401H000844

3100/3101/3102 Series
Lead Free Soldering Station

INSTRUCTION MANUAL

Thank you for purchasing the unit. It is designed for lead free soldering. Please read this manual carefully before using and keep it for future reference.

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Ⅰ. Safety Instruction

⚠WARNING

In this instruction manual, “Warning” “Caution” and “Note” are defined as followings:

⚠WARNING: Misuse may potentially cause death or serious injury to the user.

⚠CAUTION: Misuse may potentially cause injury to the user or physical damage to the objects involved. For your own safety, be sure to comply with these precautions.

NOTE: A Note indicates a procedure or point that is important to the process being described.

⚠CAUTION

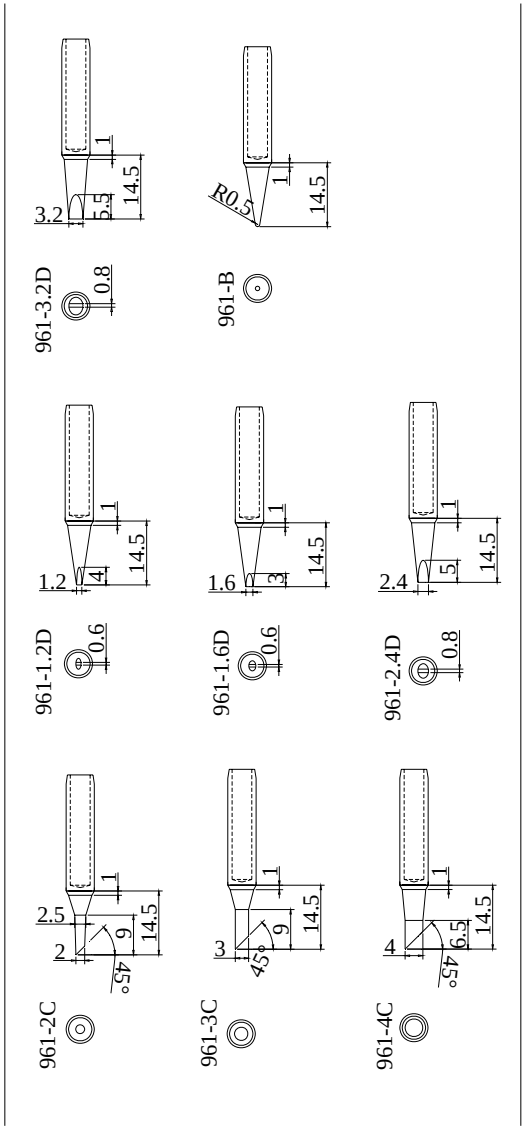
When the power is on, the tip temperature is very high. Follow the precautions strictly as mishandling may cause burn or fire:

- Do not use the unit for other applications.
- Do not touch the metallic parts near the tip.
- Do not use the product near flammable items.
- Inform other people in working area that the temperature of this unit could be very high during the work. Power the unit off when the work is finished to avoid danger.
- Power off the unit and wait till the temperature cools down to room temperature when replace or install the parts.

To prevent damage to the unit and ensure a safe working environment, be sure to comply with the following precautions:

- Only use this unit with rated voltage and frequency (refer to the trademark back of equipment).
- If there’s any damage to the unit, stop using it.

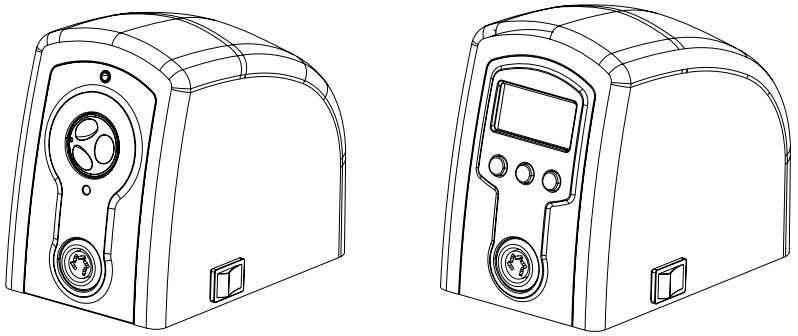
XI. TIPS



- This machine is equipped with a 3-wires grounding plug and must be plugged into a 3-terminal grounded socket. Do not modify plug or use an ungrounded power socket. If an extension cord is necessary, use only a 3-wire extension cord that provides grounding.
- Do not use the unit for other applications except soldering.
- Do not rap soldering iron against the workbench to shake off residual solder, otherwise the iron will be damaged by shocks.
- Do not modify the unit by yourselves.
- Only use the original replacement parts.
- Keep the unit dry. Don’t use or disconnect the unit with wet hands.
- The soldering process will produce smoke, so make sure the area is well ventilated.
- While using the unit, don’t do anything which may cause bodily harm or physical damage.
- Children don’t know the danger of electrical appliances. Keep it away from children.

Ⅱ. Specification

Analog-type **Digit-type**



Item	3100	3101	3102
Displaying Type	Analog	Digital	
Temperature Displaying	---	LED	LCD
Temperature Range	200℃~450℃	100℃~450℃(Decide by working mode)	
Power	220V/230V AC		
Power Consumption	80W		
Ambient Temperature(Max)	40℃		
Temperature Stability	±2℃(stationary air, no load)		
Tip to Ground Resistance	<2Ω		
Tip to Ground Potential	<2mv		
Handle Cord	1.2m (Length can be customized as per requirements)		
Dimension	83(W)×125(H) ×140(D) mm		
Weight (not including handle)	1.38Kg		

** The tip's temperature is measured by 191/192 series thermometer.*

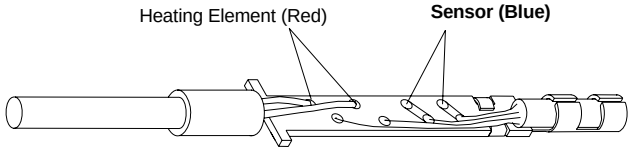
** Specifications and design subject above may be changed without notice.*

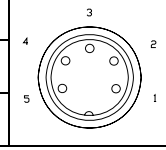
If the resistance value is not normal, replace the heating element or sensor element. Refer to the instructions included with the replacement part.

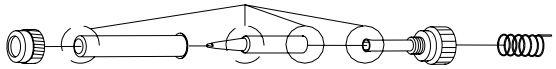
10.4 Measure the Resistance after Replacing

After replacing the heating element:

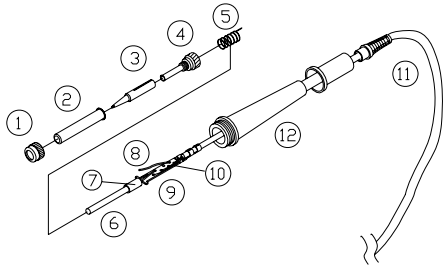
1. Measure the resistances between pins 4 & 1 or 2, pins 5 & 1 or 2. If it is not ∞, the heating element and sensor are touching. This will damage the P.W.B.
2. Measure the resistances of "a", "b" and "c" to confirm that the leads are not twisted and the grounding wire is properly connected.



a.	Between pins 4&5 (Heating Element)	3~ 4 Ω (Normal)	
b.	Between pins 1&2 (Sensor)	43~ 58 Ω (Normal)	
c.	Between pins 3& Tip	Under 2 Ω	



10.2 Disassembling the Iron Handle



1. Turn the nut① counterclockwise and remove out the tip enclosure② and the tip③.
2. Turn the nipple④ counterclockwise and remove it from the iron.
3. Pull both the heating element⑥ and the cord assembly ⑪ out of the handle ⑫ (Towards the tip of the iron).
4. Pull out the spring⑤ from the D-type.

NOTE: ***Do not use metal tools such as pliers to remove tip or Tip enclosure from the handle.***

10.3 Measure the Resistance before Replacing

NOTE: ***Measure the resistance when the heating element is at room temperature.***

1. Resistance value of heating element (Red) is 3~4 Ω (ceramic heater).
2. Resistance value of sensor (Blue) is 43~58 Ω (ceramic heater).

Ⅲ. Characteristics

1. Temperature rises and recovers rapidly, suitable for lead free soldering.
2. For analog-type soldering station, temperature adjusting and calibration is easy.
3. For displaying-type soldering station, microcomputer display, and can select working mode and favorite working temperature. With digital temperature calibration and parameters locked by password, operation and management are convenient.
4. Ceramic heater with long lifetime.
5. Various types of tips available, easy operation.
6. Light handle assembly, comfortable for use.

Ⅳ. Use of Iron Holder and Handle

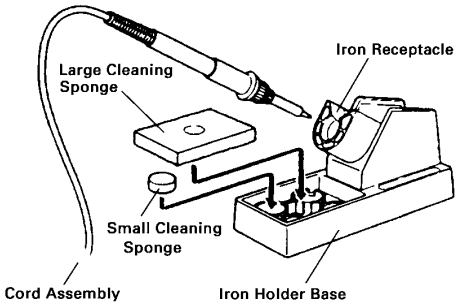
⚠**CAUTION:** ***Please check whether the power voltage is in accordance with rated voltage in the nameplate before operation.***

4.1 Iron Holder and Sponge

⚠**CAUTION:**

- ***The sponge is compressed. It will swell when moistened with water. Before using the unit, moisten the sponge with the water and squeeze it dry. Failure to do so may result in damage to the soldering tip.***
- ***If the sponge becomes dry during working, add appropriate water.***

1. Dampen the small cleaning sponge with water and then squeeze it dry.
2. Place the small sponge in groove of the iron holder base.
3. Add a little water to iron holder. The small sponge will absorb water to keep the large sponge around it wet at all times.
4. Dampen the large cleaning sponge and place it on the iron holder base.



4.2 Connection

⚠**CAUTION:** ***Be sure to turn off the power switch before connecting or disconnecting the unit. Failure to do so may damage it.***

1. Connect the plug of the handle cord to the socket of the unit. Take notice the inserting position of the connector.
2. Place the soldering iron handle in the iron holder.
3. Insert the power plug into grounded power socket.
4. Turn on the power switch of unit.

Ⅴ. Operation of the Soldering Station

5.1 Temperature Setting of Analog-type

1. Set the temperature by revolving the temperature-controlling knob.
2. When the temperature reaches to the set temperature, the light will flash, it means the temperature is stable and soldering work can be done.

NOTE: ***Put the handle on the iron holder when the work is finished.***

(6) Extend tip life by switch the system off when not in use.

(7) Don't apply pressure to the tip. More pressure does not equal more heat. To improve heat transfer, use solder to form a thermal bridge between the tip and the solder joint.

Ⅸ. Error messages (only for digit-type)

Various error messages will be displayed when there is something wrong with the unit.

S－E

Sensor error: If there is a failure in the sensor or anywhere in the sensor circuit, "S-E" will be displayed and power to the soldering iron will be cut off.

H－E

Heater error: If power cannot be sent to the soldering iron, the display window will show "H-E". This indicates the possibility of a heater malfunction.

Ⅹ. Check and Replace the Soldering Iron

When there is something wrong with the soldering iron, you can check and test it. If it is broken, replace the broken element.

10.1 Check the Soldering Iron

1. Pull out the plug and measure the resistance value between the pins of the connecting plug when the heating element cooling down to the room temperature.
2. If the values of 'a' and 'b' are different from the values in the following table, replace the heating element or sensor or cord assembly. Refer to the following steps.
3. If the value of 'c' is over the below value, remove lightly the oxidation in the joint part of the tip and the heat element with sandpaper or steel wool.

2. Why a “de-tinned” tip fails to work?

A de-tinned tip is one which cannot wet with solder. This exposes the plating to oxidation and degrades the heat transfer efficiency of the tip.

The de-tinning is caused by:

(1) Failure to keep the tip covered with fresh solder while not in use.
(2) High tip temperatures.
(3) Insufficient melting in soldering operations.
(4) Wiping the tip on dirty or dry sponges and rags. (Always use a clean, wet, industrial grade, sulfur-free sponge.)
(5) Impurities in the solder, iron plating, or on the surfaces to be soldered.

3. To restore a de-tinned tip

(1) Remove the tip form the solder handle and allow the tip to cool down.
(2) Remove scale and oxides from the timed area of the tip with 80-grit abrasive polyurethane foam stock or a 100-grit emery cloth.
(3) Wrap rosin core solder (ϕ0.8mm diameter or larger) around the newly exposed iron surface, insert the tip into the handle, and turn on the power switch.

NOTE: The de-tinned tips are preventable by proper daily care!

4. Extending tip life

(1) Coat the soldering tip with solder before and after using each time. This can prevent the tip from being oxidized and prolong the lifetime of it.
(2) Choose a low and suitable temperature, and it will protect the tip from being oxidized.
(3) Use fine point tips only when necessary. The plating on fine precision tips is less durable than the plating on blunter tips.
(4) Do not use the tip as a prying tool. Bending the tip will cause the plating to crack, shortening tip life.
(5) Use the minimum activation flux necessary to do the job. Higher activation flux is more corrosive to the tip plating.

5.2 Temperature & Sound Setting of Digit-type

⚠CAUTION:

- ***Enter the correct password to set the temperature real-time. If the password is incorrect, temperature setting and calibration cannot be done.***
- ***If the unit is powered off during temperature setting process, the value will not be saved.***

5.2.1 Rapid Setting Temperature of Digit-type

Raise Temperature: Click **“▲”** button, the temperature will rise 1 ℃, the window will display the current setting temperature. If press the “▲” button for at least 1s, the setting temperature will rise rapidly. Loose the “▲” button when the value is up to the required temperature.

Reduce Temperature: Click **“▼”** button and then the temperature will drop 1 ℃, and the window will display the current setting temperature. If pressing “▼” button not loosely at least 1s, the setting temperature will drop rapidly. Loose the “▼” button when the value is down to the required temperature.

5.2.2 One Favorite Temperature Setting

1. In the working state, press the “*” button twice, the window will display one temperature, this is the favorite temperature setting state and three favorite temperatures can be set here.
2. After entering the favorite temperature setting state, click the “*” button, the “three favorite temperatures” can be selected as requirements.
3. If the three favorite temperatures need to be changed, click the “▲”or “▼” button to set. The setting method can refer “5.2.1”.

4. Press the "*" button until the window displays "  ", it means the temperature is set and saved successfully.
5. Temperature cannot be set in password locking state, but the three favorite temperatures can be selected freely. After entering the favorite temperature setting state, press the "*" and select the one favorite temperature you need.

5.2.3 Turn On /Off the Sound

In the working state, press the "▲" and "▼" buttons simultaneously and keep about 3s. The sound will be turned on if the window displays "ON", and will be off if the window displays "OFF".

5.2.4 Check the Setting Temperature

Click the "*" button if you want to check the setting temperature during work, the window will display the current setting temperature. Click the "*" button again to enter the favorite temperature setting state (refer to 5.2.2).

Ⅵ. Parameters Setting (only for digit-type)

NOTE: ***The initial password is "000". Enter the initial password or the correct password (if changed) to the parameter setting state.***

6.1 Enter the Parameter Setting State by Inputting Password

6.1.1 Enter the Password Setting State

1. Press the "▲" & "▼" buttons simultaneously after the unit is turned off. Then turn it on.
2. Loosen the "▲" & "▼" buttons when the window displays  , this is the parameter setting state.

2. Cleaning

The remnant flux during soldering process will form oxides and carbides which will cause damage to the tip, soldering difference and thermal recovery decreasing. Clean the tips regularly with the cleaning sponge.

Remove the oxides and carbides once a week if using the soldering station continuously to protect the tip.

3. When not in use

When the work is finished, don't leave the soldering station at high temperature for long time. Or the flux in the tip will turn to oxides and carbides which will reduce the heat conductivity of the tip largely.

4. After use

Wipe the tip and coat it with fresh solder. This will protect the tip from oxidation.

8.3 Maintenance of the Tip

1. Inspect and Clean the Tip

⚠**CAUTION***: Never file the tip to remove oxide.*

(1) Set the temperature at 250℃.

(2) When the temperature is stable, clean the tip with the cleaning sponge and check the condition of it.

(3) Coat the tip with solder if there is black oxide around it, then clean it with sponge. Repeat until the black oxide is completely removed. Then coat the tip with solder again. This will protect the tip from oxidation and prolong lifetime of it.

(4) If the tip is deformed or heavily corroded, replace a new one.

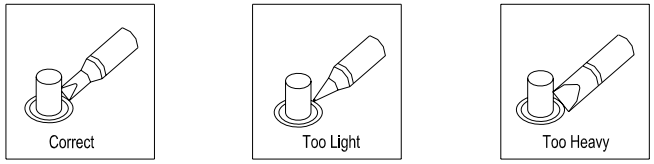
4. When the 100's digit starts to flash, select the value according to the reading of the thermometer and then click "*" button to confirm it. Input the 10's digit and 1's digit as the method, after that, click "*" button. Here, the calibration operation has been finished. If temperature is successful, the window will display " " and then return to the work state.
5. Repeat the above steps if there's any difference between the thermometer and soldering station.

NOTE: If locked by password, it will not be able to calibrate the temperature and it must input the right password.

Ⅷ. Use and Maintenance of the Tip

8.1 Select a Correct Tip

1. A tip which can contact surface of the soldering joint effectively will conduct heat effectively.
2. Select a tip which can conduct heat to the solder joint quickly and effectively. A short tip can control the process more precise, and a long or and angled tip will be more suitable for components-intensive PCBs.



8.2 Use of the Tip

1. Tip temperature

High temperature will shorten lifetime of the soldering tip. Choose a low and suitable soldering temperature if possible. With the excellent thermal recovery, it can ensure a sufficient and effective soldering event at low temperature to protect sensitive components from damage.

6.1.2 Input the Correct Password

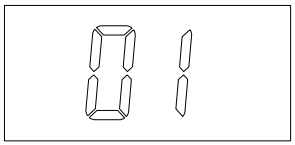
NOTE:

- ***There are twice chances to input password if the password of first time inputting is wrong.***
- ***If the inputting password is wrong for the two times, it cannot come into the parameter setting, namely it cannot set the work mode and new password.***

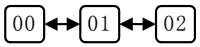
1. After entering the parameter setting mode, the window will display "---", the 100's digit will flash, initial password can be inputted.
2. Input password: Click the "▲" or "▼" button to input the 100's digit, and then click the "*" button when displaying the selected value of 100's digit. After that it comes into 10's digit input. The inputting methods of the 10's digit and 1's digit are same with the 100's digit.
3. If the inputting password is wrong for the first time, it comes into the password-inputting interface again and the window displays "---". Input the password again as the step 2.
4. If the inputting passwords both are wrong, it cannot come into the parameter setting and return to the work state directly.
5. If the inputting password is right, it comes into the parameter setting, firstly, work mode setting interface.

6.2 Set the Work Mode

1. If the input password is correct, it comes into the work mode setting and the window displays the current work mode, such as the following picture:



2. Click the "▲" or "▼" button to select the work mode and the work mode changing sequence is as following:



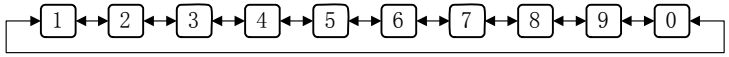
Work Mode Table

Work Mode	Temperature Range
00	100℃-350℃
01	100℃-400℃
02	100℃-450℃

3. After selecting the work mode, click the "*" button into the new password setting.

6.3 Set the New Password

1. Once into the new password setting, the window displays "---". After that, click the "▲" or "▼" button, the 100's digit is bright.
2. At the time, click the "▲" or "▼" button to select the 100's digit, and then click the "*" button when displaying the selected value of 100's digit. After that it comes into 10's digit set. The setting methods of the 10's digit and 1's digit are same with the 100's digit.



3. If the setting passwords are not same with each other, the window displays "Err", which means the password setting is not successfully, and return to the work state directly.
4. If the setting passwords are same with each other, the window displays " ", which means the password setting is successfully, and then into the work state directly.

Ⅶ. Temperature Calibration

NOTE:

- ***The temperature of the unit should be recalibrated every time if the handle, heating element or soldering tip is replaced.***
- ***Recommend using the191 or 192 series thermometer to measure the temperature of the tip.***

7.1 Temperature Calibration of Analog-type

For analog-type soldering station, the calibrating method is as following:

1. Set the temperature at a certain value (for example: 350℃).
2. When the temperature is stable, take out the stopple in the CAL hole, measure the temperature of the tip with the thermometer, write down the value.
3. Use a "-" or "+" type screwdriver to adjust the screw in the CAL hole until the thermometer shows the station's set temperature (350℃). Temperature will increase if the screw is turned clockwise and will decrease if it is turned counter-clockwise.
4. Repeat the above steps if there's any difference between the thermometer and soldering station.
5. When the calibration is finished, put the stopple back to the CAL hole.

7.2 Temperature Calibration of Digit-type

For digit-type soldering station, it uses digital calibration. The calibrating method is as following:

1. Set the temperature at a certain value (for example: 350℃).
2. When the temperature is stable, measure the tip's temperature with a thermometer and write down the value.
3. Press the "▲" & "▼" buttons simultaneously, press the "*" button until the window displays "CAL" to enter the calibrating temperature mode.