HAKKO

HAKKO 850D
SMD REWORK STATION

SMD Rework Station

Instruction Manual

●

Thank you for purchasing the Hakko 850D SMD Rework Station. This unit features digital control and display of hot air temperature.
Please read this manual before operating the Hakko 850D. Keep this manual readily accessible for reference.

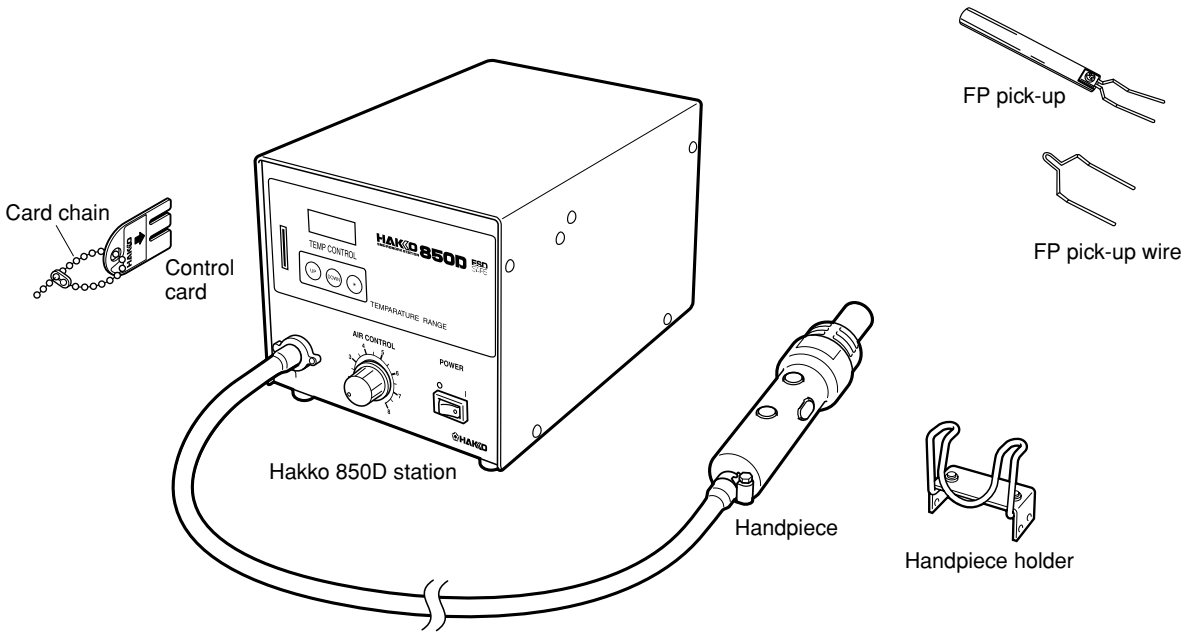
●

TABLE OF CONTENTS

PACKING LIST

Hakko 850D station 1
Handpiece holder 1
Control card 1
Card chain 1
FP pick-up 1
FP pick-up wire 1
Instruction manual 1

* This product does not include a nozzle. A large selection of nozzles is available for the Hakko 850D. Select the nozzle or nozzles suitable for the work to be performed.



SPECIFICATIONS

Name	**Hakko 850D**
Power consumption	120 V-410 W

● Station

Power consumption	30 W
Capacity	23 ℓ/min (max.)
Control temperature	100 – 450°C/212 – 842°F (sensor)
Outer dimensions (l × w × h)	263 × 160 × 148 mm (10.4 × 6.3 × 5.8 in.)
Weight (w/o cord)	4.7 kg (10.36 lb.)

● Handpiece

Power consumption	120 V-380 W
Total length (w/o cord)	200 mm (7.9 in.)
Weight (w/o cord)	200 g (0.44 lb.)

* This product is ESD-protected.
* Specifications and design subject to change without notice.

SAFETY INSTRUCTIONS

⚠ 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.

NOTE : A NOTE indicates a procedure or point that is important to the process being describe.
EXAMPLE : AN EXAMPLE is given to demonstrate a particular procedure, point or process.

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

⚠ WARNING

● Be sure not to operate the unit with any combination of temperature and air flow settings that makes the thermal protector trip (the heater lamp turns off during use). This could damage the unit.

⚠ CAUTION

When the power is ON, the temperature of the hot air and the nozzle ranges from 100 to 450°C (212 to 842°F). To avoid injury to personnel or damage to items in the work area, observe the following:

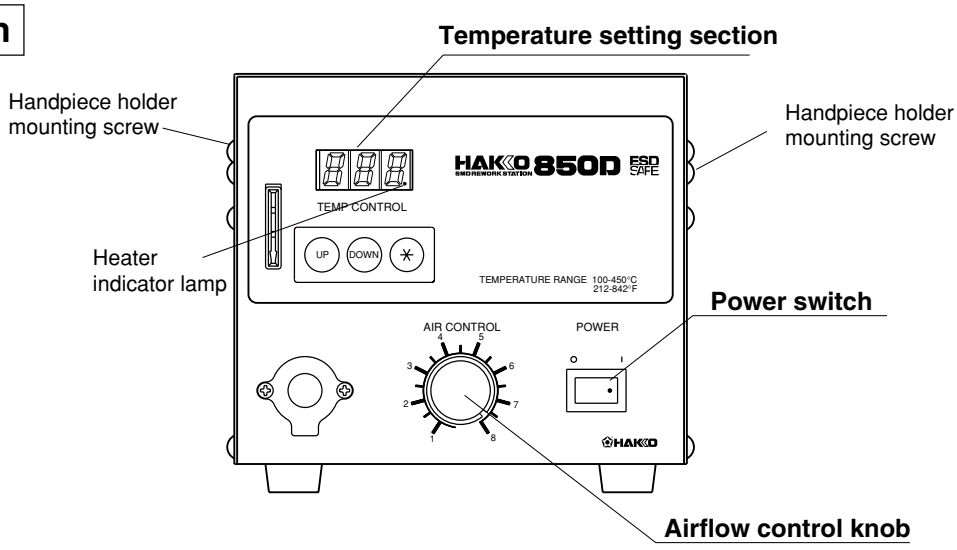
● Do not direct the hot air toward personnel or touch the metal parts near the nozzle.
● Do not use the product near combustible gases or flammable materials.
● Advise those in the work area that the unit can reach very high temperatures and should be considered potentially dangerous.
● Turn the power OFF when no longer using the Hakko 850D or when leaving it unattended.
● Before replacing parts or storing the unit, allow the unit to cool and then turn the power OFF.

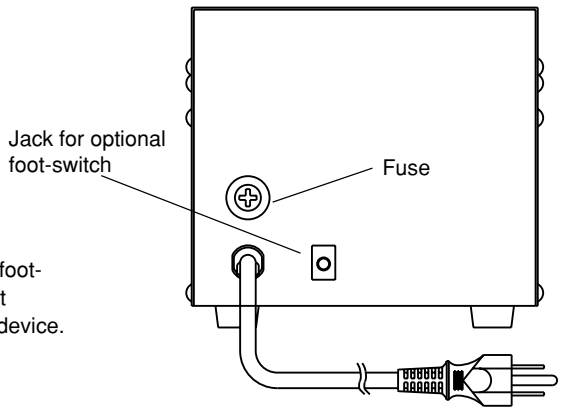
● **To prevent accidents and failures, be sure to take the following precautions:**

● Do not strike the handpiece against hard surfaces 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.
● Do not modify the unit.
● Use only genuine Hakko replacement parts.
● Do not bend or damage the control card. If the card does become damaged, do not force the card into the station slot.
● Do not wet the unit or use the unit with wet hands.
● Remove power cord by holding the plug – not the wires.
● After using, do not turn the power OFF until “P-S” is displayed on the temperature display.
● Make sure the work area is well ventilated.
● The Hakko 850D is not intended for use by children or infirm persons without supervision.
● Children should be supervised to ensure that they do not play with the Hakko 850D.

PART NAMES

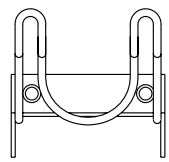
Station





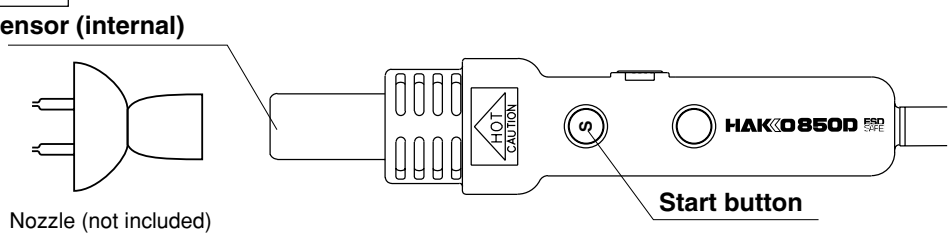
⚠CAUTION

This jack is for the foot-switch only. Do not connect any other device.



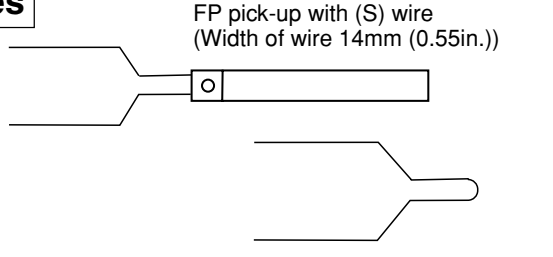
Handpiece holder

Handpiece



Nozzle (not included)

Accessories

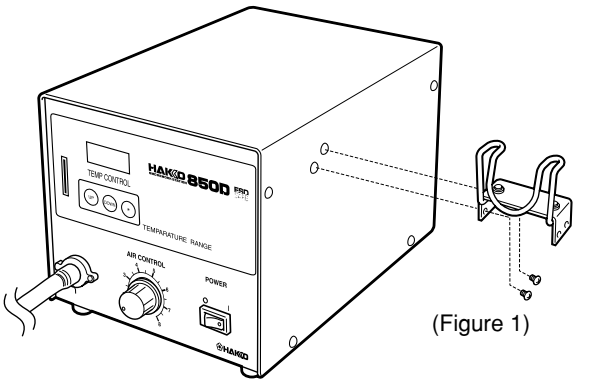


Preparation: Assembly and Electrical Connection

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.)



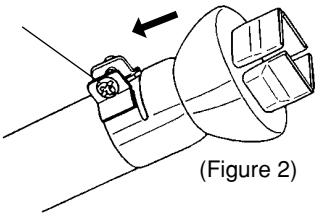
(Figure 1)

B. Handpiece Assembly

● Attach the nozzle.

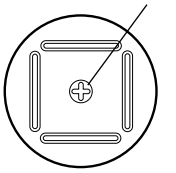
Loosen the nozzle mounting screw. Attach the nozzle as shown in the drawing.
(Figure 2)

Tighten the nozzle mounting screw.



(Figure 2)

Inside screw



(Figure 3)

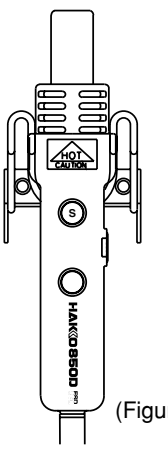
When installing an optional nozzle to the Hakko 850D, do not remove this inside screw.

C. Electrical Connection and Power ON

1. Place the handpiece on the holder. (Figure 4)
2. Plug the power cord into a grounded wall socket.
3. Turn the power switch ON.

⚠CAUTION

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



(Figure 4)

⚠CAUTION

When not in use, place the handpiece on the holder.

OPERATION

●Air Blow

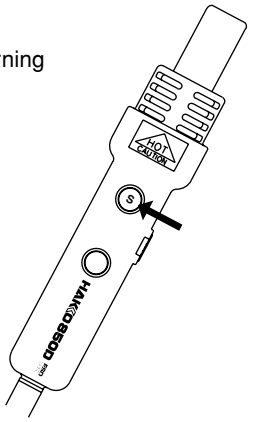
1. Start
   Press the Start button on the handpiece (or the foot-switch) to start the flow of air. The hot air blows from the tip of the nozzle, and the temperature is controlled according to the temperature setting.
2. Stop
   Press the Start switch again. Power to the heater is shut off and cooling begins. When the temperature falls to 200°C (392°F), the air stops blowing and the temperature display reads [P-5].

NOTE:

If power is turned off after use, there will be no cool-down. Automatic cool-down is only initiated by the second activation of the Start switch.

⚠CAUTION

Do not stop the hot air by turning the power switch OFF.



⚠CAUTION

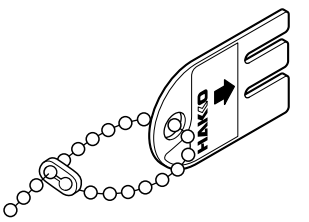
To avoid damage to the equipment, do not turn the power switch OFF until [P-5] appears on the display.

●Control card

Each Hakko 850D comes with a small card, which inserts in the control slot in the front of the unit. This card is used when entering data for the process control functions. Any Hakko 850D card can be used with any Hakko 850D SMD rework station.

Using the control card

The control card is used when a value is to be changed or data are to be entered. The Hakko 850D will operate normally with the card inserted. Remove the control card to lock the data.



Setting/Changing the Temperature

⚠CAUTION

The temperature setting range is 100 – 450°C (212 – 842°F).

- 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.)

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

1. Insert the control card into the slot in the front of the unit.

2. Press the ✳ on temperature setting section for more than one second.

- The station goes into temperature setting mode and the HUNDREDS digit flashes on the display, indicating that the HUNDREDS digit can be entered.

NOTE: It can be flashing even though no card in the unit, but the temperature cannot be set.

3. Enter the HUNDREDS digit.

- Use the UP and DOWN buttons to select the desired value for the HUNDREDS digit. **Only 1, 2, 3, or 4 can be selected. (In °F mode, 2, 3, 4, 5, 6, 7, and 8 can be selected).** When the desired value is displayed, press the ✳ button. The TENS digit begins to flash.

4. Enter TENS digit.

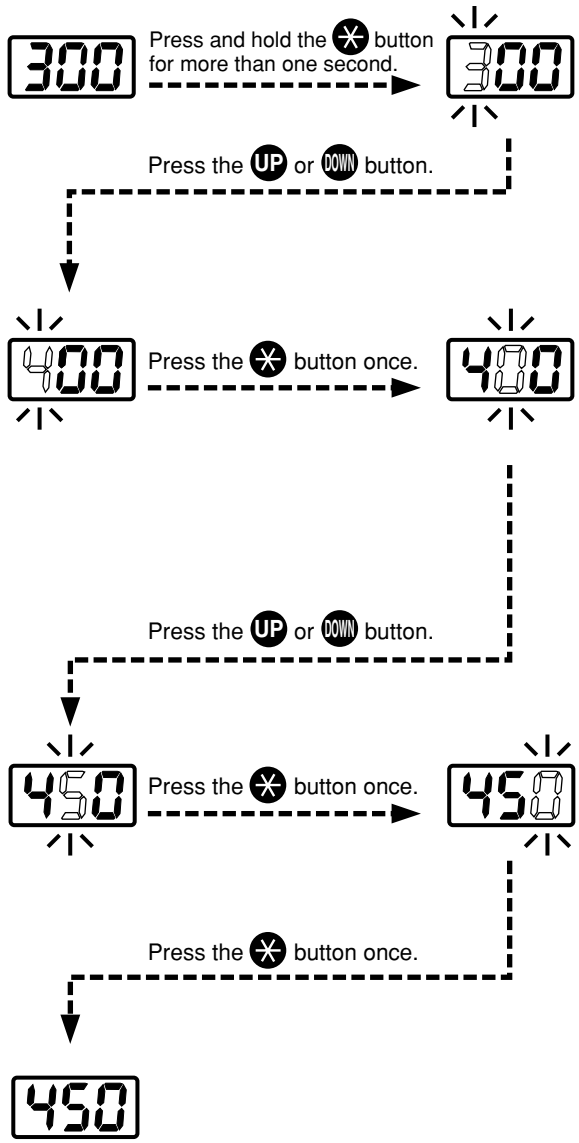
- Use the UP and DOWN buttons to select the desired value for the TENS digit. **Any value from 0 to 9 can be selected.** When the desired value is displayed, press the ✳ button. The UNITS digit begins to flash.

5. Enter the UNITS digit.

- Select the desired value for the UNITS digit in the same manner as for the TENS digit.
- Press the ✳ button.
- The temperature setting is stored in memory. Heater control begins after the new temperature setting is displayed. Remove the control card.

⚠CAUTION

If the power is turned OFF before the temperature setting procedure is completed, the new setting value will not be stored in memory.



PARAMETERS / INITIAL RESETTING

●Entering the Parameters

The Hakko 850D has the following three parameters:

1) °C or °F temperature display selection
2) Power save time (select 30 or 60 minutes)
3) Sensor temperature display

Once the station enters parameter mode, set the parameters in the order shown below. After all the parameters have been set, normal operation will be resumed.

°C (Celsius) or °F (Fahrenheit) Temperature Display

1. Turn the power switch OFF .
2. Insert the control card into the slot in the unit.
3. Press and hold down the UP and DOWN buttons on the temperature setting section simultaneously and then turn the power switch ON.
3. Continue holding down both buttons until the display shows [C] (for Celsius) or [F] (for Fahrenheit). When the display shows [C] or [F], the station is in the parameter input mode.

●Pressing the UP or DOWN button will cause [C] or [F] to be displayed alternately.

●Press the ✳ button to select the scale. The power save time may now be entered.

Power Save Time

The power save function automatically turns off the hot air when it has blown continuously for a specified amount of time. Power to the heater is turned off and then the air is stopped after the handpiece cools.

●When the station enters power save time setting mode, either [30] or [60] is displayed. Either 30 minutes or 60 minutes can be selected.

●Pressing the UP or DOWN button will cause [30] or [60] to be displayed alternately.

●Press the ✳ button to enter your selection. The sensor temperature may now be displayed.

Sensor Temperature Display

⚠CAUTION

If the power is turned OFF before the parameter setting procedure is completed, the new setting values will not be stored in memory.

●No data entry is required.
The value displayed is the temperature currently detected by the sensor.

●To end parameter input mode, press the ✳ button. After displaying the temperature setting for two seconds, the station returns to normal operation.

●Initial Reset

Turn the power switch ON while simultaneously pressing the UP, DOWN, and ✳ buttons on the temperature setting section. The station will be reset to the following initial values:

°C/°F selection	°C
Power save time	30 minutes
Temperature setting	300°C

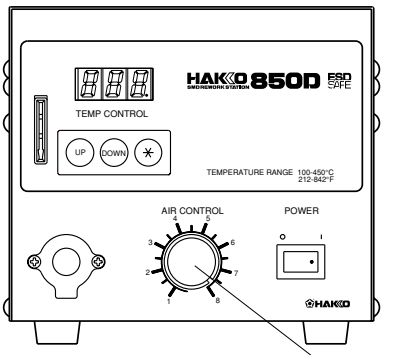
● QFP Desoldering

1. Set the temperature and adjust the air flow control knob.

Set the temperature (refer to page 6) and adjust the air flow control knob to desired temperature and the level.

⚠WARNING

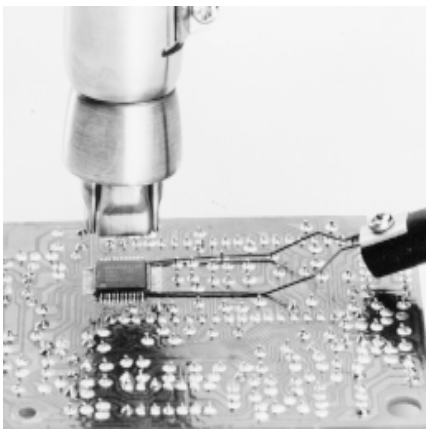
If the thermal protector is tripped (the heater lamp turns off during use), reduce the temperature setting or increase the air flow. Be sure not to operate the unit with temperature and air flow settings that makes the thermal protector trip. This could damage the unit.



2. Place the FP pick-up under the IC lead.

Slip the FP pick-up wire under the IC lead. (Refer to the photo shown.)

If the width of the IC does not match the size of the FP pick-up, adjust the width of the pick-up by squeezing the wire. In case of PLCC or small components such as chip resistors, desolder by using tweezers, etc.

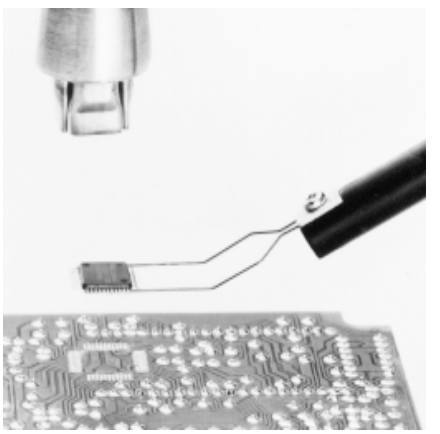


3. Heating

Hold the handpiece so that the nozzle is located directly over, but not touching the IC, and allow the hot air to melt the solder. Be careful not to touch the leads of the IC with the nozzle.

4. Remove the IC.

Once the solder has melted, remove the IC by lifting the FP pick-up.



5. Remove any remaining solder.

After removing the IC, remove remaining solder with a soldering iron and wick or desoldering tool.

● QFP Soldering

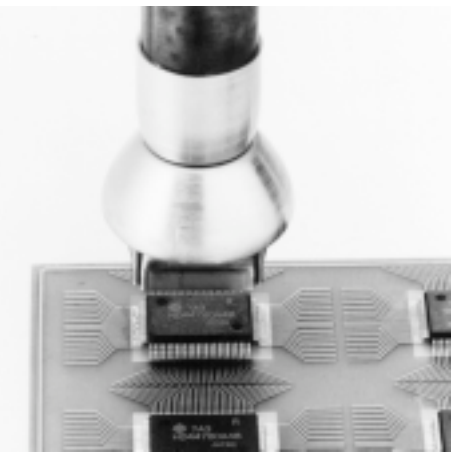
1. Apply the solder paste.
Apply the proper quantity of solder paste and install the SMD on the PWB.

2. Preheat the SMD.
Preheat the SMD as shown in the photo.

3. Soldering
Heat the lead frame evenly.

4. Cleaning
When soldering is completed, clean the residual flux from the board with an appropriate cleaner.

NOTE:
Soldering with hot air has many advantages, such as the inherent ability to pre-heat the component being replaced. As with any soldering process, however, there is always the possibility of forming solder balls, bridges between leads, and inadequate solder joints. Always inspect the finished solder joints for structural and electrical integrity.



●Broken Heater or Sensor

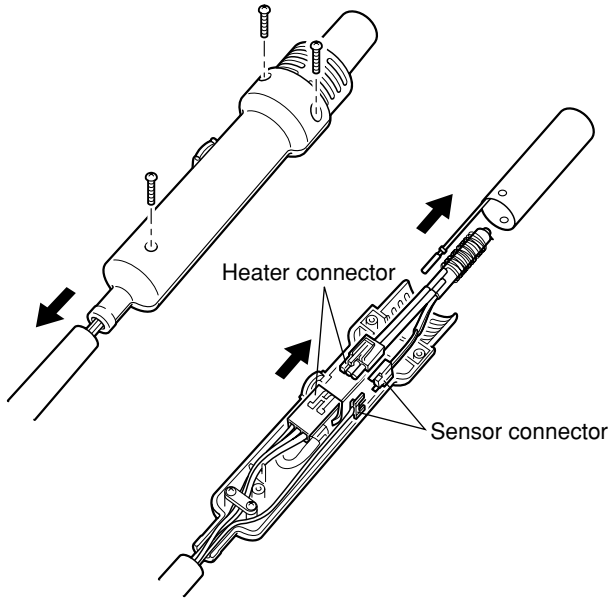
(1) Open the handpiece.

1. Remove the three screws holding the handpiece together.
2. Move the tube downward.
3. 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.

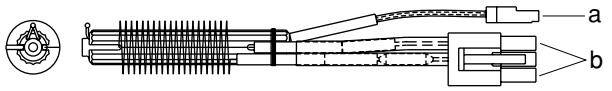
4. Disconnect the heater sensor connector and remove the heater.



(2) Measure the resistance value.

1. Measure the resistance value (a) of the sensor. The correct value is 0 Ω.
2. Measure the resistance value (b) of the heater. The correct values are approximately 33 Ω (±10%) (100-120 V), 85 Ω (±10%) (220-240 V) at room temperature.

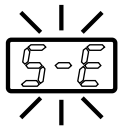
If the resistance value is incorrect, replace the part.
(Refer to the instructions included with the replacement part.)



ERROR MESSAGES

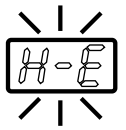
When the error detection software in the Hakko 850D detects an error, a message is displayed to alert the operator. See “Troubleshooting” for procedures to correct the error.

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. H-E flashes to indicate the possibility of a heater failure.

TROUBLESHOOTING

⚠ WARNING

- **Before checking the inside of the Hakko 850D 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 fuse blown?
  ACTION : Investigate why the fuse blew and then replace the fuse. If the cause can not be determined, replace the fuse. If the fuse blows again, send the unit in for repair.

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

  CHECK : Is the sensor broken?
  ACTION : See the procedure for checking a potentially broken sensor.

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

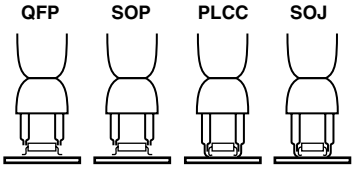
  CHECK : Is the heater broken?
  ACTION : See the procedure for checking a potentially broken heater.

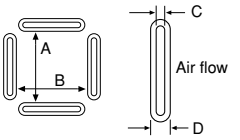
OPTIONAL NOZZLE

mm (inch)

NOTE

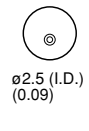
The size in Name/Specification indicates the size of IC package.



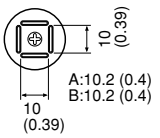


	C 0.8 (0.03) D 1.8 (0.07)	C 1.0 (0.04) D 1.8 (0.07)	C 1.0 (0.04) D 2.0 (0.08)	C 0.8 (0.03) D 2.0 (0.08)
No.	Except for A1189B, A1191, A1192	A1189B	A1191	A1192

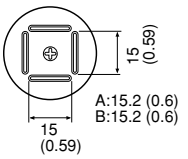
A1124B Single ø2.5 (0.09)



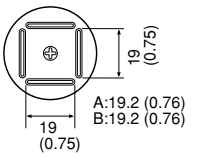
A1125B QFP 10 x 10 (0.39 x 0.39)



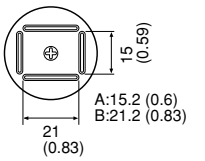
A1126B QFP 14 x 14 (0.55 x 0.55)



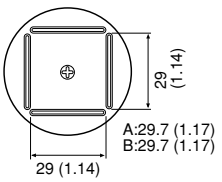
A1127B QFP 17.5 x 17.5 (0.68 x 0.68)



A1128B QFP 14 x 20 (0.55 x 0.78)

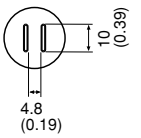


A1129B QFP 28 x 28 (1.1 x 1.1)

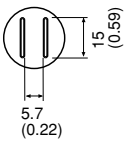


A1130 Single ø4.4 (0.17)

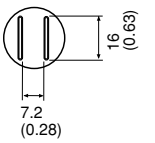
A1131 SOP 4.4 x 10 (0.17 x 0.39)



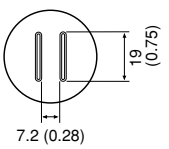
A1132 SOP 5.6 x 13 (0.22 x 0.51)



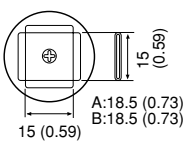
A1133 SOP 7.5 x 15 (0.3 x 0.59)



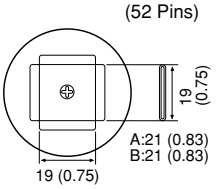
A1134 SOP 7.5 x 18 (0.3 x 0.7)



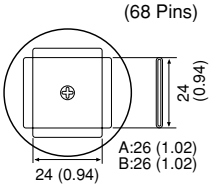
A1135B PLCC 17.5 x 17.5 (0.68 x 0.68) (44 Pins)



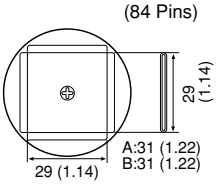
A1136B PLCC 20 x 20 (0.78 x 0.78) (52 Pins)



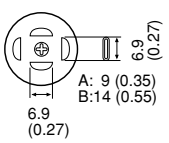
A1137B PLCC 25 x 25 (0.98 x 0.98) (68 Pins)



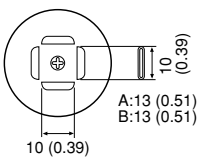
A1138B PLCC 30 x 30 (1.18 x 1.18) (84 Pins)



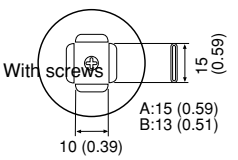
A1139B PLCC 12.5 x 7.3 (0.49 x 0.29) (18 Pins)



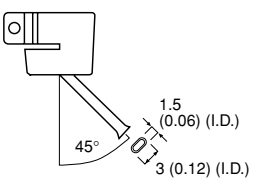
A1140B PLCC 11.5 x 11.5 (0.45 x 0.45) (28 Pins)



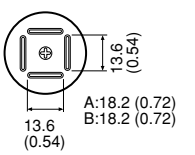
A1141B PLCC 11.5 x 14 (0.45 x 0.55) (32 Pins)



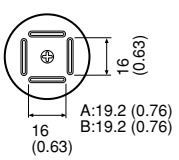
A1142B Bent Single 1.5 x 3 (0.06 x 0.12)



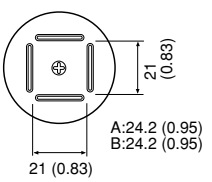
A1180B BQFP 17 x 17 (0.67 x 0.67)



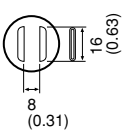
A1181B BQFP 19 x 19 (0.75 x 0.75)



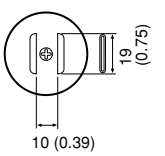
A1182B BQFP 24 x 24 (0.94 x 0.94)



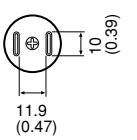
A1183 SOJ 15 x 8 (0.59 x 0.31)



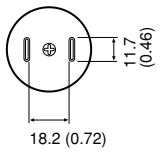
A1184B SOJ 18 x 8 (0.71 x 0.31)



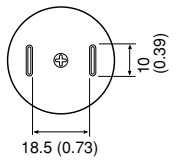
A1185B TSOL 13 x 10 (0.51 x 0.39)



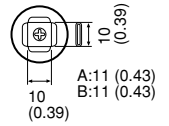
A1186B TSOL 18 x 10
(0.71 x 0.39)



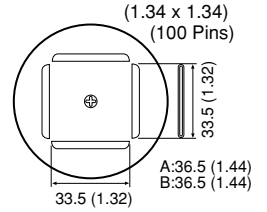
A1187B TSOL 18.5 x 8
(0.73 x 0.31)



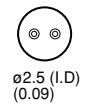
A1188B PLCC 9 x 9
(0.35 x 0.35)
(20 Pins)



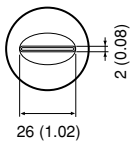
A1189B PLCC 34 x 34
(1.34 x 1.34)
(100 Pins)



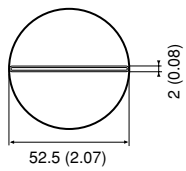
A1190 Dual Single
2.5 x 9.5
Pitch (0.09 x 0.37)



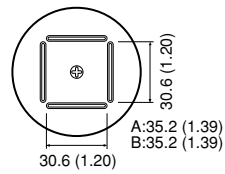
A1191 SIP 25L (0.98)



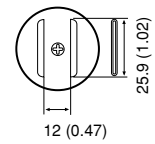
A1192 SIP 50L (1.97)



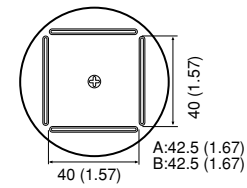
A1203B QFP 35 x 35
(1.38 x 1.38)



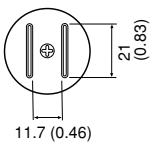
A1214B SOJ 10 x 26
(0.39 x 1.02)



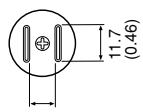
A1215B QFP 42.5 x 42.5
(1.67 x 1.67)



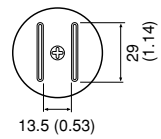
A1257B SOP 11 x 21
(0.43 x 0.83)



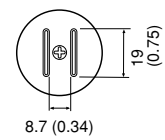
A1258B SOP 7.6 x 12.7
(0.3 x 0.5)



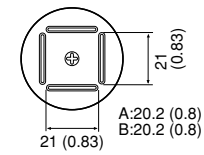
A1259B SOP 13 x 28
(0.51 x 1.1)



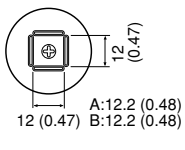
A1260B SOP 8.6 x 18
(0.34 x 0.71)



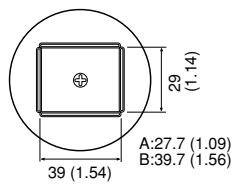
A1261B QFP 20 x 20
(0.78 x 0.78)



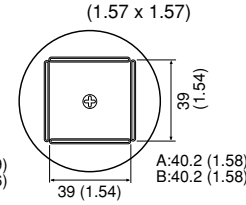
A1262B QFP 12 x 12
(0.47 x 0.47)



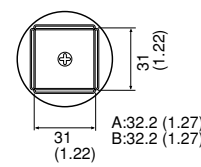
A1263B QFP 28 x 40
(1.1 x 1.57)



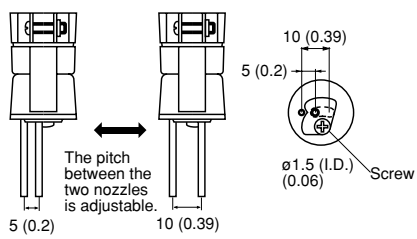
A1264B QFP 40 x 40
(1.57 x 1.57)



A1265B QFP 32 x 32
(1.26 x 1.26)



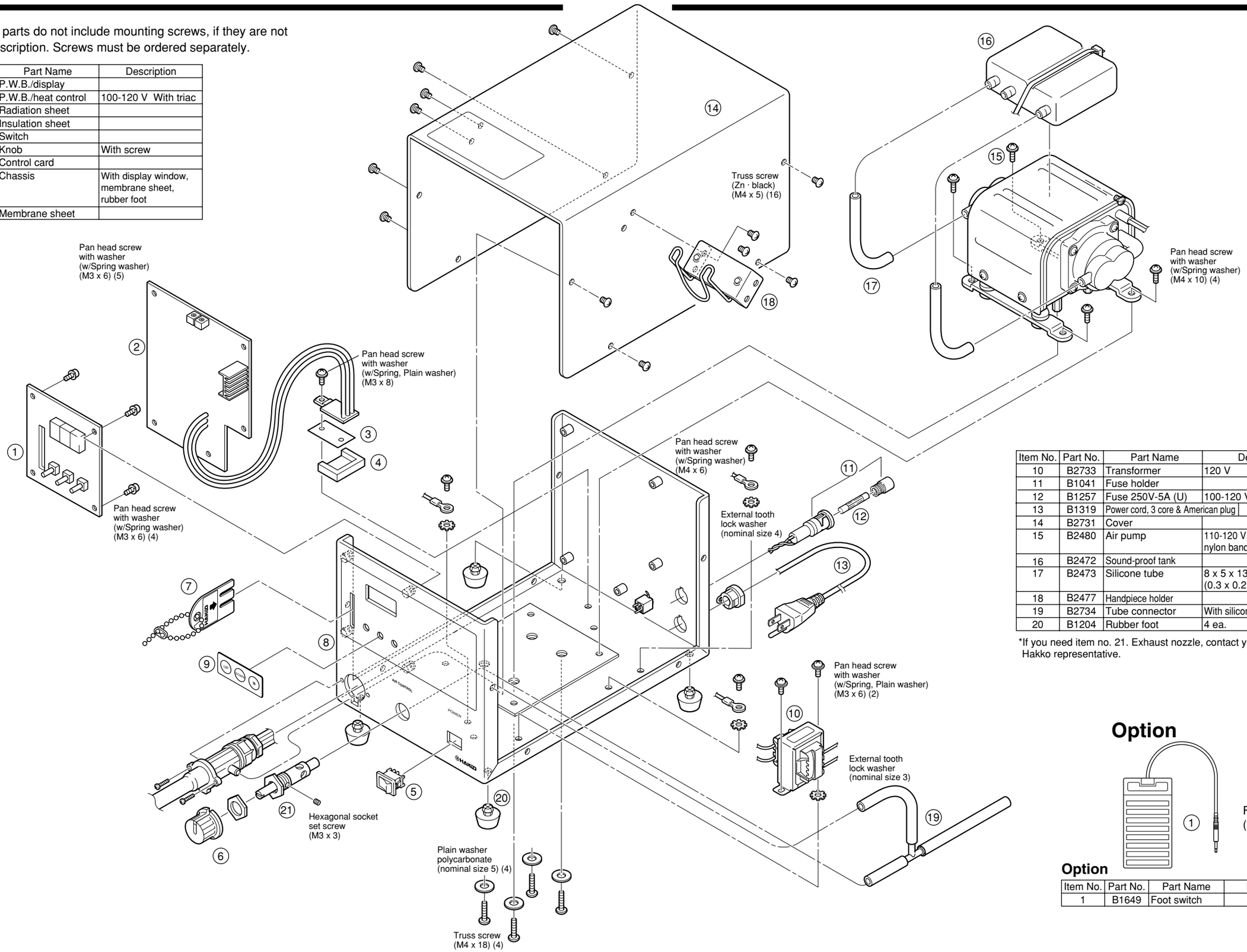
A1325 Dual Single
ø1.5 x 5-10
(0.06 x 0.2-0.39)
Adjustable Pitch



PARTS LIST / STATION

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

Item No.	Part No.	Part Name	Description
1	B2732	P.W.B./display	
2	B2462	P.W.B./heat control	100-120 V With triac
3	B2463	Radiation sheet	
4	B2317	Insulation sheet	
5	B1084	Switch	
6	B1028	Knob	With screw
7	B2388	Control card	
8	B2730	Chassis	With display window, membrane sheet, rubber foot
9	B2047	Membrane sheet	



Item No.	Part No.	Part Name	Description
10	B2733	Transformer	120 V
11	B1041	Fuse holder	
12	B1257	Fuse 250V-5A (U)	100-120 V
13	B1319	Power cord, 3 core & American plug	
14	B2731	Cover	
15	B2480	Air pump	110-120 V, With high nut, nylon band, double-side tape
16	B2472	Sound-proof tank	
17	B2473	Silicone tube	8 x 5 x 130ℓ mm (0.3 x 0.2 x 5.1ℓ in.)
18	B2477	Handpiece holder	
19	B2734	Tube connector	With silicone tube assembly
20	B1204	Rubber foot	4 ea.

*If you need item no. 21. Exhaust nozzle, contact your Hakko representative.

Option

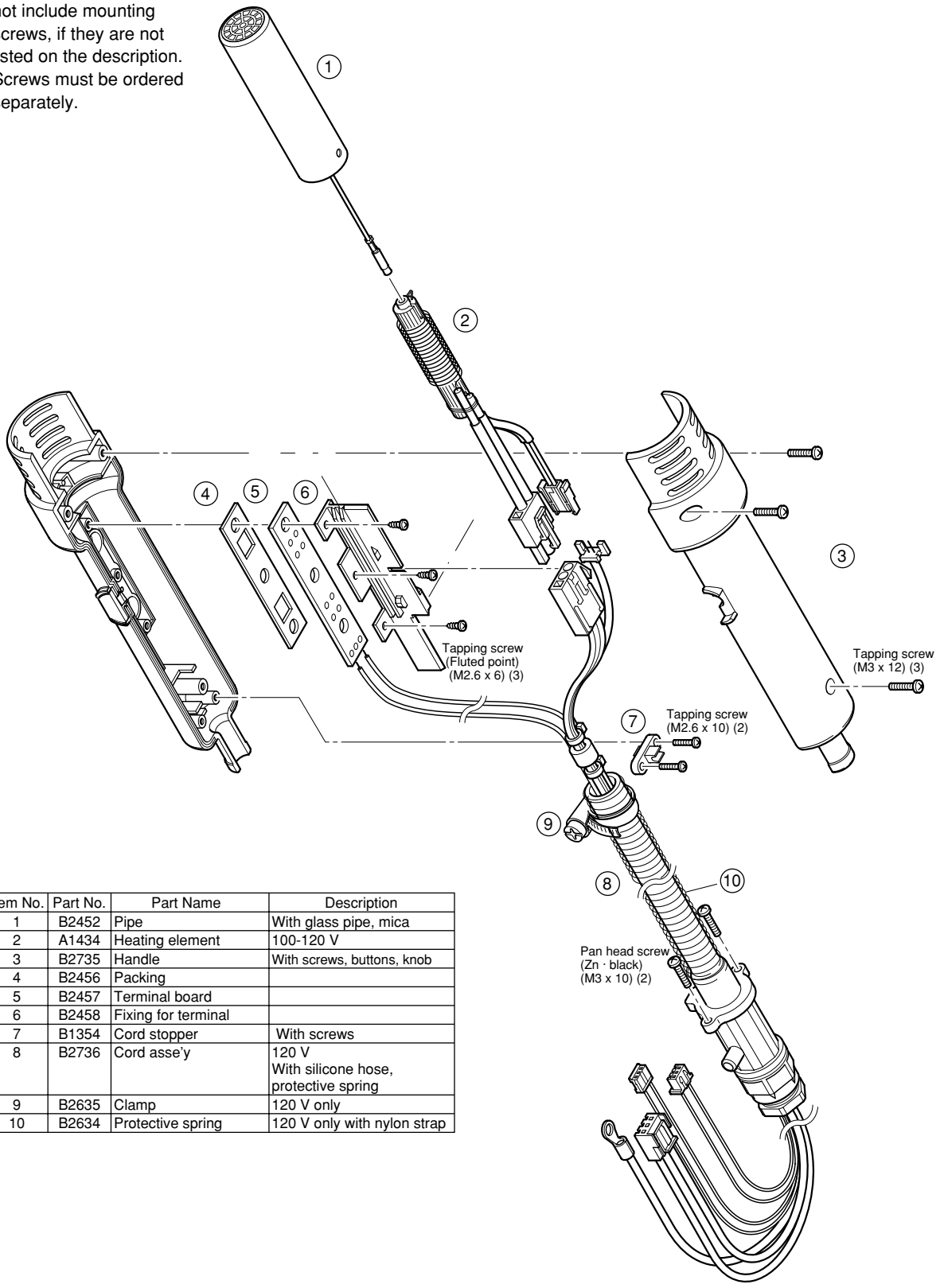
Footswitch (sold separately)

Option

Item No.	Part No.	Part Name	Description
1	B1649	Foot switch	

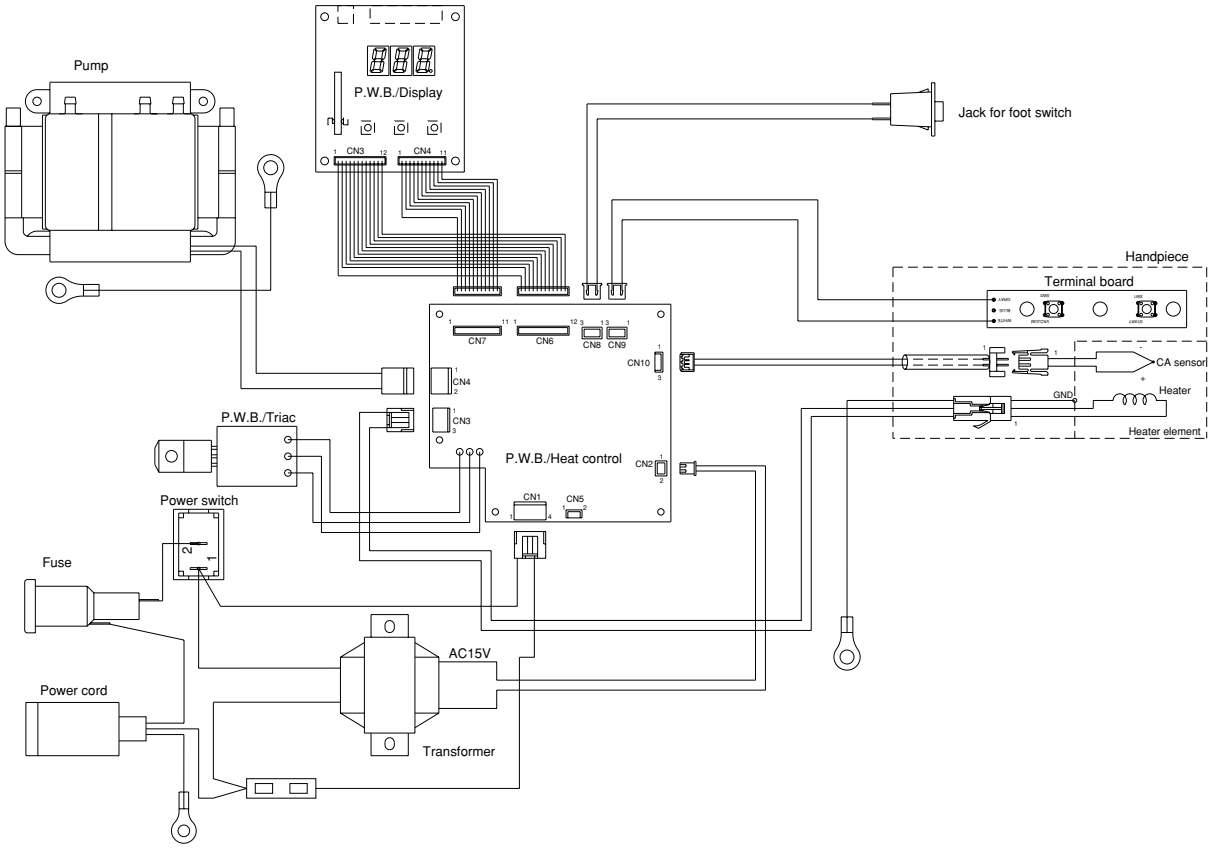
PARTS LIST / HANDPIECE

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



Item No.	Part No.	Part Name	Description
1	B2452	Pipe	With glass pipe, mica
2	A1434	Heating element	100-120 V
3	B2735	Handle	With screws, buttons, knob
4	B2456	Packing	
5	B2457	Terminal board	
6	B2458	Fixing for terminal	
7	B1354	Cord stopper	With screws
8	B2736	Cord asse'y	120 V With silicone hose, protective spring
9	B2635	Clamp	120 V only
10	B2634	Protective spring	120 V only with nylon strap

WIRING DIAGRAM



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