

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

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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.



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.

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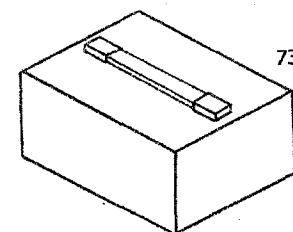
PRODUCT DESCRIPTION

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.

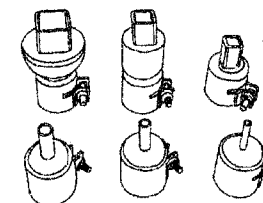
One of the notable features of this device is the auto-cooling process of the Hot Air Gun. This functionality protects the device (and its components) from excessive heat by blowing air (at room temperature) upon achieving any of the following two conditions: (1) when the soldering gun remained idle 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.

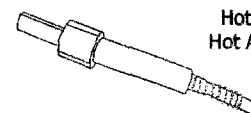
PACKAGE INCLUSION



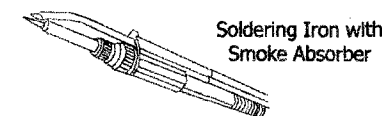
738 Main Station



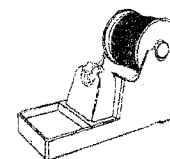
Air Nozzles
(1124, 1130,
1197, 1010, 1313,



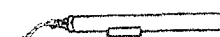
Hot Air Gun and
Hot Air Gun Holder



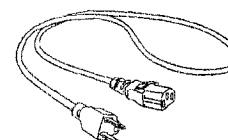
Soldering Iron with
Smoke Absorber



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.)

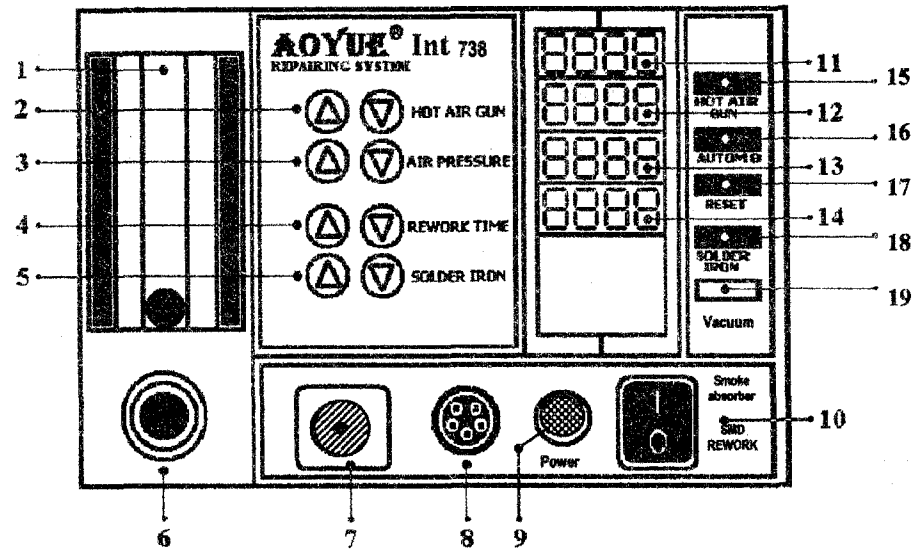
SAFETY PRECAUTIONS



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.

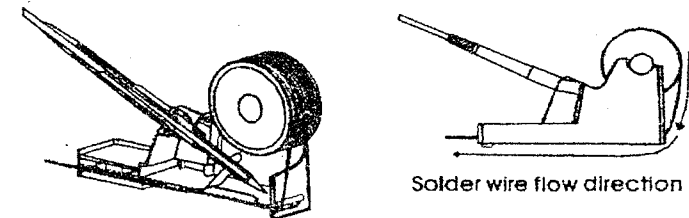


Figure 2. Soldering iron stand with solder wire holder

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.

OPERATING GUIDELINES

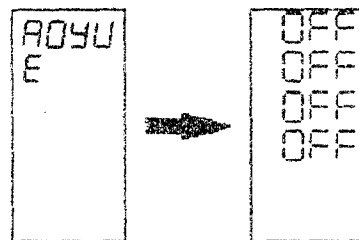
IMPORTANT REMINDERS:

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.

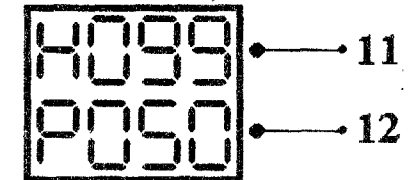


4. The air gauge (item 1) will also appear illuminated by ample light and the metal ball inside is at the lowest position of the visible area.
5. The system will remain in this state until a function is activated.

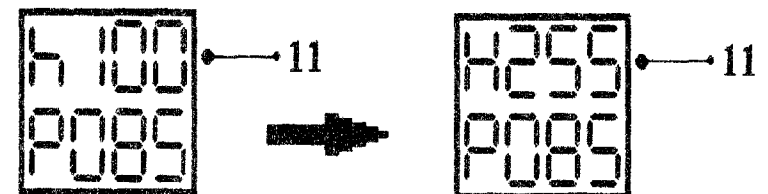
OPERATING GUIDELINES

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.



OPERATING GUIDELINES

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.

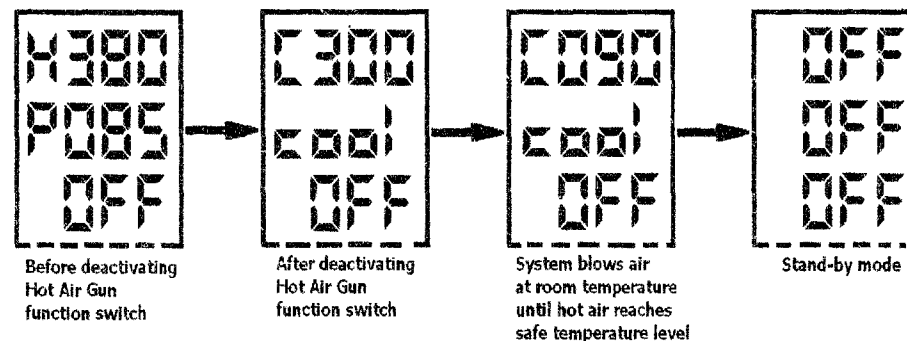
⚠ IMPORTANT: Remember to set airflow level first before setting the temperature so that it would not damage the heating element, causing it to be burnt out prematurely. This would help lengthen the usage life span of the main unit and the heating element.

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

OPERATING GUIDELINES

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.



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).

OPERATING GUIDELINES

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.

OPERATING GUIDELINES

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.

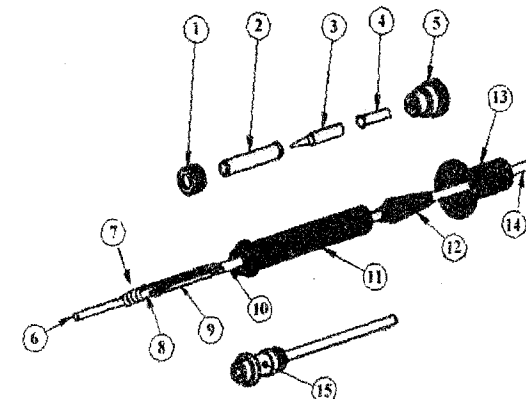
CARE and MAINTENANCE

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).



CARE and MAINTENANCE

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.
- Intermittent 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.

CARE and MAINTENANCE

- 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:

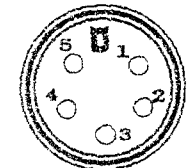
Pins 4 & 2	∞
Pins 4 & 1	∞
Pins 5 & 1	∞
Pins 5 & 2	∞

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 3 Ω
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 (Pins 4 & 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.

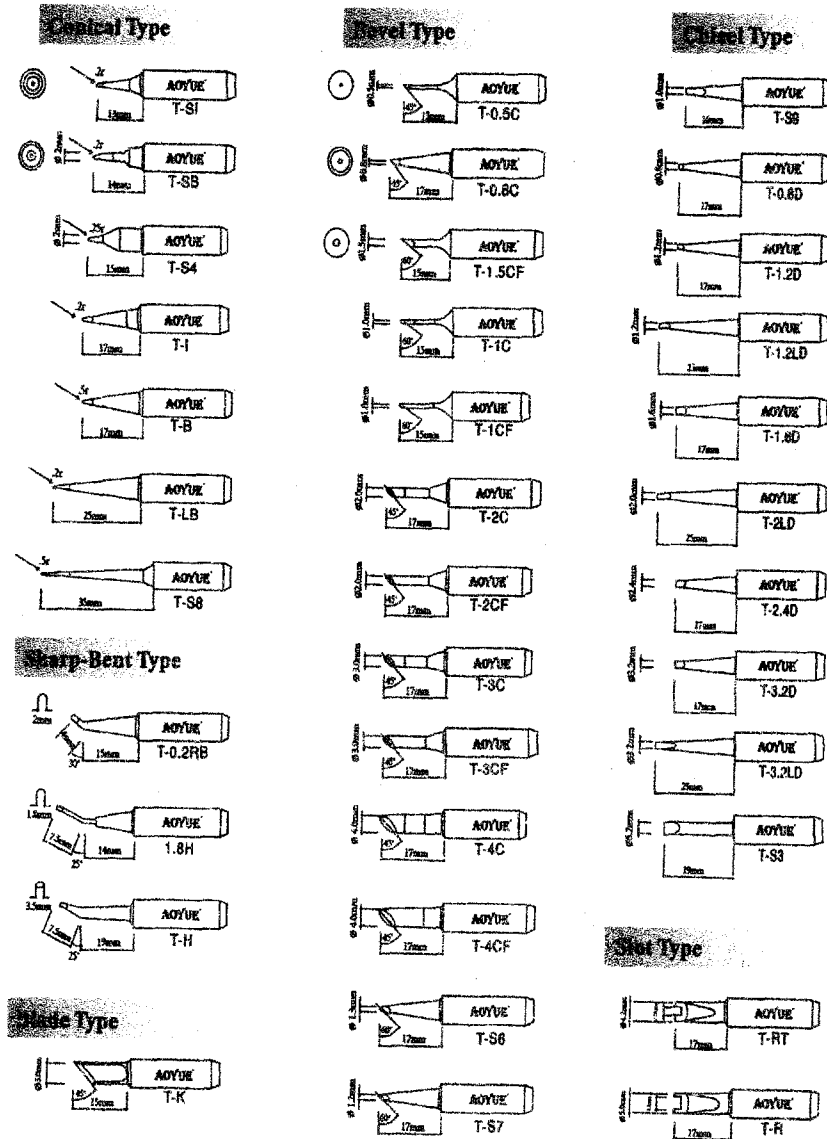
PROBLEM 8: DISPLAY AND OTHER DEVICE OPERATION ISSUES

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.

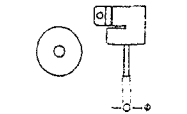
REPLACEMENT TIPS



Note: The above items are sold separately.

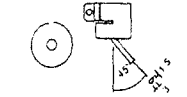
AIR NOZZLES

Straight Single



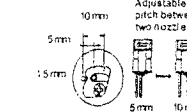
Nozzle Model	Nozzle Size (mm)
1124	2.5
1130	4.4
1194	6
1195	8
1196	7
1197	9
1198	12

Bent Single



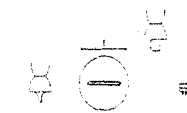
Nozzle Model 1142

Dual Single Adjustable



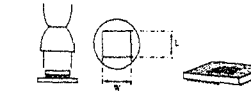
Nozzle Model 1325

Single In Line Package



Nozzle Model	IC Package Size (mm)	Nozzle Length (mm)
1191	SIP 25L	29
1192	SIP 50L	37.5

Ball Grid Array



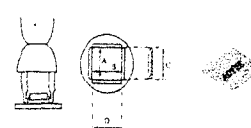
Nozzle Model	IC Package Size (mm)	Nozzle Size (mm)
1010	BGA 9x9	10 10
1313	BGA 12x12	13 13
1616	BGA 15x15	16 16
1919	BGA 18x18	19 19
2828	BGA 27x27	28 28
3636	BGA 35x35	36 36
3939	BGA 38x38	39 39
4141	BGA 40x40	41 41

Small Outline J-Lead



Nozzle Model	IC Package Size (mm)	Nozzle Size (mm)
1183	SOP 15x10	16 4
1184	SOP 18x9	19 10
1214	SOP 18x25	25 7

Plastic Leaded Chip Carrier



Nozzle Model	IC Package Size (mm)	Nozzle Size (mm)			
		A	B	C	D
1135	PLCC 17.5x17.5 (44pins)	5.4	14.5	15	5
1136	PLCC 20x20 (52pins)	7.1	21	19	12
1137	PLCC 25x25 (68pins)	9.1	26	24	13
1138	PLCC 30x30 (84pins)	11.1	31	29	16
1139	PLCC 35x35 (100pins)	13.1	36	32	17
1140	PLCC 40x40 (120pins)	15.1	41	37	19
1141	PLCC 45x45 (144pins)	17.1	46	42	21
1142	PLCC 50x50 (168pins)	19.1	51	47	23
1143	PLCC 55x55 (192pins)	21.1	56	52	25
1144	PLCC 60x60 (216pins)	23.1	61	57	27
1145	PLCC 65x65 (240pins)	25.1	66	62	29
1146	PLCC 70x70 (264pins)	27.1	71	67	31
1147	PLCC 75x75 (288pins)	29.1	76	72	33
1148	PLCC 80x80 (312pins)	31.1	81	77	35
1149	PLCC 85x85 (336pins)	33.1	86	82	37
1150	PLCC 90x90 (360pins)	35.1	91	87	39
1151	PLCC 95x95 (384pins)	37.1	96	92	41
1152	PLCC 100x100 (408pins)	39.1	101	97	43
1153	PLCC 105x105 (432pins)	41.1	106	102	45
1154	PLCC 110x110 (456pins)	43.1	111	107	47
1155	PLCC 115x115 (480pins)	45.1	116	112	49
1156	PLCC 120x120 (504pins)	47.1	121	117	51
1157	PLCC 125x125 (528pins)	49.1	126	122	53
1158	PLCC 130x130 (552pins)	51.1	131	127	55
1159	PLCC 135x135 (576pins)	53.1	136	132	57
1160	PLCC 140x140 (600pins)	55.1	141	137	59
1161	PLCC 145x145 (624pins)	57.1	146	142	61
1162	PLCC 150x150 (648pins)	59.1	151	147	63
1163	PLCC 155x155 (672pins)	61.1	156	152	65
1164	PLCC 160x160 (696pins)	63.1	161	157	67
1165	PLCC 165x165 (720pins)	65.1	166	162	69
1166	PLCC 170x170 (744pins)	67.1	171	167	71
1167	PLCC 175x175 (768pins)	69.1	176	172	73
1168	PLCC 180x180 (792pins)	71.1	181	177	75
1169	PLCC 185x185 (816pins)	73.1	186	182	77
1170	PLCC 190x190 (840pins)	75.1	191	187	79
1171	PLCC 195x195 (864pins)	77.1	196	192	81
1172	PLCC 200x200 (888pins)	79.1	201	197	83
1173	PLCC 205x205 (912pins)	81.1	206	202	85
1174	PLCC 210x210 (936pins)	83.1	211	207	87
1175	PLCC 215x215 (960pins)	85.1	216	212	89
1176	PLCC 220x220 (984pins)	87.1	221	217	91
1177	PLCC 225x225 (1008pins)	89.1	226	222	93
1178	PLCC 230x230 (1032pins)	91.1	231	227	95
1179	PLCC 235x235 (1056pins)	93.1	236	232	97
1180	PLCC 240x240 (1080pins)	95.1	241	237	99
1181	PLCC 245x245 (1104pins)	97.1	246	242	101
1182	PLCC 250x250 (1128pins)	99.1	251	247	103
1183	PLCC 255x255 (1152pins)	101.1	256	252	105
1184	PLCC 260x260 (1176pins)	103.1	261	257	107
1185	PLCC 265x265 (1200pins)	105.1	266	262	109
1186	PLCC 270x270 (1224pins)	107.1	271	267	111
1187	PLCC 275x275 (1248pins)	109.1	276	272	113
1188	PLCC 280x280 (1272pins)	111.1	281	277	115
1189	PLCC 285x285 (1296pins)	113.1	286	282	117
1190	PLCC 290x290 (1320pins)	115.1	291	287	119
1191	PLCC 295x295 (1344pins)	117.1	296	292	121
1192	PLCC 300x300 (1368pins)	119.1	301	297	123
1193	PLCC 305x305 (1392pins)	121.1	306	302	125
1194	PLCC 310x310 (1416pins)	123.1	311	307	127
1195	PLCC 315x315 (1440pins)	125.1	316	312	129
1196	PLCC 320x320 (1464pins)	127.1	321	317	131
1197	PLCC 325x325 (1488pins)	129.1	326	322	133
1198	PLCC 330x330 (1512pins)	131.1	331	327	135
1199	PLCC 335x335 (1536pins)	133.1	336	332	137
1200	PLCC 340x340 (1560pins)	135.1	341	337	139
1201	PLCC 345x345 (1584pins)	137.1	346	342	141
1202	PLCC 350x350 (1608pins)	139.1	351	347	143
1203	PLCC 355x355 (1632pins)	141.1	356	352	145
1204	PLCC 360x360 (1656pins)	143.1	361	357	147
1205	PLCC 365x365 (1680pins)	145.1	366	362	149
1206	PLCC 370x370 (1704pins)	147.1	371	367	151
1207	PLCC 375x375 (1728pins)	149.1	376	372	153
1208	PLCC 380x380 (1752pins)	151.1	381	377	155
1209	PLCC 385x385 (1776pins)	153.1	386	382	157
1210	PLCC 390x390 (1800pins)	155.1	391	387	159
1211	PLCC 395x395 (1824pins)	157.1	396	392	161
1212	PLCC 400x400 (1848pins)	159.1	401	397	163
1213	PLCC 405x405 (1872pins)	161.1	406	402	165
1214	PLCC 410x410 (1896pins)	163.1	411	407	167
1215	PLCC 415x415 (1920pins)	165.1	416	412	169
1216	PLCC 420x420 (1944pins)	167.1	421	417	171
1217	PLCC 425x425 (1968pins)	169.1	426	422	173
1218	PLCC 430x430 (1992pins)	171.1	431	427	175
1219	PLCC 435x435 (2016pins)	173.1	436	432	177
1220	PLCC 440x440 (2040pins)	175.1	441	437	179
1221	PLCC 445x445 (2064pins)	177.1	446	442	181
1222	PLCC 450x450 (2088pins)	179.1	451	447	183
1223	PLCC 455x455 (2112pins)	181.1	456	452	185
1224	PLCC 460x460 (2136pins)	183.1	461	457	187
1225	PLCC 465x465 (2160pins)	185.1	466	462	189
1226	PLCC 470x470 (2184pins)	187.1	471	467	191
1227	PLCC 475x475 (2208pins)	189.1	476	472	193
1228	PLCC 480x480 (2232pins)	191.1	481	477	195
1229	PLCC 485x485 (2256pins)	193.1	486	482	197
1230	PLCC 490x490 (2280pins)	195.1	491	487	199
1231	PLCC 495x495 (2304pins)	197.1	496	492	201
1232	PLCC 500x500 (2328pins)	199.1	501	497	203
1233	PLCC 505x505 (2352pins)	201.1	506	502	205
1234	PLCC 510x510 (2376pins)	203.1	511	507	207
1235	PLCC 515x515 (2400pins)	205.1	516	512	209
1236	PLCC 520x520 (2424pins)	207.1	521	517	211
1237	PLCC 525x525 (2448pins)	209.1	526	522	213
1238	PLCC 530x530 (2472pins)	211.1	531	527	215
1239	PLCC 535x535 (2496pins)	213.1	536	532	217
1240	PLCC 540x540 (2520pins)	215.1	541	537	219
1241	PLCC 545x545 (2544pins)	217.1	546	542	221
1242	PLCC 550x550 (2568pins)	219.1	551	547	223
1243	PLCC 555x555 (2592pins)	221.1	556	552	225
1244	PLCC 560x560 (2616pins)	223.1	561	557	227
1245	PLCC 565x565 (2640pins)	225.1	566	562	229
1246	PLCC 570x570 (2664pins)	227.1	571	567	231
1247	PLCC 575x575 (2688pins)	229.1	576	572	233
1248	PLCC 580x580 (2712pins)	231.1	581	577	235
1249	PLCC 585x585 (2736pins)	233.1	586	582	237
1250	PLCC 590x590 (2760pins)	235.1	591	587	239
1251	PLCC 595x595 (2784pins)	237.1	596	592	241
1252	PLCC 600x600 (2808pins)	239.1	601	597	243
1253	PLCC 605x605 (2832pins)	241.1	606	602	245
1254	PLCC 610x610 (2856pins)	243.1	611	607	247
1255	PLCC 615x615 (2880pins)	245.1	616	612	249
1256	PLCC 620x620 (2904pins)	247.1	621	617	251
1257	PLCC 625x625 (2928pins)	249.1	626	622	253
1258	PLCC 630x630 (2952pins)	251.1	631	627	255
1259	PLCC 635x635 (2976pins)	253.1	636	632	257
1260	PLCC 640x640 (3000pins)	255.1	641	637	259
1261	PLCC 645x645 (3024pins)	257.1	646	642	261
1262	PLCC 650x650 (3048pins)	259.1	651	647	263
1263	PLCC 655x655 (3072pins)	261.1	656	652	265
1264	PLCC 660x660 (3096pins)	263.1	661	657	267
1265	PLCC 665x665 (3120pins)	265.1	666	662	269
1266	PLCC 670x670 (3144pins)	267.1	671	667	271
1267	PLCC 675x675 (3168pins)	269.1	676	672	273
1268	PLCC 680x680 (3192pins)	271.1	681	677	275
1269	PLCC 685x685 (3216pins)	273.1	686	682	277
1270	PLCC 690x690 (3240pins)	275.1	691	687	279
1271	PLCC 695x695 (3264pins)	277.1	696	692	281
1272	PLCC 700x700 (3288pins)	279.1	701	697	283
1273	PLCC 705x705 (3312pins)	281.1	706	702	285
1274	PLCC 710x710 (3336pins)	283.1	711	707	287
1275	PLCC 715x715 (3360pins)	285.1	716	712	289
1276	PLCC 720x720 (3384pins)	287.1	721	717	291
1277	PLCC 725x725 (3408pins)	289.1	726	722	293
1278	PLCC 730x730 (3432pins)	291.1	731	727	295
1279	PLCC 735x735 (3456pins)	293.1	736	732	297
1280	PLCC 740x740 (3480pins)	295.1	741	737	299
1281	PLCC 745x745 (3504pins)	297.1	746	742	301
1282	PLCC 750x750 (3528pins)	299.1	751	747	303
1283	PLCC 755x755 (3552pins)	301.1	756	752	305
1284	PLCC 760x760 (3576pins)	303.1	761	757	307
1285	PLCC 765x765 (3600pins)	305.1	766	762	309
1286	PLCC 770x770 (3624pins)	307.1	771	767	311
1287	PLCC 775x775 (3648pins)	309.1	776	772	313
1288	PLCC 780x780 (3672pins)	311.1	781	777	315
1289	PLCC 785x785 (3696pins)	313.1	786	782	317
1290	PLCC 790x790 (3720pins)	315.1	791	787	319
1291	PLCC 795x795 (3744pins)	317.1	796	792	321
1292	PLCC 800x800 (3768pins)	319.1	801	797	323
1293	PLCC 805x805 (3792pins)	321.1	806	802	325
1294	PLCC 810x810 (3816pins)	323.1	811	807	327
1295	PLCC 815x815 (3840pins)	325.1	816	812	329
1296	PLCC 820x820 (3864pins)	327.1	821	817	331
1297	PLCC 825x825 (3888pins)	329.1	826	822	333
1298	PLCC 830x830 (3912pins)	331.1	831	827	335
1299	PLCC 835x835 (3936pins)	333.1	836	832	337
1300	PLCC 840x840 (3960pins)	335.1	841	837	339
1301	PLCC 845x845 (3984pins)	337.1	846	842	341
1302	PLCC 850x850 (4008pins)	339.1	851	847	343
1303	PLCC 855x855 (4032pins)	341.1	856	852	345
1304	PLCC 860x860 (4056pins)	343.1	861	857	347
1305	PLCC 865x865 (4080pins)	345.1	866	862	349
1306	PLCC 870x870 (4104pins)	347.1	871	867	351
1307	PLCC 875x875 (4128pins)	349.1	876	872	353
1308	PLCC 880x880 (4152pins)	351.1	881	877	355
1309	PLCC 885x885 (4176pins)	353.1	886	882	357
1310	PLCC 890x890 (4200pins)	355.1	891	887	359
1311	PLCC 895x895 (4224pins)	357.1	896	892	361
1312	PLCC 900x900 (4248pins)	359.1	901	897	363
1313	PLCC 905x905 (4272pins)	361.1	906	902	365
1314	PLCC 910x910 (4296pins)	363.1	911	907	367
1315	PLCC 915x915 (4320pins)	365.1	916	912	369
1316	PLCC 920x920 (4344pins)	367.1	921	917	371
1317	PLCC 925x925 (4368pins)	369.1	926	922	373
1318	PLCC 930x930 (4392pins)	371.1	931	927	375
1319					