

Intelligent Lead Free Soldering Station

Sensor in front Digital Calibration
High frequency Rapid recovery of temperature

OPERATION MANUAL

Thank you for purchasing a lead free soldering station. It is designed for lead free soldering. Please read this manual before operating the unit. Store this manual in a safe, easily accessible place for future reference.

Safety Instruction

WARNING

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

 **WARNING:** Misuse may potentially cause death of, or serious injury to the user.

 **CAUTION:** Misuse may potentially cause injury to the user or physical damage to the objects involved.

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

CAUTION

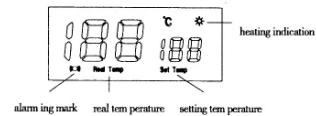
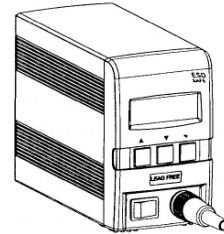
When the power is on, the tip temperature is very high. Mishandling may lead to burns or fire, be sure to comply with the following precautions:

- Please use the equipment only as the described manner, and avoid abusing it.
- Do not touch the metallic parts near the tip.
- Do not use the searing – iron near the flammable items.
- Advise other people in the working area to turn the power off when in a break or after using the equipment because the unit can reach a very high temperature and may cause potentially dangerous.
- No replace any parts or install the tips before turning the power off and cooling down the searing – iron to room temperature.

- The device shall only be used with rated voltage and frequency. (Refer to the trademark back of the equipment.)
- Do not use the device if it is damaged, especially the power supply cord.
- The device 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 extended grounding cord.
- Do not use the iron for the other applications except soldering.
- Do not rap the soldering iron against the work bench to shake off residual solder, otherwise the iron will be damaged by shocks.
- Do not modify the unit by oneself.
- Replace only with genuine parts.
- Do not wet the soldering station. When your hands are wet, don't use or disconnect it or pull the supply cord.
- The soldering process will produce smoke, so make sure the area is well ventilated.

1. Summary

This device is an intelligent lead free soldering station with rapid temperature recovery. The soldering station's temperature adopts LCD double temperature display and digital calibration, rapid and convenience. The sensor is designed in the front of tip and the temperature induction is very exact and sensitive, the speed of heating and recovery of temperature very fast. So it is one of the most perfect tools for lead free soldering.



2. Specification and characteristic

2.1 Specification

Power	90W
Output voltage	48V
The temperature range of the iron	80℃ ~480℃
The temperature range of the sleeping	50℃ ~250℃

The time range of the sleeping	0 ~ 250 (unit: minute)
The time range of the shutting	0 ~ 250 (unit: minute)
Temperature Stability	$\pm 2^{\circ}\text{C}$ (Without air flow and no load)
Highest Ambient Temperature	40°C
Tip to Ground Resistance	$< 2\Omega$
Tip to Ground Potential	$< 2\text{mV}$
Heating Element	Electromagnetic heater
Handle Power Cord	1.4m
Length of Handle (Without Cord)	180mm
Outer Dimension	$15.5 * 7.8 * 12$ (unit: mm)
Weight (Without power cord)	1Kg

- * The tip temperature is measured by the thermometer 191 or 192.
- * The length of the handle cord can be ordered.
- * Above specifications and designs will be changed without notice.

2.2 Characteristic

- (1) The thermocouple sensor locates on the top of tip. Recovery of the temperature and calefactive is rapid and exactly. Display the double temperature with the large LCD by microcomputer and Control the temperature by PID. Especially it is suitable to the lead free soldering.
- (2) The switch power supplies the power supply and protects the short circuit, over temperature and over voltage and reduces the loss of the copper and the iron. Besides, the output power is stable and not fluctuating with the voltage fluctuating.
- (3) Lock the calibration and the parameter setting with the password.
- (4) Set the parameters by three keys. Sleep or turn off automatically at the setting time.
- (5) The up and down limited temperature can be set according to the demands. If the temperature exceeds the setting limit value, the soldering station sounds alarm.

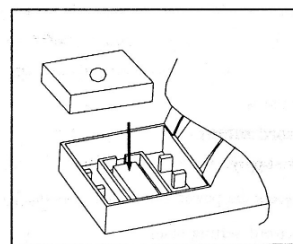
- (6) Digital calibration and operate conveniently and easy.
- (7) Various types of tips are available and replace tips conveniently.
- (8) The weight is light and the appearance is original.
- (9) ESD safe design.

3. Operation instruction

Note: please check the power supply is according to the rating voltage on the nameplate of the device before installing the solder station.

3.1 Iron Holder and Sponge

- 1 Dampen the small cleaning sponge with water and then squeeze it dry. Place it in the groove of the iron holder base.
- 2 Add a little water to the iron holder. The small sponge will absorb the water to keep the large sponge above it wet all times. It may only use big sponge and not use small one.
- 3 Dampen the larger cleaning sponge and place it on the iron holder base.



Note: If the sponge becomes dry during working, add appropriate water.

3.2 Connection

⚠ CAUTION:

Be sure to turn off the power switch before connecting or disconnecting the soldering iron. Failure to do so may damage the soldering station.

1. Connect the connector plug of the iron handle cord to the socket in front of the soldering station. Take notice of the inserting position of connector plug.
2. Place the soldering iron in the iron holder.
3. Insert the power plug into the grounding power socket.
4. Connect one end of grounding cord to the grounding hole of the soldering station and the other to ground.
5. Switch on the power supply.

3.3 Setting the parameters

3.3.1 Setting the password

The initial password is 000 and the temperature can be set after turning on the power supply at this state. If administrator wants to limit the authority and he can change the password and then those being authorized can set the parameters.

1. Enter the password setting:

Turn off the power supply. press and hold "△" and "▽" keys simultaneously and then press the power switch until the display shows . It means in the password setting state.

2. Enter the initial password:

Press "*" key after the display shows , and then the display shows . In the  state, input the initial password by

• 6 •

pressing "△" and "▽" keys. And press "*" key after inputting the right password.

a) If the inputted password is error:

The soldering station will jump over the password setting process into the normal working process after the display shows the setting password about four seconds. But the temperature cannot be changed in normal working process because of inputting the error password.

b) If the inputted password is correct:

If the display shows , this means the inputting password is correct. After displaying about four seconds, the station will come into the normal work process, and it can set the temperature.

3. Input the new password:

Note: the next inputted password must be same with the last inputted password, and then the new password will be recorded in the soldering station and change the password successfully. (Operation as follows)

1) **Input the new password:** when inputting the correct initial password, the display shows  and then press "*" and "▽" keys simultaneously in about four seconds then showing . It is in the new password setting process. Press "*" key and the display shows . After that, press "△" or "▽" key to input the new password.

2) **Repeat the new password:** after inputting the new password and then press "*" key to . Now it must input the new password again. Press "*" key and the display shows . After that, press "△" or "▽" key to input the new password.

3) **If the next inputted password is same with the last inputted password:** press "*" key and then the new password will be recorded in the soldering station and change the password successfully.

• 7 •

4) If the next inputted password is not same with the last time:

Press " * " key to  and then input the new password again until the lately two passwords are identical.

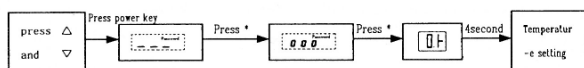
3.3.2 Setting the temperature

Note: * Make sure the temperature of the station can be adjusted (inputted password is correct or the password is initial 000).

* Do not turn off the power supply when setting the temperature, or else the setting value will not be memorized.

1. The process of temperature setting

- 1) If the password is 000 and can jump into the temperature setting process when turning on the power supply.
- 2) If the password has been changed, it must input the correct password firstly and then the process into the temperature setting.



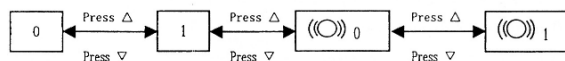
2. temperature setting

temperature up: Don't press " * " key, and press "△" key directly. And the "Set Temp" will raise 1℃ and the display will show the setting temperature. If pressing the "△" key about one second, the setting temperature will rise rapidly. And then loose the "△" key till the needed temperature.

Temperature down: press “▽” key directly. And the “Set Temp” temperature will drop 1°C and the display will show the setting temperature. If pressing the “▽” key about one second, the setting temperature will drop rapidly. And then loose the “▽” key till the needed temperature.

3.3.3 Mode setting

When inputting the correct password and the display shows  press “ Δ ” and “ $*$ ” keys simultaneously to the mode setting. The display shows the current setting value and change the type of the modes by pressing “ Δ ” and “ ∇ ” keys. The changing series as following:

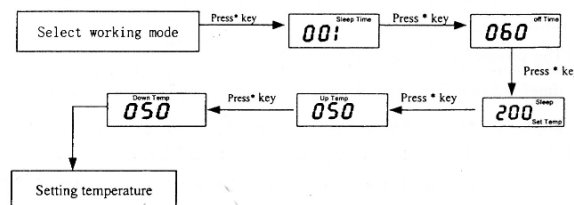


Working mode table

Working mode	Temperature range	Handle type	Tip type	Remark
0	80℃ ~ 480℃	Electromagnet	Normal tip	((○)) is a alarming mark.
1	80℃ ~ 480℃	Electromagnet	Big tip	
((○)) 0	80℃ ~ 480℃	Electromagnet	Normal tip	
((○)) 1	80℃ ~ 480℃	Electromagnet	Big tip	

3.3.4 Other setting

1 press the “ Δ ” or “ ∇ ” key can change the setting value.



2 sleep time setting

The station has an auto - sleep function. When not operating the station during a certain period of time (the setting sleep time), the power supply will be cut off and the station will come into the sleep state.

- 1) Select the needing mode and then press " * " key to the process of " sleep time " setting. The display shows  and then press " Δ " or " ∇ " key to change the sleeping time. The range of sleeping time is from 0 minute to 250 minutes.
- 2) After finishing setting the sleeping time, press " * " key to the process of off time setting.
- 3) To resume soldering, there are several ways as follows:
 - * Turn the power switch off and then turn on.
 - * Press " * ".
 - * Take up the iron - handle.

Note: * The soldering iron must be placed at the soldering iron station. And only in this state, the soldering station can sleep automatically when up to the setting time.

* The solder station will not into sleep when the sleeping time is 000. And the solder will sleep at once when the setting sleeping time is 001 and the handle is placed at the solder holder.

3 off time setting

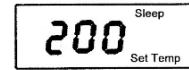
If the station isn't resumed during the sleeping time, the power supply will be shut off automatically, and the station will stop working. Turn on the power switch to resume working.

- 1) The process of setting " off time " is after the process of setting " sleep time ". At the " off time " status, the display shows  and then press " Δ " or " ∇ " key to change the off time.
- 2) The range of sleeping time is from 0 minute to 250 minutes.
- 3) After finishing the off time setting, press " * " key to the process of off time setting.

Note: * the off time should be longer than the sleep time, otherwise, the soldering station will be turned off immediately after it comes into sleep state.

4 sleeping temperature setting

- 1) In the process of " sleeping temperature " setting, the display shows " sleep " and " set temp " , and then press " Δ " or " ∇ " key to change the sleeping temperature.



Sleeping temperature setting

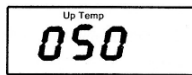
- 2) The range of sleeping temperature is from 50℃ to 250℃
- 3) In the sleeping state, if the sleeping temperature is less than the setting temperature of the soldering station, the temperature will fall down to the sleeping temperature. Otherwise, down to the soldering station's setting temperature.

Such as: If the setting sleeping temperature is 200℃ and the setting work temperature is 280℃, in sleeping state, the iron's temperature will fall down to 200℃.

If the setting sleeping temperature is 200℃ and the setting work temperature is 150℃, in sleeping state, the iron's temperature in sleeping will fall down to 150℃.

5 up temp setting

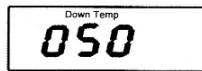
- 1) In the up temp setting state, the display shows " Up Temp " (refer to the picture) and press " Δ " or " ∇ " key to change the temperature. Once difference in temperature between the real temperature (Real Temp) and the setting temperature (set temp) is bigger than the up temp, the soldering station will alarm when in the alarming mode.
- 2) The range of the " up temp " setting is from 0℃ to 99℃.



Up Temp Setting

6 down temp setting

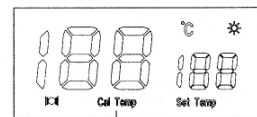
- 1) In the down temp setting, the display shows "Down Temp" (refer to the picture) and press " Δ " or " ∇ " key to change the temperature. Once difference in temperature between the real temperature (Real Temp) and the setting temperature (set temp) is bigger than the Down Temp, the soldering station will alarm when in the alarming mode.
- 2) The range of the "Down Temp" is from 0°C to 99°C.



Down Temp Setting

3.4 Calibrating the temperature

- 1 The soldering iron should be recalibrated every time after replacing the iron, the heating element or the tip.
- 2 This device adopts digital calibration mode and input the revision value by pressing key.
- 3 Methods of recalibrating the temperature:
 - 1) Set the temperature of the soldering station to a certain value.
 - 2) When the temperature stabilizes, measure the tip's temperature with thermometer and write down the values.
 - 3) Press "*" key unlooseningly and then press the " Δ " and " ∇ " keys simultaneously, the soldering station enters the temperature calibration mode and LCD displays "Cal Temp".



Calibrating temperature

- 4) The number is not flash and press " Δ " or " ∇ " key to record the temperature tested by the thermometer to the soldering station. After that, press "*" key and the process of temperature calibration is end.
- 5) If the temperature still has some departure, you can repeat calibration in according with the above steps.

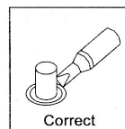
Note: * Suggest using the 191 or 192 thermometer to measure the tip's temperature.

* If the soldering station is locked by the password, it will not be able to calibrate the tip temperature and you must input the correct password.

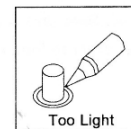
4 Use / care and maintenance

4.1 Select a correct tip

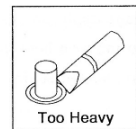
1. Select a tip which maximizes contacting area between the tip and solder joint. Maximizing contact area transfers the heat more efficient, helping the operators to produce high quality solder joints quickly.
2. Select a tip with transferring the heat to the solder joint well. A tip with shorter length can control more precise. And the Longer or angled tip may be needed for soldering densely populated boards.



Correct



Too Light



Too Heavy

4.2 Tip's using caution

- 1 High soldering temperature can degrade the function of the tip and use the tip with the lowest possible soldering temperature. The excellent thermal recovery characteristics ensure efficient and effective soldering event at low temperatures. This also can protect the sensitive components from thermal damage.
- 2 When using the soldering iron continuously, be sure to loosen the tip and remove all oxides on the tip at least once a week. This helps prevent reducing of the tip temperature.
- 3 never keep the soldering iron at high temperature for a long time when not using,. Because the tip will be covered with oxide that can greatly reduce the tip's heat conductivity .
- 4 wipe the tip and coat it with fresh solder after using. This helps to prevent tip oxidation.
- 5 Clean the tip regularly with a cleaning sponge. Oxides and carbides deriving from the solder and the flux can form impurities on the tip. These impurities can result in defective joints or reduce the heating conductivity of the tip.
- 6 Use fine tips only when necessary. The plating on fine tips is less durable than the plating of the blunter tips.
- 7 Do not use the tip as a detecting tool. Bending the tip can cause the plating to crack and shorten the tip's life.
- 8 Use the minimum activation flux necessary to do the job. Higher activation flux is more corrosive to the tip plating.
- 9 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.

4.3 check and clean the tip

- 1 Set the temperature to 250°C.
- 2 When the temperature stabilizes, clean the tip with the cleaning sponge and check the condition of the tip.
- 3 If there is black oxide on the solder-plated portion of the tip, coat new solder (containing flux) and then wipe the tip on the cleaning sponge. Repeat until the oxide is completely removed and then coat with the new solder.
- 4 If the tip is deformed or heavily eroded, replace it with a new one.

4.4 Renew a detinned tip

1 why are a detinned tip failing to work?

A detinned tip is one not wetted with solder. This exposes the plating to oxidation and degrades the heat transfer efficiency of the tip.

2 Detinning is caused by:

- a. Failure to keep the tip coating with fresh solder while not in using.
- b. High temperatures.
- c. Insufficient melting in soldering operations.
- d. Wiping the tip on dirty or dry sponges or rags. (It should use a clean, wet, industrial grade, sulfur-free sponge.)
- e. There are impurities in the solder, iron plating, or on the surfaces to be soldered.

3 renew a detinned tip

- a) Remove the tip from the handle after the tip cooling down.
- b) Remove the dirty and oxides from the tip with 80-grit abrasive polyurethane foam stock or a 100-grit emery.
- c) Wrap the stannum including rosin (Ø0.8mm or larger) around the newly exposed iron surface, insert the tip into the handle, and turn on the power switch.

Note: * Never file the tip to remove oxide.
 * Proper daily care can prevent the tip from detinned.

4.5 Error messages

Various error messages will be displayed when there is something wrong with the device. If the following message is displayed, refer to the 4.6.

S - E **Sensor error:** if there is some malfunction in the sensor or anywhere in the sensor circuit, "S - E" will be displayed and the power supply to the soldering iron will be cut off.

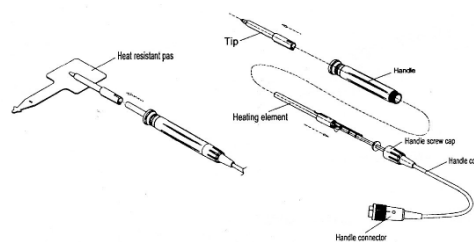
H - E **Heater error:** If there is some thing wrong with the heating element, "H - E" will be displayed and the power supply to the soldering iron will be cut off.

4.6 check and replace the soldering iron

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

4.6.1 Check the soldering iron

- 1 Turn the power switch off and disconnect the power plug.
- 2 Disconnect the handle connector from the station, and disassemble it after it cooling down.
- 3 Don't use metal tools such as pliers to remove the tip or the tip enclosure from the handle instead of using heat resistant pad.
- 4 Screw down the sheath at the end of the handle
- 5 Pull the heating element out from the handle towards the handle cord.

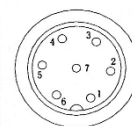


4.6.2 Checking the heating element

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.

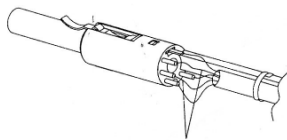
- 1 If the values of 'a' and 'b' are different from the values in the following table, replace the heating element or sensor or cord assembly. Refer to the following steps.
- 2 If the value of 'c' is over the below value, remove lightly the oxidation in the joint part of the tip and the heat element with sandpaper or steel wool.

a.	Between pins 4&5 (Heating Element)	Under 1Ω (Normal)
b.	Between pins 1&2 (Sensor)	Under 10Ω (Normal)
c.	Between pins 3& Tip	Under 2Ω

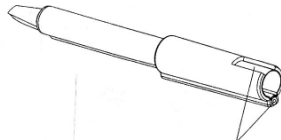


Note: * when checking b and c items in the table, the soldering iron must be equipped with tip.

* The pin's sequence above picture is same with the handle socket of the soldering station and in the socket of the soldering iron handle after disconnecting the handle. Please find the corresponding pins when check the sensor or the heating element.



Check the heating element



Check the sensor

4.6.3 replace the heating element

- 1 Cut off the strap connecting the heating element and the handle cord and pull out the sensor's pin and desolder each wire of handle cord from heating element.
- 2 Remove the broken heating element and replace a new one.
- 3 Solder each wire of handle cord to its pin according to connection way of desoldering. Connect black and white wires to two heating pins of the heating element and connect the grounding wire (shield cord) to the grounding pin.
- 4 Put the sensor pin on the red wire into the sensor pin jack of the heating element.
- 5 After replacing the heating element, test heating element according to the following "5.5.4 test the heating element" and install it after confirming it is well.
- 6 Tie up the heating element and the handle cord with the strap.
- 7 Put the heating element into handle according to the opposite order of disassembling, and the heating element must be put into bottom. The bulge of the sensor pin jack should be put into handle's flute.
- 8 Screw down the screw cap at the end of the handle.
- 9 Install tip, the sensor pin jack part must be put into the handle's flute.

• 18 •

Note:

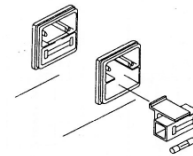
- * The joint between wire and pin should be covered with a shrinkable hose.
- * No heating when not installing the tip or else the heating element will be damaged.

4.6.4 Test the heating element

- 1 Measure the resistance values between pin 4 and pin1 or pin4 and pin2, between pin5 and pin 1 or pin 2, between pins 3 and pin 1 or pin 2, between pin 3 and pin 4 or pin 5. If they are not ∞ , the heating element and sensor or vibrator switch are touched. This will damage the PCB.
- 2 Measure the resistance value 'a', 'b' and 'c' (refer to the above form) to confirm that the leads are not twisted and that the grounding wire is properly connected.

4.7 Replace the fuse

- 1 Turn off the power switch and then pull out the fuse plug in the power plug.
- 2 Open the fuse cover board and take out the broken fuse.
- 3 replace a new fuse and put back the fuse cover board in place.



• 19 •

Tips

