

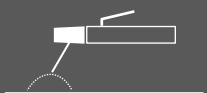


Storm 215c

Safety, Setup and General Use Guide For The
Storm 215c



**DC
200A**



**DC
160A**



**DC
40A**



FUNCTION: MIG/Stick/Plasma Cutter
PURCHASE DATE:
MODEL NAME:
SERIAL NUMBER:
OPTIONAL ACCESSORY SERIAL NUMBER:

120/240V

Operator's Manual



Welders, Plasma Cutters, Multi-Process

www.everlastwelders.com

Need Parts? Need Technical Help? Call: 1-877-755-9353

380 Swift Ave. Unit 12 South San Francisco, CA 94080, USA

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NOTICE:

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. Due to multiple variables that exist in the welding field and the changing nature of it and of the Everlast product line, Everlast Power Equipment INC. does not guarantee the accuracy, completeness, authority or authenticity of the information contained within this manual or of any information offered during the course of conversation or business by any Everlast employee or subsidiary. 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.

WARNING!

California Proposition 65 Warning:

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

 Warning: Cancer and/or Reproductive Harm

www.P65warnings.ca.gov

THANK YOU! We appreciate you as a valued customer and hope that you will enjoy years of use from your welder/plasma cutter multi-process unit. We work to please the customer by providing a well supported, quality product. ***To make sure that you receive the best quality ownership experience, please see below for important information and time sensitive details.***

What to do right now:

1. Print your receipt from your confirmation email that should have been sent to you after your purchase and put it up for safe keeping. If you do not have one, contact us at 1-877-755-9353 (US customers) or 1-905-570-1818 (Canadian Customers). You will need this if anything should ever happen for original owner verification (if bought as a gift, original receipt will still be needed, or explanation sent to Everlast).
2. Read this manual! A large number of tech and service calls are a result of not reading the manual from start to finish. Do not just scan or casually peruse this manual. There are different features and functions that you may not be familiar with, or that may operate differently than you expect. Even if you have expertise in the field of welding, you should not assume this unit operates like other brands or models you have used.
3. Carefully unpack and inspect all items immediately. Look for missing or damaged items. Please report any issues within 48 hours (72 hours on weekend or holidays) of receiving your product. Take pictures if you are able and contact us at 1-877-755-9353, ext. 207 if any issue is discovered between 9 am and 5 pm Eastern Time M-F (US customers) or at 1-905-570-1818 (Canadian Customers) between 9am and 4 pm weekdays except on Fridays when hours are from 9 am to 12pm Eastern. If outside of the US or Canada, contact your in-country/or regional distributor direct at their service number.

What to do within the next 2-3 days:

1. Make sure your electrical system is up to date and capable of handling the inrush and rated current of the unit. Consult and use a licensed and knowledgeable electrician. If you have downloaded this manual in expectation of delivery, get started now.
2. Make sure this machine is plugged in, turned on, and tested with every process and major feature, checking for proper function. You have a 30 day period to test and thoroughly check out the operation of this unit under our 30 day satisfaction period. If something is wrong, this policy covers shipping on the unit (30 day satisfaction policy applies to the USA only for the 48 lower states and D.C., territories and provinces are excluded) or any incidental parts that may be needed to resolve any issue. After this 30 day period, if you find something wrong with the unit, you will not receive the benefit of free shipping back and forth to resolve this issue. Your unit is still covered under the 5 year parts/labor warranty, but shipping is covered by the customer after the 30 day period is over. The first 30 days of operation with any electronic item is the most critical and if any issue will happen, it will often happen during this time. This is why it is very important that you put this unit to work as soon as possible. Any issue should be reported within 48 hours (72 if on the weekend or holiday). Everlast will not be liable for any shipping after that time.

What to do within the next 30 days:

Visit our website (US customers). Go to www.everlastwelders.com. Navigate to the resources tab and to the “product registration” page to register your product. While keeping your receipt/proof of purchase is still required for verification of ownership, registering will help us keep your details straight and establish a chain of ownership. Don't worry, though, your warranty is still valid if you can't do this. Remember: Always keep your receipt even if you register. You may want to staple a copy to your manual.

What to do if you have a warranty issue or problem with the unit:

1. Unplug the unit. (Also do this before any maintenance or cleaning is done.)
2. Do not attempt a self-repair until authorized by an Everlast representative. This does not include performing routine maintenance such as point gap adjustments or regular internal cleaning. Any third party repairs are not covered under warranty, and can further damage your unit.
3. Within 24-48hours, (or by the next working business day) you must contact U.S. tech support at 1-877-755-9353 ext 207 (U.S. hours are 9 am to 5pm Eastern for tech support and 9 am to 5 pm Pacific for the business/sales office). If you are in Canada contact 1-905-570-1818 (Canada hours are 9am to 4pm M-Th, 9am to 12pm Fri). Although phone contact is preferred to establish a warranty claim, you may send an email to tech@everlastwelders.com (US) or mike@everlastwelders.ca (Canada) along with your contact information and brief explanation of the issue and ask for a follow up call. If you contact us via phone, and you do not reach a live person, please leave a brief message with the nature of your problem and your contact information. You should expect a call back within 24 hours. It is also a good idea to follow up the message with an email.
4. Be prepared with as much information as possible when you talk with a tech advisor, including a details of the failure, settings, and application of the unit. ***NOTE: A Proof-Of-Purchase (receipt) is required before returning the unit for warranty or before warranty parts can be sent to you.***
5. Keep in mind that, you may be asked to check a few basic things. Before you call, having a screwdriver and volt/ohm meter at hand is a good idea and will save time. Many issues can be resolved over the phone. If the issue cannot be resolved over the phone/email, you may be given an option to return the unit, or have a part shipped to you, at Everlast's discretion. Keep in mind, you may be asked questions that seem basic, or elementary to your knowledge base. These are not meant to question your knowledge, but rather to make sure nothing is overlooked. However the tech chooses to proceed, please cooperate with the process, even if you think you know what the cause or issue is. You may be asked to check something or open the unit during the diagnosis. This does not void the warranty! Opening the unit is a part of routine maintenance and cleaning. This is an important step. The willingness of the customer to work with tech support can save lots of time and accelerate the warranty process. For

warranty to be honored, you will need to make sure that you follow these guidelines. *Units that are returned without an RMA (issued by the tech support department) may not be repaired under the warranty agreement and you may be charged for the repair and can result in a delayed repair as well.*

What to do if you need setup help, guidance, weld issue diagnosis or have general product compatibility questions.

Call us at 877-755-9353 ext. 204 for welding guidance and general welding issue diagnosis. Or email performance@everlastwelders.com with the basic issue you are having, along with your specific settings, and welding application.

Hey...wait, what is my warranty?

Warranties and service policies and procedures vary from country to country and are maintained and supported by the regional or in country distributor of Everlast welding equipment.

USA Customers Only: For full details on the 5 year parts and labor warranty, 30 day satisfaction policy, terms of sale, and how to proceed with a warranty claim, please visit: <https://www.everlastgenerators.com/standard-warranty>. Accessories are covered by a separate warranty and detailed information can also be found at the link above.

Canada Customers Only: For full details on the 3 year parts and labor warranty, terms of sale, and related policies and procedures, please visit: <https://www.everlastwelders.ca/terms.php>.

Who do I contact?

USA Technical Support:

Email: tech@everlastwelders.com
1-877-755-9353 ext. 207
9am-5pm Eastern (Closed holidays)
Monday-Friday

USA Welding Support and General Product Information:

Email: performance@everlastwelders.com
1-877-755-9353 ext 204
9am-6:30 pm Eastern (Closed holidays)
Monday-Friday

USA Sales and Main Office:

Email: sales@everlastwelders.com
1-877-755-9353 ext 201
9am-5pm Pacific (Closed holidays)
Monday-Friday

Canada Technical Support:

Email: mike@everlastwelders.ca
905-570-1818
9am-4pm Eastern Monday-Thursday
9am-12pm Eastern Friday

Canada Sales and Main Office:

Email: sales@everlastwelders.ca
905-570-1818
9am-4pm Eastern Monday-Thursday
9am-12pm Eastern Friday

Other Countries and Regions:

Visit the U.S. Website @ www.everlastwelders.com and click on the flag of the country or region represented that is closest to you. If your country or region is not found, call the U.S. office at 1-650-588-8588 between the hours of 9am to 5pm Pacific, Monday through Friday.



Safe operation and proper maintenance is your responsibility.

Everlast is dedicated to keeping safety a top priority. While we have compiled this operator's manual to instruct you in basic safe operation and maintenance of your Everlast product, it is no substitute for observing safe welding practices and behavior. Safe welding and related cutting operations require basic knowledge, experience and ultimately the exercise of common sense. **Welding does significant hazards to your health and life! Exercise extreme caution and care in all activities related to welding or cutting. Your safety, health and even life depends upon it.**

WARNING! If you do not have proper knowledge or capability to safely operate this machine, do not use this machine until proper training has been received!

While accidents are never planned, preventing an accident requires careful planning. Stay alert!

Please carefully read this manual before you operate your Everlast unit.

The warranty does not cover damage or harm created by improper use, neglect of the machine or failure to follow safe operating practices.

NOTICE:



Welding and cutting operations may generate undesirable High Frequency (HF) and EMF energy. This can interfere with surrounding electronic equipment such as computers, routers, CNC equipment, televisions, radios, fluorescent lighting etc. If disturbance in surrounding electrical and electronic equipment is noted, consult a licensed electrician to help properly ground surrounding equipment to limit the interference. This machine may cause GCFI and ground fault outlets to malfunction. This unit is designed to be operated on a dedicated, properly grounded circuit.

Safety Warnings, Dangers, Cautions and Instructions



NOTICE. This unit manual is intended for users with basic knowledge and skillset in welding. It is your responsibility to make certain that the use of this welder/plasma cutter is restricted to persons who have read, understand and follow the warnings and instructions in this manual. If you or the operator needs further instruction, contact Everlast welding support at 1-877 755-9353 ext. 204 or seek qualified professional advice and training.



WARNING! High Frequency (HF) energy can interfere with the operation of pacemakers and can damage pacemakers. Consult with your physician and pacemaker manufacturer *before* entering an area where welding and cutting equipment is in operation and *before* using this welder/plasma cutter. Some pacemakers have limited shielding. Alert any users or customers of this potential problem.



WARNING! Use approved safety glasses with wrap around shields and sides while welding and working in the weld area or serious eye damage or loss of vision may result. Use a grinding shield in addition to the safety glasses during chipping and grinding operations.



WARNING! When welding always use an approved welding helmet or shielding device equipped with at least an equivalent of a shade 9 or greater. Increase the shade number rating as amperage increase over 100 amps. Inspect helmet for cracks in lenses and in the helmet. Keep lens covers in good condition and replace as necessary.



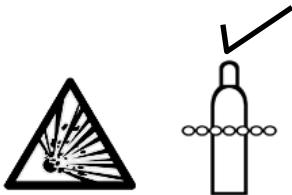
WARNING! Welding/cutting operations carry inherent risks which include but not limited to possible cuts burns, electrical shocks, lung damage, eye damage and even death. Take all appropriate measures to use proper Personal Protective Equipment (PPE). Always use leather welding gloves, closed toe (preferably reinforced or steel toe leather shoes, and long-sleeved flame resistant clothing (i.e. denim). Do not wear Poly/Nylon blend materials.



DANGER! Welding/cutting poses shock and electrocution risks. Keep this welding equipment dry. **Do not weld in the rain or where moisture accumulates.** Use dry, rubber soled shoes, gloves and clothing when welding. Do not rest or contact work clamp (ground) when welding. Keep all parts of the body insulated from the part being welded when possible. Do not touch terminals or connections while the unit is on. Consider all parts to be “live” at all times even if no live work is being performed. Do not use frayed welding cables.



CAUTION! Fires are possible but also preventable while welding. Always remove flammable rags, papers, and other materials from the weld area. Keep rags stored in an approved flame proof canister. Keep a fully charged fire extinguisher at hand. Remove any fuels, oils, paint, pressurized spray cans, and chemicals from the weld area. Make sure any smoke/fire detectors are function properly. Do not weld on tanks, drums or barrels, especially if pressurized or sealed. Do not weld on any container that previously held fuel or chemicals. Make sure the weld area is clear of flammable materials such as grass or wood shavings solvents and fuels. Do not wear frayed or loose clothing. Visually inspect and recheck the work area after welding looking for smoldering debris or flames.



WARNING! Welding gas cylinders are under high pressure. Keep all gas cylinders upright and chained to a cart or held safely in a safety holding pen. Never transport gas cylinders in an enclosed car van or other vehicle. Transport gas cylinders securely. Keep all cylinders capped while not in use or during transport. Replace the cap on the cylinder when it is going to be more than 24 hours before use. Do not use or attempt to repair faulty regulators. Never weld on gas cylinders. Keep gas cylinders away from direct sparks.

Safety Warnings, Dangers, Cautions and Instructions



DANGER! Welding and cutting operations pose serious inhalation hazards. Some of these hazards are immediate while others are cumulative in their effect. **Do not weld in enclosed spaces or in areas without adequate ventilation.** Fumes and gases released in the welding and cutting operations can be toxic. Use fans or respiration equipment to insure adequate ventilation if you are welding in a shop or garage area. **Do not weld on galvanized metal under any circumstance. You may develop metal fume fever. Symptoms are similar to lu-like symptoms. Seek medical advice and treatment if you are exposed to galvanized welding fumes.**

If you experience any eye burning, nose or throat irritation while welding, these are signs that you need more ventilation.

If you feel these symptoms:

- Stop work immediately and relocate work area with better ventilation.
- Wash and clean your face and hands.
- Stop work completely and seek medical help if irritation persists



DANGER! Never use brake cleaner or any chlorinated solvent to clean or degrease metal scheduled to be welded or other related equipment in the area being welded. The heating of this cleaner and its residue will create highly toxic phosgene gas. Small amounts of this vapor are harmful and can lead to organ failure and death. If degreasing of a part is necessary, use Acetone or an approved pre-weld cleaner. Use the proper personal protective equipment (PPE) when handling any cleaners/solvents.



DANGER! People with pacemakers should consult a physician and pacemaker manufacturer before welding. There is a potential for damage or serious malfunction resulting in death. High Frequency energy (HF)/Electromagnetic Fields generated during welding can interfere with pacemaker signals, even permanently damaging it. Some pacemakers offer some shielding, but restrictions regarding amperage and HF starting of welding arcs may be placed upon the individual. Warn all potential bystanders that they should exit the work area if they have a pacemaker or similar medical equipment before welding. Severe electrical shock leading to injury or death may occur while using the plasma cutter if the user becomes part of the circuit path. While the Amp output of the plasma cutter is limited, the unit may produce an OCV of 300V or greater. Consult with a Physician if a pacemaker is expected to be implanted.




DANGER! Never defeat or modify any safety guards or shields. Keep all safety covers and shields in place.

Never place your fingers in or near a fan shroud or insert any object into the fan(s).



DANGER! Do not supply more than 100 PSI to the air-pressure regulator supplied with this machine. If you do, the regulator may leak or explode, causing severe injury or death. Use a separate regulator mounted at the air-compressor to control supply air pressure. **Never use an air compressor without a separate compressor mounted air regulator!**

Safety Warnings, Dangers, Cautions and Instructions

	<p>CAUTION! Trip Hazards exist around this unit. Cords, cables, welding leads and hoses pose a trip hazard. Be aware of their location and inform others of their location. Tape and secure them so they will stay out of high traffic areas.</p>
	<p>CAUTION! Welded metal can stay hot long after welding is completed. Burns may occur. Always wear gloves or use tongs/pliers when handling welded or cut metal. Remember the heat from the metal may catch other material on fire. Always have a fire-proof area ready to place welded components until they fully cool. Use soap stone or a metal marking marker to label the metal as “HOT” to serve as a reminder to all present in the area.</p>
	<p>CAUTION! Welding and cutting operations generate high levels of ultraviolet (UV) radiation which can burn and damage skin and eyes. The intensity is so high that exposed skin and eyes can burn in a few minutes of exposure. Minimize direct skin and eye exposure to this intense form of radiation by using proper PPE and sun screen where appropriate.</p>
	<p>CAUTION! Do not allow bystanders. Do not allow others without proper Personal Protection Equipment (PPE) suitable for welding to stand in the welding area or to observe welding and welding related activities. If protection is not readily available, use a welding screen to separate the welding area from the rest of the area. If no protection or screen is available, physically exclude them from the welding area by a wall or other solid divider. Keep all pets and young children away from the welding area.</p>
	<p>CAUTION! Electromagnetic Fields can be generated by this unit and radiate into the work place. The effect of EMF is not fully known. Exercise caution when welding by: NOT draping welding leads (guns/cables) over your shoulders or arms, NOT coiling them around your body, NOT inserting yourself directly between the cables, and by NOT contacting the unit while welding. DO keep the work clamp connected as close as possible to the area of the weld and directly to the object being welded whenever possible.</p>
 	<p>DANGER! Never touch connectors or fittings while this machine is turned on. Keep all safety covers in place when not in use. Never remove or replace the plasma consumables while the machine is turned On. Even though the torch is equipped with a “parts-in-place” safety disconnect, it is possible that overheating of the torch, excessive wear or damage to the consumables may cause this feature to malfunction. Make sure the brass safety cut out pins on the torch head remain in good repair and that the spring loaded function remains operational and keeps them fully extended when the torch cap is removed. The Open Circuit Voltage (OCV) while in plasma mode may exceed 300V. This is enough to cause burns, injury severe electrical shock, injury and instant death.</p>

Important Information: Operating this unit with a generator or other off-grid service.

This multi-process unit should only be operated on a generator certified by its manufacturer to produce clean power. Clean power is equivalent to the quality of household or shop/garage type power. This means the generator must have 5% or less total harmonic distortion (THD) of the Sine wave. If you are unsure of the power output type of the generator, contact the manufacturer of the generator for verification. *Do not operate on square wave or modified square wave generators or converters/inverters or damage or malfunction may occur. Damage caused by running this unit off of "dirty" power or modified sine waves may not be readily apparent and can be cumulative in nature. However, damage may present itself immediately. The damage caused by running this unit on "dirty" power usually leaves internal tell-tale signs and damages specific parts.*

For recommendation for generator size, consult the specification page for surge wattage recommendations. Operating the unit on under-powered generators and/or on generators not rated with 5% or less THD can damage your unit. *The generator manufacturer determines this rating, not Everlast.* Do not assume that a name brand generator, or a "new" generator automatically provides clean power. Price paid does not guarantee a clean power output either. There are multiple brands at various price points capable of producing clean power. Investigate this before purchasing a generator. The manufacturer will usually state that a unit is clean power in the advertising information and will state actual THD. If the manufacturer does not state it, contact the manufacturer directly for a statement concerning actual THD.

NOTICE! Operation of this unit with generators not rated by its manufacturer as providing clean power (5% or less THD) is prohibited and will void the warranty. Operation with modified sine wave, or square wave generators and inverters/converters/UPS that do not produce "sine wave" output is prohibited and doing so will also void the warranty. Use only with generators/inverters/converters that produce an equivalent type of sine wave used in shops, homes and "shore" type systems.

WARNING! Do not start or stop the generator with the unit switched on. Never use the generator in ECO mode or an auto-idle mode. Even with a clean power rated generator, this action can damage the unit. *Turn the unit on only after full generator R.P.M. has been achieved and the engine is sufficiently warmed up.* Closely monitor generator fuel level so that the engine R.P.M doesn't drop or completely shut down with the unit plugged in. **For best practice: do not start or stop the generator with this plasma cutter plugged in, even if it is turned off. Unplug the unit before shutting down the generator.**

If using with a welder/generator, make sure the manufacturer has determined that the generator portion produces a clean sine wave. Many older models do not. Some newer models use "divided" power between welding and generating and cannot supply the full power to the unit unless the fine current control knob is turned to maximum. Do not use this unit with such welder/generators unless the Power/fine current control is turned to 100%. Some welder generators do have a separate alternator for generating power. If this is the case, be sure not to weld or load the machine while this unit is in use.

WARNING! Always make sure any generator or welder generator is properly wired and grounded, according to local and national code. Ground the machine per the generator manufacturers instructions to meet code requirements. Improperly grounded generators may damage the machine and more importantly may cause severe injury or death.

Dual Voltage Single Phase 120/240V Operation:

This unit can be used with either single phase 120V or 240V output. Output will be reduced automatically when operating on 120V. However, for the higher voltage (since the standard of 240V is nominal and actual voltage may vary somewhat), the unit may be used with single phase 208V if the voltage does not drop below 205V. If using this unit on 208V, duty cycle and display accuracy may be affected. Rated and Inrush Amperage will rise proportionately as well. If you decide to use this machine on 208V, before installing permanently, have an licensed electrician monitor voltage fluctuations, particularly under load and during peak use times. If the voltage remains constant, and steady without dropping below the 205V threshold, this unit may be used. Damage caused by using on undervoltage power sources is not covered by the warranty. Always be aware of the voltage output and the quality of the power source being used.

REAR OUTLET WARNING!

If equipped, never use the electrical power outlet on the back of this machine for anything other than powering an Everlast brand water cooler. This is a special outlet designed to produce 240V with limited amperage draw. No other device or brand should be used in conjunction with this unit's outlet. This outlet is designed to supply 240V only. Do not attempt to modify, or change this outlet for use with anything else other than an Everlast brand water cooler designed for 240V operation. Severe damage, fire or injury may occur if other devices or other brand equipment is connected. **Not for use while operating on 120V!**

Specifications

Duty Cycle

Duty Cycle is simply the amount of time out of a 10 minute period in which the unit can operate. For example, if this unit has a duty cycle of 35% at maximum output means that the unit can be operated for 3.5 minutes out of 10 minutes. This may be continuously, or intermittently during the 10 minute period of time. This rating standard (United States) is based on a maximum ambient temperature of 40°C. Operating above this point, or at lower temperatures with high humidity may reduce the duty cycle rating. Of course, the duty cycle may increase somewhat as ambient temperature drops. Regardless, this unit's duty cycle is not controlled by a timer. Rather, this unit is equipped with a heat sensor located on a heat sink near the critical power components of the plasma cutter. If the operating temperature of the unit is exceeded, welding output will stop and an over-temperature warning light/error code will be displayed on the panel. **If a duty cycle event is registered, do not turn the unit off!** Allow the plasma cutter to continue to run at idle for at least 10-15 minutes until the temperature has fallen enough to reset the sensor and over-temperature warning light. *Even if the unit resets, allow the unit to cool for a full 15 minutes, or the duty cycle will be more quickly triggered since the unit resets just below the heat threshold.* ***The fan(s) must continue to run for a full 15 minutes to cool the unit properly after the duty cycle shut down has occurred.*** After 15 minutes of cooling, you may switch the unit off if you are finished welding. If the unit does not automatically reset after 15 minutes, turn the unit off. Wait for 15 seconds before turning the machine back on. If the unit does not reset, contact technical support for further advice and assistance. As a best practice, when you have completed welding and have been welding continuously for extended periods of time, keep your unit on for 10 additional minutes without welding to allow it to cool.

The intentional and/or repeated triggering of the duty cycle protection feature on this unit will shorten the lifespan of the unit's electronics and can weaken internal components. The effect of overheating your unit repeatedly takes a cumulative toll on the unit.

NOTICE: These units are tested by an international and independent certifying agency for their ability to sustain the claims of duty cycle, under lab induced conditions which are typically more stringent than average shop conditions.

Specifications

BREAKER SIZING AND WIRING REQUIREMENTS

Before installation of this unit in any facility, always consult a licensed local electrician familiar with the requirements of properly wiring a plasma cutter into the electrical supply. Refer to the National Electric Code (NEC) and local codes. If needed, refer the electrician to Article 630 of the NEC during consultation to determine proper application and wiring needs. Use the I1MAX and the I1EFF ratings listed above to determine the proper breaker and conductor (wire) sizing required. Everlast plasma cutters are designed around use in industrial wiring applications and are intended to be used with modern electrical systems. Household wiring may need to be upgraded before this plasma cutter may be installed. Additional HF protection and isolation may be needed if this plasma cutter interferes with the operation of electrical/electronic equipment.

IMPORTANT: Do not modify this unit's wiring, power plug or conductors. This unit meets the standards for conductor sizing on the power cable and takes into account power cable length, duty cycle and rated current.

NOTICE: POSSIBLE HF INTERFERENCE FROM THE INVERTER AND WHAT TO DO IF IT OCCURS

If any electrical disturbance is noticed as a result of the high frequency interference that is possible with the operation of the inverter switching and operation, the HF service bolt should be connected directly to a 12 gauge wire that is bonded directly to an outside copper ground rod driven into moist soil. Additionally, all metal items including any metal frame or sheeting of the building should be connected and grounded to separate copper ground rods driven into the ground at 10 foot intervals around the perimeter of the building. This includes items such as tables, carts, rack material, metal surrounds, etc. that may act as "antenna" to radiate/absorb HF energy. Additionally, all cords and welding leads should be twisted together and run directly to the work without coils or excess cabling. Normally, this will not be required, but it is supplied in the case of any interference that may be observed. This is usually observed in older or non standard installations where grounding and ground isolation is a problem.

NOTICE: DO NOT USE WITH DUAL SHIELD OR FLUX CORED OPERATION WITH GAS (FCAW-G)

This unit is not designed or recommended for use with Dual shield type welding. This is considered a heavy industrial process that this unit does not have typically enough output in voltage, amperage and duty cycle to sustain welding at recommended settings. Most dual shield applications use welding machines that are 300A and over. The synergic feature of the unit does not support dual shielded operation either. The Flux-Cored mode is a gas-less type of operation and does not include a gas shield function.

IMPORTANT!

This unit is designed to operate with most welding rods except for E6010. If 6010 operation is desired, consider using E6011. This welding rod has similar characteristics, but has arc stabilizers in the flux that allows it to be used in similar situations with welding machines that cannot run the higher arc voltages generated by the E6010. Always select a good quality brand for best arc stability. If arc instability is observed, switch brands or change the rod suffix designation. This unit operates best with a short arc, so either drag the rod, or hold a very short arc length so that arc outages are not experienced. A dragging motion, or a slight weave is recommended, but increasing the arc length may result in arc outages. Rods like E7018, and E7014,308, 309L, 316 and hard surfacing rods are excellent choices for use with this machine.

WARNING!

This unit is not designed for Air Carbon Arc Gouging/Cutting or for Plasma Gouging or Plasma scarfing operations. Do not use this unit for these applications. It is not designed to sustain the high volt and long arc characteristics needed for Carbon Arc or Plasma gouging use.

Specifications

Storm 215c Product Specifications

*Duty Cycle

Construction Type	Inverter (IGBT based, Digital Control)
Input Voltage	120V OR 240 V (± 10%) 50/60 Hz Auto-Adjusting
Phase	1 Phase 50/60Hz
I1MAX Current Rating (Inrush Amps)	120V: 35A 240V: 33A
I1EFF Current Rating (Rated Amps)	120V: 21A 240V: 20A
OCV	74V MIG/ Stick; 280V Plasma
MIG Duty Cycle @ Maximum Output (Rated at 40° C/104° F) *	120V: 125A 240V: 35% @ 200A
Stick Duty Cycle @ Maximum Output (Rated at 40° C/104° F)*	120V: 35% @ 100A 240V: 35% @ 160A
Plasma Duty Cycle @ Maximum Output (Rated at 40° C/104° F) *	120V: 35% @ 25A 240V: 35% @ 40A
MIG Output Range V/A (DC Output Only)	120V: 15.5-20.25V/ 30-125A 240V: 15.5-24V/ 30-200A
Stick Output Range V/A (DC Output Only)	120V: 20.4-24V/10-100A 240V: 20.4-26.4V/10-160A
Plasma Output Range V/A (DC Output Only)	120V: 88V-90V/20-25A 240V: 88-96V/20-40A
MIG Wire Feed Speed:	120V: 60-400 IPM 240V: 60-600 IPM
MIG Inductance	1-100%
MIG Burn Back Time	0-2 Seconds
MIG Spot Time	.5-15 Seconds
MIG Stitch Time	No Stitch Timer
MIG Wire Size Handling Capability	.023"- .045" (with optional drive roll and contact tip sizes)
MIG Drive Roll Sizes Included	.030" / .035" (.8mm / .9mm) V-Groove for MIG .030" / .035" (.8mm / .9mm) Serrated Groove for Flux-Core
Pre Flow Time	Auto or Off
Post Flow Time	Auto or Off
Stick Hot Start Time	0-2 Seconds
Stick Hot Start Intensity	0-100% above set Amperage)
Stick Arc Force	0-100% above set Amperage
Stick 6010 Capable	No. Use E6011 as substitute.
Plasma Start Type	Blow-back style, with Pilot Arc. (Non High frequency)
Recommended Plasma Air Pressure	65 to 75 PSI while cutting. Max. supply pressure: 90PSI
Recommended Minimum Compressor Size	30 Gallon with 5.3 CFH or greater @ 90 PSI
MIG Gun Type/Length/ Connector Type	Innotec 15AK Series 12.5 ft/ 4m with Euro Quick Connect
250A Work Clamp with Cable Length	6.5 ft (2m) DINSE 35/50 (1/2 nom. dia.)
250A Stick Electrode Holder Length	9.5 ft (3m) DINSE 35/50 (1/2" nom. dia.)
Plasma Torch Type and Length	Innotec IPT 40, 15 ft.
Power Cable Length	6.5 ft (2m)
Power Plug Type for Single Phase Operation 240V	NEMA 6-50P (Standard 240V Welder Type)
Cooling Type	Full Time, High Volume Fan(s)
Dimensions (Approximate)	17.5" H X 9.75" W X 26" L (445mm X 248mm X 661mm)
Weight (Bare Unit with Cord and Handles Attached)	60lbs.
Ingress Protection Rating	IP21S

Duty Cycle is simply the amount of time out of a 10 minute period in which the unit can operate. For example, if this unit has a duty cycle of 35% at maximum output, that means that the unit can be operated for 3.5 minutes out of 10 minutes. This is rated for continuous or intermittent use during the 10 minute period of time. This rating standard (United States) is based on a maximum ambient temperature of 40°C. Operating above this point, or at lower temperatures with high humidity may reduce the duty cycle rating. Of course, the duty cycle may increase somewhat as ambient temperature drops. Regardless, the duty cycle is not controlled by a timer. Rather, a heat sensor located on a heat sink near the critical power components of the welder signals overheat. If the operating temperature of the unit is exceeded, welding output will stop and an over-temperature warning light/error code will be displayed on the screen. **If a duty cycle event occurs, do not turn the unit off!** Allow the welder to continue to run at idle for at least 10-15 minutes until the temperature has fallen enough to reset the sensor and over-temperature warning light. *Even if the unit resets, allow the unit to cool for a full 15 minutes, or the duty cycle will be more quickly triggered since the unit resets just below the heat threshold. **The fan(s) should be allowed to continue to cool for a full 15 minutes without welding/cutting activity after a duty cycle shut down has occurred.*** After 15 minutes of cooling, you may switch the unit off if you are finished welding. If the unit does not automatically reset after 15 minutes, turn the unit off. Wait for 15 seconds before turning the machine back on. If the unit does not reset, contact technical support for further advice and assistance. As a best practice, before shut down, if you have been welding continuously for extended periods of time, keep your unit on for 10 additional minutes to allow it to cool down. **The intentional and/or repeated triggering of the duty cycle protection feature on this unit will shorten the lifespan of the unit's electronics and can weaken internal components. Overheating your unit repeatedly takes a cumulative toll on the unit.**

Breaker Sizing and Wiring Requirements

Before installation of this unit in any facility, always consult a licensed local electrician familiar with the requirements of properly wiring a welder into the electrical supply. Refer to the National Electric Code (NEC) and local codes. If needed, refer the electrician to Article 630 of the NEC during consultation to determine proper application and wiring needs. Use the I1MAX and the I1EFF ratings listed above to determine the proper breaker and conductor (wire) sizing required. Everlast welders are designed around use in industrial wiring applications and are intended to be used with modern electrical systems. Household wiring may need to be upgraded before this welder may be installed. Additional HF protection and isolation may be needed if this welder interferes with the operation of electrical/electronic equipment. **WARNING!** Do not modify welder wiring. This unit meets the standards for conductor sizing on the power cable and takes into account power cable length, duty cycle and rated current.

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Getting Started

UNPACK YOUR UNIT.

Upon arrival, you will need to completely unpack your unit, and check things over. This is a time sensitive matter. Do not delay or hold the plasma cutter unopened in the box. First, make sure the unit is opened from the top. Be careful with using knives and sharp objects so you won't cut cords and cables inside the boxes. Lay all items out and inspect them.

You should have the following in your box:

1. Welder/Plasma Cutter Unit.
2. Air-Regulator with built in water trap/particulate filter.
3. Floating Ball Regulator for MIG.
4. 15 Series MIG Gun/Torch.
5. 250A Work Clamp (approx. 9.5 ft with cable).
6. 250A Stick Electrode Holder (approx. 9.5 ft with cable).
7. Consumable Starter Kit for Plasma and Misc. Parts Bag(s).
8. iPT40 Plasma Torch.
9. 240V to 120V power cord adapter.



NOTICE:

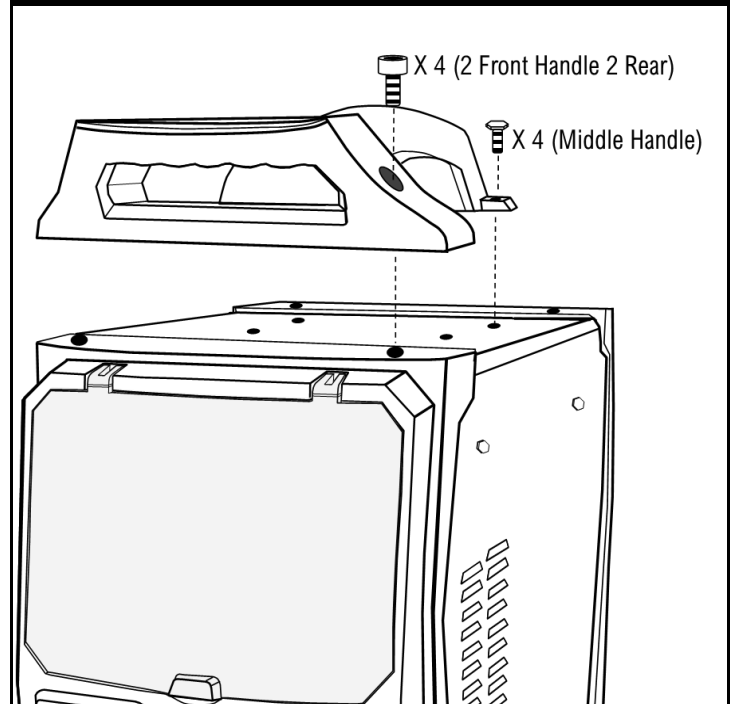
This unit includes one additional .030" MIG contact Tip (it may also include a .040" tip for specialty wires) and no other consumables for MIG. These are available direct from Everlast, online from other sources and are also available locally for the 15 series MIG gun at many places that sell welders and welding supplies. This unit does arrive with a basic plasma consumable starter kit, designed to get you only through a few days of plasma cutting. You should have 5 (pipe/non-shielded) cutting tips and electrodes. You will need to purchase a more extensive kit soon after receiving and using your unit. These consumables are also available direct from Everlast, from other online sources, and from many local stores that sell welding and plasma cutting equipment. If you don't order extra consumables soon after you receive this unit, you may run out more quickly than you expect. This kit contains stand-off type, non-shielded consumables that are sized for the maximum Amp operation of the unit are designed for stand-off cutting. Lower Amp operation, gouging or drag cutting will require the purchase of additional consumables (See torch parts page for amp ratings and sizes).

Additionally, some miscellaneous parts may be found together with the consumable kit which may include fasteners, brackets and . If you think you are missing a needed part, check the consumable kit bag and box before calling Everlast for replacement. If you are missing parts, call 1-877-755-9353 ext. 206 for help(Only in the USA, for other areas, contact the distributor in your region).

INSPECT AND ASSEMBLE YOUR UNIT.

When you receive your package, inspect the unit for damage. Check for the presence and general condition of the accessories. Some slight rubbing or chaffing of some of the accessories may be present, but this is considered normal. Most notably, the MIG and Plasma torches may appear to be used or fired. This is because it has been live tested in the factory for proper operation before putting into the box. If any item is damaged or missing, please inform Everlast within 72 hours of product receipt. See pages 4 and 5 for more details. Assemble the front, middle and rear handles with the supplied screws. Use a 5mm hex key to tighten the socket head cap screws to the front and rear handles. (Screws may be found in the consumable bag.) Remove the cap screws from the center of the machine and install the center, long handle. Use a Phillips type screw driver to tight the screws, or alternately use a 10mm socket and 1/4" drive socket wrench to tighten the screws. **IMPORTANT! Do not overtighten the screws.** *If desired for proper fitment or for space saving, the unit may be used without the handles. However, install the screws and tighten them to the panels anyway. Do not leave them out. Be sure to reinstall the handles if the unit is to be carried or lifted. Do not lift from any other point on the machine or damage may occur.*

ASSEMBLE THE HANDLES



POWER UP AND TEST YOUR UNIT.

You will need to fully test the unit as soon as possible. Within 72 hours after receipt of the unit, be sure to have every thing you need at hand to test the unit. Make sure the correct input power, wiring, and plug configuration is being used. Make sure you have the regulator and air compressor installed (See following section). If you do not have them installed, when you select the plasma function you will immediately receive an error code of "E 06" because air pressure is low/disconnected. Then, power up your machine without any accessories

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installed except for air compressor and air pressure. Allow the unit to idle for 15 minutes. Check and observe operation of knobs, controls and buttons, cycling through each as required. Make sure the fan is running at full speed. After the test is completed, turn the unit off, connect the torches and cables. Then, conduct live testing of all the functions and features of the machine. For testing and cutting make sure work clamp is connected directly to the part being welded (work). Check for arc starting and stability. If you are testing the unit on 120V, the cutting arc may not be stable unless you have purchased the optional .6 or .8mm consumables listed on the torch page in this manual. If any welding or cutting problems are observed and they persist, contact Everlast. See page 5 for more contact information. **NOTICE:** *Cosmetic damage claims after 30 days will not be accepted, unless Everlast is contacted and informed of such delay and reason for such a required delay (i.e. Overseas in deployment).*

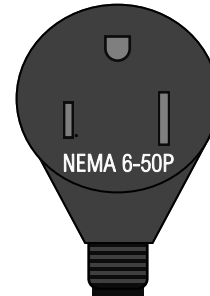
GIVE YOUR UNIT SOME SPACE TO COOL.

This unit needs room to cool itself and maintain proper duty cycle. Place the unit in a place that will allow 18" from all sides to allow for proper cooling. This welder/cutter combination unit pulls air in from the rear, and pushes it through the unit's heat sinks to cool the electronics. The air is then exhausted through the front panel and side louvers of the unit. If any of sides is blocked or restricted, the duty cycle will be reduced, and overheating will occur, leading to possible damage if the restriction is severe enough. Never attempt to restrict air flow by attaching filters to the vents or by modifying your fans for "on demand" service.

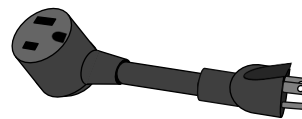
CONNECT YOUR UNIT TO POWER.

Your unit has been shipped with a NEMA 6-50P plug. This is the standard plug used for 240V 1 Phase welders and plasma cutters in North America. For single phase 240V connection, select a NEMA 6-50 Receptacle for operation with this unit. (Other regions/countries vary). A neutral is not used. In a dedicated circuit, the wire wires supplying power (the conductors and ground) are black, white and green. A red wire, which is traditionally used as a "hot" leg (power conducting wire) of power is not present in a three-wire 240V wire circuit of a plasma cutter. For plasma cutters, from the panel box, the Black wire serves as L1(Hot), White serves as L2 (Hot) and Green serves as G (Ground). A Red wire will not typically be used as a conductor in a welder circuit. No neutral wire is needed, so white is used as a "hot" conductor wire in this instance. It is recommended to either install a receptacle as close to the main panel as possible or install a subpanel cutoff as close to the outlet and welder as possible. Always follow local codes when making these connections. **If you are using this unit in conjunction with a 240V air compressor, you must supply a separate, dedicated circuit for both. Do not share or piggy-back a circuit with this unit.** When 120V operation is required, simply connect the supplied 240V to 120V pig tail adapter. This adapts the unit from the NEMA 6-50 Plug to the NEMA 5-15 Plug to allow the unit to be used with 120V input without further modification of the welder. No wiring or buss bar changes are required. Once the unit is plugged in, it will automatically detect the new power and boot up in 120V mode. To verify 120V mode, the display screen will reflect the power input mode with one of the center tree information boxes displaying "120V". To change back to 240V input, shut the machine down, unplug the adapter, and reconnect to the 240V power supply. Turn the welder back on to reboot the unit back to 240V operation.

Standard Plug Configuration 1 Phase 240V



240V to 120V Pigtail Adapter (Supplied)



Pigtail Power Adapter
(NEMA 6-50R to 5-15P)

NOTICE:

There are special rules centered around wiring service for a welding machine. The National Electric Code under Article 630 has developed specific regulations for wiring electrical service for welding equipment. These are different than for other types of service such as a stove or dryer in a household or even in a commercial application. You need to consult and/or employ a locally licensed electrician before installing this unit to make sure all national and local codes are followed. Do not wire connections for this machine if you are not qualified. Everlast is in no way liable for any damages caused by improper connection of this unit. Your welder should be operated on a dedicated branch circuit not far from an electrical disconnect box. Importantly, it should not share circuits with other shop or household items. Do not attempt to "adapt" existing circuits because conductor (wire) colors are different for welders with 3 wire configuration than for an appliance with 4 wire operation. (Unless adapting with an approved adapter when being powered with a "clean power" generator.) No neutral is used in a welder circuit. The white wire is a conductor in a single phase plasma cutter service. The red wire is not used. ***The input power cable conforms to North American standards for size, length, with consideration given to inrush amperage, rated amperage and duty cycle. Do not modify, or attempt to rewire your unit.***

Selecting A Breaker and Wire Size

Select a breaker based off of the I1MAX rating of this unit. This is the maximum inrush current of the unit. The inrush is not a sustained current. The I1EFF rating of the unit is the maximum "rated" current of the machine. When combined with the length of the run from the main panel, this determines the conductor size. Refer your licensed, local electrician to Article 630 of the NEC and the specification page of this manual (or the specification grid printed on your unit) to select the correct breaker and wire size. A delayed trip breaker, or slow blow fuse should be used with this unit.

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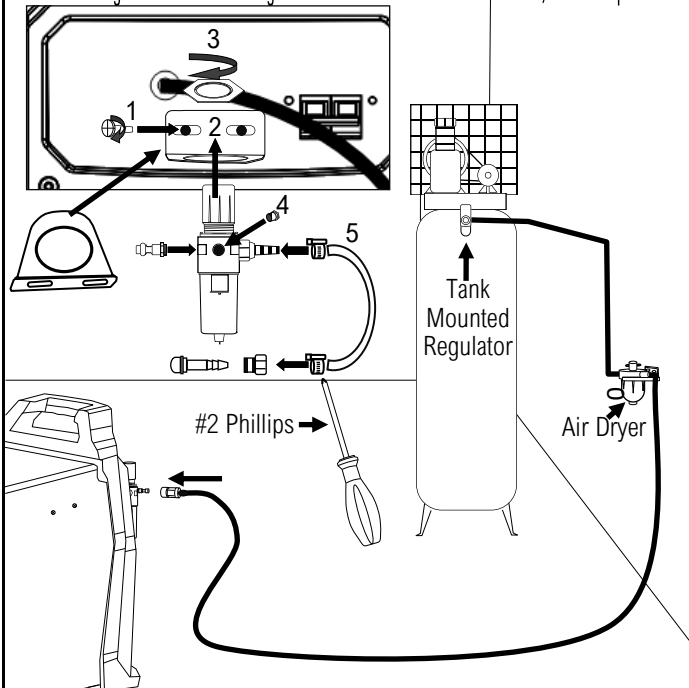
INSTALL THE AIR REGULATOR AND AIR COMPRESSOR.

NOTE: Connect the clear hose to the air inlet at the bottom rear and to the regulator. Use the couplings and hose clamps found in consumable/parts bag to connect the tubing to the regulator and fittings. If missing, contact Everlast. Make sure the air flow direction is correct according to the markings on the regulator. **Do not overtighten the fittings. Lightly tighten the regulator securing nut to the bracket.**

The male air quick coupling that is supplied with the unit is a 1/4" industrial style connector. This connector is a common one in use in many small shops and home garages. Others may be substituted if this connector does not match the other connectors in use in the system. However, Everlast makes no provision for attachment of oversized couplings. The recommended minimum size of the air supply line is 3/8", up to 25 foot. If a longer line is needed, consider upping the size of the air line to prevent air pressure loss. If a larger air line is needed, make sure you have the correct adapters to fit the fitting on the unit. A smaller fitting at the unit's regulator/filter should not greatly affect flow, as long as the length of the restriction is kept to a minimum. The regulator comes in its own box in the packaging. It is fully assembled with the exception of a brass plug that is screwed into the middle opening onto the regulator. Usually this plug is installed, but due to the possibility of a change in manufacturing, the plug may be found in the consumable starter kit bag for the plasma cutter. *To adjust the regulator:* Pull up on the black cap until it clicks (approximately 1/8"). Turn the regulator clockwise to increase the pressure and counter clockwise to decrease the pressure. **Snap the adjustment cap back down to lock the regulator into position.**

Connect Air Regulator To Compressor And Unit.

NOTICE: The regulator bracket mounting location is located on the rear of the unit, under the power cord.



What do I need to be able to plasma cut?

The unit comes with everything you need as far as a basic starter kit for consumables, torch and regulator. However, you will need to supply a few things on your own.

1. You will need a suitable air-compressor and at least 3/8" supply line hose. 1/2" supply may be required for long distances. The input side on the regulator is the standard industrial 1/4" quick connect fitting. Suitable compressor sizes should follow recommendations found in the product specification recommendations. Oilless and pancake compressors are not suitable.
2. You will need to be able to regulate your pressure at the air compressor. Do not use the pressure switch on the air compressor to control the air pressure. A gate or ball valve installed on the air compressor is not enough. You will need an adjustable regulator which will control the air pressure at the tank. The regulator that you install on the unit is to be used to regulate actual cutting pressure. You need to be able to regulate the supply pressure down to 90PSI at the air-compressor. If you supply more than 100PSI to the cutter's regulator, you may damage the regulator.
3. You will need a separate air-dryer. Moisture is the enemy of any plasma system and destroys consumable life and eventually torches themselves. The regulator/filter included with the unit is not sufficient to remove moisture from the system. It is designed to trap particulates and slugs of water created by the coupling/decoupling process. A refrigerated system is not necessary. We recommend you look at the cartridge type systems that have replaceable elements for a budget alternative. If these are not available, consider having a replaceable paint-gun dryer mounted inline and monitor the moisture, and replace it often.
4. You will need additional consumables with different sizes to match the cut Amperage. The stock consumables are designed for use at the maximum amperage of the machine. The orifice in the plasma tip is specifically designed for a range of Amps. To see that range, check the plasma torch pages of this manual, and each tip diameter corresponds to a specified amp range. Lowering air pressure to try to compensate for lower Amps results in poor quality cuts and inconsistent arc behavior. Always match the consumable size to the Amperage being used. **NOTICE:** For direct on-the-metal drag cutting, use special shielded consumables are available for most of the Innotec® IPT series torches. **However, limited drag cutting may be done under 30A with stock consumables, but consumable wear will be increased.** Since Everlast does directly manufacture the plasma torches, every consumable configuration for every torch may not be stocked or available. For these or other special applications, consult OEM distributors of the IPT/PT/PTM series torches in the North American Markets.

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CONNECT YOUR UNIT TO THE CORRECT SHIELDING GAS.

What Shielding Gas Should Be Used?

The Storm 215C is a synergic unit which incorporates the type of gas and metal wire being welded with as a base to make accurate "PowerSet" settings. It is important to pay attention to the type of gas used while in "PowerSet" mode or the unit may not determine an accurate setting. The following gases should be used and are the best choices in the gas selection during initial setup after powering the unit up:

Steel: 75%/25% Ar/CO₂ (75/25 or C25)
OR 100% CO₂ (C100)

Stainless (Inox): 98%/2% Ar/CO₂ (98/2)

Aluminum: 100% Ar (Argon)

Notice that Steel has a couple of gas choices. ***In the North American Market, 75/25 is the standard gas choice for short circuit MIG.*** It provides less spatter than CO₂ and a cleaner, less oxidized weld in general. 100% CO₂ is cheaper, but can require more cleanup and descaling after the weld is completed. In other markets, 100% CO₂ is more commonly available, or may offer slightly different combinations. If 75/25 gas mix is not available for use with the PowerSet setting, and 80/20 is an option, then this gas may be used on the 75/25 setting, but may require slight tuning to achieve perfect performance.

Stainless gas mixes can range throughout the industry. However, in the industry, this unit is designed to be used with 98/2 Ar/CO₂ blend when welding Stainless Steel. While there are other gas choices, such as "TriMix" this is typically the most widely available and economic one for welding Stainless Steel (Inox).

Aluminum will always require the use of pure Argon (100% Ar) shielding gas while welding in MIG mode. This is a widely available and a standard gas throughout the world.

Of course, if you choose manual mode, different gas mixes other than what is suggested may be used. If you choose to use a different gas, be sure to select the next closest gas on the panel during setup that matches your selection and keep "PowerSet" turned off. This will allow proper operation.

Always wear safety glasses when changing a cylinder. Before installing any cylinder, stand to the side of the valve, away from the discharge, and quickly open the cylinder to give it a quick blast. This will dislodge any dirt or particles stuck in the valve or the connection seat. This will help reduce the chance of dirt particles making its way into the solenoid valve, causing sticking issues later on.

Connecting your cylinder will require a cylinder wrench (1 1/16") to connect the regulator to the cylinder (North American Cylinders with a 580 CGA valve). If you do not have a cylinder wrench, an adjustable type wrench will work, but make sure it is properly adjusted to prevent rounding of the fitting shoulders. Do not use pliers, or a serrated-

jawed wrench such as a pipe wrench or basin wrench to tighten the fitting. The design of the fitting means that no thread sealing tape or compound needs to be used.

Connect the regulator tubing to the regulator. The regulator may be supplied with a hose barb connection, or a threaded connection for the tubing. If the regulator supplied has a hose barb, make sure the hose barb fitting is tight on the regulator. Tighten with a 3/4" (19mm) wrench. If it is a threaded connection, use two 3/4" (19mm) wrenches to hold both the regulator and the tubing connection at the same time. Hold counter pressure on the regulator connector while tightening the hose fitting to prevent damage to the regulator and to ensure maximum sealing. After connecting the tubing to the regulator, connect the other end of the tubing to the 5/8" CGA fitting on the unit. Hold the fitting on the unit with one 3/4" (19mm) wrench firmly while tightening the hose fitting with another 3/4" (19mm) wrench.

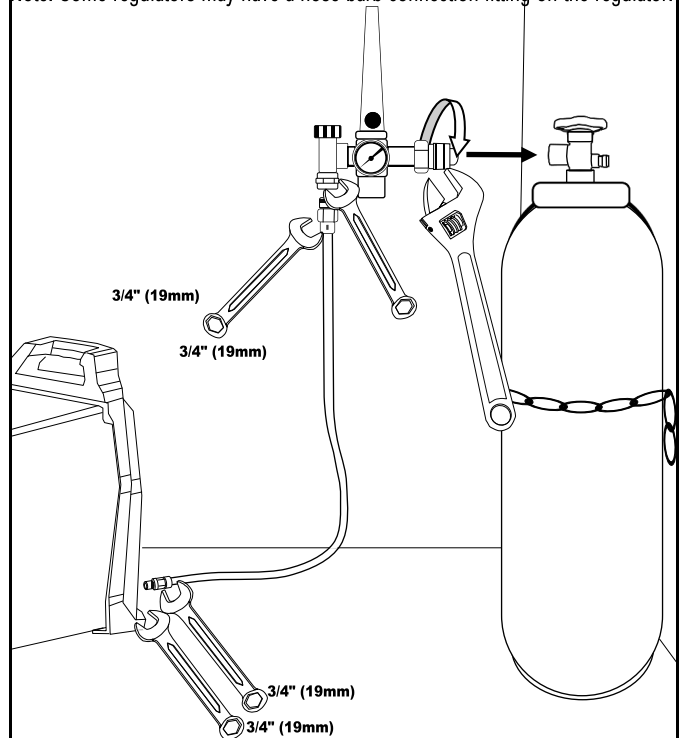
Important: Do not use thread tape or pipe sealant on any cylinder, regulator or unit connection. The residue and debris may get into the gas solenoid and cause operational issues.

CAUTION!

Do not tighten the rear unit connection without holding the female 5/8 CGA fitting located on the unit with a wrench, or damage may occur to the bezel and the fitting as the fitting may turn in the housing while the hose fitting is being turned.

Connect Regulator To Cylinder And Unit.

Note: Some regulators may have a hose barb connection fitting on the regulator.



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CHECK FOR GAS AND AIR LEAKS.

Be sure to check for gas or air leaks before attempting to weld or cut. Connect all the lines and tighten and recheck any related clamps, plugs and fittings. If you hear or suspect leaks, use warm, soapy water (or a dedicated leak testing solution available from welding suppliers) and spray on all rear external connections. If any leaks are present, bubbles will form around the area of the leak. Tighten any clamps or fittings found to be leaking. **If the MIG gas regulator is leaking, discontinue use and contact Everlast technical support. Do not attempt to modify or repair this regulator.** If the air regulator is leaking, make sure the pressure is not more than 90 psi, and tighten the small screws on the regulator with a screw driver. If too much pressure is applied, the regulator may have blown internal and external O-rings or seals. If it is the air regulator, check and remedy the problem if the regulator persists in leaking. If it is the gas regulator, discontinue use and contact Everlast. If the problem cannot be remedied, or internal leak is suspected contact Everlast. **NOTICE:** While plasma cutting, a small drop in set air pressure and operating pressure (while cutting) is normal. This does not indicate a leak. This drop should never be more than 4 to 5 psi and is usually less than 3 psi. If the pressure drops more than this, this usually indicates the air supply hose for the plasma function is too long or too small in diameter for the length it is running before reaching the unit. It may also indicate another restriction. Always keep the air supply hose as short as possible.

DISTANCE YOUR WELDER FROM YOUR WORK.

As a best practice technique, be sure to locate your welder away from the immediate work area. Sparks and debris thrown by the welding and plasma cutting processes can enter the unit and cause damage. This includes any grinding or milling operations that may occur in the area.

SELECT THE CORRECT STICK AND PLASMA POLARITY.

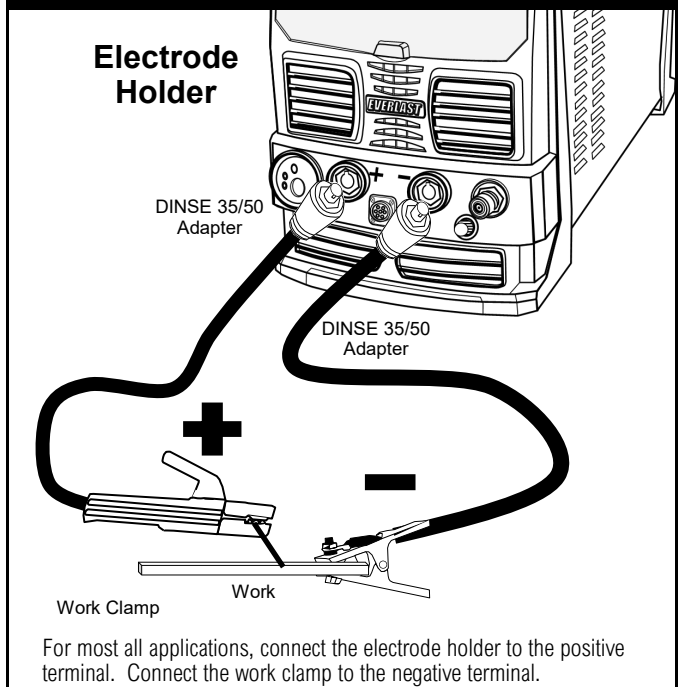
WARNING!

Make sure plasma torch polarity is correct or damage and malfunction of the torch and machine may result! Remove the torch before changing to another mode. Install the other torch *after* the mode is selected. **Do not attempt to weld or cut while the unit is in a mode that is not supported by the connected torch!** Do not leave the plasma or stick torch connected while using another process. The MIG torch *may* be left connected if the torch is isolated from contact with metal. If the MIG torch must remain in place, a piece of rubber tubing slid down over the (cool) MIG torch nozzle will help prevent accidental contact and arcing of the torch when not in use. As a best practice, remove the MIG torch when not being used for MIG or Flux-Cored welding. Accidental cross-arc-ing can cause the machine to fail.

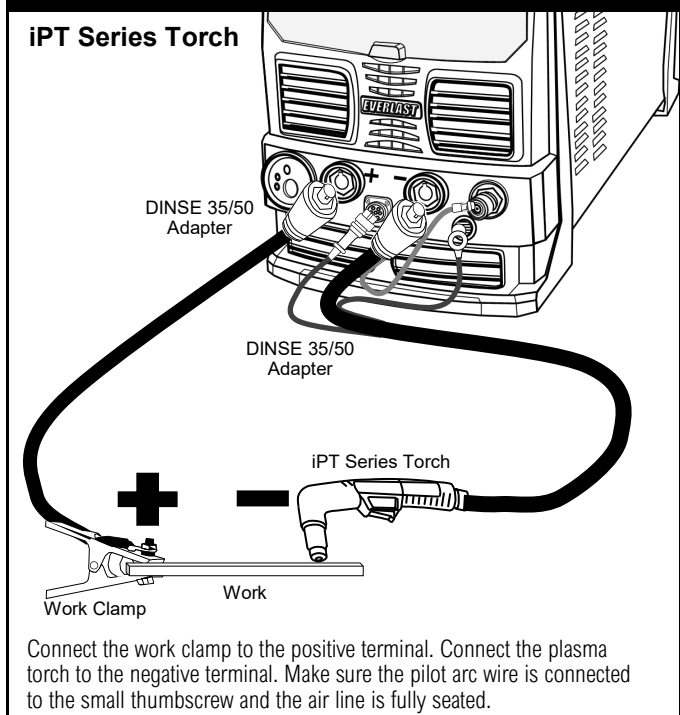
Never touch a bare or exposed part of the connectors, cables, or consumables while the unit is in use, especially while in the plasma cutting mode. Turn the machine off to replace or check plasma consumables. Severe injury, burn or electrocution may occur if contact is made. Keep all cables and covers in place and in good repair. Do not operate if damage occurs to any cable or safety device. Discontinue use immediately and contact Everlast for replacement or repair of the affected part.

The on screen programming will remind you what polarity to use, but in case you forget, refer to the illustrations below.

Where Do I Connect The Stick Torch?



Where Do I Connect The Plasma Torch?



Setup Guide

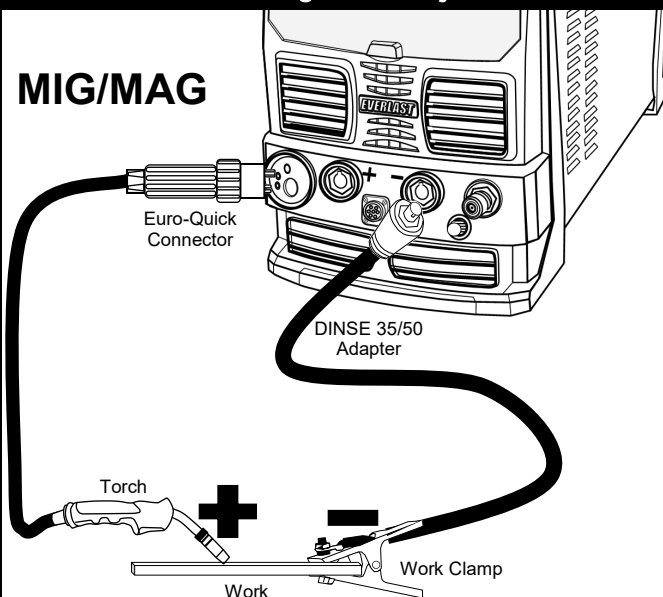
Getting Started

SELECT THE CORRECT MIG AND FLUX-CORED POLARITY.

Even though similar in concept, MIG/MAG (GMAW) and Gas-less Flux-Cored (FCAW) welding require a polarity change when transitioning between the two. The unit will remind you with an on-screen prompt to change polarity when you change between the processes, but this is an often over-looked issue, even when reminded by the machine. Failure to change polarity will result in erratic operation, bird's nesting of the wire, poor fusion and excess spatter. Use illustrations below as a guide.

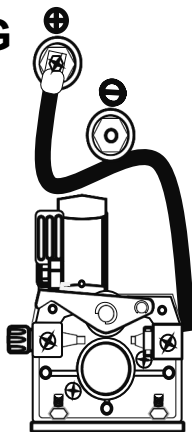
How Do I Change Polarity For MIG?

MIG/MAG



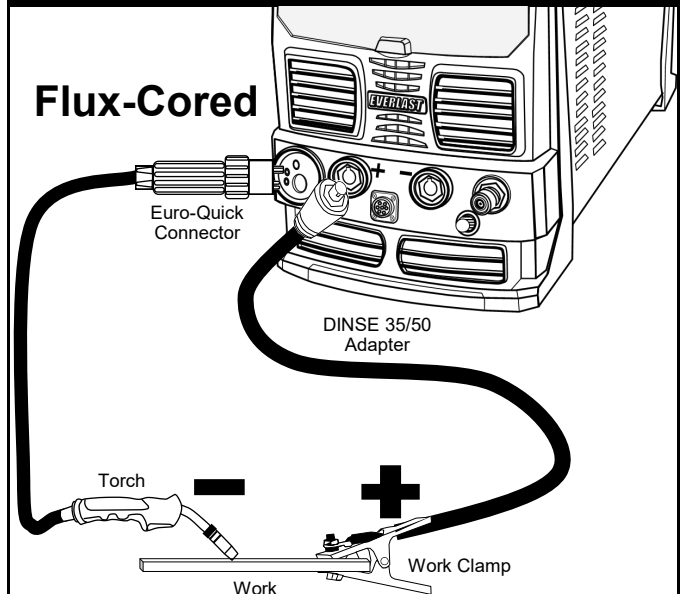
The MIG gun must also be correct in polarity. Drop open the cover on the left side of the MIG to access the wire spool and feeder. Just above the feeder, there are two terminal lugs. The upper is Positive, and the lower is negative. If there are no positive (+) or negative (-) symbols, there may also be a label that says "Gas MIG" and "Gasless" or something similar. Regardless, the top terminal is positive and the bottom terminal is negative. For MIG, the wire feeder cable should be connected to the top, positive (+) terminal with via the provided screw. See below.

MIG/MAG Position



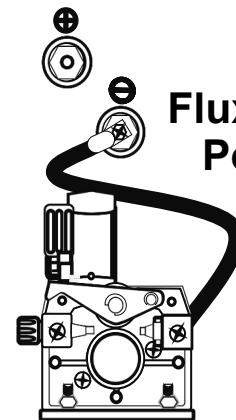
How Do I Change Polarity For Flux-Cored?

Flux-Cored



When welding most all flux-cored wires, polarity will be negative. There are a small number of exceptions. However, if the manufacturer doesn't state the polarity, assume it is negative. Drop open the cover on the left side of the MIG to access the wire spool and feeder. Just above the feeder, there are two terminal lugs. The upper is Positive, and the lower is negative. If there are no positive (+) or negative (-) symbols, there may also be a label that says "Gas MIG" and "Gasless" or something similar. Connect the wire feeder cable to the bottom terminal lug via the provided screw.

Flux-Cored Position



NOTICE:

This unit is not designed for or intended to be used in dual shield operation (FCAW-G). The Flux-cored operation that this machine supports is a gasless process (FCAW). The PowerSet and manual function is programmed for this type of operation.

Setup Guide

Getting Started

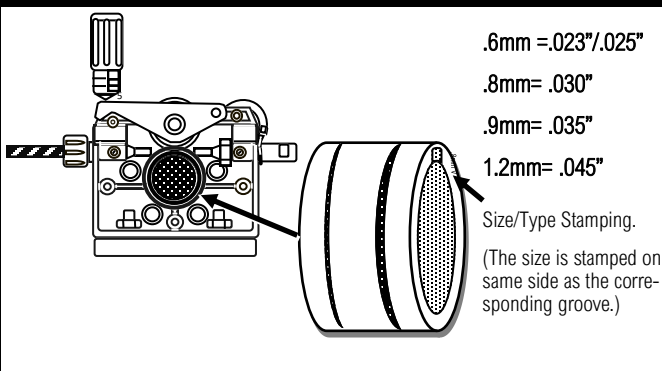
CHECK AND CHANGE YOUR DRIVE ROLL.

The unit comes equipped with .030" and .035" drive rolls. **NOTICE:** *For most purposes up to 3/16" thick material you will likely want to use .030" wire in this unit since it covers the greatest range of metal thicknesses and amperages within the capability of this unit. .030" wire typically can handle up to about 160A before it transitions to globular transfer.* For upper range use and materials 3/16" and over, .035" is advisable. Remember, if you change wire size or type, you will need to either flip the lower drive roll over or completely change the drive roll to the correct size and type.

The top drive roll is actually an idler roll used to hold tension and keep the wire in the groove and is not changeable. Only the bottom drive roll needs to be changed. The bottom drive roll has two small grooves that are sized for .030" (.8mm) and .035" (.9mm) solid wire. Additional sizes and types of drive rolls are available as options. The standard installed drive roll is meant to feed hard (solid) steel wire. The groove on this drive roll has a "V" shape designed for the solid wire. A Flux-Cored drive roll has a serrated edge to the groove, which grips the softer, cored wire. Viewing a flux-core drive roll from the top, you will see a "zipper" like pattern. This should never be used to feed hard steel, stainless or aluminum wire. This will result in damage to the wire, metal flaking and possible plugging of the MIG gun liner. To determine the exact size of wire and type you have, look at the side of the drive roll. The size of the drive roll groove is stamped on the side of the drive roll closest to the corresponding groove. The type of the drive roll will also be stamped with a V if it is for solid, hard wire. If it is stamped with an "U", this is a special drive roll for feeding aluminum wire. Aluminum wire is best fed with a spool gun.

The drive roll is held in place by a black thumbscrew. Remove the screw to expose and change the drive roll. The drive roll is mounted on a bushing. The bushing should be held in place with one finger of one hand while the other hand removes the drive roll. This will prevent both bushing and drive roll from being removed from the wire feeder drive shaft. When removing make sure that the square locating key is not dismounted. If the key falls out of the keyway, replace it before replacing the drive roll.

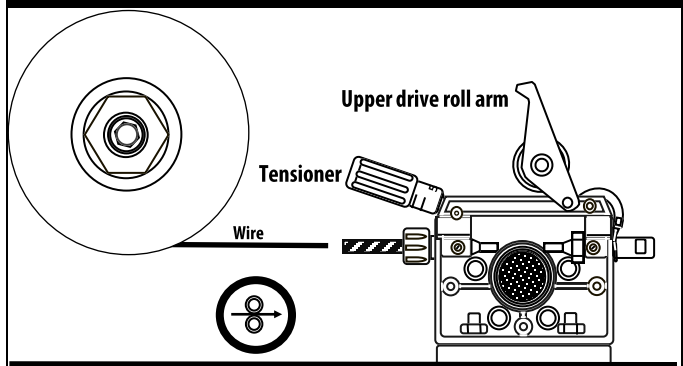
Drive Roll Size and Location Info



INSTALL THE WIRE AND FEED THE GUN.

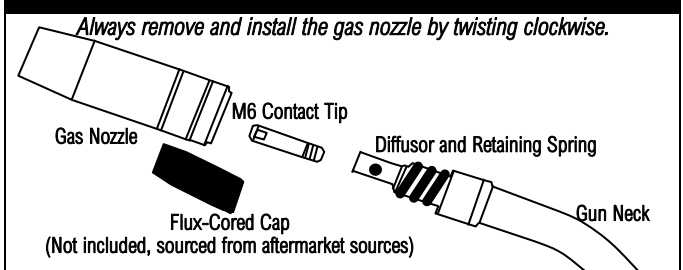
Once the wire spool has been installed, flip the tensioner lever down and raise the top drive roll to the upper position. See the illustration below. Gently guide the wire from the spool over through the wire feeder and into the front section of the gun at least 6 inches. Make sure the wire lays neatly in the groove. Hold it with your finger if necessary as you lower the top drive roll down and raise the tensioning lever with your other hand. When complete the wire should look like the illustration on the previous page. *Hint: The wire on the spool is usually bent and threaded through a small hole in the side of the spool to lock it in place and prevent de-spooling of the wire. Keep one hand on the wire spool to prevent despoiling and cut the wire loose with a pair of wire cutters. Trim the wire to make sure the end of the wire is straight and able to be threaded through the wire feeder mechanism and gun.* After the tensioner is raised back to the vertical position, confirm the wire is still in the groove and is not riding up on the shoulders of the drive roll.

Installing the MIG Wire



Next, turn the welder on and set to a desired MIG or Flux-Cored mode. Remove the gas nozzle by twisting it **clockwise** and pull. Do not turn the nozzle counter clockwise! Unscrew the contact tip as shown in the illustration below. Hold the gun cable and gun straight as possible. Press and hold the wire jog button. The wire should slowly begin to feed through the gun cable and eventually through the gun. As the wire exits the gun, allow 3 to 4 extra inches of wire to be fed out past the diffusor. Release the wire jog button. Re-install the contact tip over the wire and screw it in clockwise until it is tight, but not to the point of stripping. Install the gas nozzle.

How Do I Disassemble the MIG Gun?



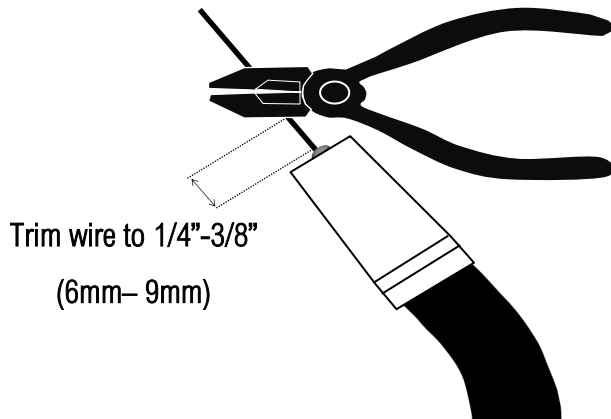
Setup Guide

Getting Started

TRIM THE WIRE AFTER INSTALLATION.

Trim the wire sticking out of the nozzle to 1/4" to 3/8" (6mm to 9mm) in length with wire cutters. See the illustration below. The gun is now ready for welding. *Hint: Always make sure that you re-trim the wire before beginning a new weld if the wire is not already trimmed to this length. This will help to improve arc restarts.*

Trim Wire Before Starting a Weld



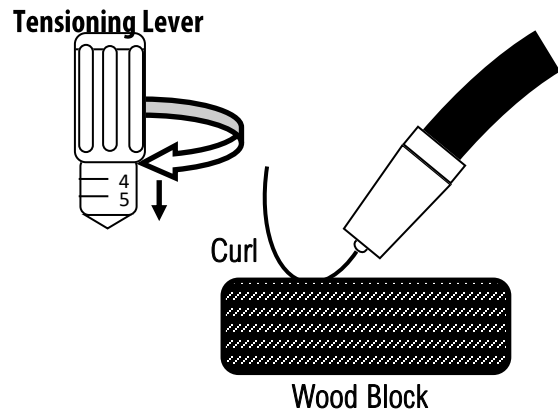
PROPERLY TENSION THE WIRE FEEDER.

To feed properly, the wire needs to be tensioned before you begin welding. The tensioning lever has numbers on the dial. To increase tension, rotate the tension lever clock-wise. Different types of wires require different tensions. There is no exact tension that works for all wire types. However, for steel wire, you will generally tension to at least 4 on the dial. For flux-cored wire, it may be only two or three. Wire diameter also plays a small part in the amount of required tension that is needed. Regardless of the wire type or wire diameter, follow the process below and refer to the following illustration. Turn the unit on and pull the trigger so that the wire extends approximately 1" beyond the gas nozzle.

- Find a small block of wood, such as a two by four, and secure it to the welding table or other solid object. **Do not test this on metal!**
- Hold the gun approximately 2 inches off the wood. Aim the gun at the block of wood so that the nozzle is at a 30 degree angle to the wood.
- Pull the trigger and allow the wire to contact the block.
- Increase wire tension so that the wire contacts the block of wood and is forced to curl up. Continue holding the trigger so that two or three full spirals are made.
- If the wire stops, or stutters during this process, let go of the trigger immediately and increase tension.

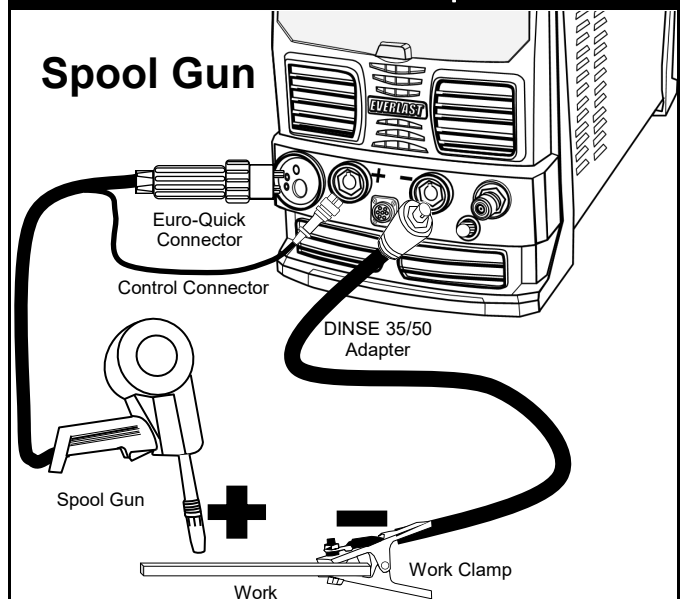
- Adjust the wire until the stuttering or jerking disappears.
- Do not over-tighten the tensioner or use more tension than necessary. When the wire begins to curl without any stoppage, the tension is enough.

Test Wire Tension Before Welding



INSTALLING THE OPTIONAL SPOOL GUN.

Where Do I Install The Spool Gun?

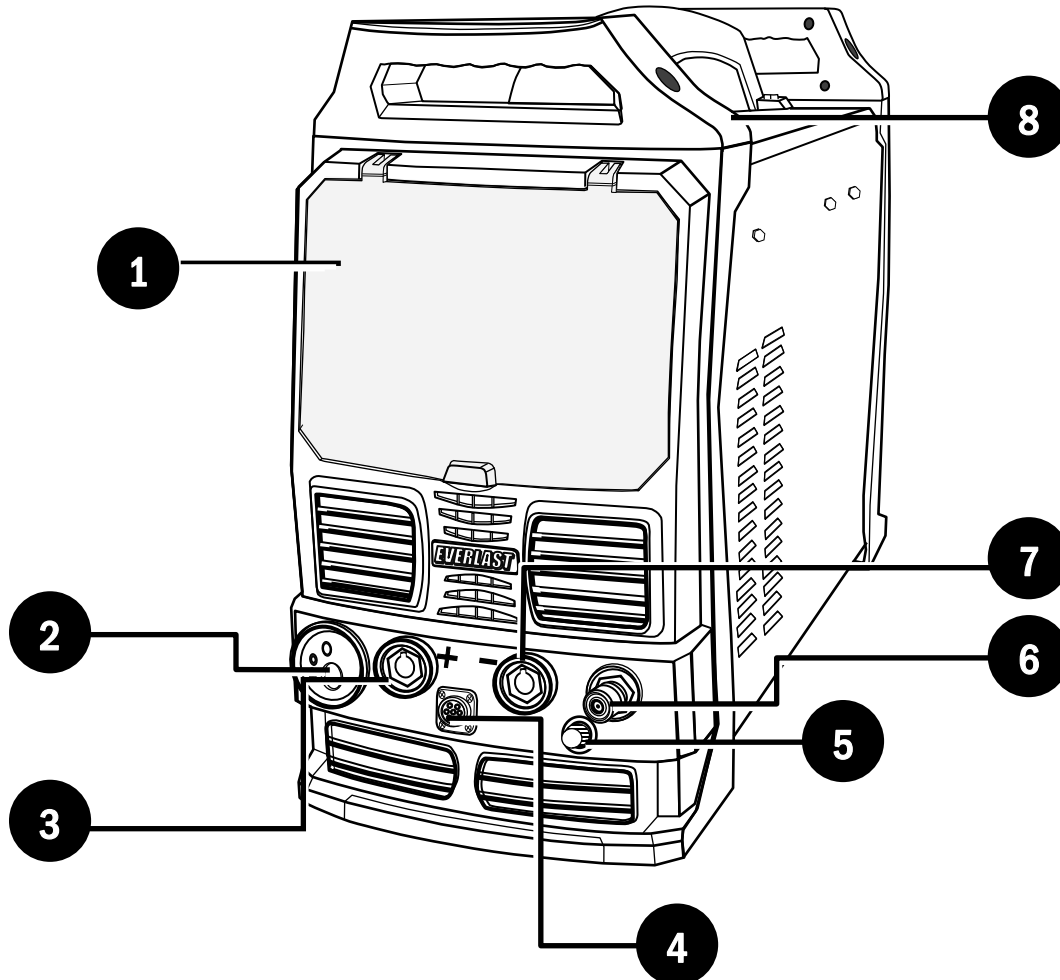


The spool gun connection process is similar to the MIG torch connection and uses the same Euro Quick Connect connection. Polarity is the same as MIG except when Flux-Cored wire is being used.

The SM200N Spoolgun is recommended for use with this unit and provides the best duty cycle and amperage rating. The SM3035N may also be used but is lower rated.

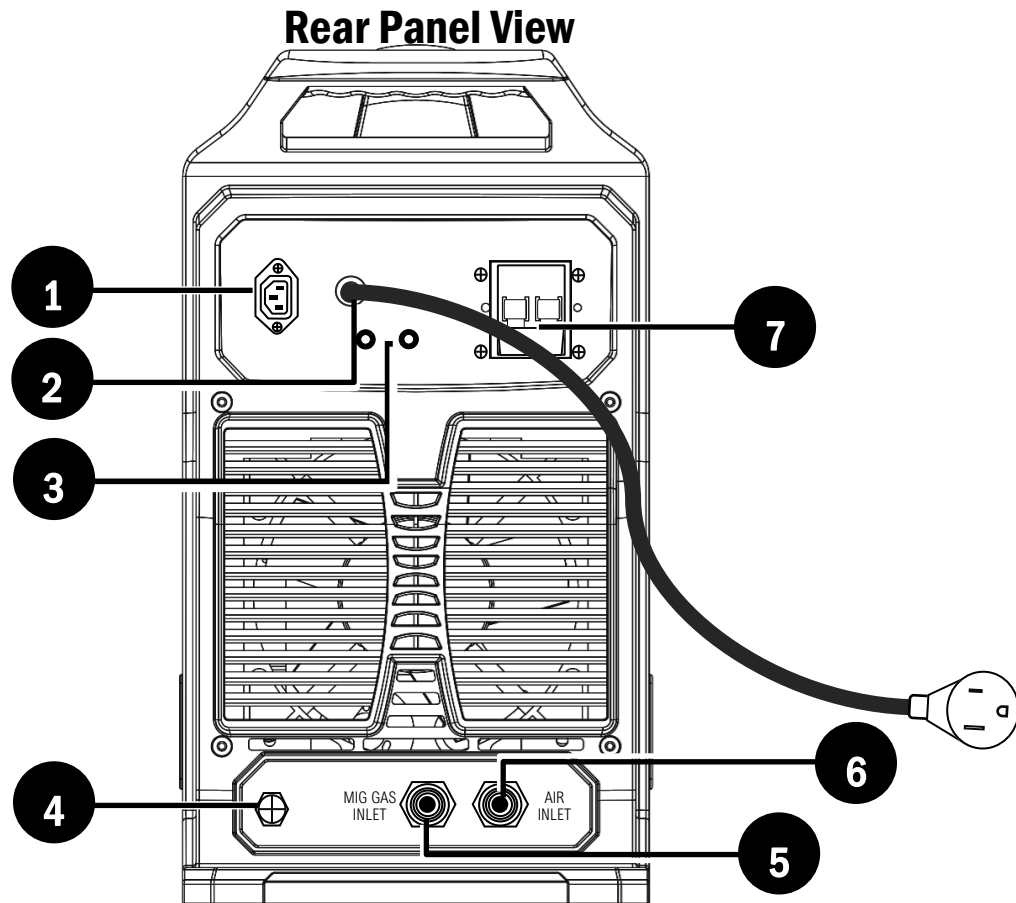
Component Identification and Explanation

Front Panel View



Number	Component Identification	Component Note
1	Protective Cover	Keep cover down and in place during welding activities and in storage.
2	Euro-Style Quick Connector	Connect this to the MIG gun or Spool Gun.
3	Positive Terminal (+) DINSE 35/50 Type	For Stick, connect to the Torch. For MIG, this remains vacant. For Flux-Cored connect the work clamp. For Plasma connect the work clamp.
4	Control Connector	For Plasma the torch switch wire connects here. For the Spool Gun, the control circuit wire goes here.
5	Pilot Arc Thumb Screw	Unscrew the thumbscrew and connect to the wire with the ring terminal from the plasma cutter torch. This terminal is only used during plasma cutting. Keep screw in place on unit when not in use.
6	Air Line Quick Connect Coupling for Plasma	The Plasma torch quick connect fitting should be inserted into this coupling. This is only used for Plasma cutting.
7	Negative Terminal (-) DINSE 35/50 Type	For Stick connect to the work clamp. For MIG, connect to the work clamp. For Flux-Cored, this remains vacant. For Plasma, connect to the torch.
8	Handles	Install handles with provided screws. If their use is not desired, you may leave them off and install just the screws.

Component Identification and Explanation



#	Component Identification	Component Note
1	240V Cooler Plug (Some Models)	Not for Service. Do not use unless a cooler is added. This plug should never be used to power any other item than an Everlast Water Cooler.
2	Input Cable and Plug* NOTICE: Always consult national codes and a local licensed electrician before wiring this welder to any service.	North America only: The unit may be operated on either 208-240V 1 phase (or on 120V 1 phase with the included pigtail adapter). North American standards require only 3 wires for 1 phase operation of welders. A neutral is not used or required. For wiring a 1 phase connection to the unit: Use Black for L1, White for L2, and Green for ground (not neutral) use. Red is not typically used in wiring a welder/plasma cutter circuit. This is in accordance with North American codes for welder/plasma cutter wiring (see Article 630 of the NEC for more info) When operating on 120V, the white wire (internally) becomes the neutral, and the green still serves as the ground. <i>The supplied NEMA 6-50P is the proper plug used for wiring single phase 240V welders and plasma cutters in North America. It should not be changed or removed unless wiring directly into a cut-off switch. Other regions may vary and may have a different plug type or no plug at all. Use the supplied adapter to convert to 120V operation.</i>
3	Air Regulator Bracket Screw Holes	The air regulator bracket is mounted using these two holes.
4	HF Ground Service Bolt**	For use in a combined effort to mitigate any electrical interference that may be caused by the operation of this unit.
5	MIG inlet connector (from regulator)	5/8" CGA
6	Air Inlet Connector (from air regulator)	Periodically check for proper fan function and cleanliness.
7	Breaker/Power Switch.	This switch doubles as the main power switch and disconnect switch. If this switch trips and the welder power turns off, a significant internal event or failure of the switch <i>may</i> have occurred. If this occurs, immediately remove from service and mark/tag according to regulations and contact Everlast Tech Support for further diagnosis and/or repair options.

Component Identification and Explanation

Control Panel Layout



#	Component I.D.	Component Note
1	Process Selector	Use the left and right arrow keys (◀ ▶) to select the desired welding or cutting process.
2	Display	This color LCD display provides all the information relative to setting the machine and indicating set parameters.
3	Left Adjustment Knob	The left adjustment knob is used change the desired status of a function (i.e. voltage, turn on/off, electrode type, thickness etc.) and to set all adjustable values to the left side of the black dividing hash mark just above the “EVERLAST” logo. If you push in on the knob while adjusting, it will adjust in larger increments, usually in whole numbers or increments of 10.
4	Left/Right Dividing Hash-mark	This mark divides the functions between left side controlled functions and right side controlled functions of the machine. The left side adjustment knob and navigation buttons control the left side of the machine. The right side adjustment knob and navigation buttons control the right side of the machine.
5	Wire Jog	This “cold feeds” the wire through the machine to assist in threading the wire through the drive rolls and into gun without danger of striking an arc.
6	Left Side Navigation	Use the up and down arrow keys (▲▼) to navigate and select the parameter on the left side of the hash mark that you wish to change or adjust. The actual direction may go either up and down or left and right, depending upon the function level you are adjusting or selecting.
7	Right Side Navigation	Use the up and down arrow keys (▲▼) to navigate and select the parameter on the left side of the hash mark that you wish to change or adjust. The actual direction may go either up and down or left and right, depending upon the function level you are adjusting or selecting.
8	PowerSet	The PowerSet function, when selected, enters a synergic mode which gives automated settings based off of the diameter of electrode, type of metal, type of gas, and thickness you input into the unit. This simplifies operation and reduces the knowledge base needed to make the correct adjustments needed to weld properly. When PowerSet mode is selected, some functions of the machine will be set to automatic and will not be adjustable.
9	Right Adjustment Knob	The right adjustment knob is used change the desired status of a function (i.e. Wire Speed, Amperage, Spool-gun operation etc.) and to set all adjustable values to the left side of the black dividing hash mark just above the “EVERLAST” logo. If you push in on the knob while adjusting, it will adjust in larger increments, usually in whole numbers or increments of 10.

NOTICE:

The unit is designed with several features and functions in common between processes. The principles of setup and operation carry over from one process to another. In this case, information may not be repeated in detail in this manual if it has been discussed previously in another process..

Component Identification and Explanation

Getting Ready To Weld

GENERAL INFORMATION ON SETUP AND USE.



Selecting the Process.

At the top of the panel (1) the process selector is used to select the desired welding or cutting process. Use either the right or left arrow (◀ ▶) buttons to advance to the next process. Pressing the left or right arrow button rapidly will require the button to be pressed twice to move to the next process. The initial press of the arrow button will display the polarity screen for the next process. A rapid second press abbreviates the polarity screen (see next page) and allows you to enter directly into the setup screen for the process selected. A third rapid press advances to the next process polarity screen. However, if you advance slowly or decide to move to the next process after the machine has had time to automatically advance to the setup screen, it will only require one press to advance to the next process. If you accidentally pass the process you wanted, instead of cycling-back through all the processes, simply use the opposite arrow button to scroll back to the process you desire.

Navigating the Menu.

The panel is divided in half by a black hash-mark (2) below the screen and a green vertical bar down the middle of the screen. This divides the control region in half. The left side up and down (3) arrows (▲▼) controls the left half of the screen and the right side up and down arrows (▲▼) controls the right half of the screen. Both functions (items that may change in status, such as ON/OFF, or Gun Selection), and parameters (items that change in value in a range such as inductance percent) are selectable with the arrow buttons. The arrows are used to scroll through and highlight the selected function or parameter. When a function or parameter is selected and available for adjustment, it will be highlighted and change color, turning from gray to green (3). In some modes, to avoid confusion, the general area that is navigated to will flash as well. Default selection will always be the main adjustment on that side (Volts/Amps/Wire Feed Speed etc.) (5). When navigation is in default mode, the main parameter will be brightly lit in white (or green for voltage in stick, see stick setup section). When navigating away from the default parameter area, the large white numbers will appear to dim. After 4 to 5 seconds if you haven't made another selection or made an adjustment

to the function or parameter selection, the machine automatically defaults back to the main parameter area and the numbers will brighten and will be able to be adjusted. Of course, if you continue to navigate completely through the left or right side functions and parameters, you will eventually cycle back to the default parameter area (voltage, wire speed, amperage etc.) and the numbers will brighten to indicate that you have fully cycled through all the parameters and returned to the default. **NOTE:** If a parameter or function has a black background (STD.) this function or parameter cannot be selected, changed or adjusted due to the mode or setting you selected (i.e. PowerSet) the function is either not relevant or is automatically set by the machine.

Changing the Functions and Adjusting the Parameters.

To change the status of a function or adjust the value of a parameter, use the left or right up and down arrow keys (▲▼) to navigate and highlight the desired function or parameter. Then, use the left or right control knob (6) to make the change in function status (change from OFF to ON, or change torch type, etc.) or change in parameter value (increase or decrease the amount of seconds or percentage etc.). As a default, without navigating to the desired function or value, the left and right control knobs will be used to adjust the Voltage, IPM, or Amperage. **NOTE:** In some modes, the default value will NOT be adjustable with the knob due to the nature of the process being used. For example: In the Plasma cutting mode, the left side will display PSI. The PSI is adjustable only in the rear of the machine and the main display area will only reflect the adjustment change made to the rear regulator. When in Stick mode, the left display will display voltage, but due to the nature of constant current stick welding, voltage is not adjustable and is controlled by the arc length.

Observing the Important Information.

At the top center of the machine (6), the welder will display important reminders to change gas, or which process is being used. It will also tell you, in case you forget, whether you are in manual or PowerSet mode. One other piece of information that is provided is the input voltage the machine senses that is present and being used (120V or 240V). If the voltage does not agree with what you are providing for power there is likely a fault with receptacle or other issue. **Contact Everlast technical support if this does not agree.**

Why Are Some Settings Limited or Blocked?

There are two basic reasons some settings are limited in adjustment or completely blocked from adjustment. The first is that the unit is being used on 120V and output is limited. With limited output, the machine must limit certain range of adjustments to protect itself from malfunction. In PowerSet mode this is obvious by the limit on selecting electrode or thickness sizes. The second reason is that the machine is in PowerSet mode and is automatically presetting the unit for you. In manual mode, most all functions are available for adjustment with the exception of stick mode which does not allow electrode selection.

Component Identification and Explanation

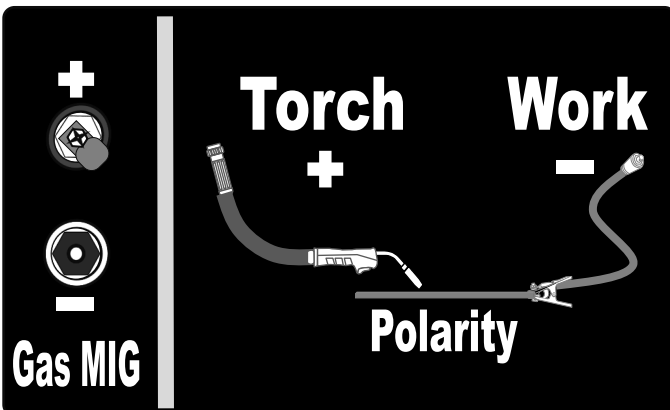
Getting Ready To Weld

THE WELCOME SCREEN



When you first turn the unit on with the rear power switch, this screen will greet you as the machine begins the boot process. Simultaneously, all the process selection LED's should be lit at the top of the panel.

THE POLARITY SCREEN



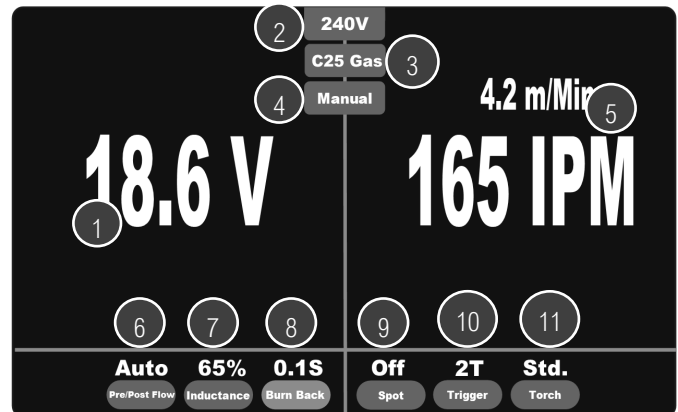
After the boot process (2 to 3 seconds) completes, the unit will briefly display a polarity reminder screen (4 to 5 seconds) as depicted above. Simultaneously, the welder should highlight the last process used by lighting one corresponding red LED at the top of the panel in the process selection area. **NOTE:** In the left column of the screen, during any wire feeding mode, the unit also reminds you to check and change your polarity connections of your wire feeder, indicated by the terminal lug and blank terminal. A reminder to use gas (MIG), or not to use gas (Flux-Cored) is also displayed for wire feeding modes. For Stick and plasma, similar polarity reminders appear as well. It's especially important to check and change your torch and work clamp polarity or improper operation and even damage to the machine may occur. As a best practice, keep the torches disconnected until the polarity screen displays to prevent damage to the machine. Also be sure to remove the torch before changing polarities. Do not try to operate the machine with more than one torch connected at a time.

If desired, at this point you may change the process by using the left/

right arrows (◀ ▶) at the top of the panel to select the desired process. Be sure to wait until this screen is present before you attempt any change of the welding process. Any time you change processes, the screen will reappear briefly to remind you to make any required changes to polarity.

THE MAIN CONTROL SCREENS (MANUAL MODE)

MIG/Flux Cored Manual Screen



1. **Welding Voltage.** Adjust with Left adjustment knob. Select with left up and down arrow keys. When the Voltage is selected for adjustment, the numbers will brighten in color. This is the default setting of the left side. After 5 seconds of no input or adjustment of other parameters or functions, the selected setting will default back to the Voltage.
2. **Voltage Input Confirmation.** This confirms which voltage the machine is being supplied. This also serves as a diagnostic tool. If the machine shows 120V, while operating on 240V, then the power supply to the welder is likely faulty. **NOTE:** Maximum output of the machine is governed by the input voltage. Some selections may not be possible on reduced input power.
3. **Gas/Process Reminder.** This reminds the user which gas or process has been selected. It will display either C25 (75/25 Ar/CO2 for Steel), C100 (100% CO2 for Steel), Mix Gas (98/2 Ar CO2 for Stainless/Inox), Ar Gas (100% Argon for Aluminum), or No Gas (For Flux-Cored on Steel) in wire feeding modes.
4. **Manual/PowerSet Mode.** This indicates which mode the machine is operating in, whether in full manual mode or in PowerSet mode which is a synergic, more automated mode. In PowerSet, many functions may not be available for adjustment. (See the MIG PowerSET section).
5. **Wire Feed Speed Indicator.** Adjust with Right adjustment knob. This indicates the wire feed speed in both Inches Per Minute (IPM) and in Meters Per Minute) m/Min. This is the default setting for the right side After 5 seconds of no input, When the Wire Feed Speed is selected for adjustment the display will brighten in color. This is the setting. After 5 seconds of no

Component Identification and Explanation

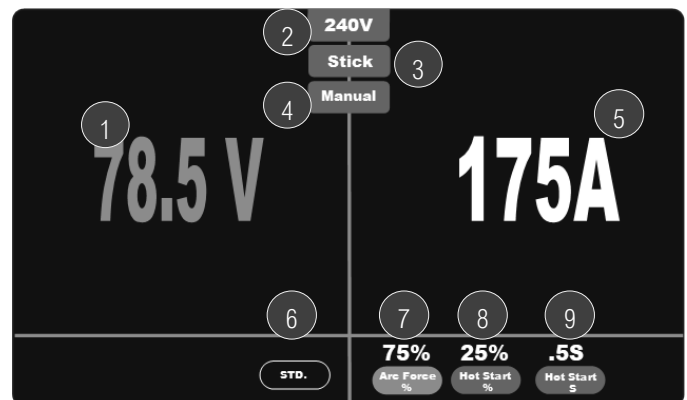
Setting the Unit Up For Welding and Cutting Manually

input or adjustment of other parameters or functions, the selected setting will default back to the Voltage.

- 6. Pre-Flow Post Flow.** The unit has an auto pre and post gas flow setting. This automatically times the flow of gas before and after the weld, improving overall weld quality at the critical start and end of the weld. However, the user may opt to turn this setting off if not desired. Use the left Up and Down navigation keys to navigate and highlight (turn green) this setting. Use the left adjustment knob to turn the setting on or off. In Flux-Cored mode, this feature will be unavailable and be listed as N/A.
- 7. Inductance.** This improves the wet in of the weld. A low setting will result in a very poor arc, with a high pitch. The result will be a raised ridge in the middle and poor wet-in. Excess spatter may be observed. The result of too high of a setting will result in a very fluid, flat puddle. The pitch will be raspy and not smooth. Starts will not be as smooth. Generally a setting of 65 to 75% is a good starting point on Steel with C25. With Steel and C100, 70 to 80% is a good starting point. Generally pure CO2 is not very smooth on many welders, but with inductance control, high quality welds can be achieved. Stainless requires the highest inductance with 90% or greater. Aluminum can range depending upon the wire from 60 to 80% or so. Flux-Core behaves a little differently with a 40 to 50% starting point. Of course, different weld positions, joint designs and thicknesses of metal can affect the inductance requirement slightly. Use the left Up and Down arrow keys to navigate and highlight (turn green) the Burn Back control. Use the left side control knob to change the value.
- 8. Burn Back.** This is the amount of time the arc stays on after the wire stops feeding. It is used to help prevent the wire from sticking in the weld and to reduce the need for constant trimming of the wire before restarting. Use a setting of .1 to .3 seconds to begin with for most applications. Smaller diameter wires need less burn back time. Use the left Up and Down navigation keys to select and highlight (turn green) the Burn Back feature. Use the left adjustment knob to adjust the duration of the Burn Back.
- 9. Spot Timer.** This is a timer that can be set to automatically shut off the weld when the trigger is held down. This allows you to make repeatable and perfectly sized tack welds or short seams. Use the Right side Up and Down navigation keys to navigate and highlight (turn green) the Spot Timer. Use the right side adjustment knob to turn the Spot Timer on and set the duration of the spot timer. **NOTE:** Keep in mind that If the spot timer is turned on accidentally, the wire feed will stop suddenly soon after the trigger is pressed. In fact it may barely feed and just seem to quit if the time is set low. This is normal, but often a source of tech support calls. If your wire feeder stops feeding unexpectedly after the trigger is pressed, check this function first.

- 10. Torch Trigger Function.** This controls how the welder reacts to the torch trigger. In 2T, the trigger is pressed and held to weld. In 4T, the trigger is pressed briefly to start the arc, then released to continue to weld. The weld is continued without the torch trigger being held down. The trigger is once again pressed, held and then released to terminate the arc.
- 11. Torch Type.** Select between the main MIG gun or Spool Gun function.

Stick Manual Screen



- 1. Welding Voltage.** In Stick Mode, the Voltage is not adjustable due to the nature of stick (Constant Current) welding. The voltage varies according to the length of the arc. The Voltage displayed while idling is the Open Circuit Voltage (OCV) of the machine. While welding this changes to reflect the actual arc voltage.
- 2. Voltage Input Confirmation.** This confirms which voltage the machine is being supplied. This also serves as a diagnostic tool. If the machine shows 120V, while operating on 240V, then the power supply to the welder is likely faulty. **NOTE:** Maximum output of the machine is governed by the input voltage. Some selections may not be possible on reduced input power.
- 3. Process Reminder.** The process reminder displays "Stick" when stick mode has been selected.
- 4. Manual/PowerSet Mode.** This indicates which mode the machine is operating in, whether in full manual mode or in PowerSet mode which is a synergic, more automated mode. In PowerSet, many functions may not be available for adjustment. (See the Stick PowerSET section).
- 5. Amperage.** The Amperage is adjusted by the right side adjustment. This is the default setting. If no adjustment is made to selected functions or parameters, the machine will automatically default back to the Amperage setting after 4 to 5 seconds.
- 6. Standard Stick Mode.** When welding in manual mode, the output and arc response is generic and cannot be tailored to a

Component Identification and Explanation

Setting the Unit Up For Welding and Cutting Manually

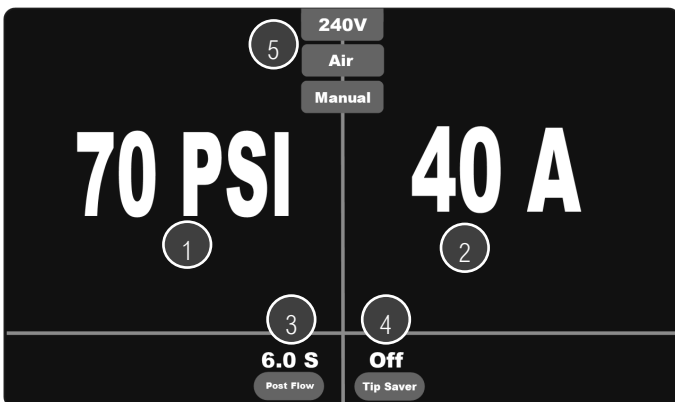
specific rod type. In the PowerSet Mode, the type of rod will be selectable. For the manual mode, this black background box means it is not selectable or adjustable.

- Arc Force %.** The arc force function only works in Stick mode. Arc force is used to offset the loss of overall wattage ($V \times A = W$) as arc length is shortened and voltage begins to drop while stick welding. It offsets the drop in voltage by injecting extra amps into the weld when voltage drops below 20V. This enables the amperage to react aggressively or mildly, depending upon settings, to prevent arc outages, and allowing the user to hold a tight arc and maintain better control.
- Hot Start %.** This adjusts the intensity of the start. When welding this helps to prevent electrode sticking and helps to eliminate porosity at the start of the weld. Hot start intensity is the percentage over the set amps at which the Amps will be boosted during the arc start.
- Hot Start Time (S).** This sets the amount of time the hot start stays engage at the beginning of the weld.

flow after the arc has stopped. This is used to cool the torch and extend consumable life. Set this for at least 3 to 5 seconds unless making very short cuts. Typically 1 to 2 seconds for every 10A is sufficient.

- Tip Saver.** By setting this function to "ON" the unit will only initiate the pilot arc one time, at the beginning of the cut. Once the pilot arc has shut off once the arc is established, the arc will go out if continuity is lost. The Pilot arc will not relight unless the trigger is pulled again and held to reset. If the Tip Saver is "OFF", then the pilot arc will automatically relight when continuity is lost if the trigger is kept held down. Keep the Tip Saver "OFF" if cutting, painted, rusty or expanded metal where continuity could be lost. **NOTE:** The pilot arc will eventually time out in either mode. Keep pilot arc on time to a minimum. Do not pull the trigger to light the pilot arc unless you are ready to cut. Using the pilot arc greatly affects consumable life.

Plasma Manual Screen



- Air Pressure.** The air pressure is set and adjusted on the rear of the unit by the air pressure regulator that you previously installed. The display reflects the air pressure that you have set, or the air pressure that is present in the system while cutting. The left adjustment knob cannot be used to adjust the air pressure. This side of the display only reflects air pressure and is not controlled by any front panel control or button. However, it still serves as the default area for navigation purposes.
- Amps.** Set amps with the right side control knob. Be sure to change consumable size with the change in Amps. Use the plasma torch parts and breakdown page in this manual, or use the PowerSet function to determine the correct consumable size to use.
- Post Flow.** This sets the amount of time the air will continue to

Component Identification and Explanation

Setting the Unit Up PowerSet Mode

UNDERSTANDING POWERSET.

The PowerSet mode, regardless of process selected is designed to help the user make accurate settings without the aid of complicated charts or calculators. This helps both new welders and professionals to set the machine easily without an extensive trial and error process.

The synergic nature of PowerSet mode requires the user to input certain basic information (depending upon the process) such as metal thickness, electrode diameter, wire type, and gas type. Once entered, the machine takes over from there and presets a setting that is determined mathematically from the information given.

While PowerSet is a useful tool, not every possible scenario can be predicted. It does a good job at getting close to the right setting (in most cases, it will be very accurate). But things like weld position, joint design, and even certain welding styles can create a situation where the provided setting is not perfect. In these cases, the PowerSet allows the user to fine tune the settings. However, there is a limit to adjustment that is allowed in the PowerSet mode to prevent an unworkable setting. This is usually a sufficient amount of adjustment allowed to allow the user to find the perfect adjustment. *However, in the event the user cannot find the perfect setting in PowerSet mode or is unhappy with limitations placed on other functions or modes, the user should leave PowerSet mode and use it in the manual configuration.*

USING POWERSET MODE.

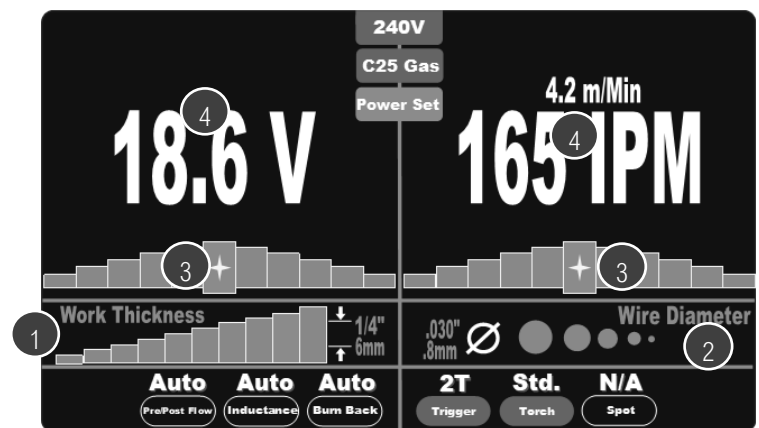
Starting PowerSet Mode

To use the PowerSet mode, first select the process you wish to use, paying attention to the type of gas/metal you are welding. Then, once you have properly set the process, select the Power Set Button at the bottom right side of the panel by pressing the button briefly. The LED above the PowerSet button will illuminate. This will activate the PowerSet Screen for the process you are using. (Each process allows the

use of PowerSet.) Once activated you will be ready to begin entering the information you need.

Using PowerSet Mode.

Keep in mind that if you don't enter the correct information into the machine, you will not get the correct operation either. Always review the information you've put into the machine before deciding the unit isn't working correctly or there isn't enough adjustment to provide the proper setting.



Regardless of the Process, the PowerSet mode essentially functions the same. The above image is the PowerSet mode as it appears in the MIG C25 process. Each process is slightly different with which functions and parameters are allowed to be set, but otherwise setup procedure is nearly identical. Begin the setup process by using the up and down arrows (▲▼) on the *left side* to navigate to the "Work Thickness" (1) level. Rotate the *left side* adjustment knob to select the thickness of the metal you are welding, or the closest thickness/gauge if not listed. Continue the setup process by using the up and down arrows (▲▼) on the *right side* to navigate to the "Wire Diameter" (2) (Each mode varies whether its electrode size or wire diameter that is to be selected). Use the *right side* adjustment knob to select the correct size. **NOTICE: If operating on 120V, some sizes and diameters will be not be allowed to be selected as it is considered beyond the capacity of the machine. In some cases, selections may be limited because it is beyond the capacity of the electrode size or wire diameter to properly weld or cut.**

Once the information has been entered, the machine will automatically set your welding or cutting parameters for you and will be indicated by the center adjustment bar in the stair stepped indicator below the parameter (3). The bar will have a 4 pointed star to indicate this is the target setting and will be highlighted green. If you need to fine tune the setting, the location of the green bar will move left or right down the "stairs" to the next lower level, (depending upon whether you are increasing or decreasing the value). If you move further than



Component Identification and Explanation

Setting the Unit Up PowerSet Mode

is recommended, the bar and numbered value (4) will turn red. If you find that you have moved too far off the suggest setting of the machine, all you will need to do is turn the adjustment knob until you are back at the center, tallest bar. Once you are back at the suggested setting, the white 4 pointed star will reappear.

If you need to make any changes to the functions, use the up and down navigation arrows to navigate to the bottom of the menu and to the function. Most parameters will be on a black background and display either "AUTO" or "N/A" above them. These will be blocked from access and will be automatically set for you. If you desire control of these settings, then deselect the PowerSet mode and use the manual mode. **HINT:** If you are concerned about loosing the PowerSet mode to access and control things such as Pre/Post Flow or Inductance, simply copy the suggested settings into manual mode. You are then free to make any adjustment you need to any parameter or function permitted.

In Stick PowerSet mode, you will notice different restrictions on rod size selections that are allowed with different rod types, especially in 120V mode. This is normal. The welder's programming takes into the account the normal min/max range of each class and size of welding rod and it's respective capability at any given amperage.

Component Identification and Explanation

EXPLANATION OF MIG FUNCTIONS AND TERMS

EXPLANATION OF WELDER FUNCTIONS

Volt and Amp Settings

When welding, the two main functions that require adjustment are Voltage and Wire feed speed. The function of voltage in MIG welding is to control the overall width and to a great extent, the height of the weld bead. In other words, voltage controls the bead profile. It controls wet-in at the toes of the weld, and arc length. Short arc lengths provide wider welds. The wire feed speed directly controls the amps, and in turn amps control penetration. When setting the welder up you will notice that the wire speed is displayed in Inches Per Minute. The relationship between wire diameter, wire speed and amps is easily figured with the following approximate industry conversions:

.023": $3.5 \times \text{Amps} = \text{Inches per minute (IPM)}$

.025": $3.1 \times \text{Amps} = \text{Inches per minute (IPM)}$

.030": $2 \times \text{Amps} = \text{Inches per minute (IPM)}$

.035": $1.6 \times \text{Amps} = \text{Inches per minute (IPM)}$

.045": $1 \times \text{Amps} = \text{Inches per Minute (IPM)}$

To convert wire speed (IPM) into approximate Amps, use the following conversion formula:

.023": $\text{IPM} \div 3.5 = \text{Amps}$

.025": $\text{IPM} \div 3.1 = \text{Amps}$

.030": $\text{IPM} \div 2 = \text{Amps}$

.035": $\text{IPM} \div 1.6 = \text{Amps}$

.045": $\text{IPM} \div 1 = \text{Amps}$

Keep in mind these are approximate conversions and do fall off in accuracy as amps are increased into the upper current limits for the given wire diameter.

Even though you will find general recommendations about setting the Amps, Volts and even shielding gas through a variety of free downloadable apps and online calculators, every filler metal manufacturer has its own

specific parameters for Volt and Amp settings for each wire diameter and class of wire. The ranges of volt and amp parameters generally varies somewhat from brand to brand, so be sure to read the packaging and/or manufacturer literature to determine what range of settings are recommended. The wire diameter also limits the practical maximum thickness of what can be reasonably welded. The issue with following charts, graphs and calculator recommendations is that most people find them either too hot or too cold. For some people, it may not be close to the setting they are used to. However, nothing can substitute for watching and listening to the arc. If the arc is correct, a steady sound, similar to the sound of bacon should be heard. The actual frying sound can vary somewhat and may have somewhat of a higher pitch whine to it. If these sounds are present, look at the arc to see if it is steady, and producing low amounts of spatter. If large amounts of spatter are present, the puddle seems fluid (appears wet) and the wire speed is within the targeted range, decrease volts a little at a time to reduce the spatter. If this does not correct the problem, change the torch angle and torch height. Hold the torch more vertical, with less than a 15 degree deviation from vertical and reduce stick-out of wire to 3/8" or less. If this still does not help, reduce the wire speed. Some spatter is normal, though it should be minimal overall.

The wire can also pop and spatter if the voltage is too low for the wire speed and/or wire diameter. This is mostly observed as flying bits of red-hot but un-melted wire, along with popping as the wire inconsistently stubs into the puddle. This is followed by the wire pushing back against your hand pressure while the wire visibly turns white/red hot before burning off. Too low of voltage will also produce a high piled bead with the toes (edges) of the weld not properly wetting in resulting in poor fusion.

Even though the PowerSet feature has been provided, sometimes additional adjustment may need to be made based off of welding position or joint type. With this unit, we've tried to provide plenty of adjustment range in the PowerSet function. Normally, this will still allow a functional setting. However, when the welding wire is pushed to its maximum limits with Volts and Wire Speed limit, welding may not be smooth and spatter, undercut, and burn back (when the wire melts back to the tip) may occur.

Starting the Arc and Welding In the MIG Process.

Starting the arc is a relatively simple process. Before beginning, the wire should initially be trimmed to between 1/4 to 3/8". Once the wire is trimmed, the gun should be firmly grasped to prevent a phenomenon often referred to as "machine gunning". A light grasp, especially at start, can cause the arc to stutter as the wire pushes back on the gun, lengthening the wire stick-out and creating an irregular start and a porous weld.

The end of the wire should be positioned just barely above the metal when the trigger is pulled for the cleanest start. This will position the end of the contact tip about 1/2" above the weld. The gun should be in the vertical position, with no more than 5 degrees lean in either side to side direction.

Holding the wire too far off from the metal will result in rough starting and

Component Identification and Explanation

EXPLANATION OF MIG FUNCTIONS AND TERMS

too long of wire stick out.

Once the arc has been established, the gun can then either be pushed or pulled in the direction of the weld. In either case, the gun nozzle should be positioned directly over the weld without angling the wire to one side or the other of the weld as already mentioned. The gun should have no more than 15 degrees lean pointed into (push) or pointed away from (pull) the direction of travel. In most cases a push motion is desired. However, a lot of texts offer conflicting information on whether to push or to pull the gun. In reality, both are correct if used correctly and with each having particular strength and weakness. Either one done with too much gun angle will result in undesirable results. Most open-minded people who are well versed in MIG quickly develop a sense of when to push and when to pull the gun. Even for novices, a sense of when to push and pull the gun comes quickly with a little practice. Pushing can result in shallower penetration but the molten puddle is easier to see and the arc sits easily on the leading edge. It will usually leave a aesthetically pleasing bead. However, be careful to prevent the gun from leaning toward or away from the direction of travel too much as spatter will increase and shielding gas flow may become turbulent, creating porosity in the weld. Pulling will result in deeper penetration, but can result in a narrow bead without much side fusion. It also can leave an undesirable humped appearance if not done correctly or if travel is too slow. **Whenever MIG welding with Aluminum, whether with the standard MIG gun or the Spool gun ALWAYS push the gun. If using Flux Cored wire, a dragging motion is almost always recommended.**

Weaving in Welding. Weaving (oscillating the torch or electrode from side to side in one pattern or the other), particularly in MIG, is a topic of controversy as much as whether to push or pull the MIG gun. Stringer beads are often best for novice welders. Stringers are simply straight beads that move forward with little or no side to side travel or oscillation. These will offer the soundest welds for a beginner in MIG or Stick. Stringer welds leave little or no room for contaminants to enter the weld and are the fastest to produce without creating an opportunity for cold lap. Moving too quickly however with a stringer can create undercut which will weaken the weld. The best policy is to move a slow steady speed, making sure the sides of the weld are filled. If undercut is present, it is either from too much voltage or moving before the wire has time to fill the area the arc has melted.

Think of weaving as a method of “sewing” the metal together. If weaving is of interest to you, start with the basic weave pattern. Simple weaves using one variation or the other of a cursive “e” motion are best to begin with. Other weave patterns can be used of course. C’s, V’S, U’s, Triangles and many more weave patterns can be used depending upon the application. Weaves are employed for a number of reasons. Weaves are often considered to have a more pleasing appearance and can help bridge gaps where fit up is a problem. A weave is also frequently used to man-

age heat build up. For example: when welding vertically weaves are almost always used to prevent the molten metal from sagging due to the force of gravity. The major drawback of weaving is that it introduces a greater possibility of getting inclusions and other forms of contamination in the weld. Properly done weaving is a valuable tool, but it must be practiced before employing it in any structural or critical application.

Metal Cleaning.

MIG and TIG welding requires a well prepped surface to obtain a sound weld. The removal of paint, rust mill scale, or other contaminate such as grease should be done before welding. Stick welding is more forgiving of rust and mill scale, but when MIG welding, contaminants will result in porosity and inclusions in the weld, weakening it. In TIG welding it can be disastrous. TIG requires the most cleaning effort. A grinder will usually prep the metal sufficiently to remove oxidation and paint. However, to remove grease a degreaser such as acetone should be used. Do not use any degreaser such a brake cleaner with chlorinated solvents or death or serious injury may occur!

MIG and TIG filler wires such as ER70S-6 or ER70S-2 include a sufficient level of deoxidizers such as silicone and copper that are formulated to allow it to handle minor to moderate amounts of rust and mill scale. These deoxidizers will float out most moderate amounts of contaminants out of the weld and will appear in the usual form of glassy like deposits on top of the cooled metal. They are easily brushed off before starting the next pass. They should not be welded over. Any pinholes that appear are a result of trapped gas in the weld and should be ground out before the next pass. It should be noted that some MIG wires such as ER70S-3 have low levels of deoxidizers and must be thoroughly cleaned and ground before welding. MIG and TIG ER70S-2 and ER70S6 are the same except that TIG wire is cut to lengths and MIG wire is continuous. When welding fine gauge materials in TIG, you can substitute sections of thinner MIG wire.

Multiple Pass Welds.

One of the common misunderstandings that people have when beginning to weld is that if the welder has the power, then a single heavy pass should be used to weld it up. This is wrong. This technique is a good way to induce cold-lap and inclusions into the weld. Single pass welds should not exceed 1/4” even with the heaviest wire the welder is capable of handling. A thick pass may also begin to cool before contaminants and gas pockets have the time to float out to the surface. It’s far better to make

NOTICE:

This unit features a slow run-in. This means the wire will feed slowly until the arc is started. It is used to improve arc initiation and reduce weld porosity which results in poor fusion during the arc starting process. Once the arc is sensed, the wire speed will ramp up and weld at the selected wire speed.

Component Identification and Explanation

EXPLANATION OF MIG FUNCTIONS AND TERMS

multiple smaller passes to complete a plate weld for a higher quality result. For best results, this requires that most joints 1/4" and over be prepared with a grinder to accept multiple weld passes. The weldment edges should be ground to form a V, U or J shaped groove to create a recess where the welds can be welded one on top of another. For welding with .035" wire and under, create a bead no thicker than 3/16" in a single pass, no more than 1/8" with .030" wire, and with .025" wire and smaller no more than 3/32 for best results. This will help maintain proper fluidity of the weld and prevent gas from being trapped in the weld and give time for any minor contaminants to float out of the weld. It will also help to maintain reasonable forward travel speeds. Too slow of travel speeds will create excess build up and can tend to create cold lap at the weld toes resulting in poor tie in. One issue created with a weaving technique even if the metal deposited is the correct thickness is that it can slow the forward

What Are the Different Kinds of Welds?

Besides a butt joint (Flat edge to flat edge) and lap joint (overlapping edges) which are often used for thinner metal gauges, consider using one of these groove joints for best welding results. When grinding or cutting the bevels, especially with a single V-groove, it may be beneficial to leave a small land with a gap between the joint to achieve full penetration. In this case a temporary backer plate can be used to support the bottom of the weld to create the root pass. The root weld will weld the backer to the main plate. This backer can later be ground or cut off. However, in many cases a plain open root can be used as a backer plate adds to the time and labor involved. A knife edge is also acceptable so long as the joint is fully penetrated when the weld is completed. Open root gaps without a backer can range from 1/16" to 1/8" depending upon wire diameter and application.

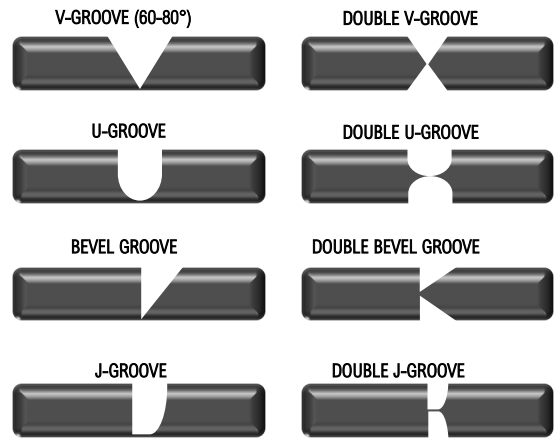
ward progress down. If weaving is too wide, one side of the puddle will

When Do I Use Multi-Pass Welds?

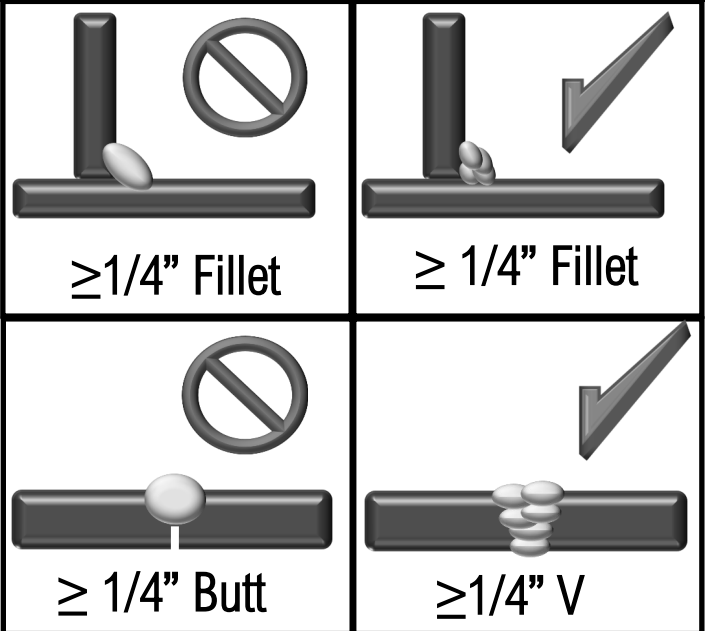
When welding material 1/4" and over be careful about trying to put too much metal down in a single pass. Use multiple passes to complete the weld along with any necessary joint preparation especially with wires of smaller diameter. As metal thickness goes up so does the number of required passes. Depending upon the wire diameter and power settings used, a 1/4" joint may only require 1 or 2 passes, but a 3/8" joint in plate metal or pipe will require not only beveling but 4 to 6 overlapping weld passes including a cap and root pass. See Example below.

cool and oxidize before the torch is brought back across to that side. This is a point where porosity can be introduced.

Joint Preparation



Weld Pass Examples


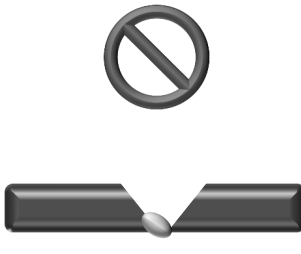
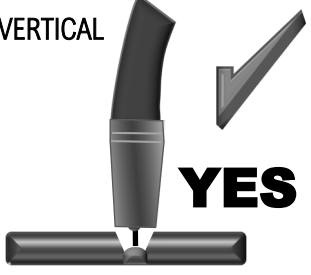
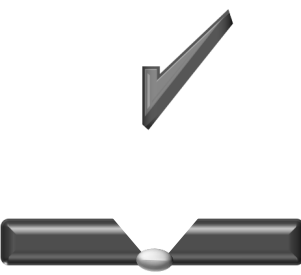
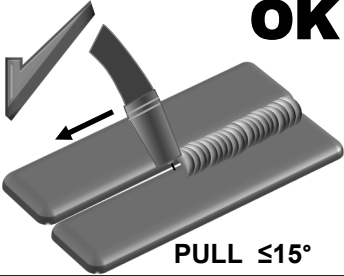
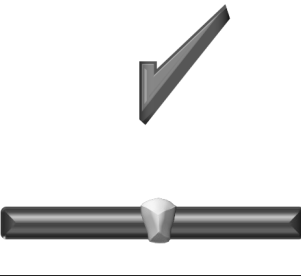
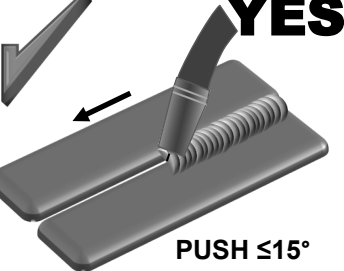
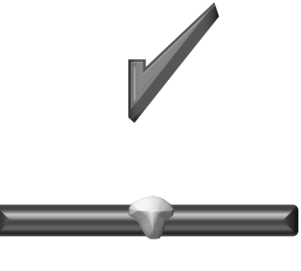


Component Identification and Explanation

EXPLANATION OF MIG FUNCTIONS AND TERMS

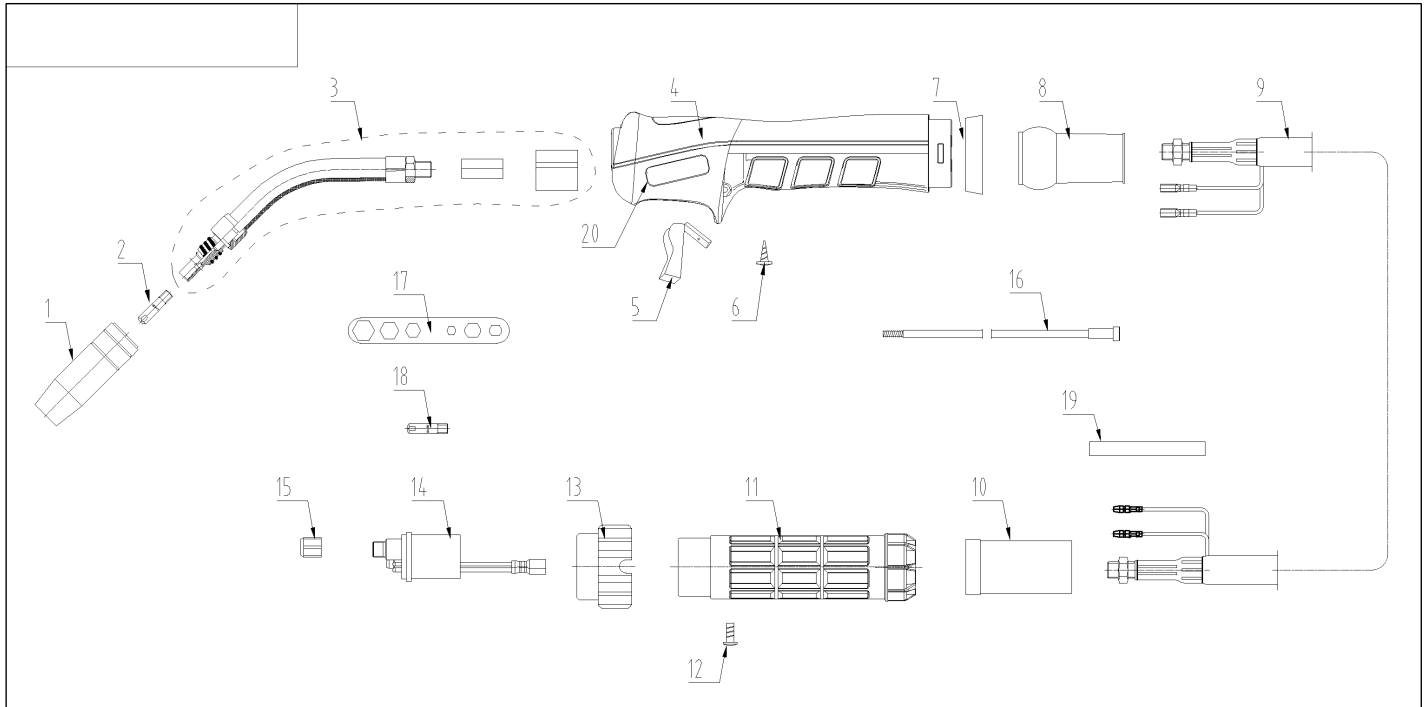
Drag or Push?

MIG Welding is fairly simple if you keep travel angle and direction in mind when welding. See below. If you are welding flux-core, the gun direction is reversed. **Remember: If it has gas, you use a push angle. If it is gas-less you use a drag angle.** *The old welder's saying "If it has slag, you drag." applies to Flux-Cored Wire welding.*

 <p>NO</p>	<p>Problem Technique: The Gun is not being held vertical from side to side. Wire is not being directed to the center of the puddle. This concentrates heat on one side of the joint and results in poor fusion on the neglected side. It also can create more buildup on one side of the joint than the other. Correction: Hold the gun so that the angle of the neck stands perpendicular from side to side.</p>	
<p>VERTICAL</p>  <p>YES</p>	<p>Correct Technique: The gun is held in a near vertical position. A variance of 5 degrees or less is acceptable from side to side. The purpose is to prevent the arc from being concentrated on one side of the weld joint or the other. This balances the heat on both sides of the joint and keeps the bead centered. Don't confuse this with push or pull angle in the travel direction.</p>	
 <p>OK</p> <p>PULL $\leq 15^\circ$</p>	<p>Correct Technique: The gun is angled toward the back of the weld when traveling forward. This angle should not exceed 15 degrees. This provides a narrower but more deeply penetrating weld. Use this method when Flux Core wire is being used. Use this method where the unit may be reaching its maximum welding capacity. Not for use with Aluminum wire.</p>	
 <p>YES</p> <p>PUSH $\leq 15^\circ$</p>	<p>Correct Technique: The gun can be angled toward the front of the weld when traveling forward. This angle should not exceed 15 degrees. This provides a wider and generally more pleasing weld. However it is shallower penetrating. This method typically allows a much better view of the arc. Use for most types of welding unless deeper penetration must be achieved.</p>	

Component Identification and Explanation

INNOTEC 15 SERIES MIG TORCH PARTS BREAKDOWN



14	ITB0059	Euro Central Adaptor Body/Spring pins	1		20	IFT0103	LABEL ERGO 15AK	1																
13	IHJ0063	Gun Plug Nut/Plastic Nut	1		19	IHQ0050	INSULATOR TUBE/Φ5 M	0.13m																
12	IFT0063	SCREW M4X6 UNI 6107	1		18	ICU0003-10	Contact Tip 1.0/M6x25	1																
11	IHJ0645	Back Box Hole	1		17	ICG6000	SPANNER FOR MIG	1																
10	IHJ0028	Front Cable Support 12-16-25 MMØ	1		16	IKC0500-02	Insulated Steel Liner 0.6-0.8 3.1m Blue/TORCH	1																
9	ICN0663	COAXIAL CABLE 16mmø 3m	1		15	I2T0071	Liner Nut	1																
8	IHJ0782	Joint For 15AK	1		serial number	drawing number	name	quantity	note															
7	IHJ0715	HOUSING FOR HANDLE	1						range of tolerance															
6	IFT0874	SCREW D.3x10 UNI9707	3						a<6	6<a<30	30<a<120	a>120												
5	IHG0070	TRIGGER RED	1						±0.1	±0.2	±0.3	±0.5												
4	ICV0757	MIG HANDLE BLUE/INNO/GRIP	1		marking/Places	Revised file No	Signature	date																
3	ICZ6087	TORCH HEAD 15AK	1		designer	standardization																		
2	ICU0003-08	Contact Tip 0.8/M6x25	2		drafted	craft																		
1	ICS0063	Gas Nozzle Ø12 14-15AK	1		proofread	approval																		
serial number	drawing number	name	quantity	note	Audit	date	2016-08-15	Shanghai Innotec Co.,Ltd	<table border="1"> <tr> <td>reference number</td> <td>material</td> <td>weight/l</td> <td>edition</td> </tr> <tr> <td></td> <td></td> <td></td> <td>A</td> </tr> <tr> <td>page one</td> <td colspan="3">one page in total</td> </tr> </table>				reference number	material	weight/l	edition				A	page one	one page in total		
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Component Identification and Explanation

STICK WELDING INFORMATION

STICK ARC STARTING METHODS

1. Make sure the unit is turned on and the boot cycle has finished.
2. Select the Stick Process on the Selector.
3. Make sure the electrode holder is in the Positive connector and the work clamp is in the negative connector.
4. Select the Amp level desired. No voltage adjustment is available. Select Hot Start Time and Hot Start Amps % (Intensity) to improve starting reliability. Use higher amounts of Hot Start %, over 50% with difficult to strike rods, or rods that aren't fresh or out of a sealed metal can.
5. Use the arc force control to select the desired arc characteristics, creating the desired arc characteristic and amp response needed to maintain the arc. Cellulose electrodes may not have the same arc force behavior as other welding electrodes, but each brand and size will weld a little differently. Typically rods such as the E6011 will require a setting 60-80% for best results. 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. *If you are new to using an inverter welder, there are some aspects that will seem different. One of the main ones is that the arc is better controlled in most situations by "pushing in" when the arc seems to get weak or unstable and the arc force will kick in as the voltage drops. If the arc length is too long, the voltage rise will signal the inverter to shut down and will terminate welding output. This is done to limit amp draw on the circuit.* This threshold is shorter than most transformers, and an extremely long arc cannot be maintained. However, with a little practice, the arc will be easy to manage with some adaptation in technique.
6. Strike the arc with either the tapping method or the match strike method. Beginners usually find that the match strike method typically yields the best results.



HELPFUL HINT:

Pay particular attention to the Arc Force setting as it affects the aggressiveness of the arc and the amp response. Set the Arc force to approximately 30-50% and readjust it from that point to find the optimum setting. Adjust in increments of 5% up or down from there to obtain the best results. Usually, an increase in the arc force for cellulose based flux welding rods is helpful. Lowering the Arc force setting is generally desirable for rods iron powder/Titania based flux. Too much arc force will create overheating of the welding rod, and even cause them to flame up. Too little can lead to sticking and arc snuffing. Use the Hot Start features to improve arc starting and cut down on failed arc strikes. Hot Start Amps refers to the % over the set amps that the amps will be boosted during arc striking until the arc is established. Hot Start Intensity controls the amount of time that the Hot Start stays engaged after the arc is struck. Start by setting Hot Start to somewhere between 30% and 50% and set hot start time to .5-1 seconds. Adjust in increments of 5% up or down to obtain best starting results.

When welding, the weld will be slower than MIG speed. One of the most common mistakes for users transitioning from MIG to Stick welding is the travel speed. Allow the metal to fill the puddle as the rod travels forward. Be sure to try to separate the difference between the slag and the molten

Component Identification and Explanation

STICK WELDING INFORMATION

HELPFUL HINT:

Pay particular attention to the Arc Force setting as it affects the aggressiveness of the arc and the amp response. Set the Arc force to approximately 30-50% and readjust it from that point to find the optimum setting. Adjust in increments of 5% up or down from there to obtain the best results. Usually, an increase in the arc force for cellulose based flux welding rods is helpful. Lowering the Arc force setting is generally desirable for rods iron powder/Titania based flux. Too much arc force will create overheating of the welding rod, and even cause them to flame up. Too little can lead to sticking and arc snuffing. Use the Hot Start features to improve arc starting and cut down on failed arc strikes. Hot Start Amps refers to the % over the set amps that the amps will be boosted during arc striking until the arc is established. Hot Start Intensity controls the amount of time that the Hot Start stays engaged after the arc is struck. Start by setting Hot Start to somewhere between 30% and 50% and set hot start time to .5-1 seconds. Adjust in increments of 5% up or down to obtain best starting results.

When welding, the weld will be slower than MIG speed. One of the most common mistakes for users transitioning from MIG to Stick welding is the travel speed. Allow the metal to fill the puddle as the rod travels forward. Be sure to try to separate the difference between the slag and the molten pool of metal. The slag will coalesce behind the puddle if travel and rod angle is correct. Do not let the slag travel in front of the puddle. Keep the top of the rod inclined to the direction of travel around 10-20 degrees while welding in the flat position (Electrode holder should be in front and inline of the puddle). To begin, simply start the arc, and then drag the rod slowly and carefully along the metal, allowing the rod flux to provide a standoff between the metal filler and the puddle. Be sure to keep feeding the rod steadily downward into the puddle as the rod melts. In the case of E6011, a slight stepping motion in front of the puddle about 1/8"-1/4" in front of the puddle can be used as a key hole opens up in the weld joint, ahead of the puddle. This is also called "whipping" the rod. Do not flip the end of the rod away from the puddle in a arc motion or the arc may terminate while using E6011 or similar cellulosic rods. When experience is gained, numerous manipulation methods may be used with rods such as E7018, 7014, 6013, and 7024. Weave the rod no more than 2.5 times the width of the welding rod. To begin weaving, weave small, tight patterns similar to C's, cursive E's, V's, or even figure 8's.

IMPORTANT!

This unit is designed for operation with E6011 (E6010 not recommended). To get the maximum performance and use with these rods, the PowerSet mode should be engaged, and the correct rod type and size selected. Improved function of all rods can be obtained through the use of the PowerSet function. In manual mode, rods such as E7014 and E7018 work well, but selecting the Power-Set mode can simplify operation and improve performance. 120V operation will reduce the capability of the E6011 setting however since arc force action is limited and hot start action is reduced.

Component Identification and Explanation

PLASMA CUTTING WARNINGS

Plasma Cutter Function Important Information and Warnings:

DANGER! Never touch any of the bare portions of the torch power connectors, fuse, consumables or torch control while the unit is switched on and torch is connected. Severe injury or death may occur if the torch trigger is accidentally activated or becomes damaged.

WARNING! Do not use sun glasses or non cutting glasses to protect the eyes. Use at least a shade 8 for plasma cutting where the arc is clearly visible. Never use less than a shade 5, and only use that for situations where the arc is not visible. Do not use cutting shades rated only for Infrared use, such as those designed for Oxy-Fuel use. These usually do not offer sufficient UV protection unless stated otherwise.

CAUTION! Keep the torch switch isolated and the consumables in place on the torch while the unit is switched on. Turn the unit off to change consumables. Do not remove the trigger safety guard or attempt to defeat its operation in any manner. If the trigger safety becomes damaged, replace immediately. Turn the machine off to replace the consumables.

WARNING! Always connect the clamp directly when possible, but the clamp should never be submerged in water, or the water may siphon down the cable through capillary action and run into the DINSE connector or the machine. If the work clamp cannot be safely attached to the work without submerging it, either lower the water level of the table, or use a thick copper jumper wire direct to the work clamp which is attached directly to the work clamp.

WARNING! A poor work clamp connection may cause faulty cutting, loss of cutting power, or excessive pilot arc engagement. The Pilot arc is not designed for continuous run and the length of its time on should be limited as much as possible. Even though the fuse may not blow if the pilot arc is left on continuously or is being used excessively, the fuse holder may overheat or become damaged. If poor cutting is experienced, with minimal penetration into the cut, the pilot arc may be staying engaged. Check the work clamp and cable for proper connection. If necessary, change the work clamp if the copper cable and strap have burned or looks corroded.

STOP!

If the pilot arc does not appear to transfer stop immediately, and investigate the cause. Usually this is a result of a poor work clamp connection, or too high of a cut height. Do not allow the pilot arc to remain on continuously. To do so will increase consumable wear greatly, or overheat the pilot arc circuit.

NOTICE:

The design of the blow back start *may* cause a slight delay in the arc as the air pressure must built inside the torch tubing and head to create the pressure needed to force the electrode off the nozzle seat. This may take up to a second, especially when using longer torches or marginal air supply systems. Restarting the arc in tip saver mode requires retriggering the torch. If the torch does not light after 3 seconds, let go of the trigger and press it again. If the start or arc is erratic check nozzle and electrode for tightness and wear.

Component Identification and Explanation

PLASMA CUTTING WARNINGS

I Selected Plasma and This Code Came Up. Why Am I Seeing it? Is It Broken?

The most probable reason for this code is that you did not connect your air supply line before you selected the plasma cutting mode. It's also possible your air pressure is too low or too high to cut. Set your air pressure between 65 and 72 PSI. Do not supply the welder itself with more than 90 PSI from the air compressor. Pressures below 40 PSI can damage the torch and the unit will shut down and display this error as well. If you've connected the air supply and you are sure the pressure is within range, give us a call for further diagnosis.

ERROR

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Check manual for error code help. Contact Tech Support for further diagnosis.

Component Identification and Explanation

Explanation of Plasma Cutting Functions and Terms

What Air Pressure do I use to cut?

The unit should maintain between 65 and 72 PSI while actively cutting. For best results, set your gas while it is flowing. Do not lower the air pressure in an attempt to improve cut at lower Amps with oversized consumables. Consumable size should always be matched to the Amp range being used to cut. Lower Amps call for smaller diameter orifices in the consumables. See the torch page and the parts information to match consumable size to the Amp range of the consumable. Using too little air pressure will rapidly accelerate wear on all torch parts and consumables. Using too high of amperage for the consumable will rapidly wear the consumable. For best results, buy a complete range of sizes of consumables to be able to tailor your cut needs.

Bevel. When plasma cutting a certain amount of bevel will be present. The cut will rarely be a true 90 degree cut. Usually 1 to 7 degrees of bevel may be present on the “keep” side. Ideally this figure is under 5 degrees of bevel. One side of the cut will have more bevel than the other. Measure the “keep” side of the bevel. Practice cut with your torch first before attempting precision requiring cuts to familiarize yourself with which side of the cut the bevel is being formed on. With the iPT60 torch the inside swirl ring can be flipped over to change the bevel side. If circle cutting, be sure you have identified the direction of bevel. Changing “clock” rotation of the torch in a circle cut will change the side of the bevel. See the instructions on circle cutting in this manual.

Blow Back Start. There are three common types of start that can be attributed to how the plasma arc is started or maintained. Two of the three are no longer used in more modern plasma cutting systems. These two are: Contact start and High Frequency start. Contact start simply means the torch must be touched to the metal and drag along to maintain an arc. High Frequency start uses points similar/same as the TIG process to create a small arc, or spark to start the arc without the torch needing to maintain contact or touch down to start. HF start with pilot arc operation causes a lot of electrical interference. The final type of start, is used in most modern plasma cuttings system. This is the Blow-back Start. In a Blow-back start torch design, when no gas is flowing and the torch is not in use, the electrode and tip rest in contact with each other, creating a closed circuit. When the torch is triggered, either a spring loaded “piston” or a specially designed spring loaded cartridge uses air pressure to drive the electrode rearward away from being in contact with the cutting tip, creating a small “Pilot Spark” energizing the pilot arc. This unit uses the modern “Blow-back” start style. For more information, see how the arc starts in the illustration located on the torch page.

Dross. Dross is the left-over oxidized metal created by the Plasma cutting arc. In an ideal cut, little or no dross will be left, as it is cleanly dispersed out the bottom of the cut. Generally, though some slight dross will be present. Dross is sometimes referred to as “slag” by people who are mostly accustomed to stick welding or cutting with oxy-fuel processes. The amount of and type of dross created is affected by torch cut height, cut speed, air pressure, consumable size and even torch angle. Two types of dross are generally present: Hard and Soft. See the instructions later in the manual to identify the type and cause of different types of dross.

Edge Start Cut. When the plasma torch reaches the upper limit of the cut capacity, piercing starts are no longer viable. Usually this is any-

where from 1/2 to 2/3 of the torch rated capacity. Cutting can still be performed, but starting a cut in the middle of the metal is no longer an option. If piercing starts are attempted near the maximum capacity of the machine, wear will greatly accelerate on all torch consumables and even the torch itself. In fact a poorly performed pierce start will completely destroy the consumable set in one cut if the pierce is performed at or near the maximum capacity of the cutter. An edge start allows the torch to be placed on the very edge of the plate to be cut to start the arc. The arc actually lights right on the edge of the metal, and the torch is brought into the metal and the cut begins. A lead in is usually used to create the cut.

Kerf. Kerf is the width of the cut. Kerf will vary according to the consumable orifice size used, the stand off height, and to a lesser extent, cut speed. Kerf width is important to maintaining cut accuracy. Testing kerf width first is advised before trying to perform cuts which need a high level of accuracy. Always remember to adjust for the kerf width. Smaller kerfs can be achieved by using smaller diameter cutting tips, but cut thickness will be limited.

Lead-In/Lead Out. Lead ins or Lead Outs are simply cuts that are made at the beginning or end of the cut that will not be used in the final part being cut. These are usually tangential to circles or start outside of the part shape and travel into or out of the cut. This is done to prevent “blow out” of the kerf width and discontinuities where the torch starts/stops.

Pierce Start Cut. When the plasma cutter is sized properly and is used in an average, daily cut, the unit will not be at the all-out maximum capacity of the machine. In this case, the torch will use the pilot arc to start the arc and will begin to pierce a hole through the metal to start the cut. Of course, if desired the pierce can happen anywhere on the metal. When hand cutting, the piercing limit can be increased by starting the cut at a slight angle to keep the sparks and molten metal from bouncing back onto the torch head, and damaging it. Once the piercing begins and the cut begins to develop, the torch can then be slowly stood fully vertical to cut as the flame begins to exit the bottom of the cut.

Problem: I just changed my consumables now my torch won't light/or the arc is blowing out my tip. What's wrong?

Did you just change your consumables? Or did someone do it for you? All iPT torches use a swirl ring. This swirl ring is used to help create the torch arc, and confine it. It is a small brown/orange high temperature plastic piece shaped like a donut with several pin holes in the side directly under the cutting tip. Sometimes it'll stick lightly to the old cutting tip, or may even be dropped, unnoticed during the change. It is lightweight, and the color may blend in with the color of the copper cutting tip. This swirl ring is rarely replaced, but must be checked for its presence before reinstalling the consumables or it can damage the torch head and cause extreme mal-

Problem: I can touch my torch to the surface and cut, but I don't get a pilot arc when I pull the trigger.

Check your fuse. The Pilot arc is served by this fuse. The fact you can touch the torch to the metal and still cut indicates the pilot arc is not functioning, but the cutting arc is still working ok.

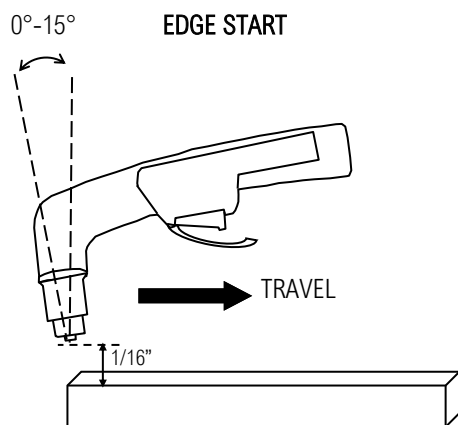
Component Identification and Explanation

Explanation of Plasma Cutting Functions and Terms

How do I edge start a plasma cut?

Edge starts are the best type of start to promote consumable and torch life. This reduces blow back of molten material and allows a smooth gradual start of the arc and maximizes cutting capacity.

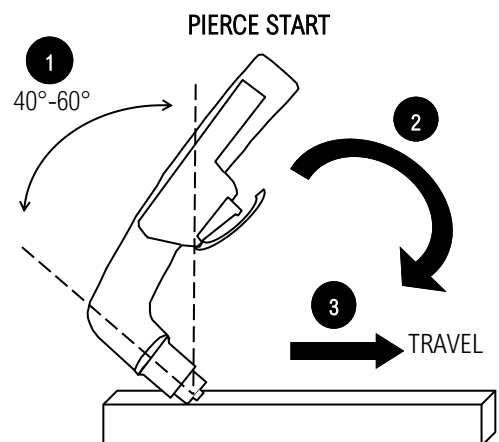
- 1) Line up the hole on the tip of the electrode on the edge of the cut. Hold torch perpendicular to the cut initially, about 1/16" off the metal. Slide the yellow safety lock and squeeze the trigger. Wait for arc to start.
- 2) Once the arc starts, wait for the arc to penetrate all the way through the metal.
- 3) As the torch penetrates the flame all the way through the metal, tilt the torch so there is a slight lead in the flame if metal is thin. If the metal being cut is thick, keep holding torch in a nearly vertical position.
- 4) Begin moving the torch in the direction of the cut. Maintain 1/16" to 1/8" standoff height.
- 5) Move the torch fast enough so the sparks and flame trail from the bottom edge at an angle of no more than 30° and no less than 10° from perpendicular to the metal. Excess angle of sparks/flame indicate too fast of travel speed or practical cut capacity has been reached. Little or no angle indicates too slow of travel speed.



How do I pierce start a plasma cut?

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

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



IMPORTANT:

If you use a standoff guide with the torch, it must be adjusted to provide no more than 1/8" standoff, less if possible. Long standoff heights reduce cut capacity and quality. It also promotes rapid consumable wear and can prevent the pilot arc from transferring.

Component Identification and Explanation

Explanation of Plasma Cutting Functions and Terms

How often should I check or change consumables?

Check consumables regularly for wear and change them out before they are completely worn out. A good practice is to check consumables before turning the machine on each time you prepare to cut. It takes only a few seconds and can save yourself a lot of extra effort later. Allowing the consumables to wear until they quit working may damage torch related components, creating a more costly repair. If the cut quality suddenly deteriorates and begins to show greater than 5 degrees bevel, stop and check the consumables for wear. Inspect the cut tip orifice for the tell-tale signs of wear including deep pitting around the orifice and an egg shaped hole. The electrode should be inspected for wear as well at this time. The cap should be pulled off, along with the tip and the swirl ring. The tip should be examined for wear. A slight pit is normal in the center of the electrode. However, if the electrode tip is pitted around the center, or the center has a deep hole in it, the tip is worn. The very center of the electrode has a special insert made of hafnium. Hafnium is an expensive and durable metal that is used for electrodes. If the hafnium insert is wearing quickly, check for water or moisture getting into the system. Also, periodically, with the unit turned off, check the spring action of the electrode by removing the cup and tip and pushing your thumb or finger down on the electrode. The electrode should depress slightly and spring back quickly without a delay. If it does not, the torch head may need to be disassembled, cleaned and lightly lubricated with di-electric grease. In some cases the sealing O-rings may be broken or dirty causing sticking. Replacement torch head kits are available if repair is not an option. Sticking of the electrode like this causes starting issues. Most often this condition occurs because of moisture and dirt that makes its way into the system. **Additionally, do not overtighten the electrode or overheat the torch (by poor cutting techniques such as excessive piercing starts on thick metal) or the electrode threads may gall in the torch head and break off during removal. Do not under tighten it either. Use the supplied wrench to tighten the electrode. Use your fingers only to tighten with this wrench. Avoid using pliers to install and remove the consumables.** This usually occurs on lower quality consumables (non-OEM) with poor chrome plating, but can occur if OEM consumables are overtight-

NOTICE:

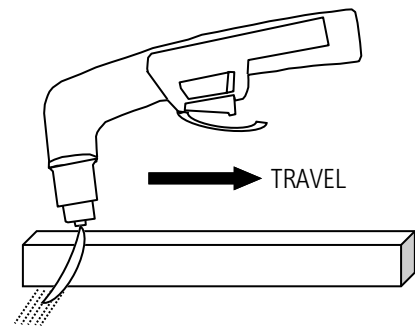
When lowering amps to cut thinner material, you must change to smaller orifice nozzle. Nozzles are offered in different sizes which are made for different amp levels. **See the torch parts page for amp range and size of consumables.** Everlast offers OEM size and configuration of consumables originally supplied with the torch for replacements and do not offer all configurations or sizes.

Everlast is not the manufacturer of the Innotec IPT series torches and does not offer all possible consumable types available for the torch series. OEM suppliers of the Innotec IPT torches (local and online) offer extended range of sizes and configurations. If drag cutting is desired, shielded drag consumables are now available from several online sources. *An orifice that is too large for the amps being used will result in arc instability and a rough cut.*

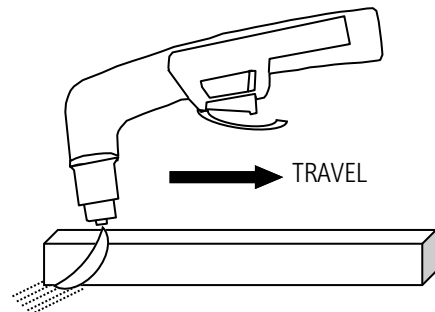
What should the torch flame look like?

The torch flame angle can tell you if you are cutting at the correct speed or not. Take a look at the examples below to help you determine if you are cutting at the correct speed.

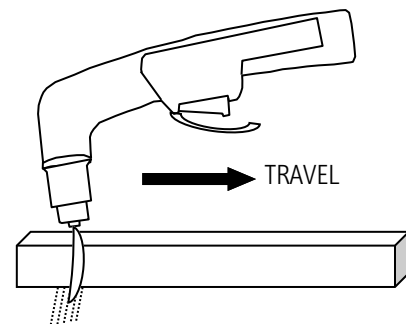
FLAME AT CORRECT TRAVEL SPEED



FLAME AT FAST TRAVEL SPEED



FLAME AT SLOW TRAVEL SPEED



Component Identification and Explanation

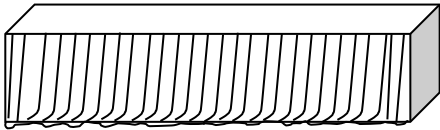
Explanation of Plasma Cutting Functions and Terms

What kind of dross am I seeing?

Dross identification can help you determine what is wrong with your cuts. Use the guide below to help you improve your cut quality.

RESULTS OF CUT AT CORRECT SPEED,
AIR PRESSURE AND TORCH ANGLE

SMOOTH, EVEN CUT LINES WITH A REARWARD SWEEP



MINIMAL EASY TO CLEAN DROSS

RESULTS OF CUT AT SLOW SPEED

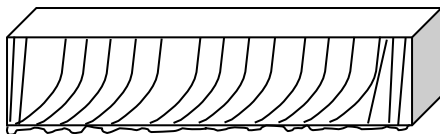
VERTICAL CUT LINES



SIGNIFICANT SOFT, POROUS DROSS

RESULTS OF CUT AT FAST SPEED

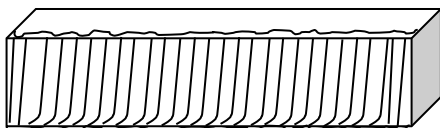
ROUGH, DISTINCT CUT LINES SPACED FAR APART



NOTICEABLE SMALL, HARD DROSS

RESULTS OF TOO MUCH STANDOFF OR
WORN CONSUMABLES

TOP DROSS, SLIGHT BEVELING AT TOP



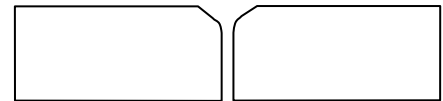
What other problems am I like to encounter?

Frequently, more than one problem may exist. Closely evaluating all issues can help narrow down cutting problems. Examine the cut for these additional issues to help you track down cut problems.

RESULTS OF TOO MUCH CURRENT OR TOO MUCH
STAND OFF HEIGHT

(END VIEW)

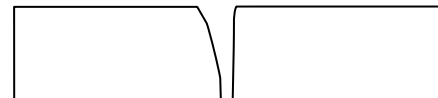
MELTED TOP EDGE



RESULTS OF WORN CONSUMABLE OR LOW AIR
PRESSURE OR OUT OF SQUARE TORCH

(END VIEW)

SEVERELY ANGLED CUT AT TOP



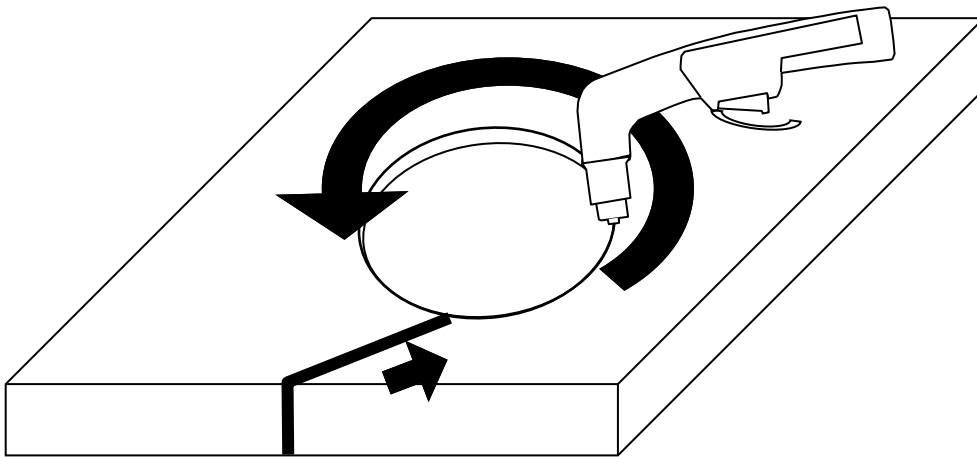
Component Identification and Explanation

Explanation of Plasma Cutting Functions and Terms

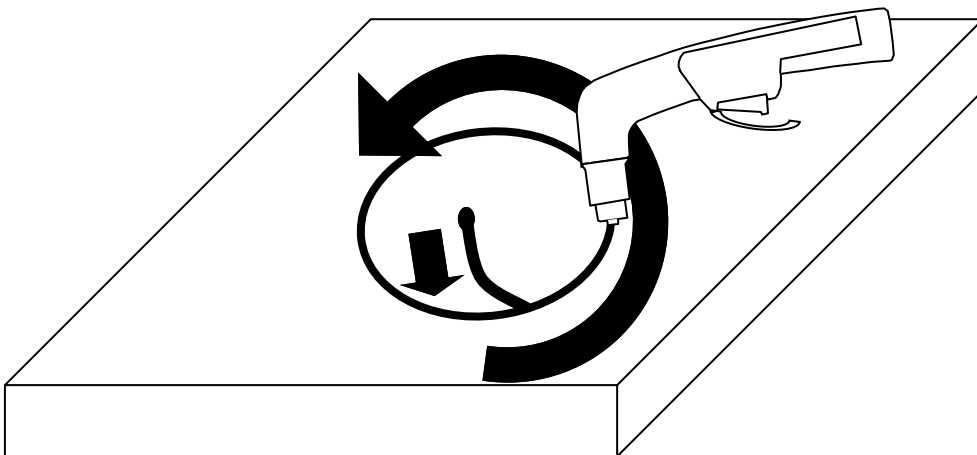
How Do I Use a Lead-in?

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

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



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

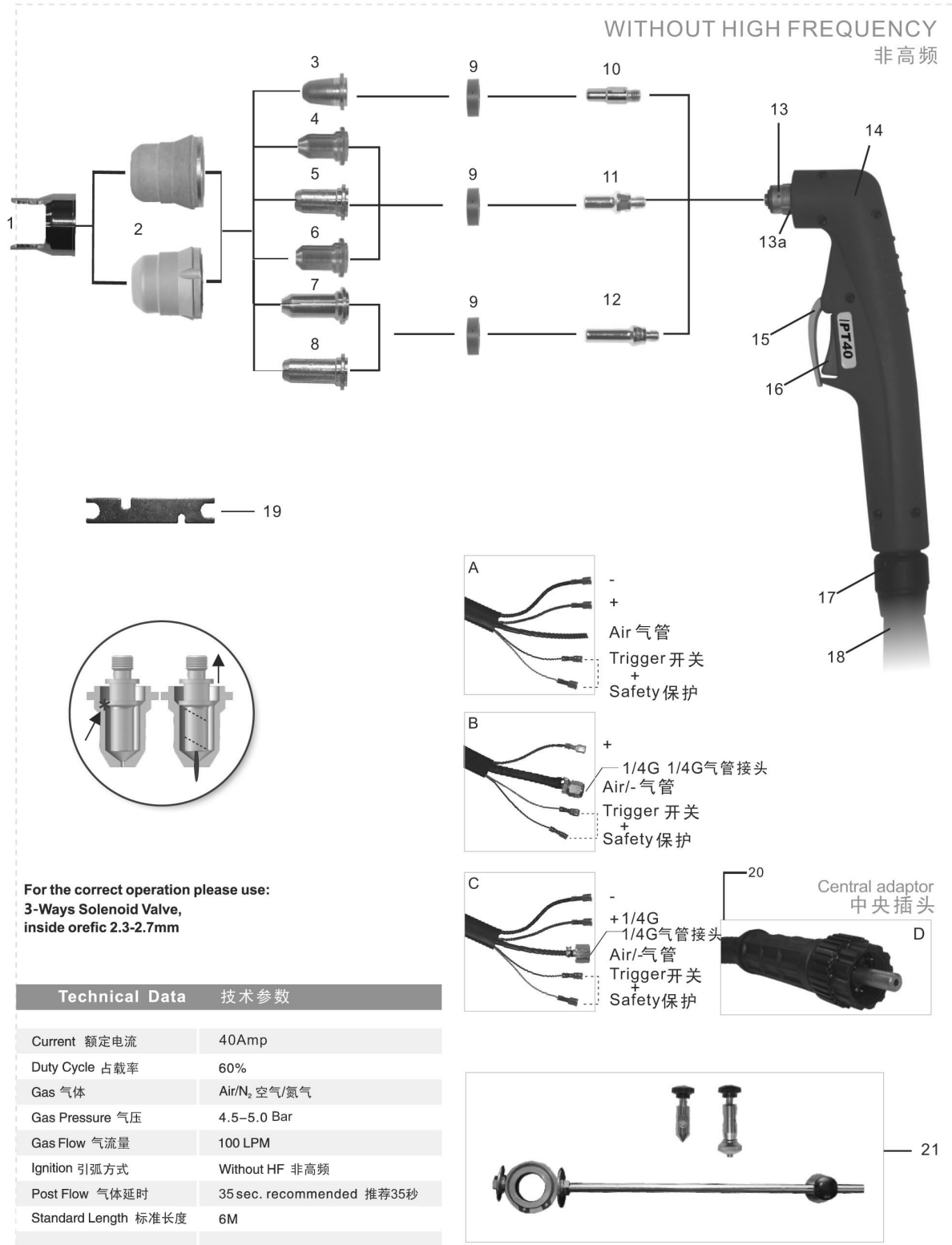


What is Kerf?

When you make a cut, a certain amount of material is removed from the cut. This is known as the kerf. In plasma cutting, knowing the width of the kerf is important to making accurate cuts. A typical kerf width from a plasma cutter will range from .045" to .090". The actual width of the kerf is affected by the orifice diameter in the consumable tip and by the cut height of the torch, and to some extent the thickness of the metal. Of course the best way to determine kerf width is to make a test cut and measure it. But if you are trying to achieve a narrow kerf width in thick plate metal, you will be limited by the fact that you will need a larger orifice to support the greater amperage needed to make a clean cut. Of course, you should always match the Amperage range to the orifice diameter. Lowering Amperage too low with a large consumable will result in arc instability and spattering. A higher amperage consumable has a wider orifice width to support the increase in the Amperage. If the consumable size isn't increased, the higher Amperage arc will quickly "blow" its way to a wider orifice, which will lead to instability in the arc and a decrease in cut capacity since the hole is usually oblong instead of round at that point. Going with a larger diameter orifice on sheet metal means that while the cut can be performed more quickly, the kerf tolerance must be increased and figured into the cut plans. Cutting too slowly with a larger diameter consumable on thin metals will possibly yield an irregular kerf width, and "melt back", where the metal and the dross melt back and close over the area just cut. If you have no choice but to cut thin material with a wider consumable, use slightly lower air pressure. However, this will reduce the quality of the cut and will make more beveled cuts.

Component Identification and Explanation

iPT 40 Innotec Plasma Torch



Component Identification and Explanation

iPT 40 Innotec Plasma Torch

Position	Code	Ref	Description
1	ISM0098		Double pointed spacer/PT60;两点支架/IPT60
2			Outside nozzle;外喷嘴
2.1	IVS0661	PC0116	Outside nozzle 6 holes;外喷嘴/6孔
2.2	IVS0663		Outside nozzle 6 holes/maximum life;外喷嘴/6孔/长寿命
3			Tip;喷嘴
3.1	IVU0661-06	PD0116-06	Tip Φ 0.6mm/10-20A IPT25-40;电极喷嘴 Φ 0.6mm/IPT25-40/10-20A
3.2	IVU0661-08	PD0116-08	Tip Φ 0.8mm/20-30A IPT25-40;电极喷嘴 Φ 0.8mm/IPT25-40/20-30A
3.3	IVU0661-09	PD0116-09	Tip Φ 0.9mm/30-40A IPT25-40;电极喷嘴 Φ 0.9mm/IPT25-40/30-40A
4			Tip;喷嘴
4.1	IVU0660-06		Tip Φ 0.6mm/10-20A/back striking;电极喷嘴 Φ 0.6mm/10-20A/后引弧
4.2	IVU0660-08		Tip Φ 0.8mm/20-30A/back striking;电极喷嘴 Φ 0.8mm/20-30A/后引弧
4.3	IVU0660-09		Tip Φ 0.9mm/30-40A/back striking;电极喷嘴 Φ 0.9mm/30-40A/后引弧
4.4	IVU0660-10		Tip Φ 1.0mm/40-50A/back striking;电极喷嘴 Φ 1.0mm/40-50A/后引弧
5	IVU0667-09		Tip Φ 0.9mm/IPT40 /back striking;电极喷嘴 Φ 0.9mm/IPT40/后引弧
6			Tip;喷嘴
6.1	IVU0668-09		Flat tip Φ 0.9mm/30-40A /back striking;扁平电极喷嘴 Φ 0.9mm/30-40A/后引弧
6.2	IVU0668-10		Flat tip Φ 1.0mm/40-50A /back striking;扁平电极喷嘴 Φ 1.0mm/40-50A/后引弧
7			Tip;喷嘴
7.1	IVU0609-06		Extended tip Φ 0.6mm/10-20A/back striking;加长电极喷嘴 Φ 0.6mm/10-20A/后引弧
7.2	IVU0609-08		Extended tip Φ 0.8mm/20-30A/back striking;加长电极喷嘴 Φ 0.8mm/20-30A/后引弧
8	IVU0603-09		Extended tip Φ 0.9mm/30-40A/back striking;加长电极喷嘴 Φ 0.9mm/30-40A/后引弧
9	IVF0601	PE0106	Diffuser IPT25-40;分流器 IPT25-60
10	IVB0660	PR0110	Electrode Plasma IPT25-60;等离子电极 IPT25-60
11	IVB0048		Electrode Plasma IPT25-60 back striking;等离子电极 IPT25-60/后引弧
12	IVB0049		Extended electrode Plasma IPT25-60 back striking;加长等离子电极 IPT25-60/后引弧
13	IVZ0672		Plasma torch head IPT40;等离子枪头 IPT40
13a	IFT0709		"O"ring Φ 15x Φ 18mm;O型圈 Φ 15x Φ 18mm
14	IGV0038		Plasma handle manual/IPT20-60/Red;等离子手工手柄/IPT20-60/红色
15	IHJ0722		Protection part/Plasma/Yellow;开关保护档片/等离子用/黄色
16	IHQ0070	185.0031	Trigger;开关
17	IHJ0898		Joint/small/new type;球节套件/小/新式
18			Cable assembly;电缆组
18.1	IVN0725		Cable assembly IPT40/4m direct;电缆组/IPT40/4m/直接连接
18.2	IVN0729		Cable assembly IPT40/4m 1/4G;电缆组/IPT40/4m 1/4G
18.3	IVN0726		Cable assembly IPT40/6m 1/4G;电缆组/IPT40/6m 1/4G
18.4	IVN0727		Cable assembly IPT40/4m seperated;电缆组/IPT40/4m/气电分离
18.5	IVN0720		Cable assembly/IPT40/6m central adaptor;电缆组/IPT40/6m/中央插头
19	ICG6006		Spanner for Plasma;等离子枪扳手
20	IZX0078	FY0023	Central adaptor torch side Plasma 5 pins;等离子中央插头/5针
21	ISM0707		Circle cutting attachment;圆周切割附件

Component Identification and Explanation

Additional Plasma Torch Information

Can I change my torch to another brand?

These units have been specifically programmed and designed for use with the blow-back design of the Innotec iPTM or a similar name brand PTM series torches. Changing out to other brands to "hybridize" the unit is not recommended and may result in damage to the machine. Some brands use a higher arc voltage, and this is controlled by the torch's internal design and tolerances. These torches may work for a while, and offer the added convenience of cheaper bulk consumables, but will eventually damage the machine by forcing it to generate a higher arc voltage than it was designed for at any given amperage. It can also theoretically affect duty cycle ratings. If you desire to use another torch with this machine, consult with Everlast before changing. There are some appropriate options.

Why is my torch pilot arc sputtering or going on and off when I pull the trigger.

Pilot arc sputtering is often caused by several factors. The first, air pressure is too low. The second is that it may be too high. However, the third reason, and likely the most common reason is that the consumable size has not been matched with the Amperage setting of the machine. The unit is shipped with consumable sizes designed to be used at or near the maximum output of the machine. When you lower the amperage, the arc is simply being blown out or destabilized. Think of a small garden hose you may use outside your house. Then think of (if it were possible) connecting a fire hose to the same faucet and how weak and unstable the stream would be. Water and electricity do share similar characteristics. Use the torch page for your cutter to identify the proper size and type of consumable for your application.

How do I set my plasma cutter for hand cutting?

Hand cutting is easy to learn and set. The maximum Amperage setting of your unit will cut even the thinnest pieces and do it well. However, there are two issues concerning this. You may have to move extremely fast, or dross will build up or the metal may weld itself back together. And, you may have a wider kerf than is desired. In order to avoid this, and get the most out of your unit, use the following guide to set your amperage, and to get your machine setup correctly. Be sure to then match the consumable size to the amperage being used.

- Keep your standoff to **less** than 1/8" distance from the work piece.
- Always use dry air. Drain compressor daily to improve effectiveness of air dryers and to prevent them from prematurely failing.
- Make sure work clamp is attached directly to the part being cut. Make sure the work clamp is attached to freshly cleaned metal.
- Don't greatly lower air pressure to try to reduce kerf or cut thinner material. Always reduce nozzle orifice size to match amperage. *See Torch pages for different consumable sizes.*
- Use this as a general rule of thumb for good hand cutting speed and quality:
 1. For the first 1/8" of thickness, use 20 amps.
 2. After the first 1/8" add 10 amps for every 1/8" after that.
 3. For Stainless and Aluminum, use settings that are 40% higher.

Troubleshooting

Error Codes

TROUBLE CODE WITH WARNING LIGHT/UNIT STOPS WELDING BUT IS TURNED ON.	DIAGNOSIS
E01	OVER TEMPERATURE/ DUTY CYCLE EXCEEDED. Allow unit to rest for 15 minutes while running. The unit should reset. If it does not or condition reoccurs, check for obstacles near unit blocking cooling. Then clean unit internals paying close attention to boards and heat sinks. Make sure unit is unplugged for 10 minutes before opening up for cleaning.
E02	OVER OR UNDER CURRENT. Check power input cable for length/size, check input voltage. Running on poor quality power supply or dirty power from generator. Possible Internal Issue.
E05	TORCH SWITCH IS STUCK CLOSED. This simply means that the arc has been trying to start and for too long. If this does not clear after releasing the switch, turn off unit immediately and check torch switch for stuck contact. If the pilot arc is engaged without attempting to cut for more than 3 seconds this will activate.
E06	AIR PRESSURE TOO LOW OR NOT CONNECTED. Increase air pressure to normal operating air pressure of 65 to 72 PSI. Air pressure safety cut out will engage around 45PSI.
OTHER	CONTACT EVERLAST

Troubleshooting

Common MIG/Flux Core Issues

NO.	Trouble	Possible Cause	Solution
1.	Unit is switched on, but the power light isn't on.	Switch damaged. Service Breaker/ Input Line Damaged	Check. Replace.
2.	After welding machine is overheating and the fan does not work.	Fan damaged. Fan connector plus is loose	Replace. Check. Reinstall.
4.	Intermittent, wandering arc.	Work Clamp not connected directly to part being welded. Work Clamp worn/damaged Torch height too high.	Reconnect. Replace. Reduce MIG torch height to under 3/8".
5.	Porosity of the Weld. Discolored weld color. Tungsten is discolored.	Low flow rate of shielding gas. High flow rate of shielding gas. Possible gas leaks internally or externally due to loose fittings. Base metal is contaminated with dirt or grease.	Increase flow rate on regulator. Check for kinks in tubing. Increase post-flow time. Reduce stick-out to less than 1/4". Increase gas nozzle size. Clean metal thoroughly with approved metal cleaner, or use acetone and a rag to clean metal.
6.	Weld quality is poor. Weld is dirty/oxidized, or porous.	Drafty conditions. The welder is located on the workpiece and is blowing gas off due to fan activity. Solenoid is sticking. For Flux Core, a certain amount of spatter, haze and smoke is common.	Eliminate drafts. Move welder. 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. Increase pre flow or post flow. Check polarity is correct for either MIG or Flux-Core, especially after changing between processes.
7.	Unstable Arc. Spatter.	Bad work clamp connection. Metal is indirectly connected through table or other item. Incorrect settings	Change Work Clamp. Use a direct connection to the part being welded. Check and adjust settings. Spatter usually increases when smaller wires are at the maximum welding capacity.
8.	Continuous Overheating	Settings too high. Too large of wire for job. Fan not running.	Reduce Settings, use smaller wire Check fan, repair or replace if not running or running at low speed. If it is not running correctly (fan should run continuously) contact Everlast.
9.	Other.		Contact Everlast.

Troubleshooting

Common Plasma Cutting Issues

NO.	TROUBLE:	CAUSE/SOLUTION
1.	Air flows but arc does not start within 2-3 seconds.	Check consumables for wear and tightness. Check fuse. Check Air Pressure. Sticky or slow spring/piston on torch blow back mechanism. Release trigger and try again.
2.	Air flows but pilot arc does not start or spark but arc starts when nozzle is rubbed on the metal.	Fuse blown. Replace with 30 A automotive type, slow blow. PCB issue.
3.	Will not start arc.	Air Pressure too low or too high. Torch electrode/blow back mechanism stuck in rear position (Clean and relubricate or replace head). Missing Swirl Ring (usually happens after consumable change).
4.	Pilot arc will not light. Arc will start when torch is drug on the metal. Pilot arc will not transfer and amps read approximately 25-27 amps while switch is held. (Arc barely cuts or only "scratches" the surface of the metal or cut is extremely slow on thin materials.)	Possible missing swirl ring. Pilot Arc wire is disconnected. Check work clamp connection. Make sure rust is removed from work clamp contact area. Faulty Clamp. Arc continuity is not being sensed. If these steps do not correct the issue, contact Everlast.
5.	Arc Sputters.	Inadequate air flow or air pressure. Improperly sized nozzle. Change to nozzle/Tip with smaller diameter orifice as amps are lowered. Readjust air pressure. Loose consumables. Check tightness. Worn Consumables
6.	Consumables are dirty, smutty looking upon inspection. Premature wear on consumables. Shortened consumable life. Tips are melted looking.	Moisture, oil contamination of consumable. Wrong consumables. Poor quality aftermarket consumables. Drag cutting with wrong consumables. Wrong cutting technique.
7.	Premature wear on consumables. Short consumable life. Uneven wear of consumables, melting of cup.	Moisture, oil contamination of consumable. Excessive pilot arc time. Improper cutting technique. Wrong piercing technique.
8.	Arc will not start with pilot arc or by drag/scratch starting nozzle directly on metal. Machine runs.	Torch cup is loose, safety contact pins dirty or not making contact with cup face. Torch switch wire is loose. Problem with Central connector. Torch is not properly connected. IGBT or PCB bad, contact Everlast.
9.	Over current/Duty cycle Error Code. 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 and remove excess/undersized extension cords. Operated on "dirty power" generator and unit has failed.
10.	Unstable arc at lower amps.	Nozzle orifice size is too large. Use nozzle with smaller orifice. Air pressure too high or too low. Poor work clamp connection.
11.	Arc tries to start but irregular, dancing arc and/or arc melts through side of nozzle.	Missing swirl ring, or worn electrode or both. Check and replace. Make sure swirl ring is not cracked.
12.	Arc will try to start if touched to the metal, but no air flow while switch is pressed.	Stuck or dirty solenoid valve. Loose solenoid wire connection. Bad PCB. Contact Everlast.
13.	Air flows continuously. Erratic or unpredictable shutting off of air after post flow time has expired.	Place switch into "normal" or "cut" mode. Reduce post flow time. Solenoid is stuck. Contact Everlast.
14.	Excessively Beveled Cut.	Worn consumables, too high of stand-off height.
15.	Cup and/or nozzle is melting or cracking.	Improper cutting technique/excessive piercing.
16.	Power input circuit breaker trips repeatedly.	Improperly sized circuit. Internal issue. Contact Everlast.
16.	Arc "Blows Out" when ready to cut.	Too high of air pressure. Wrong size consumable for amperage being used.

