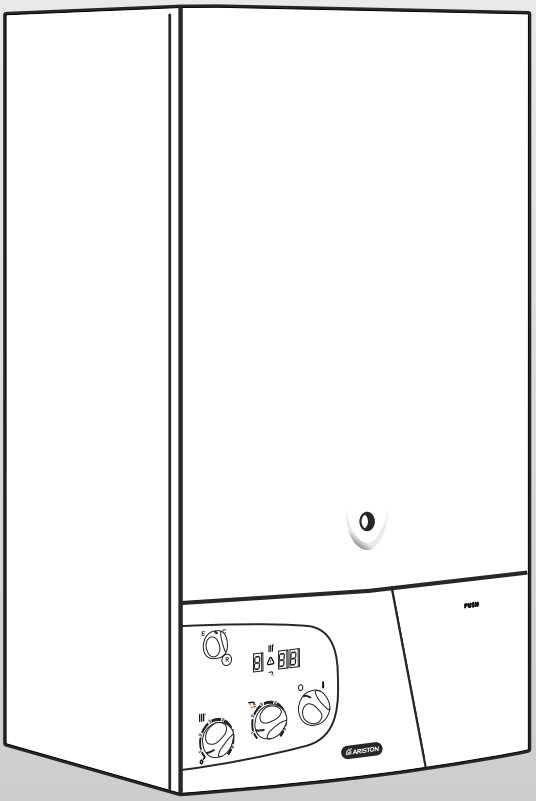
micro GENUS HE

Installation and Servicing Instructions

Type C Boilers

microGENUS HE 24 MFFI G.C.N: 47-116-37
microGENUS HE 28 MFFI G.C.N: 47-116-38
microGENUS HE 32 MFFI G.C.N: 47-116-39



LEAVE THESE INSTRUCTIONS WITH THE END-USER

ARISTON

benchmark
The code of practice for the installation, commissioning & servicing of central heating systems

CE

WRAS APPROVED PRODUCT

British Gas
Service listed

200002229998318740002040000000

Country of destination: GB / IE

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1. GENERAL INFORMATION

This manual is an integral and essential part of the product. It should be kept with the appliance so that it can be consulted by the user and our authorised personnel.

Please carefully read the instructions and notices about the unit contained in this manual, as they provide important information regarding the safe installation, use and maintenance of the product.

For operating instructions please consult the separate End User Manual.

1.1 General Instructions

Read the instructions and recommendations in these Installation and Servicing Instructions carefully to ensure proper installation, use and maintenance of the appliance.

Keep this manual in a safe place. You may need it for your own reference while Servicing Technicians or your installer may need to consult it in the future.

This is a condensing combined appliance for the production of central heating (C.H.) and domestic hot water (D.H.W.).

This appliance **must be used only** for domestic use.
The manufacturer declines all liability for damage caused by improper or negligent use.

No asbestos or other hazardous materials have been used in the fabrication of this product.

MTS recommends the use of protective clothing when installing and working on this appliance i.e. gloves.

Before connecting the appliance, check that the information shown on the data plate and the table in Section 8 comply with the electric, water and gas mains of the property. You will find the data plate on the reverse of the control panel.
The gas with which this appliance operates is also shown on the label at the bottom of the boiler.

Do not install this appliance in a damp environment or close to equipment which spray water or other liquids.
Do not place objects on the appliance.
Do not allow children or inexperienced persons to use the appliance without supervision.

If you smell gas in the room, **do not turn on or off** light switches, use the telephone or any other object which might cause sparks.
Open doors and windows immediately to ventilate the room.
Shut the gas mains tap (at or adjacent to the gas meter) or the valve of the gas cylinder and call your Gas Supplier immediately.
If you are going away for a long period of time, remember to shut the mains gas tap or the gas cylinder valve.

Always disconnect the appliance either by unplugging it from the mains or turning off the mains switch before cleaning the appliance or carrying out maintenance.

In the case of faults or failure, switch off the appliance and turn off the gas tap. Do not tamper with the appliance.
For repairs, call your local Authorised Servicing Agent and request the use of original spare parts. For in-guarantee repairs contact MTS (GB) Limited.

1.2 OVERALL VIEW

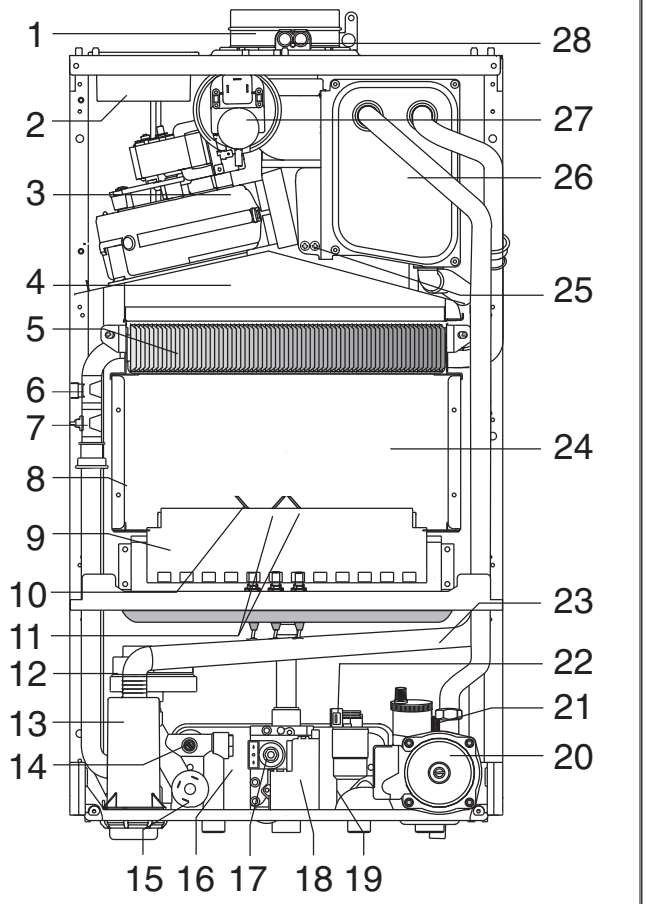

FIG. 1.0

LEGEND:

1. Flue Manifold
2. Air Intake for Twin Pipe Flue Systems
3. Fan
4. Combustion Chamber Hood
5. Main Heat Exchanger
6. Overheat Thermostat
7. Central Heating Flow Temperature Probe
8. Combustion Chamber Insulation Panel
9. Burner
10. Detection Electrode
11. Ignition Electrodes
12. Motorised Valve
13. Condensate trap
14. Domestic Hot Water Temperature Probe
15. Low Water Pressure Switch
16. Secondary Heat Exchanger
17. Gas Valve
18. Spark Generator
19. Cold Water Inlet Filter
20. Pump (w/auto air vent)
21. Safety Valve
22. D.H.W. Flow Switch
23. Condensate Trap Tube
24. Combustion Chamber
25. Condensate Sensor
26. Latent Heat Collector
27. Air Pressure Switch
28. Combustion Analysis Test Point

2. INSTALLATION

2.1 REFERENCE STANDARDS

The technical information and instructions provided herein below are intended for the installer / Servicing Technician so that the unit may be installed and serviced correctly and safely.

In the United Kingdom the installation and initial start up of the boiler must be by a CORGI Registered Installer in accordance with the installation standards currently in effect, as well as with any and all local health and safety standards i.e. CORGI.

In the Republic of Ireland the installation and initial start up of the appliance must be carried out by a Competent Person in accordance with the current edition of I.S.813 "Domestic Gas Installations", the current Building Regulations, reference should also be made to the current ETCI rules for electrical installation.

This appliance must be installed by a competent installer in accordance with current Gas Safety (installation & use) Regulations.

The installation of this appliance must be in accordance with the relevant requirements of the Local Building Regulations, the current I.E.E. Wiring Regulations, the bylaws of the local water authority, in Scotland, in accordance with the Building Standards (Scotland) Regulation and Health and Safety document No. 635 "Electricity at work regulations 1989" and in the Republic of Ireland with the current edition of I.S. 813, the Local Building Regulations (IE).

C.O.S.H.H.

Materials used in the manufacture of this appliance are non-hazardous and no special precautions are required when servicing.
Installation should also comply with the following British Standard Codes of Practice

BS 7593:1992	**Treatment of water in domestic hot water central heating systems**
BS 5546:1990	**Installation of hot water supplies for domestic purposes**
BS 5440-1:2000	**Flues**
BS 5440-2:2000	**Air supply**
BS 5449:1990	**Forced circulation hot water systems**
BS 6798:2000	**Installation of gas fired hot water boilers of rated input not exceeding 60kW**
BS 6891:1989	**Installation of low pressure gas pipe up to 28mm**
BS 7671:2001	**IEE wiring regulations**
BS 4814:1990	**Specification for expansion vessels**
BS 5482:1994	**Installation of L.P.G.**

and in the Republic of Ireland in accordance with the following Codes of Practice:

I.S. 813	**Domestic Gas Installations**

2.2 SITING THE APPLIANCE

The appliance may be installed in any room or indoor area, although particular attention is drawn to the requirements of the current I.E.E. Wiring Regulations, and in Scotland, the electrical provisions of the Building Regulations applicable in Scotland, with respect to the installation of the combined appliance in a room containing a bath or shower, the location of the boiler in a room containing a bath or shower should only be considered if there is no alternative.

Where a room-sealed appliance is installed in a room containing a bath or shower the appliance and any electrical switch or appliance control, utilising mains electricity should be situated so that it cannot be touched by a person using the bath or shower, specifically in accordance with current IEE Wiring Regulations.

The location must permit adequate space for servicing and air circulation around the appliance as indicated in Section 2.4.
The location must permit the provision of an adequate flue and termination.
For unusual locations special procedures may be necessary.
BS 6798-2000 gives detailed guidance on this aspect.
A compartment used to enclose the appliance must be designed specifically for this purpose. No specific ventilation requirements are needed for the installation within a cupboard.
This appliance is not suitable for outdoor installation.

The type C appliances (in which the combustion circuit, air vent intake and combustion chamber are air-tight with respect to the room in which the appliance is installed) can be installed in any type of room. However, as the appliance has many functioning components, pay particular attention when siting the appliance in room such as bedrooms as operating noise may be a nuisance.

Secondary ventilation is not required with this boiler. The boiler must be installed on a solid, non-combustible, permanent wall to prevent access from the rear.

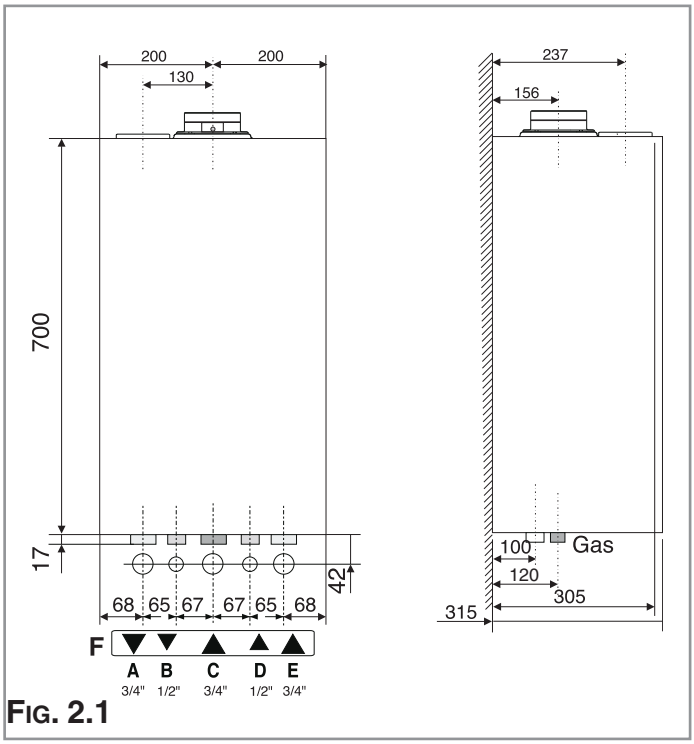

FIG. 2.1

2.3 OVERALL DIMENSIONS

LEGEND:

A = Central Heating Flow (3/4" - 22mm Copper Tail)
B = Domestic Hot Water Outlet (1/2" - 15mm Copper Tail)
C = Gas Inlet (3/4" - 15mm Copper Tail)
D = Domestic Cold Water Inlet (1/2" - 15mm Copper Tail)
E = Central Heating Return (3/4" - 22mm Copper Tail)

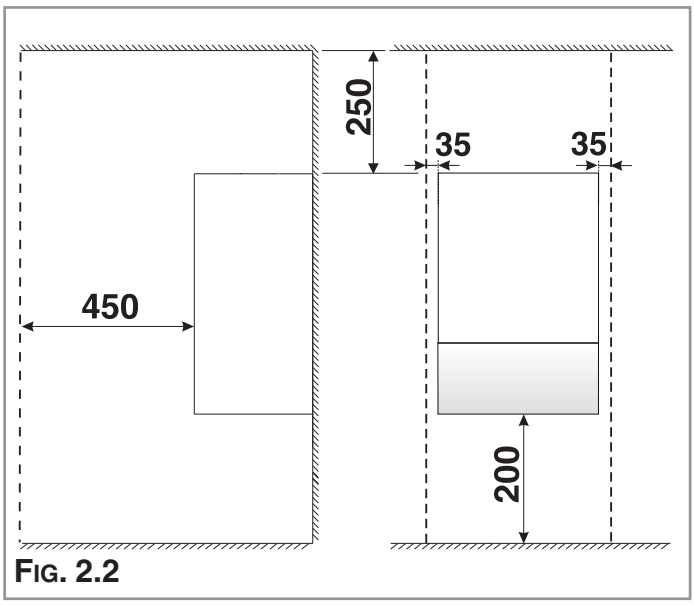

FIG. 2.2

2.4 CLEARANCES

In order to allow access to the interior of the boiler for maintenance purposes, the boiler must be installed in compliance with the minimum clearances indicated in **FIG. 2.2**

2.5 MOUNTING THE APPLIANCE

After removing the boiler from its packaging, remove the template from the separate box containing the connection kit. NOTE: Pay particular attention to any test water that may spill from the appliance.

Place the template in the position the appliance is to be mounted and after ensuring it is hanging squarely, use it to mark the holes for the hanging bracket, connection kit and flue pipe(s) **NB:** For further information relating to the flue installation please refer to Section 2.9 FLUE CONNECTION. (If the appliance is to be fitted on a wall of combustible material, the wall **must** be protected by a sheet of fireproof material).
If the appliance is to be fitted into a timber framed building, guidance should be sought from the Institute of

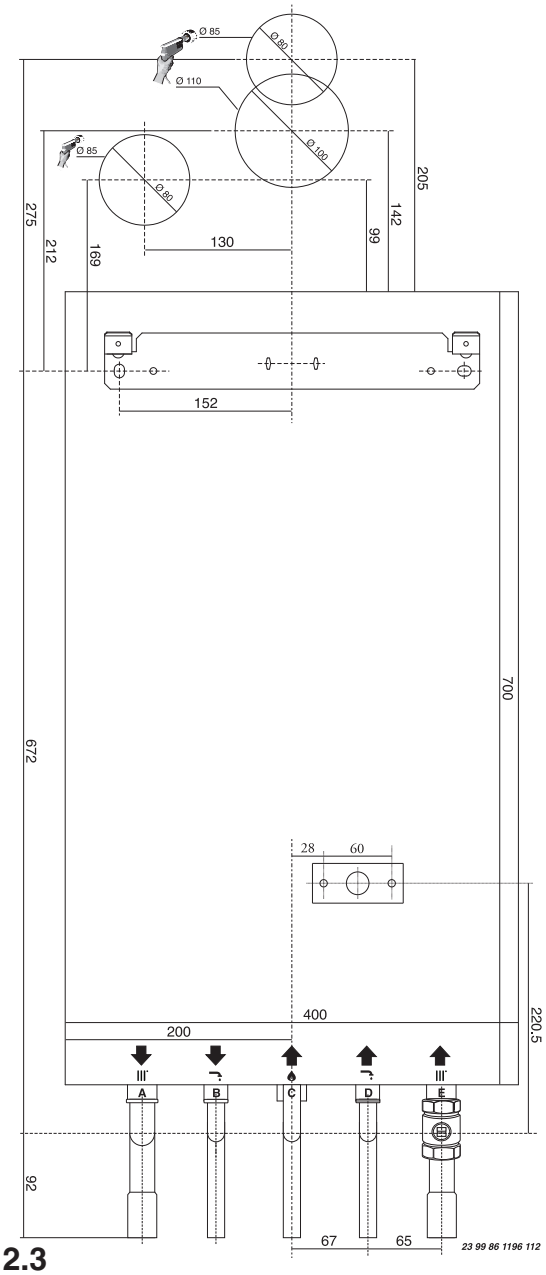

FIG. 2.3

Gas Engineers document REF: IGE/UP/7.

2.5.1. Drill the wall and plug using those supplied with the connections kit, position the hanging bracket and secure with the wall bolts supplied, assemble the connection kit and secure to the wall. **NOTE:** It is highly recommended that a spirit level be used to position the appliance to ensure that it is perfectly level.

2.5.2. Position the appliance on the hanging bracket and connect the connection kit to the boiler connections. (see also Sections 2.7 Gas Connections, 2.8 Water Connections & FIG. 2.3).

2.6 ELECTRICAL CONNECTION

For safety purposes, have a competent person carefully check the electrical system in the property, as the manufacturer will not be held liable for damage caused by the failure to earth the appliance properly or by anomalies in the supply of power. Make sure that the residential electrical system is adequate for the maximum power absorbed by the unit, which is indicated on the rating plate. In addition, check that the section of cabling is appropriate for the power absorbed by the boiler.

The boiler operates with alternating current, as indicated in the Technical Information table in Section 10, where the maximum absorbed power is also indicated. Make sure that the connections for the neutral and live wires correspond to the indications in the diagram. The appliance electrical connections are situated on the reverse of the control panel.

IMPORTANT!
In the event that the power supply cord must be changed, replace it with one with the same specifications.
Note: The diagrams for the electrical system are indicated in section 2.13.

Warning, this appliance must be earthed.

External wiring to the appliance must be carried out by a competent person and be in accordance with the current I.E.E. Regulations and applicable local regulations.
The appliance is supplied with a fly-lead already connected, this must be connected to a 240v supply fused at 3A and must facilitate complete electrical isolation of the appliance, by the use of a fused double pole isolator having a contact separation of at least 3 mm in all poles or alternatively, by **means of a 3 A** fused three pin plug and unswitched, shuttered socket outlet both complying with BS 1363.
The point of connection to the Electricity supply must be readily accessible and adjacent to the appliance unless the appliance is installed in a bathroom when this must be sited outside the bathroom (see section 2.2).

Should external controls be required, the design of the external electrical circuits should be undertaken by a competent person, see Section 2.13 for further information.

2.7 Gas Connection

The local gas region contractor connects the gas meter to the service pipe.
If the gas supply for the boiler serves other appliances ensure that an adequate supply is available both to the boiler and the other appliances when they are in use at the same time.
Pipe work must be of an adequate size. Pipes of a smaller size than the boiler inlet connection should not be used.

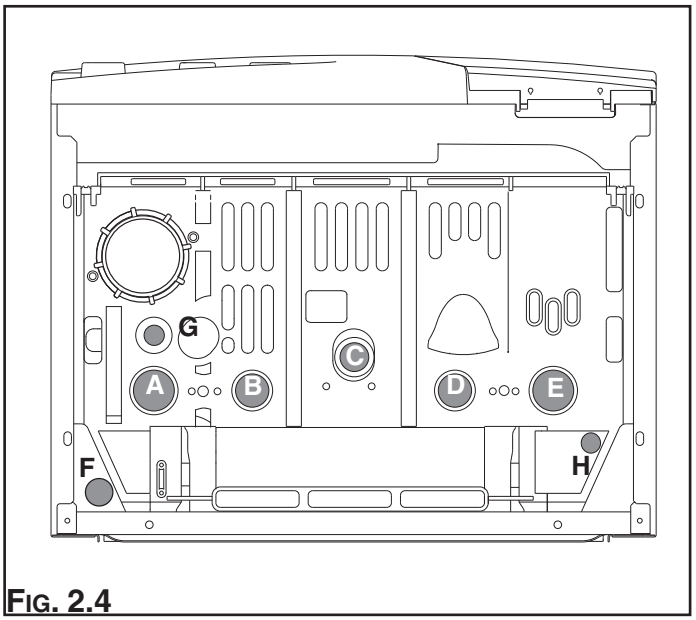

Fig. 2.4

2.8 Water Connections

View of the Boiler Connections

Legend:

A = Central Heating Flow
B = Domestic Hot Water Outlet
C = Gas Inlet
D = Domestic Cold Water Inlet
E = Central Heating Return
F = Condensate discharge
G = Drain valve
H = Safety Valve Outlet

Central Heating
Detailed recommendations are given in BS 6798:2000 and BS 5449-1:1990, the following notes are given for general guidance.

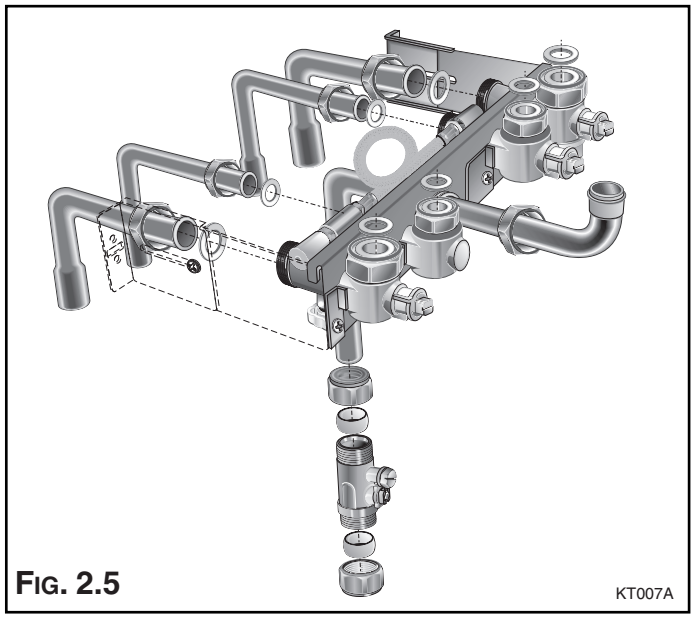

Fig. 2.5

Pipe Work:
Copper tubing to BS EN 1057:1996 is recommended for water pipes. Jointing should be either with capillary soldered or compression fittings.
Where possible pipes should have a gradient to ensure air is carried naturally to air release points and water flows naturally to drain taps.
The appliance has a built-in automatic air release valve, however it should be ensured as far as possible that the appliance heat exchanger is not a natural
collecting point for air.
Except where providing useful heat, pipes should be insulated to prevent heat loss and avoid freezing.
Particular attention should be paid to pipes passing through ventilated spaces in roofs and under floors.

By-pass:
The appliance includes an automatic by-pass valve, which protects the main heat exchanger in case of reduced or interrupted water circulation through the heating system, due to the closing of thermostatic valves or radiators.

System Design:
This boiler is suitable only for sealed systems.

Drain Cocks:
These must be located in accessible positions to permit the draining of the whole system and should be fitted at all low points. The taps must be at least 15mm nominal size and manufactured in accordance with BS 2870:1980.

Safety Valve Discharge:
The discharge should terminate facing downward on the exterior of the building in a position where discharging (possibly boiling water & steam) will not create danger or nuisance, but in an easily visible position, and not cause damage to electrical components and wiring.
The discharge must not be over an entrance or a window or any other type of public access.

Condensate Discharge:
A flexible hose connected to the bottom of the boiler should be inserted into a tundish (not supplied).

NOTE: IT MAY BE NECESSARY TO REMOVE THE CASING TO PULL THE CONDENSATE HOSE OUT OF THE BOTTOM OF THE BOILER.

The condensate discharge hose from the boiler must have a continuous fall of at least 2.5° and must be connected to a visible tundish and inserted by at least 50mm into a suitable acid resistant pipe with a nominal diameter of 32mm e.g. plastic waste pipe or overflow pipe. The condensate discharge pipe must have a continuous fall and preferably be installed and terminated within the building to prevent freezing.
The discharge pipe must be terminated in one of the following positions, allowing for a safe discharge:

i) Connecting in to an internal soil stack (at least 450 mm above the invert of the stack). A trap giving a water seal of at least 75 mm must be incorporated into the pipe run, there also must be an air break upstream of the trap i.e. tundish.
ii) Connecting into the waste system of the building such as a washing machine or sink trap. The connection must be upstream of the washing machine/sink (If the connection is down stream of the waste trap then an additional trap giving a minimum water seal of 75 mm and an air break must be incorporated in the pipe run, as above.
iii) Terminating into a gully, below the grid level but above the water level.
iv) Into a soakway.

NOTE: If any condensate pipe work is to be installed externally, then it should be kept to a minimum and be insulated with a waterproof insulation and have a continuous fall.

Some examples of the type of condensate drains can be found on pages 10 and 11.

Air Release Points:
These must be fitted at all high points where air naturally collects and must be sited to facilitate complete filling of the system.
The appliance has an integral sealed expansion vessel to accommodate the increase of water volume when the system is heated.
It can accept up to 6 litres (1.3 gal) of expansion water. If the heating circuit has an unusually high water content, calculate the total expansion and add an additional sealed expansion vessel with adequate capacity. This should be located on the return pipe work as close as possible to the pump inlet.

Mains Water Feed - Central Heating:
A method for initially filling the heating system is supplied with the connection kit. The filling loop is connected between the cold water inlet and the central heating flow connections, and incorporates a non-return valve. To operate the filling loop, it is necessary to open both quarter turn handles, once the required pressure has been achieved, close both handles and disconnect the hose in accordance with water byelaws. NOTE: The installer should ensure that there are no leaks as

RESIDUAL HEAD OF THE BOILER ΔT 20°C

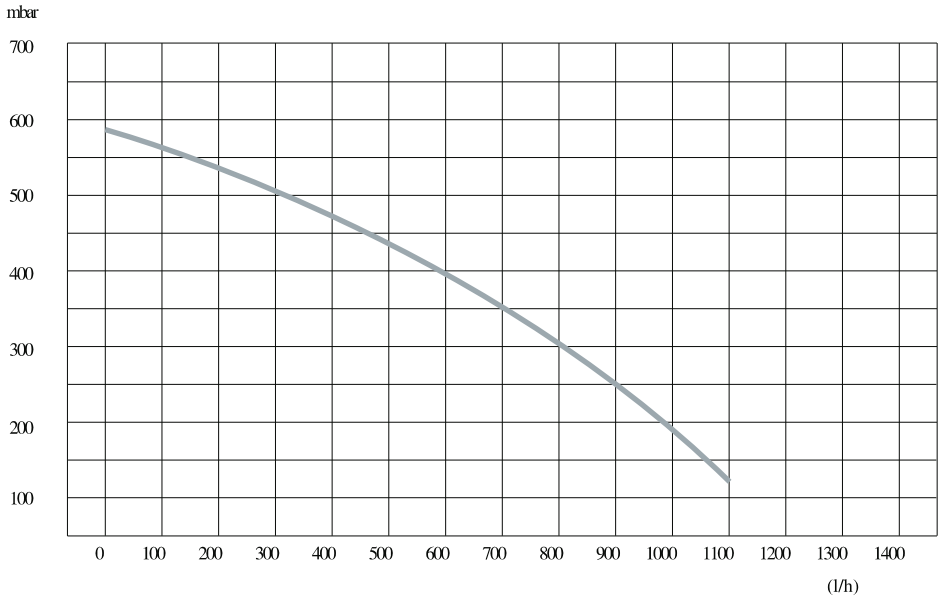

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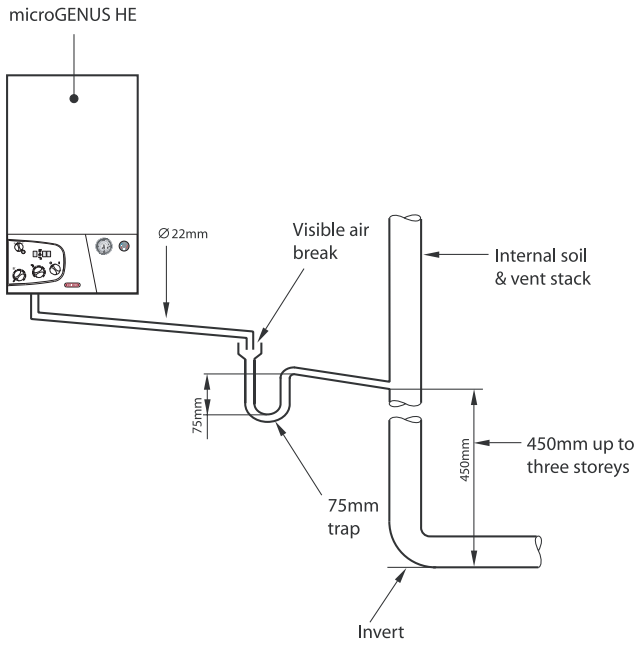
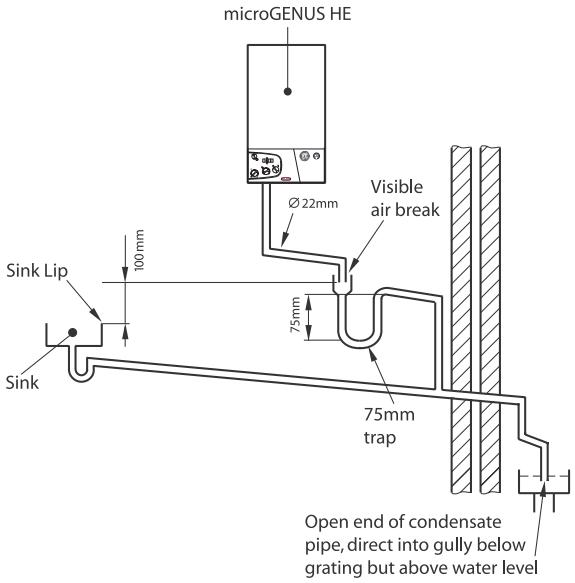
FIG. 2.6

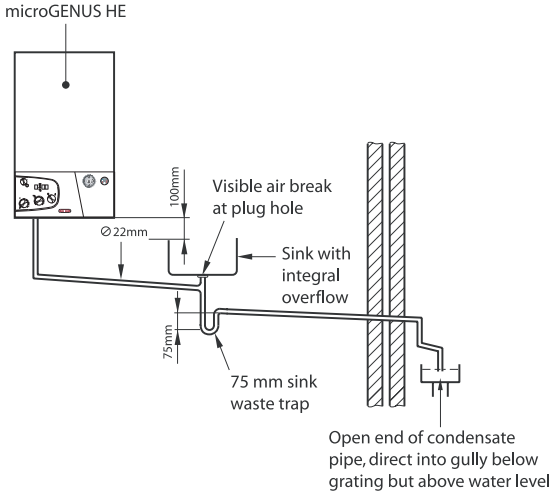
1. Internal termination of condensate drainage pipe to internal stack



2. External termination of condensate drainage pipe via internal discharge branch (e.g. sink waste) and condensate siphon



3. External termination of condensate drainage pipe via internal discharge branch (e.g. sink waste - proprietary fitting).



frequent filling of the heating system can lead to premature scaling of the main exchanger and failure of hydraulic components.

DOMESTIC WATER:

The domestic water must be in accordance with the relevant recommendation of BS 5546:1990. Copper tubing to BS EN 1057:1996 is recommended for water carrying pipe work and must be used for pipe work carrying drinking water, a scale reducer should also be used to reduce the risk of scale forming in the domestic side of the heat exchanger.

WATER TREATMENT

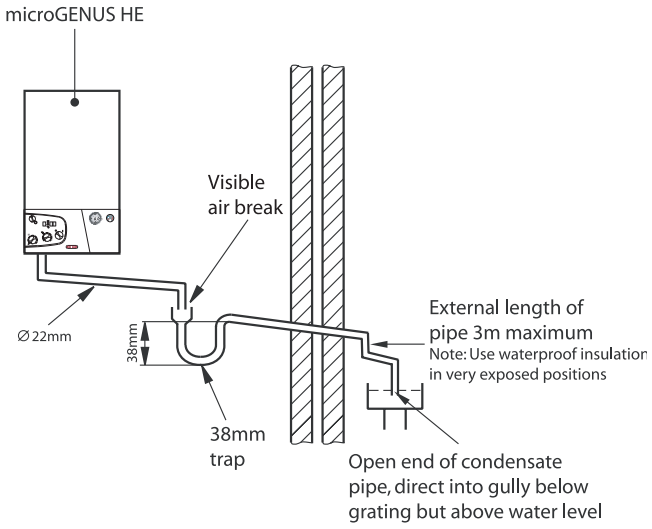
The boiler is equipped with an aluminium alloy main heat exchanger.

The detailed recommendations for water treatment are given in BS 7593:1992 (Treatment of water in domestic hot water central heating systems); the following notes are given for general guidance;

- If the boiler is installed on an existing system, any unsuitable additives must be removed;
- Under no circumstances should the boiler be fired before the system has been thoroughly flushed; the flushing procedure must be in line with BS7593:1992.
  We highly recommend the use of a flushing detergent appropriate for the metals used in the aluminium alloy circuit. These include (Fernox Superfloc, BetzDearborn Sentinel X300 or X400), whose function is to dissolve any foreign matter that may be in the system;
  In hard water areas or where large quantities of water are in the system the treatment of the water to prevent premature scaling of the main heat exchanger is necessary.

  The formation of scale strongly compromises the efficiency of the thermic exchange because small areas of scale cause a high increase of the temperature of the metallic walls and therefore add to the thermal stress of the heat exchanger.
  Demineralised water is more aggressive so in this situation it is necessary to treat the water with an appropriate corrosion inhibitor.
- Any treatment of water by additives in the system for frost protection or for corrosion inhibition has to be absolutely suitable for all the metals used in the circuit including the aluminium alloys.
  The use of a corrosion inhibitor in the system such as Fernox MB-1, BetzDeaborn Sentinel X100 or Fernox System Inhibitor is recommended to prevent corrosion (sludge) damaging the boiler and systems;
- If anti-freeze substances are to be used in the system, check carefully that they are compatible with the aluminium.
  In particular, DO NOT USE ordinary ETHYLENE GLYCOL, since it is corrosive in relation to aluminium and its alloy, as well being toxic.
  MTS suggests the use of suitable anti-freeze products such as Fernox ALPHI 11, which will prevent rust and incrustation taking place.
  Periodically check the pH of the water/anti-freeze

4. External termination of condensate drainage pipe via condensate siphon



mixture of the boiler circuit and replace it when the amount measured is out of the range stipulated by the manufacturer (7 < pH < 8).
DO NOT MIX DIFFERENT TYPES OF ANTI-FREEZE

- In under-floor systems, the use of plastic pipes without protection against penetration of oxygen through the walls can cause corrosion of the system's metal parts (metal piping, boiler, etc), through the formation of oxides and bacterial agents.
  To prevent this problem, it is necessary to use pipes with an "oxygen-proof barrier", in accordance with standards DIN 4726/4729**. If pipes of this kind are not used, keep the system separate by installing heat exchanger*s *of those with a specific system water treatment.***

IMPORTANT
Failure to carry out the water treatment procedure will invalidate the appliance warranty.

2.9. CONNECTING THE FLUE

IMPORTANT!!
BEFORE CONNECTING THE FLUE, ENSURE THAT 1 LITRE OF WATER HAS BEEN POURED INTO THE EXHAUST CONNECTION TO FILL THE CONDENSATE TRAP (FIG.2.7). SHOULD THE TRAP BE EMPTY THERE IS A TEMPORARY RISK OF FLUE GASSES ESCAPING INTO THE ROOM.

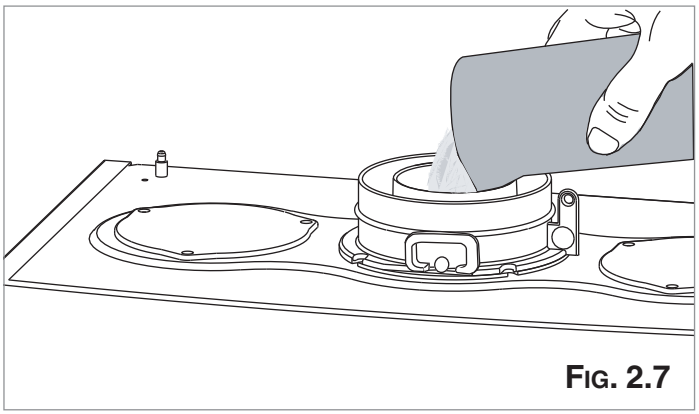


FIG. 2.7

FLUE SYSTEM

The provision for satisfactory flue termination must be made as described in BS 5440-1.
The appliance must be installed so that the flue terminal is exposed to outdoor air.
The terminal must not discharge into another room or space such as an outhouse or lean-to.
It is important that the position of the terminal allows a free passage of air across it at all times.
The terminal should be located with due regard for the damage or discolouration that might occur on buildings in the vicinity, it must also be located in a place not likely to cause nuisance.
In cold or humid weather water vapour will condense on leaving the flue terminal.
The effect of such "steaming" must be considered.
If the terminal is less than 2 metres above a balcony, above ground or above a flat roof to which people have access, then a suitable stainless steel terminal guard must be fitted.

The minimum acceptable spacing from the terminal to obstructions and ventilation openings are specified in Fig. 2.8.

Note: In cold weather the condensate could cause a safety hazard if it freezes on pathways or if it results in frost damage to surfaces and the plume could trigger infra-red security lighting if sited in the wrong place.

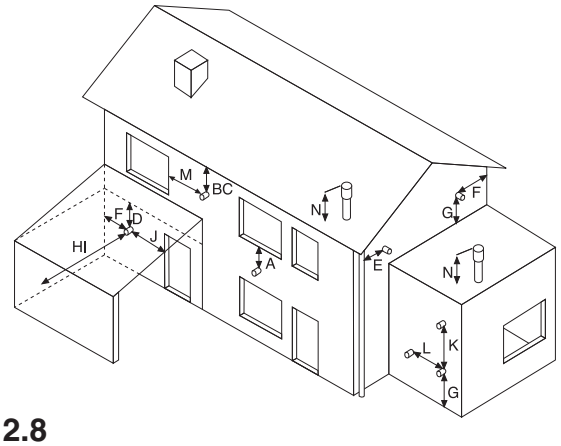


FIG. 2.8

TERMINAL POSITION	*mm*
A - Directly below an open window or other opening	*300*
B - Below gutters, solid pipes or drain pipes	*75*
C - Below eaves	*200*
D - Below balconies or car-port roof	*200*
E - From vertical drain pipes and soil pipes	*75*
F - From internal or external corners	*300*
G - Above ground or below balcony level	*300*
H - From a surface facing a terminal	*600*
I - From a terminal facing a terminal	*1200*
J - From an opening in the car port (e.g. door, window) into dwelling	*1200*
K - Vertically from a terminal in the same wall	*1500*
L - Horizontally from a terminal in the same wall	*300*
M - Horizontally from an opening window	*300*
N - Fixed by vertical flue terminal	

Ø 60/100 mm

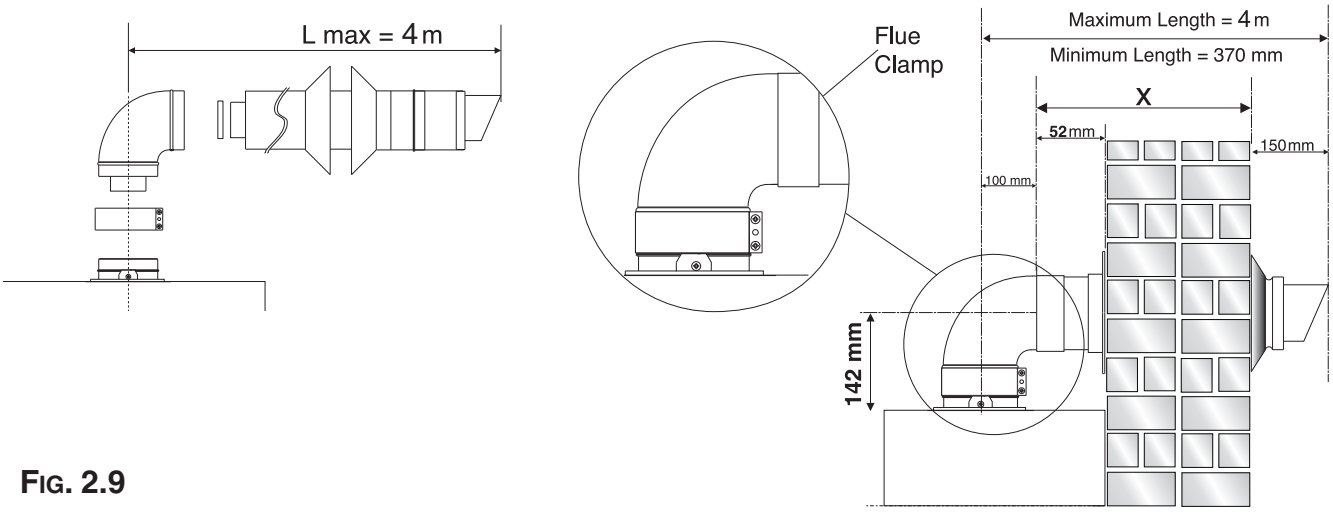


FIG. 2.9

Warning
The exhaust gas ducts must not be in contact with or close to inflammable material and must not pass through building structures or walls made of inflammable material.
When replacing an old appliance, the flue system must be changed.

Important
Ensure that the flue is not blocked.
Ensure that the flue is supported and assembled in accordance with these instructions.

Installation without extension

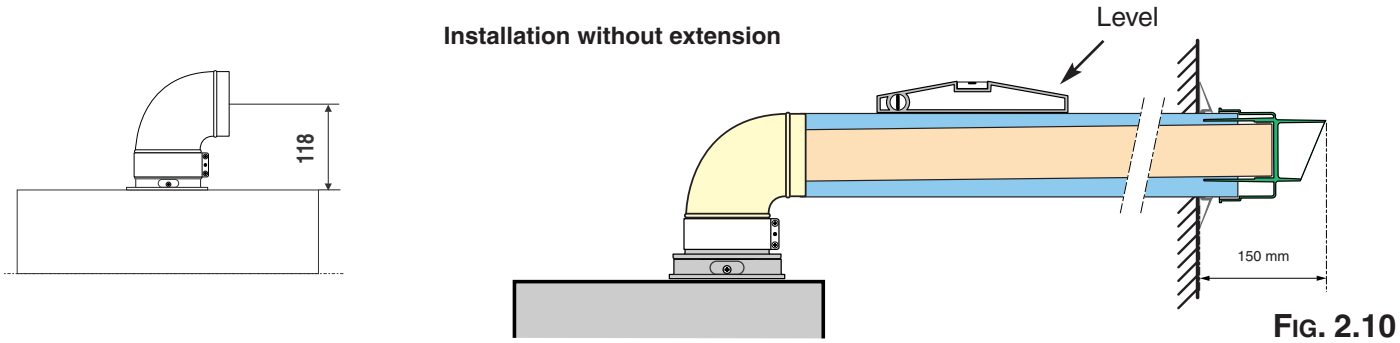


FIG. 2.10

Installation with extension

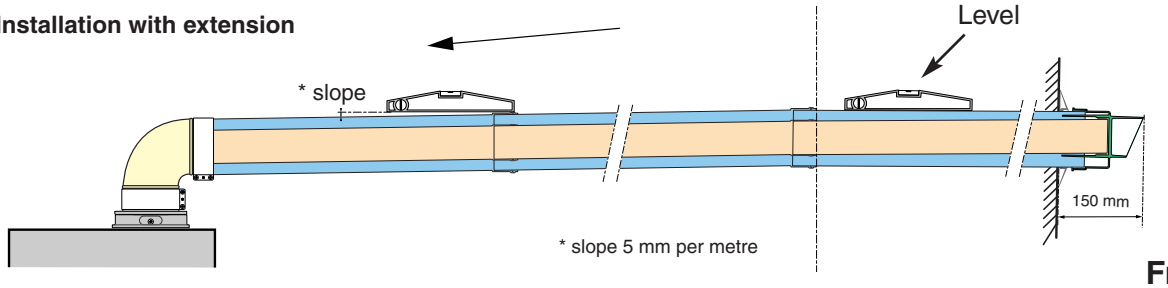


FIG. 2.11

2.9.1 FITTING THE COAXIAL FLUE (Ø 60 / 100 HORIZONTAL)

CONTENTS:
1x SILICONE O-RING (60mm)
1x ELBOW (90°)
2x WALL SEALS (INTERNAL & EXTERNAL)
1x FLUE PIPE INCLUDING TERMINAL (1 METRE - 60/100)
1x FLUE CLAMP
2x SCREWS
1x Seal

Once the boiler has been positioned on the wall, insert the elbow into the socket and rotate to the required position. NOTE: It is possible to rotate the elbow 360° on its vertical axis.

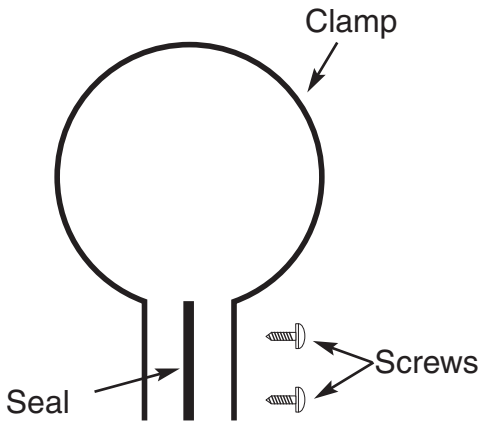
Using the flue clamp, seals and screws supplied **(Fig 2.12)** secure the elbow to the boiler.

The 1 metre horizontal flue kit (3318073) supplied is suitable for an exact **X dimension** of 823 mm.

Measure the distance from the face of the external wall to the face of the flue elbow **(X - Fig 2.9),** subtract 48 mm from this measurement, you now have the total length of flue required (including the terminal), this figure must now be subtracted from 907mm, you now have the total amount to be cut from the plain end of the flue.

Cut the flue to the required length ensuring that the distance between the inner and the outer flue is maintained **(Fig 2.12)**.
e.g.
X = 508mm - 48mm = 460mm
823 - 460 = 363mm (Length to be cut from the plain end of the flue).

Once cut to the required length, ensure that the flue is free from burrs and reassemble the flue. If fitting the flue from inside of the building attach the grey outer wall seal to the flue terminal and push the flue through the hole, once the wall seal has passed through the hole, pull the flue back until the seal is flush with the wall. Alternatively, the flue can be installed from outside of the building, the grey outer seal being fitted last.



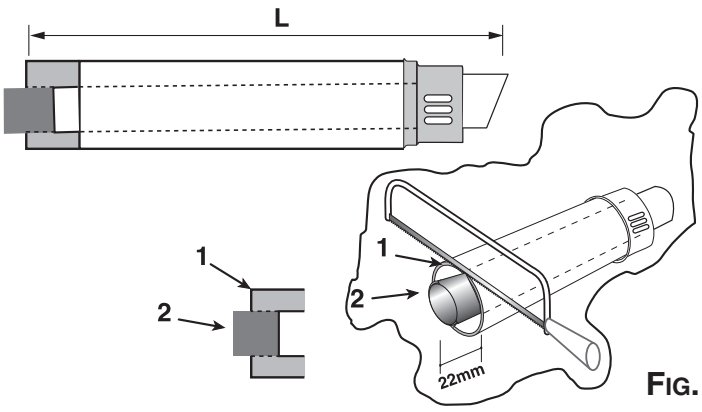


FIG. 2.12

Should the flue require extending, the flue connections are push fit, however, one flue bracket should be used to secure each metre of flue.

2.9.2 FITTING THE 5" FLUE (Ø 80 / 125 HORIZONTAL / VERTICAL)

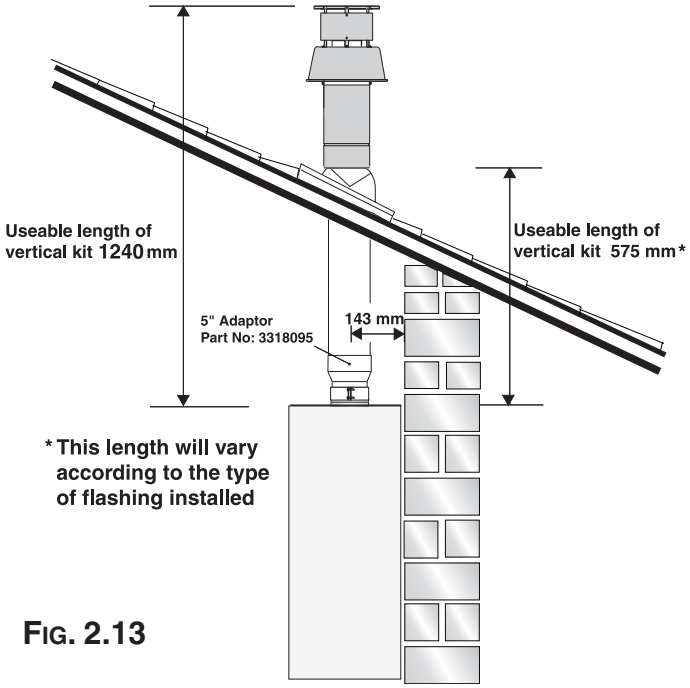


FIG. 2.13

NOTE: SEE PAGE 19 FOR MAXIMUM AND MINIMUM FLUE RUNS.

Once the boiler has been positioned on the wall, it is necessary to insert the Ø80/125 adaptor (**FIG. 2.13**) for both horizontal and vertical flue runs into the boiler flue socket (not supplied with flue kit - **Part No 3318095**).

Push the adaptor onto the boilers flue connection, grease the seals then add extensions or elbows as required, secure the adaptor, using the clamp and screws provided.

To fit extensions or elbows it is first necessary to ensure that the lip seal is fitted correctly into the inner flue, once verified, it is simply necessary to push them together, no clamps are necessary to secure the flue components.

Before proceeding to fit the flue, ensure that the maximum flue length has not been exceeded (See the tables on Page 19) and that all elbows and bends have been taken into consideration, the maximum flue length is 10 metres, for each additional 90° elbow 1 metre must be subtracted from the total flue length, and for each 45° 0.5 metres must be subtracted from the total flue length **(the height of the vertical adaptor and a 45° bend can be seen in Fig. 2.14 and a 90° bend in Fig. 2.15)**.

NOTE: **DO NOT** CUT THE VERTICAL FLUE KIT.

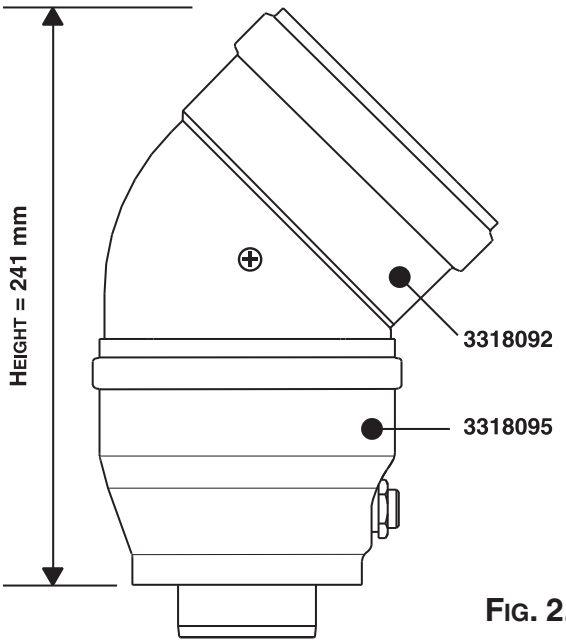


FIG. 2.14

2.9.3. Fitting the Coaxial Flue (Ø 60 / 100 Vertical)

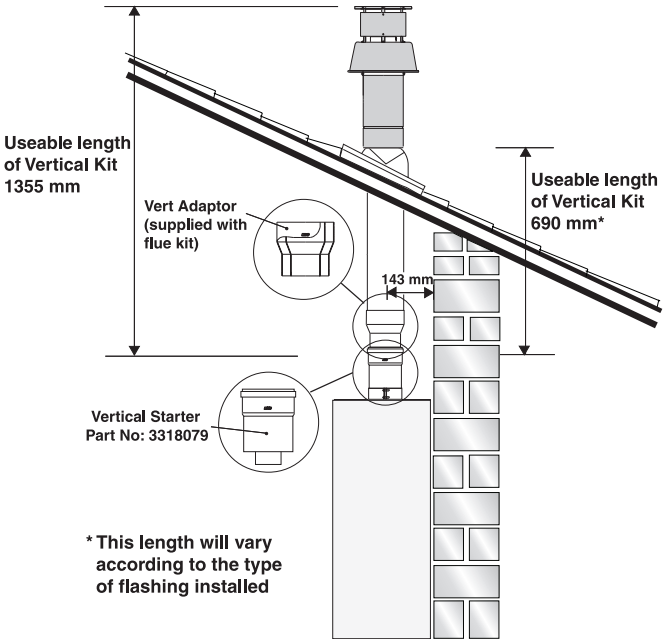


Fig. 2.15

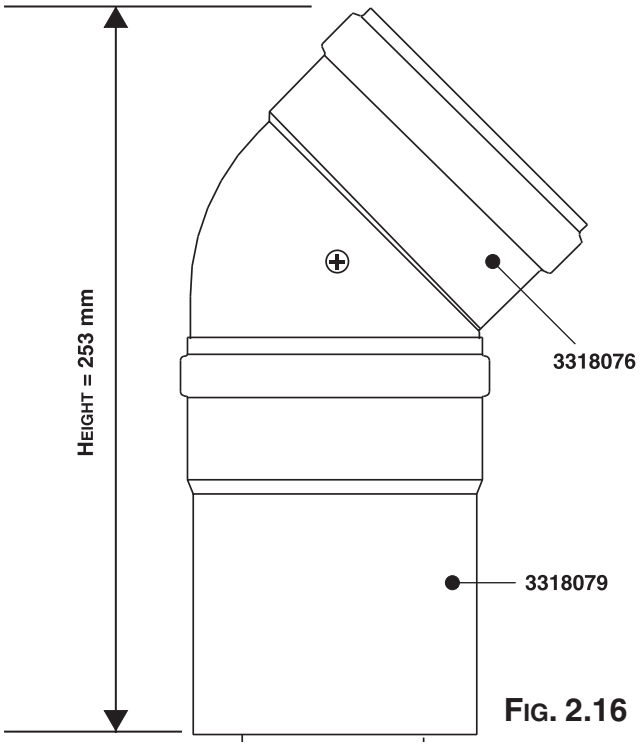


Fig. 2.16

Note: See page 19 for maximum and minimum flue runs.

Contents:
1x Silicone O-Ring (60mm)
1x Conical Adaptor (60/100mm)
1x Vertical Flue Kit (80/125mm)
3x Screws

The vertical flue kit is supplied with a specially designed weather proof terminal fitted, it can be used either with a flat roof or a pitched roof.

The Vertical flue kits useable lengths with the pitched roof flashings are indicated in **Fig. 2.15**.

Before proceeding to fit the flue, ensure that the maximum flue length has not been exceeded (See the tables on Page 19) and that all elbows and bends have been taken into consideration, the maximum flue length is 4 metres, for each additional 90° elbow 1 metre must be subtracted from the total flue length, and for each 45° 0.5 metres must be subtracted from the total flue length **(the height of the vertical adaptor and a 45° bend can be seen in Fig. 2.16)**.

Mark the position of the flue hole in the ceiling and/or roof (see **Fig. 2.15** for distance from wall to the centre of the flue).

Cut a 120mm diameter hole through the ceiling and/or roof and fit the flashing plate to the roof.

DO NOT cut the vertical flue kit.

To connect the vertical flue kit directly to the boiler, place the vertical starter kit **(Part No. 3318079)** (see **Fig. 2.16**) onto the exhaust manifold and secure with the clamp, fit the vertical adaptor onto the vertical starter kit (note: there is no need to use a clamp to secure this as it is a push fit connection), the vertical flue kit must then be inserted through the roof flashing, this will ensure that the correct clearance above the roof is provided as the terminal is a fixed height.

Should extensions be required, they are available in 1 metre **(Part No. 3318077)**, 500mm **(Part No. 3318078)** and 160mm lengths, they must be connected directly to the vertical starter kit before connecting the adaptor to allow the vertical flue kit to be fitted. In the event that extension pieces need to be shortened, they ***must*** only be cut at the male end and it must be ensured that the distance between the inner and outer flue is maintained (**Fig. 2.12**).

When utilising the vertical flue system, action must be taken to ensure that the flue is supported adequately to prevent the weight being transferred to the appliance flue connection by using 1 flue bracket per extension.

When the flue passes through a ceiling or wooden floor, there must be an air gap of 25mm between any part of the flue system and any combustible material. The use of a ceiling plate will facilitate this. Also when the flue passes from one room to another a fire stop must be fitted to prevent the passage of smoke or fire, irrespective of the structural material through which the flue passes.

2.9.4. Fitting the Twin Pipe (Ø80 / 80)

NOTE: See page 19 for maximum and minimum flue runs.

Where it is not possible to terminate the flue within the distance permitted for coaxial flues, the twin flue pipe can be used by fitting a special adaptor to the flue connector and using the aperture for the air intake located on top of the combustion chamber.

Always ensure that the flue is adequately supported, avoiding low points. (MTS supply suitable clamps as Part No. 705778).
To utilise the air intake it is necessary to:

1) Take the air intake cover off
2) Assemble the flange on the header supplied with the boiler
3) Insert the restrictor if necessary, on the tube or the elbow
4) Insert the header on the tube or the elbow up until the lower stop
(you do not have to use the washer).
5) Insert the elbow/header in the boiler air intake hole and fasten it with screws.

The twin flue pipes can be fitted with or without additional elbows and need no clamps, simply ensure that the red o-ring is inserted in the female end of the flue pipe and push the extension piece fully into the previous section of flue pipe or elbow, check that the o-ring is not dislodged when assembling the flue.

Twin pipe can also be converted back to Coaxial flue to enable vertical termination with a coaxial kit by using the pipe bridge (Twin - Coaxial Adaptor - Part No. 705767). When running the twin flue pipe vertically.

It is not recommended that the pipe bridge be used for horizontal termination, however in the unlikely event that this proves to be a necessity it is extremely important that the entire flue has a fall of 5mm in every metre back to the boiler, and where the 60mm inner flue of the concentric terminal connects to the pipe bridge, this point must be adequately sealed with silicone sealant to avoid condense leakage at this point.

When siting the twin flue pipe, the air intake and exhaust terminals must terminate on the same wall, the centres of the terminals **must** be a minimum of 280 mm apart and the air intake **must** not be sited above the exhaust terminal (refer to Fig. 2.19). The air intake pipe can be run horizontally, however, the terminal and the final 1 metre of flue must be installed with a fall away from the boiler to avoid rain ingress.

It is also strongly recommended that the air intake pipe run be constructed of insulated pipe to prevent condense forming on the outside of the tube.

The maximum permissible flue length for twin flue is dependent on the type of run used.
For flue runs with the intake and exhaust pipes under the same atmospheric conditions (Type 4) the maximum length is 40 metres (27kW) and 48 metres (32kW), for runs with the terminals under different atmospheric conditions (Type 5) the exhaust terminal **must** extend 0.5 metres above the ridge of the roof (this is not obligatory if the exhaust and air intake pipes are located on the same side of the building). For Type 5 also, the maximum permissible combined length is 40 metres (27kW) and 49 metres (32kW).

The maximum length is reached by combining the total lengths of both the air intake and exhaust pipes. Therefore a maximum length of 40 metres for example, will allow a flue run of 20 metres for the air intake and 20 metres for the exhaust pipes, also for each 90° elbow 2.2 metres must be subtracted from the total length and for each 45° elbow 1.4 metres must be subtracted from the total flue length.

Some of the acceptable flue configurations are detailed on page 20.

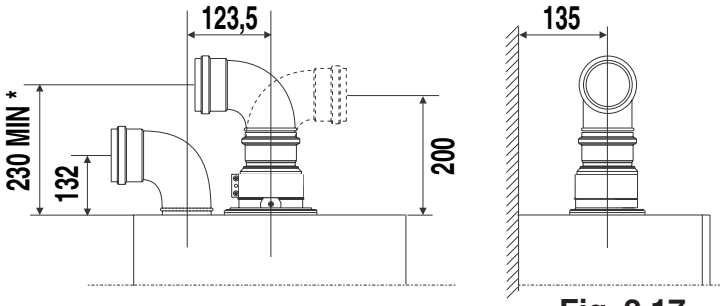


Fig. 2.17

For further information relating to flue runs not illustrated, please contact the Technical Department on 0870 241 8180.

In the event that twin flue pipes are used, and the boiler has a side clearance of less than 60mm from the wall, it is necessary to cut a larger diameter hole for the flue pipe, this should be ø10 cm, this will then allow for easier assembly of the air intake elbow and the tube outside the wall (see Fig. 2.17).

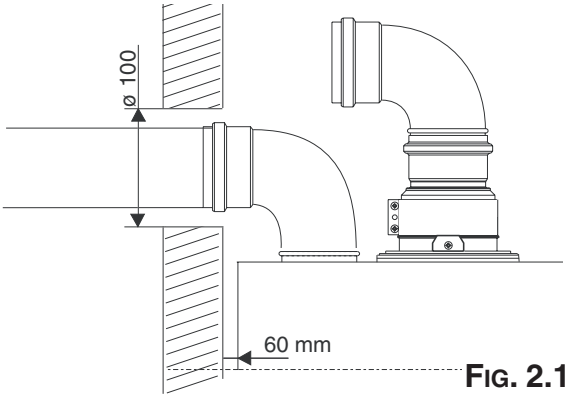
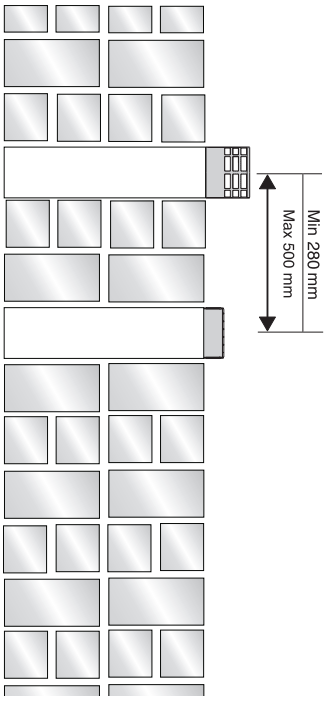


FIG. 2.18



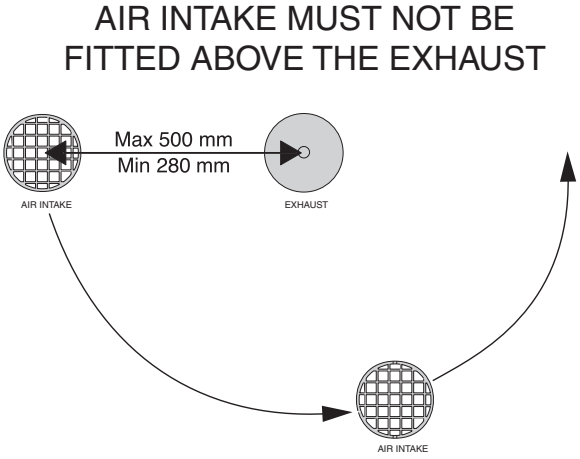


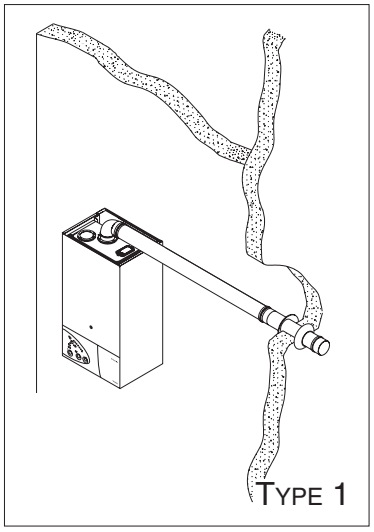
FIG. 2.19

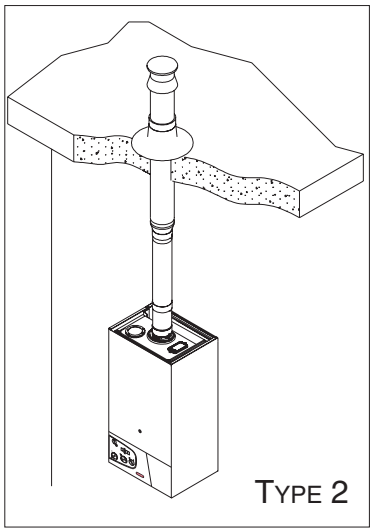
For coaxial systems, the maximum development value, mentioned in the table above also takes into account an elbow.
For twin flue systems the maximum development value, mentioned in the table includes the exhaust gas/air intake terminal.

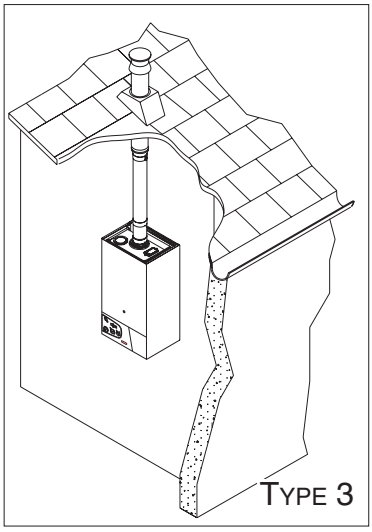
Type 5 outlets should respect the following instructions:
1- Use the same ø 80 mm flue pipes for the gas intakes and exhaust gas ducts.
2- If you need to insert elbows in the gas intake and exhaust gas ducts, you should consider for each one the equivalent length to be included in the calculation of developed length.
3- The exhaust gas duct should jut above the roof by at least 0.5 m.
4- The intake and exhaust gas ducts in Type 5 must be installed on the same wall, or where the exhaust is vertical and the air intake horizontal, the terminals must be on the same side of the building.

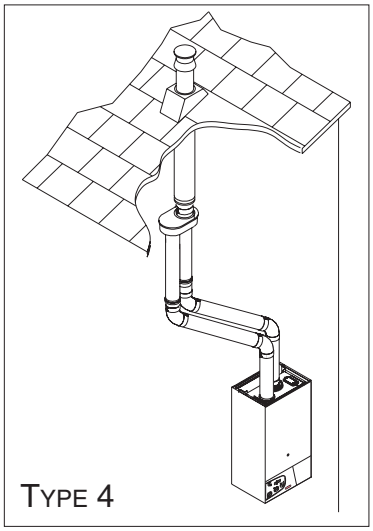
There are some different types of flue systems shown on Page 19.
For additional information regarding the flue accessories, please consult the Flue Pipe Accessories manual.

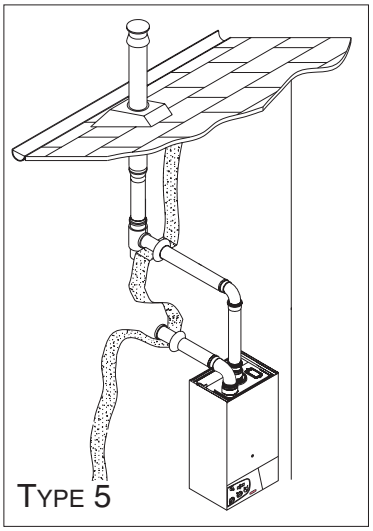
24 MFFI	**Exhaust Type**	**Use the ø 40 mm Restrictor(*)**	**Do not use the Restrictor**	**Maximum Flue Length**
Coaxial Systems ø 60/100	Type 1	Between 500 mm - 1 m	Between 1 m - 4 m	4 m
	Type 2			
	Type 3			
Coaxial Systems ø 80/125	Type 1	TBC	TBC	10 m
	Type 2			
	Type 3			
Twin Pipe Systems ø 80/80	Type 4	Between 1m - 10 m	Between 10 m - 40 m	40 m
	Type 5	Between 1m - 10 m	Between 10 m - 40 m	40 m
28 MFFI	**Exhaust Type**	**Use the ø 41 mm Restrictor(*)**	**Do not use the Restrictor**	**Maximum Flue Length**
Coaxial Systems ø 60/100	Type 1	Between 500 mm - 1 m	Between 1 m - 4 m	4 m
	Type 2			
	Type 3			
Coaxial Systems ø 80/125		TBC	TBC	10 m
Twin Pipe Systems ø 80/80	Type 4	Between 1m - 10 m	Between 10 m - 40 m	40 m
	Type 5	Between 1m - 10 m	Between 10 m - 40 m	40 m
32 MFFI	**Exhaust Type**	**Use the ø 43 mm Restrictor(*)**	**Do not use the Restrictor**	**Maximum Flue Length**
Coaxial Systems ø 60/100	Type 1	Between 500 mm - 1 m	Between 1 m - 4 m	4 m
	Type 2			
	Type 3			
Coaxial Systems ø 80/125	Type 1	TBC	TBC	10 m
	Type 2			
	Type 3			
Twin Pipe Systems ø 80/80	Type 4	Between 1m - 10 m	Between 10 m - 40 m	40 m
	Type 5	Between 1m - 10 m	Between 10 m - 40 m	40 m



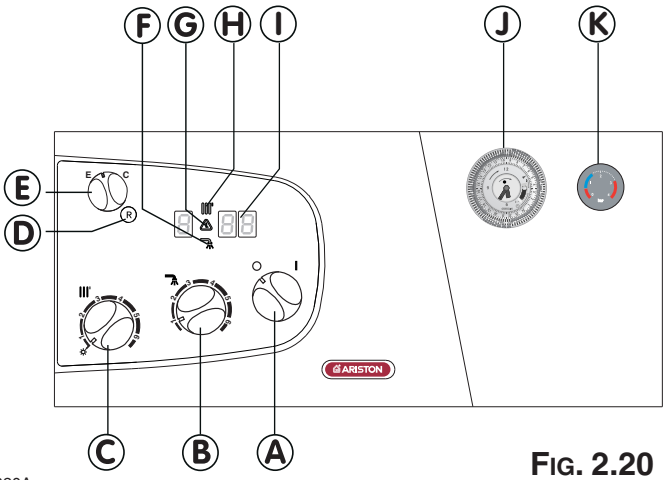








NOTE: DRAWINGS ARE INDICATIVE OF FLUEING OPTIONS ONLY.



FR020A

FIG. 2.20

* *Warning the flue analysis mode must only be selected by a qualified service engineer. See Section 3.4 for further instructions*

2.10 CONTROL PANEL

LEGEND:

A - On/Off Button
B - Domestic Hot Water Temperature Adjustment
C - Central Heating Temperature Adjustment
D - Reset Button/Flue Test analysis mode*
E - Comfort Mode Selector
F - Summer Mode LED (Green)
G - Ignition/Overheat Lockout LED (Red)
H - Central Heating (Winter Mode) LED (Green)
I - Digital Display (Fault Code/Water Temperature)
J - Time Clock
K- Central Heating System Pressure Gauge

2.11 DIGITIAL DISPLAY AND FAULT CODES

The Control Panel has a 3 digit display, during normal operation the display will show one of three things on the two right hand digits;

During Stand-by (no demand for Central Heating or D.H.W.) 'on' will be shown on the display and no LEDs will light.

During a demand for Domestic Hot Water, the temperature of the outgoing hot water is displayed in °C (e.g. 38) and the summer mode LED will light (**F - FIG. 2.20**).

During a demand for Central Heating, the temperature of the central heating flow will be displayed in °C (e.g. 65) and the central heating mode LED will light (**H - FIG. 2.20**).

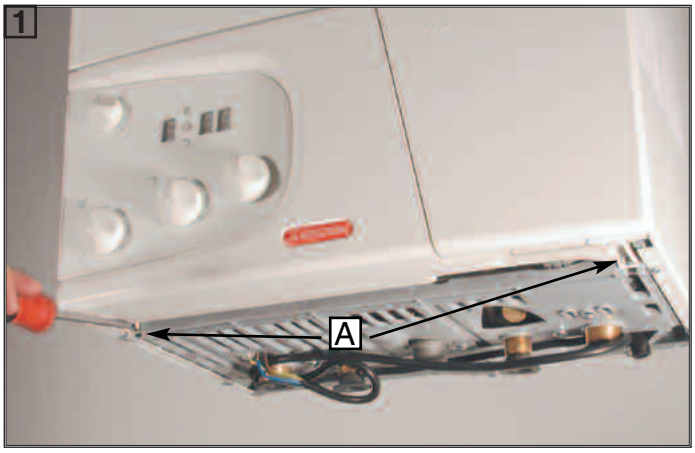
During the operation of the flue analysis mode* the display will show 'sc'.

Should a fault occur the display will show the fault code and one of two letters, for a non-volatile shutdown the letter 'A' will be shown followed by the two digit code for the fault eg. 'A02' and the red LED (**G - FIG. 2.20**) will light, a non-volatile shutdown will require the reset button (**D - FIG. 2.20**) to be pressed once before the boiler will attempt to relight, should the boiler lockout again, the assistance of an Authorised Service Engineer should be sought.

Should the boiler develop a fault that cannot be corrected by resetting the boiler, the letter 'E' will be displayed followed by a two digit code (e.g. E33) indicating a volatile shutdown code, in the event of such a shutdown, the boiler will automatically resume operation once the cause behind it is resolved. Should it not, the assistance of an Authorised Service Engineer would be required.

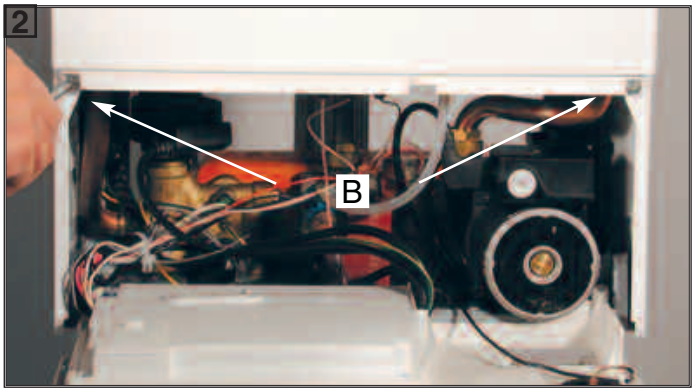
A list of the fault codes can be found opposite.

DISPLAY	CAUSE
A 01	No flame after safety time (7 seconds)
A 03	The heating flow temperature exceeds 103°C during operation
A 77	Condensate Trap full of water Condensare sensor short circuited Condensate sensor in open circuit
A 97	Problem with the electronic monitoring
A 98	Problem with the electronic monitoring
A 99	Problem with the electronic monitoring
E 02	Insufficient water pressure
E 04	Domestic hot water temperature probe in open circuit
E 05	Domestic hot water temperature probe short circuited
E 06	Heating flow temperature probe in open circuit
E 07	Heating flow temperature probe short circuited
E 08	Heating return temperature probe in open circuit
E 09	Heating return temperature probe short circuited
E 20	Flame detected with gas valve closed
E 21	Error in the electrical connection (live and neutral crossed)
E 33	The air pressure switch is closed before the ignition sequence has begun
E 34	The air pressure switch does not close when the fan runs
E 99	More than 5 RESETS of the boiler in 15 minutes.



2.12 Removing the Front Panel

In order to access the inside of the boiler, it is necessary to unscrew the fastening screws **"A"** of the control panel located on the lower part of the panel itself.
The control panel moves downward and when pulled forward rotates on two lateral hinges.
The panel stays in a horizontal position, which allows access to the inner parts of the boiler.
To dismantle the front casing panel it is necessary to:
1 - Remove the two screws **"B"**;
2 - Move the front casing panel up and lift forward.



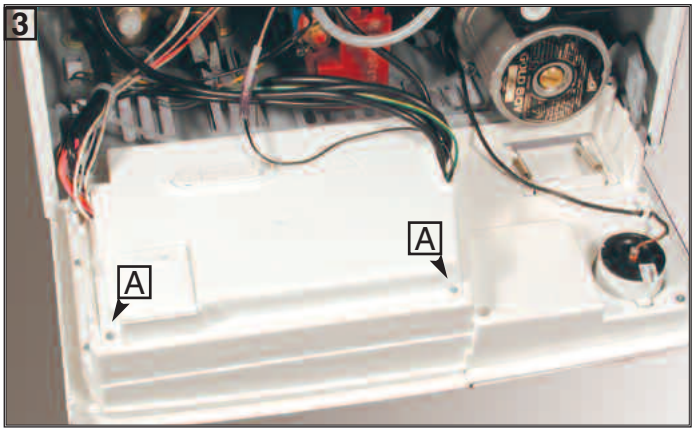
2.13 Room Thermostat Connection

To connect a room thermostat, it is necessary to:
1. - Open the control panel as indicated in **section 2.12**.
2.- Remove the screws **"A"** from the terminal block on the reverse of the control panel.
3. - Insert the thermostat cable through the cable grommet and fasten it by means of the cable-clamp provided.
4. - Connect the thermostat wires to the terminal block **(Diagram A).**
5.- If a remote time clock is to be fitted, disconnect the integral time clock from the P.C.B.
6. - Using a volt-free switching time clock, connect the switching wires from the time clock following points 1-4 above **(Diagram B).**
7. - If using an external time clock and room thermostat, these must be connected in series as points 1-6 above **(Diagram C).**

Note: Only a low voltage room thermostat capable of volt free switching must be used.

Factory fitted integral wiring must not be disturbed when wiring external controls.

Ensure high voltage and low voltage circuits are cabled separately to avoid induced voltage in the low voltage circuits.



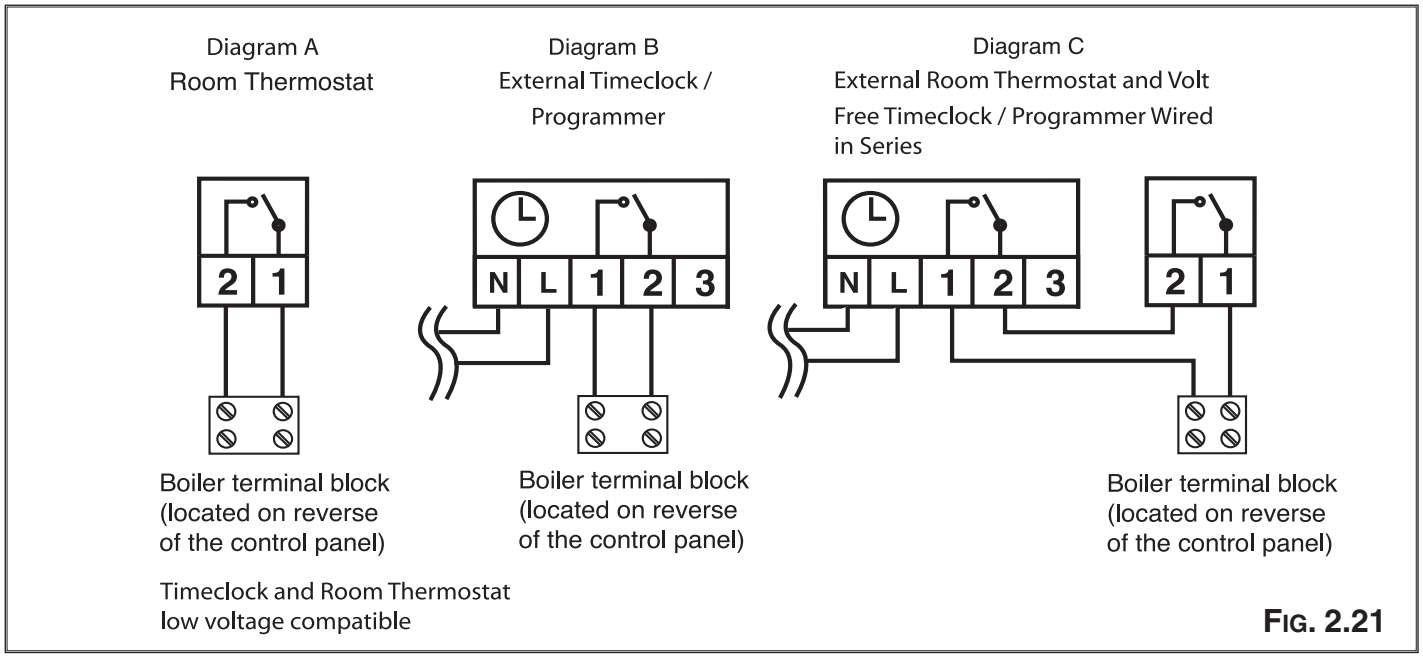


Fig. 2.21

2.14. Fitting the Digital Clock

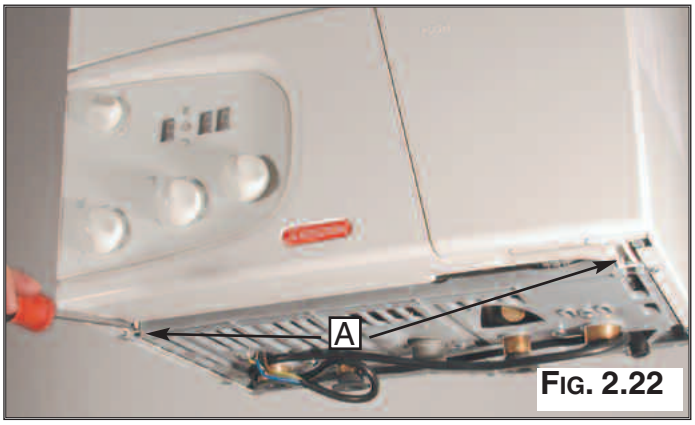


Fig. 2.22

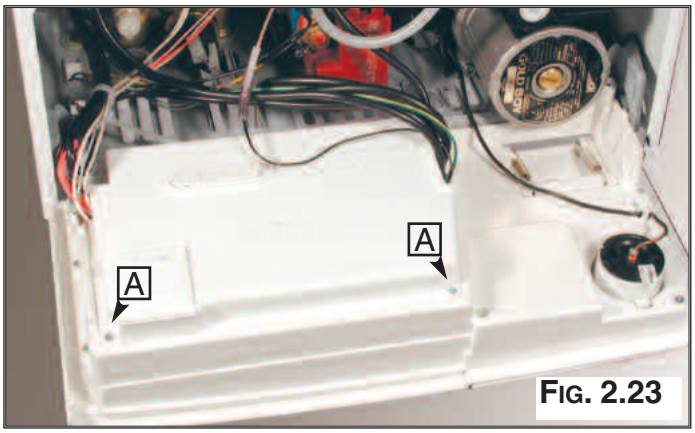


Fig. 2.23

The microGENUS HE boiler is supplied with a factory fitted mechanical time clock. There is a digital clock available as an optional extra (code: 706348).

To fit the digital clock it is necessary to proceed as follows:-

1. Remove the screws **A (Fig. 2.22)** and lower the control panel;
2. Open the control panel (see Section 2.12);
3. Remove the screws **D1** to gain access to the mechanical time clock **(Fig. 2.25)**
3. Unplug the electrical connection from the PCB **D7 (Fig. 2.26)** and unscrew the four screws **(Fig. 2.26)**;
4. Connect the wires supplied with the replacement clock kit to the digital time clock as shown in **Fig. 2.27**;
5. Reassemble in reverse order.

NOTE: THE MECHANICAL CLOCK HAS FOUR WIRES, THEREFORE THE HARNESS WILL REQUIRE CHANGING ALSO.

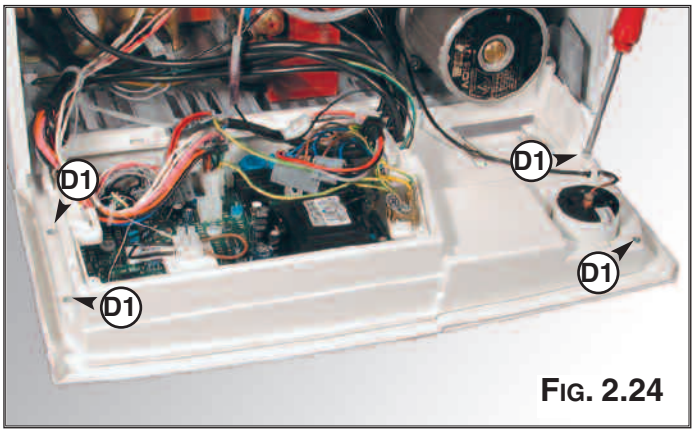


Fig. 2.24

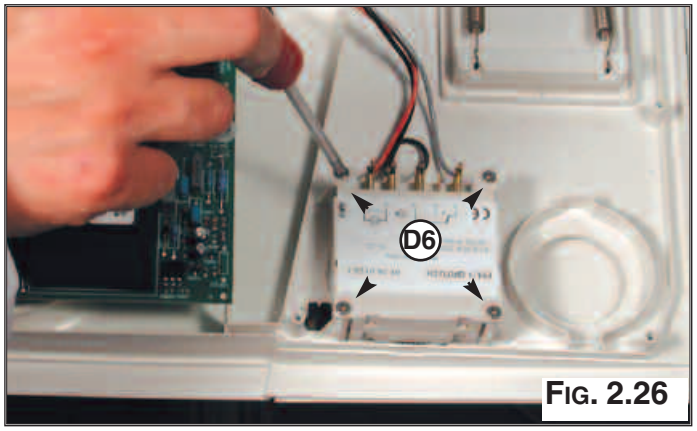


Fig. 2.26

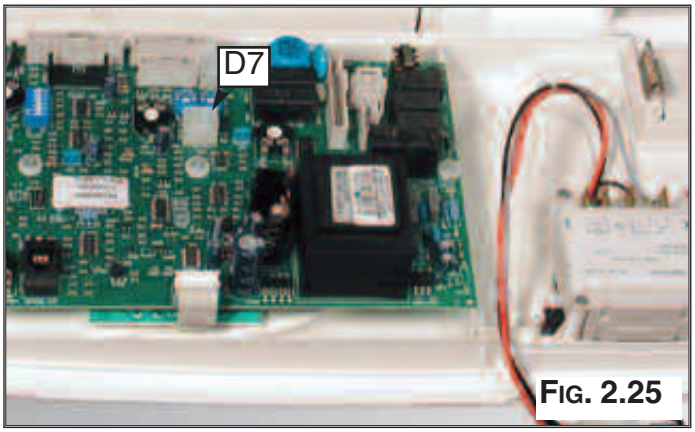


Fig. 2.25

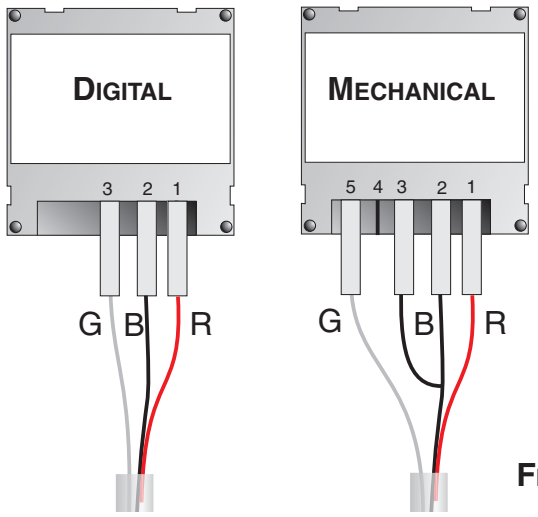


Fig. 2.27

2.15. SETTING THE MECHANICAL TIME CLOCK

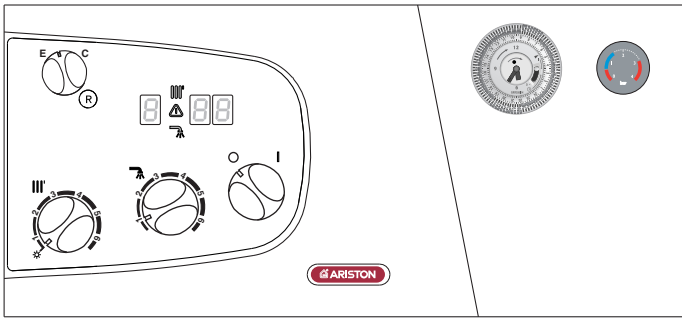


FIG. 2.28

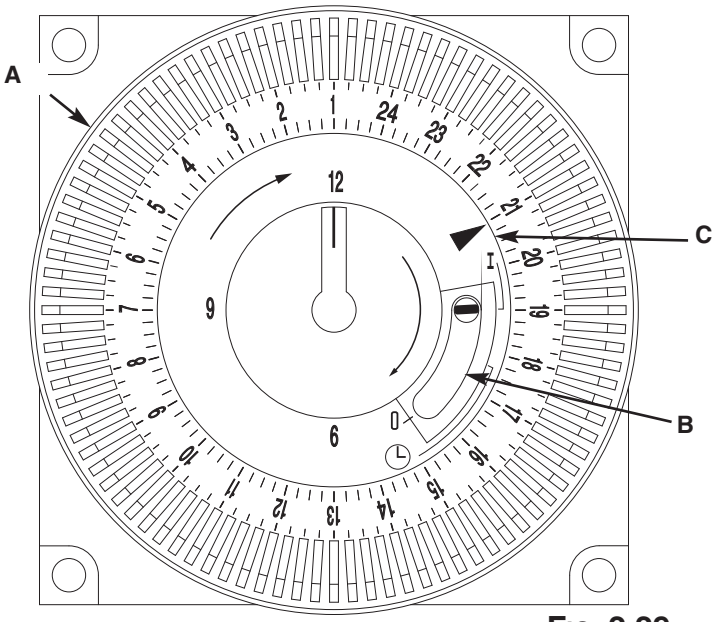


FIG. 2.29

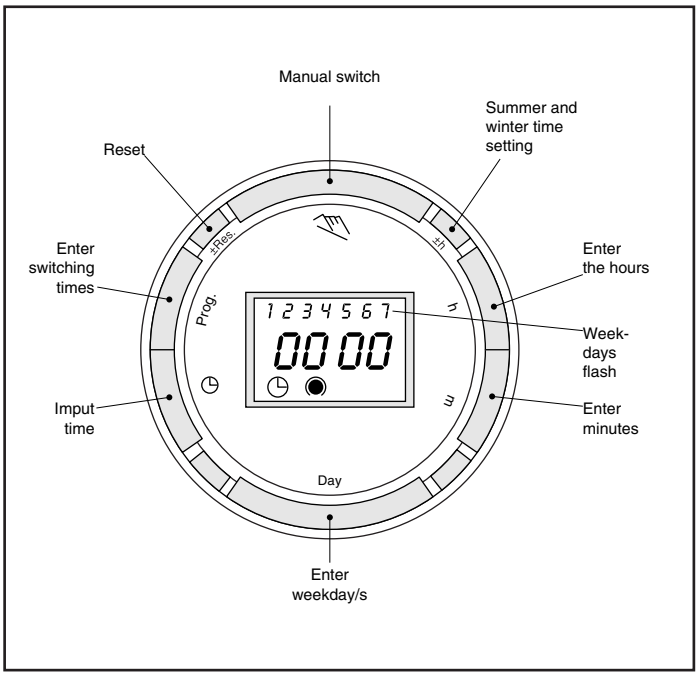
1. General layout
The mechanical clock covers a 24 hour period. Each tappet represents 15 minutes **A** (Fig. 2.29). An override switch is located on the clock **B** (Fig 2.29).

2. To set the time
To set the time of day, grasp the outer edge of the dial and turn slowly clockwise until the correct time is lined up with the arrow **C** (Fig. 2.29).

3. To Set the "On" and "Off" times
The clock uses a 24hours system. e.g. 8 = 8.00 am and 18 = 6.00 pm. "ON" periods are set by sliding all tappets between the "ON" time and the "OFF" time to the outer edge of the dial.The tappets remaining at the centre of the dial are the "OFF" periods.

4. For operation
Put the selector switch **B** to the ◷ symbol to control the central heating by the clock. Put the switch **B** to «**I**» to select permanent operation or to «**0**» to turn the central heating off permanently.

2.16. SETTING THE DIGITALTIME CLOCK



Operating the time switch
The steps marked with the symbol " ► " are necessary to carry out a switching program.

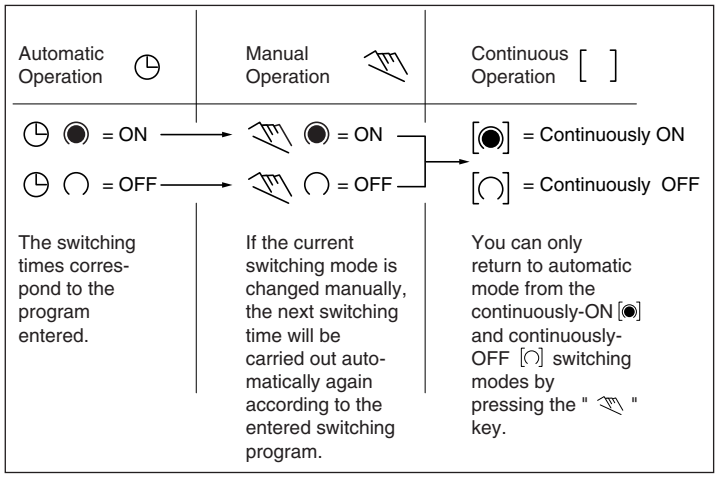
Preparing for Operation

► Activate the "Res" switch (=RESET) to reset the time switch to its default setting (activate using a pencil or similar pointed instrument). Do this:
- every time you wish to "reset" the time switch
- to erase all switching times and the current time of day.

After approximately two seconds the following display appears: "– – : – –".

► **Enter current time and weekday**
- Keep the "◷" key pressed down

During the summer time period press the +/- 1h key once.
Enter the hour using the "h" key
Enter the minutes using the "m" key
Enter the day using the "Day" key
1 = "Monday".....7 = Sunday
- Release the "◷" key.



Entering the switching times

You have 20 memory locations available. Each switching time takes up one memory location.

Keep pressing the “Prog” key until a free memory location is shown in the display “– –:– –”.

Programme ON or OFF with the “ ” key:

“ ”= OFF; “ ”= ON

Enter the hour using “h”

Enter the minutes using “m”

If a switching command is to be carried out every day (1 2 3 4 5 6 7) then store using the “ ” key, otherwise select the day(s) it is to be carried out by using the “Day” key.

When the day selection is left blank, the programmed switching instruction operates at the same time every day

1 2 3 4 5 6 = Monday – Saturday

1 2 3 4 5 = Monday – Friday

6 7 =Saturday – Sunday

Selection of single days: 1 = Mon. ..... 2 =Tues.

Save the switching time with the “ ” key.

The time switch enters the automatic operating mode and displays the current time of day.

Begin any further entry of a switching time with the “Prog” switch. If your entry is incomplete, the segments not yet selected will blink in the display. After programming is completed, and you return the time clock to the current time display with the “ ” key, the time clock will not activate any switching instruction required for the current time. You may need to manually select the desired switching state with the “ ” key. Thereafter, as the unit encounters further switching instructions in the memory in real time, it will correctly activate all subsequent switching instructions.

Manual Override Switch “ ”

With the “ ” you can change the current setting at any time. The switching program already entered is not altered.

Reading the programmed switching times

Pressing the “Prog” key displays the programmed switching times until the first free memory location appears in the display “– – : – –”.

If you now press the “Prog” key once again, the number of free memory locations will be displayed, e.g. “**18**”. If all memory locations are occupied, the display “**00**” appears.

Changing the programmed switching times

Press the “Prog” key repeatedly until the switching time you want to change is displayed. You can now enter the new data. See point “**Entering the switching times**”.

Notes on storing switching times:

If you end your entry of the switching times by pressing the “Prog” key, then the switching time you have entered will be stored and the next memory location displayed.

In addition, a complete switching command is stored **automatically** after around 90 seconds provided **no other** key is pressed. The time switch then enters the automatic operating mode and displays the current time again.

Deleting individual switching times

Press the “Prog” key repeatedly until the switching time you wish to delete is shown in the display. Then set to “– –” using the “h” or “m” key and keep the “ ” key pressed down for around 3 seconds. The switching time is now erased and the current time is displayed.

AM / PM time display

If you press the “+/-1h” and “h” keys at the same time, the time display switches into the AM/PM mode.

2.17 ELECTRICAL/SYSTEM DIAGRAMS

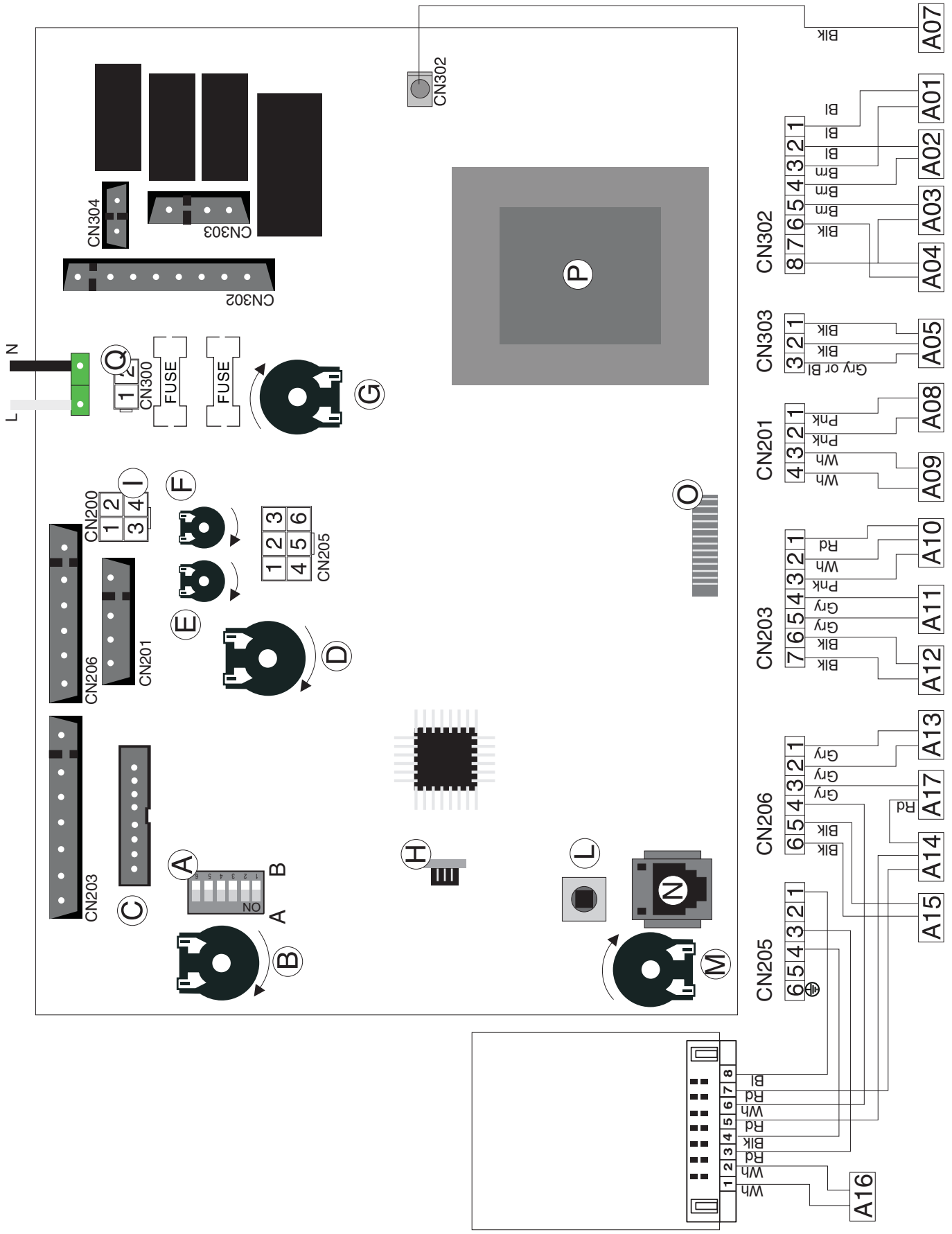
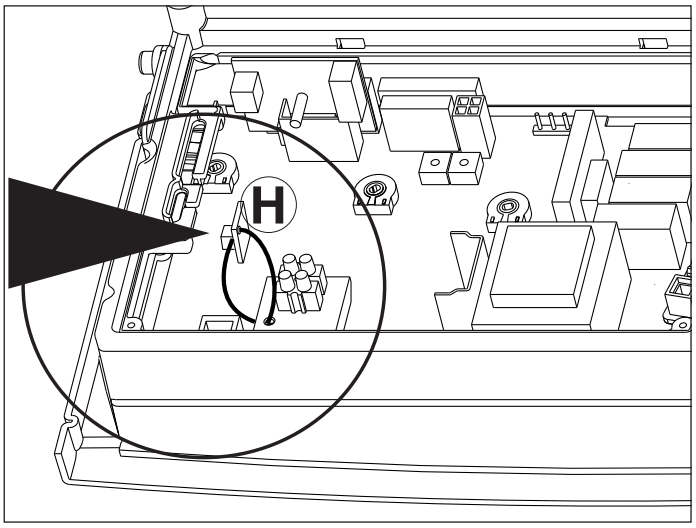


FIG. 2.30

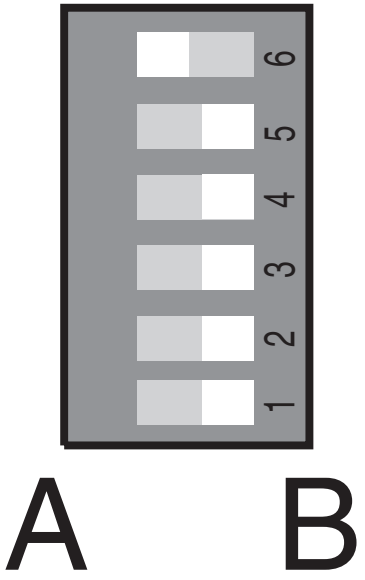
A - Dip Switches
B - Summer/Winter Switch - Central Heating Temperature Regulation
C - Connector for Remote Control (Climate Manager)
D - Domestic Hot Water Temperature Regulation
E - Soft-light Regulation
F - Maximum Central Heating Temperature Regulation
G - ON/OFF Selector
H - EEPROM
I - Time Clock Connector
L - Release Push Button
M - Economy/Comfort Selector
N - EASY Teleservice (optional) P.C.B. Section
O - Display P.C.B. Connector
P - Transformer
Q- Modem Connection (optional - EASY Teleservice)

A01 - Circulation Pump
A02 - Fan
A03 - Spark Generator Power Supply
A04 - Gas Valve Power Supply
A05 - Motorised Valve
A07 - Flame Sensor
A08 - Central Heating Flow NTC
A09 - Domestic Hot Water NTC
A10 - Domestic Hot Water Flow Switch
A11 - Low Water Pressure Switch
A12 - Modulator
A13 - Air Pressure Switch
A14 - Overheat Thermostat
A15 - External Timer/Room Thermostat
A16 - Condensate Sensor
A17 - Fume Sensor

COLOURS:
Gy - Grey
Wh - White
Rd - Red
Br - Brown
Bl - Blue
Bk - Black
Pk - Pink



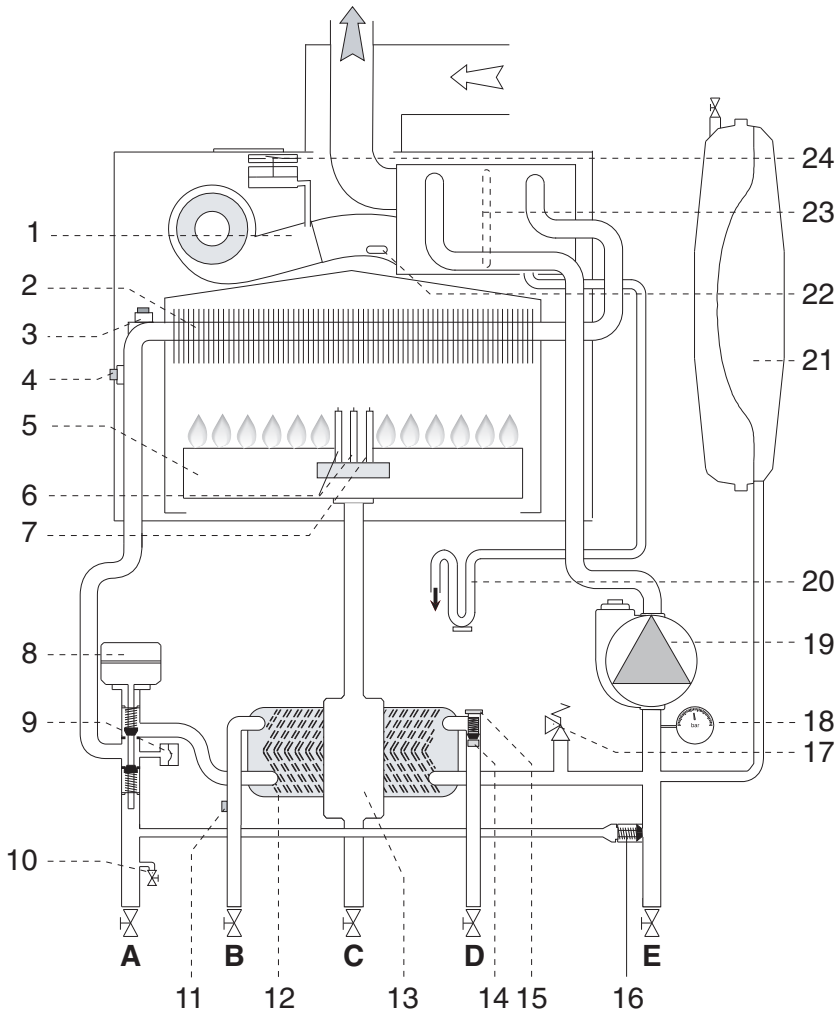
ATTENTION
IN CASE OF REPLACEMENT OF THE PCB DISCONNECT THE EEPROM (LEAVE IT ATTACHED TO THE CONTROL PANEL) AND RECONNECT TO THE NEW PCB.



A - Dip Switch:
1 - Do Not Use (jumper is factory set in position B)
2 - Anti-Cycling Device Adjustment for Heating
Position A = 0 mins Position B = 2 mins
3 - Do Not Use (jumper is factory set in position B)
4 - Do Not Use (jumper is factory set in position B)
5 - Fan over-run selector (after D.H.W. is drawn)
Position A = OFF Position B = ON
6 - Do Not Use (jumper is factory set in position A)

2.18 Water Circuit Diagram

Fig. 2.28



Legend:

1. Fan
2. Heat Exchanger
3. Overheat Thermostat
4. Central Heating Flow NTC
5. Burner
6. Detection Electrode
7. Ignition Electrodes
8. Diverter Valve
9. Low Water Pressure Switch
10. Drain Valve
11. Domestic Hot Water Temperature NTC
12. Secondary Heat Exchanger
13. Gas Valve
14. D.H.W. Flow Switch
15. D.H.W. Inlet Filter
16. Automatic By-pass
17. Safety Valve
18. Pressure Gauge
19. Circulation Pump with Automatic Air Release Valve
20. Condensate Trap
21. Expansion Vessel
22. Condensate Sensor
23. Latent Heat Collector
24. Air Pressure Switch

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

3. COMMISSIONING

3.1 INITIAL PREPARATION

MTS (GB) Limited support the benchmark initiative. In Sections 11 and 12 of this manual you will find the benchmark commissioning checklist (page 78) and the service interval record (Page 79), It is important the benchmark commissioning checklist is completed in the presence of your customer, they are shown how to use it, and it is signed by them. Please instruct your customer that they must have this manual with them whenever they contact a service engineer or us.

Preliminary electrical system checks to ensure electrical safety must be carried out by a competent person i.e. polarity, earth continuity, resistance to earth and short circuit.

FILLING THE HEATING SYSTEM:

Lower the control panel and remove the case panels (see **SECTION 2.12** for further information).
Open the central heating flow and return cocks supplied with the connection kit.
Unscrew the cap on the automatic air release valve one full turn and leave open permanently.
Close all air release valves on the central heating system.
Gradually open valve(s) at the filling point (filling-loop) connection to the central heating system until water is heard to flow, do not open fully.
Open each air release tap starting with the lowest point and close them only when clear water, free of air, is visible.
Purge the air from the pump by unscrewing the pump plug anticlockwise, also manually rotate the pump shaft in the direction indicated by the pump label to ensure the pump is free.
Refit the pump plug.
Continue filling the system until at least 1.5 bar registers on the pressure gauge.
Inspect the system for water soundness and remedy any leaks discovered.

FILLING OF THE D.H.W. SYSTEM:

Close all hot water draw-off taps.
Open the cold water inlet cock supplied with the connection kit.
Open slowly each draw-off tap and close them only when clear water, free of bubbles, is visible.

GAS SUPPLY:

Inspect the entire installation including the gas meter, test for tightness and purge the supply as described in BS 6891:1988.
Open the gas cock (supplied with the connection kit) to the appliance and check the gas connections on the appliance for leaks.

WATER TREATMENT

The detailed recommendations for water treatment are given in BS 7593:1992 (Treatment of water in domestic hot water central heating systems); the following notes are given for general guidance:

- If the boiler is installed in an existing system, any unsuitable additives must be removed;
- Under no circumstances should the boiler be fired before the system has been thoroughly flushed; the flushing procedure must be in line with BS7593:1992.
  Firstly fill the central heating system and boiler with the power off and flush through cold, fill the central heating system again, add a flushing detergent, we highly recommend the use of a flushing detergent appropriate for the metals used in the aluminium alloy circuit. These include (Fernox Superfloc, BetzDearborn Sentinel X300 or X400), whose function is to dissolve any foreign matter that may be in the system, and run the boiler on central heating until it reaches its operating temperature, flush the system as instructed by the manufacturer of the flushing detergent and refill the system with a suitable corrosion inhibitor such as Fernox

Copal MB-1, or BetzDeaborn Sentinel X100 is recommended.

NOTE: FAILURE TO CARRY OUT THE FLUSHING PROCEDURE WILL RESULT IN THE WARRANTY BECOMING VOID.

In hard water areas or where large quantities of water are in the system the treatment of the water to prevent premature scaling of the main heat exchanger is necessary.

The formation of scale strongly compromises the efficiency of the thermic exchange because small areas of scale cause a high increase of the temperature of the metallic walls and therefore add to the thermal stress of the heat exchanger.
Demineralised water is more aggressive so in this situation it is necessary to treat the water with an appropriate corrosion inhibitor.

- Any treatment of water by additives in the system for frost protection or for corrosion inhibition has to be absolutely suitable for all the metals used in the circuit including the aluminium alloys.

- If anti-freeze substances are to be used in the system, check carefully that they are compatible with the aluminium.
  In particular, DO NOT USE ordinary ETHYLENE GLYCOL, since it is corrosive in relation to aluminium and its alloy, as well as being toxic.
  MTS suggests the use of suitable anti-freeze products such as Fernox ALPHI 11, which will prevent rust and incrustation taking place.
  Periodically check the pH of the water/anti-freeze mixture of the boiler circuit and replace it when the amount measured is out of the range stipulated by the manufacturer (7 < pH < 8).
  DO NOT MIX DIFFERENT TYPES OF ANTI-FREEZE
- In under-floor systems, the use of plastic pipes without protection against penetration of oxygen through the walls can cause corrosion of the system's metal parts (metal piping, boiler, etc), through the formation of oxides and bacterial agents.
  To prevent this problem, it is necessary to use pipes with an "oxygen-proof barrier", in accordance with standards DIN 4726/4729. **If pipes of this kind are not used, keep the system separate by installing heat exchanger*s of those with a specific system water treatment.***

IMPORTANT
Failure to carry out the water treatment procedure will invalidate the appliance warranty

When the installation and filling are completed, flush the system while cold, refill, turn on the Central Heating system (**SECTION 3.2**) and run it until the temperature has reached the boiler operating temperature. The system must then be immediately flushed through. The flushing procedure must be in line with BS 7593:1992 code of practice for treatment of water in domestic hot water central heating systems.
During this operation, we highly recommend the use of a central heating flushing detergent (Fernox Superfloc or equivalent), whose function is to dissolve any foreign matter that may be in the system.
Substances different from these could create serious problems to the pump or other components.
The use of an inhibitor in the system such as Fernox MB-1 or equivalent is strongly recommended to prevent corrosion (*sludge*) damaging the boiler and system.
Failure to carry out this procedure may invalidate the appliance warranty.

3.2 INITIAL START-UP

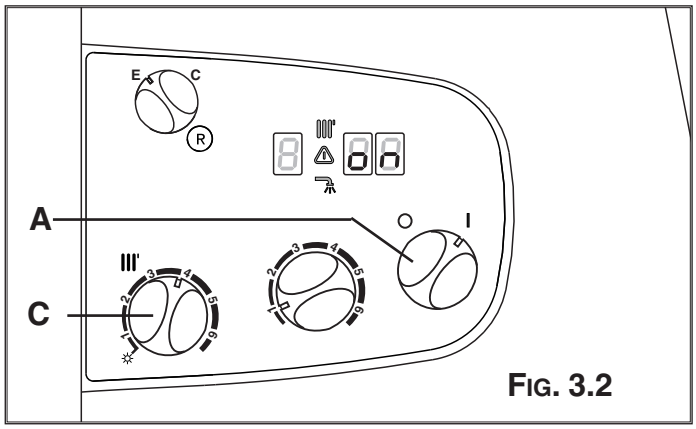
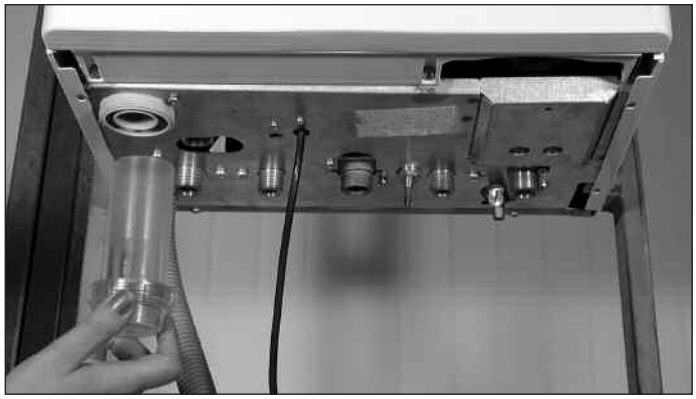


FIG. 3.2



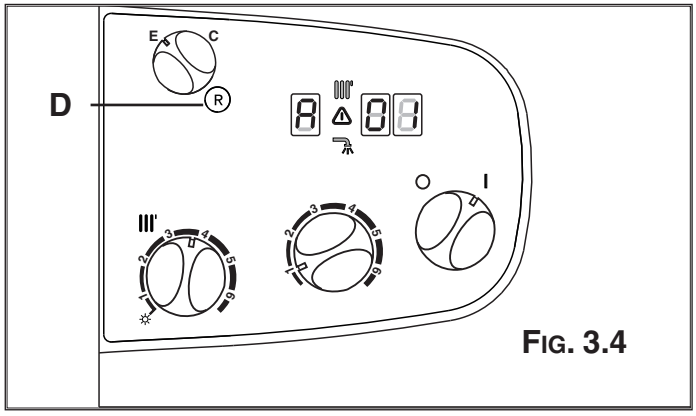


FIG. 3.4

THE CHECKS TO BE RUN BEFORE INITIAL START-UP ARE AS FOLLOWS:

1. Make sure that:
   - the screw on the automatic air valve has been loosened when the system is full;
   - If the water pressure in the system is below 1.5 bar, bring it up to the appropriate level;
   - Ensure that the gas cock is closed **(FIG. 3.1)**;
   - Make sure that the electrical connection has been made properly and that the earth wire is connected to an efficient earthing system;
   - Supply power to the boiler by turning the On/Off knob **"A"** (see **FIG. 3.2**) - on the display will appear "on". Turn the knob "C" to maximum and switch the time clock to constant.
     After 7 seconds, the boiler will signal a shutdown due to ignition failure. Leave the boiler as it is until all of the air has been bled from the system.
   - Loosen the cap on the head of the pump to eliminate any air pockets;
   - Repeat the procedure for bleeding the radiators of air;
   - Open the hot water taps for a brief period;
   - Check the system pressure and, if it has dropped, open the filling loop again to bring the pressure back up to 1.5 bar.
2. Make sure that all radiator valves are open;
3. Check the flue system for products of combustion.
4. **Fill the boiler condensate trap with water.**
   N.B. In the event of a prolonged period of system shutdown, the condensate trap should be filled before any renewed use. A shortage of water in the trap could possibly lead to fumes leaking into the air.

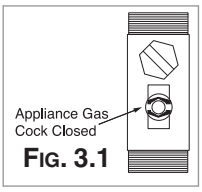


FIG. 3.1

3. Turn on the gas cock **(FIG. 3.3)** and check the seals on the connections with an approved soap solution and eliminate any leaks.
4. Press the reset button **"D"** (see **FIG. 3.4**) the boiler will re-attempt ignition. If the burner does not light the first time, wait 1 minute, purge the gas and repeat the procedure.
5. Run the boiler in Hot Water mode and bleed air from the system
6. Check the minimum and maximum burner pressure values; adjust if necessary using the values indicated in the table in **SECTION 4 (Page 31)**.

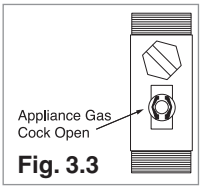
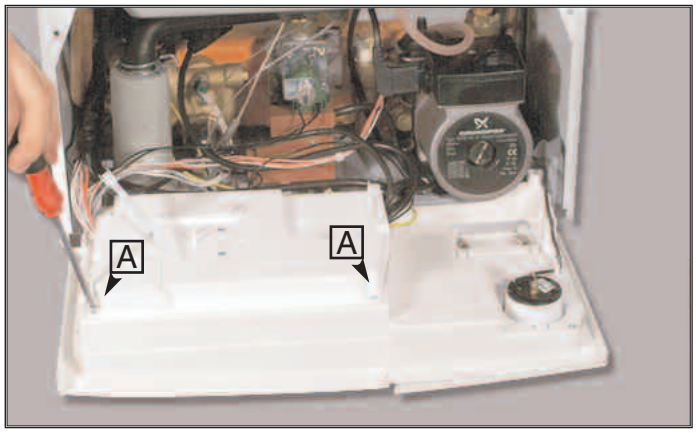


Fig. 3.3

3.3 Operational Adjustments

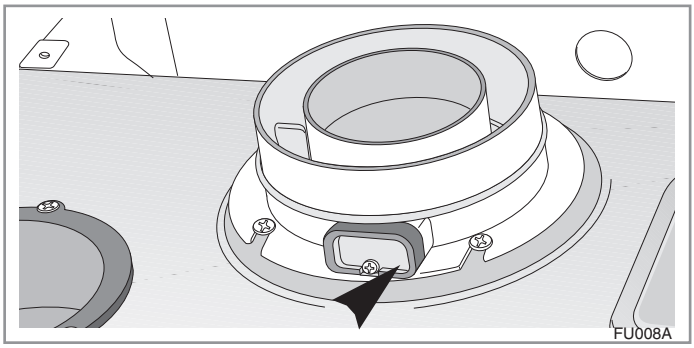


To access the areas in which adjustments are made, it is necessary to open the control panel, as indicated in **Section 2.12**, then remove the rear inspection cover by unscrewing the two screws **"A"**. Access is thereby provided to the P.C.B. and to the following components:

1. The power supply cable connector;
2. The fuses;
3. The soft-light potentiometer must be set to ensure correct ignition;
4. The maximum thermal heating power potentiometer adjustable by the minimum to maximum power (already calibrated in the factory to 70% of the maximum thermal power in Central Heating mode);
5. The dip switch for adjusting the ignition delay (anti-cycling) feature, which can be set from off to 2 minutes (set in the factory to off);
6. Fan/Pump Over-run (Electrical Diagram). When the jumper is set to position A the Fan and Pump over-run is activated. (The jumper is factory set in position B)
7. The time clock connector.

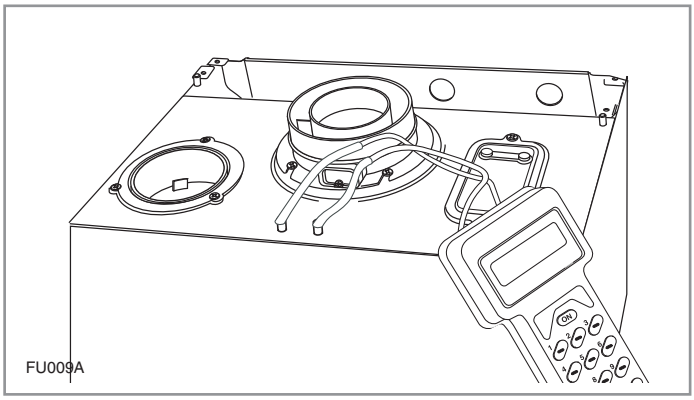
Note: **See page 22 for dip switch location.**

3.4 Combustion Analysis



The flue connector has two apertures, readings can be taken for the temperature of the combustion products and of the combustion air, as well as of the concentrations of O2 and CO2, etc.
To access these intakes it is necessary to unscrew the front screw and remove the metal plate with sealing gasket.
It is possible to activate the flue test mode (maximum output) by pressing and holding the RESET button **"D"** for 10 seconds, **"** 5C**"** will be shown on the display. The boiler will return to normal operation after 5 minutes. The boiler can be returned to normal operation sooner by switching the boiler off and on again.

3.5 Product of Combustion Discharge Monitoring



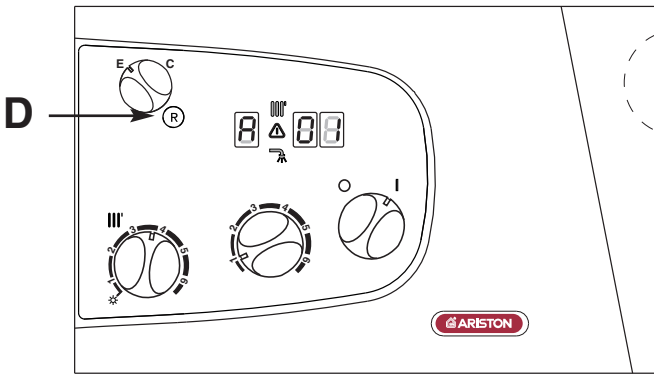
In the boiler, it is possible to monitor the correct operation of the flue exhaust/air intake, checking for a loss of general pressure in the system. Through the use of a differential manometer connected to the test points of the combustion chamber, it is possible to detect the DP of operation of the air pressure switch.
The value detected should not be less than 0,55 mbar under conditions of maximum thermal power in order for the boiler to function properly and without interruption.

3.6 Comfort Mode

The boiler allows the convenience level to be increased in the output of domestic hot water by means of the "COMFORT" function. This function keeps the secondary exchanger warm during the periods in which the boiler is inactive, thereby allowing the initial water drawn to be at a higher temperature.
The function may be activated by pressing turning the **COMFORT switch 'E'** on the control panel from E to C (see section 2.10).

3.7 BOILER SAFETY SYSTEMS

WARNING!
The boiler is still powered.



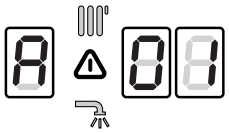
Important
If this shutdown occurs frequently, contact an authorised Service Centre for assistance. For safety reasons, the boiler will allow a **maximum of 5 reset operations to take place in 15 minutes** (pressing the RESET button).
If the shutdown is occasional or an isolated event, this is not necessarily a problem.

SAFETY SHUTDOWN **"E"**
In the event of a safety cut-off (displayed with the code shown in the table), the boiler will automatically try to reset itself and relight. Should this not be the case, contact an authorised Service Centre for assistance.

DISPLAY	CAUSE
E 02	Insufficient water pressure
E 04	Domestic hot water temperature probe in open circuit
E 05	Domestic hot water temperature probe short circuited
E 06	Heating flow temperature probe in open circuit
E 07	Heating flow temperature probe short circuited
E 08	Heating return temperature probe in open circuit
E 09	Heating return temperature probe short circuited
E 20	Flame detected with gas valve closed
E 21	Error in the electrical connection (live and neutral crossed)
E 33	The air pressure switch is closed before the ignition sequence
E 34	The air pressure switch does not close when the fan runs
E 99	More than 5 RESETS of the boiler in 15 minutes.

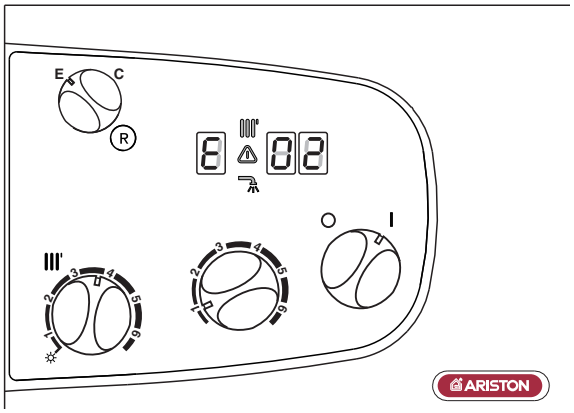
The boiler is protected from malfunctioning by means of internal checks by the P.C.B., which brings the boiler to a stop if necessary.

There are two types of shut-off:
- ***SHUTDOWN*** (A)
- ***SAFETY SHUTDOWN*** (E)



SHUTDOWN **"A"**
This type of appliance shutdown is called "non-volatile", and is indicated on the display by a number preceded by the letter (A) , and by the symbol ⚠ (G FIG. 2.20 Page 20), as illustrated in the table below:

DISPLAY	CAUSE
A 01	No flame after safety time (7 seconds)
A 03	The heating flow temperature exceeds 103°C during operation
A 77	Condensate Trap full of water Condensare sensor short circuited Condensate sensor in open circuit
A 97	Problem with the electronic monitoring
A 98	Problem with the electronic monitoring
A 99	Problem with the electronic monitoring



ANTI-FROST DEVICE:
The boiler is fitted with a device which, in the event that the water temperature falls below 3˚C, the burner ignites at the minimum power until the boiler reaches a temperature of approximately 33˚C. This device only operates if the boiler is functioning perfectly and:
- the system pressure is sufficient;
- the boiler is powered electrically;
- the gas is turned on.

PUMP / DIVERTER VALVE PROTECTION:
To prevent the pump and diverter valve from siezing the boiler will activate the pump for 20 seconds every 21 hours after it's last operation and activate the diverter valve once.

3.8 DRAINING THE SYSTEM

DRAINING THE HEATING SYSTEM
The heating system must be drained as follows:
- Turn off the boiler;
- Attach a hose pipe and open the drain valve;
- Drain the system at the lowest points (where present). When the heating system is unused for an extended period of time, it is recommended that you add antifreeze with an ethylene glycol base to the water in the heating pipe work and radiators if the ambient temperature drops below 0°C during the winter.
  This makes repeated draining of the entire system unnecessary.

DRAINING THE DOMESTIC HOT WATER SYSTEM
Whenever there is the danger of the temperature dropping below the freezing point, the domestic hot water system must be drained as follows:
- Turn off the general water valve for the household plumbing system;
- Turn on all the hot water taps;
- Empty the remaining water from the lowest points in the system (where present).

3.9 COMPLETION

For the Republic of Ireland it is necessary to complete a "Declaration of Conformity" to indicate compliance to I.S. 813. An example of this is given in the current edtion of I.S. 813. In addition it is necessary to complete the benchmark Commissioning Checklist.

3.10 OPERATIONAL CHECKS

1. The flue system must be visibly checked for soundness.

2. On Central Heating allow the system to warm up and manipulate the Central Heating temperature control knob, check the burner modulates up and down between the high and low settings;

3. Range rate the thermal power for Central Heating, as detailed in **SECTION 4.2** (page 36);

4. Run the Domestic Hot Water, manipulate the Domestic Hot Water temperature control knob to check the burner modulates up and down between the high and low settings and check the gas rate at the meter;

5. Set the Domestic Hot Water flow rate;

6. Balance the Central Heating system until all return temperatures are correct and equal;

7. Turn the ON/OFF button OFF, disconnect the gas pressure gauge, retighten screw test for sondness and relight boiler.

8. Re-examine Central Heating, Domestic Hot Water and Cold Water supplies for soundness.

9. Check the appearance of the gas flame to assess the adequacy of the combustion air supply.

10. If external controls have been disconnected, reconnect and test.

11. Refit boiler casing.

3.11 Instructing The End User

1. Hand over the copy of the End User Instructions supplied with the appliance, together with these instructions, and explain how to use the timeclock and room thermostat if fitted.

2. Show the End User how to switch the appliance off quickly, and indicate the position of the electric supply isolator.

3. Inform the End User of the location of all drains, isolating valves and air vents.

4. Explain how to turn the appliance off for both short and long periods and advise on the precautions necessary to prevent damage in the event that the appliance is inoperative when freezing conditions occur.

5. Finally advise the End User that, for continued safe and efficient operation, the appliance must be serviced by a competent person at least once a year.

4. GAS ADJUSTMENTS

TABLE A

CATEGORY II2H3+		Methane Gas G20	Liquid Butane Gas G30	Liquid Propane Gas G31
Lower Wobbe Index (15°C;1013mbar)	MJ/m³h	45.67	80.58	80.58
Nominal Delivery Pressure	mbar	20	29	37
Minimum Delivery Pressure	mbar	20	28	36
microGENUS HE 24 MFFI				
Main Burner: n. 14 jets (ø)	mm	1.30	0.70	0.70
Consumption (15°C; 1013mbar) max - min	m³/h	2.54 - 1.16	---	---
Consumption (15°C; 1013mbar) max - min	Kg/h	---	1.89 - 0.87	2.86 - 0.85
Gas Burner Pressure max - min	mbar	7.5 - 1.7	29.0 - 5.5	35.6 - 6.8
microGENUS HE 28 MFFI				
Main Burner: n. 14 jets (ø)	mm	1.30	0.70	0.70
Consumption (15°C; 1013mbar) max - min	m³/h	2.96 - 1.27	---	---
Consumption (15°C; 1013mbar) max - min	Kg/h	---	2.21 - 0.95	2.17 - 0.93
Gas Burner Pressure max - min	mbar	9.5 - 1.8	27.5 - 5.4	36.0 - 7.1
microGENUS HE 32 MFFI				
Main Burner: n. 14 jets (ø)	mm	1.30	0.70	0.70
Consumption (15°C; 1013mbar) max - min	m³/h	3.33 - 1.27	---	---
Consumption (15°C; 1013mbar) max - min	Kg/h	---	2.48 - 0.95	2.45 - 0.93
Gas Burner Pressure max - min	mbar	12.0 - 1.8	28.0 - 5.4	36.0 - 7.0

4.1 CHANGING THE TYPE OF GAS

The boiler can be converted to use either methane (natural) gas (G20) or L.P.G. (G30 - G31) by an Authorised Service Centre.

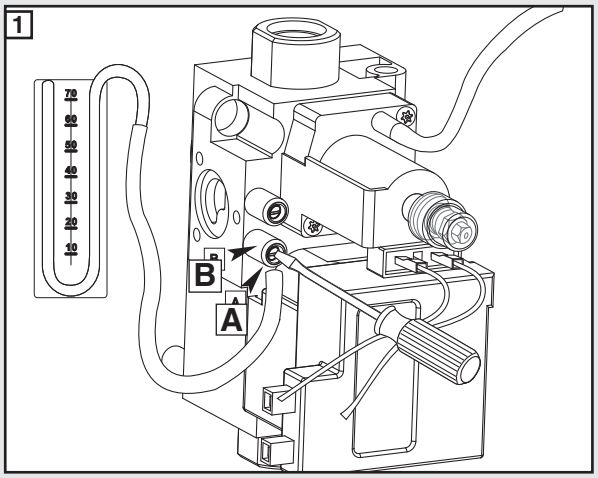
The operations that must be performed are the following:

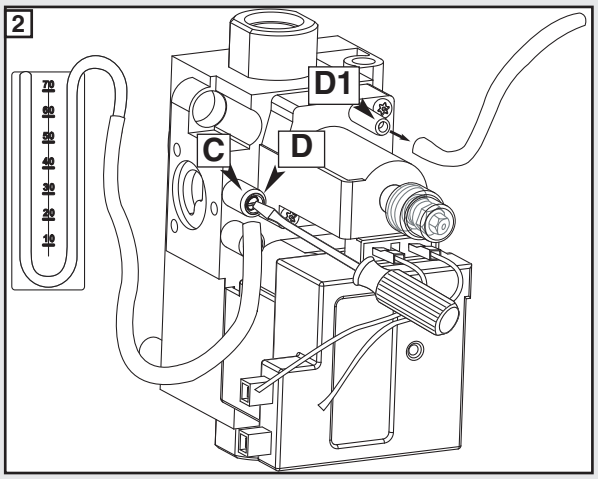
1. Replace the jets on the main burner **(see Table A)**;
2. Adjust the maximum and minimum thermal capacity values for the boiler **(see Table A and Section 4.2 Adjusting the Gas Pressures)**;
3. Adjust the maximum thermal power setting **(see tables in section 4.3 and FIG. 4.1** page 35);
4. Adjust the soft-light feature **(see Table A for recommended pressure and Fig. 4.1** see page 35);
5. Adjust the ignition delay feature for the heating system by adjusting the Jumper as indicated in Section 2.16 **(FIG. 2.30).** It can be turned on or off.

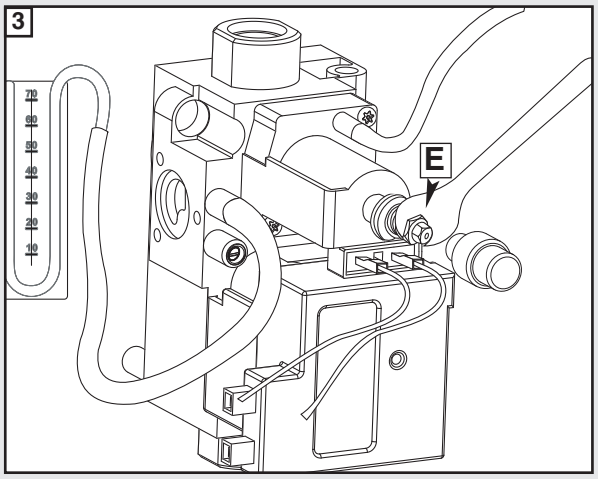
SOFT LIGHT PRESSURES

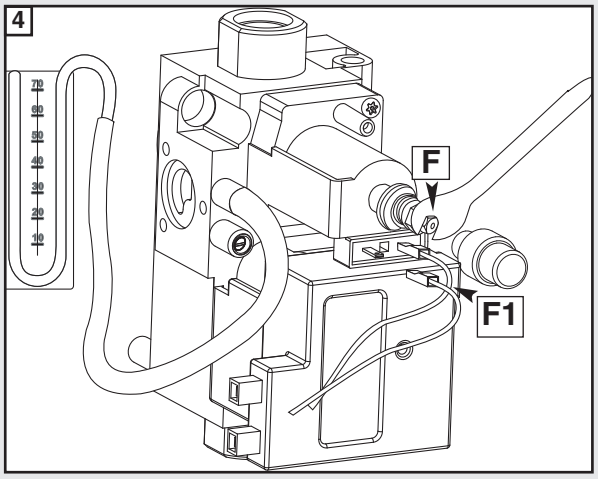
CATEGORY II2H3+	Methane Gas G20	Liquid Butane Gas G30	Liquid Propane Gas G31
Soft-light Pressure (mbar)			
24 kW Model	5.0	12.0	12.0
28 kW Model	5.5	12.0	12.0
32 kW Model	5.5	12.0	12.0

4.2 Adjusting the Gas Pressures









Setting the minimum and the maximum power of the boiler

1. Check that the supply pressure and dynamic working pressure to the gas valve is a minimum of 20 mbar for natural gas.

2. To do this, loosen the screw **"A"**.
   Fit the pipe of the pressure gauge to the inlet pressure connection of the gas valve **"B"** and check for the correct standing pressure, then operate the appliance and check for the correct working pressure.
   When you have completed this operation, replace the screw **"A"** securely into its housing to seal off the gas (check for tightness).

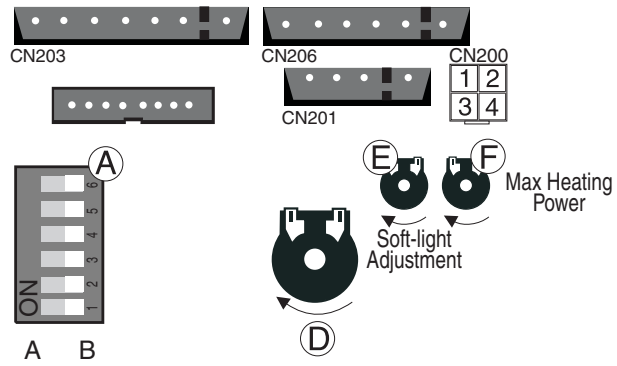
3. To check the pressure supplied by the gas valve to the burner, loosen the screw **"C"**. Fit the pipe of the pressure gauge to the pressure outlet test point of the gas valve **"D"**.
   Disconnect the compensation pipe **"D1"** either from the gas valve or from the sealed chamber.

4. Turn the On/Off knob to "ON" position -*green light*- and ensure that the hot water temperature control knob is set to maximum.
   Turn on the boiler by running a hot water tap.
   Adjust the 10mm nut **"E"** on the modureg to set the maximum gas pressure, turn the nut clockwise to increase and anti clockwise to decrease the pressure until the required pressure is achieved (see **Table A** Page 35).

5. To set the minimum power, disconnect a supply terminal **"F1"** from the modureg and adjust screw **"F"** (ensure that the 10mm nut is held in position). Turn the screw clockwise to increase the pressure and anti-clockwise to decrease the pressure (displayed on the pressure gauge) corresponding to the minimum power (see **Table A** Page 35).

6. When you have completed the above operations, turn off the hot water tap, reconnect the supply terminal to the modureg on the gas valve, reconnect the compensation pipe and replace the cap on the screw of the modureg.

IMPORTANT!
Whenever you disassemble and reassemble the gas connections, always check for leaks using a leak detection fluid.



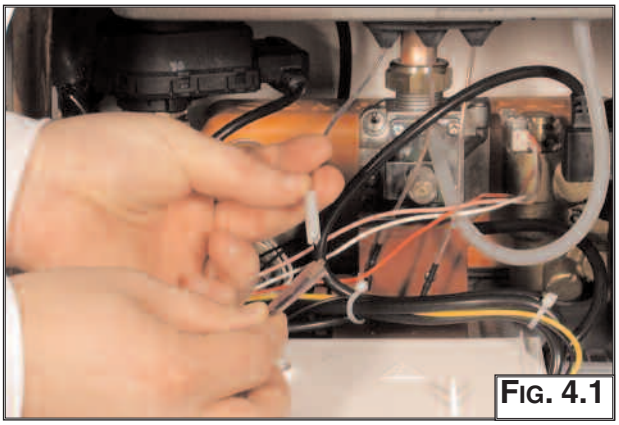


FIG. 4.1

Setting the maximum heating circuit power

1. To set the maximum heating circuit power, turn the On/Off knob to the “ON” position and set the time clock and any external controls to the “ON” position. Turn the knob of the heating thermostat clockwise to maximum.

2. Remove the inspection panel of the P.C.B. and fit a small cross-head screwdriver in to the right hand potentiometer.
   Turn clockwise to increase the pressure or anti-clockwise to reduce the pressure. Adjust the setting to the required heating pressure value (displayed on the pressure gauge), as indicated in **Table B** shown on Page 38 .

3. Turn off the boiler by placing the main switch to the "OFF" position.

Setting the pressure for soft-light ignition.

1. Disconnect the detection electrode connection close to the P.C.B. **(FIG. 4.1)**;

2. Start the boiler and during the ignition sequence adjust the left hand potentiometer until the gas pressure reads the required gas pressure **(see the table on page 38 and 39)**;

3. Once the gas pressure is set turn off the boiler and re-connect the detection electrode to the P.C.B.
   NB.: It may be necessary to reset the flame failure reset a number of times during this operation;

4. Remove the pipe from the test point and tighten the screw “**C**” and test for tightness;

5. Carefully check the pressure test points for gas leaks (both inlet and outlet).

microGENUS HE 24 MFFI

NATURAL GAS (G20)							TABLE B
kW	10.4	12	13	15	19	21	23,3
mbar	2.0	2.1	3.1	4.2	5.4	6.9	8.5
LPG (G30)							
kW	10.4	12	13	15	19	21	23,3
mbar	5.5	7.3	8.6	12.0	19.3	23.5	29.0
LPG (G31)							
kW	10.4	12	13	15	19	21	23,3
mbar	7.7	10.2	12.0	15.3	24.6	30.0	37.0

microGENUS HE 28 MFFI

NATURAL GAS (G20)							
kW	11.4	15	16	19	23	25	27
mbar	1.8	3.1	3.6	4.7	6.9	8.2	9.5
LPG (G30)							
kW	11.4	15	16	19	23	25	27
mbar	5.4	9.4	10.7	13.7	20.0	23.6	27.5
LPG (G31)							
kW	11.4	15	16	19	23	25	27
mbar	7.1	12.4	14.1	17.9	26.2	30.9	36.0

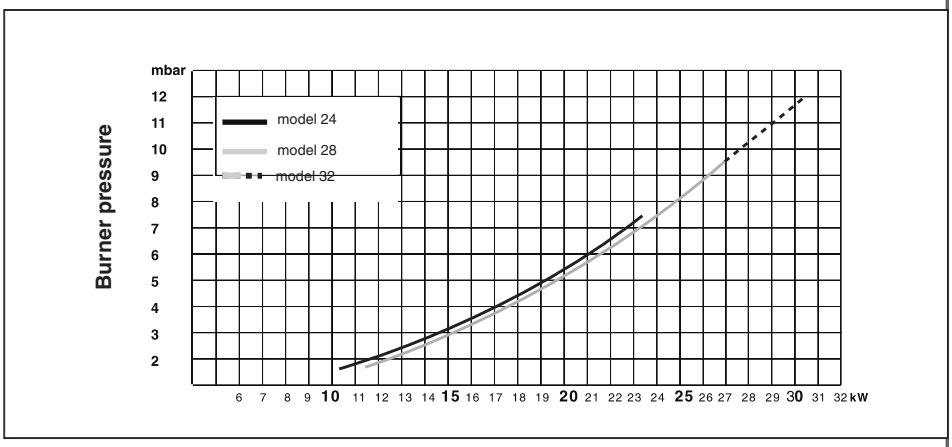
microGENUS HE 32 MFFI

NATURAL GAS (G20)							
kW	11.3	12	15	20	24	28	30.5
mbar	1.8	2.0	3.2	5.2	7.4	10.1	12.0
LPG (G30)							
kW	11.3	12	15	20	24	28	30.5
mbar	5.4	6.1	9.5	12.1	17.4	23.7	28.0
LPG (G31)							
kW	11.3	12	15	20	24	28	30.5
mbar	7.0	7.9	12.3	15.5	22.3	30.4	36.0

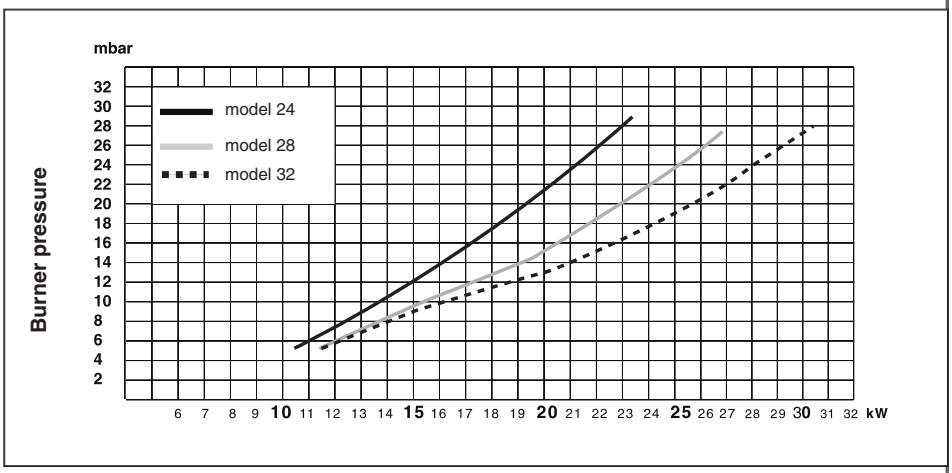
NOTE: THIS TABLE CAN BE USED IN CONJUNCTION WITH THE GRAPHS ON PAGE 39.

FIG. 4.1

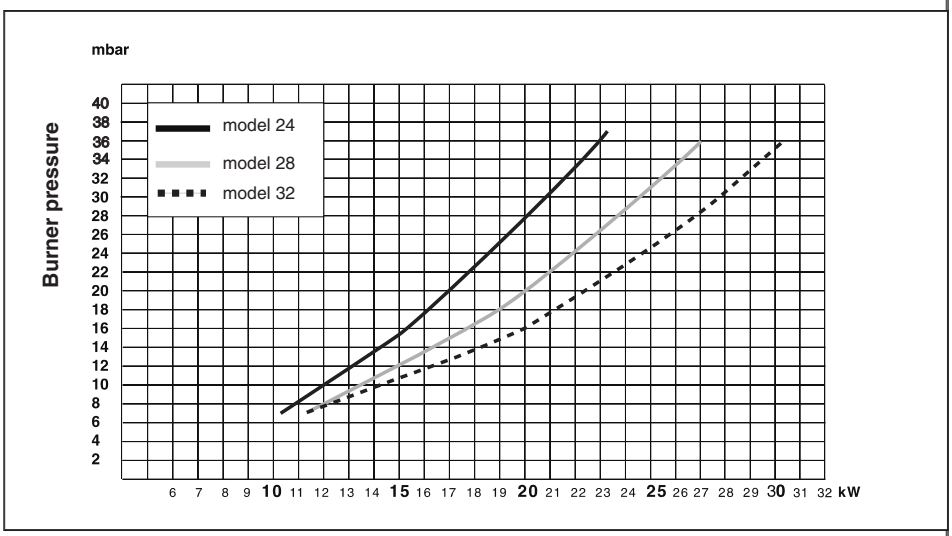
Regulating the heating power for natural gas (G20)



Regulating the heating power for butane gas (G30)



Regulating the heating power for propane gas (G31)



5. MAINTENANCE

It is recommended that the following inspections be carried out on the boiler at least once a year:

1 - Check the seals for the water connections; replace any faulty seals;
2 - Check the gas seals; replace any faulty gas seals;
3 - Visual check of the entire unit;
4 - Visual check of the combustion process or analysis of combustion by-products (see **SECTION 3.4**) and cleaning of the burner if needed;
5 - If necessary, dismantling and cleaning of the combustion chamber;
6 - If necessary, dismantling and cleaning of the burner jets;
7 - Visual check of the primary heat exchanger:
- check for overheating in the blade assembly;
- clean the exhaust fan if needed;
8 - Adjustment of the gas pressure, gas rate and soft-light, partial load and full load;
9 - Check of the heating safety systems:
- safety device for maximum temperature (overheat thermostat);
- safety device for maximum pressure (safety valve);
10- Check of the gas safety systems:
- safety device for lack of gas or flame ionisation (detection electrode);
11- Check of the electrical connection (ensure it complies with the instructions in the manual);
12- Check of Domestic Hot Water production efficiency (flow rate and temperature);
13- General check of the combustion by-products of the discharge/ventilation system
14- Check of the general performance of the unit.

6. SERVICING INSTRUCTIONS

To ensure efficient safe operation, it is recommended that the boiler is serviced annually by a competent person.

Before starting any servicing work, ensure both the gas and electrical supplies to the boiler are isolated and the boiler is cool.
Before and after servicing, a combustion analysis should be made via the flue sampling point (please refer to **SECTION 3.4** for further details).

After servicing, preliminary electrical system checks must be carried out to ensure electrical safety (i.e. polarity, earth continuity, resistance to earth and short circuit).

6.1 REPLACEMENT OF PARTS

The life of individual components vary and they will need servicing or replacing as and when faults develop.
The fault finding sequence chart in **SECTION 7** will help to locate which component is the cause of any malfunction, and instructions for removal, inspection and replacement of the individual parts are given in the following pages.

6.2 TO GAIN GENERAL ACCESS

All testing and maintenance operations on the boiler require the control panel to be lowered. This will also require the removal of the casing.

6.2.1 Removing the front panel

1. Loosen the fastening screws “A” of the control panel located on the lower part of the panel itself. (FIG. 6.1);

FIG. 6.1

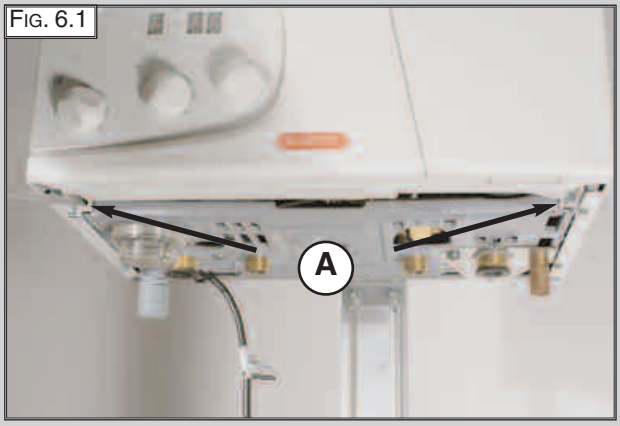
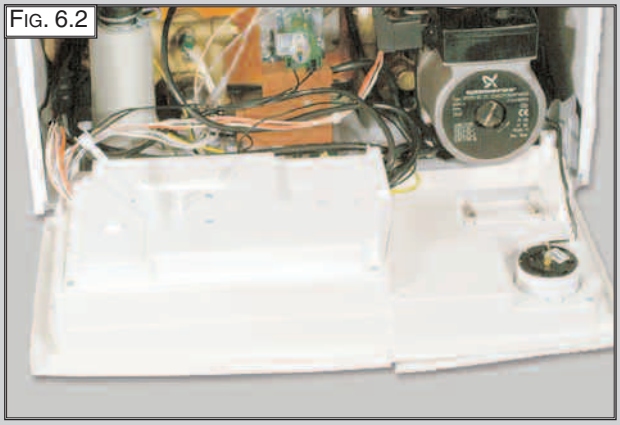
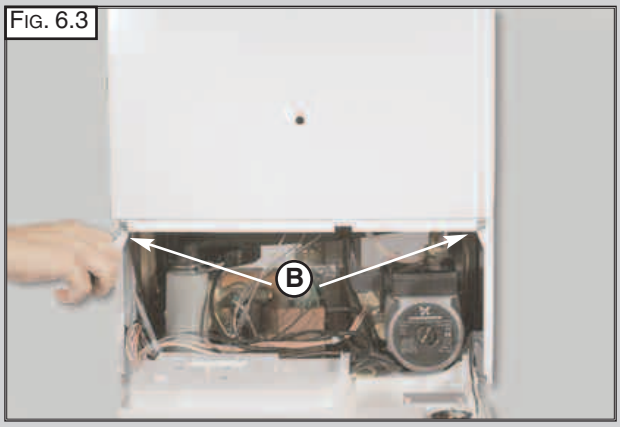


FIG. 6.2



2. The control rotates on two lateral hinges; the panel stays in a horizontal position, which allows access to the inner parts of the boiler (FIG. 6.2);
3. Remove the screws “B” from the front panel bottom lip (FIG. 6.3);
4. Lift the front panel up and forward from the raised screws at the the top of the casing (FIG. 6.4).

FIG. 6.3



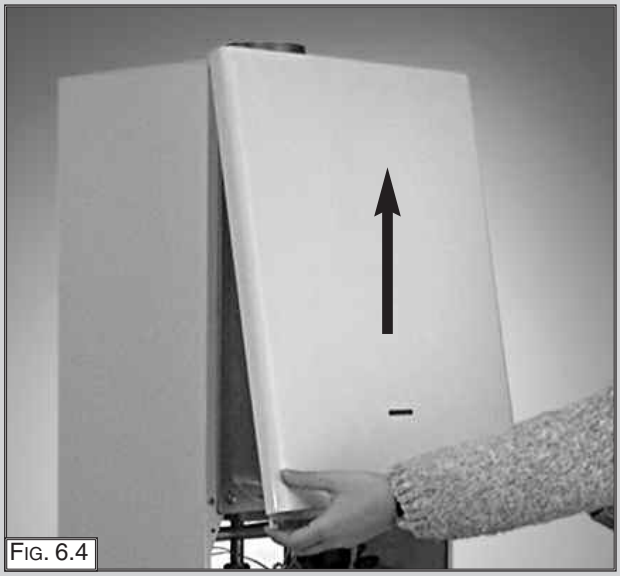


FIG. 6.4

6.2.2 Removing the sealed chamber front cover

1. Remove the screws “C” (FIG. 6.5);
2. Lift the sealed chamber front cover from the locating pins (FIG. 6.6).

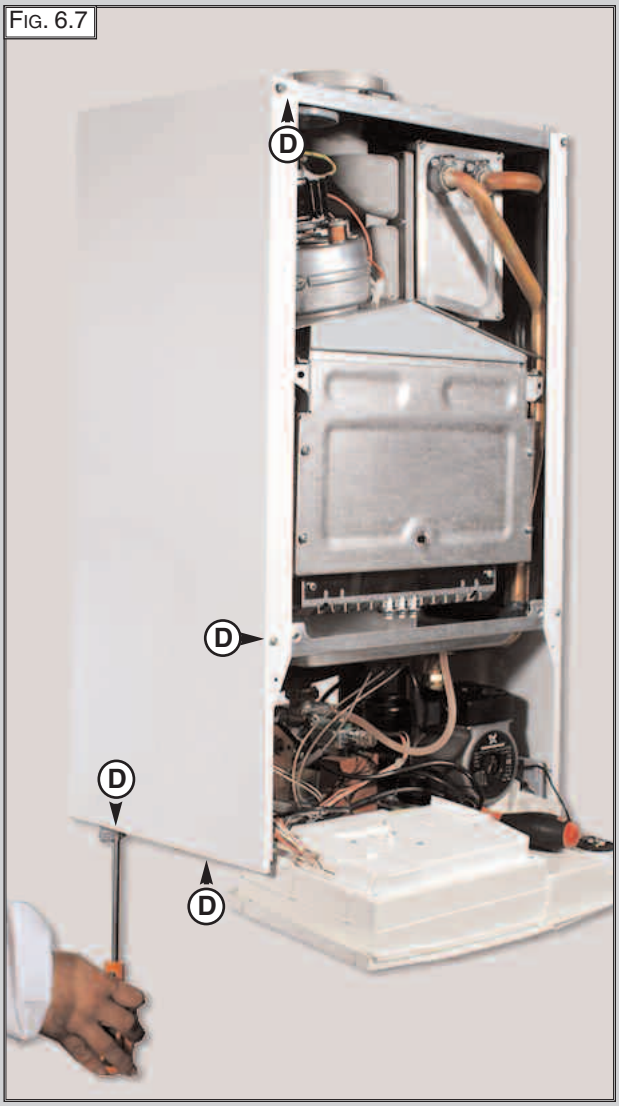
FIG. 6.5


FIG. 6.6

6.2.3 Removing the side panels

1. Remove the four screws “D” for each side panel (FIG.6.7);
2. Pull the panel away from the boiler at the base, then lift the panel up and remove from the boiler.

FIG. 6.7

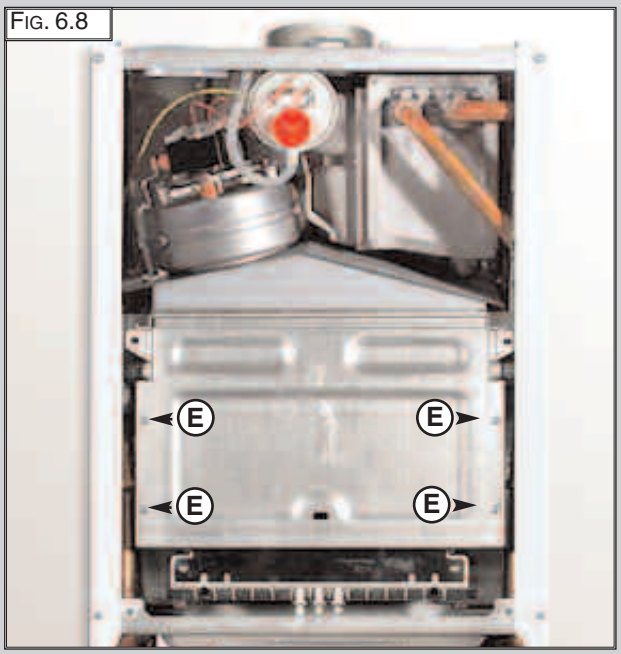


6.3 Access to the Combustion Chamber

6.3.1 Removing the combustion cover

1. Remove the screws “E” (Fig. 6.8);
2. Lift off the combustion cover.

Fig. 6.8



6.3.2 Removing the burner and jets

1. Remove the screws “F” from the burner (Fig. 6.9);
2. Remove the burner (Fig. 6.10);
3. Disconnect the electrodes (*see* **section 6.3.3**);
4. Remove the jets using a No. 7 socket spanner;
5. Replace in reverse order.

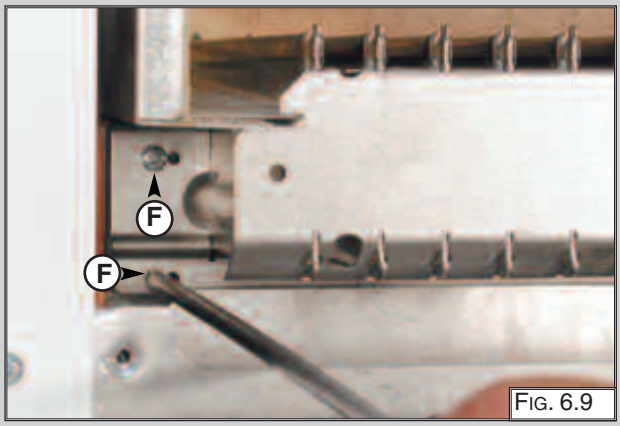


Fig. 6.9

Fig. 6.10

6.3.3 Removing the electrodes

Before carrying out this procedure, unscrew and slide the burner forward (see previous section).
1. Remove rubber gasket “G” (Fig. 6.11);
2. To remove the detection electrode disconnect the cable at its connection point close to the P.C.B. (Fig. 6.12);
3. Remove screw “H” (Fig. 6.13);
4. Gently slide the electrode downward (Fig. 6.14).

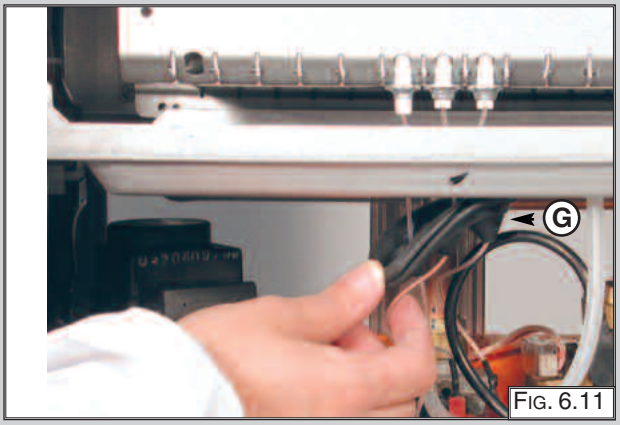


Fig. 6.11

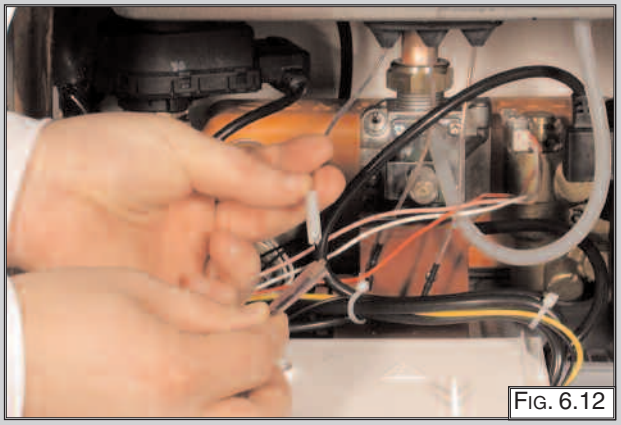
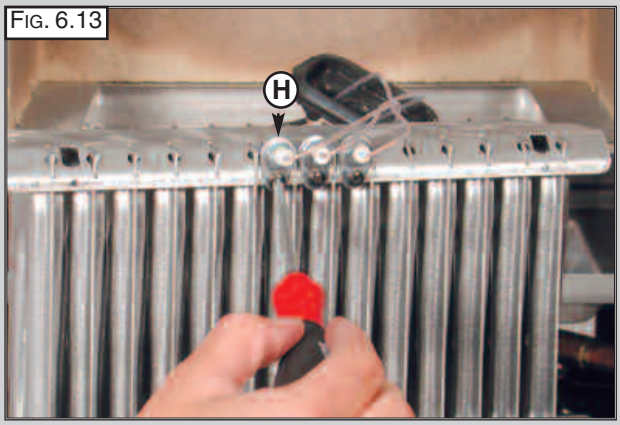


Fig. 6.12

FIG. 6.13



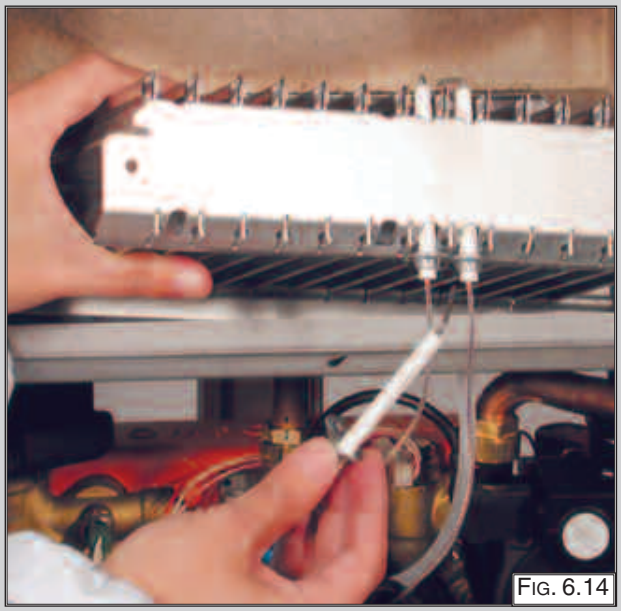


FIG. 6.14

To replace, repeat the steps in reverse order, paying particular attention to the following:

a - Centre the electrode in the positioning hole carefully, otherwise the electrode may break;

b - Ensure that the left hand and right hand electrodes are located the correct way round (facing each other), to give the correct spark gap;

c - Check that the cables have been connected correctly;

d - Check that the rubber gasket seals the cable/ electrode connection point completely.

6.3.4 Removing the main heat exchanger

1. Drain the boiler of water;
2. Remove the side panels (see 6.2.3)
3. Remove the overheat thermostat sensor “H” (FIG. 6.15);
4. Remove the clips “I” (FIG. 6.15);
5. Release the connection nut “J” (FIG. 6.16);
6. Release the connection nut “K” (FIG. 6.17);
7. Pull down the pipe (FIG. 6.18);
4. Pull it straight out (FIG. 6.19).

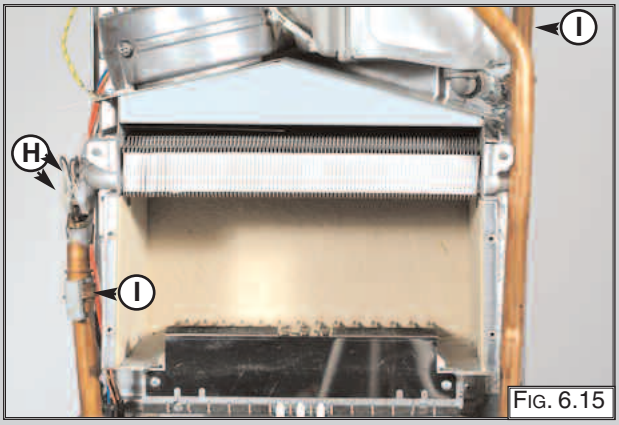


FIG. 6.15

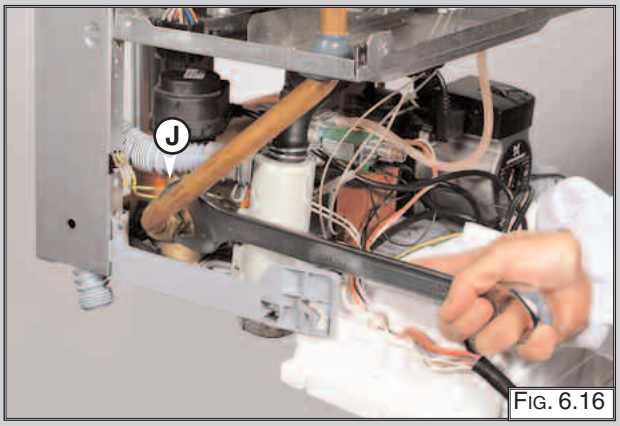


FIG. 6.16

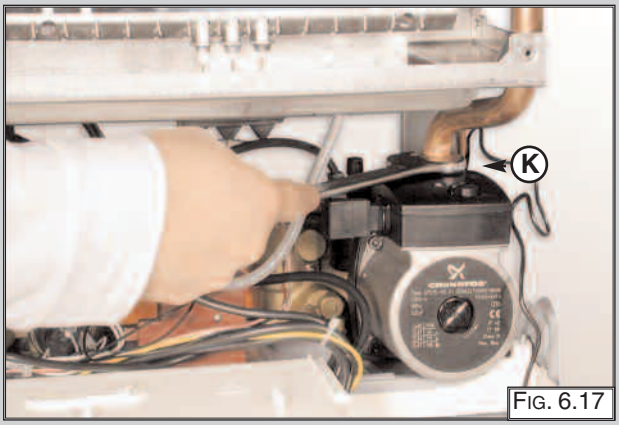


FIG. 6.17

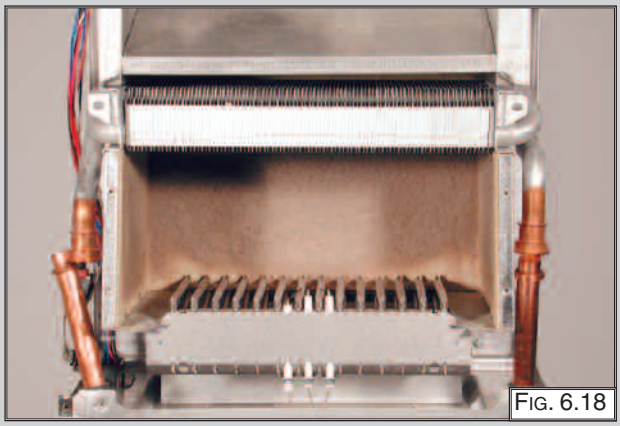


FIG. 6.18

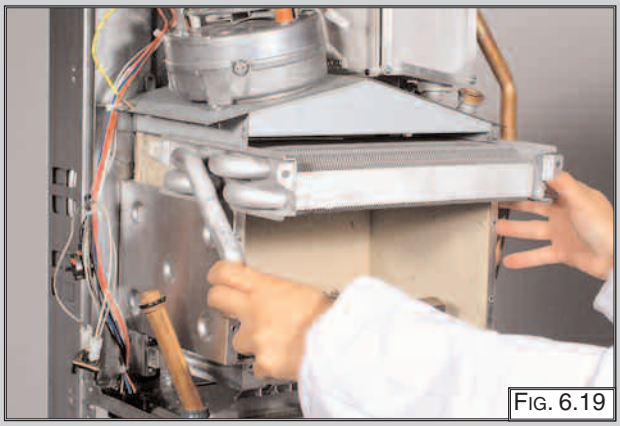


FIG. 6.19

6.3.5 Removing the air pressure switch

1. Disconnect the electrical connections “L” and silicone pipes “M” from their connection points (FIG. 6.20);
2. Remove screws “N” on the top of the sealed chamber (FIG. 6.21);
3. Lift out the air pressure switch;
4. Unscrew the two screws “O” to remove the switch from the plate (FIG. 6.22 - 6.23);
5. *Reassemble in reverse order.*

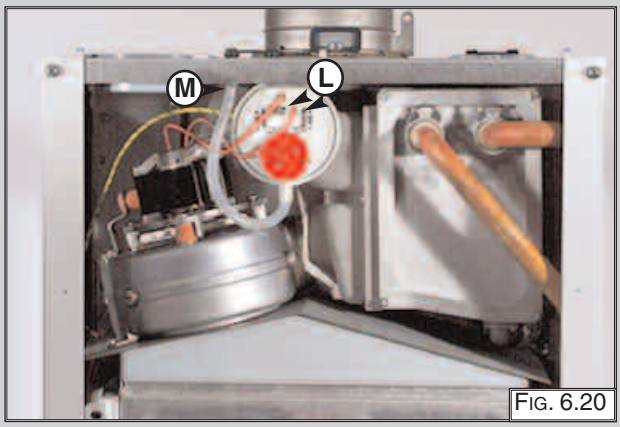


FIG. 6.20

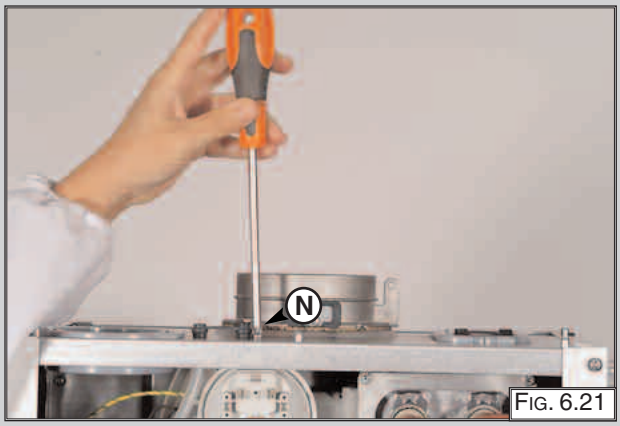


FIG. 6.21

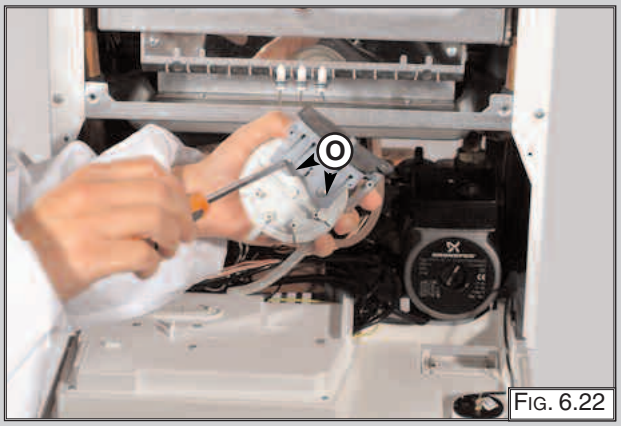


FIG. 6.22

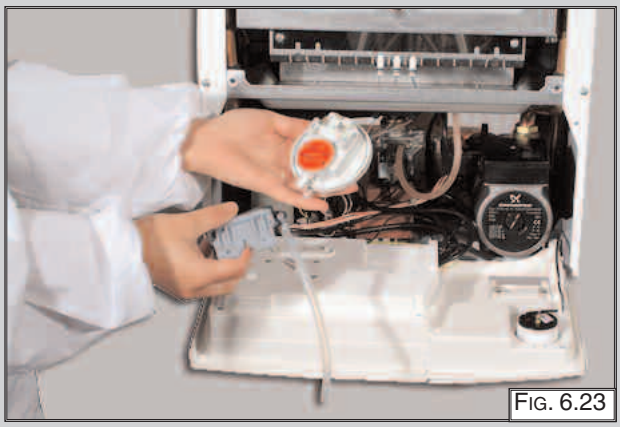


FIG. 6.23

6.3.6 Removing the fan

1. Remove screw “P” and remove the fan collar clamp “Q” (FIG.6.24);
2. Disconnect electrical connections “Q” and silicone pipe “Q” (FIG.6.25);
3. Remove fan and gasket “R” (FIG.6.26).
4. Reassemble in reverse order, ensuring the gasket “R” is seated correctly.

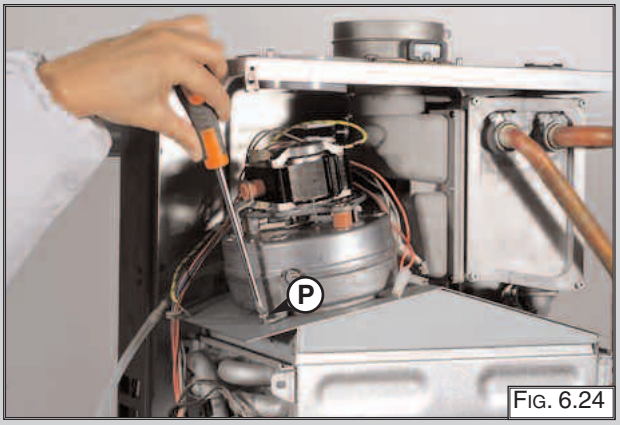


FIG. 6.24

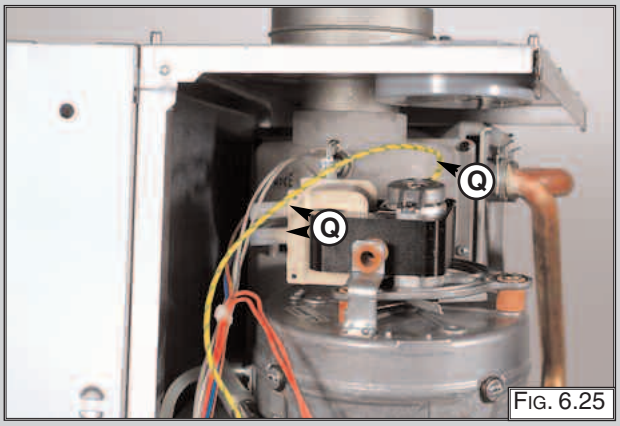


FIG. 6.25

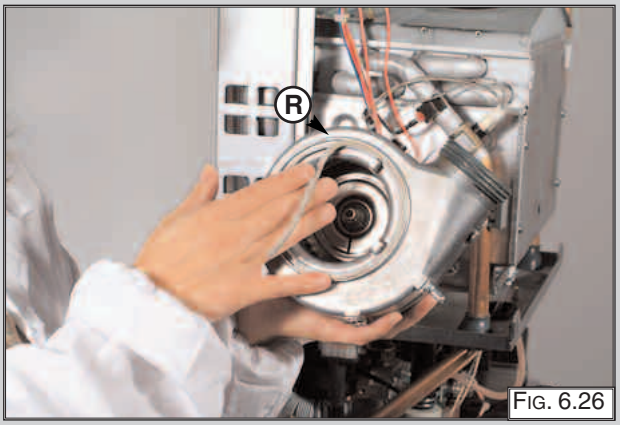


FIG. 6.26

6.3.7 Removing the condensate sensor

1. Disconnect electrical connections “S” (FIG.6.27);
2. Remove screws “T” and remove the condensate sensor (FIG.6.28 - 6.29).

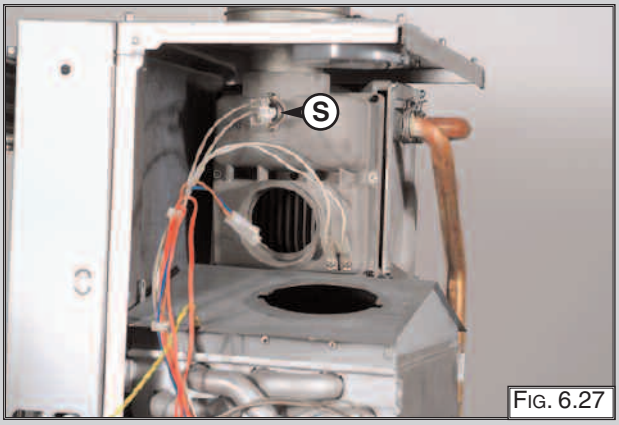


FIG. 6.27

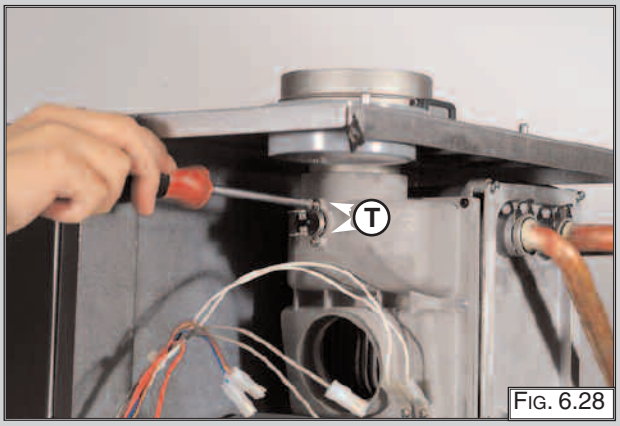


FIG. 6.28

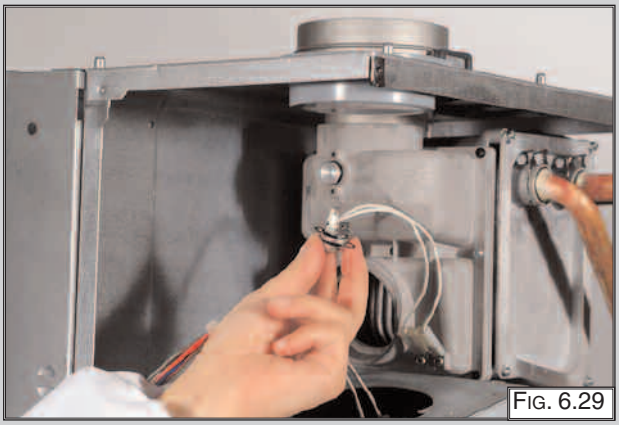


FIG. 6.29

6.3.8 Removing the latent heat exchanger

1. Remove the U-clips "U" (FIG.6.30);
2. Remove the clamp "V" to disconnect the condensate trap tube (FIG.6.31);
3. Loosen the nut "W" (FIG.6.32);
4. Remove the four screws "X" (FIG.6.33);
5. Remove the latent heat exchanger (FIG.6.34 - 6.35);
6. Reassembled in reverse order.

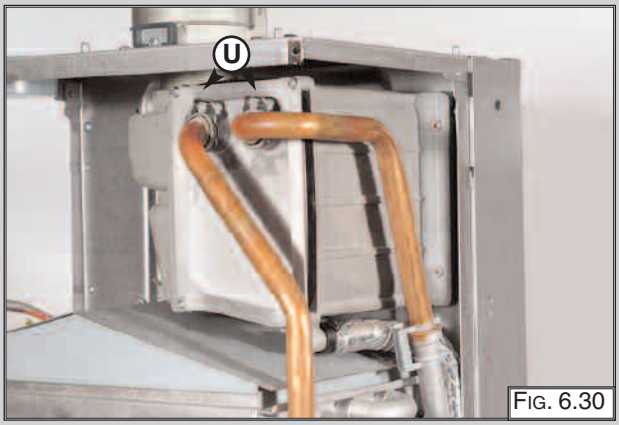


FIG. 6.30

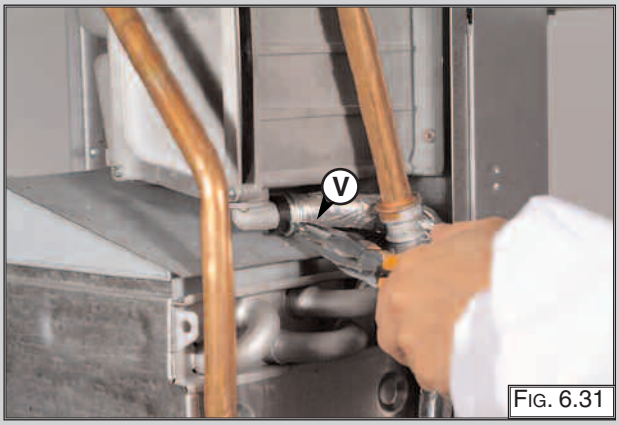


FIG. 6.31

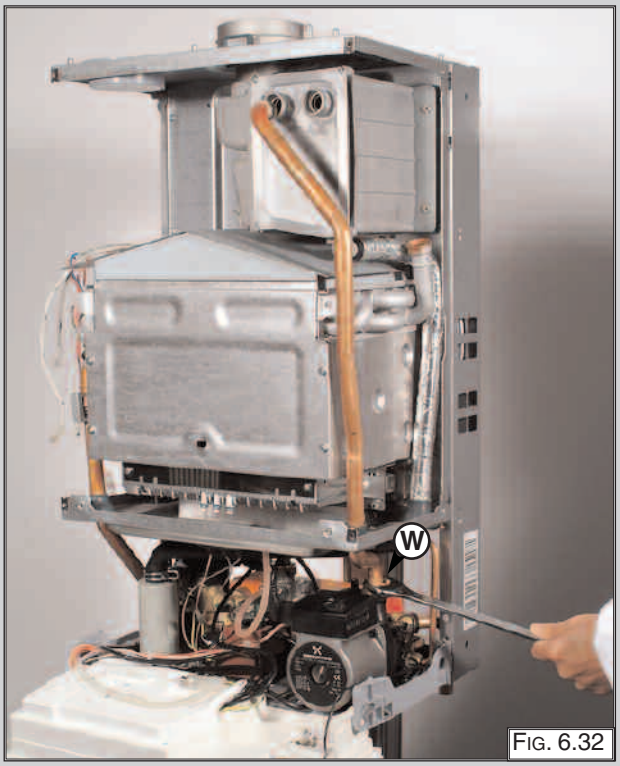


FIG. 6.32

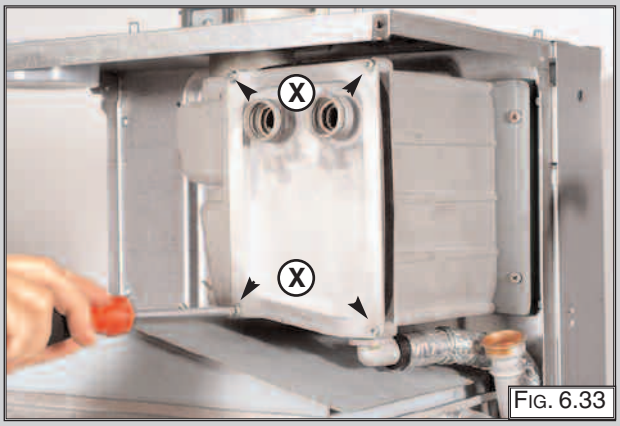


FIG. 6.33

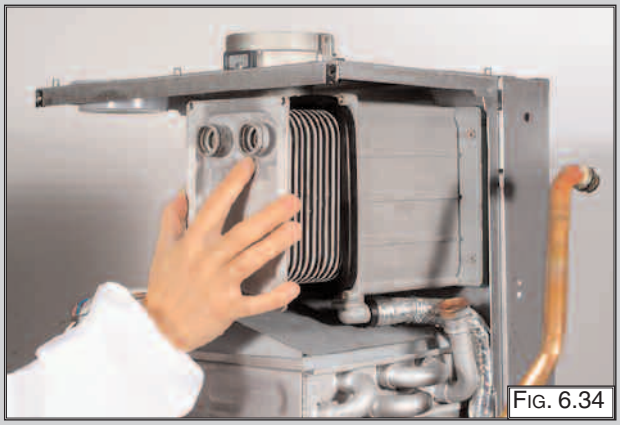


FIG. 6.34

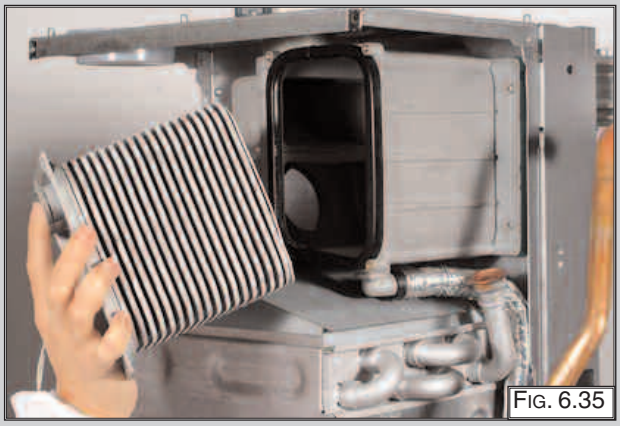


FIG. 6.35

6.3.9 Removing the Recuperator

1. Remove the latent heat exchanger - see paragh. ***6.3.8***
2. Unscrew the two screws “Y” (FIG.6.36);
3. Remove the recuperaor (FIG.6.37);
4. Reassemble in reverse order.

THE SIDE COVER OF THE RECUPERATOR MUST NOT BE REMOVED, THE TWO SCREWS ARE COVERED BY SECURITY PAINT, THERE IS A DANGER THAT FLUE GASSES COULD LEAK INTO THE ROOM IF THE FRONT COVER IS REMOVED.

SHOULD IT BE NECESSARY TO REMOVE THE RECUPERATOR, THE WHOLE UNIT MUST BE REMOVED.

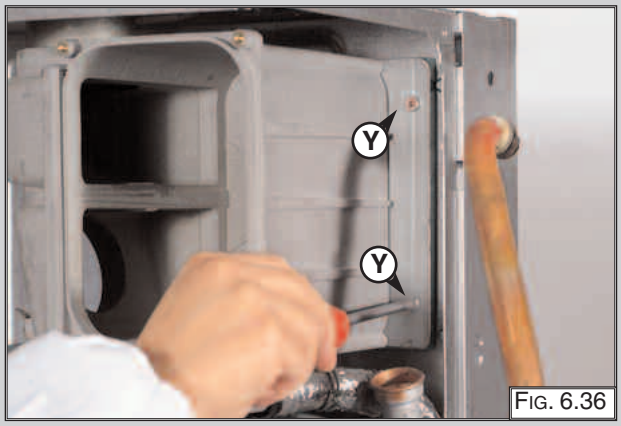


FIG. 6.36

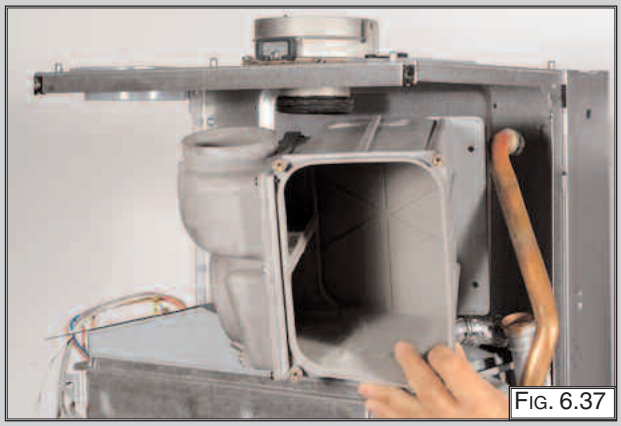


FIG. 6.37

6.3.10 Removing the Condensate Trap

1. Remove the clamp “Z” (FIG.6.38);
2. Remove the clamp “A1” (FIG.6.39);
3. Unscrew and remove the trap from the boiler (FIG.6.40);
3. Remove the trap (FIG.6.41).
4. Reassemble in reverse order

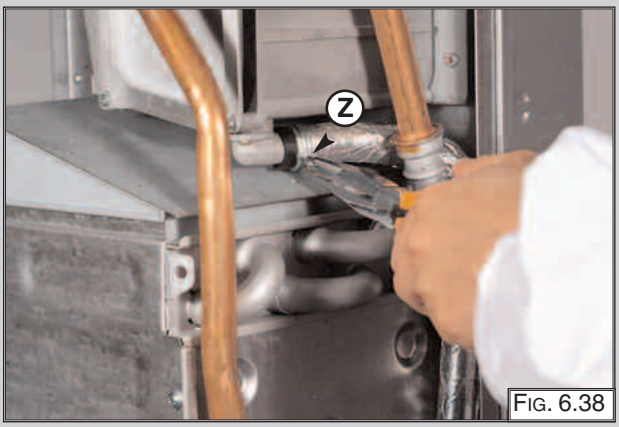


FIG. 6.38

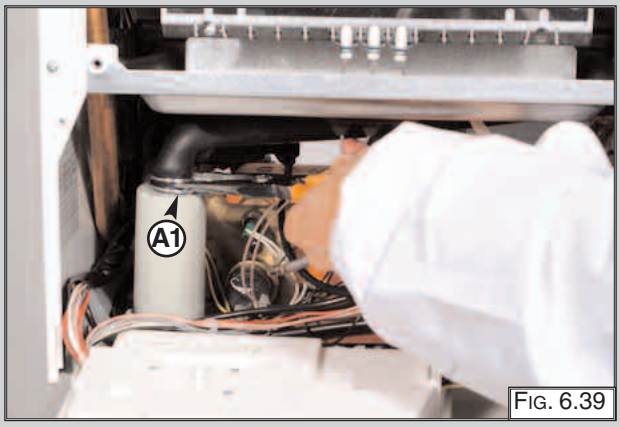


FIG. 6.39

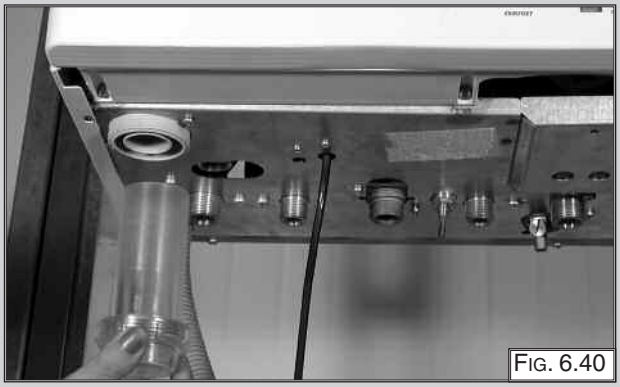


FIG. 6.40

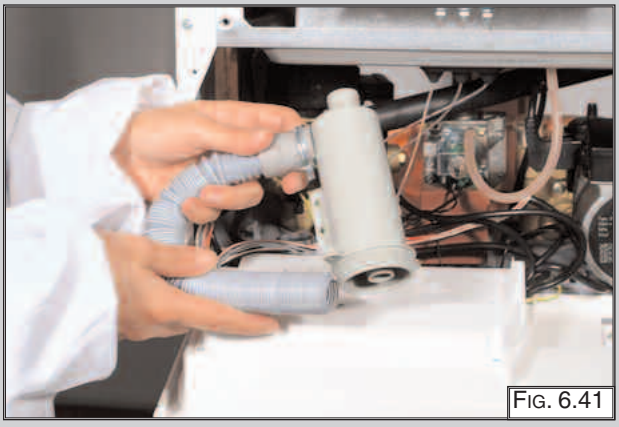


FIG. 6.41

6.4 Access to the Gas Valve

6.4.1. Removing the spark generator

1. Disconnect the ignition leads “A2” by pulling upward (Fig. 6.42);
2. Remove the screw “A3” (Fig. 6.43);
3. Remove the spark generator by pulling forward from the gas valve (Fig. 6.44).

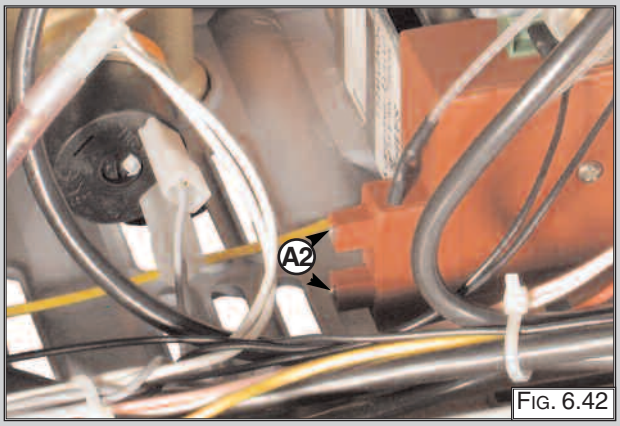


Fig. 6.42

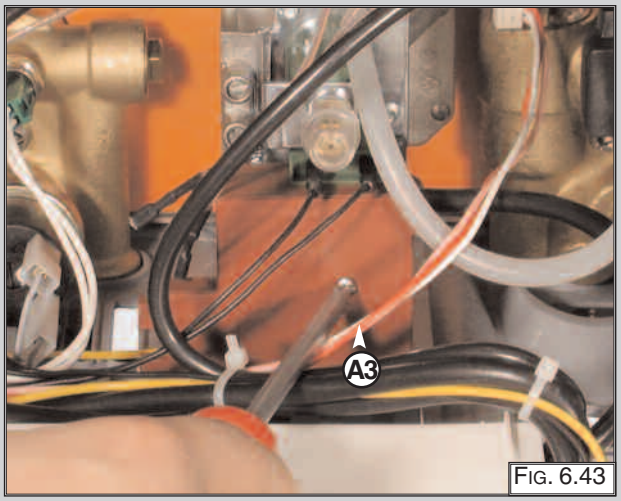


Fig. 6.43

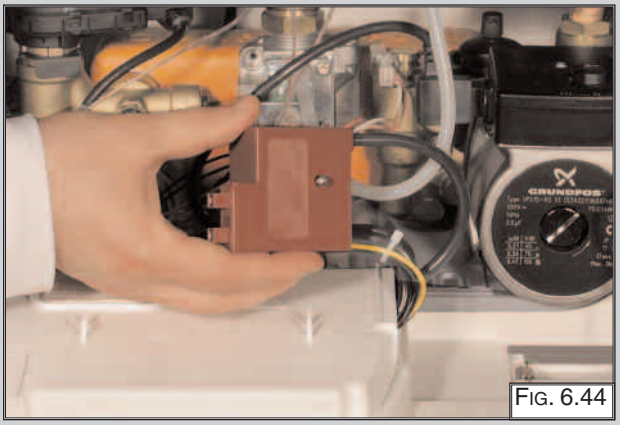


Fig. 6.44

6.4.2 Removing the gas valve (Honeywell)

Important! Before removing the gas valve, ensure the gas supply is turned off.

1. Disconnect all the cables from the solenoid and modureg;
2. Remove the spark generator (see previous section);
3. Release the nuts “A4” (Fig. 6.45);
4. Remove the screws “A5” from the bottom of the gas valve (Fig. 6.46);
5. Remove the gas valve (Fig. 6.47).

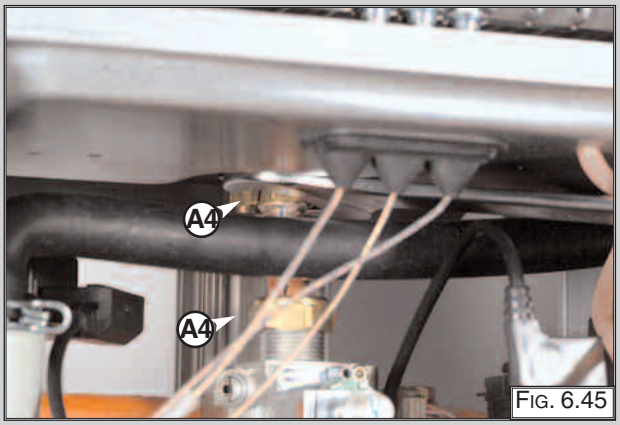


Fig. 6.45

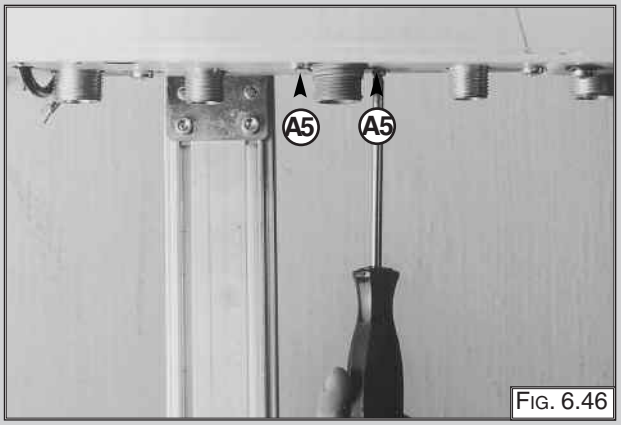


Fig. 6.46

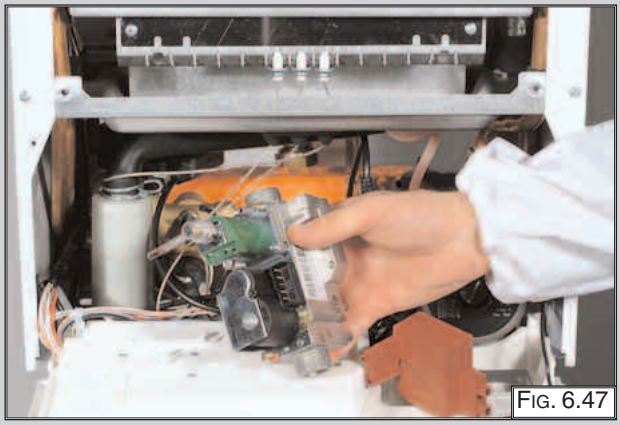


Fig. 6.47

6.5 Access to the Water Circuit

Important! Before any component is removed, the boiler must be drained of all water.

6.5.1 Removing the D.H.W. (secondary) exchanger

1. Remove the condensate trap - see parag. ***6.3.10***;
2. Remove the screws “A6” (Fig 6.48);
3. Disconnect the cable “A7” (Fig 6.49);
4. Push the insulation of the exchanger towards the rear of the boiler, and lift upwards and remove from the front of the boiler (Fig 6.50);
5. Push the exchanger towards the rear of the boiler, and lift upwards and remove from the front of the boiler (Fig 6.51);
6. Before replacing the exchanger ensure that the O-rings are in good condition and replace if necessary.

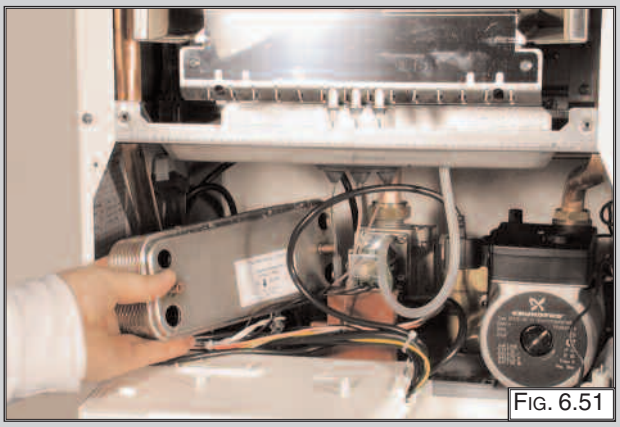


Fig. 6.51

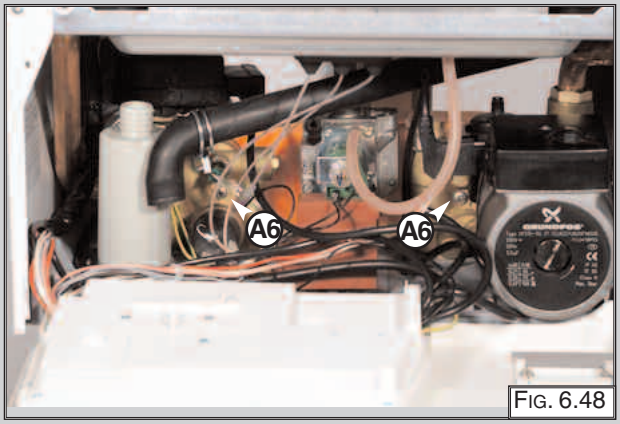


Fig. 6.48

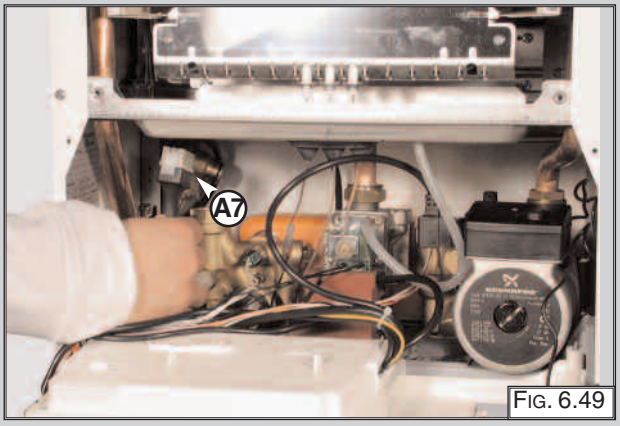


Fig. 6.49

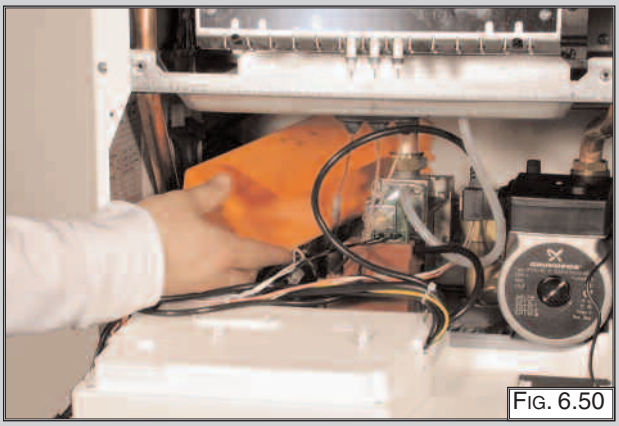


Fig. 6.50

6.5.2 Removing the pump pressure switch

1. Remove the pump pressure switch electrical connections "A8" (FIG 6.52);
2. Unscrew the pump pressure switch by using a spanner on the nut (FIG 6.53);
3. Remove the pump pressure switch (FIG 6.54).

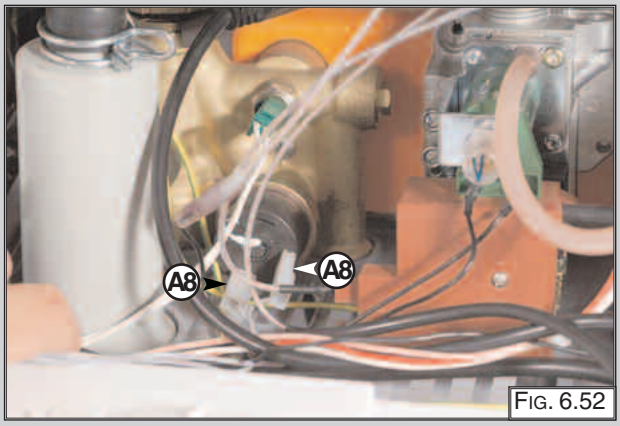


FIG. 6.52

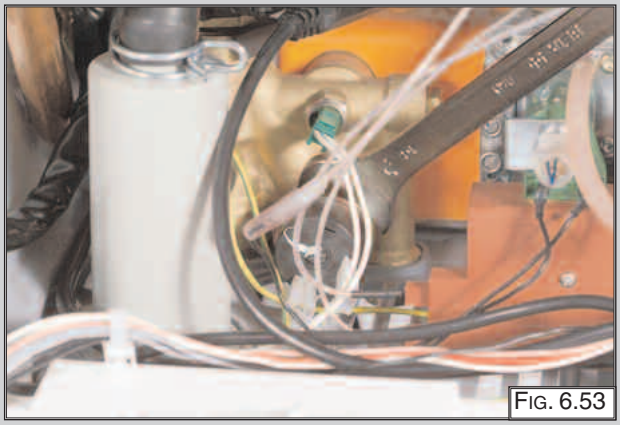


FIG. 6.53

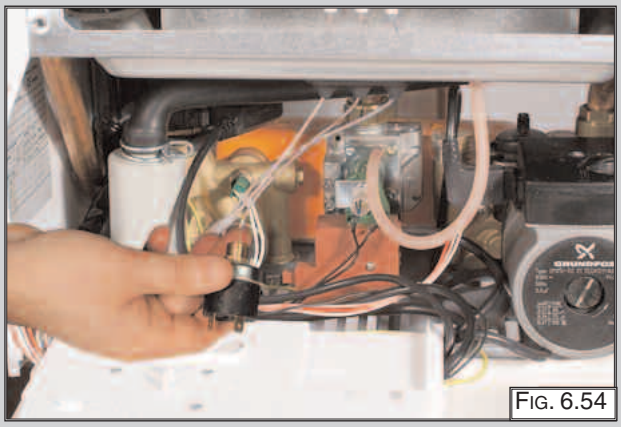


FIG. 6.54

6.5.3 Removing the safety valve

1. Disconnect the discharge pipe work from below the boiler;
2. Unscrew the fixing screw "A9" (FIG. 6.56)
3. Pull the valve upwards to remove (FIG. 6.57).

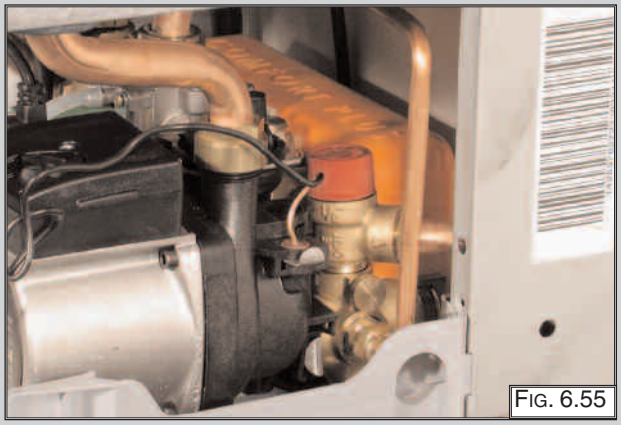


FIG. 6.55

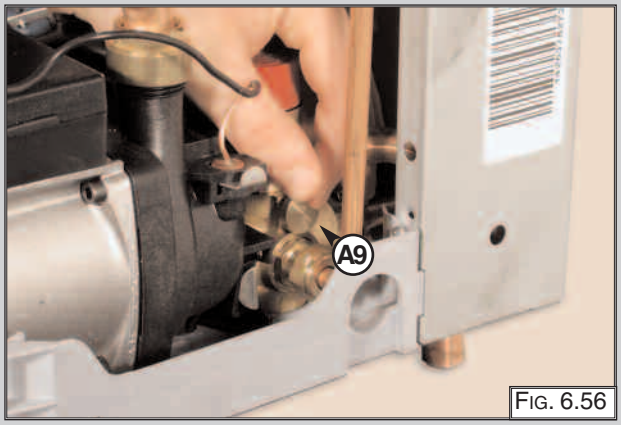


FIG. 6.56

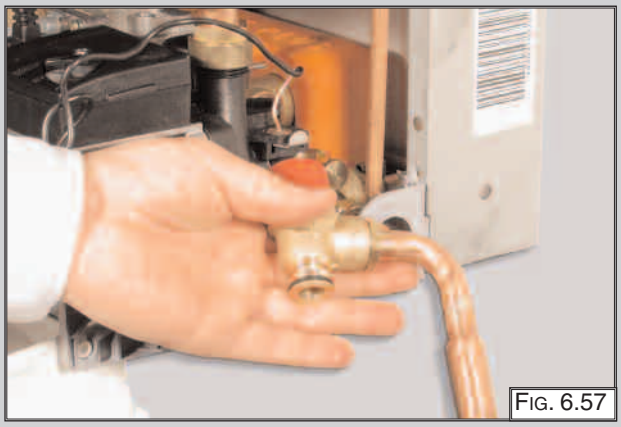


FIG. 6.57

6.5.4 Removing the automatic air vent

1. Remove the U-clip “B1” (FIG. 6.58);
2. Remove valve complete with float using a screwdriver (FIG 6.59-FIG 6.60).

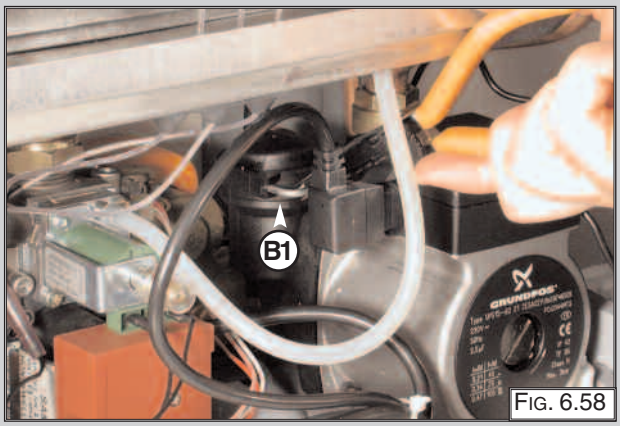


FIG. 6.58

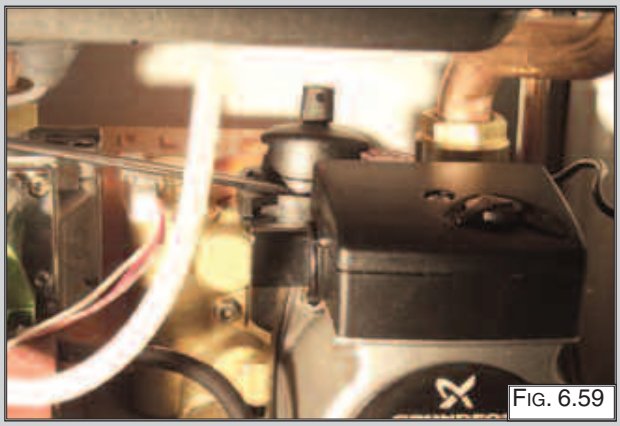


FIG. 6.59

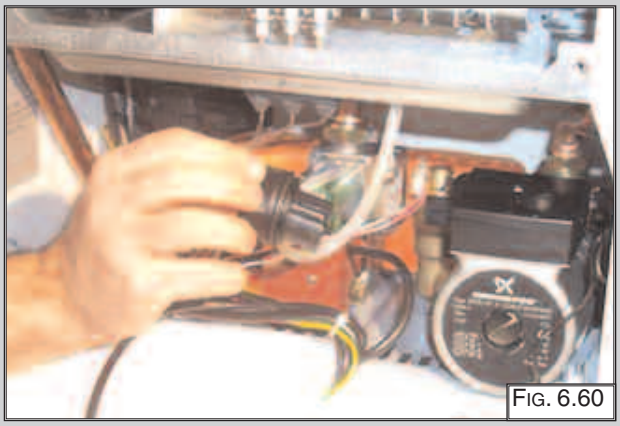


FIG. 6.60

6.5.5 Removing the pump

1. Remove the electrical connetction “ B2” (FIG. 6.61);
2. Release the nut “B3” (FIG. 6.62);
3. Remove the retainig clip “B4” from the buttom of the boiler (FIG. 6.63);
4. Remove the screws “B5” (FIG. 6.64);
5. Remove the U-clip “B6” and remove the pressure gauge connection (FIG. 6.65);
6. Remove the U-clip “B7” and remove the automatic air vent (FIG. 6.66);
7. Remove the pump.

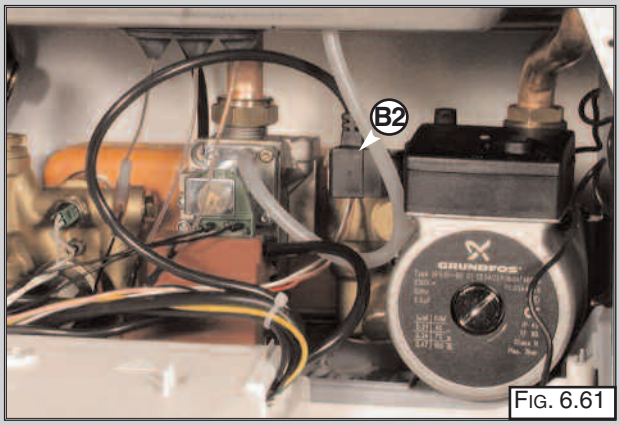


FIG. 6.61

FIG. 6.62

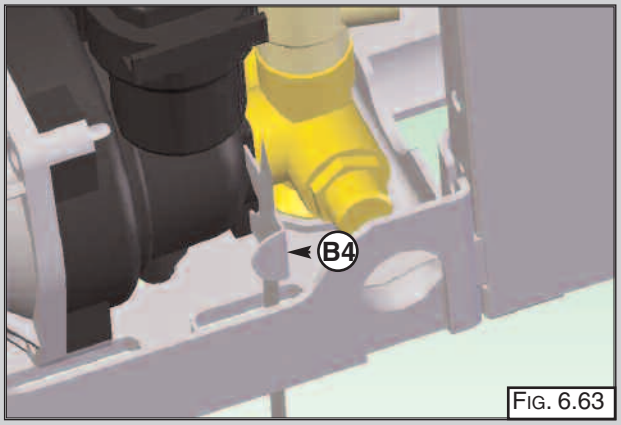


FIG. 6.63

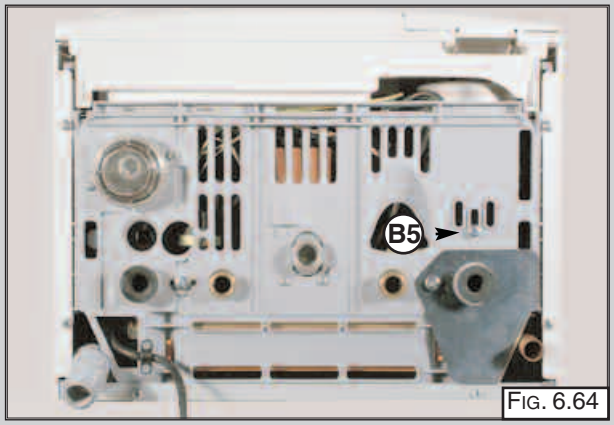


FIG. 6.64

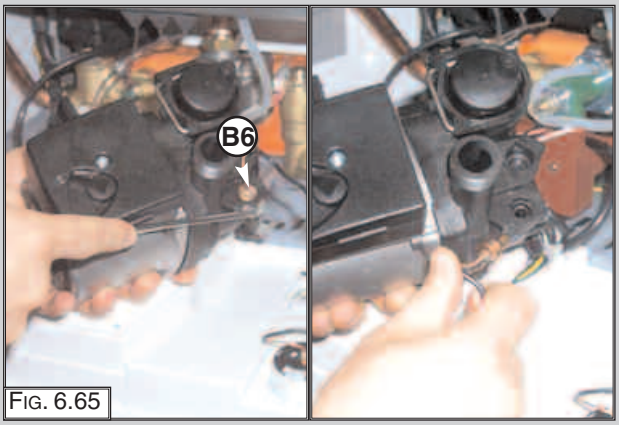


FIG. 6.65

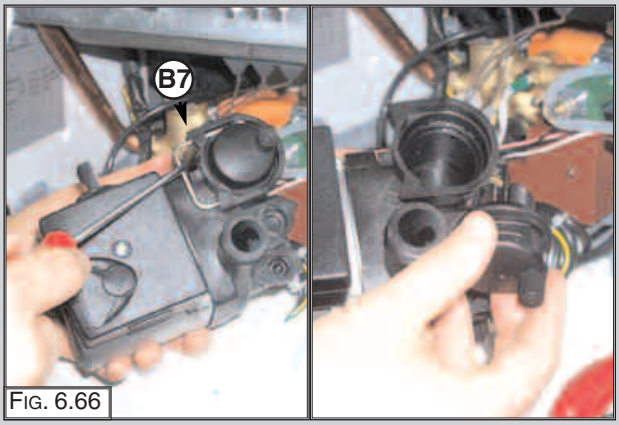


FIG. 6.66

6.5.6 Removing the pressure gauge

1. Remove the U-clip “B8” (FIG. 6.67)
2. Push the pressure gauge through the control panel from the rear using a screwdriver (FIG. 6.68-6.69).

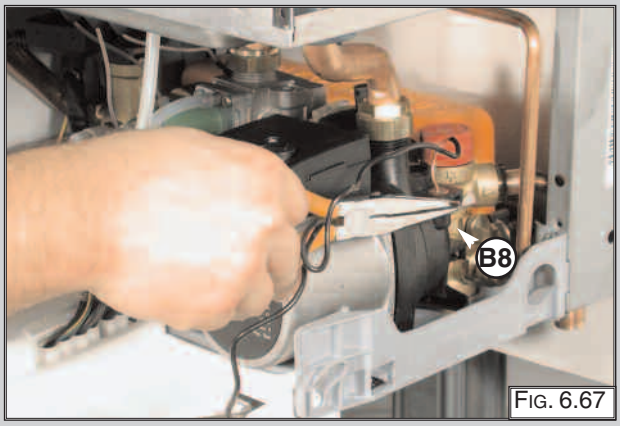


FIG. 6.67


FIG. 6.68


FIG. 6.69

6.5.7 Removing the expansion vessel

1. If rear exit flue, remove the flue;
2. Release nut “B9” (FIG. 6.70);
3. Remove back-nut “C1” (FIG. 6.71);
4. Remove the expansion vessel (FIG. 6.72).

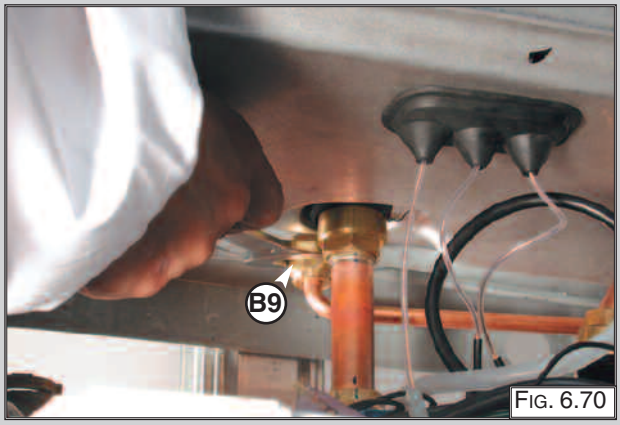


FIG. 6.70

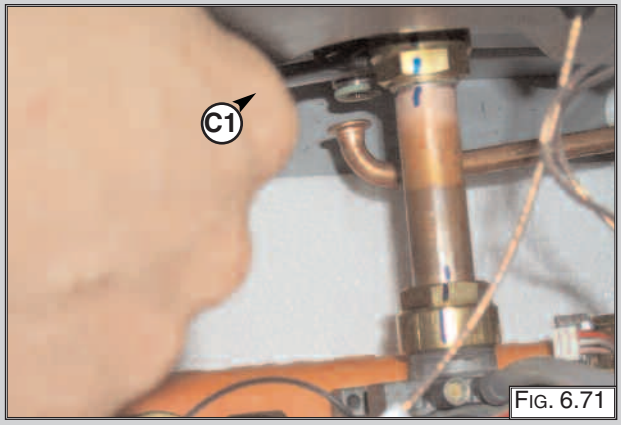


FIG. 6.71


FIG. 6.72

6.5.8 Removing the overheat thermostat

1. Disconnect the overheat thermostat electrical connections “C2” (FIG. 6.73);
2. Then remove the thermostat from its mounting by releasing the securing clip (FIG. 6.74-6.75).

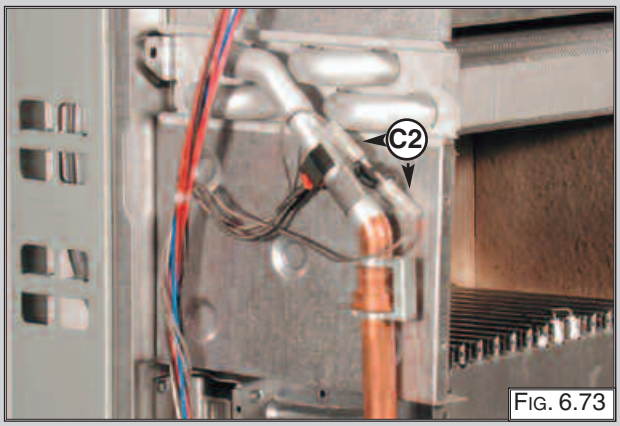


FIG. 6.73

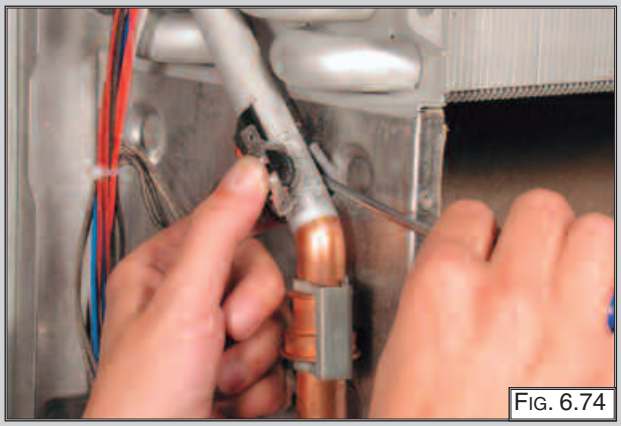


FIG. 6.74

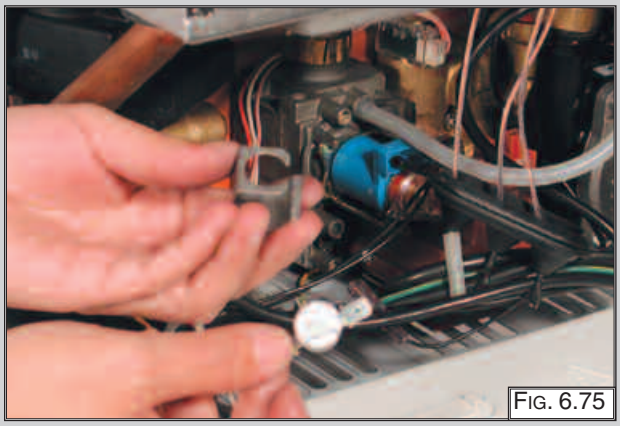


FIG. 6.75

6.5.9 Removing the C.H. temperature sensor (N.T.C.)

1. Pull off the electrical connector and remove the sensor probe using a suitable spanner (FIG. 6.76-6.77).

FIG. 6.76

FIG. 6.77

6.5.10 Removing the D.H.W. temperature sensor (N.T.C.)

1. Pull off the electrical connector and unscrew the sensor probe using a suitable spanner (FIG. 6.78).

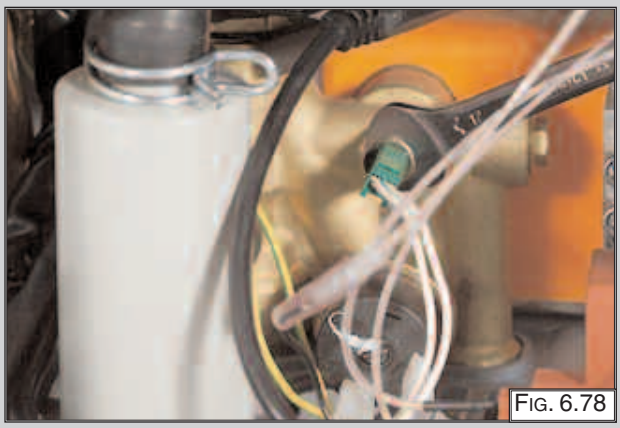


FIG. 6.78

6.5.11 Removing the diverter valve actuator

1. Unplug the electrical connector “C3” (FIG. 6.79);
2. Release the retaining clip “C4” and remove the diverter valve actuator

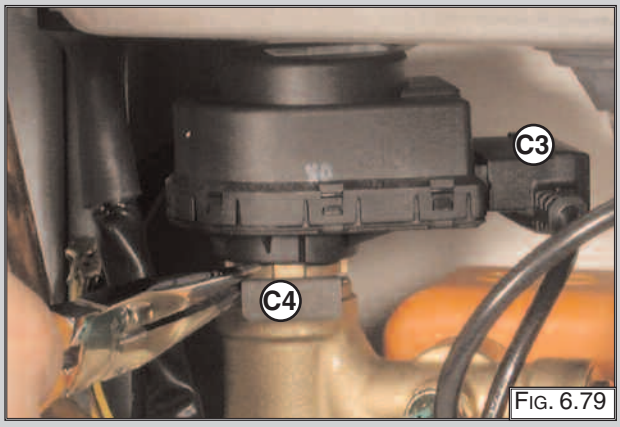


FIG. 6.79

6.5.12 *Removing the D.H.W. flow switch*

1. Unplug the electrical connector “C5” (FIG. 6.80);
2. Remove the D.H.W. flow switch using a screwdriver (FIG. 6.81-6.82).

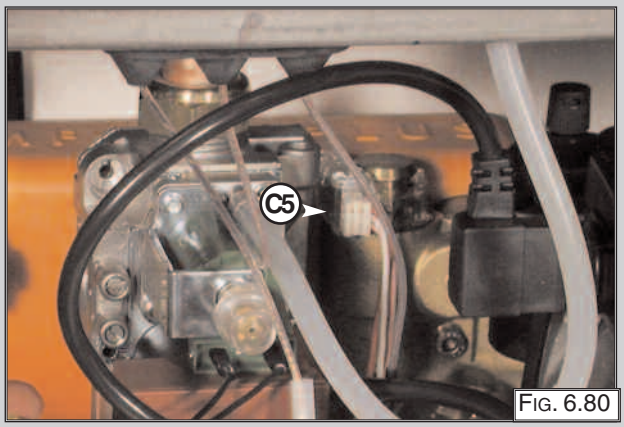


FIG. 6.80

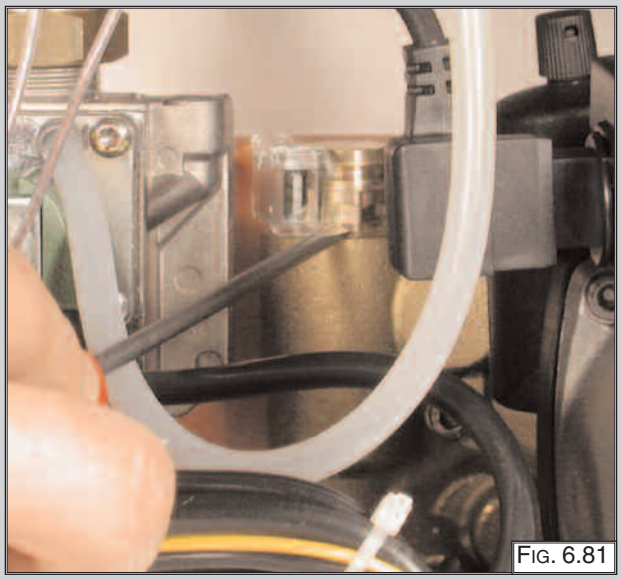


FIG. 6.81

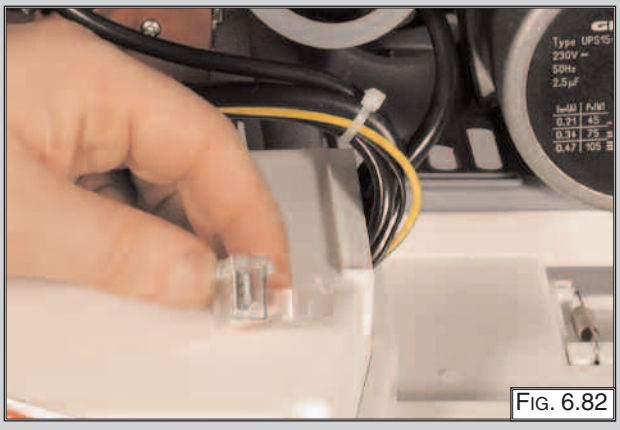


FIG. 6.82

6.6 ACCESS TO THE CONTROL SYSTEM

Important! Isolate the electrical supply to the boiler before accessing the control panel.

6.6.1 *Checking the fuses*

1. Remove the inspection cover on the reverse of the control panel and unscrew the screws “C6”(FIG. 6.83);
2. Remove the fuses (FIG. 6.84).

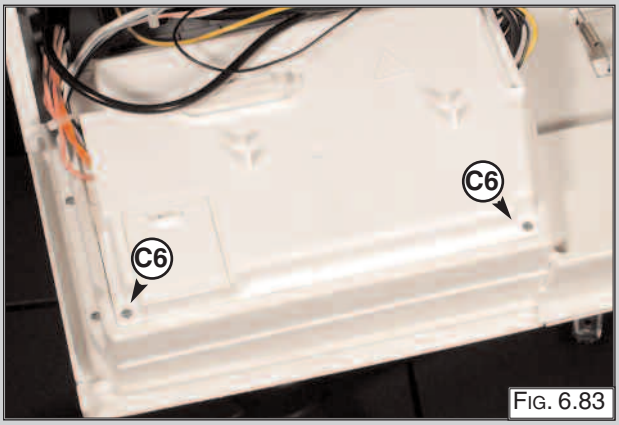


FIG. 6.83

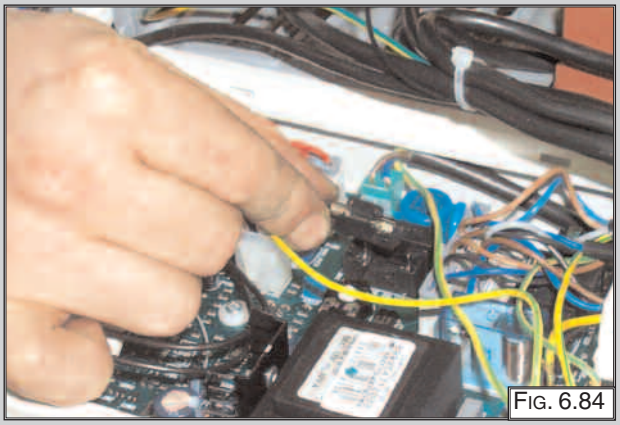


FIG. 6.84

6.6.2 Removing the P.C.B.

1. Isolate electricity;
2. Remove the inspection cover from the reverse of the control panel, unscrew the screws “C7” (Fig. 6.85);
3. Unplug all electrical connections from the recuperator P.C.B on the reverse of inspection cover (Fig. 6.86);
4. Unscrew the recuperator P.C.B mounting screws “C8” (Fig. 6.87);
5. Unplug all electrical connections from the P.C.B.;
6. Unplug carefully the EEPROM “C9” (Fig. 6.88);
7. Remove the screws “D1” (Fig. 6.89);
8. Separate the facia panel from the rear of the control panel ;
9. Remove the main P.C.B., unscrew the screws “D2”, and disconnect the P.C.B. connection cable “D3” (Fig. 6.90)
10. Unscew the display P.C.B. mounting screws “D4” (Fig. 6.91);
11. Remove the display P.C.B. (Fig. 6.92);
12. Replace either P.C.B. in reverse order;
13. Replug the EEPROM key “C9”.

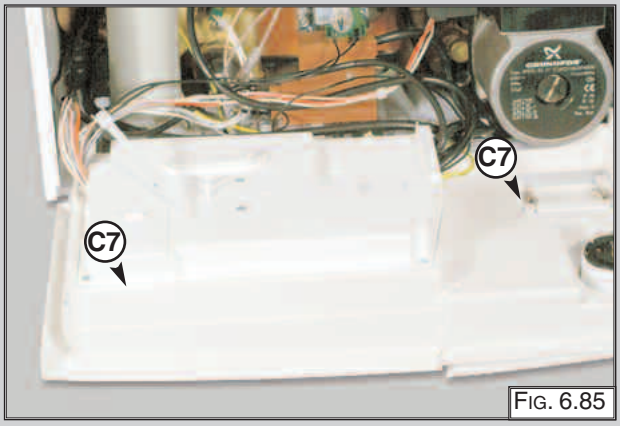


Fig. 6.85

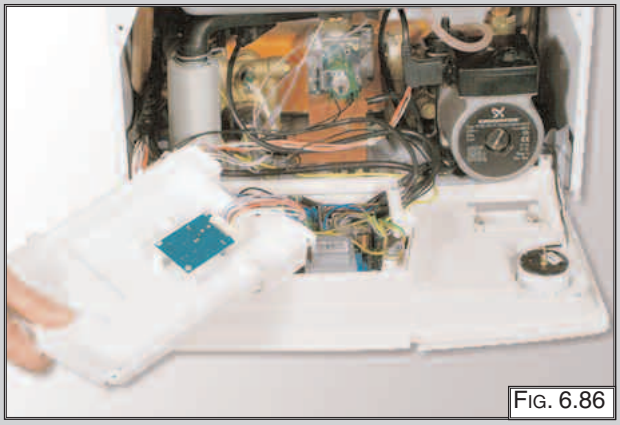


Fig. 6.86

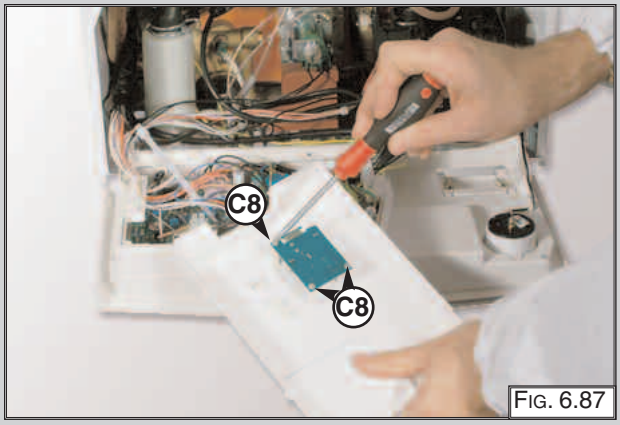


Fig. 6.87

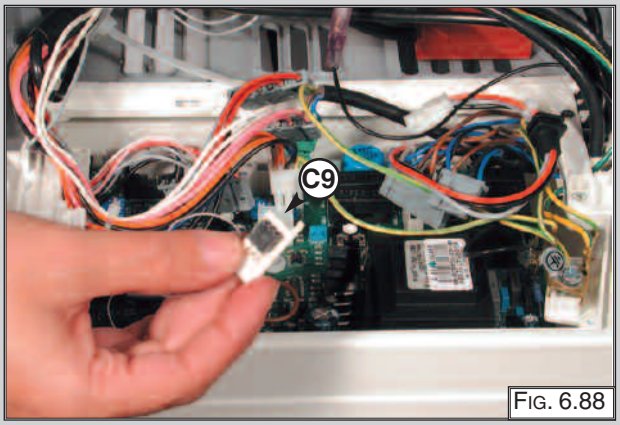


Fig. 6.88

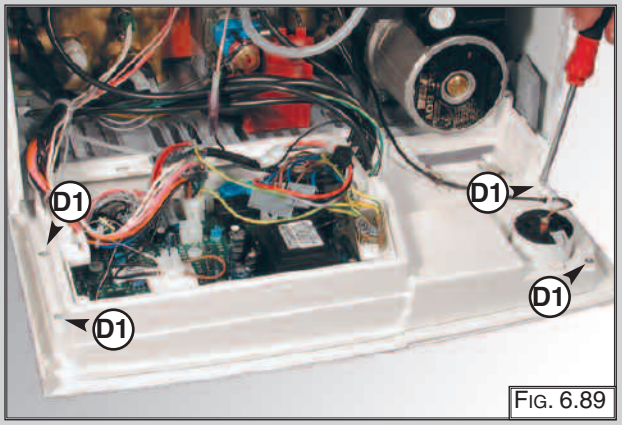


Fig. 6.89

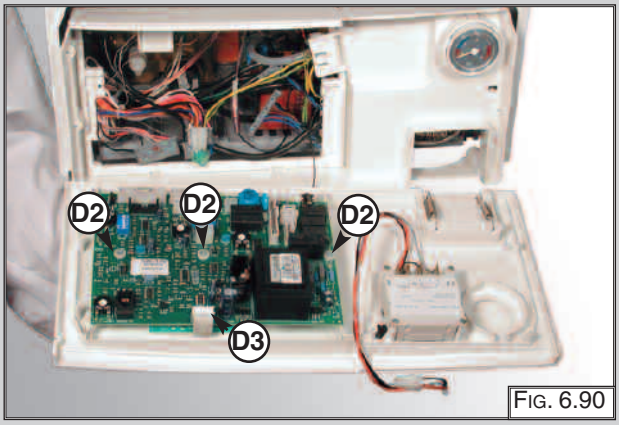


Fig. 6.90

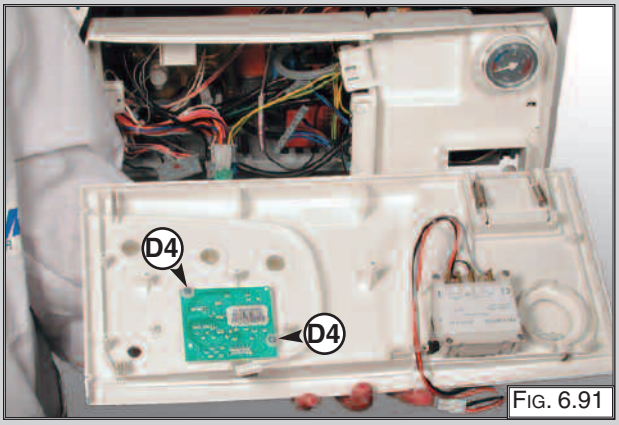


FIG. 6.91

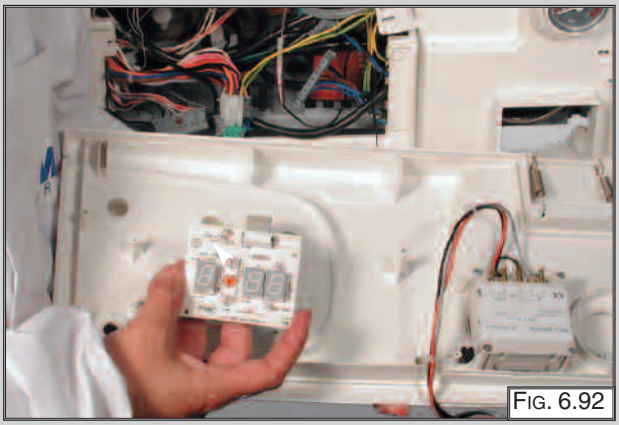


FIG. 6.92

6.6.3 Removing the time clock

1. Disconnect the electrical connections “D5” from the clock (FIG. 6.93);
2. Remove screws “D6” (FIG. 6.93);
3. Lift out the time clock from the control panel (FIG. 6.94).

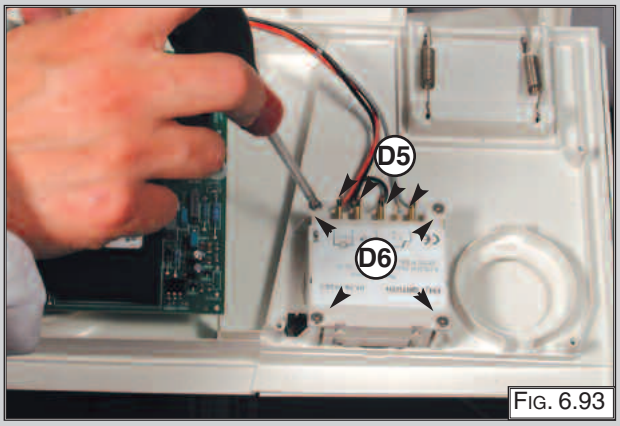


FIG. 6.93

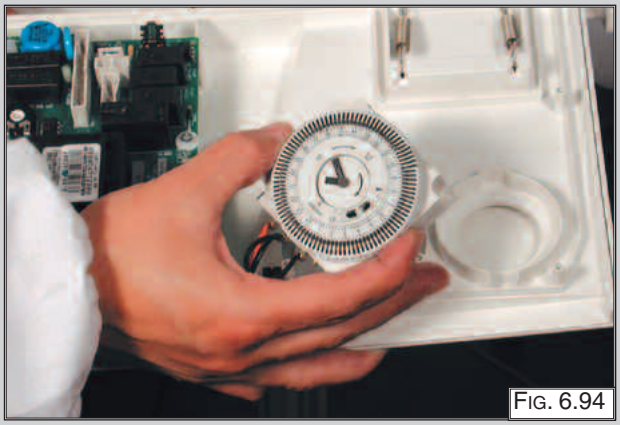


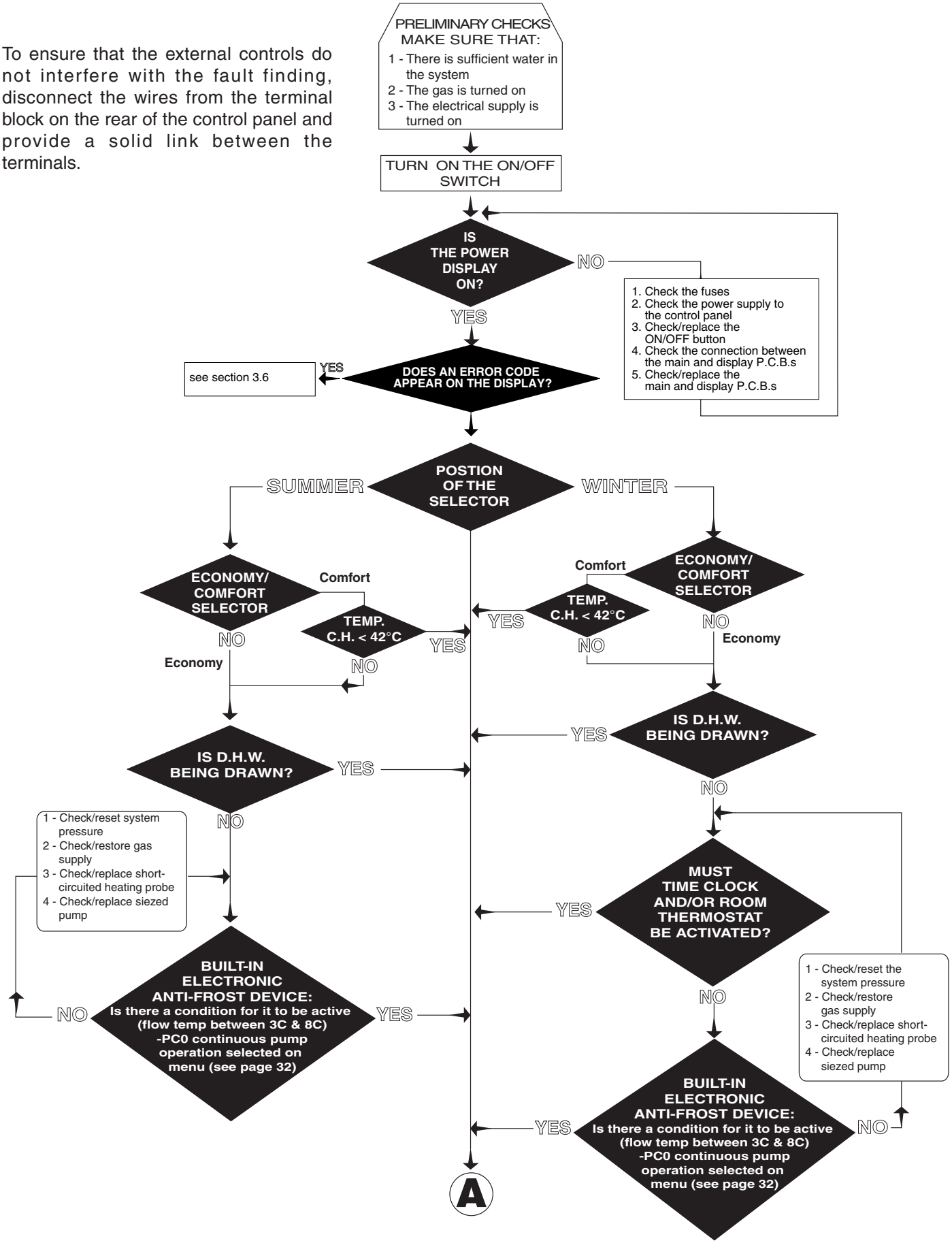
FIG. 6.94

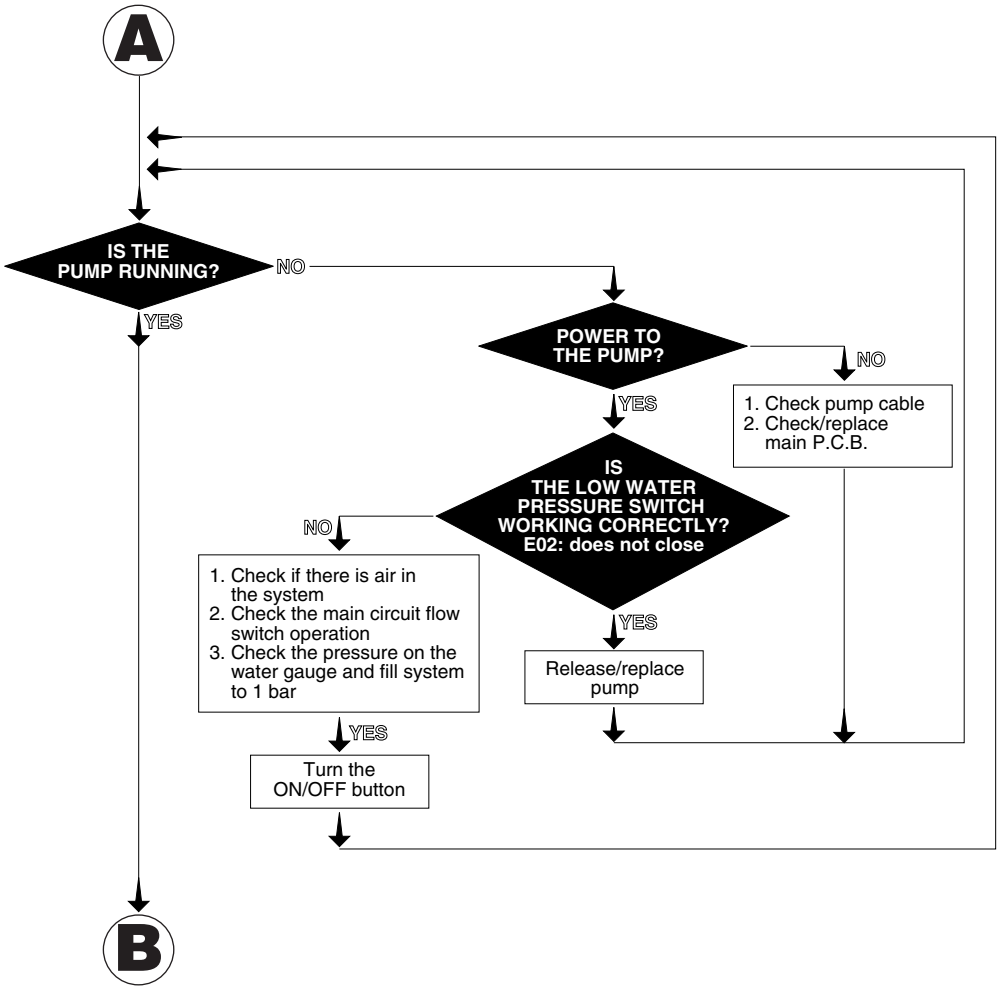
7. FAULT FINDING

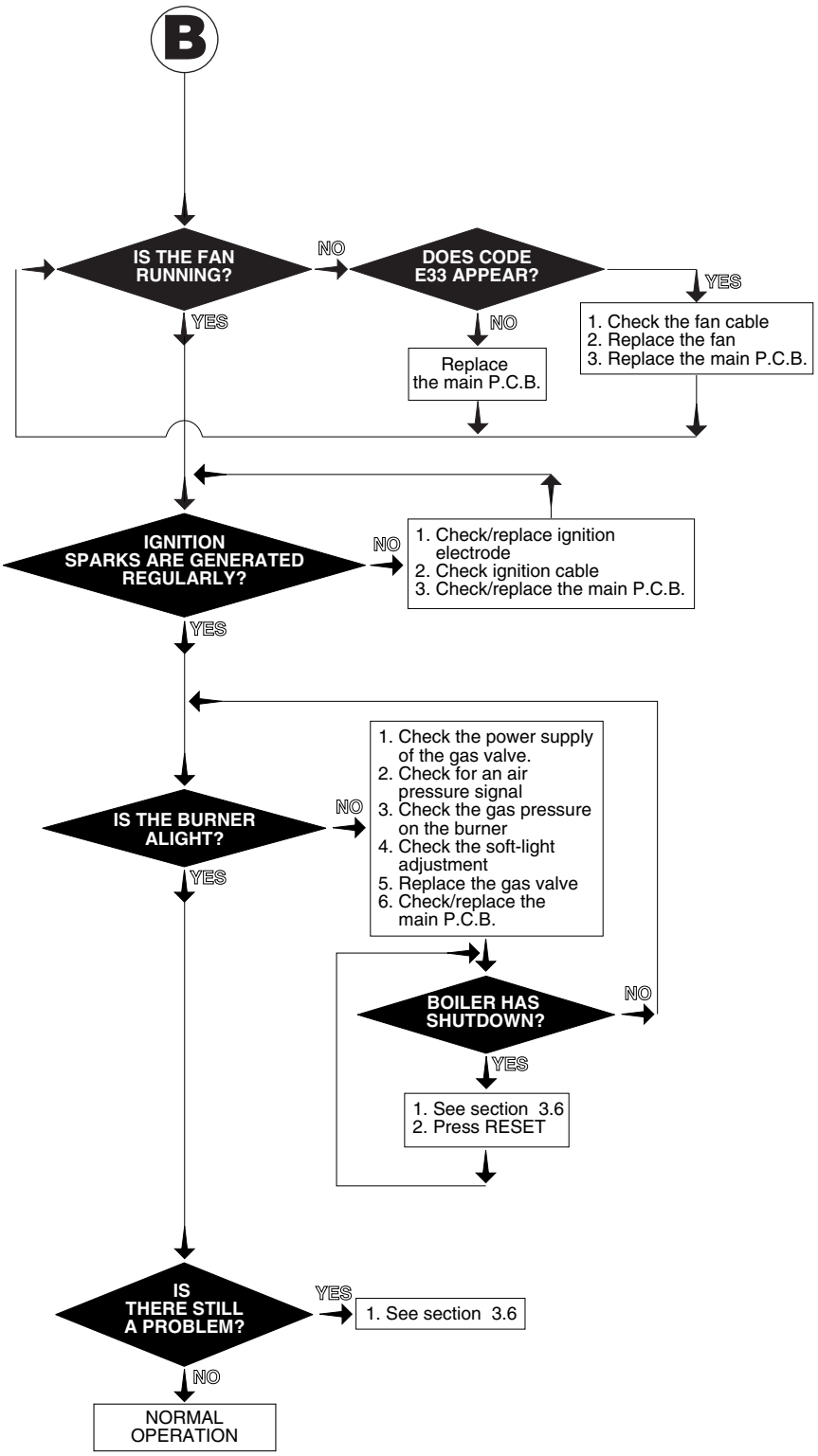
These fault finding guides are not exhaustive. However, it is possible to detect and correct many defects by using the standard fault finding diagrams described in this chapter, ensure these guides are carried out in the set order.

7.1 FAULT FINDING GUIDE (FLOW-CHARTS)

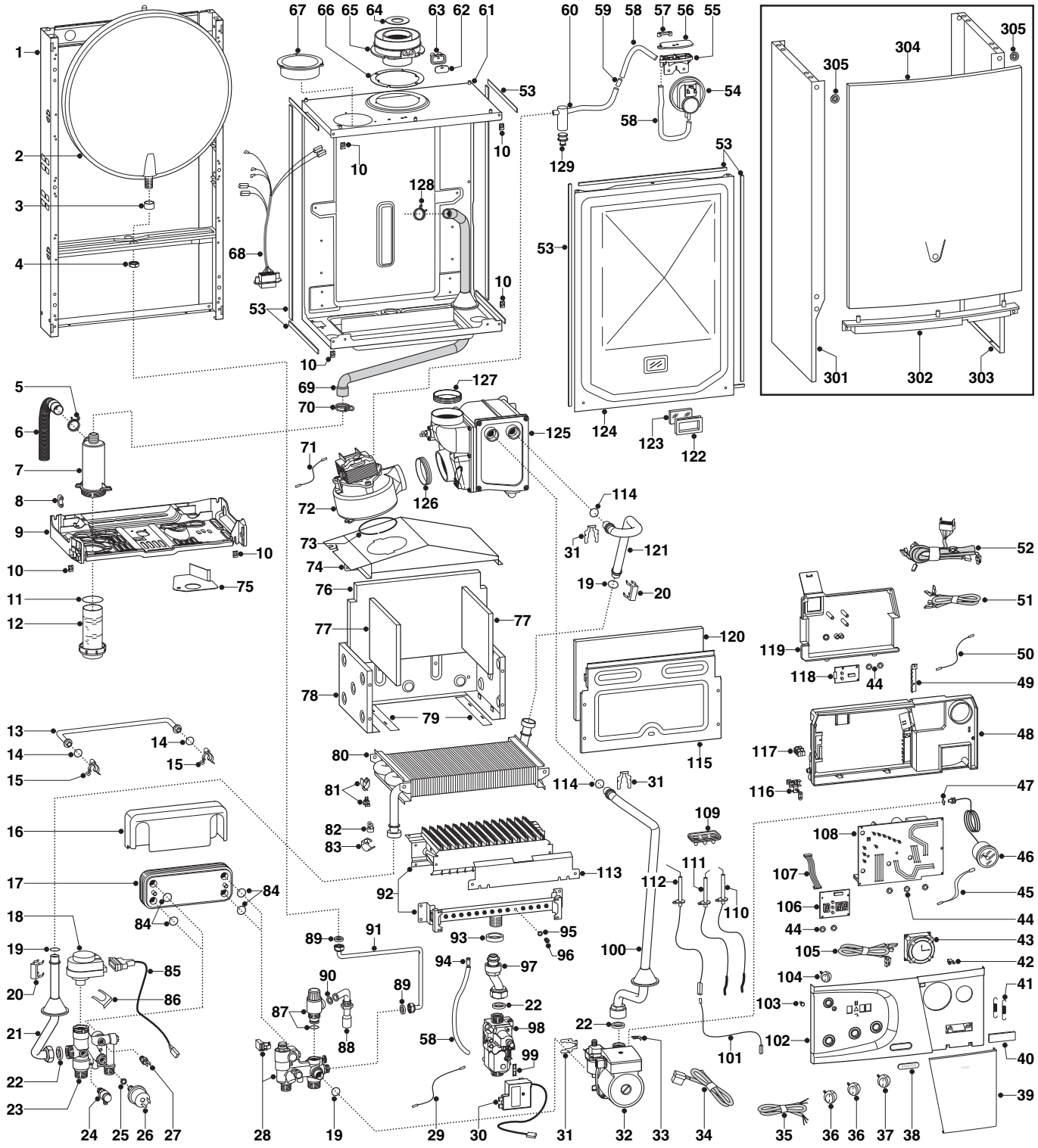
To ensure that the external controls do not interfere with the fault finding, disconnect the wires from the terminal block on the rear of the control panel and provide a solid link between the terminals.




A
IS THE PUMP RUNNING?
NO
YES
POWER TO THE PUMP?
NO
1. Check pump cable
2. Check/replace main P.C.B.
YES
IS THE LOW WATER PRESSURE SWITCH WORKING CORRECTLY? E02: does not close
NO
1. Check if there is air in the system
2. Check the main circuit flow switch operation
3. Check the pressure on the water gauge and fill system to 1 bar
YES
Release/replace pump
YES
Turn the ON/OFF button
B

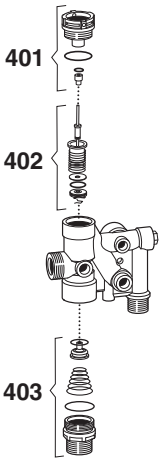

B
IS THE FAN RUNNING?
NO
DOES CODE E33 APPEAR?
YES
1. Check the fan cable
2. Replace the fan
3. Replace the main P.C.B.
YES
NO
Replace the main P.C.B.
IGNITION SPARKS ARE GENERATED REGULARLY?
NO
1. Check/replace ignition electrode
2. Check ignition cable
3. Check/replace the main P.C.B.
YES
IS THE BURNER ALIGHT?
NO
1. Check the power supply of the gas valve.
2. Check for an air pressure signal
3. Check the gas pressure on the burner
4. Check the soft-light adjustment
5. Replace the gas valve
6. Check/replace the main P.C.B.
YES
BOILER HAS SHUTDOWN?
NO
YES
1. See section 3.6
2. Press RESET
IS THERE STILL A PROBLEM?
YES
1. See section 3.6
NO
NORMAL OPERATION

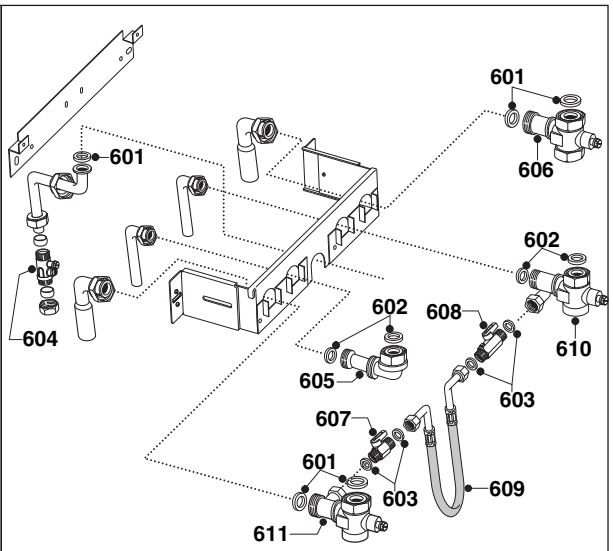
8. SHORT SPARE PART LIST



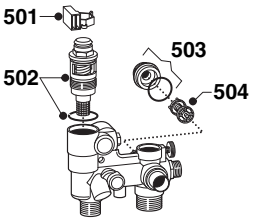
MODEL	CODE	SERIAL NO. VALIDITY	REF.
MICROGENUS 24 MFFI HE (UK) NG	3300025	2320429900001	A
MICROGENUS 28 MFFI HE (UK) NG	3300015	2320429900001	B
MICROGENUS 32 MFFI HE (UK) NG	3300026	2320429900001	C

code 65100547

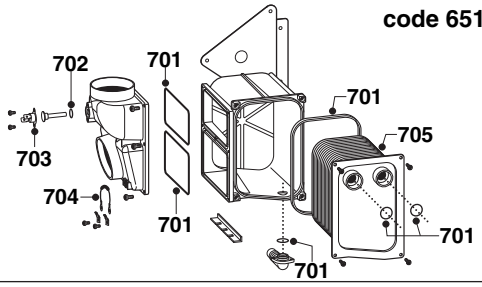




code 65101257



code 65102576



Key no.	G.C. part no.	Description	ARISTON Part. No.
18		Motor (3-Way Valve)	997147
19		O-Ring	998424
22		Gasket (3/4”)	573520
25		Gasket (1/4”)	569390
26		Low Water Pressure Switch	998458
27		Temperature probe (DHW)	990384
30		Spark Generator	65100249
32		Pump	65101417
42		Clock	999599
46		Pressure Gauge	65100695
54		Air Pressure Switch	65102164
72		Fan (24 kW)	65102566
72		Fan (28 / 32 kW)	65102567
73		Seal (Silicone)	990368
80		Main Exchanger (24kW)	65102586
80		Main Exchanger (28 / 32 kW)	65102585
81		Temperature Probe & Clip	990686
82		Overheat Thermostat	990605
84		O-Ring (Secondary Exchanger)	573825
87		Safety Valve (3 bar)	997088
89		Gasket (3/8”)	573521
90		Gasket (1/2”)	573528
93		Silicone Seal	569443
106		P.C.B. (CMP3 - display)	65100709
108		P.C.B. (main)	65102571
110		Electrode Ignition (R.H.)	65100693
111		Electrode Ignition (L.H.)	65100694
112		Electrode (detection)	65100692
118		P.C.B. (water sensor)	65102572
126		Gasket (Fan/Recuperator)	573343
127		Gasket (Recuperator/Flue Outlet)	65102565

9. TECHNICAL INFORMATION

General Info	***Name***		**microGENUS HE 24 MFFI**	**microGENUS HE 28 MFFI**
	CE Certification		0051BP2805	0051BP2805
	Flue Type		C_{12}-C_{32}-C_{42}-C_{52}-C_{82}-B_{22}-B_{32}	C_{12}-C_{32}-C_{42}-C_{52}-C_{82}-B_{22}-B_{32}
Energy Performance	Heat Input max/min (Central Heating)	kW	26,7 / 12,2	31,1 / 13,3
	Heat Output max/min	kW	23,3 / 10,4	27,0 / 11,4
	Efficiency of Nominal Heat Input (60/80°C)	%	87,4	86,7
	Efficiency of Nominal Heat Input (30/50°C)	%	87,4	86,7
	Efficiency at 30% of Nominal Heat Input (30°C)	%	87,1	86,5
	Efficiency at Minum Input	%	85,3	85,2
	Efficiency (Dir. 92/42/EEC)**		☆☆☆☆	☆☆☆☆
	SEDBUK Rating	Band	B	B
	Heat Loss to the Casing (ΔT=50°C)	%	0,2	0,9
	Flue Heat Loss with Burner Operating	%	2,7	2,8
	Flue Heat Loss with Burner Off	%	0,4	0,4
Emissions	Max Discharge of Products of Combustion (G20)	Kg/h	43,8	57,2
	Residual Discharge Head	mbar	0,68	0,73
	Temp. of exhaust fumes at nominal capacity	°C	72	65
	CO_2 Content	%	7,62	6,79
	O_2 Content	%	6,8	8,3
	CO Content	ppm	44	25,8
	Nox Class		3	3
Central Heating	Head Loss on Water Side (max) (T=20°C)	mbar	200	200
	Residual Head of System	bar	0,25	0,25
	Expansion Vessel Pre-load Pressure	bar	0,7	0,7
	Maximum Heating Pressure	bar	3	3
	Expansion Vessel Capacity	l	7	7
	Maximum Water Content of System	l	130	130
	Heating Temperature max/min (High temperature)	°C	82 / 42	82 / 42
	Heating Temperature max/min (Low Temperature)	°C	44 / 38	44 / 38
Domestic Hot Water	Domestic Hot Water Temperature (approx) max/min	°C	56 / 36	56 / 36
	Specific Flow Rate (10 minutes/DT 30°C)	l/min	11,1	12,9
	D.H.W. Flow Rate ΔT=25°C	l/min	13,4	15,5
	D.H.W. Flow Rate ΔT=35°C	l/min	9,5	11,0
	D.H.W. Minimum Flow Rate	l/min	2,5	2,5
	Pressure of Domestic Hot Water max/min	bar	6 / 0,2	6 / 0,2
	Max. Condensate produced	l/h	1,7	1,8
	PH of condensate		4	4
Gas	Nominal Pressure Natural Gas (G20)	mbar	20	20
	LPG (G30 / G31)	mbar	28-30/37	28-30/37
	Consumption at Nominal Capacity (G20)	m^3/h	2,54	2,96
	(G30 / G31)	kg/h	1,89 / 1,86	2,21 / 2,17
	Gas Consumption after 10 Minutes*	m^3	0,30	0,35
Elettrical Data	Electrical Supply	V/Hz	230/50	230/50
	Power Consumption	W	120	148
	Minimum Ambient Temperature	°C	+5	+5
	Protection Grade of Electrical System	IP	24D	24D
	Internal Fuse Rating		2A FAST 250Vac	2A FAST 250Vac
	Weight	Kg	37	38
	Dimensions (W/D/H)	mm	700/400/315	700/400/315
	G.C. Number		**47-116-37**	**47-116-38**

* Calculated at 70% maximum output

** Calculated on Upper calorific value

General Info	***Name***		**microGENUS HE 32 MFFI**
	CE Certification		0051BP2805
	Flue Type		C_{12}-C_{32}-C_{42}-C_{52}-C_{82}-B_{22}-B_{32}
Energy Performance	Heat Input max/min (Central Heating)	kW	35,0 / 13,3
	Heat Output max/min	kW	30,5 / 11,3
	Efficiency of Nominal Heat Input (60/80°C)	%	87,1
	Efficiency of Nominal Heat Input (30/50°C)	%	87,1
	Efficiency at 30% of Nominal Heat Input (30°C)	%	86,9
	Efficiency at Minum Input	%	84,8
	Efficiency (Dir. 92/42/EEC)**		☆☆☆☆
	SEDBUK Rating	Band	B
	Heat Loss to the Casing (ΔT=50°C)	%	0,7
	Flue Heat Loss with Burner Operating	%	2,6
	Flue Heat Loss with Burner Off	%	0.4
Emissions	Max Discharge of Products of Combustion (G20)	Kg/h	59,2
	Residual Discharge Head	mbar	1,15
	Temp. of exhaust fumes at nominal capacity	°C	64,5
	CO_2 Content	%	7,39
	O_2 Content	%	7,2
	CO Content	ppm	57,8
	Nox Class		3
Central Heating	Head Loss on Water Side (max) (T=20°C)	mbar	200
	Residual Head of System	bar	0,25
	Expansion Vessel Pre-load Pressure	bar	0,7
	Maximum Heating Pressure	bar	3
	Expansion Vessel Capacity	l	7
	Maximum Water Content of System	l	130
	Heating Temperature max/min (High temperature)	°C	82 / 42
	Heating Temperature max/min (Low Temperature)	°C	44 / 38
Domestic Hot Water	Domestic Hot Water Temperature (approx) max/min	°C	56 / 36
	Specific Flow Rate (10 minutes/DT 30°C)	l/min	14,6
	D.H.W. Flow Rate ΔT=25°C	l/min	17,5
	D.H.W. Flow Rate ΔT=35°C	l/min	12,5
	D.H.W. Minimum Flow Rate	l/min	2,5
	Pressure of Domestic Hot Water max/min	bar	6 / 0,2
	Max. Condensate produced	l/h	2.2
	PH of condensate		4
Gas	Nominal Pressure Natural Gas (G20)	mbar	20
	LPG (G30 / G31)	mbar	28-30/37
	Consumption at Nominal Capacity (G20)	m^3/h	3,33
	(G30 / G31)	kg/h	2,48 / 2,45
	Gas Consumption after 10 Minutes*	m^3	0,39
Elettrical Data	Electrical Supply	V/Hz	230/50
	Power Consumption	W	148
	Minimum Ambient Temperature	°C	+5
	Protection Grade of Electrical System	IP	24D
	Internal Fuse Rating		2A FAST 250Vac
	Weight	Kg	39
	Dimensions (W/D/H)	mm	700/400/315
	G.C. Number		**47-116-39**

* Calculated at 70% maximum output

** Calculated on Upper calorific value

11. BENCHMARK COMMISSIONING CHECKLIST

BENCHMARK No. | | | | | | |

GAS BOILER COMMISSIONING CHECKLIST

BOILER SERIAL No. _____ **NOTIFICATION No.** _____

CONTROLS *To comply with the Building Regulations, each section must have a tick in one or other of the boxes*

TIME & TEMPERATURE CONTROL TO HEATING	ROOM T/STAT & PROGRAMMER/TIMER	☐	PROGRAMMABLE ROOMSTAT	☐
TIME & TEMPERATURE CONTROL TO HOT WATER	CYLINDER T/STAT & PROGRAMMER/TIMER	☐	COMBI BOILER	☐
HEATING ZONE VALVES	FITTED	☐	NOT REQUIRED	☐
HOT WATER ZONE VALVES	FITTED	☐	NOT REQUIRED	☐
THERMOSTATIC RADIATOR VALVES	FITTED	☐		
AUTOMATIC BYPASS TO SYSTEM	FITTED	☐	NOT REQUIRED	☐

FOR ALL BOILERS CONFIRM THE FOLLOWING

THE SYSTEM HAS BEEN FLUSHED IN ACCORDANCE WITH THE BOILER MANUFACTURER'S INSTRUCTIONS?	☐
THE SYSTEM CLEANER USED	
THE INHIBITOR USED	

FOR THE CENTRAL HEATING MODE, MEASURE & RECORD

GAS RATE		m^3/hr		ft^3/hr
BURNER OPERATING PRESSURE (IF APPLICABLE)	☐	N/A		mbar
CENTRAL HEATING FLOW TEMPERATURE				°C
CENTRAL HEATING RETURN TEMPERATURE				°C

FOR COMBINATION BOILERS ONLY

HAS A WATER SCALE REDUCER BEEN FITTED?	YES ☐	NO ☐
WHAT TYPE OF SCALE REDUCER HAS BEEN FITTED?		

FOR THE DOMESTIC HOT WATER MODE, MEASURE & RECORD

GAS RATE		m^3/hr		ft^3/hr
MAXIMUM BURNER OPERATING PRESSURE (IF APPLICABLE)	☐	N/A		mbar
COLD WATER INLET TEMPERATURE				°C
HOT WATER OUTLET TEMPERATURE				°C
WATER FLOW RATE				lts/min

FOR CONDENSING BOILERS ONLY CONFIRM THE FOLLOWING

THE CONDENSATE DRAIN HAS BEEN INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS?	YES ☐

FOR ALL INSTALLATIONS CONFIRM THE FOLLOWING

THE HEATING AND HOT WATER SYSTEM COMPLIES WITH CURRENT BUILDING REGULATIONS				☐
THE APPLIANCE AND ASSOCIATED EQUIPMENT HAS BEEN INSTALLED AND COMMISSIONED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS				☐
IF REQUIRED BY THE MANUFACTURER, HAVE YOU RECORDED A CO/CO_2 RATIO READING?	N/A ☐	YES		CO/CO_2 RATIO
THE OPERATION OF THE APPLIANCE AND SYSTEM CONTROLS HAVE BEEN DEMONSTRATED TO THE CUSTOMER				☐
THE MANUFACTURER'S LITERATURE HAS BEEN LEFT WITH THE CUSTOMER				☐

COMMISSIONING ENG'S NAME PRINT _____ CORGI ID No. _____

SIGN _____ DATE _____

12. SERVICE INTERVAL RECORD

SERVICE INTERVAL RECORD

It is recommended that your heating system is serviced regularly
and that you complete the appropriate Service Interval Record Below.

Service Provider. Before completing the appropriate Service Interval Record below, please ensure you have carried out the service as described in the boiler manufacturer's instructions. Always use the manufacturer's specified spare part when replacing all controls

SERVICE 1 DATE
ENGINEER NAME
COMPANY NAME
TEL No.
CORGI ID CARD SERIAL No.
COMMENTS

SIGNATURE

SERVICE 2 DATE
ENGINEER NAME
COMPANY NAME
TEL No.
CORGI ID CARD SERIAL No.
COMMENTS

SIGNATURE

SERVICE 3 DATE
ENGINEER NAME
COMPANY NAME
TEL No.
CORGI ID CARD SERIAL No.
COMMENTS

SIGNATURE

SERVICE 4 DATE
ENGINEER NAME
COMPANY NAME
TEL No.
CORGI ID CARD SERIAL No.
COMMENTS

SIGNATURE

SERVICE 5 DATE
ENGINEER NAME
COMPANY NAME
TEL No.
CORGI ID CARD SERIAL No.
COMMENTS

SIGNATURE

SERVICE 6 DATE
ENGINEER NAME
COMPANY NAME
TEL No.
CORGI ID CARD SERIAL No.
COMMENTS

SIGNATURE

SERVICE 7 DATE
ENGINEER NAME
COMPANY NAME
TEL No.
CORGI ID CARD SERIAL No.
COMMENTS

SIGNATURE

SERVICE 8 DATE
ENGINEER NAME
COMPANY NAME
TEL No.
CORGI ID CARD SERIAL No.
COMMENTS

SIGNATURE

SERVICE 9 DATE
ENGINEER NAME
COMPANY NAME
TEL No.
CORGI ID CARD SERIAL No.
COMMENTS

SIGNATURE

SERVICE 10 DATE
ENGINEER NAME
COMPANY NAME
TEL No.
CORGI ID CARD SERIAL No.
COMMENTS

SIGNATURE

Manufacturer: **Merloni TermoSanitari SpA - Italy**

Commercial subsidiaries:

MTS (GB) LIMITED
MTS Building
Hughenden Avenue
High Wycombe
Bucks HP13 5FT
Telephone: (01494) 755600
Fax: (01494) 459775
Internet: www.mtsgroup.com/uk
E-mail: info@uk.mtsgroup.com
Technical Advice: 0870 241 8180
Customer Service: 0870 600 9888

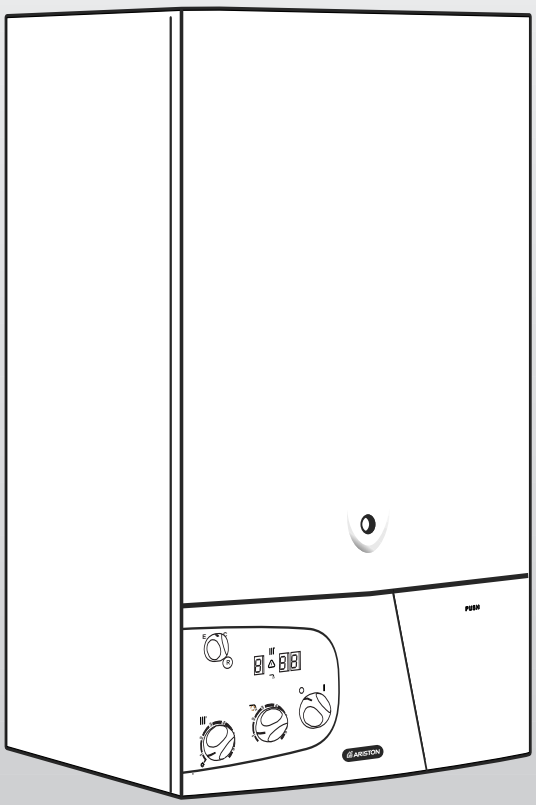
MTS Heating Limited
Damastown Industrial Park
Damastown Avenue
Mulhuddart
Dublin 15
Telephone: (01) 810 3723
Fax: (01) 810 3727
Internet: www.mtsgroup.com/ie
E-mail:info@ie.mtsgroup.com
Technical Advice: (01) 437 0121
Customer Service: (01) 437 0121

099 84 1915 000

micro GENUS HE

End User Manual

microGENUS HE 24 MFFI
microGENUS HE 28 MFFI
microGENUS HE 32 MFFI



ARISTON

benchmark™
COLLECTIVE MARK

The code of practice for the installation, commissioning & servicing of central heating systems

Country of destination: GB

Dear Customer,

Thank you for choosing an ARISTON boiler.
We guarantee that your boiler is a reliable and technically sound product.
This manual provides detailed instructions and recommendations
for proper installation, use and maintenance.
Remember to keep this manual in a safe place for future reference
i.e. by the gas meter.
Your local MTS Servicing Centre is at your complete
disposal for all requirements.

MTS GROUP

The guarantee on this appliance is valid for 24 months from the first day of installation.

Repairs to the electric, hydraulic or gas circuits may be carried out only by your local authorised MTS Servicing Centre.

Every attempt has been made to avoid errors of any kind
in this manual, the Management invites customers to inform
of any inaccuracies which they may find.
This will help to improve our service

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IMPORTANT!
Please read this manual carefully.
For additional information, please consult the "*Installation and Servicing Instructions.*"
Make sure to keep the manuals provided with the appliance so that they can be used by the end-user, installer or our authorised engineer.

1. General Information

MTS (GB) Limited support the benchmark initiative. Your installer will give you, and show you how to use, a Log Book which will give you important information about your boiler, and heating system. Please have this Log Book to hand whenever you contact a service engineer or us.

All CORGI Registered Installers carry a CORGI ID card, and have a registration number. Both should be recorded in your boiler Logbook. You can check your installer is CORGI registered by calling CORGI direct on :- (01256) 372300.

This is a combined appliance for the production of Central Heating (C.H.) and Domestic Hot Water (D.H.W.). This appliance **must be used only** for the purpose for which it is designed. The manufacturer declines all liability for damage caused by improper or negligent use.

Do not allow children or inexperienced persons to use the appliance without supervision.

If you smell gas in the room, **do not** turn light switches on or off, use the telephone or any other object which might cause sparks.

Open doors and windows immediately to ventilate the room.

Shut the gas mains tap (on the gas meter) or the valve of the gas cylinder and call your Gas Supplier immediately.

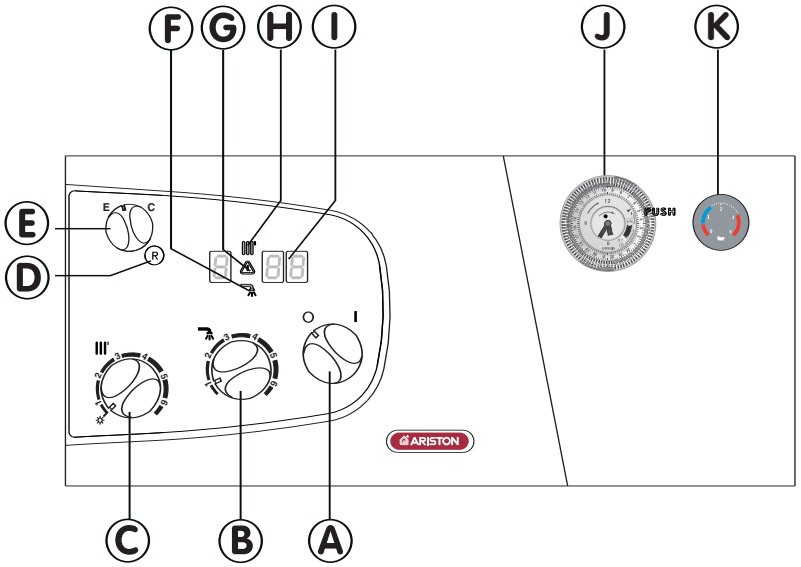
If you are going away for a long period of time, remember to shut the mains gas tap or the gas cylinder valve.

Before any intervention within the boiler it is first necessary to isolate the electrical supply by turning the external switch to "OFF".

Technical Information

		24 kW	28 kW	32 kW
GENERAL DATA				
Heating input max-min (nett)	*kW*	*26.7 - 12.2*	*331.1 - 13.3*	*35 - 13.3*
Heating output max-min (nett)	*kW*	*23.3 - 10.4*	*27 - 11.4*	*30.5 - 11.3*
Efficiency at Maximum Thermal Capacity (see installation instructions)	*%*	*87.4*	*86.7*	*87.1*
CENTRAL HEATING				
Operating Temperature max-min	*°C*	*82 - 42*	*82 - 42*	*82 - 42*
Maximum-Minimum *Heating Pressure*	*bar*	*3-0.7*	*3-0.7*	*3-0.7*
Built-in expansion vessel - Total capacity	*litres*	*7*	*7*	*7*
DOMESTIC HOT WATER				
Maximum-Minimum Temperature of Water for Domestic Use	*°C*	*56-36*	*56-36*	*56-36*
Working pressure max-min	*bar*	*6-0.2*	*6-0.2*	*6-0.2*
Flow rate ΔT 25°C	*l/min*	*13.4*	*15.5*	*17.5*
Flow rate ΔT 35°C	*l/min*	*9.5*	*11.0*	*12.5*
Minimum flow rate	*l/min*	*2.5*	*2.5*	*2.5*
ELECTRICAL DATA				
Electrical Supply/ Frequency	*V/Hz*	*230/50*	*230/50*	*230/50*
Power Consumption	*W*	*120*	*148*	*148*
Protection of Electrical System	*IP*	*X4D*	*X4D*	*X4D*
CATEGORY				
Nominal Pressure Methane Gas (G20)	*mbar*	*20*	*20*	*20*
Nominal Pressure Liquid Gas (G30-G31)	*mbar*	*28/30-37*	*28/30-37*	*28/30-37*

CONTROL PANEL



LEGEND:

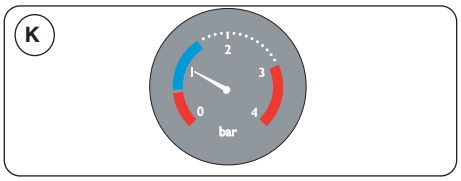
A - On/Off Button
B - Domestic Hot Water Temperature Adjustment
C - Central Heating Temperature Adjustment
D - Reset Button/Flue Test analysis mode*
E - Comfort Mode Selector
F - Summer Mode LED (Green)
G - Ignition/Overheat Lockout LED (Red)
H - Central Heating (Winter Mode) LED (Green)
I - Digital Display (Fault Code/Water Temperature)
J - Time Clock
K- Central Heating System Pressure Gauge

* ***Warning!*** *the flue analysis mode must only be selected by a qualified service engineer.*

2. OPERATING INSTRUCTIONS

CAUTION

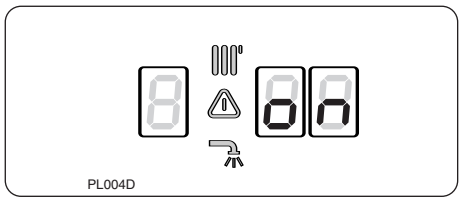
Installation, start-up, adjustments and maintenance must be performed by a competent person only, in accordance with the current Gas Safety (Installation & Use) Regulations and the instructions provided. Improper installation may cause damage or injury to individuals, animals and personal property, for which the manufacturer will not be held liable.
To ensure efficient and safe operation it is recommended that the boiler is serviced annually by a competent person.
If it is known or suspected that a fault exists on the appliance, it must not be used until the fault has been corrected by a competent person.



HELPFUL SUGGESTIONS

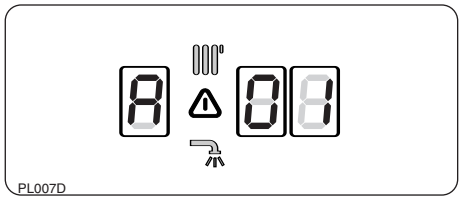
To get the most out of your boiler, we have provided you with some useful advice on proper use and maintenance:
- Periodically check the system pressure using the pressure gauge **"K"**, make sure that the pressure is between 1.0 and 1.5 bar (the blue part on the gauge) when the system is off and cool. The display will indicate **"E 02"** if the pressure is below the minimum recommended value. Consult your installer for checking and refilling the system.
- The outer panels of the unit's case must only be cleaned with a damp cloth. Do not use abrasive cleaners. The control panel can be wiped with either a damp or dry cloth. Spray polishes must not be used on the control panel surface or knobs. Care must be taken in preventing any liquid entering the appliance.

PRACTICAL TIPS

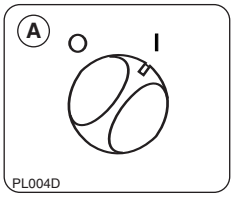


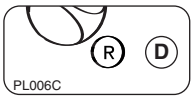
- If the water is very hard, it is recommended that a water softener be added to the system so as to reduce the formation of limescale in the boiler exchangers. This will ensure that the efficiency of the unit remains the same over time, reducing gas consumption and maintenance costs.
- If the boiler should be out of use for a prolonged period, it is recommended that the electrical power supply be disconnected and that the external gas cock be closed. If low temperatures are expected, the boiler and system pipe work should be drained in order to prevent frost damage.
- To improve comfort and take full advantage of the heat produced by the boiler, it is recommended that an external (room) thermostat be installed.
- It is good practice to clean and service the appliance and central heating system every year. Call an Authorised Service Centre.

IGNITION PROCEDURE

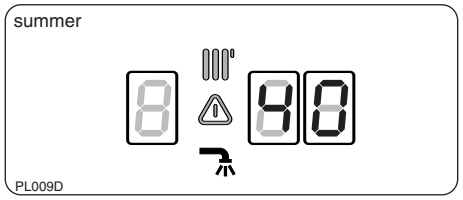


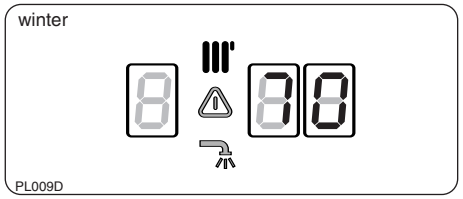
Turn the selector knob **"A"** to the "I" position. The display will indicate **"on"** indicating that the boiler is ready to operate. The electronic control unit will ignite the burner, without any manual intervention but in response to the request for Domestic Hot Water or heating. If, after approximately 10 seconds, the burner has not ignited, the boiler safety devices will shut off the gas and the display will indicate the fault code A01. To reset the ignition system, the reset button **"D"** must be pressed and released. Should the boiler fail to ignite a second time, check that the external gas cock is open. If the problem persists, contact an Authorised Service Centre.



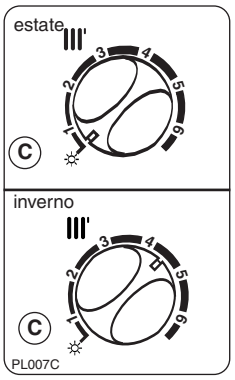


WINTER AND SUMMER OPERATING MODES

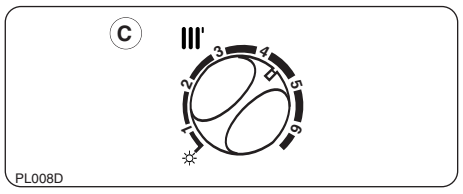




In the 'winter' operating mode, the boiler will produce both Central Heating and Domestic Hot Water. In the 'summer' operating mode, the boiler will produce only Domestic Hot Water.
Using the knobs on the control panel, the user can select 'winter' or 'summer' operating mode.
Keeping the knob **"C"** at the " ☼ " position selects the 'summer' operating mode, the simbol " ⚑ " will illuminate. 'Winter' operating mode may be selected by positioning the knob **"C"** between the min. and max. settings. The simbol " ≡ " will illuminate.

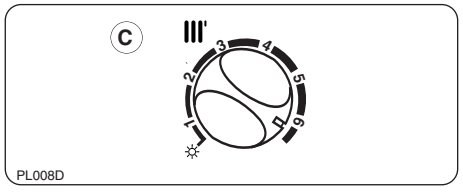


ADJUSTING THE HEATING



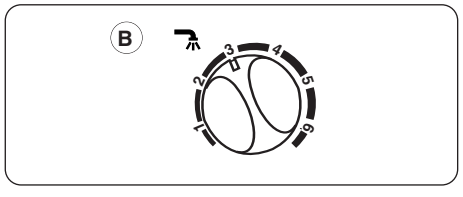
It is possible to set the temperature of the Central Heating system by adjusting the knob **"C"**. By positioning the indicator somewhere between min. and max., a temperature may be obtained which varies from approximately 45˚C to about 80˚C.
The water temperature in the primary circuit may be checked on the display.

EXTERNAL (ROOM) THERMOSTAT CONTROL

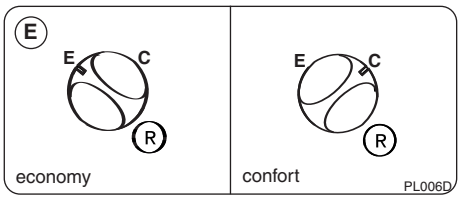


If an external (room) thermostat is installed, it is recommended that the temperature of the Central Heating system be set by means of the **"C"** knob, leaving it at max in order to obtain the best performance from the boiler and to allow the regulation of the external temperature to function efficiently.

SETTING THE HOT WATER FOR DOMESTIC USE

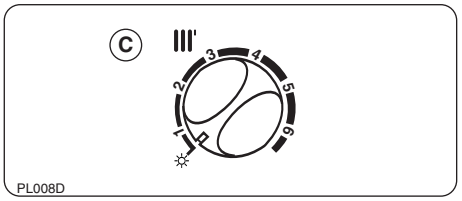


Both in the winter and summer mode, the temperature of the Domestic Hot Water may be adjusted by using the **"B"** knob. A delivery temperature for the water may be chosen in a range from 36˚C to about 56˚C, depending on the flow rate of the water and the position of the knob between the min. and max. settings.
The water temperature in the primary circuit may be checked on the display.



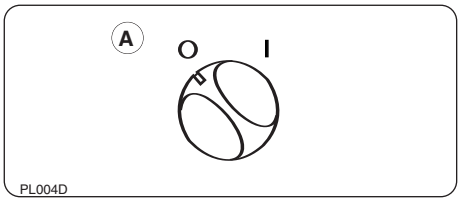
Economy/comfort mode

The selector knob **"E"** allows the user to choose the economy mode (position "E") or the comfort mode (position "C").
The economy mode is the normal state for the operation of the boiler, since the domestic water is heated up only when a tap is turned on.
The comfort mode is a special operating state, because the water contained in the secondary exchanger and in the primary exchanger is kept in a pre-heated condition, thereby allowing a quicker delivery of Domestic Hot Water when required.



Turning off the central heating

To turn off the Central Heating, rotate the **"C"** knob to the "0" position.
The boiler will stay in 'summer' mode, providing Domestic Hot Water on request.



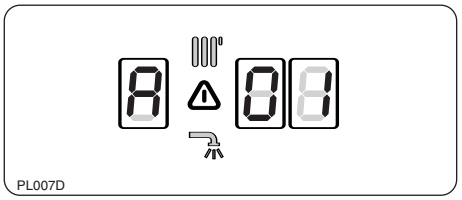
Turning off the boiler

To turn the boiler off, rotate the selector knob **"A"** to the "0" position (OFF); the display will go off. Close the gas cock located under the boiler and turn the electricity supply switch (located outside the boiler) to the OFF position.

3. USEFUL INFORMATION AND TROUBLESHOOTING

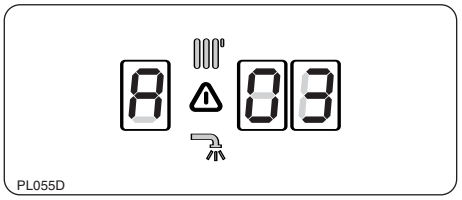
Boiler shutdown situations

The boiler is equipped with safety devices that intervene in certain situations and shut it off. Most of these situations are signalled by means of the L.E.D.s and in some circumstances the user may be able to remedy them.



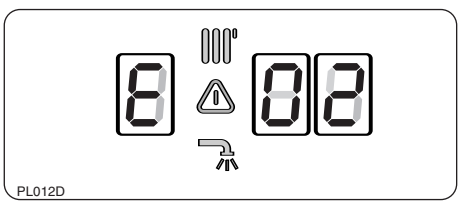
Shutdown Due to Ignition Failure

This anomaly is indicated by **"A 01"** on the display. To reset the boiler, press and then release the **"D"** button.
At this point, the electronic ignition system will attempt to light the burner again. **Should the boiler fail to ignite a second time, check that the external gas cock is open. If the problem persists, contact an Authorised Service Centre.**



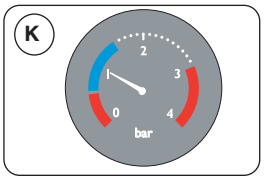
Shutdown Due to Overheating

This anomaly is indicated by **"A 03"** on the display. The boiler has shutdown because the safety thermostat detected that the boiler temperature has exceeded the maximum limit.
To reset this state, wait until the boiler has cooled and press the button **"D"**.
If the safety thermostat operates on a frequent basis, contact one of our Authorised Service Centres.



Shutdown Due to Insufficient Water Circulation

This anomaly is indicated by **"E 02"** on the display.
One of the possible causes of this shutdown situation could be the lack of water in the boiler or water circulation failure in the primary heating circuit.
Check the system pressure on the pressure gauge **"K"** and, if it is less than 0.5 bar, try bringing the system pressure up to a mean value of 1.0 bar by opening the water inlet valve. Then reset by turning the boiler off and then back on by pressing the button **"D".**



Other Shutdown Situations

Should a shutdown situation indicated on the display by the following letters and figures occur, E04, E05, E06, E07, E08, E09, E20, E21, E33, E34 contact one of our Authorised Service Centres.

If instead the display shows one of the shutdown situations indicated by the following letters and figures, A77, A78, A97, A98, A99, try resetting the boiler by pressing the reset button **"D"**. If the boiler shuts off again, contact one of our Authorised Service Centres.

ANTI-FROST DEVICE

The boiler is fitted with a device which, in the event that the water temperature falls below 8˚C the pump activates and runs until a temperature of 18˚C is attained. In the event that the water temperature falls below 3˚C, the diverter valve switches to Domestic Hot Water and the burner fires and runs on minimum power until a temperature of 33˚C is attained. This device is only activated when the boiler is operating perfectly and

- the system pressure is sufficient;
- the boiler is powered electrically;
- gas is being distributed.

4. MAINTENANCE

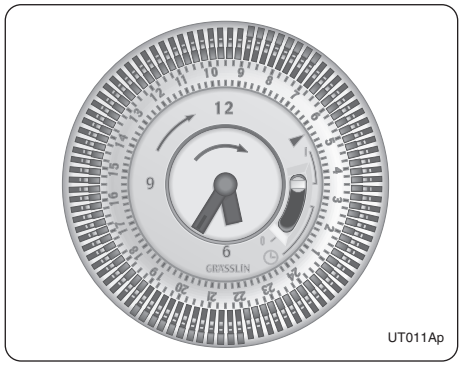
Schedule an annual maintenance check-up for the boiler with a CORGI registered Service Engineer.

Correct maintenance always results in savings in the cost of running the system.

5. CHANGE OF GAS TYPE

Our boilers are designed to function either with Natural Gas (methane) or L.P.G. gas. If you need to changeover from one gas to the other, one of our Authorised Service Centres should be contacted.

6. TIME CLOCK



aNOTE: the time clock is for central heating control only.
The time clock is provided with 96 switches, called riders, each of which covers a time interval of 15 minutes (four per hour).
When a rider is switched from the inside (off setting) to the outside of the clock border (on setting), the circuit is closed (switch on) for a period of 15 minutes and then the boiler starts if the room thermostat (if installed) or the heating thermostat require heat (heating function on).

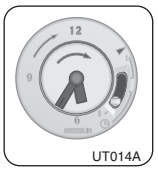
EXAMPLE
To set the heating of your home in the time interval from 7.00 am to 9.30 am and from 7.00 pm to 10.00 pm every day:
- rotate the outer ring of the clock in a clockwise direction until the correct time of day (24h) lines up with the arrow on the clock (at approx. 2 o'clock position);
- **under no circumstances should the minute hand be moved manually**;
- make sure all the switches, i.e. the riders, are placed on the inside of the clock border;
- pull outward the riders for 7.00 am and 9.30 am, and then all riders between these two;
- repeat this for 7.00 pm and 10.00 pm.

Other heating intervals may be set in the same way.
The timer has approximately 150 hours of battery back up for power failure.

The clock is provided with a selector switch with three positions (see figure):

1. **Position "I"** CONSTANT: in this position, the clock circuit is always closed (switch on), therefore the boiler will constantly be on and will only shut off upon the request of the room thermostat (if installed) or the heating thermostat;

2. **Position "O"** HEATING OFF: in this position, the clock circuit is always open (switch off) and the boiler will therefore never ignite for heating;



3. **"Central" Position** PROGRAMMING ACTIVE: in this position, the programming set by the user is active.

TECHNICAL DATA

Ambient temperature:	- 10°C to + 55°C
Running reserve:	150 h (not for 1.5 V DC)
Shortest switching time:	15 minutes
Programmable:	Every 15 minutes

Manufacturer: **Merloni TermoSanitari SpA - Italy**

Commercial subsidiary: **MTS (GB) LIMITED**
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ARISTON

SPARE PARTS EXPLODED VIEW
GAS WALL BOILERS

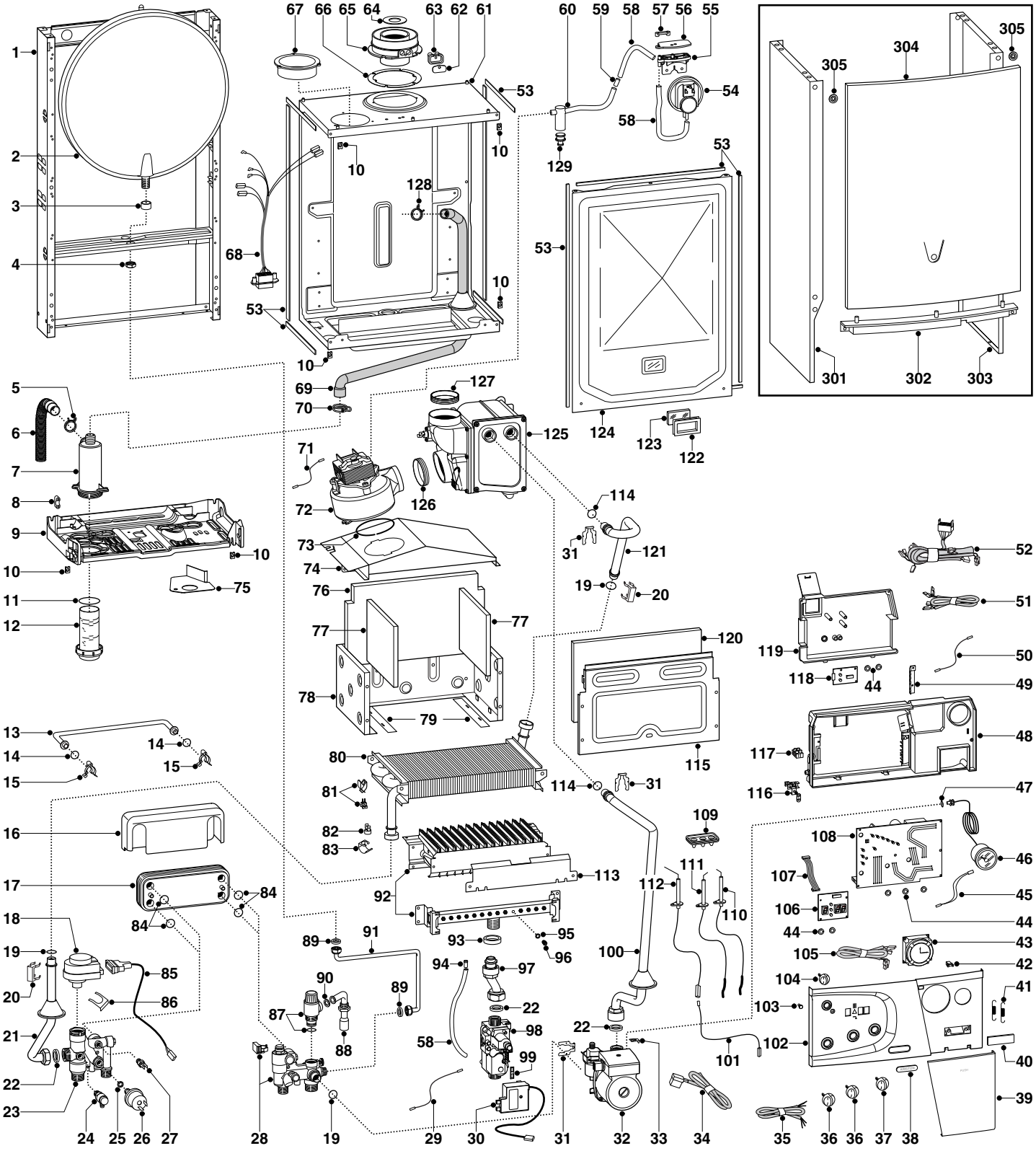
Models

MICROGENUS 24 MFFI HE
MICROGENUS 28 MFFI HE
MICROGENUS 32 MFFI HE

Edition 1 of 10 November 2004

PROFESSIONAL TEAM

ER20042100470010001



MODEL	CODE	SERIAL NO. VALIDITY	REF.
MICROGENUS 24 MFFI HE (UK) NG	3300025	2320429900001	A
MICROGENUS 28 MFFI HE (UK) NG	3300015	2320429900001	B
MICROGENUS 32 MFFI HE (UK) NG	3300026	2320429900001	C

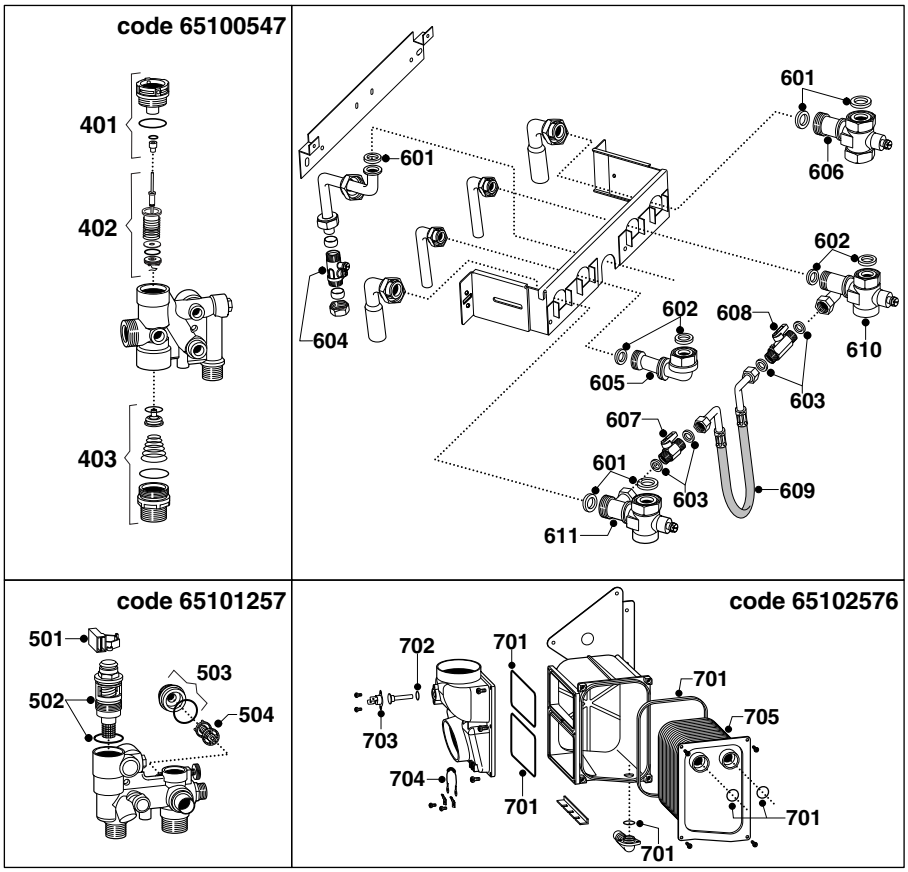
ER20042100470001001

PART.	CODE	DESCRIPTION	REF.	NOTE
1	------	Frame		11
2	998616	Expansion vessel		
3	998776	Bush (expansion vessel)		
4	998581	3/8" lock nut		
5	990662	Clamp		
6	990665	Discharge pipe (condensate)		
7	65102548	Condensate trap (upper)		
8	571562	Cable clamp		
9	------	Hydraulic group support		11
10	570717	Spring (fastening) (5 pcs)		
11	990695	O-ring(condensate trap-3175 EPDM D=44.9)		
12	65102070	Condensate trap (lower)		
13	65100684	By-pass pipe		
14	998077	O-ring gasket (20 pcs)		
15	998064	Spring (by-pass pipe) (10 pcs)		
16	65100706	Cover insulation (secondary exchanger)		
17	998483	Secondary exchanger (p-type 30Kw)		
18	997147	Motor (3-Way valve)		
19	998424	O-ring (C=4 D=17,04) (10 pcs)		
20	61010609	Fixing spring (exchanger pipe)		
21	65100682	Delivery pipe		
22	573520	Gasket 3/4" (25 pcs)		
23	65100547	3-way-pressure gauge valve group		
24	573727	Drain valve		
25	569390	Gasket 1/4" (25 pcs)		
26	995903	Low water pressure switch		
27	998458	Temperature probe (D.H.W.)		
28	65101257	Return group		
29	65100704	Earth cable (valve)		
30	65100249	Spark generator		
31	65102587	Clip d.18		
32	65101417	Pump		
33	65100680	Clips		
34	65101353	Cable (P.C.B./pump)		
35	65100699	Cable (power supply)		
36	65100687	Knob (D.W.H./C.H.)		
37	65100690	Knob (On-Off)		
38	------	Adhesive plate		11
39	65100686	Control panel cover		
40	------	Name badge		11
41	65100678	Fixing spring (panel)		
42	65100676	Push (case door) (5 pcs)		
43	999599	Clock		
44	569711	Nylon bush (10mm - 20 pcs)		
45	65100677	Safety wiring		
46	65100695	Pressure gauge		
47	998517	Gasket (20 pcs)		
48	------	Control panel		11
49	------	Cable clamp		11
50	65100705	Cable (earth)		
51	65100698	Low voltage wiring		
52	65102559	Low voltage wiring		
53	65100879	Seal (combustion chamber - 10x6)		
54	65102164	Air pressure switch		
55	990373	Support (air pressure switch)		
56	65101317	Gasket (air pressure switch) (25 pcs)		
57	573329	Pressure intake cover		
58	65102166	Silicone pipe		
59	65102584	Joint (condensate pipe)		
60	65102560	Anticondensate		
61	------	Sealed chamber		11
62	998565	Cover (flue test point)		
63	998636	Gasket (flue test point - 5 pcs)		
64	995315	Restrictor (flue-exhaust manifold-D=41)	B	
64	999980	Restrictor (flue-exhaust manifold-D=43)	C	
64	65102561	Restrictor (flue-exhaust manifold-D=40)	A	

PART.	CODE	DESCRIPTION	REF.	NOTE
65	990678	Flue (exhaust manifold / header)		
66	998637	Gasket (flue collar - 5 pcs)		
67	998595	Plug (air intake)		
68	65102562	Wiring		
69	65102563	Discharge pipe (condensate)		
70	65102564	Clamp		
71	65101271	Earth cable (fan)		
72	65102566	Fan	BC	
72	65102567	Fan	A	
73	990368	Seal (silicone - D=5 mm)		
74	65102568	Flue hood		
75	65101393	Support		
76	65100531	Panel (insulation - rear)		
77	992199	Panel (insulation - RH-LH Side)		
78	------	Combustion chamber		11
79	------	Plate (combustion chamber)		11
80	65102586	Main exchanger	A	
80	65102585	Main exchanger	BC	
81	990686	Temperature probe + clip (C.H. - T335D)		
82	996065	Thermostat (overheat- 103°C)		
83	65102550	Fixing spring (thermostat) (10 pcs)		
84	573825	O-Ring (secondary exchanger - 10 pcs)		
85	65100700	Motor cable		
86	997077	Fixing clip (motor)		
87	997088	Safety valve (3 bar)		
88	65101392	Pipe (safety valve outlet)		
89	573521	Gasket 3/8" (25 pcs)		
90	573528	Gasket 1/2" (25 pcs)		
91	65100681	Pipe (expansion vessel)		
92	65100714	Burner		
93	569443	Silicone seal		
94	573325	Rivet (20 pcs)		
95	572138	Burner jet washer (20 pcs)		
96	998433	Burner jet (NG 1.30) (10 pcs)		
97	65102569	Gas pipe		
98	65100244	Gas valve		
99	574279	Gasket (spark generator) (5 pcs)		
100	65102570	Pipe (C.H. return)		
101	996119	Cable (detection)		
102	65101277	Control panel		
103	65100688	Button (reset)		
104	65100689	Knob		
105	65101394	Connection cable (time clock)		
106	65100709	P.C.B. (CMP3-display)		
107	65100697	Display cable		
108	65102571	P.C.B.		
109	998147	Ignition electrode cable rubber		
110	65100693	Electrode (Ignition R.H.)		
111	65100694	Electrode (Ignition L.H.)		
112	65100692	Electrode (Detection)		
113	65101275	Inter ignition blade		
114	65102589	O-ring		
115	65100524	Front sealed chamber panel		
116	------	Terminal board		11
117	571787	Terminal board (two pole)		
118	65102572	P.C.B. (water sensor)		
119	65101460	Control panel cover		
120	65100530	Panel (insulation - front)		
121	65102573	Pipe (recuparator - main exchanger)		
122	998076	Gasket (sight glass)		
123	998075	Sight glass		
124	65101606	Panel (front - sealed chamber)		
125	65102576	Recuperator (complete)		
126	573343	Gasket (fan)		
127	65102565	Gasket (fan)		
128	65102575	Clips		

PART.	CODE	DESCRIPTION	REF.	NOTE
129	**65102574**	Plug		
301	**65101352**	Case panel (L.H. side)		
302	**998596**	Insert case		
303	**65101351**	Case panel (R.H. side)		
304	**998607**	Panel (front case)		
305	**995305**	Washer (20 pcs)		
801	**998716**	Burner jet full kit (NG - 15 pcs)		12
802	**998717**	Burner jet full kit (LPG - 15 pcs)		12

NOTE	DESCRIPTION
11	Not supplied as a spare part
12	Not illustrated



PART.	CODE	DESCRIPTION	REF.	NOTE
401	**998974**	Heating actuator bush		
402	**998975**	3-Way spring kit (D.H.W.)		
403	**998718**	3-Way spring kit (C.H.)		
501	**65100540**	Flow detection kit with magnet		
502	**65100541**	3-Way spring kit (D.H.W.)		
503	**65100869**	Union with O-ring		
504	**65100776**	Central heating by-pass kit		
601	**573520**	Gasket 3/4" (25 pcs)		
602	**573528**	Gasket 1/2" (25 pcs)		
603	**573521**	Gasket 3/8" (25 pcs)		
604	**571000**	Isolating valve (gas inlet)		
605	**998406**	Union 1/2" (D.H.W. outlet)		
606	**999582**	Isolating valve (3/4" return)		
607	**990742**	Tap (M/M 3/8" - C.H. flow)		
608	**65102016**	Tap (M/M 3/8" inc.non-return-C.W. inlet)		
609	**990737**	Filling loop pipe		
610	**995485**	Isolating valve 1/2" (C.W. inlet)		
611	**995486**	Isolating valve 3/4" (C.H. flow)		
701	**65102581**	Gasket (recuperator)		
702	**65102580**	O-ring (5 pcs)		
703	**573747**	Limit thermostat		
704	**65102578**	Element		
705	**65102577**	Exchanger (recuperator)		