Thank you for purchasing the HAKKO FM-204 desoldering station. Please read this manual before operating the HAKKO FM-204. Keep this manual readily accessible for reference.

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1. PACKING LIST AND PART NAMES

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>HAKKO FM-204 desoldering station</td>
<td>1</td>
</tr>
<tr>
<td>MODEL FM-2024 desoldering tool</td>
<td>1</td>
</tr>
<tr>
<td>Filter pipe assembly</td>
<td>1</td>
</tr>
<tr>
<td>Control card</td>
<td>1</td>
</tr>
<tr>
<td>Power cord</td>
<td>1</td>
</tr>
<tr>
<td>Connecting cable</td>
<td>1</td>
</tr>
<tr>
<td>Iron holder with tip cleaner</td>
<td>1</td>
</tr>
<tr>
<td>Handle (for gun configuration)</td>
<td>1</td>
</tr>
<tr>
<td>Cleaning drill (for heating element)</td>
<td>1</td>
</tr>
<tr>
<td>Nozzle remover</td>
<td>1</td>
</tr>
<tr>
<td>Ceramic paper filter (10 pcs.)</td>
<td>1</td>
</tr>
<tr>
<td>Instruction manual</td>
<td>1</td>
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● HAKKO FM-204 desoldering station

11. WIRING DIAGRAM

<table>
<thead>
<tr>
<th>Option</th>
<th>Part No</th>
<th>Part Name</th>
<th>Specification</th>
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<tbody>
<tr>
<td></td>
<td>B3216</td>
<td>Sleeve assembly</td>
<td>Yellow</td>
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<tr>
<td></td>
<td>B3217</td>
<td>Sleeve assembly</td>
<td>Orange</td>
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<tr>
<td></td>
<td>B3218</td>
<td>Sleeve assembly</td>
<td>Blue</td>
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<td></td>
<td>B3219</td>
<td>Sleeve assembly</td>
<td>Green</td>
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<td></td>
<td>B3215</td>
<td>Connector cover</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B2874</td>
<td>Cleaning pin</td>
<td>For ø0.6mm (0.02 in.) nozzle</td>
</tr>
<tr>
<td></td>
<td>B1086</td>
<td>Cleaning pin</td>
<td>For ø0.8mm (0.03 in.) nozzle</td>
</tr>
<tr>
<td></td>
<td>B1087</td>
<td>Cleaning pin</td>
<td>For ø1.0mm (0.04 in.) nozzle</td>
</tr>
<tr>
<td></td>
<td>B1088</td>
<td>Cleaning pin</td>
<td>For ø1.3mm (0.05 in.) nozzle</td>
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<tr>
<td></td>
<td>B1089</td>
<td>Cleaning pin</td>
<td>For ø1.6mm (0.06 in.) nozzle</td>
</tr>
<tr>
<td></td>
<td>B2875</td>
<td>Cleaning pin</td>
<td>For ø2.0mm (0.08 in./ø2.3mm (0.09 in.) nozzle</td>
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<tr>
<td>FM200-01</td>
<td>Iron holder</td>
<td>With 599B</td>
<td></td>
</tr>
<tr>
<td>FM200-02</td>
<td>Iron holder</td>
<td>With cleaning sponge</td>
<td></td>
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</tbody>
</table>

*1: With a sleep mode iron holder, connecting cable, heat resistant pad, 599B
*2: With a sleep mode iron holder, connecting cable, heat resistant pad, 599B
The FM-2028 must be used with the FX-780/FX-791.
### Desoldering Tool

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Part No.</th>
<th>Part Name</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>① A1512</td>
<td>FM2024-62 Desoldering tool</td>
<td>24V, 70W</td>
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<tr>
<td>②</td>
<td>A1511</td>
<td>Filter pipe assembly</td>
<td>set of 10</td>
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<tr>
<td>③</td>
<td>A1513</td>
<td>Back holder bushing</td>
<td></td>
</tr>
<tr>
<td>④ B2978</td>
<td>Back holder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>⑤ B2977</td>
<td>Nozzle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>⑥ B2979</td>
<td>Range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>⑦ B2972</td>
<td>Handle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>⑧ B2973</td>
<td>Cleaning drill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>⑨ B2976</td>
<td>Nozzle remover</td>
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</tbody>
</table>

### Nozzle

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Part Name</th>
<th>øA</th>
<th>øB</th>
</tr>
</thead>
<tbody>
<tr>
<td>N2-06</td>
<td>Nozzle 0.6 mm (0.02 in.)</td>
<td>0.6 mm (0.02 in.)</td>
<td>1.9 mm (0.07 in.)</td>
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<tr>
<td>N2-08</td>
<td>Nozzle 0.8 mm (0.03 in.)</td>
<td>0.8 mm (0.03 in.)</td>
<td>2.0 mm (0.08 in.)</td>
</tr>
<tr>
<td>N2-10</td>
<td>Nozzle 1.0 mm (0.04 in.)</td>
<td>1.0 mm (0.04 in.)</td>
<td>2.2 mm (0.089 in.)</td>
</tr>
<tr>
<td>N2-12</td>
<td>Nozzle 1.2 mm (0.05 in.)</td>
<td>1.2 mm (0.05 in.)</td>
<td>2.6 mm (0.10 in.)</td>
</tr>
<tr>
<td>N2-14</td>
<td>Nozzle 1.4 mm (0.06 in.)</td>
<td>1.4 mm (0.06 in.)</td>
<td>3.0 mm (0.12 in.)</td>
</tr>
<tr>
<td>N2-16</td>
<td>Nozzle 1.6 mm (0.06 in.)</td>
<td>1.6 mm (0.06 in.)</td>
<td>3.4 mm (0.135 in.)</td>
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<tr>
<td>N2-18</td>
<td>Nozzle 2.0 mm (0.08 in.)</td>
<td>2.0 mm (0.08 in.)</td>
<td>3.8 mm (0.15 in.)</td>
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### Iron Holder

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Part No.</th>
<th>Part Name</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>OT204-69</td>
<td>HAKKO TR-200</td>
<td>With tip cleaner</td>
</tr>
<tr>
<td>② BS251</td>
<td>Iron holder base</td>
<td>With rubber feet</td>
<td></td>
</tr>
<tr>
<td>③ BS249</td>
<td>Cleaner base</td>
<td>With rubber feet</td>
<td></td>
</tr>
<tr>
<td>④ S98G-02</td>
<td>Tip cleaner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>⑤ S98-029</td>
<td>Cleaning wire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>⑥ BS413</td>
<td>Iron holder assembly</td>
<td>With screws</td>
<td></td>
</tr>
<tr>
<td>⑦ BS250</td>
<td>Stay</td>
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<td></td>
</tr>
<tr>
<td>⑧ BS252</td>
<td>Switch case assembly</td>
<td></td>
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</tbody>
</table>

### Option

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Part No.</th>
<th>Part Name</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>BS256</td>
<td>Tip tray</td>
<td></td>
</tr>
</tbody>
</table>

### MODEL FM-2024 Desoldering Tool

- **Filter pipe assembly**: Replace as a cartridge.
- **Filter pipe lock button**: The filter pipe assembly will be locked until this button is pressed.
- **Nozzle (Not including)**: Remove the nozzle from the grip while pressing this button.
- **Nozzle unlock button**: Suction start switch (when straight grip is used).
- **Trigger**: Suction start switch (when gun style handle is used).
- **Slide button**: To remove the gun handle, slide the button up to unlock it.

#### 2. SPECIFICATIONS

### HAKKO FM-204 Desoldering Station

- **Power Consumption**: 120W
- **Temperature Range**: 200 to 450°C (400 to 840°F)
- **Temperature Stability**: ±5°C (±9°F) at idle temperature

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Part Name</th>
<th>øA</th>
<th>øB</th>
</tr>
</thead>
<tbody>
<tr>
<td>N2-23</td>
<td>Nozzle 2.3 mm (0.09 in.)</td>
<td>2.3 mm (0.09 in.)</td>
<td>3.8 mm (0.15 in.)</td>
</tr>
<tr>
<td>N2-10</td>
<td>Nozzle 1.0 mm (0.04 in.)</td>
<td>1.0 mm (0.04 in.)</td>
<td>2.3 mm (0.09 in.)</td>
</tr>
</tbody>
</table>

### Station

- **Output**: 24V
- **Dimensions (W x H x D)**: 160 x 120 x 225 mm (6.3 x 4.7 x 8.9 in.)
- **Weight**: 3.7 kg (8.1 lb.)
- **Vacuum Generator**: Vacuum pump, double cylinder type
- **Vacuum Pressure (Max)**: 600 mm Hg (24 in. Hg)
- **Suction Flow**: 15 l/min.

### MODEL FM-2024 Desoldering Tool

- **Power consumption**: 70 W (24 V)
- **Temperature range**: 200 - 450°C (400 - 840°F)
- **Tip to ground potential**: < 2 mV
- **Tip to ground resistance**: > 2 MΩ
- **Length, less cord**: 180 mm
- **Weight, less cord & hose**: 60 g
- **Length of cord**: 1.2 m

* The temperatures were measured using the HAKKO TG-101 soldering tester.
* This product is protected against electrostatic discharge.
* This product meets China RoHS requirements.

#### CAUTION

This product includes such features as electrically conductive plastic parts and grounding of the handlepiece 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.

* 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, tip temperatures will be between 350 and 450°C. 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 MODEL FM-2024 or storing the HAKKO FM-204.

⚠️ **CAUTION**

- Do not use the HAKKO FM-204 for applications other than soldering.
- Do not strike the iron against hard objects to remove excess solder. This will damage the iron.
- Do not bend or damage the control card. If the card does become damaged, do not force the card into the station slot.
- Remove power and iron cords by holding the plug – not the wires.
- Do not modify the HAKKO FM-204.
- Use only genuine Hakkio replacement parts.
- Do not allow the HAKKO FM-204 to become wet, or use it with wet hands.
- Be sure the work area is well ventilated. Soldering produces smoke.
- While using HAKKO FM-204, don’t do anything which may cause bodily harm or physical damage.

### HAKKO FM-204 Station

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Part No.</th>
<th>Part Name</th>
<th>Specifications</th>
</tr>
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<td>Card</td>
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</tr>
<tr>
<td>05</td>
<td>B3415</td>
<td>Front panel A</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>B3416</td>
<td>Front panel B</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>B2864</td>
<td>Vacuum outlet cap</td>
<td>With O-ring</td>
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<tr>
<td>08</td>
<td>61514</td>
<td>Ceramic paper filter</td>
<td>10 pcs.</td>
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<tr>
<td>09</td>
<td>B3438</td>
<td>Filter case</td>
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</tr>
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<td>B2854</td>
<td>O-ring/Filter case cover</td>
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<td>11</td>
<td>B3416</td>
<td>Button set</td>
<td>4 pcs.</td>
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<tr>
<td>12</td>
<td>B3435</td>
<td>Display</td>
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<td>13</td>
<td>B3432</td>
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<td>B2761</td>
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<td>100-120V</td>
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<td>15</td>
<td>B2866</td>
<td>Fused/250V-1.6A</td>
<td>220-240V</td>
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<td>B2862</td>
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<td>17</td>
<td>B2858</td>
<td>Power receptacle</td>
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<td>18</td>
<td>B3421</td>
<td>Transformer/100W</td>
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<td>19</td>
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<td>Transformer/120W</td>
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<td>B3424</td>
<td>Transformer/220W</td>
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<td>22</td>
<td>B3425</td>
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<td>24</td>
<td>B3427</td>
<td>Pump assembly</td>
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<td>25</td>
<td>B3414</td>
<td>Inner hose joint</td>
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<td>26</td>
<td>B3433</td>
<td>Inner hose/8MMx45L</td>
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<td>B3434</td>
<td>Inner hose/6.5MMx120L</td>
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<td>28</td>
<td>B3435</td>
<td>Inner hose/6.5MMx280L</td>
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<td>29</td>
<td>B3431</td>
<td>Cover</td>
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### Pump assembly

- Same screw M6X6 (1)
- Flat head screw M6X6 (2)
- Flat head screw M4X12 (2)
- Same screw M4X12 (8)
- Hexagon socket set screw M6X1 (1)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Part No.</th>
<th>Part Name</th>
<th>Specifications</th>
</tr>
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<tr>
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<tr>
<td>31</td>
<td>B2421</td>
<td>Power cord, 3 wire cord but no plug</td>
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</tr>
<tr>
<td>32</td>
<td>B2422</td>
<td>Power cord, 3 wire cord &amp; BS plug</td>
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</tr>
<tr>
<td>33</td>
<td>B2424</td>
<td>Power cord, 3 wire cord &amp; European plug</td>
<td>230V KTL</td>
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<td>34</td>
<td>B2425</td>
<td>Power cord, 3 wire cord &amp; BS plug</td>
<td>230V CE</td>
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<td>35</td>
<td>B2426</td>
<td>Power cord, 3 wire cord &amp; Australian plug</td>
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<td>36</td>
<td>B2436</td>
<td>Power cord, 3 wire cord &amp; Chinese plug</td>
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<td>B2300</td>
<td>Heat resistant pad</td>
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<td>B1053</td>
<td>Balance weight</td>
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<td>B1312</td>
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<td>B2060</td>
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<td>B3429</td>
<td>Pump frame</td>
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<td>43</td>
<td>B3428</td>
<td>Motor</td>
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<td>44</td>
<td>B3430</td>
<td>Rubber vibration</td>
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<td>45</td>
<td>B2085</td>
<td>Diaphragm setting plate</td>
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<td>46</td>
<td>A1013</td>
<td>Diaphragm</td>
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<td>47</td>
<td>B1508</td>
<td>Pump plate</td>
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<td>48</td>
<td>A1014</td>
<td>Washer plate</td>
<td>Set of 3</td>
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<td>49</td>
<td>B1050</td>
<td>Pump head</td>
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<tr>
<td>50</td>
<td>B1059</td>
<td>Exhaust filter</td>
<td>Set of 3</td>
</tr>
<tr>
<td>51</td>
<td>B1313</td>
<td>Filter-retaining pin</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>B2506</td>
<td>Damper</td>
<td>Set of 3</td>
</tr>
</tbody>
</table>
10. 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.

4. INITIAL SETUP

A. Iron holder

● Operation
First, 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.)

1. Insert the holder assembly securely into the iron holder base.
2. When the wire become dirty or loaded with solder, turn the wire until a clean surface is presented.
3. When changing the cleaning wire, lift the case top vertically to prevent solder debris from falling out.
4. Place the spare tips in the tip tray.

● Use of the sleep function
When using the sleep function, insert one end of the connecting cable into the jack at the back of the iron holder and the other end into the jack at the back of the desoldering station to connect them.

⚠️ CAUTION
• Be sure to turn off the power before connecting or disconnecting the connecting cable.
• Securely insert the relay cord all the way to the back.

B. MODEL FM-2024

● Connecting and replacing the filter pipe
Pull the back holder ⑥ until it locks, then insert the filter pipe assembly with the opening to the nozzle side. Ensure that the outer surface of the filter pipe assembly is even with the handle support. If the filter pipe assembly is tilted, a leak may occur.

To replace the filter pipe assembly, press back holder unlock button ⑤, pull the back holder to lock it, change the filter pipe assembly, then lock the filter pipe assembly. Replace the filter pipe assembly in the cartridge.

⚠️ CAUTION
The surface of the filter pipe assembly may be very hot.
Attaching and replacing the nozzle cartridge

Insert the grip fully into the nozzle cartridge as shown in the illustration. Once the nozzle cartridge is inserted, it is locked automatically. To replace the nozzle cartridge, insert the nozzle remover into the flange of the nozzle cartridge and pull.

Press the nozzle unlock button A and remove the nozzle cartridge.

**CAUTION**
The nozzle may be very hot.

The nozzle remover may be left mounted on the end of the straight grip when not in use to prevent it from being misplaced.

Using the desoldering iron in the gun configuration.

To use the desoldering iron in the gun configuration, attach the handle to the straight grip.

Using the desoldering iron in the pen configuration.

To remove the handle, slide down the button located on the rear of the handle to unlock it, then slide the handle toward the back of the MODEL FM-2024.


**CHECK**
Is the setting value for the low-temperature alarm tolerance too low?

**ACTION**
Increase the setting value.

Heater terminal short circuit error [HSC] is displayed.

**CHECK**
Is the nozzle cartridge for MODEL FM-2024?

**ACTION**
Turn the power switch OFF and insert the MODEL FM-2024 tip. Turn the power switch ON.

**CHECK**
Is the heat insufficient?

**ACTION**
Higher heat may be required for large projects. Perform soldering operation while preheating the work. Increasing the nozzle temperature indiscriminately can damage the work. Use an appropriate temperature.

**CHECK**
Is it difficult for solder to stay on the nozzle tip?

**ACTION**
See “Maintenance of nozzle” and “How to avoid the nozzle tip being full of flux”.

Solder cannot be removed.

**CHECK**
Is oxide adhering to the nozzle or inside the suction pipe?

**ACTION**
See “Maintenance of nozzle” and “Removing oxide from the suction pipe”.

**CHECK**
Is a piece of removed solder stuck in the filter pipe?

**ACTION**
If removed solder is clogging up 70 to 80 percent of the filter pipe, replace the filter pipe. Also replace the filter pipe after suctioning large amounts of flux or when the ceramic filter hardens.

**CHECK**
Is solder residue stuck between the front holder or back holder bushing and the contact surface of the filter pipe assembly?

**ACTION**
See “Check and clean the front and back holder bushings”.

**CHECK**
Has the ceramic paper filter deteriorated?

**CHECK**
The ceramic paper filter is full of flux, thereby reducing the suction power. See “Checking and replacing the ceramic paper filter”.

Suction power is dropping.
9. TROUBLE SHOOTING GUIDE

WARNING:
To check inside or replace parts, be sure to turn the power switch OFF and remove the AC plug to avoid electric shock.

- No operation occurs when the power switch is turned ON.
  - **CHECK**: Is the power cord connected properly?
  - **ACTION**: Properly connect the power cable.
  - **CHECK**: Is the fuse blown out?
  - **ACTION**: Investigate why the fuse blew and then replace the fuse. If the cause cannot be determined, replace the fuse. (e.g., short-circuit in the desoldering iron)

- When the power switch is turned ON, soldering iron error is displayed.
  - **CHECK**: Is MODEL FM-2024 connected?
  - **ACTION**: Connect MODEL FM-2024.
  - **CHECK**: Is the cord assembly connected properly?
  - **ACTION**: Connect again while referring to "INITIAL SETUP".
  - **CHECK**: Is the cord assembly broken?
  - **ACTION**: Refer to “Checking the electrical continuity of the cord assembly” in Maintenance.

- The nozzle is not heated.
  - **CHECK**: Is the nozzle cartridge fully inserted?
  - **ACTION**: Fully insert the nozzle cartridge.
  - **CHECK**: Is the cord assembly broken? Is the heater/sensor disconnected?
  - **ACTION**: Refer to “Checking the electrical continuity of the cord assembly” and “Checking the heater/sensor” in Maintenance.

- The nozzle end does not extract solder.
  - **CHECK**: Is the set temperature for the nozzle too high?
  - **ACTION**: Set the nozzle temperature at the appropriate level.
  - **CHECK**: Is the nozzle end plugged or coated with oxide?
  - **ACTION**: Remove the oxide by cleaning the nozzle end with cleaning sponge or tip cleaner.
  - **CHECK**: Has the nozzle end deteriorated due to corrosion?
  - **ACTION**: Replace the nozzle.

- The tip temperature is too high.
  - **CHECK**: Is the connection cord broken?
  - **ACTION**: See “Checking the electrical continuity of the cord assembly”.

- The tip temperature is too low.
  - **CHECK**: Is the nozzle end plugged or coated with oxide?
  - **ACTION**: Remove the oxide by cleaning the nozzle end with HAKKO 999B Tip cleaner.
  - **CHECK**: Has the nozzle end deteriorated due to corrosion?
  - **ACTION**: Replace the nozzle.

C. Desoldering station

**CAUTION**
- Be sure to unplug the cord by holding the plug.
- Securely insert the relay cord all the way to the back.

- The HAKKO FM-204 detects when the iron is removed from the iron holder and sends this data to the station via the relay cord. That data is then used for various functions.

- Connection
  1. Connect the power cord to the inlet on the rear of the station. (Connect the plug from the MODEL FM-2024 to the receptacle on the HAKKO FM-204.)
  
  **CAUTION**
  Connect the plug to the receptacle, aligning the tab on the plug with the opening on the receptacle.

  2. Put MODEL FM-2024 into the iron holder.

  3. Connect the hose from the MODEL FM-2024 to the filter case cover on the HAKKO FM-204 Station.

  4. Plug the power cord into a grounded wall socket. Ensure that the power switch is OFF before inserting the AC plug. Turn the power switches ON.
  
  **CAUTION**
  Be sure to ground this product as it is ESD safe by design.

  5. Turn ON the power.

**CAUTION**
The HAKKO FM-204 does not function properly if the power is turned on with the trigger pressed. Release the trigger and then turn the power ON.
5. OPERATION

Controls and displays

The front panel of the HAKKO FM-204 has four controls.

* ........ End of sequence signal (terminates a phase of a data entry mode). When pressed for less than one second, displays settings already stored.
S ........ Initiates a data entry mode.
UP ...... Increases the displayed value.
DOWN ... Decreases the displayed value.

The HAKKO FM-2027 and the MODEL FM-2024 can be connected to the HAKKO FM-204 Station.

The lamp on the grip operates as follows.
In use ............... Lights
Sleep mode ........... Blinks slowly
Off mode .......... Off
Error ................. Blinks quickly

Operation

1. Turn the power switch ON.
2. By default, when the set temperature is reached, the buzzer sounds, indicating that the unit is ready.
   The heater lamp on the front panel starts blinking.

Displays

The HAKKO FM-204 has a three-digit display element.
Depending on the selected mode, it will display:
- Sensor temperature (of the iron tip)
- Data entry:
  - Selected quantity (See the data entry procedures.)
- Temperature scale:
  °C or °F, depending on selection
- Error detection (See ERROR MESSAGES.)

An audible buzzer is provided to alert the operator when:
- When the station has reached the set temperature, the buzzer will sound once. (Default setting)
- When the low temperature threshold has been crossed, the buzzer will sound continuously. This buzzer will shut off when the sensed temperature returns to the acceptable range.
- When a foreign substance, an incompatible tip, or the soldering end of the tip is inserted into the HAKKO FM-2027, the display will blink and the buzzer will sound continuously.
- When the auto-power shutoff function is activated and power to the heater is shut off, the buzzer sounds three times.

8. ERROR MESSAGES

- Sensor Error
  [S-E]

- Low-temperature alarm tolerance error
  [H-E]
  EXAMPLE:
  **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

- Heater terminal short circuit error
  [HSE]

- Soldering iron error
  [C-E]

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.

NOTE:
The sensor error also occurs if the tip is not inserted properly.
When a grip is connected, [S-E] may be displayed momentarily. This does not indicate a malfunction.

If the sensor temperature falls below the difference between the current temperature setting and the low-temperature alarm tolerance, [H-E] 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.

[HSE] will flash, and the buzzer will sound continuously, when the tip is inserted wrong way round, an incompatible tip is inserted, or a foreign object has found its way into the connector.

[C-E] will be displayed if the connector cord is not attached to the station OR the wrong soldering iron is connected.

CAUTION
By default, the temperature is set to 350°C.
You can confirm the set temperature by pressing the * button. The set temperature will be displayed for two seconds.

CAUTION
When not in use, set the iron in the iron holder.
**Maintenance**

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

a. Set the temperature to 250°C (482°F).

b. When the temperature stabilizes, clean the tip 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, using the heat resistant pad. Set the tip aside to cool.

e. Remaining oxides, such as the yellow discoloration on the tip shaft, can be removed with isopropyl alcohol.

**Checking the heater/sensor**

Measure the resistance between this point and the heater/sensor.

Measure the resistance at room temperature (15 to 25°C; 59 to 77°F). The normal range is 8Ω ±10%. If the resistance is outside this range, replace the nozzle assembly.

**Changing the temperature setting**

- **Temperature setting range**
  
  °C...........350 to 450°C
  °F...........660 to 840°F

**Example:** Changing the temperature from 350°C to 400°C

1. **Insert the control card into the station.**
   - The hundreds digit of the display begins to flash. This indicates that the unit has entered the temperature setting mode and data may be entered.

2. **Enter the hundreds digit.**
   - Press the **UP** or **DOWN** button to set the hundreds digit. When the desired figure is displayed, press the **** button. The tens digit begins to flash.

3. **Enter the tens digit.**
   - Press the **UP** or **DOWN** button to set the tens digit. When the desired figure is displayed, press the **** button. The units digit begins to flash.

4. **Enter the units digit.**
   - Set the desired units digit in the same way as for the tens digit, and then press the **** button. The temperature is recorded to the internal memory, and heater control begins after the new set temperature is displayed.

**To change the set temperature with the control card in the station:**

1. Press and hold the **** button for at least one second. The current temperature setting is displayed, and then the hundreds digit begins to flash one second later. This indicates that the station has entered the temperature setting mode.
   
   Set or change the temperature through the above steps 3 to 4 on “Changing the temperature”.

2. If the **** button is not pressed and held for at least one second, the current set temperature is displayed, and then the tip temperature is displayed.
The temperature accuracy of iron tips is ±15°C (±27°F) except for some tips. If a higher temperature accuracy is required, use the following offset function:

- **Entering the tip offset value**
  - **Example:**
  - When the set temperature is 400°C and the actual tip temperature is 410°C: The difference in temperature is 10°C, so enter -10 as the current offset value.

1. **Insert the control card into the station.**
   - The station enters the temperature setting mode.

2. **Press the **button.**
   - The station enters the offset entry mode.
   - Press the UP or DOWN button to set the hundreds digit.
   - The values that can be entered in °C or °F are 0 (for positive values) and - (for negative values).

3. **Select ** or ** and press the ** button.**
   - The tens digit begins to flash. Enter the offset value.
   - The values that can be entered are 0 to 5 in °C (0 to 9 in °F).
   - The tens and units digits are set with the offset value range.

**Allowable offset value range**

- °C..............-50 to +50°C
- °F..............-90 to +90°F

If you enter a value outside the allowable offset value range, the display returns to the hundreds digit, and you have to enter a correct value.

4. **The station waits for the tip temperature to stabilize, and then the station measures the tip temperature with the tip temperature.**

**CAUTION**

In the offset entry mode (when the display is flashing), the tip temperature is controlled by the current offset value.

5. **Check the difference between the tip temperature and the set temperature.**

---

**Checking procedure**

**WARNING**

Unless otherwise specified, perform the following steps after turning the power switch OFF and disconnecting the AC plug.

- **Checking the cord assembly**
  1. Remove the plug of the cord assembly from the station.
  2. If the handle is attached, remove it.
  3. Remove the nozzle cartridge. For this removal, see “Attaching and replacing the nozzle cartridge.”
  4. Remove the screws for the grip and measure the resistance between the socket terminal and the connector pin as shown below (refer to the wiring diagram).

<table>
<thead>
<tr>
<th>Plug 1 ..........Red (socket) 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug 2 ..........Green (socket) 1</td>
</tr>
<tr>
<td>Plug 3 ..........Black (socket) 2</td>
</tr>
<tr>
<td>Plug 4 ..........Brown (LED circuit board)</td>
</tr>
<tr>
<td>Plug 5 ..........White (thermistors)</td>
</tr>
<tr>
<td>Plug 6 ..........Blue (switch circuit board)</td>
</tr>
</tbody>
</table>

If the resistance is larger than 0 Ω or ∞ in any location, replace the cord assembly.

1. Measure the resistance between plug pin 2 and the nozzle end.
2. If the resistance value exceeds 2 Ω (at room temperature), perform the maintenance for the tip, which is described in the next page. If this does not decrease the value, check the electrical continuity of the cord assembly.
Cleaning the pump

**WARNING**
Unplug the power cord before cleaning the pump.

1) Disassembly
   1. Remove the screws (8) used to secure the cover, and remove the cover.
   2. Remove the screws (4) used to secure the pump assembly.
   3. Remove the inner hose and pump head (at two locations).

2) Cleaning the pump head
   ● Remove the valve and guard, and clean away any adhering flux.

**CAUTION**
If the guard is difficult to remove, warm it with warm air. Do not try to force it off using a screwdriver or other tool. This may deform the guard and reduce its air leakage efficiency.

**CAUTION**
Clean with alcohol or thinner.

**NOTE:**
- Replace the valve if it is deformed or has calification.
- Replace the exhaust filter if dirty.

3) Assembly
   ● Attach the valve and guard.

**CAUTION**
When assembling the pump, be sure that it is airproof and that there are no air leaks.

---

To change the offset value with the control card in the station:

1. Press and hold the button for at least one second.
   The current offset value is displayed, and then the hundreds digit begins to flash one second later. This indicates that the station has entered the offset entry mode. Set or change the temperature following steps 3 and 4 for setting the offset value of the tip temperature.

2. If the button is not pressed and held for at least one second, the current OFF set value is displayed, and then the temperature setting is displayed.

- **Removing solder**

  **Clean the nozzle tip.**
  Be sure the nozzle tip is tinned with clean, fresh solder.

  **If the nozzle tip is coated with oxidized film or like, its thermal conductivity deteriorates. In contrast, if the nozzle end is wetted with a small amount of clean solder, its thermal conductivity increases.**

1. **Melt the solder.**
   Position the nozzle above the lead to be desoldered as shown in the illustration and melt the solder.

   **CAUTION**
   Never allow the nozzle to touch the board itself.

   Confirm that the solder is melted.

   **CAUTION**
   To confirm that all solder is melted, observe the inside of the hole and the backside of the P.W.B. If this is difficult to do, try slowly moving the lead with the nozzle. If the lead moves, the solder is melted. Never move the lead by force. If it doesn’t move easily, the solder isn’t yet fully melted.

2. **Extract the solder.**
   After confirming that the solder is completely melted, extract the solder by pressing the button (or squeezing the trigger).

   **CAUTION**
   Never leave any solder remaining inside the hole in the P.W.B.

3. **Problems during desoldering.**
   If solder remains, resolder the component and repeat the desoldering process.

---

1. Press and hold the button for at least one second.
   The current offset value is displayed, and then the hundreds digit begins to flash one second later. This indicates that the station has entered the offset entry mode. Set or change the temperature following steps 3 and 4 for setting the offset value of the tip temperature.

2. If the button is not pressed and held for at least one second, the current OFF set value is displayed, and then the temperature setting is displayed.

- **Removing solder**

  **Clean the nozzle tip.**
  Be sure the nozzle tip is tinned with clean, fresh solder.

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   **CAUTION**
   Never leave any solder remaining inside the hole in the P.W.B.

3. **Problems during desoldering.**
   If solder remains, resolder the component and repeat the desoldering process.
6. PARAMETER SETTINGS

● Parameter entry mode process
Select the parameter entry mode using the following operation.

1. Turn the power on while pressing the UP button. The station enters the parameter entry mode.
2. Select the parameter number. "0" is initially displayed, and the tens digit begins to flash. Use the * and UP buttons to change the parameter setting, or press the DOWN button to select the units digit.
3. Select the number for setting the parameter setting set in the preceding step. The current setting is initially displayed. Use the * or DOWN button to enter the parameter setting. Press the * button to return to step 2.
4. The display changes to "SS", and the station asks whether to exit the parameter entry mode. Select "SS" and press the * button to exit the parameter entry mode.

● Display: Temperature display (°C or °F)

The HAKKO FM-204 has the following parameters.

<table>
<thead>
<tr>
<th>Number</th>
<th>LED display</th>
<th>Setting</th>
<th>Default setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature display</td>
<td>01</td>
<td></td>
<td>°F display</td>
</tr>
<tr>
<td>Auto sleep time setting</td>
<td>02</td>
<td>Tens digit entry</td>
<td>Sleep time 8 min.</td>
</tr>
<tr>
<td>Low temperature error setting</td>
<td>03</td>
<td>Hundreds digit entry</td>
<td>Low temperature threshold entry 57°F</td>
</tr>
<tr>
<td>Custom input setting</td>
<td>04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blower setting (5 min. countdown)</td>
<td>05</td>
<td></td>
<td>f</td>
</tr>
<tr>
<td>Blower setting (Sleep temperature adjustment)</td>
<td>06</td>
<td></td>
<td>On (f)</td>
</tr>
<tr>
<td>Auto sleep on/off setting</td>
<td>07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto shutdown on/off setting</td>
<td>08</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE:
- Each time the UP or DOWN button is pressed, the display toggles between the following displays: "SS" and "SS".
- When "SS" is selected, the parameter number selection screen in step 2 is displayed.

Checking and replacing the ceramic paper filter

The filter is clogged with hardened flux.

Fit the filter case cover in place.

1. Turn the filter case cover on the HAKKO FM-204 station clockwise to unlock it, then remove the cover by pulling it straight out.
2. Replace the ceramic paper filter.
3. After replacing the ceramic paper filter, press the filter case cover with its tabs inserted into the corresponding slots in the filter case then turn clockwise to lock it.
Cleaning the inside of suction pipe
Move the nozzle cartridge to the cleaning position indicated in figure at right. Change the position of the nozzle cartridge before turning the power ON, to prevent accidents.

To clean the inside of the suction pipe, ensure that the solder remaining in the pipe has been completely melted.

For the cleaning of the suction pipe, set the nozzle temperature to 400°C/750°F or higher. Start this cleaning after the set temperature has been reached.

To clean the inside of the suction pipe, insert the cleaning drill fully into the suction pipe while turning it clockwise. Then remove the accumulated debris.

Check and clean the front and back holder bushings
If foreign matter gets stuck on the contact surface between the front holder and the filter pipe assembly, or between the back rubber holder bushing and the filter pipe assembly, air will be sucked into the tool, preventing normal desoldering. Remove the solder and flux adhering to the surface of front holder and back holder, then connect the filter pipe assembly.

● D2 : Auto sleep time setting
Set the time until the auto sleep function activates after the soldering iron is set on the iron holder.

Auto sleep examples:
- Sleep (immediately after the iron is set on the iron holder)
- Sleep (10 minutes after the iron is set on the iron holder)

NOTE:
- The auto sleep time can be set in units of minutes (up to 29 minutes).
- The tip temperature is reduced to approximately 200°C (400°F) during sleep mode. Note that no precise measurement has been performed. The tip temperature varies significantly, depending on the ambient environment, tip type and iron types. 200°C (400°F) should only be used as a guide.
- When the display is [ ], press the UP or DOWN button, or remove the soldering iron from the iron holder to resume power to the heater.

NOTE:
The sleep function will not activate when the set temperature is less than approximately 300°F.

● D3 : Lower temperature error setting
Lower temperature error
- When the temperature drops below a set limit, an error is displayed and the buzzer sounds.
- When the temperature returns within the allowable range, the buzzer stops.

Low temperature setting range
for Celsius: 30 to 150°C
for Fahrenheit: 50 to 300°F

Example:
When the set temperature is 350°C and the low temperature error setting is 100°C, a warning buzzer sounds when the temperature drops to 250°C.

CAUTION
- The hundreds digit begins to flash when entering the low temperature setting.
- Use the method for setting the temperature to enter and set the low temperature setting.
- If you enter a value outside the low temperature setting range (see the table on the left), the display returns to the hundreds digit, and you have to enter a correct value.
- After the low temperature setting is set, the display returns to the parameter number selection screen.
7. MAINTENANCE

Properly maintained, the MODEL FM-2024 desoldering tool should provide years of good service. Efficient desoldering depends upon the temperature, and the quality and quantity of the solder and flux. Perform the following service procedures as dictated by the conditions of the gun’s usage.

⚠️ WARNING
Since the desoldering tool can reach a very high temperature, please work carefully. Except when cleaning the nozzle and heating element, ALWAYS turn the power switch OFF and disconnect the power plug before performing any maintenance procedure.

Maintenance of nozzle

⚠️ CAUTION
The desoldering tool may be extremely hot. During maintenance, please work carefully.

Inspect and clean the nozzle

- Plug in the power cord, turn the power switch ON and let the nozzle heat up.

⚠️ CAUTION
The cleaning pin will not pass through the nozzle until the solder inside the nozzle is completely melted.

- Clean out the hole of the nozzle with the nozzle cleaning pin (not included as a standard accessories).
- If the cleaning pin does not pass through the hole in the nozzle, clean with the cleaning drill (not included as a standard accessories).
- Check the condition of the solder plating on the nozzle tip.
- Check visually if the nozzle was eroded.

⚠️ CAUTION
The inside hole and the surface of the nozzle is plated with a special alloy. Should this alloy become eroded by high-temperature solder, the nozzle will not be able to maintain the proper temperature.

- If the nozzle is still in a good condition, put some fresh solder on the nozzle tip to protect solder plated area from oxidation.

Cleaning with the nozzle cleaning pin
- The cleaning pin passes completely through the hole.

Cleaning with the cleaning drill
- Before cleaning
- Insert the bit while turning it clockwise.
- Put the drill bit out straight without turning it.

CAUTION
If the cleaning drill is forced into the nozzle, the drill bit could break or be damaged. Please use the proper size cleaning pin or cleaning drill for the nozzle diameter.

Solder plating
- If the cleaning pin and cleaning drill does not pass through the hole in the nozzle, replace the nozzle.
- If the solder plating on the nozzle tip is worn, replace the nozzle.
- If the inside hole of the nozzle is eroded, replace the nozzle.

Hole is damaged by erosion.

⚠️ CAUTION
Unfortunately, it is often difficult to observe this condition. Therefore, if desoldering efficiency goes down and all other parts appear to be OK, the nozzle is probably eroded and should be replaced.