HAKKO

# REWORK SYSTEM

# FR-702

# Instruction Manual

●

Thank you for purchasing the HAKKO FR-702 Rework System.
This product is a multi-purpose machine that uses the quick-change mechanism.
Please read the manual before operating the HAKKO FR-702.
Please keep this manual readily accessible for reference.

●

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# 1. PACKING LIST

Please check to make sure that all items listed below are included in the package.

HAKKO FR-702 station ..... 1
Power cord ..... 1
HAKKO FX-8801 soldering iron ..... 1
HAKKO FH-800 iron holder (with cleaning sponge) ..... 1
Cleaning wire ..... 1
HAKKO FR-4103 handpiece
with N61-05 (ø1.0 mm [0.04 in.] type S) nozzle ..... 1
HAKKO FH-410 iron holder (with cleaning wire) ..... 1
Tool box ..... 1
Handpiece holder (for hot air) ..... 1
Pads (ø3.0 mm [0.12 in.],
ø5.0 mm [0.20 in.], ø7.6 mm [0.30 in.]) ..... 2 each
Heat resistant pad ..... 1
Vacuum pipe control knob (L) (with tapping screw) ..... 1
Nozzle N51-02 (ø4.0 mm [0.16 in.]) ..... 1
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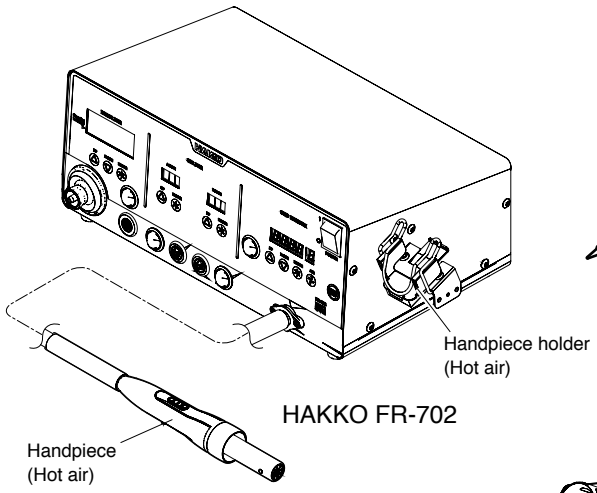
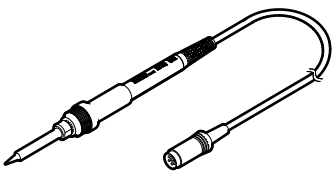
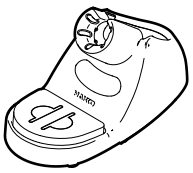



HAKKO FR-702



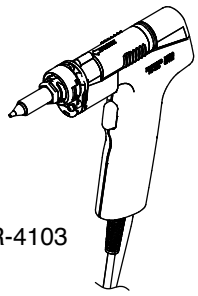
HAKKO FX-8801



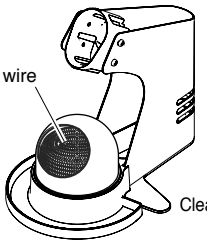
HAKKO FH-800

Color band
(×2)

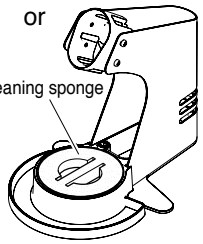
Cleaning wire



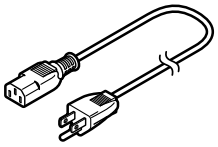
HAKKO FR-4103




or

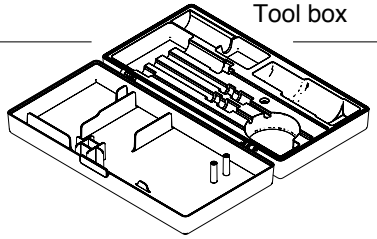



HAKKO FH-410



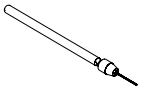
Power cord

Tool box



×1

Cleaning Pin
(for ø1.0 mm [0.04 in.] nozzle)



×1

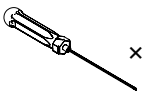
Cleaning Drill
(for ø1.0 mm [0.04 in.] nozzle)

×4

Ceramic paper
Filter
(for handpiece)

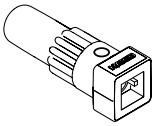
×2

Filter
(for station)



×1

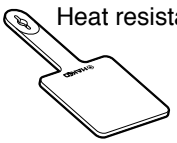
Cleaning Pin
(for heating element)



×1

Nozzle wrench

Nozzle
N51-02



Heat resistant pad

2 for each pad

Tapping
screw

Vacuum pipe
control knob (L)

# 2. SPECIFICATIONS

### ● HAKKO FR-702

| | |
|---|---|
| Power consumption | 100 V-1030 W, 110 V-1170 W,<br>220 V-1430 W, 230 V-1530 W, 240 V-1630 W |

### ● Station

| | |
|---|---|
| Dimensions (W × H × D) | 370 (W) × 150 (H) × 220 (D) mm<br>(14.6 × 5.9 × 8.7 in.) |
| Weight | 9 kg (19.8 lb.) |

### ● Station (Soldering iron)

| | |
|---|---|
| Output | AC 26 V |
| Temperature range | 50 - 480°C (120 - 899°F) |
| Temperature stability | ±1°C (±1.8°F) at idle temperature<br>When set to 200 - 480°C (400 - 899°F) |

### ● Station (Desoldering tool)

| | |
|---|---|
| Output | AC 24 V |
| Vacuum generator | Vacuum pump, double cylinder type |
| Vacuum pressure (max.) | 80 kPa (600 mmHg) |
| Suction flow | 15 L/min. |
| Temperature range | 330 - 450°C (620 - 850°F) |
| Temperature stability | ±5°C (±9°F) at idle temperature |

### ● Station (SMD Rework station)

| | |
|---|---|
| Power consumption | 30 W |
| Capacity (Airflow) | 1 - 9 (5 - 115 L/min*) |
| Control temperature | 50 - 600°C (120 - 1120°F) |

* Airflow capacity is rated as free flowing. Restrictions created by various nozzles may reduce the maximum airflow capacity.

### ● Handpiece (Soldering iron HAKKO FX-8801)

| | |
|---|---|
| Power consumption | 65 W (26 V) |
| Tip to ground resistance | <2 Ω |
| Tip to ground potential | <2 mV |
| Heating element | Ceramic heater |
| Cord lengh | 1.2 m (4 ft.) |
| Total length (w/o cord) | 217 mm (8.5 in.) with B tip |
| Weight (w/o cord) | 46 g (0.10 lb.) with B tip |

### ● Handpiece (Desoldering HAKKO FR-4103)

| | |
|---|---|
| Power consumption | 140 W (24 V) |
| Nozzle to ground resistance | <2 Ω |
| Nozzle to ground potential | <2 mV |
| Cord lengh | 1.2 m (4 ft.) |
| Length (w/o cord) | 168 mm (6.6 in.) with N61-05 nozzle |
| Weight (w/o cord) | 190 g (0.42 lb.) with N61-05 nozzle |

### ● Handpiece (SMD Rework station)

| | |
|---|---|
| Power consumption | 100 V-670 W, 110 V-810 W,<br>220 V-1070 W, 230 V-1170 W, 240 V-1270 W |
| Total length (w/o cord) | 250 mm (9.8 in.) |
| Weight (w/o cord) | 180 g (0.40 lb.) |

* The temperature was measured using the FG-101 Soldering Tester.
* This product is protected against electrostatic discharge.
* Specifications and design are subject to change without notice.

### ⚠ 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.

● 各言語（日本語、英語、中国語、フランス語、ドイツ語、韓国語）の取扱説明書は以下の URL、HAKKO Document Portal からダウンロードしてご覧いただけます。
（商品によっては設定の無い言語がありますが、ご了承ください。）

● 各國語言（日語、英語、中文、法語、德語、韓語）的使用説明書可以通過以下网站的 HAKKO Document Portal 下載參閱。
（有一部分的產品沒有設定外語對應、請見諒）

● Instruction manual in the language of Japanese, English, Chinese, French, German, and Korean can be downloaded from the HAKKO Document Portal.
(Please note that some languages may not be available depending on the product.)

➡ **https://www.hakko.com/english/support/doc/**

# 3. WARNINGS, CAUTIONS AND NOTES

Warnings, cautions and notes are placed at critical points in this manual to direct the operator's 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 : A NOTE indicates a procedure or point that is important to the process being described.

## ⚠ WARNING

**When power is ON, the tip and nozzle will be hot. To avoid injury or damage to personnel and items in the work area, observe the following:**

- Do not touch the tip and nozzle or the metal parts near the tip and nozzle. Do not direct the hot air toward personnel or touch the metal parts near the nozzle.
- Do not allow the tip and nozzle to come close to, or touch, flammable materials.
- Inform others in the area that the unit is hot and should not be touched.
- Turn the power off when not in use, or left unattended.
- Turn the power off when changing parts or storing the HAKKO FR-702.
- This unit is for counter or workbench use only.
- 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 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.

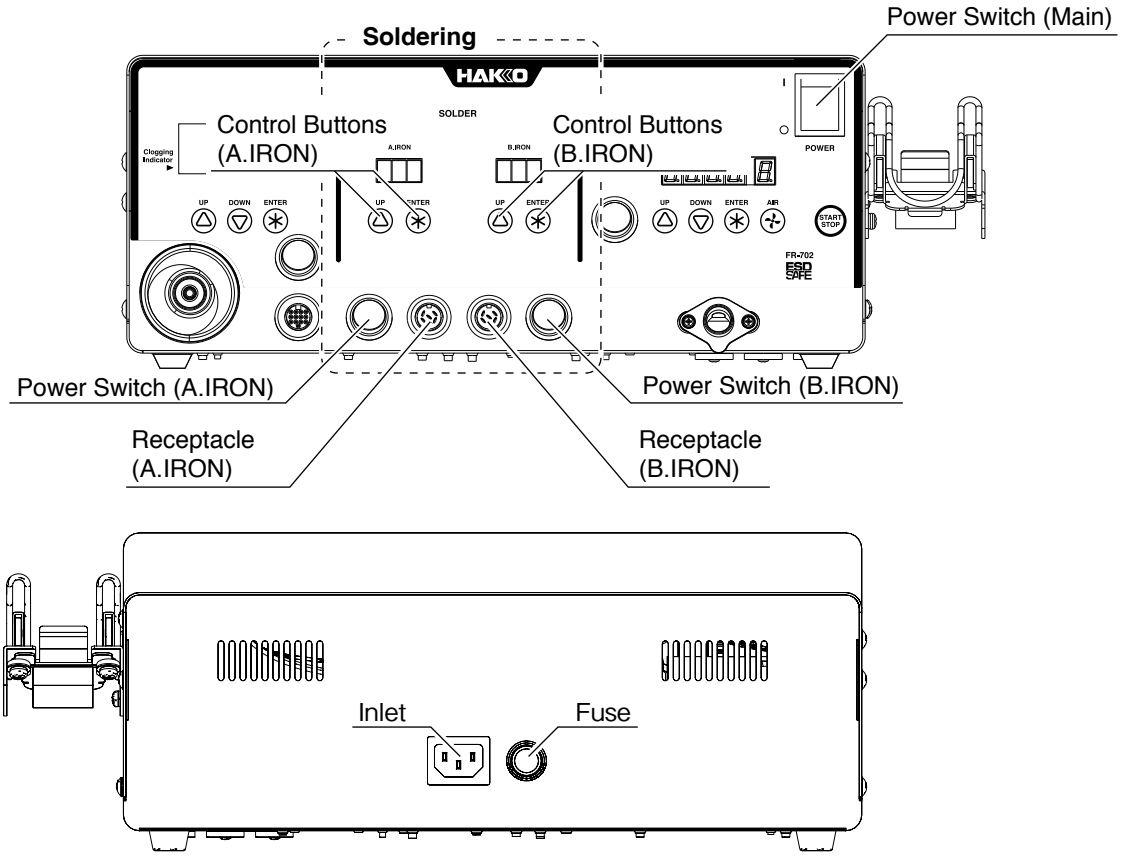
**To prevent accidents or damage to the HAKKO FR-702, be sure to observe the following:**

## ⚠ CAUTION

- Do not use the unit for applications other than soldering or desoldering.
- Do not strike the handpiece against hard objects to remove excess solder. This will damage the handpiece.
- Do not modify the HAKKO FR-702.
- Use only genuine HAKKO replacement parts.
- Do not allow the HAKKO FR-702 to become wet, or use it when hands are wet.
- Be sure to hold the plug when inserting or removing the handpiece and power cords.
- Be sure the work area is well ventilated. Soldering and desoldering produces smoke.
- While using the HAKKO FR-702, don't do anything which may cause bodily harm or physical damage.

# 4. PART NAMES (Soldering iron)

## ● Station



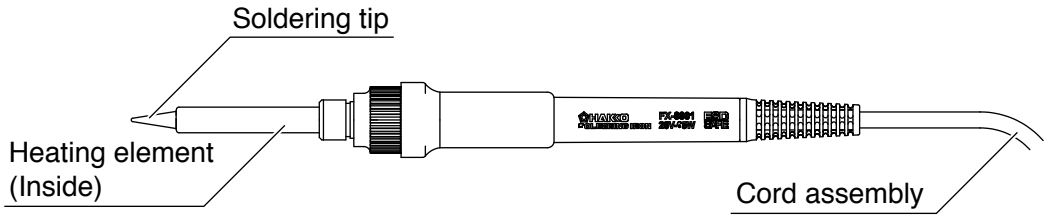

* Use this product with the following models.

- HAKKO FX-8801 {Soldering iron (M)}
- HAKKO FX-8802 (Soldering iron $N_2$ Type)
- HAKKO FX-8803 (Soldering gun)
- HAKKO FX-8804 (SMD Hot tweezer)
- HAKKO FX-8805 {Soldering iron (L)}

● When using the HAKKO FX-8802 / FX-8803 / FX-8804, please use the applicable iron holder.

● Each HAKKO handpiece with the exception of the HAKKO FX-8801 / FX-8805 has their own instruction manual. Please refer to this manual for specifications and replacement parts.

## ● Soldering iron (HAKKO FX-8801)

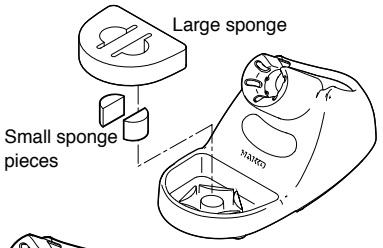


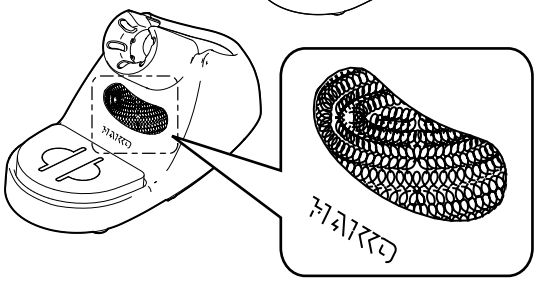
# 5. INITIAL SETUP (Soldering iron)

## A. Setup the iron holder

1. Fit the small sponge pieces into the hollows of the iron holder base.
2. Add an appropriate amount of water into the iron holder base. The small sponge will absorb water and help keep the large sponge damp at all times.
3. Dampen the large sponge and place it on the iron holder base.

> **⚠CAUTION**
> Be sure the sponge is moistened with water before use to avoid damaging the tip.



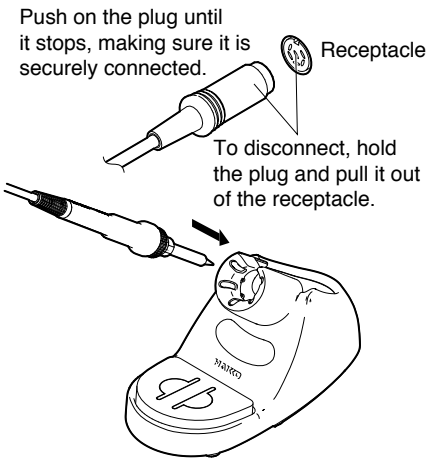
***When using a Cleaning Wire**

Place it in the iron holder as shown on the right.

## B. Connect the iron to the station

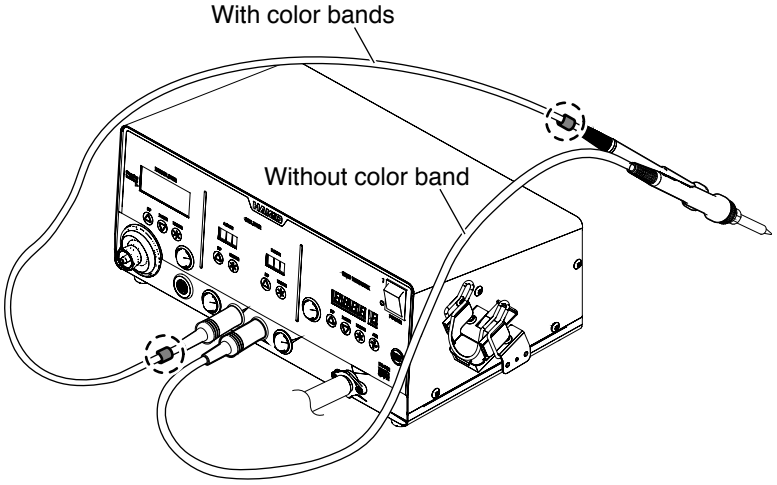
1. Connect the cord assembly to the receptacle.
2. Place the iron into the iron holder.
3. Plug the power cord into an appropriate power supply.

> **⚠CAUTION**
> · Be sure to turn off the power before connecting or disconnecting the cord assembly for the iron to and from the receptacle to avoid damaging the circuit board.
> · Do not use any iron other than those listed in Section 4 of this manual. Doing so may result in inadequate performance and / or possible damage to the unit.
> · The unit is protected against electrostatic discharge and must be grounded for full efficiency.




*** When using two soldering irons simultaneously**

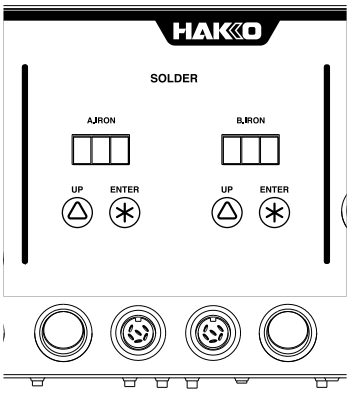
Attachment of the color bands to one of the soldering irons will help identify which soldering iron is connected to receptacle "A.IRON" and "B.IRON".



# 6. OPERATION (Soldering iron)

## ● Operation and indication

Switch and control button




The front panel of HAKKO FR-702 (Soldering iron) has two control buttons each for “A.IRON” and “B.IRON”.

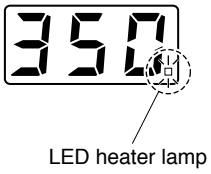
△ - Use this button to select and change settings.
In the preset mode, pressing this button will change the selected preset temperature while the unit is in operation.
Pressing and holding the button will start the adjust mode.

✳ - Use this button to make and confirm selections.
Pressing this button will display the current set temperature.
Pressing and holding the button will start the temperature setting mode.

## A. Operation

1. Turn on the power switch (main) located on the front.
2. Turn on either one of power switches located on each side depending on which receptacle of “A.IRON” or “B.IRON” is used.

After turning on the power switch, 888. will be displayed for two seconds, and current temperature will be displayed.
When the display stabilizes, the LED heater lamp will begin to flash.




> **⚠ CAUTION**
> Place the iron in the iron holder when not in use. Turn the power off when the HAKKO FR-702 is not in use for an extended period.

## B. After use

Always clean the tip and coat it with fresh solder after use. (Refer to “● Tip Maintenance” in 8. MAINTENANCE (Soldering iron).)

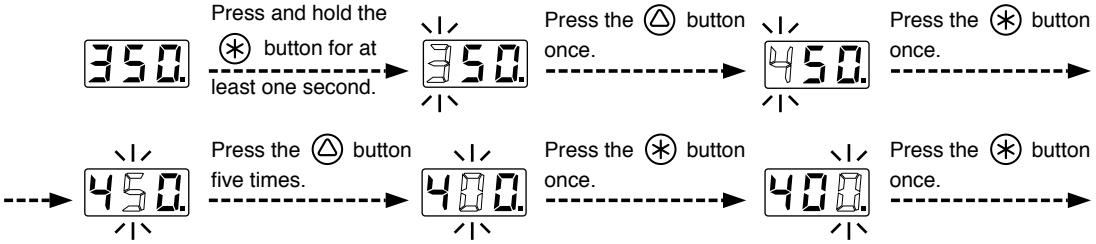
## ● Making Changes to Settings

| ⚠ CAUTION |
|---|
| If no buttons are pressed for at least one minute during the process of changing settings of the unit, the system will exit and return to operating mode and display the current temperature. |

## A. The temperature setting mode (Changing the set temperature)

The temperature setting range is from 50 to 480℃. (from 120 to 899°F)
By default, the temperature is set to 350°C. (750°F)

Example : Changing from 350°C to 400°C




The desired temperature is saved to the system memory.
Heater control will begin after the new set temperature is displayed.

# 6. OPERATION (Soldering iron) (continued)

## B. The preset mode (Select the set temperature)

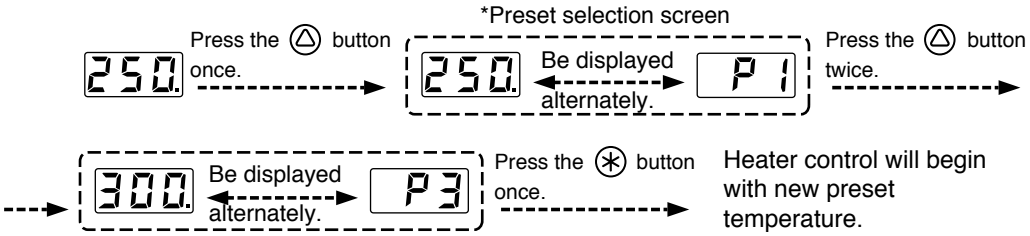
When changing the soldering iron temperature, there is a preset function that selects the temperatures set (up to 5 can be stored).

Initial preset temperatures

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)

The initial number of active presets is set to 5 at the factory.
The default selected preset is set to P3 at the factory.

Example : Changing preset temperature from preset No.1 (250°C) to No.3 (350°C).




The procedure for making changes to the preset temperatures is the same with “A. The temperature setting mode” in 6. OPERATION (Soldering iron).
Change the mode on the parameter setting screen. (Refer to “7. PARAMETER SETTING (Soldering iron)”)

## C. The adjust mode (Performing the temperature adjustment)

When replacing the iron, heater or tip, a temperature adjustment may be required.
Use the adjust mode to perform the temperature adjustment.

**⚠ CAUTION**

- Enter the observed value in the adjust mode after the tip temperature stabilizes.
- The maximum single adjustment that can be made is ±150°C (±270°F) relative to the set temperature. If a larger adjustment is needed, make the first adjustment at the maximum value of 150°C (270°F), then repeat the adjustment process.
- When a new soldering iron is used or insertion position is changed from A.IRON to B.IRON (and vice versa), temperature adjustment is always required.

**Example : If the measured temperature is 380°C, and the set temperature is 400°C.**

1. Press and hold the △ button for at least two seconds.

● A.d.J. is displayed.
When you press the ✳ button, the display will move to the adjust mode.

2. Changing from 400. to 380.

● The procedure for changing the value in adjust mode is the same with “A. The temperature setting mode” in 6. OPERATION (Soldering iron).

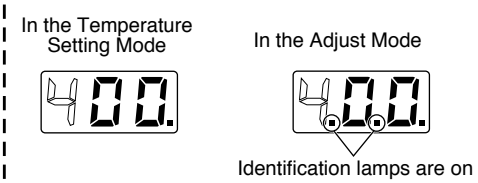
**NOTE :**
During adjust mode, the hundreds digit will accept values from 0 (1 through 9 in °F) 6 if the temperature is set to display in °C, or the values 0 through 9 if the temperature is set to display in °F.

3. Press the ✳ button to exit the setting after changing the values.

● The tip temperature will be adjusted accordingly.

* How to distinguish between Temperature Setting Mode and Adjust Mode.

The display differs in the temperature setting and the adjust mode.




**⚠ CAUTION**
Please be sure to confirm the status of the identification lamps so that you do not enter a value in the wrong mode.

## D. Password function (Restriction on setting changes)

It is possible to restrict certain setting changes to the unit.
There are three choices for the password setting. (The factory default is "0 : Open")

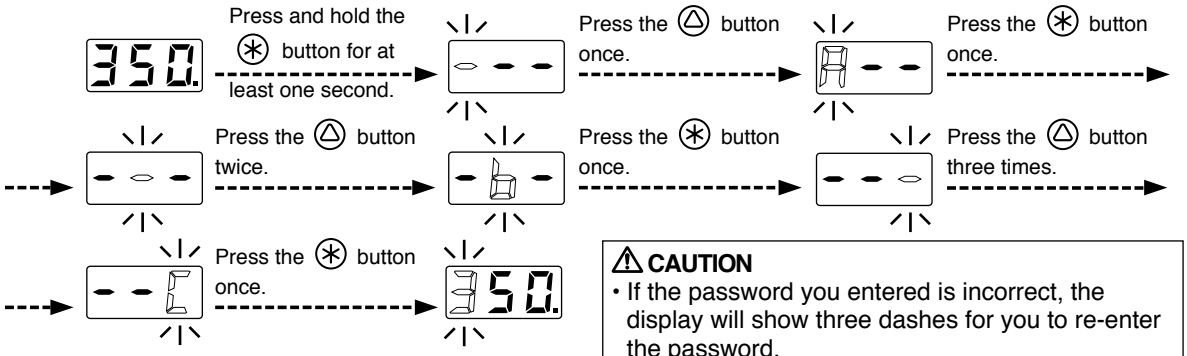
| | 0 : Open | 1 : Partial | 2 : Restricted |
|---|---|---|---|
| Move to the parameter setting mode | ○ | × | × |
| Move to the temperature setting mode | ○ | △ | × |
| Move to the preset mode | ○ | △ | × |
| Move to the adjust mode | ○ | △ | × |

○ : You can make changes without entering a password.
△ : You can choose whether or not a password is needed to make changes.
× : A password is required to make changes.

Select and input three letters for password from six letters on the right.


The letters for password

Example: The procedure for changing the set temperature when the unit is restricted by a password.
(Password is “AbC”)




**⚠ CAUTION**

- If the password you entered is incorrect, the display will show three dashes for you to re-enter the password.
- If you enter the password incorrectly twice in a row, the display will return to the previous screen.

The unit will move to the change setting screen for each mode after entering the password.
Please change the setting for each mode according to the procedure.
Enter the parameter setting to change the mode. Please refer to “7. PARAMETER SETTING (Soldering iron) ”.

# 7. PARAMETER SETTING (Soldering iron)

Soldering iron has the following parameters.

| Parameter name | Parameter No. | Value | Initial value |
|---|---|---|---|
| °C / °F selection | 01 | °C / °F | °C (°F*5) |
| Low temperature error setting | 03 | 30 to 150°C (54 to 270°F) | 150°C (270°F) |
| Setting mode selection | 11 | 0：The normal mode / 1：The preset mode | 0 |
| The number of preset*1 | | 2P (2 pcs.) to 5P (5 pcs.) | 5P |
| Password setting | 14 | 0：Open / 1：Partial / 2：Restricted | 0 |
| Temperature setting mode*2 | | 10 : ○*4 / 11 : ×*4 | 11 |
| Preset mode*2 | | 20 : ○*4 / 21 : ×*4 | 20 |
| Adjust mode*2 | | 30 : ○*4 / 31 : ×*4 | 31 |
| Password*3 | | AbCdEF Select three letters | - |

*1 It is displayed only when "1: Preset mode" is selected in the setting mode.
*2 It is displayed only when "1: Partial" is selected in the password setting.
*3 It is displayed only when either "1: Partial" or "2: Restricted" is selected in the password setting.
*4 ○ : Password not required　× : Password required
*5 For USA.

### ● 01: °C or °F temperature display seletion

The displayed temperature can be switched between Celsius and Fahrenheit.

### ● 03: Low temperature error setting

If the sensor temperature goes below the low-limit temperature although heating element is on, an error will be displayed.

### ● 11: Setting mode selection

Temperature setting can be switched between the normal mode and the preset mode.
If selecting the preset mode, you will be asked for the number of preset you required.
Press the △ button to set the number.

### ● 14: Password setting

Select “Open”, “Partial” or “Restricted” for password setting.If selecting the Restricted, perform the setting for password. If selecting the partial, choose whether or not the password function is needed when moving to the temperature setting mode, the preset mode and the adjust mode and set the password.

● **Parameter setting mode**

1. Turn off the power switch.
2. Turn on the power switch while pressing the △ button.
3. When the display shows [01], the station is in parameter setting mode.

**A. °C or °F temperature display selection**

1. Either [C] or [F] will be displayed if you press the ✳ button when [01] is displayed.
2. [C] and [F] will be switched alternately If you press the △ button.
3. The display will return to [01] if you press the ✳ button after selecting.

**B. Low temperature error setting**

1. Press the △ button to change the display to [03].
2. The low-limit temperature will be displayed if you press the ✳ button. Enter the value in the same manner as described in the normal mode 6. OPERATION (Soldering iron) “A. The temperature setting mode”.
3. The display will return to [03] if you press the ✳ button after setting.

**C. Setting mode selection**

1. Press the △ button to change the display to [11].
2. If you press the ✳ button, the display will move to the setting mode selection screen. If you press the △ button, [0] (The normal mode) and [1] (The preset mode) will be switched alternately.
3. The display will return to [11] if you press the ✳ button after selecting.*

*** If you select the preset mode, the display will move to the preset selection screen.**

4. The number of active preset will be displayed If you press the ✳ button at 3.
   (Example : If the number is three, [3P] is displayed.)
5. Press the △ button to change the value and select the number of active preset you required.
   **The unit will accept values from 2P through 5P.**
6. The display will return to [11] if you press the ✳ button after selecting.

# 7. PARAMETER SETTING (Soldering iron) (continued)

**D. Password setting**

1. Press the △ button to change the display to [14].
2. If you press the ✳ button, the display will move to the setting mode selection screen.
   If you press the △ button, [0] (Open), [1] (Partial) and [2] (Restricted) will be switched alternately.
3. If you press the ✳ button after selecting, the display will return to [14]. (Refer to *1, 2)

***1 The display will move to the following selection screen if you select [1] (Partial).**

4. If you press the ✳ button at 3, you will be asked whether or not the password function is needed when moving to the temperature setting mode.
5. Either [10] (without password) or [11] (with password) will be displayed if you press the △ button.
6. If you press the ✳ button after selecting, you will be asked whether or not the password function is needed when moving to the preset selection mode.
7. Either [20] (without password) or [21] (with password) will be displayed if you press the △ button.
8. If you press the ✳ button after selecting, you will be asked whether or not the password function is needed when moving to the adjust mode.
9. Either [30] (without password) or [31] (with password) will be displayed if you press the △ button.
10. If you press the ✳ button after selecting, the display will move to password setting screen.

***2 If you select [2] (Restricted), the display will move to the following password setting screen. If you select [1] (Partial), the display will move to the following the password setting screen after selecting *1.**

11. When the third digit is flashing, you can input the character you require. Press the △ button to change the value of the third digit.
12. After determining the desired character ( AbCdEF ), press the ✳ button. The second digit will begin to flash. Using the same procedure, enter the character you require for the second digit, and the first digit.
13. The display will return to [14] if you press the ✳ button after entering the units digit.

After changing parameters, press and hold the ✳ button down for at least two seconds until [Y] is displayed. At this time, you can switch between [Y] and [n] by pressing the △ button. Select [Y] if you are finished making changes or [n] if you need to go back and make more changes. Press the ✳ button to confirm you selection.

**Changes will not be completed until [Y] is displayed and you press the ✳ button.**
**Please note that no changes will be made if you turn off the power while making changes.**

# 8. MAINTENANCE (Soldering iron)

Performing proper and periodic maintenance extends product life. Efficient soldering depends upon the temperature, the solder/flux.
Apply the following service procedure as dictated by the conditions of usage.

| ⚠ WARNING |
| --- |
| Since the soldering iron can reach a very high temperature, please work carefully. Except the case especially indicated, always turn the power switch OFF and disconnect the power plug before performing any maintenance procedure. |

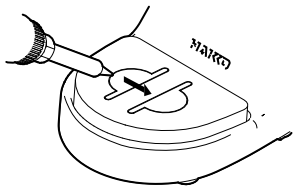
## ● Tip Maintenance

1. Set the temperature to 250°C (482°F).
2. When the temperature stabilizes, clean the tip with the cleaning sponge and check the condition of the tip.
3. If the solder plated part of the tip is covered with black oxide, apply fresh solder containing flux, and clean the tip again. Repeat until all the oxide is removed, then coat the tip with fresh solder.
4. If the tip is deformed or heavily eroded, replace it with a new one.

| ⚠ CAUTION |
| --- |
| Do not file the tip in an attempt to remove the black oxide. |

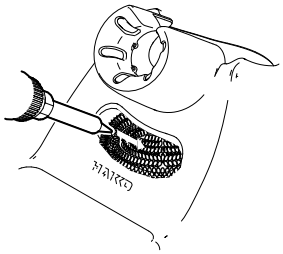
■ Cleaning the tip using the iron holder

1. Using the cleaning sponge



Use the cleaning sponge that comes with the product to clean the tip. It offers wide-ranging uses, from simple removal of excess solder to complete elimination of matter occurring as a result of oxidization.

2. Using the cleaning wire



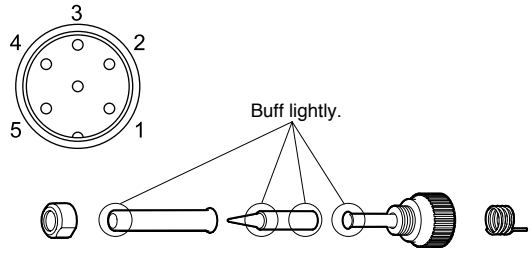
Material that is not removed easily with the cleaning sponge can likely be removed using the cleaning wire.

# 9. CHECKING PROCEDURE (Soldering iron)

Disconnect the plug of the cord assembly and measure the resistance value between the ping of the connecting plug as follows.

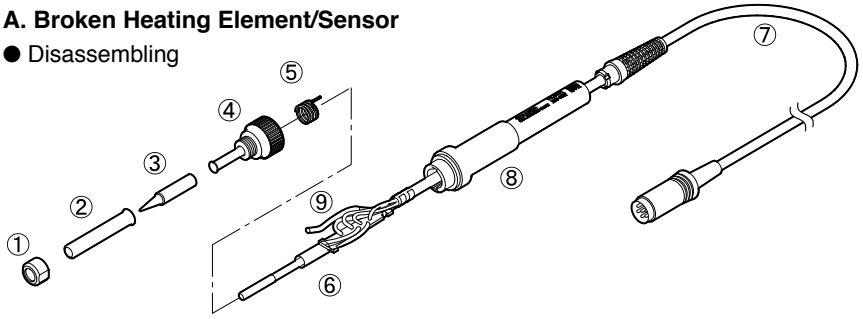
If the values of “a” and “b” are outside the value in the table, replace the heating element (sensor) and/or cord assembly.
If the value of “c” is over the value in the table, remove the oxidization film by lightly rubbing with sand-paper or steel wool the points shown in the drawing on the right.

| | |
|---|---|
| a. Between pins 4 & 5 (Heating Element) | 2.5 – 3.5 Ω (at time of room temperature) |
| b. Between pins 1 & 2 (sensor) | 43 – 58 Ω |
| c. Between pin 3 & Tip | 2 Ω or less |

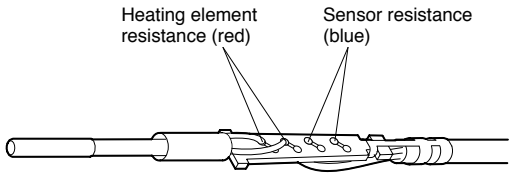



**A. Broken Heating Element/Sensor**

● Disassembling




1. Turn the nut ① counterclockwise and remove the enclosure pipe ② and the tip ③.
2. Turn the nipple ④ counterclockwise and remove it from the iron.
3. Pull both the heaing element ⑥ and the cord assembly ⑦ out of the handle ⑧. (Toward the tip of the iron).
4. Pull the grounding spring ⑤ out of the sleeve of the terminal ⑨.




*Measure when the heating element is at room temperature.
1. Heating element resistance (red) 2.5 – 3.5 Ω
2. Sensor resistance (blue) 43 – 58 Ω

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

**After replacement**

1. Measure the resistance between pins 4 and 1, 4 and 2, 5 and 1, and 5 and 2. If it is not ∞, the heating element and sensor are touching. This will damage the circuit board.
2. Measure the resitance “a”, “b”, and “c” to confirm that the leads are not twisted and that the grounding spring is properly connected.

**B. Broken Cord Assembly**

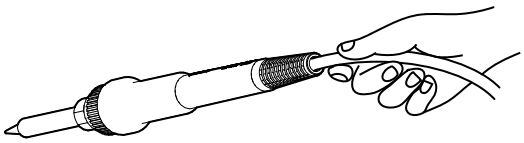
There are two methods of testing the cord assembly.

1. Turn the unit ON and set the temperature control knob to 480°C (899°F). Then bend the iron cord at various locations along its length, including in the strain relief area. The cord assembly needs to be replaced if S-E is displayed or although the LED heater lamp flashes, the tip temperature doesn't rise.

2. Check the resistance between the plug pin and the terminal lead.

   Pin 1: Red  Pin 2: Blue  Pin 3: Green  Pin 4: White
   Pin 5: Black
   Resistance: 0 Ω.

   If it is higher than 0 Ω or is ∞, the cord should be replaced.



**⚠CAUTION**
The power lamp starts to flash when the temperature reaches 480°C (899°F) regardless of the condition of the cord.

# 10. ERROR MESSAGE (Soldering iron)

● **Sensor Error**


When there is the possibility that a failure has occurred in the sensor or heater (including the sensor circuit), S-E is displayed and the power is shut down.

**⚠CAUTION**
The sensor error also occurs if the tip is not inserted properly.

● **Low-temperature alarm tolerance error**


H-E is displayed when the sensor detection temperature is lower than the low-limit temperature you set. When the tip temperature rises over the low-limit temperature you set, the normal display is restored.

* The low temperature error will be displayed once the set temperature has been reached.

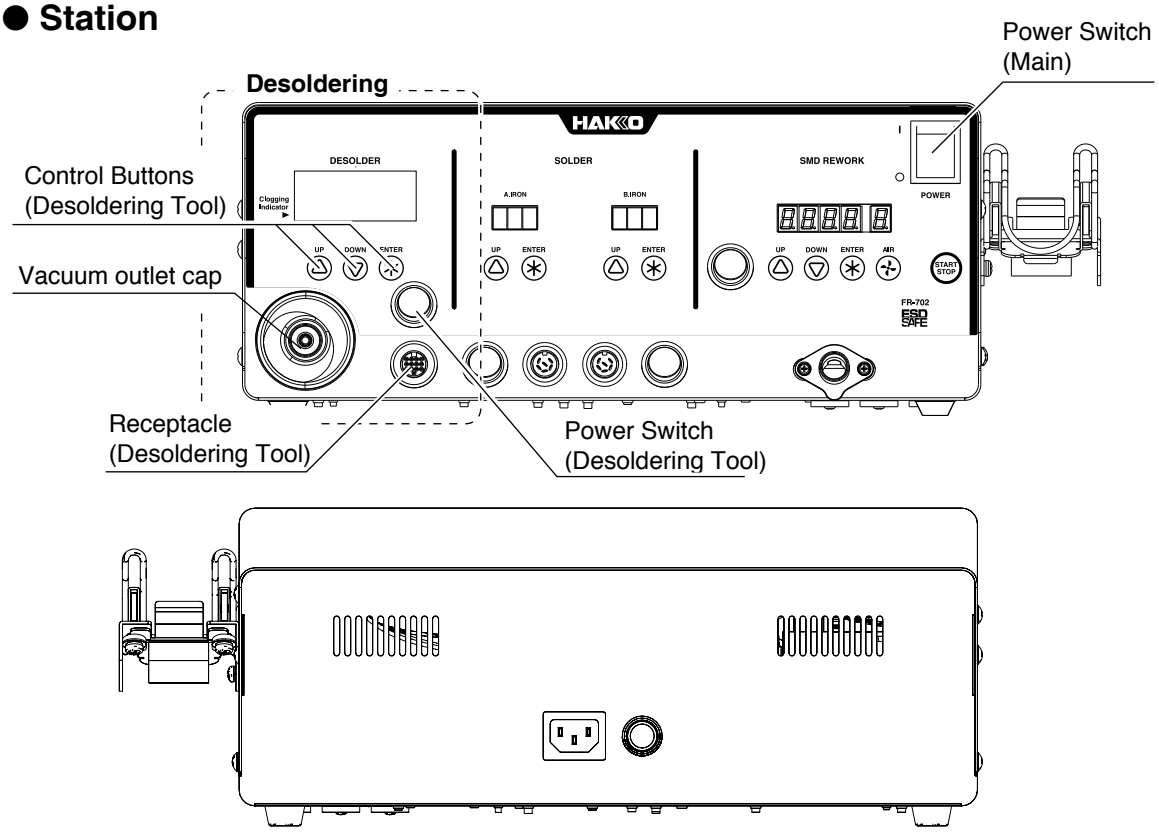
**EXAMPLE:**

350°C (400°C – 50°C)
Set temperature – Low-temperature alarm tolerance
OR
650°F (750°F – 100°F)
Set temperature – Low-temperature alarm tolerance

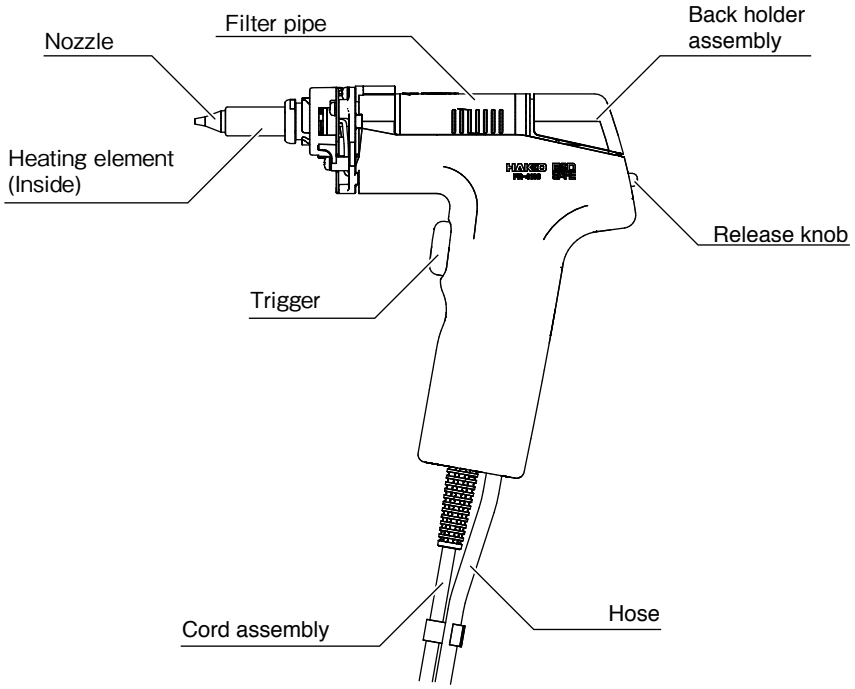
**EXAMPLE:**
Assume that the temperature setting is 400°C/750°F and the tolerance 50°C/100°F. If the temperature continues to decrease and finally falls below the value indicated left while the heating element is on, H-E starts blinking to indicate that the tip temperature has dropped.

# 11. PART NAMES (Desoldering Tool)

## ● Station



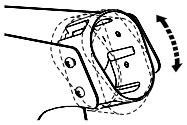

## ● Handpiece (HAKKO FR-4103 Desoldering Tool)



# 12. INITIAL SETUP (Desoldering Tool)

## A. Iron holder

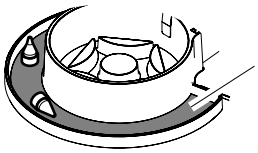
Loosen the adjusting screws to change the angle of the handpiece receptacle as you like, then tighten the screws.

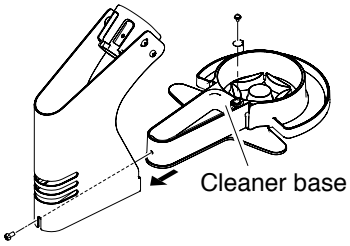


**⚠ CAUTION**
Increasing the angle of the handpiece receptacle will cause an increase in the handpiece temperature.

### ● Setup the iron holder

Following the instructions given in the illustration on the right, assemble the iron holder.

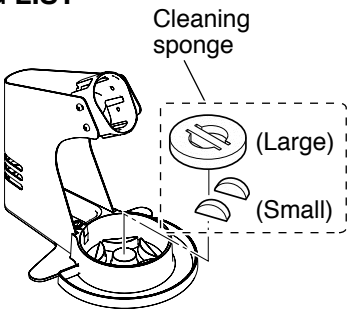



**NOTE :**
You can put nozzles that are not in use on the radial tray of the cleaner base.

### ● When the cleaning sponge is included in the PACKING LIST

The sponge is compressed. It will swell when moistened with water. Before using the unit, dampen the sponge with water and squeeze it to remove excess water.

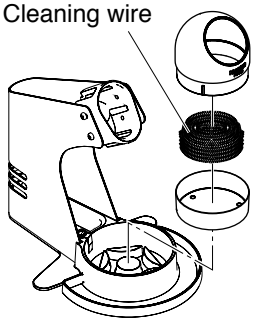



1. Fit the small sponge pieces into the hollows in the cleaner base.
2. Add an appropriate amount of water into the cleaner base. The small sponge pieces will absorb water and help keep the larger sponge damp at all times.
3. Dampen the large sponge, squeeze it to remove excess water and put it on the cleaner base.

**⚠ CAUTION**
Be sure the sponge is moistened with water before use to avoid damaging the nozzle.

### ● When the cleaning wire is included in the PACKING LIST

Following the instructions given in the illustration on the right, put the cleaning wire on the cleaner base.




Operation:
First, remove any excess solder from the nozzle by thrusting the nozzle into the cleaning wire.
(Do not wipe the nozzle against the wire. This may cause molten solder to spatter.)
When the wire becomes dirty or loaded with solder, reposition the wire until a clean surface is presented. When changing the cleaning wire, lift the case top vertically to prevent solder debris from falling out.

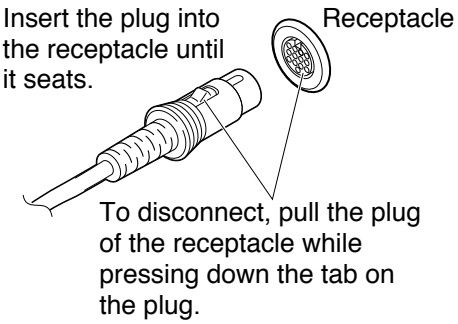
# 12. INITIAL SETUP (Desoldering Tool) (continued)

## B. Station

| ⚠CAUTION |
| --- |
| **Be sure to hold the plug when inserting or removing the handpiece cord.** |

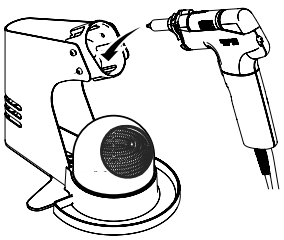
### ● Connection

1. Connect the power cord to the receptacle on the rear of the station.



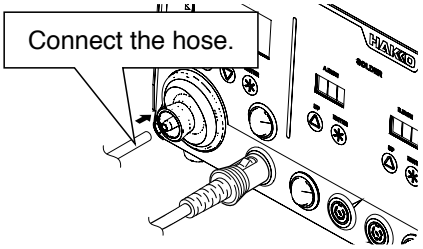

2. Connect the plug of the HAKKO FR-4103 to the receptacle on the HAKKO FR-702 (Desoldering tool).

> ⚠**CAUTION**
> Connect the plug to the receptacle, aligning the tab on the plug with the opening on the receptacle.



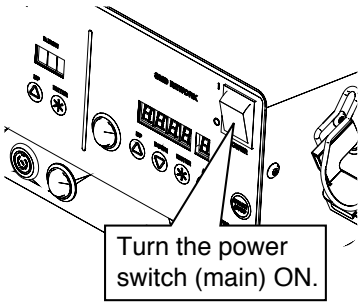
3. Set the HAKKO FR-4103 in the iron holder.

4. Connect the hose of the HAKKO FR-4103 to the vacuum outlet cap on the HAKKO FR-702 station.

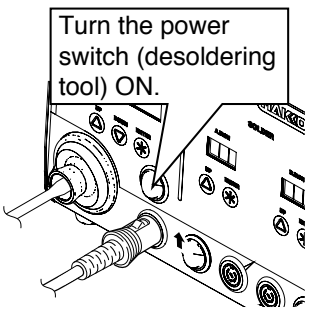



5. Plug the power cord into a grounded power outlet. Ensure that the power switch is OFF before plugging in the power cord.

> ⚠**CAUTION**
> Be sure to ground this product as it is ESD safe by design.




6. Turn the power switch (main) ON.



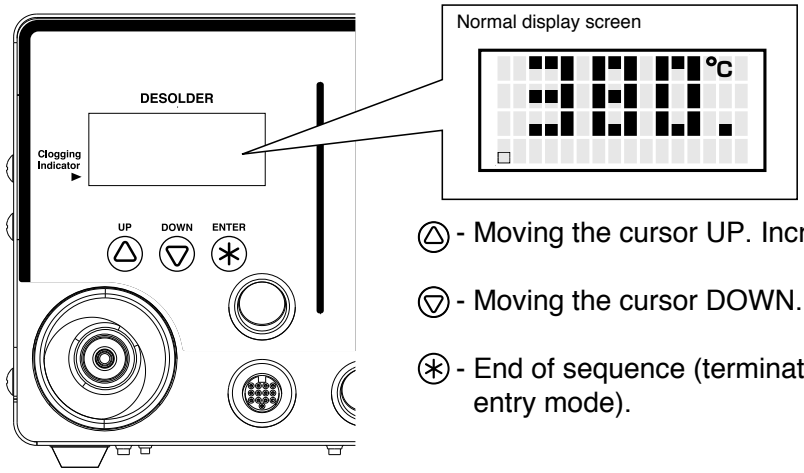

7. Turn the power switch (desoldering tool) ON.

> ⚠**CAUTION**
> When not in use, place the handpiece in the iron holder.

# 13. OPERATION (Desoldering Tool)

## ● Operation and indication

Switch and control button



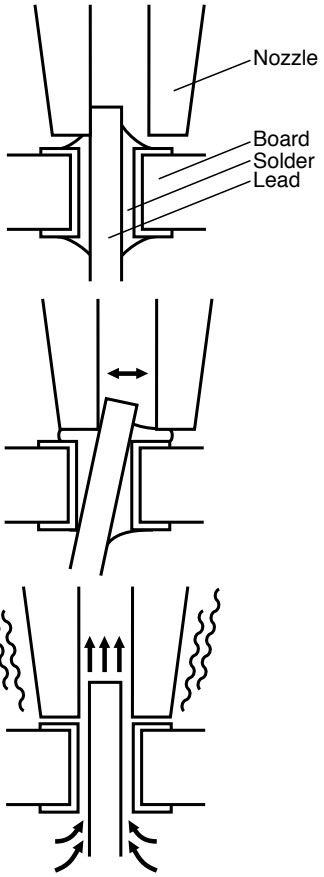

△ - Moving the cursor UP. Increases the value.

▽ - Moving the cursor DOWN. Decreases the value.

✳ - End of sequence (terminates a phase of a data entry mode).

## A. Desoldering

**⚠CAUTION**
If the pump does not operate, immediately clean the nozzle & heating element and replace the filter if necessary.




1. Place the nozzle over the lead wire of the part to be desoldered and begin heating.

   Be careful to heat the lead wire and the solder, not the land. Placing the nozzle directly in contact with the land may cause the land to peel off. You may apply a small amount of solder to form a heat bridge to help the heating process.

2. Check to make sure all of the solder on the joint has melted.

   With the nozzle still in place over the lead wire, slowly move the lead wire, being careful not to apply too much force. If the lead wire moves easily, all of the solder has melted.

3. Pull the trigger to remove the melted solder.

   **⚠CAUTION**
   Make sure that a filter has been inserted in the desoldering tool. Desoldering without a filter may damage the pump.

4. If the solder was not removed, re-solder the part using new solder and then repeat the desoldering process.

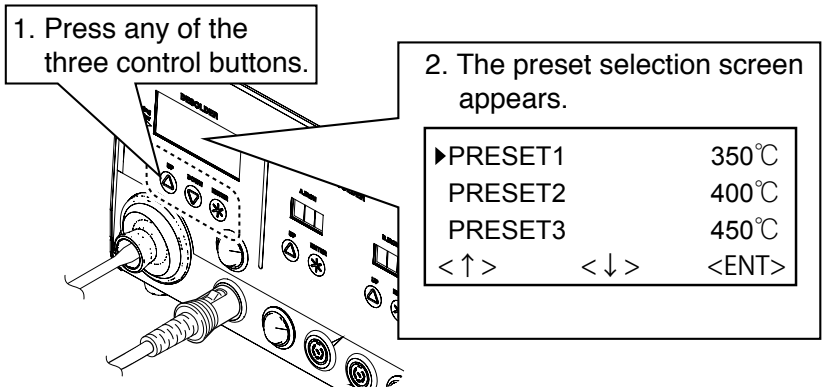
*** When triggering before the heater reaches set temperature**

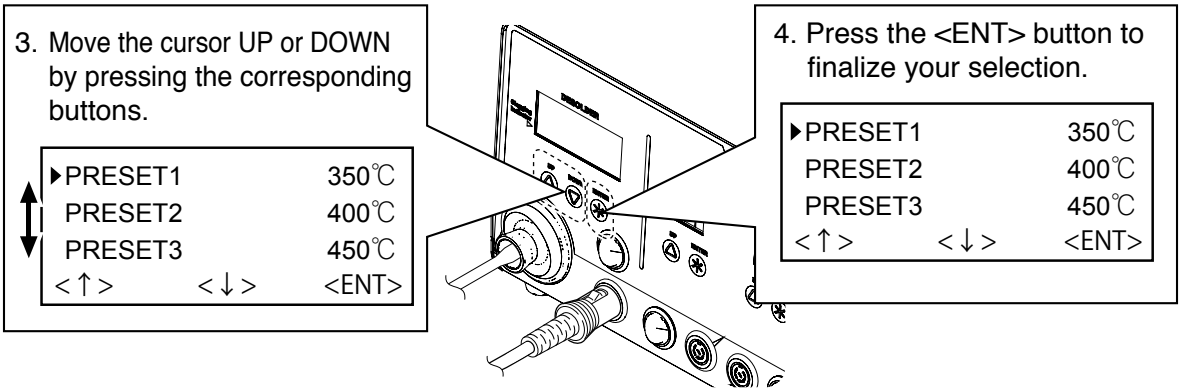
When triggering before the heater reaches set temperature, the display screen shows "HEATING… PLEASE WAIT" and the vacuum does not work.
Please wait for the heater to reach the set temperature.


## B. Making Changes to Settings

**● Selecting the preset number**

Desoldering Tool has a preset mode.



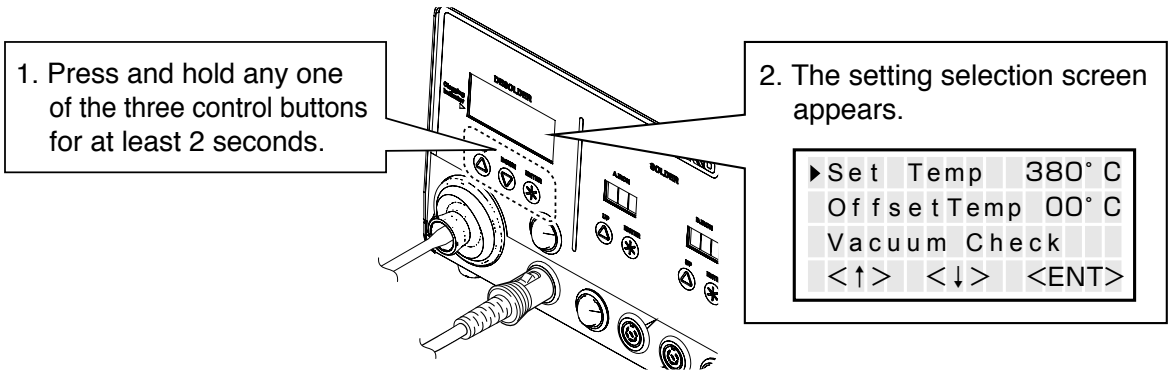




*** If you wish to exit the PRESET SELECTION screen...**

Scroll the cursor to the bottom, select <EXIT>, and press the <ENT> button. You will return to the normal display screen without making any changes.
Or if the device is left alone without making any operation for 10 seconds, you will return to the normal display screen.

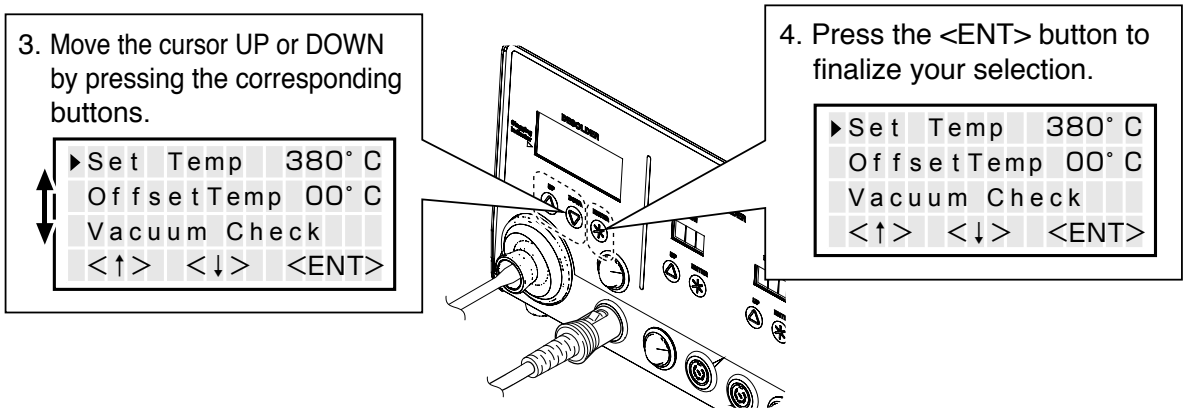
When changing the current set temperature or the preset temperature, follow the operation of "● Changing various setting (other than preset selections)" in 13. OPERATION (Desoldering Tool).

## ● Changing various settings (other than preset selections)




The following settings can be changed from this screen:

| | |
|---|---|
| Set Temp | (Nozzle temperature setting) |
| Offset Temp | (Nozzle temperature offset setting) |
| Vacuum Check | (Check of nozzle clogging and suction force) |
| Preset Temp | (Setting of each preset temperature) |
| Preset ID | (Setting of each preset name) |
| LCD Contrast | (Contrast adjustment of display screen) |
| <EXIT> | (Return to the normal display screen) |

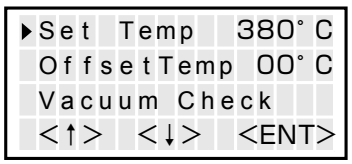


# 13. OPERATION (Desoldering Tool) (continued)

● **Set Temp (Nozzle temperature setting)**

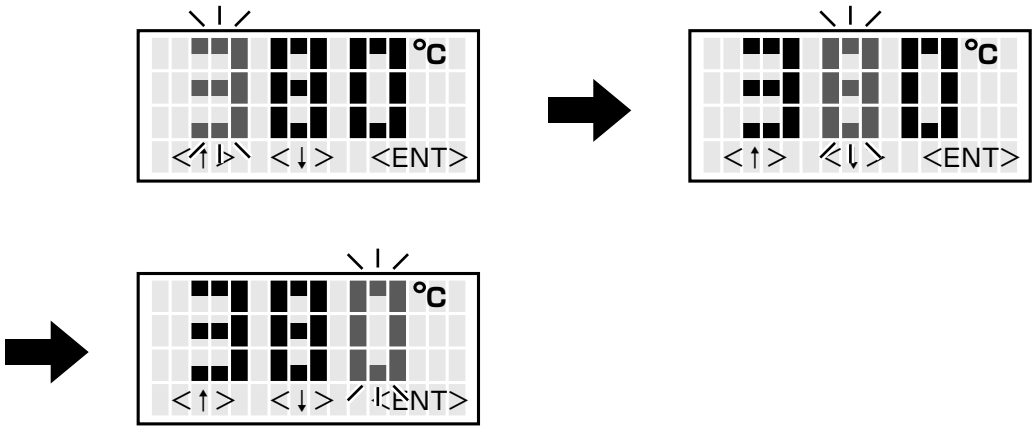
**⚠CAUTION**
The temperature range is from 330 to 450°C. (620 to 850°F)
If you enter a value outside the temperature setting range, the display returns to the hundreds digit, and you have to enter a correct value.

1. Move the cursor to select “Set Temp”. After selecting, press <ENT>.




2. Entering from hundreds to units digit
   Press the < ↑ > or < ↓ > to set the desired figure.
   Press the <ENT> button to advance to the next digit.

   Only values from 3 to 4 can be selected when entering the hundreds digit.
   (In °F mode, values from 6 to 8 can be selected.)
   Values from 0 to 9 can be selected when entering the tens or units digits.
   (The same values can be selected in °F mode.)




3. When desired figure is displayed, press the button to enter.
   The next digit will begin to flash. After entering the units digit, press the <ENT> button to save the figure to the system memory and begin heater control with new setting temperature.

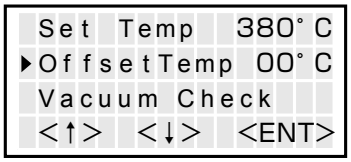
**⚠CAUTION**
If power is switched off or lost during the execution of this procedure, no data will be entered. The entire procedure must be repeated from step 1.

● **Offset Temp (Nozzle temperature offset setting)**

Example：If the measured temperature is 405°C and set temperature is 400°C, the difference is -5°C. (need to decrease by 5°C) So, enter the figure which 5 is deducted from present offset value.

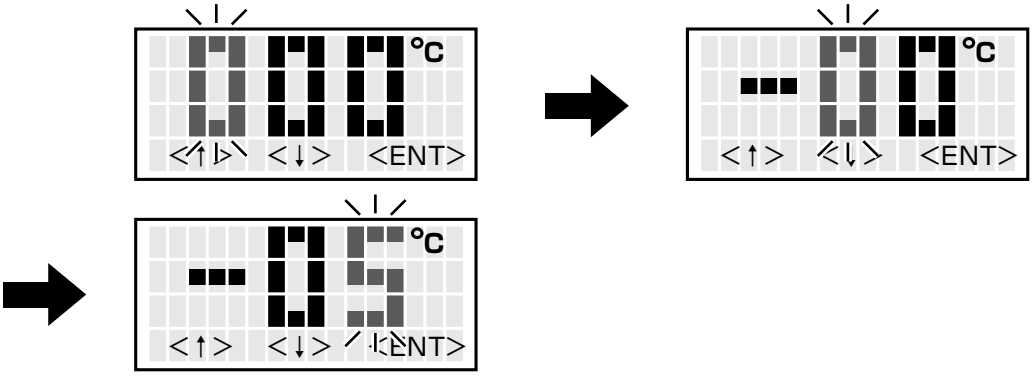
**⚠CAUTION**
The allowable ranges for offset values are from -50 to +50°C . (In °F mode, from -90 to +90°F) If you enter a value outside the offset value range, the display returns to the hundreds digit, and you have to enter a correct value.

1. Move the cursor to select “OffsetTemp”. After selecting, press <ENT>.




2. Enter the offset value (-05) which is the difference between tip temperature and set temperature.
   Press the <↑> or <↓> to set the desired figure.
   Press the <ENT> button to advance to the next digit.

   The hundreds digit can display 0 (for positive value) or minus sign. (for negative value)
   (Same values can be selected in °F mode.)
   Values from 0 to 5 can be selected when entering the ten digit.
   (In °F mode, values from 0 to 9 can be selected.)
   Values from 0 to 9 can be selected when entering the units digit.
   (Same values can be selected in °F mode.)



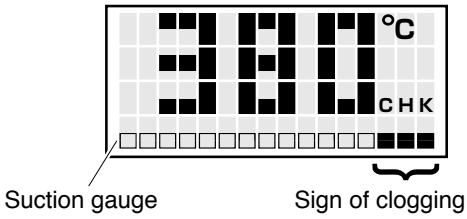

3. After entering the units digit, press the <ENT> button to save the figure to the system memory and begin heater control with the new offset value.

**⚠CAUTION**
During the offset setting, please be careful tip temperature does not exceed 450°C (850°F).

# 13. OPERATION (Desoldering Tool) (continued)

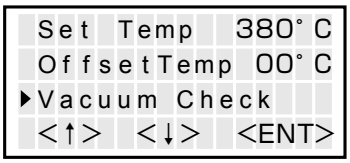
● **Vacuum Check (Check of nozzle clogging and suction force)**

During suction, the gauge indicating sucking status is shown at the lower side of the screen.

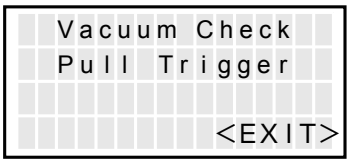



When “CHK” appears and you notice that the sucking force is weakening, perform “Vacuum Check”.

1. Move the cursor to select “Vacuum Check”. After selecting, press <ENT>.

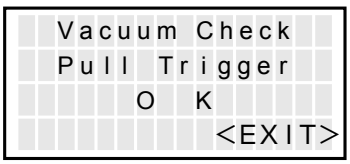



2. Pull the trigger.

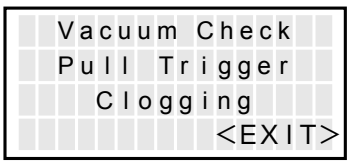



3. When “Clogging” appears, perform cleaning and replace filters.

No degradation in sucking force




Degradation in sucking force

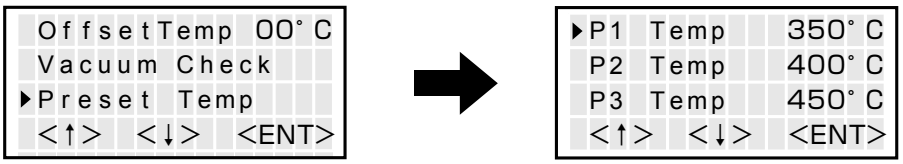



4. Select <EXIT>, and press the <ENT> button to return to the selection screen.

● **Preset Temp (Setting of each preset temperature)**

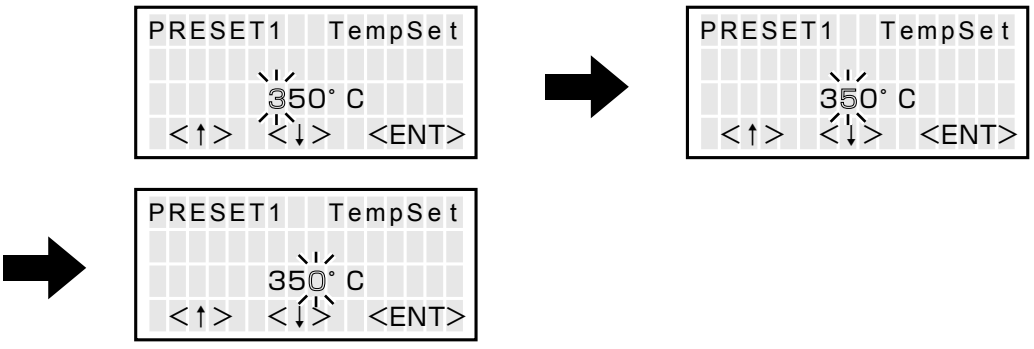
**⚠CAUTION**
The temperature range is from 330 to 450°C. (620 to 850°F)
If you enter a value outside the temperature setting range, the display returns to the hundreds digit, and you have to enter a correct value.

1. Move the cursor to select “Preset Temp”. After selecting, press <ENT>.
   Select the preset No. whose temperature setting you wish to change.




2. Entering from hundreds to units digit
   Press the < ↑ > or < ↓ > to set the desired figure.
   Press the <ENT> button to advance to the next digit.

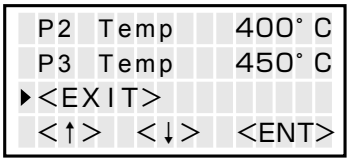
   Only values from 3 to 4 can be selected when entering the hundreds digit.
   (In °F mode, values from 6 to 8 can be selected.)
   Values from 0 to 9 can be selected when entering the tens or units digits.
   (The same values can be selected in °F mode.)




3. After entering the units digit, press the <ENT> button to save the figure to the system memory and begin heater control with new setting temperature.

**⚠CAUTION**
If power is switched off or lost during the execution of this procedure, no data will be entered. The entire procedure must be repeated from step 1.

4. To exit from each setting screen, scroll the screen, select <EXIT>, and press the <ENT> button.

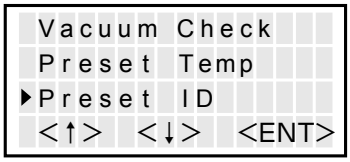


# 13. OPERATION (Desoldering Tool) (continued)

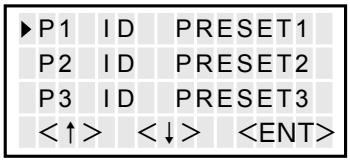
● **Preset ID (Setting of each preset name)**

**⚠CAUTION**
As a preset ID, 1 to 8 characters can be used.
Usable characters are “A - Z”, “0 - 9”, and space (“ ”). Entering a space makes your entry terminated. Any character(s) that follows the space is deleted.

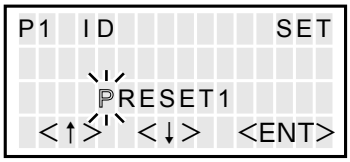
1. Move the cursor to select “Preset ID”. After selecting, press <ENT>.



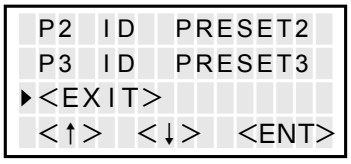

2. Move up and down the cursor with the control buttons.
   After selecting, press <ENT>.




3. Press the < ↑ > or < ↓ > to set the desired figure.
   Press the <ENT> button to advance to the next digit.



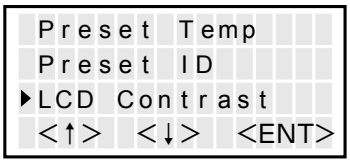

4. To exit from setting screen, scroll the screen, select <EXIT>, and press the <ENT> button.



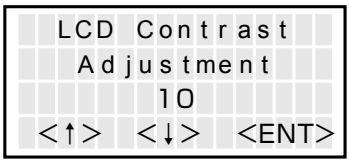
● **LCD Contrast (Contrast adjustment of display screen)**

To make the screen display easy to see, adjust contrast.

1. Move the cursor to select “LCD Contrast”. After selecting, press <ENT>.

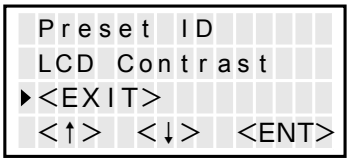



2. Press the < ↑ > or < ↓ > to set the adjust contrast.
   (Selection range is 1 to 25.)




3. After selecting the value, press <ENT> to return to the selection button.

To exit from each setting screen, scroll the screen, select <EXIT>, and press the <ENT> button.



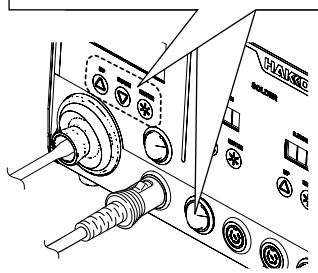
# 14. PARAMETER SETTINGS (Desoldering Tool)

## ● PARAMETER SETTINGS

Press and hold any one of the control buttons, and turn on the power switch to display the parameter setting screen. The following parameters can be set:

| Parameter name | Value | Initial value |
|---|---|---|
| Temp Mode | °C / °F | °C (°F*) |
| ShutOff Set | OFF / ON | OFF |
| Timer** | 30 to 60 min. | 30 min. |
| Vacuum Mode | Normal / Timer | Normal |
| Vacuum Time*** | 1 to 5 sec. | 1 sec. |
| Auto Sleep | OFF / ON | ON |
| Timer** | 1 to 29 min. | 6 min. |
| Sleep Temp | 200 to 300°C (390 to 570°F) | 200°C (390°F) |
| Low Temp | 30 to 150°C (54 to 270°F) | 150°C (270°F) |
| Error Alarm | ON / OFF | ON |
| Ready Alarm | ON / OFF | ON |
| Pass. Lock | ON (Lock / Partial) / OFF (Unlock) | OFF |
| Password**** | **"ABCDEF"** Select three letters | - |
| Initial Reset | °C / °F / Cancel | |

Press and hold any one of the three control buttons while turning on the power switch.



* For USA.
** Timer can be set when ShutOff / Auto Sleep is set to "ON".
*** Vacuum Time is displayed when Vacuum Mode is set to "Timer".
**** Password is displayed when Password Lock is set to "Lock" or "Partial".

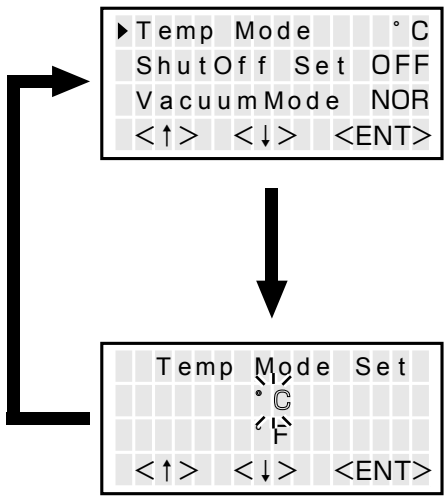
## ● Temp Mode

Select the temperature mode from Celsius or Fahrenheit.

1. Move the cursor to select "Temp Mode". After selecting, press <ENT>.

2. °C and °F will be switched alternately if you press the < ↑ > or < ↓ > button.

3. Return to parameter setting display if you press the <ENT> button after setting.



● **ShutOff Set**

Select whether you will activate the auto shut off function. When the auto shutoff function is set to on and no operation is performed for constant time after the handpiece is set in the iron holder, the buzzer sounds three times and the auto shutoff function will be enabled.

1. Move the cursor to select “ShutOff Set”. After selecting, press <ENT>.

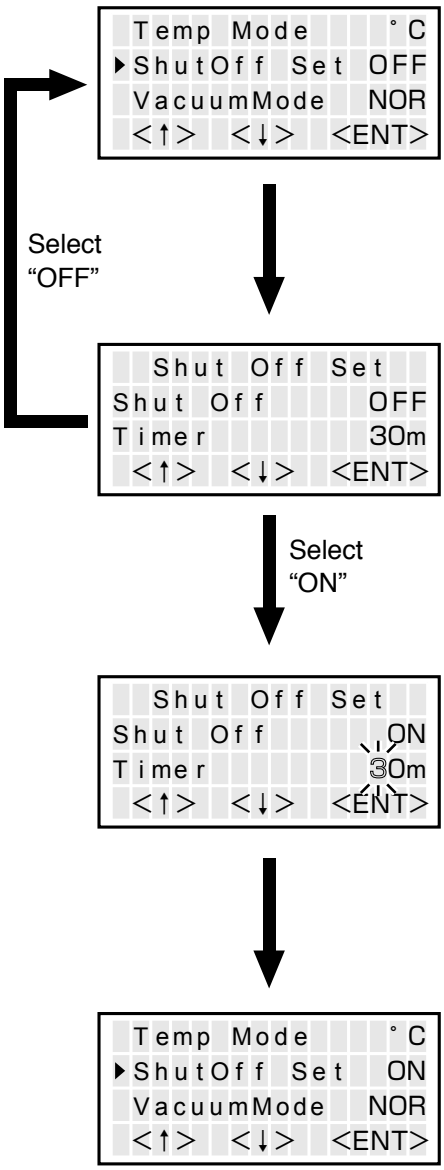
2. ON and OFF will be switched alternately if you press the < ↑ > or < ↓ > button.

3. Selecting “ON” allows you to make the setting for “Timer”. (Default is 30 minutes.)

4. When setting “Shut Off” to “ON”, the area for “Timer” flashes.

5. Press the < ↑ > or < ↓ > to set the desired figure.

6. Pressing the <ENT> button after this change makes the set time stored in the internal memory.



# 14. PARAMETER SETTINGS (Desoldering Tool) (continued)

● **Vacuum Mode**

Select whether you manually operate the desoldering pump or use the timer function.

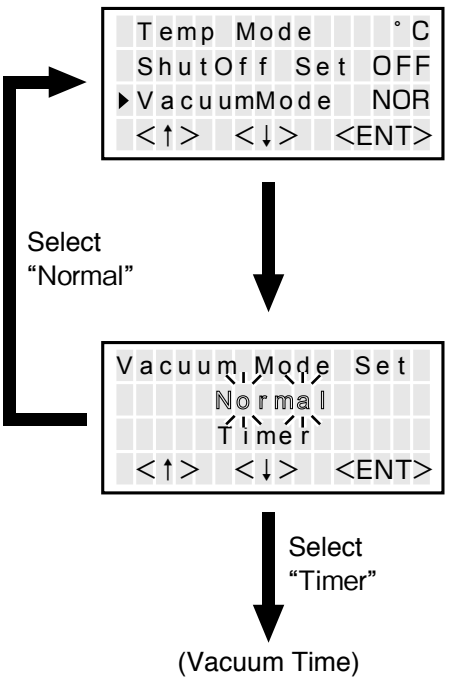
Normal：Solder is sucked only when you are pulling the trigger.
Timer：Even after you release the trigger, sucking continues for the specified period of time.

* Set time in “Vacuum Time”.

1. Move the cursor to select “VacuumMode”. After selecting, press <ENT>.

2. Normal and Timer will be switched alternately if you press the <↑> or <↓> button.

3. Return to parameter setting display if you press the <ENT> button after setting.




*** When selecting “Timer”**

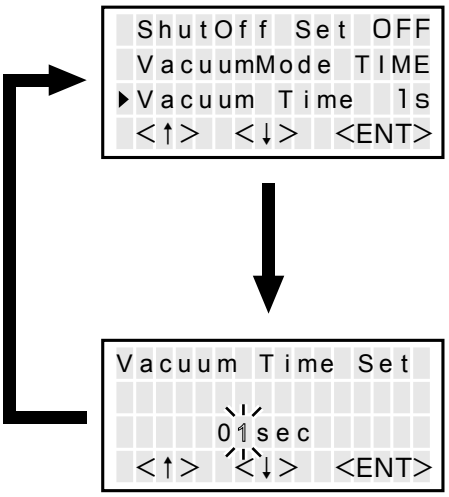
“Vacuum Time” appears under “VacuumMode” in the parameter select screen.

● **Vacuum Time**

1. Move the cursor to select “Vacuum Time”. After selecting, press <ENT>.

2. Press the <↑> or <↓> button, you can change to the desired value.

3. Return to parameter setting display if you press the <ENT> button after setting.



● **Auto Sleep**

Select whether you will activate the auto sleep function. When the auto sleep function is set to on and no operation is performed for constant time after the handpiece is set in the iron holder, the auto sleep function will be enabled and the temperature of the handpiece declines to the controlled degree.

* The auto sleep temperature can be set in “Sleep Temp”.

1. Move the cursor to select “Auto Sleep”.
   After selecting, press <ENT>.

2. ON and OFF will be switched alternately if you press the < ↑ > or < ↓ > button.

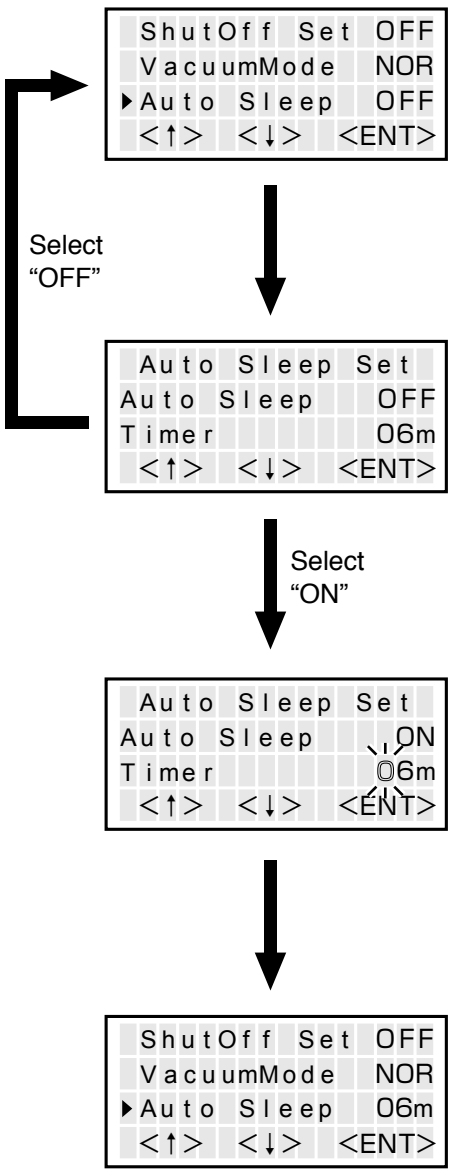
3. Selecting “ON” allows you to make the setting for “Timer”.
   (Default is 6 minutes.)

*** When selecting “ON”**

4. When setting “Auto Sleep” to “ON”, the area for “Timer” flashes.

5. Press the < ↑ > or < ↓ > button, you can change to the desired value.

6. Pressing the <ENT> button after this change makes the set time stored in the internal memory.



# 14. PARAMETER SETTINGS (Desoldering Tool) (continued)

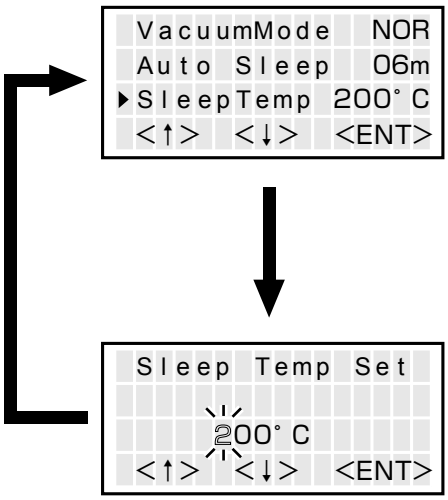
### ● Sleep Temp

Set the auto sleep temperature.

1. Move the cursor to select “SleepTemp”.
   After selecting, press <ENT>.

2. Entering from hundreds to units digit.
   Press the < ↑ > or < ↓ > to set the desired figure.
   Press the <ENT> button to advance to the next digit.

   Only values from 2 to 3 can be selected when entering the hundreds digit.
   (In °F mode, values from 3 to 5 can be selected.)
   Values from 0 to 9 can be selected when entering the tens or units digits.
   (The same values can be selected in °F mode.)




3. After entering the units digit, press the <ENT> button to save the figure to the system memory.

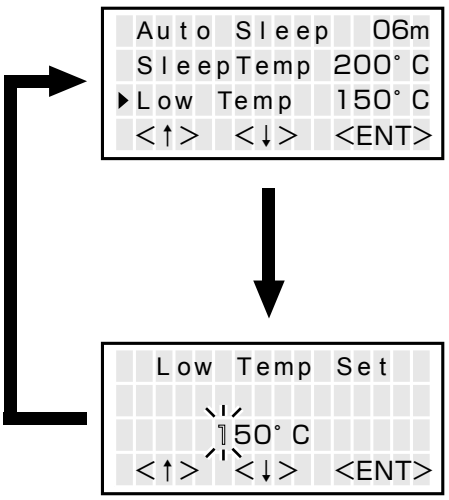
### ● Low Temp

When the temperature drops below a set limit, an error is displayed and the buzzer sounds.

1. Move the cursor to select “Low Temp”.
   After selecting, press <ENT>.

2. Entering from hundreds to units digit.
   Press the < ↑ > or < ↓ > to set the desired figure.
   Press the <ENT> button to advance to the next digit.

   Only values from 0 to 1 can be selected when entering the hundreds digit.
   (In °F mode, values from 0 to 2 can be selected.)
   Values from 0 to 9 can be selected when entering the tens or units digits.
   (The same values can be selected in °F mode.)

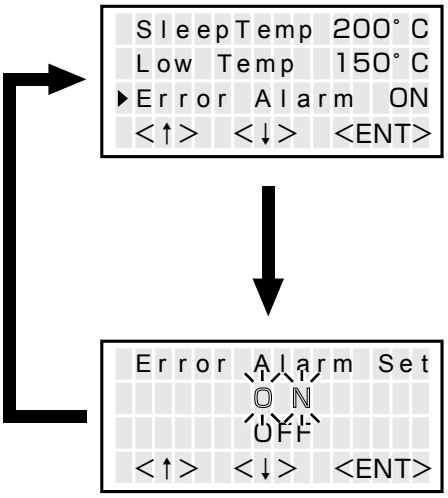



3. After entering the units digit, press the <ENT> button to save the figure to the system memory.

## ● Error Alarm

In the buzzer sound setting mode, which sets whether to sound the buzzer when a error occurs.

1. Move the cursor to select “Error Alarm”. After selecting, press <ENT>.



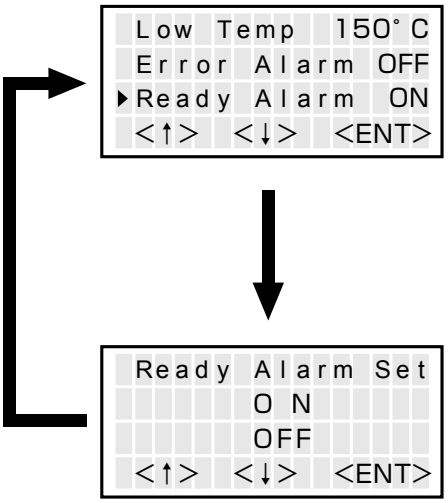

2. ON and OFF will be switched alternately if you press the < ↑ > or < ↓ > button.

3. Return to parameter setting display if you press the <ENT> button after setting.

## ● Ready Alarm

When the set temperature alert setting mode is on, the buzzer sounds if you reached the usable temperature.

1. Move the cursor to select “Ready Alarm”. After selecting, press <ENT>.




2. ON and OFF will be switched alternately if you press the < ↑ > or < ↓ > button.

3. Return to parameter setting display if you press the <ENT> button after setting.

# 14. PARAMETER SETTINGS (Desoldering Tool) (continued)

● **Pass. Lock**

Set a password and use this function to restrict the following changes.

| ⚠CAUTION |
| --- |
| The correct password must be entered to make the change. |

Lock : All setting changes require a password entry.
Partial : Select whether or not to enter your password for set temperature/preset selection/offset temperature change. Other procedures require password entry.
Unlock : Any setting change does not require a password entry.

1. Move the cursor to select “Pass. Lock”. After selecting, press <ENT>.

2. Using the < ↑ > or < ↓ > button, select an option from “Lock”, “Partial”, and “Unlock”.

*** When selecting “Partial” or “Lock”**

3. Select Lock ON/OFF for set temperature/preset selection/offset temperature change. (Only when selecting “Partial”)

4. After making all selections, using the < ↑ > or < ↓ > button, select an option from “OK” or “Cancel”. (Only when selecting “Partial”)

5. Press the <ENT> button. (Only when selecting “Partial”)

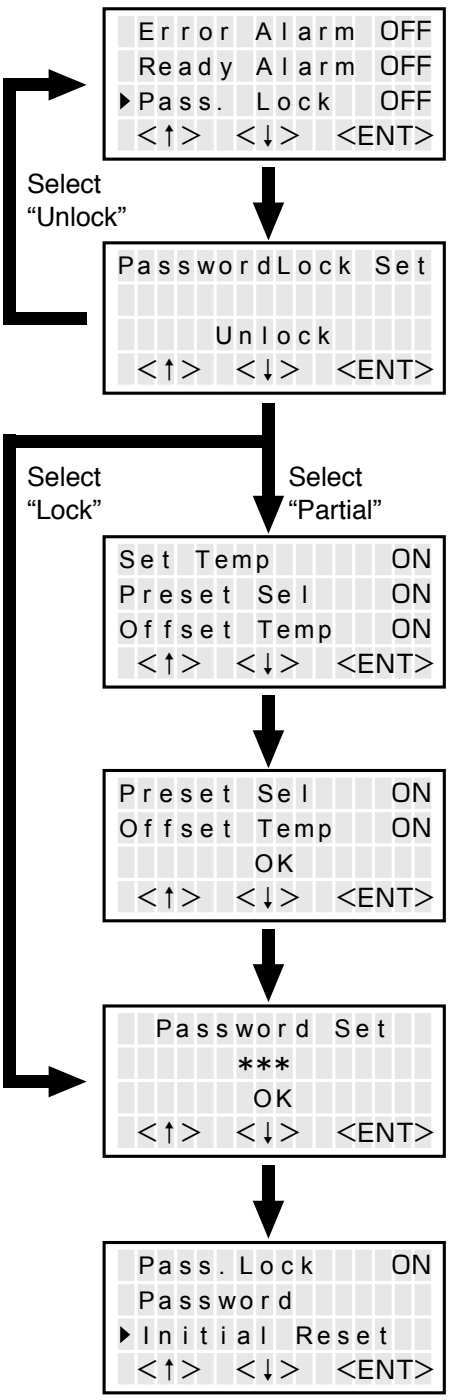
6. Using the < ↑ > or < ↓ > button, enter a password. (Selection of three characters from ABCDEF)

7. After entering, press the <ENT> button. Select “OK” or “Cancel” using the < ↑ > or < ↓ > button.

8. After setting the password, press the <ENT> button to return to the parameter setting screen.

*** When selecting “OK”**

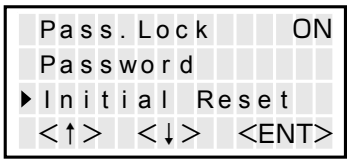
The password is shown under “Pass. Lock” on the parameter selection screen.



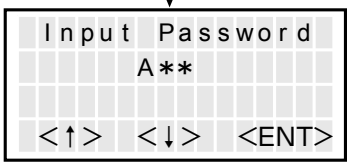
● **Password**

The password can be changed.

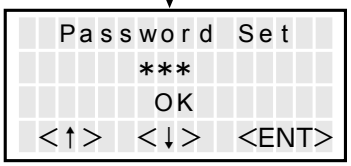
1. Match ▶ to “Password” and press the <ENT> button.



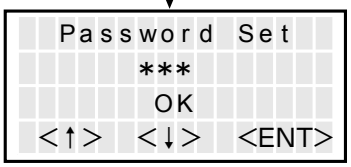

2. Use the < ↑ > or < ↓ > button to enter the current password, and press the <ENT> button.



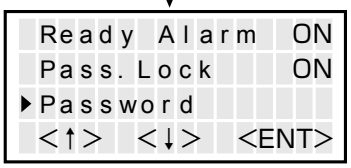

3. Enter a new password.
(For a password, select 3 letters from among ABCDEF.)




4. After setting the password, press the <ENT> button. Using the < ↑ > or < ↓ > button, select either “OK” or “Cancel”.




5. Press the <ENT> button to return to the parameter selection screen.

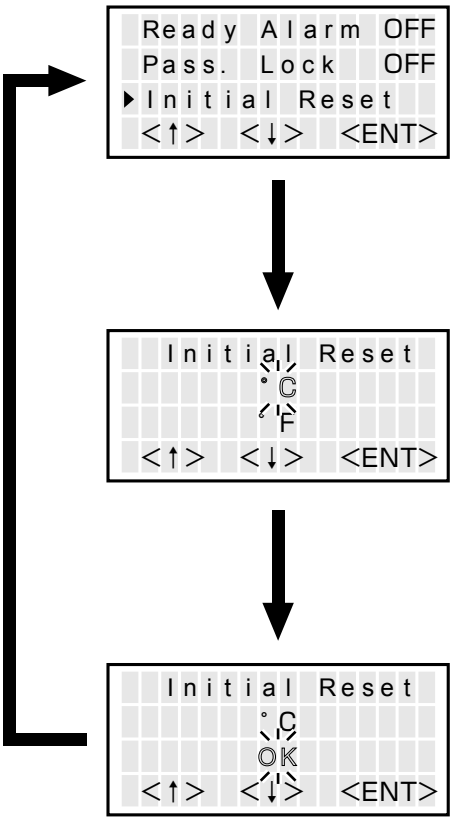


# 14. PARAMETER SETTINGS (Desoldering Tool) (continued)

● **Initial Reset**

Initial Reset allows the factory default settings to be restored.

1. Move the cursor to select “Initial Reset”. After selecting, press <ENT>.

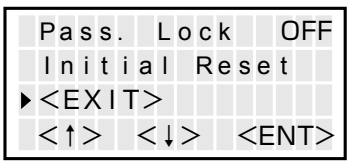



2. Using the < ↑ > or < ↓ > button, select either “°C” or “°F”. To stop “Initial Reset”, scroll the screen to select <EXIT>.

3. After selecting it, using the < ↑ > or < ↓ > button, select “OK” or “Cancel”.

**⚠CAUTION**
Even when Initial Reset is finished, “Pass. Lock” and password settings remain.

**⚠CAUTION**
To exit from the parameter setting display, scroll the screen, select <EXIT>, and press the <ENT> button.



# 15. MAINTENANCE (Desoldering Tool)

Properly maintained, the HAKKO FR-702 desoldering tool should provide years of good service. Efficient desoldering depends upon the temperature, solder/flux selection, and proper routine maintenance. Perform the following service procedures as dictated by the conditions of the station's usage.

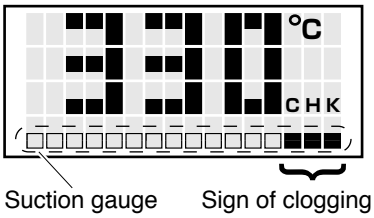
**⚠WARNING**

Since the desoldering tool can reach a very high temperature, please work carefully. Except when cleaning the nozzle and heating element, ALWAYS turn the power switch OFF and disconnect the power plug before performing any maintenance procedure.

During suction, the gauge indicating suction force is shown at the bottom of the screen.

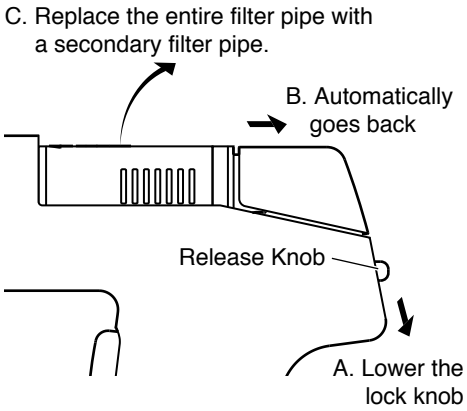
If "CHK" appears on the display, check the nozzle and heater for restrictions.

If the nozzle or heater are clogged, clean or replace them.



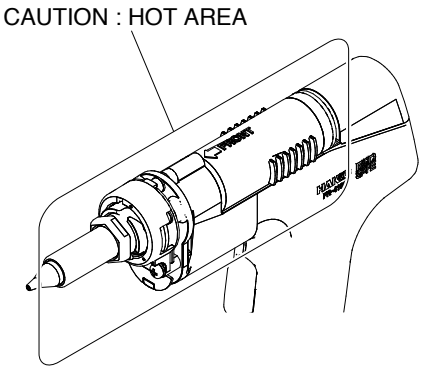

## Replacing the filter pipe

Replace the filter as shown following steps A to C. During operation, the filter pipe is very hot. Wait until the filter pipe is cool before replacing the filter or cleaning.
We recommend keeping a second filter pipe containing new filters handy, and replacing the installed filter pipe with this secondary filter pipe.




**⚠CAUTION**

The section from the heating element to the filter pipe is provided with pipes through which melted solder passes, so it may become very hot. Be very careful when handling this section.



# 15. MAINTENANCE (Desoldering Tool) (continued)

## Nozzle Maintenance

**⚠CAUTION**

The handpiece may be extremely hot. During maintenance, please work carefully.

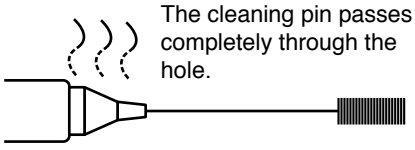
### 1. Inspect and clean the nozzle

Turn the power switch ON and let the nozzle heat up.

**⚠CAUTION**
The cleaning pin will not pass through the nozzle until the solder inside the nozzle is completely melted.

- Clean out the hole of the nozzle with the nozzle cleaning pin.
- If the cleaning pin does not pass through the hole in the nozzle, clean with the cleaning drill.
- Check the condition of the solder plating on the nozzle tip.

**Cleaning with the nozzle cleaning pin**




**Cleaning with the cleaning drill**

- Before cleaning

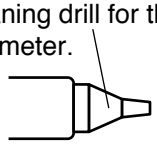
Insert the bit while turning it clockwise.

- After cleaning

Pull the drill bit out straight without turning it.

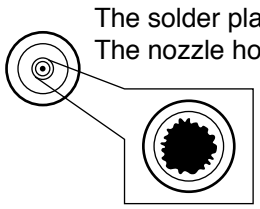
**⚠CAUTION**
- If the cleaning drill is forced into the nozzle, the drill bit could break or be damaged.
- Please use the proper size cleaning pin or cleaning drill for the nozzle diameter.

Use the proper size cleaning pin or cleaning drill for the nozzle diameter.



- Check visually if the nozzle was eroded.

**Solder plating part**

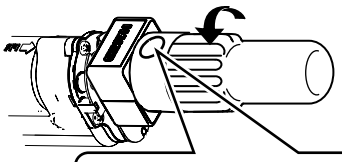



**⚠ CAUTION**
- Erosion may not be able to be confirmed visually, so replace it when it starts to work inefficiently.
- Special plating is applied to the inside and surface of the nozzle hole, but if it is exposed to high-temperature soldering for a long time, it may be eroded and temperature stability may not be maintained.

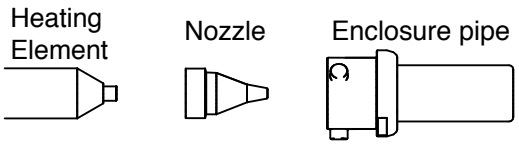
* If the nozzle is still in a good condition, put some fresh solder on the nozzle tip to protect solder plated area from oxidation.

**2. Disassemble the heating element.**

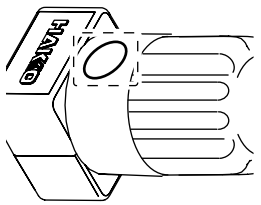
Remove the enclosure pipe and the nozzle with the provided wrench.



**⚠CAUTION**
The heating element is very hot during operation.

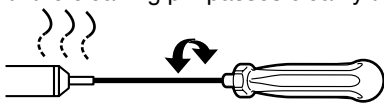



The enclosure pipe is held to the nozzle wrench by pressing this part from both sides.
(The nozzle is not held to the nozzle changing tool. Be careful when removing them.)



**3. Clean out the tube in the heating element with the provided cleaning pin.**

Scrape away all oxidation from the tube in the heating element until the cleaning pin passes cleanly through the tube.



● Turn the power off after cleaning.

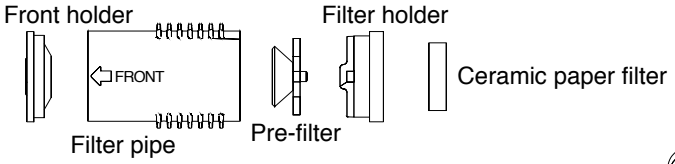
**⚠CAUTION**
- Be sure the solder in the tube in the heating element is completely heated, before cleaning the tube.
- If the cleaning pin does not pass through the tube in the heating element, replace the heating element.

## Replacing the filters

**● Handpiece filter**

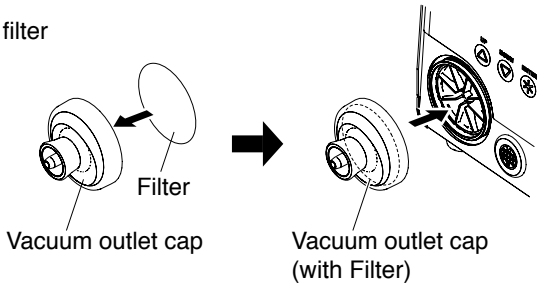
1. Turn the power switch OFF.
2. When the filter pipe is cool to the touch, push down on the release knob at the back of the handpiece and remove the filter pipe.
3. Examine the seals (front and filter holders) at each end of the filter pipe.
   Replace : Stiff and/or cracked.
4. Examine the Pre-filter: Remove solder adhering to the waste collector.
5. Examine the ceramic paper filter.
   Replace : Ceramic paper filter is showing signs of stains from flux, is stiff, or contains any solder.

**⚠CAUTION**
The filter pipe is very hot.




**● Station filter**

If the filer is showing signs of stains from flux or is stiff, replace it.
Attach the filter as shown in the right diagram.



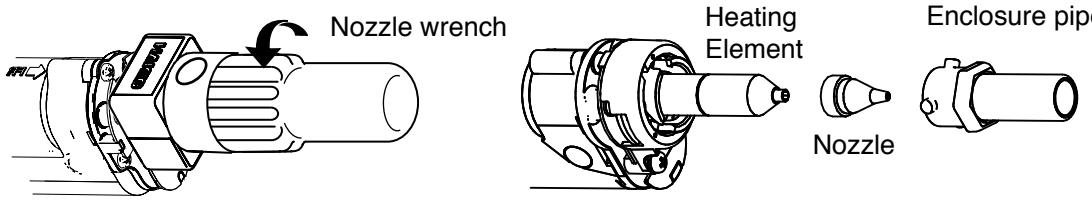
# 15. MAINTENANCE (Desoldering Tool) (continued)

## Replacing the heating element (heating core)

**⚠ CAUTION**
Except the case especially indicated, always turn the power switch OFF and disconnect the power plug before performing any maintenance procedure.

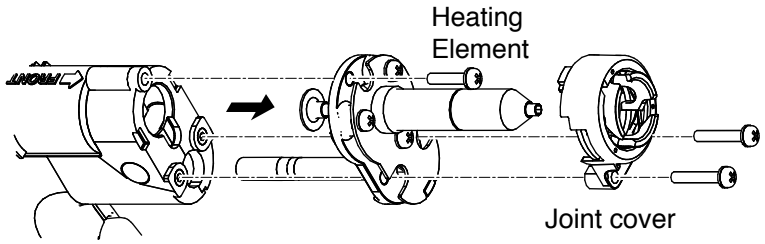
### ● Disassemble the heating element.

1. Remove the nozzle and enclosure pipe.




Remove the enclosure pipe and the nozzle with the attached wrench.

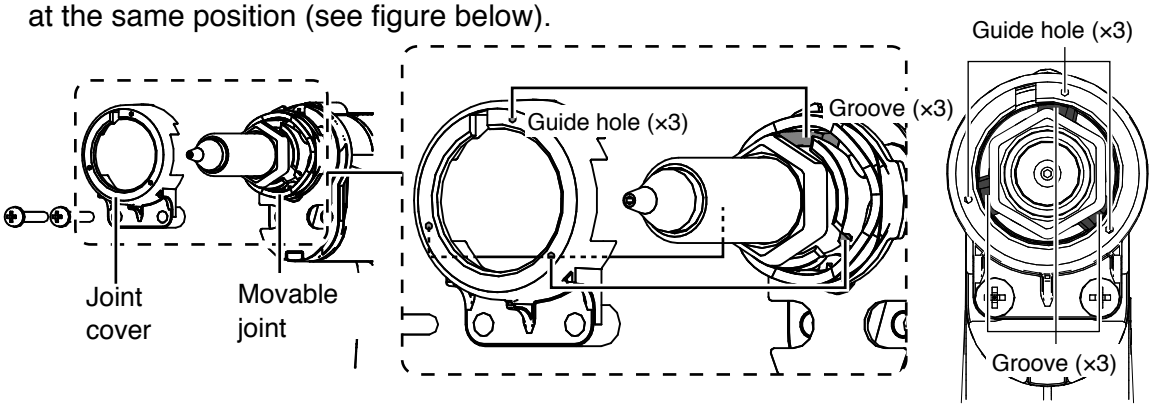
2. Remove the 2 screws fixing the joint cover and remove the joint cover.
3. Remove the screw from the handpiece and disconnect the heating element.




4. Replace the heating element. Assemble using the same procedure in reverse.

### * Caution of the heating element installation

The installation / disassembly with the quick changer smoothens. Please attach it to have the groove of the movable joint and the guide hole of the joint cover coming at the same position (see figure below).

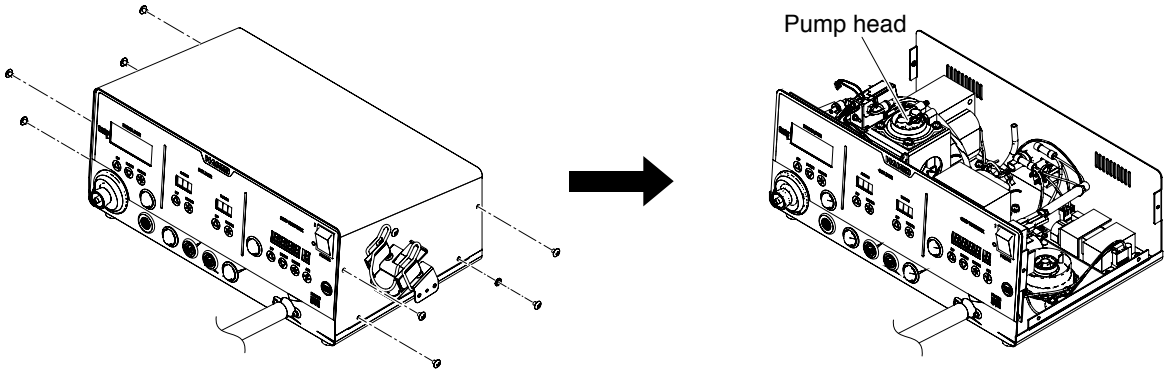



**⚠ CAUTION**
Be sure to change the offset value (temperature adjustment) of the nozzle temperature after replacing the heating element. Failure to do this may result in a heater temperature that is much higher or lower than the previous one.

## Maintenance of the pump head

### ● Remove the cover

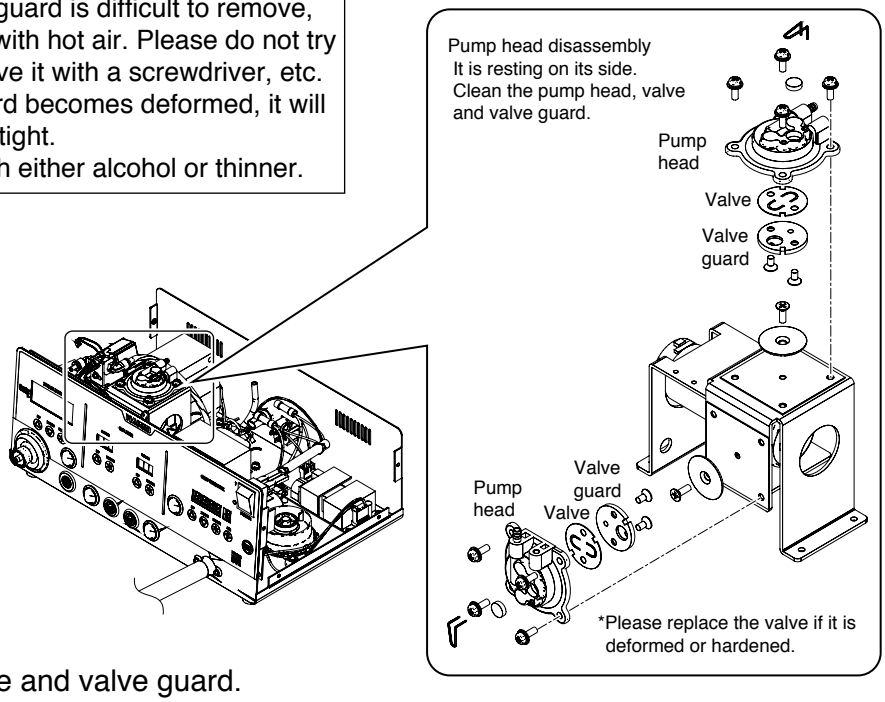
When performing maintenance on the pump head, remove the screws holding the cover and take the cover off.




### ● Cleaning the pump head

1. Remove the valve and valve guard and remove any attached flux.

> ⚠ **CAUTION**
> • When the valve guard is difficult to remove, please warm it with hot air. Please do not try to forcibly remove it with a screwdriver, etc. If the valve guard becomes deformed, it will no longer be airtight.
> • Please clean with either alcohol or thinner.




2. Install the valve and valve guard.

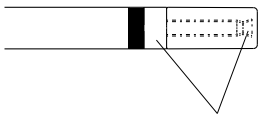
> ⚠ **CAUTION**
> When assembling the pump, please make sure to keep it airtight so that there are no air leaks.

# 16. CHECKING PROCEDURE (Desoldering Tool)

| ⚠ WARNING |
| --- |
| Unless otherwise directed, carry out these procedures with the power switch OFF and the power UNPLUGGED. |

## ■ Check for a broken heater or sensor

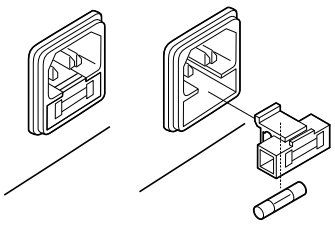
1. Check for a broken heater or sensor



Measure the resistance across this position.

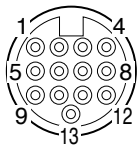
Verify the electrical integrity of the heater and sensor.
Measure the resistance of the heater and sensor while at room temperature（15 to 25°C；59 to 77°F）. It should be 3.9 Ω ±10%. If the resistance exceeds these limits, replace the tip.

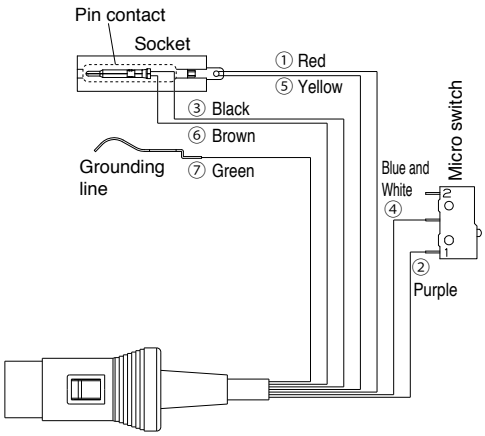
## ■ Replacing the fuse



1. Unplug the power cord from the power receptacle.
2. Remove the fuse holder.
3. Replace the fuse.
4. Put the fuse holder back in place.

## ■ Checking the connection cord for breakage




Checking the connection cord for breakage

1. Unplug the connection cord from the station.

2. Disassemble the heating element. (Please refer to “Replacing the heating element (heating core)”)

3. Measure the resistance values between the connector and the lead wires at the socket as follows. (Please refer to the wiring diagram on the left).

Pin1 · · · · · · · Red {Heating element1 (+)} ①
Pin2 · · · · · · · Purple {Trigger (+)} ②
Pin4 · · · · · · · Black {Heating element1 (-)} ③
Pin8 · · · · · · · Blue and White {Trigger (-)} ④
Pin9 · · · · · · · Yellow {Heating element2 (+)} ⑤
Pin12 · · · · · · Brown {Heating element2 (-)} ⑥
Pin13 · · · · · · Green (Grounding line) ⑦*

If any value exceeds 0 Ω or is ∞, replace the connection cord.

* For information on the plug 13, refer to “■Checking the grounding line”.

## ■ Checking the grounding line

1. Measure the resistance value between Pin 13 and the nozzle.
2. If the value exceeds 2 Ω (at room temperature), perform the nozzle maintenance. If the value still does not decrease, check the connection cord for breakage.

# 17. ERROR MESSAGE (Desoldering Tool)

**● Sensor Error**

When there is the possibility that a failure has occurred in the sensor or heater (including the sensor circuit), "**Sensor Error**" is displayed and the power is shut down.

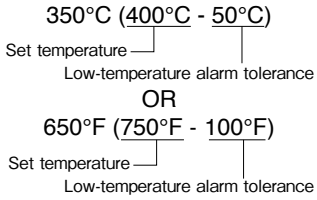
**● Grip Error**

"**Grip Error**" will be displayed if the connector cord is not attached to the station OR the wrong handpiece is connected.

**● Low Temp Error**

If the sensor temperature falls below the difference between the current temperature setting and the low-temperature alarm tolerance, "**Low Temp Error**" is displayed and the warning buzzer sounds. When the nozzle temperature rises to a value within the set tolerance, the buzzer will stop sounding.

EXAMPLE:




**EXAMPLE:**
Assume that the temperature setting is 400°C/750°F and the tolerance 50°C/100°F. If the temperature continues to decrease and finally falls below the value indicated while the heating element is on, "Low Temp Error" is displayed.

**● Heater Short Error**

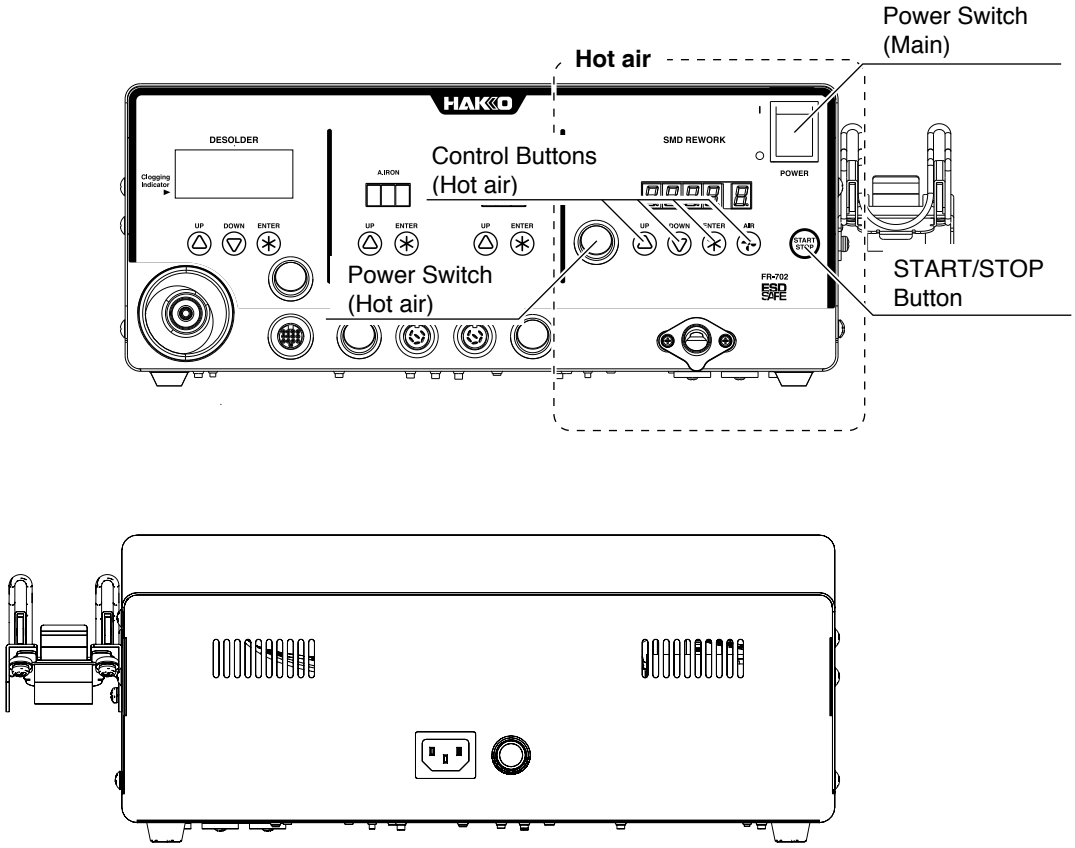
"**Heater Short Error**" will flash, and the buzzer will sound continuously, when an incompatible heater circuit is inserted, or if a foreign object has found it's way into the connector.

**● FATAL Error**

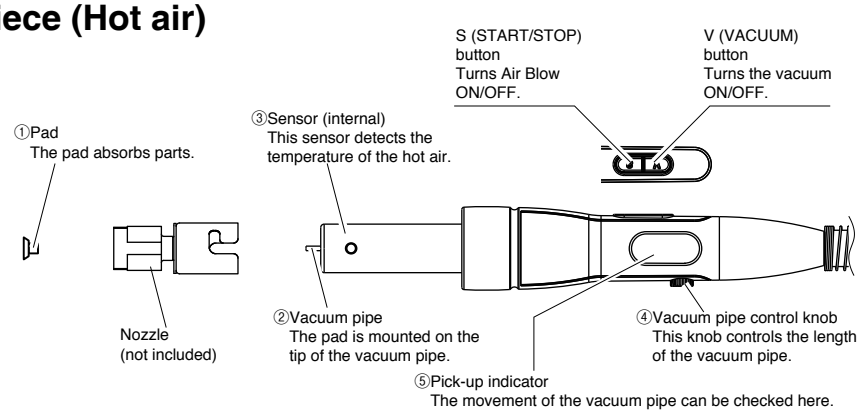
This is displayed when the system is unable to operate normally. Should this error be displayed, please contact your HAKKO representative.

# 18. PART NAMES (Hot air)

## ● Station



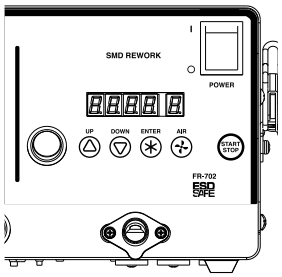

## ● Handpiece (Hot air)



# 19. INITIAL SETUP (Hot air)

## ● Operation and indication

Switch and control button




The front panel of HAKKO FR-702 (Hot air) includes five operation buttons.

START STOP - Used to start or stop the station.
- •Pressing this button when the forced cool down bypass is enabled will turn the airflow off and stop the cooling process.

△ - Used for changing values.
- •Pressing this button when using Preset Mode will cause the preset selection screen to appear.

▽ - Used for changing values.
- •Hold this button for at least one second to enter the Offset Mode.

✳ - Used for finalizing entered values and checking settings.
- •Hold this button for at least one second to display the temp/timer screen.

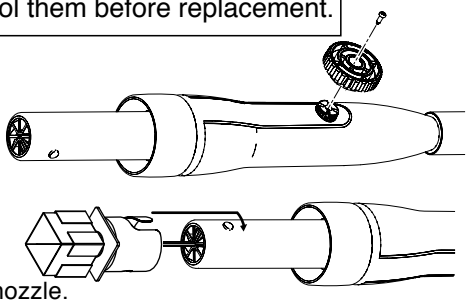
- Used to set air flow.
- •When setting the airflow, you may press ✳ or to finalize your airflow setting value.

### A. Handpiece

**⚠CAUTION**

The nozzle and pad will be heated at high temperature. Cool them before replacement.

**NOTE:**
The handpiece can be used with the provided vacuum pipe control knob (L).



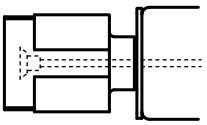
**● Using vacuum function operative nozzle**

**1. Attach the nozzle.**

a. Extend the vacuum pipe using the vacuum pipe control knob.

b. Pass the vacuum pipe through the nozzle hole and attach the nozzle.

**⚠CAUTION**
Do not use excessive force to the vacuum pipe.
When not using a nozzle, retract the vacuum pipe to the shortest length.



**2. Attach the pad.**

a. Attach the pad.

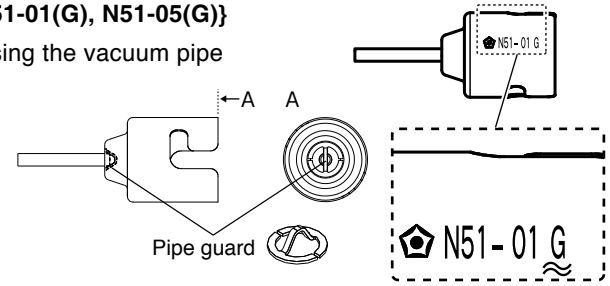
b. Adjust the pad to an appropriate position.
Adjust the vacuum pipe so that the pipe and pad protrude as little as possible.

**⚠CAUTION**
The pad does not last indefinitely. When it becomes deteriorated, replace it. Since exposure to high temperatures causes it to deteriorate faster, HAKKO recommends it be cooled after use.

**● Using vacuum function inoperative nozzle {N51-01(G), N51-05(G)}**

a. Retract the vacuum pipe to the shortest length using the vacuum pipe control knob.

**⚠CAUTION**
The new N51-01/N51-05 nozzle has a pipe guard inside. These nozzles could not be attached to HAKKO FR-702 when the vacuum pipe is extended. Do not use excessive force.



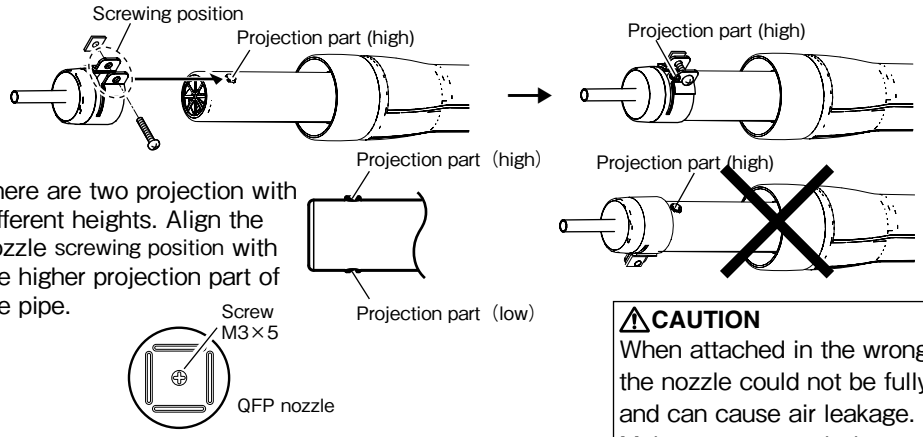

b. Tighten the nozzle mounting screw.

**⚠CAUTION**
When “G” is not marked on the nozzle, these nozzles do not have space to blow hot air. using them with the HAKKO FR-702 may result in danger.

**NOTE**：
Letter “G” is marked on the nozzle with the pipe guard.

● **How to Use a old nozzle**

Align the projection part (high), attach the old nozzle to the heater pipe.




There are two projection with different heights. Align the nozzle screwing position with the higher projection part of the pipe.

* When using the QFP nozzle, remove the inside screw (M3 × 5) of the nozzle.

**⚠CAUTION**
When attached in the wrong direction, the nozzle could not be fully inserted and can cause air leakage.
Make sure to attach the nozzle in the correct direction.

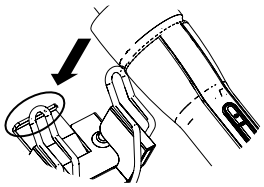
**⚠CAUTION**
**Vacuum function inoperative nozzles. (Old nozzle)**

- A1124B, A1130, A1131, A1132, A1133, A1134, A1142B, A1183, A1190, A1191, A1192, A1325
  These nozzles could not be attached to HAKKO FR-702 when the vacuum pipe is extended. Do not use excessive force.
- A1124, A1142
  Do not use these nozzles with HAKKO FR-702. These nozzles do not have space to blow hot air, using them with the HAKKO FR-702 may result in danger.

## B. Electrical connection and power ON

1. Insert the power cord into the receptacle on the rear panel of the station.
2. Place the handpiece on the holder.
3. Plug the other end of the power cord into a grounded wall socket.
4. Turn the power switch ON.

The rim of the handpiece must rest on the area circled in the illustration.



**⚠CAUTION**
When not in use, place the handpiece on the holder.

**⚠CAUTION**
This product is protected against electrostatic discharge. Be sure the unit is grounded.

# 20. OPERATION (Hot air)

● **Air Blow**

**1. Start**

Press the “S” button on the handpiece or (START/STOP) button on the station to start blowing air. Hot air blows out of the tip of the nozzle. Hot air temperature is controlled according to the temperature setting.

2. Stop

Press the “S” or (START/STOP) button again. Power to the heater is shut off and cooling begins. When the temperature falls to 100°C (200°F), or after 1.5 minutes of cooling, air blow is automatically stopped. The display will show P-S indicating that the station is ready to start again.

# 20. OPERATION (Hot air) (continued)

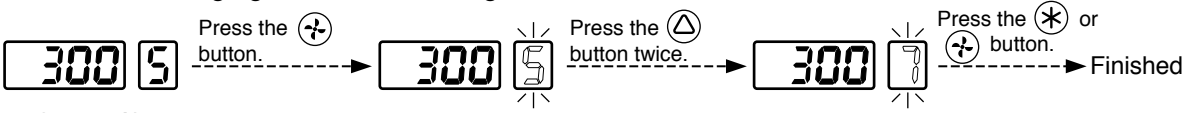
**⚠ WARNING**
Do not stop the hot air by turning the power switch OFF.
If power is turned off after use, there will be no cool-down. To avoid damage to the equipment, do not turn the power switch OFF until P-S appears on the display.

● **Setting of the air flow**

Pressing the ✣ button in the station causes the LED for AIR display to blink and allows you to change air flow. The air flow setting range is 1 to 9.

Actual airflow may be affected by the size and shape of the nozzle used.

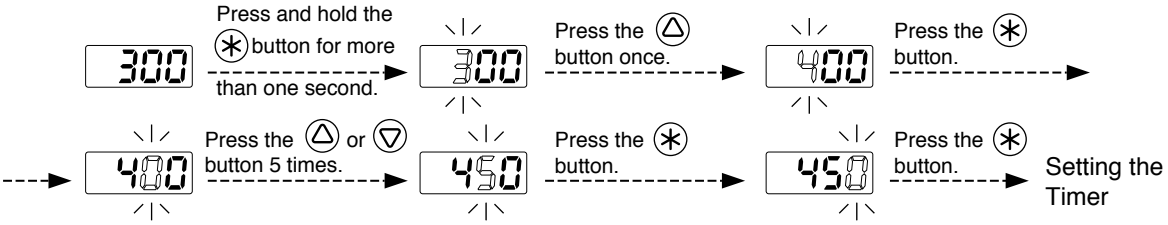
Example: Changing the air flow setting from 5 to 7



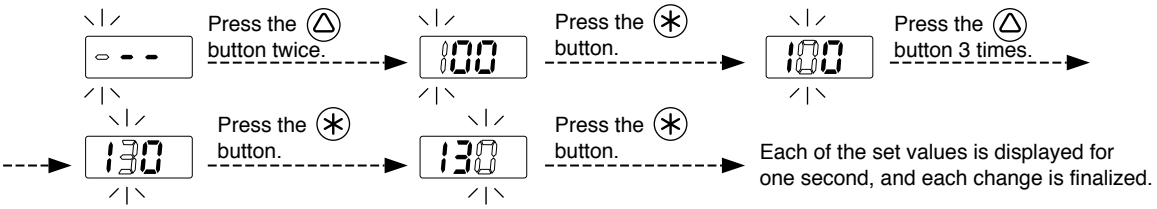

● **Setting/Changing the Temperature and Timer**

**NOTE:**
After accepting the value for the ones digit for temperature, you will have the option to set the timer starting over with the hundreds digit. The factory default : "Temperature 300°C (600°F)" "Timer --- (No setting)"

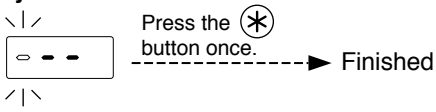
**1. Setting the Temperature (from 300°C to 450°C)**




**2. Setting the Timer (from --- to 130 sec.)**

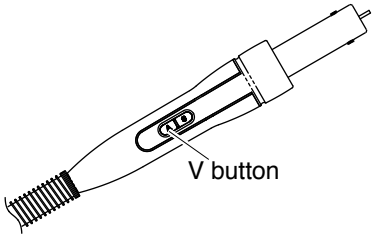


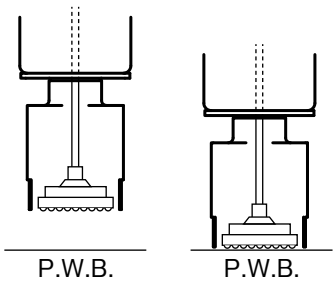

*** When you want to leave the timer "---".**




*** Vacuum Function**

Press the V (Vacuum) button on the handpiece. The vacuum pump turns ON and the part is held by suction.



*** Timer function**

In this product, setting the timer allows you to control the time during which hot air is blown.
Either of the following two modes is selectable by parameter setting: Open Timing in which count is started from the time when temperature reaches the set temperature and Closed Timing in which count is started upon start. The timer setting range is 001 to 999 seconds.
(When not using the timer function, select "---". When set in the timer setting "000" , don't work. )

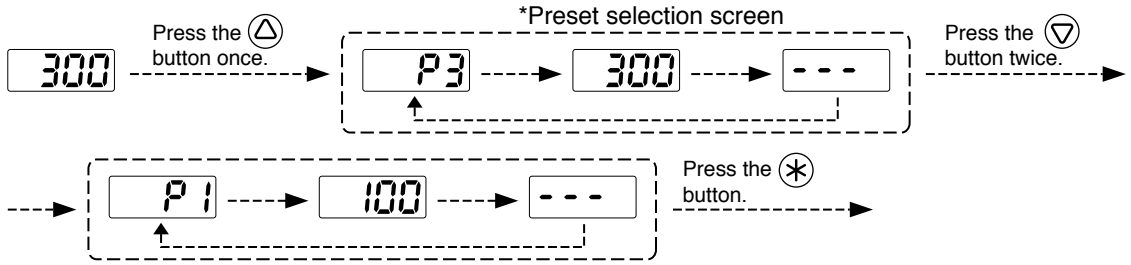
## ● Preset mode

When changing the hot air temperature, there is a preset function that selects the temperatures set (up to 5 can be stored).
Enter the parameter setting to change the mode.
(Please refer to "21. PARAMETER SETTING (Hot air)".)
Initial preset settings:

- P1 Temp. : 100°C (200°F) Timer : "---" Air flow : 5
- P2 Temp. : 200°C (400°F) Timer : "---" Air flow : 5
- P3 Temp. : 300°C (600°F) Timer : "---" Air flow : 5
- P4 Temp. : 400°C (800°F) Timer : "---" Air flow : 5
- P5 Temp. : 500°C (950°F) Timer : "---" Air flow : 5

The initial number of active presets is set to 5 at the factory.
The default selected preset is set to P3 at the factory.

Example : Changing preset selection from preset No. 3 to No. 1.




Control will begin with new preset setting.
The procedure for making changes to the preset temperatures, timer and air flow is the same as the "● Setting/Changing the Temperature and Timer" and "● Setting of the air flow" in 20. OPERATION (Hot air).

### ● Restriction on setting changes (Password function)

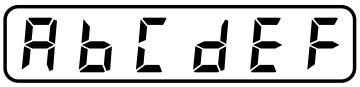
It is possible to restrict certain setting changes to the unit.
There are three choices for the password setting. The factory default value is set to "0" (password not required)
Enter the parameter settings to change the mode. (Refer to "21. PARAMETER SETTING (Hot air)")

| | 0 : Open | 1 : Partial | 2 : Restricted |
|---|---|---|---|
| Switch to the parameter setting mode | ○ | × | × |
| Switch to the temperature setting mode | ○ | △ | × |
| Switch to the preset selection mode | ○ | △ | × |
| Switch to the offset setting mode | ○ | △ | × |
| Make airflow adjustments | ○ | △ | × |

○ : You can make changes without entering a password.
△ : You can choose whether or not a password is needed to make changes.
× : A password is required to make changes.

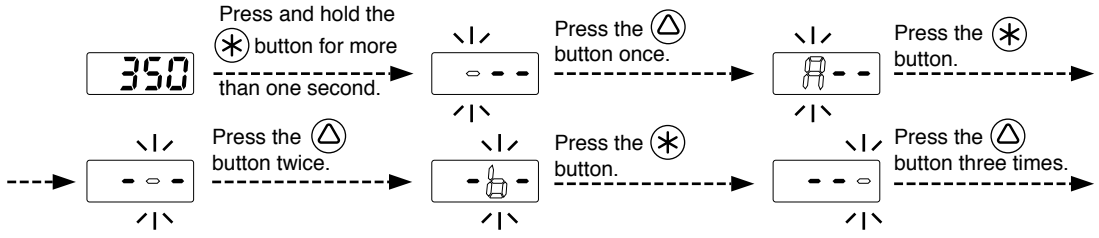
# 20. OPERATION (Hot air) (continued)

Select and input three letters for password from six letters on the right.




The letters for password

Example: The procedure for changing the set temperature when the unit is restricted by a password. (Password is "AbC")



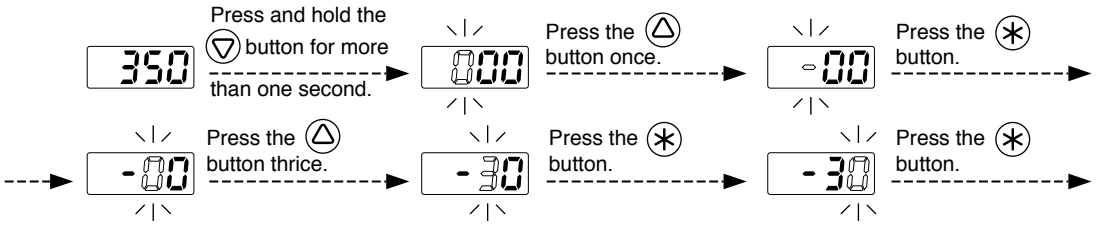

**⚠CAUTION**
- If the password you entered is incorrect, the display will show three dashes for you to re-enter the password.
- If you enter the password incorrectly twice in a row, the display will return to the previous screen.

The unit will move to the change setting screen for each mode after entering the password. Please change the setting for each mode according to the procedure covered in this manual.

### ● Offset mode {Setting is available within the range of ±50°C (±90°F)}

**⚠ CAUTION**
If the sum of the set temperature and offset value exceeds 600°C (1120°F) or falls below 50°C (120°F), the entered offset value will not be valid.

Example: Changing the offset setting from 0°C to -30°C




Each of the set values is displayed for two seconds, and each change is finalized.

## Other main functions

### ● Chain Presets function

In this station, when you turn on “Preset mode” and “Chain Presets function” in the parameter settings and set the timer for each preset, available presets are called in from “P-1” to “P-5” allowing you to simulate up to a 5 step rework profile.

A preset in which “000” is set in the timer setting is skipped and the next preset is automatically started.

### ● Auto sleep function

When the handpiece is placed in the holder, the automatic sleep function starts working (by default). Pressing the START/STOP (HOT AIR) button in this state will not turn on the station. If the handpiece is placed in the holder while it is blowing hot air, start of automatic cooling is forced before the stop of operation.

**⚠ CAUTION**
When installing this station, do not place flammable substances behind the outlet of the handpiece. If the handpiece is placed in the iron holder while blowing hot air, serious accidents such as fire may be caused by hot air.

### ● Auto shutoff function

The auto shutoff function works by default after the station is idle for 30 minutes and it automatically enters a power save state.

### ● Forced cooling bypass function

With this function enabled, if you press the “S” button or (START/STOP) button again during cooling, cooling is stopped. This function is used when working temperature is low and you do not have to wait until automatic stop is made. When the set temperature is 380°C (716°F) or more, the function is unavailable.

> ⚠ **CAUTION**
> Please do not use this function at high temperatures.

### ● Check of Temperature / Timer setting

Example : When the set temperature is 350°C and the timer setting is 150 seconds.

Pressing the (✳) button once allows you to check the settings of the set temperature [350] and set time [150] in this order.

# 21. PARAMETER SETTING (Hot air)

**Hot air has the following parameters:**

| Parameter name | Parameter No. | Value | Initial value |
|---|---|---|---|
| °C / °F selection | 01 | °C / °F | °C (°F****) |
| Auto sleep ON/OFF setting | 07 | 0: OFF / 1: ON | 1 |
| Auto shutoff ON/OFF setting | 08 | 0: OFF / 1: ON | 1 |
| Setting mode selection | 11 | 0: Normal mode / 1: Preset mode | 0 |
| The number of preset * | | [2P] (2 pcs) - [5P] (5 pcs) | [5P] |
| Password setting | 14 | 0: Open/ 1: Partial / 2: Restricted | 0 |
| Temperature setting mode ** | | [10] :○ / [11] :× | [10] |
| Preset selection mode** | | [20] :○ / [21] :× | [20] |
| Offset setting mode** | | [30] :○ / [31] :× | [30] |
| Air flow mode** | | [40] :○ / [41] :× | [40] |
| Password*** | | AbCdEF Select three letters | - |
| Auto shutoff time setting | 18 | 30 to 60 min. (Set in units of minutes) | 30 |
| Timer mode | 20 | o: Open Timing / c: Closed Timing | o |
| Forced cooling bypass | 21 | 0: OFF / 1: ON | 0 |
| Preset connection ON/OFF setting | 22 | 0: OFF / 1: ON | 0 |

* It is displayed only when "1:Preset mode" is selected in the setting mode.

** It is displayed only when "1:Partial" is selected in the password setting.

*** It is displayed only when either "1:Partial" or "2:Restricted" is selected in the password setting.

**** For USA.

# 21. PARAMETER SETTING (Hot air) (continued)

### ● 01 : °C or °F temperature display seletion

The displayed temperature can be switched between Celsius and Fahrenheit.

### ● 07 : Auto sleep ON/OFF setting

Select whether you will activate the auto sleep function.

### ● 08 : Auto shutoff ON/OFF setting

Select whether you will activate the auto shut off function.

### ● 11 : Setting mode selection

Temperature setting can be switched between the normal mode and the preset mode.
If selecting the preset mode, you will be asked for the number of preset to have available for programming.
Press the △ or ▽ button to set the number.

### ● 14 : Password setting

Select "Open", "Partial" or "Restricted" for password setting. If selecting the Restricted, perform the setting for password. If selecting partial, choose whether or not the password function is needed when moving to the temperature setting, preset, offset, and air flow modes and set the password.

### ● 18 : Auto shutoff time setting

Set auto shutoff time. The setting is available within 30 to 60 minutes in increments of one minute.

### ● 20 : Timer mode selection

Switch the timer mode. In the Open mode, timing starts when the set temperature is reached, and in the Closed mode, timing starts from when it is turned on.

### ● 21 : Forced cooling bypass

Specify whether or not to enable the function that allows you to force the termination of cooling after completion of work. Forced termination in high temperature may cause premature failure of the heating element. Do not use the function except for work in low temperature.

### ● 22 : Chain Preset setting

Select whether you will activate the Chain Preset function. If you turn on “Preset mode” and “Chain Preset function”, available presets are called in sequence from “P-1” to “P-5” allowing you to simulate up to a 5 step rework profile.

● **Parameter entering mode**

1. Turn off the power switch.
2. Turn on the power switch while pressing the △ button.
3. When the display shows [01], the station is in parameter entering mode.
4. You can switch the parameter No. by pressing the △ or ▽ .

**A. °C or °F temperature display selection**

1. Either [C] or [F] will be displayed if you press the ✱ button when [01] is displayed.
2. [C] and [F] will be switched alternately If you press the △ or ▽ button.
3. The display will return to [01] if you press the ✱ button after selecting.

**B. Auto sleep ON/OFF setting**

1. Either [0] or [1] will be displayed if you press the ✱ button when [07] is displayed.
2. [0] and [1] will be switched alternately If you press the △ or ▽ button.
3. The display will return to [07] if you press the ✱ button after selecting.

**C. Auto shutoff ON/OFF setting**

1. Either [0] or [1] will be displayed if you press the ✱ button when [08] is displayed.
2. [0] and [1] will be switched alternately If you press the △ or ▽ button.
3. The display will return to [08] if you press the ✱ button after selecting.

**D. Setting mode selection**

1. Either [0] or [1] will be displayed if you press the ✱ button when [11] is displayed.
2. [0] (The normal mode) and [1] (The preset mode) will be switched alternately, if you press the △ or ▽ button.
3. The display will return to [11] if you press the ✱ button after selecting.*

*** If you select the preset mode, the display will move to the preset selection screen.**

4. The number of active preset will be displayed If you press the ✱ button at 3.
   (Example : If the number is three, [3P] is displayed.)
5. Press the △ or ▽ button to change the value and select the number of active preset you required.
   **The unit will accept values from 2P through 5P.**
6. The display will return to [11] if you press the ✱ button after selecting.

# 21. PARAMETER SETTING (Hot air) (continued)

**E. Password setting**

1. Change the screen display to [14] by pressing the △ or ▽ button.
2. Either [0], [1] or [2] will be displayed if you press the ✱ button when [14] is displayed.
   If you press the △ or ▽ button, [0] (Open), [1] (Partial) and [2] (Restricted) will be switched alternately.
3. If you press the ✱ button after selecting, the display will return to [14]. (Refer to *1、2)

***1 The display will move to the following selection screen if you select [1] (Partial).**

4. If you press the ✱ button at 3, you will be asked whether or not the password function is needed when moving to the temperature setting mode.
5. Either [1 0] (without password) or [1 1] (with password) will be displayed if you press the △ or ▽ button.
6. If you press the ✱ button after selecting, you will be asked whether or not the password function is needed when moving to the preset selection mode.
7. Either [2 0] (without password) or [2 1] (with password) will be displayed if you press the △ or ▽ button.
8. If you press the ✱ button after selecting, you will be asked whether or not the password function is needed when moving to the offset mode.
9. Either [3 0] (without password) or [3 1] (with password) will be displayed if you press the △ or ▽ button.
10. If you press the ✱ button after selecting, you will be asked whether or not the password function is needed when moving to the Air flow mode.
11. Either [4 0] (without password) or [4 1] (with password) will be displayed if you press the △ or ▽ button.
12. If you press the ✱ button after selecting, the display will move to password setting screen.

***2 If you select [2] (Restricted), the display will move to the following password setting screen.**
**If you select [1] (Partial), the display will move to the following the password setting screen after selecting *1.**

13. When the third digit is flashing, you can input the character you require. Press the △ or ▽ button to change the value of the third digit.
14. After determining the desired character ( AbCdEF ), press the ✱ button. The second digit will begin to flash. Using the same procedure, enter the character you require for the second digit, and the first digit.
    Use the same procedure to enter the letters for tens and units digit.
15. The display will return to [14] if you press the ✱ button after entering the units digit.

**F. Auto shutoff time setting**

1. Auto shutoff time (30 minutes early) will be displayed if you press the ✻ button when [18] is displayed.
2. Press the △ or ▽ button, you can change to the desired value. The values you can enter is 30 to 60 (minutes).
3. The display will return to [18] if you press the ✻ button after selecting.

**G. Timer mode selection**

1. Either [o] or [c] will be displayed if you press the ✻ button when [20] is displayed.
2. [o] (Open Timing) and [c] (Closed Timing) will be switched alternately If you press the △ or ▽ button.
3. The display will return to [20] if you press the ✻ button after selecting.

**H. Forced cooling bypass**

1. Either [0] or [1] will be displayed if you press the ✻ button when [21] is displayed.
2. [0] and [1] will be switched alternately If you press the △ or ▽ button.
3. The display will return to [21] if you press the ✻ button after selecting.

**I. Chain Preset setting**

1. Either [0] or [1] will be displayed if you press the ✻ button when [22] is displayed.
2. [0] and [1] will be switched alternately If you press the △ or ▽ button.
3. The display will return to [22] if you press the ✻ button after selecting.

After changing parameters, press and hold the ✻ button down for at least two seconds until [Y] is displayed. At this time, you can switch between [Y] and [n] by pressing the △ or ▽ button. Select [Y] if you are finished making changes or [n] if you need to go back and make more changes. Press the ✻ button to confirm you selection.

**Changes will not be completed until [Y] is displayed and you press the ✻ button.**
**Please note that no changes will be made if you turn off the power while making changes.**

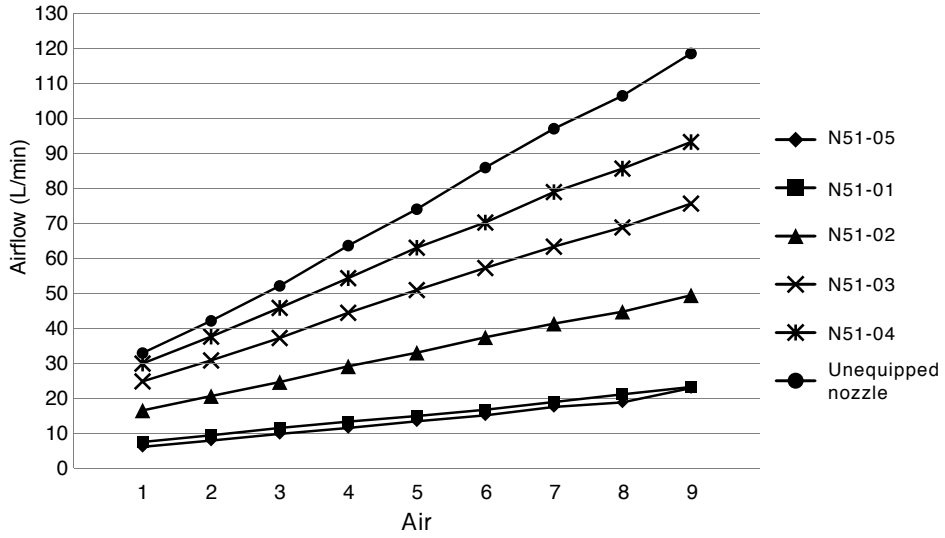
# 22. TEMPERATURE DISTRIBUTION CHART (Hot air)

**⚠ CAUTION**

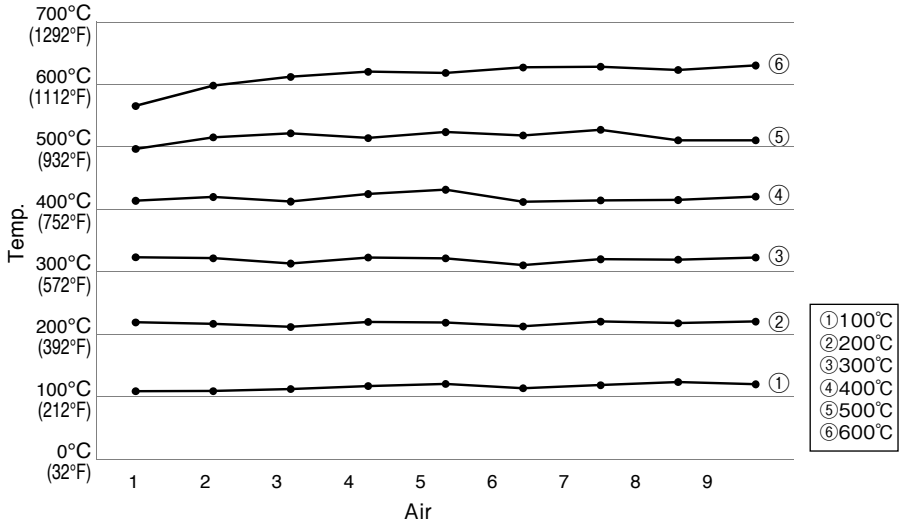
- These charts do not define the temperature characteristics, and are for reference only.
- The temperature distribution charts for HAKKO 850 or 850B should not be used for HAKKO FR-702. HAKKO FR-702 uses a different pump and control system. When you use the HAKKO FR-702, make sure to refer to the temperature distribution charts shown to the under.
- The hot air temperature may not reach the set temperature depending upon the combination of the nozzle and the set air flow. In this case, reduce the set temperature or the air flow.

- Test condition: Measured at a point 1 mm (0.04 in.) from the nozzle by recorder.

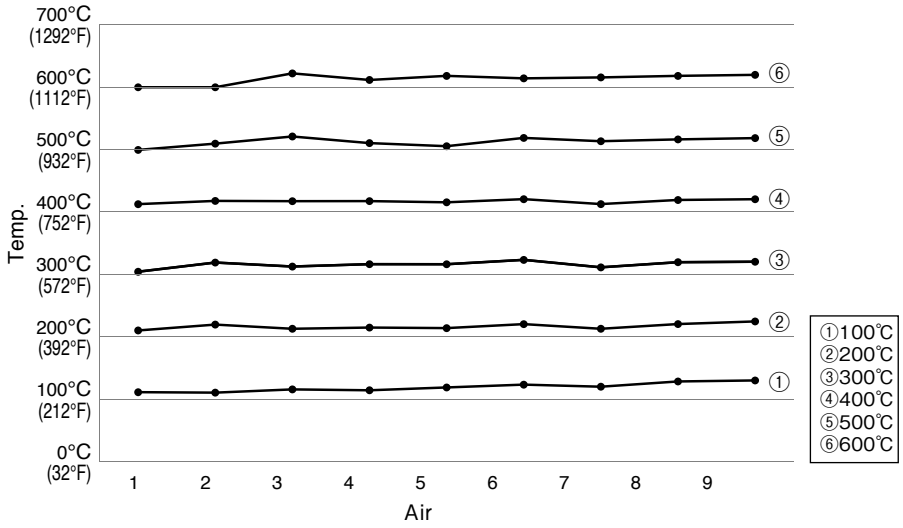
**HAKKO FR-702 Airflow**



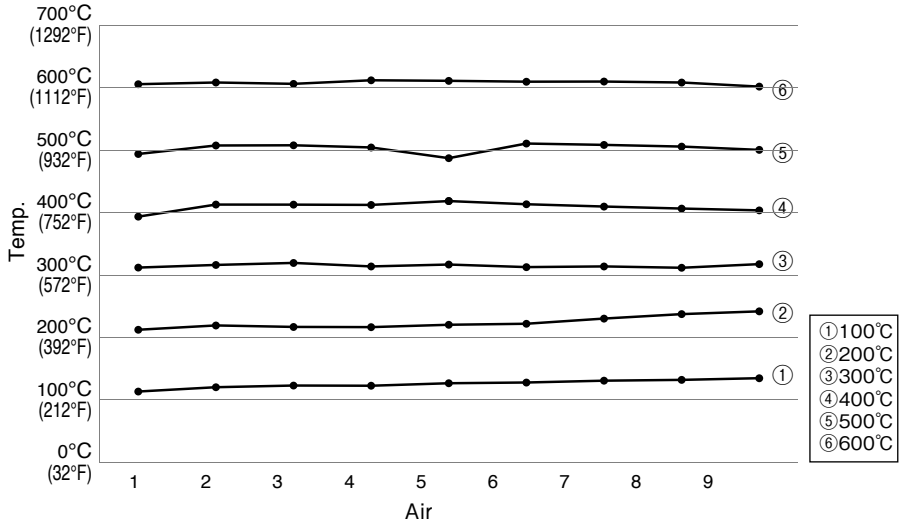

**N51-01** Single ø2.5 mm (0.10 in.)



**N51-02** Single ø4.0 mm (0.16 in.)

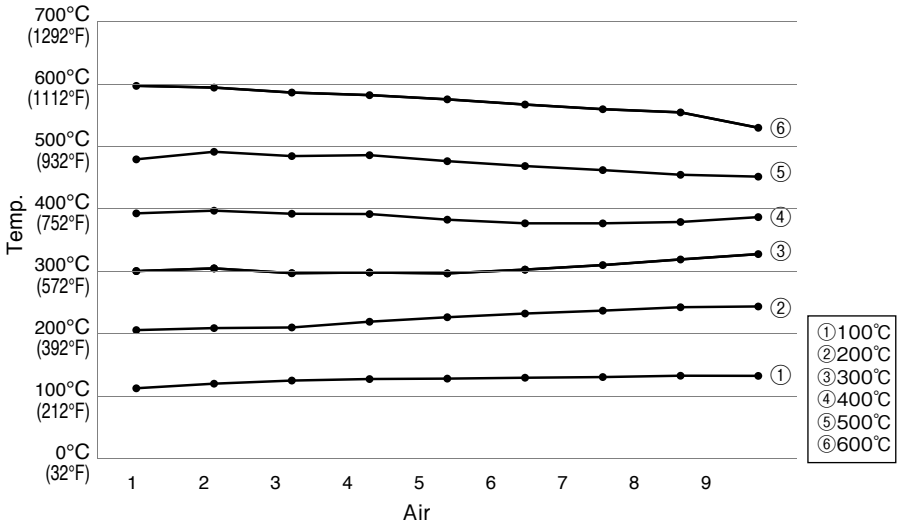



**N51-03** Single ø5.5 mm (0.22 in.)

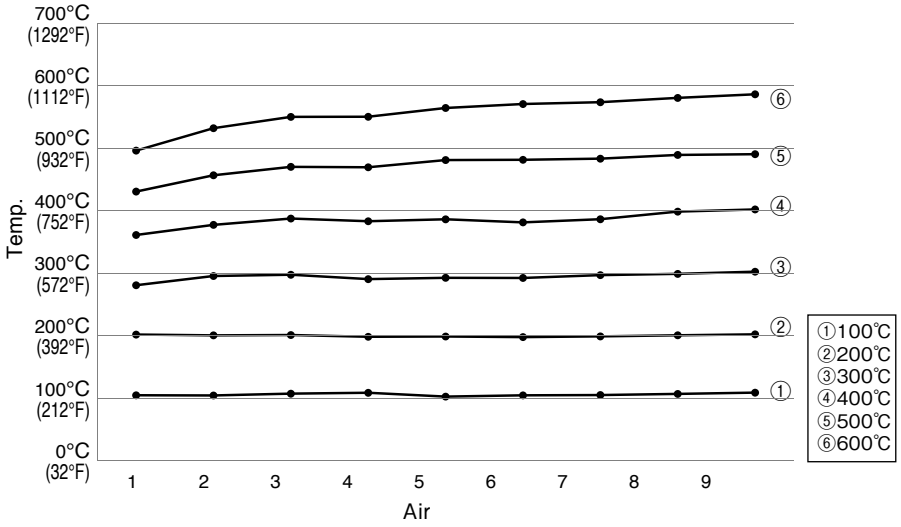


# 22. TEMPERATURE DISTRIBUTION CHART (Hot air) (continued)

**N51-04** Single ø7.0 mm (0.28 in.)




**N51-05** Bent Single 1.5 x 3 mm (0.06 x 0.12 in.)



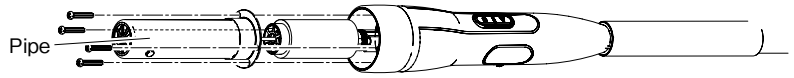
# 23. MAINTENANCE / INSPECTION (Hot air)

| ⚠ WARNING |
| --- |
| Replacing the heating element is very dangerous. Be sure to turn the power switch OFF and be careful of the following procedure when replacing the heating element. |

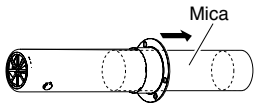
**A. Remove the heating element**

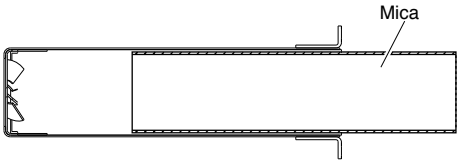
| ⚠ CAUTION |
| --- |
| When replacing the heater, please be careful not to apply force, such as vacuum pipe is bent. |

1. Remove the 4 screws that attach the heater pipe to the handpiece. Remove the heater pipe.

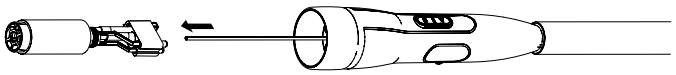



2. Remove the mica from inside the heater pipe.




3. Disconnect and remove the heating element assembly.



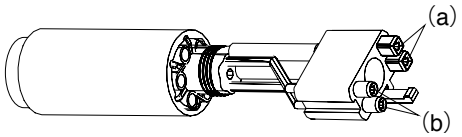
**B. Measure the resistance value**

●Normal heater resistance value

Connect an ohmmeter across the connector terminals (a).
The correct values are approximately: 14 Ω ±10% (100 - 110 V), 41 Ω ±10% (220 - 240 V).
If the resistance value is incorrect, replace the part.

●Normal sensor resistance value

Connect an ohmmeter across the connector terminals (b). If the resistance value is ∞, replace the part.




Refer to the instructions included with the replacement part.

| ⚠ CAUTION |
| --- |
| Handle the heating element with care. Never touch the heating element wire. |

# 24. ERROR MESSAGE (Hot air)

When the error detection software in the HAKKO FR-702 (Hot air) detects an error, a message is displayed to alert the operator. Refer to “TROUBLE SHOOTING GUIDE” for procedures to correct the error.

● Sensor Error


This error occurs when there is the possibility of a sensor failure (or a failure in the sensor circuit). The S-E flashes and the power is shut down.

● Heater Error


This error occurs when the temperature of the hot air is falling even though the heater is on. The H-E flashes to indicate the possibility of a heater failure.

● Fan Error


This error occurs when there is the possibility of a fan failure. The F-E flashes and the power is shut down.

# 25. TROUBLE SHOOTING GUIDE

**⚠WARNING**

Before checking the inside of the HAKKO FR-702 or replacing parts, be sure to disconnect the power plug.

| | |
|---|---|
| ● **Nothing happens when the power switch is turned on.** | **CHECK** : Is the power cord and/or connecting plug disconnected?<br>**ACTION** : Connect it.<br>**CHECK** : Is the fuse blown?<br>**ACTION** : Determine why the fue blew and eliminate the cause, then replace the fuse.<br>a. Is the inside of the handpiece short-circuited?<br>b. Is the grounding spring touching the heating element?<br>c. Is the heating element lead twisted and short-circuited?<br>Try replacing the fuse even if the cause cannot be identified.<br>If it still blows, return the product for repair. |
| ● **The heater lamp lights up but the tip does not heat up. (Soldering iron)** | **CHECK** : Is the cord assembly broken? Is the heating element/ sensor broken?<br>**ACTION** : If the cord assembly is broken, replace the HAKKO FX-8801. If the heating element / sensor is broken, replace the heating element. |
| ● **The Heater-error H-E is displayed. (Soldering iron)** | **CHECK** : Is the heater broken?<br>**ACTION** : If the heater is broken, replace the heating element.<br>**CHECK** : Is the setting value for the low-temperature alarm tolerance too low?<br>**ACTION** : Increase the setting value. |
| ● **The tip heats up intermittently. (Soldering iron)** | **CHECK** : Is the cord assembly broken?<br>**ACTION** : If the cord assembly is broken, replace the HAKKO FX-8801. |
| ● **Solder does not wet to the tip or nozzle. (Soldering iron)** | **CHECK** : Is the tip or nozzle temperature too high?<br>**ACTION** : Set an appropriate temperature.<br>**CHECK** : Is the tip coated with black oxide?<br>**ACTION** : Remove the black oxide. (Refer to “Tip Maintenance”). |
| ● **The tip or nozzle temperature is too low.** | **CHECK** : Is the tip or nozzle coated with black oxide?<br>**ACTION** : Remove the black oxide. (Refer to “Tip Maintenance”).<br>**CHECK** : Is the iron or nozzle temperature adjusted correctly?<br>**ACTION** : Perform the temperature adjustment. |
| ● **The tip can not be pulled off. (Soldering iron)** | **CHECK** : Is the tip seized? Is the tip swollen because of deterioration?<br>**ACTION** : Replace the tip and the heating element. |
| ● **The tip or nozzle doesn’t hold the desired temperature.** | **CHECK** : Is the iron or nozzle temperature adjusted correctly?<br>**ACTION** : Perform the temperature adjustment. |
| ● **Pump does not operate. (Desoldering Tool)** | **CHECK** : Is the plug of the handplece properly connected?<br>**ACTION** : Connect it tightly.<br>**CHECK** : Is the nozzle or hole in the heating element clogged?<br>**ACTION** : Clean it. |
| ● **Solder is not being absorbed. (Desoldering Tool)** | **CHECK** : Is the filter pipe full of solder?<br>**ACTION** : Clean it.<br>**CHECK** : Is the ceramic paper Filter hardened?<br>**ACTION** : Replace it with a new one.<br>**CHECK** : Is there a vacuum leak?<br>**ACTION** : Check the connections and filter pipe seals and replace any worn parts.<br>**CHECK** : Is the heater tube or nozzle clogged?<br>**ACTION** : Clean it. |

# 25. TROUBLE SHOOTING GUIDE (continued)

| | |
|---|---|
| ● **The nozzle does not heat up. (Desoldering Tool)** | **CHECK** : Is the plug of the handplece properly connected?<br>**ACTION** : Connect it tightly.<br>**CHECK** : Is the heating element damaged?<br>**ACTION** : Replace it with a new one. |
| ● **[S-E] is displayed (Hot air)** | **CHECK** : Is the sensor broken?<br>**ACTION** : Measure the resistance value of the sensor. When the resistance value is ∞, replace the heater. |
| ● **[H-E] is displayed (Hot air)** | **CHECK** : Is the heater broken?<br>**ACTION** : Measure the resistance value of the heater. The correct values are approximately: 14 Ω ±10% (100 - 110 V and normal temperature), 41 Ω ±10% (220 - 240 V and normal temperature). When the resistance value is not within the normal range, replace the heater. |
| ● **[F-E] is displayed (Hot air)** | **ACTION** : The fan may be broken. Replace the fan with a new one. |

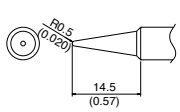
**NOTE :**
When repairs are needed, please send both the handpiece and the station to your sales agent.

# 26. TIP & NOZZLE STYLES

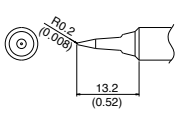
Unit：mm (inch)

● **Tip**

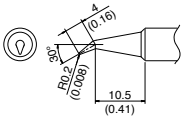
T18-B Shape-B



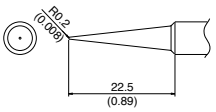

T18-SB Shape-SB



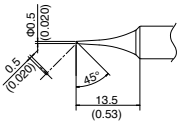

T18-BR02 Shape-0.2BR



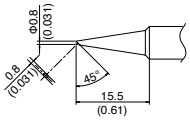

T18-BL Shape-BL



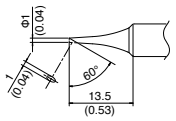

T18-C05 Shape-0.5C



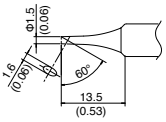

T18-C08 Shape-0.8C



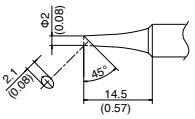

T18-C1 Shape-1C
T18-CF1*



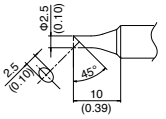

T18-CF15* Shape-1.5C



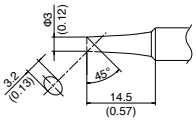

T18-C2 Shape-2C
T18-CF2*



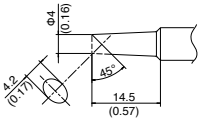

T18-CSF25* Shape-2.5CS



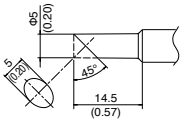

T18-C3 Shape-3C
T18-CF3*



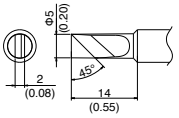

T18-C4 Shape-4C
T18-CF4*



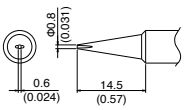

T18-C5 Shape-5C



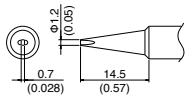

T18-K Shape-K



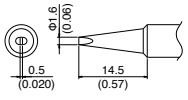

T18-D08 Shape-0.8D



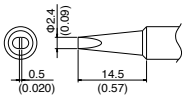

T18-D12 Shape-1.2D



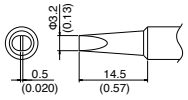

T18-D16 Shape-1.6D



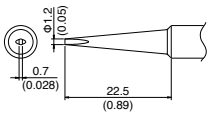

T18-D24 Shape-2.4D



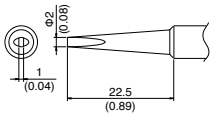

T18-D32 Shape-3.2D



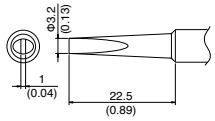

T18-DL12 Shape-1.2DL



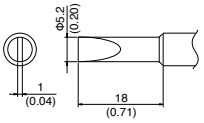

T18-DL2 Shape-2DL



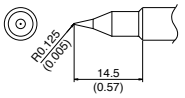

T18-DL32 Shape-3.2DL



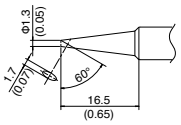

T18-S3 Shape-S3



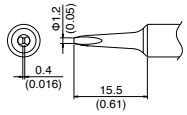

T18-S4 Shape-S4



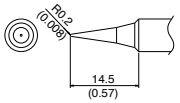

T18-S6 Shape-S6




T18-S9 Shape-S9




T18-I Shape-I

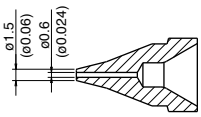



* Tinned on the soldering surface only.

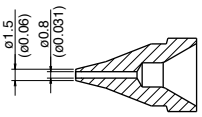
● Use only genuine HAKKO soldering iron tips. Replacement tips for the HAKKO FX-8801 are designated the T18 series.

● **Nozzle (Desoldering Tool)**

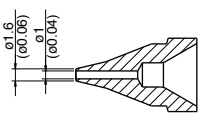
N61-01



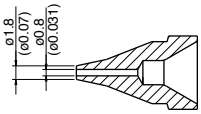

N61-02



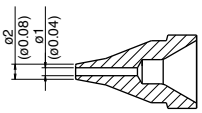

N61-03



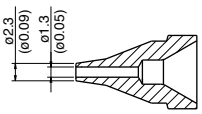

N61-04



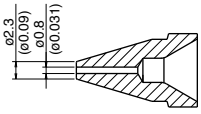

N61-05



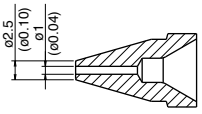

N61-06



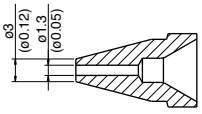

N61-07



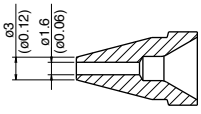

N61-08



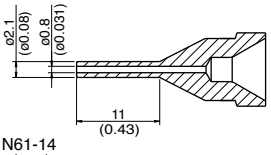

N61-09



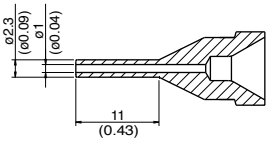

N61-10



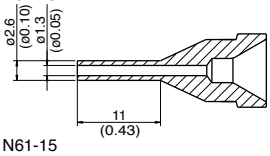

N61-11



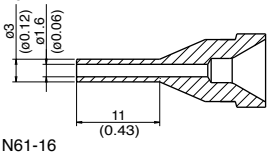

N61-12



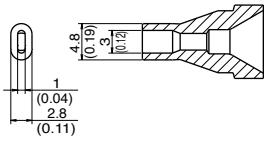

N61-13



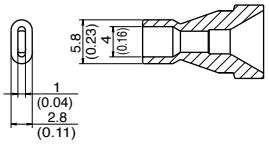

N61-14




N61-15



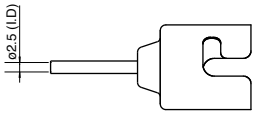

N61-16



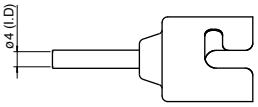
# 26. TIP & NOZZLE STYLES (continued)

● **Straight nozzle (Hot air)**

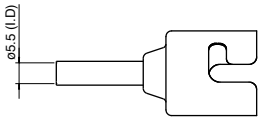
N51-01 Single ø2.5



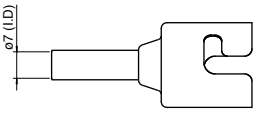

N51-02 Single ø4



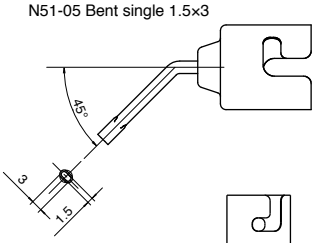

N51-03 Single ø5.5




N51-04 Single ø7

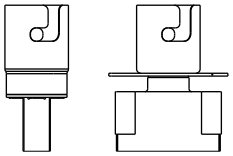



N51-05 Bent single 1.5×3




N51-50

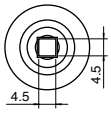
with N51-01, N51-03, N51-04, N51-05



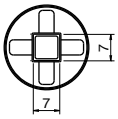
● **BGA nozzle**

**(Hot air)**

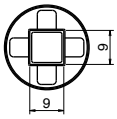
N51-10 BGA 4 × 4



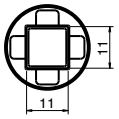

N51-11 BGA 6 × 6



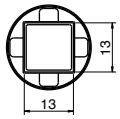

N51-12 BGA 8 × 8



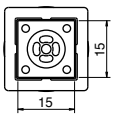

N51-13 BGA 10 × 10



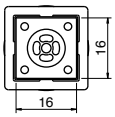

N51-14 BGA 12 × 12



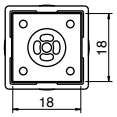

N51-15 BGA 14 × 14



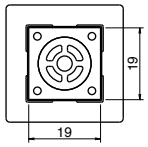

N51-16 BGA 15 × 15



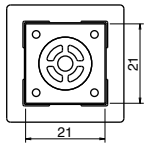

N51-17 BGA 17 × 17



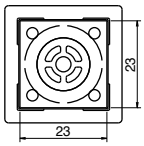

N51-18 BGA 18 × 18



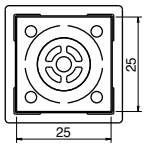

N51-19 BGA 20 × 20



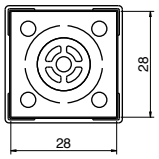

N51-20 BGA 22 × 22



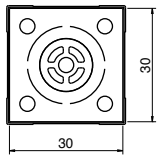

N51-21 BGA 24 × 24



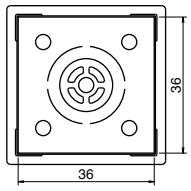

N51-22 BGA 27 × 27



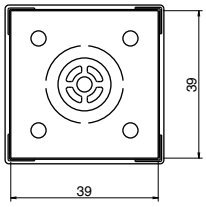

N51-23 BGA 29 × 29



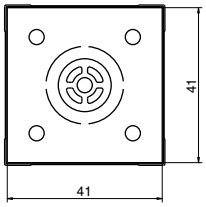

N51-24 BGA 35 × 35



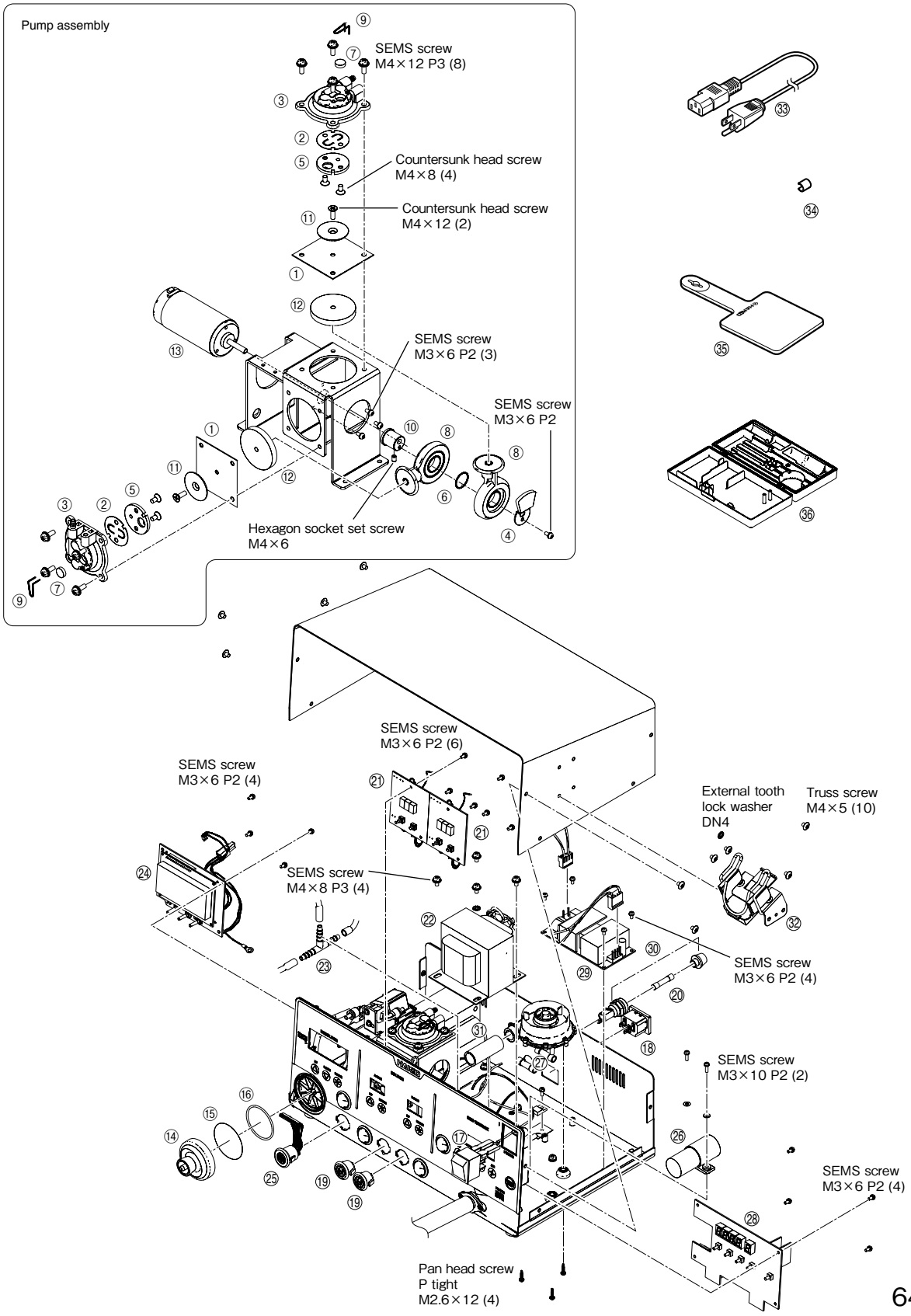

N51-25 BGA 38 × 38




N51-26 BGA 40 × 40



# 27. PARTS LIST



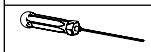
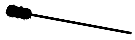
# 27. PARTS LIST (continued)

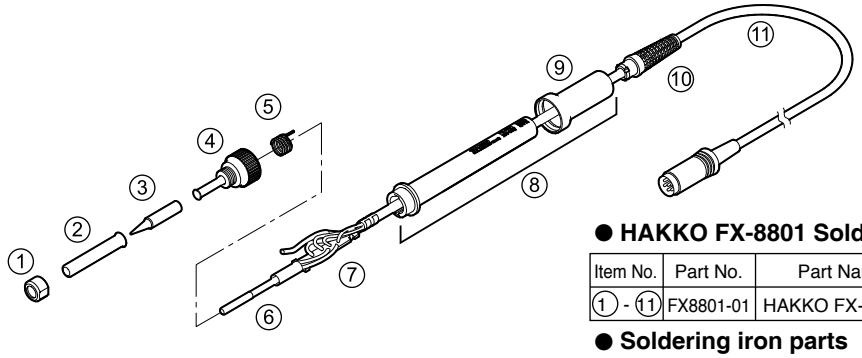
● **HAKKO FR-702**

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | A1013 | Diaphragm | qty 2 |
| ② | A1014 | Valve plate | qty 2 |
| ③ | B1050 | Pump head | |
| ④ | B1053 | Balance weight | |
| ⑤ | B1056 | Fixing plate | |
| ⑥ | B1057 | Ring for bearing | |
| ⑦ | B1059 | Exhaust filter | qty 2 |
| ⑧ | B1312 | Crank | |
| ⑨ | B1313 | Filter retaining pin | |
| ⑩ | B2060 | Crank shaft | |
| ⑪ | B2085 | Diaphragm setting plate | |
| ⑫ | B2506 | Damper | qty 2 |
| ⑬ | B3428 | Motor | |
| ⑭ | B5076 | Vacuum outlet cap | |
| ⑮ | A5020 | Filter | qty 10 |
| ⑯ | B5077 | O-ring / S-40 | |
| ⑰ | B5151 | Power switch | |
| ⑱ | B3628 | Inlet | |
| ⑲ | B3463 | Receptacle | Soldering iron |
| ⑳ | B5177 | Fuse / 125 V-12 A | 100 - 110 V |
| | B3674 | Fuse / 250 V-7 A | 220 - 240 V |
| ㉑ | B3736 | P.W.B. / for control | Soldering iron |
| ㉒ | B5112 | Transformer | 100 - 110 V Soldering iron |
| | B5114 | Transformer | 220 - 240 V Soldering iron |
| ㉓ | B3414 | Inner hose joint | |
| ㉔ | B5176 | P.W.B. for control | LCD, with connector Desoldering Tool |
| ㉕ | B5100 | Receptacle assembly | Desoldering Tool |

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ㉖ | B5092 | Pump | Hot air |
| ㉗ | B5369 | Fan | |
| ㉘ | B5108 | P.W.B. /100 - 127 V | Hot air |
| | B5109 | P.W.B. /220 - 240 V | Hot air |
| ㉙ | B5053 | Power unit | |
| ㉚ | B5152 | Fuse holder | 100 - 110 V |
| | B1134 | Fuse holder | 220 - 240 V |
| ㉛ | B5043 | Joint hose | |
| ㉜ | B5150 | Handpiece holder | |
| ㉝ | B2421 | Power cord, 3 wired cord but no plug | 220 - 240 V |
| | B2422 | Power cord, 3 wired cord & BS plug | India |
| | B2424 | Power cord, 3 wired cord & European plug | 220 V KC, 230 V CE |
| | B2425 | Power cord, 3 wired cord & BS plug | 230 V CE U.K. |
| | B2426 | Power cord, 3 wired cord & Australian plug | |
| | B2436 | Power cord, 3 wired cord & Chinese plug | China |
| | B3508 | Power cord, 3 wire cord & American plug (B) | 110 V, 220 - 240 V |
| | B3550 | Power cord, 3 wire cord & SI plug | |
| | B3616 | Power cord, 3 wire cord & BR plug | |
| | B5054 | Power cord, 3 wire cord & American plug | 110 V |
| ㉞ | B5125 | Color band | qty 2 |
| ㉟ | B2300 | Heat resistant pad | |
| ㊱ | C5030 | Tool box | |

● **Cleaning pin / Drill**

| | Part No. | Part Name | Specifications |
|---|---|---|---|
|  | B1215 | Cleaning pin | For heating element |
|  | B2874 | Cleaning pin | For ø0.6 mm (0.02 in.) nozzle |
| | B1086 | Cleaning pin | For ø0.8 mm (0.03 in.) nozzle |
| | B1087 | Cleaning pin | For ø1.0 mm (0.04 in.) nozzle |
| | B1088 | Cleaning pin | For ø1.3 mm (0.05 in.) nozzle |
| | B1089 | Cleaning pin | For ø1.6 mm (0.06 in.) nozzle |
|  | B5141 | Cleaning drill | For ø0.6 mm (0.02 in.) nozzle |
| | B1302 | Cleaning drill | For ø0.8 mm (0.03 in.) nozzle |
| | B1303 | Cleaning drill | For ø1.0 mm (0.04 in.) nozzle |
| | B1304 | Cleaning drill | For ø1.3 mm (0.05 in.) nozzle |
| | B1305 | Cleaning drill | For ø1.6 mm (0.06 in.) nozzle |
|  | B5142 | Drill holder | For ø0.6 mm (0.02 in.) nozzle |
| | B1306 | Drill holder | For ø0.8 mm (0.03 in.)/1.0 mm (0.04 in.) nozzle |
| | B1307 | Drill holder | For ø1.3 mm (0.05 in.)/1.6 mm (0.06 in.) nozzle |
|  | B5143 | Drill bit | For ø0.6 mm (0.02 in.) nozzle (qty 10) |
| | B1308 | Drill bit | For ø0.8 mm (0.03 in.) nozzle (qty 10) |
| | B1309 | Drill bit | For ø1.0 mm (0.04 in.) nozzle (qty 10) |
| | B1310 | Drill bit | For ø1.3 mm (0.05 in.) nozzle (qty 10) |
| | B1311 | Drill bit | For ø1.6 mm (0.06 in.) nozzle (qty 10) |

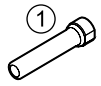



● **HAKKO FX-8801 Soldering iron**

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① - ⑪ | FX8801-01 | HAKKO FX-8801 | |

● **Soldering iron parts**

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | B1785 | Nut | |
| ② | B3469 | Enclosure pipe | |
| ③ | | Tip | see "26. TIP & NOZZLE STYLES" |
| ④ | B2022 | Nipple | |
| ⑤ | B2032 | Grounding spring | |
| ⑥ | A1560 | Heating element | 26 V-65 W |
| ⑦ | B2028 | Terminal board | with cord stopper |
| ⑧ | B3470 | Handle | with handle cover |
| ⑨ | B3471 | Handle cover | |
| ⑩ | B3467 | Cord bushing | |
| ⑪ | B3468 | Cord assembly | |

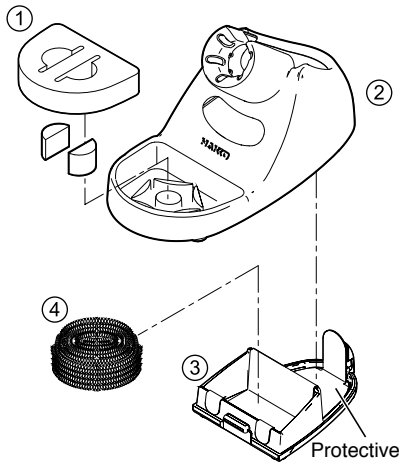



● **Optional parts**

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | B5122 | Enclosure pipe assembly | |

* If you use the capacious tip T19, change to above enclosure pipe assembly. Please see the tip styles and tip shape for T19 from the following URL.

⇨ https://www.hakko.com




● **Iron Holder**

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① - ④ | FH800-03BY | HAKKO FH-800 | blue-yellow |

● **Iron holder parts**

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | A1559 | Cleaning sponge | |
| ② | B3472 | Iron holder base/ with protecting cap | BY, with rubber foot |
| ③ | B3751 | Bottom plate | with Protective Sheet & rubber foot |
| ④ | A1561 | Cleaning wire | |

**⚠ CAUTION**

For safety reasons, please attach the protective sheet to the bottom plate when using the HAKKO FH-800 iron horder.

● **Optional parts**

| Part No. | Part Name | Specifications |
|---|---|---|
| B3474 | Rubber cleaner | |

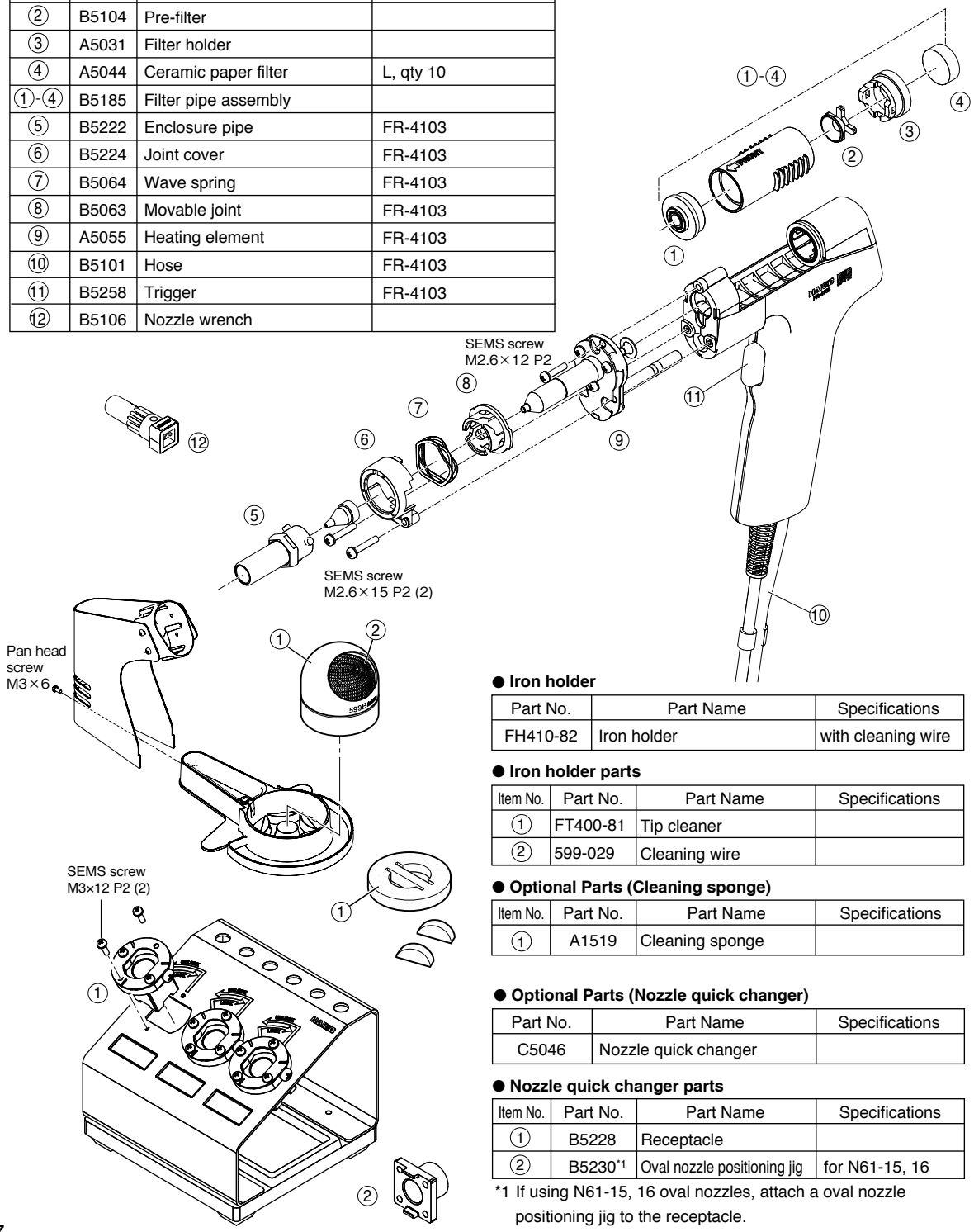
# 27. PARTS LIST (continued)

● **HAKKO FR-4103**

| Part No. | Part Name | Specifications |
|---|---|---|
| FR4103-81 | HAKKO FR-4103 | |

● **HAKKO FR-4103 parts**

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | A5030 | Front holder | |
| ② | B5104 | Pre-filter | |
| ③ | A5031 | Filter holder | |
| ④ | A5044 | Ceramic paper filter | L, qty 10 |
| ①-④ | B5185 | Filter pipe assembly | |
| ⑤ | B5222 | Enclosure pipe | FR-4103 |
| ⑥ | B5224 | Joint cover | FR-4103 |
| ⑦ | B5064 | Wave spring | FR-4103 |
| ⑧ | B5063 | Movable joint | FR-4103 |
| ⑨ | A5055 | Heating element | FR-4103 |
| ⑩ | B5101 | Hose | FR-4103 |
| ⑪ | B5258 | Trigger | FR-4103 |
| ⑫ | B5106 | Nozzle wrench | |




● **Iron holder**

| Part No. | Part Name | Specifications |
|---|---|---|
| FH410-82 | Iron holder | with cleaning wire |

● **Iron holder parts**

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | FT400-81 | Tip cleaner | |
| ② | 599-029 | Cleaning wire | |

● **Optional Parts (Cleaning sponge)**

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | A1519 | Cleaning sponge | |

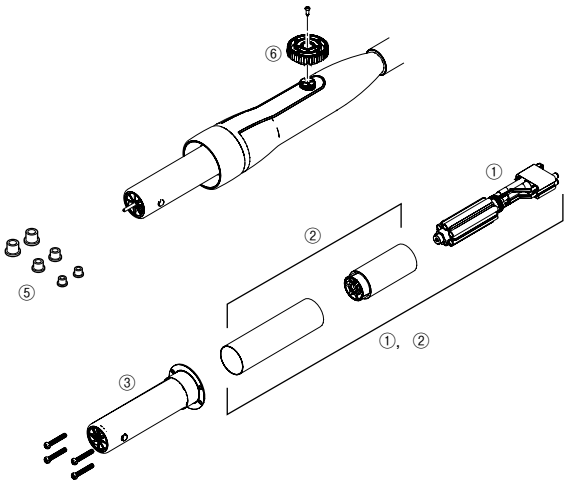
● **Optional Parts (Nozzle quick changer)**

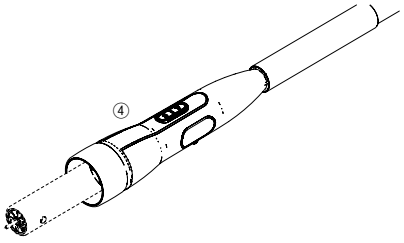
| Part No. | Part Name | Specifications |
|---|---|---|
| C5046 | Nozzle quick changer | |

● **Nozzle quick changer parts**

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | B5228 | Receptacle | |
| ② | B5230*1 | Oval nozzle positioning jig | for N61-15, 16 |

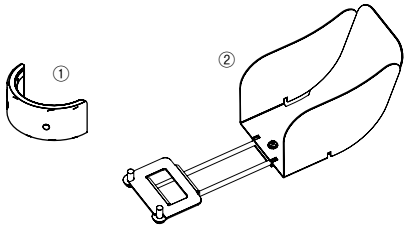
*1 If using N61-15, 16 oval nozzles, attach a oval nozzle positioning jig to the receptacle.




● **Hot air (Handpiece)**

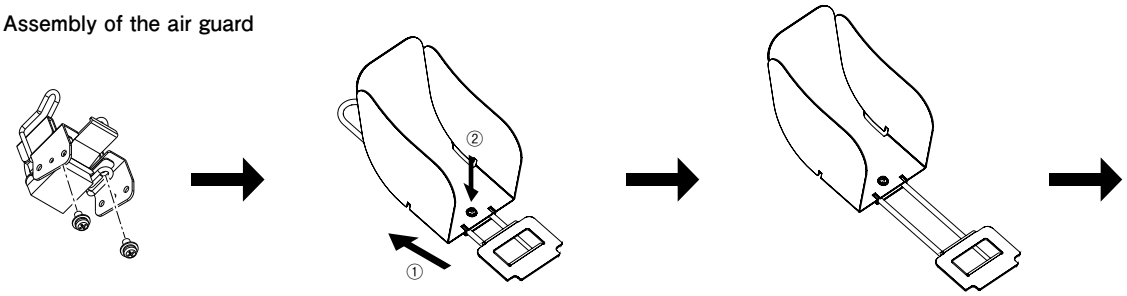
| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ①, ② | A5005 | Heating element assembly | 100 - 110 V |
| | A5007 | Heating element assembly | 220 - 240 V |
| ① | A5022 | Heating element | 100 - 110 V |
| | A5024 | Heating element | 220 - 240 V |
| ② | B5049 | Mica | with heater protection sleeve |
| ③ | B5045 | Pipe | |
| ④ | B5107 | Handle with cord assembly | with pipe |
| ⑤ | A1520 | Pad ø3.0 mm (0.12 in.) | qty 5 |
| | A1439 | Pad ø5.0 mm (0.20 in.) | qty 5 |
| | A1438 | Pad ø7.6 mm (0.30 in.) | qty 5 |
| ⑥ | B3023 | Vacuum pipe adjustment knob (L) | With screw |

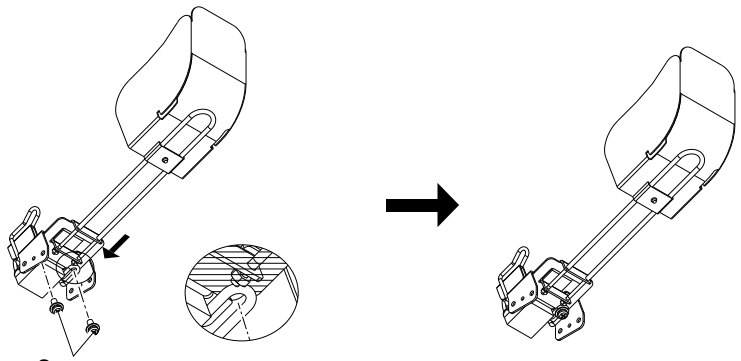



● **Optinal parts**

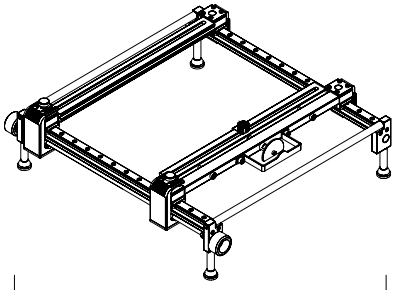
| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | B5059 | Adapter/ for fixture（C1392B) | ×2 |
| ② | B5126 | Air guard assembly | With fixing bracket |

● Assembly of the air guard

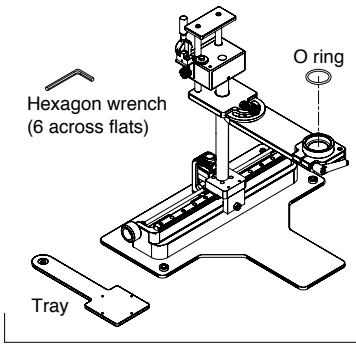


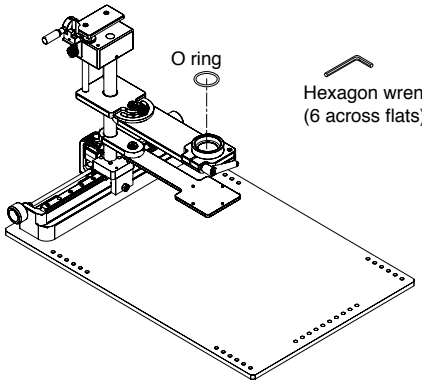
# ■ Accessories (Hot air)



①




②

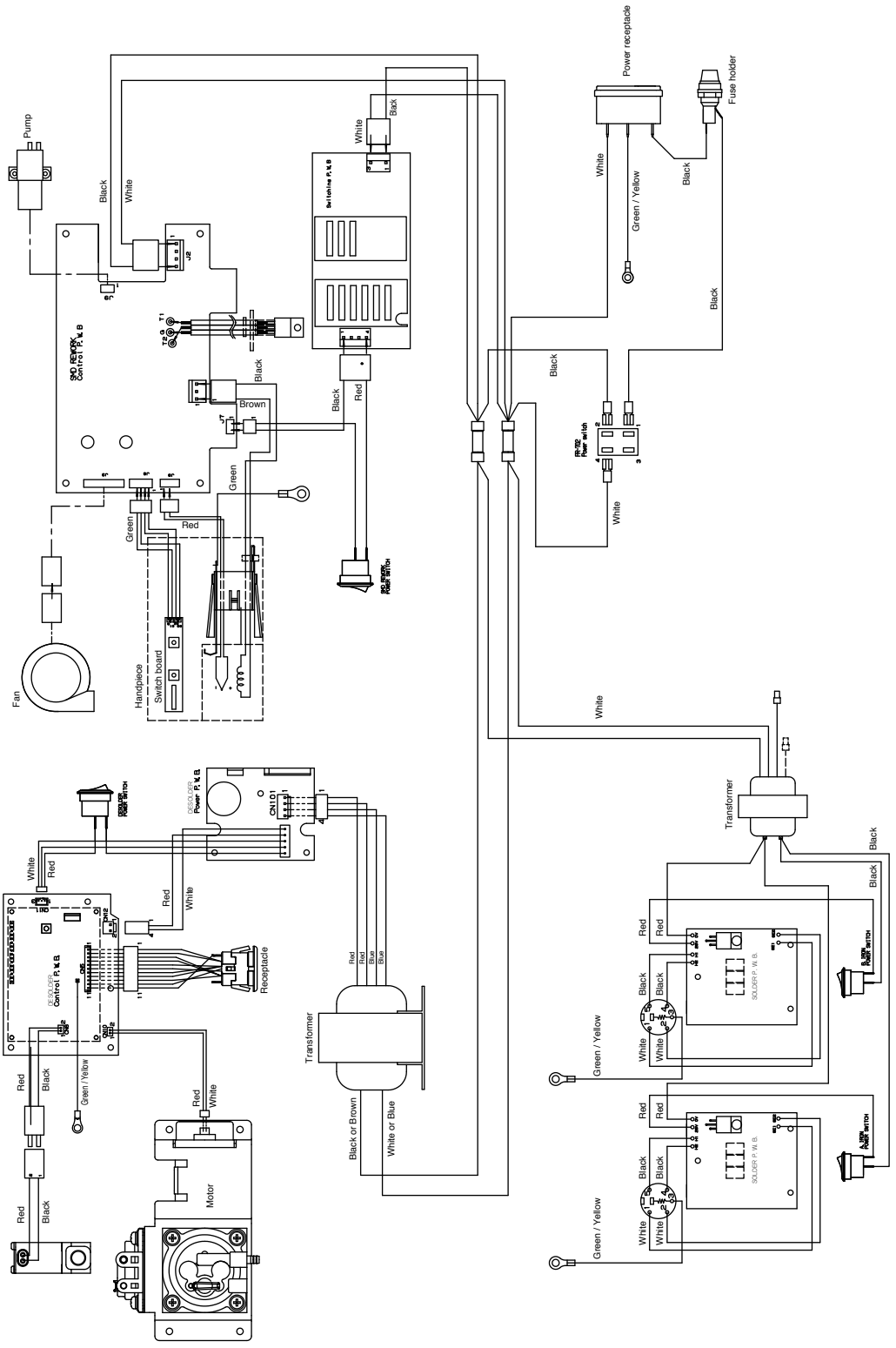



③

● **Optinal parts**

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | C5027 | Board holder | |
| ② | C5028 | Grip Fixture M | |
| ③ | C5029 | Grip Fixture L | |

# 28. WIRING DIAGRAM



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