

DESOLDERING TOOL

FR-410

Instruction Manual

(FR-4103)



Thank you for purchasing the HAKKO FR-410 Desoldering Tool.

Please read this manual before operating the HAKKO FR-410.

Keep this manual readily accessible for reference.



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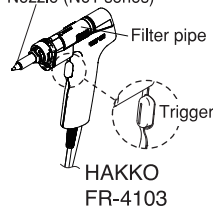
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1. PACKING LIST AND PART NAMES

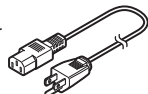
Please check to make sure that all items listed below are included in the package.

HAKKO FR-410 Desoldering station	1	HAKKO FH-410 Handpiece holder	1
HAKKO FR-4103 Desoldering Handpiece		Tool box	1
with N61-05 (ø1.0mm [0.04 in]) nozzle	1	Instruction Manual	1
Power cord	1		

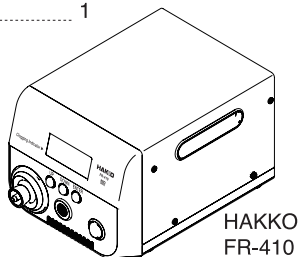
Nozzle (N61 series)



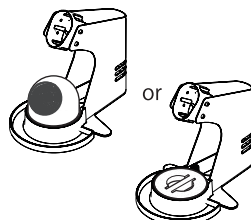
HAKKO
FR-4103



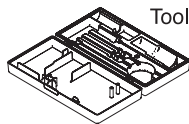
Power cord



HAKKO
FR-410



HAKKO FH-410



Tool box



Ceramic paper Filter (L) x4



Station Filter x2



Cleaning Pin (for ø1.0mm [0.04 in] nozzle) x1



Cleaning Drill (for ø1.0mm [0.04 in] nozzle) x1



Cleaning Pin (for Heating Element) x1



Nozzle wrench x1

2. SPECIFICATIONS

● HAKKO FR-410

Power consumption	190W
Temperature range	330 - 450°C (620 - 850°F)
Temperature stability	±5°C (9°F) at idle temperature

● Station

Output	AC 24V
Vacuum generator	Vacuum pump, double cylinder type
Vacuum pressure (max.)	80 kPa (600 mmHg)
Suction flow	15 L/min.
Dimensions	165(W) × 137(H) × 244(D) mm (6.5 × 5.4 × 9.6 in.)
Weight	4.8 kg (10.6 lb.)

● HAKKO FR-4103

Part name	HAKKO FR-4103
Power consumption	140W (24 V)
Nozzle to ground resistance	< 2 Ω
Nozzle to ground potential	< 2 mV
Cord	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

* The temperature was measured using the HAKKO FG-101 Station Tester.

* This product is protected against electrostatic discharge.

* Specifications and design are subject to change without notice.

⚠ CAUTION

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.

※ 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）

* 各言語（日語、英語、中文、法語、德語、韓語）の使用説明書可以通过以下网站的HAKKO Document Portal 下载参阅。
（有一部分的产品没有设定外语对应，请见谅）

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



<https://doc.hakko.com>

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 nozzle will be hot. To avoid injury or damage to personnel and items in the work area, observe the following:

- Do not touch the nozzle or the metal parts near the nozzle.
- Do not allow the 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-410.
- 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-410, be sure to observe the following:

CAUTION

- Do not use the unit for applications other than desoldering.
- Do not strike the handpiece against hard objects to remove excess solder. This will damage the handpiece.
- Do not modify the HAKKO FR-410.
- Use only genuine HAKKO replacement parts.
- Do not allow the HAKKO FR-410 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. Desoldering produces smoke.
- While using the HAKKO FR-410, don't do anything which may cause bodily harm or physical damage.

4. INITIAL SETUP

A. Handpiece holder

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

⚠ CAUTION

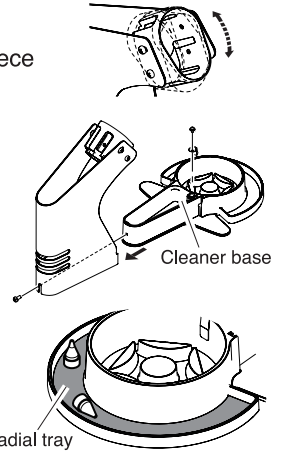
Increasing the angle of the handpiece receptacle will cause an increase in the handpiece temperature.

● **Setup the handpiece holder**

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

NOTE :

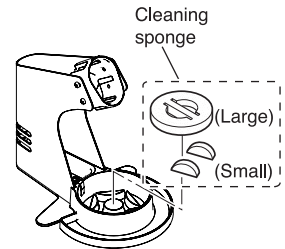
You can put nozzles that are not in use on the radial tray of the cleaner base.



● **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**

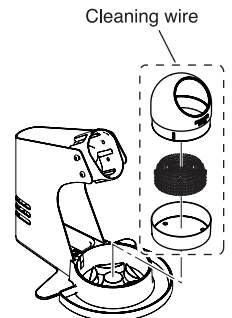
Following the instructions given in the illustration on the right, put the cleaning wire on the cleaner base.

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.



⚠ CAUTION

Be sure to hold the plug when inserting or removing the handpiece cord.

B. Station

● **Connection**

1. Connect the power cord to the receptacle on the rear of the station.
2. Connect the plug from the HAKKO FR-4103 to the receptacle on the HAKKO FR-410.

⚠ CAUTION

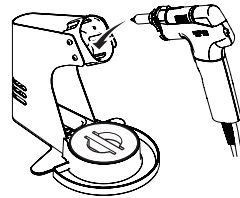
Connect the plug to the receptacle, aligning the tab on the plug with the opening on the receptacle.

3. Set the HAKKO FR-4103 in the handpiece holder.
4. Connect the hose from the HAKKO FR-4103 to the vacuum outlet cap on the HAKKO FR-410 station.

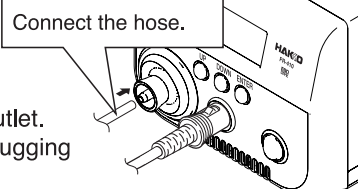
Insert the plug into the receptacle until it seats.



To disconnect, pull the plug from the receptacle while pressing down the tab on the plug.



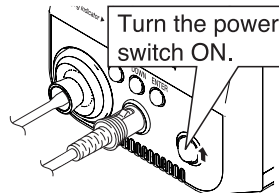
5. Plug the power cord into a grounded power outlet. Ensure that the power switch is OFF before plugging in the power cord.



⚠ CAUTION

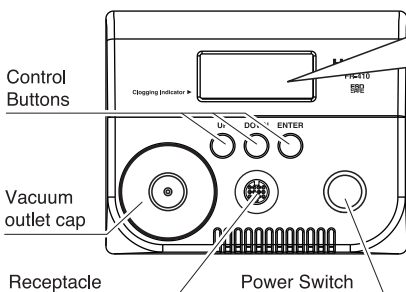
Be sure to ground this product as it is ESD safe by design.

6. Turn the power switch ON.

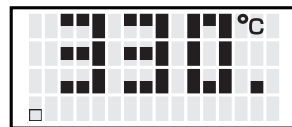


5. OPERATION

PART NAMES



Normal display screen



The HAKKO FR-410 has three controls

- UP - Moving the cursor UP. Increases the value.
- DOWN - Moving the cursor DOWN. Decreases the value.
- ENTER - 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.

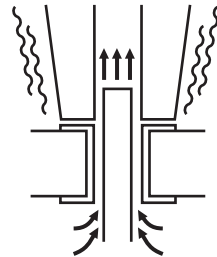
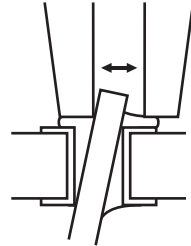
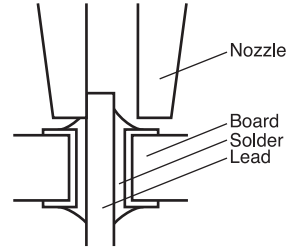
2. Check to make sure all of the solder on the joint has melted.

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.

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.

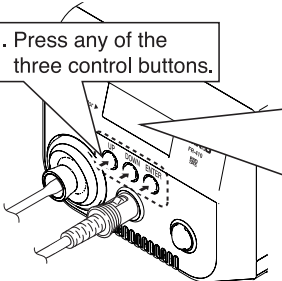
HEATING...
PLEASE WAIT

B. Making Changes to Settings

● Selecting the preset number

The HAKKO FR-410 has a preset mode.

1. Press any of the three control buttons.



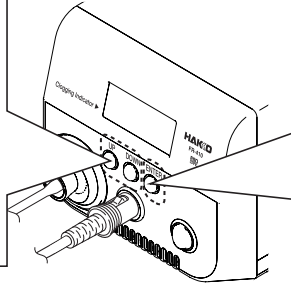
2. The preset selection screen appears.

▶PRESET1	350°C	
PRESET2	400°C	
PRESET3	450°C	
<↑>	<↓>	<ENT>

If you wish to exit the PRESET SELECTION screen, simply use the DOWN button to scroll to the bottom of the list, and select <EXIT>.

3. Make your SELECTION by moving the cursor UP or DOWN by pressing the corresponding buttons.

▶PRESET1	350°C
PRESET2	400°C
PRESET3	450°C
<↑>	<↓> <ENT>



4. Press the <ENT> button to finalize your selection.

▶PRESET1	350°C
PRESET2	400°C
PRESET3	450°C
<↑>	<↓> <ENT>

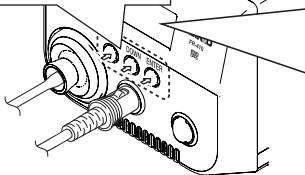
If you wish to exit the PRESET SELECTION screen...

- Select <EXIT> and press the <ENT> button. You will return to the normal display screen without making any changes.
- 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)”.

● Changing various settings (other than preset selections)

1. Press and hold any one of the three control buttons for at least 2 seconds.



2. The setting selection screen appears.

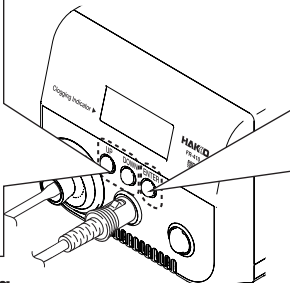
▶ Set Temp	
Offset Temp	
Vacuum Check	
<↑>	<↓> <ENT>

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 setting screen) |

3. Make your SELECTION by moving the cursor UP or DOWN by pressing the corresponding buttons.

▶ Set Temp
 Offset Temp
 Vacuum Check
 <↑> <↓> <ENT>



4. Press the <ENT> button to finalize your selection.

▶ Set Temp
 Offset Temp
 Vacuum Check
 <↑> <↓> <ENT>

*** Change of selected setting**

Depending on selected setting, the display on the screen differs. However, you can make changes to the settings by following the above operation procedure. After completing the changes to the setting, if you press the ENTER button again in the selection screen, you will return to the normal display.

Detailed information on the parameters and how to change them can be found in manuals available at the HAKKO Document Portal. Please download and make use of them.

➔ <https://doc.hakko.com>

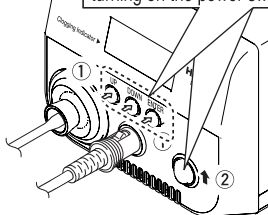
6. PARAMETER SETTINGS

● PARAMETER SETTINGS

Press and hold any one of the three 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 ~ 60 min	30 min
Vacuum Mode	Normal / Timer	Normal
Vacuum Time***	1 ~ 5sec	1sec
Auto Sleep	OFF / ON	ON
Timer**	1 ~ 29min	6 min
Sleep Temp	200 ~ 300°C (390 ~ 570 °F)	200°C (390°F)
Low Temp	30 ~ 150°C (54 ~ 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 U.S.A.

** Auto-ShutOff (Auto Sleep) Time can be set when Auto-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 "ON" or "Partial."

※Operation procedure for parameter setting

Use <↑>, <↓>, and <ENT> to set parameters as you do in the operation settings. When you are finished, press the <ENT> button in the parameter setting screen to return to the normal display.

7. MAINTENANCE

Properly maintained, the HAKKO FR-410 desoldering tool should provide years of good service. Efficient desoldering depends upon the temperature, nozzle selection, and proper routine maintenance. Perform the following service procedures as dictated by the conditions of the station's usage.

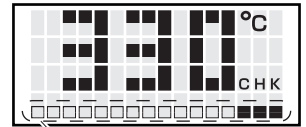
⚠ WARNING

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.



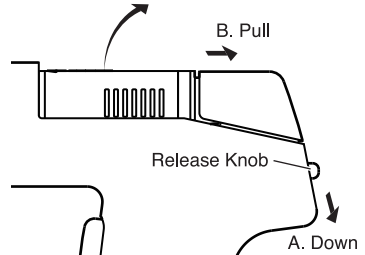
Suction gauge Sign of clogging

Replacing the filter

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.

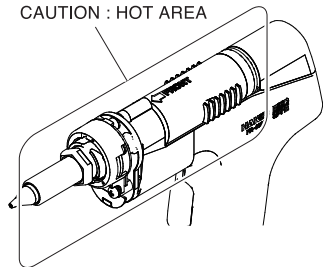
C. Replace the entire filter pipe with a secondary filter pipe.



⚠ 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.

CAUTION : HOT AREA



Nozzle Maintenance

⚠ CAUTION

The desoldering tool 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

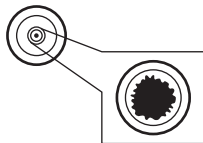
The cleaning pin will not pass through the nozzle until the solder inside the nozzle is completely melted.

- 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.

⚠ 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.

- Check visually if the nozzle was eroded.



Hole is damaged by erosion.

- If the cleaning pin and cleaning drill do not pass through the hole in the nozzle, replace the nozzle.
- If the solder plating on the nozzle tip is worn, replace the nozzle.
- If the inside hole of the nozzle is eroded, replace the nozzle.

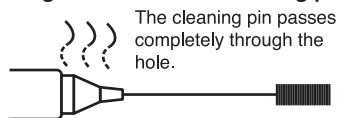
⚠ CAUTION

Desoldering efficiency goes down and all other parts appear to be OK, the nozzle is probably eroded and should be replaced.

The inside hole and the surface of the nozzle is plated with a special alloy. Should this alloy become eroded by high temperature solder, the nozzle will not be able to maintain the proper temperature.

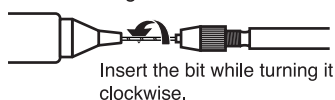
- If the nozzle is still in a good condition, put some fresh solder on the nozzle tip to protect solder plated area from oxidation.

Cleaning with the nozzle cleaning pin

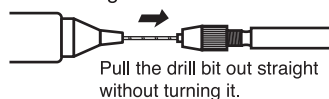


Cleaning with the cleaning drill

- Before cleaning



- After cleaning

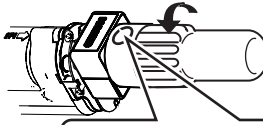


Use the proper size cleaning pin or cleaning drill for the nozzle diameter.



2. Disassemble the heating element.

Remove the enclosure pipe using the included nozzle wrench.



⚠ CAUTION

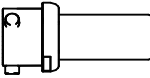
The heating element is very hot during operation.

Heating Element

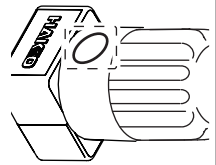


Nozzle

Enclosure pipe

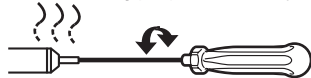


The enclosure pipe is held to the nozzle changing tool by pressing this part from both sides. (The nozzle is not held to the nozzle changing tool. Be careful when removing them.)



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.

4. Replace the filters.

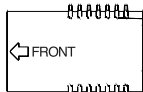
- Turn the power switch OFF.
- When the filter pipe is cool to the touch, push down on the release knob at the back of the handpiece and remove the filter pipe.

⚠ CAUTION

The filter pipe is very hot.

- Examine the seals (front and filter holders) at each end of the filter pipe. Replace : Stiff and/or cracked.
- Examine the Pre-filter: Remove solder adhering to the waste collector.
- Examine the ceramic paper filter (L). Replace : Ceramic paper filter (L) is showing signs of stains from flux, is stiff, or contains any solder.

Front holder



Pre-filter

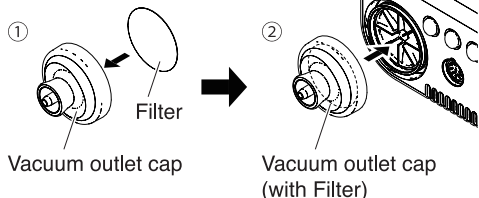
Filter holder



Ceramic paper filter (L)

5. Replacement of station filter

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



8. TROUBLE SHOOTING GUIDE

⚠ WARNING

Before checking the inside of the HAKKO FR-410 or replacing parts, be sure to disconnect the power plug. Failure to do so may result in electric shock.

● Display does not turn on.

CHECK : Is the power supply cable or connection plug disconnected?

ACTION : Connect it tightly.

CHECK : Is the fuse blown?

ACTION : Replace the fuse. If the fuse blows again, please send the entire product back to us for repair.

● Pump does not operate.

CHECK : Is the power supply cable or connection plug disconnected?

ACTION : Connect it tightly.

CHECK : Is the heater tube or nozzle clogged?

ACTION : Clean it.

● Solder is not being absorbed.

CHECK : Is the filter pipe full of solder?

ACTION : Clean it.

CHECK : Is the ceramic paper Filter (L) hardened?

ACTION : Replace it with a new one.

CHECK : Is there a vacuum leak?

ACTION : Check the connections and filter pipe seals and replace any worn parts.

CHECK : Is the heater tube or nozzle clogged?

ACTION : Clean it.

● The nozzle does not heat up.

CHECK : Is the desoldering gun cord assembly properly connected?

ACTION : Connect it tightly.

CHECK : Is the heating element damaged?

ACTION : Replace it with a new one.



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NOTE :

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