Thank you for purchasing the HAKKO FU-500 solder feed unit. Please read this manual before operating the HAKKO FU-500. Keep this manual readily accessible for reference.

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2. SPECIFICATIONS .......................... 1
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11. PARTS LIST ............................ 23

For more information about replacement parts or latest information, please visit our website (http://www.hakko.com) or HAKKO Document Portal. (see below)
1. PACKING LIST

HAKKO FU-500 .................................................. 1
Feeder unit (Type L or straight) .......................... 1
Tube unit (for ø0.3 to 1.0 mm) ......................... 1
Tube unit (for ø1.2 to 1.6 mm) ......................... 1
Solder reel stand .......................................... 1

Feeder cable (5m) ........................................... 1
Power cord (for HAKKO FU-500) ..................... 1
Instruction manual ....................................... 1

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

2. SPECIFICATION

<table>
<thead>
<tr>
<th>HAKKO FU-500 (Station only)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power consumption</strong></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feeder unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model number</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
</tr>
</tbody>
</table>

**Solder diameter**

For the HAKKO FU-500, the compatible solder wire size varies by model number.

Please check the model number of your product before ordering corresponding parts according to the Part List on page 23.

The solder diameter that can be used with the HAKKO FU-500 are shown in the table below.

<table>
<thead>
<tr>
<th>Solder diameter (mm)</th>
<th>0.3</th>
<th>0.5</th>
<th>0.6(0.65)</th>
<th>0.8</th>
<th>1.0</th>
<th>1.2</th>
<th>1.6</th>
</tr>
</thead>
</table>

Up to 1kg bobbin of solder can be used.

10. EXPLODED VIEW
9. TROUBLE SHOOTING GUIDE

● Solder cannot be fed properly. / Solder Feed error is displayed.
  **CHECK**: Is “solder clogging” or “no solder” occurred?
  **ACTION**: Remove any clogged solder. For “no solder” error, add new solder.

**CHECK**: Is the cutting blade or the pulley deposited with flux?
  **ACTION**: Remove any flux using a brush and alcohol.
  (See 7. MAINTENANCE in page 18.)

**CHECK**: Is the tube unit or the teflon tube contaminated, worn away and damaged?
  **ACTION**: Replace the part.
  (See 7. MAINTENANCE in page 18.)

**CHECK**: Is the tube unit forced?
  **ACTION**: Relax the tube unit.
  (Secure the bending radius of more than 10 cm.)

**CHECK**: Is the teflon tube or the guide pipe clogged with flux?
  **ACTION**: Remove any flux using a brush and alcohol.
If the problem persists, replace the part.

**CHECK**: Is the part such as the solder feed pulley unit corresponded to the solder diameter?
  **ACTION**: Replace the part with the correct one.
  (See 11. PARTS LIST in page 23.)

● Illegal Input error is displayed.
  **CHECK**: Is the HAKKO FU-500 received any overlapped or illegal signal from the robot?
  **ACTION**: Check the robot program.

● Iron Controller Error is displayed.
  **CHECK**: Does the soldering iron have a sensor failure, too low temperature or any other faulty condition?
  **ACTION**: Check the soldering iron.

● Motor Driver Error is displayed.
  **CHECK**: Does the motor or the motor driver have any faulty condition?
  **ACTION**: Contact your HAKKO representative.

● System Error is displayed.
  **ACTION**: Contact your HAKKO representative.

● Emergency Stop is displayed.
  **ACTION**: Check the command from the robot.

3. WARNINGS, CAUTIONS AND NOTES

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

⚠️ **WARNING**: Failure to comply with a WARNING may result in serious injury or death.

⚠️ **CAUTION**: Failure to comply with a CAUTION may result in injury to the operator, or damage to the items involved. Two examples are given below.

⚠️ **WARNING**
- Turn the power off when not in use, or left unattended.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.

⚠️ **CAUTION**
- To prevent accidents or damage to the HAKKO FU-500, be sure to observe the following.

*This product is protected against electrostatic discharge.
 Specifications and design are subject to change without notice.*
When abnormal heating of the motor driver is detected, the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.

When a hardware error is detected, the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.

Upon receiving an emergency stop command from the robot, the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.
8. ERROR MESSAGES

●Solder feed trouble error

Solder Feed Trouble
Push Knob

When the solder feed sensor detects "no solder" or "clogging", the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.

●Illegal input error

Illegal Input
Push Knob

When an illegal input signal from the robot is detected, the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.

●Iron Controller Error

Iron Controller Error
Push Knob

This error message is displayed when the HAKKO FU-601 ready input is "Not Ready" during Auto Mode or Manual Program Mode.

This error will not occur in Adjustment Mode or Continuous Feed Mode.

If the HAKKO FU-601 ready input is "Not Ready" before Auto Mode or Manual Program Mode is started up, the system will not turn into error status but remain standby status.

When this error occurs, the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.

●Feeder Unit

Feeder unit cover screw

Solder feed pulley unit (option)
Feed position adjuster
Teflon tube (option)

To solder reel stand

Feeder unit cover *

Teflon tube (option)

Guide tube (option)

Guide pipe (option)

Tube unit

SAUTION

The solder feed pulley unit with the cutting blade is dangerous. Be careful not to cut your fingers.

CAUTION

Make sure to attach this cover to prevent a flux from entering into the feeder unit.
5. INITIAL SETUP

Use a hex wrench of 2.5 mm.

Connecting components

Connecting cable to HAKKO FU-601
(Including in the HAKKO FU-601)

Feeder unit

HAKKO FU-500

Feeder cable

Assembling the feeder unit

Install the tube unit, the solder feed pulley unit, the solder feed guide set and the teflon tube. Tighten the screws shown in the figure below. Draw solder through the tube unit and supply to the feeder unit.

How to set solder

Secure the bending radius of more than 10cm to prevent solder clogging.

Ensure that solder is reeled out of the top of the bobbin.

Draw solder through the tube unit and press the end of solder against the pulley of the solder feed pulley unit. With this condition, start the HAKKO FU-500 to feed solder until solder comes out of the end of the teflon tube.

CAUTION

Do not touch any screws than the hexagon socket screws described in this manual. The attachment of the solder feed pulley unit for φ0.3mm (BX1000) is different. Refer to the “How to set solder” in the BX1000. Please be careful not to tighten the screw too much.

For information about how to install the teflon tube, see page 17.

CAUTION

Place which is easy to adhere the solder and flux.

6. MAINTENANCE

As a guide, perform maintenance/cleaning when replacing the solder.

Remove any solder or flux adhered on the solder feed pulley unit using a brush or other appropriate tool. If an insufficient cutting depth or splashing of solder balls are found in spite of the proper maintenance, the cutting blade may have reached its end of life.

Since it is impossible to replace the cutting blade only, replace the whole solder feed pulley unit.

After soldering, flux is adhered on the guide pipe part. Regularly wipe off the flux using alcohol.

CAUTION

Only the cutting blade and the teflon tube in the tube unit are not interchangeable.

Place which is easy to adhere the solder and flux.

CAUTION

The solder feed pulley unit with the cutting blade is dangerous. Be careful not to cut your fingers.

Solder feed pulley unit *

Teflon tube in tube unit *

Teflon tube

Cutting blade

CAUTION

Secure the bending radius of more than 10cm to prevent solder clogging.

Tighten

How to set solder
●How to change the solder diameter
You can change the solder diameter by replacing the teflon tube, the solder feed guide set or the solder feed pulley unit.

The compatible solder diameters varies by model number of the HAKKO FU-500. Please check your model number and then see the part list on the back cover of this manual when you need some part replacement.

⚠️ CAUTION
Only use compatible solder of specified size. Failing to do so may cause a failure. The attachment of the solder feed pulley unit for φ0.3mm (BX1000) is different. Refer to the “How to set solder” in the BX1000.

How to install the teflon tube

Turn the solder feed guide nozzle counterclockwise and remove the solder feed guide support. You can now install the teflon tube. Lastly, insert the guide pipe.

The teflon tube is quite long in length. Cut the excess length of the teflon tube to leave an appropriate length (about 3 to 5 mm) from the guide pipe before use.

⚠️ CAUTION
Make sure that the teflon tube protrudes from the guide pipe before use. Otherwise, the guide pipe may be clogged with solder. It is important to use a cutter knife instead of scissors to cut the teflon tube carefully in order to prevent the end of solder wire from being squished.

●Adjusting the solder feed position

1. Loosening the adjustment screw ① will allow you to move the entire solder feed guide set as shown in the figure below. Move the solder feed guide set to the tip.

2. Loosening the adjustment screw ② will allow you to move the guide pipe as shown in the figure below. Move the guide pipe until solder comes into contact with the tip.

Turning the eccentric tuning screw ③ will turn the feed position adjuster together, allowing you to make tuning. (This screw cannot be removed.)
6. OPERATION

Auto mode

In auto mode, the unit operates according to commands from the robot. There are two types of auto mode: PS and DS. For more information, see the timing chart below:

- **PS (Point soldering) mode**

Point soldering process

Program No. (In)  
Start solder feed (In)  
Controller ready (Out)  
Primary feed (Internal)  
Primary back feed (Internal)  
Unit down command (Out)  
Upper limit detection (In)  
Lower limit detection (In)  
Primary heating (Internal)  
Secondary feed (Internal)  
Secondary back feed (Internal)  
Secondary heating (Internal)  
Tertiary feed (Internal)  
Tertiary back feed (Internal)  
Tertiary heating (Internal)  
Status signal: Form1 (Out)  
Status signal: Form2 (Out)

*When selecting a program number, set the signal P7 (MSB) to 0 (zero).

*The controller outputs either the status signal Form1 or Form2 (according to the setting made during program setting).

- Program selection setup time: \( t_{ps} > 5 \text{msec} \)
- Program selection hold time: \( t_{ph} > 25 \text{msec} \)
- Start signal pulse width: \( t_{sw} > 25 \text{msec} \)

4. Iron Connect (Connection status to the HAKKO FU-601)

Iron Connect

Connection or Disconnection

When Not Connect is selected, preset settings can only be made in the HAKKO FU-601 and no iron controller error is detected.

5. Iron Status (Selecting the HAKKO FU-601 Ready or Error signal)

Iron Control Status

You can select which signal HAKKO FU-601 will output to the robot, Ready or Error.

Selecting Log View

When you select Log View, you can view the number of soldering points that have been made and the total amount of solder that has been fed.

If you select Log Clear, you will enter the Log Clear screen. Selecting OK in this screen will reset the count and you will enter the Mode Select screen. If you select Cancel, you will return to the previous screen.

Operation Log

- Total Point xxxxx p
- Total Feed xxxxx mm

Log Clear

Log Clear ?

Cancel OK
Selecting Parameter Set

When you select Parameter Set, you will enter Parameter Setting mode. In this mode, you can specify the operation of the entire system.

<table>
<thead>
<tr>
<th>Parameter Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed Speed</td>
</tr>
<tr>
<td>S-U Mode</td>
</tr>
<tr>
<td>S-U Timeout</td>
</tr>
<tr>
<td>Iron Connect</td>
</tr>
<tr>
<td>Iron Status</td>
</tr>
</tbody>
</table>

1. Feed Speed (Specifying the feed speed in continuous feed mode)

Feed Speed

0.1 - 99.9 mm/sec

2. S-U Mode (Selecting a slide unit connection mode)

Slide Unit Connect Mode

- Internal (Int) or External (Ext)

When Internal Mode is selected, all upper/lower limit detection signals from the robot will be ignored.

3. S-U Timeout (Specifying the slide unit upper/lower limit detection timeout)

Slide Unit Time - out

5 - 99 sec

DS (Drag Soldering) Mode

Drag soldering process

- When selecting a program number, set the signal P7 (MSB) to 1.
- The controller outputs either the status signal Form1 or Form2 (according to the setting made during program setting).

Program selection setup time: \( t_{ps} \geq 5 \) msec
Program selection hold time: \( t_{ph} \geq 25 \) msec
Start signal pulse width: \( t_{sw} \geq 25 \) msec
Iron move signal pulse width: \( t_{msw} \geq 25 \) msec
Iron stop signal pulse width: \( t_{mew} \geq 25 \) msec
Robot I/F pin assignment

2.54 mm pitch 26-pin ribbon cable connector

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Signal name</th>
<th>I/O</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P0</td>
<td>In</td>
<td>Program No. LSB</td>
</tr>
<tr>
<td>2</td>
<td>P1</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>3</td>
<td>P2</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>4</td>
<td>P3</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>5</td>
<td>P4</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>6</td>
<td>P5</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>7</td>
<td>P6</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>8</td>
<td>P7</td>
<td>In</td>
<td>Program No. MSB</td>
</tr>
<tr>
<td>9</td>
<td>Start</td>
<td>In</td>
<td>Start solder feed</td>
</tr>
<tr>
<td>10</td>
<td>Low_Lim</td>
<td>In</td>
<td>Bottom limit detection</td>
</tr>
<tr>
<td>11</td>
<td>Up_Lim</td>
<td>In</td>
<td>Top limit detection</td>
</tr>
<tr>
<td>12</td>
<td>Move_End</td>
<td>In</td>
<td>End continuous feed</td>
</tr>
<tr>
<td>13</td>
<td>Emergency</td>
<td>In</td>
<td>Emergency stop</td>
</tr>
<tr>
<td>14</td>
<td>Ready</td>
<td>Out</td>
<td>Controller ready</td>
</tr>
<tr>
<td>15</td>
<td>Down</td>
<td>Out</td>
<td>Unit down command</td>
</tr>
<tr>
<td>16</td>
<td>Move_Start</td>
<td>Out</td>
<td>Start continuous feed</td>
</tr>
<tr>
<td>17</td>
<td>Feeder_Error</td>
<td>Out</td>
<td>Feeder controller error output</td>
</tr>
<tr>
<td>18</td>
<td>Iron_Ctrl_Status</td>
<td>Out</td>
<td>HAKKO FU-601 status output</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Error or Ready)</td>
</tr>
<tr>
<td>19</td>
<td>Status</td>
<td>Out</td>
<td>Status signal</td>
</tr>
<tr>
<td>20</td>
<td>NC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>NC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>NC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>IO_Vsup</td>
<td>In</td>
<td>I/O power input (24V recommended)</td>
</tr>
<tr>
<td>24</td>
<td>DC24V_OUT</td>
<td>Out</td>
<td>24V output</td>
</tr>
<tr>
<td>25</td>
<td>IO_GND</td>
<td>Out</td>
<td>I/O GND</td>
</tr>
<tr>
<td>26</td>
<td>IO_GND</td>
<td>Out</td>
<td>I/O GND</td>
</tr>
</tbody>
</table>

1) The program No. MSB (P7) is used to select point or drag soldering.
   - OFF : Point soldering mode
   - ON : Drag soldering mode
2) Top_Lim and Bot_Lim signals are ignored when the slide unit connection mode is selected to internal mode.
3) Down signal is not output when the slide unit connection mode is selected to internal mode.
4) DC24V output voltage is turned ON/OFF by interlocking with the ON/OFF state of the power switch.

In Program Setting Mode, the following settings can be made:

| Feed 1 : | Primary Feed Length | 0.1 - 99.9mm |
| Feed Speed 1 : | Primary Feed Speed | 0.1 - 99.9mm/sec |
| Back Feed 1 : | Primary Back Feed Length | 0 - 20.0mm |
| Back Speed 1 : | Primary Back Speed | 0 - 99.9mm/sec |
| Heat Time 1 : | Primary Heat Time | 0.1 - 9.9sec |
| Feed 2 : | Secondary Feed Length | 0 - 99.9mm |
| Feed Speed 2 : | Secondary Feed Speed | 0 - 99.9mm/sec |
| Back Feed 2 : | Secondary Back Feed Length | 0 - 20.0mm |
| Back Speed 2 : | Secondary Back Speed | 0 - 99.9mm/sec |
| Heat Time 2 : | Secondary Heat Time | 0 - 9.9sec |
| Feed 3 : | Tertiary Feed Length | 0 - 99.9mm |
| Feed Speed 3 : | Tertiary Feed Speed | 0 - 99.9mm/sec |
| Back Feed 3 : | Tertiary Back Feed Length | 0 - 20.0mm |
| Back Speed 3 : | Tertiary Back Speed | 0 - 99.9mm/sec |
| Heat Time 3 : | Tertiary Heat Time | 0 - 9.9sec |
| Preset # : | Iron Ctrl Preset Number | - (Non) / 0 to 5 ※1 |
| Status Sig : | Status Signal Format | Format 1 / Format 2 |

※1 The solder might not be properly fed when setting at high speed depending on type of the solder. Contact your HAKKO representative.
※2 When the Preset Number is set to "Non", the set temperature at start-up of the program will be used for operation.
● Selecting Solder Feed

When you select Solder Feed, you will enter Solder Feed Mode. In this mode, you will specify the solder feed speed for continuous feed of solder. No signal will be output to the robot. All input signals from the robot will be ignored and no solder feed error will be detected.

Select SET FEED SPEED

Solder Feed

SELECT FEED SPEED

Feed Speed

10.0mm / sec

● Selecting Program Set

When you select Program Set, you will enter Program Setting Mode. Up to 100 programs (0 to 99) can be programmed in either PS (point soldering) or DS (drag soldering) mode.

Select Feed Mode

PS Mode

DS Mode

Exit

Select Program Number

Select Parameter

Feed Speed1

10.0

Back Feed1

0.1

Heat Time1

2.0

Feed Length

10.0mm

Robot I/F input and output circuits

Input circuit

IO_Vsup

2~10mA

(24V recommended)

Out

DC24V OUT

500mA Max

HAKKO FU-601 I/F

Connecting cable (6-pole 6-core modular cable)

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Signal name</th>
<th>I/O</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RxD</td>
<td>In</td>
<td>Incoming data</td>
</tr>
<tr>
<td>2</td>
<td>TxD</td>
<td>Out</td>
<td>Outgoing data</td>
</tr>
<tr>
<td>3</td>
<td>Iron_Ready</td>
<td>In</td>
<td>HAKKO FU-601 Ready signal</td>
</tr>
<tr>
<td>4</td>
<td>Iron_GND</td>
<td>In</td>
<td>HAKKO FU-601 GND</td>
</tr>
<tr>
<td>5</td>
<td>Iron_GND</td>
<td>In</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Iron_Vcc</td>
<td>In</td>
<td>HAKKO FU-601 Vcc (5V)</td>
</tr>
</tbody>
</table>

It transfers status and data to and from the HAKKO FU-601.

PC I/F : USB Mini-B

The PC I/F establishes communications with PC to send and receive various information. It is operated on a virtual COM port.

Please install the driver (freeware) to your PC from the following URL:

http://www.cypress.com/?rID=63794

From the top page, proceed as follows:

1) Uploading/downloading programs
   The PC I/F writes (downloads) programs created in the PC to the controller or reads in and uploads programs to the PC.

2) Uploading/downloading the HAKKO FU-601 setting information
   The PC I/F uploads or downloads the set temperature, the offset temperature and the preset temperature of the HAKKO FU-601.
Selecting Simulation Mode

When you select Simulation Mode, you will enter Simulation Mode with the Simulation Mode Standby screen shown. If the HAKKO FU-500 receives a Start signal when this screen is displayed, it will behave in the same manner as in Auto Mode but the motor will not start (no solder will be fed).

Note that no solder feed or iron control error will be detected.

Selecting Test Operation Mode

When you select Test Operation Mode, you will enter Test Operation Mode. In this mode, the HAKKO FU-500 will start to operate in PS (point soldering) mode for operation check or adjustment after selecting a program number.

The HAKKO FU-500 outputs the same signal to the robot as the output signal in Auto Mode. All input signals from the robot will be ignored, but any solder feed error will be detected and displayed.

Selecting Auto Mode

When you select Auto Mode, you will return to the Auto Mode Standby screen. If the HAKKO FU-500 receives a Start signal when this screen is displayed, it will start to operate for Auto Mode.

Changing the settings

Turn on the power switch of HAKKO FU-500. The start-up screen will be displayed, and then move to Auto Mode Standby screen.

If the HAKKO FU-500 receives a Start signal when this screen is displayed, it will start to operate for Auto Mode.

If the HAKKO FU-500 does not receive a Start signal and the control button is pressed, it will show the Mode Select screen.

To change the value or the cursor position, turn the control knob and then press the knob to confirm.

3) Uploading the HAKKO FU-601 tip temperature
   The PC I/F reads in the iron tip temperature from the HAKKO FU-601 and uploads it to the PC.

4) Uploading the operation log
   The PC I/F uploads the total number of soldering points and the total amount of fed solder to the PC.

5) Clearing the operation log.
   The PC I/F clears the operation log.

The PC I/F does not operate while the feeder is run except for uploading of the tip temperature. The display for uploading of the tip temperature is not updated while the feeder is run.

For more information about how to use, see the HAKKO FU-500 PC Link Software Instruction Manual.

The PC Link Software can be downloaded from the HAKKO Document Portal after user registration.

https://doc.hakko.com

Changing the settings

Turn on the power switch of HAKKO FU-500. The start-up screen will be displayed, and then move to Auto Mode Standby screen.

If the HAKKO FU-500 receives a Start signal when this screen is displayed, it will start to operate for Auto Mode.

If the HAKKO FU-500 does not receive a Start signal and the control button is pressed, it will show the Mode Select screen.

To change the value or the cursor position, turn the control knob and then press the knob to confirm.

3) Uploading the HAKKO FU-601 tip temperature
   The PC I/F reads in the iron tip temperature from the HAKKO FU-601 and uploads it to the PC.

4) Uploading the operation log
   The PC I/F uploads the total number of soldering points and the total amount of fed solder to the PC.

5) Clearing the operation log.
   The PC I/F clears the operation log.

The PC I/F does not operate while the feeder is run except for uploading of the tip temperature. The display for uploading of the tip temperature is not updated while the feeder is run.

For more information about how to use, see the HAKKO FU-500 PC Link Software Instruction Manual.

The PC Link Software can be downloaded from the HAKKO Document Portal after user registration.

https://doc.hakko.com
Selecting Simulation Mode
When you select Simulation Mode, you will enter Simulation Mode with the Simulation Mode Standby screen shown. If the HAKKO FU-500 receives a Start signal when this screen is displayed, it will behave in the same manner as in Auto Mode but the motor will not start (no solder will be fed). Note that no solder feed or iron control error will be detected.

Selecting Test Operation Mode
When you select Test Operation Mode, you will enter Test Operation Mode. In this mode, the HAKKO FU-500 will start to operate in PS (point soldering) mode for operation check or adjustment after selecting a program number. The HAKKO FU-500 outputs the same signal to the robot as the output signal in Auto Mode. All input signals from the robot will be ignored, but any solder feed error will be detected and displayed.

Changing the settings
Turn on the power switch of HAKKO FU-500.
The start-up screen will be displayed, and then move to Auto Mode Standby screen.

If the HAKKO FU-500 receives a Start signal when this screen is displayed, it will start to operate for Auto Mode.
If the HAKKO FU-500 does not receive a Start signal and the control button is pressed, it will show the Mode Select screen.

To change the value or the cursor position, turn the control knob and then press the knob to confirm.

- Uploading the HAKKO FU-601 tip temperature
  The PC I/F reads in the iron tip temperature from the HAKKO FU-601 and uploads it to the PC.
- Uploading the operation log
  The PC I/F uploads the total number of soldering points and the total amount of fed solder to the PC.
- Clearing the operation log.
The PC I/F clears the operation log.

The PC Link Software can be downloaded from the HAKKO Document Portal after user registration.

https://doc.hakko.com

For more information about how to use, see the HAKKO FU-500 PC Link Software Instruction Manual.

The PC Link Software does not operate while the feeder is run except for uploading of the tip temperature. The display for uploading of the tip temperature is not updated while the feeder is run.
Selecting Solder Feed

When you select Solder Feed, you will enter Solder Feed Mode. In this mode, you will specify the solder feed speed for continuous feed of solder. No signal will be output to the robot. All input signals from the robot will be ignored and no solder feed error will be detected.

Select SET FEED SPEED

Select SET FEED SPEED

Select Program Set

When you select Program Set, you will enter Program Setting Mode. Up to 100 programs (0 to 99) can be programmed in either PS (point soldering) or DS (drag soldering) mode.

Select Feed Mode

Select Feed Mode

Select Parameter

Select Parameter

PC I/F : USB Mini-B

The PC I/F establishes communications with PC to send and receive various information. It is operated on a virtual COM port.

Please install the driver (freeware) to your PC from the following URL:

http://www.cypress.com/?rID=63794

From the top page, proceed as follows:
(Support > Software Tools > Software and Drivers > Microsoft Certified USB UART Driver)

1) Uploading/downloading programs
The PC I/F writes (downloads) programs created in the PC to the controller or reads in and uploads programs to the PC.

2) Uploading/downloading the HAKKO FU-601 setting information
The PC I/F uploads or downloads the set temperature, the offset temperature and the preset temperature of the HAKKO FU-601.
Robot I/F pin assignment

2.54 mm pitch 26-pin ribbon cable connector

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Signal name</th>
<th>I/O</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P0</td>
<td>In</td>
<td>Program No. LSB</td>
</tr>
<tr>
<td>2</td>
<td>P1</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>3</td>
<td>P2</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>4</td>
<td>P3</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>5</td>
<td>P4</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>6</td>
<td>P5</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>7</td>
<td>P6</td>
<td>In</td>
<td>Program No.</td>
</tr>
<tr>
<td>8</td>
<td>P7</td>
<td>In</td>
<td>Program No. MSB</td>
</tr>
<tr>
<td>9</td>
<td>Start</td>
<td>In</td>
<td>Start solder feed</td>
</tr>
<tr>
<td>10</td>
<td>Low_Lim</td>
<td>In</td>
<td>Bottom limit detection</td>
</tr>
<tr>
<td>11</td>
<td>Up_Lim</td>
<td>In</td>
<td>Top limit detection</td>
</tr>
<tr>
<td>12</td>
<td>Move_End</td>
<td>In</td>
<td>End continuous feed</td>
</tr>
<tr>
<td>13</td>
<td>Emergency</td>
<td>In</td>
<td>Emergency stop</td>
</tr>
<tr>
<td>14</td>
<td>Ready</td>
<td>Out</td>
<td>Controller ready</td>
</tr>
<tr>
<td>15</td>
<td>Down</td>
<td>Out</td>
<td>Unit down command</td>
</tr>
<tr>
<td>16</td>
<td>Move_Start</td>
<td>Out</td>
<td>Start continuous feed</td>
</tr>
<tr>
<td>17</td>
<td>Feeder_Error</td>
<td>Out</td>
<td>Feeder controller error output</td>
</tr>
<tr>
<td>18</td>
<td>Iron_Ctrl_Status</td>
<td>Out</td>
<td>HAKKO FU-601 status output (Error or Ready)</td>
</tr>
<tr>
<td>19</td>
<td>Status</td>
<td>Out</td>
<td>Status signal</td>
</tr>
<tr>
<td>20</td>
<td>NC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>NC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>NC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>IO_Vsup</td>
<td>In</td>
<td>I/O power input (24V recommended)</td>
</tr>
<tr>
<td>24</td>
<td>DC24V_OUT</td>
<td>Out</td>
<td>24V output</td>
</tr>
<tr>
<td>25</td>
<td>IO_GND</td>
<td>Out</td>
<td>I/O GND</td>
</tr>
<tr>
<td>26</td>
<td>IO_GND</td>
<td>Out</td>
<td>I/O GND</td>
</tr>
</tbody>
</table>

1) The program No. MSB (P7) is used to select point or drag soldering.
   OFF : Point soldering mode
   ON : Drag soldering mode
2) Top_Lim and Bot_Lim signals are ignored when the slide unit connection mode is selected to internal mode.
3) Down signal is not output when the slide unit connection mode is selected to internal mode.
4) DC24V output voltage is turned ON/OFF by interlocking with the ON/OFF state of the power switch.

In Program Setting Mode, the following settings can be made:

Feed 1 : Primary Feed Length 0.1 - 99.9mm
Feed Speed 1: Primary Feed Speed 0.1 - 99.9mm/sec
Back Feed 1 : Primary Back Feed Length 0 - 20.0mm
Back Speed 1: Primary Back Speed 0 - 99.9mm/sec
Heat Time 1 : Primary Heat Time 0.1 - 9.9sec
Feed 2 : Secondary Feed Length 0 - 99.9mm
Feed Speed 2: Secondary Feed Speed 0 - 99.9mm/sec
Back Feed 2 : Secondary Back Feed Length 0 - 20.0mm
Back Speed 2: Secondary Back Speed 0 - 99.9mm/sec
Heat Time 2 : Secondary Heat Time 0 - 9.9sec
Feed 3 : Tertiary Feed Length 0 - 99.9mm
Feed Speed 3: Tertiary Feed Speed 0 - 99.9mm/sec
Back Feed 3 : Tertiary Back Feed Length 0 - 20.0mm
Back Speed 3: Tertiary Back Speed 0 - 99.9mm/sec
Heat Time 3 : Tertiary Heat Time 0 - 9.9sec
Preset #: Iron Ctrl Preset Number - (Non) / 0 to 5 ※1
Status Sig : Status Signal Format Format 1 / Format 2

※1 In either secondary or tertiary, setting the feed speed, feed length or heating time to 0 (zero) will skip the corresponding feed or heating operation.
※2 Setting any back speed or back feed length to 0 (zero) will skip the corresponding back feed operation.
※3 Note that the secondary feed length cannot be set for DS mode.
※4 The solder might not be properly fed when setting at high speed depending on type of the solder. Contact your HAKKO representative.
※5 When the Preset Number is set to "Non", the set temperature at start-up of the program will be used for operation.
Selecting Parameter Set

When you select Parameter Set, you will enter Parameter Setting mode. In this mode, you can specify the operation of the entire system.

### Parameter Set

<table>
<thead>
<tr>
<th>Feed Speed</th>
<th>10.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-U Mode</td>
<td>Int</td>
</tr>
<tr>
<td>S-U Timeout</td>
<td>30</td>
</tr>
<tr>
<td>Iron Connect</td>
<td>Con</td>
</tr>
<tr>
<td>Iron Status</td>
<td>Rdy</td>
</tr>
<tr>
<td>Exit</td>
<td></td>
</tr>
</tbody>
</table>

1. **Feed Speed** (Specifying the feed speed in continuous feed mode)

   - **Feed Speed**: 0.1 - 99.9mm/sec

2. **S-U Mode** (Selecting a slide unit connection mode)

   - **Slide Unit Connect Mode**
     - Internal (Int) or External (Ext)
     - **Int Mode**
     - **Ext Mode**
   - *When Internal Mode is selected, all upper/lower limit detection signals from the robot will be ignored.*

3. **S-U Timeout** (Specifying the slide unit upper/lower limit detection timeout)

   - **Slide Unit Time-out**: 5 - 99 sec

   - **30 sec**

- **Note**: When selecting a program number, set the signal P7 (MSB) to 1.
- The controller outputs either the status signal Form1 or Form2 (according to the setting made during program setting).

### DS (Drag Soldering) Mode

Drag soldering process

- **Program No. (In)**
- **Start solder feed (In)**
- **Controller ready (Out)**
- **Primary feed (Internal)**
- **Primary back feed (Internal)**
- **Unit down command (Out)**
- **Upper limit detection (In)**
- **Lower limit detection (In)**
- **Primary heating (Internal)**
- **Start continuous feed (Out)**
- **End continuous feed (In)**
- **Secondary feed (Internal)**
- **Secondary back feed (Internal)**
- **Secondary heating (Internal)**
- **Tertiary feed (Internal)**
- **Tertiary back feed (Internal)**
- **Tertiary heating (Internal)**
- **Status signal 1: Form1 (Out)**
- **Status signal 1: Form2 (Out)**

- **Program selection setup time**: \( t_{ps} > 5 \text{msec} \)
- **Program selection hold time**: \( t_{ph} > 25 \text{msec} \)
- **Start signal pulse width**: \( t_{sw} > 25 \text{msec} \)
- **Iron move signal pulse width**: \( t_{msw} > 25 \text{msec} \)
- **Iron stop signal pulse width**: \( t_{mew} > 25 \text{msec} \)
6. OPERATION

Auto mode

In auto mode, the unit operates according to commands from the robot. There are two types of auto mode: PS and DS. For more information, see the timing chart below:

- **PS (Point soldering) mode**
  
  Point soldering process

  ![Timing Chart](image)

  Program No. (In)
  Start solder feed (In)
  Controller ready (Out)
  Primary feed (Internal)
  Primary back feed (Internal)
  Unit down command (Out)
  Upper limit detection (In)
  Lower limit detection (In)
  Primary heating (Internal)
  Secondary feed (Internal)
  Secondary back feed (Internal)
  Secondary heating (Internal)
  Tertiary feed (Internal)
  Tertiary back feed (Internal)
  Tertiary heating (Internal)
  Status signal: Form1 (Out)
  Status signal: Form2 (Out)

*When selecting a program number, set the signal P7 (MSB) to 0 (zero).
*The controller outputs either the status signal Form1 or Form2 (according to the setting made during program setting).

Program selection setup time : \( t_{ps} > 5 \) msec
Program selection hold time : \( t_{ph} > 25 \) msec
Start signal pulse width : \( t_{sw} > 25 \) msec

---

4. Iron Connect (Connection status to the HAKKO FU-601)

Iron Control

- **Connect**
- **Disconnection**

Connection or Disconnection

When Not Connect is selected, preset settings can only be made in the HAKKO FU-601 and no iron controller error is detected.

5. Iron Status (Selecting the HAKKO FU-601 Ready or Error signal)

Iron Control Status

- **Iron Ctrl Ready**
- **Iron Ctrl Error**

You can select which signal HAKKO FU-601 will output to the robot, Ready or Error.

*Selecting Log View*

When you select Log View, you can view the number of soldering points that have been made and the total amount of solder that has been fed.

If you select Log Clear, you will enter the Log Clear screen. Selecting OK in this screen will reset the count and you will enter the Mode Select screen. If you select Cancel, you will return to the previous screen.

Operation Log

- **Total Point**
- **xxxxx p**
- **Total Feed**
- **xxxxx mm**

Log Clear

- **Log Clear**
- **Cancel**
- **OK**
● How to change the solder diameter

You can change the solder diameter by replacing the teflon tube, the solder feed guide set or the solder feed pulley unit.

The compatible solder diameters vary by model number of the HAKKO FU-500. Please check your model number and then see the part list on the back cover of this manual when you need some part replacement.

**CAUTION**

Only use compatible solder of specified size. Failing to do so may cause a failure. The attachment of the solder feed pulley unit for φ0.3mm (BX1000) is different. Refer to the “How to set solder” in the BX1000.

● How to install the teflon tube

Turn the solder feed guide nozzle counterclockwise and remove the solder feed guide support. You can now install the teflon tube. Lastly, insert the guide pipe.

The teflon tube is quite long in length. Cut the excess length of the teflon tube to leave an appropriate length (about 3 to 5 mm) from the guide pipe before use.

**CAUTION**

Make sure that the teflon tube protrudes from the guide pipe before use. Otherwise, the guide pipe may be clogged with solder. It is important to use a cutter knife instead of scissors to cut the teflon tube carefully in order to prevent the end of solder wire from being squished.

● Adjusting the solder feed position

1. Loosening the adjustment screw (1) will allow you to move the entire solder feed guide set as shown in the figure below. Move the solder feed guide set to the tip.

2. Loosening the adjustment screw (2) will allow you to move the guide pipe as shown in the figure below. Move the guide pipe until solder comes into contact with the tip.

Turning the eccentric tuning screw (3) will turn the feed position adjuster together, allowing you to make tuning. (This screw cannot be removed.)
5. INITIAL SETUP

Use a hex wrench of 2.5 mm.

Connecting components

Connecting cable to HAKKO FU-601 (Including in the HAKKO FU-601)

Connecting cable to HAKKO FU-601

Feeder unit

HAKKO FU-500

Connecting cable

Feeder cable

Assembling the feeder unit

Install the tube unit, the solder feed pulley unit, the solder feed guide set and the teflon tube.

Tighten the screws shown in the figure below.

Draw solder through the tube unit and supply to the feeder unit.

※ For information about how to install the teflon tube, see page 17.

How to set solder

Ensure that solder is reeled out of the top of the bobbin.

Draw solder through the tube unit and press the end of the solder against the pulley of the solder feed pulley unit.

With this condition, start the HAKKO FU-500 to feed solder until solder comes out of the end of the teflon tube.

CAUTION
Do not touch any screws than the hexagon socket screws described in this manual.

The attachment of the solder feed pulley unit for φ0.3mm (BX1000) is different.

Refer to the “How to set solder” in the BX1000.

Please be careful not to tighten the screw too much.

CAUTION
Secure the bending radius of more than 10cm to prevent solder clogging.

The solder feed pulley unit with the cutting blade is dangerous.

Be careful not to cut your fingers.

※ Only the cutting blade and the teflon tube in the tube unit are not interchangeable.

Place which is easy to adhere the solder and flux.

CAUTION
The solder feed pulley unit with the cutting blade is dangerous.

Be careful not to cut your fingers.

7. MAINTENANCE

As a guide, perform maintenance/cleaning when replacing the solder.

Remove any solder or flux adhered on the solder feed pulley unit using a brush or other appropriate tool.

If an insufficient cutting depth or splashing of solder balls are found in spite of the proper maintenance, the cutting blade may have reached its end of life.

Since it is impossible to replace the cutting blade only, replace the whole solder feed pulley unit.

After soldering, flux is adhered on the guide pipe part.

Regularly wipe off the flux using alcohol.

Solder feed pulley unit *

Teflon tube in tube unit *

Teflon tube

Cutting blade

CAUTION
※ For information about how to install the teflon tube, see page 17.
8. ERROR MESSAGES

● Solder feed trouble error

Solder Feed Trouble
Push Knob

When the solder feed sensor detects "no solder" or "clogging", the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.

● Illegal input error

Illegal Input
Push Knob

When an illegal input signal from the robot is detected, the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.

● Iron Controller Error

Iron Controller Error
Push Knob

This error message is displayed when the HAKKO FU-601 ready input is "Not Ready" during Auto Mode or Manual Program Mode.

This error will not occur in Adjustment Mode or Continuous Feed Mode.

If the HAKKO FU-601 ready input is "Not Ready" before Auto Mode or Manual Program Mode is started up, the system will not turn into error status but remain standby status.

When this error occurs, the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.

● Feeder Unit

Feeder unit cover screw

Solder feed guide set (option)

Feeder unit cover *

To solder reel stand

Teflon tube (option)

Feed position adjuster

CAUTION

Make sure to attach this cover to prevent a flux from entering into the feeder unit.

CAUTION

The solder feed pulley unit with the cutting blade is dangerous. Be careful not to cut your fingers.

Guide tube (option)

Guide pipe (option)

Tube unit
4. PART NAMES

**HAKKO FU-500**

- Setting display LCD
- Control knob
- Power switch
- PC interface
- Power receptacle
- Fuse
- Connecting cable connector
- Slide unit connector
- Robot connector
- Feeder unit connector

**Motor Driver Error**

When abnormal heating of the motor driver is detected, the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.

**System Error**

When a hardware error is detected, the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.

**Emergency Stop**

Upon receiving an emergency stop command from the robot, the HAKKO FU-500 will immediately stop the feed and show this error message on the LCD along with buzzer sound.
9. TROUBLE SHOOTING GUIDE

**Solder cannot be fed properly. / Solder Feed error is displayed.**

**CHECK**: Is “solder clogging” or “no solder” occurred?
**ACTION**: Remove any clogged solder. For “no solder” error, add new solder.

**CHECK**: Is the cutting blade or the pulley deposited with flux?
**ACTION**: Remove any flux using a brush and alcohol.
(See 7. MAINTENANCE in page 18.)

**CHECK**: Is the tube unit or the teflon tube contaminated, worn away and damaged?
**ACTION**: Replace the part.
(See 7. MAINTENANCE in page 18.)

**CHECK**: Is the tube unit forced?
**ACTION**: Relax the tube unit.
(Secure the bending radius of more than 10 cm.)

**CHECK**: Is the teflon tube or the guide pipe clogged with flux?
**ACTION**: Remove any flux using a brush and alcohol.
If the problem persists, replace the part.

**CHECK**: Is the part such as the solder feed pulley unit corresponded to the solder diameter?
**ACTION**: Replace the part with the correct one.
(See 11. PARTS LIST in page 23.)

**Illegal Input error is displayed.**
**CHECK**: Is the HAKKO FU-500 received any overlapped or illegal signal from the robot?
**ACTION**: Check the robot program.

**Iron Controller Error is displayed.**
**CHECK**: Does the soldering iron have a sensor failure, too low temperature or any other faulty condition?
**ACTION**: Check the soldering iron.

**Motor Driver Error is displayed.**
**CHECK**: Does the motor or the motor driver have any faulty condition?
**ACTION**: Contact your HAKKO representative.

**System Error is displayed.**
**ACTION**: Contact your HAKKO representative.

**Emergency Stop is displayed.**
**ACTION**: Check the command from the robot.

**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.

<table>
<thead>
<tr>
<th>WARNING</th>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn the power off when not in use, or left unattended.</td>
<td>To prevent accidents or damage to the HAKKO FU-500, be sure to observe the following.</td>
</tr>
<tr>
<td>This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.</td>
<td>The cutting blade is sharp. Be careful not to cut your fingers.</td>
</tr>
<tr>
<td>Children should be supervised to ensure that they do not play with the appliance.</td>
<td>When resin core solder that has been cut is not used, the properties of the resin (flux) may deteriorate with time.</td>
</tr>
<tr>
<td>● The HAKKO FU-500 is not intended for use by children.</td>
<td>● Once the solder has been cut and is inside the guide pipe, the heat from the soldering iron may accelerate the deterioration of the resin (flux). Use solder that is inside the guide pipe as soon as possible.</td>
</tr>
<tr>
<td>● Do not damage the guide pipe by bending or twisting it.</td>
<td>● Do not damage the guide pipe by bending or twisting it.</td>
</tr>
<tr>
<td>● Do not allow the tube to be bent at a severe angle. Otherwise, it will become clogged with solder.</td>
<td>● Do not allow the tube to be bent at a severe angle. Otherwise, it will become clogged with solder.</td>
</tr>
<tr>
<td>● Keep the cutting blade and pulley clean of solder and flux using a brush or other suitable cleaning device.</td>
<td>● Keep the cutting blade and pulley clean of solder and flux using a brush or other suitable cleaning device.</td>
</tr>
<tr>
<td>● Periodically remove the guide pipe or the teflon tube and clean off any accumulated flux.</td>
<td>● Periodically remove the guide pipe or the teflon tube and clean off any accumulated flux.</td>
</tr>
</tbody>
</table>

 электрофото диапроектора и т. д.
1. PACKING LIST

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAKKO FU-500</td>
<td>1</td>
</tr>
<tr>
<td>Feeder unit (Type L or straight)</td>
<td>1</td>
</tr>
<tr>
<td>Tube unit (for ø0.3 to 1.0 mm)</td>
<td>1</td>
</tr>
<tr>
<td>Tube unit (for ø1.2 to 1.6 mm)</td>
<td>1</td>
</tr>
<tr>
<td>Solder reel stand</td>
<td>1</td>
</tr>
<tr>
<td>Feeder cable (5m)</td>
<td>1</td>
</tr>
<tr>
<td>Power cord (for HAKKO FU-500)</td>
<td>1</td>
</tr>
<tr>
<td>Instruction manual</td>
<td>1</td>
</tr>
</tbody>
</table>

2. SPECIFICATION

● HAKKO FU-500 (Station only)

<table>
<thead>
<tr>
<th>Power consumption</th>
<th>35W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (W x H x D)</td>
<td>145(W) x 100(H) x 230(D)mm (5.7 x 3.9 x 9.1 in.)</td>
</tr>
<tr>
<td>Weight</td>
<td>2.3kg (5.1 lb.)</td>
</tr>
</tbody>
</table>

● Solder diameter

For the HAKKO FU-500, the compatible solder wire size varies by model number. Please check the model number of your product before ordering corresponding parts according to the Part List on page 23.

The solder diameter that can be used with the HAKKO FU-500 are shown in the table below. Before changing the solder diameter, see “● How to change the solder diameter” on page 17.

<table>
<thead>
<tr>
<th>Solder diameter (mm)</th>
<th>0.3</th>
<th>0.5</th>
<th>0.6</th>
<th>0.8</th>
<th>1.0</th>
<th>1.2</th>
<th>1.6</th>
</tr>
</thead>
</table>

Up to 1kg bobbin of solder can be used.

10. EXPLODED VIEW

● HAKKO FU-500

Feeder unit

Feeder cable

Solder reel stand

Tube unit (for ø0.3 to 1.0 mm)

Tube unit (for ø1.2 to 1.6 mm)

*With the solder feed pulley unit, the solder feed guide set and the teflon tube are optionally available.

(See 11. Part List in page 23)
Thank you for purchasing the HAKKO FU-500 solder feed unit. Please read this manual before operating the HAKKO FU-500. Keep this manual readily accessible for reference.

1. PACKING LIST
2. SPECIFICATIONS
3. WARNINGS, CAUTIONS AND NOTES
4. PART NAMES
5. INITIAL SETUP
6. OPERATION
7. MAINTENANCE
8. ERROR MESSAGES
9. TROUBLE SHOOTING GUIDE
10. EXPLODED VIEW
11. PARTS LIST

For more information about replacement parts or latest information, please visit our website (http://www.hakko.com) or HAKKO Document Portal. (see below)

11. PARTS LIST

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Part Name</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>BX1000</td>
<td>Solder feed pulley unit</td>
<td>0.3 mm</td>
</tr>
<tr>
<td>BX1001</td>
<td>Solder feed pulley unit</td>
<td>0.5 mm</td>
</tr>
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HAKKO
HAKKO CORPORATION
HEAD OFFICE
4-5, Shiokusa 2-chome, Narita-ku, Osaka 555-0024 JAPAN
TEL:+81-6-6561-3250 FAX:+81-6-6561-8468
http://www.hakko.com  E-mail:sales@hakko.com

OVERSEAS AFFILIATES
U.S.A.: AMERICAN HAKKO PRODUCTS, INC.
TEL: (661) 294-0090 FAX: (661) 294-0096
http://www.hakko.com  E-mail:sales@hakko.com

HONG KONG: HAKKO DEVELOPMENT CO., LTD.
TEL: 2811-5588 FAX: 2590-0217
http://www.hakko.com.hk  E-mail:info@hakko.com.hk

SINGAPORE: HAKKO PRODUCTS PTE., LTD.
TEL: 6748-2277 FAX: 6744-0033
http://www.hakko.com.sg  E-mail:sales@hakko.com.sg

Please access to the following address for the other Sales affiliates.
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Instructions Manual

Thank you for purchasing the HAKKO FU-500 solder feed unit. Please read this manual before operating the HAKKO FU-500. Keep this manual readily accessible for reference.

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