

## MODEL WES51 ELECTRONIC SOLDERING STATION

### DESCRIPTION

The WES51 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. The microprocessor control allows for simple and easy operation. The digital electronic control system offers excellent control performance for various soldering jobs.

A grounded soldering iron tip, zero power switching and anti-static design of the station and tool allows the WES51 Soldering System to meet the high quality standards established by Weller®. The station features external tip temperature offset 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 indicator LED 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 LED power indicator will be “Green” for normal operation or “Red”, if the temperature is “Locked”. The LED for the WES51 will also indicate the operation of the station by the following sequence: Indicator LED full “On”, indicates that the station is ramping up to temperature (this can be indicated in either the “Green” – Unlocked mode or the “Red” – Locked mode). Indicator LED full “Off” or flashing steadily, indicates that the station has reached the “Set Point” (this also can be indicated in either the “Green” – Unlocked mode or the “Red” – Locked mode). This soldering station is UL/CUL listed and meets all applicable standards for the CE mark.

### OPERATING INSTRUCTIONS

Unpack unit carefully. Place sponge and funnel in slot in top of tool stand. 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 properly grounded AC receptacle and turn station “On”. Set temperature control knob to desired tip temperature. Wait 30 seconds. Remove tool from holder and tin tip with solder. Unit is ready for use once the LED begins to flash, indicating that it has reached the operating temperature (indicated in either the “Green” or “Red” mode).

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
WES51	Power unit, 120V 60Hz, °F dial markings, PES51 tool and tool stand
WES51DUK	Power unit, 230V 50/60 Hz, °C dial markings, 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.

## 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, UL Recognized.
5. Tip temperature control range: 350°F to 850°F (177°C to 454°C).
6. Control setting resolution: 10°F (6°C).
7. Stability:  $\pm 10^\circ\text{F}$  ( $\pm 6^\circ\text{C}$ ) per MIL-STD-2000.
8. Absolute accuracy: Average tip temperature can be "Offset" to  $\pm 9^\circ\text{F}$  ( $\pm 5^\circ\text{C}$ ) at idle with no load.
9. Ambient temperature range: 60°F to 110°F (16°C to 44°C).

### PENCILS

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 are U.L. Listed and meet MIL-STD-2000, MIL-S-45743, W-S-6536, W-S-570 & DOD-STD-1686.
5. WES51 units are UL/CUL listed and meet all applicable standards for CE mark.

### ACTIVATION OF LOCKOUT FEATURE

1. Adjust the temperature set knob to the desired tip temperature.
2. Apply the Lockout Pencil to the ESD symbol on the front panel until the LED starts slowly (5 Hz) blinking "Red". Remove the Lockout Pencil within 2.5 seconds and the temperature setting will be "Locked" in. The indicator LED will be "Red" and turning the temperature set knob will have no effect on the tip temperature.
3. Reverse the lockout by applying the Lockout Pencil to the ESD symbol until the LED is slowly blinking "Red". Remove the Lockout Pencil within 2.5 seconds and the temperature set knob will function normally and the indicator LED will be "Green".

**Note:** If the Temperature Set Knob has been adjusted during the "Locked Mode", the station will control to the new set point, once the "Lockout" feature has been disabled.

## 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. Adjust the temperature set knob to the desired tip temperature and allow the tip temperature to stabilize.
3. Apply the Lockout Pencil to the ESD symbol on the front panel. The LED should slowly blink “Red” for 2.5 seconds and then slowly blink “Green”. Adjust the temperature set knob to the measured tip temperature, remove the Lockout Pencil, and the “Offset” procedure is complete.


## RESET STATION TO FACTORY DEFAULT SETTINGS

With station turned “Off”, adjust temperature set knob to 600°F (315°C). Apply the Lockout Pencil to the ESD symbol on front panel and turn station “On”. Remove the Lockout Pencil and the procedure is complete. Any tip temperature offset programmed above will be reset to nominal factory settings.

## AUTO OFF FEATURE

The Weller® Model WES51 Station will automatically shut off power to the tool and the power indicator LED after 99 minutes of inactivity of the iron. Certain applications may not be recognized by the “Loading Effect” on the tool and may require more frequent wiping of the tip on the damp sponge to recognize use.

## 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 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  $\pm$ 10% between pins #2 and #6 of tool receptacle.

- Check transformer secondary for 24VAC  $\pm$ 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 (Contact Pyrometers or Large Loading Devices), or heavier thermocouple wire, will cause errors. Replace soldering tool with known good tool and recheck tip temperature.

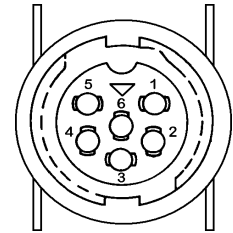
Refer to Tool Troubleshooting Guide

Calibrate 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 heating 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 any 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 and 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 Refer to PES201 Replacement Heater/Sensor Instruction Sheet before disassembling (**see PES201 Replacement Heater Instruction Sheet**).

1.1.2.1 Remove tip barrel nut assembly and tip.

1.1.2.2 Attach 3/8 - 24 nut to heater.

1.1.3 Release cord strain relief by pushing cord 1/4" to 1/2" into handle (**see PES201 Replacement Heater Instruction Sheet**).

1.1.3.1 Clamp 3/8 - 24 nut in vise, pull handle from side-to-side to disengage heater.

1.1.4 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 (**see PES201 Replacement Heater Instruction Sheet**).
  - 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 megohm 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 and never file the 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 (use only when the tip is cold). 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.

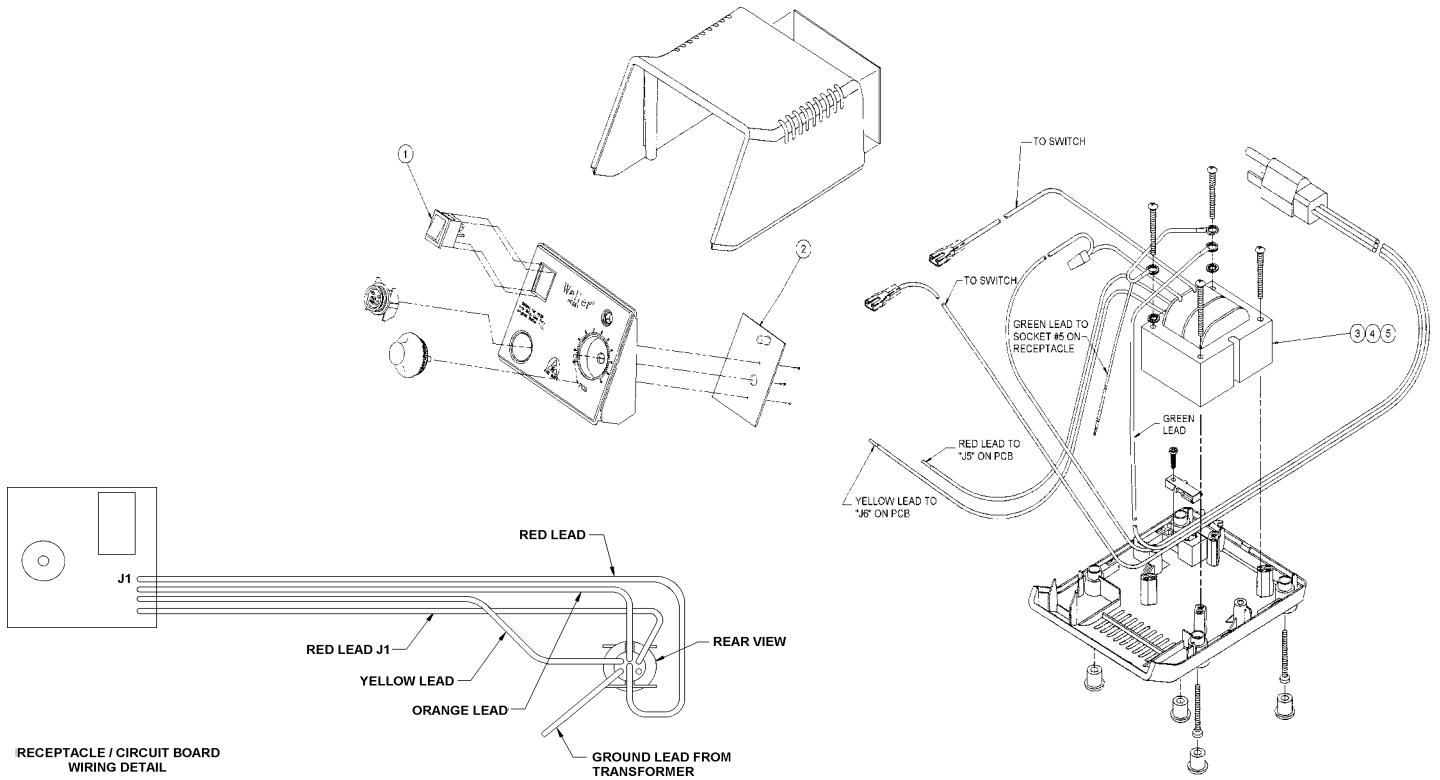
## REPLACEMENT PARTS AND ACCESSORIES

KEY NO.	PART NO.	DESCRIPTION
1	SW110	Power Switch
2	WES206	Circuit Board Assembly for WES51
3	TR215	Power Transformer, 120VAC, 60 Hz
4	TR216	Power Transformer, 230VAC, 50/60 Hz
5	PES51	PES51 Soldering Iron Only
6	BA60	Barrel Nut Assembly
7	PES201	Heater/Sensor Assembly
8	PES203	Cord/Handle Assembly
Not Shown	PW50	Lockout Pencil
Not Shown	EC254	Spring and Funnel Only for PH50 Iron Stand
Not Shown	PH50	Tool Stand w/Spring and Funnel for PES51 Tool
Not Shown	SMTA	Surface Mount Tip Adapter for PES51 Tool
Not Shown	WA2000	Soldering Tool Analyzer
Not Shown	K111	Temperature Test Kit w/Thermocoupled ETA Tip Type "K"
Not Shown	WPB1	Weller® Polishing Bar
Not Shown	SF60	Tool Funnel for SMT Tips (PES51 Iron)
Not Shown	TC205	Replacement Sponge (PES51 Iron)

## 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 WES51



## EXPLODED VIEW PES51

Figure 1

