# EVERLAST
# POWERARC 300ST

Analog DC Stick/DC TIG  IGBT Inverter Welder

CC

SMAW

GTAW

IGBT

1&3 ~ PHASE

DC


## *Operator's Manual for the PowerARC 300ST*
## *Safety, Setup and General Use Guide*

Rev. 3  1 001229-16

*everlastwelders.com*



EVERLAST IGBT INVERTER TECHNOLOGY

**1-877-755-9353**

329 Littlefield Ave.  South San Francisco, CA  94080  USA

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**NOTE:** Product Specifications and features are subject to change without notice. Every attempt has been made to ensure this manual's contents is accurate at time of publication. However, certain descriptions, quantities, appearance and specifications of the product in this manual are subject to change without notice or update of this manual. 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 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 cannot 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: everlastwelders.com**
**Everlast Technical Support: 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**
**Everlast Website: everlastwelders.ca**
**Everlast Technical Support: sales@everlastwelders.ca**
**Telephone: 905-630-8246 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) 6584 2037**
**After hours support: 0410 661 334**
**Everlast Technical Support: support@pickproducts.com**

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 an 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.

**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!**

**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.

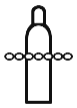
**Welding and cutting processes pose certain inhalation risks.** Be sure to follow any guidelines from your chosen consumable and electrode suppliers regarding possible need for respiratory equipment while welding or cutting. Always weld with adequate ventilation. Never weld in closed rooms or confined 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.

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.

# PERFORMANCE AND FEATURE COMPARISON

**IMPORTANT: The PowerARC 300 is DC output only and is not designed to weld aluminum or magnesium.**

| Specification: | PowerARC 300ST Stick/TIG welder |
|---|---|
| INVERTER TYPE | ANALOG CONTROLLED IGBT |
| INPUT VOLTAGE ±10%;PHASE/FREQUENCY | 220V; 1 Phase and 3 Phase /50-60Hz |
| MAXIMUM INPUT AMPS ($I_1$max) | 60A 220V 1 phase/ 45A 220V 3 phase |
| MAXIMUM INPUT RUNNING AMPS ($I_1$eff) | 46.8A @ 220V 1 phase / 31A 220V 3 phase |
| DUTY CYCLE % @ AMPS | 60% @ 300A/32V<br>100% @ 240A/ 29.2V |
| OUTPUT | 20-300A, 20.8-32V |
| OPEN CIRCUIT VOLTAGE | 70 V |
| TIG PACKAGE | OPTIONAL (Gas valve torch and regulator for scratch start DC use only) |
| CONSTANT CURRENT (CC) OUTPUT TYPE | DC (±) |
| CELLULOSE ROD CAPABLE 6010,6011 | YES |
| INCLUDES | WELDER, WORK CLAMP WITH CABLE (10 FT),STICK TORCH WITH CABLE (10FT) |
| DINSE CONNECTOR TYPE | 35/70mm² (DINSE 50 STYLE) |
| HOT START (SURGE CURRENT) | Adjustable |
| ARC FORCE CONTROL | Adjustable |
| MAXIMUM SUGGESTED ROD DIAMETER | 1/4" (6-7mm) |
| PROTECTION CLASS | IP21S |
| INSULATION GRADE | F |

***Need longer welding cables or an extension cord?*** The welding cables are held into the DINSE style connectors by set screws located under the connector cover and can be accessed by aggressively twisting the rubber cover back and forth while pulling at the same time. A little effort may be required the first time the connector cover is removed. If necessary, very lightly clamp the end of the connector pin in a vise or with a pair of pliers while working the cover back until the cover pops off. The torch has a small set screw that holds the cover in place. It acts as a wedge to hold the cover in place. It should be loosened (not removed) and the cover slid back to access the set screw holding the cable in place. **When adding welding cable or using an extension cord make sure that the respective voltage/current carrying capacity is sufficiently rated for carrying the maximum current of the welder over the distance of the cable.** Also, whether running long or short lengths, make sure the welder is strapped down so any "whipping" movement of the cable will not overturn the welder or jerk it out of place.

**2.1 General Description, Purpose and Features.**

*PowerARC 300:*
The PowerARC 300 is a compact commercial welder that incorporates professional features such as adjustable hot start and arc force control. The arc is spatter-free and stable due to heavy duty IGBT components and advanced inverter design.

The welder is designed to weld with any common category of welding rod and works well with electrodes such as E7018, E6013, E7014, E7024, 309L, and others. It is suitable for welding in any position recommended by the electrode manufacturer.

Equipped with a dedicated reactor circuit and additional negative polarity port (labeled as E6010), the PowerARC 300 offers improved performance and penetration with all cellulosic welding rods compared to standard inverter designs. This feature makes the PowerARC 300 a perfect choice for professional use where E6010/E7010 is commonly used. The E6010 port is also recommended for use with E6011.

The unit is capable of functioning on 1 or 3 phase standard 208-240V current, 50-60Hz. Measured current below 208V at the receptacle is not recommended. This unit should not be operated on long extension cords with undersized conductors.

**Note: To operate in 6010 mode, the work clamp is moved from the negative terminal connector to the connector labeled "6010". Reverse polarity (DCEP ) is maintained. There is no need to change the electrode holder position, unless straight polarity (DCEN) is desired for special operations with E6010 or similar rods. If DCEN (-) is desired, then the positions of the electrode holder and the work clamp should be swapped. Check with the manufacturer of the electrodes for polarity recommendations for each rod.**

*Hot Start:*
The adjustable hot start reduces rod sticking and porosity that is created while striking an arc by providing a controlled surge of amps until the arc is firmly established. After the arc is established, the hot start terminates and the welder resumes welding with the selected amp level. The intensity of the hot start contains more adjustability than is typically required to make good starts. The numbered scale represents a percentage of total available Hot start amperage over and above the main welding amperage. Useful settings for hot start usually range from 3 to 7 (30-70%) on the knob's scale.
**NOTE: The hot start can blow through the metal if the setting is too high for the given thickness of the metal. On thin metals use a lightly penetrating rod such as an E6013 and a low hot start setting.**

*Arc Force:*
The arc force control can be adjusted to improve arc performance and allow you to use less amperage overall and maintain penetration. It is also a useful tool when welding out of position. The arc force control reacts to the length of the arc. Typically when the arc length is shortened (rod held closer to the metal), arc voltage is lowered due to the characteristic of Constant Current design. In a transformer, this would typically reduce heat but can lead to the arc snuffing out or even a stuck rod. With the PowerARC 300, as the voltage drops below approximately 20V, the amps are automatically increased in reaction to the reduced arc length. This prevents the arc from snuffing and the rod from sticking. Although the function of voltage is significant in the welding process, welding is also concerned with overall wattage (VxA). The arc force function is also referred to as "dig" or "inductance" in the industry. **Pushing the electrode into the puddle will increase the heat and penetration without the arc going out if the arc force is adjusted correctly.** If converting from welding with a transformer based welder to an inverter welder this function will require some practice and may feel different. Some users who have been trained on transformers may find it counter-intuitive initially, but quickly begin to appreciate the advantage this offers. **Arc force requirements vary by electrode and even by manufacturer. Arc force is set by feel and experience rather than a given number and can vary by personal preference and technique.** To maintain strict control of the heat, use the lower end of the amp range of the recommended by the electrode manufacturer. Then, increase the arc force setting enough to maintain the arc while using a short arc length. This will maintain/increase penetration, but confine the arc and heat to a smaller area. Too much arc force may create random pops or spatter.

**Note: Some welding techniques that are maintained with transformer welders may not be sustainable with the PowerARC 300ST or other inverter welders. In order to control the maximum input amps, the inverter is designed to terminate the arc (shut down output) if voltage increases over a predetermined arc voltage at any given amp level. While this prevents**

**over-currents internally and limits amp draw from the power source, it also helps to improve arc termination. When converting over from a transformer a welder with a habit of stretching the arc too far may find the arc will stop suddenly. Constant Current Inverters operate on somewhat different principles than Constant Current transformers so some retraining and even rethinking may be necessary by welders who have developed an exaggerated motion using a transformer welder. A practical example is during the whipping motion required when welding E6010. If the welder is accustomed to exaggerating the whipping motion required, then the arc may go out. This usually happens when the tip of the rod is flipped too far up vertically at the end of the "whip" and raises the tip up further than necessary. This can be simply avoided if the rod is stepped out further in front of the puddle with less flipping up to draw out the arc.**

**2.2 Basic Overview and operation.**

*Package:*

The PowerARC 300ST includes a stick electrode holder with cable, and a work clamp with cable. Cables are approximately 10 ft. in length. Longer cables can be added to electrode holder, work clamp and connectors. This unit does not include TIG torch or regulator.

*Stick:*

The stick function is fairly simple and straight forward. Arc striking can be done quite easily with practice and the hot start reduces sticking. As with any type of welding, this takes practice. Be sure to double check that the electrode holder cable is located in the positive terminal, and the work clamp is located in one of the negative terminals. See page 17 for arc striking technique and general rod size selection. Using too much hot start or arc force control can result in burn through. Using too little will result in poor arc performance and rod sticking.

*TIG:*

Although the PA 300ST is sold as a DC Stick welder, the unit can be used as a lift-start DC TIG welder for welding most all metals ***except*** aluminum and magnesium. The unit though does not provide a HF circuit, foot pedal or torch switch for starting the arc, so a lift start method must be used to strike the arc. **Note:** The torch will always be powered. Avoid touching the tungsten to the metal until ready to weld. When using for lift TIG, be sure to turn the arc force and hot start controls to the minimum setting. Contact Everlast for an optional TIG package if desired, or source one locally at a nearby welding supply store.

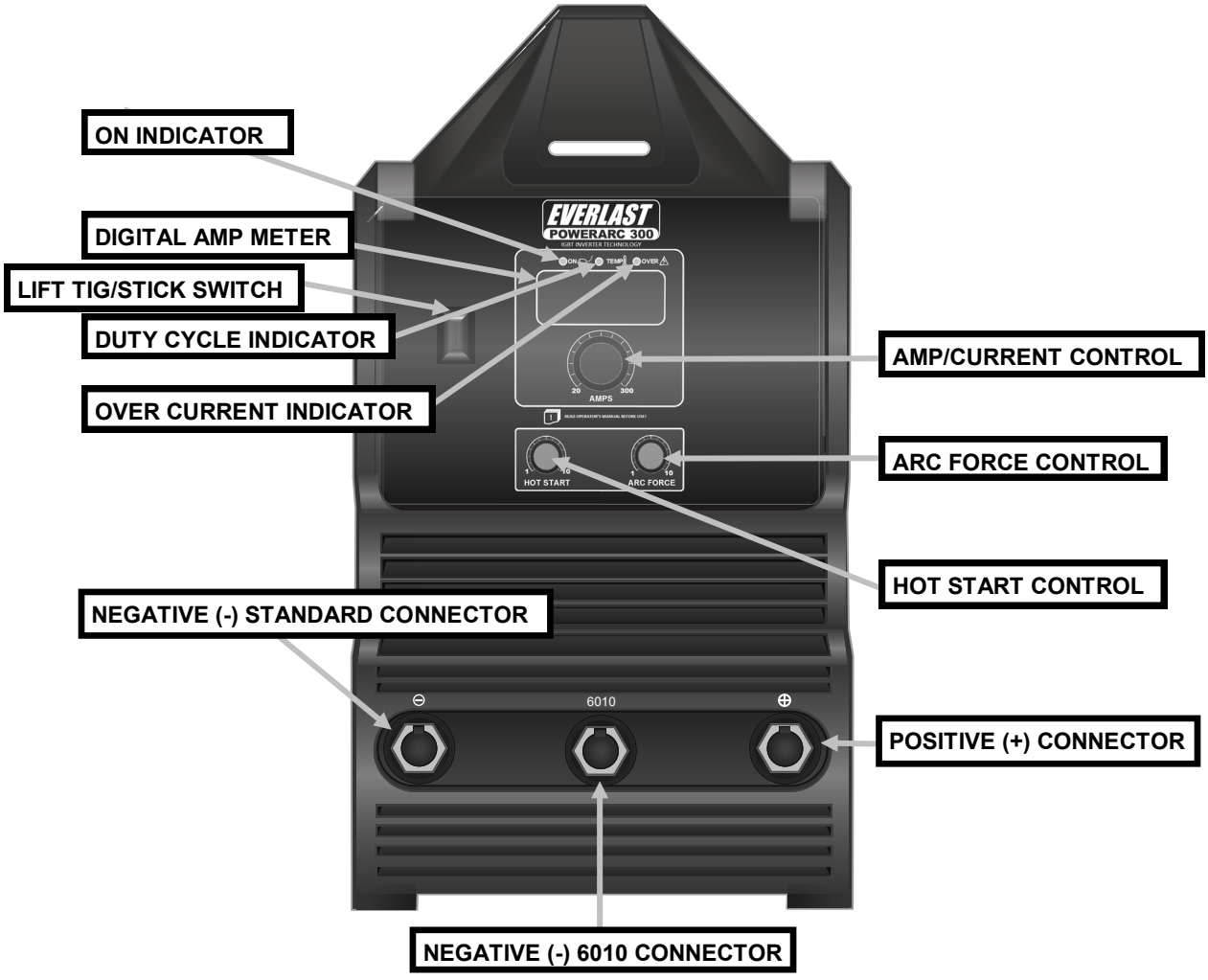
**2.3 Handling and general maintenance**.

*Duty Cycle and Overcurrent:*

**Be careful to observe the duty cycle of the welder.** Overheating may occur if the duty cycle is exceeded. Overheating will cause the unit safety cutout to engage, subsequently interrupting output. Allow the unit to rest while remaining switched on for 10 –15 minutes if the safety cut out has triggered. After that, reset the unit by cycling the main power switch on the rear. High heat and humid conditions will also affect the duty cycle of the welder. If the unit overheats or an overcurrent condition is experienced, the duty cycle light will light as well. Welding will resume once the duty cycle light is cleared after resting and cycling the power switch. An over current or under current condition is usually caused by dirty power conditions, over/under voltage power supply or an internal fault. If the overcurrent light is lit, turn the machine off and check for wiring faults, then turn the unit back on to see if the light has cleared. If it does not clear, contact Everlast technical support for further instruction. **The unit should be stored in a dry place for long term storage.** Humid/wet conditions can contribute to the eventual decay of the circuitry in the machine. For safety reasons, do not use this machine directly in the rain or with soaked clothing or damp protective gear. The service rating for this unit is IP21S, and is not designed for wet environment use.

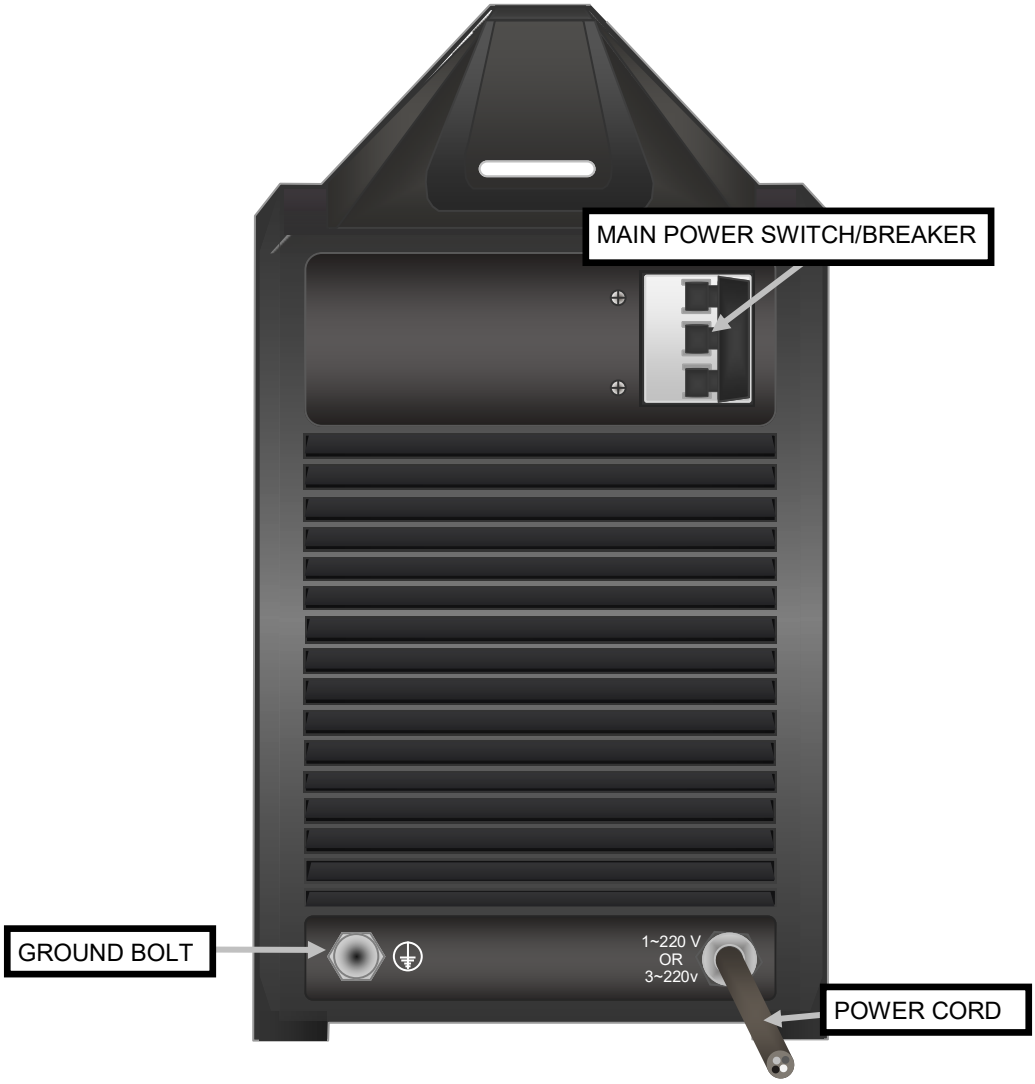
**Make sure that the unit's cooling fan and exhaust vents are kept free of obstruction.** Before every operation, inspect unit for unexpected obstructions such as insect and vermin nests. Once a month, or as needed, clean the machine thoroughly inside and out with compressed air. **Before removing the covers however, unplug the welder for 30 minutes to allow the internal capacitors to discharge to prevent shock, injury and even death.** Afterwards, open the units by removing the rear plastic cover and the metal cover only. Do not remove the front cover. Do not remove circuit boards unless authorized. Check all plugs and connections for tightness before replacing the covers. Do not pinch any wires when reinstalling the covers. Wear safety glasses/goggles to prevent eye injury from flying particles that may get dislodged while cleaning with compressed air. Do not concentrate compressed air on the skin or serious injury may occur.

# PowerARC 300ST
# Front Panel View



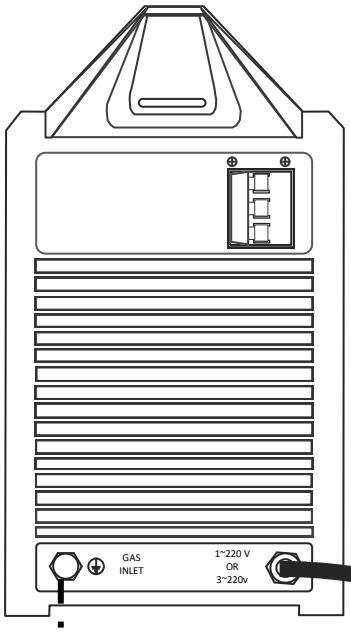

**Note:** The unit cannot strike an arc if both the electrode holder and the work clamp are engaged in the two negative (left and middle) ports. To work, either the electrode holder connector or the work clamp connector must be engaged in the far right positive (+) connector with the other engaged in one of the two negative ports. Most electrodes require reverse polarity. To maintain reverse polarity (also known as positive polarity or DCEP+) the work clamp should be engaged in one of the two negative (-) ports, and the electrode holder should always be in the positive port. When required, negative polarity may be used, and the electrode holder should then be engaged in one of the two negative ports and work clamp will be moved to the positive port. Consult electrode manufacturer data and/or instructions for polarity recommendations and specific amp requirements. Electrode instructions are usually found attached to electrode container or box. If not, consult the electrode manufacturer's online resources and specifications for more specific information.

# PowerARC 300ST
# Rear Panel View




Even though the unit is grounded by the main ground wire to the chassis, an additional bonded ground may be necessary in some locations to comply with code. Consult a locally licensed electrician concerning the any requirement of this connection and its proper use and application.

# PowerARC 300ST
# Wiring




1 PHASE 220/240 V SHOWN. FOR 3-PHASE 220/240 VUSE, CONSULT LICENSED ELECTRICIAN

GREEN GROUND (220/240V 1 and 3 phase)

L2,WHITE; HOT (240V 1or 3 phase)

L1,BLACK; HOT(240V 1 or 3 phase)

**NEMA 6-50P**

L3,RED; HOT(240V 3 phase only)

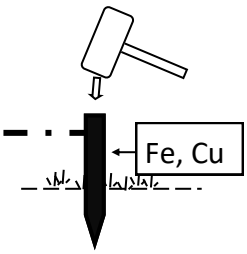
**3 PHASE WIRE COLORS FOR POWERARC 300**
**GREEN: GROUND**
**RED:L3**
**WHITE: L2**
**BLACK: L1**

**FULLY TAPE RED WIRE SO THAT IS IS OUT OF THE WAY AND COVERED FOR SINGLE PHASE USE! RED WIRE IS FOR 3 PHASE 220/240 V USE ONLY!**

**HF**

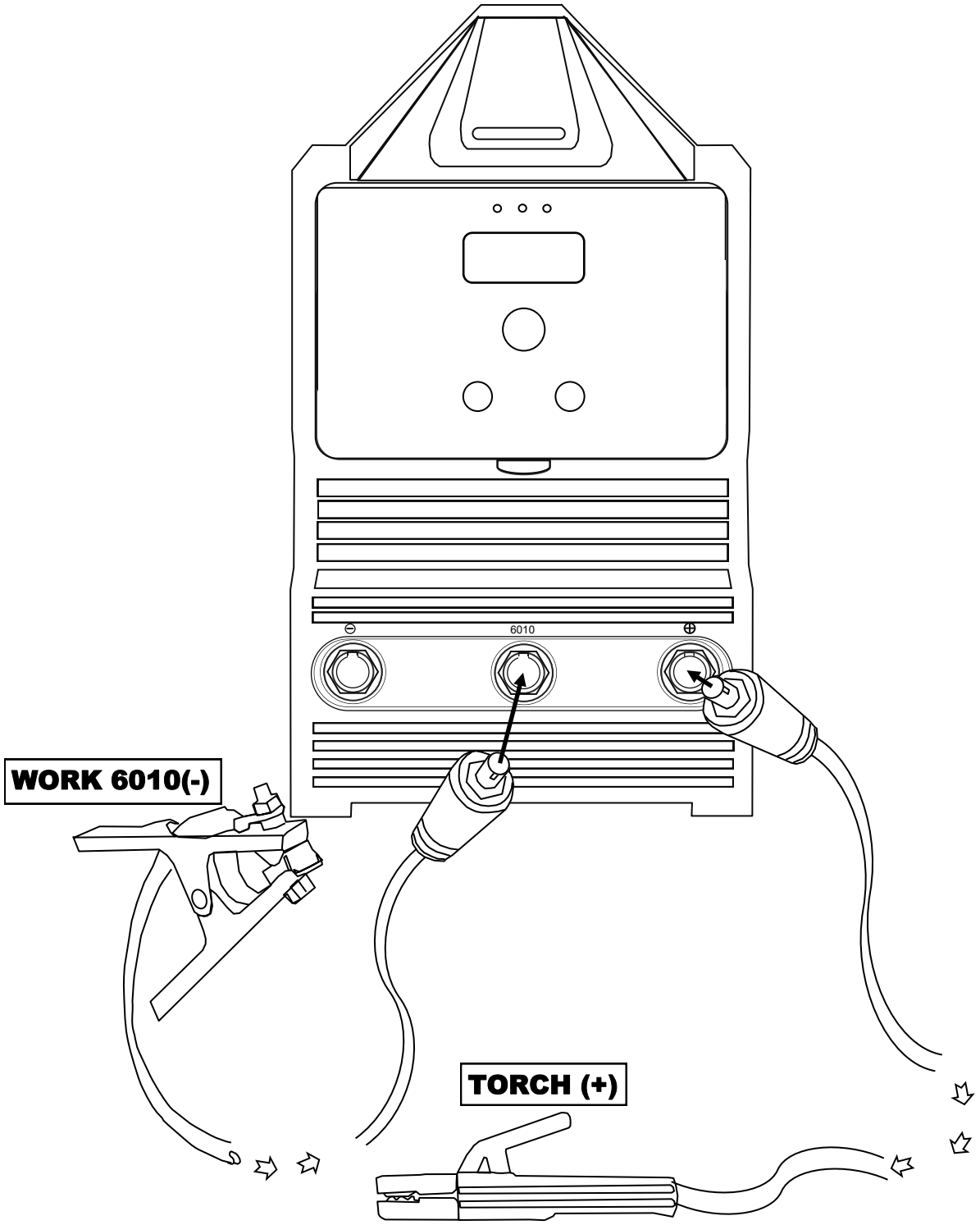
**PLUG IS NOT INCLUDED! IT MUST BE SUPPLIED BY CUSTOMER.RECOMMENDED PLUG IS A NEMA 6-50P FOR SINGLE PHASE USE. CONSULT A LICENSED ELECTRICIAN AND LOCAL CODES BEFORE MODIFYING EXISTING CIRCUITS OR INSTALLING THE WELDER. See page 20 for further details and explanation.**

**IMPORTANT:**
EVERLAST IS NOT RESPONSIBLE FOR DAMAGE OR INJURY RESULTING FROM IMPROPERLY WIRED WELDERS!



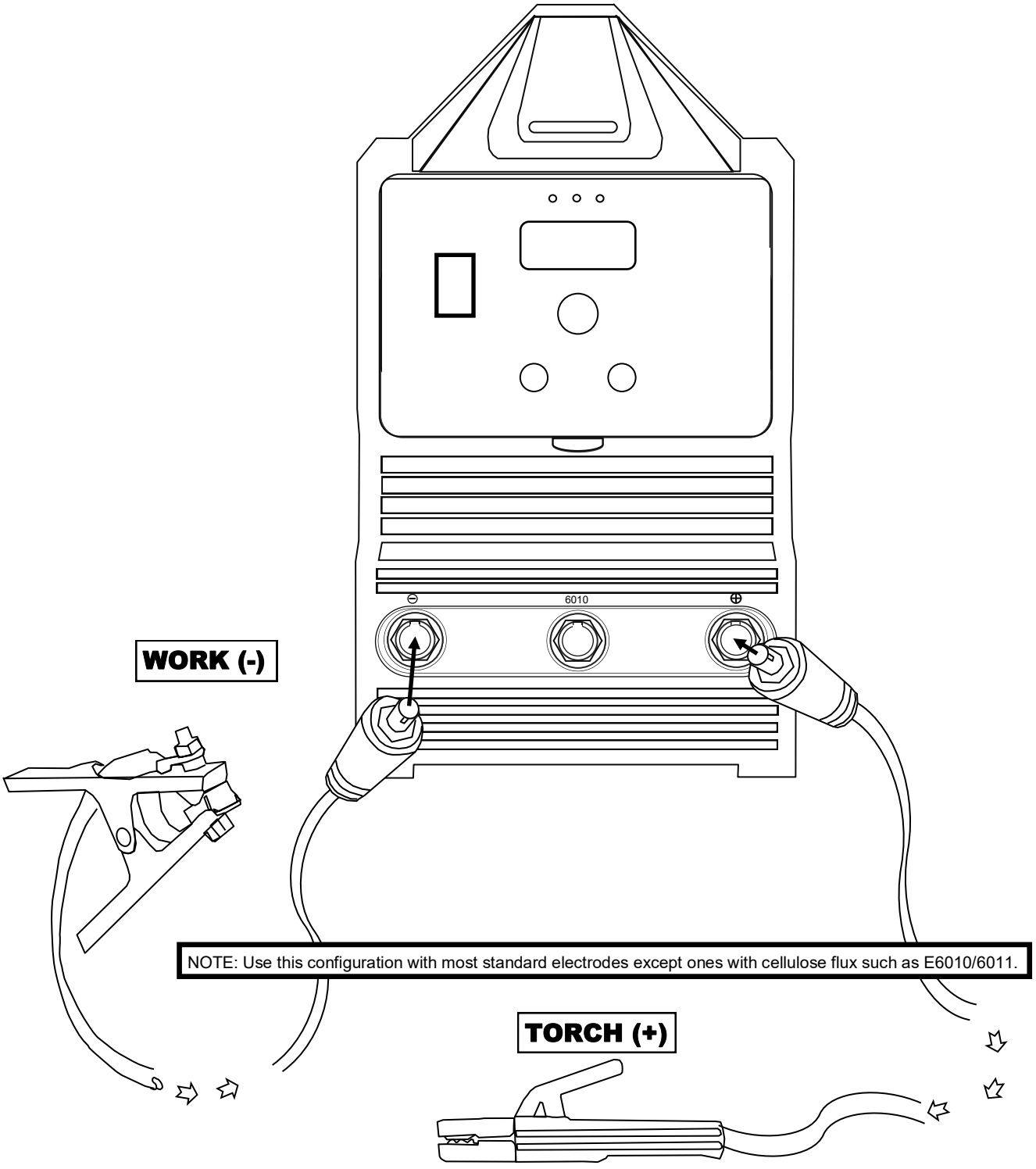

Even though the unit is grounded by the main ground wire to the chassis, an additional bonded ground may be necessary in some locations to comply with code. Consult a locally licensed electrician concerning the any requirement of this connection and its proper use and application.

# PowerARC 300ST
## STICK E6010 WELDING CONFIGURATION




NOTE: Also, suitable for use with E6011 and other electrodes with cellulose based flux such as E7010.

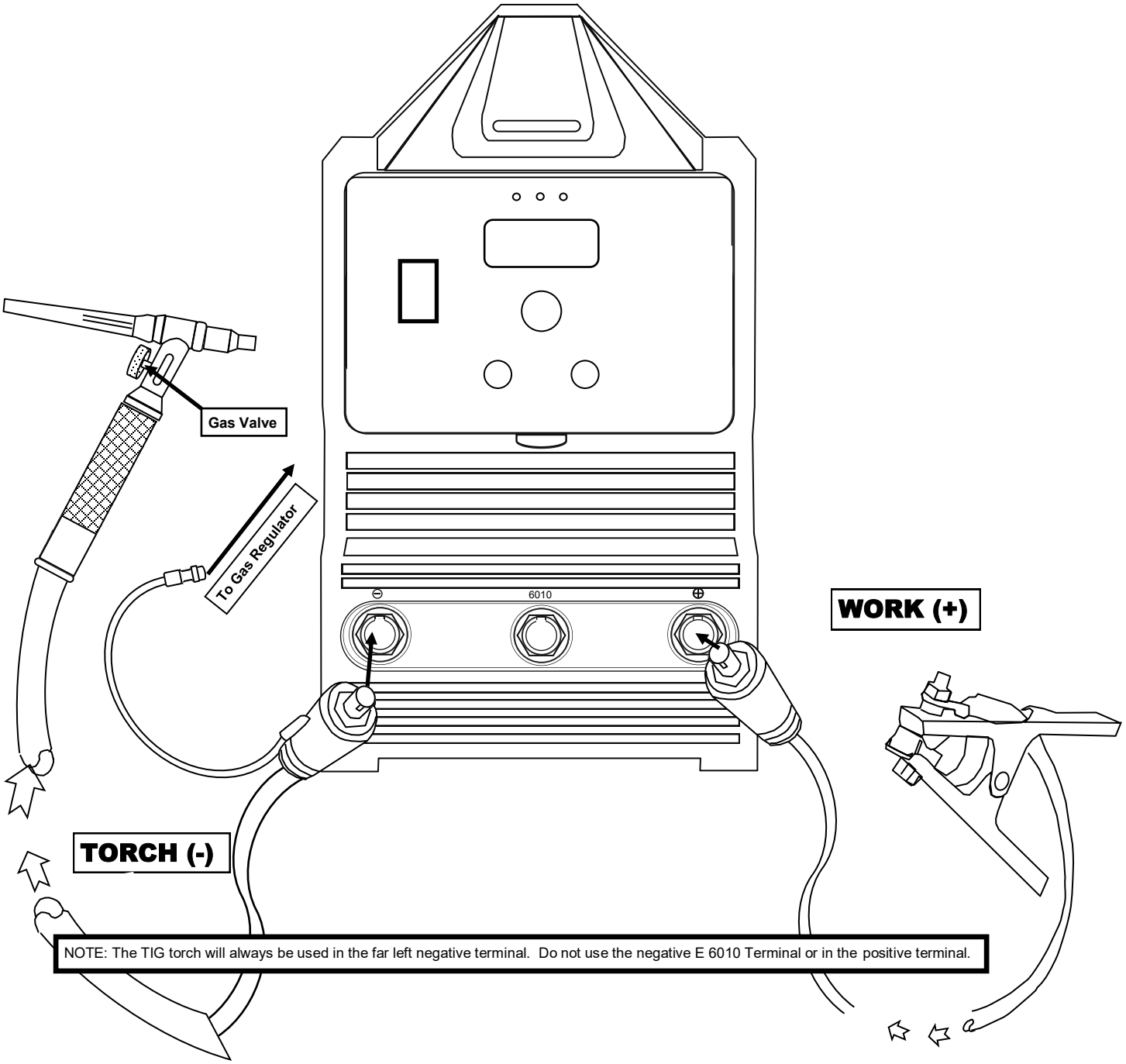
# PowerARC 300ST
## STANDARD WELDING CONFIGURATION




NOTE: Use this configuration with most standard electrodes except ones with cellulose flux such as E6010/6011.

IMPORTANT: Most electrodes require DCEP (+). Always consult electrode manufacturer directions before using DCEN (-).

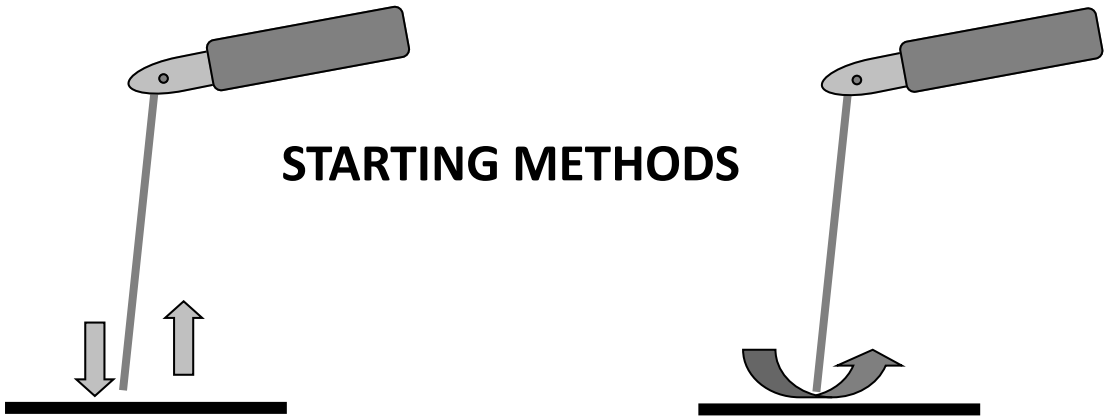
# PowerARC 300ST
## TIG WELDING CONFIGURATION




NOTE: The TIG torch will always be used in the far left negative terminal. Do not use the negative E 6010 Terminal or in the positive terminal.

TIG torch and regulator are optional items and must be purchased separately. In this type of lift start configuration, the torch will always be live. There is no foot pedal or torch switch to activate the TIG torch power. You must purchase a torch with a gas valve to control the gas flow. The unit does not contain a gas solenoid valve to regulate pre-flow or post flow. A regulator is still needed to regulate max flow. To connect Everlast torches, some adaptation or modification of the torch gas line will be needed, as is the case with most gas valve torches to connect directly to the regulator. The fittings needed to couple the torch to the regulator are stocked in most well equipped welding supply stores, and hardware stores. This can be accomplished inexpensively in several different ways using different types of fittings, depending upon the user requirements.

## STICK OPERATION TECHNIQUE




1. Turn on the power switch on the rear of the unit. Allow unit to cycle through its start up program. Select stick on the selector switch.

2. Make sure electrode holder is connected to the positive connector and the work clamp is connected to the negative connector. If welding with E6010 or a electrode (rod) with a cellulose based flux, connect the ***work clamp*** to the 6010 port.

3. Select the amps desired. Use the electrode diameter selection chart below 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 regarding amp range, though a general range can be determined.

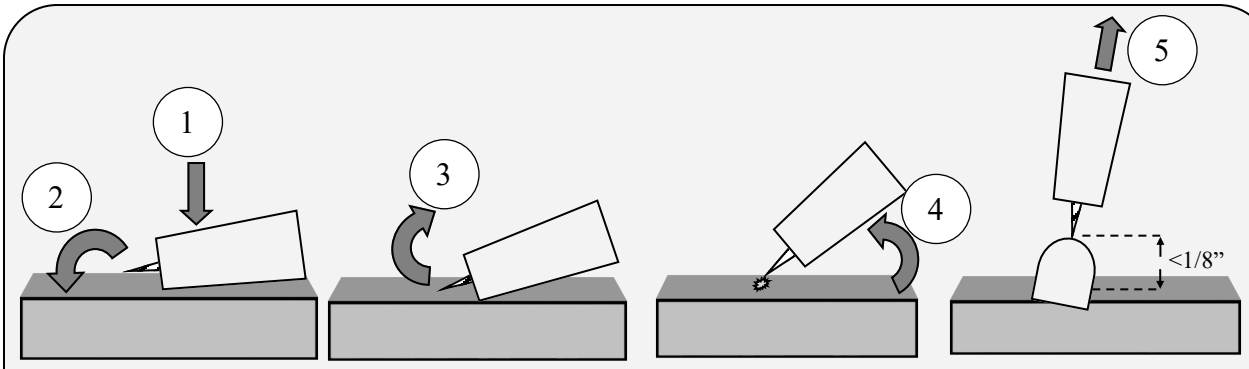
4. Strike the arc with either the tapping method or the match strike method. Beginners usually find that the match strike method yields best results. Professionals tend to gravitate toward the tapping

**DC 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" | 40-90 |
| 3 mm/ 1/8" | 3.2 mm/1/8" | 80-150 |
| 4-5 mm/ 3/16" | 3.2-4 mm/ 1/8"-3/16" | 100-170 |
| 6-12 mm/ 1/4"-1/2" | 4–5 mm/ 3/16" | 130-250 |
| >12mm/>1/2" | >5mm/3/16" | 200-300 |

# LIFT START TIG OPERATION

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




1. Position the edge of the ceramic cup on the metal. Do not touch the tungsten to the metal until ready. The tip is always live.

2. Quickly rotate the cup so that the tungsten comes in brief contact (< .2 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.

6. Poor starts and welding of the tungsten to the surface can be a result of a rapid “double tap” or quick bounce off the surface of the metal and back down. This inadvertently signals the inverter to put out full power until the continuity or arc is broken. If this occurs, fully break the arc by releasing the switch or pedal. Re-sharpen the point if necessary, then allow the point to stop glowing before attempting the start again. Do not scratch start in Lift TIG mode, or the tungsten may stick fast. Performing a scratch start instead of a lift start can also trigger this as the tungsten “skips” along the surface.

Note: This method takes some practice to master to initiate the arc on the first try. However, an arc can usually be struck fairly easily by the beginner, though it may take 2 or 3 times to get one to initiate properly. After it is mastered, arc striking can be done with a light, seamless motion on the first try. Be sure to protect the cup from damage when not in use. The Alumina TIG cups are fragile and can easily crack if dropped or tapped on the surface.

| METAL THICKNESS (STEEL) | WELDING AMPS (A) | TUNGSTEN DIA. | Ar FLOW RATE |
|---|---|---|---|
| 1-3 mm/.040”-3/32” | 30-80 | 1.5-2 mm/ 1/16”-3/32” | 8-15 CFH /4-7 lpm |
| 3-4 mm/ 3/32”-1/8” | 50-120 | 2-3 mm/ 3/32”-1/8” | 15-25 CFH/ 7-14 lpm |
| >4mm/ >1/8” | 120-200+ | 1/8” | 15-25 CFH/7-14 lpm |

Note: These ranges are approximate, and not absolute. There is a range of overlapping capability with each tungsten size, metal thickness and amp settings. Experience will eventually dictate the best range and choice of Tungsten size, filler size etc. As a general rule, select a filler metal that is no more than 1/32” larger or smaller than the Tungsten diameter. Do not use “pure” (green) Tungsten in an inverter. Use only Lanthanated, Thoriated, or Ceriated Tungsten.

| TROUBLE: | CAUSE/SOLUTION |
|---|---|
| Machine will not turn on | Check cords and wiring in the plug. Check circuit breaker. Contact Everlast Technical Support to check and replace main unit fuse. |
| Machine runs, but will not weld and/or Red LED is on. | Check for sound work clamp connection. Make sure work/Torch cable is securely fastened to DINSE connector. Check circuits for over/under voltage. Dirty power from generator. Internal fault or incorrect wiring. (LED does not have to be lit if it is incorrectly wired). Check wiring in plug/ receptacle if unit switches on but produces light spark or no spark.<br>Reset main power switch if overcurrent light is on after cool down period. Contact Technical Support if if light is still on after checking/correcting the issue. |
| Arc has difficulty establishing, welding rod sticking | Wet welding rods. Too low of amperage. Too high of amperage. Use fresh rods. Adjust amps. Wrong polarity. Hot start/Arc force too low. |
| Welding rod is rapidly consumed. | Too small of welding rod. Too high of amperage setting. Wrong polarity. |
| Porosity of the Weld. Discolored weld color. Too much spatter. | Too much arc force control. Too long of arc length. Too high of amps. |
| Weld quality is poor, Cold lapped weld, unstable arc. | Clean paint/rust from weld. Make sure work clamp has good contact. Too low of amps |
| LED illuminates yellow/green. Machine runs, but no weld power. | Duty cycle exceeded. Allow machine to cool. Reset main power switch after full cool down period. Make sure fan is not blocked. Cycle power switch after 10-15 minutes of cooling. |
| Slight whine or squeal to arc. | Normal. Sound may vary. |
| Circuit breaker trips. Internal Fuse blown. | Wiring fault. Too small of wire or circuit breaker. Welder internal short. Contact Everlast Technical Support before resuming use. |

# PowerARC 300ST Box Contents

| Qty. | Description |
|---|---|
| 1 | Tong style Stick electrode holder, 10ft cable with DINSE 50 style connector |
| 1 | Steel work clamp, 10ft cable with DINSE 50 style connector |
| 1 | PowerARC 300ST DC Stick Inverter welder |
| 1 | Manual |

**NOTE: Kit contents, appearance, size and quantity are subject to change without notice.**

**Remember that these important terms refer to the same thing and are generally interchangeable:**

Shielded Metal Arc Welding = SMAW= Stick Welding= MMA = Manual Metal Arc Welding
DCEP = Direct current, electrode positive = Reverse polarity = Positive polarity(+) = Torch in Positive
DCEN = Direct current, electrode negative (-) = Straight polarity = Negative polarity (-) = Torch in Negative
Stinger = Electrode holder = Stick Holder = Torch
Welding rod = Electrode = Stick
Arc force = Dig = Inductance = Arc response

***Why doesn't the PowerARC 300ST come with a power plug?*** The PowerARC 300ST is both a single phase and three phase machine. This means it can work in home shops and industrial factories with different power supplies. Single phase welders in North America use only three wires for 240V operation with two 120V lines arranged out of phase (measuring 240V between the hot legs and 120V to ground) with a third wire serving as a ground. No neutral is needed. This differs from a range or dryer cord where a return path is needed for a 120V circuit that may be also used in a range or dryer circuit. Wire colors used for a dryer or range connection do not match up to the standard wire colors used in wiring a welder. In three phase, 4 wires are used, with 3 hot wires (again, out of phase with each other) are used. These should measure a nominal 240V between any twp hot legs, though to ground measurements on a hot leg will be less. Once again, only one wire is used for a ground. No neutral exists in a 3 phase circuit for a welder either. Welding equipment that can operate on both single and three phase voltage do not have a "standard" plug that can be used for both single and three phase operation, so the unit must be wired specifically for each phase. Therefore, when wiring for single phase, one wire will not be used. If using it for permanent single phase operation, a separate, dedicated welder circuit is suggested. Wiring into existing range or dryer connections is not recommended as these utilize a neutral wire and confusion over wire colors and numbers can be created causing the welder to malfunction. The possible issues with wire confusion and mismatch require professional oversight so always be sure to consult/hire a licensed electrician to comply with local codes and for wiring safety.
**Do not connect unit to 460/480V 3 phase unless unit is special ordered for 460/480V use!**

# NOTES: