

# Sirius WH 90-110

## Wall Mounted Condensing Gas Boilers

### Installation, Operation & Maintenance Manual



Working towards  
a cleaner future

Dear Customer,

We are sure your new boiler will comply with all your requirements.

Do not dispose of this booklet as it contains the information, which will help you to run your boiler correctly and efficiently.

Do not leave any parts of the packaging (plastic bags, polystyrene, etc.) within children's reach as they are a potential source of danger.

**POTTERTON COMMERCIAL** boilers bear the CE mark in compliance with the basic requirements as laid down in the following Directives:

- Gas Directive 90/396/CEE
- Performance Directive 92/42/CEE
- Electromagnetic Compatibility Directive 2004/108/CEE
- Low Voltage Directive 2006/95/CE



# CONTENTS

## INSTRUCTIONS PERTAINING TO THE USER

|   |    |
|---|----|
| 1. Instructions prior to installation                   | 4  |
| 2. Instructions prior to commissioning                  | 4  |
| 3. Commissioning of the boiler                          | 5  |
| 4. Filling the boiler                                   | 12 |
| 5. Turning off the boiler                               | 12 |
| 6. Prolonged standstill of the system. Frost protection | 12 |
| 7. Servicing instructions                               | 12 |

## INSTRUCTIONS PERTAINING TO THE INSTALLER

|   |    |
|---|----|
| 8. General information                                      | 13 |
| 9. Instructions prior to installation                       | 13 |
| 10. Boiler installation                                     | 14 |
| 11. Boiler size   | 15 |
| 12. Installation of flue and air ducts                      | 16 |
| 13. Hydraulic system  | 20 |
| 14. Connecting the mains supply                             | 24 |
| 15. Gas valve adjustment                                    | 31 |
| 16. Setting the boiler parameters                           | 33 |
| 17. Control and operation devices                           | 34 |
| 18. Positioning of the ignition and flame sensing electrode | 35 |
| 19. Check of combustion parameters                          | 35 |
| 20. Activating the chimney-sweep function                   | 36 |
| 21. Annual maintenance                                      | 36 |
| 22. Boiler schematic  | 37 |
| 23. Illustrated wiring diagram                              | 38 |
| 24. Technical data  | 39 |

# 1. INSTRUCTIONS PRIOR TO INSTALLATION

This boiler is designed to heat water at a lower than boiling temperature at atmospheric pressure. The boiler must be connected to a central heating system and/or to a domestic hot water supply system in compliance with its performances and output power.

The boiler must be installed by a Qualified Service Engineer ensuring that the following operations are carried out:

- a) Careful checking that the boiler is fit for operation with the type of gas available. For more details see the notice on the packaging and the label on the appliance itself.
- b) Careful checking that the flue terminal draft is appropriate; that the terminal is not obstructed and that no other appliance exhaust gases are expelled through the same flue duct, unless the flue is especially designed to collect the exhaust gas coming from more than one appliance, in conformity with the standards and regulations in force.
- c) Careful checking that, in case the flue has been connected to pre-existing flue ducts, thorough cleaning has been carried out in that residual combustion products may come off during operation of the boiler and obstruct the flue duct.
- d) To ensure correct operation of the appliance and avoid invalidating the warranty, observe the following precautions:
  1. Hot water circuit:  
If the water hardness is greater than 20 °F (1 °F = 10 mg calcium carbonate per litre of water) a polyphosphate or comparable treatment must be used in response to current regulations.

## 2. Heating circuit

### 2.1. New system

Before proceeding with installation of the boiler, the system must be cleaned and flushed out thoroughly to eliminate residual thread-cutting swarf, solder and solvents if any, using suitable proprietary products.

To avoid damaging metal, plastic and rubber parts, use only neutral cleaners, i.e. non-acid and non-alkaline. The recommended products for cleaning are:

SENTINEL X300 or X400 and FERNOX heating circuit restore. The use of this product must be strictly in accordance with the maker's directions. Finally the system must be dosed with a suitable inhibitor at 1% system volume.

### 2.2. Existing system

Before proceeding with installation of the boiler, the system must be cleaned and flushed out to remove sludge and contaminants, using suitable proprietary products as described in section 2.1.

To avoid damaging metal, plastic and rubber parts, use only neutral cleaners, i.e. non-acid and non-alkaline such as SENTINEL X100 and FERNOX heating circuit protective.

Remember that the presence of foreign matter in the heating system can adversely affect the operation of the boiler (e.g. overheating, noisy operation, or failure of the heat exchanger may occur).

---

Failure to observe the above will render the warranty null and void.

---

# 2. INSTRUCTIONS PRIOR TO COMMISSIONING

Initial lighting of the boiler must be carried out by a qualified service engineer. Ensure the following operations are carried out:

- a) Compliance of boiler parameters with (electricity, water, gas) supply systems settings.
- b) Compliance of installation with the standards and regulations in force.
- c) Appropriate connection to the power supply and earthing of the appliance.

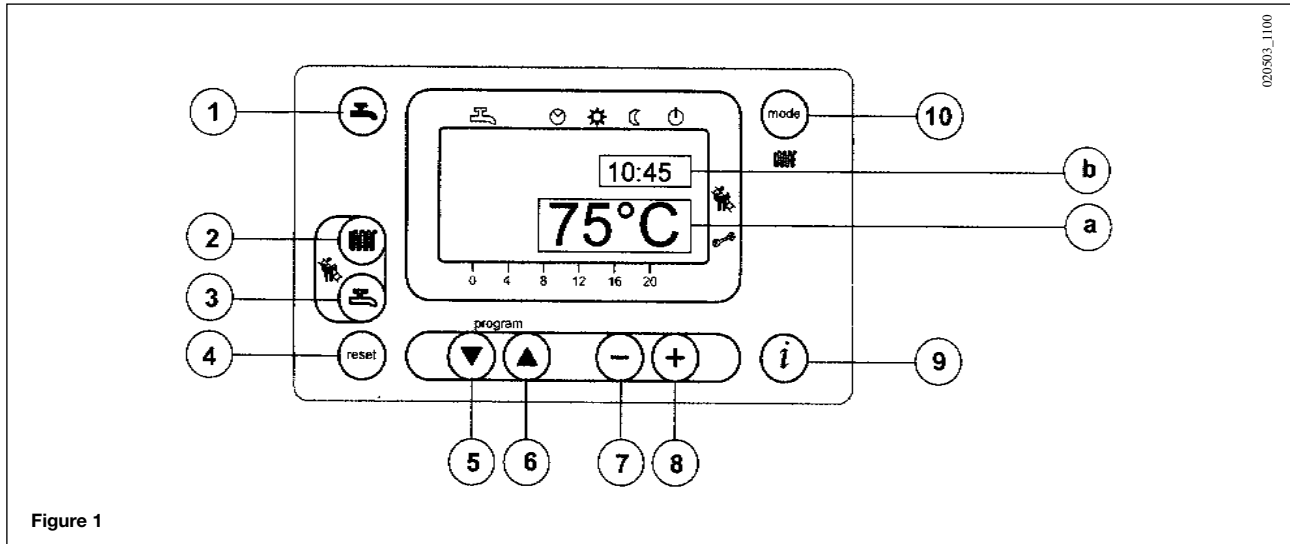
Failure to observe the above will render the guarantee null and void.

Prior to commissioning remove the protective plastic coating from the unit. Do not use any tools or abrasive detergents as you may damage the painted surfaces.

### 3. COMMISSIONING OF THE BOILER

To correctly light the burner proceed as follows:

- 1) Provide power supply to the boiler;
- 2) Open the gas cock;
- 3) Follow the directions given below regarding the adjustments to be made at the boiler control panel.



**IMPORTANT:** The instructions contained in this manual relating to the operation of the hot water circuit are relevant only if the appliance is actually connected to a hot water system.


#### KEYS


- Hot water on/off key
- Central heating water temperature setting key
- Hot water temperature setting key
- Reset key
- Program access and scroll keys
- Program access and scroll key
- Parameter setting key (decrease value)
- Parameter setting key (increase value)
- Data display reset key
- Central heating mode setting key

#### DISPLAY SYMBOLS


- Operation in hot water mode
  - Operation in central heating mode
  - Operation in automatic mode
  - Operation in manual mode at the maximum temperature set
  - Operation in manual mode at minimum temperature
  - Standby (off)
  - Outdoor temperature
  - Flame present (on)
  - Resettable alarm warning
- a) MAIN display**  
**b) SECONDARY display**

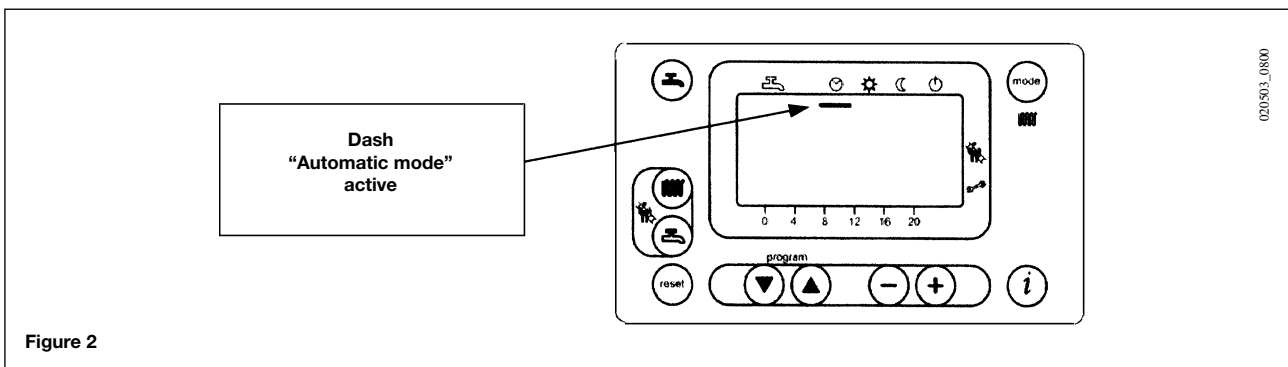
## 3.1 DESCRIPTION OF KEYS





 (2) This key can be pressed to set the central heating water output temperature as described in point 3-3.

 (3) This key can be pressed to set the hot water temperature as described in point 3-4.


 (10) **Central heating mode operating key**



The  key can be pressed to activate four boiler central heating operating modes; these modes are identified by a black cursor line underneath the relative symbol on the display, and are as follows:







- a)  **Automatic operation.** Operation of the boiler is controlled by the timed program as described in point 3-5.1 “Daily timed program for operation of the central heating system”;
- b)  **Manual operation at the maximum temperature set.** The boiler comes into operation regardless of the timed program set. The operating temperature is that set using the  key (point 3-3: “Setting the maximum central heating temperature”);
- c)  **Manual operation at minimum temperature.** The operating temperature is that set in point 3-6: “setting the minimum central heating temperature”.


The manual transition from positions a) and b) to position c) involves shut-down of the burner and disconnection of the pump after the post-circulation delay interval (the factory setting for this parameter is 3 minutes).

d)  **standby.** The boiler does not work in central heating mode, although the frost protection function is still enabled.



 (1) **Hot water on/off key:** Press this key to activate or inhibit this function, which is identified by the appearance on the display of two black dashes under the  symbol.

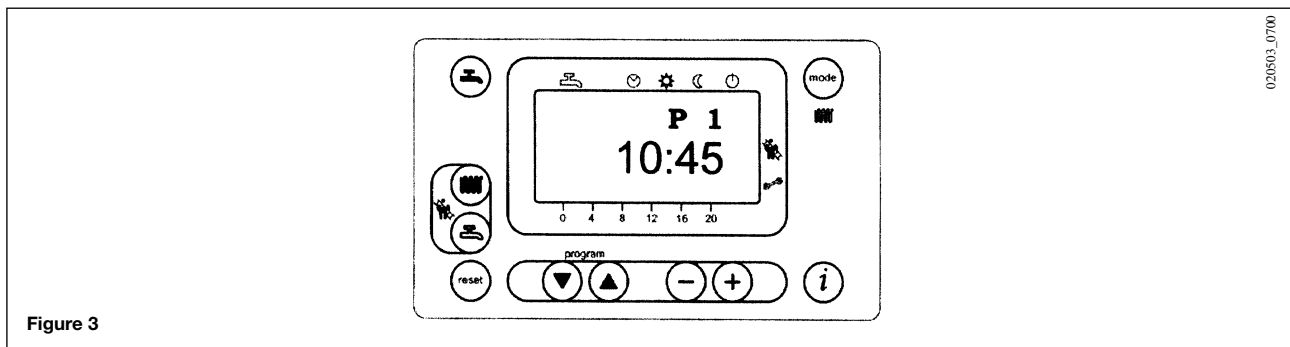
 (4) **Reset key.** In case of a fault, referred to in point 3-7 “Faults and resetting the boiler”, the boiler can be restarted by pressing this key for at least two seconds. If this key is pressed with no fault present, the display will show the message “E153”, and the same key has to be pressed again (for at least two seconds) to restart the boiler.






 (9) **Data key.** This key can be pressed repeatedly to display the following information:  
 - Temperature (°C) of the hot water ();  
 - outdoor temperature (°C) (); only provided with the outdoor temperature sensor probe connected.

Press either of the   keys to return to the main menu.






## 3.2 SETTING THE TIME




- a) Press either of the   keys to access the programming function; the display will show the letter P followed by a number (program line);








- b) Press the   keys until the display shows P1, referring to the time to be set;
- c) Press the   keys to set the time; on the display, the letter P will start to flash;
- d) Press the  key to save and exit the programming function;

## 3.3 SETTING THE MAXIMUM CENTRAL HEATING TEMPERATURE

- Press the  key (2-figure 1) to set the central heating water temperature;
- Press the   keys to set the temperature required;
- Press either of the   keys (1 or 10 - figure 1) to save and return to the main menu.







**NOTE:** With the outdoor sensor connected, the  key (2 - figure 1) can be used to shift the central heating curve. Press the   keys to decrease or increase the room temperature in the premises to be heated.

## 3.4 SETTING THE MAXIMUM HOT WATER TEMPERATURE

- Press the  key (3-figure 1) to set the maximum hot water temperature;
- Press the   keys to set the temperature required;
- Press either of the   keys (1 or 10 - figure 1) to save and return to the main menu.

## 3.5 SETTING THE DAILY PROGRAM FOR OPERATION IN CENTRAL HEATING AND DOMESTIC HOT WATER MODES





### 3.5.1 Setting the daily times for central heating mode operation


- Press either of the   keys to access the programming function;
  - a) press these keys until the display shows P11, referring to the program start time;
  - b) press the   keys to set the time;
- Press the  key; the display will show P12, referring to the program end time;
- Repeat the operations described in points a and b until the third and last cycle is reached (program line P16);
- Press the  key to save and exit from the programming function.

### 3.5.2 Setting the daily times for domestic hot water mode operation

- As supplied by the factory the appliance is set up with the hot water function always enabled and the domestic hot water programming function disabled.  
The instructions for enabling this program are given in chapter 17, which is addressed specifically to installers (parameter H91).  
If the program is enabled program lines from 31 to 36 must be set up as described in heading 3-5.1.

## 3.6 SETTING THE MINIMUM CENTRAL HEATING TEMPERATURE



- Press either of the   keys to access the programming function;
- Press these keys until the display shows P5, referring to the temperature to be set;
- Press the   keys to set the temperature required.

This operating mode is enabled when minimum temperature central heating mode “” is activated or when the daily central heating program does not require heat.

**NOTE:** With the outdoor sensor connected, parameter P5 can be used to set the minimum room temperature in the premises to be heated (night setback).




### 3.7 TABLE FOR USER-SETTABLE PARAMETERS


| Parameter N. | Parameter description  | Factory setting | Range         |
|--------------|--|-----------------|---------------|
| P1           | Time of day setting  | — — — —         | 0...23:59     |
| P5           | Minimum central heating temperature setting (°C)   | 25              | 25..80        |
| P11          | Start of first daily period of automatic central heating   | 6:00            | 00:00...24:00 |
| P12          | End of first daily period of automatic central heating   | 22:00           | 00:00...24:00 |
| P13          | Start of second daily period of automatic central heating  | 0:00            | 00:00...24:00 |
| P14          | End of second daily period of automatic central heating  | 0:00            | 00:00...24:00 |
| P15          | Start of third daily period of automatic heating   | 0:00            | 00:00...24:00 |
| P16          | End of third daily period of automatic central heating   | 0:00            | 00:00...24:00 |
| P31          | Start of first daily period of hot water production (*)  | 0:00            | 00:00...24:00 |
| P32          | End of first daily period of hot water production (*)  | 24:00           | 00:00...24:00 |
| P33          | Start of second daily period of hot water production (*)   | 0:00            | 00:00...24:00 |
| P34          | End of second daily period of hot water production (*)   | 0:00            | 00:00...24:00 |
| P35          | Start of third daily period of hot water production (*)  | 0:00            | 00:00...24:00 |
| P36          | End of third daily period of hot water production (*)  | 0:00            | 00:00...24:00 |
| P45          | Reset of daily central heating and domestic hot water production programs (factory settings). Press the - + keys together for about 3 seconds; the number 1 appears on the display. Confirm by pressing either of the   keys | 0               | 0...1         |

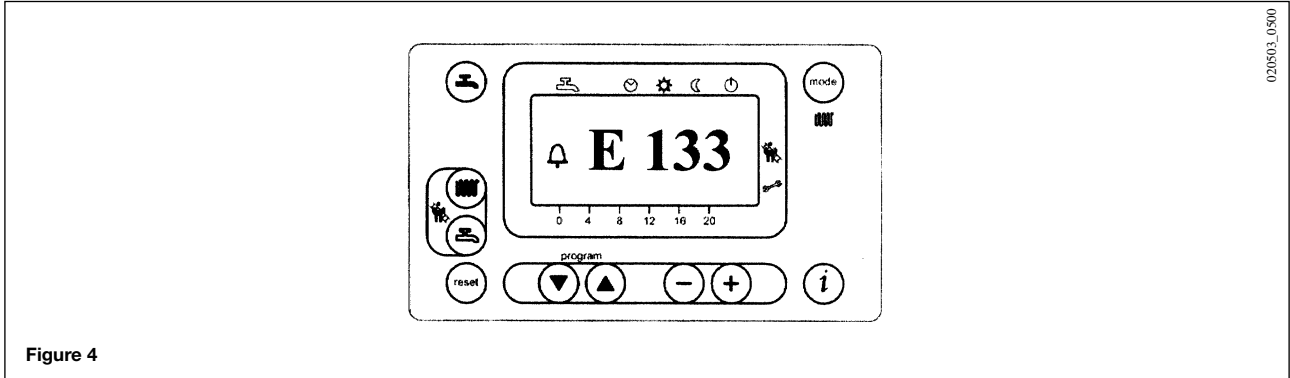
**NOTE:** Parameters from **P31** to **P36** can be displayed only if the domestic hot water program has been enabled as described in chapter 17 for the attention of the installer (parameter H91).

### 3.8 FAULT WARNINGS AND RESETTING THE BOILER

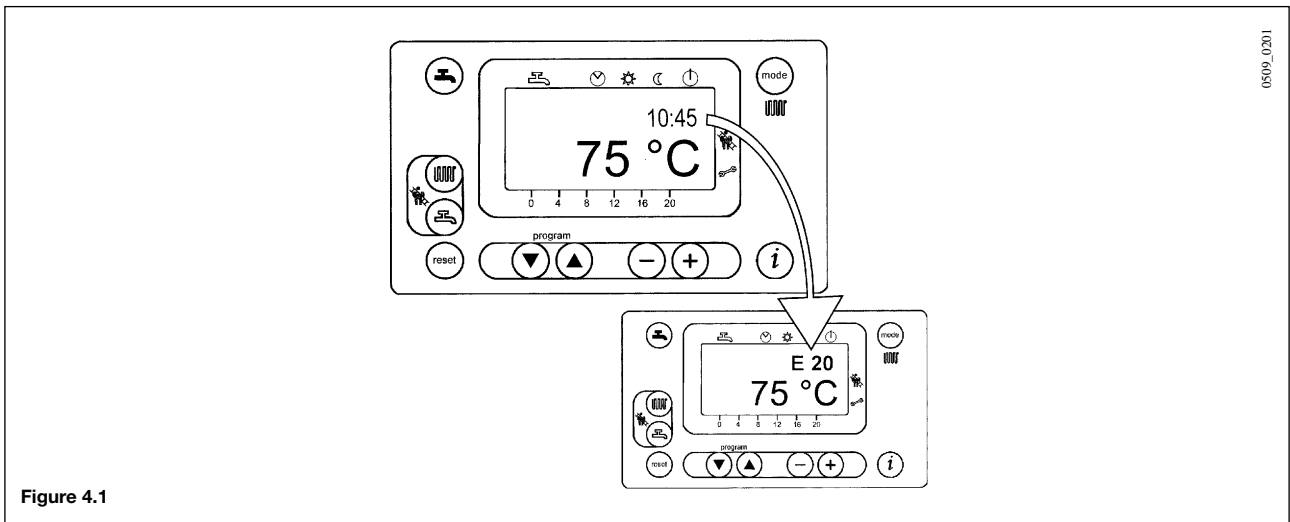
If a fault occurs, a flashing warning code appears on the display.

The fault warnings appear on the main display (figure 1 a) together with the  symbol (Figure 4).

To reset, press the reset  button for at least two seconds.



Fault warnings appear on the secondary display (figure 1 b) alternating with the time, both of them flashing (figure 4.1). It is not possible to reset malfunction warnings which appear on the secondary display as the cause of the alarm has first to be removed.



### 3.9 FAULT WARNINGS TABLE

| Fault code | Fault description  | Action required  |
|------------|--|--|
| E10        | Outdoor temperature sensor failure   | Call the authorised service centre to check the wiring and/or replace the sensor. (*)  |
| E20        | NTC output sensor failure  | Call the authorised service centre to replace the sensor. (*)  |
| E50        | Hot water NTC sensor failure   | Call the authorised service centre to replace the sensor. (*)  |
| E110       | Safety or flue gas thermostat tripped  | Press the reset key (for about 2 seconds: if this device is triggered repeatedly, call the authorised service centre)  |
| E128       | Loss of flame during operation (the ionization current has fallen below the limit) | Call the authorised service centre to check the flame.   |
| E129       | Minimum fan speed limit is not reached   | Call the authorised service centre.  |
| E132       | Lack of gas pressure / external thermostat   | Call the gas supplier / Call the authorised service centre.  |
| E133       | No flame detected  | Press the reset key (for about 2 seconds); if the fault persists, call the authorised service centre)  |
| E151       | Boiler circuit board error   | Press the reset button if the display presents the (🔔) symbol, otherwise switch off the boiler at the mains and switch it on again after 10 seconds. If the fault persists, call an authorised service centre. Check the position of the ignition electrodes (section 18). |
| E153       | The reset key has been pressed inappropriately                                     | Press the key again (about 2 seconds)  |
| E154       | Internal error on boiler circuit module  | Press and hold reset button (2 seconds approx.) then press again when warning E153 appears   |
| E160       | Fan speed threshold not reached  | Call the authorised service centre to check the fan.   |
| E164       | Low water pressure   | Check that the system is at the rated pressure. (Refer to the section on filling the system). If the fault persists, call the authorised service centre.   |

(\*) Auto reset when fault disappears

All the faults are displayed in order of importance; if several faults occur simultaneously, the first to be displayed is the one with highest priority. After the cause of the first fault has been removed, the second one will be displayed, and so on.

If any given fault occurs frequently, contact the authorised Service Centre.

## 4. FILLING THE BOILER

**IMPORTANT:** Regularly check that the pressure displayed by the pressure gauge is between 1 to 4 bar, with the boiler not operating.

In case the pressure is lower open the boiler filling tap.

We recommend you open the tap very slowly in order to let off the air.

In case pressure drops occur frequently have the boiler checked by a Qualified Service Engineer.

## 5. TURNING OFF THE BOILER

To shut down the boiler switch off the electrical supply to the appliance.

## 6. PROLONGED STANDSTILL OF THE SYSTEM. FROST PROTECTION

We recommend you avoid draining the whole system as raw water makeup will load to harmful limestone deposits inside the boiler and on the heating elements.

In case the boiler is not operated during wintertime and is therefore exposed to danger of frost we suggest you add some specific-purpose anti-freeze to the water contained in the system (e.g.: propylene glycole coupled with corrosion and scaling inhibitors).

The electronic management of the boilers includes a 'frost protection' function which operates the burner to reach a heating flow temperature of 30° C when the system heating flow temperature drops below 5°C.

The frost protection function is enabled if:

- \* electrical supply to the boiler is on;
- \* the gas service cock is open;
- \* the system pressure is as required;
- \* the boiler is not isolated.

## 7. SERVICING INSTRUCTIONS AND GAS CHANGE

To maintain efficient and safe operation of your boiler have it checked by a Qualified Service Engineer at the end of every heating season. Careful servicing will ensure economical operation of the system.

Do not clean the outer casing of the appliance with abrasive, aggressive and/or easily flammable cleaners (i.e.: gasoline, alcohol, and so on). Always isolate the electrical supply to the appliance before cleaning it (see section 5 Turning off the boiler).

***These boilers are produced for natural gas and can be converted to work with LPG (G 31). Any gas change must be effected by a Qualified Service Engineer.***

## 8. GENERAL INFORMATION

The following remarks and instructions are addressed to Service Engineers to help them carry out a faultless installation. Instructions regarding lighting and operation of the boiler are contained in the 'Instructions pertaining to the user' section.

Note that installation, maintenance and operation of the gas appliances must be performed exclusively by qualified personnel in compliance with current standards.

Please note the following:

- \* This boiler can be connected to any type of double- or single feeding pipe convector plates, radiators, thermoconvectors. Design the system sections as usual though taking into account the available output / pump head performances.
- \* Do not leave any packaging components (plastic bags, polystyrene, etc.) within children's reach as they are a potential source of danger.
- \* Initial lighting of the boiler must be effected by a Qualified Service Engineer.

Failure to observe the above will render the warranty null and void.

## 9. INSTRUCTIONS PRIOR TO INSTALLATION

This boiler is designed to heat water at a lower than boiling temperature at atmospheric pressure. The boiler must be connected to a central heating system and, on models with this option, to a domestic hot water supply system in compliance with its performances and output criteria.

**IMPORTANT:** The gas boiler is supplied **without** the following components which must be provided exclusively by qualified personnel:

- **Expansion vessel;**
- **Pressure relief valve;**
- **Circulating pump;**
- **Boiler filling tap.**

Before connecting the boiler ensure the following operations have been completed:

- a) Careful checking that the boiler is fit for operation with the type of gas available. For more details see the notice on the packaging and the label on the appliance itself.
- b) Careful checking that the flue terminal draft is appropriate; that the terminal is not obstructed and that no other appliance exhaust gases are expelled through the same flue duct, unless the flue is especially designed to collect the exhaust gas coming from more than one appliance, in conformity with the standards and regulations in force.
- c) Careful checking that, in case the flue has been connected to pre-existing flue ducts, thorough cleaning has been carried out in that residual combustion products may be created during operation of the boiler and obstruct the flue duct.

To ensure correct operation of the appliance and avoid invalidating the warranty, observe the following precautions:

### 1. Hot water circuit:

If the water hardness is greater than 20 °F (1 °F = 10 mg calcium carbonate per litre of water) a polyphosphate or comparable treatment system responding to current regulations.

### 2. Heating circuit

#### 2.1. New system

Before proceeding with installation of the boiler, the system must be cleaned and flushed out thoroughly to eliminate residual thread-cutting swarf, solder and solvents if any, using suitable proprietary

products.

To avoid damaging metal, plastic and rubber parts, use only neutral cleaners, i.e. non-acid and non alkaline. The recommended products for cleaning are:

SENTINEL X300 or X400 and FERNOX heating circuit restore. Please ensure to use this product, proceeding strictly in accordance with the manufactures instructions. Finally fill the system with the correct strength of central heating inhibitor.

## 2.2. Existing system

Before proceeding with installation of the boiler, the system must be cleaned and flushed out to remove sludge and contaminants, using suitable proprietary products as described in section 2.1.

To avoid damaging metal, plastic and rubber parts, use only neutral cleaners, i.e. non-acid and non-alkaline such us SENTINEL X100 and FERNOX heating circuit protective. To use this product proceeding strictly in accordance with the maker's directions.

Remember that the presence of foreign matter in the heating system can adversely affect the operation of the boiler (e.g. overheating and noisy operation of the heat exchanger). Dose with inhibitor.

**Failure to observe the above will render the warranty null and void.**

# 10. BOILER INSTALLATION

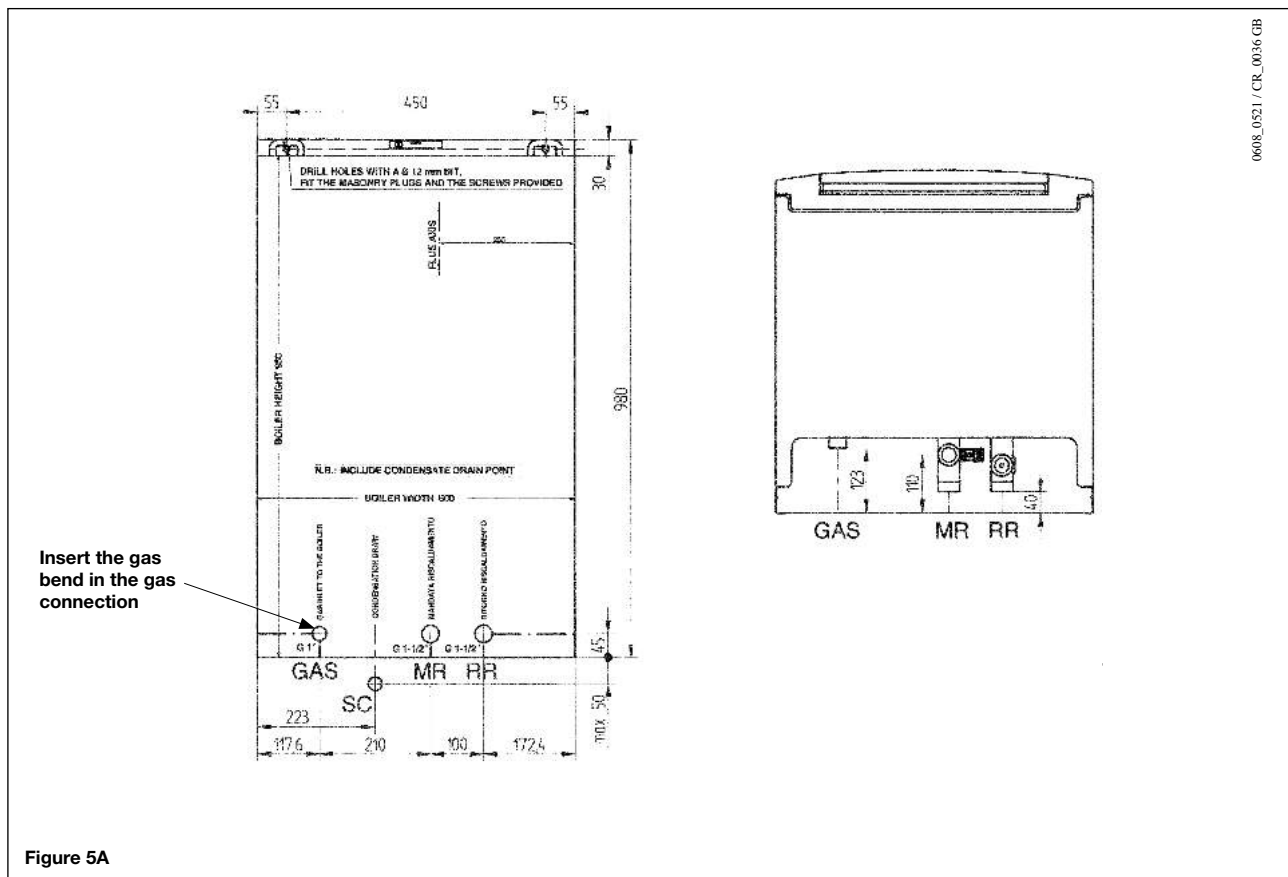
Decide upon the boiler location, then tape the template on the wall.

Connect the pipework to the gas and water inlets prearranged on the template lower bar.

If you are either installing the boiler on a pre-existing system or replacing it, we suggest you also fit strainers on the system return pipework to the boiler to collect the deposits and scaling which may remain and be circulated in the system after the initial filling.

When the boiler is fixed on the template connect the flue and air ducts (fittings supplied by the manufacturer) according to the instructions given in the following relevant sections.

Connect the condensate outlet to the siphon supplied with the boiler. Connect the siphon to a drain, making sure there is a continuous slope. Horizontal sections must be avoided.



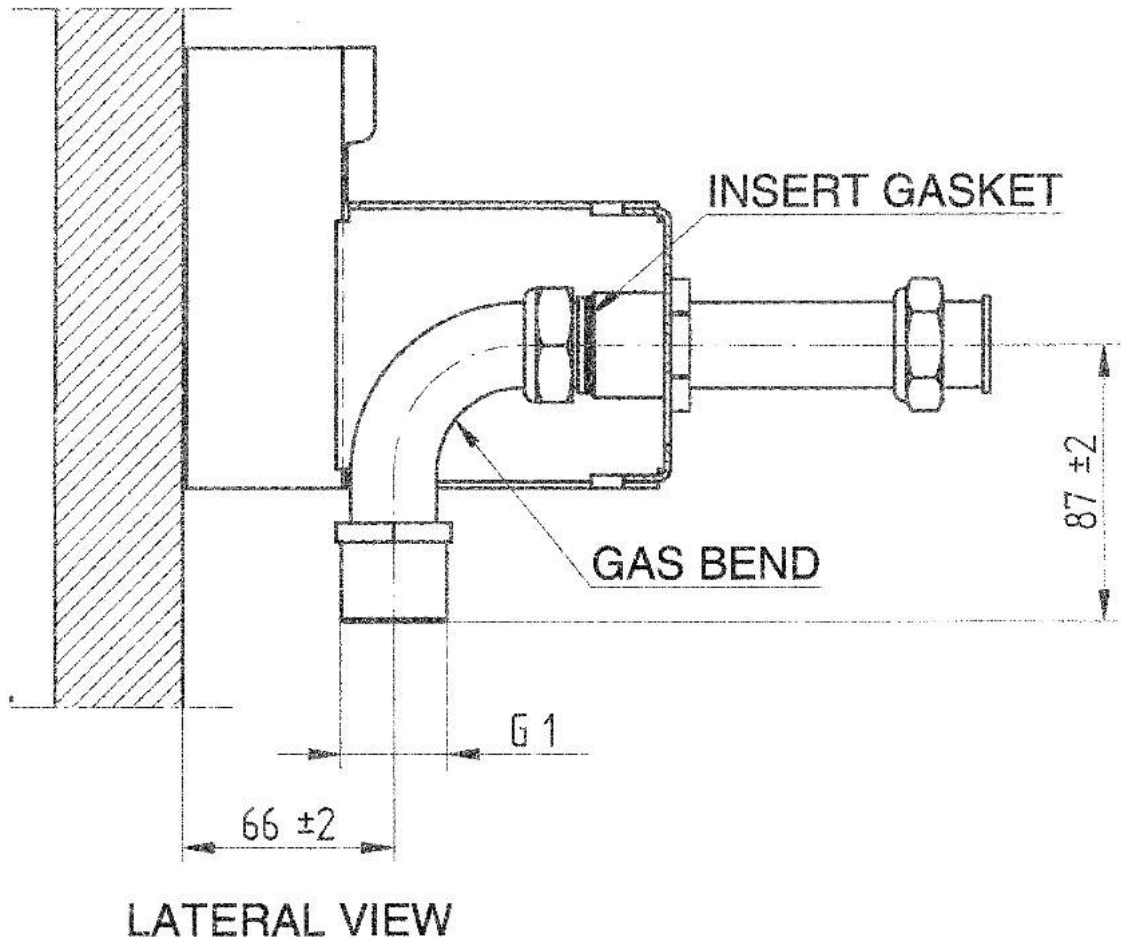


Figure 5B

## 11. BOILER SIZE

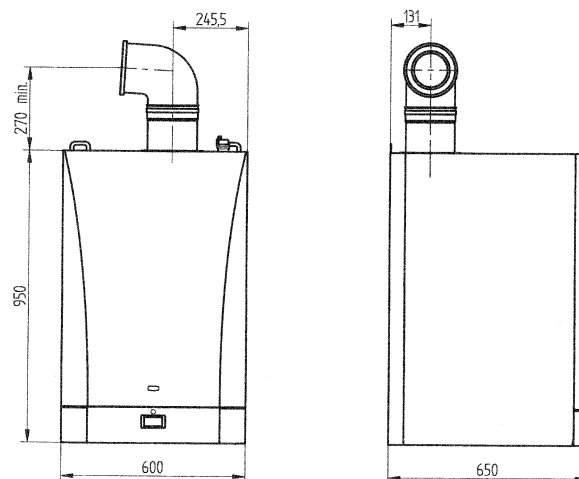


Figure 6

## 12. INSTALLATION OF FLUE AND AIR DUCTS

We guarantee ease and flexibility of installation for the boiler thanks to the fittings and fixtures supplied (described below).

The boiler is especially designed for connection to an exhaust flue / air ducting, with either concentric, vertical or horizontal terminal.

**Where exhaust and intake flues not supplied by POTTERTON COMMERCIAL have been installed, these must be certified for the type of use and must have a maximum pressure drop in according to the values reported in the table.**

### CONCENTRIC PIPE Ø 110/160 (C13 - C33 - C43)

| PIPES LENGTH<br>L<br>(m) | $\Delta P$ Max<br>(Pa) |
|--------------------------|------------------------|
| 0 m ÷ 2 m                | 140                    |
| 2 m ÷ 6 m                | 300                    |
| 6 m ÷ 10 m               | 400                    |

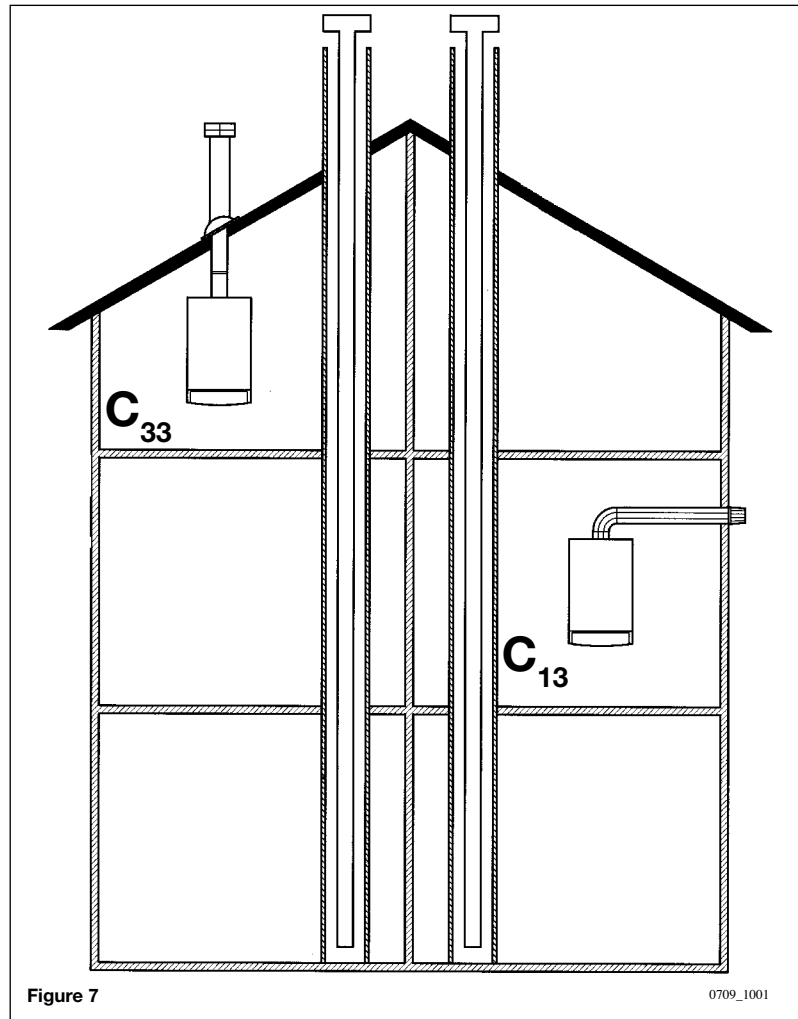


Figure 7

0709\_1001



| <b>HORIZONTAL CONCENTRIC FLUES</b> |                  |                            |          |          |          |
|------------------------------------|------------------|----------------------------|----------|----------|----------|
| <b>Boiler</b>                      | <b>Flue Size</b> | <b>Number of Bends 90°</b> |          |          |          |
|                                    |                  | <b>1</b>                   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>WH90</b>                        | Ø110/160         | 9 m                        | 8 m      | 7 m      | 6 m      |
| <b>WH110</b>                       | Ø110/160         | 9 m                        | 8 m      | 7 m      | 6 m      |

| <b>VERTICAL CONCENTRIC FLUES</b> |                  |                            |          |          |          |
|----------------------------------|------------------|----------------------------|----------|----------|----------|
| <b>Boiler</b>                    | <b>Flue Size</b> | <b>Number of Bends 90°</b> |          |          |          |
|                                  |                  | <b>1</b>                   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>WH90</b>                      | Ø110/160         | 9 m                        | 8 m      | 7 m      | 6 m      |
| <b>WH110</b>                     | Ø110/160         | 9 m                        | 8 m      | 7 m      | 6 m      |

| <b>CONVENTIONAL FLUE</b> |                  |                            |          |          |          |
|--------------------------|------------------|----------------------------|----------|----------|----------|
| <b>Boiler</b>            | <b>Flue Size</b> | <b>Number of Bends 90°</b> |          |          |          |
|                          |                  | <b>1</b>                   | <b>2</b> | <b>3</b> | <b>4</b> |
| <b>WH90</b>              | Ø110             | 19,5 m                     | 19 m     | 18,5 m   | 18 m     |
| <b>WH110</b>             | Ø110             | 19,5 m                     | 19 m     | 18,5 m   | 18 m     |

### **Concentric flue**

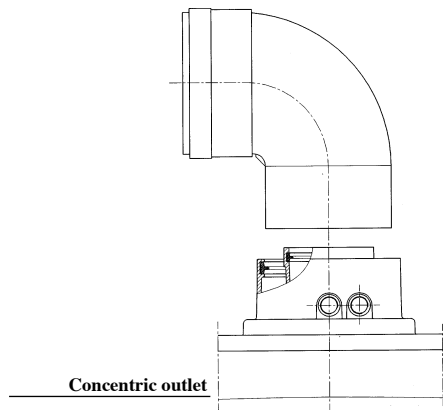
This type of duct allows to emit exhaust gases and to draw combustion air from outside the building. The 87° coaxial bend allows to connect the boiler to a flue-air duct in any direction as it can rotate through 360°.

If the flue outlet is placed outside, the flue-air ducting must protrude at least 18mm out of the wall to allow aluminium weathering tile to be fitted and sealed to avoid water leakages. If the terminal is below 2m then a terminal guard is required.

Ensure a minimum downward slope of 3° towards the boiler.

A 87° bend reduces the total flue length by 1 metre.

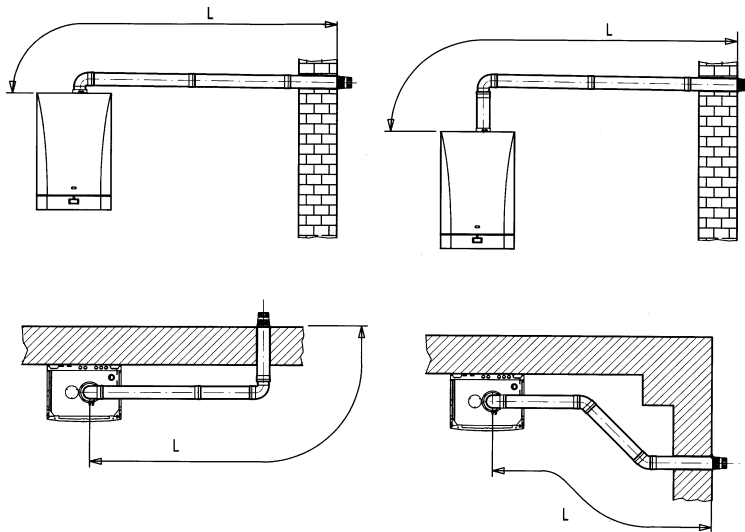
A 45° bend reduces the total flue length by 0.5 metre.



Concentric outlet

Figure 8

## 12.1 HORIZONTAL FLUE TERMINAL Ø 110/160 mm INSTALLATION OPTIONS

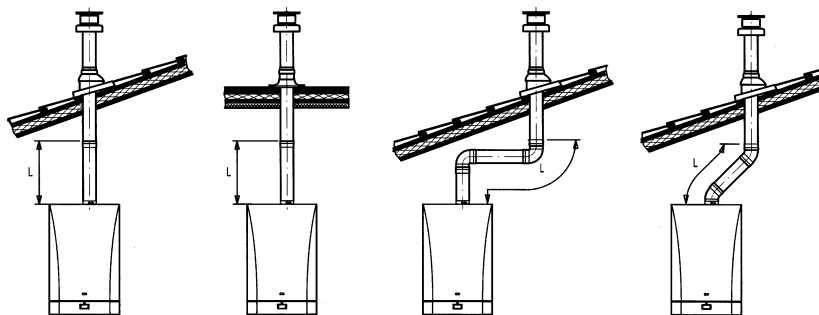


0642\_0702

L = refer to table

## 12.2 VERTICAL FLUE TERMINAL Ø 110/160 mm INSTALLATION OPTIONS

This type of installation can be carried out both on a flat or pitched roof by fitting a terminal, an appropriate weathering tile and sleeve, (supplementary fittings supplied as options).



0310\_0107

L = refer also the table

L max = 10 m

L max = 10 m

L max = 8 m

L max = 9 m

## 12.5 FAN RPM UPDATING DEPENDING ON FLUE LENGTH (e.g. figure 7)

To ensure the correct rated heat output to the maximum and minimum heat input, it is necessary to update the speed (rpm) of the fan, it depends on the length of the flue (par. 12), in accordance with the installation of flue and air pipes as indicated in the tables below. The factory-set value is referred to the minimum length of flue pipe (0÷2 m for concentric, 0÷6 m for twin). To carry such updating, changing the speed of the fan (rpm) at the maximum and minimum heat input, refer to par. 16.

### WH 90 MODELS

| CONCENTRIC PIPE Ø 110/160<br>(C13 – C33 – C43) |                              |                    |                     |                 |                |               |                |
|--|------------------------------|--------------------|---------------------|-----------------|----------------|---------------|----------------|
| GAS  | PIPES LENGTH<br>L<br><br>(m) | PARAMETERS         |                     |                 |                |               |                |
|  |                              | MAX HEAT OUTPUT    |                     | MIN HEAT OUTPUT |                | IGNITION LOAD |                |
|  |                              | H536-H613<br>(rpm) | H610-H541<br>(pwm%) | H612<br>(rpm)   | H609<br>(pwm%) | H611<br>(rpm) | H608<br>(pwm%) |
| G20  | (*) 0 m ÷ 2 m                | 5500               | 100                 | 1750            | 14             | 2400          | 20             |
|  | (**) 2 m ÷ 6 m               | 5850               | 100                 | 1750            | 14             | 3450          | 30             |
|  | 6 m ÷ 10 m                   | 6200               | 100                 | 2000            | 15             | 4300          | 45             |
| G31  | 0 m ÷ 2 m                    | 5200               | 100                 | 1650            | 13             | 3700          | 35             |
|  | (**) 2 m ÷ 6 m               | 5450               | 100                 | 1750            | 13,5           | 3700          | 35             |
|  | 6 m ÷ 10 m                   | 5750               | 100                 | 1850            | 14             | 4050          | 40             |

### WH 110 MODELS

| CONCENTRIC PIPE Ø 110/160<br>(C13 – C33 – C43) |                              |                    |                     |                 |                |               |                |
|--|------------------------------|--------------------|---------------------|-----------------|----------------|---------------|----------------|
| GAS  | PIPES LENGTH<br>L<br><br>(m) | PARAMETERS         |                     |                 |                |               |                |
|  |                              | MAX HEAT OUTPUT    |                     | MIN HEAT OUTPUT |                | IGNITION LOAD |                |
|  |                              | H536-H613<br>(rpm) | H610-H541<br>(pwm%) | H612<br>(rpm)   | H609<br>(pwm%) | H611<br>(rpm) | H608<br>(pwm%) |
| G20  | (*) 0 m ÷ 2 m                | 6400               | 100                 | 1850            | 11             | 3100          | 20             |
|  | (**) 2 m ÷ 6 m               | 6650               | 100                 | 1950            | 11,5           | 3900          | 25             |
|  | 6 m ÷ 10 m                   | 6900               | 100                 | 2050            | 12             | 4300          | 30             |
| G31  | 0 m ÷ 2 m                    | 5850               | 80                  | 1700            | 10,5           | 3100          | 20             |
|  | (**) 2 m ÷ 6 m               | 6100               | 80                  | 1850            | 11             | 3900          | 25             |
|  | 6 m ÷ 10 m                   | 6350               | 80                  | 1950            | 11,5           | 4300          | 30             |

(\*) default parameters

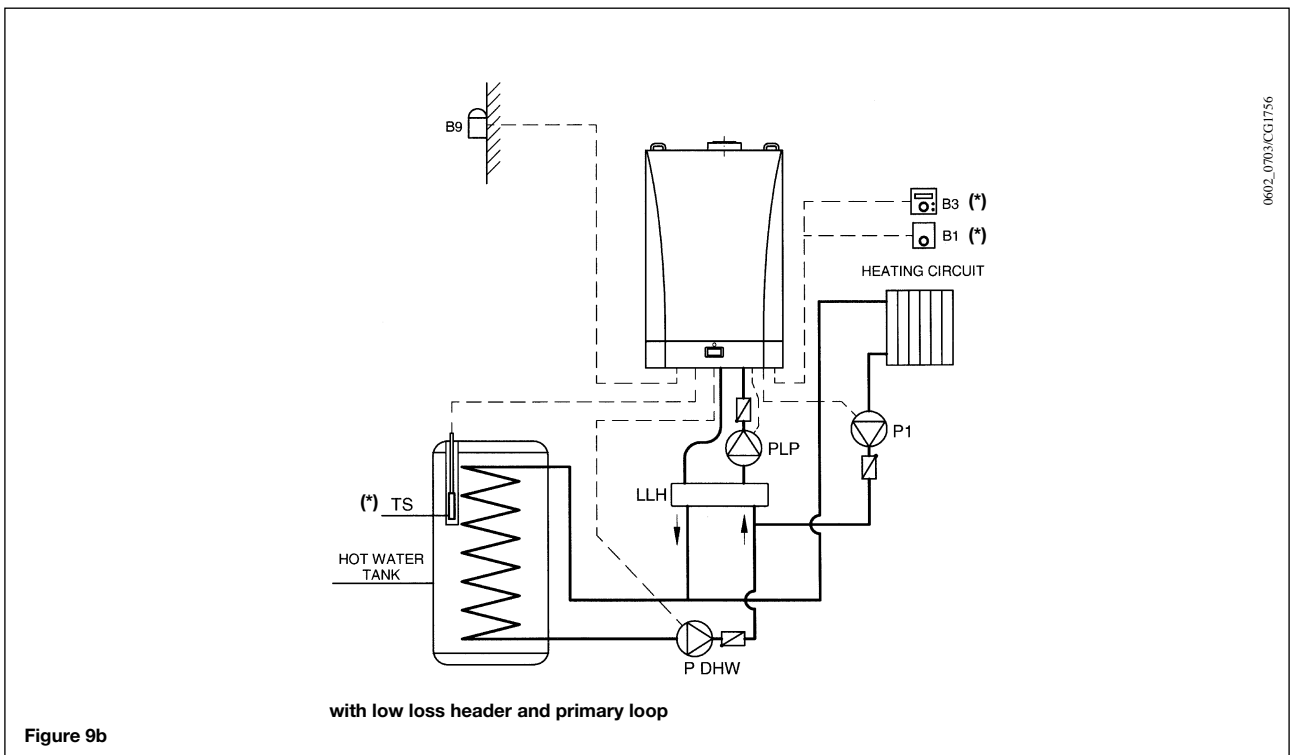
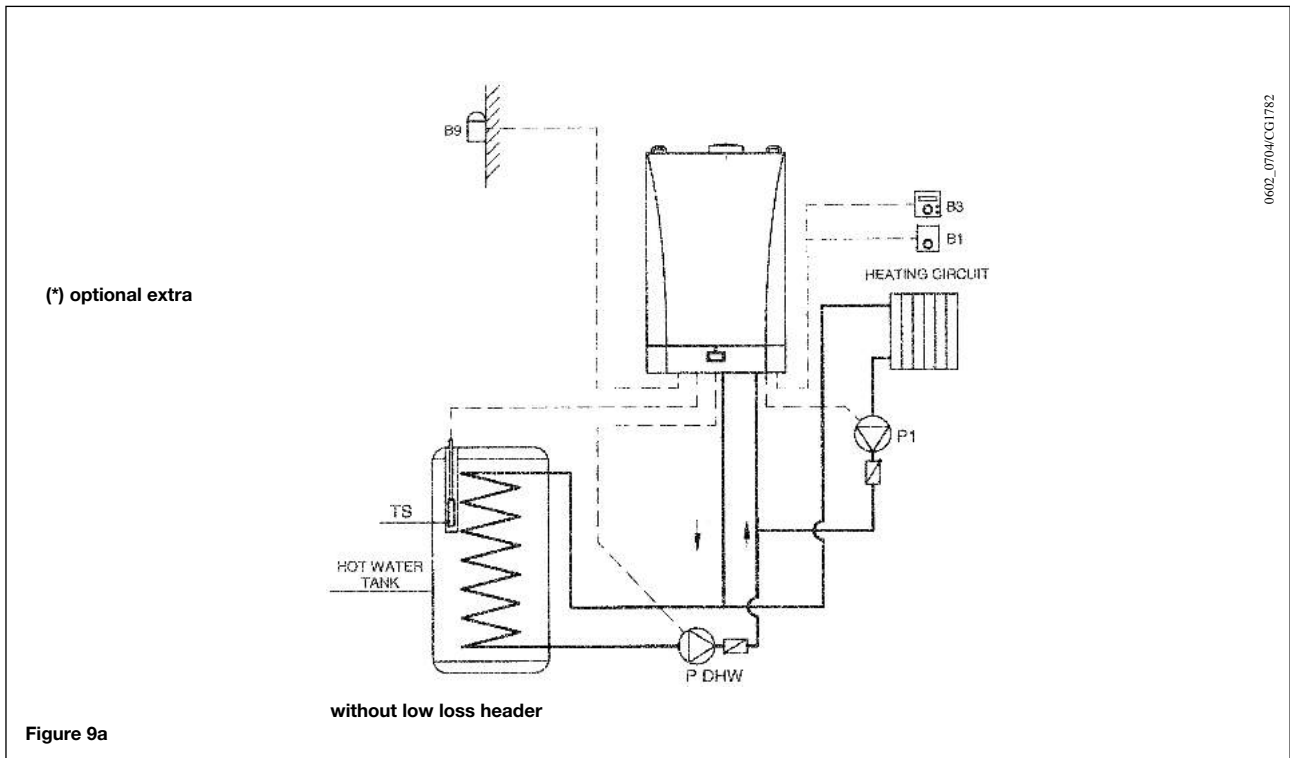
(\*\*) for cascade installation (fumes damper 110) use parameters equivalent 2m÷6m.

# 13. HYDRAULIC DIAGRAM

Applications and Installation Details

## 13.1 HYDRAULIC SYSTEM 1

(Pumped heating circuits with remote control QAA73 or Room Thermostat, including hot-water tank, without and with primary loop)



- TS: Tank Sensor (QAZ36)\*
- B3: Room Control Module (QAA73)\*
- B1: Room Thermostat
- B9: Outdoor Temperature Sensor (QAC34) (supplied with the gas boiler)
- P1: Heating Pump
- PDHW: Hot Water pump
- PLP: Primary Pump (only for figure 9b)

(\* Available Optional Extra

- Pumps (Not Supplied)
- Isolating Valve (Not Supplied)
- Installer Wiring -----
- Hot Water Cylinder (Not Supplied)
- Low Loss Header (Not Supplied)
- Non Return Valve (Not supplied)

Applications (pumps, sensor, remote control ...) have to be connected to terminal as follows (see also section 14):

|                                       | WITH QAA73<br>REMOTE CONTROL | WITH<br>ROOM THERMOSTAT |
|---------------------------------------|------------------------------|-------------------------|
| APPLICATION                           |                              |                         |
|                                       | TERMINAL BOARD               | TERMINAL BOARD          |
| PRIMARY PUMP PLP (only for figure 9b) | M1: A – B                    | M1: A – B               |
| DHW PUMP PDHW                         | M3: 13 – 14                  | M3: 13 – 14             |
| HEATING PUMP P1                       | M3: 11 – 12                  | M3: 11 – 12             |
| DHW SENSOR TS                         | M2: 7 – 8                    | M2: 7 – 8               |
| REMOTE CONTROL QAA73                  | M2: 1 – 2                    | NO                      |
| ROOM THERMOSTAT                       | M2: 3 – 4 OPEN               | M2: 3 – 4               |

Parameter changes requires (see also section 16):

| PCB<br>PARAMETER | Description      | Setting Parameter   |
|------------------|------------------|---------------------|
| H552             | Hydraulic system | H552 = 2 (*)        |
| H553             | KonfigHKS        | H553 = 21 (*)       |
| H615             | KonfigAusgang    | H615 = 9 (*)        |
| H632             | Wanfo Q8         | H632 = 00001100 (*) |

(\* Factory set

## 13.2 HYDRAULIC SYSTEM 2

(Pumped heating circuits with Room Thermostat and compensated circuit with remote control QAA73, including hot-water tank, with primary loop)

- TS: Tank Sensor (QAZ36)\*
- B3: Room Control Module (QAA73)\*
- B1: Room Thermostat
- B9: Temperature Sensor (QAC34) supplied with the gas boiler
- Zone Controller (Clip-in AGU2.500)\*
- FS: Flow Sensor (QAD36: supplied with AGU2.500)\*
- P1: Heating Pump
- P DHW: Hot Water pump
- PLP: Primary Pump
- 3WV: 3-way Valve (power open / power close)
- P2: Variable Temperature Pump

(\*) Available Optional Extra

- Pumps (Not Supplied)
- Isolating Valve (Not Supplied)
- Installer Wiring -----
- Hot Water Cylinder (Not Supplied)
- Low Loss Header (Not Supplied)
- Non Return Valve (Not supplied)

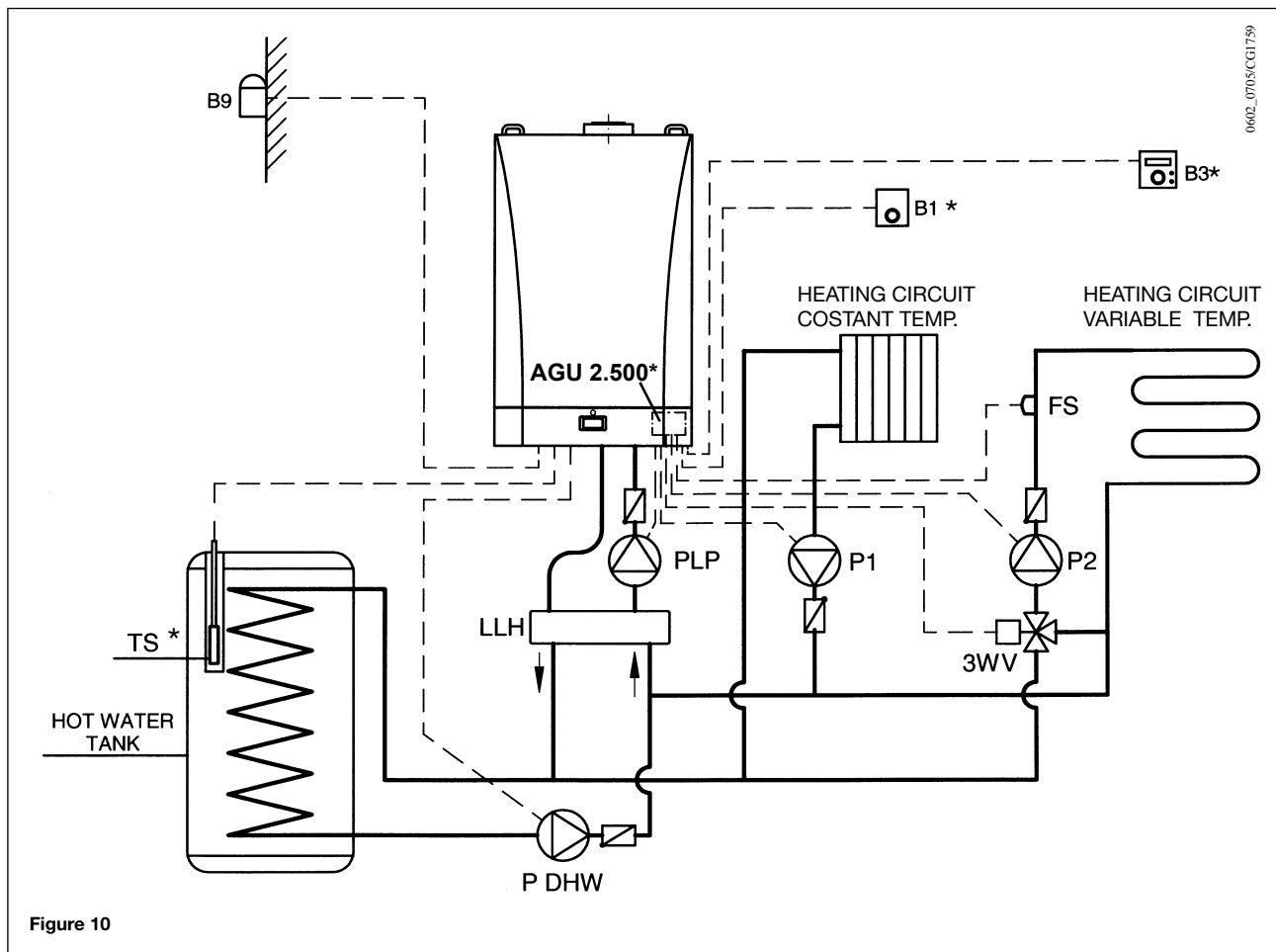


Figure 10

Applications (pumps, sensor, remote control ...) have to be connected to terminal as follows (see also section 14):

| APPLICATION                            | TERMINAL BOARD    |
|--|-------------------|
| PRIMARY PUMP PLP                       | M1: A – B         |
| DHW PUMP PDHW                          | M3: 13 – 14       |
| HEATING PUMP P1                        | M3: 11 – 12       |
| DHW SENSOR TS                          | M2: 7 – 8         |
| REMOTE CONTROL QAA73 (LOW TEMPERATURE) | M2: 1 – 2         |
| ROOM THERMOSTAT                        | M2: 3 – 4         |
| HEATING PUMP P2                        | CLIP IN AGU 2.500 |
| 3 WAY VALVE                            | CLIP IN AGU 2.500 |
| FLOW SENSOR                            | CLIP IN AGU 2.500 |

Parameter changes requires (see also section 16):

| PCB PARAMETER | Description      | Setting Parameter |
|---------------|------------------|-------------------|
| H552          | Hydraulic system | H552 = 50         |
| H553          | KonfigHKS        | H553 = 12         |
| H615          | KonfigAusgang    | H615 = 9          |
| H632          | Wanfo Q8         | H632 = 00001111   |

### 13.3 HEAT EXCHANGER PRESSURE DROP

| Boiler | Hydraulic Resistance and Water Flow Rates |         |         |         |         |         |         |         |
|--------|---|---------|---------|---------|---------|---------|---------|---------|
|        | 11°C ΔT                                   |         | 15°C ΔT |         | 20°C ΔT |         | 30°C ΔT |         |
|        | kPa                                       | Lit/sec | kPa     | Lit/sec | kPa     | Lit/sec | kPa     | Lit/sec |
| WH 90  | 77,32                                     | 1,85    | 37,3    | 1,35    | 25,42   | 1,02    | 11,23   | 0,68    |
| WH 110 | 75,42                                     | 2,28    | 41,23   | 1,67    | 23,72   | 1,25    | 13,42   | 0,83    |

| Boiler | Minimum Water Flow Rates |
|--------|--------------------------|
|        | Lit/sec                  |
| WH 90  | 0,52                     |
| WH 110 | 0,58                     |

## 14. CONNECTING THE MAINS SUPPLY

Electrical safety of the appliance is only guaranteed by correct earthing, in compliance with the applicable standards and regulations.

Connect the boiler to a 230V earthed power supply by means of the three-pin cable supplied with it make ensure the polarity is correct.

Use a double-pole switch isolator with a contact separation of at least 3mm in both poles.

In case you replace the power supply cable fit a HAR H05 VV-F' 3x0.75mm<sup>2</sup> cable with an 8mm diameter maximum outer sheath.

The fuse, a fast-acting type rated 2A, is incorporated into the power supply terminals (remove the black fuse holder to enable inspection and/or replacement).

**IMPORTANT:** Check that the overall current drawn by accessories connected to the appliance is less than 1 Amp. If the value is greater, a relay must be wired between the boiler control circuit board and the accessories drawing the higher current.

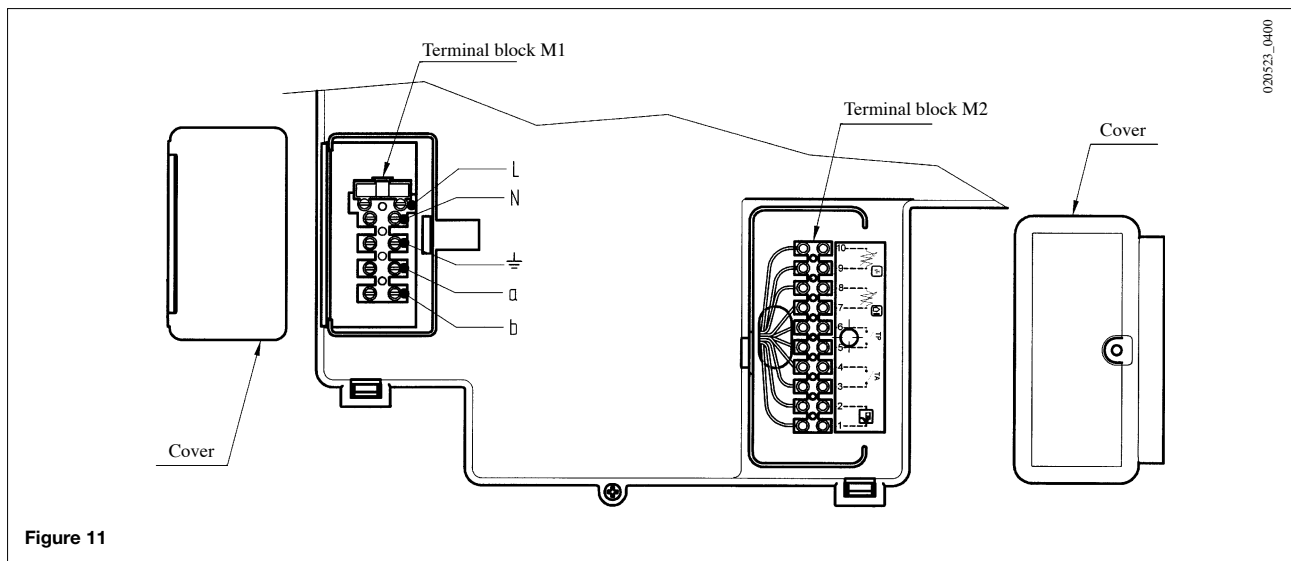


Figure 11



## 14.1 CONNECTING THE PUMPS

Turn the control box downward to access terminal boards M1 and M3 used for the electrical connections by removing the protective covers (see figure 12).

**Terminals M1 a – b:** connection of the primary loop pump for the heating system (PLP)

Check the correct size and rating of the pump by referring to its hydraulic resistance table.

**Terminals M3 11 – 12:** connection for heating pump (P1)

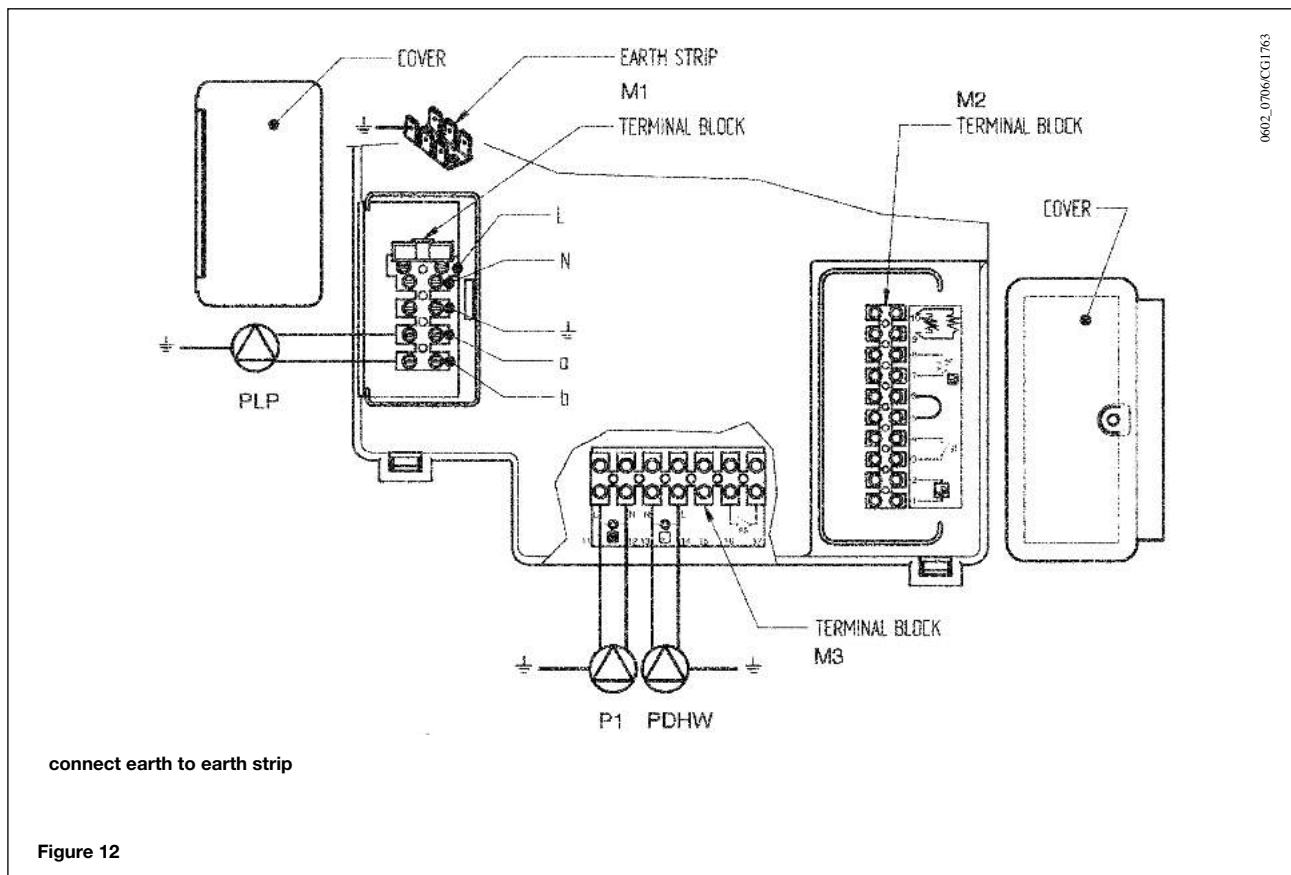
**Terminals M3 13 – 14:** connection for hot water tank pump (PDHW)

The electrical specifications of the pump must be as follows:

**230 V AC; 50 Hz; 1 A max;  $\cos \phi > 0.8$ .**

If the specifications of the installed pump are different, a relay must be wired between the boiler control circuit board and the pump.

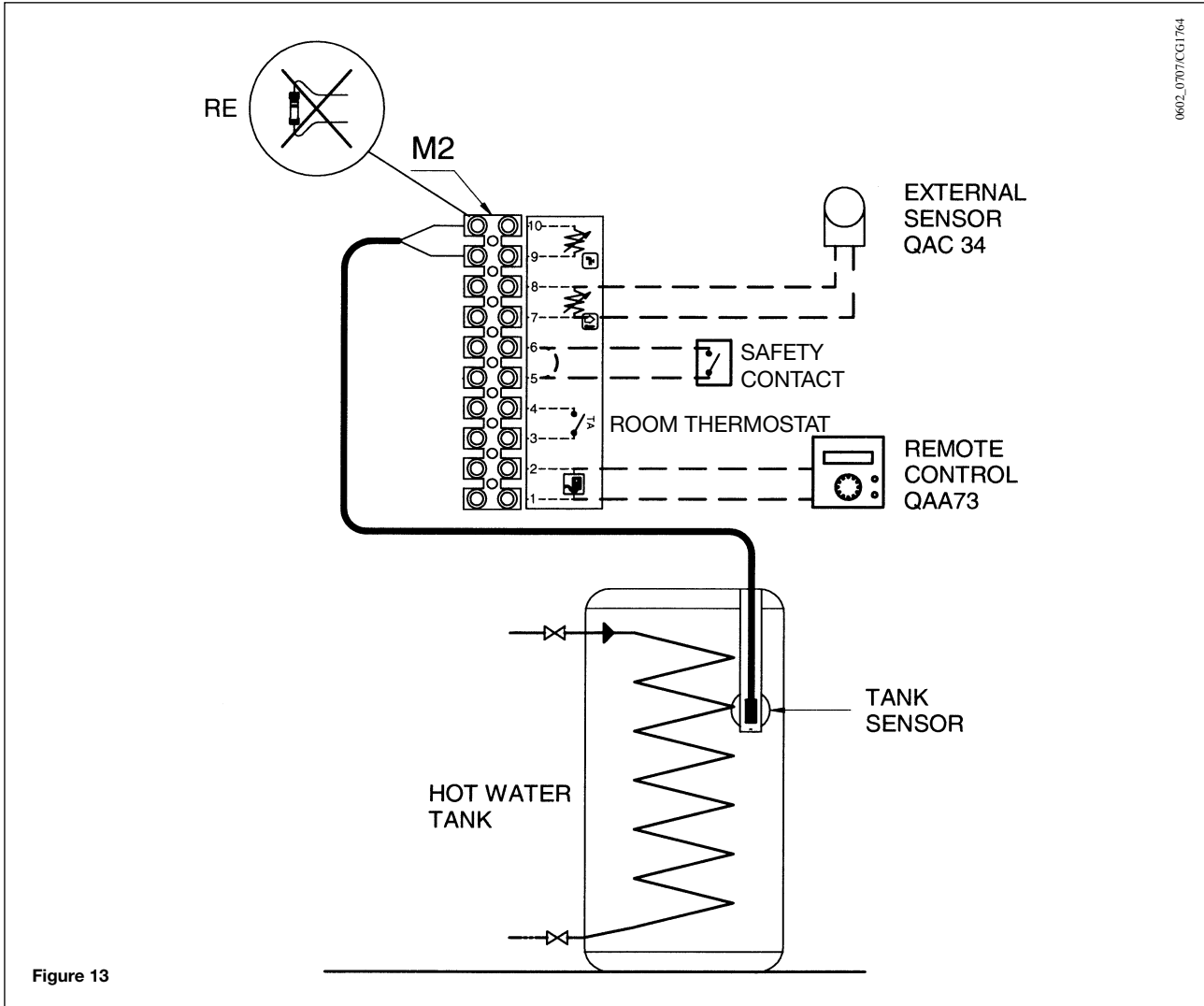
It is advisable not to adopt any electrical connection other than those described.



## 14.2 CONNECTING THE HOT WATER TANK SENSOR

Remove the resistor from terminals 9-10 of terminal strip M2 (figure 13), and connect the hot water priority NTC sensor, which is supplied as an accessory.

The sensing element of the NTC device must be located in the recess provided on the storage tank (figure 13). The temperature and on-off programming of the domestic hot water supply are selected directly from the boiler control panel, as described in this manual under the user instruction headings.



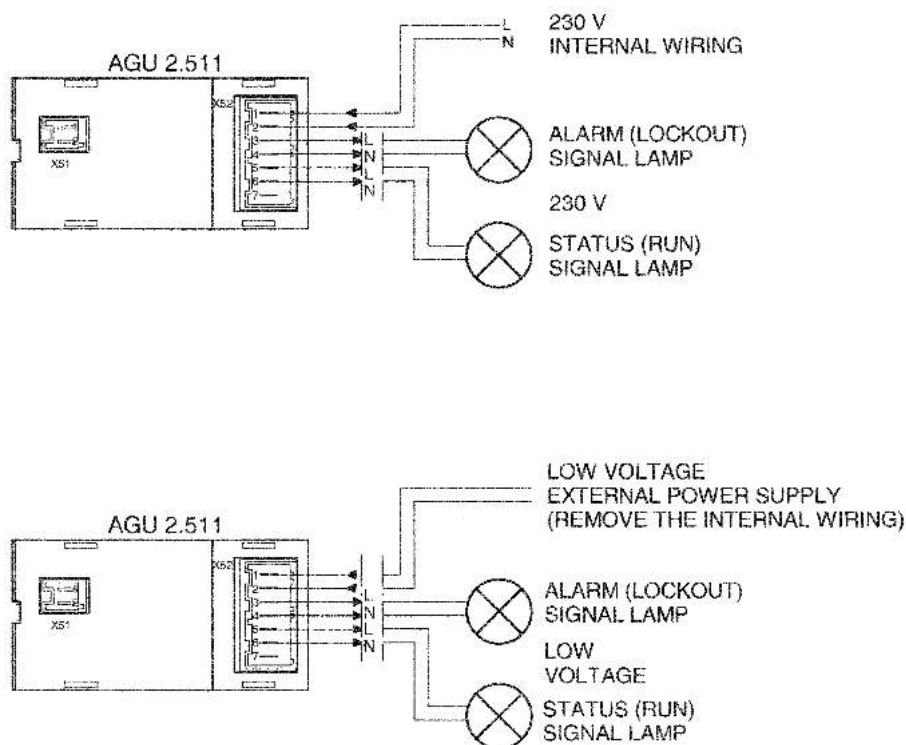


Figure 14

### 14.3 DESCRIPTION OF THE ELECTRICAL CONNECTIONS TO THE BOILER

Turn the control box downward to access terminal board M2 used for the electrical connections by removing the protective cover (see figure 13).

**Terminals 1-2:** connection of SIEMENS model QAA73 room temperature regulator supplied as optional extra. Connection polarity is irrelevant.

The jumper fitted across the “TA” terminals 3-4 must be removed.

Read the instructions supplied with this accessory for correct installation and programming procedures.

**Terminals 3-4:** “TA” room temperature thermostat connection. Thermostats with integral accelerator resistor must not be used. Check that there is no voltage across the ends of the two thermostat connection wires.

**Terminals 5-6:** external safety contact (low voltage).

**Terminals 7-8:** connection of SIEMENS model QAC34 outdoor temperature sensor supplied with the gas boiler.

Read the instructions supplied with this accessory for correct installation procedures.

**Terminals 9-10:** connection of hot water temperature sensor supplied as optional extra for connecting heating-only boilers to an external water heater.

#### CLIP-IN AGU 2.511

**Terminals 3-4 L-N OUT:** connection to signal lamp (230 V - 0,5 A max) for lockout alarm.

**Terminals 5-6 L-N OUT:** connection to signal lamp (230 V - 0,5 A max) for run mode.

For low voltage signal lamp remove the internal wiring and feed with an external low voltage power supply.

## 14.4 CONNECTING THE QAA73 TEMPERATURE REGULATOR

The SIEMENS model QAA73 room temperature regulator, if required (optional extra) must be connected to terminals 1-2 of terminal board M2 in figure 13.

The link across terminals 3-4, provided for connection of a room temperature thermostat, must be removed. The settings of the domestic hot water temperature and domestic hot water production schedule must be made using this device.

The timed program of the central heating circuit must be set on the QAA73 if there is a single zone, or in relation to the zone controlled by the QAA73 device.

The timed program for the central heating circuit of the other zones can be set directly on the boiler control panel.

See the instructions provided with the QAA73 room temperature regulator for the user parameter programming procedure.

### **QAA73: parameters which can be set by the installation engineer (service)**

By pressing the two PROG buttons together for at least three seconds it is possible to access the list of parameters that the installer can display and/or set.

Press either of these buttons to change the parameter to display or change.

Press the [+] or [-] key to change the value displayed.



Press either of the PROG buttons again to save the change.

Press the information button (i) to quit programming.

Here follows a list of the most commonly used parameters:

| Line no. | Parameter   | Range                                      | Default value   |
|----------|---|--|-----------------|
| 70       | HC1 curve<br>Selection of central heating circuit temperature curve "kt"  | 2.5...40                                   | <b>15</b>       |
| 72       | HC1 max. output<br>Central heating system maximum output temperature  | 25...85                                    | <b>85</b>       |
| 74       | Type of building  | Light, Heavy                               | <b>Light</b>    |
| 75       | Room compensation<br>Activation/deactivation of the influence of the room temperature.<br>If it is deactivated, the outdoor temperature sensor must be installed.   | on HC1<br>on HC2<br>on HC1+HC2<br>nil      | <b>On HC1</b>   |
| 77       | Automatic adaptation of the temperature curve "kt" in relation to the room temperature.   | On - off                                   | <b>On</b>       |
| 78       | Opt Start Max<br>Maximum time the boiler is switched on ahead of the timed program to optimise the temperature in the premises.   | 0...360 min                                | <b>0</b>        |
| 79       | Opt Stop Max<br>Maximum time the boiler is switched off ahead of the timed program to optimise the temperature in the premises.   | 0...360 min                                | <b>0</b>        |
| 80       | HC2 curve   | 2.5...40<br>—.- = <b>not active</b>        | —.-             |
| 90       | DHW Red Setp<br>Minimum temperature of the domestic hot water   | 10 or 35...58                              | <b>10</b>       |
| 91       | DHW program<br>Selection of the type of timed program for domestic hot water.<br>24 h/day = always on<br>PROG HC-1h = as HC1 central heating program less one hour<br>PROG HC = as central heating program<br>PROG DHW = specific domestic hot water program (see also program lines 30-36) | 24 h/day<br>TSP HC-1h<br>TSP HC<br>TSP DHW | <b>24 h/day</b> |

#### - Fault messages

In the event of fault, the display panel on the QAA73 shows the flashing symbol . Press the information key  to display the error code and a description of the fault (see Fault warning tables on paragraph 3.9).

## 14.5 CONNECTING THE OUTDOOR TEMPERATURE SENSOR




The SIEMENS model QAC34 outdoor temperature sensor for weather compensation must be connected to terminals 7-8 of terminal board M2 in figure 13.

The procedures for setting the gradient of the temperature curve "kt" vary depending on the accessories connected to the boiler.

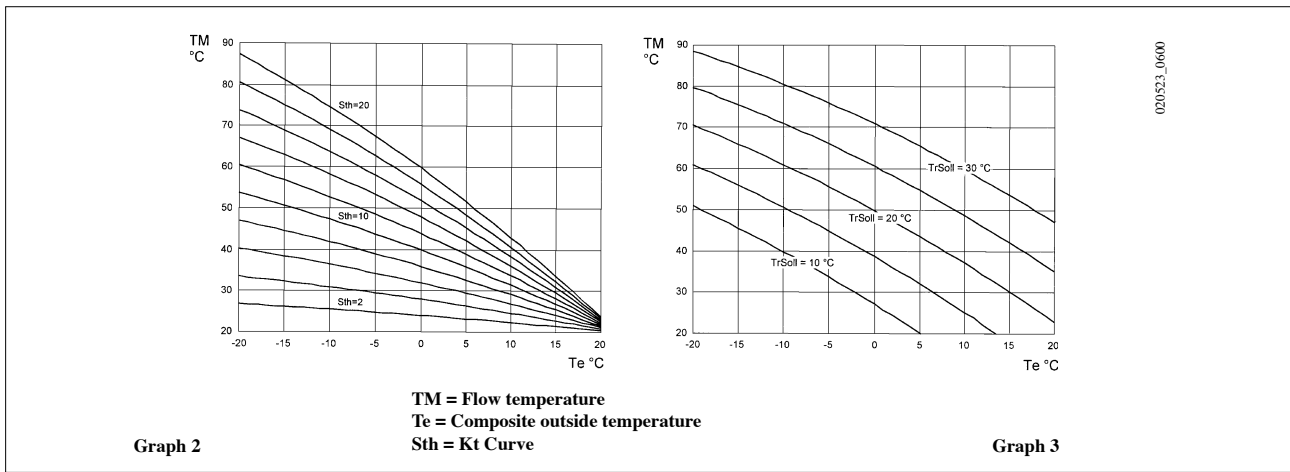
#### a) Without QAA73 room temperature regulator:

The temperature curve "kt" must be selected by setting parameter H532 as described in section 16 "setting the boiler parameters".

See graph 2 for selecting the curve referred to a room temperature of 20°C.

The chosen curve can be shifted by pressing the  (2), button (2) on the boiler control panel, and modifying the value displayed by pressing the  and  keys. See graph 3 for curve selection. (The example show in graph 3 refers to the curve Kt=15).

Increase the value displayed if the room temperature required is not reached inside the premises for central heating.



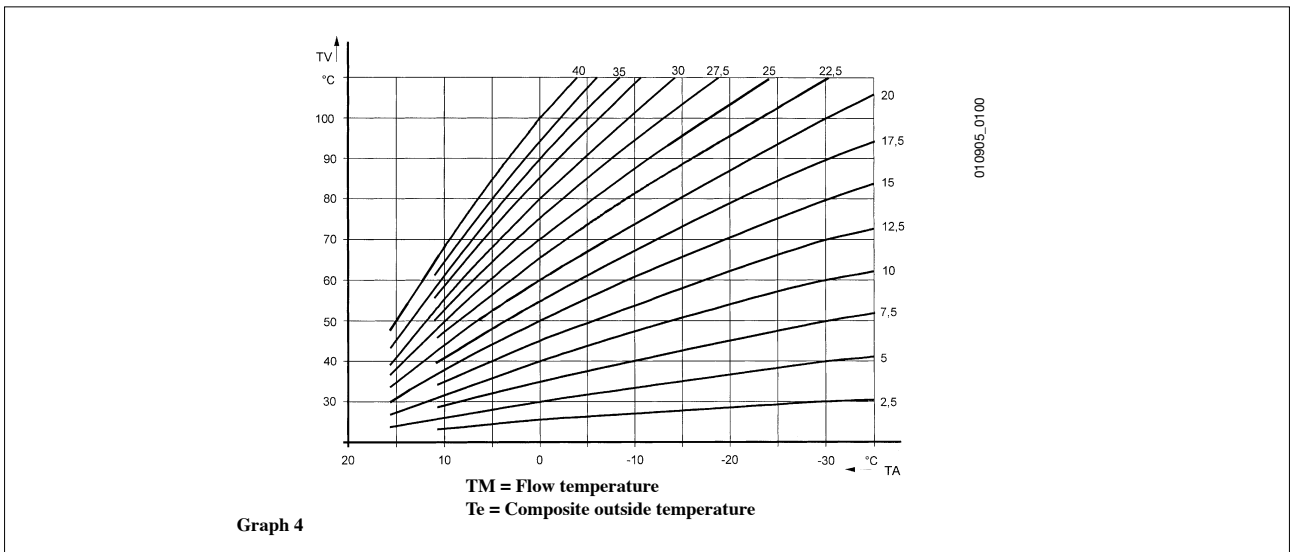
**b) With QAA73 room temperature regulator:**

The temperature curve “kt” must be selected by setting parameter 70 “HC1 curve” of the QAA73 room temperature control device as described in section 14.4 “QAA73: parameters which can be set by the installation engineer (service)”.

See graph 4 for selecting the curve referred to a room temperature of 20°C.

The curve is shifted automatically on the basis of the room temperature set using the QAA73 climate control.

If the system is divided into zones, the temperature curve “kt” relating to the part of the system not controlled by the QAA73 must be selected by setting parameter H532 as described in section 16 “setting the boiler parameters”.



**c) With AGU2.500 for control of a low temperature system:**

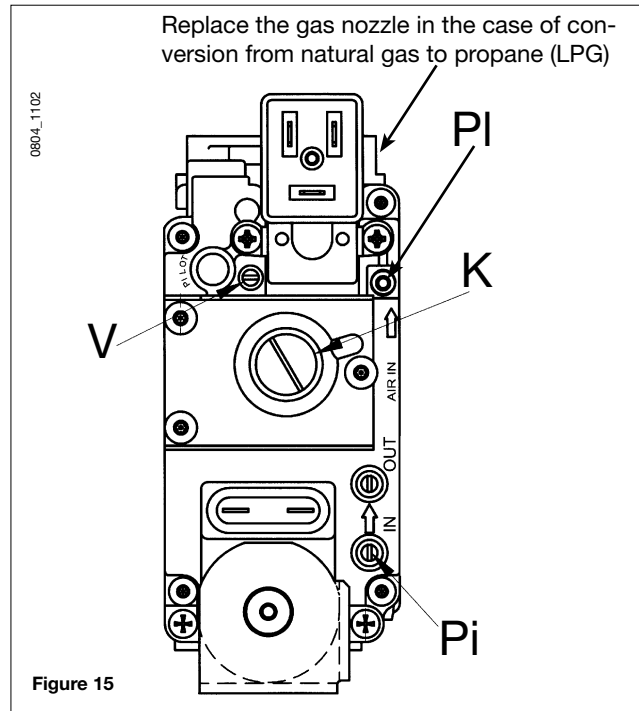
Refer to the instructions provided with the AGU2.500 accessories for connection and control of a low temperature zone.

## 15. GAS VALVE ADJUSTMENT

Carry out the following operations in the given sequence:

- 1) Calibration of the maximum heat output. Check that the CO<sub>2</sub> measured on the flue, with the boiler operating at the maximum heat output, is the same as that shown in table 1. Otherwise, turn the regulation screw (V) on the gas valve. Turn the screw clockwise to reduce the concentration of CO<sub>2</sub> and anticlockwise to increase it.
- 2) Calibration of reduced heat output. Check that the CO<sub>2</sub> measured on the flue, with the boiler operating at the minimum heat output, is the same as that shown in table 1. Otherwise, turn the offset regulation screw (K) on the gas valve. Turn the screw clockwise to reduce the concentration of CO<sub>2</sub> and anticlockwise to increase it.

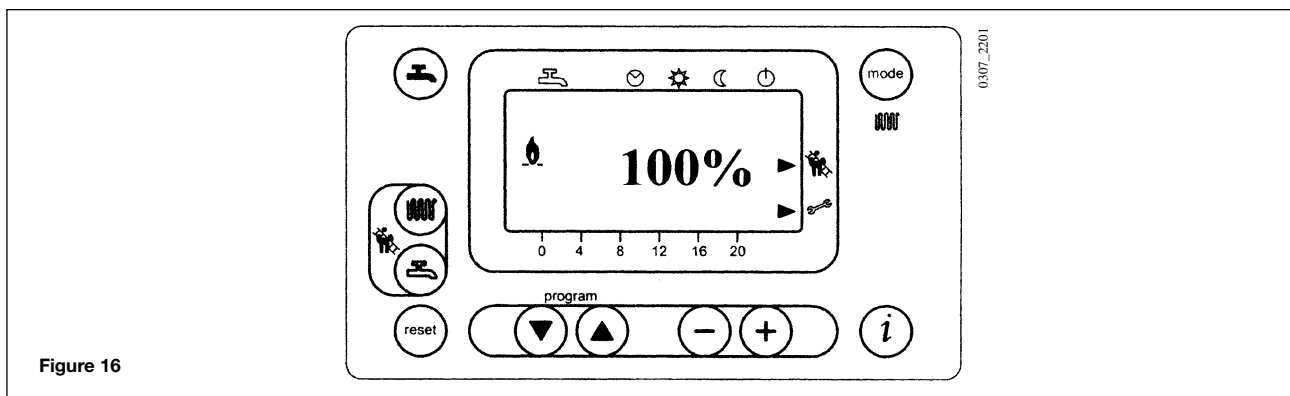
- Pi:** Gas supply pressure connection point  
**Pi:** Air signal input from fan  
**V:** Gas flow adjuster screw max fire  
**K:** OFFSET adjuster screw min fire



**Caution:** in the event of the boiler failing to ignite, or when replacing the gas valve, the recommended procedure is to tighten the adjuster screw (V) fully and then back off 2 1/2 turns, repeating the steps described above.

To simplify calibration of the gas valve, the “calibration function” can be set directly on the boiler control panel by proceeding as follows:

- 1) Press the keys (2-3) together until the display shows the pointer “▶” alongside the and symbols (about 6 seconds) (see fig. 16).
- 2) Press the keys to set the fan speed at the minimum and maximum heat output (%PWM);  
 N.b - to set the **minimum** and **maximum** heat output quickly, press the keys respectively;
- 3) press either of the two keys to exit the function.



**IMPORTANT:** In the case of conversion from natural gas to propane (LPG), the following operations must be performed before calibrating the gas valve as illustrated previously:

- Replace the gas nozzle placed inside the gas valve (flow gas connection).  
To perform this operation it is necessary to remove the gas valve by undoing the inlet and outlet connections and unscrew the nozzle using round-nose pliers.  
Check the seal of the gas couplings removed beforehand.
- On the control panel display set ignition power parameters **H536, H541, H608, H609, H610, H611, H612** and **H613**. The values to be input are given in table 2 or 2.1. The programming methods are described in chapter 16;

|                                  | <b>G20 - 2H - 20 mbar</b> | <b>G31 - 3P - 37 mbar</b> |
|----------------------------------|---------------------------|---------------------------|
| CO <sub>2</sub> max. heat output | 8.7 %                     | 10.2 %                    |
| CO <sub>2</sub> min. heat output | 8.4 %                     | 9.8 %                     |

Table 1

| <b>Gas consumption at 15 °C<br/>1013 mbar<br/>gas G20 - 2H - 20 mbar</b> | <b>WH 90</b> | <b>WH 110</b> |
|--|--------------|---------------|
| <b>PCI (MJ/m<sup>3</sup>) NET</b>  | <b>34.02</b> | <b>34.02</b>  |
| Consumption at max. heat output (m <sup>3</sup> /h)                      | 9.22         | 11.10         |
| Consumption at min. heat output (m <sup>3</sup> /h)                      | 2.79         | 3.15          |
| Gas nozzle (mm)  | 11.5         | 11.5          |
| H536-H613 parameters (rpm) at max heat output (*)                        | 5500         | 6400          |
| H541-H610 parameters (pwm%) at max heat output (*)                       | 100          | 100           |
| H612 parameter (rpm) at min heat output (*)                              | 1750         | 1850          |
| H609 parameter (pwm%) at min heat output (*)                             | 14           | 11            |
| H611 parameter (rpm) at ignition load (*)                                | 2400         | 3100          |
| H608 parameter (pwm%) at ignition load (*)                               | 20           | 20            |

Table 2

(\*) In the case of outlet ducts longer than 2 m set the values given in the charts of § 12.5.

| <b>Gas consumption at 15 °C<br/>1013 mbar<br/>gas G31 - 3P - 37 mbar</b> | <b>WH 90</b> | <b>WH 110</b> |
|--|--------------|---------------|
| <b>PCI (MJ/Kg) NET</b>   | <b>46.34</b> | <b>46.34</b>  |
| Consumption at max. heat output (Kg/h)                                   | 6.77         | 8.15          |
| Consumption at min. heat output (Kg/h)                                   | 2.05         | 2.31          |
| Gas nozzle (mm)  | 7.5          | 7.5           |
| H536-H613 parameters (rpm) at max heat output (*)                        | 5200         | 5850          |
| H541-H610 parameters (pwm%) at max heat output (*)                       | 100          | 80            |
| H612 parameter (rpm) at min heat output (*)                              | 1650         | 1700          |
| H609 parameter (pwm%) at min heat output (*)                             | 13           | 10.5          |
| H611 parameter (rpm) at ignition load (*)                                | 3700         | 3100          |
| H608 parameter (pwm%) at ignition load (*)                               | 35           | 20            |

Table 2.1

(\*) In the case of outlet ducts longer than 2 m set the values given in the charts of § 12.5.



## 16. SETTING THE BOILER PARAMETERS

The boiler parameters may only be modified by professionally qualified staff proceeding as follows:

- press the  $\blacktriangledown$   $\blacktriangle$  keys on the boiler's front panel together for about 3 s until the parameter H90 appears on the display;
- press the  $\blacktriangledown$   $\blacktriangle$  keys to select the parameter for modification;
- press the  $\ominus$  and  $\oplus$  keys to modify the parameter;
- press the  $\text{ⓘ}$  key to exit the programming function.

The following are the parameters generally used:

| N° parametro | Description  | Factory setting         |
|--------------|--|-------------------------|
| H90          | Setting for domestic hot water reduced temperature (°C)  | 10                      |
| H91          | D.H.W. (Domestic Hot Water) program<br>(0 = enabled; 1 = disabled)   | 1                       |
| H505         | Maximum temperature (°C) of the central heating circuit HC1 corresponding to: <ul style="list-style-type: none"> <li>- the main circuit in systems with just one zone;</li> <li>- the circuit of the zone where the QAA73 temperature control device is installed in case of systems with more than one high-temperature zone;</li> <li>- the high temperature zone circuit in mixed systems and if the SIEMENS AGU2.500 accessory is used.</li> </ul> | 80                      |
| H507         | Maximum temperature (°C) of the central heating circuit HC2 of a system with more than one zone, corresponding to the circuit of the low-temperature zone if the SIEMENS AGU2.500 accessory is used.   | 80                      |
| H516         | Automatic Summer / Winter switching temperature (°C).  | 20                      |
| H532         | Selection of temperature curve of central heating circuit HC1 (see Graph 1)  | 15                      |
| H533         | Selection of temperature curve of central heating circuit HC2 (see Graph 1)  | 15                      |
| H536         | Maximum speed at maximum output in heating mode (rpm - maximum speed limitation)   | Refer to paragraph 12.1 |
| H612         | Setting value of required speed (rpm) at low-fire  |                         |
| H536-H613    | Setting value of required speed (rpm) at high-fire heating / domestic hot water mode   |                         |
| H541-H610    | PWM (%) setting: maximum output in heating / domestic hot water mode   |                         |
| H544         | Pump post-circulation time in central heating mode (min)   | 10                      |
| H545         | Burner operating pause time between two start-ups (s)  | 180                     |
| H552         | Hydraulic system setting (see instructions provided with the SIEMENS AGU2.500 accessory).<br>H552 = 50 with AGU2.500<br>H552 = 80 with RVA 47  | 2                       |
| H553         | Configuration of heating circuits<br>H553 = 12 with AGU2.500   | 21                      |
| H615         | Programmable function  | 9                       |
| H632         | Configuration of system with low loss header P1<br>H632 = 00001111 with AGU2.500<br>H632 = 00001000 with storage tank without low loss header<br><br>The value of Bit could be 1 or 0.<br>Press the keys 5 and 6 to select the bit to modify (b0 is the bit on the right, b7 is the last bit on the left).<br>To modify the Bit value press on the keys 7 and 8  | 00001100                |
| H641         | Fan post-purge interval (s)  | 10                      |
| H657         | Setpoint of autonomous ANTILEGIONELLA function<br><br>60...80 °C = setting temperature range<br>0 = function inactive  | 0                       |

Table 4

If the electronic circuit board is replaced, make sure that the parameters set are those specific to the boiler model, as indicated in the documentation available from the authorised Service Centre.

(\*) For these parameters see section 13 (hydraulic system).

## 17. CONTROL AND OPERATION DEVICES

The boiler has been designed in full compliance with European reference standards and in particular is equipped with the following

- **Overheat thermostat**

This thermostat interrupts the gas flow to the main burner in case the water contained in the circuit has overheated. Under these conditions the boiler locks out and can only repeat the ignition procedure by pressing of the reset button on the boiler after the cause of the trip has been rectified.

---

It is forbidden to disable this safety device

---

- **Flue thermostat**

This device, positioned on the flue inside the boiler, interrupts the flow of gas to the burner if the temperature exceeds 90 °C. After verifying the cause of the trip, press the reset button positioned on the thermostat itself, then press the reset button on the boiler.

---

It is forbidden to disable this safety device

---

- **Flame ionization detector**

The flame sensing electrode guarantees safety of operation in case of gas failure or incomplete interlighting of the main burner.

Under such conditions the boiler is locked out.

You must press the reset button on the boiler to restore the normal operating conditions.

- **Supplementary pump overrun**

After the burner has switched off due to a room thermostat intervention the preset pump overrun of the pump is it for 10 minutes, provided the boiler is in the central heating mode.

- **Frost protection device**

The boilers electronic management includes a “frost protection” function in the central heating system which operates the burner to reach a heating flow temperature of 30°C when the system heating flow temperature drops below 5 °C.

This function is enabled as long as the boiler is connected to the a.c. power supply gas supplies and the pressure in the system is as specified.

- **Pump-blocking prevention**

In case there is no call for heat either from the central heating system or from the DHW system for 24 hours continuous the pump will automatically switch on for 10 seconds.

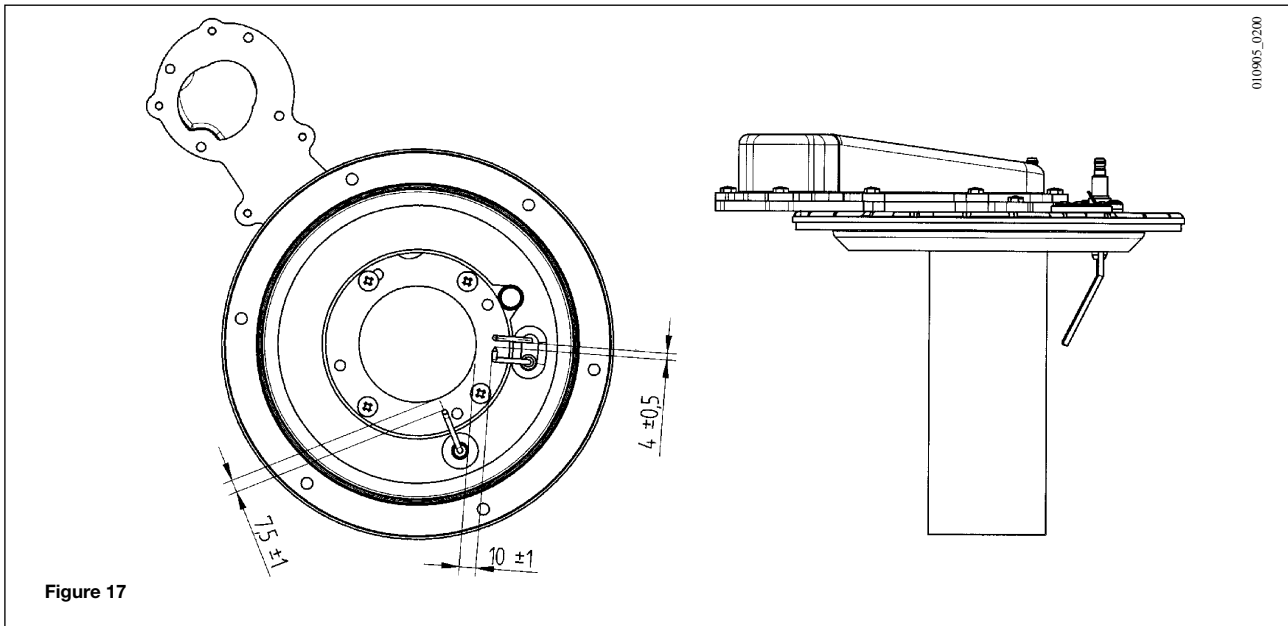
- **Gas pressure switch**

This device enables the main burner only to be switched on if the gas pressure is over 12 mbar.

- **Hydraulic pressure sensor**

This device enables the main burner only to be switched on if the system pressure is over 0.5 bar.

## 18. POSITIONING OF THE IGNITION AND FLAME SENSING ELECTRODE



## 19. CHECK OF COMBUSTION PARAMETERS

To measure the performance of combustion products, the forced draught boiler models are equipped with two test points on the tapered coupling specifically designed for this purpose.

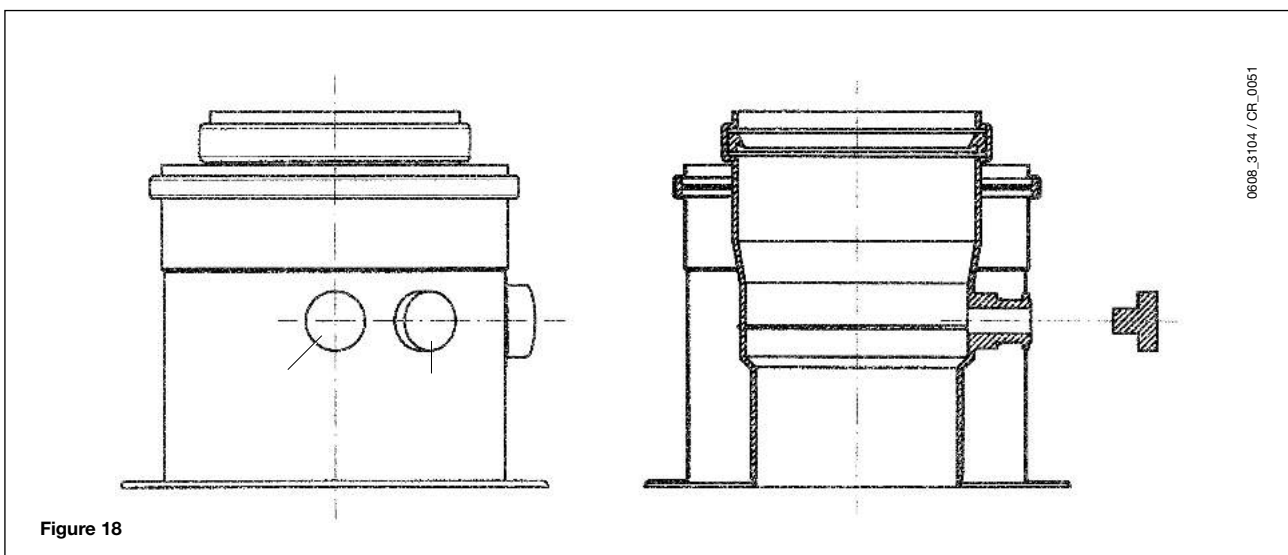
One of the two test points is connected to the exhaust flue duct to allow measurements of the combustion products and efficiency.

The second test point is connected to the comburant air inlet duct to check possible combustion products circulation in case of coaxial ducts.

The exhaust flue duct test point allows measurements of the following:

- combustion products temperature;
- concentration of oxygen ( $O_2$ ) or, alternatively, of carbon dioxide ( $CO_2$ );
- concentration of carbon monoxide (CO).

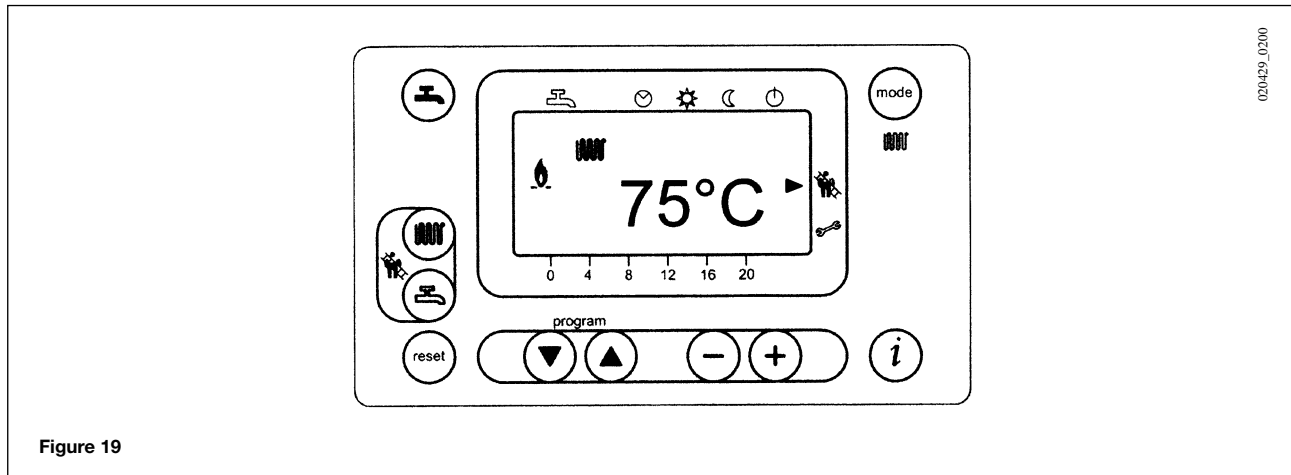
The comburant air temperature must be measured at the test point connected to the air inlet duct.



## 20. ACTIVATING THE CHIMNEY-SWEEP FUNCTION

To facilitate measurement of the combustion efficiency and improve the cleanliness of the production products, the flue-sweeper function can be activated by proceeding as described below:

- 1) Press the (2-3) together until the pointer "►" appears on the display alongside the symbol (about 3 seconds but no more than 6 seconds). In these conditions, the boiler operates at the maximum heat output set for central heating.
- 2) Press either of the buttons to exit the function



## 21. ANNUAL MAINTENANCE

To optimise boiler efficiency, carry out the following annual controls:

- check the appearance and airtightness of the gaskets of the gas and combustion circuits;
- check the state and correct position of the ignition and flame-sensing electrodes;
- check the state of the burner and make sure it is firmly fixed;
- check for any impurities inside the combustion chamber.  
Use a vacuum cleaner to do this;
- check the gas valve is correctly calibrated;
- check the pressure of the heating system;
- check the pressure of the expansion vessel;
- check the fan works correctly;
- make sure the flue and air ducts are unobstructed;
- check for any impurities inside the siphon fitted on certain boilers;
- check the magnesium anode, where present, for boilers fitted with storage boilers.

### WARNINGS

**Before commencing any maintenance operations, make sure the boiler is disconnected from the power supply. Afterwards, move the knobs and/or operating parameters of the boiler to their original positions.**

## 22. BOILER SCHEMATIC

0709\_1101 / CG1785

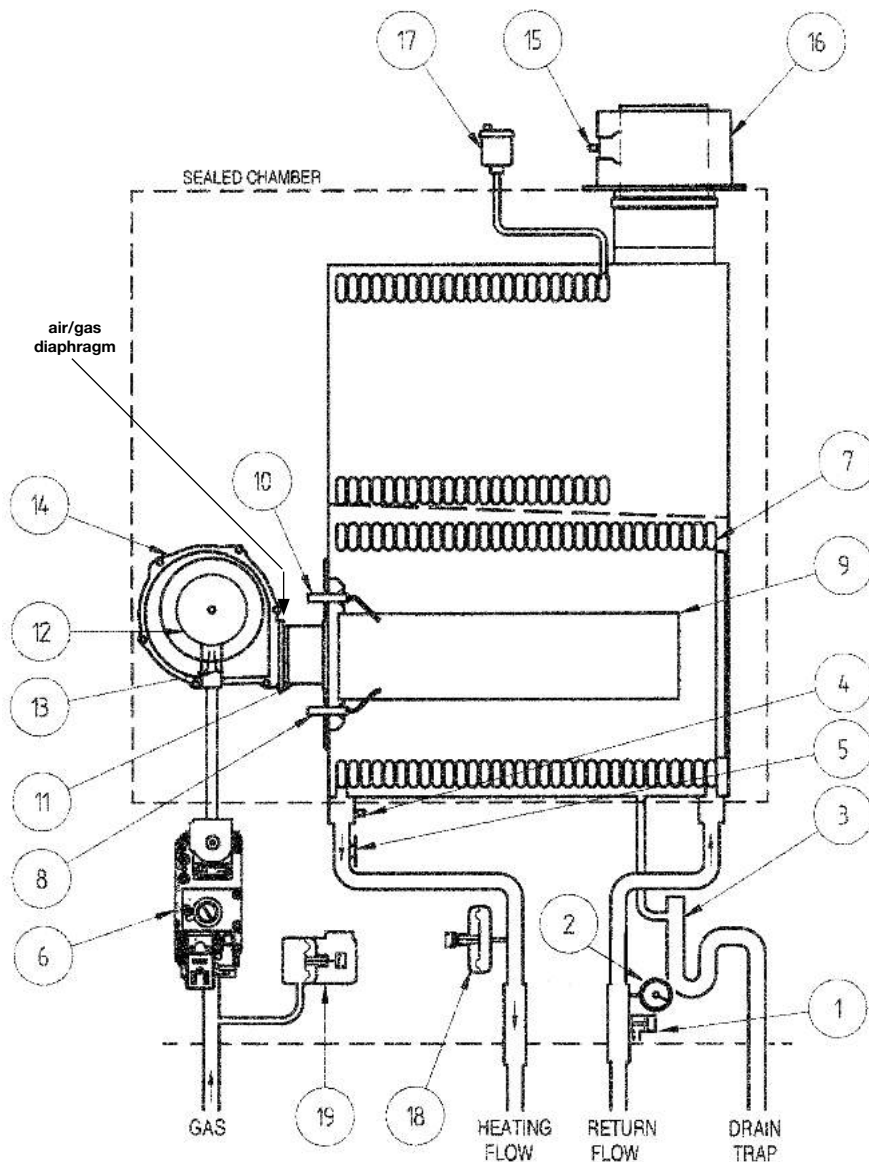
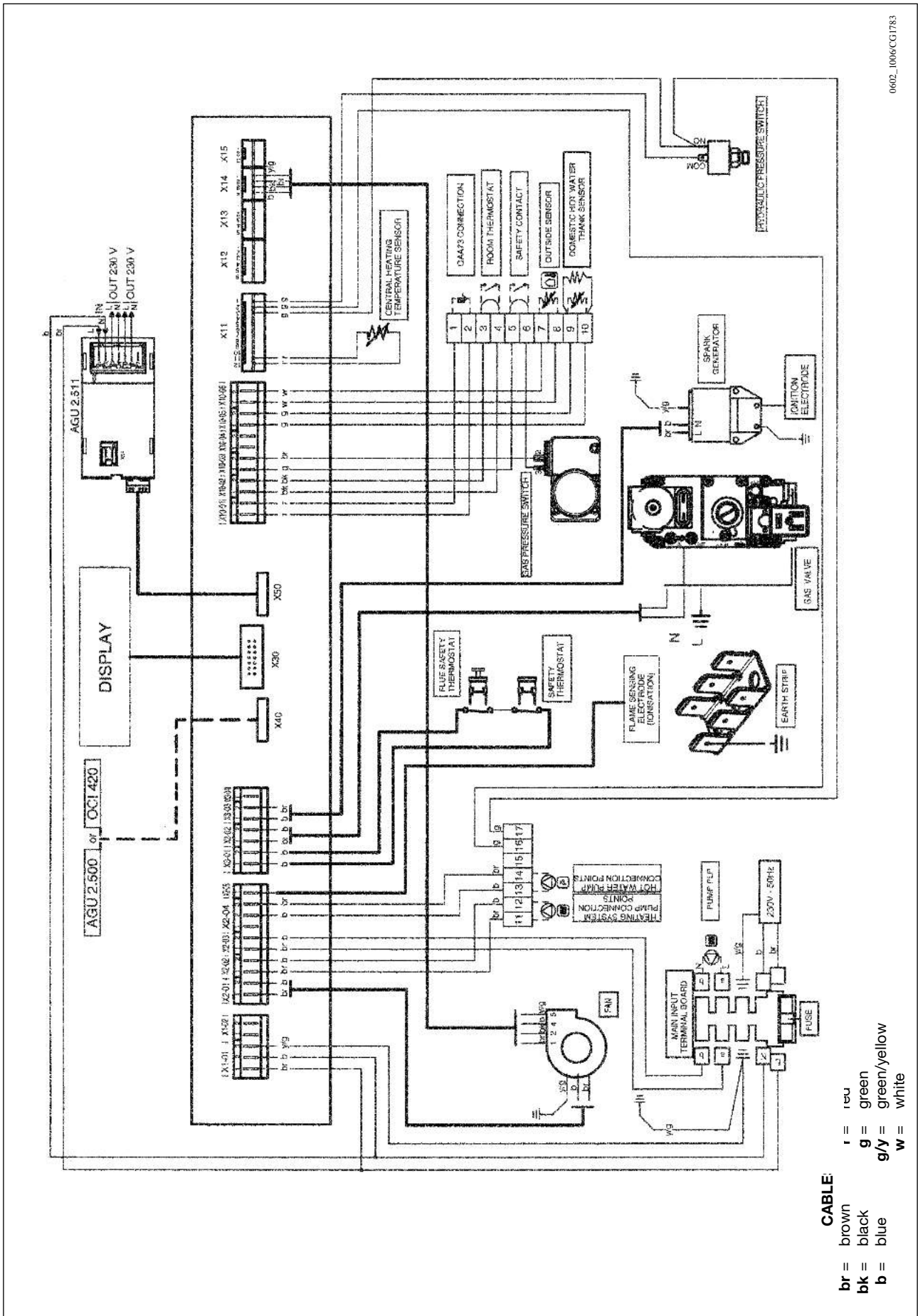


Figure 20

### Legend:

- 1 Boiler drain point
- 2 Manometer (water pressure gauge)
- 3 Siphon (condensate)
- 4 Central heating ntc sensor
- 5 105°C thermostat
- 6 Gas valve
- 7 Heat exchanger
- 8 Flame detector electrode (ionisation probe)
- 9 Main burner
- 10 Ignition electrode
- 11 Air/gas mixture header
- 12 Mixer with venturi
- 13 Injector
- 14 Fan
- 15 Flue thermostat
- 16 Flue spigot
- 17 Automatic air vent
- 18 Hydraulic pressure sensor
- 19 Pressure gas switch

# 23. ILLUSTRATED WIRING DIAGRAM



0602\_1006CG1783

## 24. TECHNICAL DATA

| Boiler model WH   |                    | WH 90                                   | WH 110             |
|---|--------------------|---|--------------------|
| Category  |                    | II <sub>2H3P</sub>                      | II <sub>2H3P</sub> |
| Nominal heat input (net/gross)                            | kW                 | 87.2 - 95.9                             | 105 - 115.4        |
| Reduced heat input (net/gross)                            | kW                 | 26.4 - 29.9                             | 29.8 - 32.7        |
| Rated heat output 75/60°C                                 | kW                 | 85                                      | 102                |
|   | kcal/h             | 73,100                                  | 87,720             |
| Rated heat output 50/30°C                                 | kW                 | 91.6                                    | 110.3              |
|   | kcal/h             | 78,776                                  | 94,858             |
| Reduced heat output 75/60°C                               | kW                 | 25.7                                    | 29                 |
|   | kcal/h             | 22,102                                  | 24,940             |
| Reduced heat output 50/30°C                               | kW                 | 27.8                                    | 31.4               |
|   | kcal/h             | 23,908                                  | 27,004             |
| Useful efficiency according to 92/42/CEE directive        | —                  | ★★★★                                    | ★★★★               |
| Useful efficiency max heat output 75/60 °C net/gross      | %                  | 97.5 / 87.8                             | 97.4 / 87.4        |
| Useful efficiency max heat output 50/30 °C net/gross      | %                  | 105.1 / 94.5                            | 105 / 94.5         |
| Useful efficiency 30% heat output                         | %                  | 107.3                                   | 107.4              |
| Central heating system max. pressure                      | bar                | 4                                       | 4                  |
| Heating circuit temperature range                         | °C                 | 25÷80                                   | 25÷80              |
| Type  | —                  | C13 - C33 - C43 - C53 - C63 - C83 - B23 |                    |
| Concentric flue duct diameter                             | mm                 | 110                                     | 110                |
| Concentric air duct diameter                              | mm                 | 160                                     | 160                |
| Twin-pipe flue duct diameter                              | mm                 | 110                                     | 110                |
| Twin-pipe air duct diameter                               | mm                 | 110                                     | 110                |
| Max. flue mass flow rate                                  | kg/s               | 0.041                                   | 0.050              |
| Min. flue mass flow rate                                  | kg/s               | 0.013                                   | 0.015              |
| Max. flue temperature                                     | °C                 | 74                                      | 79                 |
| NOx class   | —                  | 5                                       | 5                  |
| NOx   | mg/kWh             | 36.9                                    | 32.9               |
| Type of gas used  | —                  | G20                                     | G20                |
|   | —                  | G31                                     | G31                |
| Natural gas pressure 2H                                   | mbar               | 20                                      | 20                 |
| Propane gas pressure 3P                                   | mbar               | 37                                      | 37                 |
| Gas Consumption (NG)                                      | m <sup>3</sup> /hr | 9.22                                    | 11.1               |
| Gas Consumption (LPG)                                     | m <sup>3</sup> /hr | 3.56                                    | 4.29               |
| Minimum Operating Pressure                                | Bar                | 0.5                                     | 0.5                |
| High Level Ventilation to BS6644 boiler room              | cm <sup>2</sup>    | 174.4                                   | 205.4              |
| Low Level Ventilation to BS6644 boiler room               | cm <sup>2</sup>    | 348.8                                   | 410.8              |
| Water Flow at 20°C Δt                                     | lit/sec            | 1.02                                    | 1.25               |
| Hydraulic Resistance at 20°C Δt                           | kPa                | 25.42                                   | 23.72              |
| Cold Feed Size to BS6644                                  | mm                 | 25                                      | 25                 |
| Open vent size  | mm                 | 32                                      | 32                 |
| Safety valve size to BS6644 (open vent system)            | mm                 | 19                                      | 19                 |
| Water Content   | lit                | 13.7                                    | 21                 |
| Maximum Flow Temperature                                  | °C                 | 85                                      | 85                 |
| Ventilation to BS5440                                     | cm <sup>2</sup>    | N/A                                     | N/A                |
| Power supply voltage                                      | V                  | 230                                     | 230                |
| Power supply frequency                                    | Hz                 | 50                                      | 50                 |
| Rated power supply  | W                  | 150                                     | 200                |
| Net weight  | kg                 | 94                                      | 98                 |
| Dimensions  | height             | mm                                      | 950                |
|   | width              | mm                                      | 600                |
|   | depth              | mm                                      | 650                |
| Protection-limit against humidity and water leakages (**) |                    | IPX5D                                   | IPX5D              |

(\*\*) according to EN 60529

## Commercial sales technical & service enquiries

Tel: 0845 070 1055  
Fax: 0845 070 1059  
Sales hotline: 0845 070 1056  
Technical helpline: 0845 070 1057  
Service hotline: 0845 070 1058  
e-mail: [potterton.commercial@baxigroup.com](mailto:potterton.commercial@baxigroup.com)  
web: [www.pottertoncommercial.co.uk](http://www.pottertoncommercial.co.uk)

## Spares

Potterton Commercial spares are available nationwide through the interpart network of approved stockists. Alternatively please contact:-

### Interpart

Brooks House  
Coventry Road  
Warwick CV34 4LL  
Tel: 0844 871 1540

## Applications & Installations

Our experienced technical support team are available to offer advice on any aspect of heating system design and boiler installation.

Please contact: 0845 070 1057

## Commercial service offices

Our service organisation covers the whole of the UK to look after your needs for all Potterton Commercial products.

Our service office offers a wide range of specialised services including:

- Burner commissioning for all fuels
- Boiler service contracts
- Breakdown and repair services
- Burner and boiler replacement
- Oil/gas conversions
- Water treatment and descaling
- Packaged units

All descriptions and illustrations contained within this leaflet have been carefully prepared, but we reserve the right to make changes and improvements in our products which may affect the accuracy of the information in this leaflet.

PART OF BDR THERMEA



**Baxi Commercial Division**  
Wood Lane, Erdington,  
Birmingham B24 9QP  
Email: [potterton.commercial@baxigroup.com](mailto:potterton.commercial@baxigroup.com)  
[www.pottertoncommercial.co.uk](http://www.pottertoncommercial.co.uk)

Sales:  
0845 070 1056  
Technical:  
0845 070 1057

**POTTERTON**  
COMMERCIAL  
heating specialists