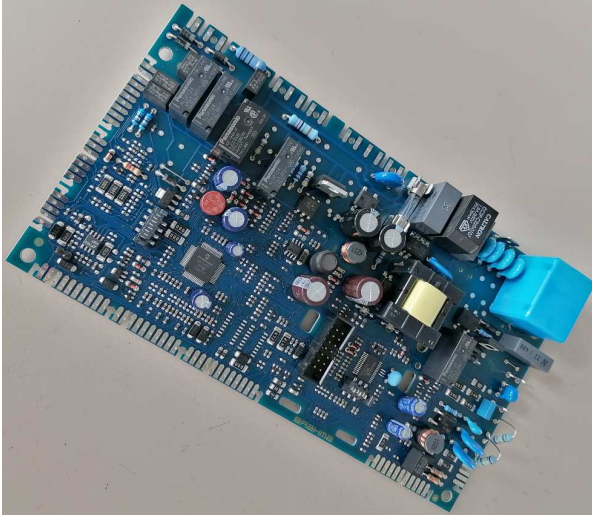


Board type “1968”

ELECTRONIC BOARD FOR IGNITION CONTROL AND THERMOREGULATION IN SYSTEMS WITH PREMIX OR ATMOSPHERIC GAS BURNER



DESCRIPTION

This device is expressly designed for the ignition control and thermoregulation operations in gas systems with premix burner, in particular for condensing boilers, both with traditional (pneumatic) air / gas mixing system and with electronic (separate) air / gas mixing. It is also suitable for systems with atmospheric burners.

GENERAL FEATURES

This control board is provided with the following features:

- Compliance with EN298:2012 (European Standard for automatic gas and oil burner control systems and flame detection) and with EN60730-2-5 (European Standard for automatic controls with C class software);
- CE-type certification in accordance with the new European Gas Appliances Regulation (EU) 2016/426 (GAR); *The certificate covers the integrated thermal cut-out function (TCF) for water temperature limit function according to the standard EN 14459:2007 as far as applicable, when combined to NTC probe complying with EN 60730-2-9 and annex J, classified as suitable for use in type 2 controls.*
- Conformity to EC directives, Electromagnetic compatibility EMC (immunity) 2014/30/EU and Low-voltage directive 2014/35/EU;
- Compliance EN 12067-2. Gas/air ratio controls for gas burners and gas burning appliances. Part 2: Electronic types.
- Board power supply: 230 V_{AC} 50/60 Hz.

- Power supply for the low voltage (24 V_{DC}) made by means of a switching device.
- Power supply for the very low voltage (5 V_{DC}) made by means of a DC / DC converter device.
- 4KV and 5mm PELV (Protective Extra Low Voltage) insulation on the printed circuit surface between components connected to the mains power supply and low voltage controls.
- Varistor for protection against voltage transients that can be generated in the mains power supply.
- Power supply over-absorption protection fuse.
- Protection filter from electromagnetic disturbances from / to the mains power supply.
- Flame detection circuit based on the ionization principle, using the rectification property of the flame (with electrode probe or by detecting of UV emissions with photodiode FDx-type, only for gas appliances).
- Flame detection circuit with voltage at the electrode generated by the thermoregulation microcontroller, which makes flame detection independent from the characteristics of the mains power supply.
- Flame detection device safe to the touch.
- Double-electrode or single-electrode ignition device.
- On-board igniter, with high efficiency driving circuitry and transformer integrated into the board. Alternatively, connection for an external igniter with 230 V_{AC} power supply.
- RAST-type connections or, on request, replaceable with classic connectors (Molex, Lumberg, CJT type).
- Visualizations by means of an on-board LCD display with 32 segments, backlit with two LEDs. Settings by means of a 6-keys silicone rubber keyboard (5 functional software keys and a hardware reset key).
Alternatively, it is possible to connect an external LCD control board.
Finally, it is possible to connect the Brahma “B-Touch” device (as local control panel or ad OpenTherm® + Wi-Fi chronothermostat) for the management of settings and visualizations.
- Use of (up to) 5 contact or immersion NTC probes for detecting the temperature of the water or exhaust fumes (CH outgoing water, return water, hot outlet sanitary water, cold inlet sanitary water, exhausts probe).
- Predisposition for the connection of an external probe for regulating the water temperature depending on the external climatic conditions and the characteristics of the installation building.
- Detection of the system water pressure via analog pressure transducer or contact water pressure switch.

- Detection of water circulation in the primary system by a differential flow switch.
- The board is equipped with an integrated condensate level detector circuit, which can recognize the presence of condensation inside the siphon / recuperator. The circuit is designed to avoid electrolysis between the electrodes immersed in the condensate.
- Instantaneous sanitary system (DHW) (managed by flow switch or flow meter and NTC probes) or with external boiler (managed by a boiler thermostat or NTC probe).
- Possibility of reading a "0-10 Volt"-type signal provided by any external electronic device for the management of generic thermoregulation operations.
- Connection of a simple (chrono)thermostat or OpenTherm® remote chronothermostat (for example Brahma "Kronos OT11 or "B-Touch") for setting working temperatures and weekly heating programs.
- Predisposition for cascade boiler applications via RS485 communication with "1968" boards both in Master and Slave configuration. Alternatively, provision for local LIN-Bus communication between devices connected to the same system.
- RS232 serial communication for the connection to a remote PC for the monitoring, analysis, and remote settings of the parameters on the boiler, or for the connection of an external "custom" board for the management of generic thermoregulation functions.
- Connection of a safety thermostat, made by a contact or by means of a double safety probe.
- Predisposition for the connection of a flue gas thermostat.
- Predisposition for the connection of an air pressure switch.
- Possibility of driving a high efficiency circulator powered by a 230 V_{AC} relay, with PWM type regulation signal for speed modulation according to the system characteristics and with PWM type feedback (flow rate) signal.
- Possibility of driving a brushless fan, powered by a 230 V_{AC} relay, with PWM type regulation signal and tacho feedback signal from a Hall-effect sensor.
- Possibility of powering a traditional fan and / or a traditional circulator by a 230 V_{AC} relay or TRIAC component, with phase cut speed modulation.
- Control of a pneumatic gas valve, for traditional premix applications, powered at 230 V_{RAC} / 230 V_{AC} / 24 V_{DC}.
Alternatively, control of an electronic gas valve, for eGARC premix applications, with 230 V_{RAC} / 230 V_{AC} / 24 V_{DC} safety power

supply and modulator via 24 V_{DC} stepper motor.

Finally, the possibility of controlling an electronic gas valve, for atmospheric applications, with safety power supply 230 V_{RAC} / 230 V_{AC} / 24 V_{DC} and current modulator driven by a 24 V_{PWM} signal.

- Control of a 230 V_{AC} motorized 3-ways valve (by relay).
Alternatively, control of a 230 V_{AC} tank pump.
- Possibility of managing an independent 24 V_{DC} stepper motor for the management of a 3-ways or mixing valve.
- Possibility of converting and re-configuring most of the board inputs and outputs in hardware and / or software mode, according to the specific needs of the customer, to obtain high flexibility and versatility of use of the product.
- Control of all basic and advanced thermoregulation functions of the system by means of a dedicated thermoregulation microcontroller.
- Control of all system safety functions by means of a dedicated safety microcontroller.
- Differentiated setting of the optimal water temperature for the following operating modes:
 - Domestic hot water
 - Heating
 - Chimney sweep
 - Antifreeze
 - Anti-Legionella
 - DHW comfort
- Burner power modulation with proportional, integral, and derivative (PID) electronic system.
- Predisposition for operation in low temperature systems.
- Possibility of implementing an electronic premixed combustion system that meets the EN12067-2 GARC standard, with a separate and independent management of the gas and air quantities, which controls and optimizes system performance and hygiene combustion (maximization of energy efficiency and reduction of the emission of harmful substances into the environment).

ACCESSORIES

System can be provided with:

- Board plastic box.
- Connectors and terminals for wirings.
- Contact or immersion NTC temperature probes type Brahma ST03, ST04, ST07, ST11, ST06, ST6B, ST09 and ST10 for the detection of the temperature of water and combustion products.
- Brahma SSE temperature probe for the detection of the external environment temperature.
- External high-efficiency igniter type Brahma TSM.
- LCD control panel type Brahma "LCDx".
- OpenTherm-compatible chrono-thermostat type Brahma "Kronos OT11" or "B-Touch".
- Ignition and detection electrodes type Brahma SALV.

For the detailed description of these devices please refer to the specific technical documentation that can be found on Brahma web site: www.brahma.it

TECHNICAL DATA

Supply voltage:	230 V _{AC} 50/60 Hz
Voltage range:	[-15% ÷ +10%]
Operating temperature range:	-20°C / +60°C
Humidity:	95% max @40°C (*)
Protection degree:	IP 00
Dimensions:	190x105x35 mm (**)

(*) Not condensing

(**) Depending on the mounted components

Integrated temperature control system

The integrated temperature control systems are usually customized (according to customer's requirements) as far as operation and control of the boiler parts are concerned. However, for a more detailed description, hereunder we will refer to the system series 1968 in its "standard" configuration.

The main technical features are described here below.

Classification codes according to EN298:

Character	Specification	Code
1°	Fanned and atmospheric	B
2°	Direct ignition of the main burner	M
3°	Non-volatile lockout	L
	Volatile lockout	V
	Recycling	C
4°	Non-volatile lockout	L
	Volatile lockout	V
5°	Fixed times	X
6°	System for non-permanent operation	N

Timings

Pre-purge time (TW):	1,5 ... 60 s
Safety time (TS):	3,0 ... 60 s
Spark ignition time (TSP):	(TS - 1) s
Drop-out time on flame failure:	< 1 s

The above times correspond to guaranteed values. Actual values may differ from declared ones, as waiting (TW) or post-purge may be longer and safety time (TS) shorter.

Ignition attempts

1...10

Flame control

The flame detection device makes use of the rectification property of the flame.

Minimum ionisation current:	0.5 µA
Recommended current:	3 ÷ 5 times the min.
Detection electrode voltage:	105 V _{RMS}
Max. cable length:	1 m
Min. insulation resistance of detection electrode and cable to earth:	≥ 50 MΩ
Max. electrode stray capacitance:	≤ 1 nF
Max. short circuit current:	<200µA AC

Flame monitoring with photosensor UV type

The FD sensors can detect the ultraviolet light (UV spectral field from 290nm to 350nm) on application with blue flame burners. These sensors are suitable for gas applications, the following table shows the various UV sensors classified according to their sensitivity.

Type	Versions	Side
FD1/S or FD1/N	NDxxxx	Frontal
FD2/S or FD2/N	NDxxxx	Lateral

Connections, overall dimensions and fixing templates are shown in the specific documents.

Internal fuse

3,15A 250V_{AC} fast

On-board ignitor

Peak voltage:	12 kV
Peak current (short circuit secondary):	165 mA _P
Effective current (short circuit secondary):	7,8 mA _{RMS}
Spark energy:	5 mJ
Spark frequency:	100 Hz
Recommended distance between the electrodes:	3 mm
Max. ignition cable length:	2 m

Maximum cable length

Room thermostat	50 m
OpenTherm chrono-thermostat	50 m
External probe	10 m
Tank (DHW) probe	10 m
Other cables	1 m

Maximum contact rating

Gas valve 24 V _{DC} :	0,4 A _{DC}
Gas valve 230 V _{AC} :	0,25 A _{AC} cosφ ≥ 0.4
Other 230 V _{AC} loads:	0.5 A _{AC} cosφ ≥ 0.4

In determining the maximum contact current rating, the following conditions must also be met:

Power filter

A filter is positioned at the board input to reduce electromagnetic disturbances conducted to and from the system. The input filter is sized for a maximum current of 1.2 A, so the sum of the currents absorbed by the filtered loads must be less than this value:

Power fuse

A fuse is positioned at the board input to protect the system from current over-absorption. The fuse is rated for a maximum current of 3.15 A, therefore the sum of the currents absorbed by the loads under the fuse must be less than this value.

Switching power supply

The devices connected to the board in low voltage are powered by a switching power supply. The maximum power that can be supplied by the switching power supply is 12 W @ 24 V_{DC}.

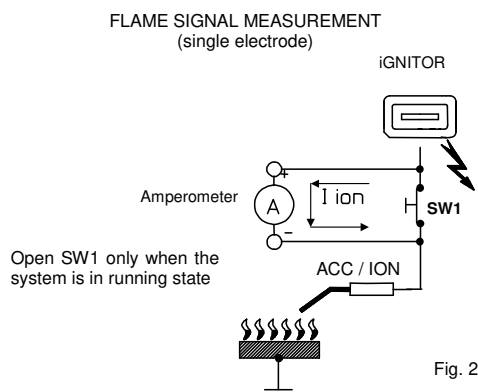
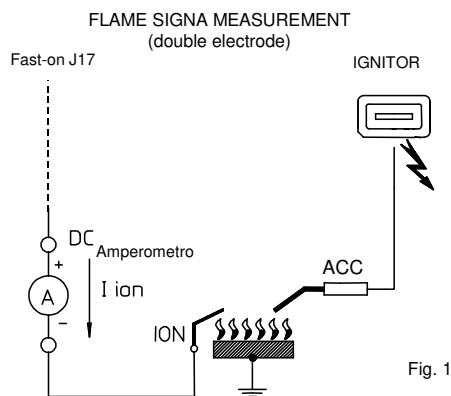
INSTALLATION DIRECTIONS

- Respect the applicable national and European standards regarding electrical safety (e.g. EN 60335-1, EN 60335-2-102, EN 50165), bearing in mind that ignition and flame control systems are safety devices: the manufacturer's responsibility and guarantee are invalidated in case of Customer's tampering with the product;
- Before the first start-up, make sure that the loads are well connected to avoid any dangerous situation or failure in the appliance. Particular attention should be paid to earth connections: make sure that all loads (fans, gas solenoid valves, ignition transformer, ...) are connected to the appliance safety earth, using for example the connector on board;
- The system is designed to stay in running status for less than 24h (system for non-permanent operation). Reaching this limit causes a regulation shutdown to enable the unit to check its own efficiency;
- All operations (installation, maintenance, etc.) must be carried out by a qualified technician.
- Before any connection operation, completely isolate the system from power supply (multi-pole disconnection). Place the system safely to avoid accidental switch-on and make sure there is no voltage. If the system is not switched off, there is a risk of electric shock.
- Check the cables before starting operation. Incorrect wiring may damage the unit and compromise the system safety.
- During and after any operation (installation, maintenance, etc.), make sure that the type, timing and code are the ones provided, that the wiring is in good condition and perform the safety check in the "Commissioning notes".
- In the event of a fall or impact, the devices must not be started, as safety functions may be compromised even if no damage is visible to the outside.
- Faulty devices or damaged must be unplugged from power supply and cannot be used.
- Condensation, ice formation and liquids intake are not permitted.
- Make sure that the device is protected against hot or live items/surfaces, eventually using a proper protective box.
- The unit can be mounted in any position;
- Avoid exposure to dripping water;
- A ventilated installation environment and a suitably low temperature ensure the longest life of the control system;
- Before installing or replacing the unit, make sure that the type, code and times are correct;
- The appliance in which the control systems are installed should provide adequate protection against the risk of electric shock (at least IP20);
- Keep signal cables and power cables as far from each other as possible;
- Always run the high-voltage ignition cables separately while observing the greatest possible distance to the unit and to other cables
- Use heat resistant detection cables and electrodes, and make sure that they are well insulated to the ground and protected from possible moisture or water in general;
- Keep the ignition cable as short and straight as possible and place it far from other conductors to reduce the emission of electromagnetic interference (max. length <2m and insulation voltage >25kV).
- EMC emission requirements, according to the directive EN55014-1, shall be tested after the incorporation of the burner control system into the equipment.
- Burner controls has a designed lifetime* of 250,000 burner startup cycles which, under normal operating conditions in heating mode, correspond to approx. 10 years of usage (starting from the production date given on the "type" field). This lifetime is based on the endurance tests in the standard EN 298. A summary of the conditions has been published by the European Control Manufacturers Association (Afecor) (www.afecor.org). The designed lifetime is based on use of the burner control according to the manufacturer's technical notes. After reaching the designed lifetime in terms of the number of burner startup cycles, or the respective time of usage, the burner control must be replaced by authorized personnel.
- * The designed lifetime is not the warranty time specified in the Terms of Delivery

COMMISSIONING NOTES

When commissioning the plant or when doing maintenance work, make the following safety checks:

Safety check to be carried out	Anticipated response
Burner startup without gas supply	Lockout at the end of (TS)
Burner operation with simulated loss of flame. For that purpose, close the fuel supply during operation and leave it in this state.	Recycle with lockout at the end of ignition attempts.



- If the presence of flame is not detected within the safety time TS, the gas valve is closed and the igniter is inhibited: if more ignition attempts are envisaged and the number of attempts available has not yet been exhausted, the system will restart with a new TW / TS cycle keeping the fan speed always at the switch-on value, otherwise a suitably signaled safety block will occur.
- If, during the TS, the presence of flame is detected, the system inhibits the igniter and starts the thermoregulation process, with modulation of the burner flame.
- The running condition remains until the request ceases, or one of the safety devices intervenes, or the flame extinguishes.

CODE PLAIN

The board description is the following:

1968.CN.XX.YY

Where:

C: Letter(s) referred to the customer following Brahma internal codify.

N: Progressive number that identifies a particular hardware and software configuration, specified in the customer dedicated technical document.

The hardware and software options involved in determining the specific coding plan of the product are described in the sections below.

XX: Safety software release index.

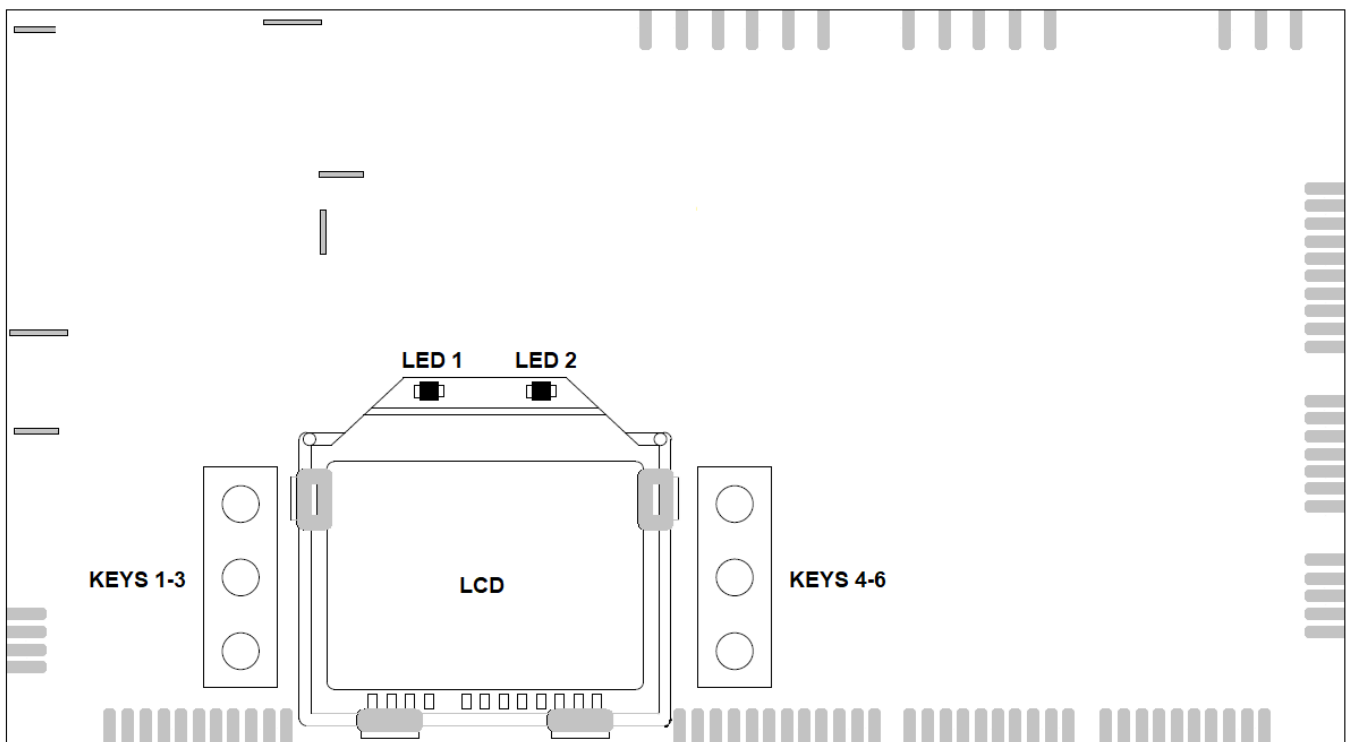
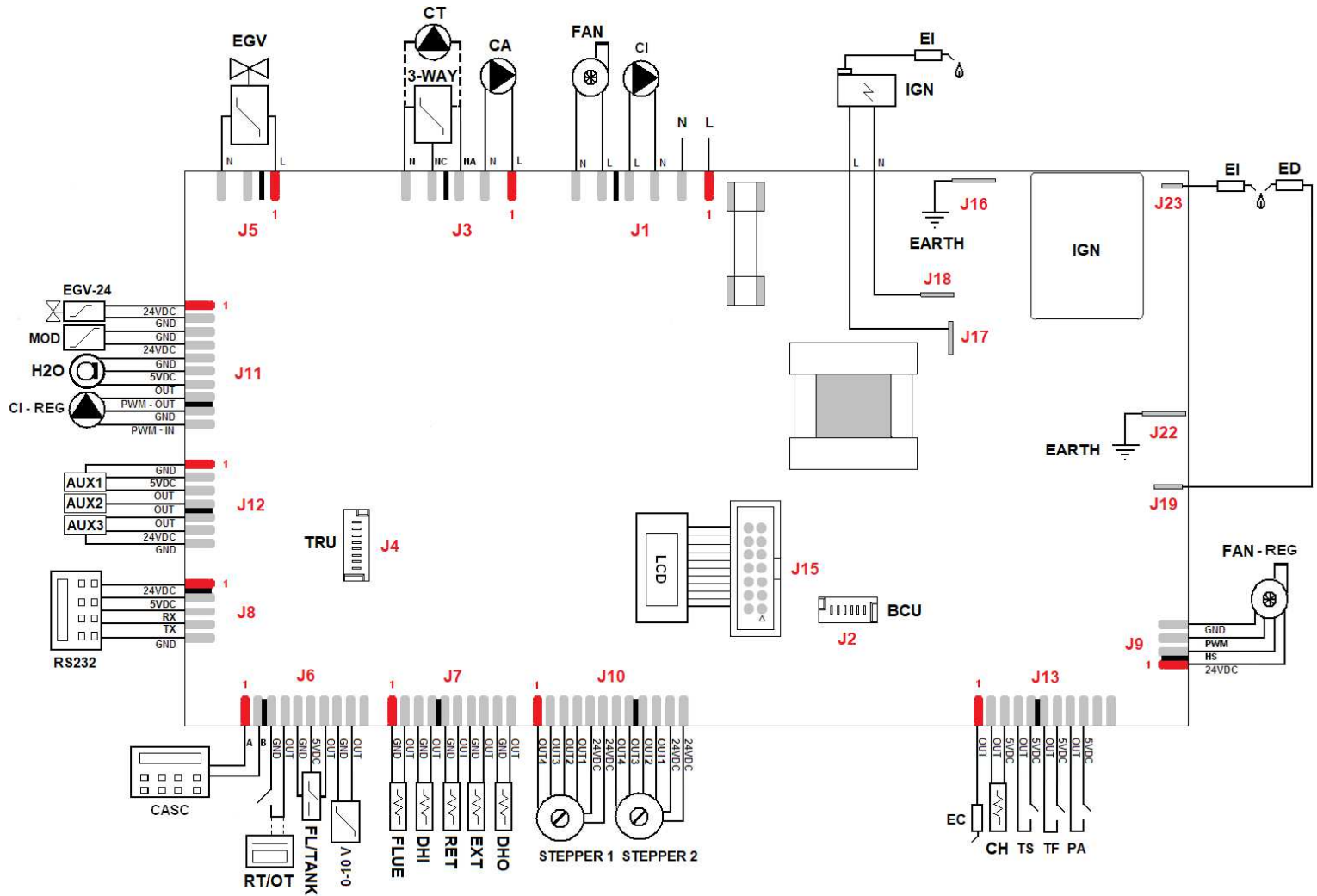
YY: Thermoregulation software release index.

OPERATING CYCLE

The operating cycle begins in response to any burner ignition request. It is characterized by the following phases (the following description refers to a 1968 board with standard operating mode, for a system with premixed burner):

- The fan is powered if the air pressure switch (if present) is in the "no air circulation" condition (open).
- The fan is activated and brought to the ignition speed; for the TW / TS safety cycle to begin, the air pressure switch must switch to the "air circulation" position (closed).
- At the end of the pre-purging time TW, with the power supply of the gas valve and the activation of the ignition device, the safety time TS begins, during which the burner power is maintained at the ignition value.

CONNECTIONS



HARDWARE OPTIONS

Hardware characteristics of the board, relating to both the thermoregulation and safety parts, must be agreed with the customer according to specific needs. In particular, the customer can choose from the hardware options listed in the table below:

Main function	Connection	Hardware options
Board main power supply (L,N,EARTH)	Contacts: J1 [1,2] Voltage: 230 V _{AC}	A) 230 V _{AC}
	Contacts: J16, J22 Voltage: 0 V (Earth/GND)	
Boiler pump power supply (CI)	Contacts: J1 [3,4] Voltage: 230 V _{AC}	A) 230 V _{AC} straight
Fan power supply (FAN)	Contacts: J1 [5,6] Voltage: 230 V _{AC}	A) Not mounted B) 230 V _{AC} straight C) 230 V _{AC} relay (on / off) D) 230 V _{AC} triac (on / off) E) 230 V _{AC} triac (modulating)
Auxiliary pump power supply (CA)	Contacts: J3 [1,2] Voltage: 230 V _{AC}	A) Not mounted B) 230 V _{AC} straight C) 230 V _{AC} relay (on / off) D) 230 V _{AC} triac (on / off) E) 230 V _{AC} triac (modulating)
3-ways valve (3-WAYS)	Contacts: J3 [3-5] Voltage: 230 V _{AC}	A) Not mounted B) Mounted (230 V _{AC} relay switching)
Gas valve power supply (high voltage) (EGV)	Contacts: J5 [1,3] Voltage: 230V _{AC} / V _{RAC}	A) Not mounted B) 230 V _{AC} C) 230 V _{RAC}
Gas valve power supply (24 V _{DC}) (EGV-24V)	Contacts: J11 [1,2] Voltage: 24 V _{DC}	A) Not mounted B) Mounted
Gas valve modulator (MOD)	Contacts: J11 [3,4] Voltage: 24 V _{DC}	A) Not mounted B) Output 24 V _{PWM}
Water pressure transducer (H2O)	Contacts: J6 [8-10] Voltage: 5 V _{DC}	A) Not mounted B) Mounted X) Auxiliary signal (GP1*)
Pump driver (CI-REG)	Contacts: J11 [8-10] Voltage: 24 V _{DC}	Signal 1: A) Not mounted B) Signal PWM-IN X) Auxiliary signal (GP1*)
		Signal 2: A) Not mounted B) Signal PWM-OUT X) Auxiliary signal (GP1*)
Auxiliary signal (AUX1)	Contacts: J12 [4] Voltage: 24 / 5 V _{DC}	A) Not mounted B) NTC probe with pull-down X) Auxiliary signal (GP3*)
Auxiliary signal (AUX2)	Contacts: J12 [4] Voltage: 24 / 5 V _{DC}	A) Not mounted B) Analog output signal 0-5 V _{DC} X) Auxiliary signal (GP3*)
Auxiliary signal (AUX3)	Contacts: J12 [4] Voltage: 24 / 5 V _{DC}	A) Not mounted B) 24 V _{DC} contact X) Auxiliary signal (GP3*)
RS232 serial communication (RS232)	Contacts: J8 [1-5] Voltage: 5 V _{DC}	Signal 1: A) Not mounted B) Signal TX X) Auxiliary signal (GP1*)
		Signal 2: A) Not mounted B) Signal RX X) Auxiliary signal (GP1*)
Secondary serial communication (CASC)	Contacts: J6 [1,2] Voltage: 5 V _{DC}	A) Not mounted B) RS485 communication – A C) RS232 communication – TX D) LIN Bus communication – Signal X) Auxiliary signal (GP4*)
		A) Not mounted B) RS485 communication – B C) RS232 communication – RX D) LIN Bus communication – VBAT X) Auxiliary signals (GP4*)

OpenTherm / Room thermostat (RT/OT)	Contacts: J6 [3,4] Voltage: 24 V _{DC}	A) Not mounted B) OpenTherm + Room thermostat C) Room thermostat (contact)
DHW flowmeter (FL/TANK)	Contacts: J6 [5-7] Voltage: 5 V _{DC}	A) Not mounted B) Mounted X) Auxiliary signal (GP1*)
0-10 Volt signal (0-10V)	Contacts: J11 [5,7] Voltage: 10 V _{DC}	A) Not mounted B) Mounted X) Auxiliary signal (GP1*)
Exhausts flue probe (FLUE)	Contacts: J7 [1,2] Voltage: 5 V _{DC}	A) Not mounted B) Mounted X) Auxiliary signal (GP1*)
Inlet (cold) DHW probe (DHI)	Contacts: J7 [3,4] Voltage: 5 V _{DC}	A) Not mounted B) Mounted X) Auxiliary signal (GP1*)
Return probe (RET)	Contacts: J7 [5,6] Voltage: 5 V _{DC}	A) Not mounted B) Mounted X) Auxiliary signal (GP1*)
External probe (EXT)	Contacts: J7 [7,8] Voltage: 5 V _{DC}	A) Not mounted B) Mounted C) Analog output signal [0-5] V _{DC} X) Auxiliary signal (GP2*)
Outlet (hot) DHW probe (DHO)	Contacts: J7 [9,10] Voltage: 5 V _{DC}	A) Not mounted B) Mounted X) Auxiliary signal (GP2*)
Gas valve unipolar stepper motor (STEPPER 1)	Contacts: J10 [1-6] Voltage: 24 V _{DC}	A) Not mounted B) Mounted
3-ways valve unipolar stepper motor (STEPPER 2)	Contacts: J10 [7-12] Voltage: 24 V _{DC}	Driver: A) Not mounted B) Mounted
		Signal 1: A) Not mounted B) Signal stepper A X) GND
		Signal 2: A) Not mounted B) Signal stepper B C) 24 V _{DC} contact X) Auxiliary signal (GP4*)
		Signal 3: A) Not mounted B) Signal stepper C X) 5 V _{DC}
		Signal 4: A) Not mounted B) Signal stepper D C) 24 V _{DC} contact X) Auxiliary signal (GP4*)
Condense level detection electrode (EC)	Contacts: J13 [1] Voltage: 5 V _{DC}	A) Not mounted B) Mounted
CH probe (CH)	Contacts: J13 [2,3] Voltage: 5 V _{DC}	A) Not mounted B) Mounted
Safety thermostat (TS)	Contacts: J13 [4,5] Voltage: 5 V _{DC}	A) Not mounted B) Contact C) Second safety NTC
Exhausts flue thermostat / probe (TF)	Contacts: J13 [6,7] Voltage: 5 V _{DC}	A) Not mounted B) Thermostat C) Probe
Air pressure switch (PA)	Contacts: J13 [8,9] Voltage: 5 V _{DC}	A) Not mounted B) Mounted
Fan driver (FAN-REG)	Contacts: J9 [1-4] Voltage: 24 V _{DC}	Signal 1: A) Not mounted B) Signal PWM X) Auxiliary signal (GP1*)
		Signal 2: A) Not mounted B) Signal HS X) Auxiliary signal (GP1*)

Flame detection electrode (ED)	Contacts: J19 Voltage: 105 V _{RMS}	B) Not mounted (single electrode system) A) Mounted (double electrode system)
Ignition electrode (EI)	Contacts: J21 Voltage: 12 kV peak impulsive	A) Not mounted (external ignitor) B) Mounted (on-board ignitor)
Ignitor (IGN)	Contacts: J17,J18 Voltage: 230 V _{AC}	A) Not mounted B) On-board C) External 230 V _{AC}
Display (LCD)	Contacts: J15 Voltage: 5 V _{DC}	A) Not mounted B) External LCD C) On-board LCD
On-board LCD keys (KEYS 1-3, KEYS 4-6)	- -	A) Not mounted B) Mounted
LEDs for backlight / signalling (LED 1, LED 2)	- -	LED 1: A) Not mounted B) Mounted
		LED 2: A) Not mounted B) Mounted
Flame amplifier	- -	A) Not mounted B) Traditional application C) eGARC application
TRU microcontroller programming (TRU)	Contacts: J4 Voltage: 5 V _{DC}	A) Not mounted B) Mounted
BCU microcontroller programming (BCU)	Contacts: J2 Voltage: 5 V _{DC}	A) Not mounted B) Mounted
Connections	- -	A) Configuration as described below X) Custom configuration

(*) GP1 signals (general purpose signals type "1"):

- Signal for cables up to 1 meter long
- Analog input signal [0-5 V_{DC}] (e.g. probes, 5 V_{DC} analog sensors)
- Digital input signal [0-5 V_{DC}] (e.g. contacts)
- Frequency input signal (square wave) [0-5 V_{DC}] (e.g. tach signals)
- PWM input signal [0-5 V_{DC}] (e.g. PWM pump flow rate feedback signal)
- PWM output signal [0-5 V_{DC}] (e.g. PWM signal for circulator / fan regulation)
- Digital output signal [0-5 V_{DC}]
- Frequency output signal (square wave) [0-5 V_{DC}]

(*) GP2 signals: like GP1 signals but also for cables up to 10 meters long (e.g. room probes, tank probes)

(*) GP3 signals as GP1 signals but also for 24 V_{DC} input signals:

- Analog input signal [0-24 V_{DC}] (e.g. analog sensors at 24 V_{DC})
- Digital input signal [0-24 V_{DC}] (e.g. 24 V_{DC} contacts)
- Frequency input signal (square wave) [0-24 V_{DC}]
- PWM input signal [0-24 V_{DC}]

(*) GP4 signals: like GP3 signals but also for cables up to 10 meters long (e.g. room thermostats with contact)

TYPE OF CONNECTORS

Series Lumberg (RAST):

J1:	MFMP 7262-006-007-960-000-00-G	6 poles pitch 5.08
J3:	MFMP 7262-005-012-960-000-00-G	5 poles pitch 5.08
J5:	MFMP 7262-003-004-960-000-00-G	3 poles pitch 5.08
J9:	MFMP 7238-004-065-960-000-00-G	4 poles pitch 2.50
J8:	MFMP 7238-005-065-960-000-00-G	5 poles pitch 2.50
J12:	MFMP 7238-007-061-960-000-00-G	7 poles pitch 2.50
J6:	MFMP 7238-010-060-960-000-00-G	10 poles pitch 2.50
J13:	MFMP 7238-011-061-960-000-00-G	11 poles pitch 2.50
J10:	MFMP 7238-012-061-960-000-00-G	12 poles pitch 2.50
J11:	MFMP 7238-010-065-960-000-00-G	10 poles pitch 2.50
J7:	MFMP 7238-010-066-960-000-00-G	10 poles pitch 2.50

Series MOLEX (PTH):

Male:

0010085031	3 poles pitch 5.08
0010085051	5 poles pitch 5.08
0010085061	6 poles pitch 5.08

Female:

0010011034	3 poles pitch 5.08
0010011054	5 poles pitch 5.08
0010011064	6 poles pitch 5.08

Terminals:

0008500105	Terminals for female connectors 00100110x4
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Series CJT (PTH):

Male:

A2508WV-2P	2 poles pitch 2.50
A2508WV-3P	3 poles pitch 2.50
A2508WV-4P	4 poles pitch 2.50
A2508WV-5P	5 poles pitch 2.50
A2508WV-6P	6 poles pitch 2.50
A2508WV-7P	7 poles pitch 2.50
A2508WV-8P	8 poles pitch 2.50
A2508WV-9P	9 poles pitch 2.50
A2508WV-10P	10 poles pitch 2.50
A2508WV-11P	11 poles pitch 2.50
A2508WV-12P	12 poles pitch 2.50

Female:

A2508H-2P	2 poles pitch 2.50
A2508H-3P	3 poles pitch 2.50
A2508H-4P	4 poles pitch 2.50
A2508H-5P	5 poles pitch 2.50
A2508H-6P	6 poles pitch 2.50
A2508H-7P	7 poles pitch 2.50
A2508H-8P	8 poles pitch 2.50
A2508H-9P	9 poles pitch 2.50
A2508H-10P	10 poles pitch 2.50
A2508H-11P	11 poles pitch 2.50
A2508H-12P	12 poles pitch 2.50

Terminals:

A2508-TP	Terminals for female connectors A2508H-xP
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Series Lumberg (PTH):

Male:

2,5 MSF 02 (3114)	2 poles pitch 2.50
2,5 MSF 03 (3114)	3 poles pitch 2.50
2,5 MSF 04 (3114)	4 poles pitch 2.50
2,5 MSF 05 (3114)	5 poles pitch 2.50
2,5 MSF 06 (3114)	6 poles pitch 2.50
2,5 MSF 07 (3114)	7 poles pitch 2.50
2,5 MSF 08 (3114)	8 poles pitch 2.50
2,5 MSF 09 (3114)	9 poles pitch 2.50
2,5 MSF 10 (3114)	10 poles pitch 2.50
2,5 MSF 11 (3114)	11 poles pitch 2.50
2,5 MSF 12 (3114)	12 poles pitch 2.50

Female:

3114-02	2 poles pitch 2.50
3114-03	3 poles pitch 2.50
3114-04	4 poles pitch 2.50
3114-05	5 poles pitch 2.50
3114-06	6 poles pitch 2.50
3114-07	7 poles pitch 2.50
3114-08	8 poles pitch 2.50
3114-09	9 poles pitch 2.50
3114-10	10 poles pitch 2.50
3114-11	11 poles pitch 2.50
3114-12	12 poles pitch 2.50

Terminals:

3111 03 G	Terminals for female connectors 3114-xx
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Other connectors:

J16:	672.08.01.3	Fast-on 6,35x0,8	IMP Group
J22:	672.08.01.3	Fast-on 6,35x0,8	IMP Group
J17:	672.08.01.3	Fast-on 4,8x0,8	IMP Group
J18:	2672.08.01.3	Fast-on 4,8x0,8	IMP Group
J19:	2672.08.01.3	Fast-on 4,8x0,8	IMP Group
J21:	1670.05.01.3	Fast-on 2,8x0,5	IMP Group
J4:	90327-0306	6 poles	Molex-Picoflex
J2:	90327-0308	8 poles	Molex-Picoflex

Connectors configuration type A):

Connection	Codify
Connector J1	J1-M-06-0
Connector J3	J3-M-05-0
Connector J5	J5-M-03-0
Connector J6	J6-L-09-0
Connector J7	J7-L-10-0
Connector J8	J8-L-05-0
Connector J9	J9-L-04-0
Connector J10	J10-L-11-1
Connector J11	J11-L-08-2
Connector J12	J12-L-06-0
Connector J13	J13-L-07-0

Where

JX-Y-ZZ-W

- JX: Reference on wiring scheme
- Y: Series (A= Absent, M = Molex, R = Rast, L = Lumberg, C = CJT)
- XX: Number of poles
- W: Mounting offset with respect to the original position on the printed circuit (i.e. 1 = shifted forward of 1 position)

SOFTWARE OPTIONS

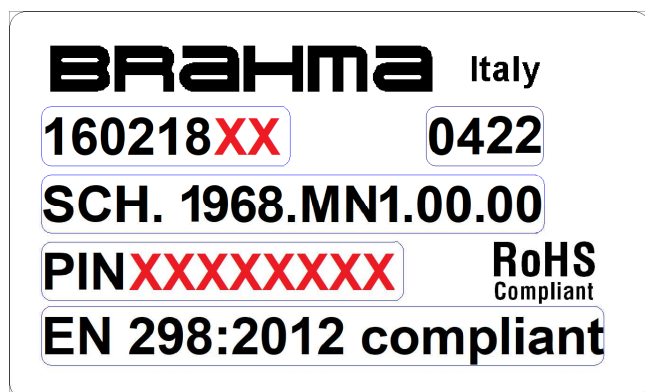
Software characteristics of the board, relating to both the thermoregulation and safety parts, must be agreed with the customer according to specific needs, and will consequently be described in detail in the technical specifications relating to the product purchased. In particular, the customer can choose from the hardware options listed in the list below:

- (1) Safety thermostat monitoring
 - 0 Safety thermostat contact is monitored only if burner ignition request is active
 - 1 Safety thermostat contact always monitored
- (2) Lack of flame on running stage
 - 0 Ignition attempts are repeated
 - 1 Immediate burner lock-out
- (3) Ignition device operation
 - 0 Spark is activated throughout the whole TSP time
 - 1 Spark is suspended when flame is detected
- (4) Lock-out
 - 0 Non-volatile lock-out (reset only on SW2 key pushing)
 - 1 Volatile lock-out (reset if main power supply is switched off)
- (5) Ignition attempts
 - 1 Only one ignition attempt
 - n Multiple ignition attempts ("n" ignition attempts)
- (6) Air pressure switch or combustion thermostat contact opening on running stage
 - 0 Burner is switched off but not locked-out
 - 1 Immediate burner lock-out
- (7) Air pressure switch or combustion thermostat contact opening on ignition cycle
 - 0 Device stops ignition cycle but is not locked-out
 - n,n Burner lock-out after "n,n" seconds
- (8) Flame amplifier failure on ignition cycle (false flame detection)
 - 0 Device stops ignition cycle but is not locked-out
 - n,n Burner lock-out after "n,n" seconds
- (9) Pre-ignition time
 - 0 No pre-ignition time (spark is activated on safety time TS)
 - n,n Spark is activated "n,n" seconds before safety time TS
- (10) Inter-purge time (TIW)
 - 0 No inter-purge time between two ignition attempts
 - n,n Inter-purge time of "n,n" seconds between two ignition attempts
- (11) Interrupted spark time (TSP)
 - 0 The igniter sparks during the whole safety time (TSP = TS)
 - n,n The igniter stops sparking "n,n" seconds before the end of safety time (TSP = TS – "n,n")
- (12) Pre-purge time (TW)
 - n,n "n,n" seconds pre-purge time
- (13) Safety time TS
 - n,n "n,n" seconds safety time

LABELING

Final product label (format 20x12 mm)

Example:



Where:

160218XX	→ Final product code (i.e. 16021811)
0422	→ Week and year (i.e. week 04 year 2022)
MN	→ Example of customer code
1	→ Progressive number that uniquely identifies the HW + SW characteristics of the board
PINXXXXXXXXX	→ Certificate number (i.e. PIN51CL5001)

QR code label (format 20 x 12 mm)

Example:



QR Code contains:

"www.brahma.it Serial 160218XX Batch **wwyy** 1018 Inst. 40605"

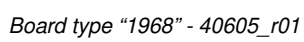
Where:

www.brahma.it	→ Brahma web site
Serial 16021XX	→ Final product code (es. 16021811)
Batch wwyy :	→ Week (ww) and year (yy) of label application
Inst. 40605	→ Document number relating to the technical note of the product

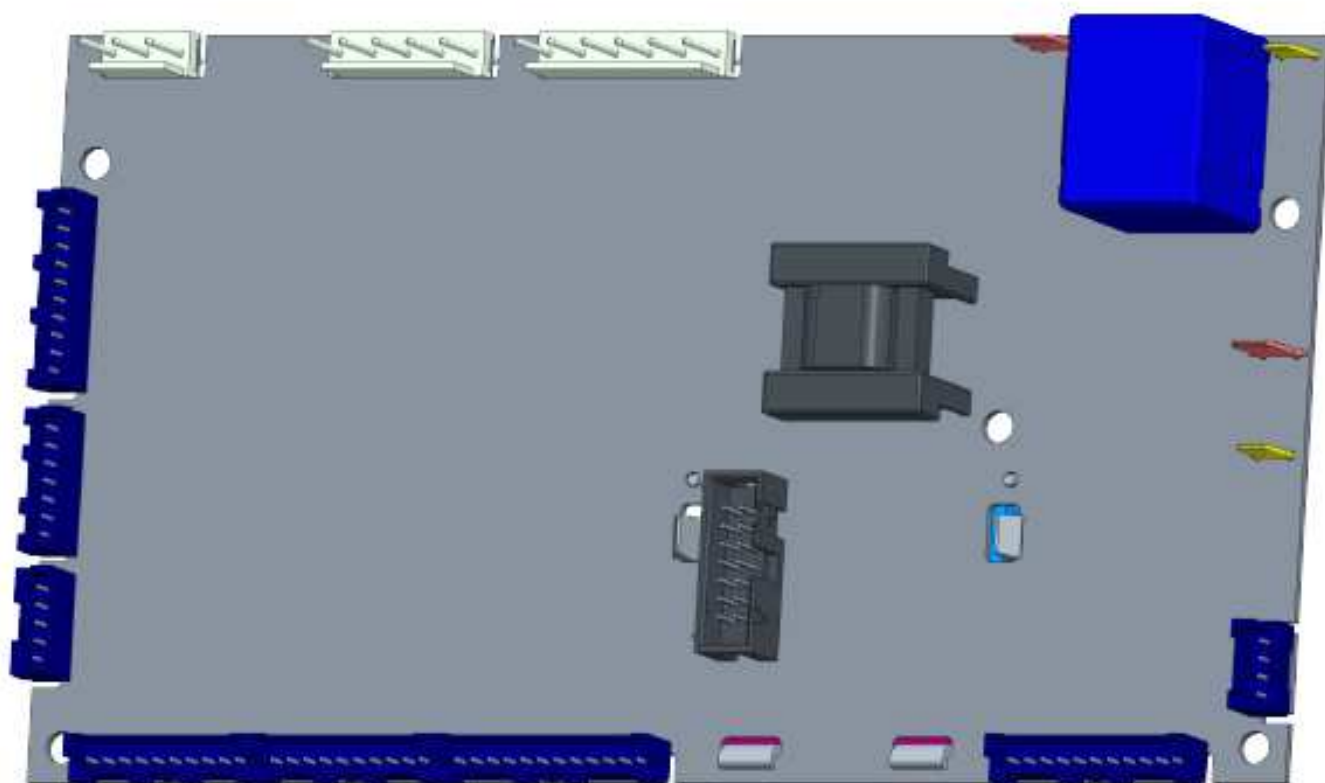
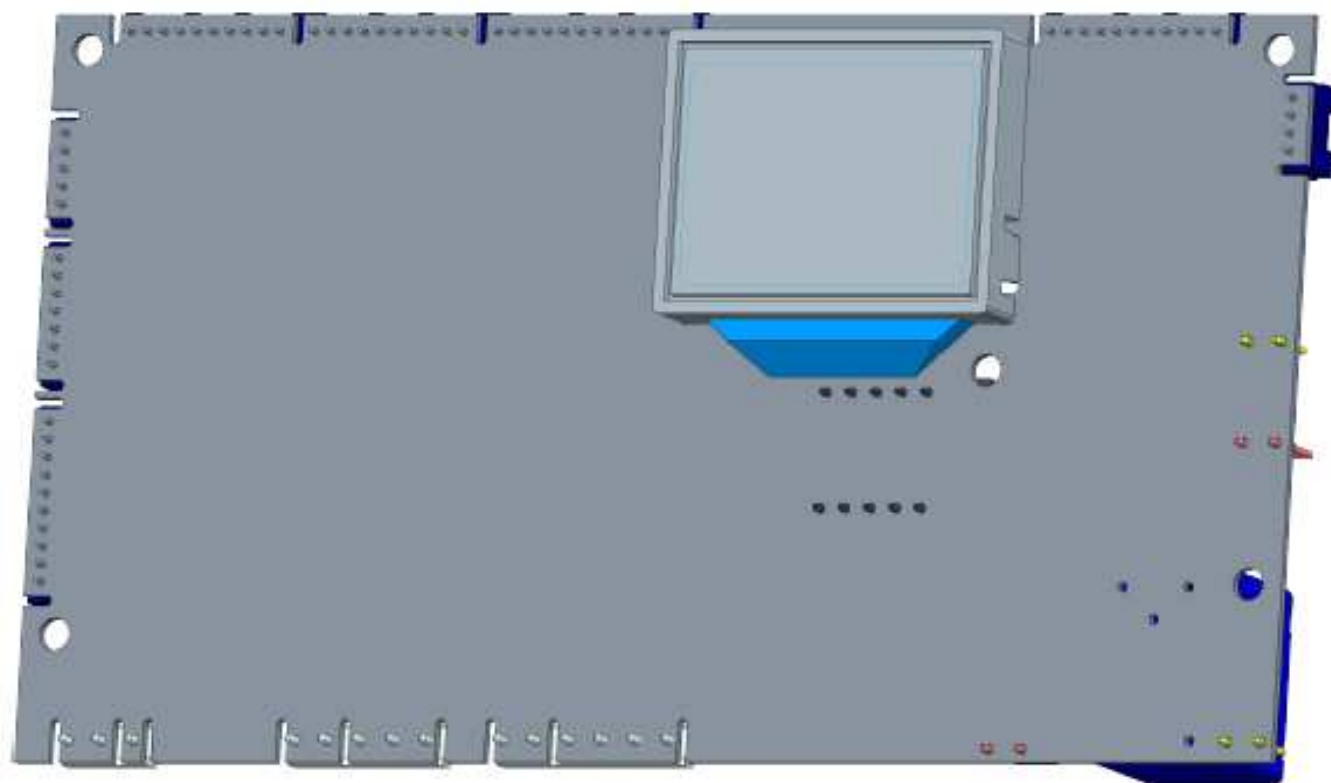


Sup: → Last two digits of the year in which the label was applied.

Sub: → Identification number of the notified body involved in the production control phase of the appliance.



BOARD 3D VIEW



ATTENTION: Company Brahma S.p.A. takes no responsibility for any damage resulting from Customer tampering with the device.

NOTES ABOUT PRODUCT DISPOSAL



The device contains electronic components and cannot therefore be disposed of as normal household waste. For the disposal procedure, please refer to the local rules in force for special waste.

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