

# HAKKO FR-820 PREHEATER

## Instruction Manual

Thank you for purchasing the HAKKO FR-820 Preheater.  
Please read this manual before operating the HAKKO FR-820.  
Keep this manual readily accessible for reference.

### TABLE OF CONTENTS

1. PACKING LIST & PART NAMES.....	20
2. SPECIFICATIONS.....	20
3. WARNINGS, CAUTIONS, AND NOTES.....	21
4. OPERATION.....	22
5. OPTIONS.....	23
6. ERROR INDICATION.....	24
7. TROUBLESHOOTING.....	24
8. HEATER/SENSOR INSPECTION.....	25
9. MAINTENANCE.....	25
10. PARTS LIST.....	26
11. WIRING DIAGRAM.....	27

## 3. WARNINGS, CAUTIONS, AND NOTES

### WARNING

Warnings and cautions are placed at critical points in this manual to direct the operator's attention to significant items. They are defined as follows:

- ⚠ **WARNING:** Failure to comply with a WARNING may result in serious injury or death.
- ⚠ **CAUTION:** Failure to comply with a CAUTION may result in injury to the operator, or damage to the items involved.

#### Observe the following precautions to ensure safety.

### CAUTION

When the power is ON, the temperature of the hot air outlet ranges from 150 to 300°C. (302 to 572°F). To avoid injury to personnel or damage to items in the work area, observe the following:

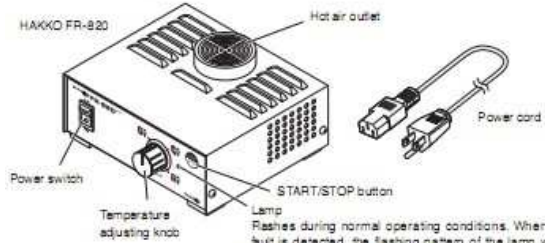
- Do not directly touch either the hot air outlet or its vicinity.
- Do not use the product near combustible gases or flammable materials.
- Do not spray inflammable substances or flux to the hot air outlet or the air inlet.
- Do not put foreign substances into the hot air outlet or the air inlet.
- Do not use the unit in an enclosed area, and with the hot air outlet or the air inlet blocked.
- Advise those in the work area that the unit can reach very high temperatures and should be considered potentially dangerous.
- Turn the power OFF when no longer using the HAKKO FR-820 or when leaving it unattended.
- Before replacing parts or storing the unit, allow the unit to cool and then turn the power OFF.
- Do not use the unit in the vicinity of anything which can be sucked from the air inlet and cause a fire (such as dust and dirt).
- Do not apply hot air to the same place for a long time.

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

- Do not use the unit for any purposes other than preheating.
- One hour is a guide for the length of time for continuous operation.
- Be sure the unit is grounded. Always connect power to a grounded receptacle.
- Do not modify the unit.
- Use only genuine HAKKO replacement parts.
- Do not wet the unit or use the unit with wet hands.
- Remove power cord by holding the plug – not the wires.
- While using the HAKKO FR-820, don't do anything which may cause bodily harm or physical damage.

## 1. PACKING LIST & PART NAMES

HAKKO FR-820.....	1	Instruction manual.....	1
Power cord.....	1		



## 2. SPECIFICATIONS

Model name	HAKKO FR-820
Power consumption	100V-330W, 110V-400W, 120V-470W 220V-450W, 230V-500W, 240V-540W
Control temperature	150 - 300°C (302 - 572°F) (above the hot air outlet)
Dimensions	140 (W) × 70* (H) × 140 (D) mm
Weight	600g
Air flow	0.18m³/min

- \* Height (H) is the distance from the bottom of the foot to the top of the hot air outlet.
- \* This product is protected against electrostatic discharge. Be sure to ground the unit during use.
- \* This product meets China RoHS requirements. (See the table at the end of this manual.)
- \* Specifications and design are subject to change without notice.

#### Electrostatic Protection

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

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

## 4. OPERATION

#### Preparation

Place FR-820 and PWB with the right figure as a guide.

**CAUTION**  
Please make sure to keep 5 mm or more gap between the PWB and the hot air outlet.

#### Turn on the power.

- ① Plug the power cord into an AC outlet.
- ② Turn on the power switch. The lamp comes on.
- ③ Adjust the temperature of the hot air.

**CAUTION**  
Make sure that the hot air outlet and its vicinity are not blocked before turning on the power switch.

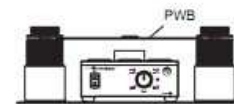
- ④ Press the START/STOP button to start preheating. The hot air is discharged from the hot air outlet. The lamp will start flashing.

#### After finishing the work

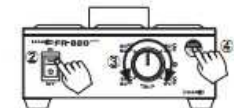
- ① Press the START/STOP button to stop preheating. The heater operation stops, then cooling of the unit by air starts.
- ② Make sure that the cooling-air discharge stops and the unit is completely cooled down before turning off the power switch.

#### Temperature Offset Feature

When making a temperature offset, measure the temperature of the hot air. The measurement should be made at the point which is 1 mm from the hot air outlet and is directly above the sensor.



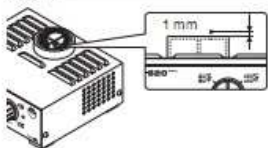
#### To start working



#### To finish working



**CAUTION**  
Turning off the power switch before air discharge stops may cause malfunction of the unit.



## 4. OPERATION

- Turn the temperature adjusting knob to 250°C and wait until the measurement temperature is stabilized.
- Make sure that the temperature stabilizes, then press the START/STOP button for three seconds. The color of the lamp will change to green.
- Turn the knob so that the measured temperature becomes 250°C. The temperature offset ranges from -50°C to +50°C relative to the initial setting. Once the temperature is offset by +10 °C, the temperature offset range is from -60°C to +40°C.
- Press the START/STOP button again. The lamp returns to red, which indicates that an automatic control of the heater begins. Turn the knob to the desired temperature for preheating.

**CAUTION**  
If you try to make a temperature offset with the knob being set at 150°C or 300 °C, the temperature cannot be offset in the negative (-) direction or in the positive (+) direction respectively.

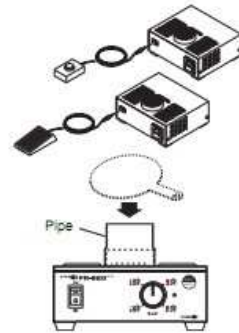
**CAUTION**  
The temperature offset feature is inoperable unless the temperature stabilizes.

**CAUTION**  
If you try to make a temperature offset that exceeds +/-50°C, the lamp will start flashing. Temperature offset cannot be made while the lamp is flashing.

**CAUTION**  
The unit automatically switches to the normal operation mode unless you turn the knob within 90 seconds after entering the temperature offset mode.

## 5. OPTIONS

- External switch**  
An optional hand switch or foot switch, which can be connected to the unit to be used as a substitute for the START/STOP button, is available.
- Optional extension pipe and lid**  
The optional extension pipe can be used to rectify the blow air. If using the B52, FR-802 or FR-803 without running the HAKKO FR-820, use the optional lid and pipe for the air outlet. Using the HAKKO FR-820 without the lid can damage it.



## 6. ERROR INDICATION

When a fault is detected, the lamp on the front panel flashes in the following pattern indicating a fault occurs.

- Heater Error**  
Lamp flashing pattern:  
\*\*\*\*\*
- Sensor Error**  
Lamp flashing pattern:  
\*\* \*\* \*
- Fan Error**  
Lamp flashing pattern:  
\*\*\* \*\* \*\*

When a heater fault is detected, the lamp flashes at equal intervals as shown to the left.

When a sensor fault is detected, the heater is forced to be turned off and the lamp flashes in a pattern of two blinks as shown to the left.

When the fan fails to speed up within a given period of time or the fan speed drops below a certain level during operation, the lamp flashes in a pattern of four blinks as shown to the left.

## 7. TROUBLESHOOTING

### WARNING

- Before checking the inside of the HAKKO FR-820 or replacing parts, be sure to disconnect the power plug. Failure to do so may result in electric shock.
- Perform troubleshooting after the unit is completely cooled down.

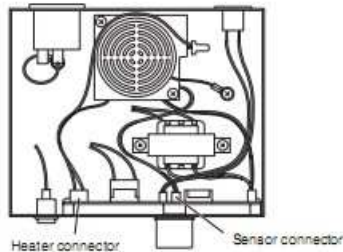
- The unit does not operate when the power switch is turned ON.
- The lamp indicates a heater error.
- The lamp indicates a sensor error.
- The lamp indicates a fan error.

- CHECK:** Is the fuse blown?  
**ACTION:** Investigate why the fuse blew and then replace the fuse.
- CHECK:** Is the heater broken?  
**ACTION:** Measure the resistance value of the heater.
- CHECK:** Is the sensor broken?  
**ACTION:** Measure the resistance value of the sensor.
- CHECK:** Does a foreign substance get caught in the fan?  
**ACTION:** Remove the foreign substance (if any).

Consult your local distributor for further information about other troubles and error indications.

## 10. PARTS LIST

## 8. HEATER/SENSOR INSPECTION

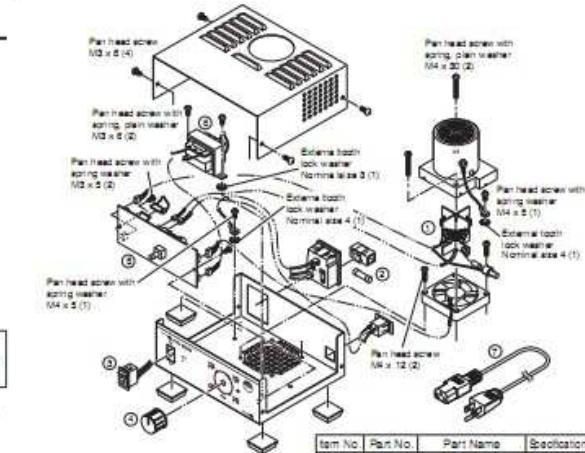


**CAUTION**  
Measure the resistances of the heater and the sensor when their temperatures are at room temperature.

- Measure the resistance of the heater.
- Measure the resistance of the sensor.

Measure the heater resistance after removing the connector from the heater.  
Heater resistance: 25 to 30Ω (100 - 120V)  
Heater resistance: 100 to 110Ω (220 - 240V)  
If the resistance value is different from the above figure, replace the heater. (For the replacement procedure, see the instruction manual supplied the replacement part.)

Measure the sensor resistance after removing the connector from the sensor.  
Sensor resistance: 0Ω  
If the resistance value is different from the above figure, replace the sensor. (For the replacement procedure, see the instruction manual supplied the replacement part.)



Item No.	Part No.	Part Name	Specifications
①	A1 537	Heater	100~120V
	A1 538	Heater	220~240V
②	B2 498	Fuse	125V/5A
	B1 258	Fuse	250V/3.15A
③	B2 852	Power switch	
④	B1 028	Knob	
⑤	B3 258	PIWB	100~120V
	B3 259	PIWB	220~240V
⑥	B3 260	Transformer	100V
	B3 261	Transformer	110~120V
	B3 262	Transformer	220~240V

Item No.	Part No.	Part Name	Specifications
⑦	B24 19	Power cord, 3 wired cord & American plug	U.S.A.
	B24 21	Power cord, 3 wired cord but no plug	220~240V
	B24 22	Power cord, 3 wired cord & BS plug	India
	B24 24	Power cord, 3 wired cord & European plug	220V K.T.L., 230V CE
	B24 25	Power cord, 3 wired cord & BS plug	230V CE, U.K.
	B24 26	Power cord, 3 wired cord & Australian plug	
	B24 36	Power cord, 3 wired cord & Chinese plug	China
	B35 08	Power cord, 3 wired cord & American plug	

## 9. MAINTENANCE

If flux adheres to the hot air outlet or its vicinity, wipe it off.