	2

FIG 26
VERTICAL BALANCED FLUE KIT (2360)



Note 'X' – Shorter flue distances can be achieved by discarding these sections. Longer flue distances can be achieved by purchasing additional sections of pipe (see page 29).

Permanent obstructions may be avoided by the use of 45º elbows (see page 29).

FIG 27
VERTICAL BALANCED FLUE KIT (2360)

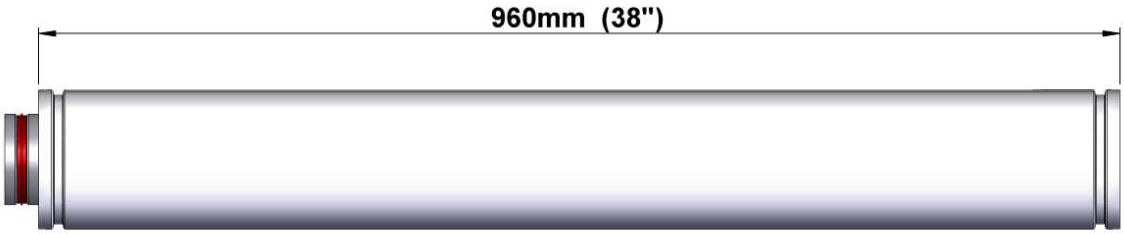
Optional Extras

Combinations of the following items can be purchased in order to provide alternative flue configurations:

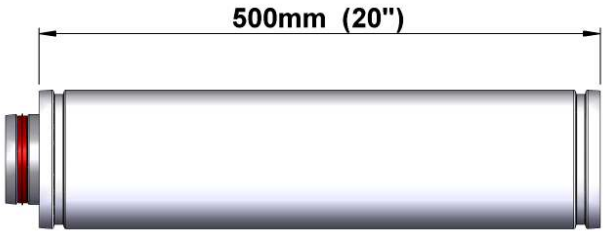
2361 – Long Flue Extension **2363 – 45º Elbow**

2362 – Short Flue Extension **2364 – 90º Elbow**

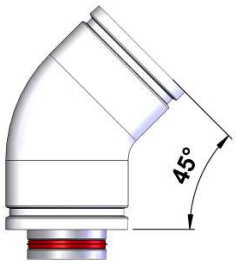
2361 – Long Flue Extension



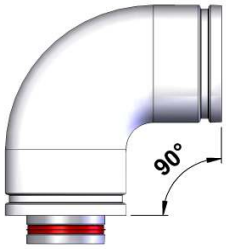
2362 – Short Flue Extension



2363 – 45º Elbow



2364 – 90º Elbow



These flue extensions can be used to extend the vertical length of the flue, or the horizontal length, in almost any combination of configurations.

The total flue distance, vertical and horizontal, **must not** exceed 6000mm. Any 45º elbows used in the assembly contribute 500mm to the calculation. 45º elbows can be used to offset the vertical sections of flue on both the high level and vertical flue kits. Ensuring all 'O'-ring seals are in position and well-lubricated, push the elbow and flue pipe firmly together, fixing together with the clamping strap provided.

Example:
2 x 45º elbows used to offset vertical flue extensions.

Note: only 45º elbows can be used on vertical sections of flue. 90º elbows must only be used to offset the high-level flue on the horizontal plane.

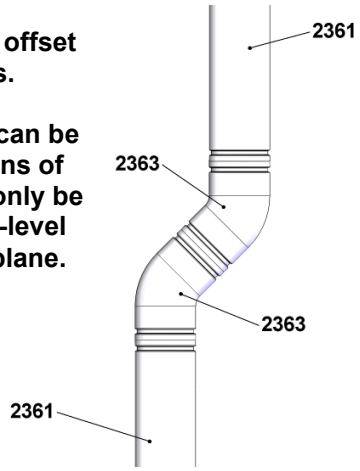


FIG 28

Any 90º elbows used in the assembly contribute 1000mm to the above calculation. **90º elbows can only be used on the high level adaptor kits to offset the flue on the horizontal plane.** Ensuring all 'O'-ring seals are in position and well-lubricated, push the elbow and flue pipe firmly together, fixing together with the clamping strap provided.

9. COMMISSIONING

The burner **must** be commissioned by a qualified OFTEC-registered technician, and a CD/10 form completed.

It is the responsibility of the installer to ensure the boiler is correctly commissioned. Failure to do so will make the boiler's guarantee and any extended warranty null and void.

Although all burners are factory-tested before despatch, due to individual site conditions they will usually require further adjustment after installation to achieve the readings specified in the burner details leaflet.

PROCEDURE

1. Switch off electrical and oil supply and ensure boiler is full of water. Ensure all isolation valves are open.

2. Check that all baffles are correctly positioned (**fig 29**).

3. Disconnect oil line(s) from burner. Run off a small quantity of oil. Check for a clean, air-free supply and reconnect.

4. Check system controls are in the ON position. Ensure boiler stat and any room stats are calling for heat. Switch on the electrical supply; the burner should now start.

Note: the burner may lock-out upon first firing due to air in the pump. Should this occur, wait for one minute before pressing the burner reset button. Should lock-outs persist, the air can be driven out of the oil supply via the pressure gauge connection on the pump.

5. Start and stop the burner several times until the burner cuts out sharply; this will indicate that any remaining air has been expelled from the oil supply.

6. Allow to burner to run for fifteen minutes before using a flue gas analyser to take a CO_2 reading from either the sampling point on the baffle access cover, or the terminal. Compare with the readings specified in the burner details leaflet and adjust the air setting as necessary. Ensure the flue gases are smoke-free.

7. If the system is not to be put into immediate operation, isolate the electrical and oil supplies. If there is a possibility of the water in the system freezing, this should be drained.

HANDING OVER

After satisfactorily completing the boiler installation and commissioning, a thorough check of the system should be made, and the use of any boiler and system controls demonstrated to the end-user. All instructions should be left on-site and advice given as to the need for an annual service.

10. SERVICING

IMPORTANT: ISOLATE THE ELECTRICAL SUPPLY TO THE BOILER BEFORE SERVICING.

Before carrying out the service, please read the health and safety information given at the start of this manual.

To maintain the boiler's high thermal efficiency and ensure reliable operation, the appliance should be serviced annually by a qualified OFTEC-registered technician. Electrical work should be carried out by a qualified engineer. A CD/11 servicing and commissioning form should be completed and left with the appliance on-site.

If the boiler is in use all year round, the best time for the service is before the start of the heating season. Where the boiler is shut down for the summer months, the service should be carried out as soon as is possible after the end of the heating season.

OIL TANK

Open the tank drain-off and allow any accumulated water and sludge to drain away.

LINE FILTERS

Turn off the oil supply and remove the filter bowl. Wash the filter clean with kerosene.

The following checks should also be carried out:

1. Ensure the air inlets on the flue terminal are not obstructed or blocked.

2. Ensure all external controls are working correctly.

3. Ensure all ventilation openings are not obstructed, and are of an adequate size.

4. Inspect all boiler connections for soundness.

5. Inspect the flexible oil line(s), and replace where necessary.

CONDENSATE PIPEWORK & TRAP

The condensate pipework and trap should be inspected as part of the annual service schedule.

Ensure there are no blockages within the condensate pipework and the ‘U’ trap.

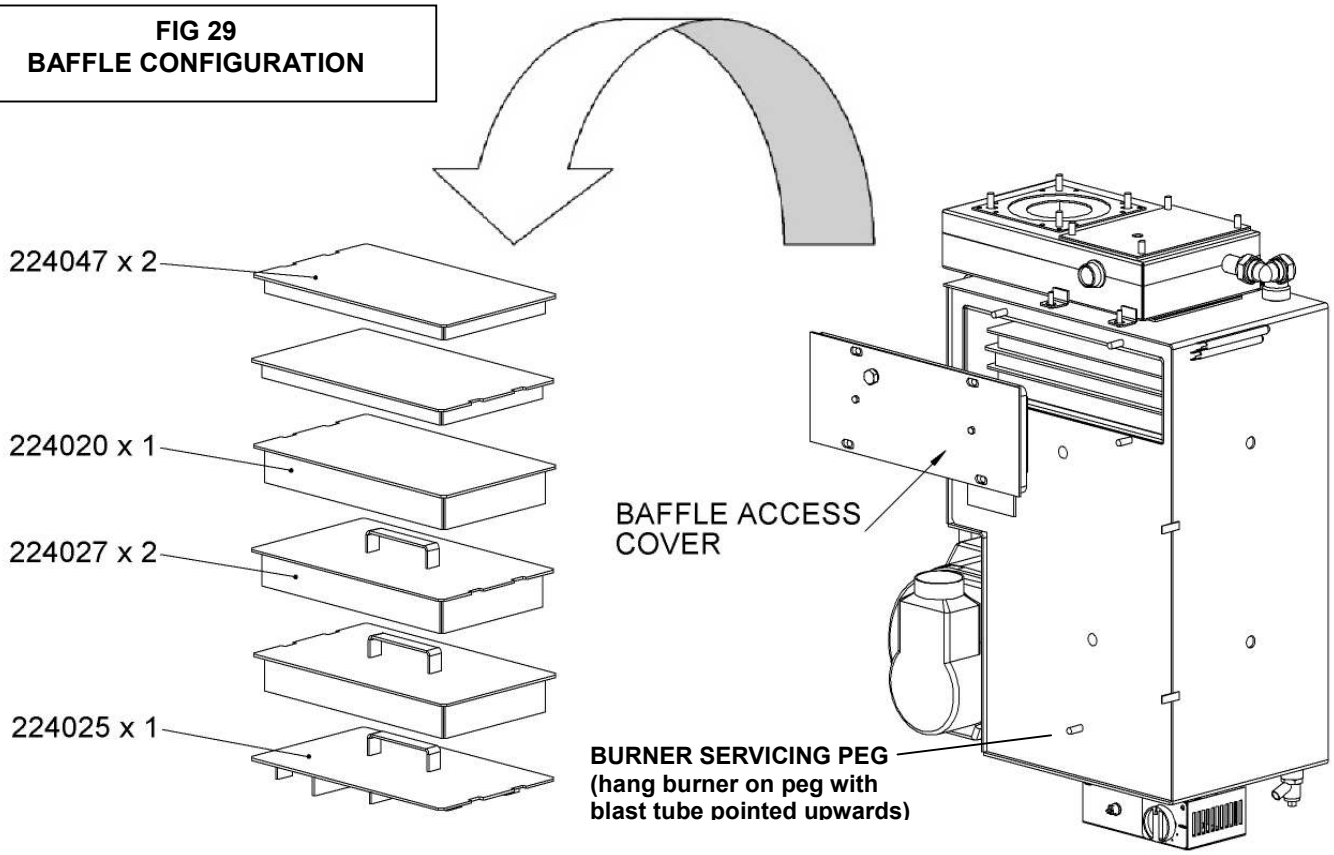
When complete, recheck the integrity of the pipework joints by pouring a small amount of water into the fill point on the condensate unit.

Failure to ensure the retention of water will result in the incorrect operation of the boiler and potentially damage the condensate pipework.

SERVICE PROCEDURE

1. Switch off the electrical supply to the boiler and remove the front casing.
2. Switch off the oil supply to the burner.
3. Remove the flexible air supply hose from the burner.
4. Remove the burner. Ensure that if the oil supply line has to be disconnected there is no spillage of oil. A peg is provided on the front of the unit to hang the burner during service.
5. Remove the baffle access cover from the front of the boiler and lift out the baffles.
6. Brush all deposits from the baffles and clean the internal surfaces of the boiler.
7. Remove deposits from the floor of the combustion chamber with a vacuum cleaner.
8. Check the integrity of the access cover seal. Replace as necessary.
9. Remove the access cover from the top of the condensate unit and clean all accumulated deposits from within.
10. Check the integrity of the flue and burner gaskets. Replace as necessary.
11. Clean any deposits from the blast tube and replace the nozzle.
12. Using the diagram below, replace the flue baffles in the correct arrangement. **Failure to ensure the correct placement of baffles will result in incorrect combustion, reducing the efficiency of the boiler and invalidating the appliance warranty.**
13. Refit the baffle access and condensate unit covers, ensuring gas-tight seals are made using the wing-nuts and washers provided.
14. Refit the burner and secure the air supply hose back in position. If removed, refit the oil supply line. Replace the top casing.
15. Switch on the electrical and oil supplies to the appliance. Ensure that the external controls are calling for heat. The boiler should now fire.
16. Check the combustion settings given against those in the burner details leaflet and make any adjustments where necessary.
17. Check all water connections and inspect for leaks.

FIG 29
BAFFLE CONFIGURATION



IMPORTANT:
When refitting baffles, failure to ensure the correct placement will result in incorrect combustion, reducing the efficiency of the boiler and invalidating the appliance warranty.

11. SPARES

Item	Description	Part No.	Qty
1	Boiler Body	224041	1
2	Main Panel Assembly	224401	1
3	Front Door	224410	1
4	Condensing Unit	224060	1
5	Boiler Control Thermostat	206896	1
6	High-Limit Thermostat	206892	1
7	Control Box Assembly	208400	1
8	Flue Socket Plate	223135	1
9	Flue Sealing Gasket	223071	1
10	Flue Gasket	223787	1
11	Top Baffle[1]	224047	2
12	Middle Baffle Top[1]	224020	1
13	Middle Baffle Bottom[1]	224027	2
14	Bottom Baffle[1]	224025	1
15	Baffle Access Cover	208331	1
16	Burner[2]	224390	1
17	Flexible Oil Line[2]	207019	2
18	Acoustic Hose	208388	1
19	Burner Mounting Flange	224392	1
20	Burner Mounting Gasket	224391	1
21	Condensate Pipework	224388	1
22	Return Pipework Assembly	224389	1
23	Drain Cock	99592	1
24	Condensate Unit Access Cover	223898	1
25	Condensate Unit Access Cover Gasket	223899	1
26	Flue Gasket (Red)	223787	1
27	Flue Spigot	223969	1
28	Flue Gasket	223071	1
29	Air Box Blanking Gasket	224072	1
30	Air Box Spigot	224436	1
31	Air Box	224430	1
32	Wall Mounting Template	224385	1
33	Automatic Air Vent	207296	1

[1] Not shown; see fig 29 (page 31) for baffle configurations.

[2] See burner details leaflet for burner spares.

12. FAULT-FINDING

BURNER FAULT-FINDING

ELECTRICAL SAFETY - before making any electrical checks, switch off the mains supply to the boiler

FAULT	POSSIBLE CAUSE	ACTION
BURNER WILL NOT START	Control box locked out	Press orange reset button on front of burner. NB: ONLY TRY TWICE
	High limit stat tripped	Press red reset button (under control panel) and check function of boiler stat
	System controls satisfied	Ensure all controls are calling for heat
	Fuse blown	Fit new fuse (5A). If problem persists, check for short circuit in wiring
	Motor or pump seized	Check for rotation, replace as necessary
BURNER STARTS BUT FLAME NOT ESTABLISHED	No oil supply	Check oil level in tank, check oil supply for adequate flow
	Photocell not seeing flame	Clean photocell, ensure it is fully inserted
	Air trapped in pump	Bleed excess air via tapping on oil pump
	Solenoid valve faulty	Check coil for continuity, replace as necessary
	Nozzle blocked	Replace nozzle with one of same specification (see burner leaflet)
	Electrodes incorrectly set	Reset gap and position to settings shown in burner leaflet
	Electrode insulator cracked	Replace as necessary
	Ignition transformer or leads faulty	Check for spark, check condition of HT leads, replace as necessary
	Low oil pressure	Check pump pressure and adjust to settings shown in burner leaflet
FLAME ESTABLISHED BUT BURNER LOCKS OUT AFTER A FEW SECONDS	Oil contaminated with water	Run off oil at burner until free of water and drain condensation from tank
	Oil filter partially blocked	Wash filter clean with kerosene
	Photocell faulty	Clean photocell, ensure it is fully inserted, check for damage. Replace as necessary
	Low oil pressure	Check pump pressure and adjust to settings shown in burner leaflet

BURNER FAULT-FINDING (cont.)

ELECTRICAL SAFETY - before making any electrical checks, switch off the mains supply to the boiler

FAULT	POSSIBLE CAUSE	ACTION
MORNING START LOCKOUT	Faulty non-return valve or air leak in two-pipe system	Replace non-return valve, cure leak
	Low voltage to appliance	Check with local electricity board
	Combustion settings incorrect	Check combustion under normal running conditions, check against settings shown in burner leaflet
	Oil level in tank falling below burner	Raise tank or fir two-pipe system
DELAYED IGNITION (BURNER PULSATES ON STARTUP)	Nozzle partially blocked	Replace nozzle with one of same specification (see burner leaflet)
	Low oil pressure	Check pump pressure and adjust to settings shown in burner leaflet
	Flue blocked or damaged	Check flue and rectify/replace as necessary
	Fan slipping on shaft	Check fan and retighten/replace as necessary
	Pump coupling loose or worn	Check fan and rectify/replace as necessary
BURNER STARTS VIOLENTLY	Delayed ignition	Reset electrode gap and position to settings shown in burner leaflet
		Check electrodes for damage, replace as necessary
		Check condition of HT leads, replace as necessary
BURNER REPEATEDLY ATTEMPTS TO FIRE (balanced flue only)	Exhaust gas in combustion air	Remove air hose from boiler end of flue, leaving burner end in place. If burner starts normally, check flue for breakdown of seals and repair/replace as necessary
		If indeterminate, leaving hose attached, pierce a small hole in air hose and use flue gas analyser to check for carbon dioxide. If more than trace elements present, check flue for breakdown of seals and repair/replace as necessary
COMBUSTION FUMES SMELL	Baffle access cover not secure	Tighten wing nuts, securing door in position
	Baffle access cover seal damaged	Replace seal as necessary
	Burner incorrectly fitted, or fixing gasket damaged	Check burner fixing gasket, replace as necessary. Tighten burner mounting nuts
	Flue gasket damaged	Check gasket, replace as necessary. Tighten flue mounting nuts

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

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