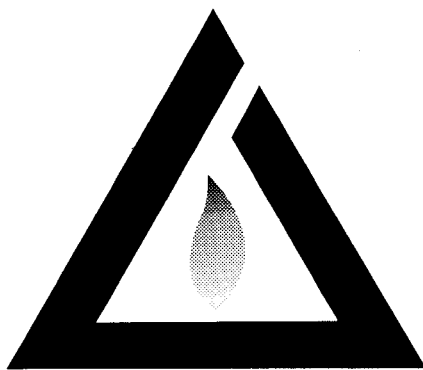


Contractor

HE 130/180

HE 190/220

OIL FIRED CENTRAL HEATING BOILER
FOR BALANCED AND CONVENTIONAL FLUE



TRIANCO

**USER, INSTALLATION
COMMISSIONING & SERVICING
INSTRUCTIONS**

To be retained by householder

HEALTH AND SAFETY

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 1988).

The Company takes every reasonable care to ensure that these products are designed and constructed to meet these general safety requirements, when properly used and installed.

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

This appliance may contain some of the items below.

When working on the appliance it is the Users/Engineers responsibility to ensure that any necessary personal protective clothing or equipment is worn appropriate to parts that could be considered as being hazardous to health and safety.

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 or throat. When handling avoid inhalation and contact with eyes. Use (disposable) gloves, face masks and eye protection.

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

GLUES, SEALANTS & PAINT

Glues, Sealants and Paints are used in the product and present no known hazards when used in the manner for which they are intended.

KEROSENE & GAS OIL FUELS (MINERAL OILS)

1. The effect of mineral oils on the skin vary according to the duration of exposure.
2. The lighter fractions also remove the protective grease normally present on the surface of the skin rendering the skin dry, liable to crack and more prone to damage caused by cuts and abrasions.
3. Skin rashes (oil acne). Seek immediate medical attention for any rash, wart or sore developing on any part of the body, particularly the scrotum.
4. Avoid as far as possible any skin contact with mineral oil or with clothing contaminated with mineral oil.
5. Never breathe any mineral oil vapours. Do not fire the Burner in the open i.e. out of the Boiler as a misfire will cause unburnt oil vapours.
6. Barrier cream containing lanolin such as Rosalex Antisolv, is highly recommended together with a strict routine of personal cleaning.
7. Under no circumstances should mineral oils be taken internally.

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1. USER INSTRUCTIONS

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

INTRODUCTION

The Trianco Contractor H.E. boiler 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 will provide both domestic hot water and central heating with the simplest of controls. It is supplied with an adjustable boiler control thermostat, and a manual-reset high limit thermostat, requiring little attention, other than the setting of any 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 (if fitted) 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 to the boiler. The burner should fire after a few seconds.

Set the time-switch/programmer (if fitted) 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 (**fig.1**) 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 select 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 82°C (High) and 55°C (Low). The thermostat is switched off when the knob is turned fully anti-clockwise to position 'O'.

Note: Where a cylinder thermostat or room thermostat is fitted, ensure that the boiler thermostat is set above or equal to the highest setting.

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 rear of the control box and can be reset by pushing in the button. If the thermostat operates frequently, consult your service engineer, as there may be a fault in the system.

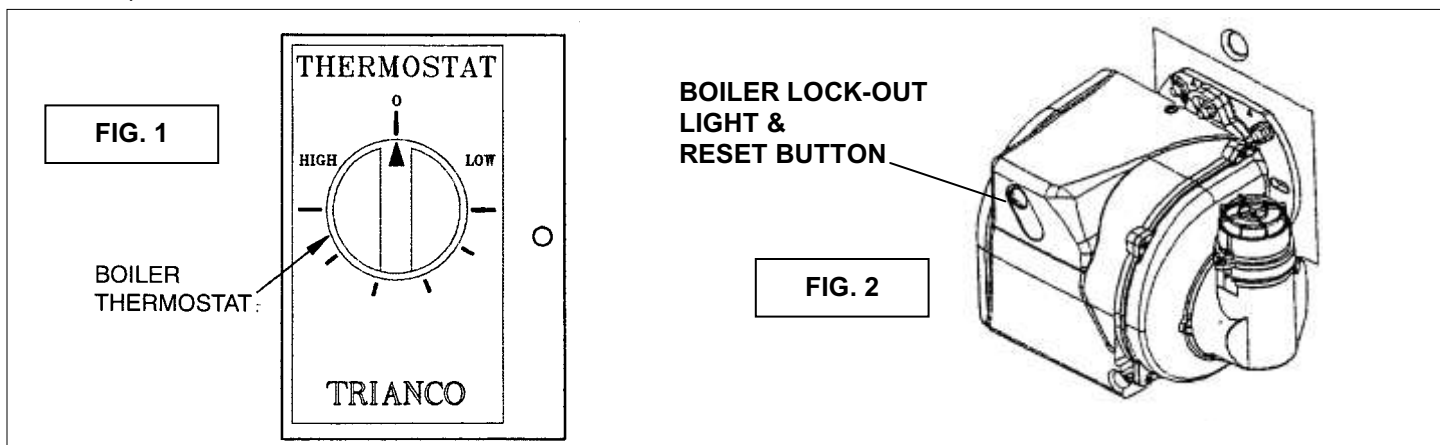
Note: the high-limit thermostat can only be reset when the water temperature has dropped by at least 20°C.

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 required temperature. Always follow the manufacturer's instructions for the best siting position of the room thermostat.

TIME-SWITCH/PROGRAMMER

When choosing the operating times for your boiler, it is useful to remember that central heating systems usually take between half an hour and an hour before becoming effective and usually remain warm for up to half an hour after boiler shut-down. The timer can therefore be switched off earlier as an economy measure.

FROST PROTECTION

If the boiler and central heating is shut down for any period of time during very cold weather, or your boiler is located in a boilerhouse external to the property being heated, the water may be in danger of freezing and, as such, it is advisable to protect the installation with a frost thermostat.

Where the system is not protected, it is suggested that the boiler is left switched on and the room thermostat set to 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 THE SUMMER

If the boiler is shut down for the summer months, 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 a qualified engineer, preferably OFTEC-trained and registered, 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 proper commissioning is carried out.
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.

TRIANCO

CUSTOMER AFTER SALES SERVICE INFORMATION

A step by step guide to reporting a fault with your appliance

A qualified field SERVICE ENGINEER is available to attend a breakdown or manufacturing fault occurring whilst the appliance is under guarantee.

The appliance must be made available for service during normal working hours, Monday to Friday (no weekend work is accepted).

A charge will be made where:

- Our Field Service Engineer finds no fault with the appliance
or
- The cause of a breakdown is due to other parts of the plumbing/heating system (including oil line/lack of oil), or with equipment not supplied by Trianco.
or
- Where the appliance falls outside the guarantee period (see terms and conditions enclosed).
or
- The appliance has not been correctly installed, commissioned or serviced as recommended (see commissioning, installation and servicing instructions)
or
- The breakdown occurs immediately following an annual service visit. In this instance your appointed Service Agent must check all his work PRIOR to requesting Trianco to attend.

PLEASE NOTE:

Unauthorised invoices for attendance and repair work carried out on this appliance by any third party will not be accepted by Trianco.

NOTE: Burner nozzles are currently guaranteed until the first service.

Over 50% of all service calls made are found to have no appliance fault.

What to do in the event of an appliance fault or breakdown:

Step 1: Always contact your installer or commissioning engineer in the first instance, who must thoroughly check all his work PRIOR to requesting a service visit from Trianco.

Step 2: If your appliance has developed an in-guarantee fault your installer should contact Trianco Service Centre for assistance.

What happens if my installer/engineer is unavailable?

Step 3: Contact Trianco Direct. We will provide you with the name and telephone number of our Service Agent. However, a charge will apply if the fault is not covered by the appliance guarantee (payment will be requested on site by our independent Service Agent).

Note: Before contacting Trianco, please have the following information ready:

- 1) Boiler serial number or your customer ID number (issued upon registration of the boiler with Trianco).
- 2) Date of appliance installation.

Boiler Serial No.: _____

Cust. ID No.: _____

Installation Date: ____/____/____

SERVICE CENTRE AND TECHNICAL SUPPORT

Tel: 0114 257 2300 Fax: 0114 257 2338

Hours of business Monday to Thursday 8.30am - 5:00pm

Friday 8.30am - 2.30pm

INSTALLATION INSTRUCTIONS

2. INTRODUCTION

The Contractor H.E. boiler has been designed to conform to European Directive/Standards BED 92/42 EEC LVD 73/23/EEC EMC 89/336/EEC.

The boiler design incorporates a secondary stainless steel heat exchanger, which recovers heat from the flue gases which would normally be lost when using conventional oil-fired boilers.

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

When installed in conjunction with a Trianco balanced flue kit, the boiler becomes a room-sealed appliance. As such, it is suitable for installation in a garage.

The boiler is suitable for all normal open-vented central heating and indirect hot water systems. The boiler can also be used with sealed systems up to a working pressure of 3 bar, with the appropriate sealed system safety equipment.

One return and two flow sockets are provided to facilitate connection to the heating and hot water systems.

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.

Due to the high efficiency of this range of boilers, and to comply with Building Regulations, Part L, it is essential that the appliance be fitted on fully-pumped systems only.

Servicing is carried out from the front of the boiler (burner) and the top (baffle access). The top-mounted flue-cover permits easy access for removal of the baffles and cleaning of heating surfaces. Distance should be left at the top of the boiler to make access possible.

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

The Contractor H.E. 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. It is also recommended this fuel is used when the boiler is connected to a conventional chimney because of the clean-burning characteristics of kerosene.

BALANCED FLUE KITS

The boiler is supplied suitably equipped for connection to a conventional chimney, but can easily be converted into a room-sealed balanced flue appliance by the application of a Trianco balanced flue kit. This kit allows the boiler to be installed in a wide variety of site conditions (see balanced flue kit details, **page 18**, for further details).

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.

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.

Ensure the output of the boiler matches the heat requirements of the property. This is the responsibility of the installer. Failure to do so may impede the correct operation of the boiler.

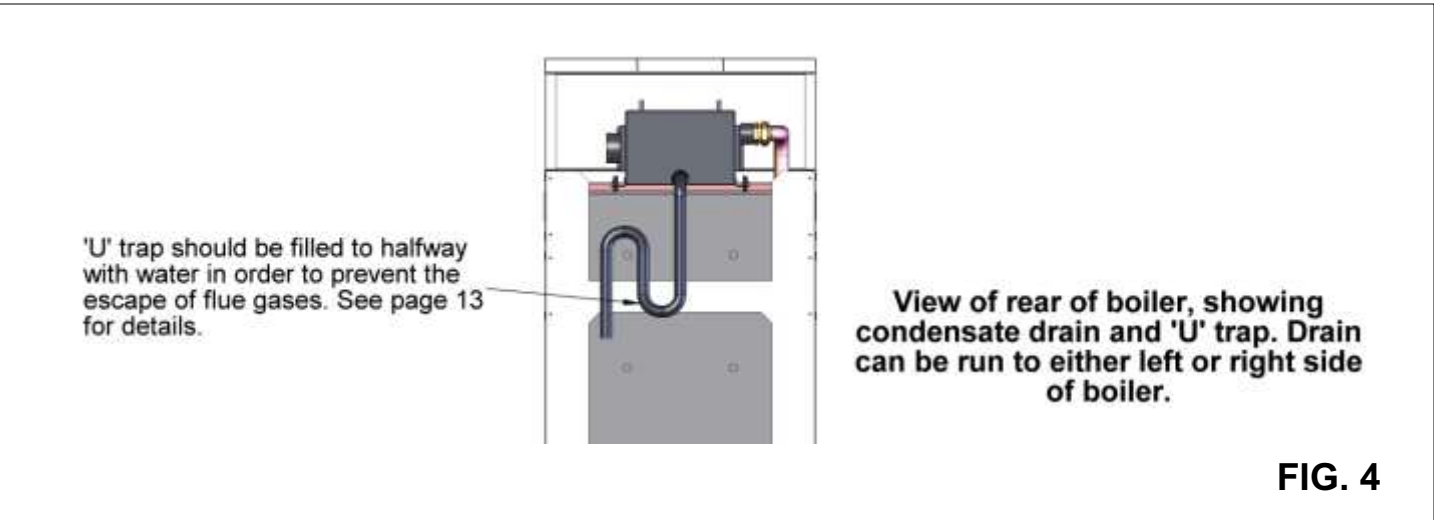
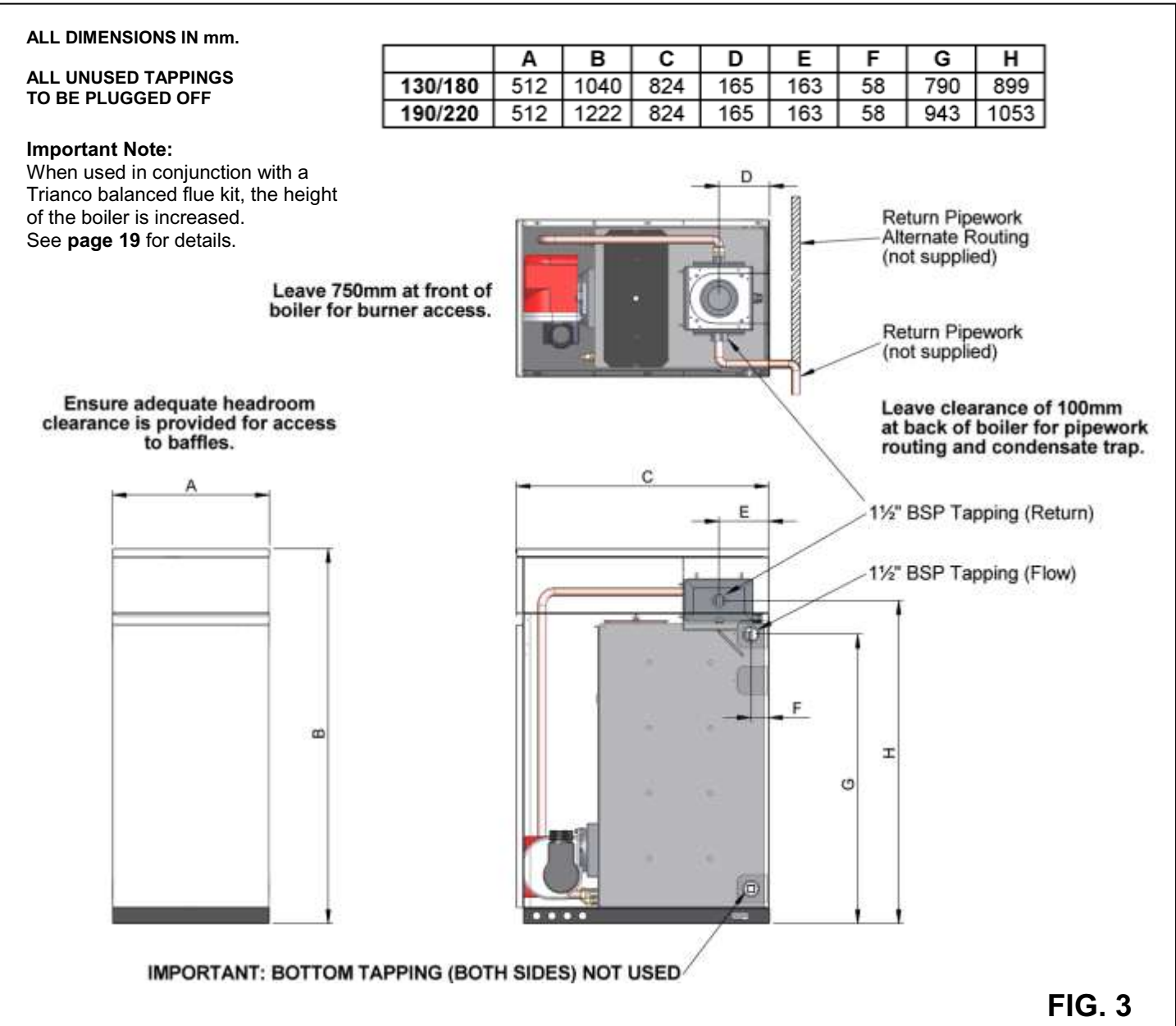
IMPORTANT NOTICE:

To comply with regulations in force, the boiler must be installed and commissioned by a qualified engineer, preferably OFTEC-trained and registered. 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



TECHNICAL SPECIFICATION

WEIGHT (empty)	236kg	250kg
WATER CONTENT	51 litres	62 litres
FLOW CONNECTIONS	1½" BSP	
RETURN CONNECTION	1½" BSP	
CONDENSATE DRAIN CONNECTION	22mm Compression (trap supplied)	
FLUE SOCKET DIAMETER	6"	
MAX OPERATING PRESSURE	3 bar (43.5 psi)	
TEST PRESSURE	4.5 bar (65.3 psi)	
STARTING CURRENT	3.5 amp	
RUNNING CURRENT	0.77 amp	
CONTROL THERMOSTAT	Adjustable up to 82°C	
LIMIT THERMOSTAT	Factory-set at 110°C	
CASING FINISH	White	
THERMAL INSULATION	Boiler shell insulated with glass fibre	
ELECTRICITY SUPPLY	230/280V – 50Hz fused at 5 amp	
OPTIONAL EXTRAS	Trianco Balanced Flue Kit (see page 18 onwards)	

4. INSTALLATION

REGULATIONS

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

BS 5410: Part 1 – Code of Practice 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 a qualified engineer, preferably OFTEC-trained and registered.

A guide to safe working practices for oil-firing technicians is available from OFTEC.

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

SITING THE BOILER

Sound Levels

Whilst the low sound level of the boiler makes it suitable for utility room installation, 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 room construction is hollow or the surface tiled.
- (c) A chimney passing through a bedroom will 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.
- (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. Adequate allowance for headroom should be made at the top for the removal of baffles and 750mm is required at the front of the boiler for burner access. At least 100mm should be left at the back of the boiler for access to the condensate fittings.

Hearth

The boiler must be fitted on a non-combustible base, which is level and capable of supporting the installed weight of the boiler, including its full water content.

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 - 10°C to 30°C

COMBUSTION AND VENTILATION AIR

Conventionally-Flued Systems

The provision of an adequate supply of combustion air is essential for the efficient and safe operation of the boiler. The air opening should be positioned to cause the least possible nuisance to the householder, and located in a place which will reduce the likelihood of it being accidentally blocked.

BS Code of Practice for Oil (BS: 5410 Part 1) requires a permanent air inlet opening of 550mm² per kW of boiler rated input above 5kW (see table below and **Fig. 5** for air openings required).

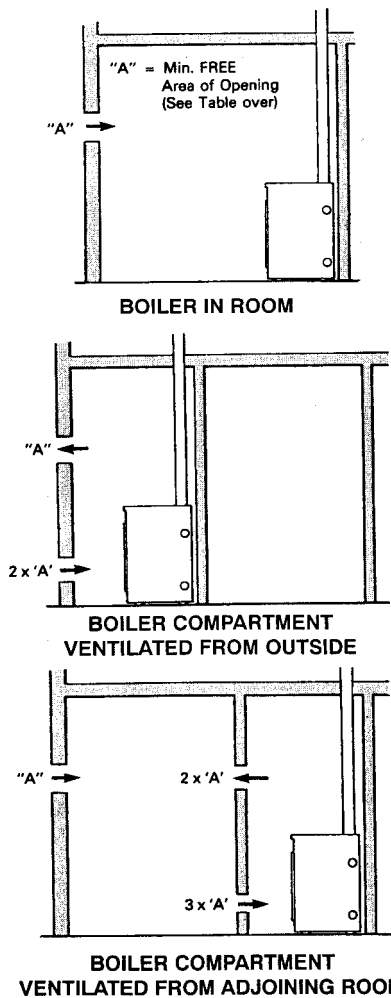
Room-Sealed Balanced Flue Systems

Although no openings are required for the supply of combustion air, to prevent the overheating of the boiler controls, ventilation is necessary if the boiler is installed in a compartment or confined space (see table below and **Fig. 6** for requirements).

Output	Detail 'A' (fig. 5 & fig. 6)
130,000 Btu/h*	182cm ²
155,000 Btu/h*	222cm ²
180,000 Btu/h	263cm ²
190,000 Btu/h*	279cm ²
205,000 Btu/h*	303cm ²
220,000 Btu/h	327cm ²

* please note that should the output of the boiler be increased at a later date, the ventilation openings should be matched in accordance with the data on this table.

FIG. 5 – AIR SUPPLY & VENTILATION FOR CONVENTIONALLY-FLUED BOILERS



Extractor Fan (Conventionally-Flued Systems Only)

If the boiler room has an extractor fan, the combustion performance of the appliance must not be affected when the fan is running and all doors and windows are closed. A flue gas analysis on the smoke and CO₂% and smoke number should be carried out to prove that combustion is taking place satisfactorily.

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.

The flow and return water connections can be made to the boiler by using the tappings on the left or right hand side of the boiler.

While the boiler is fitted with a drain-off cock, one should always be fitted in the lowest part of the system.

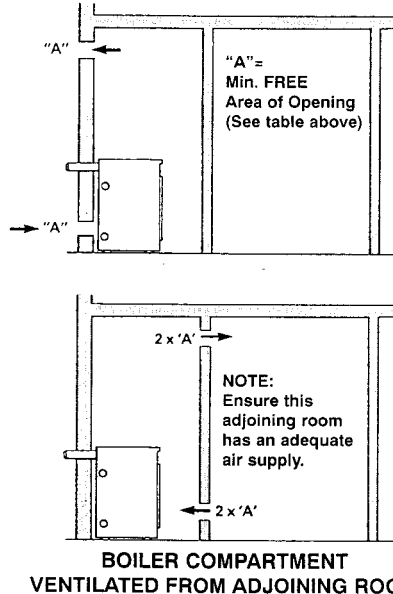
Where the boiler is also used for providing domestic hot water, a double-feed indirect cylinder to BS 1566 Part 1 must be used.

Flush out the system to remove any residue before fitting the circulating pump.

Make sure all unused boiler tappings are plugged before filling the system.

FIG. 6 – VENTILATION FOR ROOM-SEALED BALANCED FLUE BOILERS IN COMPARTMENT

BOILER COMPARTMENT VENTILATED FROM OUTSIDE



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 external cables entering the control box must be secured in position by the use of strain-relief bushes (supplied, see **fig. 7** for fitting instructions).

Terminal connections are also provided in the control box for the ancillary controls.

See wiring diagram, **fig. 8** for further details.

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.

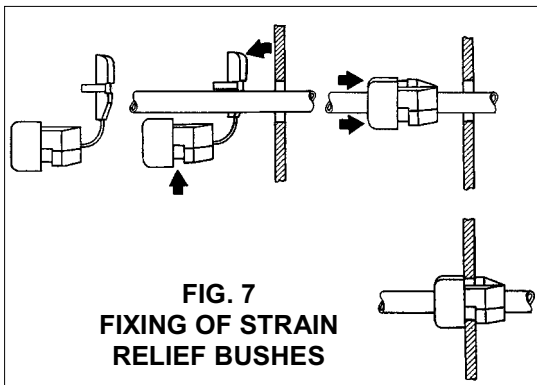


FIG. 7
FIXING OF STRAIN
RELIEF BUSHES

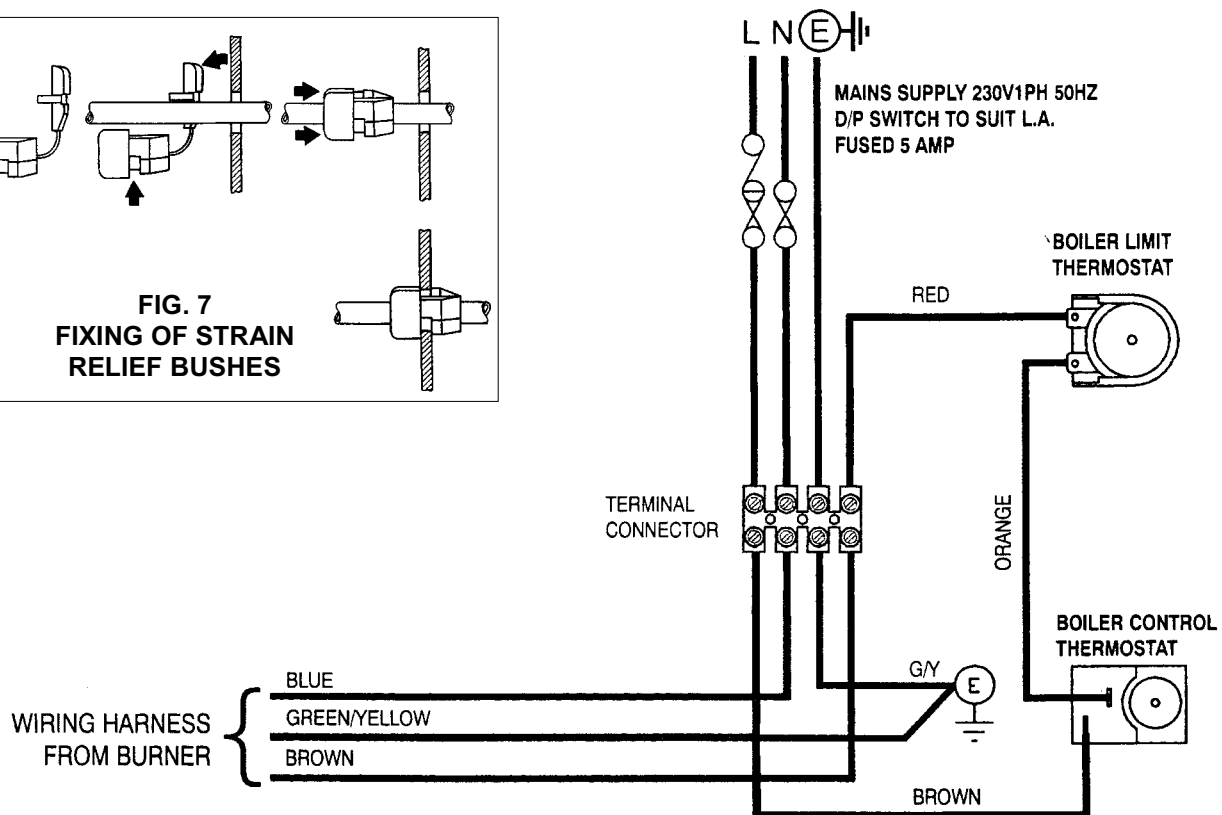


FIG. 8 – WIRING DIAGRAM

CONDENSATE DRAIN CONNECTIONS

The condensate drain can be run to either the left or the right side of the boiler.

To install the condensate pipe, after deciding the direction in which it should run, assemble the supplied pipework and 'U' trap in position as shown in the diagram opposite, ensuring a watertight seal is made to the 22mm compression fitting on the rear of the condensate unit.

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 'U' trap to the external drain is not supplied with the boiler.

Upon successful installation of the condensate pipework, pour a small amount of water into the flue port on the top of the condensate unit. Alternatively, fill the 'U' trap with water before installation. Examine the pipework for any resultant leaks and rectify accordingly.

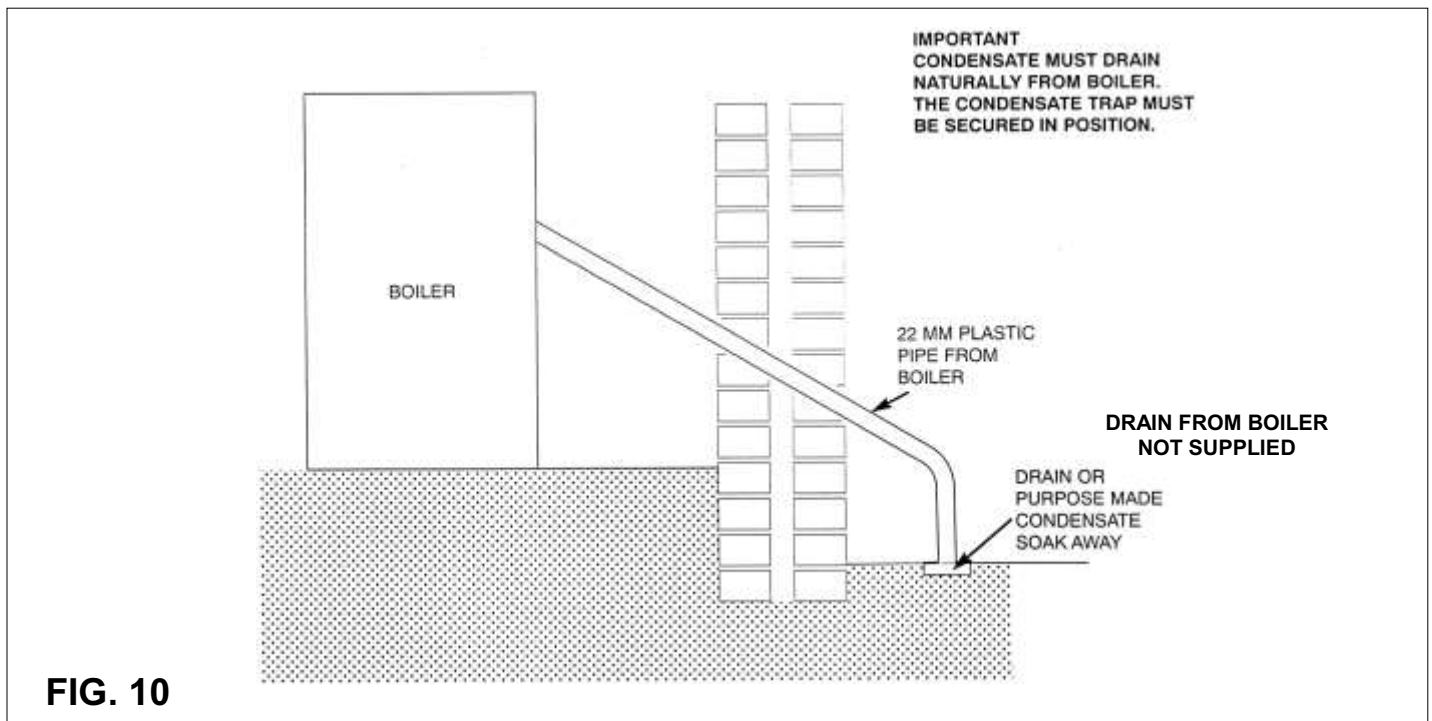
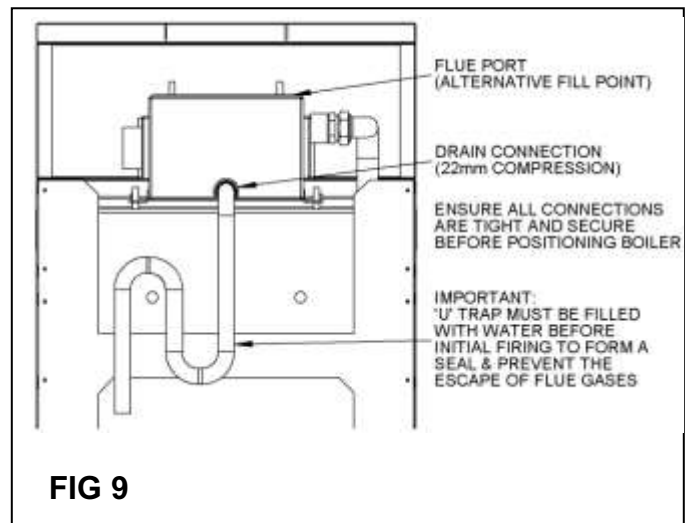
Failure to fill the 'U' trap with water before firing the boiler may result in damage to the drainage pipework and potentially allow the escape of flue gases. Any damage caused as a result of not filling the trap will not be covered by the appliance guarantee.

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 water 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.



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 **Fig. 11**).

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 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 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. 11, 12, & 13**.

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 premises, with the sensing phial located at a point above the burner.

An OFTEC CD/10 form or equivalent must be completed and left with the appliance upon installation.

OIL SUPPLY (cont.)

Single-Pipe Oil Supply (Fig. 12)

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.

Two-Pipe Oil Supply (Fig. 13)

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

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

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 is also required.

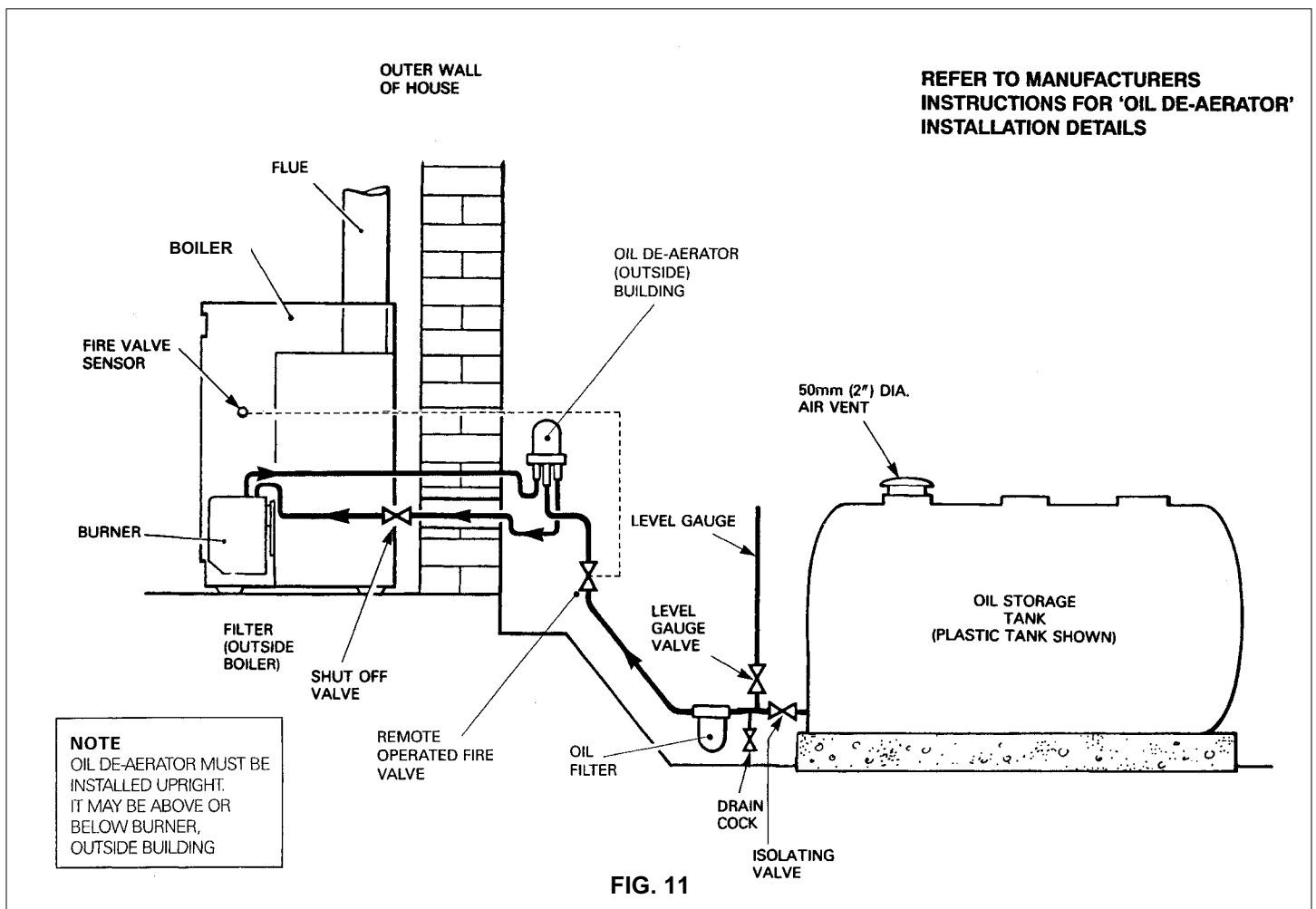
Notes:

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. 11)

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 premises.

A non-return valve is not required with this system, but the 'U' washer must be removed in the same manner as a standard two-pipe system.



MAXIMUM OIL SUPPLY LINE LENGTH 'L'

HEAD 'H' METRES.		.0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
PIPE 6mm ID	MAXIMUM LENGTH (METRES)	10	21	31	41	52	62	73	83
PIPE 8mm ID		33	66	98	100	100	100	100	100

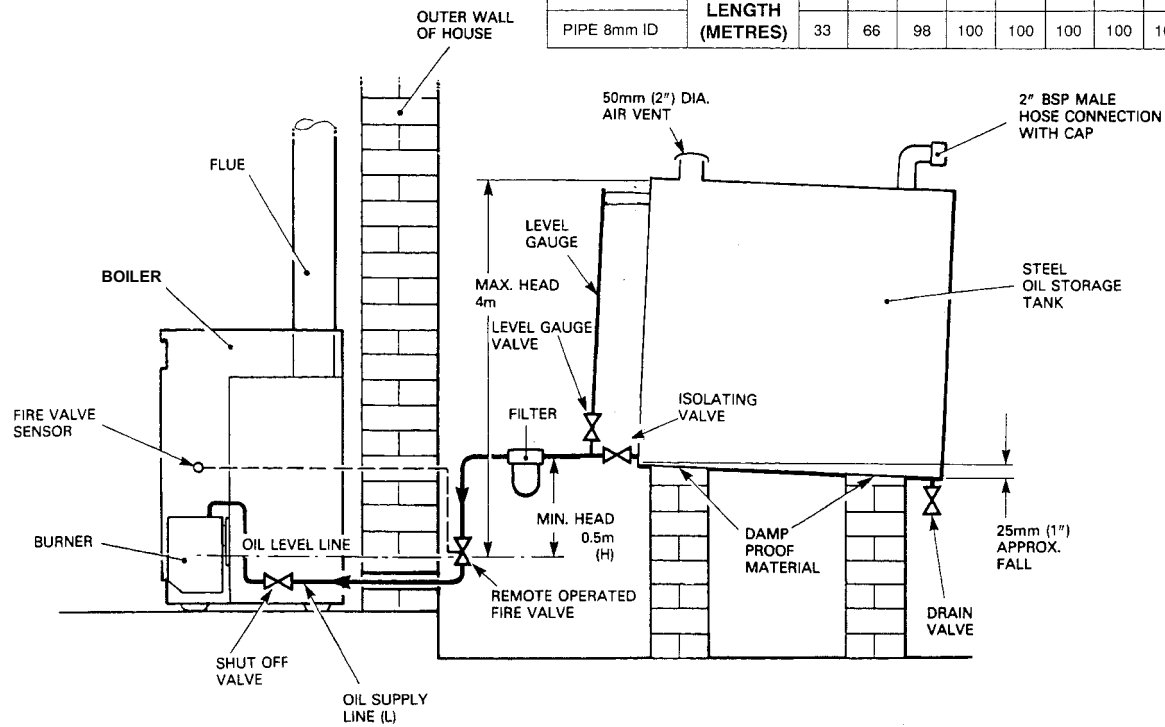


FIG. 12 – SINGLE-PIPE OIL SUPPLY

MAXIMUM OIL SUPPLY LINE LENGTH 'L'

LIFT 'H' 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

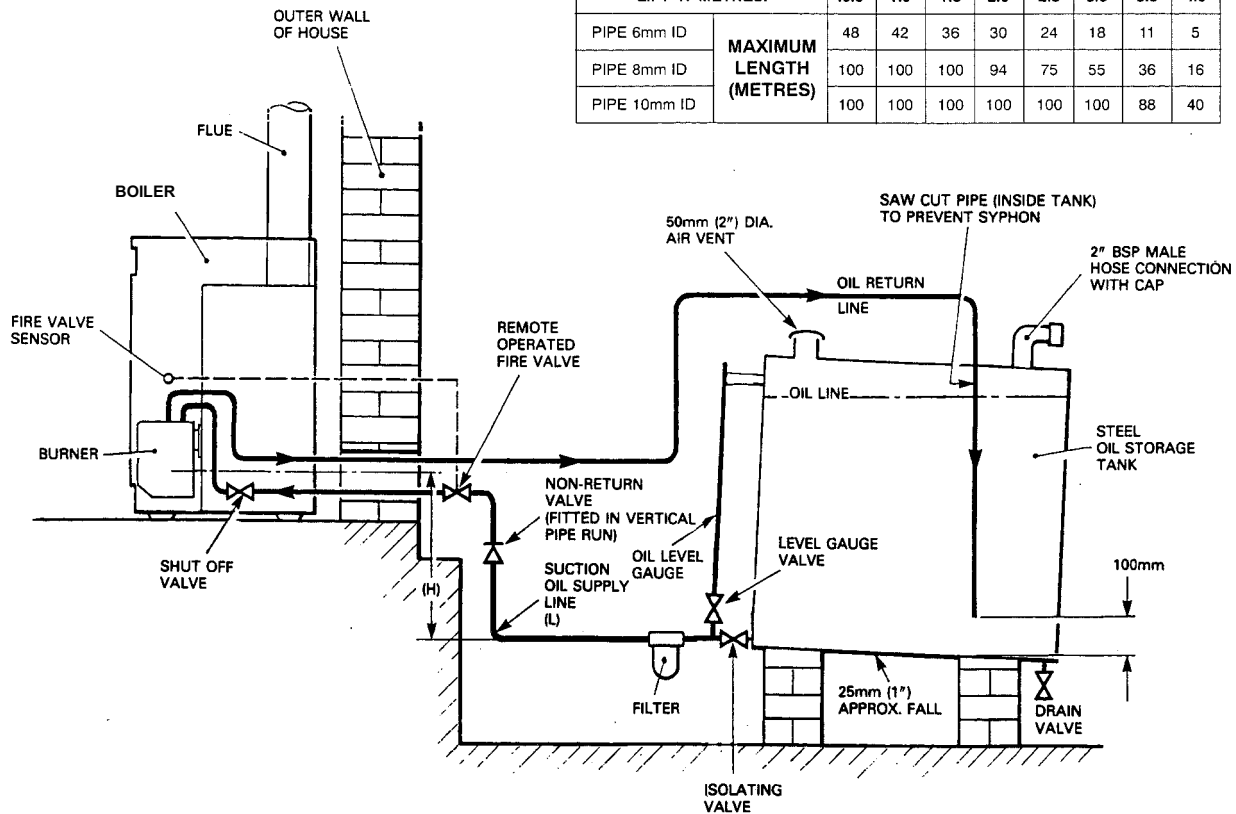


FIG. 13 – TWO-PIPE OIL SUPPLY

6. FLUE SYSTEMS

To evacuate the products of combustion safely and thoroughly, the boiler must have an efficient flue system. Under no circumstances should the boiler be fitted to an existing flue system.

All components used in the flue system should be suitable for wet flues. The design and construction of Trianco balanced-flue kits takes these factors into account, so the following guidance notes are for conventional chimneys only. Reference should also be made to BS 5410 Part 1 if further information is required.

CONVENTIONAL CHIMNEYS (FIG. 14)

Trianco condensing boilers operate at high efficiencies with low flue gas temperatures. The flue system used on this boiler must be suitable for low flue gas temperatures and condensation.

1. The chimney should rise as vertically as possible, and terminate at a point not subject to downdraughts or adverse wind effects.
2. The condensation produced in the flue system can be allowed to run back into the boiler. No separate drain at the base of the flue system is required.

3. Where an existing chimney is to be used, it must be lined with a stainless steel liner which is approved for use on an oil-fired condensing boiler. **Note:** before fitting a flue liner, the chimney must be thoroughly cleaned free of all traces of soot and scale.
4. If a rigid flue is to be fitted externally, a twin-wall flue must be used. The flue must be constructed with a stainless steel inner skin (suitable for condensation), insulation, and incorporate seals and be weather-proofed.
5. The internal flue diameter must be 152mm (6") minimum.
6. The flue pipe between the boiler and the chimney must be manufactured from 316 stainless steel or higher. Aluminium or plastic must not be used on any part of the flue system.
7. The in-built flue-gas resistance of the Contractor H.E. is such that it allows the boiler to operate reliably over the wide range of chimney draughts encountered by typical domestic chimneys. Under normal draught conditions, the flue should terminate with a standard cowl.

IMPORTANT: Ensure that all the joints on the flue system are adequately sealed, and that no condensation can escape.

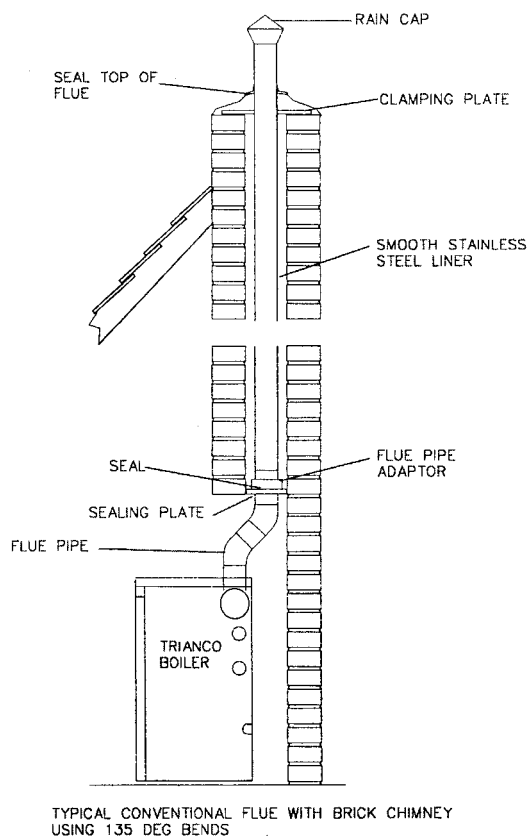


FIG.14

Balanced Flue Systems (optional extra)

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 wall to fit the horizontal discharge terminal.

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

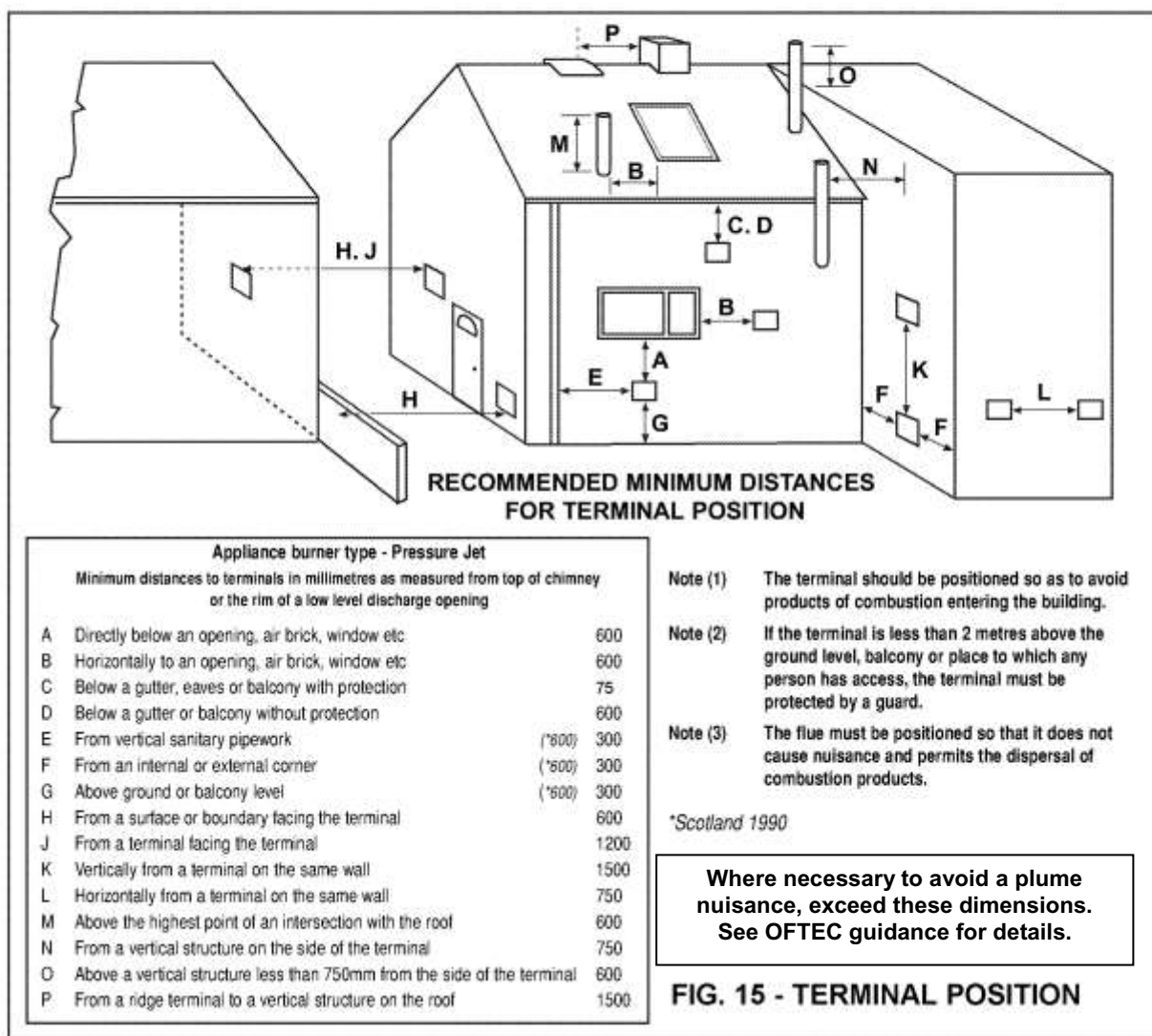
Whereas some balanced flue boilers rely on case sealing to achieve a room seal, Trianco boilers have a sealed air duct system which maintains the room sealed performance even when the casing door is removed for burner commissioning or adjustments.

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

INSTALLATION NOTES

- Balanced-flue condensing boilers are designed to operate at low noise levels. During operation, a plume of condensation will be produced at certain times from the terminal. When positioning, these factors should be taken into consideration to ensure that they do not cause a nuisance to neighbouring properties. It should also be positioned to avoid the products of combustion from entering the building.
- Keep the terminal clear of infra-red sensing devices such as those used to control security lighting.
- Positioning of flues under balconies and carports should be avoided.
- As the system operates under positive pressure, it is essential that all flue joints are sealed correctly.
- Only 28 sec. Kerosene Class C2 to BS 2869 is permitted for use with this appliance.

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



HORIZONTAL BALANCED FLUE KIT FITTING INSTRUCTIONS

Trianco balanced-flue kits are designed to incorporate the latest 'O'-ring seals. Before commencing assembly, please ensure that all 'O'-ring seals are in position.

Assembly Method (Figs. 17 to 19)

1. Having decided the position of the boiler, cut a hole 210mm square through the wall.
2. Remove the top casing from the boiler and the flue socket from the top of the secondary heat exchanger. Ensuring the gasket remains in place, place the white flue box onto the top and fit the short stainless steel spigot inside, securing firmly to the four studs on top of the secondary heat exchanger.
3. Fit the flue elbow to the stainless steel inner pipe on the terminal section. Slide the terminal into the flue box from the outside and locate the elbow over the spigot plate.
4. Adjust the terminal length as required, making sure a minimum distance of 200mm is kept from the end of the terminal to the face of the external wall. If necessary, the terminal can be cut to accommodate a smaller wall thickness.
5. After choosing the direction of termination (rear or side exit), fit the air hose spigot onto the relevant side of the flue, or onto the L-shaped blanking plate, securing into position with the wing nuts provided.
6. Secure the L-shaped blanking plate into position (using the appropriate gaskets) and block off the remaining two holes with the circular sealing plates, again securing into position with the wing nuts provided. Ensure a good seal is made by use of silicone sealant on the underside.
7. Connect the air hose from the burner to the air hose spigot, using the jubilee clip provided.
8. Fill the cavity between the flue and the wall with an appropriate material (e.g. cement). Close any gaps around the terminal on both sides of the wall.
9. Fit the additional casing extensions as described opposite.

Important Notes:

- (a) To aid assembly, it may be necessary to apply a thin bead of lubricant (e.g. washing-up liquid) to all flue joints which incorporate 'O'-ring seals.
- (b) As the flue system operates under positive pressure, all flue joints must be well sealed. All joints which do not incorporate 'O'-ring seals should 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 correctly, incline the flue slightly upwards from the boiler.

TERMINAL GUARDS

Should the terminal be positioned where there is a danger of accidental contact by persons, or of damage to the terminal, an approved stainless steel guard is necessary.

A terminal guard should also be used should the flue terminate below 2m from ground level.

CASING EXTENSIONS

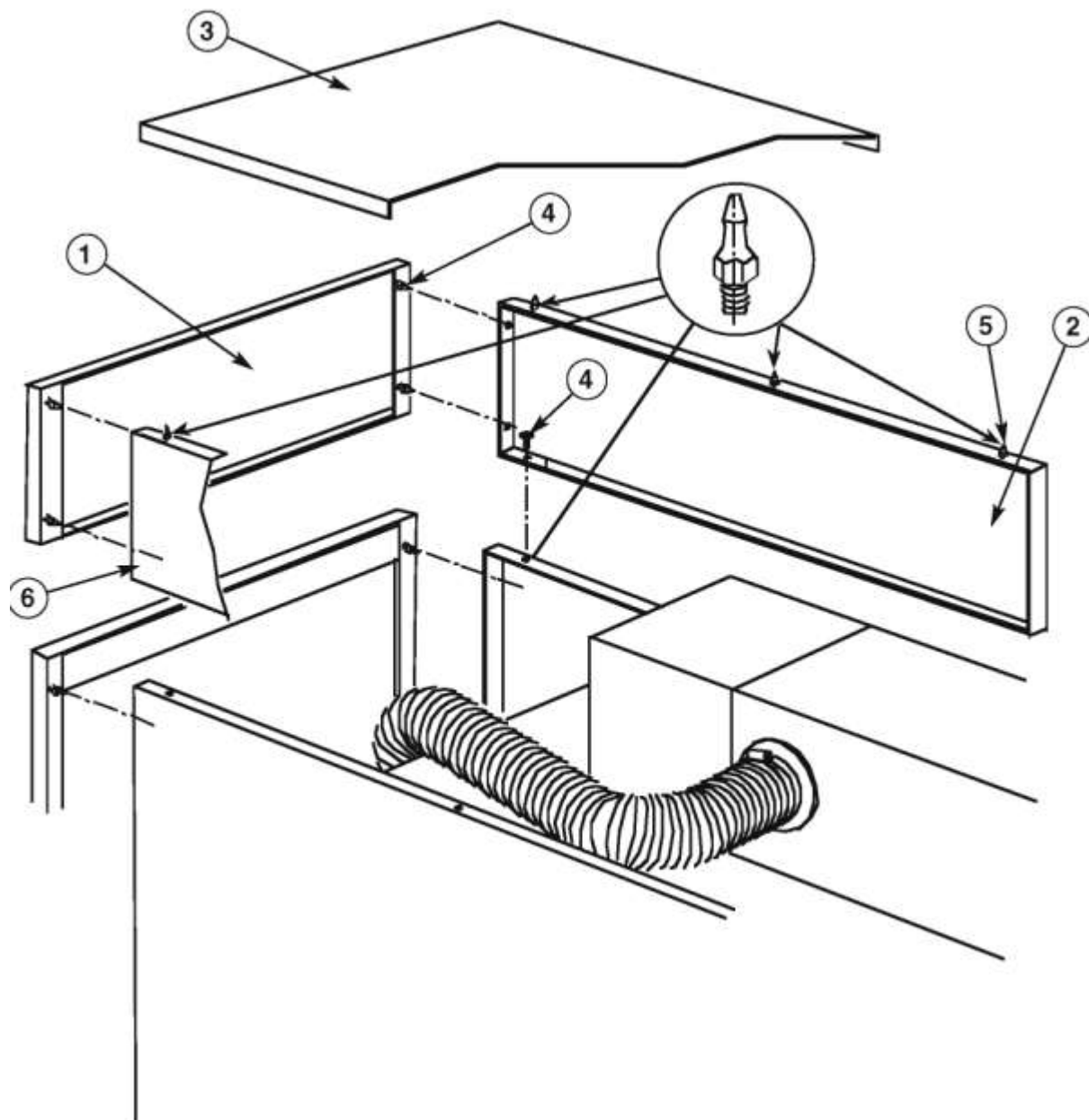
To enable the flue to be enclosed within the casings, extension pieces are provided with the flue, which must be fitted after the flue has been installed.

1. Remove the top casing.
2. Remove the short panel extensions from the front and the left/right sides (190/220 only).
3. Fit the larger panel extensions included in the flue kit as shown on **fig. 16**.
4. Refit the top panel.

Important:

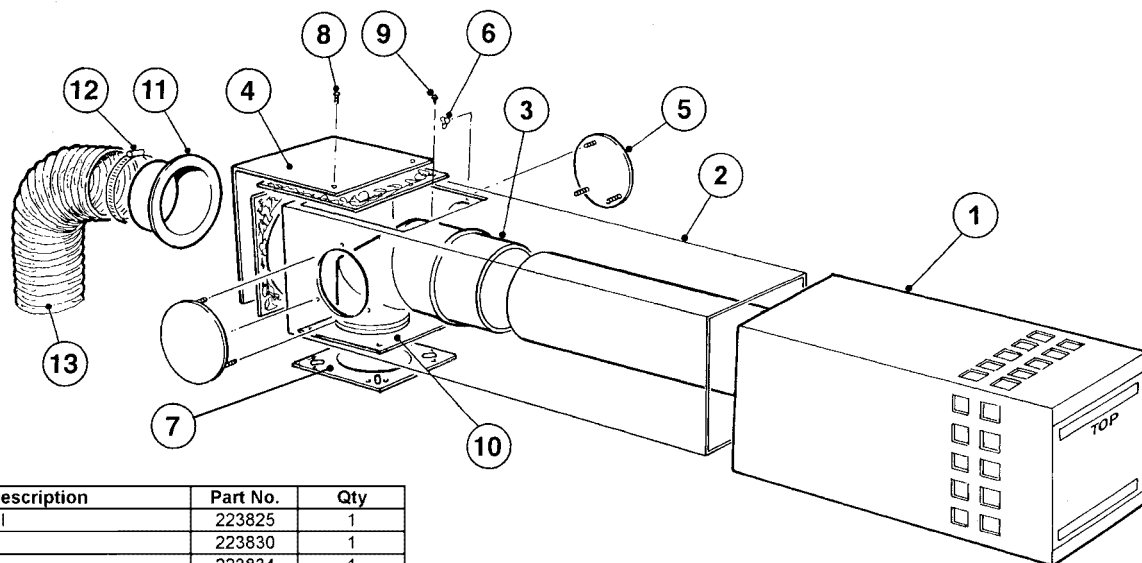
The height of the 130/180 boiler increases to 1220mm when the casing extensions have been fitted.

The height of the 190/220 boiler increases to 1372mm when the casing extensions have been fitted.



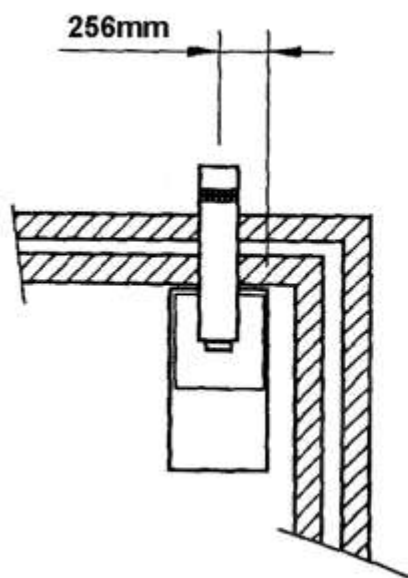
Item	Description	130/180	Qty	190/220
1	Front Panel Extension	224187	1	224198
2	Left Side Panel Extension	224182	1	224192
3	Top Casing (supplied with boiler)	221997	1	221997
4/5	Fixing Studs (supplied attached)	N/A	N/A	N/A
6	Right Side Panel Extension	224182	1	224195

FIG 16 – CASING EXTENSIONS

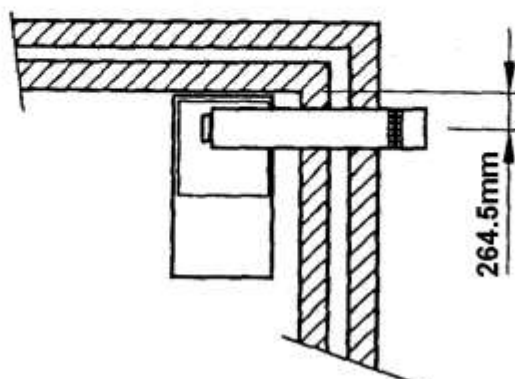


Item	Description	Part No.	Qty
1	Flue Terminal	223825	1
2	Flue Box	223830	1
3	Flue Elbow	223834	1
4	Blanking Plate	223837	1
5	Circular Sealing Plate	208551	2
6	M4 Wing Nut	94380	9
7	Blanking Plate Gasket	223836	2
8	No. 6 x 12mm ST/ST Hex Screw	91601	2
9	No. 6 x 12mm ST/ST Pozz Screw	91523	6
10	Spigot Plate	223833	1
11	Air Hose Spigot	206933	1
12	Jubilee Clip	95256	1
13	Air Hose (supplied with boiler)	209491	1
	O-ring seal (not shown)	221647	2

FIG 17 – HORIZONTAL BALANCED FLUE KIT



Rear Exit Flue Position



Side Exit Flue Position

IMPORTANT:
When installing the flue system it is important to ensure that the flue terminal inclines upwards slightly from the boiler. This will allow any condensation formed inside the flue to run back to the condensate drain.

Please note that this dimension includes an additional clearance of 100mm, which is required at the rear of the boiler for routing of the return and condensate pipework.

FIG. 18 – FLUE POSITIONS



HOLE REQUIRED 210mm SQUARE
THROUGH WALL TO TAKE TERMINAL.

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

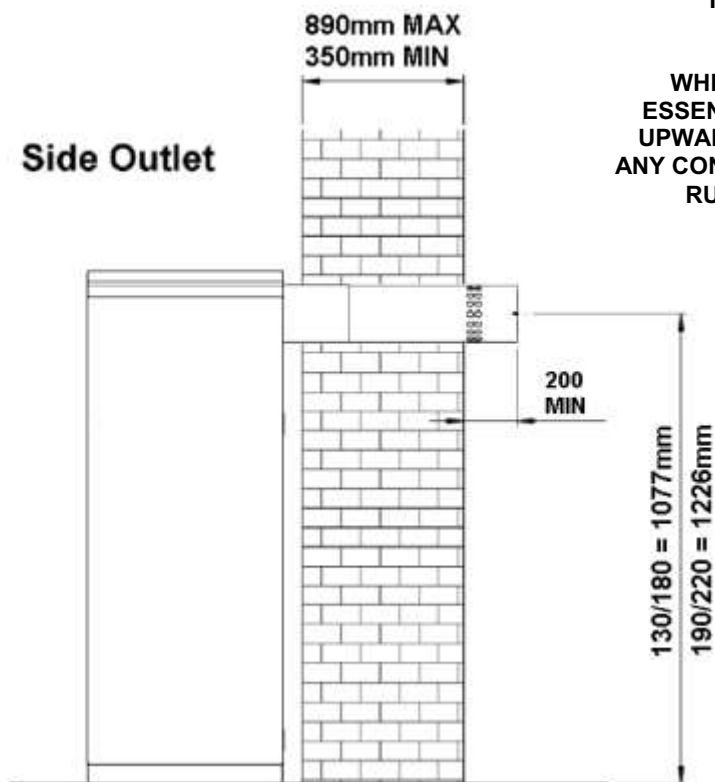


FIG. 19 – BALANCED FLUE KIT DIMENSIONS

7. COMMISSIONING

The boiler/burner **MUST** be commissioned by a qualified technician, preferably OFTEC trained and registered.

It is the responsibility of the installer to ensure the boiler is properly 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, they will usually need further air adjustment to achieve the readings indicated in 'Burner detail leaflet' because of site variations in flue draught and back pressure.

Procedure

1. Switch off electrical supply to the boiler.
2. Ensure boiler is full of water and all valves are open.
3. Remove flue-cover and check that flue-baffles are correctly positioned (See Fig 20 for baffle arrangement).
4. Disconnect oil hose from burner, open shut-off valve and run off a quantity of oil into a container to check for a clean air free supply then reconnect hose. (This applies to single pipe gravity system only).
5. Check that the time-switch (if fitted) is in the ON position and room and boiler thermostats are calling for heat.
6. Switch on electrical supply and the burner should start.

Note: The burner may lock-out on first firing due to air in the pump, if this happens, wait about a minute before pressing reset button to restart burner. If a further lock-out occurs, the air should be bled from the pump pressure gauge connection.

7. Start and stop the burner two or three times until the flame cuts off sharply - this indicates any remaining air has been dispersed.
8. Allow the burner to run for about 15 minutes, then take a CO₂ reading through the sampling hole in flue-cover. Compare the reading with that given under 'Burner Settings' and adjust the air setting if necessary to achieve the required CO₂%. Also, check the smoke and flue gas temperature.
9. If the system is not going to be put into immediate operation, the fuel supply and electricity supply should be isolated.
If there is a possibility that the boiler will not be running during freezing conditions, the system should be drained down.

Handing Over

After completing the boiler installation, 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 any system controls.

All instructions should be handed to the user for retention and advice regarding the need for annual servicing.

8. SERVICING

IMPORTANT: ISOLATE ELECTRICAL SUPPLY TO THE BOILER BEFORE SERVICING

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

If the boiler is used to provide central heating and hot water all year round, the best time for the annual service is just before the start of the heating season.

Oil tank

Open tank drain-cock to draw off any accumulated water and sludge.

Line filters

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

Important

Before commencing with service work on either the boiler or the fuel supply please read the health and safety information.

Before servicing the boiler carry out the following checks.

1. Ensure the air inlets on the flue terminal are not blocked or obstructed.
2. Check to ensure external controls are working correctly.
3. Check ventilation openings are not obstructed and are adequate for the size of the boiler.
4. Inspect all connections to boiler to ensure they are sound, remake any joints that are showing signs of leakage.
5. Inspect flexible oil supply lines and replace where necessary.

Condensate Unit & Trap

The condensate unit and trap should be inspected as part of the annual service schedule. Remove the access cover from the front of the condensate unit and clean all deposits from within. Access to certain parts of the condensate unit is available from the underside via removal of the baffle access cover and the baffles.

Ensure there are no blockages within the condensate pipework and the trap itself. When complete, recheck the integrity of the pipework joints by pouring a small amount of water into the condensate unit and looking for leaks. Some water should be retained within the trap.

NOTE: Any seals or gaskets found to be deficient should be replaced.

S

1

2

3

4

5

6

7

8

9

B

A

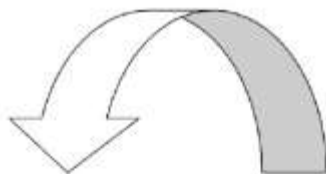
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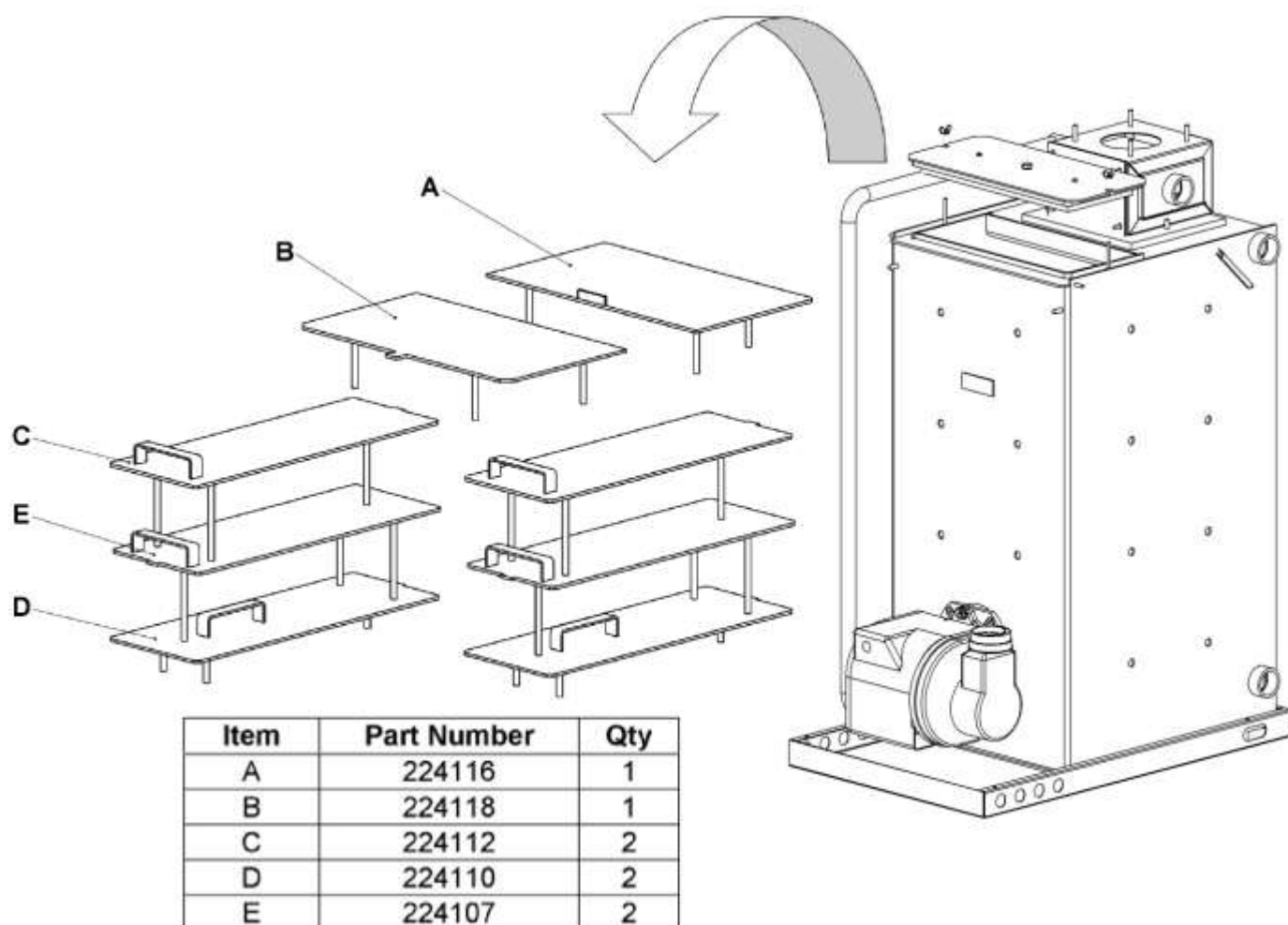
D

D

E

Item	Part Number	Qty
A	224116	1
B	224118	1
C	224132	2
D	224134	4
E	224130	2





IMPORTANT:
 FAILURE TO ENSURE THE CORRECT PLACEMENT
 OF BAFFLES WILL RESULT IN THE INCORRECT
 OPERATION OF THE BOILER, INVALIDATING THE
 APPLIANCE WARRANTY.

FIG. 20b – 190/220 BAFFLE ARRANGEMENT

9. 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
FLAME ESTABLISHED BUT BURNER LOCKS OUT AFTER A FEW SECONDS	Low oil pressure	Check pump pressure and adjust to settings shown in burner leaflet
	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
FLAME ESTABLISHED BUT BURNER LOCKS OUT AFTER A FEW SECONDS	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

10. SPARES

Item	Description	130/180	Qty	190/220	Qty
1	Boiler Body	222261	1	222291	1
2	Right Side Panel Assembly	222010	1	222010	1
3	Left Side Panel Assembly	222011	1	222011	1
4	Side Panel Extension	-	2	224182	2
5	Front Panel Extension	-	-	224187	1
6	Top Panel	222012	1	222012	1
7	Front Door	224166	1	224166	1
8	Back Panel	221998	1	221998	1
9	Condensing Unit	224150	1	224150	1
10	Condensing Unit Access Cover	224147	1	224147	1
11	Condensing Unit Access Cover Gasket	224148	1	224148	1
12	Condensate Trap	224149	1	224149	1
13	Control Box Assembly	208256	1	208256	1
14	Boiler Control Thermostat	206896	1	206896	1
15	High Limit Thermostat	206892	1	206892	1
16	Flue Socket Plate	209329	1	209329	1
17	Flue Socket Gasket	209323	1	209323	1
18	Flue Gasket	224138	2	224138	2
19	Top Baffle Rear ¹	224116	1	224116	1
20	Top Baffle Front ¹	224118	1	224118	1
21	Middle Baffle Top ¹	224132	4	224112	2
21a	Middle Baffle Bottom ¹	224134	2	224107	2
22	Bottom Baffle ¹	224130	2	224110	2
23	Baffle Access Cover	209320	1	209320	1
24	Baffle Access Cover Sealing Strip	208151	1	208151	1
25	Burner	223427	1	223440	1
26	Burner Cover	223444	1	223444	1
27	Burner Cover Plate	223447	1	223447	1
28	Burner Spacing Plate	224109	1	224109	1
29	Burner Mounting Flange	223151	1	223151	1
30	Burner Mounting Gasket	223152	1	223152	1
31	Acoustic Hose	209576	1	209576	1
32	Flexible Oil Line ²	207019	1	207019	1
33	Return Pipework Assembly	224119	1	224141	1
34	Drain Cock	99592	1	99592	1

¹ Not shown; see Figs. 20a & 20b (page 24/25) for baffle configurations.

² Not shown; see burner details leaflet for further information.

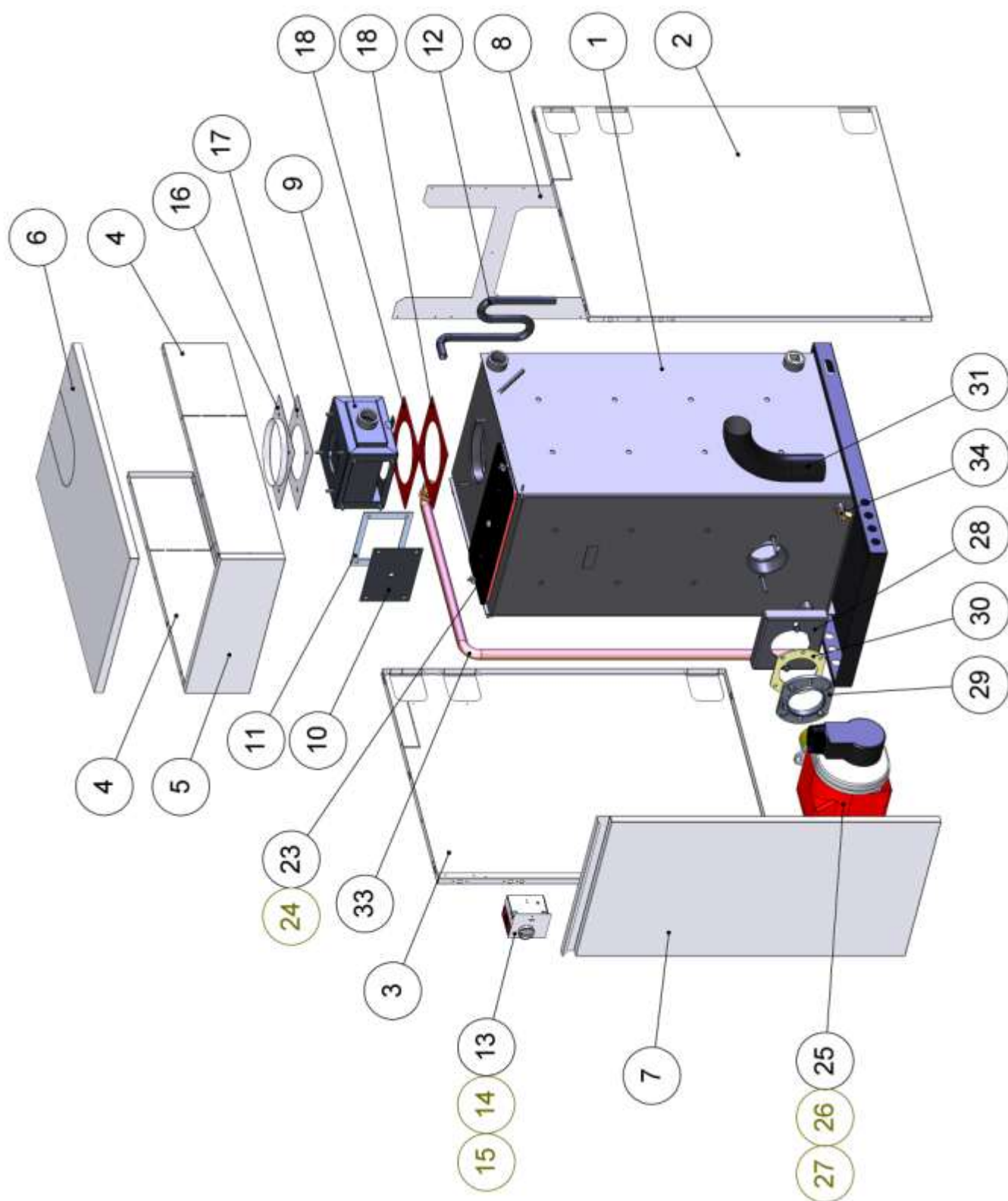


FIG 21 - BOILER ASSEMBLY



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