OPERATING MANUAL

Composite Material Polymerization Oven-xxx-xxxx

Polymerization Oven Modifications

Model	Functional internal dimension	External dimension
OVEN-500-1000	500-500-1000	778-810-1325
OVEN-500-1500	500-500-1500	778-810-1825
OVEN-500-2000	500-500-2000	778-810-2325
OVEN-700-1000	700-700-1000	978-1010-1325
OVEN-700-1500	700-700-1500	978-1010-1825
OVEN-700-2000	700-700-2000	978-1010-2325

Manufacturer

UAVOS Inc.
1111B S Governors Ave STE 20320
Dover, DE 19904, USA

Contact

Internet: www.uavos.com
email: uavos@uavos.com

UAVOS Inc. 07/2

Contents

Introduction

Congratulations on purchasing your new composite material polymerization oven. Please take the time to read this operating manual carefully.

This operating manual is intended primarily for the operator and supervisor. It contains all data necessary for the safe operation of polymerization ovens, provides information on the reliable use of these polymerization ovens, and offers practical recommendations and maintenance tips. The safety recommendations mentioned are based on the health and safety regulations in force at the time of writing this manual. If you have any questions regarding the operation of the polymerization ovens or wish to order spare parts, please please get in touch withyour nearest dealer or the manufacturer directly.

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email: uavos@uavos.com

1. Preliminary Note

Dear Customer,

For the correct operation of the polymerization ovens, you must read this operating manual completely and carefully and follow all instructions provided. Failure to read, understand, and follow these instructions could result in personal injury. It could also result in damage to the chamber and/or poor equipment performance.

– Service and specific maintenance work on the polymerization oven may only be performed by companies or individuals certified by UAVOS. These tasks must be documented by UAVOS-certified personnel in UAVOS service reports. Without a correctly completed service report, warranty claims against the Polymerization Oven manufacturer are invalid.

– We reserve the right to make technical changes that improve our oven or enhance its safety without prior notice.

– When ordering spare parts or for technical inquiries, please always provide the serial number and model of the polymerization oven. The serial number and model can be found on the nameplate.

– Service and maintain the polymerization oven according tothese instructions.

Follow the instructions in this operating manual and ensure the timely replacement of worn parts or the execution of necessary repairs.

We strongly emphasize that malfunctions resulting from failure to read, or completely read the operating manual are not covered under the UAVOS company warranty. We recommend studying this manual carefully and thoroughly before operating the polymerization oven.

DANGER

Hazards resulting from failure to comply with instructions and precautions:

- Serious injuries and damage to the chamber
- Risk of death

Adhere to the Safety Instructions provided in this manual. Follow the operating procedures outlined in this manual.
Carefully read the Operating Instructions for the polymerization oven before installation and operation.
Retain this operating manual for future reference.

Ensure that all personnel using the polymerization oven and related operating equipment have read and understood this operating manual.

2. Safety

2.1. Personnel Qualification

The Polymerization Oven must be installed, tested, and commissioned only by qualified personnel authorized to assemble, commission, and operate the chamber. Qualified personnel are individuals whose professional education, knowledge, experience, and understanding of relevant standards enable them to assess, perform, and identify potential hazards associated with their assigned work. They must be trained, instructed, and authorized to operate the Polymerization Oven.

The Polymerization Oven must be operated only by personnel specifically trained for this purpose and are familiar with all safety precautions necessary for operation. National regulations regarding the minimum age of personnel must also be observed.

2.2 Operating Manual

This manual is a component of the delivery. Always keep it readily available for reference near the Polymerization Oven. When selling the device, provide the Operating Manual to the buyer.

To prevent injury and damage, observe the Safety Instructions specified in the Operating Manual. Failure to follow instructions and precautions can result in significant risks.

DANGER

Hazards resulting from failure to comply with instructions and precautions:

- Serious injuries and damage to the Polymerization Oven
- Risk of death

Observe the Safety Instructions in this Operating Manual.
Follow the operating procedures in this Operating Manual. Carefully read the complete Operating Instructions before installing and using the Polymerization Oven.
Retain this operating manual for future reference.

2.3 Hazard Warning Symbol

The use of the Hazard Warning Symbol indicates a risk of injury.

Observe all precautions marked with the hazard warning symbol to avoid death or injuries.

This operating manual uses the following definitions and safety symbols to indicate hazardous situations in accordance with ISO 3864-2 and ANSI Z535.6 standards.

2.4 Icons

Table 1

Warning Signs	Description
	Hot Surface
	Danger of Electric Shock
	Caution! Forklift Lifting Surface
	Voltage: 220 Volts
	Three-phase AC voltage 400 Volts
	Explosive atmosphere
	Harmful substances
	Stability hazard
Mandatory action signs	
	Wear protective gloves
	Read the operating manual

2.5 Location / safety signs position on the chamber

The following signs are located on the chamber:

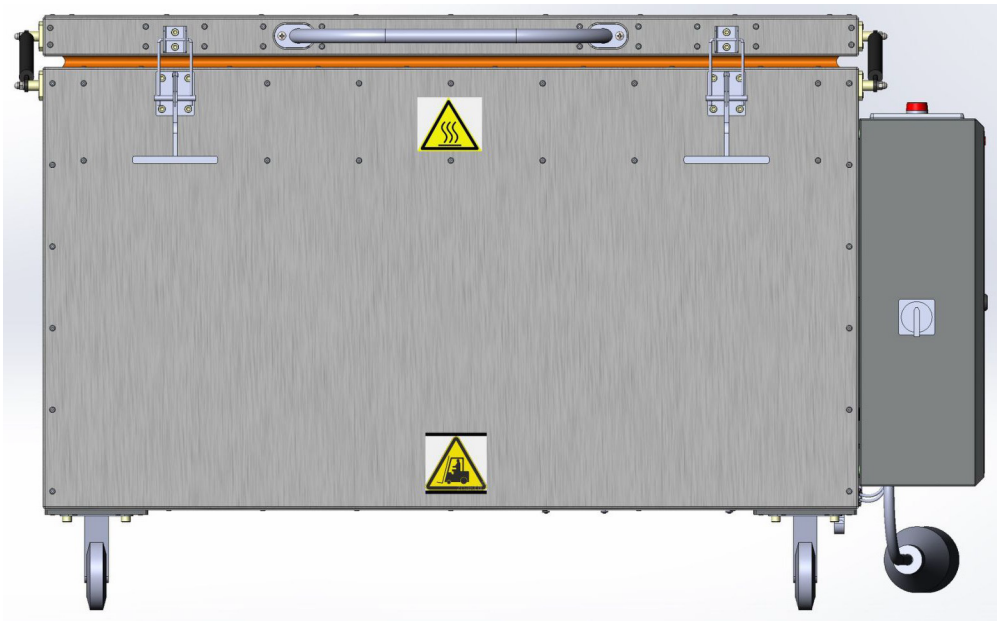


Figure 1. Positions of signs on the front of the Polymerization Oven

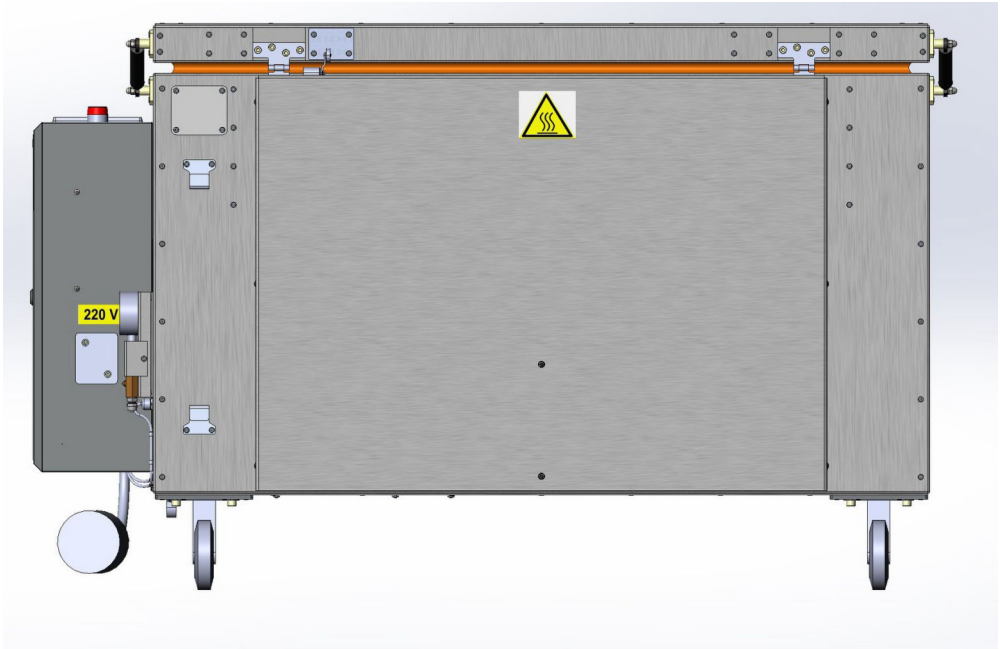


Figure 2. Position of signs on the rear of the Polymerization Oven

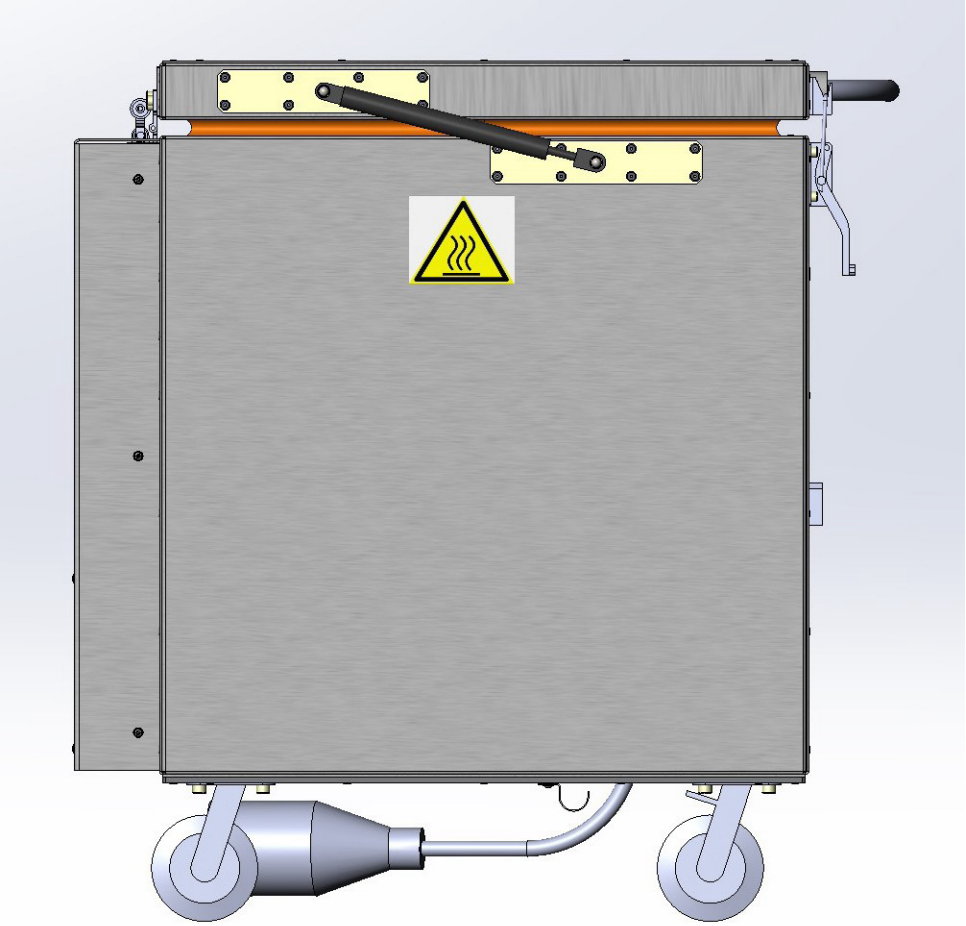


Figure 3. Sign location on the side of the Polymerization Oven

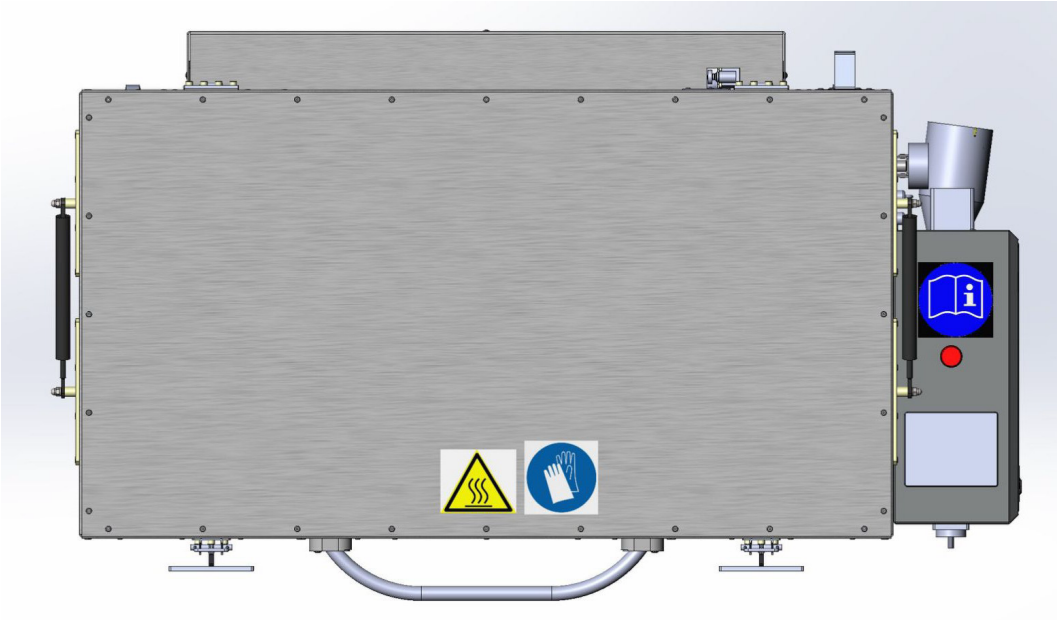


Figure 4. Sign location on the top of the Polymerization Oven

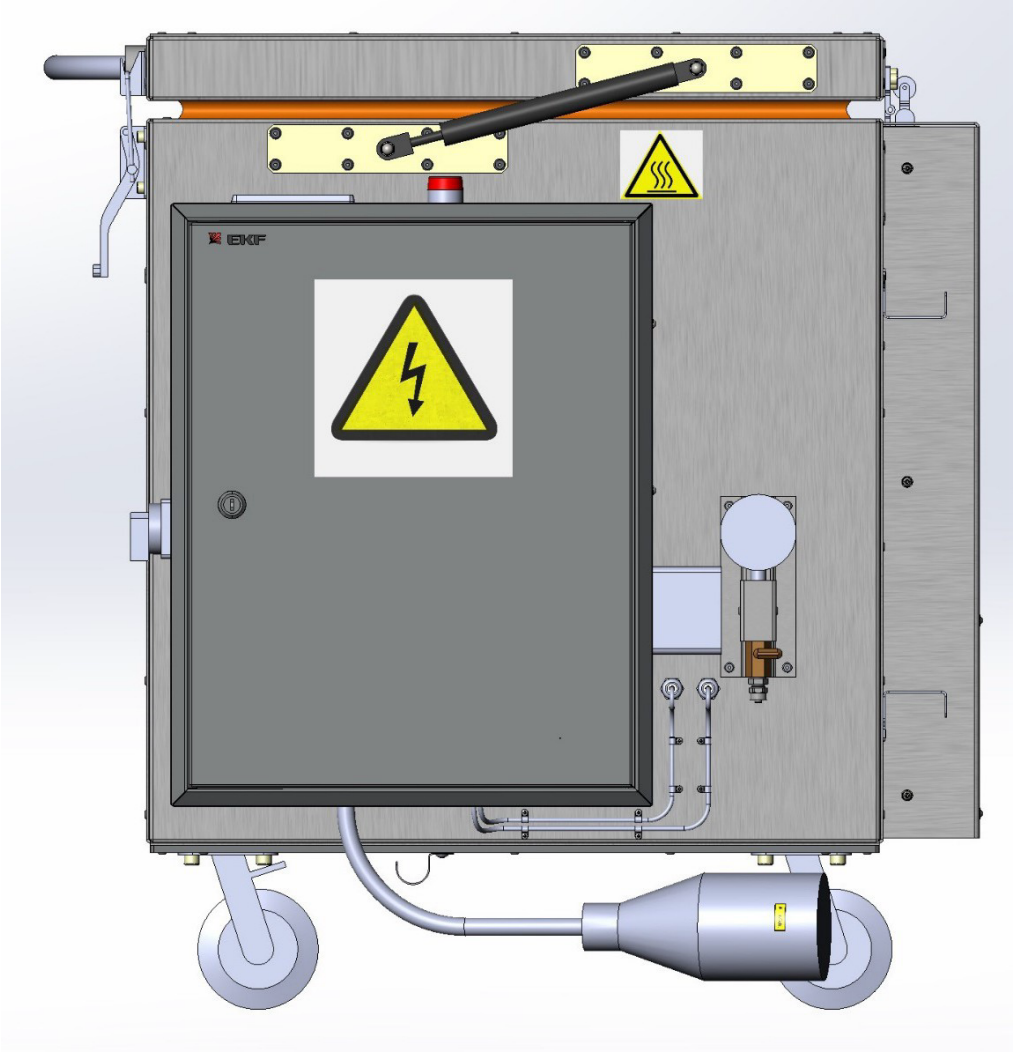


Figure 5. Sign location on the side of the Polymerization Oven

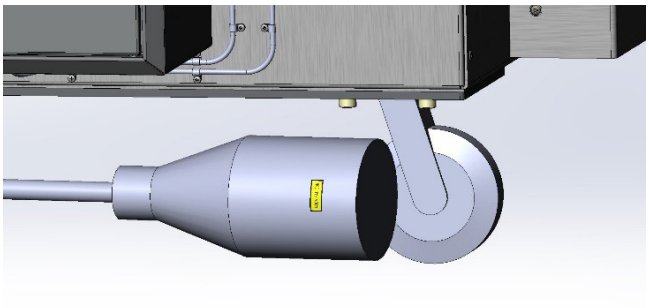


Figure 6. Sign location on the outlets

	Maintain safety signs in intact and legible condition.

2.6 Nameplate

The nameplate is riveted to the rear of the Polymerization Oven; Figure 7, item 1

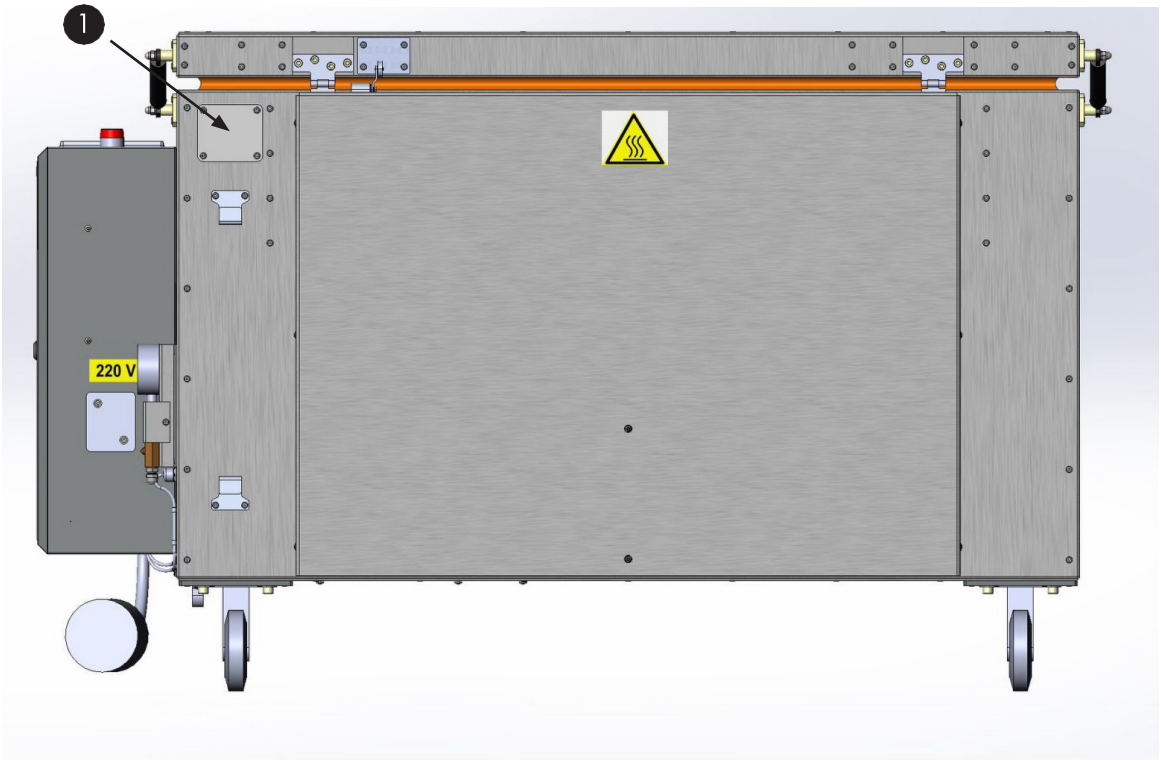


Figure 7. Nameplate Location

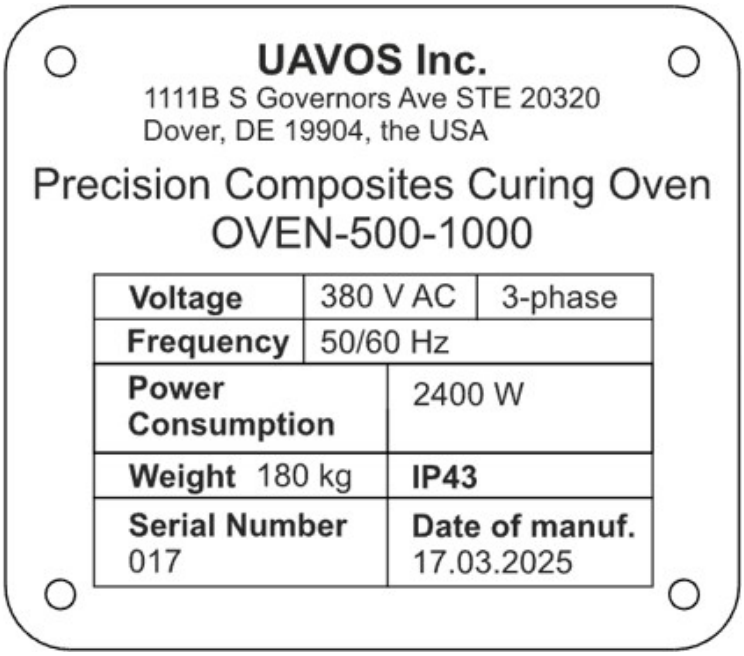


Figure 8. Typical Nameplate

Table 2

Indication	Information
Precision Composite Curing Oven	Device name
OVEN-500-1000	Model Designation
380 V AC 3-phase	Voltage
50/60 Hz	Frequency
2400 W	Power Consumption
180 kg	Weight
IP43	Protection class
017	Serial Number
17.03.2025	Manufacturing date

2.7 General Operating Instructions for Polymerization Ovens

2.7.1 Authorization for Installation Work

Only personnel who have completed industrial training, are familiar with this manual, and have received safety training on its operation are authorized to perform the installation, inspection, operation, and maintenance of the Polymerization Ovens.

2.7.2 Knowledge Requirements for Employees Operating Polymerization Ovens

Authorized personnel must know:

- device and operating principle of the Polymerization Oven;
- safety regulations for operating and maintaining the Polymerization Oven;
- hazardous and harmful factors associated with the use of the Polymerization Oven;
- industrial sanitation requirements, personal hygiene rules;
- sanitary and hygienic requirements for maintaining the workplace;
- the procedure in case of fire and the instructions for using primary fire extinguishing equipment;
- the methods of providing first aid in the event of an accident.

2.7.3 Risks Associated with Operating Polymerization Ovens

The following risks are present during operation:

- Thermal burns to the hands from contact with heated components;

- Thermal burns to the face and upper respiratory tract from exposure to hot air when opening the Polymerization Oven;
- During and immediately after operation, the temperature of internal surfaces may be nearly equal to the setpoint. The chamber heats up significantly during operation.

	**CAUTION** Danger of burns from touching hot chamber components during operation. Burns. DO NOT touch the internal surfaces or loaded material during operation.

- Electric shock due to electrical equipment malfunctioning; lack of grounding on the Polymerization Oven body.

	**DANGER** Electrical Hazard: water ingress into the chamber. Lethal Electrical Shock. The Polymerization Oven must NOT get wet during operation, cleaning, or maintenance. DO NOT install the Polymerization Oven in damp locations or where puddles may form. Install the Polymerization Oven in a location that is protected from splashes.

2.7.4 Workplace Requirements

The workplace must be equipped with effective supply and exhaust ventilation, and a disconnect switch to de-energize the Polymerization Oven.

2.7.5 General Requirements for Operating the Polymerization Oven

Appropriate protective clothing must be worn, including a suit for protection against dirt and mechanical hazards, and an apron and sleeves made of heat-resistant materials.

When installing and operating the Polymerization Oven, adhere to all current regulatory documents governing occupational safety and health requirements and operational safety rules.

To prevent electric shock or power supply system failure (power circuit overloads, short circuits, etc.) when preparing the Polymerization Ovens for use, the following requirements must be observed:

- Adhere to the established procedure for switching electrical equipment and technical equipment on and off.
- If the power supply is interrupted due to blown fuses or tripped circuit breakers, re-energizing should only occur after inspecting and correcting the causes that led to the interruption. Perform troubleshooting with the power supply disconnected.

The Polymerization Oven must be equipped with a residual current device that meets safety requirements and ensures simultaneous disconnection of all phase conductors and the neutral conductor in the event of hazardous voltages (leakage currents) on the housing. The residual current device must operate reliably when the cabinet is powered by an external power source (electrical network) with either a grounded or an isolated neutral.

The workshop where the Polymerization Oven is located must have designated locations for securing and installing standard fire extinguishers, and standard fire extinguishers must be installed.

Installation, dismantling, and Repair of the Polymerization Oven must be performed with the power supply disconnected.

As the Polymerization Oven contains components operating from an AC power supply with a nominal voltage of 380V, the Installation and connection of this equipment must be performed by qualified personnel trained in safe work practices for electrical Installations up to 1000V, and who possess the appropriate electrical safety certification. Assembled cabinet components can be replaced on-site by qualified electrical Technicians.

The Polymerization Oven is not intended for use in explosive, corrosive, or humid environments.

Before connecting the Polymerization Oven, ensure that the voltage and current characteristics of the power supply correspond to the equipment's parameters. (see section 4.1)

Maintenance personnel are responsible for adhering to safety precautions.

DANGER

Danger of explosion, implosion, or poisoning due to introduction ofhazardous substances. Poisoning hazard. Serious Injuries or death may occur due to burns or explosive pressure.

- Do not introduce any flammable or explosive substances into the Polymerization Oven while it is at operating temperature. Thisincludies any energy sources, such as batteries or lithium-ion batteries.
- Dot not allow explosive dust or solvent-air mixtures in the inner chamber.
- Do not introduce any substances that could release toxic gases when heated.

2.8 Loading Requirements for the Polymerization Oven Chamber

Products are loaded into the Polymerization Oven from the top. The maximum permissible chamber load weight for the ovens must not exceed:

- OVEN-500-1000 and OVEN-700-1000: 40kg
- OVEN-500-1500 and OVEN-700-1500: 45kg
- OVEN-500-2000 and OVEN-700-2000: 50kg

2.9 Residual Risks

The inherent design features of Polymerization Ovens and their correct application can still present risks, even when operated correctly. These residual risks include hazards that, despite the inherently safe design, existing technical safety equipment, safety measures, and additional protective measures, cannot be eliminated completely.

Warnings on the Polymerization Oven and in this operating manual highlight potential residual risks. The consequences of these residual risks and the measures necessary for their prevention are detailed in the operating manual. Furthermore, the Technologist must implement measures to minimize hazards from unavoidable residual risks. This includes, specifically, providing operating instructions.

The following list summarizes the hazards this operating manual addresses and indicates the corresponding protective measures:

Unpacking, Transportation, Installation

- Sliding or Inclined Installation of Polymerization Ovens
- Installation of Polymerization Ovens in unauthorized locations
- Installation of Damaged Polymerization Ovens
- Installation of Polymerization Ovens with a Damaged Power Cord
- Unsuitable Installation Locations

Normal Operation

- Assembly Errors
- Contact with Hot Surfaces on the Housing
- Contact with Hot Surfaces Inside and on the Inside of the Doors
- Contact with Live Parts During Normal Operation

Cleaning and Decontamination

- Water Ingress into the Polymerization Oven
- Use of Unsuitable Cleaning and Decontamination Agents
- Entrapment of Personnel and Animals Inside

Malfunctions and Damage

- Continued Operation of the Polymerization Oven with Obvious Malfunction
- Operation of the Device with a Damaged Power Cord

Maintenance

- Live Electrical Work During Maintenance
- Maintenance Performed by Unqualified or Inadequately Trained Personnel

Troubleshooting and Repair

- Failure to heed warning messages in the service manual.
- Troubleshooting live circuits without adhering to specified safety measures.
- Performing repair work by unqualified or inadequately trained personnel.
- Using non-original UAVOS spare parts.
- Not performing electrical safety analysis after repair.

2.10 Operating Instructions

Depending on the application and chamber location, the Technologist must provide relevant information for the safe operation of the Polymerization Oven within the operating instructions.

	Keep this operating manual for the Polymerization Oven readily available at all times and in a clearly visible location. It must be understandable and written in the employees' language.

2.11 Accident Prevention Measures

The Polymerization Oven operator must comply with all local and national regulations and take necessary precautions to prevent accidents.

The manufacturer has implemented the following measures to prevent ignition and explosions:

- Icons on the product (refer to operating manual, sections 2.4 and 2.5).
- Operating manual.
- An operating manual is available for each Polymerization Oven.
- Overheat monitoring. The Polymerization Oven is equipped with an external temperature display.
- The Polymerization Oven is equipped with a temperature safety controller. Visual and audible (buzzer) alarms indicate over-temperature conditions.
- Safety, measurement, and control equipment are easily accessible.
- Electrostatic charge. Internal components are grounded.
- Floors (refer to Chapter 3 of the operating manual for proper installation)

3. Scope of Delivery, Transportation, Storage, and Installation

3.1 Unpacking and Inspection of Equipment and Scope of Delivery

After unpacking, inspect the Polymerization Oven and its optional accessories, if any, for completeness and any damage incurred during transportation, based on the packing slip.

Immediately notify the carrier if any damage occurred during transportation.

Before removing the Polymerization Oven from the pallet, ensure that all mounting hardware has been removed. To remove the Polymerization Oven from the pallet, use a manual or mechanized forklift. Figure 9 shows the Installation of the Polymerization Oven on the pallet.

The icon indicates that the forklift tines can be used to lift the oven from the ground.

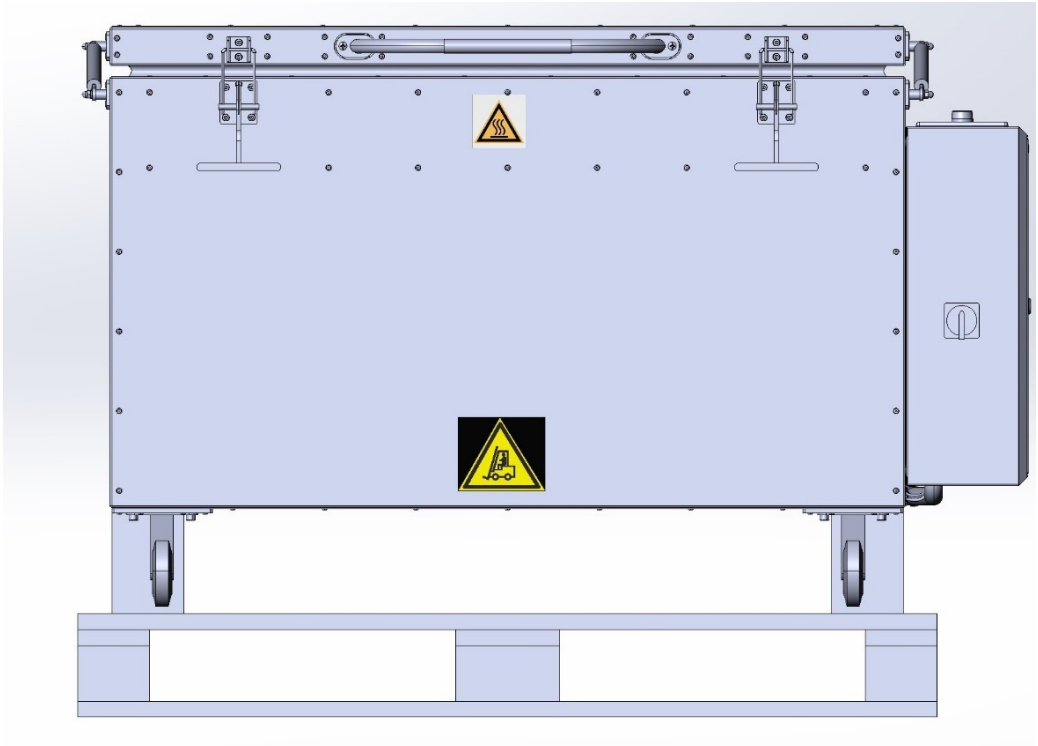


Figure 9. Installation Diagram on Pallet

The manufacturer's final testing may have left heat discoloration on the internal surfaces.

This does not affect the function and performance of the Polymerization Oven.

Please remove any protective devices and adhesives used for transportation from inside/on the chamber and lid, and also remove the operating manuals and any additional equipment.




CAUTION

- Risk of injuries and damage when lifting heavy loads, and if the chamber slips or tilts due to improper lifting.
- Injuries, damage to the chamber.

DO NOT lift or transport the Polymerization Oven by the door, handle, or electrical control panel housing. Lift the size 1000 chamber from the pallet by its four lower corners with six people or a forklift. Position the forklift only at the front center of the Polymerization Oven.

Lift the size 1500 and 2000 Polymerization Ovens from the pallet with a forklift. Position the forklift only at the front center of the chamber.

DO NOT position the forklift on the electrical panel side.

If the Polymerization Oven needs to be returned, use the original packaging and adhere to the safe lifting and transportation recommendations outlined in Section 3.2.

Refer to chapter 10 for disposal instructions of transport packaging.

3.2 Safe Lifting and Transportation Recommendations

The front wheels of the Polymerization Ovens can be locked using the brakes. Move the chamber on wheels only when empty and on a surface level; otherwise, the wheels may be damaged. After operation, observe the storage recommendations outlined in section 3.3.




CAUTION

- Risk of injuries and damage when lifting heavy loads, and if the chamber slips or tilts due to improper lifting.
- Injuries, damage to the chamber.

DO NOT lift or transport the Polymerization Oven by the door, handle, or electrical control panel housing. Lift the size 1000 chamber from the pallet by its four lower corners with six people or a forklift. Position the forklift only at the front center of the Polymerization Oven.

Lift the size 1500 and 2000 Polymerization Ovens from the pallet with a forklift. Position the forklift only at the front center of the chamber.

DO NOT position the forklift on the electrical panel side.

Permissible ambient temperature range during transportation: -10 °C. / 14 °F to +60 °C / 140 °F.

3.3 Storage

Interim storage of the Polymerization Oven is permitted in a closed and dry room.

Permitted ambient temperature range during storage: -10 °C / 14 °F to +60 °C / 140 °F.

Permitted ambient humidity: max. 70% relative humidity. humidity, without condensation.

If the Polymerization Oven is moved to a warmer Installation location after storage in a cold environment, condensation may form. Prior to start-up, allow at least one hour for the Polymerization Oven to reach ambient temperature and ensure it is completely dry.

3.4 Installation Location and Environmental Conditions

Install the Polymerization Oven on a on a smooth, level surface in a well-ventilated, dry location, and ensure it is properly leveled using a spirit level. The installation location must be capable of supporting the weight of the Polymerization Oven (refer to technical data, Table 4). Polymerization Ovens are designed for indoor installation (internal use only).

NOTICE

- Overheating hazard due to inadequate ventilation.
- Polymerization Oven damage.

DO NOT install the Polymerization Oven in unventilated recesses.
Ensure adequate ventilation for heat dissipation. Observe the specified minimum distances when installing the Polymerization Oven.

Do not install or operate the Polymerization Oven in potentially explosive atmospheres.

DANGER

- Explosion hazard due to combustible dust or explosive mixtures near the Polymerization Oven.
- Serious injuries or death can result from burns and/or explosion pressure.

Do not operate the Polymerization Oven in potentially explosive atmospheres.
Keep explosive dusts or airborne mixtures AWAY from the Polymerization Oven.

3.4.1 Environmental Conditions

Permissible ambient temperature range during operation: +10 °C / 50 °F to +30 °C / 86 °F. Temperature fluctuations may occur at high ambient temperatures.

Permitted ambient humidity: 70% RH max., non-condensing

The environment must be explosion-proof and free of conductive dust, corrosive gases, and vapors at concentrations that could damage insulation or metals, or disrupt the normal operation of the equipment installed in the Polymerization Oven.

3.4.2 Minimum Distances

When positioning multiple Polymerization Ovens adjacent to each other, maintain a minimum distance of 500 mm between each oven.

Clearance from walls: rear 500 mm, sides 500 mm.

A minimum clearance of 2000 mm above the Polymerization Oven must also be maintained.

Maximum load on the top of the enclosure: 15 kg.

Polymerization Ovens are NOT designed for stacking.

4. Polymerization Oven Description

The Polymerization Oven OVEN-xxx-xxxx is a professional heating cabinet equipped with vacuum ports. It is designed for curing composites, including prepregs, and for heat-treating parts manufactured using vacuum infusion. The Polymerization Oven can also be used to accelerate the polymerization of silicone and resin castings.

The oven is equipped with 1 or 2 ports (depending on the model), each featuring a vacuum gauge for connecting an 8/6 vacuum tube to evacuate the product during resin curing.A key characteristic of Polymerization Ovens is the uniform temperature distribution throughout the entire internal volume and smooth, adjustable heating. This is achieved through efficient air recirculation by the internal fans and control via a proprietary software system developed by our company.

The high-performance Polymerization Oven enables operation at temperatures up to 200°C, with maximum temperature stability and relatively low energy consumption.

Products are loaded into the Polymerization Oven from the top.

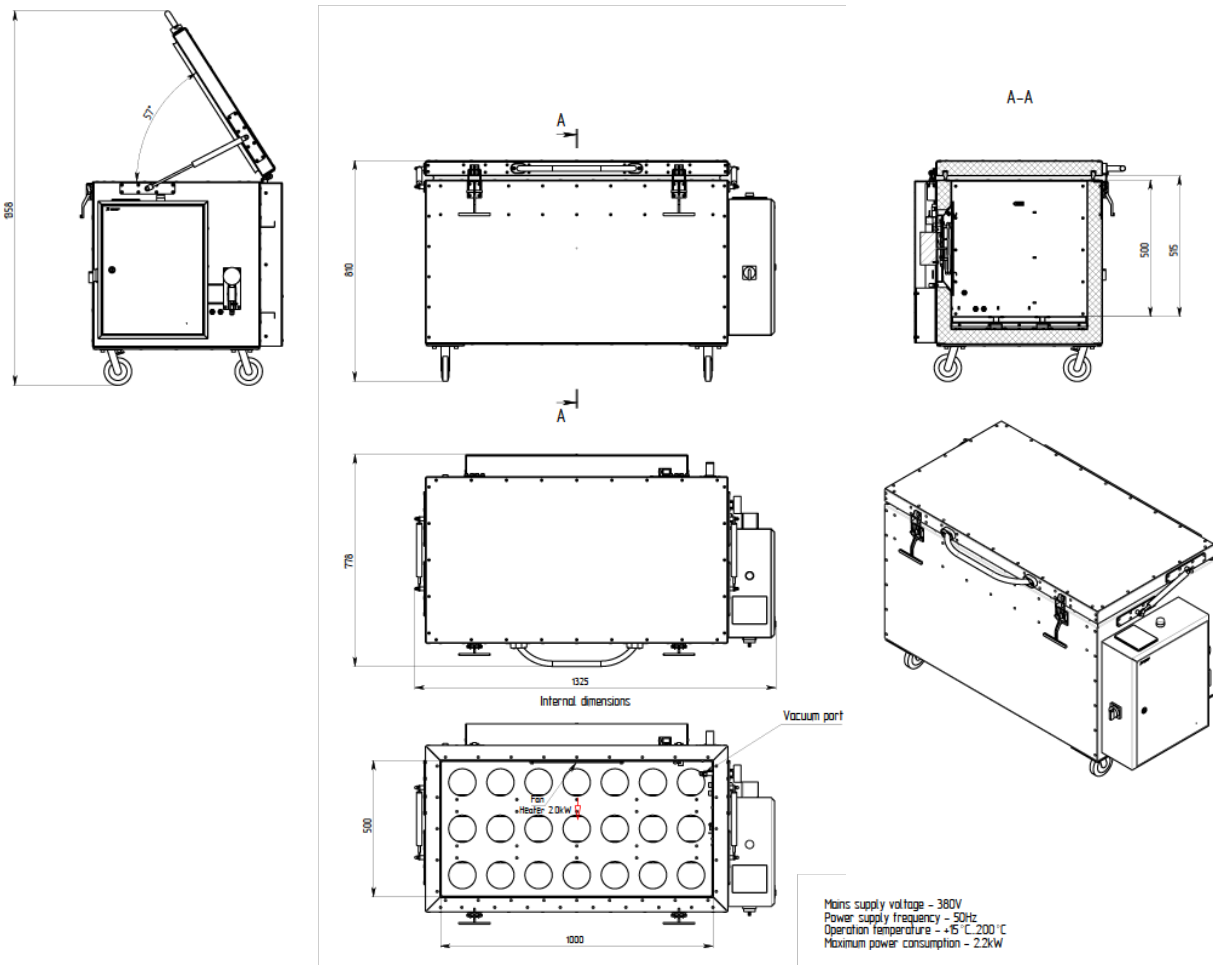


Figure 10. General View of OVEN-500-1000

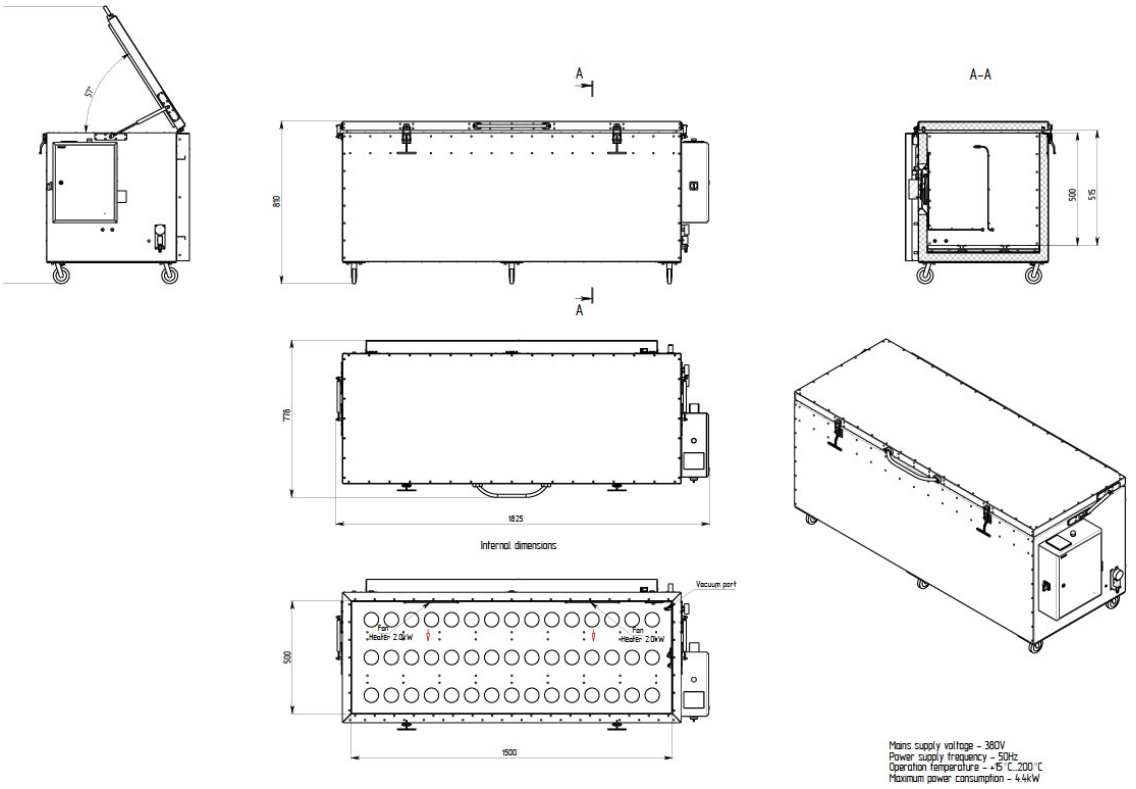


Figure 11. General View of OVEN-500-1500

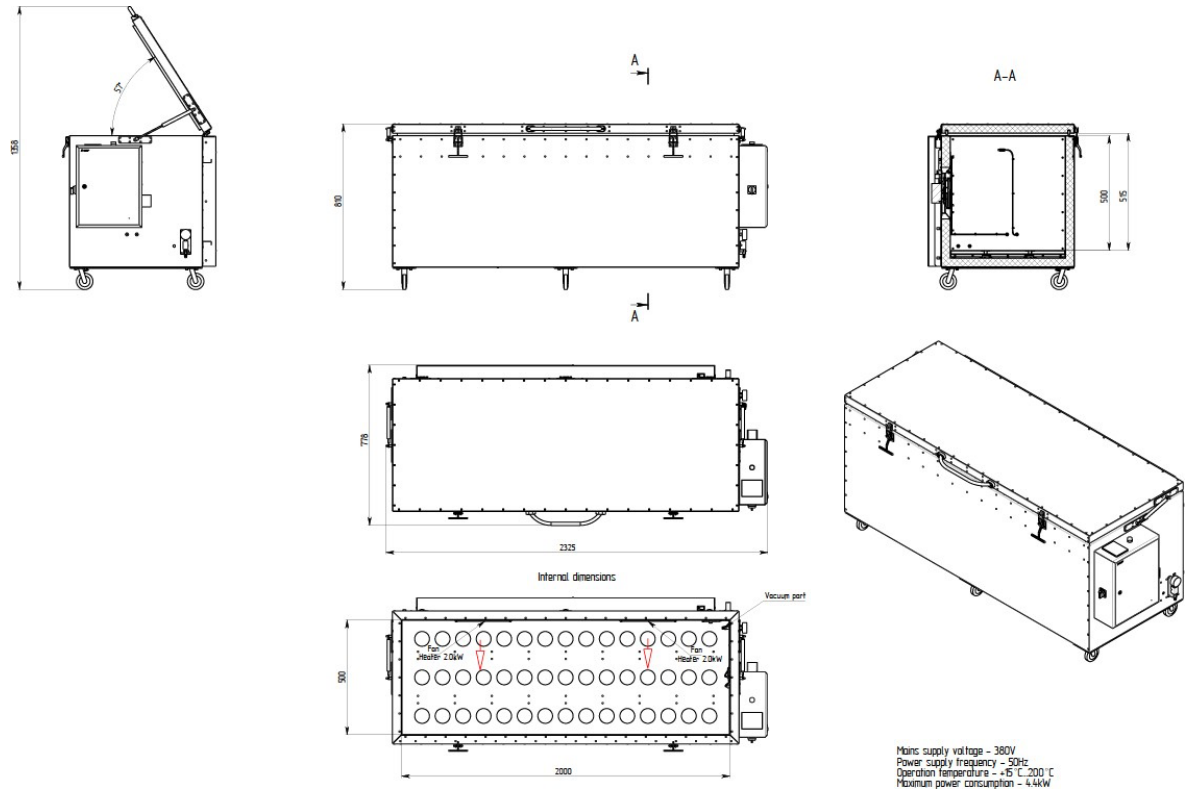


Figure 12. General View of OVEN-500-2000

4.1 Characteristics of the OVEN-xxx-xxxx Polymerization Oven

Table 3. The specifications for the Polymerization Ovens OVEN-xxx-xxxx are as follows:

Item No.	Description	Specification
1	Working Zone Material (Interior)	AISI 321
2	Outer Casing Material	A93003
3	Insulation (Ceramic Fiber)	50 mm
4	Fans	C04K00AC
5	Internal Volume, L	Refer to Table 4
6	Convection Fan Heating Element, Power, 1 pc	Refer to Table 4
7	Thermocouple	Gefran TC5N
8	Temperature Controller	Delta DT320
9	Power Supply Voltage	380 V
10	Power Supply Frequency	50 Hz
11	Overall dimensions / internal dimensions, mm	Refer to Table 5
12	Operating temperature	From +15°C to +200°C
13	Minimum temperature	20°C
14	Maximum temperature / minimum heating time to 200°C	200°C / 90-120 min
15	Product/tooling loading	Top loading
16	Maximum power consumption, W	Refer to Table 4
17	Total weight, kg	Refer to Table 4

Table 4

Model	Internal volume, L	Convection fan heating element, power, kW	Maximum power consumption, W	Total weight, kg
OVEN-500-1000	250	2	2400	130
OVEN-500-1500	375	4	4400	165
OVEN-500-2000	500	4	4400	210
OVEN-700-1000	490	2	2200	180
OVEN-700-1500	735	4	4400	220
OVEN-700-2000	980	4	4400	275

Table 5

Model	Functional internal dimension	External dimension
OVEN-500-1000	500-500-1000	778-810-1325
OVEN-500-1500	500-500-1500	778-810-1825
OVEN-500-2000	500-500-2000	778-810-2325
OVEN-700-1000	700-700-1000	978-1010-1325
OVEN-700-1500	700-700-1500	978-1010-1825
OVEN-700-2000	700-700-2000	978-1010-2325

Table 6. Technical specifications of the Weintek mt8052ip controller

Controller size, mm	119 x 93 x 32
Supply voltage	24 VDC
Power consumption, max	0.4 A
Display type	4 “3 LCD TFT
Character size	
Interfaces	
RS485 2W RTU, ASCII	Ethernet (LAN) support
Software	EasyBuilder Pro
Processor type	Cortex A8 600 MHz 128 MB
Display resolution	480 x 272
Color depth	16.7 million
Storage and operating conditions	
Operating temperature, °C Storage temperature, °C Humidity, % operating Humidity, % storage	from -10 to +50; from -20 to +60 35...85% relative humidity 35...85% relative humidity
Weight, g	~ 250

5. Device and operating principle

5.1 Design of Polymerization Oven OVEN-xxx-xxxx

The Polymerization Oven structurally consists of a housing and lid, manufactured from aluminum sheets on the exterior and stainless steel sheets on the interior. A thermal insulation material (ceramic fiber blanket) is placed between the metal sheets. Swivel wheels are installed for ease of movement within the production area (item 4 in Fig. 13).

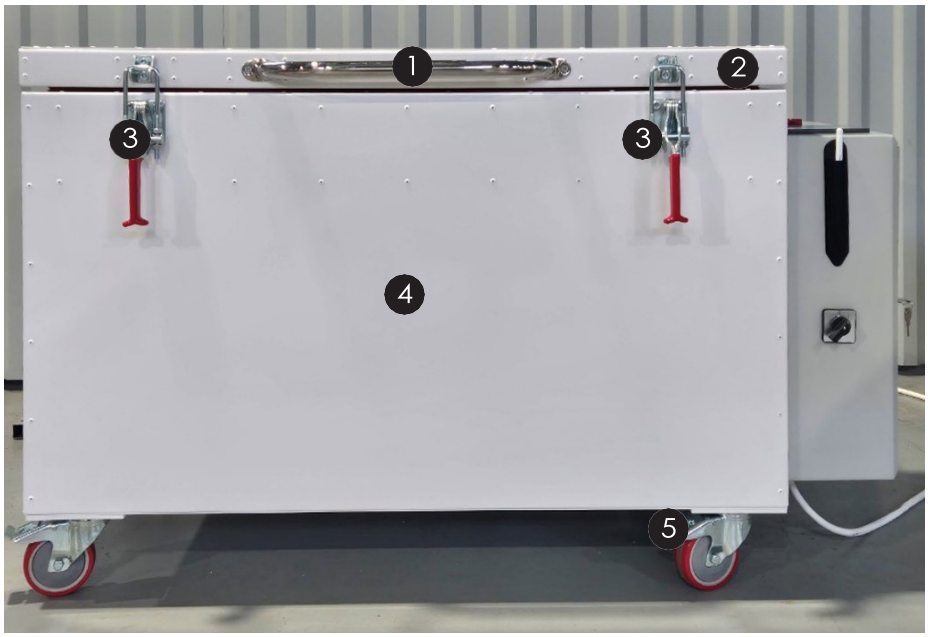


Figure 13. Front view of Thermostat Chamber OVEN-500-100.
1 – handle; **2** – lid; **3** – latches = 2 pcs; **4** – body; **5** – wheels = 4 pcs.

A silicone Seal is installed around the lid's perimeter (Fig. 14, item 3) to ensure a tight fit against the body. The lid is attached with two hinges (Fig. 14, item 1) and secured to the body with two latches (Fig. 13, item 2).

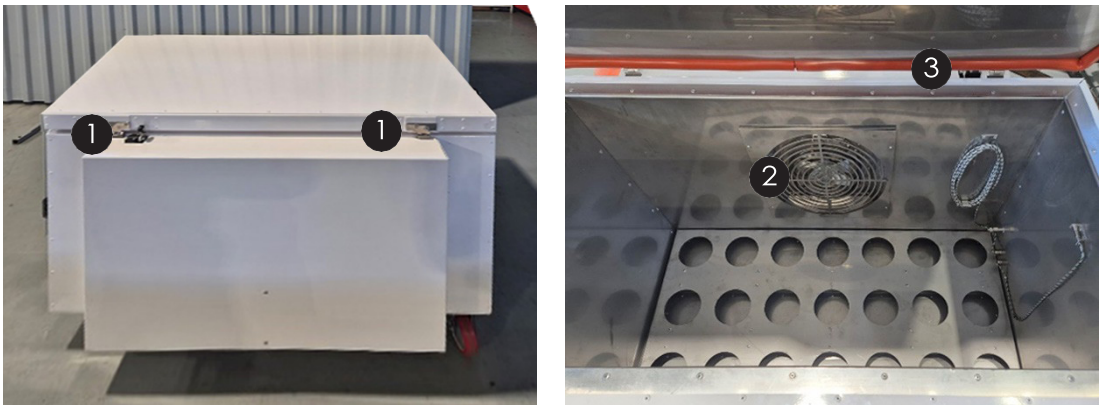


Figure 14. Rear and Interior View of Polymerization Ovens
1 – Curtains = 2 pcs; **2** – Fan; **3** – Silicone profile.

For heating, the oven is equipped with one or two tubular electric heaters with fans (depending on the Polymerization Oven model) (Fig. 15, item 1), which evenly distribute hot air. The oven is also equipped with a mold control thermocouple (Fig. 15, item 3), an oven control thermocouple (Fig. 15, item 4), and a thermostat (Fig. 15, item 2).

The Polymerization Oven is equipped with one or two ports (depending on the oven model) and a vacuum gauge for connecting a vacuum line (Fig. 15, item 7). An 8/6 tube is used and connects to a Camozzi 1510 8/6-1/4 fitting. Camozzi fittings are screwed onto a steel tube with a G1/4 thread. Alternative fittings may also be used.

Inside the chamber, it is recommended to use heat-resistant Camozzi PTFE 8/6 tubing, or other heat-resistant ones. For supplying vacuum from outside the oven, we recommend using Camozzi TPE 8/6 tubing or any other tubing suitable for vacuum applications.

A 220 V socket is provided for powering the vacuum pump, featuring an automatic power shut-off function at the end of the programmed heating cycle (Figure 15, item 6).

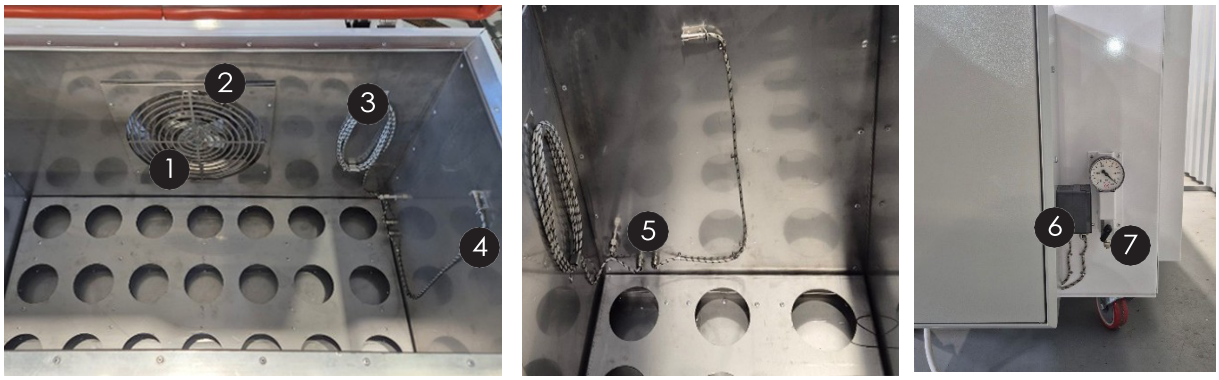


Figure 15. View of Heating Elements
1 – Heating Element; **2** – Thermostat; **3, 4** – Thermocouple; **5** – Inner Port; **6** – 220V Socket; **7**– Vacuum Port.

An electrical panel is installed on the side of the Polymerization Ovens' outer casing, with the controller and audible-visual alarm located on top, and a Toggle Switch and stylus on the side (Fig. 16).

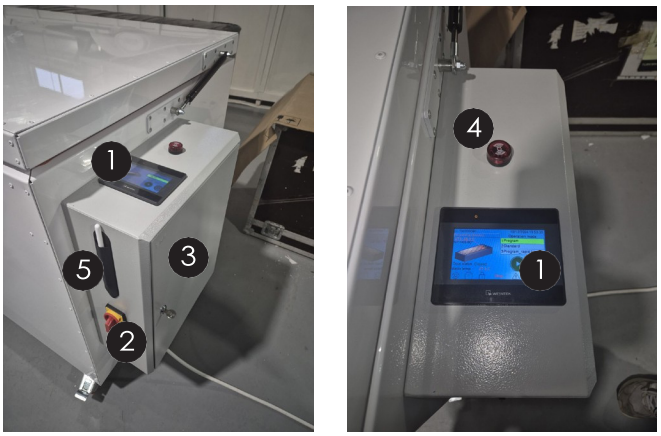


Figure 16. Panel with Toggle Switch and controller.
1 – controller, **2** – Toggle Switch, **3** – electrical panel, **4** – audible-visual alarm, **5** – stylus.

1. Preparation Stages for Operating the Polymerization OvenPrepare the work area for Polymerization Oven installation as detailed in section 3.4.2.
2. Unpack the Polymerization Oven as detailed in section 3.1. Verify that no damage is present.
3. Connect the Polymerization Oven power cable to a 380V power supply.
4. Release the latches securing the Polymerization Oven lid and lift the lid.
5. Place the prepared components into the Polymerization Oven.
6. Lower the Polymerization Oven lid and secure it by engaging the latches.
7. On the control panel (Fig. 16, item 2), set the toggle switch to position 1.
8. Select the required program on the controller (Fig. 16, item 1); see chapter 6.
9. Start the Polymerization Oven according to the selected program; see chapter 6.

6. Controller Functional Overview: Weintek mt8052ip

6.1 Button icon designation and purpose


Settings


Program selection from the program catalog


User selection


Alarms


Graph archive from completed programs


Return to Working Screen


Change or assignment of a firing program


saving changes to programs

transferring a program from the program directory to the controller for execution


program start


program stop


increase temperature or time in Standard mode


decrease temperature or time in Standard mode

6.2 Powering on the Polymerization Oven

Power on the Polymerization Oven OVEN-xxx-xxxx by turning the Toggle Switch knob (Fig. 16, item 2) clockwise to the «1» position. Upon loading, the Working Screen is activated on the controller panel (Fig. 17).

6.3 Description of the main (home) Working Screen of the controller.

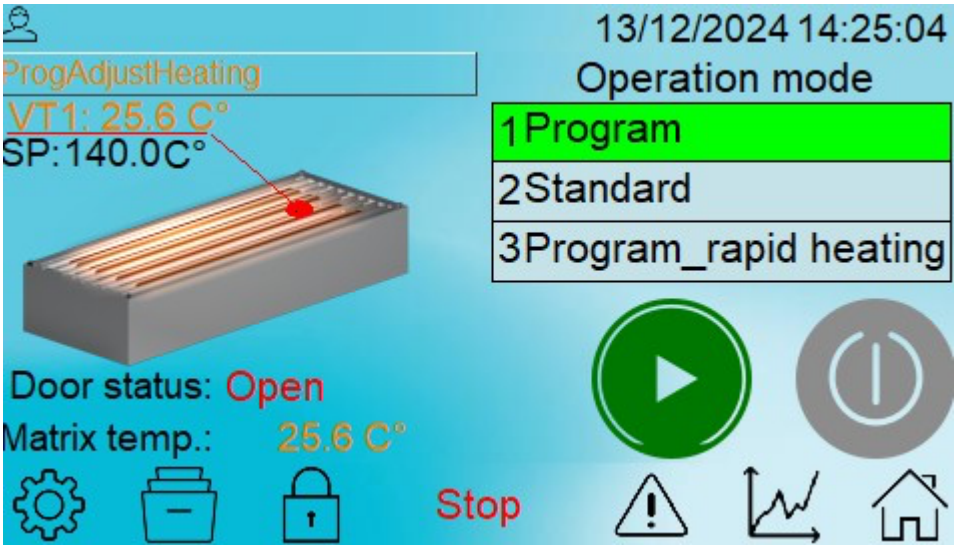


Figure 17. Working Screen

The Working Screen displays the following:

- Current temperature in the Polymerization Ovens VT1
- Setpoint temperature (SP) as defined by the program
- Matrix temperature
- Selected operating mode («Program», «Standard», «Program_rapid heating»)
- Active program («PrgAdjustHeating»)
- Door status (open/closed)
- Program execution status (stop/run)
- Program start and stop buttons
- Tabs:

Settings	Alarms
Program selection from the program catalog	Graph archive from completed programs
User selection	Return to Working Screen

6.4 User and password settings

By pressing the button  we access the user selection and Password entry menu (Fig. 18).

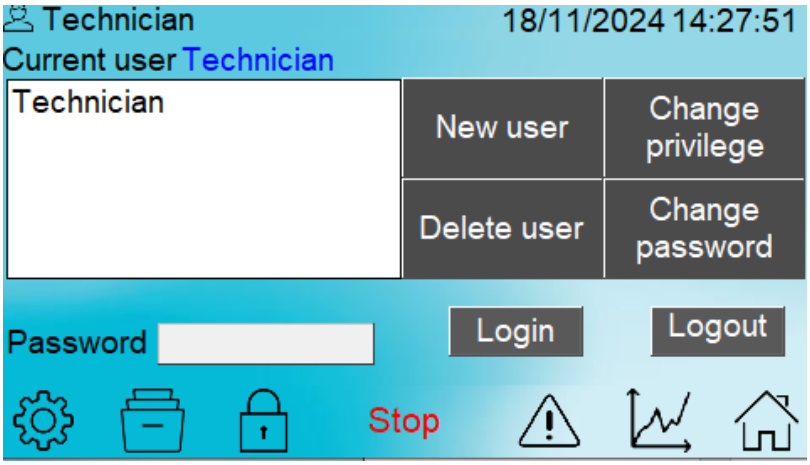


Figure 18. User selection/adjustment and Password entry screen

Select the desired User, enter the Password, and press the "enter" button. The default Password for the "Technician" User is 1111. The "Technician" User is granted default privileges to edit all program parameters and allows for the creation of other Users with restricted or expanded capabilities.

To add a new User, press the "new user" button (Fig. 19).

Figure 19. New User Creation Screen

Next, enter the username and Password, then select the access level. The selected values A, B, and C unlock the full range of modifiable parameters. Then click “Add,” and the new User will appear in the user selection menu (Fig. 19).

To change a User's Password, press the "Change Password" button after selecting the User (Fig. 18). Next, in the Password change window (Fig. 20), enter the new Password and press the "OK" button. The User's Password will be changed successfully.

Figure 20. User Password Change Screen

A user can be deleted using the «Delete User» button (see Figure 18).

6.5 Program Settings Description.

To access the settings menu, enter the «Technician» user password and press the button on  the program's work screen.

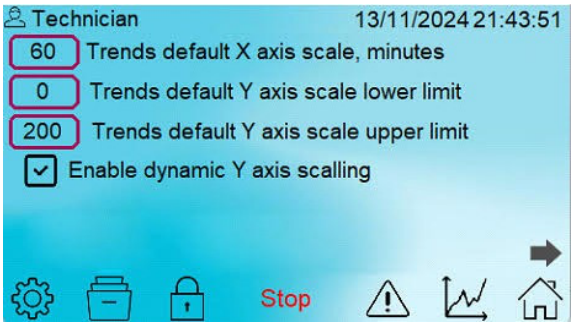


Figure 21. Settings Panel 1

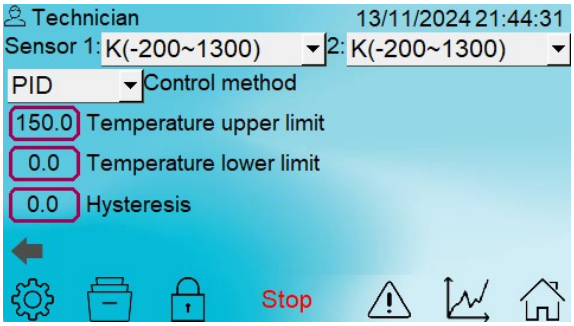


Figure 23. Settings Panel 3

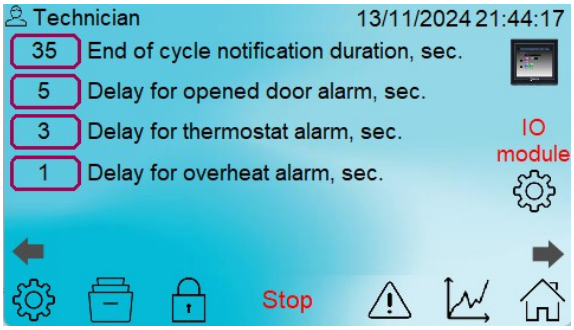


Figure 22. Settings Panel 2

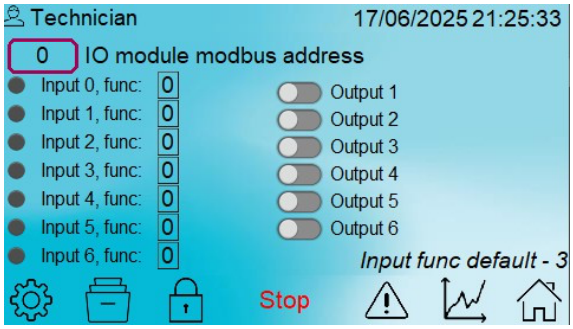


Figure 24. Settings Panel 4

Settings Panel 1 (see Figure 21). The parameters «X-axis Scale on Graphs, in minutes», «Y-axis Scale on Graphs, minimum», and «Y-axis Scale on Graphs, maximum» control the graphical display of the graphs in the tab.  . When the «Enable Dynamic Scaling» parameter is activated, the program will automatically set the-
graph limits for proper visualization of the technological process.

Settings Panel 2 (see Fig. 22). The «Cycle Completion Notification Duration, sec» parameter specifies the duration for which the audible and visual alarm will operate upon cycle completion. Setting the parameter to «0» disables the audible alert upon program completion.

The "Door Open Fault Delay" parameter controls the delay before the audible and visual alarm is activated when the door is opened during program execution. When the door open fault is triggered, the program continues to run.

The "Thermostat Fault Delay" parameter controls the delay before the audible and visual alarm is activated when the overheat protection thermostat trips. Program execution will continue once the temperature drops to the setpoint.

The "Overheat Fault Delay" parameter controls the delay before the audible and visual alarm is activated when the temperature exceeds the "Maximum temperature" parameter.

Settings Panel 3(see Fig. 23). The 'Upper Temperature Limit' parameter restricts the maximum temperature setting when creating recipes and in Standard mode. The default maximum temperature is 200 degrees.

The 'Lower Temperature Limit' parameter restricts the minimum temperature setting.

The 'Hysteresis' parameter is necessary to configure the temperature differential for activating the heating elements in the selected ON/OFF operating mode.

The settings also allow selection of the temperature sensor type.

Settings Panel 4(see Fig. 24). The Modbus module address is configured on this panel. It is also possible to manually activate 7 functional inputs and 6 outputs. During program execution, active inputs and outputs are displayed in this tab. Data entry on this menu is performed by UAVOS, the manufacturer, or by qualified service partners or UAVOS Technicians.

6.6 Description of Program Operating Modes

6.6.1 Program Mode

To select a mode, choose Program in the upper right corner of the working screen (Fig. 25).

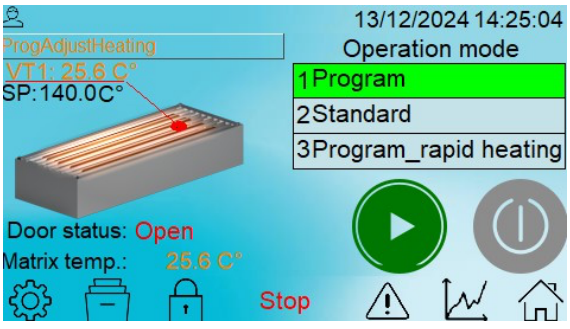


Figure 25. Program Mode Selection on the Working Screen

This mode features a gradual temperature ramp, increasing the temperature based on the specified parameters. The rate of temperature increase in degrees per minute is calculated using the following formula:

t – set firing temperature;
t – initial furnace temperature at the start of firing;
T – burn time.

For example, the initial temperature inside the oven is 20 degrees. According to the oven program, the temperature must reach 140 degrees in 60 minutes. Therefore, the controller will increase the temperature by 2 degrees every minute to achieve a smooth temperature ramp to the setpoint of 140 degrees in 60 minutes.

To select a Recipe in Program burn mode, navigate to the program selection screen by pressing the button.  . Next, in the displayed menu, press the Program mode button (Fig. 26).

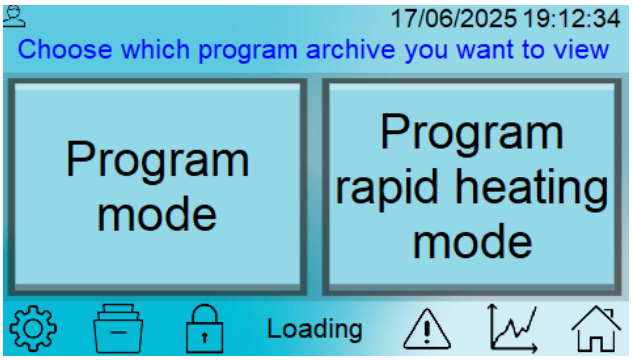


Figure 26. Program Selection Screen

After selecting the Program mode, the following panel opens (Fig. 27). From this panel, one of nineteen pre-recorded heating programs can be selected. This can be done by a standard user. After selecting a heating program, it must be transferred to the controller by pressing the button  . Now, return to the main screen by pressing the button  and initiate this program for heating.

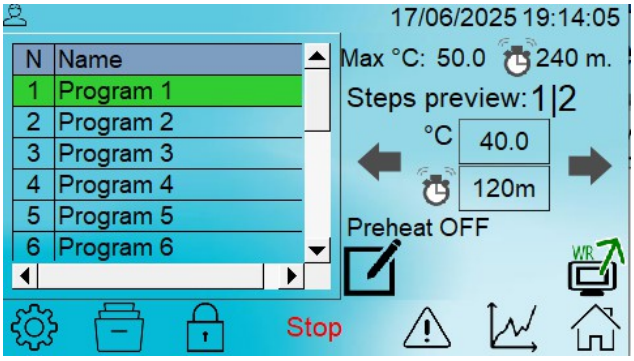


Figure 27. Program Selection Menu from the Program Mode Catalog

⚠	Only a Technician can create and edit heating programs.

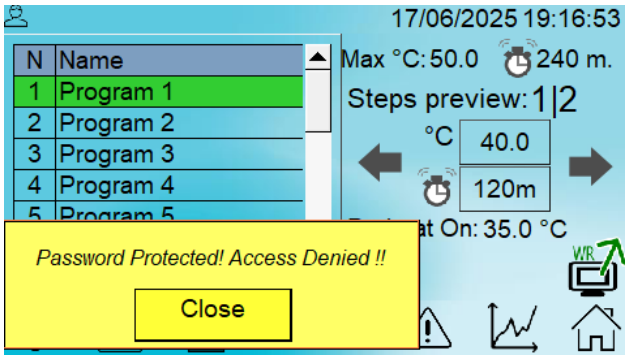


Figure 28. Only a Technician can edit.

When logged in as a Technologist, it is necessary to press the button  .

In the Recipe editing window that appears (Fig. 29), up to seven heating stages can be defined, with the ability to set the Firing Temperatures and stage duration in minutes for each stage.

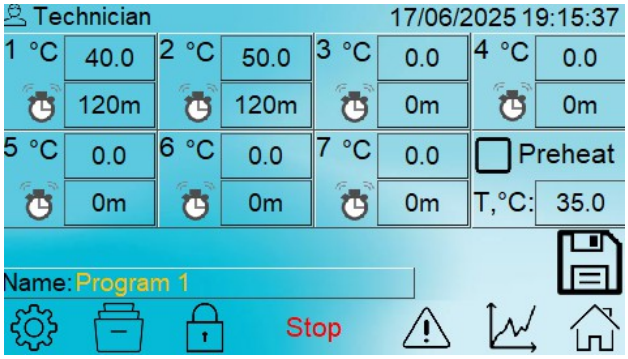
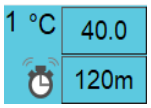


Figure 29. Recipe Editing Menu - Program

This program (Fig. 29) defines two Firing Stages. In the first stage, the firing temperature is 40 degrees, and the time to reach the setpoint is 120 minutes. In the second stage, the curing temperature is 50 degrees, and the time to setpoint is 120 minutes.



To change the program parameters, select the desired parameter (temperature or time). In the window that appears, use the keyboard to set the required value (Fig. 30).

Figure 30. Keyboard

The algorithm allows the program to start once the matrix temperature is reached. This is because the air in the Thermostat Chamber heats up faster than the matrix on which the item being cured is located, which can disrupt the curing process. To enable or disable the matrix heating, check the box (Fig. 31) and set the temperature at which the program steps will begin.

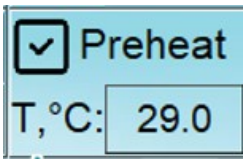


Figure 31. Enabling Matrix Preheating on the Recipe Program Editing Menu

After modifying the program parameters, save the changes using the button. . After entering the firing step parameters and saving, press the button to return to the Working Screen. The Working Screen (Fig. 25) displays buttons for-

Program start and stop . After the program starts, the remaining step execution time in minutes will be displayed on the panel (Fig. 32).

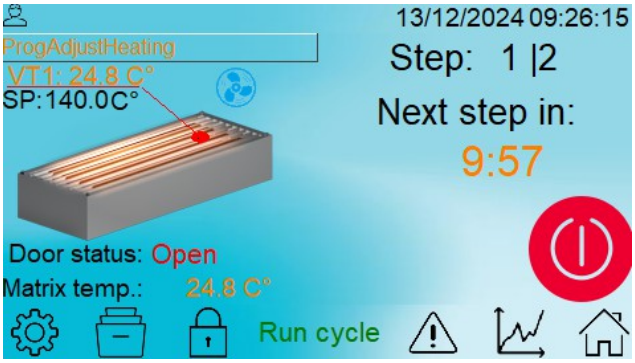


Figure 32. Program Mode Execution

This mode is exclusively for quenching products and is «self-adjusting». Accurate and stable oven operation in this mode is achieved after the temperature controller has learned the system characteristics, which typically occurs after at least 20 firing cycles. Control coefficients are written to the temperature controller to ensure stability of the firing process and eliminate the possibility of overshooting the set parameters. During operation, the step completion time may be displayed as «***» (Figure 33).

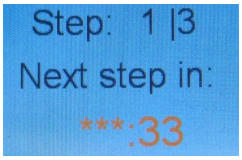


Figure 33. Step completion time display

The designation «***» indicates that, during the execution of the Firing Stages, the temperature did not reach the setpoint within the specified time. The program will proceed to the next step when the setpoint temperature for the current step is reached, and the remaining step time is correctly displayed.

If the message «Device no response» appears during program execution (Figure 34), reboot the control cabinet by disconnecting and reconnecting the power after the program has been completed. Then, restart the firing program for correct operation.

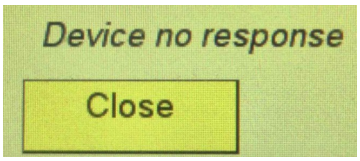


Figure 34. Emergency program execution message

Editing the current Recipe during program execution is prohibited. This mode is not recommended for standard curing of products that require a smooth temperature ramp-up according to the Recipe time.

6.6.2 Standard Mode

This operating mode is simplified and does not include heating steps. The temperature and curing time are set. The cycle completes after program execution. To select the mode, choose Standard in the right corner of the working screen and press the button-

Program start  (Fig. 35).

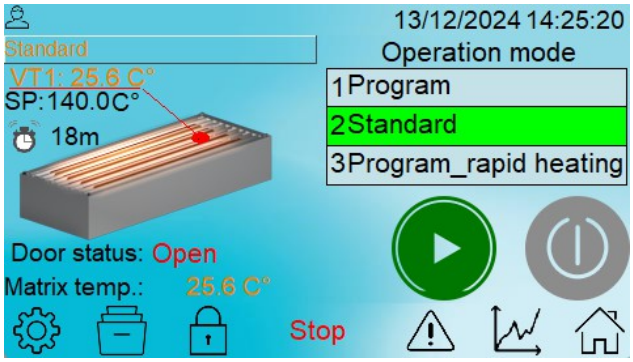


Figure 35. Standard mode execution window

On the right side of the screen, the firing time and temperatures are adjusted using the buttons (Fig. 36).

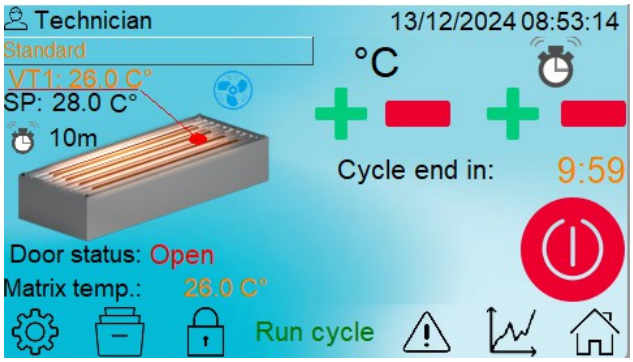


Figure 36. Standard mode execution window

The mode can be stopped prematurely by pressing the button  . Upon expiration of the set firing time, the program execution will complete automatically.

6.6.3 Program_rapid heating mode

This mode involves reaching a set temperature and maintaining it for a specified time. The rate at which the set temperature is reached is not standardized, and is characterized by the power and number of heating elements installed in the oven.

To select a mode, choose "Program_rapid heating" in the right corner of the work screen. (Fig. 37).

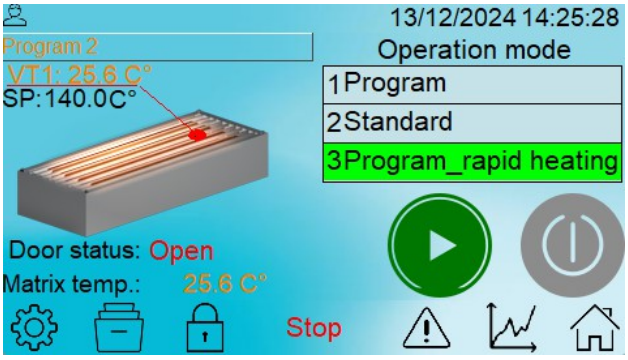


Figure 37. Program_rapid heating mode selection window

To access the program selection menu, press the button  . Next, in the menu that appears, press the Program rapid heating mode button (Fig. 26).

After selecting Program rapid heating mode, the menu shown in Figure 38 opens. On this screen, one of nineteen pre-recorded heating programs can be selected. This can be done by a standard user. After selecting a heating program, it must be transferred to the controller by pressing the button  . Now, return to the main screen by pressing the button  and start the selected heating program.

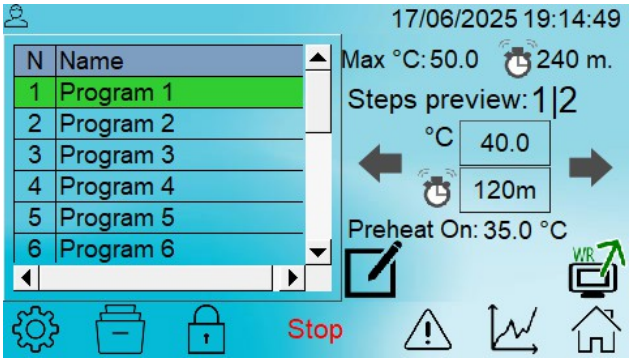


Figure 38. Menu for selecting programs from the catalog PROGRAMM rapid heating MODE

⚠	Only the Technologist can create and edit heating programs. When logged in as a Technologist, it is necessary to press the button  .

In the Recipe editing window that appears (Fig. 39), up to seven heating stages can be defined. For each stage, the Firing Temperatures and the stage duration in minutes can be specified.

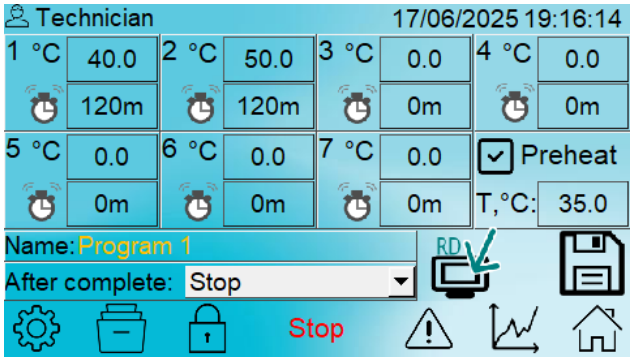


Figure 39. Recipe editing window using the example of «Program 1»

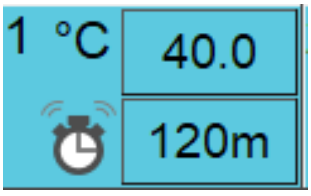


Figure 40.
Entering data for the first stage

Figure 40 shows the data for the first stage of the program, with the temperature set to 40° and a baking time of 120 minutes. To change program parameters, select the desired parameter (temperature or time). In the window that appears, use the keyboard (Figure 30) to enter the required value. After changing the program conditions, it is necessary-

-to save the changes using the button.  .

The algorithm allows the program to start once the matrix temperature is reached. This is because the air in the Thermostat Chamber heats up faster than the matrix on which the item being cured is located, which can disrupt the curing process. To enable or disable matrix heating, check the box (Figure 41) and enter the temperature at which the program stages should begin..

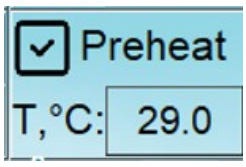


Figure 41. Enabling Matrix Heating and Setting the Temperature

Upon completion of the process, further program execution options are available (Fig. 42). The program can be stopped, or another one can be started.

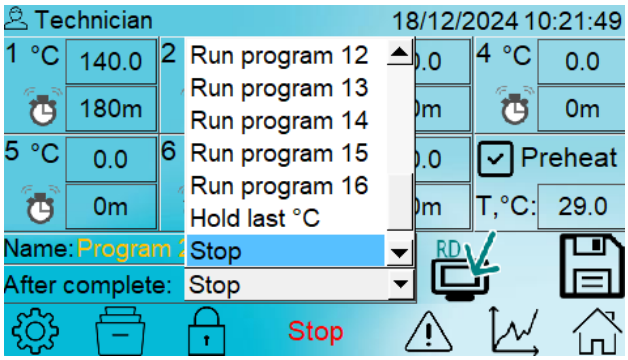


Figure 42. Selecting an Action Upon Program Completion

To exit to the Working Screen from any menu, press the button . The Working Screen (Fig. 37) displays program start buttons. and stop Af-
ter the program starts, the remaining step execution time, in minutes, will be displayed on the panel (Fig. 43).

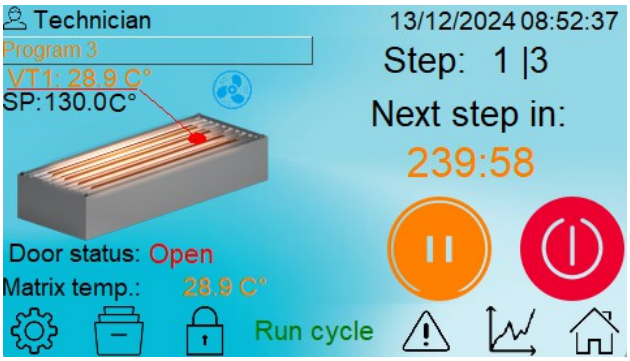


Figure 43. Program Execution

6.6.4 Graphical Representation of the Program

An event log is maintained during program execution. Graphical representation of the executed program can be viewed in the graph menu by pressing the button . The graph display menu is shown in

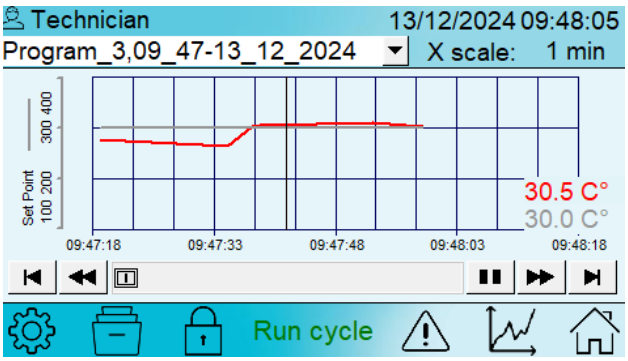


Figure 44. Graph Display Panel

The Y-axis on the graph represents temperature. The X-axis displays the time interval. Graphs of executed programs include the time and date in their names for convenient searching.

7. Cleaning

Clean the Polymerization Oven chamber as needed to prevent the accumulation of any flammable materials.
Before restarting, allow the chamber to dry completely after all cleaning procedures.

DANGER

Electrical Hazard:

- Water entering the Polymerization Oven.
- Lethal Electrical Shock.

Do not spill water or cleaning agents on the internal or external surfaces of the Polymerization Oven.

Do not insert ANY cleaning tools (cloth or brush) into the slots or openings of the Polymerization Oven. Prior to cleaning, turn off the Polymerization Oven using the main power switch and disconnect the power cord. Allow the Polymerization Oven to cool to room temperature.

Ensure the Polymerization Oven is completely dry before reactivating power.

8. Maintenance and Service, warranties, Troubleshooting, Repair, Testing

Maintaining the Polymerization Oven in operational condition involves performing a series of procedures to ensure it functions as specified and with the required efficiency.

Maintenance is a fundamental and critical preventive measure necessary to ensure the reliable operation of Polymerization Ovens between scheduled repairs and to minimize overall repair work.

During scheduled maintenance, the operation of the Polymerization Ovens is monitored and diagnosed to identify operational defects and safety violations, and to determine the scope of work required during the next Repair.

Defects in components and parts that may disrupt the performance of the Polymerization Ovens or compromise the safety of working conditions during further operation must be rectified immediately, either under warranty obligations or via a separate Maintenance agreement.

8.1 General Information, Personnel Qualification

Maintenance. See Section 8.2

Simple Troubleshooting. See Section 8.3, which describes Troubleshooting procedures for operational personnel. This does not require technical intervention involving the Polymerization Oven or disassembly of chamber parts.

Refer to Section 2.1 for personnel requirements.

Detailed Troubleshooting Guide. If errors cannot be identified through basic troubleshooting, further troubleshooting must be performed by UAVOS service, qualified UAVOS service partners, or UAVOS Technicians as detailed in the Maintenance Manual.

Refer to the Service Manual for personnel requirements.

Repair. Polymerization Oven repair may be performed by UAVOS service, qualified service partners, or UAVOS Technicians as detailed in the Service Manual.

Following servicing, the Polymerization Oven must be tested before resuming operation.

Electrical Testing. To prevent the risk of electric shock from the Polymerization Oven's electrical equipment, annual re-inspection is required, as well as testing prior to initial start-up and before resuming operation after servicing or repair. This test must meet the requirements of the relevant government authorities. We recommend performing testing in accordance with DIN VDE 0701-0702:2008, as detailed in the Maintenance Manual.

Refer to the Service Manual for personnel requirements.

8.2 Maintenance Intervals and Service

<table>
<tr><td rowspan="2">  </td><td>DANGER</td></tr>
<tr><td>Electrical Hazard:
• Risk of electric shock when working on live circuits.
• Lethal Electrical Shock Hazard.
The Polymerization Oven must NOT be exposed to moisture during operation or maintenance.
DO NOT remove the rear panel of the Polymerization Oven. Disconnect the Polymerization Oven prior to performing any maintenance. Turn off the main power switch and unplug the unit from the electrical outlet.
Ensure all maintenance is performed by licensed electricians or experts authorized by UAVOS.</td></tr>
</table>

Perform regular maintenance at least annually.

	The warranty is void if maintenance is performed by unauthorized personnel.

	Replace the rhsirb seal only when the unit is cold. Otherwise, the door seal may be damaged.

If there is an increased amount of dust in the ambient air, clean the fan grille (by vacuuming or blowing) several times a year.

8.3 Simple Troubleshooting

Defects and shortcomings can threaten the operational safety of the Polymerization Ovens and lead to risks and damage to equipment and personnel. If a technical fault or deficiency is present, remove the Polymerization Ovens from operation and report the issue to UAVOS service. If you are unsure whether a technical fault exists, follow the instructions in the following list. If you cannot clearly identify the fault or a technical malfunction occurs, please contact UAVOS service.

	Repair must be performed only by qualified service personnel authorized by UAVOS. Repaired chamber must meet UAVOS quality standards.

Table 7

Fault Description	Possible Cause	Required Actions
General		
Oven for Polymerization Not Functioning	No Power	Check the power source. power. Verify whether the polymerization on at the main Power switches.
	Incorrect voltage.	Check the power source for correct voltage. See section 4.1.
	Fuse blown.	Check the fuse polymerization oven and replace it if necessary. If it blows again, contact UAVOS service.
	Controller malfunction.	Contact service. UAVOS
	Rated temperature exceeded by 10°C due to a chamber malfunction. Protective system triggered. Overheating protection device	
Heating		
Oven chamber Is heating Constantly, Specified The temperature is not Maintained.	Controller malfunction.	Contact service. UAVOS
	The controller is faulty Adjusted or is exceeded Adjustment interval.	Calibrate and adjust Controller.

The oven chamber is not heating.	The thermocouple is faulty	Contact UAVOS service
	The heating element is faulty	
	The temperature controller is faulty	
The oven chamber fails to reach the set temperature upon activation. The safety controller has been triggered.	The heating limit set in the controller is lower than the programmed temperature.	Adjust the temperature limit in the controller. Refer to section 6.5.
Controller		
Menu functions are not accessible.	Menu functions are not accessible with the current authorization level.	Log in with the required higher authorization level. User: Technician.
Acknowledging the alarm does not clear the alarm state.	The alarm condition persists.	Correct the alarm condition. If the alarm condition persists, contact UAVOS service.
Device not responding.	No communication with the Thermostat Chamber devices.	After the program is complete, a control cabinet reset is required. Disconnect the power and restart the firing program for correct operation. If restarting does not resolve the issue, contact the UAVOS service center.

8.4 Warranties

Timely completion of all scheduled maintenance is a condition for maintaining the manufacturer's warranties on the Polymerization Oven.

Shelf life: 5 years from the date of manufacture. Warranty period: 1 year.

Service life: 10,000 hours.

9. Spare Parts

	UAVOS Inc. is only responsible for the safety functions of the Polymerization Ovens, provided that qualified electricians or authorized personnel perform all Maintenance and Repair, and if components related to the safety of the Polymerization Ovens are replaced with original spare parts in case of failure. The user is responsible for any risks resulting from the use of unauthorized accessories or components.

Table 8

Part Description	Article Number
Heat-Resistant Silicone Lid Seal	CT-43
Perforated Shelf	9000.02.17
Swivel Caster with Brake	3302-PUR-100-F18
Swivel Caster	3302-PUR-100
Thermocouple	Gefran TC5N

When ordering original spare parts, specify the Article Number of the part and the Polymerization Oven model (see Table 8).

10. Polymerization Oven Disposal in EU Member States

The Polymerization Oven does not contain any materials that are harmful to humans or the environment. Upon reaching the end of its service life, the Polymerization Oven must be disposed of in accordance with applicable local and national regulations.

In accordance with Annex I of Directive 2012/19/EU of the European Parliament and of the Council on Waste Electrical and Electronic Equipment (WEEE), this equipment is intended for professional use only. This equipment must not be disposed of at public collection points.

	NOTICE
	• Danger of violating existing legislation through improper disposal. • Non-compliance with applicable legislation. NEVER dispose of UAVOS devices at public collection points. Dispose of the device professionally at a recycling company certified under national electrical and electronic equipment legislation.

Certified companies disassemble waste (used) UAVOS equipment into primary materials for recycling, in accordance with Directive 2012/19/EU. Devices must be free of toxic, infectious, or radioactive materials to eliminate any health risks to recycling company employees.

	Before transferring the Polymerization Oven to a recycling company, the user is responsible for ensuring it is free of toxic, infectious, or radioactive materials. Prior to disposal, clean the Polymerization Oven of all introduced or residual toxic substances. Prior to disposal, disinfect the Polymerization Oven to eliminate all sources of infection. Be aware that sources of infection may also be located outside the oven's internal chamber. If you cannot safely remove all toxic substances and sources of infection from the chamber, dispose of it as special waste in accordance with national regulations.

11. Certifications and Declarations of Conformity

11.1 EU Declaration of Conformity

Declaration of conformity
number

Manufacturer

UAVOS Inc.
1111B S Governors Ave STE 20320
Dover, DE 19904, USA

Contact:

www.uavos.com

Email: uavos@uavos.com

Model	Type	Serial number
Precision Composites Curing Oven OVEN-xxx-xxxx	OVEN-xxx-xxxx	_____

Manufactured in accordance to standard

- _____
- _____

As well as the following standards

- EN 61000-6-2: 2005 EMC
- EN 61000-6-3: 2007 EMC
- EN 60204-1: 2018 Elektrické zariadenia na strojoch

Note:

Professional drying cabinet with vacuum supply. Designed for curing composites, including pre-preg curing or subsequent heat treatment of parts manufactured using vacuum infusion technology. Can be used to accelerate the polymerization of silicone and resin castings, as well as drying products after painting.

The oven is not intended for use in explosive, corrosive or humid environments.

The above is confirmed by:

Name _____

Position _____

Location _____

Date _____

Signature _____