

# Sirius two WH 50, 60 & 70 kW

Instruction manual for users and fitters



Working towards  
a cleaner future

Dear Customer,  
 Thank you for your purchase. Our company is confident that your new product will meet all of your requirements.  
 Purchasing this product gives you a solution that provides peace of mind, ease of use and exceptional performance.  
 Please ensure that you read this manual before installing the product as it contains vital information for its correct use.  
 Failure to install the product as advised in this manual may result in void of the warranty terms and conditions.

Our company declares that these products are marked **CE** in compliance with the essential requirements of the following Directives:

- Gas Directive **2009/142/EC**
- Efficiency Directive **92/42/EEC**
- Electromagnetic Compatibility Directive **2004/108/EC**
- Low Voltage Directive **2006/95/EC**



Our company, constantly striving to improve its products, reserves the right to modify the details given in this documentation at any time and without notice. These Instructions are to provide consumers with user information and under no circumstance should they be construed as a contract with a third party.

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## DESCRIPTION OF SYMBOLS



### WARNING

Risk of damage to or malfunction of the appliance. Pay special attention to the warnings concerning danger to people.



### DANGER OF BURNS

Wait for the appliance to cool down before working on the parts exposed to heat.



### DANGER - HIGH VOLTAGE

Live components - electrocution hazard.



### DANGER OF FREEZING

Possible formation of ice due to low temperatures.



### IMPORTANT INFORMATION

Information to read with particular care as it is useful for the correct operation of the boiler.



### GENERIC PROHIBITION

It is forbidden to do/use the things indicated alongside the symbol.

## GENERAL PRECAUTIONS

This boiler has been designed to heat water to a temperature lower than boiling point at atmospheric pressure. It must be connected to a central heating system and to a domestic hot water supply system according to its performance and power output. Before having the boiler installed by a qualified service engineer, make sure the following operations are performed:

- Make sure that the boiler is adjusted to use the type of gas delivered by the gas supply. To do this, check the markings on the packaging and the rating plate on the appliance.
- Make sure that the flue terminal draft is appropriate, that the terminal is not obstructed and that no exhaust gases from other appliances are expelled through the same flue duct, unless the latter has been specially designed to collect exhaust gas from more than one appliance, in compliance with current laws and regulations.
- Make sure that, if the boiler is connected to existing flue ducts, these have been thoroughly cleaned as residual products of combustion may detach from the walls during operation and obstruct the flow of fumes.
- The use of a chimney liner is required for condensing boiler.
- To ensure correct operation and maintain the warranty, observe the following precautions:

### 1. DHW circuit

**1.1** If the water is harder than 15 °F (1 °F = 10 mg calcium carbonate per litre of water), install a polyphosphate dispenser or an equivalent treatment system, compliant with current regulations.

**1.2** Thoroughly flush the system after installation of the appliance and before use.

**1.3** The materials used for the DHW circuit must comply with Directive 98/83/EC.

### 2. Heating circuit

**2.1 New system:** Before installing the boiler, the system must be cleaned and flushed to eliminate residual thread-cutting, swarf, solder and any solvents, using suitable off-the-shelf non-acid and non-alkaline products such as Sentinel X300 or Fernox F3 that do not damage metal, plastic and rubber parts. To protect the system from corrosion, sludge and scale, use inhibitors such as SENTINEL X100 and FERNOX protector for heating circuits. Use these products in strict compliance with the manufacturers' instructions.

**2.2 Existing system:** Before installing the boiler, drain the system and clean it to remove sludge and contaminants, using suitable proprietary products. Recommended cleaning products are: SENTINEL X400 or SENTICLENE 8500 (ideal for unplanned emergency cleans) and FERNOX regenerator for heating circuits. Use these products in strict compliance with the manufacturers' instructions. Remember that the presence of foreign bodies in the heating system can adversely affect boiler operation (e.g. overheating and excessive noise of the heat exchanger).

If heating systems are to be operated at lower than normal temperatures (>60C) to accommodate under-floor heating requirements etc then consideration should be given to the use of a long lasting biocide such as Sentinel Senticide 7500 or Fernox AF10 to prevent microbiological activity.

Initial lighting of the boiler must be carried out by an authorised Service Engineer who must first ensure that:

- The rated data correspond to the supply (electricity, water and gas) data.
- That the installation complies with current regulations.
- The appliance is correctly connected to the power supply and earthed.

**IMPORTANT INFORMATION : THIS FUNCTION MUST NOT BE USED WITH LPG GAS (G31)**



The appliance must be installed in a ventilated boiler room pursuant to current regulations (appliances with heating capacity > 40 kW).



*Failure to observe the above will render the warranty null and void. The names of the authorised Service Centres are indicated in the attached sheet. Prior to commissioning, remove the protective plastic coating from the boiler. Do not use any tools or abrasive detergents to do this as you may damage the painted surfaces.*



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

## SAFETY WARNINGS

### SMELL OF GAS

- Switch off the boiler.
- Do not activate any electrical device (such as switching on the light).
- Put out any naked flames and open the windows.
- Call an Authorised Service Engineer.

### SMELL OF COMBUSTION FUMES

- Switch off the boiler.
- Open all the doors and windows to ventilate the room.
- Call an Authorised Service Engineer.

### FLAMMABLE MATERIAL

Do not use and/or store highly flammable material (thinners, paper, etc.) near the boiler.

### SERVICING AND CLEANING THE BOILER

Switch off the boiler before working on it.



The appliance is not intended to be used by persons with reduced physical, sensory or mental capacities, or who lack experience or knowledge, unless, through the mediation of a person responsible for their safety, they have had the benefit of supervision or of instructions on the use of the appliance.

# 1. TECHNICAL SPECIFICATIONS

Model: SIRIUS TWO		WH 50	WH 60	WH 70
Category		II <sub>2H3P</sub>		
Gas used Natural Gas and LPG	-	G20 - G31		
Rated heat input	kW	46,3	56,6	66,9
Reduced heat input	kW	5,1	6,3	7,4
Rated heat output 80/60 °C	kW	45	55	65
Rated heat output 50/30 °C	kW	48,6	59,4	70,2
Reduced heat output 80/60 °C	kW	5,0	6,1	7,2
Reduced heat output 50/30 °C	kW	5,4	6,6	7,8
Net Rated efficiency (92/42/EEC) 80/60 °C	%	97,4	97,2	97,2
Net Rated efficiency 50/30 °C	%	105,0	105,0	105,0
Efficiency 30% Pn (92/42/EEC)	%	107,8	107,4	107,1
Max. water pressure in heating circuit	bar	4		
Min. water pressure in heating circuit	bar	1		
Capacity of boiler circuit (volume of water)	l	4	5	6
Temperature range in heating circuit	°C	25 - 80		
Flue Types	-	C13 - C33 - B23		
Concentric flue duct diameter	mm	80/125		
Max. mass flow rate of flue	kg/s	0,021	0,026	0,031
Min. mass flow rate of flue	kg/s	0,002	0,003	0,004
Max. temperature of flue	°C	92	96	76
NOx Class 5 (EN 297 - EN 483)	mg/kWh	29,8	34,1	34,8
Natural gas supply pressure 2H (G20)	mbar	20		
Propane gas supply pressure 3P (G31)	mbar	37		
Power supply voltage	V	230		
Power supply frequency	Hz	50		
Rated power supply (Without Pump)	 W	80	95	95
Rated power supply (With Pump)	 W	190	210	210
Net weight (empty)	kg	40	40	50
Dimensions - height	mm	766		
- width	mm	450		
- depth	mm	377	377	505
Protection-limit against humidity (EN 60529)	-	IPX5D		
Noise level at 1 metre	dB(A)	< 50		
EC certificate	Nr.	0085CM0128		

## CONSUMPTION AT HEAT INPUT Qmax and Qmin

Qmax (G20) - 2H	m <sup>3</sup> /h	4,90	5,98	7,07
Qmin (G20) - 2H	m <sup>3</sup> /h	0,54	0,67	0,78
Qmax (G31) - 3P	kg/h	3,60	4,40	5,20
Qmin (G31) - 3P	kg/h	0,40	0,49	0,57

## 2. INSTALLING THE BOILER

The template outline is shown in chap. "INSTALLING THE BOILER".

After deciding the exact location of the boiler, fix the template to the wall. Connect the system to the gas and water inlets present on the lower bar of the template. Make sure the rear part of the boiler (back) is as parallel as possible to the wall (otherwise, shim the lower part). **Fit two G1"1/4 taps (flow and return)** on the central heating circuit; these taps make it possible to carry out important operations on the system without draining it completely. On the Italian market, the system must comply with Raccolta R safety provisions (limit thermostat, safety pressure switch, fuel cut-off valve, etc.). Fit a hydraulic separator, sized according to maximum boiler and system pressure, downline from the hydraulic connectors of the boiler. If you are either installing the boiler on an existing system or replacing one, as well as the above, fit a settling tank under the boiler on the system return line in order to collect any deposits and scale circulating in the system after flushing. After fixing the boiler to the template, connect the flue and air ducts, supplied as accessories, as described in the following sections. Connect the siphon to a drain trap, making sure the slope is continuous. Avoid horizontal stretches. The boiler is electronically fitted out for connection to an external storage boiler.



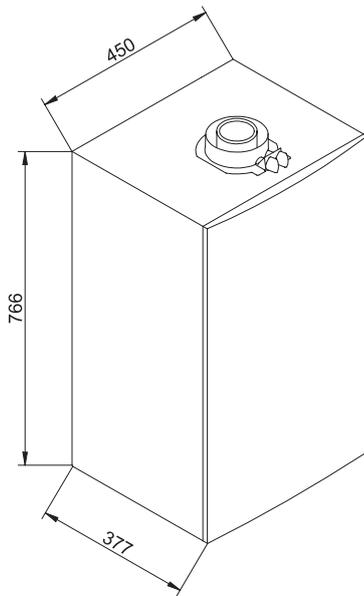
*Take special care when filling the heating system. In particular, open any thermostat valves in the system, ensure the water enters slowly in order to prevent the formation of air inside the primary circuit until operating pressure is reached. Lastly, vent any radiators in the system. POTTERTON COMMERCIAL declines all liability for damage deriving from the presence of air bubbles in the primary exchanger due to the incorrect or imprecise observance of the above.*



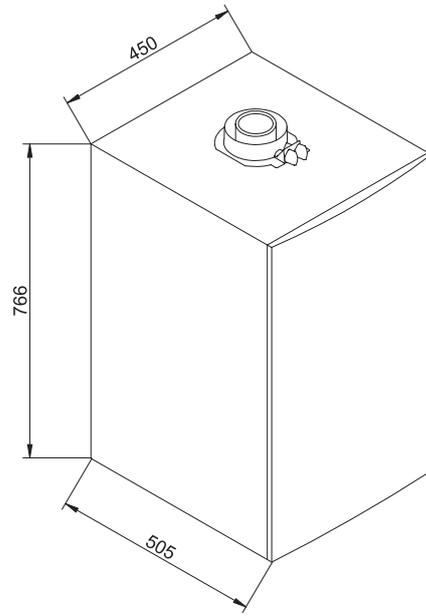
Tighten the boiler water connections with care (maximum tightening torque 30 Nm).



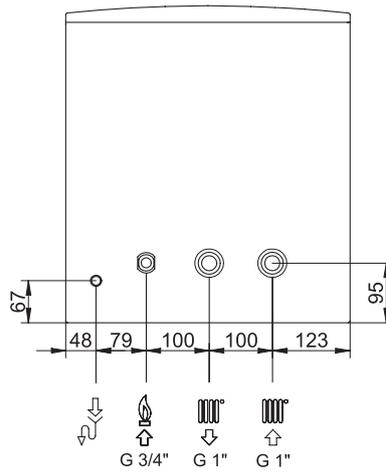
WH 50 - 60



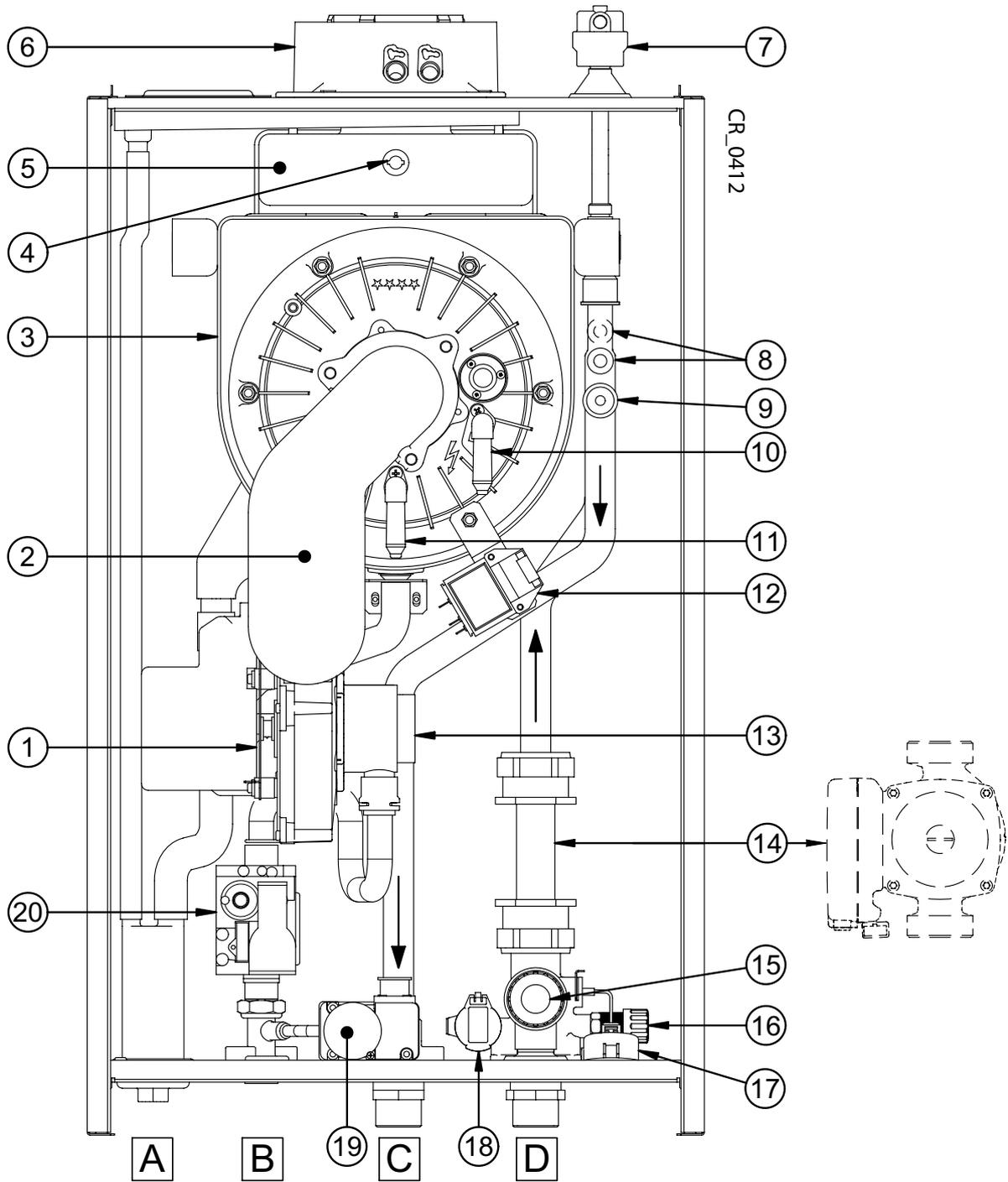
WH 70



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# BOILER SCHEMATIC LAYOUT



1	Fan	13	Venturi
2	Air/gas blend manifold	14	Optional pump position
3	Heat exchanger	15	Hydraulic Safety valve
4	Flue sensor	16	Boiler drain tap
5	Flue hood	17	Pressure gauge
6	Concentric flue connector	18	Hydraulic Pressure Sensor
7	Automatic air vent	19	Gas valve
8	NTC heating sensor	A	Siphon with condensate drain
9	Safety thermostat	B	Gas inlet connection
10	Ignition electrode	C	Heating flow connection
11	Flame detection probe	D	Heating return connection
12	Spark generator		

### 3. INSTALLING THE FLUES

The boiler is easy and flexible to install thanks to the extensive range of available accessories, as described below. The boiler has been designed for connection to a vertical or horizontal concentric flue.

#### WARNINGS

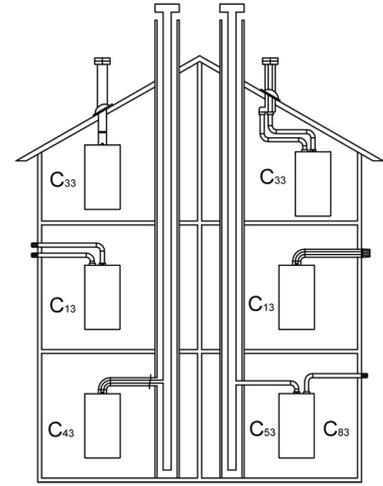
**C13, C33** The terminals for separate flues must be fitted in accordance with the BS standard and the Clean Air Act 1993. Detailed instructions are provided with the individual accessories.

 For optimal installation, the accessories supplied by the manufacturer should be used.

#### TABLE 1A

If the flue and air ducts installed are not supplied by POTTERTON COMMERCIAL, make sure they are certified for the type of use and have a maximum pressure drop as indicated in the table to the side.

	$\Delta P$ (Pa)
WH 50 – WH 60 WH 70	270



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To optimise operating safety, make sure the flues are firmly fixed to the wall with suitable brackets for every 1 metre of flue.



Make sure there is a minimum downward slope of 5 cm (3 degrees) per metre of duct towards the boiler.

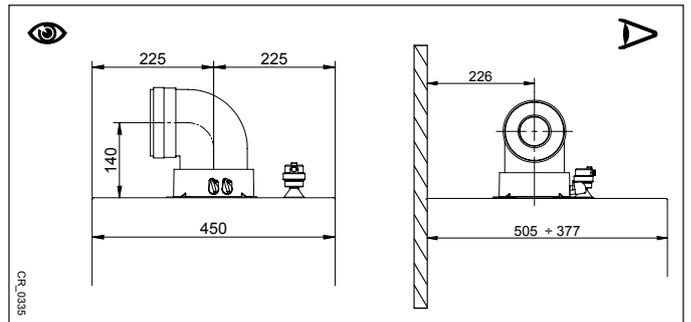


SOME OUTLET FLUE INSTALLATION EXAMPLES AND THEIR RELATIVE MAXIMUM LENGTHS ARE SHOWN IN CHAP. "CONCENTRIC FLUES".

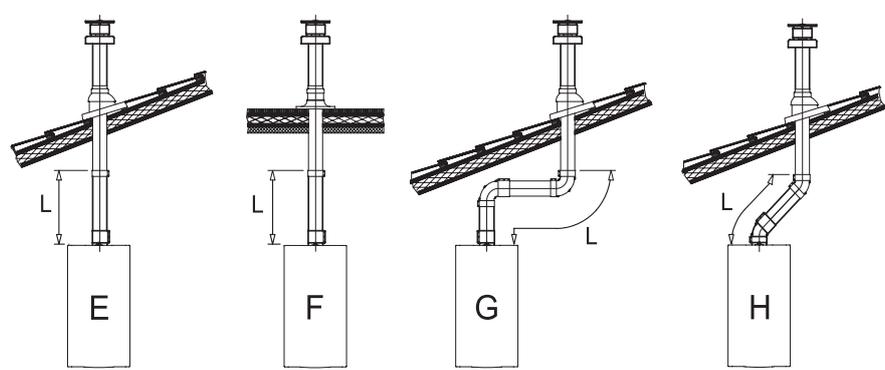
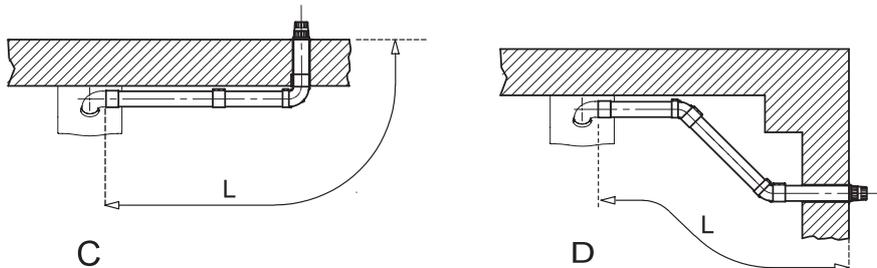
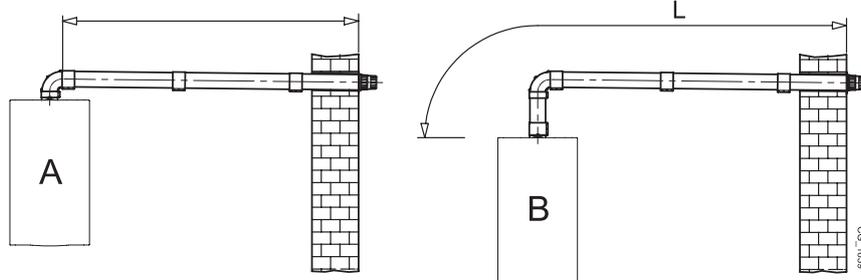
### 4. CONCENTRIC FLUES

This type of flue is used to discharge exhaust fumes and draw combustion air both outside the building. The 87° concentric bend allows the boiler to be connected to a flue-air in any direction as it can be rotated by 360°. It can also be used as a supplementary curve combined with a concentric flue or a 45° bend. If fumes are discharged outside the building, the flue-air must protrude at least 200 mm from the wall to allow weathering surround to be fitted and sealed to avoid water infiltrations.

- The 87° bend reduces the total flue length by 1 metre.
- The 45° bend reduces the total flue length by 0.5 metres.
- The first 87° bend is not included when calculating the maximum available length.



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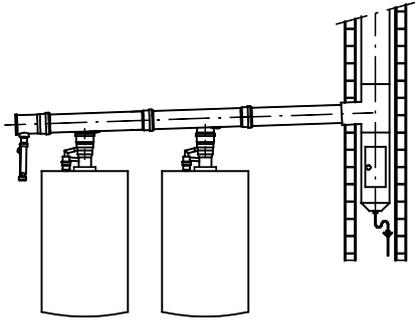


<b>A B</b>	Lmax = 10 m - Ø 80/125 mm
<b>C D</b>	Lmax = 9 m - Ø 80/125 mm
<b>E F</b>	Lmax = 10 m - Ø 80/125 mm
<b>G</b>	Lmax = 8 m - Ø 80/125 mm
<b>H</b>	Lmax = 9 m - Ø 80/125 mm

## 5. CASCADE FLUES

This type of duct evacuates the products of combustion of more than one boiler in a cascade connection through a shared fumes collector. The collector may only be used to connect the boilers to the flue duct. Available diameters are: Ø125 mm - Ø160 mm and Ø200 mm. A range of accessories is available on request.

BOILER MODEL	MAXIMUM NUMBER OF BOILERS IN A CASCADE CONNECTION			PARAMETER P60 Minimum power rpm	
	Ø125 mm (200 kW Max)	Ø160 mm (250 kW Max)	Ø200 mm (500 kW Max)	G20	G31
WH 50	4	5	10	1700	1700
WH 60	3	4	9	1620	1620
WH 70	2	3	7	1470	1470




*In this outlet typology, a flue no-return valve, Ø 80/110 mm, must be fitted to each boiler. Change the parameter P60 as shown in table following the procedure described in chapter 14.*



**The flue header size must be calculated by a qualified technician during the system design stage, as required by current regulations.**

## 6. BOILER PUMP

The boiler is supplied without the circulation pump. This component must be installed on the heating return to allow water to circulate between the boiler and the low loss header and can be purchased off the shelf or supplied by **POTTERTON COMMERCIAL** as an accessory (modulating pump).

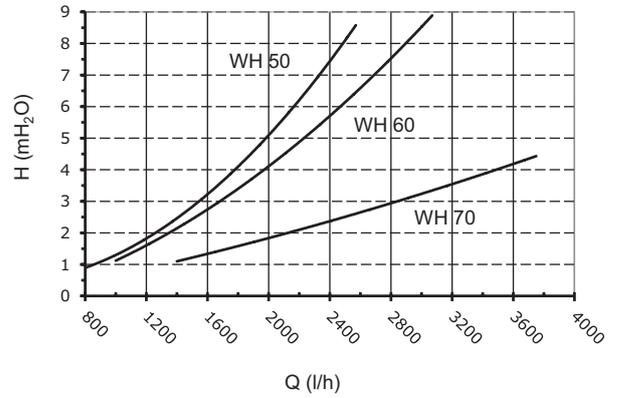
- In the first case  the pump is installed on the heating return union near the boiler. To size it correctly see the Flow/Pressure drops chart at the end of the manual in chap. "BOILER PUMP" (Size the pump in accordance to the delta t of the system design).
- In the second case  the pump is installed directly on the boiler removing the pipe on the internal circuit (first remove the front casing). For hydraulic performance data, see the Flow/Head charts at the end of the manual in chap. "BOILER PUMP".

The water in the system is circulated by the relative pumps, see chap. "BOILER PUMP". Check that the flow of the water circulating in the boiler is not less than the value indicated in the following table.

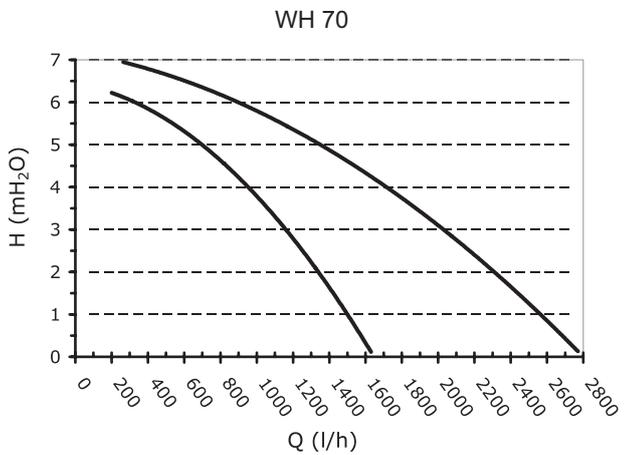
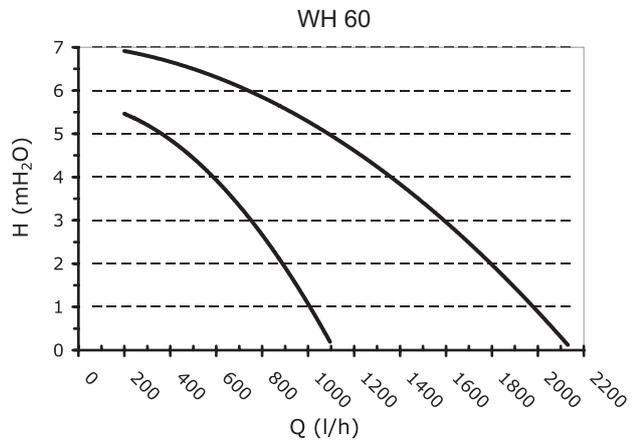
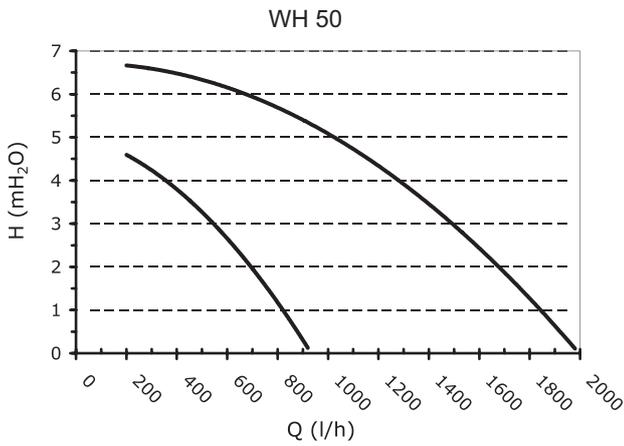
Model	Minimum flow rate (l/h)	Operating flow rate (l/h) with POTTERTON COMMERCIAL low loss header
WH 50	800	1950
WH 60	1000	2100
WH 70	1500	2750



### HYDRAULIC RESISTANCE



### MODULATING PUMP OPERATION GRAPHS



## 7. PUMP CAPACITY/ HEAD

The hydraulic pump, supplied as an accessory kit from POTTERTON COMMERCIAL, is a modulating pump. The purpose of the pump is to circulate the water between the boiler and the hydraulic separator.

KEY TO PUMP CHARTS - see chap. "BOILER PUMP"

Q	RATE OF FLOW
H	HEAD



THE PUMP FLOW / HEAD CHARTS CAN BE CONSULTED IN CHAP. "BOILER PUMP".

## 8. ELECTRICAL CONNECTIONS

This machine is only electrically safe if it is correctly connected to an efficient earth system in compliance with current safety regulations. Connect the boiler to a 230V single-phase earthed power supply using the supplied three core cable, observing correct Live-Neutral polarity.

**Use a double-pole switch with a contact separation of at least 3 mm.**

When replacing the power supply cable, fit a harmonised 3x0,75 mm<sup>2</sup> cable with a maximum diameter of 8 mm. To access the terminal block, remove the front boiler panel (fixed with two screws at the bottom), turn the control box downwards and access terminal blocks **M1**, **M2**, **M3**, used for the electrical connections, after removing the protective cover. The 3.15 A fast-blowing fuses are incorporated in the power supply terminal block (to check and/or replace the fuse, pull out the black fuse carrier).

SEE WIRING DIAGRAM IN CHAP. "ELECTRICAL CONNECTION"



Make sure that the overall rated power input of the accessories connected to the appliance is less than 2A. If it is higher, install a relay between the accessories and the electronic board.



The connections in terminal blocks M1- M3 are high voltage (230 V). Before making connections, make sure the appliance is disconnected from the power supply. Check the input polarity on terminal block M1: L (LINE) - N (NEUTRAL).

### TERMINAL BLOCK M1

(L) = Live (brown)

(N) = Neutral (light blue).

⊕ = Earth (yellow-green).

(1) (2) = contact for **Room Thermostat**.



Put back the jumper on terminals 1-2 of boiler terminal block M1 if the room thermostat is not used or if the Remote Control is installed.

### TERMINAL BLOCK M2

**Terminals 1 (back-lighting) - 2 (earth) - 3 (+12V):** connection to the Remote Control (low voltage) supplied as an accessory.

**Terminals 4 - 5 (common):** Outdoor temperature sensor (supplied as an accessory)

**Terminals 6 - 5 (common):** 2nd Auxiliary Sensor (sensors for solar plant, cascade system, zone system, etc.).

**Terminals 7 - 5 (common):** 1st Auxiliary Sensor (sensors for solar plant, cascade system, zone system, etc.).

**Terminals 9-10:** storage tank sensor connection.

**Terminal 8:** not used.

### TERMINAL BLOCK M3

**Terminal 1-2:** boiler pump supply 230 V AC (max 1 Amp)

**Terminal 3-4:** not used

**Terminal 5-6:** PWM signal of the modulating pump

**Terminal 7-8:** safety connection contact.

**Terminal 9 - 10:** Domestic Hot Water tank pump (max 1 Amp)

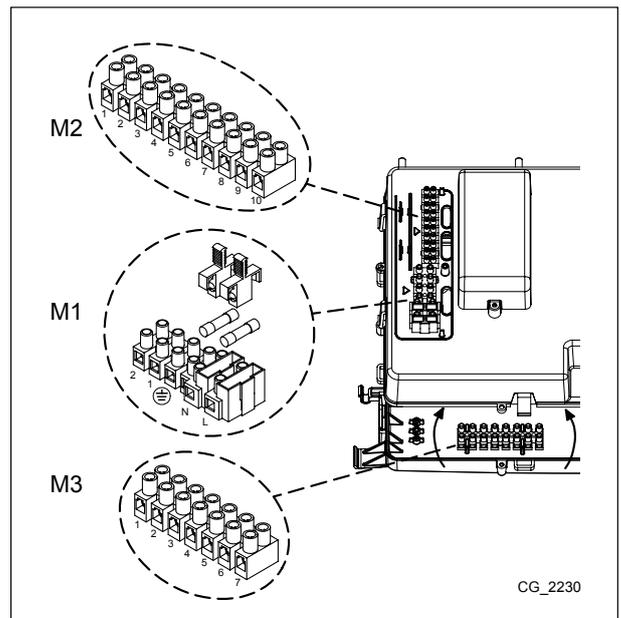
**Terminal 11 - 12:** Heating System pump (device connected downstream of the hydraulic separator - max 1 Amp)



If the appliance is connected to an underfloor system, install a limit thermostat to prevent the circuit from overheating.



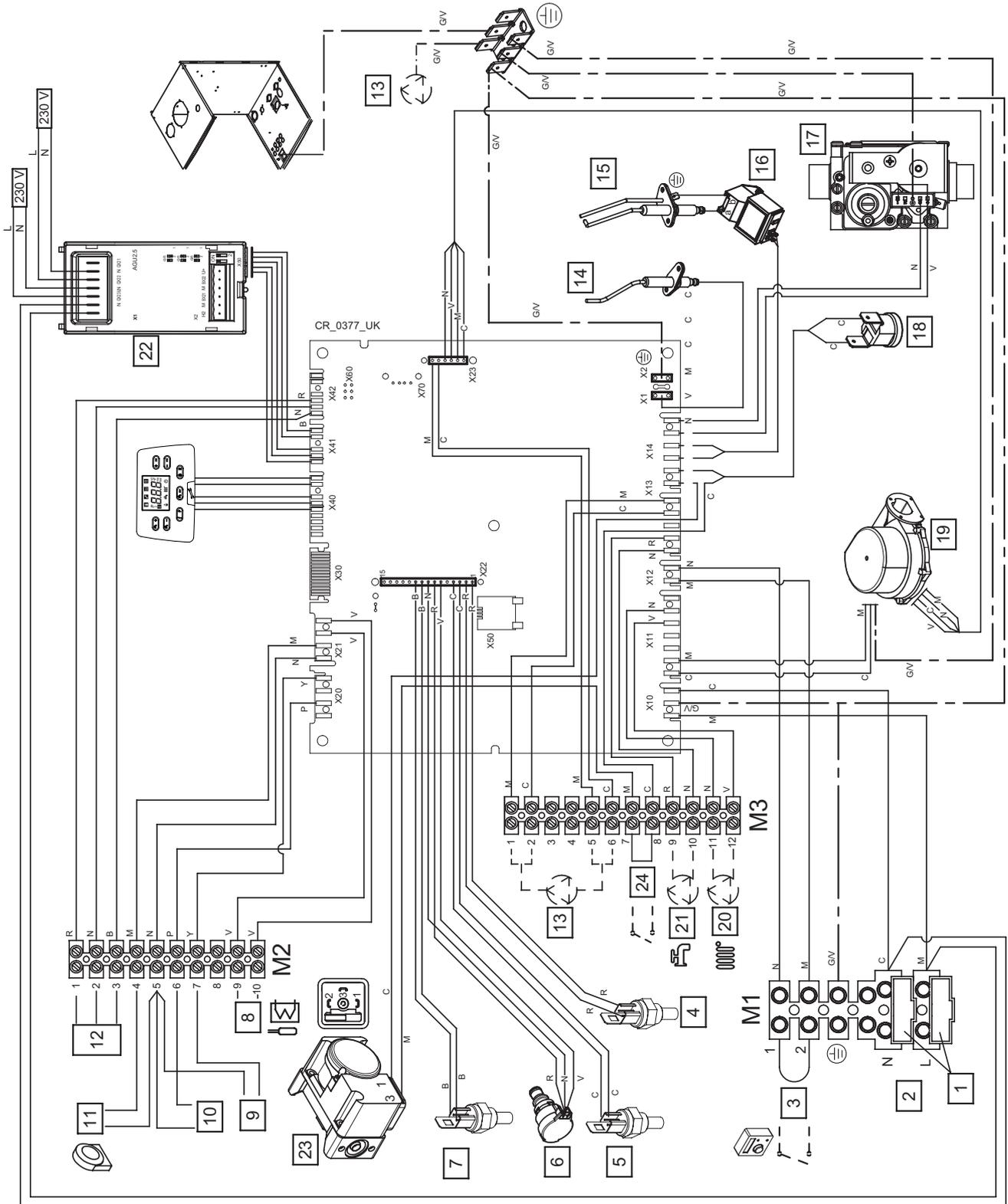
Use the relative cable grommets at the bottom of the boiler to thread the cables through to the terminal blocks.



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# ILLUSTRATED WIRING DIAGRAMS

1	Fuses
2	230 V Power Supply IN
3	Room Thermostat (RT) – Volt free
4	Heating Flow NTC Sensor
5	Heating Return NTC Sensor
6	Water pressure sensor
7	Fumes Sensor
8	DHW tank Sensor
9	Auxiliary Sensor 1
10	Auxiliary Sensor 2
11	Outdoor sensor
12	Remote Control
13	Boiler pump
14	Sensing electrode
15	Spark electrode
16	Spark generator
17	Gas valve
18	Safety Thermostat 105°C
19	Fan
20	Heating circuit pump
21	DHW tank pump
22	AGU 2.550
23	Gas pressure switch
24	Safety connection
C	Blue
M	Brown
N	Black
R	Red
G/V	Yellow/Green
V	Green
B	White
G	Grey
Y	Yellow
P	Violet



# 9. ACCESSORIES NOT INCLUDED IN THE PACKAGING

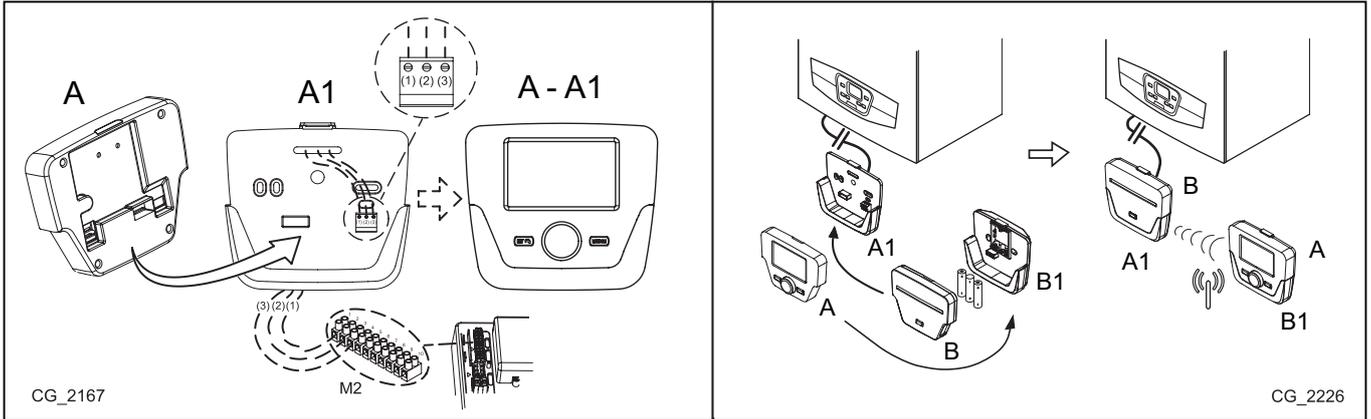
## 9.1 REMOTE CONTROL



The wire (1) from the boiler terminal block M2 powers the display backlighting (12 V). It is not necessary to connect this wire to make the Remote Control work.

To operate the boiler with the Remote Control mounted on the wall, purchase accessory A supplied with the base A1. Also see the mounting and operation instructions supplied with the kit A. Proceed as follows:

- Switch off the boiler.
- Pass the three wires from the boiler terminal block M2 through the hole in the base A1 to apply to the wall.
- Connect wires 1-2-3 of the boiler terminal block M2 to terminals (1)-(2)-(3) of the base terminal block A1 respectively.
- Fix the base A1 to the wall using the expansion grips and screws supplied with the accessory.
- Apply the Control Panel A to the base fixed to the wall, taking care not to apply excessive force.
- Power the boiler making sure that the Remote Control lights up.



<b>A</b>	Control Panel	<b>A1</b>	Base for wall-mounted Control Panel		
<b>B</b>	Led interface accessory	<b>B1</b>	Base for Led interface accessory		
<b>(1)</b>	Display backlighting +12V	<b>(2)</b>	Earth connection	<b>(3)</b>	Power input/Signal +12V



Use the Remote Control to set the programmable timer for heating and DHW. See the instructions supplied with the accessory.

## SETTING PARAMETERS USING THE REMOTE CONTROL

SYMBOLS FOR REMOTE CONTROL			
	Turn knob <b>B</b>		Display shows
	Press knob <b>B</b>		Press button <b>A</b> and knob <b>B</b> together
	Press button <b>A</b> or <b>C</b>		Press buttons <b>A</b> and <b>C</b> together

### KEY TO FIGURE MENU

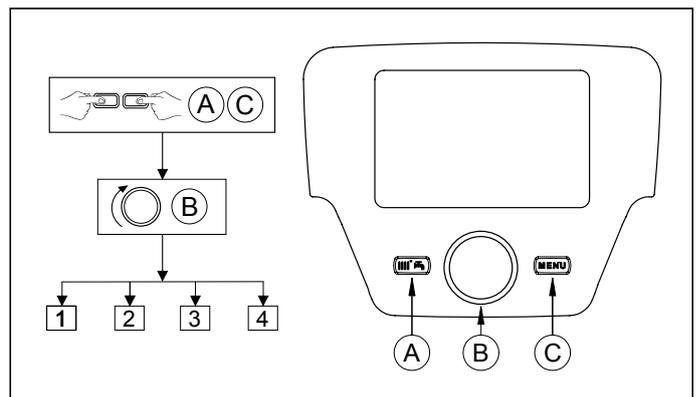
<b>1</b>	Enduser	<b>3</b>	Engineer
<b>2</b>	Commissioning	<b>4</b>	OEM



ALL MODIFIED PARAMETERS SHOULD BE NOTED DOWN IN THE TABLE AT THE END OF THIS MANUAL.

The following procedure is used to access the four boiler programming menus:

- from the main menu **C**.
- **A** and **C** (hold down for approx. 6 seconds) **B** menu 1-2-3-4 (see figure to side and key).
- **C** to go back one menu at a time to the main menu.



When the Control Panel is wall-mounted enable the **Room Temperature Sensor** and **flow temperature modulation** as follows:

**A) ROOM SENSOR**

- Access menu **2**.
- **Ⓚ** **Operator unit** **Ⓚ** to confirm.
- **Ⓚ** programme row **40** (Used as) **Ⓚ**.
- **Ⓚ** (anti-clockwise) **Room unit 1** **Ⓚ** to confirm (the room sensor is now active).
- **Ⓚ** to return to the previous menu then **Ⓚ** **Configuration** **Ⓚ**.
- **Ⓚ** programme row **5977** (Function input H5) then **Ⓚ** to confirm.
- **Ⓚ** **None** **Ⓚ** to confirm.

**B) FLOW TEMPERATURE MODULATION**

To set flow temperature modulation, disable parameter **742** (HC1). Proceed as follows:

- Access menu **2**.
- **Ⓚ** **Temps / mode CH1** **Ⓚ** to confirm **Ⓚ** **742** (Flow temp setpoint room stat) **Ⓚ** to confirm.
- **Ⓚ** (anti-clockwise) **"---**" then **Ⓚ** to confirm.

**Ⓚ** *If, when turning the knob B on the main menu, the display shows the boiler flow temperature instead of the ambient temperature, parameter 742 has not been set correctly.*

After every system configuration (e.g.: solar combination, connection an external storage tank, etc.) perform the following procedure to update the boiler board to the new configuration:

- Access menu **2** as indicated at the beginning of this section.
- **Ⓚ** **Configuration** **Ⓚ** **Ⓚ** programme row **6200** then **Ⓚ**.
- **Ⓚ** **Yes** then **Ⓚ** to confirm.

**ZONE SYSTEM WITH INSTALLATION OF THE REMOTE CONTROL**

The electrical connection and the adjustments required to manage a system divided into zones with use of the Remote Control differs according on the accessories connected to the boiler. To install and configure, see the instructions of the **Expansion Module** supplied as an accessory.

**ADJUSTING THE TEMPERATURE OF THE HIGH TEMPERATURE HEATING SYSTEM**

To avoid frequent starting and stopping, raise the minimum temperature setpoint of the boiler in the heating mode by setting parameters **740**, to not less than 25°C, using the procedure described in point **B**.

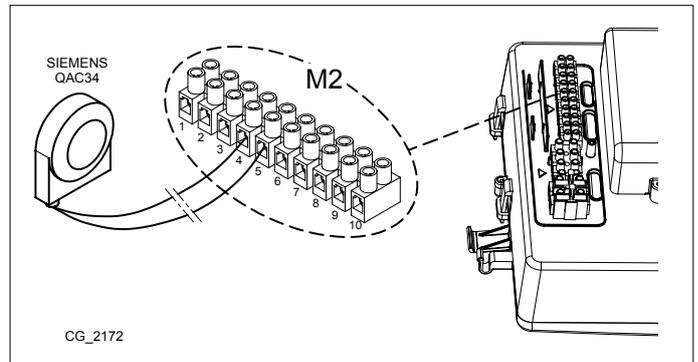
**TEMPERATURE ADJUSTMENT ON LOW TEMPERATURE HEATING SYSTEM**

For a low temperature system (such as underfloor heating), reduce the maximum CH temperature setpoint on the boiler by setting parameter **741** (point **B**) to a value not greater than 55°C.

**9.2 OUTDOOR SENSOR**

The outdoor sensor must be installed on an external wall of the building that is to be heated (see chap. "OUTDOOR SENSOR"), considering the following instructions:

- work on a wall facing north/north-east (avoid direct sunshine;
- do not install on walls subject to the formation of damp or moss (identify the presence of thermal bridges;
- do not install near fans, steam outlets or chimneys (it is important to avoid the external temperature controlled by the probe being influenced by external agents;
- ensure that the thickness of the wall used is suitable for obtaining good heat insulation (do not fix it to metal walls).



To connect this accessory, see figure to side (terminals **4-5**) and the instructions supplied with the sensor.

With the outdoor sensor connected, press **Ⓚ** **Ⓚ** buttons on the control panel to move the set climate curve **Kt** in parallel (see chap. "OUTDOOR SENSOR" and parameter **P03** in the table in section 14). To increase room temperature press **+**, to decrease press **-**.

**SETTING THE "Kt" CLIMATE CURVE**

To set the required kt climate curve, proceed as follows:

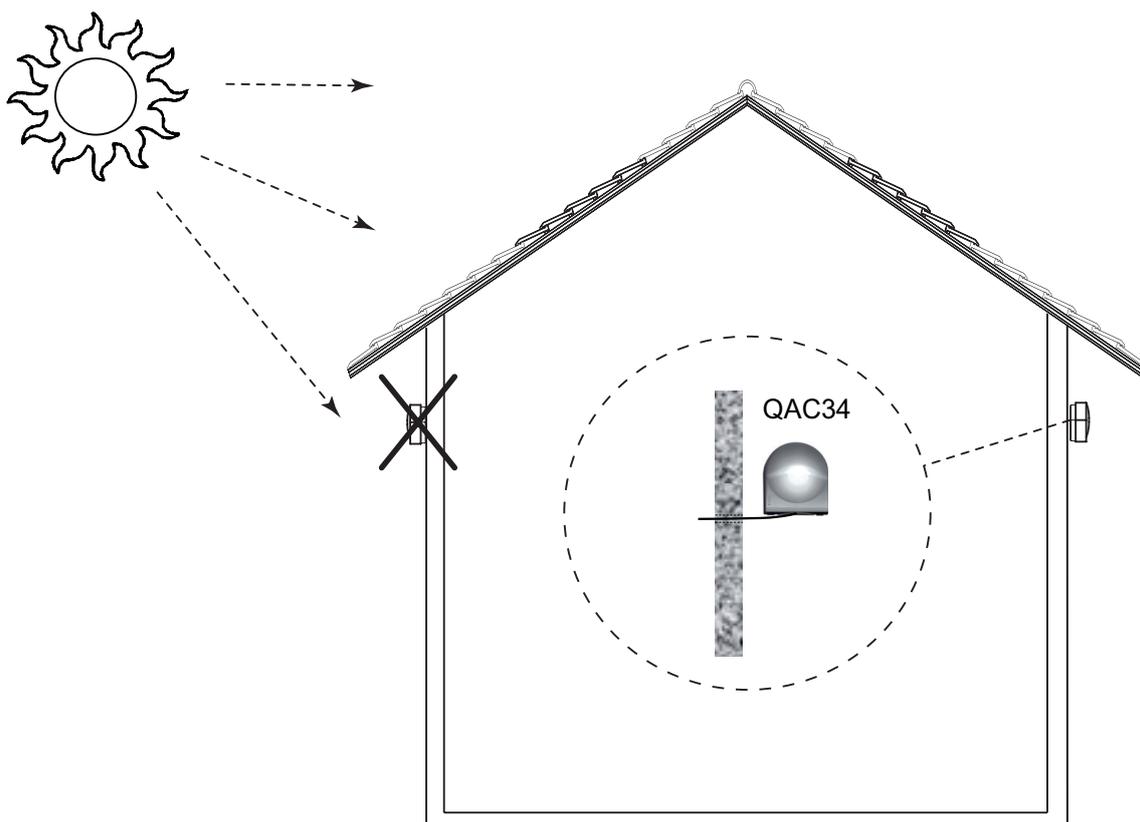
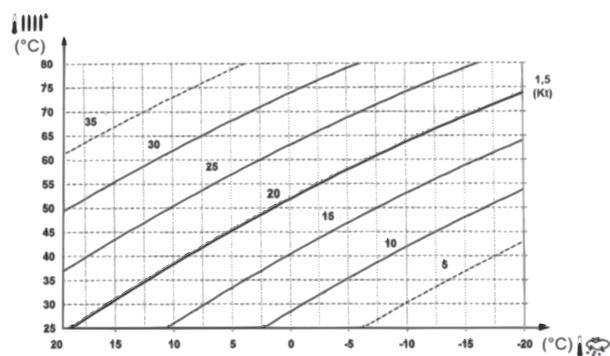
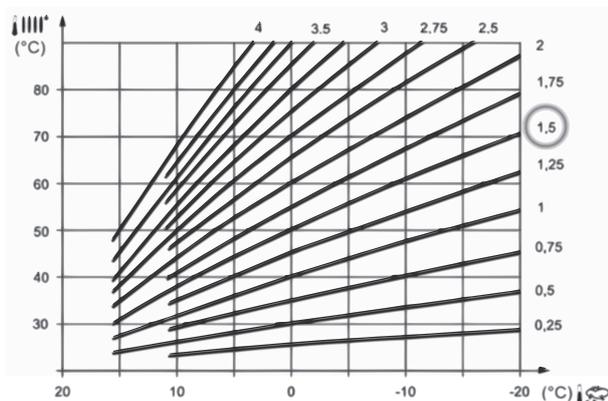
- Access the menu as described in section 14.
- Select parameter **P03**.
- Select the climate curve from among those available, see the curve chart in chap. "OUTDOOR SENSOR" (the preset curve is 1.5).

KEY TO CURVE CHART Kt - see chap. "OUTDOOR SENSOR"

	Flow temp		Outside temp
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## WEATHER COMPENSATION CURVE GRAPHS



### 9.3 WIRING OF BOILER PUMP

Connect the boiler pump to terminals 1-2 of the **M3** terminal block as described in section 3. If the pump is a modulating pump connect the **PWM** signal to the terminals 5-6 of the **M3** terminal block.

### 9.4 HEATING SYSTEM PUMP

Install the system pump downline from the hydraulic separator. Choose the pump according to the required system capacity/head characteristics (see chap. "**BOILER PUMP**").

## 9.5 DOMESTIC HOT WATER CYLINDER

The boiler can be electrically connected to an external storage tank. A diagram of the hydraulic connection of the external storage tank is shown in chap. "DIAGRAMS". Connect the storage tank pump to terminals **4-5** of the **M3** terminal block (see chap. "ELECTRICAL CONNECTION"). Install the storage boiler downline from the hydraulic separator. Use the sensor supplied as an accessory and connect it to terminals **9-10** of terminal block **M2** (see chap. "ELECTRICAL CONNECTION"). Make sure that the exchange capacity of the domestic hot water coil is appropriate for the power of the boiler.

The boiler can independently manage up to three heating circuits by using external accessories such as room units, remote controls and external modules (AVS 75). The boiler electronics also comprises a wide range of functions for personalising and managing various system types. To assure correct system operation, a number (from 1 to 3) must be assigned to each accessory in order to allow the boiler board to recognise it. Consequently, carefully read the instructions provided with the accessories.

## 9.6 MIXED ZONES (see chap. "DIAGRAMS")

A mixed zone can be managed using the **AVS75** external module, supplied as an accessory. This accessory can manage: a zone pump, a mixing valve, a temperature sensor, a limit thermostat and a room thermostat. To connect the components and adjust the system read the manual provided with the accessory.

## OUTDOOR SYSTEM MANAGEMENT MODULES

### 9.7 BOILERS IN A CASCADE CONNECTION (see chap. "DIAGRAMS")

The **AVS75** external unit, supplied as an accessory, is used to manage a heating system with up to 16 boilers connected in a cascade arrangement and a possible separate storage tank providing domestic hot water. This accessory, connected to one of the cascade boilers, can directly control the circuit components up to a maximum of 3 independent relay outlets, 2 temperature sensors, 1 high voltage limit thermostat connector and one 1 control input (e.g.: room thermostat). The system also requires an **OCI 345** interface on each boiler comprising in the cascade arrangement.

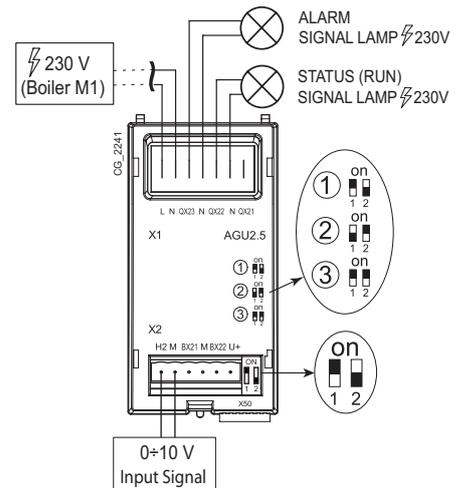


THE HYDRAULIC DIAGRAMS OF THE CASES DESCRIBED CAN BE FOUND IN CHAP. "DIAGRAMS".

### 9.8 AGU 2.550

Use the **AGU 2.550**, already installed in the boiler, to send information from the boiler as described below to a BMS panel.

ELECTRICAL CONNECTION	
<b>X1 (L-N)</b>	Power supply (230V 50Hz AC) connected to the boiler terminal block M1 (C+M)
<b>X1 (QX21)</b>	Not used
<b>X1 (QX22-N)</b>	Boiler OPERATION (light on = run)
<b>X1 (QX23-N)</b>	Boiler ALARM (light on = lockout)
<b>X2 (H2-M)</b>	INPUT Electrical Signal 0÷10 V



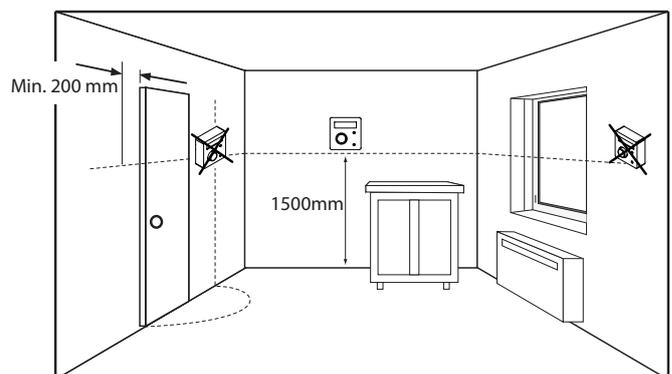
### 9.9 CONNECTING THE ROOM THERMOSTAT



The connections in terminal block M1 are in high voltage (230 V). Before making connections, make sure the appliance is disconnected from the power supply. Check the polarity: L (LIVE) - N (NEUTRAL).

To connect the Room Thermostat to the boiler, proceed as described below:

- Switch off the boiler;
- Access the terminal block **M1**;
- Remove the jumper from the ends of contacts **1-2** and connect the wires of the volt free Room Thermostat;
- Switch on the boiler and make sure the Room Thermostat works correctly.



## 10.COMMISSIONING THE BOILER

To light the boiler correctly, proceed as follows:

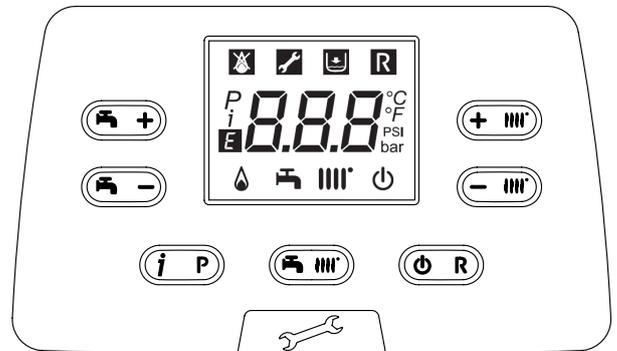
- Check that the system pressure is correct (section 6);
- Power the boiler;
- Open the gas tap;
- Select the required heating mode (section 1.2).



During initial ignition, the burner may not ignite (causing the boiler to shut down) until any air in the gas pipes is vented. In this case, repeat the ignition procedure until gas reaches the burner. To reset boiler operation, press  for at least 2 seconds.

### Key to BUTTONS

	DHW temperature adjustment (+ to increase the temperature and – to decrease it)
	Heating water temperature adjustment (+ to increase the temperature and – to decrease it)
	Boiler operating information
	Operating mode: DHW – DHW & Heating – Heating Only
	Off – Reset – Exit menu/functions



CG\_2386

### Key to SYMBOLS

	Off: heating and DHW disabled (only boiler frost protection is active)		Burner lit
	Fault preventing the burner from lighting		DHW operating mode enabled
	Boiler/system water pressure low		Heating mode enabled
	Technical Service Centre call-in		Programming menu
	Manually resettable fault (  )		Boiler information menu
	Fault in progress		Set unit of measurement (SI/US)

## 11.FILLING THE SYSTEM

The pressure displayed on the pressure gauge has to be between 1 - 1.5 bar, with the system cold. If it is lower, turn the system filling tap installed by the fitter.

**IMPORTANT:** open the tap very slowly in order to vent the air.



The boiler is fitted with a hydraulic pressure switch which prevents the boiler from working if there is no water.



If pressure drops occur frequently (monthly basis), have the system checked by the Authorised technical service agent.

## 12.SYSTEM AIR EXTRACTION FUNCTION

This function is used to facilitate the elimination of the air inside the heating circuit when the boiler is first installed or after maintenance when the water is drained from the primary circuit and re-filled.

To enable the system air extraction function press buttons   together for 6 seconds. When the function is active, **On** appears on the display for a few seconds, followed by programme row **312**.

The electronic board will activate a pump on/off cycle lasting 10 minutes. The function will automatically stop at the end of the cycle. To manually exit this function, press the above buttons together for 6 seconds once again.

# 13. GAS VALVE COMMISSIONING

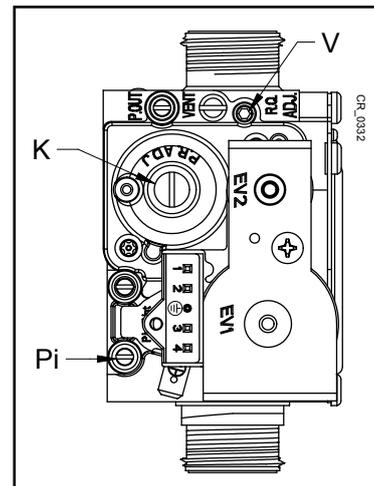
To commissioning the gas valve, enable the commissioning function as described in section 12.2 and carry out the following operations:

## 1) Commissioning MAXIMUM heat output.

Check that the **CO<sub>2</sub>** measured on the flue duct, with the boiler operating at maximum heat capacity, matches that indicated in table 2 (allowed tolerance +/- 0.5% with front cover on). If it does not, turn the adjustment screw (**V**) on the gas valve. Turn the screw clockwise to decrease the level of **CO<sub>2</sub>** and anti-clockwise to increase it (allowed tolerance +/- 0.2% with front cover removed).

## 2) Commissioning REDUCED heat output

Check that the **CO<sub>2</sub>** measured on the flue duct, with the boiler operating at minimum heat capacity, matches that indicated in table 2 (allowed tolerance +/- 0.5% with front cover on). If it does not, turn the adjustment screw (**K**) on the gas valve. Turn the screw clockwise to increase the level of **CO<sub>2</sub>** and anticlockwise to decrease it (allowed tolerance +/- 0.2% with front cover removed).



## 13.1 GAS CONVERSION

The boilers can operate both on natural gas (G20) and LPG (G31). All gas conversions must be made by the AUTHORISED TECHNICAL SERVICE CENTRE.

**!** When converting from natural gas to propane (LPG), before calibrating the gas valve as described above, replace the complete venturi assembly (**B**) as indicated in the figure. To achieve this, release the gas pipe (fixed with clips for models WH 50 - WH 60 and threaded nut G1" for model WH 70) and remove the three screws securing the flange. Afterwards, make sure there are no gas leaks. Modify the parameters (fan rpm) as indicated in table 2 following the procedure described in section 14.

**i** To simplify commissioning of the gas valve, set the "commissioning function" directly on the boiler control panel as described in section 12.2.

**i** For cascade ducts, change the parameter P60 increasing the number of fan revolutions (rpm) by 200 (see table in chapter 10.2).

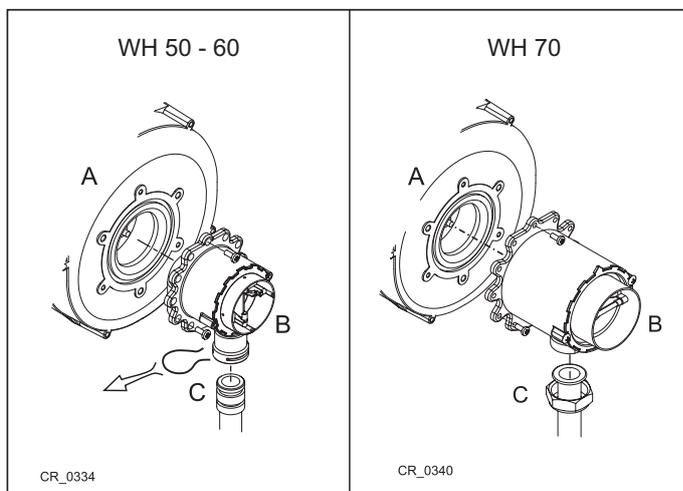


TABLE 2

Model boiler	PARAMETERS - rpm						VENTURI Ø (mm)	GAS NOZZLES Ø (mm)		CO <sub>2</sub> Min (%)		CO <sub>2</sub> Max (%)		Max. CO (ppm)
	P60 **		P30 - P61 **		P59 **			G20	G31	G20	G31	G20	G31	
	Min. power	Max. power	Min. power	Max. power	Ignition power									
	G20	G31	G20	G31	G20	G31	G20-G31	G20	G31	G20	G31	G20	G31	G20/G31
WH 50	1500	1500	6650	6400	2300	3000	24	3,7(n°2)	2,95(n°2)	*8,5	*9,5	*9,0	*10	< 250
WH 60	1420	1420	6750	6600	2000	2500	28	4,6(n°2)	3,45(n°2)	*9,0	*9,4	*9,0	*10,1	
WH 70	1270	1270	6450	6100	2100	2500	30	5,3(n°2)	4,0(n°2)	*8,5	*9,5	*9,0	*10	

\* CO<sub>2</sub> with cover closed. Without cover (chamber open) the value is less than 0.2%.

\*\* Value read on the boiler front panel display to multiply x 10 (e.g.: 150 corresponds to 1500 rpm)

## 14. SPECIAL FUNCTIONS

### 14.1 COMMISSIONING FUNCTION

To commissioning the gas valve, proceed as follows:

- Press buttons and together for at least 6 seconds. When the function is enabled, the displays shows "On" for a few seconds followed by programme row "304" alternated with the % of boiler power.
- Press and to gradually adjust power (sensitivity 1%) 100% for high fire and 0% for low fire.
- To exit press both buttons together for at least 6 seconds, as described in point one.



Press to display the instantaneous flow temperature for 15 seconds.

### 14.2 CHIMNEY SWEEP MODE

When this function is enabled, the boiler generates maximum heating power. To enable the function, proceed as follows:

- press and together for 6 seconds. The display shows "303" alternated with the power output of the boiler.
- Press and to adjust boiler power 1=minimum, 2=maximum DHW, 3=maximum heating.
- To exit press both buttons together for at least 6 seconds, as described in point one.

## 15. ADJUSTING THE CH AND DHW FLOW TEMPERATURE

Press and and and respectively to adjust the CH and DHW flow temperature (if an external storage tank is fitted). When the burner is lit, the display shows the symbol .

**HEATING:** while the boiler is operating in the heating mode, the display shows the flashing symbol and the heating delivery temperature (°C).

When connected to an Outdoor Sensor, and will indirectly adjust the room temperature (factory setting 20°C).

**DHW:** connect an external storage tank to produce domestic hot water. While the boiler is operating in the DHW mode, the display shows the flashing symbol and the heating flow temperature (°C).

## 16. OPERATING MODES

SYMBOL DISPLAYED	OPERATING MODE
	DHW
	DHW & HEATING
	HEATING ONLY

To enable the appliance in **DHW - Heating** or **Heating only** press repeatedly and choose one of the three available modes.

To disable the boiler operating modes whilst keeping the frost function enabled, press . Just the symbol appears on the display (with the boiler not blocked).

## 17. SWITCHING OFF THE BOILER

To turn off the boiler, disconnect the electric power supply using the two-pole switch. In the "Off" operating mode the boiler stays off but the electrical circuits remain powered and the frost protection function remains active.

## 18. PROLONGED SHUTDOWN / FROST PROTECTION

Do not drain the whole system as filling up with water again could cause unnecessary and harmful scale to build up inside the boiler and the heating elements. If the boiler is not used during winter and is therefore exposed to the danger of frost, add some specific anti-freeze to the water in the system (e.g.: propylene glycol coupled with corrosion and scale inhibitors). The electronic boiler management system includes a "frost protection" function for the heating system which, when delivery temperature falls below 5°C, lights the burner until a delivery temperature of 30°C is reached.



The function is operative if: the boiler is electrically powered, there is gas, system pressure is normal and the boiler is not blocked.

## ENERGY-SAVING TIPS

### Adjustment in the heating mode

Adjust the boiler flow temperature depending on the kind of system. For systems with radiators, set a maximum heating water flow temperature of approximately 60°C, and increase this value if the required room temperature is not reached. For systems with radiant floor panels, do not exceed the temperature indicated by the system designer. Use the External Sensor and/or Control Panel to automatically adjust the flow temperature to atmospheric conditions or the indoor temperature. This ensures that no more heat than that effectively necessary is produced. Adjust the room temperature without overheating the rooms. Every extra degree centigrade means consuming approximately 6% more energy. Also room ambient temperature depending on how the rooms are used. For example, the bedroom or the least used rooms can be heated to a lower temperature. Use the programmable timer and set the night-time room temperature at approximately 5°C lower than that during the day. There is no appreciable saving to be achieved by setting it any lower. Only in case of a prolonged absence, such as a holiday, should the temperature setpoint be lowered. Do not cover radiators as this prevents the air from circulating correctly. Do not leave the windows partially open to ventilate the rooms but open them completely for a short period.

### Domestic hot water

Setting the domestic hot water at the required temperature without mixing it with cold water saves a lot of money. Additional heating wastes energy and creates additional scale. Recommended minimum storage temperature of 60°C to reduce the Legionella risk.

## 19. BOILER MENU CONTENTS

Press **(iP)** to display the information indicated in the following table. Press **(oIR)** to exit.

<b>i</b>	<b>Description</b>	<b>i</b>	<b>Description</b>
<b>00</b>	SW Diagnostic Code	<b>11</b>	Zone 2 heating flow temperature
<b>01</b>	Heating flow temperature	<b>12</b>	Ion current
<b>02</b>	Outdoor temperature (if the outdoor sensor is fitted)	<b>13</b>	Burner working hours
<b>03</b>	External storage tank temperature (fitted models)	<b>14</b>	Zone 1 heating mode
<b>04</b>	DHW temperature (fitted models)	<b>15</b>	Zone 2 heating mode
<b>05</b>	Water pressure in heating system	<b>16</b>	DHW circuit operating mode
<b>06</b>	Heating return temperature	<b>17</b>	Boiler operating mode
<b>07</b>	Flue sensor temperature	<b>18</b>	Solar plant operating mode
<b>08</b>	Not used	<b>19</b>	Manufacturer information
<b>10</b>	Zone 1 heating flow temperature	<b>20</b>	Manufacturer information

## 20. PARAMETER SETTINGS

To programme the parameters of the boiler electronic board, proceed as follows:

- Press **(M-) (M+)** together and hold them down for 6 seconds until programme row "P02" appears on the display alternated with the set value (°C);
- Press **(iP)** and hold down for 6 seconds until "On" appears on the display. Release the button and "P01" appears on the display;
- Press **(M-) (M+)** to scroll the list of parameters;
- Press **(iP)**, the value of the selected parameter begins flashing, press **(M-) (M+)** to change the value;
- Press **(iP)** to confirm the value or press **(oIR)** to exit without saving.



*Further information concerning the parameters listed in the following table are supplied together with the required accessories.*

(a)	(b)	<b>ZONE 1 HEATING PARAMETERS (main zone)</b>		Factory setting	Minimum	Maximum
P01	700	*Operating mode (0=Frost Protection, 1=Timed, 3=T.comfort)	-	3	0	3
P02	712	*Reduced ambient temperature	°C	16	4	35
P03	720	**"Kt" curve slope	-	1,5	0,1	4
P04	721	**"Kt" curve drift	-	0	- 4,5	4,5
P05	726	**"Kt" curve adaptation (0=off)	-	1	0	1
P06	740	Flow temperature setpoint (minimum value)	°C	25	8	80
P07	741	Flow temperature setpoint (maximum value)	°C	80	25	80
P08	742	*Enable modulating temperature if set = "---"	°C	80	25	80
P09	750	*Room influence ("---" = disabled)	%	50	1	100
P10	834	*Opening/Closing speed of mix valve	S	180	30	873
<b>ZONE2 HEATING PARAMETERS (with accessory Expansion Unit)</b>						
P11	1000	*Operating mode (0= Frost Protection, 1=Timed, 3=T.comfort)	°C	3	0	3
P12	1010	*Comfort room temperature	°C	20	4	35
P13	1012	*Reduced room temperature	°C	16	4	35
P14	1020	**"Kt" curve slope	-	1,5	0,1	4
P15	1021	**"Kt" curve drift	-	0	- 4,5	4,5
P16	1026	**"Kt" curve adaptation (0=off)	-	1	0	1
P17	1040	Flow temperature setpoint (minimum value)	°C	25	8	80
P18	1041	Flow temperature setpoint (maximum value)	°C	80	25	80
P19	1042	*Enable modulating temperature if set = "---" (flow temp. setpoint if P63=0)	°C	80	25	80
P20	1050	*Room influence ("---" = disabled)	%	50	1	100
P21	1134	*Opening/Closing speed of mix valve	s	180	30	873
<b>DHW PARAMETERS</b>						
P22	1620	Operating mode in DHW (with Remote Control) 0=always enabled, 1=according to hourly heating programme, 2= according to hourly DHW programme.	-	0	0	2
P23	1640	Anti-legionella function Disabled 0=disabled, 1=periodic (depending on P24)	-	0	0	1
P24	1641	Periodic anti-legionella function enable (only if P23 =1) 1=daily, 2..6=intervals of 2..6 days, 7=once a week	-	7	1	7
P25	1663	Circulation temperature setpoint (additional DHW pump)	°C	45	8	80
P26	5470	Preheating time for DHW circuit (1=10' -- 144=1440')	min	0	0	144
<b>BOILER PARAMETERS</b>						
P27	2243	Minimum boiler off time	min	3	0	20
P28	2217	Frost Protection setpoint	°C	5	-20	20
P29	2250	Pump post-circulation time	min	3	0	240
P30	2441	Max. fan speed (heating)	rpm	xxx	0	8000
P31	2455	Minimum boiler off differential	°C	5	0	20
P32	2720	Not used (Do NOT change this parameter)	-	0	0	1
P33	2721	Not used (Do NOT change this parameter)	-	1	1	2
<b>SOLAR PLANT PARAMETERS (with accessory Expansion Unit)</b>						
P34	3810	Temperature - on differential	°C	8	0	40
P35	3811	Temperature - off differential	°C	4	0	40
P36	3830	Pump start function ("---" = disabled)	min	---	5	60
P37	3850	Solar panel manifold overheating protection ("---" = disabled)	°C	---	30	350
P38	5050	DHW boiler tank charging temperature max	°C	65	8	95
P39	5051	Maximum temperature of storage tank	°C	90	8	95
<b>CONFIGURATION</b>						
P40	5700	Not used (Do NOT change this parameter)	-	---	---	---
P41	5710	Zone 1 heating circuit (1=enabled)	-	1	0	1
P42	5715	Zone 2 heating circuit (1=enabled)	-	0	0	1
P43	5730	DHW sensor (1=Tank sensor, 2=Thermostat, 3=instantaneous sensor)	-	1	1	3
P44	5890	Not used (Do NOT change this parameter)	-	33	0	43
P45	5931	*BX2 sensor input (first auxiliary sensor – section 11)	-	0	0	19
P46	5932	*BX3 sensor input (second auxiliary sensor – section 11)	-	0	0	19
P47	5977	*Input H5 (multifunction input – 18=Room thermostat)	-	18	0	32
P48	6020	*Configuration of accessory Expansion Unit	-	0	0	7
P49	6024	Input EX21 module 1 (configuration of HC Safety Thermostat)	-	0	0	1
P50	6046	Input H2 module 1 (multifunction input)	-	0	0	58

P51	6097	Sensor type collector (1= NTC, 2= Pt 1000)	-	2	1	2
P52	6110	Building time constant (depending on the insulations of the building)	h	15	0	50
P53	6220	Software version	-	---	0	99
P54	6600	LPB device address (BUS connection)	-		1	16
P55	6601	LPB segment address (BUS connection)	-		0	14
P56	6640	Clock time source	-		0	3
<b>MAINTENANCE</b>						
P57	7045	Time after maintenance	month	xxx	0	240
P58	6704	View/Hide secondary fault internal code (0=no)	-	1	0	1
<b>BURNER CONTROL</b>						
P59	9512	Required ignition speed	rpm	xxx	0	8000
P60	9524	Required minimum operating speed (low speed)	rpm	xxx	0	8000
P61	9529	Required maximum operating speed (high speed)	rpm	xxx	0	8000
<b>BOILER CONTROL PANEL PARAMETERS</b>						
P62	-	Unit of measurement (1=bar, °C – 2=PSI, °F)	-	1	1	2
P63	-	Control panel operation: (1=central, 0=local)	-	1	0	1
P64	-	Software version	-	xx	0	999

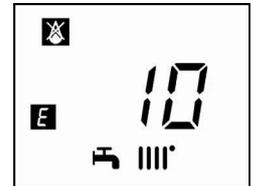
\* see "Accessories not included in supply"

xx: the value depends on the software version      xxx: the value depends on the type of boiler

(a): parameters read on the front boiler panel (fixed control panel)      (b): parameters read on the Remote Control

## 21. FAULTS

The faults shown on the display are identified with the symbol **E** and a number (fault code). For a complete list of faults, see the following table.



If **R** appears on the display the fault must be RESET by the user.

To RESET the boiler, press **⏏**. If faults are displayed frequently, call the Authorised Service Engineer.

<b>E</b>	Description of FAULT	<b>E</b>	Description of FAULT
10	External probe sensor faulty	128	No flame
20	NTC flow sensor faulty	130	Fumes NTC tripped due to overtemperature
28	NTC fumes sensor faulty	132	Ignition failure (4 attempts)
40	NTC return sensor faulty	133	Boiler board internal fault
50	NTC domestic hot water sensor faulty (only for heating-only model with storage boiler)	151	No flame
83	Communication problem between boiler board and control unit. Probable short circuit on wiring.	153	Forced reset after pressing the Reset button for over 10 seconds (see section 13)
84	Address conflict between control units	160	Fan fault
98	Accessory not detected (*)	164	NTC domestic hot water sensor faulty
109	Air in boiler circuit (temporary fault)	384	Parasite flame (internal error)
110	Safety thermostat tripped due to overtemperature. (pump probably blocked or air in heating circuit)	385	Input voltage too low
111	Safety thermostat tripped due to overtemperature.	386	Fan speed threshold not reached
117	Pressure in hydraulic circuit too high	430	No circulation safety trip (control performed via pressure sensor)
118	Pressure in hydraulic circuit too low	432	Safety thermostat tripped due to the temperature too high or earth connection missing (E110)
125	No circulation safety trip (control performed via a temperature sensor)		

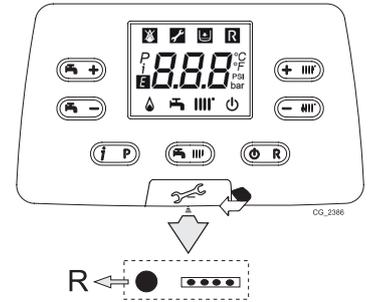
(\*) After powering the boiler (or after a fault reset), the fault code appears on the display until the system diagnostics cycle finishes. If the fault code remains it means the accessory has not been detected.



**In the event of a fault, the display backlighting indicates the error code. 5 reset attempts can be performed after which the boiler shuts down. Wait 15 minutes before attempting to reset the boiler again.**

## 22. FAULTS THAT CANNOT BE RESET BY THE USER

In case of **FAULTS** that cannot be reset by pressing  (such as E151 or exceeding 5 manual RESET attempts by the user) RESET the board by pressing the black button (**R**) located under the rubber cap (symbol ) of the front control panel (figure to side).



## 23. ADJUSTMENT AND SAFETY DEVICES

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

- **Limit thermostat**

Thanks to a sensor placed on the CH flow line, this thermostat interrupts the flow of gas to the burner if the water in the primary circuit overheats. Under such conditions the boiler is blocked and only after the fault has been eliminated can it be ignited again by pressing .



It is forbidden to disable this safety device.

- **NTC flue sensor**

This device is positioned on the fumes duct. The electronic board stops gas from flowing to the burner in case of over heating. Press  to re-establish normal operating conditions.



The above reset operation is only possible if the temperature is less than 90°C.



It is forbidden to disable this safety device

- **Flame ionisation detector**

The flame sensing electrode guarantees safety of operation in case of gas failure or incomplete ignition of the main burner. In these conditions, the boiler blocks. Press  to re-establish normal operating conditions.

- **Hydraulic pressure switch**

This device allows the main burner to be ignited only if system pressure is higher than 1 bar.

- **Pump post-circulation**

The electronically-controlled pump post-circulation function lasts 3 minutes and is enabled, in the heating mode, if the ambient thermostat causes the main burner to go out.

- **Antifreeze device**

The electronic boiler management system includes an "antifreeze" function for the heating and DHW systems which, when flow temperature falls below 5°C, operates the burner until a flow temperature of 30°C is reached. This function is enabled when the boiler is switched on, the gas supply is open and the system is correctly pressurised.

- **Pump anti-block function**

If no heat demand is received in the heating and/or DHW modes for 24 consecutive hours, the pumps will automatically start and operate for 10 seconds.

- **Hydraulic safety valve (heating circuit)**

This device is set to 4 bar and is used for the heating circuit. Connect the safety valve to a drain trap. Do not use it to drain the heating circuit.

- **Heating pump pre-circulation**

In case of a heat demand in the heating mode, the appliance can pre-circulate the pump before the burner is ignited. This pre-circulation phase last from a few seconds to a few minutes, depending on the operating temperature and installation conditions.

- **Gas pressure switch**

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

**The functions performed by the adjustment and safety devices are only operative if the boiler is switched on.**

## 24. ROUTINE MAINTENANCE INSTRUCTIONS

To keep the boiler efficient and safe, have it checked by the Authorised Service Centre at the end of every 12 months. Careful servicing ensures economical operation of the system.

## 25. ANNUAL SERVICING

The service must be performed only by qualified and competent staff in accordance with the Gas safety, Installation and use regulations. In UK this person need to be approved by the Health and Safety Executive. To optimise boiler efficiency, carry out the following at the annual service:

- 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 (system);
- Check the fan works correctly;
- Make sure the flue and air ducts are unobstructed;
- Check for any blockages inside the siphon.



Before commencing any maintenance operations, make sure the boiler is disconnected from the power supply. After servicing, reset the original operating parameters of the boiler if they were changed.

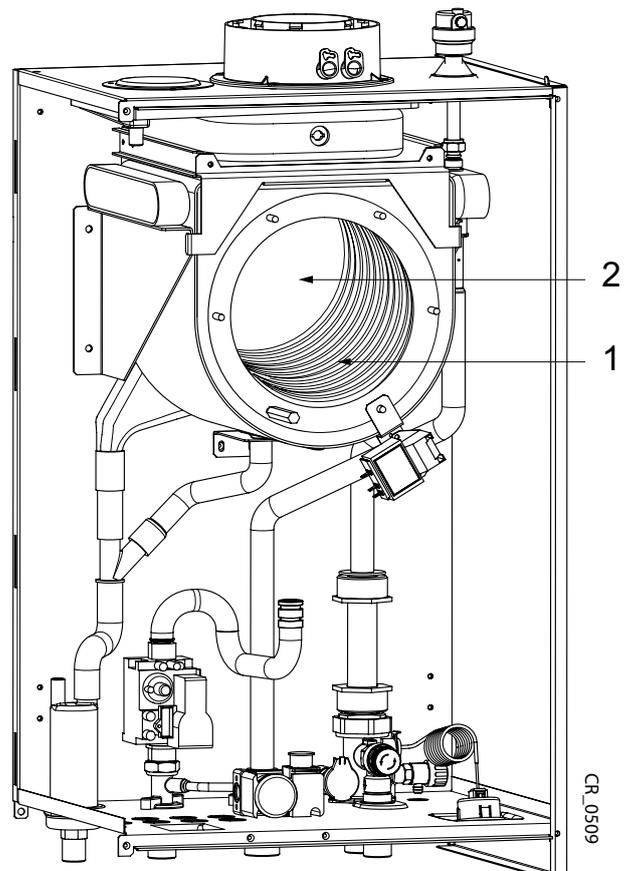
### 25.1 CLEAN THE HEAT EXCHANGER



Before starting to disassemble the heat exchanger protect the electronic box and all the electrical components against sprayed water.

Proceed as follows to dismantle the Heat Exchanger (see chap. "INSTALLING THE BOILER"):

- Isolate the unit from the electrical mains (disconnect the boiler from the main electrical supply).
- Cut off the gas supply to the boiler.
- Close the maintenance taps on the boiler.
- Remove the front cover from the boiler.
- Unscrew the screw securing the electrical box, lower it and protect it from splashing water.
- Remove the Ignition electrode and the flame detection probe.
- Remove the Assembly Fan-Mixer
- Clean the pipes (1) of the heat exchanger using regular vinegar. Flush with water. The water flows out of the heat exchanger through the water condense trap.
- Wait for approx. 20 minutes than flush away the dirt particles with a powerful water jet. Avoid pointing the water jet directly at the insulating surface (2) on the back of the heat exchanger.



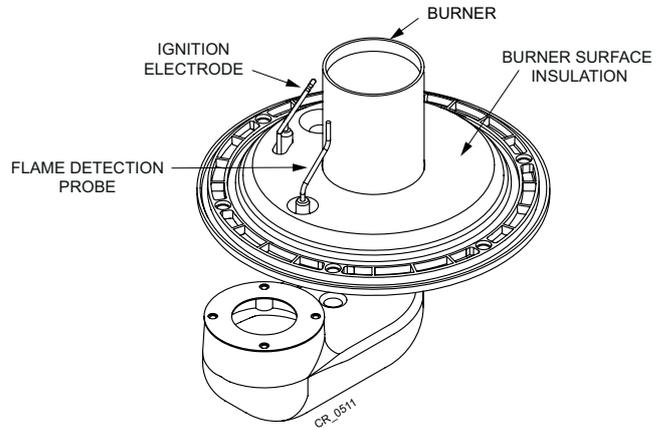
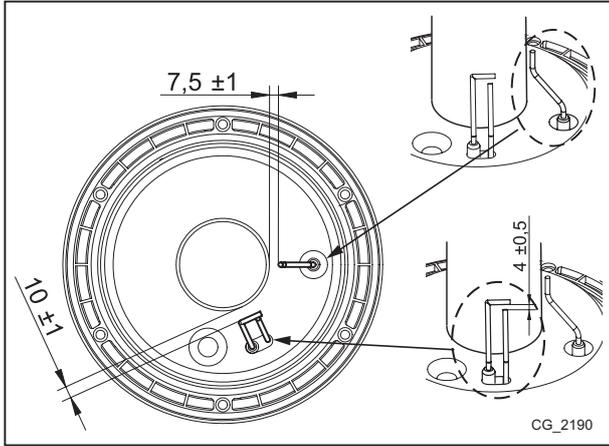
## 25.2 CHECKING THE BURNER

The burner needs no cleaning.

- Check the burner surface for damage, replace the burner if necessary.
- Check the positioning of the flame detection probe.
- Verify that the distance of the ignition electrode is within tolerance as shown in the figure.
- Check that the burner surface insulation in the burner flange it is not damaged otherwise replace it.



Connect the gas supply with a new gasket, open the gas supply and check the boiler for gas leaks using a leak testing spray.



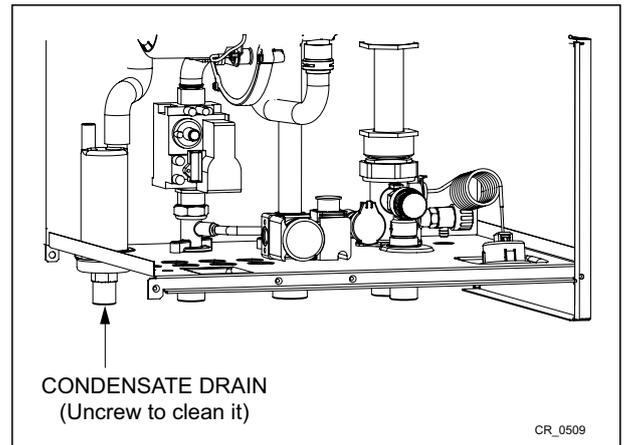
## 25.3 CLEANING THE CONDESATE TRAP

Unscrew the lower section of the water condense trap.

- Clean the bottom of the trap by flushing it out with water.
- Fill the lower section with water until about 10 mm below the upper edge.
- Fasten the lower section onto the condense trap again.



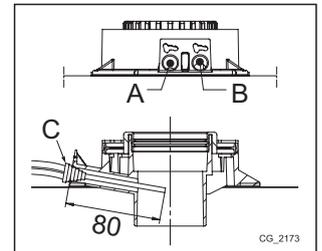
Do not operate the boiler with empty condense trap to avoid risk of poisoning through the gas combustions.



## 25.4 COMBUSTION PARAMETERS

To measure combustion efficiency and the emissions of the products of combustion, the boiler is fitted with two dedicated test points. One connection point is connected to the flue gas discharge circuit (A), and allows monitoring of the quality of the combustion products and the combustion efficiency. The other is connected to the combustion air intake circuit (B), allowing checking of any recycling of the combustion products in case of coaxial pipelines. The following parameters can be measured at the connection point on the flue gas circuit:

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

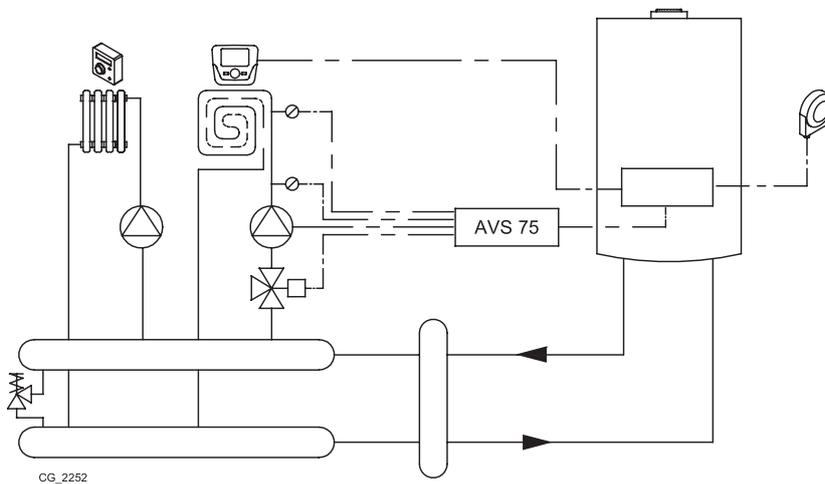
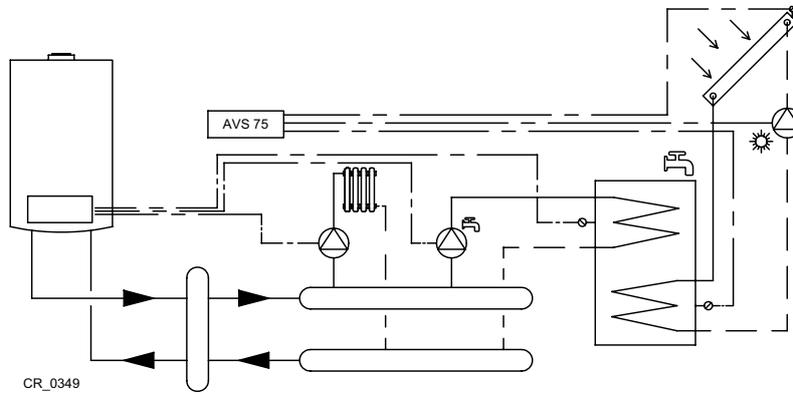
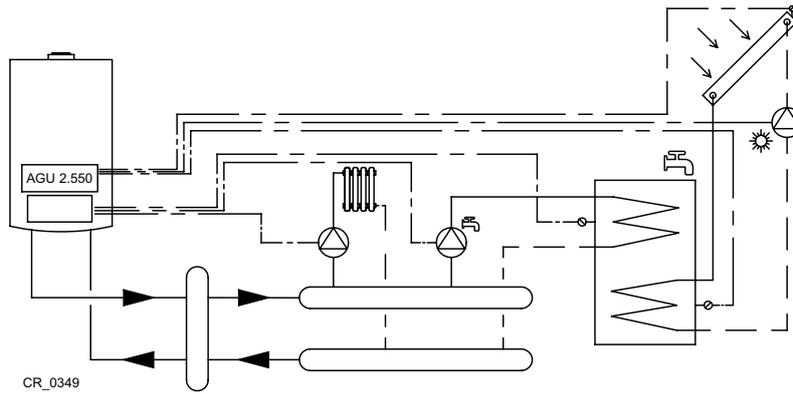
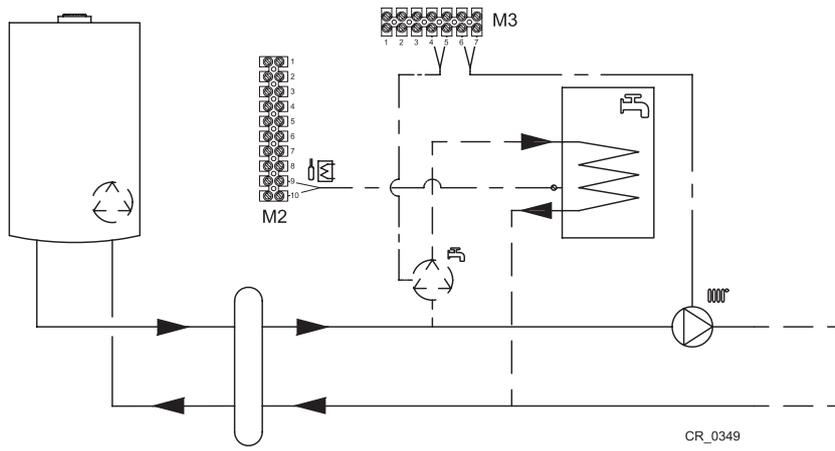


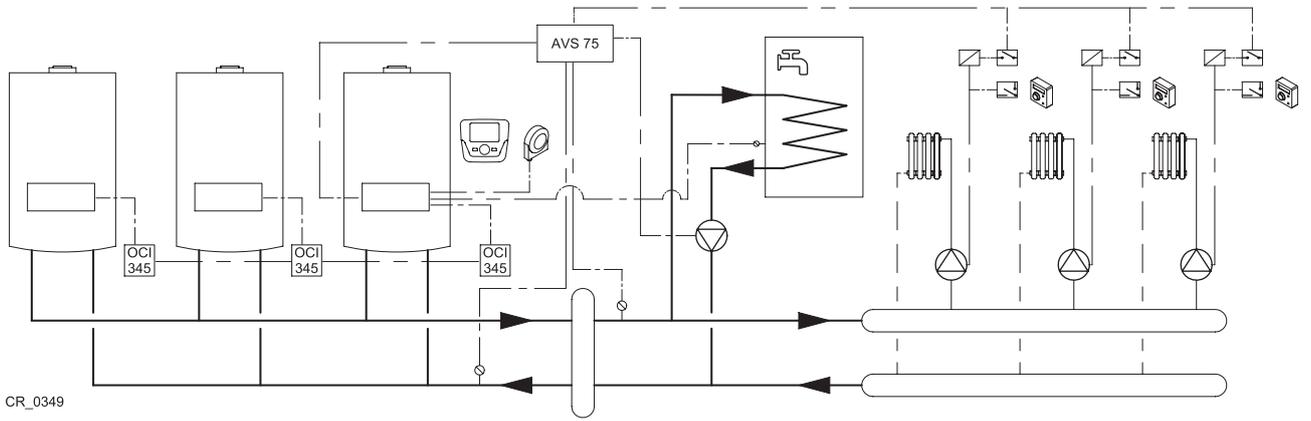
The temperature of the combustion air must be measured on the test point located on the air intake flue (B) by inserting the measurement sensor by about 80 mm (C).



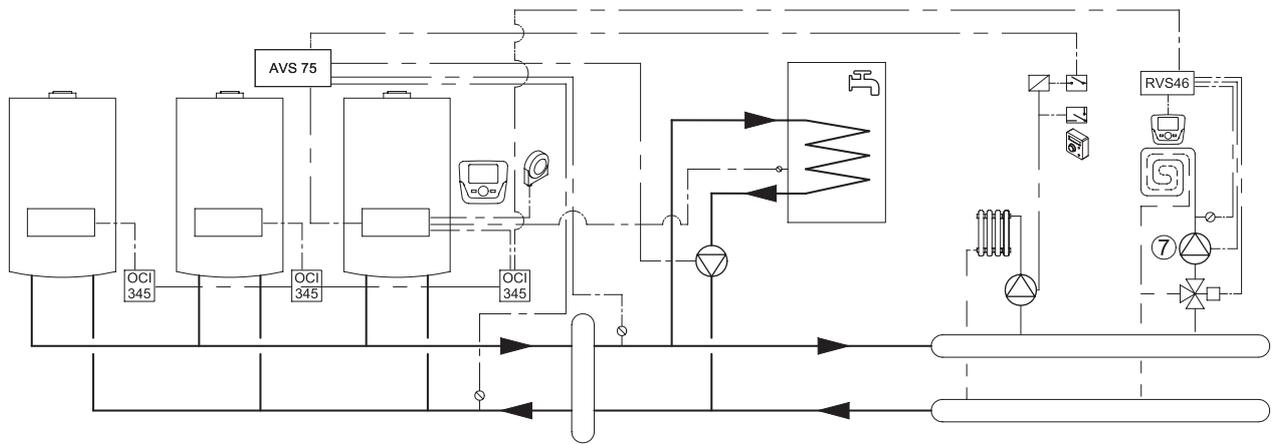
To enable the "CHIMNEY SWEEP MODE" consult section 12.3.

# 26. DIAGRAMS

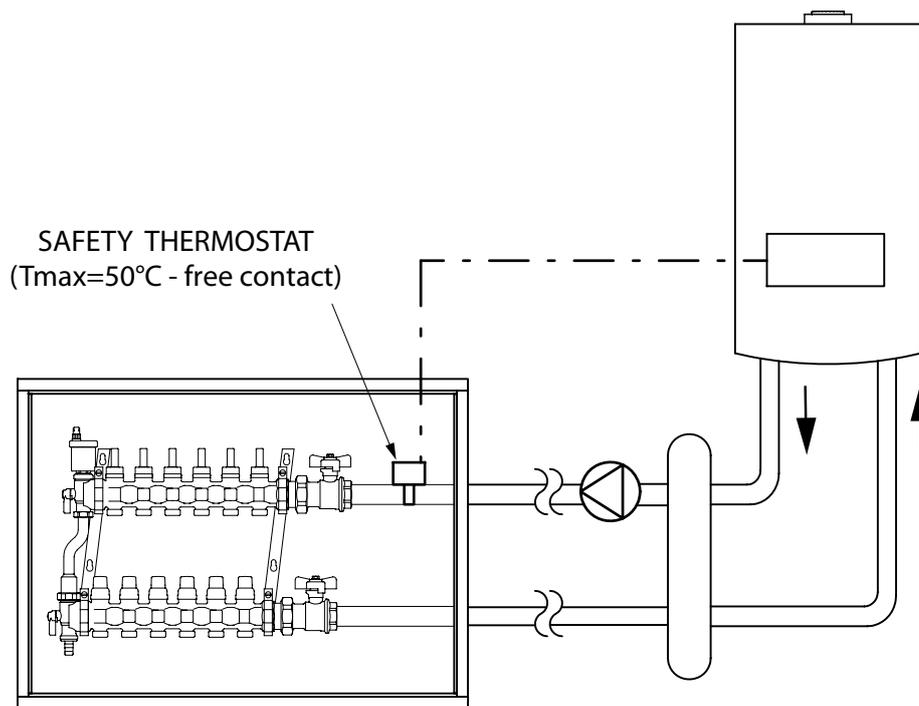




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