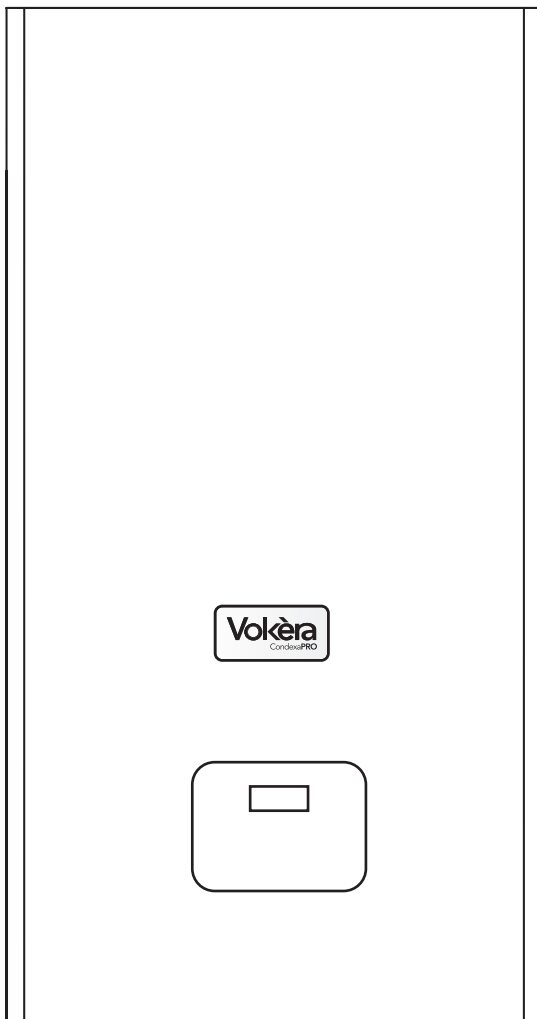


# CondexaPRO

## Light commercial boiler



### Installation & Servicing Instructions



**THESE INSTRUCTIONS  
TO BE RETAINED  
BY USER**



Vokèra is a licensed member of the Benchmark scheme which aims to improve the standards of installation and commissioning of domestic hot water systems in the UK.

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## CONFORMITY

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The **Vokera CONDEXA PRO** boilers comply with:

- Gas Appliances Directive 90/396/EEC
- Boiler Efficiency Directive 92/42/EEC
- Electromagnetic Compatibility Directive 89/336/EEC
- Low Voltage Directive 73/23/EEC.
- EN 677 standard on condensing boilers.



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## RANGE

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MODEL	FUEL	CODE
CONDEXA PRO 50 M	Natural gas - LPG	50-37685-12869-4
CONDEXA PRO 100 M	Natural gas - LPG	50-37685-12867-0
CONDEXA PRO 100 S	Natural gas - LPG	50-37685-12868-7

Dear Customer,

congratulations on your purchase of a **Vokera CONDEXA PRO** Boiler. You have chosen proven technology based on **Vokera Ltd** experience in this field and is fully compliant with current European standards. This appliance ensures maximum comfort for an extended period, with high reliability, efficiency, quality and safety.

The purpose of this manual is to provide all the information that we feel is necessary for the correct and simple installation of the boiler and must be preserved and made available as and when requested to ensure correct installation, operation and maintenance.

Full warranty cover applies providing the boiler has been correctly installed, operated and commissioned by qualified personnel. The manufacturer is not liable for any damage caused by the incorrect layout or installation of the flue system.

Vokera Ltd

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## WARRANTY

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The **Vokera CONDEXA PRO** Boiler comes with a SPECIFIC WARRANTY of 24 months (parts and labour) starting from the date of commissioning or 3 months from date of purchase whichever ever sooner providing it has been commissioned by **Vokera** or a qualified engineer and a copy of the commissioning certificate has been returned and filled with **Vokera Ltd**.

As a result, we suggest that you contact **Vokera Service Department** or a qualified engineer for commissioning of the boiler, as described in the conditions listed on the WARRANTY CERTIFICATE supplied with the boiler, which should be read with care.

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The following symbols are used in some parts of this booklet:



**CAUTION** = actions that require special care and suitable preparation












**PROHIBITED** = actions that absolutely must NOT be carried out

This booklet, code 068464EN - Rev. 0 (09/05), contains 76 pages.

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## GENERAL WARNINGS

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-  After having removed the packaging, check that the material supplied is intact and complete; if this is not the case, contact **Vokera Ltd**.
-  The **CONDEXA PRO** Boiler must be installed by qualified personnel as detailed under any current standards and law applicable and with the instructions provided by **Vokera** in the manual supplied with the appliance.
-  The boiler must be used for the purposes it has been expressly manufactured. **Vokera Ltd** declines all contractual and extra-contractual liability for damage caused to persons, animals or things, due to errors in installation, control, servicing or improper use.
-  In the event of water leaks, disconnect the boiler from the mains power supply, close the water supply and promptly notify **Vokera Ltd** or other professionally qualified personnel.
-  Periodically check that the condensate drain is free of blockages.
-  Periodically check that the operating pressure of the water circuit when cold is **1.5 bar** and less than the maximum limit specified for the appliance. If this is not the case, contact **Vokera Ltd** or other professionally qualified personnel.
-  If the boiler is not used for an extended period, the following minimum operations must be completed:
  - move the main system switch to "off"
  - close the fuel cock and the water cocks on the central heating system
  - empty the central heating system if there is the risk of frost.
-  Servicing must be performed on the boiler at least once a year.
-  This manual is an integral part of the boiler and as a consequence must be kept with care. If the manual is damaged or lost, contact **Vokera Ltd** for another copy.

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## FUNDAMENTAL SAFETY RULES

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The use of products that operate on fuel, electricity and water requires a number of fundamental safety rules to be observed, including:

-  The boiler must not be used by children or invalid persons without supervision.
-  Electrical devices or appliances, such as switches, household appliances, etc. must not be used if there is the smell of gas or unburned fuel. In this case:
  - ventilate the room by opening doors and windows;
  - close the fuel stopcock;
  - promptly contact **Vokera Ltd**, your gas supplier or other professionally qualified personnel.
-  Do not touch the boiler when barefoot or with wet parts of the body.
-  No service or cleaning operations may be performed without first having disconnected the boiler from the mains power supply, moving the main system switch to "off".
-  The safety or control devices must not be adjusted without the authorisation and written instructions from the manufacturer of the boiler.
-  The condensate drain must not be plugged.
-  Do not pull, remove or twist the electrical cables coming out of the boiler, even if the appliance is disconnected from the mains power supply.
-  The ventilation openings in the room where the appliance is installed must not be plugged or reduced in size and must comply with any current standards and law applicable.
-  Do not expose the boiler to the elements. It is not designed to operate outdoors and does not have sufficient frost protection systems.
-  Do not switch the boiler off if the outside temperature may fall below ZERO (risk of freezing).
-  Do not leave containers and flammable substances in the room where the boiler is installed.
-  The packaging material must not be dispersed in the environment or left within the reach of children as it is a potential source of hazard. It must be disposed of according to the legislation in force.

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## DESCRIPTION OF THE APPLIANCE

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The **CONDEXA PRO** Boiler is a wall-hung condensing boiler, for heating only, with a premix burner, made up of one or two heating units, depending on the model.

The **CONDEXA PRO** Boiler can be combined in a cascading configuration with other heat generators to create modular heating plants made up of boilers connected to the same water circuit and with electronic controllers communicating via bus. The heat output of each heating unit reaches 48.50 kW (100%, 50°C-30°C) and can be modulated from 30% to 100%. The efficiency reaches 108.7% and the low flue gas outlet temperature allows the use of a flame-retardant polypropylene flue (class B1), with a diameter of just 50 mm and a total equivalent height of 30 metres.

The versatility of the electronic board makes quick connection possible to all types of central heating and domestic hot water production systems with storage, managing three circuits operating with three different temperatures at the same time.

The individual heating units in cascading configuration can be activated, as well as by simple rotation, in such a way that when a certain percentage of output is reached by the first unit, the other units start automatically, all with the same load factor.

Specific accessories are available for the boiler, such as two-way valves or pumps, or devices for taking in the combustion air.

These ensure adaptability to a vast range of system configurations. Other accessories include water headers and the flue gas header for cascading installations.

The main features of the **CONDEXA PRO** Boiler are:

- premix jet burner with constant air-gas ratio
- output from 16.3 to 100 kW (models 100 M and 100 S)
- heat output up to 450 kW, by connecting up to 9 heating units in a cascading configuration, using the water-connection kit (code 5037685135029), available separately
- maximum flue gas outlet temperature 80°C
- total flue gas outlet and combustion air intake length up to 30 m, Ø 50 mm
- quick connection of the water and gas headers (optional), with outlet on the right or left
- microprocessor control with self-diagnosis, shown on LEDs and the display
- the electronic controller can manage up to 60 heating units in cascading
- frost protection function activated according to the outside temperature and/or the temperature of the boiler
- fitted for room thermostat in the high and low temperature zones
- outside probe to enable the climate control function
- post-circulation function for the central heating and DHW circuits
- priority settable on the DHW, high or low temperature circuit
- possibility to manage two circuits with fixed set point or with climate control using two separate curves
- automatic reversal of the burner ignition order
- emergency function, which in the event of faults on the Master board still allows the Slave boards to be controlled.

---

## SAFETY DEVICES

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The **CONDEXA PRO** Boiler is fitted with the following safety devices, installed on each heating unit:

**Safety thermostat** with automatic reset, activated if the outlet temperature exceeds 90°C, shutting down the burner.


**Diagnosis in the water circuit**, the minimum flow-rate of the heat exchange fluid in each heating unit is controlled by a water differential pressure switch and an electronic safety system, using an outlet probe and a return probe. The appliance goes into safety mode if there is insufficient water or circulation.


**Flue gas outlet safety device:** the flue gas probe, located at the bottom of the exchanger, sets off an alarm in the event of high flue gas temperatures (> 80°C). In addition, the float in the drain trap prevents the flue gas from passing through the condensate drain.

**Fan safety device:** a Hall-effect sensor constantly monitors the rotation speed of the fan. The **CONDEXA PRO** Boilers are designed for cascading connection, which allows the creation of compact and very flexible heating plants, due to the high degree of modulation.

 The activation of the safety devices indicates a potentially dangerous malfunction on the boiler; immediately contact **Vokera Ltd** or other professionally qualified personnel.

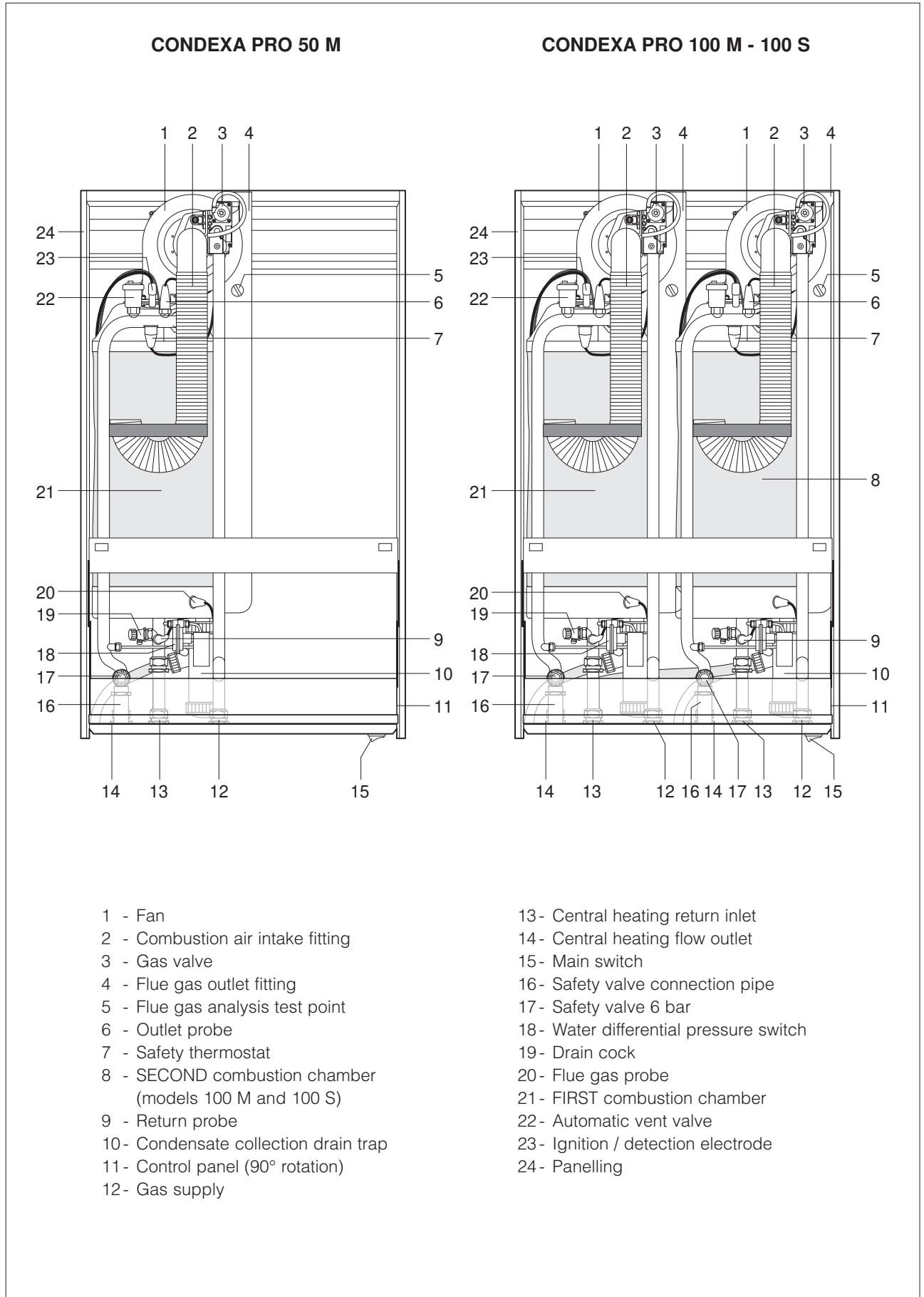
After a short wait, try restarting the boiler (see chapter on starting for the first time).

 The boiler must never be started, even temporarily, with the safety devices not working or having been tampered with.

 The safety devices must be replaced by the only using the original components supplied by the manufacturer. See the spare parts catalogue supplied with the boiler.

After having performed the repairs or replacements, check the correct operation of the boiler.





**CONDEXA PRO 50 M**

**CONDEXA PRO 100 M - 100 S**

- 1 - Fan
- 2 - Combustion air intake fitting
- 3 - Gas valve
- 4 - Flue gas outlet fitting
- 5 - Flue gas analysis test point
- 6 - Outlet probe
- 7 - Safety thermostat
- 8 - SECOND combustion chamber (models 100 M and 100 S)
- 9 - Return probe
- 10- Condensate collection drain trap
- 11- Control panel (90° rotation)
- 12- Gas supply

- 13- Central heating return inlet
- 14- Central heating flow outlet
- 15- Main switch
- 16- Safety valve connection pipe
- 17- Safety valve 6 bar
- 18- Water differential pressure switch
- 19- Drain cock
- 20- Flue gas probe
- 21- FIRST combustion chamber
- 22- Automatic vent valve
- 23- Ignition / detection electrode
- 24- Panelling

## TECHNICAL SPECIFICATIONS

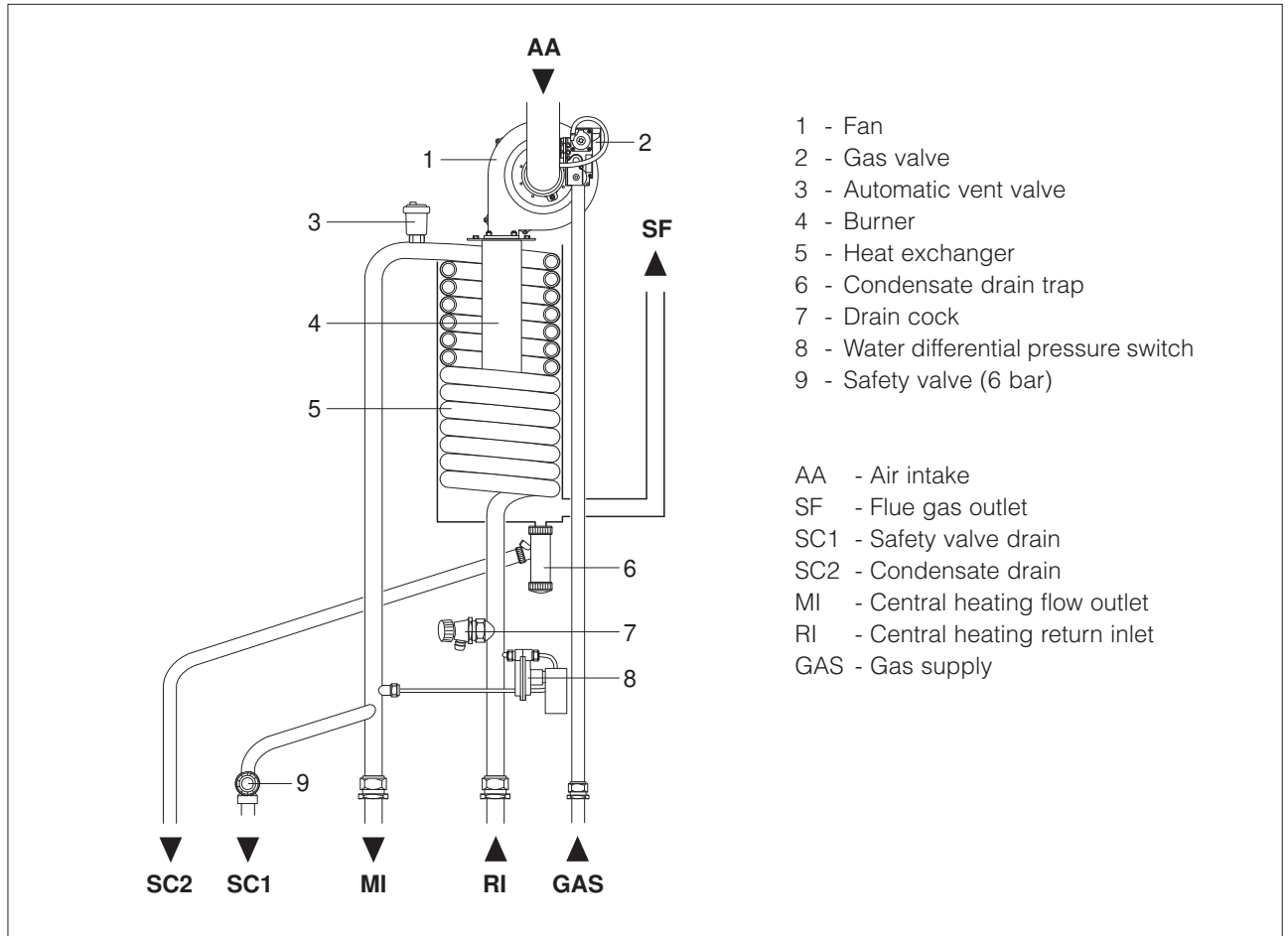
DESCRIPTION	CONDEXA PRO			
	50 M	100 M	100 S	
Fuel	G20 - G30 - G31			
Appliance category	II2H3+			
Type of appliance	B23 - C63			
Heat input ref. HHV (min - max)	16,3 - 50	16,3 - 100	16,3 - 100	kW
Heat input ref. NHV (min - max)	15 - 45	15 - 90	15 - 90	kW
Useful heat output (80°/60°C)	44,2	88,30	88,30	kW
Useful heat output (50°/30°C)	48,5	96,8	96,8	kW
Useful efficiency ref. NHV (80°C/60°C)	98,2			kW
Useful efficiency ref. NHV (50°C/30°C)	107,7			%
Useful efficiency at 30% ref. NHV (50°C/30°C)	108,7			%
Losses through the chimney with the burner operating	1,3			%
Losses through the chimney with the burner off	0,1			%
Losses through the casing (Tm=70°C )	0,5			%
Flue gas temperature	Return temp. + 5			°C
CO2 at minimum - maximum	8,4 - 9,4			%
CO without air at minimum - maximum less than	10 - 120			p.p.m.
NOx without air at minimum - maximum less than	10 - 20			p.p.m.
NOx class	5			
Maximum operating pressure, central heating	6			bar
Maximum admissible temperature	90			°C
Range of boiler water temperature settings (± 3 °C)	20-80			°C
Water content	5	10	10	l
Power supply	230~50			V~Hz
Maximum power input	169	333	333	W
Index of protection	X0D			IP
Quantity of condensate	7,2	14,4	14,4	l/h

## ACCESSORIES

The following accessories are available to be ordered separately.

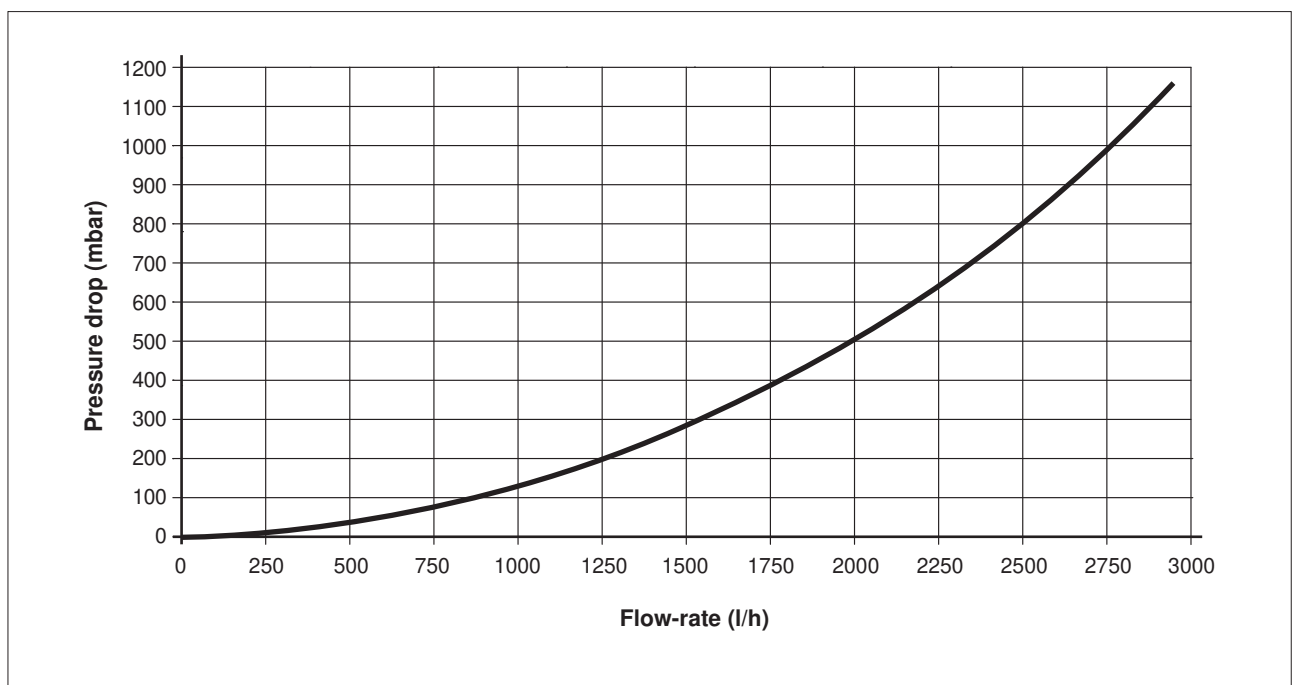
ACCESSORY	CODE
Flue gas header kit	5037685135005
Water connection kit for installations < 100 kW	5037685135012
Water connection kit for installations > 100 kW	5037685135029
Remote control kit	5037685135036
Two-way valve kit	5037685135043
Injection pump kit	5037685135050
Conversion kit for room-sealed operation <b>CONDEXA PRO 50</b>	5037685135067
Conversion kit for room-sealed operation <b>CONDEXA PRO 100</b>	5037685135074

## WATER CIRCUIT



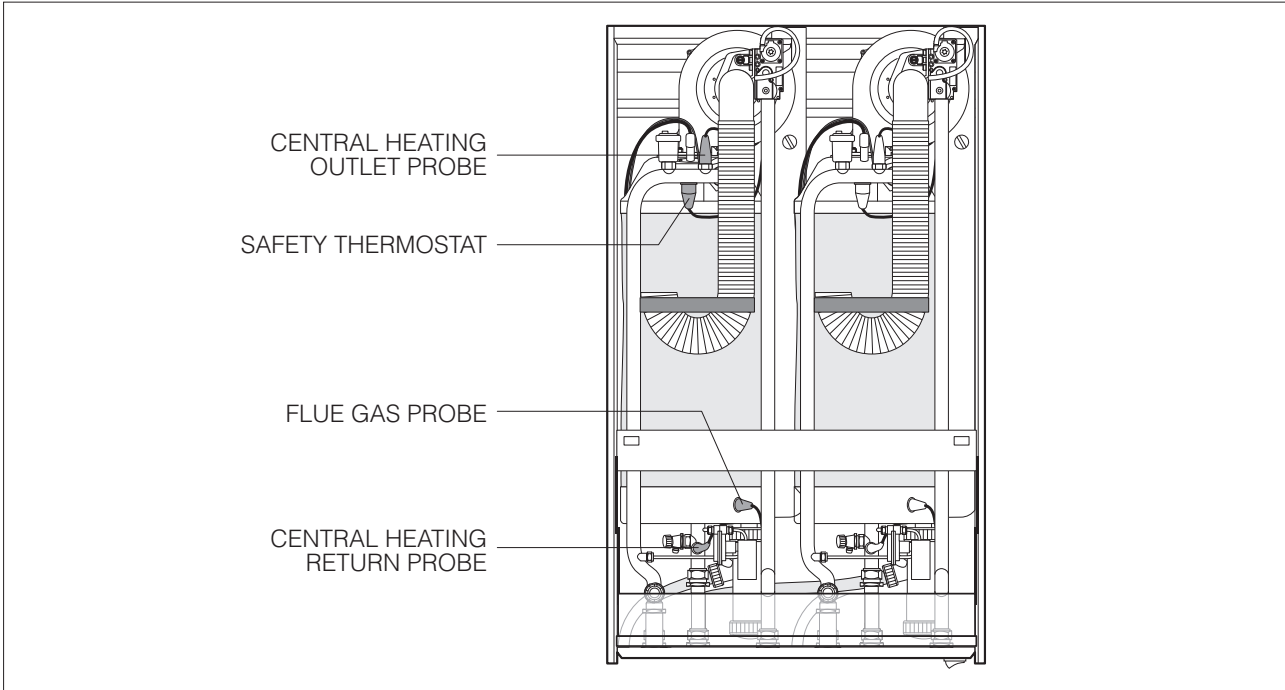
### Water-side pressure drop in the boiler

The **CONDEXA PRO** Boiler does not come with a pump, which must be installed in the system. When sizing the pump, refer to the water-side pressure drop in the boiler, as shown in the figure below.



## POSITIONING THE PROBES

The following probes/thermostats are installed for each heating unit:



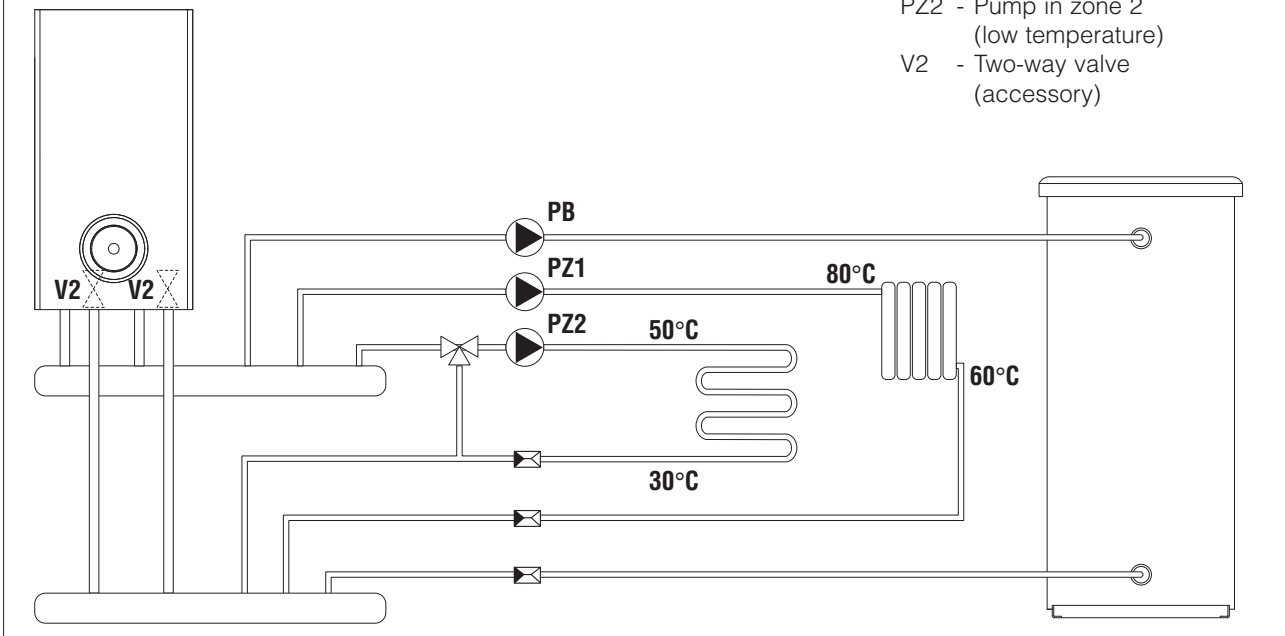
## PUMPS

**THE CONDEXA PRO** Boiler does not come with a pump, which must be installed in the system. When choosing the pump, refer to the following system diagrams.

### Configuration with distribution pumps

Boiler discharge head: 7 mWC  
 Boiler flow-rate: 2 m<sup>3</sup>/h for each heating unit.  
 Also consider the pressure drops in the individual circuit.

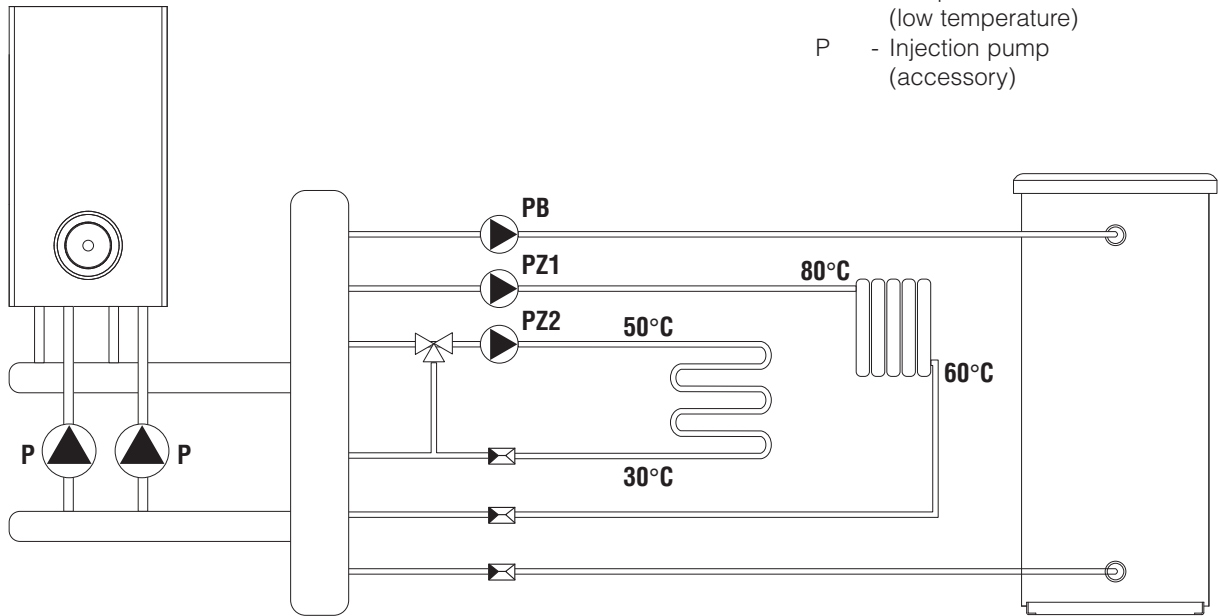
- PB - DHW pump
- PZ1 - Pump in zone 1 (high temperature)
- PZ2 - Pump in zone 2 (low temperature)
- V2 - Two-way valve (accessory)



### Configuration with injection pumps

Boiler discharge head: 6 mWC  
 Boiler flow-rate: 2 m<sup>3</sup>/h for each pump.  
 Recommended pump TYPE A for each heating unit.

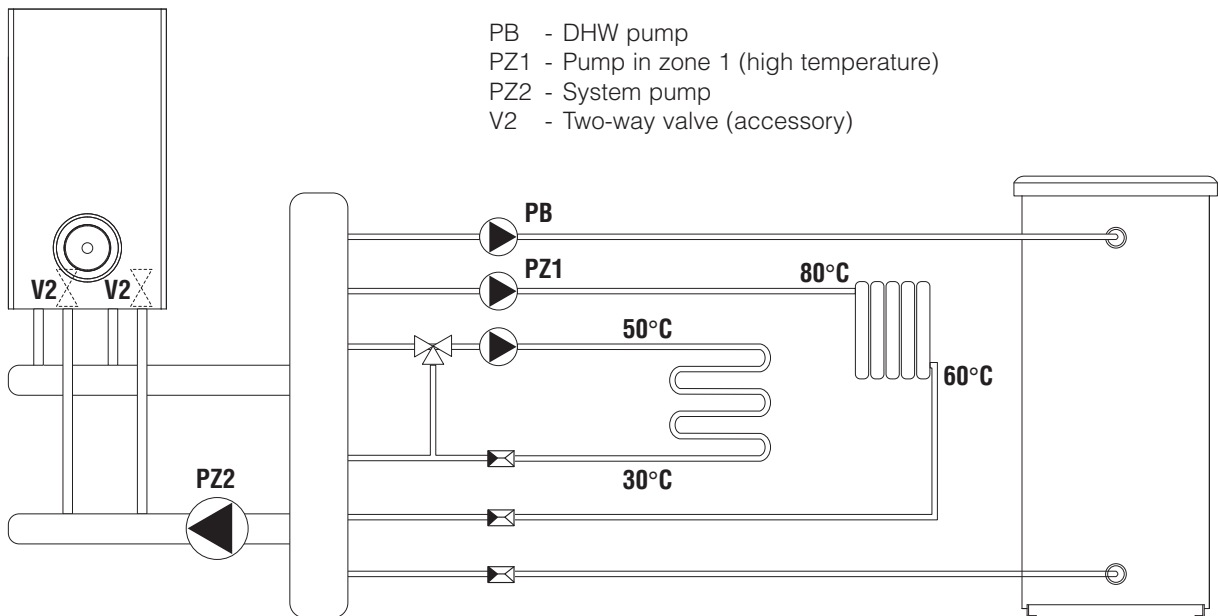
- PB - DHW pump
- PZ1 - Pump in zone 1 (high temperature)
- PZ2 - Pump in zone 2 (low temperature)
- P - Injection pump (accessory)



### Configuration with loop pump and valves on the heating units (\*)

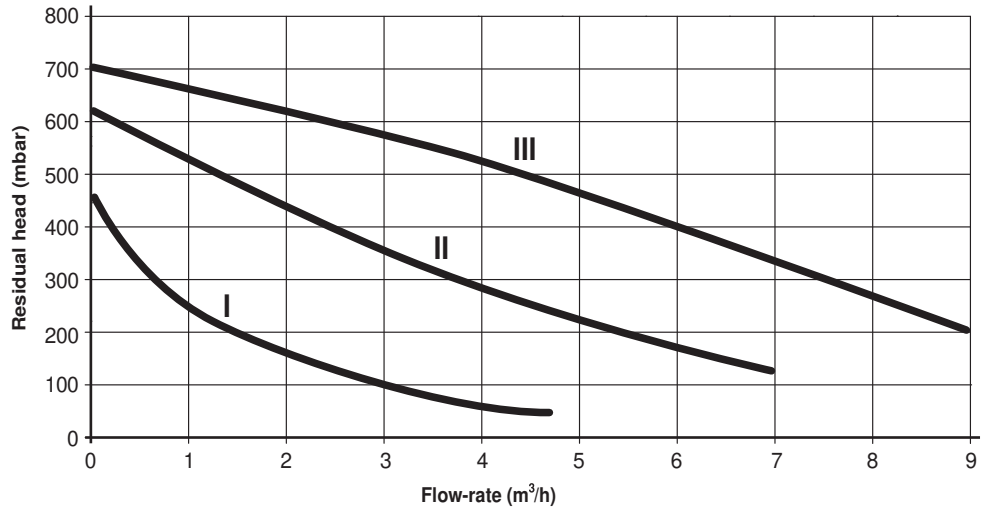
Boiler discharge head: 7 mWC.  
 Boiler flow-rate: 2 m<sup>3</sup>/h for each heating unit.  
 Recommended: **condexa pro 50 M**: TYPE A; **100M/S**: TYPE B; **100M+100S**: TYPE C.

- PB - DHW pump
- PZ1 - Pump in zone 1 (high temperature)
- PZ2 - System pump
- V2 - Two-way valve (accessory)

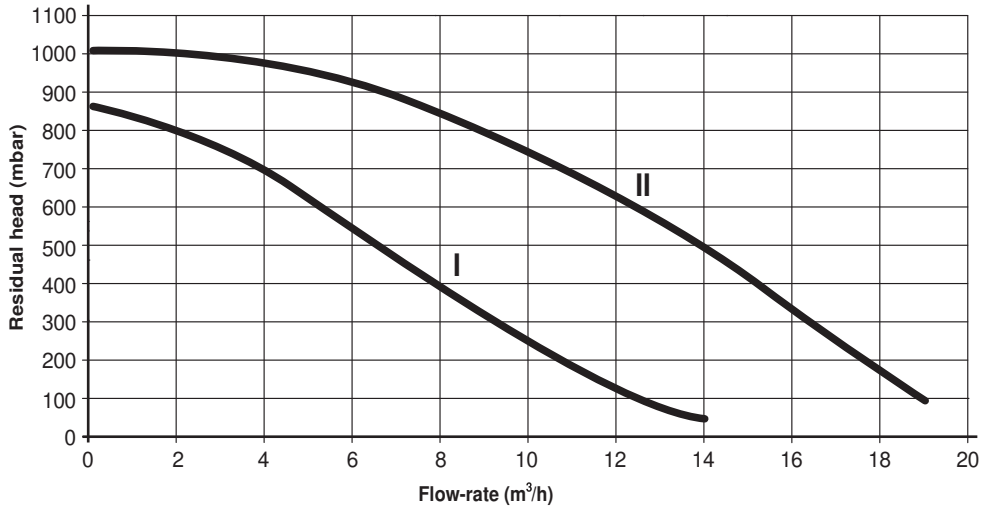


(\*) With this configuration the pump in the low temperature circuit is managed externally by a thermostat (see parameter 34 on page 59).

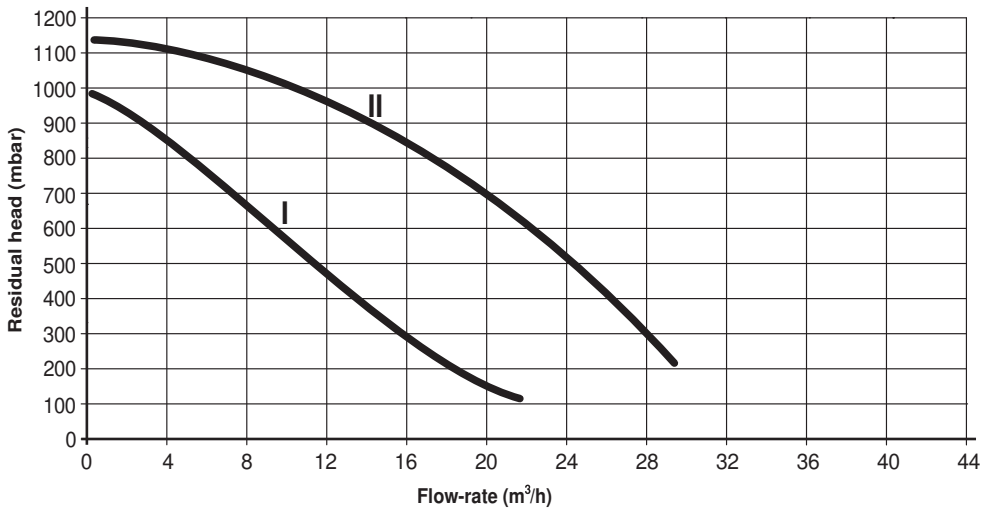
**Pump TYPE A**



**Pump TYPE B**

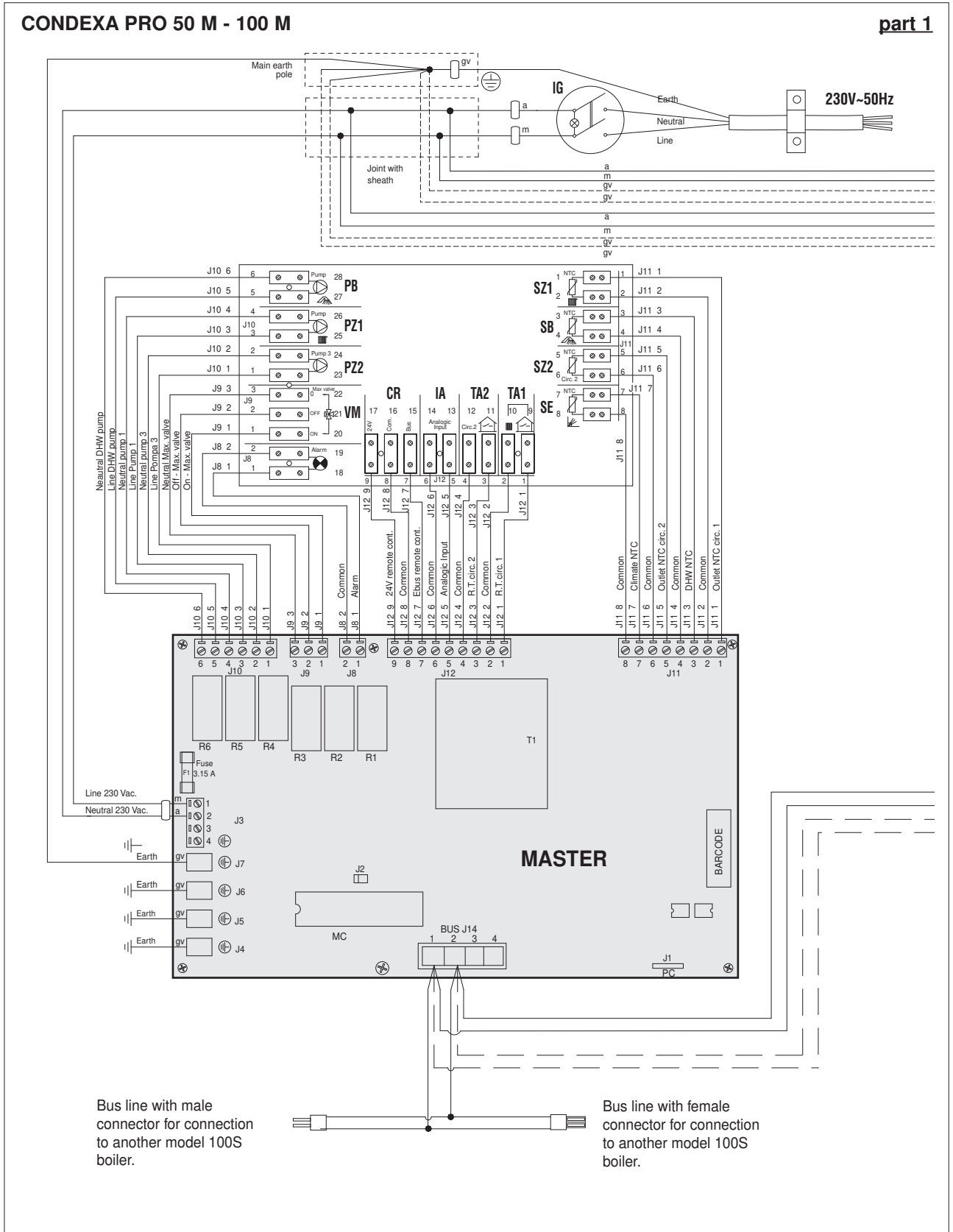



**Pump TYPE C**



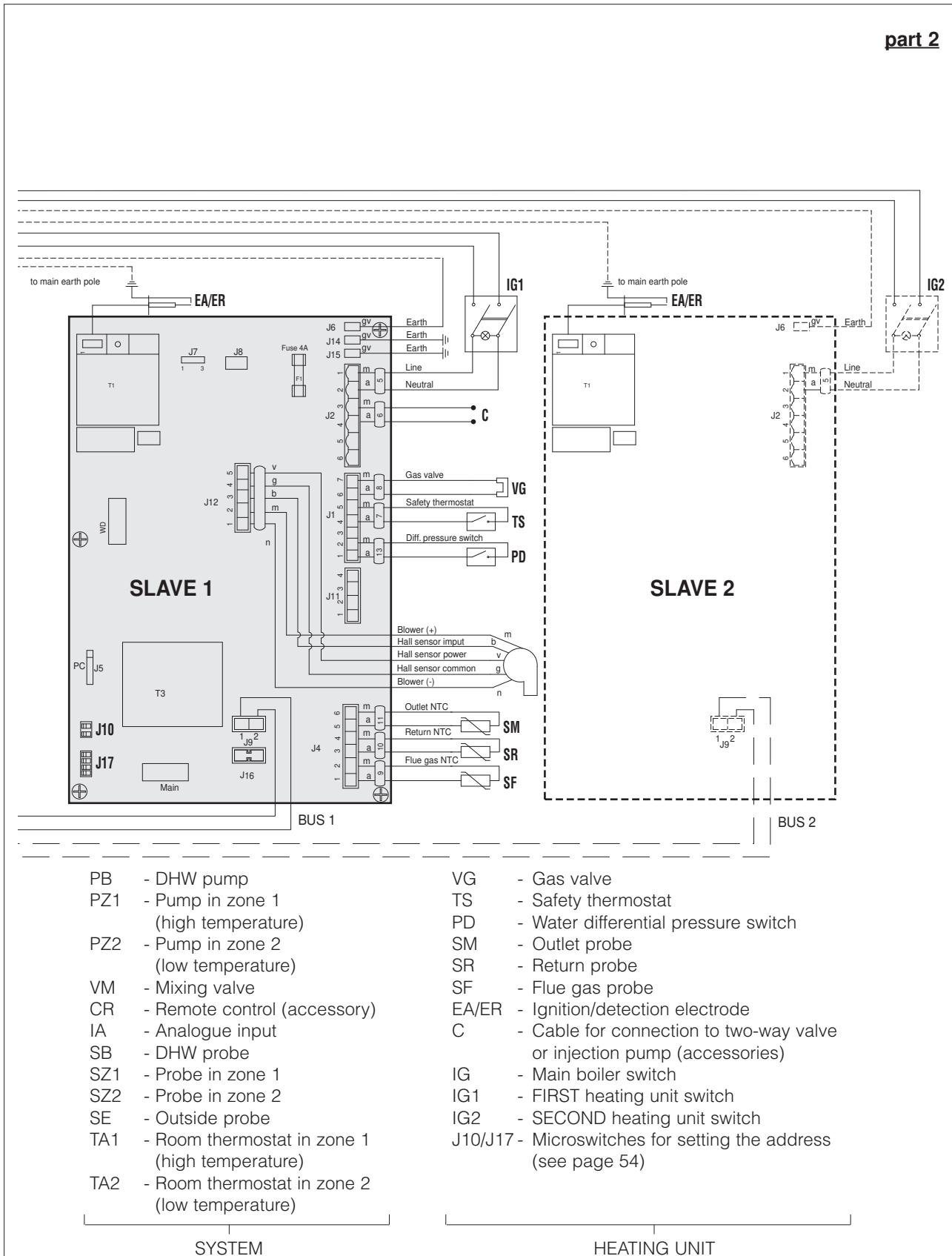
# WIRING DIAGRAMS

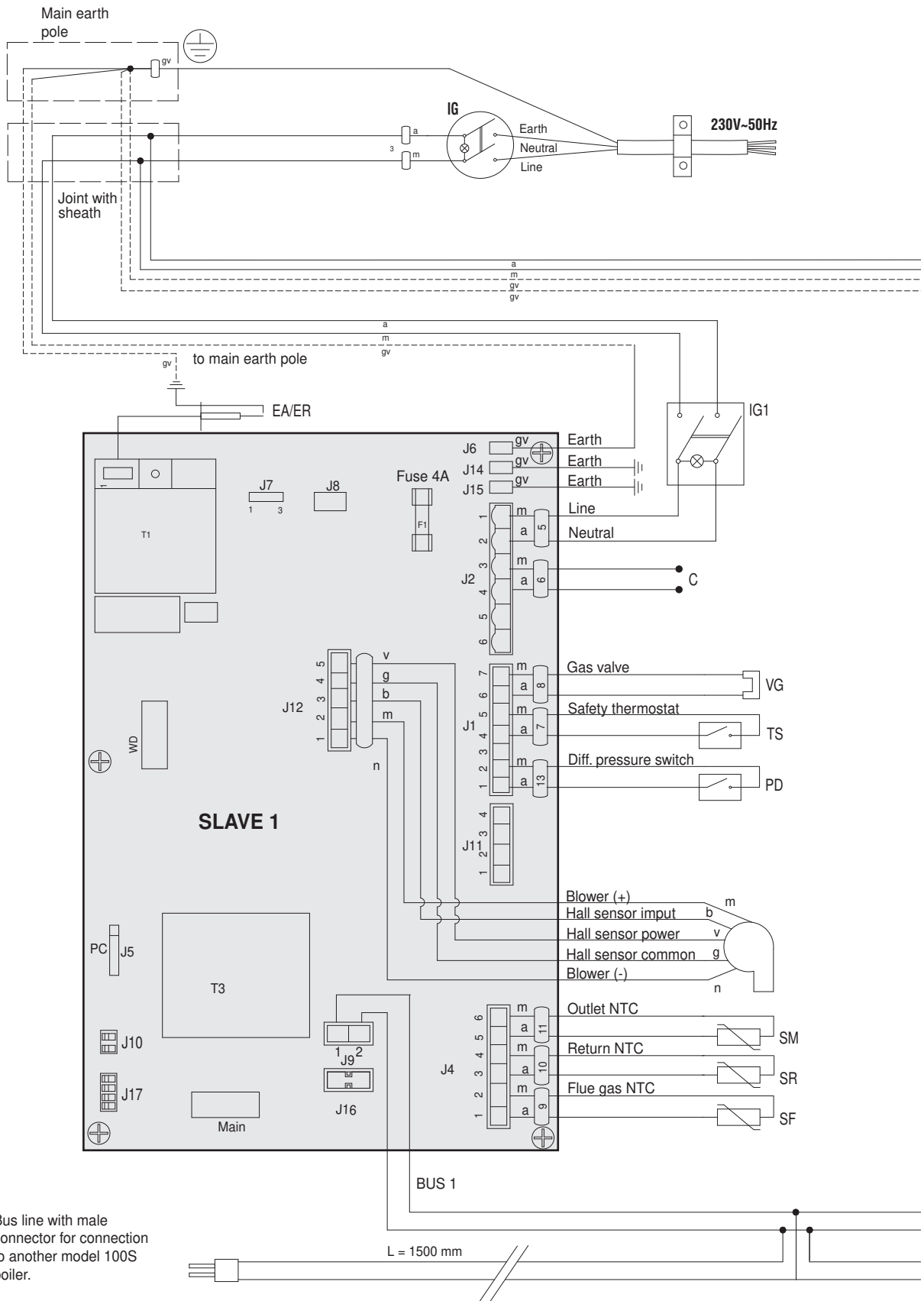
The control panel on **CONDEXA PRO** models **50 M** and **100 M** contains one master board and one or two slave boards, depending on the output of the boiler. Model **100 S** contain just two slave boards. If connecting a series of boilers in cascading, the master board on the **CONDEXA PRO 50 M** or **100 M** manages all the boards on the **CONDEXA PRO 100 S** boilers via BUS.



 The pumps should be connected by installing suitable contactors with manual emergency operation.

**part 2**

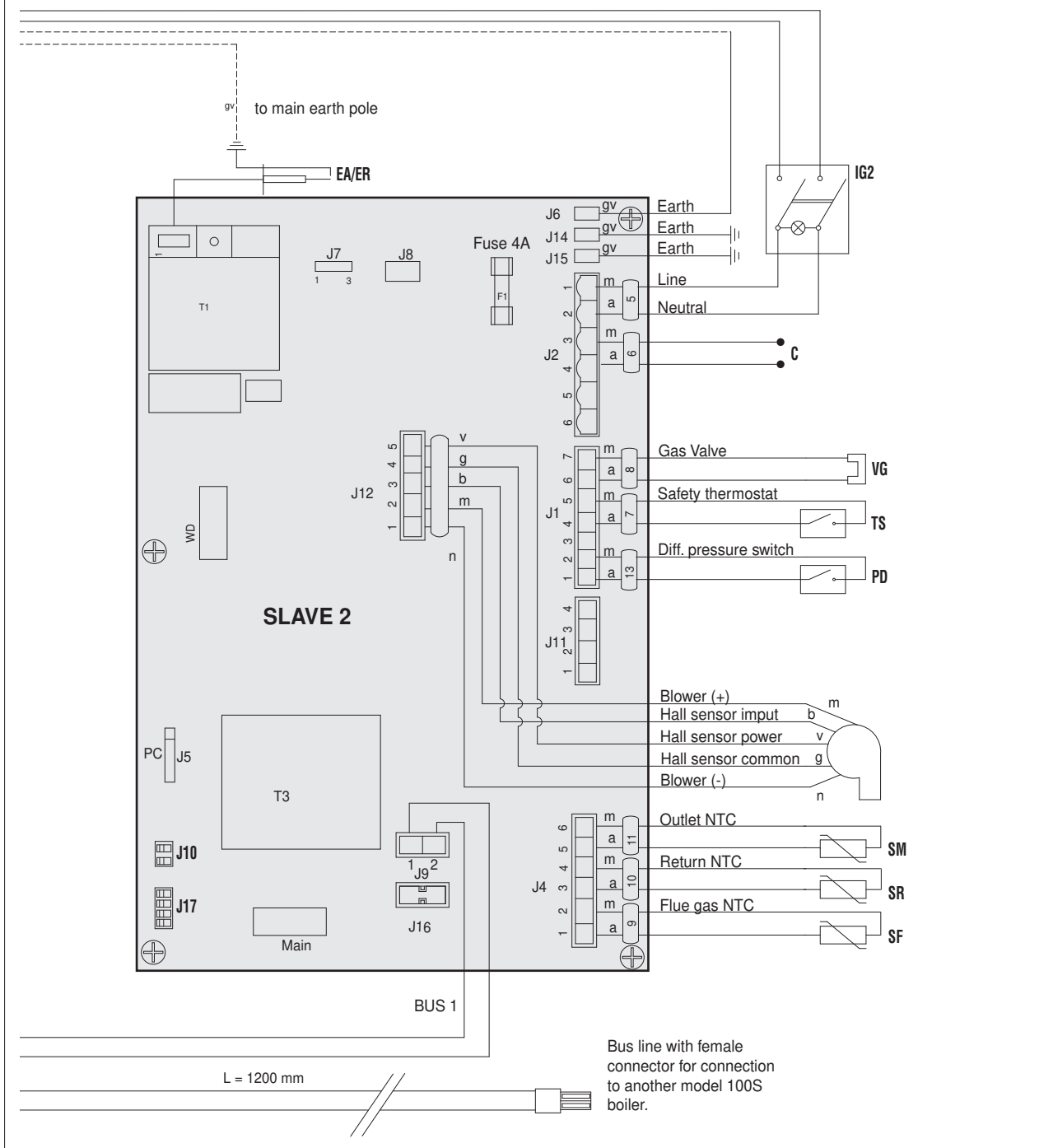




Bus line with male connector for connection to another model 100S boiler.

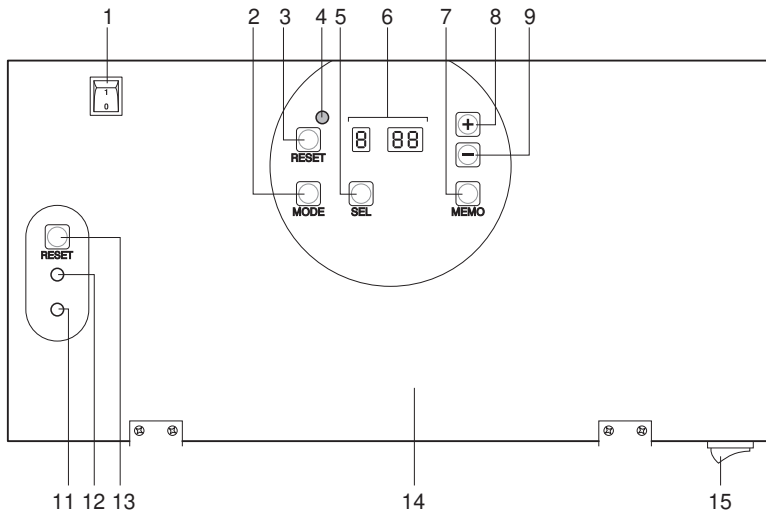
L = 1500 mm

- VG - Gas valve
- TS - Safety thermostat
- PD - Water differential pressure switch
- SM - Outlet probe
- SR - Return probe
- SF - Flue gas probe
- EA/ER - Ignition/detection electrode
- C - Cable for connection to two-way valve or injection pump (accessories)
- IG - Main boiler switch
- IG1 - FIRST heating unit switch
- IG2 - SECOND heating unit switch
- J10/J17 - Microswitches for setting the address (see page 54)

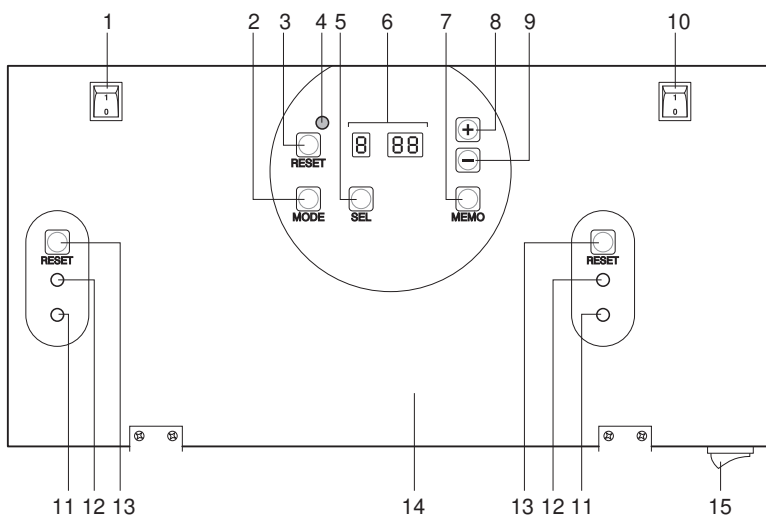


# CONTROL PANELS

## CONDEXA PRO 50 M

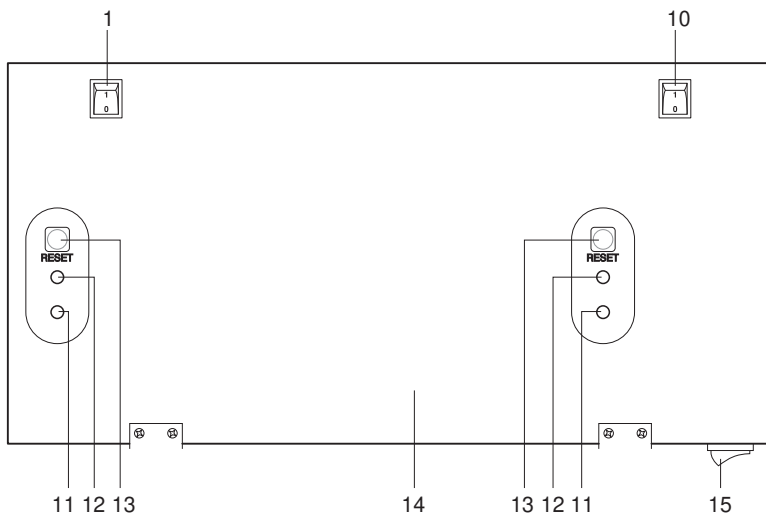


## CONDEXA PRO 100 M



- 1 - FIRST heating unit switch
- 2 - Button for selecting the operating mode
- 3 - Reset button (Master)
- 4 - Boiler lockout signal
- 5 - Button for selecting the parameters
- 6 - Display
- 7 - Save button
- 8 - Button to increase values
- 9 - Button to decrease values
- 10 - SECOND heating unit switch
- 11 - Slave power supply signal
- 12 - Slave lockout signal
- 13 - Reset button (Slave)
- 14 - Instrument panel
- 15 - Main boiler switch

## CONDEXA PRO 100 S



## Functional notes

The control panel on the **CONDEXA PRO** Boiler models **50 M** and **100 M** manages:

- The domestic hot water priority function whereby when there is demand for domestic hot water, the master board can also serve the high or low temperature circuit.
- The frost protection function, also active in standby, which starts the pump in the high temperature circuit and the loop pump if the temperature in the manifold falls below 5°C.  
If the outside probe is fitted, the pumps start if the outside temperature falls below 3°C.  
If after 10 minutes the temperature in the manifold is less than 5°C, one burner starts at maximum output, until the temperature in the manifold reaches 20°C.  
If after 10 minutes the temperature in the manifold exceeds 5°C but the outside temperature is less than 3°C, the pumps stay on until the outside temperature exceeds this value.
- The dispersion function: the pumps in the high and low temperature circuits remain on for 5 minutes after the last burner has shut down. There is a 6 minute delay from when the burner shuts down before closing the two-way valve. When the last burner has shut down, the valve closes only when there is no demand from the room thermostat.
- The cascading function: to manage the output delivered by the system, the minimum and maximum number of burners started can be selected.
- The burner on/off control function: in both cascading modes there is a function that limits the ignition and shutdown of the burners in the event of low heating requirement.

---

## USER INTERFACE

---

The buttons on the **CONDEXA PRO 50 M** and **100 M** control panel have different functions in different modes. For example, the combination of two buttons corresponds to one specific function. Alternatively, a function can be activated by pressing the button briefly or by holding it for around 5 seconds.

### RESET

This resets the electronic board after a permanent lockout.

### MODE

This is used to enter parameter setting mode and monitor mode on the individual units.

### SEL

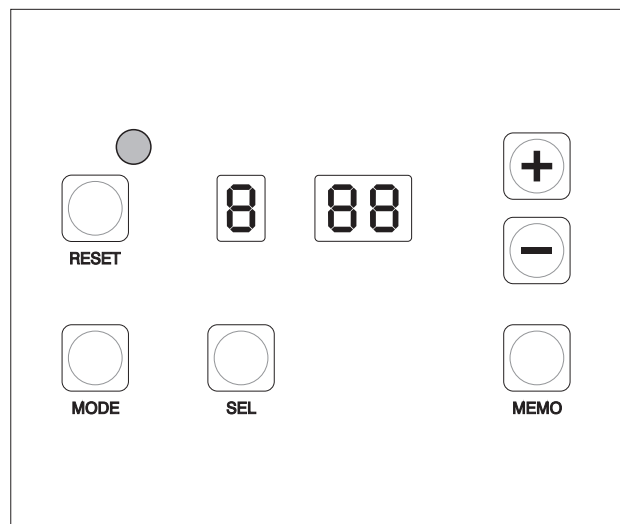
This is used to display the operating status of the various circuits managed by the Master board.

### + and -

Permettono di aumentare o diminuire un determinato valore

### MEMO

This is used to save the new values.



## DISPLAY MODE

The red LED (see ref. 4 on page 18) comes on in the event of faults that cause the permanent lockout of a heating unit (normal operation is reset only by pressing the Master or Slave reset button).

The 3 digits with seven segments display the status of the system:

Status of the system	Display
No central heating or DHW demand. The two digits on the right display the outlet temperature T1. E.g.: T1 = 30°C	
Demand from circuit no.1 or from circuits 1 and 2 together. The two digits on the right display the outlet temp. T1. E.g.: T1 = 80°C	
Demand from the DHW circuit or simultaneous operation. The two digits on the right display the outlet temp. T1 E.g.: T1 = 80°C. The decimal point after the 1st digit on the left flashes	
Demand from the 2nd circuit The two digits on the right display the outlet temperature T1. E.g. T1 = 80°C.	

## READOUT MODE

### (TEMPERATURE VALUES AND OPERATING STATUS OF THE VARIOUS CIRCUITS)

Press the "SEL" button to scroll forwards and display the values set for the individual circuits.  
The values listed below will be displayed in sequence when pressing the "SEL" button.

Value displayed	Display
1 Outlet temperature T1 in the high temperature circuit. E.g. : T1 = 80°C	
2 DHW temperature T3. E.g.: storage heater temperature = 50°C	
3 Outside temperature T4. E.g. T4 = 7°C	
4 Outlet temperature in 2nd circuit or low temperature circuit T6	
5 Room thermostat in the 1st circuit, closed or open. OFF = contact open ON = contact closed	 
6 Room thermostat in the 2nd circuit, closed or open OFF = contact open ON = contact closed	 
7 0-10V analogue input E.g. 5.5V, 10V	 

Value displayed	Display
8 Operating status of the mixing valve E.g.: closing, opening, standby	
9 Operating status of the main pump E.g.: pump not working, pump working	
10 Operating status of the DHW pump E.g.: pump not working, pump working	
11 Operating status of the secondary pump E.g.: pump not working, pump working	

To exit the display of the values, press the **"MEMO"** button.

If no operation is performed for 5 minutes, the board automatically returns to Display mode.

## **SETTING THE USER PARAMETERS**

Pressing **"SEL"** displays the following values in sequence:

- Outlet temperature T1 in the high temperature circuit



- DHW temperature T3



- Outlet temperature in the second circuit or low temperature circuit T6.



To change the corresponding set points:




- Press **"MODE"**, the corresponding value will be displayed and the two digits on the right will flash.

- If the value does not need to be changed, press **"MODE"** again to return to Display mode.

- If the value needs to be changed, press **"+"** or **"-"** until reaching the desired value. Press **"MEMO"** to save the new value. The value displayed will stop flashing and the display will return to Display mode.

Example: changing the set point in the low temperature circuit from 50°C to 40°C

Procedure	Display
1 E.g.: Value read on the display in the high temperature circuit 80°C	
2 Press <b>"SEL"</b> to access Readout mode, press the button again and scroll the first digit to 6 so as to display the set value, E.g.: 50°C	






Procedure	Display
3 Press <b>"MODE"</b>	
4 Press <b>"-"</b> to change the set point to the desired value. E.g.: 40°C.	
5 Press <b>"MEMO"</b> to save the new value	
6 After 3 seconds Display mode resumes, with the new value set.	

If after having pressed **"MODE"** no change is made for 10 seconds (because the desired value is already set), the operation of the board returns to Display mode.

If after having pressed **"+"** or **"-"** no other button is pressed for at least one minute, Display mode resumes. If this happens, the new value is not saved.

## **MONITOR MODE**

Press **"MODE"** for 5 seconds to access "Monitor" mode. This mode is used to check the operating values of each individual unit in the system (addresses from 1 to 60).

Operation	Display
1 The boiler is operating with the high temperature circuit at 80°C	
2 Press <b>"MODE"</b> for 5 seconds. The display indicates that the values and the operating status of unit 1 can be read.	
3 Press <b>"+"</b> or <b>"-"</b> to scroll and read the values for the desired unit.	
4 Pressing <b>"SEL"</b> on the display shows the 1st value for the selected unit. Pressing the <b>"SEL"</b> button again displays the following values. E.g. outlet temperature 70°C	
5 To exit Monitor mode, press <b>"MODE"</b> . If within 5 minutes no button is pressed or no operation is performed, Display mode resumes.	

Press **"SEL"** to display the subsequent values for the individual unit:

Value	Display
1 Outlet temperature E.g.: 70°C	
2 Return temperature E.g.: 50°C	
3 Flue gas temperature E.g.: 60°C	
4 Ionisation current (index from 0 to 99) E.g.: ionisation current index 44	

Value	Display
5 Fan PWM signal (%). If PWM = 100%, this corresponds to 99 on the display. E.g.: 66 %	
6 Flow switch contact open/closed (not active) E.g.: contact open	 
7 Pump or motorised valve on the individual unit on/off E.g.: Pump ON E.g.: Pump OFF	 
8 Maximum ionisation current (range from 0 to 99) at first attempt E.g.: maximum ionisation current 80	

## INSTALLER PROGRAMMING MODE

The installer parameters can be changed by entering the password (**22**).

The password for the installer level allows access to display and change the user and installer parameters.

Procedure to enter programming mode:

Procedure	Display
1 E.g.: the outlet temperature T1 is 80°C	
2 Press " <b>MODE</b> " and " <b>MEMO</b> ". After 5 seconds the second and third digit will flash.	
3 Use " <b>+</b> " and " <b>-</b> " to enter the first number in the password on the centre digit. E.g.: password = X2	
4 Press " <b>MEMO</b> " to save the second number in the password.	
5 Use " <b>+</b> " and " <b>-</b> " to enter the first number in the password on the centre digit. E.g.: password = 22	
5 Press " <b>MEMO</b> " to confirm the password, if the password is wrong the board returns to Display mode.	
6 Press " <b>+</b> " and " <b>-</b> " to scroll the parameters enabled by the password. Press " <b>MODE</b> " to start setting the parameters. The code P-XX and the corresponding value will alternate on the display.	
7 Use " <b>+</b> " and " <b>-</b> " to change the value of the parameter. Whenever a button is pressed, the alternating display of the parameter and the corresponding value is stopped for 5 seconds and only the value is shown.	
8 Press " <b>MEMO</b> " to save the new value of the parameter.	

To exit installer programming mode press "**MEMO**".




**For the complete list of parameters see page 58.**

## **TEST MODE**

In Test mode, a high temperature heating demand can be generated corresponding to maximum output and minimum output.





All the system fans must be on. If the installer switches off some of the Slaves, the others, connected to the Master, must continue operating.

To enter Test mode from Display mode, proceed as follows:

<b>Procedure</b>	<b>Display</b>
1 Press <b>"MODE"</b> and <b>"+"</b> at the same time per 5 seconds.	
After 5 seconds the maximum or minimum speed can be selected using the <b>"+"</b> and <b>"-"</b> buttons.	
All the system fans will operate at the selected speed.	
The first digit will show the selected speed:	
H = maximum speed	
L = minimum speed.	
The other two digits will show the outlet temperature. E.g.: T1 = 80°C.	
	
2 Press <b>"MEMO"</b> to exit Test mode and return to Display mode.	

## **ERROR MODE**

The display starts flashing when there is a fault on any of the heating units. Proceed as follows to identify the faults.

<b>Procedure</b>	<b>Display</b>
1 The display starts flashing to signal one or more errors.	
1.b Press <b>"+"</b> : the display will show the address of the first unit, alternating with the first error code.	
Press <b>"+"</b> again to display the other errors on this unit.	
The errors on the following unit with faults will be displayed in sequence, by pressing <b>"+"</b> Pressing <b>"-"</b> displays the errors in reverse order (E.g. unit 2 error code E02). If the errors come from the Master board, these are displayed as errors on unit 00 (U 00 + error code).	
	
2 Press <b>"MODE"</b> to exit Error mode and return to Display mode.	

**For the complete list of errors, see page 56.**

## **PERMANENT LOCKOUT**

In the event where the burners are in permanent lockout, press **"RESET"** to resume operation.

If **"RESET"** is pressed in readout mode, all the Slave heating units will be reset.

If **"RESET"** is pressed when displaying the error that caused the permanent lockout, only the heating unit in question will be reset.

---


## RECEIVING THE PRODUCT

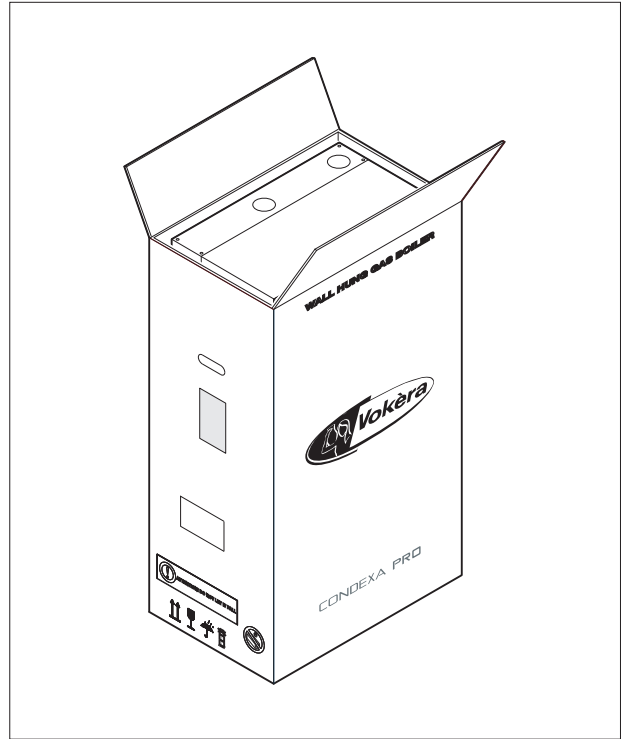
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The **Vokera CONDEXA PRO** Boiler is supplied in a single package protected by a cardboard box.

The following material is supplied with the boiler:

- Installation and operation manual
- Warranty certificate
- Water pressure test certificate
- Spare parts catalogue
- Outside probe
- Kit for conversion from natural gas to LPG
- Assembly template.

 The Installation and operation manual is an integral part of the appliance and must be read and kept with care.

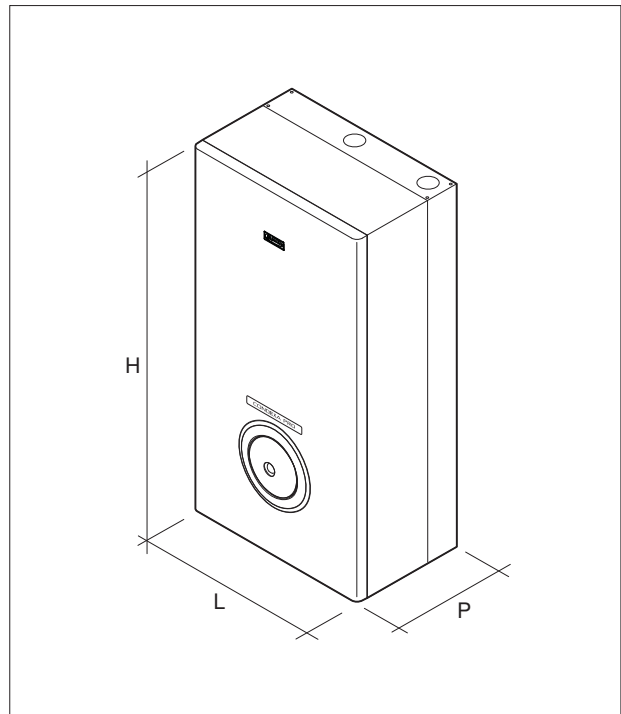


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## DIMENSIONS AND WEIGHT

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Description	50 M	100 M - 100 S	
W	600		mm
D	380		mm
H	1000		mm
Net weight	~ 60	~ 90	kg
Weight with packaging	~ 65	~ 95	kg



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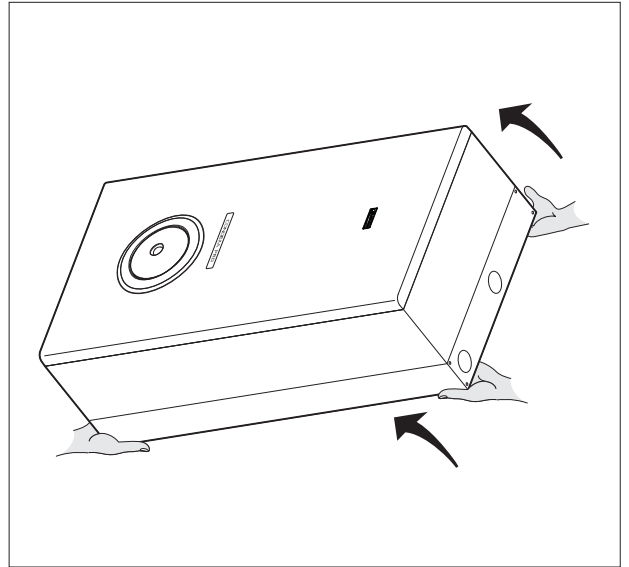
## HANDLING

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Once having removed the packaging, the **Vokera CONDEXA PRO** Boiler is handled manually by tilting and lifting it, grabbing the points shown in the figure.

⚠️ Adopt suitable safety and protection measures.

⊘ The packaging material must not be dispersed in the environment or left within the reach of children as it is a potential source of hazard. It must be disposed of according to the legislation in force.



---

## ROOM WHERE THE BOILER IS INSTALLED

---

The **Vokera CONDEXA PRO** boiler must be installed in rooms used exclusively for this purpose, provided with adequately sized ventilation openings, in compliance with any current standards and low applicable. If the combustion air is taken from outside (accessories code 5037685135067 and 5037685135074) the room where the boiler is installed, **CONDEXA PRO** operates as a room-sealed appliance (type C).

⚠️ Provide enough clearance to access the safety and control devices and to carry out the servicing operations.

⚠️ Check that the index of protection of the boiler is suitable for the characteristics of the room where the appliance is installed.

⚠️ If the boilers operate on gas fuel with a higher specific weight than air, the electrical parts must be located at least 500 mm from the floor.

⊘ The boilers cannot be installed outside as they are not designed for outdoor operation.


---


## INSTALLATION IN OLD SYSTEMS OR SYSTEMS TO BE UPGRADED

---

Where **Vokera CONDEXA PRO** Boilers are installed in old systems or systems to be upgraded, check that:

- The flue is suitable for the temperature of the products of combustion with condensing operation, calculated and manufactured according to the standards, as straight as possible, airtight, insulated and not blocked or choked. It must also be fitted with suitable condensate collection and drain systems
- The electrical system has been installed in compliance with the relevant standards by qualified personnel
- The fuel supply line and any cylinders or tanks (LPG) are made and installed according to the relevant standards
- The expansion vessel can completely absorb the expansion of the fluid contained in the system
- The flow-rate and the discharge head of the pump are suitable for the characteristics of the system
- The system is flushed, treated, vented and pressure tested. To clean the system, see the paragraph on "Water connections", page 28. The manufacturer is not liable for any damage caused by the incorrect flushing, treatment and venting etc of the system.
- The condensate drain system (drain trap) is connected and runs into the sewerage drain or a neutraliser, where required by the legislation in force.
- A treatment system is available for special supply/top-up water requirements (for the reference values, see the table).

 The manufacturer is not liable for any damage caused by the incorrect layout or installation of the flue system which must be in accordance with any current standards and law applicable

 The flues for condensing boilers are made from special material and differ from those used for standard boilers.

SUPPLY WATER VALUES	
pH	6-8
Conductivity	less than 200 mV/cm (25°C)
Chloride ions	less than 50 ppm
Sulphuric acid ions	less than 50 ppm
Total iron	less than 0,3 ppm
Alkalinity M	less than 50 ppm
Total hardness	less than 35°F
Sulphur ions	none
Ammonia ions	none
Silica ions	less than 30 ppm

## INSTALLING THE BOILER

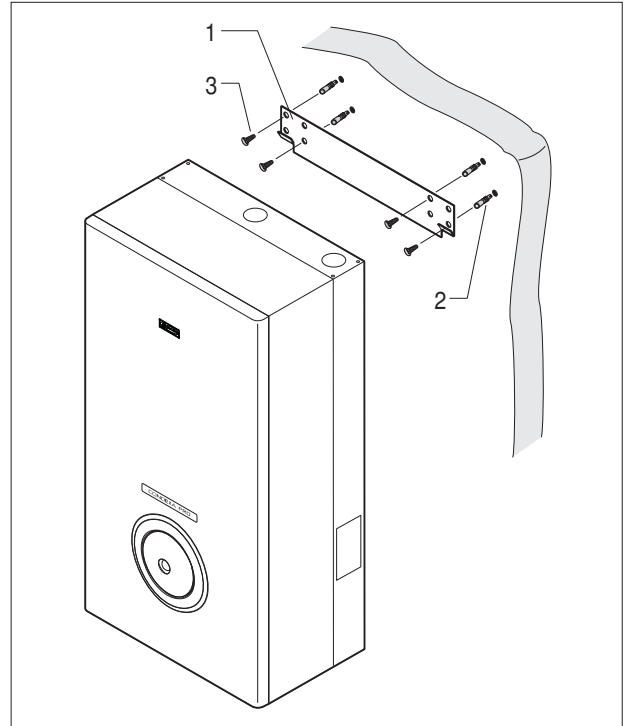
The **Vokera CONDEXA PRO** Boiler must be secured to a solid brick wall using the bracket (1).

For installation:

- Position the bracket (1) on the wall at a height of around 200 cm from the ground, using a spirit level to make sure that the holes are perfectly horizontal
- Mark the fastening holes on the wall
- Drill the holes and insert the expansion plugs (2)
- Fasten the bracket to the wall using the screws (3)
- Hook the boiler to the bracket.

⚠ The height of the boiler should be chosen so as to simplify the dismantling and servicing operations.

⚠ The **Vokera CONDEXA PRO** Boiler is not designed for outdoor installation.



## WATER CONNECTIONS

The **Vokera CONDEXA PRO** Boilers are designed and built to be installed in central heating and domestic hot water systems. The characteristics of the water fittings are as follows:

- MI - Central heating flow outlet 1" M
- RI - Central heating return inlet 1" M
- Gas - Gas supply 3/4" M

### CONDENSATE COLLECTION

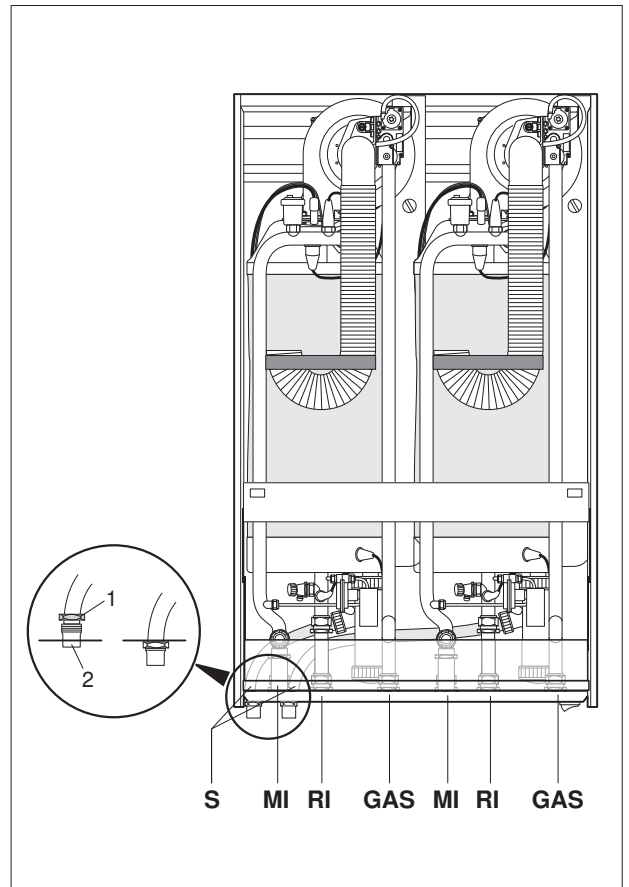
Identify the condensate drain (S) located at the bottom of the boiler and then:

- remove the ring nut/nuts (1)
- pass the hose (2) through the hole and replace the ring nut on the outside.

Pipe the condensate into the sewerage drain or a neutraliser, where required and in accordance with any legislation in force.

⚠ The manufacturer is not liable for any damage caused by the failure to install the condensate drain pipe.

⚠ The condensate drain pipe must be watertight.




## CLEANING THE SYSTEM

This preliminary operation is required when installing the heat generator in pre-existing systems, and is also recommended in new systems, so as to remove any scale, impurities, processing residues etc. Power Flushing is recommended for system cleaning.

To clean the system, if the old heat generator is still installed in the system, proceed as follows:

- Add scale-remover into the system water circuit;
- Operate the system with the heat generator on for around 7 days;
- Empty the dirty water from the system and flush with clean water. Repeat the operation until the system is clean.

 For additional information on the type and the use of the additives, contact **Vokera Ltd** or a suitable additives manufacture.

### Water connection kits

To assist the construction of the water circuit, two accessory kits are available, featuring water headers and support brackets:

#### water connection kit for installations up to 100 kW (code 5037685135012)


- 1 gas manifold, diameter 45 mm
- 1 central heating outlet manifold, diameter 45 mm
- 1 central heating return manifold, diameter 45 mm


2" female fittings.

#### water connection kit for installations above 100 kW (code 5037685135029).

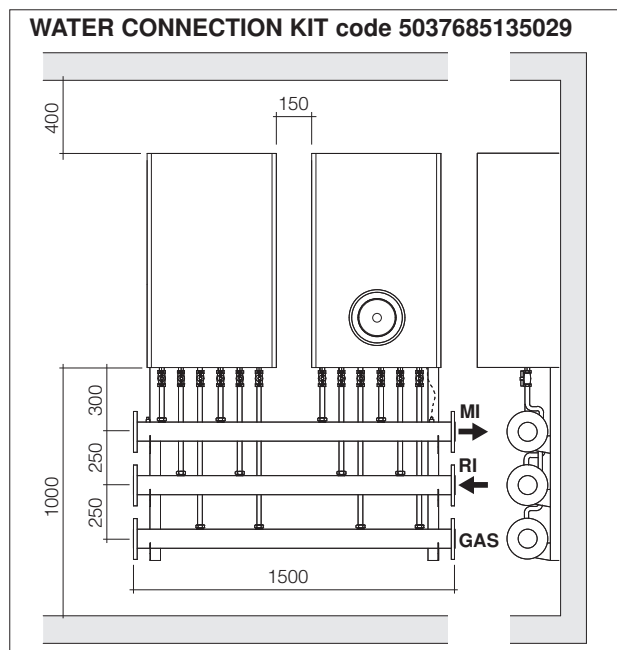
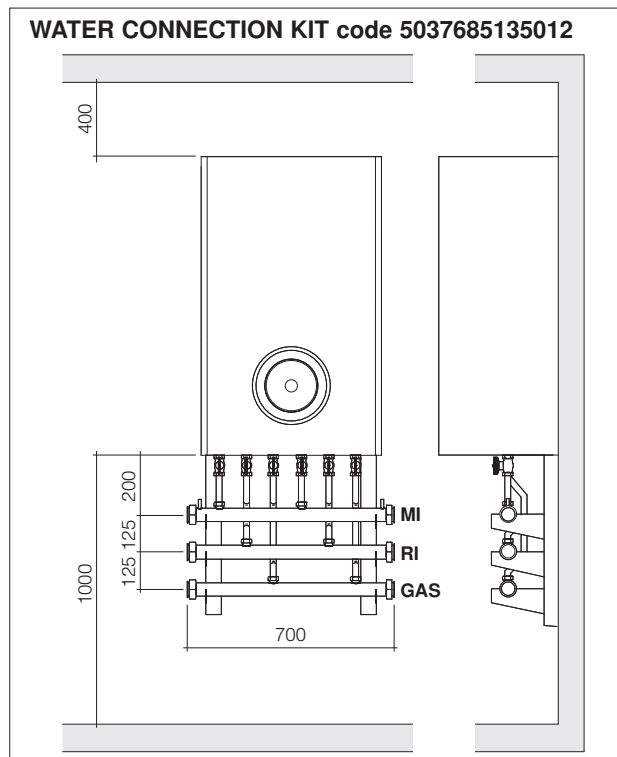
- 1 gas manifold, diameter 3"
- 1 insulated central heating outlet manifold, Ø 3"
- 1 insulated central heating return manifold, Ø 3"

DN 80 - PN 6 flanged pipes.

 Identify the unit that is closest to the central heating flow outlet as the Master boiler, so as to minimise the length of the cables to the pumps, the outlet probe and any storage heater probe.

 The outlet probe should be fitted in the socket nearest to the central heating flow outlet, in the direction of water flow.

If the old heat generator is not installed or not available, use a pump to circulate the water with the additive in the system for around 10 days, and carry out flushing as described in the previous point. At the end of the cleaning operations, before installing the boiler, an additive should be introduced into the water circuit that provides protection against corrosion and fouling.



## FUEL CONNECTIONS

The **Vokera CONDEXA PRO** Boiler must be connected to the natural gas or LPG supply in compliance with the relevant standards in force.

Before making the connections, check that:

- the type of gas is the same that the appliance is set for
- the pipes are thoroughly clean
- the gas supply pipes are the same size or larger than the fitting on the boiler (3/4"), with a pressure drop that is less than the pressure drop between the gas supply and the appliance.


When installation is completed, check that the joints are all tight, as required by the installation standards.

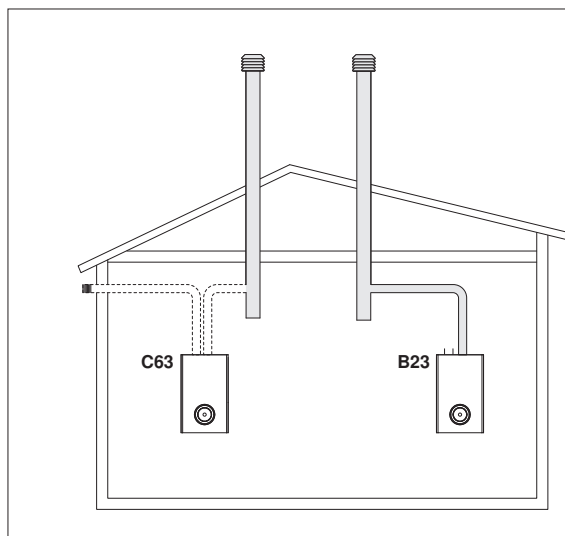
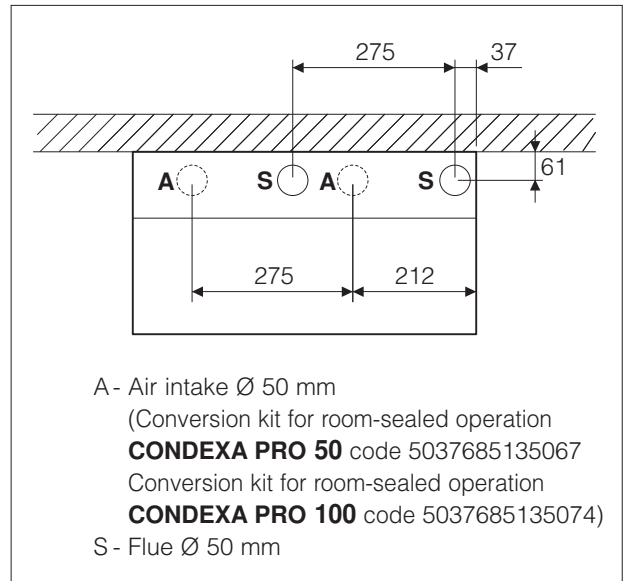
A suitable filter should be installed on the gas line.

## FLUE GAS OUTLET AND COMBUSTION AIR INTAKE

The flue and the fitting to the flue must be made in compliance with the standards and the legislation in force, as well as with local regulations.


The pipes used must be rigid and resistant to temperature, condensate and mechanical stress, and airtight.

 Non-insulated flues are potential sources of danger.



**B23** Fan upstream. Combustion air intake directly from the room where the boiler is installed. Flue gas exhaust through horizontal or vertical pipes, fitted with ventilation openings.

**C63** Fan upstream. Combustion air intake and flue gas exhaust without terminals.


 Please refer to any current standards and law applicable to flues and ventilation.

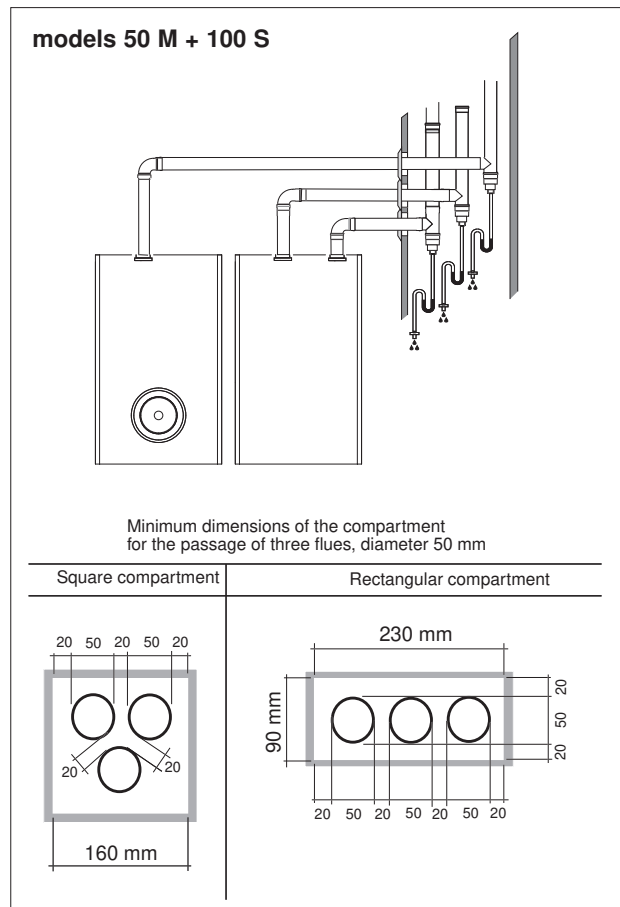
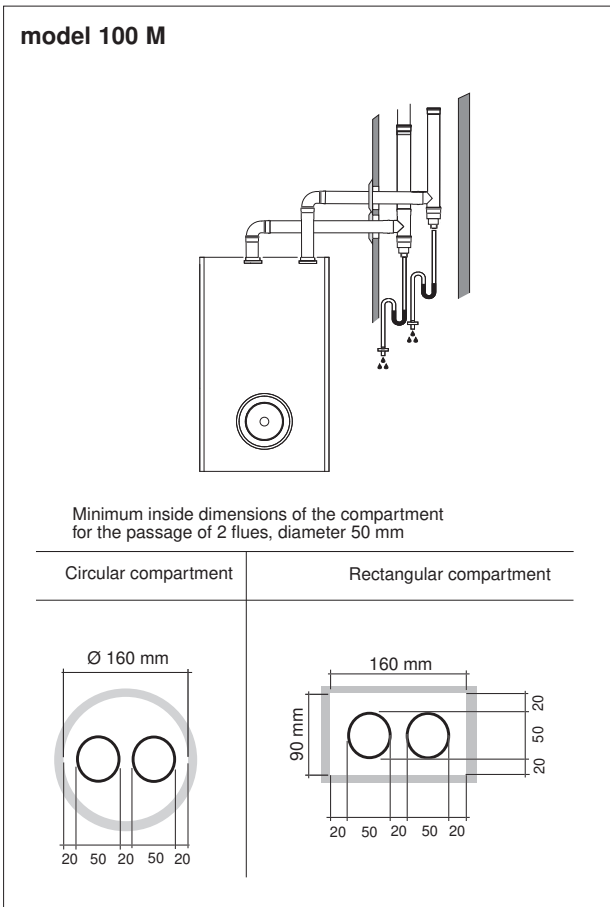
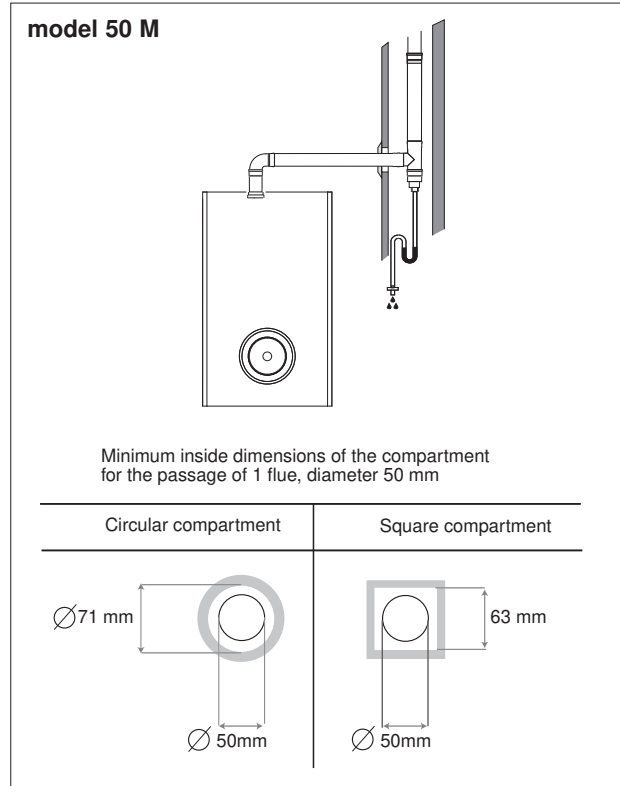
## MAXIMUM LENGTH OF THE PIPES

The maximum equivalent length of the sum of the 50 mm intake pipes and flues is 30 metres, with a pressure drop of 2 metres for each 90° bend.

### Installation of a single boiler with flue passing inside a compartment (open flue operation).

For this type of operation, make sure that the size of the compartment complies with the standards in force. The figure on the side shows the minimum dimensions of the compartment when passing one flue (model 50 M) or two flues (models 100 M or 100 S).

 Parameter 36 (see page 59) needs to be set based on the type of gas and the length of the chimney.



## PREPARING THE CONDENSATE DRAIN

The condensate produced by the boiler during normal operation must be drained at atmospheric pressure and must conform to any current standards and law applicable.

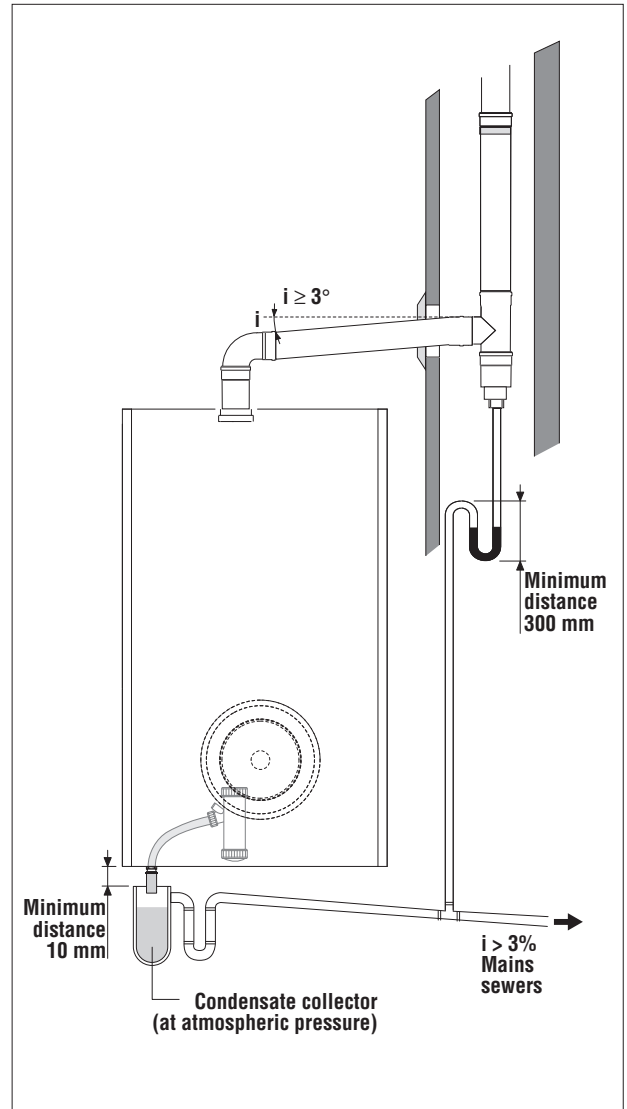
- install a neutraliser where required by law.

**⚠ Specific pipes for condensing boilers must be used. For installation, follow the instructions provided with the kit.**

### Drain trap along the drain pipe

If the vertical or horizontal section of the drain pipe needs to be extended by more than 4 metres, a drain trap must be installed at the foot of the pipe.

The useful height of the drain trap must be at least 300 mm. The discharge of the drain trap must then be connected to the sewerage system.

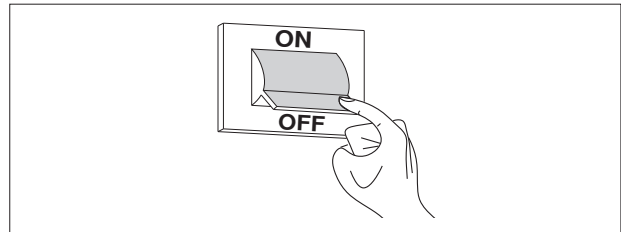


## ELECTRICAL CONNECTIONS

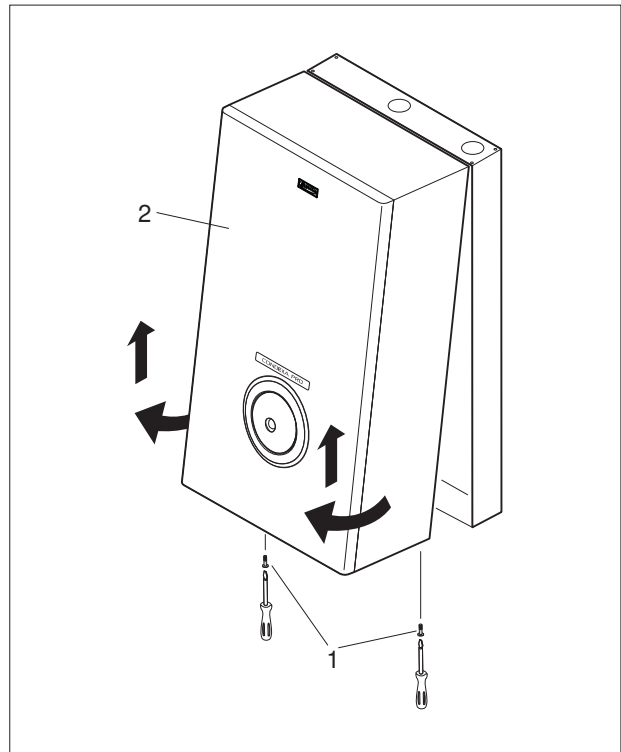
The **CONDEXA PRO 50 M** and **100 M** boilers leave the factory completely wired, with the power cable already connected, and only require the connection of the room thermostats, the outside probe and the pumps used, to the corresponding terminals. For the **CONDEXA PRO 100 S** boiler, only the Bus cable needs to be connected (see the wiring diagram on page 16).

To do this:

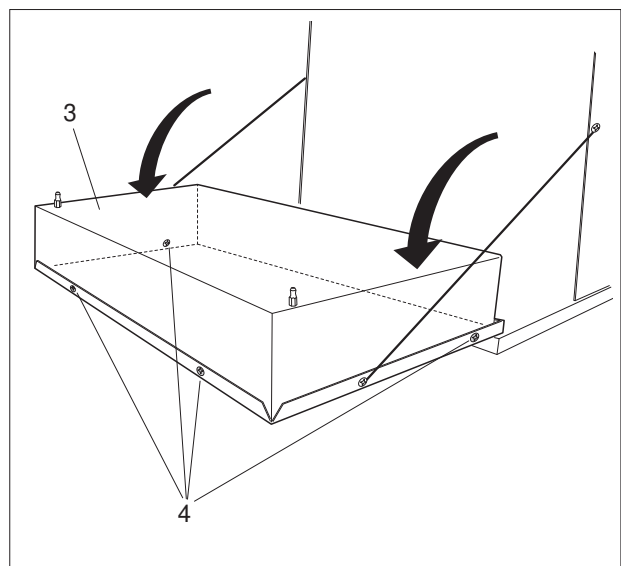
- Move the main system switch to "off"



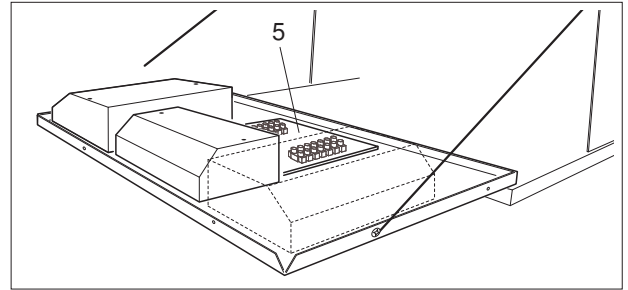
- Unscrew the fastening screws (1) on the front panel (2)
- Pull the base of the panel (2) outwards and then upwards to release it from the frame and then remove it



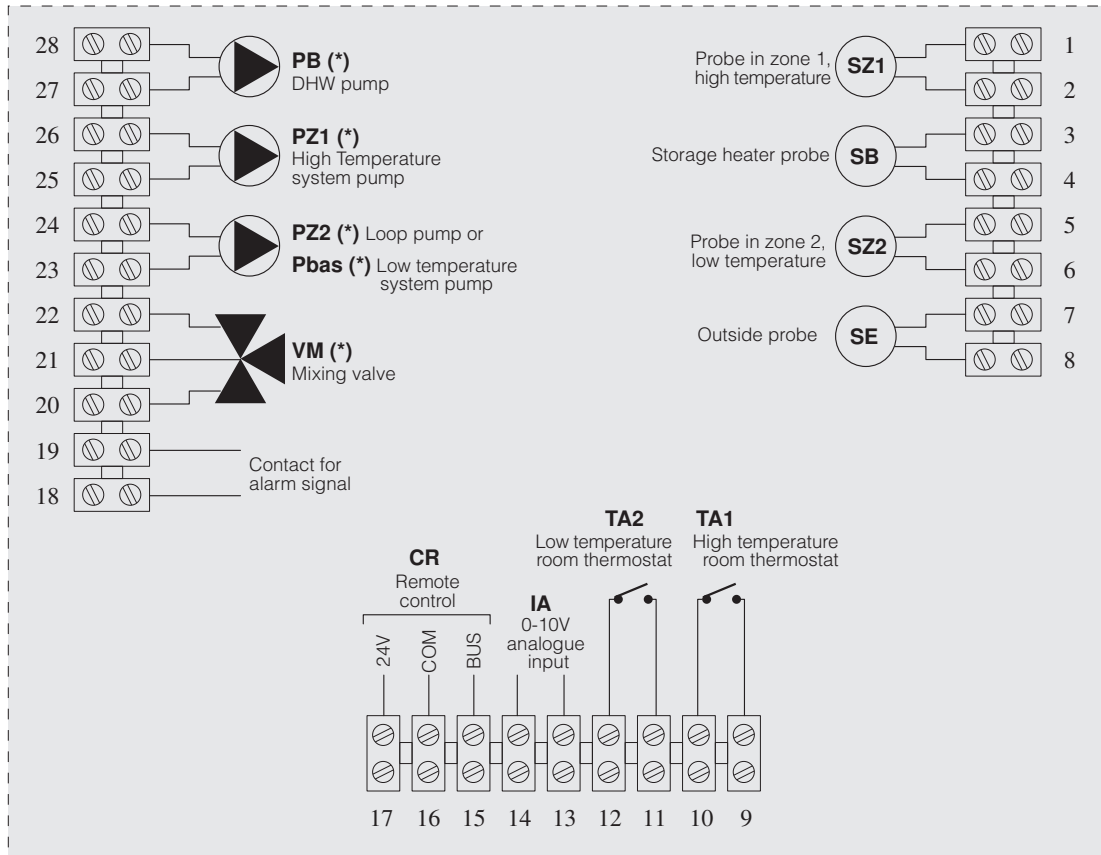
- Turn the control panel (3) and remove the rear cover, taking out the locking screws (4)



- Identify the terminal block (5) and make the connections, as in the diagram shown below.



**TERMINAL BLOCK INSIDE THE MASTER CONTROL PANEL**



(\*) 230V~50Hz

- ⚠** The following measures are compulsory:
  - 1 - the use of an omnipolar thermal overload switch, mains disconnecting switch, compliant with the CEI-EN standards (minimum contact opening 3 mm);
  - 2 - respect the connection L (Line) - N (Neutral). Leave the earth wire around 2 cm longer than the power wires;
  - 3 - use wires with a cross-section greater than or equal to 1.5 mm<sup>2</sup>, complete with pointed end terminals;
  - 4 - refer to the wiring diagrams in this booklet for any operations on the electrical system;
  - 5 - connect the appliance to an effective earth system.

- ⚠** The pumps should be connected by installing suitable contactors with manual emergency operation.
- ⊖** The gas and/or water pipes must not be used to earth the appliance.
- ⊖** The power supply and room thermostat cables must not run near hot surfaces (outlet pipes).

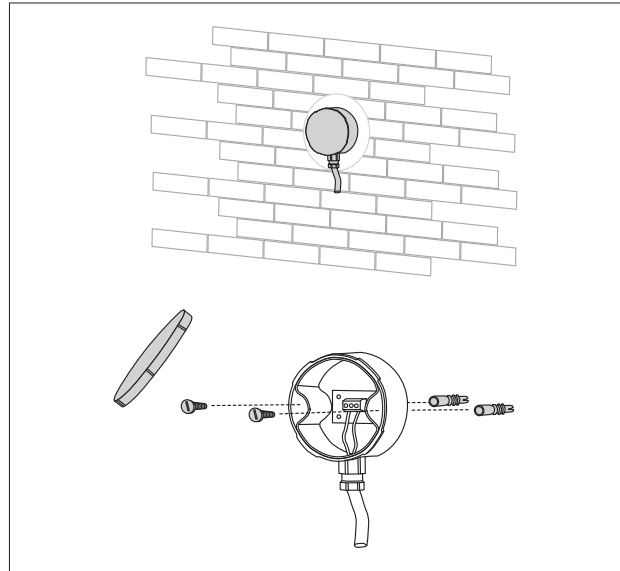
**The manufacturer is not liable for any damage due to the failure to earth the appliance and to observe the information provided on the wiring diagrams.**

## INSTALLING THE OUTSIDE PROBE

The correct positioning of the outside probe is fundamental for the correct operation of the climate control function. The probe must be installed outside of the building being heated, at a height of around 2/3 of the wall facing NORTH or NORTH-WEST, and away from flues, doors, windows and areas exposed to direct sunlight.

### Fastening the outside probe to the wall

- Unscrew the cover on the probe protection box, turning it anticlockwise to access the terminal block and the fastening holes
- Trace the fastening points using the protection box as the template
- Remove the box and drill the holes for the 5x25 expansion plugs
- Fasten the box to the wall using the two plugs supplied
- Unscrew the nut on the cable gland, pass a two-wire cable through (cross-section from 0.5 to 1mm<sup>2</sup>, not supplied) to connect the probe to terminals 7 and 8 (see the diagram on page 34)
- Connect the two wires on the cable to the terminal block, without needing to identify the polarity
- Tighten the nut on the cable gland and close the cover on the protection box.



**!** The probe should be placed on a smooth section of the wall; in the event of exposed brick walls or uneven walls, a smooth contact area should be used.

**!** The maximum length of the connection between the outside probe and the control panel is 50 m.

**!** The connection cable between the probe and control panel must not have junctions; if required, these must be sealed and adequately protected.

**!** Any conduits used for the connection cable must be separate from the power cables (230Vac).

### Conversion table valid for all probes

Temperature measured (°C) - Resistance of the probes (Ω).

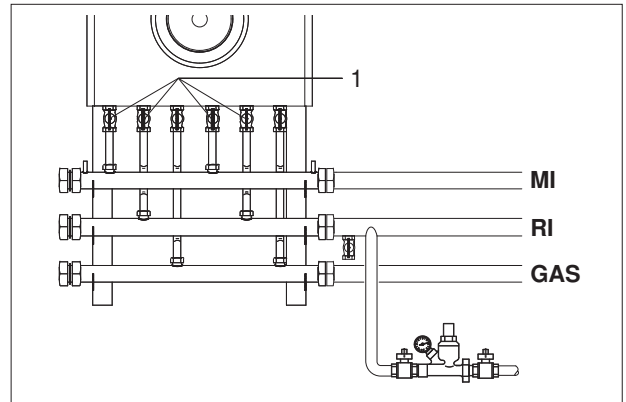
T (°C)	R (°Ω)	T (°C)	R (°Ω)	T (°C)	R (°Ω)	T (°C)	R (°Ω)	T (°C)	R (°Ω)	T (°C)	R (°Ω)	T (°C)	R (°Ω)
-20	67739	0	27279	20	12090	40	5828	60	3021	80	1669	100	973
-19	64571	1	26135	21	11634	41	5630	61	2928	81	1622	101	948
-18	61568	2	25044	22	11199	42	5440	62	2839	82	1577	102	925
-17	58719	3	24004	23	10781	43	5258	63	2753	83	1534	103	901
-16	56016	4	23014	24	10382	44	5082	64	2669	84	1491	104	879
-15	53452	5	22069	25	9999	45	4913	65	2589	85	1451	105	857
-14	51018	6	21168	26	9633	46	4751	66	2512	86	1411	106	836
-13	48707	7	20309	27	9281	47	4595	67	2437	87	1373	107	815
-12	46513	8	19489	28	8945	48	4444	68	2365	88	1336	108	796
-11	44429	9	18706	29	8622	49	4300	69	2296	89	1300	109	776
-10	42449	10	17959	30	8313	50	4161	70	2229	90	1266	110	757
-9	40568	11	17245	31	8016	51	4026	71	2164	91	1232		
-8	38780	12	16563	32	7731	52	3897	72	2101	92	1199		
-7	37079	13	15912	33	7458	53	3773	73	2040	93	1168		
-6	35463	14	15289	34	7196	54	3653	74	1982	94	1137		
-5	33925	15	14694	35	6944	55	3538	75	1925	95	1108		
-4	32461	16	14126	36	6702	56	3426	76	1870	96	1079		
-3	31069	17	13582	37	6470	57	3319	77	1817	97	1051		
-2	29743	18	13062	38	6247	58	3216	78	1766	98	1024		
-1	28481	19	12565	39	6033	59	3116	79	1717	99	998		

## FILLING AND EMPTYING THE SYSTEMS

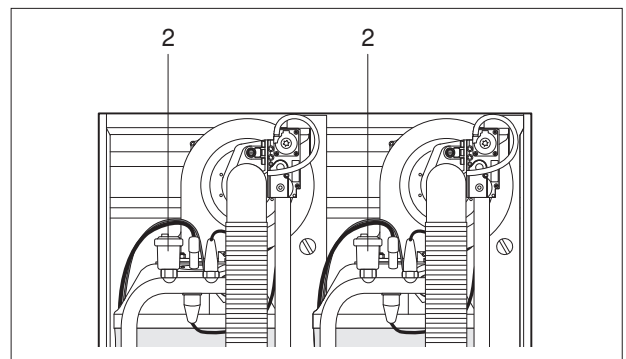
The **Vokera CONDEXA PRO** Boiler is not fitted with an automatic filling valve, which must be installed on the system return.

### FILLING

- Open the valves (1) installed on the boiler water fittings;



- Open the caps on the automatic vent valve/valves (2) two or three turns;



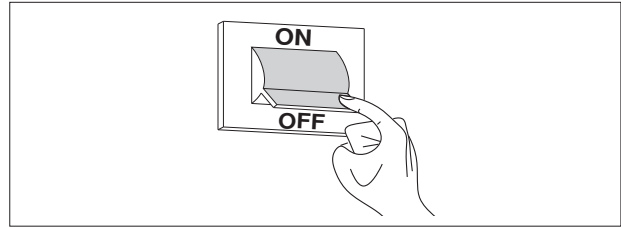
- Open the filling valve on the system until the pressure shown on the pressure gauge is **1,5 bar**;

- Close the filling valve again.

**!** The air is vented from the **CONDEXA PRO** boiler automatically through the automatic vent valve/valves installed on the top of the heating units. Check that the cap on the valve is open.

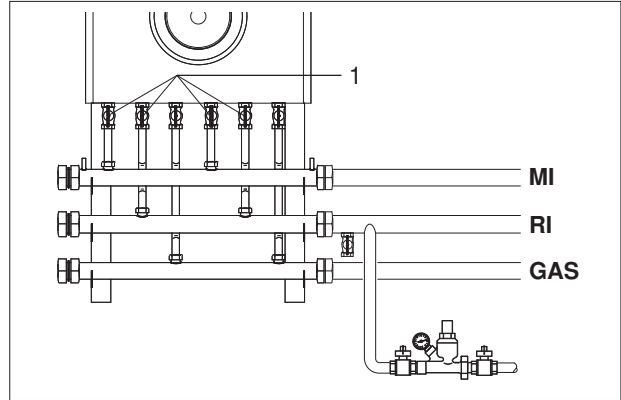
## EMPTYING

Before starting to empty the system, disconnect the power supply by moving the main system switch to "off".




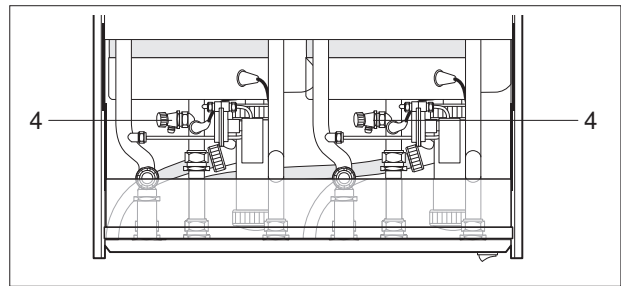
### Emptying the BOILER

- Close the valves (1) installed on the boiler water fittings;



- Connect a plastic hose to the drain cock (4), on each heating unit, and open the cock;

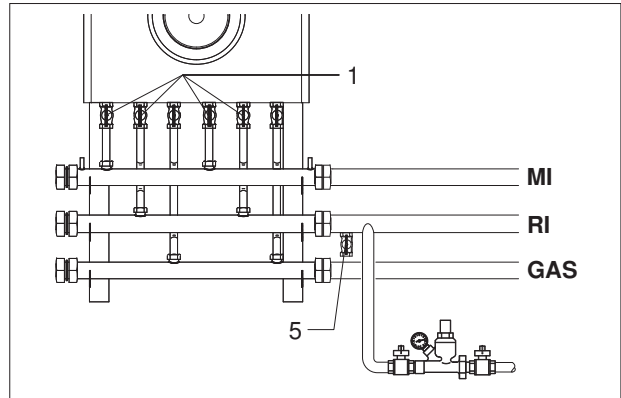
 Before opening the drain cock (4), protect the electrical devices underneath against water spillage.



### Emptying the SYSTEM

- Check that the valves (1), installed on the water circuit, are open;


- Connect a plastic hose to the drain cock (5), fitted on the system return line, and open the cock.




## PREPARING FOR FIRST START-UP

Before starting the system and running the functional tests on the **Vokera CONDEXA PRO** Boiler, check that:

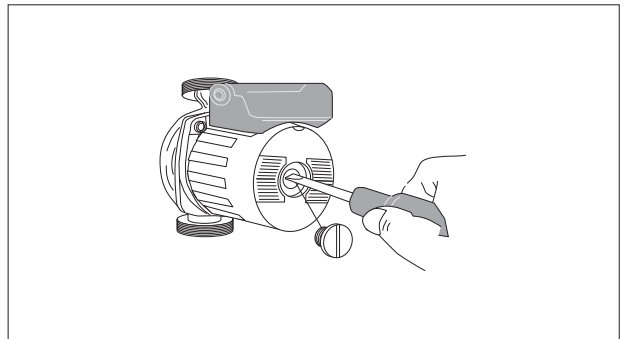
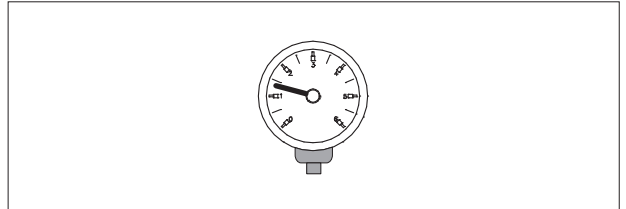
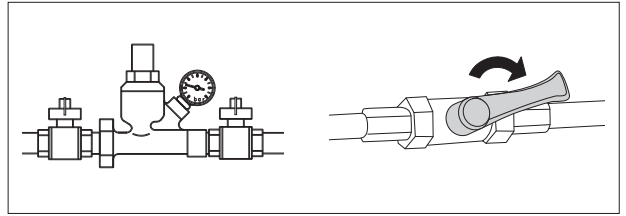
- The fuel valve and valves in the central heating system are open;
- The type of gas and the supply pressure are correct for the boiler;
- The system is filled, pressure in the water circuit, when cold, is around **1,5 bar** and the circuit has been vented;
- The system expansion vessel is suitably pre-charged;
- The electrical connections have been performed correctly.

 The pumps should be connected by installing suitable contactors with manual emergency operation.

- Check that the cap on the vent valve/valves is unscrewed;
- The pumps turn freely: loosen the inspection screw and check with a flathead screwdriver that the motor shaft is rotating without impediments.

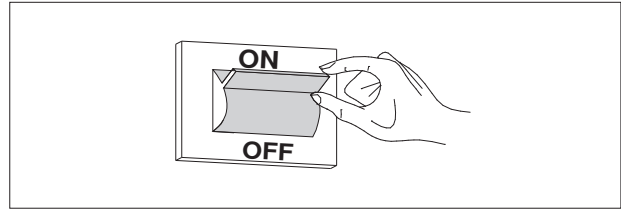
 Before loosening or removing the seal cap on the pump, protect the electrical devices underneath against water spillage.

- The flues have been properly made and installed.



## STARTING FOR THE FIRST TIME

- Move the main system switch to "on";

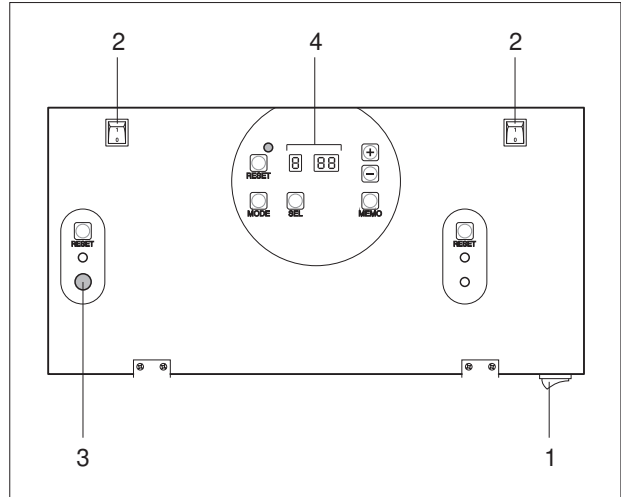


- Move the main switch (1) on the boiler and the switches (2) on each heating unit to "on".

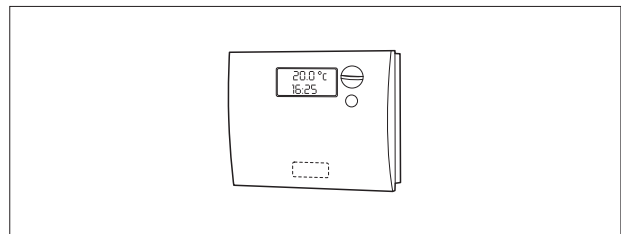
The green SLAVE power supply signal (3) flashes. The boiler performs a self-diagnosis cycle, after which it will enter DISPLAY mode.

The display (4) shows the status of the system and the temperature measured by the probe in the "high temperature" circuit (see Display mode on page 20).

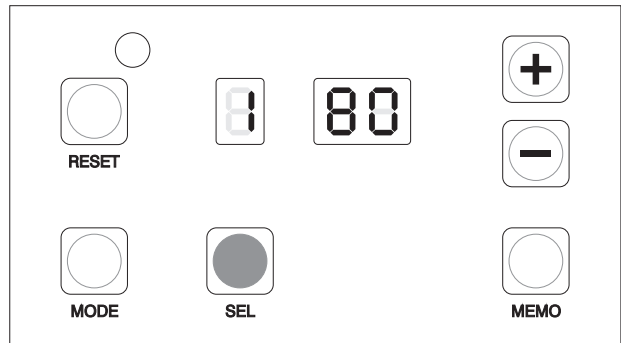
If there are more than two boilers installed, configure the addresses from the third boiler on. To do this, see the paragraph "Setting the addresses for cascading configurations" on page 54).



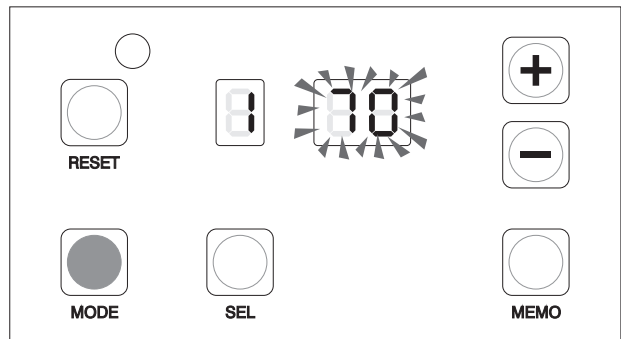
- Set the room thermostats in the high and low temperature zone to the desired temperature (~20°C) or if the systems are fitted with a timer-thermostat or timer, check that this is on and set (~20°C).



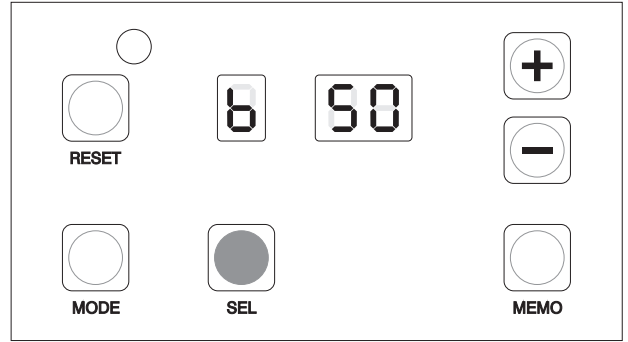
- Press the "SEL" button: the maximum temperature of the boiler will be displayed, that is, the maximum temperature in the high temperature circuit, preceded by the symbol "1".



- Press "MODE": the corresponding set point will be displayed and the two digits on the right will flash. To change the value, press "+" or "-". To confirm press "MEMO".



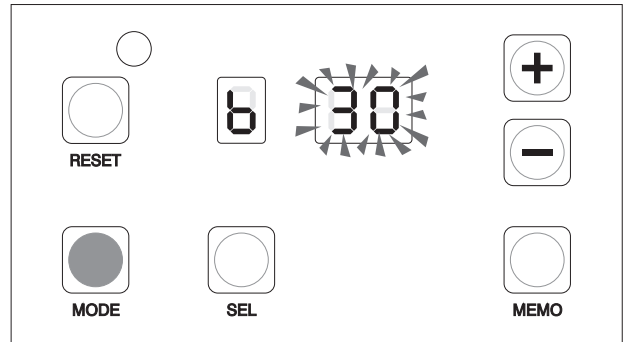
- Press the **"SEL"** button four times: the maximum temperature in the low temperature circuit will be displayed, preceded by the symbol "6".



- Press **"MODE"**: the corresponding set point will be displayed and the two digits on the right will flash. To change the value, press **"+"** or **"-"**. To confirm press **"MEMO"**.

**⚠** For low temperature systems, select a temperature between 20°C and 45°C. When setting the system as "Low temperature", the maximum outlet temperature will be limited at 50°C (Par. 23=T\_CH\_Low\_limit).

**⚠** Changing the outlet temperature modifies the climate control curve (see the paragraph "Setting the temperature controller"). These settings must only be performed by **Vokera Ltd** or a suitably qualified person.



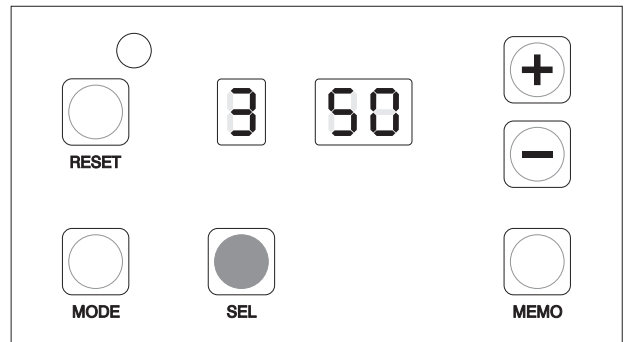
If the boiler is connected to a storage heater, set parameter 6 (pre-set to 0=no DHW service). To do this, access "Installer programming" mode and set parameter 6 to:

- 2 = for storage heater with probe
- 6 = for storage heater with thermostat.

In addition, set parameter 9 (DHW\_Priority) to 2 for absolute priority.

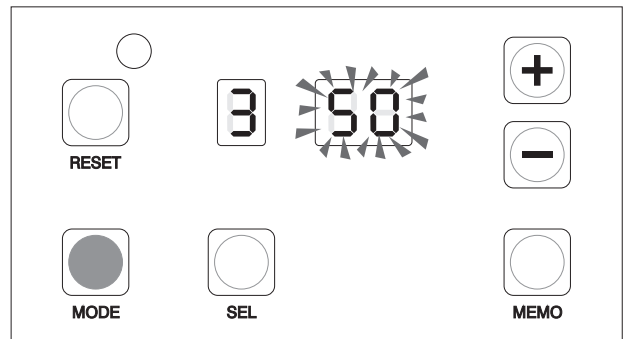
If the storage heater is fitted with an NTC probe, the desired temperature can be set on the display, from 10°C to 50°C. If the storage heater is fitted with a thermostat, the desired temperature should be set directly on the storage heater, while parameter 3 must be left at 50°C.

- Press **"SEL"** button twice: the DHW temperature will be displayed, preceded by the symbol "3".



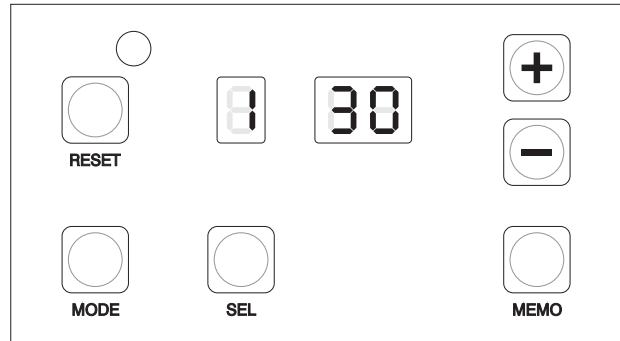
- Press **"MODE"**: the corresponding set point will be displayed and the two digits on the right will flash. To change the value, press **"+"** or **"-"**. To confirm press **"MEMO"**.

The boiler will start in DHW mode, until the demand is satisfied.



When the boiler is in Standby, the display on the Master unit is in Readout mode and the three digits show the number "1", followed by the value of the outlet temperature. The green LED (ref. 11 on page 18) flashes.

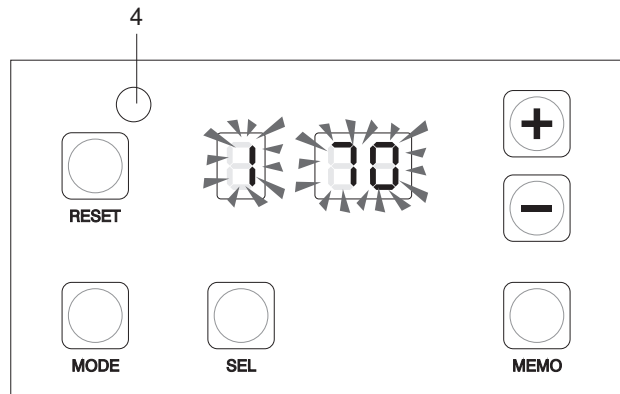
See the paragraph on "DISPLAY MODE", page 20, for details on the various information displayed by the system.



If ignition or operating faults occur on any heating unit, the display on the Master boiler starts flashing and the red LED (4) comes on.

There are two possible types of errors:

- Type A errors, which can only be deactivated by pressing RESET;
- Type E errors, which are deactivated when the causes are no longer present (see ERROR MODE on page 24 and the "Fault codes" paragraph on page 56).



## CHECKS DURING AND AFTER FIRST START-UP

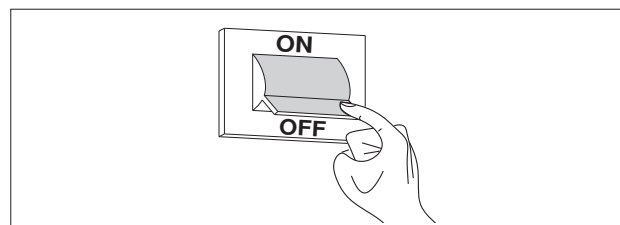
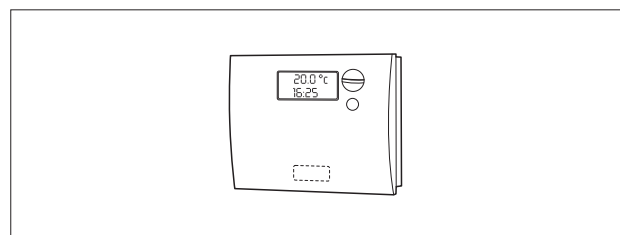
When ignition is complete, check that the **CONDEXA PRO** boiler correctly:

- Starts and stops, closing the contacts on the zone thermostats;
- Displays the DHW temperature (only if the storage heater is fitted) and central heating temperature, pressing the "SEL" button twice;  
Check, if the storage heater is fitted, that parameter "6" is set correctly:

- 2 = storage heater with probe
- 6 = storage heater with thermostat

and check that operation is correct, by opening a hot water tap.

Check the complete shutdown of the boiler by moving the main system switch to "off".

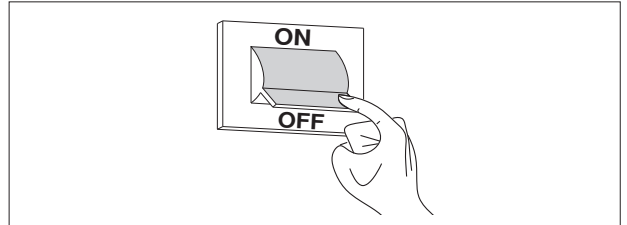


After a few minutes of continuous operation controlled by the room thermostat, the adhesives and the processing residues will have evaporated, and the following checks can be completed:

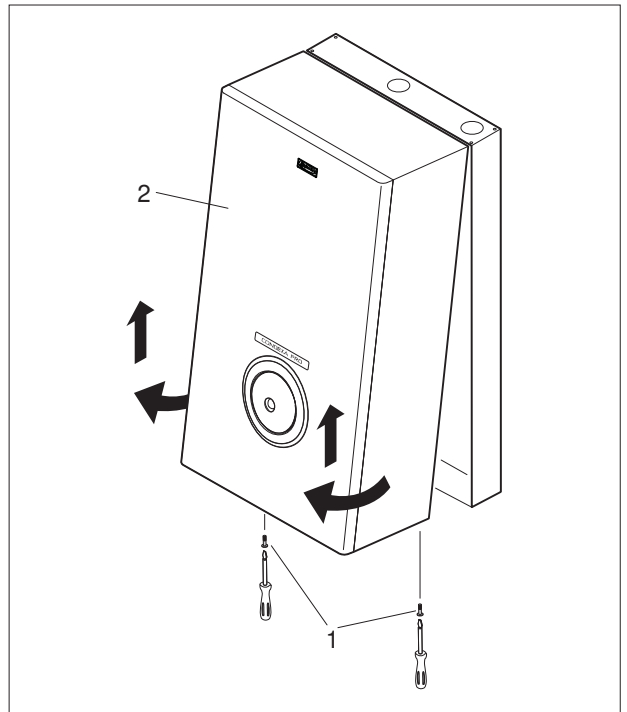
- check the gas supply pressure;
- check combustion,

### **CHECKING THE GAS SUPPLY PRESSURE**

- Move the main system switch to "off";

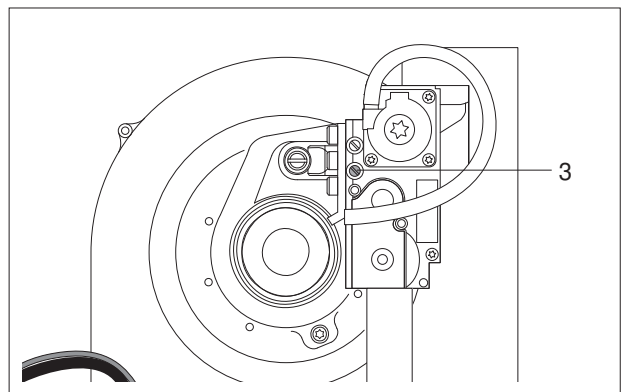


- Unscrew the fastening screws (1) on the front panel (2);

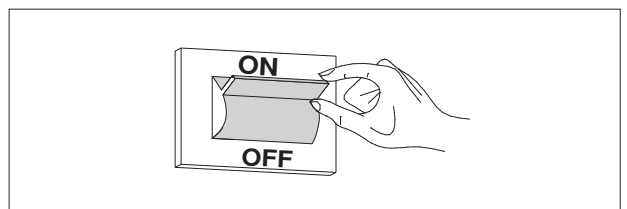


- Pull the base of the panel (2) outwards and then upwards to release it from the frame and then remove it;

- Unscrew the screw on the pressure test point (3), located upstream of the gas valve, around two turns, and connect a pressure gauge;



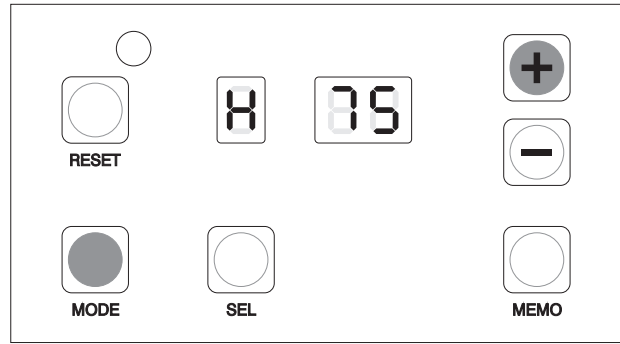
- Power-up the boiler by moving the main system switch and the main switch/switches on the appliance to "on".



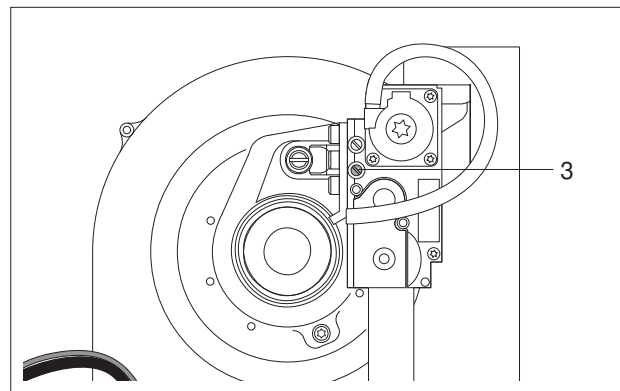
In TEST mode, a high temperature heating demand at maximum output can be generated.

To do this:

- Press the **"MODE"** and **"+"** buttons together for 5 seconds;
- Start the boiler by adjusting the room thermostat. The boiler will operate at maximum output showing "H" on the display, followed by the outlet temperature (chimney sweep function);
- Check that with the burner on at maximum output the gas pressure is the rated supply pressure, as shown in the table to the side;
- Adjust the thermostat so as to stop the boiler;
- Press **"MEMO"** to exit TEST mode;
- Disconnect the pressure gauge and tighten the screw on the pressure test point (3) upstream of the gas valve.



DESCRIPTION	G20	G30	G31	
Wobbe index	45,7	80,6	70,7	MJ/m <sup>3</sup>
Rated supply pressure	20	28-30	37	mbar



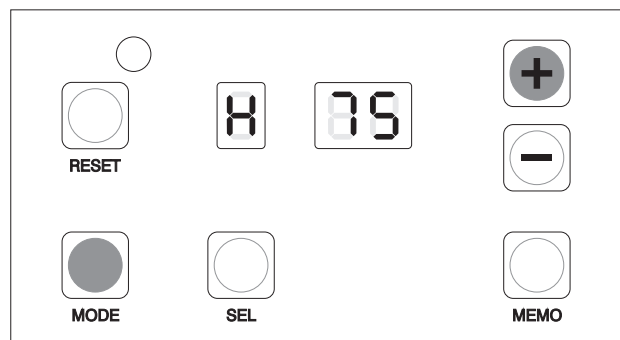
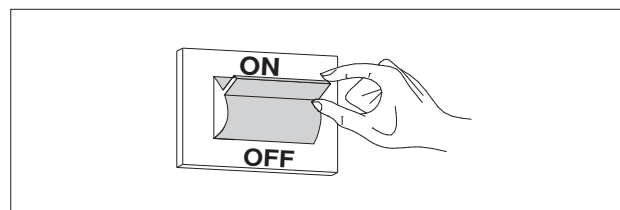
### **CHECKING COMBUSTION**

- Power-up the boiler by moving the main system switch and the main switch/switches on the appliance to "on";

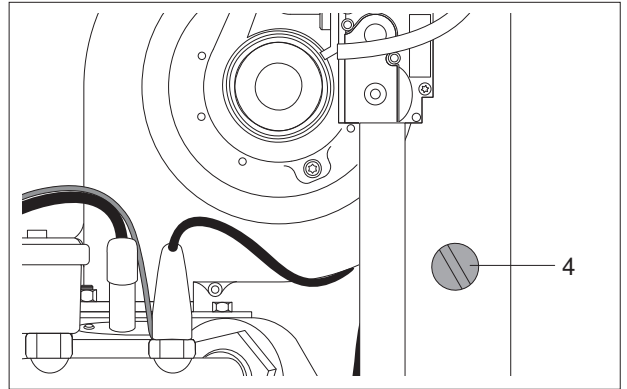
In TEST mode, a high temperature heating demand at maximum output can be generated.

To do this:

- Press the **"MODE"** and **"+"** buttons together for 5 seconds;
- Start the boiler by adjusting the room thermostat. The boiler will operate at maximum output showing "H" on the display, followed by the outlet temperature (chimney sweep function).



- Combustion can be checked by unscrewing the cap (4) and inserting the analyser probe in the available position;
- Once having completed the check, stop the chimney sweep function by pressing "**MEMO**";
- Adjust the thermostat so as to stop the boiler;
- Remove the analyser probe and carefully retighten the cap (4);



### **FAN SPEED**

The fan speed is controlled automatically based on the type of gas and the length of the flue (L). This information is managed by parameter 36.

To change the settings:

- Enter "INSTALLER PROGRAMMING MODE" following the procedure described on page 23, and set parameter 36 to:
  - 1 = natural gas and L<15 m
  - 2 = natural gas and L>15 m
  - 3 = LPG and L<15 m
  - 4 = LPG and L>15 m.

The **CONDEXA PRO** boilers are supplied for operation on G20 (natural gas), with a flue L<15m (parameter 36=1).

Once the checks are complete, replace the front panel and secure it using the same screws.

**⚠** All checks must be performed by a suitably qualified person.

---

## SETTING THE FUNCTIONAL PARAMETERS

---

The functions of the central heating high temperature and low temperature circuits and the DHW circuits can be set based on the system requirements, by setting the functional parameters.

The first three parameters are accessible at a user level, while the remaining parameters require the password to be entered ("22", see page 23).

To access the user parameters, press the "SEL" button, after which the following values will be displayed:

- Outlet temperature in the high temperature circuit T1 8 80
- Temperature in the DHW circuit T3 3 50
- Outlet temperature in the low temperature circuit T6 6 50

To change the corresponding set points:

- Press "MODE", the corresponding value will be displayed and the two digits on the right will flash.
- Press "+/-" until reaching the desired value. Press "MEMO" to save the new value. The value displayed will stop flashing and will be valid after 3 seconds.

For a detailed description of all the parameters and the default values see page 58.

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## SETTING THE CENTRAL HEATING PARAMETERS

---

The following functions can be set for central heating:

### 1 Setpoint\_T\_CH\_High

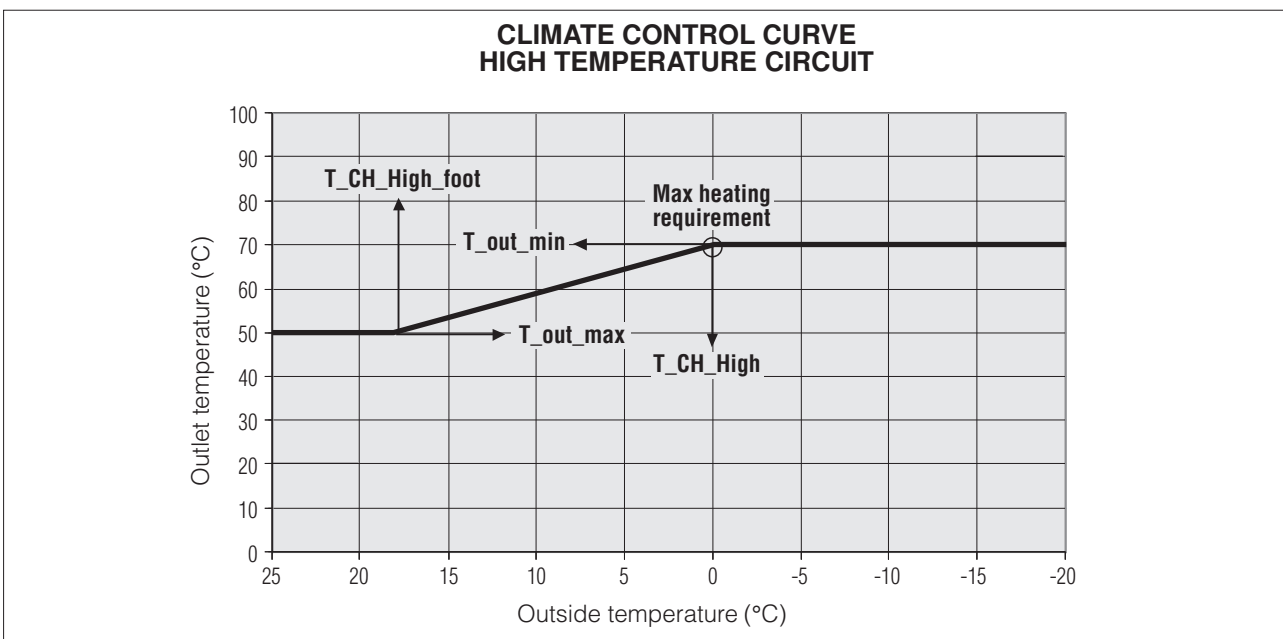
#### Set point in the high temperature circuit (parameter 1)

If the operating mode is set to "fixed set point" (par. 14=CH\_type\_high=0), this is the objective temperature.

If the operating mode is set to "climate control" (par. 14=1), this is the maximum objective temperature for the minimum outside temperature ( $T_{out\_min}$ =par. 37, pre-set to 0°C).

Parameter 18 ( $T_{CH\_high\_foot}$ , pre-set to 50°C) defines the minimum set point for the maximum outside temperature ( $T_{out\_max}$ , pre-set to 18°C).

**Pre-set to 70°C with upper limit set by par. 17 ( $T_{CH\_high\_limit}$ , pre-set to 80°C).**



## 2 Setpoint\_T\_CH\_Low

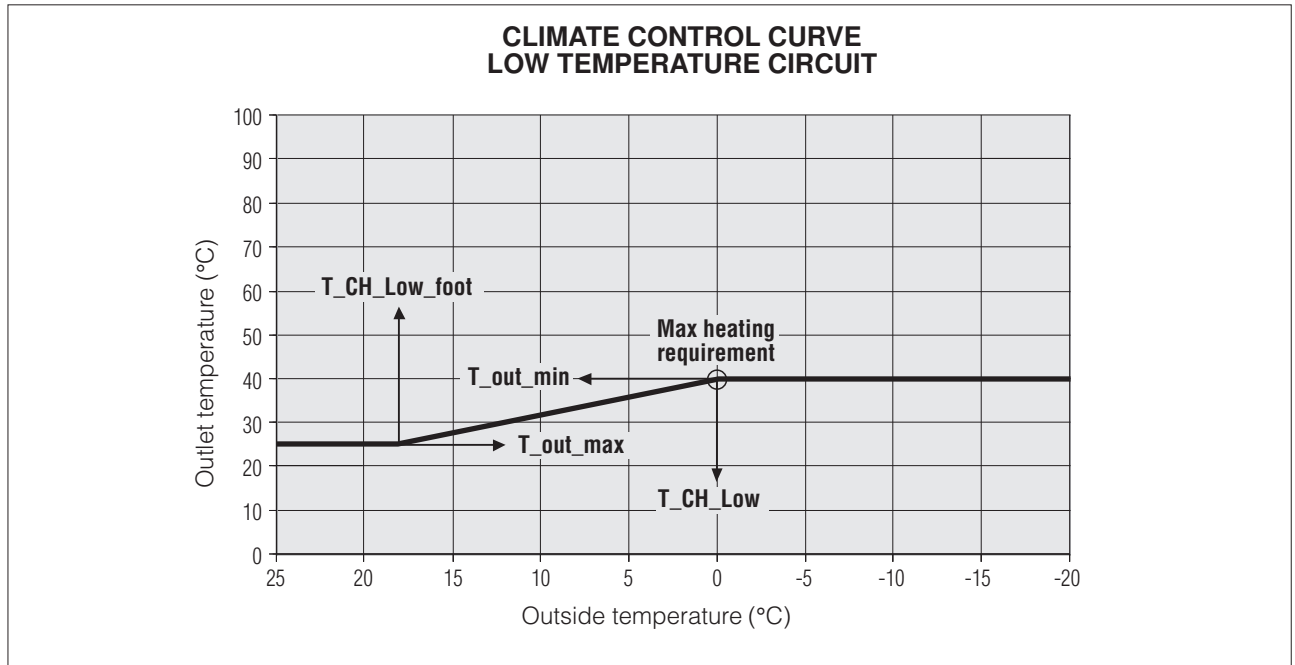
### Set point in the low temperature circuit (parameter 3)

If the operating mode is set to "fixed set point" (par. 22=CH\_type\_low=0), this is the objective temperature.

If the operating mode is set to "climate control" (par. 22=1), this is the maximum objective temperature for the minimum outside temperature ( $T_{out\_min}$ =par. 37, pre-set to 0°C).

Parameter 24 ( $T_{CH\_low\_foot}$ , pre-set to 25°C) defines the minimum set point for the maximum outside temperature ( $T_{out\_max}$ , pre-set to 18°C).

**Pre-set to 40°C with upper limit set by par. 23 ( $T_{CH\_Low\_limit}$ , pre-set to 50°C).**



Consequently, each circuit can operate with a fixed set point or using a set climate control curve.

## 3 CH\_Priority

### Central heating priority (parameter 16)

If this is set to 0 the system works without central heating priority, that is, with the high temperature and low temperature circuit served in parallel.

If set to 1, the demand from the low temperature circuit is ignored and the corresponding pump remains off.

The demand from the low temperature circuit is only accepted when the high temperature circuit is off.

Vice-versa, if set to 2 the low temperature circuit has priority.

**Pre-set to 0.**

---

## SETTING THE DOMESTIC HOT WATER PARAMETERS

---

The following functions can be set for the domestic hot water circuit:

### 1 Setpoint\_DHW

#### Domestic hot water set point (parameter 2)

This is the temperature value for the production of domestic hot water.  
The maximum limit is set by par. 8 (T\_DHW\_limit, pre-set to 60°C).

**Pre-set to 50°C.**

### 2 DHW\_Type

#### Type of storage heater (parameter 6)

- 0 = No DHW service
- 1 = Rapid heat exchanger with probe
- 2 = Storage heater with probe
- 6 = Storage heater with thermostat

For the storage heater with thermostat, if the input is a closed contact, the domestic hot water demand is activated, if it is an open contact the demand is no longer present.

**Pre-set to 0.**

### 3 DHW\_Priority

#### Domestic hot water priority (parameter 9)

##### 0 = Sliding priority A

The purpose of the sliding priority A function is to allow the system to also serve the central heating function when the heating demand is low.

The system responds to the heating demand if:

$$(\text{Setpoint\_Ch} - 50^\circ\text{C}) < \text{Manifold temp.} < (\text{Setpoint\_Ch} + 1^\circ\text{C})$$

Setpoint\_Ch = Set point in the high or low temperature circuit, according to the demand.

##### 1 = Sliding priority B

The purpose of the sliding priority B function is to ensure that the system does not stop the central heating service for too long.

The system responds to the heating demand if:

$$(\text{Setpoint\_Dhw} + \text{T\_Tank\_extra}) - 50^\circ\text{C} < \text{Manifold temp.} < (\text{Setpoint\_Dhw} + \text{T\_Tank\_extra}) + 1^\circ\text{C}$$

T\_tank\_extra = Par. 10 = pre-set to 30°C.

##### 2 = Absolute priority (DHW service only)

**Pre-set to 0.**

---

## SETTING THE TEMPERATURE CONTROLLER

---

### 1 Attenuation\_High

#### Attenuation function for the HIGH TEMPERATURE circuit (parameter 21)

Two cases are possible:

- Operation with fixed set point, Par. 14=0
- Operation with climate control Par. 14=1.

#### OPERATION WITH FIXED SET POINT, PAR. 14=0

With attenuation in the high temperature circuit disabled, Par21=0, when the thermostat in the high temperature circuit closes, the heating demand is signalled. When opening, the system stops.

The Master controller starts the pump in the high temperature circuit PZ1 and the loop pump PZ3, if the parameter for the third pump is set to 0 (Par. 34=0 ), otherwise the third pump remains off.

The set point for the high temperature circuit can be set on the Master controller, Setpoint\_T\_CH\_High = Par. 1, pre-set to 70°C, in the range from 10°C to T\_CH\_high\_limit=Par 17, in turn pre-set to 80°C.

The set point used will be the value set for parameter 1.

The burner is on when:

Manifold Temperature  $\leq$  Set point – Start hysteresis.

The start hysteresis can be set, CH\_High\_mod\_hyst\_on = Par. 19, pre-set to 7°C, between 0 and 20°C.

The Master controller converts the heating demand into an output requirement for each slave controller.

The burners are off when:

Manifold Temperature  $\geq$  Set point + Stop hysteresis.

The stop hysteresis can be set (CH\_High\_mod\_Hyst\_off=Par. 20, pre-set to 3, between 0 and 20°C).

When the attenuation in the high temperature circuit parameter is enabled, Par. 21 $\neq$ 0, the contact on the high temperature thermostat is ignored, and a demand for heat in the high temperature circuit is present when:

Manifold Temperature  $\leq$  Set point – Start hysteresis

The demand for heat stops when:

Manifold Temperature  $\geq$  Set point + Stop hysteresis.

The set point in this case coincides with the value set for parameter 1 (Setpoint\_T\_CH\_High), if the contact of the high temperature thermostat is closed, while it is calculated as the value set for parameter 1 minus the attenuation (Setpoint\_T\_CH\_High-Attenuation\_high) if the contact is open.

#### OPERATION WITH CLIMATE CONTROL, PAR. 14=1

If the attenuation in the high temperature circuit parameter is equal to 0, attenuation\_high=Par. 21=0, the behaviour is the same as in the previous paragraph, except the set point is calculated according to the outside temperature.

If the outside temperature = T out\_min=Par. 37, pre-set to 0°C, then set point =setpoint\_T\_Ch\_high

If the outside temperature = T out\_max=Par. 38, pre-set to 18°C, then set point T\_CH\_high\_foot=Par. 18, preset to 50°C.

Between the two outside temperature values, the set point is calculated linearly.

**Pre-set to 0.**

## 2 Attenuation\_Low

### Attenuation function for the LOW TEMPERATURE circuit (parameter 25).

This paragraph is similar to the previous one, however in this case referred to the low temperature circuit.

Two cases are possible:

- Operation with fixed set point, Par. 22=0
- Operation with climate control Par. 22=1.

#### **OPERATION WITH FIXED SET POINT, PAR. 22=0**

With attenuation in the low temperature circuit disabled, Par. 25=0, when the thermostat in the low temperature circuit closes, the heating demand is signalled. When opening, the system stops.

The Master controller starts the pump in the low temperature circuit PZ3.

The set point for the low temperature circuit can be set on the Master controller, Setpoint\_T\_CH\_low = Par. 3, pre-set to 40°C in the range from 10°C to T\_CH\_Low\_limit=Par. 23, in turn pre-set to 50°C.

The set point used will be the value set for parameter 3.

The burner is on when:

Manifold Temperature  $\leq$  Set point – Start hysteresis.

The start hysteresis can be set, CH\_Low\_mod\_hyst\_on = Par. 26, pre-set to 5°C, between 0 and 20°C.

The Master controller converts the heating demand into an output requirement for each slave controller.

The burners are off when:

Manifold Temperature  $\geq$  Set point + Stop hysteresis..

The stop hysteresis can be set (CH\_Low\_mod\_Hyst\_off=Par. 27, pre-set to 3, between 0 and 20°C).

When the attenuation in the low temperature circuit parameter is enabled, Par. 25 $\neq$ 0, the contact on the low temperature thermostat is ignored, and a demand for heat in the high temperature circuit is present when:

Manifold Temperature  $\leq$  Set point – Start hysteresis

The demand for heat stops when:

Manifold Temperature  $\geq$  Set point + Stop hysteresis.

The set point in this case coincides with the value set for parameter 3 (Setpoint\_t\_ch\_low) if the contact of the low temperature thermostat is closed, while it is calculated as the value set for parameter 3 minus the attenuation (Setpoint\_t\_ch\_low-Attenuation\_low) if the contact is open.

#### **OPERATION WITH CLIMATE CONTROL, PAR. 22=1**

If the attenuation in the low temperature circuit parameter is equal to 0, attenuation\_low=Par. 25=0, behaviour is the same as in the previous paragraph, except the set point is calculated according to the outside temperature.

If the outside temperature = T\_out\_min=Par. 37, pre-set to 0°C, then set point =setpoint\_T\_Ch\_low.

If the outside temperature = T\_out\_max=Par. 38, pre-set to 18°C, then set point T\_ch\_low\_foot=Par. 24, pre-set to 50°C.

Between the two outside temperature values, the set point is calculated linearly.

**Pre-set to 0.**

### 3 T\_out\_correct

#### Outside temperature correction (parameter 39)

Normally the value displayed is the value read by the micro-controller, plus or minus a correction value (T displayed = T read by the probe +/- correction).

The outside temperature value read can be corrected by changing the value of parameter 39, (the limit allowed for the correction is +/- 30 °C). In this phase, the use of a reference thermometer is suggested.

**Pre-set to 0.**

### 4 T4\_frost\_protection

#### Frost protection (parameter 35)

The electronic controller features a frost protection function that is also active in standby. The frost protection function has two levels, the first that starts the pump, and the second that starts the pump and the burner.

If the Manifold Temperature  $\leq 5^{\circ}\text{C}$ , the pump in the high temperature circuit and the loop pump are started, or, when CH\_type=1 and the outside probe is connected, if the Outside Temperature  $\leq 3^{\circ}\text{C}$  (par. 35), the pump in the high temperature circuit and the loop pump are started.

If after 10 minutes the Manifold Temperature  $\leq 5^{\circ}\text{C}$ , a burner is started at maximum output, until the Manifold Temperature  $\geq 20^{\circ}\text{C}$ .

If after 10 minutes the Manifold Temperature  $\geq 5^{\circ}\text{C}$  but, when CH\_type=1 (Par. 14 or 22) and the outside probe is connected, the Outside Temperature  $\leq 3^{\circ}\text{C}$  (par. 35), the pump continues operating until the Outside Temperature  $\geq 3^{\circ}\text{C}$ .

**Pre-set to 3.**

### 5 Power\_control\_mode

#### Cascading management (parameter 33)

To manage the output delivered by the system, two cascading strategies are available. In both cases, the Master controller can only start a new burner when another is already on.

If the Master controller needs to increase the number of burners on, it first checks that the subsequent burner can be started: no error is present and temperature of the boiler is less than the maximum.

Otherwise, it checks another burner. If no burner is available, the master decreases the number of burners to be started.

#### **MODE: MINIMUM NUMBER OF BURNERS ON (PAR. 33=0)**

The output of the system is modulated by a PID control algorithm, where the value controlled is the temperature in the manifold, and the set point refers to the active circuit (set point in the high or low temperature circuit, or DHW set point). The PID control directly manages the last 2 burners started, while the previous burners operate at maximum output.

If the Manifold Temperature  $< \text{set point} - 5^{\circ}\text{C}$ , the next burner is started, and both are managed by the PID control algorithm.

The Master controller waits 30 seconds, and then if the Manifold Temperature  $< \text{set point} - 5^{\circ}\text{C}$ , another burner is started.

The first burner works at maximum output, while the other two are managed by the PID control algorithm.

If the Manifold Temperature  $> \text{set point} + 2^{\circ}\text{C}$ , the last burner is stopped, the other two most recently started burners are managed by the PID control algorithm, while the others work at maximum output. The Master controller waits 30 seconds before checking the situation again.

### **MODE: MAXIMUM NUMBER OF BURNERS ON (PAR.33=1)**

All the burners are controlled by the same PID control algorithm, where the value controlled is the temperature in the manifold, and the set point refers to the active circuit (set point in the high or low temperature circuit, or DHW set point).

If the Manifold Temperature < set point – 5°C, the next burner is started.

The Master controller waits 30 seconds, and then

if the Manifold Temperature < set point - 5°C, another burner is started.

If the Manifold Temperature > set point + 2°C the last burner is stopped. The Master controller waits 30 seconds before checking the situation again.

### **ADDITIONAL CASCADING MANAGEMENT FUNCTIONS**

#### **Rotation of burner ignition sequence**

When Master controller is switched on, the burner with address 1 is the first in the sequence. After 24 hours, the burner with address 2 becomes the first burner, while the burner with address 1 becomes the last in the sequence.

#### **Limitation of starts/stops**

In both cascading strategies, after each start or stop, a minimum time must expire before the Master can start or stop any of the burners.

#### **Rapid start/stop**

In both modes a function is available for rapidly reaching stable operating conditions and shutting down.

If the Manifold Temperature < set point - 70°C the burners are started at 2 second intervals.

If the Manifold Temperature > set point + 4°C the burners are stopped at 2 second intervals.

#### **Low load**

The low load function prevents the burners from starting and stopping when there is a low heating demand. The conditions for the activation of the Low Load function are checked on every Slave board, which sends the request to enable the function to the Master.

During normal operation, the set point in the active circuit (set point in the high or low temperature circuit, or DHW set point) is sent to the Slave boards, and the temperature of the heating unit is checked by each Slave board:

if the Boiler temperature > Set point – 8°C or

the Boiler temperature > 85°C - 8°C, the signal to start the burner is disabled.

When the Slave board reads a boiler temperature greater than 85°C three times when the burner is on, the heating unit is stopped and the start-up procedure is enabled again.

#### **Emergency function**

In the event of faults on the Master board, there are two ways of manually controlling the Slave boards:

##### **- By eBUS and manifold probe**

Disconnect the power supply from the system, unplug the BUS. Set the address 000000 on all the Slave boards (J10 and J17 OFF). Connect a power supply between 21 and 28 Vac to the BUS.

If the Manifold Temperature < Emergency Temp. (Par.40; pre-set to 70°C; settable between 10 and 80°C) all the burners operate at maximum output.

If the Manifold Temperature > Emergency Temp. + 5°C all the burners are stopped;

##### **- By PC**

Disconnect the power supply from the system, unplug the BUS and connect the PC interface. The output of the burners can be sent directly to the Slave boards using the PC.



In the event of faults, contact **Vokera Ltd** or a suitably qualified person.

**Managing the heating demand in the high temperature circuit by analogue input (Par. 14=2 or 3)**

The room thermostat in the high temperature circuit is ignored for the heating demand, and the input signal is used to calculate the output or the system set point.

There is just one analogue input (see terminals 13-14 on the wiring diagram on page 34) on the Master board and this can also be used for the low temperature circuit (Par.22). The analogue input cannot be used for both the circuits.

**ANALOGUE INPUT FOR HEAT OUTPUT, PAR. 14=2 (PAR. 22=2 FOR LOW TEMPERATURE CIRCUITS)**

The demand for the high temperature (low temperature) circuit is made according to the following rules:

**0-2Vdc:** no demand from the high temperature (low temperature) circuit

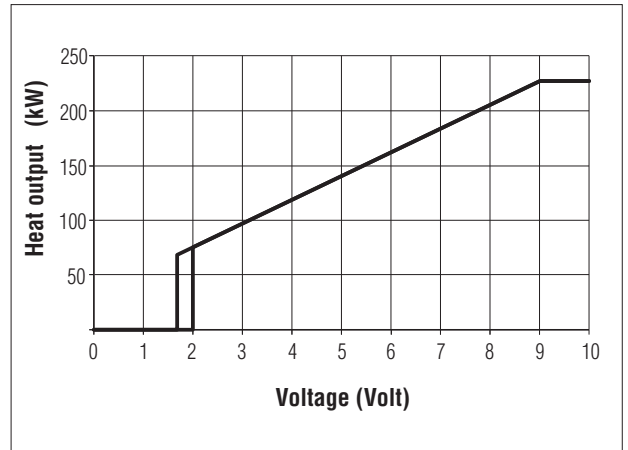
**2-9Vdc:** 2-9Vdc: the demand for heat is converted into an output demand for each Slave. An input of 2V corresponds to minimum output, 9V to maximum output (Par.15). Between 2V and 9V the output is calculated linearly. The hysteresis for the end of the demand is 0.2V and therefore the demand is active above 2V and ends below 1.8V.

The burner starts when:

Outlet Temp.  $\leq$  Setpoint\_Ch\_high (Par.1) – Ch\_high\_mod\_hist\_on (Par.19)  
(Outlet Temp.  $\leq$  Setpoint\_Ch\_low (Par.3) – Ch\_low\_mod\_hist\_on (Par.26))

The burner stops when:

Outlet Temp.  $>$  Setpoint\_Ch\_high (Par.1) + Ch\_high\_hist\_off (Par.20)  
(Outlet Temp.  $>$  Setpoint\_Ch\_low (Par.3) + Ch\_low\_hist\_off (Par.27))



**ANALOGUE INPUT FOR TEMPERATURE, PAR. 14=3 (PAR. 22=3 FOR LOW TEMPERATURE CIRCUITS)**

The demand for the high temperature (low temperature) circuit is made according to the following rules:

**0-2Vdc:** no demand from the high temperature (low temperature) circuit

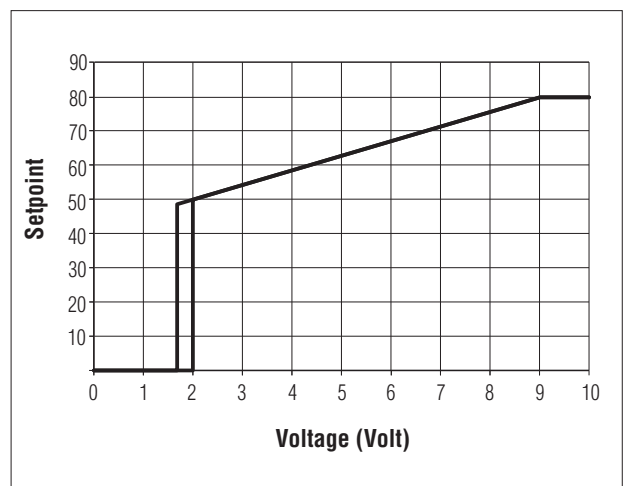
**2-9Vdc:** the demand for heat is converted into an output requirement for each Slave, by the PID\_CH\_high (PID\_CH\_low) algorithm. 2V corresponds to a set point of T\_Ch\_high\_foot, Par. 18 (T\_Ch\_low\_foot, Par. 24), 9V to a set point of Setpoint\_Ch\_high, Par.1 (Setpoint\_Ch\_low, Par.3). Between 2V and 9V the set point is calculated linearly. The hysteresis for the end of the demand is 0.2V and therefore the demand is active above 2V and ends below 1.8V.

The burner starts when:

Outlet Temp.  $\leq$  Setpoint\_ch\_high (Par. 1) – Ch\_high\_hist\_on (Par 19)  
(Outlet Temp.  $\leq$  Setpoint\_ch\_low (Par. 3) – Ch\_low\_mod\_hist\_on (Par.26))

The burner stops when:

Outlet Temp.  $>$  Setpoint\_ch\_high (Par. 1) + Ch\_high\_hist\_off (Par. 20)  
(Outlet Temp.  $>$  Setpoint\_ch\_low (Par. 3) + Ch\_low\_hist\_off (Par. 27)).



## MANAGEMENT OF THE MIXING VALVE

The mixing valve is controlled by the following parameters:

Mix\_valve\_step\_open\_time: Par.28 pre-set to 5s  
 Mix\_valve\_step\_close\_time: Par.29 pre-set to 7s  
 Mix\_valve\_interval\_time: Par.30 pre-set to 5s  
 Mix\_valve\_p\_hyst: Par.31 pre-set to 2°C  
 Mix\_valve\_still\_hyst: Par.32 pre-set to 2°C

Before opening or closing, the valve waits the time set for Par.30.

It opens if:

$T_{\text{low inlet temperature}} < \text{Setpoint}_{\text{low}} - \text{Par}32$

It closes if:

$T_{\text{low inlet temperature}} > \text{Setpoint}_{\text{low}} + \text{Par}32$

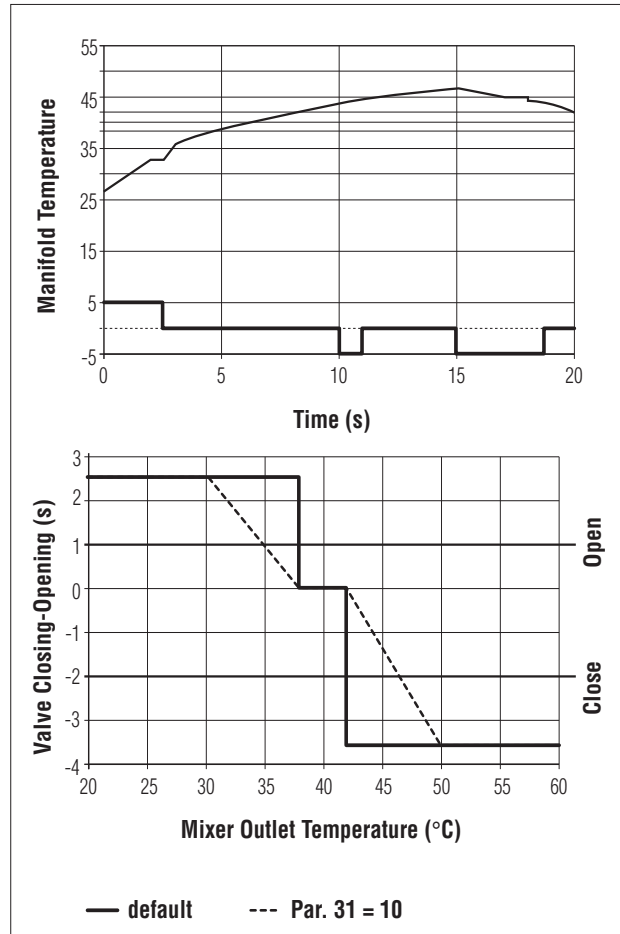
Within the interval, the valve remains in the current position.

If:

$T_{\text{low inlet temperature}} < \text{Setpoint}_{\text{low}} - \text{Par}31$  it opens for a time equal to half of the value set for Par. 28

If:

$T_{\text{low inlet temperature}} > \text{Setpoint}_{\text{low}} + \text{Par}31$  it closes for a time equal to half of the value set for Par. 29.



## Safety functions on the Slave boards

When the Outlet Temperature  $> 90^{\circ}\text{C}$  for 5s, the Slave board shuts down (no. 46).

When the Return Temperature  $> 80^{\circ}\text{C}$  for 5s, the Slave board shuts down (no. 47).

When the Flue Gas Temperature  $> 80^{\circ}\text{C}$  for 5s, the Slave board shuts down (no. 48) and the fan operates for 10 minutes at maximum speed.

The Slave board can protect the main exchanger against the dangers of low water circulation, in three ways:

1 = by flow switch (water differential pressure switch)

2 = by controlling the difference between the outlet and return temperature DT

3 = by flow switch and DT

The control on the DT uses a parameter, DT\_max (pre-set to  $35^{\circ}\text{C}$ ) and limits the output of the burner as follows:

if $\text{DT}_{\text{max}} - 5^{\circ}\text{C} > \text{DT} > \text{DT}_{\text{max}} - 10^{\circ}\text{C}$	burner modulation
if $\text{DT}_{\text{max}} > \text{DT} > \text{DT}_{\text{max}} - 5^{\circ}\text{C}$	burner at minimum
if $\text{D}_T > \text{D}_T_{\text{max}}$	burner off.

## SETTING THE ADDRESSES FOR CASCADING CONFIGURATIONS

The microswitches on the slave boards are factory-set so as to interface a master boiler (50 M or 100 M) to a slave boiler (100 S). If other slave boilers need to be connected, the microswitches must be set again.

### Accessing the slave boards

- Move the main system switch to "off"
- Access the slave boards inside the boiler control panel (see the steps described on page 65)
- Follow the address setting procedure described below, and then connect the boilers using the special bus cable (see the wiring diagrams starting from page 14).

### Setting the ADDRESSES

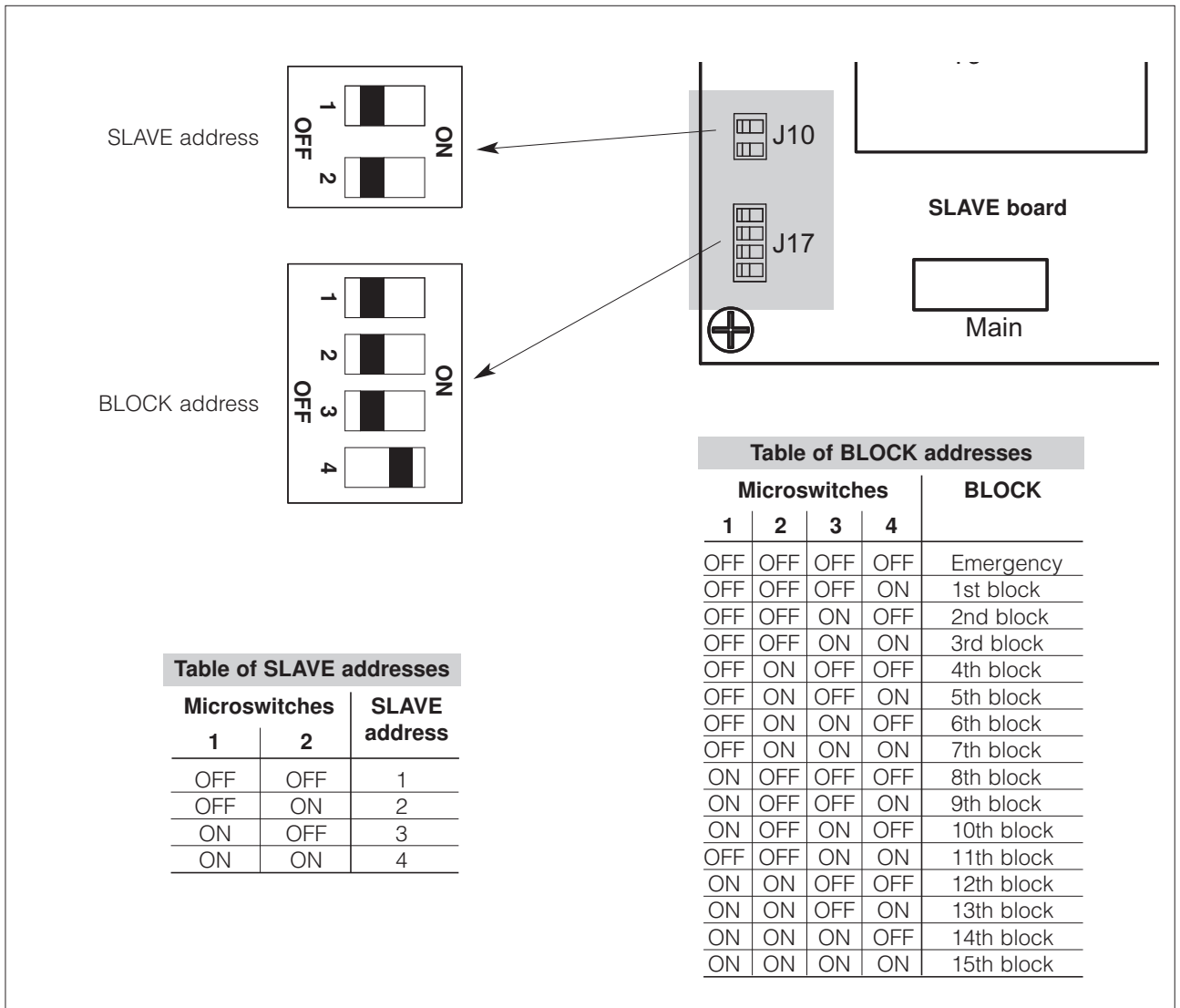
Each slave board (one for each heat generator) must be configured so as to be recognised in the right sequence by the master board.

The slave generators should first of all be divided into blocks; the system can manage up to 15 blocks of four slave generators each.

For example, if 5 slave generators are connected to a master, there are two blocks: the first made up of four slave generators and the second of one slave generator.

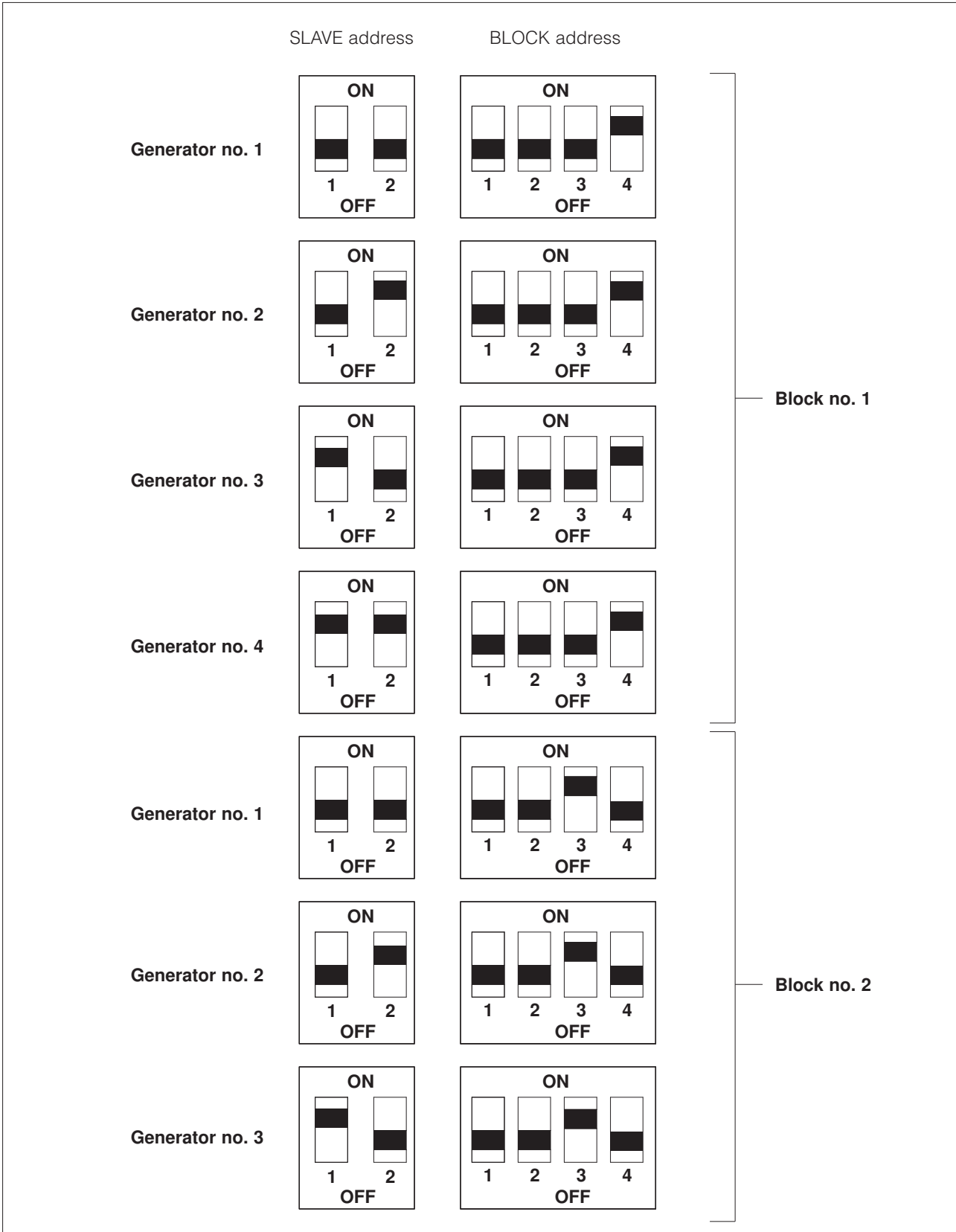
Consequently, the addresses should be set as follows:

- Identify the block of four that the slave generator being configured belongs to (for example block 1, 2, ....., up to block 15)
- Identify the position of the slave generator inside each block (e.g. position 1, 2, 3 or 4).



**Example configuration of a set of 7 burners in cascading**

If installing a set of seven slave generators, there are two blocks: the first made up of four generators, and the second of three. Therefore, two blocks need to be configured, with address 1 and 2 respectively, and the generators belonging to the first block must have address 1, 2, 3 and 4, and those belonging to the second block address 1, 2 and 3.



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## FAULT CODES

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### **ERRORS ON THE MASTER BOARD**

The following tables provide a description of the errors that may occur on the Master board.

The errors can be divided into two groups:

- Type A errors, which can only be deactivated by pressing RESET (see ref. 3 on page 18).
- Type E errors, which are deactivated when the causes are no longer present.

#### **Permanent errors, TYPE A**

<b>N°</b>	<b>Error</b>	<b>Description</b>
A 16	EEPROM ERROR	The contents of the EEPROM are not correct
A 18	INCORRECT EEPROM SIGNATURE	EEPROM not recognised by the processor

#### **Errors deactivated automatically, TYPE E**

The following errors may occur, and can be deactivated automatically.

If any one of these errors occurs, the red LED comes on (see ref. 4 on page 18).

<b>N°</b>	<b>Error</b>	<b>Description</b>
E 02	NTC1 open (or not connected) (NTC1 = outlet sensor)	Probe manifold not connected
E 04	NTC3 OPEN	Storage heater probe not connected
E 18	NTC1 short-circuited (NTC1 = outlet sensor)	Probe manifold short-circuited
E 20	NTC3 short-circuited (NTC3 = sensor on the storage heater)	Storage heater probe short-circuited
E 23	REFHI TOO LOW ERROR	Temperature measured not correct
E 24	REFHI TOO HIGH ERROR	Temperature measured not correct
E 25	EEPROM READING ERROR	The EEPROM is not legible
E 25	REFLO TOO LOW ERROR	Temperature measured not correct
E 26	REFLO TOO HIGH ERROR	Temperatura misurata non corretta
E 32	SLAVES NON PRESENT	There are no slave boards connected
E 34	50 Hz ERROR	The mains frequency is not 50 Hz

## **ERRORS ON THE SLAVE BOARD**

### **List of slave errors: manual reset (see ref. 3 on page 18)**

If slave errors with manual reset occur, the Slave reset button can be used (see ref. 13 on page 18).

<b>No.</b>	<b>Error</b>
A 01	5 failed attempts at ignition
A 02	Too many failed ignitions
A 04	Gas valve relay error
A 05	Gas valve relay error
A 06	Safety relay does not close
A 07	Safety relay does not open
A 08	Safety relay open when should be closed
A 09	RAM error
A 10	EEPROM error
A 11	Fan error
A 12	Incorrect EEPROM signature
A 16	Safety relay closed when should be open
A 17	Outlet sensor error for having exceeded the max. outlet temperature
A 18	Return sensor error for having exceeded the max. return temperature
A 19	Flue gas sensor error for having exceeded the max. flue gas temperature (with this error the fan operates at maximum speed )
A 20	The flame is extinguished too late after the gas valve closes
A 24	Fan error

### **List of slave errors: automatic reset**

<b>NO.</b>	<b>Error</b>
E 33	Phase error
E 34	Reset button error
E 35	Water pressure switch error – contact not closed
E 36	EEPROM reading error
E 37	Flame detection error – line and neutral reversed
E 38	Flue gas probe short-circuited
E 39	Flue gas probe open
E 40	50 Hz error
E 41	Communication error
E 42	Outlet probe short-circuited
E 43	Outlet probe with contact open
E 44	Return probe short-circuited
E 45	Return probe with contact open
E 46	Outlet probe error for having exceeded the temperature limit
E 47	Return probe error for having exceeded the temperature limit
E 48	Flue gas probe error for having exceeded the temperature limit (with this error, the fan operates at max.)

## LIST OF PARAMETERS

No.	Name	lower limit	upper limit	default setting	UOM	Description
<b>User parameters</b>						
<b>1</b>	SetPoint_ch_high	10	Par. 17	<b>70</b>	°C	If Par14=0 this is the high temperature circuit set point If Par14=1 this is the maximum temperature in the high temperature circuit
<b>2</b>	SetPoint_DHW	10	Par. 8	<b>50</b>	°C	
<b>3</b>	SetPoint_ch_low	10	Par. 23	<b>40</b>	°C	If Par22=0 this is the low temperature circuit set point If Par22=1 this is the maximum temperature in the low temperature circuit
<b>INSTALLER parameters accessible by password: 22</b>						
<b>6</b>	DHW_type	0	6	<b>0</b>		0 = No DHW service 1 = Instant with NTC probe 2 = Storage heater with NTC probe 5 = Instant with flow switch 6 = Storage heater with thermostat
<b>7</b>	P_DHW_max	1	255	<b>230</b>		Maximum speed/output in DHW
<b>8</b>	T_DHW_limit	10	80	<b>60</b>		Limit for user DHW setting
<b>9</b>	DHW_priority	0	2	<b>0</b>		0 = Sliding A 1 = Sliding B 2 = Absolute priority
<b>10</b>	T_tank_extra	0	50	<b>30</b>	°C	Modular temp system in DHW = Par. 2 + Par. 10
<b>11</b>	T_tank_hyst_up	0	20	<b>1</b>	°C	Upper DHW differential
<b>12</b>	T_tank_hyst_down	0	20	<b>5</b>	°C	Lower DHW differential
<b>13</b>	N°_bruc_DHW	1	60	<b>60</b>		Maximum no. of burners in DHW
<b>14</b>	CH_type_high	0	3	<b>1</b>		0 = Fixed temperature 1 = Climate with outside probe 2 = 0-10 Vdc for heat output 3 = 0-10 Vdc for temperature
<b>15</b>	P_ch_max	1	255	<b>230</b>		Maximum speed/output in CH
<b>16</b>	CH_priority	0	2	<b>0</b>		0 = No priority between circuits 1 = Priority to the high temperature circuit 2 = Priority to the low temperature circuit
<b>17</b>	T_CH_high_limit	10	80	<b>80</b>	°C	Limit for user high temperature circuit setting
<b>18</b>	T_CH_high_foot	10	Par. 1	<b>50</b>	°C	Min. high circuit set point at the maximum outside temperature (Par. 38)
<b>19</b>	CH_high_hyst_on	0	20	<b>7</b>	°C	Start hysteresis in high temperature circ.
<b>20</b>	CH_high_hyst_off	0	20	<b>3</b>	°C	Stop hysteresis in high temperature circ.
<b>21</b>	Attenuation_high	0	70	<b>0</b>	°C	Set point attenuation with room thermo. open
<b>22</b>	CH_type_low	0	3	<b>1</b>		0 = Fixed temperature 1 = Climate with outside probe 2 = 0-10 Vdc for heat output 3 = 0-10 Vdc for temperature
<b>23</b>	T_CH_low_limit	10	70	<b>50</b>	°C	Limit for user low temperature circuit setting
<b>24</b>	T_CH_low_foot	10	Par. 13	<b>25</b>	°C	Min. low circuit set point - at the maximum outside temperature (Par. 38)
<b>25</b>	Attenuation_low	0	70	<b>0</b>	°C	Set point attenuation with room thermo. open

<b>26</b>	CH_low_hyst_on	0	20	<b>5</b>	°C	Start hysteresis in low circuit calculated on the mixer outlet temp
<b>27</b>	CH_low_hyst_off	0	20	<b>3</b>	°C	Stop hysteresis in low circuit calculated on the mixer outlet temp
<b>28</b>	Mix_valve_step_open_time	0	255	<b>5</b>	s	For each step the valve opens 1/2 of the set value
<b>29</b>	Mix_valve_step_close_time	0	255	<b>7</b>	s	For each step the valve closes 1/2 of the set value
<b>30</b>	Mix_valve_interval_time	0	255	<b>5</b>	s	Mixing valve delay
<b>31</b>	Mixing_p_hyst	0	255	<b>2</b>	°C	Hysteresis for maximum valve opening
<b>32</b>	Mixing_still_hyst	0	255	<b>2</b>	°C	
<b>33</b>	Power control mode	0	1	<b>1</b>		0 = Minimum number of burners 1 = Maximum number of burners
<b>34</b>	3° pump	0	1	<b>0</b>		0 = System/loop 1 = Low temperature circuit
<b>35</b>	Frost protection	-30	15	<b>3</b>	°C	System
<b>36</b>	Gas_type	1	7	<b>1</b>		1 = NG with flue < 15m 2 = NG with flue > 15m 3 = LPG with flue < 15m 4 = LPG with flue > 15m
<b>37</b>	T_out_min	-20	30	<b>0</b>	°C	
<b>38</b>	T_out_max	0	30	<b>18</b>	°C	
<b>39</b>	T_out_correct	-30	30	<b>0</b>	°C	
<b>40</b>	T_emergency	10	80	<b>70</b>	°C	
<b>41</b>	Parameter_reset	0	1	<b>0</b>		
<b>42</b>	Flow switch on slave	0	1	<b>1</b>		0 = The slave does not control the pressure switch
<b>43</b>	Protocol	0	1	<b>1</b>		0 = Eco protocol 1 = Argus link (new)

## CONVERSION FROM ONE TYPE OF GAS TO THE OTHER

The **Vokera CONDEXA PRO** Boiler is supplied for operation on G20 (natural gas). However, it can be converted for operation on G30-G31 (LPG), using the special kit supplied.

Before performing the conversion:

- Disconnect the power supply from the appliance by moving the main switch to "off";

- Close the fuel valve.

To install the kit:

- Unscrew the fastening screws (1) on the front panel (2)

- Pull the base of the panel (2) outwards and then upwards to release it from the frame and then remove it


- Set parameter 36 to 3 or 4, according to the length (L) of the flue:


3 =  $L < 15$  m

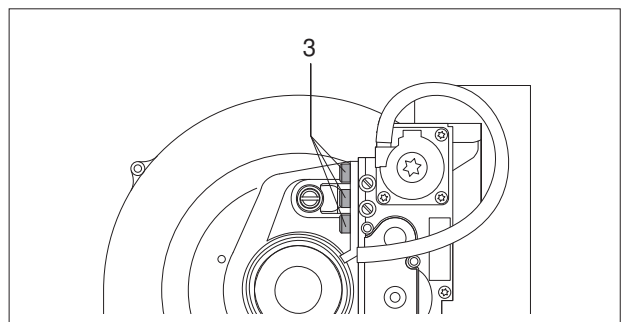
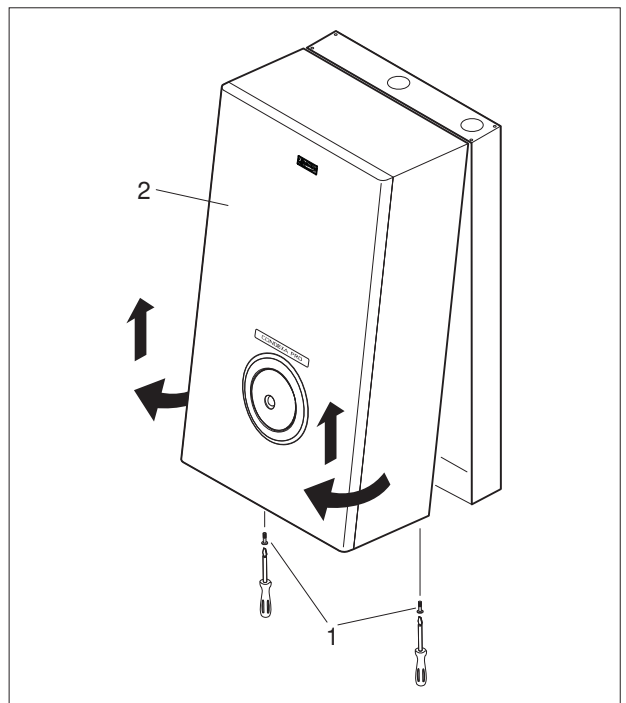
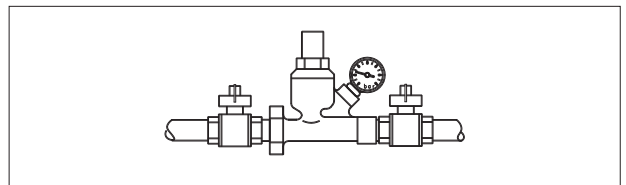
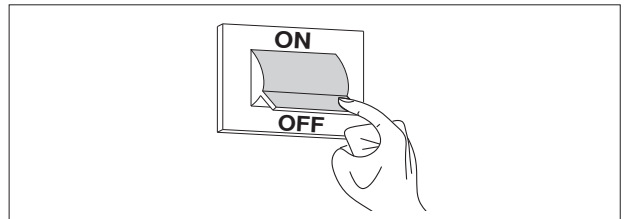
4 =  $L > 15$  m.

The fan speed is controlled automatically.

- Disassemble the gas valve from the fan assembly by loosening the three screws (3)

 The conversion must only be carried out by **Vokera Ltd** or personnel authorised by **Vokera**, even when the boiler is already installed.

 Once the conversion has been completed, set the boiler again as described in the paragraph on "Adjustments".



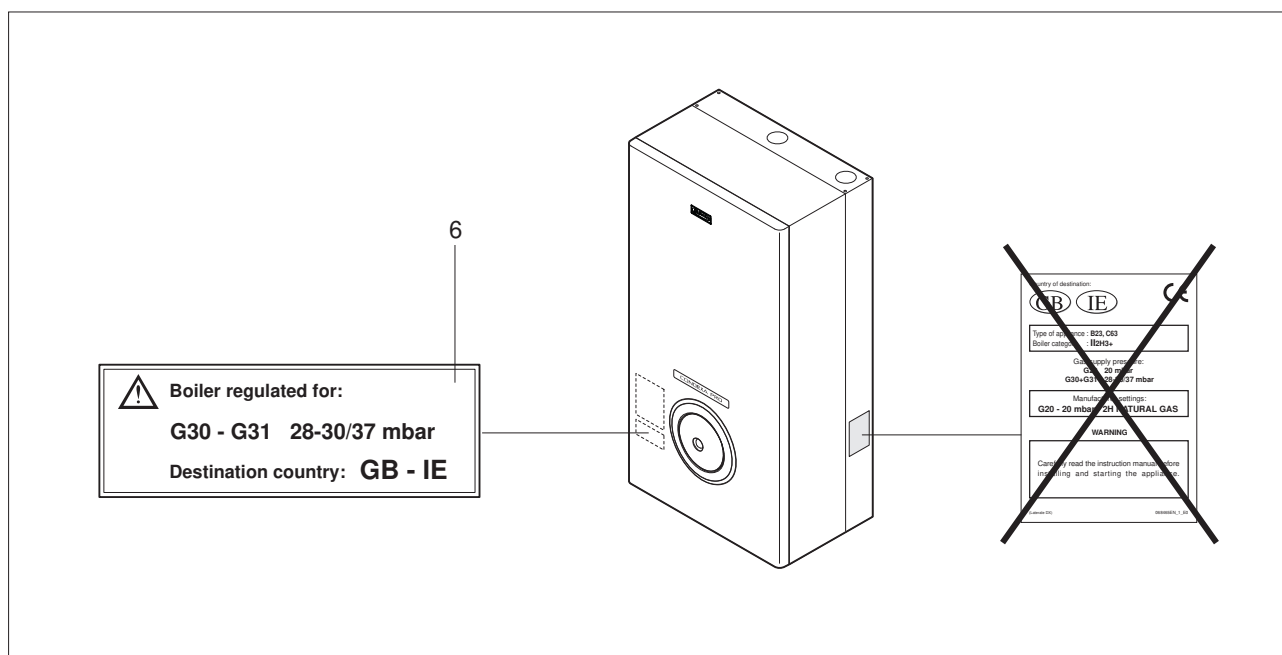
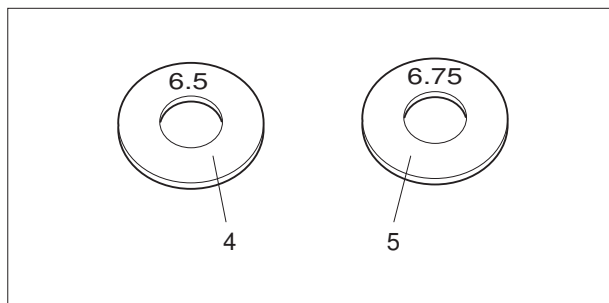
- Replace the calibrated diaphragm fitted on the gas valve with the diaphragm (4) supplied inside the kit, marked "6.5".

Only if the boiler is supplied by a mixture of gases that causes ignition problems, use the other diaphragm (5) marked "6.75".

- Reassemble the gas valve

- Apply the sticker (6) for G30-G31, supplied inside the kit, on the inside of the panelling, and remove the sticker for G20

- Remove the G20 gas label from the inside of the frame.



After having installed the kit make sure that:

- All the joints made are tight

- All the calibration operations described in the "Adjustments" paragraph below have been completed.

## ADJUSTMENTS

The **Vokera CONDEXA PRO** Boiler is supplied for operation on G20 (natural gas), as indicated on the rating plate, and has already been adjusted in the factory by the manufacturer.

If, however, the adjustments need to be performed again, for example after special servicing operations, the replacement of the gas valve, or alternatively following the conversion from G20 to G30-G31 or vice-versa, proceed as follows.

### CO<sub>2</sub> ADJUSTMENT AT MAXIMUM OUTPUT

- Press the **"MODE"** and **"+"** buttons together for 5s.
- Start the boiler by adjusting the room thermostat.

The boiler will operate at maximum output showing "H" on the display, followed by the outlet temperature (chimney sweep function).

- Unscrew the cap (1) and insert the combustion analyser probe
- Adjust the CO<sub>2</sub> using a screwdriver on the adjustment screw (2) located on the fan assembly (**turning clockwise decreases the CO<sub>2</sub> value**), so as to achieve a value of 9.4% for G20 and 10.7% for G30-G31.

### CO<sub>2</sub> ADJUSTMENT AT MINIMUM OUTPUT

- Press the **"MODE"** and **"-"** buttons together for 5s.

The boiler will operate at minimum output showing "L" on the display, followed by the outlet temperature.

- Adjust the CO<sub>2</sub> using a screwdriver on the adjustment screw (3) located on the fan assembly (**turning anti-clockwise decreases the CO<sub>2</sub> value**), so as to achieve a value of 8.4% for G20 and 8.7% for G30-G31.

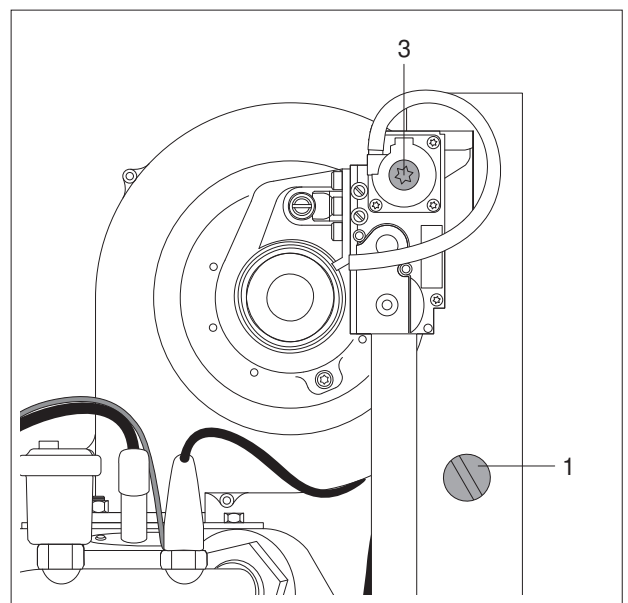
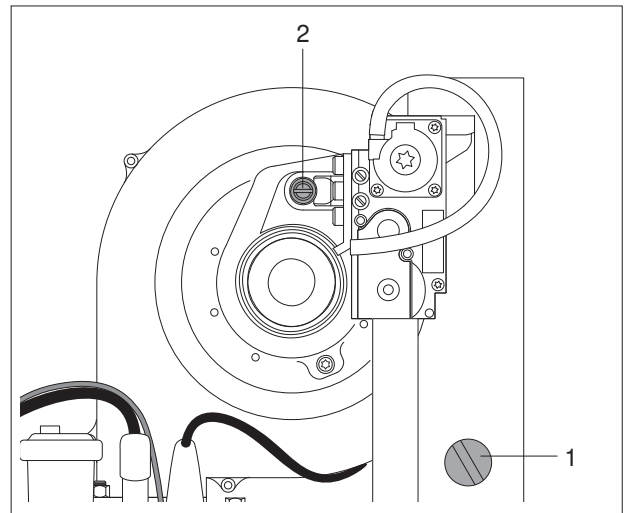
### CHECKING THE CALIBRATION

Press the "MODE" and "+" buttons together for 5s and check the max CO<sub>2</sub> value (9.4% for G20 and 10.7% for G30-G31). Then press the "MODE" and "-" buttons for 5s and check the min CO<sub>2</sub> value (8.4% for G20 and 8.7% for G30-G31).

After having completed the checks:

- Stop the chimney sweep function by pressing **"MEMO"**
- Adjust the thermostat so as to stop the boiler
- Remove the analyser probe and carefully retighten the cap (1).

**⚠ The adjustments at maximum and minimum output must be carried out in the sequence described, and only by Vokera Ltd or personnel authorised by Vokera.**



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## TEMPORARY SHUTDOWN

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In the event of temporary absence over the weekend, brief trips, etc. proceed as follows:

- Set the room thermostats to around 10°C
- Set parameter 2 to "10" or alternatively set the storage heater thermostat to 10°C

By leaving the power supply on, as signalled by the green LED flashing, and the fuel supply open the boiler is protected.

The electronic controller has a **frost protection** function that is also **active** in standby

The frost protection function has two levels:

- the first starts the pump  
if the manifold temperature  $\geq 5^{\circ}\text{C}$ , or alternatively, when  $\text{CH\_type}=1$  and the outside probe is connected; if the out. temp  $\leq 3^{\circ}\text{C}$  (Par. 35=Frost\_protection) the system pump and the pump in the high temperature circuit are started.
- the second starts the pump and the burner  
if after 10 minutes the temperature in the manifold  $\leq 5^{\circ}\text{C}$ , a burner is started at maximum output until the temperature in the manifold  $\geq 20^{\circ}\text{C}$ ;  
if after 10 minutes the temperature in the manifold  $\geq 5^{\circ}\text{C}$ , while if  $\text{CH\_Type} = 1$  and the outside probe is connected, and the outside temperature  $\leq 3^{\circ}\text{C}$ , the pump continues operating until the outside temperature  $\geq 3^{\circ}\text{C}$ .

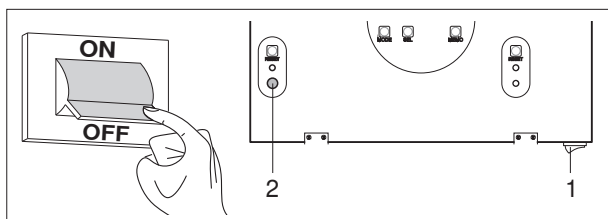
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## SHUTTING DOWN FOR EXTENDED PERIODS

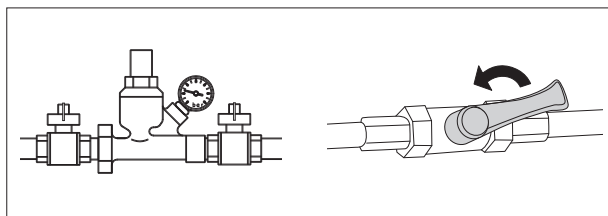
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If the **CONDEXA PRO** boiler is not used for an extended period, the following operations must be performed:

- Move the main system switch and the main boiler switch (1) to "off" and check that the green indicator light is off (2).
- Close the fuel and water valves on the central heating system.



**⚠ In this case, the frost protection system is deactivated. Empty the central heating and DHW system if there is the risk of freezing.**



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## SERVICING

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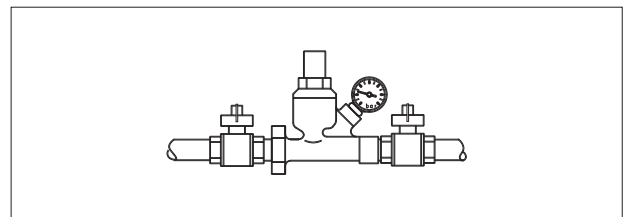
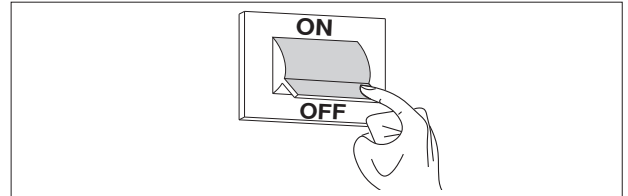
Periodical servicing is a "requirement" and is also essential for the safety, the efficiency and the long life of the appliance. It ensures reduced consumption and polluting emissions and maintains the reliability of the product over time.

The appliance can be serviced **Vokera Ltd** or personnel authorised by **Vokera**.

Analysis of combustion, performed before starting servicing, provides useful information on the operations to be performed.

Before performing any operation:

- Disconnect the power supply by moving the main system switch to "off"
- Close the fuel valve.



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## CLEANING THE BOILER AND DISMANTLING THE INSIDE COMPONENTS

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Before performing any cleaning operation, disconnect the power supply by moving the main system switch to "off".

### OUTSIDE

Clean the casing, the control panel, the painted parts and the plastic parts with cloths dipped in soap and water. In the case of hard-to-remove stains, wet the cloth with a 50% mixture of water and denatured alcohol or specific products.

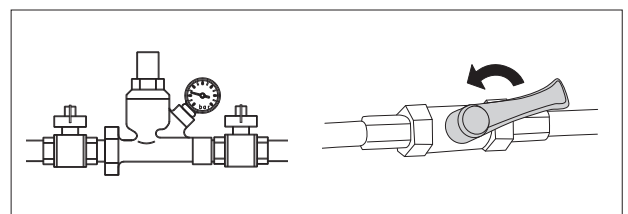
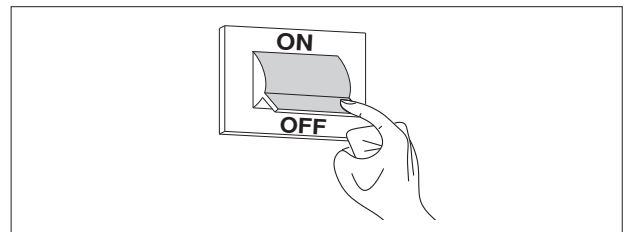


Do not use fuels and/or sponges with abrasive solutions or detergent powder.

### INSIDE

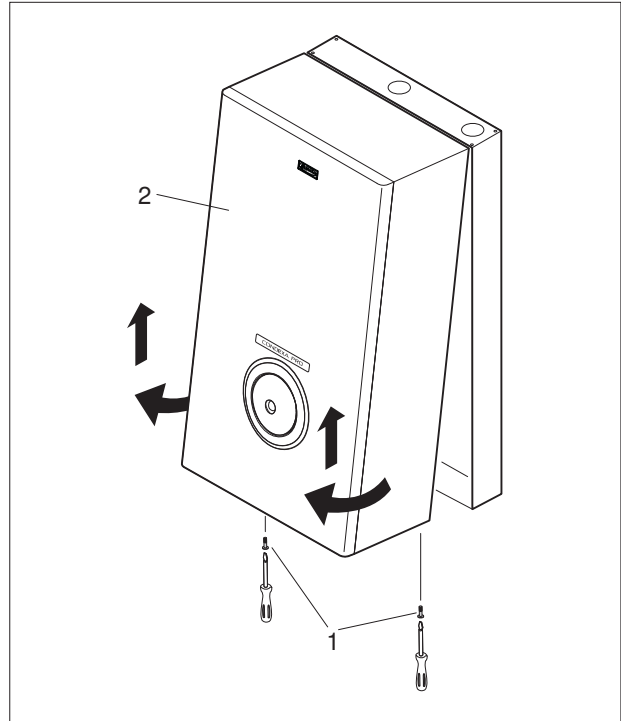
Before starting the inside cleaning operations:

- Close the gas valves
- Close the system valves.

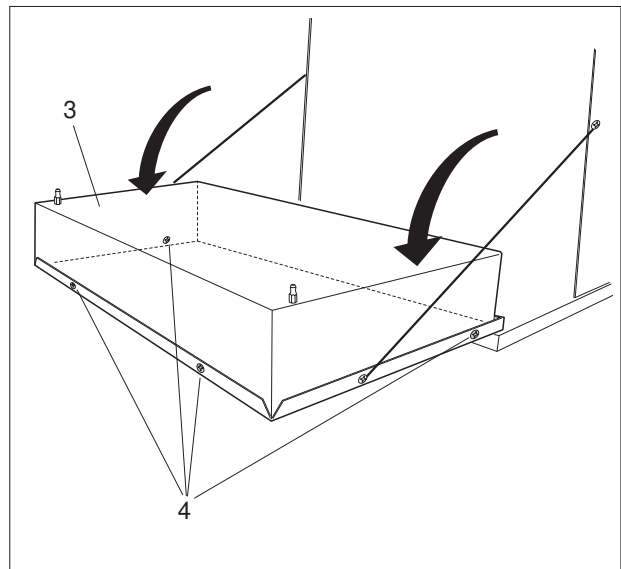


**Removing the front panel, accessing the control panel and the inside of the boiler**

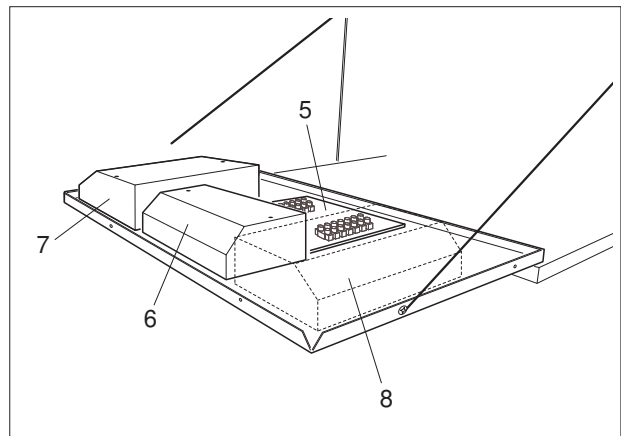
- Unscrew the fastening screws (1) on the front panel (2)
- Pull the base of the panel (2) outwards and then upwards to release it from the frame and then remove it



- Turn the control panel (3) 90°C and take out the four screws (4) so as to remove the rear cover.




- The terminal block (5) and the boards can now be accessed:
- Master board (6) (models 50M and 100M)
- first Slave board (7)
- second Slave board (8) (models 100M and 100S)



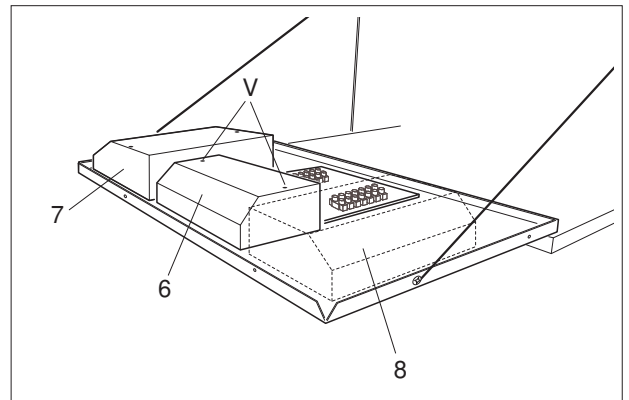
Once the servicing operations have been completed, reassemble the components in the reverse order.

### **Dismantling the Master and Slave boards**

- Remove the panel front and access the inside of the control panel (see the steps described on the previous page).
- Remove the screws (V) and then the cover from the Master board.
- Repeat the same operation to remove the cover (7) from the first Slave board and (8) any second Slave board.
- Remove the wiring connectors from the boards and unscrew the fastening screws so as to remove the boards.

 If replacing the Master board, refer to the wiring diagram on page 14 to restore the connections.


Once the servicing operations have been completed, reassemble the components in the reverse order.

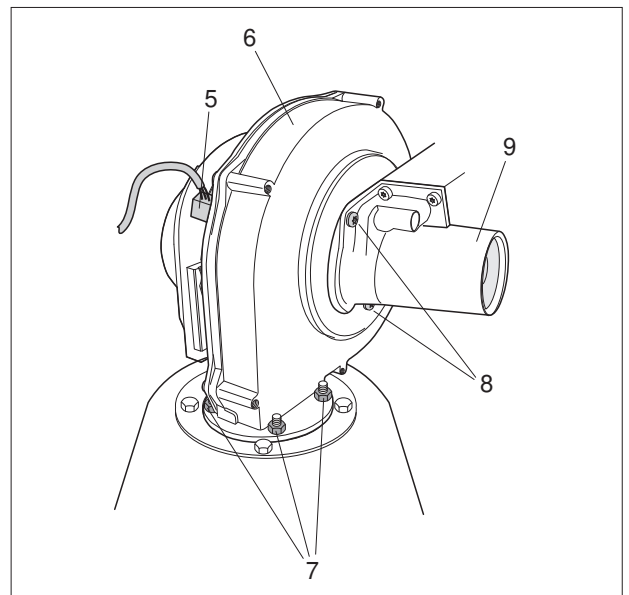


### **Dismantling the fan**

- Remove the front and top panel of the boiler (see the operations described on page 65).
- Remove the wiring (5) from the fan (6)
- Unscrew the four screws (7) that fasten the fan (6) to the exchanger using an 8 mm socket wrench
- Unscrew the two screws (8) that fasten the fan (6) to the air conveyor (9)
- Remove the fan (6).

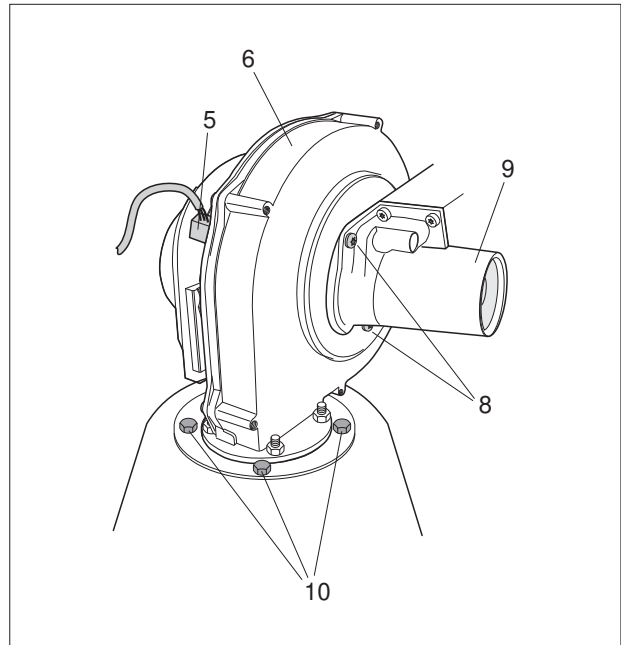
Once the cleaning operations have been completed, reassemble the components in the reverse order.

 Check that the gas connection is tight.




### Dismantling and cleaning the burner and the exchanger

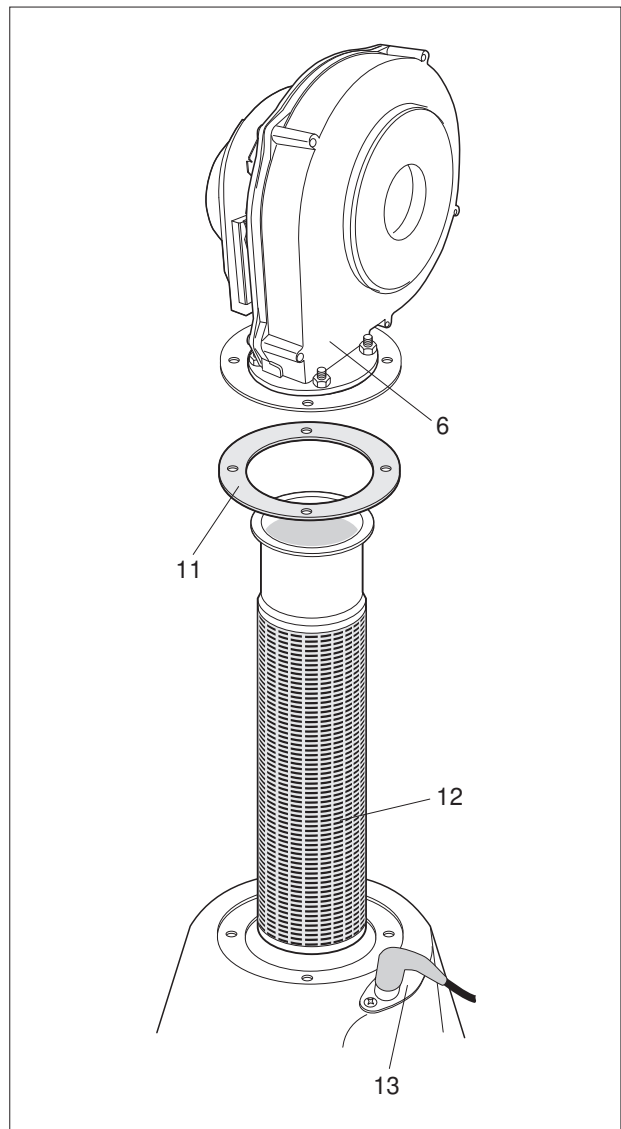
- Remove the front and top panel of the boiler (see the operations described on page 65).
- Remove the wiring (5) from the fan (6)
- Unscrew the two screws (8) that fasten the fan (6) to the air conveyor (9)
- Unscrew the four screws (10) that fasten the fan assembly (6) to the exchanger, using a 10 mm socket wrench



- Remove the gasket (11) and remove the burner (12)
- Remove the electrode plate (13), check the condition of the electrode and replace if necessary.

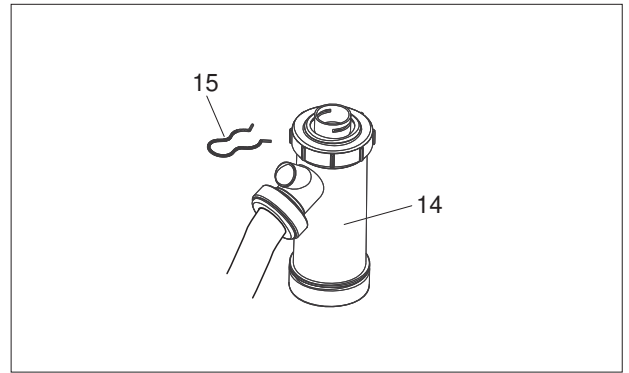
Once the cleaning operations have been completed, reassemble the components in the reverse order.

 Check that the gas connection is tight.



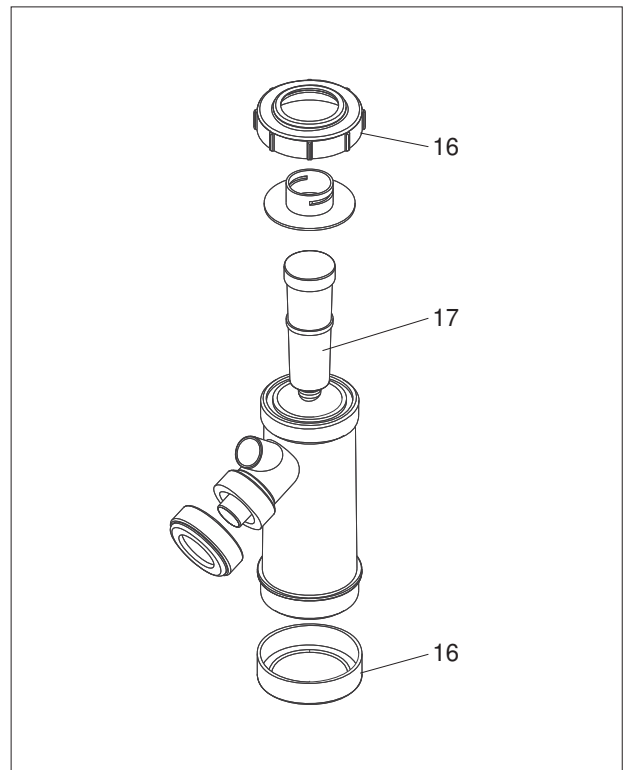
### **Cleaning the drain trap and condensate drain**

- Remove the front and top panel of the boiler (see the operations described on page 65) and identify the condensate drain trap (14)



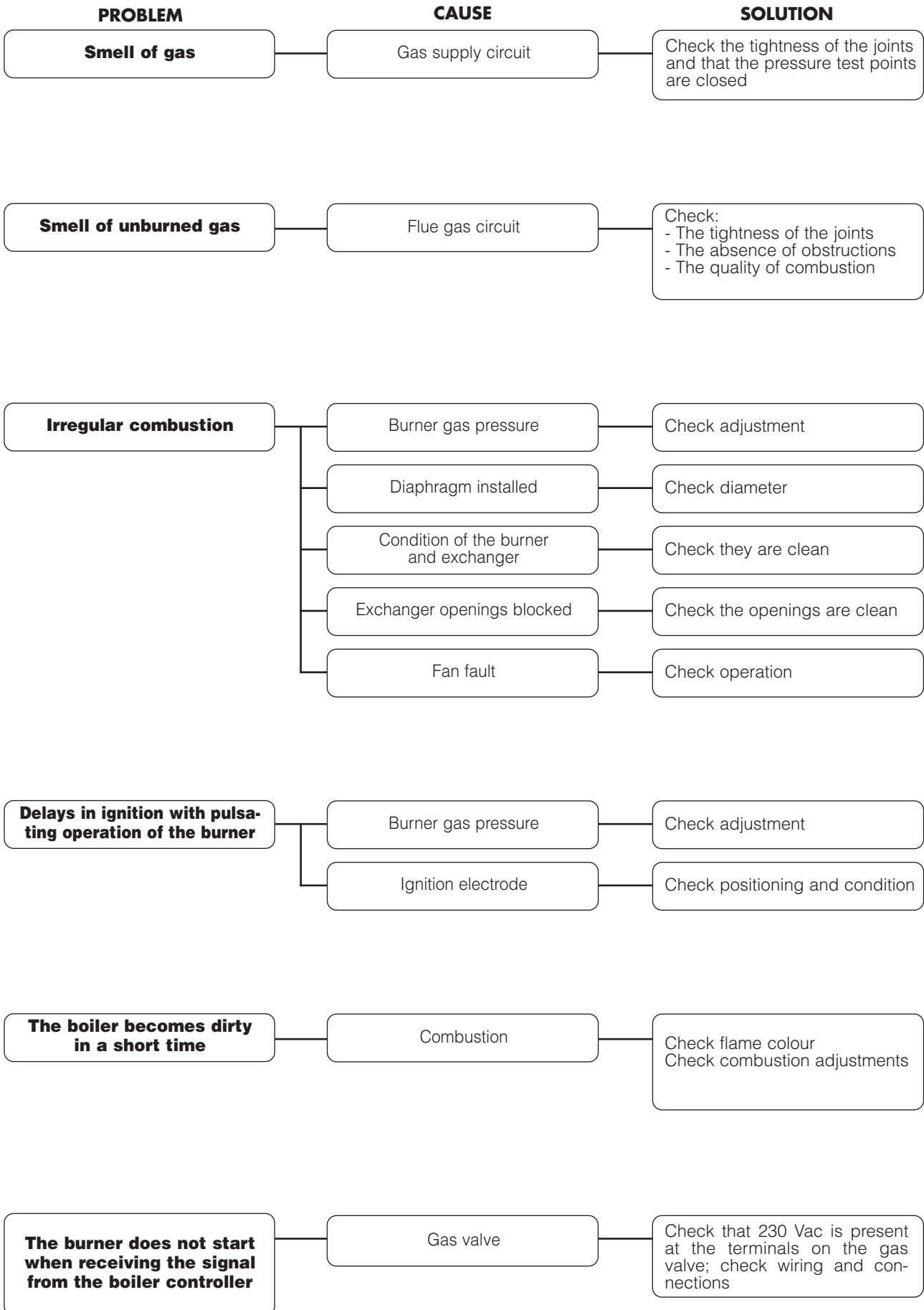
- Remove the safety pin (15), remove the corrugated condensate drain pipe, remove the drain trap and dismantle it, using the two screw caps (16).

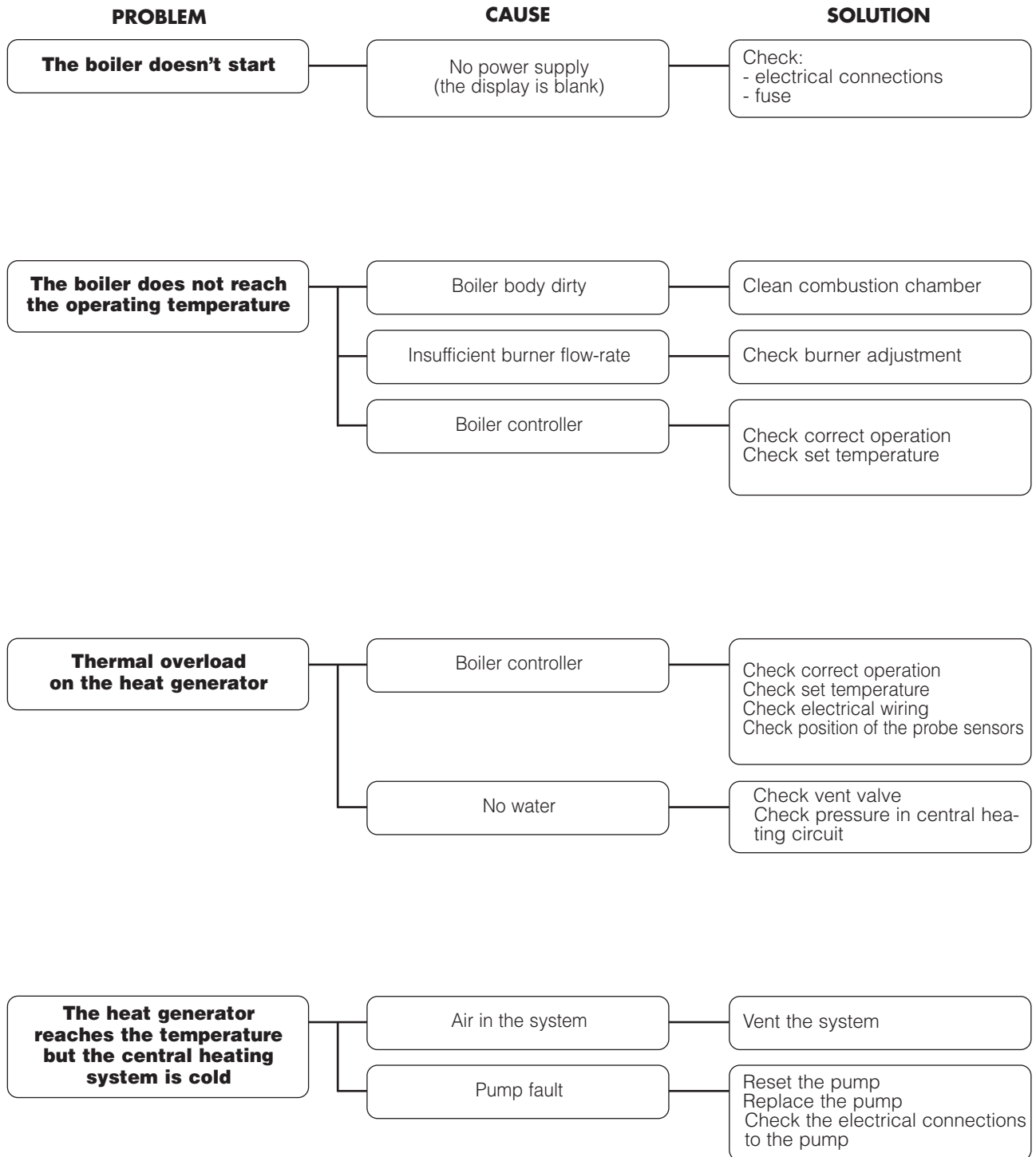
- Remove the float (17) and clean all the components.

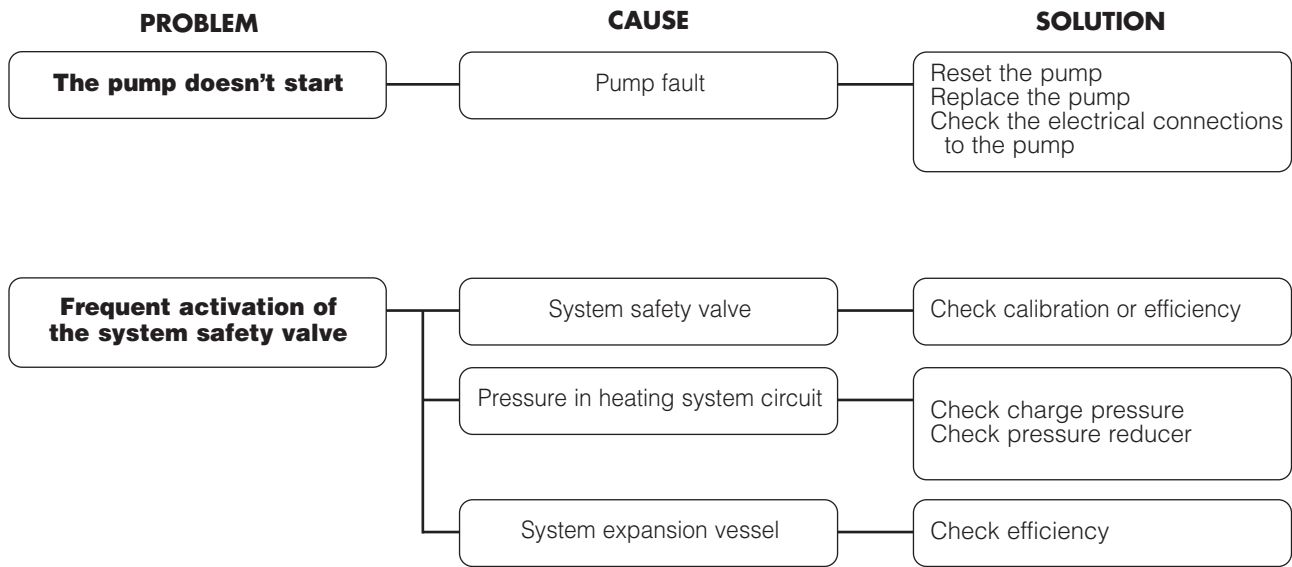


Once the cleaning operations have been completed, reassemble the components in the reverse order.

## TROUBLESHOOTING







**GAS BOILER COMMISSIONING CHECKLIST**

BOILER SERIAL No.

NOTIFICATION No.

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

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

**FOR ALL BOILERS CONFIRM THE FOLLOWING**

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

**FOR THE CENTRAL HEATING MODE, MEASURE & RECORD**

GAS RATE	<sup>3</sup> /hr	<sup>3</sup> /hr
BURNER OPERATING PRESSURE (IF APPLICABLE)	N/A	
CENTRAL HEATING FLOW TEMPERATURE		°C
CENTRAL HEATING RETURN TEMPERATURE		°C

**FOR COMBINATION BOILERS ONLY**

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

**FOR THE DOMESTIC HOT WATER MODE, MEASURE & RECORD**

GAS RATE	<sup>3</sup> /hr	<sup>3</sup> /hr
MAXIMUM BURNER OPERATING PRESSURE (IF APPLICABLE)	N/A	mbar
COLD WATER INLET TEMPERATURE		°C
HOT WATER OUTLET TEMPERATURE		°C
WATER FLOW RATE		lts/min

**FOR CONDENSING BOILERS ONLY CONFIRM THE FOLLOWING**

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

**FOR ALL INSTALLATIONS CONFIRM THE FOLLOWING**

THE HEATING AND HOT WATER SYSTEM COMPLIES WITH CURRENT BUILDING REGULATIONS  
 THE APPLIANCE AND ASSOCIATED EQUIPMENT HAS BEEN INSTALLED AND COMMISSIONED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS  
 IF REQUIRED BY THE MANUFACTURER, HAVE YOU RECORDED A CO/CO<sub>2</sub> RATIO READING? N/A YES CO/CO<sub>2</sub> RATIO  
 THE OPERATION OF THE APPLIANCE AND SYSTEM CONTROLS HAVE BEEN DEMONSTRATED TO THE CUSTOMER  
 THE MANUFACTURER'S LITERATURE HAS BEEN LEFT WITH THE CUSTOMER

COMMISSIONING ENG'S NAME PRINT  
 SIGN

CORGI ID No.  
 DATE

## SERVICE INTERVAL RECORD

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

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

**SERVICE 1** DATE \_\_\_\_\_  
ENGINEER NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
TEL No. \_\_\_\_\_  
CORGI ID CARD SERIAL No. \_\_\_\_\_  
COMMENTS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

**SERVICE 2** DATE \_\_\_\_\_  
ENGINEER NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
TEL No. \_\_\_\_\_  
CORGI ID CARD SERIAL No. \_\_\_\_\_  
COMMENTS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

**SERVICE 3** DATE \_\_\_\_\_  
ENGINEER NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
TEL No. \_\_\_\_\_  
CORGI ID CARD SERIAL No. \_\_\_\_\_  
COMMENTS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

**SERVICE 4** DATE \_\_\_\_\_  
ENGINEER NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
TEL No. \_\_\_\_\_  
CORGI ID CARD SERIAL No. \_\_\_\_\_  
COMMENTS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

**SERVICE 5** DATE \_\_\_\_\_  
ENGINEER NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
TEL No. \_\_\_\_\_  
CORGI ID CARD SERIAL No. \_\_\_\_\_  
COMMENTS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

**SERVICE 6** DATE \_\_\_\_\_  
ENGINEER NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
TEL No. \_\_\_\_\_  
CORGI ID CARD SERIAL No. \_\_\_\_\_  
COMMENTS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

**SERVICE 7** DATE \_\_\_\_\_  
ENGINEER NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
TEL No. \_\_\_\_\_  
CORGI ID CARD SERIAL No. \_\_\_\_\_  
COMMENTS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

**SERVICE 8** DATE \_\_\_\_\_  
ENGINEER NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
TEL No. \_\_\_\_\_  
CORGI ID CARD SERIAL No. \_\_\_\_\_  
COMMENTS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

**SERVICE 9** DATE \_\_\_\_\_  
ENGINEER NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
TEL No. \_\_\_\_\_  
CORGI ID CARD SERIAL No. \_\_\_\_\_  
COMMENTS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

**SERVICE 10** DATE \_\_\_\_\_  
ENGINEER NAME \_\_\_\_\_  
COMPANY NAME \_\_\_\_\_  
TEL No. \_\_\_\_\_  
CORGI ID CARD SERIAL No. \_\_\_\_\_  
COMMENTS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_







**Registered address:**

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Borderlake House  
Unit 7 Riverside Industrial Estate  
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Herts AL2 1HG

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