



**Operating Manual
for**

WeldAll™

**256PI 250 AMP
AC/DC Series IGBT
Machine**

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THANK YOU!

We, at LONGEVITY, want to thank you for purchasing our product. You are almost ready to experience Longevity Welding first hand. Longevity definitely appreciates your business and understand that this equipment may be overwhelming to setup and operate so we have prepared a manual that will assist you in understand your new plasma cutter/welder. If you have any questions during or after reading this manual, please feel to contact us! Please take a moment to register your product on our website at www.longevity-inc.com or www.lweld.com

Once again, thank you for choosing Longevity as your main welding supplier!

Longevity Global, Inc
23591 Foley St
Hayward, CA 94545

Toll-Free Customer Support: 1-877-LONG-INC / 1-877-566-4462
Website: www.longevity-inc.com
Sales: sales@longevity-inc.com
Customer Service: help@longevity-inc.com
Dealers: dealers@longevity-inc.com
Complaints: complaints@longevity-inc.com

Please join our welding forums to share welding tips and tricks, to receive useful information from customers who also use our products, and to be a part of the Longevity™ welding community at www.freeweldingforum.com

Warranty

A manufacturer's limited warranty covers parts only, unless indicated below, and is furnished for five years from the date of purchase warranting the product to be free of material defect or workmanship as follows:

Plasma Cutters, Welders, and Multi-Purpose Welders (Coverage for Parts and Labor for five years from the purchase date at our facility).

In the event of product failure or malfunction, the purchaser/recipient must contact LONGEVITY™ GLOBAL, INC. to obtain an RMA (return or missing) number and a location of a designated repair facility. The welder, plasma cutter, multi-purpose unit, or any other welding related equipment comes with warranty on all internal components. The torch, cables, power cord, clamps, air regulator, argon regulator, hoses, case, paint, and consumables are not covered under warranty. Packages that are not pre-approved for return, and that do not have an RMA number will be refused and returned to the purchaser/recipient at the purchasers/recipients own cost. The product must be returned in its original packaging, with all accompanying components. Repair or replacement of the defective product will be at our option. The repaired/replaced product will then be returned to the purchaser. LONGEVITY Global, Inc. will cover the return and replacement shipping charges (both ways) for units in need of warranty within and only for the first 30 days from the purchase date. After the 30 days from the purchase date, the purchaser shall be responsible for all shipping and handling costs of returning (both ways) the defective/faulty products for repair or replacement. We are not responsible for lost returns. The labor coverage only applies if the unit is serviced at our facility or one of our authorized dealers. We will not reimburse the labor if your wish to have a third-party or unauthorized repair technicians work on the product.

Shipping Damage

Your machine is insured against damage during shipping. Keep all packing materials and containers in case machine must be returned. We will initiate a claim with the shipping company to cover damage or loss. If there is shipping damage upon opening your package, our customer service team will work with you to get the matter resolved.

~~In-Warranty Service~~

Customers, who own machines that are in warranty and require service, should contact our Warranty Department by email at help@longevity-inc.com to obtain a return authorization code. In addition to the warranty we offer, we would like for you to register your product on our website at www.longevity-inc.com/resources. Remember, warranty starts from the date of purchase. For your convenience, write your order information below so you can track your order in case you need warranty work.

Order No.: _____

Date of Purchase: _____

Warranty Period: _____

Out-of-Warranty Service

Customers, who own machines that are out of warranty and require service, should contact us for an estimate. Longevity offers an exchange program on out of warranty units. We also help non LONGEVITY customers with repairs, replacement, and service.

If your unit is not manufactured by Longevity and you cannot receive service from your manufacturer or seller, Longevity will lend out hand. Our warranty policy is also available for all plasma cutters and welders. For more information, please email us at help@longevity-inc.com

Warnings and Safety

Welding and plasma cutting may be dangerous to the operator and to bystanders, if the equipment is not operated properly. Welding or cutting must be performed in accordance with all relevant safety regulations. Carefully read and understand this instruction manual before installing and operating this equipment.

Changing function modes during welding may damage equipment.

Before welding, disconnect the electrode-holder cable from the equipment.

A circuit breaker is required to prevent electrical overload of the equipment.

Only high quality welding tools should be used.

Electric Shock can be fatal.

Ensure that ground cable is connected in accordance with applicable safety codes.

Never touch electrodes, wires, or circuit components with bare hands. Wear dry welding gloves when welding.

The operator must be insulated from the work piece.

Smoke and gas can be harmful to health.

Ensure that the working area is well ventilated.

Avoid breathing smoke and gas generated during the welding process. Cutting and welding can cause cancer because of the smoke that comes from the welds and cuts.

Arc-light emission can be harmful to eyes and skin.

Always wear a welding helmet, anti-radiation glass, and work clothes while welding.

Ensure that people in or near the working area are protected.

Welding splash is a fire hazard.

Keep flammable material away from the work place.

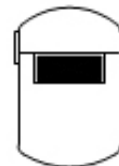
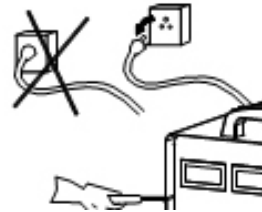
Keep a fire extinguisher nearby, and have all personnel trained in it's use.

Surface noise generated while welding or cutting can be harmful to hearing.

In the event of a machine fault.

Refer to this instruction manual.

If the fault cannot be determined, contact your local dealer or supplier for assistance.



Safety Tips

Consider the following tips to ensure safe operation of your welding/cutting equipment:

- Ensure that this welding equipment is installed in an area free of corrosive chemical gases, flammable gases or materials, and explosive chemicals.
- The area should contain little dust, and have a humidity of no more than 80%.
- Operate the welding equipment in an area sheltered from direct sunlight and precipitation. Work area temperature should be maintained at -10°C to +40°C;
- If, because of an overload, the machine suddenly stops, and it is necessary to restart it, leave the internal fan operating to lower the inside temperature.
- Always wear protective clothing and a welding mask to protect your skin.
- Wear safety goggles designed to darken the arc generated by your machine.
- Wear suitable noise protection to protect your hearing.
- Ensure that machine is grounded through the power cord or on the machine case.
- Never operate the machine in bare feet or on a wet floor.
- Never switch the machine off while it's in use. Doing so will damage the internal circuitry.
- Ensure that your circuit breaker is rated to handle the current requirements of your machine.
- Use a UL approved receptacles and plugs with your machine. Never hard wire the machine to main power.
- Work in a well ventilated area to avoid smoke. Keep your head out of the smoke. Ensure that air is flowing away from you to avoid inhaling smoke.
- Ensure proper ventilation through the machine's louvers. Maintain a distance of at least 12 inches between this cutting equipment and any other objects in the work area.
- Use a screen or curtain designed to keep passers by from viewing the arc.
- The arc spray and metal spray from machine use may cause nearby fires. Use caution.
- If, after reviewing this manual, you have any problems in setting up or operating your machine, contact us at help@longevity-inc.com.

General Description

The LONGEVITY WeldAll series multi-purpose unit offers a variety of multiple welding aspects. You will be able to cut and weld all types of metals including aluminum. This LONGEVITY multiprocess welder can plasma cut, AC/DC TIG Weld, and ARC weld all in one machine with a flip of a switch. Weighing under 69lbs, the unit is portable and reliable featuring a duty cycle of 60%

Enjoy your combination machine!

General Specifications:

Genuine: Siemens Infineon IGBT based electronics
Operating Voltage: 220/230/240 VAC 50/60Hz Input
Open Circuit Voltage: 70V
60% Duty Cycle @ Rated Amps
Weight: 60 lbs
Thermal Overload Protection with Large Size Cooling Fan
Size: 21.5" L x 8 3/4"W x 15.25" H (with handles)inches

20-60AMP Plasma Cutting Specifications @ 60psi:

3" Per minute @ 1 " Steel (Severance Cut)
7" Per minute @ 3/4" Thick Steel
17" Per minute @1/2" Thick Steel Minimum requirement for air compressor: (4.0 CFM)

5-250AMP AC/DC TIG Features:

Up Slope, Down Slop Control: 0-10 Seconds
Post Flow Control: 0-25 Seconds
Base Current Control: 5-250 Amps
Peak Pulse Current Ratio: 10- 250 Amps
Pulse Frequency Control: .0.2-300 Hz
Pulse Width Control: 10%-90%
AC Frequency Control: 50-250 Hz
AC Balance Control: 30-70% (for Aluminum)
After Flow Time: 1-25s
Rated Duty Cycle: 35%
Arc Starting Mode: High Frequency/Lift Arc Striking

10-200AMP Stick Features:

Arc Force Controls the amperage from 0-10 to push an E6010 Stick Rod.
No Load Voltage: 70V
Rated Duty Cycle: 60%
Rated Output Current: 200 AMP

Pilot Arc and Contact Start:

Pilot Arc plasma cutter starting technology allows you to start and maintain an ARC as long as the trigger is pressed. This ARC is a similar to the ARC you will see from an oxy fuel cutting torch. In addition, you are able to hook these torches up to CNC machines because contact with the workpiece and the tip of the torch is not required. Also because there the

starting technology is not High Frequency, your plasma cutter does not interfere with CNC Computers. Pilot Arc torches also have longer consumable life because you can maintain a distance when starting an arc.

www.longevity-inc.com What's Included?



Plasma Torch



TIG Torch + Accessories



Stick Holder



Ground Clamp



Foot Pedal



Air/Gas Hose



Air Regulator



Argon Regulator



Additional Accessories

Knob Functions:

POWER SWITCH: Dual throw switch is located on the back of the unit. (NOTE: When finished welding or cutting, always let the machine's fan run for a minute or two to cool the machine before turning the power switch off.)

POWER LAMP: This light illuminates while the unit is powered on.

OVER CURRENT/OVER HEAT WARNING LAMP: (lightning bolt) Illuminates when the duty cycle has been exceeded or the machine has overheated due to improper ventilation. Discontinue use until lamp goes out. Allow the fan to continue to run. Once lamp goes out, you may resume using the unit.

DIGITAL DISPLAY: The display shows the approximate welding amps controlled by base current.

FUNCTION POSITION SWITCH: Selects **Stick** welding, plasma **Cutting**, or **TIG** welding.

AC/DC SWITCH: Use AC for Aluminum and Magnesium, DC for all other metals. Plasma cutting must be performed in DC mode.

BASE CURRENT.: (Base Current 5-### amps welding, 20-### amps plasma cutting) This is the primary amperage control for all functions. In TIG pulse mode, this knob sets the base current (low) amperage. For TIG pulse adjustment, set the Pulse current knob full left, then set the desired base current (low amperage) using the Base current knob. The digital display will show the amp setting. Next use the Pulse current control to set the high amperage of the high pulse cycle. As you turn the Pulse current control to the right the digital display will increase, showing your pulse peak amps.

FOOT CONTROL: The Foot Control overrides the Base Current knob. The Base Current knob does not function when the Foot Control is plugged into the machine. When the Foot Control is depressed, the welding current starts. Base Current will increase with pedal depression. In pulse mode, the Foot Control changes both the base (low) amps and pulse (high) amps, just as turning the Base Current knob would. The **Foot Control Knob** can be used to reduce the maximum current allowed by the Foot Control. **Example for 200PI:** Placing the knob to the 5 position will limit the maximum amps to approximately 20 amps, the 6 position approximately 50 amps, 7 about 90 amps, 8 about 150, and the 9 position 200 amps. This allows the Foot Control to be less sensitive.

PULSE ON/OFF SWITCH: Enables pulsed **AC and DC** TIG welding. Pulse welding is an advanced welding technique that allows fine control over the welding process. Pulse Mode gives the same effect as quickly moving the Base current knob back and forth between a low and high amp setting, at a rate that would be impossible to do by hand. To set the high and low pulse currents, first set the Pulse current knob full left, then set the desired base current (low amperage) using the Base current knob. The digital display will show the amp setting. Next use the Pulse current control to set the high amperage of the high pulse cycle. As you turn the Pulse current control to the right, the amperage on the digital display will increase, showing your pulse peak amps.

PULSE CURRENT. (Pulse Current 5-### amps): Only active in pulse mode. This Set's the pulse peak (high) amperage of the pulse cycle. Select the peak amperage with this control to achieve the maximum amperage

requirements for the high pulse cycle. The amperage change will be reflected on the digital display.

PULSE FREQUENCY. (Pulse Frequency 0.5-25 cycles per second): Only active in pulse mode. The TIG pulse frequency controls the number of pulse cycles per second (Hz). Changing the frequency sets the duration of each pulse cycle, so the lower the frequency the longer the pulse. A higher pulse frequency will give a shorter pulse cycle. This allows for fine control of heat input into the base metal.

PULSE WIDTH (0.1 to 0.9 or 10-90%): Only active in pulse mode. This TIG pulse control adjusts the relative amount of time the pulse spends in the peak (high) current stage during a pulse cycle. For example, a control knob setting of 90% or .9 will give you 90% of the time in the peak (high) current stage and 10% in the base (low) current stage of the pulse cycle. Note: The Pulse width does not control the overall length of the pulse. The Pulse frequency sets the cycle length, thereby setting the overall length of each leg of the cycle.

DOWN SLOPE (0-10 seconds): The Down slope time controls the end cycle of the weld by slowly bringing down the welding current. The down slope helps prevent weld cracking and hole formation in the crater, as the end of the weld is reached and the torch trigger is released.

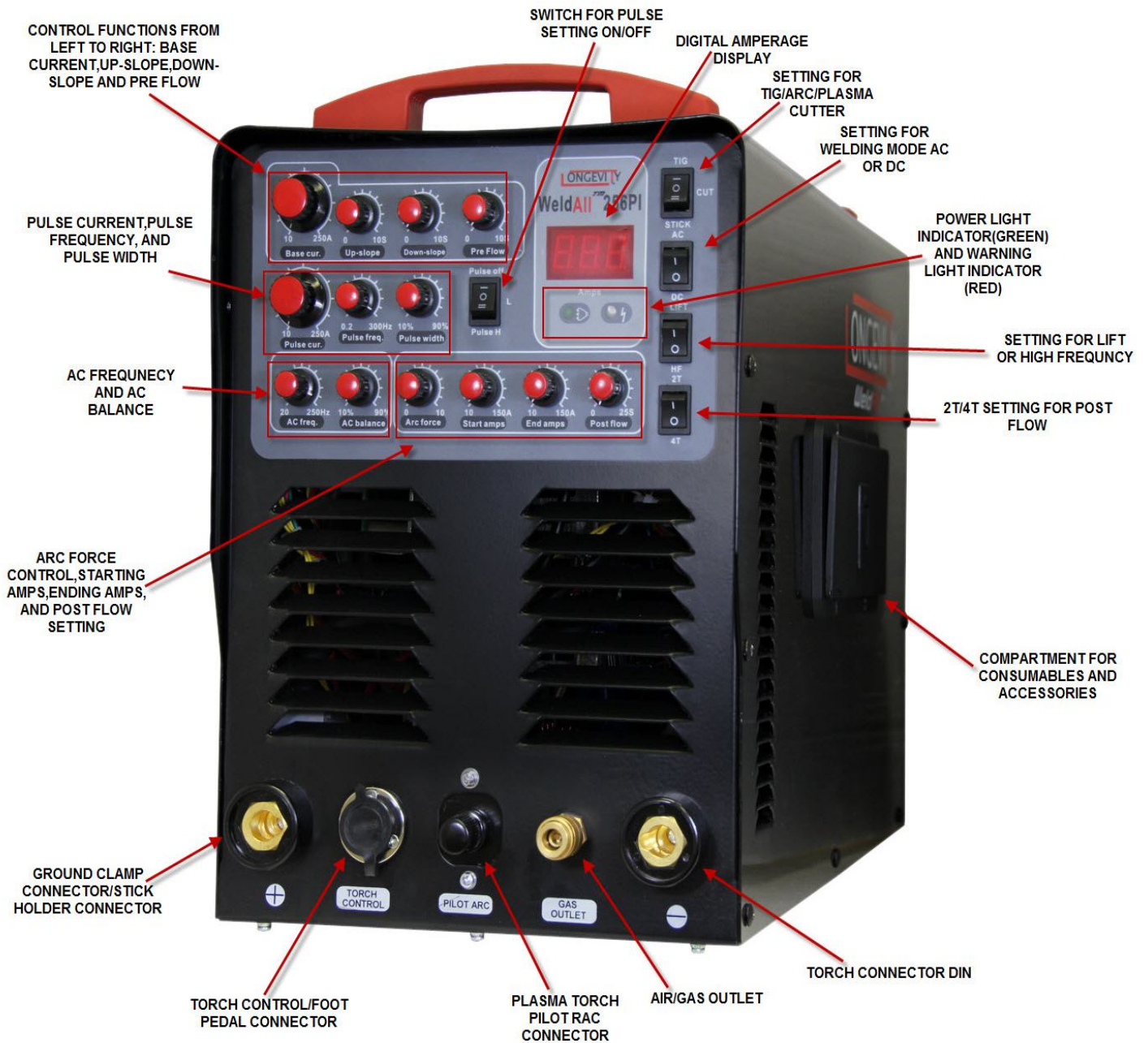
AC FREQUENCY. (Alternating Current Frequency 20-100 cycles per second): Only active in AC mode. This AC TIG & Stick control adjusts the arc frequency. Setting high frequency narrows the welding arc making it more directional and increasing penetration. Lower frequency widens the arc and shallows the welding puddle.

AC BALANCE (30-70%): Only active in AC mode. This AC TIG & Stick control determines the amount of time the AC cycle spends in DCEN (Direct Current Electrode Negative -) or DCEP (DC Electrode Positive +). More DCEP is preferred for cleaning oxidation, particularly in aluminum. More DCEN is preferred for better penetration and faster travel speed. A 50% setting equalizes the time spent in both. 30% setting is a good starting point. A higher AC balance setting will clean the weld more but put more heat into the electrode, reduce this setting if you melt the electrode. For higher AC balance settings use a thicker electrode to keep it from melting.

POST FLOW (1-25 seconds): This timer controls the flow of shielding gas after the TIG weld arc is terminated. Not enough post flow can cause weld contamination or torch overheating. During plasma cutting, Post Flow allows for cooling air to flow after terminating the arc. Keep the TIG torch in position over the weld until the post flow ends. Five seconds for plasma cutting and 5 to 10 seconds for TIG welding is a recommended starting point.

4T/2T SWITCH: This switch select is for the control of the TIG weld cycle via the TIG torch trigger. In the 2T mode, simply touch and hold the trigger to start the arc and continue holding while welding. Release the trigger to finish. In the 4T mode each push of the trigger toggles between on and off (push and release trigger once to start, push and release once to stop welding).

PRESSURE REGULATOR: To adjust the pressure regulator, pull the knob out to unlock. Turn the knob left to decrease the Argon/air flow, or right to increase flow. Both pressurized air for plasma cutting and Argon gas for welding are affected by this knob. Set regulator to approximately 75 psi. air pressure for plasma cutting. Push the knob in to lock it after regulator is set. Adjust the Argon regulator on the gas bottle to control gas flow for TIG welding. The air regulator, once set can be left for all plasma cutting and TIG welding projects. Further adjustment should not be required.





| | Welding Method | Stick (SMAW) | | TIG (GTAW) | | Plasma Cutting | Notes |
|----------|--------------------|---|--|---|--|--|---|
| | | AC | DC | AC | DC | | |
| Process | Process used for | Steel, Aluminum | Steels | Aluminum | Steel, Stainless Steel | Cutting any conductive material | AC TIG preferred for Aluminum, DC TIG/Stick preferred for Steels |
| | Gas used | N/A | N/A | Argon | Argon | Compressed Air | purge hose with Argon using trigger on gun before beginning TIG welding |
| | Torch used | Electrode Clamp | Electrode Clamp | TIG | TIG | Plasma | Ground cable and clamp used for all. Plasma and Tig Torch share connections welding unit. |
| | tungsten | N/A | N/A | Ceriated (grey) tungsten, ball/flat end | Ceriated/thoriated, (red or grey) sharp tip | N/A | Grey is typically for aluminum. Red usually indicates 2% thoriated for steel and stainless steel. Sharpen to point grinding axially with taper with length of taper = 2.5 x Diameter |
| | Gas pressure/flow | N/A | N/A | 10-25 cu-ft/hr start at 20 | 10-25 cu-ft/hr start at 20 | 40-70 PSI start at 65 psi | Start with Argon at 18 CFM for TIG. Start with compressed air at 60-75 psi for Plasma |
| Settings | ARC/TIG/Plasma | ARC | ARC | TIG | TIG | Plasma | select welding type desired |
| | AC/DC | AC | DC | AC | DC | DC | select DC or AC welding current |
| | 4T/2T | N/A | N/A | 2T see note | 2T see note | 2T see note | Normally set to 2T where trigger pulled = on, released = off. Setting to 4T causes the trigger switch to latch on until triggered a second time |
| | Pulse | N/A | N/A | select as appropriate | select as appropriate | N/A | While in DC/TIG mode this switch will provide pulsed DC or constant DC. It switches between the peak current and base current at the selected frequency. |
| Dial | Gas Preweld | N/A | N/A | Set 0-1 sec | Set 0-1 sec | N/A set to 0 | Recommended to pre purge weld area for before current starts when TIG welding to help prevent oxidation, set between 0 and 1 seconds. Purge with Argon before starting first TIG weld. |
| | Current (Amps) | 0-200 Amps as appropriate for workpiece/ electrode | 0-200 Amps as appropriate for workpiece/ electrode | 0-200 Amps as appropriate zero for foot switch | 0-200 Amps as appropriate zero for foot switch | 0-50 Amps as appropriate for workpiece/ electrode | Set current as recommended for material and thickness. If using foot pedal set to zero -- foot pedal adjusts current |
| | Base Current | N/A | N/A | N/A | set 20-90% | N/A | Only active when set to "Pulse" in DC/TIG mode. Sets lower (trough/valley) current (percentage of the "current" above) that is seen during each DC pulse cycle |
| | Slope Down Control | N/A | N/A | set 0-10 sec | set 0-10 sec | N/A | Rate at which current is dropped after you release the weld trigger. Adjusts time from 0 to 10 seconds. If using foot pedal, set to zero as foot pedal is used to reduce current. |
| | Arc Force | set 0-100% | set 0-100% | N/A set to max | N/A set to max | N/A set to max | Designed for use when Stick welding, but influences maximum current of all modes. Also called Dig or Arc Force Control. Gives a welder variable additional amperage during low voltage (short arc length) conditions while welding. Helps avoid "sticking" stick electrodes when a short arc length is used and gives stick operator some heat control. This must be set to maximum to achieve maximum power for all modes, but variable voltage/arc-length dependent current is only active while stick welding. |
| | Pulse Frequency | N/A | N/A | N/A | Set from 0.3 to 200 pulses/sec | N/A | Adjusts pulse frequency from 0.5 to 200Hz. Only active when set to "Pulse" in TIG mode. |
| | Pulse Duty | N/A | N/A | N/A | set 10-90% | N/A | Only active when set to "Pulse" in TIG mode. Sets width of AC/DC Pulse from 10 to 90% of each AC/DC pulse cycle. This is the duration as % of pulse width (one pulse cycle) of the higher current pulse |
| | Clear Width | Set 20-80%, neutral set to 50% | N/A | Set 20-80% | N/A | N/A | Only active in AC welding. Biases the AC current by varying the percentage of current going in each direction. This balances the weld heat penetration (DCEN) and cleaning action (DCEP). This setting can help prevent overheating and damaging the tungsten vs cleaning oxidation on the work pieces. Middle setting is 50/50. Low is 20% positive on. High is 80% positive on. Large current small clear width and vice versa. This setting depends on weld penetration needed (current), tungsten diameter, gas flow (tungsten cooling), and existing work oxidation. |
| | Gas Post Flow | N/A | N/A | Set 1-10 sec | Set 1-10 sec | Set 1-10 sec | Controls gas flow duration after trigger is released. Higher time uses more gas but helps prevent oxidation of hot TIG weld material. Also helps cool weld pool, tungsten electrode, and ceramic cups. Post flow can also cool freshly cut work pieces and plasma torch parts. |
| | Notes | requires slag removal with chipping hammer, use AC for less spatter (depends on electrode chosen) | requires slag removal with chipping hammer | Distance between tungsten and workpiece should be 2-4 mm, either set current or use foot pedal recommend 5356 filler rod, remember to allow post flow | Distance between tungsten and workpiece should be 2-4 mm, either set current or use foot pedal remember to allow post flow | lower current if cut is too wide. Air flow is critical to prevent damage to tip. Tilt nozzle to start hole in thicker materials. | |

TORCH CONNECTOR DIN (-): (TIG, Stick or Plasma Cutter) is normally connected to this terminal, but the + and - connectors can be reversed for DCEP (Direct Current Electrode Positive +) stick welding.

TORCH CONTROL/PEDAL CONNECTOR: The Torch connector and the Foot pedal connector both attach to receptacle.

PLASMA TORCH PILOT ARC CONNECTOR: The plasma torch's pilot arc wire connects here.

GAS OUTLET: The TIG and plasma torch's gas/air line connect to this receptacle.

GAS INLET: (back of unit) Compressed air for the plasma torch and Argon gas for TIG welding are fed into the machine using this barbed hose receptacle.

Plasma Cutter: Plasma Cutter Torch Assembly



The plasma cutter torch handle is made of fire and heat resistant materials. Avoid dropping the torch or striking anything with it. Assemble the consumables as pictured above, and described below.

1. Insert the electrode. Tighten it with pliers.
2. Seat the swirl ring on the electrode.
3. Place the copper tip on the ring, ensuring that is seated flat.
4. Place the shield cup over the tip and secure. Secure all parts into place by turning the ceramic cup clockwise until it is snug. Do not over tighten.

~~Plasma Cutter Operating Tips from www.plasma-cutters.com~~

Tips For Longevity Plasma Cutting

Using a Longevity Plasma Cutter with either High Frequency or Pilot Arc technology is very easy to use, and since each Longevity unit is quality tested at our in house testing facility before it is shipped, most of our customers take right out of the box, plug it in and get to work. Naturally, it is easy to understand how excited you would be to see the delivery truck pull up with your brand new Longevity Plasma Cutter and you should be. Congratulations is in order and we want to ensure you have the best experience with your Longevity Plasma Cutter. However, excited as we are you can't wait to put your Longevity Plasma Cutter into action, we would like you to consider these helpful tips and examples that will enable you to get the most out of your Longevity Plasma Cutter and it's consumables. So, before using your Longevity Plasma Cutter it is extremely important to read the owner's manual all the way through regardless of your experience level. Even if you are a seasoned veteran, give it a once through and keep it near by in case you, someone you know or someone you work with has a question about the use or specifications of your Longevity Plasma Cutter.

At this point, let us assume that you have purchased the Longevity Plasma Cutter that is right for you, and even though you did your research already, it is always a good idea to revisit the safety precautions, specifications and unique options ensuring you achieve the most with your Longevity Plasma Cutter while staying safe. In case you have not decided which Longevity Plasma Cutter is right for you, please visit the Help Me Choose section and take advantage of the Longevity Smart Selector.

In terms of safety, the price of carelessly cutting corners can be extremely costly, not only to your health but to the people around you as well. So, before you get started using your Longevity Plasma Cutter to create your master piece, build a bridge, or whatever you want to do, make sure you have a quality safety checklist you follow after you read the manual and before you get started. Below are a list of tips and safety measures you might find useful in developing your safety checklist. Remember, in no way shape or form does this checklist or any other check list ever replace the necessity of thoroughly reading the owner's manual of your Longevity Plasma Cutter.

Check List Suggestions

▶ Connect the air supply to your Longevity Plasma

Cutter and consult your owner's manual to ensure the correct PSI. The PSI is about 65-75.

▶ Each Longevity Plasma Cutter, regardless if it uses Pilot Arc or High Frequency technology, comes with an air flow regulator and water catcher. Reference the owner's manual of your Longevity Plasma Cutter for specifications and care instructions of your air flow regulator and filter.

▶ Check the torch of your Longevity Plasma Cutter and make sure everything is in order. Reference the owner's manual of your Longevity Plasma Cutter to make sure all of your consumables are clean, correct, and pieced together securely before you begin cutting.

▶ Gouging or piercing can be achieved by simply lowering the amperage output and keeping with the recommended psi. Examples on how to achieve the desired results can be referenced in the owner's manual of your Longevity Plasma Cutter.

▶ Now you are ready to use your Longevity Plasma Cutter safely and efficiently. Turn the machine on and enjoy the satisfying experience of a quality Longevity Plasma Cutter.

▶ Double check your air supply, air flow regulator and water filter. (More on this below.)

▶ All Longevity Plasma Cutters require a solid ground connection as close to the work piece as practical. Remember, even though your Longevity Plasma Cutter can cut through paint and other coatings on the metal, the ground connection requires a clean, flush connection to the work piece.

▶ Utilizing the proper safety equipment is just as important as understanding how to properly operate your Longevity Plasma Cutter. Consult the owner's manual of your Longevity Plasma Cutter to be sure you are using the correct gloves, eye protection, welding leathers, face shield, etc. You can find all of the necessary equipment as stated in the owner's manual of your Longevity Plasma Cutter in the accessories section of our website.

▶ The old adage says to measure twice and cut once,

but we want to go ahead and suggest you make a

sample cut (of the same caliber as the intended use) with your Longevity Plasma Cutter before you get started. Use this rehearsal just to be sure you have correctly calibrated all the settings to work as desired. If you are going to be cutting for a large piece of metal, it can sometimes be difficult for even the most experienced metal worker to cleanly stop and start. We recommend you use the sample cut to thoroughly rehearse the intended cut with your Longevity Plasma Cutter.

Longevity Plasma Cutter Tips

In order to successfully execute a clean cut with your Longevity Plasma Cutter you must consider a combination of elements involved in the cutting process:

¹The tip of your torch is designed to focus the plasma stream to the work piece in accordance with the appropriate setting (see owner's manual). Trying to use a 80-amp torch tip at a 40-amp setting will not focus the energy of your torch accurately and thus lead to a wider kerf. And the opposite scenario of using an 80-amp setting with a 40-amp tip will abuse your torch tip and require it to be replaced sooner than intended.

¹When cutting a thicker material with your Longevity Plasma Cutter it is important to use a torch tip designed for a higher-amp output. Higher-amp tips have a larger opening than lower-amp tips. Attempting to use a 40-amp tip to cut thick metal with a higher-amp output will distort your 40-amp tip meaning it will need to be replaced.

¹Each Longevity Plasma Cutter, both Pilot Arc and High Frequency, allow you to cut different metals at different speeds. For example to achieve a quality cut of 1/2in. thick steel with the Longevity Force Cut LP-40D Pilot Arc your speed will be roughly 7 inches per minute. Where as the Longevity Force Cut LP-80D will cut 1.25in. thick steel at the same rate.

¹Use extended tips on your Longevity Plasma Cutter for tough to reach corners, tracing a pattern, or areas with tight spaces.

¹Pilot Arc technology allows you to ignite the arc without the tip touching the metal. Use a torch guide or tip shield to protect your consumable. The more often you drag your torch tip across the material or stop and restart the Pilot Arc, the shorter the life span of your consumables will be.

¹Using a torch guide or tip shield is a great way to protect the

consumables of your Longevity Plasma Cutter. Remember to

maintain a 1/16in. - 1/8in. distance from the material when cutting.

* The important things to consider while using your Longevity Plasma Cutter to cleanly execute a cut is correct amperage of the torch tip, thickness of the material, intended speed, proper technique, and ultimately protecting the life of your consumables.

Cutting Posture

Sometimes you may find that you are unable to use a guide or shield when operating your Longevity Plasma Cutter. In some instances a project may be a very ornate design with different curves and protrusions or the material is too thick to apply a shield or guard to your Longevity Plasma Cutter torch tip. In order to maintain the quality and consistency of your work we recommend that you use your other hand as a guide. Give yourself a fighting chance to steady your hands and take advantage of the protective gear you have like our guys on the Longevity Facility Testing Team .

One of the reasons you purchase a Longevity Plasma Cutter is because of it's quality. Therefore, we think you should have a few quality reminders to think about when you are cutting.

If you stop and start an arc in the middle of a cut, often the the quality of your cut will suffer and compromise the integrity of your so far clean cut-line. Remember, even when we do facility testing, a suitable method to apply when using your Longevity Plasma Cutter is rehearsing the cut. Be sure you are going to be able to produce a smooth continuous cut-line all the way through.

Along with rehearsing your cut, another equally good reminder is to protect your consumables as much as possible. Often we can get comfortable piercing right through thin steel with our Longevity Plasma Cutters, but when cutting thicker metal often the intense back splash from initial contact will rapidly wear down your torch tip and other consumables. Even though the seeing the bright sparks show off the awesome power of your Longevity Plasma Cutter, remember we want you to be able to enjoy the results of your work time and time again. So, in situations when you are going to be cutting thick metals at high amperage with your Longevity Plasma Cutter, we recommend you start with the torch pointed at a 45 degree angle. This angled approach allows for the first blast of metal to be released with out back splash on to your valuable consumables.

Know Your Amperage, Know Your Metal

At www.longevity-inc.com, you can see the cutting thickness capability.

Understanding the amperage in relation to your cut speed is important.

Some metals respond differently than others. For example the faster you move on a material such as aluminum, the cleaner your cut will be. Conversely, when using your Longevity Plasma Cutter to cut thicker material, set your unit to full output and vary your travel speed accordingly. Thin material requires you to turn down the amperage and change to a lower-amperage to achieve a narrow kerf.

Figuring out if you are going too slow or too fast can be a daunting task that really only comes with time and experience. However, our guys in the Longevity Facility Testing Team have a few pointers for you:

- If your cut has a lot of spray back then you are probably going too fast.
- If the arc exits the material going straight down then you are probably moving too slow and you will have an unnecessary buildup of "dross" or "slag."
- Your arc should be exiting the material at a 15 - 20 degree angle, but opposite the direction of your cut path.

Using A Cutting Guide

First thing in using a torch guide with your Longevity Plasma Cutter is make sure it isn't flammable! Aluminum works as a great torch guide, but be sure it is attached to the torch cup and not the torch tip. Aluminum is a great contact guide because of it's smooth surface but be wary of the torch tip because of electrical conductivity of aluminum. It would be a terrible mess of a cut, loss of consumables, and overall depressing mistake if your torch guide melted to the torch tip or the project at hand. Next you want to mark the material to be cut with either white chalk or a black marker. If you are unsure of how steady your hands are, we recommend you try using a straight edge clamp attached to the work piece or torch guide.

All articles are composed by the Longevity Facility Testing Team and are written with expressed interest of maintain a strong standard in Longevity Global Inc. quality, to help address topics, and answer questions for amateur and experienced users alike. Please remember to always exercise extreme causation and abide by all provided safety specification.

Sample Photos:



For more information on plasma cutting from professionals go to

www.freeweldingforum.com and www.plasma-cutters.com

~~TIG Function: Setting Up The TIG Torch~~



Selecting the Right Tungsten Electrodes:

Selecting the right tungsten is crucial to a successful TIG weld. You have to insure the correct tungsten is used for the type of metal you are welding, the type of technology used in your welder such as transformer or inverter, and the thickness of the metal you will need to weld. This leaves you with a variety sizes ranging from 1/16 to 1/8” and the types of tungstens such as the Pure Tungsten (TP), 2% Thoriated Tungsten (TT2), 2% Ceriated Tungsten (TC2), and 2% Lanthanated Tungsten (TL2). Fortunately, LONGEVITY offers high quality tungsten electrodes and explains which tungsten is required for the right application. Pure Tungsten (TP) – (green tipped) - Pure tungsten readily forms a ball on the end. It is designed for use with transformer-based power sources for AC welding of aluminum. Unfortunately, LONGEVITY does not carry transformer based technology considering the size and weight of TRANSFORMER welders. Therefore, this tungsten is rarely sold buy our sales staff

2% Thoriated Tungsten (TT2) – (red tipped) - This tungsten is the most common tungsten currently being used with LONGEVITY DC TIG. It is generally utilized for DC welding of mild steel, bronze, and stainless steel and basically all metals except aluminum and offers excellent performance. A drawback is that this tungsten has a low level radiation hazard and the fact that they no recommend to weld aluminum. We recommend this tungsten with our stand alone DC only TIG Welders, our WeldMax series multi-purpose welders, which feature DC TIG welders. The 2% Thoriated Tungsten works well with Inverter Welders

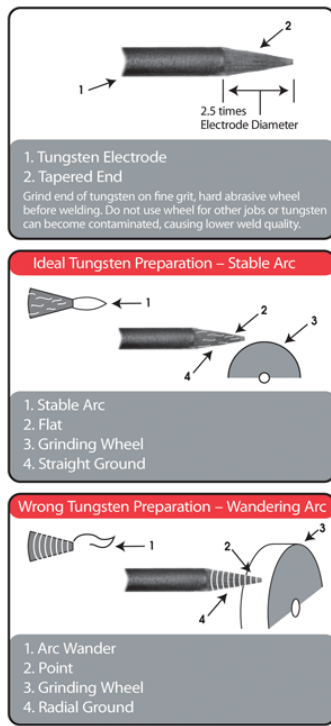
2% Ceriated Tungsten (TC2) – (grey/orange tipped) – 2% ceriated is an excellent substitute for 2% thoriated tungsten and is designed for transformer and inverter based power sources. For Transformer DC welding, this tungsten requires less amperage to start so it is recommended for thinner metals. It offers a stable arc and can be used for both AC and DC welding with inverter power sources and is our most popular sold tungsten because it can be used to weld every type of metal in both AC / DC modes in our LONGEVITY INVETER TIG welders. We recommend this unit with our ArcMate 200AMP ACDC TIG/STICK unit or our WeldAll series multi functional welders and plasma cutters because of the versatility of AC DC welding.

2% Lanthanated Tungsten (TL2) – blue tip – 2% lanthanated is probably the most popular substitute for 2% thoriated tungsten. Offering a longer life span than the 2% thoriated tungstens, it is a nice a nice alternative, but not as recommended as our 2% Thoriated Tungsten. This tungsten can be used with both transformer and inverter technology on both AC DC modes.

| Tungsten Type | Diameter | | | |
|----------------|-------------|--------------|--------------|-------------|
| | 040"(1.0mm) | 1/16"(1.6mm) | 3/32"(2.4mm) | 1/8"(3.2mm) |
| Pure Tungsten | TP-7040 | TP-7116 | TP-7332 | TP-718 |
| 2% Thoriated | TT2-7040 | TT2-7116 | TT2-7332 | TT2-718 |
| 2% Ceriated | TC2-7040 | TC2-7116 | TC2-7332 | TC2-718 |
| 2% Lanthanated | TL2-7040 | TL2-7116 | TL2-7332 | TL2-718 |
| Amparage-Ac | 20-30 | 30-80 | 60-130 | 120-200 |
| Amparge-Dc | 15-50 | 50-120 | 80-150 | 130-250 |

Sharpening a Tungsten

Sharpening a tungsten is very important for a nice fine arc strike. There are auto sharpeners to place the perfect sharpening point on your tungstens or you can simply use a grinding wheel to sharpen your tungsten. Remember, after sharpening to a pencil point, you want to flatten the bottom for a good arc.



Selecting the right FILLER RODS FOR TIG WELDING:

Filler Rods are essential to [TIG Welding](#) because the filler rod is fed into the molten puddle by hand filling in the puddle to create a stronger metal bond or puddle to join two metal pieces. It is extremely important to have the right filler rod based on the metal you are welding. It is also necessary to have the right [tungsten](#) to insure you are properly setup to weld your metal.

Part # Application:

| | | |
|-------------|---------------------------|-------------|
| 4043-1/16-1 | 4043 Alloy Aluminum Wire | 1/16" X 36" |
| 4043-3/32-1 | 4043 Alloy Aluminum Wire | 3/32" X 36" |
| 5356-1/16-1 | 5356 Alloy Aluminum Wire | 1/16" X 36" |
| 5356-3/32-1 | 5356 Alloy Aluminum Wire | 3/32" X 36" |
| 308L-035-1 | 308L Stainless Steel Wire | .035" x 36" |

| | |
|---------------------------------------|--------------|
| 308L-1/16-1 308L Stainless Steel Wire | 1/16" X 36" |
| 70S6-1/16-1 ER70S-6 Steel Wire | 1/16" X 36" |
| 70S6-3/32-1 ER70S-6 Steel Wire | 3/32" X 36" |
| 70S2-1/16-1 ER70S-2 Steel Wire | 1/16" X 36" |
| 80SD2-1/16-1 ER80SD-2 Steel Wire | E1/16" X 36" |

LONGEVITY offers quality filler rods at affordable prices. Please take a look at the selection of filler rods that we carry to decide what the best application of rod will be for your weld.

Your choice of filler rod is extremely important to the strength and matter density of your weld. You can determine the diameter of the filler rod needed, by the thickness of the material that you will be welding. Here are some pointers in deciding how to choose the correct filler rod for your weld.

1. 4043 is a general filler rod for most aluminum welding.
2. 5356 is perfect for 5xxx series aluminum. If you are planning on anodizing the finished piece, this rod should be used for the weld.
3. ER70S-6 is designed for welding mild steel.
4. ER70S-2 is recommended for welding 4130 chrome moly tubing in most applications.
5. ER80S-D2 is for welding 4130 chrome moly tubing if a higher strength weld is required.
6. 1/16" diameter filler rod should be used when material is 1/8" and less thick. 3/32" diameter filler rod can be used for 1/8" and thicker material.

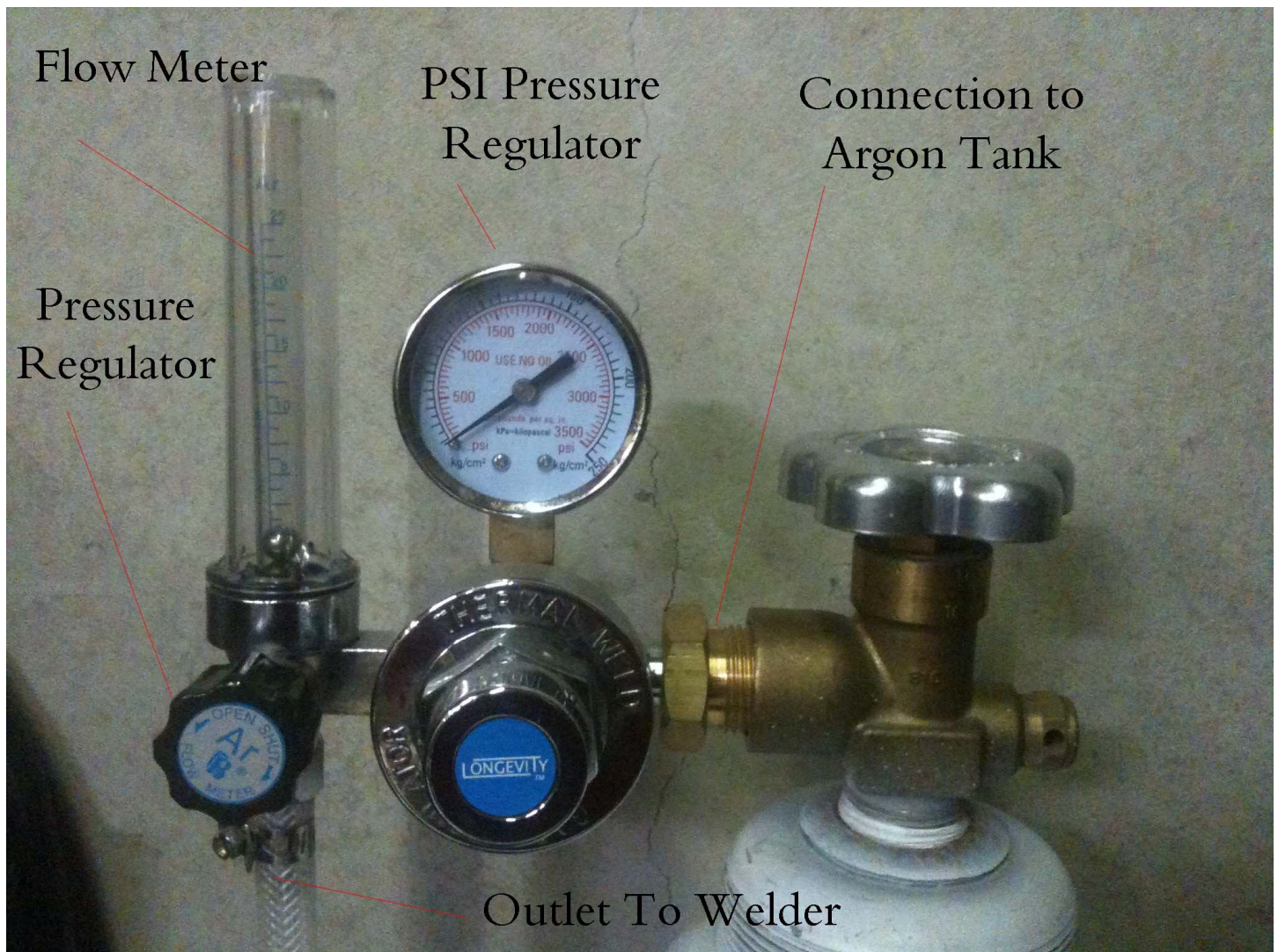
You can find more discussions on filler rods at our welding forum via this [link](#).

Basic Installation for TIG Function:

1. Plug the argon regulator to the bottle.
2. Plug the torch into the unit on the right side of the unit (+)
3. Either plug the pedal or the remote 7 pin connector to the machine. You cannot plug both in.
4. Plug the ground clamp into the left side din Ground Clamp Din (+) is plugged on the right side (+) and attaches on the workpiece.
5. Plug in the Power Cord to the wall.

Setting Up the Argon Regulator:

The argon regulator (pictured below) is included with your unit. Setting it up to your argon bottle is easy. Simply screw in the valve to the bottle and set the pressure to about. Use 100% Argon at 15-25 (cubic feet per hour). Set the gas flow using the regulator on the gas bottle. Use higher flow when extending the tungsten electrode to reach into corners or gaps. We recommend about 18 CFM. Remember, that you also have a post flow setting on the unit to pass more argon after the arc to cool the electrode.



Argon Regulator Assembled

Basic TIG Operation

(Tungsten Inert Gas - Gas Tungsten Arc Welding - GTAW)

Connect the TIG torch to the (-) terminal, Torch Control and Gas Outlet.

Connect the ground clamp to the (+) terminal of the machine and clamp the other side to the metal that will be welded.

AC TIG (Aluminum & Magnesium): Select TIG on the function switch. The AC function will be required for aluminum welding. Set desired amps using the Base current knob, AC freq., AC balance (start adjustments around 30%). Post flow 5-10 seconds, Pulse Mode off.

AC TIG Pulse (Aluminum & Magnesium): Select TIG on the function switch. The AC function will be required for aluminum welding. Pulse Mode will be set to on. Set the Pulse cur. knob to full left, then the desired low amperage using the Base cur knob. Now adjust the high amperage using the Pulse cur. knob, Pulse frequency, Pulse width, AC frequency, AC balance (start adjustments around 30%). Post flow 5-10 seconds.

DC TIG: Select TIG, DC, Pulse Mode off, desired amps using Base cur knob, Post flow 5-10 seconds.

DC TIG Pulse: Select TIG, DC, Pulse Mode on, set Pulse cur. knob to full left, then the desired low amperage using the Base cur. knob, then adjust the high amperage using the Pulse cur knob, Post flow 5-10 seconds. Set pulse controls as desired: Pulse frequency, Pulse width.

TIG Operation and Principles:

Shielding Gas: Use 100% Argon at 15-25 (cubic feet per hour). Set the gas flow using the regulator on the gas bottle. Use higher flow when extending the tungsten electrode to reach into corners or gaps.

Tungsten Electrode: We recommend Ceriated tungsten (grey or orange) for TIG welding with our AC/DC TIG welders. Ceriated tungsten's will work for both AC and DC welding. Use smaller diameter electrodes for thinner metal (low amperage), thicker electrodes for thicker metals that require more amperage. When using a higher AC balance setting in AC mode, a thicker electrode will be required due to more heat moving into the electrode. For the right tungsten electrode, please refer to earlier in this manual or go to www.longevity-inc.com

Filler Rod Selection: Depending upon the metal to be welded, filler rod selection is critical. Consult with your local welding supplier for the optimum filler rod to properly complete the weld. In certain applications, TIG welding can be performed without the use of a filler rod. Use a 5356 filler rod for most Aluminum. For more detailed Filler Rod info, please read the filler section of this manual or go to www.longevity-inc.com.

Pre-TIG Welding

As you get to know the above information of basic TIG welding applications, there are a couple of basic steps that need to be taken. ~~The tungsten must be sharpened and shaped before initiating an arc.~~ With inverter TIG welding machines, tungsten sharpness is important. Your weld's outcome will be partially determined by the shape of your tungsten. Sharpening an electrode consistently will cause an unstable, wandering arc, making it more difficult to control the weld puddle. Carefully rotate the tungsten as it is being ground to prevent a flat spot or a hollow ground point. Also note that tapering the tungsten to 2.5 times of its diameter is generally recommended for most DC welding applications. For high amperage DC welding, do not over sharpen the point, but leave a slight truncation on the end of the tungsten. This prevents the tungsten tip from breaking away and falling into the weld. AC TIG welding may cause a formation of a ball to develop on the end of the tungsten. This is normal. However, if a large globular ball begins to form, re-sharpen the tungsten and adjust the AC balance. It is also normal for a slight dome to form on the tungsten in DC mode. However, if the arc becomes erratic or the arc is difficult to start, regrinding the tungsten will be necessary. If the tungsten is accidentally dipped into the weld puddle, regrinding the tungsten will be necessary to eliminate contamination, particularly on aluminum. Grind tungsten's only on a dedicated stone, free of contamination from other metals.

Starting a TIG Weld: Filler rod selection is critical to a TIG welds density, strength and purity. Check out our filler rod selection chart on our website for optimum filler rod to properly complete a weld. In certain applications, TIG welding can be performed without the use of a filler rod. One of the biggest issues for beginning welders is holding and maintaining an arc. Starting an arc with your High Frequency welder is quite simple. Set the machine for TIG operation then select the desired amperage. Grasp the torch in a manner that is comfortable to you. Place the torch so that the tungsten is no more than 1/8 inch from the weld surface. Depending upon the setup, either press the foot pedal down or press (2T setting) the trigger to initiate the high frequency arc. A small blue glowing cone may be observed. This is the high frequency arc. Immediately after that, you should see a strong and stable arc flowing from the torch. As the arc begins to grow, a molten puddle will appear. If it does not appear, stop your weld and increase the amperage. Repeat the start sequence.

1. To help the molten puddle form, slowly make small circles with the torch to build the heat in the weld area. A bright, fluid puddle will begin to form.
2. Once a uniform puddle is established, tilt the torch head about 75 degrees from the weld surface into the direction of the weld. This will direct the arc to the front of the weld puddle.
3. Grip the filler rod at a 15 degree angle to the weld surface with the other hand. Hold the rod in the iridescent cone of gas that surrounds the weld puddle. Do not hold it in the arc. Keep it close to the weld. A "skeleton" keyhole will begin to form in front of the weld. The keyhole is evidence that you are ready to add filler material and move forward. Introduce the filler rod into the key hole area underneath the arc. Wait for a single molten drop to fall off the tip of the rod.
4. When a molten drop falls from the rod, quickly remove the rod, keeping it inside the gas cone. The molten drop of filler metal should blend quickly into the puddle.
5. Move the torch forward slightly, carrying the keyhole with the weld. If the key hole is lost, then forward travel was too fast or too far. When the keyhole shows good development, repeat the steps 3-5 until you have a proper weld bead established.
6. Weld termination. When the weld bead has reached the desired length, add a final drop of filler and slowly circle the torch over the end of the weld to fill the crater. If the weld crater is not correctly filled, cracking and weld failure may occur. This is a small but important step to properly completing a weld. Release the foot pedal or release the trigger to stop. Keep the TIG torch in place until the post flow ends--usually around 5 seconds.
7. When finished welding always let the welder's fan run for a minute or two to cool the machine before turning the power switch off.

Fig.1

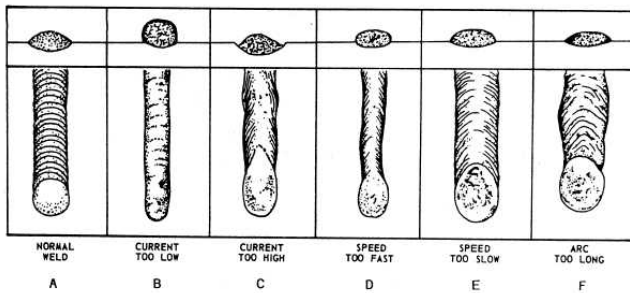
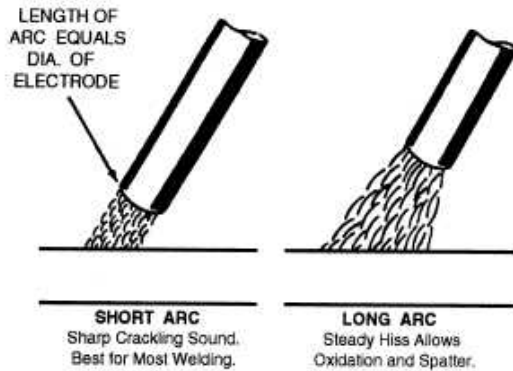


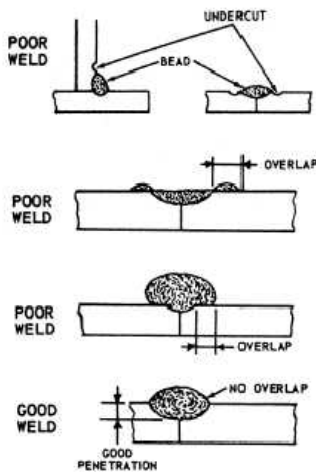
Figure 1: Comparison chart of welds

Fig. 2



Length of Arc When an arc is too long, the metal melts off the electrode in large globules and the arc may break frequently. This produces a wide, spattered, and irregular deposit with insufficient fusion between the base metal and the weld. When an arc is too short, it fails to generate enough heat to melt the base metal properly, causes the electrode

Fig. 3



Setting the length of an arc to stick frequently to the base metal, and produces uneven deposits with irregular ripples. The recommended length of the arc is equal to the diameter of the bare end of the electrode, as shown in figure 3.

The length of the arc depends upon the type of electrode and the type of welding being done; therefore, for smaller diameter electrodes, a shorter arc is necessary than for larger electrodes. Remember: the length of the arc should be about equal to the diameter of the bare electrode except when welding in the vertical or over-

head position. In either position, a shorter arc is desirable because it gives better control of the molten puddle and prevents atmospheric impurities from entering the weld.

Sample of a quality stainless steel weld:



STICK/ARC Welding

Stick Welding

(Also known as MMA-Manual Metal Arc or Shielded Metal Arc Welding-SMAW)

Connect the Stick torch to the - terminal and Torch Control receptacles.

Connect the ground clamp to the + terminal and clamp the metal to be welded. Reverse the torch and ground connections for DCEP (Direct Current Electrode Positive).

DC Stick - Select Stick, DC, desired amps using Base cur knob, Pulse Mode off.

AC Stick - (Aluminum) Select Stick, AC, desired amps using Base current knob, Pulse Mode off, AC frequency. AC Balance (start at approximately 30%)

1. Insert electrode into electrode holder. Position the electrode for the most comfortable position so that the electrode can be held directly over the work piece with a slight angle.
2. Set Amperage to the recommended amperage by the electrode manufacturer. Strike an arc by swiping it briskly across the work piece in the same manner as one would strike a match. Alternatively, you may strike an arc with firm tapping motion against the work piece. Either method is acceptable. An arc should initiate. Continue to keep the arc going by holding the electrode off the work piece no more than the electrode width.
3. Continue the arc by feeding the electrode into the weld puddle while moving the electrode forward. This will take some coordination, but will be fairly easy to do after practice. Do not allow the arc to become too long, because air and slag can become entrapped in the metal. The sound of a proper arc will be similar to a gentle frying sound. A long arc will emit a humming sound. An arc that is too short may be extinguished and the electrode may stick to the work piece. If the electrode sticks, immediately release the electrode from the electrode holder and break the electrode loose by hand. If the flux breaks off, simply trim off the excess rod until flux and bare metal meet. A welding rod must have flux to shield the weld from the atmosphere or the weld will fail.
4. Use the Basic Current control to change arc qualities. Adjust the amperage according to the recommendations of the electrode (welding rod) manufacturer for the type and size of the electrode used. When welding in the AC mode the AC Frequency control will affect how crisp the arc is, whether it is smooth and buttery or deeply penetrating. Use it to suit the desired weld finish. Experimentation will be required to find the optimal setting desired. It is an excellent tool for out of position welding.
5. Electrode selection. Electrodes are usually given performance and characteristic ratings using a system of letters and numbers determined by the American Welding Society (AWS). The rating system includes the minimum tensile strength of the finished weld, the weld position (flat, vertical, horizontal, or overhead or a combination of two or more positions) and the flux type. Additional information may be given. Each manufacturer has their individual name and terminology as well. As there is no general recommendation that can be made about a particular electrode selection, except for practice welds, a electrode designated by the AWS as E 6011, E 6013, E 7014, or E 7018 may be used, each having its own distinct features and purpose. These are among the most common electrodes used in the industry and are not difficult to find. E 6011 electrodes are not as smooth running as some of the other electrodes, but offer the advantage of being able to weld on rusty metal and contaminated surfaces. It is widely used and requires very little skill to begin using. This is not a particular endorsement of an E6011, rather a simple example of what may be used in developing proficient technique. It is recommended that a variety of electrodes be used and practiced with. Consultation with an experienced local welding supplier will help greatly in determining what welding electrode is the best for your given situation. Many times, samples or small packages of electrodes are available at relatively low cost to determine for yourself

the best electrode to use.

Stick Electrode Chart Example: E 60 1 3

Strength

60--60,000 psi,

70--70,000 psi

Weld Position

1--All positions: Flat, Vertical, Horizontal, & Overhead

2--Flat Position or Horizontal Fillets Only

3--Flat Position Only

Weld Characteristics

0--Non-low hydrogen, DC Reverse polarity

1--Non-low hydrogen, AC or DC Reverse polarity

2--Non-low hydrogen, AC or DC Straight polarity

3--Non-low hydrogen, AC or DC Either polarity

4--Non-low hydrogen, iron powder coating, AC or DC Reverse polarity

5--Low-hydrogen, DC Reverse polarity

6--Low-hydrogen, AC or DC Reverse polarity

7--Non-low hydrogen, iron powder coating, AC or DC Reverse polarity

8--Low hydrogen, iron powder coating, AC or DC Reverse polarity

Polarity Definition

electrode negative = straight polarity (typical stock machine setup)

electrode positive = reverse polarity

Be sure to observe the electrode manufacturer recommendations regarding polarity. If the weld appears lumpy, porous or otherwise malformed, change the polarity of the ground cable and the electrode holder cable. Many electrodes run with in reverse polarity, (DCEP) setting. A few run with a straight polarity (DCEN). Some will run either way. For reverse polarity (DCEP) stick welding, swap the electrode holder and ground cable connections.

Proper weld identification: Overlap and undercutting are two main causes of weld failure. Proper washing of the weld bead into the sides or "toes" of the weld is important. Keep the welding electrode or the TIG tungsten and welding arc within the weld joint to prevent overlap. Pausing on the sides of the welds to wait for the sides to fill reduces the chance of undercutting, even if the current is a little too high. If it is possible, with any practice weld, cut the joint down the middle, lengthwise, or place the weld in a vice and use a hammer to bend the metal over the weld area until it is either broken or bent 90 degrees. This destructive testing method will help you improve your skill by revealing faults and flaws in your welds.

Stick (SMAW) Electrode Welding

Stick, the most basic of welding processes, offers the easiest option for joining steel and other metals. Although it produces the least pretties or cleanest welds, ARC/STICK welding gets the job done! Stick welding power sources deliver inexpensive options for welding versatility, portability and reliability. Stick joins metals when an arc is struck between the electrode and the work piece, creating a weld pool and depositing a consumable metal electrode into the joint. The electrode's protective coating also acts as a shielding gas, protecting the weld and ensuring its purity and strength. Best for windy conditions and adverse environments.

If you're not familiar with Stick (SMAW) welding basics, the following information can make choosing an electrode easier.

| AWS Class | Position | Polarity | Usage |
|-----------|----------|--------------|---|
| E6010 | All | DCEP | A great choice for welding on dirty, rusty, greasy or painted steel - especially in vertical or overhead applications. |
| E6011 | All | AC,DCEP | All-purpose stick electrode; used for carbon and galvanized steel; 60,000 PSI tensile strength; deep penetration and ideal for welding light to medium amounts of dirty, rusty or painted materials. |
| E6013 | All | AC,DCEN,DCEP | Light to medium penetrating all-purpose stick electrode; for use on carbon steel; 60,000 PSI tensile strength; good for general all-purpose applications and joints with poor fit-up. |
| E7014 | All | AC,DCEN,DCEP | For higher-deposition requirements; 70,000 PSI tensile strength; ideal for applications requiring light penetration and faster travel speeds. |
| E7018 | All | DCEP | Low-hydrogen electrode; for low, medium and high-carbon steels; 70,000 PSI tensile strength; ideal for out-of-position welding and tacking; not recommended for low-voltage AC Welders. |
| E7018AC | All | AC,DCEP | Low-hydrogen electrode; for low, medium and high-carbon steels; 70,000 PSI tensile strength; ideal for out-of-position welding and tacking; specially formulated to operate with small 208/230 volt AC welders. |

Electrode Polarity Chart

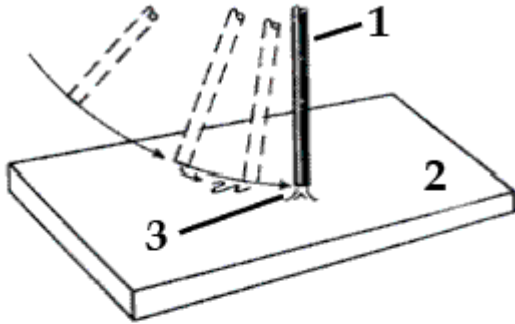
| Electrode | DC* | AC | Position | Penetration | Usage |
|-----------|--------|----|-----------------------|-------------|-----------------------------------|
| 6010 | EP | — | All | Deep | Min. Prep, Rough, High Spatter |
| 6011 | EP | ✓ | All | Deep | |
| 6013 | EP, EN | ✓ | All | Low | General |
| 7014 | EP, EN | ✓ | All | Medium | Smooth, Easy, Fast |
| 7018 | EP | ✓ | All | Low | Low Hydrogen, Strong |
| 7024 | EP, EN | ✓ | Flat, Horz. Fillet | Low | Smooth, Easy, Faster |
| 308L | EP | ✓ | All | Low | Stainless Steel |

*EP = Electrode Positive (Reverse Polarity); EN = Electrode Negative (Straight Polari

Electrode Amperage Chart

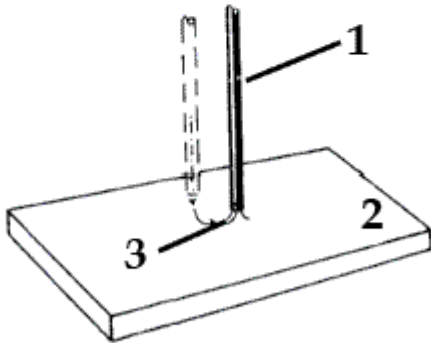
| Elect. | Dia. (in.) | Amperage Range | | | | | |
|-------------------|---------------|----------------|-----|------|------|------|------|
| | | MIN. | 50A | 100A | 150A | 200A | MAX. |
| 6010 & 6011 | 3/32 | | | | | | |
| | 1/8 | | | | | | |
| | 5/32 | | | | | | |
| | 3/16 | | | | | | |
| 6013 | 5/64 | | | | | | |
| | 3/32 | | | | | | |
| | 1/8 | | | | | | |
| | 5/32 | | | | | | |
| 7014 | 3/32 | | | | | | |
| | 1/8 | | | | | | |
| | 5/32 | | | | | | |
| 7018 | 3/32 | | | | | | |
| | 1/8 | | | | | | |
| | 5/32 | | | | | | |
| 308L | 3/32 | | | | | | |
| | 1/8 | | | | | | |
| | 5/32 | | | | | | |

- Striking an Arc



Helpful Hints

- Use a drag technique for most applications.
- Take precautions with flying materials when chipping slag.
- Keep electrodes clean and dry - follow manufacturers instructions.
- Common steel electrodes (refer to chart above).
- Penetration: DCEN- Less penetration; AC - Medium (can be more spatter also); DCEP - Most penetration



1 Electrode; 2 Workpiece; 3 Arc

Catalog and Capabilities

LONGEVITY has what you need for stick welding, from welders to welding supplies and protective clothing. Stick welders come in two basic classifications; 115V stick welders and 230/460V stick welders. Stick Electrodes or welding rod for stick welding are available in stainless steel, carbon steel, low alloy steel, maintenance alloy, hard facing, nickel alloy, and magnesium

Routine Maintenance

The life of your machine and the quality of the work performed using your machine, will be enhanced by practicing periodic routine maintenance.

- At regular intervals, clear dust that may accumulate in the machine using clean and dry compressed air. If the working condition has heavy smoke and pollution, the welding machine should be cleaned once a month.
- Keep the machine exterior clean with mild soap and water.
- Do not walk on or store items on the cables or cords.
- Do not jar, drop, or stack items on top of the machine.
- Always connect the machine to a well grounded electrical outlet.
- Always check the torch consumables before and after use and ensure that they are clear of obstructions, and that no parts are damaged.
- Replace any worn or damaged consumables before using machine.
- For periods of prolonged non-use, remove cables and store them in their original boxes in a cool dry place, free of bug infestation.

Troubleshooting

If your unit is not properly functioning, please call us immediately toll free at 1-877-566-4462 for support. We have included a small table here to diagnose most common problems.

| Problems, Causes, and Solutions | |
|---|---|
| Problems | Causes/ Solutions |
| Machine will not turn on. | Check cords and breaker. If nothing is found, contact LONGEVITY |
| The machine runs, but nothing is happening | Check to see if you are in the right mode, plasma cutter, tig, stick. Check the torches and your ground. Make sure there is argon or compressed air for plasma and tig. |
| Pilot Arc will not start | Check the ground connection. Check the torch for proper consumables installation. Replace consumables. |
| Consumables (tips) are being consumed | Improper air/gas flow. Increase the PSI on the regulator, check for leaks in the hose, maintain a distance of 1/8" from the torch tip or workpiece |
| Heavy Underside Slag (Cutting) | Slow travel speed. Increase travel speed or amperage on unit. |
| Poor Cut Quality | Check Air Pressure. Insure your unit is capable of cutting the desired thickness of material. Check the consumables to insure they are producing a stable arc. Replace Consumables and insure you have the proper PSI at the regulator. |
| Inconsistent Arc | Improper grounding or possible lack of air pressure. Check and replace consumables and adjust the regulator to proper PSI |
| O.C. Over Current LED Lights | The unit has reached its DUTY Cycle. Leave power of the machine on and allow fans to cool the machine. You can also turn the machine off to properly cool it. Do not continue to weld until light is off. |
| Issue Not Listed | Contact LONGEVITY Toll Free 1-877-566-4462 or via email at help@longevity-inc.com |
| Unit Will Not Weld | Check ground connection, torch setup, and check if you are in the proper mode ARC/TIG. If you are TIG Welding check to see if you have the proper TUNGSTEN and FILLER ROD. |
| Tungsten is Melting or Being Consumed Quickly | Low Argon Gas flow. Check the Argon Gas flow. Turn up post flow. Incorrect Tungsten or Incorrect Tungsten Size. Possible small size shield cup. Read selecting the right tungsten on www.longevity-inc.com/resources |
| Contaminated Tungsten | If the Tungsten is dipping or melting inside the weld. Use larger tungsten and fewer amps on the unit. Sharpen tungsten. |
| Poor Weld Quality | Remember to clean welding material prior to welding with acetone. Practice on the form and technique. Use the right tungsten and filler rod. |
| STICK Welder | Check the ground. Check the workpiece and clean it. Decrease |

| Problems, Causes, and Solutions | |
|---|----------------------------------|
| Problems | Causes/ Solutions |
| Having a Hard Time Striking an Arc | amps. |
| STICK Welder Producing Poor Quality Welds | Use the proper rod and polarity. |