

# MODEL WESD51 ELECTRONIC SOLDERING STATION

## DESCRIPTION

The WESD51 Soldering Station is one in a series of products, which have been developed for industrial manufacturing as well as for the rework and repair sector. Microprocessor control and a digital display allow for simple and easy operation. The digital electronic control system offers excellent control performance for various soldering jobs.

A digital readout, grounded soldering iron tip, zero power switching and anti-static design of the station and tool allow the WESD51 Soldering System to meet the high quality standards established by Weller®. The station features an external tip temperature "Offset", selectable between Degrees "F" and Degrees "C", and the ability to "Lock" the tip temperature setting using the PW50 Probe (supplied). The station will automatically enter a sleep mode and shut off power to the tool and digital display, after 99 minutes of inactivity.

Tip temperature is adjustable in the range of 350°F to 850°F (177°C to 454°C), with the front panel temperature control knob. The "Lockout" function will be indicated by a single "Decimal Point" in the upper left hand corner of the MSD (Most Significant Digit), when the station is "Locked". The station can also be switched between Degrees "F" and Degrees "C". The station is represented in the Degrees "C" mode, when the single "Decimal Point" in the upper left hand corner of the LSD (Least Significant Digit) of the display, is illuminated. An "Offset" feature is offered and is indicated by a single "Decimal Point" in the upper left hand corner of the MD (Middle Digit), of the display. (See Individual Operating Instructions for details). This soldering station meets all applicable standards for the CE mark.

## OPERATING INSTRUCTIONS

Unpack unit carefully. Place spring and funnel in slot in top of tool stand. Position tool stand on appropriate area of workbench. Dampen the sponge, distilled or de-ionized water is preferred. Insert tool in holder and connect tool plug to receptacle on power unit; rotate plug housing Clockwise (CW) to lock plug into receptacle. Insert line cord plug into a properly grounded AC receptacle and turn station "On". Set temperature control knob to desired tip temperature. When the tip temperature reaches 400° F (204° C), remove tool from holder and tin tip with solder. Unit will be ready for use when the set point temperature is reached.

When first turned "On", the unit will display "888" for two seconds as a test and then will display the "Set" temperature for three seconds before switching into the "Read" mode. The unit display shows a "Read" mode by default, which displays the current temperature of the tip. To switch into the "Set" mode, turn the temperature control knob slightly and the display will show the current "Set" temperature. Release the knob when you have reached the desired temperature setting and after a three second delay, the display will switch back to the "Read" mode.

While in the "Read" mode, the displayed tip temperature may fluctuate. This fluctuation is normal and represents the control systems response to the changing load. Tip selection, for a particular job, may be optimized by observing the tip temperature fluctuations during the soldering application. Normally, the tip should be selected for minimum fluctuation. This will assist in providing the shortest soldering dwell time. However, some applications may require a fast response time with total fluctuation not being critical.

Always use the lowest temperature that will handle the load that you are soldering. The Weller® electronic control provides maximum power to the heated load even when set to the lowest temperature; therefore, there is no need to use high temperatures to handle heavy soldering loads. By using lower temperatures and properly selecting tip styles, sensitive components will be protected from heat damage.

**WARNING:** Do not remove ground prong from line cord plug. Removal may cause tip temperature control to be erratic.

## AVAILABLE MODELS AND HAND PIECES

PRODUCT	DESCRIPTION
WESD51	Power unit, 120V 60Hz, °F/°C Selectable, PES51 tool and tool stand
WESD51D	Power unit, 220V 50/60 Hz, °F/°C Selectable, PES51 tool and tool stand
WESD51DUK	Power unit, 230V 50/60 Hz, °F/°C Selectable, PES51 tool and tool stand
WESD51J	Power unit, 100V 50/60 Hz, °F/°C Selectable, PES51 tool and tool stand
WESD51T	Power unit, 110V 60 Hz, °F/°C Selectable, PES51 tool and tool stand
PES51	50 watt Soldering Tool w/ETA Tip

**WARNING:** This product, when used for soldering and similar applications, produces chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.



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## SPECIFICATIONS

### STATIONS

1. Power Input: 120VAC  $\pm$ 10%, 60 Hz, (230VAC  $\pm$ 10%, 50/60 Hz), 60 watts.
2. Power unit output voltage: Isolated 24VAC @ 2.1 amperes.
3. Size: 4.5" x 5.9" x 3.6".
4. Line Cord: 3-Wire
5. Tip temperature control range: 350°F to 850°F (177°C to 454° C).
6. Control setting resolution: 1° F (1° C).
7. Stability:  $\pm$ 10° F ( $\pm$ 6° C) per MIL-STD-2000.
8. Absolute accuracy: Average tip temperature can be "Offset" to  $\pm$ 9° F ( $\pm$ 5° C) at idle with no load.
9. Ambient temperature range: 60° F to 110° F (16° C to 44° C).

### IRONS

1. Wattage: 50 watts at 24 VAC.
2. Tip voltage: Less than 2 mv TRMS to line cord ground pin.
3. Tool weight: 2 ounces without cord.
4. Tool material: Static dissipative thermoplastic handle and stainless steel.
5. Heater type: Fiberglass and ceramic insulated heating element. Reverse wound for low leakage and magnetic field cancellation.
6. Tip type: Weller® ET and SMT series tips. Copper with heavy Iron, Nickel and Chromium plating for long life.
7. Sensor: Type "K" Thermocouple. Fits deep inside tip for maximum response.
8. Handle design: Heat insulated with foam sleeve for low grip temperature and maximum comfort.
9. Tool cord: Silicone rubber, burn resistant.
10. Connector: Polarized, 6 pin locking.
11. Recovery time: Less than 10 seconds from 100°F drop with ETA tip at 700°F.

### STANDARDS

1. Housing and tool handle made with Electrostatic Protective Materials as required in MIL-B-81705.
2. Housing passes Static Decay Test per Federal Test Method Std. No. 101, Method 4046.
3. Weller® ESD tools comply with DOD-HDBK-263.
4. WES51 & WESD51 units meet MIL-STD-2000, MIL-S-45743, W-S-6536, W-S-570 and DOD-STD-1686.
5. WESD51 units meet all applicable standards for CE mark.

### ACTIVATION OF LOCKOUT FEATURE

1. Set the digital display to the desired tip temperature.
2. Momentarily touch the Lockout Pencil (PW50) to the ESD symbol on the front panel. The decimal point on the MSD (Most Significant Digit) will blink if the Lockout Pencil is held against the touch panel. Remove the Lockout Pencil from the ESD Symbol and the single decimal point in the MSD (Most Significant Digit) will be illuminated, indicating that the station has been "Locked". The lockout set temperature will be displayed for 3 seconds before switching to the actual tip temperature. Adjusting the temperature set knob will temporarily display the "Set" point of the station, even though the unit will not change the temperature setting, when in the "Lockout" mode.
3. Reverse the lockout by momentarily touching the Lockout Pencil to the ESD symbol. Remove the Lockout Pencil slowly and the temperature set knob will function as normal. The single decimal point in the MSD (Most Significant Digit) will now be "Off".

**Note:** If the temperature set knob is adjusted during the "Lockout" mode, the temperature setting will display the current "Position/Setting" of the temperature set pot, when the "Lockout" function is removed.

### TIP TEMPERATURE "OFFSET" PROCEDURE

1. Monitor the tip temperature using the K111, Type "K" Thermocoupled Tip temperature test kits. (see Replacement Parts and Accessories Section)
2. Set the digital display to the desired tip temperature and allow the tip temperature to stabilize (as indicated by the "Read" mode).

3. Apply the Lockout Pencil to the ESD symbol on the front panel. The single decimal point in the MSD (Most Significant Digit) will slowly blink for approximately 3 seconds. At this point, the single decimal point in the MD (Middle Digit) will begin to flash, indicating that it is in the "Offset" mode. Adjust the digital display to where it matches the measured tip temperature. Now remove the Lockout Pencil and the temperature "Offset" procedure is complete. The "Offset" is retained when the station power is turned off.

**Note:** The "Offset" allows for approximately +/- 75° F (42° C) adjustment capability. If the measured error is greater than +/- 75° F (42° C), the station will reject the input by continuously displaying "NO" on the digital display, until the "Lockout Probe" is removed from the panel. At this point, the "Offset" procedure (Step 3 above) must be repeated with an offset used, within the acceptable range.

### RESET STATION TO FACTORY DEFAULT SETTINGS

With the station power turned "Off", adjust the temperature set knob to the lowest setting: 350°F (177°C). Apply the Lockout Pencil to the ESD symbol on the front panel and turn the station "On". Remove the Lockout Pencil and the procedure is complete. Any tip temperature "Offset" programmed into the memory will now be reset to the nominal factory settings. Lockout will also be cleared.

### AUTO OFF FEATURE

The Weller® Model WESD51 Model Station will automatically shut off power to the tool and the digital display after 99 minutes of inactivity of the iron. Certain applications may not be recognized by the "Loading Effect" or "Temperature Drop" on the tool and may require more frequent wiping of the tip on the damp sponge, to recognize use.

### °F/°C OPERATION

The WESD51 Station will display temperature in either °F or °C. The factory default is °F. To change the display to °C, turn the station off and adjust the temperature set knob fully clockwise to the maximum temperature setting. Apply the Lockout Pencil to the ESD symbol on the front panel and turn the station on. Remove the Lockout Pencil. After a brief display test, the display will read all temperatures in °C. Repeat the procedure to toggle back to °F.

### TROUBLESHOOTING GUIDE

**WARNING:** AC line voltage is present inside power unit even when power switch is off. Refer service to qualified personnel.

**NOTE:** Access to internal parts, may be gained by removing the four rubber feet, four screws under feet and top case.

### TOOL DOES NOT HEAT

With line cord unplugged and power switch on, check for approximately 21 ohms at line cord blades (55 ohms for 230V unit).

- Check power switch for continuity in the "On" position - replace if defective.
- Check line cord for continuity - repair or replace if defective.
- Check transformer primary - replace transformer if defective.

With line cord plugged in and power switch on, check for 24VAC ±10% between pins #2 and #6 of tool receptacle.

- Check transformer secondary for 24VAC ±10% - replace transformer if defective.
- Check wiring to printed circuit board assembly - repair or replace if defective.
- Replace printed circuit board assembly.

Check wiring from tool receptacle to printed circuit board.

- Repair or replace if defective.

Replace soldering tool with known good tool and recheck.

- Refer to Tool Troubleshooting Guide
- Replace printed circuit board assembly.

### TOOL OVERHEATING

Replace soldering tool with known good tool and recheck.

- Refer to Tool Troubleshooting Guide

Replace printed circuit board assembly in station.

## TIP TEMPERATURE TESTING ERRORS

**NOTE:** Tip temperature testing must be done using the K111, Type “K” Thermocoupled Tip temperature test kits. (see Replacement Parts and Accessories Section). Other methods, which include Contact Pyrometers or large loading devices such as heavier thermocouple wire, will cause errors. Replace soldering tool with known good tool and recheck tip temperature.

- Refer to Tool Troubleshooting Guide

Adjust station according to Tip Temperature “Offset” Procedure.

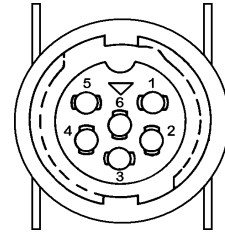
## HIGH TIP VOLTAGE

Replace soldering tool with known good tool and recheck tip voltage.

- Refer to Tool Troubleshooting Guide

Check for continuity from pin #5 of tool receptacle to line cord ground pin.

- Check wiring from tool receptacle to line cord ground pin - repair if defective.



## MODEL PES51 50 WATT SOLDERING TOOL

### PRODUCT DESCRIPTION

The Weller® PES51 Soldering Pencil features a Nichrome wound, stainless steel heater element construction, a non-burning silicone rubber cord and a large selection of Iron, Nickel and Chrome Plated, Copper tips in various styles, including tips for surface mount devices. The handle design is lightweight, high impact ESD plastic, with controlled thermal conductivity via a foam sleeve to allow continuous use without discomfort from heat or fatigue. The heating element is a fast response, long life, Nichrome wound, unit encased in stainless to eliminate corrosion at high temperature.

The Weller® PES51 tools are interchangeable without the need to make adjustments to the station “Offset” function. This is made possible by the use of a precision temperature sensor; which is positioned deep inside the tip to insure rapid response to soldering load variations.

The Weller® PES51 tool has been specifically designed for use at electrostatic free workstations and is completely free from stored static charges. The plastic used in this product meets the requirements for Electrostatic Protective Materials. All Weller® ESD tools comply with DOD-HDBK-263.

The Weller® PES51 tool is designed to be used with the WES51 & WESD51 series power units. The station and tool combination meets DOD-STD-2000, MIL-S-2000, MIL-S-45743, W-S-570 as well as DOD-STD-1686.

### PES51 SERIES SOLDERING TOOL TROUBLESHOOTING GUIDE

**CAUTION: Disconnect from power unit before attempting repairs.**

**NOTE: If ground pin has been removed from power unit line cord, tip temperature control may be erratic.**

#### 1. Tool does not heat.

1.1 Check heater resistance from pin 2 to pin 6 (see Figure 1) of the tool connector, should measure 9 - 11 ohms.

1.1.1 Proceed to 1.2 if heater is correct.

1.1.2 Remove heater/sensor assembly from handle and check resistance at heating element wires.

1.1.2.1 Remove tip barrel/nut and tip.

1.1.2.2 Attach 3/8 - 24 nut to heater.

1.1.2.3 Release cord strain relief by pushing cord 1/4" to 1/2" into handle.

1.1.2.4 Clamp 3/8 - 24 nut in vise, pull and wiggle handle side-to-side to disengage heater.

1.1.3 Replace cord/handle assembly if heater is correct; else replace heater/sensor assembly, complete instructions are provided with replacement part.

1.2 Check sensor resistance from pin 3 to pin 4 of the tool connector, should measure 1 - 2 ohms.

1.2.1 If sensor resistance is incorrect, remove heater/sensor assembly from handle and check at the sensor leads.

1.2.2 Replace cord/handle assembly if sensor is correct; else replace heater/sensor assembly.

1.2.3 Check resistance from pin 3 to pins 2 and 6 of the tool connector, should measure 1 meg ohm minimum.

1.2.4 Remove heater/sensor assembly from handle and check for shorts in wiring inside handle. Repair or replace as required.

#### 2. Tool overheating. (NOTE: Tool will overheat with tip removed).

2.1 Check resistance from pin 3 to pin 4 of the tool connector, should measure at least 1- 2 ohms.

2.1.1 Remove heater/sensor assembly and check for shorts in wiring inside handle. Repair wiring as required, or replace cord/handle assembly, complete instructions are provided with replacement part.

### 3. High voltage on tip.

- 3.1 Check resistance from pin 5 of the tool connector to tip, should measure 2 ohms maximum.
  - 3.1.1 If tip ground is open, remove heater/sensor assembly and check continuity of ground wire in cord.
  - 3.1.2 Repair wiring as required, else replace cord/handle assembly if open.

Weller® ET and SMT series tips are solid Copper, plated with Iron, Nickel and Chromium. The Nickel and Chromium protect the shank from corrosion and solder creep. The tips are pre-tinned in the working area with solder. Use only Weller® soldering tips. Use of non-Weller® components may void product warranty if the non-Weller® component causes damage to the unit. Consult tool and tip selection sheet for available tip styles.

- 1. Keep tip tinned; wipe only before using.
- 2. Use rosin or activated rosin fluxes. Acid type fluxes will greatly reduce tip life.
- 3. Remove tip and clean with suitable cleaner for flux used. The frequency of cleaning will depend on the type of work and usage. Tips in constant use should be removed and cleaned at least once a week. Corrosion between tip and sensor can cause erratic temperature control. **WARNING: If tip does not remove easily, do not force it.** The sensor will be damaged. Try removing the tip while heated. If this does not work, return tool to Weller® for service. When installing new tips, they should slide freely over sensor probe.
- 4. Don't try to clean tip with abrasive materials other than the Weller® WPB1 polishing bar and never file tip; to do so will greatly reduce tip life. Tip wettability is affected by contact with organics; such as plastic resins silicone grease, and other chemicals. If the tip becomes unwettable, it may be cleaned hot with a soft steel or brass brush using solder flux as a solvent; or with a Weller® WPB1 polishing bar. Do not over do this or the iron plating will be removed and the tip ruined. Re-tin tip immediately after cleaning to prevent oxidation.
- 5. Do not remove excess solder from heated tip before storing. The excess solder will prevent oxidation of the wettable surface when tip is re-heated.
- 6. Do not use any compound or anti-seize material on Weller® tips or sensor probe. This may cause wettability problems and may cause seizing after extended heating periods.

Use the soldering tool only with the specified voltage or specified pressure and pressure range.

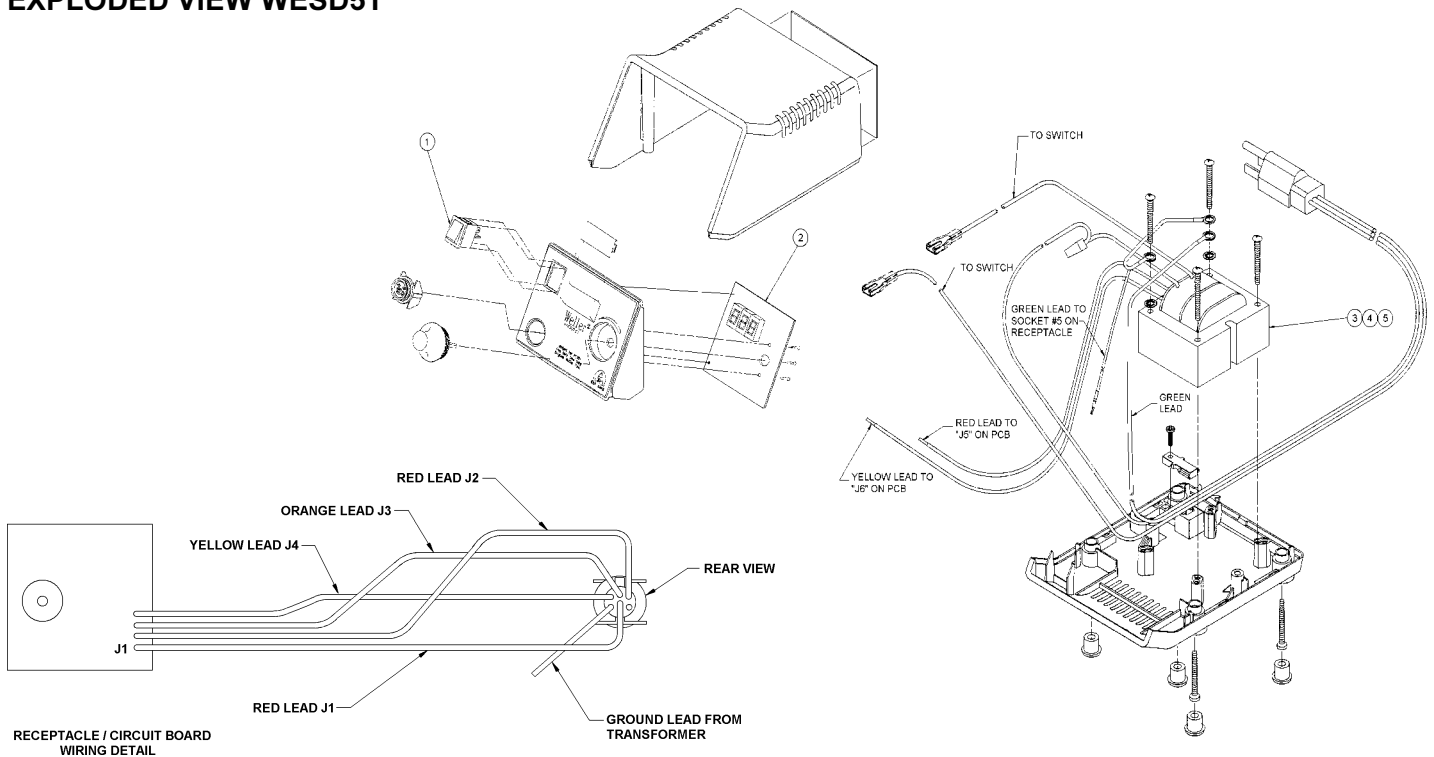
### REPLACEMENT PARTS AND ACCESSORIES

KEY NO.	PART NO.	
		Power Switch
1	SW110	Circuit Board Assembly for WESD51
2	WES207	Power Transformer, 120VAC, 60 Hz
3	TR215	Power Transformer, 230VAC, 50/60 Hz
4	TR216	PES51 Soldering Iron Only
5	PES51	Barrel Nut Assembly
6	BA60	Heater/Sensor Assembly
7	PES201	Cord/Handle Assembly
8	PES203	Lockout Pencil
Not Shown	PW50	Spring and Funnel Only for PH50 Iron Stand
Not Shown	EC254	Tool Stand w/Spring and Funnel for PES51 Tool
Not Shown	PH50	Surface Mount Tip Adapter for PES51 Tool
Not Shown	SMTA	Soldering Tool Analyzer
Not Shown	WA2000	Temperature Test Kit w/Thermocoupled ETA Tip Type "K"
Not Shown	K111	Weller® Polishing Bar
Not Shown	WPB1	Tool Funnel for SMT Tips (PES51 Iron)
Not Shown	SF60	Replacement Sponge (PES51 Iron)
Not Shown	TC205	Power unit only, 120V 60 Hz, °F/°C Selectable, US style 120VAC plug.
Not Shown	WESD51PU	

## SELECTION OF WELLER® SOLDERING TIPS

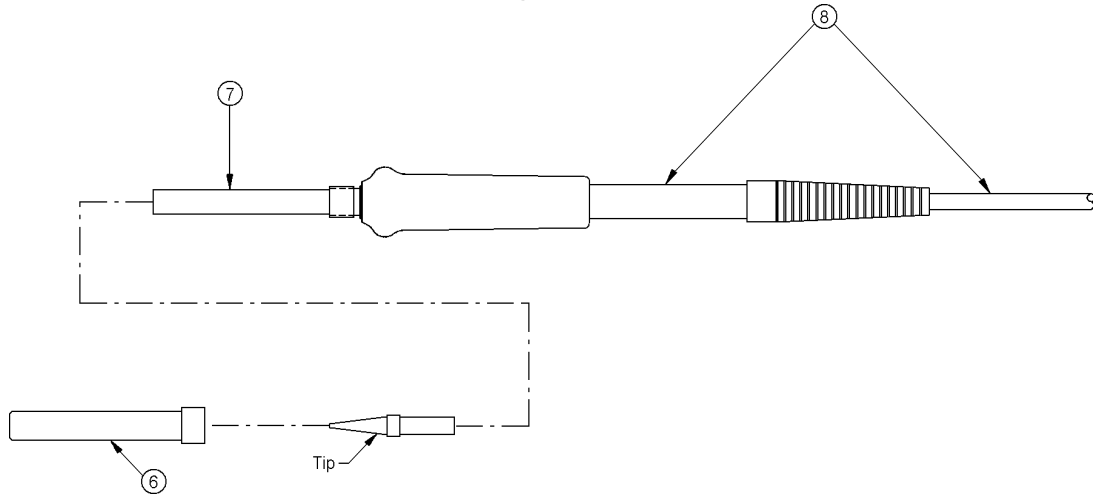
NUMBER	DESCRIPTION	TIP	REACH
ETA	Screwdriver	1/16	5/8
ETAA	Single Flat	1/16	5/8
ETB	Screwdriver	3/32	5/8
ETBB	Single Flat	3/32	5/8
ETC	Screwdriver	1/8	5/8
ETCC	Single Flat	1/8	5/8
ETD	Screwdriver	3/16	5/8
ETDD	Single Flat	3/16	5/8
ETH	Screwdriver	1/32	5/8
ETJ	Long Conical	1/32	1
ETK	Long Screwdriver	1/8	1
ETL	Long Screwdriver	1/32	1
ETM	Long Screwdriver	3/64	1
ETO	Long Conical	3/64	1
ETP	Conical	5/64	5/8
ETR	Narrow Screwdriver	1/16	5/8
ETS	Long Conical	1/64	1
ETT	Long Conical	3/64	1
ETU	Single Flat	1/64	5/8
ETV	Single Flat	1/32	5/8

## EXPLODED VIEW WESD51



EXPLODED VIEW PES51

Figure 1



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