



ARISTON



TRAINING MANUAL

FAMILY: Wall hang boilers

UNIT: Condensation Compact

MODELS: CLAS PREMIUM

BRAND : ARISTON

RELEASE: 1V6 27/05/09



UPDATE

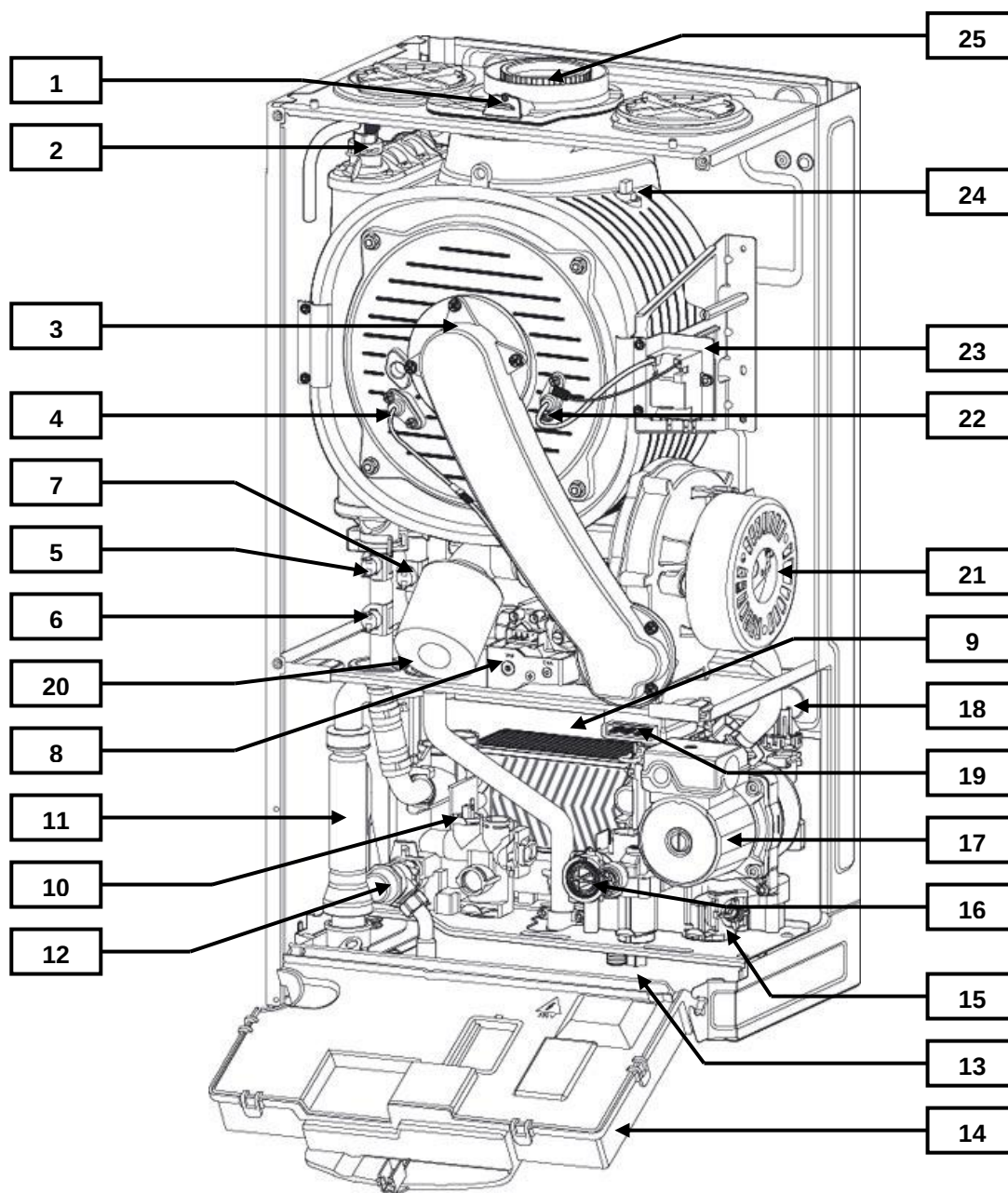
VERSION	DATE	NAME	MODIFICATIONS
1V6	27/05/09	TLM	New pump for 30 and 35 kW model and new PCB GAL2
1V5	30/10/08	TLM	New pump and overheating thermostat eliminating
1V4	26/09/08	TLM	Add gas table
1V3	27/11/07	TLM	Fan error 612 correction
1V2	26/07/07	TLM	Parameter 228 correction
1V1	18/07/07	TLM	Parameters update
VERSION	DATE	NAME	MODIFICATIONS

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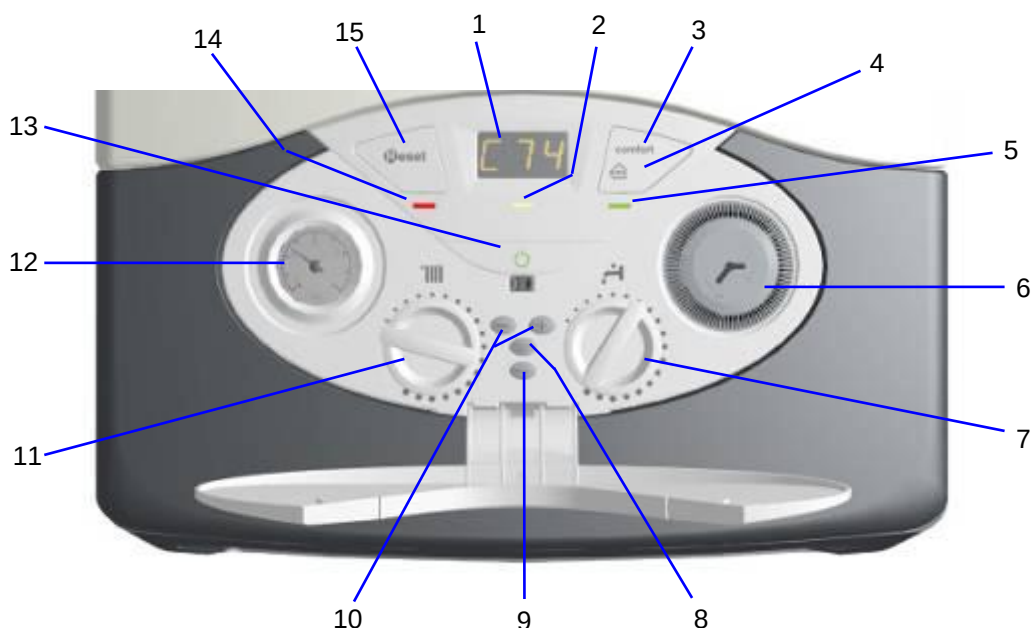
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1.2 DETAILED DESCRIPTION



CAPTION			
1	Combustion analysis test point	14	Electrical box
2	Air separator valve	15	Heating filter
3	Burner	16	Sanitary proportional flow meter
4	Ionisation probe	17	Pump
5	Overheat thermostat	18	Heating pressure sensor
6	NTC1 heating delivery T° probe	19	3 WV
7	NTC2 heating return T° probe	20	Silencer
8	Gas valve	21	Ventilator
9	Sanitary exchanger	22	Ignition probes
10	NTCs sanitary temperature probe	23	Spark generator
11	Siphon	24	Thermo fuse protection
12	3 bar safety valve	25	Exhaust fume box
13	Telescopic filling tap		

1.3 CONTROL PANEL DESCRIPTION



CAPTION

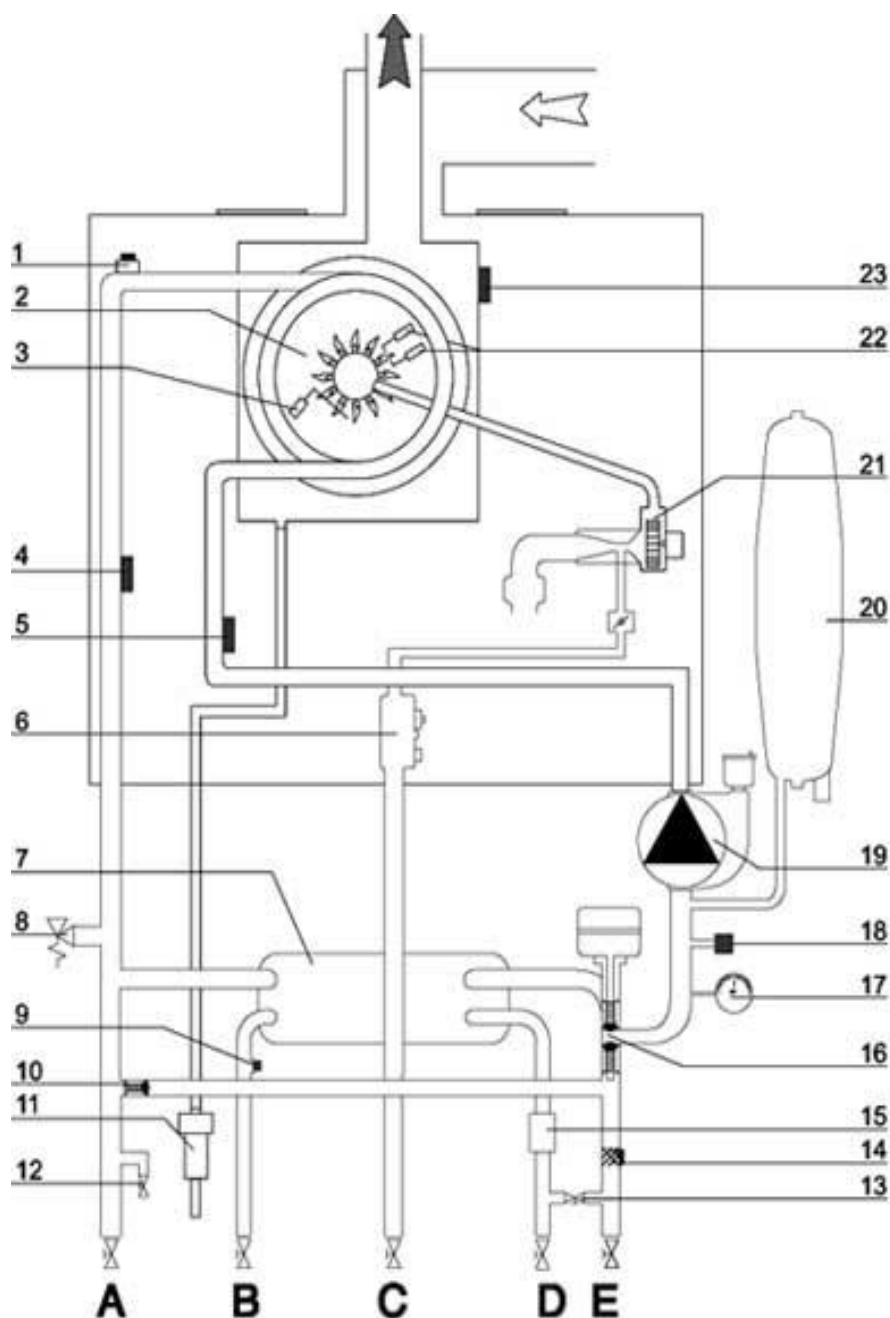
1	Display	9	Button "ESC"
2	Yellow led –Comfort function	10	"+" e "-" programming Buttons
3	Button "Comfort"	11	Heating temperature regulation knob and summer/winter
4	Button "Auto"	12	Water pressure gauge
5	Green led – Auto function	13	Button "ON/OFF"
6	Programming clock (version UK)	14	Red led – boiler blocked
7	Sanitary temperature regulating knob	15	Button "RESET"
8	Button "Programming / OK"		

1.4 INTERFACE DISPLAY INDICATIONS

During normal operation of the boiler the multifunction display shows the operating state of the boiler.

DISPLAY	BOILER OPERATING STATE
O	STAND-BY. No heating request. The two numbers on the right side indicate the temperature read by the primary exchanger outlet probe (NTC1).
C	The boiler is operating on HEATING mode . The two numbers on the right side indicate the temperature read by the primary exchanger outlet probe (NTC1).
c	After a 2 minute POST-CIRCULATION of the pump at the end of a heating cycle, the boiler will go on STAND-BY. The two numbers on the right indicate the temperature read by the primary exchanger outlet probe (NTC1).
d	The boiler is operating on SANITARY mode . The two numbers on the right side indicate the set temperature for sanitary.
h	POST-CIRCULATION of the pump when, during a sanitary withdrawal the temperature requested is reached. The two numbers on the right side indicate set temperature for sanitary.
F	ANTIFREEZE: alternatively shows F and 1 if working only pump or F and 2 if working also the burner, followed by the temperature read by sensor NTC1.
S	SOLAR: flow temperature with single coil
P1-	AIR PURGE function

1.5 HYDRAULIC DIAGRAM



LEGEND

1. 105°C overheat thermostat OT	13. Telescopic filling tap
2. Burner	14. CH filter
3. Ionization electrode	15. Sanitary proportional flow meter
4. CH flow temperature sensor NTC1	16. Three way valve Automatic air release
5. CH return temperature sensor NTC2	17. Pressure gauge
6. Gas valve	18. Heating pressure sensor
7. Secondary heat exchanger	19. Circulation pump Mixer system
8. Safety valve 3 bar	20. Expansion vessel
9. Domestic Hot Water temperature sensor	21. Ventilator
10. Automatic by-pass	22. Ignition electrodes
11. Condensate trap	23. Thermal fuse
12. Drain tap	

2 OPERATING LOGIC

2.1 HEATING MODE : OPERATING LOGIC

You can see (for 4 seconds) the temperature that you are setting on the display by turning the knob.

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.

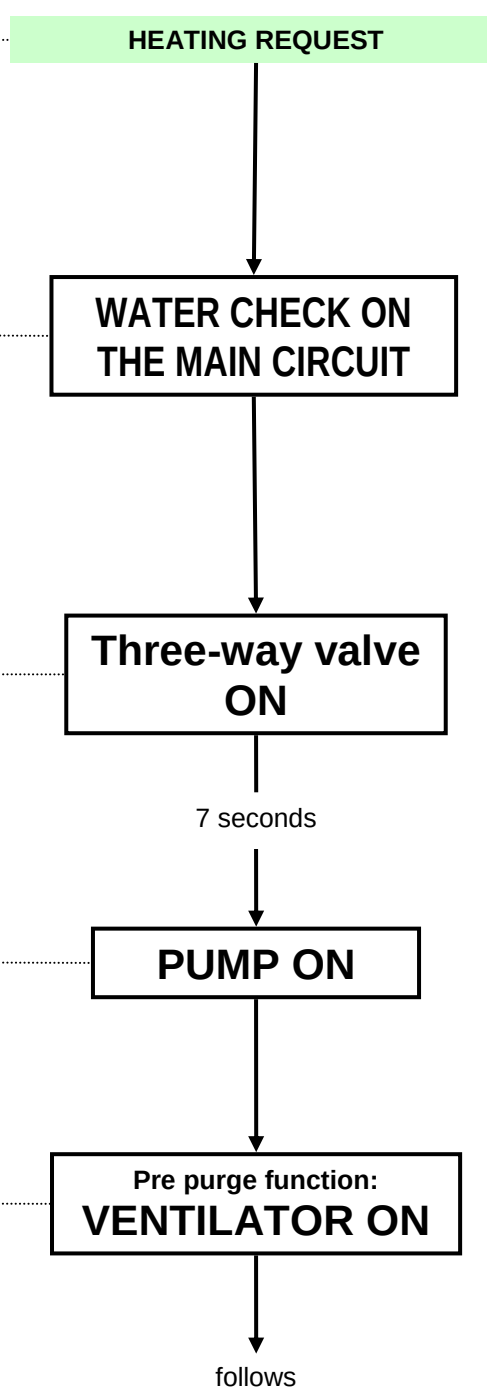
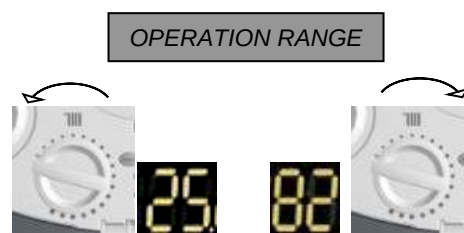
The room thermostat and/or programming clock and/or REMOCON request heating to be turned on. Letter **C** will be displayed and then the delivery temperature (read by sensor NTC1)

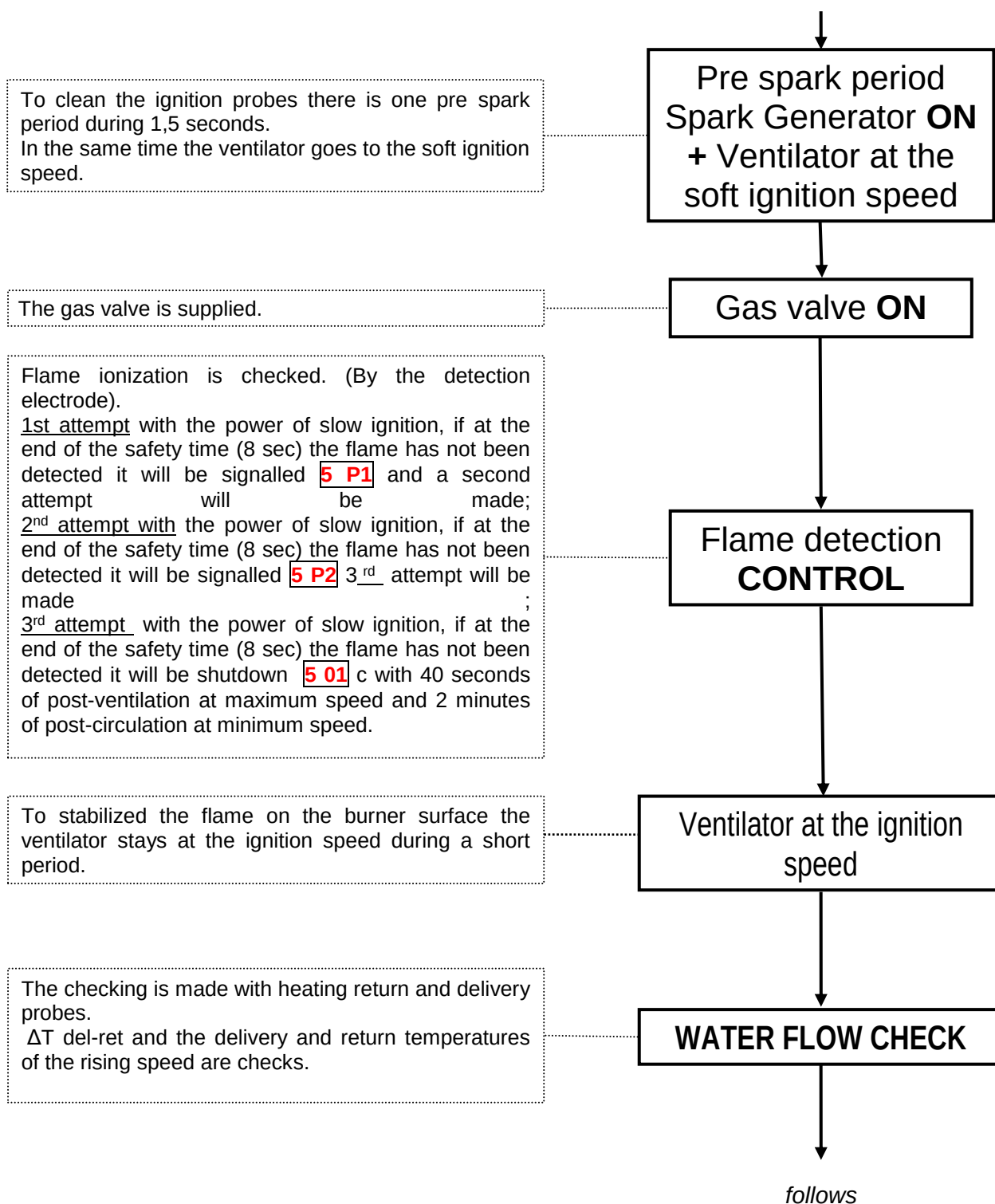
Turn the pressure switch ON/OFF to perform the check which should always be carried out after turning on the central heating. When the pressure switch opens, the burner stops immediately and the circulation pump stops after 40 secs and an error **1 08** is displayed. If the pressure switch is open when the central heating is turned on, the circulation pump will in any case start up and then stop after 40 secs and an error **1 08** is displayed, but the burner will not ignite.

When the boiler is at rest the valve is on the "sanitary" 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:**
 $T_{off} = T_{set-point} + 8^{\circ}\text{C}$
- **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 **2 36**).

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

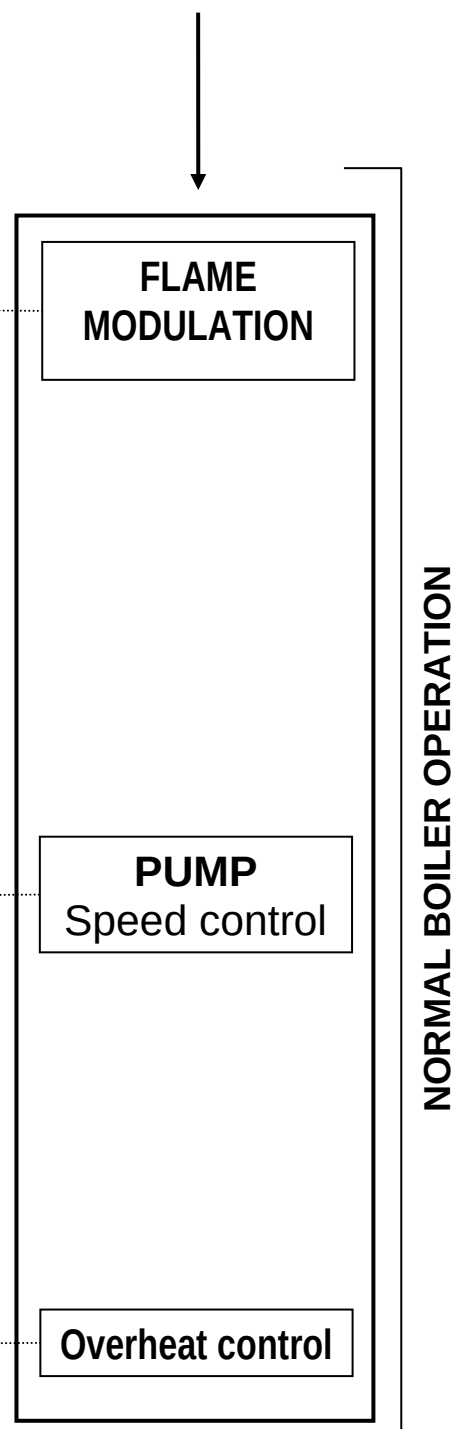
where: $\Delta T = 20^{\circ}\text{C}$ (default value can be sent by parameter 14 of menu 2 between 10 and 30°C).

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

Performed from:

- Produced till 27/08/2008: the thermostat with automatic reset ($102 \pm 4^{\circ}\text{C}$) located on heating delivery (even while the burner is off).
- Produced from 28/08/2008: delivery and return heating sensor to 102°C (even while the burner is off).

After a overheating a safety shut down occurs (not indicated) and after 5 sec if there is already a block shutdown of the boiler occurs (non volatile), 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 SPECIAL HEATING FUNCTIONS

2.2.1 HEATING DELAY REGULATION

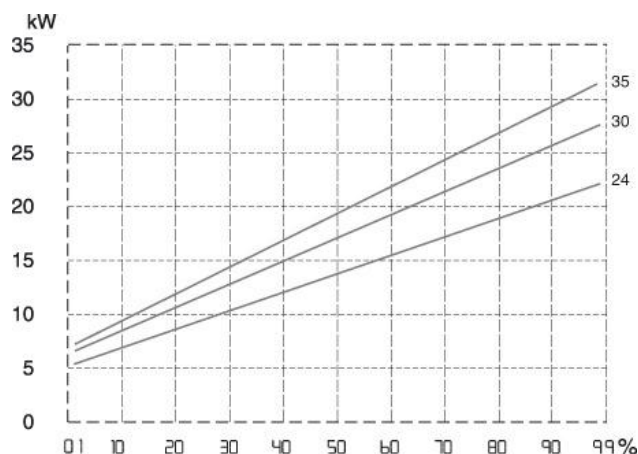
- Regulation carried out on parameter 2 36

- 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 4 on menu 2 (see paragraph 6.2 and 6.3).

2.2.2 HEATING MAXIMUM POWER REGULATION

- 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 (see paragraph 6.2 and 6.3).



2.2.3 SELF ADAPTATIVE HEATING RESART DELAY

When the boiler turns off having reached the switch off temperature, the restart delay is calculated automatically, according to the heating set point temperature. (See table attached).

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

- 2 35 = 0 : Manual.
- 2 35 = 1 : Automatic.

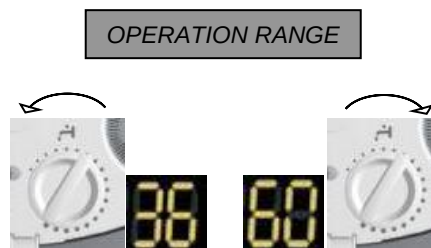
MANUAL: with menu 2 3 parameter 6, it is possible to set the heating restart delay between 0 and 7 min.

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

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

2.3 SANITARY MODE: OPERATING LOGIC

You can see (for 4 seconds) the temperature that you are setting on the display by turning the knob.



A demand for Domestic hot water, is detected by the sanitary proportional flow meter. Then, the display will show letter **d** and the set temperature is showed.

DEMAND FOR DOMESTIC HOT WATER

Turn the pressure switch ON/OFF to perform the check which should always be carried out after turning on the central heating. When the pressure switch opens, the burner stops immediately and the circulation pump stops after 40 secs and an error **1 08** is displayed. If the pressure switch is open when the central heating is turned on, the circulation pump will in any case start up and then stop after 40 secs and an error **1 08** is displayed, but the burner will not ignite.

WATER CHECK ON THE MAIN CIRCUIT

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.

Three-way valve

Heating
ON

Heating
OFF

Switch shaft
position

Shaft position is
OK

In the same time:

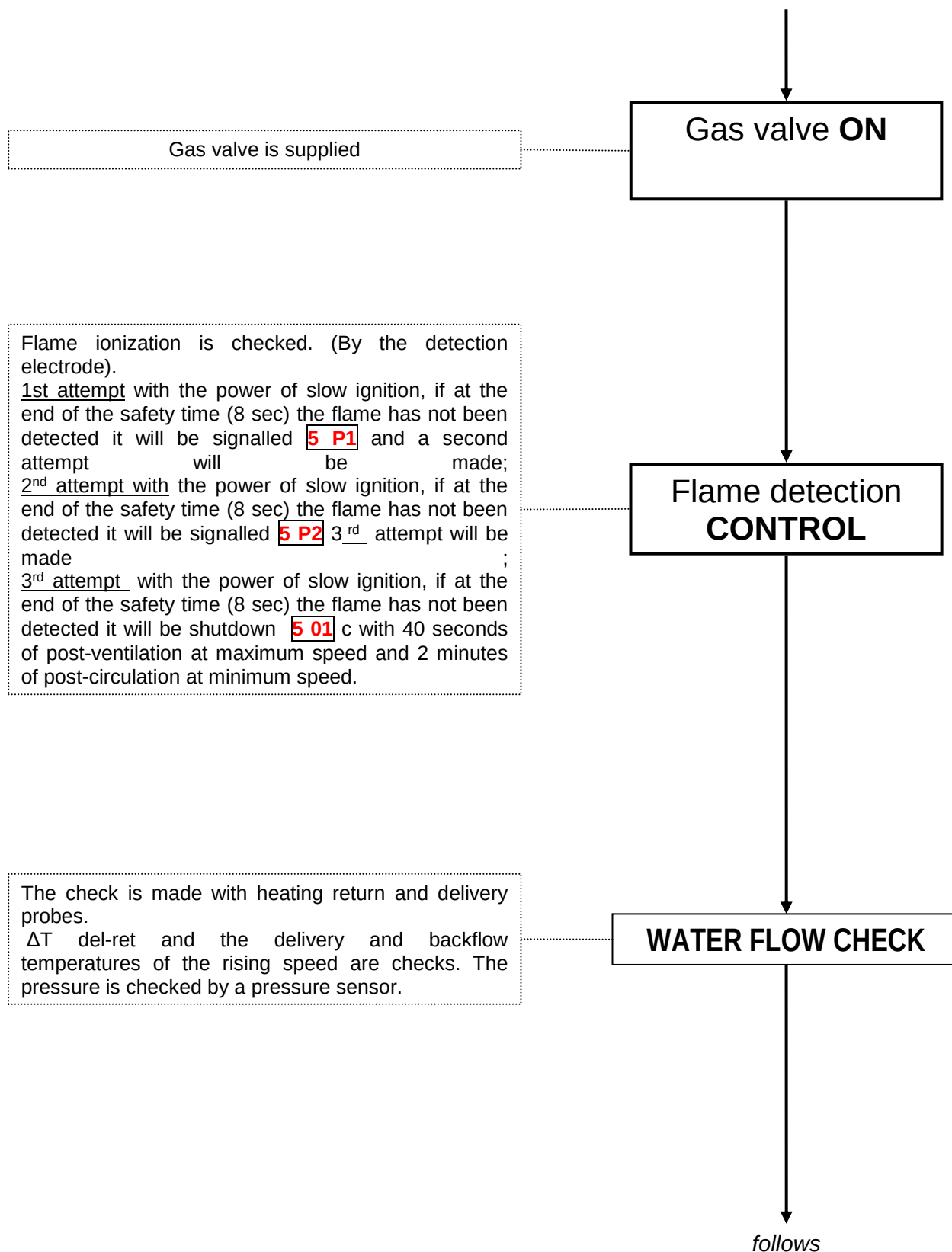
The pump (set automatically on maximum speed), intakes water coming from the outlet of the secondary and sends it to the primary exchanger.

The ventilator is supplied at the soft ignition speed.

The spark generator is supplied to clean the ignition probes.

Pump ON
Ventilator ON
Spark generator ON

follows



The burner output is modulated varying the VENTILATOR rpm between the minimum to the maximum speed.

The burner runs until the scale prevention temperature is reached. The temperature is checked by the sanitary probe NTCs.

Performed from:

- Produced till 27/08/2008:
the thermostat with automatic reset ($102 \pm 4^{\circ}\text{C}$) located on heating delivery (even while the burner is off).
- Produced from 28/08/2008:
delivery and return heating sensor to 102°C (even while the burner is off).

After a overheating a safety shot down occurs (not indicated) and after 5 sec if there is already a block shutdown of the boiler occurs (non volatile), indicated on the display with **1 01**.

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:

	<i>T set</i>	<i>Antilime temp. limit</i>	<i>RE-START</i>
NTC1 (delivery probe)	<i>Non influente</i>	85°C	81°C
NTCs (sanitary probe)	$> 52^{\circ}\text{C}$	65°C	64°C
	$< 52^{\circ}\text{C}$	62°C	61°C

**FLAME
MODULATION**

Overheat control

**SCALE
PREVENTION
temperature**

NORMAL BOILER OPERATION

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

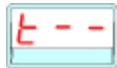
- 0 : Anti-scale (62 o 65°C) $\Rightarrow$ default
- 1 : Set-point + 4°C

3 SPECIAL FUNCTIONS

3.1 “FLUE CLEANER” Function

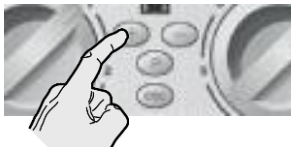
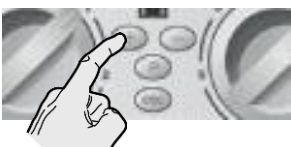
This function is used to perform proper boiler combustion analysis and maximum and minimum gas calibration.

Follow the instructions below to enable it:

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

- 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, the burner turns on only during sanitary demand.
- 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
the pushbutton “+”			Max heating
the pushbutton “+”			Max sanitary
the pushbutton “+”			Minimum

To exit the “Flue cleaner” function presses the ESC button. However after 10 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 follow the instructions below:

How to enable the COMFORT function	
Press button “C” comfort	

When the **COMFORT** function is enabled the display shows COMFORT icon and letter **C** followed by the temperature read by sensor NTC1.

The **COMFORT** function becomes operative after each sanitary demand and remains enabled for the subsequent 30 minutes. To disable it press button “C” comfort.

Moreover, by means of parameter **2 5 0** you can set comfort function as follows:

2 5 0 = 0 : disabled;

2 5 0 = 1 : enabled for 30 minutes after sanitary request;

2 5 0 = 2 : always enabled.

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

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

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	- 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 F followed by the temperature read by sensor NTC1	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 PUMP is supplied on speed III; - The 3-WAY VALE is positioned on “heating” - The DISPLAY shows F followed by the temperature read by sensor NTC1	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 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 Tman > 7°C/sec (checked every 100ms)	Check always with the flame on, except during the first 4 seconds after flame detection.	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 Tman > 20°C/sec or Gradient Trit > 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.	1. Shutdown 1 04: - 20sec of post ventilation - 1min of post-circulation.
Tman – Trit > 55°C	Check 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: - 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.
Trit > Tman + 10°C	Check always with the flame on.	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.
Trit > Tman + 30°C	Check always with the flame on.	Shutdown 1 07 : 20sec of post ventilation; - 1min of post circulation

3.5 “AIR PURGE” Function

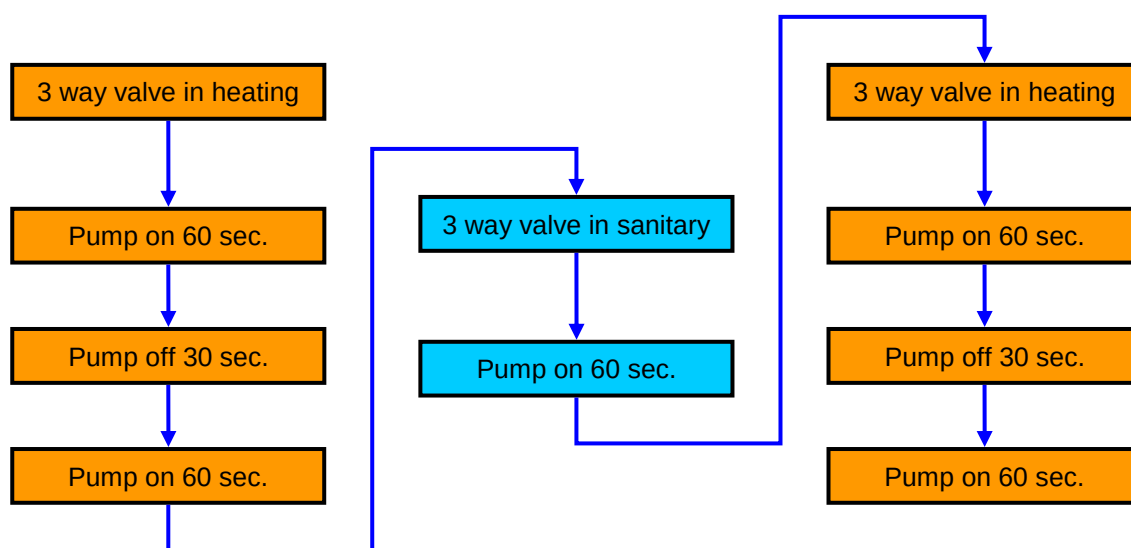
The aim is to help the professional to purge the residual air inside the primary circuit after a filling cycle or one operation on the heating circuit.

This function can be activated by the professional:

- by pressing during 5 sec the “ESC” bottom
- With the of the menu 7 0 parameter 01

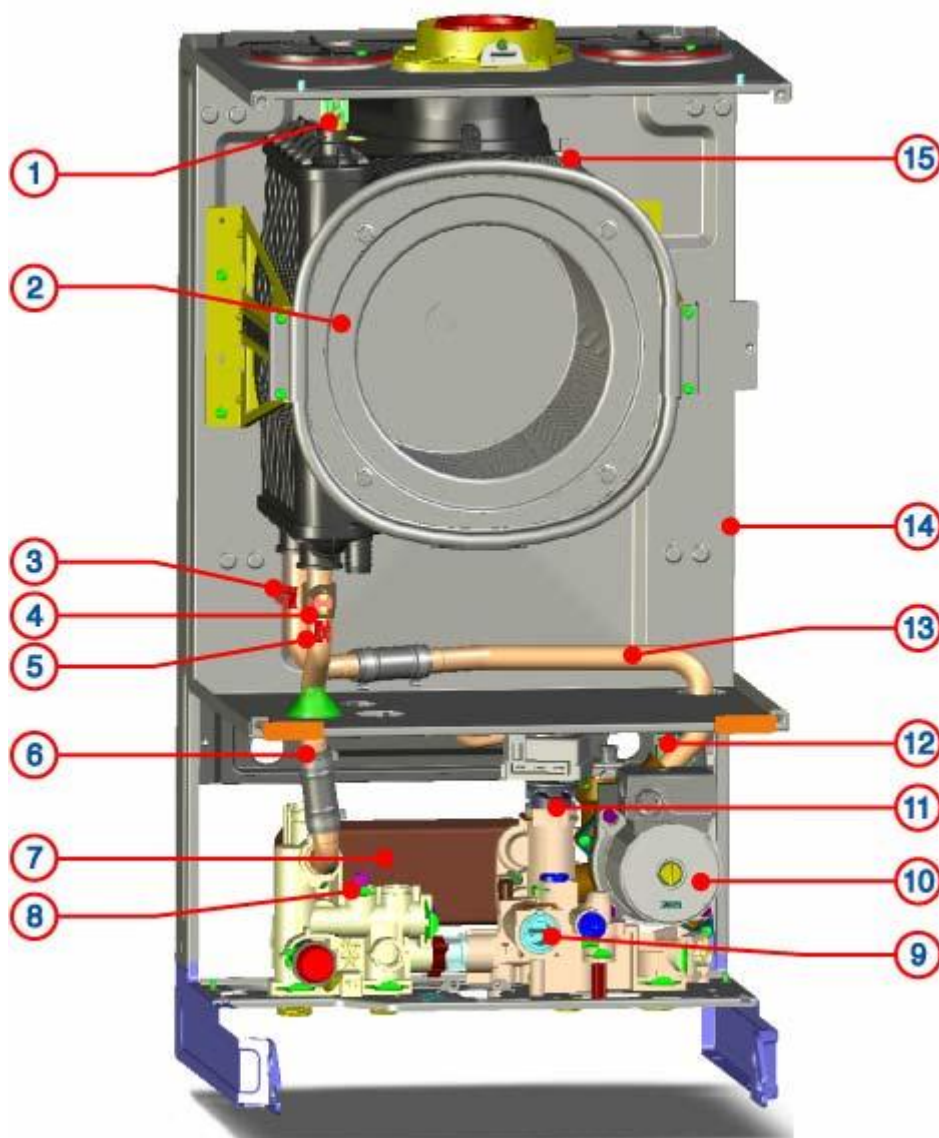
The cycle is activated and continues till the end (about 6') or pressing of “ESC” key once: digits: **P 1-**).

At the activation the following cycle runs as follow:



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

4 HYDRAULIC UNIT



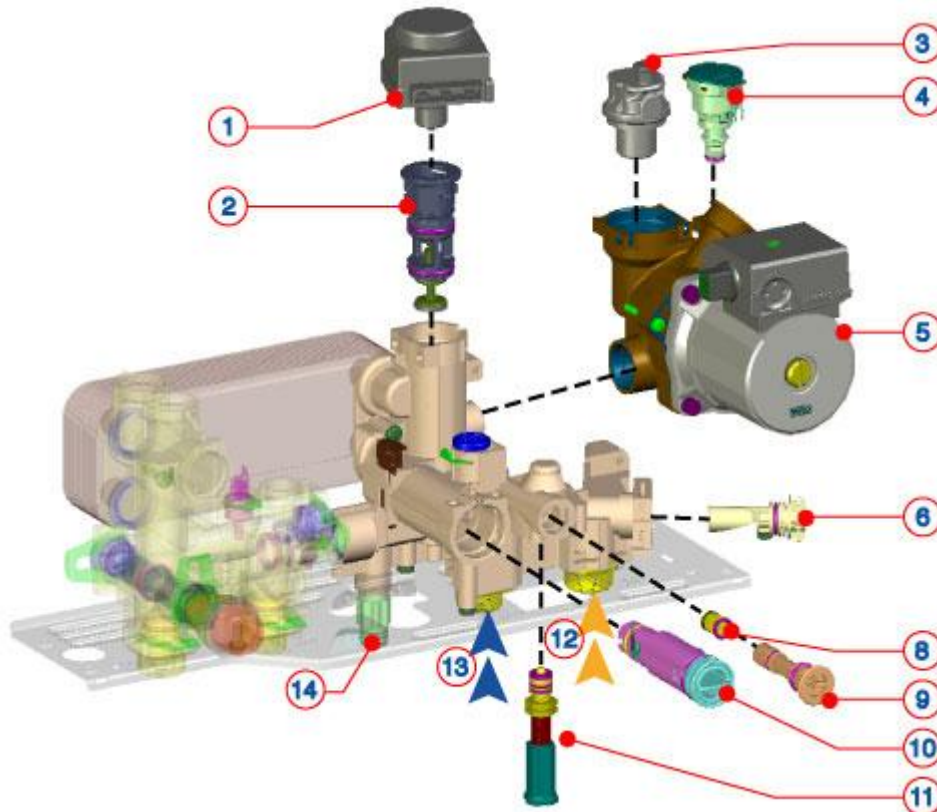
LEGEND

1. Manual air vent valve	9. Sanitary proportional flow meter
2. Primary heat exchanger	10. Circulation pump
3. Heat exchanger return temperature sensor NTC2	11. 3-way valve
4. Overheat 105°C thermostat	12. Heating pressure sensor
5. Heat exchanger flow temperature sensor NTC1	13. Main exchanger inlet pipe
6. Heat exchanger outlet pipe	14. Expansion vessel (not visible)
7. Secondary heat exchanger	15. Thermal fuse
8. Domestic hot water temperature sensor NTCs	

4.1 Right hydraulic block

Composite block with integrated functions :

- CH and DHW filter
- Electrical diverter valve
- All components fitted by clips
- Pump unit with deaerator valve and Heating pressure sensor
- Safety primary pressure switch
- Brass connectors for installation
- Primary filling system



LEGEND

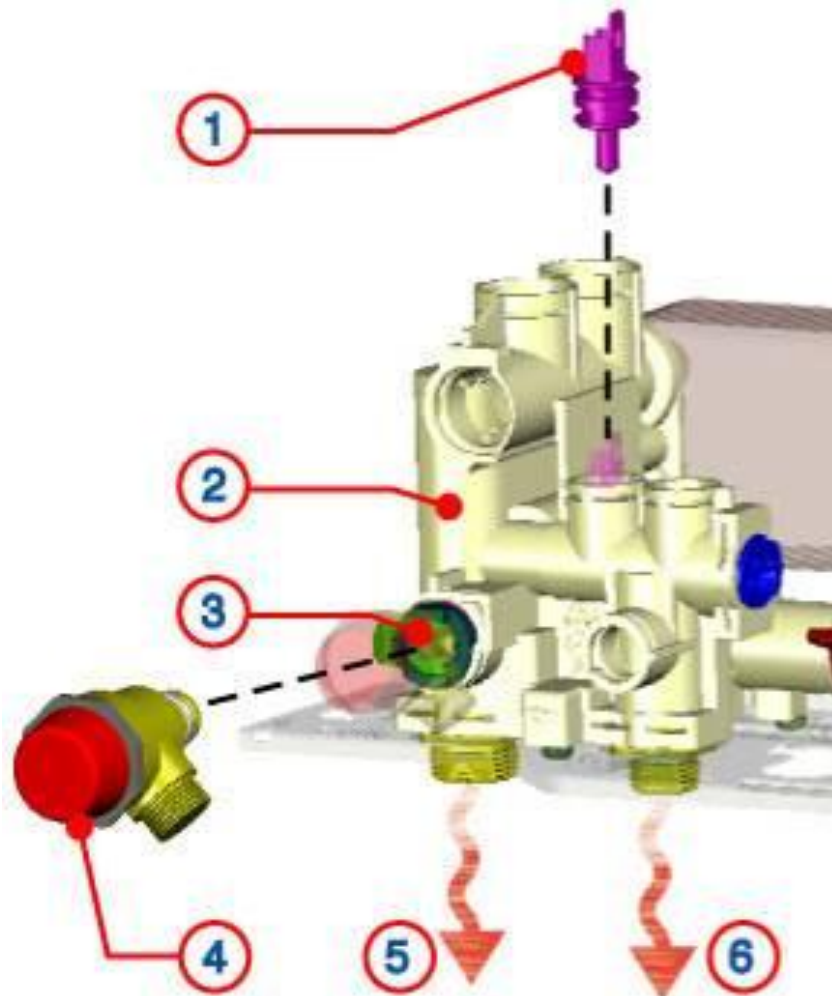
1.	3-way valve motor	8.	Anti return valve
2.	3-way valve	9.	Anti return bracket
3.	deaerator valve	10.	Sanitary proportional flow meter
4.	Heating pressure sensor	11.	Telescopic filling tap
5.	Pump	12.	Heating system return
6.	CH filter	13.	Cold water inlet

4.2 Left hydraulic block

Composite module for CH and domestic hot water outlet.

Components integrated in the block :

- immersed DHW NTC
- CH safety valve 3bar
- Automatic by-pass
- Brass connections
- All copper pipes connected by clips
-



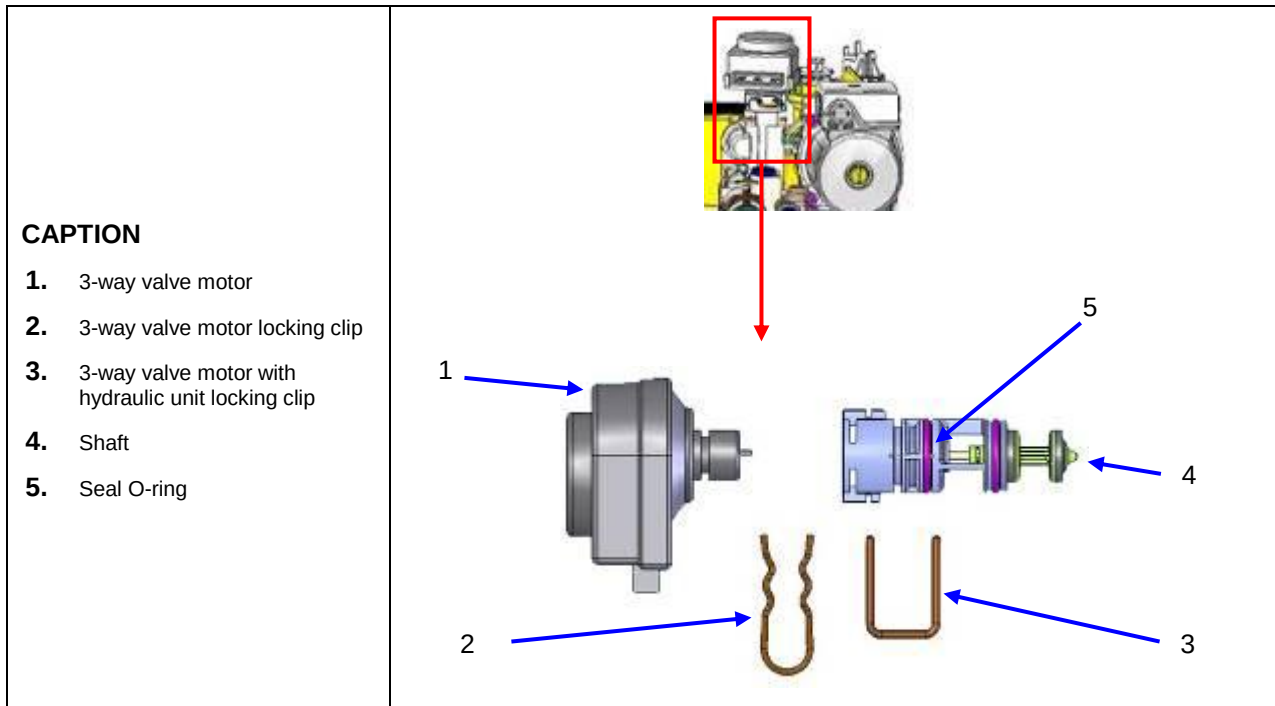
LEGEND

1. DHW Temperature sensor	4. Safety valve
2. Left hydraulic bloc	5. Central heating flow
3. By pass	6. Domestic water flow

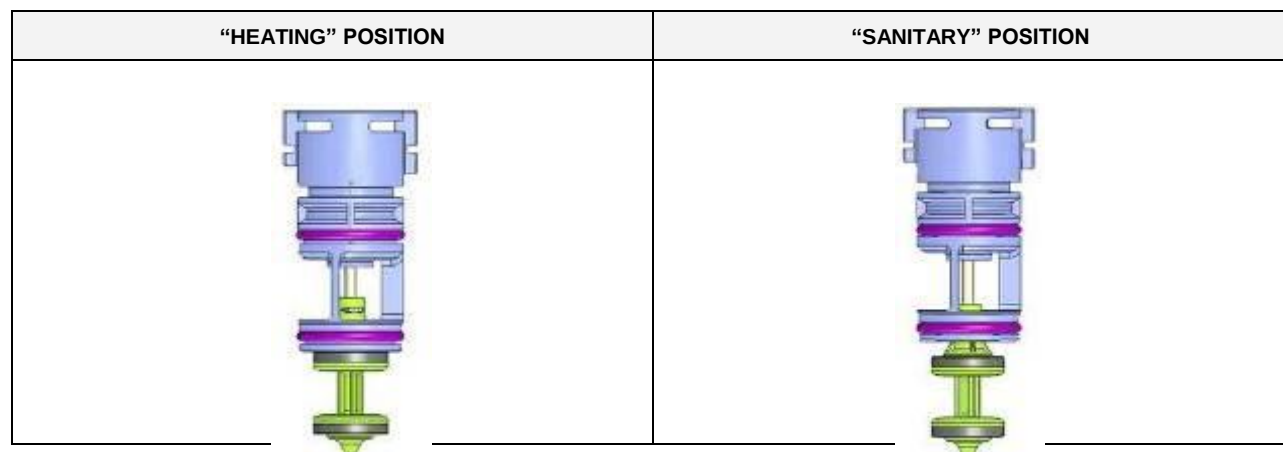
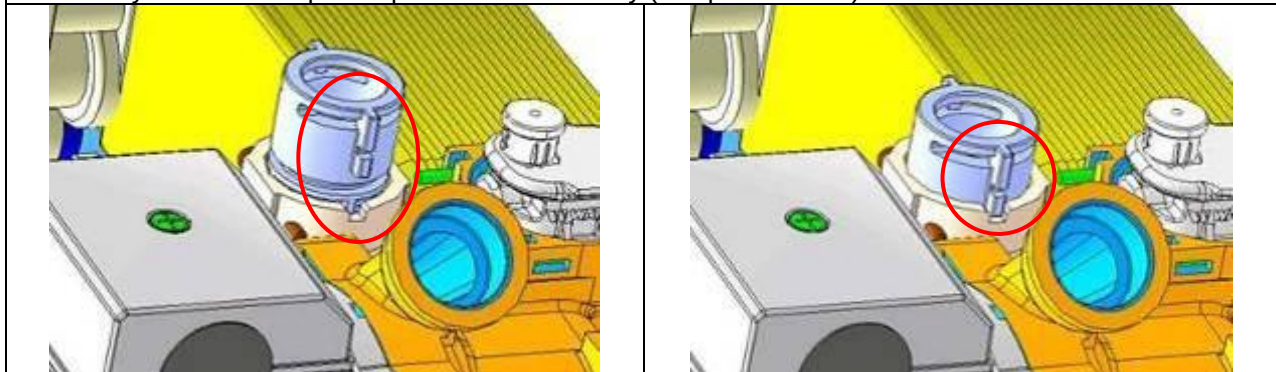
4.3 3 WAY VALVE

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

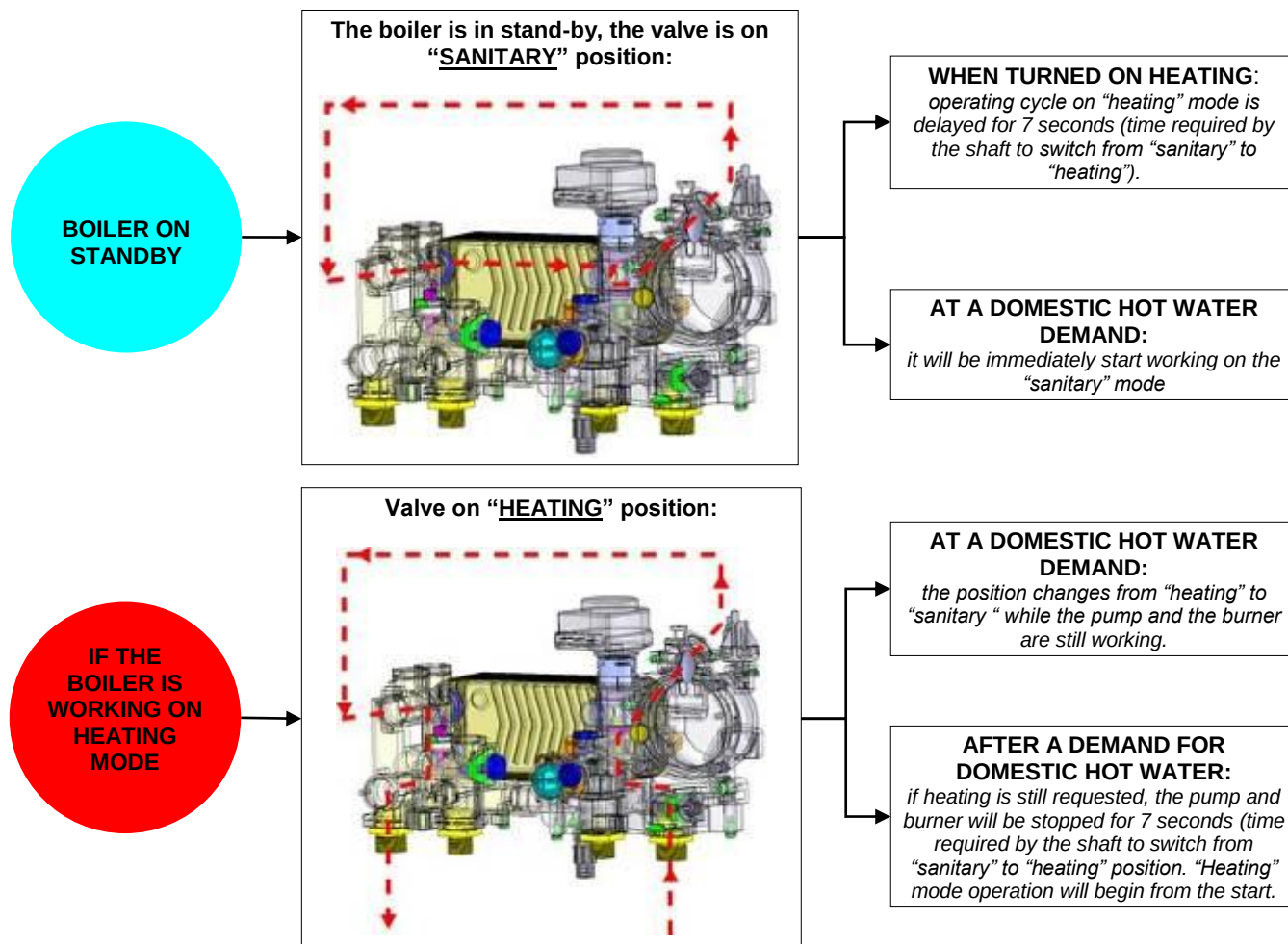
With the boiler on stand-by the 3-way valve is positioned on sanitary mode.



The 3-way valve has a specific position for assembly (see photo below).



What the boiler does when the 3-way valve switching.

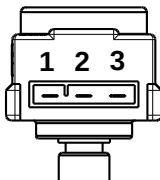


4.3.1 3-way valve motor

The movement of the 3-way valve is assured by an ELBI I electric motor that is easy to disassemble. The boiler does not have to be emptied in order to replace it but you just have to take out the clip (2) and disconnect the supply wire.

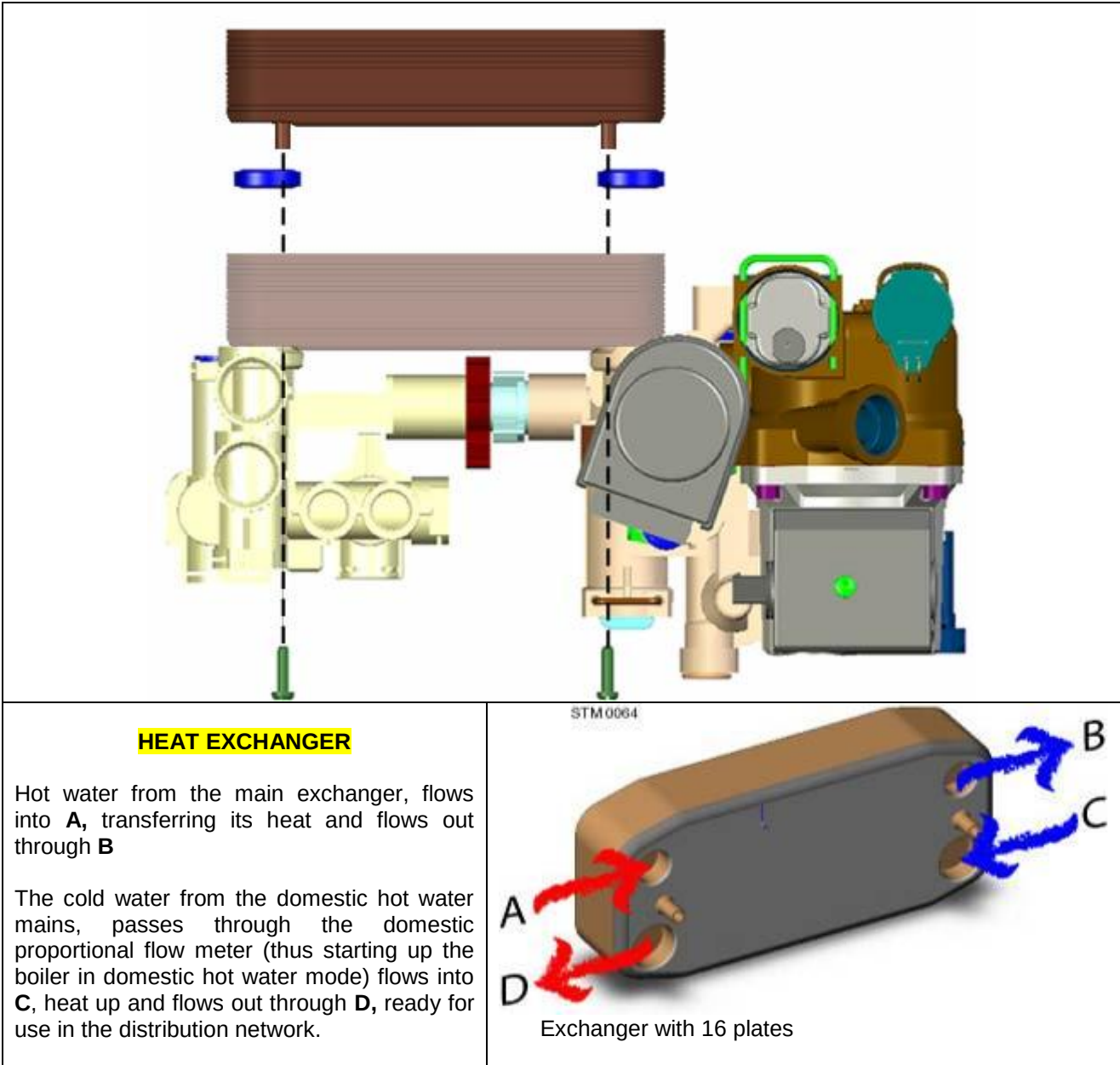
The PCB supply always reaches the electric motor according to the function selected (mixed or just sanitary) on the control panel.

It has two (right and left) micro-switches inside the body that disconnect voltage to the electric engine when the position has been switched.

Electric wires:	Electric supply	
 STM0011	Supply : 230Vac Resistance: 10 kohm	
	Supplied contacts	Motor pin
Sanitary function	2-1	external
Heating function	2-3	pulled back

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.



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 (delivery probe)	Not influent	85°C	81°C
NTCs (sanitary probe)	> 52°C	65°C	64°C
	<52°C	62°C	61°C

4.5 PUMP UNIT

Pump type:

- Wilo MTSL 15/5 HE-2 (CLAS PREMIUM 24 till 27/08/2008)
- Wilo INMTSL 15/5 HE-2. (CLAS PREMIUM 24 from 28/08/2008)
- Wilo MTSL 15/6,7-2CLF 12. (CLAS PREMIUM 30 and 35 till June 2009)
- Wilo INTMTSL 15/6.7 HE-2. (CLAS PREMIUM 30 e 35 from July 2009)

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:

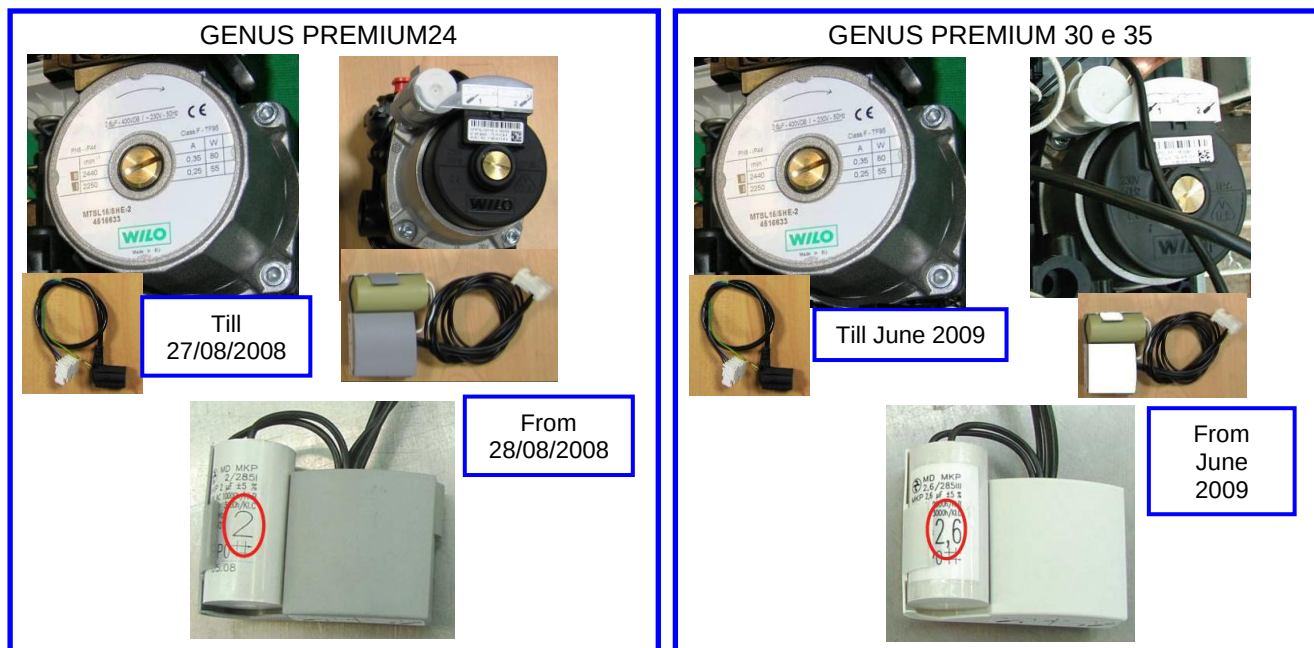
- $\Delta T_{del-ret} < \Delta T - 2^{\circ}\text{C} \rightarrow \text{V2};$
- $\Delta T_{del-ret} > \Delta T \rightarrow \text{V3};$

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

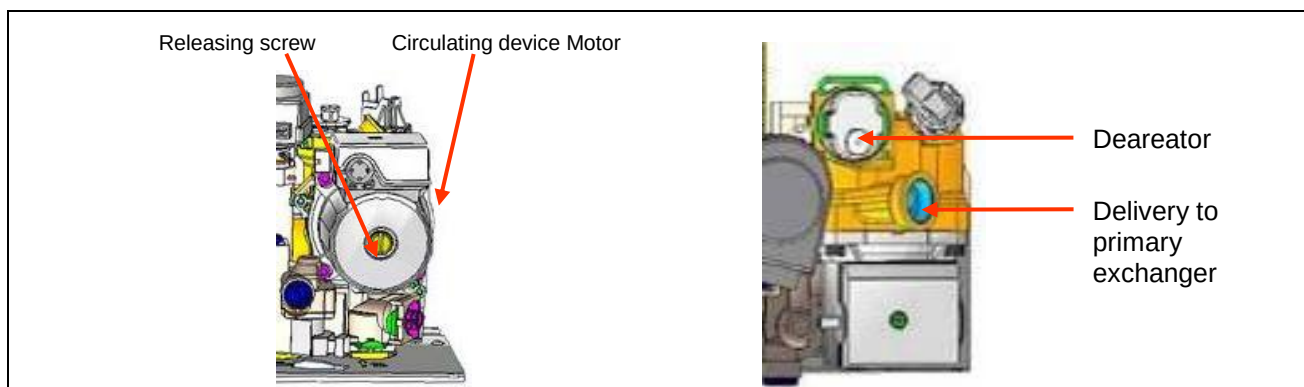
Speed switching is performed with a 5 minute delay (value that cannot be set) up or down.

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

- 0: speed 2 fix.
- 1: speed 3 fix.
- 2: adaptative



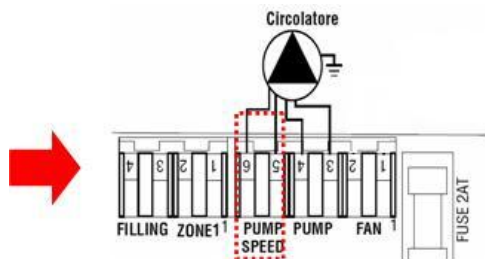
The anti-sticking system enables the circulating device and the 3-way valve for 15 sec. every 21 hours from the last operation.



4.5.1 PUMP speed check

The speed of the pump can be checked by the on 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 Types of post-circulation

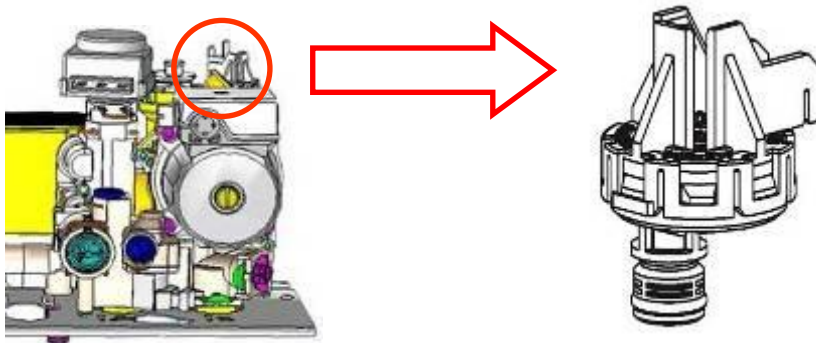
	CAUSE	POST-CIRCULATION TIME
HEATING OPERATING MODE	Room thermostat opening	3' (can be set by on menu 2 3 parameter 7 between 0 and 15')
	Passage from heating to stand-by cXY	2'
	Burner off (setpoint + 4°C)	Non stop
	Boiler shutdown because there is no water circulation 1 03 – 1 04 – 1 05 – 1 06 – 1 07	1'
	Boiler blocked because no flame is detected 5 01	2'
	Temperature raise 1 01	2'
	Stop because the thermostat intervention is to be carried out on the floor	Until it disappears
	End of chimney sweeping function	2'
	If menu 2 3 parameter 7 is set on CO	Non stop
SANITARY OPERATING MODE	End of sanitary demand and end of comfort cycle hXY	30"
	Antiscale system turns of at 62 or 65°C on sanitary probe NTCs	Non stop
	End of antifreeze function	2'

4.6 HEATING PRESSURE SWITCH

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

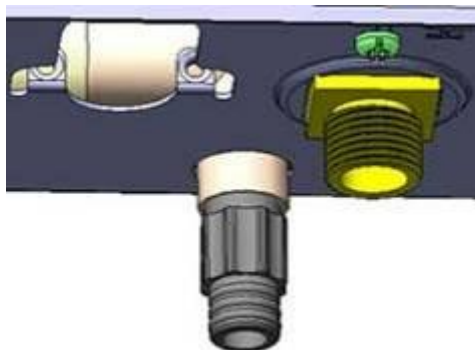
- OFF: 0,4 bar;
- ON: 0,6 bar.

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



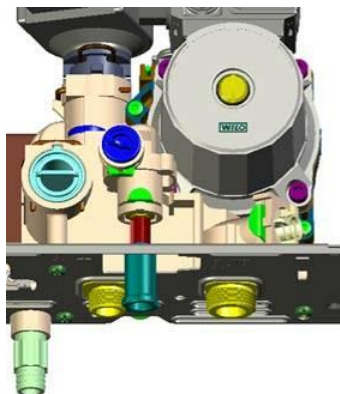
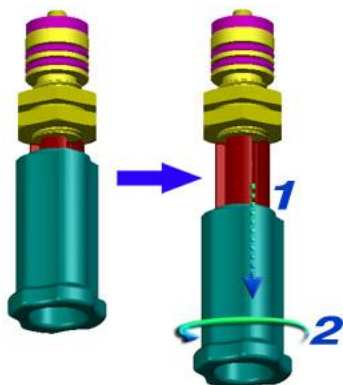
4.7 DRAIN VALVE

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



4.8 FILLING OF THE HEATING INSTALLATION

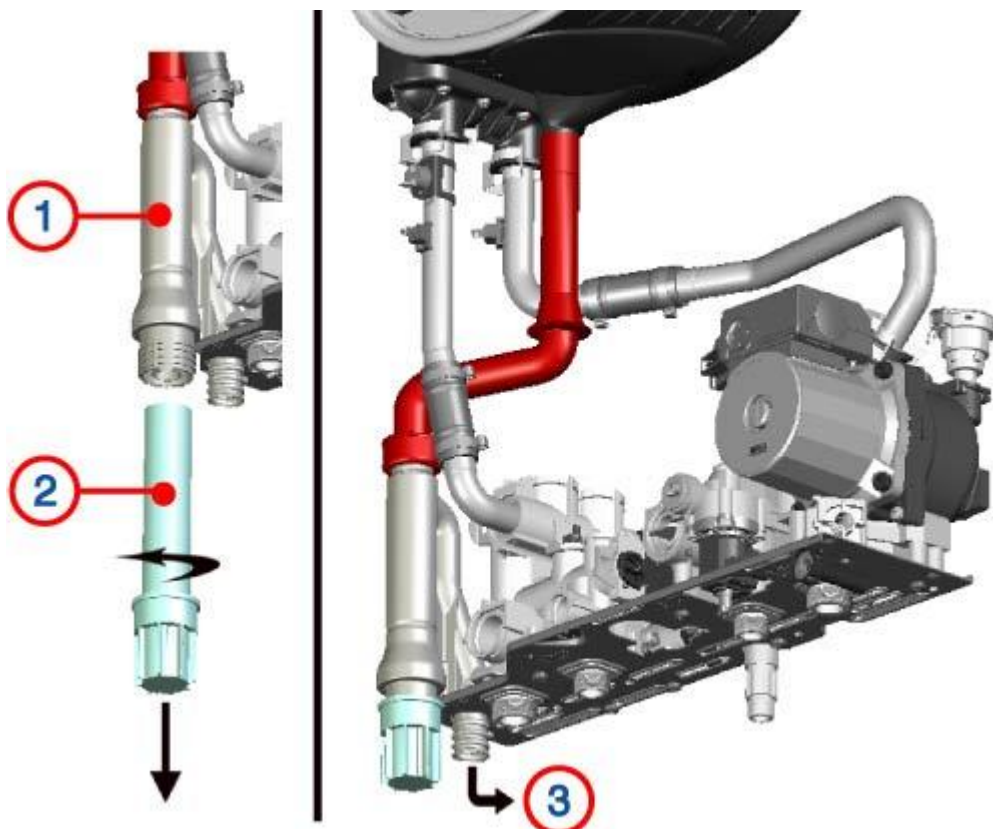
To fill the installation there is one telescopic filling tap. The first operation is to pull down the tap. The second operation is to open the tap to fill the installation.



4.9 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.

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



LEGEND

1. Condensate trap

2. Condensate drain

3. Condensate tank

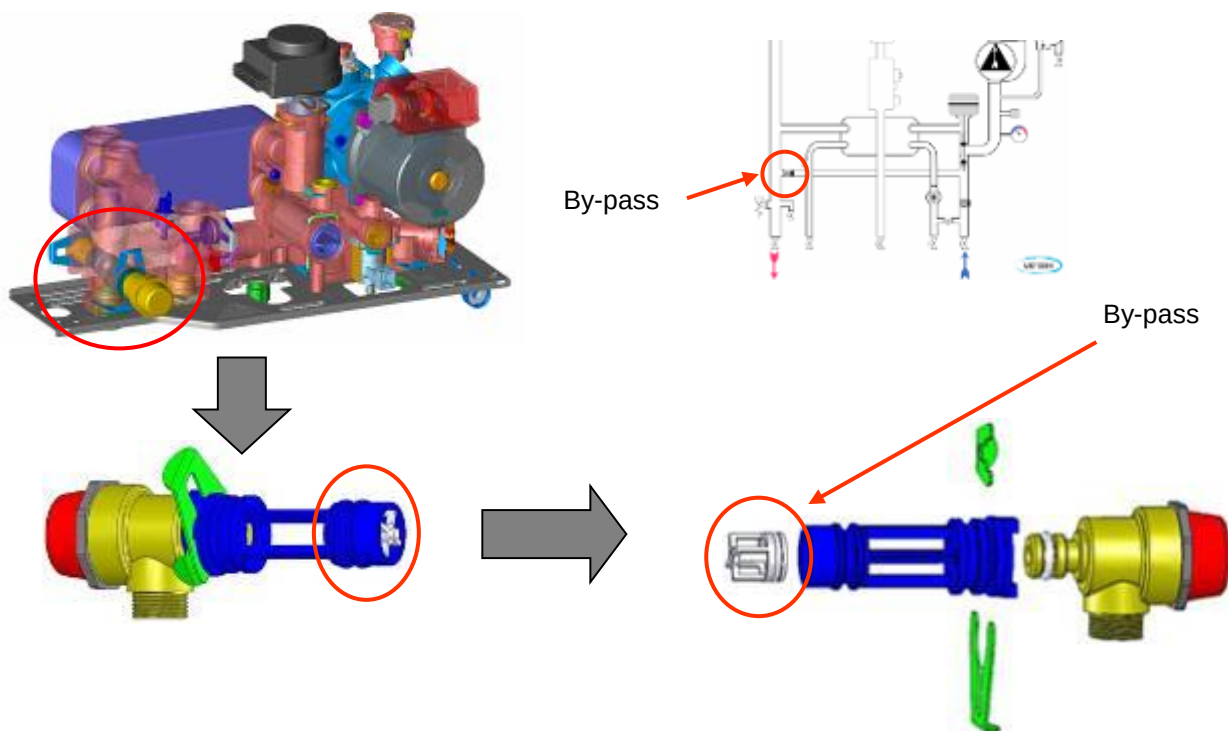
4.10 BY-PASS

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.

The by-pass is positioned in the delivery unit and is built-in the same block of the 3 bar safety valve.



4.11 PRIMARY EXCHANGER UNIT

The primary exchanger is keeping in position localised inside the combustion chamber by 3 points. It integrated extra functions: flue box, air valve, drain condensate.

The generator is made with stainless steel smooth pipes (material: 304 L / Diameter: 18 mm / Thickness: 0,8 mm). In order to have a maximum thermal exchange, the tubes are flattened and clamped to 6 mm.

Bosses are used to maintain the distance between each coil (1,5 mm to 2 mm). The coils are series-mounted in parallel, two by two.

Number of tubes according to the burner power:

Burner power	Nb of tube
24 KW	3 tubes + 1 tube
30 KW	4 tubes + 1 tube
35 KW	5 tubes + 1 tube

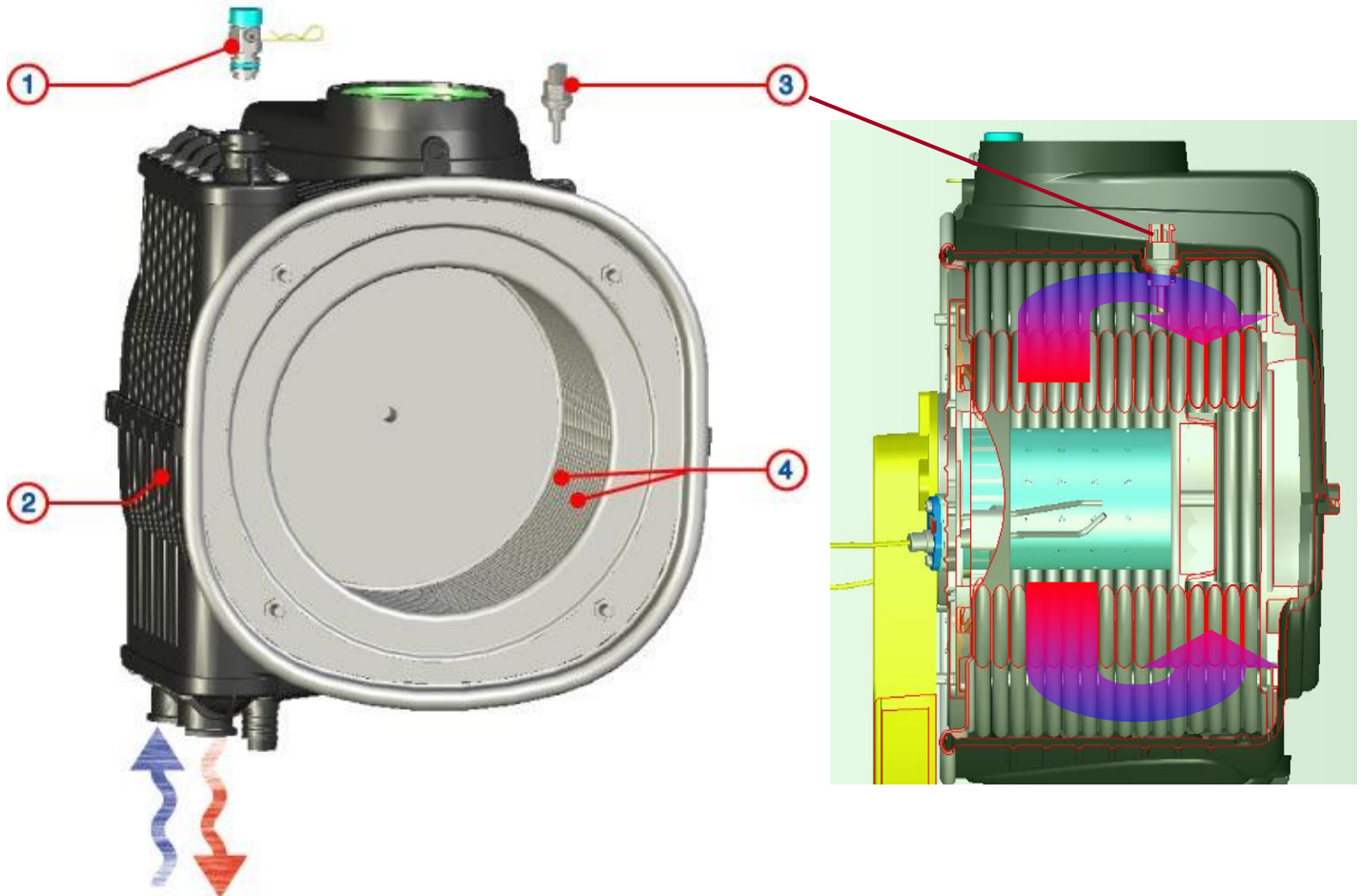


The lid generator is made in composite material: PP FG 30 % & PPO.

One thermal fuse protects the primary exchanger. When the fume temperature is more than 167°C, the thermal fuse contact is open and the defect 6 10 appears on the display.

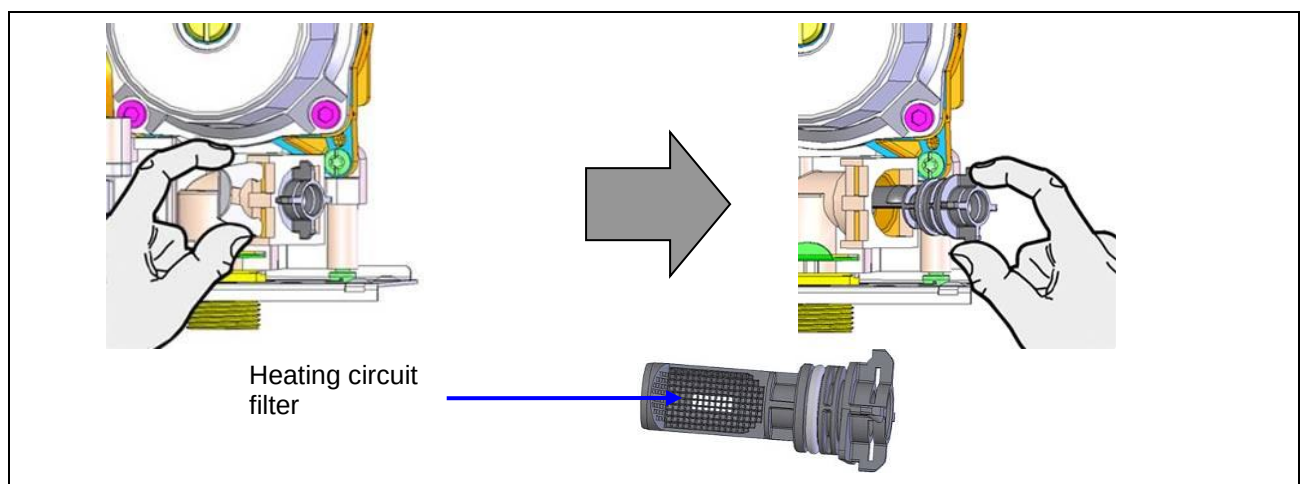
LEGEND

- | | |
|--------------------------------------|--------------------------|
| 1. Manual Air release valve | 4. Thermal fuse |
| 2. Low temperature condensation zone | 5. High temperature zone |



4.12 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 follows the instructions shown below.



4.13 EXPANSION VESSEL

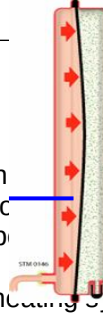
The expansion vessel is a component of the primary circuit water expansion when a boiler temperature rise. It is constituted by a spherical vessel divided by a diaphragm. On the one side of the diaphragm is the primary circuit. The inert gas chamber on the other side of the diaphragm can be compressed) absorbs the water volume increased because of temperature raise.

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



HEATING WATER CIRCUIT

INERT GAS



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

4.14 **SANITARY PROPORTIONAL FLOW METER**

When turned on sanitary mode, the water flow passes through the turbine that allows the PCB to measure the flow by means of a reed sensor.

When there are variations of sanitary flow, through the measurement of the proportional flow meter, the PCB anticipates the gas opening or closing, to reduce the temperature oscillations.

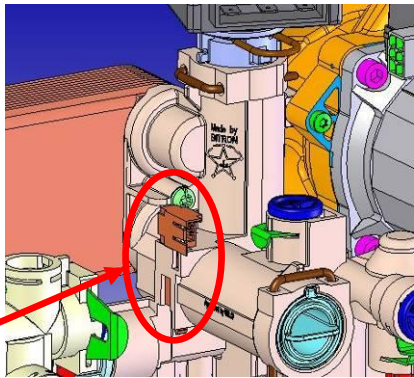
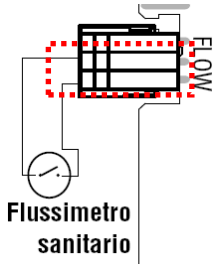
A cold water inlet filter is built-in the sanitary flow meter to stop impurities from the installation.

There is also an anti-hammer device (through the PCB) that can be set by means of on parameter **2 25** between 0.5 sec and 20 sec (default 0.5 sec).

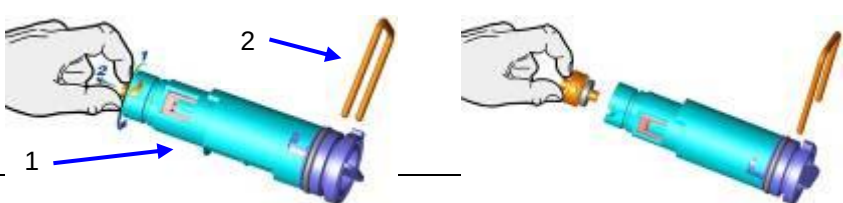
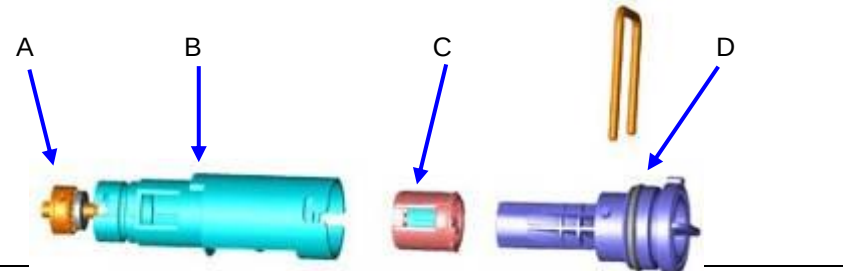
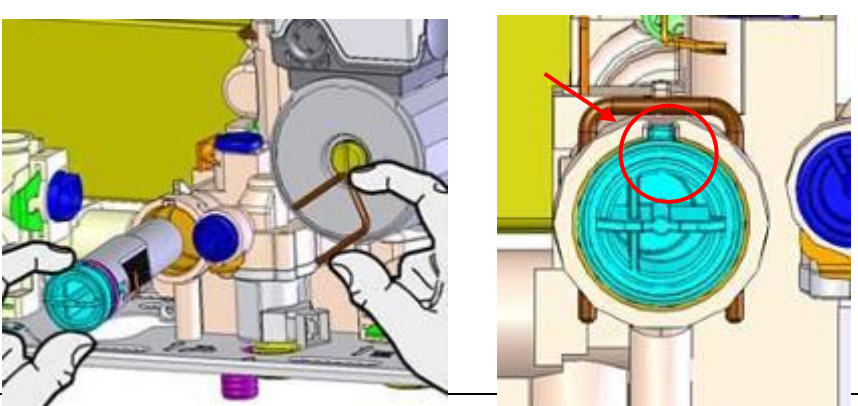
You can see the sanitary flow by means of menu 8 2 parameter 5. It is also possible to measure the voltage on connector CN14:

- 0Vdc = no flow
- 5Vdc = no flow
- between 2Vdc and 3Vdc = flow

FLOW REGULATOR inside	
8 l/min	24 kW
10 l/min	30 kW
12 l/min	35 kW



Reed sensor

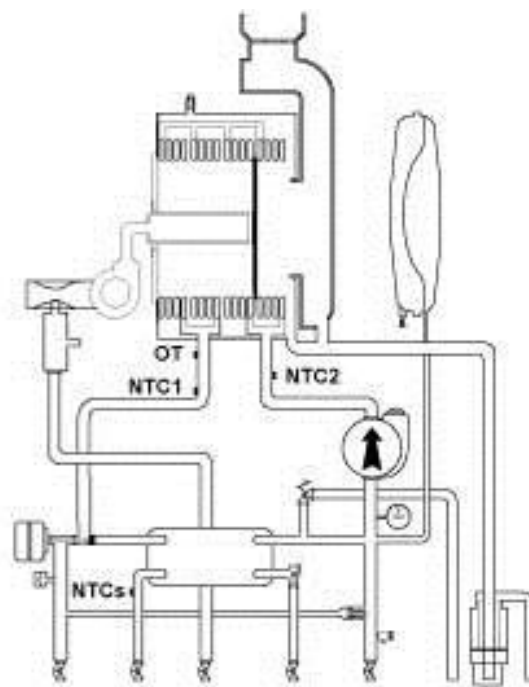
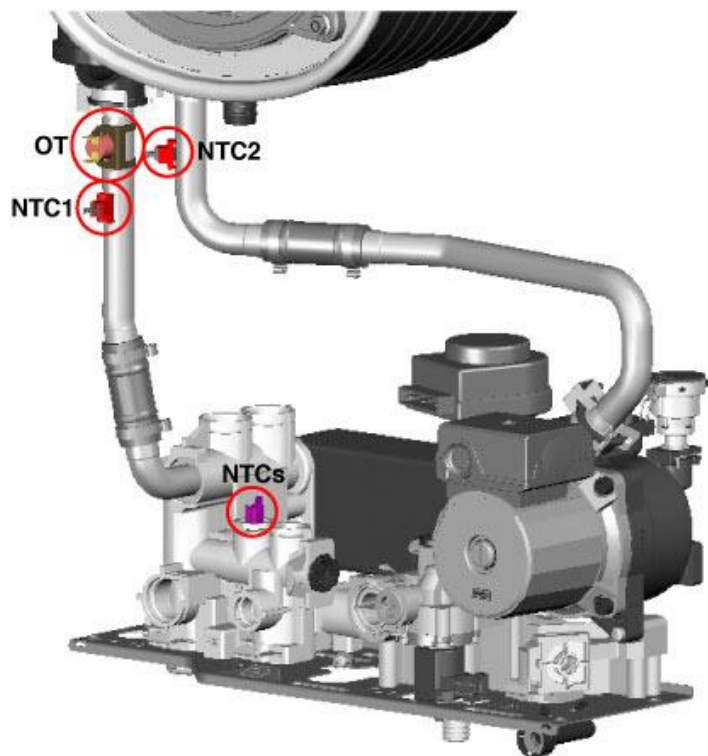
CAPTION	
1. Flow meter unit 2. Clip that fixes the flow meter unit to the hydraulic unit	
A Flow regulator device B Flow meter/filter cold water inlet container C Turbine D Flow meter cap	
The flow meter can be assembled only in one position.	

4.15 TEMPERATURE PROBE

To check the delivery and return temperature use the two contact sensor. To read the sanitary water temperature the immersion sensor located on the sanitary outlet is used; if the **NTCs** sensor does not work properly the temperature will be checked by sensor **NTC2**.

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

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



PROBE ERROR CODES	
2 01	NTCs sanitary outlet probe open circuit or no signal.
1 10	NTC1 heating delivery probe open circuit or no signal.
1 12	NTC2 heating return probe open circuit or no signal.

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

4.16 OVERHEAT THERMOSTAT

Produced till 27/08/2008:

The opening of contact of overheat thermostat ($102\pm4^{\circ}\text{C}$) causes boiler safety shutdown (not signalled) and if after 5 sec the thermostat is already opened causes shutdown signalled by the "blocked" led that lights up and the relevant error code shown on the display **1 01**.

To restart the boiler the temperature must be go down within the normal operating values (of the thermostat (87°C) and of the limit temperature (88°C) of the delivery probe on heating mode and 81°C on the delivery probe on sanitary mode) and that the reset button on the control panel is pressed in order to restart the boiler.

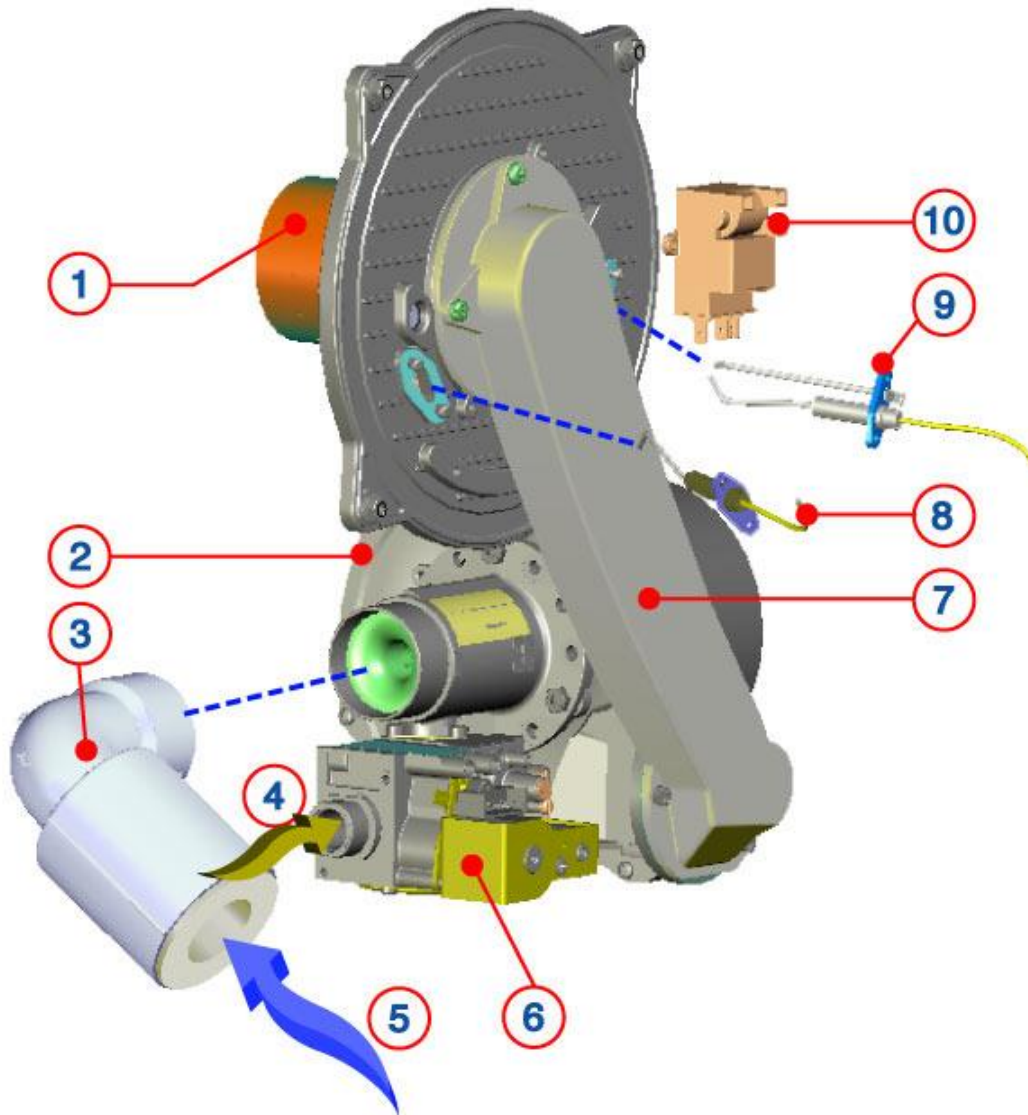
Produced from 28/08/2008:

The overheating is checked by the heating delivery and return sensor to 102°C , (also with burner off), if there is this condition there is a shutdown signalled by the "blocked" led that lights up and the relevant error code shown on the display **1 01**.

To restart the boiler the temperature must be go down within the normal operating values (of the limit temperature (88°C) of the delivery probe on heating mode and 81°C on the delivery probe on sanitary mode) and that the reset button on the control panel is pressed in order to restart the boiler.



5 BURNER UNIT

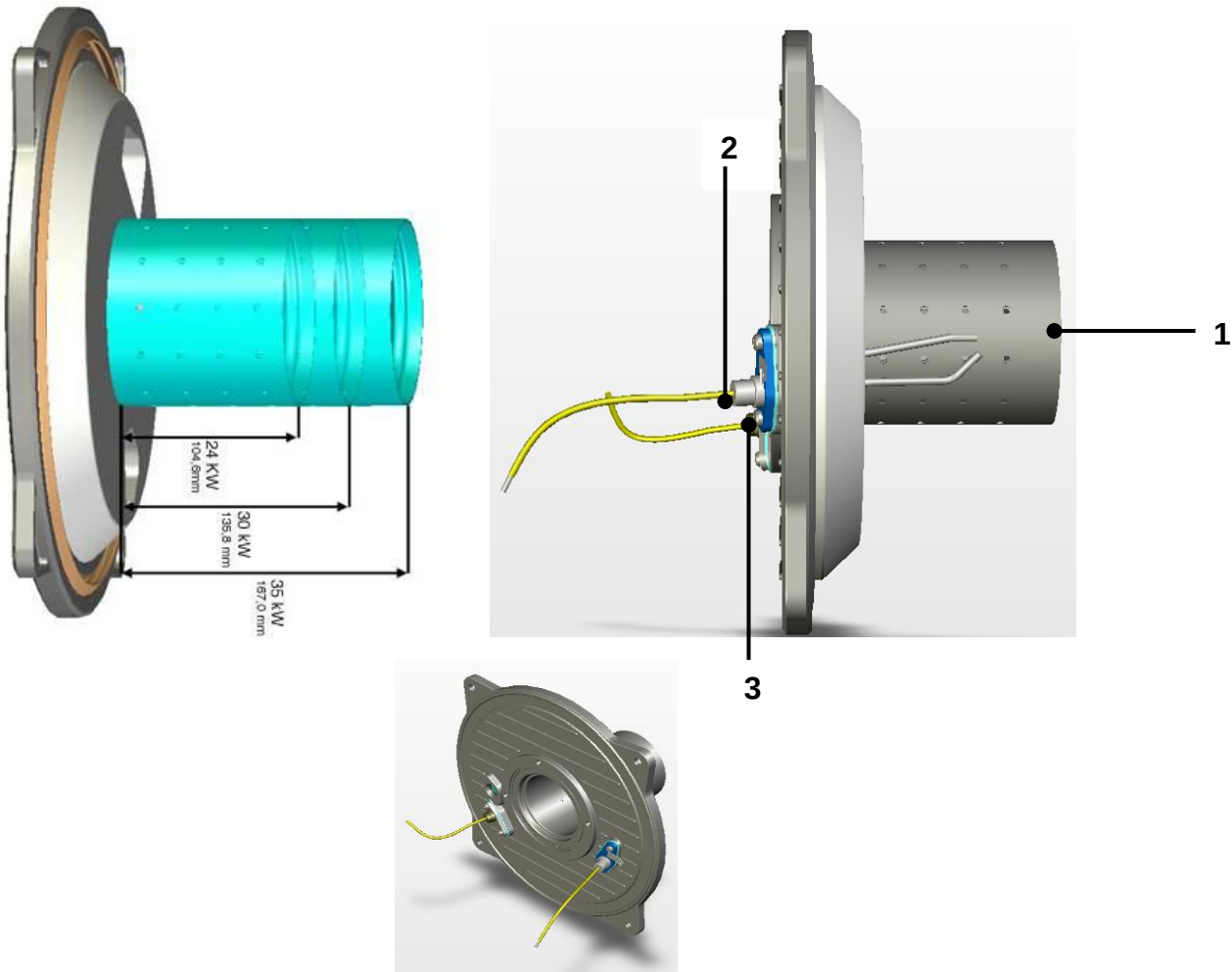


LEGEND

1. Burner	6. Gas valve
2. Ventilator	7. Air/gas collector
3. Silencer	8. Ionization electrode
4. Gas inlet	9. Spark electrode
5. Air inlet	10. Spark generator

5.1 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.

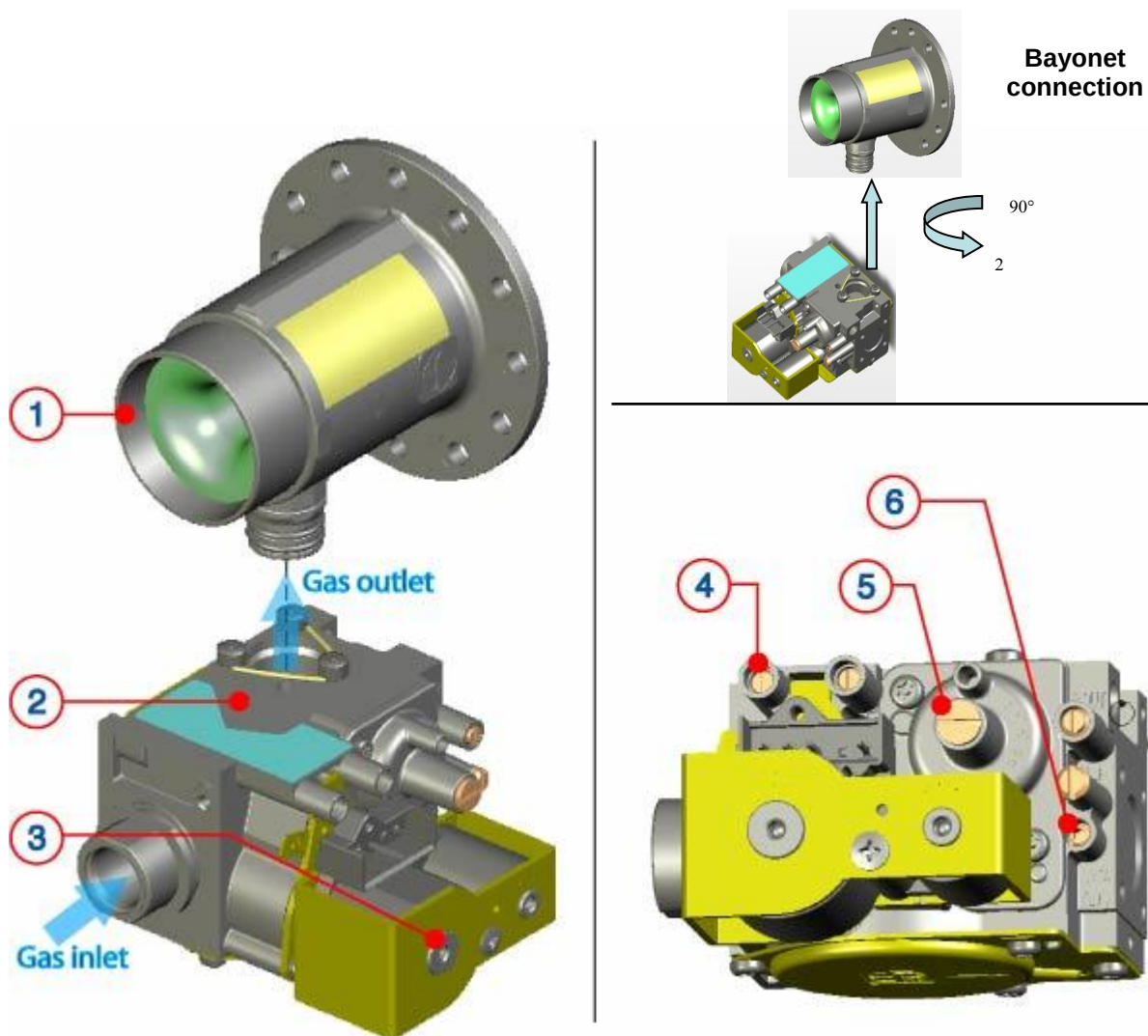


LEGEND				
1. Stainless Steel Burner		Power	Length	Venturi
2. Spark electrode		24 KW	104,6 mm	Ø 42 mm
3. Ionization electrode		30 KW	135,8 mm	/
		35 KW	167 mm	/

5.2 SIT 848 SIGMA GAS VALVE

The gas valve mounted is a **SIT 848 SIGMA** valve fitted with two operators supplied at 230 VCA that consent or cut off the gas supply to the main burner. The speed of the ventilator 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.



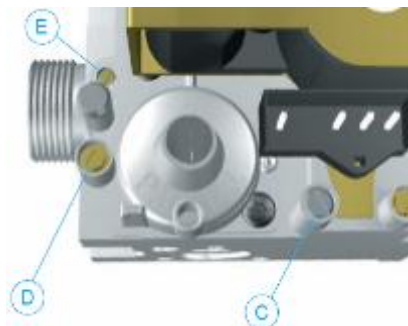
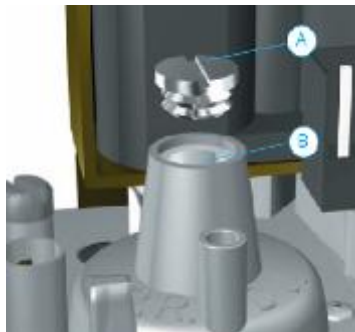
LEGEND

1. Mixer system	4. Inlet outlet gas point pressure
2. Gas valve	5. Offset adjust
3. Safety coils	6. Throttle adjust

5.3 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).



A	Off-set cap
B	Zero adjustment for <u>CO2 minimum power</u>
C	Intermediate pressure gauge. Attention: do not use
D	Outlet pressure gauge
E	Gas/air adjustment for <u>CO2 maximum power</u>

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 (♂ x ♀).

Type of gas	CO2 value		
	24 KW	30 KW	35KW
G20 20 mb	9,0% + - 0,2%	9,0% + - 0,2%	9,0% + - 0,2%
G31 37 mb	10,7% + - 0,2%	10,0% + - 0,2%	10,0% + - 0,2%

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 (♂ x ♀).

Type of gas	CO2 value		
	24 KW	30 KW	35KW
G20 20 mb	9,0% + - 0,2%	9,0% + - 0,2%	9,0% + - 0,2%
G31 37 mb	10,7% + - 0,2%	10,0% + - 0,2%	10,0% + - 0,2%

The soft ignition power checking and setting

To check and to set the soft ignition, it is possible in the parameter **2 20** (see paragraph 7.1.2).

The factory's setting is 60

5.3.1 GAS TABLE

	para- metro	24 kW		30 kW		35 kW	
		G20	G31	G20	G31	G20	G31
Indice di Wobbe inferiore (15°C, 1013 mbar) (MJ/m ³)		45,67	70,69	45,67	70,69	45,67	70,69
Velocità ventilatore al minimo (%)	233	05	05	01	01	01	01
Velocità ventilatore maxi riscaldamento (%)	234	85	85	80	80	80	80
Velocità ventilatore maxi sanitario (%)	232	98	98	89	89	89	89
Diaframma valvola gas (ø)		NO	3,80	NO	4,50	NO	5,20
Consumi max/min (15°C, 1013 mbar) (nat - m ³ /h) (GPL - kg/h)	max sanitario	2,65	1,94	3,17	2,33	3,65	2,68
	max riscaldamento	2,33	1,71	2,96	2,17	3,28	2,41
	min	0,58	0,43	0,69	0,50	0,74	0,54

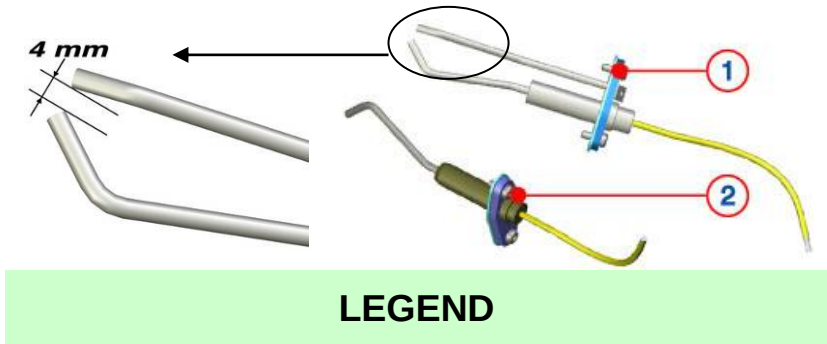
5.4 THE FUME DISCHARGE SYSTEM

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.

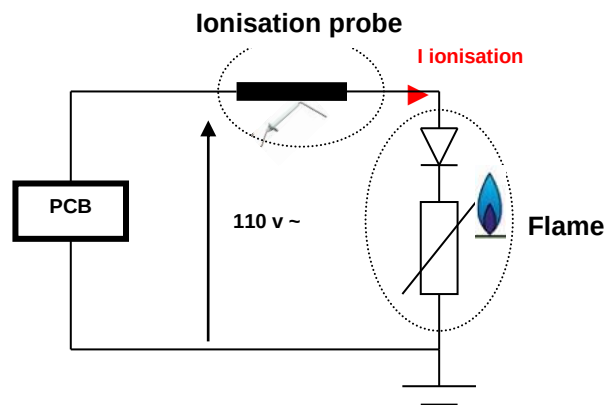
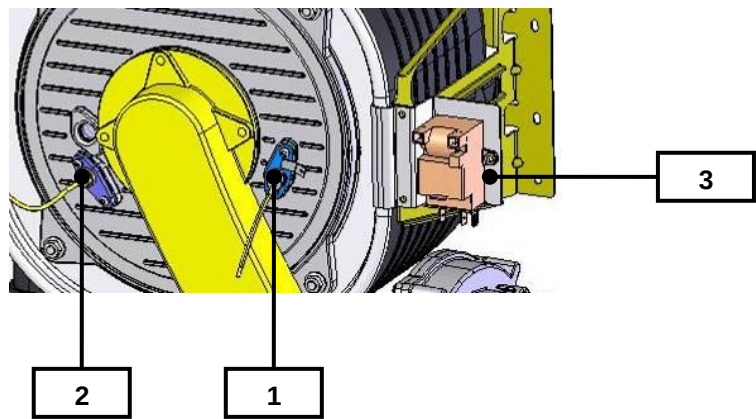


5.5 IGNITER / ELECTRODE PROBES

Ionisation current more than 1 μ A



The spark generator produces the high voltage (14 Kv) between the two ignitions probes. The ionisation probe detects the presence of the flame in the burner Ionisation current more than 1 μ A. If the signal disappears, three attempts are made to try to ignite the burner.

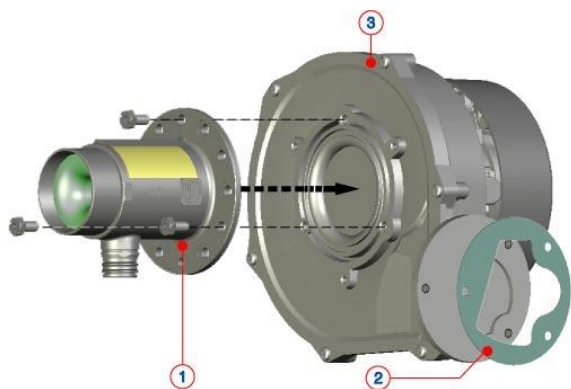


LEGEND	
2. Ionisation probe	
1. Ignition probes	
3. Spark generator	

5.6 MODULATING SPEED VENTILATOR

The VENTILATOR 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. It is possible to display the ventilator rpm measured by means of parameter **2 82**.



LEGEND

1. Mixer system
2. Gasket
3. Ventilator

Ventilator & mixer venture according to the model

Power	Ventilator	Mixer venture diameter
24 KW	EBM RG 128 45 W	Ø 17 mm
30 KW	EBM RG 128 45 W	Ø 21 mm
35 KW	EBM RG 128 45 W	Ø 25 mm

5.7 EXHAUST SYSTEMS

The boiler is arranged for both coaxial smoke exhaust 60/100mm and for the split 80/80mm (two ways to connect the intake pipes). Combustion analysis intakes are built-in the smoke exhaust neck.



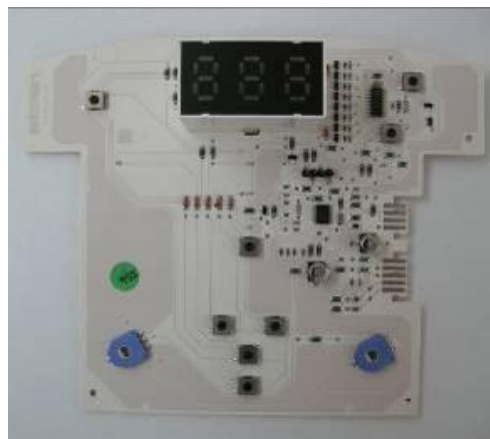
	Type	Ø (mm)	Material	24 KW	30 KW	35 KW
Coaxial system	C13 xx C43	60/100	Al/PP	12 m	10 m	8 m
	C13 xx	80/125	Al/PP	36 m	30 m	24 m
	C33 xx	80/125	Al/PP	42 m	35 m	28 m
Twin flue	C13 xy	80/80	PP	36 m (x=y)	30 m (x=y)	24 m (x=y)
	C33 xy	80/80	PP	60 m (x=y)	50 m (x=y)	40 m (x=y)
	C53 C83	80/80	PP	84 m(x=y)	70 m (x=y)	56 m (x=y)
	B23 B23 p	80/80	PP	60 m (y)	50 m (y)	40 m (y)

6 ELECTRIC AND ELECTRONIC SYSTEM

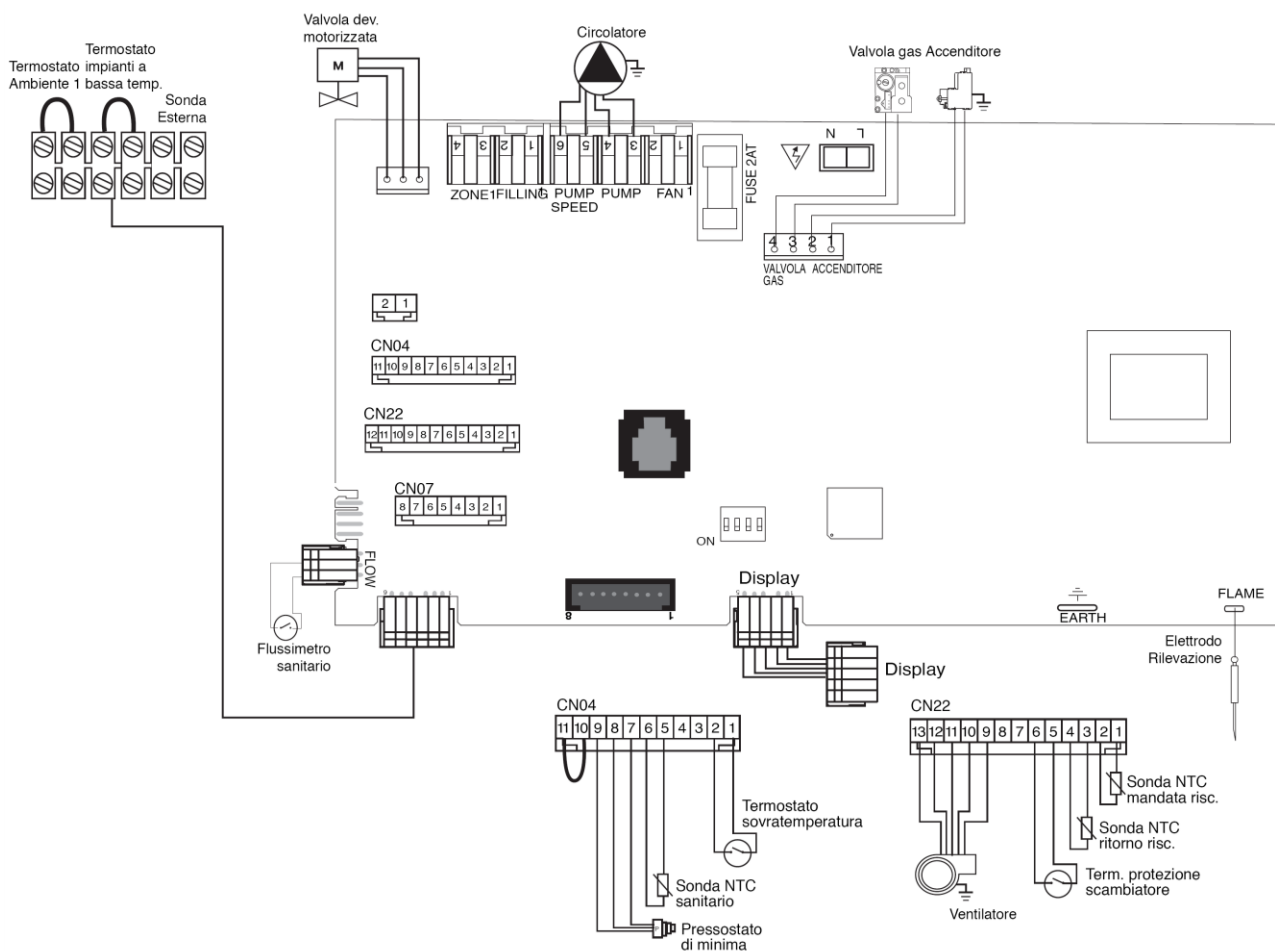
6.1 MAIN CARD (till June 2009)

The boiler uses a **GALILEO-MCU** electronic card for complete checking of the boiler and one users interfaces display LCD;

The **GALILEO-MCU** 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.



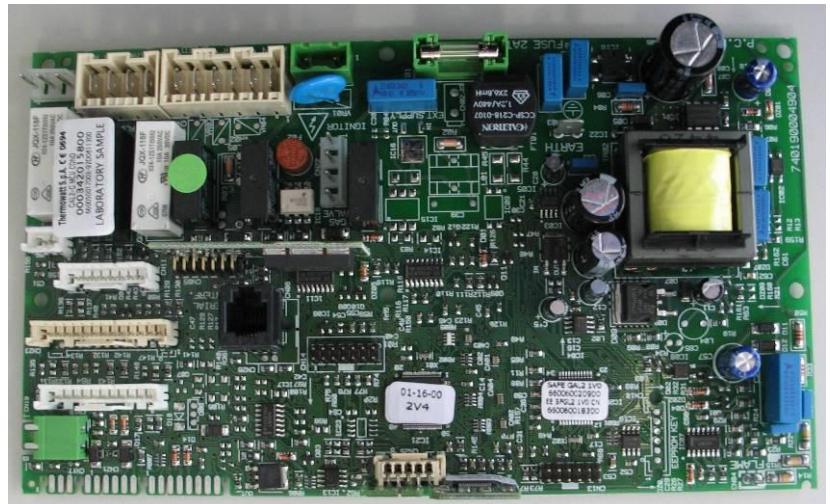
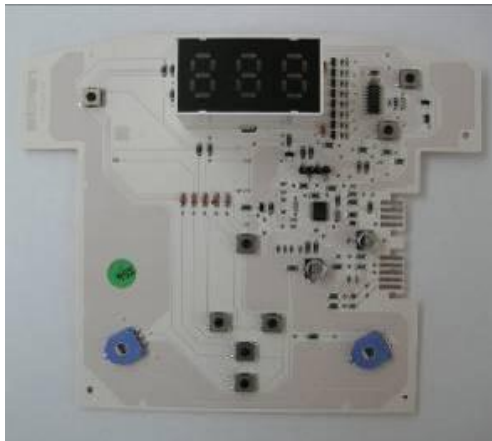
6.1.1 ELECTRIC DIAGRAM (till June 2009)



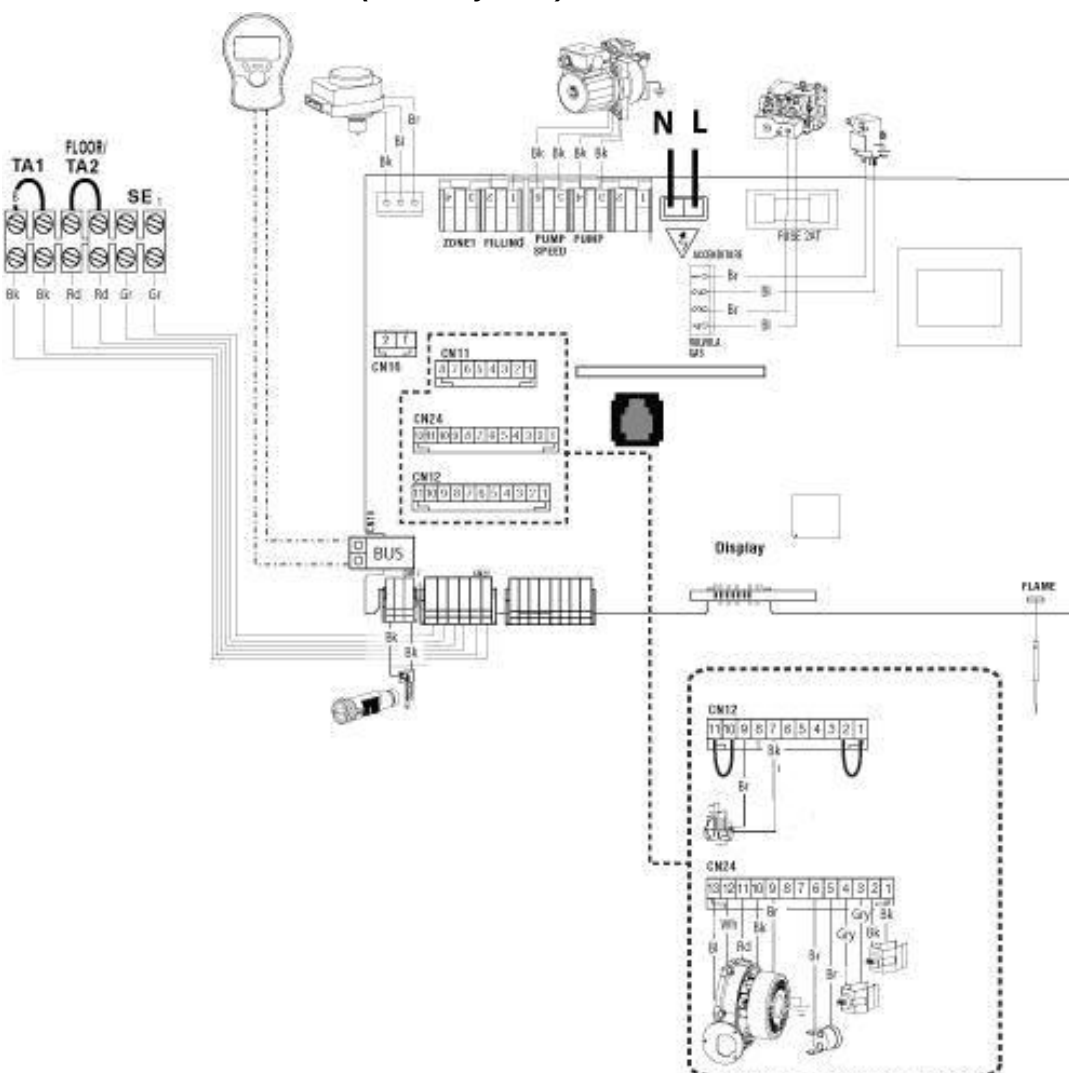
6.2 MAIN CARD (from July 2009)

The boiler uses a **GAL2-MCU** electronic card for complete checking of the boiler and one users interfaces display LCD;

The **GAL2-MCU** 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.



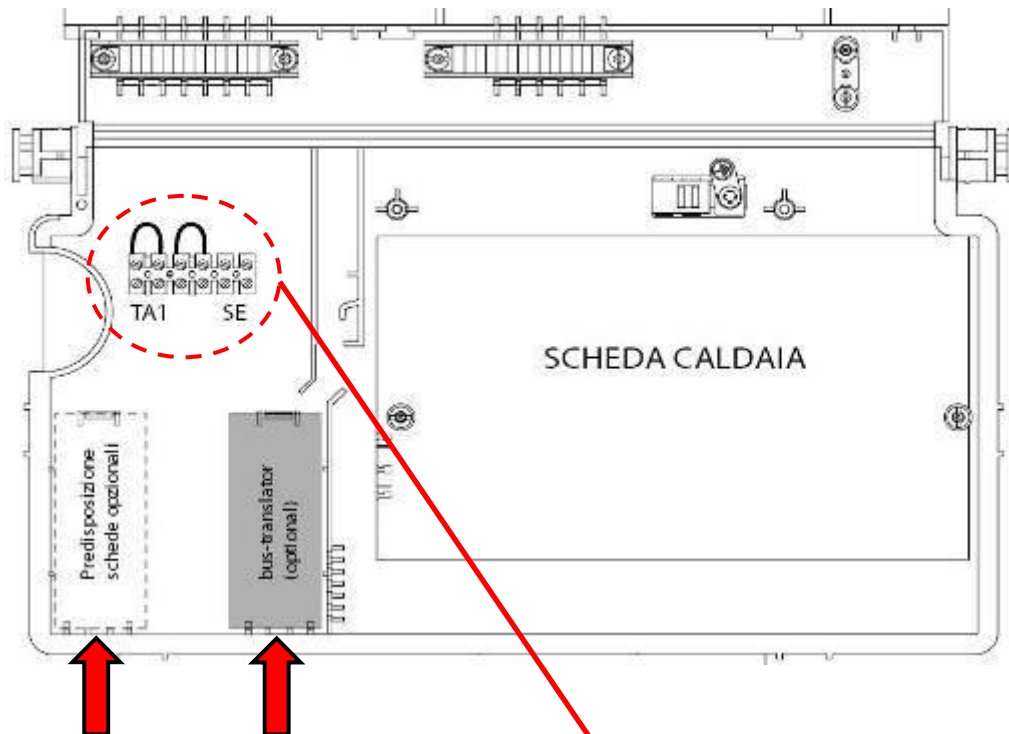
6.2.1 ELECTRIC DIAGRAM (from July 2009)



6.3 PERIPHERALS CONNECTION

It is possible to connect the peripherals below:

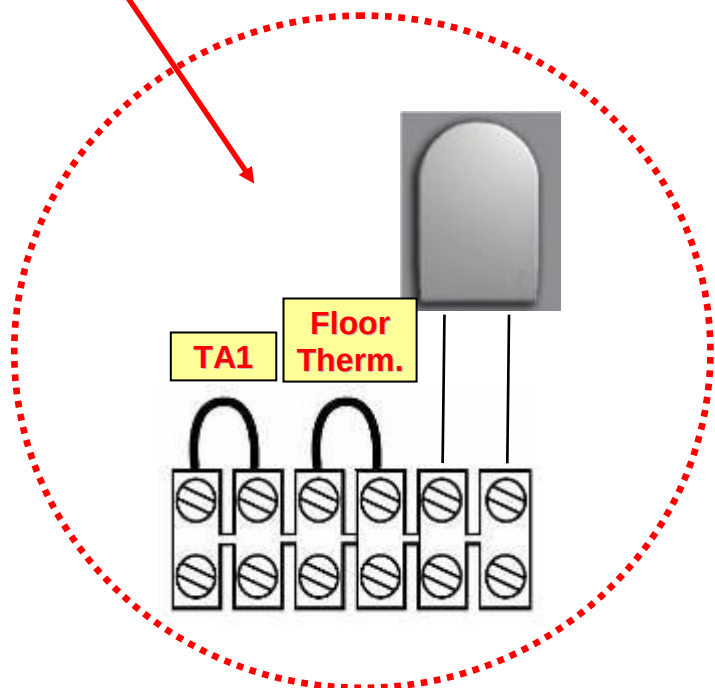
- Room thermostat;
- Crono-thermostat (available also wireless version);
- Room sensor (available also wireless version);
- External sensor;
- Remote control Remocon.



Clip-in 2 zones
or Solar



Bus



7 MENU AND SETTINGS

To set-adjust and visualize the parameters that regulate the operating logic, the CLAS PREMIUM version boiler has several menus.

The technicians (and sometimes even the user) can find below the description of all the programs on the menu.

7.1.1 How to access "MENU"

1. Press button "MENU/OK", "0" will be displayed			
2. To reach menu, press button "+" or "-", the different menus will be displayed, as follows ("+": "0" - "1" - "2" - etc.; "-": "0" - "8" - "7" - etc.)			
3. To access menu press button "MENU/OK". To enter in the technician menu needs access code: select 234 and after press button "MENU/OK".			
4. With "+" or "-" you can scroll through the selected sub-menu (i.e.: "2 1" - "2 2" - "2 3" - ..etc.). To access sub-menu press button "MENU/OK".			
5. With "+" and "-" buttons you can scroll the parameters of menu.			
<i>follows ▼</i>			

6. Per modificare il parametro selezionato premere il tasto "MENU"/OK" e poi mediante i tasti "+" e "-" si può modificare il valore.	
7. Per memorizzare il parametro modificato premere il tasto "MENU"/OK"	
8. Per uscire dal menù premere il tasto "ESC"	

7.1.2 Description of the programs on MENU 2: BOILER PARAMETERS

Menu	Sub-Menu	Parameter	Operation	Regulating range	Default value
2	1		<u>ACCESS CODE</u>	With knob 11 (turn counter clockwise) set: 2 3 4 then press 'MENU/OK'	222
2	2		<u>BOILER GENERAL SETTING</u>		
2	2	0	Slow ignition as a % of the maximum output	0 ÷ 99	60
2	2	1	Minimum room temperature for antifreeze activation (°C) (When MTS room sensor fitted)	2 ÷ 10	5
2	2	3	Floor thermostat or Room thermostat zone 2 selection	0: Floor thermostat 1: Room thermostat zone 2	0
2	2	5	Heating delay. To allow external devices to open/activate (clip in 2 zone necessary)	0: disabled 1: 10 seconds 2: 90 seconds 3: 210 seconds	0
2	2	8	Boiler version	0: combi 1: With external tank 2: System boiler (Non Combi) 3: Micro-storage 4: Internal stratification tank 5: Internal storage boiler	0
follows ▼					

2	3		<u>CENTRAL HEATING – 1</u>		
2	3	1	Maximum central heating power (Percentage of max output set at 234) (%)	0 ÷ 99	60
2	3	2	Maximum DHW power	0 - 99	See paragraph 5.3.1
2	3	3	Minimum boiler power	0 - 99	See paragraph 5.3.1
2	3	4	Maximum absolute heating power (Max output of CH)	0 - 99	See paragraph 5.3.1
2	3	5	Restart period after boiler has reached max temp. (request on)	0: manual (set with par. 2 36) 1: automatic	1
2	3	6	Heating delay (min), enabled by parameter. 2 35= 0	0 ÷ 7	3
2	3	7	Heating post-circulation (min)	0 ÷ 15 CO: constant	3
2	3	8	Pump speed on heating	0: Fixed at minimum 1: Fixed at maximum 2: Either Min or max depending on ΔT	2
2	3	9	ΔT for pump modulation (°C)	10 ÷ 30	20
2	4		<u>CENTRAL HEATING – 2</u>		
2	4	3	Heating post-ventilation	0: 5 sec 1: 3min	0
2	4	4	Boost time (min)	0 ÷ 60 (min) (with Auto function working)	16
2	4	7	Heating water pressure detection device	0: temperature probes only 1: pressure switch 2: pressure sensor	2
2	5		<u>SANITARY</u>		
2	5	0	Sanitary comfort function	0: disabled 1: enabled for 30 minutes after the last demand 2: Enabled constantly for one comfort selection only (default back to (1) by pressing comfort button.	0
2	5	1	Comfort anticycle (min)	1 ÷ 30	0
2	5	2	Sanitary delay start (anti water hammering) (1/10s)	5 ÷ 200	05
2	5	3	Sanitary switch off logic	0: anti-scale (62 or 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	9		<u>RESET MENU' 2</u>		
2	9	0	Reset menu 2 factory setting	YES: press button "MENU'/OK" NO: press button "ESC"	

7.1.3 Description of the programs on MENU 3: SOLAR AND STORAGE

Menu	Sub-Menu	Parameter	Operation	Regulating range	Default value
3	0		<u>GENERAL SETTING</u>		
3	0	0	Storage set-point temperature (°C)	40 – 65	60
3	0	1	Storage-out Delta temperature setting	5 - 25	15
3	1		<u>ACCESS CODE</u>	With button “+” or “-” set: 2 3 4	222
3	2		<u>SPECIAL SETTING</u>		
3	2	0	Anti-legionella function	0: disabled 1: enabled	0
3	2	1	Solar configuration type	0: nothing or single coil natural circulation 1: single coil forced circulation 2: double coil	0
3	2	2	Electrical mixing valve	0: OFF 1: ON	0
3	2	3	Collector Delta temperature for pump on (°C)	0 - 30	8
3	2	4	Collector Delta temperature for pump off (°C)	0 – 30	2
3	2	5	Minimum collector temperature for pump on (°C)	10 - 90	30
3	2	6	Collector kick	0: Off 1: On	0
3	2	7	Cooling function	0: disabled 1: enabled	0
3	2	6	“contribution Chaudière maxi” (°C)	0 - 20	10
3	2	9	Collector frost protection temperature (°C)	- 20 to 5	- 20

7.1.4 Description of the programs on “MENU 4”: ZONE 1 PARAMETERS

Menu	Sub-Menu	Parameter	Operation	Regulating range	Default value
4	0		<u>ZONE 1 TEMPERATURE SET-POINT</u>		
4	0	0	Comfort temperature setting zone 1 heating (°C)	10 ÷ 30	19
4	0	1	Economic temperature setting zone 1 heating (°C)	10 ÷ 30	16
4	0	2	Fixed temperature regulation (if par. 421= 0) (°C)	20 ÷ 82 (with Auto function working)	40 (par. 420=0) 70 (par. 420=1)
4	1		<u>ACCESS CODE</u>	With button “+” or “-” set: 2 3 4	222
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	Enabled thermoregulation by the sensors	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 ÷ 3_5 (with Auto function working)	0_6 (par 420=0) 1_5 (par 420=1)
4	2	3	Select thermoregulation curve parallel shifting (°C)	-20 to +20 (with Auto function working)	0
4	2	4	Influence of the room probe on thermoregulation (°C)	0 ÷ 20 (with Auto function working)	20
4	2	5	Zone 1 maximum heating temperature (°C)	35 to 85	45 (par. 420=0) 82 (par. 420=1)
4	2	6	Zone 1 minimum heating temperature (°C)	20 to 85	20 (par. 420=0) 35 (par. 420=1)
4	3		<u>DIAGNOSTICS</u>		
4	3	0	Room temperature zone 1 (°C)	0 to 40 (only visualization)	
4	3	1	Set temperature zone 1	(only visualization)	
4	3	2	Heating request by zone 1	OFF: no ON: yes (only visualization)	
4	3	3	Pump zone 1 status	OFF ON (only visual)	
4	4		<u>ZONE 1 DEVICES</u>		
4	4	0	Pump zone 1 control	OFF ON	

7.1.5 Description of the programs on “MENU 5”: ZONE 2 PARAMETERS

Menu	Sub-Menu	Parameter	Operation	Regulating range	Default value
5	0		<u>ZONE 2 TEMPERATURE SET-POINT</u>		
5	0	0	Comfort temperature setting Zone 2 heating (°C)	10 ÷ 30	19
5	0	1	Economic temperature setting Zone 2 heating (°C)	10 ÷ 30	16
5	0	2	Fixed temperature regulation (if par. 521= 0) (°C)	20 ÷ 82 (with Auto function working)	40 (par. 520=0) 70 (par. 520=1)
5	1		<u>ACCESS CODE</u>	With button “+” or “-” set: 2 3 4	222
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	Enabled thermoregulation by the sensors	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 ÷ 3_5 (with Auto function working)	0_6 (par 520=0) 1_5 (par 520=1)
5	2	3	Select thermoregulation curve parallel shifting (°C)	-20 to +20 (with Auto function working)	0
5	2	4	Influence of the room probe on thermoregulation (°C)	0 ÷ 20 (with Auto function working)	20
5	2	5	Zone 2 maximum heating temperature (°C)	35 to 85	45 (par. 520=0) 82 (par. 520=1)
5	2	6	Zone 2 minimum heating temperature (°C)	20 to 85	20 (par. 520=0) 35 (par. 520=1)
5	3		<u>DIAGNOSTICS</u>		
5	3	0	Room temperature Zone 2 (°C)	0 to 40 (only visualization)	
5	3	1	Outlet temperature Zone 2	(only visualization)	
5	3	2	Return temperature zone 2	(only visualization)	
5	3	3	Set temperature zone 2	(only visualization)	
5	3	4	Heating request by zone 2	OFF: no ON: yes (only visualization)	
5	3	5	Pump zone 2 status	OFF ON (only visual)	
<i>follows ▼</i>					

5	4		<u>ZONE 2 DEVICES</u>		
5	4	0	Operation mode-test zone 2	0= off 1= on	0
5	4	1	Zone 2 valve control	0= off 1= open 2= close	0
5	4	2	Zone 2 pump control	0=off 1= on	0
5	4	3	Zone 2 Kp valve control	0 ÷ 30	7
5	5		<u>MULTIZONE</u>		
5	5	0	Hydraulic compensator temperature	0 ÷ 120	
5	5	1	Flow temperature offset	0 ÷ 40	5

7.1.6 Description of the programs on “MENU 7”: TEST AND UTILITY

Menu	Sub-Menu	Parameter	Operation	Regulating range	Default value
7	0	0	Flue cleaning function	t ⁺ Max sanitary thermal capacity t ⁻ Max heating thermal capacity t _{min} Min thermal flow capacity	t ⁻
7	0	1	Air Purge function	Puss Menù/OK button to activate	

7.1.7 Description of the programs on “MENU 8”: PARAMETERS AND ASSISTANCE

Menu	Sub-Menu	Parameter	Operation	Regulating range	Default value
8	1		<u>ACCESS CODE</u>	With button “+” or “-” set: 2 3 4	222
8	2		<u>BOILER</u>		
8	2	1	Ventilator state	0: Off ; 1: On (only visualization)	
8	2	2	Ventilator speed	Fan speed X 100 (only visualization)	
8	2	3	Pump state	0: Off ; 1: On V2 ; 2: On V3 (only visualization)	
8	2	4	3-way valve position	0= Sanitary; 1= Heating (only visualization)	
8	2	5	Sanitary flow meter (l/min)	(only visualization)	
follows ▼					

8	3		<u>BOILER'S TEMPERATURE</u>		
8	3	0	Temperature set on heating (°C)	(only visual)	
8	3	1	Temperature measured on heating delivery (°C)	(only visual)	
8	3	2	Temperature measured on heating return (°C)	(only visual)	
8	3	3	Temperature measured on sanitary (°C)	(only visual)	
8	4		<u>SOLAR AND STORAGE (if present)</u>		
8	4	0	Storage measured temperature (°C)	(only visualization)	
8	4	1	Solar collector temperature (°C)	(only visualization)	
8	4	2	Sanitary inlet temperature (°C)	(only visualization)	
8	4	3	Storage probe temperature low (°C)	(only visualization)	
8	4	5	Solar pump run time	(only visualization)	
8	4	6	Collector overheat temperature time	(only visualization)	
8	5		<u>SERVICE</u>		
8	5	4	Hardware version main board	(only visual)	
8	5	5	Software version main board	(only visual)	
8	5	6	Software version bus translator	(only visual)	
8	6		<u>STATISTICS</u>		
8	6	0	Hours burner on in heating (h)	(only visualization)	
8	6	1	Hours burner on in sanitary (h)	(only visualization)	
8	6	2	Number of flame faults	(only visualization)	
8	6	3	Number of ignition cycles	(only visualization)	
8	6	5	Heating request duration	(only visualization)	
8	8		<u>ERROR HISTORY</u>		
8	8	0	Last 10 errors	In sequence for every error are visualized the information described in the following example : E-0 : error number (E-0 ÷ E-9) 108 : error code A 15 : day when the error E-0 is occurred B 09 : month when the error E-0 is occurred (September) C06 : year when the error E-0 is occurred (2006) D XX : not used	
8	8	1	Reset error list	YES: press button "MENU"/OK" NO: press button "ESC"	

8 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 codes

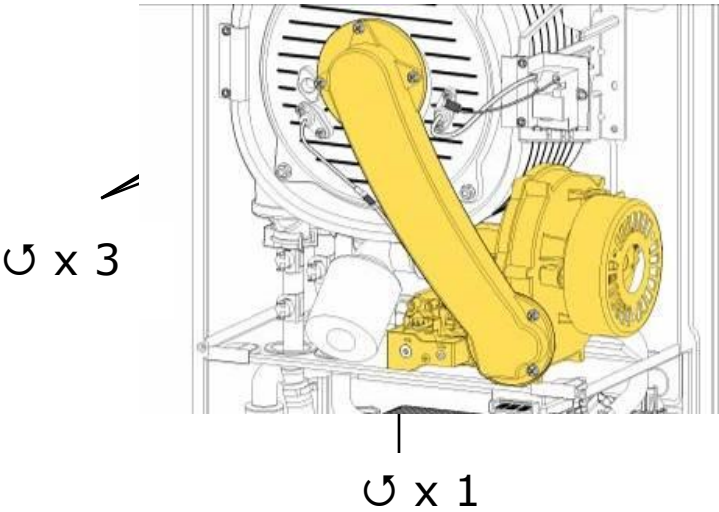
The error codes are divided in six different functional units, in other words the first figure indicates which functional unit of the boiler is involved in the error:

1. Primary circuit;
2. Sanitary circuit;
3. Electronic card;
4. Communication with peripherals;
5. Ignition and detection;
6. Air inlet / Smoke outlet.
7. Zones

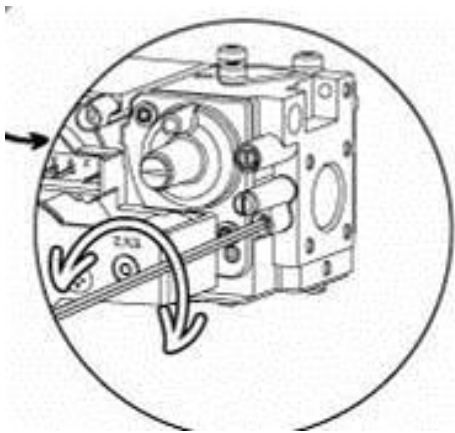
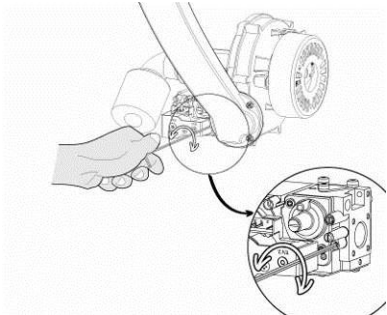
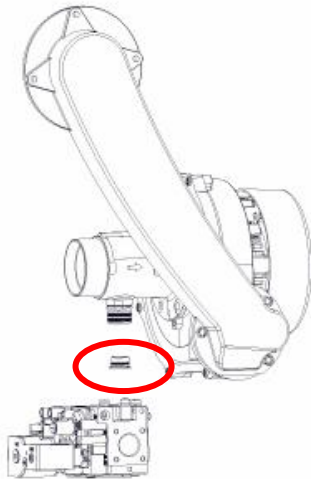
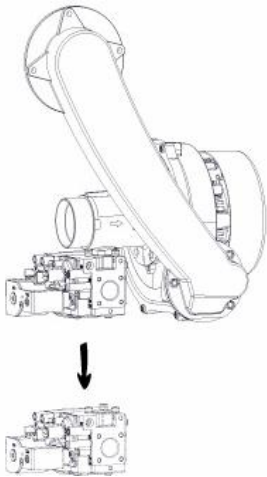
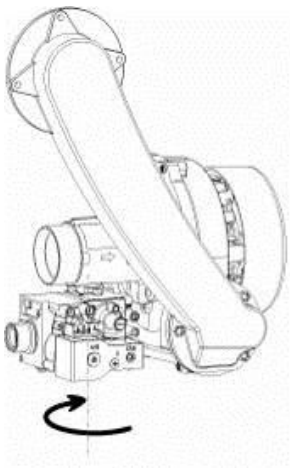
Display	Description	Reset
<i>PRIMARY CIRCUIT</i>		
1 01	Overheat	Reset
1 02	Heating proportional pressure short circuit or open circuit	No Reset
1 03	Circulation or presence of water: Gradient Tman > 7°C/sec for 3 times	Reset
1 04	Circulation or presence of water: Gradient Tman > 20°C/sec or Gradient 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 not having the auto-filling	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 having the auto-filling	No Reset
1 12	Heating return probe open circuit or no signal (NTC2)	No Reset
1 14	Outdoor probe open circuit or no signal	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
1 P5	First filling cycle failed (the pressure of the boiler did not rise): try filling again by pressing the proper button	Signalling
1 P6	Pressure stability control failed: try filling again by pressing the proper button	Signalling
1 P7	More than 5 fillings in 50 minutes, filling button disabled (ON/OFF to reset)	ON/OFF
1 P8	More than 6 fillings in 7 days, filling button disabled (ON/OFF to reset)	ON/OFF
<i>SANITARY CIRCUIT</i>		
2 01	Sanitary probe open circuit or no signal (NTCs)	No Reset
2 02	Tank low sensor open circuit or no signal (solar)	No Reset
2 03	Tank sensor open circuit or no signal	No Reset
2 04	Solar collector sensor open circuit or no signal	No Reset
2 05	Sanitary inlet probe open circuit (solar)	No Reset
2 06	Sanitary inlet probe short circuit (solar)	No Reset
2 07	Solar manifold overheat	No Reset
2 08	Solar manifold temperature low	No Reset
2 09	Not used	/

<i>PCB</i>		
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
<i>COMMUNICATION WITH PERIPHERALS</i>		
4 01	Communication error between modem and BUS	No Reset
4 02	Modem error GPRS/GSM	No Reset
4 03	Sim Card modem error	No Reset
4 04	Communication error between modem and card	No Reset
4 05 / 4 06	Modem error	No Reset
4 07	Room probe open circuit	No Reset
4 08	Room probe short circuit	No Reset
<i>IGNITION AND DETECTION</i>		
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
5 P4	3 flame detachments detected in one operation cycle	ON/OFF
<i>AIR INLET / FUME OUTLET</i>		
6 10	Thermal fuse contact open	Reset
6 12	Fan turns too slow or wire not connected	Reset
<i>ZONES</i>		
7 01	Heating delivery probe zone 2 open or short circuit	No Reset
7 02	Heating return probe zone 2 open or short circuit	No Reset
7 03	Heating delivery probe zone 3 open or short circuit	No Reset
7 04	Heating return probe zone 3 open or short circuit	No Reset
7 05	Hydraulic separator probe open or short circuit	No Reset
7 06	Zone 2 overheating	No Reset
7 07	Zone 3 overheating	No Reset

9 GAS TRANSFORMATION



Type of gas	Model		
	24 KW	30 KW	35 KW
G20 20 mb	NO	NO	NO
G25 25 mb	NO	NO	NO
G31 37 mb	Ø 4,15 mm	Ø 4,60 mm	Ø 4,60 mm



Remark : The combustion must be controlled after each transformation. See table attached.

Type of gas	CO2 value		
	24 KW	30 KW	35KW
G20 20 mb	9,0% + - 0,2%	9,0% + - 0,2%	9,0% + - 0,2%
G31 37 mb	10,7% + - 0,2%	10,0% + - 0,2%	10,0% + - 0,2%

10 FIRST IGNITION OPERATION

1. Check the electrical supply.

Complete

2. Check the type of gas and change the gas if necessary.

Complete

3. Check the gas tightness.

Complete

4. Measure the gas inlet.

Complete

5. Check the exhaust fume.

Complete

6. Fill the installation.

Complete

7. Check the hydraulic water tightness.

Complete

8. Spin the pump.

Complete

9. Purge the air with once pressing on ESC button during 5 sec.

Complete

10. Set the heating power.

Complete

11. Adapt the regulation at the heating installation.

Complete

12. Balance the central heating circuit.

Complete

13. Check the working in DHW mode.

Complete

14. Adjust DHW flow rate on the boiler (if necessary).

Complete

15. Make a combustion rate with once pressing on RESET button during 5 sec

16. Check the ionisation current.

Complete

17. Explain to the end user the working of the boiler.

Complete

11 PERIODICAL CHECKING

Plate heat exchanger

When : Every year

How : To measure DT according to data inside the training module.



By pass & Safety valve

When : Every year

How : Visual aspect / Cleanness



Primary filter

When : Every year

How : Visual aspect / Cleanness



Expansion vessel

When : Every year

How : Pressure air up to 1 b



Flowswitch function

When : Every year

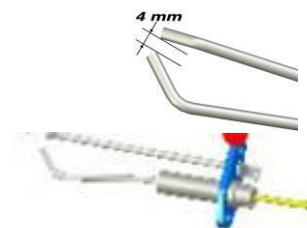
How : Flow rate / Visual aspect / Cleanness



Ignition & ionisation probes

When : Every year

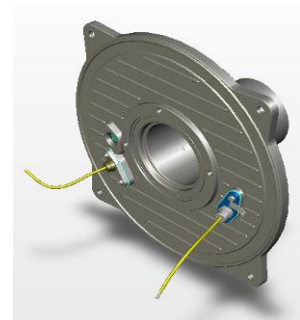
How : Visual aspect / Cleanness / Distance with the burner / Ionisation current more than 1 μ A



Burner

When : Every year

How : Visual aspect / Cleanness / Flame aspect



VENTILATOR

When : Every year

How : Visual aspect – Turbine / Cleanness



Primary Heat exchanger

When : Every year

How : Visual aspect / Cleanness



Condensate trap

When: Every year or after primary heat exchanger cleaning

How : Visual aspect / Cleanness



Pump

When: At the first ignition and every year

How: Check that the aerator tap is always open



12 TECHNICAL DATA TABLE

General notes	Model name		CLAS PREMIUM 24 FF	CLAS PREMIUM 30 FF	CLAS PREMIUM 35FF
	CE certification (pin)				
	Boiler type		C13 C33 C43 C53 C63 B23p B33		
Energetic performance	Nominal heat input max/min (60/80°C) (Hi)	kW	22,0/5,5	28,0/6,5	31,0/7,0
	Nominal heat input max/min (60/80°C) (Hs)	kW	24,4/6,1	31,1/7,2	34,4/7,8
	Sanitary heat input max/min (60/80°C) (Hi)	kW	25,0/5,5	30,0/6,5	34,5/7,0
	Sanitary heat input max/min (60/80°C) (Hs)	kW	27,7/6,1	33,3/7,2	38,3/7,8
	Thermal power max/min (60/80°C)	kW	21,0/5,0	27,0/6,0	30,0/6,0
	Sanitary thermal power max/min		25,0/5,0	30,0/6,0	35,0/6,0
	Combustion efficiency	%	98,0	98,0	98,0
	Efficiency at the nominal heat input (60/80°C) Hi/Hs	%	97,5/87,8	97,5/87,8	97,5/87,8
	Efficiency at the nominal heat input (30/50°C) Hi/Hs	%	107,0/96,3	107,0/96,3	107,0/96,3
	Efficiency at 30% 30°C Hi/Hs	%	107,0/96,3	107,0/96,3	107,0/96,3
	Efficiency at 30% 47°C Hi/Hs	%	101,0/90,9	99,0/89,1	99,0/89,1
	Efficiency at minimum Hi/Hs	%	95,0/85,5	95,0/85,5	95,0/85,5
	Efficiency stars (dir. 92/42/EEC)	n°	4	4	4
	Rating sedbuk	Class	A	A	A
	Maximum heat loss to casing ($\Delta T=50^{\circ}\text{C}$)	%	0,5	0,5	0,5
Emissions	Heat loss to flue with burner in function	%	2	2	2
	Heat loss to flue with burner off	%	0,2	0,2	0,2
	Flue gas maximum flow (G20)	kg/h	11,4	13,7	15,2
	Minimum draught	Pa	-	-	-
	Flue gas temperature (G20)	°C	65,0	65,0	65,0
	CO ₂ contents (G20)	%	9,0	9,0	9,0
	CO contents (0%O ₂)	ppm	100	100	100
	O ₂ contents	%	4,5	4,5	4,5
Heating circuit	Nox class	n°	5	5	5
	Air excess	%	1,27	1,27	1,27
	Water side pressure loss (max) $\Delta T=20^{\circ}\text{C}$	mbar	1,8/950	0,7/1160	2,1/1290
	System residual head	bar	0,25	0,25	0,25
	Heating maximum pressure	bar	3	3	3
	Expansion vessel capacity	litres	8	8	8
	Expansion vessel pre-load	bar	0,7	0,7	0,7
	Max water content in the system ($\Delta T_{\text{max}} 75^{\circ}\text{C rad} / \Delta T 35^{\circ}\text{C pannelli}$)	Litres	100/300	100/300	100/300
Sanitary circuit	Heating temperature max/min (high temp. range)	°C	85/35	85/35	85/35
	Heating temperature max/min (low temp. range)	°C	50/20	50/20	50/20
	Sanitary temperature max/min	°C	60/36	60/36	60/36
	Sanitary specific flow (10 min. with $\Delta T=30^{\circ}\text{C}$)	Litres/min	12,0	15,0	16,7
	Quantity of hot water $\Delta T=25^{\circ}\text{C}$	Litres/min	14,4	18,0	20,0
	Quantity of hot water $\Delta T=35^{\circ}\text{C}$	Litres/min	10,3	12,8	14,3
	Confort performance stars (EN13203)	n°	3	3	3
Condensate	Minimum hot water flow	Litres/min	<2	<2	<2
	Sanitary pressure max/min	bar	10/0,3	10/0,3	10/0,3
Electrical data	Maximum production of condensate	Litres/h	2,4	2,4	2,4
	Condensate PH	PH	2,6	2,6	2,6
Weight and dimensions	Supply voltage frequency	V/Hz	230/50	230/50	230/50
	Total electrical power absorbed	W	120	130	150
	Electrical system protection	IP	X4D	X4D	X4D
Weight and dimensions	Weight	kg	32	35	35,5
	Dimensions (A x L x P)	cm	770/400/315	770/400/385	770/400/385