

EVERLAST

POWERPRO 256D

TIG/STICK/PLASMA DIGITAL IGBT INVERTER WELDER/CUTTER

- CC**
- GTAW-P**
- SMAW**
- PAC**
- IGBT**
- 1 PHASE**
- AC/DC**



Operator's Manual for the PowerPro 256D

Safety, Setup and General Use Guide

everlastwelders.com

Rev.1 0 010520-15



1-877-755-9353
329 Littlefield Ave. South San Francisco, CA 94080 USA

Specifications and Accessories subject to change without notice.

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NOTE: Product Specifications and features are subject to change without notice. While every attempt has been made to provide the most accurate and current information possible at the time of publication, this manual is intended to be a general guide and not intended to be exhaustive in its content regarding safety, welding, or the operation/maintenance of this unit. Everlast Power Equipment INC. does not guarantee the accuracy, completeness, authority or authenticity of the information contained within this manual. The owner of this product assumes all liability for its use and maintenance. Everlast Power Equipment INC. does not warrant this product or this document for fitness for any particular purpose, for performance/accuracy or for suitability of application. Furthermore, Everlast Power Equipment INC. does not accept liability for injury or damages, consequential or incidental, resulting from the use of this product or resulting from the content found in this document or accept claims by a third party of such liability.

Dear Customer,

THANKS! You had a choice, and you bought an Everlast. We appreciate you as a customer and hope that you will enjoy years of use from your welder.

Please go directly to the Everlast website to register your unit and receive your warranty information. Your unit registration is important should any information such as product updates or recalls be issued. It is also important so that we may track your satisfaction with Everlast products and services. If you are unable to register by website, contact Everlast directly through the sales department through the main customer service number in your country. Your unit will be registered and warranty will be issued and in full effect. Keep all information regarding your purchase. **In the event of a problem you must contact technical support before your welder can be a candidate for warranty service and returned.**

Please review the current online warranty statement and information found on the website of the Everlast division located in or nearest to your country. Print it for your records and become familiar with the terms and conditions of the warranty.

Everlast offers full technical support, in several different forms. We have online support available through email, and a welding support forum designed for customers and noncustomer interaction. Technical advisors are active on the forum daily. We also divide our support into two divisions: technical and welding performance. Should you have an issue or question concerning your unit, please contact performance/technical support available through the main company headquarters available in your country. For best service call the appropriate support line and follow up with an email, particularly during off hours, or in the event you cannot reach a live person. In the event you do not reach a live person, particularly during heavy call volume times, holidays, and off hours, leave a message and your call will normally be returned within 24 hours. Also, for quick answers to your basic questions, join the company owned forum available through the website. You'll find knowledgeable, helpful people and staff available to answer your questions, and perhaps find a topic that already addresses your question at <http://www.everlastgenerators.com/forums/>.

Should you need to call or write, always know your model name, purchase date and welder manufacturing inspection date. This will assure the quick and accurate customer service. **REMEMBER: Be as specific and informed as possible. Technical and performance advisors rely upon you to carefully describe the conditions and circumstances of your problem or question. Take notes of any issues as best you can. You may be asked many questions by the advisors to clarify problems or issues that may seem very basic. However, diagnosis procedures MUST be followed to begin the warranty process. Advisors can't assume anything, even with experienced users, and must cover all aspects to properly diagnose the problem. Depending upon your issue, it is advisable to have basic tools handy such as screwdrivers, wrenches, pliers, and even an inexpensive test meter with volt/ohm functions before you call.**

Let us know how we may be of service to you should you have any questions.

Sincerely,

Everlast Customer Service



Serial number: _____

Model number: _____

Date of Purchase _____

Contact Information

Everlast US:

Everlast consumer satisfaction email: sales@everlastwelders.com

Everlast Website: www.everlastwelders.com

Everlast Technical Support: support@everlastwelders.com

Everlast Support Forum: www.everlastgenerators.com/forums/index.php

Main toll free number: 1-877-755 WELD (9353) 9am—5pm PST M-F

11am-4pm PST Sat. (Seasonal)

Tech Support: EXT 207

FAX: 1-650-588-8817

Everlast Canada:

Everlast consumer satisfaction email: sales@everlastwelders.ca

Everlast Website: everlastwelders.ca

Everlast Technical Support: sales@everlastwelders.ca

Telephone: 905-637-1637 9am-4:30pm EST M-F

10am-1pm EST Sat.

FAX: 1-905-639-2817

Everlast Australia:

Sydney: 5A Karloo Parade Newport NSW 2106

(02) 9999 2949

Port Macquarie: 2B Pandorea Place Port Macquarie

(02) 8209 3389

After hours support: 0413 447 492

Everlast Technical Support: support@pickproducts.com

SAFETY PRECAUTIONS

Everlast is dedicated to providing you with the best possible equipment and service to meet the demanding jobs that you have. We want to go beyond delivering a satisfactory product. That is the reason we offer technical support to assist you with your needs should an occasion arise. With proper use and care your product should deliver years of trouble free service.



Safe operation and proper maintenance is your responsibility.

We have compiled this operator's manual to instruct in the safe operation and maintenance of your Everlast product. It is not exhaustive however. This manual is provided to assist the operator with the information needed to be able to enjoy the best and safest operating experience. Overall, welding and cutting require experience and common sense to obtain the best results in the safest manner. As thorough as this welding manual may be, it is no substitute for either. Welding takes time, patience and training to perfect. This manual is not a substitute for professional training or experience. Exercise extreme caution and care in all activities related to welding and cutting. Your safety, health and even life depends upon it. If you are in doubt of your skills or capability, don't attempt to use this unit. Stop and consult a welding professional.

Please carefully read this manual before you operate your Everlast unit. This manual is not written only for the use of the unit, but to assist you in obtaining the best performance out of your unit. Do not operate this welder until you have read this manual and you are thoroughly familiar with the safe operation of the unit. If you feel you need more information on this unit or do not understand how a feature of function operates, please contact Everlast Support.

The warranty does not cover improper use, maintenance or consumables. Torches and accessories are covered under a separate warranty. **Do not attempt to alter or defeat or otherwise render any piece or part of your unit unserviceable, particularly any safety device.** Keep all shields and covers in place during unit operation should an unlikely failure of internal components result in the possible presence of sparks and explosions. If a failure occurs, discontinue further use until malfunctioning parts or accessories have been repaired or replaced by qualified personnel.



Note on High Frequency electromagnetic disturbances:

Certain welding and cutting processes generate High Frequency (HF) waves. These waves may disturb sensitive electronic equipment such as televisions, radios, computers, cell phones, and related equipment. High Frequency may also interfere with fluorescent lights. Consult with a **licensed** electrician if disturbance is noted. Sometimes, improper wire routing or poor shielding may be the cause. Keep in mind HF interference is not easily predictable or identifiable.



HF can interfere with pacemakers and other medical devices. See EMF warnings in following safety section for further information. Always consult your physician before entering an area known to have welding or cutting equipment if you have a pacemaker.

SAFETY PRECAUTIONS



These safety precautions are for protection of safety and health. Failure to follow these guidelines may result in serious injury or death. Be careful to read and follow all cautions and warnings. Protect yourself and others.



Welding and cutting processes produce high levels of ultraviolet (UV) radiation that can cause severe skin burn and damage. There are other potential hazards involved with welding such as severe burns and respiratory related illnesses. Therefore observe the following to minimize potential accidents and injury:



Use appropriate safety glasses with wrap around shields while in the work area, even under welding helmets to protect your eyes from flying sparks and debris. When chipping slag or grinding, goggles and face shields may be required.



When welding or cutting, always use an approved shielding device, with the correct shade of filter installed. Always use a welding helmet in good condition. Discard any broken or cracked filters or helmets. Using broken or cracked filters or helmets can cause severe eye injury and burn. Filter shades of no less than shade 5 for cutting and no less than shade 9 for welding are highly recommended. Shades greater than 9 may be required for high amperage welds. Keep filter lenses clean and clear for maximum visibility. It is also advisable to consult with your eye doctor should you wear contacts for corrective vision before you wear them while welding.



Do not allow personnel to watch or observe the welding or cutting operation unless fully protected by a filter screen, protective curtains or equivalent protective equipment. If no protection is available, exclude them from the work area. Even brief exposure to the rays from the welding arc can damage unprotected eyes.



Always wear hearing protection because welding and cutting can be extremely noisy. Ear protection is necessary to prevent hearing loss. Even prolonged low levels of noise has been known to create long term hearing damage. Hearing protection also further protects against hot sparks and debris from entering the ear canal and doing harm.



Always wear personal protective clothing. Flame proof clothing is required at all times. Sparks and hot metal can lodge in pockets, hems and cuffs. Make sure loose clothing is tucked in neatly. Leather aprons and jackets are recommended. Suitable welding jackets and coats may be purchased made from fire proof material from welding supply stores. Discard any burned or frayed clothing. Keep clothing away from oil, grease and flammable liquids.



Leather boots or steel toed leather boots with rubber bottoms are required for adequate foot protection. Canvas, polyester and other man made materials often found in shoes will either burn or melt. Rubber or other non conductive soles are necessary to help protect from electrical shock.



Flame proof and insulated gauntlet gloves are required whether welding, cutting or handling metal. Simple work gloves for the garden or chore work are not sufficient. Gauntlet type welding gloves are available from your local welding supply companies. Never attempt to weld with out gloves. Welding with out gloves can result in serious burns and electrical shock. If your hand or body parts comes into contact with the arc of a plasma cutter or welder, instant and serious burns will occur. **Proper hand protection is required at all times when working with welding or cutting machines!**

SAFETY PRECAUTIONS



WARNING! Persons with pacemakers should not weld, cut or be in the welding area until they consult with their physician. Some pacemakers are sensitive to EMF radiation and could severely malfunction while welding or while being in the vicinity of someone welding. *Serious injury or death may occur!*



Welding and plasma cutting processes generate electro-magnetic fields and radiation. While the effects of EMF radiation are not known, it is suspected that there may be some harm from long term exposure to electromagnetic fields. Therefore, certain precautions should be taken to minimize exposure:

- Lay welding leads and lines neatly away from the body.
- Never coil cables around the body.
- Secure cables with tape if necessary to keep from the body.
- Keep all cables and leads on the same side the body.
- Never stand between cables or leads.
- Keep as far away from the power source (welder) as possible while welding.
- Never stand between the ground clamp and the torch.
- Keep the ground clamp grounded as close to the weld or cut as possible.



Welding and cutting processes pose certain inhalation risks. Be sure to follow any guidelines from your chosen consumable and electrode suppliers regarding possible need for respiratory equipment while welding or cutting. Always weld with adequate ventilation. Never weld in closed rooms or confined spaces. Fumes and gases released while welding or cutting may be poisonous. Take precautions at all times. Any burning of the eyes, nose or throat are signs that you need to increase ventilation.

- Stop immediately and relocate work if necessary until adequate ventilation is obtained.
- Stop work completely and seek medical help if irritation and discomfort persists.



WARNING! Do not weld on galvanized steel, stainless steel, beryllium, titanium, copper, cadmium, lead or zinc without proper respiratory equipment and or ventilation.



WARNING! This product when used for welding or cutting produces fumes and gases which contains chemicals known to the State of California to cause birth defects and in some cases cancer. (California Safety and Health Code §25249.5 *et seq.*)



WARNING! Do not weld or cut around Chlorinated solvents or degreasing areas. Release of Phosgene gas can be deadly. Consider all chemicals to have potential deadly results if welded on or near metal containing residual amounts of chemicals.



Keep all cylinders upright and chained to a wall or appropriate holding pen. Certain regulations regarding high pressure cylinders can be obtained from OSHA or local regulatory agency. Consult also with your welding supply company in your area for further recommendations. The regulatory changes are frequent so keep informed.



All cylinders have a potential explosion hazard. When not in use, keep capped and closed. Store chained so that overturn is not likely. Transporting cylinders incorrectly can lead to an explosion. Do not attempt to adapt regulators to fit cylinders. Do not use faulty regulators. Do not allow cylinders to come into contact with work piece or work. Do not weld or strike arcs on cylinders. Keep cylinders away from direct heat, flame and sparks.

SAFETY PRECAUTIONS

continued



WARNING! Electrical shock can kill. Make sure all electrical equipment is properly grounded. Do not use frayed, cut or otherwise damaged cables and leads. Do not stand, lean or rest on ground clamp. Do not stand in water or damp areas while welding or cutting. Keep work surface dry. Do not use welder or plasma cutter in the rain or in extremely humid conditions. Use dry rubber soled shoes and dry gloves when welding or cutting to insulate against electrical shock. Turn machine on or off only with gloved hand. Keep all parts of the body insulated from work, and work tables. Keep away from direct contact with skin against work. If tight or close quarters necessitates standing or resting on work piece, insulate with dry boards and rubber mats designed to insulate the body from direct contact.



All work cables, leads, and hoses pose trip hazards. Be aware of their location and make sure all personnel in area are advised of their location. Taping or securing cables with appropriate restraints can help reduce trips and falls.



WARNING! Fire and explosions are real risks while welding or cutting. Always keep fire extinguishers close by and additionally a water hose or bucket of sand. Periodically check work area for smoldering embers or smoke. It is a good idea to have someone help watch for possible fires while you are welding. Sparks and hot metal may travel a long distance. They may go into cracks in walls and floors and start a fire that would not be immediately visible. Here are some things you can do to reduce the possibility of fire or explosion:

- Keep all combustible materials including rags and spare clothing away from area.
- Keep all flammable fuels and liquids stored separately from work area.
- Visually inspect work area when job is completed for the slightest traces of smoke or embers.
- If welding or cutting outside, make sure you are in a cleared off area, free from dry tender and debris that might start a forest or grass fire.
- Do not weld on tanks, drums or barrels that are closed, pressurized or anything that held flammable liquid or material.



Metal is hot after welding or cutting! Always use gloves and or tongs when handling hot pieces of metal. Remember to place hot metal on fire-proof surfaces after handling. Serious burns and injury can result if material is improperly handled.



WARNING! Faulty or poorly maintained equipment can cause injury or death. Proper maintenance is your responsibility. Make sure all equipment is properly maintained and serviced by qualified personnel. Do not abuse or misuse equipment. Keep all covers in place. A faulty machine may shoot sparks or may have exploding parts. Touching uncovered parts inside machine can cause discharge of high amounts of electricity. **Do not allow employees to operate poorly serviced equipment.** Always check condition of equipment thoroughly before start up. Disconnect unit from power source before any service attempt is made and for long term storage or electrical storms.



Further information can be obtained from The American Welding Society (AWS) that relates directly to safe welding and plasma cutting. Additionally, your local welding supply company may have additional pamphlets available concerning their products. Do not operate machinery until your are comfortable with proper operation and are able to assume inherent risks of cutting or welding.

PowerPRO 256D



256D: Water-Cooled 20 series 12 ft.
(Style and series subject to change)



iPT 60 Plasma Torch
12 ft.



Work Clamp



Argon Regulator



Consumable Kit
(Does not include Tungsten)



Foot Pedal Assembly



Stick Electrode Holder

NOTE: Accessory appearance and quantities are subject to change without notice.

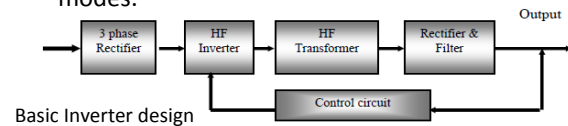
PowerPro 256D Specifications

PowerPro 256D	Specification
Processes	AC/DC GTAW-P/DC SMAW/PAC
Inverter Type	Digitally controlled IGBT
Minimum/Maximum Rated Output TIG	DC: 3A/10.1V –250A/20 V AC: 5A/10.2V-250A/20V
Minimum/Maximum Rated Output Stick	5 A/20.2 V - 200 A/28 V
Minimum/Maximum Rated Output Plasma	20A/88V-60A/104V
Start Type	TIG: HF Solid State, Plasma: Blow-back type
TIG Duty Cycle @ Rated Amps/Volts	60% @ 250A/ 20 .0V 100% @ 200A/ 18 .0V
Stick Duty Cycle @ Rated Amps/Volts	60% @ 200A/ 28.0V 100% @ 160A/ 26.4V
Plasma Duty Cycle @ Rated Amps/Volts	60% @ 60A /104V 100% @ 50A /100V
OCV (U0)	70V
Voltage Input (U1)	220/ 240V; 50/60Hz 1 Ph
Maximum Inrush Amps (I1MAX)	42A @ 220V
Maximum Operating Amps (I1EFF) (Rated effective)	35A @ 220V
Gas Pre-Flow /Post Flow Time	0-25Seconds/ 0-50 Seconds
Start Amps/End Amps	DC: 3-250A AC: 5-250A
Up/Down Slope	0-25 Seconds/0-25 Seconds
AC Frequency Control	20-250 Hz
AC Balance Control	10-90% of Electrode Positive (EP)
AC Wave Form	Advanced Square, Soft Square, Triangular, Sine
Std. Pulse Frequency Hz (Pulses Per Second)	DC: .1-500 Hz AC: Adv. Sq. 1-250Hz, Other wave forms: .1-10Hz
Advanced Pulse Frequency (For AC use only)	.1-10Hz (All wave forms)
Pulse Amps (Ratio) (Std. and Advanced)	1-100%
Pulse Time On (Balance) (Std. and Advanced)	10-90%
Stick Arc Force Control	0-100%
Stick Hot Start Time	0-2 Seconds
Stick Hot Start Intensity	0-100% over welding amps
Minimum Water Ingress Protection Standard	IP21S
Efficiency	>80%
Cooling Method	Full Time High Velocity Fan
Dimensions (approximate)	18" H X 10" W X 25" L
Weight (Bare Unit)	65 lbs

SECTION 1

General overview: The Everlast PowerPro 256D is intended to be a reliable digitally controlled TIG/Stick/Plasma welding/cutting unit ideal for portable repair service, and for general prototyping/one-off fabrication duties. This unit includes the following key features:

- A. Digitally controlled IGBT components improve reliability. The modular design of the main internal components are an improvement over the older analog series.
- B. Full bridge rectifier design features soft switching technology which further extends IGBT component life and its performance capabilities.
- C. Improved HF design offers more reliable arc starts, even at lower amperages.
- D. Features automatic over-voltage, over current, duty cycle (over-heat) and low air pressure protection.
- E. The adjustable wave form design allows the user to customize the welding arc properties for welding aluminum in different applications.
- F. Arc force control, hot start time and hot start intensity helps improve Stick welding performance.
- G. New, improved design offers more intuitive adjustments, and provides better panel protection.
- H. Advanced AC pulse mode is an exclusive feature which helps to improve capability on thin aluminum and extends the top capability while welding while welding in AC. Standard Pulse may be used in either AC or DC modes.



General Use and Care: The Digital PowerPro 256D welder/plasma cutter is uniquely designed for routine use performing on-the-spot repairs or in other similar non production tasks. It provides function and convenience in these situations. This unit is not designed, however, for use in production welding or cutting operations or similar industrial applications. Care should be taken to keep the unit out of direct contact with water spray. This unit is water ingress rated for IP21S, which rates it for light dripping contact with water. It is a good idea to remove the welder from the vicinity of any water, heavy, condensing fog or other type of moisture source to reduce the possibility of electrocution or shock. Never operate in standing water.



Every 1-2 months, the welder should be unplugged, opened up and carefully cleaned with dry, compressed air. Regular maintenance will extend the life of the unit. Failure to keep the unit clean internally will damage and shorten lifespan of the components. Remove the rear cover and then the metal cover to open. Do not remove the front plastic cover. **Opening the case to clean the welder will not void the warranty. Do not operate with the main cover off. Isolate the unit from vibration and impacts.**

INTRODUCTION AND SPECIFICATIONS

IMPORTANT: Before opening the unit for any reason, make sure the unit has been unplugged for at least 10 minutes to allow time for the capacitors to fully discharge. Severe shock and/or death can occur.

Do not restrict air flow or movement of air around the welder. Allow a buffer distance of 18" from all sides if possible. Do not operate the welder immediately in the weld area or the force of the fan will cause welding issues such as unstable arc, or porosity. Do not mount in areas that are prone to severe shock or vibration. Lift and carry the welder by the handle.

Do not direct metallic dust or any dirt intentionally toward the machine, particularly in grinding and welding operations. Make sure the control panel is protected from damage during welding and cutting operations by flipping down the clear protective cover.

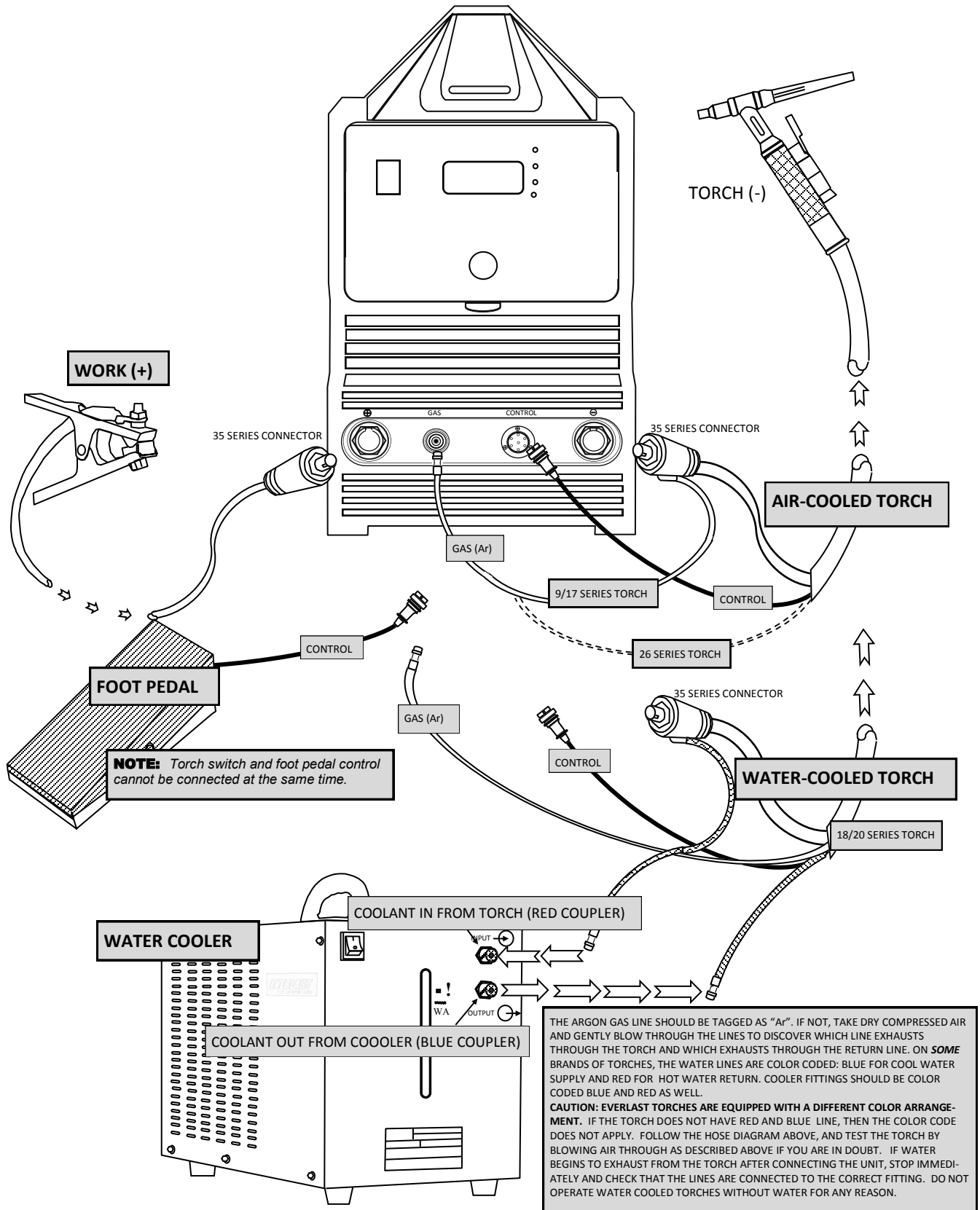
Duty Cycle. The duty cycle rating of the PowerPro 256D is rated at 60% for TIG, Stick and Plasma cutting @ 40° C. This means that the unit can be operated continuously at the maximum amps for the 60% percent of time out of 10 minutes (in this case 6 out of 10 minutes) without a cool down break. For the remainder of the 10 minute time period, the welder should rest to achieve proper cooling. If the unit overheats and surpasses the duty cycle threshold temperature, the unit will cease welding/cutting and the overheat indicator will light up. If this happens, leave the unit powered on to cool down while the fan continues to run. Welding in dirty, humid, or hot conditions can affect negatively duty cycle. Do not shut down the welder until it has safely cooled for at least 15 minutes. Once the welder has sufficiently cooled, turn the power switch off and then back on to clear the code and reset the unit.

HF Start. The welder uses High Frequency to start the TIG arc. A slight buzz, or hiss may be heard immediately upon start as the HF energizes. A bright blue light may be emitted from the front or side panel as the HF spark attempts to energize the arc. This is completely normal.

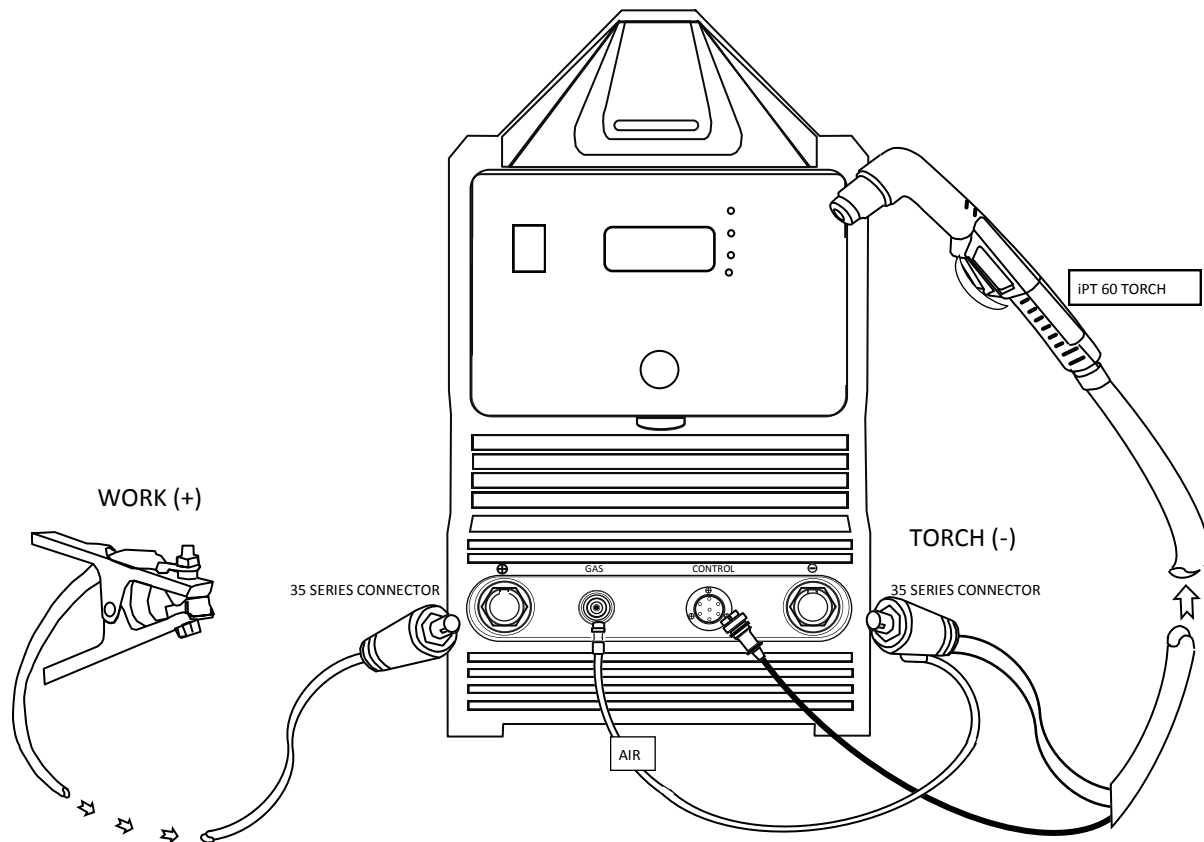


This manual has been compiled to give an overview of operation and is designed to offer information centered around safe, practical use of the welder. Welding is inherently dangerous. Ultimately, only the operator of this welder can ensure that safe operating practices are being followed, through the exercise of common sense practices and training. Do not operate this machine until the manual has been thoroughly read and understood. If you do not have the skill or knowledge to safely operate this machine, do not use it until further training is received.

QUICK SETUP GUIDE: TIG CONNECTIONS



QUICK SETUP GUIDE: PLASMA CONNECTIONS



NOTES:

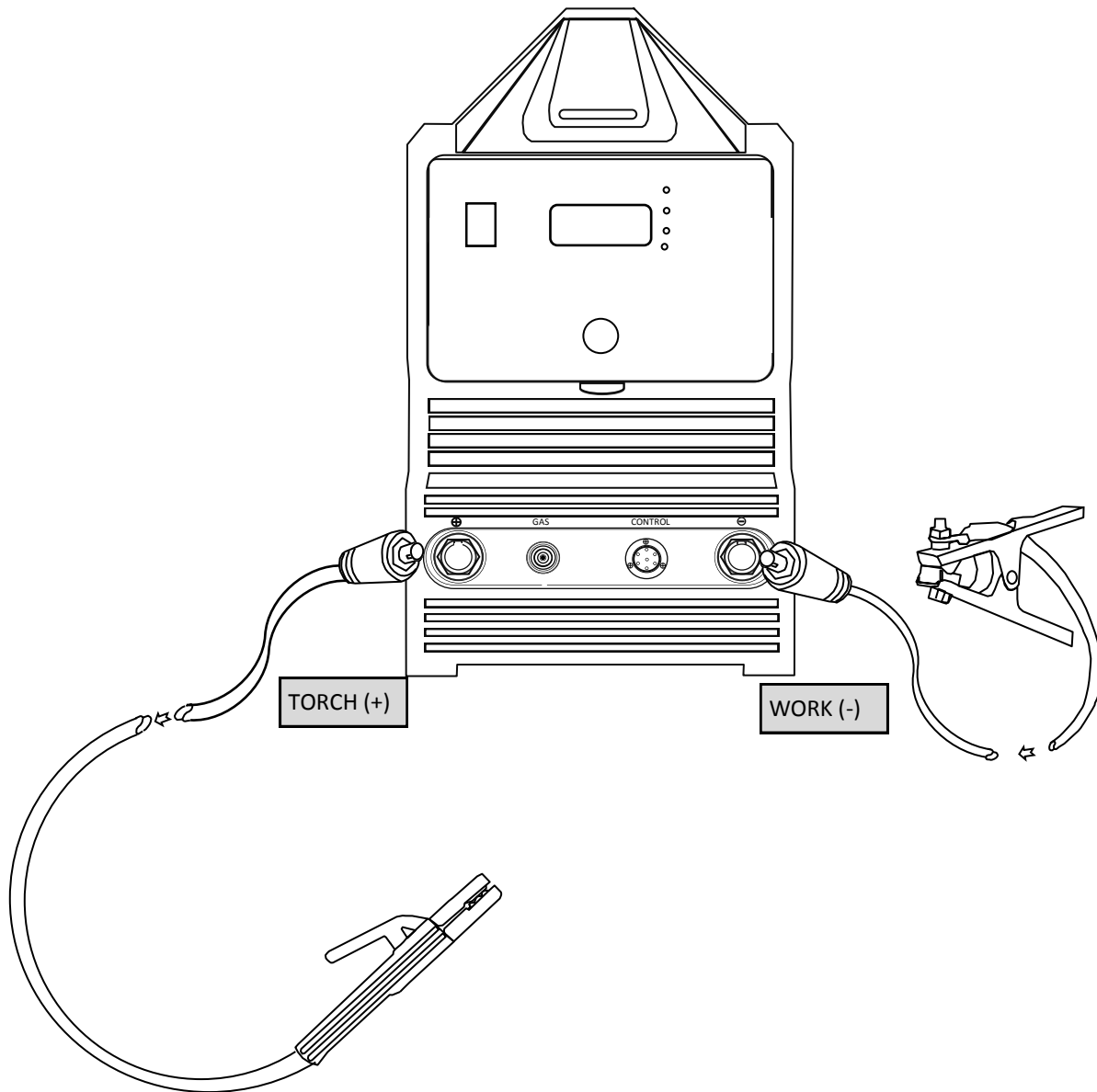
- 1) For safest operation, be sure 2T is selected. Do not attempt to use the foot pedal to control the amps.
- 2) Do not attempt to use the plasma torch in any other mode or test in any other mode with torch connected.
- 3) Attempt to operate only with sufficient air pressure. If pressure is too low, the unit will cease output and the unit will code "806" to indicate the air pressure is too low.
- 4) See torch manual included in this manual for best pressure settings and parts identification.
- 5) Do not exceed 90 psi air supply pressure from compressor or failure or leakage of internal line components may result.
- 6) Do not use with an oiler or with an air line that has had oil run through the line.
- 7) Adjust torch operation pressure to 72 psi (5 bar) for best results while post flow is flowing.
- 8) When using lower amperage levels, the nozzles will need to be changed out for ones with a smaller diameter orifice. Everlast is an OEM supplier of the torch but not the torch manufacturer. Smaller diameter nozzles are available through authorized distributors of the Tecmo/Innotec PT/iPT60 torches or contact Everlast to purchase direct. (Not all parts or consumables listed may be sold or serviced individually by Everlast.)



STOP: Do not fire the torch continuously without attempting to make a cut. Doing so will keep the pilot arc engaged and will drastically shorten the life of the consumables. The Pilot arc should only be used to initiate the arc to start a cut. Always make sure the work clamp is directly connected to a deoxidized, unpainted location on the part being cut. Use a grinder to ensure proper contact is being made between the work clamp and the metal if necessary.

WARNING: Plasma cutting uses a high voltage, high temperature arc. **Do not touch any part of the consumable while cutting or with the torch energized even if the arc is not present!** Always switch the unit off while changing consumables. Do not disable the yellow safety cover over the torch switch.

CAUTION: Never attempt to use the torch while hooked up to the positive (+) connector or damage may occur to the consumables and/or the torch. Always verify correct torch polarity before each use. Do not change processes while the Plasma torch is connected or severe damage may result to the machine and torch.

QUICK SETUP GUIDE: STICK POLARITY AND CONNECTIONS**NOTE:**

Most electrodes require that the torch be connected to positive terminal as depicted above. This is considered “Electrode Positive” or “Reverse” polarity. A few electrodes are rated for both positive and negative polarity (also referred to as “Straight” polarity). The rating may vary from manufacturer to manufacturer and is dependent upon the specific formulation of the electrode chemistry. Negative polarity is rarely used but can be useful in some circumstances to control burn through and speed up metal deposition. To determine the electrodes’ polarity capability be sure to consult the manufacturer’s information, which is usually found on or in the container with the rods or on the manufacturer’s website. If no polarity information is found, assume it is rated for electrode positive only.

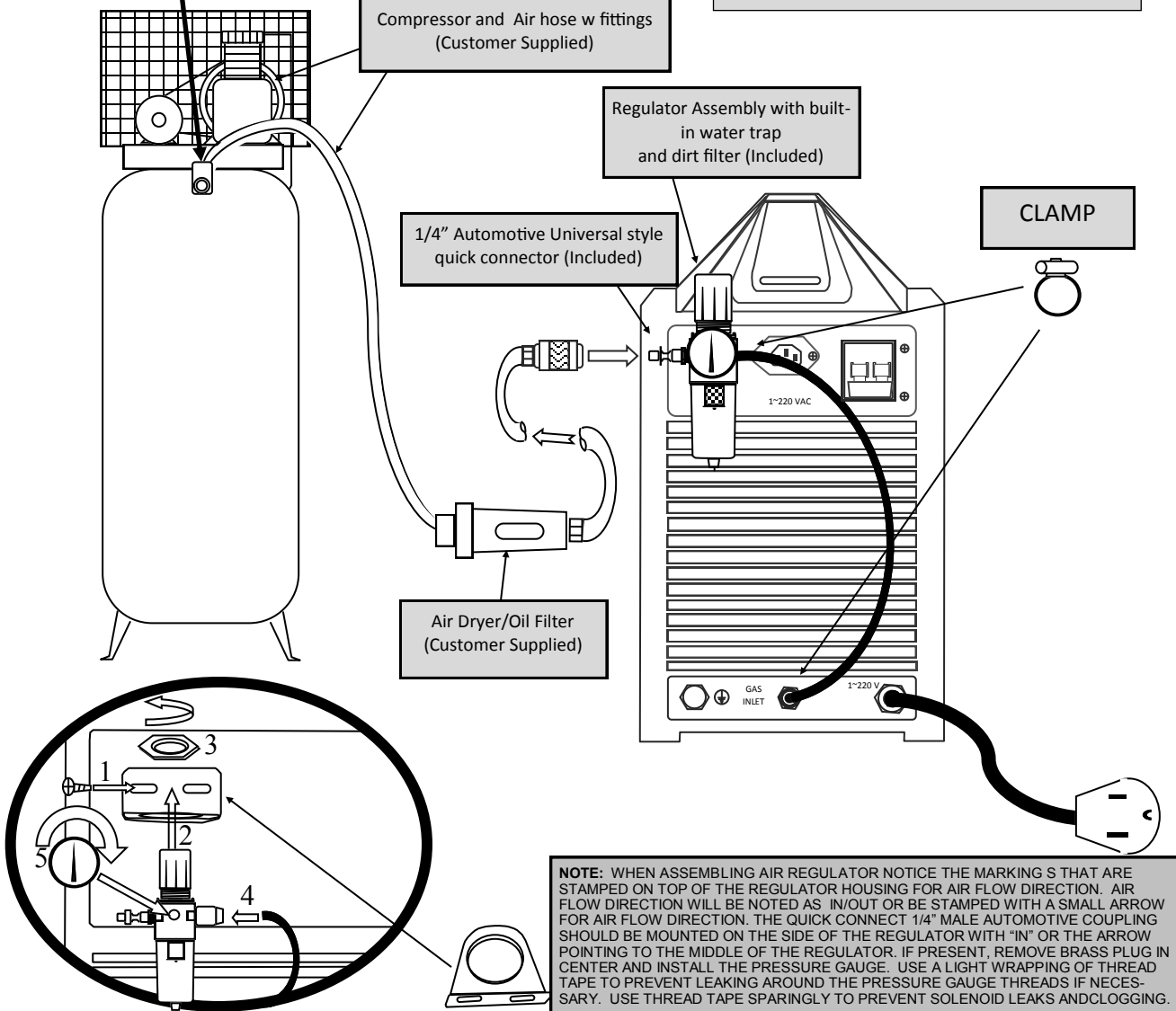
SECTION 2

QUICK SETUP AND USE GUIDE

**QUICK SETUP GUIDE: REAR CONNECTIONS FOR PLASMA OPERATION
Compressor and Dryer Diagram**

Caution: Do not exceed 90 psi from air compressor!

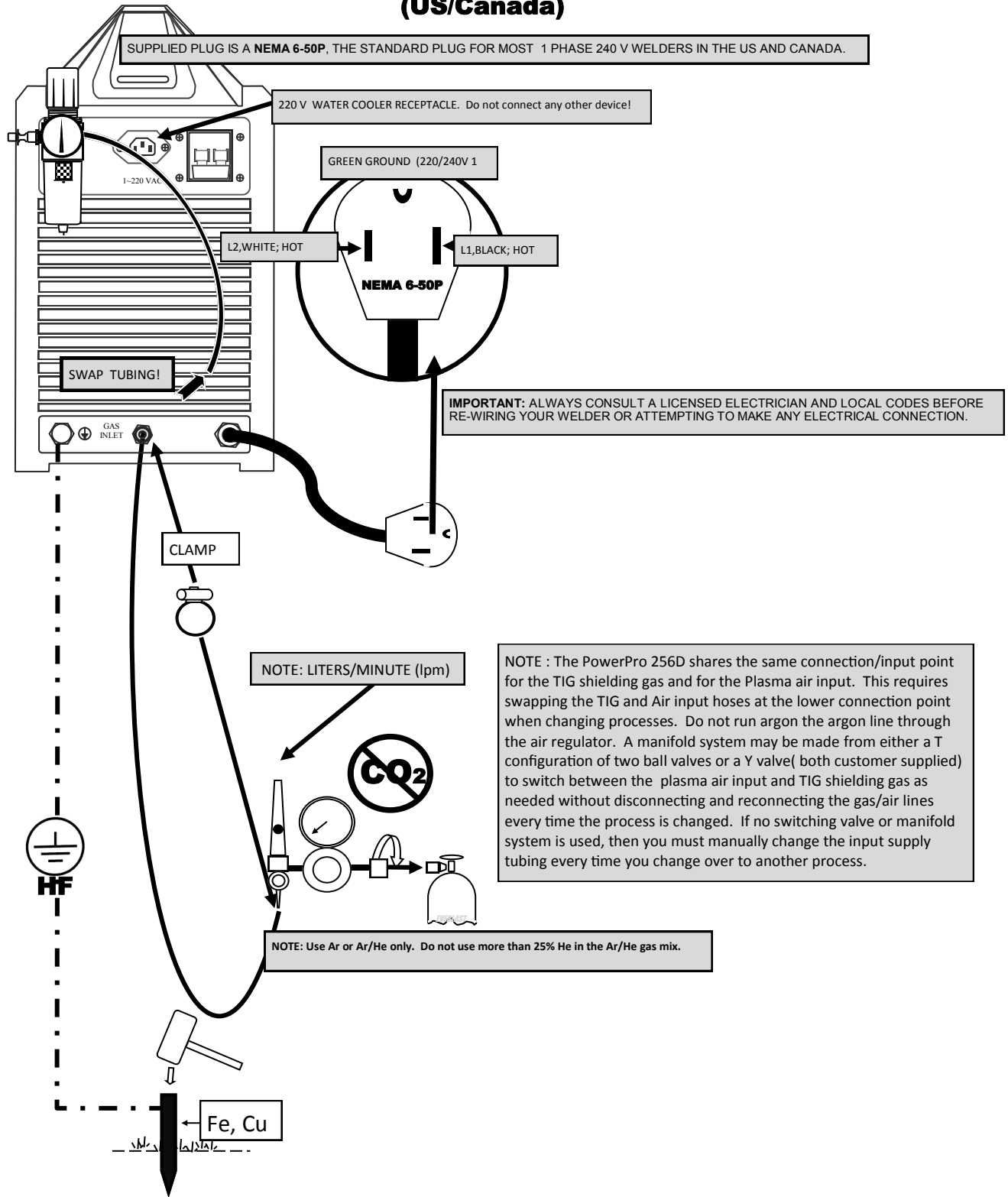
Use with compressors capable of a minimum of 5.3 cfm at 90 psi and with at least 25 gallon tank or larger.



NOTE: WHEN ASSEMBLING AIR REGULATOR NOTICE THE MARKING S THAT ARE STAMPED ON TOP OF THE REGULATOR HOUSING FOR AIR FLOW DIRECTION. AIR FLOW DIRECTION WILL BE NOTED AS 'IN/OUT' OR BE STAMPED WITH A SMALL ARROW FOR AIR FLOW DIRECTION. THE QUICK CONNECT 1/4" MALE AUTOMOTIVE COUPLING SHOULD BE MOUNTED ON THE SIDE OF THE REGULATOR WITH "IN" OR THE ARROW POINTING TO THE MIDDLE OF THE REGULATOR. IF PRESENT, REMOVE BRASS PLUG IN CENTER AND INSTALL THE PRESSURE GAUGE. USE A LIGHT WRAPPING OF THREAD TAPE TO PREVENT LEAKING AROUND THE PRESSURE GAUGE THREADS IF NECESSARY. USE THREAD TAPE SPARINGLY TO PREVENT SOLENOID LEAKS AND CLOGGING.

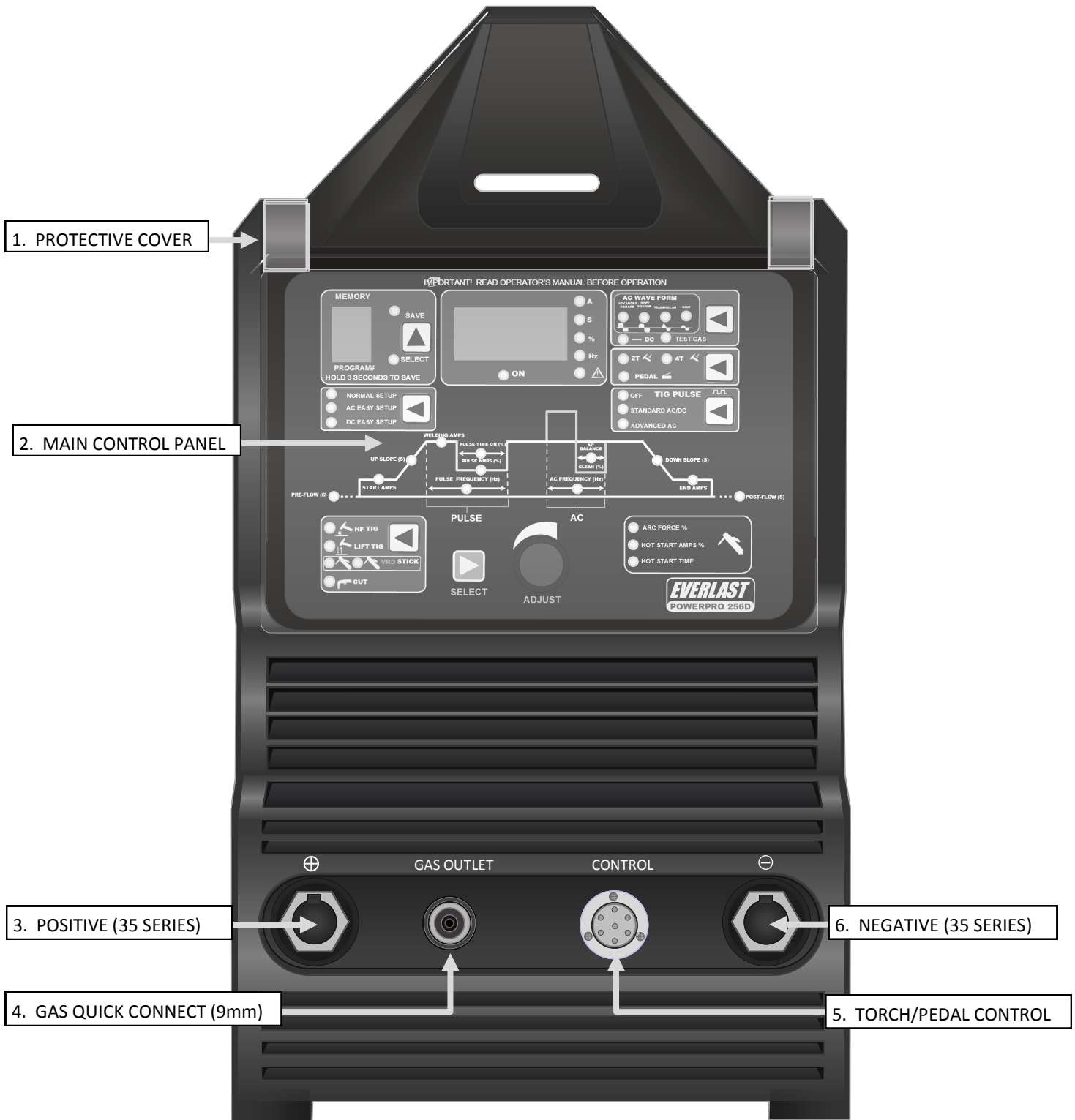
NOTE: A SEPARATE AIR DRYER BETWEEN THE AIR COMPRESSOR AND REGULATOR ASSEMBLY MUST BE INSTALLED. IT SHOULD BE INSTALLED AS CLOSE TO THE WELDER AS PRACTICAL. **THIS IS A CUSTOMER SUPPLIED ITEM.** THIS WILL REDUCE CUTTING ISSUES SUCH AS SPITTING, POPPING AND RAPID CONSUMABLE WEAR. THE REGULATOR/FILTER THAT IS INCLUDED IS NOT SUFFICIENT TO REMOVE ALL MOISTURE. IT SERVES ONLY AS A WATER TRAP AND FINE SEDIMENT FILTER. ANY AIR COMPRESSOR SYSTEM WILL PRODUCE AT LEAST SOME MOISTURE REGARDLESS OF HUMIDITY LEVELS AND ENVIRONMENT. DAILY DRAINING OF THE AIR COMPRESSOR SUPPLYING AIR TO THE PLASMA CUTTER IS RECOMMENDED. THE AIR SUPPLIED TO THE PLASMA CUTTER SHOULD BE OF SIMILAR QUALITY USED FOR AUTOMOTIVE PAINTING. DIFFERENT STYLES OF DRYERS ARE AVAILABLE. THE MOST INEXPENSIVE AND COMMONLY AVAILABLE IS THE REPLACEABLE DESSICANT TYPE USED FOR AUTOMOTIVE PAINTING. DAMAGE DONE TO THE TORCH AND THE PLASMA CUTTER (INCLUDING BUT NOT LIMITED TO: SHORTING, CORROSION, AND DETERIORATION OF INTERNAL LINES AND COMPONENTS) AS A RESULT OF EXCESS MOISTURE OR IS NOT COVERED UNDER THE WARRANTY. ADDITIONALLY, A FILTER SHOULD BE INSTALLED IN-LINE OR AT THE COMPRESSOR THAT WILL FILTER ANY EXCESS OIL OR OIL BLOW-BY FROM THE LINE IF NECESSARY. DO NOT USE WITH OILING SYSTEMS DESIGNED TO AUTOMATICALLY LUBRICATE AIR TOOLS. OIL WILL DAMAGE THE TORCH AND CONSUMABLES AS WELL. DAMAGE DONE TO THE CUTTER OR THE TORCH BY OIL IS NOT COVERED UNDER THE WARRANTY EITHER. IT IS ADVISABLE TO USE THE PLASMA CUTTER WITH A NEW AIR HOSE/LINE THAT IS FRESH WITHOUT MOISTURE OR LUBE CONTAMINATION AND DEDICATE IT FOR PLASMA USE ONLY. IF THERE IS AN AIR PRESSURE DROP GREATER THAN 5-10PSI FROM THE COMPRESSOR, OR AIR FLOW IS SUSPECTED TO BE INSUFFICIENT, INCREASE TO A LARGER SIZE EXTERNAL DRYER/FILTER. FAILURE TO USE A DRYER/FILTER IS A LEADING CAUSE OF PLASMA CUTTING AND CONSUMABLE WEAR ISSUES.

QUICK SETUP GUIDE: REAR CONNECTIONS FOR TIG / WIRING (US/Canada)



NOTE: TO PREVENT STRAY HIGH FREQUENCY INTERFERENCE, THIS UNIT PROVIDES AN ADDITIONAL GROUNDING POINT AT THE REAR OF THE UNIT. IT SHOULD BE DIRECTLY GROUNDED THROUGH A SEPARATE WIRE TO AN OUTSIDE METAL ROD DRIVEN IN THE GROUND. THIS HELPS PREVENT BLEEDBACK OF HF INTO THE POWER GRID, AND HELPS MUTE HF INTERFERENCE. ADDITIONALLY, ALL SURROUNDING METAL OBJECTS SHOULD BE GROUNDED INCLUDING THE TABLE, PIPES, WALLS ETC. TO PREVENT ELECTRICAL INTERFERENCE WITH OTHER CIRCUITS. DO NOT COUPLE THIS WIRE TO THE GROUND PROVIDED IN THE ELECTRICAL CIRCUIT.

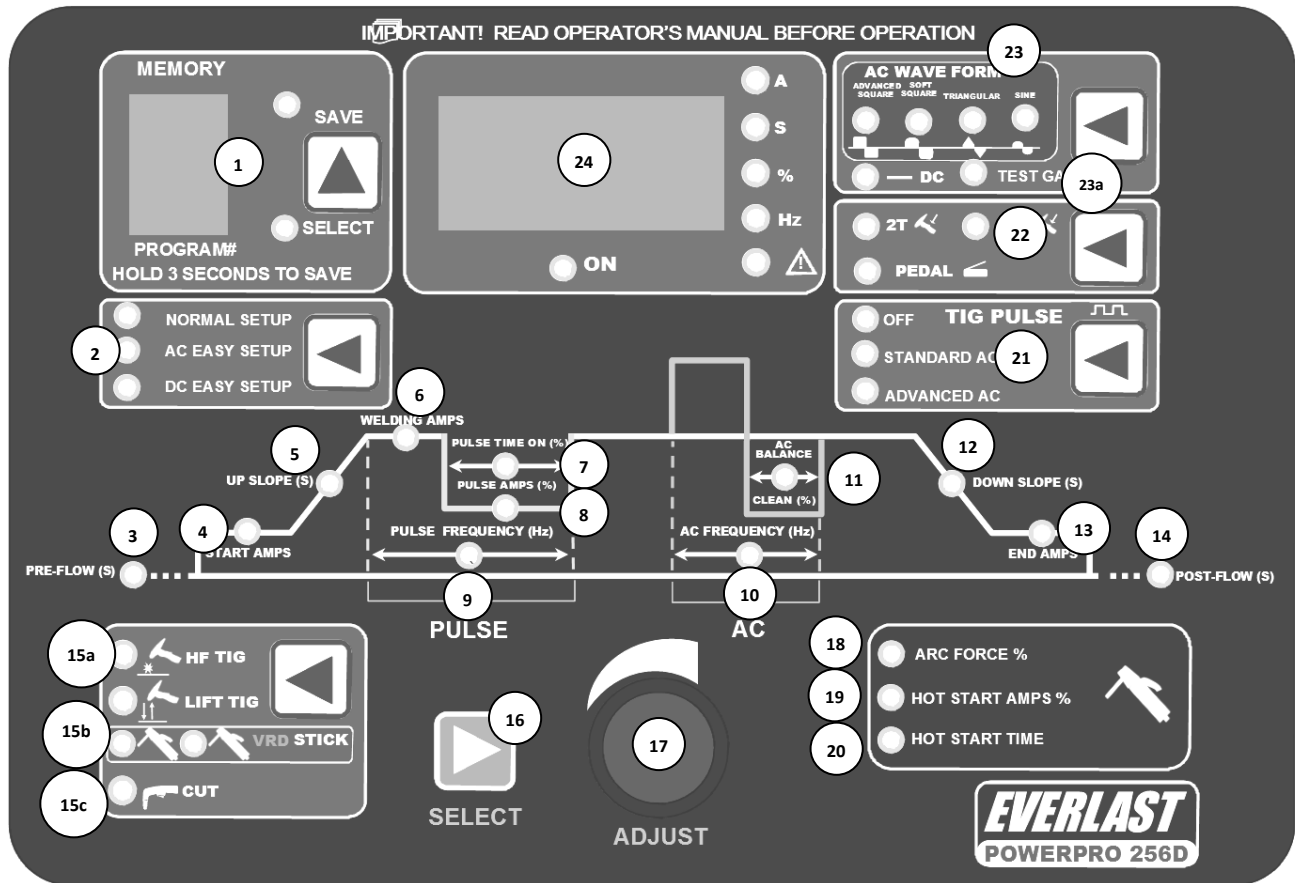
FRONT PANEL FEATURES AND CONTROLS POWERPRO 256D



FRONT PANEL FEATURES AND CONTROLS POWERPRO 256D

POWERPRO 256D	PARAMETERS	PURPOSE
1. Protective Cover	N/A	Clear hinged cover protects panel from damage. Keep closed during welding operations.
2. Main Control Panel	Digital	The main control features digital adjustment. It offers features that include Easy Start Up, Pulse, Advanced AC pulse, Stick welding feature, VRD Stick welding feature, Stick Hot Start, Arc force control, Lift start Tig, HF start TIG, Plasma Cutting, 2T/4T/Pedal/Amptrol Control, and error code diagnosis.
3. Positive Connector	DINSE 35-70mm ²	Location of the positive terminal. This is a standard 35 series connector. For Stick: Torch Connection (most electrodes). For TIG: Work Clamp Connection. For Plasma Cutting: Work Clamp connection
4. Gas Outlet Quick Connect	9mm	Connects the gas to the TIG torch and Plasma torch To connect: Push the torch fitting into the connector until the collar slides forward with a click. To Release: Slide the outer collar back and remove the fitting.
5. Control Connector	7 Pin (Panasonic type)	Connect the foot pedal, amptrol or torch switch to this socket to control the welder. Only one control connector can be plugged in at one time. If the torch has a torch switch feature or hand amptrol feature, tie the loose connector back or leave it hanging while using the pedal.
7. Negative Connector	DINSE 35-70mm ²	Location of the negative terminal. This is a standard 35 series connector. Stick: Work clamp Connection. TIG: Torch connection. Plasma: Torch connection

FRONT PANEL FEATURES AND CONTROLS POWERPRO 256D



POWERPRO 256D	PARAMETERS	PURPOSE
1. Memory Function	1-9	This unit has 9 programs which allow the operator to select parameters then save the settings to the selected program channel. To operate, use the selector button to select the desired program number where the program is to be stored. The red select light will be lit, indicating that the welder is in the programming mode. Enter the desired program parameters. After all parameter changes have been made, press the selector button and hold for 3 seconds and release. The green save button will light, indicating the function has been saved. After releasing the button, it will take approximately 2 seconds for the save light will go out. The unit will then default back to the red select light. NOTE: Any additional adjustments made after pressing "Save" will need to be resaved by pressing and holding the save button again. Remember this before turning the unit off as last unsaved settings will be erased. The unit has no default settings other than "Easy Start".
2. Easy Start Up Menu	Normal, AC,DC	In TIG mode the welder features two Easy Start Up modes, one for AC and one for DC. The Easy Start Up features for AC and DC have been pre-programmed with parameters that are generally usable in most situations. Most parameter adjustments are blocked and are non adjustable in these modes. Amperage, and control functions are adjustable. Select Normal to allow standard setup. This feature is intended for quick welds, repairs or novice use.
3. Pre-Flow	0-25 Seconds	Pre-Flow sets the gas flow time before the arc starts after the trigger or pedal is pressed. This is used to purge the torch and flood the weld area with shielding gas so the arc start is stable and weld is free from porosity. Use enough time so that the first "blast" of argon has time to settle. (about .3-.5 seconds) Pre-flow delays the arc start by the amount of time selected.
4. Start Amps	5-250 A (AC/DC)	Serves as the 2T/4T beginning arc start amp value while using the torch switch, pedal or amptrol. Allows the arc to be started at a different value than the selected maximum or minimum welding amps while using the torch switch, foot pedal or hand amptrol. Typically used to start the weld puddle more quickly/slowly. This feature is usually turned to the minimum amp setting (5 amps) while the foot pedal is in use. However, It can be used to create a "hot" TIG start with the pedal, or used to improve arc starting.

FRONT PANEL FEATURES AND CONTROLS POWERPRO 256D

POWERPRO 256D	PARAMETERS	PURPOSE
5. Upslope*	0-25 Seconds	Upslope ramps up the amps from the start amp value to the welding amp value while starting the weld puddle. For best operation, value should be set to 0 with foot pedal in use. If used with an hand amptrol, without a separate switch to control slope in 2T/4T mode, then the upslope should be also be set to 0. If slope is set while in use with the foot pedal, delayed or sluggish amp acceleration after the arc is struck will result.
6. Welding Amps	AC: 5-250 Amps DC: 3-250 Amps	Welding amps define the top limit of amps at which the machine has been programmed to operate. Used with the foot pedal and amptrol, this is the maximum limiting value at the upper limit of the range of travel. With the torch switch this is the destination, or maximum current reached after up slope has occurred. When used with pulse, Welding Amps represents the high amp stage of the pulse cycle. When used with Advanced AC Pulse, this represents the AC, high amp stage of the pulse.
7. Pulse Time On (Balance)	5-95% of Welding Amp (Peak) Time	Defines the duty cycle (balance) of the pulse, by dividing or skewing the amount of time the pulse stays in the lower or upper stage of the pulse. The pulse consists of two stages: Welding amps (upper /Peak) and Pulse amps (lower/background current). This is represented by a % of total time the pulse spends in the welding amp stage of the cycle during one full pulse cycle. The feature can be used to increase or decrease pulse amp time relative to the welding amp time of the cycle to help manage heat input. This functions the same in both Standard and Advanced AC pulse modes.
8. Pulse Amps (%)	1-100% of Welding amps	Governs the lower(base or background current) amp value during the pulse cycle as a percent of welding amps. In Advanced AC Pulse mode this also represents the DC-(negative) low amp portion of the pulse cycle.
9. Pulse Frequency , Hertz (Pulses per second)	DC: .1-500 Hz AC Advanced Square.: .1-250Hz AC Soft Square: .1-10 Hz AC Triangular: .1-10 Hz AC Sine: .1-10 Hz Advanced AC Pulse: .1-10 Hz	Represented by Hertz (Hz), the pulse frequency defines the actual number of times each second the pulse makes one complete cycle between welding amps (peak/high amp value) and pulse amps (background/low amp value). This is also commonly referred to as Pulses Per Second (PPS). Low pulse frequencies are ideal for timing the point at which filler metal is added. This is useful for improving appearance and uniformity during manual welding activities while controlling heat. Higher pulse frequencies are useful for welding seams and edges of thin material. Also it is useful for overall heat input control for thicker metals. Higher pulse frequencies are highly useful for automated welding processes. WARNING: WELDING AT HIGH PULSE FREQUENCIES INCREASES THE DECIBEL /NOISE LEVEL OF THE ARC. HEARING PROTECTION IS HIGHLY RECOMMENDED! In Advanced AC mode, the function of the frequency is essentially the same, and represents the number of times per second that the welder cycles completely between AC (assigned as Welding Amps, the Peak current) and DC- (assigned as Pulse amps, the base current).
10. AC Frequency	20-250 Hz	Governs the number of times per second that the current alternates from polarity in AC mode. To achieve greater arc focus (constriction) and increase puddle agitation while welding in AC mode, increase AC frequency. This allows pinpoint use on thin materials, and helps penetration on thicker materials. Ideal adjustment range is usually between 100-150 Hertz. For comparison most transformer welders in the US operate on 60 Hz. Greater arc control and stability can be achieved through the higher frequency range offered by this welder. Lower Frequencies will widen and soften the arc and reduce the level of control. WARNING: INCREASING THE AC FREQUENCY ALSO INCREASES THE DECIBEL/NOISE LEVEL OF THE AC WELDING ARC. HEARING PROTECTION SHOULD BE WORN!
11. AC Balance	10-90% of EP	Defines the percent of Electrode Positive (EP) used during AC welding to provide cleaning action. This divides the time that the AC cycle spends in Electrode Positive or Electrode Negative during one full AC cycle. It controls the amount of cleaning and penetration via a ratio to achieve the best balance while welding on AC. Too much cleaning action will result in tungsten balling or splitting. Too little cleaning can result in dirty, sooty welds and even a dull weld appearance. Simply put, as the percent increases, greater cleaning will occur, but less penetration will be achieved. NOTE: This is expressed as a percent of full Electrode Positive polarity. This unit uses 100% Electrode Positive as the reference, which is opposite (a reciprocal value) from some brands of TIG welders with this adjustment. Using the welder in excess of 50% EP can ball and vaporize the tungsten. For most welds, no more than 45% cleaning is needed. Ideally, start with 30% EP for a reference point, and fine tune the cleaning by adjustment this point in increments of 5%.

*NOTE: Your program version may not allow the slope features to be adjusted while the foot pedal is plugged in and in pedal mode. In this case you will still be able to select and highlight slope and a the parameter can be adjusted while in pedal mode but it will default and automatically re-zero immediately after an adjustment is made. This is normal. To adjust slope with a torch mounted amp control, select either the 2T Pedal or 4T Pedal setting where both pedal and 2T(or 4T) are lit.

FRONT PANEL FEATURES AND CONTROLS POWERPRO 256D

POWERPRO 256D	PARAMETERS	PURPOSE
12. Down Slope*	0-25 Seconds	Down Slope ramps the amperage down from the welding amp value to the end amp value to allow time to fill the crater left at the end of the weld bead. For best operation, the set the value to 0 with the foot pedal in use. If used with a hand amptrol, without a separate switch to control slope in 2T/4T mode, then the upslope should be set to 0 as well. When using the foot pedal or amptrol without a separate control switch, the arc may flare at the end of the weld after the weld has been lowered to the minimum amp level if the value has not been set to 0. Can also be used in the 4T mode to help with heat control by briefly tapping the switch to cool off the weld before tapping it again to restart the up slope sequence before the arc reaches the end amp stage.
13. End Amps	AC: 5-250 Amps DC: 3-250 Amps	Sets the final or minimum current before the arc is terminated. Used for filling craters at the ends of the weld and crack prevention. When using the foot pedal, this should be set to the lowest amp value (3 for DC; 5 for AC) or arc may suddenly get hot at the end of the weld.
14. Post Flow	0-50 Seconds	Controls the amount of time in seconds that the argon flows after the arc has terminated. Provides proper shielding during cooling to prevent rapid oxidation of the weld which results in porosity. Use approximately 1-2 seconds post flow time for every 10 amps.
15a. HF TIG/ Lift TIG/ Stick/VRD/Plasma (Cut) Selector	N/A	This selects TIG, Stick mode or Plasma (CUT) modes. It also selects the type of TIG start. The Process selector offers the choice of Lift Tig (for DC only) which requires contact with the metal to initiate the arc and High Frequency Start which allows non contact starting of the arc (for AC and DC). When in HF mode, the unit relies upon a gapless solid state HF module to start the arc. The lift start function provides a cold electrode for safety, and prevents accidental starts. This requires that the pedal or torch switch must be pressed to energize the torch. HF refers to the start type only. The inverter design of the welder eliminates the need for a constant HF overlay in AC.
15b. Stick/VRD Stick Selector	N/A	This selects the stick process or the VRD stick process. A Voltage Reduction Devices (VRD) is required in some situations to reduce the risk of electrocution. The VRD reduces the Open Circuit Voltage (OCV) below 20 volts ($\pm 3V$) for safer operation until the arc is struck and low resistance is sensed. The VRD can make starting more difficult in some situations, and requires a brief contact with the metal to start the weld. Rusty metals, or painted surfaces may make starting more difficult by offering too high of a resistance value for the unit to sense an arc strike attempt. When using the VRD Stick mode, a slight delay in arc starting may be noticed. A firm scratching action may be necessary.
15c. Plasma (Cut) Selector	N/A	This selects the Plasma process. WARNING: Before the plasma torch is connected, select Cut and do not switch modes and fire torch or damage to the torch and to the unit may result.
16. Parameter Selector	N/A	The push button selector is used to scroll left to right through different panel settings.
17. Parameter Adjuster	N/A	The control knob is used increase or decrease parameter values. To increase adjustment speed, push in on the knob while turning.
18. Arc Force Control (DIG)	0-100%	Controls the arc response when an arc is held short and voltage begins to drop. Arc force automatically compensates by modifying the volt/amp curve to maintain the energy needed to weld. Represented as a percent of available arc force amperage.
19. Hot Start Time (Surge Amp Time)	0-2 Seconds	Sets the length of time that the Hot Start is active while starting the arc. Used to reduce sticking of the electrode during the arc strike phase.
20. Hot Start Amps %	0-100%	Controls the "hot" start amperage during the initial contact of the electrode. It makes arc starting easier by sending a surge of amps briefly while arc is struck to prevent sticking. The % represents the percent of additional hot start amps available.
21. TIG Pulse Mode Selector	Pulse OFF Standard Pulse Advanced AC Pulse	The unit features two pulse modes. The standard mode is available in AC and DC modes. The Advanced AC mode, works only in AC. Pulse is used to control heat input on metals by pulsing amperage between a high (Peak) and low (Base or background) amp value. The high amp stage is represented as Welding Amps. The low amp stage is represented as Pulse Amps. The Advanced AC pulse pulses between AC and DC— polarity to control heat input on thin aluminum. In advanced mode, AC is assigned to the welding amps stage of the pulse, and DC— is assigned to the pulse amps stage of the pulse. Both the standard and Advanced pulse modes have the same features of pulse time on, pulse frequency and pulse amps. Other than changing the polarity in Advanced AC pulse mode, the two pulses are similar in adjustment.

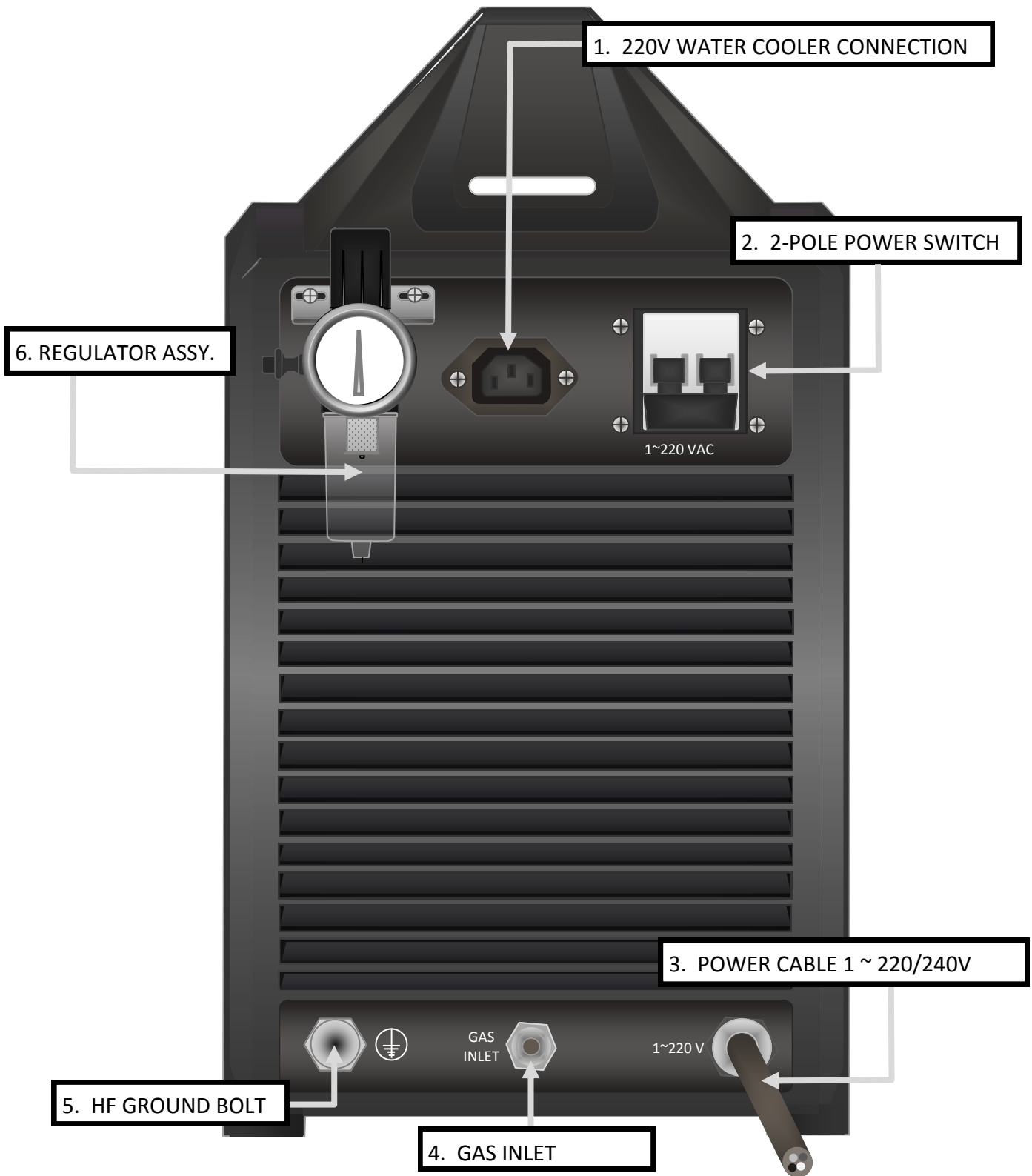
*NOTE: Your program version may not allow the slope features to be adjusted while the foot pedal is plugged in and in pedal mode. You will be able to select down slope and make a temporary adjustment while in pedal mode but it will re-zero automatically after an adjustment is made. This is normal. To adjust slope with a torch mounted amp control, select either the "2T Pedal" or "4T Pedal" setting where both pedal and 2T (or 4T) are lit.

FRONT PANEL FEATURES AND CONTROLS POWERPRO 256D

POWERPRO 256D	PARAMETERS	PURPOSE
22. 2T/4T/ Pedal/Amptrol Selector*	2T, 4T, Pedal, Pedal with 2T, Pedal with 4T	<p>This selects the operation of the torch switch, pedal, or hand amptrol.</p> <p>To operate with the torch switch, select 2T or 4T. For 2T operation, simply press and hold the switch. The panel program will cycle automatically. When the switch is released, the arc will downslope and terminate with post gas flow. When in 4T mode, the switch is pressed, and held to start the pre-flow and the start amps part of the cycle. When released, upslope begins and continues until the amps are raised to the preset welding amps. When pressed and held again, downslope starts and ramps down to the end amp stage (crater current). When released, the arc terminates, and post flow begins. If desired, before the downslope finishes, the switch may be tapped again to start the up slope again.</p> <p>To operate with the foot pedal, select pedal mode. The features such as start amps, upslope, down slope, and end amps will function with the pedal. Be sure to lower these features to the minimum values when the foot pedal is in use, unless a desired effect is needed. The start amp feature can be particularly useful as a brief “hot start” tig setting which provides an initial burst of amps to be to rapidly develop a puddle.</p> <p>To operate with a hand amptrol, select Pedal, and then press the selector additionally to select the 2T or 4T feature light. Both the Pedal and the 2T or 4T pedal will be lit. The starting and ending of the arc will be the same as the standard 2T or 4T mode, except the amps can be adjusted while welding with the amptrol. However, some amptrols have only a switch that is built into the amptrol mechanism, and is not controllable independently of the amperage. When this type of amptrol is used, the unit should be placed into standard pedal mode for proper operation.</p>
23. AC Waveform/DC selector Test Gas (Plasma)	DC AC Advanced Square Soft Square Triangular Sine	<p>The unit features AC/DC operation, with 4 standard wave forms available in AC for specialized welding needs. The advanced square wave is the default mode and is the best all around mode with excellent wet in, and arc controllability. Soft Square wave and Sine wave mimic the feel and effect of the transformer welders. The Soft square wave is similar to Square wave transformers, and have a smooth, buttery feel, but maintains good control over the arc. The Sine wave is similar to much older sine wave transformer TIG welders. This offers the softest arc, and affords less control than other modes. The Triangular wave is designed for rapid wet in, and high speed travel on the metal. It also features rapid freeze of the puddle.</p> <p>DC mode is the standard mode used for all metals except aluminum and magnesium. Aluminum and Magnesium should be welded in AC only.</p>
23a.	Test Gas (Purge)	To purge gas or set gas flow during Plasma use, select “Test Gas”. Deselect this before cutting so that it returns to normal operation.
24. Data Indicator	Amps Seconds Percent Hertz Warning On	The unit features a single main display. The data in the display is always accompanied by a corresponding LED light which indicates the function being represented. This also includes a self diagnosing function which displays an error code and a corresponding warning light. See trouble shooting for lists of error codes. NOTE: Some error codes once displayed require resetting of the welder by powering down the welder and turning it back on to clear and allow the welder to return to normal function. Other codes will allow the welder to weld once the cause of the code has been remedied without cycling the power off and on.

*NOTE: Your program version may not allow certain parameters to be adjusted while the foot pedal is plugged in and in pedal mode. You will be able to highlight or select certain features and make a temporary adjustment while in pedal mode but the unit will automatically re-zero after manual adjustment is made. This is normal. For adjustment of slope (if needed) with a torch mounted amp control, select the 2T Pedal or 4T Pedal setting where both pedal and 2T(or4T) are lit.

REAR PANEL FEATURES AND CONTROLS POWERPRO 256D



REAR PANEL FEATURES AND CONTROLS POWERPRO 256D

POWERPRO 256D	PARAMETERS	PURPOSE
1. Water Cooler Receptacle	IEC 60320-1 "C-14"	This connection supplies power to the Everlast PowerCool 300 water cooler. This is a 220 VAC outlet. Do not use this connection to power any other device. 4 amp max. This remains live while the unit is plugged in. The power switch on the unit does not turn the cooler outlet off.
2. 2-Pole Power switch	On/Off	The breaker switch has 2 poles. It serves as the On/Off switch for the welder. Always turn the welder on and off by the switch first before using any disconnect. The Water cooler outlet on the rear remains live after the switch is turned off.
3. Power Cord	220/240 V 1 phase, 50/60 Hz.	The unit is prewired with a standard NEMA 6-50 plug. This is the standard plug for welders in the US and Canada. Other countries vary plug configuration as well as input.
4. Gas Input Connection	1/4-5/16"	This is the point where the shielding gas from the regulator connects. The unit is supplied with tubing and clamps which connect this fitting to the regulator. The hose barb design allows universal connection of the welder to almost any regulator or setup found throughout the world. Make sure the tubing slides fully over the connector, then thoroughly tighten the clamp. Use an additional clamp if necessary to prevent leaking. If you suspect leaking, test the connection with a solution of mild soapy water. If bubbles are seen, retighten or reinstall the tubing. While changing processes, the tubing must be swapped. Do not run the Argon gas through the air regulator/filter. A T-fitting or Y-fitting may be placed inline at the connection to leave both argon and air hooked up without having to swap out the lines. This is not supplied by Everlast and is up to the customer to responsibly install if not using the standard change over method recommended by Everlast. This can usually be purchased from online sources or at any well equipped welding supply store.
5. HF Ground Bolt	N/A	HF energy can be devastating to surrounding electronic equipment. If the operating environment includes electronic equipment, this connection can serve as a direct path to an outdoor grounded metal rod that is isolated from the main electrical circuit to help bleed off excess HF circuit. All metal parts inside the building should be grounded as well, including pipes, tables, and even metal siding. HF energy has been known to bleed back into the power grid and disrupt electronic devices further down the line. It is recommended that a separate ground wire (minimum 14 gauge) be attached at this point while in use.
6. Air Regulator Assembly with pressure gauge	90 psi maximum Supply pressure. 70-75 psi operating pressure while cutting	The regulator serves a multiple purposes. 1) It controls air pressure for plasma. 2) It filters fine particulates and large drops of water. The regulator is not designed to regulate Argon flow or have argon flowing through it. 3) It displays the operating air pressure. NOTE: A separate air dryer must be installed inline to prevent rapid torch and consumable wear (customer supplied). The regulator assembly is not designed to remove moisture from the air, only large drops of water that may be created in the coupling and uncoupling process. Everlast does not warranty damage caused to torches or consumables by moisture. Residual moisture in the line will also contaminate the system, causing problems while TIG welding. So, keeping the internal lines of the unit dry is of utmost importance. One of the leading issues experienced with Plasma cutting and the cause of many different symptoms in TIG is the presence of moisture in the air line. To adjust the pressure for cutting, simply pull up slightly on the knob until it clicks then rotate it clockwise to increase the pressure and rotate it counter clockwise to decrease the pressure. To adjust the pressure correctly, adjust the pressure while the air is flowing in the " Gas Test" mode. If a flow tube for the torch is provided, adjust it so the ball floats in the window as depicted in the torch manual. Do not fire torch with the flow tube installed on the torch. Turn Post flow to maximum, fire the torch, then install the flow meter and make adjustments to the air pressure while it is flowing. If no flow tube is provide, adjust the air pressure to 70-75 psi, with 73 psi being the optimum target pressure.

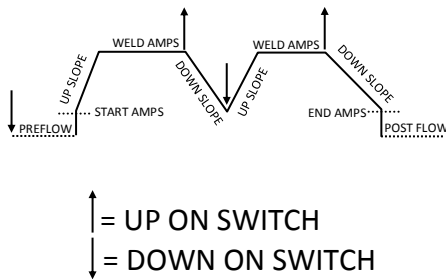
NOTES:

- The gas input connection should be checked for tightness periodically, especially if the machine is moved or when changing processes.
- Never operate welder on a generator that is not certified by its manufacturer to be "clean" power, which is less than 10% total harmonic distortion. less than 5% is preferred. Operating the unit on square wave output or modified sine wave generator is strictly prohibited. Contact the manufacturer of the generator for this information. Everlast does not have an "approved" list of generators. But, if the generator is not listed as clean power by its manufacturer, then operation is prohibited. Generators that do not at least meet the operating input requirements of the welder are also forbidden to be used with the welders. Surge amp capability of the generator should equal or exceed the maximum inrush demand of the welder. But the surge capability should not be used as the only factor. The regular, running output of the generator should match or exceed the running or "rated" demand of the welder. Any damage done by operating the welder on a generator not specified by its manufacturer to be "clean", will not be covered under warranty. This also includes all forms of questionable power sources where voltage is below 208 V and above 250 V (including wiring that is undersized for its length and rating).

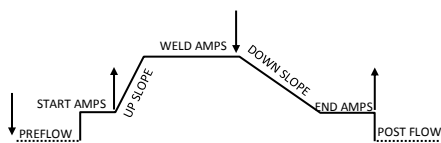
Welder Function Summary and Explanations.

1. *2T/4T/Pedal sequencer.* The 2T/4T feature allows operation of the welder without a foot pedal. In many circumstances, a foot pedal is not practical for use. So, the 2T/4T function has been created to allow programming of the welder to simulate the activities of the foot pedal while providing more accurate, programmed control. The “T” refers to the number of travels of the remote switch installed on the torch required to operate the programming. 2T is essentially a “press and hold” operation and all programming is cycled automatically. Releasing the switch begins the final stage of programming. 4T operates differently in the fact that each touch activates a different stage of the programming, allowing for greater control. Also, in 4T, while actually welding at full amps, no finger contact with the switch is required which allows a more relaxed grip. Follow the graphic lines below, to visually trace and learn the activity and function of each part of the welding cycle. In either 2T or 4T operation the programming can be reset to “upslope” before reaching the end amp stage by pressing the switch once more. Setting a long down slope improves the use of this reset function. See the graphics below for further explanation. The up and down arrows indicate the switch travel direction.

2T Torch Operation Effect on Weld Cycle



4T Torch Operation Effect on Weld Cycle



The standard pedal mode in certain program versions of the PowerPro 256D incorporates the same adjustability of the parameters of the sequencer. When used, it is similar in operation to the 2T mode with the same settings. However, all features except pre-flow and post flow would should be programmed for the minimum allowable value so the functions do not interfere with normal pedal operation. But if a TIG “hot start” is needed to improve arc transfer, or develop an instant puddle, the start amp feature can be used. Any other feature such as down slope can be used as well, for any special application or need. However, be sure to remember to reset these features to the minimum values when they are not required, or undesirable operation such as arc flares, sluggish operation may occur after releasing the foot pedal. **Depending upon the program version, for setup simplification and improved operator experience, your unit may not allow adjustment to some parameters in pedal the mode even though you may be able to toggle through each individual parameter. In this case, any adjustment made to the parameter will automatically re-zero after an is adjustment has been made. This is normal and is subject to further programming change as Everlast seeks to continually improve the usefulness of the features and simplify setup up procedures.**

NOTE: The welder features an additional combined 2T or 4T pedal mode where the pedal mode light is lit along with either the 2T or 4T light. This is actually designed for use with a hand amptrol with a separate torch switch for initiating the arc and activating the 2T or 4T sequencer cycle. This type torch amptrol should have a momentary on/off button should mounted sep-



Everlast 26 series torch with hand operated amptrol and separate switch

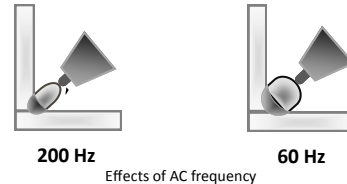
arately to activate the arc cycle if none is provided. Some aftermarket torch amptrols have a built-in switch that automatically activates and initiates the arc as the amptrol is rolled on. In this case, the amptrol should **only** be used in the pedal mode, or 2T pedal mode. Everlast offers additional torch options with built-in amptrols that are designed for use in the combined 2T or 4T pedal mode of the welder. Torches with both a separate torch switch and a separate amptrol functions just as it would with a regular 2T or 4T cycle switch, *except* the amperage can be adjusted at the torch while welding once the welding cycle has reached the normal welding stage of the cycle.

2. *Easy Start Modes (AC and DC).* The unit is equipped with a separate AC and DC “Easy Start” mode. This mode allows the operator to quickly start welding without having to worry about correct setup. The unit’s easy startup modes are programmed for all-around performance, handling a broad, general purpose range of tasks requiring either AC or DC output. The amperage is preset, but can also be adjusted if desired. Torch switch or pedal control can be selected, but most other features are locked into an optimized general purpose setting. This feature is useful for novice welders and for customers desiring a quick start up, bypassing the usual setup procedure. The easy start up modes are not intended for advanced welding tasks but can be useful as a default setting without having to create and save another program to the welder’s memory channel.

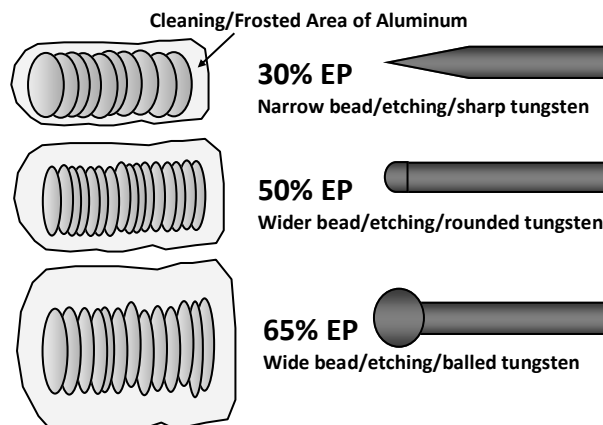
3. *AC Wave Forms.* The wave form control is a useful feature for achieving a desired type of arc performance in AC mode. There are 4 wave forms to choose from. The default AC wave form is the advanced square wave. This wave form is excellent for all types of welding, and offers quick puddle wet-in, and good arc stability. The triangular wave form is useful in situations where a fast freezing puddle is desired, particularly on thin aluminum. The soft square wave offers a buttery arc, with a smooth feel similar to the feel of a standard square wave transformer-based welder. The sine wave form mimics older transformer welders. This is the softest feeling wave form, and offers less arc definition and control than other wave forms. This is preferred by some older more experienced welders. When using various AC wave forms, only the Advanced Square wave offers a high pulse frequency of 250 Hz in the standard pulse mode. All other wave forms are limited to a maximum of 10 Hz. Advanced pulse mode limits the pulse frequency to 10 Hz on all wave forms due to practical limitations.

4. *AC Frequency.* The AC frequency control is only used in the AC mode. It does not have any bearing or effect in the DC mode. Standard transformer based welders typically have a fixed frequency of 60 Hz. This is essentially the line input frequency supplied by the power company. However, due to the IGBT inverter design of this welder, the capability of to make adjustments to the AC frequency is practically limitless up to 250Hz. The capability to adjust AC frequency is useful to help improve di-

rectional control of the arc, and to focus the arc so that a narrower bead profile can be achieved. Also, at higher frequencies, the puddle agitation is greater which improve the breakup of undesirable oxides. Penetration can also be pinpointed and deepened as frequency goes up. All wave forms can be adjusted from 20-250 Hz. For obtain a more fluid puddle when welding aluminum, lower the AC frequency. A good starting point for AC frequency is between 100 and 120 Hz as it seems to offer good general capability.

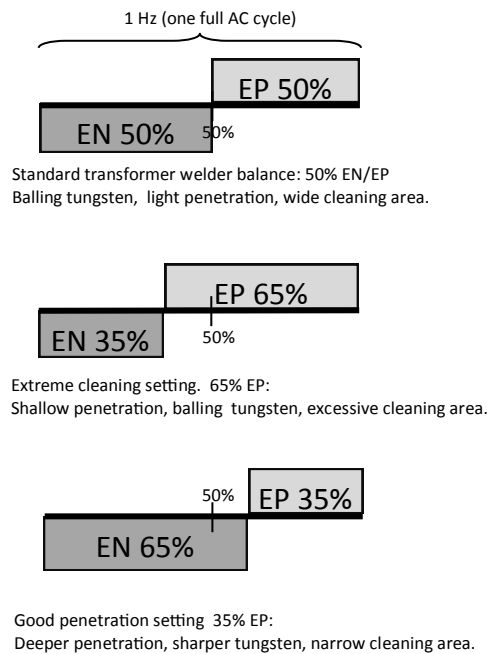


5. *AC Balance.* The AC output is formed by rapidly alternating a current’s polarity between electrode negative (EN) and electrode positive (EP), creating a type of a sine wave when viewed on an oscilloscope. Usually, a standard transformer welder (both standard sine wave and square wave welders) have little or no way to alter the ratio of EN to EP, which results in having to weld with a molten ball at the tip of the tungsten and a less stable arc. In TIG, electrode negative (EN) provides the penetration part of the AC cycle due to the direction of the electron flow. Electrode positive (EP) creates a strong reverse flow of electricity that breaks up weld-resistant oxidation that is present on Aluminum. However, it is poor at creating penetration because it places most of the heat on the Tungsten. In a “balanced” wave where both EP and EN are equal in time length (50% setting), penetration is reduced and too much cleaning action results in wide etch lines running parallel to the side of the weld. This is not ideal at all as the Tungsten will tend to ball (or even burn) and the arc will begin to “hunt” or wander. Not all welds conditions are alike so more cleaning is re-



quired at times than others. Similarly, more penetration will be required at times than others. Ordinarily, about 20-35% electrode positive is considered an ideal amount (65-75% electrode negative). This means that more heat is put into the work than on the tungsten and a sharper point can be used. Cleaning is still sufficient at that level. Typically, good results can be achieved with an AC balance setting of about 30% EP

EXAMPLE: AC EP (+) BALANCE



or less. The cleaning action is still sufficient even at these levels. Ideally, the cleaning action should be adjusted until a small amount of frosting can be seen no more than 1/8" distance from the edge of the weld. If a particular piece of Aluminum is heavily oxidized or dirty, more cleaning action will be required. If too much cleaning action is used, the tungsten will begin to ball and will erode (burn) away. If this much cleaning action is truly needed, then switch to a larger sized tungsten that can handle the increased heating level. Signs of too little cleaning action while welding aluminum are sooty, black or dull looking welds. A dedicated stainless brush and suitable aluminum cleaner such as acetone should still be used before welding any type of aluminum to help break up the heavy oxide layer. This will require less EP so better penetration can be achieved. Even if the aluminum has a mirror finish to it, it still has a layer of oxide that must be removed to achieve a properly welded joint.

NOTE:

1. High Frequency (HF) is not needed except to start the arc. The HF TIG feature refers specifically to the initial arc start, and is normally used in both AC and DC modes. In a standard transformer welder, the HF is used continuously to stabilize the AC arc. However, continuous HF is not needed in an inverter due to the rapid switching provided by the IGBT electronics. Therefore, with this welder, HF refers only to how the arc is started, and not to AC function. However, to reduce tungsten contamination by the aluminum, you should only operate the welder in the AC mode with the HF start selected unless it is absolutely necessary due to work place restrictions. Lift start is recommended for use only in DC mode, or for use in AC mode when a copper scratch block is used and the arc is transferred. Lift start would be used in areas that are sensitive to electronic interference such as hospitals or around computerized equipment such as CNC.
2. The addition of Helium to Argon can increase the welding capacity of the welder and alter the amount of cleaning typically needed. Do not exceed 25% however or arc starts will be difficult and erratic.
3. If arc wandering in AC is a problem, reduce cleaning percent. If it continues, reduce gas flow and then check for drafts or for poor work clamp connection. Also check for highly oxidized or dirty aluminum or a faulty work clamp or connection. Try relocating work clamp directly to the metal being welded.
4. AC controls only apply to AC operation, and do not affect the settings on DC.
5. Too slow of travel speed will increase the etching (cleaning) area even if the AC balance is adjusted correctly.

Parameter Notes:

6. *Standard Pulse. (AC and DC)* The pulse creates two amp values, a high and a low value that cycle back and forth between each other while welding. The upper amperage is called the “welding amps” (sometimes called peak current) and the lower amperage is called “pulse amps” (sometimes called background or base current). This creates a situation where penetration can be achieved without overheating the metal, particularly on metals that are prone to structural deterioration or burn through. In effect you are creating an average of amps. The PowerTIG series feature three adjustable parameters concerning the pulse:

1. *Pulse Amps.* Both welding amps and pulse amps are independently set. Adjust the welding amps with the main control knob and the pulse amps with the pulse amp knob. However, when you adjust the pulse amps, you are actually defining a fixed ratio of amps. This is expressed as a percentage of Welding Amps. The display is not synchronized with the pulse so it samples at a set rate that is independent of pulse changes, which yields randomly fluctuating numbers. As you increase amperage, the pulse will maintain the same ratio of amps you have selected. To adjust the pulse amps to a desired setting using an example of 100 Welding Amps, setting the pulse amps to 50% would yield a 50 amp value for the pulse amps. The foot pedal will control both Welding Amps and Pulse Amps according to the %(Ratio) selected on the panel.

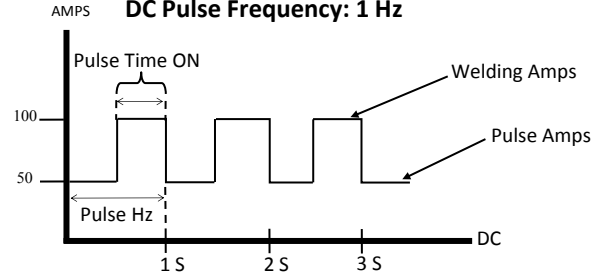
2. *Pulse Frequency.* Pulse speed or frequency as it is referred to is measured in the unit standard “Hertz”. Simply, it is the number of pulses per second that occur. Pulse frequency controls the arc constriction and also help with heat management.

3. *Pulse Time On (Balance).* Pulse Balance is the percentage (%) of time that the pulse stays in the welding amp stage of the cycle. Increasing the Pulse time on can increase the duration the welding amp stage of the cycle to increase the overall heat input. Pulse Balance is also commonly referred to as pulse duty cycle. For welding purposes, the term “Pulse Time On” is used as it deals with the sharing of on time between Peak and base amp values during one pulse cycle.

Setting up the pulse is not a process with a fixed adjustment procedure. Changes to frequency, balance, and time will skew the final result. A slow pulse with a equal 50% pulse time on and somewhere around a

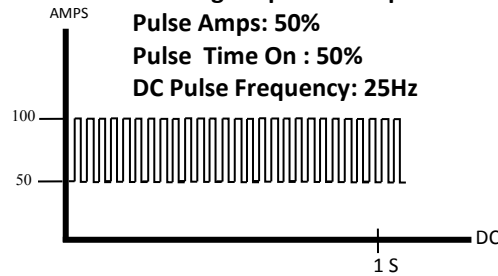
EXAMPLE 1

**Welding Amps: 100 amps,
Pulse Amps: 50%
Pulse Time On: 50%
DC Pulse Frequency: 1 Hz**



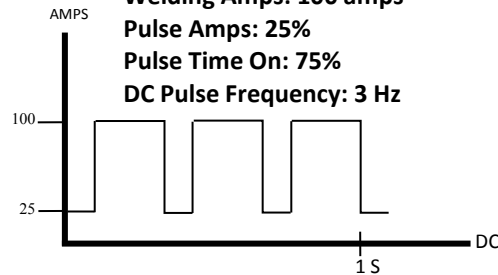
EXAMPLE 2

**Welding Amps: 100 amps
Pulse Amps: 50%
Pulse Time On : 50%
DC Pulse Frequency: 25Hz**



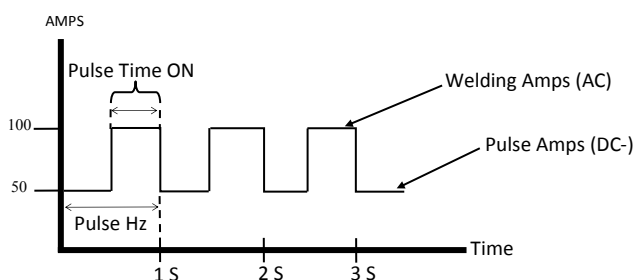
EXAMPLE 3

**Welding Amps: 100 amps
Pulse Amps: 25%
Pulse Time On: 75%
DC Pulse Frequency: 3 Hz**



50-75% Pulse Amp setting is typically used to help with timing the addition of filler metal to the weld puddle. A higher pulse frequency level with variations in Pulse Time On and a narrow/wider ratio can be used to prevent burn through and speed up welding on thin materials. It can also help maintain a proper bead on a thin edge weld or prevent burn through on extremely thin metal. A fast pulse speed will make fine ripples in the weld while a slow pulse speed will give a much more coarse, but visually appealing result. There are limitless ways to adjust the pulse. Keep in mind though, that the basic purpose of the pulse is to average the heat input while maintaining penetration.

7. *Advanced Pulse (AC only).* The Advanced Pulse is a feature not typically found on most pulse type TIG welders. In the “advanced” mode, the unit pulses current back and forth between AC and DC negative (-) polarity. This is designed primarily for use with welding aluminum, and is accessible only when used in AC mode. The purpose of Advanced Pulse mode is to create a quick freezing puddle, and offer more definition of the puddle ripples. It is also useful for controlling cleaning width, and for heat input control on thin gauge aluminum. AC is assigned as the welding amps setting (pulse peak), and the DC— is assigned as the pulse amps % (base value). Otherwise, the pulse frequency, and pulse time on are adjusted the same and perform the same function as the standard pulse mode adjustments. Occasionally during use, a slight wobble of the arc may be seen as it pulses between AC and DC—. This is usually observed if the frequency is set low and the metal is highly oxidized, the arc length is too long, or the work clamp is not connected securely. If this happens, readjust the work clamp, re-clean the metal and /or shorten the arc length. If pulsing slowly, the filler should be added on the audible AC stage of the pulse as this is the hotter stage of the pulse. **Note: The graph below has been simplified for clarity. It is designed to show the relationship and interaction between the AC and DC parts of the pulse and does not depict the effect of AC frequency cycling between — and + polarity during the pulse cycle.**



8. *Arc Force Control/Surge Amp Control.* When stick welding, arc force is used to help improve weldability of certain metals and welding rods. The arc force boosts current flow to match the demands of arc length and position. As an arc is held shorter, voltage tends to drop so extra amps are introduced to help maintain a steady arc. Surge amps boost the starting amperage briefly to heat up the welding electrode and weld area so the arc starts cleanly, without sticking or porosity. Both controls are inactive while welding in TIG mode.

9. *Foot Pedal. 47k Ω .* Select 2T on the panel. Select maximum amp value desired on the panel. The foot pedal will only control amps up to the range governed on the front panel. If more amperage is needed raise the amp level on the panel. The foot pedal also controls both Welding Amps and Pulse Amps through the ratio established by selecting the pulse Amp % on the panel. Welding with pulse and the foot pedal takes practice, as it will seem the welder is welding at less amps than it is. Always set the panel amps to about 25% more than what should be needed. Increasing the amps more than this margin on the panel will reduce the accuracy of the foot pedal by lowering the resolution of the foot pedal. Be sure to turn the start/end amps and up/down slope to the minimum setting or it will interfere with pedal operation. The pedal cannot override the start/end amp and slope controls. For more accurate and responsive control, Everlast offers a US made foot pedal available as an additional option.

10. *Water-cooled/ Air-cooled torch. (20 and 9 series).* A water cooler is necessary for use with the water-cooled 20 series torch and to reach the maximum current potential of the unit. **Using a water-cooled torch even briefly without water can seriously and permanently damage your torch!** The Power Cool 300 may be purchased separately from Everlast which is designed to cool the torch up to the maximum amp capacity of the welder. If you do not have a water cooler or have not purchased a water cooler, you will need to use the air-cooled (gas -cooled) 9F series torch that is included with the unit. Keep in mind that the 100% duty cycle mark on the 9 series is 125 amps DC, and 85 amps AC. The torch may be used at slightly higher amperages but the torch duty cycle will be reduced and the potential to overheat and damage the torch exists. Overheated torches or water-cooled torches run without water are not warrantable. Everlast has worked to ensure that the TIG torch consumables are interchangeable with other brands with similar 9 or 20 designations. They should be available locally for purchase. No special consumables are required. Although a small starter kit of consumables is

included, you will need more consumables fairly quickly, so it's a good idea to purchase a larger kit with the welder or shortly after purchase. **Note: No Tungsten is included with the complementary starter kit. The complimentary starter kit contents may vary in appearance and quantity.** Everlast offers (available for purchase) additional deluxe TIG kits with gas lenses and stubby kits. These kits do include quantities of tungsten which include a variety of types and sizes of Tungsten. Tungsten however, can be sourced locally at almost any well equipped welding supply store.

11. *DINSE style connector.* Everlast uses a 35-70mm² connector for both negative and positive connectors, which is considered a standard connector within the welding industry. This is commonly known as a 1/2" or 35 series DINSE-style connector. The connector allows the use of almost any brand or style of TIG torch.

12. *7 pin remote/foot pedal connector.* This 7 pin connector is available from Everlast should it become damaged. See Pin-out reference found in the appendix of this manual.

13. *Argon quick connect.* This is a 9 mm size quick connect nipple. These are commonly available from Everlast or online sites which carry torches and fittings. Should you need a new one for your torch or damage yours, consult Everlast. Do not use a nipple that is scarred, bent or otherwise deformed. Damage to the female connector may result. Serious leaks may occur.

14. *Low amp starts and welding.* The units have been configured to be able to start at approximately 5 amps AC/DC. After the arc is started in DC, amps may be reduced to the minimum 3 amp minimum level. Start Amps may also be increased for a "hot start" while in TIG mode if required. To achieve the most stable low amp starts, you will need to decrease gas flow, tungsten size, and standoff height. If inconsistency is experienced, drop to a smaller tungsten size, cup size and reduce the flow rate to prevent turbulence. Stand-off height at low amp start and operation must be maintained between .035-.060".

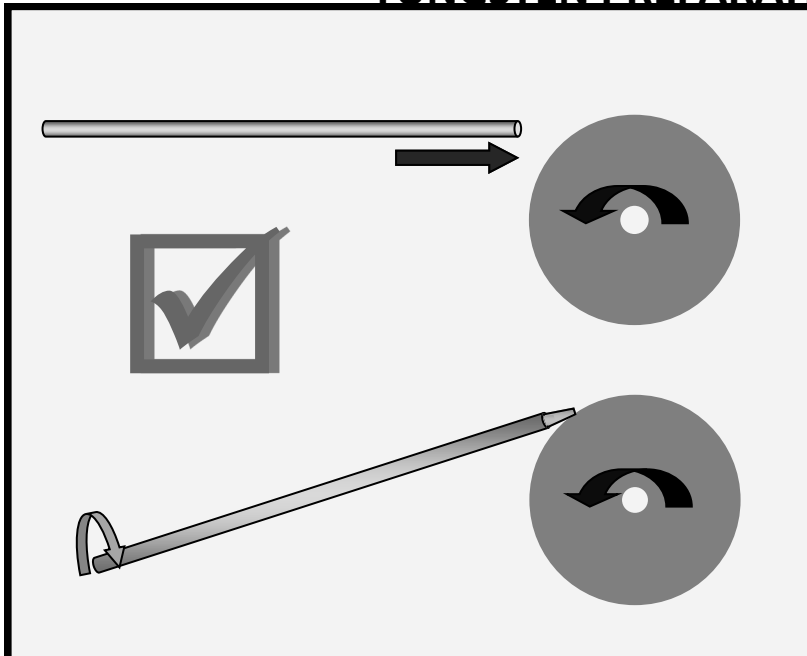
15. *Argon Regulator.* The argon regulator is listed in SCFH for North American markets. (subject to change).

NOTE ABOUT THE FOOT PEDAL MODE:

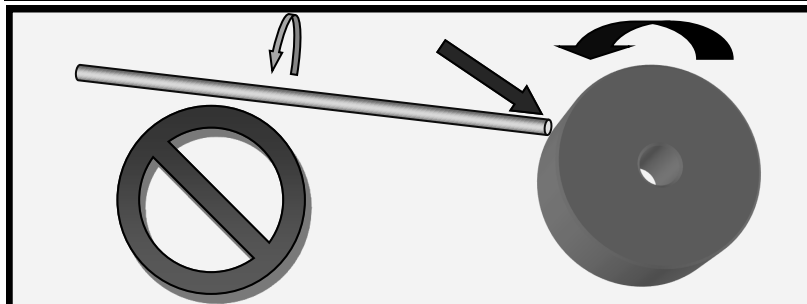
While using the welder with the foot pedal, and with hand controlled amptrols that don't feature an independent torch switch, the welder's digital display will

revert back to the minimum amp setting on the welder after the arc is terminated. It will not display maximum set amps as the pedal It will only display maximum set amps while the amperage is being actively adjusted. While welding, the display will read output weld amperage. After finishing the amperage adjustment, the display will default back to the minimum amp reading within 3-4 seconds. When using 2T or 4T control modes, the display will register the maximum set amps until the arc is started. To see the maximum set amperage in the pedal mode without the arc on, simply make a small adjustment in the main adjustment knob while the Welding Amps light is lit. The unit will then revert to the adjustment mode and display the currently selected maximum amperage.

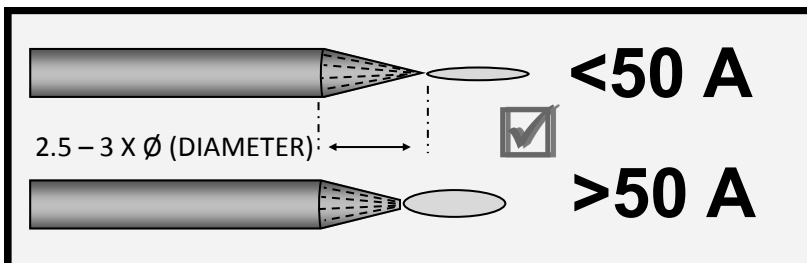
TUNGSTEN PREPARATION



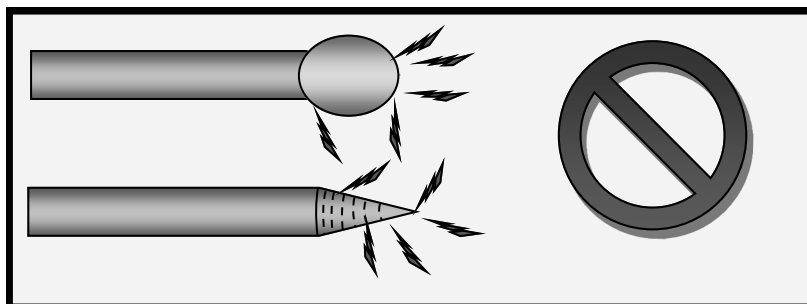
1. Use a dedicated grinding wheel or contamination may result. Do not breath grinding dust! Wear eye protection and gloves.
2. Hold Tungsten firmly.
3. Grind perpendicular to grinding wheel face. Allow tungsten to grind away slowly, creating point.
4. Rotate tungsten quickly as it is being ground to keep point even and symmetrical.



DO NOT GRIND TUNGSTEN PARALLEL TO WHEEL FACE OR AN UNSTABLE ARC WILL RESULT.



Use a point for low amp use to help control arc. Create a slight truncation on the tip for higher amp use for best arc stability. Grind the tip so that it is 2.5 - 3 times longer than the diameter of the tungsten.



DO NOT BALL THE TUNGSTEN TO WELD IN THE AC MODE. AN ERRATIC ARC WILL RESULT. MAKE SURE GRINDING MARKS RUN PARRALEL TO TIP. CONCENTRIC MARKS WILL CAUSE ERRATIC ARCS AND DIFFICULTY STARTING.

IMPORTANT: Do not attempt to use Pure tungsten (green) or Zirconiated (white) tungsten to weld aluminum with this welder. These tungsten types will not hold up well in an inverter. With modern inverters a ball is not desired for AC welding as in the past with traditional transformer welders. A balled tungsten will yield an unstable, wandering arc. Many welding supply warehouses are not familiar with inverter TIGs and will try to sell pure or zirconiated tungsten for welding AC. Do not use either. Any other type Tungsten, including Thoriated (red) may be used for AC.

LIFT START TIG OPERATION

Note: A Lift TIG start should be done with a nearly seamless motion. Use a light touch and a quick motion for best results.

FOR DC USE. NOT RECOMMENDED FOR AC.

1. Position the edge of the ceramic cup on the metal. Press and hold the torch switch or press the foot pedal. Wait for the Pre-flow to start. (Make sure pre-flow is set for less than .5 seconds or start will be noticeably delayed.)
2. Quickly rotate cup so that the tungsten comes in brief contact (< .5 seconds) with the metal.
3. After contact with the metal, quickly rock the torch back so that the tungsten breaks contact with the metal.
4. An arc should form. As the arc grows, raise the cup up off the metal and slowly rotate the torch into welding position.
5. Leave 1/8" or less gap between the tungsten tip and the metal. Proceed with welding, leaving the torch inclined at a 15° angle.

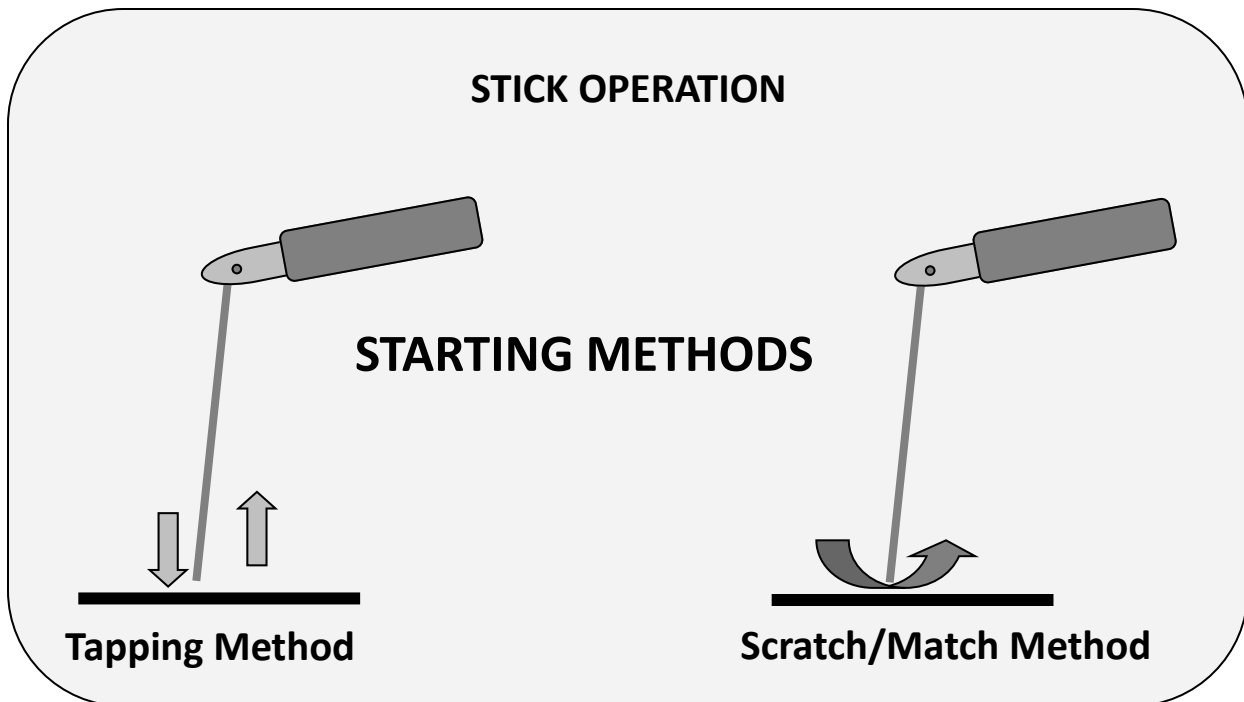
HIGH FREQUENCY START TIG OPERATION

FOR AC OR DC USE.

1. Position the point of the sharpened tungsten about 1/8" or less above the metal. Use less than 1/16" stand-off for low amp starts.
2. Press the torch trigger or press the foot pedal to initiate the arc. The HF arc will be initiated. It may appear briefly as a blue spark.
3. An arc should form, almost immediately after the pre-flow cycle is completed. HF arc initiation will be delayed by the amount of pre-flow time used. If arc does not start after the pre-flow interval, and the HF is creating a spark, then check the work clamp contact with the work piece. Move the tungsten closer to the work. Repeat steps 1 and 2.
4. Leave 1/8" or less gap between the tungsten tip and the metal and proceed with welding, leaving the torch inclined at a 15° angle.

General TIG Arc Starting Steps

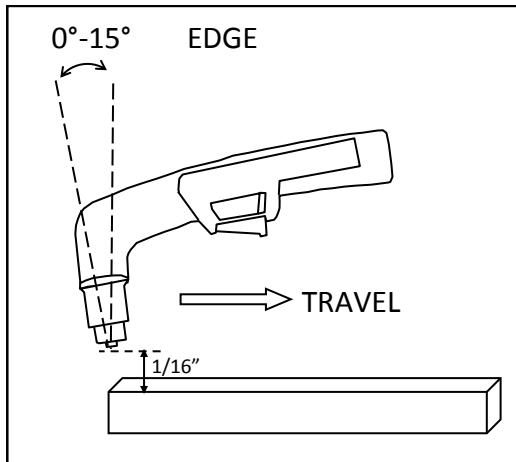
1. Turn the welder on. Allow time for power up cycle to complete its start up process.
2. Select either HF or Lift Start TIG with the HF/Lift Start/Stick/Cut selector switch. Select an AC wave form or DC mode.
3. Plug in the TIG torch and select 2T, 4T, Pedal, 2T Pedal, or 4T pedal mode with the selector switch.
4. If using the torch switch or foot pedal, set start/end amps amperage by rotating the knob to increase or decrease amps.
5. If using the torch switch, select up/ down slope time by rotating the knob to increase/decrease the ramp up or ramp down time of the amperage.
6. Adjust amps with amp control knob.
7. Start arc as depicted above.
8. If using 2T, continue to hold the torch switch until you are ready to stop welding. Release the switch. The Arc will then cease.
If using pedal raise foot fully off the pedal and arc will stop automatically.
9. If using 4T, release the switch, after arc initiates. Continue to weld without holding the switch down. To stop, press and release the switch again.



1. Turn on the power switch on the rear of the unit. Allow unit to cycle through its start up program.
2. Select the Stick mode with the HF/Lift Start/Stick/Cut selector switch.
3. Make sure electrode holder is located in the positive connector and the work clamp is located in the negative connector.
4. Select the welding amps desired. Use the electrode diameter selection chart in this manual to determine the approximate range of amps suitable for the rod size selected. Consult the welding electrode manufacturer's recommendation for the proper amperage range. Each manufacturer has specific recommendations for its electrodes, so exact settings may vary.
5. Use the arc force control to select the desired arc characteristics, creating the desired arc characteristic and automatic amp response needed to maintain the arc when voltage falls below the threshold. 6010 and 6011 Cellulose electrodes will require more arc force control than other rods, but each brand and size will weld a little differently. The arc force control setting will vary from person to person as well. Different rod angles, positions, and arc lengths all factor into the arc force control performance and exact setting required.
6. Adjust hot start time and intensity to create a hotter start than the actual weld current to prevent rod sticking and improve starting reliability.
7. Strike the arc with either the tapping method or the match strike method. Beginners usually find that the match strike method yields best results. Professionals tend to gravitate toward the tapping method because of its placement accuracy which helps prevent arc striking outside of the weld zone.

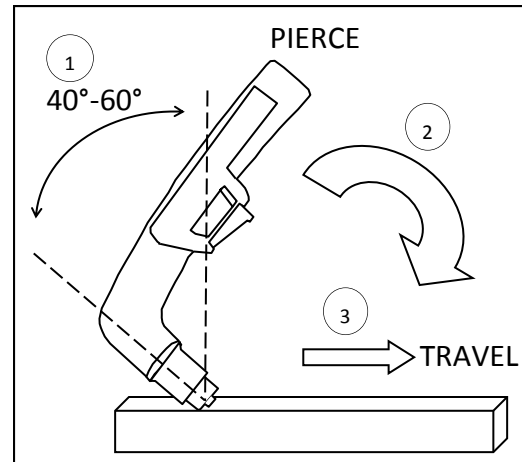
IMPORTANT: Do not attempt to weld in the TIG mode with the Stick electrode holder or Plasma torch still attached. **Do not attempt to select a new process with another torch attached to prevent accidental damage to the unit and torch!**

Plasma Cutting Technique



Edge Starts are the best type of start if possible to promote consumable and torch life. This reduces blow back of molten material and allows a smooth gradual start of the cut.

1. Line up the hole on the tip of the electrode on the edge of the cut. Hold torch perpendicular to the cut initially, about 1/16" off the metal. Slide the yellow safety lock and squeeze the trigger. Wait for arc to start.
2. Once the arc starts, wait for the arc to penetrate all the way through the metal.
3. As the torch penetrates its flame all the way through the metal, tilt the torch so there is a slight lead in the flame if metal is thin. If it is thick, keep holding torch in a nearly vertical position.
4. Begin moving the torch in the direction of the cut. Maintain 1/16" standoff height.
5. Move the torch fast enough so the sparks and flame trails from the bottom edge at an angle of no more than 30° and no less than 10° from perpendicular to the metal. Excess angle of sparks/flame indicate too fast of travel speed or practical cut capacity has been reached. Little or no angle indicates too slow of travel speed.



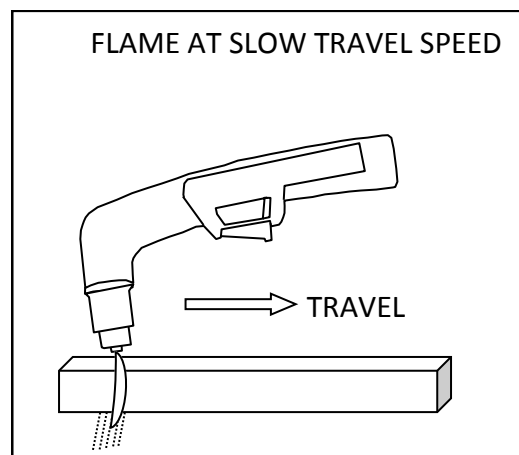
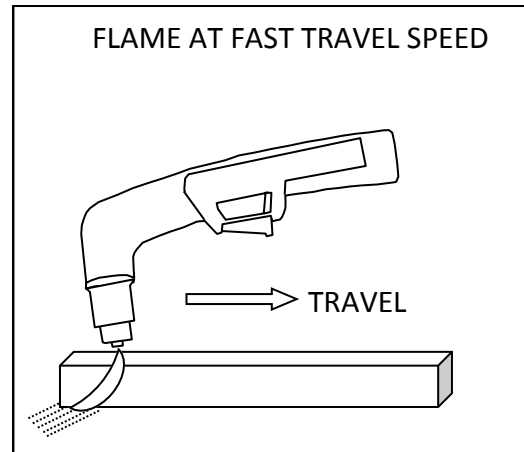
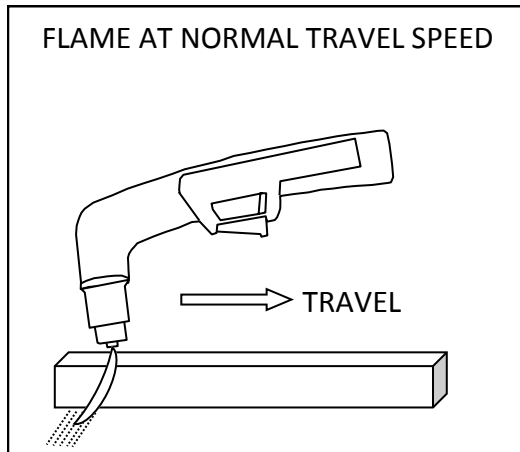
Piercing starts often result in rapid consumable wear and excess blow back of molten metal deposited onto torch and consumables. This should be performed only as necessary.

1. Tilt the torch in the direction of travel or toward the side of the metal to be discarded or wasted at a 40° to 60° angle. Slide the yellow safety lock and squeeze the trigger. Wait for arc to start.
2. Once the arc starts, wait for the arc to transfer from pilot arc to the cutting arc.
3. As the torch penetrates its flame at an angle rotate the torch slowly to the vertical position, as the arc penetrates the metal. Tilt the torch from 0°-15° for thin metal cuts, or hold it nearly perpendicular for thicker metal cuts.
4. Begin moving the torch in the direction of the cut. Maintain 1/16" standoff height.
5. Move the torch fast enough so the sparks and flame trails from the bottom edge at an angle of no more than 30° and no less than 10° from perpendicular to the metal. Excess angle of sparks/flame indicate too fast of travel speed or practical cut capacity has been reached. Little or no angle indicates too slow of travel speed.

IMPORTANT PLASMA CUTTER OPERATING NOTES:

- 1) If you use a standoff guide with the torch, it must be adjusted to provide no more than 1/8" standoff, less if possible. Too much standoff reduces cut capacity and quality. Kerf and dross will be increased. It will also increase consumable wear and may prevent the pilot arc from correctly transferring to the work piece. However, do not drag the consumables unless you are using shielded consumables.
- 2) If arc fails to transfer check the work clamp connection. Make sure the work clamp is directly contacting the metal to be cut and is on a clean section of metal. If not reroute the work-clamp so that it directly contacts the metal. If necessary, grind a spot clean to ensure good contact.
- 3) The design of the blow back start **may** cause a slight delay in the arc as the air pressure must built inside the torch tubing and head to create the pressure needed to force the electrode off the nozzle seat. This may take up to two seconds. Restarting the arc with the post flow going may not cause a delay. If the torch does not light after 3 seconds, let go of the trigger and press it again. **If arc or arc start is inconsistent or otherwise unstable check the nozzle and electrode for tightness and wear. Also make sure the swirl ring is installed and not damaged.**

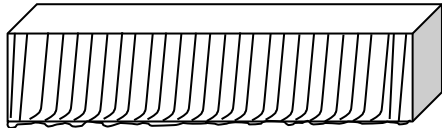
TIP: For longer consumable life do not use the pilot arc unnecessarily. Select the 3 second pilot arc feature and do not fire the torch unless you are near the metal and ready to cut. For expanded metal cutting be sure to select "Normal" to re-fire the pilot arc automatically.



NOTE: When stepping down amps to cut thinner material, you must change to smaller orifice nozzle. Standard nozzle supplied is rated for 50-60 amp cutting. Nozzles are offered through in different sizes which are appropriate for different amp levels. Too large of a diameter orifice will result in arc instability and a rough cut. Lowering the air pressure below 65 psi to try to get the torch to cut will only result in a lazy, wandering arc.

IMPORTANT: Check consumables regularly for wear and change them out before they are completely worn. Allowing the consumables to wear until they quit working may damage related torch components, creating a more costly repair.

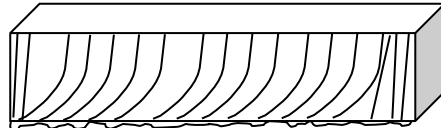
**RESULTS OF CUT AT CORRECT SPEED,
AIR PRESSURE AND TORCH ANGLE**
SMOOTH, EVEN CUT LINES WITH A S REARWARD SWEEP



MINIMAL EASY TO CLEAN DROSS

This diagram shows a 3D perspective of a rectangular metal piece with a cut. The cut surface is smooth and even, with a slight rearward sweep. An arrow points to the bottom edge of the cut, which is labeled as having minimal, easy-to-clean dross.


RESULTS OF CUT AT FAST SPEED
ROUGH, DISTINCT CUT LINES SPACED FAR APART



NOTICEABLE SMALL, HARD DROSS

This diagram shows a 3D perspective of a rectangular metal piece with a cut. The cut surface is rough, with distinct, widely spaced lines. An arrow points to the bottom edge of the cut, which is labeled as having noticeable, small, hard dross.

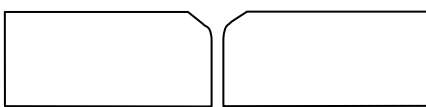
RESULTS OF CUT AT SLOW SPEED
VERTICAL CUT LINES



SIGNIFICANT SOFT, POROUS DROSS

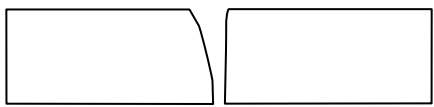
This diagram shows a 3D perspective of a rectangular metal piece with a cut. The cut surface is characterized by vertical cut lines. An arrow points to the bottom edge of the cut, which is labeled as having significant, soft, porous dross.

**RESULTS OF TOO MUCH CURRENT OR
TOO MUCH STAND OFF HEIGHT
(SIDE VIEW)**
MELTED TOP EDGE



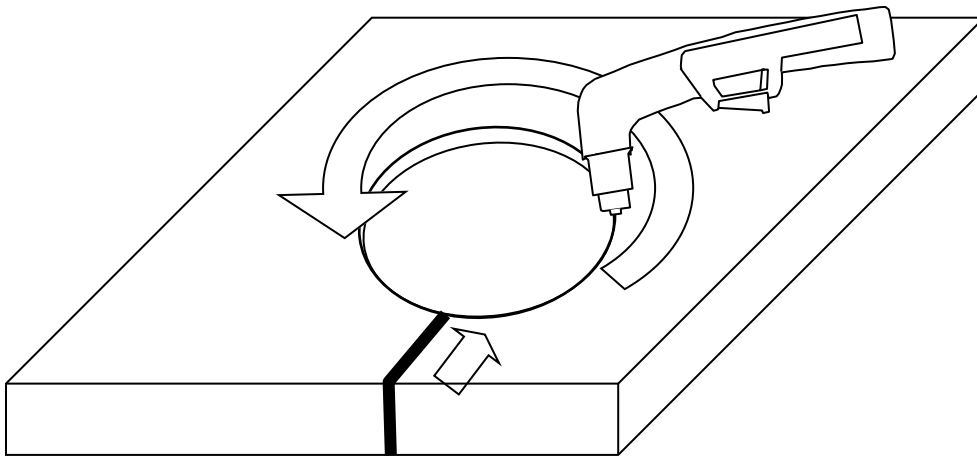
This diagram shows a side view of a cut. The top edge of the cut is melted and rounded. The diagram consists of two rectangular shapes representing the cut and the remaining metal piece.

**RESULTS OF WORN CONSUMABLE(S)
OR LOW AIR PRESSURE
(SIDE VIEW)**
SEVERLY ANGLED CUT AT TOP

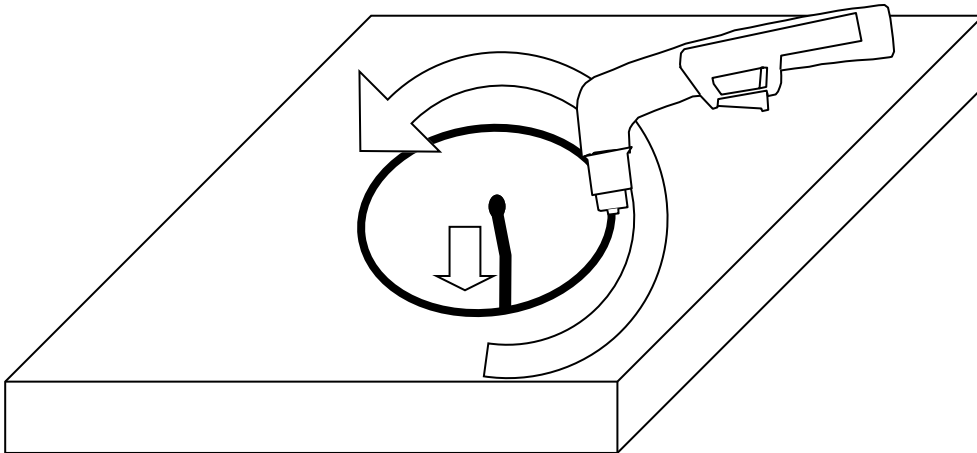


This diagram shows a side view of a cut. The top edge of the cut is severely angled. The diagram consists of two rectangular shapes representing the cut and the remaining metal piece.

AN EXAMPLE OF CUTTING A LEAD-IN WHEN CUTTING OUT A DISK SHAPED OBJECT



AN EXAMPLE OF CUTTING A LEAD-IN WHEN CUTTING HOLE IN AN OBJECT



NOTE: When cutting an object, particularly a pattern shape, where the torch must pierce or re-fire in-line at an intersection of a cut, a lead-in cut should be employed. A lead-in is a cut that is made in the disposable part (also known as a drop) of the object to “lead” into the main part of the cut so that the destructive force of the arc is not directed into the desirable side of the cut itself. Also, all plasma cutters exhibit some angularity or bevel in the cut which is greater on one side than the other. Keep this in mind when cutting an object to size to prevent too much metal from being accidentally removed.

GENERAL POLARITY RECOMMENDATIONS*

*Follow manufacturer of stick electrode for complete polarity recommendations

PROCESS	TORCH POLARITY	WORK POLARITY
TIG (GTAW)	-	+
STICK (SMAW)	+	-

TIG (GTAW) OPERATION GUIDE FOR STEEL (ALUMINUM)*

*As a general rule, set amperage using 1 amp for every .001" of metal thickness for aluminum. Less is required for DC.

METAL THICKNESS	WELDING AMPS (A)	TUNGSTEN DIA.	Ar FLOW RATE
1-3 mm/.040"-1/8"	40-80 (60-125)	1-2 mm/.040"-3/32"	8-15 CFH /4-7 lpm
3-6 mm/ 1/8"-1/4"	80-200 (125-200)	2-3 mm/ 3/32"-1/8"	15-25 CFH/ 7-14 lpm
6-10 mm 1/4"-3/8"	150-200 (200-250)	3-6 mm/ 1/8"-1/4"	20+ CFH/10-15 lpm.

STICK (SMAW) OPERATION GUIDE

METAL THICKNESS	ELECTRODE SIZE	WELDING AMPS
< 1 mm/.040"	1.5 mm/ 1/16"	20-40
2 mm/.080"	2 mm/3/32"	40-50
3 mm/ 1/8"	3.2 mm/1/8"	90-110
4-5 mm/ 3/16"	3.2-4 mm/ 1/8"	90-130
6-10 mm/ 1/4"-3/8"	4-5 mm/ 1/8"-5/32"	130-200

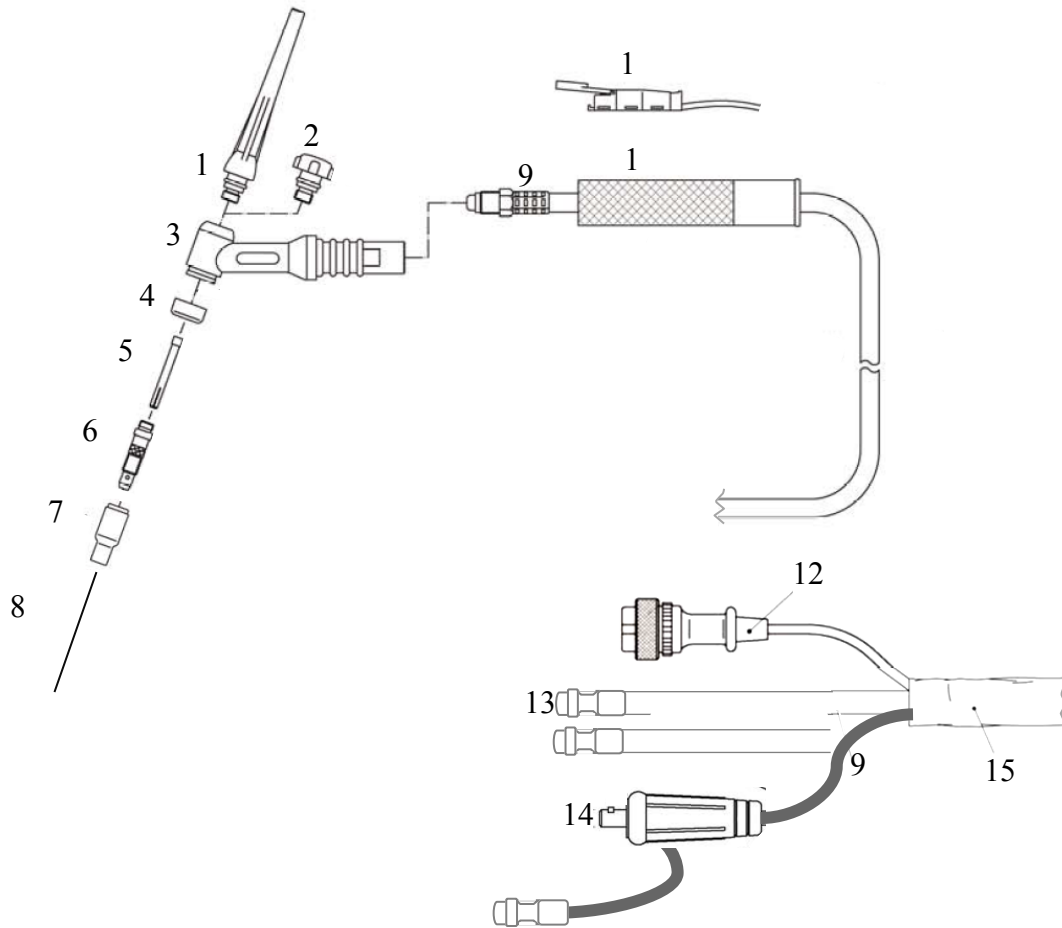
TUNGSTEN SELECTION GUIDE FOR AN INVERTER

TYPE	PERCENT	COLOR	PROCESS	RECOMMENDATION
Pure	100% Tungsten	Green	AC	NOT RECOMMENDED! Do not use in an inverter.
Thoriated (slightly radioactive)	2% Thorium	Red	AC/DC	YES. Great for all purpose welding. Most economical.
Ceriated	2% Ceria	Orange	AC/DC	YES. Good for low amp use.
Lanthanated	1.5% Lanthanum	Gold	AC/DC	YES. Best alternative to 2% Thoriated. Tough performer.
Lanthanated	2% Lanthanum	Blue	AC/DC	YES. Slight advantage over 1.5% Lanthanated.
Zirconiated	1% Zirconia	Brown	AC	NOT RECOMMENDED! Do not use in an inverter.

NOTE: Thoriated tungsten is slightly radioactive, but is commonly used in the US. Care should be used when grinding so as not to breath the dust. If you have concerns about Thoriated (red) tungsten, choose from Lanthanated or Ceriated tungsten.

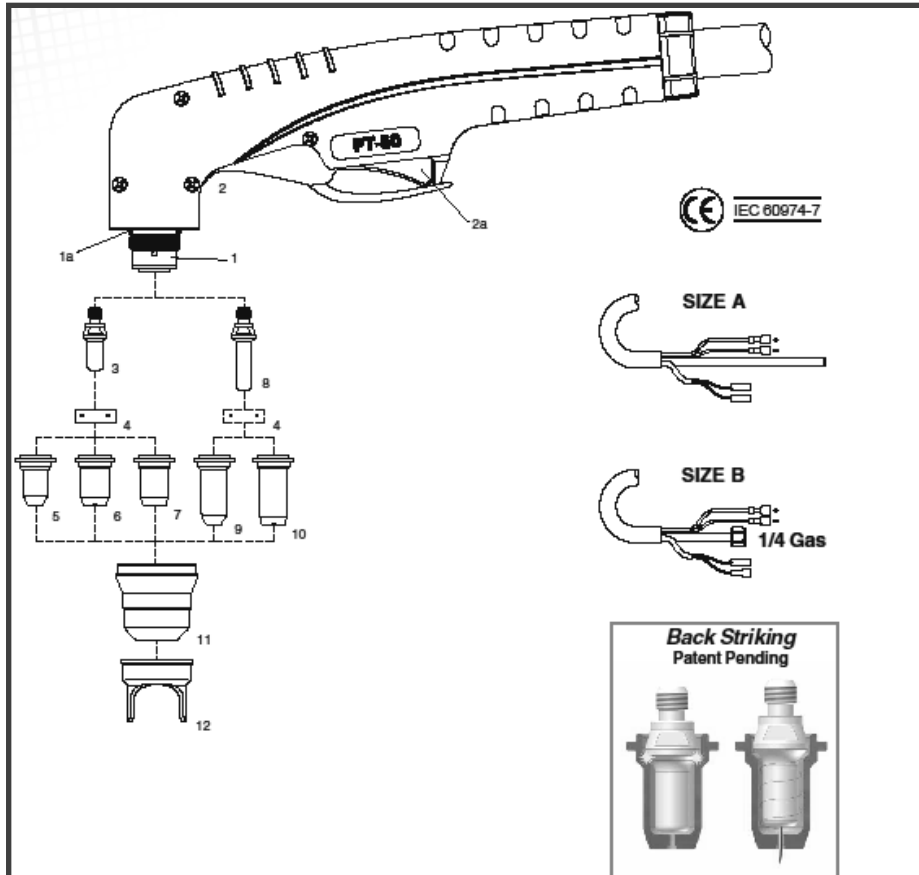
EXPANDED VIEW OF TIG TORCH

(Actual appearance may vary slightly from what is listed.)



NO.	Basic part diagram for 18 or 20 Series Torch (STYLE MAY VARY)	QTY.
1	Long Back Cap with O-Ring	1
2	Short Back Cap	Opt.
3	Torch Head	1
4	Insulator	1
5	Collet 1/16 or 3/32	1
6	Collet Holder	1
7	Ceramic Cup #5,6, or 7	1
8	Tungsten (customer supplied)	0
9	Torch Cable	1
10	Torch Handle (Blue ergo handle std, not pictured)	1
11	Torch Switch (Built into ergo handle, separate on straight handle)	1
12	Torch Switch Connector	1
13	9mm (1/8") b quick connect coupling (male)	1
14	Power Connector	1
15	Protective Synthetic Rubber Cover	1

POWERPRO 205 IPT/PT 60 PLASMA TORCH*

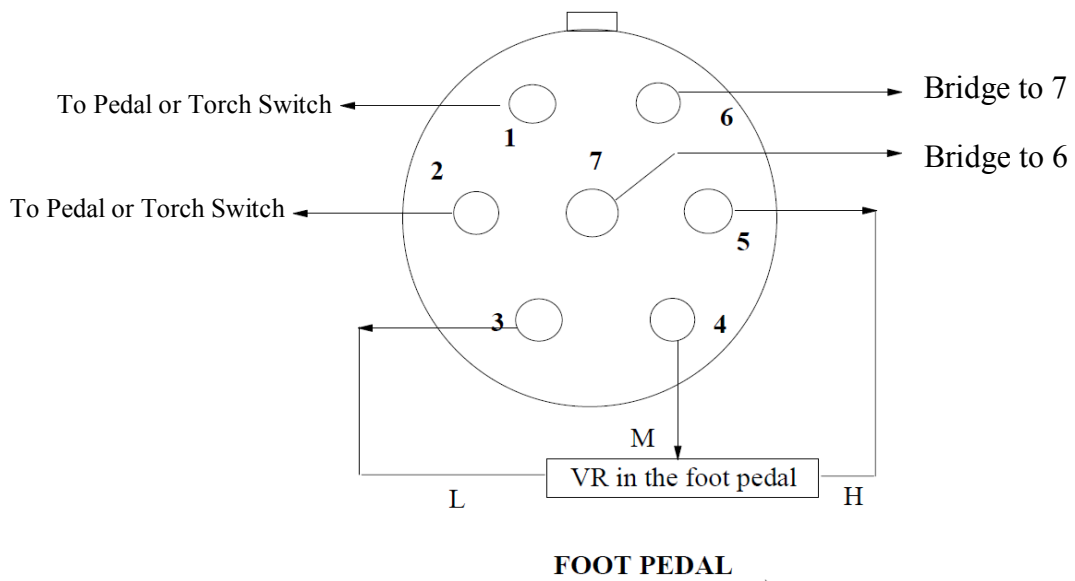


Torch parts		
Item#	Description	Catalog #
1	● PT-60 70° Torch Head	09603
1a	● O-Ring	51620.60
2	● Handle with Switch	09605
2a	● Switch	07301.20
3	● Electrode, Back Striking	52582
4	● Gas Distributor	60028
5	Tip, Contact Cutting, ø 0.65, 10-20A, Back Striking	51318.06
6	Tip, Contact Cutting, ø 0.8, 20-30A, Back Striking	51318.08
7	Tip, Contact Cutting, ø 0.9, 30-40A, Back Striking	51312P.09
8	Extended Electrode, Back Striking	52583
9	Extended Tip, Contact Cutting, ø 0.65, 10-20A, Back Striking	51318L.06
10	Extended Tip, Contact Cutting, ø 0.8, 20-30A, Back Striking	51318L.08
11	Retaining Cap, 6 holes	60389
	Retaining Cap, 6 holes, Maximum Life	60389S
12	● Double Pointed Spacer (for use with item. 5 and 7 only)	60432
N/S	● Wrench for electrode	60368

Current :	10-60 Amps
Duty Cycle:	60 Amps 80%
Gas:	Air/N2
Gas Pressure:	65-75 psi (4.4-5.0 bar)
Gas Flow:	230 scfh (110 lpm)
Pilot :	Electrode to Tip
Ignition:	Without HF

* Note: Not all items, accessories or parts are sold directly through Everlast. In this case parts are provided as general information. Everlast is not the manufacturer of the Innotec/Tec.mo PT/IPT 60 torch nor is it affiliated with either company other than as an OEM supplier of the torches. More Innotec and Tec.mo torch parts and consumables are available from national distributors of the Innotec/Tec.mo brands. Innotec and Tec.mo are trademarked brands. Information courtesy of Tec.mo. Back striking design is patented.

7 PIN CONNECTOR FOR 47K/22K Ω FOOT PEDAL OR AMP TROL



SECTION 4**TROUBLE SHOOTING**

TROUBLE:	CAUSE/SOLUTION
Machine will not turn on.	Check cords and receptacle wiring. Check circuit breaker.
Machine runs, but will not weld in either mode.	Check for sound work clamp and cable connections. Make sure work cable and TIG Torch are securely fastened to the Dinse style connector. Reset main power switch if overcurrent light is on. Contact Technical Support.
Arc will not start unless lift started or No "spark".	Too long of stand off. Failed HF module. Contaminated tungsten. No tungsten or stick out too short.
Tungsten is rapidly consumed.	Inadequate gas flow. Too small of tungsten. Wrong shielding gas or contaminated shielding gas. Use only Ar. Using green tungsten. Use red thoriated or other color. Wrong polarity . Too much AC cleaning.
Tungsten is contaminated, arc changes to a green color.	Tungsten is dipping into weld. Check and adjust stick out to minimum 1/8 inch. Tungsten is melting. Reduce amperage or increase tungsten size.
Porosity of the Weld. Discolored weld color. Tungsten is discolored.	Low flow rate of shielding gas. High flow rate of shielding gas. Too short of post flow period. Wrong TIG cup size. Possible gas leaks internally or externally due to loose fittings. Base metal is contaminated with dirt or grease.
Weld quality is poor and is dirty/oxidized with possible porosity.	Eliminate drafts. Check if there is sufficient shielding gas left in tank. Check gas flow. Adjust for higher flow of gas. Listen for audible click of gas solenoid. If no click is heard, then contact Everlast Support. Clean weld properly, especially in Aluminum. Too short of post flow time. Check tungsten stick out. Consider using gas lens.
Over current/Duty cycle LED illuminates. Machine runs, but no output with code.	Duty cycle exceeded or Over current. Allow machine to cool. Reset main power switch after full cool down period. Make sure fan is not blocked. Check wiring. Loose cord.
Unstable Arc.	Poorly ground or shaped tungsten. Regrind to proper point. Too much stand off height. Drafty conditions. Welder fan is blowing on weld area. Move welder to a cart. Wrong polarity. Aluminum: Too much AC positive polarity. Reduce balance to 30% or less. Increase AC Frequency. Possible magnetized base. Reroute cables and/or coil around table leg. Work clamp too far from work piece. Move work clamp close to weld area and clamp direct.
HF spark but no welding arc (often referred to as seeing lightning bolt or small blue spark)	No ground connection. Wrong polarity. Too great of distance between tungsten and work piece. Too large of tungsten with too little amps. Contact Everlast after checking all above issues for possible internal issue.
Unstable arc or irregular starts at low amps. Arc flashing on and off, oscilating between HF and arc.	Start amps/End amps too low for tungsten diameter. Use smaller tungsten. Too far from work piece or inconsistent/shaky standoff height. Reduce tungsten to work distance to 1/32" to 1/16" for low amp start. Move work clamp.
Other issues.	Contact Everlast support.

SECTION 4**TROUBLE SHOOTING**

PLASMA TROUBLE SHOOTING:	CAUSE/SOLUTION
Air Flows but arc does not start within 2-3 seconds.	Check consumables for wear and tightness. Check fuse. Check Air Pressure. Sticky or slow spring/piston on torch blow back mechanism. Release trigger and try again. Preflow turned on.
Air Flows but arc does not start or spark when nozzle is rubbed on the metal.	Pre Flow is turned on. Fuse blown. Missing swirl ring. Worn or loose consumables. IGBT issue. PCB issue.
OK to cut light is not on. Will not start arc.	Increase air Pressure. Make sure air is connected.
Pilot arc will not light.	Fuse blown. Check fuse. Make sure consumables are correct.
Pilot arc will not transfer and amps read approximately 25-27 amps while switch is held. (Arc barely cuts or only "scratches" the surface of the metal or cut is extremely slow on thin materials.)	Check work clamp connection. Make sure rust is removed from work clamp contact area. Faulty Clamp. Arc continuity is not being sensed. If these steps do not correct the issue, contact Everlast.
Arc Sputters.	Inadequate air flow or air pressure. Improperly sized nozzle. Decrease size as amps are lowered. Increase air pressure to 70-75 psi while air is flowing through torch. Loose consumables. Check tightness.
Consumables are dirty, smutty looking upon inspection. Premature wear on consumables. Shortened consumable life.	Moisture, oil contamination of consumable. Wrong consumables. Poor quality aftermarket consumables.
Premature wear on consumables. Short consumable life. Uneven wear of consumables, melting of cup.	Moisture, oil contamination of consumable. Excessive pilot arc time. Improper cutting technique. Wrong piercing technique. Wrong/mismatched consumables.
Arc will not start. Air will not flow. Machine runs.	Torch cup is loose, safety contact pins dirty or not making contact with cup face. Torch switch wire is loose. Problem with connector. Torch is not properly connected.
Arc will not start. Air flows. Machine runs.	Swirl Ring damaged or missing. Wrong Polarity. Wrong process selected.
Unstable Arc at lower amps.	Consumable orifice size is too large. Reduce orifice size. Wrong air pressure. Poor work clamp connection. Check clamp and connectors.
Arc tries to start but irregular, dancing arc and/or arc melts through side of nozzle.	Missing swirl ring, or worn electrode or both. Check and replace. Make sure swirl ring is not cracked.
Arc will try to start if touched to the metal, but no air flow while switch is pressed.	Stuck or dirty solenoid valve. Contact Everlast. Wrong Process selected.
Air flows continuously.	Post flow turned set too long. Preflow is turned on. "Gas Test" is selected. Solenoid is stuck. Contact Everlast.
Excessively Beveled Cut.	Worn consumables, too high of stand-off height.
Cup and/or nozzle is melting or cracking.	Improper cutting technique/excessive piercing.
Power input circuit breaker trips repeatedly.	Improperly sized circuit. Internal issue. Contact Everlast.
Arc "Blows Out" when ready to cut.	Too high of air pressure. Reduce to 72 psi. Use smaller nozzle
Arc will not stop when switch is released.	Unit is in 4T. Switch to 2T. Torch trigger is stuck.

SECTION 4**TROUBLE CODES**

TROUBLE CODE WITH WARNING LIGHT/ UNIT STOPS WELDING BUT IS TURNED ON.	DIAGNOSIS
801	OVER OR UNDER VOLTAGE. Check power input cable for length/size, check input voltage. Running on poor quality power supply or dirty/low power from generator.
802	OVER CURRENT. Check to make sure input power cable is correct length and size. Internal unit fault or low input voltage. Possible issue running on generator .
804	OVER TEMPERATURE/DUTY CYCLE EXCEEDED. Allow unit to rest for at least 15 minutes while running. Do not turn the unit off. Allow the fan to continue to cool the unit. Check for obstructions, clean welder and heat sinks. Make sure unit is unplugged for 30 minutes before opening up for cleaning.
805	TORCH SWITCH IS STUCK CLOSED. Turn off welder immediately and check torch switch for stuck contact. Check foot pedal for complete return or stuck micro-switch. Do not hold down the switch or pedal without attempting to strike an arc. Doing so for more than 2 seconds without starting will cause this error code.
806	Air Pressure is too low (Plasma).
OTHER/No Code displayed	CONTACT EVERLAST

NOTES: