

HAKKO 938

SOLDERING STATION

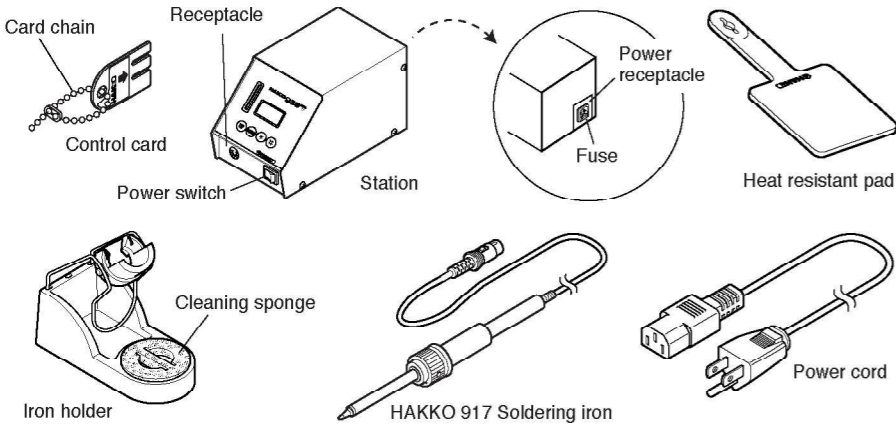
Instruction Manual

Thank you for purchasing the HAKKO 938 soldering station.
Please read this manual before operating the HAKKO 938.
Keep this manual readily accessible for reference.

1. PACKING LIST

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

Control card	1	Heat resistant pad	1
Station	1	Power cord	1
HAKKO 917 Soldering iron	1	Instruction manual	1
Iron holder	1		



2. SPECIFICATIONS

● HAKKO 938 soldering station

Power consumption	100 W
Temperature range	200 – 450°C (400 – 840°F)
Temperature stability	±2°C (±4°F) at idle temperature

● Station

Output	27 V 3.4 A
Dimensions	100 (W) × 106 (H) × 188 (D) mm (3.9 × 4.2 × 7.4 in.)
Weight	2.5 kg (5.5 lb.)

● HAKKO 917 soldering iron

Power consumption	90 W (27 V)
Standard tip	T10 – D24
Tip to ground resistance	< 2 Ω
Tip to ground potential	< 2 mV
Total length (w/o cord)	175 mm (6.9 in.) (When 2.4D tip is inserted)
Weight (w/o cord)	45g (0.10 lb.) (When 2.4D tip is inserted)
Cord	1.2 m (4 ft.)

NOTE:

The temperatures were measured using the HAKKO 191 thermometer.
* This product is protected against electrostatic discharge.
* This product meets China RoHS requirements.
* 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 replacing parts or repairing, take sufficient care not to expose live electrical parts or damage insulation materials.
2. Be sure to ground the unit during use.

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3. WARNINGS, CAUTIONS AND NOTES

⚠ WARNING

In this instruction manual, “WARNING” and “CAUTIONS” 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.

Failure to do so may result in serious problems.

⚠ CAUTION

When the power is ON, the nozzle temperature is between 200°C/392°F and 450°C/896°F. Since mishandling may lead to burns or fire, be sure to comply with the following precautions.

- 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 changing parts or storing the HAKKO 938.

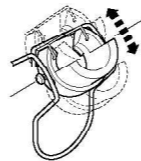
To prevent accidents or damage to the HAKKO 938, be sure to observe the following:

- Do not use the HAKKO 938 for applications other than soldering.
- Do not allow the HAKKO 938 to become wet, or use it when hands are wet.
- Do not modify the HAKKO 938.
- 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 will 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.
- Do not do anything else that might be dangerous.

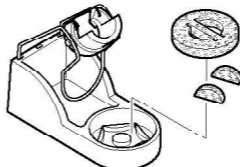
4. INITIAL SETUP

A. Iron holder

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



⚠ **CAUTION**
Do not set up the iron receptacle too high, the temperature of the soldering iron will become very hot.



⚠ **CAUTION**
Using the sponge without dampen with water may damage the tips.

- The sponge is compressed. It will swell when moistened with water. Before using the unit, dampen the sponge with water and squeeze it dry.

1. Put the small cleaning sponge in one of the five holes in the iron holder base.
2. Add water to the iron holder base. The small sponge will keep the large sponge moist through capillary action.
3. Wet the large sponge, squeeze it dry and put it on the iron holder base.

B. Handpiece

- Pass the iron cord through the hole in the heat resistant pad.

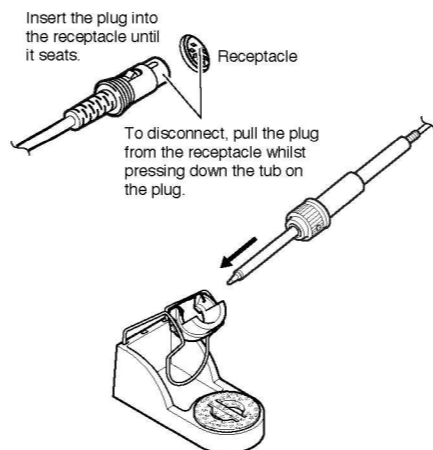


C. Soldering station

⚠ CAUTION

Be sure the power switch is OFF before connecting or disconnecting the soldering iron cord. Failure to do so may result in damage to the circuit board.

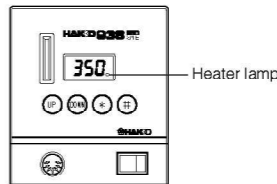
1. Insert the power cord into the receptacle at the back of the station.
Insert the soldering iron cord into the receptacle at the front of the station.
2. Set the iron in the iron holder.
3. Plug the power cord into a grounded wall socket. The HAKKO 938 is protected against electrostatic discharge and must be grounded for full efficiency.



5. OPERATION

● Controls and displays

Controls



The front panel of the HAKKO 938 soldering station has the following controls:

- A power on/off switch.
- Four control buttons:
- ⊕ – Initiates a data entry mode.
- ⊗ – End of sequence signal (terminates a phase of a data entry mode); when pressed for less than one second, displays settings already stored.
- ⬆ – Increases the value in the appropriate display window.
- ⬇ – Decreases the value in the appropriate display window.

● Operation

1. Turn the power switch ON.
2. Once the temperature is reached, the buzzer sounds. The heater lamp at the lower right of the temperature display **350** starts blinking.

● Changing the temperature setting

⚠ CAUTION

The temperature setting range is 200 – 450°C (400 – 840°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.
- The HAKKO 938 is preset at 350°C at the factory.

Example: 350 to 400°C

1. Insert the control card into the slot in the front of the unit.
 - The hundreds digit will begin to flash, indicating that the unit is in the TEMPERATURE SET mode and data may be entered.
2. Entering the hundreds digit
 - Press the ⬆ or ⬇ button to set the desired figure. When the desired figure is displayed, press the ⊗ button to enter. The tens digit will begin to flash.
3. Entering the tens digit
 - Press the ⬆ or ⬇ button to set the desired figure. When the desired figure is displayed, press the ⊗ button to enter. The units digit will begin to flash.
4. Entering the units digit
 - Press the ⬆ or ⬇ button to set the desired figure. When the desired figure is displayed, press the ⊗ button to enter. The desired temperature is now entered into the system memory and heater control will begin.

When the station is ON and the card is in the station, the data entry procedure follows:

Displays

The HAKKO 938 has a three-digit display element. Depending upon the selected mode, it will display:

- Normal mode:
 - Sensor temperature (tip temperature)
- Data entry:
 - Selected quantity (see 'data entry procedures' for exact characteristics)
- Temperature scale:
 - °C or °F, depending upon selection
- Error detection:
 - Refer to 'ERROR MESSAGES' section

In addition, a single heater lamp will flash when the station has reached the desired temperature, indicating that it is ready for use.

An audible buzzer is provided to alert the operator when:

- The station has reached the set temperature. The buzzer will sound once.
- The low temperature threshold has been crossed. This buzzer will shutoff when the sensed temperature returns to the acceptable range.
- A failure has occurred in the sensor or heater (including the sensor circuit). The buzzer will sound continuously.
- The auto power shutoff is activated and the power to the heating element is shutoff, the buzzer will sound three times.

⚠ CAUTION

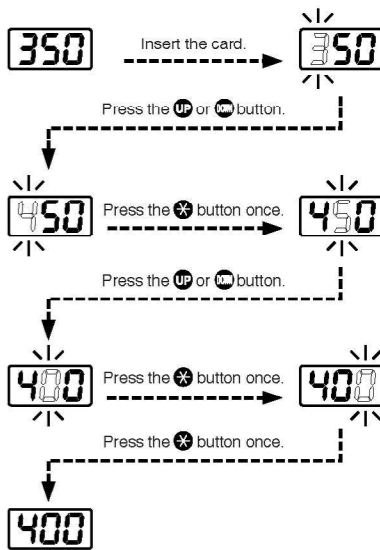
The HAKKO 938 is preset at 350°C at the factory. Check the temperature setting by pressing the ⊗ button. The set temperature will be displayed for two seconds.

⚠ CAUTION

Place the iron in the iron holder when not in use.

⚠ CAUTION

The card must be inserted into the card slot in the correct direction. The heater is off while you are setting the temperature.



NOTE:

If power is switched off or lost during the execution of this procedure, no data will be entered. The entire procedure must be repeated from step 1.

1. Hold the ⊗ button down for at least one second. The current temperature setting will be displayed, then the hundreds digit will begin to flash. This indicates that the station has entered the temperature setting mode. Continue with the procedure of 2 – 4, above.
2. When the ⊗ button is pressed for less than one second, the current temperature setting is displayed for two seconds, then returns to show the actual tip temperatures.

5. OPERATION

● Replacing the tip

- 1. Always turn the power OFF when removing or inserting a tip.
- 2. Turn around the nipple slightly and then hold the tip with the heat resistant pad and pull it out.
- 3. Insert the new tip fully into the HAKKO 917 and then lock the nipple. The socket of the tip has an orientation. If the tip is not fully inserted, the display will show a sensor [S-E] error when power is turned on.

● How to enter the tip offset value into the HAKKO 938

Example 1
If the measured temperature is 410°C and the set temperature is 400°C, the difference is -10°C (need to decrease by 10°C). So, enter the value subtracting 10 from the current offset value.

- 1. Insert the control card into the slot in the station.
- The station will default to the temperature setting mode. Set the temperature at 400°C (750°F).
- 2. Press the [⊕] button on the front panel and hold for one second.
- This will set the station to the offset value entry mode.
- 3. Measure the tip temperature.

CAUTION
Allow the tip temperature to become stable. During offset data entry mode, the tip temperature is controlled by presented offset value.

- 4. Enter the offset value
The allowable ranges for offset values are -99 to +99°C (In °F mode -178 to +178°F).

6. PARAMETER SETTINGS

The HAKKO 938 comes from the factory with the following values preset:

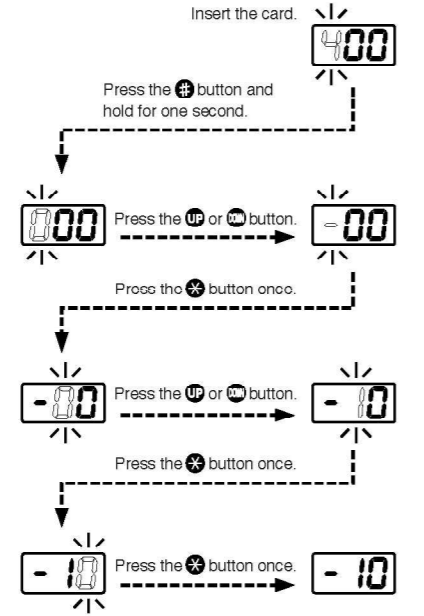
Temperature scale	Celsius
Power save	Disabled
Low temperature alarm setting	150°C
Resetting the supervisor/operator control setting	4 0
Setting temperature	350°C

● Entering the parameter

1 °C of °F temperature display

CAUTION
The tip will be HOT! Use the heat resistant pad to remove it. Do not hold the tip with the heat resistant pad for an extended time.

CAUTION
Turn around the nipple approximately 180° counterclockwise, then replace the tip. Be careful not to loosen the nipple too much. Otherwise it may be broken.



NOTE:
When the unit is in offset-free mode, you can go into the offset value entry mode without control card by pressing the [⊕] button for one second.

2 Power save setting

Power save is an optional setting HAKKO 938 has two kinds of power save functions. To turn off the power save function, select 0 and then press the [⊗] button.

Power save function setting:	
2 0 Disabled	
210 Sleep	work after 15 minutes
230 Auto power shutoff	work after 30 minutes

- When the display shows [SLP], pressing any button the power will be turned on again.

NOTE:
The sleep function does not work in case the setting temperature is less than 300°C/600°F.

- When the display shows [---], and to begin soldering, cycle the power switch OFF, then ON.

- 3 Resetting the low temperature alarm tolerance setting
This unique function alerts the operator when the sensed temperature falls below a set limit. If the sensed temperature drops below the alarm level, an error message [H-E] will be displayed, and the buzzer will sound. When the temperature returns within the allowable range, the buzzer will stop. The value is stored in the HAKKO 938 as described in the example below:

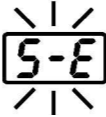
EXAMPLE:
If the set temperature is 350°C and the low temperature alarm is 100°C, the alarm will trip when the sensed temperature drops below 250°C.

- 4 Resetting the supervisor/operator control setting

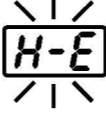
7. ERROR MESSAGES

When trouble occurs with HAKKO 938, the following error message will display. If the error message occurs, see "2. TROUBLE SHOOTING GUIDE" on the separate Maintenance & Checking.

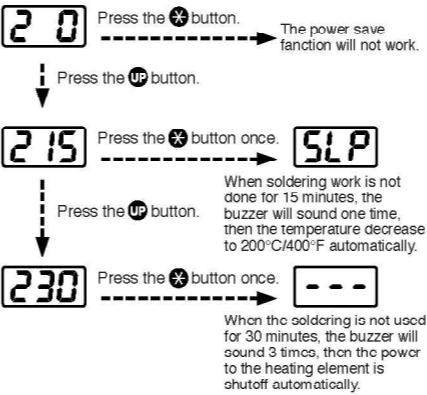
● Sensor Error



● Low-temperature alarm tolerance error



When the station enters the parameter input mode, the procedure is as follows.



- When the station enters low-temperature alarm tolerance setting mode, the hundreds digit begins flashing. Enter and store the value in the same manner as described in "Changing the temperature setting."
- If you enter a value exceeding the allowable range shown to the left, you will be brought back to entering a value in the hundreds digit. If this occurs, re-enter a correct value.
- Once the value is stored, the system will automatically sequence to resetting the supervisor/operator control setting.

NOTE:
The threshold limits are: 30 - 150°C; 50 - 300°F. If a value exceeding these limits should be entered, the system will revert to the beginning of the mode (the hundreds digit will flash) and the procedure must be begun anew.

To change the supervisor/operator control settings, the procedure is as follows.
● The display will show [4 0] or [4 1] when this mode is entered.

[4 0] : No offset value can be entered without inserting the card.

[4 1] : An offset value can be entered without inserting the card.

Pressing the [UP] or [DOWN] button will change [4 0] and [4 1].
When the desired setting is displayed, select by pressing [⊗] button.
The system will exit the parameter setting mode and begin heater control.
It is now ready for normal operation.

When there is the possibility that a failure has occurred in the sensor or heater (including the sensor circuit), [S-E] is displayed and the power is shut down with the buzzer sounding continuously.

CAUTION
The sensor error also occurs if the tip is not inserted properly. Once the tip is inserted properly, the HAKKO 938 is restarted.

If the sensor temperature falls below the difference between the current temperature setting and the low-temperature alarm tolerance, is displayed and the warning buzzer sounds. When the tip temperature rises to a value within the set tolerance, the buzzer will stop sounding.

EXAMPLE:
Assume that the temperature setting is 400°C/750°F and the tolerance 50°C/100°F. If the temperature continues to decrease and finally falls below the value indicated below while the heating element is on, the displayed value starts blinking to indicate that the tip temperature has dropped.

350°C (400°C - 50°C)
Set temperature Low-temperature alarm tolerance
OR
650°F (750°F - 100°F)
Set temperature Low-temperature alarm tolerance

8. MAINTENANCE

Performing proper and periodical maintenance extends the products life and contributes to use it always in a good condition. Efficient soldering depends upon the temperature, the quality and quantity of the solder and flux. Apply the following service procedure as dictated by the conditions of the usage.

WARNING
Since the soldering iron can reach a very high temperature, please work carefully. Except the case especially indicated, always turn the power switch OFF and disconnect the power plug before performing any maintenance procedure.

● Tip maintenance

1. Tip temperature

2. Cleaning

3. After use

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

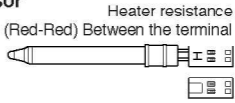
5. Inspecting and cleaning the tip

CAUTION
NEVER file the tip to remove oxides!

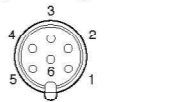
● Checking Procedure

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

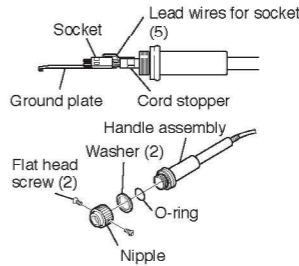
● Check for a broken heater or sensor



● Check the grounding line



● Checking the connection cord for breakage



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 HAKKO 938 ensure effective soldering at low temperatures.

Always clean the soldering tip before use, to remove any residual solder or flux adhering to it. Use a clean and moist cleaning sponge (provided with the HAKKO 938) or the HAKKO 599B tip cleaner. Contaminants on the tip have many deleterious effects, including reduced heat conductivity, which contribute to poor soldering performance.

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

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.

- This procedure, if followed daily, will materially add to tip life.
1. Set the temperature to 250°C (482°F).
 2. 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.
 3. 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.
 4. Turn the power OFF and remove the tip, using the heat resistant pad. Set the tip aside to cool.
 5. Remaining oxides, such as the yellow discoloration on the tip shaft, can be removed with isopropyl alcohol.

1. Check for a broken heater or sensor

Heater resistance (Red-Red)	1.0 - 2.6Ω (Normal)
Sensor resistance (White-White)	43 - 58Ω (Normal)

If the values are outside the above value, replace the tip.

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

1. Remove the soldering tip and the nipple.
2. Push the socket out from inside the handle assembly.
3. Measure the resistance values between the connector and the lead wires at the socket as follows:

Pin 1 - Blue	Pin 2 - White	Pin 3 - Green
Pin 3 - Red	Pin 5 - Black	

If any value exceeds 0Ω or is ∞, replace the handle assembly.

CAUTION
Do not lose all of the spare parts. When reassembling, match the convex part of the handle assembly with the concave parts of the socket.

● Replacing the fuse

1. Unplug the power cord from the power receptacle.
2. Remove the fuse holder.
3. Replace the fuse.
4. Put the fuse holder back in place.

