

Mini Multiple Zones Conveyor Reflow Oven

Model: T-961 (updated)



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I .PRODUCT FEATURES

1. Employs IR and hot air heating technology, equipped with specially designed convection fans that ensures stable air flow and uniform temperature distribution, suitable for medium-volume continuous soldering of LED board, PCBs in all packaging forms such as CHIP, SOP, PLCC, QFP and BGA components etc.
2. Equipped with 6 heating-zone heating system, independent circulation, PID control and up-down heating type, ensures accurate and uniform temperature distribution in the furnace chamber. With high thermal capacity and rapid heating speed.
3. Intelligent curve heating method with a large capacity for curve selection, equipped with 8 tech curves to fully meet the requirements of various soldering processes.
4. The programmable control tech with preset curve memory storage function, allowing the machine to automatically complete the entire soldering process based on users predefined curves.
5. Thermal couples for temperature measurement , compensation circuit added for more accurate temperature readings, more perfect curves.
6. PID intelligent temperature control tech ensures precise temperature control. High-quality large current solid-state relay with no-contact output effectively prevents rapid or continuous heating that could damage chips or circuit boards, making the entire soldering process more scientific and safe.
7. The transmission system is driven by a stepper motor, ensuring smooth operation.
8. Adopts an independent roller structure and flat support, with dedicated stainless steel I-shaped mesh belt, enables speed control up to $\pm 10\text{mm/min}$.
9. Independent cooling zone ensures the low temperature required when the PCB board exits the machine.
10. The powerful touch screen module that integrates operation, display, monitoring, providing intuitive displays and simpler operations, facilitating product upgrades.
11. Ergonomic design, practical and easily operated. Good build quality. Technology - based concept is constant.

II .PRODUCT PARAMETERS

Model	T-961
The heating zone quantity	Upper3/down3
The length of the heating zone	730mm
The heating type	IR and hot air heating
The cooling zone quantity	1
Maximum width of PCB	230mm
The operation direction	From left To right
Delivery options	Mesh belt
The time of PCB soldering	100-600secs
The power supply	(220v) 50/60Hz
Peak power	4.5KW
Average power	1.9KW
Heating up time	Around 7-10 min
Temperature control range	Room temperature~300℃
Temperature control mode	PID closed-loop control
Temperature control accuracy	±1℃ (Instantaneous temperature fluctuation)
PCB temp distribution deviation	±2℃ (Copper coated PCB only)
Overall dimensions	1000mm×520mm×450mm
Net weight	70KG

III. PACKAGE LIST

Item	Qty
Complete machine	1
Power cable (2m)	1
User manual	1

IV.DESCRPTION OF THE MAIN PARTS

Machine Body



Control Panel



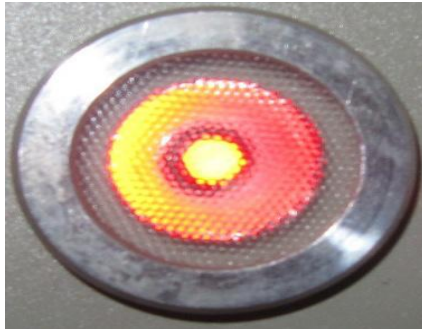
Instruction Of The Wiring

Remove the sealing plate of the power wiring cabinet,connect the power cords on the terminal block in sequence according to the wiring requirements of L, N and PE. L connected to the fire line , N connect neutral line and PE connect ground line.



Status Indicator Lamp

When the status indicator is green, it indicates that the temperature zones are in heating state; when the status indicator is red, it means that all the temperature zones are not in heating state.



V. INSTRUCTIONS

(it takes 1 minute to upload and save the revised data ,during which please keep the power on.)

1.Main menu interface:



Click the buttons to enter the corresponding interface.

2.Room temperature setting interface.

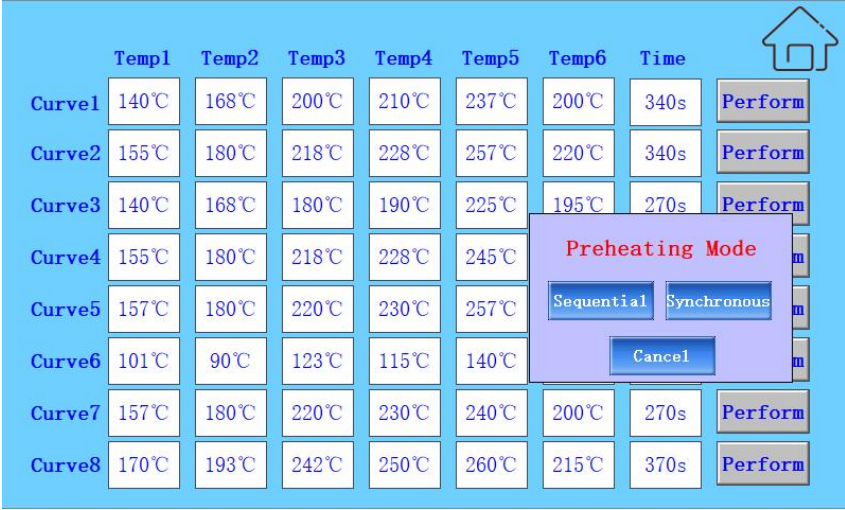
Click the "RT Setting" to enter the following interface:



Require password from factory

Input the current room temperature in the dialog box when the machine in cooling state, click "save" to finish the room temp adjustment, and click the "Return" to enter the main menu .

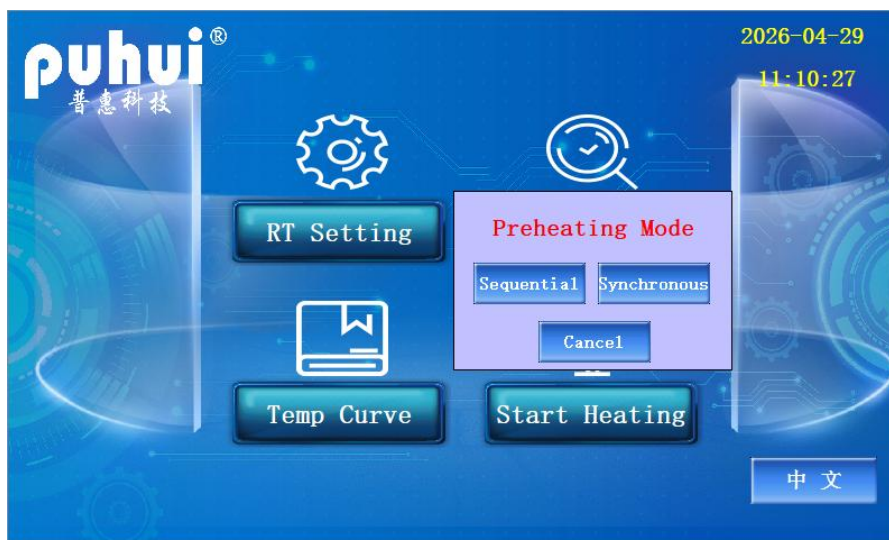
3.Click the "Temp Curve" option to enter the following interface:

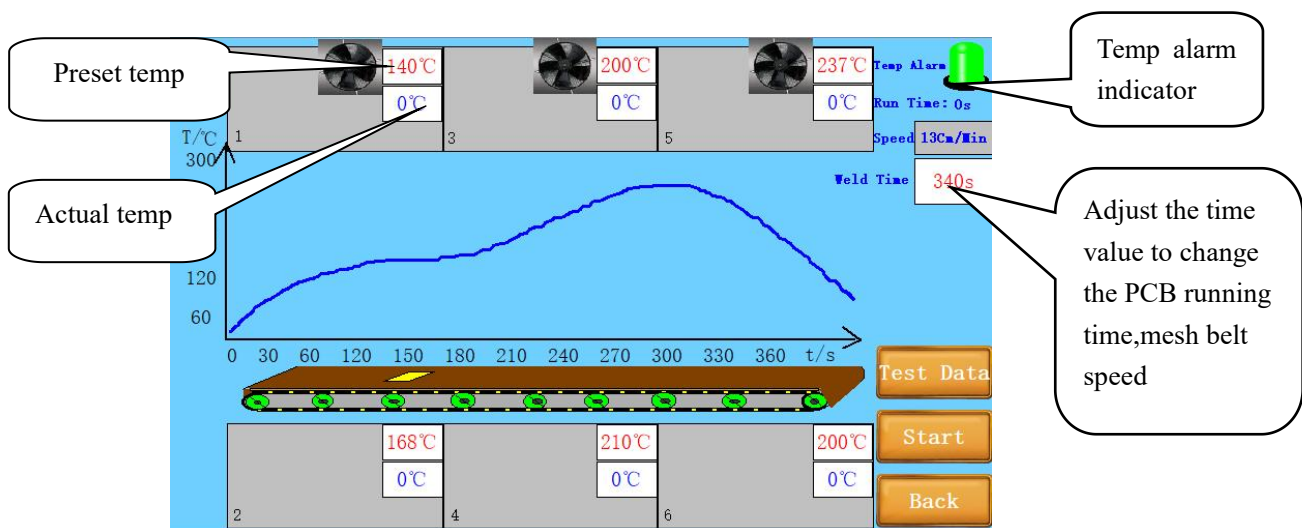


	Temp1	Temp2	Temp3	Temp4	Temp5	Temp6	Time	
Curve1	140℃	168℃	200℃	210℃	237℃	200℃	340s	Perform
Curve2	155℃	180℃	218℃	228℃	257℃	220℃	340s	Perform
Curve3	140℃	168℃	180℃	190℃	225℃	195℃	270s	Perform
Curve4	155℃	180℃	218℃	228℃	245℃			Preheating Mode Sequential Synchronous Cancel
Curve5	157℃	180℃	220℃	230℃	257℃			
Curve6	101℃	90℃	123℃	115℃	140℃			
Curve7	157℃	180℃	220℃	230℃	240℃	200℃	270s	Perform
Curve8	170℃	193℃	242℃	250℃	260℃	215℃	370s	Perform

There are 8 default solder paste solder curves of the machine. Users can select the appropriate curve according to the requirements of solder paste. Click "perform", pops up preheating mode dialogue, click "sequential" (Temperature zones will start heating successively to avoid excessive starting current) or "synchronous" (All temperature zones start synchronously and run with full load) to start. (The revised data can be saved permanently from 6-8th curves on this page.)

4.On the main interface, click "Start Heating", pops up "Preheating Mode" dialogue, click "sequential" or "synchronous" to start. The machine runs the selected curve.

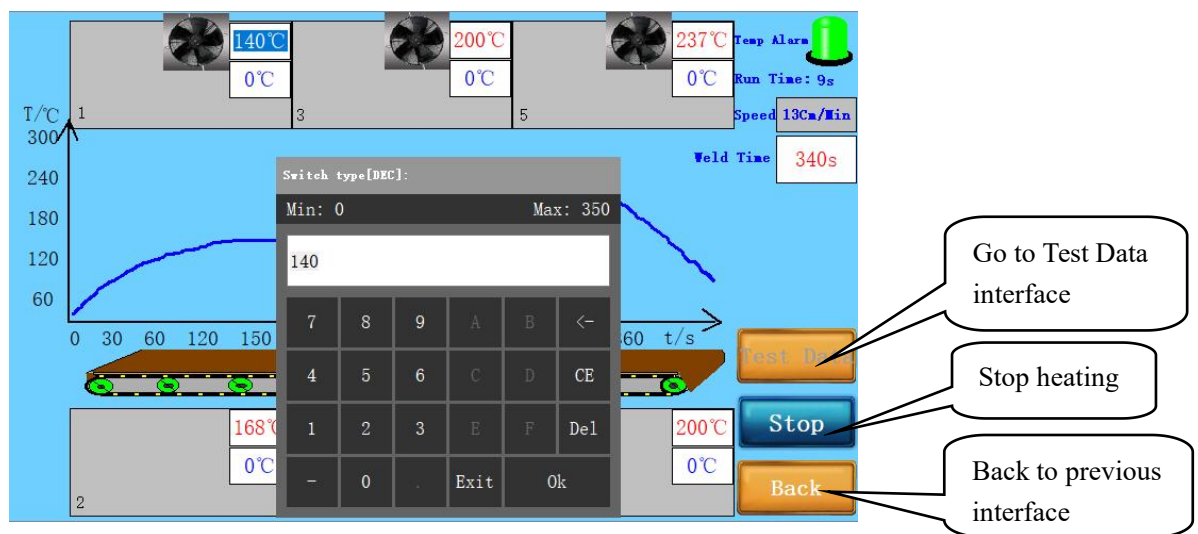




When the actual operating temperature exceeds the set temperature by 30°C, the temp alarm indicator will flash red and green alternately. During the heating process and the normal temperature control cases, the alarm indicator shows green.

Special note: it is a normal phenomenon, actual operating temperature value fluctuates momentarily and then returns to the normal collection range value by itself.

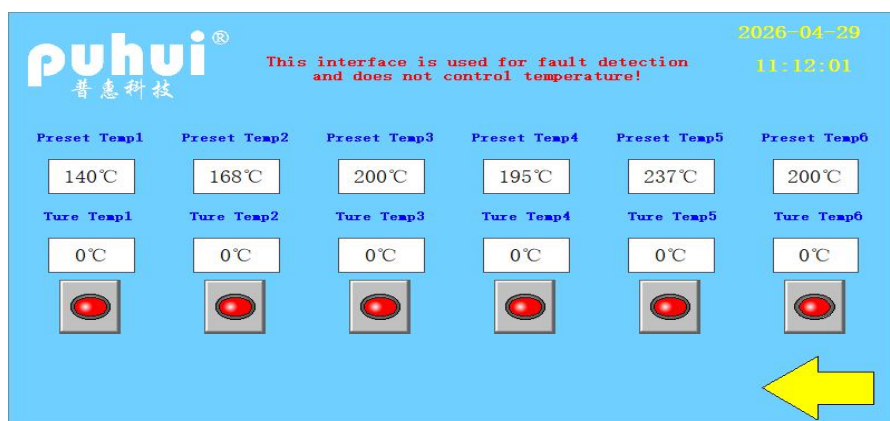
Users can modify temperature parameters of the curve on this interface:



Modify the parameters directly. (But the revised values won't change the default 8 curves data)

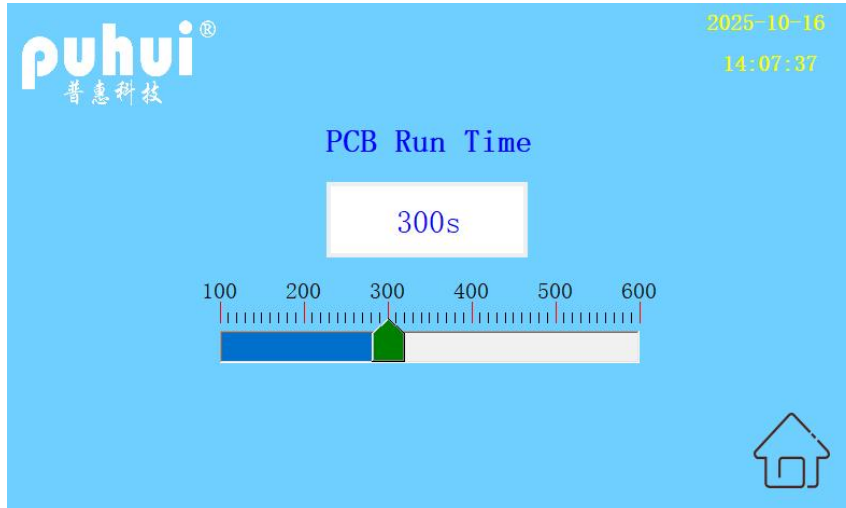
After heating process is completed, clicking the "Stop" / "Return" button will pop up a dialogue box with the suggestion: "Please cool down and shut down after heating."

click the "Test Data" button to enter the following interface When not heating:



By clicking the button, you can turn on / off a single temperature zone. When the temperature zone is turned on, the button will display green and the temperature zone off, button will display red. Click the "Finish" button to quit heating .

5.Click "Time Setting" to enter the following interface:



By dragging the ruler slider left and right or input the value to change the PCB run time, the run speed of the chain and belt can be changed.

6.Special reminder:

- ①When soldering chip, select appropriate curve according to chip size and specific process requirements.
- ②If the touch screen crashes, the machine will automatically cut off the heating, prevent damage to the PCB and chip.
- ③The touch screen alarms. The fault is that the single chip computer crashes or the communication line between the main board and the touch screen is damaged.
- ④When the touch screen has been in the state of over temperature alarm (the display interface has an indicator light to indicate), the power should be cut off to prevent damage to the PCB and chip.
- ⑤At present, there are many kinds of solder production and use, and each company chooses differently. There are many articles about theoretical & test analysis.For these reasons, the machine launched preset eight curves, each curve has 3 sections, and the heating time of each section can be changed. The user can reset the heating curve according to the required heating temperature and time of solder.

[Tips: Should reserve more than 5s- time- interval between last turning off and next turning on.](#)

VI.FOUNDATION FOR WAVE SET

1. The Reflow Soldering Theory And The Temperature Wave

Reflow process: preheating - equalizing temperature - wetting (flux restores the pad and evaporates)- high temperature reflow (solder paste melting to form liquid tin ball)-insulation

(liquid tin forming a low resistivity crystal phase)- cooling.

The temperature wave is the key to soldering quality. The actual and the setting temperature warming slope and the peak temperature should be accordant. Before the temperature reaches 160°C, please control the heat up speed in about 1°C/S. If heats up too quickly, there will be risks for the PCB and the components being damaged, and the PCB may be out of shape. On the other side, the flux volatilizes too fast. Easy to make soldering tin balls. Set the peak temperature 20°C-40°C higher than the solder paste melting point.

For example, the melting point of Sn63 / Pb37 solder paste is 183°C, the peak temperature should be set at 205°C ~ 230°C), the reflow time is 10s-60s, the peak temperature is low or the reflow time is short, the soldering will be insufficient, and the solder paste will not melt in serious cases. The peak value is too high or the reflow time is long, causing metal powder oxidation, affecting the soldering quality, and even damaging components and PCB.

2. Temperature Wave Set

According to the solder paste and the soldering principles to set temperature waves. Solder paste with different metal content should use different temperature curves. Refer to data from solder paste manufacturers. In addition, the wave is also related to the PCB, the density and size of the components.

VII.TEMPERATURE AREA SET

1. Set the temperature and belt speed based on initial value(usually given by the manufacturer)
2. To the cold oven, should preheat for 20-30 minutes.
3. When the temperature is stable, let PCBs pass heat reflow system. Under this set, the solder paste can reach the reflow critical point. If there is no reflow, to operate as step 4. If the reflow is too fast, please keep correct proportion to increase or reduce the temperature. And let the PCB pass the system again until reach the reflow critical point. Then turn to step 4, only when there is reflow that is good.
4. If there is no reflow, please reduce the belt speed 5-10%. For example, now the belt speed is 500mm/min, please adjust it to about 460mm/min. Usually, reduce the speed 10% can increase the reflow temperature about 16°C. Another way is that, do not adjust the speed, but increase the temperature properly. The increase range based on the standard temperature wave. Adjust the temperature on the basis difference between PCB actual and standard curve temperature. The adjust range is about 5°C. When adjust the temperature, it can not exceed the PCB and component bearing capacity.
5. Let the PCB pass the reflow system in the new speed or new set temperature. If there is no reflow, back to step 4 to adjust again. Or carry out the step 6 for temperature fine-turning.
6. The heat temperature wave is adjustable according to the PCB . You can adjust the transmission belt speed to adjust the temperature. Reduce the belt speed can increase the product heat temperature. On the contrary, you can reduce the product heat temperature with speeding up.
7. Tip: Generally, when the PCB equipped with components passes through the reflow system without complete melting, it can be properly adjusted and put into the oven for welding twice, which generally will not cause negative impact on the PCB and components.
8. From low to high when set temperature. If the heat range is over the reflow temperature too high, should increase the transmission speed or reduce the set temperature. The detailed operation is opposite to step 4.

VIII. INSTALLATION

1. Set up field

1.1. Please work in the clean environment condition.

1.2. Do not put the machine near the electromagnetism interfering resource.

1.3. Do not put the oven exits and entrances face towards to the fan and the window.

2.Height adjustment

2.1 Preparation

Clean the installation area to ensure that the ground is smooth and free of debris;

Check that the level/sensor is in good condition and that the power supply voltage meets the requirements of the device.

Prepare leveling tools: torque wrench (manual tightening), special leveling assembly (level);

2.2Manual Leveling Procedure

Use a level to measure the height difference between the four corners and the center point of the equipment;

By adjusting the adjustable pad iron/leg nut, the maximum height difference is less than 2mm;

Adjust the device in a diagonal sequence to avoid tilting the device.

3. Power supply

Please use right power supply. Ensure the machine grounded well and request a professional electrician operation.

IX. DAILY MAINTANCE

1. Keep the electrical control cabinet clean.

2. Check if the fan shaft is in good condition.

3. Check if the fan and the motor have abnormal sound.

4. Be sure the fan does work flexibly.

5. Check the air hole if there are abnormal materials.

6. Check the transmission net-belt is in good condition.

7. Check the electrical chest and electrical equipment have abnormal sound.

8. Check the transmission part if it is in good condition and has abnormal sound.

9. Before turn on the machine, please check the working voltage if it is in the safe voltage and stable. Ensure all the parts can work safely and normally. Meantime, check the parameters are the same to the last time turn off. Should let the temperature in the machine drop down before stopping the conveyor belt before turning off the machine .

10. Lubricate the driving rolls. Put lubricating oil every two months.

11. The motor works in high temperature for long time, please put lubricating oil twice a week or more, ensure the motor can work normally.

12. Timely clean up all kinds of debris on the fan blade and the motor to avoid short circuit or burn out the fan caused by aging of the line.

13.The machine must be grounded reliably.

X. CAUTIONS

1. Safety precautions

1.1. Electrical safety

- 1.1.1 Devices must be grounded reliably to prevent leakage risks.
- 1.1.2 The power supply should be turned off during maintenance to avoid electric shock or circuit short circuit.
- 1.2. Operation protection
 - 1.2.1 Only special personnel are allowed to operate the equipment, and untrained personnel are forbidden to use the equipment.
 - 1.2.2 Do not extend your hand into the furnace during normal operation, and keep a safe distance from the high-temperature area.
 - 1.2.3 Wear high-temperature gloves during operation to avoid burns.
- 1.3. Environmental management
 - 1.3.1 Do not store inflammable and explosive materials near the equipment.
 - 1.3.2 It is prohibited to transfer foreign matter (including non-welded parts) on a chain or mesh belt.
- 1.4. Equipment maintenance
 - 1.4.1 The maintenance should be powered off at room temperature to avoid the risk of high temperature operation.
 - 1.4.2 Clean the residue in the furnace regularly to prevent blockage or ignition.
- 2. Precautions for users
 - 2.1. Working environment requirements
 - 2.1.1 The equipment must be operated in a clean and dust-free environment to ensure the welding quality.
 - 2.1.2 Do not use or store in the open air, high temperature or high humidity environment.
 - 2.2. Long-term maintenance
 - 2.2.1 After moving the device, verify the levelness and transmission system again.
 - 2.2.2 Check the status of key components such as heating pipes and motors every month, and replace the lost parts in time.

T-961 Tool kit:

Item	Model	Q'ty
Solid wrench	24 One-handed	1
Allen wrench	2、3、4、5、6、8	1 Set
Cross screwdriver	75*5	1
Jackscrew	Hexagonal head M4*10/M5*10	2
Tool bag	A4 PUC self-sealing plastic bag	1
PBP	25A	1
Belt	pitch =9, steel wire diameter =1.4, 5 grids	8 sections

Due to tech innovation and product upgrade, the pictures in the manual are representative examples, and may be different from the purchased products, without prior notice, subject to the actual product!