

SOLDERING STATION

FX-971

Instruction Manual

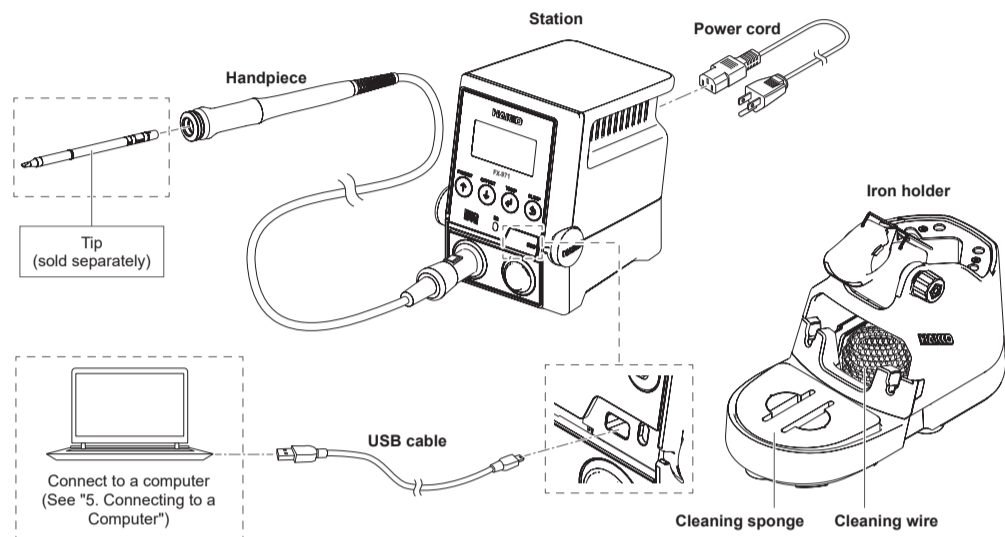
Thank you for purchasing a HAKKO product.
This product is a soldering iron station.

Make sure to read this manual before using the product, and keep it in a safe place for future reference.

1. Set contents and assembly

Confirm the contents before use.
*This product may differ from the following:

Station FX-971.....	1	Cleaning wire.....	1
Handpiece FX-9701.....	1	USB cable.....	1
Iron holder FH-215.....	1	Power cord.....	1
Cleaning sponge.....	1	Instruction manual (A/B).....	1



See the web page for the product information such as replacement parts/options.
https://www.hakko.com/doc_fx971-e

3. Warnings, Cautions, and Notes

Warnings, cautions, and notes are placed at critical points in this manual to direct your attention to significant items. They are defined as follows:

- WARNING:** Failure to comply with a WARNING may result in serious injury or death.
- CAUTION:** Failure to comply with a CAUTION may result in injury to the operator, or damage to the items involved.
- NOTE:** This indicates procedures or information that are important in a process described in this document.

Be sure to observe the following precautions to ensure safety.

WARNING

- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children shall not play with the appliance.
- Cleaning and user maintenance shall not be made by children without supervision.
- When this product is not used, place the handpiece on the iron holder.
- The tip reaches high temperatures when the power source is turned on. You may risk getting burned or causing a fire if mishandled.
- Do not touch the metal parts near the tip.
- Do not place anything that easily burns or ignites near the product.
- Make sure that people nearby are aware of the "high temperature danger."
- When the product is not in use, being repair, or being cleaned, turn off the power switch and disconnect the plug from the power outlet.

Failure to observe the following precautions to ensure safety might result in electric shock, malfunction or other trouble.

CAUTION

- Before using this product, fully read all descriptions in this document.
- Only use the product for soldering.
- Do not hit the handpiece against a workbench or subject it to strong shocks to remove solder residue.
- Soldering produces smoke, so make sure to work in a well-ventilated area.
- Use genuine HAKKO parts for included parts/replacement parts/options.
- Do not modify this product.
- Do not use damaged cords or plugs. Doing so can result in malfunction or injury.
- Do not use the product if it has been dropped or shows signs of damage.
- When inserting and removing the cord, hold the plug body and do not pull the cord.
- Do not allow this product to get wet. Also, do not handle it with wet hands.
- Do not perform any other actions that may be considered to be dangerous.

2. Specifications

Power consumption	100 W
Temperature range	50 to 450°C (120 to 850°F)
Temperature stability	±3°C (5°F) (At idle temperature)

Station

Output	AC 24 V
Dimensions	When angled: 93 (W) × 126 (H) × 133 (D) mm (3.7 × 5 × 5.2 in)
	When not angled: 93 (W) × 126 (H) × 123 (D) mm (3.7 × 5 × 4.8 in)
Weight	1.2 kg (2.6 lb)

Handpiece

Power consumption	95 W (24 V)
Tip to ground resistance	<2 Ω
Tip to ground potential	<2 mV
Heating element	Composite heater
Cord length	1.2 m (3.9 ft)
Total length	206 mm (8.1 in) (with T39-D24 tip)
Weight	31 g (1.1 oz) (with T39-D24 tip)

- The total length and weight excludes the cord.
- This product is applied with electrostatic countermeasures.
- Please note that specifications and appearance are subject to change without notice in the interest of product improvement.

CAUTION

Handling precautions for ESD Safe products

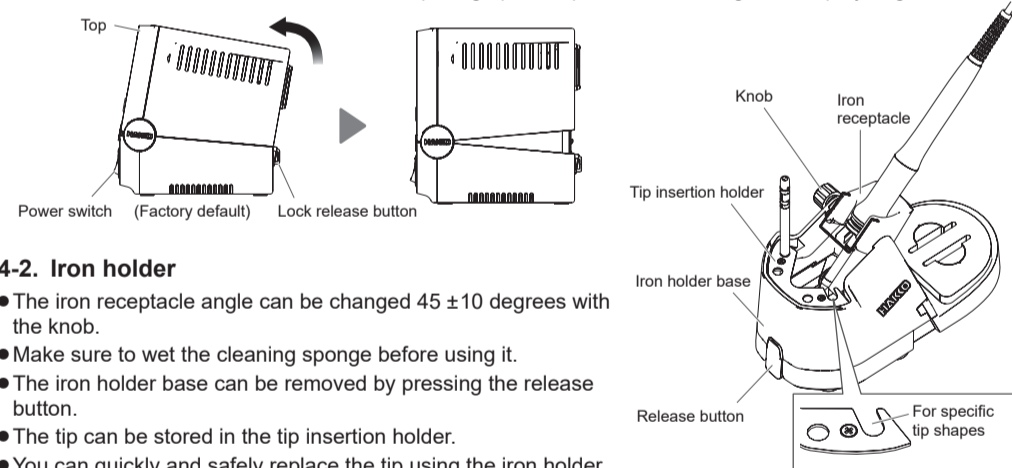
This product contains electrostatic countermeasures, so please use the following precautions:

1. Not all plastic parts are insulators, they may be conductive. Be careful not to expose live electrical parts or damage insulating materials when performing repairs or replacing parts.
2. Be sure the product is grounded before use.

4. Operation

4-1. Station

Press and hold the lock release button while pulling up the top section to change the display angle.

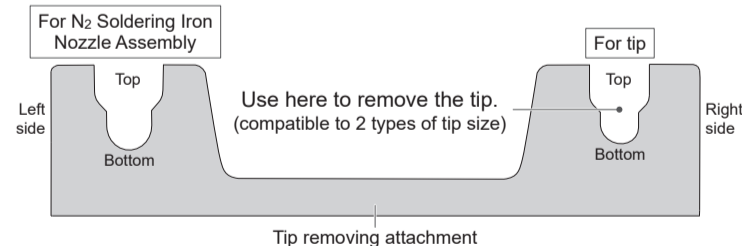


4-2. Iron holder

- The iron receptacle angle can be changed 45 ± 10 degrees with the knob.
- Make sure to wet the cleaning sponge before using it.
- The iron holder base can be removed by pressing the release button.
- The tip can be stored in the tip insertion holder.
- You can quickly and safely replace the tip using the iron holder.

Replacing the tip

Use the "left/right or top/bottom grooves" of the tip removing attachment to replace the tip.



- (1) Insert the tip until the handpiece contacts the "right side groove." (Figure 1)
- (2) Pull the handpiece straight out. (Figure 2)

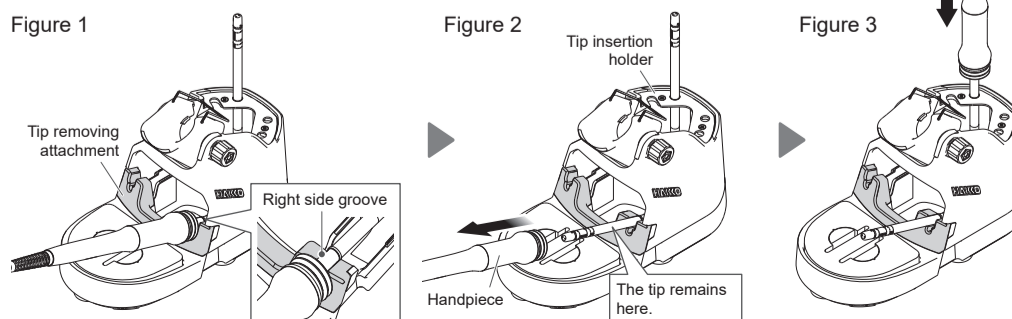
NOTE Cool the tip in the tip removing attachment, and then rotate it to pull it out.

NOTE Note that using too much downward force can damage the tip or handpiece.

NOTE For safety purposes and to prevent damage to the product, make sure to press the iron holder with your hand.

- (3) Insert the tip that has been placed in the tip insertion holder into the handpiece. (Figure 3)

NOTE By using the tip insertion holder, tip can be inserted firmly to the end.



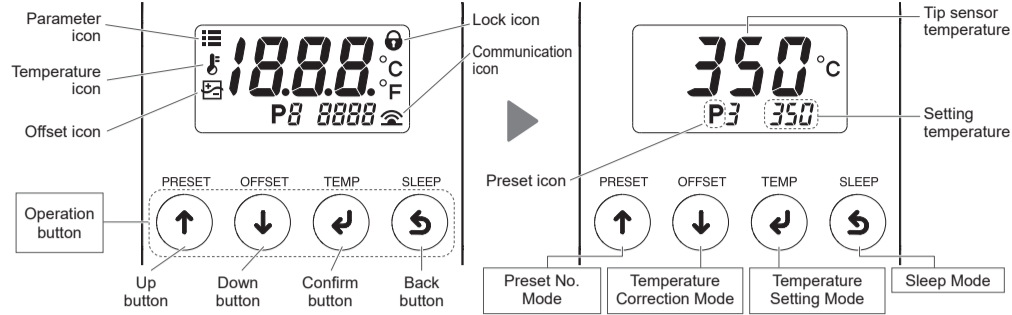
4. Operation (cont'd)

4-3. Operation

CAUTION

Place the handpiece into the iron holder and then turn on the power.

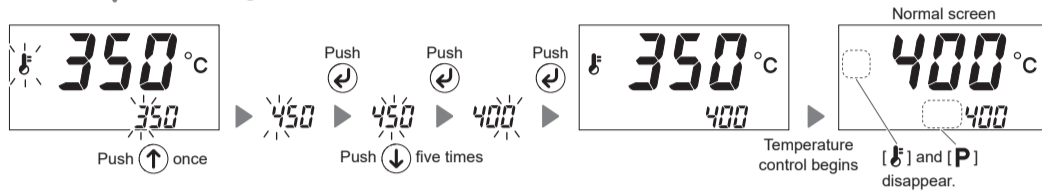
The following display appears after turning the power on.



Changing the temperature setting

Push Push this button once to display and transition to "temperature setting mode." This mode is used when changing the set temperature.

To change to 400°C



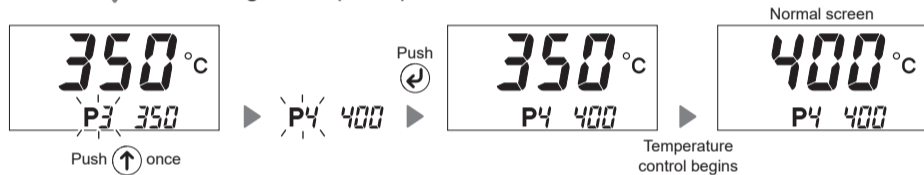
Once the normal screen appears, push the button to transition to preset No. mode.

Changing the preset No.

You can register up to five frequently used setting temperatures on the product, and then select the registration No. to change the setting temperature.

Push Push this button once to transition to "preset No. mode." Select one of the five temperatures registered in this mode. (Factory default temperature settings: P1 250°C (600°F), P2 300°C (700°F), P3 350°C (750°F), P4 400°C (800°F), P5 450°C (850°F))

To change to P4 (400°C)



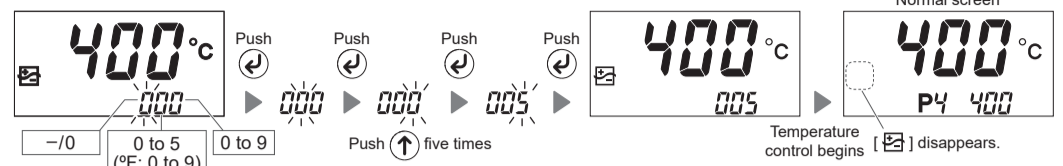
NOTE The registered temperature of each preset No. can be changed in "parameter No. 23." (See "6. Parameter Settings")

NOTE If you want to limit setting temperature changes, change the setting in "parameter No. 14." (See "6. Parameter Settings")

Tip temperature correction (offset)

Push Push this button once to display and transition to "temperature correction mode." If the setting temperature and the measured value of the tip temperature differ in this mode, you can correct the temperature. (Correction range: ±50°C/±90°F)

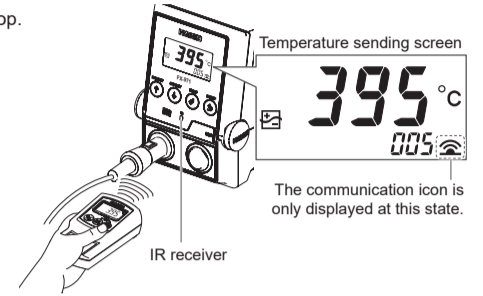
To correct a temperature by 5°C for a setting of 400°C (to correct actual tip measurement reading 395°C when set to 400°C)



*Note that temperatures that exceed the correction range cannot be entered.

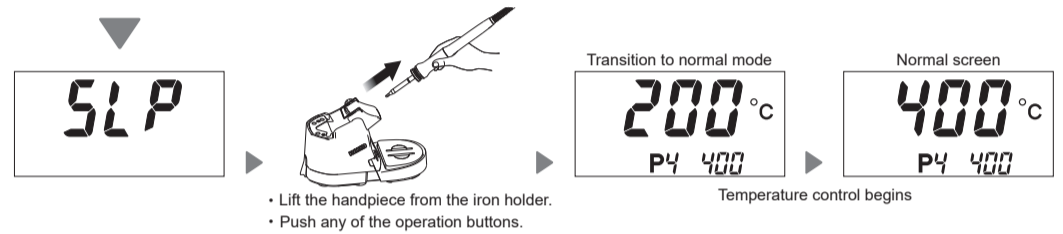
Once a tip degrades from wear, the tip temperature tends to drop. The tip temperature changes if you replace the tip, the offset will need to be readjusted. Make sure to change the offset value as needed while monitoring the actual tip temperature.

You can automatically change the offset value using a HAKKO thermometer with a temperature sending function. Push the button before sending the measured value. (See the figure on the right)



Pausing work (sleep mode)

Push Push this button once to immediately transition to "sleep mode (state where the tip temperature has dropped to the set activation temperature)." Use this function occasionally to prevent tip oxidation. (Factory default setting: Parameter No. 07 setting is enabled and the activation temperature in Parameter No. 13 is 200°C)



The product will not transition to sleep mode in the following cases:

- When the setting temperature is lower than 300°C (570°F)
- When the parameter No. 07 setting is disabled

Approximately six minutes after placing the handpiece on the iron holder, the product automatically transitions to sleep mode. Change parameter No. 02 and 13 settings as necessary for your work. (See "6. Parameter Settings")

To further prevent tip oxidation, set auto shut-off.

- Enable the parameter No. 08 setting.
- Set the time until the product is automatically shut-off in parameter No. 18.

The shorter the set time, the more effective it is.

If you disable the parameter No. 08 setting, the product will not automatically shut-off even when the set time has elapsed.

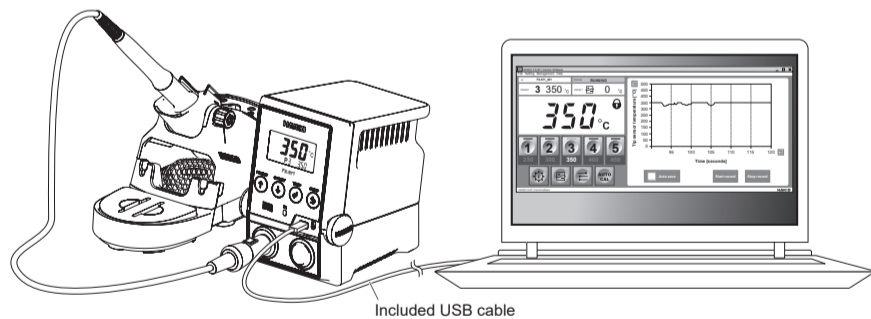
5. Connecting to a Computer

The following will become available when the software is installed.

- Change the parameter setting value from the PC
- Save the parameter settings as a CSV file
- Copy the saved parameter settings on another unit
- Save the automatic calibration results as a CSV file
- Search the saved automatic calibration results by "Date" or "Number of recent histories," and display the results in a graph
- Monitor the tip temperature and save its history as a CSV file

NOTE Do not use a USB cable that is more than two meters long.

NOTE Only Windows 10 is supported.



5-1. Downloading the Software (Online)

- Go to the HAKKO website and visit [Customer support\Support & service\Login/Signup].



https://www.hakko.com/doc_support-e

- Follow the on-screen instructions to complete user registration. Once user registration is complete, you can use My Page.
 - Click [My page (Product registration from here)] to register the product.
- NOTE** You can only download the software after registering the product.
- Click [Download of product data] from the menu at the top right of the page.
 - Select [SOFTWARE] in the document search area.
 - Enter the product name as a keyword.
 - Select a language, and then click [Search by Condition].
 - Click [Download] in the search results.

5-2. Installing the software

- Double-click the software (HAKKOControlSoftwareSetup X.X.X.X.exe) downloaded from Online.
- Select a language, and then click [OK]. (Figure 1)
- Check the License Agreement, select [I accept the agreement], and then click [Next]. (Figure 2)
- Follow the on-screen instructions to complete the installation.
- If the software is installed correctly, it will be launched automatically.

Figure 1

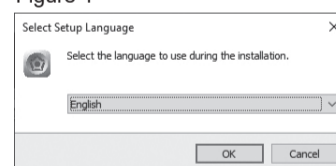
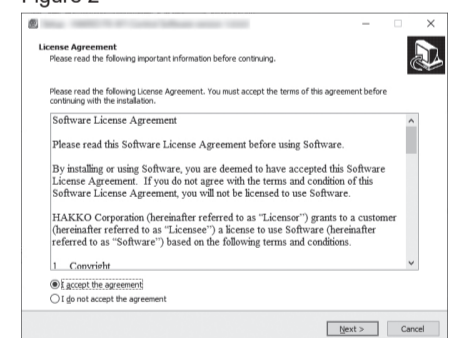
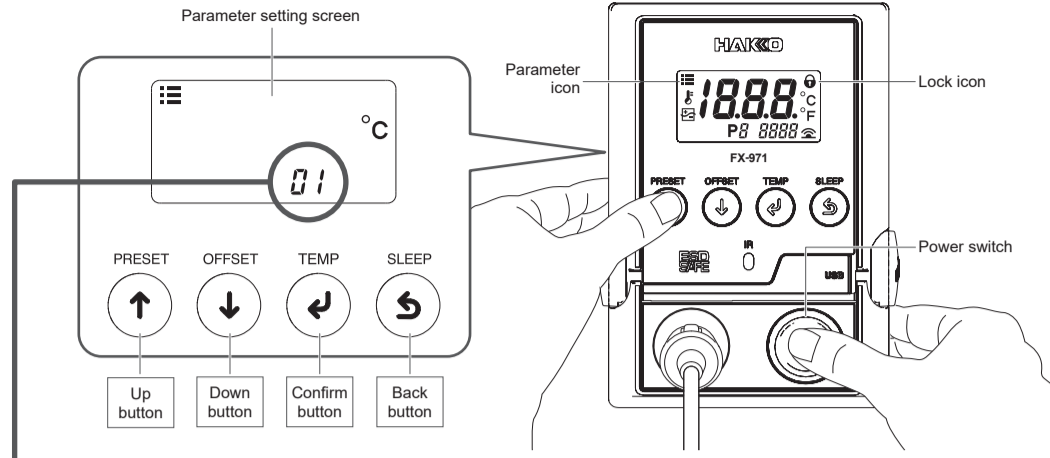


Figure 2



6. Parameter Settings



- (1) Turn on the power while pressing the [Up] button.
- (2) Select the parameter number using the [Up] button or the [Down] button.
- (3) Push the [Confirm] button.
- (4) Change the setting using the [Up] button or the [Down] button.
- (5) Push the [Confirm] button.
- (6) Push the [Back] button.
- (7) The normal screen reappears.

Default values are factory default settings.

Parameter No.	Parameter name/summary	Setting value	Default value Value when implementing No. 25.
01	Display temperature unit Select from °C or °F. ● All set values are converted to the changed display temperature unit.	°C/°F	°C 01 (For USA: °F)
02	Sleep: Time setting Set the time until the product transitions to sleep mode after the handpiece is placed on the iron holder. ● A shorter set time is more effective for preventing tip oxidation. ● This function is only activated if the temperature is set to 300°C (570°F) or higher. ● The normal screen reappears if you lift the handpiece from the iron holder. The normal screen also reappears if you push an operation button.	1 to 29 min	06 02
03	Low temp alarm Set the temperature range to notify via buzzer if the tip temperature drops while soldering. ● The buzzer sound cannot be turned off.	30 to 150°C 50 to 300°F	150°C 03 (°F: 270)
05	Error alarm set: [On]/[OFF] setting A buzzer sound notifies of soldering iron error [C - E] or sensor error [S - E]. Select [OFF] if you do not wish to use this function.	On/OFF	On 05
06	Ready alarm: [On]/[OFF] setting A buzzer sound notifies that the tip has reached the setting temperature. Select [OFF] if you do not wish to use this function.	On/OFF	On 06
07	Sleep: [On]/[OFF] setting Set whether or not to automatically transition to sleep mode once the time set in parameter No. 02 is reached.	On/OFF	On 07
08	Auto shut-off: [On]/[OFF] setting Set whether or not to automatically turn the product off once the time set in parameter No. 18 is reached.	On/OFF	OFF 08
13	Sleep: Activation temperature setting Set the tip temperature during sleep configured in parameter No. 02. ● A lower setting temperature is more effective for preventing tip oxidation. ● The normal screen also reappears if you push any operation button.	200 to 300°C 390 to 580°F	200°C 13 (°F: 400)
14	Password lock: [On]/[OFF] setting Limit the scope of change using a combination of six characters <i>RbC dEF</i> and three digits. • Select [OFF].....None are locked • Select [On].....Locks all • Select [PAR] > [P3].....Locks changes to offset temperature • Select [PAR] > [P].....Locks preset temperature selection • Select [PAR] > [F].....Locks temperature changes via the [TEMP] button	OFF On* PAR*	Process when [PAR] is selected When [PAR] is selected From (a) to (c), use [Up] [Down] to select On/OFF. Enter the password and push [Confirm].
18	Auto shut-off: Time setting Set the time until the product transitions to powered down mode after the handpiece is placed on the iron holder. If a time of 30 minutes is set, the buzzer sounds three times every 30 minutes. ● The normal screen also reappears if you push any operation button. ● A shorter set time is more effective for preventing tip oxidation.	30 to 60 min	30 18
23	Preset temperature: Changing registered temperatures You can register up to five frequently used setting temperatures. This function saves time when changing the setting temperature. Default value: P1 250°C (600°F), P2 300°C (700°F), P3 350°C (750°F), P4 400°C (800°F), P5 450°C (850°F)	50 to 450°C 120 to 850°F	250°C 300°C 300°C 320°C P1 SET P2 SET P2 SET P2 SET
24	Preset temperature: [On]/[OFF] setting Set whether or not to use the preset temperature function for each temperature. Default value: On/P3 350°C ● The [PRESET] button is disabled if you set all five options to [OFF]. ● If you change P3 to [OFF] and push the [PRESET] button in the normal screen, the display switches between P1 > P2 > P4 > P5.	On/OFF	On P1 250 On P1 250 OFF P1 250 OFF P1 250 P1 has been disabled.
25	Initial reset Reset the product to factory default settings.	°C/°F	25 25 455°C 1888°C P8 8888 350°C P3 350

Note

- If the power is turned off while configuring settings, the changes may be lost.
- If you set the password in No. 14, the lock icon appears on the normal screen and a password prompt appears before transitioning to the parameter setting screen. Contact us if you do not know the password.

E-mail: support@hakko.com



This function is convenient for when you want to work within a specified temperature range.

To solder between 320 and 350°C at a setting temperature of 350°C, change the setting value to [30] in No. 03 before beginning soldering. The buzzer will sound, notifying you when the tip sensor temperature is lower than 320°C while soldering. The upper limit is restricted by the setting temperature.

Leave the No. 07 default value set to [On], and set No. 02 and 13 to desired settings.

In sleep and auto shut-off, tip oxidation is prevented, which can extend the tip lifetime.

Set No. 08 to [On], and set No. 18 to desired settings.

7. Maintenance

CAUTION

Do not file oxidation attached on the tip. This will shorten the tip lifespan.

Conducting maintenance will help keep the product in good condition and prolong the usage of the unit.

Inspection

Soldering tip inspection

Measure the resistance between the heating element and sensor, and if the measured value is abnormal, replace the tip. The normal resistance values are as follows:

T39: $5.7 \Omega \pm 10\%$ (at room temperature) T50: $8.0 \Omega \pm 10\%$ (at room temperature)

For the measurement location, see "8. Troubleshooting".

Ground line inspection

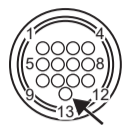
Unplug the iron connection cord from the station.

Disconnect the power plug from the power outlet and measure the following resistance.

- (1) Power cord
- (2) Resistance between the tip and the plug (Pin 13) of the iron connection cord

For both, the normal resistance is $< 2 \Omega$ (at room temperature). If the resistance is abnormal, replace the power cord or the iron connection cord.

The plug of the iron connection cord



Daily maintenance

Setting temperature	Using the product at a temperature that is higher than necessary can accelerate tip deterioration and damage parts that are susceptible to heat. Use the lowest temperature whenever possible.
Before beginning work	Perform a visual check of the tip. Replace it if it is bent or considerably worn. Use the cleaning sponge to wipe off any oxidation or old solder from the tip. Impurities on a circuit board can result in poor soldering.
When pausing work	Use sleep mode instead of leaving the handpiece set to a high temperature for a long period of time. This prevents tip oxidation which helps to maintain workability, which can extend the tip lifetime. Turn off the power switch when not using the product for a long period of time. (See "■ Pausing work (sleep mode)" in "4-3. Operation")
After finishing work	Thoroughly clean the tip with the cleaning sponge and then coat it with new solder. Doing so can prevent oxidation of the tip.

Periodic maintenance

Tip

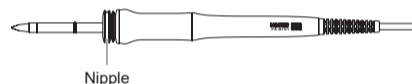
Wear and tear on the tip will vary due to the operating temperature as well as the quality and amount of solder/flux used. Maintenance should be performed based on what suits your usage.

- (3) Turn the power ON.
- (4) Set the temperature to 250°C (482°F).
- (5) Once the temperature is stable, use the cleaning sponge to wipe the tip.
- (6) If there is any black oxidation on the solder plating, apply new solder containing flux and then wipe it off with the cleaning sponge. Repeat this process until the oxidation is removed. Afterward, coat it with new solder.
- (7) Turn the power off and remove the tip once it has cooled.
If you find flux, debris, and other particulates on anything other than the end of the tip, wipe it off with industrial alcohol.

Handpiece

Remove flux, debris, and other particulates adhering to the nipple.

It may cause contact failure inside the handpiece.



Nipple

Iron holder

- Press down the release button and remove the iron holder base, then clean the collected solder waste from the iron holder.
- Rotate the cleaning wire as need to a clean side where solder is not accumulated.

8. Troubleshooting (cont'd)

[- -] is displayed.	Is there a strong noise source around the soldering iron?	▶ Move the soldering iron away from the noise source, or use other circuit for the power.
Cannot get solder on the tip.	Is the tip setting temperature too high or too low?	▶ Set an appropriate temperature.
	Is there any oxidation on the tip?	▶ Remove the oxidation. (See "7. Maintenance")
The tip temperature is too high/low.	Is the offset value entered correct?	▶ Measure and adjust the value. (See "■ Tip temperature correction (offset)" in "4-3. Operation")
It does not switch to the sleep mode.	Is the setting temperature less than 300°C (570°F)?	▶ Set the temperature at 300°C (570°F) or more. (See "Parameter No. 02" in "6. Parameter Settings")
	Is there a vibrating object near the soldering iron?	▶ Move the soldering iron to a place where it is not affected by the vibration.
The auto shut-off function does not work.	Is parameter No. 08 [OFF]?	▶ Change it to [On] to enable feature.



For more support information, visit the website.

If you cannot find a solution in this manual or on the website, or if another problem occurs, please contact the retailer where you purchased the product.

https://www.hakko.com/doc_fx971-e

8. Troubleshooting

CAUTION

Before performing an inspection or replacing parts, make sure to disconnect the power plug from the outlet.

No operation even if power switch is turned ON.	Has the power cord or connection plug been removed?	▶ Plug unit into outlet.
	Is the fuse blown?	▶ Replace the fuse. If the fuse is blown again, send the main unit (including handpiece, power cord) back for service.
[C - E] is displayed.	Is an incompatible soldering iron connected?	▶ Connect the compatible handpiece.
	Has the handpiece plug been removed?	▶ Turn off the power switch, reconnect the handpiece, and turn the power switch back on again.
[H - E] is displayed.	Is the heat capacity of the tip too small for the object to be soldered?	▶ Use a tip with a larger heat capacity.
	Is the set value for the low temp alarm too small?	▶ Increase the set value. (See "Parameter No. 03" in "6. Parameter Settings")
[H S E] is displayed.	Is the tip an applicable genuine tip?	▶ Turn off the power switch, insert an applicable genuine tip, and turn on the power switch again. If the problem persists, replace the tip.
	Is the tip fully inserted?	▶ Insert tip firmly into the handpiece. (Do not use excessive force)
[S - E] is displayed.	Is the heating element/sensor disconnected?	▶ Measure the resistance between the heating element and sensor, and if the measured value is abnormal, replace the tip. The normal resistance values are as follows: T39: $5.7 \Omega \pm 10\%$ (at room temperature) T50: $8.0 \Omega \pm 10\%$ (at room temperature)
		<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>T39</p> <p>Measure the resistance between these points.</p> </div> <div style="text-align: center;"> <p>T50</p> <p>Measure the resistance between these points.</p> </div> </div>



HAKKO CORPORATION

HEAD OFFICE

4-5, Shiokusa 2-chome, Naniwa-ku, Osaka 556-0024 JAPAN
TEL: +81-6-6561-3225 FAX: +81-6-6561-8466
<https://www.hakko.com> E-mail: sales@hakko.com

OVERSEAS AFFILIATES

U.S.A.: AMERICAN HAKKO PRODUCTS, INC.
TEL: (661) 294-0090 FAX: (661) 294-0096
Toll Free (800) 88-HAKKO

<https://www.hakkoUSA.com> E-mail: Support@HakkoUSA.com

HONG KONG: HAKKO DEVELOPMENT CO., LTD.
TEL: 2811-5588 FAX: 2590-0217

<https://www.hakko.com.cn> E-mail: info@hakko.com.hk

SINGAPORE: HAKKO PRODUCTS PTE., LTD.
TEL: 6748-2277 FAX: 6744-0033

<https://www.hakko.com.sg> E-mail: sales@hakko.com.sg

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