SPARE PARTS LIST

Part No.	Description
10094	Hot air gun heating element
30105S	Plastic handle of hot air gun
S012	Hot air gun complete handle
20962	Hot air gun metal pipe
P005	Diaphragm Pump
C001	Soldering Iron heating element
3098S	Plastic handle of soldering iron
B004	Soldering Iron complete handle
20170-1	Soldering Iron Tip enclosure

Manufacturer:
AOYUE TONGYI INTERNATIONAL LIMITED
Jishui Industrial Zone, Nantou, Zhongshan City,
Guangdong Province, P.R.China
http://www.aoyue.com

AOYUE® INT 738

Professional Repairing System

INSTRUCTION MANUAL

Thank you for purchasing Aoyue Int738 Professional Repairing System.
It is important to read the manual before using the equipment.
Please keep manual in accessible place for future reference.

CE ESD SAFE

This manual is designed to familiarize the technician with the proper operation and maintenance of the equipment. The "Care and Safety Precautions" section explains the hazards of using any type of soldering or reworking device. Please read carefully and observe the guidelines in order to maximize usage and minimize the risk of injury or accidents.

TABLE OF CONTENTS

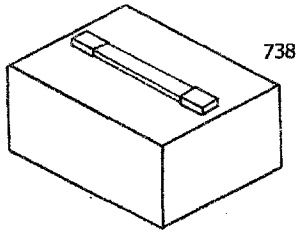
PRODUCT DESCRIPTION

The Aoyue INT738 Professional Repairing System is a reworking equipment that combines the functionality of a Hot Air Gun, Soldering Iron, and Smoke absorber in one sophisticated package.

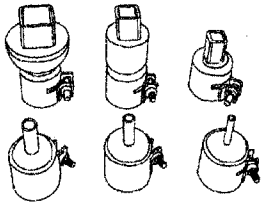
One of the notable features of this device is the auto-cooling process of the Hot Air Gun. This functionality protects the device (and its components) from excessive heat by blowing air (at room temperature) upon achieving any of the following two conditions: (1) when the soldering gun remained idle on its resting handle after a certain period and (2) when the temperature of the device is above a safe threshold upon turning off. This will be discussed in further detail together with the complete features in the succeeding sections of this manual.

Finally, the unique, innovative design with digital control panel and display provides precision, safety, and ease of use to match all reworking requirements.

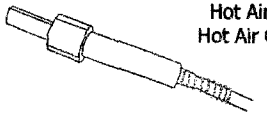
PACKAGE INCLUSION



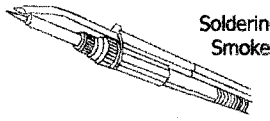
738 Main Station



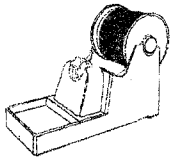
Air Nozzles
(1124, 1130,
1197, 1010, 1313,



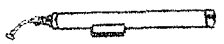
Hot Air Gun and
Hot Air Gun Holder



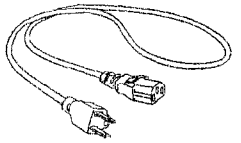
Soldering Iron with
Smoke Absorber



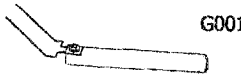
2630B Soldering Iron Holder
with Solder Wire Stand



939 Vacuum
Suction Pen



Power Cord



G001 IC Popper

Soldering Iron
Spare Heating Element

30181X Filter Pads
(6 pcs.)

SPECIFICATIONS

MAIN STATION	
Power Input :	available in 110V / 220V
Station Dimensions:	188(w) x 126(h) x 250(d) mm
Weight:	6.3 Kg
SOLDERING IRON	
Power Consumption:	45W
Temperature Range:	200°C - 480°C
Heating Element:	Ceramic Heater
Output Voltage:	24V
HOT AIR GUN	
Power Consumption:	550W
Temperature Range:	100°C - 480°C
Heating Element	Metal Heating Core
Pump/Motor Type:	Diaphragm Pump
Air Capacity:	23 l /min (max)

FUNCTIONS and FEATURES

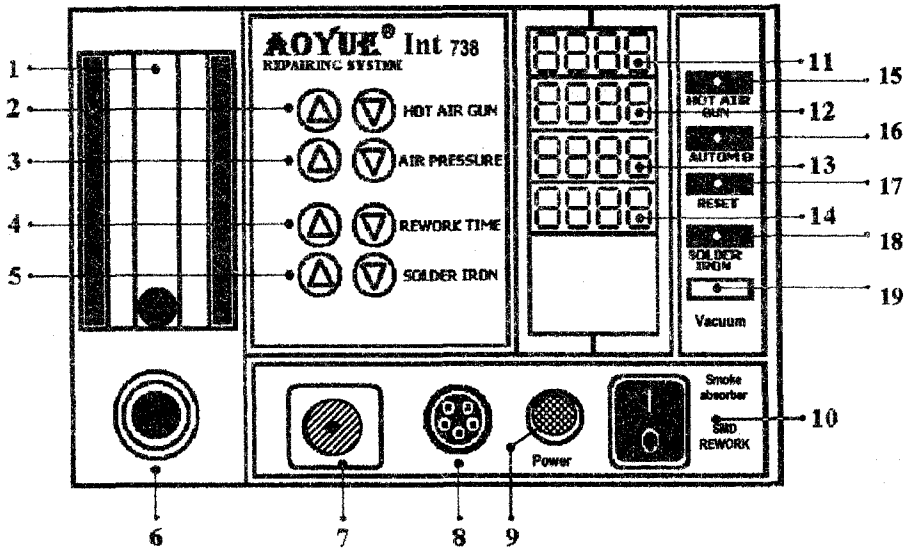
- Microprocessor-driven ESD safe equipment.
- 3-in-1 repairing system combining Hot Air Gun, Soldering Iron, and Smoke absorber in one sophisticated package.
- Digital control and display of hot air temperature, soldering iron temperature and air pressure,.
- Programmable timer functionality from 6 to 9999 seconds for automating reworking tasks.
- User-configurable 1- to 20-minute idle-to-auto-stand-by mode (with 5 minutes as default) for additional device protection and power saving.
- Built-in auto-cooling process that protects the system and its components from excessive heat, thereby, prolonging usage life.
- Compatibility with various type of air nozzles and soldering iron tips. (Please refer to MISCELLANEOUS section of this manual.)

SAFETY PRECAUTIONS

⚠ **CAUTION:** Improper usage can cause serious injury to personnel and/or extensive damage to equipment and working area. For your own safety, please observe the following precautions.

- Check each component after opening the package to make sure everything is in good condition. If there are any suspected damage, don't use the item and report the issue to your dealer.
- Turn off power switch and unplug the unit from the mains power source when moving the equipment from one location to another.
- Do not strike or subject the equipment (or its components) to physical shock. Use carefully to prevent damage on any parts.
- Make sure the unit is always grounded. Always connect power to a grounded receptacle.

CONTROL PANEL GUIDE



LEGEND:

1 — Air Gauge
2 — Hot Air Gun Temperature Control Buttons
3 — Air Pressure Control Buttons
4 — Auto Rework Time Adjustment Buttons
5 — Soldering Iron Temperature Control Buttons
6 — Hot Air Output Terminal
7 — Smoke absorber connector
8 — Soldering Iron 5-Pin Connecting Terminal
9 — Main power switch
10 — Function selector
11 — Hot Air Gun Temperature Display
12 — Hot Air Gun Pressure Display
13 — Auto Rework Time Display
14 — Soldering Iron Temperature Display
15 — Hot Air Gun Activation Switch
16 — Auto Reworking Activation Switch
17 — Reset
18 — Soldering Iron Activation Switch
19 — Vacuum indicator

ASSEMBLY and PREPARATION

A. Soldering Iron

1. Install the solder wire to the soldering iron holder as in Figure 2.

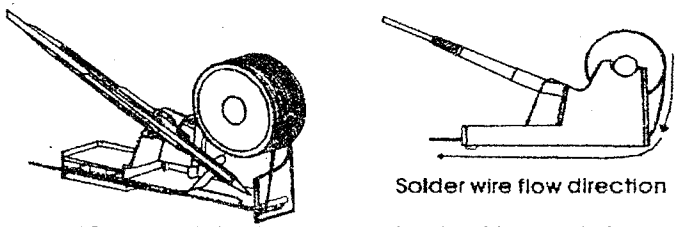


Figure 2. Soldering iron stand with solder wire holder

2. Connect the soldering iron cord assembly to the 5-pin output terminal found at the lower portion of the main unit. Please refer to item 8 from the Control Panel Guide.
3. Place soldering iron to the soldering iron stand as shown above.

B. Hot Air Gun

The Hot Air Gun holder was installed on the station upside down for packaging purpose. To set up the Hot Air Gun holder:

1. Loosen the two screws that secure the holder to the station.
2. Turn the holder right upside.
3. Fasten the two screws back.
4. Place the hot air gun on the holder in preparation for usage.

Note: Make sure the screw at the center of the base of the main unit has been removed. This holds the pump in place during transportation and needs to be removed before using the equipment.

C. Smoke Absorber

Attach the smoke absorbing tube to the vacuum cap. Make sure that the cord connections are free from any tangles.

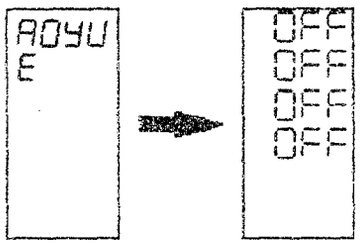
IMPORTANT REMINDERS:

1. Make sure the equipment is placed on a flat stable surface and all its heat-generating components placed on their respective holders/stands.
2. Ensure all switches are OFF prior to reworking.
3. Ensure all terminal connections are properly secured.

NOTE: Please refer to the CONTROL PANEL GUIDE if needed.

A. START-UP PROCEDURE

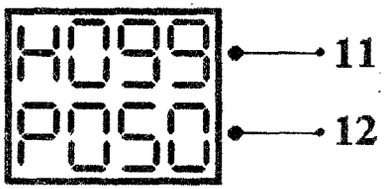
1. Plug the device to the main power source.
2. Switch ON the device using the main power switch (item 9 on the CONTROL PANEL GUIDE) found at the lower right portion of the control panel.
3. The display panel will show the product name momentarily and then "OFF" on each line of the panel, provided all function switches are deactivated. See below for illustration.



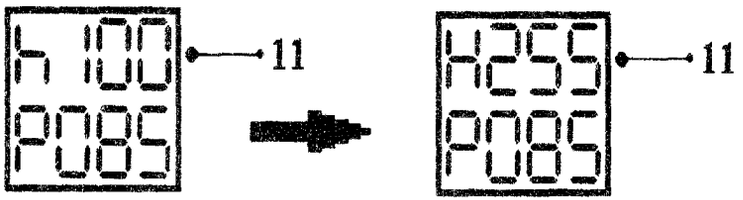
4. The air gauge (item 1) will also appear illuminated by ample light and the metal ball inside is at the lowest position of the visible area.
5. The system will remain in this state until a function is activated.

B. HOT AIR GUN

1. Switch ON the equipment by activating main power switch (9).
2. Activate HOT AIR GUN function switch (15) from the right side of the control panel.
3. The system will immediately blow air from the hot air gun while gradually increasing the air temperature to the default value of 99°C. The ball inside the air gauge will also settle somewhere in the middle of the visible area, corresponding to an air pressure level of 50. The display area for hot air temperature and air pressure level, items 11 and 12, respectively, will show the following.



4. Adjust air pressure using the AIR PRESSURE control buttons (3).
5. Adjust hot air temperature using the HOT AIR GUN temperature control buttons (2). **Note:** When increasing or decreasing the air temperature, the prefix of the display area for hot air gun temperature (11) will temporarily change from uppercase "H" to lowercase "h", indicating that **heat** is being adjusted. Once the buttons are released, it will switch back to its original case while the temperature value also gradually increases or decreases and until the desired temperature is reached.



6. You may start reworking as soon as the desired air temperature and air pressure levels are reached.
7. . When reworking is complete, place the Hot Air Gun back to its holder.
8. Deactivate the HOT AIR GUN function switch (15). The system will immediately start the auto-cooling process.

Note: During this process, the system will try to release excess heat by blowing air (at room temperature) until it reaches a safe temperature value of 85°C before completely switching OFF.

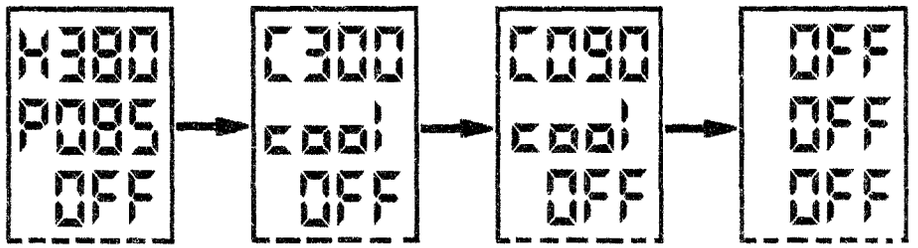
9. Wait for the auto-cooling process to finish before switching OFF the main power switch (9). If the display panel shows "OFF" on each line, then it is now safe to do so.
10. Unplug the device from the main power source.

⚠ IMPORTANT: Remember to set airflow level first before setting the temperature so that it would not damage the heating element, causing it to be burnt out prematurely. This would help lengthen the usage life span of the main unit and the heating element.

⚠ IMPORTANT: Airflow level should be set accordingly, working with low airflow and high temperature often causes heating element to get easily burnt.

Auto-cool off function

1. When reworking is complete, return the Hot Air Gun to its holder and **DO NOT** immediately unplug the device from the main power source.
2. Deactivate the HOT AIR GUN activation switch first in order to activate the auto-cooling process. The system will start to blow air (at room temperature) at maximum rate to reduce heat from the hot air gun and bring the temperature down to a safe level of **90°C.** During this time, the prefix of hot air gun temperature display will also change from "**H**" to "**C**" while temperature is gradually decreasing. The air pressure level, likewise, will be at its highest reading as indicated from the display panel. Once the temperature drops to approximately **90°C** the hot air gun will automatically stop and display "**OFF**" on the panel. It is now safe to unplug the device from the main power source if the system reached this stage.



Before deactivating Hot Air Gun function switch | After deactivating Hot Air Gun function switch | System blows air at room temperature until hot air reaches safe temperature level | Stand-by mode

3. Unplug the device from the main power source.
4. Allow the device (and its components) to completely cool down before keeping in a safe and dry place. (Optional but recommended).

Auto-sleep mode — unit is also programmed to have an auto-sleep mode, this is activated when hot air gun is turned on but is placed on the hot air gun holder and not put to use for set amount of minutes, temperature automatically decreases and eventually turns to sleep mode. When the handle is held up again the unit will go back to its previous setting.

Sleep Mode Timer Set-Up

1. Switch the unit ON (or press "Reset" button, from the panel).
2. Press and hold hot air gun up button, while the Name and model is displayed.
3. Display panel, will initially indicate '-05-', which means the device will switch to sleep mode after **5** minutes (default) of idle time and if the nozzle is docked on the handle for the duration of time.
4. Adjust the time before sleep by pressing air pressure up and down buttons.
5. Press Hot air gun down button to confirm.
6. The device will start counting down when the hot air gun is docked on the handle. Once countdown is finished and the hot air gun still docked, the device will automatically blow air (at room temperature) to bring down temperature to 90°C. The panel will then display four dashes "- - - - " to indicate that the device is now in sleep mode.

NOTES:

- Time is configurable from 1 to 20 minutes (default 5 minutes).
- The device has a switch located at the handle (cradle), which activates the countdown before the system goes to sleep.
- Once the hot air gun is released from the handle during sleep mode, the unit will automatically switch back to previous working temperature and airflow level parameters.
- Timer settings defaults back to 5 minutes every time the unit is powered down or the reset button is pushed.

C. AUTOMATE HOT AIR REWORKING

1. Turn on the hot air gun function switch , and set to the desired reworking temperature. Turn of hot air gun function switch.
2. Turn on the automate function switch,"16" from the panel, Set the time by using the up/down rework time button,"4" from the panel. It is preset at 300 seconds.
3. After preferred automate rework time has been set. Turn on the hot air gun function switch.
4. Timer would start counting down when the actual hot air temperature has reached the set temperature. Once automate rework time is finished, it would cool down automatically, and display the letters "End" indicating automate process is finished.
5. To resume manual hot air reworking de-press automate function switch.

D. SOLDERING IRON

1. Check if the Soldering Iron is attached properly to the 6-pin receptacle and the vacuum tube is securely connected.
2. Turn on the Power Switch.
3. Press the Soldering Iron function switch to turn on soldering iron. "18" from the panel.
4. When the display shows the word "PLUG" check the connection of the soldering iron to its receptacle.
5. The Solder iron is set to automatically increase temperature to 249° C upon turning on. It will show the set temperature when you are adjusting the temperature, then it will automatically switch to display the actual temperature when you have finished setting the temperature.
5. Set the temperature using the up/down Solder iron buttons ,"5" from the panel
6. Start using when real temperature reaches the set temperature.

OPERATING PROCEDURE

E.. SMOKE ABSORBER

1. Wait until the soldering iron reaches the set temperature and stabilizes.
2. Set Vacuum Control to *smoke absorber.*
3. Check if the Vacuum Indicator lights up.
4. Fumes absorbed will pass through a filter and be blown out thru the hot air gun. So the smoke that is blown out from the hot air gun during soldering is already filtered.

IMPORTANT: Filters should be cleaned and replaced regularly so that it would not clog up the air path and will effectively clean the toxic fumes produced during soldering process.

CARE and MAINTENANCE

A. Replacing the Hot Air Gun heating element

1. Remove the screws which secure the handle and slide the cord tube.
2. Open the handle. Disconnect the ground wire and remove the pipe.
3. Remove the heating element by disconnecting the terminal.
4. Insert a new heating element and reconnect the terminal. Handle the heating element with care. Never rub its wire. Reconnect the ground wire after replacing the element.
5. Assemble the handle in the reverse order of disassembly.

B. Care for the Soldering Iron tip.

Always keep the solder-plated section of the tip coated with a small amount of solder. If the tip is coated with oxide, the tip's heat conductivity will be lowered. Coating the tip with a small amount of fresh solder ensures maximum heat conductivity.

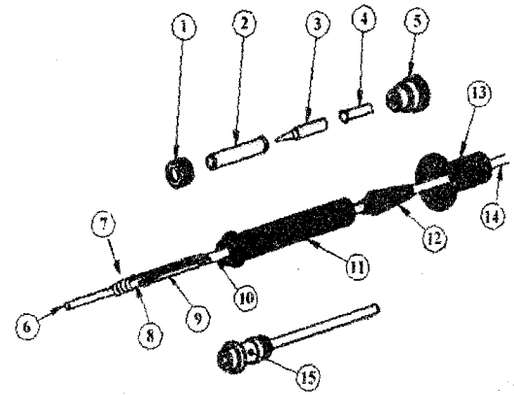
CARE and MAINTENANCE

STEPS in Checking, Cleaning and Tinning the Tip

1. Set temperature to 250° C (482° F)
2. After real temperature reaches the set temperature, use a damp sponge to clean the tip and check for damages.
3. If the tip has oxidation, apply solder and wipe using the damp sponge, repeat these steps until oxidation is removed.
4. After cleaning, coat tip with a thin layer of solder and set it aside ready for the next usage.
5. If the tip shows disfiguration or has rust on it. Change the tip.

The hand piece may be disassembled for trouble shooting and repair:

1. Turn of main station and unplug from power source.
2. Detach the soldering iron plug("15" as shown in the figure below) from the main unit.
3. Turn the nut, ("1" as shown in the figure below) counter clockwise.
4. Pull out the tip enclosure ("2" as shown in the figure below), the tip ("3" as shown in the figure below) , and the tip stand ("4" as shown in the figure below).
5. Turn the front module ("5" as shown in the figure below) counter clockwise to release it from the main body.
6. Push out the Heating element ("6" as shown in the figure below) via the cord ("14" as shown in the figure below).



To test if the heating element of the soldering iron is in working condition:

Let whole assembly cool down to room temperature and unplug from electrical sources before continuing the tests below:

1. Follow disassembling the hand piece guide.
2. Do the following tests on the hand piece PCB board:
   Resistance value of heating element (RED) 19-23 Ω
   Resistance value of sensor (blue) 1.2 — 3 Ω
   Note: resistance value of sensor may vary according to ambient temperature

After testing check results with the following:

- If the resistance value is not as stated above replace the heating element.
- If a 0 Ω or infinite resistances are measured check for shorts or open circuits.
- Itermittent readings can also be caused by cold solder double check solder points if the heating element has recently been replaced.

The heating element can be replaced as follows:

1. Follow the steps in "disassembling the soldering iron".
2. Unsolder the heating element wires (RED) and the sensor wires (blue).
3. The old heating element can now be detached from the hand piece board.
4. Detach the metal protector located at the bottom part of the heating element.
5. Reattach the metal protector to the bottom part of the new heating element.
6. Pass the New heating elements wires (RED) thru the holes located on top of the board.
7. Solder the heating element's wires and the sensor wires to the board
8. Solder one RED wire of heating element with RED wire on PCB.

- Solder the other RED wire of heating element with YELLOW wire on PCB.
- Solder BLUE wire of heating element with BLUE wire on PCB.
- Solder WHITE wire of heating element to with BLACK wire on PCB

The 5 pin Solder Iron socket can be tested to detect faults in the hand piece:

Before plugging in the hand piece conduct the following test:

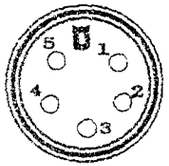
Pins 4 & 2	∞
Pins 4 & 1	∞
Pins 5 & 1	∞
Pins 5 & 2	∞

If any of the above mentioned combination registers a short review the steps in replacing the heating element to ensure proper connections.

⚠ Warning: Ensure none of the above mentioned conditions are present before plugging in the hand piece. Failure to do so can damage the internal circuitry of the unit.

Test the resistances of the following configurations:

Pins 1 & 2	19 to 23 Ω
Pins 4 & 5	1.2 to 3Ω
Pin 3 & solder tip	Below 2 Ω



If resistance test conforms to the above tables then the soldering iron hand piece is deemed working and can be plugged in to the Soldering Iron receptacle for usage, if problems after installation of new heating element occurs review the previous steps to double check connections.

Note: resistance value of sensor(Pins4&5) may vary according to ambient temperature

BASIC TROUBLESHOOTING GUIDE

PROBLEM 1: THE UNIT HAS NO POWER

1. Check if the unit is switched ON.
2. Check the fuse. Replace with the same type if fuse is blown.
3. Check the power cord and make sure there are no disconnections.
4. Verify that the unit is properly connected to the power source.

PROBLEM 2: TEMPERATURE DISPLAY IS ALWAYS ABOVE 500°C

Description: Constant display of above 500°C temperature from the panel then displays a blinking "OFF" on the panel after a few minutes.

SOLUTION:

The thermal sensor may be broken and needs to be replaced.

PROBLEM 3: ACTUAL AIR TEMPERATURE IS NOT INCREASING

Description: Actual temperature reading is not increasing or decreasing based on desired level. The panel will then display a blinking "OFF" on panel.

SOLUTION:

The heating element may be broken and needs to be replaced.

PROBLEM 4: THE UNIT IS VIBRATING TOO MUCH

Check if the 4 screws that hold the pump in place are properly and tightly connected. Unplug the system from the main power source before opening the case to check the internal settings.

PROBLEM 5: THE UNIT IS VERY NOISY

SOLUTION: Make sure the screw at the center of the base of the main unit has been removed. This holds the pump in place during transportation and needs to be removed before using the equipment.

BASIC TROUBLESHOOTING GUIDE

PROBLEM 6: AIR PRESSURE LEVEL IS SIGNIFICANTLY LOW NO MATTER HOW HIGH THE AIRFLOW LEVEL IS CALIBRATED

Case 1: Check the mains voltage (AC power source). If the voltage level falls significantly low, about 15-20% lower than the standard, there will also be a noticeable drop in the air pressure level.

SOLUTION: Please refer to your local power service provider.

Case 2: The microcontroller might have detected the operating frequency incorrectly. The user will notice that airflow level is weaker with reference to the airflow gauge compared with the displayed value.

SOLUTION: Try to press the RESET button on the panel to let the device re-detect the proper operating frequency.

PROBLEM 7: SOLDERING IRON TEMPERATURE DISPLAY PANEL SHOWS "PLUG" CHARACTERS

Case 1: The system shows "PLUG" from the soldering iron temperature display panel .

SOLUTION 1: Check if the soldering iron connection assembly is properly connected and secured to the receptacle on the control panel.

SOLUTION 2: Make sure the soldering iron tip is properly inserted and secured inside the handle. Lose contacts between the tip and handle can also cause this error message.

PROBLEM 8: DISPLAY AND OTHER DEVICE OPERATION ISSUES

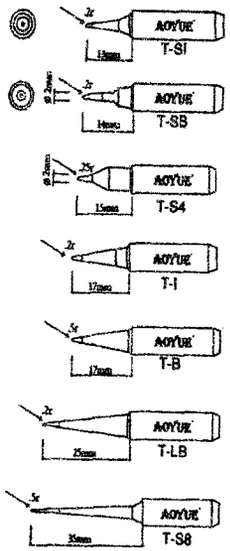
SOLUTION: Try to switch OFF the device and switch ON again. Unplug the system from the main power source and plug in again when necessary

OTHER PROBLEMS NOT MENTIONED:

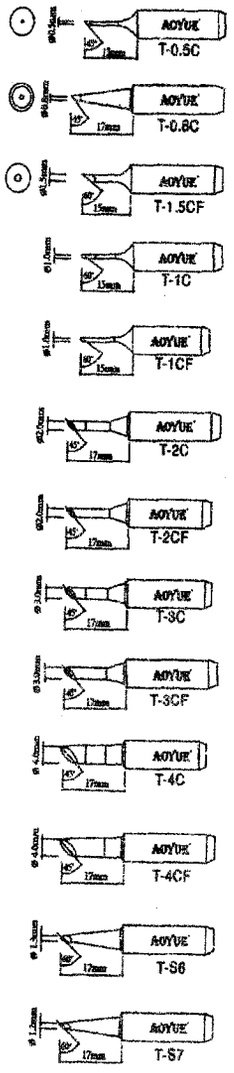
Contact the vendor.

REPLACEMENT TIPS

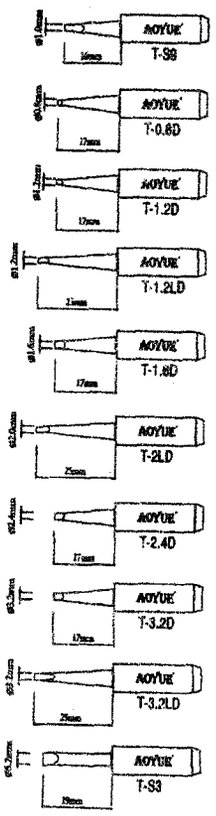
Conical Type



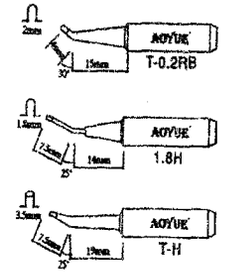
Bevel Type



Chisel Type

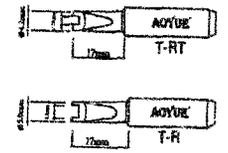


Sharp-Bent Type



Blade Type

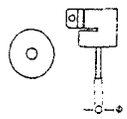
Slot Type



Note: The above items are sold separately.

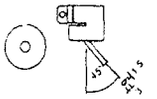
AIR NOZZLES

Straight Single



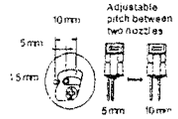
Nozzle Model	Nozzle Size (mm)
1124	2.5
1130	4.4
1194	6
1195	8
1196	7
1197	9
1198	12

Bent Single



Nozzle Model **1142**

Dual Single Adjustable

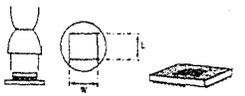


Nozzle Model **1325**

Single In Line Package

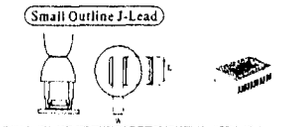
Nozzle Model	IC Package Size	Nozzle Length (mm)
1191	SIP 25L	26
1192	SIP 50L	51.5

Ball Grid Array



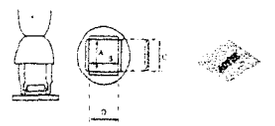
Nozzle Model	IC Package Size (mm)	Nozzle Size (mm) W	Nozzle Size (mm) L
1010	BGA 9x9	10	10
1313	BGA 12x12	13	13
1616	BGA 15x15	16	16
1919	BGA 18x18	19	19
2828	BGA 27x27	28	28
3636	BGA 35x35	36	36
3939	BGA 38x38	39	39
4141	BGA 40x40	41	41

Small Outline J-Lead



Nozzle Model	IC Package Size (mm)	Nozzle Size (mm) L	Nozzle Size (mm) W
1183	SOJ 15x8	16	9
1184	SOJ 18x8	19	10
1214	SOJ 16x26	25.9	17

Plastic Leaded Chip Carrier

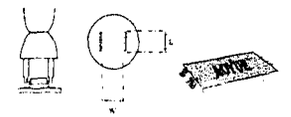


Nozzle Model	IC Package Size (mm)	Nozzle Size (mm) A	B	C	D
1135	PLCC 17.5x17.5 (44pins)	19.3	19.5	15	15
1136	PLCC 20x20 (52pins)	21	21	17	17
1137	PLCC 25x25 (68pins)	26	26	24	24
1138	PLCC 30x30 (84pins)	31	31	29	29
1139	PLCC 33.x32.5 (108pins)	34	34	32	32
1140	PLCC 11.6x11.5 (28pins)	12	11.5	9	10
1141	PLCC 11.5x14 (32pins)	12	11	10	13
1188	PLCC 9x9 (20pins)	11	11	10	10
1189	PLCC 34x34 (100pins)	36.5	36.5	33.3	33.5

Small-Outline Package

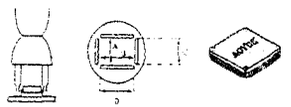
Nozzle Model	IC Package Size (mm)	Nozzle Size (mm) L	Nozzle Size (mm) W
1131	SOP 4.4x10	10	4.8
1132	SOP 5.6x13	15	5.7
1133	SOP 7.5x15	16	7.2
1134	SOP 7.5x18	19	7.2
1257	SOP 11x21	21	11.7
1258	SOP 7.6x12.7	11.7	8.2
1259	SOP 13x28	29	13.5
1260	SOP 8.6x18	19	8.7

Thin Small-Outline



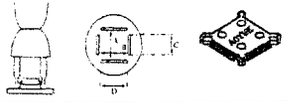
Nozzle Model	IC Package Size (mm)	Nozzle Size (mm) L	Nozzle Size (mm) W
1185	TSOL 13x10	10	11.2
1187	TSOL 18.5x8	10	14.5
1186	TSOL 14x10	11.7	14.2

Quad Flat Pack



Nozzle Model	IC Package Size (mm)	Nozzle Size (mm) A	B	C	D
1125	QFP 10x10	10.2	10.2	10	10
1126	QFP 14x14	15.2	15.2	15	15
1127	QFP 17.5x17.5	19.2	19.2	19	19
1128	QFP 14x20	16.2	21.2	15	21
1229	QFP 28x28	26.5	29.7	26	26
1215	QFP 42.5x42.5	42.5	42.5	40	40
1261	QFP 20x20	20.2	20.2	21	21
1262	QFP 12x12	12.2	12.2	12	12
1263	QFP 28x40	27.7	39.7	29	39
1264	QFP 40x40	40.2	40.2	39	39
1265	QFP 32x32	32.2	32.2	31	31

Bumpered Quad Flat Pack



Nozzle Model	IC Package Size (mm)	Nozzle Size (mm) A	B	C	D
1180	BQFP 17x17	18.2	18.2	13.6	13.6
1181	BQFP 19x19	19.2	19.2	16	16
1203	BQFP 35x35	35.2	35.2	30.6	30.6
1167	BQFP 24x24	24.2	24.2	21	21

Note: The above items are sold separately.