

**The Welding  
Accessory Experts™**



# **THE SHARP SHOOTER™**

## **Operations Manual**

The Sharp Shooter™ is manufactured by Pro-Fusion Technologies.

**Arc-Zone.com, Inc.**

**Sold By:**



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### Technical support

For technical support or questions regarding the operation of the Sharp Shooter system or the contents of this manual please contact an Arc-Zone.com technician at

800-944-2243 (Toll Free)  
760-931-1500 (Worldwide)  
or via email at [technician@arc-zone.com](mailto:technician@arc-zone.com)

You may also contact the manufacturer, Pro-Fusion Technologies, Inc. at 208-656-0665.

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# 1. Introduction

Thank you for purchasing The Sharp Shooter™ Tungsten Electrode Grinder. This product has been manufactured with quality construction and will provide years of reliable service if it is used properly. This unit comes with a one year warranty on parts and labor, excluding consumable parts (like the grinding wheel) or cases of operator abuse.

The Sharp Shooter™ will allow you to prepare consistent, properly ground electrodes that offer the following benefits to your welding:

- Improved arc starting
- Increased arc stability
- Reduction of possible tungsten inclusions in the weld
- Longer electrode life

Therefore, before operating this product you should first thoroughly read through this manual. If you have any additional questions, please feel free to call our office and we will help you.

# 2. Unpacking

Please check to ensure that your Sharp Shooter™ was not damaged in shipping. If there appears to be any damage, please call us so that we can work with you to correct the problem.

# 3. Specification

- Motor: AC 115V or 208-230V
- Output Current: 6.8 Full Load Amps at 115V, 3.4 at 230V with automatic overload protection
- Grinder Motor: 1/2 Horsepower (UL listed)
- Weight: 40 lbs. (stand alone unit without cabinet or vacuum)
- Dimensions: 13" (33cm)H x 12.5"(31.75cm)W x 13" (33cm)D (stand alone unit without cabinet or vacuum)

# 4. Description

The Sharp Shooter™ is the most capable tungsten electrode grinder on the market. Depending on the model purchased, the equipment can include some or all of the following features:

- Enclosed grinding area that protects fingers from abrasions, eyes from sparks, and lungs from (potentially radioactive) dust.
- Optional diamond cutting feature that is also enclosed for protection.
- A universal electrode wand for .040" (1.0mm), 1/16" (1.6mm), 3/32" (2.4mm), 1/8" (3.2mm), and 3/16" (4.8mm) electrodes. Slightly off sized or out of tolerance electrodes are handled with no problem.
- Excellent electrode grind concentricity and accurate tip diameter control via unique twin-stop feature in the electrode wand.
- A range of included grind angles from 10° to 60°.

- Optional all-welded metal cabinet with integrated vacuum system that comes with a 5-micron filter. A 0.3-micron HEPA filter is available as an upgrade. Vacuum stays on for three seconds after grinder is powered off to remove any remaining dust from the system.
- Longitudinal grinding
- Rugged construction with no vibration.
- Precise measurement scales for setup and repeatability.

## 5. Safety Tips

- 5.1 Never open the safety cover during operation.
- 5.2 Never operate the machine sideways or upside down.
- 5.3 Avoid impact, such as dropping the machine, otherwise the internal mechanism could be damaged.
- 5.4 If you have any problems with the equipment, contact Arc-Zone.com. Overhaul by yourself can be dangerous and may invalidate the warranty.
- 5.5 If the motor stops during operation, turn off the power switch and let the equipment cool down to normal temperature. The unit has an internal thermostat to avoid overheating.
- 5.6 Use the power switch to turn off the unit when not in use in order to prolong the life of the equipment.
- 5.7 Never operate equipment when overly tired, intoxicated, or when taking medication that makes you drowsy.
- 5.8 Do not abuse the equipment by trying to jab the electrode into the wheel to grind too quickly.
- 5.9 Only use this grinder for tungsten electrodes. Do not use it for other operations.

## 6. Models Available

There are four Sharp Shooter™ models available:

- TSS-1: Stand alone unit with grinding and flatting
- TSS-2: Stand alone unit with grinding, flatting, and cutting
- TSS-3: Same as TSS-1 with the addition of all-welded metal cabinet and integrated vacuum system
- TSS-4: Same as TSS-2 with the addition of all-welded metal cabinet and integrated vacuum system

If you buy a model without cutting or without the cabinet and vacuum system, you can always update your model at a later date.

Contact [Arc-Zone.com](http://Arc-Zone.com) for consultation and pricing.

## 7. Before Operation

7.1 With the power switch OFF, ensure that the grinding wheel is securely fastened to the motor shaft.

7.2 Be sure the front, clear plastic cover is in place.

7.3 Insert the power plug into an AC 115V outlet. (Note: 208-230V is available for purchase as an option, but most units are 115V. You can confirm your setting by checking the indication on the AC plug on the back of the grinder)

7.4 Turn the power switch ON for a couple of seconds then back OFF to check that the rotating action of the motor is working properly.

For all of the instructions and explanations in the following sections, please refer to the figures for clarification and for the identification of the various system components. If you have any doubts about how to properly operate the equipment, call an Arc-Zone.com technician.

## 8. How to Grind with the Sharp Shooter™

### 8.1 Setting Up the Electrode Wand

8.1.1 Unscrew the cap from the front of the electrode wand.

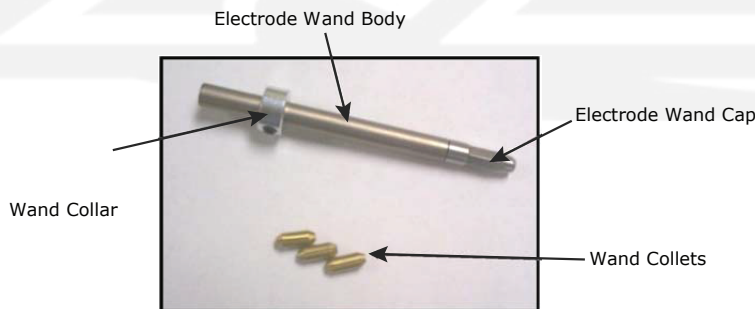
8.1.2 Insert the proper sized collet that matches the tungsten diameter you want to grind into the end of the electrode wand.

8.1.3 Screw the electrode wand cap back on, leaving it loose enough to insert your tungsten electrode.

8.1.4 Insert an electrode into the wand

8.1.5 Tighten the electrode wand cap "finger tight."

8.1.6 Slide a collar onto the OD of the wand and up towards the handle at the wand end and leave it on loose.



The Electrode Wand

Not Shown: Wand Handle (positioned at end of wand body)



## 8.2 Setting Up the Grind Angle

8.2.1 With the power OFF, loosen the large knob (not pictured) on the right side of the grinder by turning it counter-clockwise.

8.2.2 With your fingers on the Wand Guide Tube, move the Pivot Block up and down until the Pointer indicates the included angle reading you require on the Angle Scale.

8.2.3 Tighten the large knob (not pictured) on the right side of the grinder by turning it clockwise. Your angle is now set.

## 8.3 Tip Grinding In Less Precise Applications

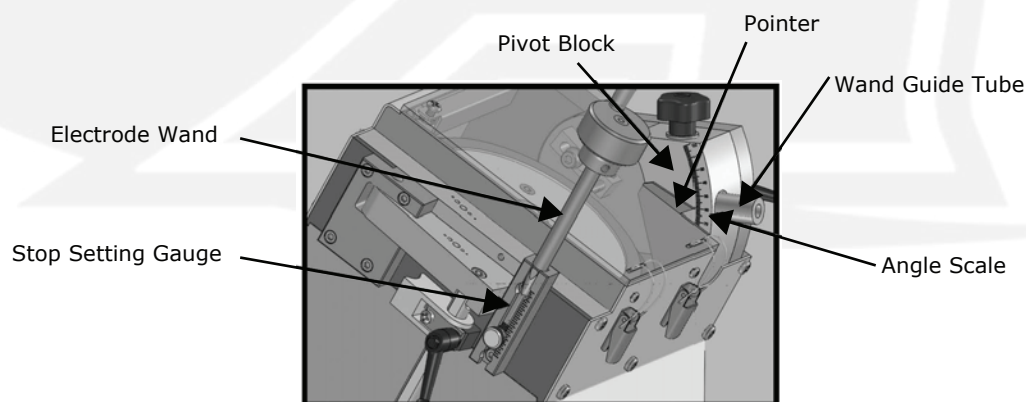
There are different requirements for manual welding and for automatic/semi-automation welding applications. While the tip diameter consistency is critical in precise applications due to the effect on penetration and weld bead size, many manual welding applications benefit only from a repeatable electrode angle. For less precise applications, a quick and simple method to set up for grinding after setting the grinding angle is as follows:

8.3.1 With the power OFF, insert the set up electrode wand (Section 8.10 to 8.16) with the collar loose into the Wand Guide Tube.

8.3.2 With the Electrode Wand Cap a reasonable distance away from the grinding wheel, move the wand collar up the wand until it touches the Wand Guide Tube and then tighten the allen wrench set screw in the wand collar.

8.3.3 Using trial and error, determine how much the electrode needs to stick out from the wand to produce the desired grinding result.

8.3.4 To be able to quickly and easily repeat this stick-out amount, insert the wand and electrode into the Stop Setting Gauge and adjust the stop to touch the new stick-out amount of the wand. Using this stick-out setting and the existing wand collar setting will produce the desired electrode repeatedly.



## 8.4 Tip Grinding in Precision Applications

In order to repeatedly produce both a repeatable tip angle and tip diameter, there are a number of steps to perform in order to set up the electrode stick-out and collar setting. Once set, the benefit of a repeatable angle and size of the tip diameter (the flat spot at the end of the electrode) is consistency in your weld penetration and weld bead size. See section 15.0 for details.

8.4.1 With the power OFF, insert the set up electrode wand (Section 8.10 to 8.16) with the collar loose into the Wand Guide Tube.

8.4.2 With the Electrode Wand Cap a reasonable distance away from the grinding wheel, move the wand collar up the wand until it touches the Wand Guide Tube and then tighten the allen wrench set screw in the wand collar.

8.4.3 Remove the Electrode Wand from the Wand Guide Tube and insert an electrode into the wand, leaving the electrode loose. Using quick trial and error, adjust the stick-out of the electrode to approximately one electrode diameter more than the stick-out length it takes to just touch the wheel.

8.4.4 "Finger Tighten" the electrode with this stick-out length, then insert it into the Stop Setting Gauge and turn it clockwise the required amount to further tighten it.

8.4.5 Set the electrode to impact wheel at the 3 o'clock position by doing the following: (A) loosen the black knob on top of the Pivot Block and the small handle on the right side of the Pivot Block. (B) Insert the wand into the Wand Guide Tube and move the wand up/down and left/right to make the electrode impact the wheel at the 3 o'clock position with a longitudinal grind. (C) Make sure that the threaded collet closer at the end of the wand is not touching the wheel. (D) Tighten the black knob on top of the Pivot Block and the small handle on the right side of the Pivot Block.

8.4.6 When grinding smaller diameter electrodes such as .040"(1.0mm) extra support may be desired for the electrode. In this case, with the equipment powered off and the electrode wand inserted with the electrode touching the wheel, lift the Plexiglas and push the electrode support down until it just touches the electrode. Tighten the set screw for this support and close the Plexiglas lid. (Note: At some angle adjustments, the Plexiglas lid will not open unless you loosen the handle as described in Section 8.21 to 8.23).

8.4.7 Grind an electrode by inserting the wand into the wand guide and rotating the wand in a consistent manner until complete. It will be complete when the wand collar has touched the Wand Guide Tube and no more grinding is occurring. Try not to bounce the electrode while grinding.

8.4.8 Using the Tip Prep Block as described in Section 10.0, remove material from the point a little at a time until you achieve the desire tip diameter. Observe the tip diameter that was produced by your first grind using methods consistent with your need for precision. High precision requirements will call for using a microscope here and less-precise requirements will look at the tip visually.

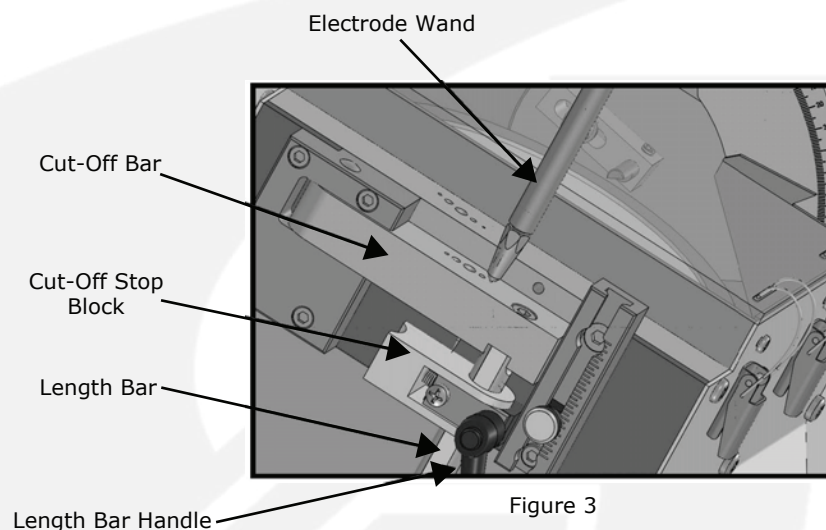
8.4.9 If the tip diameter produced in 8.31 is what you require, you now have the correct setup and can grind numerous electrodes to the same geometry very easily. If you need to modify the tip diameter measurement, use the tip flattening apparatus and repeat the instructions above as necessary to create a flat that you desire.



8.4.10 After creating the electrode that you wish to duplicate, insert the wand and electrode into the Stop Setting Gauge and adjust the stop the touch the new stick-out amount of the wand. Using this stick-out setting and the existing wand collar setting will produce the desired electrode repeatedly. You may want to create another electrode to ensure that the geometry is exactly what you want to make over and over. For high-precision electrode requirements where various tip diameter requirements exist, a repeat quick stop setting bar is available or can be made. It allows you to create a template to come back to the setting you just created very quickly and easily. Please call Arc-Zone if you have any questions about this.

## 9. Cutting Electrodes to Length

Cutting electrodes to length is a feature available on The Sharp Shooter™ models TSS-2 and TSS-4. With the Sharp Shooter™ powered OFF, choose from the following instructions according to your requirements for precision:



### Normal Cutting

9.1 Using the measurement scale on the Length Bar, loosen the black Length Bar Handle and move the cutting stop block up or down until you reach the desired length to cut. Tighten the knob. Then power the equipment on.

9.2 To cut your previously sharpened electrode, insert the electrode (secured tightly in the Electrode Wand) into the diameter hole on the cutting bar that matches the diameter of your electrode.

9.3 Move the cutting bar into the cutting wheel until the cutting operation is complete. Then move the bar back out to its original position, making sure not to move it out too far and expose the cutting wheel. The bar will only need to travel a small amount to accomplish the cut.

9.4 To remove the cut electrode, rotate the Cut-Off Stop Block forward about an inch. It is on an axis that allows you to do so. The electrode will then fall from the cutting block and the cutting process will be complete.

### Precise Cutting

There are two methods that can be used to produce super-accurate lengths in the cutting process. Both of them involve using a different method to set the most accurate position of the cutting stop block. The options are:

Create a dowel pin out of tungsten material that is the exact length you want to repeat. With the power off, insert the dowel pin into the correct diameter on the cutting block and adjust the cutting stop block position according to the instructions described in the "Normal Cutting" section.

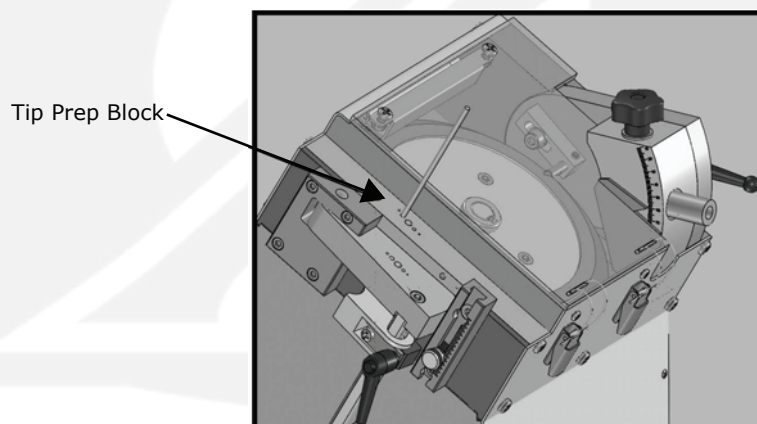
Use a micrometer to set the correct cutting stop block position according to the instructions described in the "Normal Cutting" section.

One important item to note is that the diamond cutting wheel impacts the electrode at .25" above the bottom of the cutting block.

## 10. Tip Flatting Electrodes

Welders often need to either remove eroded tips on electrodes or create a tip diameter after grinding an electrode to a sharp point. Achieving either of these results is easy on The Sharp Shooter™. Simply locate the correct diameter hole for your tungsten on the Tip Prep Block and insert the tungsten. Be careful not to gouge the wheel, which can produce uneven and accelerated wheel wear.

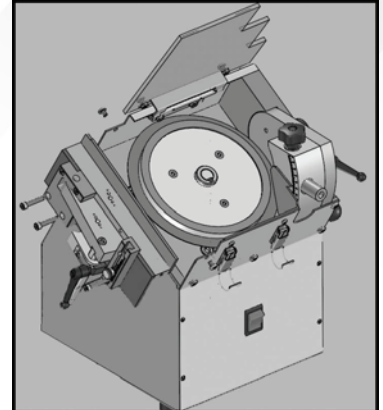
After removing an eroded tip, the operator can proceed to the grinding operation as previously described and reuse the remaining amount of the electrode length.



To create a slight, but imprecise tip flat diameter after grinding, insert the electrode carefully and remove some of the sharp point. If using this method to create tip diameters, it is recommended to do a quick touch up of the electrode grind by inserting the wand back into the tube and grinding again for one or two revolutions. For precise and repeatable tip diameter, use the instructions in Section 8.40.

## 11. Changing Wheels

- Remove the large side handle (don't lose the washer on it) that is used for tightening the angle measurement.
- Remove the angle pointer by removing the allen head button head cap screw on the front panel of the grinder.
- Remove the three hex screws on the top of the wheel and slide the wheel out carefully. Install the replacement wheel and reverse the steps above to reinstall.



## 12. Emptying Tungsten Dust From A Stand-Alone Unit

The Sharp Shooter™ models TSS-1 and TSS-2 are stand-alone units that do not include an integrated vacuum system. Since all of The Sharp Shooter™ models are completely enclosed, the non-vacuum units will collect dust internally to be removed later. Therefore, for these models it will be necessary from time to time (depending on usage) to vacuum out the dust from inside the unit. This is accomplished using the following steps:

- Unfasten the two latches on the front of the unit that secure the clear cover.
- With the power off, loosen the large knob (not pictured) on the right side of the grinder by turning it counter-clockwise.
- With your fingers on the Wand Guide Tube, move the Pivot Block down until the clear cover is free to move.
- Lift the cover to the top and hold it open.
- Using the extension hose on a vacuum, vacuum out the dust from inside the grinding area. If the area is particularly full with dust, you may want to remove the wheels using the instructions in Section 11.0, vacuum, the replace them.
- Close the clear cover and fasten the two latches on the front.
- Set your angle and tighten the large knob (not pictured) on the right side of the grinder by turning it clockwise as discussed in Section 8.20.

## 13. Vacuum System Overview

The Sharp Shooter™ models TSS-3 and TSS-4 include an integrated vacuum system. Since all of The Sharp Shooter™ models are completely enclosed, the vacuum system will collect nearly all of the dust generated by grinding, cutting, and/or flatting of Tungsten electrodes.

The vacuum system comes already integrated to The Sharp Shooter™ upon delivery so when the grinder is powered up, the vacuum system automatically activates. You will notice that when you power off the grinder, the vacuum system has a built-in delay to keep the vacuum operating for an additional 3-seconds to clean out the vacuum lines and grinder internals of any remaining dust.

Replacement vacuum filters can be purchased from Arc-Zone. The standard filter that ships with a TSS-3 or TSS-4 is a 5-micron filter. An optional 0.3-micro HEPA filter is also available as an optional item.

## 14. Accessories and Consumable Parts List

The Sharp Shooter™ models have the following accessories and consumable parts available which can be ordered directly from Arc-Zone.com:

Part Number	Description
TSS-G300	Spare Diamond Grinding Wheel
TSS-C100	Spare Diamond Cutting Wheel
TSS-UST	Upgrade Stand-Alone Unit (TSS-1 or TSS-2) to Complete Grinding Station with all-welded metal cabinet and integrated vacuum system.
TSS-UCT	Upgrade TSS-1 or TSS-3 to Add Cutting Features
PFG-P044	Replacement Wand Collar
PFG-M012	Replacement Clear Cover Window
PFG-M021	Electrode Wand Body
PFG-M022	Electrode Wand Cap
PFG-M023A	Replacement .040" (1.0mm) wand collet
PFG-M023B	Replacement 1/16" (1.6mm) wand collet
PFG-M023C	Replacement 3/32" (2.4mm) wand collet
PFG-M023D	Replacement 1/8" (3.2mm) wand collet
PFG-M023F	Replacement 3/16" wand assembly
PFG-M031	Electrode Wand Handle

Contact your Arc-Zone.com representative to order these, or other parts not listed.