



Oct. '96

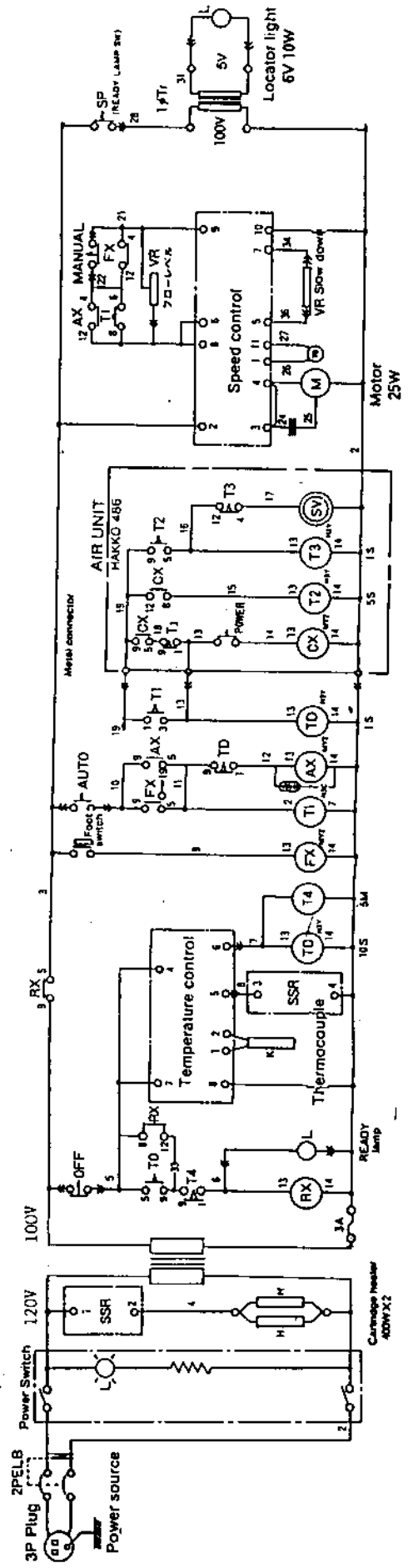
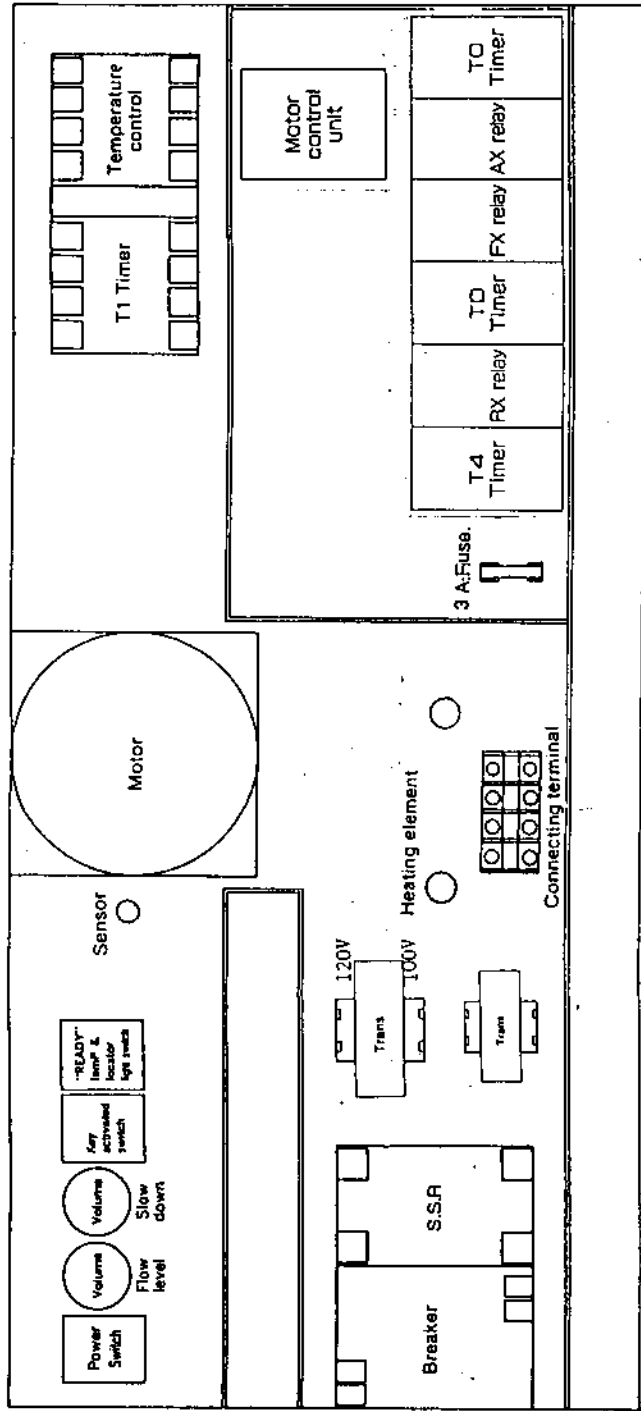
HAKKO 485

SOLDERING SYSTEM

INSTRUCTION MANUAL

**Please read this instruction manual thoroughly
before operating the HAKKO 485**

► Correction For 2 The Internal Parts of the Body 3 Wiring Diagram



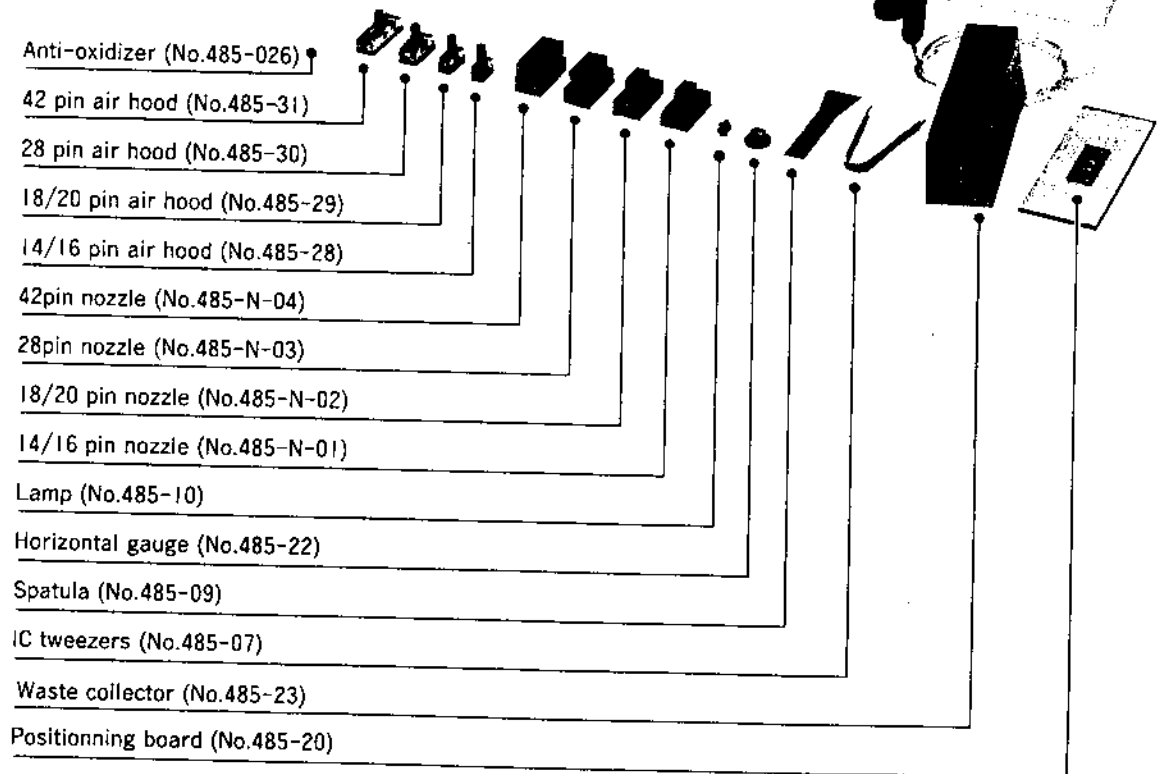
1 Construction & Accessories

AIR UNIT (No.486)

Body (No.485-1)

*Other air hoods and solder nozzles are available for special requirements.

Fig1



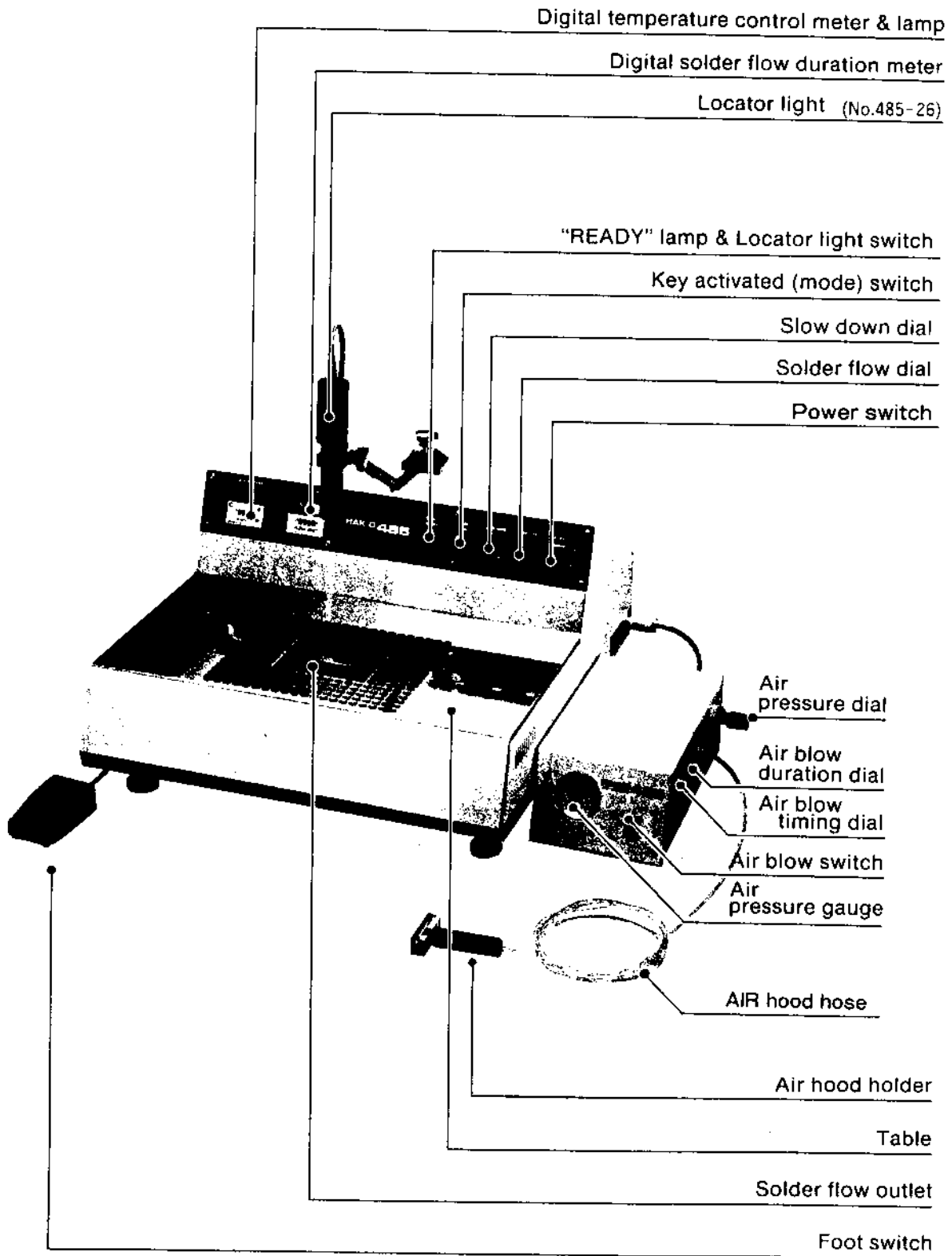
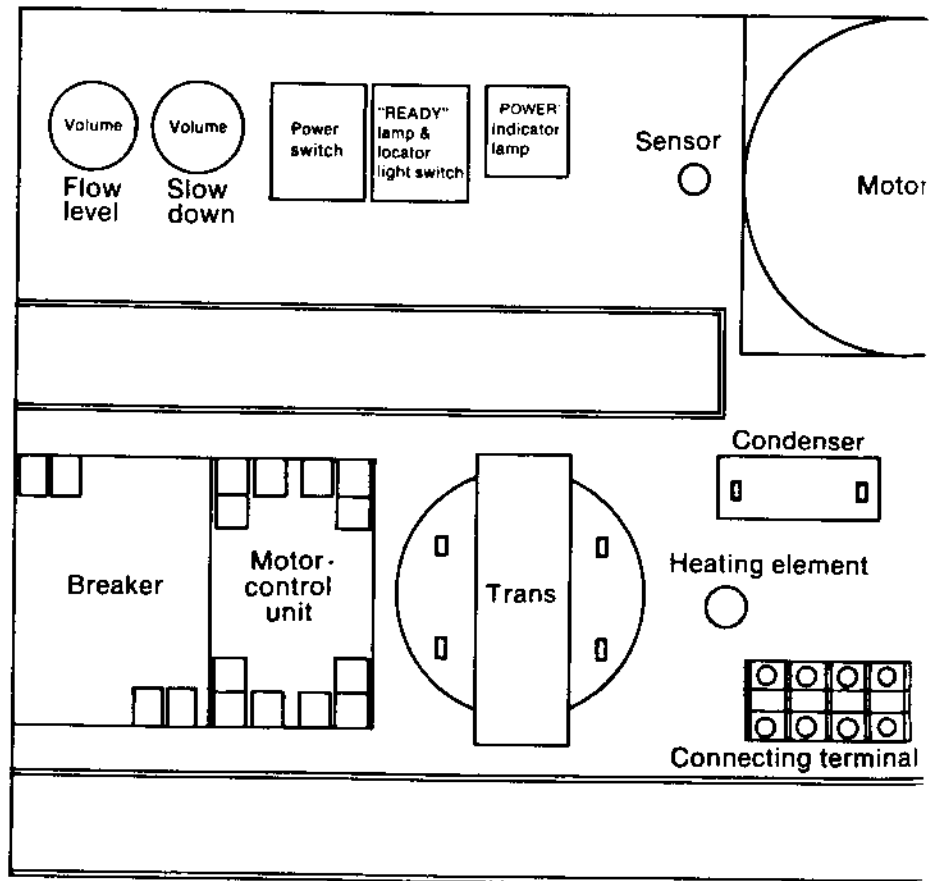
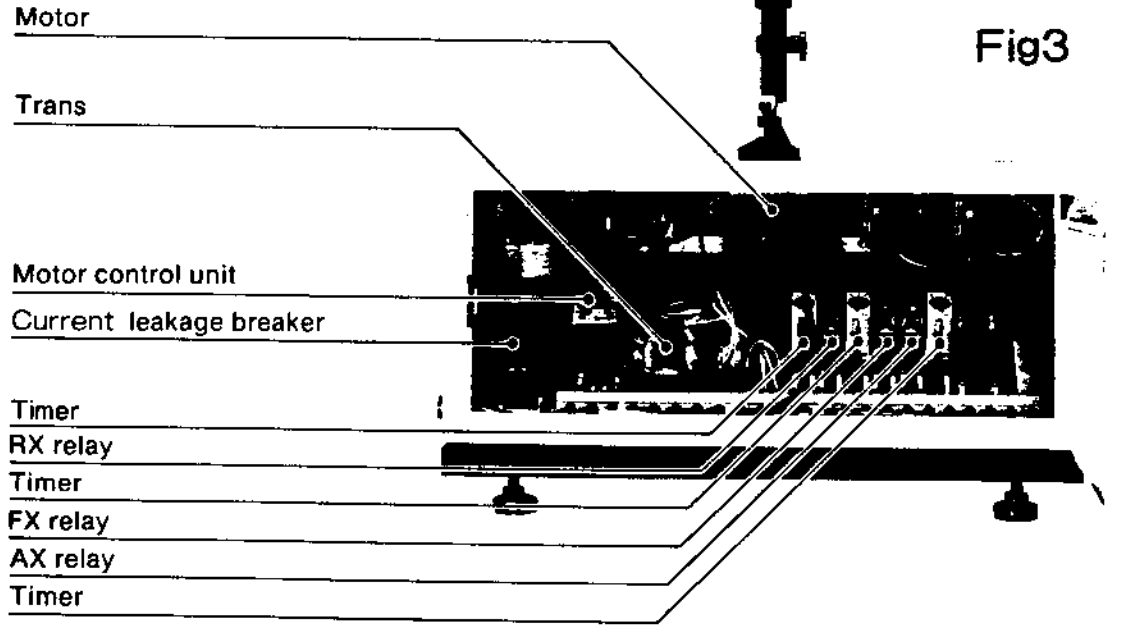
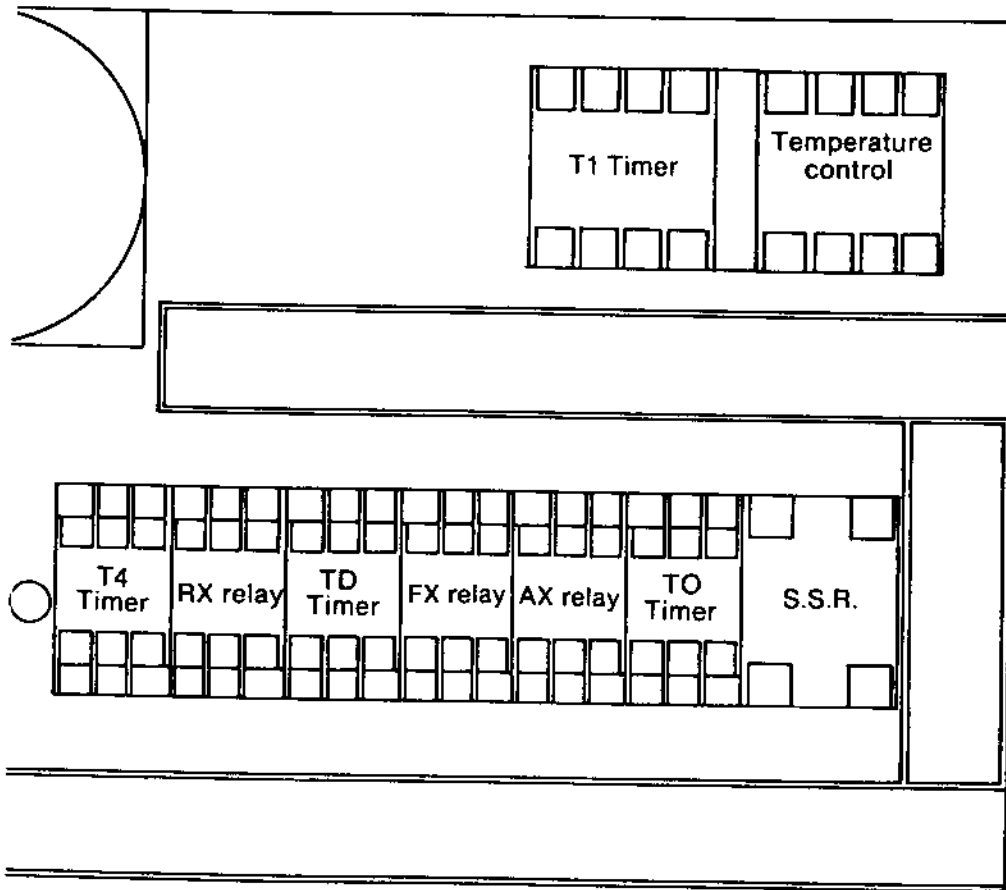


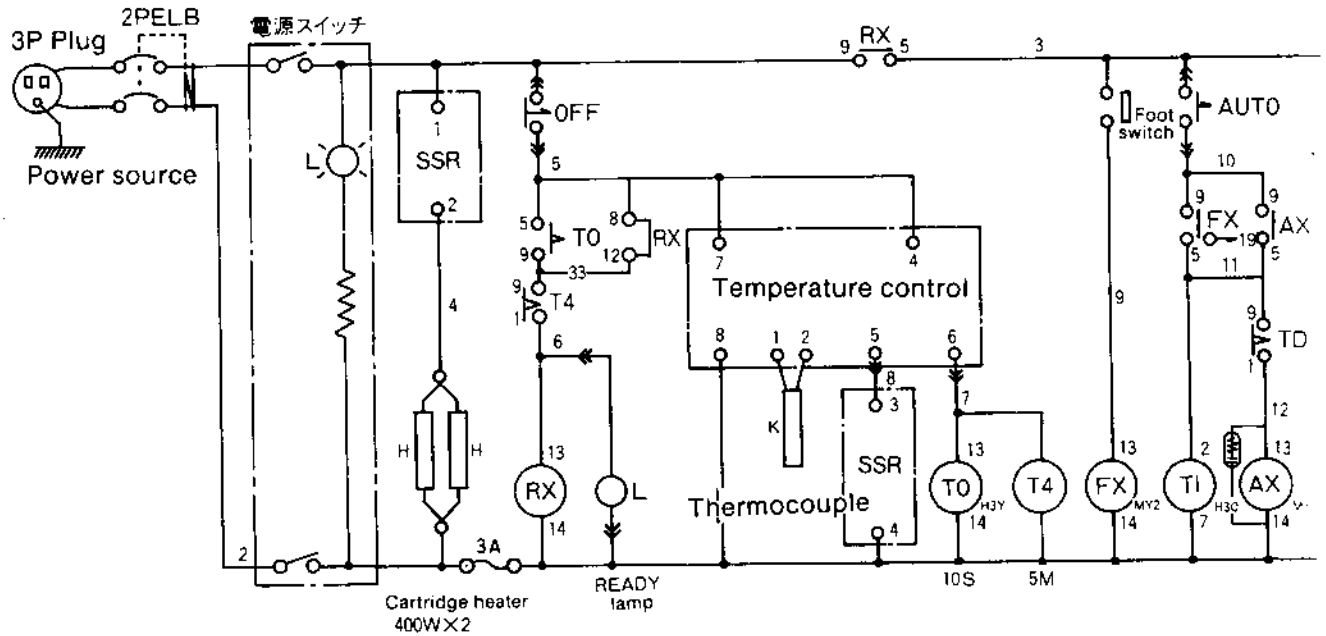
Fig2

2 The Internal Parts of the Body



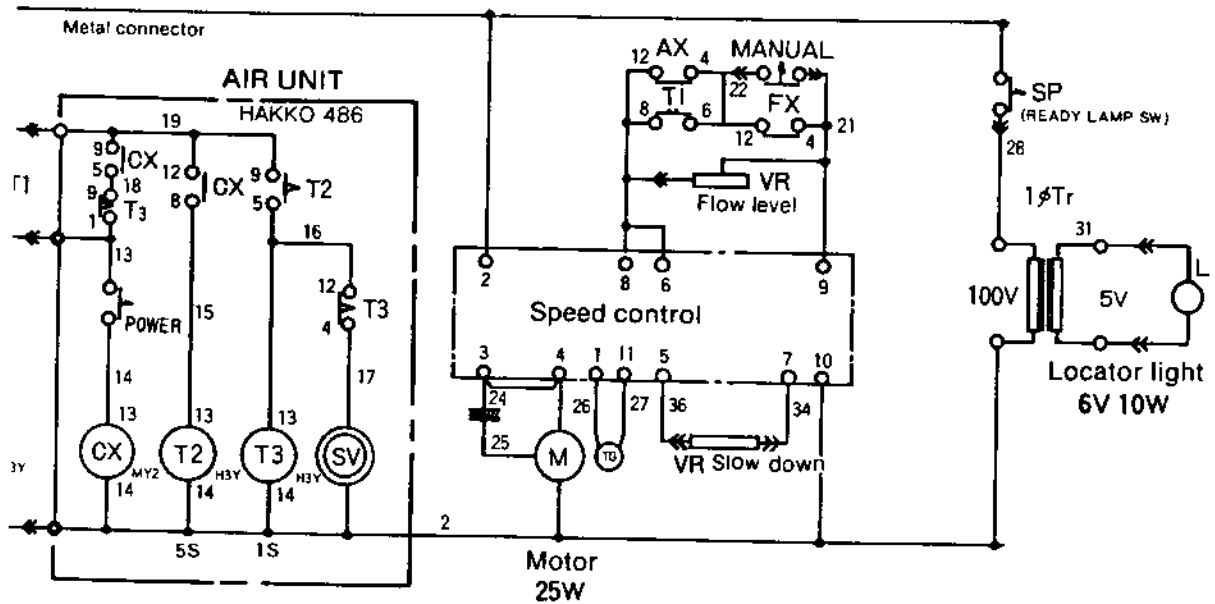


3 Wiring Diagram & Setting Up



Setting Up

1	2	3
<p>Remove packing material and check enclosed accessories with Fig. 1. (Some accessory parts will be found in the body.)</p>	<p>Put the locator light into the upper holder of the body (485), and secure it. Connect the plug to a power source.</p>	<p>Connect a compressor to AIR UNIT (486).</p>



4	5	6
<p>Plug the AIR UNIT into 3p metal connector of the body.</p>	<p>Plug the air hose into the side (Fig. 2) of AIR UNIT.</p>	<p>Adjust the feet on the body (485) so that it is stable and level. Place the Anti-oxidizer.</p>

4 How to Use

First, plug the power supply cord into a power source, then open the rear panel of the body and turn on the Current Leakage Breaker. (Push the black switch to the up position.) Check the breaker switch (red button to right of Current Leakage Breaker switch) by depressing the red button, approximately once a month.

When setting the mode switch (located on the front panel of the body) to MANUAL or AUTO, the "POWER" indicator lamp lights to show the unit is receiving electricity.

Adjust temperature (0-299°C, 32-570°F) with the digital temperature control meter (located on the front panel). When operating in AUTO, adjust the solder flow dial (standard setting: 250°C, 482°F 4 sec.).

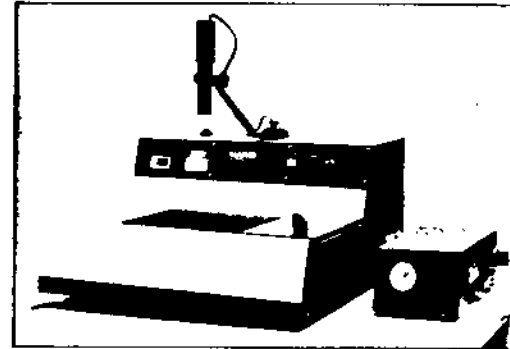
When temperature reaches the pre-set one, the temperature control lamp turns from ◀ (red) to |||| (the center). Shortly after, the "READY" lamp will light. The unit is then ready to use. Select the appropriate flow nozzle for your IC and fix it to the solder flow outlet. Turn the locator light on and set it to the center of the IC.

NOTE: As a safety feature, the locator light will not operate until the temperature reaches the pre-set one, regardless if the switch is turned on.

Mode - AUTO

Before changing to AUTO mode, depress the foot switch and adjust the solder flow precisely as desired while still in MANUAL mode. Then change to AUTO mode. Set the solder flow duration according to your needs. Put a printed circuit board on the table, then set the locator light to the center of the IC.

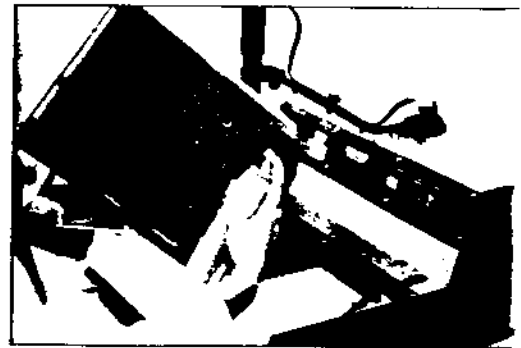
Lightly depress the foot switch. Observe closely to see when the solder comes from the IC holes. At that time remove IC. Should it not remove easily, depress the foot switch once more. The solder will flow only for the duration set on the flow timer.



①



③



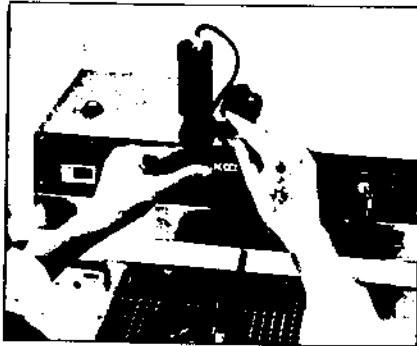
⑤

Mode - MANUAL

Change to MANUAL. Adjust the solder flow precisely with Solder flow dial to the desired setting by depressing the foot switch. Put a printed circuit board on the table, and set the locator light to the center of IC.

Lightly depress the foot switch. Observe closely to see when the solder comes from the IC holes. At that time remove IC.

NOTE: As solder continues to flow while the foot switch is depressed, remove your foot from switch just before removing IC from the table. An inter-locking device prevents the motor, the foot switch, and the locator lamp from operating until the "READY" lamp is lit.



Compressed Air Cleaning - after removal of IC

Connect AIR UNIT (486) to the body (485) with 3P metal connector. Turn the AIR UNIT switch to ON in order to prepare for cleaning. Next, switch the MODE key on the body to AUTO, then, using a printed circuit board to test, set the solder flow duration according to your needs.

Adjust Slow down dial, Air pressure dial, Air blow duration dial and Air blow timing dial. (Refer to 7)

Put a printed circuit board on the table and set the locator light where the IC had been.

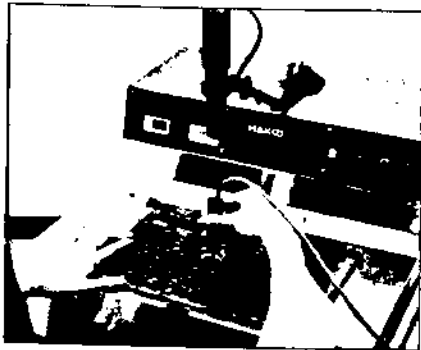
Then place the hood of the air cleaning hose over the section to be cleaned and lightly depress the foot switch. Be especially careful not to press the printed circuit board too much with your hands, as the solder will overflow through the holes. After the solder has run out, compressed air from the air hood cleans IC holes for the pre-set time period.

Other Uses

If an IC is defective or does not operate properly, it may be replaced with a new IC. Remove defective IC, spray flux on backside of board, and attach new IC using the same procedure as above.

Excessive solder on the leads of the IC or other components can be removed easily. Depress the foot switch and briefly dip the leads into the solder bath.

It is also possible to attach various sized connects by special ordering separate nozzle attachments from us.



5 Trouble Shooting

- If the "POWER" lamp should fail to light, yet the solder bath has reached the desired temperature, check whether the bulb needs to be replaced.
- Should the solder bath not heat to the desired temperature, although the ◀ (red) lamp lights, the cause is likely one or more of the following:
 1. The heating elements have worn out.
 2. The SSR semiconductor switch has gone bad.
 3. The thermocouple has gone bad.
 4. The temperature control itself has gone bad.

If the thermocouple goes bad, the right arrow (▶) on the solder temperature gauge will light after the unit is switched on.

- If the solder does not flow after the foot switch is depressed, or if the ◀▶ lamp fails to light but the "READY" light does come on, then the "To timer RX relay" has gone bad.
- If the "READY" lamp fails to light, yet the solder flows, check to see if the bulb needs to be replaced.
- If the locator light fails to light after turning on the switch, but the "READY" lamp lights, then replace the locator light.

Mode - MANUAL

If the solder does not flow when foot switch is depressed, examine the following:

- Foot Switch

Open the rear panel of the body, depress the foot switch, and determine whether the FX relay is working or not. If it is not working properly, then replace the foot switch. (Normally, when the foot switch is depressed, the relay will make a rattling sound.)

- The Solder Flow Dial, the Motor, the Speed Control

If the FX relay is working properly but the solder still does not flow, then the contact of the FX relay is likely bad or components related to the speed control are bad. Remove the work table and depress the foot switch.

1. If the motor fails to work, then (1) the FX relay, or (2) the motor, the control, the motor control, the condenser, or the flow level dial has gone bad.
2. If the motor does operate, then the impeller in the solder bath has gone bad.

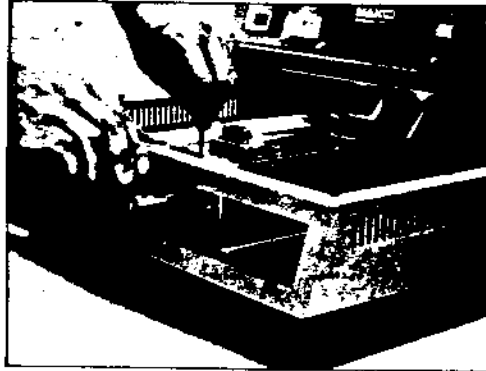
Mode - AUTO

If the solder does not flow when foot switch is depressed:

- The causes are almost identical to those of the MANUAL mode, with the exception that the time setting circuit may have gone bad.
- If the solder continues to flow in spite of the timer setting, then T1 Timer or AX relay has gone bad.

Replacing the Heating Element

- ① Open the rear panel of the body. Remove the four white wires from the connecting terminal.
- ② Remove the work table and pull out heat insulating material from the front of the solder bath. Unscrew the two securing nuts with a hex key wrench.
- ③ Push the heating elements forward and replace them.



Replacing the Sensor

Loosen the temperature control terminals ① and ② in the rear portion of the body. Pull the sensor out and replace it.

- ① = red (+) terminal
② = black (-) terminal

Replacing the Locator Light

Unscrew the securing nut through the locator light cover hole. Pulling the light up, remove it and then replace it.

Trouble Shooting the AIR UNIT

If compressed air is not forced out after the solder has ceased flowing, the problem is one or more of the following:

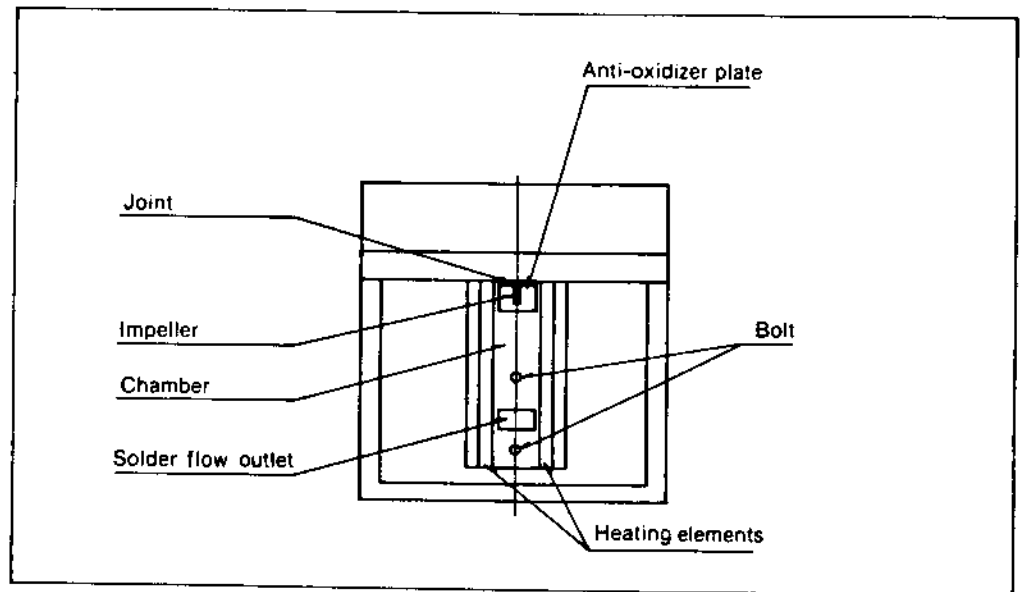
1. The key-activated switch has gone bad.
2. The air compressor is bad or one of the connections needs attention.
3. The dial has been improperly adjusted.
4. The T1 timer contact has gone bad.
5. The terminal connector joint cable is improperly connected.
6. The timer for the air control unit has gone bad.
7. The valve has gone bad.

6 How To Clean The Inside of The Solder Bath

A. Daily Cleaning

Clean before or after every use.

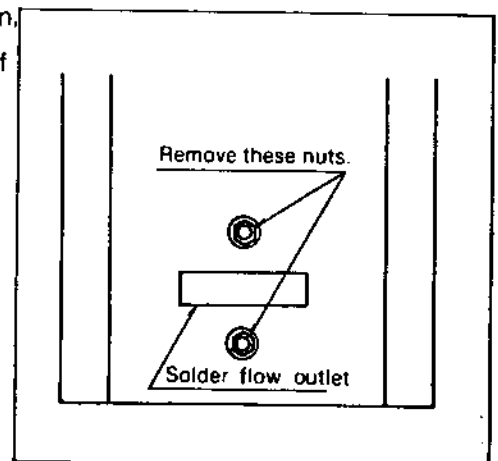
- Remove the table.
- Remove any and all oxide inside the bath using the provided spatula.
- Replace the anti-oxidizer on the anti-oxidation plate.



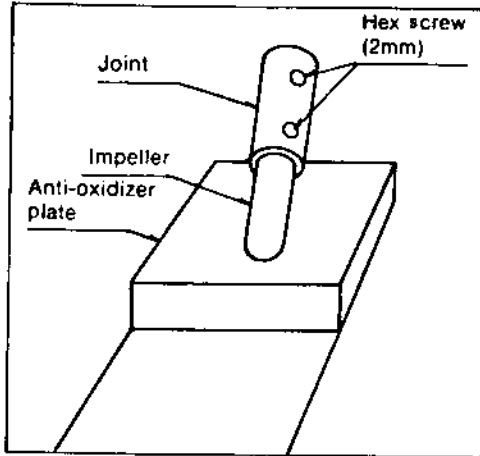
B. Monthly Disassembly and Cleaning

To keep the unit in good working condition, clean the unit once a month following the procedure described below.

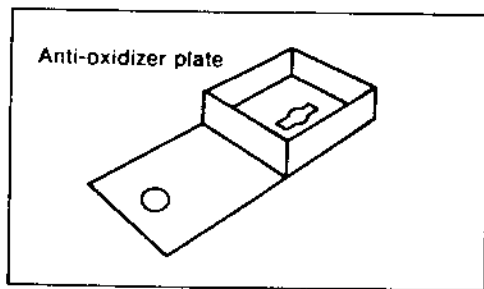
- 1) With the Power switch in the OFF position, remove the 2 nuts located at the top of the solder bath.



2) Turn the Power switch on and wait 30-40 minutes for the solder in the bath to melt.



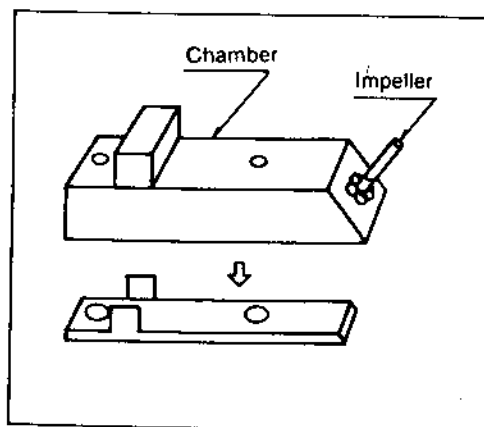
3) Using a 2.0mm hex wrench, remove the 2 screws securing the joint to the impeller and let the impeller drop down.



4) Remove the anti-oxidizer plate.

5) Grasp the Impeller and the Chamber with two pairs of pliers and gently pull the Chamber away from the bottom plate.

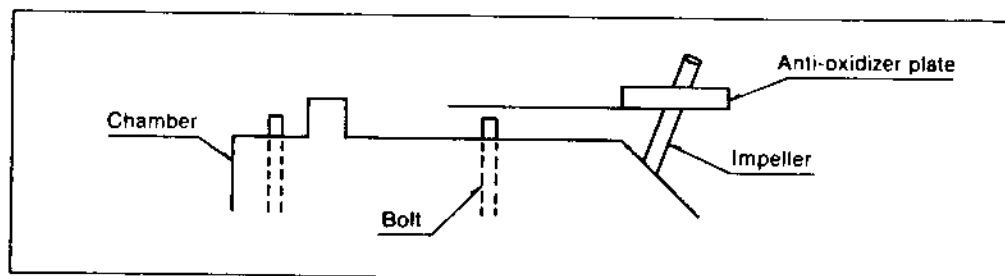
Caution: Be sure not to spill or touch the melted solder in the bath while removing the chamber.



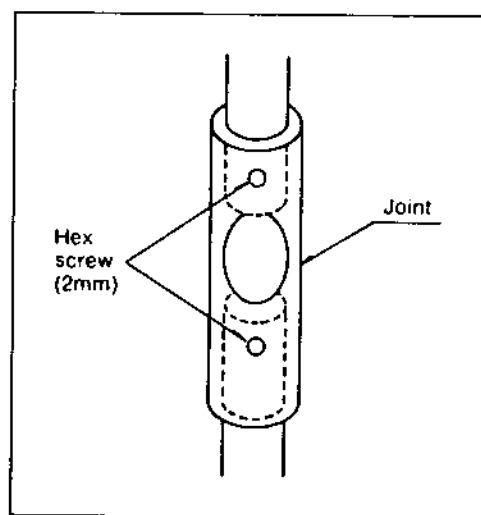
6) Remove any and all oxide from the bottom plate using the provided spatula.

7) Place the Impeller into the Chamber and secure the Chamber to the bottom plate.
Place the Chamber into the bath over the 2 bolts.

8) Insert the Anti-oxidizer plate over the Impeller and the nearest bath bolt.



9) Align the D-shaped cuts on the impeller and the motor shaft through the hole in the joint and secure them with the 2 hex screws.



10) Turn on the motor. If the Impeller touches the bottom plate, adjust the Impeller so that it doesn't.

11) Place the Anti-oxidizer.

7 Setting up the Hakko No.485/486 System

SAMPLE OF ADJUSTMENT

No. 485 Body and No. 486 Air Unit

A. Through-hole P.C. Board on both side.

	485 Body			Air Unit (486)		
	Nozzle	Temperature Control	Flow Time	Air Pressure	Delay	Time
Slow Down Dial Scale - Max.	14/16P	250°C (482°F)	5 sec.	0.4kg/cm ²	2.2 sec.	0.1 sec.
	18/20P	250°C (482°F)	5 sec.	0.4kg/cm ²	2.2 sec.	0.1 sec.
	28P	250°C (482°F)	5 sec.	0.5kg/cm ²	2.2 sec.	0.1 sec.
	42P	250°C (482°F)	5 sec.	0.5kg/cm ²	2.2 sec.	0.1 sec.
Slow Down Dial Scale - 0	14/16P	250°C (482°F)	5 sec.	0.4kg/cm ²	0.6 sec.	0.1 sec.
	18/20P	250°C (482°F)	5 sec.	0.4kg/cm ²	0.6 sec.	0.1 sec.
	28P	250°C (482°F)	5 sec.	0.5kg/cm ²	0.6 sec.	0.1 sec.
	42P	250°C (482°F)	5 sec.	0.5kg/cm ²	0.6 sec.	0.1 sec.

- Set the "Flow Level" as the solder just begins to flow from the nozzle.
- When using a special-order nozzle (for connectors, etc.), set the "Delay Timer" on the Air Unit. Set the "Timer" while the air is blowing and just when there is 2-3mm of solder under the top of the nozzle.

B. Multi Layers P.C. Board

For printed circuit boards with more than 4 layers, preheat the board but don't increase the soldering temperature.

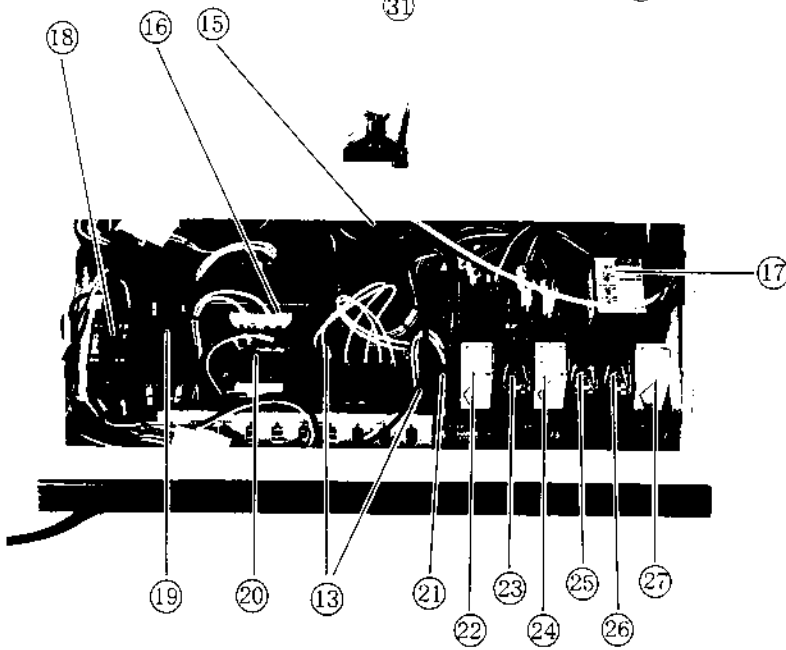
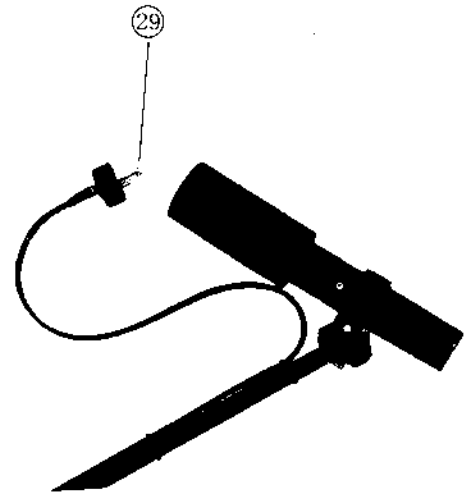
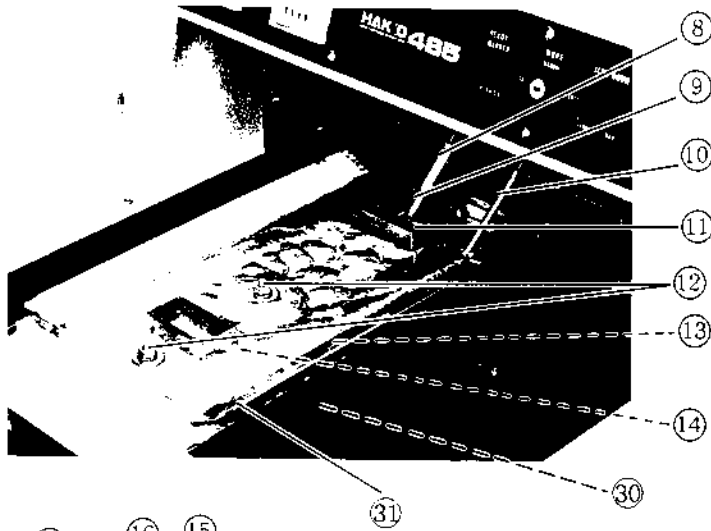
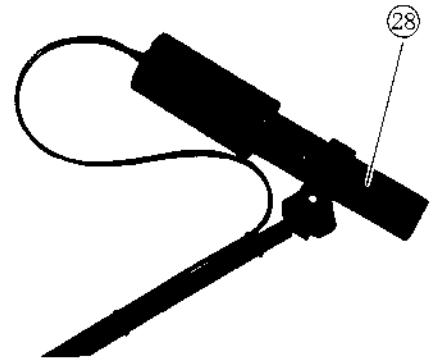
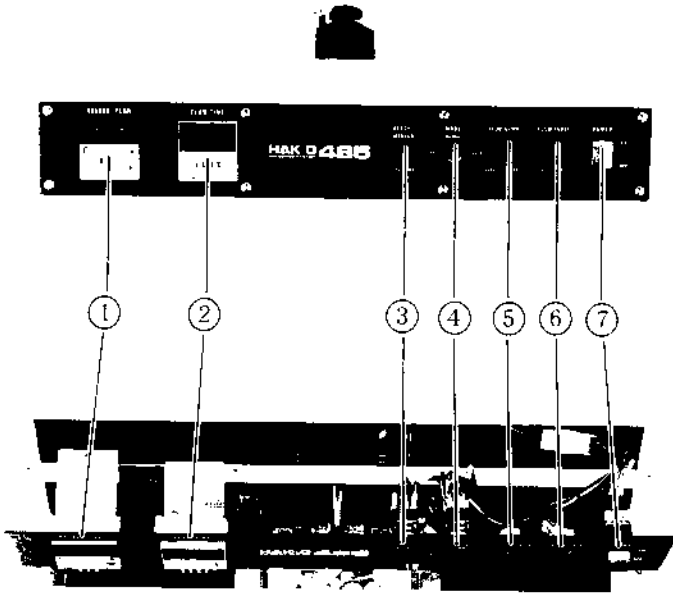
Specifications

Dimensions	485 (Body)	500mm (19.7in) (W) × 245mm (9.6in) (H) × 550mm (21.7in) (D)
	486 (Air Unit)	150mm (5.9in) (W) × 100mm (3.9in) (H) × 300mm (11.8in) (D)
Weight	485 (Body)	35kg (77lbs.) without solder
	486 (Air Unit)	3.5kg (7.7lbs.)
Power Consumption	950W	
Room Temperature	Between -5°C (23°F) and 40°C (104°F)	
Temperature Control	Normal Temperature ~ 299°C (570°F)	
Solder	10kg (22lbs.)	
Heating Element	800W (400W × 2)	
Air Pressure	2kg/cm ² (4.4lbs.) ~ 7kg/cm ² (15.4lbs.)	

* The specifications written here may be subject to change without notice.

No.	Part No.	Part Name	Description
1	485-49	Temperature Control Meter	
2	485-50	Digital Solder Flow Duration Meter(T-1 Timer)	
3	485-59	Locator Light Switch ("READY" Lamp)	
4	485-61	Key Activated Switch	
5	485-74	Slow Down Control Dial	
6	485-62	Flow Level Control Dial	
7	485-63	Power Switch	
8	485-64	Joint	w/hexagon 2 screws (2.0mm/0.079in.)
9	485-53	Impeller	w/shaft
10	485-06	CA Sensor	
11	485-65	Anti-oxidizer Plate	
12	485-66	Nut (M6)	w/washer
13	485-H	Heating Element	100V
	485-H-V12	Heating Element *	120V
14	485-67	Chamber	
15	485-46	Motor	
16	485-68	Transformer *	120V
17	485-57	Motor Control Unit	
18	485-69	Current Leakage Breaker	
19	485-70	S.S.R	
20	485-71	Transformer/for Locator Light	
21	485-72	Fuse/3A	
22	485-73	T4 Timer	
23	485-51	Control Relay (RX Relay)	
24	485-55	' T.D' Timer	
25	485-51	Control Relay (FX Relay)	
26	485-51	Control Relay (AX Relay)	
27	485-54	' T.O' Timer	
28	485-26	Locator Light	
29	485-10	Lamp (6V/10W)	
30	485-58	Insulation Set	
31	485-47	Solder Bath	

* Used for 120V model only.



Applicable Manufacture Conditions for Custom Nozzles for HAKKO 485

HER04

Established on Jan. 12, 1998

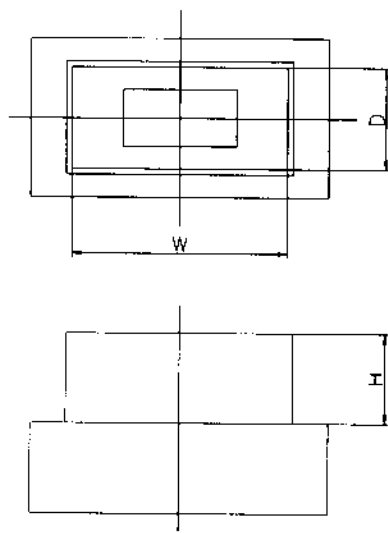
Revised on Jul. 10, 1998

Our custom nozzles for the HAKKO 485 are subject to the following manufacture conditions:

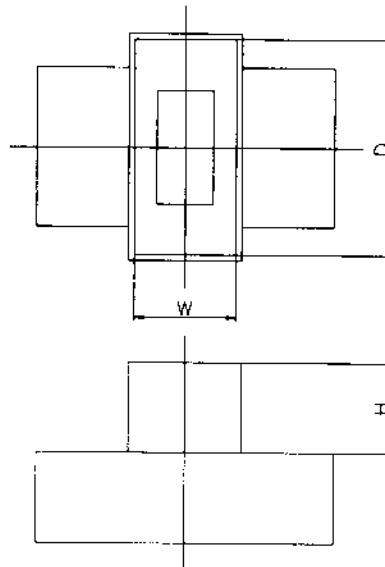
1. Nozzle type

Custom nozzles can be manufactured in either of the following two types:

Standard type



Cross type



※ W, D: inside size

2. Maximum solder flow capacity

A maximum solder flow capacity of 40,000mm³ is possible depending on the capacity of the solder flow motor used.

$$\text{Maximum capacity} = W \times D \times H = 40,000\text{mm}^3$$

3. Nozzle size (standard type)

1) When the standard table is used (opening size: 110(W) × 80(D)):

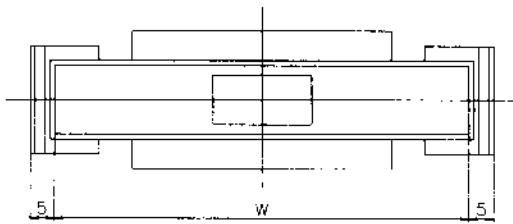
Nozzles can be manufactured in sizes of up to 100(W) × 70(D).

2) When a custom table is used (maximum opening size: 150(W) × 120(D)):

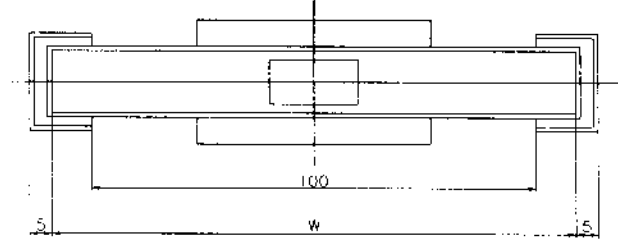
Nozzles can be manufactured in sizes of up to 140(W) × 116(D).

In either of the above cases 1) and 2), if the width exceeds 82mm, some means is required to prevent solder from overflowing the bath.

Type A(W:82~100mm)

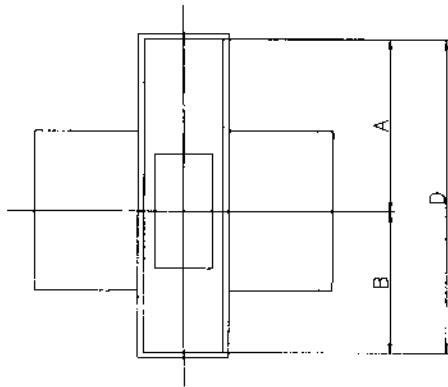


Type B(W:101mm~)



4. Dimensions of nozzle (cross type)

1) When the standard table is used:

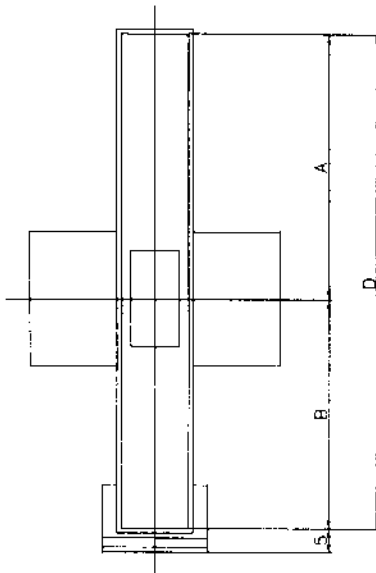


$$D = A + B$$

$$A = 35\text{mm max.}$$

$$B = 35\text{mm max.}$$

2) When a custom table is used:



$$D = A + B$$

$$A = 60\text{mm max.}$$

$B = 50\text{mm max.}$ (If this is 46mm or more, some means is required to prevent overflow.)

※ When D is 91~105mm, B should be 45mm.

5. A nozzle larger than these dimensions that can be used with the table removed may have been manufactured in the past. However, we will not manufacture such nozzle for the safety reason.