

# **HAKKO 854**

**SMD REWORK STATION**

SMD Rework Station

## **INSTRUCTION MANUAL**

Thank you for purchasing the HAKKO 854 SMD Rework Station. This product incorporates an upper heater with a vacuum pickup and a preheater.

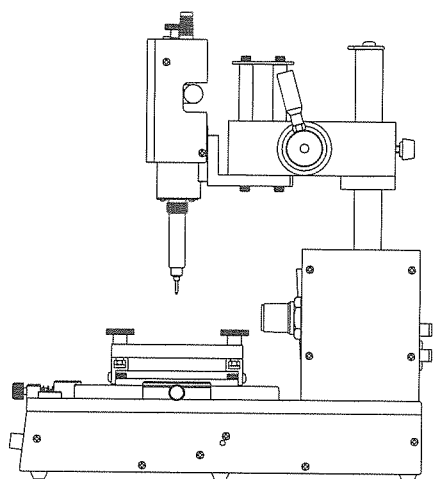
Please read this manual before operating the HAKKO 854. Keep this manual readily accessible for reference.

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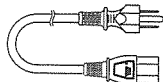
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# PACKING LIST

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Main unit of HAKKO 854



Power cord  
(1600mm)



Anti-seize Lubricant



Cleaning pin

# SPECIFICATIONS

Product name	HAKKO 854	
Power supply	100 VAC, 50/60 Hz	
Power consumption	Upper heater	60W
	Preheater	340W
Airflow	Upper heater	Variable within air supply capacity
	Preheater	0.18m <sup>3</sup> /min
Air supply pressure	Upper heater	5 Kgf/cm <sup>2</sup> max.
	Vacuum	5 Kgf/cm <sup>2</sup>
External dimensions	225(W) × 340(H) × 303(D)mm	
Weight	7.5kg	

\* This product is protected against electrostatic discharge.

\* Specifications and design are subject to change without notice.


# SAFETY INSTRUCTIONS

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## 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. Two examples are given below.

- Be sure to comply with following WARNINGS and CAUTIONS for your safety.

## CAUTION

After the power has been turned ON, the temperatures of hot air and the area around the nozzle reach 100° to 450 °C (212° to 842° F). Since improper handling may result in burns or fire, be sure to observe the following precautions:

- Do not touch the outlet of hot air or any metal part around the nozzle.
- Do not use HAKKO 854 near any inflammable gas or material, or any other thing that is easy to burn.
- Do not use HAKKO 854 with the outlet of hot air blocked.
- Do not put any foreign matter in the outlet of hot air.
- Do not turn the nozzle to a person or the face.
- Let the persons in the neighboring area know that there is danger due to high temperature.
- Turn OFF the power whenever suspending or stopping the use, or leaving the site.
- Before replacing any part or storing HAKKO 854, turn OFF the power switch to let the main unit cool down.

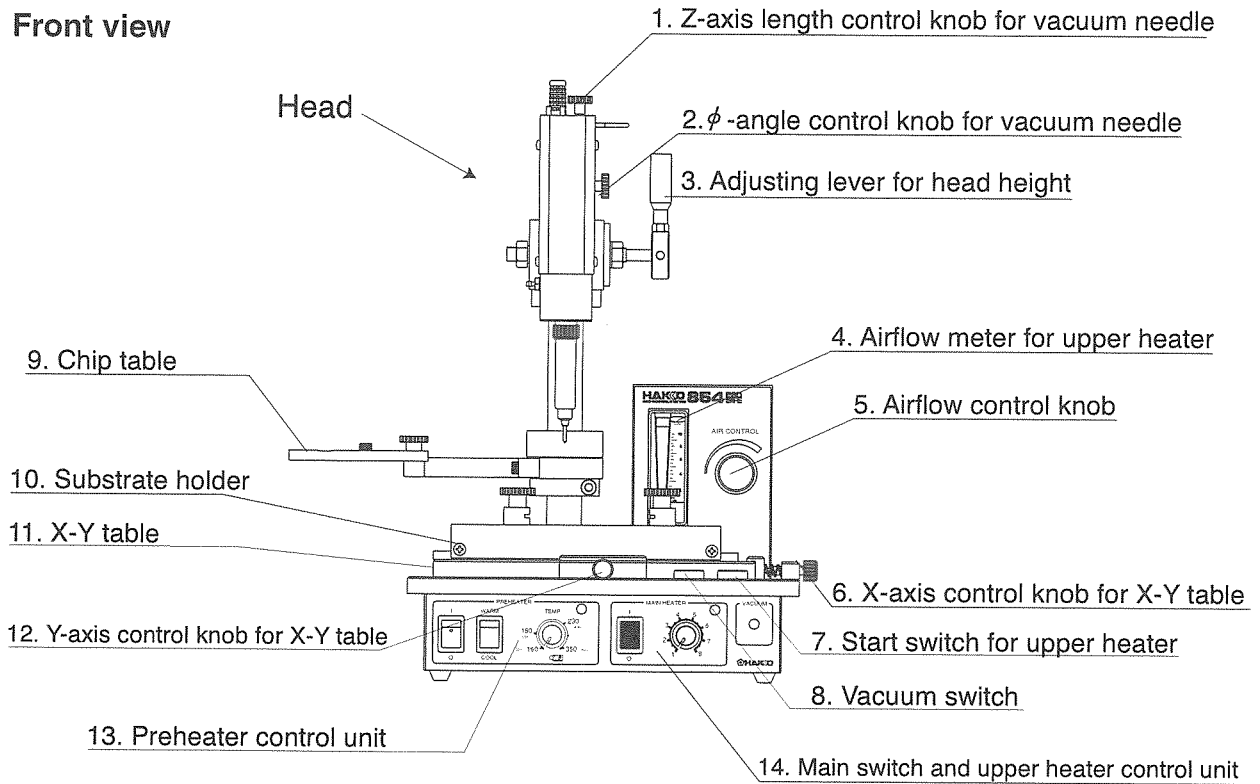
- To prevent accidents and failures, be sure to take the following precautions

For fluid, use clean air that has been passed through an air filter. Regulate the pressure while air is flowing.

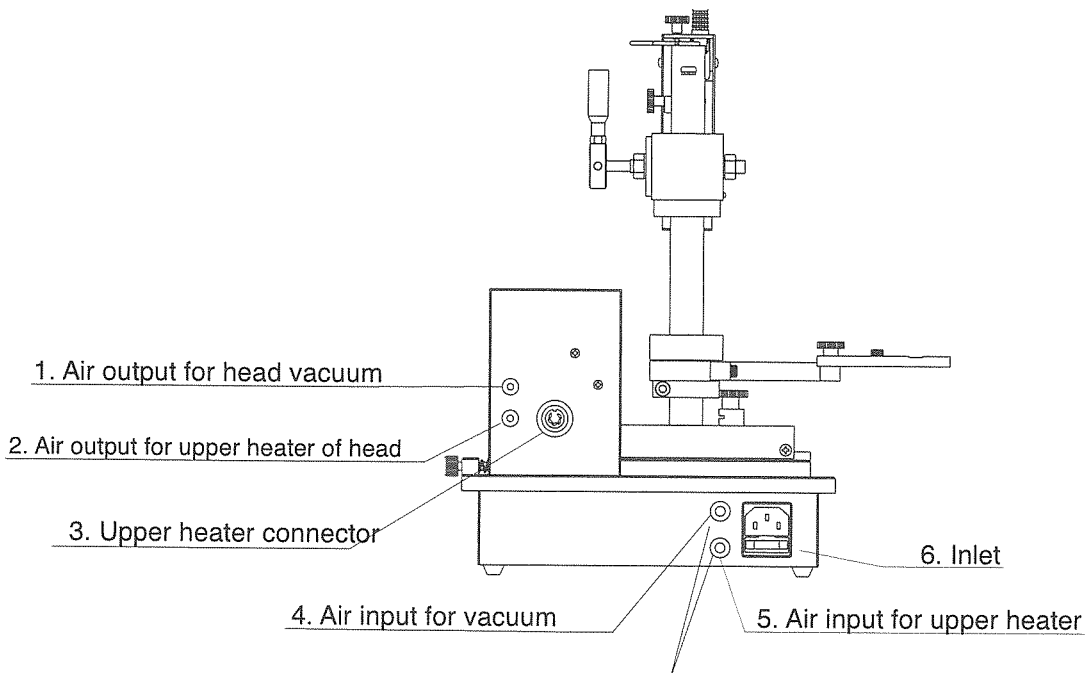
- In principle, limit the continuous use to one hour.
- Be sure to ground HAKKO 854.
- Do not modify this product.
- Use genuine parts for replacement.
- Do not immerse HAKKO 854 in water or handle it with a wet hand.
- Do not pull the plug by the power cord. Hold the plug whenever disconnecting the power cord.
- Avoid any act that is likely to cause a hazardous situation.

# PART NAMES

## Front view



## Rear view



(Use an air tube of 6 mm in outer diameter.)

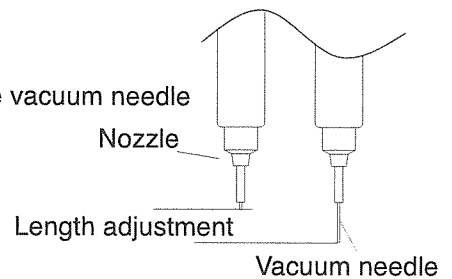
# PART NAMES

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## Front view

1. Z-axis length control knob for vacuum needle

Used to adjust the length of the vacuum needle that is drawn from the nozzle.



2.  $\phi$ -angle control knob for vacuum needle

Used to adjust the  $\phi$ -angle of the vacuum pipe, which is adjustable at 45 degrees maximum on either the left or right side.

3. Adjusting lever for head height

Used to adjust the height of the head.

4. Airflow meter for upper heater

Indicates the airflow for the upper heater (0 to 10 SCFH)

5. Airflow control knob

Used to control the airflow for the upper heater.

6. X-axis control knob for X-Y table

Used to adjust the X-axis of the X-Y table.

7. Start switch for upper heater

Toggles between turning ON and OFF the upper heater.

8. Vacuum switch

Toggles between turning ON and OFF the vacuum.

9. Chip table

Allows you to place taping parts. Normally, turn the chip table to the left. When picking up a chip component, turn the table toward you so that it is located below the vacuum pipe.

# PART NAMES

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10. Substrate holder	Used to hold a substrate. If not required for a specific substrate, remove the substrate holder by loosening the screws.
11. X-Y table	Allows you to fine-tune the substrate position with the X and Y-axis control knobs for the X-Y table. The X-Y table is movable within a range of $\pm 3$ mm.
12. Y-axis control knob for X-Y table	Used to adjust the Y-axis of the X-Y table.
13. Preheater control unit	Used to control the preheater (bottom heater). ON/OFF switch: Used to turn ON/OFF the preheater. WARM/COOL: When in the WARM position, hot air is blown. When in the COOL position, the heater is OFF and air at room temperature is blown. TEMP: Used to control the temperature of the preheater.
14. Main switch and upper heater control unit	Used to control the upper heater. ON/OFF switch: Used to turn ON/OFF the upper heater. The ON/OFF switch also serves as the main power switch. Unless this switch is turned ON, the preheater cannot be used. TEMP: Used to control the temperature of the upper heater.

# PART NAMES

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## Rear view

- |  |  |
|--|--|
| 1. Air output for head vacuum          | Connect the air tube from the vacuum pipe on the head.   |
| 2. Air output for upper heater of head | Connect the air tube from the air pipe for the upper heater of the head.   |
| 3. Upper heater connector              | Connect the control cord for the upper heater.   |
| 4. Air input for vacuum                | Supply air for vacuum from an air source, e.g., at the factory.<br><b>⚠ Caution:</b> The air supply pressure is 5 Kg/cm <sup>2</sup> maximum.<br>Do not exceed this limit to avoid any failure.<br>If the supply pressure is too low, the vacuum capacity deteriorates |
| 5. Air input for upper heater          | Supply air for vacuum from an air source, e.g., at the factory.<br><b>⚠ Caution:</b> The air supply pressure is 5 Kg/cm <sup>2</sup> maximum.<br>Do not exceed this limit to avoid any failure.  |
| 6. Inlet                               | Connect the power cord.  |

# PREPARATION: ASSEMBLY AND CONNECTION

## PREPARATION: ASSEMBLY AND CONNECTION

### -Removing the clamp screw

Remove the clamp screw for use in transportation, which is located on the head. To do so, perform the following steps:

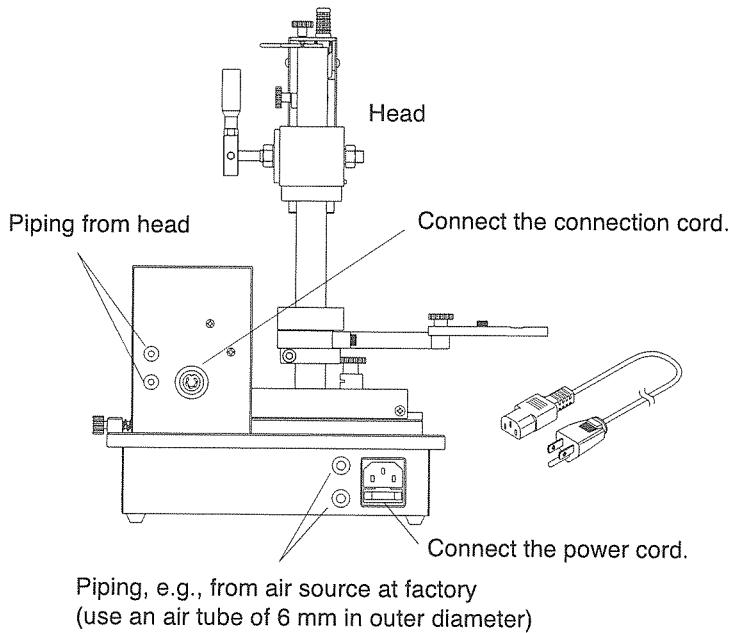
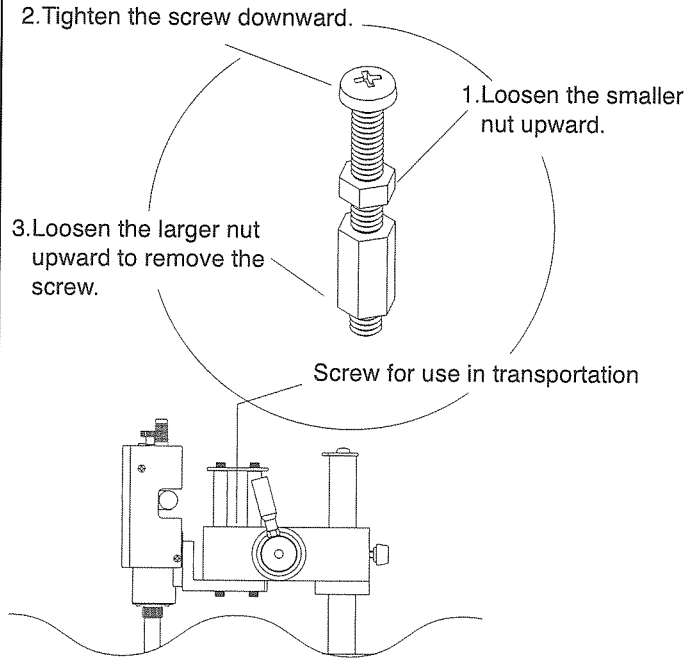
1. Loosen the smaller nut upward.
2. Tighten the screw downward.
3. Loosen the larger nut upward to remove the screw.

### Caution

The removed clamp screw should be carefully stored as it may be required for use in transportation.

### -Connecting the hoses and others to the main unit

1. Connect the power cord to the power inlet on the rear.
2. Connect an air tube, e.g., from an air source at the factory, to the air piping connector located at the lower part of the rear of the main unit.
3. Connect the air tubes and the control cord to the head. The air tube marked with V is used for vacuum.
4. Connect the power plug to the power outlet.
5. Turn ON the main power switch.



### Caution:

Limit the air supply pressure at the specified value. Be sure to pass the air through the air filter to eliminate dust, moisture, and oil. Regulate the pressure while air is flowing.



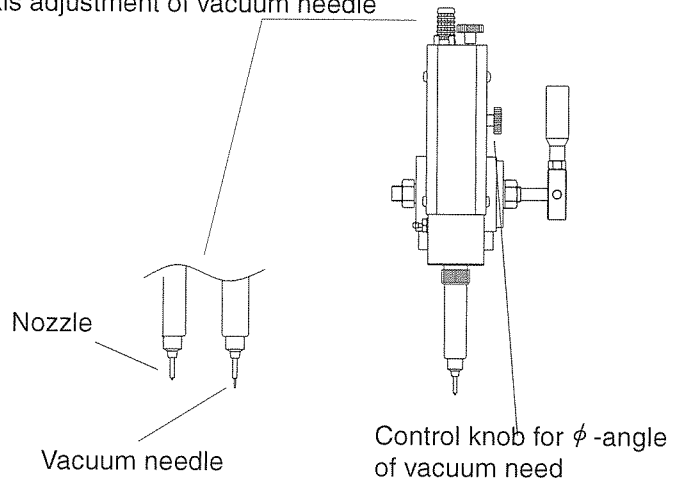
# OPERATION

## Adjusting the vacuum needle

Turn the control knob for the vacuum needle length clockwise or counterclockwise to adjust the length of the leading length of the vacuum needle.

Turn the control knob for the  $\phi$ -angle of the vacuum needle to adjust the  $\phi$ -angle. The angle is adjustable at 45 degrees maximum to either the left or right.

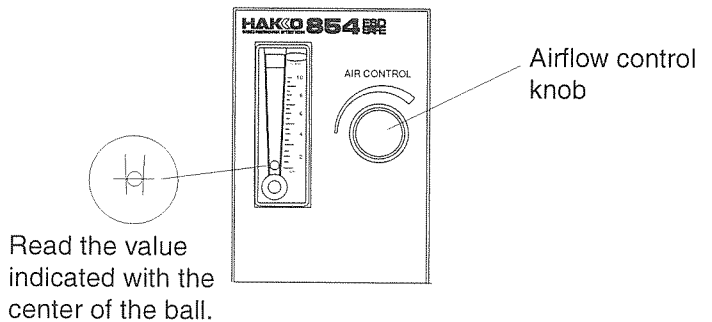
## Z-axis adjustment of vacuum needle



## Controlling the airflow for upper heater

To control the airflow for the upper heater, use the main control knob for the airflow. Pull the control knob toward you to unlock it, control the airflow, and then push the control knob to lock it.

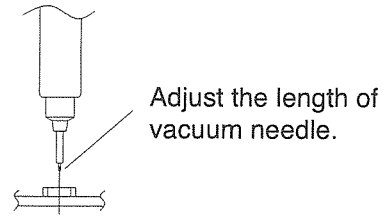
Read the airflow indicated with the center of the ball.



# OPERATION

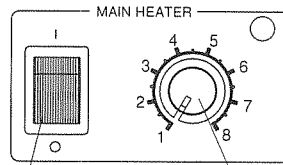
## Picking up a component

1. Turn ON the main power switch.
2. Select an airflow level for the upper heater. To do so, control the airflow on the airflow meter while allowing hot air to blow. After finishing the control, temporarily turn OFF the main switch.
3. Place a substrate on the substrate holder. Position the component to be reworked, almost at the center of the air outlet of the preheater.
4. Adjust the length of the vacuum needle corresponding to the substrate. Normally, it is 2 to 3 mm.
5. Lower the vacuum needle as close as possible to the component level, and then obtain the accurate position with the control knob for the X-Y table.
6. Select temperatures of the preheater and upper heater.

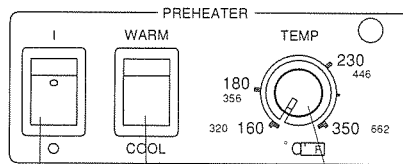


Position the component at almost the center.

First place the substrate in an appropriate position and the accurately position it with the X and Y-axis control knobs for the X-Y table. At this time, if the vacuum needle is lowered as close as possible to the component level, the component can be positioned easily. However, ensure that the vacuum needle does not make contact with the component. If the X-Y table is moved with the vacuum needle contacting with the component, the vacuum needle will be damaged.



Main power switch      Control knob  
for upper heater temperature



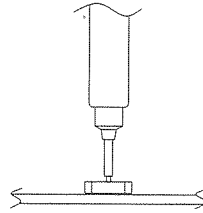
Power switch  
for preheater      Control knob  
for preheater temperature

WARM / COOL

# OPERATION

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7. Lower the head so that the vacuum needle makes contact with the component. At this time, ensure that appropriate tension is applied to the component.

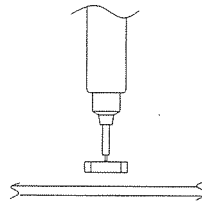


8. Turn ON the preheater. Set the WARM/COOL switch to the WARM mode.

Lower the vacuum needle so that appropriate tension is applied to the component.

Turn ON the heater switches to melt solder and then turn ON the vacuum switch to pick up the component.

9. Turn ON the start switch located on the upper heater. Hot air will start blowing to melt solder.



10. After checking that solder has been melted, turn ON the vacuum switch.

**⚠ Caution:**

The temperatures of the upper heater/ preheater and the heating time vary depending upon the workpiece. Excessive heating may damage the substrate and/or the component. It is recommended that various conditions be reviewed before heating.

11. Raise the head to pick up the component. Subsequently turn OFF the upper heater and the preheater. Turn OFF the vacuum switch to take the component off the vacuum needle.

After the component has been removed, set the WARM/COOL switch located on the preheater to the COOL mode so that the preheater is allowed to cool down.

# OPERATION

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## Mounting a component

1. Turn the chip table toward you so that it comes under the vacuum needle.  
Place the tape of the chip component on the cross-shaped concavity in the table and position the component below the vacuum needle.
2. Press the vacuum needle against the component to give appropriate tension to the component. Subsequently, turn ON the vacuum switch, raise the head, and then pick up the component from the tape.
3. Put the chip table back in place, lower the head, and then place the dismantled component on the substrate while positioning it.
4. Turn OFF the vacuum switch and turn ON the upper heater/preheater switches.
5. After checking that solder has been melted, raise the head.
6. Depending on the condition, maintain the upper heater/preheater ON until solder is properly melted.
7. Turn OFF the upper heater/preheater switches to allow the heaters to cool down.

The chip table should be turned around the support. Before turning the table, make sure that the head is raised completely.

To align the component with the vacuum needle, use two screws located on the chip table. After loosening the screws to make the alignment, retighten the screws.

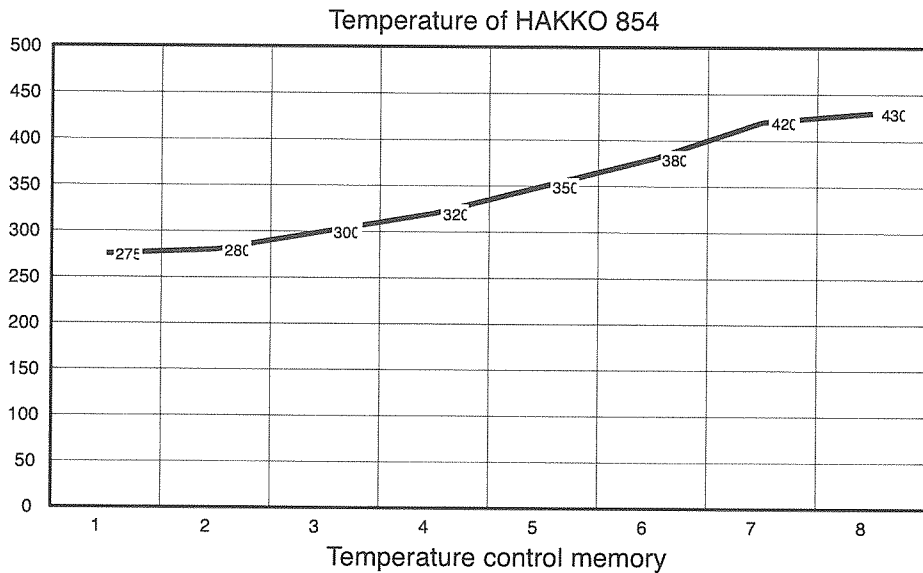
### Caution:

As in the case of removing the component, it is recommended that various conditions such as the temperatures of the upper heater/preheater, heating time, and soldering be reviewed before heating.

To turn the chip table, pay attention to the height of the head. If the chip table is turned with the head lowered, the nozzle and/or vacuum needle may be damaged.

# HEATER TEMPERATURE

## Temperature profile for upper heater



The temperature was measured 3 mm away from the tip of the nozzle when the airflow was 4 SCFH.

This graph shows the temperature profile of air. For the actual use, carefully review the temperature of the substrate to determine the temperature setting.

1 SCFH=0.472L/min.

## Temperature of preheater

The scale shows the temperature at the air outlet. However, the temperature may greatly vary depending upon the position of the substrate and other factors. The temperature scale for the bottom heater indicates the temperature of air. For the actual use, it is recommended that the temperature setting be determined after the temperature of the substrate has been reviewed carefully.

# MAINTENANCE

## Maintenance for vacuum needle

The vacuum needle sucks in flux and dust in air. Periodically clean the pipe of the vacuum needle using a cleaning pin.

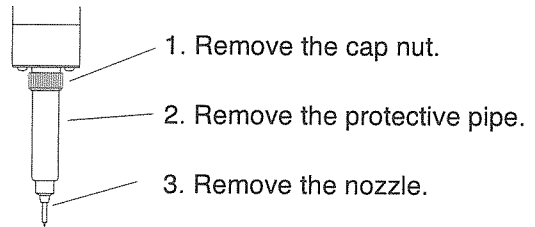
If this cleaning is difficult, the vacuum needle may be removed from the main body.

Before putting the vacuum needle back in place, apply sticking preventives to the threaded part of the vacuum pipe.

After finishing the cleaning, reassemble the nozzle, protective pipe, and cap nut in this order.

### **⚠ Caution:**

The vacuum needle is so thin that it is bent with slight force. Therefore, it should be handled very carefully.

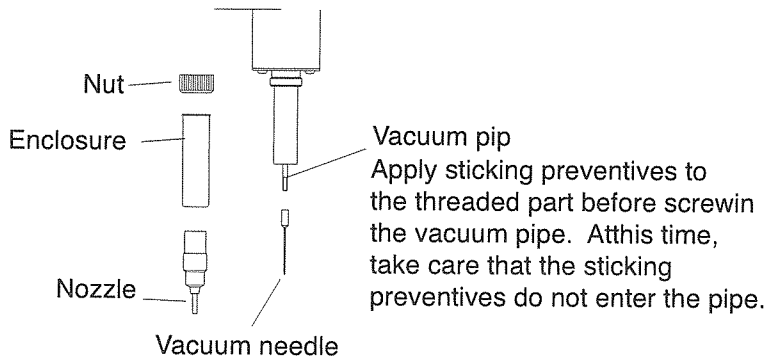


(Once the cap nut is removed in (1), the protective pipe and the nozzle are released from the head.)

### **⚠ Caution:**

The vacuum pipe is the screwed type.

Do not use excessive force when screwing or unscrewing the vacuum pipe.



(When the vacuum pipe is first heated after sticking preventives have been coated, smoke and smell will be emitted. This is a normal phenomenon.)

# MAINTENANCE

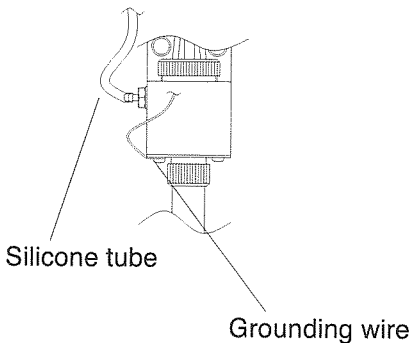
## Replacing the heater

1. Remove the cover from the head.

2. Remove the head from the main unit.

3. Previously remove the silicone tube and grounding wire connected to the heater, and pull the heater out of the head. At this time, take care not to bend the vacuum pipe.

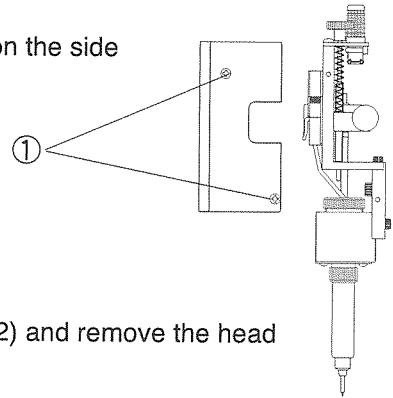
It is recommended that the vacuum needle (protective pipe) be removed temporarily.



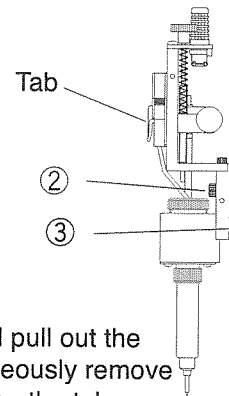
4. Remove the cap nut from the heater and lift up the heater.

5. Install a new heater in the reversed steps.

① Loosen four screws on the side of the cover.

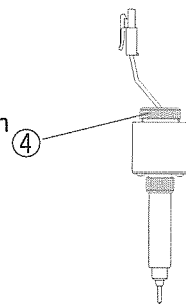


② Remove two screws (2) and remove the head from the main unit.

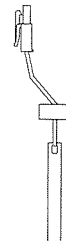


③ Loosen two screws (3) and pull out the heater downward. Simultaneously remove the connector while lowering the tab.

④ Remove the cap nut and then lift up the heater.



Install a new heater.



# OPTIONAL HOLDER

HAKKO 854 allows you to install HAKKO 852 using the optionally available holder for HAKKO 852.

## Installing the holder for HAKKO 852

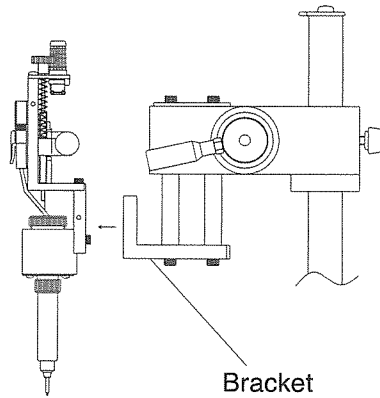
1. Remove the head of HAKKO 854 by performing the steps for replacing the heater.

2. Install the holder for HAKKO 852 using the provided screws.

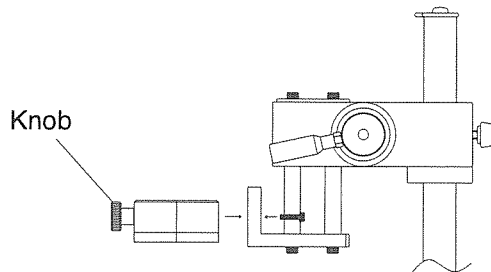
The holder can be installed more easily if the bracket is lowered.

-Different holes in the bracket are used between HAKKO 854 and 852.  
Use the correct holes by seeing the illustration.

-After installing the holder for HAKKO 852, turn the knob and open the holder. Insert the grip for HAKKO 852 and then lock the knob by tightening it.



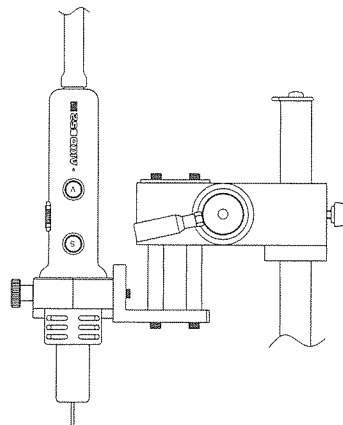
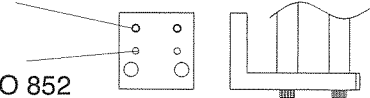
Remove the head from the main unit.



Install the holder for HAKKO 852 using the provided screws.

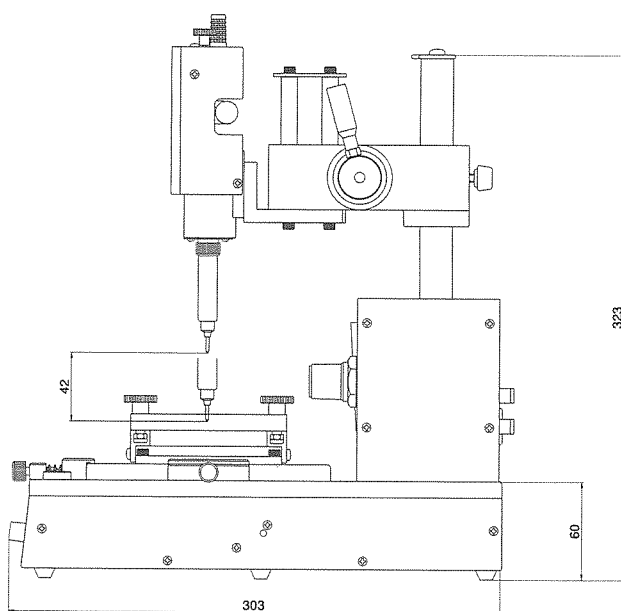
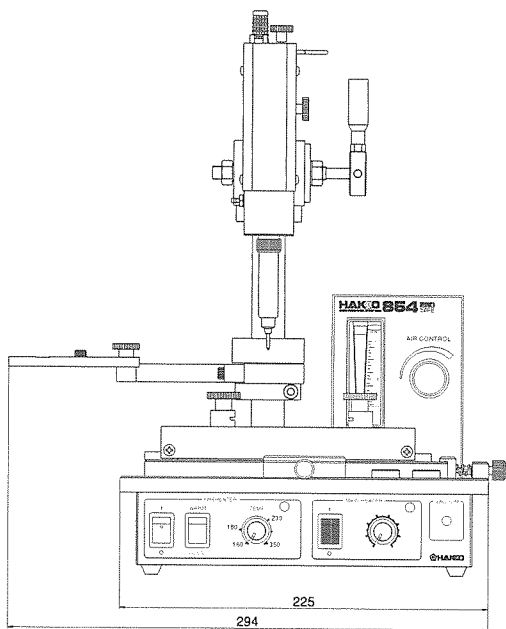
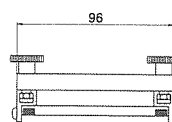
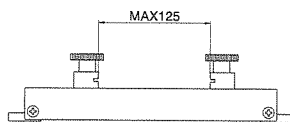
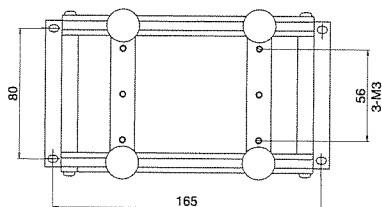
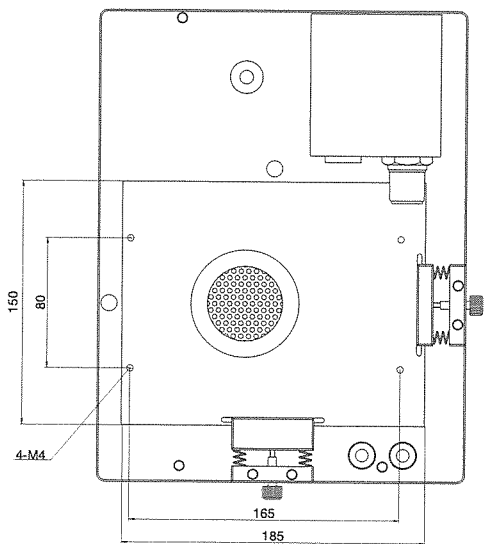
Holes for HAKKO 854

Holes for HAKKO 852





# EXTERNAL DIMENSIONS



## OPTIONAL AND REPLACEMENT PARTS

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### Replacement parts

Part name	Part No.
Nozzle $\phi$ 1.5 mm	A1482
Nozzle $\phi$ 3 mm	A1483
Vacuum needle $\phi$ 0.33 mm	B2611
Vacuum needle $\phi$ 0.51 mm	B2622
Vacuum needle $\phi$ 1.12 mm	B2623
Heater	A1481
Cleaning pin	B2612

\* HAKKO 854 comes with the nozzle  $\phi$ 1.5 mm.  
and the vacuum needle  $\phi$ 0.33 mm.

### Optional part

Part name	Part No.
Holder for HAKKO 852	B2613



#### OVERSEAS AFFILIATES

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