

STSS-002E SOLDERING SYSTEM

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Your local representative is:

FOR MORE INFORMATION

Contact your local Metcal representative for pricing and availability. There are data sheets on accessories, tip cartridges, and other Metcal® systems.

METCAL
The *SmartHeat* Company™

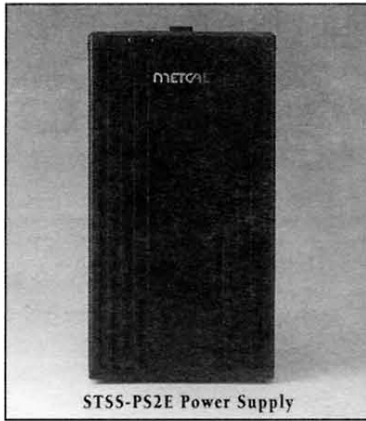
1530 O'Brien Drive, Menlo Park, CA 94025

415-325-3291

800-776-1778

Fax 415-325-5932

ASSEMBLY



STSS-PS2E Power Supply

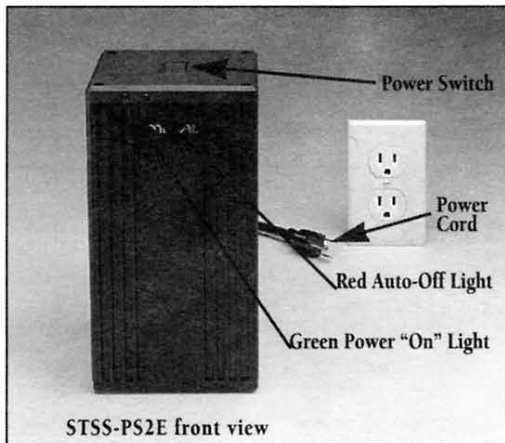


STSS-WS4 Workstand with STSS-YS3 Sponge

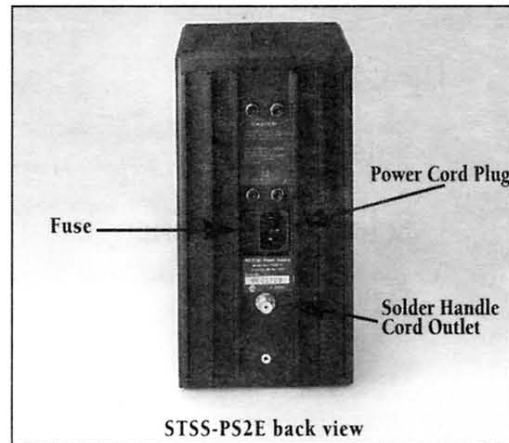


STSS-RM3E Handle with STTC-137 tip cartridge (sold separately)

The Metcal Soldering System includes a 40-Watt power supply with separate power cord, a handle cord assembly that uses replaceable tip cartridges, a work stand with sponge, and a Cartridge Removal Pad. A wide variety of tip cartridges are sold separately.



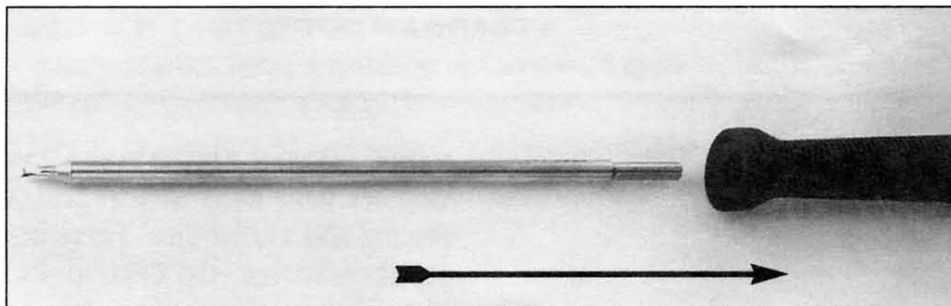
STSS-PS2E front view



STSS-PS2E back view

To set up the system, plug the power cord into the three pronged outlet on the back of the power supply. Next, with the power "off", attach the solder handle cord to the power supply by screwing it into the outlet at the base of the back of the power supply. Keep turning the handle cord until it is finger tight.

Insert a tip cartridge into the solder handle by pushing in the "back end" of the cartridge (the end without the tip) as far as it will go. You should feel a slight "click" as it locks into place.



Plug the power cord into a grounded wall socket of the appropriately rated input line voltage. To turn the unit on, push the switch on the top of the power supply.

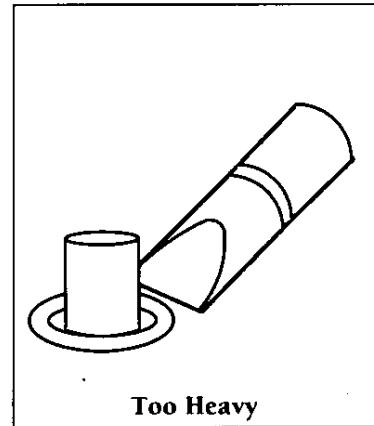
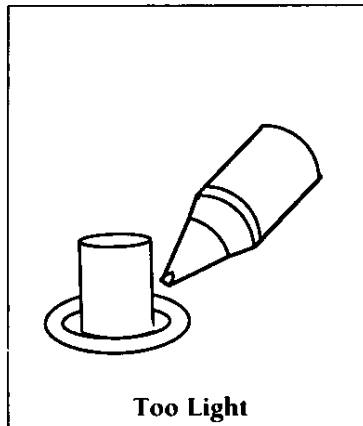
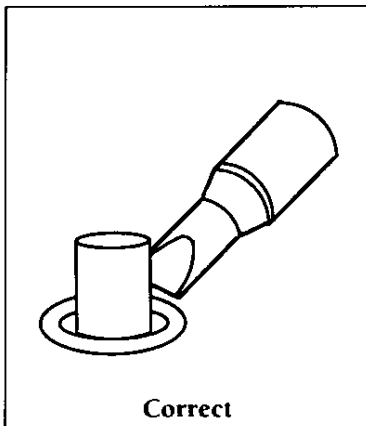
The green "On" indicator light at the upper left corner of the front of the power supply should light up. If it does not light, or if the red "Auto-Off" indicator lights, see the "Troubleshooting Guide" in this manual.

METCAL SMART HEAT - NO DIALS TO SET

Each Smart Heat™ tip cartridge contains a self-regulating heater that senses and maintains a set idle temperature. The temperature is determined by the inherent metallurgical properties of the heater; no external adjustment or equipment is required. The power delivered to the tip automatically varies in direct response to the thermal load. This eliminates spikes and transients associated with electrically switched elements found in conventional soldering irons.

SELECTING AND CHANGING TIP CARTRIDGES

Metcal tip cartridges come in a wide variety of tip geometries and in two standard temperature ranges (600 Series and 700 Series). A limited selection of 500 Series cartridges for special low temperature soldering needs is available. These tip geometries cover a broad range of tasks from delicate precision work to heavy ground plane soldering to surface mount rework.



TO SELECT THE CORRECT TIP FOR A SOLDER APPLICATION:

1. Pick a tip that **MAXIMIZES CONTACT AREA** between the tip and solder joint. Maximizing contact area gives the most efficient heat transfer, allowing operators to produce high quality solder joints quickly.
2. Pick a tip that allows good access to the solder joint. Shorter tip lengths allow more precise control. Longer or angled tips may be needed for soldering densely populated boards.
3. Pick the lowest temperature tip cartridge that will accomplish the task. This minimizes the potential for thermal damage. Start with a 600 Series cartridge and switch to a 700 Series only if you need more heat. The temperature series is marked on the shaft. A number starting with 0 is a 600 Series, with 1 is a 700 Series, and with 5 is a 500 Series.

TO REPLACE TIP CARTRIDGES:

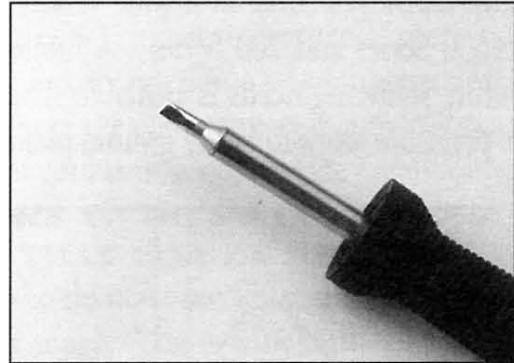
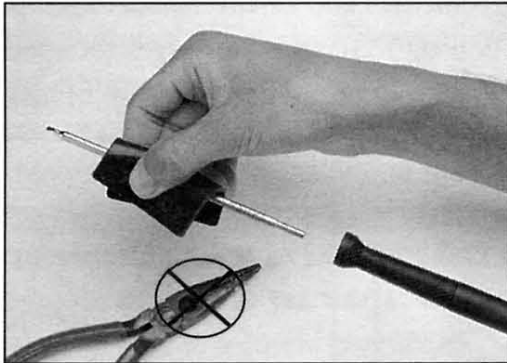
1. **PUSH THE POWER SWITCH OFF.**

2. Pull out the cartridge using the Cartridge Removal Pad.

****** CAUTION: THE TIP CARTRIDGE MAY BE HOT! ******

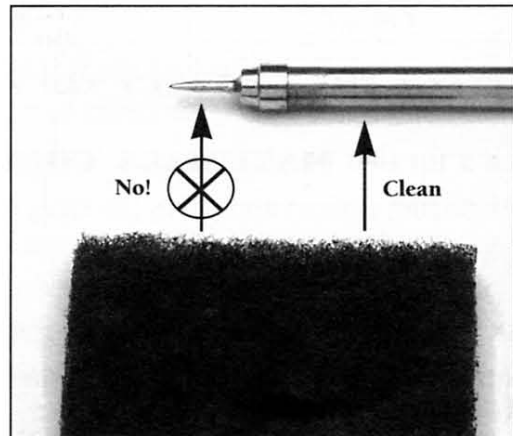
3. Push a new cartridge into the solder handle with the Cartridge Removal Pad.

4. Push the Power Switch "On." The new tip cartridge will heat up to temperature in less than 20 seconds.



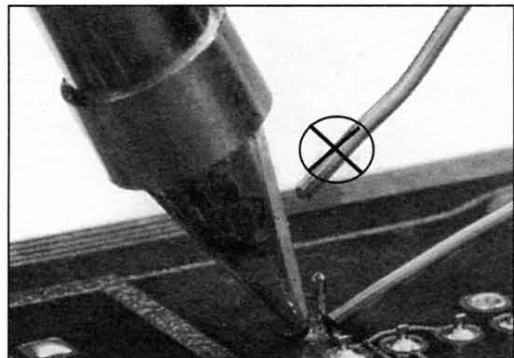
DO NOT USE METAL TOOLS SUCH AS PLIERS TO REMOVE TIP CARTRIDGES FROM THE HANDLE. THIS CAN DAMAGE THE CARTRIDGE HEATER.

DAILY TIP CARE



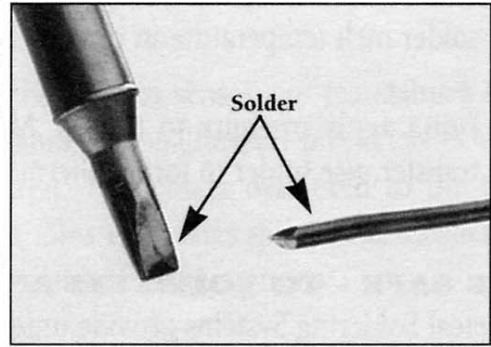
1. Each day, remove, inspect, and clean the cartridge shaft and handle using denatured alcohol and a clean cloth. Stubborn flux deposits on the shaft can be removed using Scotch-Brite®. **DO NOT USE ABRASIVES ON THE TIP ITSELF** as they will damage the plating and shorten tip life.

2. After you turn on the system, and each time you return the tip to the holder, apply rosin core solder to the tinned surfaces of the tip. The solder protects the tip from oxidation and prolongs the life of the tip.



® Scotch-Brite is a registered trademark of 3M Corporation.

3. When making a solder connection, apply fresh solder to the members being joined, NOT to the hot soldering tip. NOTE: Excessive pressure on the tip or rubbing the tip on a connection does not improve heat transfer. It will, however, shorten the life of the soldering tip.
4. Clean the tip on a clean, wet sponge — not on a rag or dirty, dry sponge.



DETINNED TIPS

WHY A “DETINNED” TIP FAILS TO WORK

A detinned tip is one not wetted with solder. This exposes the plating to oxidation and degrades the heat transfer efficiency of the tip. Detinning is caused by:

- a. Failure to keep the tip covered with fresh solder during idling periods.
- b. High tip temperatures.
- c. Lack of sufficient flux in soldering operations.
- d. Wiping the tip on dirty or dry sponges and rags. (Always use a clean, wet, industrial grade, sulfur-free sponge.)
- e. Impurities in the solder, iron plating, or on the surfaces to be soldered.

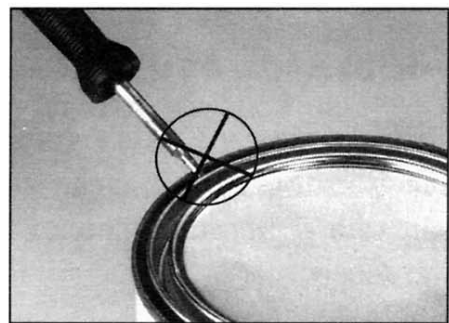
TO RESTORE A DETINNED TIP

1. Turn off the system, remove the tip cartridge from the solder handle using the Cartridge Removal Pad and allow the cartridge to cool down.
2. Remove scale and oxides from the tinned area of the tip with 80-grit abrasive polyurethane foam stock (Plato AB-3 Polishing Bar or Multicore Tip Tinner/Cleaner or equivalent) or a 100-grit emery cloth.
3. Wrap rosin core solder (0.031” diameter or larger) around the newly exposed iron surface, insert the tip cartridge into the handle, and turn on the system.

NOTE: Detinned tips are preventable with proper daily care!

EXTENDING TIP LIFE

1. Tin the tip before and after each use. This protects the tip from oxidizing, prolonging tip life.
2. Do not use the tip as a prying tool. Bending the tip can cause the plating to crack, shortening tip life.
3. Use the lowest tip temperature that will do the job. Lower temperatures decrease tip oxidation and are easier on the components being joined.



Use fine point tips only when necessary. The plating on fine precision tips is less durable than the plating on blunter tips.

5. Use the minimum activation flux necessary to do the job. Higher activation flux is more corrosive to the tip plating.

6. Extend tip life by switching the system off when not in use. A standard Metcal tip reaches solder melt temperature in roughly 20 seconds.
7. Don't apply pressure to the tip. More pressure does not equal more heat. To improve heat transfer, use solder to form a thermal bridge between the tip and the solder joint.

BE SAFE - TO YOURSELF AND YOUR WORK!

Metcal Soldering Systems provide unique safety advantages due to our proprietary Smart Heat technology that is unavailable from any other tool. However, maximum safety requires the user's participation.

1. Although Metcal Soldering Systems offer superior EOS (Electrical Overstress) protection, periodic checks of the instrument cord should be incorporated into standard operator maintenance procedures. Always check to make sure the cord connector is tightly connected to the power supply. Also, make sure the instrument cord is in good working condition with no damage to the shielding. **CAUTION: FAILURE TO DO SO COULD RESULT IN INTERMITTENT EOS CONDITIONS THAT MAY BE DETRIMENTAL TO EOS-SENSITIVE DEVICES.** Operators should make weekly checks to ensure that the instrument cord is securely fastened to the power supply. This is done by making sure the connection is finger-tight.

The recommended frequency and methods for checking shield integrity of the instrument cord are very dependent on the applications and available test equipment. For suggestions as to how to implement such checks, please contact your local Metcal representative or Metcal direct.

2. Since Metcal tip cartridges heat up in seconds, turn off the unit when not in use. This not only saves tip life and energy, but minimizes the danger of injury caused by accidental contact with unattended hot soldering tools.
3. Metcal systems have the smallest exposed heated area of any tool on the market, but always remember to treat this area as if it were at 600°F or higher. Always turn off the system prior to tip removal and insertion, and always use a Cartridge Removal Pad to remove tips.

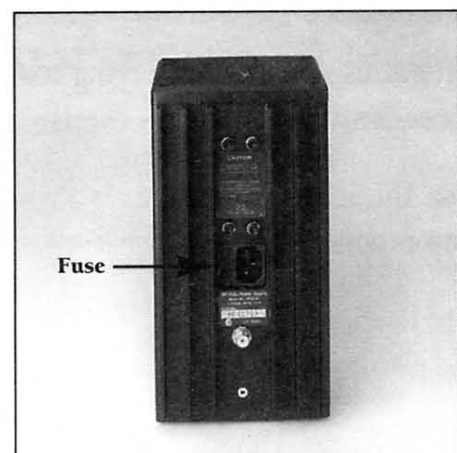
TROUBLESHOOTING GUIDE: TIP CARTRIDGE WON'T HEAT

IS THE GREEN LIGHT OFF?

If the green light is off, make sure the 3-wire power supply cord is properly connected to the wall outlet and power supply.

If the cord is connected and the green light is still off, remove the internal fuse (located next to the power cord inlet) and check for damage. Replace if blown.

If the green light is still off, see "Power supply cycles on/off".

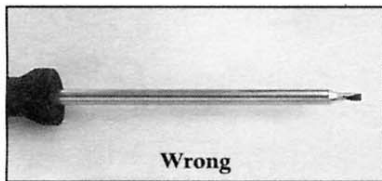
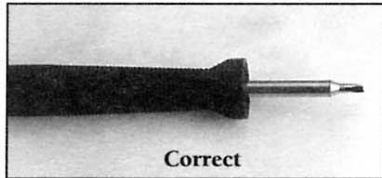


IS THE RED LIGHT ON?

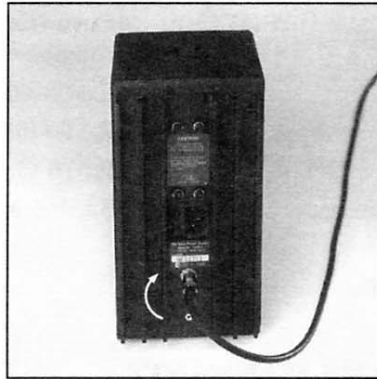
If the red light is not on, proceed to the section "Is the cartridge bad" below.

If the red light is on, something has triggered the automatic "Auto-Off" feature. After completing each step below, the system will have to be turned off and then on again to reset this feature. Otherwise, even if you have fixed the problem, the red light will remain on.

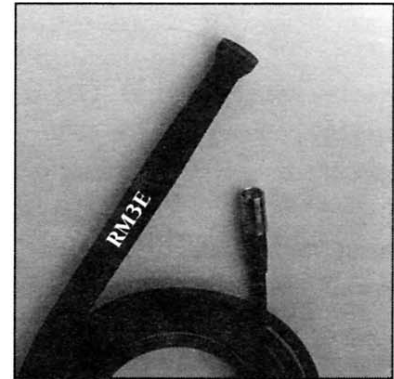
IS THE CARTRIDGE BAD?



CHECK TO SEE WHETHER THE TIP CARTRIDGE IS PUSHED ALL THE WAY INTO THE HANDLE.



CHECK TO SEE IF THE HANDLE CORD CONNECTOR IS TIGHTENED SECURELY TO THE POWER SUPPLY.



CHECK TO MAKE SURE YOU ARE USING AN ENHANCED VERSION HANDLE (RM3E/6E).

Using a Cartridge Removal Pad, remove the old tip cartridge and insert a new tip cartridge into the handle, making sure it is seated properly.

If the new cartridge heats, discard the old cartridge or check it to see if it is still in warranty. If it is still in warranty, call Metcal Customer Service to return it.

If the new cartridge does not heat, call Metcal Customer Service to return the system for repair.

POWER SUPPLY CYCLES ON/OFF

The power supply unit contains an "Auto-Off" over-temperature cutoff feature. A system operated at a high duty cycle and/or in a high ambient temperature may reach a temperature that will trip the resettable thermal switch.

After cutoff and shutdown, the power supply unit will remain off until it cools to an acceptable operating temperature, at which time it will automatically return to normal operation.

TO TEST THE AUTO-OFF FEATURE

To test the "Auto-Off" feature, pull out the tip cartridge. The power supply should shut off. The system must be reset by switching the power supply "Off" and then back "On."

NOTE: The "Auto-Off" feature will not operate with a Net Power Meter (NPM 50) in line. An enhanced version handle (RM3E/6E) must be used with the STSS-PS2E. The unit will not function with non-enhanced handles.

If the above steps do not result in proper performance, call Metcal Technical Service at 800-776-1778 from inside the United States or 415-325-3291 from outside of the United States.

SYSTEM SPECIFICATIONS

POWER SUPPLY

Tip-to-Ground Potential	< 2 mV	True RMS, 50-500 Hz
Tip-to-Ground Resistance	< 2 ohms	DC, unit on
Idle Temperature Stability	± 2 °F (± 1.1 °C)	Still air
Ambient Operating Temp.	50 - 104 °F (10-40 °C)	
Maximum Enclosure Temp.	150 °F (65°C)	
Thermal Switch	Setpoint at 140±5°F (60±2.8°C) Auto-reset once cooled to 110°F (43°C)	
Input Line Voltage	90 - 130 VAC	
Input Line Frequency	45 - 70 Hz	
Output Power	40 Watts maximum @ 72 °F (22 °C) ambient temperature	
Output Frequency	13.56 MHz	
Auto-off Feature	10 millisecond lag time	

DIMENSIONS

L x W x H	4.5"x 4.5"x 9.1" (11.4 x11.4 x23.2 cm)
Weight (total unit)	9.5 lbs (4.3 kg)
Weight (handle)	2 ounces (57 grams)
Power Cord (3 wire)	6 ft. (183 cm) - 18/3 SJT
Handle Cord Assy	6 ft. (183 cm) - carbon loaded silicone
ESD Materials	10 ⁵ - 10 ⁹ ohm/square per ASTM D257

STANDARDS COMPLIANCE

MIL-STD-2000
MIL-STD-168
MIL-STD-45743E
WS-6536D and E

AGENCY APPROVALS

UL Listed
CSA Approved
FCC Approved

METCAL SOLDERING SYSTEMS WARRANTY

Metcal, Inc. warrants Power Supplies against any defects in materials or workmanship for two (2) years from the date of purchase by the original owner. All Handle/Cord Assemblies are warranted against any defects in materials or workmanship for one (1) year from the date of purchase by the original owner.

Metcal warrants all other products except consumables against any defects in materials or workmanship for ninety (90) days from the date of purchase by the original owner. This Warranty excludes normal maintenance and shall not apply to any opened, misused, abused, altered or damaged items.

If the product should become defective within the warranty period, Metcal, Inc., will repair or replace it free of charge at its sole option. The replacement item(s) will be shipped, freight prepaid, to the original purchaser. The warranty period will start from the date of purchase. If the date of purchase cannot be substantiated the date of manufacture will be used as the start of the warranty period.

SERVICE AFTER WARRANTY

Metcal will repair or replace (at Metcal's sole option) an STSS-PS2, STSS-PS2E, STSS-PS2V, or SP-PW1 Power Supply that fails in normal use within three (3) years after the expiration of the two-year warranty at the then current repair or exchange rate. To return a failed Power Supply for repair or replacement, follow the steps outlined below. This offer does not apply to any previously opened, modified, repaired, altered, misused or damaged Power Supply.

REPLACEABLE TIP CARTRIDGE WARRANTY

Metcal warrants that the heater in its Soldering or Desoldering Tip Cartridges will operate according to specifications for a minimum of 200 hours. A Tip Cartridge that fails to heat for at least 200 hours of operation will be replaced at no charge. Metcal also warrants that the plating on its Desoldering Tip Cartridges will operate according to specifications for a minimum of 40 hours. A Desoldering Tip Cartridge that becomes unuseable with less than 40 hours of operation will be replaced at no charge. For replacement, follow the steps outlined below. The replacements will be shipped, freight prepaid, to the original purchaser. This Warranty shall not apply to any misused, abused, altered or damaged Tip Cartridges.

This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.

RETURN PROCEDURE

- 1) Call Metcal at 415-325-3291 or 800-776-1778 to obtain a Returned Material Authorization (RMA) number.
- 2) Ship materials, freight prepaid, to Metcal, Inc., 1530 O'Brien Drive, Menlo Park, California 94025, with the RMA number visible on the outside of the package.
- 3) Proof and date of purchase must be on file for the returned product(s).

ADDENDUM STSS-002E ENHANCED SOLDERING SYSTEM

The STSS-002E Enhanced Soldering System has several additional features over the standard STSS-002. These include:

- Improved EOS Protection via Metcal's new AUTO-OFF feature
- Improved Durability STSS-RM3 Instrument Handle
- Extended Warranty to 1 Year on the Instrument Handle

AUTO-OFF Feature

The PS2E Enhanced Power Supply is designed to continuously monitor the ground path. When used with the new STSS-RM3E Instrument Handle, Metcal's AUTO-OFF feature immediately shuts down the power supply in the event of ground loss, preventing the development of voltage in the soldering tip for even greater EOS protection. There is a 10 millisecond lag in operation.

To test the AUTO-OFF feature, pull out the tip cartridge. The power supply should shut off. **The system is reset by switching the power supply "Off" then back "On."**

NOTE:

- (1) The AUTO-OFF feature will not operate with a Net Power Meter (NPM 50) in line.
- (2) An enhanced version instrument handle, RM3E or RM6E **must** be used with the STSS-PS2E. The unit will not function with non-enhanced instrument handles.

Troubleshooting Guide

IF POWER SUPPLY WILL NOT TURN ON (TIP CARTRIDGE WILL NOT HEAT):

1. Check to make sure that the 3-wire power cord is securely connected to both power supply and wall outlet.
2. Check to be sure that you are using an enhanced version instrument handle (RM3E/6E).
3. Check that tip cartridge is pushed all the way into the instrument handle.
4. Check that the unit is reset by turning unit "OFF" then "ON."
5. Check the instrument cord connector. It must be tightly secured to the power supply output connector.
6. Remove the internal fuse (located next to the power cord outlet) and check for damage. Replace if blown.

IF THE AUTO-OFF FEATURE KEEPS TRIPPING:

1. Check first for a bad cartridge first by replacing cartridge. Reset unit by turning "OFF" then "ON."
2. If AUTO-OFF still shuts off, check for a bad instrument handle by replacing. Reset unit by turning "OFF" then "ON."