



## **Thank you**

for choosing a Razertip® Tool.

Please take a few minutes to read these instructions. Model SL burners are ETL C-US safety certified solid state power supplies. They will provide many years of dependable service if properly used and maintained.

## **Caution**

Because of the high output of the SL Burner Standard Pens are not recommended at settings greater than 60 as damage may occur.

## **Warnings**

**Shock Hazard:** Do not open the enclosure. No user serviceable parts inside. Use only under the supervision of an adult. Keep this and all power tools well away from water or sources of moisture.

- Do not use excessive pressure on tip. If a deep cut is required, turn the temperature up and let the heat do the cutting.
- Keep this and all tools away from children. This tool should not be used by children unless under the direct supervision of an adult.
- Always be sure to have adequate ventilation. Many materials give off dangerous fumes when burned.
- Any technical questions concerning this product can be directed to Razertip Industries Inc. (contact information on page E12).
- This tool is an attended appliance, do not use unattended
- Power cord: If the cord is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.
- Do not use this tool if the enclosure broken.
- **Instructions en français voir page F1 • Instrucciones en español ver página S1**

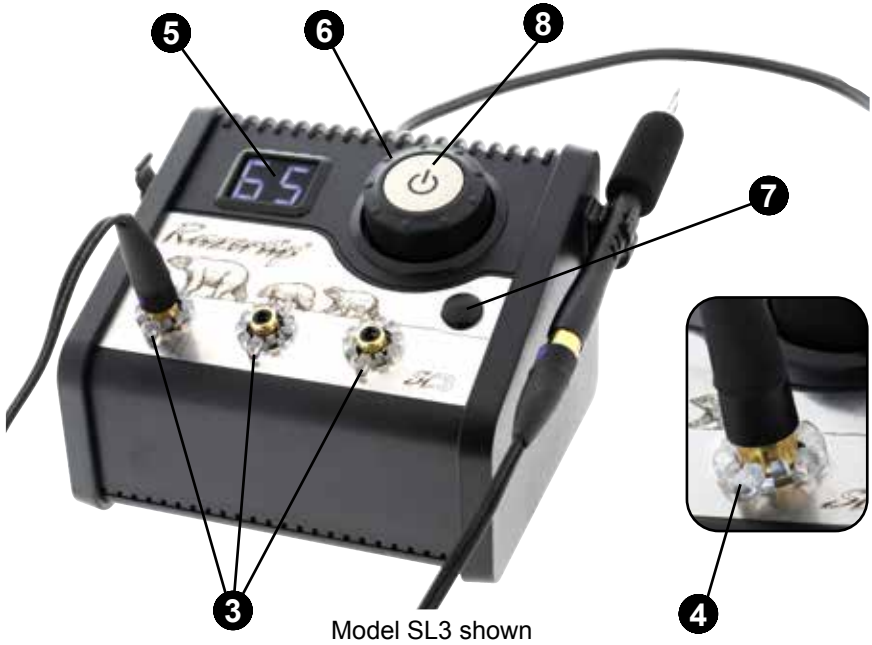
# Controls and their Operation

## Basic Operation

Connect Power Cord to input **1** . Plug one end of the pen cord into the Pen Jack **3** . Plug the other end into the back of the pen. Be sure that the connectors are fully seated (Fig1). Turn the Main Power Switch **2** “on”, then adjust the heat setting with the Heat Adjust Knob **6** on the front panel (“01” is coolest, “99” is hottest). Press the Pen Power Switch **8** to begin heating the tip. Adjust heat **6** as desired. Press the Pen Power Switch **8** again to stop power to the tip. Most tips take only seconds to heat up and may take a bit longer to cool.

- 1 Power Cord Input:** Power cord\* connects here.
- 2 Main Power Switch:** Used to turn power on and off to the unit.
- 3 Pen Jack(s):** Plug one end of the pen cord firmly and fully into this jack. (Fig.1)
- 4 Jack Light Bezel(s):** Glow blue when power is being applied to the tip. See page E4 for full information.
- 5 LED Display** - Shows the heat setting. “01” is coolest, “99” is hottest. Also displays diagnostic codes (see page E4).
- 6 Heat Adjust Knob** - Used to adjust the heat setting.
- 7 Jack Selector Switch** (model SL-3 only) - Press to cycle from one Pen Jack to another.
- 8 Pen Power Switch** - Pressing the switch in the center of the Heat Adjust Knob will activate power to the pen. Pressing it again will turn off power to the pen.
- 9 Pen Clips** - Hold pens when not in use. Snap-in, snap-out operation. Unbreakable. Replacements available Cat# CLIP.
- 10 Cooling Fan Vents:** Be careful not to block the fan openings.

\* if using a power cord other than the cord supplied with the SL1/SL3 you must use a safety-approved C8 power cord for the country in which the unit is being used.



## Jack Light Bezel

A slow pulsing white light will indicate that no power is being supplied to the pen (idle state).

When the Pen Power Switch at the center of the Heat Adjust Knob is pressed and released power will be supplied to the Pen Jack, and the Jack Light Bezel will change to blue. A solid blue light indicates that everything is functioning properly. A blinking blue light indicates that there is either a broken contact in the cord, pen or tip, or that there is no pen and/or cord plugged into the Pen Jack.



## Auto Shutoff (after 60 minutes)

Auto shutoff in model SL burners ensure that the units cannot be accidentally left on for long periods. Auto shutoff is also a helpful feature to remind users to stop and take a break. Both models will auto shutoff if they are used for 60 minutes without any input (changing heat setting, changing jacks, changing pens or powering a pen on/off). After the unit enters auto shutoff the Jack Light Bezel will alternately blink blue/white for 30 seconds and the unit will then revert to idle state. Simply press the Pen Power Switch when you want to activate power to the Pen Jack again.

Any input to the unit will give you another 60 minutes before auto shutoff.

## Thermal Overload State

SL burners are internally protected from thermal overload. The unit will go into Thermal Overload State and the tip will stop heating when the transformer exceeds safe operating temperature. Thermal overload is most likely to occur if the unit is used at high heat settings (70+) continuously for long periods of time, or when used in very hot conditions. Under typical operation (at normal room temperature at heat settings below 70) and/or shorter durations (under 30 minutes) thermal overload is unlikely. If the unit enters Thermal Overload State the Jack Light Bezel will blink blue/white for 15 seconds and the LED Display will change to "OL". "OL" will remain on the display and the unit will not power a pen until the transformer temperature has dropped below 70°C.

Pressing and holding the Pen Power Switch anytime for 3 seconds or more will display the transformer temperature. Releasing the Pen Power Switch will cause the LED Display to revert to the heat setting (or "OL" if in Thermal Overload State). Note that if a pen is powered when you check the transformer temperature, power to the pen will be maintained.

SL burners contain internal cooling fans which will automatically cycle on and off as required for best operation and longest fan life. They will run continuously at heat settings above 50.

## Using the SL-3

The SL-3 features 3 Pen Jacks, allowing you to attach up to 3 pens to the unit and adjust heat to each pen individually. You can cycle through the Pen Jacks by pressing and releasing the Jack Selector Switch (see page E2, E3). The active Pen Jack will be indicated by a slow pulsing white light at the Jack Bezel. The Jack Bezel will turn blue when the Pen Power Switch is pressed and released. If you change to a different Pen Jack (by pressing and releasing the Jack Selector Switch) while a pen is powered, the next Pen Jack will be selected and that jack will not provide heat to its pen until the Pen Power Switch is pressed. Each Pen Jack will retain its heat setting as you cycle through the jacks. For example, if you had the heat set at “20” while using the first jack and you cycled to the second jack and set the heat to “30”, then cycled to the third jack and set the heat to “40”, the heat setting would revert to “20” again every time you cycled to the first jack and “30” for the second and “40” for the third. These heat settings will be retained for each jack until you re-adjust it. Settings are retained even after power is turned off and/or unit is unplugged. Turning the Heat Adjust Knob when the unit is off or unplugged will not have any effect on the stored heat setting.

## Tip Temperature

SL burners can provide tip temperatures from ambient (room temperature) to approximately 900 degrees C. Upper temperature range will depend on the pen cord used and how heavy or large the tip is. Smaller tips will get hotter while larger, heavier tips will not get quite as hot. Heavy-duty pen cords will give higher heat at the tip than standard pen cords. For more detailed information on tip heat see pages 8 and 9 (Fundamentals of Pyrography Tools).

### **About Heat Settings.**

Hot-wire pyrography tools are primarily intended to be used at moderate heat settings. If your tip is glowing red during use you will find that the pen may eventually get uncomfortable. If your work requires high heat settings, be sure to give yourself and the tool a bit of a break - a few minutes every half hour is a good idea.

**Caution:** Because of the high output of the SL Burner Standard Pens are not recommended at settings greater than 60 as damage may occur.

### **Razertip Pens and Tips.**

A copy of our product catalogue should accompany these instructions. If you would like additional copies, please contact us (See page E12). You can also download the latest catalogue at [www.razertip.com](http://www.razertip.com).

## Burner FAQ's

***Q. My burner won't make a dark mark on wood until its set at "30" or "40" or higher? Why?***

**A.** Our burners are designed to give a very broad range of heat (see page E5). The lower heat settings can be used for foil transferring, waxes, plastics, or for detailing surfaces without leaving a brown burn mark.

***Q. Sometimes my burner works great at a certain heat setting, and the next day I have to use a different setting to get the same burn. Why is this?***

**A.** When the voltage from a wall plug changes, the temperature of the tip will change with it. Razertip burners are set to perform optimally at 115V. Wall outlet voltages can range from 95V to over 130V. Wall outlet voltage can change depending on time of day and demand on your electrical grid (also check your pen/cord connections - see Troubleshooting guide on pages E10 & E11).

## Cord/Pen FAQ's

***Q. What's the difference between heavy duty and regular pens, and why would I choose one over the other?***

**A.** Regular pens are recommended for most fine and delicate applications. HD pens have heavier posts and tips, making them more durable. They are recommended for applications like shading, where the side of the tip is used or if the tip or pen will be subjected to more pressure or to rougher use (like in schools). The trade-off is that HD tips don't develop as much tip heat (you'll need to use a higher heat setting) and the tip won't recover its heat as quickly as a regular pen. Some pens (like shaders) are only made in HD because they must be able to withstand considerable pressure.

***Q. Can I use a standard cord on an HD pen, or vice-versa?***

**A.** Yes. Any Razertip cord can be used with any Razertip pen, but SL burners are best used with HD cords.

***Q. Is there any way I can change the tip on a fixed-tip pen myself?***

**A.** No. When a fixed-tip needs replacing on a standard or HD pen it must be returned to the factory for tip replacement (see page E12).

If tip interchangeability is important, we recommend using the #BPH interchangeable-tip pen.

## Tip FAQ's

**Q. Is there anything special I have to do (i.e annealing or tempering) to my pen/tips before I use them?**

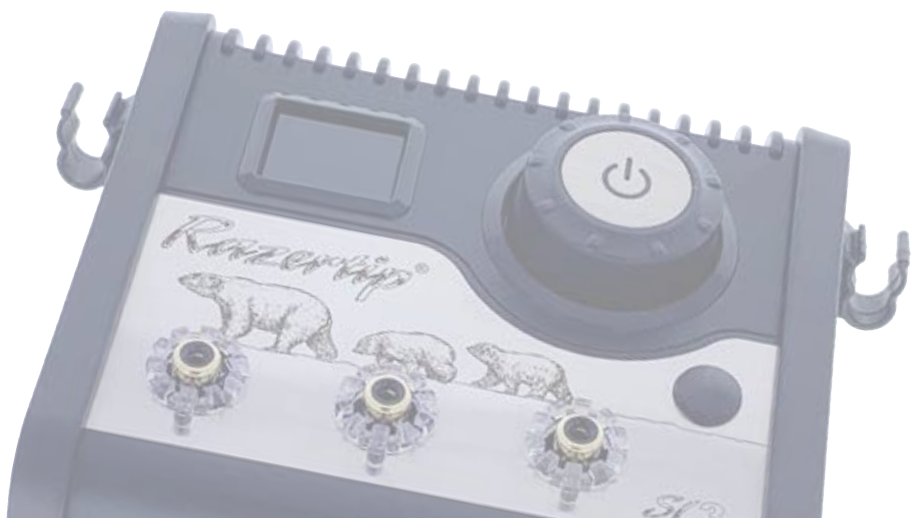
**A.** No. There is nothing to do other than to simply connect everything and start burning.

**Q. There are so many tip shapes to choose from, and I don't want to be stuck with a pen or tip that I can't use. How do I know which shape(s) I should buy?**

**A.** Even though we produce hundreds of different tip profiles, most artists will own and use a modest number of different pens/tips. Personal preference would dictate choice. We generally recommend starting with the tip (or tips) packaged with your burner. Use it until you find its limitations for your work. At that time you can look at the available tip shapes and determine which shapes might work for your needs.

Feel free to contact us for advice on which tip shapes might work best for your particular application. All that being said, you may still find that a certain pen you already own is of little or no use to you. Should that happen, you may return the pen(s) to us for re-tipping at any time. Our re-tipping charges are always reasonable, and we will install whatever tip you want - it doesn't have to be the same as the original. Note: HD pens must be retipped with HD tips and standard pens with standard tips. If the pen is under warranty (under a year old), the re-tipping will be done at no charge.

**Still have questions? Don't hesitate to contact us. We're here for you!**



# Fundamentals of Pyrography Tools

We offer the following information to those who want a better understanding of how our tools work, along with some of the limitations that the laws of physics places on their design.

There are two basic types of electric pyrography tool: the hot-wire tool and the solid-tip tool. Razertip tools are the hot-wire variety, meaning that the hot tip of the tool is made from a special wire that gets hot quickly when electricity is passed through it. Solid-tip tools get their heat from a relatively fine, delicate heating element enclosed in a housing (usually metal or porcelain). As the element heats, it transfers its heat into a solid tip. On these tools the tip takes quite a while to heat and to cool down. Tips for these tools tend to be larger and heavier. Many people's first experience with pyrography was using a bulky, awkward solid-tip tool - and it often involved a burnt finger or two.

Razertip's hot-wire tips allow you to work with your fingers positioned close to the work surface. Because the wire tip is the only thing getting hot, the tip heats in a matter of seconds and cools almost as quickly. While most wire tips are formed from a single piece of wire, Razertip also fuses various metals directly to some tips allowing "hybrid" tips that offer the best of both worlds. Designing and building a durable, comfortable hot-wire tool poses significant challenges as tips must be operated at very low voltages to keep the pen and cord cool.

Voltage, or volts, is electrical force, or pressure - think of how pressure is needed to pump water through a pipe. Powering a tip wire with low voltage is like trying to pump water through a pipe with a very small pump. In order to get the tip to heat quickly, and to hold its heat well, we need to get lots of electricity (current) through the tip wire - but we're using a small pump! The measure of electrical current, or flow, is called amperage (amperes or amps). On a cold morning, a car may use 70 amps or more (at 12 volts of pressure) to start the engine. Most wall outlets can supply a maximum of 15 amps. The transformer in Razertip SL-1 and SL-3 burners can provide over 10 amps of current. More amperage would be even better, but there is a limit to the amount of current that can flow through a given size wire - just like there is a limit to how much water can squeeze through a certain size pipe.

*Continued on next page*



# Fundamentals of Pyrography Tools

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The two pen cords available from Razertip use the most flexible cables possible that can handle the high current flow. The extra-flex cord is an 18-gauge cable that slightly restricts the current flow to your tip. For maximum tip heat recovery, the heavy-duty 16-gauge cord is available. It easily handles the current, providing superior tip heat recovery and stability.

If you're trying to pump lots of water through a small pipe with a small pump, you want to make sure that there are no restrictions. So it is with electricity. A poor electrical connection causes a restriction. That's why Razertip uses custom made, gold plated connectors to ensure the best electrical contact possible.

Understanding how your Razertip tool works can be very helpful in diagnosing and correcting potential problems. Be sure that your cord, pen and tip are sound and that all of your connections are clean, snug and fully seated.



# Troubleshooting Guide

If the guide below doesn't solve a problem, contact your dealer or Razertip before returning product for service.

Symptom	Diagnosis	Suggested Solution
Inconsistent or erratic burning - may be accompanied by a faint "buzzing" in the pen and/or - may be accompanied by very hot connections at the pen or burner end.	(BPH pen only) Poor contact between the tip and the pen.	Be sure that the screws are snug and all contacts are clean.
	Broken contact in pen or tip.	Return for service.
	Poor electrical contact somewhere between burner box and tip. Could be the cord, pen jack, or pen.	Check all connections to make sure they are fully seated and snug. Note that heat will build up at any point of poor connection. Try a different pen, then a different cord to determine where poor contact is.
Unit will not work. LED Display comes on and Jack Bezel is lit.	Defective cord, pen, or broken tip.	Try a different cord and/or another pen.
	Defective Pen Jack or other fault inside power supply.	Return for service.
Unit will not operate; LED Display not lit; Jack Bezels not lit.	No power at outlet, or unit not plugged in. If using a power bar, be sure it is switched "on".	Check power outlet with another device.
	Internal power supply fault.	Return for service.
Pen gets hot at the front end or middle.	Pen used at too high heat setting for too long.	Allow cooling time for pen if high heat is necessary. Buy an extra pen and alternate them when hot.
	Cracked or broken tip can cause unusually high heat at damaged area.	Return pen to Razertip for tip replacement. Fixed-tips have a 1 year warranty. Out-of-warranty costs for tip replacement are always reasonable.
Pen gets hot at back end (sometimes accompanied by erratic tip heating)	Poor electrical contact between the cord and pen.	Be sure the plug is all the way into the pen. Try flipping the cord end-for-end. Try other pens and another cord to determine whether the fault is the pen or the cord. Replace the faulty component or return for service.

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# Troubleshooting Guide (Cont.)

If the guide below doesn't solve a problem, contact your dealer or Razertip before returning product for service.

Symptom	Diagnosis	Suggested Solution
Tips break or wear out	Too much pressure on the tip while burning, or too high heat setting.	Reduce pressure and/or heat setting while burning. Always use the lowest setting that will do the job.
	Worn out tip from abrasive cleaning or incorrect carbon removal.	Use only scraping products or brass brush to clean tips. Abrasives will wear tips out prematurely.
	Old or defective tip.	If tip breakage continues to be a problem, change to a Razertip Heavy-duty pen.
	Inappropriate tip use.	Be sure to always select a tip that is suitable for the intended use.
Blue and white light flashing at Jack Light Bezel, no power to pen. LED Display is normal.	Unit has entered auto shut off mode (see page E4)	Press Pen Power Switch to start power to the Pen Jack (see page E4)
Blue and white light flashing at Jack Light Bezel, no power to pen. LED Display shows "OL"	Unit has entered Thermal Overload State (see page E4)	Wait for unit to cool (see page E4)
Blue blinking light at Jack Light Bezel.	Broken contact in pen, tip or cord, or no pen and/or cord attached. (see page E4)	Double check connections; try a different cord and/or another pen (see page E4)

There is no need to register Razertip products for warranty. For your records, please record the date of purchase and your Razertip dealer information below. Should your Razertip product ever require service you can contact your dealer or send the product directly to Razertip Industries.

Serial # \_\_\_\_\_

Purchase Date \_\_\_\_\_

Dealer (where purchased) \_\_\_\_\_

## Warranty Information

Your Razertip pyrography tool is guaranteed to operate properly for a period of three (3) years on the power supply, one (1) year on cords and pens (including fixed tips), and ninety (90) days on all interchangeable tips. This warranty provides for repair or replacement, at the manufacturer's option, of any defective components. This warranty is limited to the actual cost of repairs and will not cover shipping costs or any consequential damages resulting from failure of the unit or its components to perform as stated. All warranty work must be done by the manufacturer. The manufacturer will not cover the costs of repairs done elsewhere. Warranty will be voided if the unit has been tampered with, altered or repaired by unauthorized persons or companies. In the event that your burner or pen should need service, our average repair turn around time is only one day in shop. To receive warranty or out-of-warranty servicing, return the complete unit including any cord(s), pen(s) and/or tip(s) to your dealer or send directly (prepaid) to Razertip Industries Inc. at the address below.

## Technical Data

**Type:** Electronic hot-wire pyrography tool  
**Model:** SL-1 or SL-3   **Input:** 120VAC, 60Hz, 0.4A  
**Output:** 3.2VAC, 14.0A max.   **Wattage:** Max. 45 watts  
**Temperature range:** 77F(25C) to 1650F(900C) approx.  
**Size:** 5"x4.6"x3.75" (140mm x 118mm x 95mm)   **Weight:** 2lb / 900g  
**Safety Certification:** ETL C-US (North America) File 5010480

**Razertip Industries Inc.**  
**PO Box 910, 301-9th Street North**  
**Martensville, SK S0K 2T0 Canada**  
**Phone 306-931-0889**

**Toll-free (Canada & US only) 1-877-729-3787**  
**razertip.com info@razertip.com**

*More Questions? Don't hesitate to contact us - that's what we're here for!*

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