

# **EVERLAST**

## **POWERARC 280STH**

### **DIGITAL STICK/TIG (SMAW/GTAW) WELDER**

- CC**  
|
- GTAW-P**  
⚒
- SMAW**  
⚒
- IGBT**  
→
- 1-3**  
~  
**PHASE**
- DC**  
⚡



### *Operator's Manual for the PowerARC 280STH Safety, Setup and General Use Guide*

[everlastwelders.com](http://everlastwelders.com)

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Specifications and Accessories subject to change without notice.

## TABLE OF CONTENTS

Section.....	Page
Letter to the Customer .....	3
Everlast Contact Information.....	4
Safety Precautions.....	5
Introduction and Specifications.....	9
Unit Specifications.....	10
General Overview.....	11
General Use and Care.....	11
Quick Setup Guide, TIG Torch/Cooler Connection	12
Quick Setup Guide, Stick Polarity.....	13
Rear Panel Gas Connection and Wiring.....	14
Front Panel Features and Controls.....	15
Rear Panel Features and Controls.....	21
Welder Function Summary and Explanations.....	23
Tungsten Preparation.....	28
Lift Start and High Frequency Start.....	29
Stick Starting Methods.....	30
Recommendations for Polarity/Amps/Tungsten..	31
Expanded View of TIG torch.....	32
7 Pin Connector Pinout.....	33
Troubleshooting.....	34
Trouble Codes.....	35

**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 LLC 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 to download your current 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 of its terms and conditions.**

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 if off hours, or 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 \_\_\_\_\_

***EVERLAST***

Contact Information

Everlast US:

Everlast consumer satisfaction email: [sales@everlastwelders.com](mailto:sales@everlastwelders.com)

Everlast Website: [everlastwelders.com](http://everlastwelders.com)

Everlast Technical Support: [support@everlastwelders.com](mailto:support@everlastwelders.com)

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

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

11am-4pm PST Sat.

FAX: 1-650-588-8817

Everlast Canada:

Everlast consumer satisfaction email: [sales@everlastwelders.ca](mailto:sales@everlastwelders.ca)

Everlast Website: [everlastwelders.ca](http://everlastwelders.ca)

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Port Macquarie: 2B Pandorea Place Port Macquarie

(02) 8209 3389

After hours support: 0413 447 492

Everlast Technical Support: [support@pickproducts.com](mailto:support@pickproducts.com)

## **SAFETY PRECAUTIONS**

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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 to you. That is the reason we offer technical support to assist you with your needs should an occasion occur. 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 you in basic safety, operation and maintenance of your Everlast product to give you the best possible experience. Much of welding and cutting is based upon experience and common sense. As thorough as this welding manual may be, it is no substitute for either. Exercise extreme caution and care in all activities related to welding or cutting. Your safety, health and even life depends upon it. While accidents are never planned, preventing an accident requires careful planning.

**Please carefully read this manual before you operate your Everlast unit.** This manual is not only for the use of the machine, but to assist in obtaining the best performance out of your unit. Do not operate the unit 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 please contact Everlast Support.

The warranty does not cover improper use, maintenance or consumables. **Do not attempt to alter or defeat any piece or part of your unit, 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.



HF can interfere with pacemakers. 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 or 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 you are comfortable with proper operation and are able to assume inherent risks of cutting or welding.



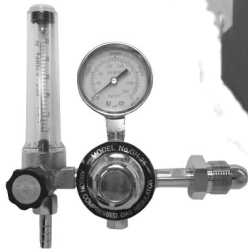
# PowerARC 280STH



15 ft. WP 18 Torch with  
DINSE 35 connector



Heavy Duty Work Clamp



Argon Regulator



Consumable Kit  
(Does not include Tungsten)



47K  $\Omega$   
Foot Pedal Assembly



Stick Electrode Holder

NOTE: Accessory and consumable appearance, style and quantity subject to change without notice.

**General overview:** The PowerARC 280STH is the most advanced welder in the PowerARC line, representing a new generation of digital SMAW/GTAW-P Everlast inverter welders. A Siemens microprocessor, IGBT modules, and an overall plug and play design improve reliability and reduces down time for service and repair. Touch pad design simplifies operation and

- A. Full bridge design features soft switching technology which further extends IGBT component life and extends its capabilities.
- B. DC output provides stable arc for Stick or Pulse TIG capability.
- C. Solid state High Frequency design for TIG arc starting has improved arc initiation down to 5 amps. True Lift start is included as a start option as well for low EMF starting.
- D. Features automatic over-voltage, over current and duty cycle protection (over-heat) with self diagnosing trouble code feature.
- E. Special Cellulose setting maximizes performance with E6010 and E6011 rods or any rod with a cellulose flux coating.
- F. Arc force control and Hot Start time and Hot Start intensity controls expand stick welding ability.
- G. A built in Voltage reduction (VRD) setting reduces OCV reducing chances of shock and electrocution while welding stick.

**General Use and Care:** The welders are good for use

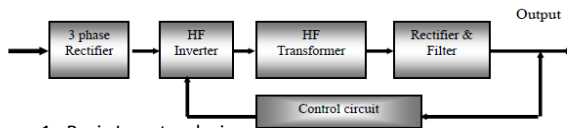


Figure 1. Basic Inverter design

Care should be taken to keep the unit out of direct contact with water spray. The unit is rated IP21S, which rates it for minimal contact with water. It is a good idea to remove the welder from the vicinity of any water or moisture source to reduce the possibility of electrocution or shock. Never operate in standing water or rain.

Every 1-2 months, depending upon use, the welder should be unplugged, opened up and carefully cleaned with compressed air. Regular maintenance will extend help extend the life of the unit.

**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 2 ft from all sides if possible, with a minimum distance of at least 18".** 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 panel is protected from damage while welding and cutting operations by flipping down the clear protective cover.

**Duty Cycle.** The duty cycle of the PowerARC 280STH is set at 60% at maximum operating amps in Stick and TIG modes. This rating is rated at the industry standard of 40° C operating temperature. This means the unit may operate at maximum amperage for up to 6 minutes out of every 10 minutes of run time without stopping for at least a 4 minute break. Duty cycle is rated as a percentage of time out of a 10 minute period of time that the welder can operate at a given amperage without rest. Duty cycle can be affected by temperature, humidity, and internal cleanliness of the welder. Overheat, over current, over voltage, and under voltage faults are indicated by a warning light accompanied with an error code. Do not operate the unit until the cause of the problem has been determined and corrected. Do not shut down an overheated welder until it has safely cooled. Do not cycle the power switch or to try to reset the machine until the unit has cooled for 15 minutes after an overheated condition has been indicated. Once the overheat condition has been cleared, welding can resumed. Do not operate the welder with the covers removed. In case of other troubles follow the trouble diagnosis section and/or call Everlast Technical support.

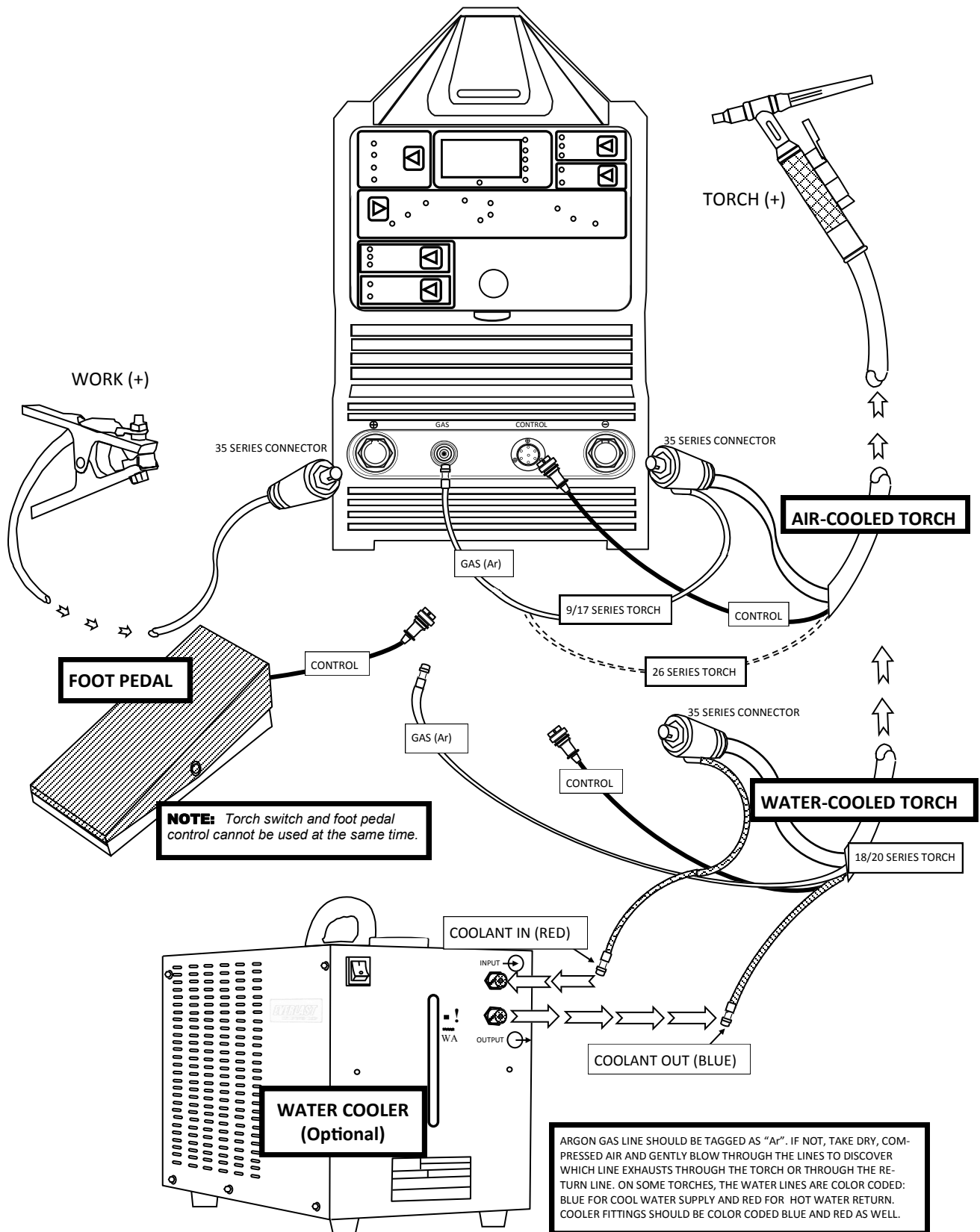
**This manual has been compiled to give an overview of operation and is designed to offer information centered around safe, practical use of the welder.** Welding is inherently dangerous. Only **YOU**, the operator of this welder, can ensure that safe operating practices are followed, through the exercise of common sense practices and safety training. Do not operate this machine until you have fully read the manual, including points of safety. **If you do not have the skill, and/or knowledge to safely operate this welder, do not use this welder until formal training regarding safe operation of this welder has been received.**



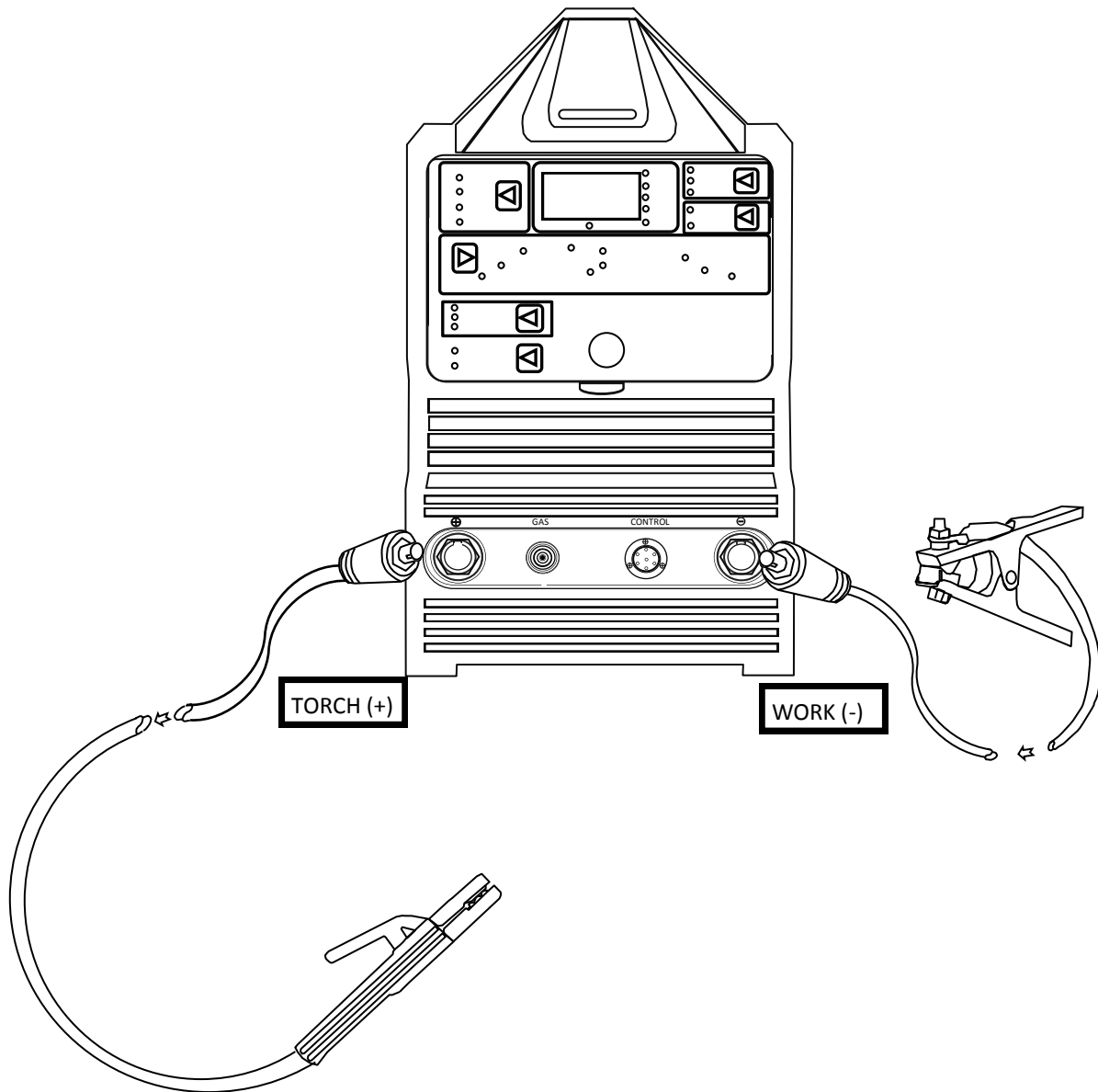
**SECTION 1****INTRODUCTION AND SPECIFICATIONS**

<b>PowerARC 280STH Stick/TIG welder</b>	<b>Specification</b>
<b>Process</b>	DC SMAW/DC GTAW
<b>Inverter Type</b>	Digital Microprocessor Controlled, IGBT Module
<b>Minimum/Maximum Rated Output Stick</b>	5A/10.2 V - 250 A/30V
<b>Minimum/Maximum Rated Output TIG</b>	5 A/10.2 V - 280A/21.2V
<b>TIG Start Type</b>	Solid State HF and Lift Start
<b>HF Point Gap</b>	Non-Adjustable Gapless Solid-State Design
<b>Stick Duty Cycle @ Rated Amps/Volts</b>	60% @ 250A/ 30V 100% @ 200A/ 28V
<b>TIG Duty Cycle @ Rated Amps/Volts</b>	60% @ 280A/ 21.2V 100% @ 220A/ 18.8V
<b>OCV (U<sub>o</sub>) /VRD Voltage</b>	75 V/<24V
<b>Voltage Input (U<sub>i</sub>)</b>	220/ 240 V; 50/60Hz 1~3 ph
<b>Maximum Inrush Amps (I<sub>1MAX</sub>)</b>	52A @ 220 V 1 phase, 30A @ 220V 3 phase
<b>Maximum Operating Amps (I<sub>1EFF</sub>)</b>	42A @ 220V 1 phase, 24A @ 220V 3 phase
<b>Gas Pre-Flow /Post Flow Time</b>	0-10 Seconds/ 0-25 Seconds
<b>Start Amps/End Amps</b>	Start: 5-280A / End: 5-280A
<b>Up/Down Slope</b>	Up: 0-25Seconds / Down: 0-25 Seconds
<b>Pulse Frequency Hz (Pulses Per Second)</b>	.5-250 Hz
<b>Pulse Amps (Ratio)</b>	5-95%
<b>Pulse Time On (Balance)</b>	5-95%
<b>Stick Arc Force Control</b>	0-100%
<b>Stick Surge Amp Control (Hot Start Intensity)</b>	0-100%
<b>Stick Surge Amp Duration (Hot Start Time)</b>	0-2.0 Seconds
<b>Minimum Water Ingress Protection Standard</b>	IP21S
<b>Efficiency</b>	>/= 80%
<b>Cooling Method</b>	Full Time High Velocity Fan
<b>Dimensions (approximate)</b>	17.5" H X 9.25" W X 22" L
<b>Weight (Bare Unit)</b>	55 lbs

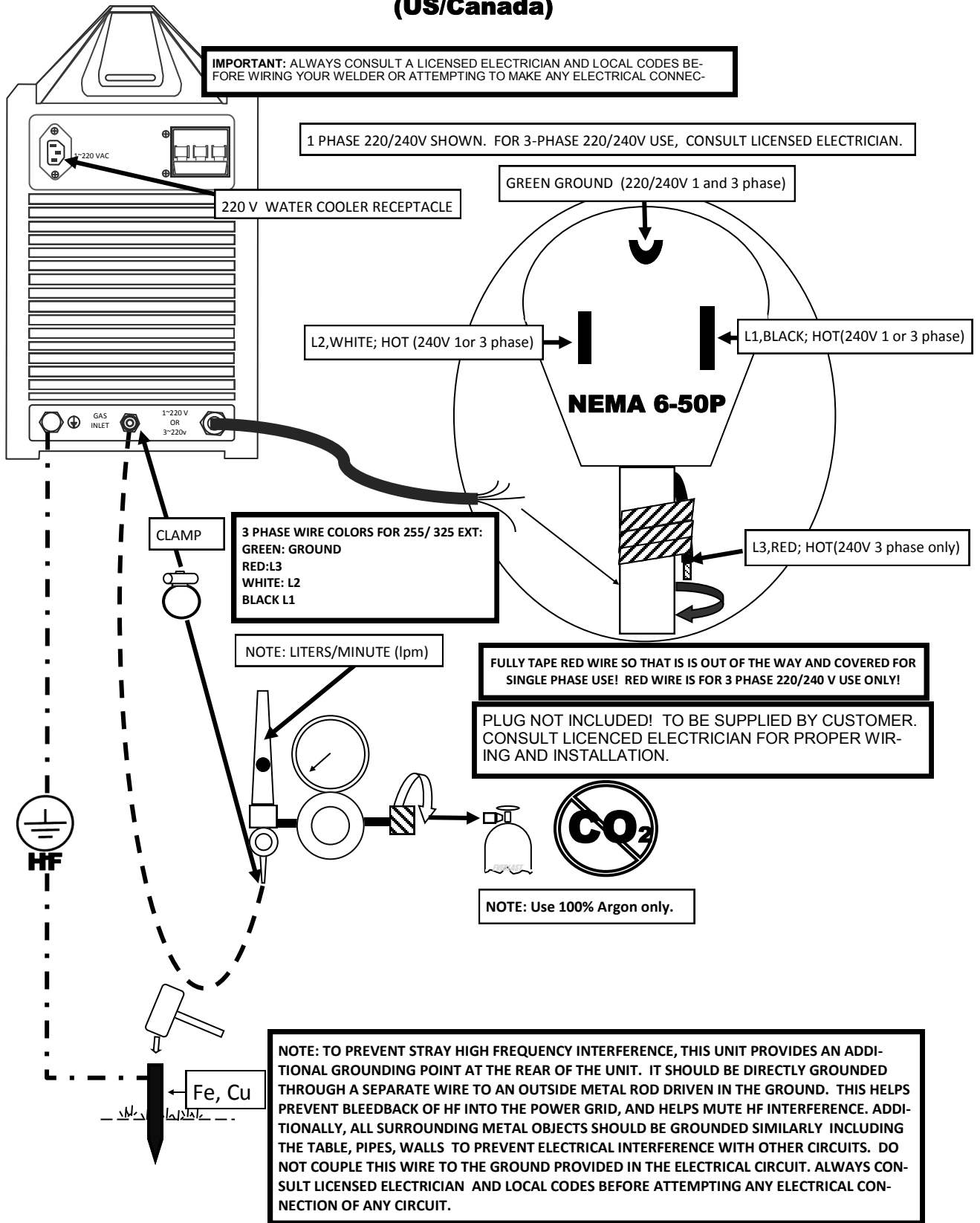
QUICK SETUP GUIDE: TIG CONNECTIONS



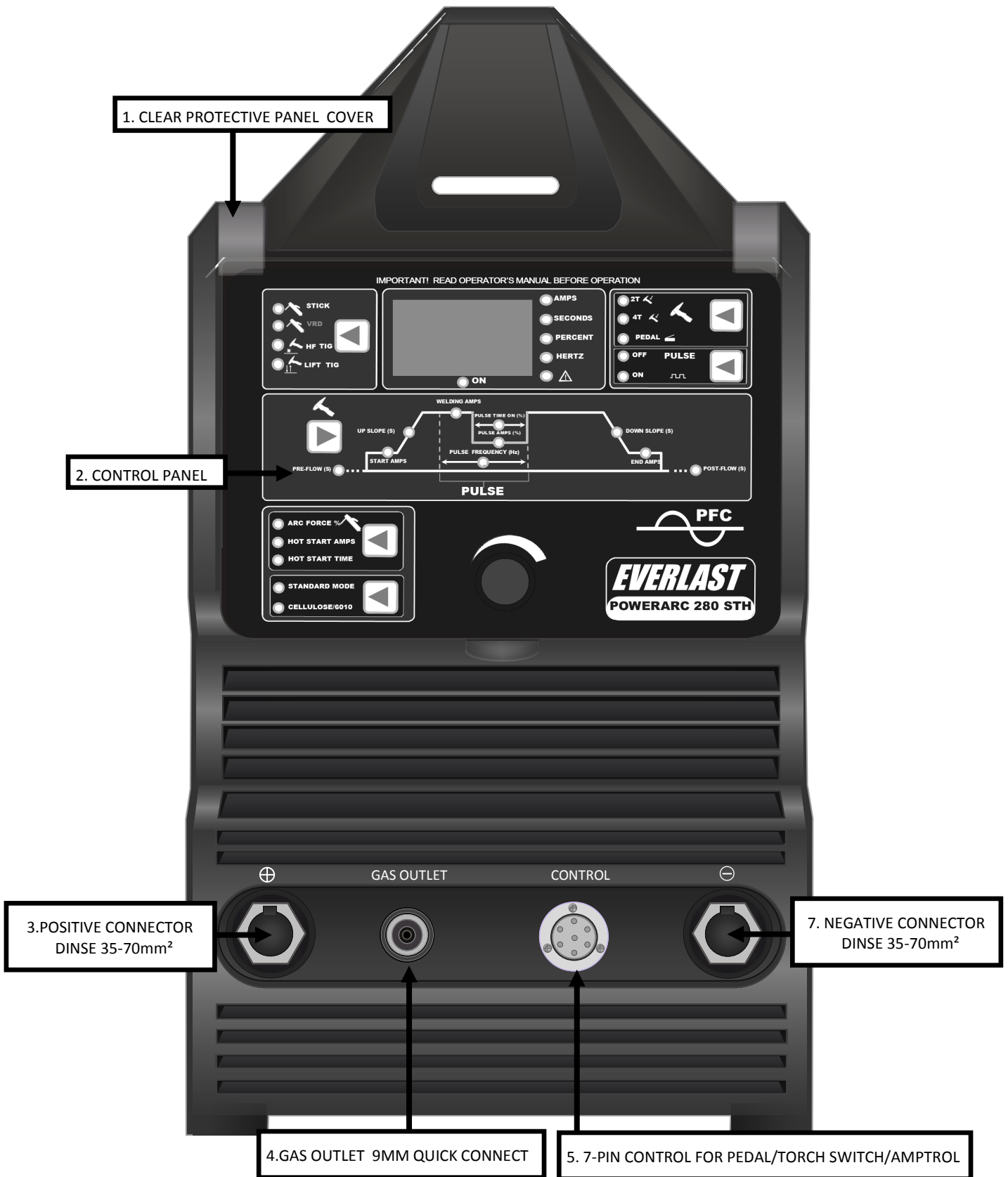
**QUICK SETUP GUIDE: STICK POLARITY AND CONNECTIONS**



**QUICK SETUP GUIDE: REAR CONNECTIONS AND WIRING (US/Canada)**



FRONT PANEL FEATURES AND CONTROLS POWERARC 280STH



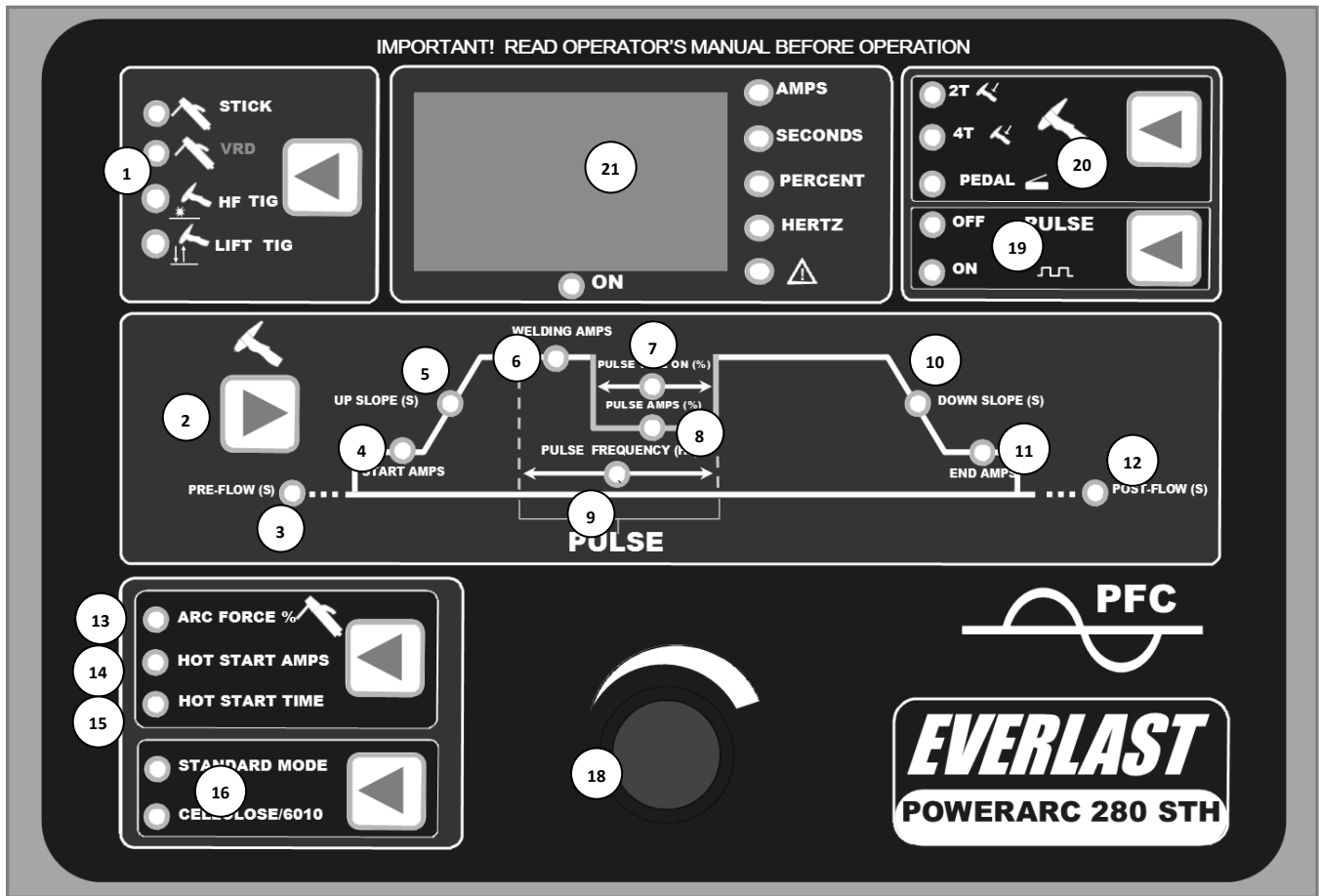
**FRONT PANEL FEATURES AND CONTROLS POWERARC 280STH**

POWERTIG 255 EXT/325EXT MAIN PANEL FEATURES	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, 2T/4T/Pedal/Amptrol Control, and error code diagnosis.
3. Positive Connector	DINSE 35-70mm <sup>2</sup>	Location of the positive terminal connection. This is a standard 35 series connector. For Stick: Torch Connection (most electrodes). For TIG: Work Clamp Connection.
4. Gas Outlet Quick Connect	9mm	Connects the gas to the TIG torch. To connect: Push the torch fitting into the connect- or until the collar slides forward with a click. To Release: Slide the outer collar back.
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 hang- ing while using the pedal.
6. Negative Connector	DINSE 35-70mm <sup>2</sup>	Location of the negative terminal connection. This is a standard 35 series connector. For Stick: Work clamp Cconnection. For TIG: Torch connection.

**NOTES:**



FRONT PANEL FEATURES AND CONTROLS POWERARC 280STH



POWERARC 280STH	PARAMETERS	PURPOSE
1. Stick/TIG Process Selector	Stick Stick with VRD HF Start TIG Lift Start TIG	This selects the Stick, Stick with VRD, HF Start TIG, or Lift Start TIG mode. Stick is the default mode after start up. A Voltage Reduction Device (VRD) is required in some situations to reduce the risk of electrocution, therefore the VRD function is provided which provides <math><24V</math> OCV. The VRD reduces the Open Circuit Voltage (OCV) below 24 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 then a lifting motion to start the weld, similar to the tapping motion described within the manual. Rusty metals, or painted surfaces may make arc starting more difficult by offering too high of a resistance value for the unit to sense an arc strike attempt. The process selector offers the choice of Lift TIG which requires contact with the metal to initiate the arc and High Frequency Start which allows non contact starting of the arc. When in HF mode, the unit relies upon a gapless solid state HF module to start the arc, which is a more reliable and trouble free design than traditional point gap HF design. The lift start function provides a cold electrode for safety, and prevents accidental starts. This requires that the pedal or torch switch must be used to energize the arc. HF refers to the start type only. See more about Stick and TIG arc starting methods on page 29.
2. Function Selector	Normal, AC,DC	This touch pad button selects for the following functions to be adjusted, such as preflow, start amps, upslope, welding amps, downslope, end amps and postflow. It also selects pulse functions when pulse is activated. If pulse is not turned on, the pulse function will be skipped over. Certain functions (depending upon the 2T/4T amptrol or foot pedal selection) may also be skipped over, depending upon routine programming updates in later versions.
3. Pre-Flow	0-25 Seconds	Pre-Flow sets the gas flow time before the arc starts after the trigger or pedal is pressed. 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 first "blast" of argon is settled. (about .3-.5 seconds) <b>Pre-flow delays the arc start by the amount of time set.</b>

## FRONT PANEL FEATURES AND CONTROLS POWERARC 280STH

POWERARC 280STH	PARAMETERS	PURPOSE
4. Start Amps	5-280 Amps	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. <b>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.</b>
5. Upslope	0-25 Seconds	Upslope ramps amps "up" 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. <b>If slope is set while in use with the foot pedal, sluggish or delayed amp acceleration after the arc is struck will result.</b>
6. Welding Amps	5-280 Amps	Welding amps define the top limit of amps at which the machine has been programmed to operate. Used with the foot pedal or 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. <b>When used with pulse, Welding Amps represents the high amp stage of the pulse cycle.</b>
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 pulse amp stage of the cycle during one full pulse. 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 (%)	5-95% of Welding amps	Governs the lower( base or background current) amp value during the pulse cycle as a percent of welding amps.
9. Pulse Frequency , Hertz (Pulses per second )	.5-250Hz	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 where filler metal is added. This helps improve appearance and uniformity. 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. <b>WARNING: WELDING AT HIGH PULSE FREQUENCIES INCREASES THE DECIBEL /NOISE LEVEL OF THE ARC. HEARING PROTECTION IS HIGHLY RECOMMENDED!</b>
10. Down Slope	0-25 Seconds	Down Slope will ramp amps "down" from the welding amp value to the end amp value to give time to fill the crater left at the end of the weld bead. For best operation, value should be set to 0 with 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. <b>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.</b> 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.
11. End Amps	5-280 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. <b>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.</b>
12. Post Flow	0-25 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 1-2 seconds post flow time for every 10 amps.

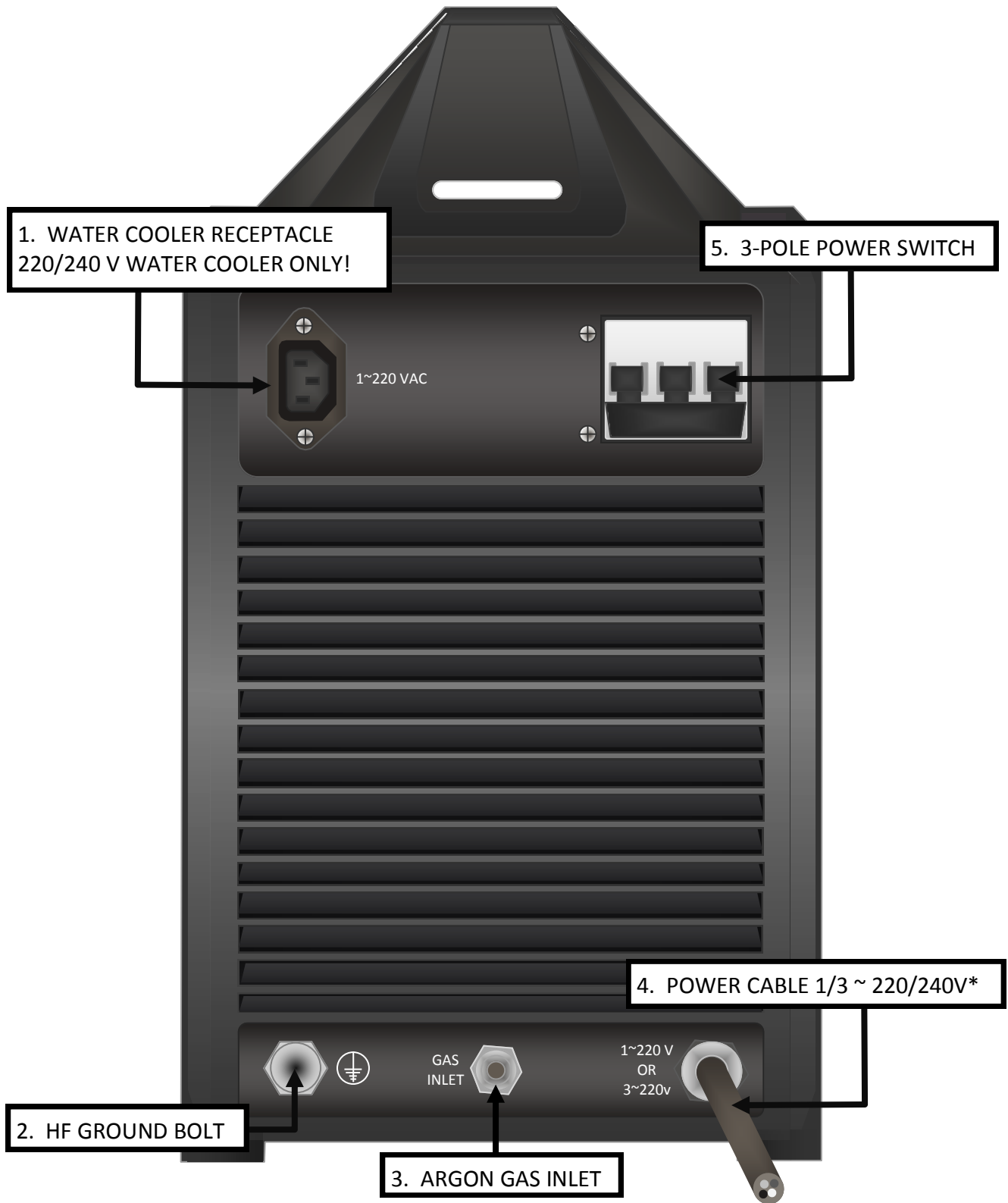
## FRONT PANEL FEATURES AND CONTROLS POWERARC 280STH

POWERARC 280STH	PARAMETERS	PURPOSE
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.
13. Arc Force Control (DIG)	0-100%	Controls the arc response when an arc is held short and voltage begins to drop below a preset value (<20 volts in 6010 mode, and <16 Volts in standard mode). 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. In 6010/Cellulose mode, lesser arc force may be required depending upon welding style, amp setting, and electrode diameter. In any mode, excess arc force can create rapid burn through of the metal if the arc is held close and irregular or random popping of flux and metal while welding. If undesirable popping is noticed, turn down arc force until it is eliminated, and arc is still running smoothly.
14. 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. May create a slight "popping" noise on arc start up if it is set at a high setting. <b>NOTE: If rod sticks, immediately release it or the rod turn red hot or flame out Also try to avoid double tapping or bouncing the rod the metal excessively as this can create issues with rod sticking if Hot start time is set too long or amps are set too high.</b>
15. Hot Start Amps % (Surge amp duration)	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.
16. Standard/Cellulose (6010)	N/A	This unit is designed to operate well with any type of stick welding rod. The unit features a special cellulose setting, which enhances operation with rods that employ a cellulose based flux such as E6010, E7010, or even E6011. In this setting the arc is much more crisp and penetrating. Use the standard mode for all other electrodes with iron powder, iron/titania, or other type fluxes including stainless and aluminum type rods. Common rods used in the standard setting are E7018, E7014, E6013, 309L. If it is felt that the 6010 mode is too strong or forceful for the cellulose rod due to welding style preferences, try the standard mode and increase the arc force. This may create some rod sticking or require higher amps to run stably.
19. TIG Pulse Mode Selector	Pulse OFF Pulse on.	Pulse is recommended for improving heat control and constricting arc cone focus on metals that are difficult to weld or where excess wicking of the metal is an issue due to overheating of the metal such as edge welds or edge of seams.
20. 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>

**FRONT PANEL FEATURES AND CONTROLS POWERARC 280STH**

POWERARC 280STH	PARAMETERS	PURPOSE
<b>21. Data Indicator</b>	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 the trouble shooting and diagnosis pages for error code information.

**REAR PANEL FEATURES AND CONTROLS**



\*325EXT 3 ~ 220/240V or 460/480V (Special order)

## REAR PANEL FEATURES AND CONTROLS CONTINUED

FEATURE	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 1 phase outlet. Do not use this connection to power any other device. 4 amp max.
2. HF Ground Bolt	N/A	HF energy can be devastating to surrounding electronic equipment. If the operating environment includes electronic equipment, this bolt can serve as a direct path to a 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 grid. If point gap becomes out of adjustment, more HF energy may build up, or even jump across circuitry within the welder. It is highly recommended that a small, separate ground wire be attached at this point while in use.
3. 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 5/8" CGA connector found on US and Canadian models on the rear of the unit interchanges with standard threads on any standard regulator designed for the US/North American market. Make sure the tubing slides fully over the connector and thoroughly tighten the clamp on the regulator. 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. Make sure compression nut retaining the hose barb fitting on the regulator is tight as well.
4. Power Cord	220/240 V 1 and 3 phase.	The PowerARC 280STH can be used with either one or three phase 220/240 V power, including good quality 208 V power. The wiring contains 4 separate wires. Everlast uses standard wire color codes for welders. Standard welder wire colors are L-1 black (hot), L-2 white (hot), and green (ground) for 1 phase 220/240 V. Standard wire colors for 3 phase 220/240 V are L-1 black (hot), L-2 white, L-3 red (hot) and green (ground). Do not attempt to use a 4 wire 1 phase 220/240 connection and match up wire colors. <b>NOTE: In many home circuits, red and black are the power wires. But in standard welding circuitry, white and black are hot wires. Green is always the ground in both circuits. There is NO neutral in a standard welder circuit.</b> The suggested plug for the PowerARC 280STH is the NEMA 6-50, which is the standard 50 amp welder plug used on welders. See wiring diagram for more details on wiring this plug. Always consult a licensed electrician who is aware of local codes before attempting any wiring of the welder or of the power circuits. Everlast is not responsible for any mis-wiring or damage caused to the unit by mis-wiring the welder. If additional help is needed, contact Everlast. <b>WARNING: DO NOT CONNECT THE WELDER TO 460/ 480 V 1 OR 3 PHASE POWER, UNLESS SPECIALLY ORDERED FOR THIS VOLTAGE OR SEVERE DAMAGE WILL RESULT TO THE WELDER! CONSULT THE SIDE PANEL ON THE WELDER WITH SPECIFICATIONS IF IN DOUBT. THE SIDE OR BACK PANEL (LOCATION VARIES) SPECIFIES THE CORRECT VOLTAGE/PHASE AS WELL AS SPECIFIC AMP REQUIREMENTS.</b>
5. 3-Pole Power Switch	On/Off	The breaker switch contains 3 poles for power. 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. In single phase, only two poles are active. The remaining pole is inactive until it is connected to 3 phase power.

## NOTES:

1. The gas input connection should be checked for tightness periodically, especially if the machine is moved.

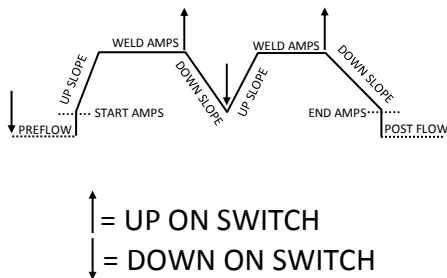
**Welder Function Summary and Explanations.**

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 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. Following the graphic lines below, you can 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.

The standard pedal mode incorporates the same features 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.

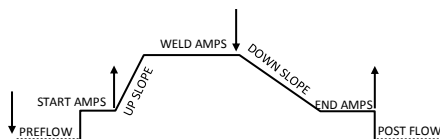
**NOTE:** The welder features an additional 2T and 4T mode when the pedal light is on. This is actually designed for use with a hand amptrol (47k or 50k Ω). However, to work correctly, a torch switch must be used in conjunction with the amptrol to control the arc cycle. A momentary on/off button should mounted separately to activate the arc cycle if none is provided. Some aftermarket torch amptrols have a built in switch that automatically activates when the amptrol amperage is increased. In this case, the amptrol should be used in the foot pedal mode, or 2T pedal mode only depending upon amptrol switch configuration. Everlast sells torches with built in amptrols that are designed for use with our units in the amptrol 2T and 4T mode. Torches with both a separate torch switch and amptrol will function just as it would with the regular 2T or 4T cycle, except the amperage can be adjusted at the torch while welding, once the welding cycle has reached the normal welding stage of the cycle.

**2T Torch Operation Effect on Weld Cycle**



Everlast 26 series hand amptrol torch

**4T Torch Operation Effect on Weld Cycle**



**NOTE:**

Due to the rapid switching of the inverter, High Frequency (HF) is not used except to start the arc. HF TIG only refers to the initial arc start, and in DC TIG is usually considered the preferred method of starting an arc. Lift start would be used in areas that are sensitive to electronic interference such as hospitals or computer/CNC equipment. Both are satisfactory ways of starting the arc. Lift TIG is not the same as scratch start tig as current is lowered which allows the arc when lifted to start cleanly without sticking or creating a contamination problem with the tungsten.

**Parameter Notes:**



6. *Pulse.* 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 PowerARC 280STH 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.

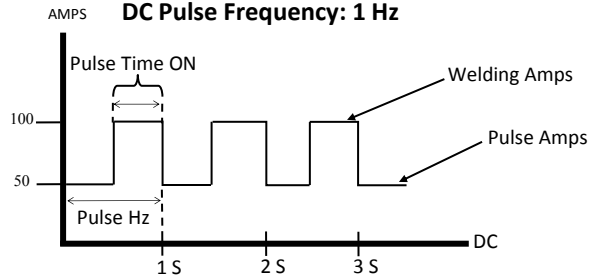
2. *Pulse Frequency.* Pulse speed or frequency as it is often referred to is measured in the unit standard “Hertz”. Simply, it is the number of pulses per second that occur. Pulse frequency controls the arc constriction and also help with heat management.

3. *Pulse Time On (Balance).* Pulse Balance is the percentage (%) of time that the pulse stays in the pulse amp stage of the cycle. Increasing the Pulse time on can increase the duration the pulse amp stage of the cycle to decrease heat. Pulse Balance is also commonly referred to as pulse duty cycle. For welding purposes the term “Pulse Time On” is used here.

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

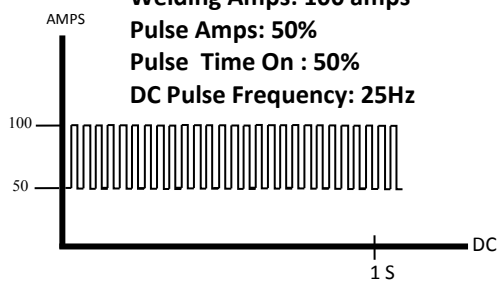
**EXAMPLE 1**

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



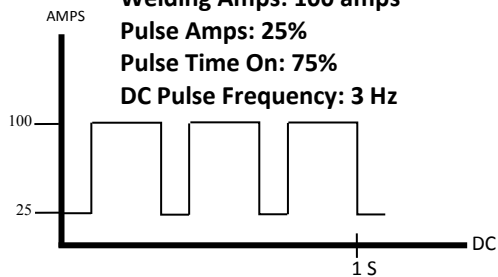
**EXAMPLE 2**

**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**



7. *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  $\Omega$ .* 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. **Do not attempt to control stick function with the foot pedal.**

10. *Water-cooled/ Air-cooled torch. (18/26 series)* A water cooler is necessary for use with the water-cooled 18 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 purchase an air-cooled 26 series which has a rating of 200 amps at 60% duty cycle. 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 are not warrantable. All consumables should be interchangeable with other brand torches with similar 17,26 or 18

designations. They should be available for local purchase. No special consumables are required. Although a small starter kit of consumables is included, you will need more consumables fairly quickly. **No Tungsten is included with the starter kit. Actual starter kit contents may vary.**

11. *DINSE style connector.* Everlast uses a 35-70mm<sup>2</sup> connector for both negative and positive connectors, which is 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.* The units have been configured to be able to start at approximately 5 amps. Start Amps may also be increased for a "hot start" while in TIG mode if required.

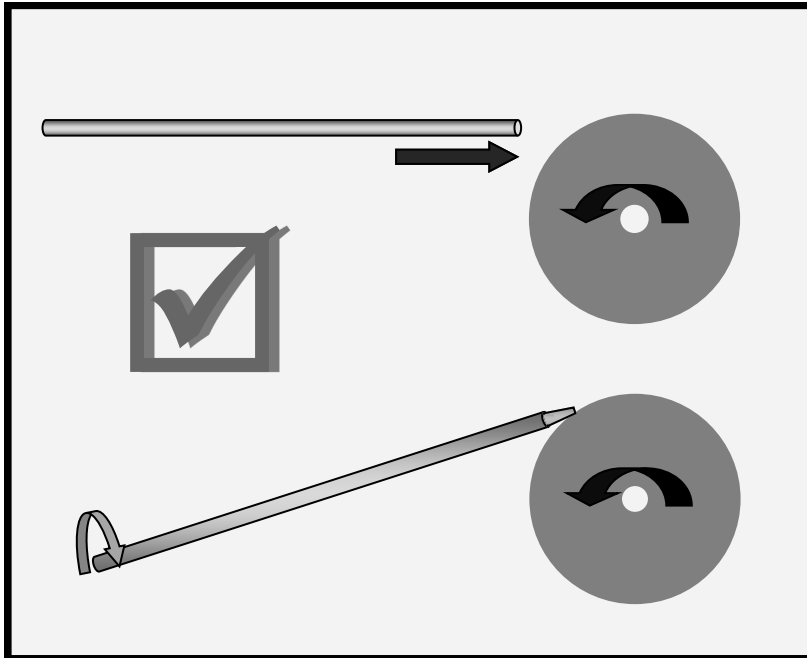
15. *Argon Regulator.* The argon regulator is listed in SCFH for North American markets. (subject to change).

#### **NOTE ABOUT THE FOOT PEDAL MODE:**

**While using the foot pedal, and some hand amptrols, the welder will revert back to the minimum amp setting on the welder after the arc is terminated and it will not show maximum set amps. It will only show maximum set amps while the unit is being adjusted for amperage. While welding the display will read actual weld amperage. After 3-4 seconds the display will default back to the minimum amp reading. When using 2T or 4T control modes, the amps 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 revert to the "setting" mode and display selected maximum amperage.**

OPERATION/PARAMETER NOTES:

**TUNGSTEN PREPARATION**

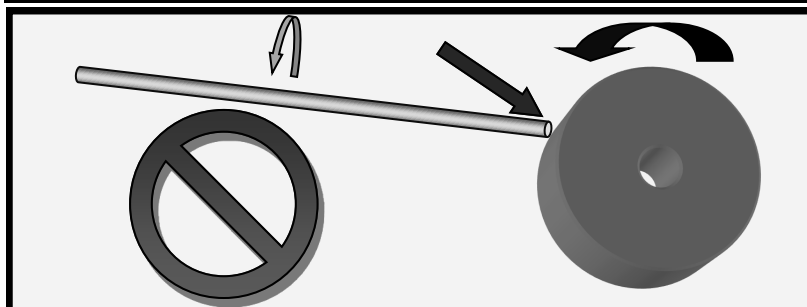


1. Use a dedicated grinding wheel or contamination may result. Do not breath grinding dust! Wear eye protection and gloves.

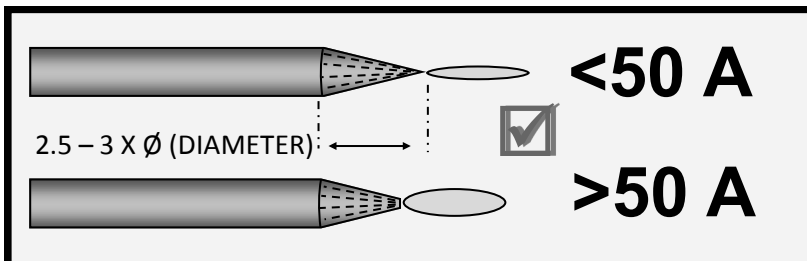
2. Hold Tungsten firmly.

3. Grind perpendicular to grinding wheel face. Allow tungsten to grind away slowly, creating point.

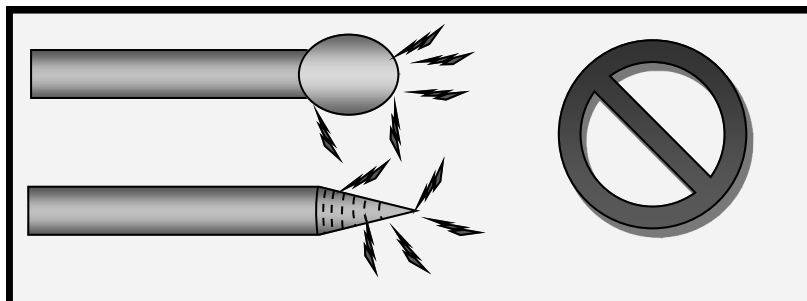
4. Rotate tungsten quickly as it is being ground to keep point even and symmetrical.



**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 tungsten is wide (Diameter).



**DO NOT BALL TUNGSTEN WHILE USING AC. ERRATIC ARC WILL RESULT. MAKE SURE GRINDING MARKS RUN PARRALEL TO TIP. CONCENTRIC MARKS WILL CAUSE ERRATIC ARC.**

**NEVER USE PURE (GREEN) TUNGSTEN IN AN INVERTER WELDER TO WELD ALUMINUM. SEE FOLLOWING RECOMMENDATIONS ABOUT TUNGSTEN SELECTION FOUND IN THIS MANUAL ON NEXT PAGE.**

## 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 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.

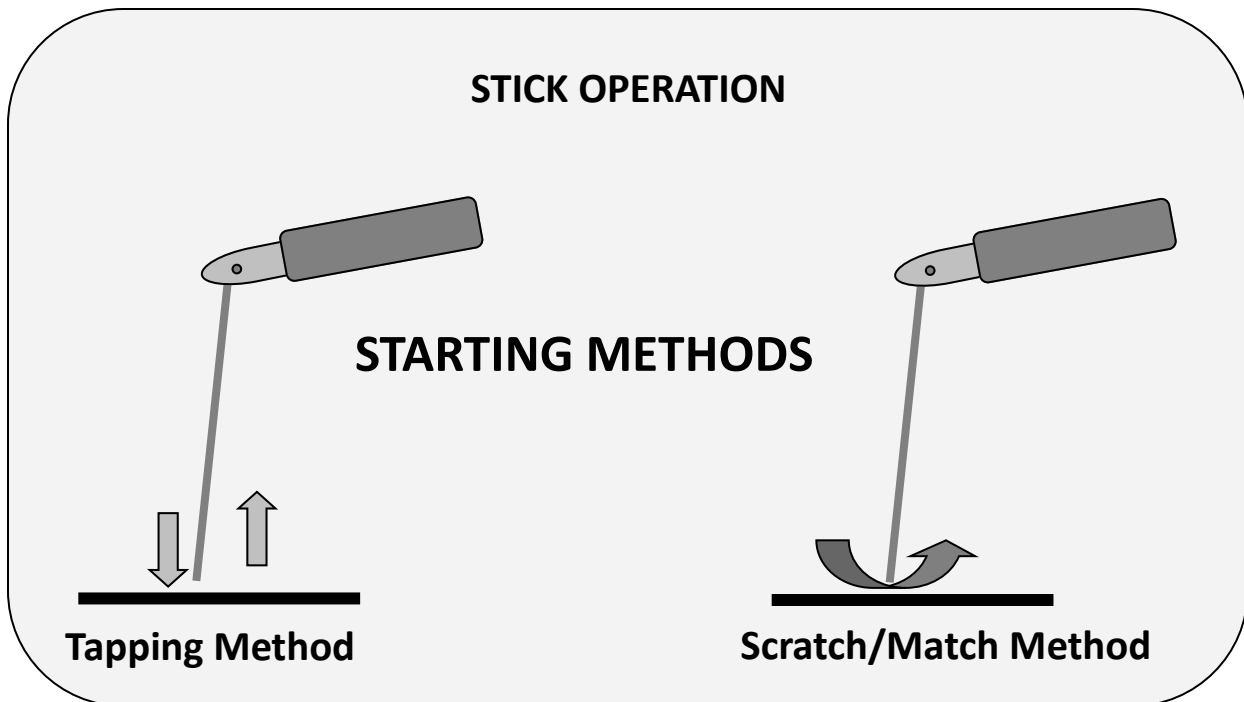
## HIGH FREQUENCY START TIG OPERATION

**FOR AC OR DC USE.**

1. Position the point of the sharpened tungsten about 1/8" or less above the metal.
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 Operation of TIG

1. Turn unit 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 selector switch. Select DC mode .
3. Plug in Torch and select 4T or 2T mode with the selector **OR** plug in foot pedal and pedal with selector **OR** plug in amptrol and select pedal 2T or 4T.
4. If using the torch switch select start/end amps to increase or decrease amps for starting and ending the weld.
5. If using the torch switch, select up/ down slope to increase/decrease the ramp up or ramp down time of the amperage.
6. Adjust maximum amps to the recommended amperage. Generally use 1 amp per .001".
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 or Stick VRD with the HF/Lift Start/Stick/VRD selector button
3. Make sure electrode holder is hooked into the positive connector and the work clamp is hooked the negative connector.
4. Select the 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 proper amperage range. Each manufacturer has specific recommendations for its electrodes.
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. 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, with different rod angles, positions, and arc lengths all factoring into the arc force control performance.
6. Adjust Hot Start (%) to create a hotter start than the actual weld current to prevent rod sticking and improve starting reliability. Increase duration (Hot Start Time) to prolong surge until starting is improved.
6. 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 weld in the TIG mode with the stick electrode holder still attached. VRD Function will decrease OCV while machine is idle and cause a slight delay in start.

**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"	130-175

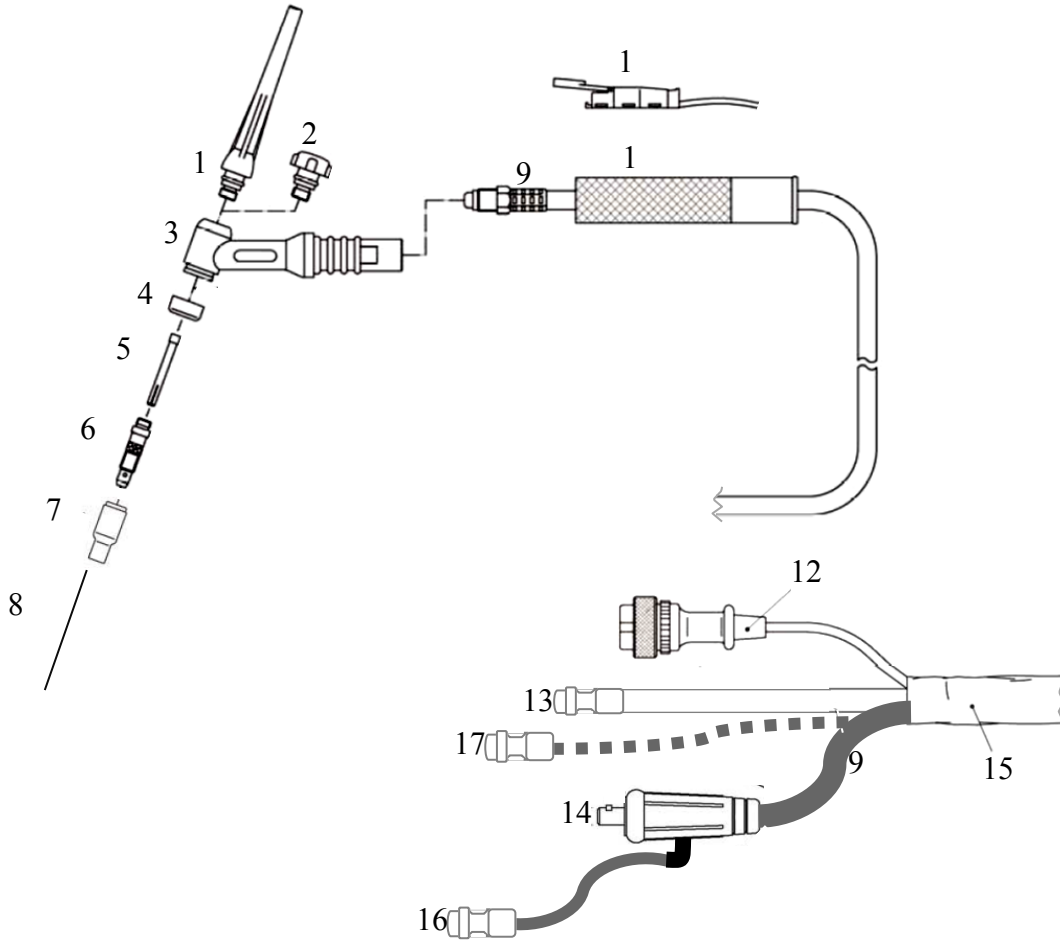
**TUNGSTEN SELECTION GUIDE FOR AN INVERTER**

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 not to breath the dust. If you have concern using thoriated (red) tungsten, choose from Lanthanated or Ceriated tungsten.

### EXPANDED VIEW OF TIG TORCH

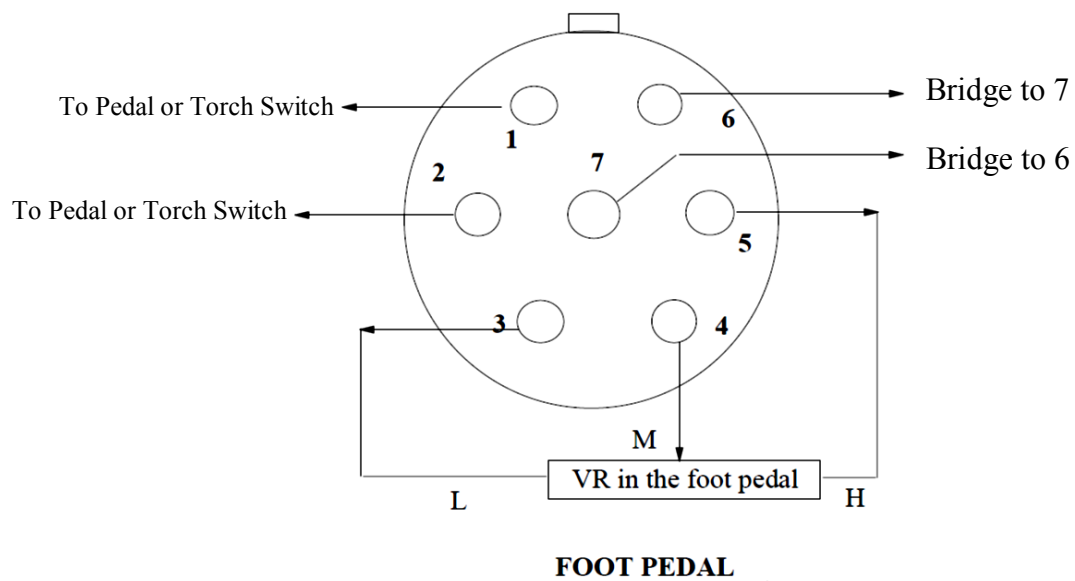
(Actual appearance may vary slightly from what is listed.)



NO.	TYPICAL PARTS FOR 26/18 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 #4, 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) (Water IN, 20 series)	1
14	Power Connector	1
15	Protective Cove (Denim, synthetic rubber or nylon)	1
16	Gas IN (26 series single line design) / Water OUT (18 Series)	
17	Gas IN (18 series AND 26 series dual line)	



## 7 PIN CONNECTOR FOR 47K $\Omega$ FOOT PEDAL



### NOTE:

The new digital models are designed to accept multiple potentiometers values, but the performance of different ohm pedals cannot be guaranteed. Some resolution or range may be lost. But, the pedals must still be wired correctly and 7 pin plugs with the correct wiring must be used.

TROUBLE:	CAUSE/SOLUTION
Machine will not turn on.	Check cords and wiring in the plug. 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. 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. Weld is dirty/oxidized.	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.
Over current/Duty cycle LED illuminates. Machine runs, but no output.	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.
Unstable Arc.	Poorly ground or shaped tungsten. Regrind to proper point. Too much AC positive polarity. Reduce balance to 30% or less. Increase AC Frequency.
Other issues.	Contact Everlast support.

**SECTION 4****TROUBLE CODES**

TROUBLE CODE WITH WARNING LIGHT/UNIT STOPS WELDING BUT REMAINS ON.	DIAGNOSIS
801	OVER OR UNDER VOLTAGE/ Check power input cable for length/size, check input voltage
802	OVER TEMPERATURE/ DUTY CYCLE EXCEEDED. Allow unit to rest for 10 minutes. Check for obstacles, clean welder, and heat sinks. (make sure unit is unplugged for 30 minutes before cleaning)
804	OVER CURRENT/ Check to make sure cable is correct length and size. Internal unit fault or low voltage
805	TORCH SWITCH IS STUCK CLOSED/ Turn off welder immediately and check switch.
OTHER	CONTACT EVERLAST

**Notes:**