



ELECTRIC HEATING AND INSTANTANEOUS SANITARY HOT WATER PRODUCTION WALL BOILER

series **Elektra Small 12 C x Inside**



USE AND MAINTENANCE MANUAL



CE APPLIANCES IN COMPLIANCE WITH EUROPEAN DIRECTIVE 2006/95/EC. Built and compliant with the following standards: IEC 60335-2-21:2012, IEC 60335-1:2010, EN 60335-2-21:2003 + A1:2005 + A2:2008 - EN 60335-1:2012 - EN 62233:2008



ELECTRIC WALL BOILER

Series SMALL C x Inside

Presentation

Thank you for choosing a GUIVAL electric wall boiler, a product that features the latest heating technologies, and robust and safe materials that ensure maximum efficiency during use, the highest appliance quality and utmost safety for the user.

The **SMALL...** series is built according to European Machine Directive 2006/42 - IEC 60335-1:2010 and EN 60335-2-21:2003 +A1:2005 + A2:2008 - EN 60335-1:2012 - EN 62233:2008.

The result is a product with several distinguishing features:

- Particularly quiet operation, with maximum insulation of the unit by means of innovative special materials, for minimum heat loss.
- High level of reliability due to the careful choice of materials and the rigorous tests carried out on each appliance after production.
- High yield, with maximum efficiency thanks to the modulation of the electric power to the heaters following the actual energy requirements of the system, or the sanitary water production needs. The D.E.S. system manages the appliance by means of temperature detection probes positioned in every sensitive point of the boiler, allowing the regulation of the "*comfort*" or "*economy*" operating modes to your requirements, in order to reduce consumption when the appliance is not used at maximum power or demand.
- The appliance is fully adjustable both as far as central heating system water temperature (with the possibility of choosing high and low temperature system for underfloor heating) and sanitary hot water temperature.
- The components have been coupled together so that they are all easily accessible from the front of the unit during routine and extraordinary maintenance activities.

We suggest that our recommendations are carefully followed, and that you contact an authorised service centre in your area to agree a scheduled maintenance contract, which will ensure that your appliance always operates at maximum efficiency and safety, and that it lasts a long time. In thanking you again for your choice, we would like to remind you that our technical offices and our technical-commercial network are always at your disposal to provide you with any information of a technical or general nature that you might require.

FIAMMA GIRO s.r.l.
Company group



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WARNINGS:



THIS APPLIANCE MAY BE USED BY CHILDREN FROM 8 YEARS OF AGE AND OVER AND BY PERSONS WITH REDUCED PHYSICAL, SENSORY OR MENTAL CAPABILITIES OR LACK OF EXPERIENCE AND KNOWLEDGE, PROVIDED THAT THEY ARE SUPERVISED OR HAVE RECEIVED INSTRUCTIONS FOR THE SAFE USE OF THE APPLIANCE, SO THAT THEY UNDERSTAND THE RISKS INVOLVED. CHILDREN MUST NOT PLAY WITH THE APPLIANCE. CLEANING AND MAINTENANCE ACTIVITIES MUST NOT BE CARRIED OUT BY CHILDREN WITHOUT SUPERVISION.



THE CONNECTION TO THE ELECTRICITY NETWORK MUST BE THROUGH A DEVICE THAT ALLOWS ITS DISCONNECTION, WITH A CONTACT OPENING DISTANCE THAT ALLOWS COMPLETE DISCONNECTION UNDER THE CONDITIONS OF OVERVOLTAGE CATEGORY III, IN ACCORDANCE WITH THE INSTALLATION RULES.



IN ORDER TO PREVENT ANY RISKS, DAMAGED POWER SUPPLY CABLES MUST BE REPLACED BY THE MANUFACTURER OR ITS TECHNICAL SUPPORT SERVICE, OR BY SOMEONE WITH SIMILAR QUALIFICATIONS.



WATER MAY DRIP FROM THE OVERPRESSURE DRAIN PIPE OF THE APPLIANCE. FOR THIS REASON, SUCH PIPE MUST BE DIRECTED OUTSIDE AND LEFT OPEN.



THE PRESSURE RELIEF DEVICE MUST BE OPERATED REGULARLY TO REMOVE LIMESCALE DEPOSITS AND TO CHECK THAT IT IS NOT BLOCKED.



THE DRAIN PIPE CONNECTED TO THE OVERPRESSURE DEVICE MUST BE SET ON A CONTINUOUS DOWNWARD SLOPE AND IN A LOCATION PROTECTED FROM THE FORMATION OF ICE.

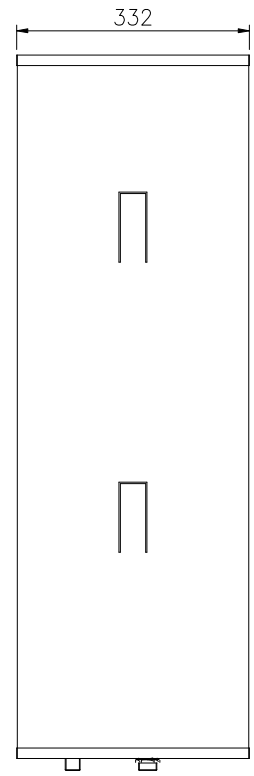
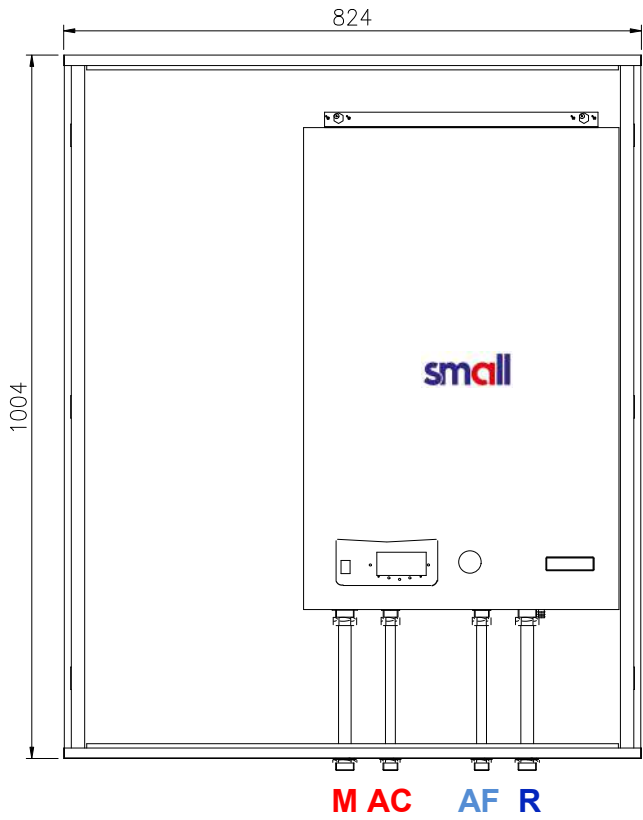


OVERALL DIMENSIONS

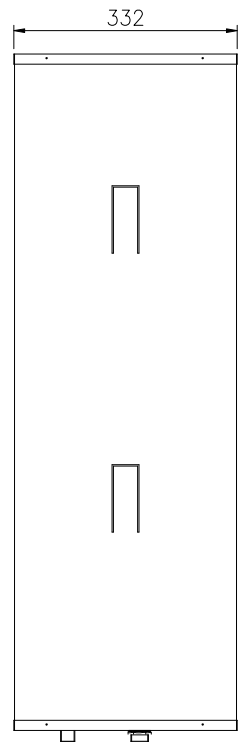
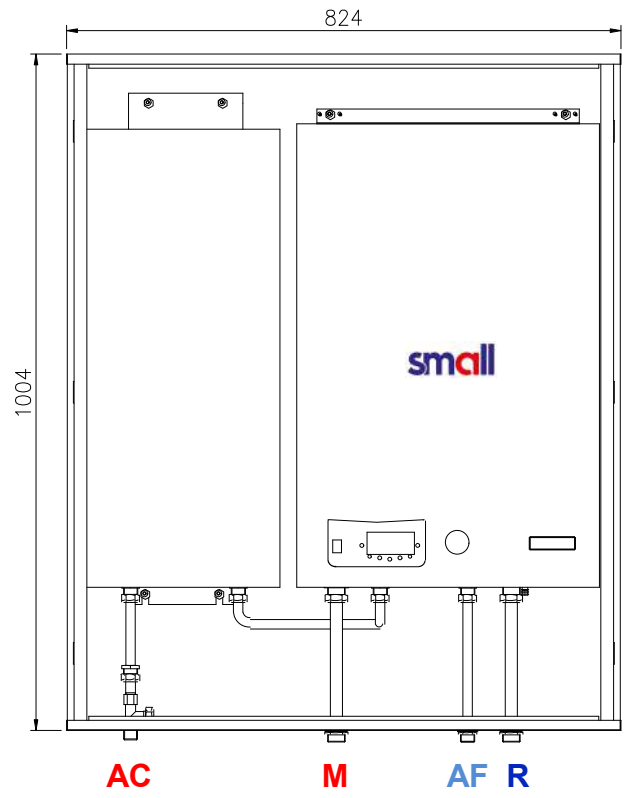
The **SMALL C x Inside** series develops on a single level of power with the following dimensions:

SMALL 12 C x Inside

12 kW maximum electric power



No Tank version



Tank version

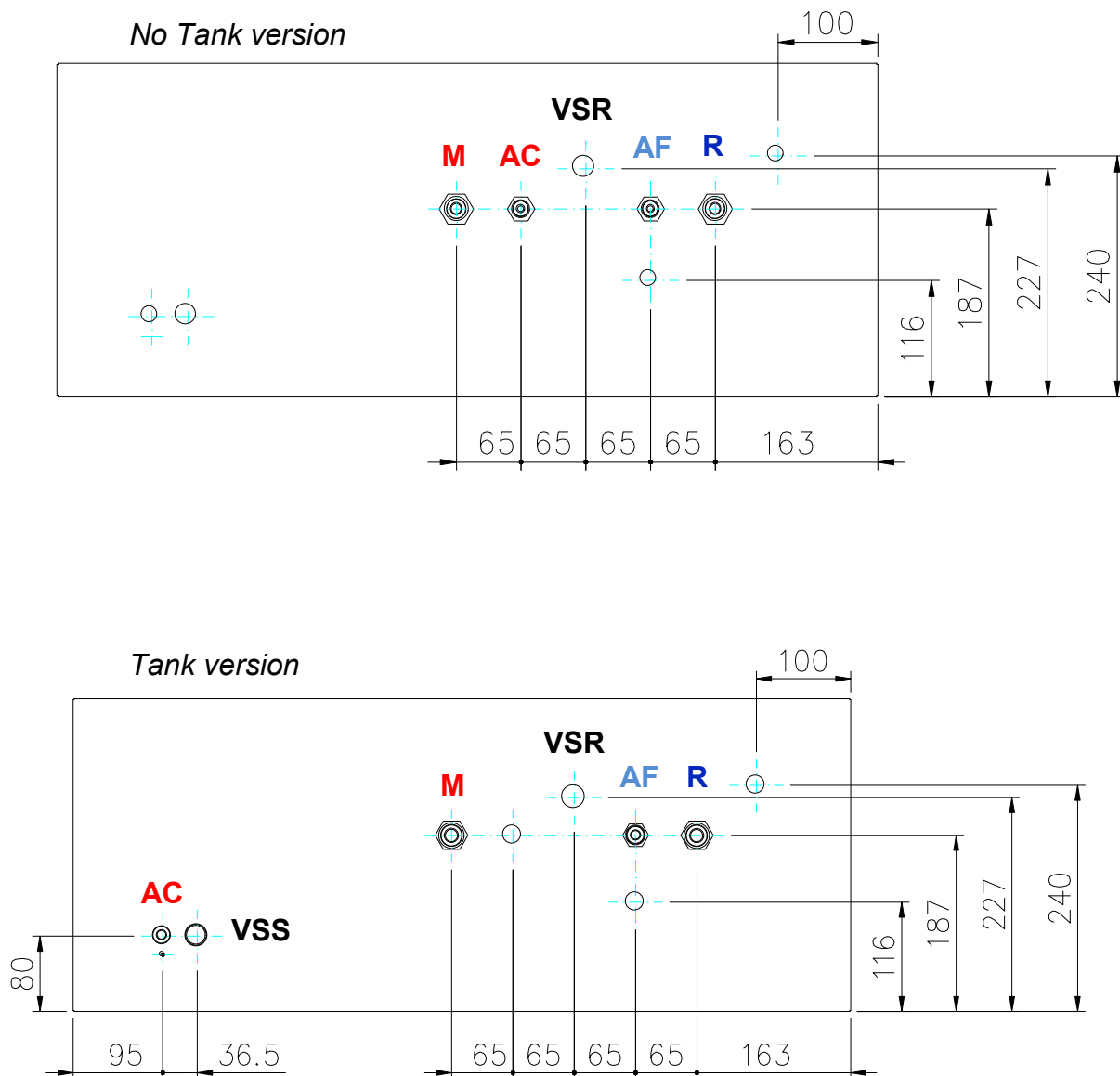


HYDRAULIC CONNECTIONS - Connection arrangement diagram:

M	Central Heating Delivery:	$\frac{3}{4}$ " M
R	Central Heating Return:	$\frac{3}{4}$ " M
AF	Sanitary Cold Water:	$\frac{1}{2}$ " M
AC	Sanitary Hot Water:	$\frac{1}{2}$ " M
VSR	Central Heating Safety Valve (0.3 MPa - 3 bar):	$\frac{1}{2}$ " F
VSS	DHW Safety Valve (0.65 MPa - 6,5 bar):	$\frac{1}{2}$ " F

The appliance is designed to be continuously connected to the water mains without intermediate fittings.

View from below (under the boiler)





MAIN TECHNICAL FEATURES

Elektra SMALL 12 C (no tank version) 12 kW maximum electric power

Single-phase power supply: 230-240 V - 50 Hz

Weight: 36 kg.

Central heating system: 12 kW electric/thermal power from no.2 heating elements (no.2 of 3x2 kW).

Maximum head available to the circulator approx 7 m.

Expansion vessel capacity 9 litres.

0.3 MPa (3 bar) central heating circuit safety valve.

Maximum central heating operating pressure: 0.25 MPa (2.5 bar).

Maximum sanitary water operating pressure: 0.55 MPa (5.5 bar).

Minimum central heating circuit operating pressure: 0.06 MPa (0.6 bar).

Minimum sanitary water operating pressure in "*comfort*" mode: 0.025 MPa (0.25 bar).

Minimum sanitary water operating pressure in "*economy*" mode: 0.005 MPa (0.05 bar).

Central heating circuit-boiler body maximum thermal safety limit: 100°C.

Elektra SMALL 12 C (tank version) 12 kW maximum electric power

Single-phase power supply: 230-240 V - 50 Hz

Weight: 45 kg.

30 litres storage tank in vitrified steel with inspection flange and magnesium anode.

Central heating system: 12 kW electric/thermal power from no.2 heating elements (no.2 of 3x2 kW).

Sanitary hot water: 2 kW (2.000 W) electric heating element for the sanitary hot water tank.

Maximum head available to the circulator approx 7 m.

Expansion vessel capacity 9 litres.

0.3 MPa (3 bar) central heating circuit safety valve.

0.65 MPa (6.5 bar) sanitary water circuit safety valve.

Maximum central heating operating pressure: 0.25 MPa (2.5 bar).

Maximum sanitary water operating pressure: 0.55 MPa (5.5 bar).

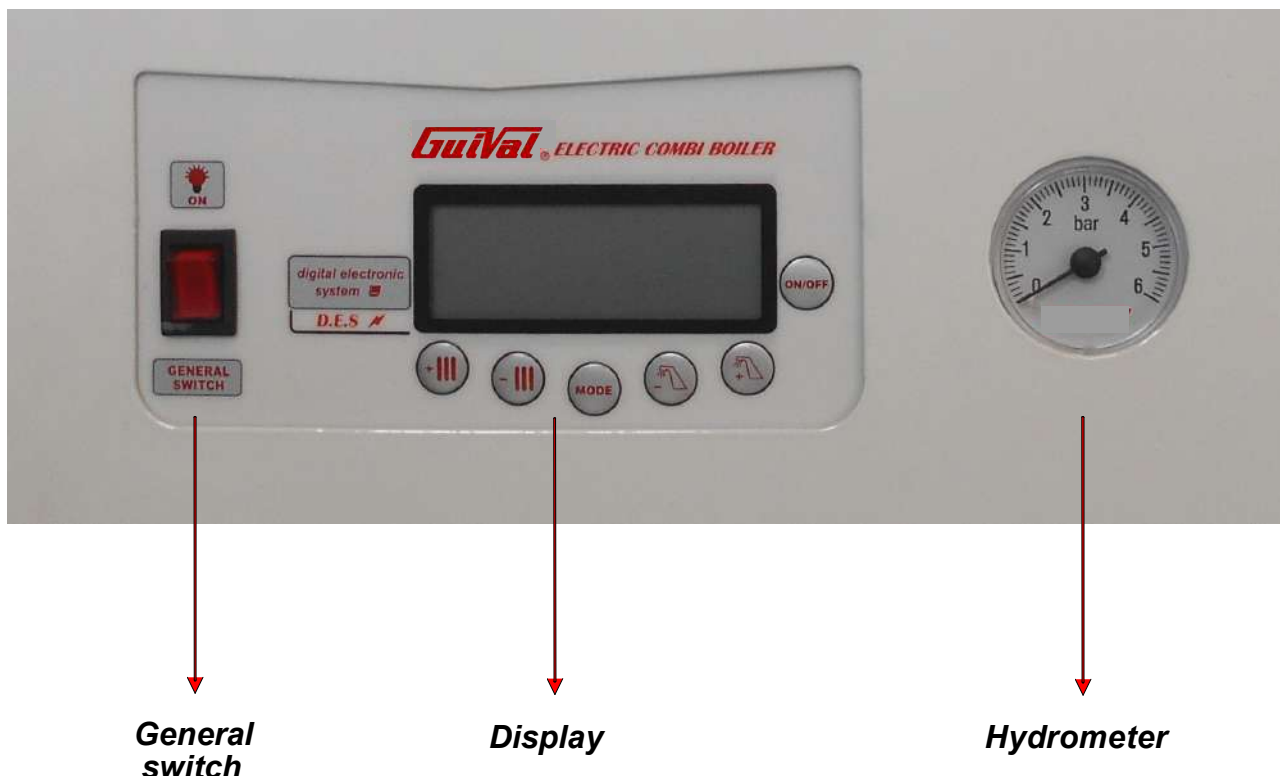
Minimum central heating circuit operating pressure: 0.06 MPa (0.6 bar).

Minimum sanitary water operating pressure in "*comfort*" mode: 0.025 MPa (0.25 bar).

Minimum sanitary water operating pressure in "*economy*" mode: 0.005 MPa (0.05 bar).

Central heating circuit-boiler body maximum thermal safety limit: 100°C.

CONTROL PANEL

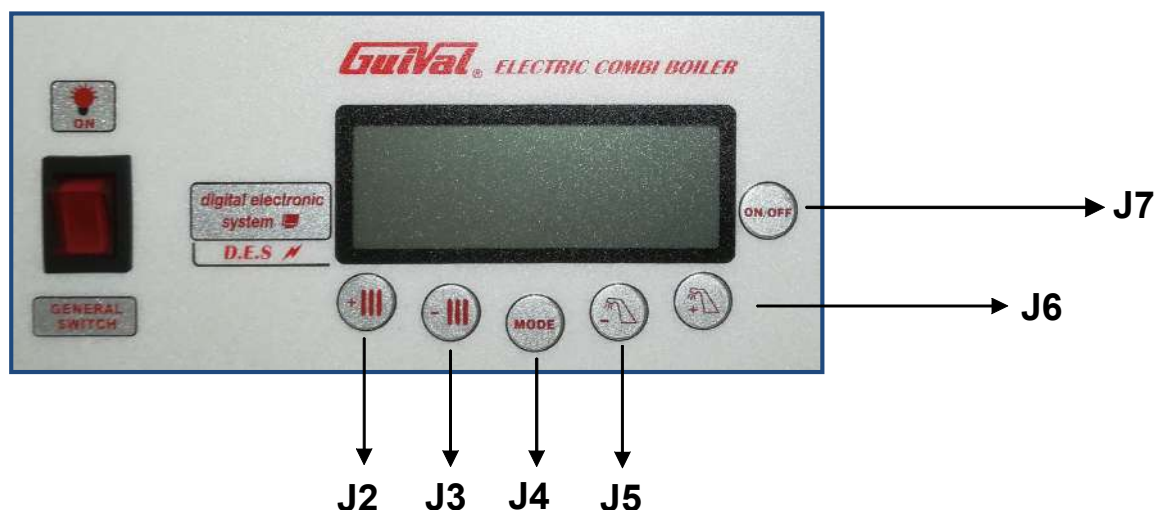


The control panel is composed of: display, function selection keys, general switch and the hydrometer it is placed in the lower left corner in front of the unit (see image above).

Using analogical hydrometer

The analogical hydrometer control panel has a dial with unit of measure in a bar, by 0 to 6 bar. The water pressure in the heating system is indicated by the index of the black arrow. The optimum pressure for the system is between 1 and 1,5 bar. More than 1,5 bar you can have a maximum pressure of the 2 bar (maximum expansion of the system during the rise in temperature). More than 2 bar pressure the system is not in the range of operation, and the mechanical safety valve (preset to 3 bar) can start to lose water (to access the valves remove the knockout openings at the valves, see page 6 hydraulic installation diagram). The minimum operating pressure is 0,8 bar (+/-0,2 bar). The differential positive or negative tolerance is due to the operation of the water pressure switch with fixed setting.

Keyboard panel (Control panel)



Meaning of keys in user mode

Key	Function
-F (J5)	Change settings and parameters / DHW setpoint decrease
+F (J6)	Change settings and parameters / DHW setpoint increase
ON/OFF (J7)	- ON - OFF switching (long press) - Display temperature output / Display setpoint output - Unlock error of safety thermostat
MODE (J4)	Summer - Winter switching (long press)
+III (J2)	Display / Increase of heating setpoint (or room temperature)
-III (J3)	Display / Decrease of heating setpoint (or room temperature)
-F + +F (J5 + J6)	Enabling function Eco / Comfort (only if JP8 = 0 and P9 = 0)
MODE + ON/OFF (J4 + J7)	Start function degassing
-F + -F (J3 + J5)	To enter into informations menu or temperatures menu
+III + +F (J2 + J6)	To enter into parameters menu



SWITCHING ON THE BOILER

The boiler is switched on by pressing the luminous main switch found on the left of the display in the dashboard. If the boiler is connected to a single-phase power supply source, the button lights up when pressed (230-240 V - 50 Hz). Then, it shall be pressed the **ON-OFF (J7)** on the keypad to switch the power from standby to the operating position, the display will light up of blue and will appear various symbols signaling function/faults etc. At this point it shall be chosen the mode of operation, summer or winter operation.

CHOICE OF THE OPERATION MODE (Winter/Summer)

Pressing the key **MODE (J4)**, it will be chosen the mode of operation, Winter or Summer. Pressing repeatedly each time for at least 5 seconds, you switch from WINTER to SUMMER or from SUMMER to WINTER then. When the device will be in WINTER mode, on the display will appear the Symbol ❄ (snow). When the device will be in SUMMER mode, on the display will appear the Symbol ☀ (sun).

TEMPERATURE VARIATION OF THE HEATING CIRCUIT

When the apparatus has been set with the snow symbol (❄) for the Winter functioning, you can change the maximum temperature of heating circuit pressing one of the two keys with the radiator symbol located on the left of the display (**+III** and **-III** keys). The key with the symbol **+III (J2)**, increases the temperature, and the key with the symbol **-III (J3)** decreases the temperature.

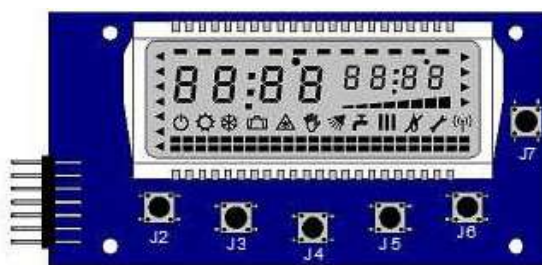
TEMPERATURE VARIATION OF HOT SANITARY WATER

The temperature of hot sanitary water can be varied independently from the mode of functioning, both Winter and Summer. The two keys with the Tap symbol on the left of the control panel, are used to set the maximum temperature of the hot sanitary water circuit. The key with symbol **+T (J6)** increases the temperature, and the one with the symbol **-T (J5)** decreases the temperature.

ON-OFF KEY

Display symbols

The **ON/OFF (J7)** key, in addition to put the boiler in standby mode, allows to reset (unlock) the apparatus in case of high temperature lock. If the lock would be caused by lack of water pressure alarm, the recovery will be automatic after that the hydraulic pressure will be restored at the minimum operating level (0,08 MPa - 0,8 bar) by means of the operating and the closure of the charging tap placed under the boiler (black handle).



The display has several symbols, signaling in addition to operation modes, also the various alarm or system displays:

Symbol	Meaning
	Anomalies presents
	Power resistors energization request
	Heating request
	Demand hot water request (generic)
	“Comfort” function enabled
	Parameter menu enabled
	Antifreeze request
	Winter mode
	Summer mode
	OFF mode
Level of modulation	The instantaneous power of the boiler is indicated from 0 to 100%

At each Power-on the firmware revision of the electronic board appears for a few seconds

Big digit: Number of revision

Small digit: Word res

A different main screen is then shown depending on the type of system set and the operating status.

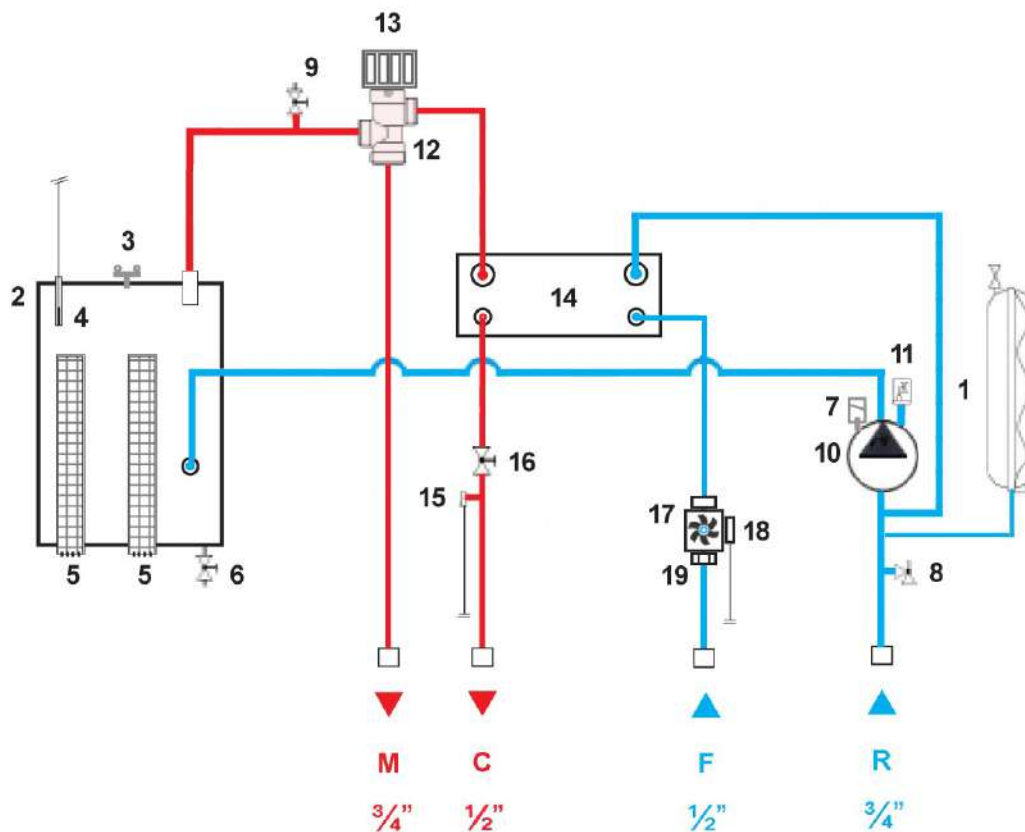


INSTALLATION

TECHNICAL NOTE FOR THE INSTALLER AND THE MAINTENANCE TECHNICIAN.

PLUMBING DIAGRAM

(version: SMALL C 12 kW no tank version)



SYSTEM DIAGRAM LEGEND:

- 1 Central heating circuit expansion tank 9 litres
- 2 Electric boiler body 12 kW
- 3 Bimetal safety thermostat 100°C
- 4 Central heating water temperature probe
- 5 Heating elements 3x2 kW - 230V/50Hz
- 6 Boiler body drain tap
- 7 Pressure switch
- 8 Safety valve 3 bar (central heating)
- 9 Exhaust tap (air vent)
- 10 Variable head circulator
- 11 Automatic vent valve
- 12 3-way electric diverter valve

- 13 diverter valve actuator (motor)
- 14 Stainless steel plate heat exchanger
- 15 Sanitary water temperature probe
- 16 Sanitary water flow regulator tap
- 17 Sanitary water flow meter
- 18 Sanitary water flow meter probe
- 19 Cold water inlet filter

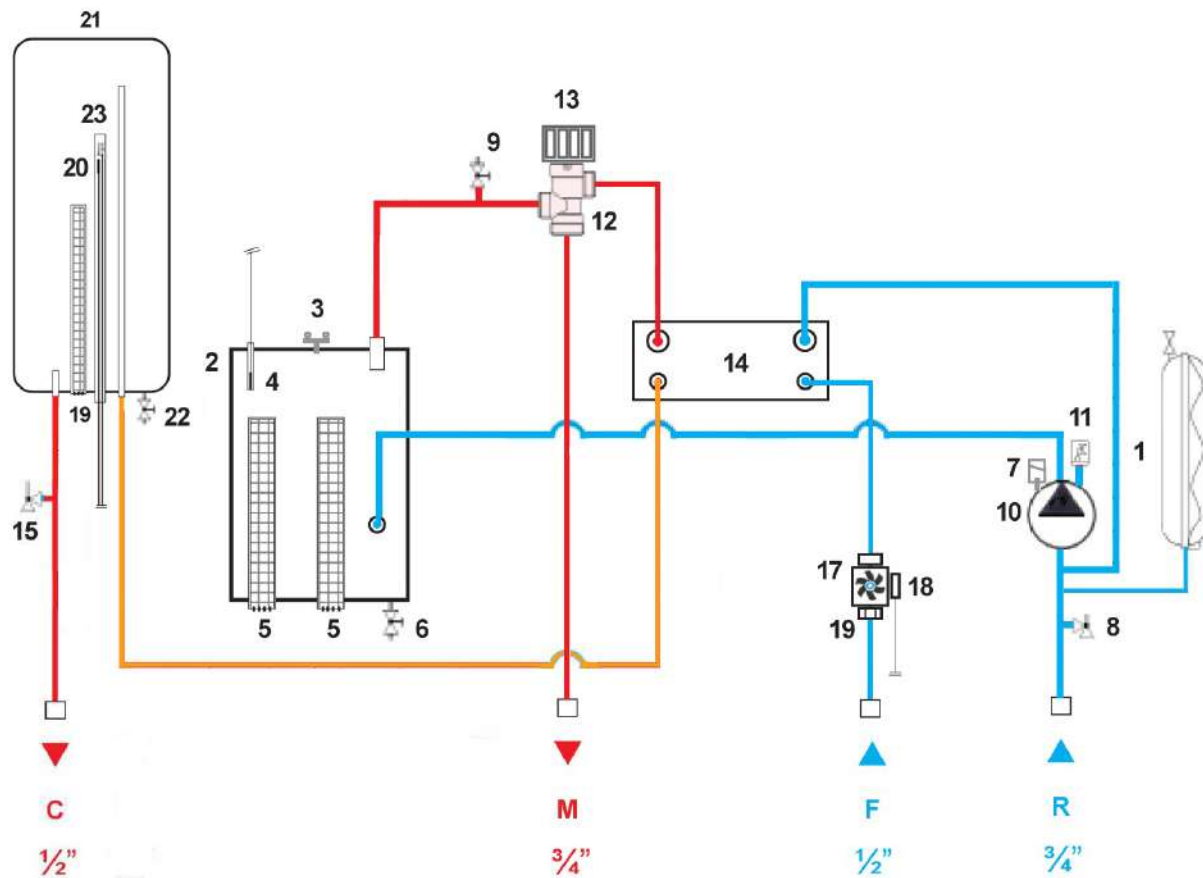
R Central heating system return

F Sanitary cold water inlet

M Central heating system delivery

C Sanitary hot water output

PLUMBING DIAGRAM (version: SMALL C 12 kW tank version)

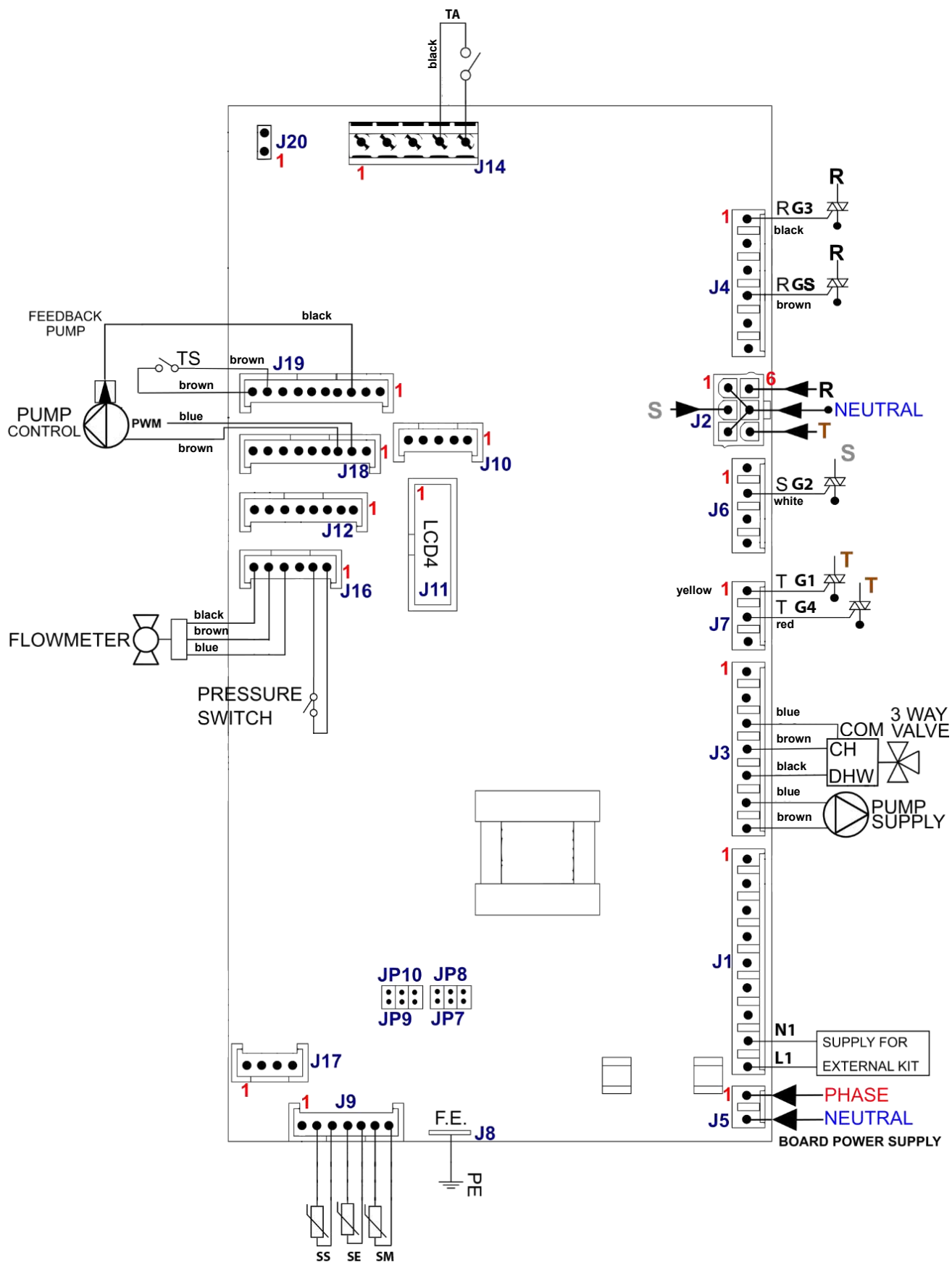


SYSTEM DIAGRAM LEGEND:

- | | |
|---|---|
| 1 Central heating circuit expansion tank 9 litres | 16 Sanitary water flow regulator tap |
| 2 Electric boiler body 12 kW | 17 Sanitary water flow meter |
| 3 Bimetal safety thermostat 100°C | 18 Sanitary water flow meter probe |
| 4 Central heating water temperature probe | 19 Sanitary water storage tank ceramic heating element 2 kW |
| 5 Heating elements 3x2 kW - 230V/50Hz | 20 Sanitary water storage tank safety thermostat |
| 6 Boiler body drain tap | 21 Vitrified sanitary water storage tank 30 litres |
| 7 Pressure switch | 22 Tank exhaust tap |
| 8 Safety valve 3 bar (central heating) | 23 Sanitary water storage tank temperature probe |
| 9 Exhaust tap (air vent) | |
| 10 Variable head circulator | |
| 11 Automatic vent valve | |
| 12 3-way electric diverter valve | |
| 13 diverter valve actuator (motor) | |
| 14 Stainless steel plate heat exchanger | |
| 15 Safety valve 6,5 bar (sanitary water) | |
| | R Central heating system return |
| | F Sanitary cold water inlet |
| | M Central heating system delivery |
| | C Sanitary hot water output |

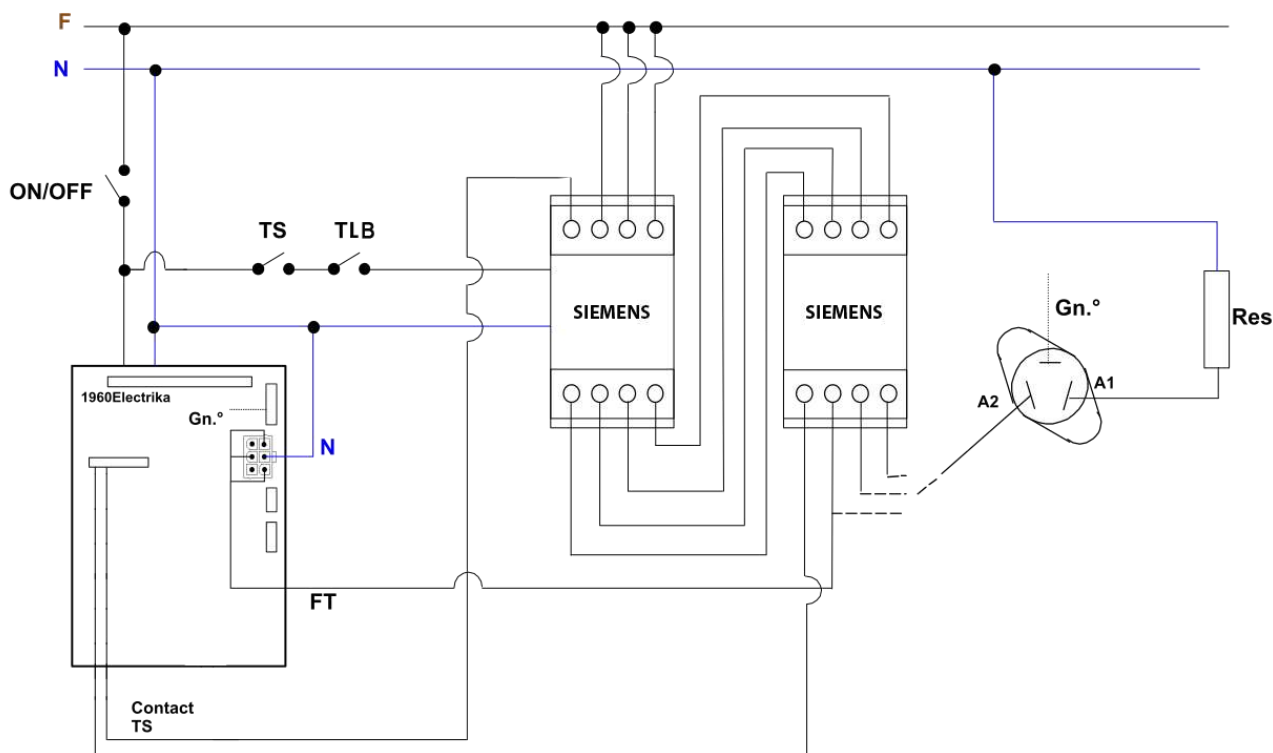


WIRING DIAGRAM (single phase)





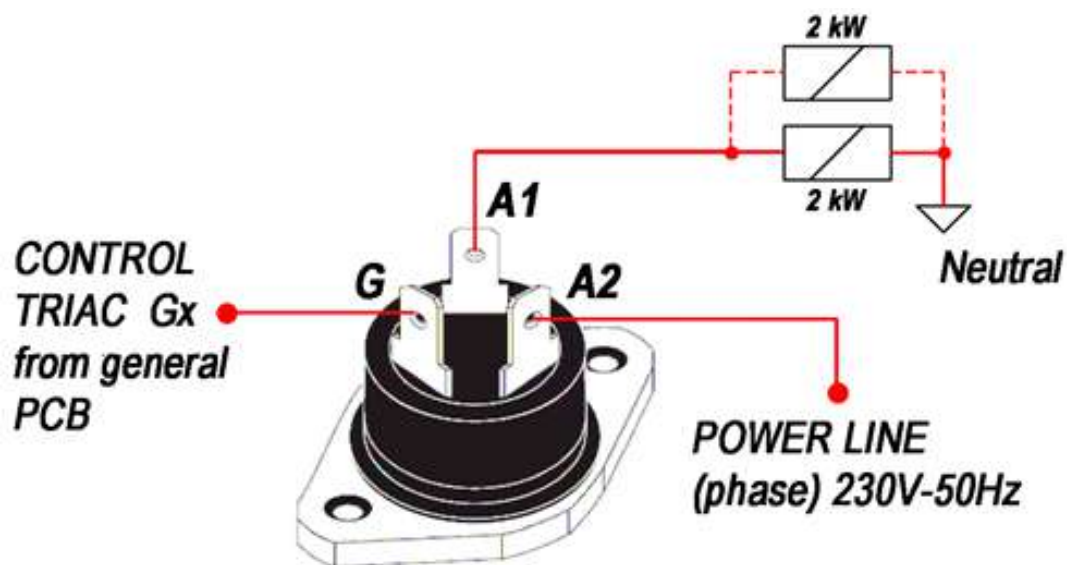
GENERAL WIRING DIAGRAM - POWER (Single-phase)



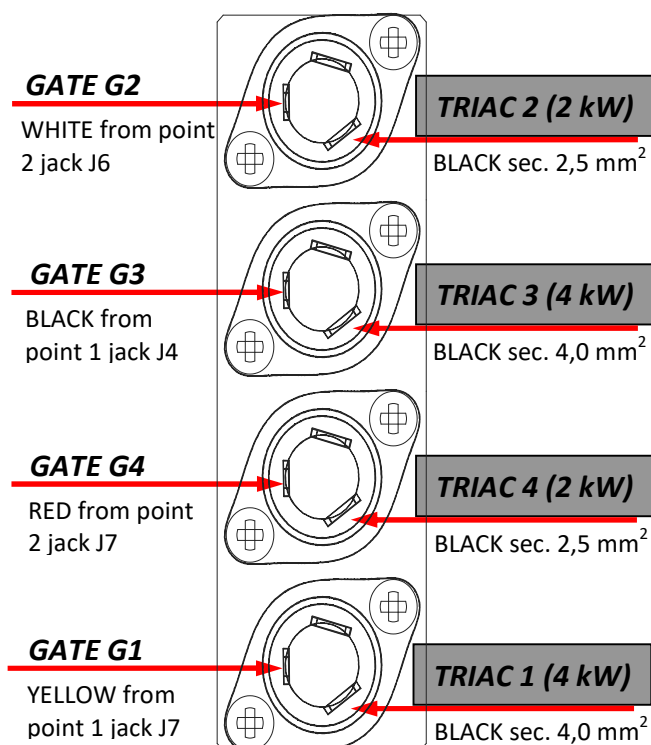
Legend of wiring diagrams

Phase 230 Vac	F
Neutral 230 Vac	N
Contactor sectioned phase	FT
Pump	PI
Sanitary water diverter valve control	DHW
Central heating diverter valve control	CH
Diverter valve common	COM
Sanitary water flow meter	FLM
Gate command, triac no. 1 (12 kW version - 4 kW load)	G1
Gate command, triac no. 2 (12 kW version - 2 kW load)	G2
Gate command, triac no. 3 (12 kW version - 4 kW load)	G3
Gate command, triac no. 4 (12 kW version - 2 kW load)	G4
Gate command, triac no. 5 (12 kW version - 2 kW load) [Tank]	GS
Delivery probe	SM
External probe	SE
Sanitary water probe	SS
Pressure transducer / switch	PT
Safety thermostat	TS
Limit Thermostat	TLB
Room thermostat (prearranged terminals)	TA
Main switch (also disconnects the board)	ON/OFF
Functional earth derived from the earth point	F.E.
Safety earth point on the application	PE

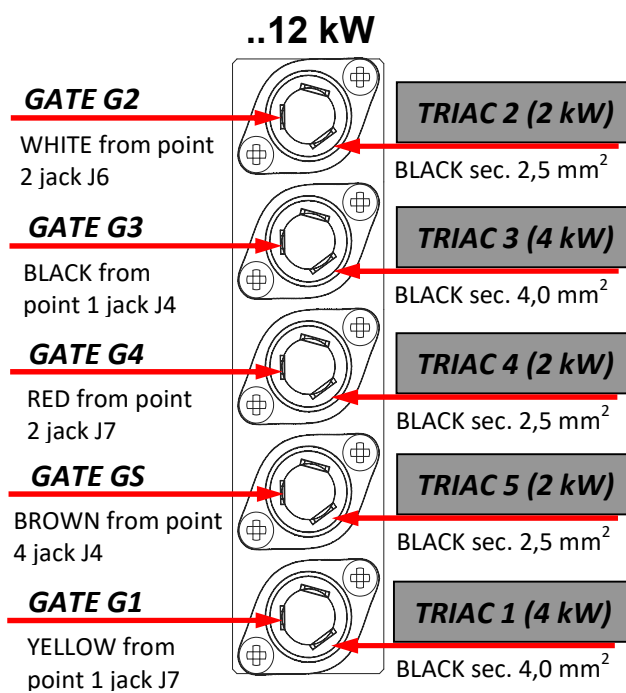
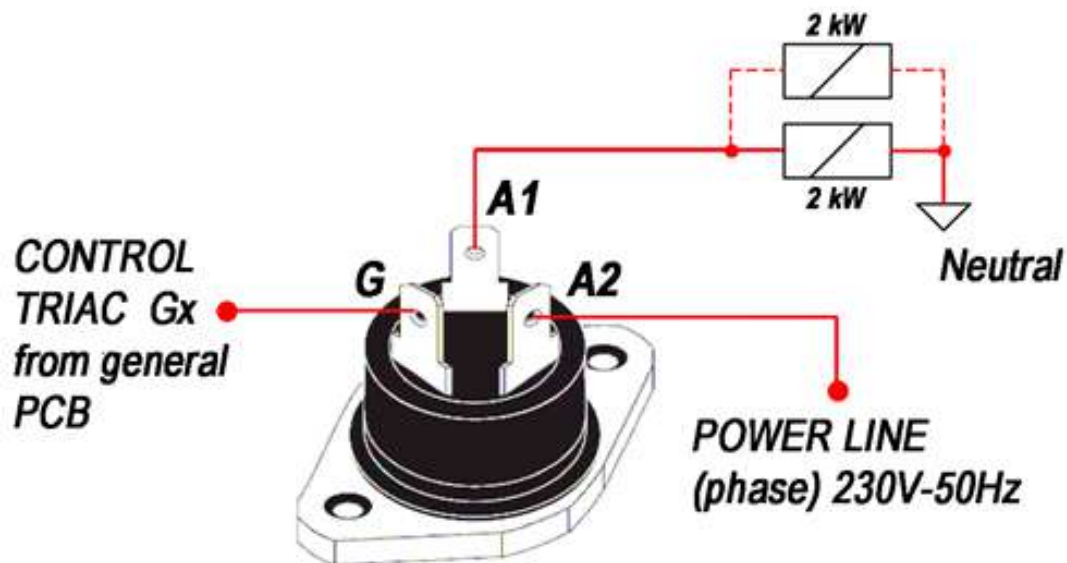
TRIAC - Wiring diagram (no Tank version)



..12 kW



TRIAC - Wiring diagram (Tank version)





FACTORY CONSTANTS

Function	Value
Anti-legionella range temperature (only tank version)	65 °C
Anti-legionella activation interval (only tank version)	7 days
Maximum primary circuit temperature	80 °C
Circulator lock prevention operation time	10 sec
Circulator lock prevention activation time	24 hours
Anti-freeze temperature On (circulator only)	< 8 °C
Anti-freeze Temperature On (circulator and power)	< 5 °C
Anti-freeze Temperature Off	> 20 °C

SETPOINTS AND PARAMETERS

Function	Default	Range
Central heating setpoint	60 °C	30 - 75 °C
Underfloor central heating setpoint	30 °C	10 - 40 °C
Room setpoint (with external probe present)	20 °C	10 - 30 °C
Sanitary water setpoint	50 °C	30 - 60 °C
Sanitary water setpoint (tank version)	60 °C	30 - 60 °C

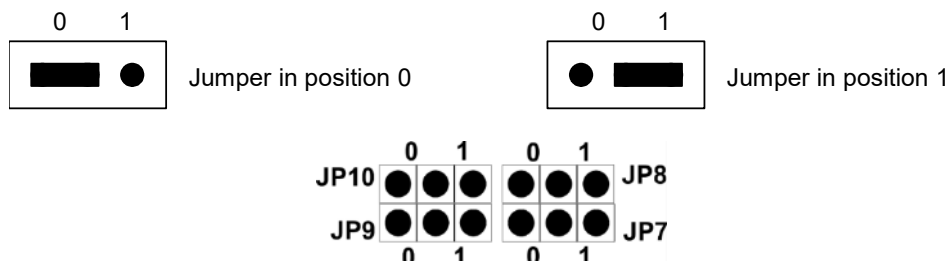
PARAMETERS

Function	Display	Def.	Range
External probe enable (SE)	P1	0	0 - 1
Building dispersion coefficient	P2	35	5 - 35 °C
Sanitary water post-circulation duration	P3	15	1 - 180 sec
Central heating post-circulation duration	P4	30	1 - 180 sec
Primary exchanger ON delay	P5	0	0 - 240 sec
DHW supply differential	P6	15	0 ÷ 20 °C
PWM circulator operation speed	P7	4	1 = 400 l/h 2 = 800 l/h 3 = 1,000 l/h 4 = 1,200 l/h
Min. temperature of primary exchanger for circulator ON	P8	30	0 - 50 °C
Type of sanitary water storage tank	P9	0	0 = internal with probe 1 = external with thermostat 2 = external with probe
Type of sanitary water request sensor	P10	1	0 = flow switch + three-way pneumatic 1 = flow meter + three-way electric
Boiler power selection	P11	2	1 - 7
System pressure sensor type	P12	0	0 ÷ 2



Value P11	Total power [kW]	No. TRIAC	No. of heating elements used and power of each element	G1 [kW]	G2 [kW]	G3 [kW]	G4 [kW]	GS [kW]
no Tank version								
2	12	4	no. 2 heating elements, power 3 x 2kW	4	2	4	2	-
Tank version								
2	12	5	no. 2 heating elements, power 3 x 2kW	4	2	4	2	2
Value P12	Description							
0	Boiler with PSA water pressure switch connected to poles 1 and 2 (J16 PCB)							
1	Boiler with pressure transducer connected to poles 1, 2 and 3 (J16 PCB)							
2	The board is configured for operation with P12=1 , but the presence of errors F1 and F10 is ignored. This is necessary in the event that the pressure transducer fails and technical support does not have the spare part available. However, the boiler has a needle hydrometer that indicates the correct pressure of the system. When P12=2 , the pressure shown on the display is 0.0 bar							

SELECTION JUMPERS (move jumpers with the board not powered)

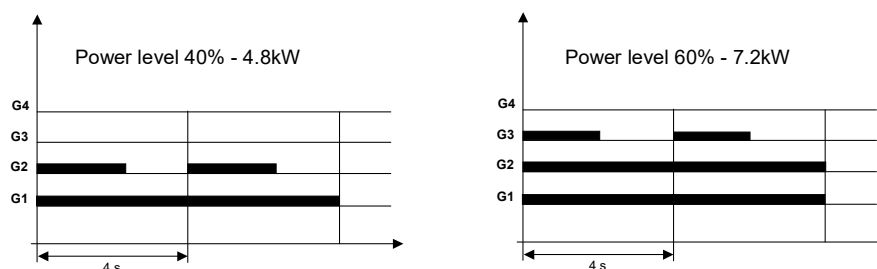


Jumper	0	1	Default
JP7	High temperature heating system (radiators)	Low temperature heating system (floor)	0
JP8	Combined application	Central heating only application	0
JP9	DHW system with storage tank (tank version)	Instantaneous DHW system (no tank version)	0 / 1
JP10	Boiler application	Screed heater	0



PRIMARY EXCHANGER MANAGEMENT (BOILER BODY)

Depending on the power level required during the "heat demand", all or part of the controls from G1 to G4 relating to the primary exchanger are switched on. The activation of each command is controlled within an interval of 4 seconds. The higher the power required, the more the command will remain active in this interval. The power during a central heating or sanitary hot water request is calculated using a PID algorithm. Below are two examples for powers equal to 40% and 60% of the total power (12 kW).



In case of simultaneous request of heating and sanitary hot water, the commands G1÷G4 relating to the primary exchanger, and GS, relating to the sanitary water storage heater (tank version) are operated as follows:

Boiler status	Primary G1÷G4	Storage tank GS
Central heating request only	G1 ÷ G4 = modulation	GS = OFF
Central heating + sanitary hot water request	G1 ÷ G3 = modulation G4 = OFF	GS = ON
Central heating + micro sanitary hot water request	G1 ÷ G3 = modulation G4 = OFF	GS = ON

In practice, the command GS of the storage tank, if active, switches off the command G4 of the primary exchanger, so that the maximum boiler power is always 12Kw.

Rotation of commands

The switch-on order of the triacs G1 - Gn-1 commands is rotated every hour in order to uniformly distribute the use of all the heating elements over time. In the domestic hot water configuration with the internal tank, the Gn command does not enter rotation but its activation is subject to the activation of the GS tank command.

EXTERNAL PROBE MANAGEMENT (SE)

Installation and sliding temperature operation

The connection of the External Probe (SE) requires the use of the Original Kit code F.532, offered as part of the accessories for Elektra series electric boilers. The electric connection must be to the terminals (S and E) outside the main electric panel already arranged in the standard wiring of the boiler.



The connection requires connection cables and wires with a minimum cross section of 1.5 mm, possibly avoiding the proximity of power lines or digital lines of inverters or anything else not compatible. After connection, the external probe must be enabled by entering a variation of parameter **P1** from **0** to **1**.

The setpoint followed by the central heating delivery probe will be calculated using the following formula:

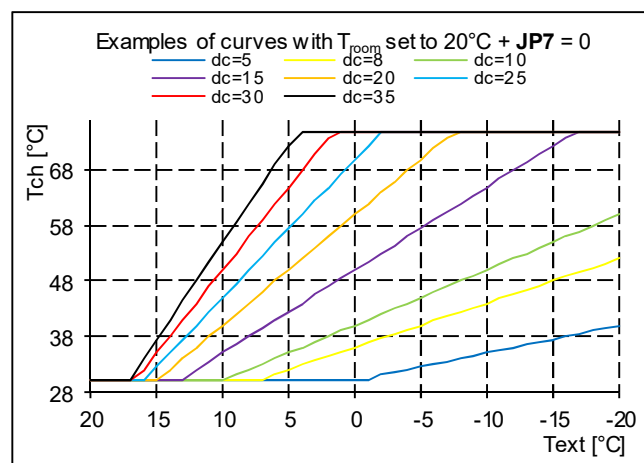
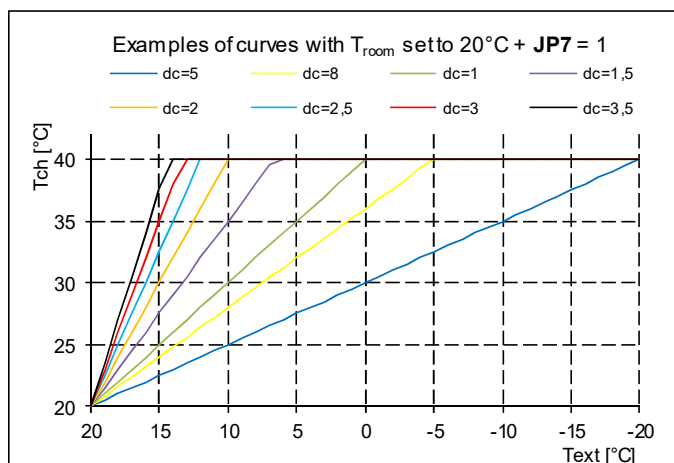
$$T_{ch} [^{\circ}C] = [(T_{room} [^{\circ}C] - T_{ext} [^{\circ}C]) * dc/10] + T_{room} [^{\circ}C]$$

T_{ch} : central heating setpoint calculated by the system

T_{room} : room temperature set by the user

T_{ext} : external temperature measured by the probe

dc: dispersion coefficient of the building, set using the parameter **P2**.





HEATING STATE

When the room thermostat is closed and if the main board is in the WINTER mode, the 3-way valve is set to heating position. The circulator is powered only if the temperature measured on the primary exchanger is greater than the value set on **P8** parameter. If the temperature measured by heating probe is less than setpoint, the triacs are powered based on the power required. That happen only after a time set on **P5** parameter, and this is useful to wait for the opening of zone valves. The instant power of the boiler and control of the triacs G1, G2, G3, ..., Gn is the 50% of maximum power if the temperature measured by the heating probe is less than the value set on **P8** parameter, otherwise the power is managed by PID controller. In sanitary configuration with internal tank and probe (**JP8=0** e **P9=0**) if the tank request is present, with subsequent activation of tank triac GS, the last triac of primary exchanger is not powered in order to keep constant the total power of the system. If a chronothermostat OT11 request is present, the zone valve is powered and the setpoint calculated by chronothermostat is taken. When the request ends, the circulator remains active for a time set on **P4** parameter, in order to implement a postcirculation on the heating system.

SANITARY STATE (Tank version)

Stand-by or with simultaneous heating request:

If the temperature measured by tank probe is less than tank setpoint - 1°C, then the triac command GS is activated. When the temperature measured by tank probe is greater than tank setpoint, the command GS is deactivated. The activation of GS causes the turn-off of the last triac of primary exchanger, in order to have constant the total power available so that the maximum total consumption of the system is always 12 kW.

Flow-meter request:

When a flow-meter (**P10** = 0) request is present, the command GB is activated as long as the tank temperature remains below 70°C.

In "ECO" mode, no triacs of primary exchanger are activated.

In "COMFORT" mode, the commands G1, G2, G3, ..., Gn are activated, so that it is possible to bring the temperature until the tank setpoint + a differential set by the **P6** parameter.

When the request ends, the circulator remains powered for a post-circulation time set on the **P3** parameter. If the electrical 3-way valve (**P10** = 1) is present, it is activated in the DHW position (230VAC). In "COMFORT" mode, when the request ends, the 3-way valve is activated for a short period (switching from DHW position to CH position and return to DHW) in order to avoid blocking due to long inactivity.



INSTANT DHW REQUEST (JP9 = 1 – no tank version)

When a flow-meter (**P10** = 0), the circulator is activated and the command G1, G2, G3,..., Gn are controlled and the sanitary probe and the sanitary setpoint are taken as reference. If the sanitary probe is broken, the heating probe is taken as reference and the sanitary setpoint + a differential set by the parameter **P6** is taken as setpoint.

When the request ends and if the "comfort" mode is not activated, the circulator remains powered for a post-circulation time set on the **P3** parameter. If the electrical 3-way valve (**P10** = 1) is present, it is activated in the DHW position (230VAC). In COMFORT mode, when the request ends, the 3-way valve is activated for a short period (switching from DHW position to CH position and return to DHW) in order to avoid blocking due to long inactivity.

"COMFORT" FUNCTION AND PREHEATING

The following function can be activated only in sanitary instantaneous (**JP9=1**) or with internal tank with probe (**P9=0, JP9=0**). The "comfort" function keeps warm the primary exchanger in order to have a rapid answer of sanitary if a new request flow-meter happens.

When the system is in stand-by state (No heating request, no sanitary request, no antifreeze request, no antilegionella request) and boilers with sanitary instantaneous or internal tank with probe configurations, the function "COMFORT" activates the primary exchanger, keeping it at a temperature equal to the DHW setpoint plus a delta temperature that can be set using parameter **P6**, in order to have a rapid answer of sanitary.

The circulator is not activated. The working power is the 50% of maximum power when the temperature measured by heating probe is less than sanitary setpoint, 25% of maximum power when the temperature measured is between the sanitary setpoint and sanitary setpoint + **P6** and the primary exchanger is turned-off when the temperature is greater than sanitary setpoint + **P6**.

In the sanitary instantaneous configuration furthermore every **15 minutes** is activated the circulator in order to warm the plate heat exchanger as well. Preheating has priority over the heating request until the temperature detected by the heating probe is higher than the DHW setpoint + **P6**.

The flowmeter request does not reset the 15 minutes timer used to reactivate the circulator.



ANTI-LEGIONELLA FUNCTION (only tank version)

This function is available only with internal or external tank and probe. The system continuously checks the storage tank temperature. If for a period the temperature does not reach 65°C, the sanitary request is activated to avoid the formation of bacteria. The time of intervention of antilegionella function is 3 hours the first time and 7 days for the subsequent ones.

ANTI-FREEZE FUNCTION

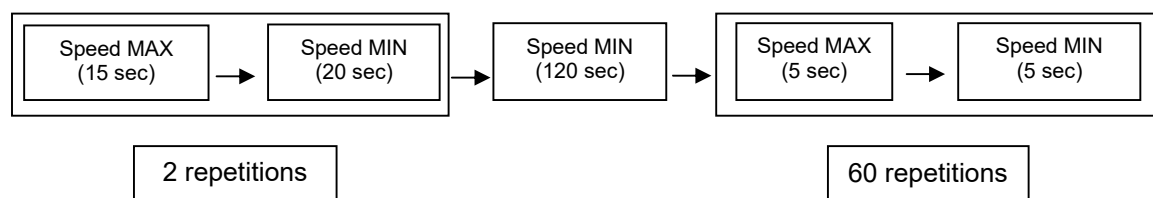
The anti-freeze function is active in all the modes of operation SUMMER – WINTER – OFF (in stand-by mode but with the illuminated main switch on). If the temperature measured by heating probe is less than 8°C the circulator is activated, the zone valve is powered and the 3-way valve is set to heating position. If the temperature is less than 5°C, the primary exchanger is powered until the temperature rises to 20°C. When the antifreeze request ends, the circulator remains powered for a post-circulation time set by parameter **P4**.

CIRCULATOR LOCK PREVENTION

When the circulator has not performed an operation cycle in a 24h period, it is activated for 10 sec. to avoid locking due to long period of inactivity. At the end of the post-circulation phase, activated following the demand for sanitary hot water, the electric diverter valve is activated for 2 sec. in order to avoid locking due to long period of inactivity.

DEGASSING FUNCTION

The degasification function can be activated by pressing **MODE (J4)** and **ON / OFF (J7)** keys simultaneously of the LCD display. During this function, the circulator works at the maximum speed and at the minimum speed of circulator are activated following the algorithm described below.



When the function is activated, on display appears the residual timer. The 3-way valve is powered in heating position (CH).



TACO 3GS "PWM" PUMP

The 3GS series is a high-efficiency synchronous circulator with a permanent magnet motor designed for heating systems. 3GS circulators offer a variety of solutions in terms of performance, connectivity and communication protocols. 3GS platform can communicate



with the appliance with pulse with modulation (PWM) signal. The pump can be set by the external appliance but also can provide information to the appliance. The circulator's speed are controlled by an internal frequency converter set by the external signal (PWM). To change the pump speed only the external signal is permitted. An external speed control shall not be used.

GRUNDFOS UPM4 "PWM" Version 2022 PUMP INSTRUCTIONS



The new UPM4 pump version 2022 is equipped with four default variable speeds via the PWM signal, which can be set by control panels.

Pump programming

Select the parameter **P7** and choose one of the four flow rates available, setting the values from 1 to 4. Set 1 for minimum flow rate, or 4 for maximum flow rate, set 2 and/or 3 for intermediate flow rates.

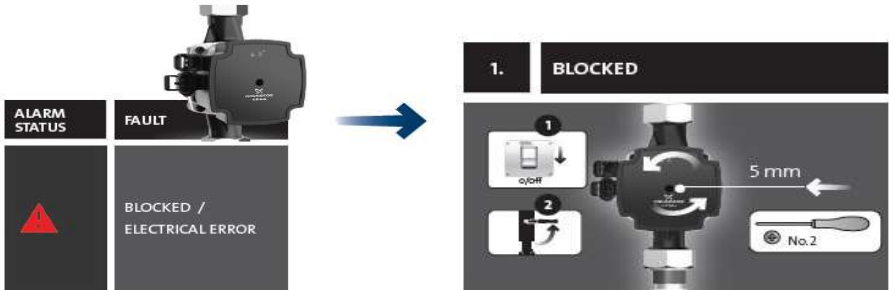
View operating / Alarms

CONTROL MODE	
	No communication
	Communication: LIN/ PWM 10 flashes per second

ALARM STATUS	FAULT
	Blocked / electrical error

Alarms solution

1. Blocking error



2. Electrical error





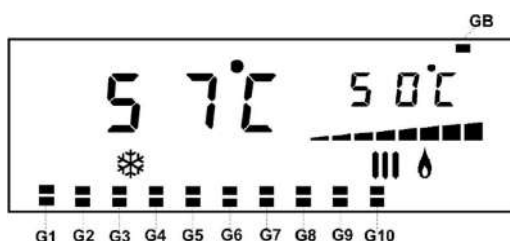
MAIN SCREEN

Status of Elements

The dashes placed at the bottom and top indicate the status of the heating elements. At the bottom, the number of dashes corresponds to the number of active heating elements. A single dash or double dash is displayed based on the power of the element according to the following rule:

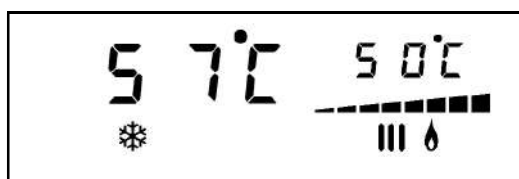
	4 kW or 6 kW heating element
	2 kW or 3 kW heating element

The dash in the upper right corner refers to the heating module dedicated to the internal storage tank (GS) (only if **P9** = 0 and **JP9** = 0).



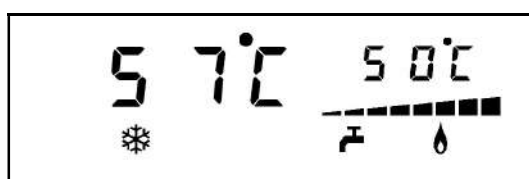
"Heating request"

When there is a heating request, the temperature detected by the flow probe is displayed and the **III** symbol starts flashing. The instantaneous boiler power is indicated by the modulation bar. It is possible to observe at any time which triacs are on.



DHW flow meter request

When there is a request from the flow meter, the temperature detected by the flow probe is displayed and the **⚡** symbol starts flashing. The instantaneous DHW circuit temperature is displayed on the small digits. The instantaneous boiler power is indicated by the modulation bar. It is possible to observe at any time which triacs are on.



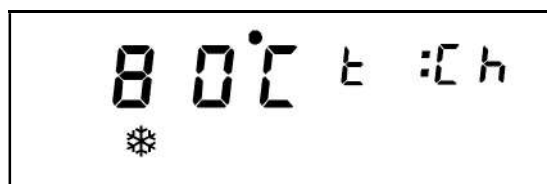


INFORMATION or TEMPERATURE MENU: Temperature display

From the main screen, enter the “INFORMATION MENU” by pressing and holding the **-III** (J3) + **-P** (J5) keys for 4 seconds. Within the menu, the keys take on the following meanings:

Key	Function
ON/OFF (J7)	Exit - Return to main screen
+III (J2)	Index increment
-III (J3)	Index decrement

On small digits, the information indication is displayed (e.g. “t :” if temperature), while on large digits, the value is shown (e.g. 80°C). In the absence of the device or if the device is not enabled, the indication “- -” will appear.



In the table, a list of the information available in the menu:

Index	Info	Unit	Description
1	t :Ch	°C	Supply temperature, main exchanger, or collector probe temperature
2	t :dh	°C	Temperature of the sanitary probe
3	t :Ep	°C	Temperature of the external probe
4	t :SE	°C	Compensated heating set-point based on the temperature detected by the external probe
5	Fl.Mt	liters/minute	Flow rate of the sanitary flowmeter
6	duty	%	Duty cycle of the PWM feedback signal for the circulator
7	PH2o	Bar	System pressure detected by the pressure transducer
8	EHc1	°C	Temperature of the probe for the first heat exchanger (double exchanger)
9	EHc2	°C	Temperature of the probe for the second heat exchanger (double exchanger)



PARAMETER MENU: Parameter display

Pressing the **+III** (J2) and **+P** (J6) keys simultaneously and holding them for 4 seconds will display the symbol  on the screen. Within the "PARAMETER" menu, the keys take on the following meanings:

Key	Function
-P (J5)	Decrease displayed parameter value
+P (J6)	Increase displayed parameter value
ON/OFF (J7)	Exit Parameters Menu
+III (J2)	Increase parameter index
-III (J3)	Decrease parameter index

On small digits, the parameter index is displayed, while on large digits, the value is shown.



FAULT CODES

Faults are indicated by an "ERR FX" message, with X being the corresponding error code.

"ERROR" Code	Meaning
F 1	Functional system shutdown due to system pressure below 0.7 bar
F 3	Central heating probe fault (SM)
F 4	Sanitary probe fault (SS)
F 7	Block by error of circulator feedback signal
F 8	- Safety Thermostat (TS) trip. - Tank Limit Thermostat (TLB) trip (Manually unlock using the designated button located on the tank by removing the black cap). - To reset system press ON-OFF (J7)
F 9	EEPROM memory hardware failure



UNLOCKING THE APPLIANCE (RESET)

Following a block, once the fault is restored, you can restore the system by pressing the appropriate button on the user interface display **ON-OFF** (J7).



DESCRIPTION ANOMALIES

Err F 1: Anomaly pressure water system	
Anomaly	Following the values of the pressure transducer under the set threshold
Operating effects	The heat request is not served in all operating states
Effects on loads	<u>TRIAC primary exchanger</u> : OFF <u>Circulator</u> : DEACTIVATED after possible postcirculation <u>Deviator valve</u> : DHW <u>Zone valve</u> : DEACTIVATED
Actions to be carried out	System loading. Correct verification of operation and connection of e water pressure switch.
Block	NO

Err F 3: Heating probe anomaly (SM)	
Anomaly	Primary short circuit exchanger probe or open circuit
Operating effects	The heat request is not served in all operating states
Effects on loads	<u>TRIAC primary exchanger</u> : OFF <u>Circulator</u> : DEACTIVATED after possible postcirculation <u>Deviator valve</u> : DHW <u>Zone valve</u> : DEACTIVATED
Actions to be carried out	Verification of operation and connection of the heating probe (SM)
Block	NO

Err F 4: DHW probe anomaly (SS)	
Anomaly	DHW probe in short circuit or open circuit
Operating effects	In the states where modulation takes as a reference, the DHW probe is not served heat
Effects on loads	Only in relation to the states in which the anomaly has effect. The state status takes control of the system.
Actions to be carried out	Verification of operation and connection of the DHW probe (SS)
Block	NO



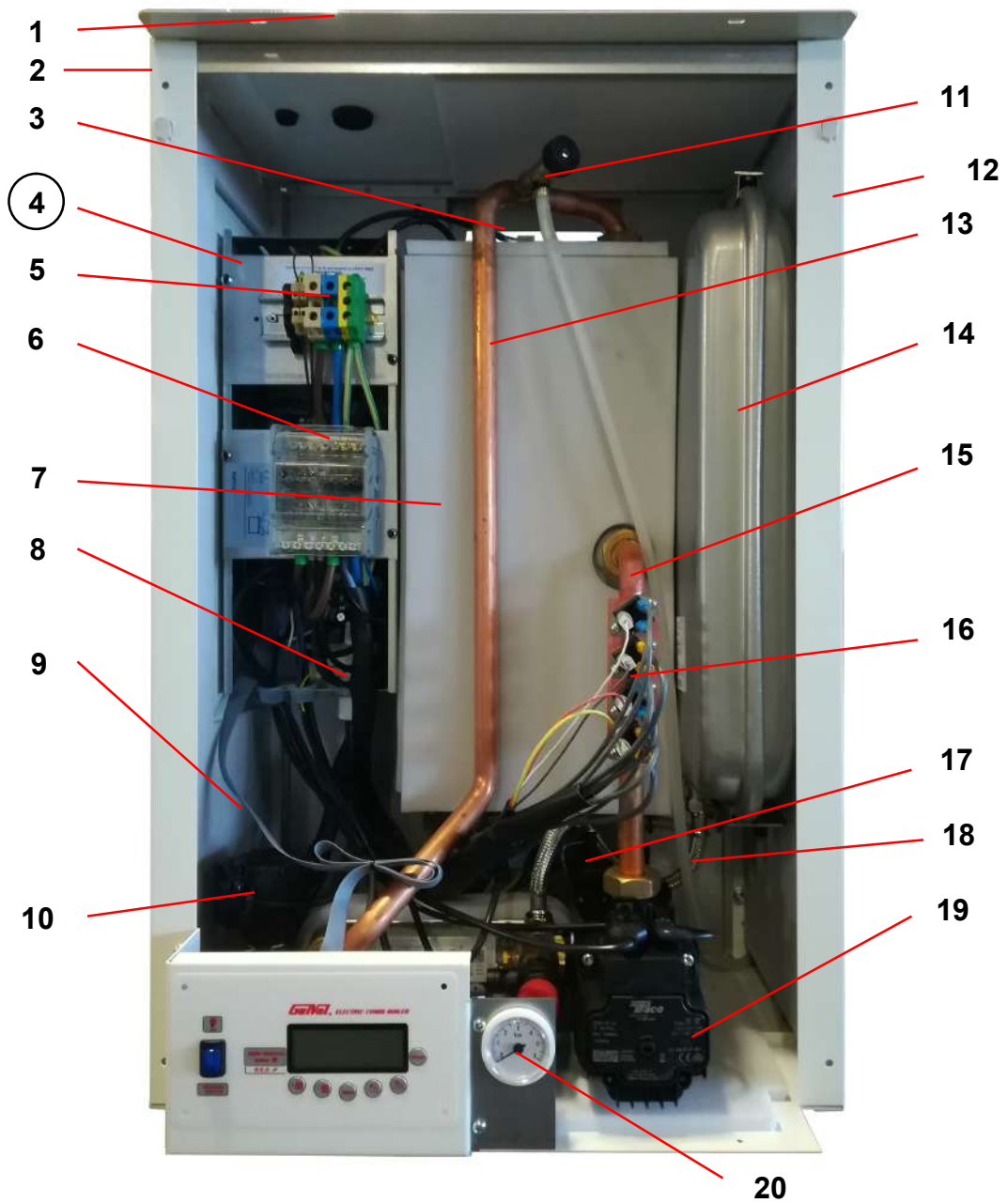
Err F 7: Circulator feedback signal anomaly	
Anomaly	The circulator's feedback signal takes on a non regular value
Operating effects	After 1 minute the PCB is sent to block
Effects on loads	After 1 minute: <u>TRIAC primary exchanger:</u> OFF <u>Circulator:</u> DEACTIVATED after possible postcirculation <u>Deviator valve:</u> DHW <u>Zone valve:</u> DEACTIVATED
Actions to be carried out	Verification of operation and circulator connection. Requirement correct water flow in the plant.
Block	YES

Err F 8: Block for Security Thermostat intervention (TS)	
Anomaly	Above temperature in the primary exchanger or in the heating system
Operating effects	The heat request is not served in all operating states
Effects on loads	<u>TRIAC primary exchanger:</u> OFF <u>Circulator:</u> DEACTIVATED after possible postcirculation <u>Deviator valve:</u> DHW <u>Zone valve:</u> DEACTIVATED
Actions to be carried out	Requirement correct water flow in the plant. Verification of circulator operation. Verification of Security Thermostat operation (TS) and Limit Thermostat (TLB).
Block	YES

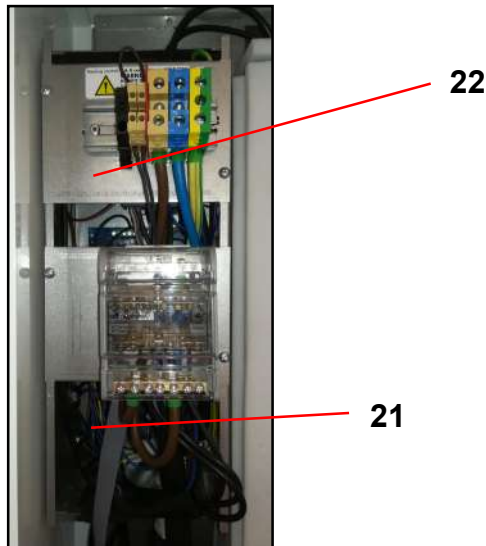
Err F 9: Hardware Anomaly Memory EEPROM	
Anomaly	Breakage or malfunction of the storage in Eeprom that stores the parameters
Operating effects	The heat request is not served in all operating states
Effects on loads	<u>TRIAC primary exchanger:</u> OFF <u>Circulator:</u> DEACTIVATED after possible postcirculation <u>Deviator valve:</u> DHW <u>Zone valve:</u> DEACTIVATED
Actions to be carried out	Reset power supply and verification of the correctness of the stored parameters. PCB replacement.
Block	NO



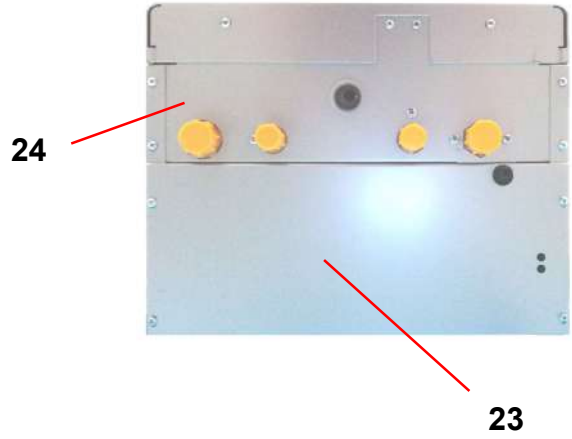
SPARE PARTS



4 Detail view: Electric Box

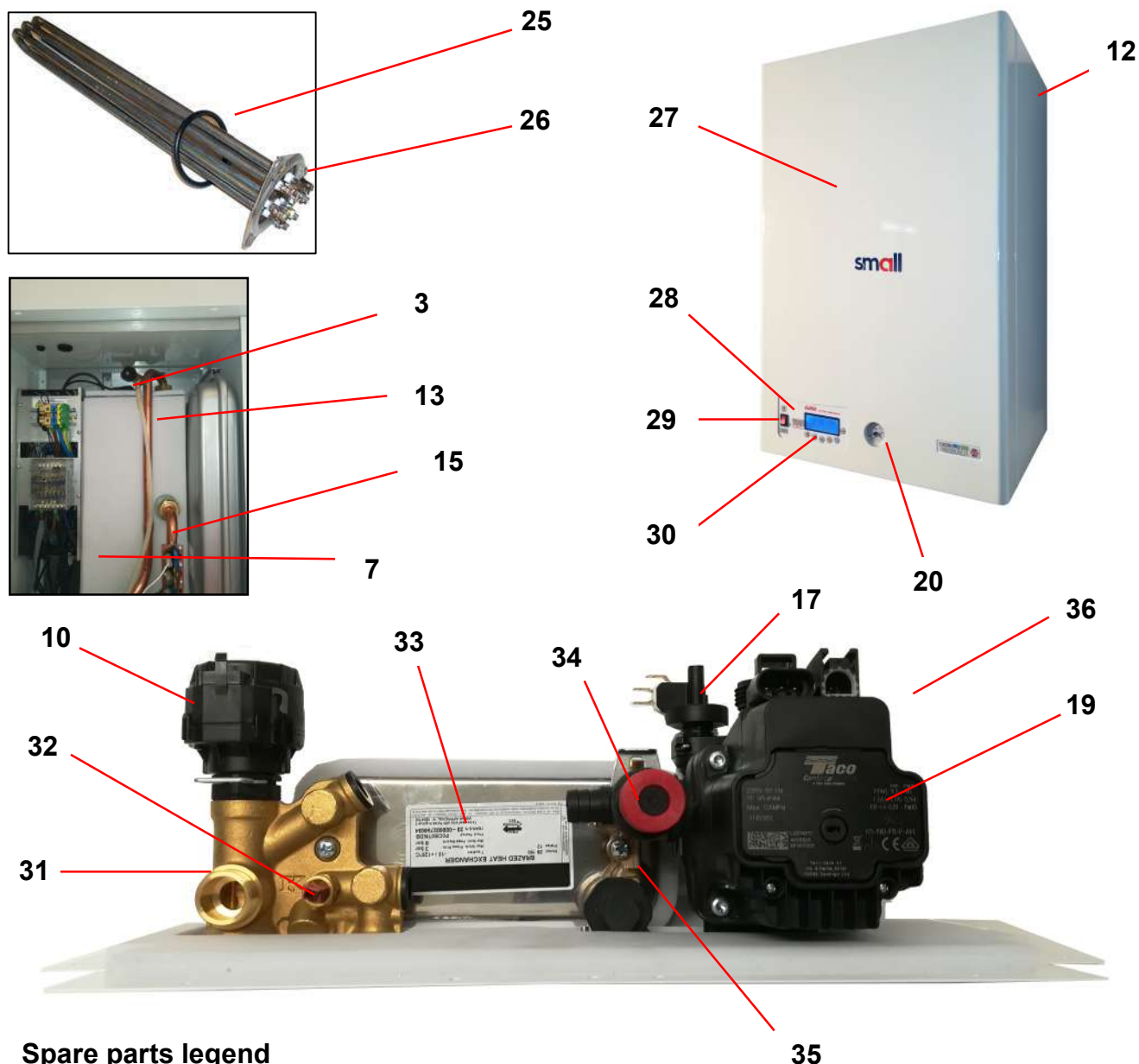


Detail view: Hydraulic connections





Boiler front

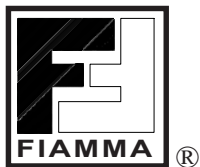


Spare parts legend

1	Small C upper sheet metal cover.....	Cod.FGB.8496
2	Left side shell.....	Cod.FGB.8489
3	Contact safety thermostat 100°C.....	Cod.FGB.1195
4	General electric box (contactor/electronic board panel).....	
5	Power supply line terminal 230-240 V (L) x 10 pcs.....	Cod.FGB.2073
	Neutral power supply terminal 230-240 V (N) x 10 pcs.....	Cod.FGB.2072
	Earth terminal (⊥) x 10 pcs.....	Cod.FGB.2074
6	Two-pole power terminal block.....	Cod.P.8550
7	Small C/N boiler body.....	Cod.FGB.1949
8	Small C Wiring.....	Cod.P.8495
9	Lcd display connection cable.....	Cod.FGB.7561
10	Diverter valve motor (actuator).....	Cod.FGB.223



11	Drain tap 1/4".....	Cod.FGB.225
12	Right side shell.....	Cod.FGB.8488
13	Small C delivery pipe.....	Cod.FGB.8499
14	Small C 9 litre expansion tank.....	Cod.P.8459
15	Return pipe (pump/body).....	Cod.FGB.8498
16	Power Triacs (40 A - 600 V).....	Cod.FGB.247
17	Pressure switch (max./min. pressure).....	Cod.RIT.7609
18	Expansion vessel hose.....	Cod.FGB.8417
19	Variable head circulator Grundfos (electronic pump).....	Cod.FGB.8415
	Variable head circulator Guival (electronic pump).....	Cod.FGB.8422
	Variable head circulator Taco (electronic pump).....	Cod.FGB.8064
20	Hydrometer.....	Cod.FGB.155
21	Electronic board.....	Cod.FGB.8182
22	Power contactor.....	Cod.P.2153
23	Small C bottom grid.....	Cod.FGB.8490
24	Hydraulic connection template.....	Cod.FGB.8483
25	O-Ring seal x heating element 3x2 kW.....	Cod.FGB.238
26	Heating element 3x2 kW.....	Cod.FGB.255
27	Small C front cover.....	Cod.FGB.8487
28	Small C Instrument Panel.....	Cod.P.8278
29	Illuminated main switch.....	Cod.FGB.248
30	Lcd Display.....	Cod.FGB.1763
31	Delivery assembly - diverter valve.....	Cod.FGB.8435
32	Sanitary probe.....	Cod.P.1929
33	Small 12kW C plate heat exchanger.....	Cod.FGB.8506
34	Central heating safety valve 0.3 MPa (3 bar).....	Cod.FGB.1727
	Composite Central heating safety valve 0.3 MPa (3 bar).....	Cod.FGB.8469
35	Return assembly - cold water.....	Cod.FGB.8492
36	Automatic vent valve.....	Cod.FGB.263
37	Silicone tube for condensate drainage	Cod.P.1870



FIAMMA
GAS & ELECTRIC BOILER



**DICHIARAZIONE DI
CONFORMITA'**



**DECLARATION OF
CONFORMITY**

In accordo con - According to:

2014/35/EU	Direttiva Bassa Tensione (BT) – <i>Low Voltage Directive (LVD)</i> .
2004/30/EU	Direttiva Compatibilità Elettromagnetica - <i>Electromagnetic compatibility Directive (EMC)</i> .
2011/65/EU	Direttiva restrizione uso di determinate sostanze pericolose in apparecchiature elettriche ed elettroniche. <i>Directive on the restriction of use of certain hazardous substances (RoHS)</i> .
1935/2004	Regolamento riguardante i materiali e gli oggetti destinati a venire a contatto con i prodotti alimentari. <i>Regulation on materials and articles intended to come into contact with food</i> .
813/2013/EU	Regolamento per la progettazione ecocompatibile degli apparecchi per il riscaldamento d'ambiente e degli apparecchi di riscaldamento misti. - <i>Ecodesign requirements for space heaters and combination heaters</i> .
811/2013/EU	Regolamento riguardante l'etichettatura indicante il consumo d'energia degli apparecchi per il riscaldamento d'ambiente, degli apparecchi di riscaldamento misti. <i>Regulation regard to the energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device</i> .

N° di identificazione - <i>Identification No.</i> :	Vedi numero di matricola / <i>See the serial number</i>
Costruttore - <i>Manufacturer</i> :	FIAMMA GIRO s.r.l.
Indirizzo - <i>Address</i> :	via L. Landucci n° 2/B - 51100 PISTOIA - ITALY
Telefono - <i>Telephone</i> :	(+39).0573.532812
Fax / e-mail – <i>Telefax / E-mail</i> :	(+39).0573.532890 - info@fiammagiro.it
Tipo di apparecchio - <i>Type of equipment</i> :	Caldaia murale elettrica / <i>Electric wall boiler</i>
Marchio commerciale - <i>Trademark</i> :	 (dicitura GUIVAL / GUIVAL marked)
Tipo / Modello – <i>Type / Model</i> :	Vedi Modello su targhetta dati / <i>See the model in data code</i> ELEKTRA.. 6 ÷ 24 ... ELEKTRA.. 6 ÷ 24...

Le norme armonizzate o le specifiche tecniche (designazioni) che sono state applicate in accordo con le regole della buona arte in materia di sicurezza in vigore nella Unione Europea sono :
The following harmonised standards or technical specifications (designations) which comply with good engineering practice in safety matters in force within the European Union have been applied :

Norme o altri documenti normativi - *Standards or other normative documents*

IEC 60335-1:2010+A1:2013+A2:2016 – IEC 60335-2-21:2012+A1:2018

EN 60335-2-21:2003+A1:2005+A2:2008

EN 60335-1:2012+A11:2014+A13:2017+A1:2019+A2:2019+A14:2019

Le caldaie della serie ELEKTRA.. sono certificate CB con documento n°. IT-22669/A1.

The boilers of the ELEKTRA.. series are CB certified with document number IT-22669/A1.

Rapporto di collaudo - Schede tecniche

Test report-Technical file

Nr. EP20-0059463-01 rev.1

EN 61000-3-11:2011; EN 61000-3-12:2011; EN 61000-3-11:2001; EN 61000-3-11:2000; EN 55014-1; EN 55014-2

Le caldaie della serie ELEKTRA sono state verificate con Test-Report n°. TRA-030968-36-00A

The boilers of the ELEKTRA series have been verified with Test-Report n°. TRA-030968-36-00A.



In qualità di costruttore e/o rappresentante autorizzato della società all'interno della Unione Europea, si dichiara sotto la propria responsabilità che gli apparecchi sono conformi alle esigenze essenziali previste dalle Direttive e Regolamenti su menzionate/i.
As the manufacturer's authorized representative established within European Union, we declare under our sole responsibility that the equipment follows the provisions of the Directives and Regulations stated above.

Pistoia, 15/07/2022

Giro Luca

presidente consiglio di amministrazione
Board Chairman of administration



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Cap. soc. Euro.40.000,00 Int. versato. - P.I.V.A. 01432870473 - R.E.A. 149197 - Albo Art. PT49948
FILIALE: 37049 VILLA BARTOLOMEA (VR) - ITALIA - Via P. Bettini, 19 Z. I. Tel. (+39).0442.659028 - Telefax (+39).0442.659045
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<http://www.fiammagiro.com>



FIAMMA
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**DECLARATION OF
CONFORMITY**

**UK
CA**

**DICHIARAZIONE DI
CONFORMITA'**

According to - *In accordo con* :

Electrical Equipment (Safety) Regulations 2016. - *Regolamento Apparecchiature Elettriche (Sicurezza) 2016.*

Electromagnetic Compatibility Regulations 2016. - *Regolamento Compatibilità Elettromagnetica 2016.*

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012.

Restrizioni all'Uso di Certe Sostanze Pericolose in Apparecchiature Elettriche ed Elettroniche 2012.

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Type of equipment - <i>Tipo di apparecchio</i> :	Electric wall boiler / <i>Caldaia murale elettrica</i>
Trademark - <i>Marchio commerciale</i> :	 (marked GUIVAL / GUIVAL dicitura)
Type / Model - <i>Tipo / Modello</i> :	See the model in data code / <i>Vedi Modello su targhetta dati</i> ELEKTRA.. 6 ÷ 24 ... ELEKTRA.. 6 ÷ 24...

The following standards or technical specifications (designations) which comply with good engineering practice in safety matters in force have been applied :

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EN 60335-2-21:2003+A1:2005+A2:2008

EN 60335-1:2012+A11:2014+A13:2017+A1:2019+A2:2019+A14:2019

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Test report-Technical file

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EN 61000-3-11:2011; EN 61000-3-12:2011; EN 61000-3-11:2001; EN 61000-3-11:2000; EN 55014-1; EN 55014-2

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As the manufacturer's authorized, we declare under our sole responsibility that the equipment follows the provisions of the Regulations stated above.

In qualità di costruttore e/o rappresentante autorizzato della società, si dichiara sotto la propria responsabilità che gli apparecchi sono conformi alle esigenze essenziali previste da i Regolamenti su menzionati.

Pistoia, 15/07/2022

Giro Luca

Board Chairman of administration
presidente consiglio di amministrazione



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FIAMMA GIRO s.r.l. Company group



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