TRIANCO

TRISTAR

TRISTAR OPTIMA JUNIOR K CB AND SB

WALL MOUNTED GAS BOILERS

TRIANCO

INSTALLATION INSTRUCTIONS

TO BE RETAINED BY HOUSEHOLDER

CB MODEL	G.C. No:	47-897-06
SB MODEL	G.C. No:	41-898-39

INDEX:

1 WARNINGS & SAFETY ADVICE

This booklet, along with the accompanying user manual, should be kept by the householder and should always stay with the boiler, even when the appliance is transferred to another system.

Please read these instructions carefully, as they provide important directions for the safe installation, use and maintenance of the appliance.

Any use of the boiler not sanctioned by these instructions is strictly prohibited and will invalidate the guarantee.

Installation, commissioning and servicing of the boiler must only be carried out by a CORGI-trained and registered engineer.

Any person(s) who carries out other remedial work, e.g. electrical fault-finding, must have suitable engineering qualifications.

The appliance contains no asbestos or other substances which contravene the COSHH Regulations (Control of Substances Hazardous to Health Regulations, 1988).

Flue systems must not be modified in any way other than as described in the installation manual.

Do not store or use any combustible materials close to, or within the appliance.

In the case of structural work or maintenance close to the pipework, flue system, appliance or accessories, switch off the boiler prior to the commencement of such work. Only reactivate the boiler once these have been thoroughly checked by suitably-qualified personnel.

The appliance must be serviced annually by a CORGI-registered engineer, unless the requirements of the installation demand more frequent service.

Do not obstruct the clean air supply to the boiler, or the flue terminal.

When installing the appliance, do not mount it on chairs, ladders, stools or any other unstable surface.

To clean the appliance casing, switch off the boiler and isolate the power supply. Wipe with a damp cloth. Do not use detergents, harsh liquids, or other toxic products.

Before operating the appliance, please ensure that all gas and water supply valves are open, and that the system has been correctly filled with water.

The system must be flushed of all deposits before filling.

Installation is the purchaser's responsibility.

Any repair should be carried out using original spares. Failure to do so may invalidate the guarantee and jeopardise the safety of the boiler. Trianco is not held liable for the malfunction of any of these components

It is forbidden to climb on the appliance.

Always turn off the gas cock before carrying out any work on components which carry gas.

If you smell gas:

- do not operate any electrical appliances
- extinguish any fires
- close the main gas valve upstream of the meter
- open all windows and doors to ventilate the room
- telephone the gas company

If you smell combustion fumes from the boiler:

- switch off the boiler
- open all windows and doors to ventilate the room
- call your local authorised engineer

Before carrying out any work on the boiler, always switch off the power to the appliance at the mains isolation.

1.1 E.C. DECLARATION OF CONFORMITY

This appliance is in accordance with the applicable requirements of the Gas Appliance Directive, Boiler Efficiency Directive, Electromagnetic Compatibility Directive, and the Low Voltage Directive.

PIN	CE 0694 BM 3593
Category UK	$II_{2H\ 3P}$
Appliance Type	C_{13}, C_{83}, B_{23}, B_{33}

1.2 CONTENTS OF PACK

The boiler carton should include:

- Boiler
- Pipework connection manifold
- Wall mounting bracket and templates
- Instruction/guarantee pack
- Bag of screws/fixings
- Diverter valve connection (SB model only)
- External controls connection (SB model only)

1.3 STANDARDS AND REGULATIONS

This boiler must only be installed by a CORGI-registered engineer and be in accordance with any local building regulations. Where no specific instruction is given, reference should be made to the relevant British Standards Codes of Practice.

The installation must also comply with the following regulations and standards:

The Building Regulations Part L

I.E.E. Wiring Regulations

Gas Safety (Installation and Use) Requirements

Local Water Undertaking bylaws.

BS 6891 – Gas Installations

BS 5482 – Installation of LPG

IS 813 – Installation of Gas Appliance (Ireland only)

BS 5546 – Installation of Hot Water Supplies for Domestic Purposes

BS 5449 – Flues and Ventilation

BS 4814 – Specification for Expansion Vessels for Sealed Hot Water Heating Systems

BS 6798 – Measurement of Emitted Noise

BS 5449 – Forced Circulation Hot Water Central Heating Systems

BS 7074 – Expansion Vessels and Ancilliary Equipment for Sealed Water Systems

BS 7593 – Treatment of Water in Domestic Hot Water Central Heating Systems

BS 7671 – Electrical Wiring Regulations

BS EN 1264 Part 4 – Installation of Floor Heating, Systems and Components.

Incorrect installation may cause harm to people, animals and property. The manufacturer is not liable for damage caused by incorrect installation and by non-observance of these instructions.

The addition of anything which may interfere with the normal operation of the boiler without the written permission of Trianco Ltd could invalidate the appliance guarantee and infringe the Gas Safety (Installation and Use) Regulations.

1.4 DESCRIPTION OF APPLIANCE

- Wall-mounted appliance. Siting not dependant upon room size.
- Multi-function display
- Natural gas models are low-emission
- Automatic ignition
- Modulating Output
- Full safety systems, with flame ionisation monitoring and temperature sensors
- Concentric flue with CO/CO_2 test point
- Regulated-speed fan
- Pre-mix burner
- Central heating temperature control
- DHW temperature control (CB Model)
- Three-speed circulating pump with auto vent
- Pressure gauge, relief valve, expansion vessel
- Hot water priority circuit
- Plate-type heat exchanger (CB Model)
- Integral condensate trap

1.5 USE OF ANTIFREEZE PRODUCTS

If antifreeze substances are to be used in the system, always check with the manufacturer that they are compatible with the aluminium which forms the main body of the boiler heat exchanger. Due to its corrosive nature, **do not** use antifreeze products which contain ETHYLENE GLYCOL.

A suitable antifreeze liquid will prevent rust and the formation of scale.

Periodically check the pH value of the system water, replacing as necessary when this falls below that stipulated by the antifreeze manufacturer.

Do not mix different types of antifreeze.

Trianco cannot be held liable for damage caused to the boiler or water system as a result of the incorrect use of antifreeze or other additives.

2 TECHNICAL SPECIFICATION

TRISTAR OPTIMA Junior K model			CB	SB
SEDBUK Rating			A	A
Maximum heat output Qmax (80°/60°C)		kW	23,6	23,6
Minimum heat output Qmin (80°/60°C)		kW	7,8	7,8
Maximum heat output (50°/30°C)		kW	25,0	25,0
Minimum heat output (50°/30°C)		kW	8,6	8,6
Maximum heat range (heating)		kW	24,0	24,0
Maximum heat range (DHW)		kW	27,0	–
Minimum heat range		kW	8,0	8,0
Working efficiency at max output (80°/60°C)		%	98,4	98,4
Working efficiency at max output (50°/30°C)		%	104,3	104,3
Working efficiency at 30% max output (Average T=50°C)		%	107,3	107,3
Working efficiency at min output (80°/60°C)		%	97,5	97,5
Working efficiency at min output (50°/30°C)		%	107,3	107,3
Flue losses with burner in operation		%	1,5	1,5
Flue losses with burner extinguished		%	0,4	0,4
Shell losses		%	0,1	0,1
Flue Gas temperature		°C	67	67
%CO2 in dry fumes	nat. gas (G20)	% vol	10,5	10,5
	LPG (G31)	% vol	12	12
Class of NOx emissions (EN 483)		Cl.	5	5
Combustion efficiency		%	98,5	98,5
Flue Gas mass range at nominal capacity		kg/h	38,5	38,5
Residual flue gas discharge head		Pa	90	90
Gas consumption	Natural gas G20	m^3/h	2,85	2,53
(15°C, 1013 mbar)	gas G30 / G31	m^3/h	0,84 / 1,10	0,74 / 0,98
Max. production of condensation water		l/h	2,1	2,1
Water content		l	1,8	1,8
Available head (ΔT=20°C)		kPa	25	25
Max. operating pressure		bar	3	3
Expansion vessel volume		l	7	7
Expansion vessel preload press.		bar	1	1
Nominal G20 natural gas press.		mbar	20	20
Nominal G30/G31 LPG gas press.		mbar	30	30
Max. heating temperature		°C	82	82
Min. heating temperature		°C	25	25
Specific domestic water range (ΔT=30°C)		l/min	12,5	–
Specific domestic water range (ΔT=35°C)		l/min	10,7	–
Max. domestic circuit pressure		bar	6	–
Min.domestic water withdrawal		l/min	2,5	–
Max. domestic hot water temperature		°C	56	–
Min. domestic hot water temperature		°C	36	–
Power supply		V/Hz	230/50	230/50
Max. power consumed		W	135	135
Degree of electrical protection		IP	X4D	X4D
Weight		kg	44	40
Noise at 1m at nominal capacity		dB(A)	42,5	42,5
Appliance class			II 2H 3P	
Appliance type			B23, C13, C33, C43,C53, C83	
Appliance CE Certificate No.			0694BM3593	

Key to boiler models

CB = Combi Boiler
SB = System Boiler

2.1 BOILER DIMENSIONS

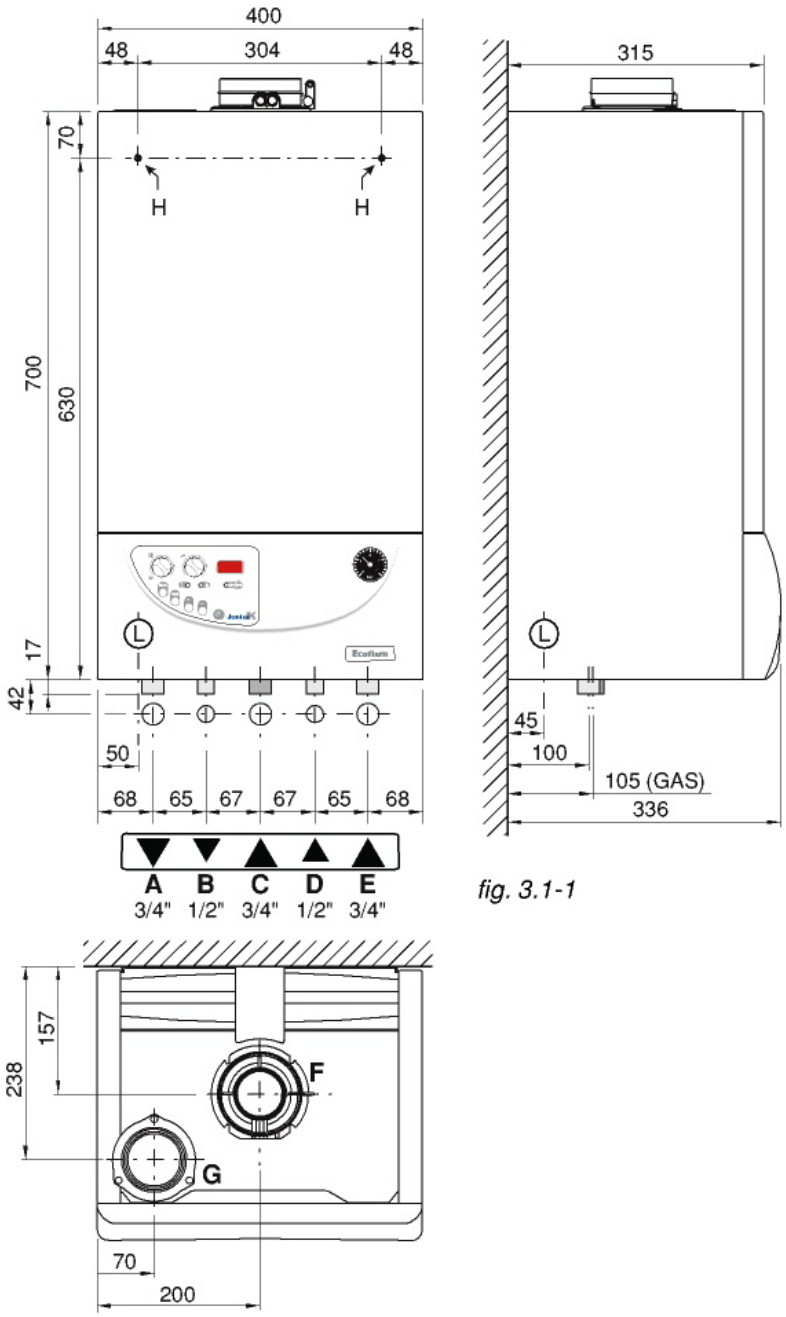


fig. 3.1-1

KEY:

A - Heating Flow ..... _"
B - Domestic Hot Water (CB only) ..... _"
C - Gas Inlet ..... _"
D - Domestic Cold Water Inlet ..... _"
E - Heating Return ..... _"
F - Flue Pipe Collar ø60/100mm
H - Wall Mounting Holes ø8mm
L - Condensate Trap Pipe

FIG. 1

2.2 WALL-MOUNTING TEMPLATE

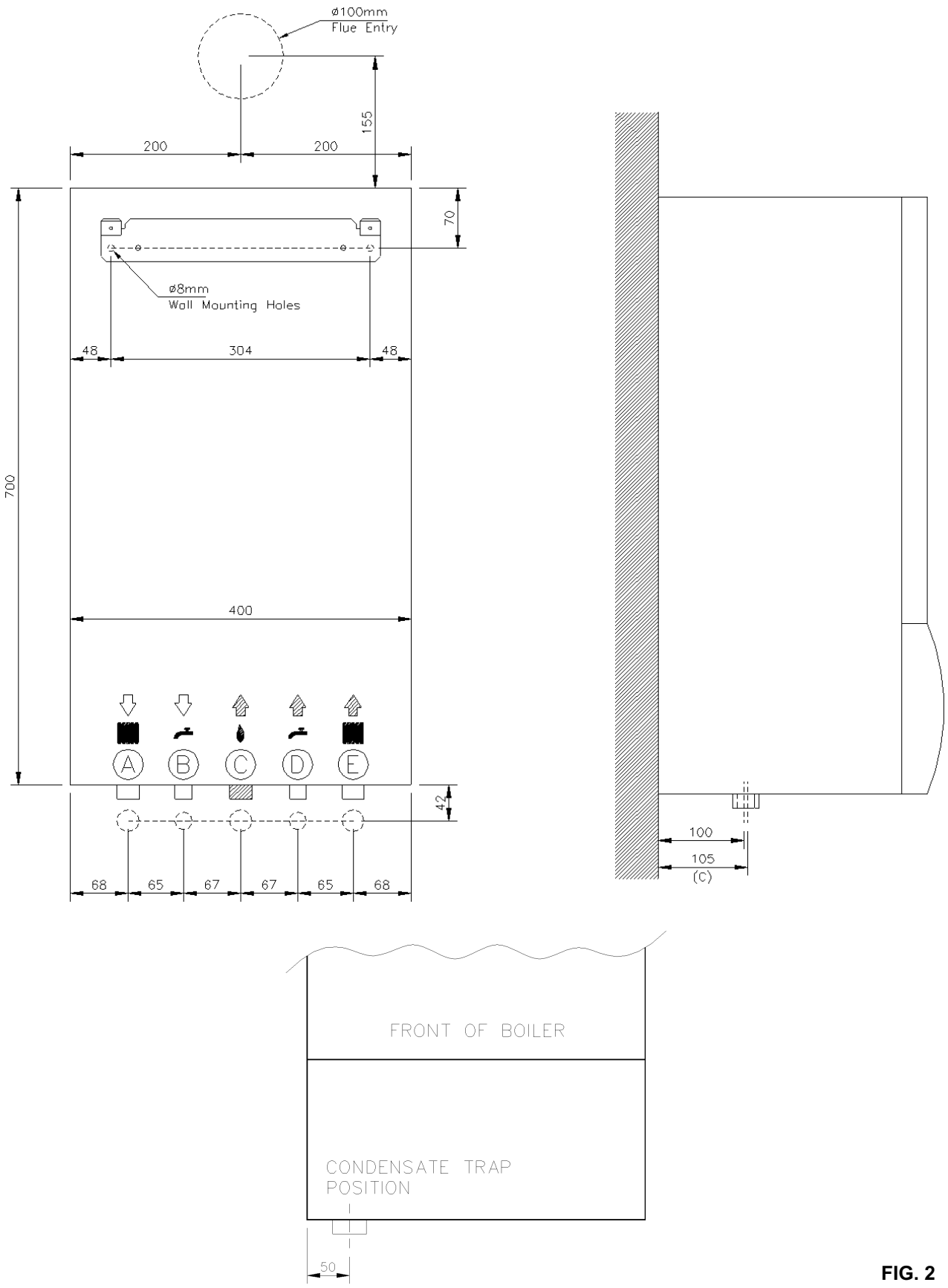
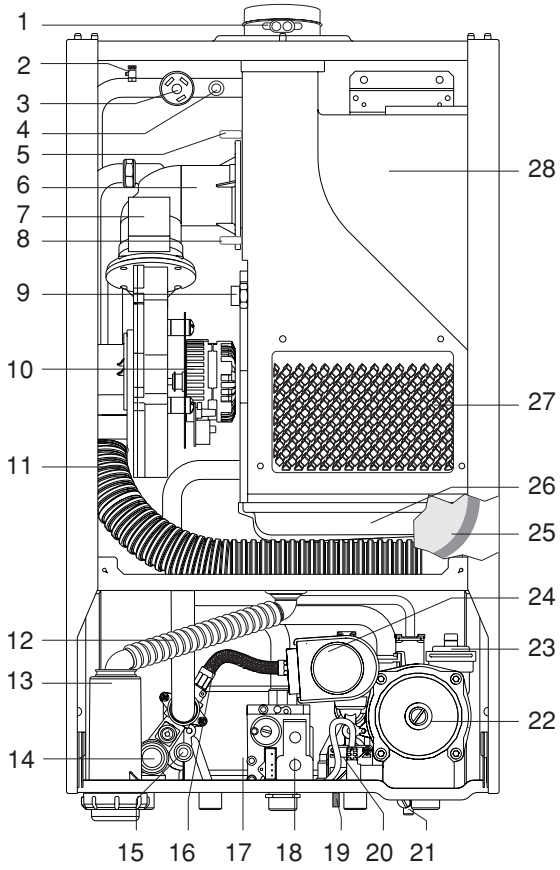
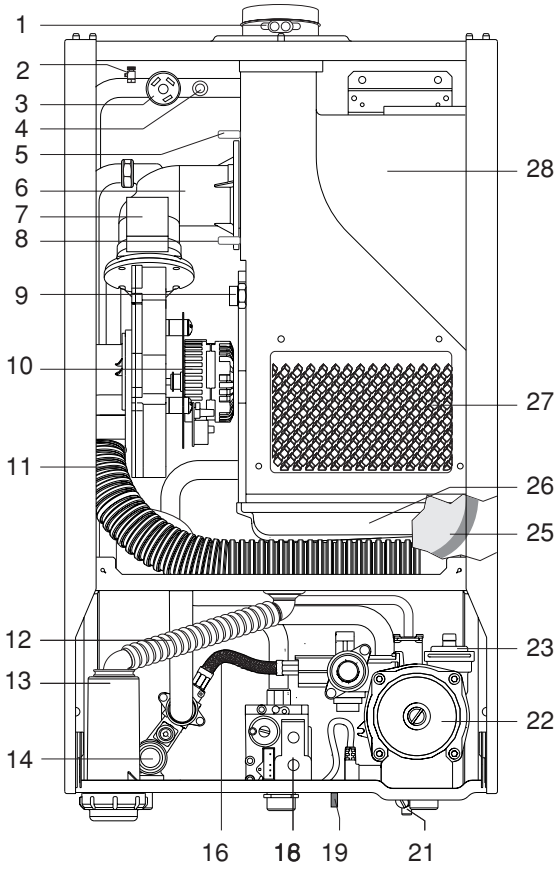


FIG. 2

2.3 TECHNICAL SCHEMATIC



Combi (CB) Model



System (SB) Model

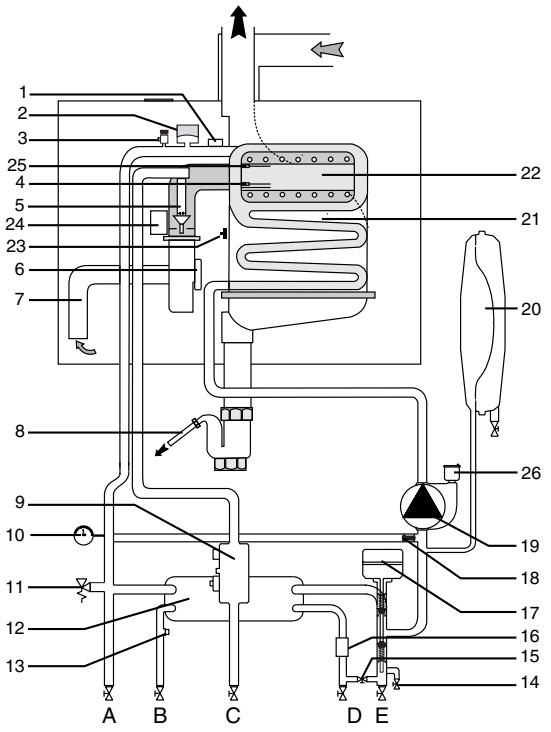
FIG. 3

KEY:

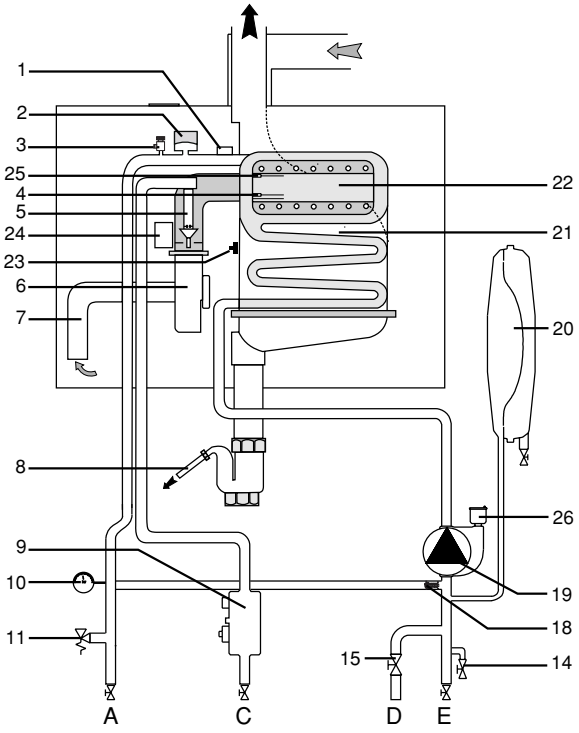
1 Flue Collar
1 Manual Air Valve
2 Pressure Switch
3 Flow Sensor
4 Ionisation Probe
5 Gas Pipe Mixer
6 Ignition Transformer
7 Ignition Electrode
8 Safety Thermostat
9 Fan
10 Silencer
11 Condensate Trap Pipe
12 Condensate Trap
13 3 bar Pressure Relief Valve
14 DHW Sensor
15 Bypass
16 Secondary Heat Exchanger
17 Gas Valve
18 Filling Valve
19 Domestic Water Pressure Switch
20 Drain Tap
21 Pump
22 Automatic Air Valve
23 Three-way Valve
24 Expansion Vessel
25 Condensation Bottom Plate
26 Inspection Cover
27 Primary Heat Exchanger

2.4 HYDRAULIC SCHEMATIC

FIG. 4



Combi (CB) Model



System (SB) Model

KEY:

1 Flow Sensor
2 Low Pressure Switch
3 Manual Air Valve
4 Ignition Electrode
5 Nozzle
6 Fan
7 Silencer
8 Condensate Trap Pipe
9 Gas Valve
10 Pressure Gauge
11 Pressure Relief Valve
12 Secondary Heat Exchanger
13 DHW Sensor
14 Drain Tap
15 Filling Valve
16 Domestic Water Pressure Switch
17 Three-way Valve
18 Bypass
19 Pump
20 Expansion Vessel
21 Primary Heat Exchanger
22 Burner
23 Overheat Thermostat
24 Ignition Transformer
25 Ionisation Probe
26 Automatic Air Valve

A Heating Flow
B Domestic Hot Water
C Gas Inlet
D Domestic Cold Water Inlet
E Heating Return

3 INSTALLATION AND ASSEMBLY

The appliance **must** only be installed on sealed heating systems.

Do not use galvanised radiators or pipework, as this will lead to the formation of gas in the system.

A suitable antifreeze fluid should be added to the water in the central heating system.

Do not use add sealing agents to the water in the central heating system, as deposits may remain in the boiler heat exchanger.

Regard should be given to the siting of the flue terminal, so as not to cause a nuisance. Further guidance is given in **section 6**, on **page 21**.

3.1 SITING AND ACCESS

Clearances

The boiler must be installed in an accessible position, with attention given to the need for future servicing and maintenance.

While the side panels will not require removal during most service operations, it is recommended that a clearance of 35mm is provided on either side of the boiler for convenience.

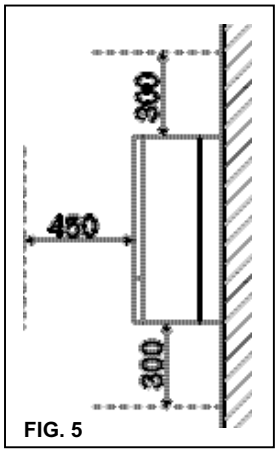


FIG. 5

As the casing and flue temperature will not exceed 85°C, no special provisions are required to protect flammable building components and nearby furniture, though all specified clearances must be observed.

Due to low thermal losses from the casings, the appliance is eminently suitable for installation in a cupboard or compartment, provided all specified clearances are observed and the requirements of BS 6798 and BS 5440 Part 2 are observed.

Combustion Air

The combustion air to the appliance must not contain any corrosive substances. Substances which are classed as corrosive include chlorine and fluorine-based products, solvents, paints adhesives, some aerosols and household cleaners.

3.2 UNIT ASSEMBLY

The boiler must be installed in a position complying with the dimensions set out in **section 3.1**.

Using the wall template (**section 2.2, page 9**) provided, and making sure that the template is level, mark and drill the holes required for mounting the wall plate, pipework, manifold connections and flue. Mark and drill the holes required for the boiler mounting plate and insert appropriate plugs for the type of wall.

Fix the boiler mounting plate and manifold in position on the wall. In this way the water connections can be pre-piped before the boiler is mounted. Lift the boiler onto the mounting plate and make good all appropriate connections.

3.3 HYDRAULIC CONNECTIONS

For optimum performance after installation, the boiler and associated central heating system must be flushed in accordance with BS 7593 (Treatment of Water in DHW Central Heating Systems).

Observe all regulations in force, specified by the Local Water Authority.

The pressure relief valve (**item 13**, **page 10** & **item 11**, **page 11**) is set at 3 bar. All pipework, fitting, etc. used on the system should be suitable for pressures in excess of this. The pressure relief discharge pipe should not be less than 15mm in diameter and should run continuously downward. The termination point should be bent facing downwards and towards the wall and not discharge over windows, entrances, walkways and any other place likely to cause nuisance to persons and electrical components. Consideration should be given to the fact that boiling water and steam will discharge from the pipe upon activation of the pressure relief valve.

A _" male pipe connection will be required to connect to the pressure relief valve.

The 10 litre expansion vessel provided with the boiler is suitable for system volumes of up to 140 litres. An additional vessel will be required for system volumes in excess of this. The following formula can be used to calculate the required expansion vessel size:

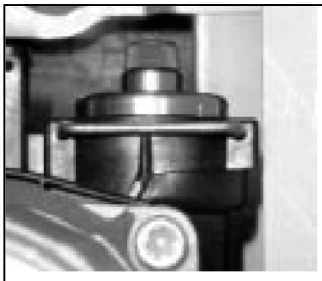
V = 0.07 x C

V = Expansion vessel volume (litres)
C = Water system volume (litres)

3.4 FILLING THE SYSTEM

To fill the system once the pipework has been connected, first gain access to the inside of the boiler (see **section 4**, **page 16**) and open the cap on the automatic air valve (**item 23**, **page 10**). Gradually open the filling loop valves located on the underside of the boiler. Once at desired pressure, close the filling loop and open the manual air valve (**item 2**, **page 10**) to vent the system when full. When complete, close the manual air valve (**fig 7**).

All system filling must be done in accordance with recommended WRAS guidelines.



Automatic Air Valve

FIG. 6

Manual Air Valve

FIG. 7

The boiler operates between working pressures of 1-1.5 bar. This can be checked on the pressure gauge located on the front control panel. Once all the air has been vented from the system, close the manual and automatic air valves. Once the desired pressure has been reached, close the filling valves.

3.5 CIRCULATING PUMP

Before initial firing of the boiler, ensure that the pump has not become blocked by carrying out the following operation:

1) Remove screw 'A' (**fig 8**).

2) Turn the rotator knob, taking care not to apply excessive force.

3) Replace screw 'A'.

Check that the circulator is operating correctly, and if necessary, bleed of air by turning screw 'A' anti-clockwise. Tighten once complete.

Important: Before proceeding, always ensure that the water within the pump is not boiling. Also take care not to damage any other components with water which may escape during this process.

The pump is factory-set at **setting III**. In most circumstances this is the best setting to achieve optimum boiler performance and will not require adjustment. We recommend that this is not altered unless strictly necessary.

To change the pump speed, rotate knob '**S**' (see below) into the required position (**I**, **II**, **III**).

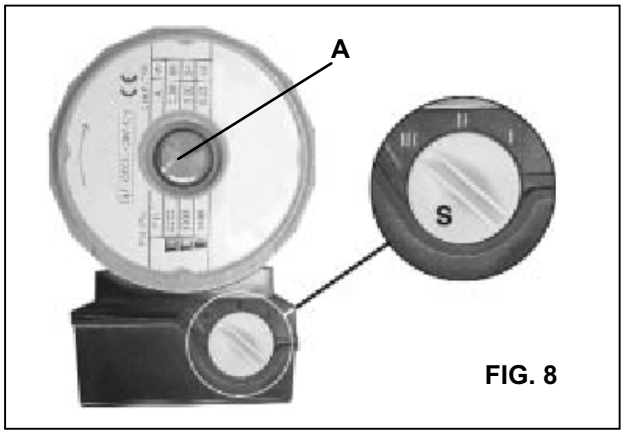


FIG. 8

3.6 SYSTEM PRESSURE CHECKS

The householder should be informed that the system pressure should be checked periodically via the gauge on the front face of the control panel.

To recalibrate the system pressure, slowly open the filling valves on the underside of the appliance. When the desired pressure has been reached, close the valve.

(continued overleaf)

When the system pressure drops below the minimum values, the digital readout on the control panel will display the fault codes '**E 02**'. Once the pressure has been reset, the boiler should be switched off, then on, via the **ON/OFF** button on the control panel.

If during normal operation the pressure drops repeatedly, this indicates a loss of pressure in the system beyond expected levels and all valves, pipework, etc. should be checked for leaks.

3.7 CONDENSATE TRAP

The appliance has an in-built condensate trap (**item 12**, **page 10**) which eliminates the need for any external traps. The flexible drain hose is located behind the pipework on the underside of the boiler. This should be routed through the cutout in the base. Connect to the flexible and extend the pipe run away from the appliance with a continuous fall of 2° (or 20mm in every metre).

Before initial firing of the boiler, the condensate trap **must** be filled with water to prevent the escape of flue gases. On the underside of the boiler, unscrew the transparent glass of the drain connection, fill the trap to halfway with water, before reassembling.

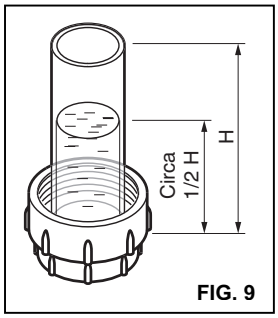


FIG. 9

3.8 CONDENSATE PIPE

The condensate pipe may terminate into any four areas:

1) Into an internal waste system, with the end of the pipe into a gully below ground level, but above the water line.

2) Into an external waste system, with the end of the pipe into a gully below ground level, but above the water line.

3) Into an internal soil and vent stack.

4) Into an external purpose-made soakaway.

As external condensate pipe runs may be susceptible to freezing during very cold weather, it is advisable to terminate the pipe into an internal waste system where possible.

If there is no alternative to an external pipe run, the following should be taken into consideration:

1) The pipework should be insulated with weather-proof material to prevent the condensation from freezing.

2) The pipe run should take the shortest practical route.

3) The pipe should terminate as close as is possible to the ground/drain, while still allowing for the safe dispersal of the condensation.

A condensate pump can be fitted where the external ground level is higher than the boiler and there are no internal drains.

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

3.9 HARD WATER AREAS

If the combi (CB) model is to be installed in a hard water area, a suitable water-treatment device must be fitted in the mains supply to the boiler.

If in doubt, please contact the local water authority.

3.10 UNDERFLOOR HEATING

These notes are for guidance only. In all cases, refer to manufacturer's instructions and BS EN 1264-4 for best practice when installing underfloor heating systems.

The use of plastic pipes without protection against oxygen ingress can cause corrosion of parts within the system. All pipework must be of a type which incorporates an oxygen-proof barrier in accordance with standards DIN 4726 and DIN 4729.

Trianco is not liable for any damage caused to the appliance, system, or floor areas as a result of non-compliance with manufacturer's instructions and the standards quoted above.

3.11 PIPEWORK CONNECTION MANIFOLD

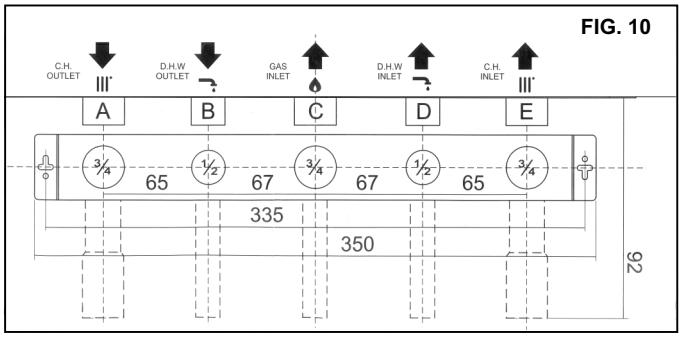
The boiler is supplied with a pipework connection manifold (**fig 12**), simplifying the connection of the gas and water supplies.

Mount the boiler as shown and described on the template provided and the manifold as shown on **fig 11**.

Connect the pipework to the manifold, ensuring all joints are sealed correctly. The correct pipework placement can be seen on **fig 10**.

After the system fill, check all joints once more for leaks.

FIG. 10



A - Installation with bracket extended (to allow for the passage of the pipes behind the boiler) when the unit is installed with a spacer frame.

B - Installation without bracket extended.

FIG. 11

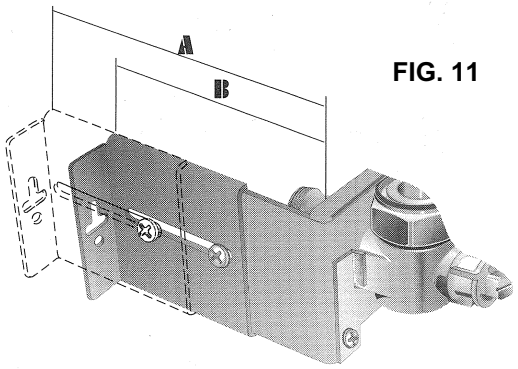
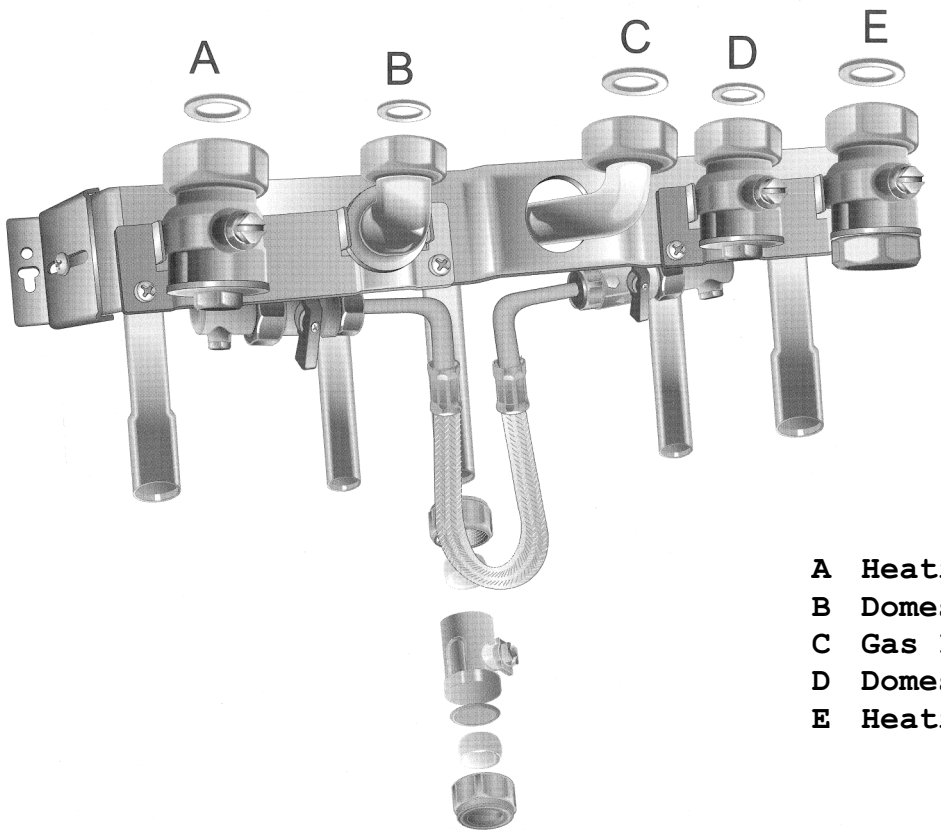


FIG. 12



A Heating Flow
B Domestic Hot Water
C Gas Inlet
D Domestic Cold Water Inlet
E Heating Return

4 ACCESS TO THE INSIDE OF THE BOILER

To gain access to the combustion chamber, proceed as follows:

1) Remove the two screws from the underside of the control panel (**fig 13**) and bring forward, pulling from the top.

2) Remove the two screws behind the control panel.

3) Lift the front door upwards and then forward to remove.

4) Remove screws (marked '**a**' on **fig 15**) from the combustion chamber cover and lift off.

5) Remove screws (marked '**b**' on **fig 16**) from the side panel and lift off.

Note: Removal of the side panel will not be required during normal maintenace and service procedures.

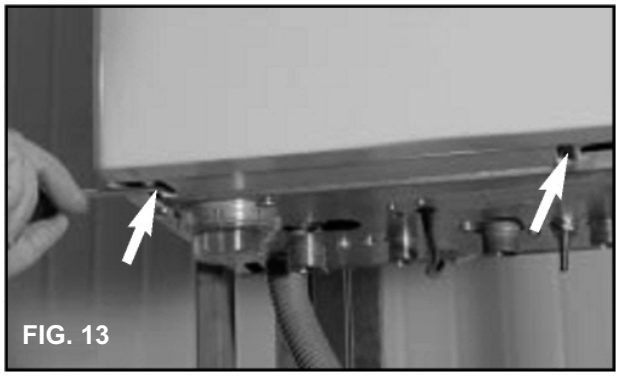


FIG. 13

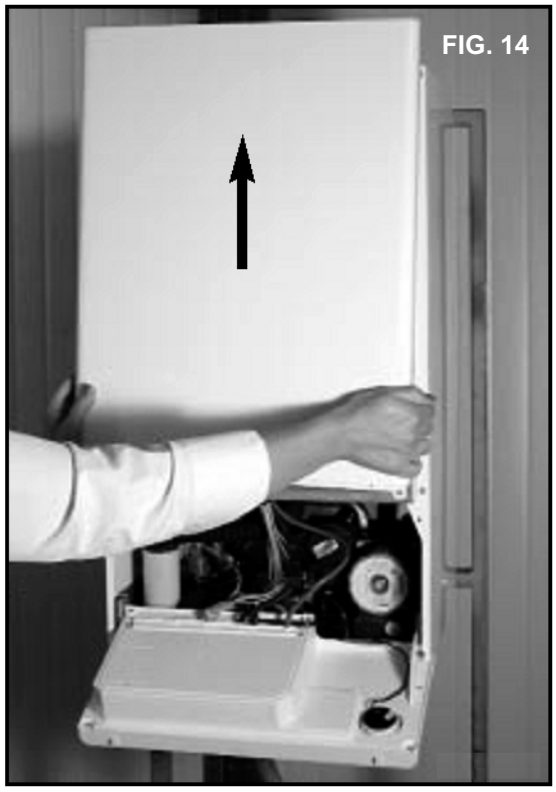


FIG. 14

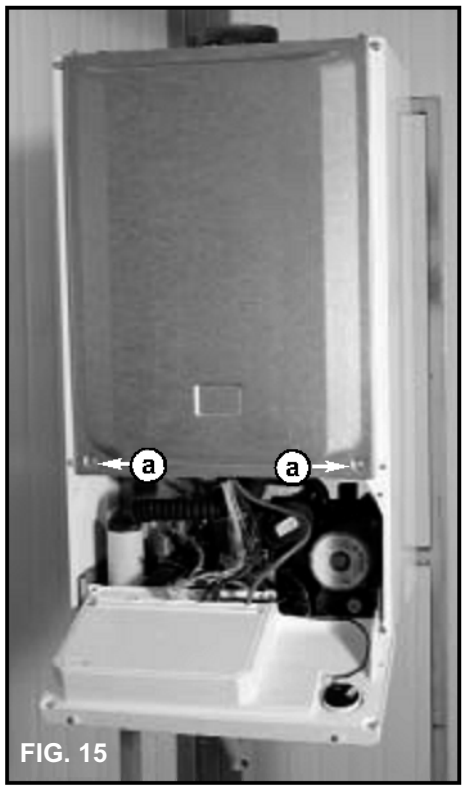


FIG. 15

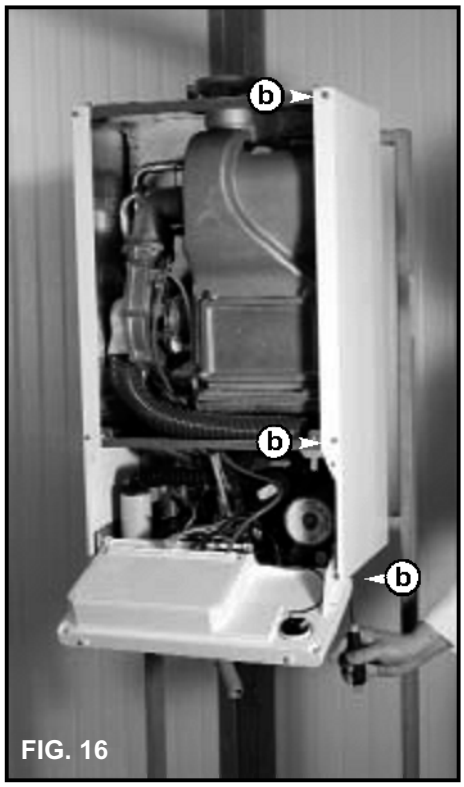


FIG. 16

5 ELECTRICAL

Always isolate the power supply to the appliance before carrying out any work on the electrical systems and components.

Wiring to the boiler must conform with all requirements of the current issue of the IEE Wiring Regulations for fixed wiring to a stationary appliance, and any local regulations which may apply. Failure to do so may cause a hazard and will invalidate the appliance warranty.

This appliance must be earthed.

Connection to the appliance should be via a fused double-pole isolation switch, with a contact separation of at least 3mm in all poles, and serving only the boiler and system controls.

The cables to low power supply peripherals such as remote controls, room thermostats, probes, etc. must be double-isolated or follow a different path from those to the main net.

After installation, or in the event of a fault, the electrical system should be thoroughly checked for fuse failure, short circuits, incorrect polarity, resistance to earth, and earth continuity.

In the event of replacement, use a cable with the same specification as that fitted.

- Supply – 230V, 50Hz, 150 Watts.
- External fuse – 3 amp.
- Water protection IPX4D.

5.1 ACCESS TO ELECTRICAL PANEL

To gain access to the electrical components, remove the two screws from the underside of the control panel (**fig 17**) and bring forward, pulling from the top. Remove screws (marked '**A**' on **fig 18**) from the rear of the control panel and lift the fixed panel as shown on **fig 19**.

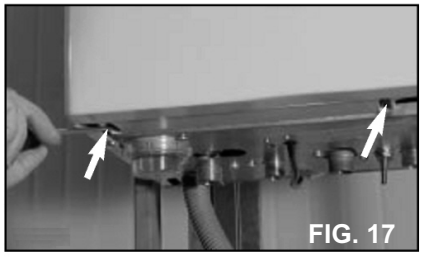


FIG. 17

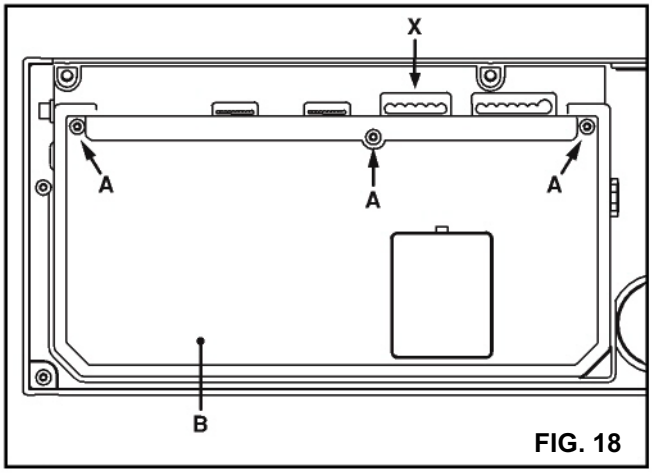


FIG. 18

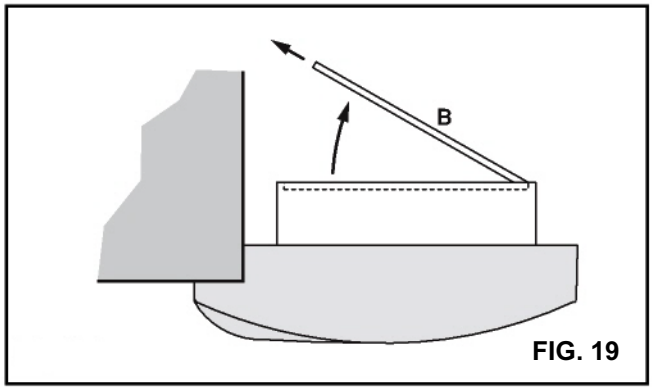


FIG. 19

5.2 CONTROLS CONNECTION PLUG

On the **System (SB) Model** only, this item is supplied separately in a bag within the boiler carton and is used to connect external controllers to the boiler. See wiring diagram (**section 5.6**, **fig 24**) for correct placement. Using a crimping tool, attach the external control wiring to the terminals provided and insert into the plug provided (**fig 20**).

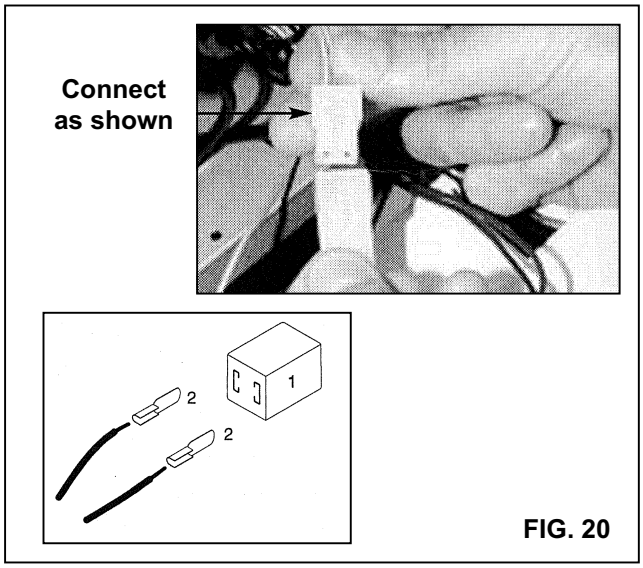


FIG. 20

5.3 CONTROLS & WIRING

Combi (CB) Model

The boiler should be connected to a double-channel programmer with volts-free switching to allow the control of the central heating and hot water. A room thermostat should also be fitted.

Alternatively, a digistat can be fitted in place of these, controlling the central heating and leaving the hot water facility on permanently. See **fig 21** for digistat wiring.

In both circumstances, it may also be necessary to fit a frost thermostat, should there be a possibility of the water in the pipes freezing.

When using standard controls, the boiler flow temperature can be set using the heating knob on the control panel. The hot water control becomes inactive when the temperature is set via the cylinder thermostat.

System (SB) Model

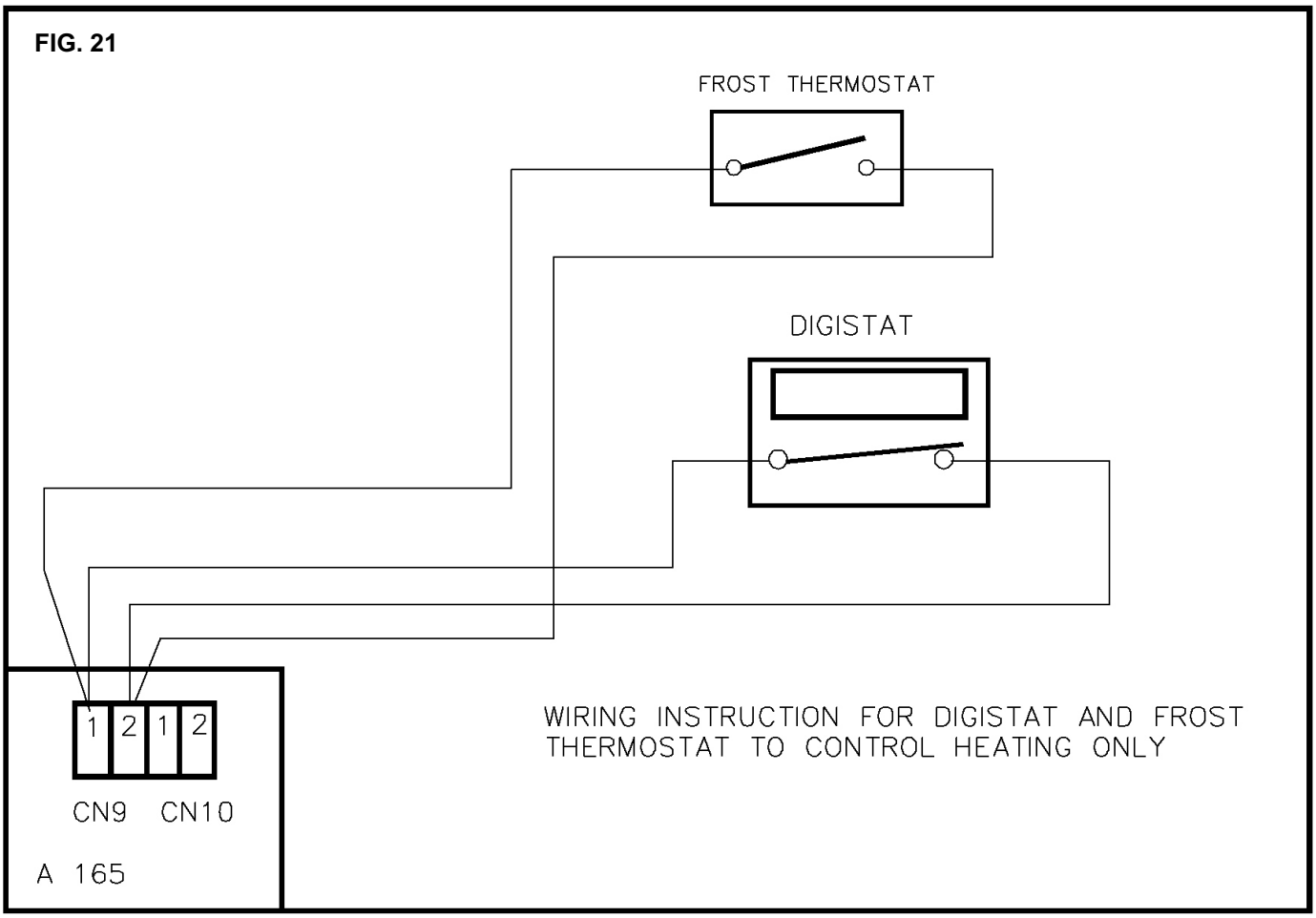
The boiler should be connected to a double-channel programmer with volts-free switching to give the option of controlling both the central heating and hot water separately. A room thermostat and cylinder thermostat should also be fitted.

It may also be necessary to fit a frost thermostat, should there be a possibility of the water in the pipes freezing.

The System (SB) model can be wired to both Y-plan and S-plan control systems (see **figs 22 & 23**).

When using standard controls, the boiler flow temperature can be set using the heating knob on the control panel. The hot water control becomes inactive when the temperature is set via the cylinder thermostat.

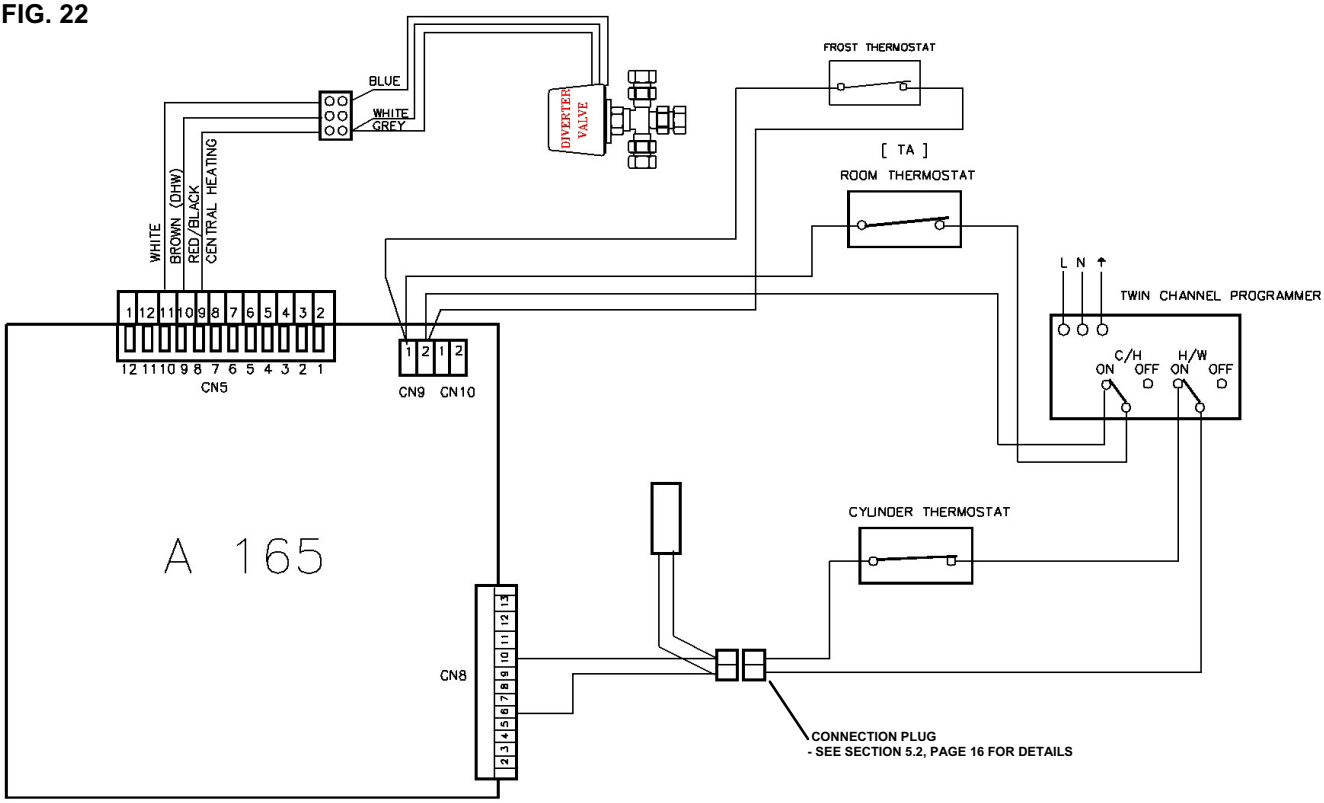
FIG. 21



IMPORTANT:
All external controls must be volts-free switching type.

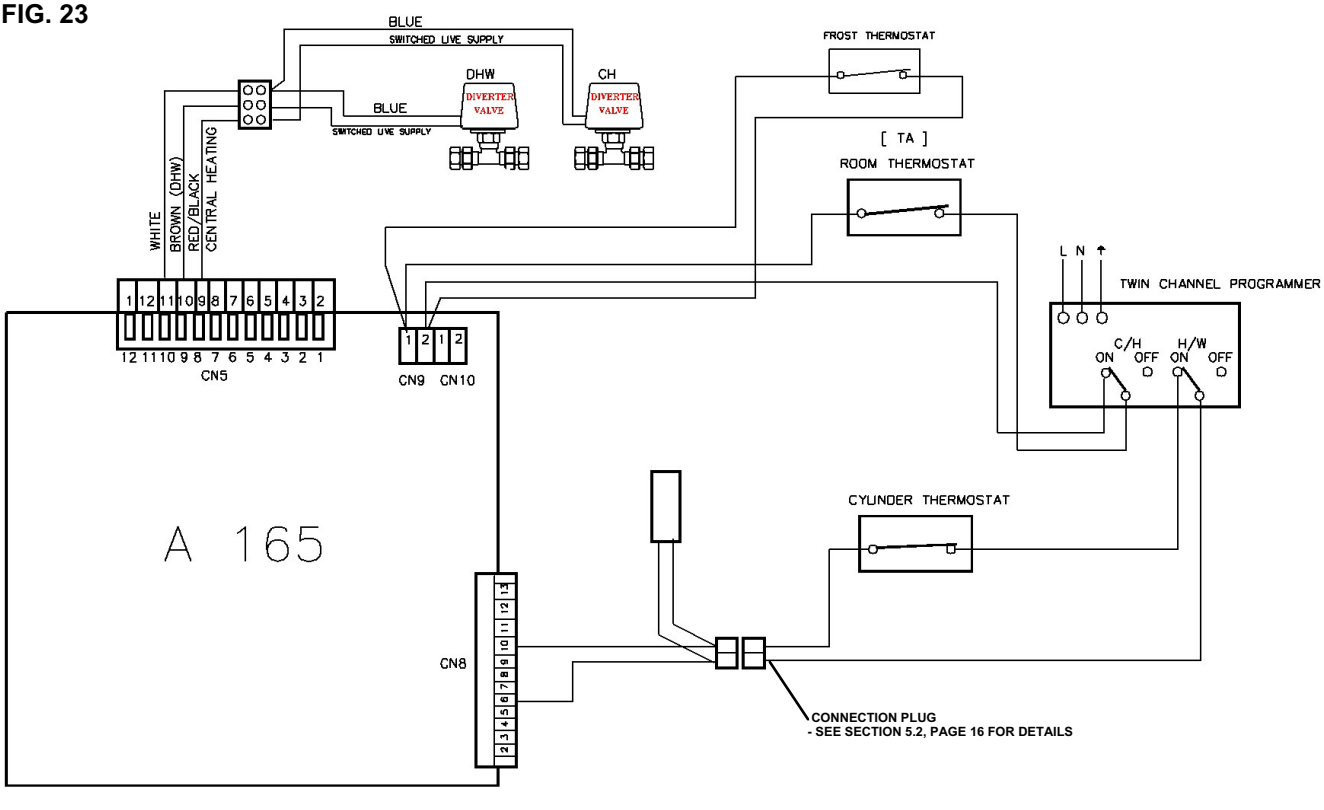
5.4 Y-PLAN WIRING

FIG. 22



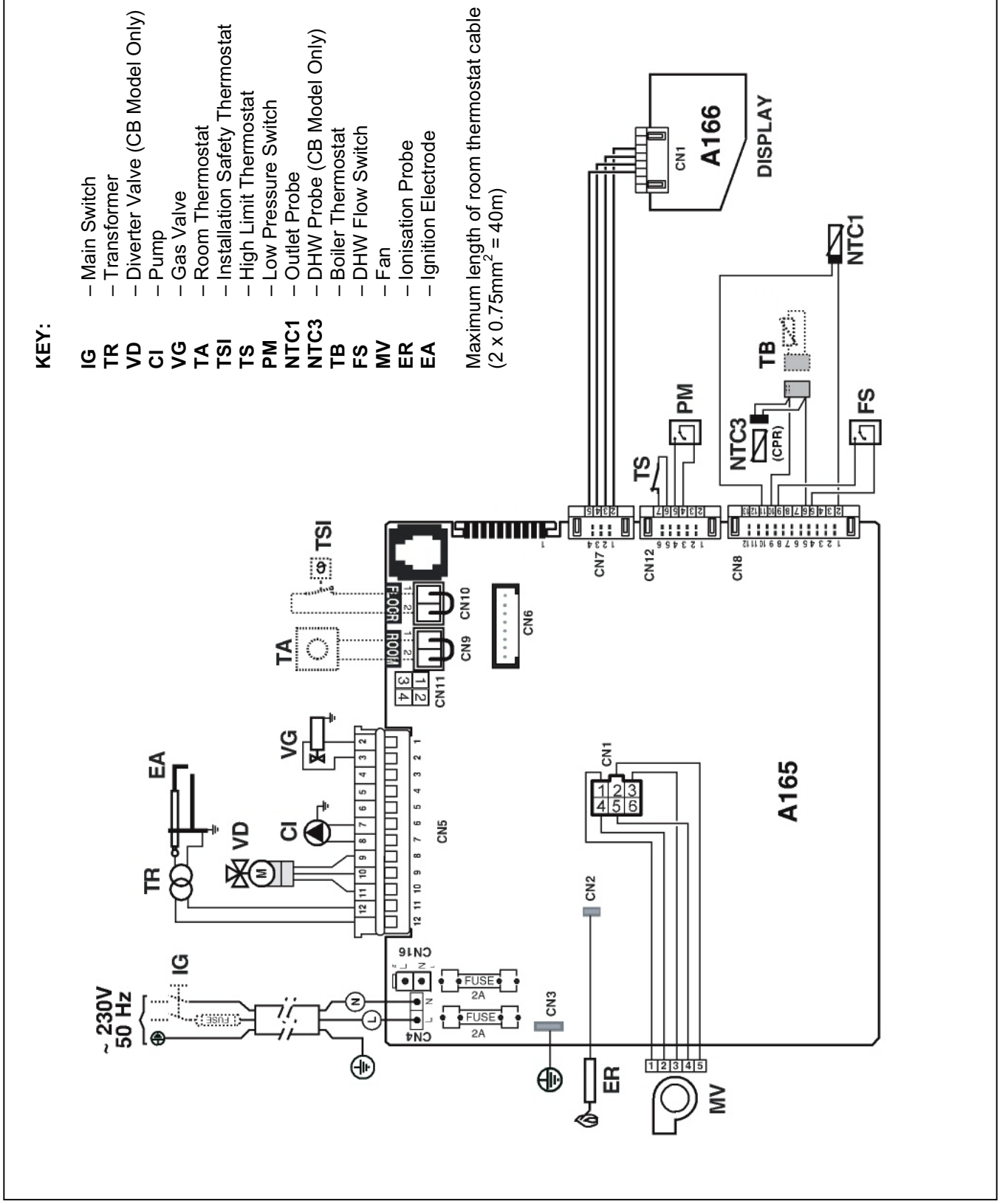
5.5 S-PLAN WIRING

FIG. 23



5.6 WIRING SCHEMATIC

FIG. 24



6 FLUE SYSTEM

The flue must be installed in accordance with BS 5440 Part 1 and comply with all current Building Regulations.

The Tristar Optima Junior K is a Type C Certified Appliance.

As the appliance is a condensing-type boiler, the exhaust temperature is significantly lower than that of a non-condensing boiler. As such, as part of its normal operation residual water vapour will collect in the flue pipe and from time to time be emitted as a plume of steam. It is therefore strongly recommended to take this into account when deciding the position of the flue terminal.

Only Trianco flues are permitted for use on this appliance. Correct operation of other manufacturers' flues on the boiler cannot be guaranteed.

Requirements will vary dependent upon the type of kit installed. Guidance is given, but unless otherwise stated, always comply with the recommendations of the relevant codes of practice.

Keep clear of infra-red security light sensors.

If the terminal discharges onto a path or passageway, ensure that combustion products will not cause a nuisance and that the terminal will not cause an obstruction.

If the terminal discharges less than 2 metres from ground level, a suitable terminal guard must be fitted.

Siting the terminal below a carport or balcony is not recommended.

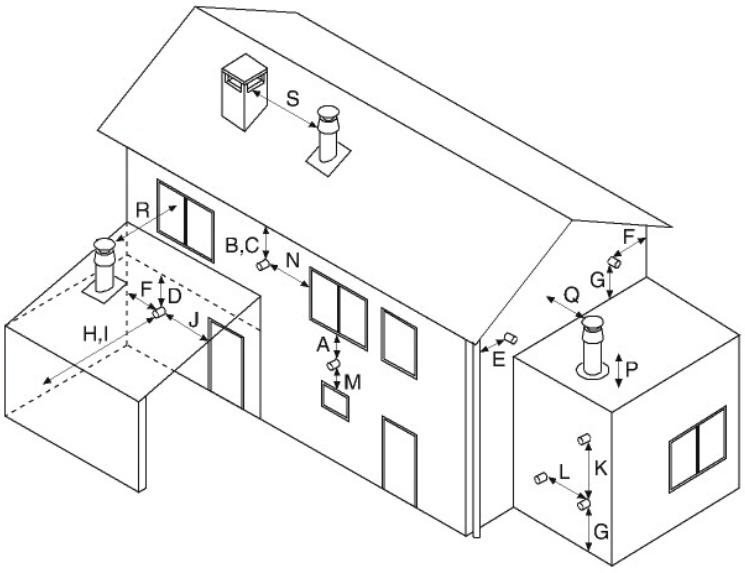
Full clearance requirements for flue terminals are given on the diagram below.

Please refer to the Trianco catalogue for a full list of available flues and configurations.

Any pipe exposed to the elements should be protected with a suitable material and maintained regularly.

To fit the flue pipes together, it is essential to apply a thin bead of lubricant (e.g. washing-up liquid, vaseline) around all 'o'-ring seals.

As the flue operates under positive pressure, it is essential to achieve a total seal on all flue joints.



Terminal position with minimum distance		*mm*
A	*Directly below an openable window, air vent or any other ventilation opening.*	*300*
B	*Below gutter, drain/soil pipe.*	*75*
C	*Below eaves.*	*200*
D	*Below a balcony/car port.*	**NOT RECOMMENDED**
E	*From vertical drain pipes and soil pipes.*	*75*
F	*From internal or external corners.*	*300*
G	*Above adjacent ground or balcony level.*	*300*
H	*From a surface facing a terminal.*	**1200**
I	*Facing a terminal.*	**2000**
J	*From opening (door/window) in carport into dwelling.*	**NOT RECOMMENDED**
K	*Vertically from a terminal on the same wall.*	*1500*
L	*Horizontally from a terminal on the same wall.*	*300*
M	*Above an opening, air brick, opening window etc.*	*300*
N	*Horizontally to an opening, air brick, opening window etc.*	*300*

Vertical Flues - minimum distance to edge of terminal		***mm***
P	*Above the roof level (to base of terminal).*	*300*
Q	*From adjacent wall to flue.*	*300*
R	*From adjacent opening window.*	*1000*
S	*From another terminal.*	*600*

FIG. 25

6.1 HORIZONTAL BALANCED FLUE KIT

1) Having decided the position of the boiler, accurately mark out the position of the terminal and boiler fixing holes using the template provided. Cut a Ø120mm hole through the wall to accept the terminal, and drill 2 x Ø8mm holes to accept the plugs and mounting bolts.

2) Fix boiler to the wall using the mounting bracket.

3) Pass the terminal through the wall, and fit the internal wall seal to the terminal.

4) Fit the Ø60mm (black) seal, clamping to the inner spigot on the boiler flue offtake (see diagram opposite).

5) Fit the Ø100mm and Ø60mm (blue) seal into the 90° concentric bend.

6) Fit the 90° concentric bend into the boiler flue offtake and secure in position with the clamp.

7) Slide the terminal into the 90° bend, ensuring that it is pushed in firmly. Ensure the wall seal is fitted against the wall.

8) Fit external wall seal to the terminal.

9) To extend the terminal length, use the 500mm concentric pipe and cut to the length required, ensuring that the inner section is cut 20mm longer than the outer.

6.2 HIGH-LEVEL BALANCED FLUE KIT

1) Measure vertically the height required (950mm maximum) from the position of the cutout on the provided template to give the correct terminal position.

2) Cut the 1000mm concentric pipe to the required length. Fit the Ø100mm and Ø60mm (blue) seal into the pipe.

3) Fit the Ø60mm (black) seal and pipe adapter to the inner spigot on the boiler flue offtake (see diagram opposite).

4) Fit the concentric pipe into the pipe adapter, securing in position with the clamp.

5) Fit the 90° concentric bend into the pipe and fit the remaining components as above.

IMPORTANT:
When installing the flue system, it is important that the flue assembly inclines slightly (2°) up from the boiler to allow any condensation formed to run back to the appropriate drain.

6.3 VERTICAL BALANCED FLUE KIT

1) Having decided the position of the boiler, accurately mark out the position of the fixing holes using the template provided. Drill 2 x Ø8mm holes to accept the plugs and mounting bolts

2) Cut a Ø150 hole in the ceiling and roof.

3) Determine the flue length required, ensuring the maximum permissible flue length is not exceeded. If it is necessary to cut one of the pipes to achieve the required length, ensure that the inner pipe is cut 20mm longer than the outer pipe.

4) Fit Ø60mm (black) seal to the inner spigot on the boiler flue offtake.

5) Fit the Ø100mm and Ø60mm (blue) seals into the concentric flue pipes.

6) If possible, pre-assemble the entire flue on a flat surface, ensuring all sections are pushed in firmly. Secure lower section to boiler with the clamp.

7) Fir a roof flashing sleeve (not supplied), and insert the flue terminal through the flashing from the outside.

8) Starting at the appliance end, assemble the extension pipes, ensuring each joint is pushed firmly in position. Ensure that none of the flue joints are situated within the joist space.

9) Fit the ceiling plate centrally around the flue, ensuring that the outer pipe has a minimum clearance of 25mm from any combustible material. Pack space with glass fibre insulation.

10) Fit wall clamp around terminal and secure to roof member, ensuring that the weight of the terminal is carried by the wall clamp and not the roof flashing sleeve.

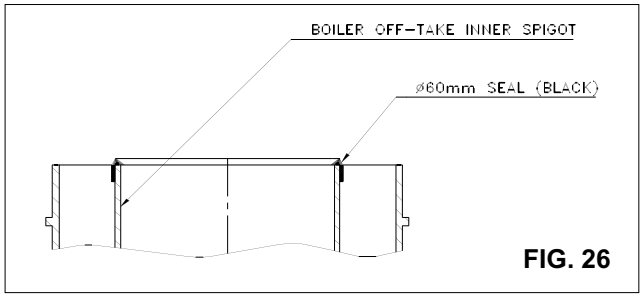
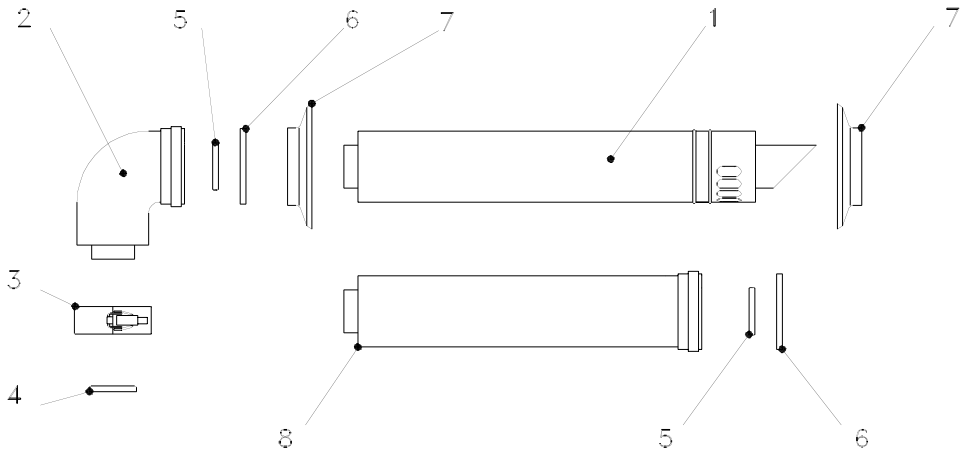


FIG. 26

Note: When fitting the high-level or vertical balanced flue kits, always ensure that the outer pipe is adequately supported. Extra wall clamping brackets are available from Trianco. Quote part code **510032**.

6.4 HORIZONTAL BALANCED FLUE KIT (5010)

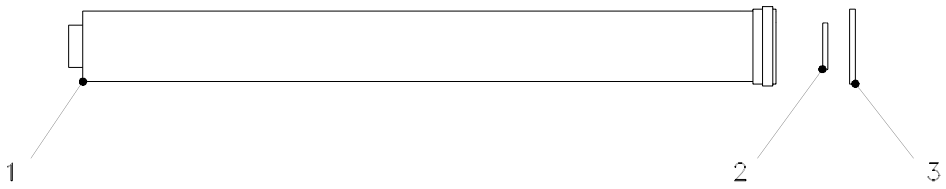
FIG. 27



Item	Part No.	Description	Qty
1	510021	Terminal	1
2	510023	90° Concentric Bend	1
3	510031	Clamp with Seal	1
4	510029	Ø60mm Seal (Black)	1
5	510027	Ø60mm Seal (Blue)	2
6	510028	Ø100mm Seal	2
7	510033	Wall Seal	2
8	510026	500mm Concentric Flue Pipe	1

6.5 1000mm CONCENTRIC FLUE PIPE (5011)

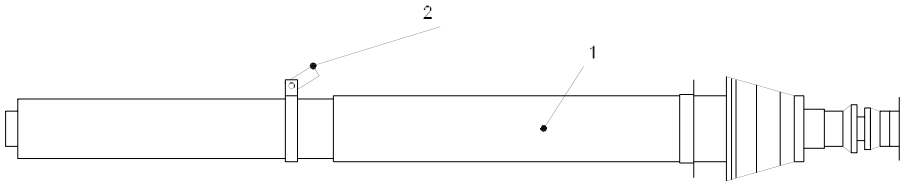
FIG. 28



Item	Part No.	Description	Qty
1	510025	1000mm Concentric Flue Pipe	1
2	510027	Ø60mm Seal (Blue)	1
3	510028	Ø100mm Seal	1

6.6 VERTICAL BALANCED FLUE KIT (5012)

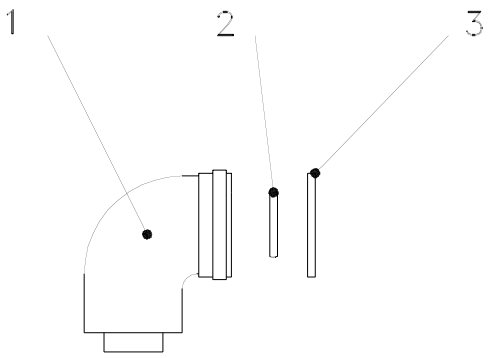
FIG. 29



Item	Part No.	Description	Qty
1	510022	Terminal With Cap	1
2	510032	Wall Clamp	1

6.7 90° CONCENTRIC BEND (5013)

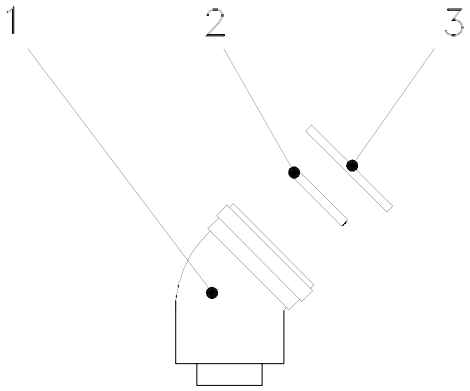
FIG. 30



Item	Part No.	Description	Qty
1	510023	90° Concentric Bend	1
2	510027	Ø60mm Seal (Blue)	1
3	510028	Ø100mm Seal	1

6.8 45° CONCENTRIC BEND (5014)

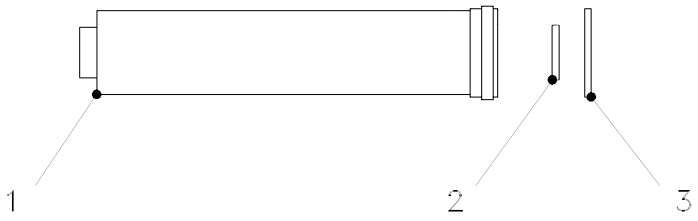
FIG. 31



Item	Part No.	Description	Qty
1	510023	90° Concentric Bend	1
2	510027	Ø60mm Seal (Blue)	1
3	510028	Ø100mm Seal	1

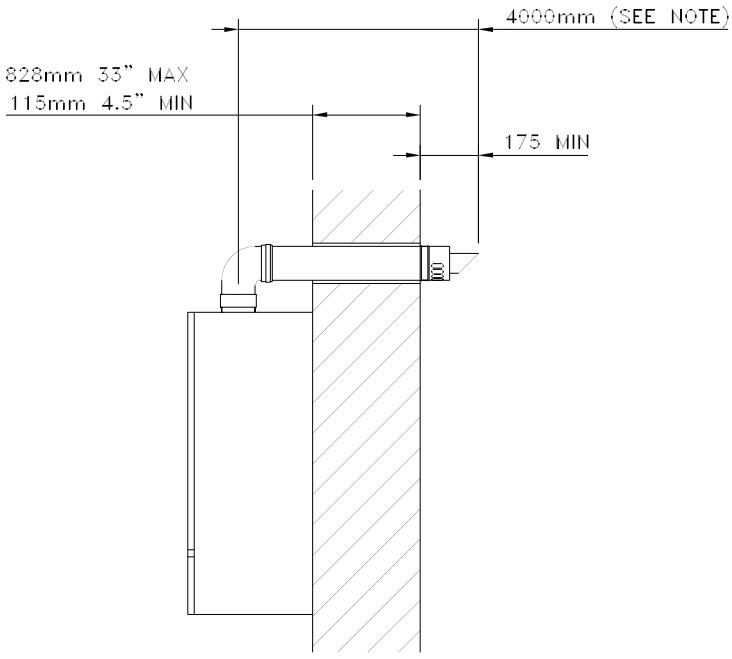
6.9 500mm CONCENTRIC FLUE PIPE (5015)

FIG. 32



Item	Part No.	Description	Qty
1	510023	90° Concentric Bend	1
2	510027	Ø60mm Seal (Blue)	1
3	510028	Ø100mm Seal	1

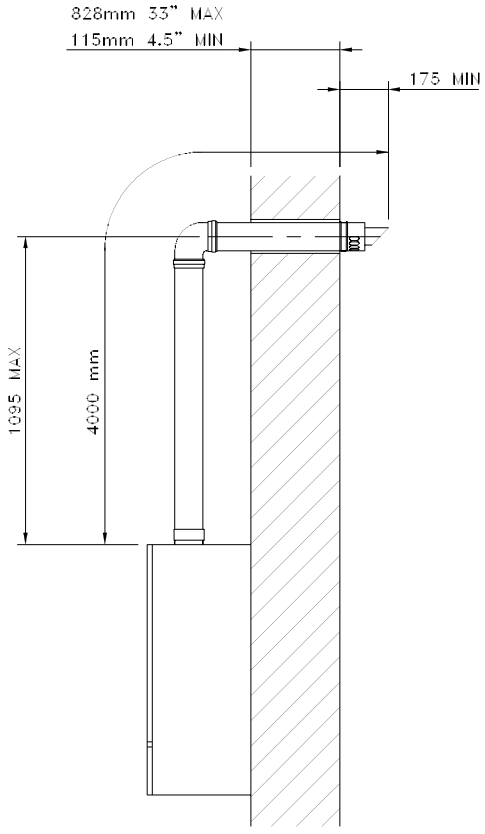
6.10 REAR OUTLET HORIZONTAL BALANCED FLUE SCHEMATIC



MAX/MIN WALL THICKNESS IS WITH KIT SUPPLIED.
EXTRA PIPES CAN BE PURCHASED TO EXTEND TO 4 MTRS.

FIG. 33

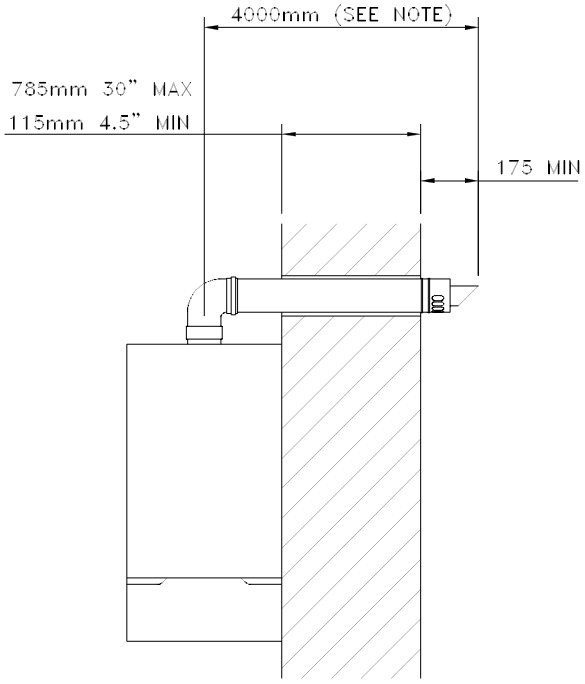
6.11 REAR OUTLET HIGH-LEVEL HORIZONTAL BALANCED FLUE SCHEMATIC



MAX/MIN WALL THICKNESS AND HEIGHT II WITH KIT SUPPLIED
EXTRA PIPES CAN BE PURCHASED TO EXTEND TO 4 MTRS

FIG. 34

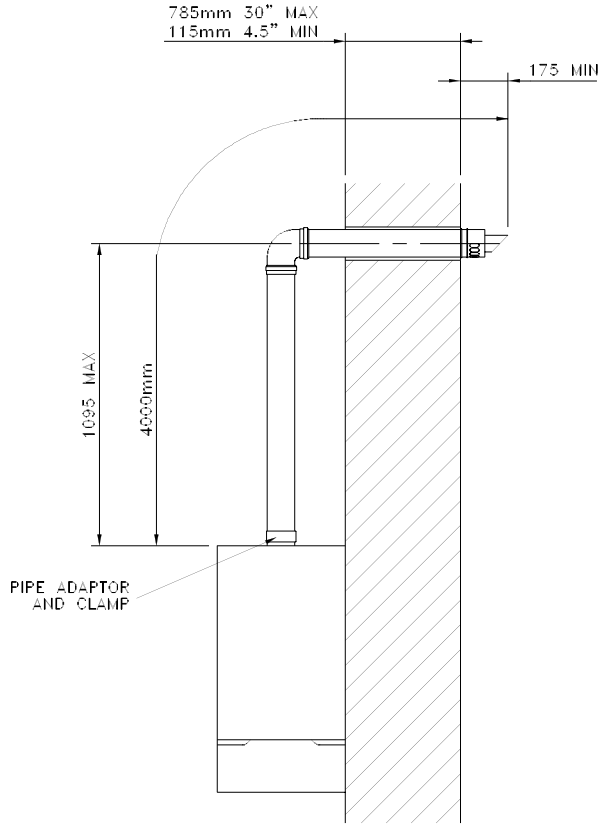
6.12 R/H SIDE OUTLET HORIZONTAL BALANCED FLUE SCHEMATIC



MAX/MIN WALL THICKNESS IS WITH KIT SUPPLIED.
EXTRA PIPES CAN BE PURCHASED TO EXTEND TO 4 MTRS.

FIG. 35

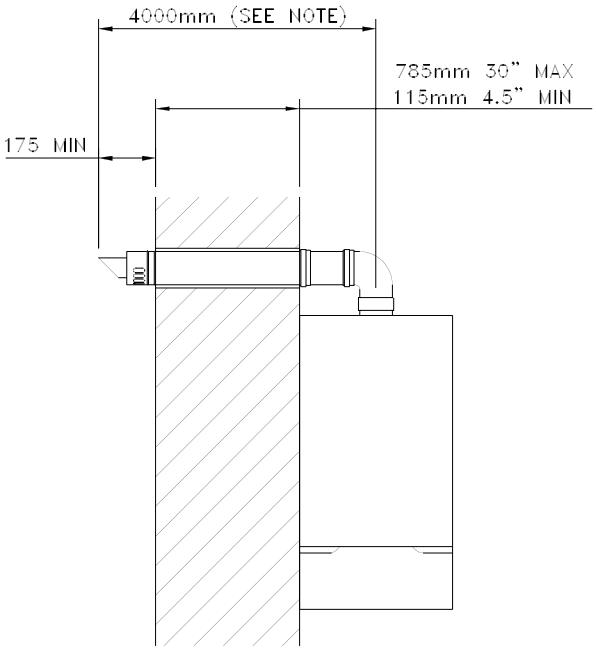
6.13 R/H SIDE OUTLET HIGH-LEVEL HORIZONTAL BALANCED FLUE SCHEMATIC



MAX/MIN WALL THICKNESS IS WITH KIT SUPPLIED.
EXTRA PIPES CAN BE PURCHASED TO EXTEND TO 4 MTRS

FIG. 36

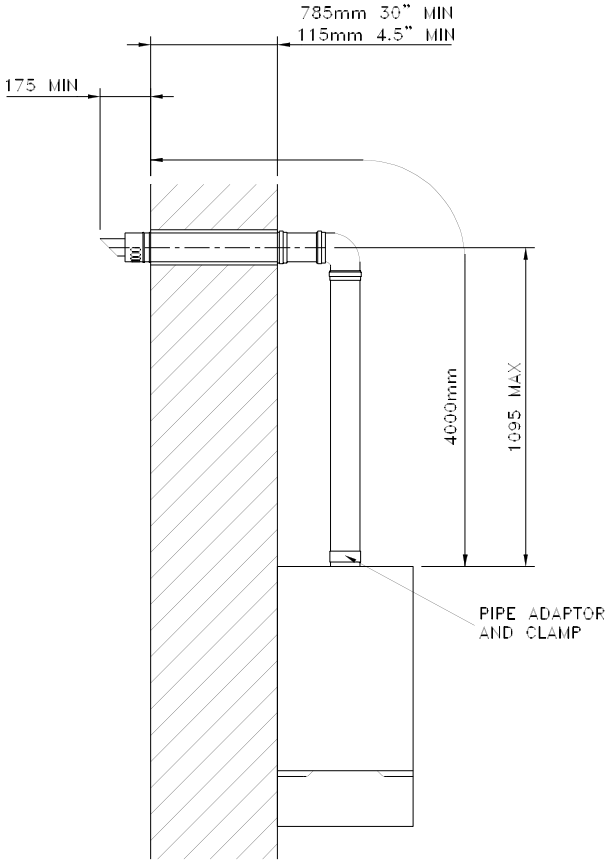
6.14 L/H SIDE OUTLET HORIZONTAL BALANCED FLUE SCHEMATIC



MAX/MIN WALL THICKNESS IS WITH KIT SUPPLIED
EXTRA PIPES CAN BE PURCHASED TO EXTEND TO 4 MTRS.

FIG. 37

6.15 L/H SIDE OUTLET HIGH-LEVEL HORIZONTAL BALANCED FLUE SCHEMATIC



MAX/MIN WALL THICKNESS IS WITH KIT SUPPLIED.
EXTRA PIPES CAN BE PURCHASED TO EXTEND TO 4 MTRS.

FIG. 38

6.16 VERTICAL BALANCED FLUE SCHEMATIC

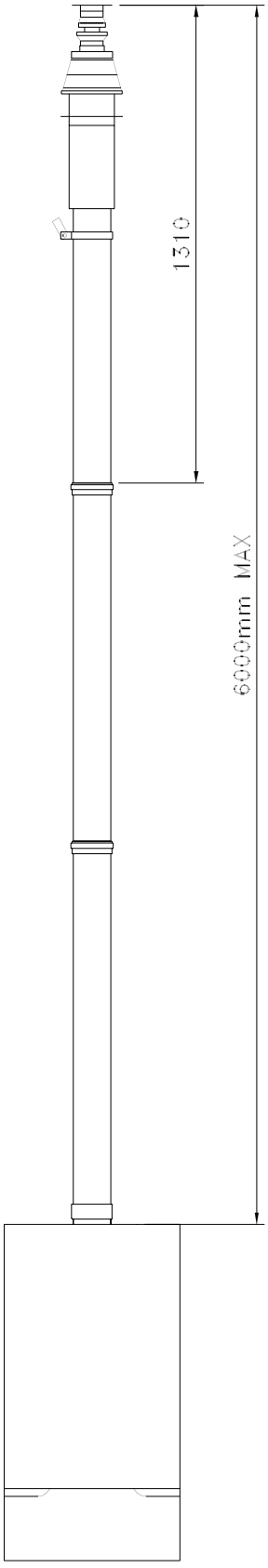


FIG. 39

6.17 ALTERNATIVE FLUEING EXAMPLES

When determining the flue length on non-typical flue courses, it is important to take into consideration that each additional elbow added to the run will dectract from the overall permitted flue length.

A 90° elbow should be classed as reducing the length of the overall run by 1500mm.
A 45° elbow should be classed as reducing the length of the overall run by 750mm.

Do not include the first 90° elbow on the boiler when calculating the maximum permitted length on the horizontal flue; this has already been taken into consideration. See **figs 40** & **41** for example configurations.

Example 1 (horizontal) - Maximum permitted flue length: 4000mm

1 x additional 90° elbow: 1500mm
Maximum permitted length of A + B: 4000 minus 1500
= **2500mm**

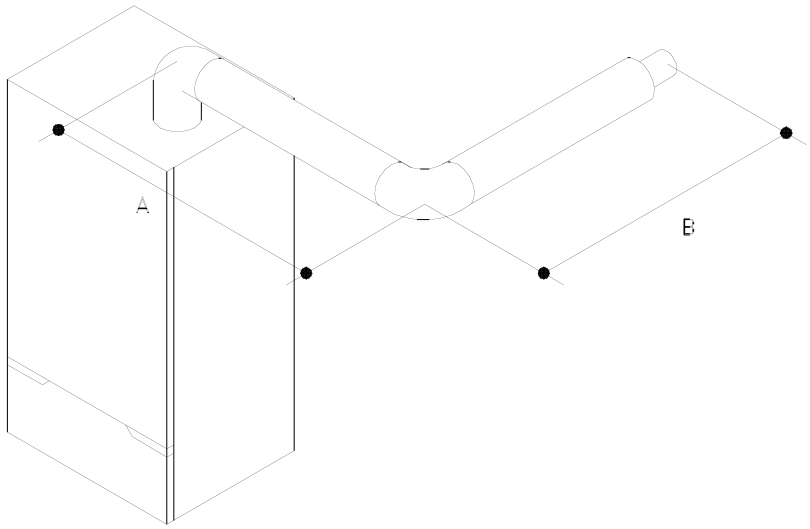


FIG. 40

Example 2 (vertical) - Maximum permitted flue length: 6000mm

2 x additional 45° elbows: 750mm each (1500mm)
Maximum permitted length of D + E: 6000 minus 1500
= **4500mm**

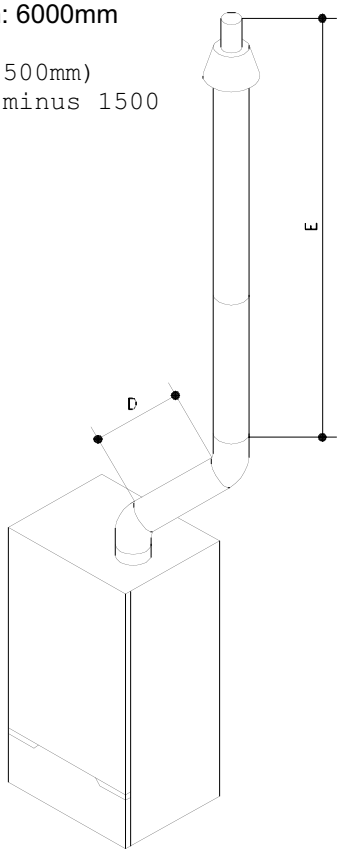
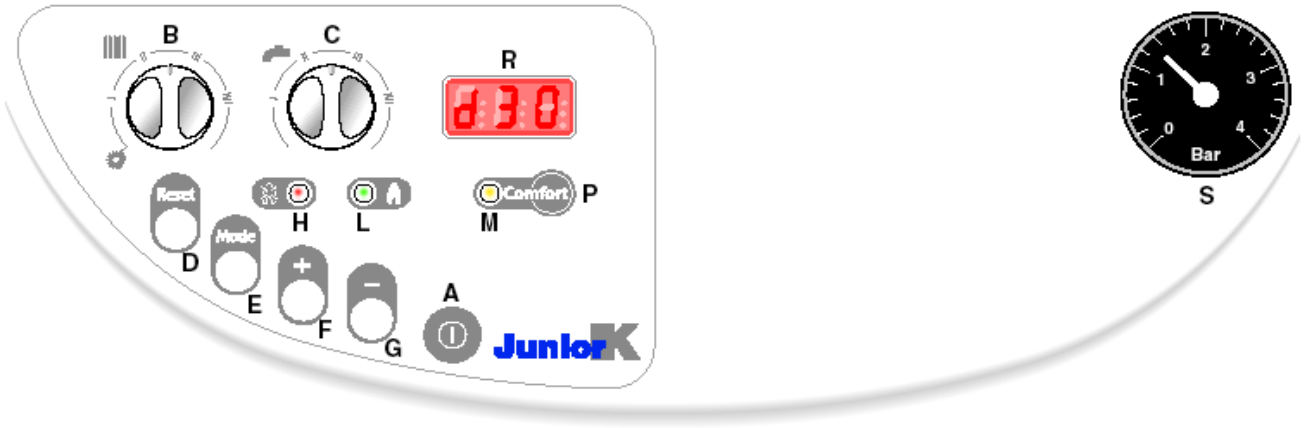


FIG. 41

7 BOILER CONTROLS



A - on/off switch
B - central heating temperature control
C - DHW temperature control (combi only)
D - master RESET button
E - MODE button
F - programming control (+)
G - programming control (-)
H - boiler lock-out LED
L - boiler running LED
M - 'comfort' function running LED
P - 'comfort' function on/off button
R - multifunction display
S - pressure gauge

FIG. 42

7.1 STARTING THE BOILER

To switch the appliance **ON**, press button '**A**' on the front control panel. After a few seconds, the boiler will be ready to run.

On the multifunction display (**see fig. 42**), the first digit will display the current operating mode of the boiler, indicated by the following symbols:

0 - no heating requested
C - heating activated
d - domestic hot water setting
h - boiler deactivated due to overheating
F - frost thermostat activated

The two digits on the right of the multifunction display will indicate the boiler flow temperature in °C as standard. When adjusting the temperature controls via knobs '**B**' & '**C**', this will indicate the temperature being set, before returning to its default state.

7.2 USE OF THE CONTROLS

Heating Control Thermostat (B)

This regulates the temperature of the central heating. To increase the temperature, turn the knob clockwise. To decrease, turn the knob anti-clockwise.

The display (**R**) will briefly display the temperature being set, before returning to its normal mode of operation displaying the boiler flow temperature.

The thermostat operates in a temperature range between 82°C (high) and 25°C (low).

Turning the thermostat knob **fully** anti-clockwise will deactivate the central heating.

Domestic Hot Water Thermostat (C)
- Combi (CB) model

This regulates the temperature of the domestic hot water. To increase the temperature, turn the knob clockwise. To decrease, turn the knob anti-clockwise. The display (**R**) will briefly display the temperature being set, before returning to its normal mode of operation displaying the boiler flow temperature.

Domestic Hot Water Thermostat (C)
- System (SB) model

The system model does not make use of this thermostat setting during normal operation. However, to ensure production of hot water, the knob should always be in the **ON** position, indicated by the constant illumination of LED '**M**'. To activate, turn the knob **fully** anti-clockwise, then **fully** clockwise. To deactivate, repeat these steps.

7.3 MODE FUNCTION – ADJUSTABLE PARAMETERS

The MODE function (button '**E**') and the '+' and '-' programming control buttons ('**F**' and '**G**') are for use by the installation/commissioning engineer during the initial set-up of the boiler running parameters.

To read or set these parameters, first press the reset button ('**D**'), and while this is still held, press the MODE button ('**E**') for at least five seconds. The first digit of the multifunction display will show a '1', followed by the value this parameter is set at (default: '60'). Repeatedly pressing the reset button will cycle through the available parameters to view and change. The value of these parameters can be altered via the '+' and '-' programming control buttons.

These values are stored when cycling to the next parameter (via the reset button), or once the parameter modification mode is properly exited. This is achieved either by pressing the MODE button, or by leaving the '+' and '-' buttons untouched for 90 seconds.

Parameters	Function	measure unit	working field	Value
1	**Slow starting percentage**	%	00 – 99 (step: 1%)	60
2	**Maximum power output when heating** The percentage makes reference to the useful power between the min and max	%	00 – 99 (step: 1%)	55
3	**Restarting delay when heating** The time that goes from one ignition of the burner to the next	min	00 – 07 (step: 1min)	02 (2 min)
4	**Minimum water input temperature**	°C	25°C if param. **r** = 00 42°C if param. **r** = 01	42
5	**Maximum water input temperature**	°C	programmable on active working field (min/max). max. 75°C if param. **r** = 00 max. 82°C if param. **r** = 01	82
6	**Function not used**		– –	45
t/S	**Function not used**		– –	50
F	**Selecting the Working Process of the Boiler** F 00 - Quick production of domestic hot water F 01 - Boiler for heating only, with cylinder for domestic hot water production provided with a NTC sensor F 02 - Boiler for heating only or boiler for heating only, with cylinder for domestic hot water production provided with thermostat		00 – 02	00 (CB) 02 (SB)

(continued overleaf)

Parameters	Function	measure unit	working field	Value
E	**External Exit Configuration of the CM Module** E 00 - Zone valve E 01 - Not used E 02 - Not used E 03 - Not used		00 – 03	00
P	**Post circulation of the heating circulator** P 01, …, P 15 (1, …, 15 min of post-circulation) P C0 - Continuous post circulation	minutes	01 – 15, C0	02 (2 min)
C	**Comfort Function** C 00 - Comfort function deactivated C 01 - Activation for 30 min after the last domestic hot water requirement C 02 - Always active (combi model)		00 – 02	00 (SB) 02 (CB)
PU	**Circulator's speed control** P U0 - Deactivated P U1 - Activated		U0 – U1	U0
r	**Temperature's range selection** R 00 - Low temperature (min= 25°C; max= 75°C) R 01 - High temperature (min= 42°C; max= 82°C)		00 – 01	01
P9	**Thermoregulation** P 90 - Deactivation of the thermoregulation with external probe (fix point working) P 91 - Activation of the thermoregulation with external probe (variable time working)		90 – 91	90
P6	**Function not used**		– –	– –
P5	**Configuration of the Heating curve (visualisation between P5 and the value; the low line "_" is like the ",")**		0,1 – 5,0 (step: 0,1)	0_9
t	**Function not used**		– –	– –
A	**Bus Device**		A 81	A81
b0	**Configuration of the input temperature of the circuit controlled by the room thermostat (Heating system with 2 zones, with room thermostat and remote control Ecorem CM) (Alternate visualization between b0 and the value)**	°C	25 – 82	75
b1	**Function not used**	– –	– –	– –
b2	**Delay on the heating activation after the last domestic hot water requirement (Alternate visualization between b2 and the value)**	minutes	00 – 30 (step: 1min)	00
b30	**Function not used**	– –	– –	– –
b40	**Function not used**	– –	– –	– –
b50	**Function not used**	– –	– –	– –
b60	**Function not used**	– –	– –	– –
b70	**Function not used**	– –	– –	– –

7.4 MODE FUNCTION – INFORMATION PARAMETERS

To access the information-only parameters, press and hold the MODE button ('**E**') for 15 seconds. Repeatedly pressing the reset button will cycle through the available parameters to view. To exit from this function, press the MODE button once more, or leave the reset, '+' and '-' buttons idle for 30 seconds.

Display visualisation	Information
U 1	Visualization of the input temperature of the boiler measured (°C; visualization alternated between U and 1 followed by the value)
U 2	Information not used (visualization "00")
U 3	Domestic hot water temperature (°C) (Alternate visualization between U and 3 followed by the value) If the boiler is used just for heating (SB) you will see 0 if the contact is open or 1 if the contact is closed
U 4	External temperature (°C) (Alternate visualization between U and 4 followed by the value) If the external temperature is lower than –9°C the display will not show a lower value than –9°C If the external probe is not connected, you will see "--" instead of the value
U 5	Information not used (visualization "00")
U 6	Fan speed - max setting 5200 (Alternate visualization between U and 6 followed by the value) The value is expressed in hundreds and it tries to give exact figures.
U 7	Information not used (visualization "00")
E	Last block error recorded "E" (visualization: "E xx" where "xx" indicates the error code) (see page 40)
A	Last block error recorded "A" (visualization: "A xx" where "xx" indicates the error code) (see page 40)

7.5 FROST THERMOSTAT

To prevent damage to the appliance during very cold weather, it is advisable to fit an external frost thermostat to the installation, which will supersede the central heating and hot water settings to temporarily activate the boiler should the temperature drop too low.

7.6 COMFORT FUNCTION – COMBI (CB) ONLY

When activated, the comfort function will enable the boiler to keep a permanent store of heated water within the appliance. As such, this will improve water delivery times, providing domestic hot water at a quicker than usual rate.

To activate the comfort function, press button '**P**'. The yellow LED (**item M**, **fig 42**) will illuminate. To deactivate, press this once more.

Please note that when activated, the comfort function will cause the boiler to operate at times outside of those specified by the user.

The yellow LED ('**M**') will also be illuminated when the DHW mode is active on the system (SB) model.

7.7 RESETTING THE BOILER

After an appliance malfunction, the boiler will enter a lock-out state (indicated by the illumination of LED '**H**'). Restart the boiler by pressing reset button '**D**'. Should it attempt to fire and fail for a second time, refer to the fault-finding guide (**section 13**, **page 39**).

7.8 SYSTEM PRESSURE

The user should be informed that they should periodically check the system pressure on gauge '**S**' to the pressure set. If this has dropped, reset the pressure to the correct setting by gradually opening the filling loop on the underside of the boiler. Close the loop once the desired pressure has been reached.

Should the system pressure fall too low, the multifunction display will show the error code '**E 02**'. If this should occur, once the pressure has been returned to normal, switch the boiler off then on, using **ON/OFF** button '**A**'.

If during normal operation the system pressure drops on a regular basis, in most cases there will be a heating system fault, rather than a boiler fault. For details of other fault codes and general fault-finding, refer to **section 13**.

7.9 ANTILOCK FUNCTION

After 21 hours of inactivity, the pump will activate for 15 seconds. During this time, the diverter valve will change position to DHW mode, before returning to normal.

8 MAINTENANCE AND CLEANING

To ensure the safe and efficient operation of the appliance, the boiler must be serviced annually, by a CORGI-registered engineer. Failure to do so will invalidate the appliance guarantee.

To clean the appliance casing, switch off the boiler and isolate the power supply. Wipe with a damp cloth. Do not use detergents, harsh liquids, or other toxic products.

9 USEFUL TIPS

To guarantee production of domestic hot water and the operation of the frost thermostat and comfort function at all times, it is recommended that the boiler is not switched off during normal use via the **ON/OFF** button '**A**'. Instead, turn off the programmer, or deactivate the heating via the control knob '**B**'.

If the appliance must remain off for any long periods of time during very cold weather, it is advisable to completely drain the heating system. This operation is essential if there are no antifreeze additives in the system.

The boiler heat exchanger is constructed from aluminium alloy. Only use additives in the heating system if it is strictly necessary, and if such additives are compatible with this type of material. If in doubt, please contact the additive manufacturer.

10 COMBUSTION ANALYSIS

The combustion analysis should be carried out in heating mode. While in this function, the boiler temperature limits are deactivated and the boiler will operate at the maximum setting of 88°C.

However, should this be problematic (e.g. in summer), it is possible to use the domestic hot water circuit (combi model only). In this case, when the function is active, the temperature limits are deactivated and the boiler will keep active the domestic hot water temperature only, set at 78°C .

To perform the combustion analysis, first activate the specific function by pressing the reset button ('**D**') for more than 5 seconds.

The multifunction display should now read: "**t – –**"

To perform a combustion analysis at maximum output, subsequently press buttons '+' and '-'. The multifunction display should now read: "**t ¯ ¯** "

To perform a combustion analysis at minimum output, press button '-'. The multifunction display should now read: "**t _ _** "

This function remains active for a maximum of 5 minutes.

10.1 PREPARATION

Remove the screw (marked '**V**' on **fig 43**) from the flue offtake, then the small cover and gasket. This gives access to the test points for the analyser.

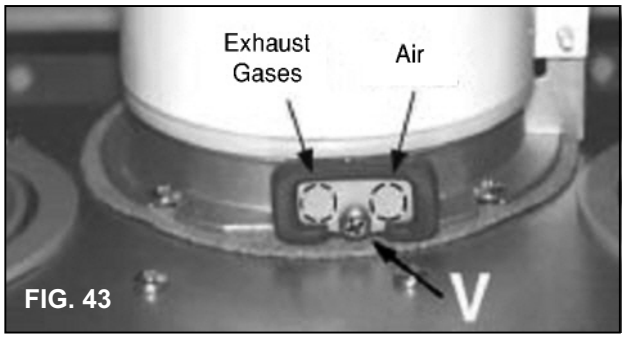


FIG. 43

10.2 ANALYSIS AT MAXIMUM OUTPUT

Using the method detailed above, run the boiler at its maximum output. Wait for the boiler to stabilise and perform the combustion analysis, checking the results against the figures outlined in the following table:

Nominal heat capacity		kW	27,0 CB 24,0 SB
Check calibrations values	nat. gas G20	% vol	9,3÷9,7
CO_2 at MAXIMUM OUTPUT	LPG G31	% vol	10,8÷11,2

If the values are found to be inconsistent with these, turn the gas valve regulator (item **B**, **fig 44**) in the appropriate direction. Turning anti-clockwise will increase the CO_2; turning clockwise will decrease the CO_2. Please note that due to the sensitivity of the screw, only small adjustments will be necessary.

Once adjustment has been made, wait until the CO_2 level stabilises and recheck the combustion. Repeat the above steps as necessary.

10.3 ANALYSIS AT MINIMUM OUTPUT

Using the method detailed above, run the boiler at its minimum output. Wait for the boiler to stabilise and perform the combustion analysis, checking the results against the figures outlined in the following table:

Minimum heat capacity		kW	8,0
Check calibrations values	nat. gas G20	% vol	8,9÷9,3
CO_2 at MINIMUM OUTPUT	LPG G31	% vol	9,8÷10,2

If the values are found to be inconsistent with these, turn the gas valve regulator (item **A**, **fig 44**) in the appropriate direction. Turning anti-clockwise will increase the CO_2; turning clockwise will decrease the CO_2. Please note that due to the sensitivity of the screw, only small adjustments will be necessary.

Once adjustment has been made, wait until the CO_2 level stabilises and recheck the combustion. Repeat the above steps as necessary.

After completion of calibration, recheck the CO_2 at maximum output. It is also advisable to check the gas capacity at the metre against the figures given in the technical specification table (page 7).

To return the boiler to normal operation press the reset button ('**D**').

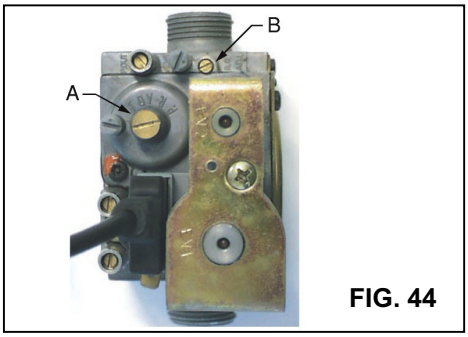


FIG. 44

11 PROPANE CONVERSION

To convert the boiler from natural gas operation to propane, the following steps **must** be carried out:

1) Isolate the electrical supply to the appliance.

2) Close the gas supply to the appliance.

3) Gain access to the internal sealed chamber of the appliance, following the directions on **page 16**.

4) Remove the fan (**item 'V'**, **fig 45**) from the air/gas mixer ('**X**').

5) Change the injector ('**U**') to the type shown in the following table:

Injector	Injector code	Number of holes	ø holes (mm)
for LPG	CFA18012/2	6	2,0
for nat. gas	CFA18012/1	6	2,8

6) Reattach the fan, ensuring that gasket '**G**' is fitted correctly and has not been damaged by the dismantling process.

   This must be replaced if damage has occurred. Failure to do so will impair the correct operation of the appliance.

7) Switch on the electricity supply to the appliance.

8) Open the gas supply to the appliance.

9) Check the combustion figures, following all steps given in **section 10**.

10) Refit the cover to the internal sealed chamber.

11) Replace the gas identification plate, showing the new settings.

When replacing all items, ensure it is done in the same order in which they were removed.

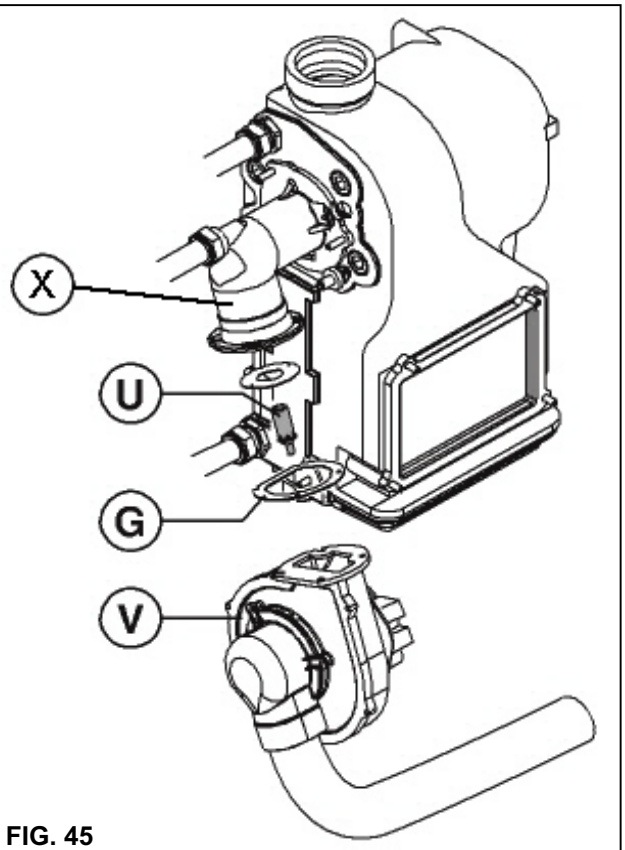


FIG. 45

12 SERVICING AND MAINTENANCE

To ensure safe and efficient operation of the appliance, the boiler **must** be serviced at least once a year by a CORGI-registered engineer. Failure to do so will invalidate the guarantee.

Before and after servicing, a combustion analysis must be performed, in accordance with the instructions given in **section 10**, **page 35**.

To access the internal chamber of the boiler, refer to **section 4**, **page 16**.

Before carrying out any work on the gas-carrying parts, always switch off the supply to the appliance.

Always isolate the electrical supply to the boiler before carrying out any work on electrical components.

12.1 SERVICE PROCEDURE

- Call up the last fault stored by the appliance onto the multifunction display (see **section 7.4**, **page 33** for visualisation codes).
- The display will now show the last fault to occur with the boiler (see **section 13.1**, **page 40** for fault codes). It should then be ascertained whether this fault was rectified. Carry out any action as necessary.
- Perform a visual check of the flue and associated seals for evidence of gaps and splits. Repair as necessary.
- Check the gas supply pressure against the figures specified on the technical specification table (**section 2**, **page 7**).
- Check the combustion analysis figures for the CO_2 against those given in **section 10**, **page 35**.
- Check the gas and water systems for leaks.
- On the combi (CB) model only, check the hot water outlet temperature does not exceed that given on the technical specification table.
- Check and clean the burner and heat exchanger (see **section 12.2**, **page 38**).
- Remove the condensate trap pipe (**item 9**, **fig 47**) from the bottom plate (**10**). Remove bolt (**11**) and the bracket (**12**).
- Disconnect the condensate bottom plate by pulling downwards, then away from the right side of the shaft (**13**).
- Clean the condensate trap by unscrewing the plastic cover on the underside of the boiler. Check inside for deposits and clean as necessary. Refill to halfway with water.
- Check all condensate run-off pipework for leaks.
- Check that the pressure charge of the expansion vessel matches that given on the technical specification table (**section 2**, **page 7**).
- Check the central heating water pressure. If outside required parameters, adjust as necessary (see **section 3.6**, **pages 13/14**).
- Visually inspect the wiring to the appliance for physical damage.
- Check the programmer settings are to those required by the user.
- Check the peripheral controls for correct operation.
- Refit all components in reverse order, ensuring that all seals are checked for damage and replacing if necessary.

12.2 BURNER & HEAT EXCHANGER SERVICING

- Ensuring that both the electrical supply and gas supply to the boiler are isolated, disconnect the gas pipe (**item 1**, **fig 46**). Remove the 2 x nuts (**2**) and remove the manifold (**3**).

- Disconnect the air pipe and electrical connections from the fan.

- Extract the burner (**4**) and clean using a brush.

- Remove the screw (**5**), disconnect the snorkel (**6**) and clean the fan using a brush.

To prevent damage to the fan bearings, do not use pressurised air while cleaning.

- Take out nuts (**7**) and remove the combustion chamber inspection door. Using a brush and vacuum cleaner, remove all deposits from inside the heat exchanger.

- Refit all components in reverse order, ensuring that all seals are checked for damage and replacing if necessary.

Once all maintenance procedures have been carried out, reconnect the gas and electrical supplies to the appliance and carry out a final combustion analysis.

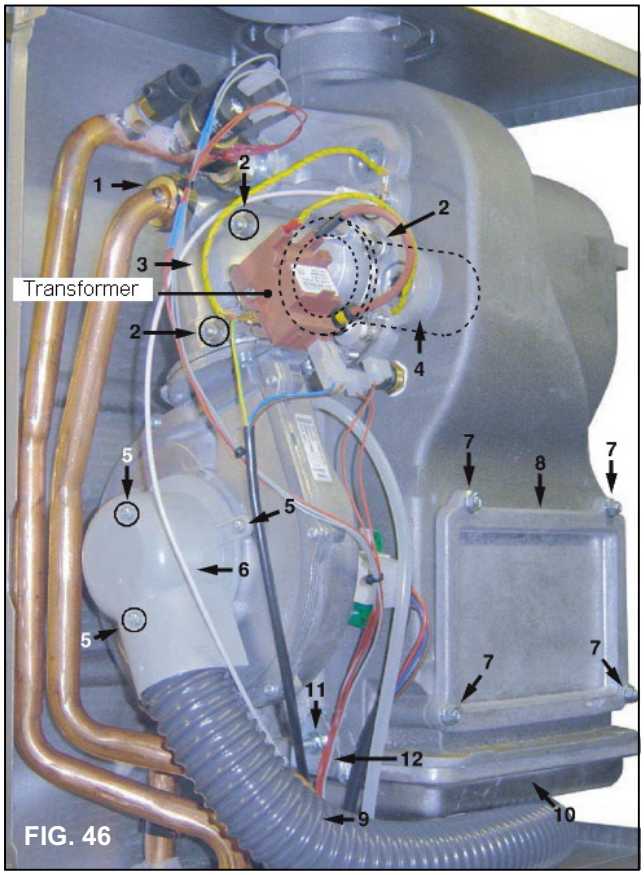


FIG. 46

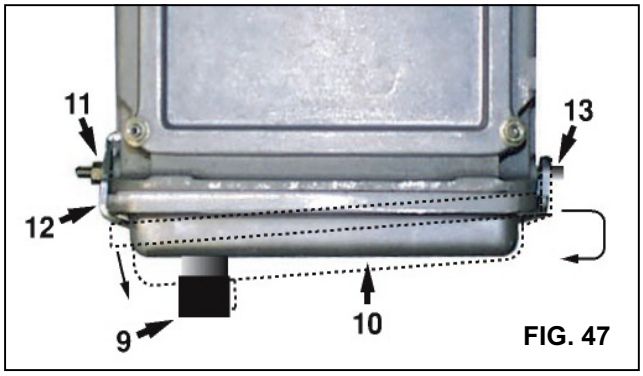


FIG. 47

13 FAULT-FINDING

After an appliance malfunction, the boiler will enter a lock-out state (indicated by the illumination of LED '**H**'). The multifunction display will show a three-digit fault code. In most cases, the fault can be eliminated by switching the boiler off then on, using **ON/OFF** button '**A**'. An attempt can also be made to reset the operation by holding reset button '**D**' for two seconds. The boiler will perform a self-diagnostic cycle and restart if the problem has been eliminated. If the problem persists, refer to the comprehensive list of fault codes (**section 13.1**, **page 40**)

FAULT	POSSIBLE CAUSE	SOLUTION
'E02' fault code shown on the multifunction display: Pressure gauge needle has dropped below set pressure.	Water pressure too low.	Reset the pressure to the correct setting by gradually opening the filling loop on the underside of the boiler. Close the loop once the desired pressure has been reached. Switch the boiler off then on, using **ON/OFF** button '**A**'. If the problem persists, check the installation, as in most cases there will be a heating system, rather than boiler fault.
'S01' or 'A01' fault code will be shown on the multifunction display. At initial startup, the burner fails to start.	Gas supply to appliance has been interrupted	Check the gas supply/switch on at valves and press reset button '**D**'.
Required room temperature not reached.	Radiator valves set too low.	Increase settings on radiator valves.
	Room thermostat set too low.	Increase settings on room thermostat.
	Central heating temperature set too low on boiler.	Increase temperature setting by turning knob '**B**' clockwise.
	Air trapped in heating system.	Bleed radiators of air and re-pressurise heating system.
Required room temperature exceeded.	Radiator valves set too high.	Decrease settings on radiator valves.
	Room thermostat set too high.	Decrease settings on room thermostat.
	Central heating temperature set too high.	Decrease temperature setting by turning knob '**B**' anti-clockwise.
Heating/hot water not operating.	Room thermostat/programmer not calling for heat	Check settings on room thermostat/programmer.
	Faulty cylinder thermostat.	Change cylinder thermostat
	No power to boiler.	Check power supply is active, that isolation switch is switched **ON**.
Heating remains on too long.	Room thermostat/programmer incorrectly set.	Check settings on room thermostat/programmer.
Hot water temperature too low or too high.	Programmer incorrectly set.	Check settings on programmer.
	DHW temperature set wrong - Combi (CB) model only	Adjust temperature setting by turning knob '**C**' clockwise (higher) or anticlockwise (lower).
	Incorrect cylinder stat settings.	Adjust cylinder stat settings.

13.1 FAULT CODES

After an appliance malfunction, the boiler will enter a lock-out state (indicated by the illumination of LED '**H**'). The multifunction display will show a three-digit fault code. In most cases, the fault can be eliminated by switching the boiler off then on, using **ON/OFF** button '**A**'. An attempt can also be made to reset the operation by holding reset button '**D**' for two seconds. The boiler will perform a self-diagnostic cycle and restart if the problem has been eliminated. If the problem persists, refer to the following fault-code chart:

If in doubt, fully-trained Trianco technical operatives are available to help you with any on-site need. For technical advice, call 0114 257 2300 (Monday-Thursday: 08:30 – 16:45, Friday: 08:30 – 14:30).

code	description
E02	Water pressure too low (after a heating requirement, the circulator start and after 40 seconds it faults). Restart the pressure between the values stablished as idicated in par. 8.4 after switch off and restart the boiler with the button OFF/ON
E04 ●	Domestic hot water or boiler sensor not connected
E05 ●	Domestic hot water or boiler sensor in short-circuit
E06 ●	Input water sensor not connected
E07 ●	Input water sensor in short-circuit
E10 ●	Safety thermostat TSI operation (contact open)
E20 ●	Flame appears with gas valve closed
E30 ●	External probe disconnected
E31 ●	External probe in short-circuit
E80 ●	Remote control not connected or in short-circuit
E94	Communication error
E95	Internal board error
E99	RESET button pressed more than 5 times in the last 15 minutes To restart the boiler, switch it off and restart with the button OFF/ON
A01	The boiler does not start after the fifth try
A03	Intervention of the security thermostat
A07	Flame does not appear during working after three attempts
A33	Fan broken
A97	Internal board error
A98	Internal board error
A99	Internal board error
S01	Flame does not appear after the first attempt to start the system System restarts automatically
S02	Flame does not appear after the second attempt to start the system System restarts automatically
S06	Flame does not appear while working System restarts automatically

● - Fault that, once the problem is solved, the system restarts automatically

14.1 CONTROLS CONNECTION PLUG

On the **System (SB) Model** only, this item is used to connect external controllers to the boiler. See wiring diagram (**section 5.6**, **fig 24**) for correct placement. Using a crimping tool, attach the external control wiring to the terminals provided and insert into the plug provided.

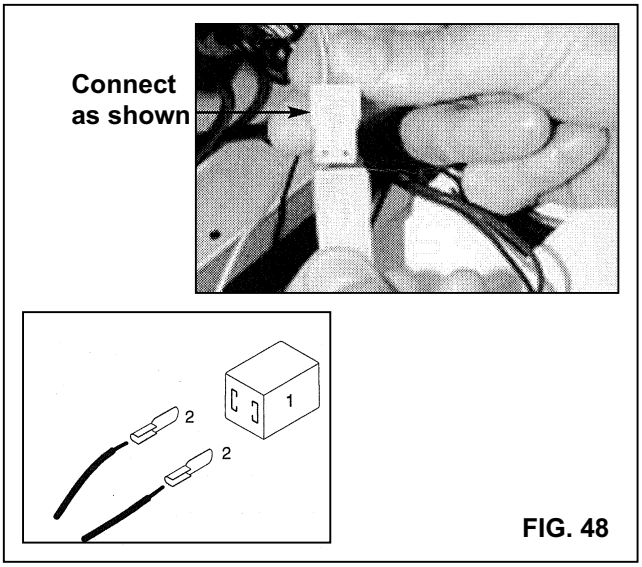


FIG. 48

14.2 DIVERTER VALVE CONNECTION

Also included (on the **System (SB) Model** only), which **must** be fitted, is the diverter valve power cable connection box. Cut the plug from the cable which feeds from the control box and feed the cut end into the box. Feed into the other end the cable from the diverter valve and wire both these into the terminal block provided. Use the strain reliefs provided to secure cables safely in position. Close the box and mount in an accessible place behind the control panel. Refer to wiring diagrams (pages 19/20) for terminal block wiring details.

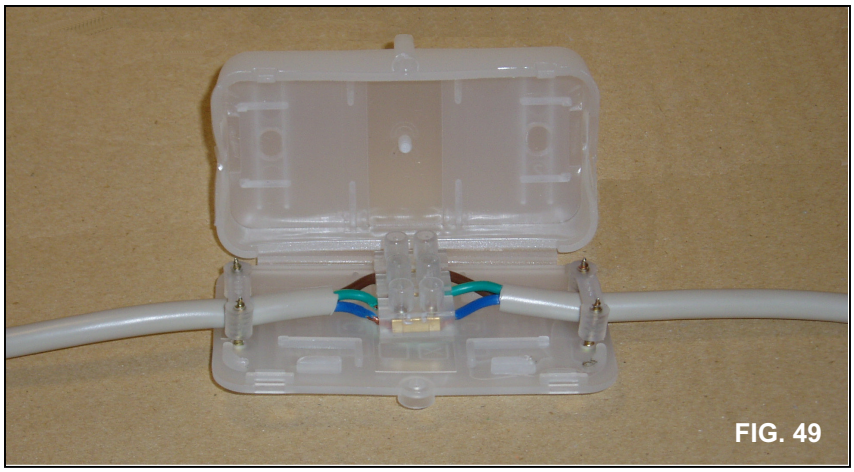


FIG. 49

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

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

Issue 1 – Rev 0 May 2005 Item No. 510062

LB 1480 - 01/09/2005