HAKKO

SMD REWORK STATION

FR-850

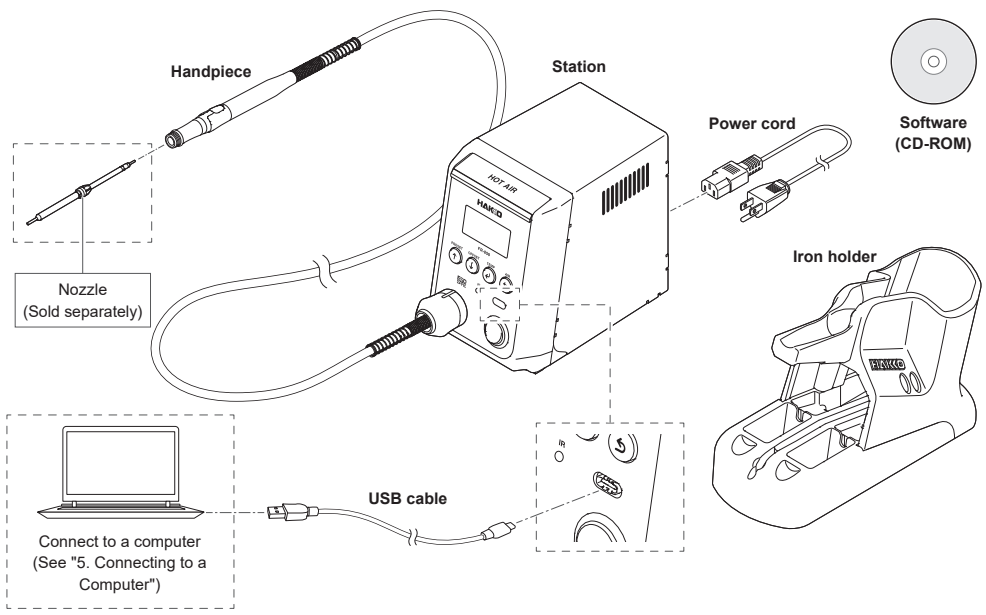
Instruction Manual

Thank you for purchasing a HAKKO product.
This product is a hot air rework 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 FR-850 1
Handpiece FR-8501 1
Iron holder FH-225 1
USB cable..... 1
Power cord 1
Instruction manual (A / B)..... 1
* Software (CD-ROM)..... 1



See the web page for the product information such as replacement parts/options.
https://www.hakko.com/doc_fr850-e

2. Specifications

Power consumption	112 W
Temperature range	50 to 600ºC (120 to 1150ºF)

Station

Power consumption	7 W
Airflow	1.5 to 5 L/min*
Dimensions	98 (W) × 140 (H) × 165 (D) mm (3.9 × 5.5 × 6.5 in)
Weight	1.8 kg (4.0 lb)

* These numbers are approximate. The range of airflow will vary depending on the nozzle you attach.

Handpiece

Power consumption	105 W (24 V)
Nozzle to ground resistance	<2 Ω
Nozzle to ground potential	<2 mV
Heating element	Composite heater
Cord length	1.2 m (3.9 ft)
Total length	227 mm (8.9 in) (With NA01-C20 nozzle)
Weight	70 g (2.5 oz) (With NA01-C20 nozzle)

- The total length and weight do not include cord and hose.
- 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 nozzle reaches high temperatures when the power source is turned on. Do not touch the metal parts near the nozzle. You may risk getting burned or causing a fire if mishandled.
- Replace the nozzle only after it has cooled.
- 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.
- The air coming out of the nozzle is very hot. Do not allow it to come in contact with a person.

3. Warnings, cautions, and notes (cont'd)

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

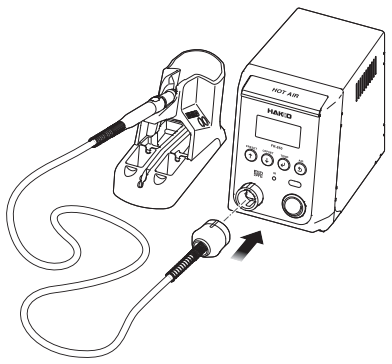
⚠CAUTION

- Before using this product, fully read all descriptions in this document.
- After use, the device will automatically cool down. Do not turn off the power until [HOT AIR] button stops flashing or the device may malfunction.
- Soldering produces smoke, so make sure to work in a well-ventilated area.
- When attaching/removing the nozzle, be sure to turn OFF the power.
- Turn the station off before connecting or disconnecting the handpiece to prevent damage to the P.W.B.
- 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.

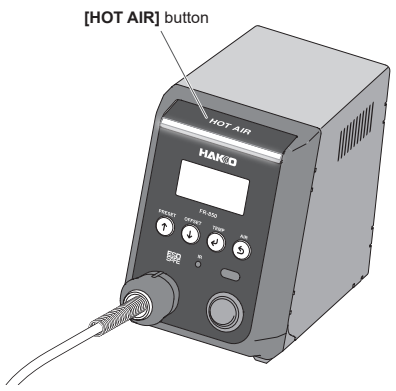
4. Operation

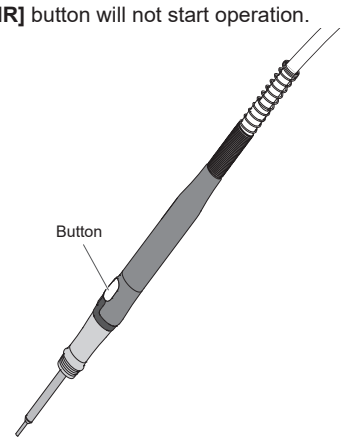
4-1. Station and handpiece

(1) Connect the handpiece to the station , then turn on the power.
(2) Remove the handpiece from the iron holder.
(3) Press the button on the handpiece or the **[HOT AIR]** button on the main unit to start operation. The **[HOT AIR]** button will light up blue.
(4) Press either button again to turn off the power to the heater. The airflow will stop after automatic cooling. The **[HOT AIR]** button will flash blue.



● Auto sleep function
Placing the handpiece back in the iron holder during operation will turn off the heater. It will automatically cool down, and the airflow will stop.
The **[HOT AIR]** button will flash blue.
With the handpiece in the iron holder, pressing the **[HOT AIR]** button will not start operation.
The buzzer will sound when the button is pressed.





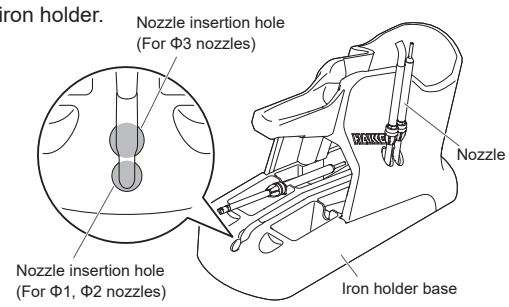
4. Operation (cont'd)

4-2. Iron holder

⚠CAUTION

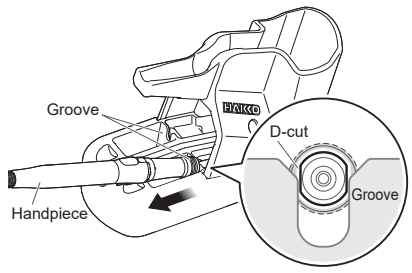
- When attaching/removing the nozzle, be sure to turn OFF the power.
- The nozzle becomes very hot. Make sure it has cooled down enough before replacing it.

- The nozzle can be removed and inserted using the iron holder.
- The nozzles can be stored in the iron holder.
- There are two types of nozzle insertion holes in the iron holder base.
  (For Φ1, Φ2 nozzles and Φ3 nozzles.)

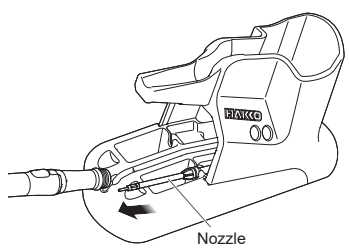


● Removing the nozzle

(1) While rotating the handpiece, insert the D-cut part of the nozzle into the groove in the iron holder.

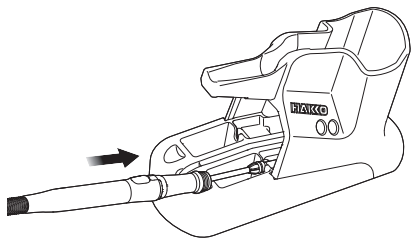


(2) Pull the handpiece straight out.



● Nozzle installation

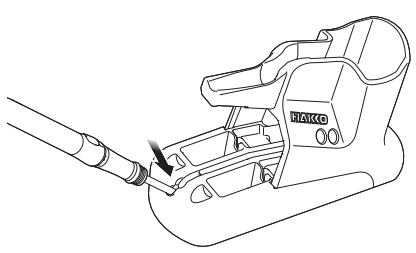
(1) Insert the nozzle into the handpiece.



(2) Use the hole in the iron holder base to insert the nozzle all the way in. (The figure below shows hole for Φ1 and Φ2 nozzles.)
The direction of the bent nozzles can be adjusted using the hole.

NOTE Applying too much downward pressure may damage the nozzle.

NOTE To prevent damage and ensure safety, hold the iron holder securely while the operating.

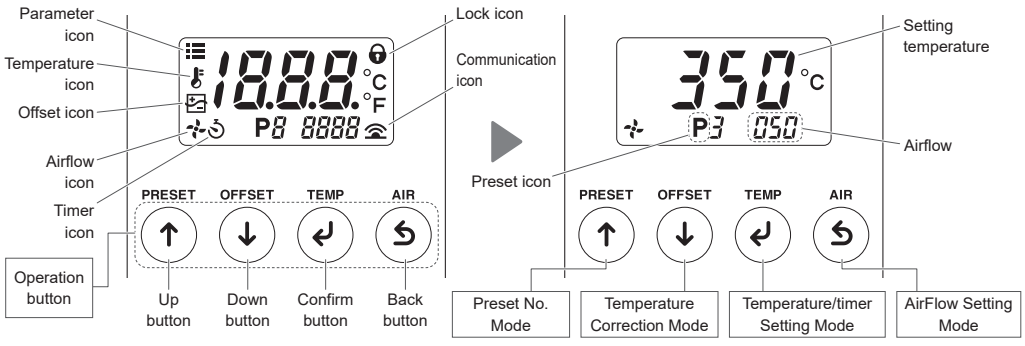


4-3. Operation

⚠CAUTION

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

The following display appears after turning the power on.



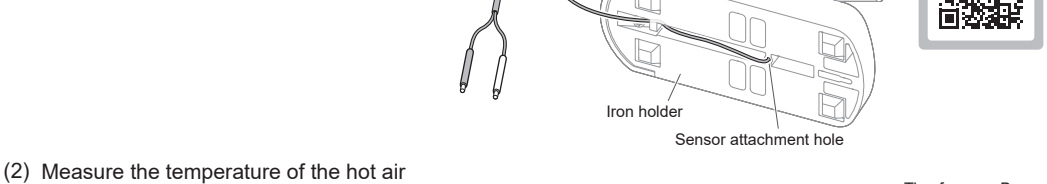
■ Changing the set temperature/timer settings

Factory default settings
Set temperature: 350ºC Timer setting: OFF

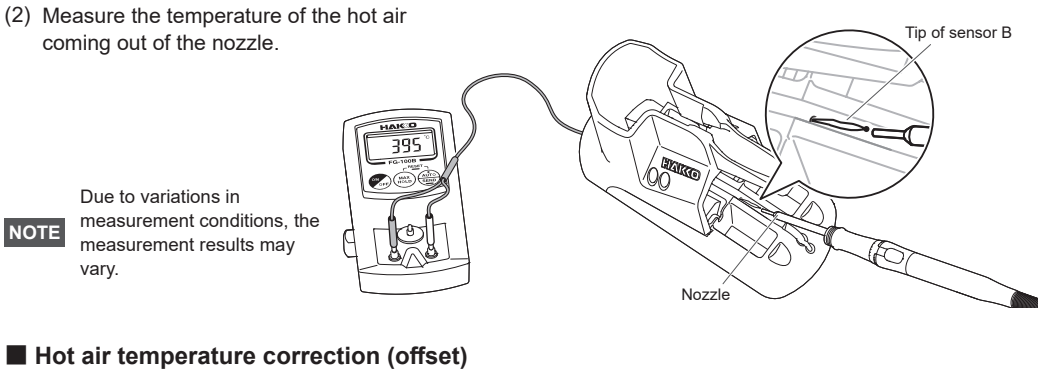
Push TEMP	Push this button once to display [🌡] and the device will enter "temperature/timer setting mode." This mode is used to change the set temperature and timer settings.

▼ **To change to 400ºC**

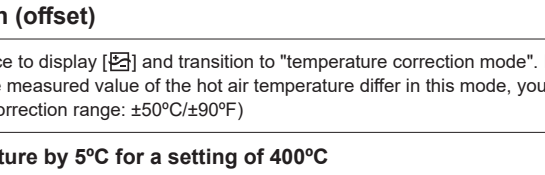
Set temperature



Timer settings



Once the setup is complete, the display will show as follows.
The set time and airflow alternate on the display.



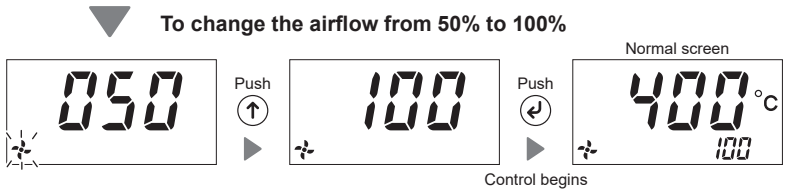
■ Changing the airflow setting

Factory default setting 50%

The airflow can be set from 5 to 100%.

Push AIR	Push this button once to display the [🌀] and transition to "airflow setting mode." This mode is used when changing the set airflow.

▼ **To change the airflow from 50% to 100%**



■ Changing the preset No.

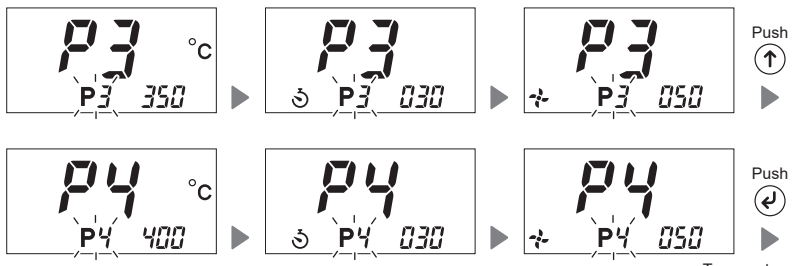
You can program up to five frequently used settings on the product, and then select the preset number to change the settings.

Factory default settings

Preset No.	P1	P2	P3	P4	P5
Set temperatures	250ºC (600ºF)	300ºC (700ºF)	350ºC (750ºF)	400ºC (800ºF)	450ºC (850ºF)
Timer settings (OFF/Opened/Closed)	OFF				
Airflow	50%				

Push PRESET	Push this button once to transition to "preset No. mode." Select one of the 5 programmed presets in this mode.

▼ **To change from P3 (350ºC) to P4 (400ºC)**



NOTE The programmed set temperature, timer setting, and airflow for each preset number can be changed in "parameter No. 23". (See "6. Parameter settings")

NOTE To restrict changes to the set temperature, change the setting in "parameter No. 14."

4. Operation (cont'd)

■ Measurement of hot air temperature

With optional part A1557, sensor B, attached to the iron holder, hot air temperature measurement is possible.

(1) To attach the sensor, insert the tip of sensor B into the sensor attachment hole on the back of the iron holder. (See the figure on the right)

Video

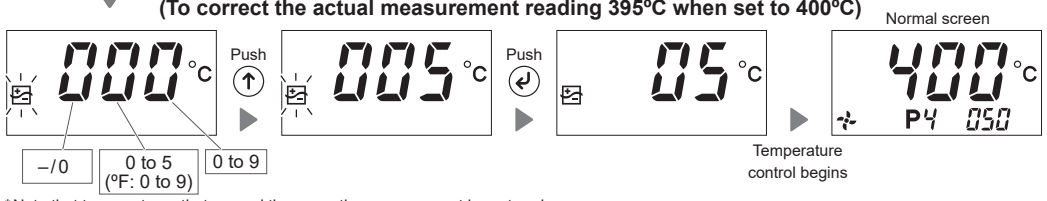
(2) Measure the temperature of the hot air coming out of the nozzle.

NOTE Due to variations in measurement conditions, the measurement results may vary.

■ Hot air 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 hot air 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 the actual measurement reading 395ºC when set to 400ºC)

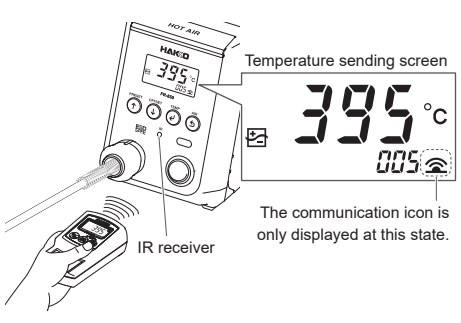


*Note that temperatures that exceed the correction range cannot be entered.

NOTE The offset correction range is a design value and not a guaranteed value.
The correction range may vary depending on the measurement environment.

As the heater element degrades, the hot air temperature tends to decrease.
The hot air temperature changes with nozzle replacement, so the offset value needs to be readjusted.
Make sure to change the offset value as needed while monitoring the actual hot air temperature.

With a HAKKO thermometer with temperature sending function, the offset value can be automatically adjusted.
Transmit the measured value of the thermometer after transitioning to "temperature correction mode".

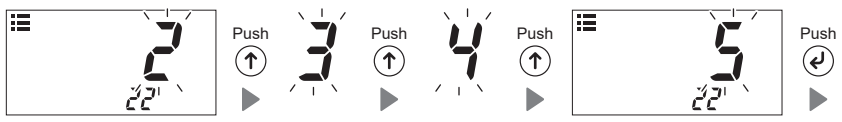


■ Chain preset function (temperature profile function)

This function can chain presets to create a basic profile with up to 5 steps.

(1) Set "parameter No. 22" to "On". (See "6. Parameter settings")

(2) Determines the number of presets to be chained.



(3) Select the preset number that you want to chain.

(4) Change the settings of the preset to be chained in "parameter No. 23."

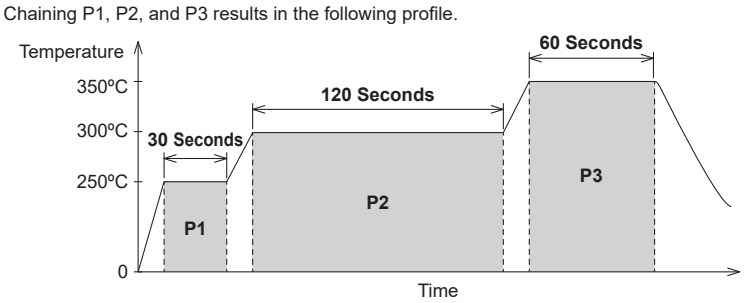
NOTE By the factory default, the chain preset is not set, so change the timer setting in "Parameter No. 23" to "OPn" or "CLS."

(5) After the setting is complete, push the **[HOT AIR]** button or the button on the handpiece to start the chain-presets.

Example: When P1, P2, and P3 are chained from the following presets

Preset No.	P1	P2	P3	P4	P5
Set temperature	250ºC (600ºF)	300ºC (700ºF)	350ºC (750ºF)	400ºC (800ºF)	450ºC (850ºF)
Timer settings (OFF/Opened/Closed)	Opened				
Time	30 Seconds	120 Seconds	60 Seconds	60 Seconds	60 Seconds
Airflow	50%				

Chaining P1, P2, and P3 results in the following profile.

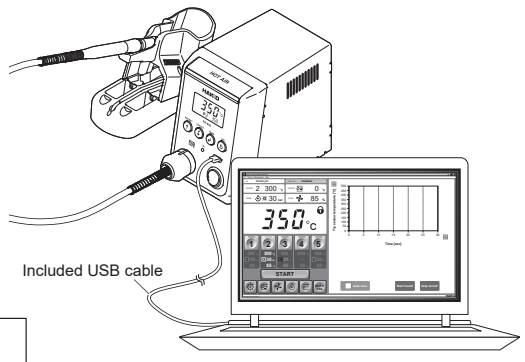


Video

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 temperature and save its history as a CSV file



5-1. Operating environment

Supported OS	Windows 10, Windows 11 (Excluding ARM-based Windows)
CPU	1GHz or faster processor or SoC (Excluding ARM processors)

Supported operating systems are based on information as of March 2025 and are subject to change.
The lastest information is available on the HAKKO website.

5-2. Downloading the Software (Online)

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

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

(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.

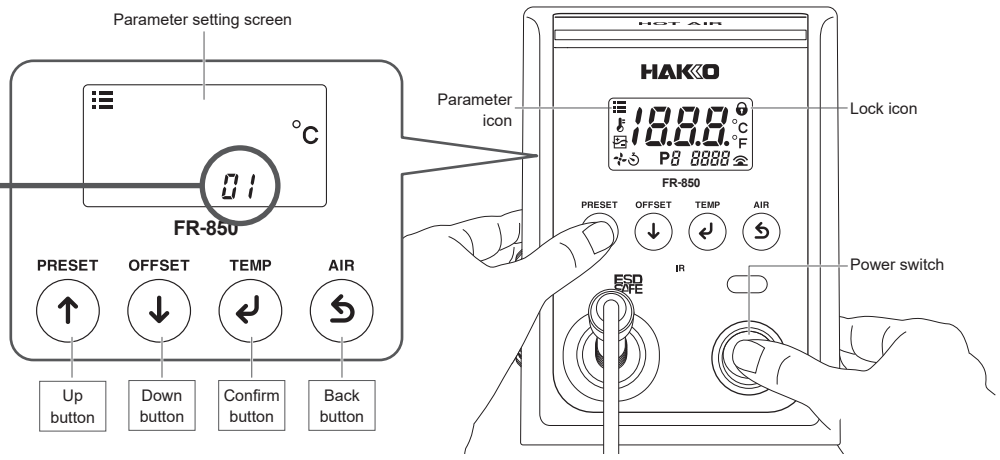
(6) Enter the product name as a keyword.

(7) Select a language, and then click **[Search by Condition]**.

(8) Click **[Download]** in the search results.

Please refer to the manual included in the download data for instructions on installing the software and operation.

6. Parameter settings



(1) Turn on the power while pressing the ↑.

(2) Select the parameter number using the ↑ or the ↓.

(3) Push the ↵.

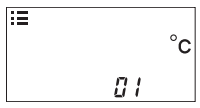
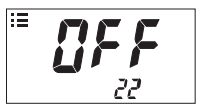
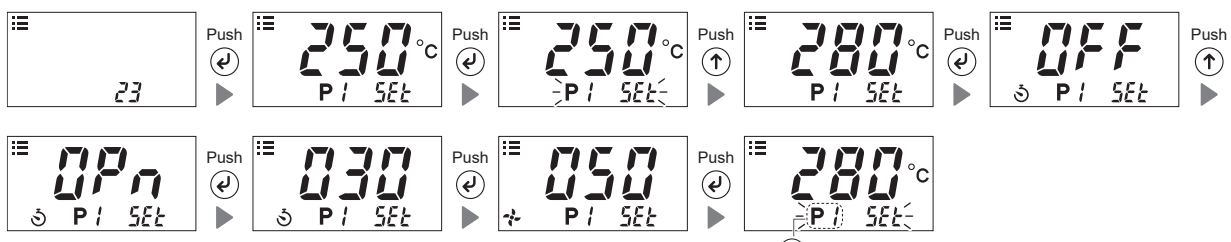
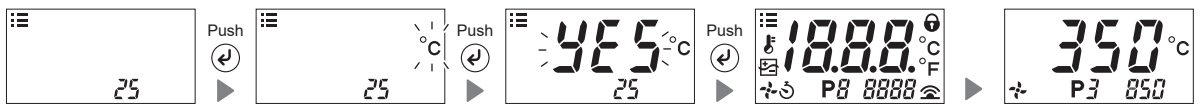
(4) Change the setting using the ↑ or the ↓.

(5) Push the ↵.

(6) Push the ↩.

(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 ºC or ºF. ●All set values are converted to the changed display temperature unit.	ºC/ºF	 (For USA: ºF)
05	**Error alarm set: [On]/[OFF] setting** A buzzer will note when a sensor error [S - E] occurs. Select [OFF] if you do not wish to use this function.	On/OFF	
06	**Ready alarm: [On]/[OFF] setting** A buzzer will sound when hot air reaches the setting temperature. Select [OFF] if you do not wish to use this function.	On/OFF	
08	**Auto shut-off: [On]/[OFF] setting** Set whether to automatically turn off power to the heater when the time set in Parameter No. 18 is reached. Select [OFF] if you do not wish to use this function.	On/OFF	
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.	**Process when [PAr] is selected** 
18	**Auto shut-off: 30 or 60 minutes setting** Set the maximum duration the heater can be powered after turning the heater power on. If set to 30 minutes, the buzzer will sound three times after 30 minutes, and the device will automatically enter cooling mode.	30/60 min	
22	**Chain-Preset: [On]/[OFF] setting** Presets can be chained. This function can chain presets to create a basic profile with up to 5 steps. ●When using this function, change the timer setting in "Parameter No. 23" to "OPn" or "CLS."	On/OFF	
23	**Preset settings: Change each programmed set temperature, timer setting, and airflow** You can program 5 frequently used settings. This function saves you the trouble of changing settings. Default value: Preset No. / P1 / P2 / P3 / P4 / P5 Set temperature / 250ºC (600ºF) / 300ºC (700ºF) / 350ºC (750ºF) / 400ºC (800ºF) / 450ºC (850ºF) Timer settings (OFF/Opened/Closed) / OFF Airflow / 50%	50 to 600ºC 120 to 1150ºF	The setting items change in the order of "temperature", "timer", and "airflow." Example: If P1 settings are changed to a temperature of 280ºC, opened time of 30 seconds, and airflow of 50%  With ↑, the display switches between P1 > P2 > P3 > P4 > P5.
38	**Quick Start: [On]/[OFF] setting** Remove the handpiece from the holder and the operation will start immediately. This function allows you to start working quickly.	On/OFF	
39	**Operating mode change alarm: [On]/[OFF] setting** A buzzer will sound when air starts flowing, when the heater transitions to cooling, and when the timer settings is reached. Select [OFF] if you do not wish to use this function.	On/OFF	
25	**Initial reset** Reset the product to factory default settings.	ºC/ºF	

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

7. Maintenance

⚠CAUTION

Turn the power off and unplug the power cord before inspecting or replacing any internal components.

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

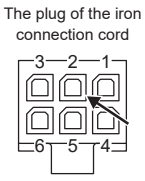
■ Inspection

● Nozzle inspection

Measure the resistance between the two contact points at the end of the nozzle, and if the measured value is abnormal, replace the nozzle.
The normal resistance values are as follows:
NA01: 6.2 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 nozzle and the plug (pin 2) 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.



■ Daily maintenance

Setting temperature	Using the product at a temperature that is higher than necessary can accelerate the degradation of the heating element and damage parts that are sensitive to heat. Use the lowest temperature whenever possible.
Before beginning work	Perform a visual check of the nozzle. Replace it if it is deformed or damaged.
During work	To prevent degradation of the heating element and ensure safety, do not leave the hot air on when not in use. Turn off the power switch when not using the product for a long period of time.

8. Troubleshooting

⚠CAUTION

Turn the power off and unplug the power cord before inspecting or replacing any internal components.

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
The [HOT AIR] button lights up red. [S-E] is displayed.	Is the nozzle fully inserted?	▶ Insert nozzle 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 nozzle. The normal resistance values are as follows: NA01: 6.2Ω±10% (at room temperature) NA01 Measure the resistance between these points.
The [HOT AIR] button lights up red. [- - -] 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.
The hot air temperature is too high/low.	Is the offset value entered correct?	▶ Measure and adjust the value. (See "■ Hot air temperature correction (offset)" in "4-3. Operation")
The hot air does not stop even when the iron is placed in the holder.	Is the soldering iron properly inserted into the Iron receptacle?	▶ Insert the handpiece properly into the Iron receptacle.
The auto shut-off function does not work.	Is parameter No. 08 [OFF]?	▶ Change it to [On] to enable feature.

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

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