HAKKO

HAKKO SOLDERING STATION MODEL FP-102

High-output, temperature controlled soldering station

Instruction Manual

●

Thank you for purchasing the FP-102 soldering station. This high-output, temperature controlled soldering station uses a composite tip, incorporating heater and sensor functions into one element. Several process control features unique to the FP-102 make it applicable to a broad range of soldering applications.
Please read this manual before operating the FP-102 . Keep this manual readily accessible for reference.

●

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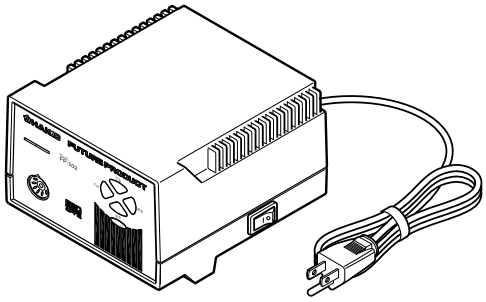
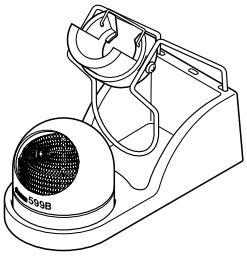
1. PACKING LIST

Please check to make sure that all items listed below are included in the FP-102 package.

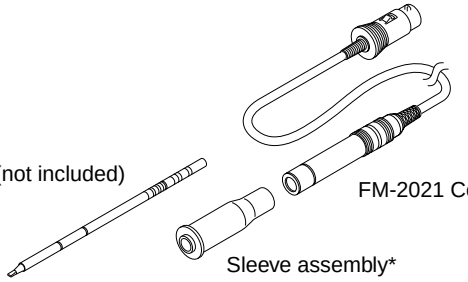
FP-102 soldering station 1
FM-2021 connector assembly 1
Sleeve assembly 1
Control card, with chain 1
Heat resistant pad 1
Tip tray 1
Iron holder 1
Cleaning wire 1
Instruction manual 1



FP-102 Soldering station



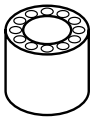
Iron holder



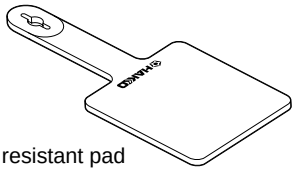
Tip (not included)

FM-2021 Connector assembly

Sleeve assembly*



Tip tray



Heat resistant pad

*Yellow, orange or blue sleeve assembly is included.

2. SPECIFICATIONS

● FP-102 soldering station

Power consumption	75 W
Temperature range	The four segment lights on the front panel indicate the heat range selected for the FP-102 (6.5 = ~650°F. [343°C]; 7.0 = ~700°F. [371°C]; 7.5 = ~750°F. [399°C]; 8.0 = ~800°F. [427°C]).
Temperature stability	±9°F (±5°C) at idle temperature

● Station

Output	24 V
Dimensions(W × H × D)	120 × 93 × 140 mm (4.7 × 3.7 × 5.5 in.)
Weight (w/o cord)	1,400 g (3.1 lb.)

● Soldering iron

Power consumption	70 W (24 V)
Tip to ground resistance	< 2 Ω
Tip to ground potential	< 2 mV
Length, less cord	188 mm (7.4 in.) with 2.4D tip
Weight, less cord	30 g (0.067 lb./1.07 oz.) with 2.4D tip
Length of cord	1.2 m (4 ft)

NOTE:
This product is protected against electrostatic discharge.
Specifications and design are subject to change without notice.

3. WARNINGS, CAUTIONS, NOTES AND EXAMPLES

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. (Two examples are given below.)

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.

⚠ CAUTION

When power is ON, the tip will be HOT (between 300-450°C. [~572-840°F.])
To avoid injury or damage to personnel and items in the work area, observe the following:

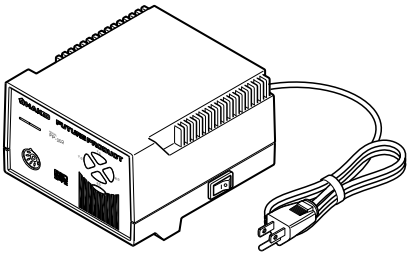
- Do not touch the tip or the metal parts near the tip.
- Do not allow the tip to come close to, or touch, flammable materials.
- Inform others in the area that the unit is hot and should not be touched.
- Turn the power off when not in use, or left unattended.
- Turn the power off when connecting the FM-2021 or storing the FP-102.
- Do not remove or damage the bar code sticker.

⚠ CAUTION

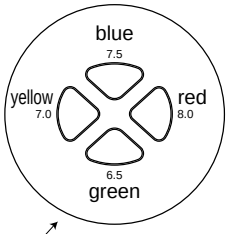
To prevent accidents or damage to the FP-102, be sure to observe the following:

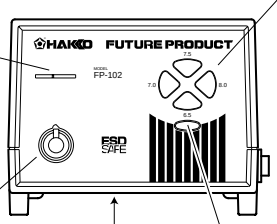
- Do not use the FP-102 for applications other than soldering.
- Do not allow the FP-102 to become wet, or use it with wet hands.
- Do not modify the FP-102.
- Use only genuine Hakko replacement parts.
- Do not bend or damage the control card. If the card does become damaged, do not force the card into the station slot.
- Do not strike the iron against hard objects to remove excess solder. This may damage the iron.
- Remove power and iron cords by holding the *plug*, not the *wires*.
- Be sure the work area is well ventilated. Soldering produces smoke.

4. PART NAMES



FP-102 Soldering station





Card slot

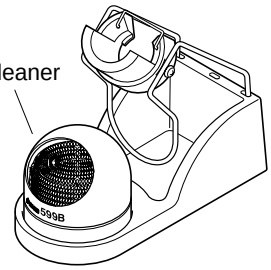
Control card

Card chain

Receptacle

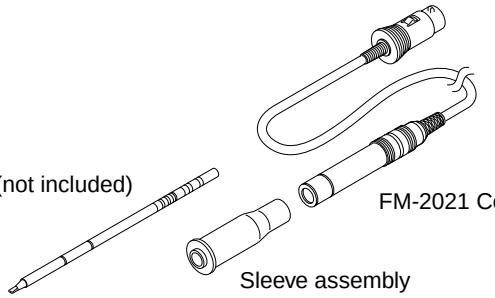
Auto power shutoff switch
(on the bottom front of the case)

The heat range selector button



Tip cleaner

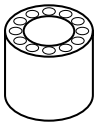
Iron holder



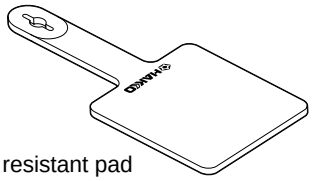
Tip (not included)

FM-2021 Connector assembly

Sleeve assembly



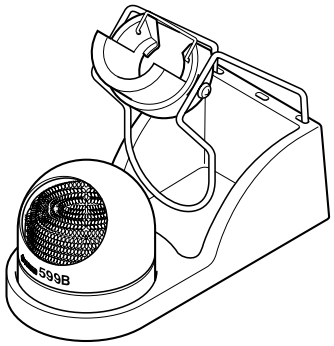
Tip tray



Heat resistant pad

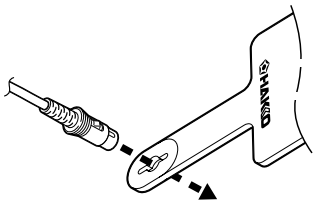
5. INITIAL SETUP

● Iron holder



● Connector cord

Pass the connector cord through the hole in the heat resistant pad.

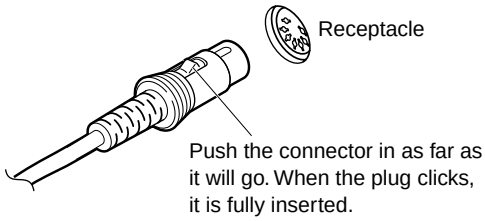


● Soldering station

1. Insert the connector cord into the receptacle at the front of the station.

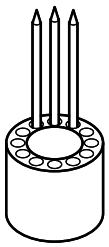
2. Plug the power cord into a grounded wall socket. The FP-102 is protected against electrostatic discharge and must be grounded for full efficiency.

> ⚠**CAUTION:**
> Be sure to turn off the power switch before connecting or disconnecting the soldering iron. Failure to do so may damage the P.W.B.



● Tip tray

Place spare tips in the tip tray.



6. OPERATION

OPERATION

1. Turn the power switch ON.
2. A heat range indicator (one of the four segment buttons, indicating the selected range) will blink.
3. When the set temperature is reached, the buzzer alarm sounds indicating it is ready for use. The indicator lamp remains on steadily.

NOTE:
When not in use, place the soldering iron to the iron holder.

● Control card

Each FP-102 comes with a small card, which inserts into the Card slot on the front of the unit. This card is used when changing *heat ranges*. Any FP-102 card can be used with any FP-102 soldering station.

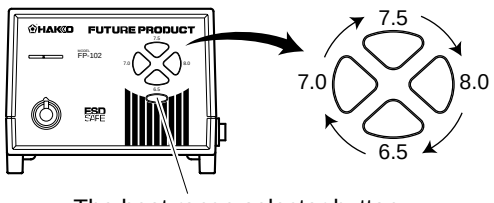
● Changing the heat range

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

   As previously noted, the four segment lights on the front panel indicate the heat range selected for the FP-102 (6.5= ~650°F. [343°C]; 7.0= ~700°F. [371°C]; 7.5= ~750°F. [399°C]; 8.0= ~800°F. [427°C]. The ranges are approximate values only; the actual tip temperature depends upon tip geometry and mass. These lights are *indicators;* one must press the “heat range” button, located below the indicators, to change range.

⚠CAUTION:
The control card must be inserted into the card slot in the correct direction for data to be entered.

2. Press the heat range selector button. Each time this button is pressed a different heat range indicator lamp will light. It will blink *slowly* until the set range is reached; once at temperature, it will remain on steadily.



The heat range selector button

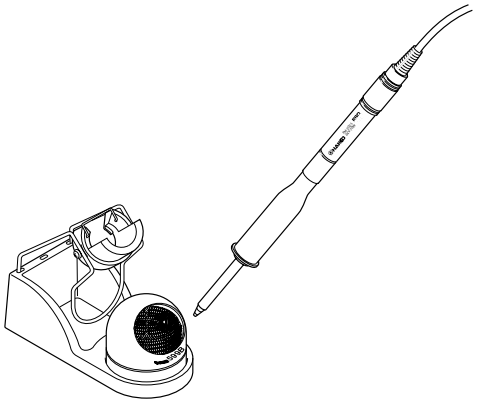
3. Removing the card.
   When the station is on and the control card is in the station, the temperature can be changed any time.

4. When the alarm sounds and the heat range indicator lamp starts lighting, the station is ready for use.

When power is switched off the selected heat range is stored in memory.

● Using the iron holder

Remove any excess solder from the tip by thrusting the tip into the cleaning wire. (Do not wipe the tip against the wire. This may cause molten solder to spatter.)
When the wire become dirty or loaded with solder, turn 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.



● Replacing the tip

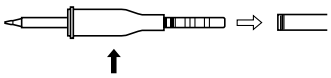
Removing and inserting the tip:

Removing the tip: Hold the sleeve assembly to remove the connector.
Remove the tip from the sleeve assembly.
(If the tip is hot, hold it with the heat-resistant pad.)
Inserting the tip: Hold the head part and insert the tip into the sleeve assembly. Push until the sleeve assembly touches the ring round the tip; at this point the tip should not be forced further into the sleeve assembly.
Put the tip into the connector.
Insert the new tip firmly into the connector.

There are no orientation requirements.

Hold the sleeve assembly at the front to remove tip.

Hold these parts to insert tip into sleeve assembly.



Hold and squeeze this part to insert into the connector.

⚠**CAUTION:**
The tip can be very HOT. Use the heat-resistant pad for handling hot tips, but do not hold the hot portion of the tip, even with the pad, for a long time.

7. PARAMETER SETTINGS

Auto power shutoff

This is an optional setting. When it is activated and the soldering iron is not used for 30 minutes, the power to the heating element is shut off automatically, the alarm will sound three times and the selected heat range lamp will light slowly. When the temperature decreases to 100°C/212°F, the heat range indicator lamps light in a slow clockwise sequence. If the station is left in this mode, the 'alarm' will continue to sound every thirty minutes. To resume soldering, cycle the power switch OFF, then ON. The power will be turned on automatically if the heat range selector button is pressed before the temperature decreases to 100°C/212°F.
The auto power shutoff switch is on the bottom front of the case. To turn this function ON ,set the switch to the' **I** ' position. (OFF is reverse.)

8. MAINTENANCE

● Tip maintenance

1. Tip temperature

High temperatures shorten tip life and may cause thermal shock to components. Always use the lowest possible temperature when soldering. The excellent thermal recovery characteristics of the FP-102 ensure effective soldering at low temperatures.

2. Cleaning

Always clean the soldering tip before use to remove any residual solder or flux adhering to it. Use the 599B tip cleaner (provided with the FP-102) or use a clean and moist cleaning sponge part no. A1495. Contaminants on the tip have many deleterious effects, including reduced heat conductivity, which contribute to poor soldering performance.

3. After use

Always clean the tip and coat it with fresh solder after use. This guards against oxidation.

4. When the unit is not being used and the auto power shutoff is not active.

Never allow the unit to idle at a high temperature for extended periods. This will allow the tip to become oxidized. Turn the power switch OFF. If it is to be out of service for several hours, it is advisable to pull the power plug as well.

5. Inspecting and cleaning the tip

This procedure, if followed daily, will materially add to tip life.

a. Set the heat range to 6.5.
b. When the temperature stabilizes, clean the tip (see 2, above) and check the condition of the tip. If the tip is badly worn or deformed, replace it.
c. If the solder plated part of the tip is covered with black oxide, apply fresh solder, containing flux, and clean the tip again. Repeat until all the oxide is removed, then coat the tip with fresh solder.

> ⚠ **CAUTION:**
> NEVER file the tip to remove oxides!

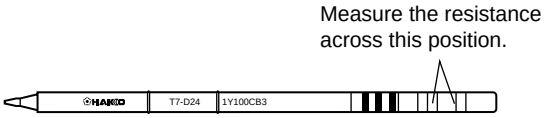
d. Turn the power OFF and remove the tip. Set the tip aside to cool.

● Checking Procedure

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

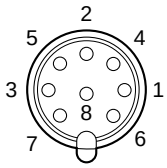
■ Check for a broken heater or sensor

1. Check for a broken heater or sensor



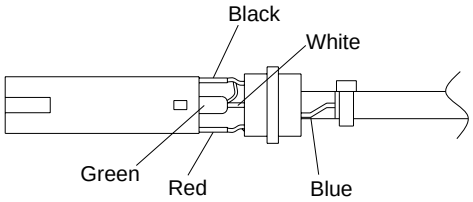
Verify the electrical integrity of the heater and sensor.
Measure the resistance of the heater and sensor while at room temperature (15 to 25°C; 59 to 77°F). It should be 8Ω ±10%. If the resistance exceeds these limits, replace the tip.

■ Check the grounding line



1. Unplug the connection cord from the station.
2. Measure the resistance value between Pin 2 and the tip.
3. If the value exceeds 2Ω (at room temperature), perform the tip maintenance described on P.7. If the value still does not decrease, check the connection cord for breakage.

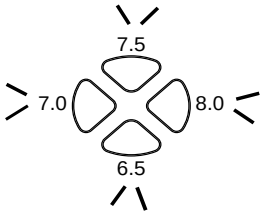
■ Checking the connection cord for breakage



1. Remove the soldering tip and the sleeve assembly.
2. Turn the front piece of the FM-2021 clockwise and remove the cover.
3. Measure the resistance values between the connector and the lead wires at the socket as follows:
   Pin 1 – Red Pin 2 – Green
   Pin 3 – Black Pin 5 – White
   If any value exceeds 0Ω, replace the FM-2021.

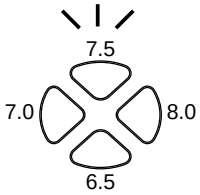
9. ERROR MESSAGES

● System Error



When the power is turned on, the system automatically checks its memory and the stored program. If a problem is found, all the heat range indicator lamps will light and the tip will not heat.

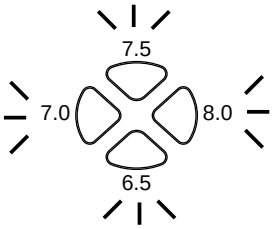
● Sensor Error



When there is the possibility that a failure has occurred in the sensor or heater (including the sensor circuit), the heat range indicator lamp will blink rapidly and the heater is shut down.

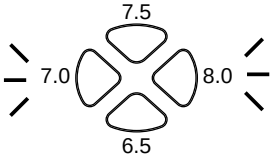
NOTE:
'Sensor error' also occurs if the tip is not inserted properly.

● Heater terminal short circuit error



All the heat range indicator lamps will blink, and the alarm will sound continuously. Possible causes are: the tip is inserted the wrong way, an incompatible tip is inserted, or a foreign object is in the connector.

● Soldering iron error



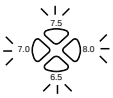
The *yellow* and *red* heat range indicator lamps will blink if the connector cord is not attached to the station OR the wrong soldering iron is connected.

⚠CAUTION:
Do not connect the FM-2022 or FM-2023 with the FP-102.

10. TROUBLE SHOOTING GUIDE

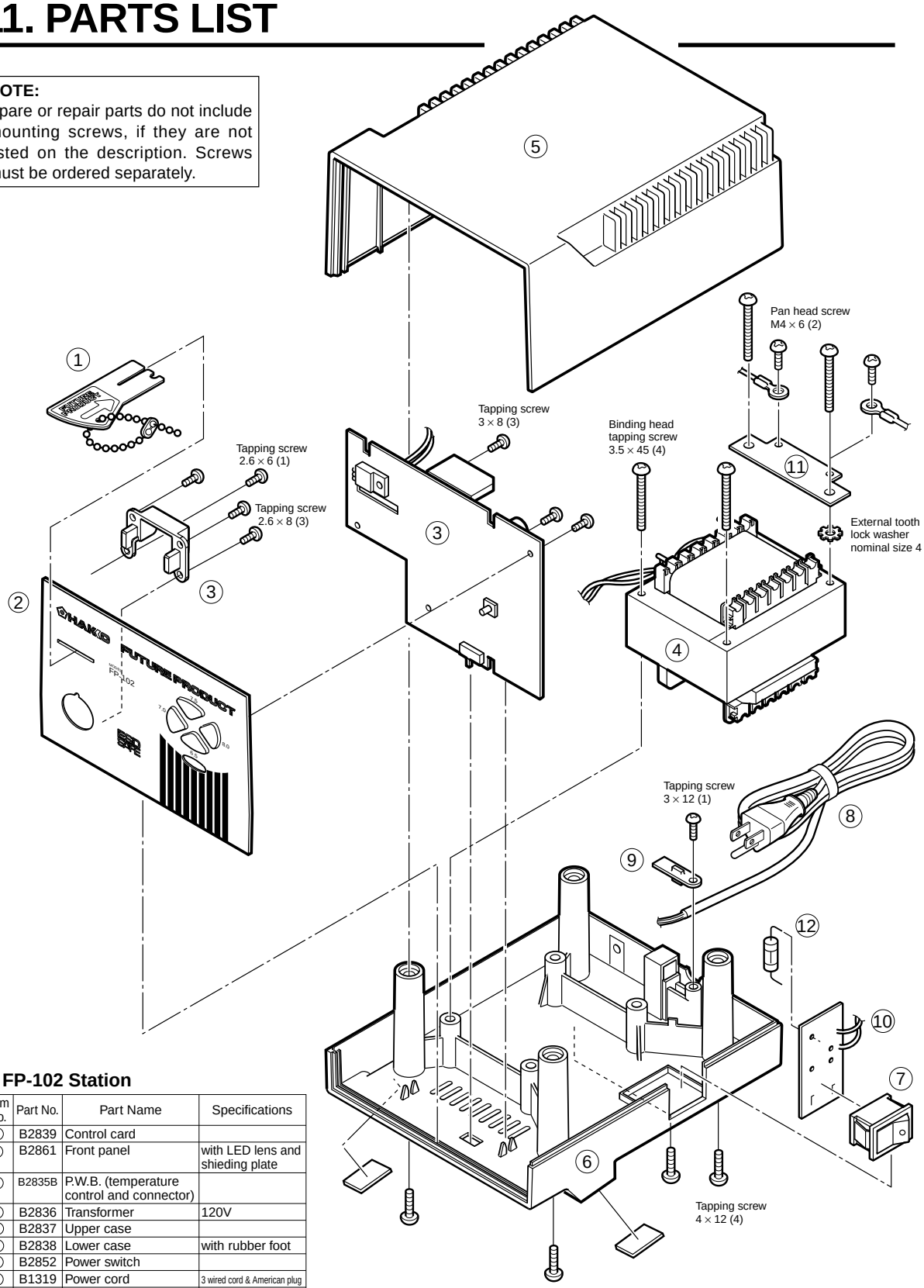
⚠ WARNING:

- Before opening the FP-102, 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 plug disconnected? **ACTION**: Connect it.
● The tip does not heat up. • 'Sensor error' is displayed.	**CHECK**: Is the tip inserted properly? **ACTION**: Insert the tip completely. **CHECK**: Is the connection cord and/or the heater/sensor broken? **ACTION**: See the appropriate section of this manual regarding how to check the connection cord and/or the heater/sensor for breakage.
● Solder does not wet the tip.	**CHECK**: Is the tip contaminated with oxide? **ACTION**: Remove the oxide (see "Tip maintenance" on P. 7).
● The tip temperature is too high.	**CHECK**: Is the connection cord broken? **ACTION**: See "Checking the connection cord for breakage" on P. 8.
● The tip temperature is too low.	**CHECK**: Is the tip contaminated with oxide? **ACTION**: Remove the oxide (see "Tip maintenance" on P. 7).
● The soldering iron error, yellow and red lamp blink.	**CHECK**: Is the wrong soldering iron connected? Or the FM-2021 plug disconnected? **ACTION**: Turn off the power switch, re-connect the FM-2021 soldering iron, then turn on the power switch.
● Heater terminal short circuit error  **is displayed**	**CHECK**: Is the tip for FM-2021? **ACTION**: Turn the power switch OFF and insert genuine FM-2021 tip. Turn the power switch ON.

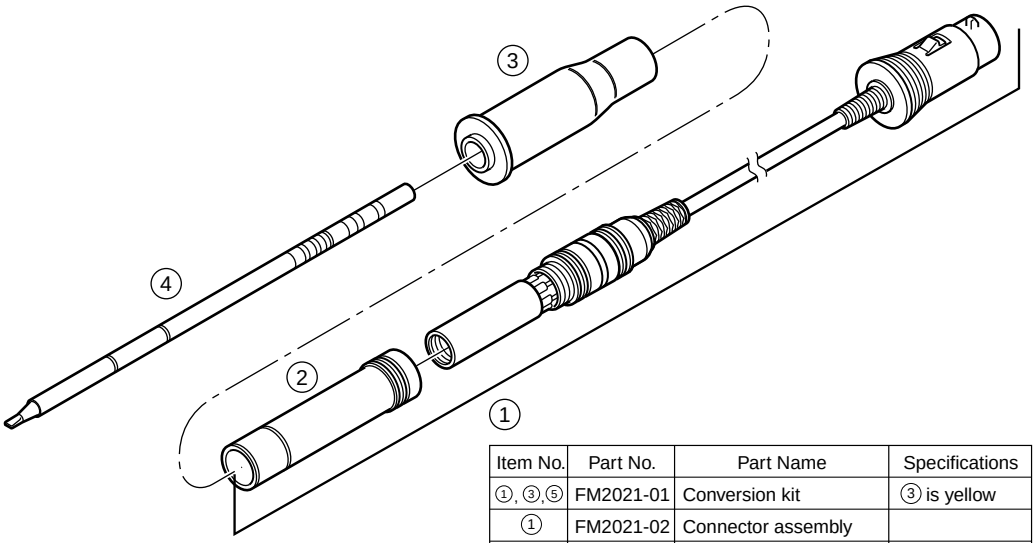
11. PARTS LIST

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

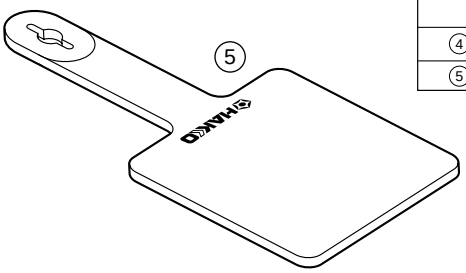


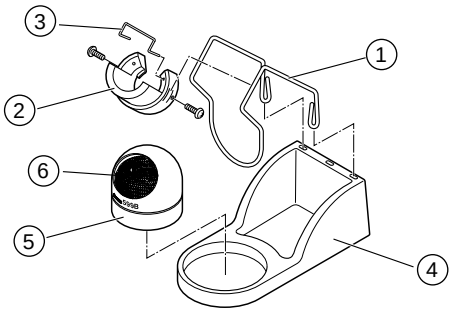
● FP-102 Station

Item No.	Part No.	Part Name	Specifications
①	B2839	Control card	
②	B2861	Front panel	with LED lens and shieding plate
③	B2835B	P.W.B. (temperature control and connector)	
④	B2836	Transformer	120V
⑤	B2837	Upper case	
⑥	B2838	Lower case	with rubber foot
⑦	B2852	Power switch	
⑧	B1319	Power cord	3 wired cord & American plug
⑨	B2015	Cord stopper	
⑩	B2103	Wiring board for switch	
⑪	B2227	Grounding plate	
⑫	B2224	Fuse	2A (UL)



Item No.	Part No.	Part Name	Specifications
①, ③, ⑤	FM2021-01	Conversion kit	③ is yellow
①	FM2021-02	Connector assembly	
②	B2770	Connector cover	
③	B2765C	Sleeve assembly	Yellow
	B2768C	Sleeve assembly	Orange
	B2769C	Sleeve assembly	Blue
④		Tip	See section '12. TIP STYLES'
⑤	B2300	Heat resistant pad	



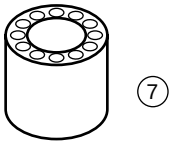


● Iron Holder

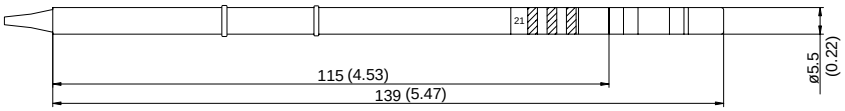
Item No.	Part No.	Part Name	Specifications
① ~ ⑥	634-01	Iron holder	

● Iron Holder Parts

Item No.	Part No.	Part Name	Specifications
①	B2786	Holder for iron receptacle	
②	B2790	Iron receptacle	With screw
③	B2791	Retaining clip	
④	B2792	Iron holder base	With rubber foot
⑤	599B-02	Tip cleaner	
⑥	599-029	Cleaning wire	
⑦	B2756	Tip tray	

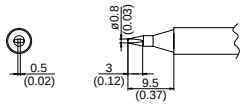


12. TIP STYLES

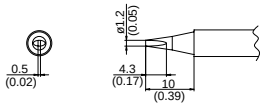


Unit: mm (in.)

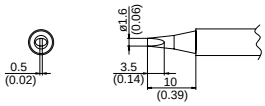
T7-D08 SHAPE-0.8D Chisel



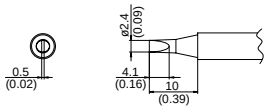
T7-D12 SHAPE-1.2D Chisel



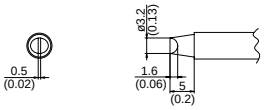
T7-D16 SHAPE-1.6D Chisel



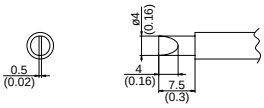
T7-D24 SHAPE-2.4D Chisel



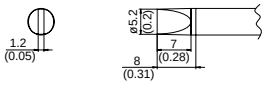
T7-D32 SHAPE-3.2D Chisel



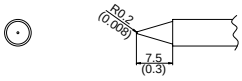
T7-D4 SHAPE-4D Chisel



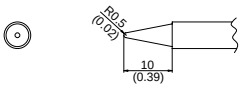
T7-D52 SHAPE-5.2D Chisel



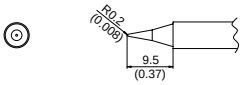
T7-B SHAPE-B Conical



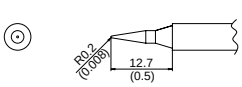
T7-B2 SHAPE-2B Conical



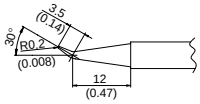
T7-I SHAPE-I Sharp Conical



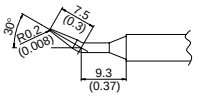
T7-LI SHAPE-LI Long Sharp Conical



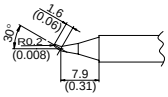
T7-J02 SHAPE-0.2RSB Bent



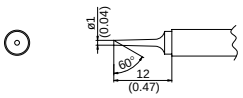
T7-JL02 SHAPE-0.2RLB Bent



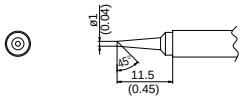
T7-JS02 SHAPE-0.2RSSB Bent



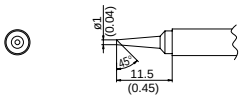
T7-C1 SHAPE-1C Bevel



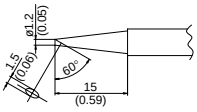
T7-BC1 SHAPE-1BC Bevel



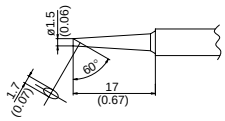
T7-BCF1 SHAPE-1BC Bevel
(Tinned on the soldering surface only)



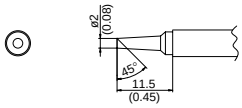
T7-BC12 SHAPE-1.2BC Bevel



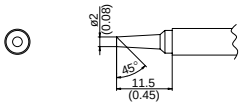
T7-BC15 SHAPE-1.5BC Bevel



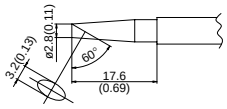
T7-BC2 SHAPE-2BC Bevel



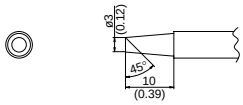
T7-BCF2 SHAPE-2BC Bevel
(Tinned on the soldering surface only)



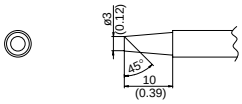
T7-BC28 SHAPE-2.8BC Bevel



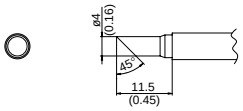
T7-BC3 SHAPE-3BC Bevel



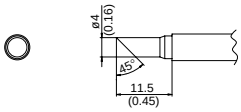
T7-BCF3 SHAPE-3BC Bevel
(Tinned on the soldering surface only)



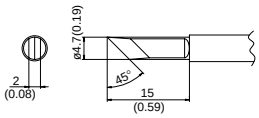
T7-C4 SHAPE-4C Bevel



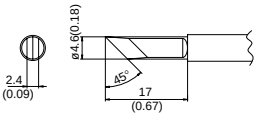
T7-CF4 SHAPE-4C Bevel
(Tinned on the soldering surface only)



T7-K SHAPE-K Knife

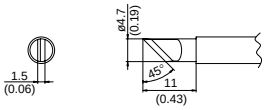


T7-KF SHAPE-KF Knife

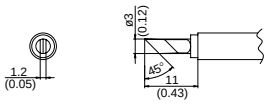


Unit: mm (in.)

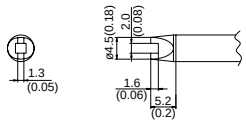
T7-KL SHAPE-KL Knife



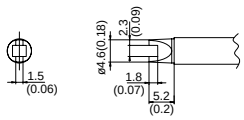
T7-KU SHAPE-KU Knife



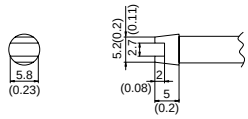
T7-R20 SHAPE-2.0R Slot



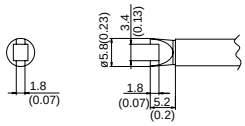
T7-R23 SHAPE-2.3R Slot



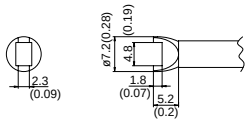
T7-R27 SHAPE-2.7R Slot



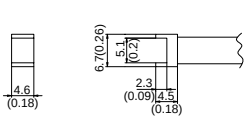
T7-R34 SHAPE-3.4R Slot



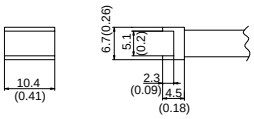
T7-R48 SHAPE-4.8R Slot



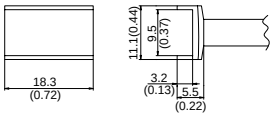
T7-1001 SOP5.1 x 4.6



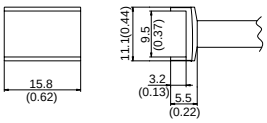
T7-1002 SOP5.1 x 10.4



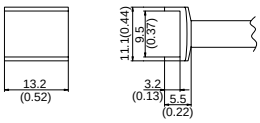
T7-1003 SOP9.5 x 18.3



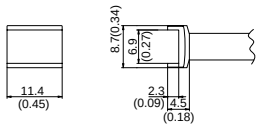
T7-1004 SOP9.5 x 15.8



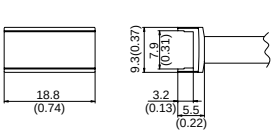
T7-1005 SOP9.5 x 13.2



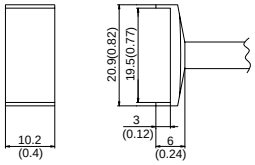
T7-1006 SOP6.9 x 11.4



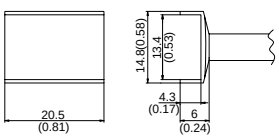
T7-1007 SOP7.9 x 18.8



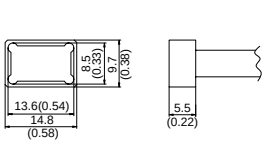
T7-1008 SOP19.5 x 10.2



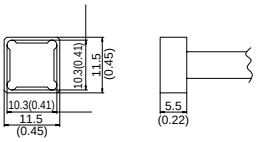
T7-1009 SOP13.4 x 20.5



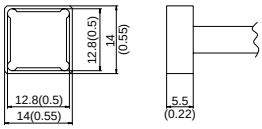
T7-1201 PLCC13.6 x 8.5



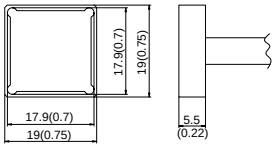
T7-1202 PLCC10.3 x 10.3



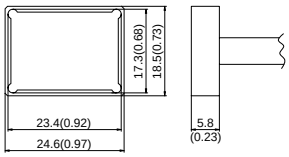
T7-1203 PLCC12.8 x 12.8



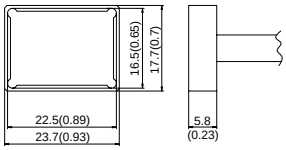
T7-1204 PLCC17.9 x 17.9



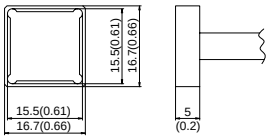
T7-1205 PLCC23.4 x 17.3



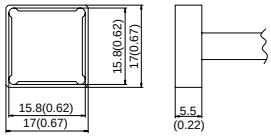
T7-1206 PLCC22.5 x 16.5



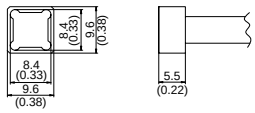
T7-1207 PLCC15.5 x 15.5



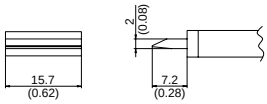
T7-1208 PLCC15.8 x 15.8



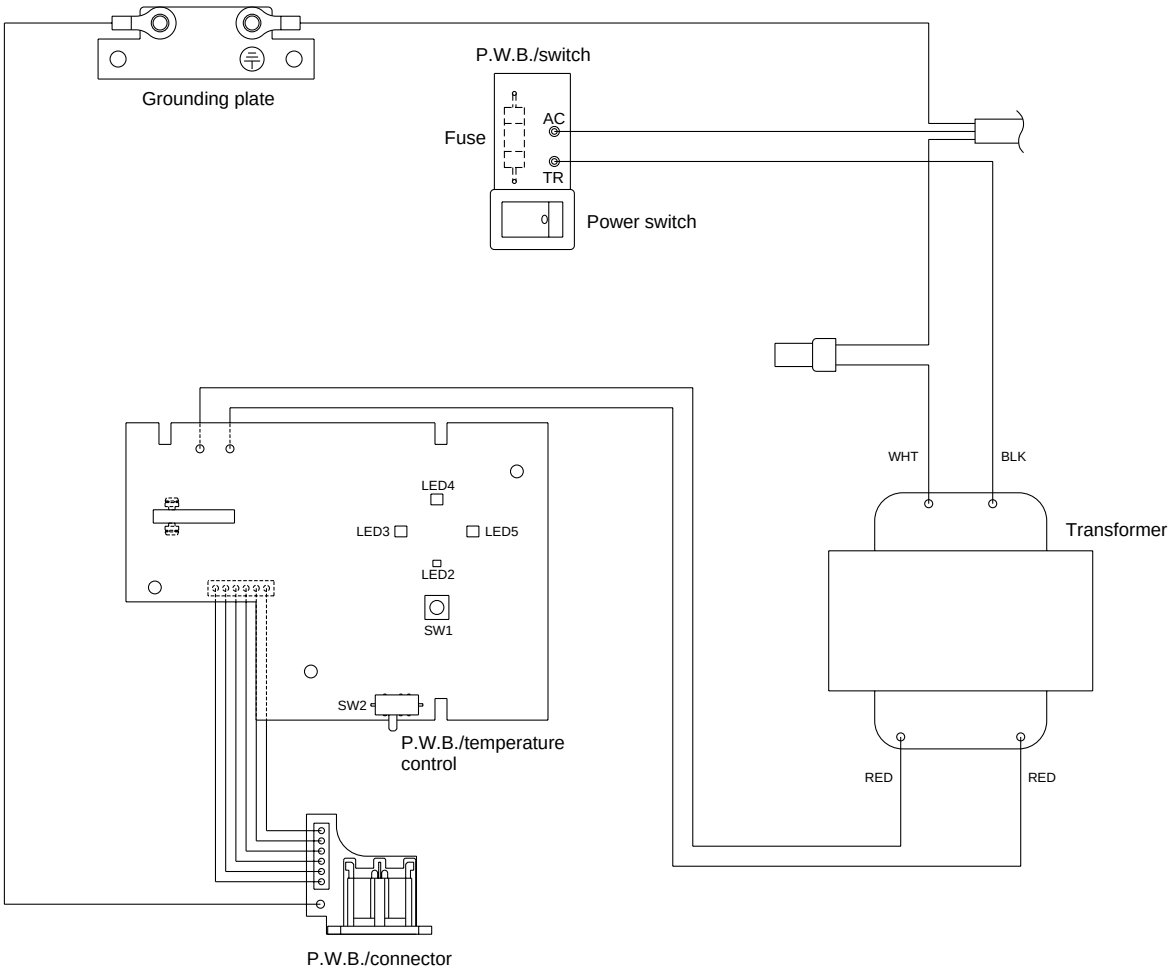
T7-1209 PLCC8.4 x 8.4



T7-1401 Spatula 15.7



13. WIRING DIAGRAM



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