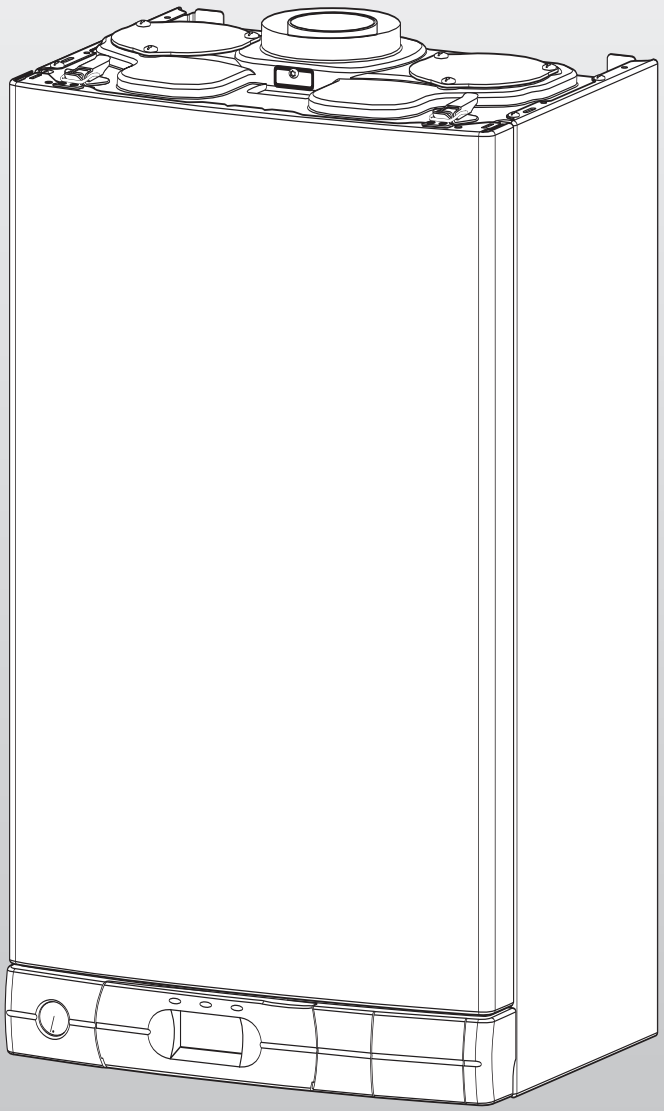
SYSTEM A

Installation, Servicing and Operating Instructions

Type C Boilers

SYSTEM A 24 MFFI G.C.N: 41-116-14
SYSTEM A 30 MFFI G.C.N: 41-116-15

LEAVE THESE INSTRUCTIONS WITH THE END USER



ARISTON

Country of destination: GB/IE

CE WRAS APPROVED PRODUCT benchmark

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

These instructions are suitable for the SYSTEM A boilers :

MTS (GB) Limited supports Benchmark, the heating industry code to ensure the correct installation, commissioning and servicing of domestic central heating systems.

To The Householder

Make sure that your installer completes Section 24 of this manual (page 61), this provides a record of the commissioning of your boiler.

It contains important information about your particular installation that may be required by service engineers. It will also provide contact details for the installer should you need guidance in the use of this appliance or if there are any problems.

As with your car, your boiler will work more reliably and efficiently if regularly serviced. We recommend an annual service check. The service history of the appliance must be recorded in Section 25 of this manual (page 62).

In the unlikely event of any problems with your boiler or system you should first contact your installer. If your installer cannot resolve the problem he should telephone our national service helpline.

A charge may be made if Ariston Service is called out to resolve a non-product related fault.

Your statutory rights are not affected.

To The Installer

As part of the commissioning of this appliance it is necessary to complete Section 24 of this manual (page 61) and give this manual to the Householder. Please ensure that your customer is aware of the importance of keeping this manual safe as a record of the installation (Section 24, page 61) and the appliance service history (Section 25, page 62).

Please ensure that your customer is aware of the correct operation of the system, boiler and controls.

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

CUSTOMER CARE

The MTS Group, as a leading manufacturer of domestic and commercial water heating appliances is committed to providing high quality products and a high quality after sales service.

Advice on installation or servicing can also be obtained by contacting the Ariston Technical and Customer Service Departments on:

TECHNICAL DEPARTMENT

Tel: 0870 241 8180

Fax: 01494 459775

CUSTOMER SERVICE DEPARTMENT

Tel: 0870 600 9888

Fax: 01494 459775

GUARANTEE

The manufacturer's guarantee is for 2 years from the date of purchase. The guarantee is invalidated if the appliance is not installed in accordance with the recommendations made herein or in a manner not approved by the manufacturer. To assist us in providing you with an efficient after sales service, please return the guarantee registration card enclosed with the boiler without delay.

CAUTION

In the United Kingdom, 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.

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 Buidling Regulations, reference should also be made to the current ETCI rules for electrical installation.

All CORGI registered installers carry a CORGI ID card, and have a registration number. Both should be recorded in the Benchmark Commissioning Checklist (Section 24 - page 61). You can check your installer is CORGI registered by calling CORGI direct on:- (01256) 372300.

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 that a fault exists on the appliance, it must not be used until the fault has been corrected by a competent person.

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INTRODUCTION

The **SYSTEM A** is a fully automatic, wall mounted, low water content condensing system boiler. It is a room sealed, fan assisted, appliance providing central heating. It has electronic ignition and is suitable for all modern electrical control systems. The boiler has been designed for domestic use on sealed systems only. A circulating pump, expansion vessel together with a pressure gauge and safety valve are included within the boiler.
The standard horizontal flue kit is suitable for lengths 300 mm minimum to 815 mm maximum (see pages 19 & 20) and includes an elbow adapter that can be rotated through 360° . The horizontal flue can extend up to 5 metres (Ø60/100) and 10 metres (Ø80/125) using 1 metre flue extension kits. 45° and 90° flue bends are also available as accessories, for more information on the fitting of the flue kits and the suitable flue runs, please refer to Section 12 Connecting the Flue (page 19).

USER'S INSTRUCTIONS

1. Control Panel

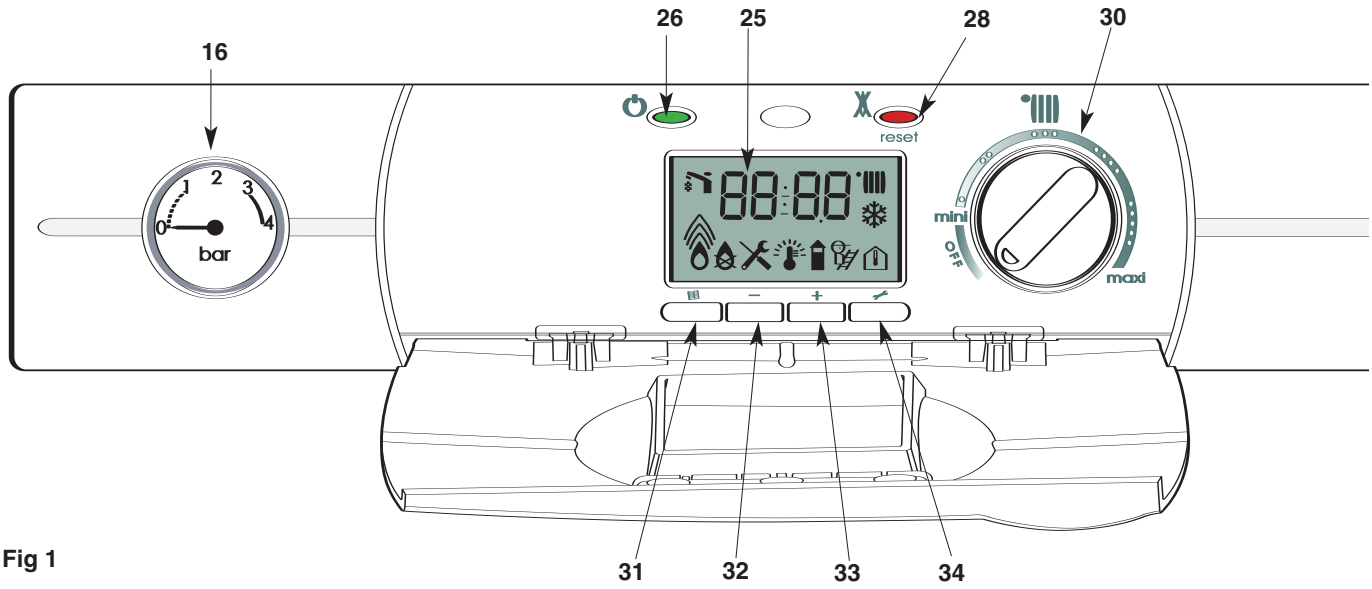


Fig 1

Control panel (Fig.1)

16.- Pressure Guage
25.- Display
26.- On/off push button and power on indicator light
28.- Reset push button and red indicator lockout light
30.- Central Heating control knob and temperature setting
31.- Menu key
32.- Reducing key
33.- Increasing key
34.- Setting key

Connecting bracket

Taps shown in Open position (Fig. 2)

39 : Gas service tap
41 : Central heating flow isolating valve
42 : Central heating return isolating valve
43 & 44: Filling taps
45 : Filling loop

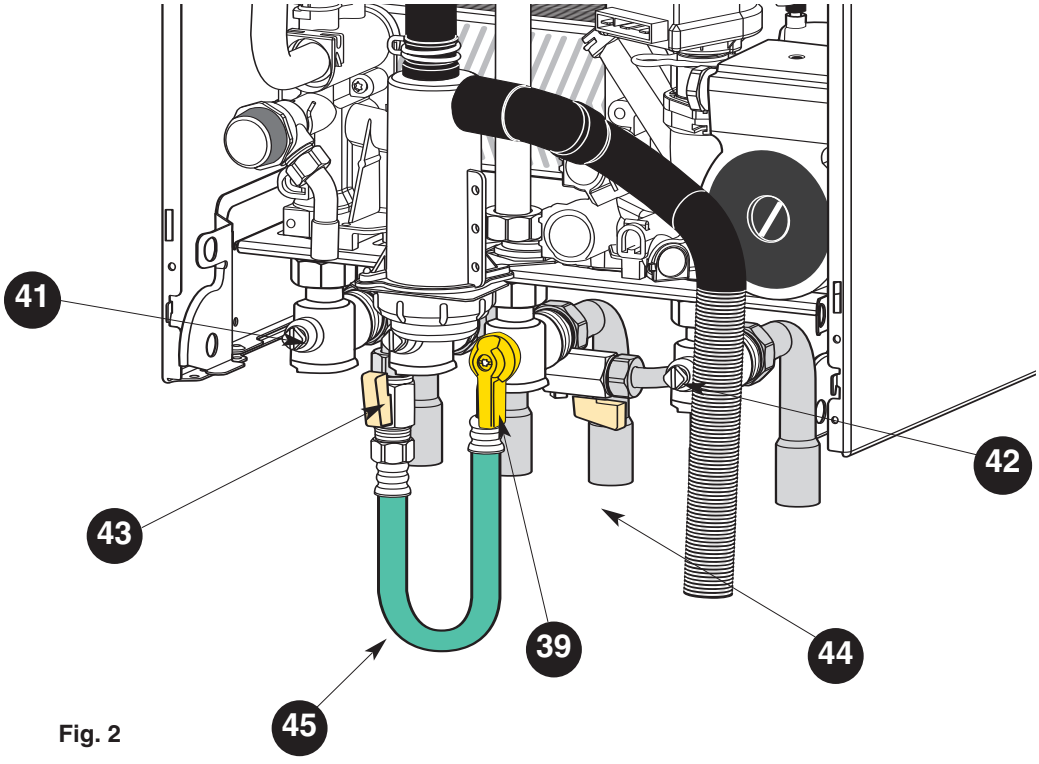


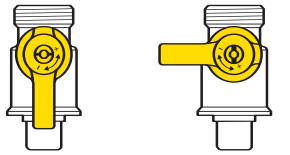
Fig. 2

2. How to Use

Switching on

1. Check that the pressure in the central heating system is above 0.7 bar and below 1.5 bar on the pressure gauge **16** (Fig. 1) should it be neccessary to re-pressurise the system, ensure the filling loop **45** (Fig. 2) is attached, open the filling taps **43** & **44** (Fig. 2), the pressure gauge will now start to rise, once the pressure reads 1.0 bar, close the filling taps and disconnect the filling loop, periodically check the pressure gauge for correct pressures.
2. Check that the gas service tap is opened at the gas meter and main power is on. Green indicator **26** (Fig. 1) lit.
3. Open the gas tap **39** (Fig.2).
4. The boiler is now ready to use.

NOTE: If the boiler is left off for a long time, some air in the gas pipe can hinder the first lighting attempt, (please refer to Section 20 Incorrect Operation, page 56).



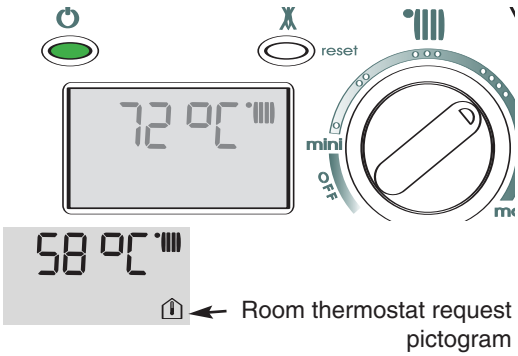
Time setting

You can set the time by using the keys underneath the display.
Press the setting key for 5 seconds. The hour digits on the display will begin to flash. Set the correct time by using the ⊕ or ⊖ keys. To alter the minutes, press the setting key again, the minute digits will begin to flash. Set the correct time by using the ⊕ or ⊖ keys, once the correct time has been set, press the setting key once more to accept the time.

Note: This is not a timer for Central Heating control.

To obtain heating

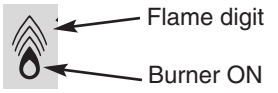
Turn the Central heating knob (**30** Fig.1**)** between mini and maxi.
During the setting flashes and displays the temperature the knob has been set to.



The flashing will continue for a while after the setting and the display will then indicate one of the following :
- the heating temperature when the room thermostat is ON (Calling).
- the time when the room thermostat is OFF (Satisfied).

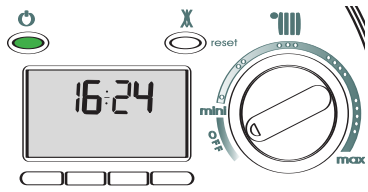
BURNER ON and output level

Burner operation is indicated by the symbol. The output of the burner is then indicated by the flame digits above the burner symbol.



Stand by mode

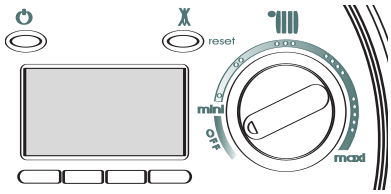
Turn the control knob **30** (Fig. 1) to the **OFF** position to deactivate the Central Heating. Leave the ON/OFF button (**26** Fig. 1) On (green light).
During the stand by mode the display indicates the time, the anti-sieze and anti-frost functions will remain active.



Switch OFF

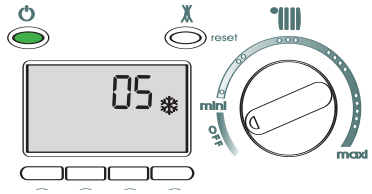
Press the ON/OFF button (26 Fig.1) the green light will go out.

IMPORTANT: WHILE THE BOILER HAS BEEN SWITCHED OFF THE CENTRAL HEATING, ANTI-FROST AND ANTI-SIEZE OPERATIONS WILL BECOME INACTIVE. THE BOILER IS STILL ALSO CONNECTED TO THE MAINS ELECTRICAL AND GAS SUPPLIES.



Anti-freeze and anti-sieze modes

Provided the ON/OFF button is on (green light), the water pressure is adequate and the boiler has not shut down due to an error, the anti-freeze and ant-sieze operations will remain active.
When the anti-freeze comes on, one of two codes will be displayed with the snowflake pictogram ❄ .
The two possible codes are 05 (pump anti-freeze) or 06 (burner anti-freeze).



05 (Pump anti-freeze):
When the boiler senses a temperature of 8°C or lower, the pump will run for 2 minutes, the boiler will then check if the flow temperature is higher than 8°C. Should the temperature still be between 3°C and 8°C the above process will be repeated a maximum of 10 times, after this the burner will light and run until a temperature of 33°C is detected (see 06 Burner anti-freeze below).

06 (Burner anti-freeze):
When the boiler senses a temperature of 3°C or lower, the boiler will fire at minimum power until a temperature of 33°C is achieved, the pump will run for 2 minutes after the burner is switched off.

Anti-sieze mode
The anti-sieze mode will activate the pump for 1 minute everytime the boiler has been inactive for 23 hours.

Note: The anti-freeze and anti-sieze modes will be automatically overriden as soon as there is a demand for heaing from the room thermostat or cylinder thermostat.

The anti-freeze functions will only protect the boiler from freezing, to protect the Central Heating system it will be necessary to leave the boiler powered, the Central Heating knob turned on and the room thermostat set to its anti-frost setting (usually between 5°C and 10°C).

3. Maintenance

As with your car, your boiler will work more reliably and efficiently if regularly serviced. We recommend an annual service check. The service history of the appliance will be marked in the Service Interval Record (**Section 25, Page 61**).

4. Guarantee

The manufacturer`s guarantee is for 2 years from the date of purchase. The guarantee is voidable if the appliance is not installed in accordance with the recommendations made herein or in a manner not approved by the manufacturer. To assist us in providing you with an efficient after sales service, please return the guarantee registration card enclosed with the boiler without delay.

5. Practical information

Cleaning the casing and control panel
Should it be necessary to clean the casing and control panel, do so only with a damp cloth, do not use any spray polishes or cleaners.

Precaution to avoid freezing
We recommend that you contact your installer or local service centre for further advice on the actions to be taken to avoid the system freezing (should the boiler be turned off at the mains isolator)

• **CH system**

Choose one of the following solution :
- 1) Drain the Central Heating system completely
- 2) Protect the Central Heating system with anti freeze chemical products and periodically check the concentration
- 3) Leave the Heating mode switched on and set the room thermostat to anti-freeze mode (between 5 and 10°C)
- 4) Leave your boiler in stand-by mode, the anti-freeze device will switch on the pump and the burner if necessary.

• **DHW system**
Turn off the main cold water supply and drain the cylinder.

6. Setting the Time Clock

6.1 Setting the Mechanical Clock

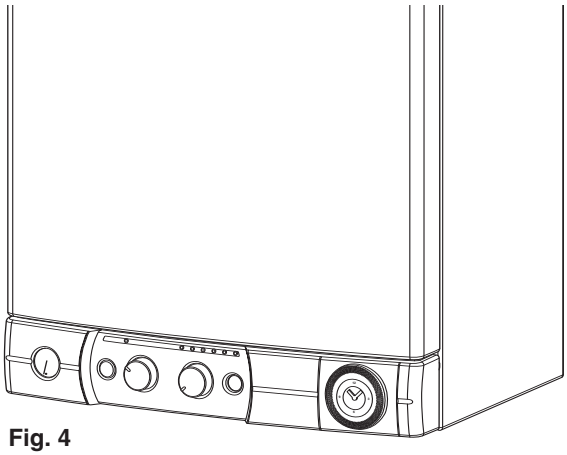


Fig. 4

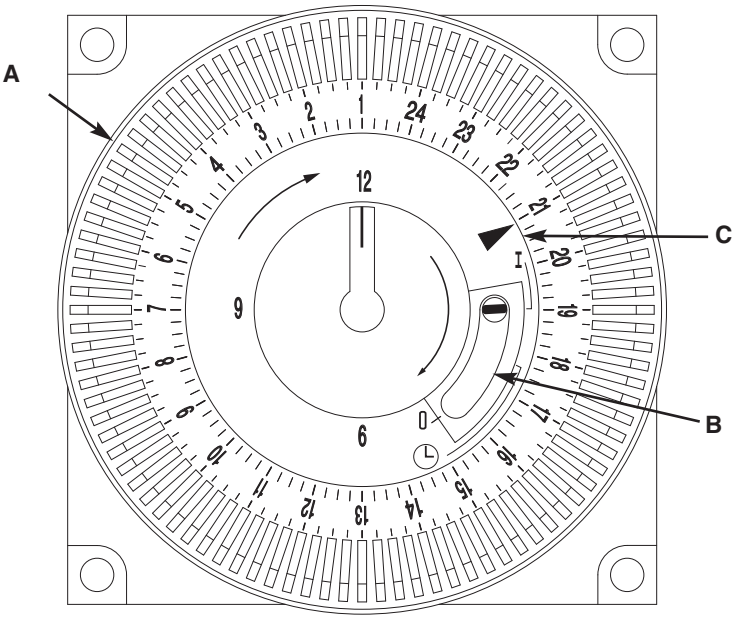


Fig. 5

1. General layout
The mechanical clock covers a 24 hour period. Each tappet represents 15 minutes **A** (Fig. 5). An override switch is located on the clock **B** (Fig 5).

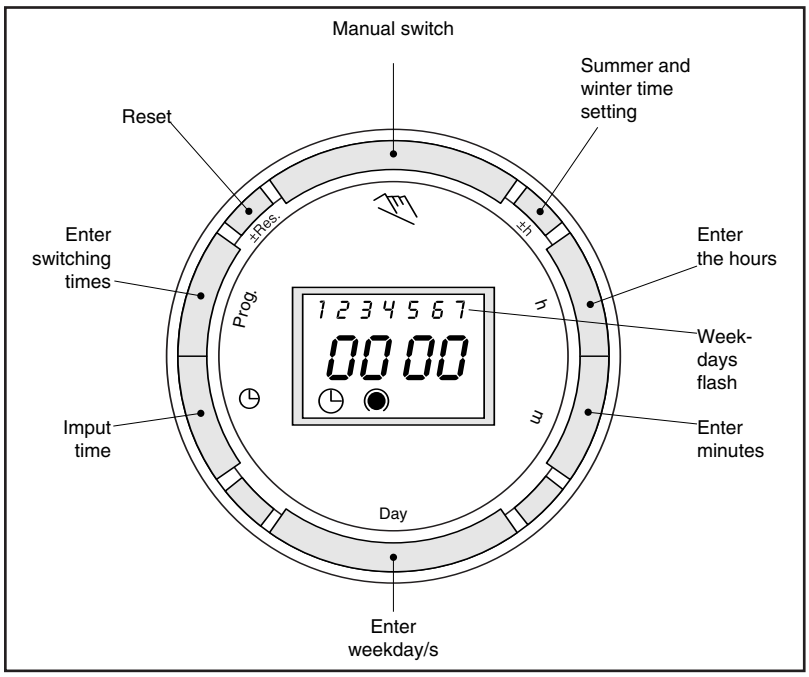
2. To set the time
To set the time of day, grasp the outer edge of the dial and turn slowly clockwise until the correct time is lined up with the arrow **C** (Fig. 5).

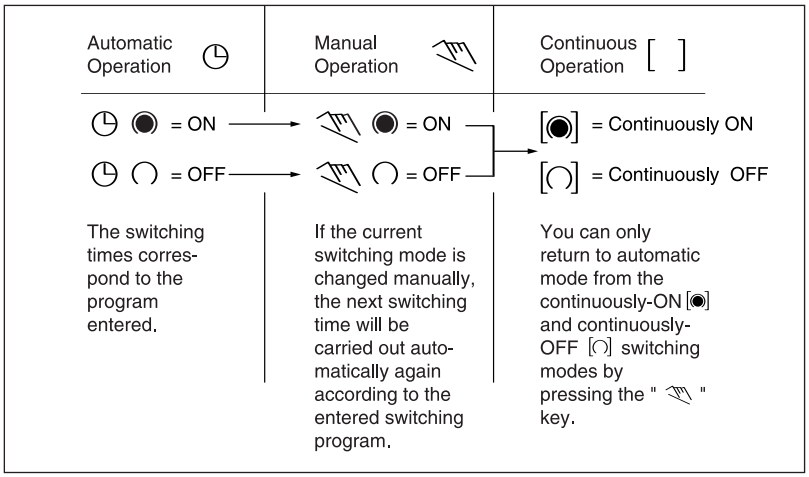
3. To Set the "On" and "Off" times
The clock uses a 24 hour system e.g. 8 = 8.00 am and 18 = 6.00 pm "ON" periods are set by sliding all tappets between the "ON" time and the "OFF" time to the outer edge of the dial.The tappets remaining at the centre of the dial are the "OFF" periods.

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

6. Setting the Time Clock (continued)

6.3 Setting the Digital 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.

6. Setting the Time Clock (continued)

► **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.

7. Description

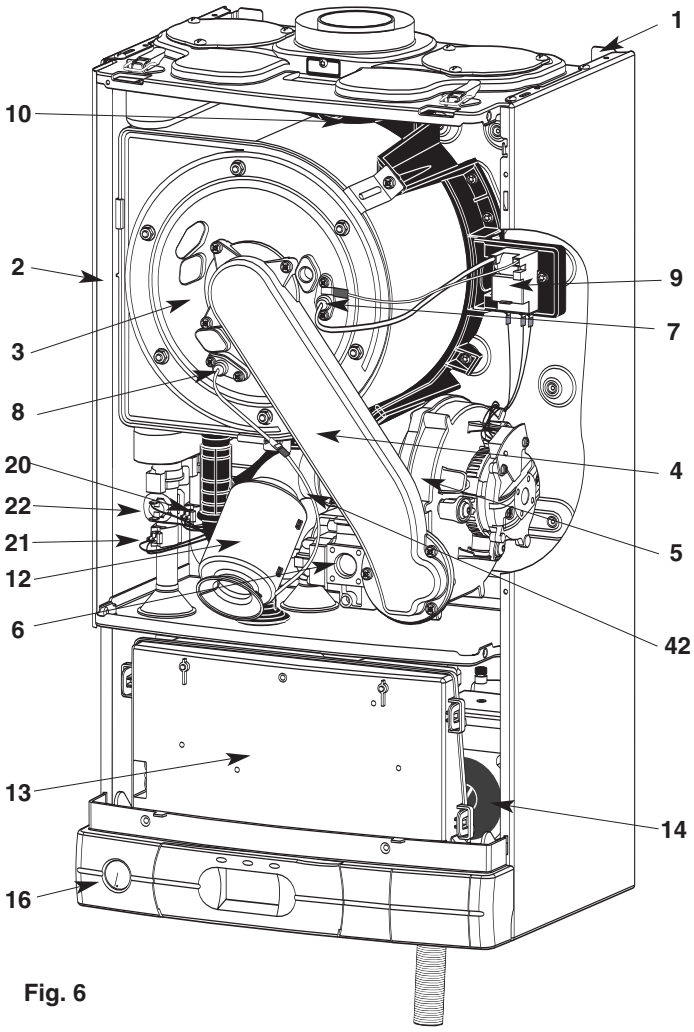


Fig. 6

1.- Steel chassis complete with expansion vessel
2.- Sealed chamber
3.- Burner and heat exchanger assembly
4.- Air / gas connection
5.- 24 V modulating fan
6.- Gas valve
7.- Ignition electrode
8.- Ionisation probe
9.- Ignitor
10.- Combustion products manifold
11.- Condense trap
12.- Silencer
13.- Electrical box
14.- Pump
16.- Pressure gauge
17.- Three way valve
18.- Automatic air separator and automatic vent
20.- Main exchanger return thermistor
21.- Main exchanger flow thermistor
22.- Overheat sensor
23.- Central heating pressure relief valve
24.- Condensate pipe

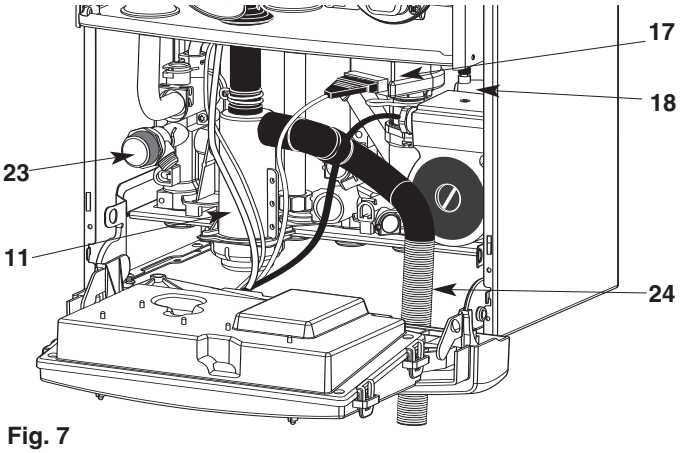


Fig. 7

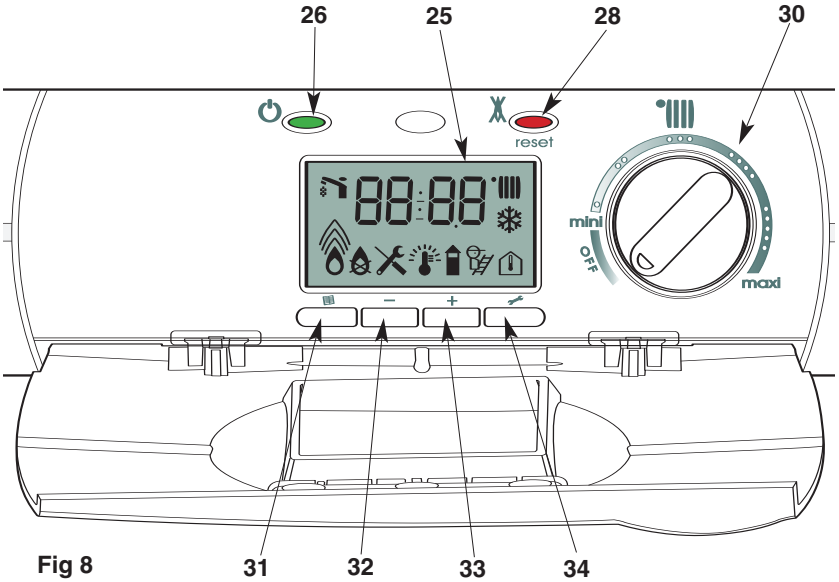


Fig 8

25.- Display
26.- On/off push button and power on indicator light
28.- Reset push button and red indicator locking light
30.- Central Heating start button and temperature setting
31.- Menu key
32.- Reducing key
33.- Increasing key
34.- Setting key

8. Dimensions

All dimensions in mm

I	Safety valve C/H and condensate
J	Heating flow
K	Cylinder return
L	Gas supply
M	Cold water supply
N	Heating return

Weight with packaging :
24 kW : 34 kg
30 kW : 37 kg

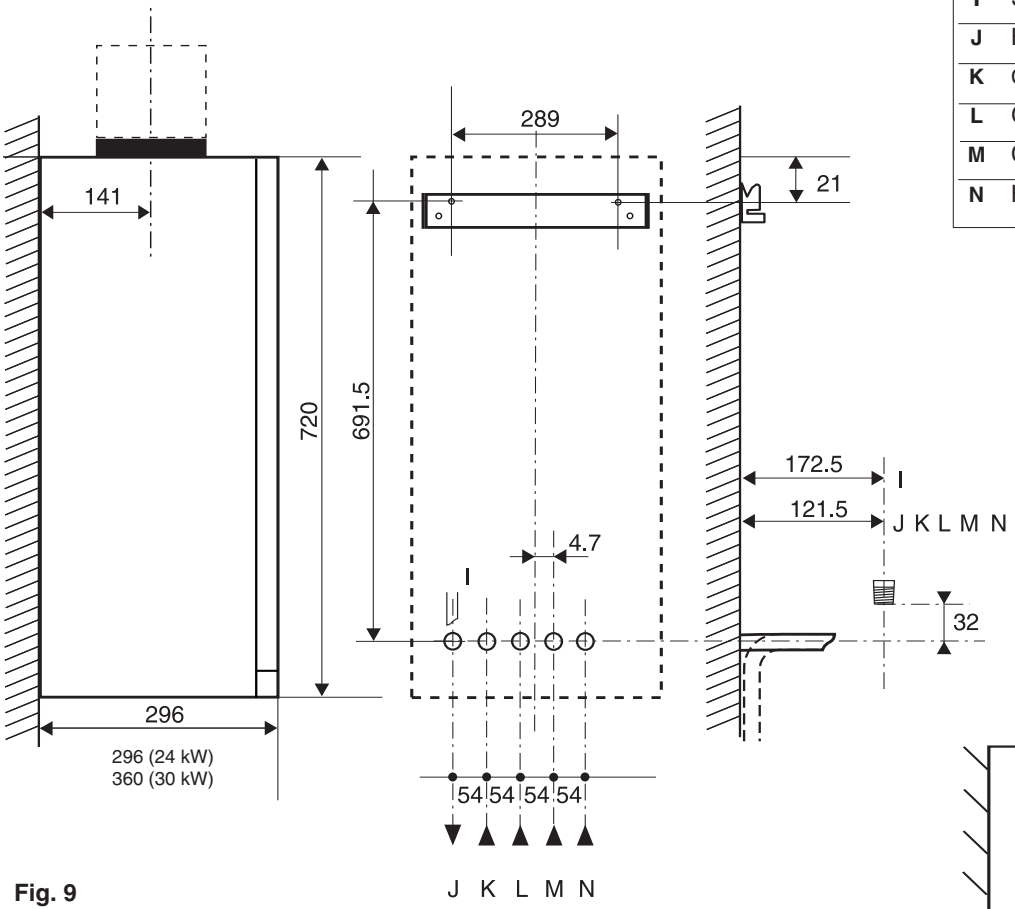
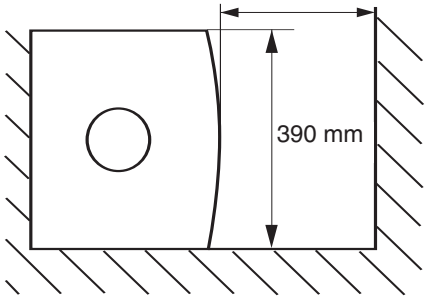
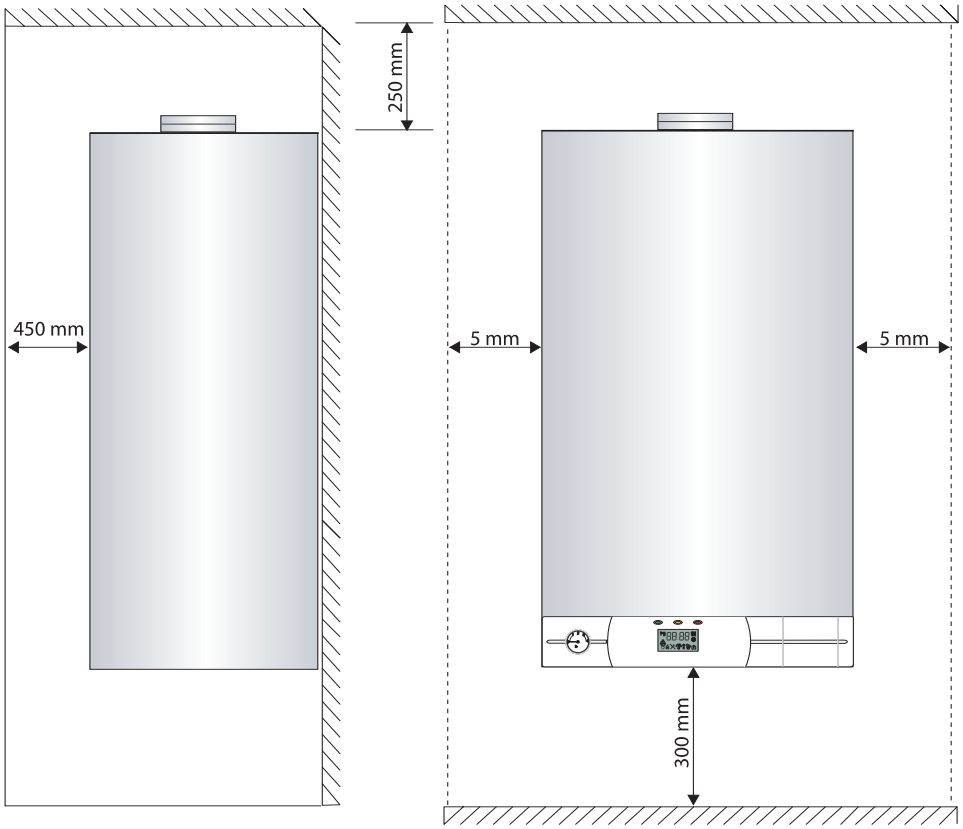


Fig. 9

Minimum space required 450mm





NOTE: THE CLEARANCES STATED ABOVE ARE REQUIRED FOR SERVICING PURPOSES

9. Hydraulic data

The boiler is fitted with an automatic by-pass as standard.

The graphs (Fig. 10) show the development of the pressure available in relation to flow (on exit from the boiler).

To ensure correct operation, the minimum flow of the appliance must be 300 l/h. (Thermostatic taps closed).

Capacity of the installation.

The water heater is fitted with a pressurised expansion vessel.

Maximum volume of expansion vessel: 6 litres.(24 kW)
6 litres.(30 kW)

Pressure: 1 bar.

The volume of the expansion vessel in a pressurised appliance varies according to:

- the average operating temperature in °C

- the static height, which is the difference in metres between the highest point of the appliance and the expansion vessel axis.

The minimum cold filling pressure of the appliance is 0.8 bar (recommended pressure between 1.0 and 1.5 bar).

The pressure of the expansion vessel should always be greater than the static height (in metres) divided by 10.

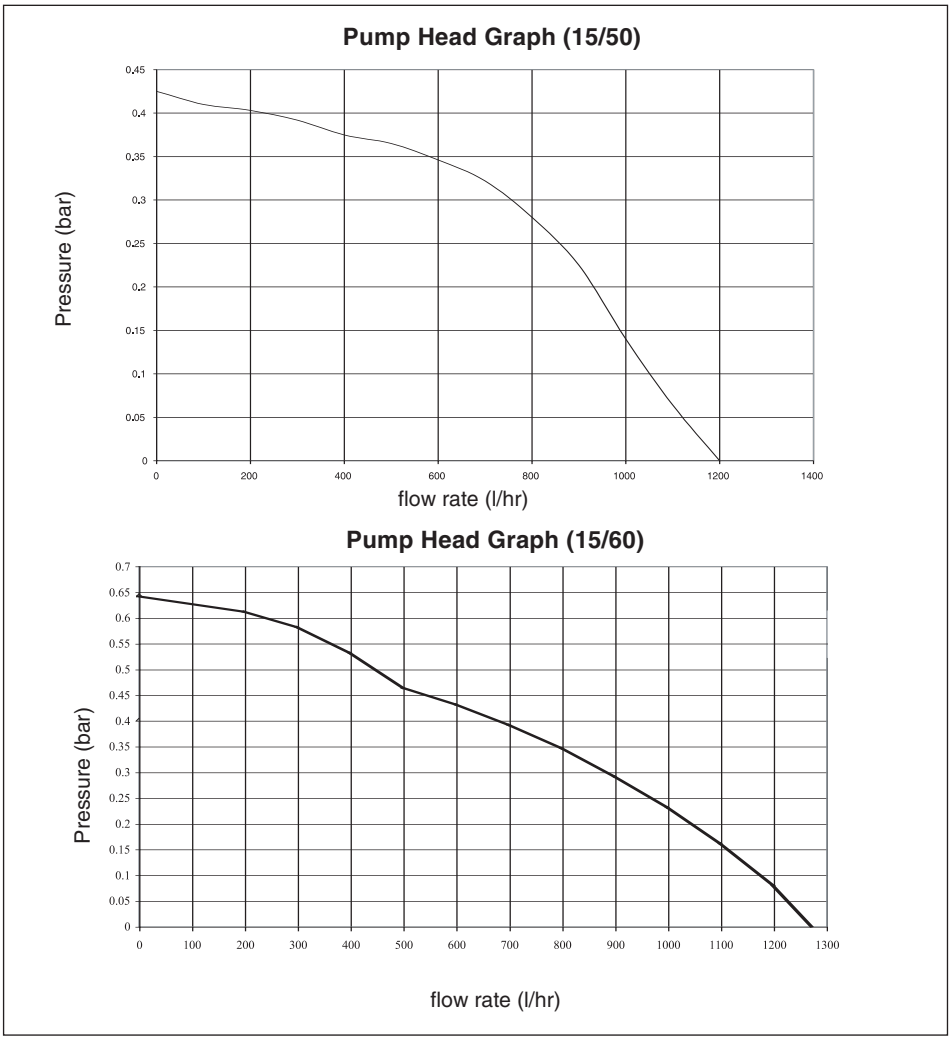


Fig. 10

System capacity chart

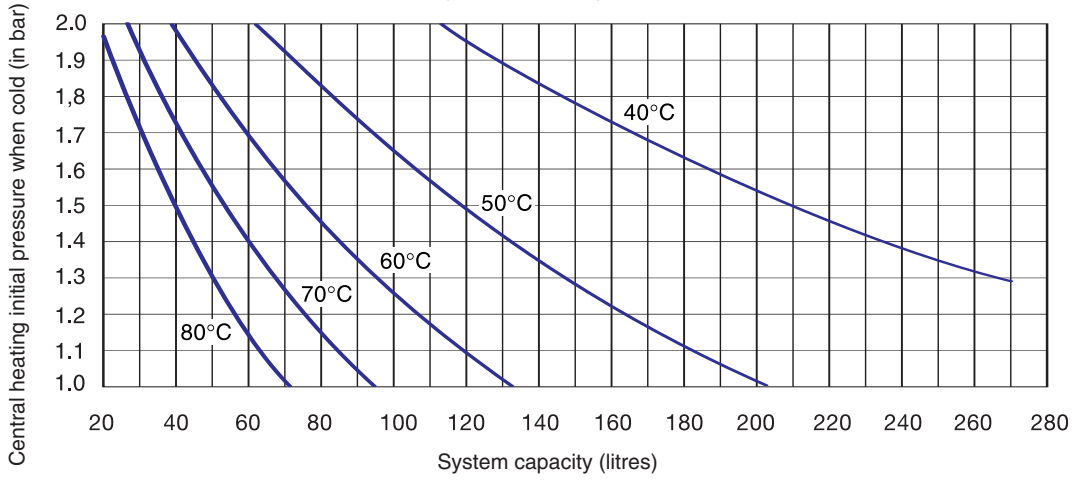


Fig. 11

10. Installation Requirements

Reference Standards
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" and the current Building Regulations, reference should also be made to the current ETCI rules for electrical installation.

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 by-laws 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 and the Local Building Regulations (IE).

For detailed information on the installation of Condensing boilers, reference should be made to the ***ODPM Guide to the Condensing Boiler Assesment Procedure for Dwellings***.

C.O.S.H.H.
Materials used in the manufacture of this appliance are non-hazardous and no special precautions are required when servicing.

Codes of Practice
Installation should also comply with the following British Standards Codes of Practice:

BS 7593:1992	**Treatment of water in domestic hot water central heating systems**
BS 5440-1:2000	**Flues**
BS 5440-2:2000	**Air Supply**
BS 5449:1990	**Forced ciculation hot water systems**
BS 6798:2000	**Installation of gas fired hot water boilers of rated input not exceeding 70kW**
BS 6891:1998	**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**

Avoid installing the boiler where the air inlet can be polluted by chemical products such as chlorine (swimming pool area), or ammonia (hair-dresser), or alkaline products (launderette)

Flue
Detailed information on flue assembly can be found in **Section 12 "Connecting the flue"**.
The boiler must be installed so that the flue terminal is exposed to the free passage of external air at all times and must not be installed in a place likely to cause nuisance. It must not be allowed to discharge into another room or space such as an outhouse or closed lean-to.

Condensing boilers have a tendency to form a plume of water vapour from the flue terminal due to the low temperature of the flue gasses. The terminal should therefore be located with due regard for the damage or discolouration that might occur to buildings in the vicinity and consideration must also be given to adjacent boundaries, openable windows should also be taken into consideration when siting the flue.
The minimum acceptable clearances are shown below:

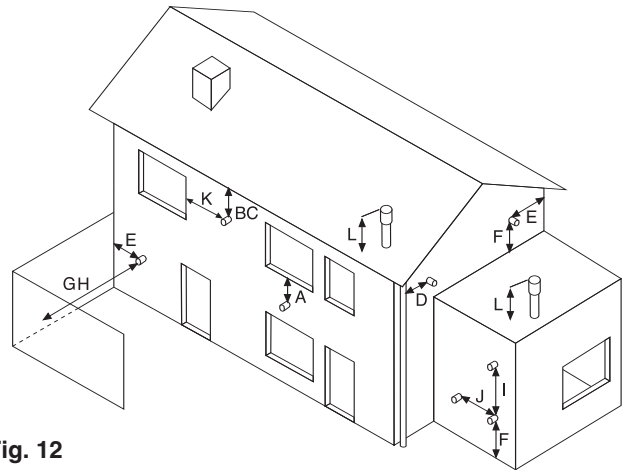


Fig. 12

A -	Directly below an open window or other opening	300
B -	Below gutters, solid pipes or drain pipes	75
C -	Below eaves	200
D -	From vertical drain pipes and soil pipes	75
E -	From internal or external corners	300
F -	Above ground on a public walkway or patio	2100
G -	From a surface facing a terminal	2500
H -	From a terminal facing a terminal	2500
I -	Vertically from a terminal in the same wall	1500
J -	Horizontally from a terminal in the same wall	300
K -	Horizontally from an opening window	300
L -	Fixed by vertical flue terminal	

NOTE: THE FLUE MUST NOT BE INSTALLED IN A PLACE LIKELY TO CAUSE A NUISANCE.

It may be necessary to protect the terminal with a guard, if this is the case it will be necessary to purchase a stainless steel terminal guard. Reference should be made to the Building Regulations for guidance.

Ventilation
The room in which the boiler is installed does not require specific ventilation. **If it is installed in a cupboard or compartment permanent ventilation is not required for cooling purposes.**

Gas Supply
The gas installation and soundness testing must be in accordance with the requirements of BS 6891. Ensure that the pipe size is adequate for demand including other gas appliances on the same supply.

Electrical Supply
The appliance requires an earthed 230V - 50 Hz supply and must be in accordance with current I.E.E. regulations.

10. Installation Requirements (continued)

It must also be possible to be able to completely isolate the appliance electrically. Connection should be via a 3 amp fused double-pole isolating switch with a contact separation of at least 3 mm on both poles. Alternatively, a fused 3 Amp. 3 pin plug and unswitched socket may be used, provided it is not used in a room containing a bath or shower. It should only supply the appliance.

The boiler is suitable for sealed systems only. The maximum working pressure for the appliance is 6 bar. All fittings and pipework connected to the appliance should be of the same standard. If there is a possibility of the incoming mains pressure exceeding 6 bar, particularly at night, then a suitable pressure limiting valve must be fitted.
The boiler is designed to provide Central Heating on demand to a Central Heating system and to heat an Indirect Hot Water Storage Cylinder.

Flushing and Water Treatment
The boiler is equipped with a stainless steel 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 circuit. These include cleansers produced by Fernox and BetzDearborn, 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.

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 system;

If anti-freeze substances are to be used in the system, check carefully that they are compatible with the metals used in the circuit.

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 systems 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.

Location
The boiler can be installed on any suitable internal wall. Provision must be made to allow the correct routing of the flue and siting of the terminal to allow the safe and efficient removal of the flue products. A compartment or cupboard may be used provided that it has been purpose-built or modified for the purpose. It is not necessary to provide permanent ventilation for cooling purposes. Detailed recommendations are given in BS 5440 pt 2. If it is proposed that it is installed in a timber framed building then reference should be made to British Gas Document DM2, or advice sought from CORGI.

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 specifically in accordance with current IEE Wiring Regulations.

For unusual locations, special procedures may be necessary. **BS 6798:2000** gives detailed guidance on this aspect.

Condensate Discharge
The condensate discharge hose from the boiler must have a continuous fall of 2.5° and must be inserted by at least 50mm into a suitable acid resistant pipe - e.g. plastic waste or overflow pipe. The condensate discharge pipe must have a minimum diameter of 22mm, must have a continuous fall and preferably be installed and terminated to prevent freezing.
The discharge pipe must be terminated in a suitable position:

i) Connecting into an internal soil stack (at least 450mm above the invert of the stack). A trap giving a water seal of at least 75mm must be incorporated into the pipe run, there also must be an air break upstream of the trap.

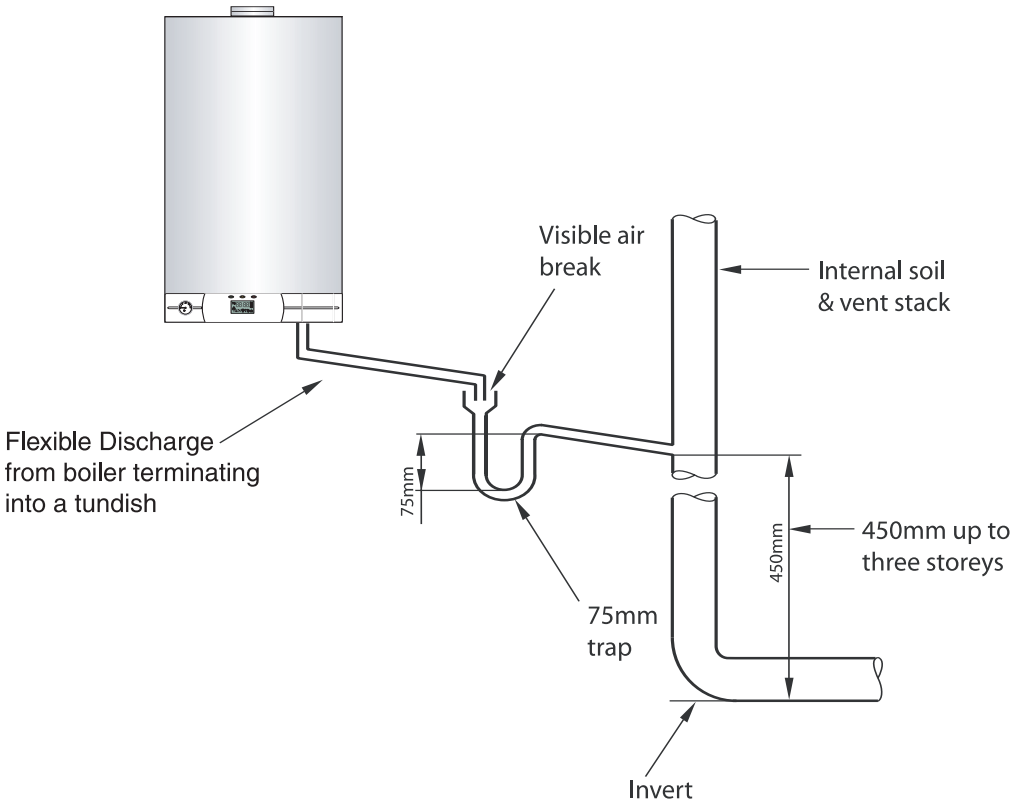
ii) Connecting into the waste system of the building such as a washing machine or sink trap. The connection must be upstream of the washing machine/sink. If the connection is down stream of the waste trap then an additional trap giving a minimum water seal of 75mm and an air break must be incorporated in the pipe run, as above.

10. Installation Requirements (continued)

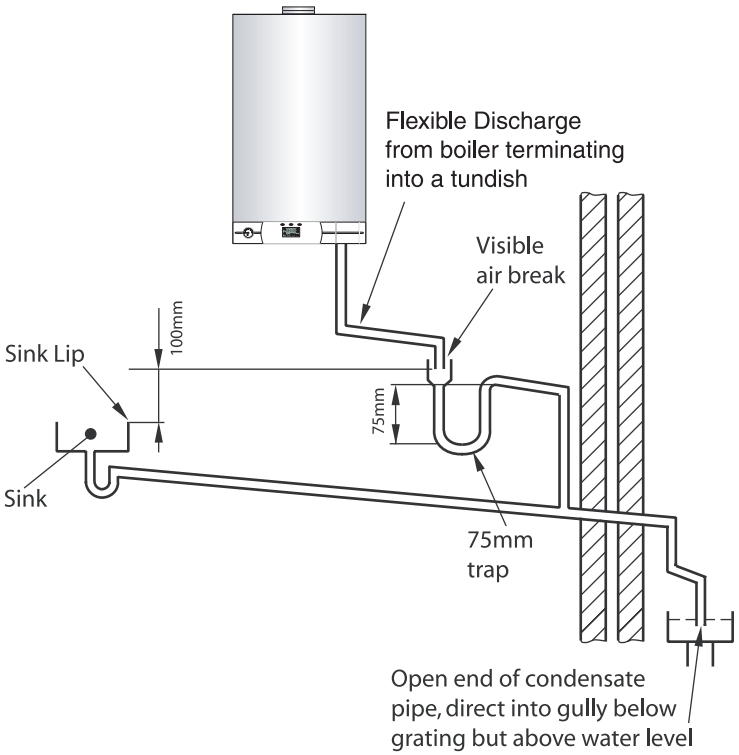
iii) Terminating into a gully, below the grid level but above the water level.
iv) Into a soakaway.

NOTE: If any condensate pipework 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. The total length of external pipe used should not exceed 3 metres.
Some examples of the type of condensate terminations can be found below.

1. Internal termination of condensate drainage pipe to internal stack

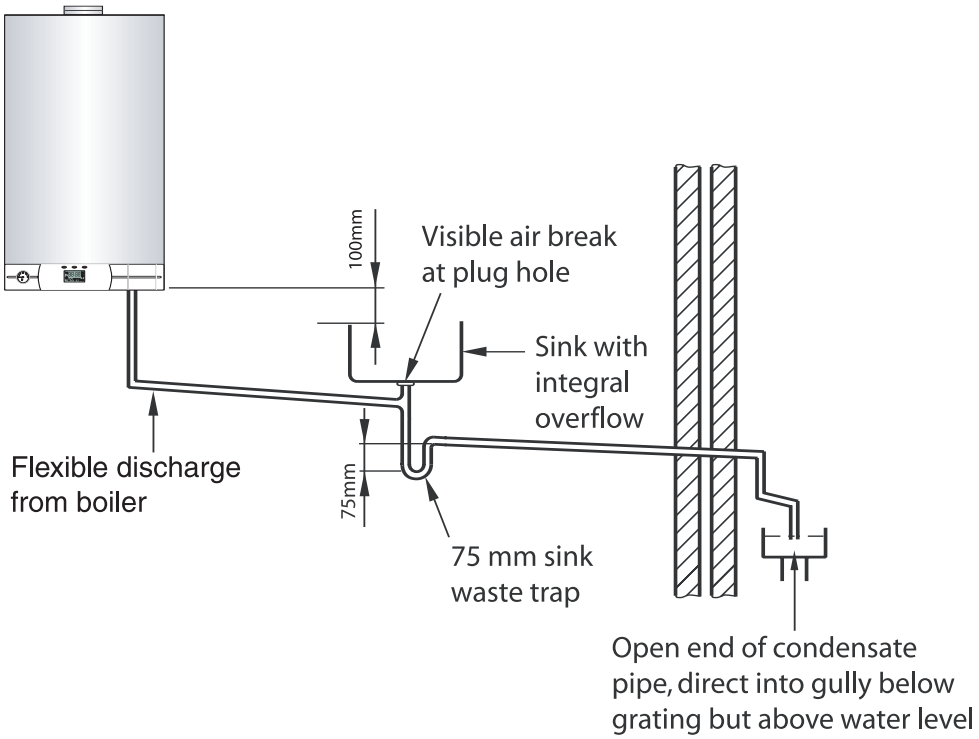


2. External termination of condensate drainage pipe via internal discharge branch (e.g. sink waste) and condensate siphon

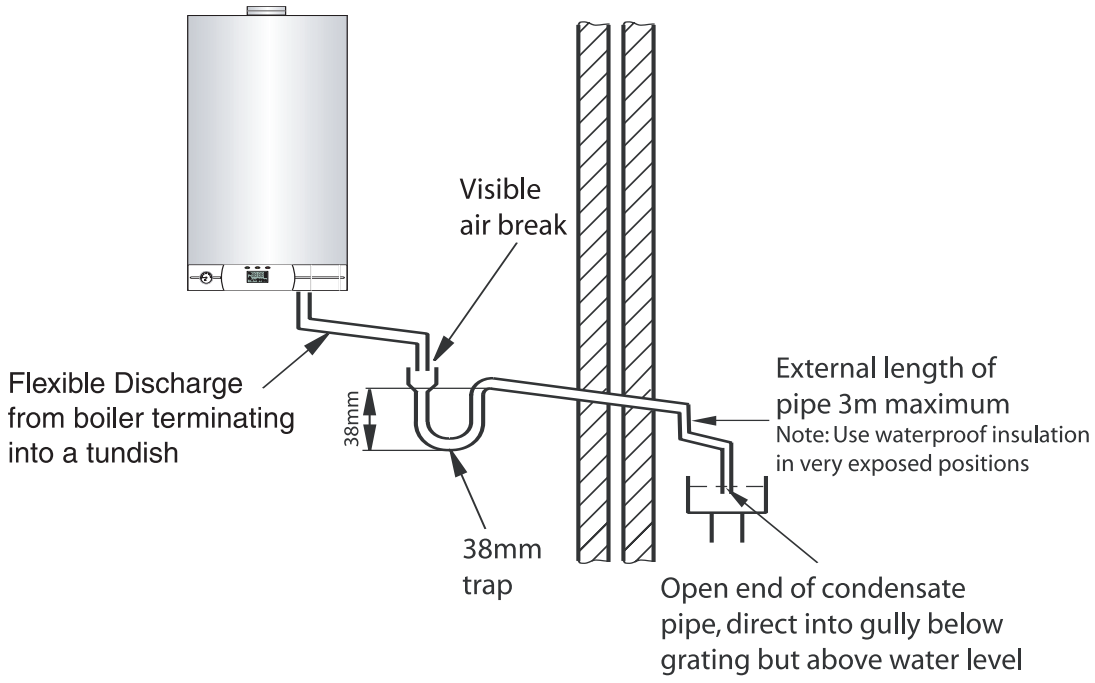


10. Installation Requirements (continued)

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



4. External termination of condensate drainage pipe via condensate siphon



11. Installing the Boiler

Please check that you are familiar with the installation requirements before commencing work (Section 10).

The installation accessories described in the following list are included in the boiler packaging:

- Hanging bracket
- A paper template (showing the dimensions of the boiler with 5 mm side clearances)
- Connection tails and valves
- Screws and washers
- Connection washers
- Installation, Servicing and Operating Instructions
- Air Inlet Header (for use with twin flue pipe)
- Guarantee Card

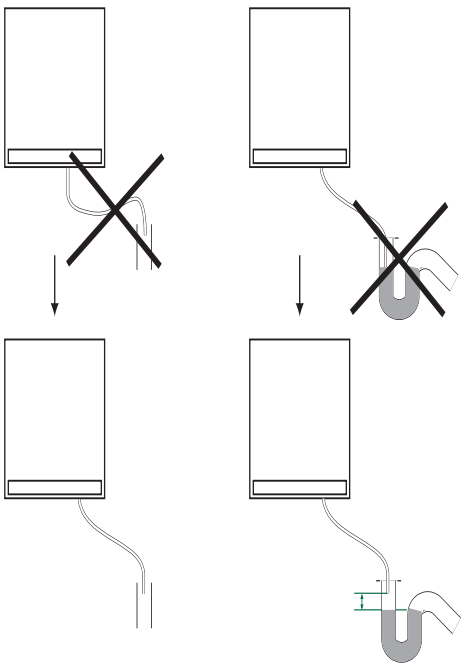
Method of positioning the boiler on the wall.
The paper template can be used to ensure the correct positioning of kitchen cabinets etc. It also details the commissioning instructions.
The paper template has to be fixed to the wall and used to locate the position of the hanging bracket and the centre for the flue hole.
Drill and plug the wall and secure the hanging bracket using the screws provided. Remove the boiler from its packaging as shown in Fig. 13, unscrew the clamp locking bolt **A** and remove the casing (Fig. 14).
Place the boiler on the wall on the hanging bracket (Fig. 15).
NOTE: THE APPLIANCE MUST NOT BE FITTED ON A COMBUSTIBLE WALL SURFACE.

Connecting the boiler to the system

- Remove the boiler casing as described in Section 18 (page 45).
- Push in the tabs "**P**" (Fig. 15) on either side of the boiler and pivot the electrical box forward to gain access to the valve connections
- Remove the caps and connect the valves to the boiler using the washers provided in the plastic bag.
  2 x fibre washers for the C/H flow and return.
  1 x rubber washer for gas connection

Safety valve discharge
The pressure relief valve tube is made of copper. It should terminate below the boiler safely outside the premises. Care should be taken that it does not terminate over an entrance or window or where a discharge of heated water could endanger occupants or passers by.

Fill the Central Heating and DHW system and bleed air from the system as described in Section 14 (page 32).
The system should be carefully checked for leaks, as frequent refilling could cause premature system corrosion or unnecessary scaling of the heat exchanger. The condensate pipe from the siphon (24 Fig. 7, page 11) should be connected to a drain as described in the relevant Brittish regulations.
Pay special attention to not bend the plastic condensate drain pipe in such a way as to cause the flow to be interrupted. Please use exclusively drain pipe material compatible with condensate products. (refer to **BS 6798 : 2000**)
The condensate flow can reach 2 litres / hour; because of the acidity of the condensate products (Ph close to 2), take care before operation.



Fitting the Horizontal Flue
Attention ! Before starting the boiler, the trap (11 Fig. 7, page 11) must be filled with water. Before fitting the flue onto the boiler, pour 1/4 litre of water into the exhaust pipe as shown in Fig. 17 (page 19).

Instructions on fitting the flue can be found in Section 12.

IMPORTANT!!
Use only the specific condensation flue kit supplied by MTS (GB) Limited.

11. Installing the Boiler (continued)

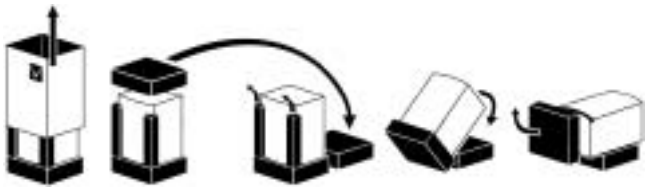


Fig. 13

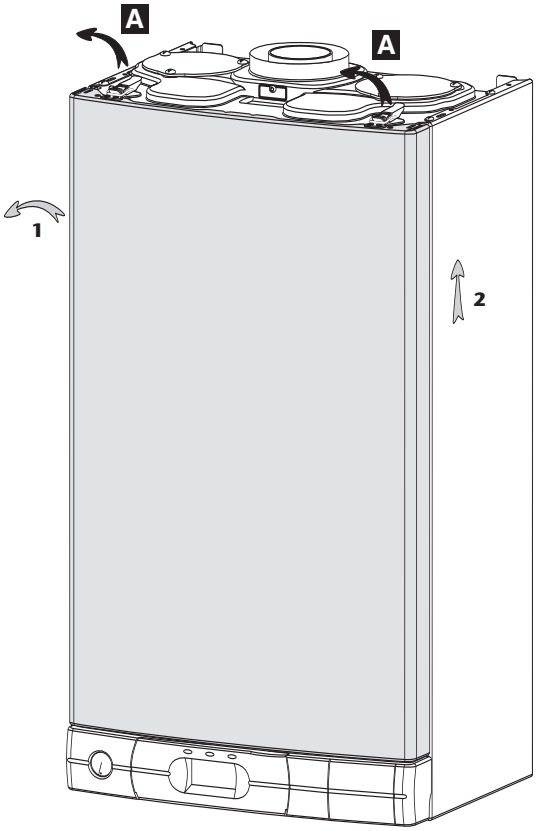


Fig. 14

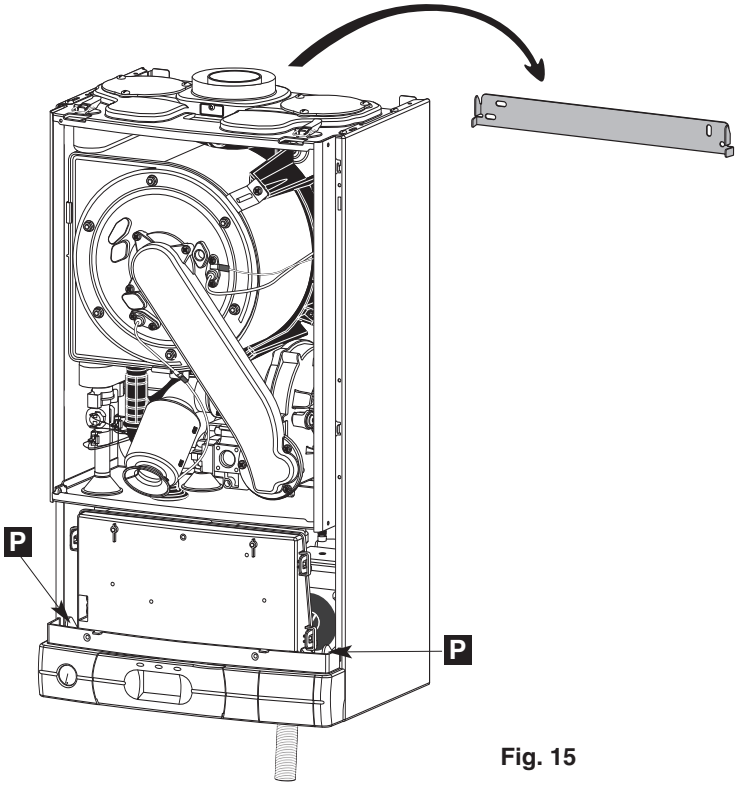


Fig. 15

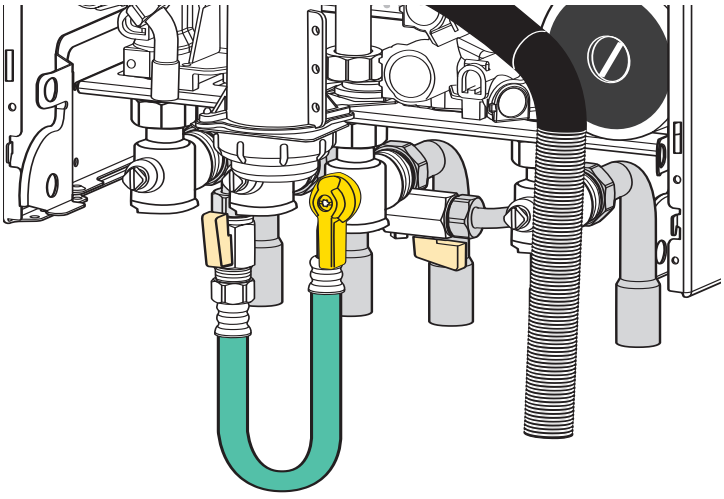


Fig. 16

12. Connecting the Flue

The boiler should only be installed with a flue system supplied by MTS (GB) Limited.
These kits are supplied separately to the appliance in order to respond to different installation solutions. For more information with regard to the inlet/outlet accessories consult the accessory catalogue. The boiler is supplied ready for connection to a concentric flue system.

NOTE: SEE PAGE 24 FOR MAXIMUM AND MINIMUM FLUE RUNS (TABLES A, B AND C)

IMPORTANT!!
BEFORE CONNECTING THE FLUE, ENSURE THAT 1/4 LITRE OF WATER HAS BEEN POURED INTO THE EXHAUST CONNECTION TO FILL THE CONDENSATE TRAP (FIG. 17). SHOULD THE TRAP BE EMPTY THERE IS A TEMPORARY RISK OF FLUE GASSES ESCAPING INTO THE ROOM.

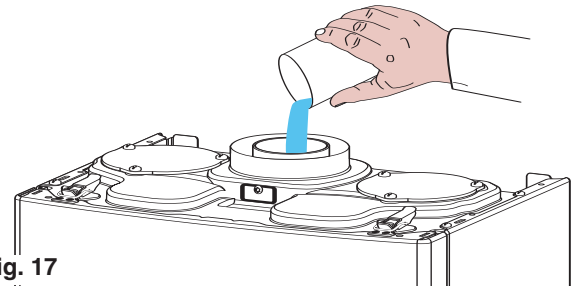


Fig. 17

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.

Ø 60/100 mm

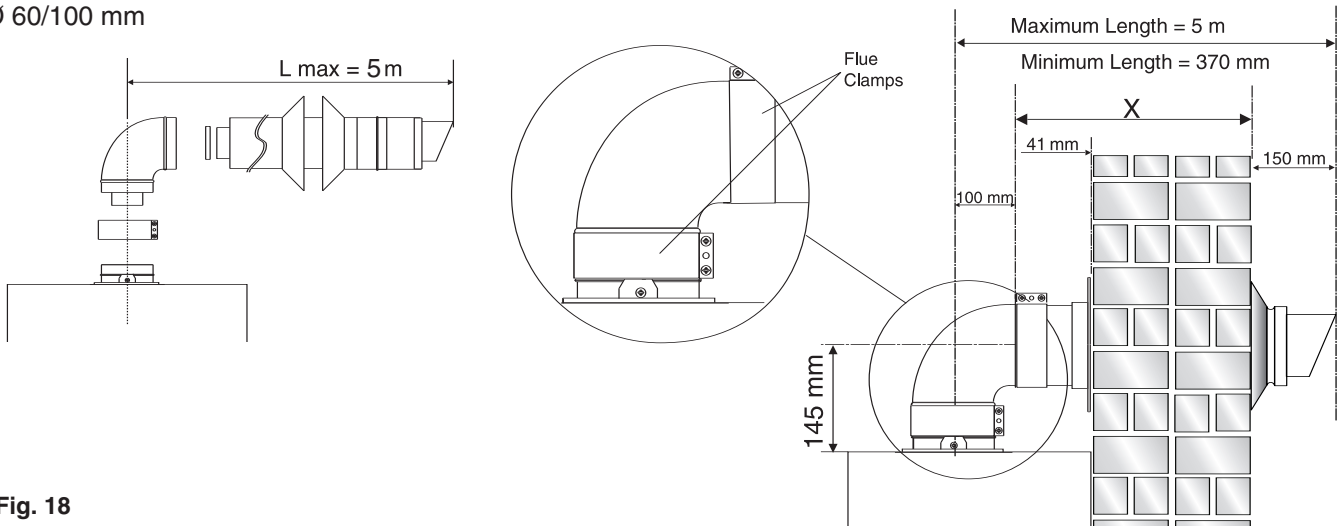
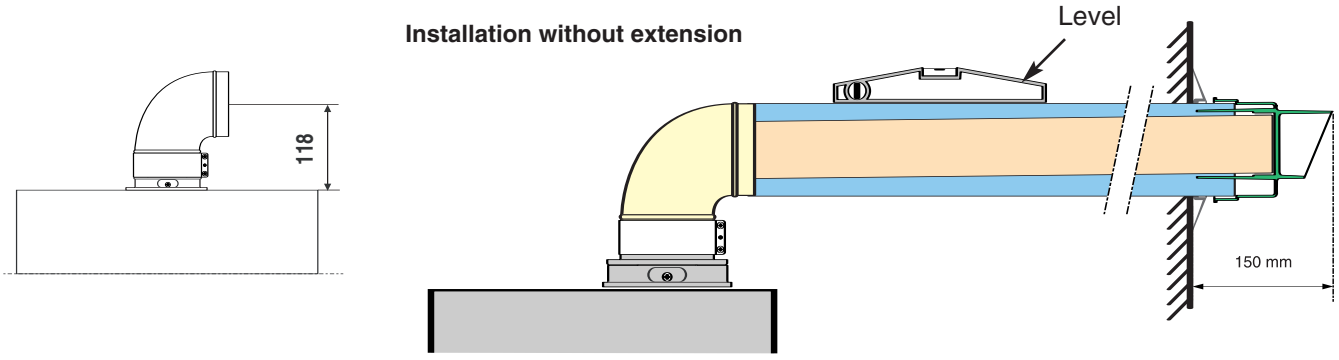


Fig. 18

Installation without extension



Installation with extension

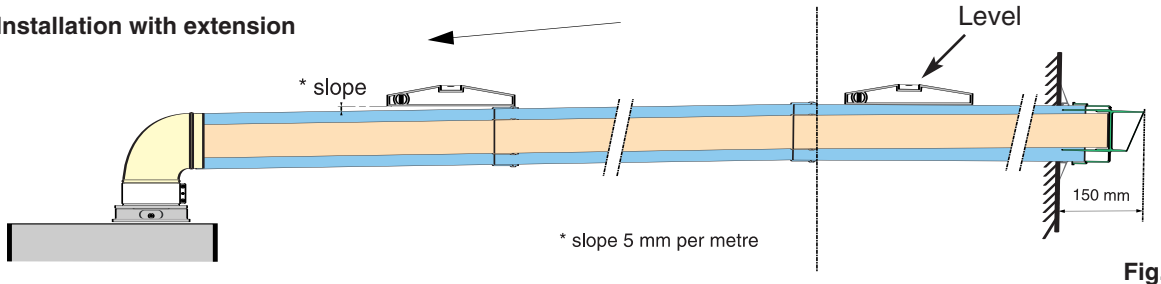


Fig. 19

12.1 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
1x 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 20)** secure the elbow to the boiler.

The 1 metre horizontal flue kit (3318073) supplied is suitable for an exact **X dimension** of 815mm.

Measure the distance from the face of the external wall to the face of the flue elbow **(X - Fig 18),** this figure must now be subtracted from 815mm, you now have the total amount to be cut from the plain end of the flue.

Draw a circle around the outer flue and cut the flue to the required length taking care not to cut the inner flue, next cut the inner flue ensuring that the length between the inner and outer flue is maintained. **(Fig 20)**.
e.g.
X = 555mm
815-555 = 260mm (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.

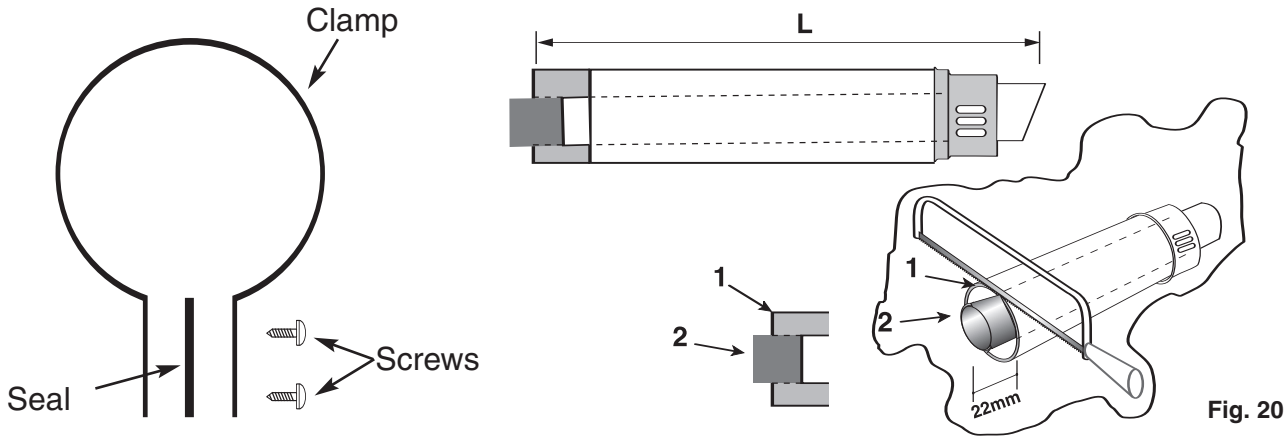


Fig. 20

12.2 Fitting the 5" Flue (Ø 80 / 125 Horizontal/vertical)

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

NOTE: SEE PAGE 24 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. 21)** 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 23) 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. 22 and a 90° bend in Fig. 24)**.

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

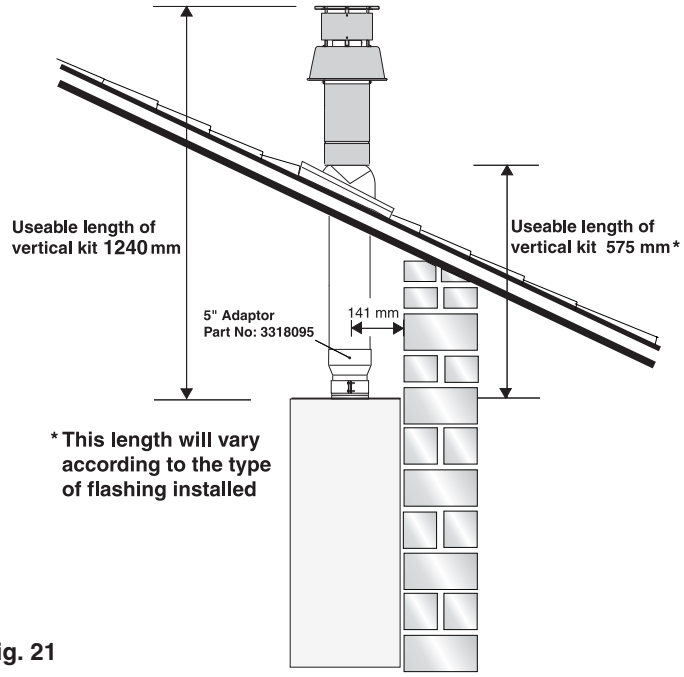


Fig. 21

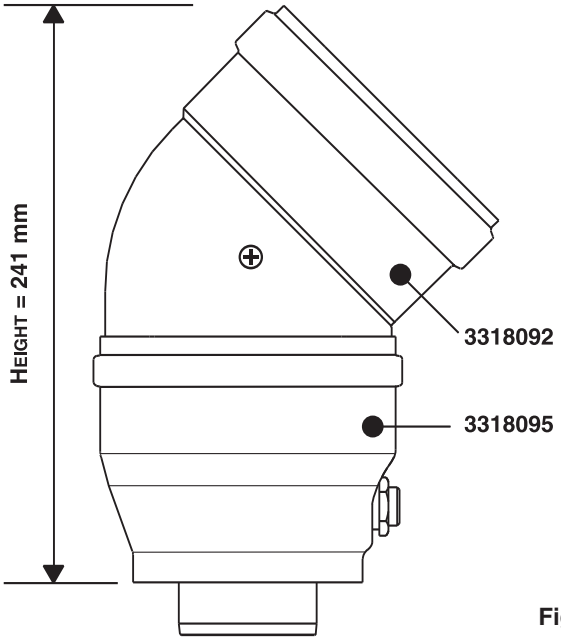


Fig. 22

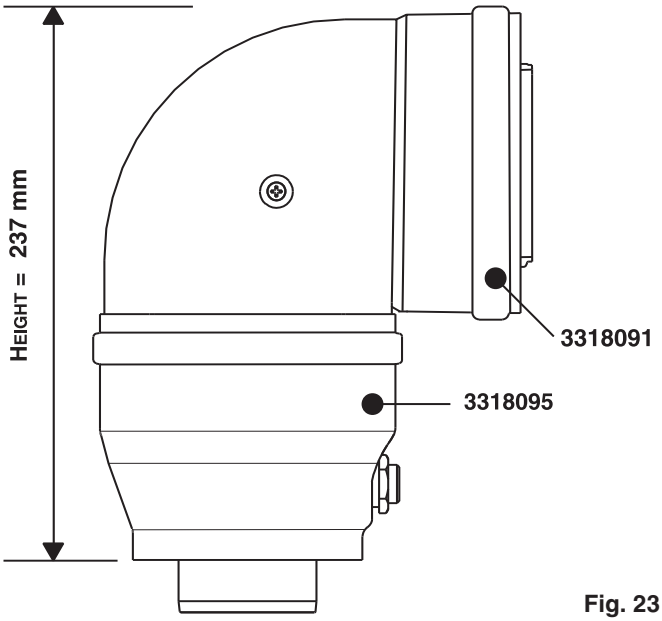


Fig. 23

12.3 Fitting the Coaxial Flue (Ø 60 / 100 Vertical)

NOTE: SEE PAGE 24 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. 24**.

Before proceeding to fit the flue, ensure that the maximum flue length has not been exceeded (See the tables on Page 24) 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. 25)**.

Mark the position of the flue hole in the ceiling and/or roof (see **Fig. 24** for the distance from the 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 **Figs. 24 and 25**) 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 inner and outer flue remain flush.

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.

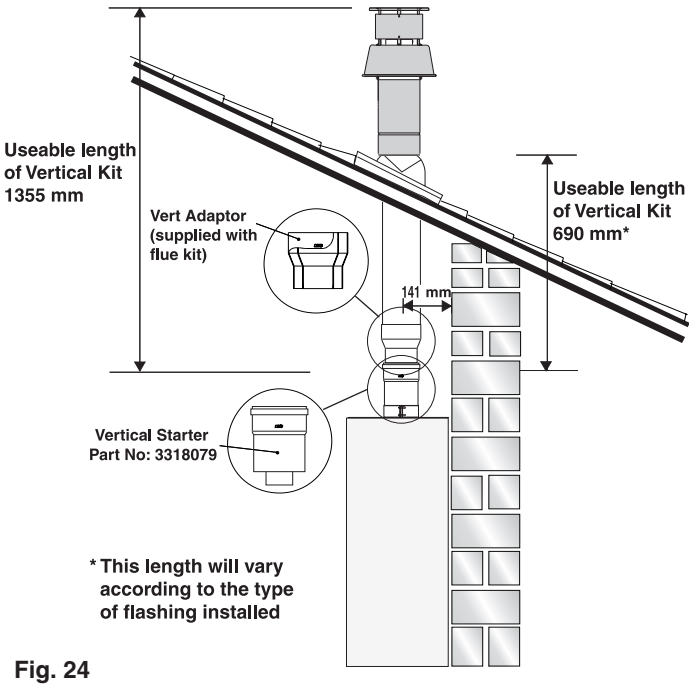


Fig. 24

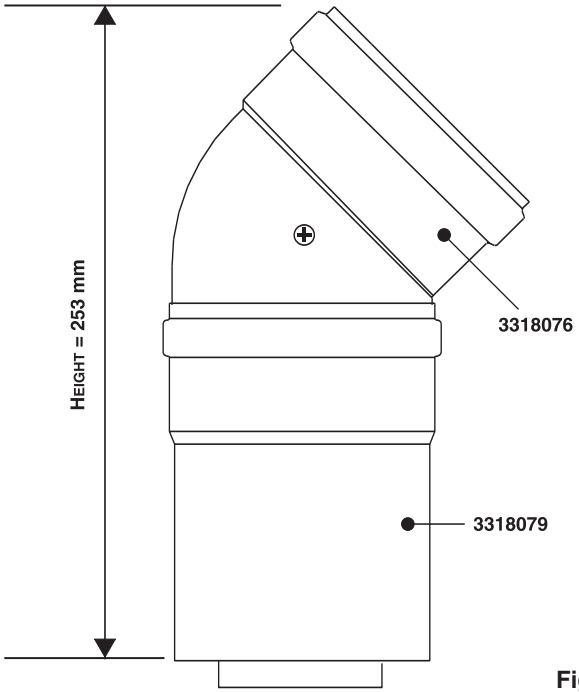


Fig. 25

12.4 Fitting the twin pipe flue (Ø80/80)

NOTE: SEE PAGE 24 FOR MAXIMUM AND MINIMUM FLUE RUNS (TABLE C)

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. 30). 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 60 metres (24kW and 30kW), 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 60 metres (24kW and 30kW).

The maximum length is reached by combining the total lengths of both the air intake and exhaust pipes. Therefore a maximum length of 60 metres for example, will allow a flue run of 30 metres for the air intake and 30 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 25.

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

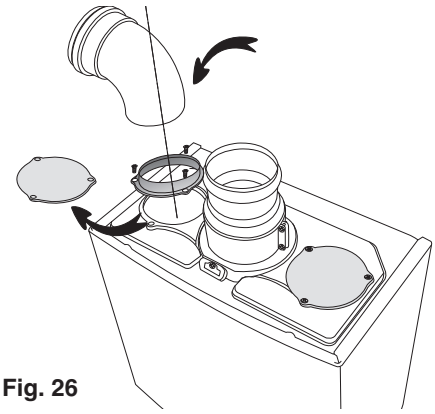


Fig. 26

Fig. 27

14. Commissioning and testing (continued)

14.10 Operational checks

1. The system must be visually checked for soundness;

2. **Fill the condensate trap with water, by pouring ½ litre of water into the exhaust flue connector (see Fig. 43). 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 a temporary leakage of fumes into the air, until it refills itself;**

3. Ensure that the flue is fitted correctly;

4. Allow the central heating system to warm up and adjust the central heating temperature control knob **30** (Fig.1), check the burner modulates between the high and low settings;

5. Range rate the thermal power for central heating as detailed in Section 14.5. To adjust the maximum heating power it is necessary to follow the steps in Section 14.5 Menu 4 (page 41). and adjust in relation to the chart on Page 36 (Fig. 44);

6. Check the gas rate;

7. Record the finding in the Benchmark Commissioning Checklist (Page 60);

8. Balance the central heating system until all return temperatures are correct and equal;

9. Turn the boiler off by pressing the On/Off button **26** (Fig.1) to OFF, disconnect the gas pressure gauge, retighten the screw and relight the boiler;

10. Re-examine the central heating system and gas supply for soundness;

11. If external controls have been disconnected, reconnect and test;

12. Refit the boiler casing.

14.11 Instructing the end user

1. Hand over these instructions and explain how to use the time clock and room thermostat (if fitted) and explain how to register the guarantee;

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. Instruct the end user on the correct procedure for checking and refilling the boiler;

6. 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 and the service logged in the Service Interval Record (Page 61).

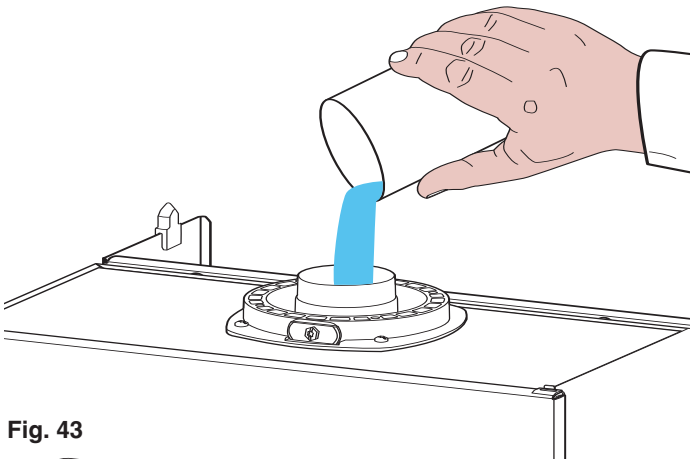


Fig. 43

14. Commissioning and testing (continued)

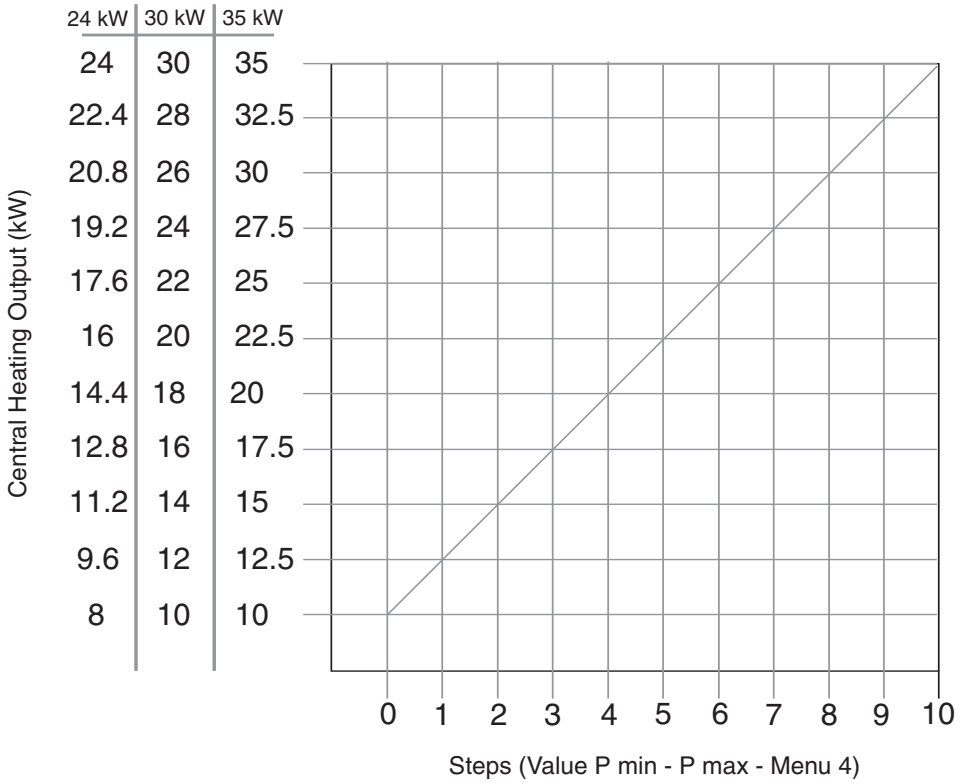


Fig. 44

15. Fitting the casing

Fitting the casing

Remove the protective film on the casing;

- Locate the lower clips into the slots in the chassis;
- Engage hooks **N** on the casing in notches **R** on the side panels **M** (Fig. 45);
- Close the panel mounting clamps (Fig. 45);
- Screw in the clamp locking bolt **A;**

Note: it is essential to refit the locking bolt A

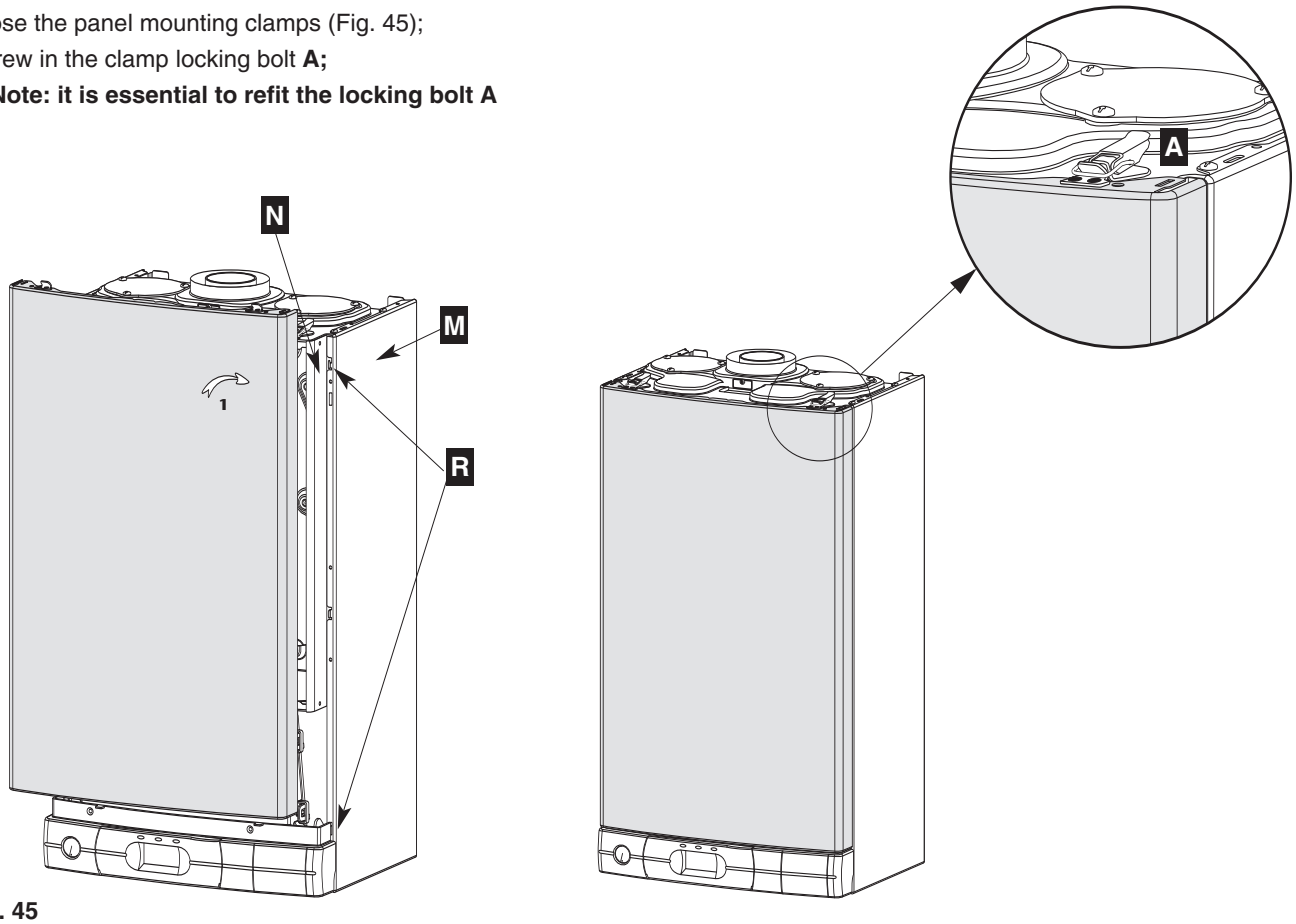
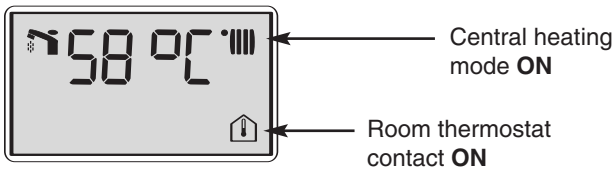


Fig. 45

16. Sequence of operation

Central Heating Mode

Activation of the time clock and/or room thermostat starts the boiler. The display panel indicates the flow temperature in the Central Heating system as illustrated below:



The PCB checks the pressure of the primary circuit, if the pressure measured is 0.8 bar or lower, the boiler will lockout after 40 seconds. The error code **E02** will appear on the LCD and the pump will stop.

If the pressure measured is above 0.8 bar, the boiler ignition sequence will begin.

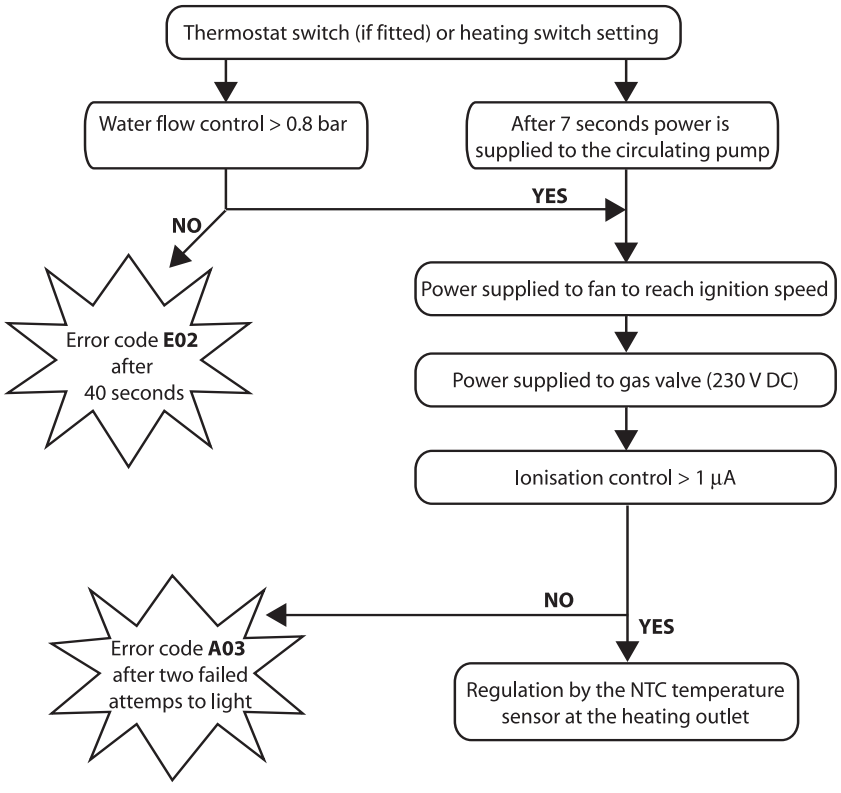
At first, the fan starts and the speed increases to the required ignition speed (3460 rpm), once this speed has been achieved, the safety coil of the gas valve is supplied with 230V DC, after 8 seconds the boiler checks that the burner has lit, if the boiler does not sense that the burner has lit, the error code **E04** will appear on the display, should this error occur, the boiler will attempt to relight two more times (20 seconds between each attempt). After this, should the boiler still not sense a flame, error code **A03** will appear on the LCD. Should the boiler detect that the burner has lit, the boiler continues to regulate as follows.

The NTC fitted on the outlet of the primary circuit exchanger is the only NTC to adjust the heat output of the boiler according to the adjustable setting point. This point is adjustable from 25°C to 85°C by the user. This NTC relays information to the PCB, which in turn modulates the burner by adjusting the speed of the fan.

When the NTC senses that the set temperature has been achieved (+ 4°C to the temperature set by the user), the burner will go out. To avoid excessive burner lighting, an anti-cycle timer can be set between 0 to 7 minutes in menu **4** line **48** (see Section 17 Adjustments and Settings).

The speed of the pump can be set at two levels. The PCB controls the speed of the circulation pump depending on the speed set in menu **4** line **41**. Setting **410** will cause the pump to operate continually at high speed, and setting **411** will cause the pump to modulate between high and low speed depending on the ΔT between the inlet and the outlet. If the ΔT is greater than 20°C the pump will run on high speed and if the ΔT is less than 20°C the pump will run on low speed.

NOTE: THE DEFAULT SETTING FOR THE PUMP IS HIGH SPEED.



17. Adjustments and Setting

The boiler is delivered with preset values described in Menus 3 and 4.
All settings can be changed by the installer or a qualified person. To gain access to the setting keys please, open the front cover **P** (Fig. 46).

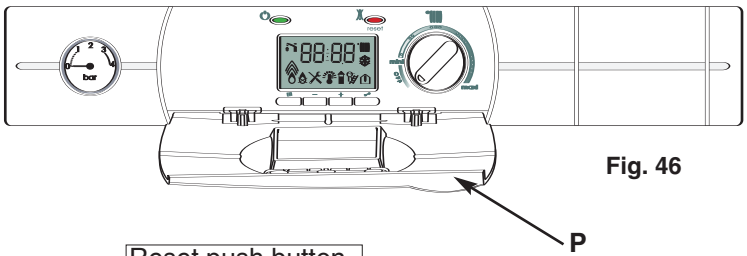


Fig. 46

P

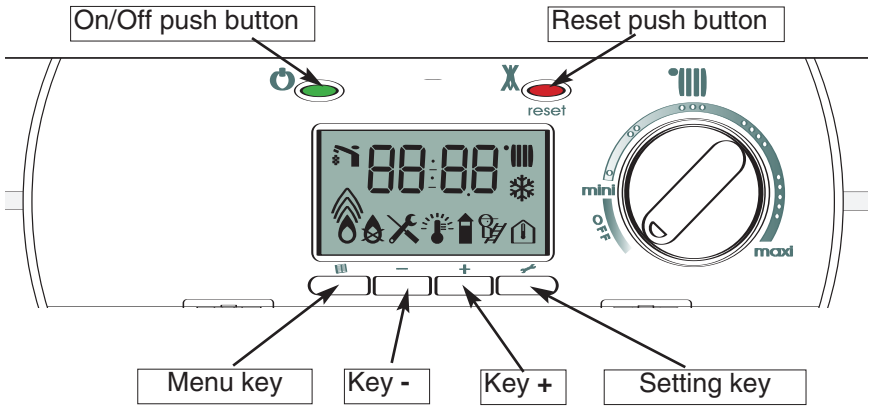
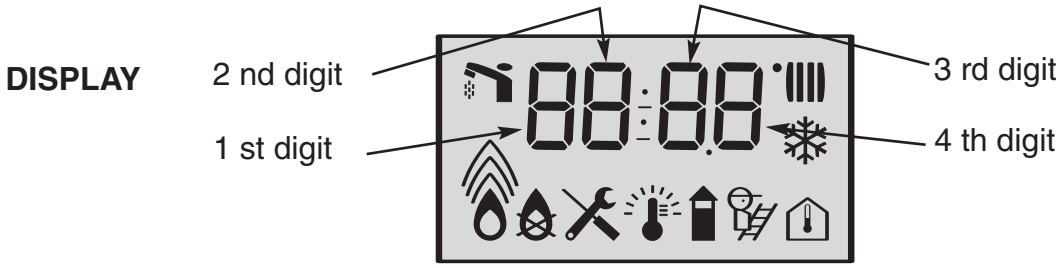


Fig. 47



Pressing the reset, menu , ⊖ , ⊕ , or the setting keys will make the display light. The light will go out 30 seconds after the last key has been pressed.

To gain access to setting menus press the ⊖ and ⊕ keys together for 5 seconds. (Fig. 41). Menu 1 will be displayed on the 1st digit of the display.

Changing the menu **:**

Press the Menu key (Fig. 47). The menu number is displayed for 3 seconds. Press the Menu key to change between menus

Setting a parameter in a section **:**

Press either the ⊕ key or the ⊖ key to change between sections.

Note : When you arrive at the last section of a menu, pressing the ⊕ key will move to the the 1st section. When you are at the first section, pressing the ⊖ key will move to the last section of the menu.

Changing section in a menu (available only for menu 3 and 4) :

Press the setting key to enter the modification mode, The 3rd and 4th digits will begin flashing, press the ⊕ or ⊖ keys to select the correct value then press the setting key to confirm this modification and to exit the setting mode. The 3rd and 4th digits will stop flashing.

Recalling the basic configuration **:**

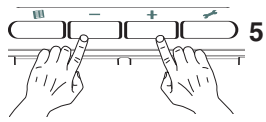
Select Menu **3** or **4** then press the ⊕ + keys together for more than 5 seconds. The digits will flash **CM** for a while to indicate that the operation is completed.

Erasing the default register **:**

Select menu **1** then press the ⊕ + keys together for more than 5 seconds. The digits will flash **CM** for a while to indicate that the operation is completed.

Note : To exit the setting mode, leave the boiler for approx. 1 minute the boiler will automatically switch back to user mode.

ACTION	CONFIGURATION	DISPLAY

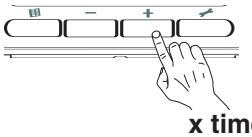


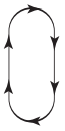
Menu - 1 - Default register

Record the last 10 defaults

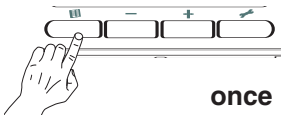
Section	Digit 1	Digit 2	Digits 3 and 4
Last default occured	1	0	code from **01** to **99**
Last but one default occurred	1	1	code from **01** to **99**
...	1	...	code from **01** to **99**
Last default occurred before the previous one	1	9	code from **01** to **99**

Note **--** is displayed if no default is recorded





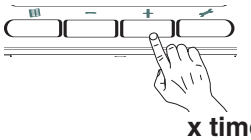
DISPLAY: 10-- 11-- 19--

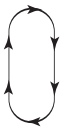


Menu - 2 - Boiler conditions

Indicates the conditions or the configurations of the boiler

Section	Digit 1	Digit 2	Digits 3 and 4
Software version of display PCB	2	0	code from **01** to **99**
Software version of main PCB	2	1	code from **01** to **99**
Flue type	2	2	**4** : Condensation
Room thermostat is calling for heat	2	3	**0** : No **1** : Yes



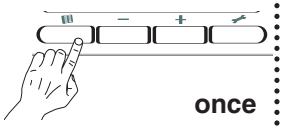


DISPLAY: 20-- 21-- 22- 4 23- 0 23- 1

CH flow temperature in °C	2	7	from **01** to **99**
CH return temperature in °C	2	8	from **01** to **99**
Outside temperature Flashing when below 0 °C.	2	9	from **01** to **99**

DISPLAY: 27-- 28-- 29--

ACTION | CONFIGURATION | DISPLAY

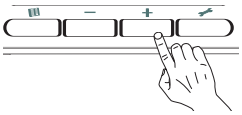


once

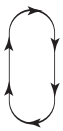
Menu - 3 - Boiler options

Factory setting

Section	Digit 1	Digit 2	Digits 3 and 4



x times



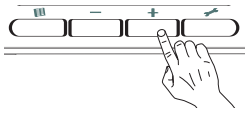
Thermostatic device	3	1	**0** : No **1** : Yes	31: 0 31: 1	✓
Integral time clock	3	2	**1** : Fitted **2** : Not Fitted	32: 1 32: 2	✓

ACTION | CONFIGURATION | DISPLAY

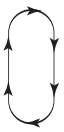
once

Menu - 4 - Boiler settings

Factory setting



x times



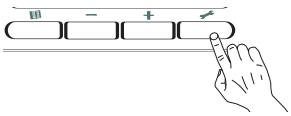
Section	Digit 1	Digit 2	Digits 3 and 4	DISPLAY	Factory setting
Continuous pump run	4	0	**0** : Yes **1** : No	40 0 40 1	✓
Pump overrun duration	4	2	**0** to **5** min by step 0.5 min	42 1.0	✓
	4	3			
Maximum Central Heating flow temperature	4	4	**50°C** to **80°C** by steps of 1°C	44 80	✓
Minimum Central Heating flow temperature	4	5	**25°C** to **50°C** by steps of 1°C	45 25	✓
	4	6			
CH anti-cycling delay	4	8	**0** to **7** min by step 0.5 min	48 2.5	✓
CH maximum output limitation	4	9	Value from **0** to **10** Pmin & Pmax general	49 1.0	✓

ACTION	CONFIGURATION	DISPLAY

Menu - 5 - Combustion rate control mode

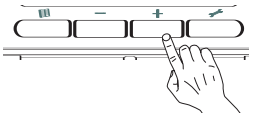
once

Effect	Display
Combustion rate control mode OFF	



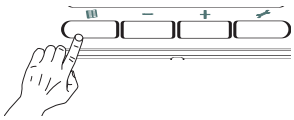
once

Combustion rate control mode ON	The main exchanger temperature appears on the display. The digit - on the display shows the gas output level. (Top = maxi, bottom = mini).



x times

Gas output setting	To modify the gas output use the ⊕ and ⊖ keys.



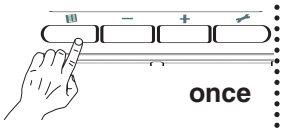
To cancel the combustion rate control mode press the 📖 key.

The combustion rate control mode will not operate if:

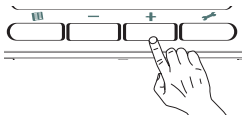
- the boiler is in stand-by mode
- the room thermostat is not calling for heat
- the boiler has locked out
- after a reset or if the main supply fails
- end of the mode if the operator leaves Menu 5
- after 15 minutes if no keys are pressed

Note : As soon as the combustion rate control mode is on the Central Heating temperature control knob will become inactive.

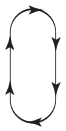
ACTION | CONFIGURATION | DISPLAY



once



x times



Menu - 6 - External Sensor Settings

Section	Digit 1	Digit 2	Digit 3 and 4	Display	Factory setting
External Sensor Fitted	6	0	**0** : External sensor fitted	60 0	
			1 : No external sensor (factory setting)	60 1	✓
Automatic heating adjustment active	6	1	**0** : Inactive - External Sensor not fitted (factory setting)	61 0	✓
			1 : Active - External Sensor fitted	61 1	
Thermal Curve (see table **D**)	6	2	0.3 0.5 1 1.2 1.5 2 2.5 3	62 10	✓
Parallel Shift (see table **E**)	6	3	from **0** to **20** (in steps of 1)	63 10	✓

In the event of connection of the external sensor, you must:

1. Activate the external senor (menu 6.0)
2. Activate the automatic heating adjustment (menu 6.1)
3. Select the correct thermal curve (menu 6.2)
4. Adjust the parallel shift (menu 6.3)

NOTE: SEE SECTIONS 14.6, 14.7 AND 14.8 (PAGES 33 & 34) FOR INSTRUCTIONS ON SETTING THE ABOVE.

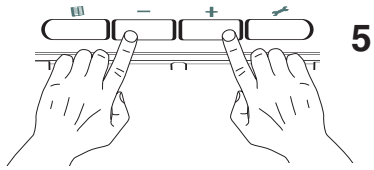
17. Adjustments and Setting (continued)

CH anti cycling delay setting :

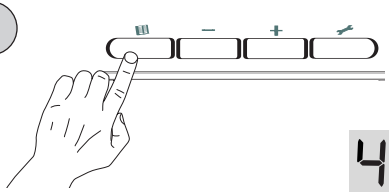
If you would like to change the setting of CH anti cycling delay to 3 mins, please proceed as follows:
(**NOTE** : the factory setting is 2 min 30 seconds and the following explanation refers to Menu 4 Section 8)

Display

1 Switch to installer mode, press the ⊕ and ⊖ keys for 5 seconds, the display shows :**10**=**0** if there is no default in the default register.

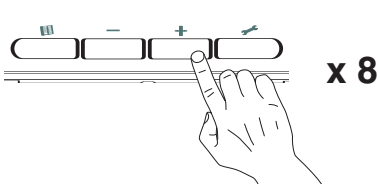


2 Press the menu key 📖 three times to gain access to menu *4,* the display shows : **40**=**0** or **40**=**1**



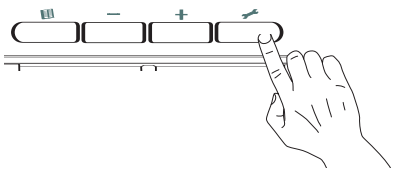
or

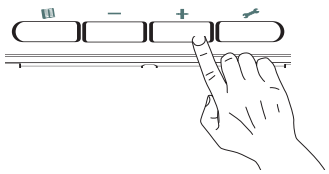
3 Change to section 8 (CH anti-cycling delay), press the ⊕ key eight times, the display shows :***48***=***2.5*** (factory setting 2 min 30 secs)
4 = menu 4
8 = section 8
2.5 = 2.5 min (2 min 30 seconds)

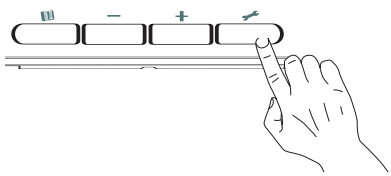


4 Press the setting key 🔧 once, the 3rd and 4th digits flash together. Then press the ⊕ key to change the CH anti-cycling delay, the display shows:
48=***3.0*** press the setting key 🔧 to confirm the value. The display stops flashing.

To exit from setting mode, leave the boiler for approx. 1 minute the boiler will automatically switch back to the user mode.
After programming please close the door **P** (Fig. 46)







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 (see Section 14.3, steps 1-6).

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).

18. Replacement of parts

The life of individual components vary and they will need servicing or replacing as and when faults develop, instructions for removal, inspection and replacement of the individual parts are given in the following pages.

18.1 To Gain General Access

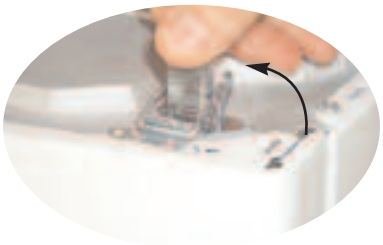
All testing and maintenance operations on the boiler require the control panel to be lowered. This will also require the removal of the casing.

18.1.1 Removing the front panel :

1. Unlock the two clamps **A** *(see Fig. 48)*;

2. Remove the front panel from the rest of the casing *(see Fig. 49)*.

Fig. 48



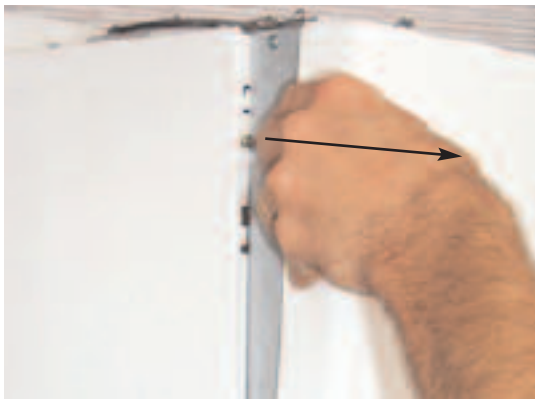


Fig. 49

18.1.2 Lowering the control panel :

1. Remove the front panel;

2. Push in the tabs on either side of the electrical box *(see Fig. 50)* and pivot the electrical box forward.

Fig. 50

18.2 Access to the Combustion Chamber

18.2.1 Removing the air gas assembly

1. Carry out step ***18.1.1***;
2. Remove the silencer (Fig. 51)*;*

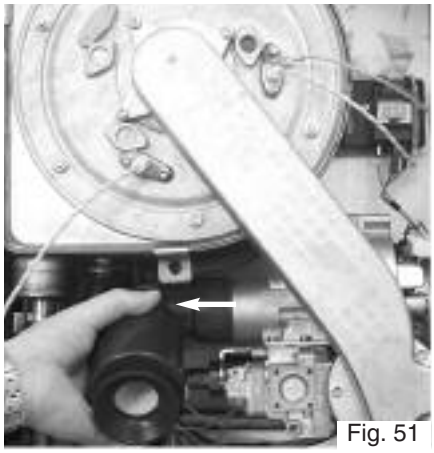


Fig. 51

3. Disconnect the detection electrode cable (Fig. 52);

Fig. 52

4. Remove the earth cable from the ignition electrode (Fig. 53), and remove the ignition electrode cable from the ignitor (Fig. 54);

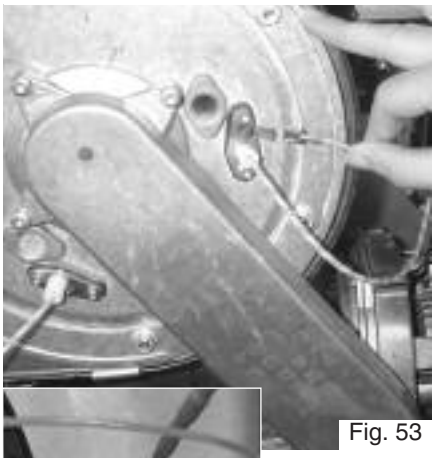


Fig. 53

Fig. 54

5. Unplug the gas valve and fan connectors (Figs. 55 and 56);

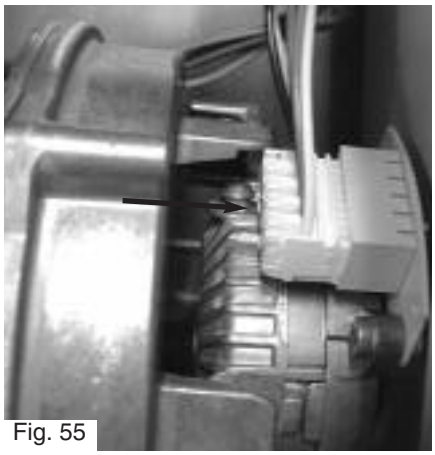


Fig. 55

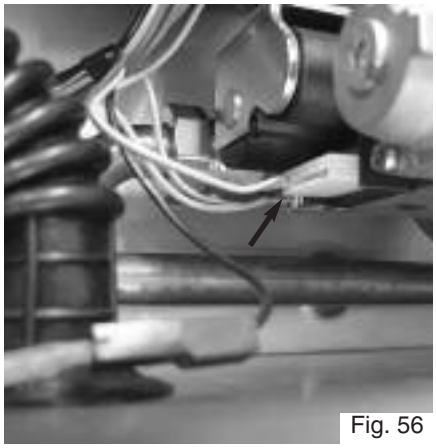


Fig. 56

6. Unscrew the 6 nuts **D** on the combustion chamber (Fig. 57);

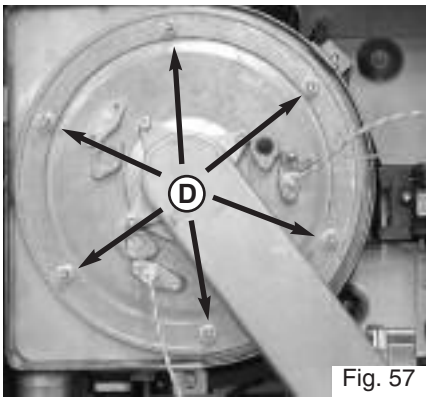


Fig. 57

7. Unscrew the gas valve nut **E** (Fig. 58);

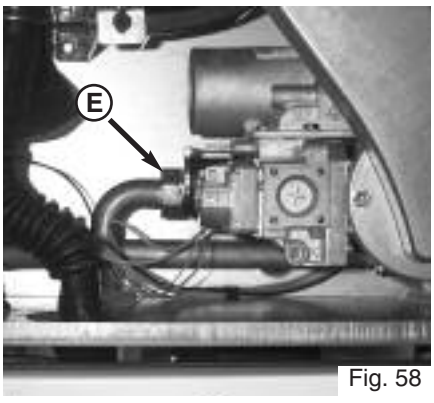


Fig. 58

7. Remove the air gas assembly and combustion chamber front (Fig. 59);
8. Reassemble in reverse order.

Fig. 59

18.2.2 Removing the burner

1. Carry out step ***18.1.1*** and ***18.2.1***;
2. Remove the 3 screws **F** from the air/gas manifold (Fig. 60)*;*
3. Slide the burner out from the front, taking care not to damage the insulation (Fig. 61);
4. Reassemble in reverse order, check all seals are undamaged and the burner is positioned correctly (Fig. 62).

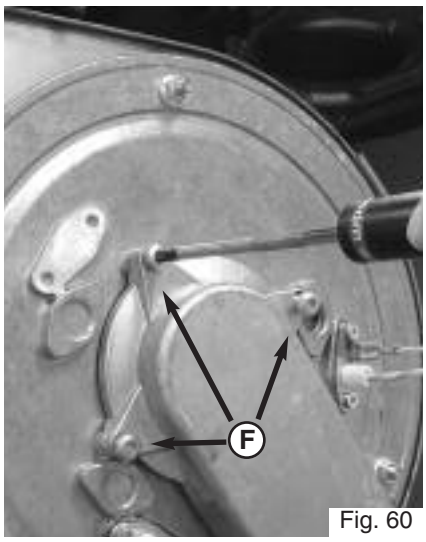


Fig. 60

Fig. 61

Fig. 62

18.2.3 Removing the detection electrode

1. Carry out step ***18.1.1***;
2. Remove the 2 screws **G** from the electrode manifold (Fig. 63)*;*
3. Pull the electrode from the combustion chamber (Fig. 64);
4. Disconnect the detection electrode cable (Fig. 65).
5. Reassemble in reverse order.

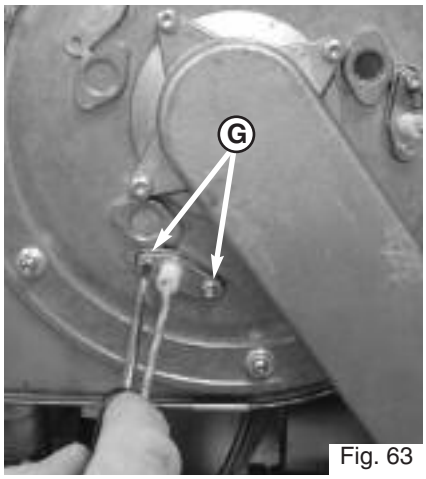


Fig. 63

Fig. 64

Fig. 65

18.2.4 Removing the ignition electrode

1. Carry out step ***18.1.1***;
2. Remove the earth cable from the electrode (Fig. 66)*;*
3. Remove the electrode cable **H** from the ignitor (Fig. 67);
4. Unscrew the 2 screws **I** on the electrode (Fig. 68);

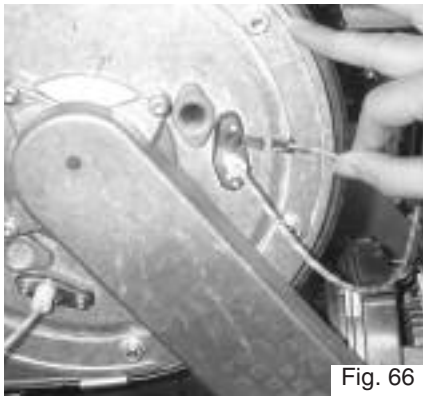


Fig. 66

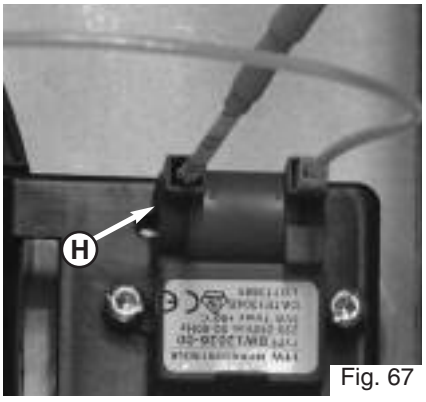


Fig. 67

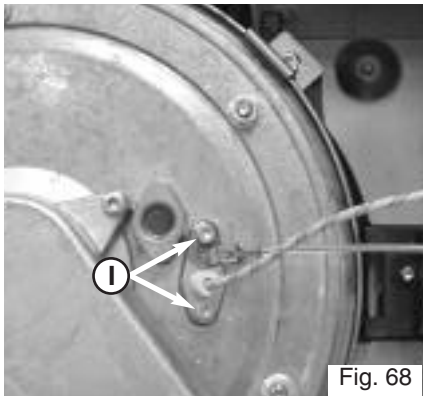


Fig. 68

18.2.5 Removing the fan

1. Carry out step ***18.1.1***;
2. Remove the air gas manifold as in **18.2.1** (Fig. 69)*;*

Fig. 69

3. Unscrew the two screws on the venturi **J** and remove with the gas valve (Fig. 70);

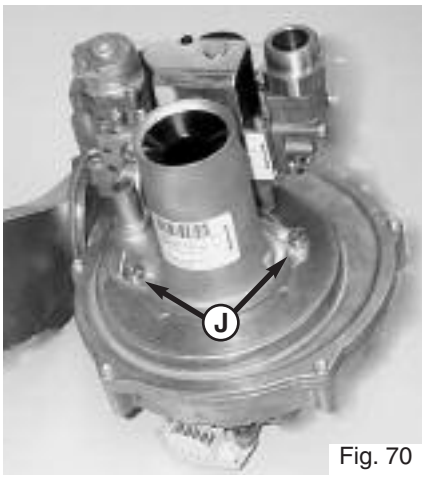


Fig. 70

4. Unscrew the three screws **K** on the air/gas pipe and remove (Fig. 71);
5. Reassemble in reverse order.

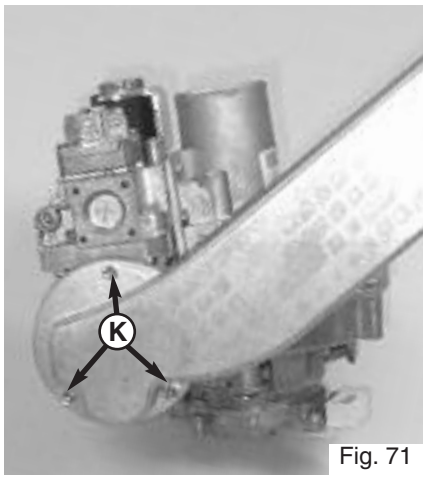


Fig. 71

18.2.6 Removing the gas valve

1. Carry out step ***18.1.1***;
2. Remove the air gas manifold as in **18.2.1** (Fig. 72)*;*

Fig. 72

3. Unscrew the three screws **K** on the air/gas pipe and remove (Fig. 73);

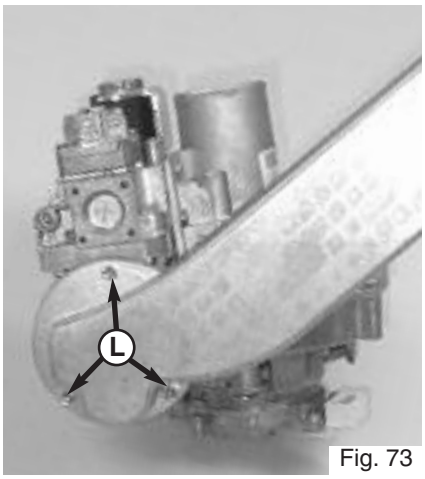


Fig. 73

4. Unscrew the three screws **L** holding the gas valve on the venturi (Fig. 74);

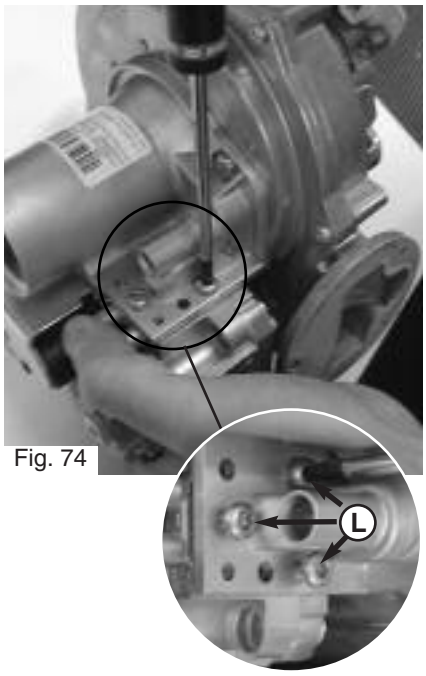


Fig. 74

5. Remove the gas valve from the venturi. (Fig. 75)*;*
6. Reassemble in reverse order;
7. The CO_2 settings will need to be checked and if necessary adjusted (see Section 14.3 page 30);
8. Test for tightness on reassembly

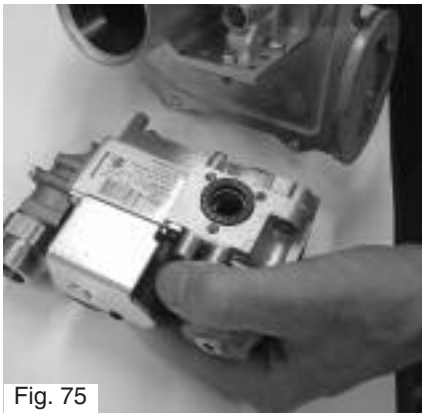


Fig. 75

18.2.7 Removing the heat exchanger

1. Drain down the boiler;
2. Carry out step ***18.1.1***;
3. Remove the air gas manifold as in 18.2.1 (Fig. 76)*;*

Fig. 76

4. Unscrew the three bolts **M** from the main heat exchanger (Fig. 77);

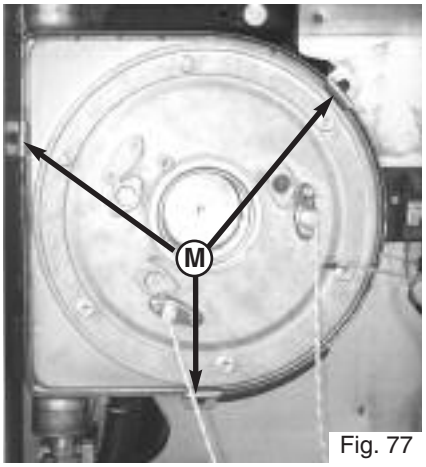


Fig. 77

5 .Remove the flow and return pipes and the condense drain pipe from the heat exchanger. (Fig. 78)

Fig. 78

6. Remove the heat exchanger from the boiler by sliding it forwards. (Fig. 79);
7. Reassemble in reverse order.

Fig. 79

18.2.8 Removing the spark generator

1. Carry out step ***18.1.1***;
2. Disconnect the earth cable from the ignition electrode. (Fig. 80)*;*

Fig. 80

3. Disconnect the ignition electrode, live, neutral and earth cables from the ignitor. (Fig. 81);

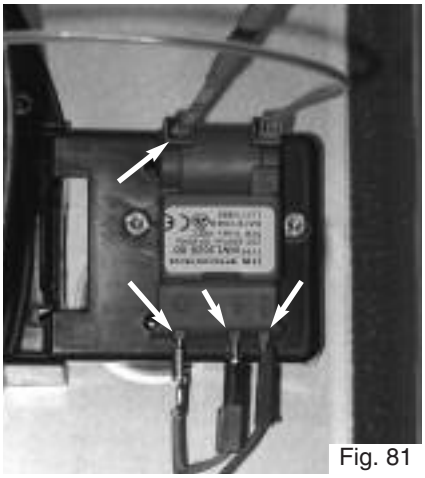


Fig. 81

4. Remove the two screws **N** from the ignitor and remove (Fig. 82);
5. Reassemble in reverse order.

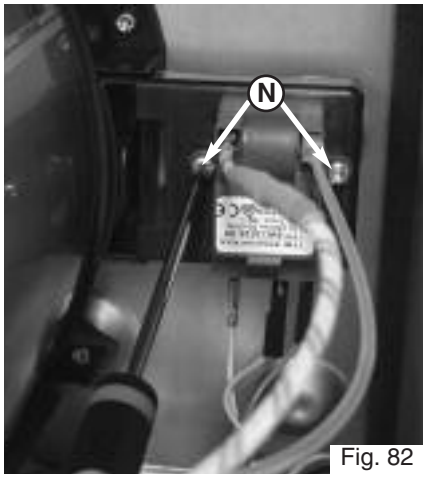


Fig. 82

18.3 Access to the Water Circuit

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

18.3.1 Drain down

Close the flow and return isolating valves and open the pressure relief valve.

18.3.2 Removing the Central Heating return body

1. Carry out step ***1.2.1*** and ***1.2.3***;
2. Remove the clip "**Q1**" from the by-pass tube (Fig. 84);
3. Remove the clips "**Q2**" and "**Q3**" from the heating return and the pump (Fig. 85 & 86);
4. Remove the two screws "**P1**" (Fig. 84);
5. Remove the Central Heating return body by pulling it toward you (Fig. 87);
6. Reassemble in reverse order;

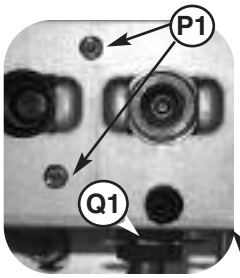


Fig. 84

Fig. 87

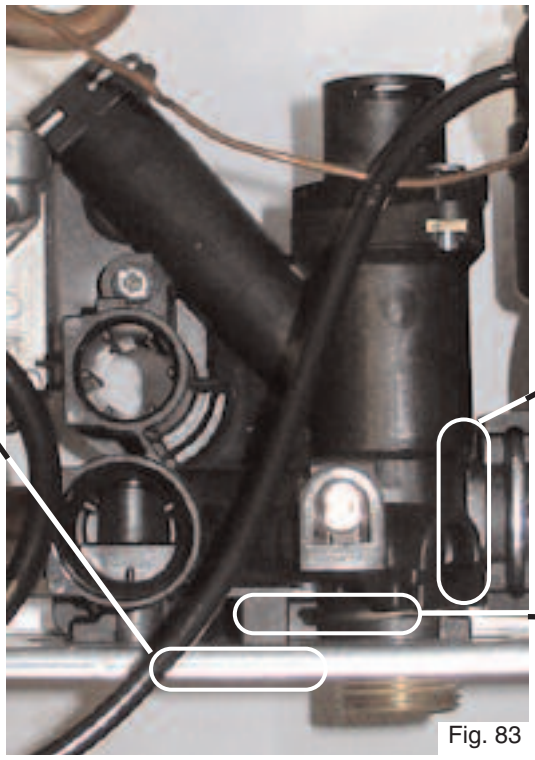


Fig. 83

Fig. 85

Fig. 86

18.3.3 Removing the pump

1. Carry out step ***18.1.1***;
2. Lower the electrical box cover as in step ***18.1.2;***
3. Remove the PCB cover;
4. Remove the pump plug from the control board and earth plug from the earth socket *(see Fig. 88);*

Fig. 88

5. Remove the clip **S2** on the pump volute *(see Fig. 90);*

Fig. 90

6. Unscrew the pump nut *(see Fig. 89);*

Fig. 89

7. Pull the pump toward you and remove the clip **S3** securing the pressure gauge *(see Fig. 91);*
8. Reassemble in reverse order.

Fig. 91

18.3.4 Removing the pressure relief valve

1. Carry out step ***18.1.1*** and ***18.3.1***;
2. Remove the clip securing the valve *(see Fig. 92)* and pull it toward you;
3. Reassemble in reverse order; take care to ensure the valve is in the correct position;

Fig. 92

18.3.5 Removing the expansion vessel

1. Carry out step 18.3.1;
2. Isolate the gas supply and disconnect all pipe connections;
3. Remove the boiler from the wall
4. Unscrew the nut **U** *(see Fig. 97)*;
5. Pull the expansion vessel to remove it *(see Fig. 98)*;
6. Reassemble in reverse order.

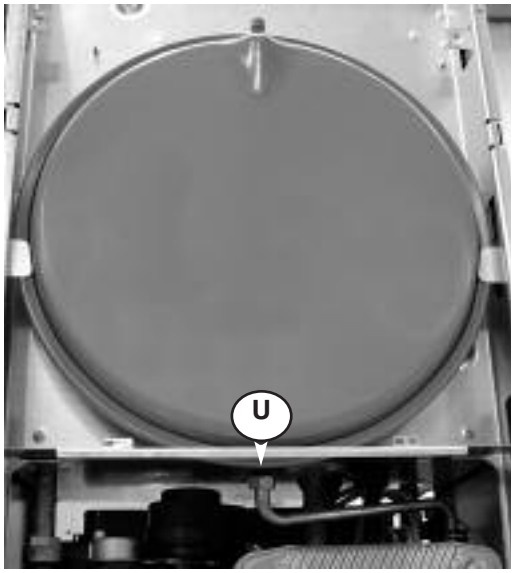


Fig. 93

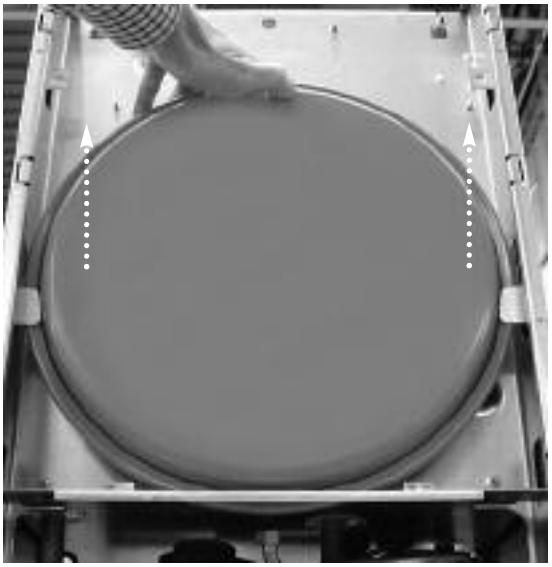


Fig. 94

18.3.6 Removing the overheat thermostat

1. Remove the casing as in step **18.1.1**;
2. Pull off the thermostat connections. Then remove the thermostat from the pipe by releasing it's securing clip *(see Fig. 99)*.

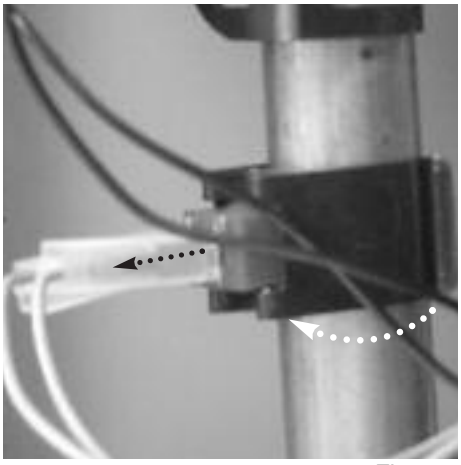


Fig. 95

18.3.7 Removing the temperature sensors (N.T.C's)

1. Remove the casing as in step **18.1.1**;
2. Pull off the NTC connections. Then remove the NTC from the pipe by releasing it's securing clip *(see Fig. 100)*.

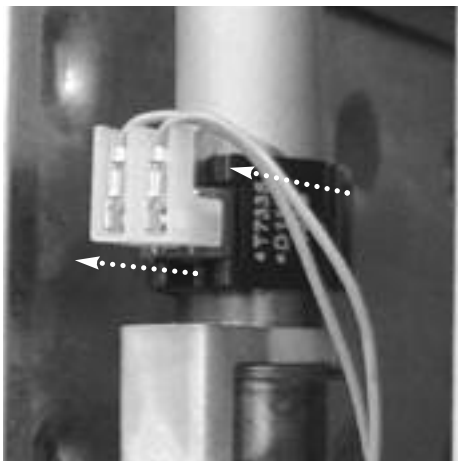


Fig. 96

18.3.8 Removing the pressure gauge

1. Carry out steps ***18.3.1 and 18.3.3***;
2. Remove the pressure gauge by releasing the two clips **V** and pulling the pressure gauge out. (*see Fig. 97*)

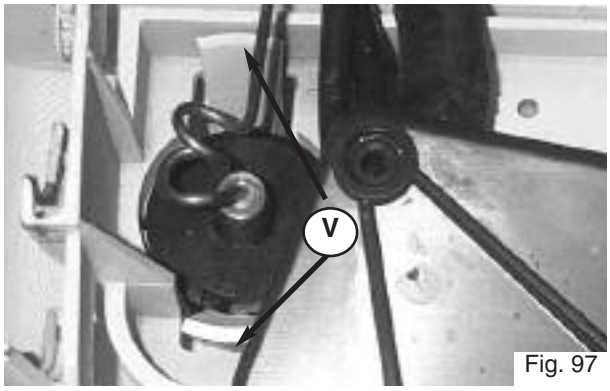


Fig. 97

18.3.9 Removing the water pressure switch

1. Carry out steps **18.1.1 and 18.3.1**;
2. Pull off the connections and remove the pressure switch by releasing it's securing clip *(see Fig. 98)*.

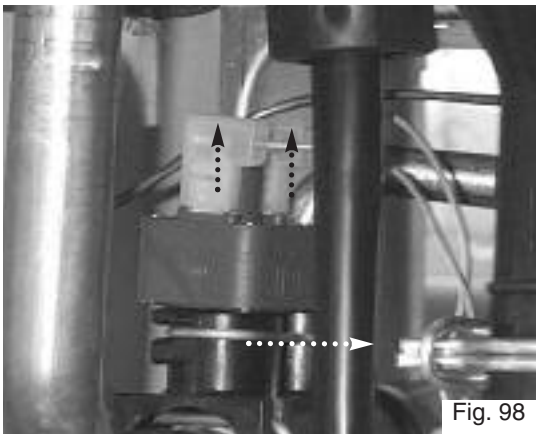


Fig. 98

18.4 Access to the Control System

18.4.1 Removing the P.C.B.s

1. Carry out steps ***18.1.1*** and ***18.1.2***;
2. Remove the screw **W1** from the electrical box (*see Fig. 99*);

Fig. 99

3. Release the three clips **W2** and remove the electrical box cover (s*ee Fig. 100)*;

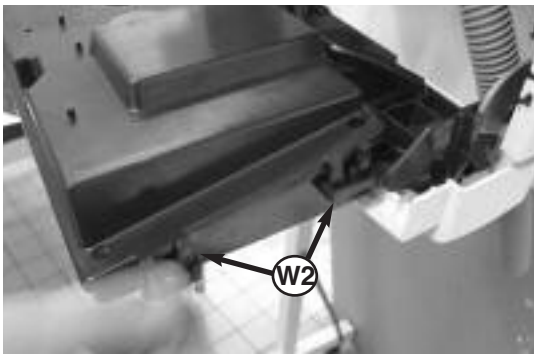


Fig. 100

4. Remove the two screws **W3** from the front control panel and lower the front control panel (see *Fig. 101*);

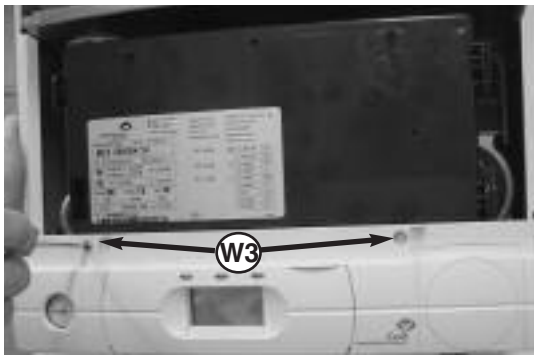


Fig. 101

5. Remove all electrical connections from the display PCB (see *Fig. 101*);

Fig. 102

6. To remove the display PCB, remove the two screw **W4** and lift the PCB out (see *Fig. 103*);
7. Reassemble in reverse order;

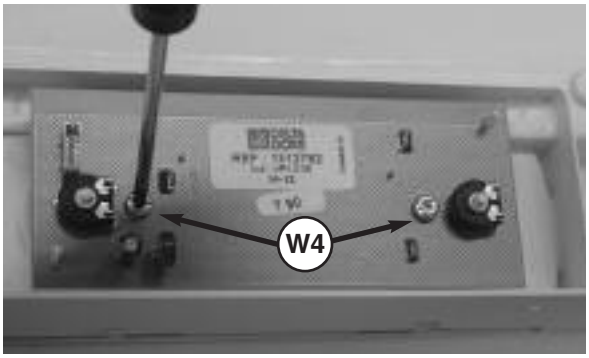


Fig. 103

8. To remove the main PCB disconnect all electrical connections and remove the two screws **W5** (see *Fig. 104*);
Fit the correct EEPROM key when replacing the old PCB.
9. Reassemble in reverse order.

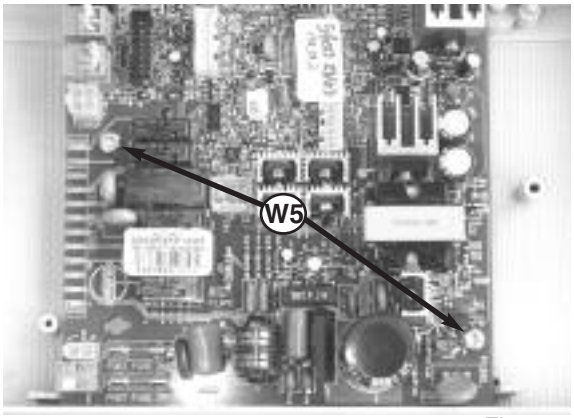


Fig. 104

18.4.2 Removing the fuses

1. Carry out step ***18.4.1***;
2. Remove the fuses "**X**" *(see Fig. 105)*
3. Reassemble in reverse order.

NOTE: FUSE RATING = 2 AMP FAST FUSE

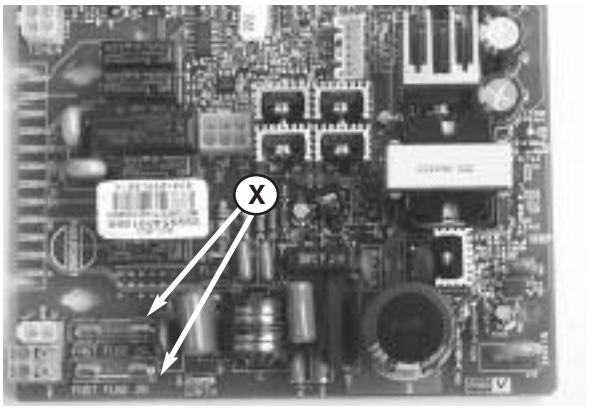


Fig. 105

18.5 Connecting the external sensor

1. Access the main PCB as in step ***18.4.1***;
2. Install the interface PCB supplied in the external sensor kit on the main PCB *(see Fig. 106)*
3. Connect the wires between the external sensor and the interface *(see Fig. 106)*.

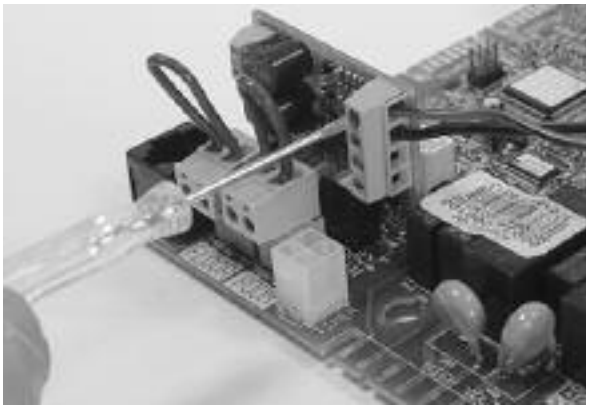


Fig. 106

19. Error Codes

In case of an error, or when the boiler has to display a message, the display flashes 2 digits. Please refer to the table below to diagnose the default.

For default 01 and 03, **A** appears on the display, the boiler is locked and the red button lights (28). To reset the boiler press key **28**.

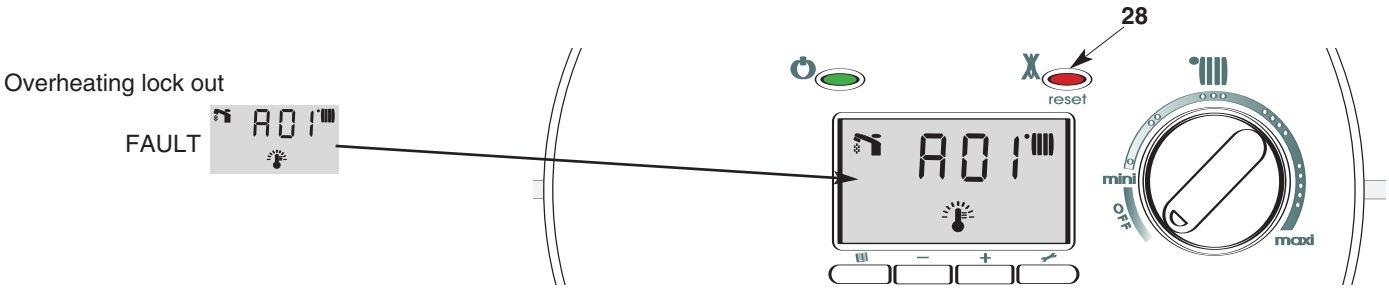


Fig. 107

Code	Fault description
A 01	Overheat lockout
A 03	No flame detected within allowed time
A 36	Flue pipe too high temperature
A 37	CPU fault
A 39	PCB fault 1
A 40	PCB fault 2
A 41	Fan error
E 02	No Circulation (check pump and water pressure)
E 04	No flame detection
E 05	Anti-freeze system, pump only
E 06	Anti-freeze system, pump and burner
E 07	No water circulation in primary circuit
E 08	No water in the primary circuit
E 11	Flow sensor open circuit
E 12	Flow sensor short circuit
E 13	Return sensor open circuit
E 14	Return sensor short circuit
E 15	Outdoor sensor open circuit (where fitted)
E 16	Outdoor sensor short circuit (where fitted)
E 18	Flame lift
E 20	Flame detected with gas valve off
E 22	Faulty air pressure switch
E 23	Low fan speed
E 25	Tank sensor open circuit
E 26	Tank sensor short circuit
E 27	Tank fault warning
E 29	Room sensor open circuit
E 30	Room sensor short circuit
E 33	Under floor heating thermostat open circuit
E 34	Flue pipe sensor open circuit
E 35	Flue pipe sensor short circuit
E 36	Flue pipe too high temperature
E 37	Communication problem with the main PCB
E 38	Reset pressed 5 times within 15 minutes

20. Incorrect Operaton

Fault	Cause	Solution
The boiler doesn't start	No gas, no water or no electricity	Check gas, water and electrical supplies and fuses.
	Air in the gas pipe	Follow the procedure in Section 14.2 (page 32)
	Room thermostat switched off	Turn up the room thermostat
Red indicator alight		Wait for a few minutes Press the reset button **28** (Fig. 107, page 55) the red led will go out and the boiler will attempt to re-light. If the red indicator lights too frequently, please call your local service centre.
Noises in CH system	Air present in the CH system or insufficient pressure	Purge the system of air and increase the system pressure (Section 2 page 6)
Radiators rise in temperature During summer season	2 Port Valve for Central Heating stuck open or demand for Central Heating from Time Clock and Room Thermostat	Check the Central Heating 2 port valve, time clock and room thermostat.

If these solutions do not cure the fault, call a qualified professional

21. Maintenance Instructions

21.1 General remarks

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

1. Check the seals in the water group, and if necessary, replace the gasket and restore the seal to perfect working order;

2. Check the seals in the gas group, and if necessary replace the gaskets and restore the seal to perfect working order;

3. Visually check the overall condition of the boiler;

4. Visually check the combustion, and if necessary, disassemble and clean the burner;

5. Following inspection 3, disassemble and clean the combustion chamber as necessary;

6. Following inspection 4, disassemble and clean the injector, if necessary;

7. Clean the primary heat exchanger. (see Section 21.2);

8. Check and adjust the CO_2 emissions as necessary (see Section 14.3);

9. Check the correct operation of the heating safety devices:
   - Overheat thermostat

10. Check the correct operation of the low water pressure switch;

11. Check the correct operation of the gas group safety devices:
    - absence of gas or flame safety device (ionisation);

12. Check that the electrical connections are correct (as described in Section 13, page 26);

13. Check the efficiency of the production of domestic hot water (test the flow rate and temperature rise);

14. Carry out a general inspection of the boiler;

15. Check the flue and termination point;

16. Remove any oxide from the detection electrode by using an emery cloth.

21.2 Cleaning the primary exchanger

Cleaning the exhaust side

Remove the air gas assembly (Section 18.2.1). Check that the exhaust passages are free, if there are deposits present, clean the exchanger with compressed air or wash with water or a vinegar based detergent.

Cleaning the water side

Use detergents that dissolve CaCO3. Leave to act for a short time and then rinse.

Make sure that the detergent does not remain inside the exchanger.

Remove the condensate trap and clean it. Fill it with water and reassemble.

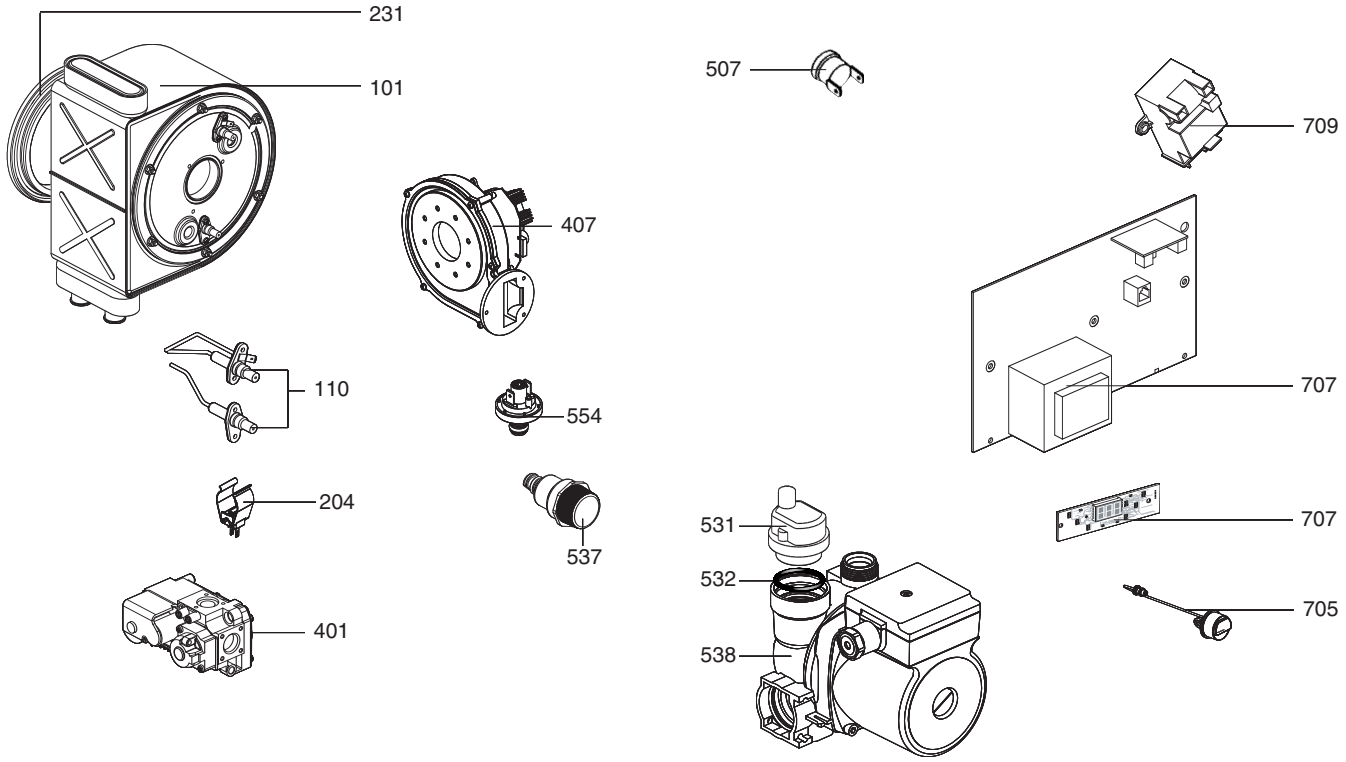
21.3 Operational test

After servicing the boiler, fill the heating circuit to a pressure of approximately 1.5 bar and release the air from the system.

- Place the boiler in operation;
- If necessary, release the air again from the heating system;
- Check the settings, seals and the correct functioning of the system for expelling the products of combustion and drawing combustion air;
- Check the settings and correct operation of all the control, regulation and monitoring components;
- Check that the burner ignites properly and carry out a visual check of the burner flame;
- Check that the 3 bar safety valve is operating correctly;
- Check the operation of the time control and room thermostat (if fitted);
- Complete the Service Interval Record (Section 25, page 36)

NOTE: THESE CHECKS ARE NOT EXHAUSTIVE

22. Short spares list



Key N°	Description	G.C N°	Manf. Pt. N°	Type	24 SYSTEM A FF	30 SYSTEM A FF	35 SYSTEM A FF	Manf. date from	Manf. date to
100	**BURNER ASSEMBLY**								
101	BURNER 24KW		61313760		●				
	BURNER 30KW		61313763			●			
	BURNER 35KW		61314834				●		
200	**FAN ASSEMBLY**								
204	TEMPERATURE PROBE		990686		●	●	●		
231	GASKET D:129.4		61306030		●	●	●		
400	**GAS SECTION**								
401	GAS SECTION ASSY		61307584		●				
	GAS SECTION ASSY		61310129			●			
	GAS SECTION ASSY		61315410				●		
407	FAN ASSY		61314434		●	●	●		
500	**HYDRAULIC BLOCK**								
507	OVERHEAT THERMOSTAT 100°C		61010572		●	●	●		
531	AIR SEPARATOR HEAD ASSEMBLY		61304608		●	●	●		
532	GASKET KIT		61304618		●	●	●		
537	PRESSURE RELIEF VALVE		61312668		●	●	●		
538	PUMP + AIR SEPARATOR 15/50		61301964		●	●	●		
	PUMP + AIR SEPARATOR 15/60		61303461		●	●	●		
554	PRESSURE SENSOR 0.8B		61310364		●	●	●		
700	**ELECTRICAL BOX**								
705	PRESSURE GAUGE		61313561		●	●	●		
707	PRINTED CIRCUIT BOARD		65102353		●	●	●		
	PRINTED CIRCUIT BOARD ADJUST.		61312782		●	●	●		
	PRINTED CIRCUIT BOARD CONNECT.		61314958		●	●	●		
709	IGNITER		61002105-20		●	●	●		

23. Technical data

Model				**SYSTEM A 24**		**SYSTEM A 30**	
CE certificate				1312-BP-4083		1312-BP-4084	
Performance category				****		****	
NoX class				5		5	
Category				II2H3P		II2H3P	
Heating output	80°C/60°C		kW	7 to 24		9 to 29	
Heating output	50°C/30°C		kW	7 to 26		9 to 32	
Variable heating power	PN max		kW	24		29	
Nominal gas flow rate (15°C-1013 mbar)				min	max	min	max
Central Heating (gas flow rate)		Qn	kW	7	24	9	29
G20 (NG H - Lacq)	34.02 MJ/m^3 under 20 mbar	Vr	m^3/h	0.79	2.65	0.99	3.17
G31 (propane)	46.4 MJ/kg under 37 mbar	Vr	kg/h	0.58	1.94	0.73	2.33
Membrane Diameter (mm)/marking							
G20			mm	without		without	
G31 propane			mm	4.4		4.8	
Adjustable heating outlet temperature			°C	25 to 85		25 to 85	
Central heating minimum flow rate			l/h	300		300	
Central heating circuit maximum pressure	Pw max		bar	3		3	
Central heating expansion vessel capacity			L	6		8	
Expansion vessel inflation pressure			bar	0.7		0.7	
Electric voltage				230 volt, single phase-50 Hz		230 volt, single phase-50 Hz	
Electrical input power			W	150		150	
Electrical protection				IP 44		IP 44	
Maximum flow rate for combustion products				10.9		13.5	
Fume temperature (60-80)			°C	79		74	
Fume temperature (30-50)			°C	60		59	
CO^2 G20			%	9.5		9.2	
CO^2 G31			%	10		10	
Flue duct type				C13 / C33 / C43 / C53			
Maximum flue length (Horizontal and Vertical - Ø60/100)			m	5			
Maximum flue length (Horizontal and Vertical - Ø80/125)			m	10			
SEDBUK		Band	(%)	A (90.1)		A (90.3)	
Dimensions	HxWxD		mm	720 x 390 x 396		720 x 390 x 360	
Weight			kg	31.4		34	

24. 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 _____

25. 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

TERMS AND CONDITIONS OF GUARANTEE

Please read these terms and conditions which are in addition to any terms and conditions detailed in this book or any registration card supplied with your appliance.

A charge will be made to the owner of the appliance if:

- The reason for any service visit is as a direct result of a failure to install the appliance in accordance with the manufacturer's instructions.
- Your installer does not complete the necessary commissioning process and procedure as detailed in the Installation and Operating Instructions.
- Your appliance is not serviced on or before the 12 month anniversary of installation - this only applies to appliances with a 2 and 5 year guarantee.
- Our service engineer calls as requested and the failure is a non-manufacturing defect.

Failure to pay an invoice for any such occurence **will** be assumed by MTS that you accept that your appliance has not been installed correctly and understand that any manufacturer's guarantee has been withdrawn.

On the 12 month anniversary of the appliance installation, you must have it serviced to continue any guarantee offered into the following year. Failure to do so **will** invalidate your guarantee and should an MTS engineer be required to attend and no proof of service documentation is made available, then MTS **will** charge.

As part of the commissioning process, it is a legal requirement to register all boiler installations or replacements with CORGI. Upon registration a "Certification Number" will be issued followed by a "Declaration of Safety" Certificate. MTS (GB) Ltd cannot be called upon to carry out any work under the manufacturer's guarantee without proof of registration. The registration number must be quoted when requesting a service visit, and the "Declaration of Safety" Certficate subsequently shown to the service engineer.
If the certificate is not made available, the engineer will not work on the appliance and a wasted call charge will be made.

If you have a problem with commissioning on installation, please contact our
Technical Department on 0870 241 8180

Please remove the completed boiler commissioning checklist sticker from the front of the boiler and place in this box for customer reference

Manufacturer: **MTS SA - France**
Commercial subsidiary: **MTS (GB) Limited,** MTS Building, Hughenden Avenue, High Wycombe, Bucks HP13 5FT

13164457b - 12/2005

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