# EVERLAST

**POWERARC 140ST/160STH/200/300**

# CC/ DC SMAW/GTAW WELDER


## *Operator's Manual for the PowerARC Series*

## *Safety, Setup and General Use Guide*



Rev. 1 0 00131-11

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**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 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

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 Austrailia:

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.

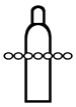
**Welding and cutting processes pose certain inhalation risks.** Be sure to follow any guidelines from your chosen consumable and electrode suppliers regarding possible need for respiratory equipment while welding or cutting. Always weld with adequate ventilation. Never weld in closed rooms or confined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

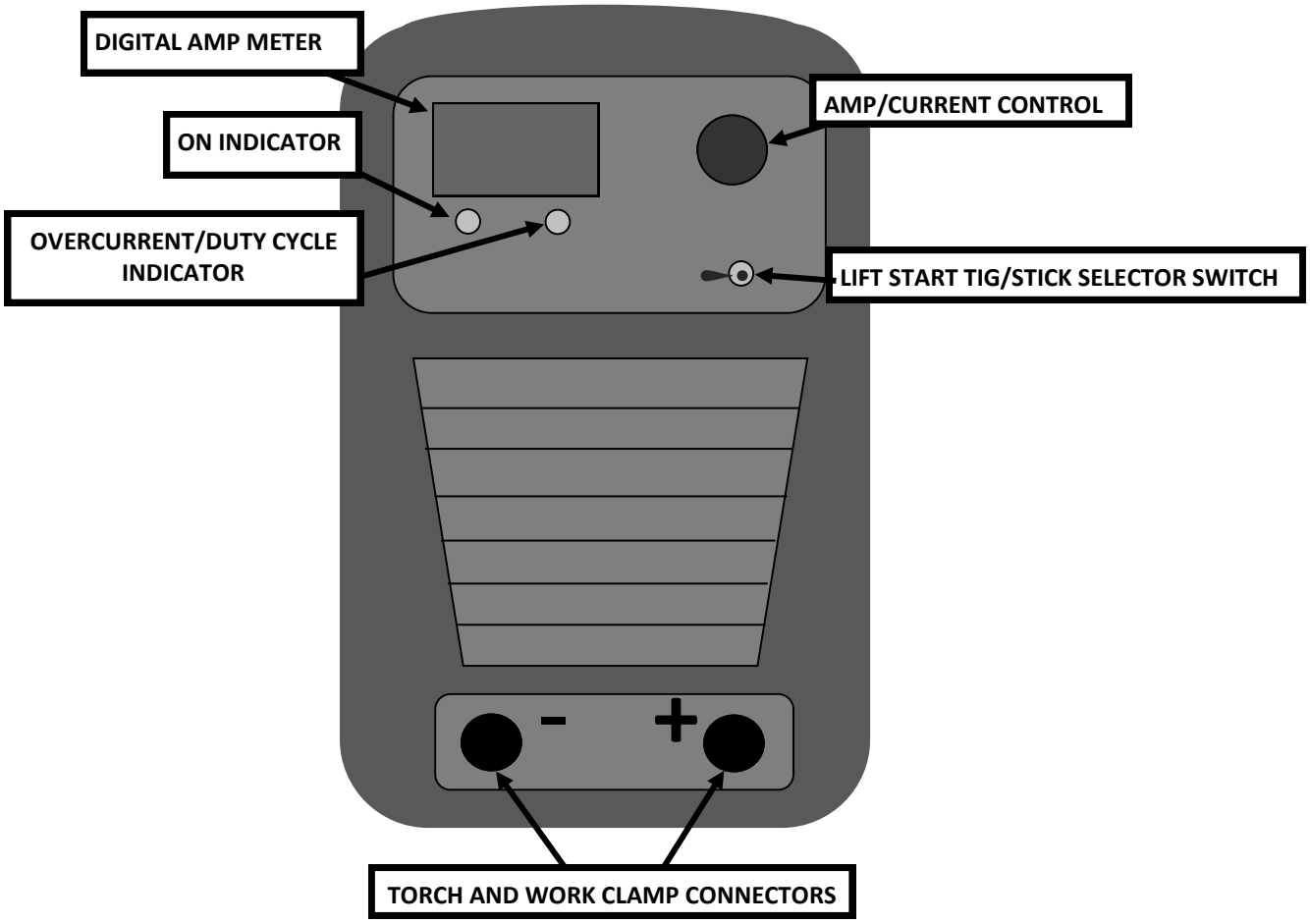
WARNING! **Faulty or poorly maintained equipment can cause injury or death.** Proper maintenance is your responsibility. Make sure all equipment is properly maintained and serviced by qualified personnel. Do not abuse or misuse equipment.
Keep all covers in place. A faulty machine may shoot sparks or 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

| FEATURE/SPEC. | PowerARC 140ST | PowerARC 160STH | PowerARC 200 | PowerARC 300 |
|---|---|---|---|---|
| INVERTER TYPE | IGBT | IGBT | IGBT | IGBT |
| INPUT VOLTAGE ±10%;PHASE/ FREQUENCY | 110/220V; 1PH/50-60Hz | 110/220V; 1PH/50-60Hz | 220V; 1PH/50-60Hz | 220; 1PH/3PH 50-60Hz |
| MAXIMUM INPUT AMPS ($I_1$MAX) | 3O A @110V/ 25 A @ 220V | 30 A @ 110V/ 29 A @ 220V | 40 A @220V | 60 A @ 220V 1PH/ 47 A @ 220V 3PH |
| MAXIMUM INPUT RUNNING AMPS ($I_1$eff) | 25 A @ 110V/ 20 A @ 220V | 25 A @ 110V/26 A @ 220V | 32 A @ 220V | 50 A @220V 1PH/ 40 A @ 220V 3 PH |
| DUTY CYCLE % @ AMPS | 35% @ 100 A (110V)<br>60% @85 A (110V))<br>100% @ 55 A (110 V)<br>35%@ 140 A (220V)<br>60% @ 100 A (220V)<br>100% @ 85 A (220V) | 35% @ 105 A (110V)<br>60% @ 90 A (110V)<br>100% @ 60 A (110V))<br>35% @ 160 A (220V)<br>60% @ 120 A (220V)<br>100% @ 90 A (220V) | 60%@200 A<br>100%@ 160 A | 60% @ 300 A |
| OUTPUT AMP RANGE | 10-110 A (110V)<br>10-140 A (240V) | 5-105 A (TIG 110V)<br>5-160 A (TIG 220V) | 10-200 A | 20-300 A |
| VOLTAGE RANGE | 20.4-25.6 V | 20.4-26.1 V | 20.4-28V | 20.8-32V |
| OPEN CIRCUIT VOLTAGE | 60-80 V | 60-80 V | 70 V | 60-80 V |
| LIFT /HF TIG FEATURE | STANDARD W GAS VALVE TORCH. LIFT ONLY. | STANDARD WITH TORCH PACKAGE. LIFT AND HF. | NO | NO |
| SCRATCH START TIG PACKAGE | N/R | N/R | OPTIONAL | OPTIONAL |
| CONSTANT CURRENT (CC) OUTPUT TYPE | DC (±) | DC (±) | DC (±) | DC (±) |
| CELLULOSE ROD CAPABLE 6010,6011 | 6011 ONLY (DC+) | 6011 ONLY (DC+) | YES | YES |
| INCLUDES | WELDER, WORK CLAMP WITH CABLE (5FT),STICK TORCHWITH CABLE (5FT), TIG TORCH, CARRY CASE, CONSUMABLES AND BRUSH (NO TUNGSTEN) | WELDER WORK CLAMP WITH CABLE ( 8 FT), STICK TORCH WITH CABLE (8 FT), TIG TORCH, REGULATOR, CARRY CASE CONSUMA-BLES AND BRUSH (NO TUNGSTEN) | WELDER, WORK CLAMP WITH CABLE (10 FT), STICK TORCH WITH CABLE (10FT) | WELDER, WORK CLAMP WITH CABLE(10FT), STICK TORCH WITH CABLE(10FT) |
| DINSE CONNECTOR TYPE | 25/35mm² | 25/35mm² | 35/70mm² | 35/70 mm² |
| HOT START (SURGE CURRENT) | AUTO | AUTO | AUTO | ADJUSTABLE |
| ARC FORCE CONTROL | ADAPTIVE | ADAPTIVE | ADAPTIVE | ADJUSTABLE |
| MAXIMUM SUGGESTED ROD DIAMETER | 1/8” | 1/8” | 3/16” | 1/4” |
| PROTECTION CLASS | IP21S | IP21S | IP21S | IP21S |
| INSULATION GRADE | F | F | F | F |

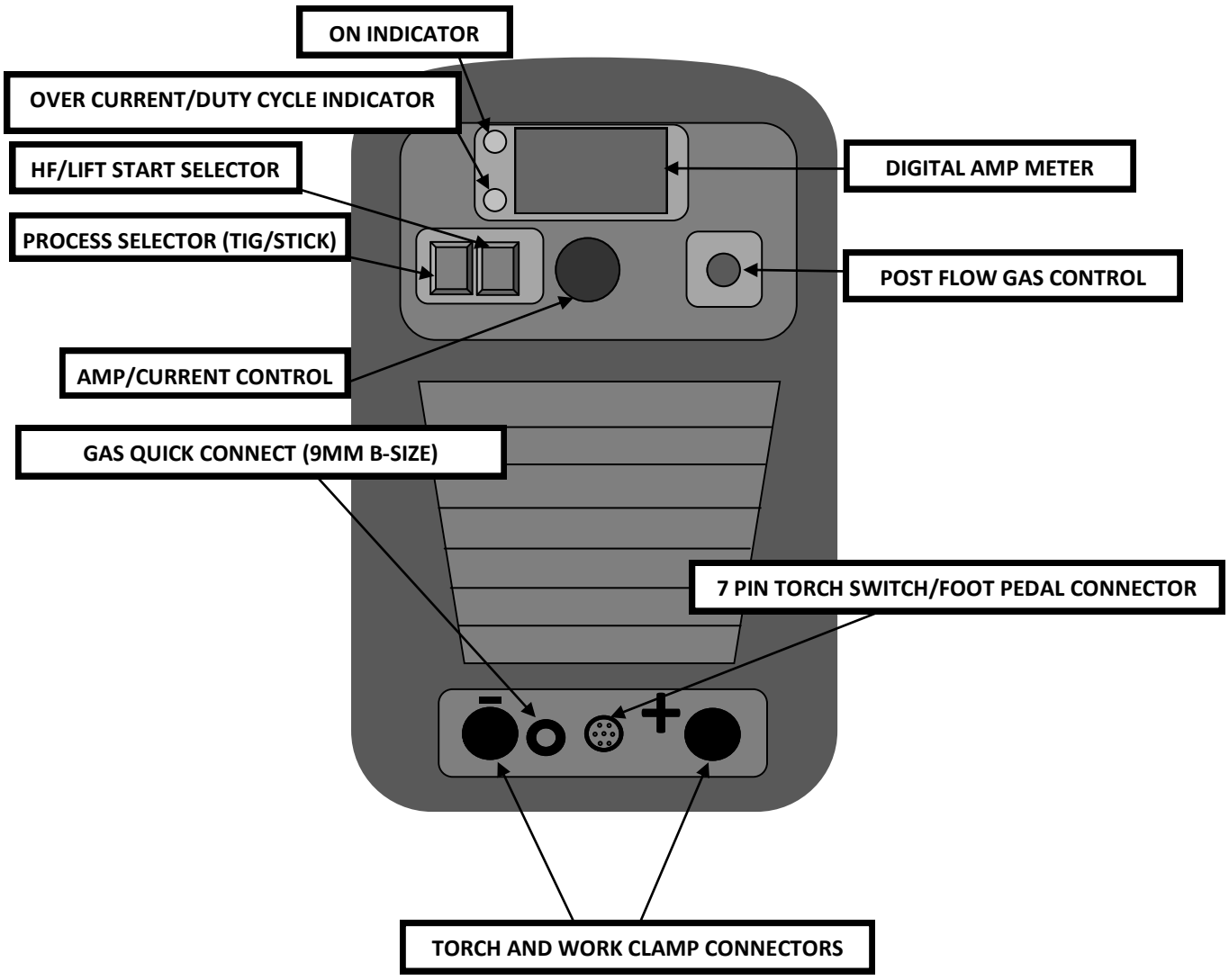
# PowerARC 140 ST
# Front Panel View




***POLARITY:***
**TIG MODE: TORCH NEGATIVE (-), WORK POSITIVE (+)**
**STICK MODE: TORCH POSITIVE (+), WORK NEGATIVE (-)**

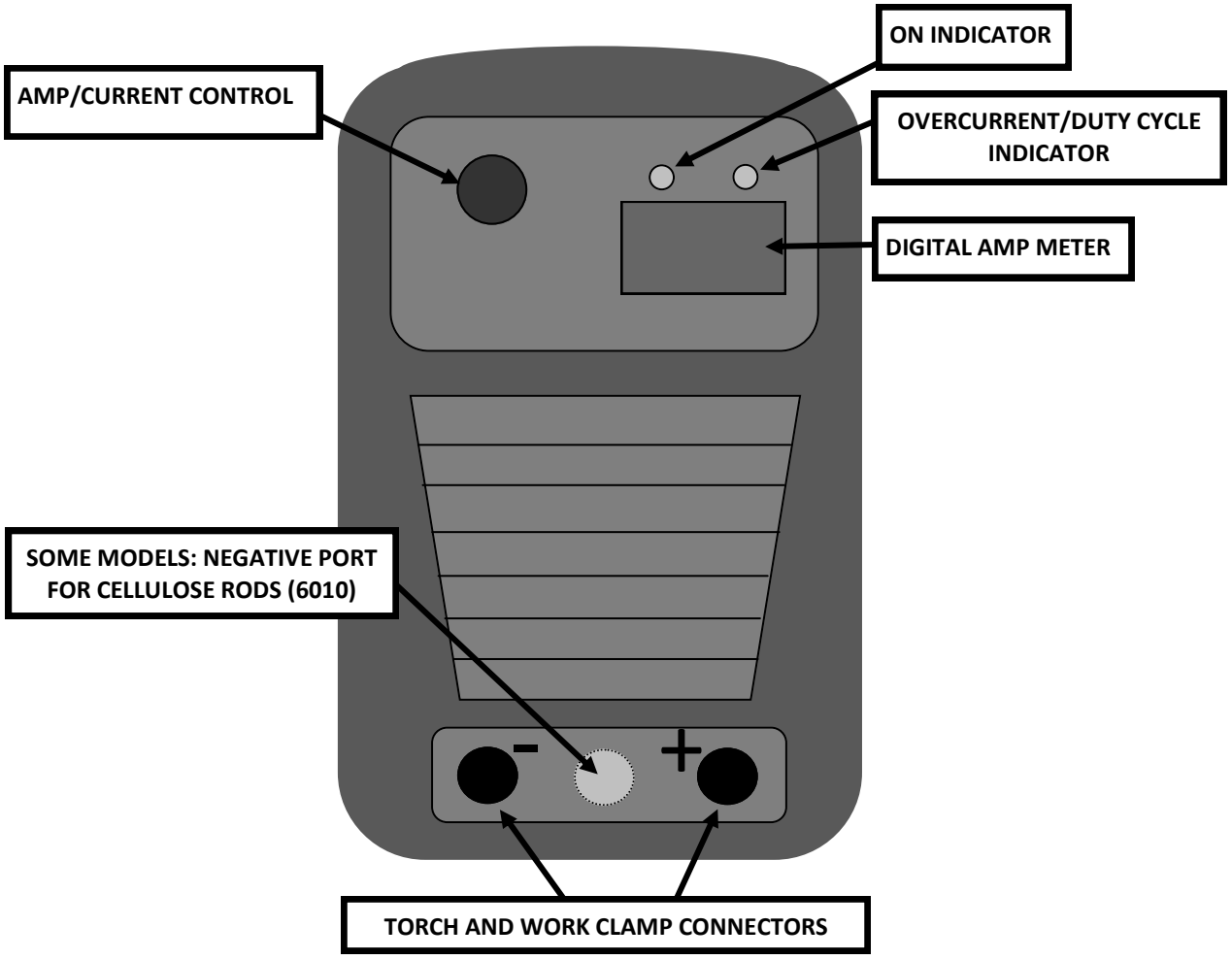
# Power ARC160 STH

## FRONT PANEL VIEW

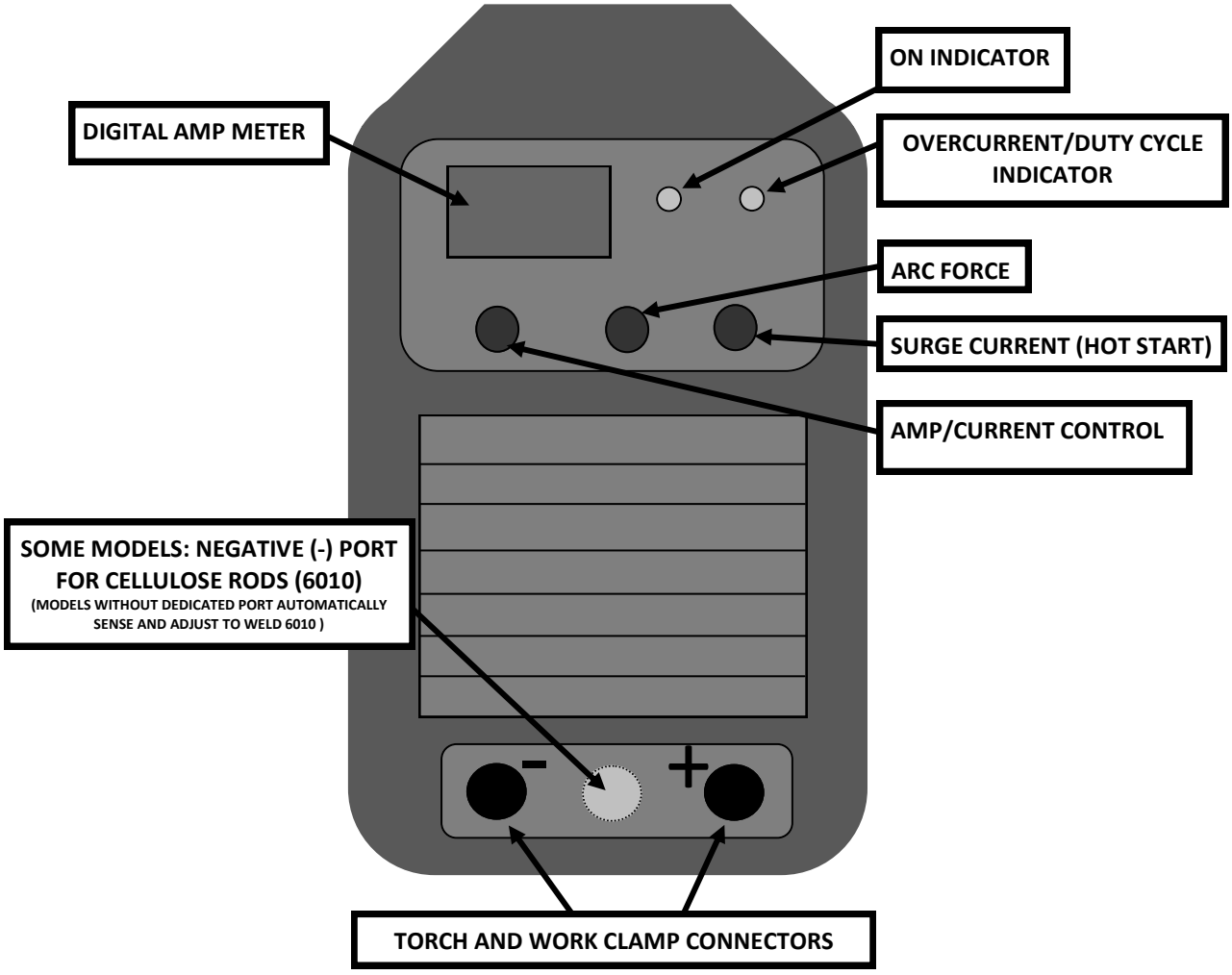



***POLARITY:***
**TIG MODE: TORCH NEGATIVE (-), WORK POSITIVE (+)**
**STICK MODE: TORCH POSITIVE (+), WORK NEGATIVE (-)**

# PowerARC 200
# Front Panel View



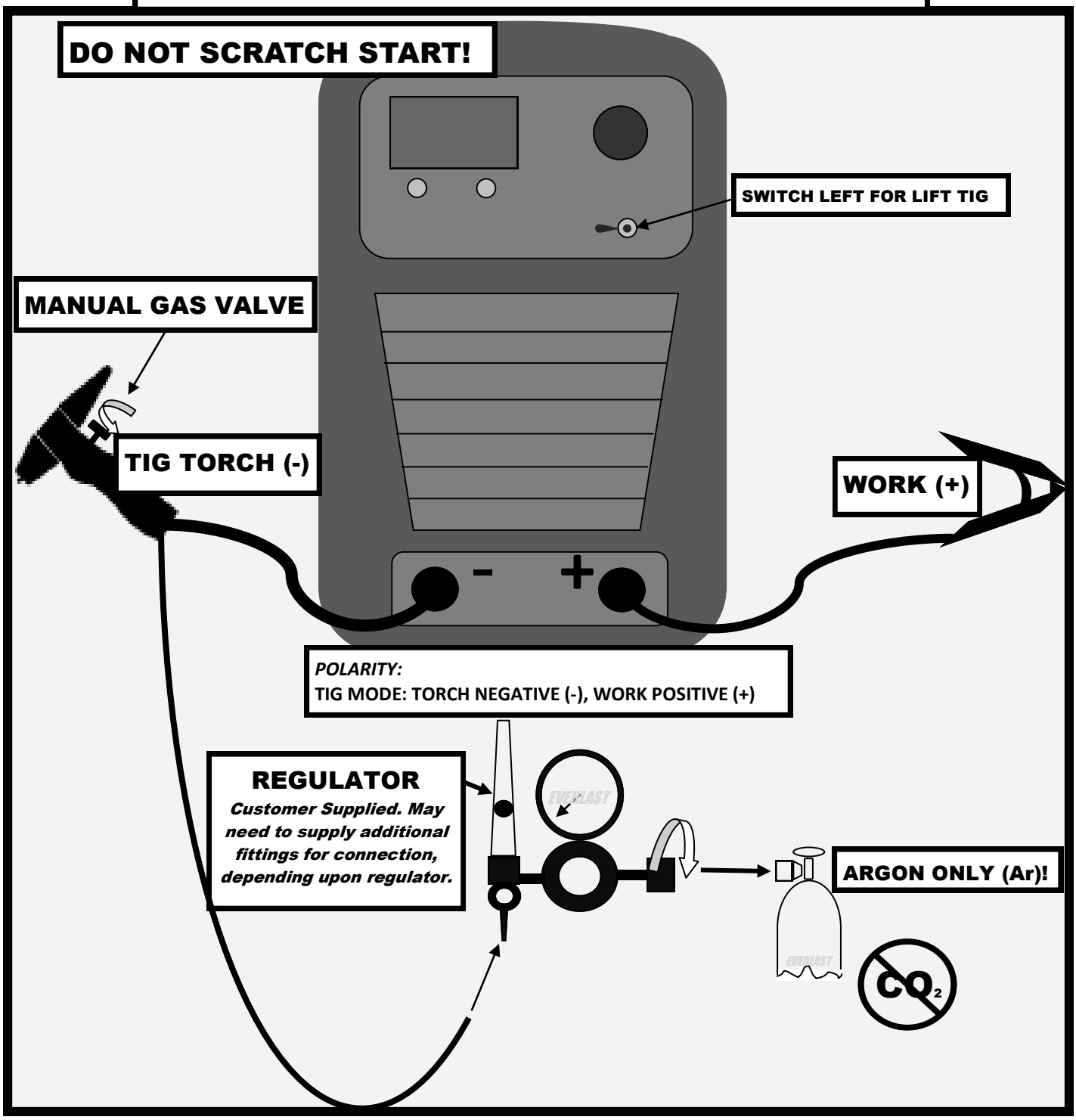
# PowerARC 300
# Front Panel View



# Power ARC140 ST

## TIG TORCH AND GAS CONFIGURATION

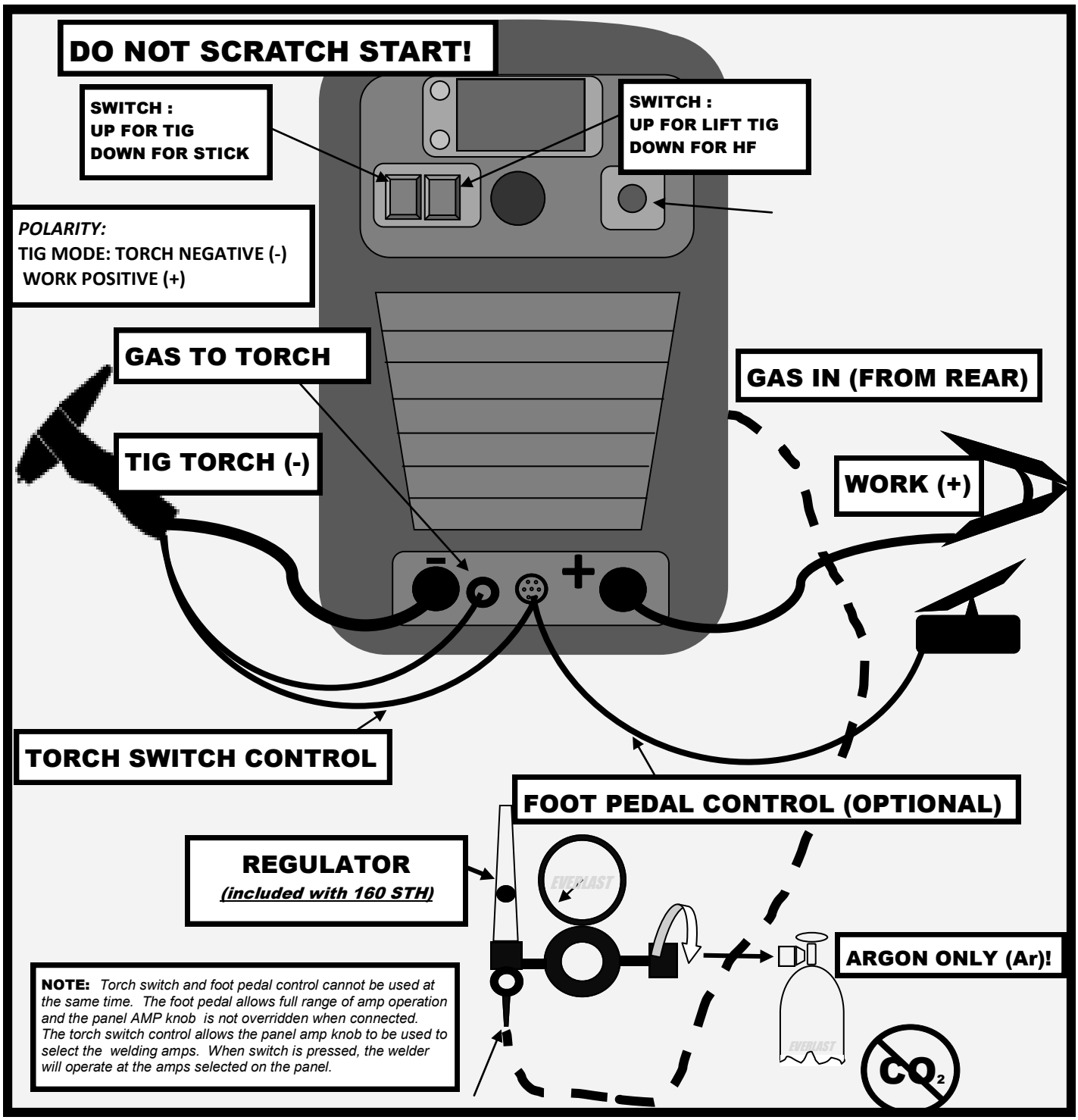
**IMPORTANT: The PowerARC 140ST is DC output only. DC TIG is not recommended for welding aluminum. The lift start process is a low maintenance start type for DC TIG, and High Frequency is not needed for high quality welds in steel or stainless.**



# Power ARC160 STH

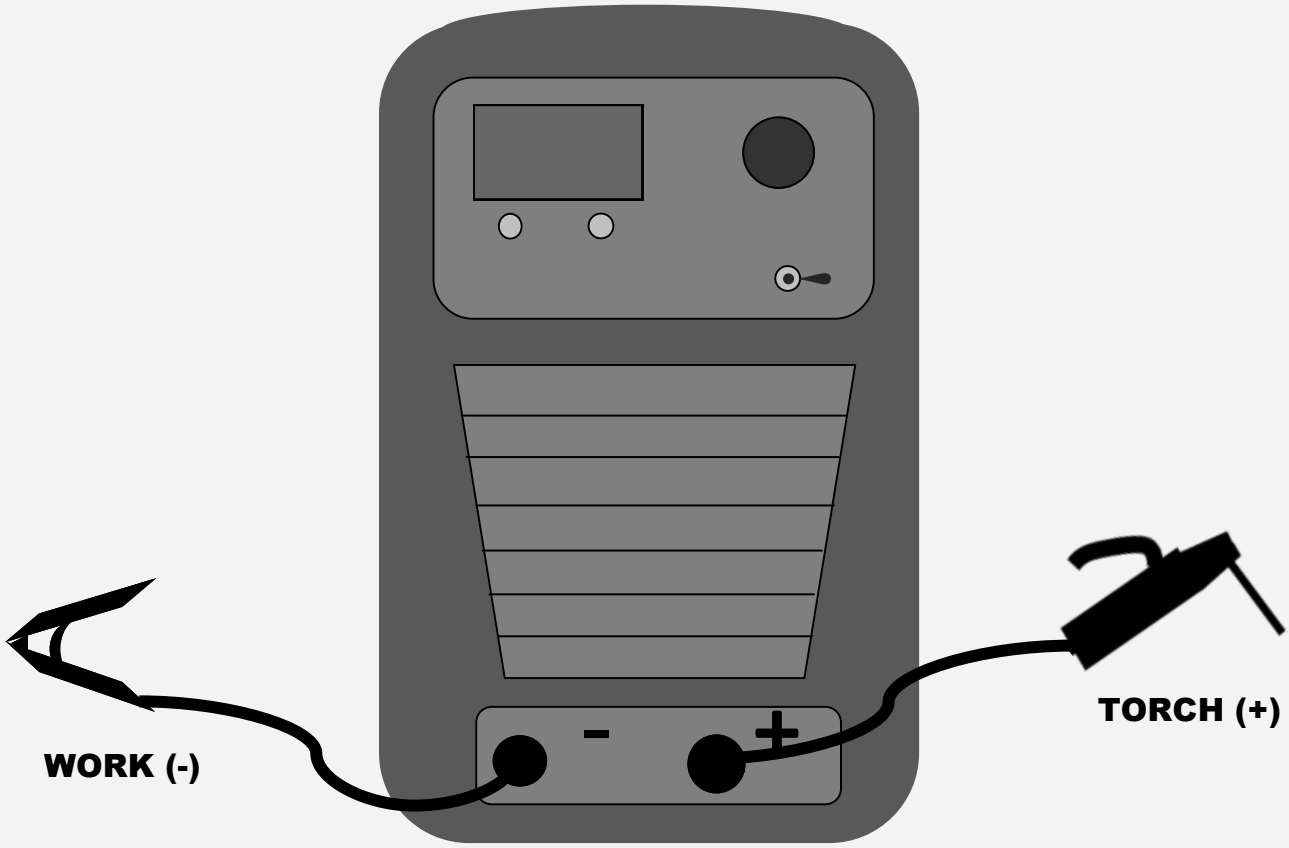
## TIG TORCH AND GAS CONFIGURATION

**IMPORTANT: The PowerARC 160STH is DC output only. DC TIG is not recommended for welding aluminum. The lift start process is a low maintenance start type for DC TIG, The High Frequency start does not require contact with the metal to start the arc, which provides the easiest method of starting.**



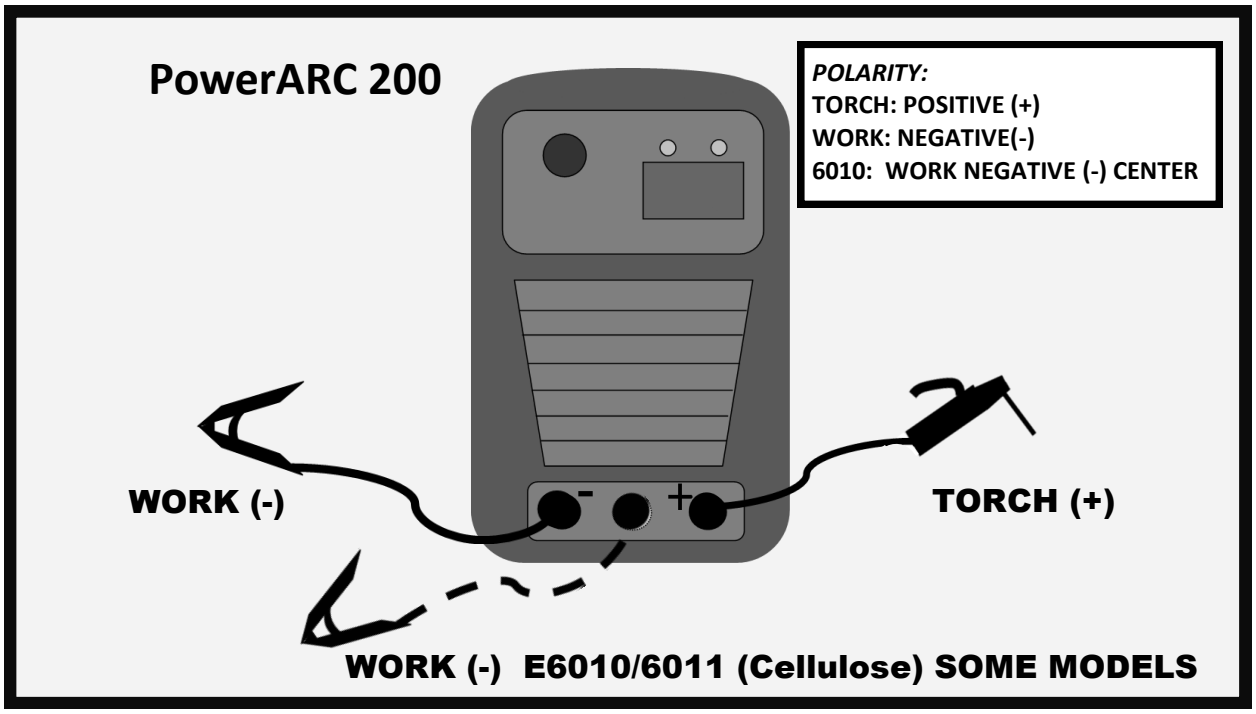
# PowerARC 140ST, 160 STH

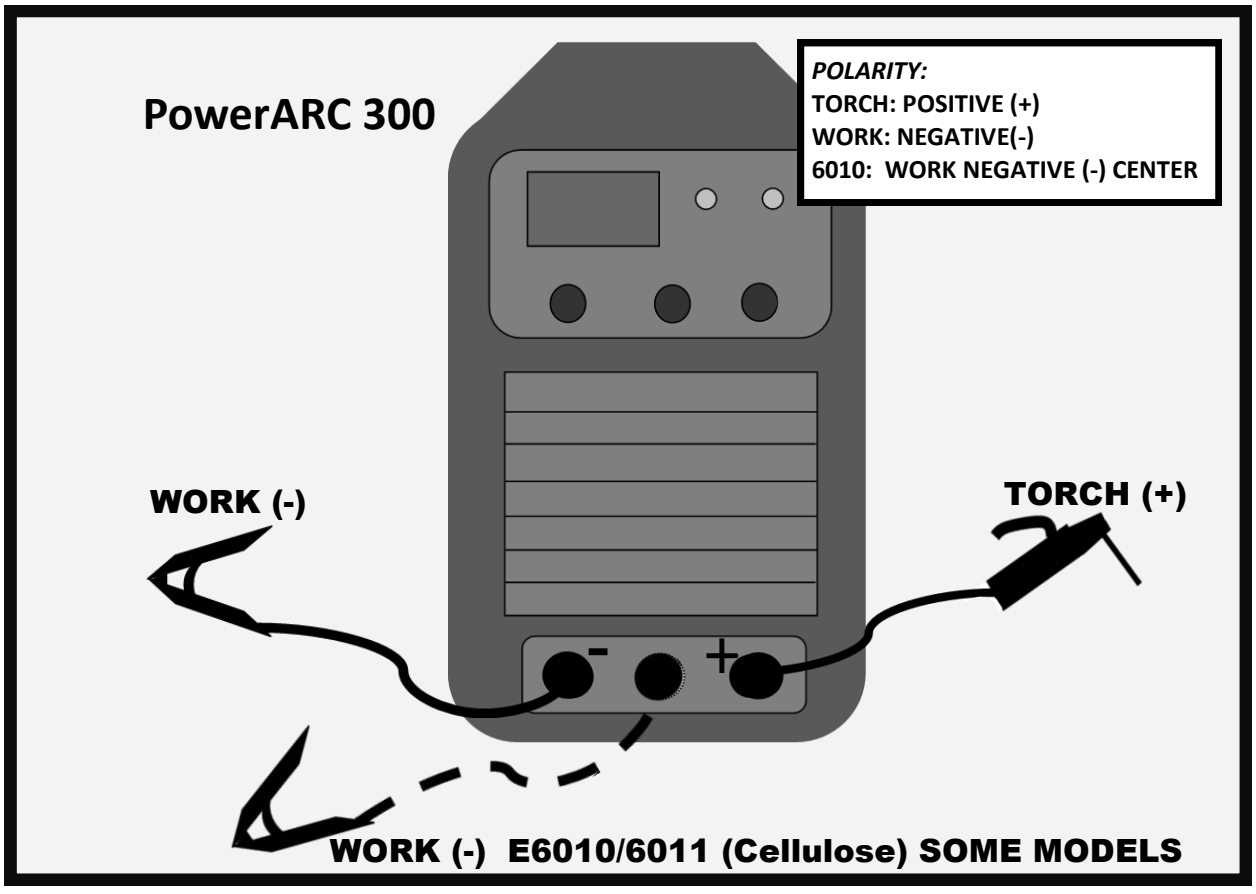
## STICK WELDING CONFIGURATION




***POLARITY:***
**STICK MODE: TORCH POSITIVE (+), WORK NEGATIVE(-)**

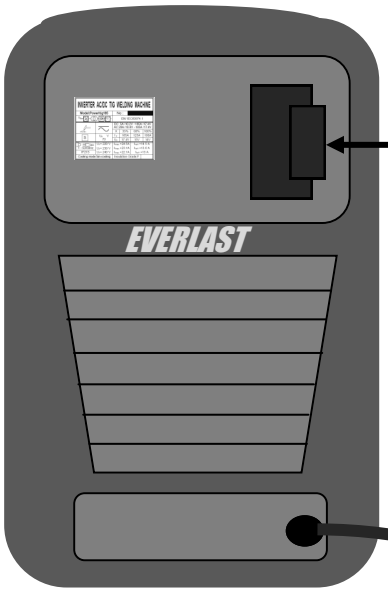
## PowerARC 200/300



# PowerARC 140ST/160STH/200 WIRING

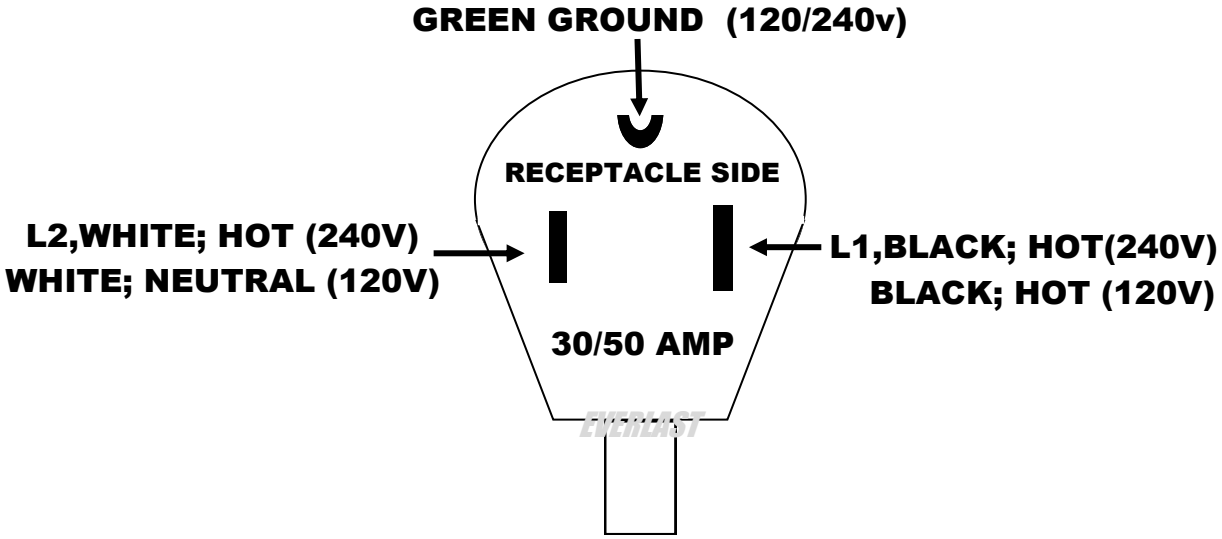
**CONSULT A LICENSED ELECTRICIAN AND LOCAL CODES BEFORE WIRING YOUR UNIT!**
**EVERLAST IS NOT RESPONSIBLE FOR DAMAGE RESULTING FROM IMPROPER WIRING.**




**SWITCH ON/OFF**
(Switch position and type may vary)

**240V PA 200,120/240V PA 140STH, and PA160 STH**

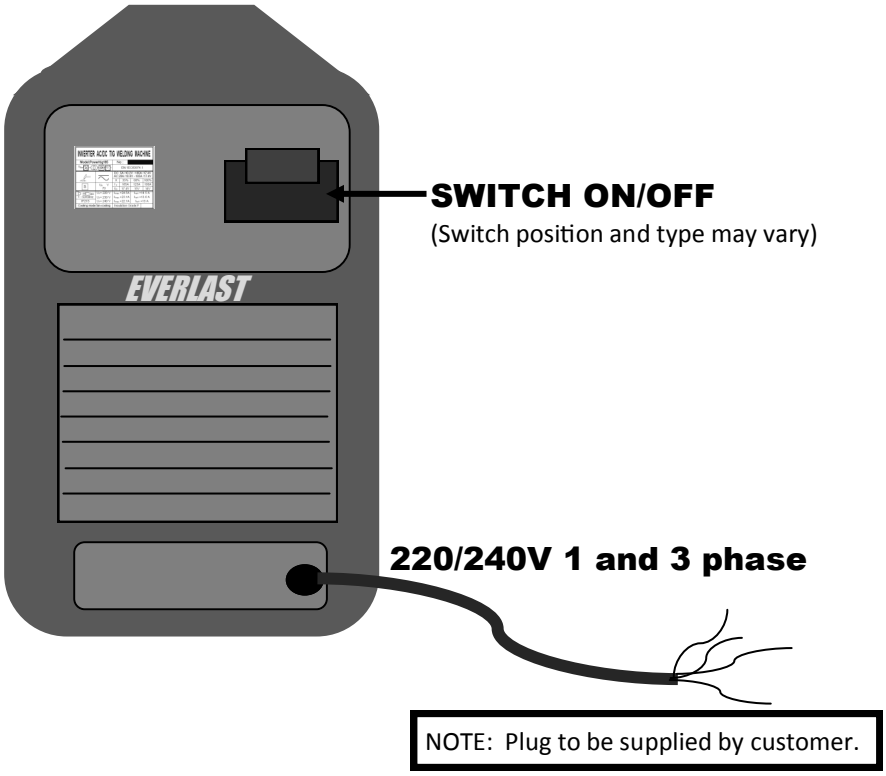
NOTE: Plug to be supplied by customer.

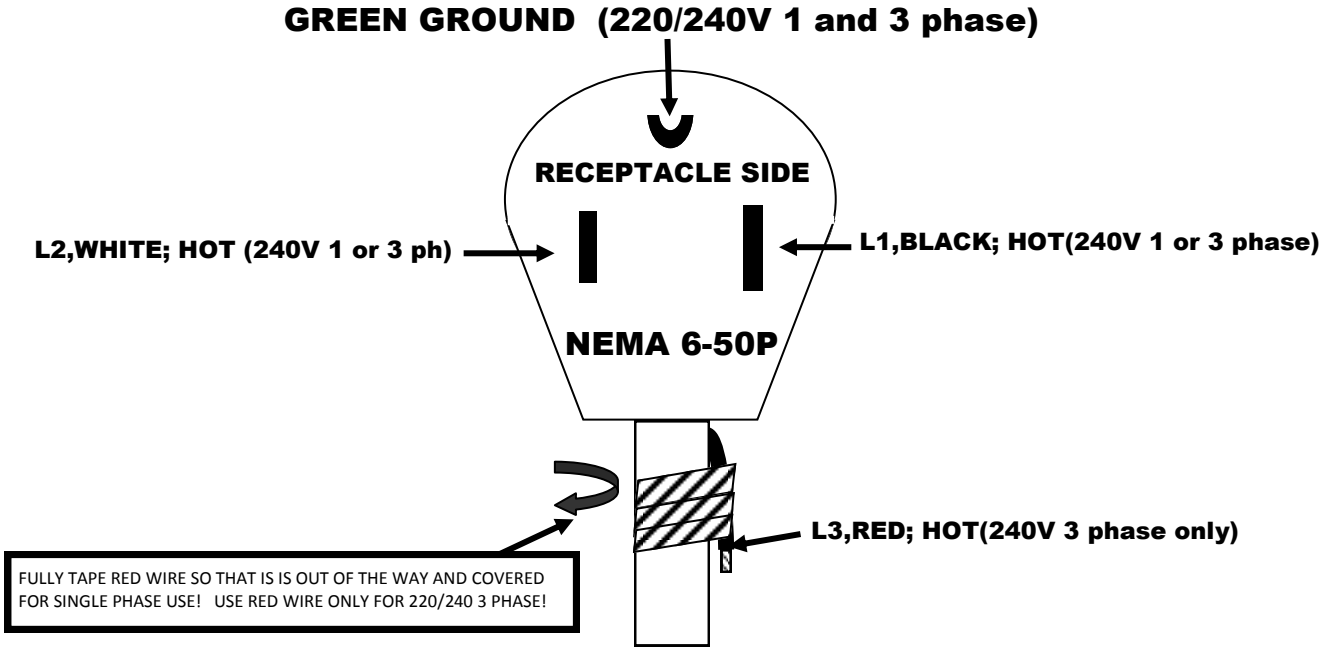



**IMPORTANT:** WHILE USING THE POWERARC 140 ST/160 STH WITH A 120V POWER SUPPLY, BE SURE TO USE THE WHITE WIRE AS THE COMMON/NEUTRAL, THE BLACK AS THE HOT, AND THE GREEN AS THE GROUND OR MALFUNCTION/DAMAGE MAY OCCUR.

# PowerARC 300 WIRING

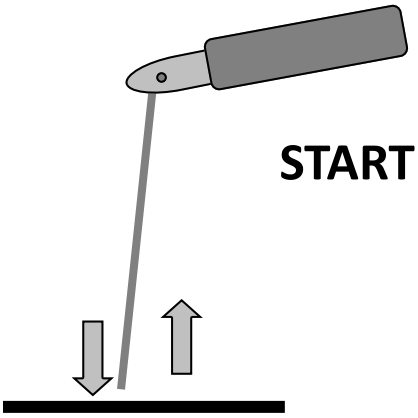
**CONSULT A LICENSED ELECTRICIAN AND LOCAL CODES BEFORE WIRING YOUR UNIT!**
**EVERLAST IS NOT RESPONSIBLE FOR DAMAGE RESULTING FROM IMPROPER WIRING.**



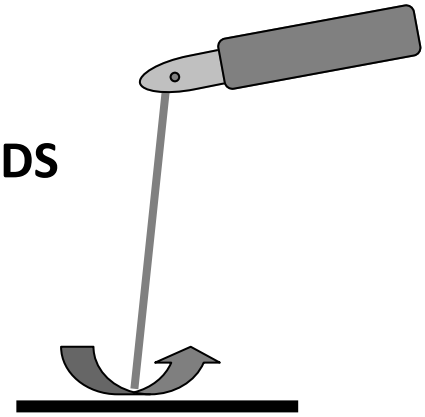



# POWER ARC 140/160/200/300
# STICK OPERATION TECHNIQUE

## STARTING METHODS



Tapping Method

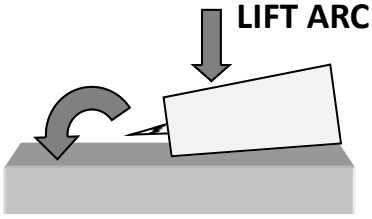


Scratch/Match Method

**DC STICK (SMAW) OPERATION GUIDE**

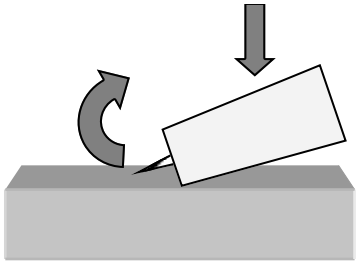
| METAL THICKNESS | ELECTRODE SIZE | WELDING AMPS |
|---|---|---|
| < 1 mm/.040” | 1.5 mm/ 1/16” | 20-40 |
| 2 mm/.080” | 2 mm/3/32” | 40-90 |
| 3 mm/ 1/8” | 3.2 mm/1/8” | 80-150 |
| 4-5 mm/ 3/16” | 3.2-4 mm/ 1/8”-3/16” | 100-170 |
| 6-12 mm/ 1/4”-1/2” | 4–5 mm/ 3/16” | 130-250 |
| >12mm/>1/2” | >5mm/3/16” | 200-300 |

## LIFT ARC STARTING METHOD FOR POWERARC 140ST/160STH

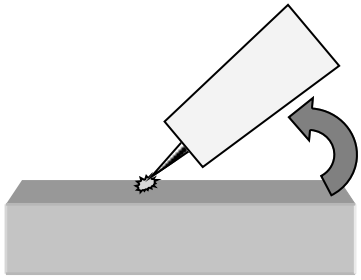


**DO NOT SCRATCH START!**

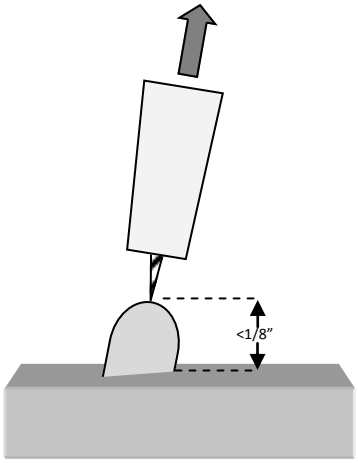
1. Position the edge of the ceramic cup on the metal.
2. Quickly rotate cup so that the tungsten comes in contact with the metal.



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.

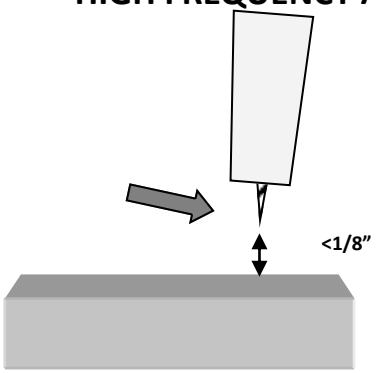



5. Leave 1/8" or less gap between the tungsten tip and the metal.

| METAL THICKNESS | WELDING AMPS (A) | TUNGSTEN DIA. | Ar FLOW RATE |
|---|---|---|---|
| 1-3 mm/.040"-1/8" | 5-80 | 1-2 mm/.040"-3/32" | 8-15 CFH /4-7 lpm |
| 3-6 mm/ 1/8"-3/16" | 80-140 | 2-3 mm/ 3/32"-1/8" | 15-25 CFH/ 7-14 lpm |

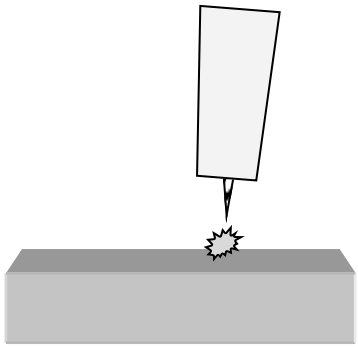
Note: This method takes some practice to master to initiate the arc on the first try. However, an arc can usually be struck fairly easily by the beginner, though it may take 2 or 3 times to get one to initiate properly. After it is mastered, arc striking can be done with a light, seamless motion on the first try.

## HIGH FREQUENCY ARC STARTING METHOD FOR POWERARC 160STH




**DO NOT SCRATCH START!**

1. Position the point of the sharpened tungsten about 1/8” above the metal
2. Press the torch trigger or press the foot pedal until the switch just turn on arc.



3. An arc should form, after a slight spark or snap sound. If arc does not start, repeat it and move tungsten closer to metal.

4. Leave 1/8” or less gap between the tungsten tip and the metal and proceed with welding.

| METAL THICKNESS (STEEL) | WELDING AMPS (A) | TUNGSTEN DIA. | Ar FLOW RATE |
|---|---|---|---|
| 1-3 mm/.040”-1/8” | 5-80 | 1-2 mm/.040”-3/32” | 8-15 CFH /4-7 lpm |
| 3-6 mm/ 1/8”-1/4” | 80-160 | 2-3 mm/ 3/32”-1/8” | 15-25 CFH/ 7-14 lpm |

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

PowerARC 140 ST and 160 STH:

The PowerARC 140ST and 160 STH are commercial capable, 120/240 volt, 140 and 160 amp stick and DC TIG IGBT inverter DC welder with 35% duty cycles. The welders are capable of welding steel or stainless steel. Their ideal for tasks where portability and performance are required. The arc is smooth and stable, and will weld up to 1/8" electrodes. Hot start and automatically regulated arc force control make them easy to weld with. The welders are suitable for welding with iron powder, stainless and low hydrogen class rods ( i.e. 7018, 6013, 7014, and 309). The lift start TIG function (140ST and 160STH) is excellent for running root passes and welding metals up to 3/16" thick in a single pass. The 160STH features High Frequency starting. On the 140 ST, a gas control valve installed on the TIG torch efficiently controls gas flow.
The 160 STH features a built in gas control valve inside the welder which automatically controls gas flow.
PowerARC 200:

The PowerARC 200 is an industrial duty IGBT inverter DC welder with one of the most stable welding arcs in the industry. Many professionals find them suitable for general repair, construction, and even pipeline work. Excellent performance can be achieved with cellulose rods such as 6010 5P, and 6011 as well as low hydrogen (typ. 7018), iron powder or stainless rods. Again, the 200 perform well with almost any welding rod in the industry. Hot Start and automatically regulated arc force control improves weld quality and arc performance.

PowerARC 300:

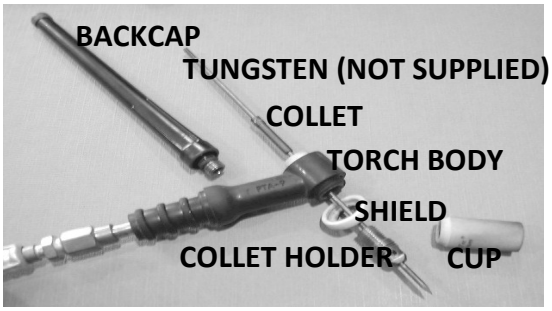
The PowerARC 300 is an industrial IGBT inverter DC welder that is capable of producing the finest quality welds achievable through the SMAW welding processin virtually any application. Equipped with both adjustable arc force and ignition control (hot start), the unit can be tailored exactly to suit the welding environment. The PowerARC 300 is capable of welding with any electrode up to 1/4", including cellulose rods.

**3.2 Basic Overview and operation.**

PowerARC140ST and PowerARC 160STH:
The PowerARC 140 ST package includes a basic TIG torch with a manual gas valve, stick electrode holder with cable, and a work clamp. The 160STH uses a standard torch without a gas valve since the unit has a gas solenoid built into the welder. Customers must supply argon for TIG shielding gas and regulator for the 140 ST. The 160 STH includes a regulator in the purchase price. A regulator may be purchased from Everlast, or one may be bought locally.

*TIG:*
The 140ST does not have a gas solenoid circuit so it does not provide automatic flow control of the gas. Rather its equipped with a common manually controlled torch mounted valve. See page 14. Twisting the valve located on the neck of the torch opens and closes the gas flow. The 160STH operates and starts the arc by simply pressing the torch trigger, or stepping on the panel. Gas will flow automatically.

The 140 ST torch gas supply hose does not have any fittings on it. To set up the TIG feature and make it ready for use, the torch must be connected directly to a regulator. Most regulators come with a 5/8" CGA fitting. Some, such as the regulator available from Everlast, may be supplied without fittings, designed for use with barbed fittings. You will need to join the regulator and torch by adapting the 5/16" torch gas hose to the regulator. This is easily accomplished with a minimal amount of standard hose barb and CGA fittings available at any welding supply store. The 160 STH should have the fittings plumbed into the torch for the gas. However the rear of the unit should be connected with the argon regulator (provided on 160STH), with the hose and clamps provided. Make sure that the tungsten, collet and cups are assembled correctly according to the breakdown




pictured below (handle is removed for further detail):
To use the TIG lift arc, flip the switch toward the TIG icon on the welder. Adjust welding current with the Amp control knob to desired amp level. Make sure the tank is open and the regulator is adjusted for 10-

20 CFH (5-10 lpm). For lift start (140ST and 160STH): lightly touch the tungsten to the metal, and quickly lift up to a distance of 1/8" or less. See page 18 for lift arc striking method. With the 140ST, the tungsten will be hot all the time. See page 21 for complete details. With the 160STH, you must either press the switch or press the foot pedal to make the tungsten live and start the arc. To make a HF start with the 160STH, see page 22 for details.

*Stick:*
Make sure the switch is flipped so that the stick icon is selected. Insert the electrode holder into the positive output terminal. Insert the welding electrode (rod) and strike arc with either tapping or match strike method. See page 17 for arc striking method.

PowerARC 200:
The PowerARC 200 units are straight forward stick welders. The built in arc force and hot start are automatically managed, so that attention can be paid to welding. The arc should be smooth and stable, at any amp selection, providing the correct type and electrode is used.

Stick:
For units with three out put ports: Facing the unit, insert the work clamp cable connector into either the far left or middle negative out put terminal. For E6010/E6011 and other cellulose flux rods, select the middle negative out put terminal. The middle terminal increases operating voltage and adjusts programming to burn cellulosic rods correctly. The left output terminal lowers the voltage and changes the programmed response of the welder to burn other welding rods more smoothly. Then, Insert the electrode holder cable connector into the positive output terminal.

For units with two output ports: Insert work clamp cable connector into the left (negative -) output terminal. Insert electrode holder into the right (positive +) output terminal. The two port models automatically adapt output voltage for cellulose based rods. Adjust the welding current to the amps desired. Insert welding electrode (rod) and strike an arc with either the tapping or match-strike method. Readjust amperage as needed. See page 17.

PowerARC 300:
The PowerARC 300 provides the operator with maximum control over the welding parameters. The PowerARC 300 utilizes adjustable surge current (hot start) and arc force control yield the best possible welds. The result is a stable smooth arc, with reduced sticking in all positions.

Stick:

For units with three output ports: Facing the unit, insert the work clamp cable connector into either the far left or middle negative out put terminal. For E6010/E6011 and other cellulose flux rods, select the middle negative out put terminal. The middle terminal increases operating voltage and adjusts programming to burn cellulosic rods correctly. The left output terminal lowers the voltage and changes the programmed response of the welder to burn other welding rods more smoothly. Then, Insert the electrode holder cable connector into the positive output terminal.

For units with two output ports: Insert work clamp cable connector into the left (negative -) output terminal. Insert electrode holder into the right (positive +) output terminal. The two port models automatically adapt output voltage for cellulose based rods. Adjust the welding current to the amps desired. Insert welding electrode (rod) and strike an arc with either the tapping or match-strike method. Readjust amperage as needed. See page 17.

Use the arc force control to control arc response in situations that where the arc length is reduced but more heat is needed. When the arc is held close, volts tend to drop and overall wattage goes down. Increasing the arc force control offsets this condition by boosting amps in relation to arc length, to maintain the arc stability and quality.
The surge current, commonly referred to hot start, sends a rush of current when the arc is struck to rapidly heat up the weld and the rod to help reduce sticking when contact with the metal is made. Increasing surge current increases the intensity of the surge. Used properly, it makes the weld start easily before settling in at reduced amps for normal welding. Excessive hot start settings can cause burn through on thin materials. For thin materials, select a lower surge current setting, and choose a welding rod such as the E6013 with an easy arc establishment, and low penetration.

**3.3 Handling and general maintenance**. **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, and interrupt the welding. Allow the unit to run for 10 minutes after the safety has triggered. Then reset the unit at the main switch by cycling it off and back on. On 110/220V machines, the duty cycle and the output of the machine will be reduced when operated on 110V. 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 and welding will be interrupted. Do not turn of the welder until the light has gone out. Welding will resume once the duty cycle light clears. If it does not clear after 10 minutes or extended periods of time, cycle the machine off and then back on. It is likely in these cases that the machine experienced an over current/voltage, but in some cases, the unit may not reset automatically if the duty cycle was exceeded.

**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, sufficient for dripping water protection, but is not recommended for wet environment use.

**Use the carry strap or handle provided to lift the welder.** Do not suspend the unit in the air by the strap or handle.

**Make sure that the units 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 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 and 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 to prevent eye injury from flying particles that may get dislodged while cleaning with compressed air. Do not concentrate compressed air on the skin.

If HF arc starts on the 160STH are hard or difficult, the point gap may need to be adjusted. To adjust the HF point gap on the 160STH, contact Everlast Tech Support for assistance.

| 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 in either mode. Red LED is on. | Check for sound work clamp connection. Make sure work/Torch cable is securely fastened to DINSE connector. Reset main power switch if overcurrent light is on after cool down period. Contact Technical Support. |
| Arc has difficulty establishing, welding rod sticking | Wet welding rods. Too low of amperage. Use fresh rods. Turn up amps. Wrong polarity. |
| Welding rod is rapidly consumed. | Too small of welding rod. Too high of amperage setting. Wrong polarity. |
| Tungsten is rapidly consumed. (140ST and optional TIG package units) | No/low gas flow. Wrong torch polarity (+). Open gas valve, readjust flow meter. Change polarity so torch is in negative (-). Scratch starting. For 140ST use only lift start technique. 200/300 results in more wear because lift sta |
| Porosity of the Weld. Discolored weld color. Too much spatter.<br><br>Tungsten is discolored. | Stick: Too long of arc length. Too high of amps.<br>TIG: Same as above/ Low flow rate of shielding gas. Too short of post flow period. Wrong TIG cup size. |
| Weld quality is poor, unstable arc. Weld is dirty/oxidized. | Clean paint/rust from weld. Make sure work clamp has good contact. Too low of amps. Incorrect wiring of welder.<br>Tungsten (TIG) is poorly ground/contaminated. |
| LED illuminates illuminates yellow/ green or red. 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. |
| Slight whine or squeal to arc or to welder while turned on. | No problem. This is a inverter that cycles over 20k/second. This may be more noticeable in the smaller 140ST. |
| Main Switch has tripped/ Internal Fuse blown. | Wiring fault/ Welder internal short. Contact Everlast Technical Support before resuming use. |

# NOTES: