



ARISTON



TRAINING MANUAL

FAMILY: Wall hang boilers

UNIT: Condensation Compact

MODELS: CLAS ONE
CLAS ONE H
CLAS ONE WIFI

RELEASE: 2V2 06.04.2022

UPDATE

2V2	06/04/2022	TLM	Par.1.13: modified title Par.1.14: add paragraph for Clas One WiFi Par.1.15: add indication on outdoor sensor icon Par.6.7.1: add Clas One WiFi gas table Par.7.1.3: add electric diagram for Clas One Wi-Fi Par.8.2.7: add parameter 8.7.9 Par.8.2.8: add menu 19 (Connectivity) Par.10.1: add technical data for Clas One WiFi
2V1	28/07/2021	TLM	Add the boiler Clas One H 24
2V0	31/08/2020	TLM	New bottom, France version, Floor drying function (missing in the previous training manual version), Heating circuit water pressure on display, Pressure sensor, System hydro group (missing in the previous training manual version), Air purge function, 3 way valve management, New syphon, Integrated by-pass, pressure sensor, Combustion chamber clean-up routine, Exhaust lengths correction, G25 (all the modifications are underlined in yellow)
1V0	26/05/2017	TLM	Document creation
VERSION	DATE	NAME	MODIFICATIONS

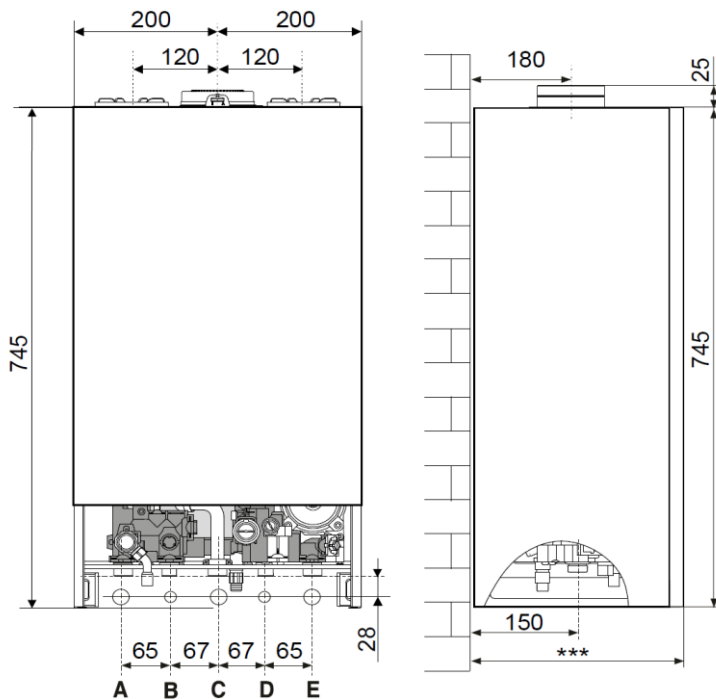
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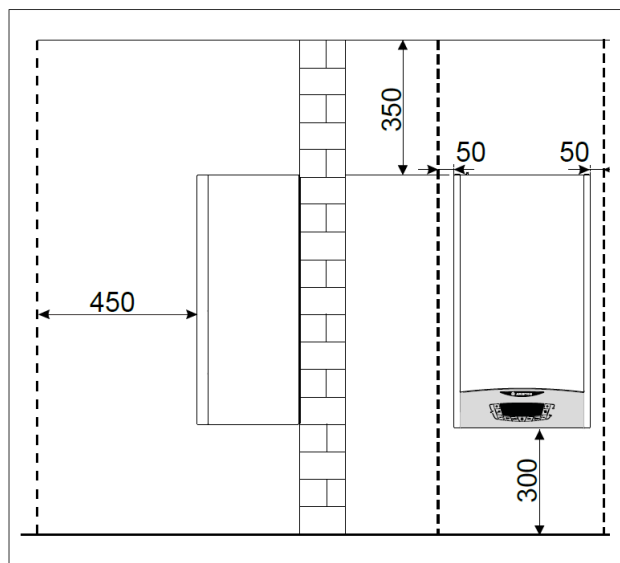
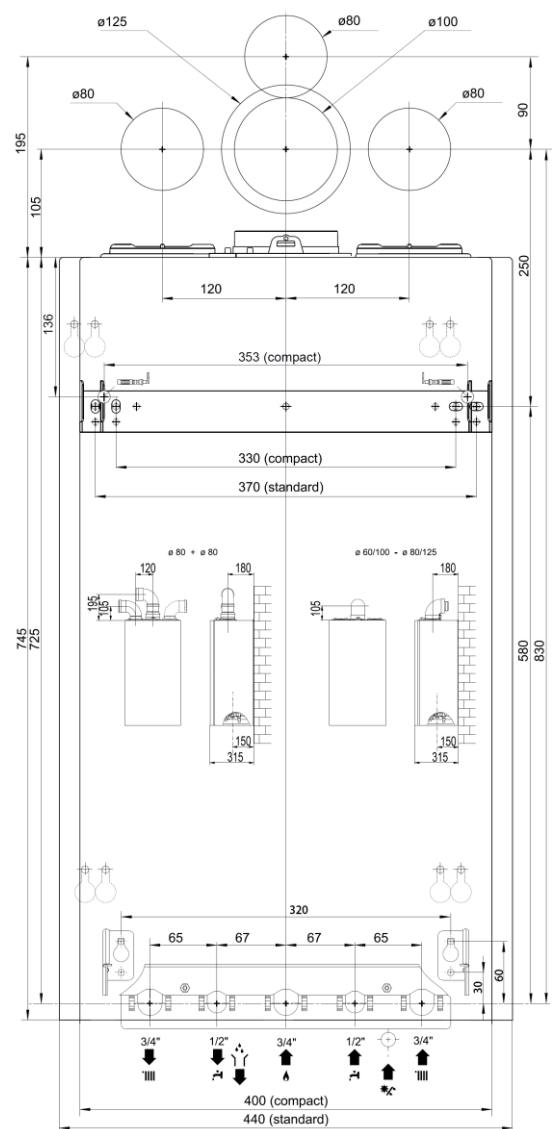
1 GENERAL INFORMATION

1.1 SIZES AND DIMENSIONS

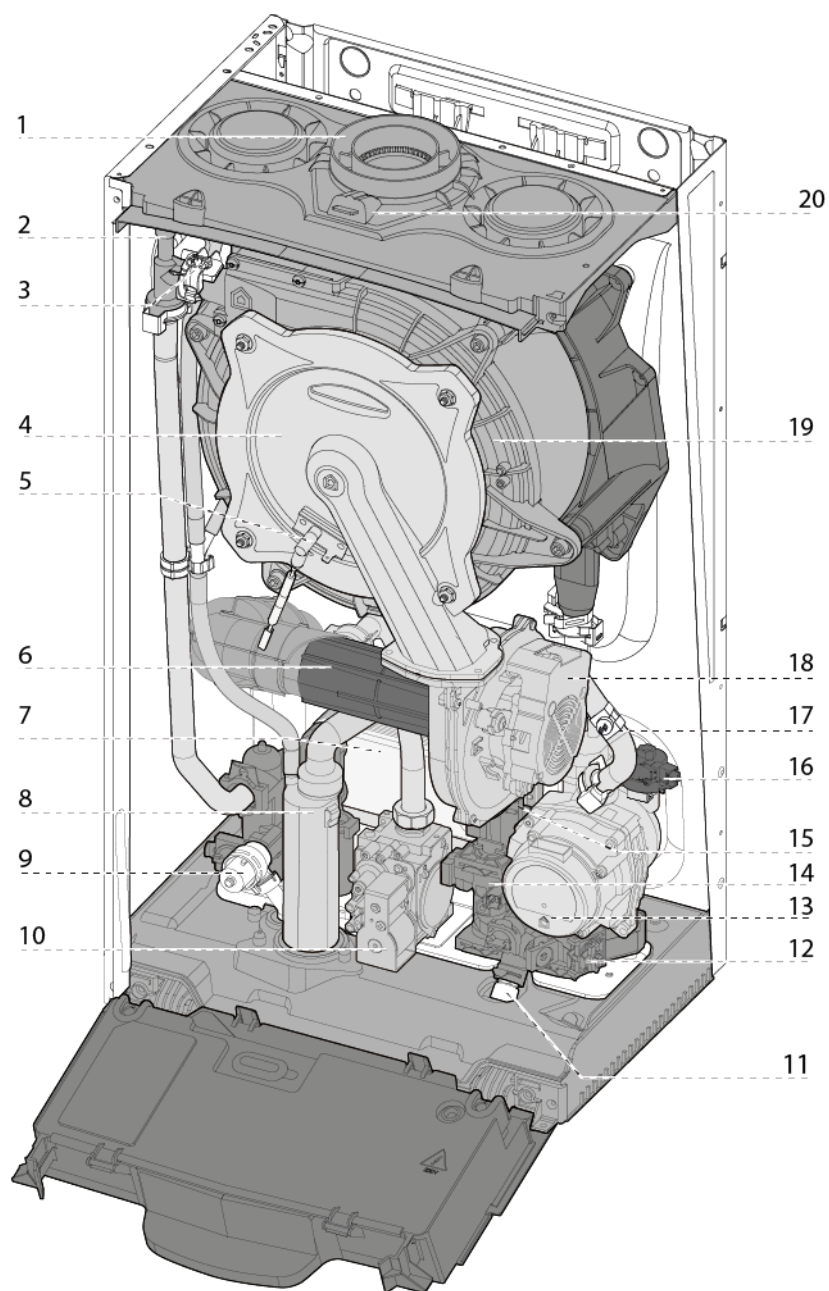


*** = 315 - mod. 24
385 - mod. 30-35

CAPTION	
A	System delivery
B	Hot water outlet
C	Gas inlet
D	Cold water inlet
E	Heating system return

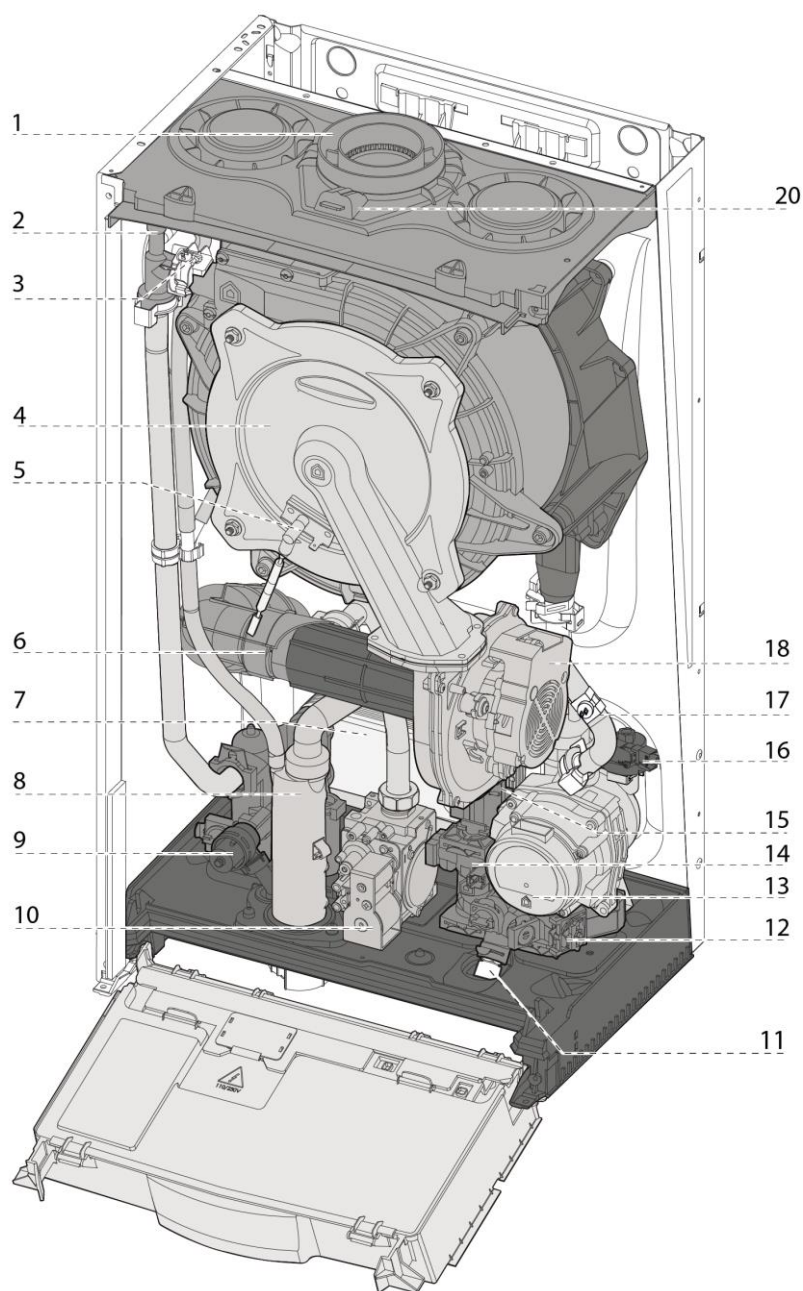


1.2 DETAILED DESCRIPTION – COMBI VERSION – ErP markets (till October 2019)



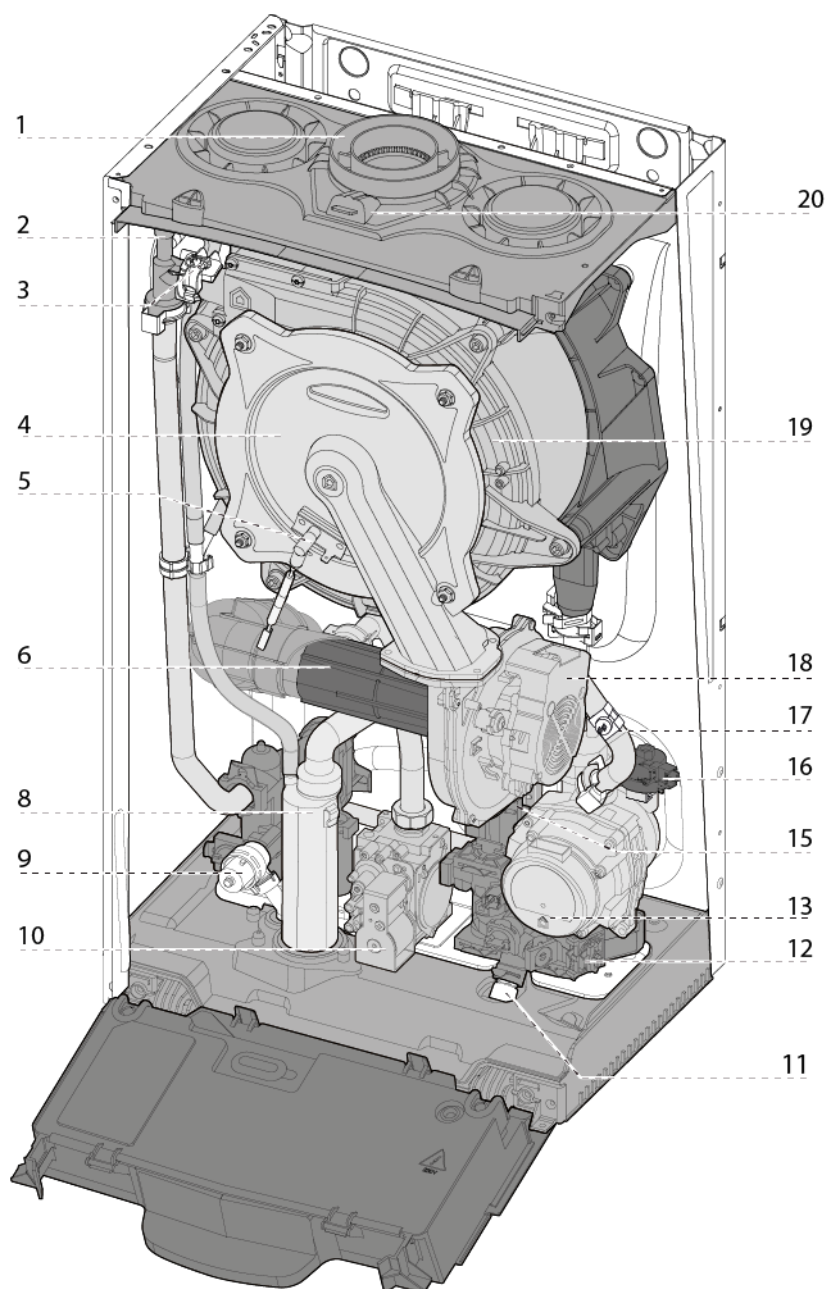
CAPTION			
1	Exhaust discharge	11	Filling tap (not for UK)
2	Manual deaerator	12	Heating filter
3	Delivery sensor NTC1	13	Pump
4	Primary heat exchanger	14	DHW flow switch
5	Ignition and detection electrode	15	3 way valve
6	Mixer	16	Heating pressure sensor
7	DHW heat exchanger	17	Return sensor NTC2
8	Siphon	18	Fan
9	3 bar safety valve	20	Exhaust analysis intake
10	Gas valve		

1.3 DETAILED DESCRIPTION – COMBI VERSION – ErP markets (from October 2019)



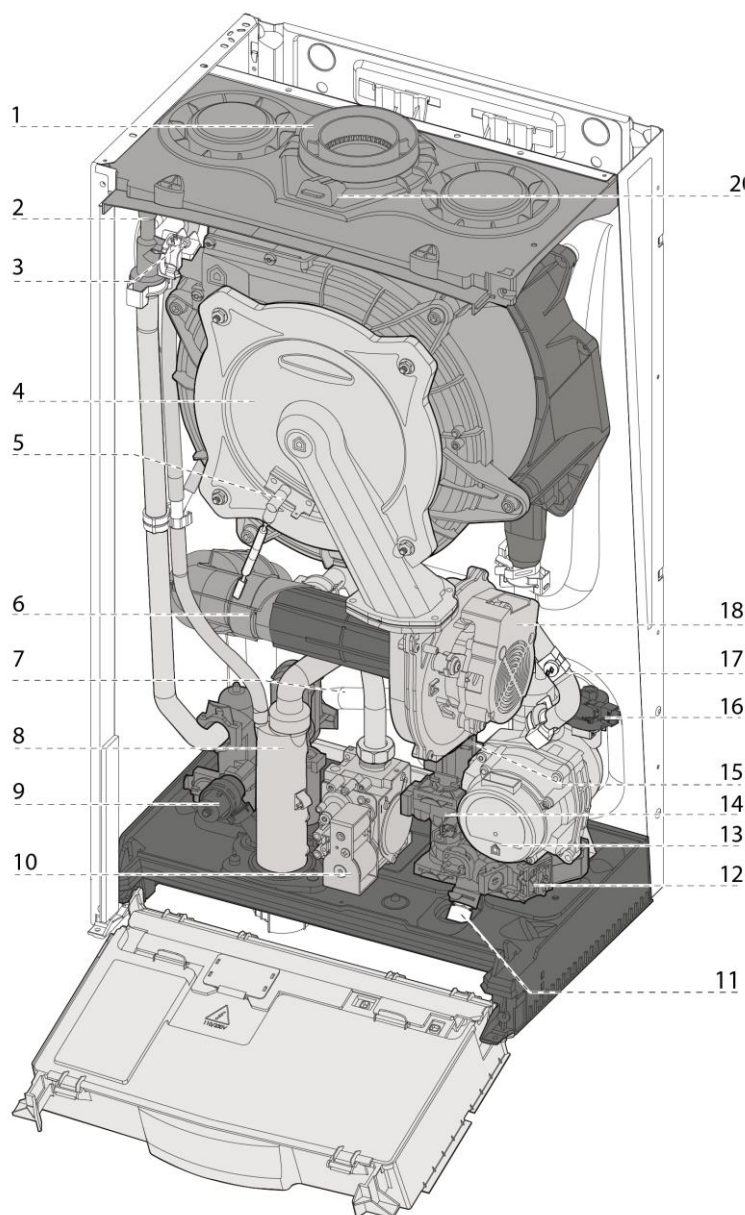
CAPTION			
1	Exhaust discharge	11	Filling tap (No for UK and France)
2	Manual deaerator	12	Heating filter
3	Delivery sensor NTC1	13	Pump
4	Primary heat exchanger	14	DHW flow switch
5	Ignition and detection electrode	15	3 way valve
6	Mixer	16	Heating pressure sensor
7	DHW heat exchanger	17	Return sensor NTC2
8	Siphon	18	Fan
9	3 bar safety valve	20	Exhaust analysis intake
10	Gas valve		

1.4 DETAILED DESCRIPTION – SYSTEM VERSION – ErP markets (till October 2019)

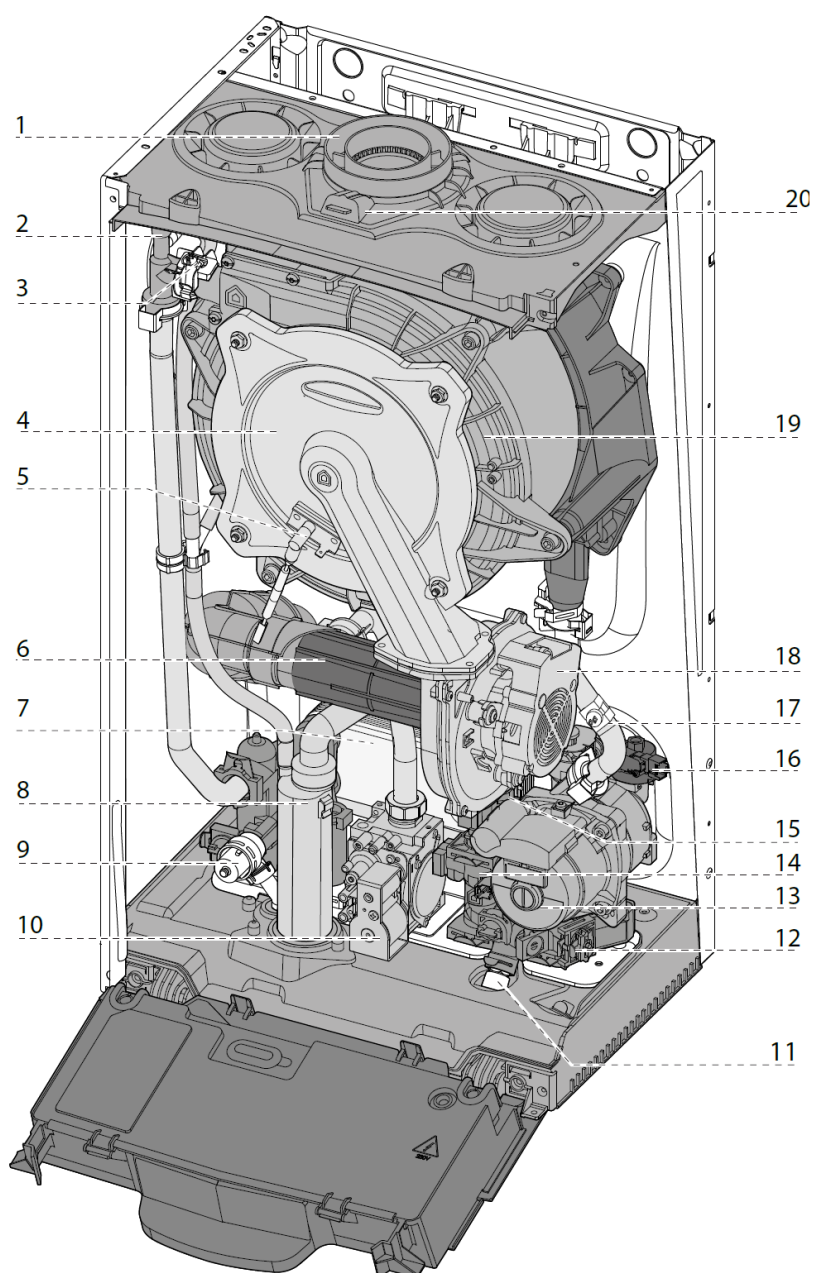


CAPTION			
1	Exhaust discharge	11	Filling tap (not for UK)
2	Manual deaerator	12	Heating filter
3	Delivery sensor NTC1	13	Pump
4	Primary heat exchanger	15	3 way valve
5	Ignition and detection electrode	16	Heating pressure sensor
6	Mixer	17	Return sensor NTC2
8	Siphon	18	Fan
9	3 bar safety valve	20	Exhaust analysis intake
10	Gas valve		

1.5 DETAILED DESCRIPTION – SYSTEM VERSION – ErP markets (from October 2019)

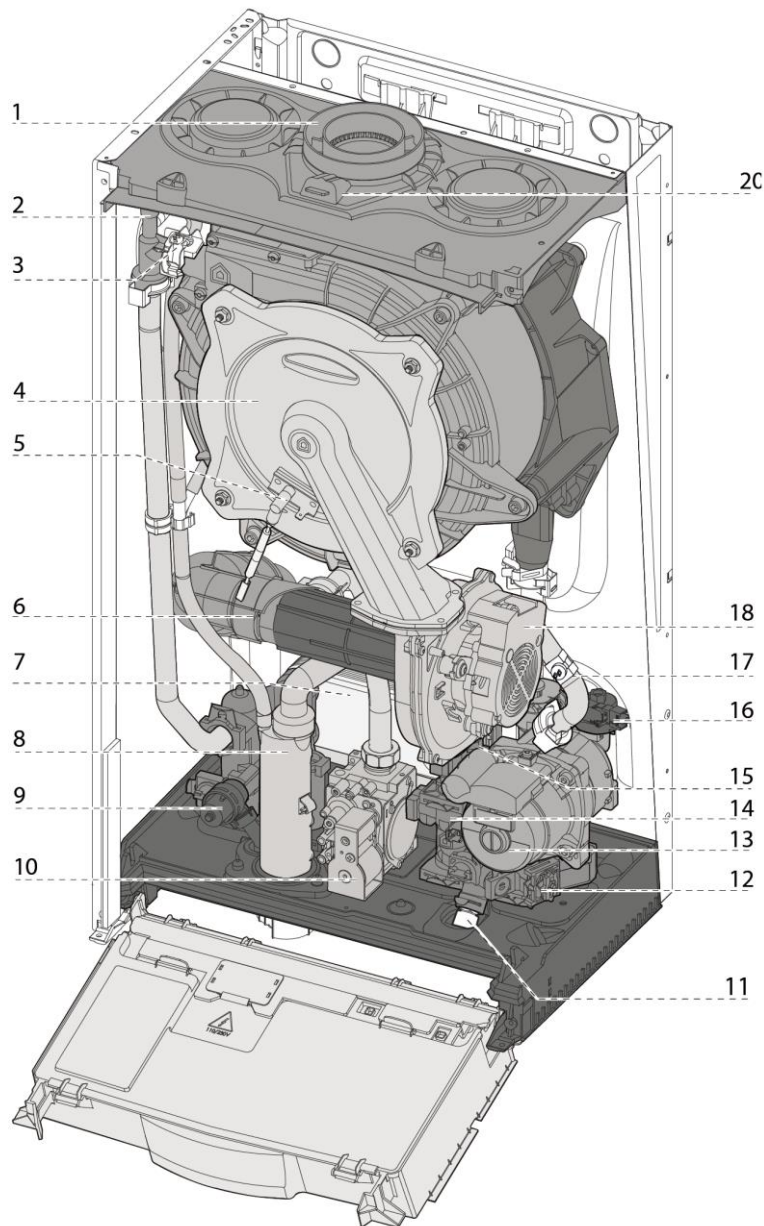


CAPTION			
1	Exhaust discharge	11	Filling tap (not for UK and France)
2	Manual deaerator	12	Heating filter
3	Delivery sensor NTC1	13	Pump
4	Primary heat exchanger	15	3 way valve
5	Ignition and detection electrode	16	Heating pressure sensor
6	Mixer	17	Return sensor NTC2
8	Siphon	18	Fan
9	3 bar safety valve	20	Exhaust analysis intake
10	Gas valve		

1.6 DETAILED DESCRIPTION – COMBI VERSION – RDC markets and China (till October 2019)

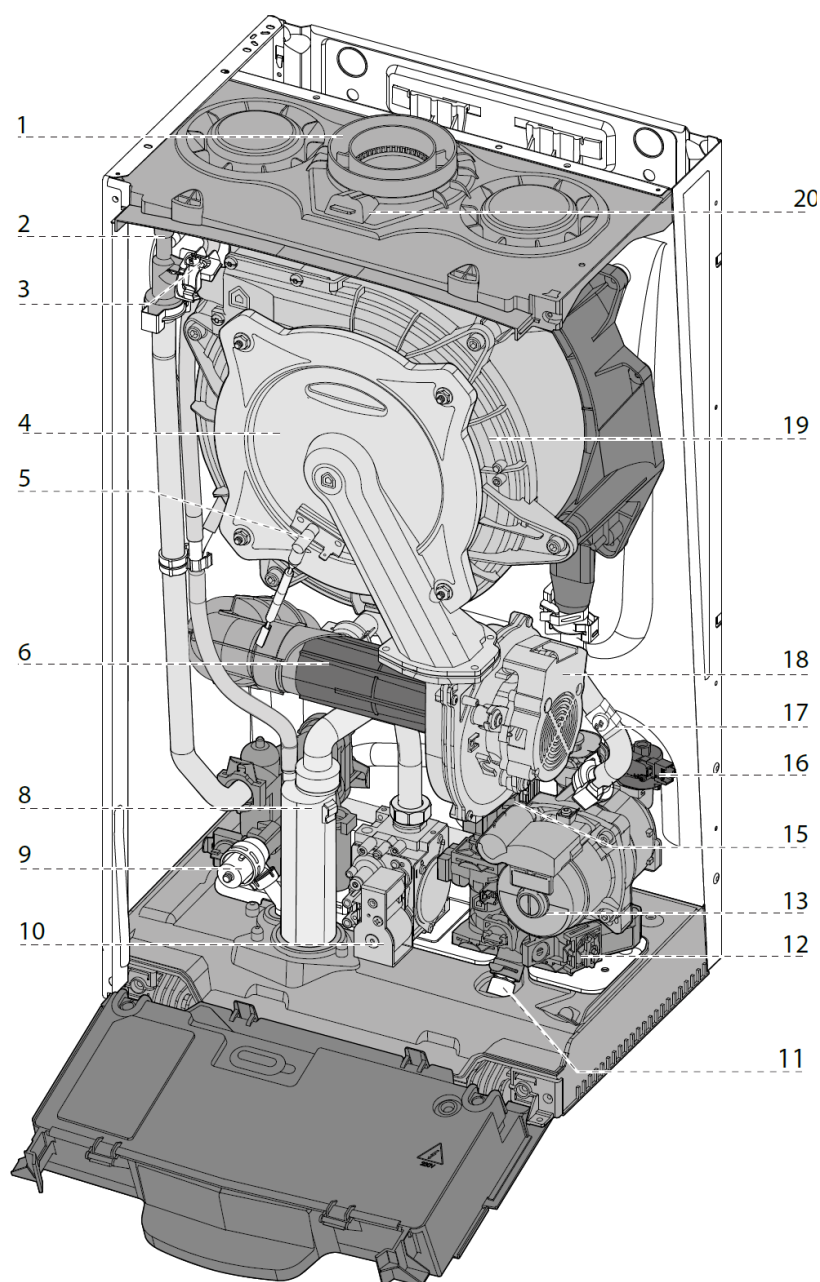
CAPTION			
1	Exhaust discharge	11	Filling tap
2	Manual deaerator	12	Heating filter
3	Delivery sensor NTC1	13	Pump
4	Primary heat exchanger	14	DHW flow switch
5	Ignition and detection electrode	15	3 way valve
6	Mixer	16	Heating pressure sensor
7	DHW heat exchanger	17	Return sensor NTC2
8	Siphon	18	Fan
9	3 bar safety valve	20	Exhaust analysis intake
10	Gas valve		

1.7 DETAILED DESCRIPTION – COMBI VERSION – RDC markets and China (from October 2019)



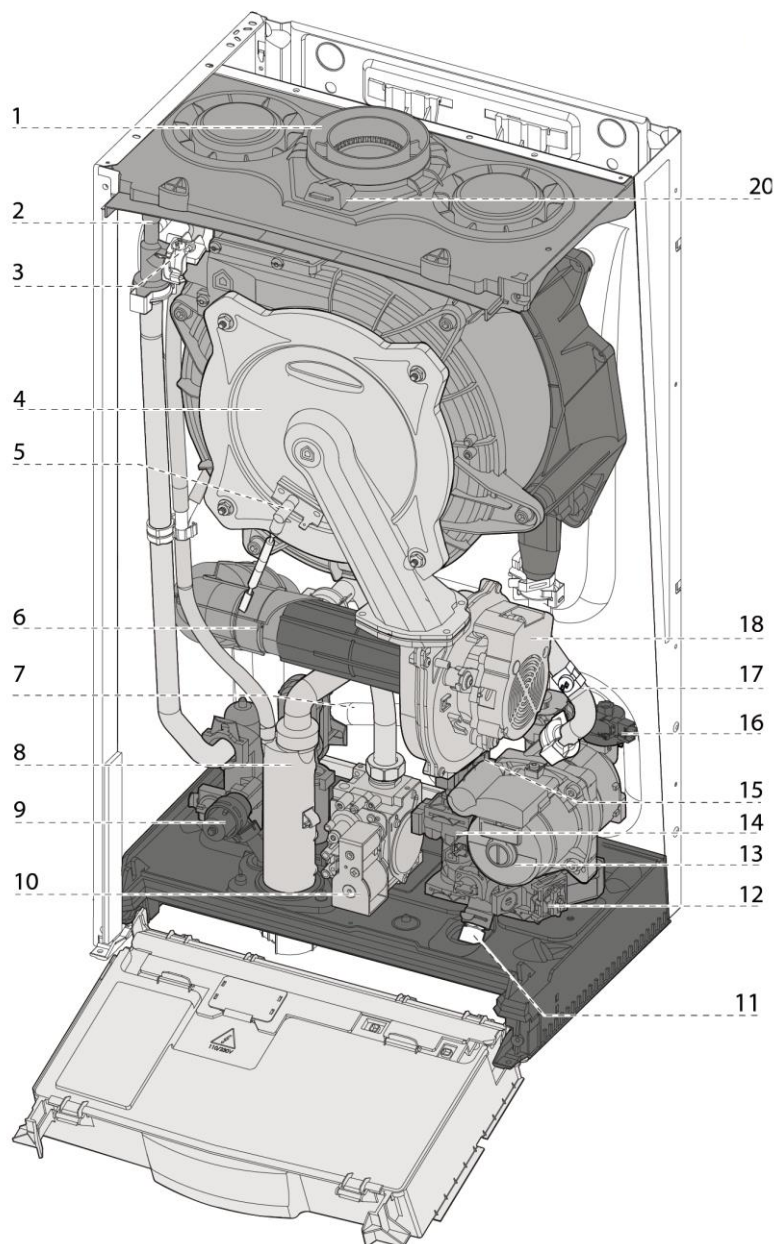
CAPTION			
1	Exhaust discharge	11	Filling tap
2	Manual deaerator	12	Heating filter
3	Delivery sensor NTC1	13	Pump
4	Primary heat exchanger	14	DHW flow switch
5	Ignition and detection electrode	15	3 way valve
6	Mixer	16	Heating pressure sensor
7	DHW heat exchanger	17	Return sensor NTC2
8	Siphon	18	Fan
9	3 bar safety valve	20	Exhaust analysis intake
10	Gas valve		

1.8 DETAILED DESCRIPTION – SYSTEM VERSION – RDC markets and China (till October 2019)



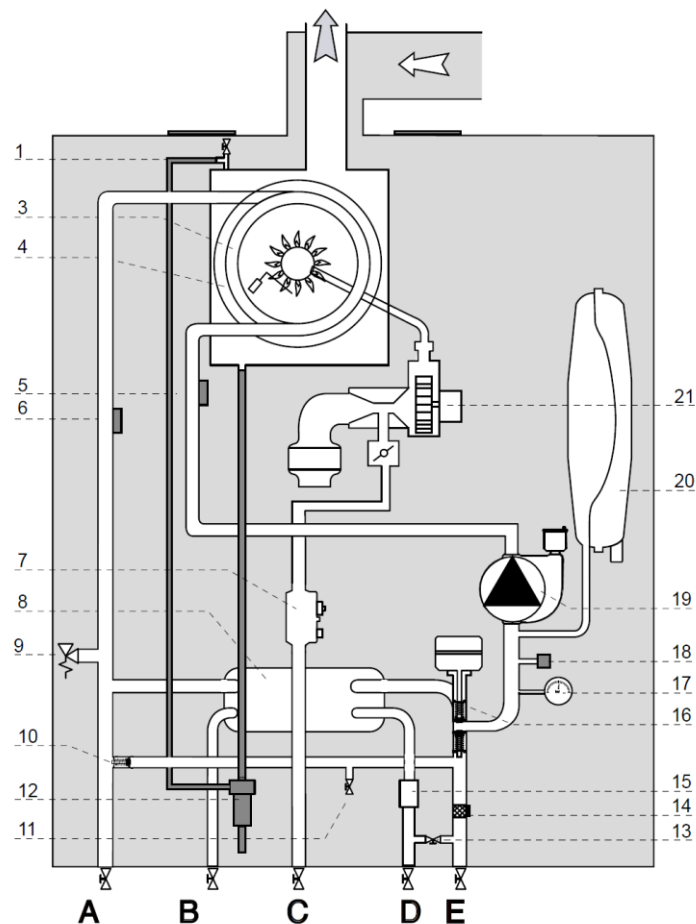
CAPTION			
1	Exhaust discharge	11	Filling tap
2	Manual deaerator	12	Heating filter
3	Delivery sensor NTC1	13	Pump
4	Primary heat exchanger	15	3 way valve
5	Ignition and detection electrode	16	Heating pressure sensor
6	Mixer	17	Return sensor NTC2
8	Siphon	18	Fan
9	3 bar safety valve	20	Exhaust analysis intake
10	Gas valve		

1.9 DETAILED DESCRIPTION – SYSTEM VERSION – RDC markets and China (from October 2019)



CAPTION			
1	Exhaust discharge	11	Filling tap
2	Manual deaerator	12	Heating filter
3	Delivery sensor NTC1	13	Pump
4	Primary heat exchanger	15	3 way valve
5	Ignition and detection electrode	16	Heating pressure sensor
6	Mixer	17	Return sensor NTC2
8	Siphon	18	Fan
9	3 bar safety valve	20	Exhaust analysis intake
10	Gas valve		

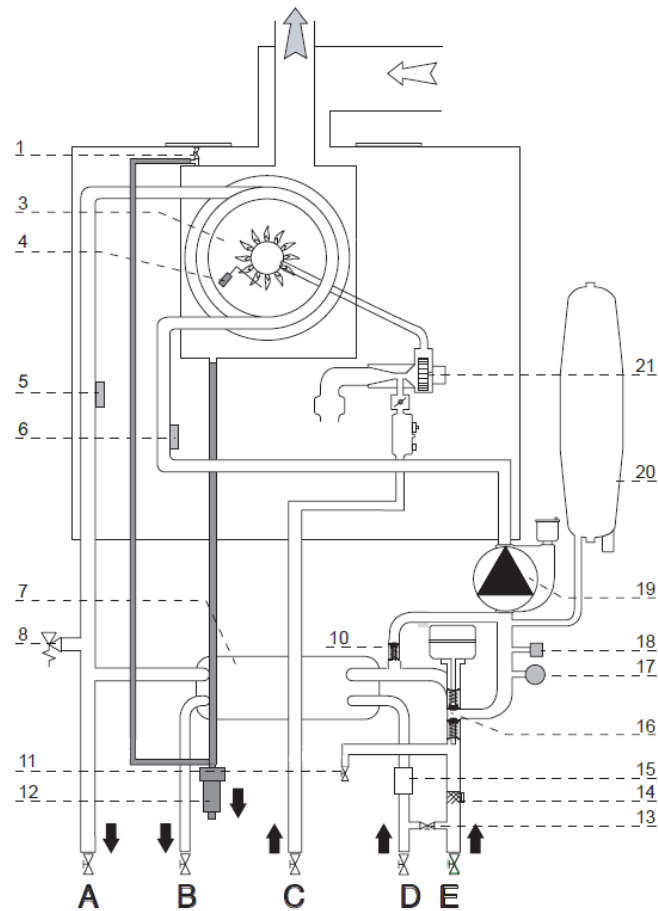
1.10 HYDRAULIC SCHEME (till July 2018)



1. Air relief valve
3. Main Heat Exchanger
4. Detection/Ignition electrode
5. Central Heating Return Temperature Probe
6. Central Heating Flow Temperature Probe
7. Gas Valve
8. Secondary Exchanger
9. Safety valve
10. Automatic By-pass
11. Drain valve
12. Condensate Trap
13. Filling valve
14. Central Heating Filter
15. D.H.W. Flow Switch
16. Diverter valve
17. Pressure Gauge
18. Switch On/Off
19. Modulating Circulation Pump with air release valve
20. Expansion vessel
21. Modulating Fun

Note: Filling tap not present for UK boilers

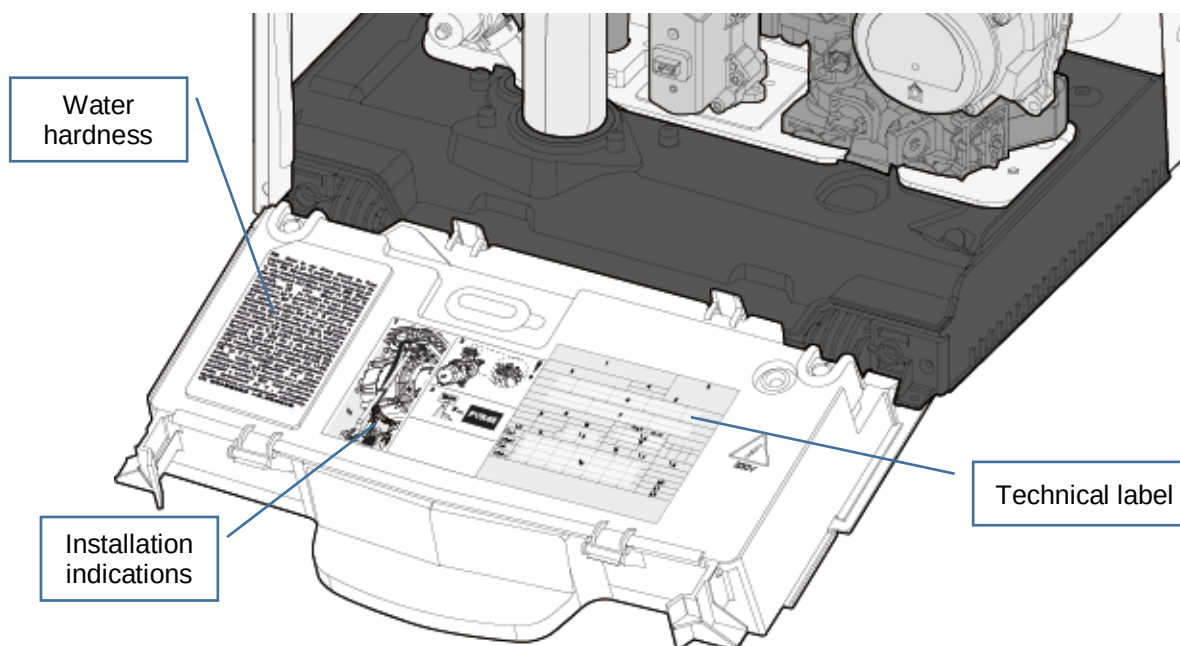
1.11 HYDRAULIC SCHEME (from July 2018)



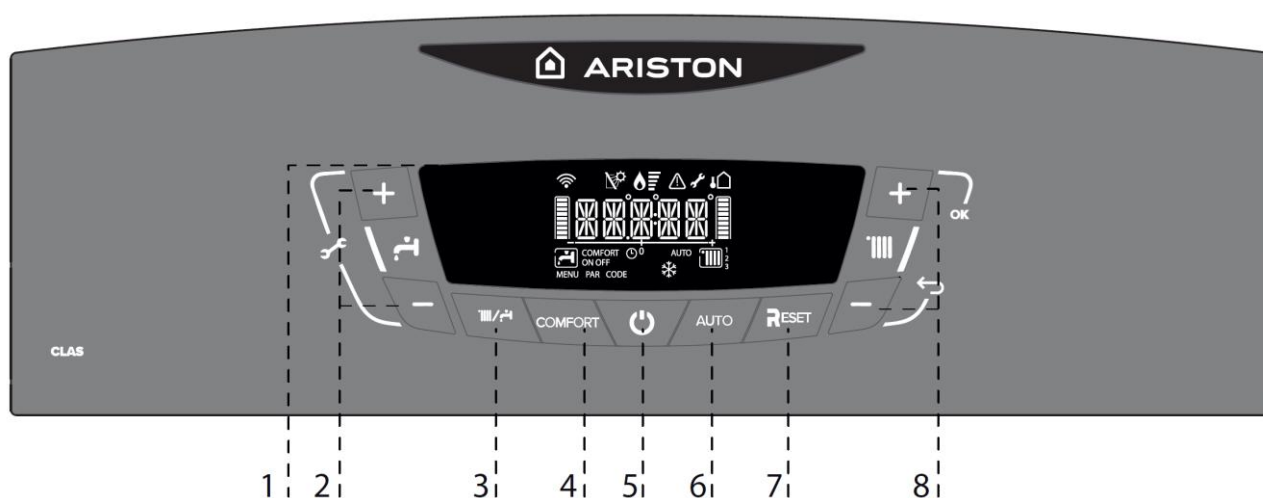
1. Air relief valve
3. Main Heat Exchanger
4. Detection/Ignition electrode
5. Central Heating Return Temperature Probe
6. Central Heating Flow Temperature Probe
8. Secondary Exchanger
9. Safety valve
10. Automatic By-pass
11. Drain valve
12. Condensate Trap
13. Filling valve
14. Central Heating Filter
15. D.H.W. Flow Switch
16. Diverter valve
17. Pressure Gauge
18. Water pressure sensor
19. Modulating Circulation Pump with air release valve
20. Expansion vessel
21. Modulating Fun

Note: Filling tap not present for UK and France boilers

1.12 LABELS POSITION

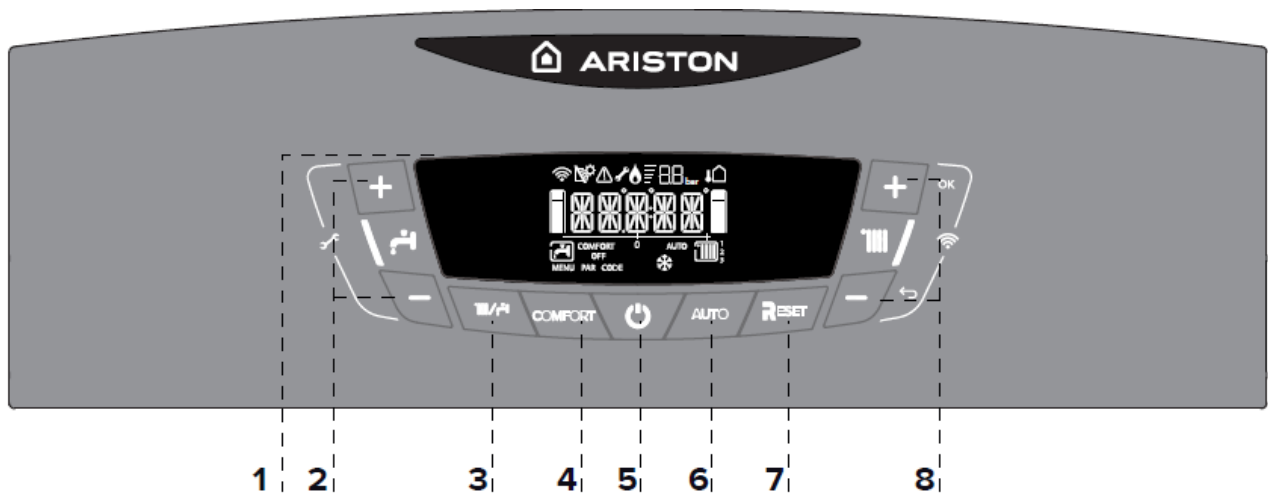


1.13 CONTROL PANEL DESCRIPTION (CLAS ONE)



LEGENDA			
1	Display	5	On/Off button
2	DHW Temperature control button	6	Auto
3	Summer/ Winter button	7	Reset button
4	Comfort button	8	CH temperature adjustment buttons zone 1 or offset of thermoregulation slope with Auto-function enabled.

1.14 **CONTROL PANEL DESCRIPTION (CLAS ONE WIFI)**

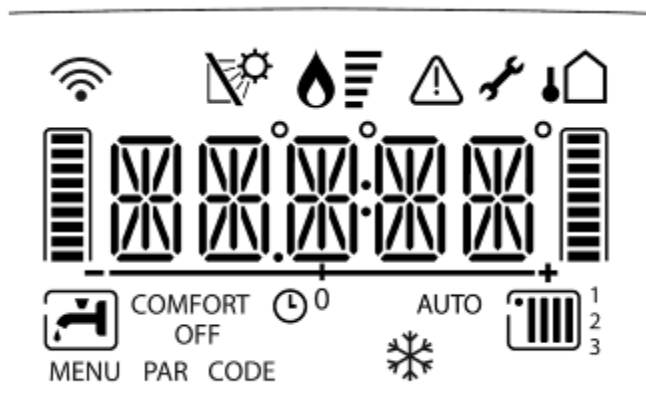


LEGENDA			
1	Display	5	On/Off button
2	DHW Temperature control button	6	Auto
3	Summer/ Winter button	7	Reset button
4	Comfort button	8	CH temperature adjustment buttons zone 1 or offset of thermoregulation slope with Auto-function enabled. Wi-Fi menu

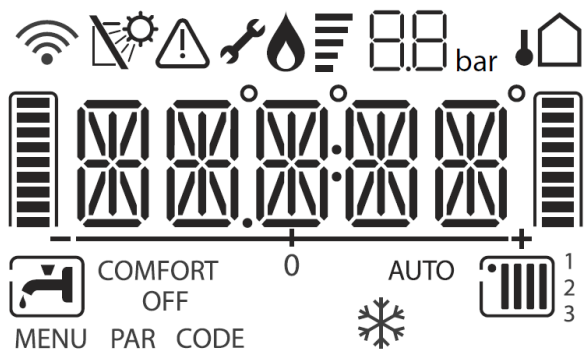
WIFI MENU:

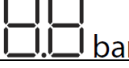
Press “+” and “-” jointly, medium pressure (2 seconds) to enter the connectivity menu directly from the HMI:

1. **WI-FI:** ON/OFF
2. **AP:** Opening Access Point
3. **SN:** Serial Number (scrolling)
4. **RESET:** Wi-Fi Reconfiguration
5. **ITEMP:** Outdoor internet temperature

1.15 DISPLAY (till May 2019)

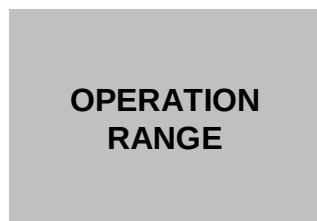
ICON	DESCRIPTION
	- Set temperature - Error code - Reset indication - Menu seeing
	Temperature indication
MENU	Navigation→ Menu number
PAR	Navigation→ Parameter number
CODE	Code request
	Safety shutdown, not resettable
	Error signal
	Flame on and power level
	Heating enabled
	Heating request in progress
	DHW enabled
	DHW request in progress
COMFORT	Comfort function enabled
	High efficiency operation
OFF	Boiler off with antifreeze function enabled
	Antifreeze function in progress
AUTO	Auto function enabled
	Solar system connected
	Outdoor sensor connected (from display software version 02.04.00 visible for firsts 2 minutes after power supply on also if outdoor sensor not present)
	Wi-Fi active (optional)

1.16 **DISPLAY (from May 2019)**

ICON	DESCRIPTION
	- Set temperature - Error code - Reset indication - Menu seeing
	Temperature indication
MENU	Navigation→ Menu number
PAR	Navigation→ Parameter number
CODE	Code request
	Safety shutdown, not resettable
	Error signal
	Flame on and power level
	Heating enabled
	Heating request in progress
	DHW enabled
	DHW request in progress
COMFORT	Comfort function enabled
OFF	Boiler off with antifreeze function enabled
	Antifreeze function in progress
AUTO	Auto function enabled
	Solar system connected
	Outdoor sensor connected (optional)
	Wi-Fi active (optional)
	Heating circuit water pressure

2 OPERATING LOGIC

2.1 HEATING MODE: OPERATING LOGIC



40°C ÷ 82°C

By pushing the buttons “+” or “-”, you can see on the display (for 4 seconds) the set temperature.



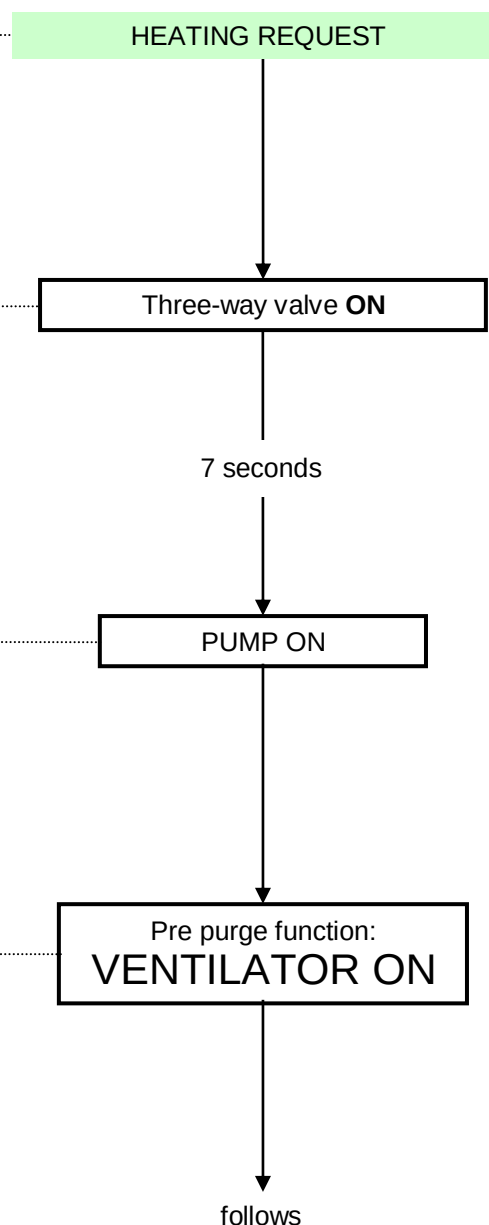
Through the parameter **420** is possible set the heating range 1: 35÷82°C ; 0: 20÷45°C). Through the parameters **425** (min) and **426** (max) is possible set the maximum and the minimum temperature of the heating.

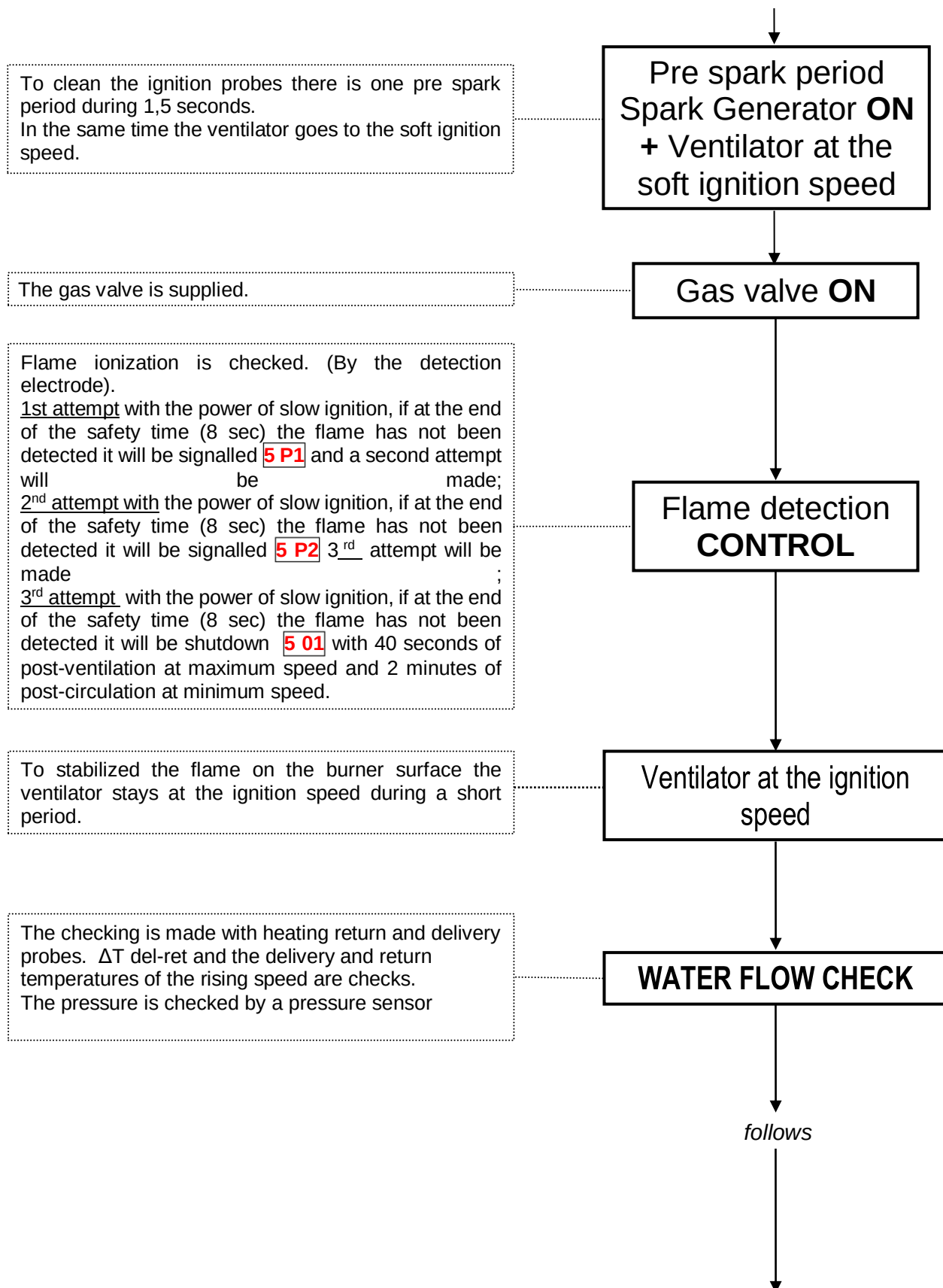
The heating request can be performed by: room thermostat 1, room thermostat 2, programming clock, remote control and room sensor. Icon  and set temperature will be displayed.

When the boiler is in stand-by the valve is on the “stand-by” position. When heating is turned on the motor is supplied (inside shaft out), that closed the outlet of the secondary exchanger and puts pump intake in communication with the heating circuit.

The circulating device start is delayed 7 seconds after heating request in order to allow switching the 3 way valve; when it starts, the circulating device intakes the water coming from the heating system backflow and sends it to the primary exchanger

To clean the combustion chamber, the ventilator is supplied at the maximum speed during pre-ventilation period 5 seconds. The same operation will be made after the burner OFF during 5 seconds.





After flame detection the boiler is free to modulate the power according to the required thermal load and realized thanks to the speed of the ventilator. Modulation is carried out between the maximum heating power values (adjustable from the control panel with parameter **2 31**) and the minimum power value (value fix). The shut down temperature of the burner is operated as follows:

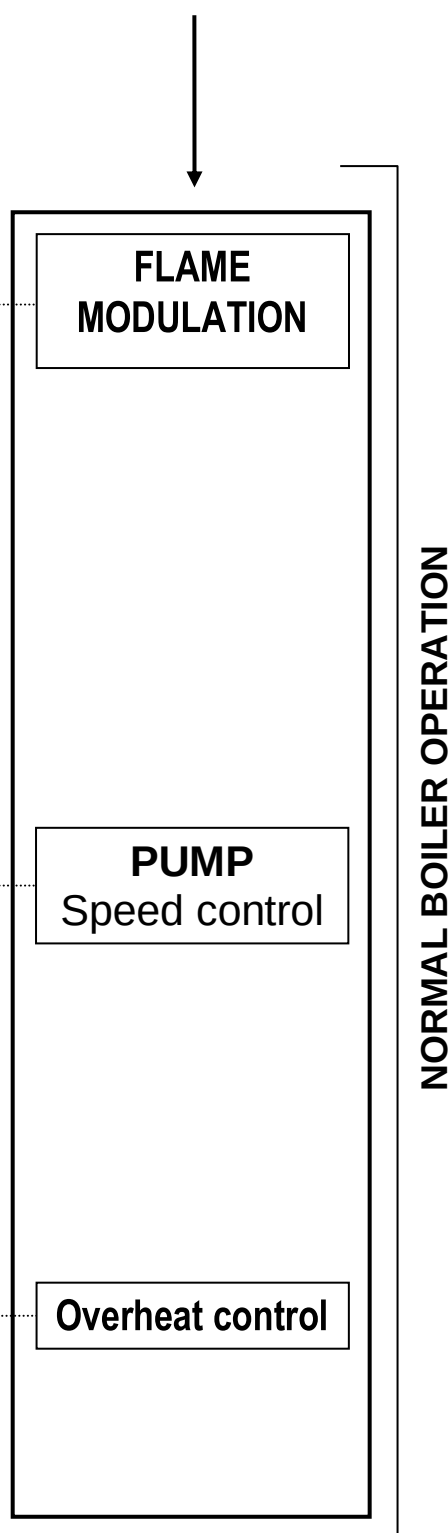
- **1° min after flame detection:**
 $T_{\text{off}} = T_{\text{set-point}} + 8^{\circ}\text{C}$
- **2° min after flame detection:**
 $T_{\text{off}} = T_{\text{set-point}} + 6^{\circ}\text{C}$
- **starting from the 3rd min after flame detection:**
 $T_{\text{off}} = T_{\text{set-point}} + 4^{\circ}\text{C}$

This logic is used to prevent the burner from shutting down too quickly with the system at temperature.

Next ignition can be delayed from 0 to 7 minutes (default value = 2 min., adjustable from the control panel with parameter **2 36**).

The pump is fully modulating.
The pump speed change in relation with the boiler power

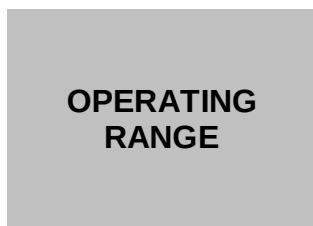
Performed from the flow and return NTC. If the temperature rise 102°C a lock out occurs, indicated on the display with **1 01**.



N.B. Starting from heating request, the “**limit temperature**” (88°C , not adjustable fixed value) remains on executed by the primary exchanger outlet probe (NTC 1).
When the burner is switched OFF, post ventilation is performed in order to evacuate the residual exhaust during 5 seconds.

If there is a bad circulation through the heating system, the **automatic by-pass** can be opened (max capacity 350 l/h).

2.2 DHW MODE: OPERATING LOGIC



36°C ÷ 60°C

By pushing the buttons “+” or “-”, you can see on the display (for 4 seconds) the set temperature



A demand for Domestic hot water, is detected by the flow switch or proportional flow meter (from May 2019).
Now the boiler will be working on the DHW mode. The display will show icon  with the set temperature for DHW.

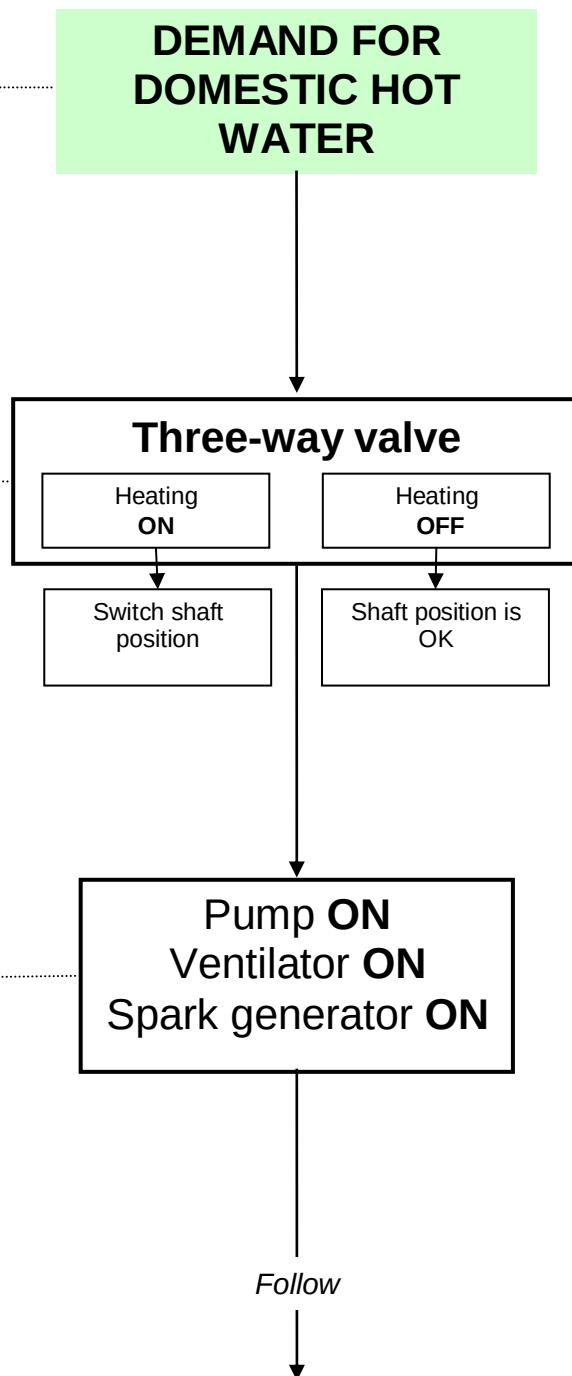
When the boiler is on stand-by the valve is on the STAND-BY position.
If there is a DHW request the three-way valve moves to sanitary position.
If there is a demand while the boiler is operating on HEATING mode, the three-way valve will be switched on DHW.
During this passage the circulating device and the burner remain on.
The outlet of the plate exchanger will be in communication with the pump intake directed towards the primary exchanger.

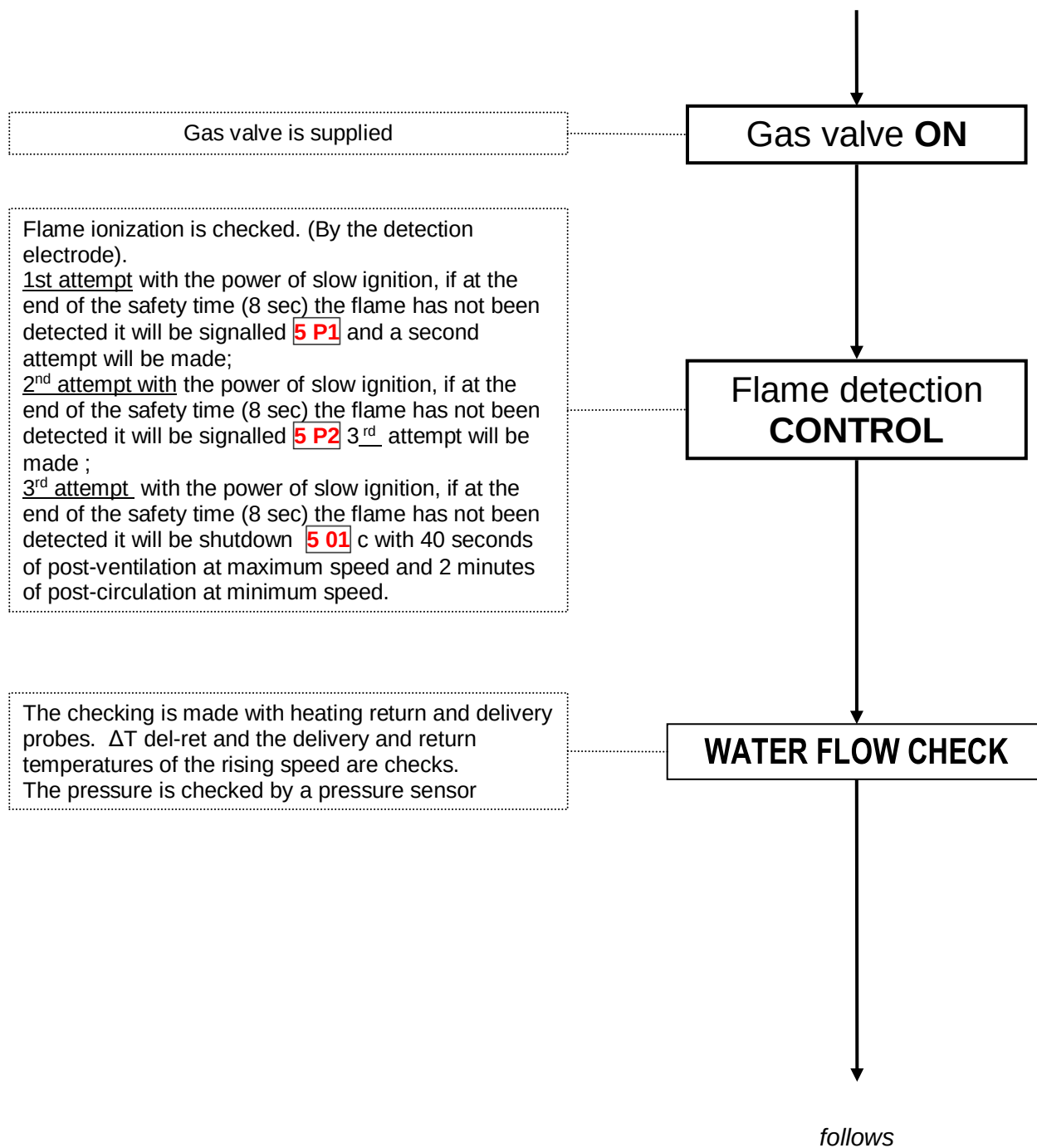
At the same time:

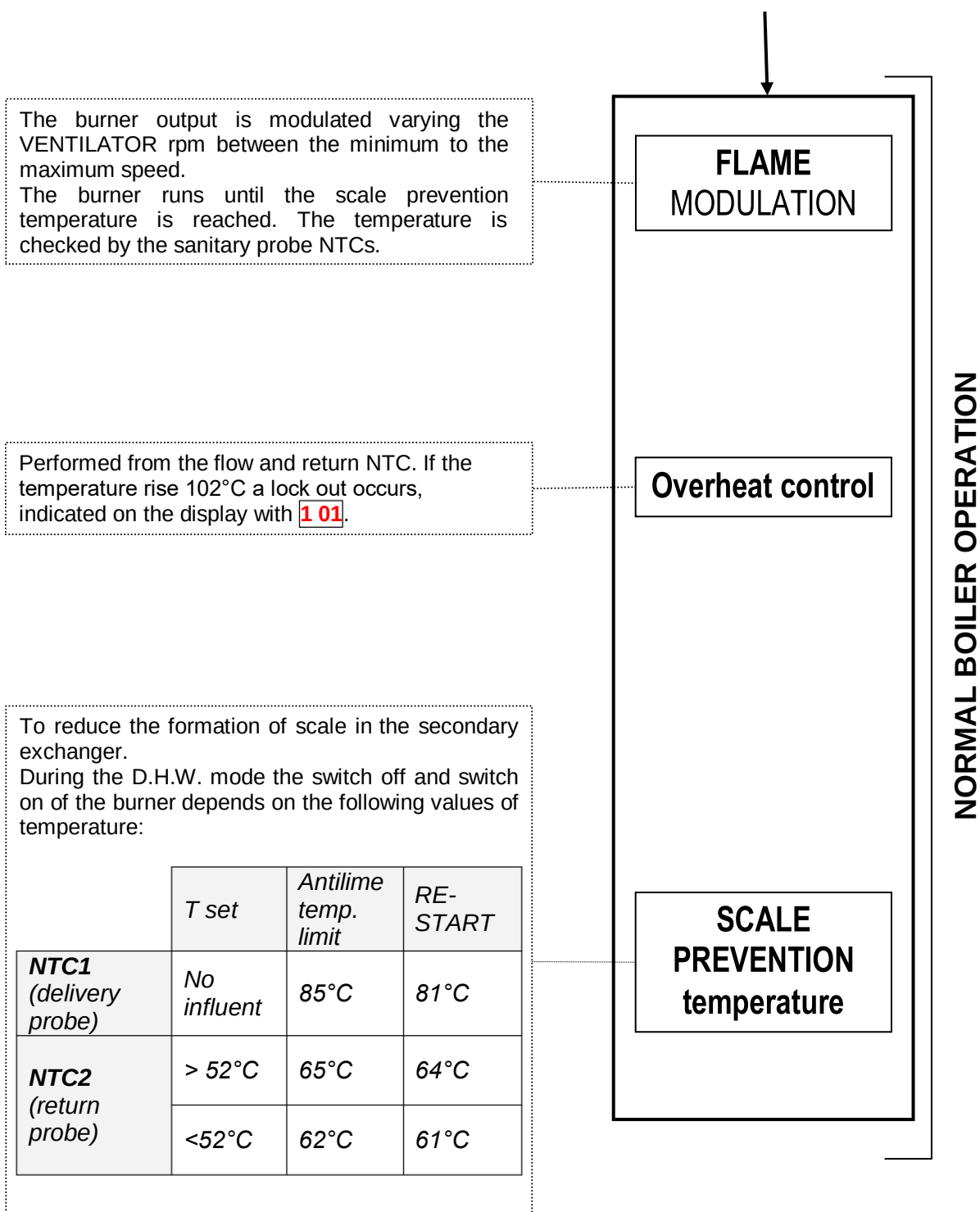
The pump (set automatically on maximum speed), intakes water coming from the outlet of the secondary and sends it to the primary exchanger.

The ventilator is supplied at the soft ignition speed.

the spark generator is supplied to clean the ignition probes.







N.B.: The DHW switch-off logic could be changed by the parameter **2 53**:

- 0 : Anti-scale (62 or 65°C) ⇒ default
- 1 : Set-point + 4°C

3 SYSTEM VERSION

3.1 “TANK” MODE

To select this typology of operation **set 1 on the parameter 228**. In this version the setting of the tank temperature (SET-POINT) is done through the buttons “+” and “-”.

DHW sensor (NTCs):

Temperature range 40-65°C.

The control of the temperature of the tank is managed in the following way:

- **T tank $\geq$ T set+2** : off burner, off pump
- **T tank $\leq$ T set – Thyst** : on burner, on pump where: Thyst=(T set/10)+3
- **T tank $\geq 80^\circ\text{C}$** : safety shut down **209**, that disappear when the temperature go down 75°C

Flow heating sensor (NTC1):

The PCB manages the flow temperature (NTC1) in the following way:

- **T flow $>$ T set + 20** : start modulation;
- **T flow $\geq 88^\circ\text{C}$** : burner off, pump on (on continuous)
- **T flow $\leq$ T set + 14** : burner on

3.2 “SYSTEM” MODE

To select this typology of operation **set 2 on the parameter 228**. In this version the tank temperature is manage thorough mechanical thermostat (ON/OFF).

Flow heating sensor (NTC1):

The PCB manages the flow temperature (NTC1) in the following way:

- **T flow $> 82^\circ\text{C}$** : start modulation;
- **T flow $\geq 86^\circ\text{C}$** : burner off, pump on (on continuous)
- **T flow $\leq 82^\circ\text{C}$** : burner on

3.3 ANTILEGIONELLA FUNCTION

This function is available only for boiler with external tank and tank NTC sensor (par.228=1).

The factory setting is with this function enabled (par.257= 1) and with the time set to 30 days (par.258).

In this situation the boiler starts to heat the tank till 60°C for 1 hour in the following condition:

- Each time that the boiler is supplied by electrical power;
- Each 30 days or after 30 days from the last time that the tank stays at 60°C at least for 60 minutes continuously.

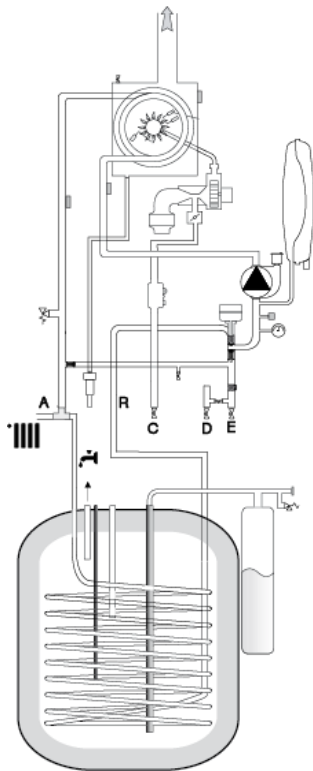
It is possible modify the frequency of this function through the parameter 258 from 25 hours to 480 hours (factory setting 30 days).

It is possible disable the function setting the parameter 257 to 0.

2	5	7	Antilegionella function (only for boilers with external tank and NTC sensor – par. 228 = 1)	0: disabled 1: enabled	1
2	5	8	Antilegionella time (only for boilers with external tank and NTC sensor – par. 228 = 1). The setting temperature is always 60°C (tank temperature).	24 ÷ 480 h and 30 days	30 day

It is advisable to install a thermostatic valve on the hot water outlet to prevent scalding.

3.4 HYDRAULIC SCHEME



CAPTION			
A	Heating and tank delivery	E	Heating return
C	Gas inlet	R	Tank return
D	Inlet cold water (for filling)		

4 SPECIAL FUNCTIONS

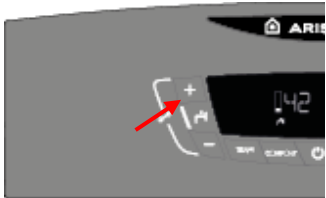
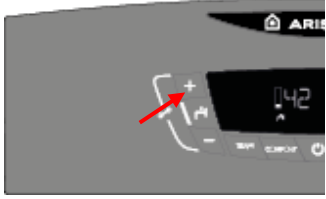
4.1 FLUE CLEANER” Function

This function is used to perform proper boiler combustion analysis and maximum and minimum gas calibration. Follow the instructions below to enable it:

PRESS	DISPLAY
 <i>Press Reset button for 5 continuous seconds</i>	 <i>The display will show this indication</i>

- With the boiler on “Winter” mode, the 3-way valves is positioned on “heating” and the burner turns on even without heating requested.
- With the boiler on “summer” mode:
 - without DHW demand the burner turns on in heating;
 - with DHW demand the burner turns on in DHW.
- The delivery temperature (NTC1) is checked during the “Flue cleaner” function, as follows:
 - “summer” mode → Off: 86°C; On: 81°C;
 - “winter” mode → Off: 89°C; On: 84°C.

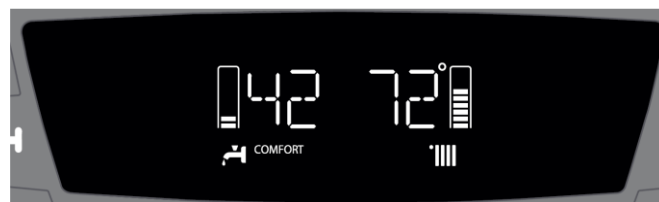
Three different powers can be selected when the function is enabled:

	PRESS	DISPLAY	POWER
Press + button			Max DHW
Press + button			Minimum

To exit the “Flue cleaner” function press the RESET button. However after 30 minutes the function will be disabled automatically.

4.2 “COMFORT” Function

This function reduces the hot DHW water output time. The objective is reached by keeping the primary circuit in the boiler hot. To enable this function push the comfort button.



Moreover, by means of parameter 2 50 you can set comfort function as follows:

0: disabled;

1: enabled for 30 minutes after DHW request;

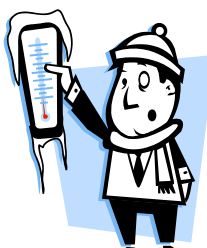
2: always enabled;

The operating range is variable and depends on the temperature set for the DHW mode:

TEMP. SET FOR DHW MODE	OFF TEMPERATURE	ON TEMPERATURE
36	40	34
37	41	35
38	42	36
39	44	38
40	45	39
41	46	40
42	47	41
43	49	43
44	50	44
45	51	45
46	53	47
47	54	48
48	56	50
49	58	52
50	59	53
51	61	55
52	63	57
53	64	58
54	66	60
55	68	62
56	70	64
57	71	65
58	72	66
59	73	67
60	74	68

4.3 “ANTIFREEZE” Function

This function is enabled only if the boiler is supplied with gas and electrical power. It is operated by means of the temperature detected by the heating delivery probe (NTC1).

	CONDITION	EVENTS	TIME
1ST CASE	The temperature detected by probe NTC1: Ranges between 3°C and 8°C	- The PUMP is supplied on speed III - The 3-WAY VALVE alternatively switches the position of the shaft from 1 minute on “heating” to 1 minute on “DHW” mode - The DISPLAY shows the icon ❄️	Until the NTC1 temperature is $\geq 9^{\circ}\text{C}$
	 If, after 20 minutes, the CONDITIONS described in the 1st CASE are still present ($3^{\circ}\text{C} < \text{NTC1} < 8^{\circ}\text{C}$) automatically check the EVENTS of the 2nd CASE 		
	2ND CASE	- The BURNER turns on, supplied with minimum power; - The 3-WAY VALE is positioned on “DHW” and switch every 30 s DHW/CH - When the temperature is $\geq 40^{\circ}\text{C}$ the burner turn OFF. For 15 minutes the boiler maintain the temperature between 35°C and 40°C - After 15 minutes there is 2 minutes of post circulation in heating - Into 90 minutes if the temperature decreases again less than 8°C the burner switch on immediately. - The DISPLAY shows the icon ❄️.	Until the NTC1 temperature is $\geq 30^{\circ}\text{C}$

If the NTC1 delivery probe is not working (open or short circuit) the “antifreeze” function check is followed by the NTC2 heating return probe but in these cases only the pump works (the burner doesn’t light). The display doesn’t show the antifreeze enabling code, but the error code of the NTC1 open or short circuit **1 10** or **1 11**.

The antifreeze is enabled even if the NTC2 return probe is not working (open or short circuit) but only the pump works (the burner doesn’t light). In this case the display doesn’t show the antifreeze enabling code, but the error code of the NTC2 open or short circuit **1 12** or **1 13**.

The antifreeze is enabled even if the boiler is shutdown due to no flame detection **5 01** or blocked for over heat **1 01**, but in these cases only the pump works (the burner doesn’t light), and the display shows the error code of blocking and not the antifreeze enabling one.

If there is an interruption of the power supply, the boiler maintains in the memory all the settings and when the power supply is restored the boiler returns in the condition it was before shutting down.

4.4 "WATER FLOW CHECK"

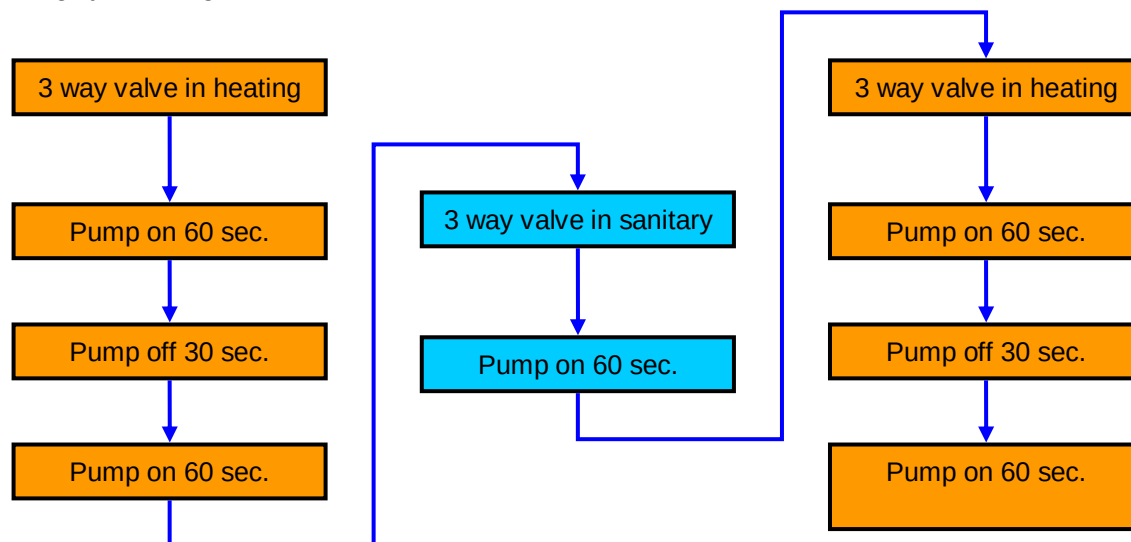
Check	When	What happens
Gradient Tman > 7°C/sec (checked every 100ms)	Checked always with the flame on, except during the first 4 seconds after flame detection.	1. Immediate safety shutdown 1 P1 : <i>- 10sec of post-circulation</i> <i>- 10 sec of post-ventilation</i> The boiler restarts after 10sec. 2. If the error occurs other 2 times within the following 4 minutes it will be shutdown 1 03 : <i>- 20sec of post ventilation</i> <i>- 1min of post circulation.</i>
Gradient Tman > 20°C/sec or Gradient Trit > 20°C/sec (checked every 100ms)	Checked always with the flame on, and up to 7 sec after each turn off for temperature set or safety shutdown.	1. Shutdown 1 04 : <i>- 20sec of post ventilation</i> <i>- 1min of post-circulation.</i>
Tman – Trit > 55°C	Checked always with the flame on, and up to 7 sec after each turn off for temperature set or safety shutdown.	1. Immediate safety shutdown 1 P2 : <i>- 10sec of post-circulation;</i> <i>- 10sec of post ventilation.</i> After 10sec the boiler restarts. 2. If the error occurs other 2 times within the following 4 minutes it will be shutdown 1 05 : <i>- 20sec of post ventilation</i> <i>- 1min of post circulation.</i>
Trit > Tman + 10°C	Checked always with the flame on.	1. If the defect occurs for 20 continuous seconds there will be a safety shutdown 1 P3 : <i>- 10sec of post-circulation;</i> <i>- 10sec of post ventilation.</i> After 10sec the boiler restarts. 2. If the defect occurs for 20 continuous seconds another 2 times within 4 minutes it will shutdown 1 06 : <i>- 20sec of post ventilation;</i> <i>- 1min of post circulation.</i>
Trit > Tman + 30°C	Checked always with the flame on.	Shutdown 1 07 : <i>20sec of post ventilation;</i> <i>- 1min of post circulation</i>

4.5 “AIR PURGE” Function

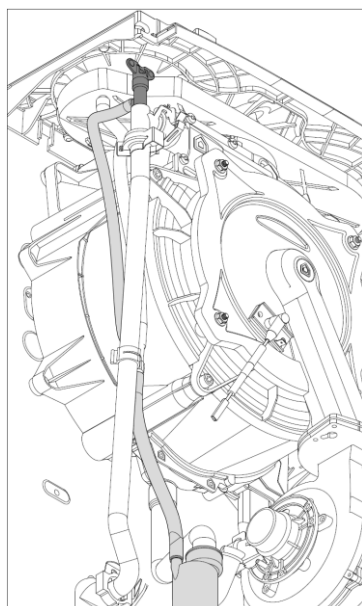
This function can be activated by the installer by the parameter **2 71** or pressing of the mode button  for 5 sec (continues till to the finish (about 6'') or pressing of the mode button ).

From the PCB software version 22.34.00 (September 2020) the air purge function automatically activated after the first boiler electrical power supply on and after the errors 108 (remain the possibility to activate manually the function using the dedicated button and to stop it with the dedicated button.).

Its aim is to help to purge the residual air inside the primary circuit after a filling cycle. At the activation the following cycle is begun:



This cycle can be repeated several times, till the boiler and the heating system are completely purged from air.



Using the manual air purge on the heat exchanger it is possible to remove air from the heat exchanger and fill the condense trap up with water as per commissioning.

4.6 “SELF ADAPTIVE HEATING RESTART DELAY”

With the parameter 2 35 it is possible chose the heating restart delay type:

- 0: manual;
- 1: automatic.

MANUAL: with the parameter 2 36 it is possible set the heating restart delay between 0 and 7 min.

AUTOMATIC: the heating restart delay is calculated in base of the heating set-point temperature, see table below:

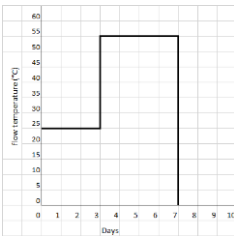
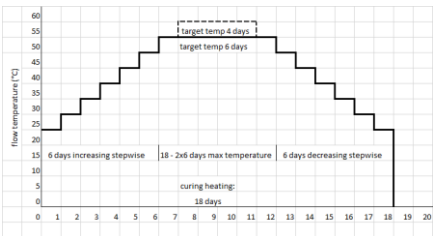
Heating Set-point	< 50°C	51-60°C	61-70°C	71-80°C	> 80°C
Restart delay (minutes)	5	4	3	2	1

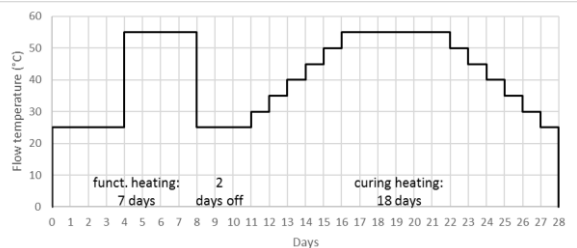
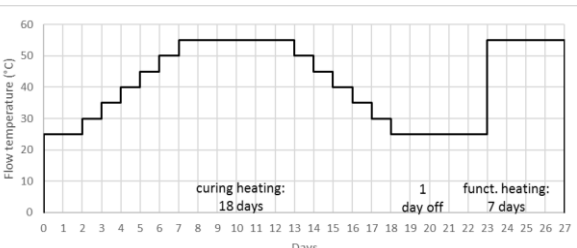
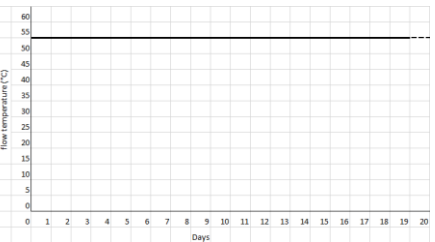
4.7 “FLOOR DRYING FUNCTION”

The Floor Drying Function is a special function that allows the installer, through a dedicated heating cycle, to use the boiler for drying the fresh floor during a floor system installation.

By parameter [2.7.4](#) (Floor Drying Cycle) inside the technical menu the installer is able to decide the cycle's mode (Functional Heating, Curing Heating, a combination of functional and curing heating or Manual Heating)

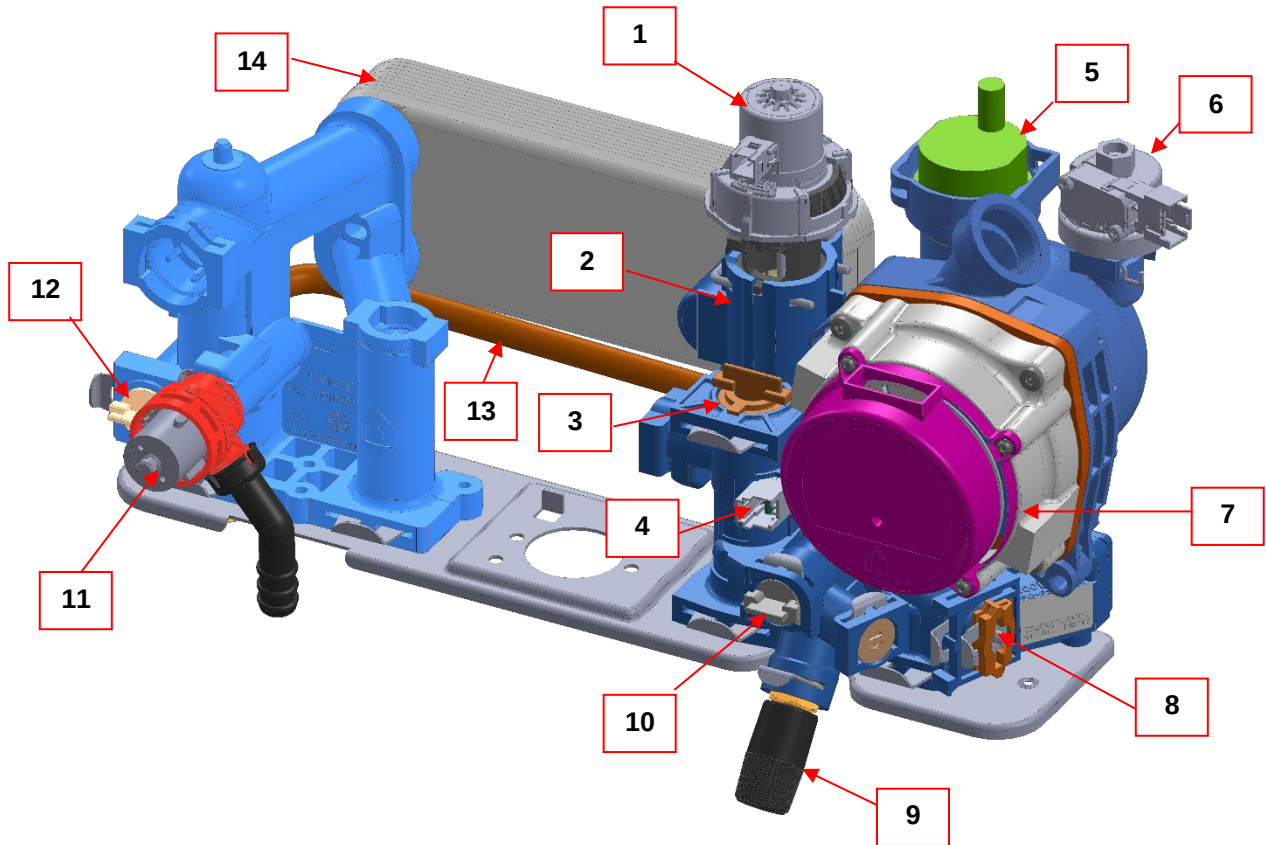
This function can follow different flow temperature profiles according to the parameter 2.7.4 values:

Value	Function Mode	
0	OFF	
1		Functional Heating: the flow set point temperature is kept at 25°C during 3 days, then increased to target temperature (defined by parameter 275 – default= 55°C) and kept at this temperature during 4 days.
2		Curing Heating: flow setpoint temperature is incremented from 25°C to target temperature (defined by parameter 275) by 5°/day, kept at target temperature for “x” days and decremented from target temperature to 25°C by 5°/day for a fixed total amount of days of 18. Example 1: <i>par275=55°C; increasing phase from 25°C to 55°C = 6 days; keep at 55°C for 6 days; decreasing phase from 55°C to 25°C = 6 days</i> Example 2: <i>par275=60°C; increasing phase from 25°C to 60°C = 7 days; keep at 60°C for 4 days; decreasing phase from 60°C to 25°C = 7 days</i>

3	 Flow temperature (°C) Days funct. heating: 7 days 2 days off curing heating: 18 days	Functional Heating + Curing Heating: two operation modes are executed consecutively with a stop period of 2 days in between.
4	 Flow temperature (°C) Days curing heating: 18 days 1 day off funct. heating: 7 days	Curing Heating + Functional Heating: two operation modes are executed consecutively with a stop period of 1 day in between.
5	 Flow temperature (°C) Days	Manual Heating: the flow setpoint temperature is fixed at the value defined by the parameter 2.7.5 "Floor drying Flow Setpoint Temperature".

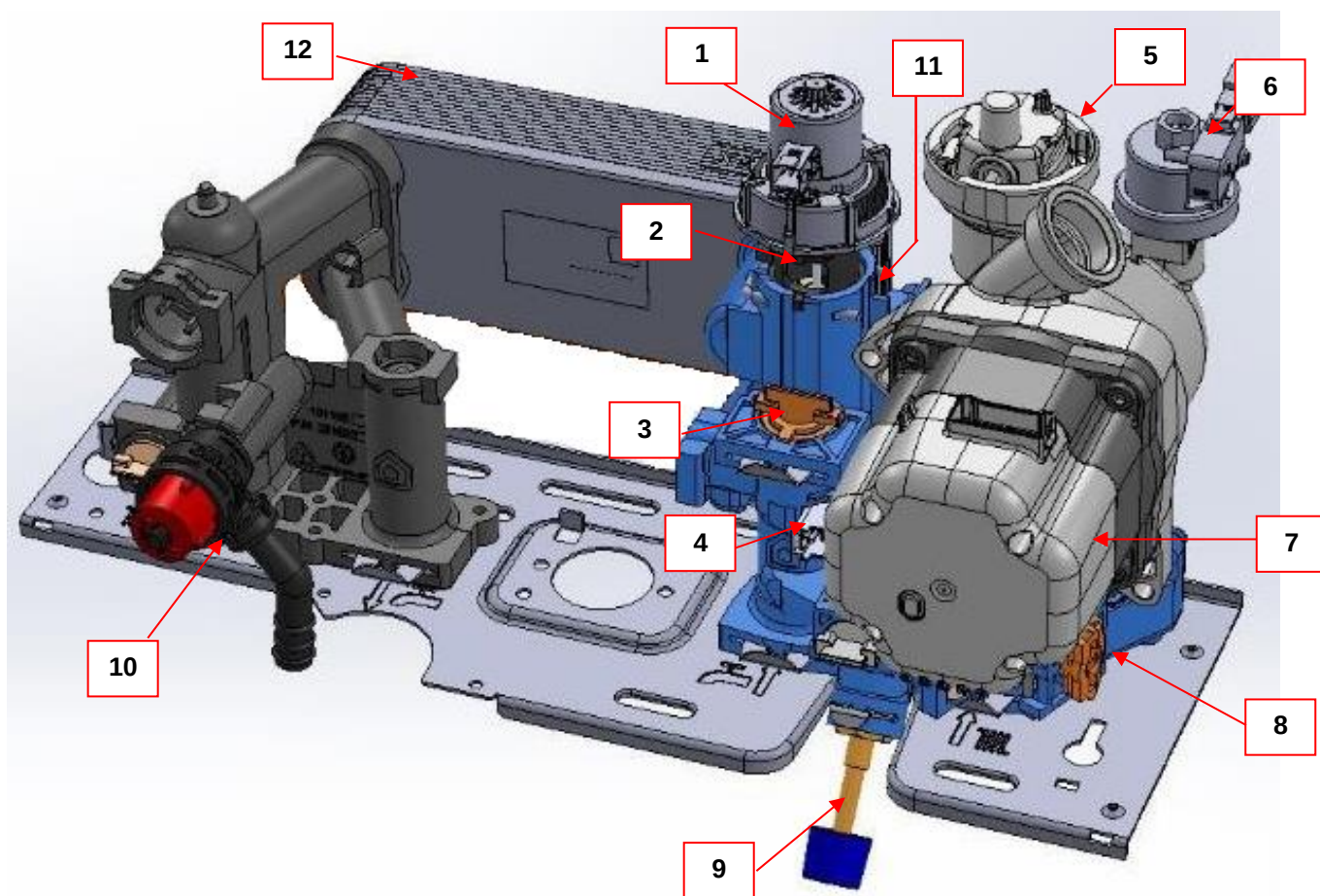
5 HYDRAULIC UNIT

5.1 HYDRAULIC UNIT – COMBI VERSION - ErP markets (till July 2018)



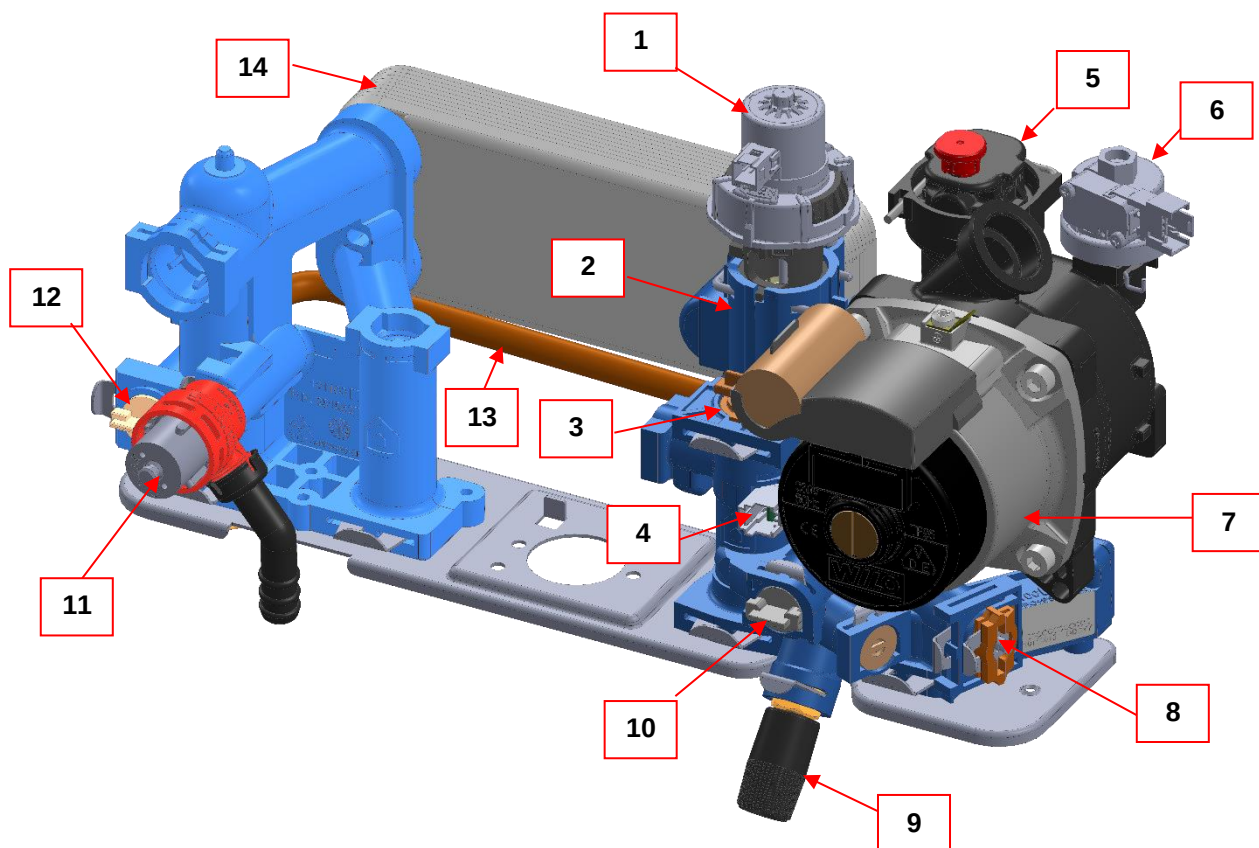
CAPTION			
1	3 way valve motor	8	Heating filter and pressure gauge connection
2	3 way valve	9	Filling tap
3	DHW flow switch	10	No back-flow valve
4	Reed sensor	11	3 bar safety valve
5	Automatic air valve	12	By-pass
6	Pressure switch	13	By-pass pipe
7	Pump	14	DHW plate heat exchanger

5.2 HYDRAULIC UNIT – COMBI VERSION - ErP markets (from July 2018)



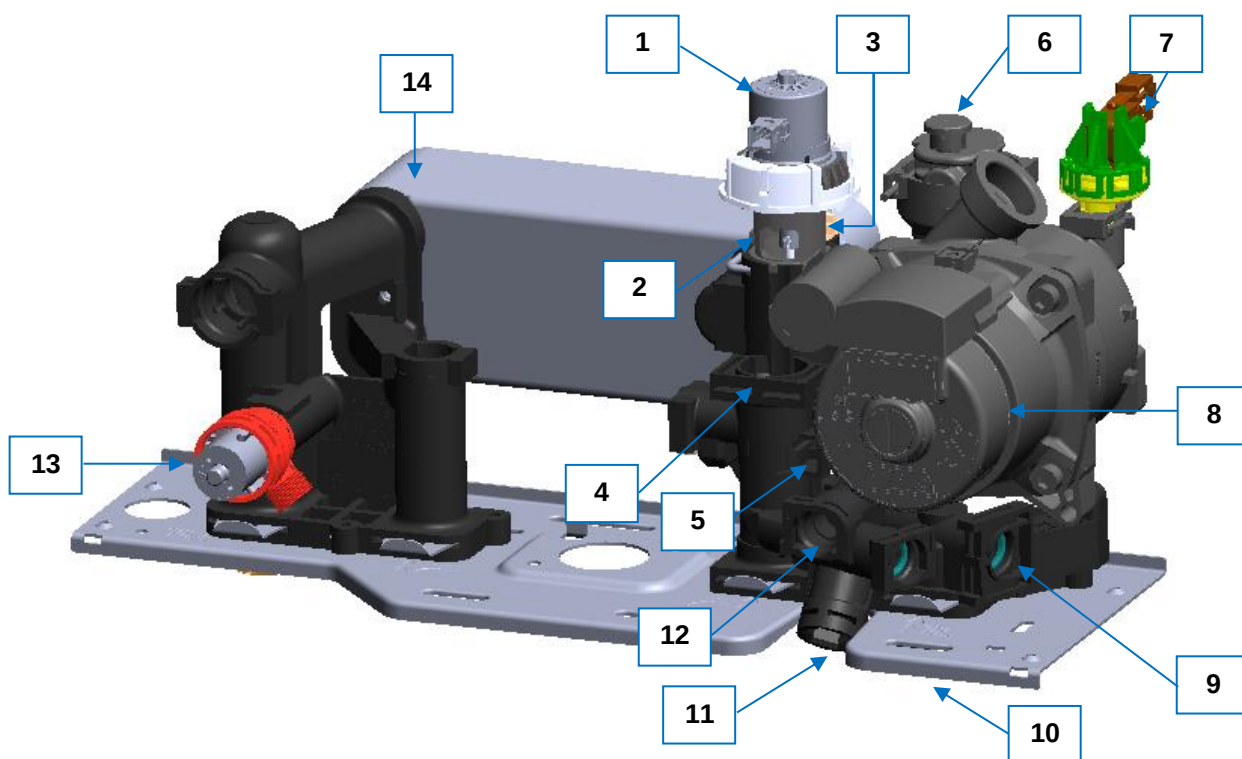
LEGEND			
1	3 way valve motor	7	Pump
2	3 way valve	8	Heating filter and pressure gauge connection
3	DHW flow switch	9	Filling tap (no for France)
4	Reed sensor	10	3 bar safety valve
5	Automatic air valve	11	By-pass
6	Minimum pressure switch connection (till May 2019) Pressure sensor (from May 2019)	12	DHW plate heat exchanger

5.3 HYDRAULIC UNIT – COMBI VERSION - RDC markets and CHINA (till July 2018)



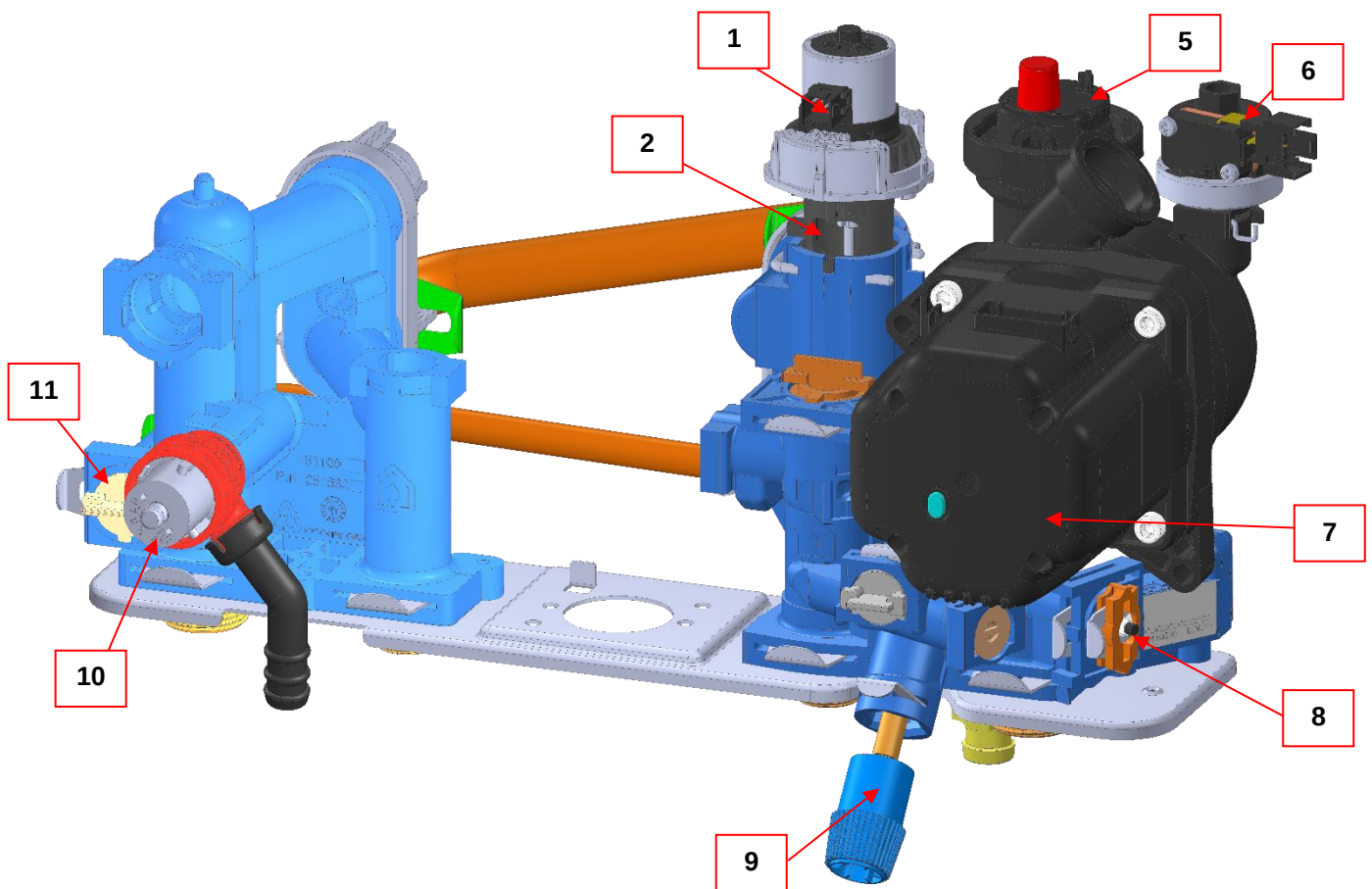
CAPTION			
1	3 way valve motor	8	Heating filter and pressure gauge connection
2	3 way valve	9	Filling tap
3	DHW flow switch	10	No back-flow valve
4	Reed sensor	11	3 bar safety valve
5	Automatic air valve	12	By-pass
6	Pressure switch	13	By-pass pipe
7	Pump	14	DHW plate heat exchanger

5.4 HYDRAULIC UNIT – COMBI VERSION - RDC markets and CHINA (from July 2018)



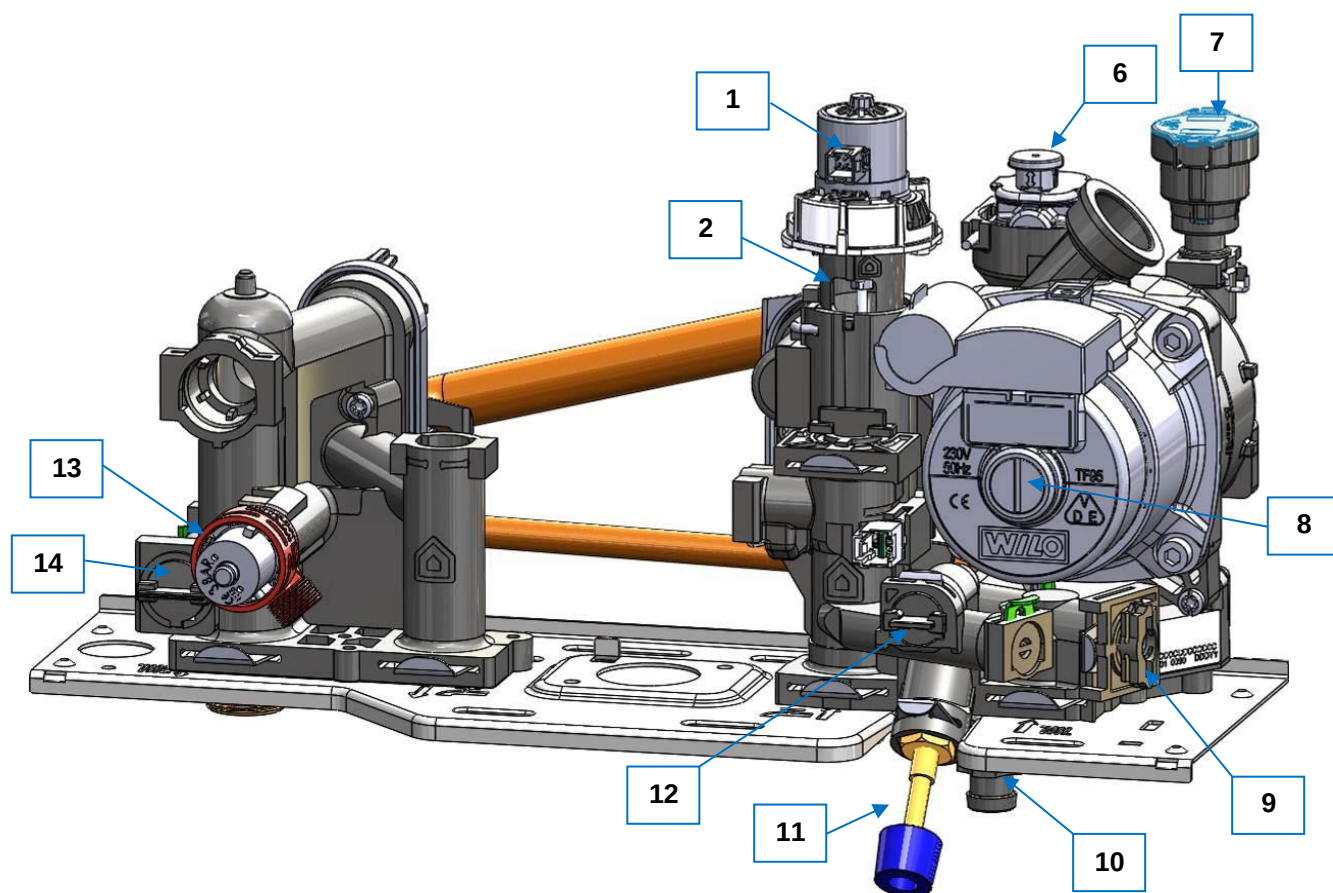
CAPTION			
1	3 way valve motor	8	Pump
2	3 way valve	9	Heating filter and pressure gauge connection
3	By-pass	10	Drain tap
4	DHW flow switch	11	Filling tap
5	Reed sensor	12	No back-flow valve
6	Automatic air valve	13	3 bar safety valve
7	Minimum pressure switch connection (till May 2019) Pressure sensor (from May 2019)	14	DHW plate heat exchanger

5.5 HYDRAULIC UNIT – SYSTEM VERSION - ErP markets



LEGEND			
1	3 way valve motor	8	Heating filter and pressure gauge connection
2	3 way valve	9	Filling tap (no for France)
5	Automatic air valve	10	3 bar safety valve
6	Minimum pressure switch connection (till May 2019) Pressure sensor (from May 2019)	11	By-pass
7	Pump		

5.6 HYDRAULIC UNIT – SYSTEM VERSION - RDC markets and CHINA



CAPTION

1	3 way valve motor	10	Drain tap
2	3 way valve	11	Filling tap
6	Automatic air valve	12	No back-flow valve
7	Minimum pressure switch connection (till May 2019) Pressure sensor (from May 2019)	13	3 bar safety valve
8	Pump	14	By-pass
9	Heating filter and pressure gauge connection		

5.7 3 WAY VALVE

The boiler uses a 3-way to change the water distribution (heating system side or secondary exchanger side). It's managed by the PCB that drives the stepper motor. It is formed by a composite material body and an electric stepper motor.

With the boiler on stand-by the 3-way valve is positioned on DHW mode.

The 3 way valve can have 3 different positions:

- Heating;
- Domestic hot water (DHW);
- Stand-by (position similar to DHW, but with the gasket uncompressed).

Every time that the boiler is supplied the 3 way valve motor does a reset procedure, it does 3 complete switching (DHW → Heating → DHW), after that the position is related to the boiler working mode.

After DHW request (if there is not heating request), the 3 way valve remains in DHW position for 10 minutes, after that it goes in stand-by position.

At the end of the heating request (if there is not DHW request), after the post-circulation, the 3 way valve goes on DHW position and after 10 minutes it goes in stand-by position.

From the PCB software version 22.34.00 (September 2020) after the heating request (if there is not DHW request), after the post-circulation, the 3 way valve goes directly in stand-by position.

If the boiler is switched off through the ON/OFF button, the 3 way valve goes immediately in stand-by (if post-circulation is in progress, the 3 way valve goes in stand-by position at the end of the post-circulation).



HEATING POSITION	DHW POSITION
	

The anti-sticking function of the 3 way valve is performed every 21 h after the last request.

3 WAY VALVE MOTOR DISASSEMBLY:

Before disassembly the 3 way valve it is mandatory to remove the stepper motor.
To remove the stepper motor the 3 way valve must be in DHW or stand-by position, otherwise it is not possible remove it. To do this it is enough the switch off the boiler by the ON/OFF button.

- Remove the motor blocking ring, rotating clockwise.



- Unblock the stepper motor

BLOCKED



UNBLOCKED



- Remove the stepper motor.



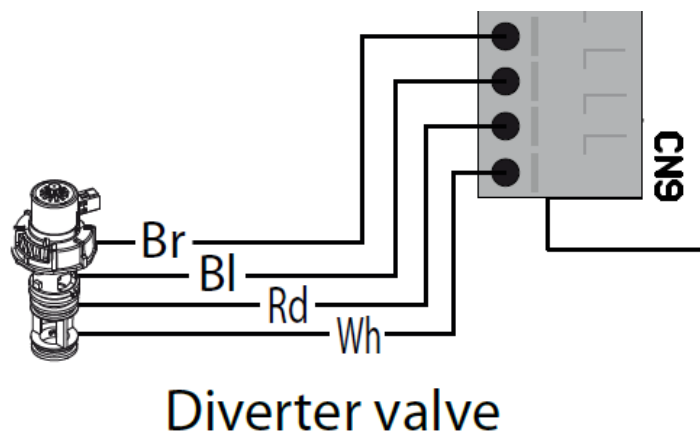
- Remove the 3 way valve (using a flat screwdriver as a lever at the key point.).



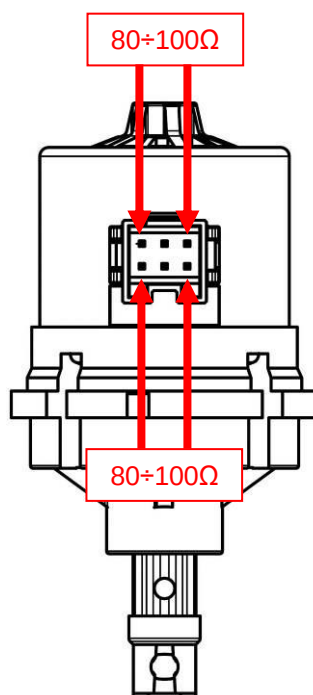
5.7.1 Stepper motor

The stepper motor is managed from the PCB.

Switching time (Heating → DHW or DHW → Heating) : about 3sec.,



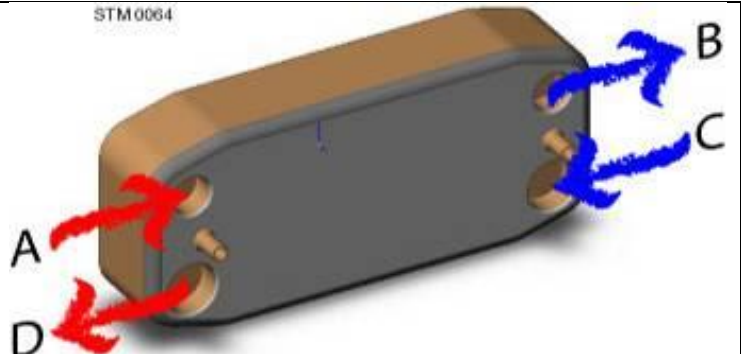
To check the stepper motor measure the resistance between the following pins. If it is between 80 and 100 Ohm it means that the coils of the stepper motor are ok.



5.8 SECONDARY EXCHANGER

The secondary exchanger is fixed to the hydraulic unit with two screws.

The two points where the screws are fixed are asymmetric with the body of the exchanger so that it can be assembled only in the proper position.

HEAT EXCHANGER Hot water from the main exchanger, flows into A, transferring its heat and flows out through B The cold water from the domestic hot water mains, passes through the domestic proportional flow meter (thus starting up the boiler in domestic hot water mode) flows into C, heat up and flows out through D, ready for use in the distribution network.	 Exchanger with 10 plates (24kW) Exchanger with 12 plates (30kW) Exchanger with 14 plates (35kW)
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5.8.1 Antiscale limit temperature

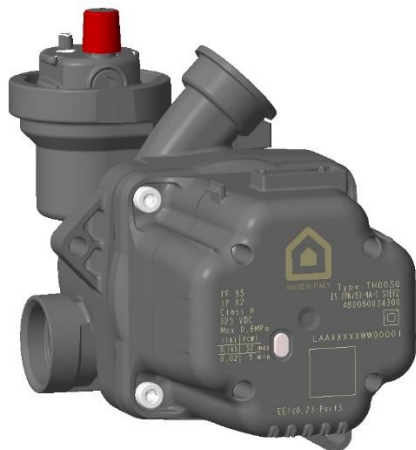
Reduces the formation of scale in the secondary exchanger. During DHW MODE operation the burner turn off and restart depends on the temperature values detected by probes NTC1 and NTCs indicated here on the right.

	<i>T set</i>	<i>Antiscale limit temp.</i>	<i>START</i>
NTC1 (delivery probe)	Not influent	85°C	81°C
NTC2 (return probe)	> 52°C	65°C	64°C
	<52°C	62°C	61°C

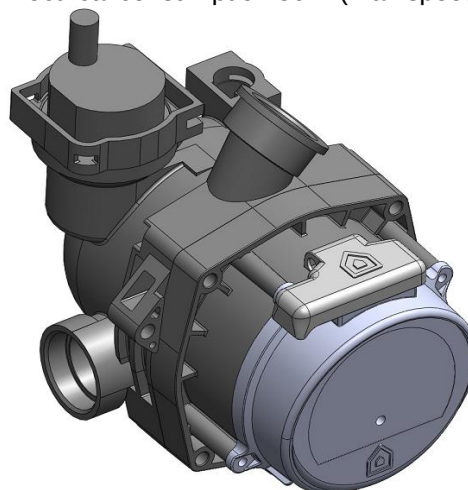
5.9 PUMP UNIT – ErP markets

The pump is full modulating. The modulation is according to the boiler power in heating.
In DHW the pump goes always at the maximum speed.
We can have 2 alternative pumps on this boiler:

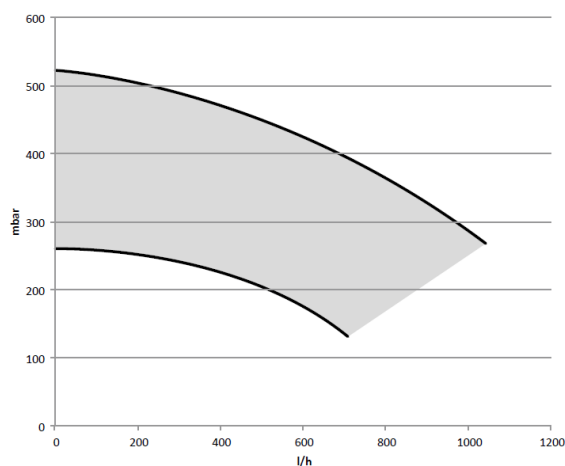
Pump model: ES 2PK/53-9A-C STEP2.
Electrical power supply: 325Vdc.
Electrical consumption: 52W (max speed).



Pump model: EUMEZECP2AE-C
Electrical power supply: 325Vdc.
Electrical consumption: 50W (max speed).

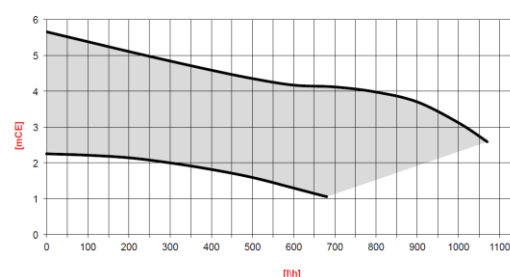


Setting the parameter 246 like the parameter 245 the pump works always at fixed speed.
Setting the parameter 245 and 246 to 75 the pump works at the speed that is like the low speed in the pump modulating in 2 step, at this speed the by-pass is guaranteed to work.

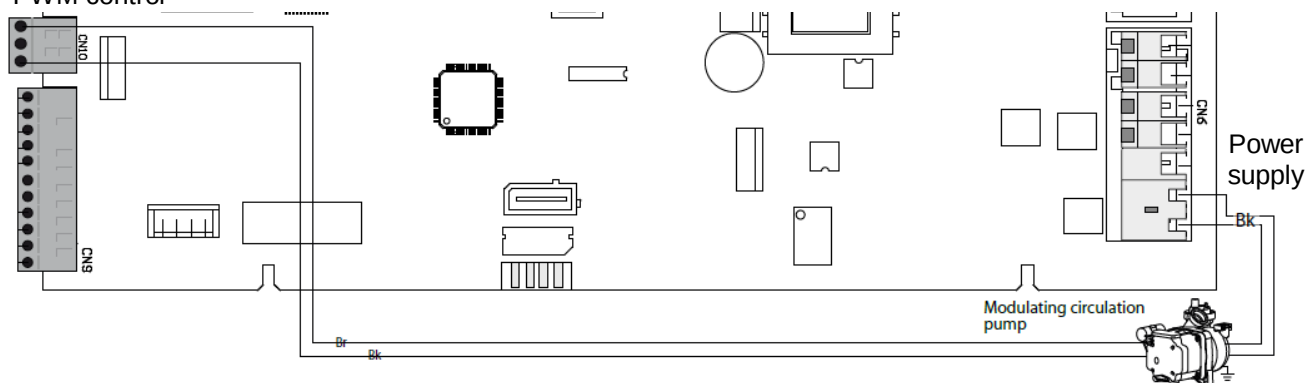


PAR.	NOTE
245	Max pump speed (settable between 75 and 100)
246	Min pump speed (settable between 40 and par. 245)

CLAS ONE 30 L

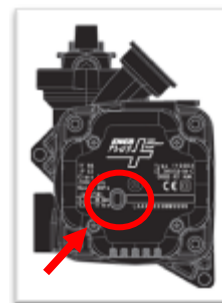


PWM control



There is one bi-colour led (green and red) in the frontal part of the pump:

- Led off: pump off or not supplied;
- Led green on fix: pump on with stable speed;
- Led green on blinking: pump on with speed changing;
- Led red on fix: pump blocked; with the system empty or with air inside the system switch-on alternatively the red led and the green blinking.



With the PWM wire disconnected (main PCB connector CN10) the pump goes at the maximum speed.

5.9.1 Types of post-circulation

Post-circulation after:	3 way valve position	Time of post circulation	Speed pump
Switching off due to:			
Room thermostat opening	Heating	3 min (set by parameter 237 between 0 e 15')	Min/Mean
Heating Off by Summer/Winter button	Heating	3 min (set by parameter 237 between 0 e 15')	Min/Mean
NTC delivery > T set +4	Heating	continuasly	Min/Mean
NTC return > 62°C or 67°C	DHW	continuasly	Max
End of DHW demand	DHW	Par. 254=0 → 30 sec if: Tdel<75°C ; 3 min if Tdel>75°C; Post circulation: 30sec	Max
		Par. 254=1 → 3 min	
End of comfort cycle	DHW	30 sec	Max
End of antifreeze function	Heating / DHW	2 min	Max
End of chimney sweeping function	Heating	1 min	Min
Solar sensor	DHW	30 sec	Min
Errors			
Pressure sensor (102), Low pressure (108, 111)	Heating	40 sec	Min
No circulation (103, 104, 105, 106, 107)	Heating	1 min	Max
Flame missing, flame lift (501, 504)	Heating	2 min	Min
Overheat (101), Thermo fuse opening (610)	Heating	2 min	Min
No circulation (1P1, 1P2, 1P3)	Heating	10 sec	Max
Floor thermostat opened (116)	Heating	90 sec	Min

5.10 PUMP UNIT – RDC markets and CHINA

Pump type:

Wilo INMTSL 15/5 HE-2	RDC markets
Wilo INTMTSL 15/6.7 HE-2	CHINA

The P.C.B. controls modulation of the circulation pump at two different speeds V2 and V3 :

- On “DHW” the pump always works on V.3 to allow excellent heat exchange
- On “heating” the circulating device has 2 speeds that are operated by the heating del-ret ΔT control.

Operated as follows:

- $\Delta T_{del-ret} < \Delta T - 2^{\circ}\text{C} \rightarrow V2$;
 - $\Delta T_{del-ret} > \Delta T \rightarrow V3$;
- where: $\Delta T = 20^{\circ}\text{C}$ (default value, which can be set by parameter 2 39 between 10 and 30°C).

Speed switching is performed with a 5 minute delay (value that cannot be set) up or down.

It is possible to exclude the pump modulation with the parameter 2 38:

- 0: speed 2 fix;
- 1: speed 3 fix;
- 2: modulating.

The antisticking function switch on the pump and 3 way valve for 15 sec every 21 h after the last request.

Wilo INMTSL 15/5 HE-2



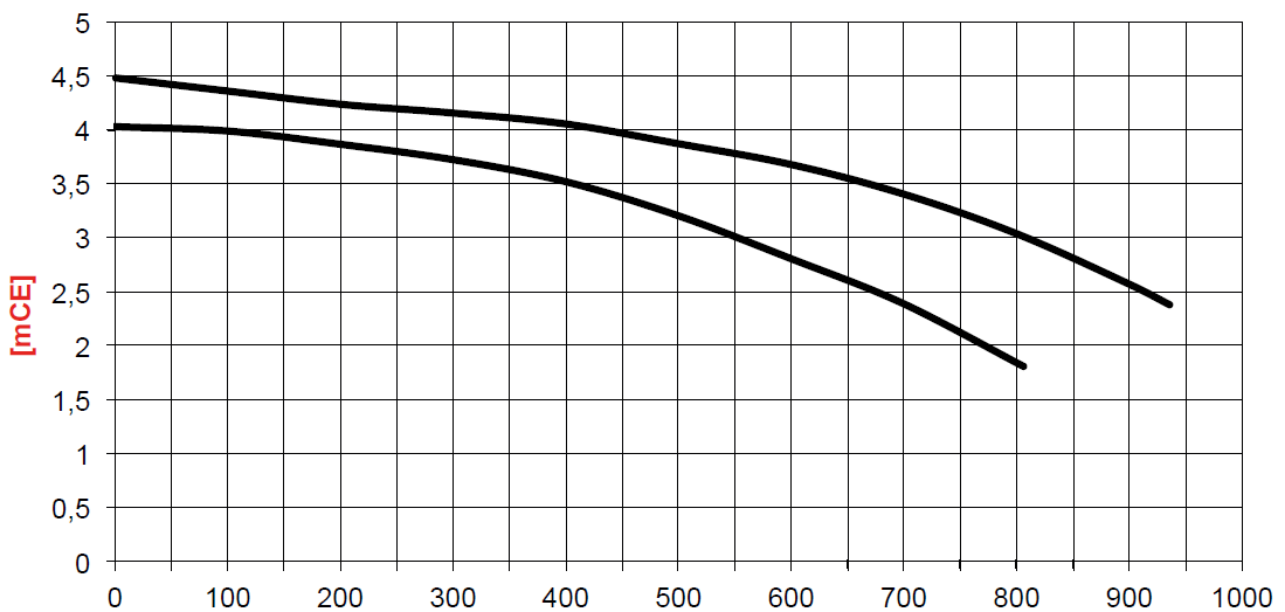
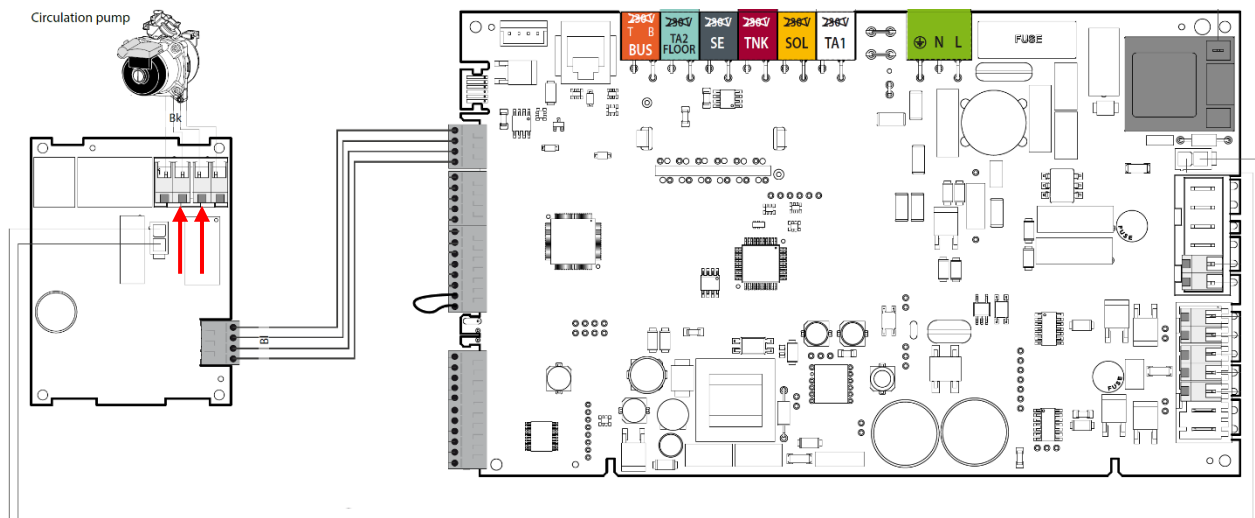
Wilo INTMTSL 15/6.7 HE-2



5.10.1 PUMP speed check

The speed of the pump can be checked by the parameter **8 23** or by measuring the voltage (Vac) between pins in the picture below:

- **145 Vac**: maximum speed;
- **0 Vac**: minimum speed.



5.10.2 Post-circulation.

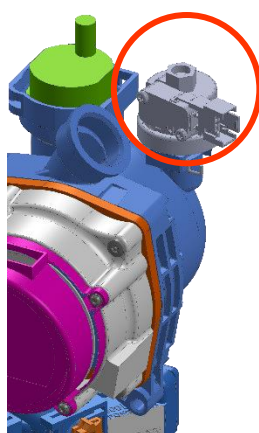
Post-circulation after:	3 way valve position	Time of post circulation	Speed pump
Switching off due to:			
Room thermostat opening	Heating	3 min (set by parameter 237 between 0 e 15')	Low
Heating Off by Summer/Winter button	Heating	3 min (set by parameter 237 between 0 e 15')	Low
NTC delivery > T set +4	Heating	continuasly	Low
NTC return > 62°C or 67°C	DHW	continuasly	High
End of DHW demand	DHW	Par. 254=0 → 30 sec if: Tdel<75°C ; 3 min if Tdel>75°C; Post circulation: 30sec	High
		Par. 254=1 → 3 min	
End of comfort cycle	DHW	30 sec	High
End of antifreeze function	Heating / DHW	2 min	High
End of chimney sweeping function	Heating	1 min	Low
Solar sensor	DHW	30 sec	Low
Errors			
Pressure sensor (102), Low pressure (108, 111)	Heating	40 sec	Low
No circulation (103, 104, 105, 106, 107)	Heating	1 min	High
Flame missing, flame lift (501, 504)	Heating	2 min	Low
Overheat (101), Thermo fuse opening (610)	Heating	2 min	Low
No circulation (1P1, 1P2, 1P3)	Heating	10 sec	High
Floor thermostat opened (116)	Heating	90 sec	Low

5.11 HEATING PRESSURE SWITCH (till May 2019)

The minimum pressure switch verifies the pressure in the heating circuit, with micro-switch ON/OFF.
The setting are:

- OFF: 0,4 bar;
- ON: 0,6 bar.

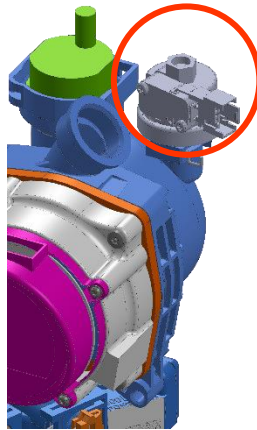
When it opens there is the safety shout down **1 08**



5.12 HEATING PRESSURE SENSOR (from May 2019)

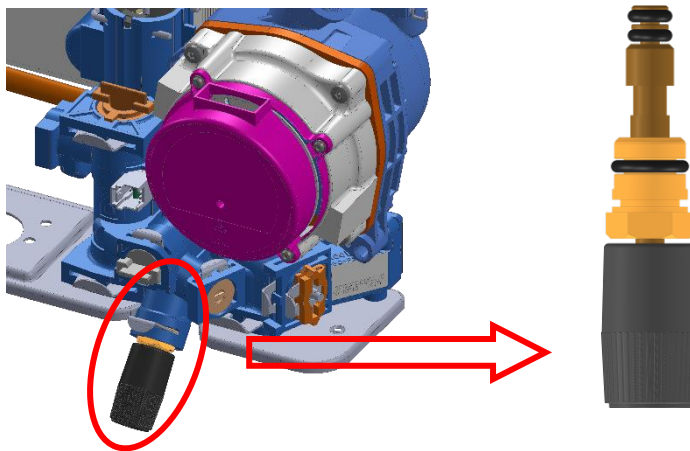
The proportional pressure sensor measures the pressure of the primary circuit, which is shown on the display.

If the pressure decreases below the value set by parameter 241 (default: 0,6bar) occur a warning (**1 P4**), but the boiler continues to operate normally; If the pressure decreases below the value set by parameter 240 (default: 0,4bar) occur a safety shut down **1 08**.



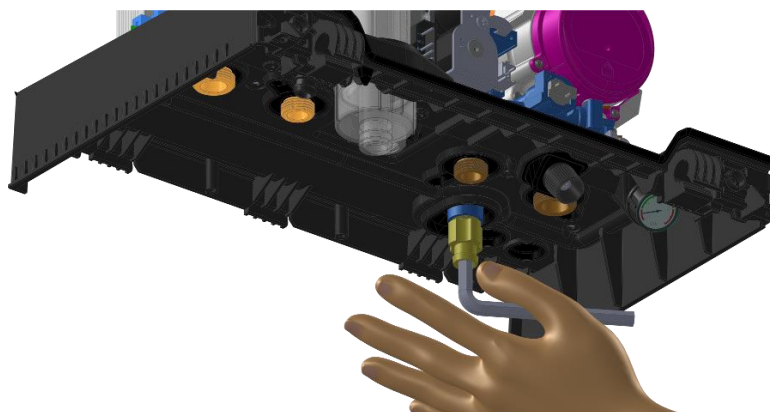
5.13 FILLING TAP (not for UK and France)

To fill the heating circuit use the tap positioned under the hydraulic group support, pull down the handlebar and after rotate in anticlockwise.



5.14 DRAIN VALVE

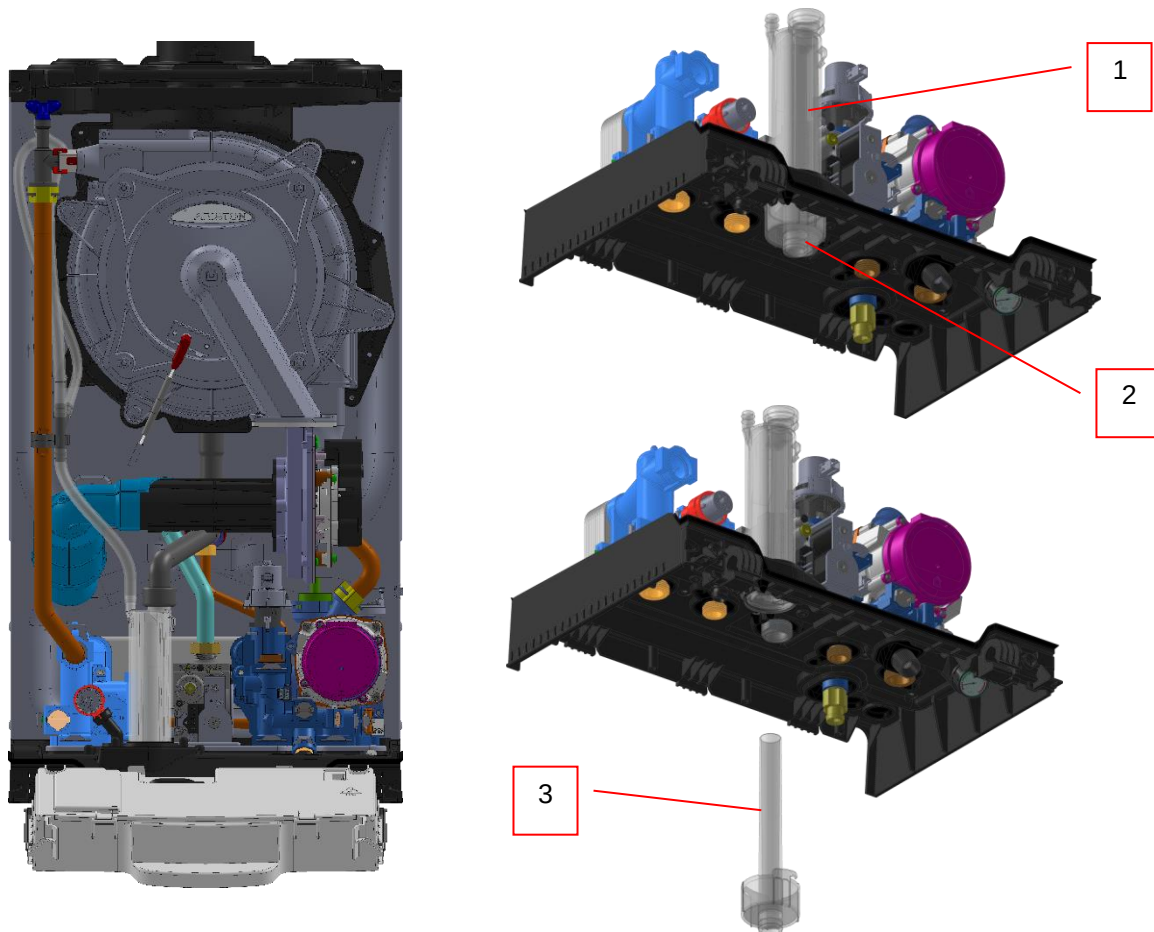
To empty the system, turn the drain tap positioned on the lower part of the boiler anti-clockwise.



5.15 CONDENSATION TRAP

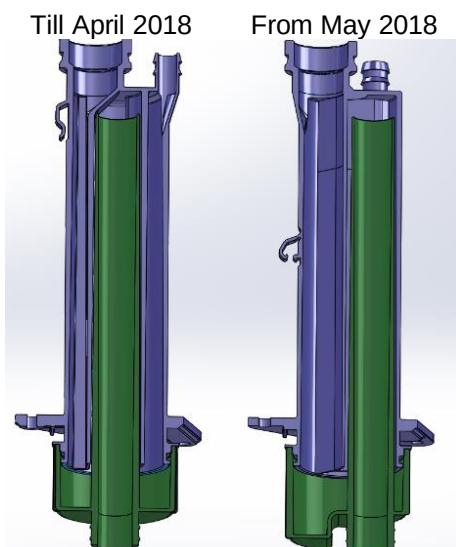
The condensation trap is integrated in the boiler, and located in front of flow part of hydraulic group. It can be accessed from the outside of the case, without opening the air chamber. In the condensation trap is also connected the pipe that came from main heat exchanger air purge and from the water protection plate.

N.B. Remember to fill the trap before commissioning the boiler.



LEGEND

1. Condensate trap	3. Condensate tank
2. Condensate drain	



5.16 **BY-PASS**

The boiler has an automatic by-pass and, therefore no regulation is required. In the case of load losses in the system caused for example by the intervention of thermostat or area valves, the by-pass guarantees a flow in the condensing main exchanger of at least 350l/h.

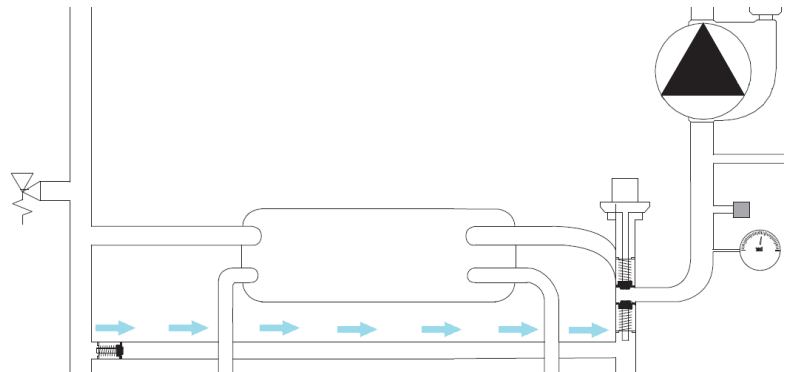
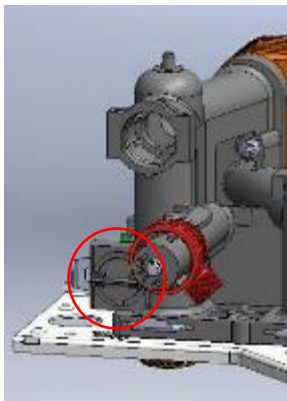
The by-pass is therefore designed to protect the condensing main exchanger from overheating in the case of poor or insufficient water circulation.

If this condition occurs, the system regulates the power normally and then switches off the main burner when the set-point temperature is reached.

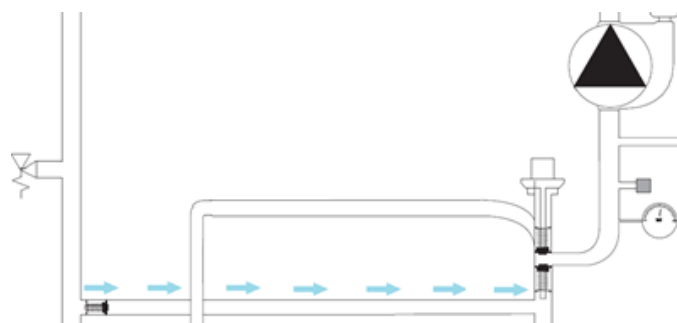
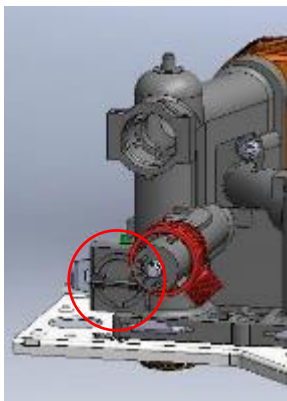


By-pass

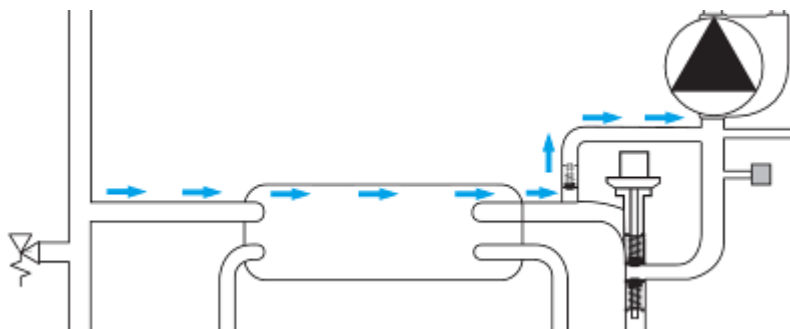
5.16.1 *By-pass (Combi version till July 2018)*



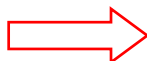
5.16.2 *By-pass (System version)*



5.16.3 By-pass (Combi version from July 2018)



For easier by-pass disassembly is better remove before the 3 way valve motor nut.



5.17 PRIMARY EXCHANGER UNIT

The primary exchanger is kept in position inside the combustion chamber by 4 points. It has integrated extra functions: flue box, drain condensate.

The heat exchanger is made with one pipe in stainless steel smooth (material: 304 L / Diameter: 28 mm / Thickness: 0,8 mm). In order to have a maximum thermal exchange, the tubes are flattened.

Spacers are used to maintain the distance between each coil (0,8 mm).

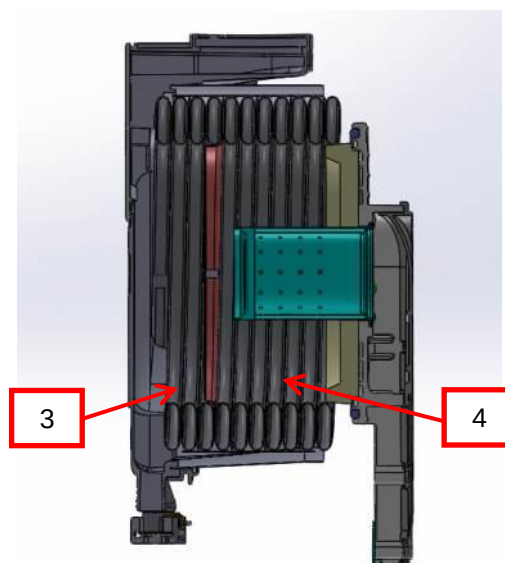
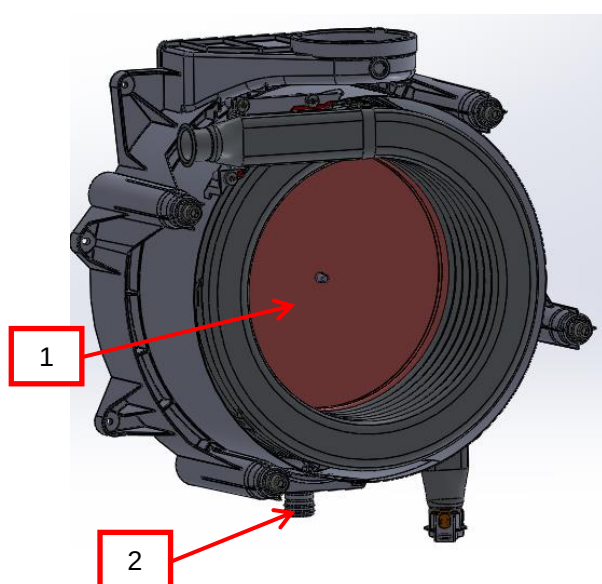
Number of coils according to the burner power:

Burner power	Nb of coils
18 kW	10
24 KW	10
30 KW	13
35 KW	15



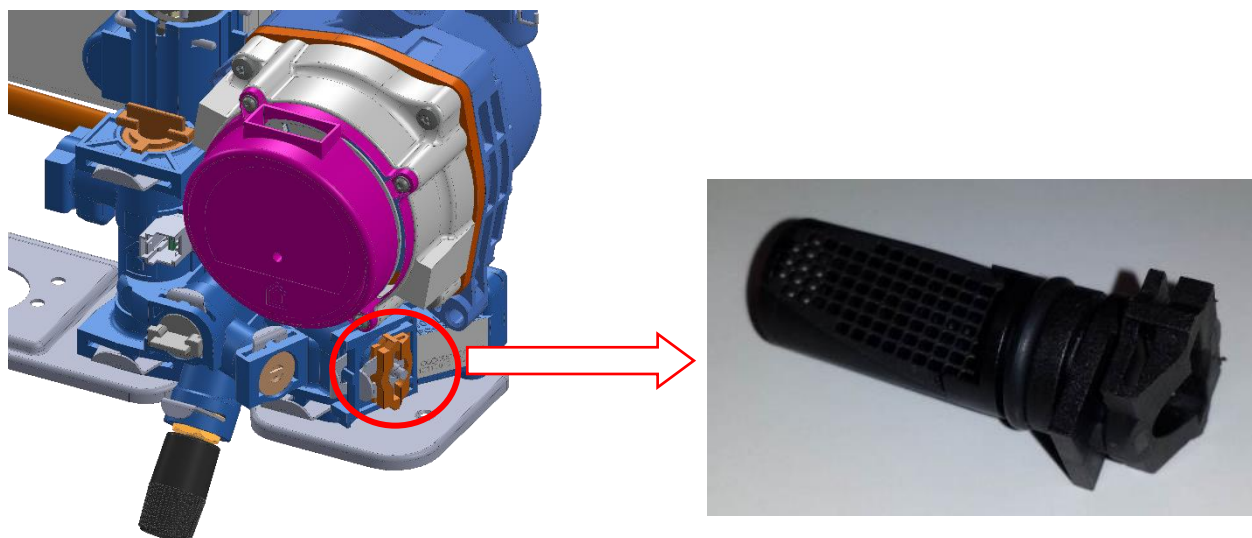
LEGEND

- | | |
|-------------------------|--------------------------|
| 1. Insulation | 3. Low temperature zone |
| 2. Condensate discharge | 4. High temperature zone |



5.18 HEATING FILTER

On the heating return unit there is a filter that can be removed from the front side of the boiler. To inspect and clean the filter follow the instructions shown below.

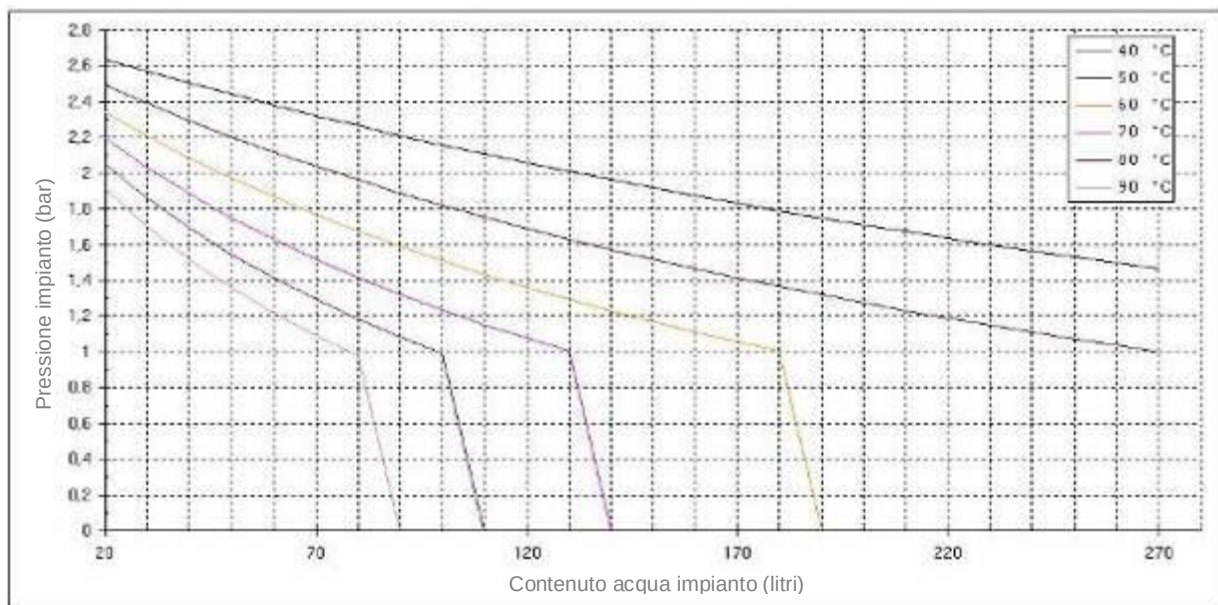
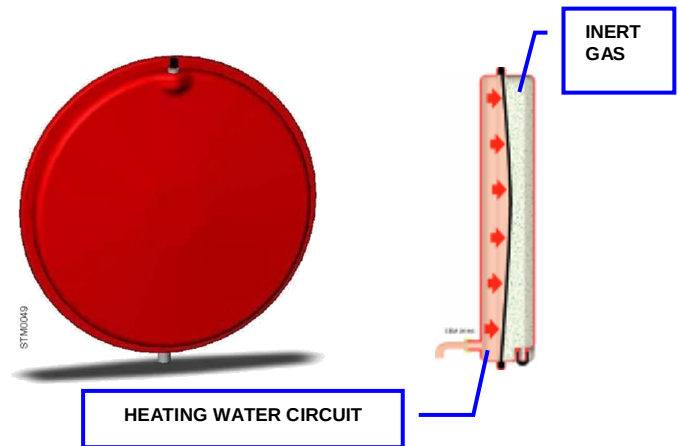


5.19 EXPANSION VESSEL

The expansion vessel absorbs primary circuit water expansion when there is a boiler temperature raise. It is constituted by two parts separated by a SBR rubber membrane. On one side, it is an inert gas (nitrogen) and on the other side, water of the primary circuit. The inert gas chamber (which can be compressed) absorbs the water volume increased because of temperature raise.

The expansion vessel has been conceived for an approx. 175 litres heating system.

Technical features	
Capacity	8 litres
Maximum operating temperature	90°C
Nitrogen pressure	1 bar
Maximum operating pressure	3.0bar



5.20 DHW FLOW SWITCH

The DHW flow meter is positioned in front of e way valve.

When turned on DHW mode, the flow of water passes through the flow switch (on/off), the float moves upwards and through the magnet close the reed sensor contact and the PCB know that the tapping is in progress.

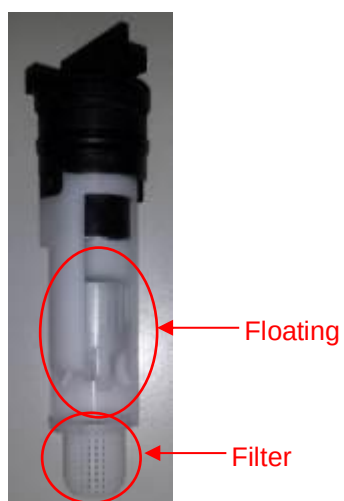
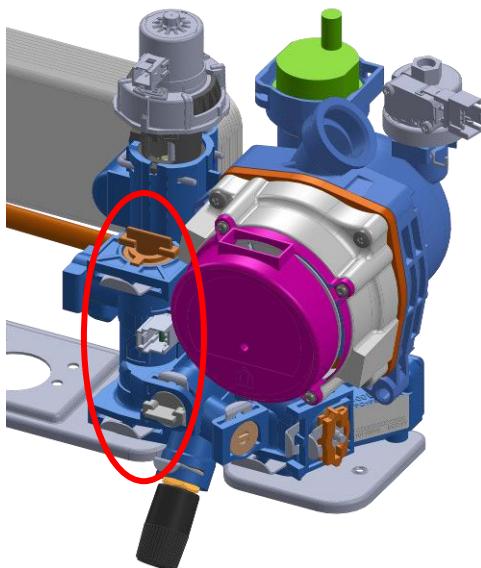
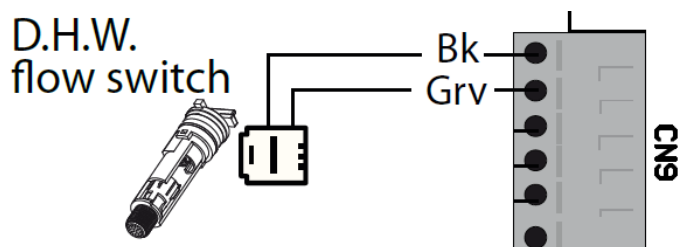
A cold water inlet filter is built-in the DHW flow meter to stop impurities from getting in.

There is also an anti-hammer device (through the PCB) that can be set by parameter **2 52** between 0.5 sec and 20 sec (default 0.5 sec).

It is possible check if the contact is open or closed through the connector CN09.

Flow capacity on: 2 l/min

Flow capacity off: 1,4 l/min



5.21 DHW FLOW LIMITER (accessory)

If the DHW flow rate is too high, it is possible assemble in the boiler the flow limiter. It is available in 3 different flow rate: 8l/min, 10l/min and 12l/min, it is possible identify them with the colour:

8 l/min



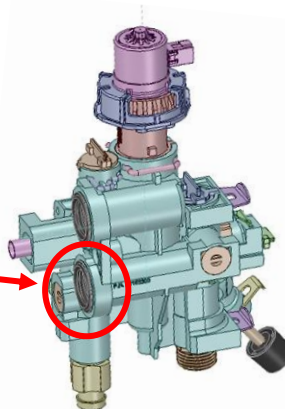
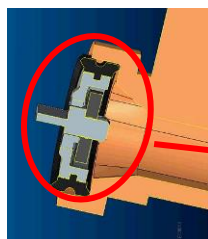
10 l/min



12 l/min



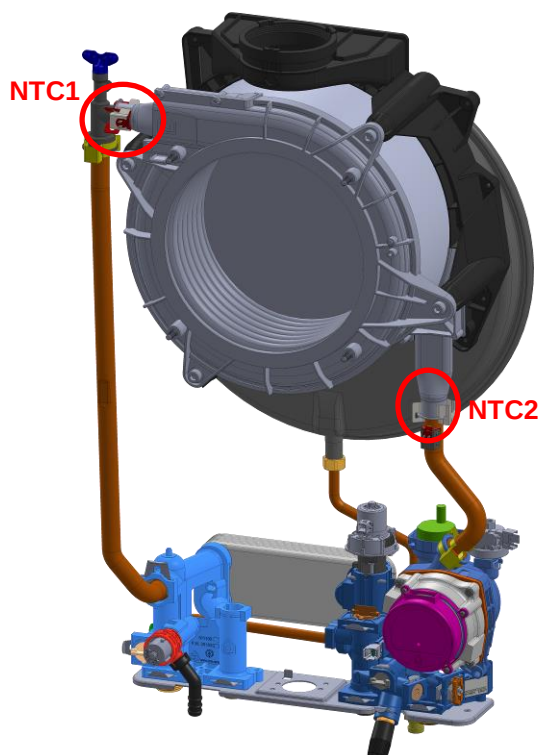
The flow limiter must be assembled in the connection between right hydraulic block and DHW heat exchanger.



5.22 TEMPERATURE PROBE

To check the delivery and return temperature use the two contact sensor. To read the DHW water temperature the boiler uses the sensor **NTC2**.

If the NTC1 sensor does not work properly the antifreeze function will be checked by sensor **NTC2** (only pump circulation).

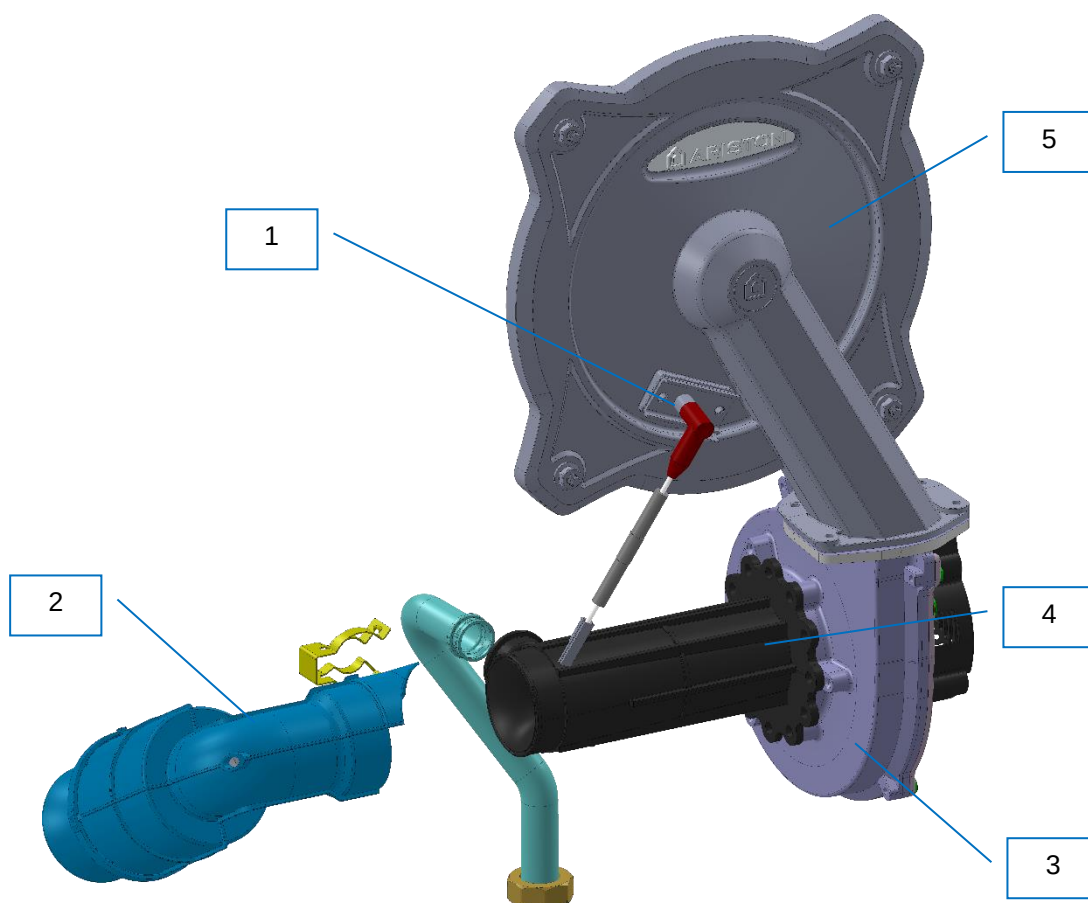


TEMPERATURE (°C)	RESISTANCE (kOhm)
0	27
10	17
20	12
25	10
30	8
40	5
50	4
60	3
70	2
80	1,5

PROBE ERROR CODES	
1 10	NTC1 heating delivery probe open circuit or no signal.
1 12	NTC2 heating return probe open circuit or no signal.

6 BURNER UNIT

6.1 BURNER UNIT



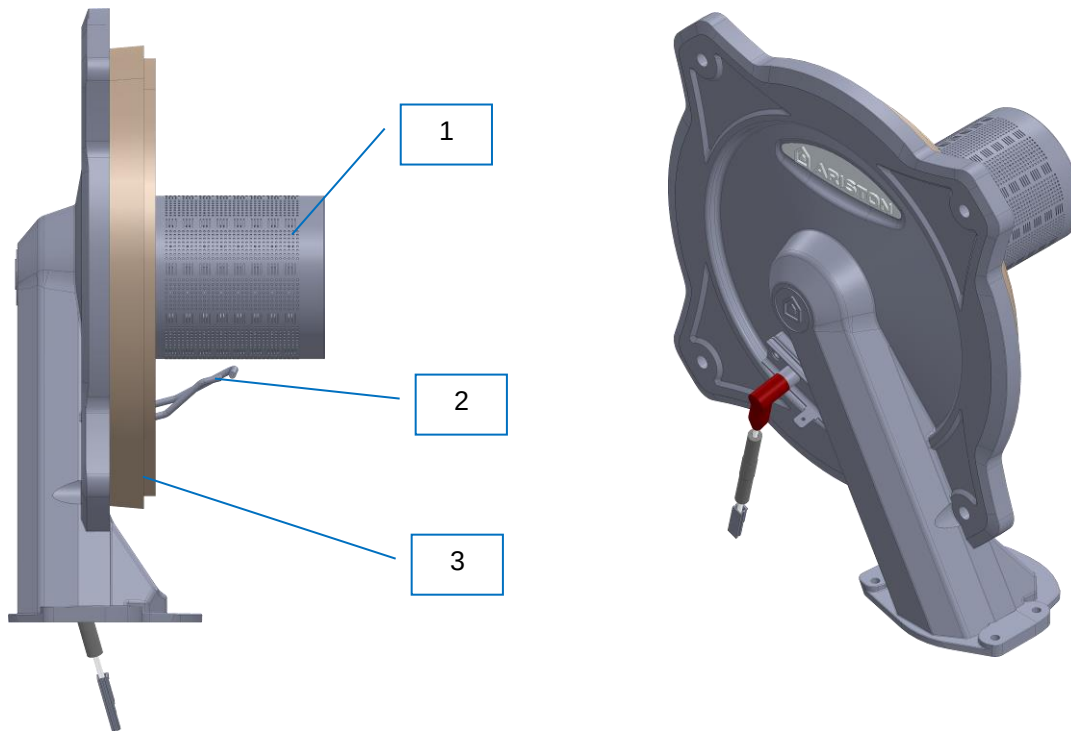
CAPTION

1. Ignition/detection electrode	4. Mixer
2. Silencer	5. Burner door
3. Fan	

6.2 PREMIX BURNER

The cylindrical stainless steel premix burner pot Ø 70 mm is made up of a small-diameter perforated external casing on which the combustion occurs, a large-diameter perforated internal casing that balances the propagation of the gas.

This burner can be used with natural gas and LPG.

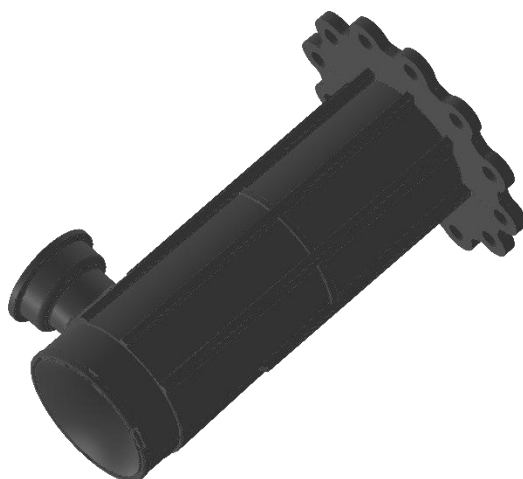


LEGEND

- | |
|---------------------------------|
| 1. Stainless Steel Burner |
| 2. Ignition/detection electrode |
| 3. Insulation |

Power	Length
18 kW	89 mm
24 KW	89 mm
30 KW	98 mm
35 KW	118 mm

6.3 MIXER



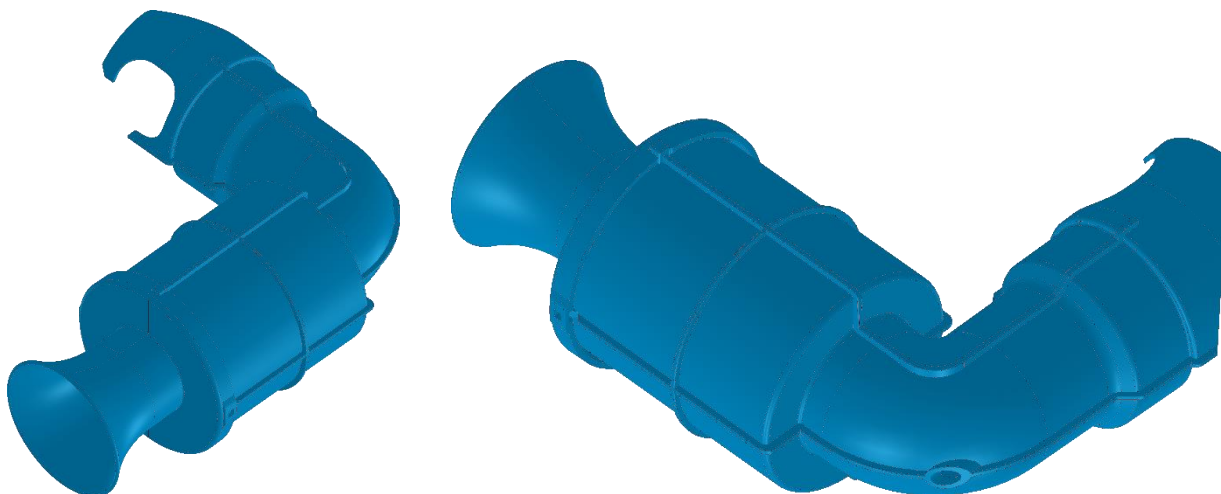
Gas	18kW (ø mm)	24kW (ø mm)	30kW Clas One H 24 (ø mm)	35kW (ø mm)
G20 / G25 / G31 / G230	16	16	18,7	21,5

6.4 GAS CHANGE

For gas G20 the diaphragm is integrated in the mixer. For G31 it needs to add a diaphragm (see table below), that is available in the dedicated kit.

Gas	18kW (ø mm)	25kW (ø mm)	30kW Clas One H 24 (ø mm)	35kW (ø mm)
G20 / G230 (integrated)	5,0	5,0	5,8	6,8
G25	/	NO	NO	NO
G31	3,6	3,6	4,0	4,7

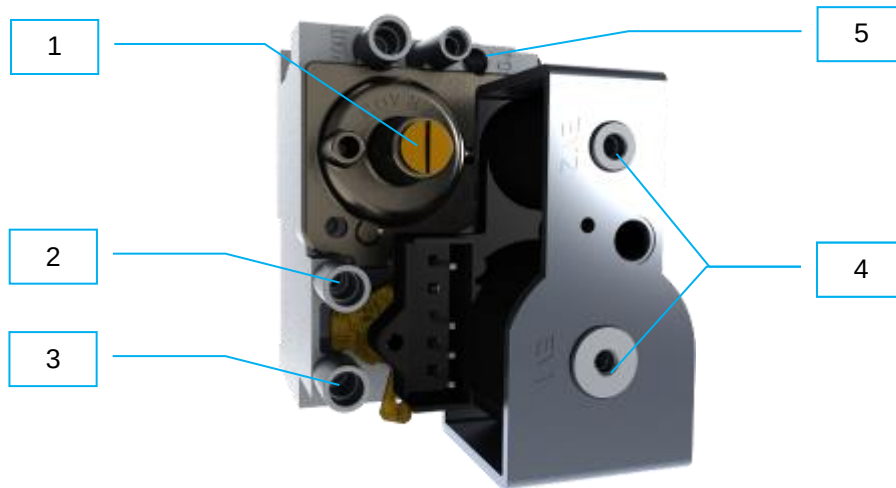
6.5 SILENCER



6.6 SIT 848 SIGMA GAS VALVE

The gas valve mounted is a **SIT 848 SIGMA** valve fitted with two operators supplied at 230 VAC that consent or cut off the gas supply to the main burner. The speed of the fan regulates the outgoing gas pressure of the valve according to the readings detected by the electronic P.C.B. via the temperature probes.

The valve is prearranged to work with different types of gas without having to replace any part, but need only to change the nozzle. The maximum inlet pressure with which the gas valve can work is 60mbar.



CAPTION

1. OFF-SET SETTING (minimum power setting)	4. GAS VALVE ELETTROVALVE
2. P INT PRESSURE GAUGE	5. TROTTLE SETTING (maximum power setting)
3. INLET GAS PRESSURE GAUGE	

6.7 GAS SETTINGS

With the gas valve it is possible to set:

- The gas/air adjustment on the gas valve (maximum power);
- The zero adjustment on the gas valve (minimum power).

CO₂ adjustment - maximum power (gas/air)

It must be made during the “flue cleaner function”.

To set the screw, use only one hexagonal key CH 2,5 .

Gas	CO ₂ max			
	18 KW	24 KW	30 KW	35KW
G20 - G2.350 - G27 - G25	9,2% ± 0,5	9,2% ± 0,5	9,2% ± 0,5	9,2% ± 0,5
G25.1	10,2% ± 0,5	10,2% ± 0,5	10,2% ± 0,5	10,2% ± 0,5
G31 - G230	10,0% ± 0,5%	10,0% ± 0,5%	10,0% ± 0,5%	10,0% ± 0,5%



CO₂ adjustment - minimum power (zero)

It must be made during the “flue cleaner function”.

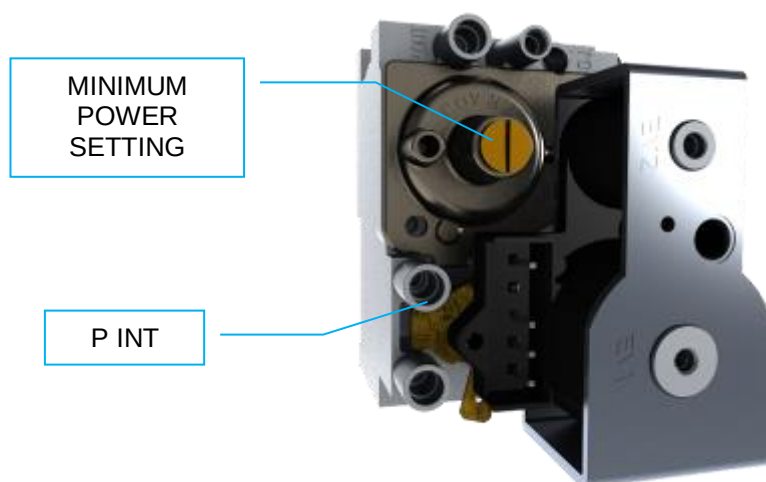
To set the screw, remove the cap, and use only one hexagonal key CH 4.

Gas	CO ₂ min			
	18 KW	24 KW	30 KW	35KW
G20 - G2.350 - G27 - G25	8,9% ± 0,5	8,9% ± 0,5	8,9% ± 0,5	8,9% ± 0,5
G25.1	10,0% ± 0,5	10,0% ± 0,5	10,0% ± 0,5	10,0% ± 0,5
G31 - G230	10,0% ± 0,5%	10,0% ± 0,5%	10,0% ± 0,5%	10,0% ± 0,5%



If there are difficulties to set the CO₂ at the minimum power, follow the procedure below:

- Connect the monometer at the gas valve pressure intake “P INT”;
- Force the boiler at the maximum power (through the chimney function);
- Through the minimum screw set the pressure to have the pressure near 0mbar;
- Force the boiler at the minimum power (through the chimney function);
- Set the CO₂ (see above).



The soft ignition power checking and setting

To check and to set the soft ignition, it is possible in the parameter **2 20**.
The factory's setting is 60.

6.7.1 GAS TABLE

		parameter	CLAS ONE System / RDC					
			18					
			G20	G230	G25.1	G2.350	G27	G31
Lower Wobbe index (15°C, 1013 mbar) (MJ/m ³)			45,67	38,90	35,25	29,67	35,17	70,69
Gas supply pressure - mbar			20	20	25	13	20	37
Slow ignition		220	98					
Maximum C. H.power Adjustable (%)		231	60					
Minimum power (%)		233	3					
Max CH power (%)		234	60					
Max DHW power (%)		232	60					
Gas diaphragm (Ø) mm			5 (*)	NO	NO	NO	NO	3,6
Change air/gas mixer			NO	YES	YES	YES	YES	NO
Gas flow max/min (15°C, 1013 mbar) (nat - m3/h)	max D.H.W		1,90	1,48	2,21	2,65	2,32	1,40
	max C.H		1,90	1,48	2,21	2,65	2,32	1,40
	min		0,39	0,30	0,45	0,54	0,48	0,29

		parameter	CLAS ONE / RDC					
			CLAS ONE System / RDC					
			24					
			G20	G230	G25.1	G2.350	G27	G31
Lower Wobbe index (15°C, 1013 mbar) (MJ/m³)			45,67	38,90	35,25	29,67	35,17	70,69
Gas supply pressure - mbar			20	20	25	13	20	37
Slow ignition		220	64					
Maximum C. H.power Adjustable (%)		231	56					
Minimum power (%)		233	3					
Max CH power (%)		234	75					
Max DHW power (%)		232	90					
Gas diaphragm (Ø) mm			5 (*)	NO	NO	NO	NO	3,6
Change air/gas mixer			NO	YES	YES	YES	YES	NO
Gas flow max/min (15°C, 1013 mbar) (nat - m3/h)	max D.H.W		2,75	2,13	3,19	3,82	3,36	2,02
	max C.H		2,33	1,81	2,70	3,23	2,84	1,71
	min		0,39	0,30	0,45	0,54	0,48	0,29

		parameter	CLAS ONE / RDC					
			CLAS ONE System RDC					
			30					
			G20	G230	G25.1	G2.350	G27	G31
Lower Wobbe index (15°C, 1013 mbar) (MJ/m³)			45,67	38,90	35,25	29,67	35,17	70,69
Gas supply pressure - mbar			20	20	25	13	20	37
Slow ignition		220	62					
Maximum C. H.power Adjustable (%)		231	60					
Minimum power (%)		233	3					
Max CH power (%)		234	84					
Max DHW power (%)		232	90					
Gas diaphragm (Ø) mm			5,8 (*)	NO	NO	NO	NO	4,0
Change air/gas mixer			NO	YES	YES	YES	YES	NO
Gas flow max/min (15°C, 1013 mbar) (nat - m3/h)	max D.H.W		3,17	2,46	3,69	4,41	3,87	2,33
	max C.H		2,96	2,30	3,44	4,12	3,61	2,18
	min		0,46	0,35	0,53	0,63	0,56	0,33

		parameter	CLAS ONE / RDC					
			CLAS ONE System RDC					
			35					
			G20	G230	G25.1	G2.350	G27	G31
Lower Wobbe index (15°C, 1013 mbar) (MJ/m ³)			45,67	38,90	35,25	29,67	35,17	70,69
Gas supply pressure - mbar			20	20	25	13	20	37
Slow ignition		220	62					
Maximum C. H.power Adjustable (%)		231	60					
Minimum power (%)		233	3					
Max CH power (%)		234	85					
Max DHW power (%)		232	94					
Gas diaphragm (Ø) mm			6,8 (*)	NO	NO	NO	NO	4,7
Change air/gas mixer			NO	YES	YES	YES	YES	NO
Gas flow max/min (15°C, 1013 mbar) (nat - m3/h)	max D.H.W		3,65	2,83	4,24	5,07	4,45	2,68
	max C.H		3,28	2,30	3,81	4,56	4,00	2,41
	min		0,53	0,35	0,61	0,73	0,65	0,39

(*) Gas diaphragm integrated in the air/gas mixer
(NON-REMOVABLE)

FRANCE

		Paramètre	CLAS ONE								
			CLAS ONE System						CLAS ONE System		
			25			30			35		
			G20	G25	G31	G20	G25	G31	G20	G25	G31
Indice de Wobbe inférieur (15°C, 1013 mbar) (MJ/m ³)			45,67	37,38	70,69	45,67	37,38	70,69	45,67	37,38	70,69
Pression d'alimentation gaz (mbar)			20	33	37	20	33	37	20	33	37
Allumage lent		220	64			62			62		
Pourcentage Puissance mini (%)		231	56			60			60		
Pourcentage Puissance maxi chauffage (%)		233	3			3			3		
Pourcentage Puissance Max Sanitaire (%)		234	75			84			85		
Réglage puissance chauffage max.		232	90			90			94		
Diaphragme gaz (ø)			5 (*)	NON	3,6	5,8 (*)	NON	4,0	6,8 (*)	NON	4,7
Nouveau mélangeur air/gaz			NON	OUI (2)	NON	NON	OUI (2)	NON	NON	OUI (2)	NON
Débit gaz max/min (15°C, 1013 mbar) (nat - m3/h) (GPL - kg/h)	max sanitaire		2,75	3,20	2,02	3,17	3,69	2,33	3,65	4,25	2,68
	max chauffage		2,33	2,71	1,71	2,96	3,45	2,18	3,28	3,82	2,41
	min		0,39	0,46	0,29	0,46	0,53	0,33	0,53	0,62	0,39

(*) NOTE : DIAPHRAGME VANNE GAZ INTÉGRÉ DANS
LE MIXER AIR/GAZ.

Les appareils sont prévus pour fonctionner en

		parametro	CLAS ONE H	
			24	
			G20	G31
Indice di Wobbe inferiore (15°C, 1013 mbar) (MJ/m ³)			45,67	70,69
Pressione di alimentazione gas - mbar			20	37
Lenta accensione	220		64	
Massima potenza riscaldamento regolabile	231		64	
Velocità ventilatore al minimo (%)	233		3	
Velocità ventilatore maxi riscaldamento (%)	234		66	
Velocità ventilatore maxi sanitario (%)	232		78	
Diaframma gas (ø) mm			5,8 (*)	4,0
Consumi max/min (15°C, 1013 mbar) (nat - m ³ /h) (GPL - kg/h)	max sanitario		2,75	2,02
	max riscaldamento		2,33	1,71
	minimo		0,39	0,29

(*) Diaframma gas integrato nel mixer aria/gas
(NON REMOVIBILE)

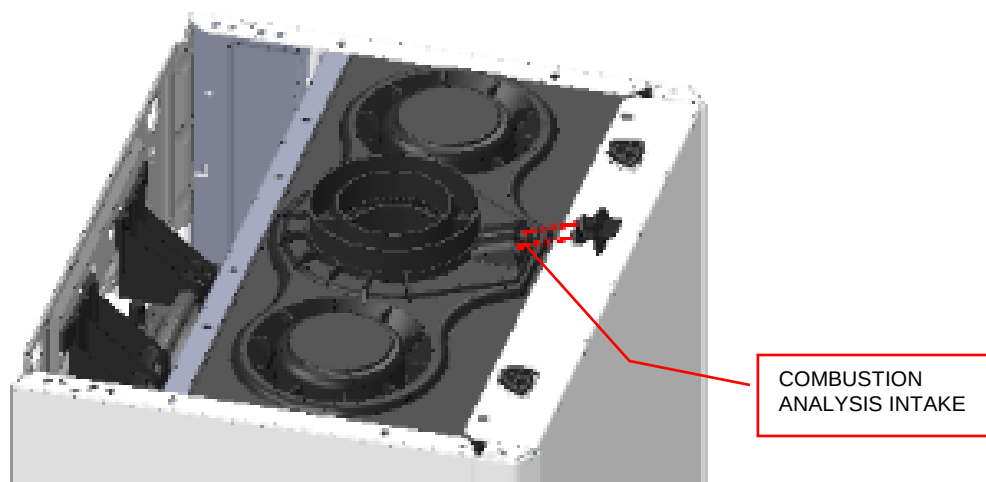
		parameter	CLAS ONE 24 WIFI						
			G20	G25	G25.1	G2.350	G27	G230	G31
Lower Wobbe index (15°C, 1013 mbar) (MJ/m ³)			45,67	37,38	35,25	29,67	35,17	38,9	70,69
Inlet Gas pressure -mbar			20	25	25	13	20	20	37
Slow ignition	220	64							
Maximum C. H.power Adjustable (%)	231	56							
Minimum power (%)	233	2							
Max CH power (%)	234	75							
Max DHW power (%)	232	90							
Gas diaphragm (Ø) mm		5,0 (*)	NO					3,6	
Air / gas mixer replacement		NO	YES					NO	
Gas flow max/min (15°C, 1013 mbar) (nat - m3/h) GPL - kg/h)	max D.H.W	2,75	3,20	3,19	3,82	3,36	2,13	2,02	
	max C.H	2,33	2,71	2,70	3,23	2,84	1,81	1,71	
	min	0,5	0,46	0,45	0,54	0,48	0,30	0,29	

		parameter	CLAS ONE 30 WIFI CLAS ONE L 30 WIFI						
			G20	G25	G25.1	G2.350	G27	G230	G31
Lower Wobbe index (15°C, 1013 mbar) (MJ/m ³)			45,67	37,38	35,25	29,67	35,17	38,9	70,69
Inlet Gas pressure - mbar			20	25	25	13	20	20	37
Slow ignition	220	62							
Maximum C. H.power Adjustable (%)	231	60							
Minimum power (%)	233	2							
Max CH power (%)	234	84							
Max DHW power (%)	232	90							
Gas diaphragm (Ø) mm		5,8 (*)	NO					4,0	
Air / gas mixer replacement		NO	YES					NO	
Gas flow max/min (15°C, 1013 mbar) (nat - m3/h) GPL - kg/h)	max D.H.W	3,17	3,69	3,69	4,41	3,87	2,46	2,33	
	max C.H	2,96	3,45	3,44	4,12	3,61	2,30	2,18	
	min	0,53	0,53	0,53	0,63	0,56	0,35	0,33	

		parameter	CLAS ONE 35 WIFI						
			G20	G25	G25.1	G2.350	G27	G230	G31
Lower Wobbe index (15°C, 1013 mbar) (MJ/m ³)			45,67	37,38	35,25	29,67	35,17	38,9	70,69
Inlet Gas pressure -mbar			20	25	25	13	20	20	37
Slow ignition		220	62						
Maximum C. H.power Adjustable (%)		231	60						
Minimum power (%)		233	2						
Max CH power (%)		234	85						
Max DHW power (%)		232	94						
Gas diaphragm (Ø) mm			6,8 (*)		NO				4,7
Air / gas mixer replacement			NO		YES				NO
Gas flow max/min (15°C, 1013 mbar) (nat - m3/h) GPL - kg/h)	max D.H.W		3,65	4,25	4,24	5,07	4,45	2,83	2,68
	max C.H		3,28	3,82	3,81	4,56	4,00	2,54	2,41
	min		0,46	0,62	0,61	0,73	0,65	0,41	0,39

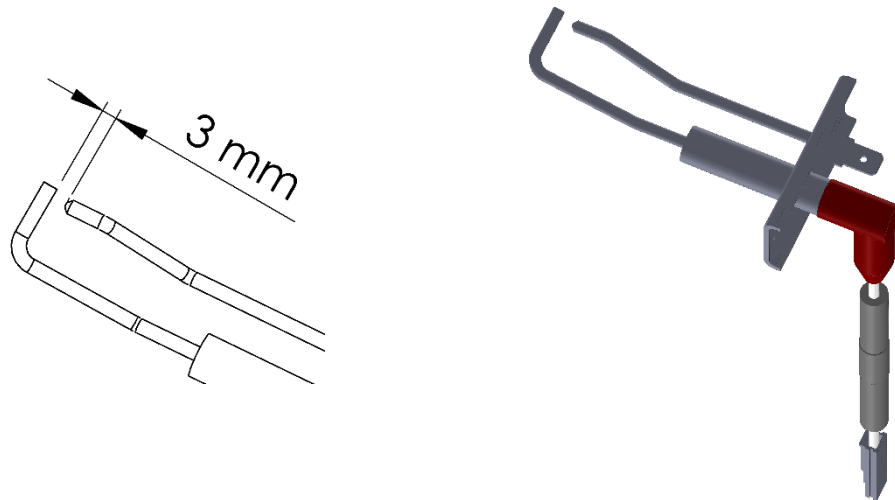
6.8 THE FUME DISCHARGE SYSTEM

On the external part of the boiler there is a fume discharge collector with two intakes used to detect the temperature of the combustion gas and of the fresh air inlet , concentrations of O₂, CO₂, etc.



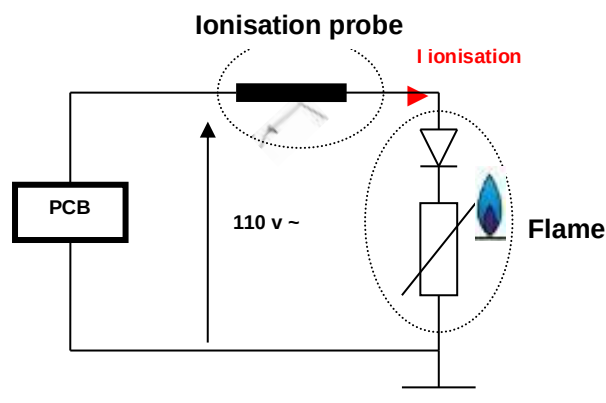
6.9 IGNITER / ELECTRODE PROBES

There is only one electrode that produces ignition and detects the presence of the flame in the burner if the ionization current is more than $1\ \mu\text{A}$. If the signal disappears, three attempts are made to try to ignite the burner.



Distance between the ignition electrodes: $3,2 \pm 0,5\ \text{mm}$.

Distance between the burner and the electrodes: $8 \pm 1\ \text{mm}$.



6.10 SPARK GENERATOR

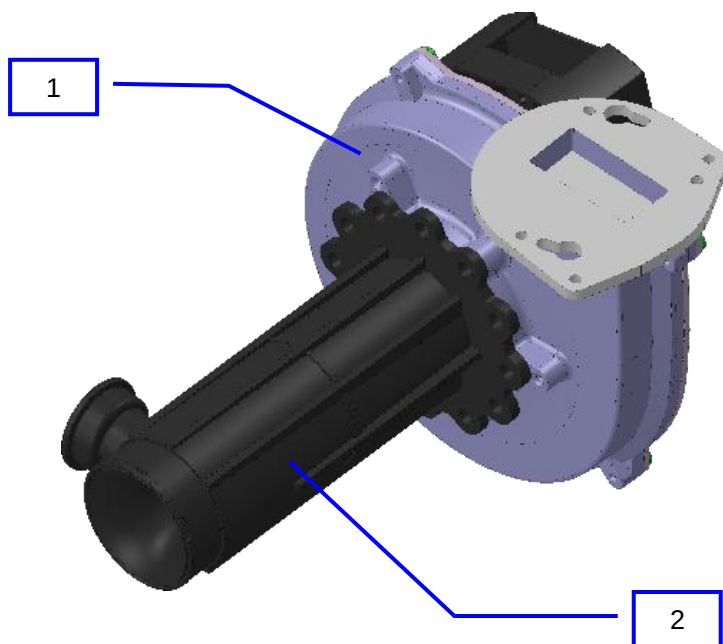
Integrated in main PCB

Inlet power supply: 230 V



6.11 MODUALTING SPEED VENTILATOR

The fan has the dual purpose of expelling the fumes produced by the combustion and ensuring a consistent flow of excess air throughout the entire modulation range, from the maximum to the minimum heat output. As soon as heat is requested the ventilator is piloted by the electronic card if required on ignition speed. The tachymeter of the ventilator detects the right speed the gas valve is supplied. When the flame is detected by the detecting electrode the ventilator is free to modulate according to the thermal load requested by the boiler. The burner power is directly proportional to the speed of the ventilator. The HALL sensor, to detect the fan speed, is integrated inside the motor. It is possible to display the ventilator rpm measured by means of the parameter **8 22**.



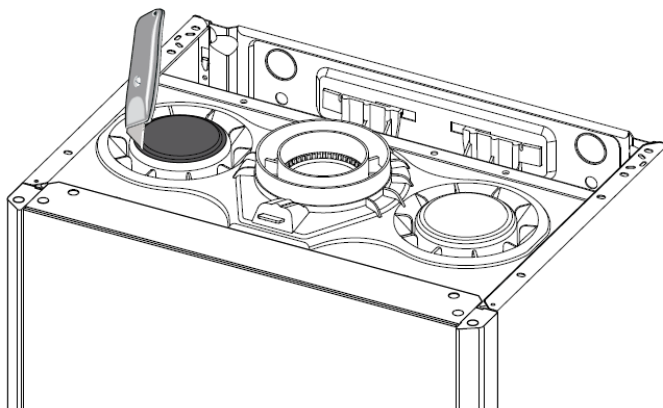
CAPTION	
1	Fan
2	Mixer

Power	Fan
18 KW	EBM NRG 118/0800-3612 - 365Vdc
24 KW	
30 KW	FIME PX 118 006 03 - 365Vdc
35 KW	

Combustion chamber clean-up routine [from the PCB software version 22.34.00 (September 2020)]:
Each 6 hours after the last fan activation there is a 60 seconds of ventilation at 1500Rpm.
It is possible to exclude this function setting the parameter 2.1.5 at 1 (factory setting 0, function enabled)
This function is to clean the combustion chamber and to improve burner ignitions.

6.12 EXHAUST SYSTEMS (no for CLAS ONE H)

The boiler is set up for connection to a 60/100 coaxial air intake and flue gas exhaust ducting system. To use split types of suction and exhaust, one of the two air intakes must be used. Remove the top of the air intake by cutting it with a suitable knife.



FLUE TYPE		Maximum Extension Exhaust-air (m)				Diameter of pipe (mm)
		CLAS ONE / CLAS ONE NET				
			24	30	35	
		CLAS ONE SYSTEM				
		18	24	30	35	
Coaxial System	C13 C33 C43	8		7	6	ø 60/100
	B33	8		7	6	
	C13 C33 C43	32	33	24	27	ø 80/125
	B33	32	33	24	27	
Twin-pipe System		S1 = S2				ø 80/80
	C13	36/36	24/24	26/26	16/16	
	C33	48/48		40/40	32/32	
	C43	36/36	24/24	26/26	16/16	
	C13	9/9	7/7	7/7	6/6	ø 60/60
	C33	12/12	9/9	9/9	8/8	
	C43	9/9	7/7	7/7	6/6	
		S1 + S2				
	C53 C83	50	60	50	35	ø 80/80
		18	14	14	12	ø 60/60
B23		50	60	50	35	ø 80

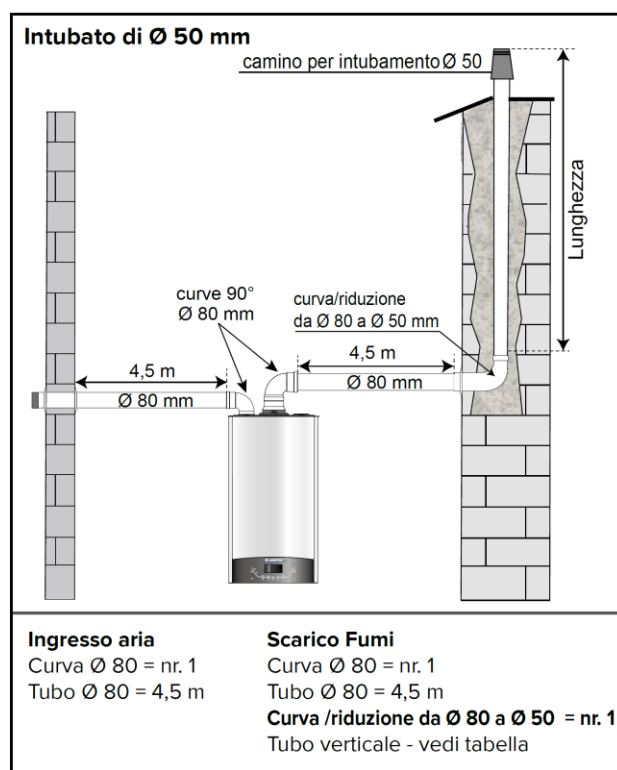
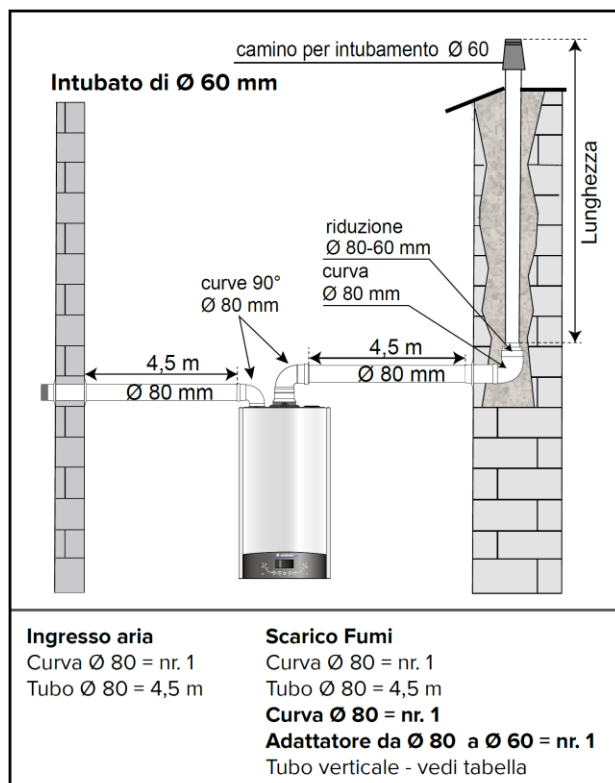
S1 = Air intake S2 = Flue gas exhaust

S1 = S2 - Air intake and flue gas exhaust equal lengths

S1 + S2 - Air intake and flue gas exhaust unequal lengths

6.12.1 PIPE IN PIPE SPLIT DUCTS Ø50 or 60mm (only for Italy)

It is possible connect the boiler with pipe in pipe with diameter 50 and 60 mm. The base configuration allowed is indicated in the picture below.



In the table below are indicated the maximum lengths allowed.

Modello	RPM (giri ventilatore)	Parametro 234 (impostazione di fabbrica)	Lunghezza massima tratto verticale intubato (m)	
			60	50
CLAS ONE SYSTEM 18	4300	60	31	5
CLAS ONE/SYSTEM 24	5950	90	11	4
CLAS ONE/SYSTEM 30 CLAS ON L 30	5950	90	10	2
CLAS ONE/SYSTEM 35	6170	94	9	1

If longer lengths are required, it is possible increase fan speed (RPM) to compensate for leaks of load, always guaranteeing the thermal capacity of the boiler indicated in the Character Plate.

CLAS ONE SYSTEM 18					
RPM	Parametro 234 (impostazione di fabbrica)	Lunghezza massima tratto verticale intubato (m)			
		60	ΔP_{1-2}	50	ΔP_{1-2}
4300	60	26	1,3	8	1,58
4400	62			10	0,86
4500	64			14	1,25

CLAS ONE / SYSTEM 24					
RPM	Parametro 234 (impostazione di fabbrica)	Lunghezza massima tratto verticale intubato (m)			
		60	ΔP_{1-2}	50	ΔP_{1-2}
6000	91	15	0,85	6	1,05
6050	92	19	1	7	1,2
6100	93	24	1,16	8	1,42
6200	95			10	1,73
6300	96			13	2,09 (*)

CLAS ONE / ONE L / SYSTEM 30					
RPM	Parametro 234 (impostazione di fabbrica)	Lunghezza massima tratto verticale intubato (m)			
		60	ΔP_{1-2}	50	ΔP_{1-2}
6000	91	15	1,02	3	1
6050	92	20	1,25	5	1,25
6100	93	25	1,52	6	1,46
6200	95			8	1,89
6300	96			9	2,12 (*)

CLAS ONE / SYSTEM 35					
RPM	Parametro 234 (impostazione di fabbrica)	Lunghezza massima tratto verticale intubato (m)			
		60	ΔP_{1-2}	50	ΔP_{1-2}
6300	96	15	1,35	3	1,2
6400	98	21	1,68	5	1,58
6500	100	24	1,92	8	2,13(*)

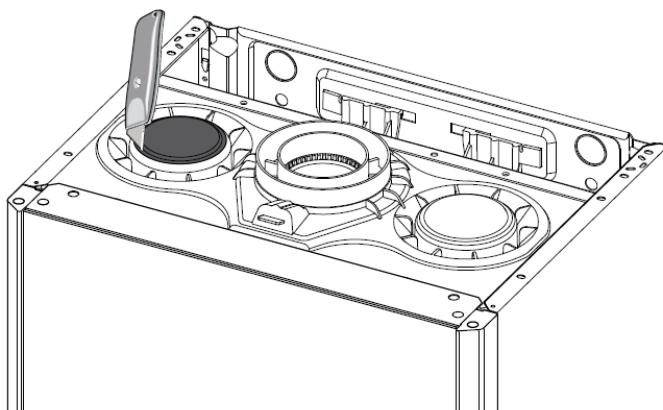
(*) It need to use H1 pipes.

ATTENTION:

- If the pressure inside the pipes are higher than 200 Pa it is mandatory use H1 class pipes.
- Do not modify the parameters of maximum and minimum heating power.
- It is mandatory respect the pipes configuration indicated in the previous page.
- If the pipes utilized are not Ariston, it is mandatory check the ΔP to calculate the maximum lengths.

6.13 EXHAUST SYSTEMS – CLAS ONE H

The boiler is set up for connection to a 60/100 coaxial air intake and flue gas exhaust ducting system. To use split types of suction and exhaust, one of the two air intakes must be used. Remove the top of the air intake by cutting it with a suitable knife.

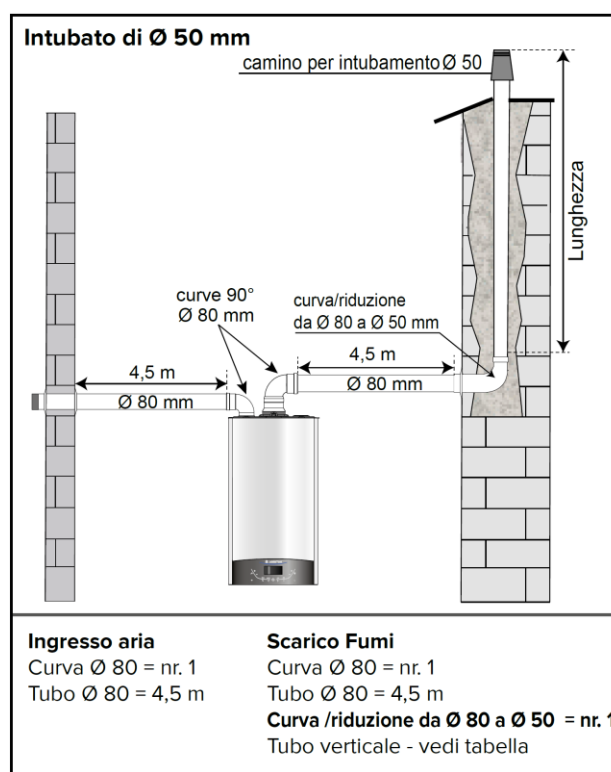
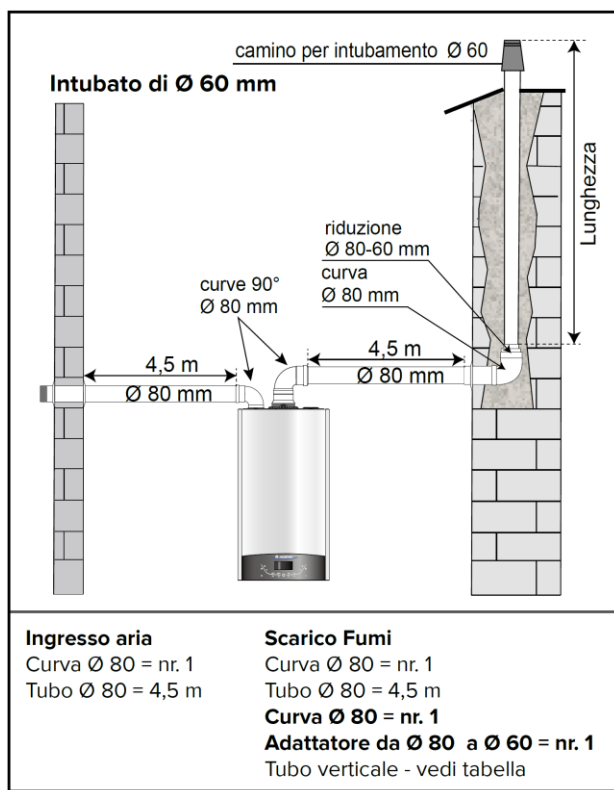


Tipologia di scarico fumi		Lunghezza massima tubi aspirazione/scarico (m)	Diametro condotti (mm)
		CLAS ONE 24 H	
Sistemi Coassiali	C13 C33 C43	8	ø 60/100
	B33	8	
	C13 C33 C43	20	ø 80/125
	B33	20	
Sistemi Sdoppiati		S1 = S2	ø 80/80
	C13	31/31	
	C33	37/37	
	C43	31/31	
	C13	7/7	ø 60/60
	C33	9/9	
	C43	7/7	
		S1 + S2	
	C53 C83	62	ø 80/80
		12	ø 60/60
	B23	62	ø 80

S1. aspirazione aria - S2. scarico fumi

6.13.1 PIPE IN PIPE SPLIT DUCTS Ø50 or 60mm

It is possible connect the boiler with pipe in pipe with diameter 50 and 60 mm. The base configuration allowed is indicated in the picture below.



In the table below are indicated the maximum lengths of the vertical pipe allowed with factory setting:

Modello	RPM (giri ventilatore)	Parametro 232	Parametro 234	Lunghezza massima tratto verticale intubato (m)	
		(impostazione di fabbrica)	(impostazione di fabbrica)	Ø 60	Ø 50
CLAS ONE H 24	5290	78	66	9	3

If longer lengths are required, it is possible to increase the fan speed (RPM) to compensate the pressure drops, always guaranteeing the heat output of the boiler indicated in data plate.

In the table below are indicated the maximum lengths allowed and the fan parameters setting:

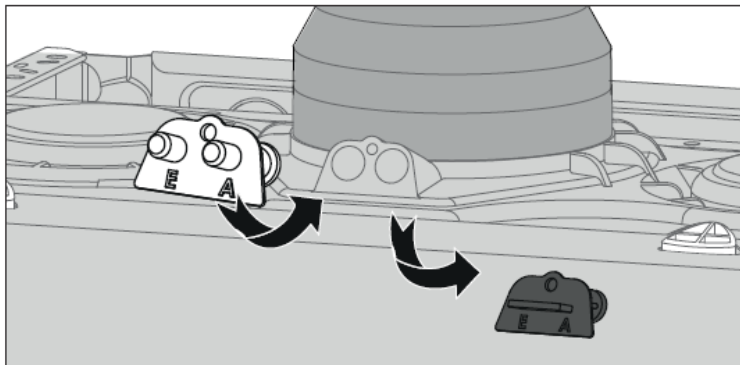
CLAS ONE H 24						
Param. 232 MAX SANITARIO		Param. 234 MAX RISC.		Lunghezza massima tratto verticale intubato (m)		
RPM	valore	RPM	valore	Ø 60 mm	Ø 50 mm	ΔP 1-2 mbar
5455	81	4795	69	19	6	da 1,00 a 1,15
5620	84	4960	72	31	9	da 1,15 a 1,80
5785	87	5070	74		12	da 1,80 a 2,37 (*)
5950	90	5180	76		16	da 2,37 a 3,00 (*)
6115	93	5290	78		19	da 3,00 a 3,60 (*)
6280	96	5400	80		23	da 3,60 a 4,30 (*)
6390	98	5565	83		25	da 4,30 a 4,72 (*)
Tabella Impostazione parametri						

(*) It need to use H1 pipes.

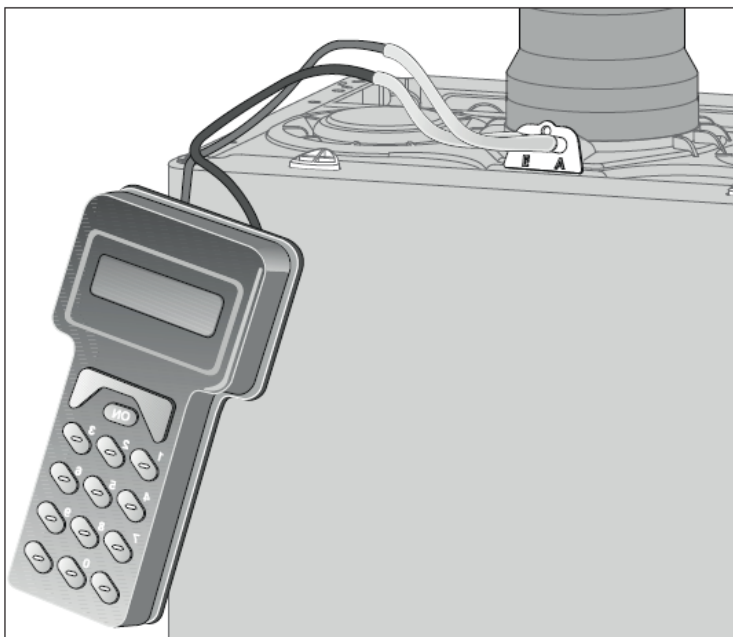
To verify the right setting of the fan speed parameters indicate in the above table, it needs to check the ΔP_{1-2} (mbar) between air and exhaust pipes.

To do this check follow the procedure below:

- Set the parameters 232 and 234 like indicated in the above table.
- Remove the black cap from the top of the boiler and install the white one supplied in the instruction manual packaging (like in the picture below).



- Connect the manometer on the pressure intakes (like in the picture below).



- With the boiler frontal panel closed and using the “Flue cleaner” function switch on the boiler at maximum DHW power.
- Measure the ΔP (mbar) and verify that it is in the range indicated in the above table for the required flue length.
- If the ΔP is out of the range set the parameters with the values indicated for the measured ΔP .
- If the ΔP is inside the range the setting is completed:
 - deactivate the “Flue cleaner” function;
 - remove manometer;
 - remove the white cap;
 - install the black cap.

EXAMPLE (Installation with 16m of vertical pipe ø50mm):

- Set the parameters 232 and 234 like indicated in the above table.

RPM	232	RPM	234	Ø 50 mm	ΔP 1-2
5950	90	5180	76	16	da 2,37 a 3,00 (*)

- Measure the ΔP using the “Flue cleaner” function switch at maximum DHW power.
- If the ΔP is inside the range 2,37÷3,00mbar the setting is completed.
- If the ΔP is outside the range 2,37÷3,00mbar set the parameters with the values indicated for the measured ΔP.

For example if the measured ΔP is 3,40mbar set the parameters as below:

RPM	valore	RPM	valore	Ø 50 mm	ΔP 1-2
6115	93	5290	78	19	da 3,00 a 3,60 (*)

ATTENTION:

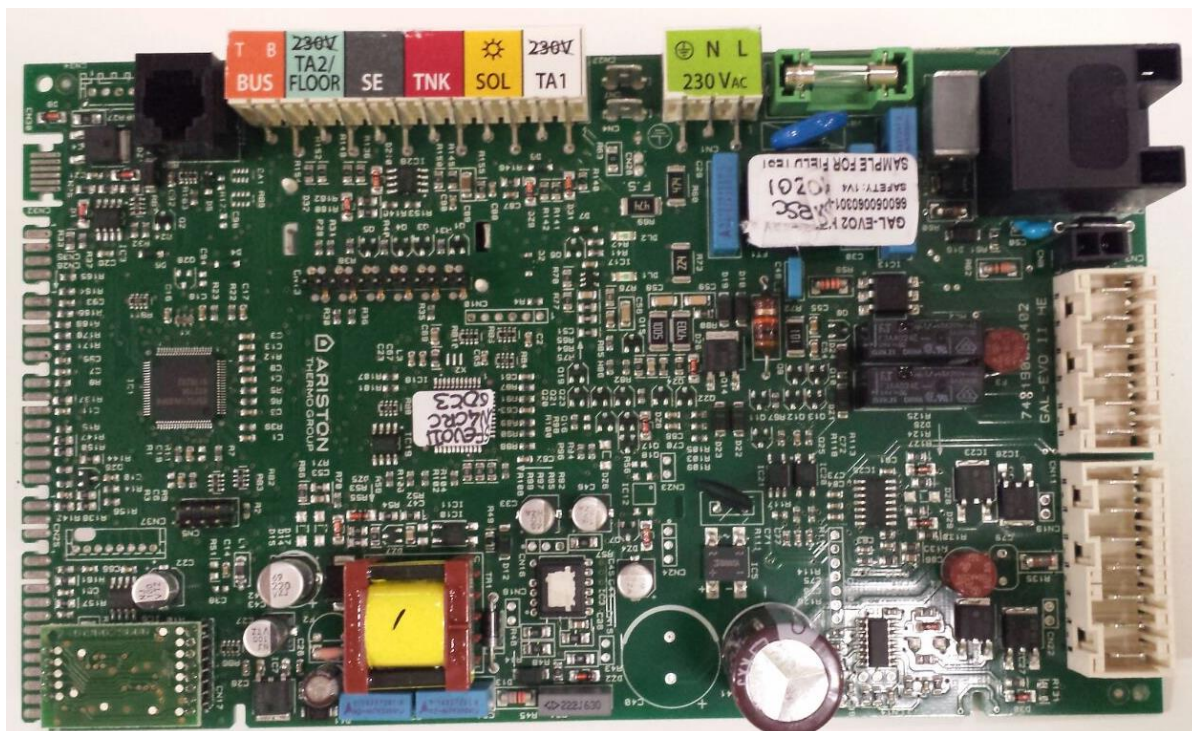
- If the pressure inside the pipes are higher than 200 Pa it is mandatory use H1 class pipes.
- It is mandatory respect the pipes configuration indicated in the previous page.

7 ELECTRIC AND ELECTRONIC SYSTEM

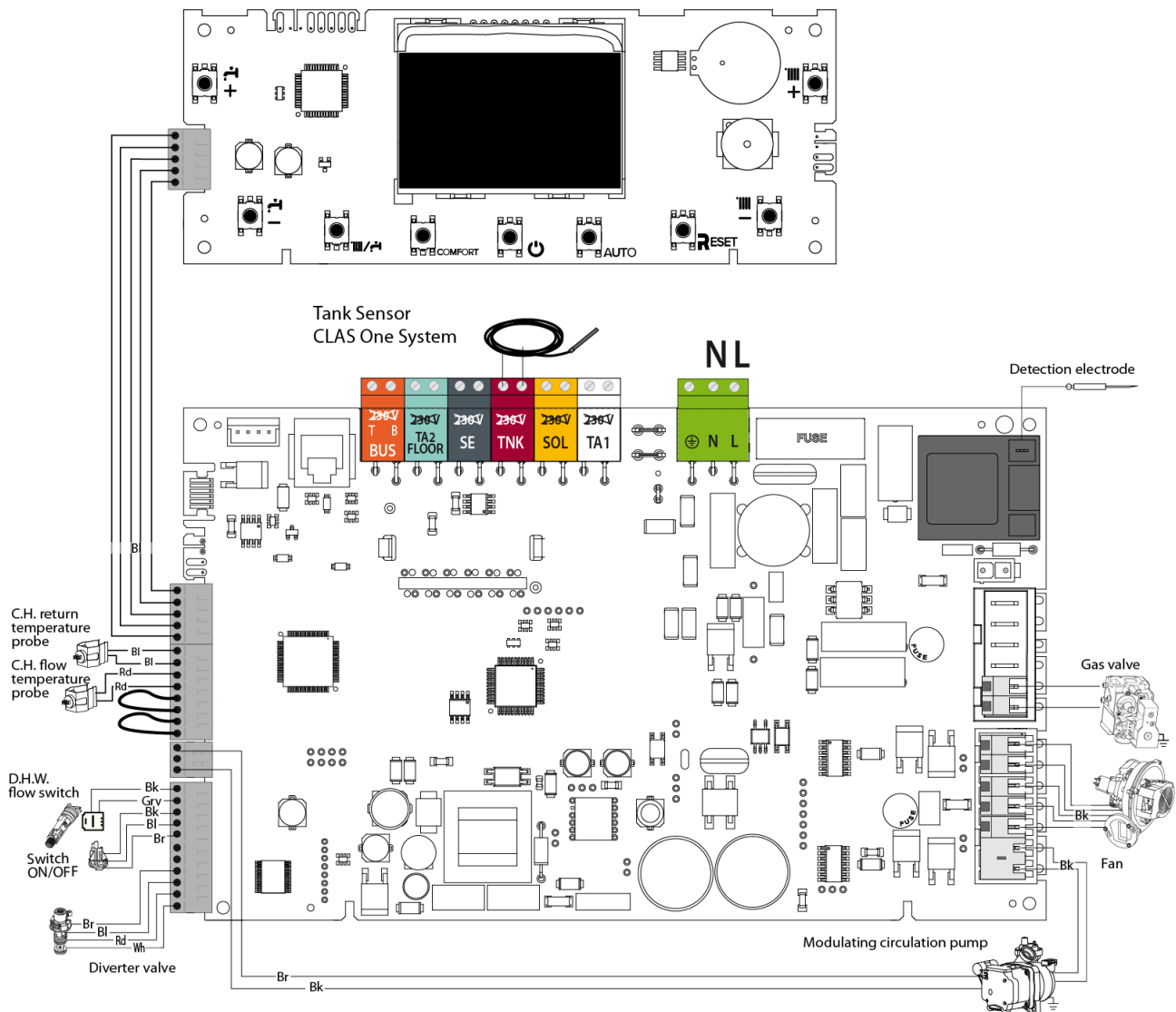
7.1 MAIN CARD

The boiler uses a **GAL2EVO COND** electronic card for complete checking of the boiler and users interfaces display LCD;

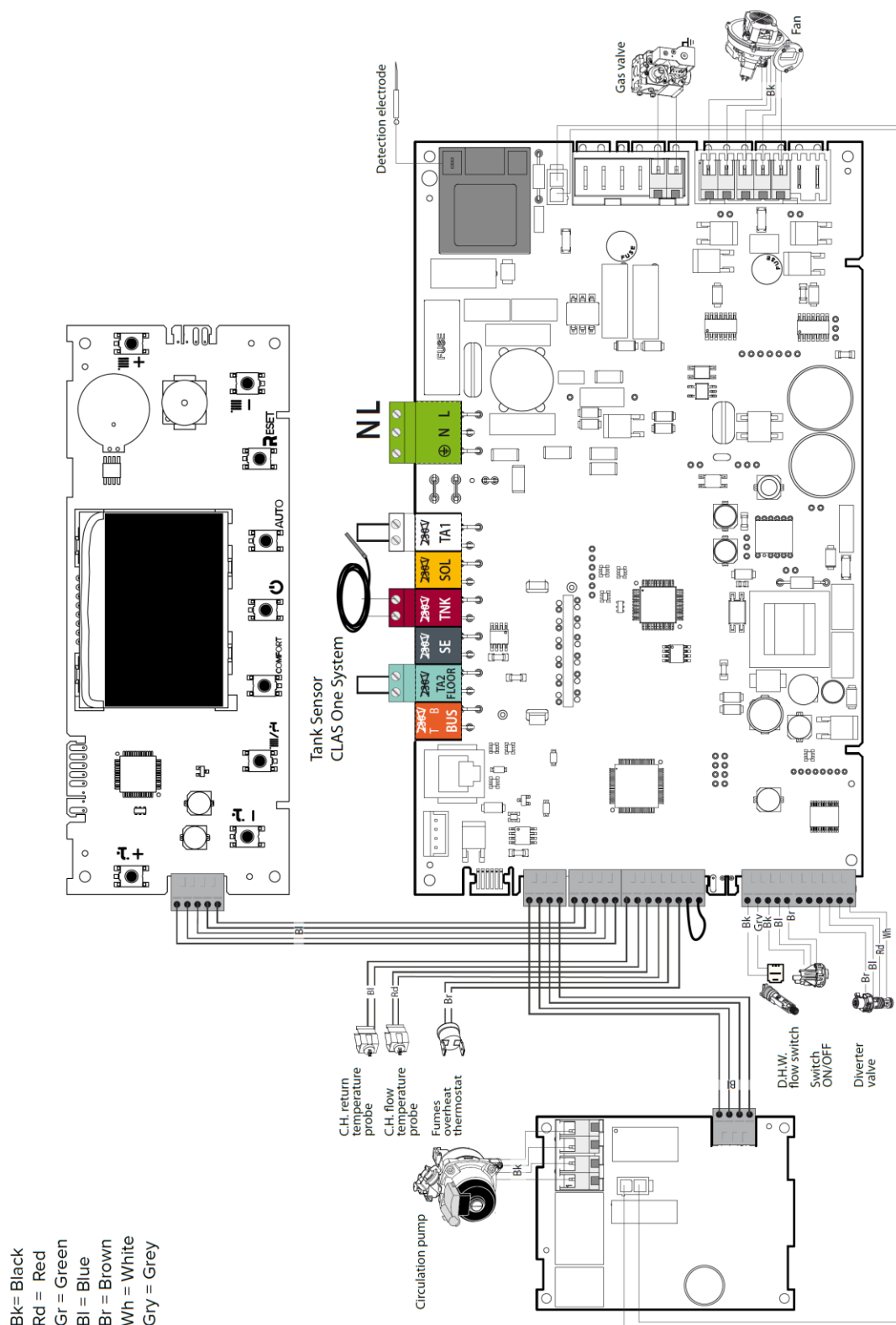
The **GAL2EVO COND** electronic card is protected by one 2A, 250 VAC fuses and a VDR protects the card against supply voltage peaks up to 275VAC. The supply voltage tolerance is 230 Vac +10% -15% and does not have to comply with the phase and with neutral.



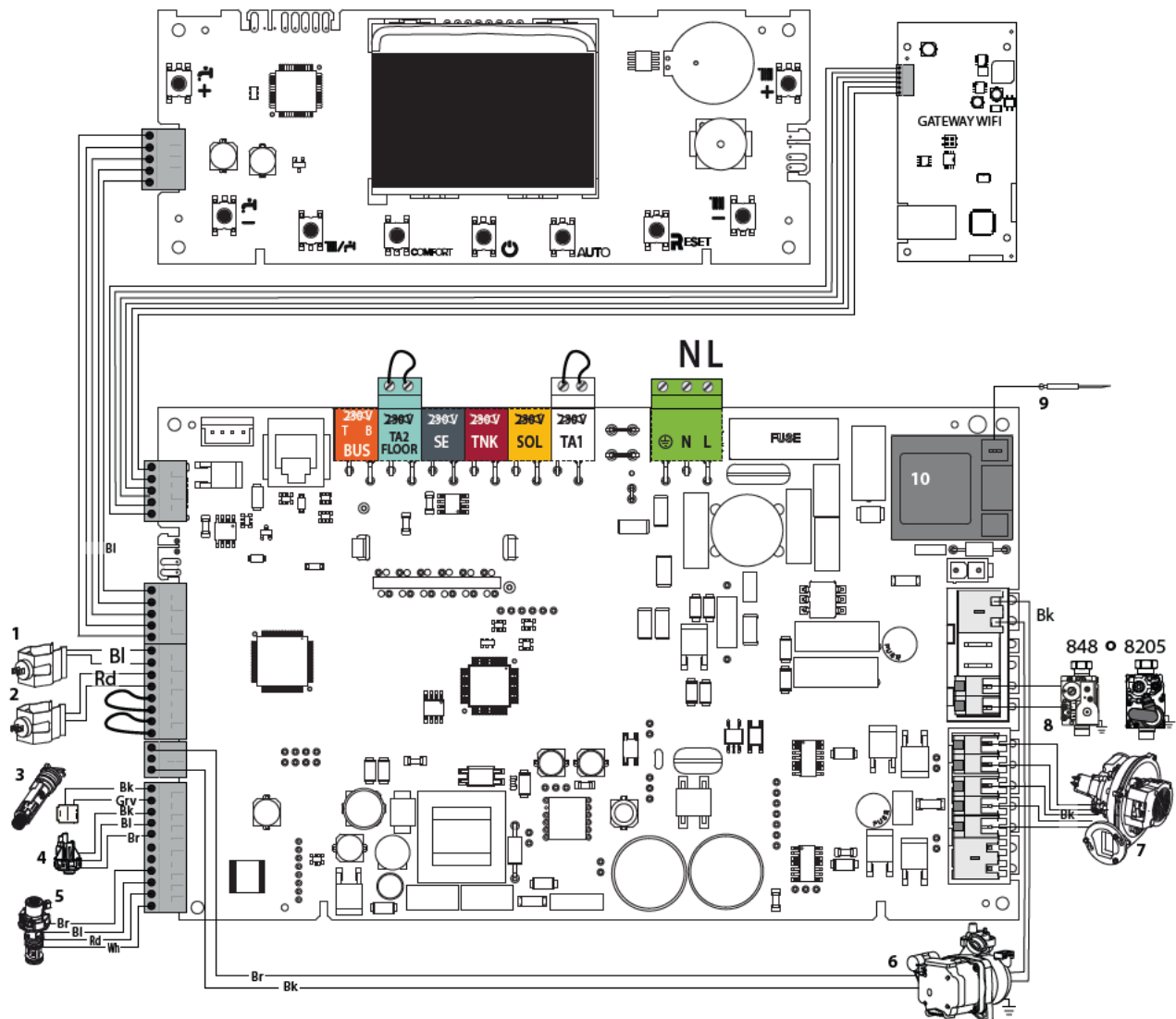
7.1.1 ELECTRIC DIAGRAM – ErP markets



7.1.2 ELECTRIC DIAGRAM – RDC markets and CHINA



7.1.3 ELECTRIC DIAGRAM – Clas One WiFi



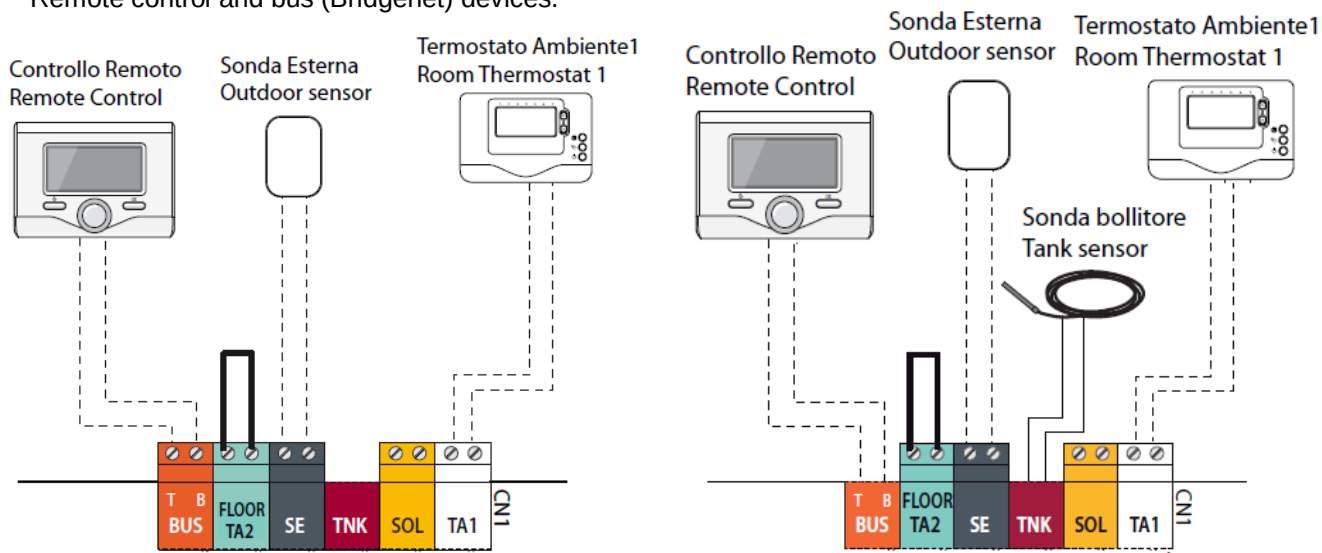
1. Central Heating Return Temperature Probe
2. Central Heating Flow Temperature Probe
3. D.H.W. Flow Switch
4. Switch On/Off
5. Diverter valve
6. Modulating Circulation Pump with air release valve
7. Modulating Fan
8. Gas Valve
9. Detection/Ignition electrode
10. Spark generator

Bk= Black
 Rd = Red
 Gr = Green
 Bl = Blue
 Br = Brown
 Wh = White
 Gry = Grey

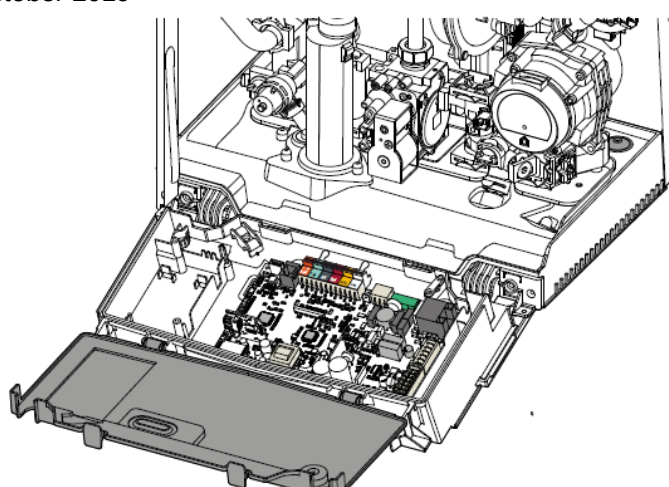
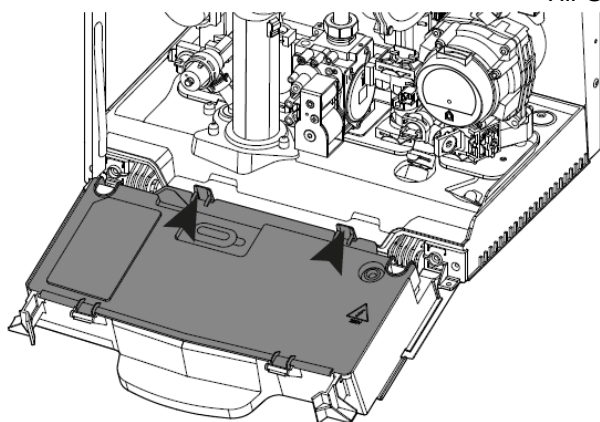
7.2 PERIPHERALS CONNECTION

It is possible to connect the peripherals below:

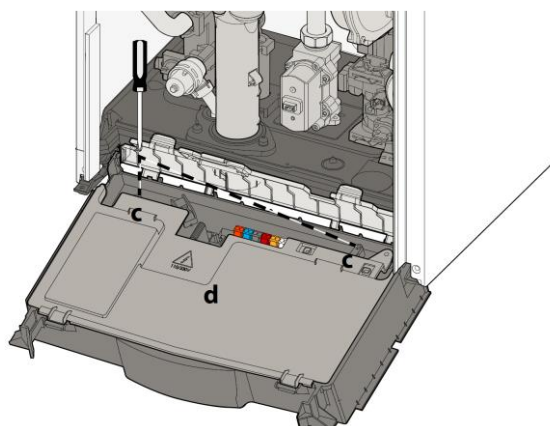
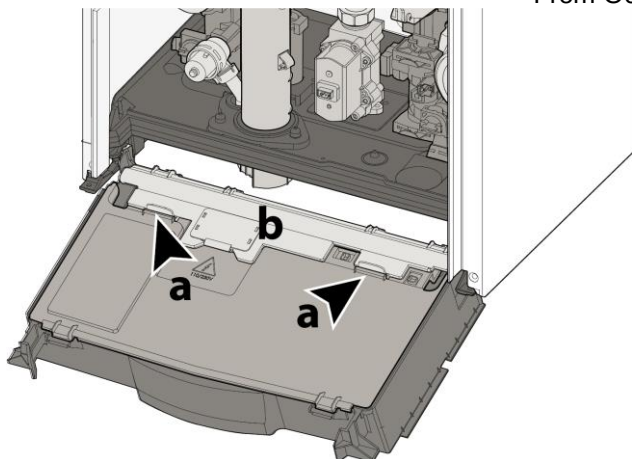
- Room thermostat 1 (Crono thermostat available also wireless version);
- Room thermostat 2 (Crono thermostat available also wireless version);
- Room sensor ;
- External sensor;
- Remote control and bus (Bridgenet) devices.



Till October 2019



From October 2019



8 MENU AND SETTINGS

8.1 TECHNICIAN MENU

To enter in the technician menu push for 5 second the buttons  end "OK", and after set the access code "234" and push the button "OK".

SERVICE CODE	
GAS	Direct access to the parameters to verify / change in the event of adjustment / change gas
220 - 231 - 232- 233 - 234 - 270	
SET	Direct access to the parameters to verify / change in the event of setting/commissioning of the boiler
220 - 231 - 223 - 245 - 246	
PCB	Direct access to the parameters to verify / change in the event of P.C.B. replacement
214 - 220 - 228 - 229 - 231 - 232- 233 - 234 - 247 - 250 - 253	
VIS	Direct access to the parameters for displaying information regarding the operation of the boiler
821 - 822 - 824 - 825 - 827 - 830 - 831 - 832 - 833- 840 - 835 - 874	
ZONE	Direct access to the parameters for displaying / setting the heating zones
040 - 402 - 502 - 602 - 420 - 520 - 620 - 434 - 534 - 634 - 830	
ERR	Show the last ten errors from ERR 0 to ERR 9. Turn the encoder to scroll the errors.
MENU COMPLETO - see table on following pages	

8.2 COMPLETE MENU

8.2.1 Menù 0 : Network

Menù	Sub Menù	Parameter	Function	Range	Default setting
0	2		<u>BUS NETWORK</u>		
0	2	0	Network presence in the bus	(only visualization)	/
0	4		<u>USER INTERFACE</u>		
0	4	0	Zone to be set by display	1: heating zone 1 2: heating zone 2 3: heating zone 3	1
0	4	1	Backlight time (min)	1 ÷ 10 ; 24h	24h
0	4	2	Thermoregulation button deactivation	0: Off 1: On	0

8.2.2 Menù 2 : Boiler parameter

Menù	Sub Menù	Parameter	Function	Range	Default setting
2	0		<u>GENERAL</u>		
2	0	0	DHW setpoint temperature	36 ÷ 60	/
2	1		<u>FREE PARAMETERS</u>		
2	1	5	Combustion chamber clean-up routine	0: enabled 1: disabled	0
2	2		<u>GENERAL</u>		
2	2	0	Slow ignition as % of the maximum heating power	0 ÷ 100	See gas table
2	2	3	Floor thermostat or Room thermostat zone 2 selection	0: Floor thermostat 1: Room thermostat zone 2	0
2	2	4	Thermoregulation	0: disabled 1: enabled	0
2	2	5	Heating delay restart	0: disabled 1: 10 seconds 2: 90 seconds 3: 210 seconds	0
2	2	8	Boiler version	0: combi 1: Storage with NTC (tank) 2: only heating or storage with thermostat 3: micro-storage	Depend on the boiler version
2	2	9	Boiler nominal power	0 ÷ 100 kW	Depend on the boiler
2	3		<u>CENTRAL HEATING-1</u>		
2	3	1	Maximum heating power (heating absolute maximum power percentage par. 234) (%)	0 ÷ 100	See gas table

2	3	2	Maximum DHW power (do not modify this parameter, modify only in even of PCB replacement)	0 ÷ 100	See gas table
2	3	3	Minimum boiler power (do not modify this parameter, modify only in even of PCB replacement)	0 ÷ 100	See gas table
2	3	4	Maximum absolute heating power (do not modify this parameter, modify only in even of PCB replacement)	0 ÷ 100	See gas table
2	3	5	Select of heating delay manage	0: manual (set with par. 2 36) 1: automatic	1
2	3	6	Heating delay (min), enabled by par. 2 35= 0	0 ÷ 7	3
2	3	7	Heating post-circulation (min)	0 ÷ 15 CO: non stop	3
2	3	8	Pump modulation on heating (only for RDC markets and CHINA)	0: Low speed 1: High speed 2: Modulating	2
2	3	9	ΔT for pump modulation (°C) (only for RDC markets and CHINA)	0 ÷ 30°C	20
2	4		<u>CENTRAL HEATING-2</u>		
2	4	3	Heating post-ventilation	0: 5 sec 1: 3 min	0
2	4	4	Boost time (min)	0 ÷ 60 (with Auto function working)	16
2	4	5	Pump max speed (only for ErP markets)	75 ÷ 100	100
2	4	6	Pump minimum speed (only for ErP markets)	40 ÷ par 245	40
2	4	7	Heating water pressure detection device	0: temperature probes only 1: pressure switch 2: pressure sensor	1
2	4	9	External temperature correction (°C)	-3 ÷ 3	0
2	5		<u>DOMESTIC HOT WATER</u>		
2	5	0	DHW comfort function	0: disabled 1: enabled for 30 minutes after a heating request 2: always enabled	0
2	5	1	Comfort anticycle (min)	0 ÷ 120	0
2	5	2	DHW delay start (anti water hammering) (dec)	5 ÷ 200	5
2	5	3	DHW switch off logic	0: anti-scale (62 o 65°C). 1: set-point+4°C	0
2	5	4	DHW post-circulation and post- ventilation	0: Post-ventilation: Tflow<75°C = no post- ventilation; Tflow>75°C = 3 min (minimum speed); Post-circulation: 30sec 1: Post-ventilation: 3min Post-circulation: 3min	0
2	5	5	Heating start delay after DHW (min)	0 ÷ 30	0
2	5	7	Antilegionella function (only for boilers with external tank and NTC sensor – par. 228 = 1)	0: disabled 1: enabled	1

2	5	8	Antilegionella time (only for boilers with external tank and NTC sensor – par. 228 = 1). The setting temperature is always 60°C (tank temperature).	24 ÷ 480 h and 30 days	30 days
2	6		<u>BOILER MANUAL SETTING</u>		
2	6	0	Manual mode activation	0: Off 1: On	0
2	6	1	Boiler pump control (set parameter 260 =1)	0: Off 1: On (timed 10 min)	0
2	6	2	Fan control (set parameter 260 =1)	0: Off 1: On (timed 10 min)	0
2	6	3	3 way valve control (set parameter 260 =1)	0: DHW 1: Heating (timed 10 min)	0
2	7		<u>TEST & UTILITIES</u>		
2	7	0	Flue cleaning function	0: Off 1: On (select desired power)	0
2	7	1	Air Purge function	0: Off 1: On	0
2	7	4	Floor drying cycle	0: Off 1: Functional Heating 2: Curing Heating 3: Functional Heating + Curing Heating 4: Curing Heating + Functional Heating 5: Manual	0
2	7	5	Floor drying Flow Set Point Temperature	25-60°C	40°C
2	8		<u>RESET MENU'</u>		
2	8	0	Reset menu 2 factory setting	YES: press button "OK" NO: press button "ESC"	/

8.2.3 Menù 4 : Zone 1 parameters

Menù	Sub Menù	Parameter	Function	Range	Default setting
4	0		<u>SETPOINT</u>		
4	0	2	Temperature setpoint zone 1	Par 425 ÷ Par 426	/
4	2		<u>ZONE 1 SETTING</u>		
4	2	0	Select high or low temperature for zone 1	0: low temperature 1: high temperature	1
4	2	1	Thermoregulation mode selection	0: fixed delivery temperature 1: basic thermoregulation 2: only room probe 3: only outside probe 4: room probe + external probe	1
4	2	2	Select thermoregulation curve	0_2 ÷ 1_0 (par. 420=0) 1_0 ÷ 3_5 (par. 420=1) (with Auto function enabled)	0_6 (par 420=0) 1_5 (par 420=1)
4	2	3	Select thermoregulation curve parallel shifting	-7 ÷ 7 (par. 420=0) -14 ÷ 14 (par. 420=1) (with Auto function enabled)	0
4	2	4	Influence of the room probe on thermoregulation	0 ÷ 20 (with Auto function enabled)	20

4	2	5	Zone 1 maximum heating temperature (°C)	20 ÷ 45 (par. 420=0) 35 ÷ 82 (par. 420=1)	45 (par. 420=0) 82 (par. 420=1)
4	2	6	Zone 1 minimum heating temperature (°C)	20 ÷ 45 (par. 420=0) 35 ÷ 82 (par. 420=1)	20 (par. 420=0) 35 (par. 420=1)
4	3		<u>DIAGNOSTICS</u>		
4	3	2	Zone 1 delivery temperature (°C)	(only visualization)	/
4	3	3	Zone 1 return temperature (°C)	(only visualization)	/
4	3	4	Heating request by zone 1	OFF: no ON: yes (only visualization)	/
4	3	5	Zone 1 pump status	OFF: switch-off ON: switch-on (only visualization)	/
4	4		<u>ZONE 1 ZONE MODULE SETTINGS</u> (visible only with zone module connected)		
4	4	0	Zone 1 pump modulation	0: Fix 1: Modulating (ΔT) 2: Modulating (pressure)	1
4	4	1	ΔT for pump modulationa	4 ÷ 25	7 (par. 420=0) 20 (par. 420=1)
4	4	2	Pump fixed speed setting (with par. 440 = 0)	20 ÷ 100	100

8.2.4 Menù 5 : Zone 2 parameters

Menù	Sub Menù	Parameter	Function	Range	Default setting
5	0		<u>SETPOINT</u>		
5	0	2	Temperature setpoint zone 2	Par 525 ÷ Par 526	/
5	2		<u>ZONE 2 SETTING</u>		
5	2	0	Select high or low temperature for zone 2	0: low temperature 1: high temperature	1
5	2	1	Thermoregulation mode selection	0: fixed delivery temperature 1: basic thermoregulation 2: only room probe 3: only outside probe 4: room probe + external probe	1
5	2	2	Select thermoregulation curve	0_2 ÷ 1_0 (par. 520=0) 1_0 ÷ 3_5 (par. 520=1) (with Auto function enabled)	0_6 (par 520=0) 1_5 (par 520=1)
5	2	3	Select thermoregulation curve parallel shifting	-7 ÷ 7 (par. 520=0) -14 ÷ 14 (par. 520=1) (with Auto function enabled)	0
5	2	4	Influence of the room probe on thermoregulation	0 ÷ 20 (with Auto function enabled)	20
5	2	5	Zone 2 maximum heating temperature (°C)	20 ÷ 45 (par. 520=0) 35 ÷ 82 (par. 520=1)	45 (par. 520=0) 82 (par. 520=1)
5	2	6	Zone 2 minimum heating temperature (°C)	20 ÷ 45 (par. 520=0) 35 ÷ 82 (par. 520=1)	20 (par. 520=0) 35 (par. 520=1)
5	3		<u>DIAGNOSTICS</u>		
5	3	2	Zone 2 delivery temperature (°C)	(only visualization)	/

5	3	3	Zone 2 return temperature (°C)	(only visualization)	/
5	3	4	Heating request by zone 2	OFF: no ON: yes (only visualization)	/
5	3	5	Zone 2 pump status	OFF: switch-off ON: switch-on (only visualization)	/
5	4		<u>ZONE 2 ZONE MODULE SETTINGS</u> (visible only with zone module connected)		
5	4	0	Zone 2 pump modulation	0: Fix 1: Modulating (ΔT) 2: Modulating (pressure)	1
5	4	1	ΔT for pump modulationa	4 ÷ 25	7 (par. 520=0) 20 (par. 520=1)
5	4	2	Pump fixed speed setting (with par. 540 = 0)	20 ÷ 100	100

8.2.5 Menù 6 : Zone 3 parameters

Menù	Sub Menù	Parameter	Function	Range	Default setting
6	0		<u>SETPOINT</u>		
6	0	2	Temperature setpoint zone 3	Par 425 ÷ Par 426	/
6	2		<u>ZONE 2 SETTING</u>		
6	2	0	Select high or low temperature for zone 3	0: low temperature 1: high temperature	1
6	2	1	Thermoregulation mode selection	0: fixed delivery temperature 1: basic thermoregulation 2: only room probe 3: only outside probe 4: room probe + external probe	1
6	2	2	Select thermoregulation curve	0_2 ÷ 1_0 (par. 420=0) 1_0 ÷ 3_5 (par. 420=1) (with Auto function enabled)	0_6 (par 420=0) 1_5 (par 420=1)
6	2	3	Select thermoregulation curve parallel shifting	-7 ÷ 7 (par. 420=0) -14 ÷ 14 (par. 420=1) (with Auto function enabled)	0
6	2	4	Influence of the room probe on thermoregulation	0 ÷ 20 (with Auto function enabled)	20
6	2	5	Zone 3 maximum heating temperature (°C)	20 ÷ 45 (par. 420=0) 35 ÷ 82 (par. 420=1)	45 (par. 420=0) 82 (par. 420=1)
6	2	6	Zone 3 minimum heating temperature (°C)	20 ÷ 45 (par. 420=0) 35 ÷ 82 (par. 420=1)	20 (par. 420=0) 35 (par. 420=1)
6	3		<u>DIAGNOSTICS</u>		
6	3	2	Zone 3 delivery temperature (°C)	(only visualization)	/
6	3	3	Zone 3 return temperature (°C)	(only visualization)	/
6	3	4	Heating request by zone 3	OFF: no ON: yes (only visualization)	/
6	3	5	Zone 3 pump status	OFF: switch-off ON: switch-on (only visualization)	/
6	4		<u>ZONE 3 ZONE MODULE SETTINGS</u> (visible only with zone module connected)		

6	4	0	Zone 3 pump modulation	0: Fix 1: Modulating (ΔT) 2: Modulating (pressure)	1
6	4	1	ΔT for pump modulationa	4 ÷ 25	7 (par. 420=0) 20 (par. 420=1)
6	4	2	Pump fixed speed setting (with par. 640 = 0)	20 ÷ 100	100

8.2.6 Menù 7 : Zone module

Menù	Sub Menù	Parameter	Function	Range	Default setting
7	1		<u>MANUAL MODE</u>		
7	1	0	Manual mode activation	0: Off 1: On	0
7	1	1	Zone 1 pump control (set parameter 710 =1)	0: Off 1: On (timed 10 min)	0
7	1	2	Zone 2 pump control (set parameter 710 =1)	0: Off 1: On (timed 10 min)	0
7	1	3	Zone 3 pump control (set parameter 710 =1)	0: Off 1: On (timed 10 min)	0
7	1	4	Zone 2 mix valve control (set parameter 710 =1)	0: Off 1: Open (timed o 10 min) 2: Close (timed 10 min)	0
7	1	5	Zone 3 mix valve control (set parameter 710 =1)	0: Off 1: Open (timed 10 min) 2: Close (timed 10 min)	0
7	2		<u>GENERAL ZONE MODULE</u>		
7	2	0	Hydraulic scheme	0: not defined 1: MCD 2: MGM II 3: MGM III 4: MGZ I 5: MGZ II 6: MGZ III	0
7	2	1	ΔT between zone delivery and boiler delivery ($^{\circ}\text{C}$)	0 ÷ 40 (0= ΔT variable according the number of zones that require heat; HT = $+7^{\circ}\text{C}$ each zone; LT = $+5^{\circ}\text{C}$ each zone)	0
7	2	2	Auxiliary output setting	0: Heat request (to do a heat request to a generic boiler) 1: External pump management 2: Alarm (the contact close if there is an error regarding the zone module)	0
7	2	3	External temperature correction	-3 ÷ 3	0
7	8		<u>ERROR HISTORY</u>		
7	8	0	Last 10 errors	/	/
7	8	1	Reset error list	YES: push button "OK" NO: push button "ESC"	/
7	9		<u>RESET MENU'</u>		
7	9	0	Reset menu 7 factory setting	YES: push button "OK" NO: push button "ESC"	/

8.2.7 Menù 8 : Service parameters

Menù	Sotto-Menù	Parametro	Funzione	Range di regolazione	Valore di default
8	0		<u>BOILER STATISTICS</u>		
8	0	0	Diverter valve cycles No.(n x 10)	(only visualization)	/
8	0	1	Time of circulator on (h x 10)	(only visualization)	/
8	0	2	Boiler circulator cycles No. (n x 10)	(only visualization)	/
8	0	3	Boiler Life Time (h x 10)	(only visualization)	/
8	0	4	Time of fan ON (h x1 0)	(only visualization)	/
8	0	5	Fan cycles No. (n x 10)	(only visualization)	/
8	0	6	CH flame detection (n x 10)	(only visualization)	/
8	0	7	DHW flame detection (n x 10)	(only visualization)	/
8	1		<u>BOILER STATISTICS</u>		
8	1	0	Hours burner on in heating (h x 10)	(only visualization)	/
8	1	1	Hours burner on in DHW (h x 10)	(only visualization)	/
8	1	2	Number of flam lifts (n x 10)	(only visualization)	/
8	1	3	Number of ignition cycles (n x 10)	(only visualization)	/
8	1	4	Average heat request duration	(only visualization)	/
8	2		<u>BOLILER</u>		
8	2	1	Fan state	0: Off ; 1: On (only visualization)	/
8	2	2	Ventilator speed	Ventilator speed X 100 (only visualization)	/
8	2	3	Pump state (for 2 step pump)	0= off; 1= low speed; 2= high speed (only visualization)	/
8	2	4	3-way valve position	0= DHW; 1= heating (only visualization)	/
8	2	7	Pump Modulation (%)	(only visualization)	/
8	2	8	Gas power (kW)	(only visualization)	/
8	3		<u>BOILER TEMPERATURE</u>		
8	3	0	Temperature set on heating (°C)	(only visualization)	/
8	3	1	Temperature measured on heating delivery (°C)	(only visualization)	/
8	3	2	Heating return measured temperature (°C)	(only visualization)	/
8	3	3	DHW measured temperature (°C)	(only visualization)	/
8	3	5	External temperature (°C)	(only visualization)	/
8	4		<u>STORAGE AND SOLAR (if present)</u>		
8	4	0	Storage measured temperature (°C)	(only visualization)	
8	4	2	DHW inlet temperature (°C)	(only visualization)	
8	5		<u>SERVICE</u>		
8	5	0	Month to next maintenance	0 ÷ 60	24

8	5	1	Maintenance on days act	0: Off 1: On	0
8	5	2	Maintenance warning reset	YES: push button "OK" NO: push button "ESC"	/
8	5	4	Display software version	(only visualization)	/
8	5	5	Main PCB software version	(only visualization)	/
8	6		<u>ERROR HISTORY</u>		
8	6	0	Last 10 errors	/	/
8	6	1	Reset error list	SI: push button "OK" NO: push button "ESC"	/
8	7		<u>FREE PARAMETERS</u>		
8	7	4	Boiler Flowswitch	0: No flow rate (open) 1: Flow rate (closed)	/
8	7	6	SAFETY Flame sensor	0: no flame 1: flame	/
8	7	9	Ionization current (from display software version: 02.04.00)	0 - 131 (During ignition < 18: no flame detection During normal working < 15: flame lift) (read only)	/

8.2.8 Menù 19 : Connectivity

Menù	Sub Menù	Parameter	Function	Range	Default setting
19	0		<u>CONNECTIVITY CONFIGURATION</u>		
19	0	0	Wi-Fi activation	0: Off 1: On	0
19	0	1	Configuration by AP	If you press "OK button", you send the command that permits to activate AP Mode on the Wifi module.	/
19	0	2	Configuration by WPS	0: Off 1: On	0
19	0	3	Internet time	0: Off 1: On	0
19	0	4	Internet weather	0: Off 1: On	0
19	0	5	On line outdoor temperature correction	-3 ÷ 3	0
19	0	6	Homekit Unpair	NO YES	/
19	1		<u>CONNECTIVITY INFO</u>		
19	1	0	Connectivity Status	(only visualization)	/
19	1	1	Signal level	(only visualization)	/
19	1	2	Active Status	(only visualization)	/
19	1	3	Serial number	(only visualization)	/
19	1	4	SW Upgrade Status	(only visualization)	/
19	1	5	On line outdoor temperature	(only visualization)	/
19	1	6	On line weather data	(only visualization)	/
19	2		<u>RESET MENU</u>		
19	2	0	Reset menu 19 factory setting	YES: press button "OK" NO: press button "ESC"	/

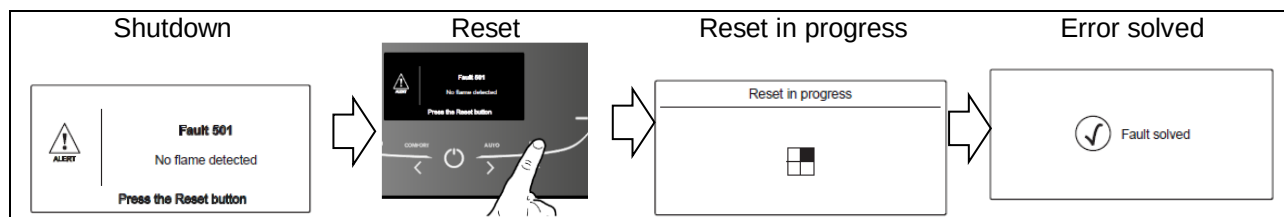
9 ERROR CODES

9.1 BOILER PROTECTION SYSTEMS.

There are two types of errors for malfunctions:

- Shutdown (solved by resetting);
- Safety stop (No Reset: the boiler will start working again properly when the cause is removed).

There is a third type of error code that is used to indicate a malfunction that does not stop the boiler which continues to work properly (Indication).



Safety shout down example		Warning example
Service intervention need	The end-use can restart the boiler	
 ALERT Fault 110 Send Probe Damaged Call the technical service	 ALERT Fault 108 Filling Needed	

9.1.1 Error codes

The error codes are divided in six different functional units, in other words the first figure indicates which functional unit of the boiler is involved in the error:

1. Primary circuit;
2. DHW circuit;
3. Electronic PCB;
4. Communication with peripherals;
5. Ignition and detection;
6. Air inlet / Fume outlet.
7. Zones

Display	Description	Reset
<i>PRIMARY CIRCUIT</i>		
1 01	Overheat	Reset
1 02	Heating proportional pressure short circuit or open circuit	No Reset
1 03	Circulation or presence of water: Gradient Tman > 7°C/sec for 3 times	Reset
1 04	Circulation or presence of water: Gradient Tman > 20°C/sec or Gradient Trit > 20°C/sec	Reset
1 05	Circulation or presence of water: Tman – Trit > 55°C for 3 times	Reset
1 06	Circulation or presence of water: Trit > Tman + 10°C for 3 times	Reset
1 07	Circulation or presence of water: Trit > Tman + 30°C	Reset
1 08	Water missing on the primary circuit (P<Pmin) for boiler with minimum pressure switch on/off (par.247=1)	No Reset

1 09	High primary circuit pressure (P>3bar)	No Reset
1 10	Heating delivery probe open or short circuit (NTC1)	No Reset
1 11	Water missing on the primary circuit (P<Pmin) for boiler with pressure sensor(par. 247=2)	No Reset
1 12	Heating return probe open circuit or no signal (NTC2)	No Reset
1 14	Outdoor temperature not available, check outdoor sensor or internet temperature	No Reset
1 16	Floor thermostat opened	No Reset
1 P1	Circulation or presence of water: Gradient Tman > 7°C/sec	Signalling
1 P2	Circulation or presence of water: Tman – Trit> 55°C	Signalling
1 P3	Circulation or presence of water: Trit > Tman + 10°C	Signalling
1 P4	Low primary circuit pressure(P<P _{SIGNALLING}): fill up	Signalling
DHW CIRCUIT		
2 02	Tank low probe open circuit or no signal (solar)	No Reset
2 03	Tank probe open circuit or no signal	No Reset
2 04	Solar collector probe open circuit or no signal	No Reset
2 05	DHW inlet probe open circuit (solar)	No Reset
2 07	Solar manifold overheat	No Reset
2 08	Solar manifold temperature low	No Reset
2 09	Not used	/
PCB		
3 01	Eeprom display error	No Reset
3 02	GP – GIU communication error	No Reset
3 03	PCB internal error	No Reset
3 04	More than 5 resets executed in 15 minutes	No Reset
3 05	PCB internal error	Reset
3 06 / 3 07	PCB card internal error	Reset
3 09	Gas Relais check Failed	Reset
3P9	Sched. Maintenance-Call Service	
COMMUNICATION WITH PERIPHERALS		
4 07	Room probe open or short circuit	No Reset
IGNITION AND DETECTION		
5 01	Flame missing	Reset
5 02	Flame detected with gas valve closed	No Reset
5 04	In lockout after 3 flame lifts	Reset
5 P1	First ignition attempt failed	Signalling
5 P2	Second ignition attempt failed	Signalling
5 P3	Flame detachment during operation	Signalling
AIR INLET / FUME OUTLET		
6 10	Thermal fuse contact open (Only China)	Reset
6 12	Fan turns too slow or wire not connected	Reset
ZONES		
7 01	Heating delivery probe zone 1 open or short circuit	No Reset
7 02	Heating delivery probe zone 2 open or short circuit	No Reset
7 03	Heating delivery probe zone 3 open or short circuit	No Reset
7 11	Heating return probe zone 1 open or short circuit	No Reset
7 12	Heating return probe zone 2 open or short circuit	No Reset
7 13	Heating return probe zone 3 open or short circuit	No Reset
7 22	Zone 2 overheating	No Reset
7 23	Zone 3 overheating	No Reset
7 50	Hydraulic scheme not defined	No Reset

10 TECHNICAL DATA TABLE

10.1 ErP MARKETS

GENERAL	Model: CLAS ONE		24	30	35
	CE Certification nr.		0085CR0393		
	Boiler type		C13(X)-C23-C33(X)-C43(X)-C53(X)-C63(X) C83(X)-C93(X) - B23-B23P-B33		
POWER SPECIFICATIONS	Max/min nominal calorific flow rate (Pci) Qn	kW	22,0 / 3,7	28,0 / 4,3	31,0 / 5,0
	Max/min nominal calorific flow rate (Pcs) Qn	kW	24,4 / 4,1	31,1 / 4,8	34,4 / 5,6
	Domestic hot water max/min nominal calorific flow rate (Pci)..... Qn	kW	26,0 / 3,7	30,0 / 4,3	34,5 / 5,0
	Domestic hot water max/min nominal calorific flow rate (Pcs)..... Qn	kW	28,9 / 4,1	33,3 / 4,8	38,3 / 5,6
	Max/min power output (80°C-60°C) Pn	kW	21,4 / 3,4	27,4 / 3,9	30,2 / 4,7
	Max/min power output (50°C-30°C) Pn	kW	23,6 / 3,9	30 / 4,5	33,5 / 5,3
	Domestic hot water max/min power output Pn	kW	24,9 / 3,5	28,7 / 4,1	33,0 / 4,8
	Combustion efficiency (of flue gas)	%	98,0	98,0	97,9
	Nominal calorific flow rate efficiency (60/80°C) Hi/Hs	%	97,5 / 87,8	97,9 / 88,2	97,5 / 87,8
	Nominal calorific flow rate efficiency (30/50°C) Hi/Hs	%	107,3 / 96,7	107,3 / 96,6	108,2 / 97,4
	Efficiency at 30% at 30°C (condensation) Hi/Hs	%	109,8 / 98,9	109,6 / 98,7	109,6 / 98,7
	Minimum calorific flow rate efficiency (60/80°C) Hi/Hs	%	93,1 / 83,8	91,1 / 82	93,3 / 84
	Efficiency rating (dir. 92/42/EEC)	stars	☆☆☆☆		
	Loss of burner gas when operating	%	2,0	2,0	2,1
EMISSIONS	Available air pressure	Pa	100	100	100
	NOx class	class	5		
	Flue gas temperature (G20) (80°C-60°C)	°C	61	62	63
	CO ₂ content (G20) (80°C-60°C)	%	9,2 / 8,9		
	CO content (0%O ₂) (80°C-60°C)	ppm	141,8	123,8	106,5
	O ₂ content (G20) (80°C-60°C)	%	3,9	4,2	4,3
	Maximum flue gas flow (G20) (80°C-60°C)	Kg/h	42,1	48,6	56,1
	Excess air (80°C-60°C)	%	23	25	26
HEATING CIRCUIT	Expansion chamber inflation pressure	bar	1		
	Maximum heating pressure	bar	3		
	Expansion chamber capacity	l	8		
	Min/max heating temperature (high temperature range)	°C	35 / 82		
	Min/max heating temperature (low temperature range)	°C	20 / 45		
DOMESTIC HOT WATER	Domestic hot water max/min temperature	°C	36 / 60		
	Specific flow rate of domestic hot water (ΔT=30°C)	l/min	12,1	14,5	16,7
	Quantity of hot water ΔT=25°C	l/min	14,5	17,4	20,0
	Quantity of hot water ΔT=35°C	l/min	10,4	12,5	14,3
	Hot water comfort rating (EN13203)	stars	☆☆☆☆		
	Hot water minimum flow rate	l/min	2,0	2,0	2,0
	Domestic hot water max/min pressure	bar	7 / 0,2		
ELECTRICAL	Power supply frequency/voltage	V/Hz	230 / 50		
	Total electrical power absorbed	W	77	83	84
	Minimum ambient temperature for use	°C	> 0		
	Protection level for the electrical appliance	IP	X5D		
	Weight	kg	29,7	32,3	34,6

GENERAL	Model: CLAS ONE SYSTEM		18	24	30	35
	CE Certification nr.		0085CR0393			
	Boiler type		C13(X)-C23-C33(X)-C43(X)-C53(X)-C63(X)C83(X)-C93(X) - B23-B23P-B33			
POWER SPECIFICATIONS	Max/min nominal calorific flow rate (Pci) Qn	kW	18,0 / 3,7	22,0 / 3,7	28,0 / 4,3	31,0 / 5,0
	Max/min nominal calorific flow rate (Pcs) Qn	kW	20,0 / 4,1	24,4 / 4,1	31,1 / 4,8	34,4 / 5,6
	Domestic hot water max/min nominal calorific flow rate (Pci) Qn	kW	18,0 / 3,7	26,0 / 3,7	30,0 / 4,3	34,5 / 5,0
	Domestic hot water max/min nominal calorific flow rate (Pcs) Qn	kW	20,0 / 4,1	28,9 / 4,1	33,3 / 4,8	38,3 / 5,6
	Max/min power output (80°C-60°C) Pn	kW	17,6 / 3,4	21,4 / 3,4	27,4 / 3,9	30,2 / 4,7
	Max/min power output (50°C-30°C) Pn	kW	19,4 / 3,9	23,6 / 3,9	30 / 4,5	33,5 / 5,3
	Domestic hot water max/min power output Pn	kW	17,2 / 3,4	24,9 / 3,5	28,7 / 4,1	33,0 / 4,8
	Combustion efficiency (of flue gas)	%	98,1	98,0	98,0	97,9
	Nominal calorific flow rate efficiency (60/80°C) Hi/Hs	%	97,6 / 87,9	97,5 / 87,8	97,9 / 88,2	97,5 / 87,8
	Nominal calorific flow rate efficiency (30/50°C) Hi/Hs	%	107,6 / 96,9	107,3 / 96,7	107,3 / 96,6	108,2 / 97,4
	Efficiency at 30% at 30°C (condensation) Hi/Hs	%	109,4 / 98,5	109,8 / 98,9	109,6 / 98,7	109,6 / 98,7
	Minimum calorific flow rate efficiency (60/80°C) Hi/Hs	%	93,1 / 83,8	93,1 / 83,8	91,1 / 82	93,3 / 84
	Efficiency rating (dir. 92/42/EEC)	stars	☆☆☆☆			
	Loss of burner gas when operating	%	1,9	2,0	2,0	2,1
EMISSIONS	Available air pressure	Pa	100	100	100	100
	NOx class	class	5			
	Flue gas temperature (G20) (80°C-60°C)	°C	60	61	62	63
	CO ₂ content (G20) (80°C-60°C)	%	9,2 / 8,9			
	CO content (0%O ₂) (80°C-60°C)	ppm	109,4	141,8	123,8	106,5
	O ₂ content (G20) (80°C-60°C)	%	4,0	3,9	4,2	4,3
	Maximum flue gas flow (G20) (80°C-60°C)	Kg/h	28,8	42,1	48,6	56,1
	Excess air (80°C-60°C)	%	23	23	25	26
HEATING CIRCUIT	Expansion chamber inflation pressure	bar	1			
	Maximum heating pressure	bar	3			
	Expansion chamber capacity	l	8			
	Min/max heating temperature (high temperature range)	°C	35 / 82			
	Min/max heating temperature (low temperature range)	°C	20 / 45			
DOMESTIC HOT WATER	Domestic hot water min / max temperature	°C	40 / 60			
	Specific flow rate of domestic hot water (ΔT=30°C)	l/min				
	Quantity of hot water ΔT=25°C	l/min				
	Quantity of hot water ΔT=35°C	l/min				
	Hot water comfort rating (EN13203)	stars				
	Hot water minimum flow rate	l/min				
	Domestic hot water max/min pressure	bar				
ELECTRICAL	Power supply frequency/voltage	V/Hz	230 / 50			
	Total electrical power absorbed	W	60	77	83	84
	Minimum ambient temperature for use	°C	> 0			
	Protection level for the electrical appliance	IP	X5D			
	Weight	kg	29,7	29,7	32,3	34,6

GENERAL	Model: CLAS ONE L		30
	CE Certification nr.		0085CR0393
	Boiler type		C13(X)-C23-C33(X)-C43(X)-C53(X)-C63(X) C83(X)-C93(X) - B23-B23P-B33
POWER SPECIFICATIONS	Max/min nominal calorific flow rate (Pci) Qn	kW	28,0 / 4,3
	Max/min nominal calorific flow rate (Pcs) Qn	kW	31,1 / 4,8
	Domestic hot water max/min nominal calorific flow rate (Pci)..... Qn	kW	30,0 / 4,3
	Domestic hot water max/min nominal calorific flow rate (Pcs)..... Qn	kW	33,3 / 4,8
	Max/min power output (80°C-60°C) Pn	kW	27,4 / 3,9
	Max/min power output (50°C-30°C) Pn	kW	30,0 / 4,5
	Domestic hot water max/min power output Pn	kW	28,7 / 4,1
	Combustion efficiency (of flue gas)	%	98,0
	Nominal calorific flow rate efficiency (60/80°C) Hi/Hs	%	97,9 / 88,2
	Nominal calorific flow rate efficiency (30/50°C) Hi/Hs	%	107,3 / 96,6
	Efficiency at 30% at 30°C (condensation) Hi/Hs	%	109,6 / 98,7
	Minimum calorific flow rate efficiency (60/80°C) Hi/Hs	%	91,1 / 82
	Efficiency rating (dir. 92/42/EEC)	stars	☆☆☆☆
	Loss of burner gas when operating	%	2,0
EMISSIONS	Available air pressure	Pa	100
	NOx class	class	5
	Flue gas temperature (G20) (80°C-60°C)	°C	62
	CO ₂ content (G20) (80°C-60°C)	%	9,2
	CO content (0%O ₂) (80°C-60°C)	ppm	123,8
	O ₂ content (G20) (80°C-60°C)	%	4,2
	Maximum flue gas flow (G20) (80°C-60°C)	Kg/h	48,6
	Excess air (80°C-60°C)	%	25
HEATING CIRCUIT	Expansion chamber inflation pressure	bar	1
	Maximum heating pressure	bar	3
	Expansion chamber capacity	l	10
	Min/max heating temperature (high temperature range)	°C	35 / 82
	Min/max heating temperature (low temperature range)	°C	20 / 45
DOMESTIC HOT WATER	Domestic hot water max/min temperature	°C	36 / 60
	Specific flow rate of domestic hot water (ΔT=30°C)	l/min	14,5
	Quantity of hot water ΔT=25°C	l/min	16,4
	Quantity of hot water ΔT=35°C	l/min	11,7
	Hot water comfort rating (EN13203)	stars	☆☆☆
	Hot water minimum flow rate	l/min	2
	Domestic hot water max/min pressure	bar	7 / 0,2
ELECTRICAL	Power supply frequency/voltage	V/Hz	230 / 50
	Total electrical power absorbed	W	78
	Minimum ambient temperature for use	°C	> 0
	Protection level for the electrical appliance	IP	X5D
	Weight	kg	32,3

GENERAL NOTE	Model:	CLAS ONE			
			24 WIFI	30 WIFI	35 WIFI
	CE Certification (pin)	0085CR0393			
	Boiler type	C13(X)-C23-C33(X)-C43(X)-C53(X)-C63(X)-C83(X)-C93(X) B23-B23P-B33			
POWER SPECIFICATIONS	Max/min nominal calorific flow rate G20 (Hi) Qn	kW	22.0 / 3.3	28.0 / 3.8	31.0 / 4.3
	Max/min nominal calorific flow rate G20 (Hs) Qn	kW	24.4 / 3.7	31.1 / 4.2	34.4 / 4.8
	DHW max/min nominal calorific flow rate G20 (Hi) Qn	kW	26.0 / 3.3	30.0 / 3.8	34.5 / 4.3
	DHW max/min nominal calorific flow rate G20 (Hs) Qn	kW	28.9 / 3.7	33.3 / 4.2	38.3 / 4.8
	Max/min power output G20 (80°C-60°C) Pn	kW	21.4 / 3.1	27.4 / 3.5	30.2 / 4.0
	Max/min power output G20 (50°C-30°C) Pn	kW	23.6 / 3.5	30.0 / 4.0	33.5 / 4.6
	DHW max/min power output G20 Pn	kW	24.9 / 3.2	28.7 / 3.6	33.0 / 4.1
	Max/min nominal calorific flow rate G31 (Hi) Qn	kW	22.0 / 3.7	28.0 / 4.3	31.0 / 5.0
	Max/min nominal calorific flow rate G31 (Hs) Qn	kW	23.9 / 4.0	30.4 / 4.7	33.7 / 5.4
	DHW max/min nominal calorific flow rate G31 (Hi) Qn	kW	26.0 / 3.3	30.0 / 4.3	34.5 / 5.0
	DHW max/min nominal calorific flow rate G31 (Hs) Qn	kW	28.3 / 3.6	32.6 / 4.7	37.5 / 5.4
	Max/min power output G31 (80°C-60°C) Pn	kW	21.4 / 3.4	27.4 / 3.9	30.2 / 4.7
	Max/min power output G31 (50°C-30°C) Pn	kW	23.6 / 3.9	30.0 / 4.5	33.5 / 5.3
	DHW max/min power output G31 Pn	kW	24.9 / 3.2	28.7 / 4.1	33.0 / 4.8
	Combustion efficiency (of flue gas)	%	98.0	98.0	97.9
	Nominal calorific flow rate efficiency (60/80°C) (Hi)	%	97.5 / 87.8	97.9 / 88.2	97.5 / 87.8
	Nominal calorific flow rate efficiency (30/50°C) (Hi)	%	107.3 / 96.7	107.3 / 96.6	108.2 / 97.4
	Efficiency at 30% at 30°C	%	109.8 / 98.9	109.6 / 98.7	109.6 / 98.7
	Minimum calorific flow rate efficiency (60/80°C) (Hi)	%	93.1 / 83.8	91.1 / 82.0	93.3 / 84.0
	Efficiency rating (dir. 92/42/EEC)		☆☆☆☆		
	Loss of burner gas when operating	%	2.0		
EMISSIONS	Available air pressure	Pa	100		
	NoX class	classe	6		
	Flue gas temperature (G20) (80°C-60°C)	°C	61	62	63
	CO2 content (G20) (80°C-60°C) max / min	%	9.2 / 8.9		
	CO2 content (G31) (80°C-60°C) max / min	%	10.0 / 10.0		
	CO content (0%O2) (80°C-60°C)	ppm	142.0 / 8.0	124.0 / 1.0	107.0 / 8.0
	O2 content (G20) (80°C-60°C)	%	3.9	4.2	4.3
	Maximum flue gas flow (G20) (80°C-60°C) max/min	Kg/h	42.1 / 5.5	48.6 / 6.3	56.1 / 7.2
	Maximum flue gas flow (G31) (80°C-60°C) max/min	Kg/h	44.0 / 5.6	50.6 / 7.3	58.2 / 8.4
	Excess air (80°C-60°C)	%	23	25	26
HEATING CIRCUIT	Expansion chamber inflation pressure	bar	1		
	Maximum heating pressure	bar	3		
	Expansion chamber capacity	l	8		
	Min/max heating temperature (high temperature range)	°C	35 / 82		
	Min/max heating temperature (low temperature range)	°C	20 / 45		
DOMESTIC HOT WATER CIRCUIT	Domestic hot water min/max temperature	°C	36 / 60		
	Specific flow rate of domestic hot water ($\Delta T=30^\circ\text{C}$)	l/min	12.1	14.5	16.7
	Quantity of hot water $\Delta T=25^\circ\text{C}$	l/min	14.5	17.4	20.0
	Quantity of hot water $\Delta T=35^\circ\text{C}$	l/min	10.4	12.5	14.3
	Hot water comfort rating (EN13203)		☆☆☆		
	Hot water minimum flow rate	l/min	2		
	Domestic hot water max/min pressure	bar	7 / 0.2		

10.2 RDC MARKETS

GENERAL	Model: CLAS ONE / CLAS ONE NET (RDC)		24	30	35
	CE Certification nr.		0085CR0393		
	Boiler type		C13(X)-C23-C33(X)-C43(X)-C53(X)-C63(X) C83(X)-C93(X) - B23-B23P-B33		
POWER SPECIFICATIONS	Max/min nominal calorific flow rate (Pci) Qn	kW	22,0 / 3,7	28,0 / 4,3	31,0 / 5,0
	Max/min nominal calorific flow rate (Pcs) Qn	kW	24,4 / 4,1	31,1 / 4,8	34,4 / 5,6
	Domestic hot water max/min nominal calorific flow rate (Pci)..... Qn	kW	26,0 / 3,7	30,0 / 4,3	34,5 / 5,0
	Domestic hot water max/min nominal calorific flow rate (Pcs)..... Qn	kW	28,9 / 4,1	33,3 / 4,8	38,3 / 5,6
	Max/min power output (80°C-60°C) Pn	kW	21,4 / 3,4	27,4 / 3,9	30,2 / 4,7
	Max/min power output (50°C-30°C) Pn	kW	23,6 / 3,9	30 / 4,5	33,5 / 5,3
	Domestic hot water max/min power output Pn	kW	24,9 / 3,5	28,7 / 4,1	33,0 / 4,8
	Combustion efficiency (of flue gas)	%	98,0	98,0	97,9
	Nominal calorific flow rate efficiency (60/80°C) Hi/Hs	%	97,5 / 87,8	97,9 / 88,2	97,5 / 87,8
	Nominal calorific flow rate efficiency (30/50°C) Hi/Hs	%	107,3 / 96,7	107,3 / 96,6	108,2 / 97,4
	Efficiency at 30% at 30°C (condensation) Hi/Hs	%	109,8 / 98,9	109,6 / 98,7	109,6 / 98,7
	Minimum calorific flow rate efficiency (60/80°C) Hi/Hs	%	93,1 / 83,8	91,1 / 82	93,3 / 84
	Efficiency rating (dir. 92/42/EEC)	stars	☆☆☆☆		
	Loss of burner gas when operating	%	2,0	2,0	2,1
EMISSIONS	Available air pressure	Pa	100	100	100
	NOx class	class	5		
	Flue gas temperature (G20) (80°C-60°C)	°C	61	62	63
	CO ₂ content (G20) (80°C-60°C)	%	9,2 / 8,9		
	CO content (0%O ₂) (80°C-60°C)	ppm	141,8	123,8	106,5
	O ₂ content (G20) (80°C-60°C)	%	3,9	4,2	4,3
	Maximum flue gas flow (G20) (80°C-60°C)	Kg/h	42,1	48,6	56,1
	Excess air (80°C-60°C)	%	23	25	26
HEATING CIRCUIT	Expansion chamber inflation pressure	bar	1		
	Maximum heating pressure	bar	3		
	Expansion chamber capacity	l	8		
	Min/max heating temperature (high temperature range)	°C	35 / 82		
	Min/max heating temperature (low temperature range)	°C	20 / 45		
DOMESTIC HOT WATER	Domestic hot water max/min temperature	°C	36 / 60		
	Specific flow rate of domestic hot water (ΔT=30°C)	l/min	12,1	14,5	16,7
	Quantity of hot water ΔT=25°C	l/min	14,5	17,4	20,0
	Quantity of hot water ΔT=35°C	l/min	10,4	12,5	14,3
	Hot water comfort rating (EN13203)	stars	☆☆☆		
	Hot water minimum flow rate	l/min	2,0	2,0	2,0
	Domestic hot water max/min pressure	bar	7 / 0,2		
ELECTRICAL	Power supply frequency/voltage	V/Hz	230 / 50		
	Total electrical power absorbed	W	104	114	115
	Minimum ambient temperature for use	°C	> 0		
	Protection level for the electrical appliance	IP	X5D		
	Weight	kg	29,7	32,3	34,6

GENERAL	Model: CLAS ONE SYSTEM (RDC)		18	24	30	35
	CE Certification nr.		0085CR0393			
	Boiler type		C13(X)-C23-C33(X)-C43(X)-C53(X)-C63(X)C83(X)-C93(X) - B23-B23P-B33			
POWER SPECIFICATIONS	Max/min nominal calorific flow rate (Pci) Qn	kW	18,0 / 3,7	22,0 / 3,7	28,0 / 4,3	31,0 / 5,0
	Max/min nominal calorific flow rate (Pcs) Qn	kW	20,0 / 4,1	24,4 / 4,1	31,1 / 4,8	34,4 / 5,6
	Domestic hot water max/min nominal calorific flow rate (Pci) Qn	kW	18,0 / 3,7	26,0 / 3,7	30,0 / 4,3	34,5 / 5,0
	Domestic hot water max/min nominal calorific flow rate (Pcs) Qn	kW	20,0 / 4,1	28,9 / 4,1	33,3 / 4,8	38,3 / 5,6
	Max/min power output (80°C-60°C) Pn	kW	17,6 / 3,4	21,4 / 3,4	27,4 / 3,9	30,2 / 4,7
	Max/min power output (50°C-30°C) Pn	kW	19,4 / 3,9	23,6 / 3,9	30 / 4,5	33,5 / 5,3
	Domestic hot water max/min power output Pn	kW	17,2 / 3,4	24,9 / 3,5	28,7 / 4,1	33,0 / 4,8
	Combustion efficiency (of flue gas)	%	98,1	98,0	98,0	97,9
	Nominal calorific flow rate efficiency (60/80°C) Hi/Hs	%	97,6 / 87,9	97,5 / 87,8	97,9 / 88,2	97,5 / 87,8
	Nominal calorific flow rate efficiency (30/50°C) Hi/Hs	%	107,6 / 96,9	107,3 / 96,7	107,3 / 96,6	108,2 / 97,4
	Efficiency at 30% at 30°C (condensation) Hi/Hs	%	109,4 / 98,5	109,8 / 98,9	109,6 / 98,7	109,6 / 98,7
	Minimum calorific flow rate efficiency (60/80°C) Hi/Hs	%	93,1 / 83,8	93,1 / 83,8	91,1 / 82	93,3 / 84
	Efficiency rating (dir. 92/42/EEC)	stars	☆☆☆☆			
	Loss of burner gas when operating	%	1,9	2,0	2,0	2,1
EMISSIONS	Available air pressure	Pa	100	100	100	100
	NOx class	class	5			
	Flue gas temperature (G20) (80°C-60°C)	°C	60	61	62	63
	CO ₂ content (G20) (80°C-60°C)	%	9,2 / 8,9			
	CO content (0%O ₂) (80°C-60°C)	ppm	109,4	141,8	123,8	106,5
	O ₂ content (G20) (80°C-60°C)	%	4,0	3,9	4,2	4,3
	Maximum flue gas flow (G20) (80°C-60°C)	Kg/h	28,8	42,1	48,6	56,1
	Excess air (80°C-60°C)	%	23	23	25	26
HEATING CIRCUIT	Expansion chamber inflation pressure	bar	1			
	Maximum heating pressure	bar	3			
	Expansion chamber capacity	l	8			
	Min/max heating temperature (high temperature range)	°C	35 / 82			
	Min/max heating temperature (low temperature range)	°C	20 / 45			
	Domestic hot water max/min temperature	°C	40 / 60			
DOMESTIC HOT WATER	Specific flow rate of domestic hot water (ΔT=30°C)	l/min				
	Quantity of hot water ΔT=25°C	l/min				
	Quantity of hot water ΔT=35°C	l/min				
	Hot water comfort rating (EN13203)	stars				
	Hot water minimum flow rate	l/min				
	Domestic hot water max/min pressure	bar				
ELECTRICAL	Power supply frequency/voltage	V/Hz	230 / 50			
	Total electrical power absorbed	W	97	104	114	115
	Minimum ambient temperature for use	°C	> 0			
	Protection level for the electrical appliance	IP	X5D			
	Weight	kg	29,7	29,7	32,3	34,6

10.3 CHINA

产 品 号	产品型号: CLAS ONE / CLAS ONE SYSTEM		18	24	30	35
	热水炉安装方式		1G			
燃 烧 特 征	供暖最大/最小额定热输入 (Hi) Qn	kW	17,0/3,7	22,0/3,7	28,0/4,4	31,0/5,0
	供暖最大/最小额定热输入 (Hs) Qn	kW				
	生活热水模式最大/最小热输入 (Hi) Qn	kW	17,0/3,7	26,0/3,7	30,0/4,4	34,5/5,0
	生活热水模式最大/最小热输入 (Hs) Qn	kW				
	最大/最小功率输出(80°C-60°C) Pn	kW	16,6/3,4	21,5/3,4	27,3/4,1	30,2/4,8
	最大/最小功率输出(50°C-30°C) Pn	kW	18,0/3,8	23,6/3,8	29,7/4,6	33,0/5,4
	生活热水最大/最小功率输出 Pn	kW				
	燃烧效率(烟道处)	%		98,0	98,0	97,9
	额定热输入的效率(60/80°C) Hi	%		97,56	97,30	98,03
	额定热输入的效率(30/50°C) Hi	%		107,51	106,08	105,84
	额定热输入30%的效率(30°C)	%		107,97	107,91	107,93
	最小热输入的效率(60/80°C) Hi	%		93,06	91,1	93,3
	能效星级 92/42/EEC)	stars		****	****	****
	燃烧器工作时烟气热损失	%		2,0	2,0	2,1
排 烟 特 征	排空压差	Pa		100	100	100
	氮氧化物Nox等级	class	5	5	5	5
	烟气温度(80°C-60°C)	°C		61	62	63
	二氧化碳CO ₂ 含量(80°C-60°C)	%	9,2	9,2	9,2	9,2
	一氧化碳CO含量(80°C-60°C)	ppm		142	124	107
	氧气O ₂ 含量(80°C-60°C)	%		3,9	4,2	4,3
	最大烟气流量(80°C-60°C)	Kg/h		42,1	48,6	56,1
	过量空气(80°C-60°C)	%		23	25	26
供 暖 特 性	膨胀水箱预充压力	bar	1	1	1	1
	供暖系统最大水压	bar	3	3	3	3
	膨胀水箱容量	l	8	8	8	8
	最小/最大供暖温度(高温范围)	°C	35 / 82			
	最小/最大供暖温度(低温范围)	°C	20 / 45			
生 活 热 水 特 性	最小/最大生活热水温度	°C	36 / 60			
	热水产率(ΔT=30°C)	l/min	8,0	12,0	14,1	16,0
	热水产率(ΔT=25°C)	l/min		14,3	16,4	18,9
	热水产率(ΔT=35°C)	l/min		10,2	11,7	13,5
	舒适性能星级(EN 13203)	stars		***	***	***
	最小工作流量	l/min		2	2	2
	生活热水最大/最小水压	bar	7 / 0.3			
	额定电压/频率	V/Hz	220/50			
电 气 特 性	额定电功率	W		124	124	124
	最低运行温度	°C	+5			
	防护/防水等级	IP	X5D			
	净质量	kg	30	30	33	37

10.4 CLAS ONE H

NOTE GEN	Modello:		CLAS ONE H 24
	Certificazione CE (pin)		0085CR0393
	Tipo caldaia		C13(p)-C23-C33(p)-C43(p)- C53(p)-C63(p)-C83(p)- C93(p)-B23-B23P-B33
PRESTAZIONI ENERGETICHE	Portata termica nominale in riscaldamento max/min (H) Qn	kW	22,0 / 4,3
	Portata termica nominale in riscaldamento max/min (Hs) Qn	kW	24,4 / 4,8
	Portata termica nominale in sanitario max/min (H) Qn	kW	26,0 / 4,3
	Portata termica nominale in sanitario max/min (Hs) Qn	kW	28,9 / 4,8
	Potenza termica riscaldamento max/min (80°C-60°C) Pn	kW	21,4 / 3,9
	Potenza termica max/min (50°C-30°C) Pn	kW	23,6 / 4,5
	Potenza termica max/min sanitario Pn	kW	24,9 / 4,1
	Rendimento di combustione (ai fumi)	%	98,0
	Rendimento alla portata termica nominale (60/80°C) H/Hs	%	97,5 / 87,8
	Rendimento alla portata termica nominale (30/50°C) H/Hs	%	107,3 / 98,7
	Rendimento al 30 % a 30°C (condensation) H/Hs	%	109,8 / 98,9
	Rendimento al minimo (60/80°C) H/Hs	%	93,1 / 83,8
	Stelle di rendimento (dlt. 92/42/EEC)		★★★★
	Perdite al camino bruciatore funzionante	%	2,0
EMISSIONI	Prevalenza residua di evacuazione	Pa	100
	Classe Nox	classe	8
	Temperatura fumi (G20) (80°C-60°C)	°C	61
	Contenuto di CO ₂ (G20) (80°C-60°C) max /min	%	9,2 / 8,9
	Contenuto di CO (D%O ₂) (80°C-60°C)	ppm	150
	Contenuto di O ₂ (G20) (80°C-60°C)	%	4,2
	Portata massica fumi (G20) (80°C-60°C)	Kg/h	42,0
	Eccesso d'aria (80°C-60°C)	%	23
CIRCUITO RISCALDAMENTO	Pressione di precarica vaso di espansione	bar	1
	Pressione massima di riscaldamento	bar	3
	Capacità vaso di espansione	l	8
	Temperatura di riscaldamento min/max (range alte temperature)	°C	35 / 82
	Temperatura di riscaldamento min/max (range basse temperature)	°C	20 / 45
	Temperatura sanitario min/max - CLAS ONE	°C	30 / 60
CIRCUITO SANITARIO	Portata specifica in sanitario (10 min. con ΔT=30°C) - CLAS ONE	l/min	12,1
	Quantità istantanea di acqua calda ΔT=25°C - CLAS ONE	l/min	14,5
	Quantità istantanea di acqua calda ΔT=35°C - CLAS ONE	l/min	10,4
	Stelle comfort sanitario (EN13203) - CLAS ONE		★★★
	Prelievo minimo di acqua calda - CLAS ONE	l/min	2,0
	Pressione acqua sanitaria max/min	bar	7 / 0,2
DATI ELETTR.	Tensione/frequenza di alimentazione	V/Hz	230 / 50
	Potenza elettrica assorbita totale	W	77
	Indice di efficienza energetica del circolatore		> 0,23
	Temperatura ambiente minima di utilizzo (*)	°C	-5
	Gradi di protezione impianto elettrico	IP	X50
	Peso	kg	30