

PO-2 Oven

Operator & Installation Manual

Fillauer®

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1. Safety Warnings

Read all safety instructions before operating the Fillauer PO-2 Oven. Retain this manual for future reference. In the event the oven is sold or transferred, this manual must accompany the unit.



DANGEROUS ELECTRICAL VOLTAGE: The PO-2 Oven operates at 208–240 V AC (single phase) or 380–400 V AC (three phase). Internal voltages are lethal. All electrical connections must be made by a licensed electrician in compliance with all applicable national and local codes. Disconnect and lock out power before performing any maintenance.



HOT SURFACES: Interior surfaces, the tray, and heated plastic can cause severe burns. Always wear heat-resistant gloves and appropriate PPE when loading or unloading material. Allow surfaces to cool completely before performing maintenance.



DO NOT OPERATE WITHOUT ALL EMITTERS INSTALLED: Operating the oven with missing emitters allows the emitter jumper wires to short to the oven wall, causing damage to electrical components.



INTENDED USE ONLY: The PO-2 Oven is designed specifically for heating thermoplastics for orthotics and prosthetics fabrication and has features that make it inappropriate for other uses. Heating other materials may be dangerous or may damage the oven. Check MSD sheets for potential toxic vapors and do not heat materials past their ignition temperature. Protection provided by the equipment may be impaired if the unit is not used in the manner specified by the manufacturer.

1.1 Operating Environment

Parameter	Specification
Temperature	70–77 °F (21–25 °C)
Relative Humidity	35–65 %
Overvoltage Category	II
Minimum Clearance	6 inches (150 mm) on all sides
Installation	Indoor, dry locations only

Do not place anything on top of the oven. Blocking airflow WILL cause the IR sensor to malfunction. Placing heavy items on top of the oven and/or allowing the door to slam will cause premature failure of oven emitters.

1.2 Safety Precautions

- Do not install or operate the PO-2 Oven on or near flammable materials or gases.
- Be sure to allow sufficient ventilation around oven surfaces — the recommended spacing is 6 inches minimum on all sides.
- Do not operate the oven without all emitters installed; the emitter jumper wires can short to the oven wall and damage electrical components.

Symbol	Meaning	
	Electrical Voltage	Risk of electric shock. Refer to accompanying documents.
	Hot Surfaces	Surface may cause burns. Allow cooling before contact.
	Warning	May cause equipment damage or personal injury if not followed.
	Note	Important information to ensure correct operation.

1.3 Cleaning

Clean interior surfaces with glass cleaner (water-based stains) or a solvent such as acetone or mineral spirits (oil-based stains). Do not use solvents on powder-coated exterior surfaces. The oven must be switched off and completely cool before using any cleaning agent, and solvents must be allowed to evaporate completely before the oven is turned on.

1.4 Moving the Oven

The PO-2 Oven is light enough to be moved by 4 people. Before moving: allow the oven to cool, disconnect the electrical power, and remove the cart. It is always advisable to secure the oven to the floor for permanent installation.

1.5 Compliance Information

The PO-2 Oven complies with UL 61010-1:2012, UL 61010-2-010:2019, CSA C22.2#61010-1-12:2012, and CSA C22.2#61010-2-010:2019 electrical and safety standards. All electrical connections must be performed by a certified electrician following all national and local codes and regulations.

2. Assembly & Setup

The PO-2 Oven ships partially disassembled to reduce freight cost and prevent transit damage. Assembly requires 4 people, a Phillips head screwdriver, and the included hardware kit.



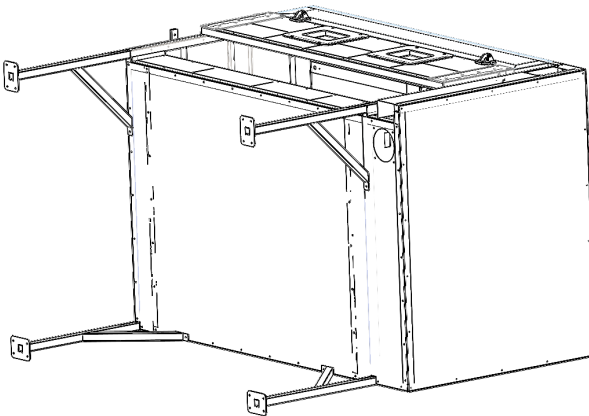
CAUTION — INFRARED EMITTERS IN TRANSIT: PO-2 Ovens have the infrared emitter tubes wrapped and secured to the back of the unit. Handle with extreme care during unpacking. Emitters are fragile quartz tubes.

2.1 Unpacking

- Unband and unpack the oven. Ensure the inside of the oven does not contain any loose items such as the tray or bubble forming frame.

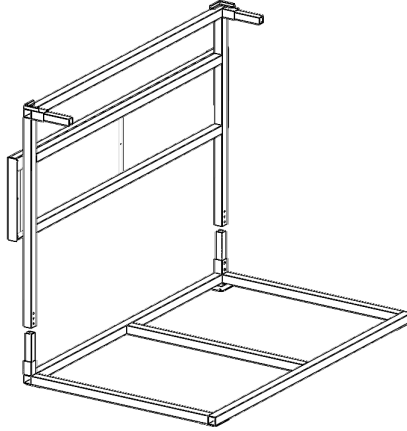
2.2 Leg Assembly

- Lifting the side of the oven opposite the control panel, insert the round section of the legs into the leg holes on the underside of the oven. Install the bolts through the hole in the leg support into the threaded hole on the underside of the oven, and install the two screws for each leg with a Phillips head screwdriver.
- Lift the control-panel side of the oven and repeat the process. Note: the angled supports run front-to-back on the two front legs and side-to-side on the two back legs.

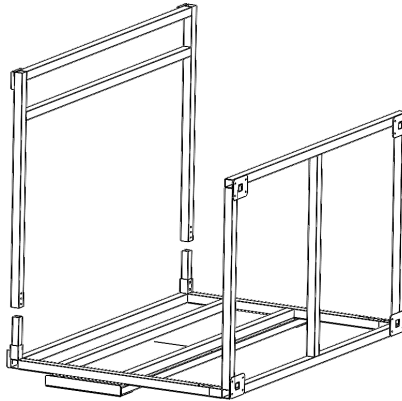


2.3 Cart & Tray Assembly

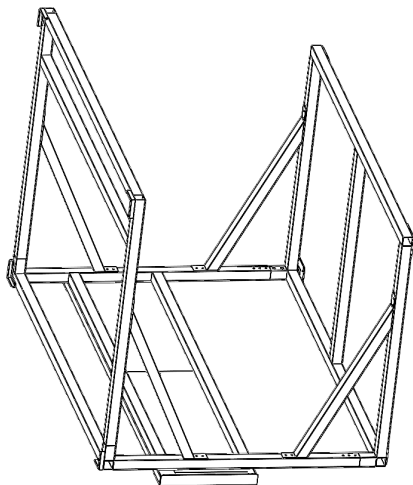
- Lay the bottom of the cart flat on the floor. Slide the cart back onto the bottom and attach with 6 ¼"-20 screws.



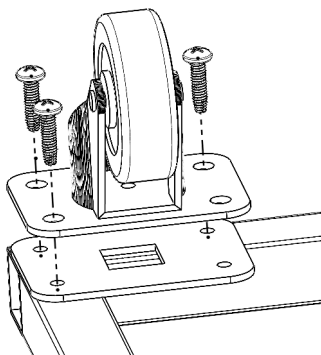
- Lay the cart on its back and slide the cart top on; attach with 6 ¼"-20 screws.



- With the cart still on its back, attach the 4 cart braces with 2 ¼"-20 screws each. Match the number on each brace with the number on the cart or the cart may not sit level.



- Flip the cart onto its top and attach the 4 casters with $\frac{1}{4}$ "-20 screws. Flip the cart right-side up.



- The cart has a sliding bar to accommodate different bubble-forming frame sizes. Adjust the sliding bar so that the bubble-forming frame rests on the fixed bar at the rear of the cart and on the sliding bar. This promotes more even heating of the plastic.

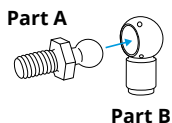
2.4 Door & Gas Shock Installation

The PO-2 comes with the door shocks preinstalled. Follow these steps only if replacement is needed:

- Insert Part A into Part B (a gentle force may be needed).
- Slide the retaining pin up through the holes in Part B and rotate the pin around the neck of Part B.

Step #1

Insert Part A into Part B
(a gentle force may be needed)



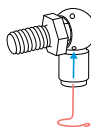
Step #2

Slide retaining pin up through holes in Part B, and rotate pin around neck of Part B

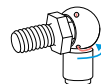
Retaining Pin through Holes



Retaining Pin



Fully Assembled



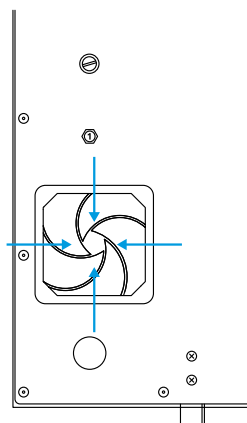
2.5 Fan Filter

The cooling fan filters are located on the rear and top of the oven. Check them regularly and replace when restricted — a clogged filter significantly reduces cooling fan and internal component life.



CAUTION — AIRFLOW: A clogged filter can significantly reduce the life of the cooling fan and internal components. DO NOT PLACE ANYTHING ON TOP OF THE OVEN; preventing the free flow of air will cause the sensor to malfunction.

- Turn off the oven, allow it to cool, and disconnect electrical power.
- Unclip the guard from all four sides and carefully remove it.
- Remove and discard the dirty filter; install a new filter, ensuring it is properly seated in the frame.
- Firmly clip the guard back into place on all four sides and reconnect electrical power.



3. Electrical Connections



ALL WIRING BY LICENSED ELECTRICIAN ONLY: All electrical connections must be performed by a certified electrician following all applicable national and local codes and regulations. Incorrect wiring can result in immediate and irreversible damage to electrical components.

An external circuit breaker and shut-off device must be mounted as close as possible to the oven and clearly marked as the disconnecting device for this equipment. The main supply wire must be at least 75 °C copper of the appropriate gauge for the recommended circuit breaker.

3.1 208–240 V Single Phase

The PO-2 Oven must be hardwired to your electrical system through an external circuit breaker and shut-off mounted as close as possible to the oven.

Specification	Value	Notes
Voltage	208–240 V (L1–L2)	Single phase
Actual Amperage	44 A	At rated load
Recommended Circuit Breaker	60 A	Minimum recommended

3.2 380–400 V Three Phase

EU models are supplied with 8 feet of VDE-rated cord and must be connected to an external circuit breaker and shut-off mounted as close as possible to the oven.

Specification	Value	Notes
Voltage	380–400 V	Three phase
Actual Amperage	15.4 A	At rated load
Circuit Breaker	Check local & national regulations	Varies by region

Installation procedure:

- Remove the right-side electrical panel by removing the screws with a Phillips head screwdriver. Caution: sheet-metal edges may be sharp.
- If using flexible cord, feed the supply cord through the strain relief and connect the power wires to the terminal blocks and ground screw.
- If using conduit, remove the strain relief and attach the conduit in the knockout, then connect the power wires to the terminal blocks and ground screw.
- Reinstall the side panel.

3.3 Over-Temperature Protection

Two independent over-temperature protection layers are provided:

- Software limit (500 °F / 260 °C): the controller cuts emitter power and displays a fault when the oven air temperature reaches this value.
- Mechanical limit switch (500–525 °F / 260–275 °C): a hardware backup that turns the emitters off if this range is exceeded. A reset button is located on the back of the oven above the main power entry point — unscrew the cap and push the button firmly if an over-temperature situation occurs. If the limit trips again, contact Fillauer support before resuming operation.

3.4 Over-Temperature Protection Device Check

- Disconnect electrical power and confirm the oven is cool to the touch.
- Remove the device's temperature probe (short copper bulb and capillary tube — not the long chrome probe) from the mount inside the oven.
- Insert the probe into a calibrated handheld dry-well calibrator (e.g., Hart Scientific 9100S) and heat it gradually.
- The device should trip between 500 °F and 525 °F (260 °C–275 °C).
- Allow the probe to cool to room temperature and reinstall it in the mount. Reset the device by pressing the reset button.

4. Emitter Installation



INFRARED EMITTERS ARE FRAGILE: Emitters are quartz-infrared tubes. Handle gently. Clean only with a soft cloth and glass cleaner.



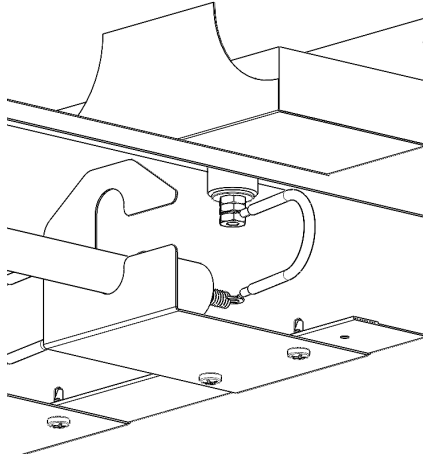
DISCONNECT POWER BEFORE PROCEEDING: All electrical power must be disconnected and the oven allowed to cool completely before installing or removing emitters.

4.1 Initial Emitter Installation

For emitter installation follow the procedure below (also referenced in Section 13.2):

- Disconnect electrical power to the oven and allow it to cool (for replacement) completely to room temperature.
- Remove the Emitter Passthrough assembly guards and bottom grate as needed. Locate the emitter(s) to be installed.
- Position the new emitter in the emitter hanger, ensuring it is fully seated.
- Attach the jumper wires to the emitter terminals and tighten the hex nuts securely.

- Clean the emitter surface with a soft cloth and glass cleaner to improve radiation efficiency.
- Reinstall any Emitter Passthrough assembly guards and bottom grate, tightening the mounting screws so the guards lightly touch the emitter hangers for support.
- Reconnect electrical power and perform a short test cycle.



View with assembly guards removed.

4.2 Emitter Passthrough Assembly Replacement

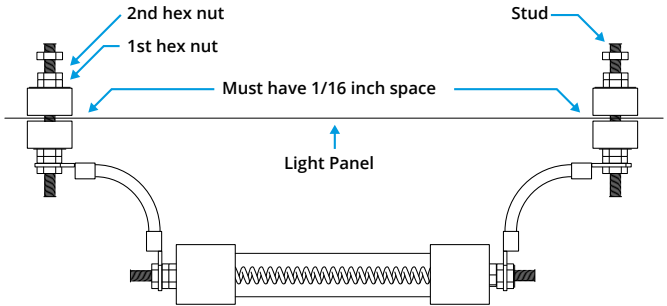
The Emitter Passthrough Assembly transfers electrical power to the emitter while maintaining electrical isolation. Replacement may be necessary if the ceramic insulators crack or if electrical continuity is lost.



CRITICAL SPACING REQUIREMENT: The 1/16" gap between the ceramic insulator and the light panel is mandatory. Insufficient spacing cracks the ceramic insulators. Excessive spacing causes the post to short to the light panel (ground fault).

- Disconnect electrical power to the oven and allow it to cool completely.
- Remove bottom access panels for the lower assemblies as needed.
- Remove the 3" strips of insulation covering the jumper wires and Emitter Passthrough assemblies.
- Remove the Emitter Passthrough assembly guards and bottom grate as required, then remove the old assembly.
- Position the new assembly and adjust the 1st hex nut to achieve the required 1/16" spacing between the ceramic insulator and the light panel.
- Hold the stud and 1st hex nut while tightening the 2nd hex nut against the 1st (jam-nut method).

- Reattach the jumper wires and reinstall the emitters. Clean the emitters with a soft cloth and glass cleaner.
- Reinstall the Passthrough guards (lightly touching the hangers), the insulation strips, and all previously removed parts. Reconnect electrical power and perform a test cycle.



5. Oven Controller — Overview

The Fillauer PO-2 Oven is controlled by a microprocessor paired with a color touchscreen. The controller monitors the oven's temperature sensors and drives the infrared emitters through solid-state relays for precise temperature regulation.

5.1 Sensors

Sensor	Description
Material Surface Temp (IR)	Non-contact infrared sensor. Measures the surface temperature of the plastic. This is the primary control in SmartMode.
Oven Air Temp (Thermocouple)	Thermocouple used to preheat the oven, as a safety air-temperature limit, and in Standard Mode.

5.2 Operating Modes

Mode	Description
SmartMode	Automated material-specific heating using preset or custom profiles. The oven manages temperature ramping, dwell phases, and power to reach forming temperature and signals when the plastic is ready.
Standard Mode	Simple air-temperature control. The user sets a target air temperature; suitable for materials not covered by a profile or when direct control is preferred.
Ramp Mode	Controlled ramp with a configurable ramp rate and soak time. Useful for delicate materials or processes requiring a gradual, precise temperature increase (see Section 9).

5.3 Fault Safety

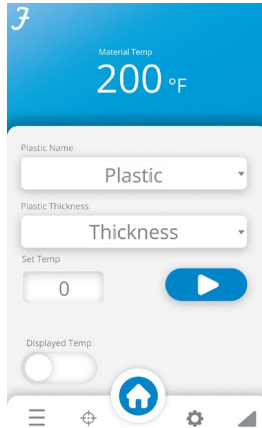
Fault	Description
IR Over-Temperature	Plastic surface exceeded the maximum allowed temperature. Emitters cut; cycle aborted.
Air Over-Temperature	Oven air exceeded the maximum allowed temperature. Emitters cut until temperature drops.
Cycle Timeout	Heating cycle reached the maximum allowed time. The oven stops heating to prevent burning.
IR Sensor Fault	The controller cannot read the IR sensor. The oven can still be used in Standard Mode.
Thermocouple Error	Open- or short-circuit error preventing the controller from reading the thermocouple.
Controller Error Fault	Internal controller error. Power cycle the oven; contact Fillauer if it persists.

6. Touchscreen Interface

The PO-2 Oven uses a color touchscreen as the primary operator interface. All controls are touch-sensitive. The interface is organized into the screens described below, and every screen includes a navigation bar for moving between the Home, Profile Edit, Calibration, Ramp, and Settings screens.

6.1 Smart Main Screen

The Smart Main screen is the primary operating screen when SmartMode is active. It displays the current material temperature and air temperature in real time. From this screen operators can view real-time temperatures, access the menu, and access settings.



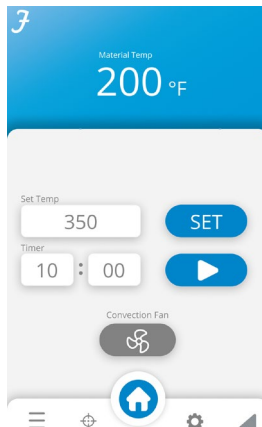
NAVIGATION BAR

Every screen includes a persistent bottom navigation bar with four icons:

-  Edit screen opens plastic program editing
-  Calibration menu
-  Home returns to the Home screen
-  Settings opens the Settings screen.
-  Ramp controls complex ramp and soak functions

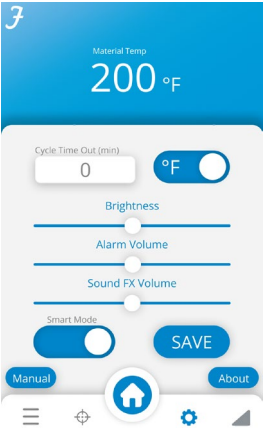
6.2 Standard Main Screen

The Standard Main screen provides a simplified interface for traditional oven operation without SmartMode algorithms. It is active when Smart Mode is toggled OFF in Settings and shows material and air temperatures with manual control options.



6.3 Settings Screen

The Settings screen is accessible from the gear icon. Changes take effect when SAVE is tapped.



Setting	Description
Cycle Time Out (min)	Maximum allowed cycle time. The smart mode cycle will automatically cut off after the timeout has been reached. Maximum allowed time is 60 minutes.
°F / °C Toggle	Switches all temperature displays between Fahrenheit and Celsius.
Brightness	Adjusts touchscreen backlight brightness.
Alarm Volume	Adjusts the volume of the ready/alert alarm.
Sound Effects Volume	Adjusts the touchscreen button click sound volume.
Smart Mode Toggle	Enables SmartMode (ON) or Standard Mode (OFF).
SAVE	Commits all settings changes to memory.

6.4 Profiles Screen

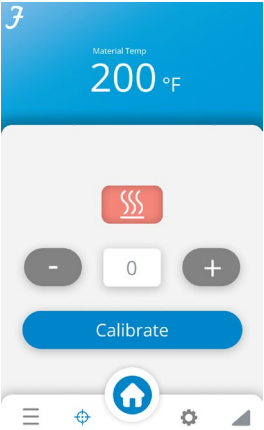
The Profiles screen lists all material heating profiles stored in the oven's memory. Factory profiles for supported materials are pre-loaded, and user-created custom profiles also appear here. From this screen you can view stored profiles, select a profile to view or edit, add a new profile with the + button, or delete a profile with the trash icon.

The screenshot shows a mobile application interface for editing a heating profile. At the top is a blue header with a stylized 'J' logo. Below it is a form with two columns of input fields. The first column contains: 'Plastic Name' (with a text input showing 'Name'), 'Ready Temp' (with a numeric input showing '0'), 'First Dwell Power' (with a numeric input showing '0'), 'Second Dwell Power' (with a numeric input showing '0'), and 'Heating Power' (with a numeric input showing '0'). The second column contains: 'Max Temp' (with a numeric input showing '0'), 'Temp Offset' (with a numeric input showing '0'), 'First Dwell Time' (with a numeric input showing '0'), 'Second Dwell Time' (with a numeric input showing '0'), and 'Hold Temp' (with a toggle switch). Below the form is a blue 'SAVE' button. At the bottom of the screen are three circular icons: a trash can, a home icon, and a plus sign. The bottom of the screen also shows a standard Android navigation bar with icons for a menu, zoom, home, settings, and signal strength.

Field	Description
Plastic Name	The name displayed in the Plastic Name selector on the main screen.
Max Temp	Maximum temperature ceiling (hard limit at 250 °C / 482 °F). If reached, emitters are cut and a fault is displayed.
Ready Temp	Target temperature for the plastic-readiness notification.
Temp Offset	Calibration adjustment for temperature difference between the sheet center and edges (typically 0 ± 10 °C).
First Dwell Power / Time	Heating power (0–100 %) and duration of the first (high-heat) dwell phase.
Second Dwell Power / Time	Heating power (0–100 %) and duration of the second dwell phase.
Heating Power	Power level (0–100 %) during the initial ramp-up phase.
Hold Temp	Enable to maintain temperature after cycle completion; disable to cool down.
SAVE / + / Trash	Save changes, add a new profile, or delete the current profile (confirmation required).

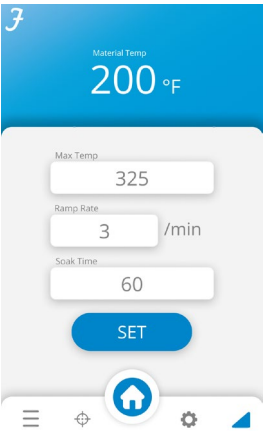
6.5 Calibration Screen

The Calibration screen allows operators to adjust the air-temperature calibration offset using the + / – buttons to correct for sensor drift over time. The Calibrate button confirms the adjustment.



6.6 Ramp Screen

The Ramp screen configures Ramp Mode operation (see Section 9 for the full procedure).



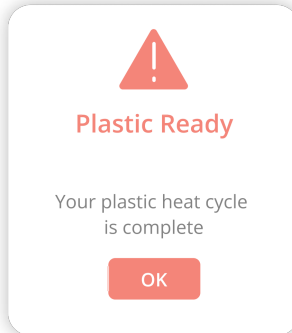
Control	Description
Max Temp	The target maximum oven temperature to ramp toward.
Ramp Rate	The rate of temperature rise, in degrees per minute.
Soak Time	The time to hold at Max Temp once reached, in minutes.
SET	Confirms the ramp parameters and begins the controlled ramp cycle.

6.7 Dialog Screens

The oven displays several modal dialog screens to confirm important actions or communicate alerts. These appear over the current screen and require a response before the operator can proceed.

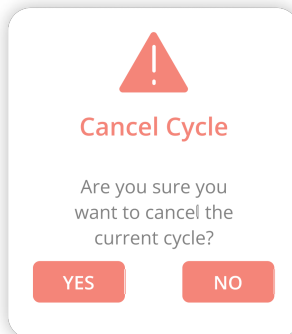
6.7.1 Plastic Ready

Indicates “Your plastic heat cycle is complete.” Tap OK to acknowledge, then remove the plastic and proceed with forming.



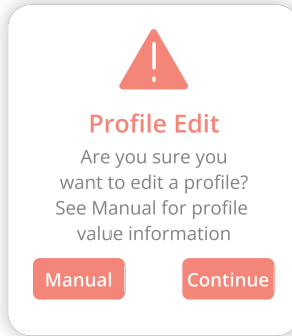
6.7.2 Cancel Cycle

A confirmation dialog asking “Are you sure you want to cancel the current cycle?” with YES and NO options, preventing accidental cycle interruption.



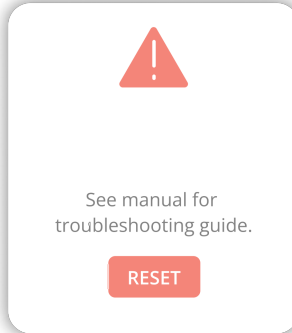
6.7.3 Profile Edit Warning

A warning shown before entering a profile edit screen (“Are you sure you want to edit a profile?”), with options to view the Manual or Continue.



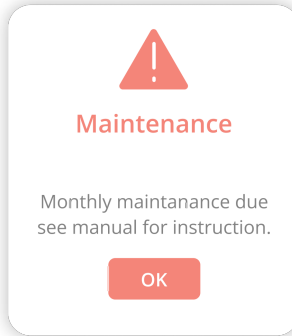
6.7.4 Error

Displays error conditions with instructions to “See manual for troubleshooting guide.” Includes a RESET button to recover from the error state.



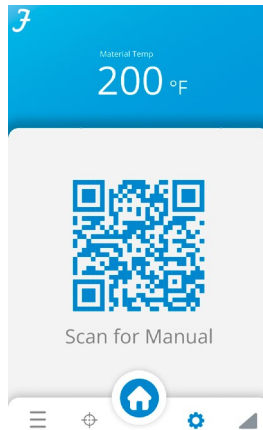
6.7.5 Maintenance Reminder

Notifies the operator that monthly maintenance is due. Tap OK to acknowledge. See Section 13 for the full maintenance schedule.



6.7.6 QR Code / Manual Screen

Displays a QR code labeled "Scan for Manual" that links to online documentation resources.



6.8 About / Device Info Screen

The About screen displays device information for service and maintenance reference: model number, serial number, year of manufacture, zero calibration offset, voltage specifications, current draw, phase, and emitter information.



7. SmartMode Operation — Step by Step

SmartMode automates the complete heating cycle using preset or custom profiles. The system manages temperature ramping, dwell times, and power adjustments to bring the plastic to forming temperature and signal when it is ready.

7.1 Enabling SmartMode

1. Press the Settings icon (gear icon) from the main screen.
2. Locate the “Smart Mode” toggle switch.
3. Tap the toggle to enable (ON position).
4. Press “SAVE” to apply the setting.

7.2 SmartMode Heating Cycle - Step by Step

Step 1: Preheat the Oven

- Ensure the oven is powered on and SmartMode is enabled.
- The system will display the current material and air temperatures on the main screen.
- Allow the oven to reach a baseline temperature before loading material.

Step 2: Select or Load a Profile

- From the main screen, tap the Profiles icon.
- Select the appropriate profile for your plastic type (e.g., Polypropylene, Copolymer, Polyethylene).
- If your specific plastic type is not listed, see Section 8: Material Profiles to create a custom profile.

Step 3: Prepare the Plastic

- Position your plastic on the appropriate cart or tray.
- For flat sheets, center the plastic on the heating tray.
- For bubble forming, insert plastic into the bubble forming frame.

Step 4: Start the Heating Cycle

- Press the play/start button to initiate the heating cycle.
- SmartMode will automatically:
 - Heat and preset power level (Heating Power)
 - Apply First Dwell heating (specified power for specified time)
 - Apply Second Dwell heating (specified power for specified time)

Step 5: Monitor the Cycle

- Real-time temperature and progress are displayed on the screen.
- The system will alert when approaching temperature readiness.
- At any time, press the Cancel Cycle button to stop heating (confirmation required).

Step 6: Cycle Completion

- When the cycle completes, the “Plastic Ready” notification displays.
- Remove the plastic from the oven and allow to cool as needed for your application.
- Press OK to acknowledge.

7.3 SmartMode Parameters Explained

Parameter	Description
Max Temp	Maximum temperature ceiling (hard limit at 250°C / 482°F)
Ready Temp	Target temperature for plastic readiness notification
Temp Offset	Calibration adjustment for temperature difference between the sheet center and edges (typically 0 ± 10 °C).
First Dwell Power	Heating power (0-100%) during first dwell phase
First Dwell Time	Duration (in minutes) of first dwell phase
Second Dwell Power	Heating power (0-100%) during second dwell phase
Second Dwell Time	Duration (minutes) of second dwell phase
Heating Power	Power level (0-100%) during initial ramp phase
Hold Temp	Enable/disable temperature maintenance after cycle completion

7.4 Colored Plastics

Colored plastics generally require 2–3 minutes longer to reach forming temperature than natural-color plastics of the same material and thickness, due to differences in infrared emissivity. Because the IR sensor measures surface temperature directly, the controller extends the cycle automatically to reach the target temperature.

7.5 Thin Plastics (Under 3 mm / 1/8")

Plastics thinner than 3 mm (1/8") may begin to form prematurely on a preheated tray. For these materials, use a "cool tray": roll the tray out of the oven and allow it to cool to room temperature before placing the sheet, then slide the loaded tray into the oven to begin the cycle.

8. Standard Mode Operation

Standard Mode provides manual control of temperature and heating without the automated profile-based algorithms of SmartMode. Use it for materials not covered by a profile, for custom temperature requirements, or when you prefer direct control.

8.1 Enabling Standard Mode

- Press the Settings icon (gear icon) from the main screen.
- Locate the "Smart Mode" toggle switch.
- Tap the toggle to disable (OFF position).
- Press "SAVE" to apply the setting.

8.2 Standard Mode Heating Cycle - Step by Step

Step 1: Access Standard Mode Interface

- The Standard Main screen will display when SmartMode is disabled.
- This screen shows material and air temperatures with manual control options.

Step 2: Set the Target Temperature

- Select or type the desired temperature in the Set Temp field.
- Temperature range: 0-450°F (0-232°C)
- Recommended operating range for plastics: 300-400°F (150-204°C)

Step 3: Configure Optional Parameters

- Fan Speed: Use the toggle switch to turn the convection fan on and off.
- Configure timer minutes and seconds.

Step 4: Prepare the Plastic

- Position plastic on the heating tray or bubble forming frame.
- Ensure plastic is centered for even heating.
- Allow plastic to reach ambient temperature before loading if transferring from a cool location.
- Press play button to start the timer. (Note: Timer is there for convenience and does not control the oven.)

Step 5: Remove Plastic

- When ready, carefully remove the plastic from the oven.
- Use appropriate protective equipment (gloves, etc.) as plastic will be hot.
- Allow plastic to cool and form as required for your application.

8.3 Standard Mode Operating Suggestions for Flat Plastic:

- Preheat the oven and tray/cart to the desired cooking temperature.
- Your PO-2 Oven will work best if set at 400°F or 204°C for plastics such as Polypropylene, Copolymer and Polyethylene.
- Plastics less than 1/8" or 3mm cook best when utilizing a "cool tray" or by removing the tray/cart from the oven and allowing it to cool before placing the plastic on the tray and sliding it into the oven.
- Colored plastics generally will require 2-3 minutes longer to cook than the same thickness natural color plastics.

8.4 Bubble Forming Frame:

- Remove the tray from the cart. Pre-position the sliding bar the proper distance from the fixed bar to properly support the bubble forming frame. Roll the cart into the oven.
- Heat the oven to the desired cooking temperature. Normally between 375°F and 440°F or 190°C and 225°C.
- Select the appropriate size bubble forming frame and insert the plastic into the frame.
- Position the bubble forming frame and plastic on the cart and roll the cart into the oven.

9. Ramp Mode Operation

Ramp Mode provides controlled heating with a configurable temperature ramp rate and soak time. It is useful for delicate materials or applications requiring precise temperature profiles with a sustained hold at maximum temperature.

9.1 Ramp Mode Parameters

Parameter	Description
Max Temp	Maximum temperature the oven will reach (0–450 °F / 0–232 °C; hard limit 250 °C / 482 °F).
Ramp Rate	Temperature increase rate in °F/min or °C/min (typical 1–5 °F/min).
Soak Time	Duration to hold at Max Temp after it is reached, in minutes.

9.2 Ramp Mode Heating Cycle - Step by Step

Step 1: Access Ramp Mode

- From the main screen, select the Ramp Mode option (or access via menu).
- The Ramp Settings screen will display.

Step 2: Configure Ramp Parameters

- Set Max Temp: Enter the target maximum temperature (0–450°F / 0–232°C)
- Set Ramp Rate: Enter the temperature increase rate (typical: 1–5°F/min depending on application)
- Set Soak Time: Enter the duration to hold at maximum temperature (in minutes)

Step 3: Configure Fan (Optional)

- The Convection Fan button can be toggled to on or off.
- Fan circulation helps achieve more uniform heating.

Step 4: Apply Settings

- Press the “SET” button to apply the ramp configuration.
- Settings are confirmed and ready for operation.

Step 5: Prepare and Load Plastic

- Position plastic on the heating tray or bubble forming frame.
- Center plastic for even heating.

Step 6: Start Ramp Cycle

- Press the play/start button to begin.
- The oven will ramp temperature at the configured rate.
- Current temperature and progress are displayed in real-time.

Step 7: Monitor Ramp Progress

- As temperature increases, the system displays the current temperature.
- When Max Temp is reached, the soak timer begins.
- The oven maintains temperature during the soak period.

Step 8: Cycle Completion and Plastic Removal

- After soak time completes, the “Plastic Ready” notification displays.
- Carefully remove plastic from the oven.
- Allow to cool and form as needed.

9.3 Ramp Mode Tips and Best Practices

- Slower ramp rates (1-2°F/min) provide gentler, more uniform heating for delicate plastics.
- Faster ramp rates (3-5°F/min) reduce cycle time for robust materials.
- Soak time allows complete temperature saturation throughout the plastic thickness.
- Typical soak times: 2-5 minutes depending on plastic thickness and thermal conductivity.
- Use the convection fan for more uniform heat distribution.

10. Material profiles and Calibration of New Plastics

Material profiles store optimized heating parameters for specific plastic types. The PO-2 Smart Oven includes pre-loaded factory profiles and allows creation of custom profiles.

10.1 Selecting and Using Profiles

Step 1: Access Profiles Menu

- From the main screen, select the Profiles icon or menu option.
- The Profiles screen will display available profiles.

Step 2: Select a Profile

- Tap on the desired profile (e.g., Polypropylene, Copolymer, Polyethylene).
- The profile parameters are loaded into memory.

Step 3: Start Heating with Profile

- Return to the main screen.
- Ensure SmartMode is enabled (via Settings).
- Press the play/start button to initiate the heating cycle.
- The profile parameters automatically control the heating sequence.

10.2 Creating and Editing Custom Profiles

Step 1: Access Profile Creation

- From the Profiles screen, select the “+” (Add) button.
- The Profile Edit screen opens for new profile creation.

Step 2: Enter Profile Information

- Plastic Name: Enter a descriptive name (e.g., "Custom Polypro - Thick")
- Max Temp: Set the maximum heating temperature (hard limit: 250°C / 482°F)
- Ready Temp: Set the target temperature for readiness notification
- Temp Offset: Adjust for sensor calibration (typically 0 ± 10°C)

Step 3: Configure Dwell Phases

- First Dwell Power: Heating power (0-100%) for initial high-heat phase
- First Dwell Time: Duration in seconds (typical: 30-120 sec)
- Second Dwell Power: Heating power (0-100%) for secondary phase
- Second Dwell Time: Duration in seconds

Step 4: Set Heating Parameters

- Heating Power: Power level (0-100%) during ramp-up phase
- Hold Temp: Enable toggle to maintain temperature after cycle, or disable to cool down

Step 5: Save the Profile

- Press the "SAVE" button.
- The profile is stored and available for future use.

Step 6: Edit or Delete Profiles

- From the Profile Edit screen, modify parameters as needed and press SAVE.
- To delete a profile, press the trash/delete icon. Confirm deletion.

10.3 Profile Development Guide

- Start with a factory profile for a similar plastic as a baseline.
- Adjust Max Temp based on the plastic's glass transition temperature (Tg).
- Increase Dwell Power and Time for thicker materials.
- Reduce Dwell parameters for thin films to prevent warping.
- Test with representative samples and refine parameters based on results.
- Document the final parameters for future reference.

10.4 Calibration Log Template

Parameter	Value
Material name / brand	
Thickness	
Standard Mode air setpoint	
Material Temp at READY	
Approx. cycle time	
First Dwell Power / Time	
Second Dwell Power / Time	
Ready Temp	
Temp Offset	
Notes	
Technician / Date	

11. Troubleshooting & Fault Codes

11.1 Fault Codes and Corrective Actions

Fault Code	Corrective Action
IR OVER TEMP	Material temperature exceeded the maximum allowed value. Allow the plastic to cool and restart the cycle. If it persists, adjust the smart cycle parameters.
AIR OVER TEMP	Oven air temperature exceeded the maximum allowed value. Check the fan is running and allow the oven to cool, then reset.
CYCLE TIMEOUT	The cycle reached the maximum allowed time; the oven stopped heating to prevent burning. Allow the plastic to cool and restart the cycle.
IR SENSOR FAULT	The controller cannot read the IR sensor. Power cycle the oven; the oven can still be used in Standard Mode. Contact Fillauer if it persists.
THERMOCOUPLE ERROR	Open- or short-circuit error preventing thermocouple reading. Contact Fillauer Customer Support.
CONTROLLER ERROR FAULT	Internal controller error. Power cycle the oven; contact Fillauer Customer Support if it persists.

11.2 General Troubleshooting

Symptom	Possible Cause	Resolution
No power	Electrical disconnect, tripped circuit breaker, or tripped over-temp switch	Check the power source, reset the circuit breaker, reset the over-temp switch
Oven heats slowly	Clogged fan filter or low heating-power setting	Replace the fan filter; increase heating power in settings
Uneven heating	Emitter failure or air-circulation issue	Check emitter function; verify fan operation
Touchscreen unresponsive	Software glitch or touchscreen needs recalibration	Power cycle the oven; contact support if it persists
Temperature reading inaccurate	Thermocouple miscalibration or disconnection	Recalibrate the sensor; check connections

If problems persist or you encounter error codes not listed here, contact Fillauer Customer Support at (423) 624-0946, toll free (800) 251-6398, or www.fillauer.com. Have the error code, serial number, and model number ready.

12. Maintenance Schedule

Frequency	Task	Reference
Weekly	Check fan filter airflow	Section 2.5
Monthly (or as needed)	Replace fan filter; acknowledge the monthly maintenance reminder	Section 2.5
Quarterly	Calibrate the temperature sensor; perform a general inspection	Sections 6.5 / 13.3
Annually	Perform the Over-Temperature Protection device check	Section 3.4

12.1 Teflon Tray Care

The Teflon (PTFE) sheeting on the tray is a durable nonstick material but is not indestructible. Avoid sliding hard objects across the surface, and do not use sharp utensils or abrasive cleaners. The sheet degrades over time with use and should be replaced if there is significant tearing — contact Fillauer for the replacement kit.

12.2 Emitter Replacement

Emitter output decreases gradually over years of use; replace emitters when heating times increase significantly or heating becomes uneven. The full replacement procedure is given in Section 4.1.



ELECTRICAL HAZARD: Emitter replacement involves work near live electrical conductors. All power must be disconnected and locked out, and the oven allowed to cool completely.

12.3 IR Sensor & Calibration

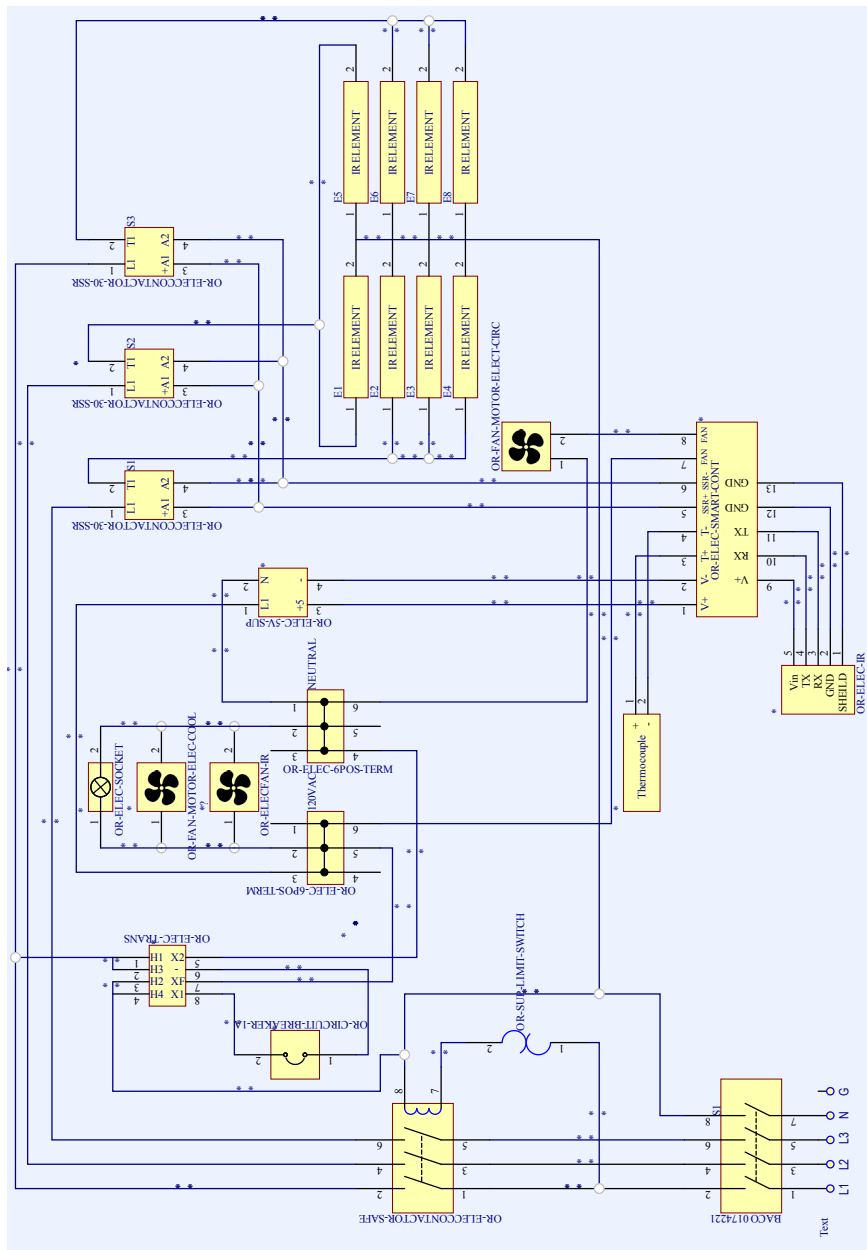
Verify the temperature-sensor calibration offset quarterly or after service using the Calibration screen (Section 6.5). Keep the IR sensor area unobstructed — do not place anything on top of the oven, as blocking airflow will cause the sensor to malfunction. Also perform a quarterly general inspection: check external connections for corrosion or looseness, verify all guards and covers are secure, confirm the oven sits level, and ensure ventilation openings are clear.

13. Wiring Diagrams

The following describes the electrical architecture for the PO-2 Oven. Full schematic drawings are included in the documentation packet shipped with the oven; always refer to the printed schematic before performing any electrical work. The schematic shows the main circuit breaker and safety switch, the solid-state relays (contactors) for the infrared emitter groups, the over-temperature limit switch protection, the cooling fan motor circuits, the thermocouple sensor inputs, the smart controller connectivity, and the infrared emitter heating elements (E1–E8).

13.1 Schematic Component Legend

Symbol / Component	Description
OR-ELEC-5V-SUP	5 V power supply
OR-ELEC-SWITCH	Main rotary disconnect switch
OR-ELEC-SMART-CONT	Fillauer smart controller
OR-ELEC-IR	IR sensor
OR-ELEC-THERMO-96"-LEAD	Thermocouple connected to controller
OR-ELECCONTACTOR-30-SSR	30A solid-state relays controlling emitters
OR-FAN-MOTOR-ELEC-CIRC	Circulation fan
OR-ELECFAN-IR	IR sensor cooling fan
OR-ELEC-5V-SUP	5 V DC power supply for controller board.
OR-SUP-LIMIT-SWITCH	Mechanical over-temperature limit switch.
OR-ELEC-SOCKET	Interior illumination.
OR-FAN-MOTOR-ELEC-COOL	Control box cooling fan motor.
OR-ELECTERM	Main terminal block
OR-ELECCONTACTOR-SAFE	Mechanical safety contactor
OR-CIRCUIT-BREAKER-1A	1 Amp circuit breaker
OR-ELEC-6POS-TERM	6 position terminal bus



14. Warranty Information

PO-2 Oven — 1 Year Limited Warranty

Fillauer LLC (“Seller”) warrants to the original purchaser (“Purchaser”) that the PO-2 Oven is free from defects in material and workmanship under normal use and service, provided it has been properly installed and operated in accordance with this manual. Seller’s obligation under this warranty is limited to the repair or exchange of defective parts within one (1) year from the date of purchase. Defective parts must be returned to Fillauer in Chattanooga, Tennessee no later than one (1) year after purchase.



WARRANTY EXCLUSIONS: The warranty does not cover: (1) infrared emitter tubes; (2) damage from misuse, negligence, or accident; (3) repairs or alterations made without prior written consent from Fillauer; (4) operation exceeding the conditions specified in this manual; (5) accessories or parts not supplied by Fillauer.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. UNDER NO CIRCUMSTANCES SHALL FILLAUER’S LIABILITY EXCEED THE PURCHASE PRICE PAID.

FOR YOUR RECORDS

Field	Value
Serial Number	
Model Number	
Date Purchased	
Purchased From	

Fillauer®

www.fillauer.com



Fillauer

2710 Amnicola Highway
Chattanooga, TN 37406
423.624.0946



Fillauer Europe

A Fillauer Company
Kung Hans väg 2
192 68 Sollentuna, Sweden
+46 (0)8 505 332 00



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M119/08-03-26/Rev.1