HAKKO

# HAKKO SMD REWORK STATION FR-803B

SMD Rework Station with Vacuum Pickup

# Instruction Manual

●

Thank you for purchasing the HAKKO FR-803B SMD Rework Station.
This unit features:

- Digital control and display of time and temperature
- Display of air-flow rate
- Manual and automatic modes
- Built-in vacuum pickup

Please read this manual before operating the HAKKO FR-803B.
Keep this manual readily accessible for reference.

●

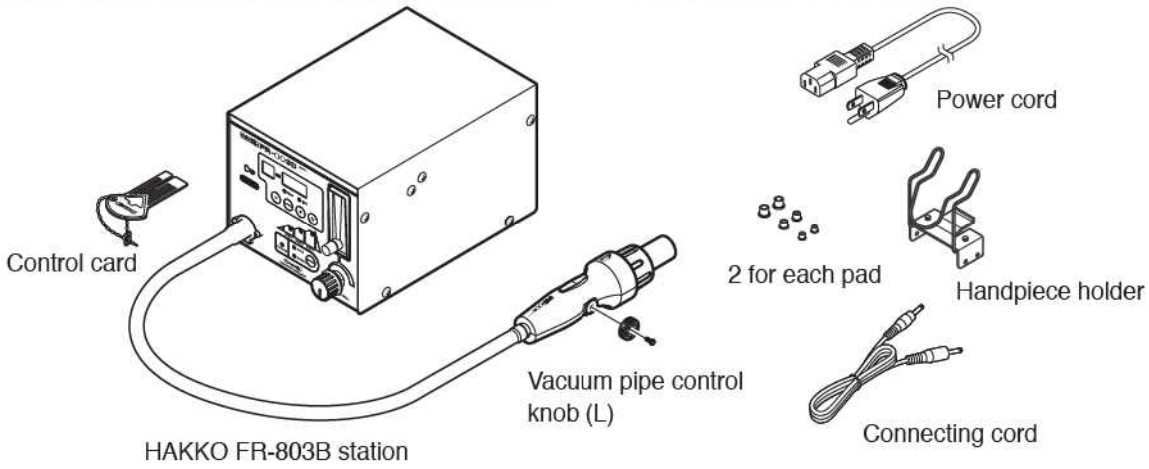
## TABLE OF CONTENTS

# 1. PACKING LIST

Check the contents of the Hakko 852 package and confirm that all the items listed below are included.

HAKKO FR-803B station ..... 1
Power cord ..... 1
Handpiece holder ..... 1
Pads (ø3 mm (0.12 in.), ø5 mm (0.20 in.), ø7.6 mm (0.3 in.)).....2 each
Vacuum pipe control knob (L) ..... 1
Control card ..... 1
Connecting cord ..... 1
Instruction manual ..... 1

* This product does not include a nozzle. A large selection of nozzles are available for the HAKKO FR-803B. Select the nozzle or nozzles suitable for the work to be performed.




# 2. SPECIFICATIONS

| | |
|---|---|
| Name | HAKKO FR-803B |
| Power consumption | 100V-310W 110V-370W 120V-440W<br>220V-590W 230V-650W 240V-700W |

### ● Station

| | |
|---|---|
| Power consumption | 100V 30 W<br>110-120V 40W<br>220-240V 50W<br>(Standby, 100-120V 4W, 220-240V 4W) |
| Capacity | 5 ℓ/min to more than 20 ℓ/min |
| Control temperature | 100 ~ 500°C/200 ~ 930°F (sensor) |
| Modes | Manual/Auto |
| Timer | 50 file/step |
| External dimensions | 160 (W) × 145 (H) × 230 (D) mm/<br>6.3 × 5.7 × 9.1 in. |
| Weight | 5 kg (11.02 lb.) |

### ● Handpiece

| | |
|---|---|
| Power consumption | 100V-280W 110V-330W 120V-400W<br>220V-540W 230V-600W 240V-650W |
| Total length (w/o cord) | 200mm/7.9 in. |
| Weight (w/o cord) | 200 g/0.44 lb. |

**NOTE:**
* This product is protected against electrostatic discharge.
* This product meets China RoHS requirements.
* Specifications and design are subject to change without notice.

### ■ Electrostatic Protection

This product includes such features as electrically conductive plastic parts and grounding of the handpiece and station as measures to protect the device to be soldered from the effects of static electricity. Be sure to observe the following instructions:

1. The handle and other plastic parts are not insulators, they are conductors. When replacing parts or repairing, take sufficient care not to expose live electrical parts or damage insulation materials.
2. Be sure to ground the unit during use.

**中國RoHS: 產品中有毒有害物質或元素的名稱及含量**

| 部件名稱 | 有毒有害物質或元素 | | | | | |
|---|---|---|---|---|---|---|
| | 鉛(Pb) | 汞(Hg) | 鎘(Cd) | 六價鉻(Cr(VI)) | 多溴聯苯(PBB) | 多溴二苯醚(PBDE) |
| 插頭 | × | ○ | ○ | ○ | ○ | ○ |
| 排氣噴嘴 | × | ○ | ○ | ○ | ○ | ○ |

○：表示該有毒有害物質在該部件所有均質材料中的含量均在SJ/T 11363-2006 標準規定的限量要求以下。
×：表示該有毒有害物質至少在該部件的某一均質材料中的含量超出SJ/T 11363-2006 標準規定的限量要求。

注有「附帶BS插頭」之時，表示「插頭」為含有有害物質的部件。

# 3. WARNINGS, CAUTIONS, AND NOTES

## ⚠ WARNING

**Warnings and cautions 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.

**EXAMPLE** : An EXAMPLE is given to demonstrate a particular procedure point or process.

## ⚠ WARNING

**To avoid damage to the unit, do not turn the power switch OFF until the pump stops automatically by cooling down (until P-5 appears on the display) after use.**

## ⚠ CAUTION

**When the power is ON, the temperature of the hot air and the nozzle ranges from 100 to 500°C (200 to 930°F.). To avoid injury to personnel or damage to items in the work area, observe the following:**

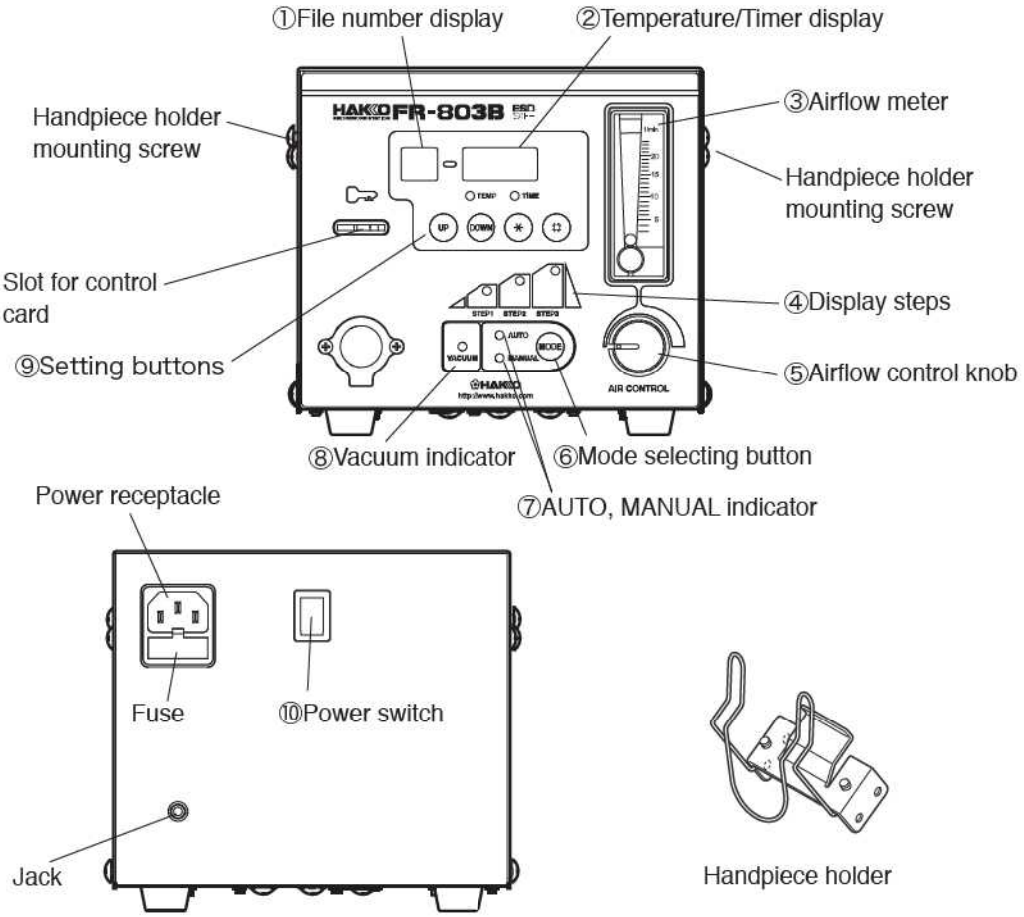
- Do not direct the hot air toward personnel or touch the metal parts near the nozzle.
- Do not use the product near combustible gases or flammable materials.
- Advise those in the work area that the unit can reach very high temperatures and should be considered potentially dangerous.
- Turn the power OFF when no longer using the HAKKO FR-803B or when leaving it unattended.
- Before replacing parts or storing the unit, allow the unit to cool and then turn the power OFF.
- Do not use the product for a long time at the same place.

**Observe the following precautions to prevent accidents or damage to the unit.**

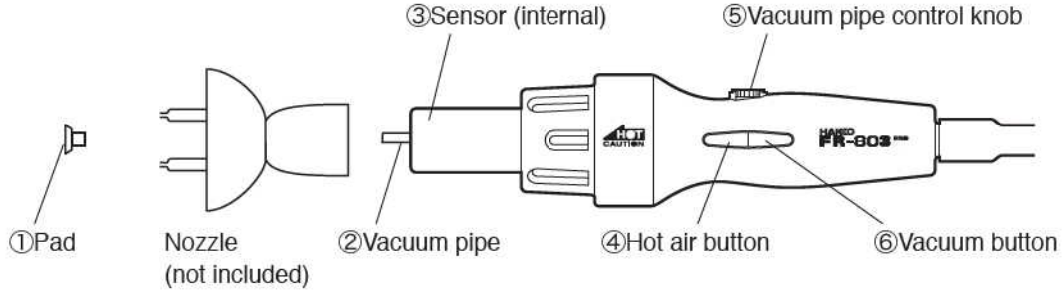
- Do not strike the handpiece against hard surface or otherwise subject it to physical shock.
- Be sure the unit is grounded. Always connect power to a grounded receptacle.
- Do not disassemble the pump or the vacuum pump.
- Do not modify the unit.
- Use only genuine HAKKO replacement parts.
- Do not wet the unit or use the unit with wet hands.
- Remove power cord by holding the plug – not the wires.
- Do not leave the vacuum pump on for long periods of time.
- Make sure the work area is well ventilated.
- While using the HAKKO FR-803B, don't do anything which may cause bodily harm or physical damage.

# 4. PART NAMES

## Station




## Handpiece



## Station

**① File number display**
This section displays files 1 to 50 in Auto mode.

**② Temperature/timer display**
This section displays a temperature and timer setting time for each step in AUTO mode.

> **⚠CAUTION**
> The displayed and set temperature indicates the temperatures at the sensor.

**③ Airflow meter**
This meter indicates the airflow rate.

**④ Display steps**
This section will be lit during every step in AUTO mode.

**⑤ Airflow control knob**
This knob controls the airflow. The airflow can be set in the range of 5 to 20 l/min.

**⑥ Mode selection button**
This button displays and selects the MANUAL and AUTO modes.

**⑦ AUTO/MANUAL indicator**
This indicator lights the selected mode.

**⑧ Vacuum indicator**
This indicator lights when the vacuum pump is in operation.

**⑨ Setting button**
Use this button for setting, determining and checking the file number, temperature, timer, etc.

**⑩ Power switch**
This switch turns the power ON and OFF.

## Handpiece

**① Pad**
The pad absorbs parts.

**② Vacuum pipe**
The pad is mounted on the tip of the vacuum pipe.

**③ Sensor (internal)**
This sensor detects the temperature of the hot air.

**④ Hot air button**
- MANUAL Mode
  When the Start button is pressed, the unit begins blowing hot air. When the Start button is pressed again, the unit begins cooling and stops blowing hot air after reaching 100°C (200°F).
- AUTO Mode
  When the Start button is pressed again, the selected AUTO program begins.

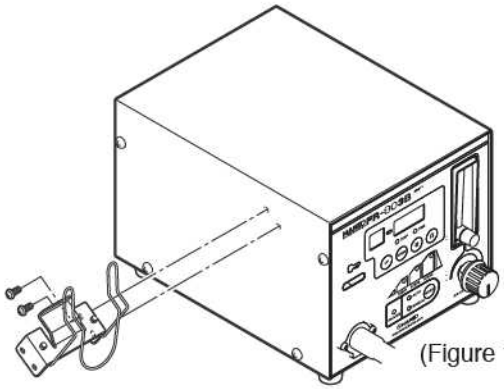
**⑤ Vacuum pipe control knob**
This knob controls the length of the vacuum pipe.

**⑥ Vacuum button**
This button turns the vacuum pump ON and OFF.

# 5. PREPARATION: ASSEMBLY AND ELECTRICAL CONNECTION

## A. Station Assembly

- **Attach the handpiece holder.**
  Remove the handpiece holder mounting screw from the side of the station. Attach the handpiece holder to the station. (Figure 1) (The handpiece holder can be installed on either the left or right side.)



(Figure 1)

## B. Handpiece Assembly

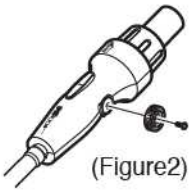
**NOTE:**
The handpiece can be used with the provided vacuum pipe control knob (L). (See figure 2.)

- **Using vacuum function operative nozzle (see page 21.)**

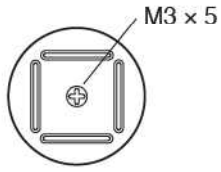
1. **Attach the nozzle.**
   a. Extend the vacuum pipe using the vacuum pipe control knob. (Figure 3)
   b. Remove the inside screw (M3 × 5) of the nozzle. (Figure 4)
   c. Loosen the nozzle mounting screw. Pass the vacuum pipe through the nozzle hole and attach the nozzle. (Figure 5)
   d. Tighten the nozzle mounting screw.

2. **Attach the pad.**
   a. Attach the pad. (Figure 7)
   b. Adjust the pad to an appropriate position. Adjust the vacuum pipe so that the pipe and pad protrude as little as possible.

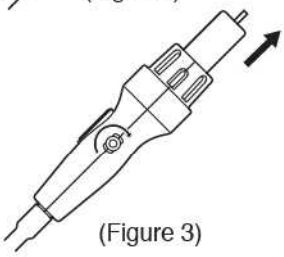
**⚠CAUTION**
The nozzle and pad will be heated at high temperature. Cool them before replacement.



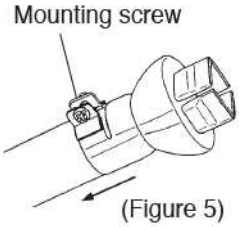
(Figure2)




(Figure 4)

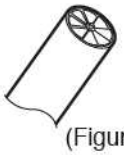


(Figure 3)

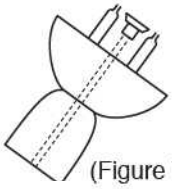



(Figure 5)

**⚠CAUTION**
- **Vacuum pipe**
  Do not use excessive force.
  When not using a nozzle, retract the vacuum pipe to the shortest length. (Figure 6)



(Figure 6)



(Figure 7)

**⚠CAUTION**
- **Pad**
  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 (see page 22.)**

■ **Attach the nozzle.**

a. Retract the vacuum pipe to the shortest length using the vacuum pipe control knob. (See page 5, Figure 6)
b. Loosen the nozzle mounting screw. Attach the nozzle. (See page 5, Figure 5)
c. Tighten the nozzle mounting screw.

**⚠CAUTION**
The pad cannot be used with this type of nozzle.

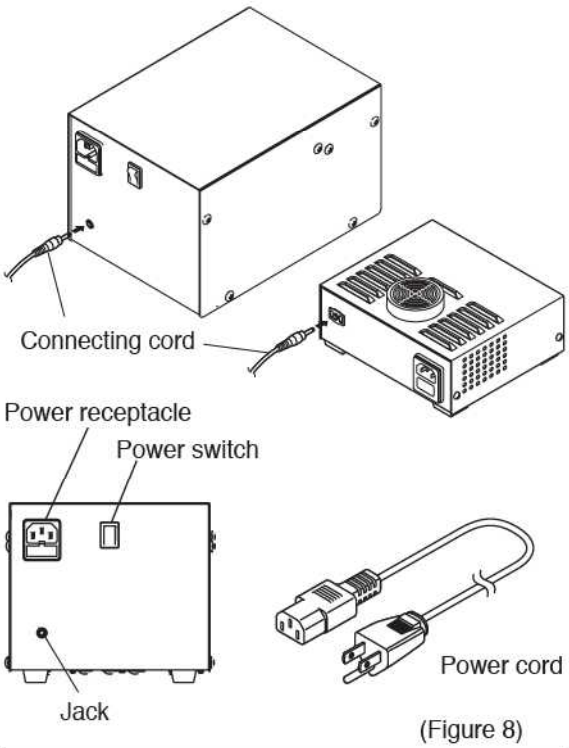
● **Connection with FR-820**

FR-820 can be connected to FR-803B with the junction cord, which permits FR-820 to be used along with FR-803B running in AUTO mode.

**⚠CAUTION**
Make sure the power to FR-803B is OFF before connecting FR-820 to FR-803B.

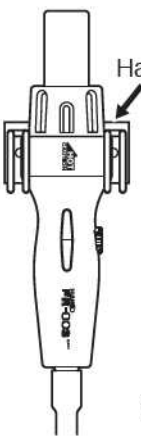
## C. Electrical Connection and Power ON

1. Connect the power cord to the power receptacle on the back panel of the station. (Figure 8)
2. Place the handpiece on the holder. (Figure 9)
3. Plug the power cord into a grounded wall socket.
4. Turn the power switch ON.




(Figure 8)

**⚠CAUTION**
This product is ESD-protected. Be sure to use a grounded wall socket.



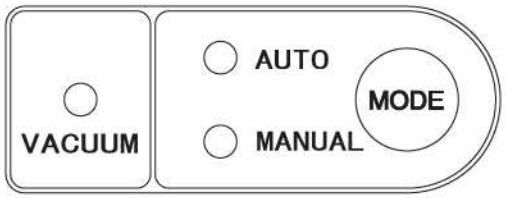

**⚠CAUTION**
When not in use, place the handpiece on the holder.

(Figure 9) Top View

# 6. OPERATION

## A. Mode Selection

Insert the control card into the card slot and select your desired mode using the mode selection button. (Figure 10)
The HAKKO FR-803B provides the following two modes. The AUTO mode consists of the INSTALL and REMOVE modes.




(Figure 10)

- **Manual Mode**
  In this mode, air and vacuum pump operation are controlled entirely by manual operation.

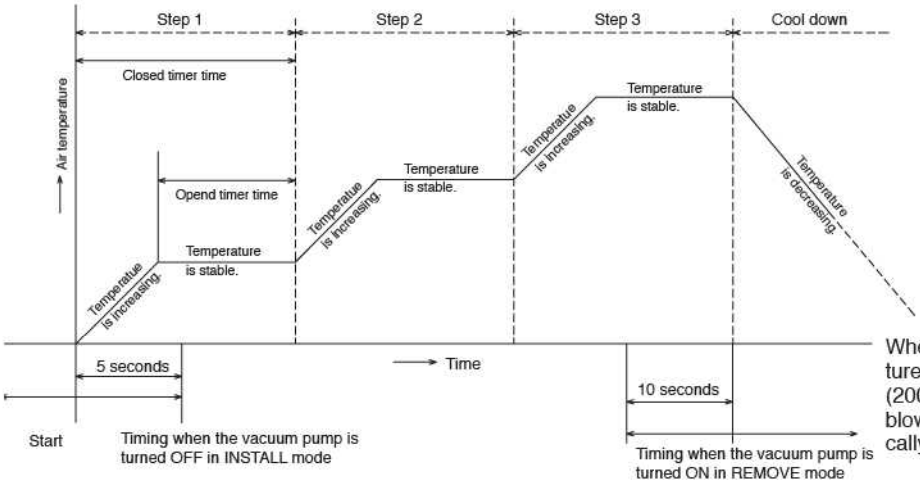
**NOTE:**
The timer cannot be set when using MANUAL mode.

- **AUTO mode**
  - **Install Mode (AUTO) (See page 14.)**
    This mode is used when installing parts. The vacuum pump will be automatically turned OFF.

    In INSTALL mode, turn ON the vacuum function manually and align the component on the PWB. Vacuum function automatically will turn OFF 5 seconds after starting selected the profile.

  - **Remove Mode (AUTO) (See page 13.)**
    This mode is used when removing parts. The vacuum pump will be automatically turned ON.

    In REMOVE mode, the vacuum function automatically turns ON during the last 10 seconds of the selected profile.
    Set the temperature profile shown in the following figure in advance.



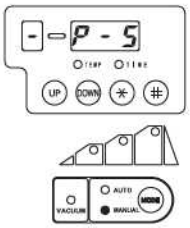

When the temperature falls to 100°C (200°F), the air stops blowing automatically.

* **In REMOVE mode, turn OFF the vacuum pump manually.**

# 6. OPERATION

## B. Selecting Manual Mode

The temperature/timer is displayed by P-S.
The HAKKO FR-803B is preset at 300°C at the factory, see page 9.



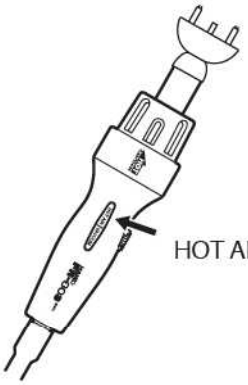

To check the set temperature, press the ✳ button .

### ● Air Blow

1. **Start**
   Press the HOT AIR button on the hand-piece to start the flow of air. The hot air blows from the tip of the nozzle, and the temperature is controlled according to the temperature setting.
2. **Stop**
   Press the HOT AIR button again.
   Power to the heater is shut off and cooling begins. When the temperature falls to 100 °C. (200°F.), the air stops blowing and the temperature display reads P-S.

**NOTE:**
When the forced air shutoff function is enabled (ON), pressing the HOT AIR button again stops blowing air provided that the temperature readout is lower than 380°C.

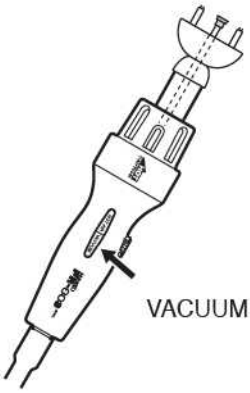
**⚠CAUTION**
To avoid damage to the equipment, do not turn the power switch OFF until P-S appears on the display.




### ● Vacuum Function

This function is used to hold the component securely to the pads.

1. **Start**
   Press the Vacuum button on the hand-piece. The vacuum pump turns ON and the part is held by suction.
2. **Stop**
   Press and hold the Vacuum button. The vacuum pump turns OFF.




**⚠CAUTION**
Parts held by the pads are very hot. Be careful when removing them from the pads.

# 6. OPERATION

## C.Temperature change method in MANUAL mode

**⚠CAUTION**
Be sure to insert the control card into the card slot and set the mode to MANUAL before changing.

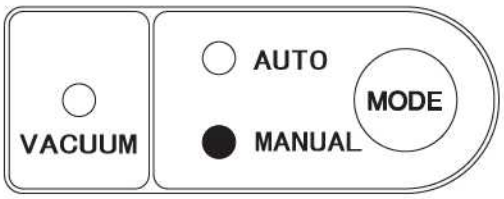
### Setting change in temperature

**⚠CAUTION**
The temperature setting range is 100 to 500°C (200 to 930°F).

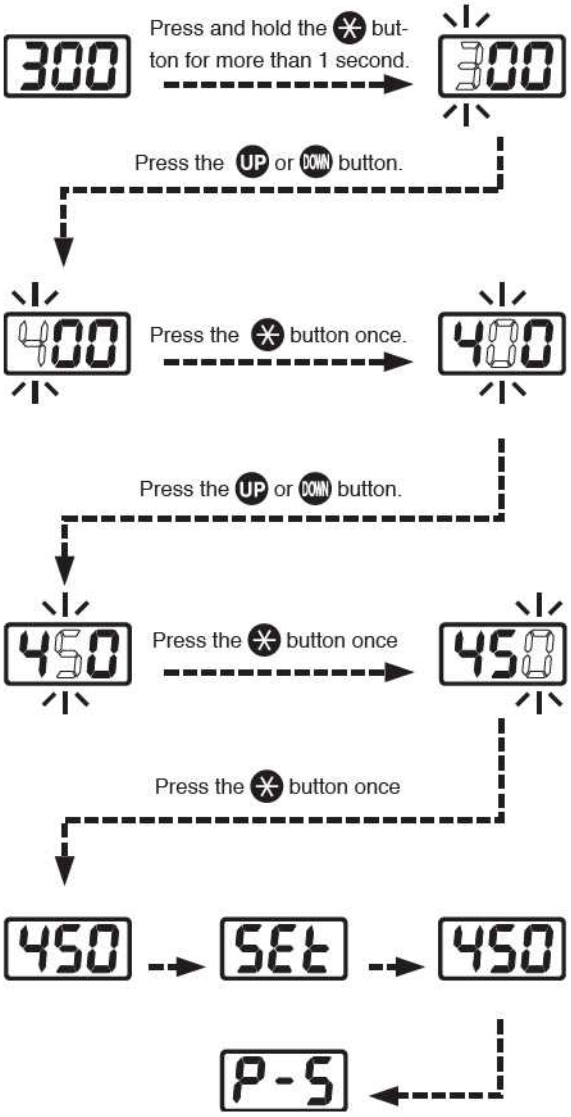
**Example: Change the temperature setting from 300 to 450°C.**

1. **Press the ✳ button on the temperature setting section for 1 sec. or more.**
   - The HUNDREDS digit flashes on the display, indicating that the HUNDREDS digit can be entered.
2. **Enter the HUNDREDS digit.**
   - Use the UP or DOWN buttons to select your desired value for the HUNDREDS digit. When your desired value is displayed, press the ✳ button. The TENS digit begins to flash.
3. **Enter TENS digit.**
   - Use the UP or DOWN buttons to select your desired value for the TENS digit. When your desired value is displayed, press the ✳ button. The UNITS digit begins to flash.
4. **Enter the UNITS digit.**
   - Select your desired value for the UNITS digit in the same manner as for the TENS digit. When your desired value is displayed, press the ✳ button. SEt displays and indicates that the temperature setting procedure is completed.

**⚠CAUTION**
If the power is turned OFF before the temperature setting procedure is completed (SEt is not displayed), the new setting value will not be stored in memory.



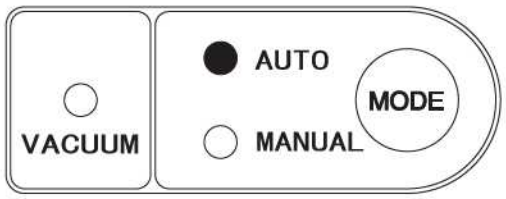

- Attempting to enter a value outside the setting range will cause the display to begin flashing the HUNDREDS digit again. Reenter a correct value.
- Both the display temperature and the temperature setting are the temperature at the sensor. (Even with the same temperature setting, the temperature of the hot air differs depending on the nozzle size.)



## D. Setting method in AUTO mode

**⚠CAUTION**
Be sure to press the MODE button and set the mode to AUTO.

The temperature profiles from 1 to 3 have been initially set. If it is necessary to change, see page 13.



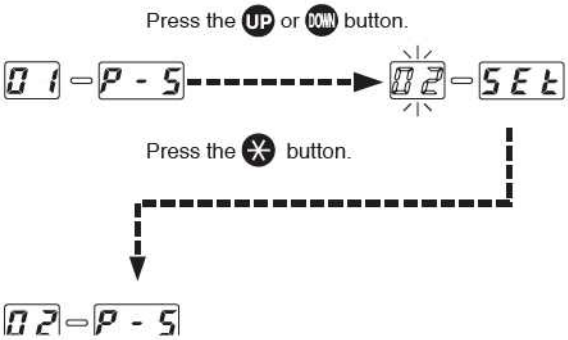

### 1. Opening up a file

**⚠CAUTION**
Be sure to insert the control card before opening.

Display a file number using the UP or DOWN button.

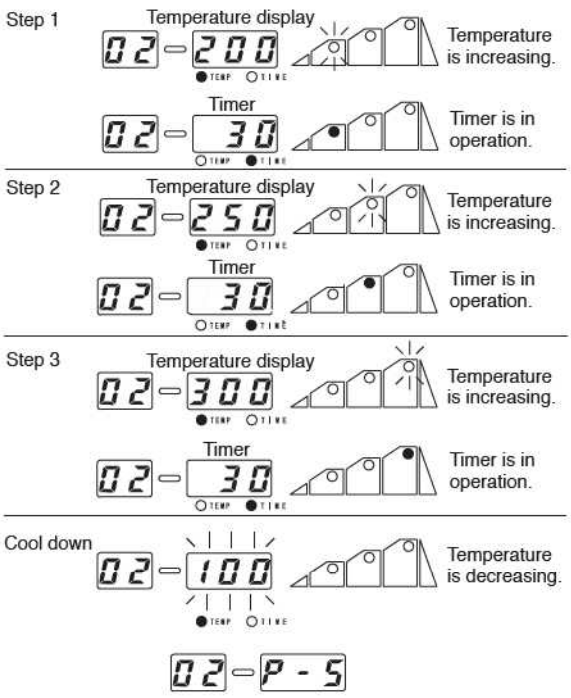
**NOTE:**
If the file number is not changed, it is unnecessary to insert the control card.

When a desired file number appears, press the ✳ button. The file number is changed.




### 2. Pressing the HOT AIR button on the handpiece causes the unit to begin to blow, and setting the temperature profile causes it to start the file program.

**NOTE:**
When FR-820 has been connected to FR-803B with the junction cord, pressing the HOT AIR button also starts FR-820 blowing air.
In such a case, the cool down timing is also synchronized in both the products.




### 3. When all the steps are completed, the unit will be automatically stopped.

# 6. OPERATION

## D-1 Setting method in AUTO/INSTALL mode

### ● Operations in INSTALL mode

This mode has the following sequence:

① Vacuum ON (Manual)
② Start/hot air blow (Manual)(Step/start)
③ Vacuum OFF after 5 seconds
④ Step 1 operation
⑤ Step 2 operation
⑥ Step 3 operation
⑦ Cool down operation

**NOTE:**
The operation can be set from 1 to 50.

### ● Installation

• Advance preparation of P.W.B.
Apply an appropriate amount of solder paste to the P.W.B.)

① **Part suction and positioning**
Press the VACUUM button on the handpiece. Have the part sucked by the pads and position the part on the P.W.B. (Figure 1)

② **Start (heating)**
Press the HOT button on the handpiece. Hot air blows from the nozzle to melt the solder. The station operates based on the preprogrammed temperature profile. (Figure 2)

**⚠CAUTION**
To stop the program, press the HOT AIR button. Cooling begins.

③ **Vacuum stop**
After 5 seconds, the vacuum turns OFF and the part is released from suction. (Figure 3)

④ **Stop**
When the step operation is completed, cooling begins. Make sure the solder has hardened before lifting the handpiece. (Figure 4)

In INSTALL mode, press the HOT AIR button after turning the vacuum function ON manually and aligning the component on the PWB. Vacuum function automatically will turn OFF 5 seconds after starting selected the profile.

To check the temperature setting, press the ✳ button. To change the temperature setting, see "Setting method in AUTO mode" on page 13.

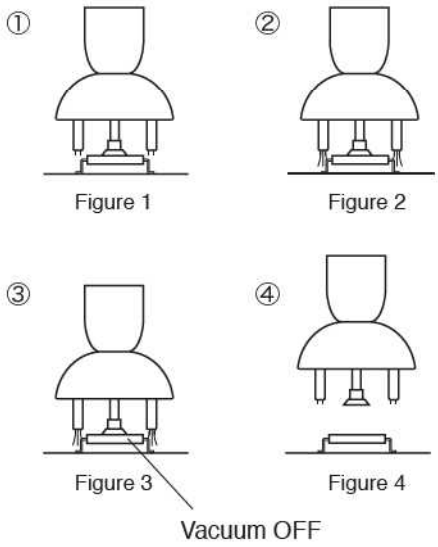



Figure 1
Figure 2
Figure 3
Figure 4

## D-2 Setting method in AUTO/REMOVE mode

### ● Operations in REMOVE mode

This mode has the following sequence:

① Start/hot air blow (manual)
② Step 1 operation
③ Step 2 operation
④ Step 3 operation
⑤ Ten seconds before the last step is completed, the vacuum automatically turns ON and then a single sound lasting 1 second is generated. Two seconds before completion, a continuous sound is generated.
⑥ Vacuum OFF (manual)
⑦ Cool down

**NOTE:**
The operation can be set from 1 to 50.

### ● Removal

- **Parts mounting**

Mount the nozzle and pads on the part to be removed. (Figure 1)

① **Start (heating)**
Press the HOT AIR button on the handpiece. Hot air blows from the nozzle and melts the solder. The station operates based on the preprogrammed temperature profile. (Figure 2)

**⚠CAUTION**
To stop the program, press the HOT AIR button. Cooling begins.

② **Part suction**
When the timer runs down to 10 sec., the vacuum automatically turns ON and the part is sucked. Lift the handpiece and remove the part from the P.W.B. (Figure 3)

③ **Releasing the sucked part**
To release the sucked part, press the VACUUM button. (Figure 3)

④ **Stop**
After that, when the step operation is completed, cooling begins and the airblow stops as soon as the temperature reaches 100°C (200°F). (Figure 4)

In REMOVE mode, the vacuum function automatically turns ON during the last 10 seconds of the selected profile.

To check the set temperature, press the ✱ button.
To change the set temperature, see “Setting mode in AUTO mode” on page 13.

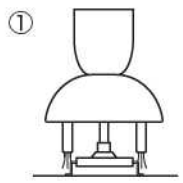



Figure 1

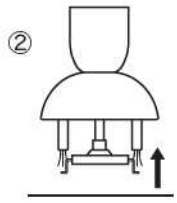



Figure 2

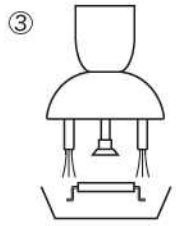



Figure 3

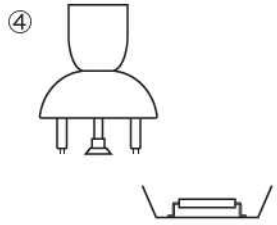



Figure 4

**⚠ CAUTION**
If the vacuum button is pressed before the timer runs down to 10 seconds, the vacuum pump turns ON. Press the vacuum button again to stop the air blowing.

# 6. OPERATION

## E. File changing method in AUTO mode

**⚠CAUTION**
Be sure to insert the control card into the card slot before changing.

File initial setting

| Mode | | INSTALL |
|---|---|---|
| Step 1 | Setting temperature | 200 |
| | timer time | 30 |
| Step 2 | Setting temperature | 250 |
| | timer time | 30 |
| Step 3 | Setting temperature | 300 |
| | timer time | 30 |

⬇

Example: When file 2 is changed as follows:

| | | File 2 |
|---|---|---|
| Mode | | REMOVE |
| Step 1 | Setting temperature | 250 |
| | timer time | 25 |
| Step 2 | Setting temperature | 250 |
| | timer time | 30 |
| Step 3 | Setting temperature | 320 |
| | timer time | 25 |

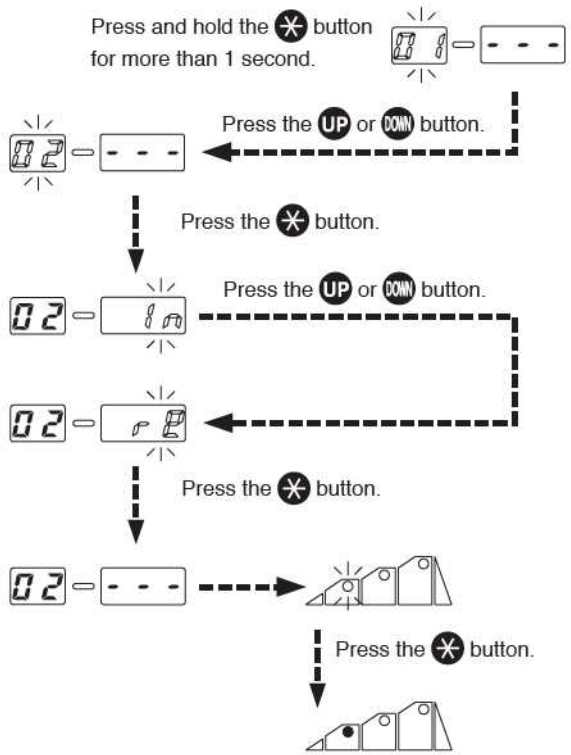
1. If the ✳ button is pressed for 1 second or more, the file number display section flashes. Select the file number using the UP or DOWN button. If your desired file number is displayed, press the ✳ button. The mode will be shifted to **the INSTALL or REMOVE selection mode**.

2. Use the UP or DOWN button to display [rE]. Then, press the ✳ button to select and shift to **the step selection mode**.

3. Select your desired step using the UP or DOWN button. Display your desired step and press the ✳ button to select. After that, the mode will be shifted to **temperature setting mode in step 1**.

**NOTE:**
The temperature setting range:
100°C - 500°C (200°F - 930°F).
The time setting range:
0 sec. - 300 sec. (0 min. - 5 min.)

- Attempt to enter a value outside the setting range will cause the display to begin flashing the HUNDREDS digit again. Reenter a correct value.
- Both the display temperature and the temperature setting are the temperature at the sensor. (Even with the same temperature setting, the temperature of the hot air differs depending on the nozzle size.)
- If the time setting is set to 0 sec., the step can be cancelled.



4. a. The HUNDREDS digit on the temperature/ timer display section flashes. Press the ✳ button to select. The TENS digit begins to flash.

   b. Enter the TENS digit.
   Use the UP or DOWN button to select your desired value for the TENS digit. If your desired value is displayed, press the ✳ button. The UNITS digit begins to flash.

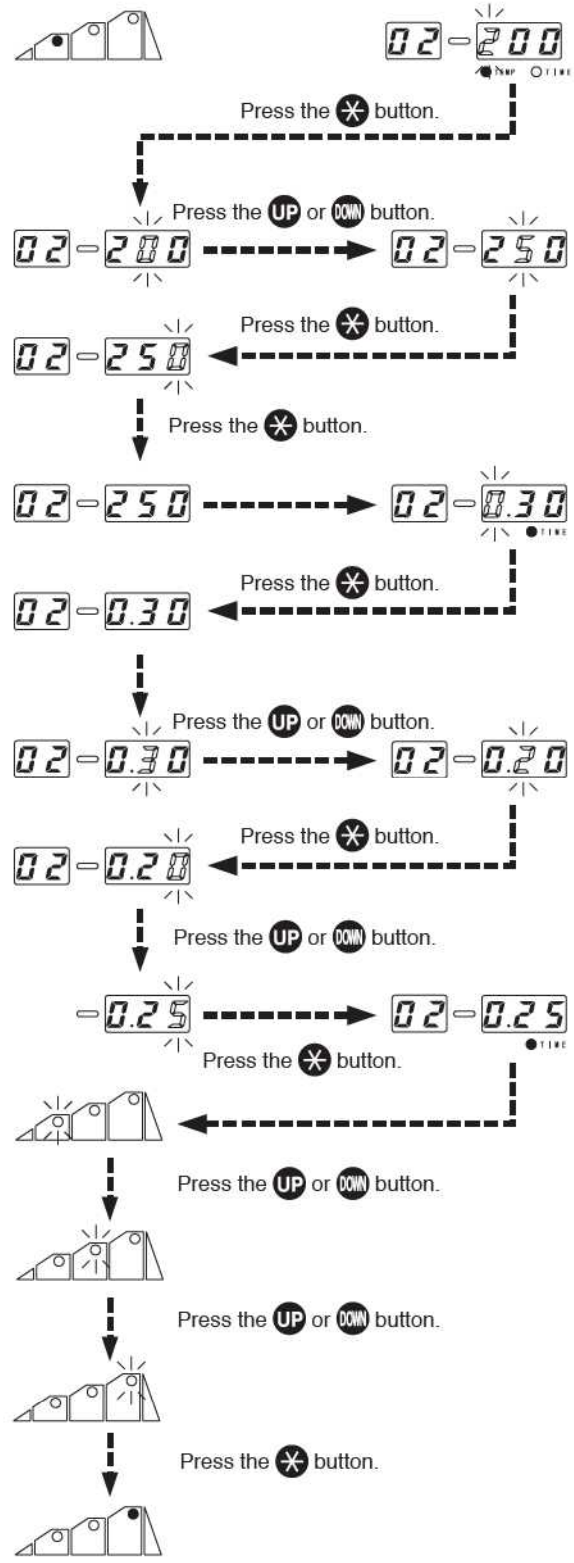
   c. Enter UNITS digit.
   Use the UP or DOWN button to select your desired value for the UNITS digit. If your desired value is displayed, press the ✳ button. The mode will be shifted to **the timer time setting mode in step 1**.

5. a. The HUNDREDS digit on the temperature/ timer display section flashes. Press the ✳ button to set the HUNDREDS digit to 0. The TENS digit begins to flash.

   b. Enter the HUNDREDS digit.
   Use the UP or DOWN buttons to select your desired value for the TENS digit. When your desired value is displayed, press the ✳ button. The UNITS digit begins to flash.

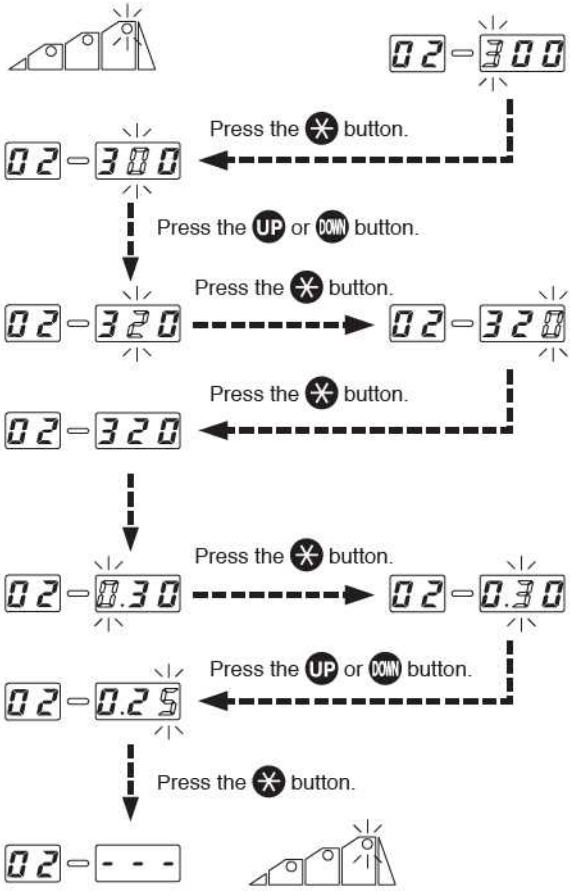
   c. Enter the UNITS digit.
   Use the UP or DOWN buttons to select your desired value for the TENS digit. When your desired value is displayed, press the ✳ button. The mode will be shifted into **the step selection mode**.

6. Use the UP or DOWN buttons to select your desired step. Since it is not changed in step 2, select step 3. When your desired value is displayed, press the ✳ button to select. The mode will be shifted to **the temperature setting mode**.



# 6. OPERATION

7. a. The HUNDREDS digit on the temperature/ timer display section flashes. Press the ✳ button to select. The TENS digit begins to flash.
   b. Enter the TENS digit.
   Use the UP or DOWN button to select your desired value for the TENS digit. If your desired value is displayed, press the ✳ button. The UNITS digit begins to flash.
   c. Enter UNITS digit.
   Use the UP or DOWN button to select your desired value for the UNITS digit. When your desired value is displayed, press the ✳ button. The mode will be shifted to **the timer time setting mode in step 3**.
8. a. The HUNDREDS digit on the temperature/ timer display section flashes. Press the ✳ button to select. The TENS digit begins to flash.
   b. Enter the TENS digit.
   Use the UP or DOWN button to select your desired value for the TENS digit. If your desired value is displayed, press the ✳ button. The UNITS digit begins to flash.
   c. Enter UNITS digit.
   Use the UP or DOWN button to select your desired value for the UNITS digit. If your desired value is displayed, press the ✳ button. The temperature and timer setting in step 3 will be completed and shifted to **the step selection mode**.

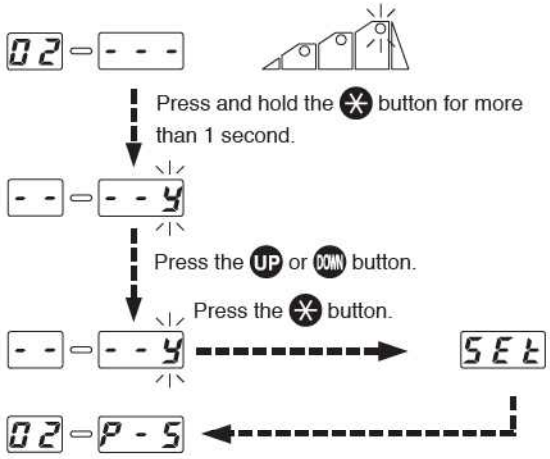


9. File writing

   Press the ✳ button for 1 second or more to shift into the file writing mode. Use the UP or DOWN buttons to display [--y] and press the ✳ button. The file writing will be completed.

   **NOTE:**
   If [--n] is selected, the data will be returned to the data before change and the mode will be shifted to the file number selection mode.

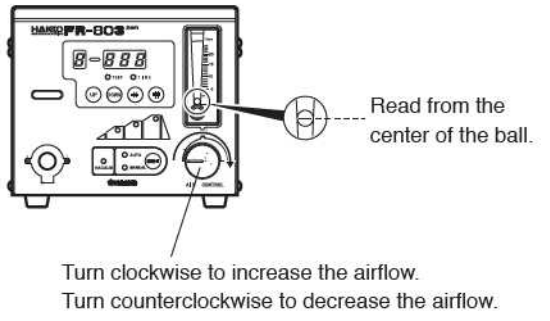
* **In AUTO mode, files are not selected. Select the file to be used and start it.**




## F. Airflow adjustment

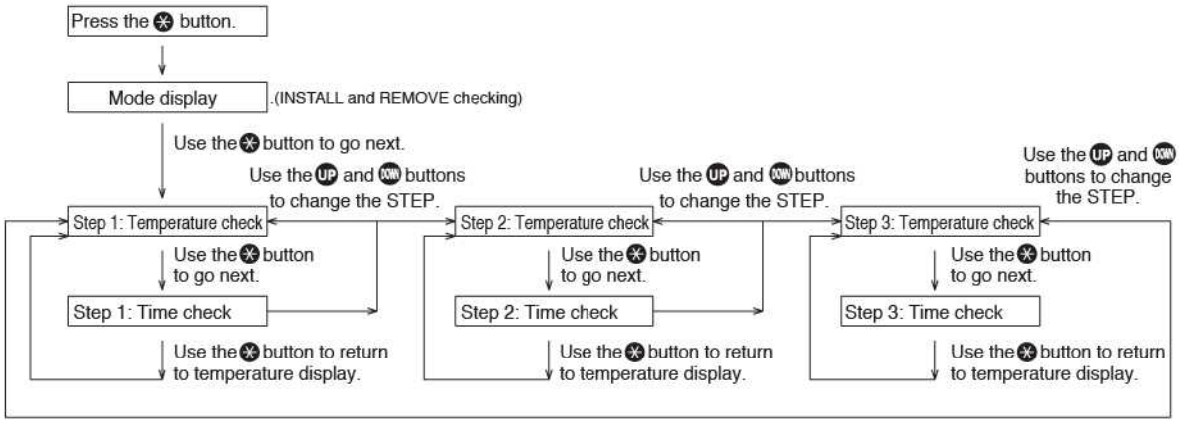
Adjust the flow rate of the hot air while watching the airflow meter. The adjustment range is 5 ℓ/min to 20 ℓ/min.

**⚠CAUTION**
Do not apply excessive force when turning the airflow control knob.




## G. Set data checking method

**Setting in Auto mode**
Select your desired file No. in advance.




* If no button is input for 2 seconds or more in any condition, the unit will be returned to normal conditions.

# 7. PARAMETERS

| Parameter | Parameter display | Initial setting |
|---|---|---|
| °C/°F change | °C or °F | C (°C) |
| Power saving time (30 min/60 min/∞) | 30, 60 or ∞ | 30 (30 min) |
| Timer display unit (min/sec) | n or S | n (min) |
| Change of count-down method (Opened timer/closed timer) | o or c | o (opened timer) |
| Change of control card lock function (Normal/single lock) | 1 or 2 | 1 (normal) |
| Change of forced air shutoff function (ON (Enable)/OFF (Disable)) | 0 or 1 | 0 (OFF) |

* In case of simple lock, the change of file number in AUTO mode can be changed without inserting the control card.
* The forced air shutoff function is inoperative when the temperature readout is 380°C or higher, even if the function is set to be enabled.

## ● Parameter change method

To enter in Parameter Change mode, turn on the power switch while pressing the UP and DOWN buttons simultaneously.

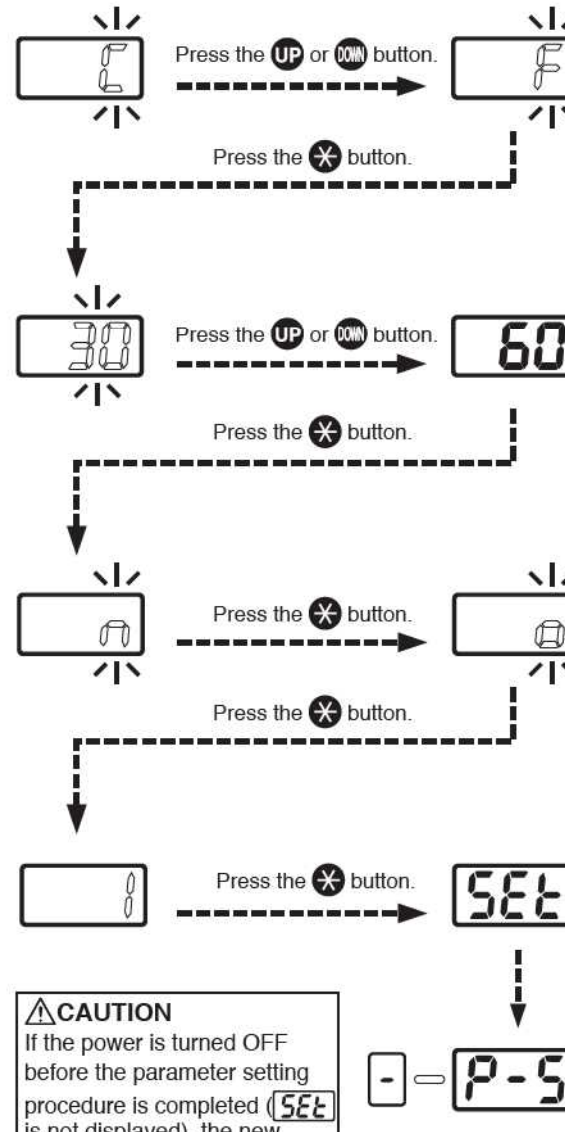
1. **°C/°F change**
   Press the UP or DOWN button, select "C" (Celsius) or "F" (Fahrenheit) and press the ✳ button to enter.
2. **Change of power save time**
   Press the UP or DOWN select 30 min, 60 min or ∞ and press the ✳ button to enter.
3. **Change of timer display unit**
   Press the UP or DOWN button, select “n” (min) or “S” (sec) and press the ✳ button to enter.
4. **Change of countdown method**
   Press the UP or DOWN select “o” (Opened timer) or “c” (Closed timer) and press the ✳ button to enter. (See the table on page 7.)
5. **Change of card-lock function**
   Press the UP or DOWN button, select 1 or 2 and press the ✳ button to enter.
   The parameter input mode is completed, SEt is displayed and then returned to the normal mode.

## ● Initial resetting method

**⚠CAUTION**
Be sure to insert the control card into the card slot before initial resetting.

Turn the power switch ON while simultaneously pressing the UP, DOWN and ✳ buttons to reset to the initial set values upon shipment from the factory. The mode is displayed in MANUAL.

**⚠CAUTION**
Be sure to insert the control card into the card slot before changing.




**⚠CAUTION**
If the power is turned OFF before the parameter setting procedure is completed (SEt is not displayed), the new setting value will not be stored in memory.

## ● Factory setting

**⚠CAUTION**
Be sure to insert the control card into the card slot before initial resetting.

Turn the power switch ON while simultaneously pressing the UP, DOWN and ✳ buttons to reset the initial set values upon shipment from the factory. The mode is displayed in MANUAL.
Upon shipment from the factory, the data are set to the values as shown in the right tables.

<In MANUAL mode>

| | |
|---|---|
| Temperature | 300°C |
| Offset value | 0 |

<In AUTO mode>

| Mode | | INSTALL |
|---|---|---|
| Step 1 | Setting temp. | 200°C |
| | Timer time | 30 |
| Step 2 | Setting temp. | 250°C |
| | Timer time | 30 |
| Step 3 | Setting temp. | 300°C |
| | Timer time | 30 |

# 8. OFFSET SETTING METHOD

**NOTE:**
The temperature at the blowout port varies depends on the nozzle size. The offset temperature can be selected.

**⚠CAUTION**
Change the mode to MANUAL before setting.
The operations cannot be performed in AUTO mode.

Be sure to insert the control card.

1. **Press the # button for 1 second or more.**
   The mode will be shifted to the offset inputting mode.
2. **Input the offset value.**
   The input range is -50 to + 50°C (In °F mode, from -90 to + 90°F)

   **Enter the HUNDREDS digit.**

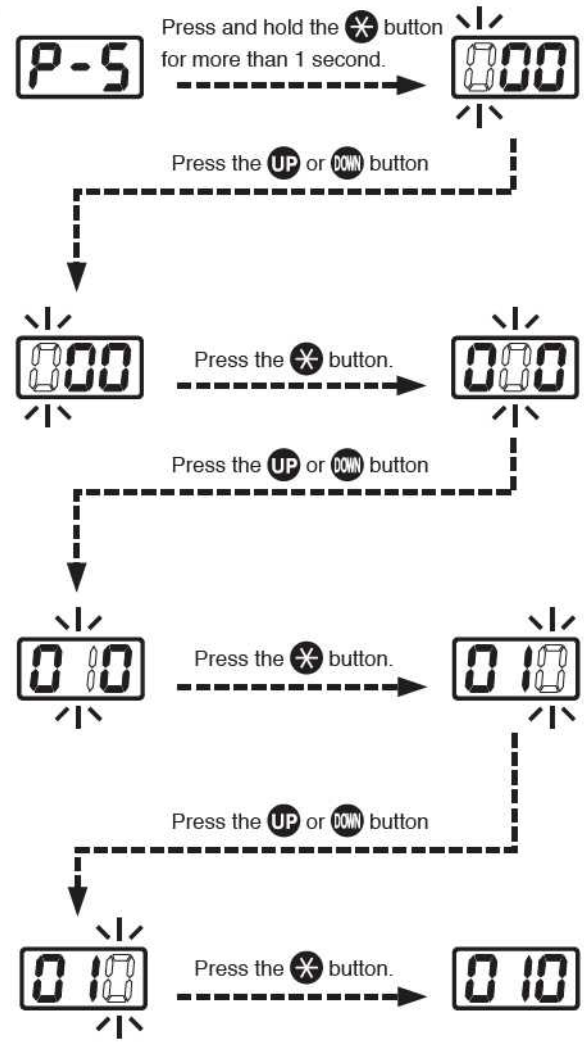
   a. Use the UP or DOWN buttons to select your desired value for the HUNDREDS digit. Only 0 (in case of positive) and – (in case of negative) can be input (the same as in °F mode). Select 0 or – and press the ✳ button. The TENS digit begins to flash.

   **Enter the TENS digit.**

   b. Use the UP or DOWN buttons to select your desired value for the TENS digit. When your desired value is displayed, press the ✳ button. The UNITS digit begins to flash.

   **Enter the UNITS digit.**

   c. Select your desired value for the UNITS digit in the same manner as for the TENS digit. When your desired value is displayed, press the ✳ button. SET displays and indicates that the temperature setting procedure is completed.



# 9. MAINTENANCE / INSPECTION

## ● Broken Heater or Sensor

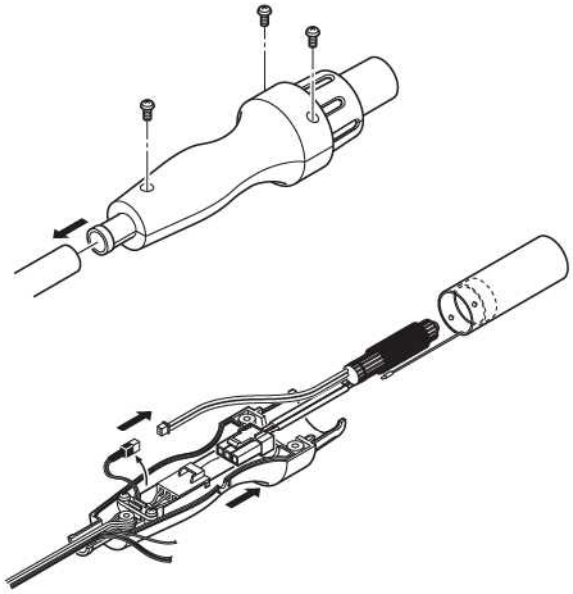
### ① Open the handpiece.

1. Retract the vacuum pipe to its shortest length.
2. Move the tube downward.
3. Remove the three screws holding the handpiece together.
4. Remove the pipe from the protruding portion of the handle.

> ⚠CAUTION
> Quartz glass and heat insulation are inside the pipe. Be careful not to drop or lose these items.

5. Disconnect the heater sensor connector and remove the heater.

> ⚠CAUTION
> Do not apply excessive force to the vacuum pipe.

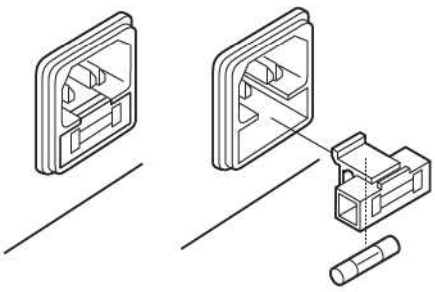



### ② Measure the resistance value.

1. Measure the resistance value (a) of the sensor. The normal value is 0Ω.
2. Measure the resistance value (b) of the heater. The normal values are approximately 33Ω (±10%) (100-120V), 85Ω (± 10%) (220-240V) at room temperature. If the resistance value is abnormal, replace the part. (Refer to the instructions included with the replacement part.)

> ⚠CAUTION
> Since there are various hazards with replacing the heating element, be sure to turn off the power and replace them according to the avove procedure.

## ● Replacing the Fuse



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

# 10. ERROR MESSAGE

When the error detection software in the HAKKO FR-803B detects an error, a message is displayed to alert the operator. See "Troubleshooting" 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). 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.

# 11. TROUBLESHOOTING

**⚠ WARNING**

- **Before checking the inside of the HAKKO FR-803B or replacing parts, be sure to disconnect the power plug. Failure to do so may result in electric shock.**

- **The unit does not operate when the power switch is turned ON.**

  **CHECK** : Is the power cord or connection plug disconnected?
  **ACTION** : Connect it.
  **CHECK** : Is the fuse blown?
  **ACTION** : Investigate why the fuse blew and then replace the fuse.

- **S-E flashes, indicating a sensor error.**

  **CHECK** : Is the sensor broken?
  **ACTION** : Measure the resistance value of the sensor. The normal value is 0 Ω. If the resistance value is abnormal, replace the parts with new parts.

- **H-E flashes, indicating a heater error.**

  **CHECK** : Is the heater broken?
  **ACTION** : Measure the resistance value of the sensor. The normal value is 33 Ω (±10%) (100-120V), 85Ω (±10%) (220-240V) at room temperature. If the resistance value is abnormal, replace the parts with new parts.

- **The profile cannot be set.**

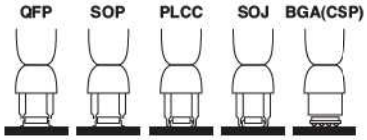
  **CHECK** : Is the station in Auto mode?
  **ACTION** : Put the station into Auto mode.
  **CHECK** : Is the value outside the setting range?
  **ACTION** : Enter a value that is within the setting range.

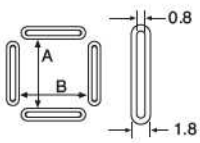
- **The vacuum pump does not stop when the vacuum button is pressed.**

  **CHECK** : Is the VACUUM button being pressed?
  **ACTION** : Press the VACUUM button.

# 12. OPTINAL PARTS

**⚠CAUTION**
The size in Name/Specification indicates the size of IC package.




Air nozzle (common to all nozzles)

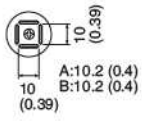
| | | | |
|---|---|---|---|
| | C0.8<br>D1.8 | C1.0<br>D2.0 | C0.8<br>D2.0 |
| No. | A1125B~A1129B<br>A1131~A1141B<br>A1180B~A1189B<br>A1203B~A1266B | A1191 | A1192 |

## ● Vacuum function operative nozzles.

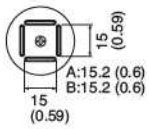
*HAKKO FR-801 and FR-802 are not equipped with the vacuum function.

Unit: mm (inch)

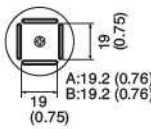
**A1125B**
QFP 10 × 10 (0.39 × 0.39)



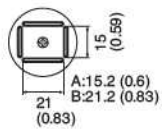

**A1126B**
QFP 14 × 14 (0.55 × 0.55)



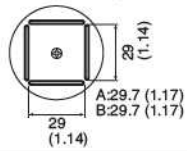

**A1127B**
QFP 17.5 × 17.5 (0.68 × 0.68)



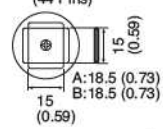

**A1128B**
QFP 14 × 20 (0.55 × 0.78)



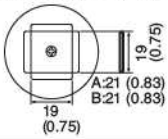

**A1129B**
QFP 28 × 28 (1.1 × 1.1)



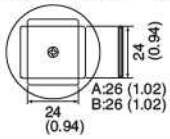

**A1135B**
PLCC 17.5 × 17.5 (0.68 × 0.68) (44 Pins)



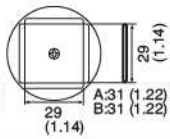

**A1136B**
PLCC 20 × 20 (0.78 × 0.78) (52 Pins)



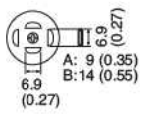

**A1137B**
PLCC 25 × 25 (0.98 × 0.98) (68 Pins)



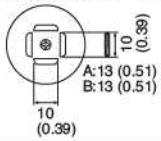

**A1138B**
PLCC 30 × 30 (1.18 × 1.18) (84 Pins)



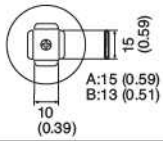

**A1139B**
PLCC 12.5 × 7.3 (0.49 × 0.29) (18 Pins)



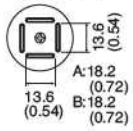

**A1140B**
PLCC 11.5 × 11.5 (0.45 × 0.45) (28 Pins)



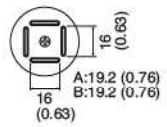

**A1141B**
PLCC 11.5 × 14 (0.45 × 0.55) (32 Pins)



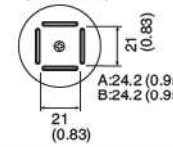

**A1180B**
BQFP 17 × 17 (0.67 × 0.67)



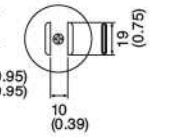

**A1181B**
BQFP 19 × 19 (0.75 × 0.75)



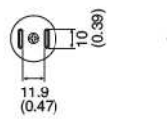

**A1182B**
BQFP 24 × 24 (0.94 × 0.94)



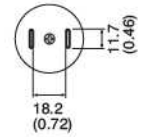

**A1184B**
SOJ 18 × 8 (0.71 × 0.31)



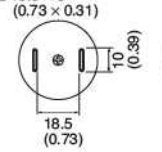

**A1185B**
TSOL 13 × 10 (0.51 × 0.39)



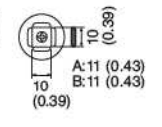

**A1186B**
TSOL 18 × 10 (0.71 × 0.39)



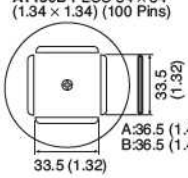

**A1187B**
TSOL 18.5 × 8 (0.73 × 0.31)



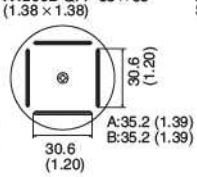

**A1188B** PLCC 9 × 9 (0.35 × 0.35) (20 Pins)



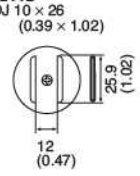

**A1189B** PLCC 34 × 34 (1.34 × 1.34) (100 Pins)



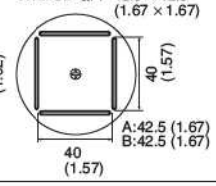

**A1203B** QFP 35 × 35 (1.38 × 1.38)



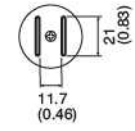

**A1214B**
SOJ 10 × 26 (0.39 × 1.02)



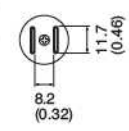

**A1215B** QFP 42.5 × 42.5 (1.67 × 1.67)



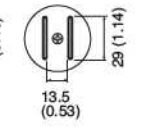

**A1257B**
SOP 11 × 21 (0.43 × 0.83)



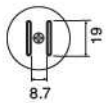

**A1258B**
SOP 7.6 × 12.7 (0.3 × 0.5)



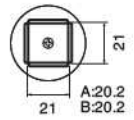

**A1259B**
SOP 13 × 28 (0.51 × 1.1)



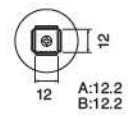

**A1260B**
SOP 8.6 × 18



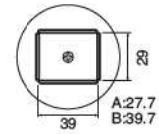

**A1261B**
QFP 20 × 20



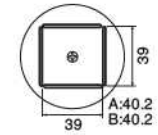

**A1262B**
QFP 12 × 12



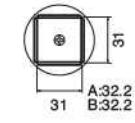

**A1263B**
QFP 28 × 40



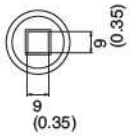

**A1264B**
QFP 40 × 40



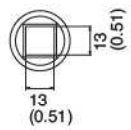

**A1265B**
QFP 32 × 32



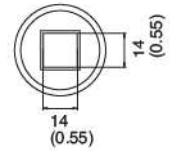

**A1470**
BGA 8 × 8



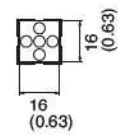

**A1471**
BGA 12 × 12



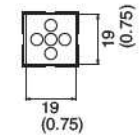

**A1472**
BGA 13 × 13



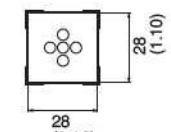

**A1473**
BGA 15 × 15



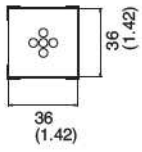

**A1474**
BGA 18 × 18



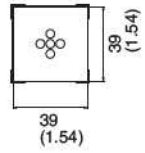

**A1475**
BGA 27 × 27



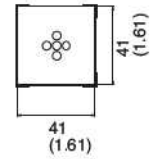

**A1476**
BGA 35 × 35




**A1477**
BGA 38 × 38




**A1478**
BGA 40 × 40



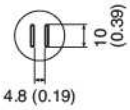
## ● Vacuum function inoperative nozzles.

Unit: mm (inch)

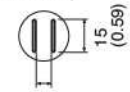
**A1124B** Single Ø2.5 (0.09)


**A1130** Single Ø4.4 (0.17)

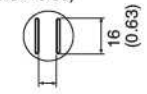

**A1131** SOP 4.4 × 10 (0.17 × 0.39)



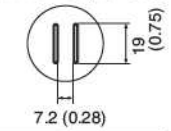

**A1132** SOP 5.6 × 13 (0.22 × 0.51)



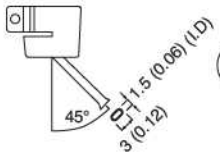

**A1133** SOP 7.5 × 15 (0.3 × 0.59)



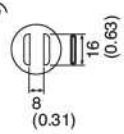

**A1134** SOP 7.5 × 18 (0.3 × 0.7)




**A1142B** Bent Single 1.5 × 3 (0.06 × 0.12)

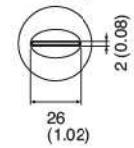



**A1183** SOJ 15 × 8 (0.59 × 0.31)

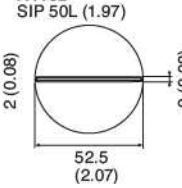



**A1190** Dual Single 2.5 × 9.5 Pitch (0.09 × 0.37)

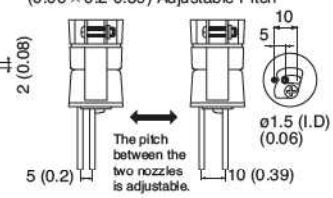

**A1191** SIP 25L (0.98)




**A1192** SIP 50L (1.97)




**A1325** Dual Single Ø1.5 × 5-10 (0.06 × 0.2-0.39) Adjustable Pitch

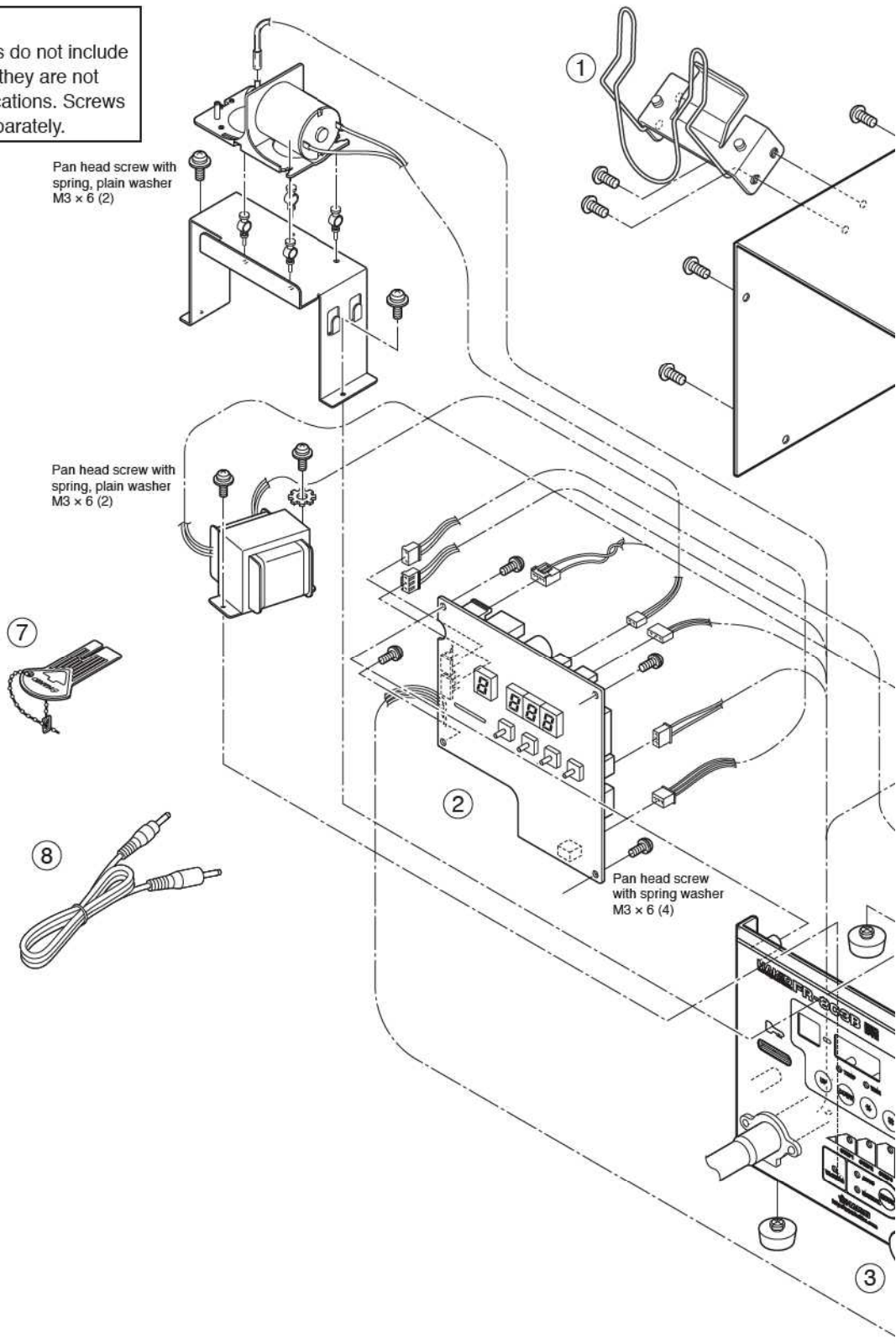


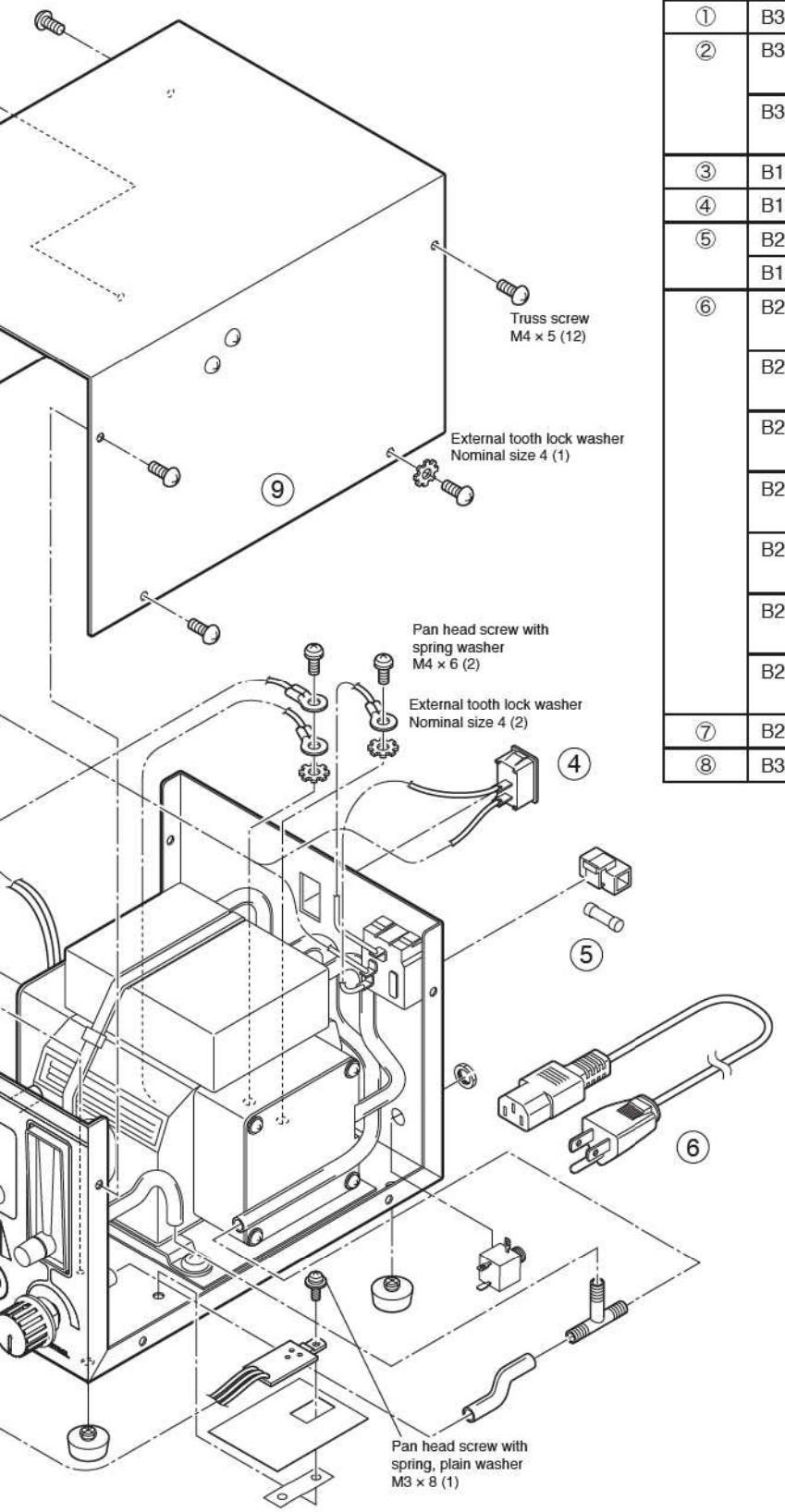

**⚠CAUTION**

Do not use **No. A1124B** Single ø2.5 (0.09) and **No. A1142B** Bent Single 1.5 × 3 (0.06 × 0.12) nozzle with the HAKKO FR-803B. These nozzles do not have space to blow hot air, using them with the HAKKO FR-803B may result in danger.

# 13. PARTS LIST / STATION

**NOTE:**
Spare or repair parts do not include mounting screws, if they are not listed on the specifications. Screws must be ordered separately.

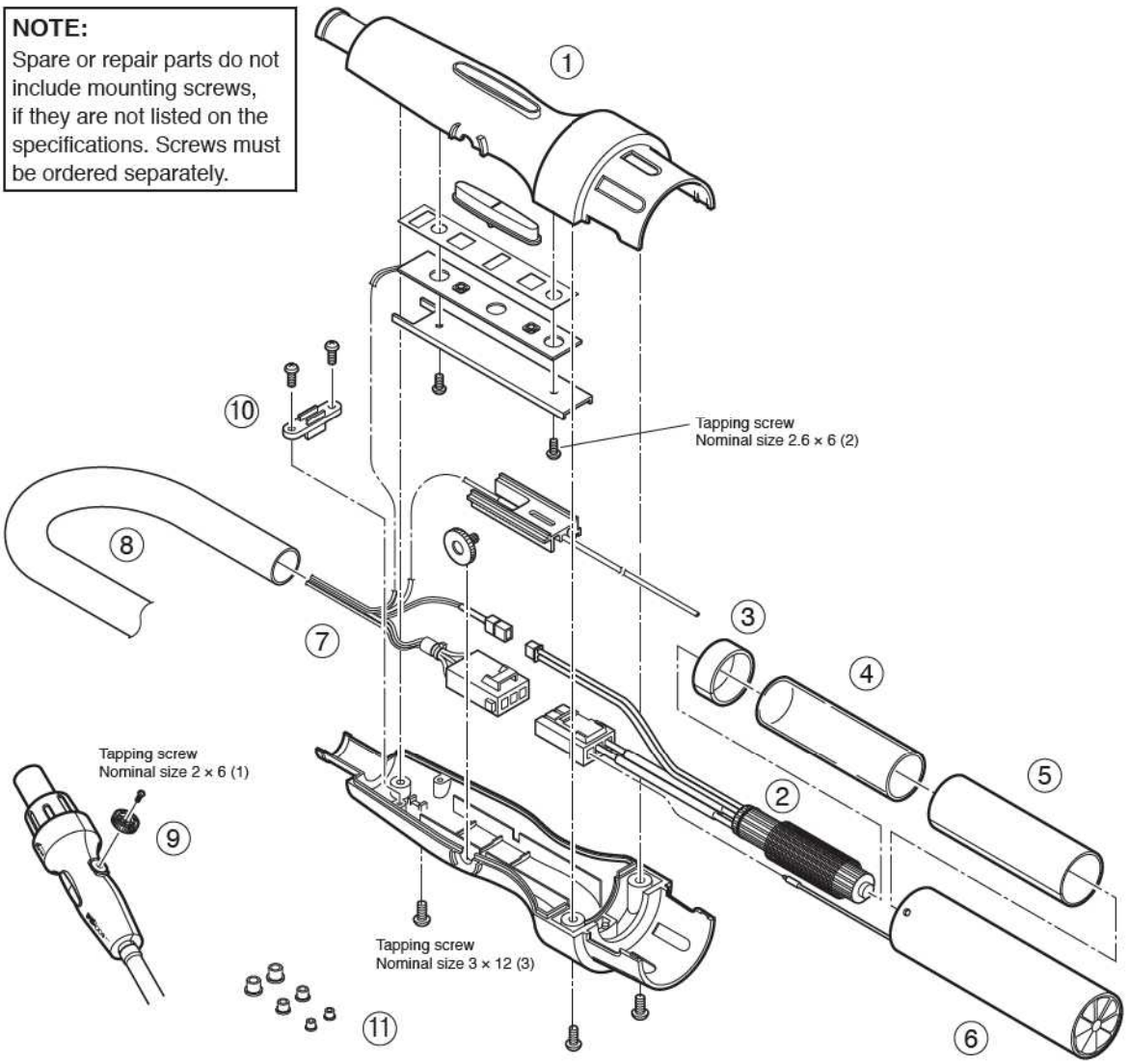





| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | B3442 | Handpiece holder | |
| ② | B3380 | P.W.B./for temperature control | 100~120V, with triac |
| | B3381 | P.W.B./for temperature control | 220~240V, with triac |
| ③ | B1028 | Knob | With screw |
| ④ | B1084 | Power switch | |
| ⑤ | B2468 | Fuse/125V-5A | 100~120V |
| | B1258 | Fuse/250V-3.15A (S) | 220~240V |
| ⑥ | B2419 | Power cord, 3 wired cord & American plug | 100~120V |
| | B2421 | Power cord, 3 wired cord but no plug | 220~240V |
| | B2422 | Power cord, 3 wired cord & BS plug | India |
| | B2424 | Power cord, 3 wired cord& European plug | 220V KTL, 230V CE |
| | B2425 | Power cord, 3 wired cord & BS plug | 230V CE, U.K. |
| | B2426 | Power cord, 3 wired cord & Australian plug | |
| | B2436 | Power cord, 3 wired cord & Chinese plug | China |
| ⑦ | B2972 | Control card | |
| ⑧ | B3410 | Connecting cord | |

# 13. PARTS LIST / HANDPIECE

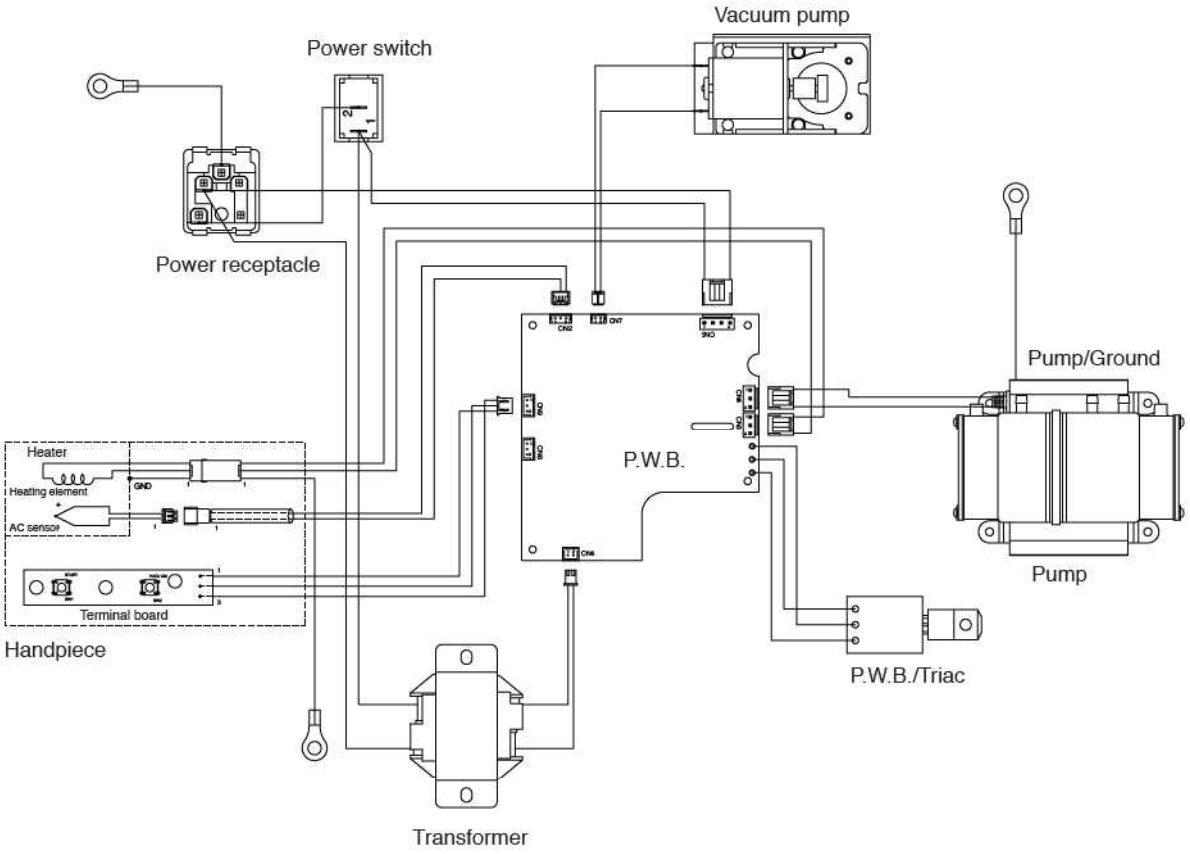
**NOTE:**
Spare or repair parts do not include mounting screws, if they are not listed on the specifications. Screws must be ordered separately.




| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ① | B3015 | Handle | With screws |
| ② | A1523 | Heating element | 100~120V |
| | A1524 | Heating element | 220~240V |
| ③ | B3009 | Mica B | |
| ④ | B2995 | Quartz glass pipe | For support heating element |
| ⑤ | B3008 | Mica A | |
| ⑥ | B3095 | Pipe assembly | |
| ⑦ | B3018 | Cord assembly | With silicone tube |
| ⑧ | B1188 | Silicone hose | |

| Item No. | Part No. | Part Name | Specifications |
|---|---|---|---|
| ⑨ | B3023 | Vacuum pipe adjustment knob (L) | With screw |
| ⑩ | B1354 | Cord stopper/for handle | |
| ⑪ | A1520 | Pad ø3 mm (0.12 in.) | Set of 5 |
| | A1439 | Pad ø5 mm (0.20 in.) | Set of 5 |
| | A1438 | Pad ø7.6 mm (0.30 in.) | Set of 5 |

# 14. WIRING DIAGRAM



HAKKO

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