USER AND MAINTENANCE MANUAL FOR SOLDER POT GC01

Grassi Trade S.R.L

Via Trieste 5, 22063 Cantù (CO), Italy

C.D. TECNOLOGIE S.R.L

Via F.lli Cervi 22, 20833 Giussano (MB), Italy

CONTENTS

❖ CHAPTER 1: SAFETY WARNINGS

1.1 PERSONNEL REQUIREMENTS

- It is the responsibility of the employer to inform operators and to provide adequate ventilation and suitable personal protective equipment.
- To ensure the physical safety of personnel and the correct use of the solder pot, it is essential to strictly comply with the following safety instructions. Failure to observe these rules may expose the operator to serious risks.
- The equipment must be used exclusively by qualified and trained personnel.
- Before use, carefully read the instruction manual.
- Any unauthorized modification during operation is prohibited.

1.2 PERSONAL PROTECTION

- Clothing and accessories:
  - The operator must wear only clothing that does not pose a hazard during work operations.
  - Jewelry prohibition: It is strictly forbidden to wear watches, bracelets, rings, or any metal accessories. In case of accidental contact with heat or burns, metal acts as a thermal conductor, significantly worsening injuries.
  - Fit: Clothing must fit closely to the body. Loose garments, scarves, or any items that may become entangled or cause dangerous accidental movements are prohibited.

- Personal Protective Equipment (PPE):
  The use of the following equipment is mandatory to prevent injuries caused by high temperatures and splashes of molten material:

Device	Technical Requirements
Body Protection	Suits or aprons made of heat-resistant material (e.g. leather).
Face Protection	Protective face shield providing full facial coverage.
Hand Protection	Certified gloves for protection against heat and molten metal splashes.

Note: Safety starts with prevention. Ensure that all PPE is in good condition before starting each work session.

1.3 HIGH TEMPERATURE AND BURN HAZARDS

- Warning: the crucible temperature is high.
- Direct contact with molten alloy is prohibited.
- It is forbidden to move the machine when it contains molten alloy.
- In case of splashes or spills of molten alloy, immediately follow emergency procedures (cooling, washing, medical assistance).

Danger hot surface

1.4 FUMES AND VENTILATION

The fumes generated during the soldering process are hazardous to health. Therefore, it is essential that these fumes are removed from the working environment:

- Use the solder pot only with appropriate extraction or ventilation systems.
- Do not use in enclosed environments without ventilation.

Attenzione, pericolo inalazione

1.5 ELECTRICAL SAFETY

- The equipment must be properly grounded.
- It is prohibited to perform maintenance or cleaning while the power supply is active.
- The supply voltage must correspond to the values specified in the manual.

Pericolo Alta tensione

1.6 EMERGENCY SITUATIONS

- Be familiar with the emergency stop procedures.
- In the event of a fire, use only CO_2 or dry powder fire extinguishers.
- In case of burns or accidents, immediately follow emergency procedures.

1.7 OTHERS

The use of water in the presence of molten alloy is prohibited.

❖ CHAPTER 2: EQUIPMENT OVERVIEW

2.1 EQUIPMENT INTRODUCTION

Generic equipment name: Solder pot

Model: CG01

Manufacturer: CD Tecnologie S.r.L

The GC01 solder pot is designed for tin soldering operations by immersion.

It is manufactured in compliance with best practices for safety, energy efficiency, and industrial reliability. The insulating and structural materials are suitable for continuous use at high temperatures.

2.2 IDENTIFICATION OF MACHINE COMPONENTS

The solder pot body is made of titanium alloy, ensuring mechanical strength and durability. The surface is coated with a high-temperature resistant ceramic layer, which improves resistance to corrosion and oxidation, while ensuring stability and safety during soldering operations.

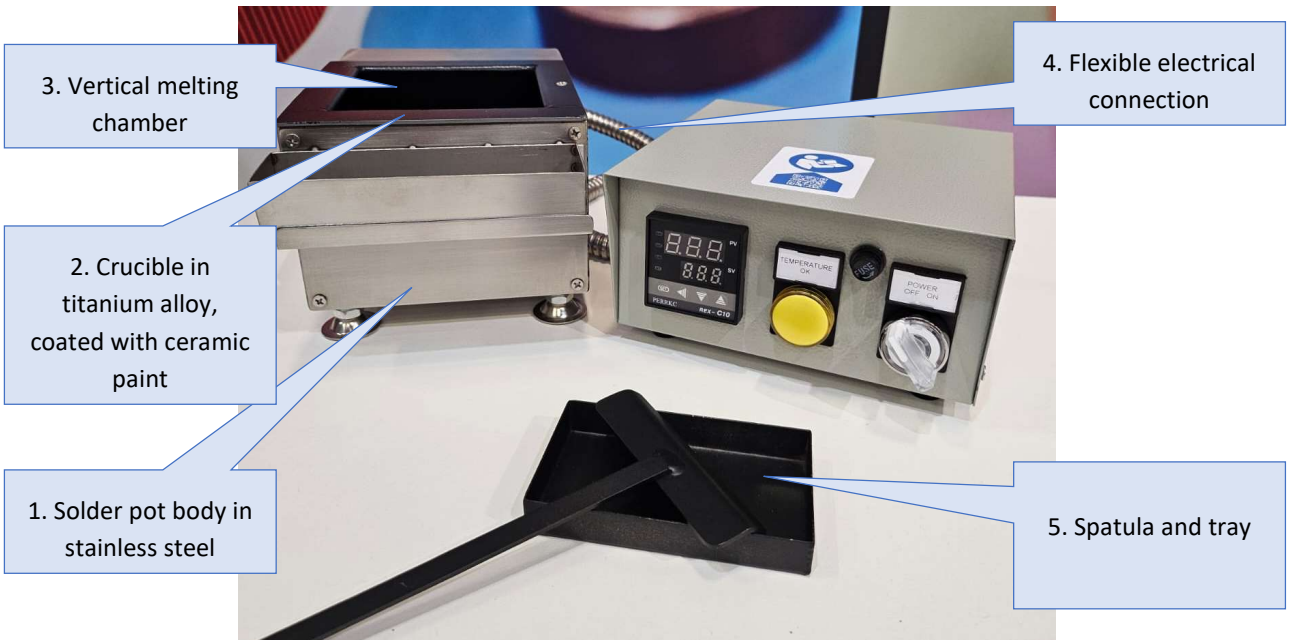


Figure 1 Main machine components 1

Figure 2 Main machine components 2

As shown in **Errore. L'origine riferimento non è stata trovata.** and Figure 2, the main components of the solder pot are:

1. Solder pot body in stainless steel
2. Crucible in titanium alloy, coated with ceramic paint
3. Vertical melting chamber
4. Flexible electrical connection
5. Spatula and tray
6. Remote control panel
7. Electronic temperature controller
8. Main switch with indicator light

The equipment is supplied with a power cable with a Schuko plug, suitable for connection to the electrical mains.

❖ CHAPTER 3: TECHNICAL CHARACTERISTICS

3.1 MAIN SPECIFICATIONS

Model: CG01
Power supply: 230 V single-phase - 50 Hz
Connection: Schuko plug
Rated power: 1500 W
Temperature range: up to 500 °C
Operating environment: 0 - 50 °C, relative humidity 35% - 85% RH, absence of strong electromagnetic fields.

3.2 DIMENSIONS AND CAPACITY

- Internal dimensions of the pot: 100 × 100 × h 50 mm
- Geometric volume: 500 cm^3
- Theoretical capacity for lead-free tin: ≈ 3.6 - 3.7 kg (average density 7.3 g/cm^3)
- Recommended operating capacity: ≈ 3.2 - 3.3 kg (value calculated considering an 85–90% fill level for safety, thermal expansion, and splash prevention)

➢ Weight: 4.10 kg

Technical note:

Do not exceed the recommended operating capacity.

Exceeding the maximum level may cause molten alloy overflow, splashing, and a reduction in the service life of the machine.

❖ CHAPTER 4: INSTALLATION AND CONTROL PANEL OVERFVIEW

4.1 INSTALLATION

Install the solder pot on a flat, stable, and heat-resistant surface. The workstation must be equipped with a fume extraction system.

At the first start-up, set the solder pot to a heating temperature of 80 °C and allow it to operate for approximately 1 hour. After this period, the temperature can be increased directly to reach the required setpoint. Perform this procedure even when the solder pot has not been used for more than 30 consecutive days.

4.2 CONTROL PANEL OVERVIEW

Figure 3 Control panel

The control panel is shown in **Errore. L'origine riferimento non è stata trovata.**, and the functions of the buttons on the panel are listed below.

1. Display screen (Model PERRKC REX-C10)

- This is a thermostat (temperature control instrument).
- PV (Process Value): displays the current actual temperature inside the pot.
- SV (Set Value): displays the set target temperature.

- 4 keys:
    - SET: enter parameter settings or confirm settings.
    - ◀: shift the setting position
    - ▼/▲: adjust the temperature value or browse parameters.

2. Main switch with indicator light

- By turning the white main switch on the right side clockwise, the device enters the “ON” position; the white indicator light turns on and the solder pot begins heating. When the heating temperature reaches 2°C below the set value, the yellow indicator light on the left side turns on.
- By turning the white main switch counterclockwise, the device enters the “OFF” position; the white indicator light turns off, interrupting the heating circuit and stopping the heating of the solder pot.

3. FUSE (Fuse holder knob)

- This is a fuse holder used to protect the circuit.

When a fuse blows, the circuit is interrupted, and the heating function can only be restored by replacing or reinstalling the fuse.

❖ CHAPTER 5: OPERATION AND ADJUSTMENT

5.1 OPERATION

1. Verify that the pot is filled with solid solder alloy.
2. Connect the Schuko plug.
3. By turning the main switch clockwise, the controller begins heating.
4. Set the desired temperature starting from zero.
5. Wait for the temperature to be reached. When the temperature reaches the set value, the yellow indicator light turns on and the pot maintains the set temperature.
6. If the temperature drops below the set value, the yellow indicator light turns off, indicating that heating has started. When the set temperature is reached, the indicator light turns on again.
7. Proceed with the soldering operations.
8. By turning the main switch counterclockwise, the white indicator light turns off, the controller interrupts the heating circuit, and the heating of the solder alloy stops.

5.2 ADJUSTMENT

5.2.1 OPERATING PROCEDURE

This section provides a detailed explanation of how to access the parameter setting screen and modify each parameter, allowing the user to correctly adjust the machine settings. The operating procedure is illustrated in Figure 4.

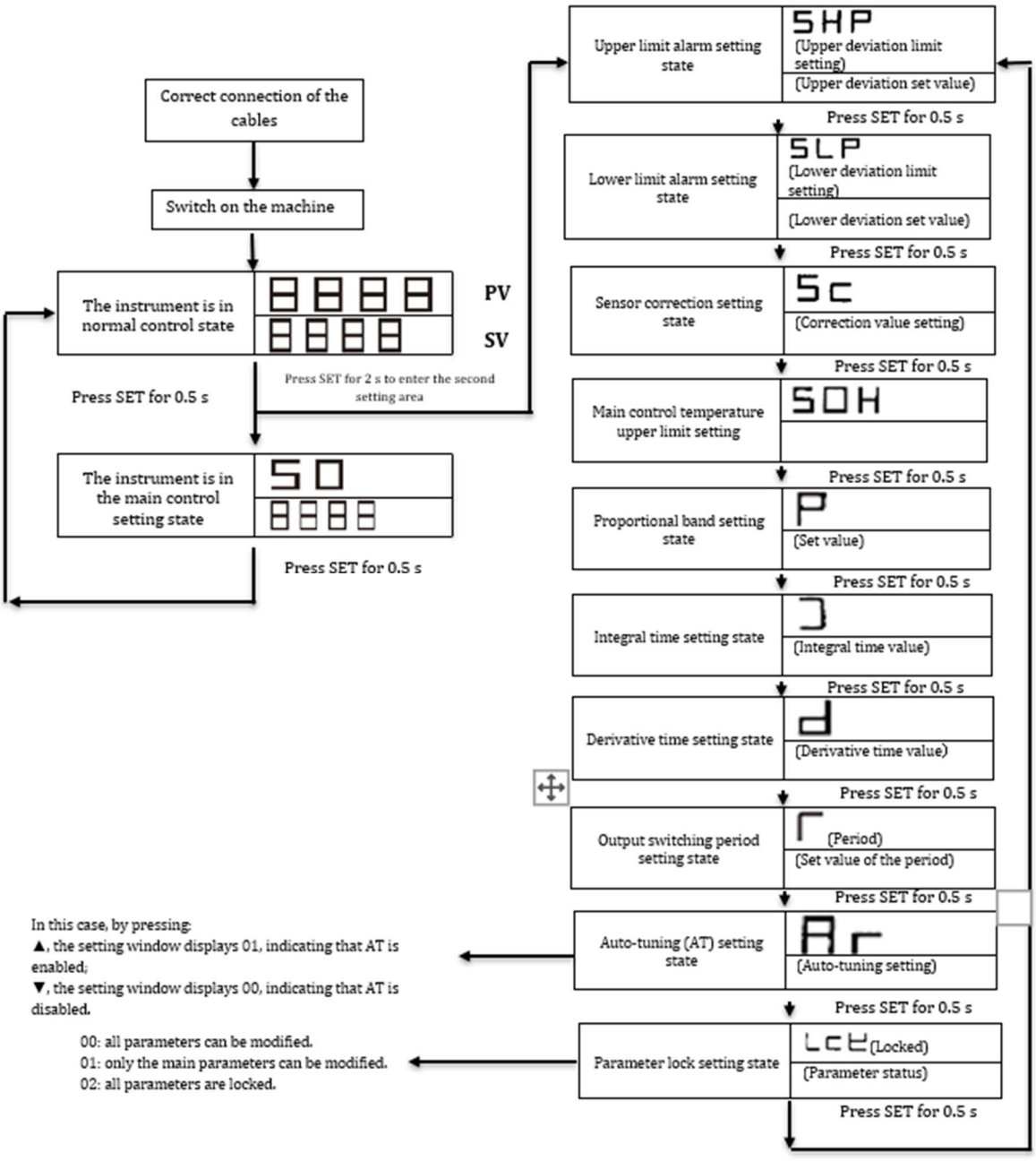


Figure 4 Parameter adjustment procedure

Note:

1. In the setting state, the PV window displays the set characters, while the SV window displays the current set value.
2. To enter the second setting area from the normal control state, press and hold the SET key for more than 2 seconds.
3. To exit the second setting area and return to the normal control state, there are two methods:
   - First method: press and hold the SET key for more than 2 seconds to exit;
   - Second method: do not press any instrument key for more than 30 seconds; the system will automatically exit the second setting area.

   These two methods have different effects: with the first method, the set or modified parameters will take effect; with the second method, the set or modified parameters will be invalid.
4. In the second setting state, when AT = 1, press and hold the SET key for more than 2 seconds; the system will exit the second setting area and automatically enter the auto-tuning state; in this case, the AT indicator LED flashes.
5. In the auto-tuning state, pressing the SET key will cause the system to exit the auto-tuning state and enter the setting state. To return to the auto-tuning state, set AT = 1 again and press and hold the SET key for 2 seconds to exit.
6. To prevent others from modifying parameters, in the second setting area, LCK can be set to 01 or 02 before exiting.

Description of instrument function keys:

- SET key: sequence control key
- ◀ key: setting position shift key
- ▼ key: value decrement key
- ▲ key: value increment key

5.2.2 EXPLANATION OF SETTING PARAMETERS

The characters listed in Table 1 will appear sequentially each time the SET key is pressed. Depending on the function, some characters may not be available on the selected instrument.

Character	Name	Setting Range	Description	Factory Set Values
(1) SO	Main control setting	0 - 9999	Set the main control setpoint value	150
(2) SH	Upper absolute alarm limit setting	0 - 9999	Set the upper limit point (upper alarm)	200
(3) SHP	Upper deviation alarm limit setting	0 - 9999	Set the difference between the upper alarm point and the main control setpoint	10
(4) SL	Lower absolute alarm limit setting	0 - 9999	Set the lower limit point (lower alarm)	100

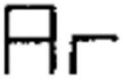
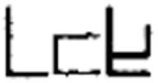
(5) 	Lower deviation alarm limit setting	0 - 9999	Set the difference between the lower alarm point and the main control setpoint	10
(6) 	Sensor correction setting	-20 - 20	Correction of the sensor error	0
(7) 	Main control temperature upper limit setting	0 - 9999	Limit the maximum value of the main control temperature	1200
(8) 	Proportional band	1 - 999	Set the proportional band. It cannot be set to zero	20
(9) 	Integral time	0 - 3600 secondi	Set the integral time; setting it to 0 disables the integral function	130
(10) 	Derivative time	0 - 3600 secondi	Set the derivative time; setting it to 0 disables the derivative function	30
(11) 	Proportional cycle	1 - 99 secondi	Set the output switching period. It cannot be set to zero	20 (2) Relay output: 20; other outputs: 2
(12) 	Auto-tuning	00: Stop auto-tuning 01: Start auto-tuning	Enable/disable auto-tuning	00
(13) 	Lock settings	00: Unlocked 01: Unlock settings except main control 02: Full lock of all parameters	Enable/disable parameter modification	00

Table 1 Description of parameters

5.3 OPERATING WARNINGS

5.3.1 INITIAL FILLING

- Insert the solid alloy into the pot with the machine switched off.
- Do not exceed the maximum level.
- Switch on only after the alloy has been correctly positioned.

5.3.2 TOP-UP

- Before the solder is completely melted, it is prohibited to add new solder or to introduce wet or cold objects.
- Once the set temperature is reached, if necessary, only molten solder at a similar temperature may be added; adding solid solder is prohibited.

5.3.3 OPERATIONAL USE

- When the temperature is stabilized, soldering operations can be carried out.
- Do not introduce wet or cold objects.
- Do not leave the solder pot powered on/unattended during heating.
- Stir the alloy periodically to ensure uniform temperature.
- Use the supplied spatula to clean the surface of the solder. Dross may be disposed of in the dedicated tray as shown in Figure 5.

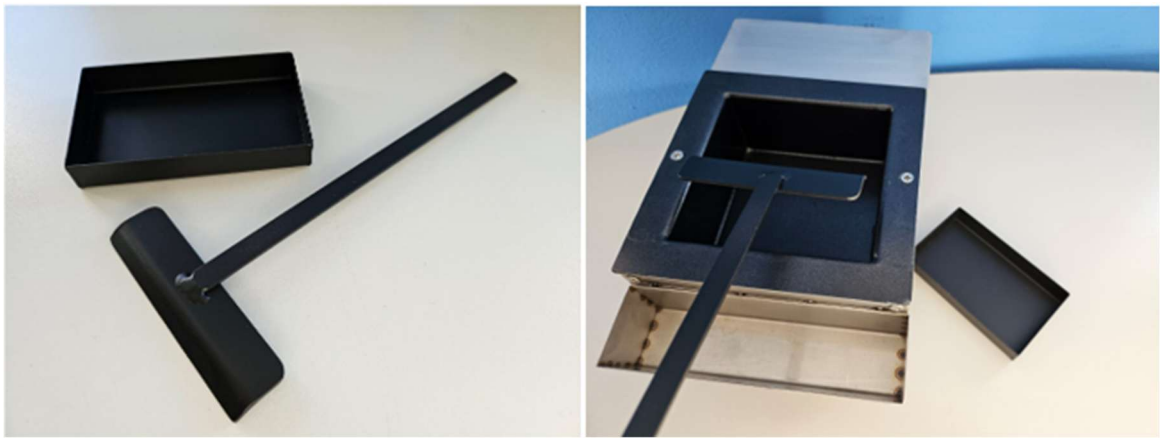


Figure 5 Spatula and tray

5.3.4 SHUTDOWN

- Turn off the main switch.
- Allow the equipment to cool completely before performing any intervention.

❖ CHAPTER 6: MAINTENANCE

- Perform maintenance only when the machine is cold.
- Remove any dross using suitable tools.

As shown in

Maintenance frequency	Item	Description
Daily	Cleaning of the surface and surrounding area of the solder pot	Use clean and heat-resistant tools to remove solder residues, dross, and dust, keeping the work area clean.
	Inspection of personal protective equipment (PPE)	Verify that all PPE (eye protection, gloves, protective clothing) is intact and ready for use.
Weekly	Electrical grounding check	Ensure that grounding connections are secure and that cables and plugs show no damage.
	Inspection of heating elements and temperature controller	Verify that the temperature control functions correctly and that the solder heating is uniform without abnormal fluctuations.
Monthly	Mechanical structure inspection	Verify that the screws and fastenings of the pot and frame are properly tightened, ensuring the stability of the machine.
	Internal cleaning of the frame and cooling components	Remove dust and dirt to prevent reduced heating efficiency or damage to electronic components.
Quarterly	Calibration of the temperature controller and safety devices	Check the proper operation of the over-temperature protection systems and the main switch.
Annually	Complete maintenance and performance inspection	Performed by qualified personnel: internal cleaning of the heating and control systems, inspection of the pot, temperature controller, electrical safety checks, and replacement of worn components if necessary.

Table 2, this table lists the maintenance and inspection plan for the solder pot, in order to ensure safety, stable performance, and extend the service life of the equipment.

Maintenance frequency	Item	Description
Daily	Cleaning of the surface and surrounding area of the solder pot	Use clean and heat-resistant tools to remove solder residues, dross, and dust, keeping the work area clean.
	Inspection of personal protective equipment (PPE)	Verify that all PPE (eye protection, gloves, protective clothing) is intact and ready for use.

Weekly	Electrical grounding check	Ensure that grounding connections are secure and that cables and plugs show no damage.
	Inspection of heating elements and temperature controller	Verify that the temperature control functions correctly and that the solder heating is uniform without abnormal fluctuations.
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Quarterly	Calibration of the temperature controller and safety devices	Check the proper operation of the over-temperature protection systems and the main switch.
Annually	Complete maintenance and performance inspection	Performed by qualified personnel: internal cleaning of the heating and control systems, inspection of the pot, temperature controller, electrical safety checks, and replacement of worn components if necessary.

Table 2 Maintenance and inspection plan for the solder pot

❖ CHAPTER 7: TROUBLESHOOTING

In case of no heating, verify that the solder pot is powered. If the solder pot is powered but heating does not occur, there may be a fault in one or more heating elements (for fault verification, refer to Section 7.2 of this manual).

For electronic anomalies, contact technical support.

In the event of a fault in the thermocouple or heating elements, it is possible to replace the components by following the procedure described below.

7.1 PRELIMINARY SAFETY PROCEDURES

WARNING: Before any technical intervention, it is mandatory to:

- Turn off the main switch on the control unit.
- Disconnect the plug from the electrical power supply.
- Wait for the solder pot and the molten metal in the crucible to cool completely to avoid severe burns.

7.2 DIAGNOSTICS: HEATING ELEMENT INTEGRITY CHECK

In case of no heating of the pot, before proceeding with replacement, it is recommended to check the electrical condition of the heating elements using a multimeter (tester).

7.2.1 TEST PROCEDURE

- Electrical isolation: ensure that the machine is disconnected from the power outlet.
- During the entire procedure, it is mandatory to wear protective gloves and use a screwdriver, as it will be necessary to come into contact with the fiberglass insulation.
- Access to terminals: Unscrew the screws on the cover (see Figure 6) and open the pot cover to expose the cables connecting the heating elements to the control unit.

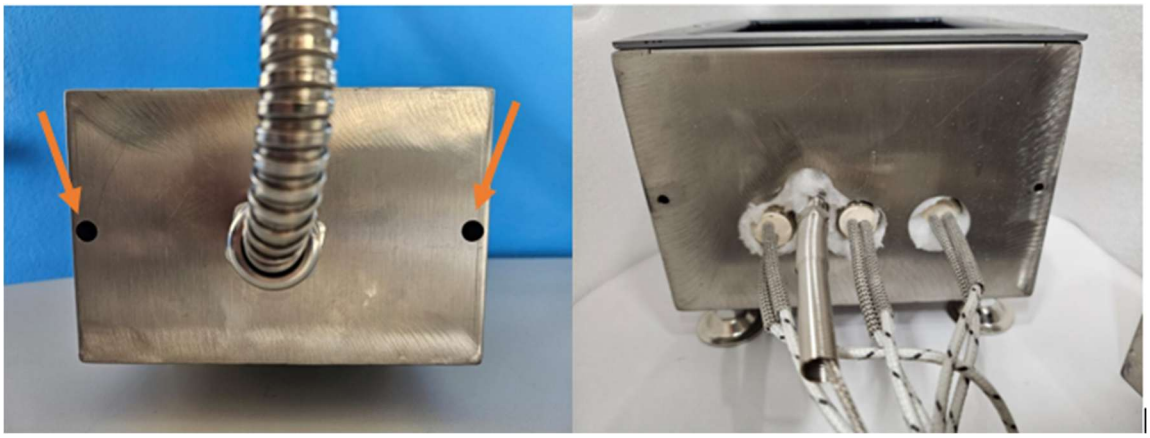

Figure 6 Opening the pot cover

Take care NOT to loosen the lower hex socket screw (see Figure 7), as it protects the cable support of the heating element and the thermocouple.

Figure 7 Lower hex socket screw

Remove the three heating elements one by one. If they cannot be removed, loosen the screws on the opposite cover (see Figure 8), open it, and use a screwdriver to gently push the terminals of the elements through the holes, facilitating their removal.

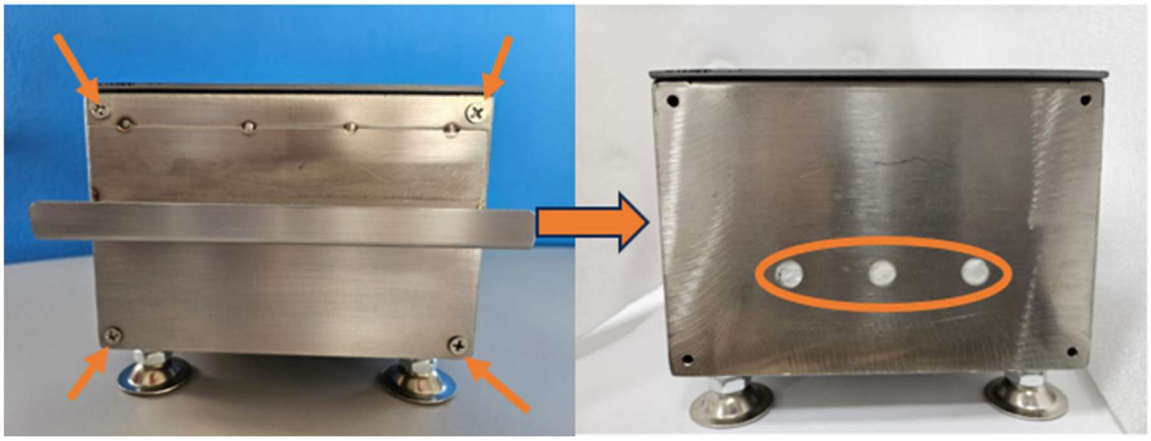

Figure 8 Opening the opposite cover of the pot

- Multimeter setting: set the tester selector to the Ohm (Ω) function, using the lowest available range (usually 200 Ω), according to the specifications of the measuring instrument.
- Measurement: place the tester probes on the two terminals of each individual heating element.

7.2.2 INTERPRETATION OF RESULTS

- Intact heating element: The display will show a stable numerical value. For heating elements with a power rating between 400 and 450 W, the indicative resistance is approximately 121 Ω (400 W) and 107 Ω (450 W), with possible variations due to manufacturing tolerances.
- Faulty (open-circuit) heating element: The multimeter will display “1”, “OL” (Over Load), or an infinite value. In this case, the internal filament is broken and the component must be replaced.
- Short circuit: If the value is close to 0, the heating element is short-circuited and must be replaced immediately to avoid damage to the control unit.

7.3 NOTE ON THE THERMOCOUPLE

If the controller displays an error (e.g., “S.ERR” or “---”), the issue is usually the thermocouple. Check the integrity of the connections and, if necessary, replace the thermocouple.

7.4 ACCESS TO COMPONENTS

To access the wiring and component compartments, follow the same procedure for opening the cover described in Section 7.2.1. During the entire procedure, it is mandatory to wear protective gloves and use a screwdriver, as it will be necessary to come into contact with the fiberglass insulation.

- Locate the crucible steel cover.
- Unscrew the fixing screws of the outer cover and carefully remove it to expose the crucible assembly.

7.5 IDENTIFICATION AND REPLACEMENT

Referring to the configuration of the holes at the base of the crucible (see Figure 9), proceed as follows:

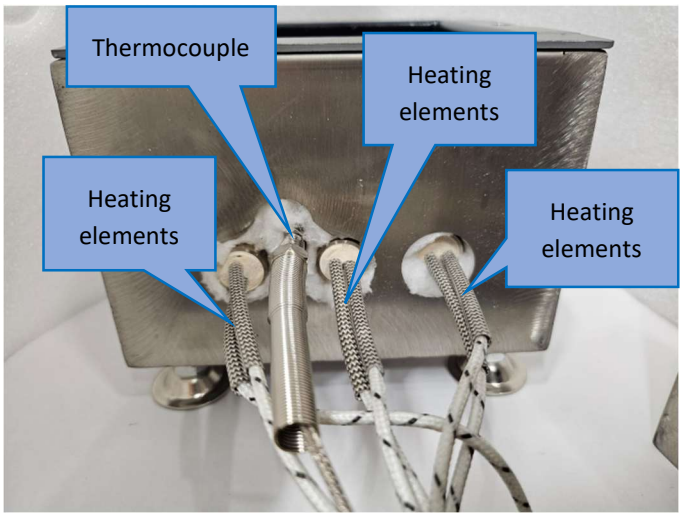

Figure 9 Heating elements e thermocouple

- Heating elements: These are housed in the 3 larger-diameter holes (identical to each other). To replace them, remove the faulty element from its housing and insert the new heating element, ensuring it is properly seated.
- Thermocouple: It is inserted into the smaller hole, closest to the base of the crucible. To replace it, carefully remove the sensor from the hole and insert the new probe fully into place for correct temperature measurement.
- Insert the fiberglass insulation into the four remaining holes, using a screwdriver to facilitate the operation.

7.6 RESTORATION

Once the faulty component has been replaced with the new one:

- Close the outer cover and tighten the screws that were previously removed.
- Reconnect the power supply and test the operation via the digital controller.

Tip: During replacement, avoid forcing the electrical cables and ensure that the connections are securely fastened inside the control unit.

7.7 FUSE REPLACEMENT

The replacement of the fuse must be carried out exclusively by qualified personnel, with the equipment completely powered off.

7.7.1 SHUTDOWN AND DISCONNECTION

- Turn the main switch to the OFF position.
- Disconnect the power cable from the electrical mains.
- Wait at least 5 minutes to allow complete discharge of the internal components.

7.7.2 LOCATING THE FUSE HOLDER

The fuse holder is located on the front panel of the control unit (see Figure 10), identified by the label “FUSE”.

Figure 10 Fuse holder location

7.7.3 FUSE REMOVAL

- Unscrew the fuse holder cover.
- Pull out the fuse holder and remove the faulty fuse.

7.7.4 INSPECTION AND REPLACEMENT

- Check that the fuse is indeed blown (burnt or blackened filament).
- Replace only with a fuse of the same type and size (5×20 mm).

⚠ Do not use fuses with different characteristics, as this may damage the equipment or pose a risk to the operator.

7.7.5 REINSTALLATION

- Insert the new fuse into the fuse holder.
- Reinsert the fuse holder into its seat.
- Screw the cover until fully tightened (without forcing).

7.7.6 POWER RESTORATION

- Reconnect the power cable.
- Turn the main switch to the ON position.
- Verify that the device starts correctly.

7.7.7 SAFETY WARNINGS

- Do not perform any intervention while the equipment is powered.
- In the event of repeated fuse failure, do not replace the fuse again without identifying the cause of the fault.
- If necessary, contact authorized technical support.

❖ CHAPTER 8: WARRANTY AND LIABILITY

The warranty period is 12 months, based on an 8-hour work shift per day, 5 days per week.

Consumable or wear parts are excluded from the warranty.

The warranty shall be void in the event of improper use or unauthorized modifications.

The manufacturer declines any responsibility for improper use.