HAKKO

SOLDERING STATION
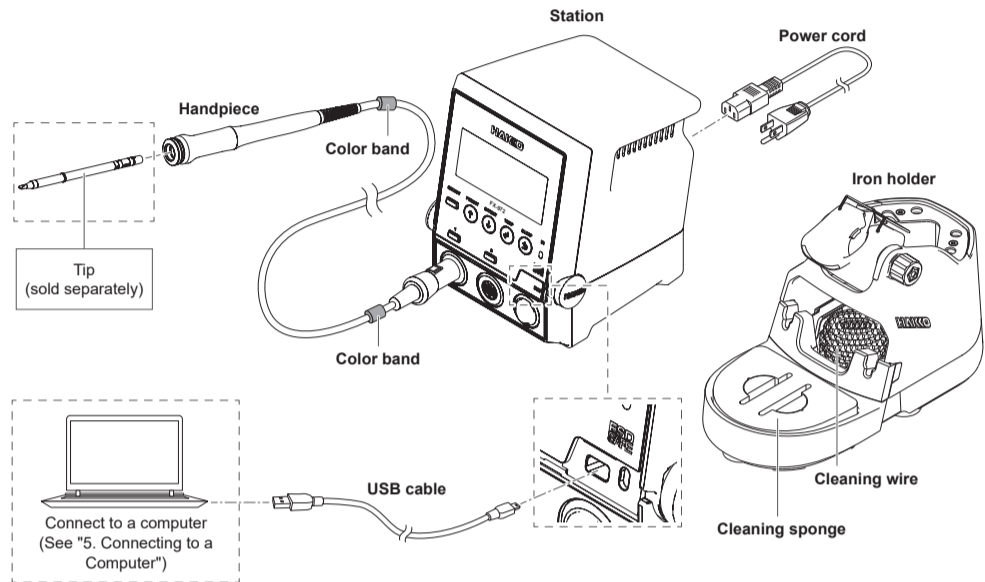# FX-972

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-972	1
Handpiece FX-9701	1
Iron holder FH-215	1
Cleaning sponge	1
Cleaning wire	1
Color band	2
USB cable	1
Power cord	1
Instruction manual (A / B)	1

Station
Power cord
Handpiece
Color band
Tip (sold separately)
Color band
Iron holder
USB cable
Cleaning wire
Cleaning sponge
Connect to a computer (See "5. Connecting to a Computer")

2. Specifications

Power consumption	200 W
Temperature range	50 to 450ºC (120 to 850ºF) With heavy duty soldering iron connected: 50 to 500ºC (120 to 940ºF)
Temperature stability	±3ºC (5ºF) (At idle temperature) With heavy duty soldering iron connected: ±5ºC (9ºF) (At idle temperature)

Station

Output	AC 24 V
Dimensions	When angled: 126 (W) × 151 (H) × 149 (D) mm (5 × 5.9 × 5.9 in) When not angled: 126 (W) × 151 (H) × 136 (D) mm (5 × 5.9 × 5.4 in)
Weight	2.8 kg (6.2 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.

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.
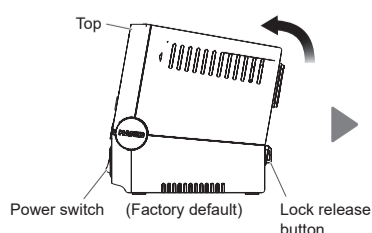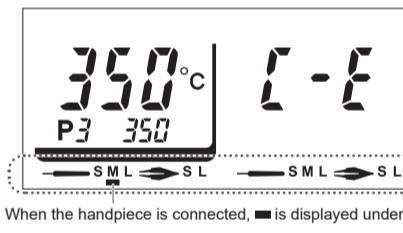
⚠ CAUTION

● 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 soldering actions that may be considered to be dangerous.

4. Operation

4-1. Station

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

Top
Power switch (Factory default) Lock release button

4. Operation (cont'd)

4-1. Station (cont'd)

The type of handpiece connected can be identified on the display.

350°C C - E
P3 350

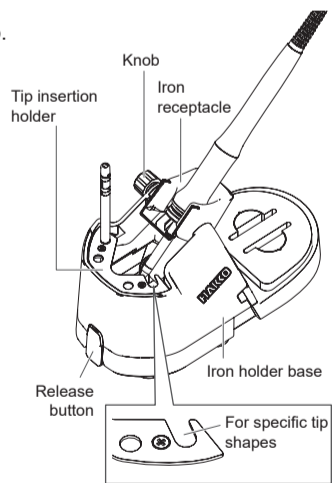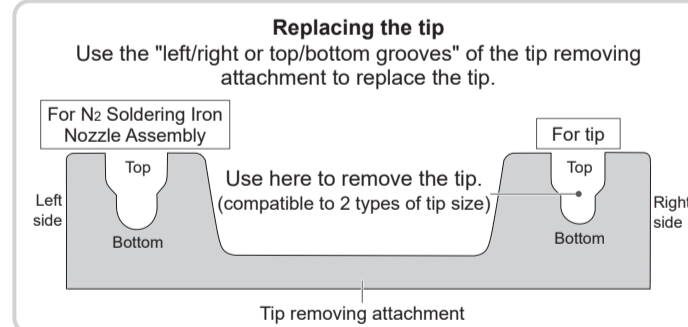When the handpiece is connected, ■ is displayed under S/M/L.

If no handpiece is connected to a channel. [C - E] is displayed and the buzzer will sound. If the channel button is pressed for 2 seconds, the display will change to [OFF] and the buzzer will stop.
(See "■ Channel power ON/OFF" in "4-3. Operation")

S M L → S L
S ..... Micro soldering iron
M ..... Soldering iron
L ..... Heavy duty soldering iron

S L
S ..... Micro hot tweezers
L ..... Hot tweezers

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.

For N2 Soldering Iron Nozzle Assembly
Top
Left side
Bottom
Use here to remove the tip. (compatible to 2 types of tip size)
For tip
Top
Right side
Bottom
Tip removing attachment

Knob
Tip insertion holder
Iron receptacle
Iron holder base
Release button
For specific tip shapes

(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. 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)

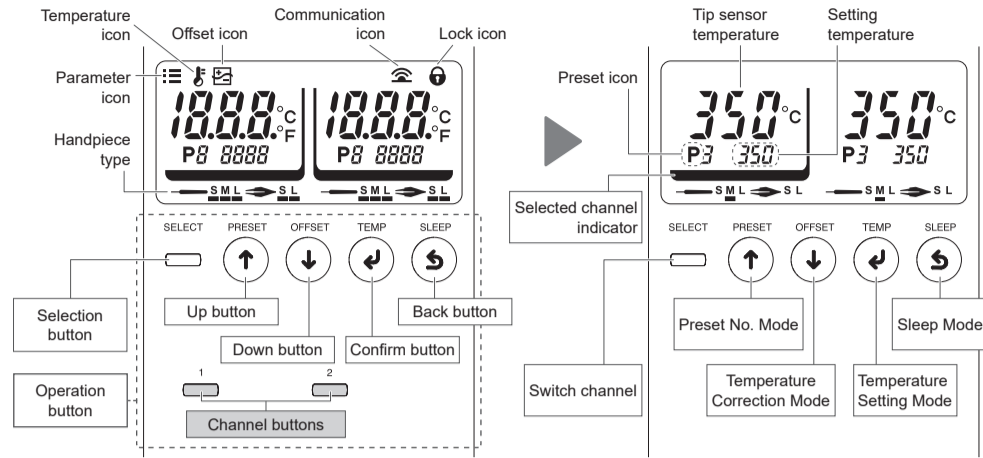NOTE By using the tip insertion holder, tip can be inserted firmly to the end.

Figure 1
Tip removing attachment
Right side groove

Figure 2
Tip insertion holder
Handpiece
The tip remains here.

Figure 3
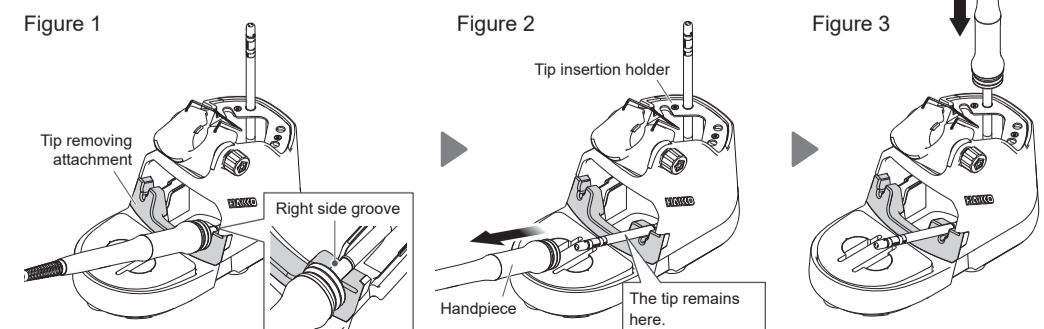
4-3. Operation

| ⚠ CAUTION |
|---|
| Place the handpiece into the iron holder and then turn on the power. |

The following display appears after turning the power on.

Temperature icon | Offset icon | Communication icon | Lock icon | Tip sensor temperature | Setting temperature

Parameter icon | Handpiece type | Preset icon | Selected channel indicator

SELECT | PRESET | OFFSET | TEMP | SLEEP

Selection button | Up button | Back button | Preset No. Mode | Sleep Mode
Operation button | Down button | Confirm button | Switch channel | Temperature Correction Mode | Temperature Setting Mode

Channel buttons

■ Switch the channel to edit (When both channels are used)

Push SELECT
Pressing this button once will switch the channel to edit and also switch the selected channel indicator.
You can also switch the channel by pressing the channel buttons directly.
For the selected channel, the following settings will be available.

■ Changing the temperature setting

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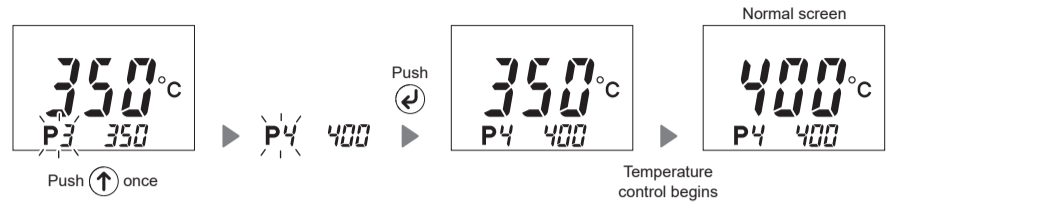This mode is used when changing the set temperature.

To change to 400ºC

Push (↑) once | Push (↓) five times | Temperature control begins | [🌡] and [P] disappear.
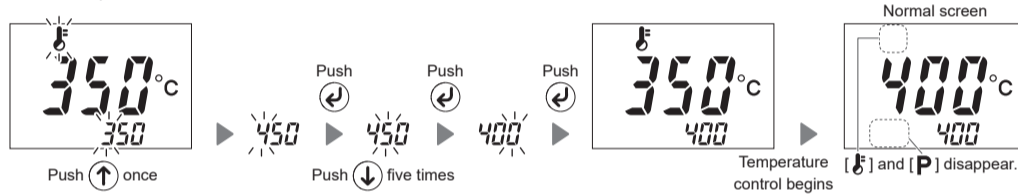
🔅 Once the normal screen appears, push the (↑) button to transition to preset No. mode.

■ Changing the preset No.

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

Push PRESET ↑
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 250ºC (600ºF), P2 300ºC (700ºF), P3 350ºC (750ºF), P4 400ºC (800ºF), P5 450ºC (850ºF))

To change to P4 (400ºC)

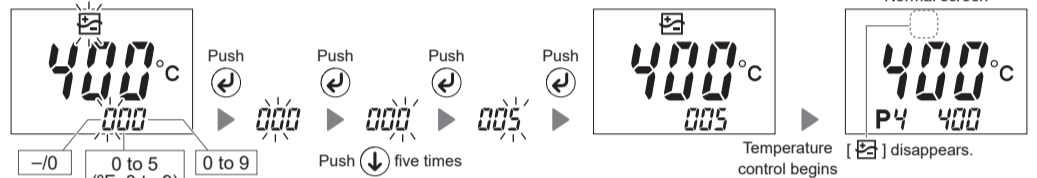Push (↑) once | Push (↵) | Normal screen | Temperature control begins

NOTE Setting between 451ºC (851ºF) to 500ºC (940ºF) is only available if a heavy duty soldering iron is connected.

NOTE To change the registered temperature for each preset No., use Parameter No. *23* to change the setting, and to restrict the change of the setting temperature, use Parameter No. *14* to change the setting. (See "6. Parameter Settings")

■ Tip temperature correction (offset)

Push OFFSET ↓
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: ±50ºC/±90ºF)

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

−/0 | 0 to 5 (ºF: 0 to 9) | 0 to 9 | Push (↓) five times | Temperature control begins | [🈁] disappears.

*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 value 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)
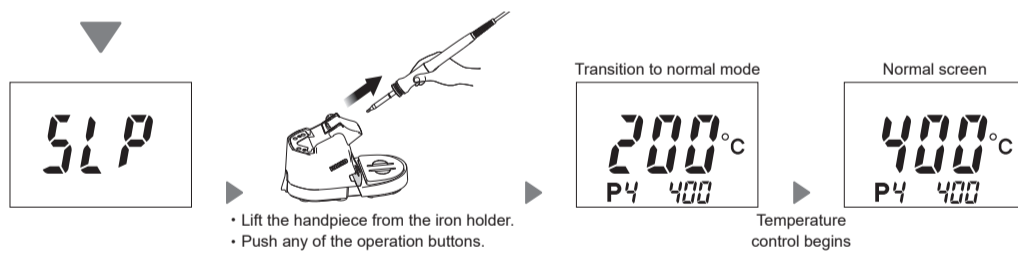

Temperature sending screen

The communication icon is only displayed at this state.

IR receiver
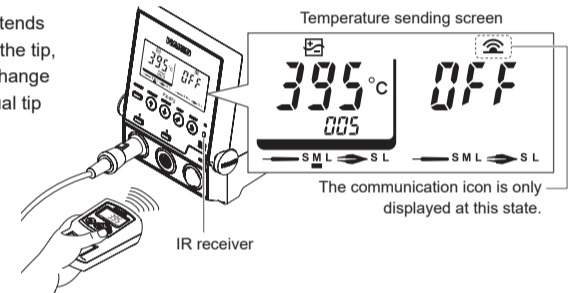
4-3. Operation (cont'd)

■ Pausing work (sleep mode)

Push SLEEP ↩
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 200ºC)

• Lift the handpiece from the iron holder.
• Push any of the operation buttons.

Transition to normal mode | Normal screen | Temperature control begins

🔅 The product will not transition to sleep mode in the following cases:
　• When the setting temperature is lower than 300ºC (570ºF)
　• 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.
　(1) Enable the parameter No. *08* setting.
　(2) 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.

■ Channel power ON/OFF

Pressing the channel button for 2 seconds will turn the channel power ON/OFF.
When a channel is turned off, [OFF] will be displayed.
Channel button light will turn ON/OFF based on the power status.

■ Setting the priority channel

You can set the channel to be given priority for use when a heavy duty soldering iron, hot tweezers, or micro hot tweezers are connected. When doing so, the other channel will be on standby at the setting temperature and the button will flash.
When the setting of the standby channel is finished, the selected channel will return to the priority channel.

**NOTE** If a handpiece other than the above is used, both channels can be used at the same time.

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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

Included USB cable

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

NOTE Only Windows 10 is supported.
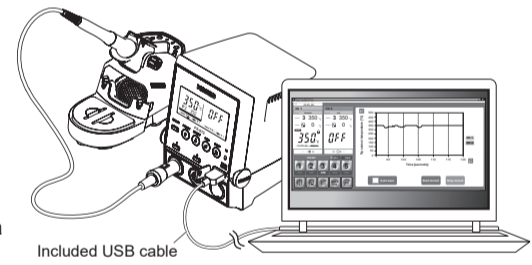
5-1. Downloading the Software (Online)

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

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

5-2. Installing the software

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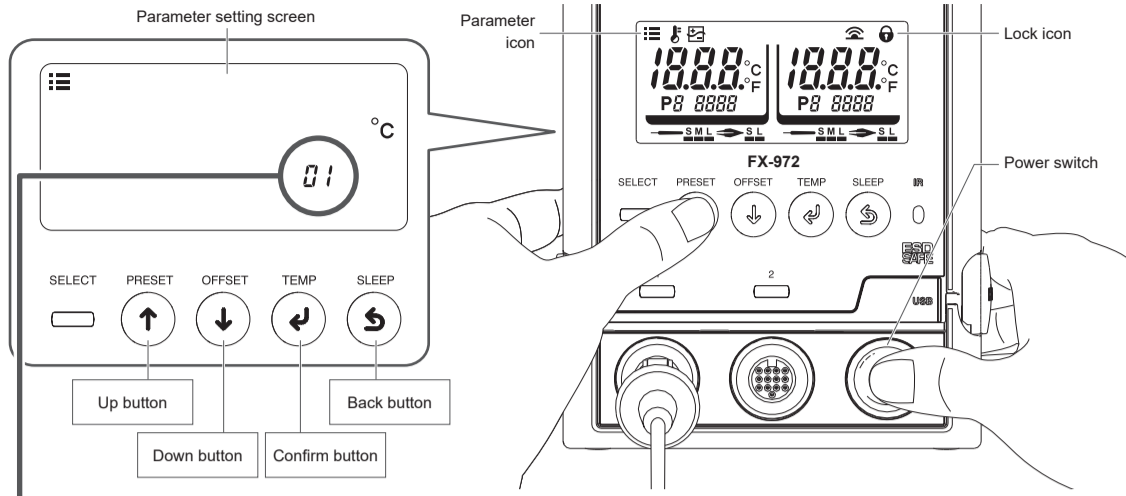(5) If the software is installed correctly, it will be launched automatically.
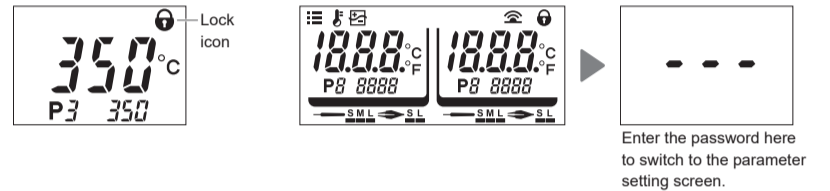
Figure 1 | Figure 2

6. Parameter Settings

Parameter setting screen — Parameter icon — Lock icon — Power switch — Up button — Back button — Down button — Confirm button

(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.

💡 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.

Normal screen

Enter the password here to switch to the parameter setting screen.

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 ºC or ºF. ●All set values are converted to the changed display temperature unit.	ºC/ºF	ºC *01* (For USA: ºF)
02	**Sleep: Time setting** Set the time until the product transitions to sleep mode after the handpiece is placed on the iron holder. Set Channel 1 first and then, Channel 2. ●A shorter set time is more effective for preventing tip oxidation. ●This function is only activated if the temperature is set to 300ºC (570ºF) 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 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 150ºC 50 to 300ºF	*150*ºC 03 (ºF: 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
09	**Auto channel switching: [On]/[OFF] setting** Select whether or not to switch the channel automatically as a load on the handpiece is detected, or when the handpiece is lifted from the iron holder.	On/OFF	*On* 09
13	**Sleep: Activation temperature setting** Set the tip temperature during sleep configured in parameter No. *02*. Set Channel 1 first and then, Channel 2. ●A lower setting temperature is more effective for preventing tip oxidation. ●The normal screen also reappears if you push any operation button.	200 to 300ºC 390 to 580ºF	*200*ºC *200*ºC 13 (ºF: 400)
14	**Password lock: [On]/[OFF] setting** Limit the scope of change using a combination of six characters *AbCdEF* and three digits. • Select [OFF] .... None are locked • Select [On] .... Locks all • Select [PAr] > [🔘] .... Locks changes to offset temperature • Select [PAr] > [**P**] .... Locks preset temperature selection • Select [PAr] > [🌡] .... Locks temperature changes via the [TEMP] button	OFF On * PAr * * When selected, a lock icon [🔒] appears on the right side of the normal screen.	
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 for each channel. This function saves time when changing the setting temperature. • Default value: P1 250ºC (600ºF), P2 300ºC (700ºF), P3 350ºC (750ºF), P4 400ºC (800ºF), P5 450ºC (850ºF) • Temperature range: Heavy duty soldering iron .... 50 to 500ºC (120 to 940ºF) Other handpieces .... 50 to 450ºC (120 to 850ºF)	50 to 500ºC 120 to 940ºF	
24	**Preset temperature: [On]/[OFF] setting** Set whether or not to use the preset temperature function for each temperature. Set Channel 1 first and then, Channel 2. Default value: On/P3 350ºC ●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	
25	**Initial reset** Reset the product to factory default settings.	ºC/ºF	

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

To solder between 320 and 350ºC at a setting temperature of 350ºC, 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 320ºC 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.

Process when [PAr] is selected

When [PAr] is selected — (a) From (a) to (c), use ⬆ ⬇ to select On/OFF. (b) Enter the password and push ↵.

Push ↵ — Use ⬆ to cycle through P1 > P2 > P3 > P4 > P5, for Channel 1 first and then, Channel 2. — Change the P2 temperature. — Temperature changed

Push ↵ — P1 has been disabled.

When ºC is selected

7. Maintenance

<table>
<tr><td colspan="2" align="center">⚠ CAUTION</td></tr>
<tr><td colspan="2">Do not file oxidation attached on the tip. This will shorten the tip lifespan.</td></tr>
</table>

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/T51: 5.7 Ω±10% (at room temperature)   T50: 8.0 Ω±10% (at room temperature)
T52: 7.5 Ω±10% (at room temperature)   T53: 2.9 Ω±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 Ω (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.
(1) Turn the power ON.
(2) Set the temperature to 250ºC (482ºF).
(3) Once the temperature is stable, use the cleaning sponge to wipe the tip.
(4) 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.
(5) 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

<table>
<tr><td colspan="3" align="center">⚠ CAUTION</td></tr>
<tr><td colspan="3">Before performing an inspection or replacing parts, make sure to disconnect the power plug from the outlet.</td></tr>
</table>

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 there a channel not being used? ▶	Turn the channel not being used to [OFF].
	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.

8. Troubleshooting (cont'd)

[S - E] is displayed.	Is the tip fully inserted? ▶	Insert tip firmly into the handpiece. (Do not use excessive force)
	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/T51: 5.7 Ω±10% (at room temperature) T50: 8.0 Ω±10% (at room temperature) T52: 7.5 Ω±10% (at room temperature) T53: 2.9 Ω±10% (at room temperature)

T39/T51
Measure the resistance between these points.

T50/T52
Measure the resistance between these points.

T53
Measure the resistance between these points.

[- - -] 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 300ºC (570ºF)? ▶	Set the temperature at 300ºC (570ºF) 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.

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