



ARISTON



TRAINING MANUAL

FAMILY: Wall Hang boiler

UNIT: Conventional Compact

MODELS: CLAS X FF/CF

RELEASE: 1V0 06.06.2016



UPDATE

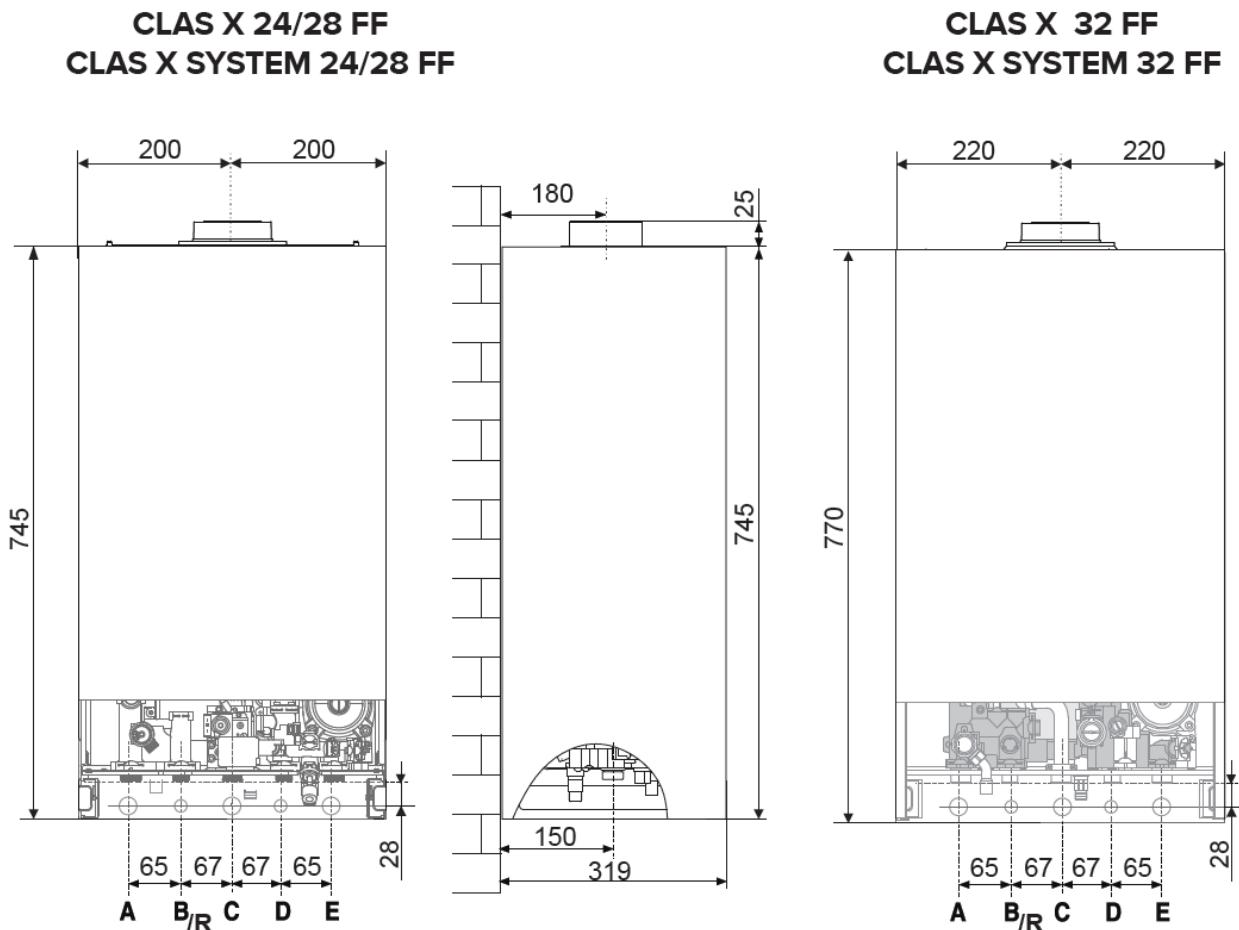
INDEX

1 GENERAL INFORMATION.....	5
1.1 SIZES AND DIMENSIONS	5
1.2 SEALED CHAMBER OVERALL VIEW (FF).....	6
1.3 SEALED CHAMBER OVERALL VIEW (FF - SYSTEM).....	7
1.4 OPEN CHAMBER ASSEMBLY VIEW (CF)	8
1.5 HYDRAULIC SCHEMES	9
1.6 CONTROL PANEL	10
1.7 DISPLAY	11
2 OPERATION.....	12
2.1 HEATING MODE: OPERATING LOGIC	12
2.2 SANITARY MODE: OPERATING LOGIC.....	15
3 SPECIAL FUNCTIONS.....	18
3.1 FLUE CLEANER" FUNCTION.....	18
3.2 "COMFORT" FUNCTION.....	19
3.3 "ANTIFREEZE" FUNCTION.....	20
3.4 "WATER FLOW CHECK "	21
3.5 "AIR PURGE" FUNCTION	22
3.6 "SELF ADAPTIVE HEATING RESTART DELAY"	22
4 HYDRAULIC BLOCK	23
4.1 COMBI HYDRAULIC BLOCK.....	23
4.2 SYSTEM HYDRAULIC BLOCK.....	24
4.3 3-WAY VALVE.....	25
4.3.1 <i>Stepper motor</i>	27
4.4 SECONDARY EXCHANGER	29
4.4.1 <i>Antiscale limit temperature</i>	29
4.5 PUMP UNIT	30
4.5.1 <i>PUMP speed check</i>	31
4.5.2 <i>Post-circulation</i>	32
4.6 HEATING PRESSURE SWITCH	33
4.7 FILLING TAP.....	33
4.8 DRAIN VALVE.....	33
4.9 BY-PASS	34
4.10 PRIMARY HEAT EXCHANGER.....	35
4.11 HEATING FILTER.....	36
4.12 EXPANSION VESSEL.....	37
4.13 SANITARY FLOW SWITCH	38
4.14 TEMPERATURE PROBE	39
5 GAS UNIT.....	40
5.1 SIT 845 SIGMA GAS VALVE	40
5.2 SOLENOID VALVE ELECTROPNIC CONNECTION DIAGRAM.....	40
5.3 GAS REGULATIONS	41
5.3.1 <i>SUPPLY PRESSURE CHECK</i>	41
5.3.2 <i>MAXIMUM SANITARY POWER CHECK</i>	41
5.3.3 <i>MINIMUM POWER CHECK</i>	42
5.3.4 <i>SOFT IGNITION POWER CHECKING</i>	42
5.3.5 <i>GAS PRESSURE/HEAT INPUT – MODELS CF</i>	43
5.3.6 <i>GAS PRESSURE/HEAT INPUT – MODELS FF</i>	43
5.3.7 <i>HEATING DELAY REGULATION</i>	44
5.3.8 <i>HEATING MAXIMUM POWER REGULATION</i>	44
5.3.9 <i>GAS TABLE</i>	44
5.4 BURNER	46
5.5 IGNITION CYCLE	47
5.6 THE FUME DISCHARGE SYSTEM	47
5.7 AIR PRESSURE SWITCH	48
5.8 FAN.....	48

5.8.1	<i>Post-ventilation</i>	48
5.9	EXHAUSTIVE CONTROL (CF OPEN CHAMBER).....	49
5.10	EXHAUST SYSTEMS (SEALED CHAMBER FF).....	50
5.11	EXHAUST SYSTEMS (CF OPEN CHAMBER).....	53
6	ELECTRIC AND ELECTRONIC SYSTEM.....	54
6.1	MAIN CARD	54
6.1.1	<i>ELECTRIC DIAGRAM FF.</i>	55
6.1.2	<i>ELECTRIC DIAGRAM CF.</i>	56
6.2	PERIPHERALS CONNECTION.....	57
7	MENU AND SETTINGS.....	58
7.1	TECHNICIAN MENU	58
7.2	COMPLETE MENU	58
7.2.1	<i>Menù 0 : Network</i>	58
7.2.2	<i>Menù 2 : Boiler parameter</i>	58
7.2.3	<i>Menù 4 : Zone 1 parameters</i>	60
7.2.4	<i>Menù 5 : Zone 2 parameters</i>	61
7.2.5	<i>Menù 6 : Zone 3 parameters</i>	62
7.2.6	<i>Menù 7 : Zone module</i>	63
7.2.7	<i>Menù 8 : Service parameters</i>	64
8	ERROR CODES.....	65
8.1	BOILER PROTECTION SYSTEMS.....	65
8.1.1	<i>Error code</i>	65
9	TECHNICAL DATA TABLE	67

1 GENERAL INFORMATION

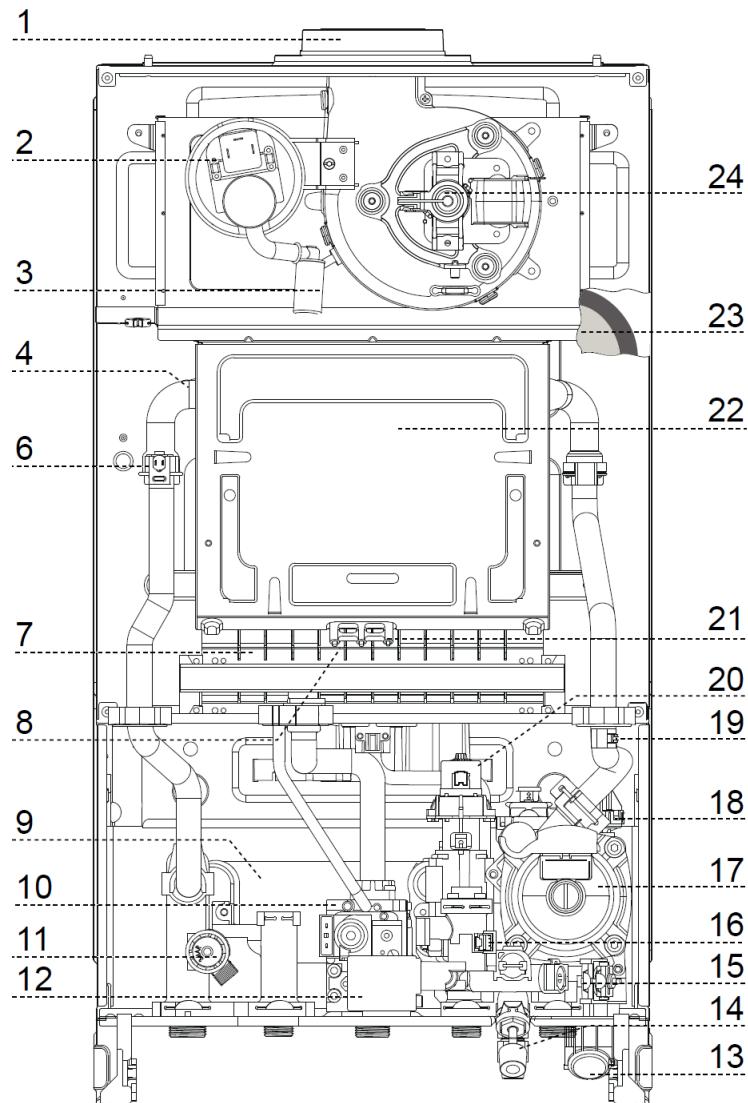
1.1 SIZES AND DIMENSIONS



CAPTION

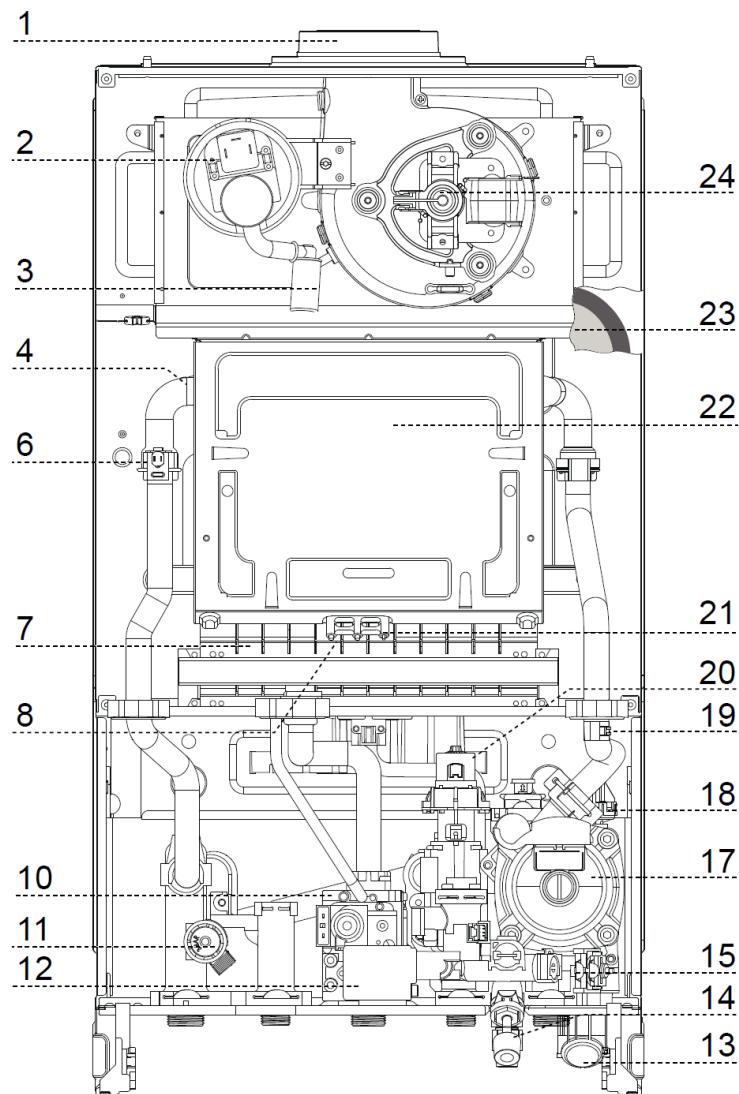
A	System delivery
B	Hot water outlet
R	Tank return (Clas X System)
C	Gas inlet
D	Cold water inlet
E	Heating system return

1.2 SEALED CHAMBER OVERALL VIEW (FF)



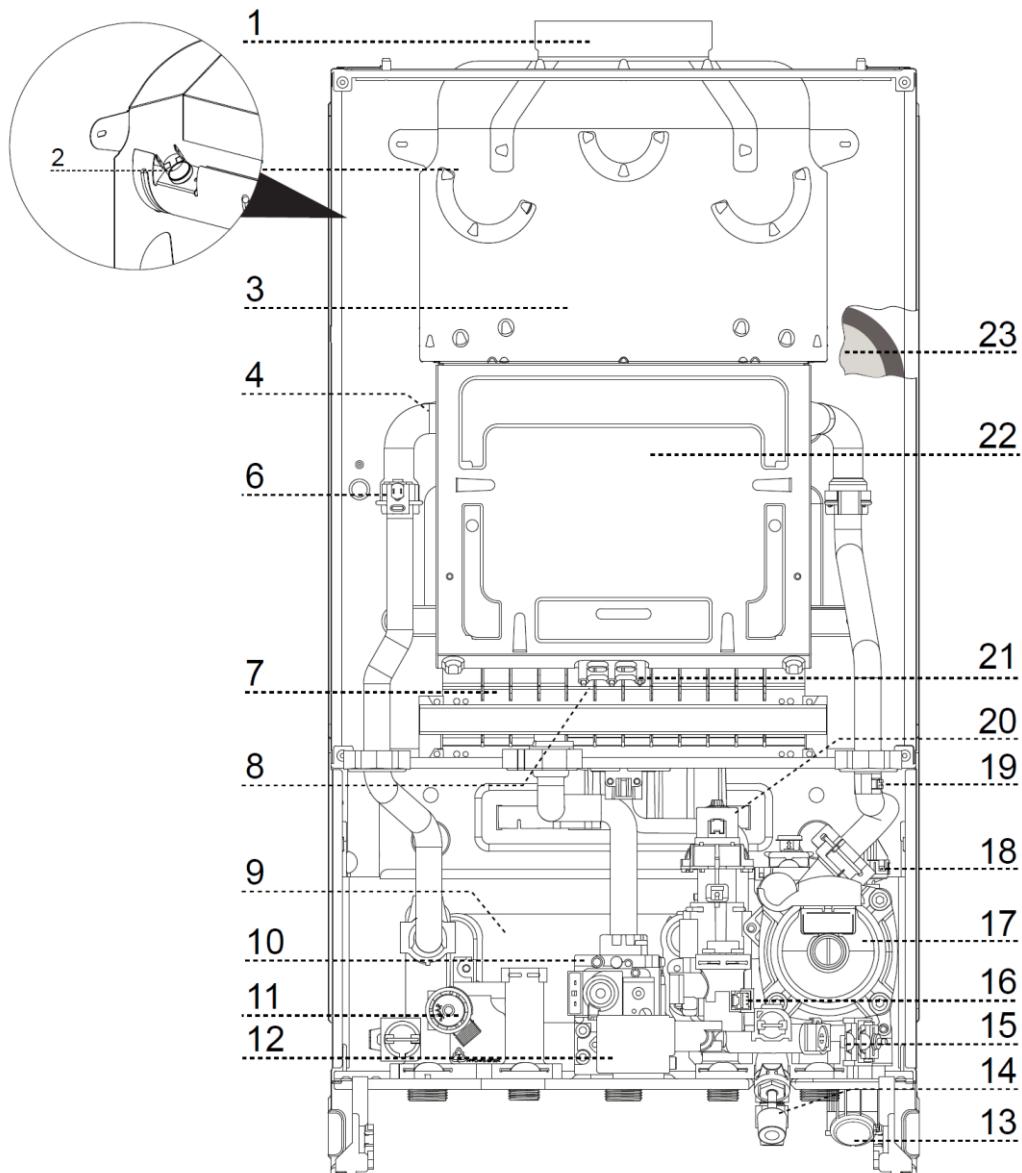
CAPTION			
1	Flue connector	14	Filling Tap
2	Air pressure switch	15	CH Filter
3	Air pressure switch pressure intake condensate exhaust	16	Sanitary flow switch
4	Main Heat Exchanger	17	Pump
6	NTC1 heating delivery temperature probe	18	Heating minimum pressure switch
7	Burner	19	NTC2 heating return temperature probe
8	Ignition electrodes	20	3 Way Valve
9	Secondary Heat Exchanger	21	Detection electrode
10	Gas valve	22	Combustion Chamber
11	3 bar safety valve	23	Expansion Vessel
12	Spark generator	24	Fan
13	Pressure gauge		

1.3 SEALED CHAMBER OVERALL VIEW (FF - SYSTEM)



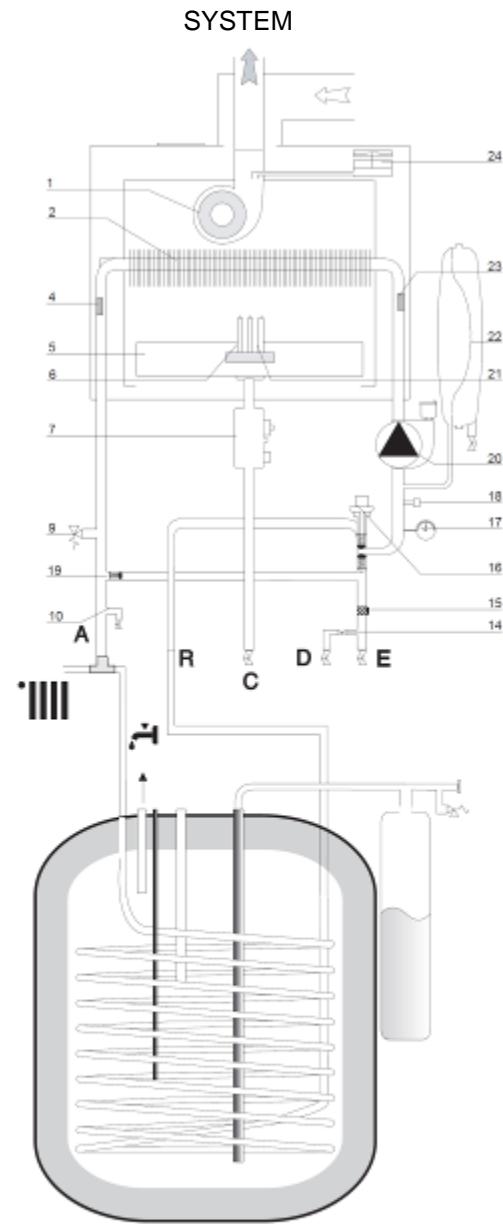
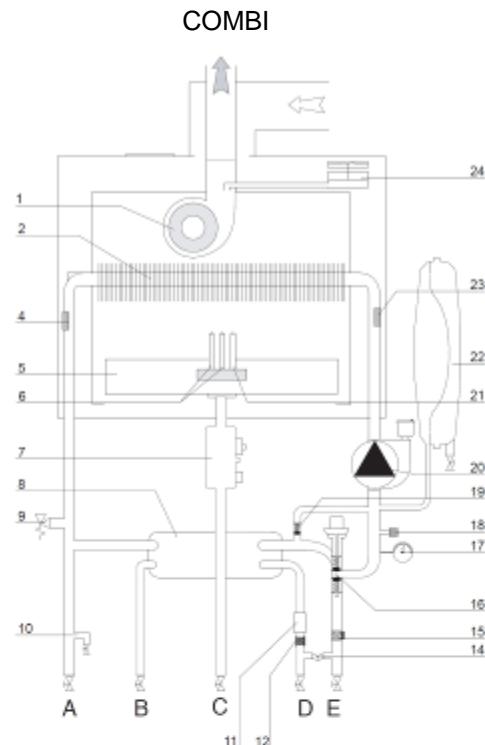
CAPTION			
1	Flue connector	14	Filling Tap
2	Air pressure switch	15	CH Filter
3	Air pressure switch pressure intake condensate exhaust	16	Sanitary flow switch
4	Main Heat Exchanger	17	Pump
6	NTC1 heating delivery temperature probe	18	Heating minimum pressure switch
7	Burner	19	NTC2 heating return temperature probe
8	Ignition electrodes	20	3 Way Valve
9	Secondary Heat Exchanger	21	Detection electrode
10	Gas valve	22	Combustion Chamber
11	3 bar safety valve	23	Expansion Vessel
12	Spark generator	24	Fan
13	Pressure gauge		

1.4 OPEN CHAMBER ASSEMBLY VIEW (CF)



LEGENDA			
1	Flue Manifold	13	Pressure gauge
2	Flue Control Thermostat	14	Filling Tap
3	Flue Hood	15	CH Filter
4	Main Heat exchanger	16	Sanitary flow switch
6	NTC1 heating delivery temperature probe	17	Pump
7	Burner	18	Minimum pressure switch
8	Ignition electrodes	19	NTC2 heating return temperature probe
9	Secondary Heat Exchanger	20	3 Way Valve
10	Spark generator	21	Detection electrode
11	3 bar safety valve	22	Combustion Chamber
12	Gas valve	23	Expansion Vessel

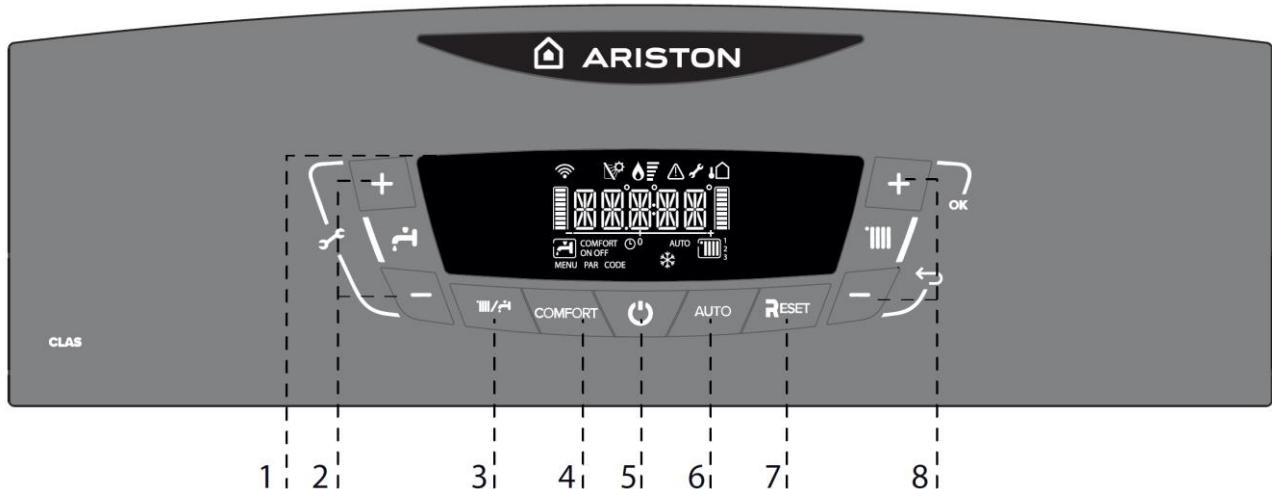
1.5 HYDRAULIC SCHEMES



Legend:

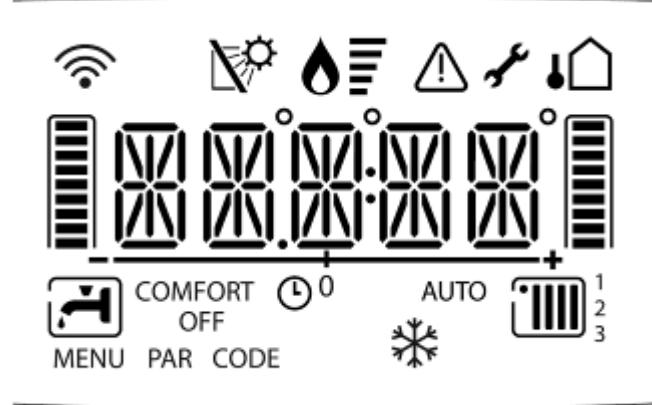
1. Fan
2. Main Heat Exchanger
4. Central Heating Flow Temperature Probe
5. Burner
6. Ignition Electrodes
7. Gas Valve
8. Secondary exchanger
9. Safety valve
11. Drain valve
11. D.H.W. Flow Switch
12. D.H.W. circuit filter
14. Inlet valve
15. C.H. Filter
16. Diverter valve
17. Pressure Gauge
18. Minimum pressure switch
19. Automatic By-pass
20. Circulation Pump with air release valve
21. Detection electrode
22. Expansion vessel
23. Central Heating Return Temperature Probe
24. Air Pressure Switch

1.6 CONTROL PANEL



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.				

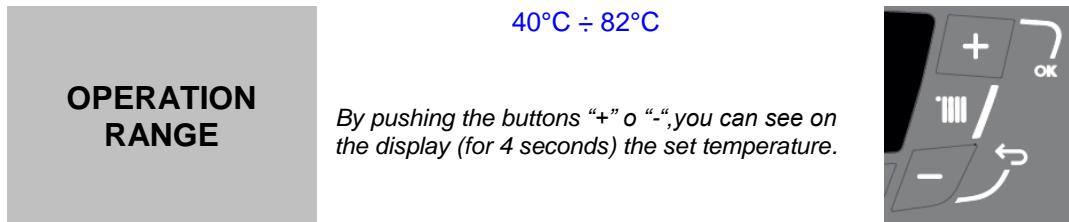
1.7 DISPLAY



ICONA	DESCRIZIONE
	<ul style="list-style-type: none"> Set temperature Error code Reset indication Menu seeing
	Temperature indication
	Navigation → Menu number
	Navigation → Parameter number
	Code request
	Safety shutdown, nor resettable
	Error signal
	Flame on and power level
	Heating enabled
	Heating request in progress
	Sanitary enabled
	Sanitary request in progress
	Comfort function enabled
	Boiler off with antifreeze function enabled
	Antifreeze function in progress
	Auto function enabled
	Solar system connected
	Outdoor sensor connected (optional)
	Wi-Fi active (optional)

2 OPERATION

2.1 HEATING MODE: OPERATING LOGIC



Through the parameters **425** (min) and **426** (max) is possible to set the maximum and the minimum heating temperature.

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

HEATING REQUEST

When the boiler is at rest the valve is on the "sanitary" position. When heating is turned on the motor is supplied (inside shaft in), that closed the outlet of the secondary exchanger and puts pump intake in communication with the heating circuit

Three-way valve ON

7 seconds

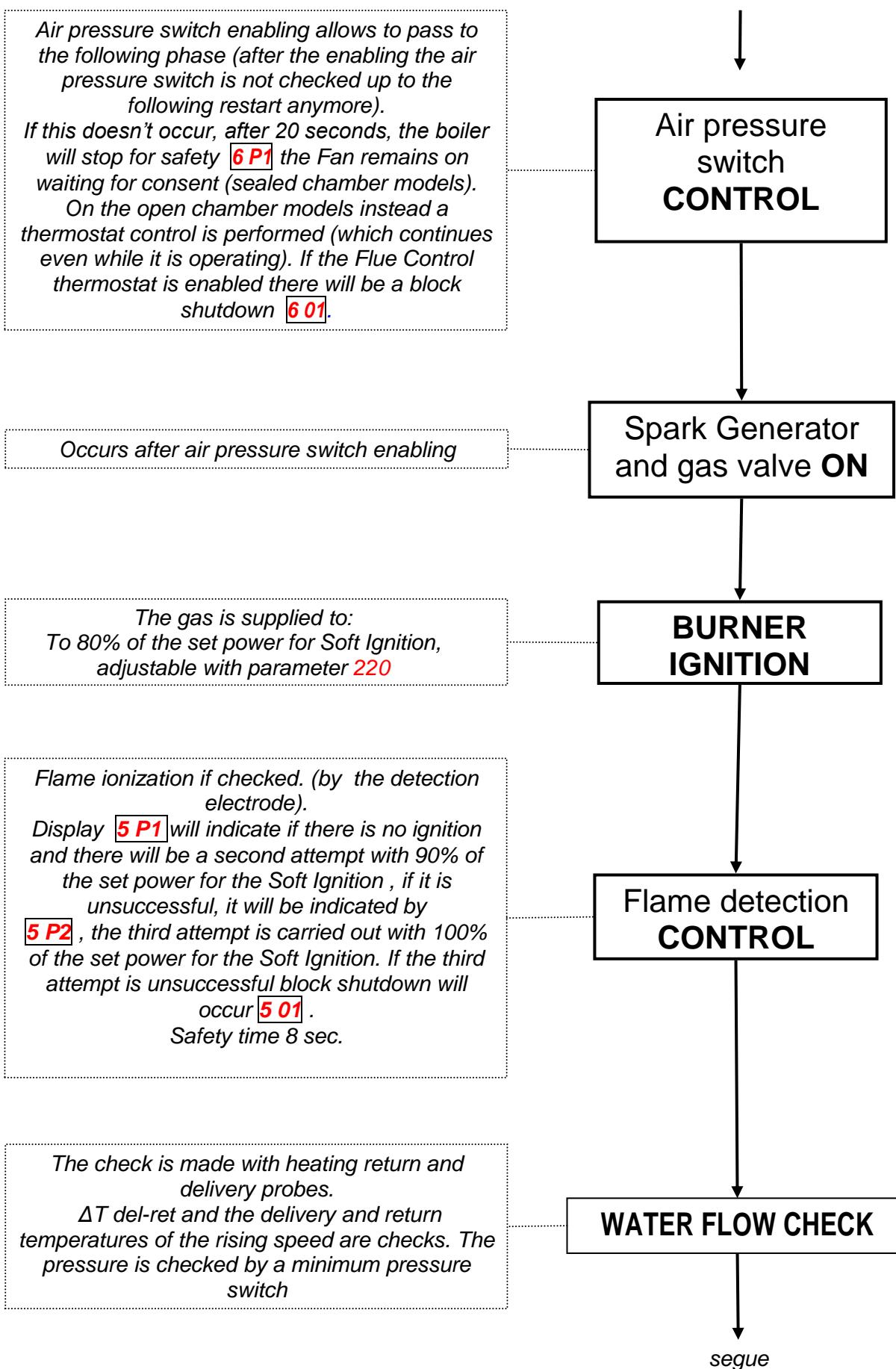
Pump ON

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

Fan ON

The Fan is supplied (sealed chamber models)

segue



NORMAL BOILER OPERATION

After flame detection the boiler is free to modulate the power according to the required thermal load. Modulation is carried out between the maximum heating power values (adjustable from the control panel with parameter 231) and the minimum power value (set made on the gas valve). The shut down temperature of the burner is operated as follows:

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

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 236)

FLAME MODULATION

The pump has 2 speeds that are operated by the control of the heating delivery-return ΔT . It is operated as follows:

- $\Delta T_{del-ret} < \Delta T - 2^{\circ}\text{C} \rightarrow V2$ pump speed
- $\Delta t_{del-ret} > \Delta T \rightarrow V3$ pump speed

where: $\Delta T = 20^{\circ}\text{C}$ (default value can be sent by parameter 239 between 10 and 30°C).

Speed switching is carried out with a 5 minute delay (non-settable value) raising or diminishing.

PUMP Speed control

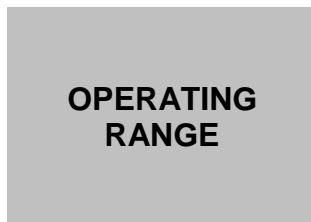
Performed from the flow and return NTC. If the temperature rise 102°C a lock out occurs, indicated on the display with **101**.

Overheat control

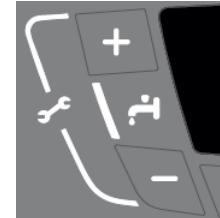
N.B. Starting from heating request, the “**limit temperature**” (88°C , not adjustable fixed value) remains on executed by the primary exchanger outlet probe (NTC 1).

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

2.2 SANITARY MODE: OPERATING LOGIC



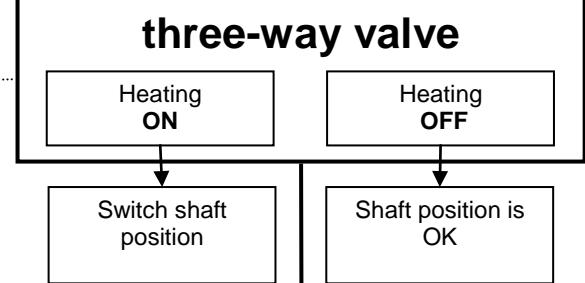
By pushing the buttons "+" o "-", you can see on the display (for 4 seconds) the set temperature



A demand for Domestic hot water, is detected by the flow switch.
Now the boiler will be working on the SANITARY mode. The display will show icon  with the set temperature for sanitary.

DEMAND FOR DOMESTIC HOT WATER

When the boiler is on stand-by the valve is already on the SANITARY position.
If there is a demand while the boiler is operating on HEATING mode, the three-way valve will be switched on SANITARY.
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.



The pump (set on speed 3), intakes water coming from the outlet of the secondary and sends it to the primary exchanger

Pump ON

The fan is supplied (sealed chamber models)

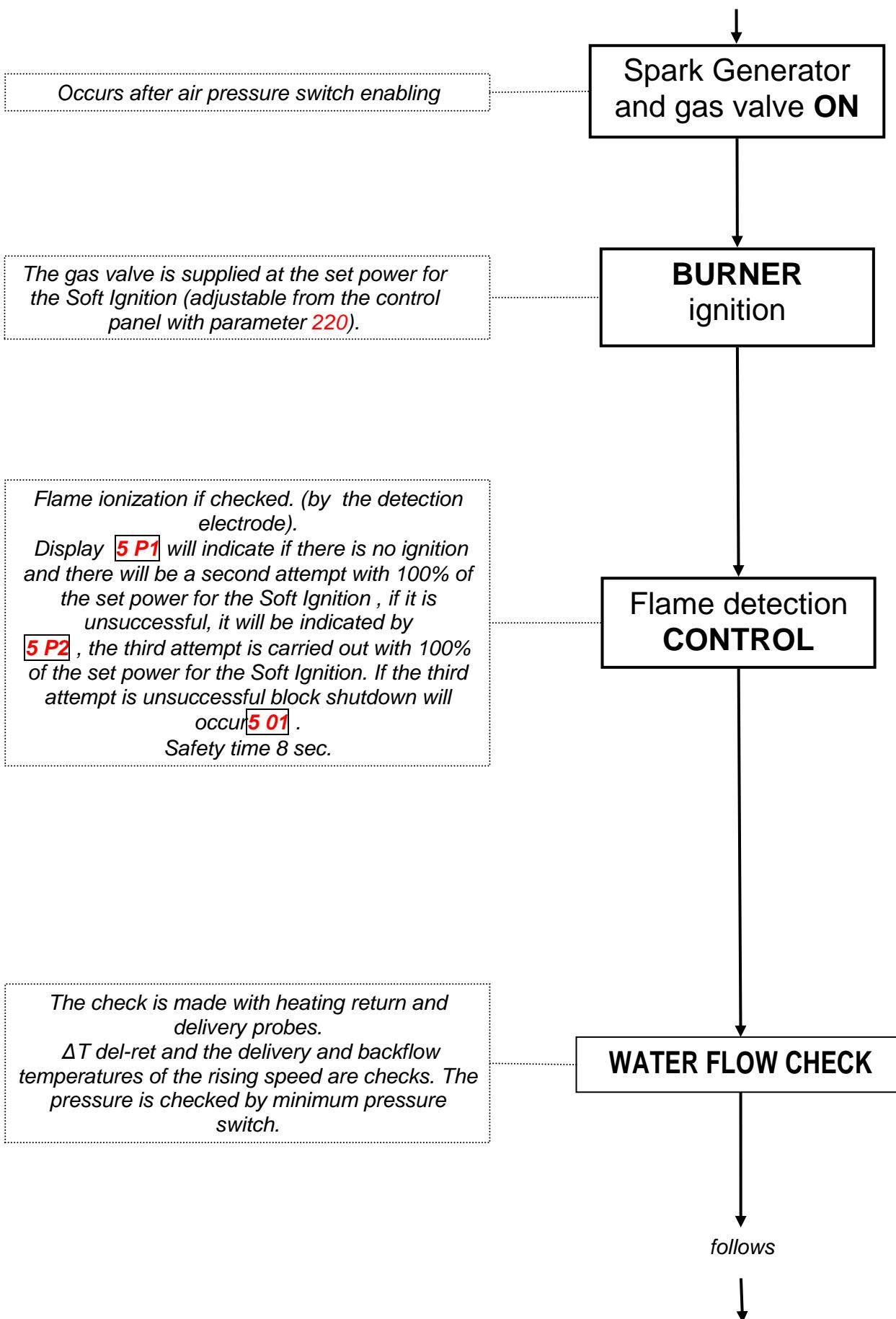
Fan ON

Air pressure switch enabling allows to pass to the following phase.
If this doesn't occur, after 20 seconds, the boiler will stop for safety **6 P1** the Fan remains on waiting for consent (sealed chamber models).

On the open chamber models instead a thermostat control is performed (which continues even while it is operating). If the Flue Control thermostat is enabled there will be a block shutdown **6 01**.

Air pressure switch CONTROL

follows



*Modulation occurs between the value of the sanitary maximum power (set on the gas valve) and the value of the minimum power (also set on the gas valve).
The burner runs until the scale prevention temperature is reached. The temperature is checked by the return probe NTC2.*

FLAME MODULATION

*Performed from the flow and return NTC. If the temperature rise 102°C a lock out occurs, indicated on the display with **101**.*

Overheat control

*To reduce the formation of scale in the secondary exchanger.
During the D.H.W. mode the switch off and switch on of the burner depends on the following values of temperature:*

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

SCALE PREVENTION temperature

NORMAL BOILER OPERATION

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

- 0 : Anti-scale (62 o 65°C) \Rightarrow default
- 1 : Set-point + 4°C

3 SPECIAL FUNCTIONS.

3.1 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
 <p>Press Reset button for 5 continuous seconds</p>	 <p>The display will show this indication</p>

- 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 sanitary demand the burner turns on in heating;
 - with sanitary demand the burner turns on in sanitary.
- 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.

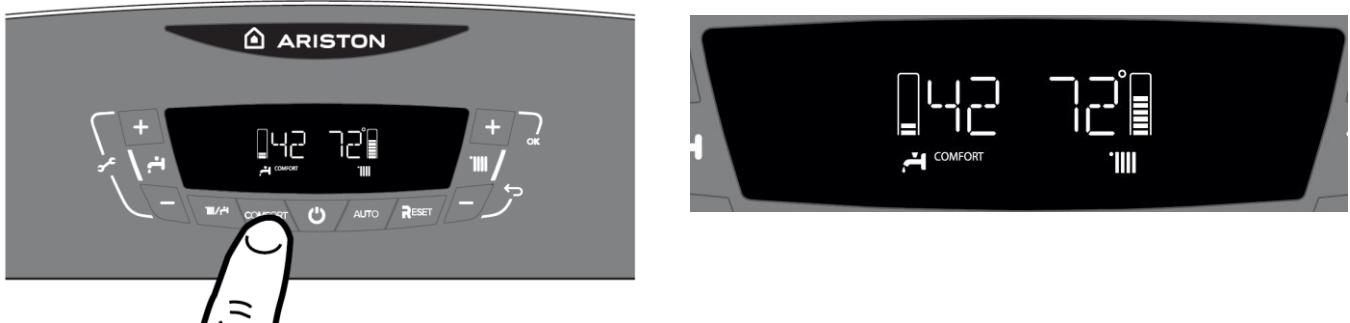
Three different powers can be selected when the function is enabled, after the activation of the function the boiler goes at the maximum heating power, after that is possible change it:

PRESS	DISPLAY	POWER
Push the button "+"		Max sanitary
Push the button "+"		Minimum

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

3.2 "COMFORT" Function.

This function reduces the hot sanitary 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 sanitary request;
- 2: always enabled.

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

TEMP. SET FOR SANITARY 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

3.3 “ANTIFREEZE” Function

This function is enabled only if the ON/OFF selector is turned on position ON. 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	<ul style="list-style-type: none"> - 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 “sanitary” mode - The DISPLAY shows the icon  	Until the NTC1 temperature is $\geq 9^{\circ}\text{C}$
	<p>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</p>		
2nd CASE	The temperature detected by probe NTC1: Is below 3°C	<ul style="list-style-type: none"> - The BURNER turns on, supplied with minimum power; - The 3-WAY VALVE is positioned on “sanitary” 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 $\geq 40^{\circ}\text{C}$

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**.

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**.

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 memory all the setting and when the power supply is on the boiler returns in the condition that had before the turning off.

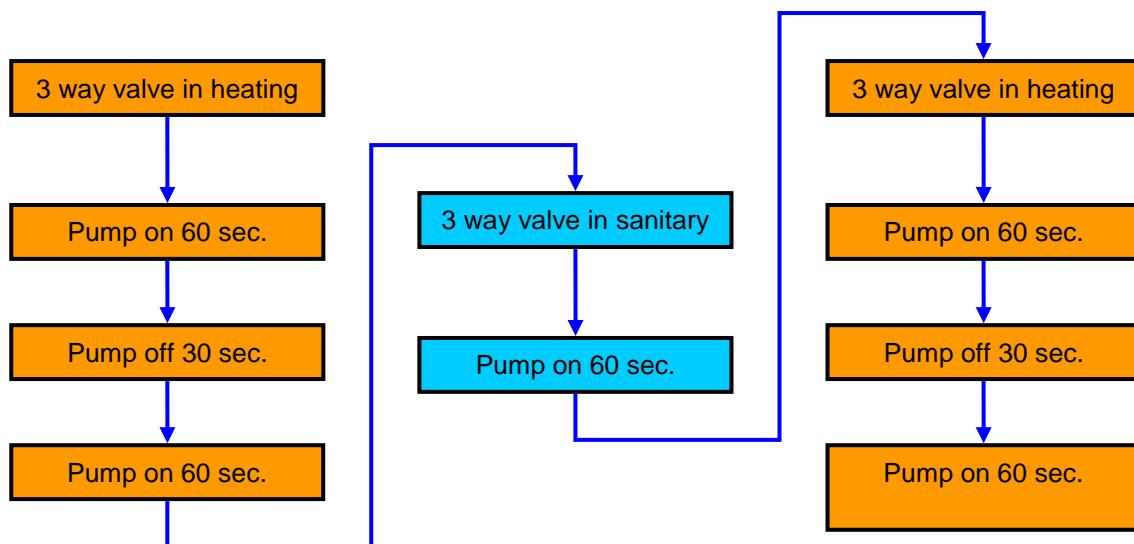
3.4 "WATER FLOW CHECK"

Check	When	What happens
Gradient Tdel > 7°C/sec (checked every 100ms)	Check always with the flame on, except during the first 4 seconds after flame detection.	<ol style="list-style-type: none"> 1. Immediate safety shutdown 1 P1: - 10sec of post-circulation - 10 sec of post-ventilation The boiler restarts after 10sec. 2. If the error occurs other 2 times within the following 4 minutes it will be shutdown 1 03 : - 20sec of post ventilation - 1min of post circulation.
Gradient Tdel > 20°C/sec or Gradient Tret > 20°C/sec (checked every 100ms)	Check always with the flame on, and up to 7 sec after each turn off for temperature set or safety shutdown.	<ol style="list-style-type: none"> 1. Shutdown 1 04: - 20sec of post ventilation - 1min of post-circulation.
Tdel – Tret > 55°C	Check always with the flame on, and up to 7 sec after each turn off for temperature set or safety shutdown.	<ol style="list-style-type: none"> 1. Immediate safety shutdown 1 P2: - 10sec of post-circulation; - 10sec of post ventilation. After 10sec the boiler restarts. 2. If within 4 minutes from the first safety shutdown the defect occurs again there will be a safety shutdown 1 P2 : - 10sec of post-circulation; - 10sec of post ventilation. After 10sec the boiler restarts but the timer is zeroed. 3. If within 4 minutes from the first safety shutdown the defect occurs again it will be shutdown 1 05 : - 20sec of post ventilation - 1min of post circulation.
Tret > Tdel + 10°C	Check always with the flame on.	<ol style="list-style-type: none"> 1. If the defect occurs for 20 continuous seconds there will be a safety shutdown 1 P3 : - 10sec of post-circulation; - 10sec of post ventilation. 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 : - 20sec of post ventilation; - 1min of post circulation.
Tret > Tdel + 30°C	Check always with the flame on.	Shutdown 1 07 : 20sec of post ventilation; - 1min of post circulation

3.5 “AIR PURGE” Function

This function can be activated by the installer by the parameter 271 (premendo il tasto “Menù/OK”) or pressing of the key Winter/Summer (mode) for 5 sec (continues till to the finish (about 6') or pressing of the key Winter/Summer).

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.



3.6 “SELF ADAPTIVE HEATING RESTART DELAY”

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

- 0: manual;
- 1: automatic.

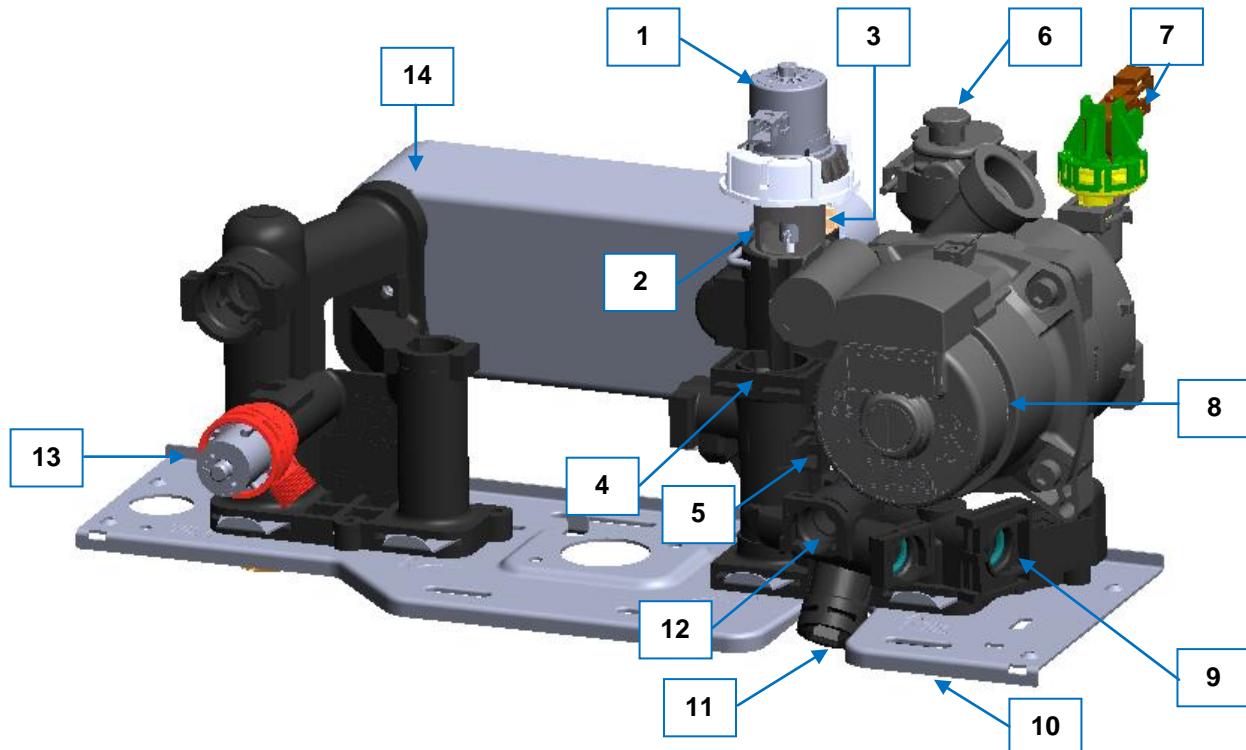
MANUAL: with the parameter 2 36 it is possible set the heating restart delay between 0 and 7 min.

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

Set-point riscaldamento	< 50°C	51-60°C	61-70°C	71-80°C	> 80°C
Ritardo alla riaccensione (minuti)	5	4	3	2	1

4 HYDRAULIC BLOCK

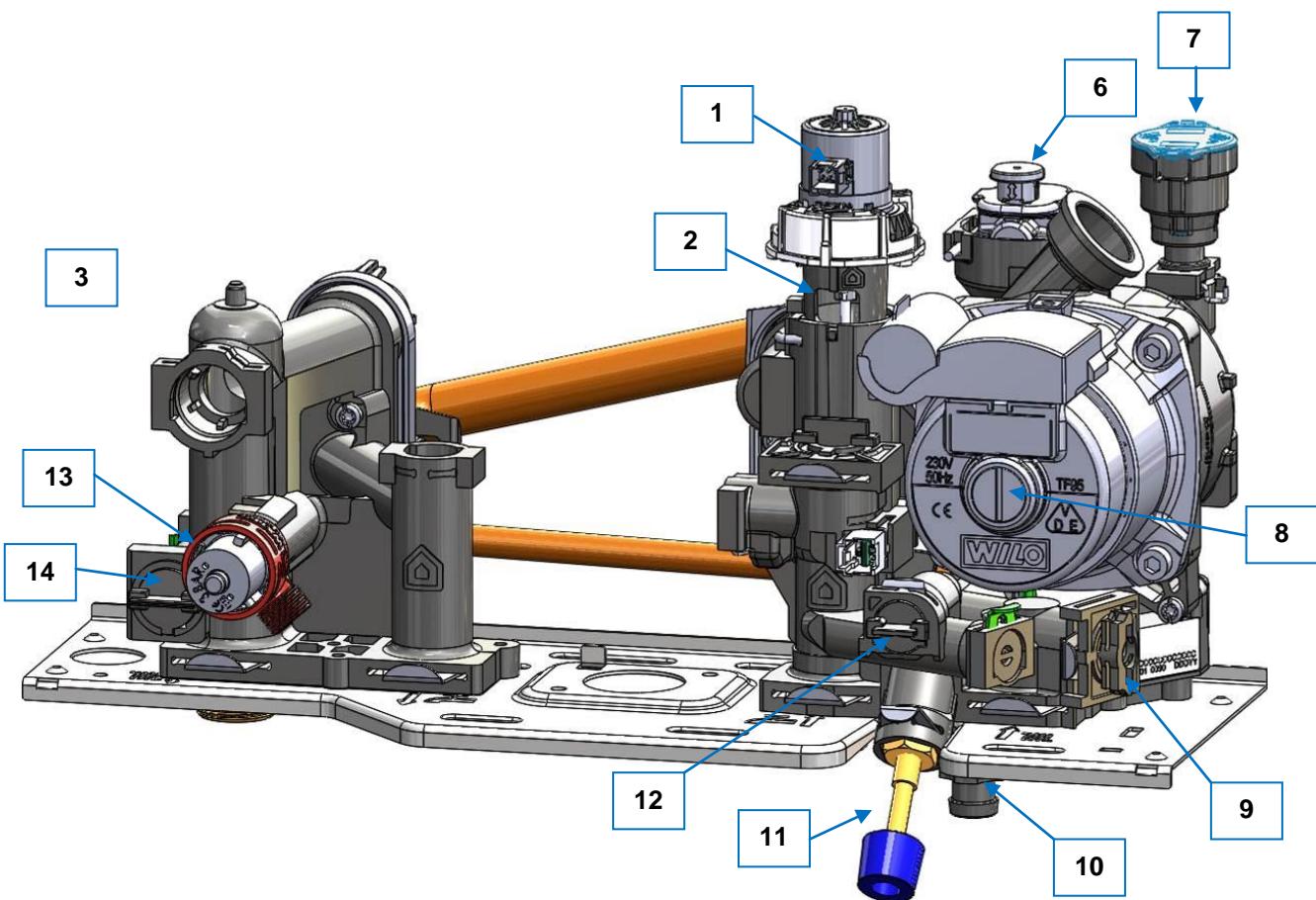
4.1 Combi hydraulic block



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	Sanitary 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	14	Sanitary plate heat exchanger

4.2 System hydraulic block



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	13	3 bar safety valve
8	Pump	14	By-pass
9	Heating filter and pressure gauge connection		

4.3 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 drive 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 sanitary 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.

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 is mandatory 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 switch off the boiler through the ON/OFF button.

- Remove the motor blocking ring, rotating clockwise.



- Unblock the stepper motor

BLOCKED



UNBLOCKED



- Remove the stepper motor.

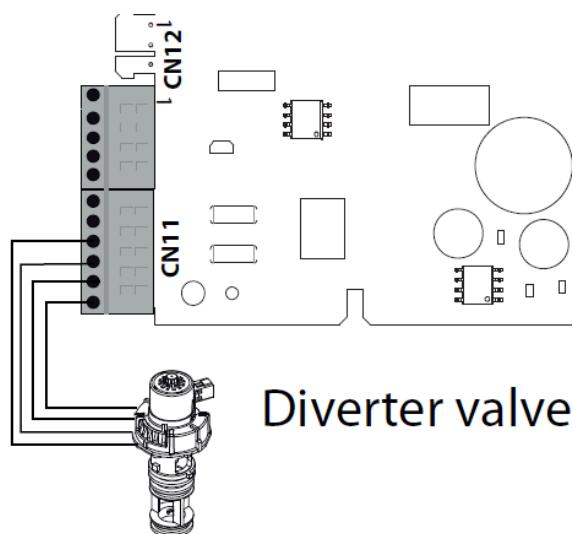


- Remove the 3 way valve (to do it easier it is possible use a flat screwdriver).

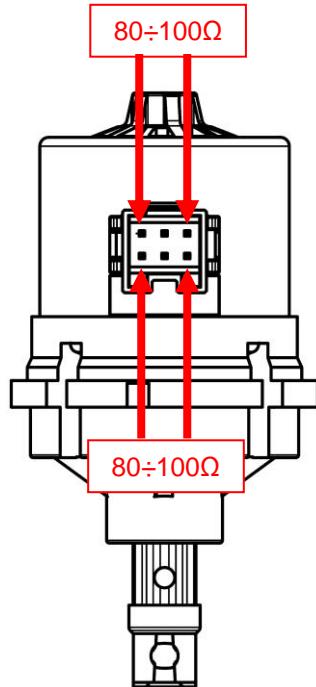


4.3.1 Stepper motor

The stepper motor is managed from the PCB.
Its supply is not measurable (it would be necessary an oscilloscope).
Switching time (Heating → DHW or DHW → Heating) : about 3sec.,



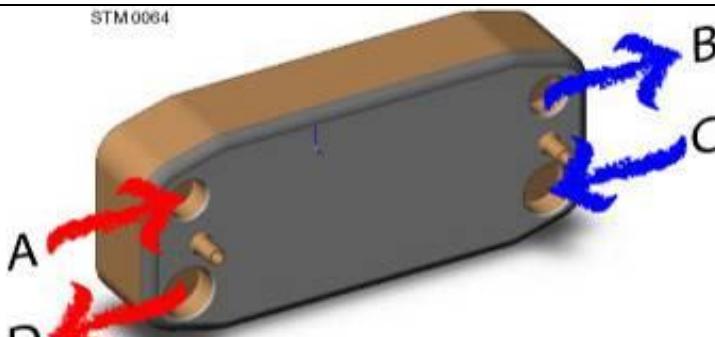
To check the stepper motor is possible measure the resistance between the following pins. If it is between 80 and 100 Ohm it means that the coils of the stepper motor are ok.



4.4 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.

<p>HEAT EXCHANGER</p> <p><i>Hot water from the main exchanger, flows into A, transferring its heat and flows out through B</i></p> <p><i>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.</i></p>	 <p>STM0064</p> <p>Exchanger with 10 plates</p>
--	---

4.4.1 Antiscale limit temperature

Reduces the formation of scale in the secondary exchanger. During SANITARY 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 <i>(delivery probe)</i>	<i>Not influent</i>	85°C	81°C
NTC2 <i>(return probe)</i>	> 52°C	65°C	64°C
	<52°C	62°C	61°C

4.5 PUMP UNIT

Pump type:

Wilo INMTSL 15/5 HE-2	CLAS X 24 CF NG
	CLAS X 24 FF NG
	CLAS X 28 FF NG
	CLAS X SYSTEM 15 CF NG (RU)
	CLAS X SYSTEM 15 FF NG (RU)
	CLAS X SYSTEM 24 CF NG
	CLAS X SYSTEM 24 CF NG (RU)
	CLAS X SYSTEM 24 FF NG
	CLAS X SYSTEM 24 FF NG (RU)
	CLAS X SYSTEM 28 CF NG
	CLAS X SYSTEM 28 FF NG
	CLAS X SYSTEM 32 FF NG
Wilo INTMTSL 15/6.7 HE-2	CLAS X SYSTEM 32 FF NG (RU)
	CLAS X 24 FF NG (CI)
	CLAS X 28 FF NG (CI)
	CLAS X 32 FF NG (CI)
	CLAS X SYSTEM 24 FF NG (CI)
	CLAS X SYSTEM 28 FF NG (CI)
	CLAS X SYSTEM 32 FF NG (CI)

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

- On “sanitary” 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;

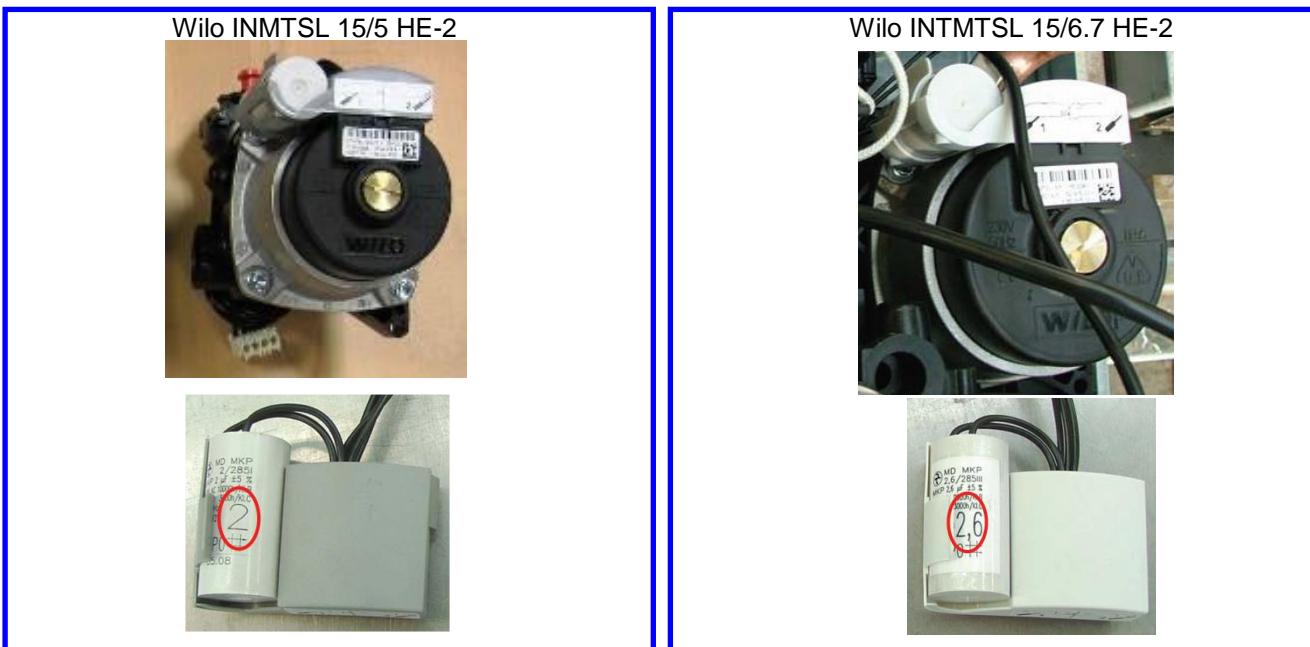
where: $\Delta T = 20^\circ\text{C}$ (default value, which can be set by parameter **2 39** between 10 and 30°C).

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.

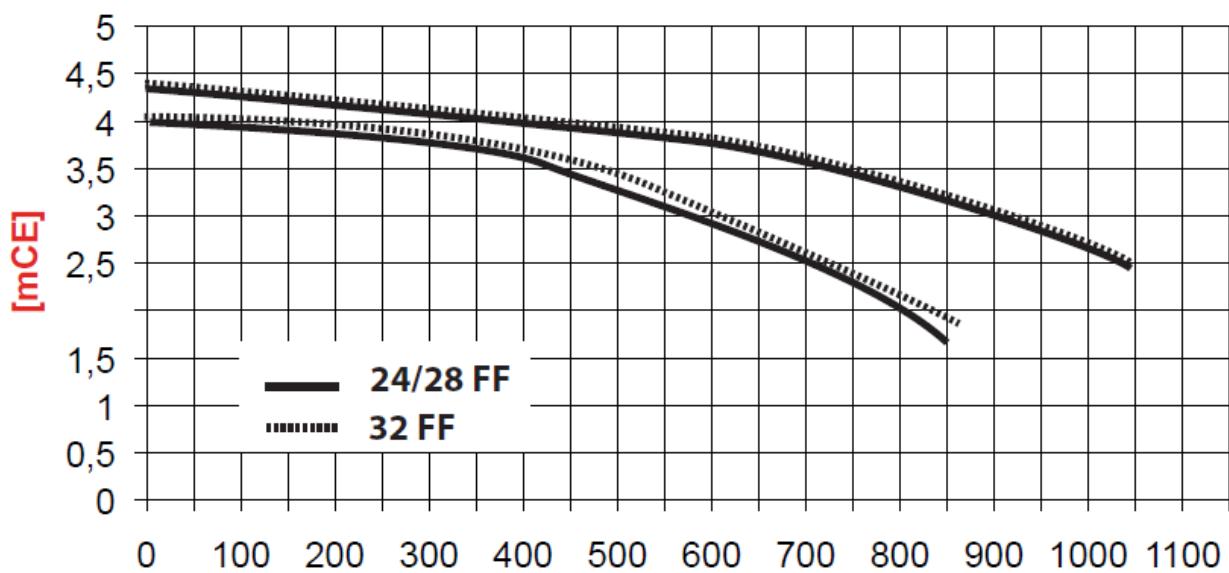
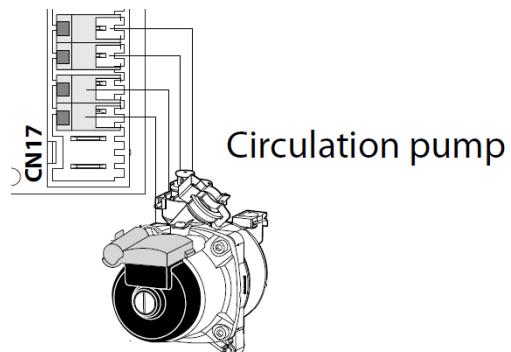


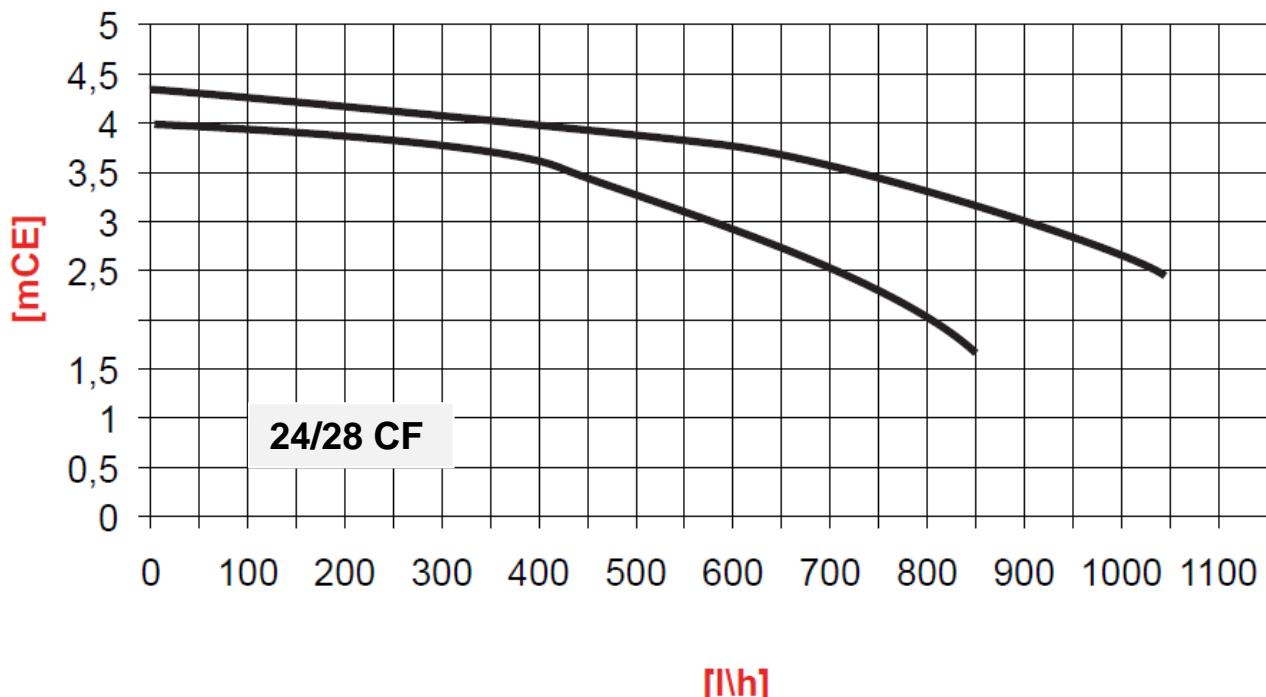
4.5.1 PUMP speed check

The speed of the pump can be checked by the parameter **8 23** or by measuring the voltage (Vac) between pins 5 and 6 of the electronic card CN10 connector:

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

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





4.5.2 Post-circulation.

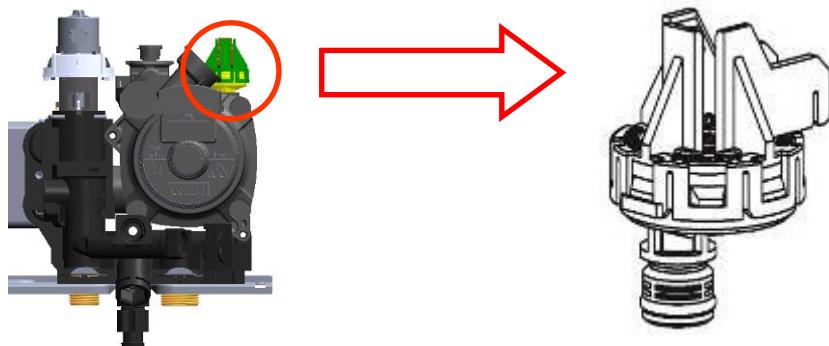
Post-circulation after:	3 way valve position	Time of post circulation	Speed pump
Switching off due to:			
Room thermostat opening	Heating	3 min (set by parameter 237 between 0 e 15')	Low
Heating Off by Summer/Winter button	Heating	3 min (set by parameter 237 between 0 e 15')	Low
NTC delivery > T set +4	Heating	continuasly	Low
NTC return > 62°C or 67°C	Sanitary	continuasly	High
End of sanitary demand	Sanitary	Par. 254=0 → 30 sec if: Tdel<75°C ; 3 min if Tdel>75°C; Post circulation: 30sec	High
End of comfort cycle	Sanitary	30 sec	High
End of antifreeze function	Heating / Sanitary	2 min	High
End of chimney sweeping function	Heating	1 min	Low
Solar sensor	Sanitary	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

4.6 HEATING PRESSURE SWITCH

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 shut down **1 08**



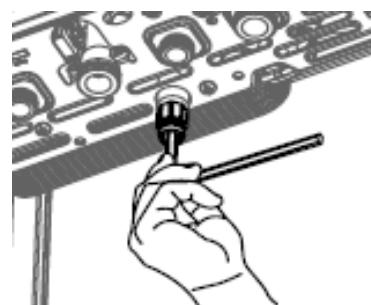
4.7 FILLING TAP.

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



4.8 DRAIN VALVE.

To empty the system turn the proper tap positioned on the lower part of the boiler anti-clockwise. To open it is possible use hexagonal wrench 9mm.



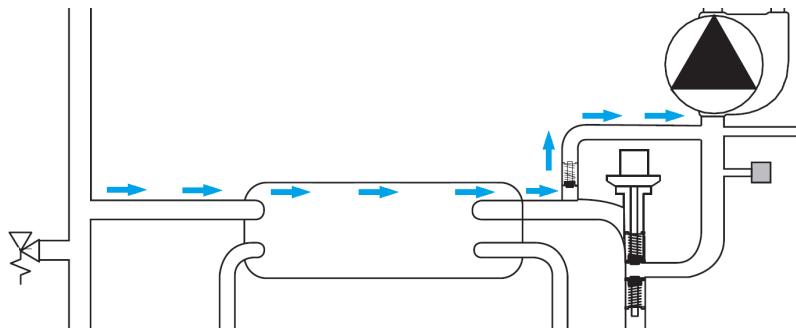
4.9 BY-PASS

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 (on the combi boiler this circulation is done through the DHW plate heat exchanger).

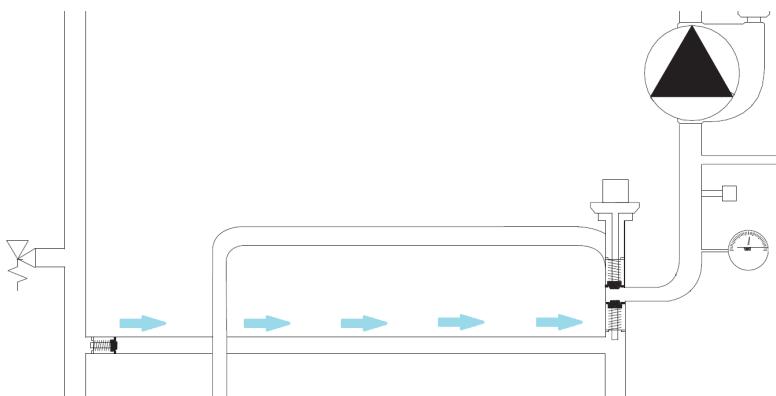
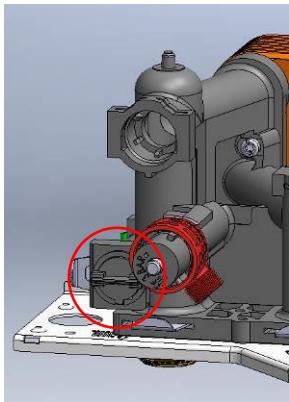
The by-pass is therefore designed to protect the condensing main exchanger from overheating in the case of poor or insufficient water circulation.

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

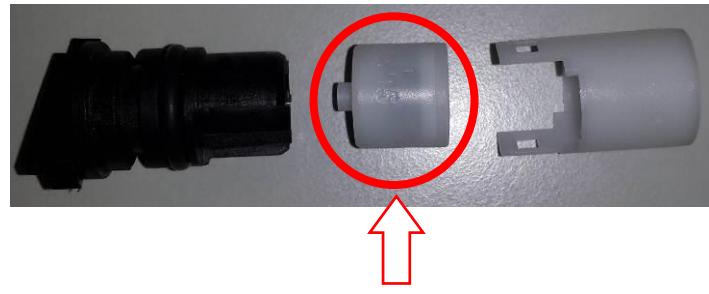
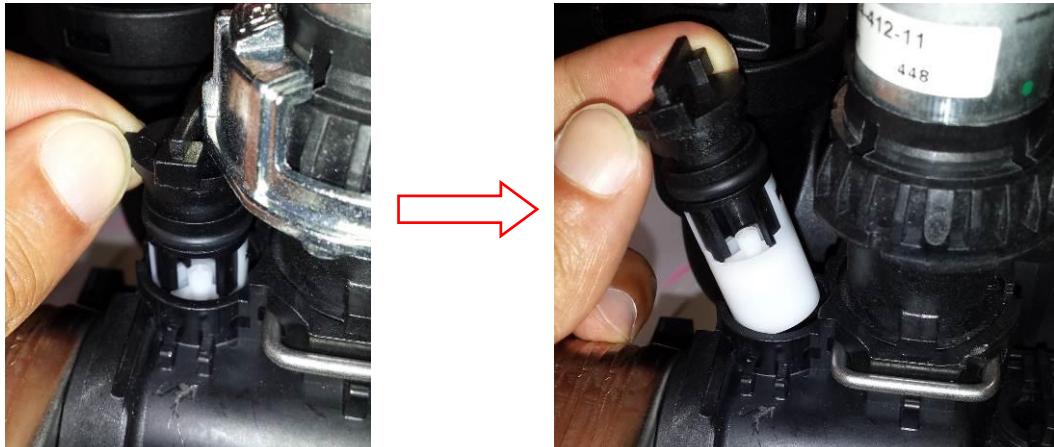
In the combi boiler the by-pass is positioned in the return group and behind the 3 way valve.



In the system boiler the by-pass is positioned in the delivery unit in the left side of the 3 bar safety valve.



In the Combi boiler to remove the by-pass it needs to remove before the ring that fix the 3 way valve motor.



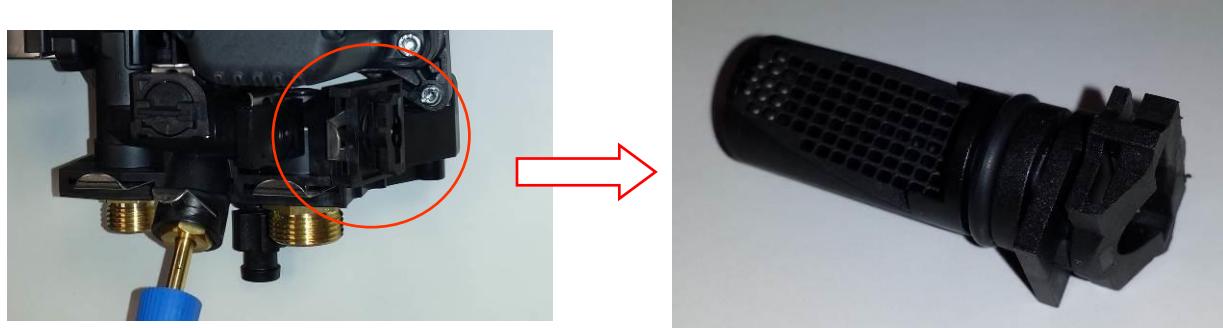
4.10 PRIMARY HEAT EXCHANGER

The heat exchanger transmits heat of the combustion products to the primary circuit water.

Model	Dimensions
24 and 15 kW CF	260 x 180 mm
28 kW CF	300 x 180 mm
24 and 15 kW FF	220 x 180 mm
28 kW FF	260 x 180 mm
32 kW FF	300 x 180 mm

4.11 HEATING FILTER

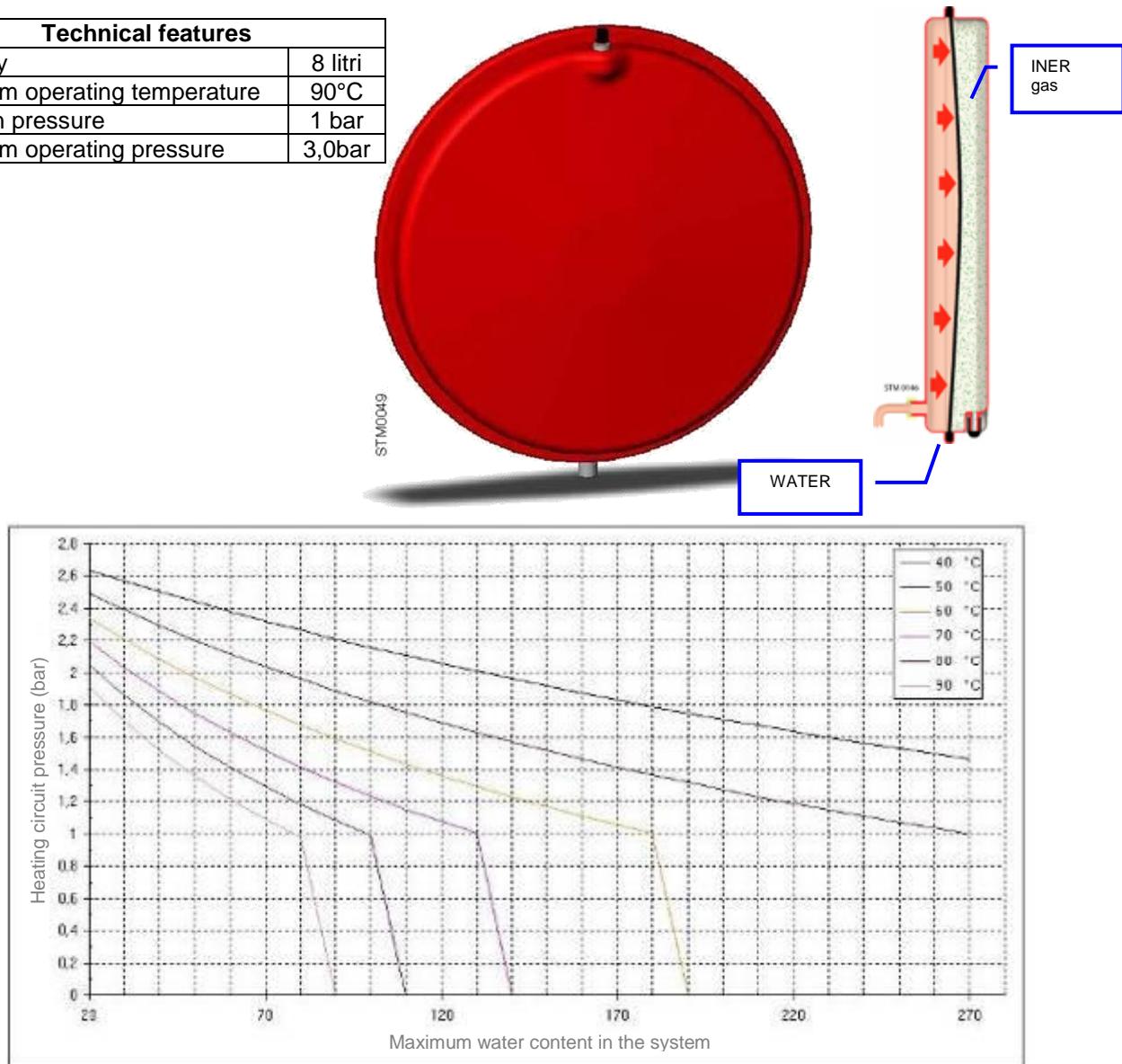
On the heating return unit there is a filter that can be reached from the front side of the boiler. To inspect and clean the filter follow the instructions shown below.



4.12 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 nitrogen on the other water of the primary circuit. The nitrogen chamber (which can be compressed) absorbs the water volume increased because of temperature raise.

Technical features	
Capacity	8 litri
Maximum operating temperature	90°C
Nitrogen pressure	1 bar
Maximum operating pressure	3,0bar



4.13 SANITARY FLOW SWITCH

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

When turned on sanitary 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.

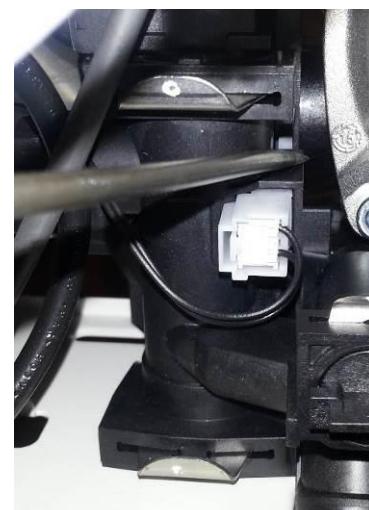
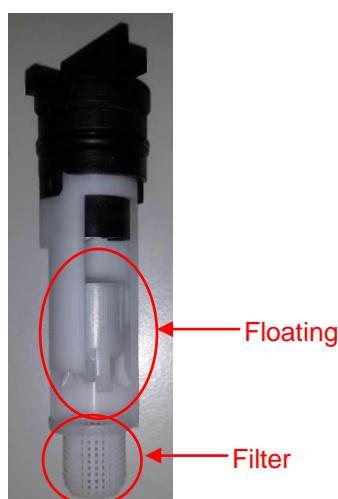
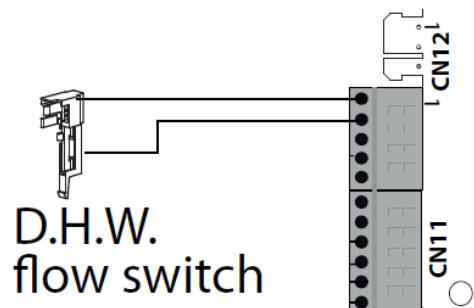
A cold water inlet filter is built-in the sanitary flow meter to stop impurities from getting in.

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 CN11.

Flow capacity on: 2 l/min

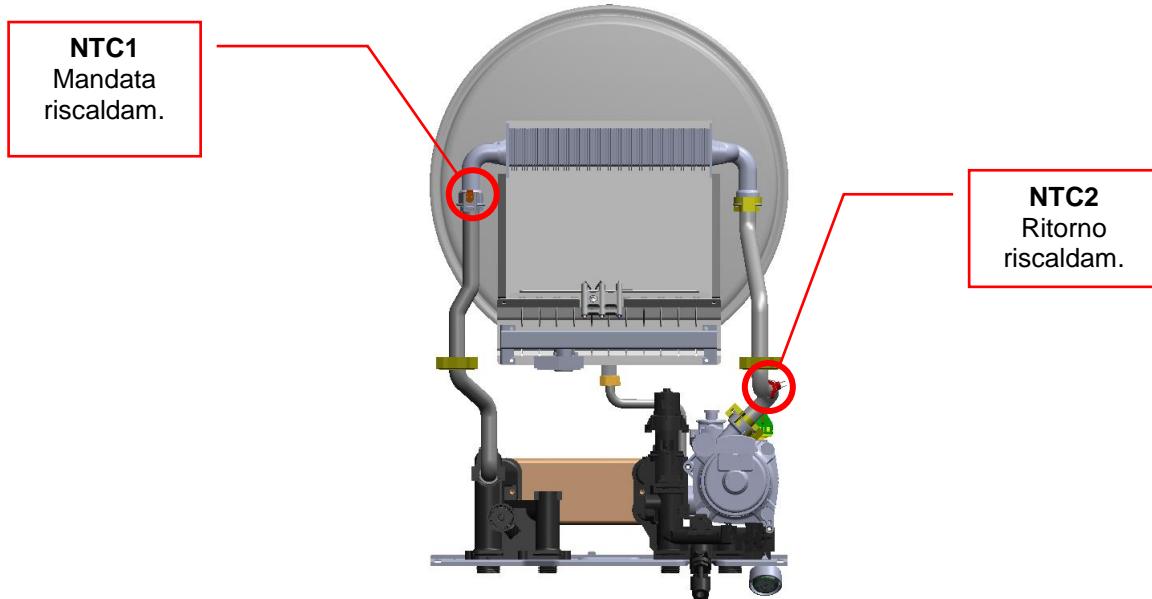
Flow capacity off: 1,4 l/min



4.14 TEMPERATURE PROBE

To check the delivery and return temperature use the two contact sensor. To read the sanitary water temperature the NTC1 heating delivery is used.

IMPORTANT!!!! Do not use conducting paste for the contact sensors because they alter the resistance value.



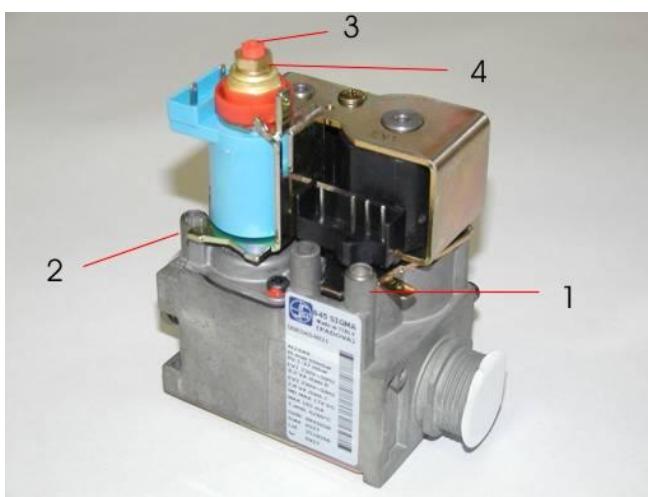
PROBE ERROR CODES	
1 10	NTC1 heating delivery probe open or short circuit
1 12	NTC2 heating return probe open or short circuit

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

5 GAS UNIT

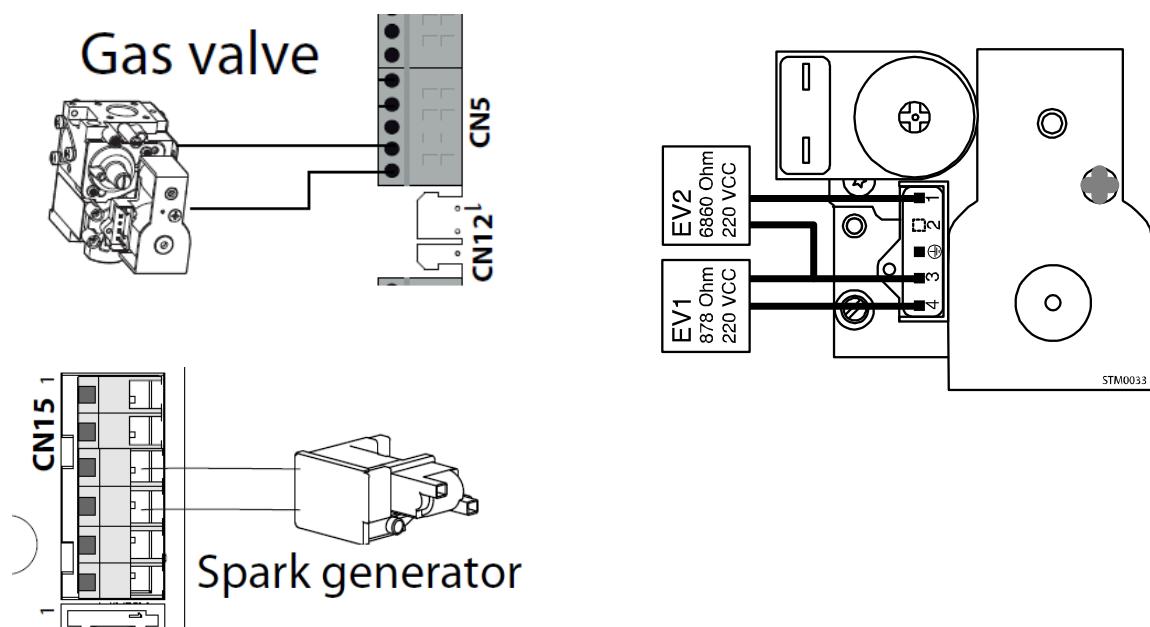
5.1 SIT 845 SIGMA GAS VALVE.

The gas valve mounted is a SIT 845 SIGMA valve fitted with two operators supplied at 220VCA that consent or cut off the gas supply to the main burner. A low voltage (24V) modulator is mounted on the valve to regulate the outgoing gas pressure of the valve according to the readings detected by the electronic P.C.B. via the temperature probes. The modular is used for both natural and liquid gas. The valve is also fitted with component NAC504 that has the function of powering both the main burner ignition transformer and valve. 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.



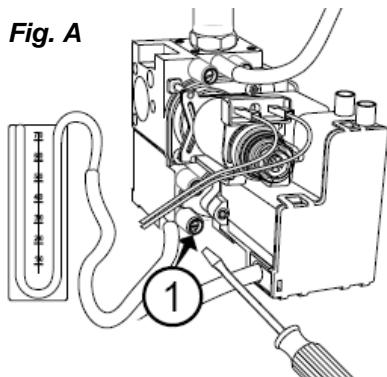
- | | |
|---|---------------------------|
| 1 | inlet pressure gauge |
| 2 | outlet pressure gauge |
| 3 | min power adjusting screw |
| 4 | max power adjusting nut |

5.2 SOLENOID VALVE ELECTROPNIC CONNECTION DIAGRAM.



5.3 GAS REGULATIONS.

5.3.1 SUPPLY PRESSURE CHECK.

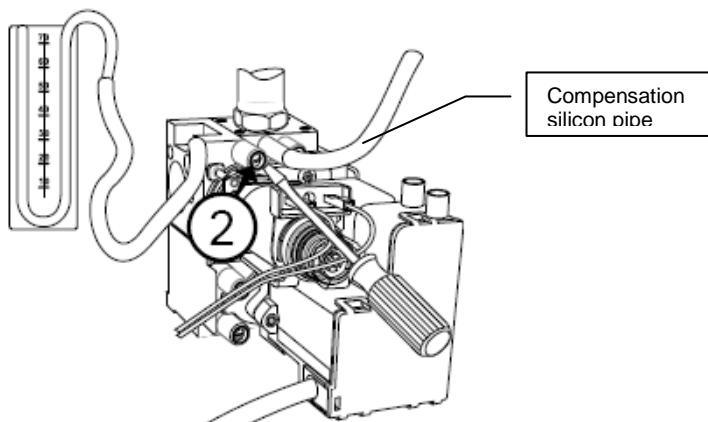
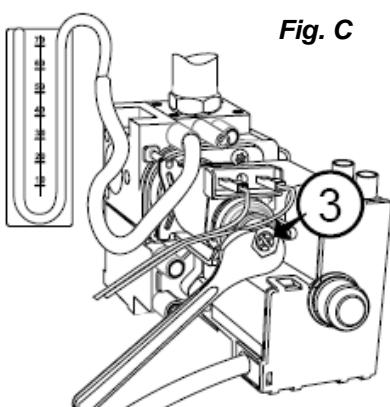
Fig. A

SUPPLY PRESSURE CHECK

- 1. Loosen screw "1" (fig. A) and insert the pressure gauge fitting pipe in the pressure intake.
- 2. Put the boiler on maximum operating power (hot water tap open). The supply pressure must correspond with the one foreseen for the type of gas for which the boiler has been prearranged (refer to table below).
- 3. After checking tighten screw "1" and check the seal.

MINIMUM SUPPLY PRESSURE		
METHANE G 20	BUTHANE G 30	PROPANE G 31
17 mbar	25 mbar	25 mbar

5.3.2 MAXIMUM SANITARY POWER CHECK.

Fig. B**Fig. C**

1. To check maximum power, loosen screw "2" (fig.B) and insert the pressure gauge fitting pipe in the pressure intake.
2. Disconnect the compensation pipe of the air chamber (fig.B).
3. Start the boiler at maximum power with the flue cleaner function (press Reset button for 5 sec.).
4. The supply pressure must correspond with the one foreseen for the type of gas for which the boiler has been prearranged (refer to table below). If it does not, remove the protection cap and act on adjusting hexagon nut "3" (fig. C).
5. After checking tighten screw "2" and check the seal.
6. Reassemble the protection cap of the modulator.
7. Reconnected the compensation pipe.

OUTLET PRESSURE SANITARY MAX POWER (mbar)		
24 kW CF	0	G31
28 kW CF	3	35,6
24 kW FF	5	35,3
28 kW FF	1	35,7
32 kW FF	7	35,7
	11	28
		35,9

5.3.3 MINIMUM POWER CHECK.

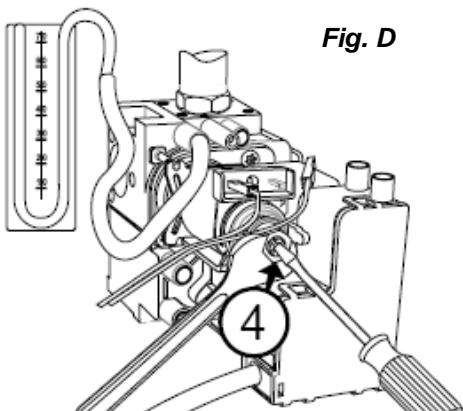


Fig. D

1. To check the minimum power loosen screw "2" (fig.B) and insert the pressure gauge fitting pipe in the pressure intake.
2. Disconnect the compensation pipe of the air chamber (fig.B).
3. Have the boiler work on minimum power and disconnect a cable from the modulator (fig.D). The supply pressure must correspond with the one foreseen for the type of gas for which the boiler has been prearranged (refer to table below). If it does not correspond, act on adjusting screw "4" (fig.D) while holding the hexagon nut steady "3" (fig.C).
4. After checking tighten screw "2" and check sealing.
5. Reconnect the cable of the modulator.
6. Reconnect the compensation pipe

OUTLET PRESSURE MIN. POWER (mbar)			
	AGGIORNARE		G31
24 kW CF			6,9
28 kW CF			7,5
24 kW FF			7,2
28 kW FF			7,2
32 kW FF	2,3	5,2	6,8

5.3.4 SOFT IGNITION POWER CHECKING

Regulation carried out on parameter **2 20**

1. To check the slow ignition power, loosen screw "2" (fig.B) and insert the pipe of the pressure gauge in the pressure intake.
2. Disconnect the air chamber compensation pipe (fig.B) (sealed chamber).
3. Open the tap of the hot water, the burner turns on, disconnect the detection electrode in order to have the slow ignition pressure for 8 seconds before safety block.
4. Change parameter **2 20** (see paragraph 6.2 and 6.3).

OUTLET PRESSURE SOFT IGNITION (mbar)			
	0,0	0,0	G31
24 kW CF			6,9
28 kW CF			7,5
24 kW FF			12,7
28 kW FF			13,7
32 kW FF	5,0	12	12

5.3.5 GAS PRESSURE/HEAT INPUT – MODELS CF.

Pressione Gas Riscaldamento / Heating Gas Pressure										
	Gas	Potenza termica / Heat output (kW)	9,9	12	14	16	18	20	22	23,7
CLAS EVO 24 CF CLAS EVO SYSTEM 24 CF	G20	mbar	2,2	3,2	4,4	5,7	7,2	7,6	9,1	10,6
		Parametro / Parameter 2 3 1	0	39	44	49	54	55	59	64
CLAS EVO SYSTEM 28 CF	G30	mbar	5,5	8,0	11,0	14,3	18,1	18,9	22,9	26,5
		Parametro / Parameter 2 3				73	75	80	84	
CLAS EVO SYSTEM 28 CF	G31	mbar				19,8	23,5	28,5	33,0	
		Parametro / Parameter 2 3				76	80	87	93	
AGGIORNARE						20	24	25	26,7	
CLAS EVO 24 FF CLAS EVO SYSTEM 24 FF	G20	mbar				7,3	9,0	9,7	11,1	
		Parametro / Parameter 2 3 1	0	37	41	45	50	55	57	62
CLAS EVO SYSTEM 28 FF	G30	mbar	5,3	8,3	8,9	13,7	16,9	22,0	23,8	27,2
		Parametro / Parameter 2 3 1	0	51	58	63	68	78	80	85
CLAS EVO SYSTEM 28 FF	G31	mbar	7,5	11,7	15,3	19,4	23,9	28,3	30,7	35,0
		Parametro / Parameter 2 3 1	0	59	66	72	79	86	89	97

5.3.6 GAS PRESSURE/HEAT INPUT – MODELS FF.

Pressione Gas Riscaldamento / Heating Gas Pressure										
	Gas	Potenza termica / Heat output (kW)	9,8	12,5	14,5	16,5	20,0	22,0	24,2	
CLAS EVO 24 FF CLAS EVO SYSTEM 24 FF	G20	mbar	2,3	3,7	5,0	6,5	8,0	9,7	11,7	
		Parametro / Parameter 2 3 1	0	43	49	55	59	64	69	
CLAS EVO SYSTEM 28 FF	G30	mbar	5,5	8,9	12,0	15,6	17,7	21,4	25,9	
		Parametro / Parameter 2 3 1	0	62	70	77	80	85	90	
CLAS EVO 28 FF CLAS EVO SYSTEM 28 FF	G31	mbar	6,8	11,1	14,9	19,3	22,5	27,3	33,0	
		Parametro / Parameter 2 3 1	0	68	76	82	86	92	98	
AGGIORNARE						11,6	14	16	18	20
CLAS EVO 32 FF	G20	mbar				15	6,8	8,9	10,4	12,1
		Parametro / Parameter 2 3 1				49	57	61	64	
CLAS EVO SYSTEM 32 FF	G30	mbar				15,2	19,1	22,4	26,0	
		Parametro / Parameter 2 3 1				69	76	81	84	
CLAS EVO SYSTEM 32 FF	G31	mbar	6,2	9,0	11,8	14,9	18,4	24,4	28,6	33,2
		Parametro / Parameter 2 3 1	0	54	61	67	73	83	89	95
AGGIORNARE						12,3	14	16	18	20
CLAS EVO 24 FF CLAS EVO SYSTEM 24 FF	G20	mbar	2,3	3,1	4,0	5,1	6,3	8,9	10,4	12,1
		Parametro / Parameter 2 3 1	0	37	42	46	50	57	61	64
CLAS EVO SYSTEM 28 FF	G30	mbar	5,1	6,8	8,9	11,3	13,9	19,1	22,4	26,0
		Parametro / Parameter 2 3 1	0	52	58	63	69	76	81	84
CLAS EVO SYSTEM 32 FF	G31	mbar	6,2	8,3	10,8	13,7	16,9	24,4	28,6	33,2
		Parametro / Parameter 2 3 1	0	55	62	68	73	83	89	95

5.3.7 HEATING DELAY REGULATION.

- Regulation carried out on parameter **2 36**

- This boiler has a regulation that allows to change the delay time between the heating request and the burner ignition choosing between 0 and 7 minutes. This regulation is carried out on parameter **2 36**.

5.3.8 HEATING MAXIMUM POWER REGULATION.

The boiler has two different maximum power: one for sanitary and one lower for heating (absolute maximum heating power).

The absolute maximum heating power is set by parameter **2 30**. This parameter must be verified and eventually modified only and exclusively in the case of a gas change.

OUTLET PRESSURE ABSOLUTE MAXIMUM HEATING POWER (mbar)			
			G31
24 kW CF			34
28 kW CF			35
24 kW FF			34,5
28 kW FF			35,3
32 kW FF	10,1	25,7	33

To adjust the heating power at the heating circuit there is maximum heating power regulation (between minimum heating and absolute maximum heating power).

- - Regulation carried out on parameter **2 31**

- This boiler has a regulation that allows to change the maximum heating power by means of parameter **2 31**.

5.3.9 GAS TABLE

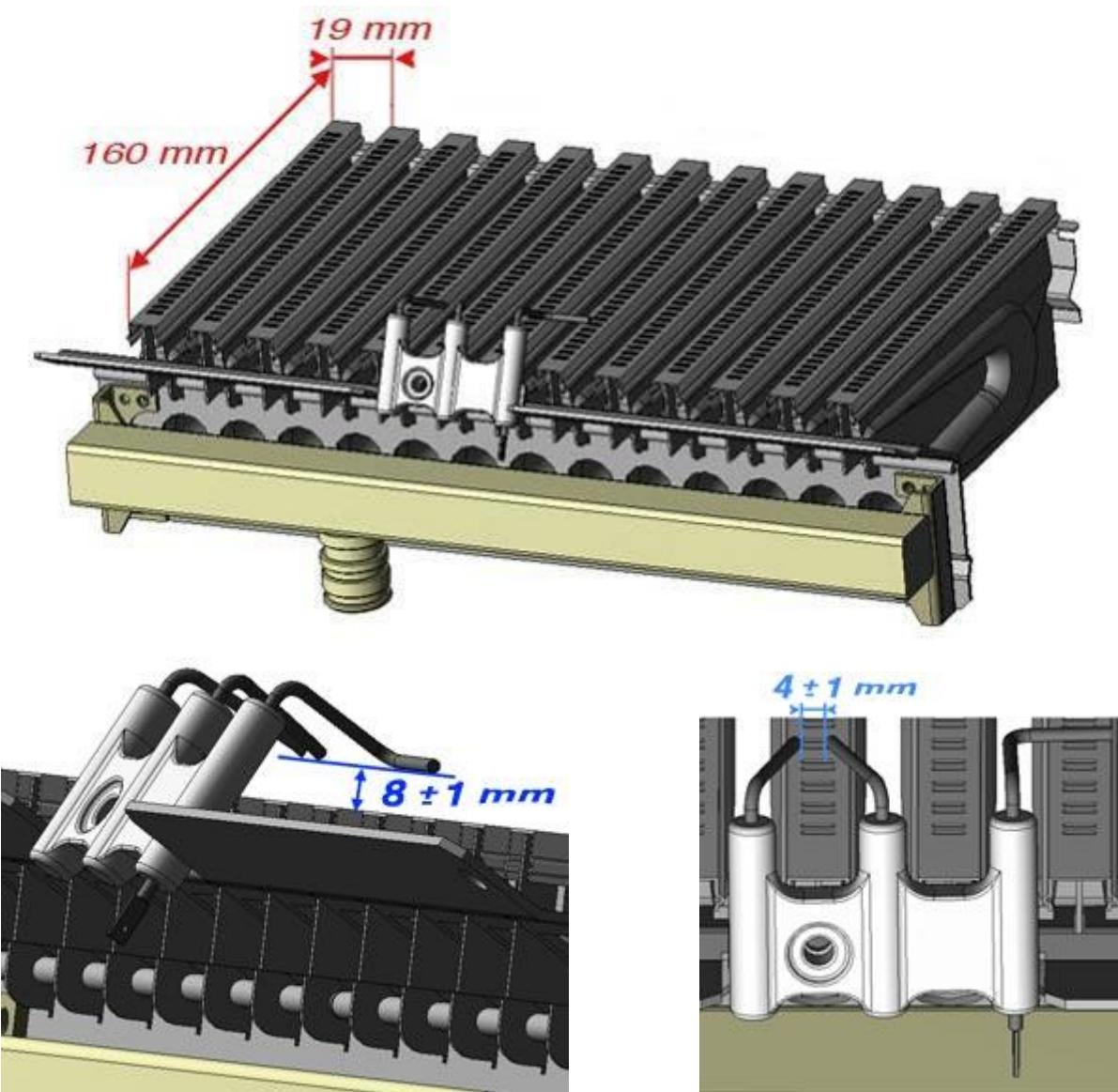
		CLAS EVO 24 CF				CLAS EVO SYSTEM 28 CF			
		G20	G230	G30	G31	G20	G230	G30	G31
Indice di Wobbe inferiore (15°C, 1013 mbar) lower Wobbe index (15°C, 1013 mbar)	MJ/m ³	45,67	38,9	80,58	70,69	45,67	38,9	80,58	70,69
Pressione nominale di alimentazione Gas inlet pressure	mbar	20	20	28/30	37	20	20	28/30	37
Pressione in uscita della valvola gas /Gas Burner Pressure									
massima sanitario maximum D.H.W.						8,1	27,5	35,3	
massima riscaldamento assoluto (parametro maximum heating - absolute (parameter 230)						7,6 (54)	27,2 (85)	35,0 (97)	
minima minimum						1,6	5,3	7,5	
Pressione di lenta accensione (parametro 220) Soft light (parameter 220)	mbar (param)	2,2 (0)	1,6 (0)	5,5 (0)	6,9 (0)	2,5 (0)	1,6 (0)	5,3 (0)	7,5 (0)
Valore massima potenza riscaldamento - parametro 231 Maximum heating power adjustment - parameter 231		75	41	74	78	77	41	66	72
Valore ritardo di accensione - parametro 235 Ignition delay - parameter 235			automatico automatic				automatico automatic		
Ugelli bruciatore Main Burner jets	nr.	13				15			
Ø ugelli bruciatore principale Ø burner jets	mm	1,25	1,45	0,76	0,76	1,25	1,45	0,75	0,75
Consumi max/min Max/min consumption (15°C, 1013 mbar) (G.N.= m ³ /h) (GPL = Kg/h)	massima sanitario max D.H.W.		2,86	2,22	2,13	2,10	3,23	2,50	2,41
	massima riscaldamento max Heating		2,73	2,12	2,03	2,00	3,12	2,42	2,33
	minima minimum		1,16	0,9	0,87	0,85	1,8	1,07	1,03

AGGIORNARE

			CLAS EVO 24 FF CLAS EVO SYSTEM 24 FF				CLAS EVO 28 FF CLAS EVO SYSTEM 28 FF				CLAS EVO SYSTEM 32 FF			
			G20	G230	G30	G31	G20	G230	G30	G31	G20	G230	G30	G31
Indice di Wobbe inferiore (15°C, 1013 mbar) lower Wobbe index (15°C, 1013 mbar)	MJ/m ³	45,67	38,9	80,58	70,69	45,67	38,9	80,58	70,69	45,67	38,9	80,58	70,69	
Pressione nominale di alimentazione Gas inlet pressure	mbar	20	20	28/30	37	20	20	28/30	37	20	20	28/30	37	
Pressione in uscita della valvola gas /Gas Burner P		AGGIORNARE												
massima sanitario maximum D.H.W.	mbar	(52)	(59)	(96)	(95)	(65)	(55)	(85)	(92)	7	11,0	8,0	28,0	35,9
massima riscaldamento assoluta (parametro 230) maximum heating - absolute (parameter 230)	mbar	(52)	(59)	(96)	(95)	(65)	(55)	(85)	(92)	3	10,1 (62)	7,30 (52)	25,7 (83)	33,0 (95)
minima minimum	mbar	2,3	1,7	5,5	7,2	2,5	1,41	5,1	7,2	2,3	1,5	5,2	6,8	
Pressione di lenta accensione (param. 220) Soft light (param. 220)	mbar	6,3 (50)	3,7 (43)	10,0 (65)	12,7 (65)	5,1 (50)	3,51 (40)	9,51 (58)	13,7 (66)	5,6 (50)	3,5 (39)	12,0 (63)	12,0 (63)	
Valore massima potenza riscaldamento - param. 231 Maximum heating power adjustment - param.231		74	45	71	79	77	42	66	78	78	42	64	71	
Valore ritardo di accensione - param. 235 Ignition delay - param. 235		automatico automatic				automatico automatic				automatico automatic				
Ugelli bruciatore Main Burner jets	nr.	11				13				15				
Ø ugelli bruciatore principale Ø burner jets	mm	1,32	1,55	0,8	0,8	1,32	1,55	0,8	0,8	1,32	1,55	0,78	0,78	
Consumi max/min Max/min consumption (15°C, 1013 mbar) (G.N.= m ³ /h) (GPL = Kg/h)	massima sanitario max D.H.W.	2,86	2,22	2,13	2,10	3,31	2,57	2,47	2,43	3,60			2,68	2,64
	massima riscaldamento max Heating	2,73	2,12	2,03	2,00	3,17	2,12	2,46	2,33	3,44			2,56	2,52
	minima minimum	1,16	0,90	0,87	0,85	1,38	0,90	1,07	1,01	1,48			1,10	1,09

5.4 BURNER

The same Polidoro burner is used on all the models. The electrodes (two ignition and one for flame detection) are constituted by one part. The ignition electrodes have to be kept at a **$4\pm1\text{mm}$** distance from the burner **$8\pm1\text{mm}$** ramp. The detection electrode must be at least **$8\pm1\text{mm}$** away from the burner. Any missed ignition of the burner after the safety time is displayed on the control panel with code **5 01**. The minimum ionisation current is equal to 1 microAmp. The ionisation voltage on the ground is equal to 110Vac.



DIAMETER OF THE NOZZLES

	Number	G20	G30	G31
24 and 15 kW CF	13	1,25 mm	0,76 mm	0,76 mm
28 kW CF	15	1,25 mm	0,75 mm	0,75 mm
24 and 15 kW FF	11	1,32 mm	0,80 mm	0,80 mm
28 kW FF	13	1,32 mm	0,80 mm	0,80 mm
32 kW FF	15	1,32 mm	0,78 mm	0,78 mm

5.5 IGNITION CYCLE.

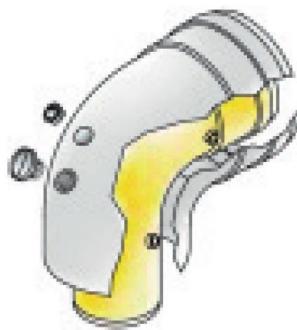
The ignition sequence is carried out in two different ways depends if it is working on sanitary or heating mode:

- **SANITARY** if required the ignition cycle is repeated 3 times:
 1st attempt with the power of slow ignition, if at the end of the safety time (8 sec) the flame has not been detected it will be signalled **5 P1** and a second attempt will be made;
 2nd attempt with the power of slow ignition, if at the end of the safety time (8 sec) the flame has not been detected it will be signalled **5 P2** 3rd attempt will be made ;
 3rd attempt with the power of slow ignition, if at the end of the safety time (8 sec) the flame has not been detected it will be shutdown **5 01** c with 40 seconds of post-ventilation at maximum speed and 2 minutes of post-circulation at minimum speed.
- **HEATING** if required the ignition cycle is repeated 3 times:
 1st attempt with 80% of the power of slow ignition, if at the end of the safety time (8 sec) the flame has not been detected it will be signalled **5 P1** and a second attempt will be made;
 2nd attempt with 90% the power of slow ignition, if at the end of the safety time (8 sec) the flame has not been detected it will be signalled **5 P2** 3rd attempt will be made;
 3rd attempt with the power of slow ignition, if at the end of the safety time (8 sec) the flame has not been detected it will be shutdown **5 01** with 40 seconds of post-ventilation at maximum speed and 2 minutes of post-circulation at minimum speed.

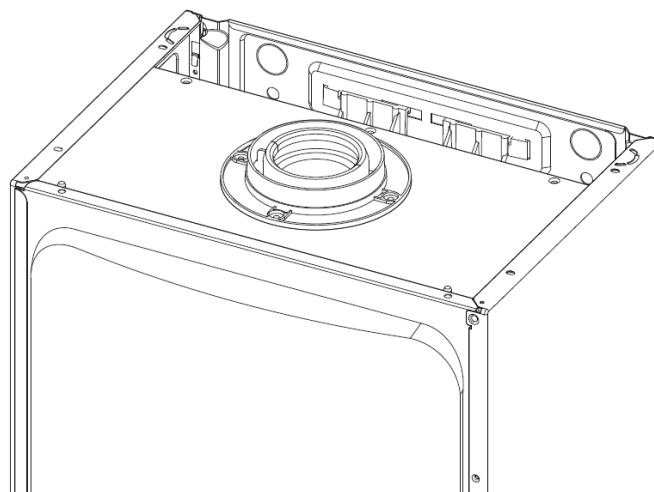
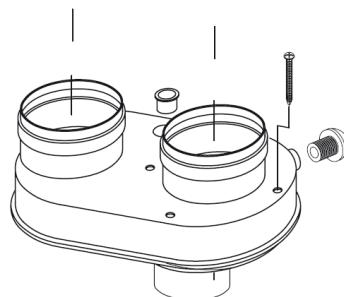
5.6 THE FUME DISCHARGE SYSTEM

On the external part of the boiler there is a fume discharge collector.

COAXIAL SYSTEM



TWIN-PIPE SYSTEM



5.7 AIR PRESSURE SWITCH

The boiler uses a differential pressure switch to check correct evacuation of the fume:

- 24kW: Off= 50Pa/0,50mbar;
On= 60Pa/0,60mbar;
- 28kW: Off= 74Pa/0,74mbar;
On= 89Pa/0,89mbar.
- 32kW: Off= 74Pa/0,74mbar;
On= 89Pa/0,89mbar;

The first pressure value is taken on the fan (intake "L" on the air pressure switch).

The second pressure values is taken inside the combustion chamber (intake "H" on the air pressure switch). Actually two negative pressure values are used (in relation to the atmospheric pressure) but that counts most of all for the air pressure switch, is that there is an appropriate pressure difference (which can be measured with a differential pressure gauge connected to the two pressure intakes located on the upper side of the boiler).

Air pressure switch is not carried out during operation. Any "opening" during operation is not detected.

6 07 : Pressure switch enabled already before the ignition sequence.

6 P1 : Pressure switch enabling missed with fan turned on.

5.8 FAN.

The following fans are used:

- 24kW: 30W motor;
- 28kW: 60W motor;
- 32kW: 60W motor;

5.8.1 Post-ventilation.

5.8.1.1.1 Switch Off	Post-ventilation time
CH burning off Winter to Summer commutation CH Temp Reached burner off	Par 243=0 →5sec Par 243=1 →3min
DHW burning off DHW Antiscale off Storage Loading burner off (Tank) Storage Loading burner off (System) (par.228=2) Storage Loading burner off (Antilegionella)	Par.254=0 Tflow>75°C→3min Tflow<75°C→ 5sec Par.254=1 always 3 min
Comfort Pre-heating burner off	5 sec
Chimney function end burner off Chimney function Temp reached burner off	1 min
Antifreeze Temp Reached burner off (Tflow > 40°C) Antifreeze burner off (end 15 min timer)	5 sec
5.8.1.1.2 Fault	Post-ventilation time
No Flame error (5P1 - 5P2) Flame lift error (5P3)	10 sec (ATM)
Water Flow Check Shutdown (1P1 – 1P2 – 1P3)	10 sec
No Flame Error (501) Overtemp Error (101)	40 sec
Water Flow Check Shutdown Error (103 – 104 – 105 – 106 – 107)	40 sec
T Flow probe error (110) T Ret probe error (112)	5 sec
Water Pressure error (108)	40 sec
False Flame (502)	Always on
APS Warning (6P1-6P2)	Always On

5.9 EXHAUSTIC CONTROL (CF open chamber)

Supplying the card, the control system of proper combusted smoke exhaust is carried out by means of an automatic reset thermostat. "Fume protection" enabling stops the boiler on safety and it will be displayed on the control panel with the relevant error code **6 01**

This intervention can be caused by:

A thermostat temperature raise, the fume enabling threshold is $75\pm3^{\circ}\text{C}$.

After 12 minutes after restoring the fumes thermostat the protection will be automatically disabled.

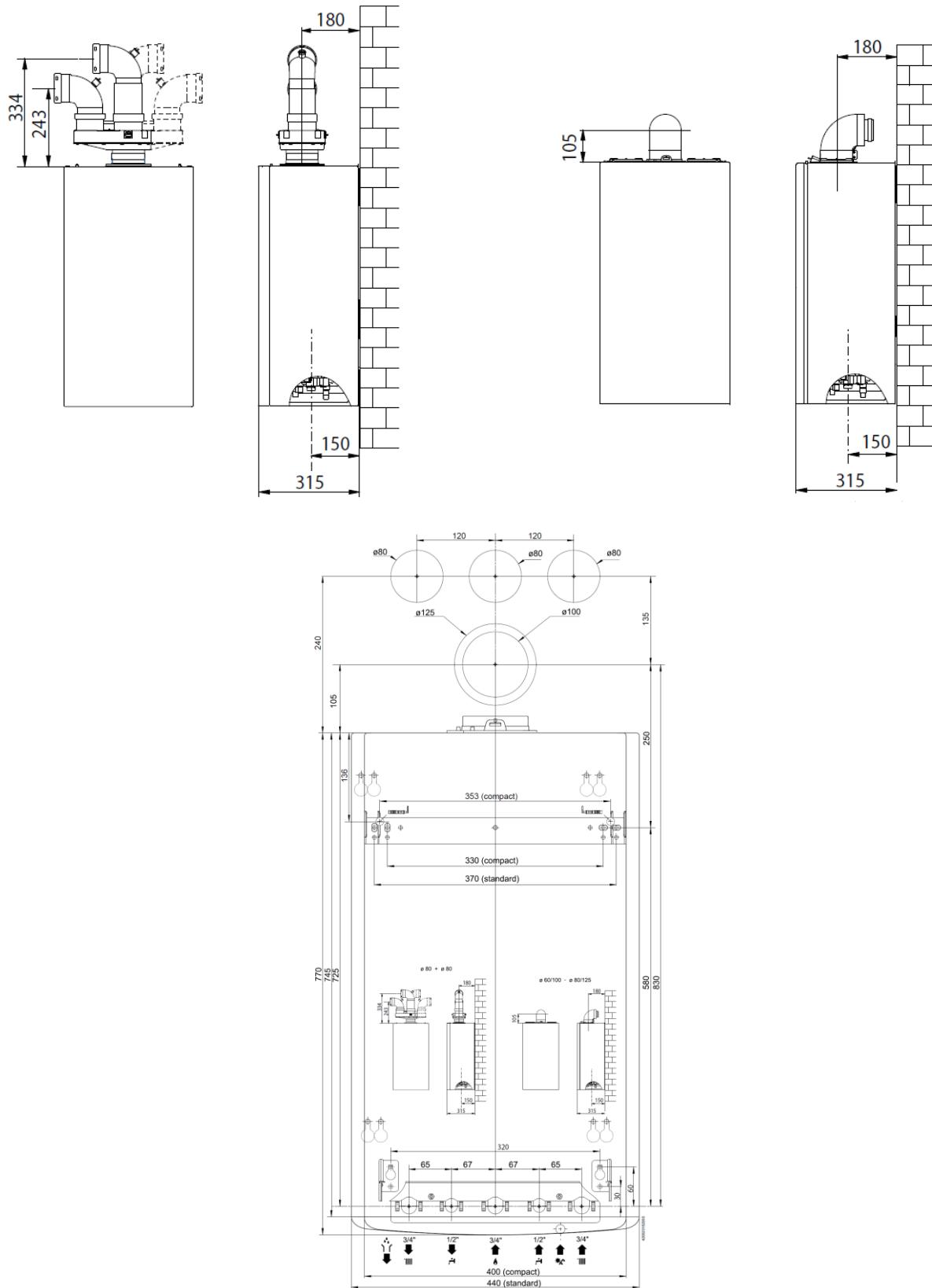
Timing can be zeroed by the ON/OFF electric supply of the card.

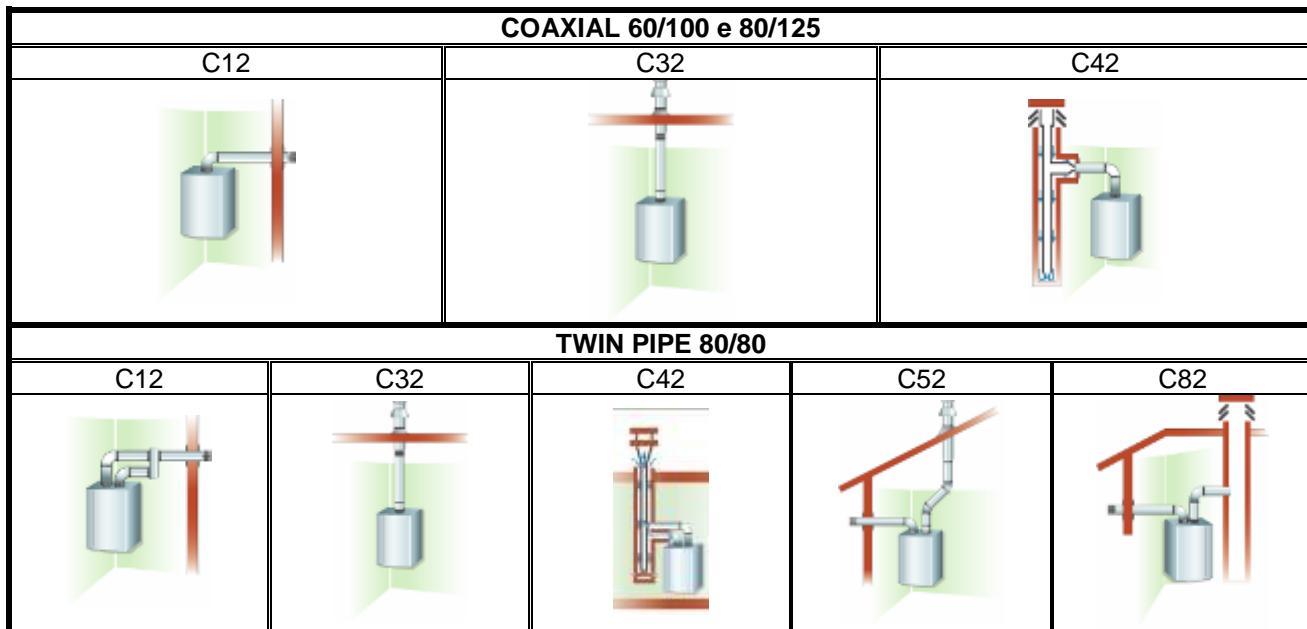
Automatic
thermostat
reset



5.10 EXHAUST SYSTEMS (sealed chamber FF)

The boiler is arranged smoke exhaust 60/100mm. For 80/80mm it needs to use one adapter. Combustion analysis intakes are built-in the smoke exhaust slope (60/100) or in the adapter (80/80).





	TYPE OF EXHAUST	Length (L)		DIAPHRAME [mm]
		from [m]	to [m]	
24 kW	60/100 COAXIAL SYSTEMS	C12,C32,C42, B32	0,5 ⇔ 0,75 ⇒ Ø44	Ø44
			0,75 ⇔ 4 ⇒ NO	NO
	80/125 COAXIAL SYSTEMS	C12	AGGIORNARE	
			Ø44 NO	
	80/80 SPLIT SYSTEMS	C12, C32,C42 (Air/Flue)	0,5 / 0,5 ⇔ 9 / 9 ⇒ Ø44	Ø44
			9 / 9 ⇔ 21 / 21 ⇒ NO	NO
		C52,C82 (Air/Flue)	1 / 0,5 ⇔ 1 / 23 ⇒ Ø44	Ø44
			1 / 23 ⇔ 1 / 44 ⇒ NO	NO
		B22 (Flue)	0,5 ⇔ 23 ⇒ Ø44	Ø44
			23 ⇔ 45 ⇒ NO	NO

	TYPE OF EXHAUST	Length (L)		DIAPHRAME [mm]
		from [m]	to [m]	
28 kW	60/100 COAXIAL SYSTEMS	C12,C32,C42, B32	0,5 ⇌ 0,75 ⇒ Ø44	
			0,75 ⇌ 4 ⇒ NO	
	80/125 COAXIAL SYSTEMS	C12,C32,C42, B32	0,5 ⇌ 3 ⇒ Ø44	
			3 ⇌ 11 ⇒ NO	
	80/80 SPLIT SYSTEMS	C12, C32 (Air/Flue)	AGGIORNARE	
			0,5 ⇌ 27 ⇒ Ø44	
		C52,C82 (Air/Flue)	1 / 0,5 ⇌ 1 / 27 ⇒ Ø44	
			1 / 27 ⇌ 1 / 50 ⇒ NO	
		B22 (Flue)	0,5 ⇌ 27 ⇒ Ø44	
			27 ⇌ 50 ⇒ NO	

	TYPE OF EXHAUST	Length (L)		DIAPHRAME [mm]
		from [m]	to [m]	
32 kW	60/100 COAXIAL SYSTEMS	C12,C32,C42, B32	0,5 ⇌ 0,75 ⇒ Ø46	
			0,75 ⇌ 4 ⇒ NO	
	80/125 COAXIAL SYSTEMS	C12,C32, B32	AGGIORNARE	
			0,5 / 0,5 ⇌ 9 / 9 ⇒ Ø46	
	80/80 SPLIT SYSTEMS	C12, C32,C42 (Air/Flue)	9 / 9 ⇌ 23 / 23 ⇒ NO	
			1 / 0,5 ⇌ 1 / 17 ⇒ Ø46	
		C52,C82 (Air/Flue)	1 / 17 ⇌ 1 / 23 ⇒ NO	
			1 ⇌ 17 ⇒ Ø46	
		B22 (Flue)	17 ⇌ 23 ⇒ NO	

5.11 EXHAUST SYSTEMS (CF open chamber)

The boiler so that both $\varnothing 130\text{mm}$ and $\varnothing 125\text{mm}$ smoke exhausts can be assembled on it (without any adapters). With both diameters the minimum length of the smoke exhaust is equal to 1 meter.

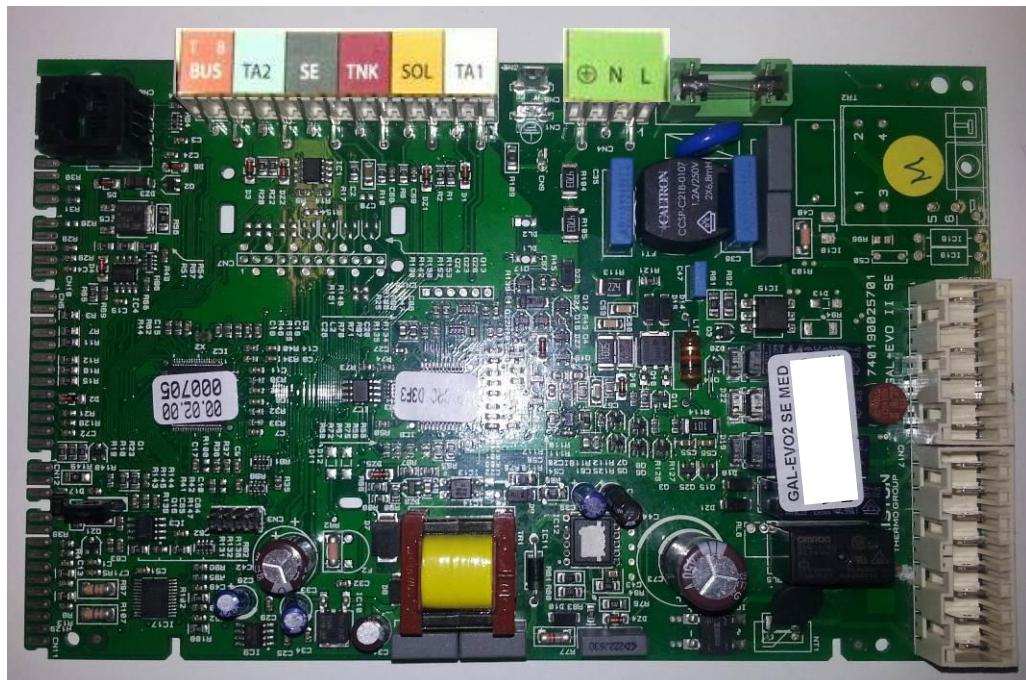


6 ELECTRIC AND ELECTRONIC SYSTEM

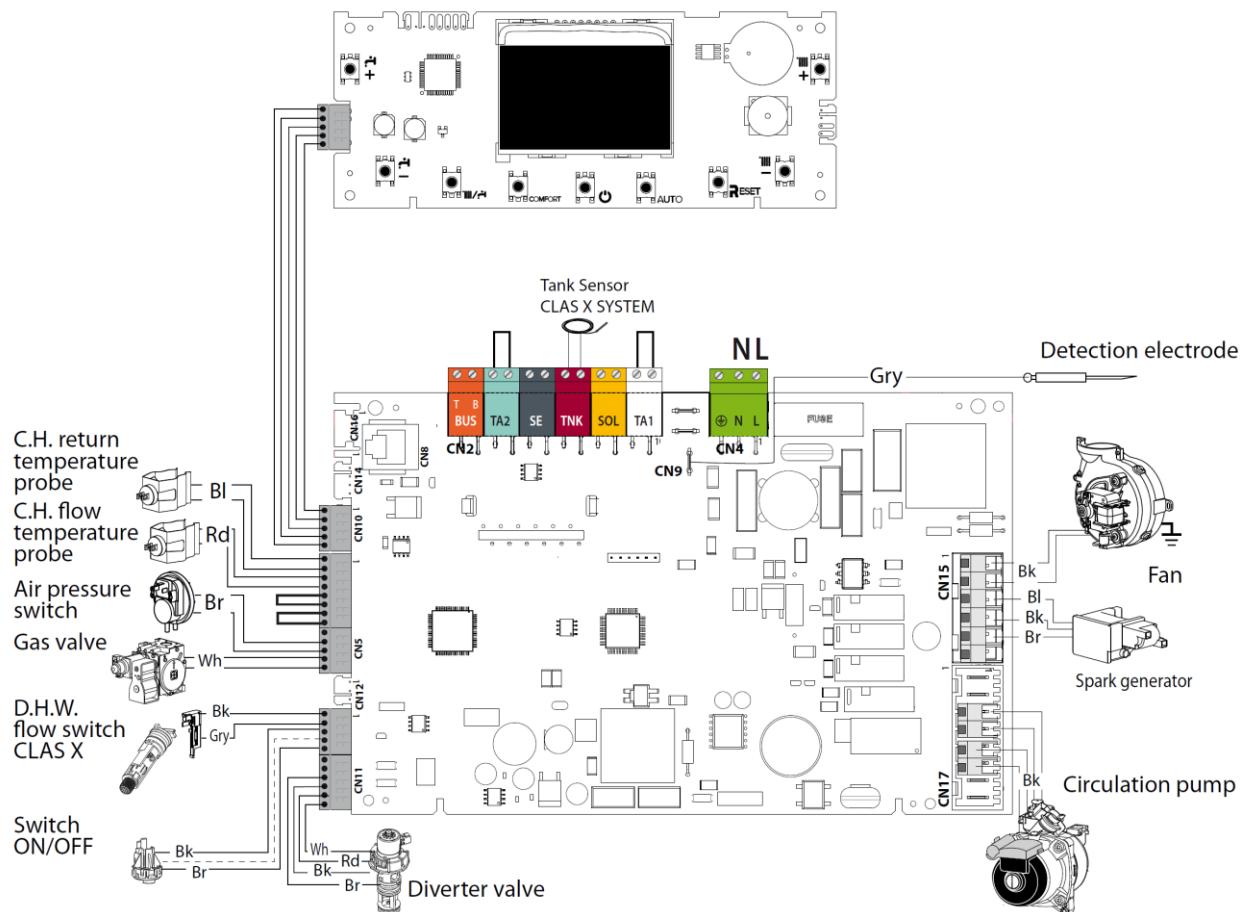
6.1 MAIN CARD

The boiler uses a **GALEVO2 SE** electronic card for complete checking of the boiler and one users interfaces display LCD;

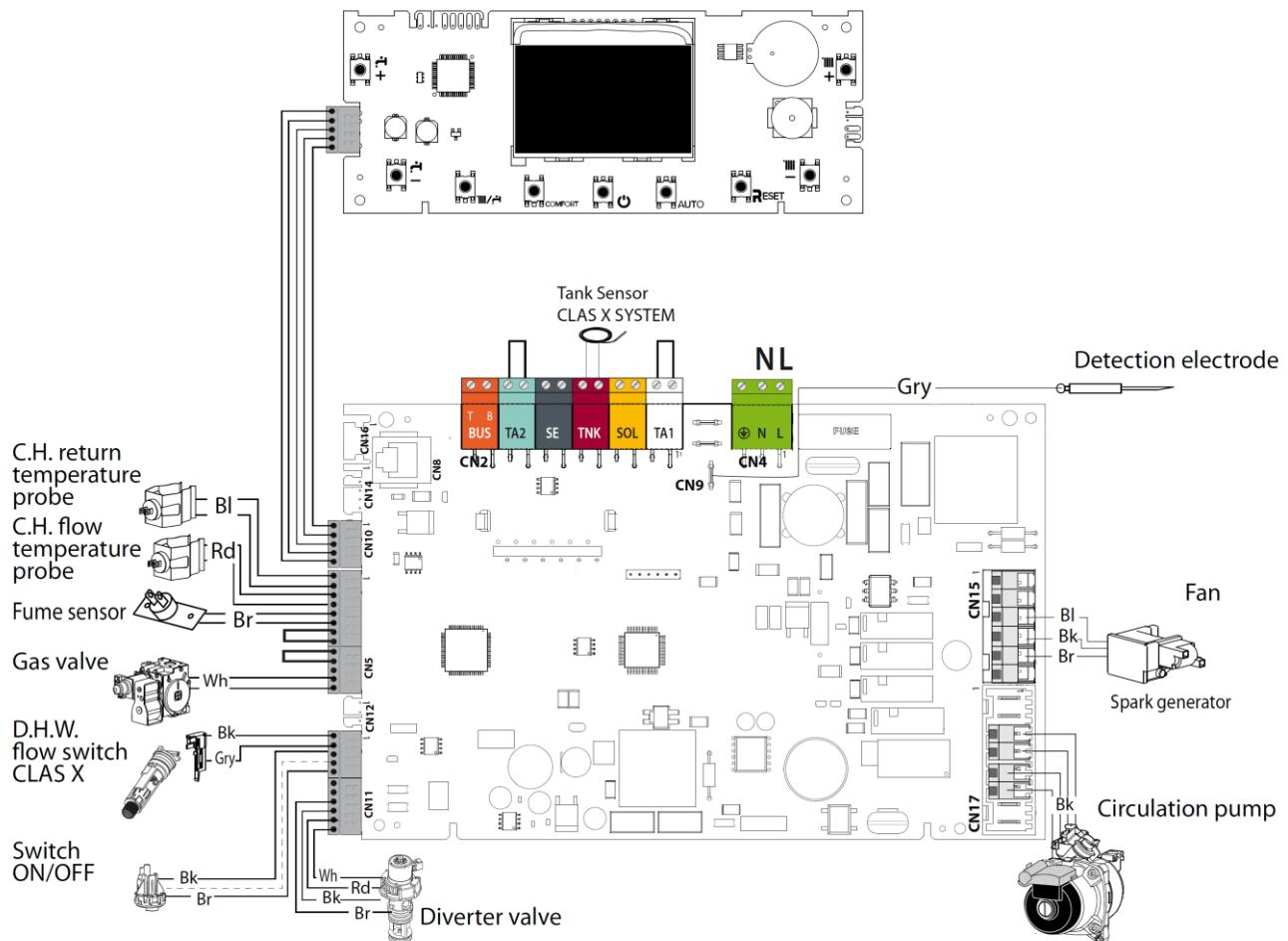
The **GALEVO2 SE** electronic card is protected by two 2A, 250 VAC fuses and a VDR protects the card against supply voltage peaks up to 275VAC. The supply voltage tolerance is 230 Vac +10% -15% and does not have to comply with the phase and with neutral.



6.1.1 ELECTRIC DIAGRAM FF.



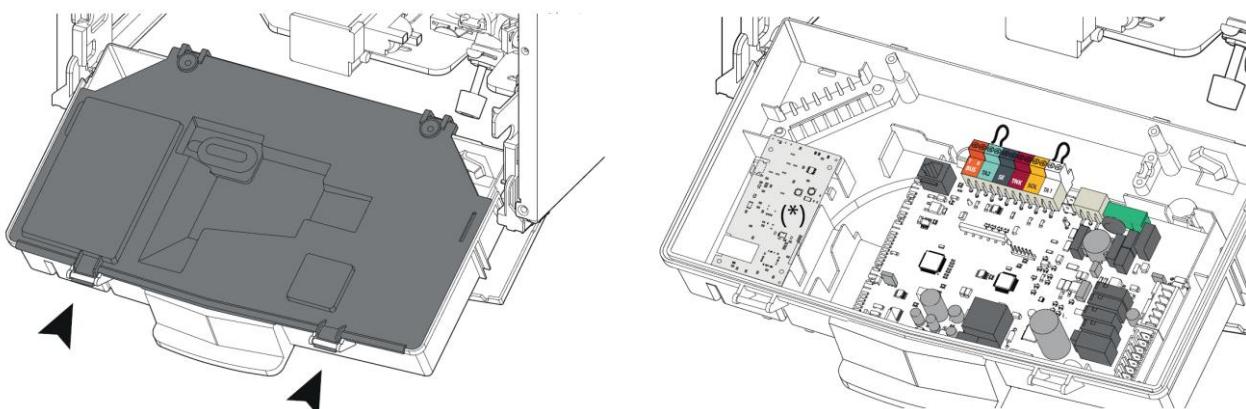
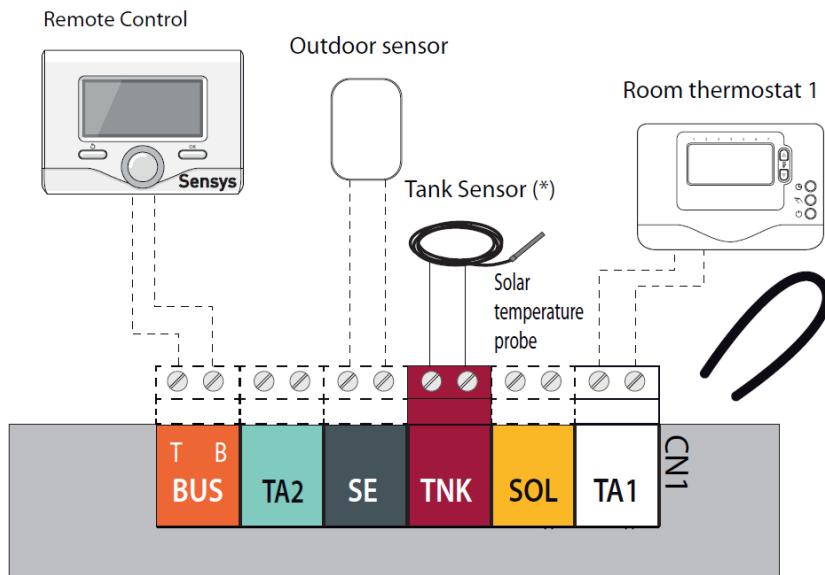
6.1.2 ELECTRIC DIAGRAM CF.



6.2 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 ;
- Outdoor sensor;
- All Bus-Bridgenet devices.



7 MENU AND SETTINGS

7.1 TECHNICIAN MENU

To enter in the technician menu push for 5 second the buttons  and "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 - 230 - 231 - 270	
SET	Direct access to the parameters to verify / change in the event of setting/commissioning of the boiler
214 - 220 - 221 - 226 - 231 - 223 - 238 - 245 - 246 - 833 - 880	
PCB	Direct access to the parameters to verify / change in the event of P.C.B. replacement
220 - 228 - 229 - 230 - 231 - 247 - 250 - 253	
VIS	Direct access to the parameters for displaying information regarding the operation of the boiler
831 - 832 - 834 - 835 - 837 - 840 - 841 - 842 - 843 - 850 - 845	
ZONE	Direct access to the parameters for displaying / setting the heating zones
040 - 402 - 502 - 602 - 420 - 520 - 620 - 434 - 534 - 634 - 840	
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	

7.2 COMPLETE MENU

7.2.1 Menù 0 : Network

Menù	Sub Menù	Parameter	Function	Range	Default setting
0	4		<u>USER INTERFACE</u>		
0	4	0	Zone to be set by display	1 ÷ 3	1
0	4	1	Backlight time (min)	1 ÷ 10 ; 24h	24h
0	4	2	Thermoregulation button deactivation	0: Off 1: On	1

7.2.2 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	/

<u>FREEPARAMETERS</u>					
2	1	4			
2	1	4	Boiler circulator type	0: Standard efficiency 1: High efficiency	0
<u>GENERAL</u>					
2	2	0	Slow ignition as % of the maximum heating power	0 ÷ 100	See gas table
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	6	Conventional boiler configuration	0: Monothermic open chamber 1: Monothermic open chamber VMC 2: Monothermic sealed chamber fan fix speed 3: Monothermic sealed chamber fan modulating speed 4: Bithermic open chamber 5: Bithermic sealed chamber	Depend on the boiler version
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
<u>CENTRAL HEATING-1</u>					
2	3	0	Absolute maximum heating power	0 ÷ 100	See gas table
2	3	1	Maximum heating power (heating absolute maximum power percentage) (%)	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	0: speed 2 steady 1: speed 3 steady 2: modulating	2
2	3	9	ΔT for pump modulation (°C)	10 ÷ 30	20
<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	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
<u>DOMESTIC HOT WATER</u>					
2	5	0	Sanitary 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	Sanitary delay start (anti water hammering) (dec)	5 ÷ 200	5
2	5	3	Sanitary switch off logic	0: anti-scale (62 o 65°C). 1: set-point+4°C	0
2	5	4	Sanitary 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 sanitary (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	0
2	5	8	Antilegionella frequency (h)	24 ÷ 720	100
2	5	9	Antilegionella temperature (°C)	60 ÷ 70	66
2	6		<u>BOILER MANUAL SETTING</u>		
2	6	0	Manual mode attivation	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	Diverter valve control (set parameter 260 =1)	0: Sanitary 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	8		<u>RESET MENU'</u>		
2	8	0	Reset menu 2 factory setting	YES: press button "OK" NO: press button "ESC"	/

7.2.3 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 (only with zone module)	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)	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

7.2.4 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 (only with zone module)	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)	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. 440 = 0)	20 ÷ 100	100	

7.2.5 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 (only with zone module)	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)	/

<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)
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. 440 = 0) 20 ÷ 100 100

7.2.6 Menù 7 : Zone module

Menù	Sub Menù	Parameter	Function	Range	Default setting
7	1		<u>MANUAL MODE</u>		
7	1	0	Manula 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 (°C)	(0= ΔT varible according the number of zones that require heat; HT = +7°C each zone; LT = +5°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	SI: push button "OK" NO: push button "ESC"	/
7	9		<u>RESET MENU'</u>		
7	9	0	Reset menu 2 factory setting	YES: push button "OK" NO: push button "ESC"	/

7.2.7 Menù 8 : Service parameters

Menù	Sub Menù	Parameter	Function	Range	Default setting
8	0		<u>BOILER STATISTICS</u>		
8	0	0	Diverter valve cycles (nr x 10)	(only visualization)	/
8	0	1	Time of circulator on (h x 10)	(only visualization)	/
8	0	2	Boiler circulator cycles (nr x 10)	(only visualization)	/
8	0	3	Boiler Life Time (h x 10)	(only visualization)	/
8	0	4	Time of fan ON (h x 10)	(only visualization)	/
8	0	5	Number of fan cycles (nr x10)	(only visualization)	/
8	0	6	Number of flame detection in CH (nr x10)	(only visualization)	/
8	0	7	Number of flame detection in DHW (nr x10)	(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 sanitary (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 (h x 10)	(only visualization)	/
8	2		<u>BOILER</u>		
8	2	0	Burner modulation	0 ÷ 255 (only visualization)	/
8	2	1	Fan state	0: Off ; 1: On (only visualization)	/
8	2	3	Pump speed	0: Off ; 1: On low speed ; 2: On high speed (only visualization)	
8	2	4	3-way valve position	0= sanitary; 1= heating ((only visualization))	/
8	2	5	Sanitary flow meter (l/min)	(not active)	/
8	2	6	APS Status	0: open; 1: closed (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	Sanitary measured temperature (°C)	(not active)	/
8	3	5	External temperature (°C)	(only visualization)	/
8	4		<u>STORAGE AND SOLAR (if present)</u>		
8	4	2	Sanitary inlet temperature (°C) (only with solar inlet sensor connected)	(only visualization)	

8 ERROR CODES.

8.1 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).

8.1.1 Error code

The error codes are divided in seven 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. Sanitary circuit;
3. Electronic PCB;
4. Communication with peripherals;
5. Ignition and detection;
6. Air inlet / Fume outlet.
7. Zones

Display	Description	Ripristino
PRIMARY CIRCUIT		
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 ($P < P_{min}$) for boiler with minimum pressure switch on/off (par.247=1)	No Reset
1 09	High primary circuit pressure ($P > 3\text{bar}$)	No Reset
1 10	Heating delivery probe open or short circuit (NTC1)	No Reset
1 11	Water missing on the primary circuit ($P < P_{min}$) for boiler with pressure sensor(par. 247=2)	No Reset
1 12	Heating return probe open or short circuit (NTC2)	No Reset
1 14	Outdoor probe open or short circuit	No Reset
1 16	Floor thermostat opened	No Reset
1 P1	Circulation or presence of water: Gradient Tman > 7°C/sec	Warning
1 P2	Circulation or presence of water: Tman – Trit > 55°C	Warning
1 P3	Circulation or presence of water: Trit > Tman + 10°C	Warning
1 P4	Low primary circuit pressure($P < P_{SIGNALLING}$): fill up	Warning

SANITARY CIRCUIT		
2 02	Storage low probe open or short circuit (solar)	No Reset
2 03	Storage probe open or short circuit	No Reset
2 04	Solar collector probe open or short circuit	No Reset
2 05	Sanitary inlet probe open or short circuit (solar)	No Reset
2 07	Solar manifold overheat	No Reset
2 08	Solar manifold temperature low (anti-freeze)	No Reset
2 09	Storage overheat	Warning
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	PCB card internal error	Reset
3 07	PCB card internal error	Reset
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	Flame lift during operation (10 flame lift in the same heat request)	Reset
5 P1	First ignition attempt failed	Warning
5 P2	Second ignition attempt failed	Warning
5 P3	Flame lift during operation	Warning
AIR INLET / FUME OUTLET		
6 01	Fume thermostat enabling (only on open chamber)	No Reset
6 04	Fan turns too slow (<1775Rpm-100Rpm) or Hall sensor malfunction	Reset
6 07	Air pressure switch enabled before ignition sequence	No Reset
6 P1	Air pressure switch closing delayed	No Reset
ZONE		
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

9 TECHNICAL DATA TABLE

Model Name		CLAS EVO 24 CF	CLAS EVO SYSTEM 24 CF	CLAS EVO SYSTEM 28 CF	
CE certification (pin)		1312BR4794	1312BR4923		
Boiler type		B11 - B11bs			
Max/min nominal heat input(Hi)	kW	25,8 / 11,0	25,8 / 11,0	29,5 / 13,0	
Max/min nominal heat input (Hs)	kW	28,7 / 12,2	28,7 / 12,2	32,8 / 14,4	
Max/min nominal heat input for hot water (Hi)	kW	27 / 11,0	27 / 11,0	30,5 / 13	
Max/min nominal heat input for hot water (Hs)	kW	30 / 12,2	30 / 12,2	33,9 / 14,4	
Heat output: max/min	kW	23,7 / 9,9	23,7 / 9,9	26,7 / 11,2	
D.H.W. Heat output: max/min	kW	24,8 / 99	24,8 / 99	27,6 / 11,2	
Combustion efficiency (at flue) Hi/Hs	%	93	93	92,3	
Gross efficiency of nominal heat input (60/80 °C) Hi/Hs	%	91,9 / 82,8	91,9 / 82,8	90,6 / 81,6	
Gross efficiency at 30 % at 47°C Hi/Hs	%	91,2 / 82,1	91,2 / 82,1	89,7 / 80,8	
Gross efficiency at minimum power Hi/Hs	%	90,2 / 81,2	90,2 / 81,2	86,5 / 77,9	
Number of efficiency stars (Directive 92/4)			***	**	
Rating Sedbuk			D	D	
Ma. heat loss to the casing ($\Delta T = 50^\circ\text{C}$)			1,1	1,7	
Heat loss through the flue when burner on			7	7,7	
Heat loss through the flue when burner off			0,4	0,4	
Residual discharge head	Pa	3	3	3	
Nox class	class	3	3	3	
Flue fumes temperature (G20)	°C	118	118	133	
CO ₂ content2 (G20)	%	5,8	5,8	6,2	
CO content (0 %02)	ppm	53	53	41	
O ₂ content2 (G20)	%	10,1	10,1	9,3	
Max capacity fumes (G20)	kg/h	63,6	63,6	68,9	
Excess air	%	93	93	80	
Load losses water side (max) $\Delta T=20^\circ\text{C}$	(mbar)	200	200	200	
Residual head for the system	bar	0,25	0,25	0,25	
Expansion vessel pre-charged pressure	bar	1	1	1	
Maximum central heating circuit pressure	bar	3	3	3	
Expansion vessel capacity	l	6,5	6,5	6,5	
Central heating temperature: max/min(high temperature range)	°C	82 / 35	82 / 35	82 / 35	
Domestic hot water temperature max/min	°C	60 / 36	60 / 40	60 / 40	
Specific flow rate of domestic hot water system (10 min. with $\Delta T=30^\circ\text{C}$) instant boilers	l/min	12,2	/	/	
D.H.W. flow rate $\Delta T=25^\circ\text{C}$	l/min	14,5	/	/	
D.H.W. flow rater $\Delta T=35^\circ\text{C}$	l/min	10,2	/	/	
Hot water comfort stars (EN13203)	stars	3	/	/	
D.H.W. minimum flow rate	l/min	1,7	/	/	
Domestic hot water pressure max/min	bar	7	/	/	
Power supply voltage/frequency	V/Hz	230/50	230/50	230/50	
Power consumption	W	79 – 60 (EU)	79 – 60 (EU)	90 – 60 (EU)	
Minimum operating room temperature	°C	5	5	5	
Electric system grades of protection	IP	X5D	X5D	X5D	
Weight	kg	30	30	31	

AGGIORNARE

Model Name		CLAS EVO 24 FF	CLAS EVO 28 FF
CE certification (pin)		1312BR4793	
Boiler type		C12-C32-C42-C52-C62-C82-B22-B22p-B32	
Max/min nominal heat input(Hi)	kW	25,8 / 11,0	30,0 / 13,0
Max/min nominal heat input (Hs)	kW	28,7 / 12,2	33,3 / 14,4
Max/min nominal heat input for hot water (Hi)	kW	27 / 11,0	31,3 / 13,0
Max/min nominal heat input for hot water (Hs)	kW	30 / 12,2	34,8 / 14,4
Heat output: max/min	kW	24,2 / 9,8	28,1 / 11,6
D.H.W. Heat output: max/min	kW	25,3 / 9,8	29,3 / 11,6
Combustion efficiency (at flue) Hi/Hs	%	94,5	93,9
Gross efficiency of nominal heat input (60/80 °C) Hi/Hs	%	93,8 / 84,5	93,6 / 84,3
Gross efficiency at 30 % at 47°C Hi/Hs	%	93,6 / 84,3	93,2 / 83,9
Gross efficiency at minimum power Hi/Hs	%	89,2 / 80,3	89,3 / 80,4
Number of efficiency stars (Directive 92/42/EEC)	stars	***	***
Rating Sedbuk	class	D	D
Ma. heat loss to the casing ($\Delta T = 50^\circ\text{C}$)	%	0,7	0,3
Heat loss through the flue w		6,1	
Heat loss through the flue w		0,4	
Residual discharge head		104	
Nox class		3	
Flue fumes temperature (G20)	°C	165	114
CO2 content2 (G20)	%	6,5	6,4
CO content (0 %O2)	ppm	50	92
O2 content2 (G20)	%	8,8	8,9
Max capacity fumes (G20)	kg/h	57,4	67,5
Excess air	%	72	74
Load losses water side (max) $\Delta T=20^\circ\text{C}$	(mbar)	200	200
Residual head for the system	bar	0,25	0,25
Expansion vessel pre-charged pressure	bar	1	1
Maximum central heating circuit pressure	bar	3	3
Expansion vessel capacity	l	6,5	6,5
Central heating temperature: max/min(high temperature range)	°C	82 / 35	82 / 35
Domestic hot water temperature max/min	°C	60 / 36	60 / 36
Specific flow rate of domestic hot water system (10 min. with $\Delta T=30^\circ\text{C}$) instant boilers	l/min	12,5	14,1
D.H.W. flow rate $\Delta T=25^\circ\text{C}$	l/min	14,5	16,8
D.H.W. flow rater $\Delta T=35^\circ\text{C}$	l/min	10,4	12
Hot water comfort stars (EN13203)	stars	3	3
D.H.W. minimum flow rate	l/min	1,7	1,7
Domestic hot water pressure max/min	bar	7	7
Power supply voltage/frequency	V/Hz	230/50	230/50
Power consumption	W	112	129
Minimum operating room temperature	°C	5	5
Electric system grades of protection	IP	X5D	X5D
Weight	kg	30	31

AGGIORNARE

Model Name		CLAS EVO SYSTEM 24 FF	CLAS EVO SYSTEM 28 FF	CLAS EVO SYSTEM 32 FF
CE certification (pin)		1312BR4793	1312BR4794	
Boiler type		C12-C32-C42-C52-C62-C82-B22-B22p-B32		
Max/min nominal heat input(Hi)	kW	25,8 / 11,0	30,0 / 13,0	32,5 / 14,0
Max/min nominal heat input (Hs)	kW	28,7 / 12,2	33,3 / 14,4	36,1 / 15,5
Max/min nominal heat input for hot water (Hi)	kW	27 / 11,0	31,3 / 13,0	34,0 / 14,0
Max/min nominal heat input for hot water (Hs)	kW	30 / 12,2	34,8 / 14,4	37,8 / 15,5
Heat output: max/min	kW	24,2 / 9,8	28,1 / 11,6	30,4 / 12,3
D.H.W. Heat output: max/min	kW	25,3 / 9,8	29,3 / 11,6	31,4 / 12,3
Combustion efficiency (at flue) Hi/Hs	%	94,5	93,9	94,3
Gross efficiency of nominal heat input (60/80 °C) Hi/Hs	%	93,8 / 84,5	93,6 / 84,3	93,5 / 84,2
Gross efficiency at 30 % at 47°C Hi/Hs	%	93,6 / 84,3	93,2 / 83,9	92,7 / 83,5
Gross efficiency at minimum power Hi/Hs	%	89,2 / 80,3	89,3 / 80,4	88,1 / 79,3
Number of efficiency stars (Directive 92/42/EEC)	stars	***	***	***
Rating Sedbuk	class	D	D	D
Ma. heat loss to the casing ($\Delta T = 50^\circ\text{C}$)	%	0,7	0,3	0,5
Heat loss through the flue when burner on				5,7
Heat loss through the flue when burner off				0,4
Residual discharge head				98
Nox class				3
Flue fumes temperature (G20)	°C	105	114	105
CO2 content2 (G20)	%	6,5	6,4	6,3
CO content (0 %02)	ppm	50	92	89
O2 content2 (G20)	%	8,8	8,9	9,2
Max capacity fumes (G20)	kg/h	57,4	67,5	73,9
Excess air	%	72	74	78
Load losses water side (max) $\Delta T=20^\circ\text{C}$	(mbar)	200	200	200
Residual head for the system	bar	0,25	0,25	0,25
Expansion vessel pre-charged pressure	bar	1	1	1
Maximum central heating circuit pressure	bar	3	3	3
Expansion vessel capacity	l	6,5	6,5	6,5
Central heating temperature: max/min(high temperature range)	°C	82 / 35	82 / 35	82 / 35
Domestic hot water temperature max/min	°C	60 / 40	60 / 40	60 / 40
Specific flow rate of domestic hot water system (10 min. with $\Delta T=30^\circ\text{C}$) instant boilers	l/min	/	/	/
D.H.W. flow rate $\Delta T=25^\circ\text{C}$	l/min	/	/	/
D.H.W. flow rater $\Delta T=35^\circ\text{C}$	l/min	/	/	/
Hot water comfort stars (EN13203)	stars	/	/	/
D.H.W. minimum flow rate	l/min	/	/	/
Domestic hot water pressure max/min	bar	/	/	/
Power supply voltage/frequency	V/Hz	230/50	230/50	230/50
Power consumption	W	112	129	142
Minimum operating room temperature	°C	5	5	5
Electric system grades of protection	IP	X5D	X5D	X5D
Weight	kg	30	31	32

AGGIORNARE