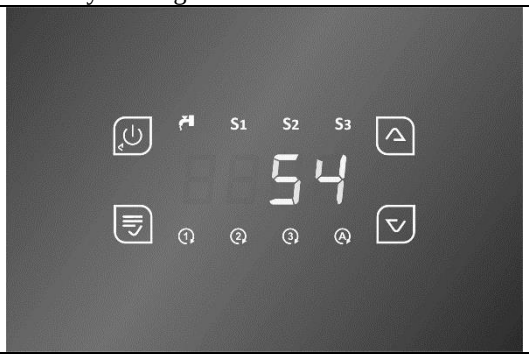
GLH110 Temperature Controller — User Manual

1. MAIN FEATURES

The **GLH110** Temperature Controller manages Wood Fireplaces and Boilers, for heating and domestic hot water production, with the possibility to integrate it to a Gas Boiler.



Safety Rules

Read carefully the following safety regulations, in order to prevent accidents to people and things.

Before working on the hydraulic plant, please be aware of the following:

- Accident prevention measures
- Environmental protection measures
- National Institute for Work accidents measures
- Recognized prevention measures
- This manual is intended for qualified technical staff only
- Electrical wiring and connection must be performed by qualified technicians only
- The first installation of the hydraulic plant must be performed expert personnel

Declaration of Conformity

Regulations:
EN 60730-1 50081-1
EN 60730-1 A1 50081-2

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CE

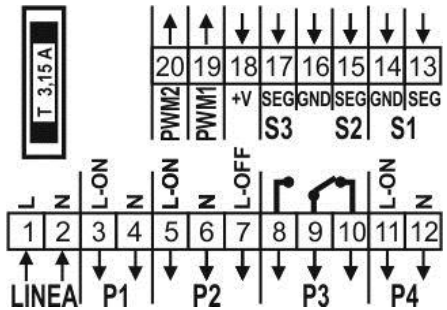
Technical data		**Mechanical Characteristics**	**Installation conditions and Use**
Supply:	230 Vac 50 Hz ± 10%	Material: PA	Operating Temperature: 0÷40 °C
Absorption:	2,5 VA	Flush mount Installation: 3 Modules/ Wall	Storage Temperature:0 ÷ 60 °C
Outputs Range:	5A 250 Vac	Dimensions:Flush mount: 132x68x50 mm	Umidity: 85% @25°C
Internal fuse:	T3,15 A	Degree of Protection:IP40	

2. INSTALLATION

⚠ ***Make sure that the Main Power Supply is OFF, before installing the device***

- Install the product in a dry environment with proper climatic conditions
- Insert a bipolar main switch compliying to local regulations
- Avoid coupling the probe cables with these of power
- Use for wiring, cables with conductors of appropriate section and in according the rules
- Position the probes to detect correctly the temperature
- Make sure the probe wires are placed away from direct/indirect flame

3. ELECTRICAL CONNECTIONS



All the probe inputs and command outputs are controlled automatically according to the type of hydraulic/plumbing plant selected.
For electrical connections
you must refer to Chapter 7 and the following paragraphs concerning the hydraulic/plumbing schematic drawings.

Fig.2 – Electrical connections

	Code	Connectors	Device	Characteristics
INGRESSI	**LINE**	**1 – 2**	Main Power Supply	230 Vac 50 Hz ± 10%
	S1	**13 – 14**	Fireplace Temperature Probe	Operating Range: -50°C ÷ 125 °C NTC 10K Measure: -10 ÷ 110 °C ± 1°C NTC 100K Measure: -10 ÷ 300 °C ± 1°C PT 1000 Measure: -40 ÷ 300 °C ± 1°C Flow switch or Level switch contact ON/OFF
	S2	**15 – 16**	Sanitary (DHW) Boiler /Buffer Probe Flow Switch	
	S3	**16 – 17**	Ambient Probe/Thermostat Buffer, Collector Panel/Level switch	
		16 – 17 – 18	Water Pressure Sensor	Operating Range: 0 ÷3 bar / 0 ÷ 3V
USCITE	**P1**	**3 – 4**	Pump 1	230 Vac 5A
	P2	**5 – 6 – 7**	Diverter Valve / Pump 2	230 Vac 5A
	P3	**8 – 9 – 10**	Boiler Integration Consent	Contact in exchange: COM.(9)-N.O.(8) - N.C.(10)
	P4	**11 - 12**	Service = Thermostat	230 Vac 5A
			Service = Grill	
			Combustion Air Damper	
			Pump 2	
	PWM1	**19 – 16 o 14**	Control PWM1	0-5Vdc, Frequency 1Khz, Duty Cycle 0-100%
	PWM2	**20 – 16 o 14**	Control PWM2	

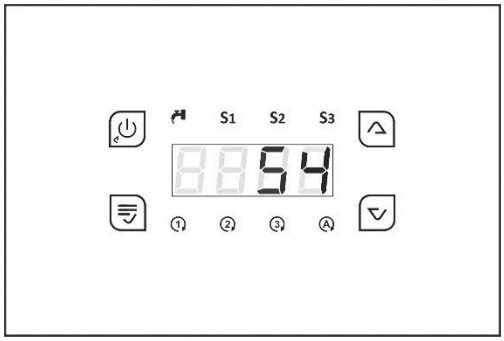
4. Control Panel: USE AND FUNCTIONS

ON/OFF
Exit the Menu
Grill Service
Air Damper Manual Start

K1

Enter User Menu
SET
Shower Key

K2



K3

Scroll/Increase
Pump1 Test
Probes Menu

K4

Scroll/Decrease
Pump2 Test
Probes Menu

Fig. 3 Main Screen

54	S1 Probe Temperature	S1	S1 Probe Displayed
1	P1 Output Activated	S2	S2 Probe Displayed
2	P2 Output Activated	S3	S3 Probe Displayed Fashing: Ambient Thermostat open or Level switch notification
3	P3 Output Activated		
	ON: Flow Switch Closed Fashing: Shower Function Activated	A	P4 Output Activated

5. FUNCTIONALITIES

5.1 ON/OFF

The controller is turned ON/OFF by applying prolongued pressure to **K1** key

- OFF-mode is displayed by **K1** key being turned-on
- When the controller is turned on, the following messages will appear

Product Code: **t001** Product Revision: **r 0.5 o rc0.5** Configuration: **CF01**

5.2 PROBE DISPLAY

The display shows the correct temperature sensor value **S1** (**S1** led is lit up).

- To enter the probe menu press either **K4** or **K3**, the temperature **S2** is displayed (**S2** Led flashes) or **S3** (**S3** Led flashes)
- By pressing **K3** or **K4** it is possible to scroll and check other connected probes
- To exit the Menu press **K1** or wait 10 seconds
- If the probe reading is below the minimum range of the sensor the message **Lo** appears
- If the probe reading is above the maximum range of the sensor the message **Hi** appears

5.3 SAFETY FUNCTION

When this function is activated; **P11**=**1**, it starts a heat disposing process to remove excess heat buildup of the fireplace
The management of the safety feature is expalined in the plumbing/hydraulic schematic drawing parapraphs

5.4 ALARM FUNCTION

If the temperature **S1** exceeds the value of the thermostat alarm **A08**

- An audible and visual signal is activated (the temperature flashes on the Display)
- **SILENCE** Function: The audible signal can be turned off for 5 minutes by pressing any key. If the controller remains in the alarm condition, the audible signal will start again.

5.5 ANTIFREEZE FUNCTION

If the temperature **S1** drops below the value of the Antefreeze Thermopstat **A06**

- The Pump **P1** is activated for time **t01** at time intervals **t02**
- The display shows the message **ICE**

5.6 PUMP P1 ANTISEIZE FUNCTION

If Pump **P1** remains inactive, also while OFF, for a time greater than Timer **t05**

- The output for Pump **P1** is turned-on for **t04** seconds
- The display will show the message **bLP**

5.7 STANDBY FUNCTION

If the controller is **OFF**, and in **ALARM**, **ANTIFREEZE** or **ANTISEIZE FUNCTION** of Pump **P1**

- The controller automatically turns itself **ON**
- At the end of **ANTIFREEZE** or **ANTISEIZE** of Pump **P1** functions, the controller will turn **OFF** itself.
- Al the end of **ALARM** function the controller will remain **ON**.

5.8 PUMP P1 FUNCTIONING TEST

When the controller is **OFF**, prolongued pressure of **K3** key:

- **P1** output is activated for as long as the key is pressed and the display will show **tSt1**

5.9 PUMP P2 FUNCTIONING TEST

When the controller is OFF, prolongued pressure of **K4** key:

- **P2/P4** output is activated for as long as the key is pressed and the display will show **tSt2**

5.10 SERVICE OUTPUT

P4 SERVICE output is programable from the Installer MENU by the parameter **P06**:

- **P06 = 0: DISABLED**: the output does not work.
- **P06 = 1: THERMOSTAT**: the output is activated if the temperature **S1** is above Thermostat **A09.**
- **P06 = 2: GRILL**: press **K1** key to turn On/Off the output.
- **P06 = 3: AIR DAMPER**: this output is used to manage an Air Damper to control the Combustion inlet Air.

5.11 AIR DAMPER

To make use of the Air Damper function set parameter **P06 = 3**
If the output is ON the Air Damper will be Open, if the output OFF the Air Damper will be Closed.

The Air Damper will stay Open as long as the temperature **S1** is below **A05** Thermostat. The Air Damper will close when the temperature is above this Thermostat.

- If **P12 = 1** the **Start Manual** function is enabled:

If **S1** Temperature is below **A01**, the Air Damper will Close. During the Ignition phase of the Fireplace, by pressing **K1** the Air Damper will Open manually (the output corresponding Led will flash). When the Temperature will drop below **A01** Thermostat, after **t06** time the Air Damper will close automatically.

5.12 PROBE TYPE

The controller manages NTC10K, NTC100K and PT1000 probes, configurable through parameters **P01**, **P02**, **P03, P04, P17**

Parameter	*Device*	NTC10K	NTC100K	PT1000
P01	Fireplace Probe	**0**	**1**	**2**
P02	DHW Boiler Probe / Buffer Tank Probe			
P03	Buffer Tank Low Probe			
P04	Ambient Probe			
P17	Solar Collector Probe			

5.13 S3 INPUT CONFIGURATION

The parameter **P05** manages the following type of inputs configuration, according to the hydraulic plant:

P05	**0**	**1**	**2**	**3**	**4**	**5**
Management	Disabled	Water Pressure Sensor	Ambient Probe	Ambient Thermostat	Level Switch N.O.	Level Switch N.C.

5.14 WATER PRESSURE SENSOR

If **P05=1** the water pressure sensor management is enabled on **S3** input.

If **P07=1** the water pressure sensor errors are enabled:

- If Water Pressure < **Pr1** the display will show **PrLo** and a beep will sound.
- If Water Pressure > **Pr2** dispaly will show **PrHi** and a beep will sound audible signal.

5.15 AMBIENT PROBE/THERMOSTAT

Parameter **P05** can be setup to enable the management of the Probe Sensor/Ambient Thermostat

If the Temperature **S3**>**b01** or the Ambient Thermostat is **Open** (**S3** Led flashing) and there is **NO** DHW request

- The Air Damper is **Closed**

In case of hydraulic plants with a Buffer Tank, if the Temperature **S3**>**b01** or the Ambient Thermostat is **Open**

- The Heating Pump will be turned Off (deactivated)

5.16 SHOWER

If **P13=1** is used in specific hydraulic plants where it is required, it can be enabled by pressing **K2** for 3 sec**:**

- The display shows **T03** time (minutes) giving (DHW) Domestic Hot Water priority;
- **K3** and **K4** keys increase /decrease the duration
- Wait 5 seconds to save and exit from this setup.
- To exit without saving press **K1** key.

T03 time is signaled by led flashing, giving priority to DHW production based on the type of hydraulic plant in use.

This function is over in case of **T03** time has expired

- By pressing again **K2** key
- If the temperature **S1** is greater than **A07** Safety Thermostat

In case of **T03=0**, the shower function can be disabled by pressing **K2**.

5.17 SOLAR CIRCUIT

Buffer Tank Loading:

The Solar Pump is activated:

- If the Temperature **S3** >**A33** and **Δ** (**S3**-**S2**) > **d02**

The Buffer Loading is disabled once the Buffer Comfort Thermostat (**A20**) on S2 has been reached..

Collector and Buffer Safety:

If the Temperature of the Collector **S3** > **A35** (Collector Safety Thermostat) the Solar Pump is turned on again and fills the Buffer Tank until **A23** high temp. Thermostat has been reached.

Collector Protection:

If the Collector Temperature **S3** > **A36** (Collector Safety Thermostat) the solar pump is turned Off

Antifreeze:

When this function is enabled (**P09=1**) if the temperature **S3** (even while the controller is **OFF**) falls below the Antifreeze Thermostat **A34**, the Solar Pump is turned On for **t04** time at intervals of **t05** time

5.18 WOOD INTEGRATION PRIORITY (Plants including Buffer Tank)

This feature gives priority to the integration of the fireplace instead of the Gas boiler.

If **P10**=1 priority is given to the wood fireplace in managing the integration of the Buffer Tank instead if the Gas Boiler.

5.19 PUMPS MANAGEMENT WITH PWM CONTROL

P18 and **P19** parameters are used to enable and select the operating mode of the PWM1 and PWM2 signals, to manage the pumps provided in the hydraulic/plumbing schemes:

- **PWM1:** **P18 = 0 → Disabled;** **P18 = 1 → Manual;** **P18 = 2 → Automatic**
- **PWM2:** **P19 = 0 → Disabled;** **P19 = 1 → Manual;** **P19 = 2 → Automatic**

PWM Disabled:

The pumps are controlled exclusively via 230V outputs

PWM Manual:

The PWM duty cycle which determines the speed of the pumps is set with the following parameters:

- **U06** if PWM1 with Heating profile (Fireplace Pump)
- **U16** if PWM2 with Heating profile (Heating Pump)
- **U26** if PWM2 with Solar profile (Solar Pump)

Automatic PWM:

In relation to the type of pump, the PWM duty cycle is calculated on the basis of the temperature of the fireplace probe, high Buffer Tank probe or solar collector probe and can vary within the following ranges:

- Between U01 and U02 if PWM1 with Heating profile (es. 85 ÷ 5 %)
- Between U11 and U12 if PWM2 with Heating profile (es. 85÷ 5 %)
- Between U21 and U22 if PWM2 with Solar profile (es. 15 ÷ 95 %)

Fireplace Pump speed change is enabled within the following temperature range:

- Between A01 and A01+A80 in heating management (ex. if A01=35°C, A80=20°C then range: 35 ÷ 55 °C)
- Between A01 and A01+A81 in DHW management (ex. if A01=35°C, A81=15°C then range: 35 ÷ 50 °C)

Heating Pump Speed change is enabled within the following temperature range:

- Between A04 and A04+A82 (ex. if A04=45°C, A82=20°C then range: 45 ÷ 65 °C)

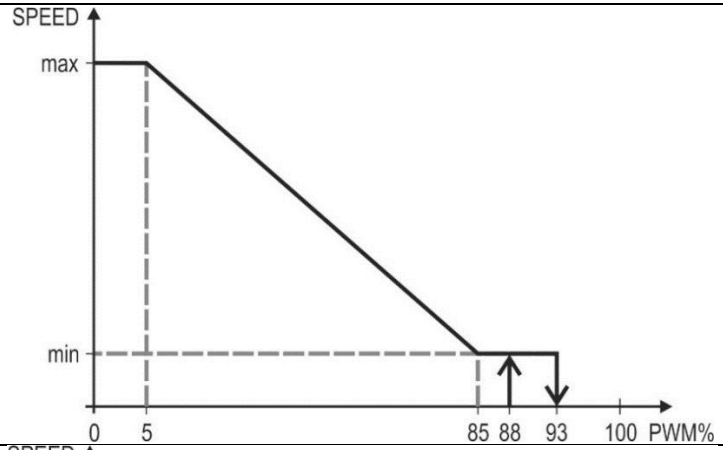
Or if the Buffer Tank is present

- Between A17 and A17+A82 (ex. if A17=45°C, A82=20°C then range: 45 ÷ 65 °C)

Solar Pump speed change is enabled within the following temperature range:

- Between A33 and A33+A82 (ex. if A33=45°C, A82=20°C then range: 45 ÷ 65 °C)

The profile of the PWM signal, Heating or Solar, is selected automatically on the basis of the pump that needs to be managed and the following are the profiles of the pumps that can be found on the market:

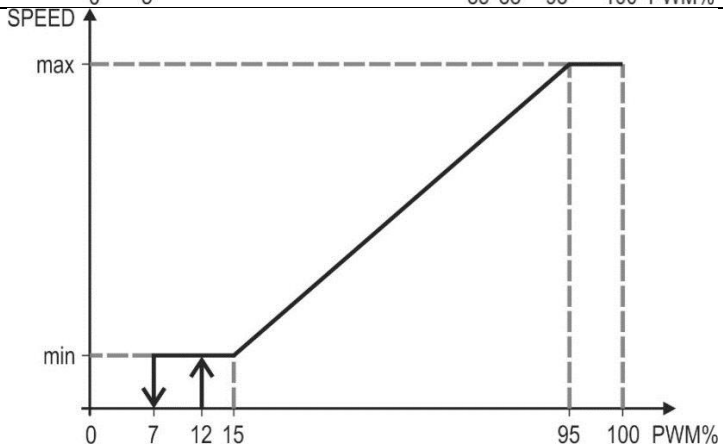


HEATING Profile

On the basis of this profile it is advisable to set the PWM duty cycle parameters as shown below

PWM1
Vmin: U01 <= 85%
Vmax: U02 >= 5%

PWM2
Vmin: U11 <= 85%
Vmax: U12 >= 5%



SOLAR Profile

On the basis of this profile it is advisable to set the PWM duty cycle parameters as shown below:

PWM2
Vmin: U01 >= 15%
Vmax: U02 <= 95%

In the following conditions the PWM can be setup with the following parameters:

- **ANTIFREEZE**: **U03**, **U13** and **U23**
- **SAFETY**: **U04**, **U14** and **U24**
- **ANTISEIZE**: **U05**, **U15** and **U25**

5.20 FLOW SWITCH

In the plants where the flow switch is provided, the type of flow switch can be set using parameter **P33**:

- **P33** = **1**: ON/OFF Flow Switch type
- **P33** = **2**: Flow Switch input through the use of a flow sensor that provides a square waqve signal whose frequency is a function of the flow rate.

In case of use of a flow sensor (**P33**=2), it is possible to set the threshold to define the minimum flow rate for the sanitary water request using parameter **P34**.

Below are the connections for the **ELTEK** sensors (code 10.0884.00.03)

GND = terminal**16**(GND); **OUT** = terminal **15**(SEG); **IN** = terminal **18**(+V)

The sensor has the following behavior of the signal frequency as a function of the flow rate (at 30 ° C):

l/min	2	4	6	8	10	12
Hz	11,9	26,2	40	53,7	67,5	81,8

The choice of the flow rate to be detected is made through parameter **P34** equal to double the corresponding frequency: for example, in the case of a flow rate greater than **2 l/min**, must be set **P34=24**. In case you want to detect the minimum water flow, it is advisable to set **P34=5** in order to detect even a smaller value.

6. MENU'

6.1 MAIN MENU'

To enter into the main menu simply **click** on **K2** key:

- Keys **K3** and **K4** are used to scroll through various parameters signaled by the corresponding flashing led.
- Press **K2** key to modify (the led remains solid while value flashes).
- Keys **K3** and **K4** are used to change the parameter value.
- Press **K2** to save the new value.
- Press **K1** to exit without saving.

Press **K1** again to exit the Menu or wait 30 seconds.

Led	*Description*	*Cod.*	*Min*	*Set*	*Max*	*U.M.*
①	Minimum Temperature thermostat for Fireplace Pump	**A01**	20	**35**	90	[°C]
②	Diverter Valve Thermostat on Fireplace probe	**A02**	20	**45**	90	[°C]
	Heating Pump Thermostat on Fireplace probe	**A04**	20	**45**	90	[°C]
	Heating Pump Thermostat on high Buffer Tank probe	**A17**	20	**45**	90	[°C]
	Service Thermostat on Fireplace probe	**A09**	20	**50**	90	[°C]
	Valve Thermostat for DHW priority	**A24**	20	**70**	90	[°C]
③	Thermostat to activate Integration on Fireplace probe	**A03**	20	**45**	90	[°C]
	Thermostat Integration Buffer Tank on High Buffer Tank Probe	**A19**	20	**45**	90	[°C]
Ⓐ	Heating Pump Thermostat on Fireplace probe	**A04**	20	**45**	90	[°C]
	Service Thermostat on Fireplace probe	**A09**	20	**50**	90	[°C]
	Heating Pump Thermostat on High Buffer Tank probe	**A17**	20	**45**	90	[°C]
S2	DHW Boiler Thermostat on S2	**A18**	20	**50**	90	[°C]
	Buffer Comfort Thermostat on High Buffer Tank probe	**A20**	20	**60**	90	[°C]
S3	Ambient Probe Thermostat on S3	**b01**	5	**20**	50	[°C]
S1+S3	Δ Differential Thermostat Fireplace-Boiler DHW/Buffer	**d01**	5	**20**	2	[°C]

6.2 INSTALLER MENU'

Access to this menu is reserved for expert an qualified personnel only, because if the set parameters are changed this could make the product completely unsuitable for the application.

- To enter into the INSTALLER MENU press at the same time **K2** and **K4** keys for 3 seconds.
- To scroll through the parameter codes use **K3** and **K4** keys.
- To view the value of a parameter and to enter modification mode press **K2** key.
- To modify the value press **K3** and **K4** keys.
- To save the new value press **K2** key.
- To exit without saving press **K1** key.
- Press **K1** again to exit the Menu or wait 60 seconds.

Description	*Cod.*	*Min*	*Set*	*Max*	*U.M.*
Thermostat to close Air Damper on S1 probe	**A05**	20	**75**	90	[°C]
ANTIFREEZE Thermostat on S1 probe	**A06**	-10	**4**	10	[°C]
SAFETY Thermostat on S1 probe	**A07**	60	**80**	90	[°C]
ALARM Thermostat on S1probe	**A08**	80	**90**	99	[°C]
High Temp. Thermostat on high Buffer Tank probe	**A23**	20	**95**	95	[°C]

Solar Pump Activation Thermostat	**A33**	5	**20**	50	[°C]
ANTIFREEZE Thermostat on Collector Probe	**A34**	-10	**4**	10	[°C]
Collector Safety Thermostat	**A35**	60	**120**	180	[°C]
Collector Protection Thermostat	**A36**	60	**140**	180	[°C]
Temperature Delta for automatic management of PWM1 in Heating	**A80**	1	**20**	50	[°C]
Temperature Delta for automatic management of PWM1 in Sanitary/DHW	**A81**	1	**15**	50	[°C]
Temperature Delta for automatic management of PWM2 in Heating	**A82**	1	**20**	50	[°C]
Buffer-Solar Collector Differentail Thermostat	**d02**	5	**20**	2	[°C]
Pressure Sensor Minimum threshold	**Pr01**	500	**3000**	500	[mbar]
Pressure Sensor Maximum threshold	**Pr02**	2000	**3000**	500	[mbar]
P1 Fireplace Pump Hysteresis Thermostat	**IA01**	0	**2**	20	[°C]
P2 Deviator Valve Hysteresis Thermostat	**IA02**	0	**2**	20	[°C]
Boiler Integration Activation Hysteresis Thermostat	**IA03**	0	**2**	20	[°C]
Hysteresis Thermostat of Heating Pump on S1	**IA04**	0	**2**	20	[°C]
Hysteresis Thermostat to Close Air Damper	**IA05**	0	**2**	20	[°C]
ANTIFREEZE Hysteresis Thermostat	**IA06**	0	**1**	20	[°C]
SAFETY Hysteresis Thermostat	**IA07**	0	**1**	20	[°C]
ALARM Hysteresis Thermostat	**IA08**	0	**1**	20	[°C]
SERVICE output activation Hysteresis Thermostat	**IA09**	0	**2**	20	[°C]
Hysteresis Thermostat of Heating Pump on Buffer probe	**IA17**	0	**2**	20	[°C]
Hysteresis Thermostat of DHW Boiler Thermostat on S2	**IA18**	0	**2**	20	[°C]
Hysteresis Thermostat of Integr. Buffer Tank on High Buffer Tank Probe	**IA19**	0	**2**	20	[°C]
Hysteresis Thermostat of Buffer Comfort on High Buffer Tank Probe	**IA20**	0	**2**	20	[°C]
Hysteresis Thermostat of High Temp. on High Buffer Tank Probe	**IA23**	0	**2**	20	[°C]
Hysteresis Thermostat of Valve for DHW priority	**IA24**	0	**2**	20	[°C]
Hysteresis Thermostat of Solar Pump Activation	**IA33**	0	**2**	20	[°C]
Hysteresis Thermostat of ANTIFREEZE Thermostat on Solar Collector Probe	**IA34**	0	**1**	20	[°C]
Hysteresis Thermostat of Solar Collector Safety	**IA35**	0	**2**	20	[°C]
Hysteresis Thermostat of Solar Collector Protection	**IA36**	0	**2**	20	[°C]
S3 Ambient probe Hysteresis Thermostat	**Ib01**	0	**1**	20	[°C]
Differential Hysteresis Thermostat Fireplace - Buffer	**Id01**	1	**1**	5	[°C]
Differential Hysteresis Thermostat S3-S2	**Id02**	1	**1**	5	[°C]
Differential Hysteresis Thermostat S1-S3	**Id03**	1	**1**	5	[°C]
Hysteresis Pressure Sensor Minimum threshold	**IP01**	0	**50**	400	[mbar]
Hysteresis Pressure Sensor Maximum threshold	**IP02**	0	**50**	400	[mbar]
Time on for ANTIFREEZE pump	**t 01**	1	**5**	300	[s]
Time off for ANTIFREEZE pump	**t 02**	0	**30**	300	[min]
SHOWER function time duration	**t 03**	0	**10**	120	[min]
ANTISEIZE time “on” of Pump	**t 04**	0	**20**	99	[s]
ANTISEIZE time “off” of Pump	**t 05**	1	**168**	255	[h]
Delay time for Air Damper closure	**t 06**	0	**10**	120	[min]
Audible alarm suspension time	**t 07**	1	**5**	60	[min]
Type of Fireplace Probe	**P01**	0	**0**	2	n

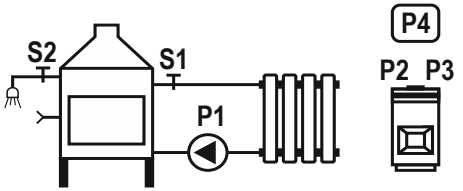
Type of DHW Boiler/High Buffer Tank Probe	**P02**	0	**0**	2	n
Type of Low Buffer Tank Probe	**P03**	0	**0**	2	n
Type of Ambient Probe	**P04**	0	**0**	2	n
S3 Input Configuration	**P05**	0	**0**	5	n
SERVICE Output Configuration	**P06**	0	**0**	3	n
Enable Alarm Pressure Sensor	**P07**	0	**0**	1	n
Enable ANTIFREEZE on Fireplace Probe	**P08**	0	**1**	1	n
Enable ANTIFREEZE on Collector Probe	**P09**	0	**0**	1	n
Enable Boiler Integration Priority	**P10**	0	**0**	1	n
Enable Fireplace SAFETY Function	**P11**	0	**1**	1	n
Enable "Start" Function of Air Damper	**P12**	0	**0**	1	n
Enable SHOWER Function	**P13**	0	**0**	1	n
Enable ANTISEIZE of Pump1	**P14**	0	**1**	1	n
Abilitazione ANTISEIZE of Pump2	**P15**	0	**0**	1	n
Type of Collector Probe	**P17**	1	**1**	2	n
PWM1 Management	**P18**	0	**0**	2	n
PWM2 Management	**P19**	0	**0**	2	n
Flow Switch Type; 1=ON_OFF; 2 = Flow Rate sensor	**P33**	1	**1**	2	n
Minimum Thereshold Flow rate for DHW management	**P34**	1	**3**	300	n
Percentage of PWM1 Duty Cycle at Minimum Speed HEATING profile	**U01**	0	**85**	100	%
Percentage of PWM1 Duty Cycle at Maximum Speed HEATING profile	**U02**	0	**5**	100	%
Percentage of PWM1 Duty Cycle in Antifreeze HEATING profile	**U03**	0	**0**	100	%
Percentage of PWM1 Duty Cycle in Safety HEATING profile	**U04**	0	**0**	100	%
Percentage of PWM1 Duty Cycle in Antiseize HEATING profile	**U05**	0	**0**	100	%
Percentage of PWM1 Duty Cycle in Manual Mode HEATING profile	**U06**	0	**50**	100	%
Percentage of PWM2 Duty Cycle at Minimum Speed HEATING profile	**U11**	0	**85**	100	%
Percentage of PWM2 Duty Cycle at Maximum Speed HEATING profile	**U12**	0	**5**	100	%
Percentage of PWM2 Duty Cycle in Antifreeze HEATING profile	**U13**	0	**0**	100	%
Percentage of PWM2 Duty Cycle in Safety HEATING profile	**U14**	0	**0**	100	%
Percentage of PWM2 Duty Cycle in Antiseize HEATING profile	**U15**	0	**0**	100	%
Percentage of PWM2 Duty Cycle in Modalità Manual HEATING profile	**U16**	0	**0**	100	%
Percentage of PWM2 Duty Cycle at Minimum Speed SOLAR profile	**U21**	0	**15**	100	%
Percentage of PWM2 Duty Cycle at Maximum Speed SOLAR profile	**U22**	0	**95**	100	%
Percentage of PWM2 Duty Cycle in Antifreeze SOLAR profile	**U23**	0	**100**	100	%
Percentage of PWM2 Duty Cycle in Safety SOLAR profile	**U24**	0	**100**	100	%
Percentage of PWM2 Duty Cycle in Antiseize SOLAR profile	**U25**	0	**100**	100	%
Percentage of PWM2 Duty Cycle in Manual Mode SOLAR profile	**U26**	0	**50**	100	%
Hydraulic Plant Configuration	**ConF**	1	**1**	16	n

7. HYDRAULIC DIAGRAMS

7.1 Diagram 1 ConF=1

7.1.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	(1)	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Boiler 2 Integration	A03	(3)	Boiler Integration Thermostat	20	45	90
P3	8 – 9 – 10	Boiler Integrationn	A09	(A)	Service Thermostat	20	50	90
P4	11 – 12	Service: Parameter P06	b01	S3	Ambient Probe Thermostat	5	20	50
S1	13 – 14	Fireplace Probe						
S2	15 – 16	Flow Switch						
S3	16 – 17 --18	Configurable: parameter P05						



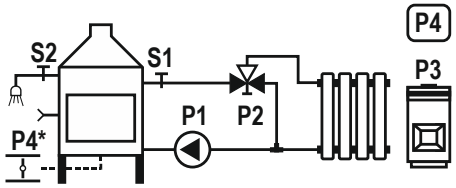
7.1.2 Operating Principle

S1	Checks	Management	State	Output
S1< 5° [A06]		Antifreeze	ON	P1
5° <S1< 35° [A01]		Fireplace OFF	OFF	
35° <S1< 80° [A07]	DHW not active	Heating	ON	
	DHW active	Sanitary/DHW	OFF	
S1>80° [A07]		Safety	ON	
S1> 45° [A03]		Integration OFF	OFF	P2 P3
S1> 75° [A05]	See Par. 5.11	Air Damper	OFF	P4
S1> 45° [A09]	See Par. 5.10	Service	ON	

7.2 Diagram 2 ConF=2

7.2.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	(1)	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Diverter Valve	A02	(2)	Diverter Valve Thermostat	20	45	90
P3	8 – 9 – 10	Boiler Integrationn	A03	(3)	Boiler Integration Thermostat	20	45	90
P4	11 – 12	Service: Parameter P06	A09	(A)	Service Thermostat	20	50	90
S1	13 – 14	Fireplace Probe	b01	S3	Ambient Probe Thermostat	5	20	50
S2	15 – 16	Flow Switch						
S3	16 – 17 --18	Configurable: parameter P05						



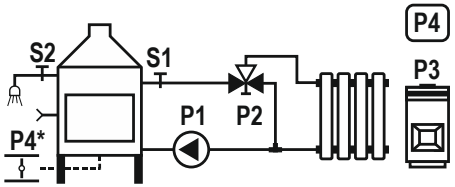
7.2.2 Operating Principle

S1	Checks	Management	State	Output
S1< 5° [A06]		Antifreeze	ON	P1
5° <S1< 35° [A01]		Fireplace OFF	OFF	
35° <S1< 80° [A07]	DHW not active	Recirculation	ON	
	DHW active	Sanitary/DHW	OFF	
S1>80° [A07]		Safety	ON	
S1>45° [A02]		Heating	ON	P2
S1> 45° [A03]		Integration OFF	OFF	P3
S1> 75° [A05]	See Par. 5.11	Air Damper	OFF	P4
S1> 45° [A09]	See Par. 5.10	Service	ON	

7.3 Diagram 3 ConF=3

7.3.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	1	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Diverter Valve	A02	2	Diverter Valve Thermostat	20	45	90
P3	8 – 9 – 10	Boiler Integrationn	A03	3	Boiler Integration Thermostat	20	45	90
P4	11 – 12	Service: Parameter P06	A09	A	Service Thermostat	20	50	90
S1	13 – 14	Fireplace Probe	b01	S3	Ambient Probe Thermostat	5	20	50
S2	15 – 16	Flow Switch						
S3	16 – 17 --18	Configurable: parameter P05						



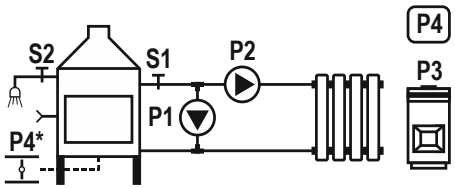
7.3.2 Operating Principle

S1	Checks	Management	P1	P2
S1< 5° [A06]		Antifreeze	ON	OFF
5° <S1< 35° [A01]		Fireplace OFF	OFF	OFF
35° <S1< 45° [A02]		Recirculation	ON	OFF
45° <S1< 80° [A07]	DHW not active	Heating	ON	ON
	DHW active	Sanitary/DHW	OFF	OFF
S1>80° [A07]		Safety	ON	ON
S1> 45° [A03]		Integration OFF	OFF	P3
S1> 75° [A05]	See Par. 5.11	Air Damper	OFF	P4
S1> 45° [A09]	See Par. 5.10	Service	ON	

7.4 Diagram 4 ConF=4

7.4.1 Parameters

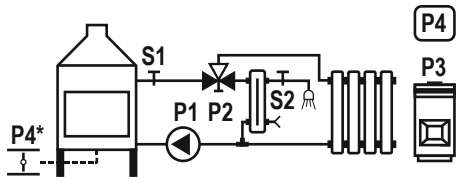
Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	1	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Heating Pump	A04	2	Heating Pump Thermostat	20	45	90
PWM2	20 – 16/14							
P3	8 – 9 – 10	Boiler Integrationn	A03	3	Boiler Integration Thermostat	20	45	90
P4	11 – 12	Service: Parameter P06	A09	A	Service Thermostat	20	50	90
S1	13 – 14	Fireplace Probe	b01	S3	Ambient Probe Thermostat	5	20	50
S2	15 – 16	Flow Switch						
S3	16 – 17 --18	Configurable: parameter P05						



7.4.2 Operating Principle

S1	Checks	Management	P1	P2
S1< 5° [A06]		Antifreeze	ON	OFF
5° <S1< 35° [A01]		Fireplace OFF	OFF	OFF
35° <S1< 45° [A04		Recirculation	ON	OFF
45° <S1< 80° [A07]	DHW not active	Heating	OFF	ON
	DHW active	Sanitary/DHW	ON	OFF
S1>80° [A07]		Safety	ON	ON
S1> 45° [A03]		Integration OFF	OFF	P3
S1> 75° [A05]	See Par. 5.11	Air Damper	OFF	P4
S1> 45° [A09]	See Par. 5.10	Service	ON	

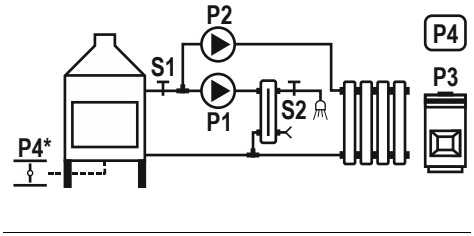
7.5		Diagram 5	ConF=5	7.5.1 Parameters					
Code	*Pins*	*Device*		*Cod.*	*Led*	*Description*	*Min*	*Def*	*Max*
P1	**3 – 4**	Fireplace Pump		**A01**	①	Fireplace Pump Thermostat	20	**35**	90
PWM1	**19 – 16/14**								
P2	**5 – 6 – 7**	Diverter Valve		**A02**	②	Diverter Valve Thermostat	20	**45**	90
P3	**8 – 9 – 10**	Boiler Integrationn		**A03**	③	Boiler Integration Thermostat	20	**45**	90
P4	**11 – 12**	Service: Parameter P06		**A09**	Ⓐ	Service Thermostat	20	**50**	90
S1	**13 – 14**	Fireplace Probe		**b01**	**S3**	Ambient Probe Thermostat	5	**20**	50
S2	**15 – 16**	Flow Switch							
S3	**16 – 17 --18**	Configurable: parameter P05							



7.5.2 Operating Principle

S1	*Checks*	*Management*	P1	P2
S1< 5° [*A06*]		Antifreeze	**ON**	**OFF**
5° <S1< 35° [A01]		Fireplace OFF	**OFF**	**OFF**
35° <S1< 45° [A02]		Recirculation	**ON**	**OFF**
45° <S1< 80° [A07]	DHW not active	Heating	**ON**	**ON**
	DHW active	Sanitary/DHW	**ON**	**OFF**
S1>80° [A07]		Safety	**ON**	**ON**
S1> 45° [A03]		Integration OFF	**OFF**	**P3**
S1> 75° [A05]	See Par. 5.11	Air Damper	**OFF**	**P4**
S1> 45° [A09]	See Par. 5.10	Service	**ON**	

7.6		Diagram 6	ConF=6	7.6.1 Parameters					
Code	*Pins*	*Device*		*Cod.*	*Led*	*Description*	*Min*	*Def*	*Max*
P1	**3 – 4**	Fireplace Pump		**A01**	①	Fireplace Pump Thermostat	20	**35**	90
PWM1	**19 – 16/14**								
P2	**5 – 6 – 7**	Heating Pump		**A04**	②	Heating Pump Thermostat	20	**45**	90
PWM2	**20 – 16/14**								
P3	**8 – 9 – 10**	Boiler Integrationn		**A03**	③	Boiler Integration Thermostat	20	**45**	90
P4	**11 – 12**	Service: Parameter P06		**A09**	Ⓐ	Service Thermostat	20	**50**	90
S1	**13 – 14**	Fireplace Probe		**b01**	**S3**	Ambient Probe Thermostat	5	**20**	50
S2	**15 – 16**	Flow Switch							
S3	**16 – 17 --18**	Configurable: parameter P05							



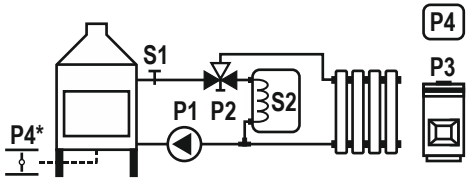
7.6.2 Operating Principle

S1	*Checks*	*Management*	P1	P2
S1< 5° [A06]		Antifreeze	**ON**	**OFF**
5° <S1< 35° [A01]		Fireplace OFF	**OFF**	**OFF**
35° <S1< 45° [A04		Recirculation	**ON**	**OFF**
45° <S1< 80° [A07]	DHW not active	Heating	**OFF**	**ON**
	DHW active	Sanitary/DHW	**ON**	**OFF**
S1>80° [A07]		Safety	**ON**	**ON**
S1> 45° [A03]		Integration OFF	**OFF**	**P3**
S1> 75° [A05]	See Par. 5.11	Air Damper	**OFF**	**P4**
S1> 45° [A09]	See Par. 5.10	Service	**ON**	

7.7 Diagram 7 ConF=7

7.7.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	1	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Diverter Valve	A02	2	Diverter Valve Thermostat	20	45	90
P3	8 – 9 – 10	Boiler Integrationn	A03	3	Boiler Integratiopn Thermostat	20	45	90
P4	11 – 12	Service: Parameter P06	A09	A	Service Thermostat	20	50	90
S1	13 – 14	Fireplace Probe	A18	S2	Sanitary/DHW Tank Thermostat	20	50	90
S2	15 – 16	Sanitary/DHW Probe	b01	S3	Ambient Probe Thermostat	5	20	50
S3	16 – 17 --18	Configurable: parameter P05	d01	S1+S2	Differential Thermostat Δ (S1-S2))	2	5	20



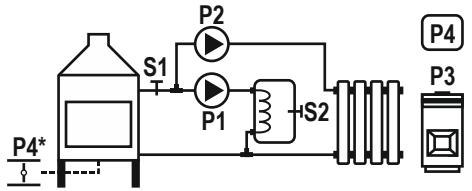
7.7.2 Operating Principle

S1	S2	Δ (S1-S2)	Management	P1	P2
S1< 5° [A06]			Antifreeze	ON	OFF
5° <S1< 35°[A01]			Fireplace OFF	OFF	OFF
35°<S1<45°[A02]	S2<50°[A18]	Δ<5° [d01]		OFF	OFF
		Δ>5° [d01]	Sanitary/DHW	ON	OFF
	S2<50°[A18]			OFF	OFF
45°<S1< 80°[A07]	S2<50°[A18]	Δ<5° [d01]	Sanitary/DHW Priority	OFF	OFF
		Δ>5° [d01]		ON	OFF
	S2<50°[A18]		Heating	ON	ON
S1>80° [A07]			Safety	ON	ON
S1> 45° [A03]			Integration OFF	OFF	P3
S1> 75° [A05]	See Par. 5.11		Air Damper	OFF	P4
S1> 45° [A09]	See Par. 5.10		Service	ON	

7.8 Diagram 8 ConF=8

7.8.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	1	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Heating Pump	A04	2	Heating Pump Thermostat	20	45	90
PWM2	20 – 16/14							
P3	8 – 9 – 10	Boiler Integrationn	A03	3	Boiler Integratiopn Thermostat	20	45	90
P4	11 – 12	Service: Parameter P06	A09	A	Service Thermostat	20	50	90
S1	13 – 14	Fireplace Probe	A18	S2	Sanitary/DHW Tank Thermostat	20	50	90
S2	15 – 16	Sanitary/DHW Probe	b01	S3	Ambient Probe Thermostat	5	20	50
S3	16 – 17 --18	Configurable: parameter P05	d01	S1+S2	Differential Thermostat Δ (S1-S2)	2	5	20



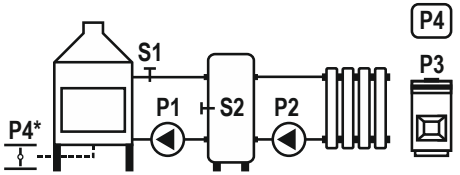
7.8.2 Operating Principle

S1	S2	Δ (S1-S2)	Gestione	P1	P2
S1< 5° [A06]			Antifreeze	ON	OFF
5° <S1< 35° [A01]			Fireplace OFF	OFF	OFF
35° <S1< 45° [A02]	S2<50°[A18]	Δ<5° [d01]		OFF	OFF
		Δ>5° [d01]	Sanitary/DHW	ON	OFF
	S2<50°[A18]			OFF	OFF
45° <S1< 80° [A07]	S2<50°[A18]	Δ<5° [d01]	Sanitary/DHW Priority	OFF	OFF
		Δ>5° [d01]		ON	OFF
	S2>50°[A18]		Heating	OFF	ON
S1>80° [A07]			Safety	ON	ON
S1> 45° [A03]			Integration OFF	OFF	P3
S1> 75° [A05]	See Par. 5.11		Air Damper	OFF	P4
S1> 45° [A09]	See Par. 5.10		Service	ON	

7.9 Diagram 9 ConF=9

7.9.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	1	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Heating Pump	A17	2	Heating Pump Thermostat on Buffer	20	45	90
P3	8 – 9 – 10	Boiler Integration on Buffer	A19	3	Boiler Integration Thermostat on Buffer	20	45	90
P4	11 – 12	Service: Parameter P06	A09	A	Service Thermostat	20	50	90
S1	13 – 14	Fireplace Probe	b01	S3	Ambient Probe Thermostat	5	20	50
S2	15 – 16	Buffer Tank Probe	d01	S1+S2	Differential Thermostat Δ (S1-S2)	2	5	20
S3	16 – 17 --18	Configurable: parameter P05						



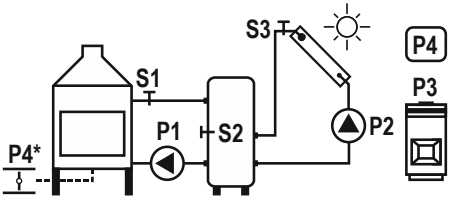
7.9.2 Operating Principle

S1	S2	Δ (S1-S2)	Management	State	Output
S1< 5° [A06]			Antifreeze	ON	P1
5° <S1< 35° [A01]			Fireplace OFF	OFF	
35°<S1<80° [A07]		Δ<5° [d01]		OFF	
		Δ>5° [d01]	Buffer Tank Loading	ON	
S1>80° [A07]			Safety	ON	
S2>45° [A17]			Heating	ON	P2
P05=2 and S3=Open or P05=3 and S3>20° [b01]				OFF	
	S2> 45°[A19]		Integration OFF	OFF	P3
S1> 75° [A05]	See Par. 5.11		Air Damper	OFF	P4
S1> 45° [A09]	See Par. 5.10		Service	ON	

7.10 Diagram 10 ConF=10

7.10.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	1	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Solar Pump	A19	3	Boiler Integration Thermostat on Buffer	20	45	90
PWM2	20 – 16/14							
P3	8 – 9 – 10	Boiler Integration on Buffer	A09	A	Service Thermostat	20	50	90
P4	11 – 12	Service: Parameter P06	A20	S2	Buffer Comfort Thermostat	20	60	90
S1	13 – 14	Fireplace Probe	d01	S1+S2	Differential Thermostat Δ (S1-S2)	2	5	20
S2	15 – 16	Buffer Tank Probe						
S3	16 – 17	Solar Collector Probe						



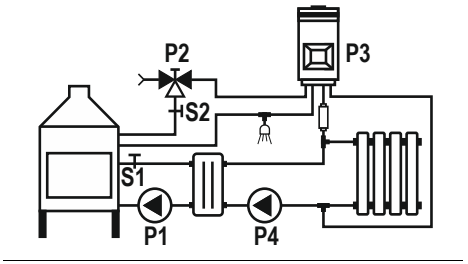
7.10.1 Operating Principle

S1	S2	Δ (S1-S2)	Management	State	Output
S1< 5° [A06]			Antifreeze	ON	P1
5° <S1< 35° [A01]			Fireplace OFF	OFF	
35°<S1<80°[A07]		Δ<5° [d01]		OFF	
		Δ>5° [d01]	Buffer Tank Loading	ON	
S1>80° [A07]			Safety	ON	
See Par. 5.17			Buffer Solar Loading	ON	P2
	S2>45° [A19]		Integrazione OFF	OFF	P3
S1> 75° [A05]	See Par. 5.11		Air Damper	OFF	P4
S1> 45° [A09]	See Par. 5.10		Service	ON	

7.11 Diagram 11 ConF=11

7.11.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	1	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Diverter Valve	A02	2	Diverter Valve Thermostat	20	45	90
P3	8 – 9 – 10	Boiler Integration	A03	3	Boiler Integration Thermostat	20	45	90
P4	11 – 12	Heating Pump	A04	A	Heating Pump Thermostat	20	45	90
PWM2	20 – 16/14							
S1	13 – 14	Fireplace Probe	b01	S3	Ambient Probe Thermostat	5	20	50
S2	15 – 16	Flow Switch						
S3	16 – 17 --18	Configurable: parameter P05						



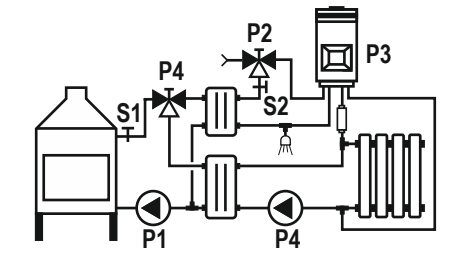
7.11.2 Operating Principle

S1	Checks	Management	P1	P4
S1< 5° [A06]		Antifreeze	ON	OFF
5° <S1< 35° [A01]		Fireplace OFF	OFF	OFF
35° <S1< 45° [A02]		Ricirculation	ON	OFF
45° <S1< 80° [A07]	DHW not active	Heating	ON	ON
	DHW active	Sanitary/DHW	OFF	OFF
S1>80° [A07]		Safety	ON	ON
S1> 455° [A02]		Sanitary/DHW	ON	P2
S1> 45° [A03]		Integration OFF	OFF	P3

7.12 Diagram 12 ConF=12

7.12.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	1	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Diverter Valve	A02	2	Diverter Valve Thermostat	20	45	90
P3	8 – 9 – 10	Boiler Integration	A03	3	Boiler Integration Thermostat	20	45	90
P4	11 – 12	Heating Pump	A04	A	Heating Pump Thermostat	20	45	90
PWM2	20 – 16/14							
S1	13 – 14	Fireplace Probe	b01	S3	Ambient Probe Thermostat	5	20	50
S2	15 – 16	Flow Switch						
S3	16 – 17 --18	Configurable: parameter P05						



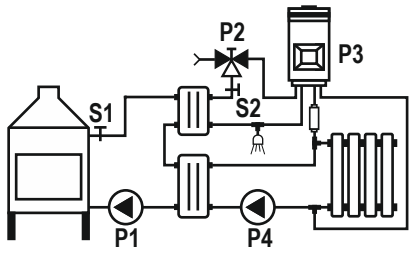
7.12.2 Operating Principle

S1	Checks	Management	P1	P4
S1< 5° [*A06*]		Antifreeze	ON	OFF
5° <S1< 35° [A01]		Fireplace OFF	OFF	OFF
35° <S1< 45° [A02]		Ricirculation	ON	OFF
45° <S1< 80° [A07]	DHW not active	Heating	ON	ON
	DHW active	Sanitary/DHW	ON	OFF
S1>80° [A07]		Safety	ON	ON
S1> 45° [A02]		Sanitary/DHW	ON	P2
S1> 45° [A03]		Integration OFF	OFF	P3

7.13 Diagram 13 ConF=13

7.13.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	①	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Diverter Valve	A02	②	Diverter Valve Thermostat	20	45	90
P3	8 – 9 – 10	Boiler Integration	A03	③	Boiler Integration Thermostat	20	45	90
P4	11 – 12	Heating Pump	A04	Ⓐ	Heating Pump Thermostat	20	45	90
PWM2	20 – 16/14							
S1	13 – 14	Fireplace Probe	b01	S3	Ambient Probe Thermostat	5	20	50
S2	15 – 16	Flow Switch						
S3	16 – 17 --18	Configurable: parameter P05						



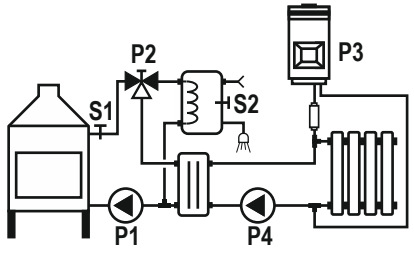
7.13.2 Operating Principle

S1	Checks	Management	P1	P4
S1< 5° [*A06*]		Antifreeze	ON	OFF
5° <S1< 35° [A01]		Fireplace OFF	OFF	OFF
35° <S1< 45° [A02]		Ricirculation	ON	OFF
45° <S1< 80° [A07]	DHW not active	Heating	ON	ON
	DHW active	Sanitary/DHW	ON	OFF
S1>80° [A07]		Safety	ON	ON
S1> 45° [A02]		Sanitary/DHW	ON	P2
S1> 45° [A03]		Integration OFF	OFF	P3

7.14 Diagram 14 ConF=14

7.14.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	①	Fireplace Pump Thermostat	20	35	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Diverter Valve	A03	③	Boiler Integration Thermostat	20	45	90
P3	8 – 9 – 10	Boiler Integration	A04	Ⓐ	Heating Pump Thermostat	20	45	90
P4	11 – 12	Heating Pump	A18	S2	Sanitary/DHW Thermostat	20	50	90
PWM2	20 – 16/14							
S1	13 – 14	Fireplace Probe	b01	S3	Ambient Probe Thermostat	5	20	50
S2	15 – 16	Sanitary/DHW Probe	d01	S1+S2	Differential Thermostat Δ (S1-S2)	2	5	20
S3	16 – 17 --18	Configurable: parameter P05						



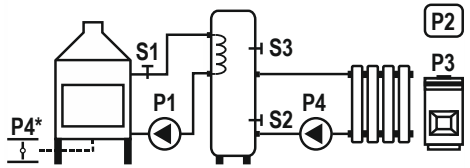
7.14.2 Operating Principle

S1	S2	Δ (S1-S2)	Management	P1	P4	P2
S1< 5°[*A06*]			Antifreeze	ON	OFF	OFF
5°<S1<35°[A01]			Fireplace OFF	OFF	OFF	OFF
35°<S1<45°[A04]	S2<50°[A18]	Δ<5°[d01]		OFF	OFF	OFF
		Δ>5°[d01]	Sanitary/DHW	ON	OFF	OFF
	S2>50°[A18]		Ricirculation	ON	OFF	ON
45°<S1<80°[A07]	S2<50°[A18]	Δ<5°[d01]	Sanitary/DHW Priority	OFF	OFF	OFF
		Δ>5°[d01]		ON	OFF	OFF
	S2>50°[A18]		Heating	ON	ON	ON
S1>80°[A07]			Safety	ON	ON	ON
S1> 45°[A03]			Integration OFF	OFF		P3

7.15 Diagram 15 ConF=15

7.15.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	①	Fireplace Pump Thermostat	20	40	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Service	A09	②	Service Thermostat	20	50	90
P3	8 – 9 – 10	Boiler Integration	A19	③	Boiler Integration on S3 Buffer Tank	20	45	90
P4	11 – 12	Heating Pump	A17	Ⓐ	Heating Pump Thermostat on S3	20	45	90
PWM2	20 – 16/14							
S1	13 – 14	Fireplace Probe	d01	S1+S3	Differential Thermostat Δ (S1-S3)	2	5	20
S2	15 – 16	Low Buffer Tank Probe						
S3	16 – 17	High Buffer Tank Probe						



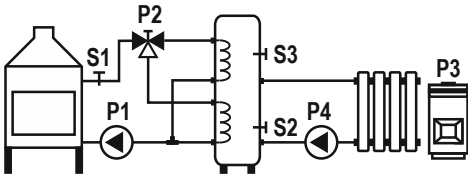
7.15.2 Operating Principle

S1	S3	Δ (S1-S3)	Management	State	Output
S1< 5° [A06]			Antifreeze	ON	P1
5°<S1<40°[A01]			Fireplace OFF	OFF	
S1>40°		Δ<5°[d01]		OFF	
		Δ>5°[d01]	Buffer Tank Loading	ON	
S1> 75° [A05]	See Par. 5.11		Air Damper	OFF	P2
S1> 45° [A09]	See Par. 5.10		Service	ON	
	S3>45°[A19]		Integration OFF	OFF	P3
	S3>45°[A17]		Heating	ON	P4

7.16 Diagram 16 ConF=16

7.16.1 Parameters

Code	Pins	Device	Cod.	Led	Description	Min	Def	Max
P1	3 – 4	Fireplace Pump	A01	①	Fireplace Pump Thermostat	20	40	90
PWM1	19 – 16/14							
P2	5 – 6 – 7	Diverter Valve	A24	②	Diverter Valve Thermostat	20	70	90
P3	8 – 9 – 10	Boiler Integration	A19	③	Boiler Integration on S3 Buffer Tank	20	45	90
P4	11 – 12	Heating Pump	A17	Ⓐ	Heating Pump Thermostat	20	45	90
PWM2	20 – 16/14							
S1	13 – 14	Fireplace Probe	d01	S1+S3	Differential Thermostat Δ (S1-S3 and S1-S2)	2	5	20
S2	15 – 16	Low Buffer Tank Probe						
S3	16 – 17	High Buffer Tank Probe						



7.16.2 Operating Principle

S1	S3	Δ (S1-S3)	Δ (S1-S2)	Management	State	Output
S1< 5°[A06]				Antifreeze	ON	P1
5°<S1<40°[A01]				Fireplace OFF	OFF	
S1>40°	S3<70°[A24]	Δ<5°[d01]		High Buffer Loading	OFF	
		Δ>5°[d01]			ON	
S1>40°	S3>70°[A24]		Δ<5°[d01]	Low Buffer Loading	OFF	
			Δ>5°[d01]		ON	
	S3>70°[A24]			Low Buffer Loading	ON	P2
	S3> 45° [A19]			Integration OFF	OFF	P3
	S3>45° [A17]			Heating	ON	P4