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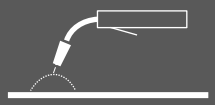
EVSTORM215c Rev. 2
USA/North America



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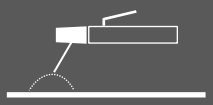

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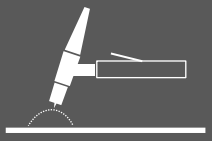

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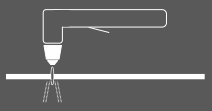


DC 40A

EVERLAST
WELDING AND CUTTING SYSTEMS

Storm 215c

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

FUNCTION: **MIG/Stick/ DC Lift-TIG / Plasma Cutter**
PURCHASE DATE:
MODEL NAME:
SERIAL NUMBER:
OPTIONAL ACCESSORY SERIAL NUMBER:

120/240V

Operator's Manual

www.everlastwelders.com
Need Parts? Need Technical Help? Call: 1-877-755-9353
380 Swift Ave. Unit 12 South San Francisco, CA 94080, USA

EVERLAST
IGBT INVERTER TECHNOLOGY
Welders, Plasma Cutters, Multi-Process

TABLE OF CONTENTS

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 purpose 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!

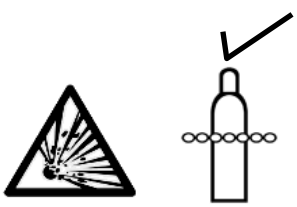
While accidents are never planned, preventing an accident requires careful planning. Stay alert!

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

	**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.
	**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.
	**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.
	**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.
	**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.
 	**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.

Specifications

NOTICE:

This manual has been written to guide the user in basic safe operation of the "Storm" series MIG/DC Lift TIG/Stick/Plasma units. It is not exhaustive in content and the user will need a certain amount of pre-existing welding and plasma cutting knowledge and experience to achieve proper results out of the box.

Beginners and untrained users should seek out educational resources to instruct on how to safely and properly use a welder or plasma cutter. Similar to other operator's manuals in other applications, (like a car operator's manual for comparison) this manual seeks to identify features and key functions found on this unit. This is not designed to train a new user or beginner how to weld or cut. It is not a welding manual. In short, this machine is designed for professional use. It has advanced features that trained/skilled professionals are expected to know how to use. The additional "how to" information and explanations found in this manual are intended to provide a common resource for baseline welding and cutting methods used in the industry. This additional "how to" information is useful for troubleshooting and highlighting the unique characteristics of this multi-process welder.

Due to Everlast's continual effort to improve and advance the design of the Storm series, specifications are subject to change without notice. Though new unit may appear visually to be the same as earlier production models, new units may have updated designs and programming improvements not found in earlier production models. This raises the question of upgradeability of older units to newer programming/features. While in some cases it is possible to update or upgrade a welder, it may not always be possible to do so. And even if it is possible to update an older machine with newer programming or features, it may not be updateable without returning the units for major service (at customer's expense).

Additionally, if an update of an older unit is ruled to be possible, it is not considered to be a part of warranty *unless* it is an update that is designed to address and to correct a critical malfunction of the welder. The cost of such an optional update is to be paid for fully by the customer.

In many simple update cases, a small specially designed reprograming machine is used to flash and update the software. If a customer elects to update a machine by him/herself and it is possible, a flasher may be sent direct to the customer. In such a case, whether it is for warranty or not, Everlast may require a refundable deposit be paid to ensure the quick return the reprogramming machine. Everlast cannot guarantee that an optional update will not change or alter any status of the machine that was previously awarded by a certifying agency.

Regardless, of circumstance cited, Everlast holds no obligation and offers no promise, guaranty or any form of assurance to the customer or user to update older units to newer or current programming, features, accessories or styles found on subsequent model updates and releases, except those deemed by Everlast to be warrantable items related to welder malfunction or inadequate performance.

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

Minimum Required Surge Watt Rating: 9500W
Required THD Rating: 5% or less

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.*

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. *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.

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. Some generators can back feed onto the ground during shutdown.

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 manufacturer's 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 Information

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

What is Duty Cycle?

Duty Cycle is simply the amount of time out of a 10 minute period in which the unit can operate (weld or cut) without overheating. For example, this unit has a duty cycle of 35% at maximum rated Amperage/Voltage output for all processes on 240V. This means that the unit can be operated for 3.5 minutes out of 10 minutes. Operation 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 of whether it is continuous, or intermittent use, 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 welder. 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 continuous 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.

Intentionally or repeatedly triggering 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.

Continuous Fan Information.

This multi-process welder's fan runs continuously. It does not have a type of fan that comes on as demanded or one that is temperature controlled. The fan's continuous output at full speed helps maintain maximum duty cycle. This type fan system is a traditional one, which helps maintain a cooler over-all temperature and maintain maximum cooling and prevents temperatures from reaching preset trigger thresholds that are set for demand type cooling systems. This improves the life span of the unit. Do not attempt to modify this unit to control fan behavior. Doing so will void the warranty.

Specifications

Breaker Sizing and Wiring Requirement Information.

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.

Possible Interference From HF Energy From This Unit with Other Electronics.

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: Gas Shielded Flux-Cored Operation (FCAW-G)

This unit does not have a dedicated gas-shielded flux-cored setting since this type of welding is usually done with larger welders with more power. Using this unit with Gas-Shielded Flux-Cored Wire may overheat or damage the machine. This type of flux-cored welding will cause higher voltages than the machine is calibrated for in standard MIG mode and the output will be higher than what is set on the machine while welding This will reduce the rated duty cycle and may cause. Welding with Gas-Shielded Flux Core is not recommended and will void the warranty.

NOTICE: E6010 Use For Open Root Welding.

This unit is designed to operate with most welding rods including E6010. However, open root E6010 operation may induce some arc outages or inconsistent behavior as the arc seeks to find the shortest circuit path or the unit senses the arc has grown too long and shuts output to prevent the machine from exceeding internal component ratings. This issue can often be relieved by closing up the gap, dragging the rod in the root or using a larger rod. A whipping motion that lengthens the arc too long will result in the arc snuffing. This issue is best resolved by switching to E6011, which is similar to E6010, but has more arc stabilizing properties in the flux. While there is a small difference in penetration, the performance is usually acceptable and will provide a more sustainable arc.

NOTICE: DC Lift-Arc type of Starting and Basic Operation.

The TIG function of this welder only provides DC output. The form of DC TIG found on this unit uses a lift start function to start the arc. This form of Lift Start is considered a live lift, which means the Tungsten always is engergized while in TIG mode. Touching down on the metal and lifting up starts the arc.. There is no remote switch or foot pedal to modulate Amperage. The Amperage is preset on the panel and cannot be adjusted while welding. DC TIG is not meant to be used for Aluminum or Magnesium welding. Additionally, the TIG torch is optional and requires a gas valve TIG torch as the unit does not have an automatic gas solenoid to control gas flow on and off. The gas line is connected directly to the gas cylinder in this configuration. The lift-arc starting and the gas valve torch are typically used for field work on pipe or structural weldments. This style of welding is good for long seems, where amperage control is accomplished mostly by technique. When Amperage is only set on the panel, constant adjustment of Amperage real time isn't possible, so a variety of heat control techniques must be employed to achieve best results. This includes varying travel speed, using the timing of the "dab" into the puddle to absorb heat, controlling arc length distance, and manipulating the torch to control the heat and puddle.

Specifications

CAUTION! Monitor, Use and Set the Plasma Cutter Air Pressure Correctly or Damage May Occur.

The plasma cutter function on this unit is fairly simple to operate, but several things need to be kept in mind.

First, the air pressure supplied to the rear of the plasma cutter should not exceed 100PSI. Operating pressure while cutting should not exceed 72 PSI, and no lower than 65 PSI should be used to cut.

Second, the plasma cutter function will immediately signal an error when the plasma process is selected if:

1) The air is not connected to the unit when the plasma process is connected. Connect the air supply and set the tank pressure at no more than 100PSI. (Max supply recommended is 90PSI.)

2) The air pressure is set too high or too low for operation at the plasma regulator or at the air compressor itself. If low air pressure is suspected, check the air compressor and make sure it is turned on and putting out correct pressure. If correct, pull up slightly on the regulator knob until it clicks and slowly increase air pressure until the warning disappears.

Third, if the air pressure is dropping more than 5 PSI when the trigger is pulled, or it drops out of the safe range after triggering the plasma and and an error code is displayed, then the air supply line is too long or too small for the length or both. Increase the air line (1/2" or 5/8" air hose/line) to the welder or shorten the existing distance between the air compressor and the welder. Never attempt to compensate for a large discrepancy between static air pressure and cutting air pressure by increasing the supply air pressure from the compressor beyond 100psi or plasma cutting air pressure more than 80 psi. Over pressurizing the internal air lines of the plasma cutter beyond 80 PSI may cause them to swell, leak or burst. This is not covered under warranty.

WARNING! Do Not Use For Plasma Gouging or CNC/Automated Use.

This unit is not designed for Plasma Gouging or Plasma scarfing operations. It is not designed for CNC use or with any type of automated cutting equipment. Do not this unit for these applications. It is for hand cutting use only.

WARNING! Do Not Use For Carbon Arc Gouging or Cutting.

This unit is not designed for Carbon Arc Gouging or Cutting. This will overheat and damage the machine internal components. Do not use this unit to Carbon Arc Gouge or Cut. Carbon Arc Gouging or Carbon Arc Cutting use will void the warranty.

Specifications

DCStorm 215c Product Specifications	
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: 33A 240V: 33A
I1EFF Current Rating (Rated Amps)	120V: 20A 240V: 20A
OCV	70V MIG/ /DC Lift TIG/Stick; 280V Plasma
MIG Duty Cycle @ Maximum Output (Rated at 40° C/104° F) *	120V: 35% @ 125A/20.3V 240V: 35% @ 200A/24V
Stick Duty Cycle @ Maximum Output (Rated at 40° C/104° F)*	120V: 35% @ 100A/24V 240V: 35% @ 160A/26.4V
DC Lift Start TIG @ Maximum Output (Rated at 40°C/ 104° F)*	120V: 35% @ 125A/15V 240V: 35% @ 200A/28V
Plasma Duty Cycle @ Maximum Output (Rated at 40° C/104° F)*	120V: 60% @ 25A/ 90V 240V: 35% @ 40A/96V
MIG Output Range V/A (DC Output Only)	120V: 15.5-20.3V/ 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
TIG Output Range V/A (DC Output Only)	120V: 10.4-15V/ 10-125A 240V: 10.5-18V/10-200A
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 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
Spot/Stitch Timer	Yes
TIG Function	Live Lift DC TIG (No AC output. Not suitable for TIG Welding Aluminum)
Pre Flow Time	0-5 Seconds
Post Flow Time	0-15 Seconds
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	NORTH 24 KD 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

Setup Guide

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. 24 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.

INSPECT AND ASSEMBLE YOUR UNIT.

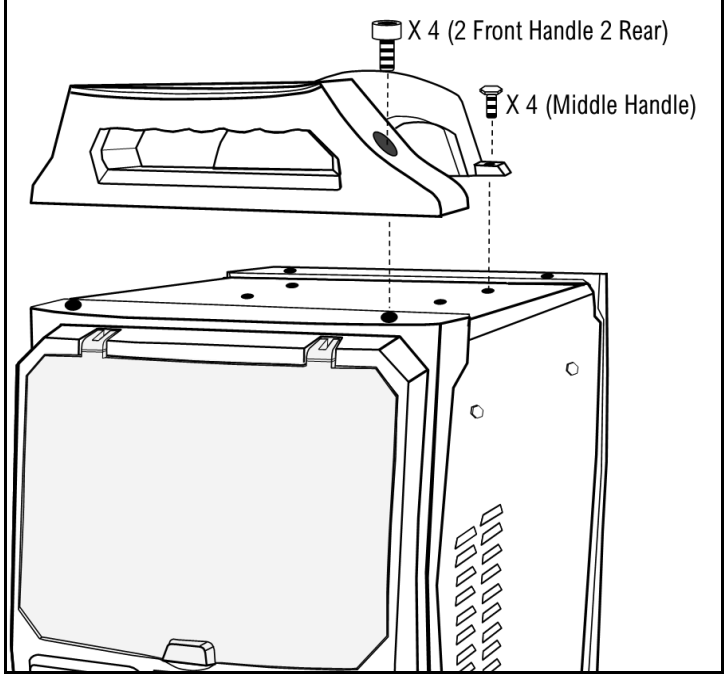
NOTICE:

This unit includes one additional MIG contact Tip (it may also include a tip for specialty wires) and no other consumables for MIG. Contact tips are available direct from Everlast, online from other sources and are also available locally for the 24 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. (This is only for customers in the USA.)

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.*

POWER UP AND TEST YOUR UNIT.

ASSEMBLE THE HANDLES



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 installed except for air compressor and air pressure. Allow the unit to idle for 15 minutes. Check and observe

Setup Guide

Getting Started

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).*

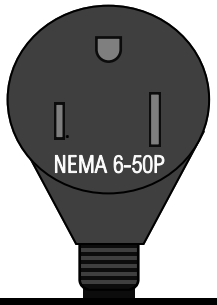
GIVE YOUR UNIT SOME SPACE TO COOL.

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.

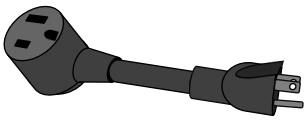
CONNECT YOUR UNIT TO POWER.

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, only after the power has been reconnected.

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 I_{1MAX} rating of this unit. This is the maximum inrush current of the unit. The inrush is not a sustained current. The I_{1EFF} 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.

Setup Guide

Getting Started

INSTALL THE AIR REGULATOR AND AIR COMPRESSOR.

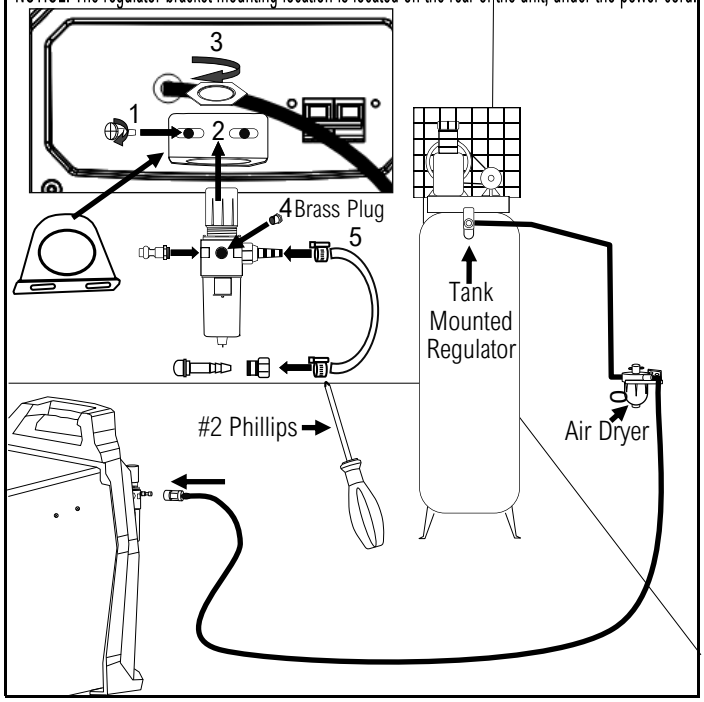
NOTE: *Connect the clear hose to the air inlet at the bottom rear and to the regulator. Use the couplings and hose clamps found in consumable/parts bag to connect the tubing to the regulator and fittings. If missing, contact Everlast. Make sure the air flow direction is correct according to the markings 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.**

CHECK FOR GAS AND AIR LEAKS.

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" or 5/8" supply may be required for long distances. The input side on the regulator is the standard industrial 1/4" quick connect fitting. A suitably sized compressor should follow size recommendations found in the product specification page. 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 the torch itself. 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. Alternatively a rolling stand-off may be purchased.*** *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 torches in the North American Markets.*

Setup Guide

Getting Started

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/CO_2 (75/25 or C25) or if not available 80/20 100% CO_2 (C100) may be used for a hotter short circuit gas. Spray Arc will require 90%/10% ArCo_2 in mixed gases mode

Stainless (Inox): 98%/2% Ar/CO_2 (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 CO_2 and a cleaner, less oxidized weld in general. 100% CO_2 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/CO_2 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). A TriMix blend of gas with helium will not harm the unit.

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.

The Spray-Arc capability of this unit is very limited and generally not recommended.

Always wear safety glasses when changing a cylinder. Before installing any cylinder, stand to the site 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.

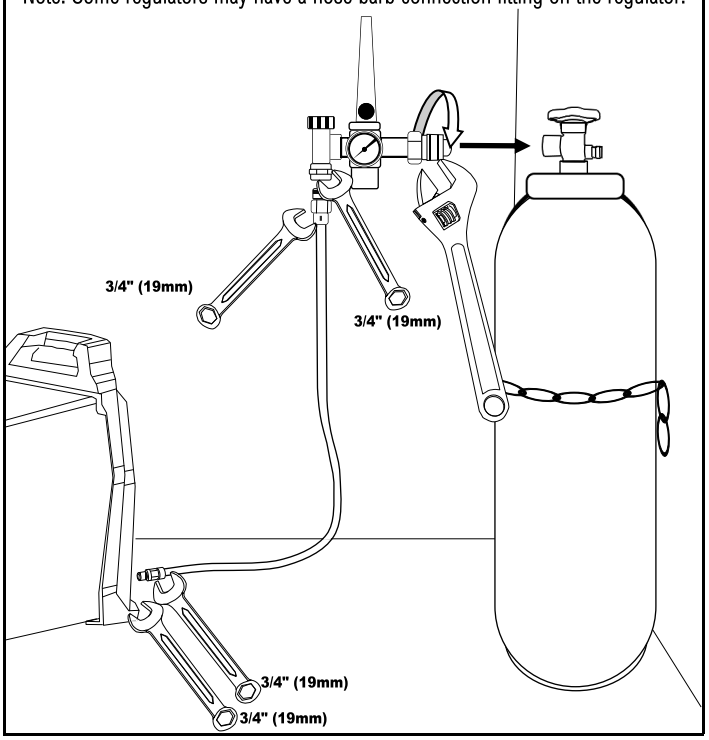
Important: Do not use thread tape or pipe sealant on any cylinder, regulator or unit connection. The residue and debris may get into the gas solenoid and cause operational issues.

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.



Setup Guide

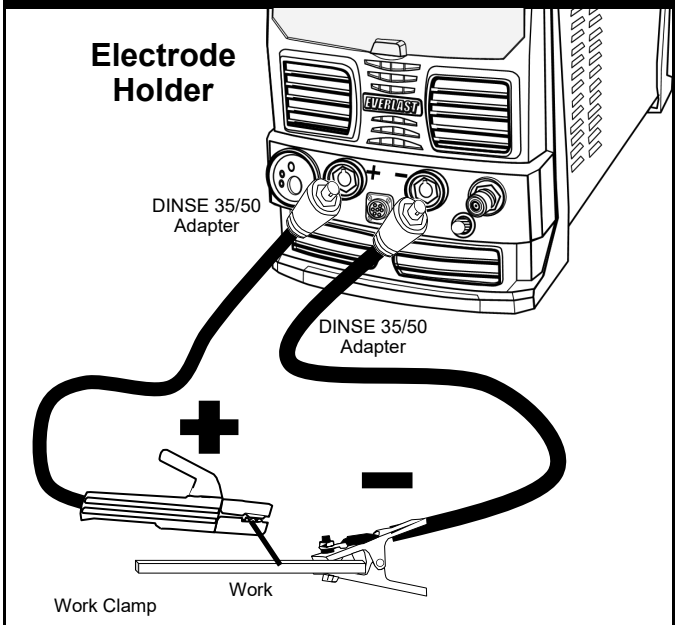
Getting Started

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.

Where Do I Connect The Stick Torch?



For most all applications, connect the electrode holder to the positive terminal. Connect the work clamp to the negative terminal.

case you forget, refer to the illustrations below.

WARNING!

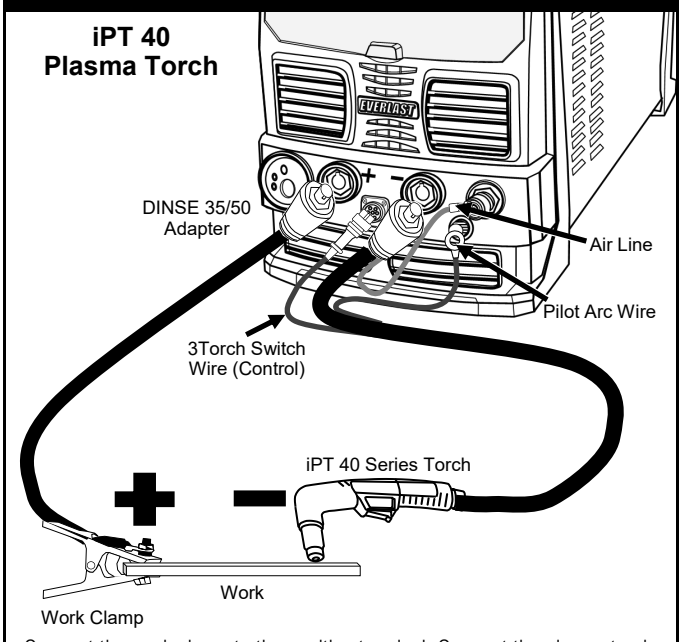
Make sure plasma torch polarity is correct or damage and malfunction of the torch and machine may result! Remove the torch before changing to another mode. Install the other torch *after* the mode is selected. **Do not attempt to weld or cut while the unit is in a mode that is not supported by the connected 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-arcing 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.

SELECT THE CORRECT STICK AND PLASMA POLARITY.

The on screen programming will remind you what polarity to use, but in

Where Do I Connect The Plasma Torch?



Connect the work clamp to the positive terminal. Connect the plasma torch to the negative terminal. Make sure the pilot arc wire is connected to the small thumbscrew and the air line is fully seated in the quick connector. The pilot arc wire is the "spare" red wire. Unscrew the thumbscrew and attach wire to the screw post and reinstall the thumb screw finger tight.

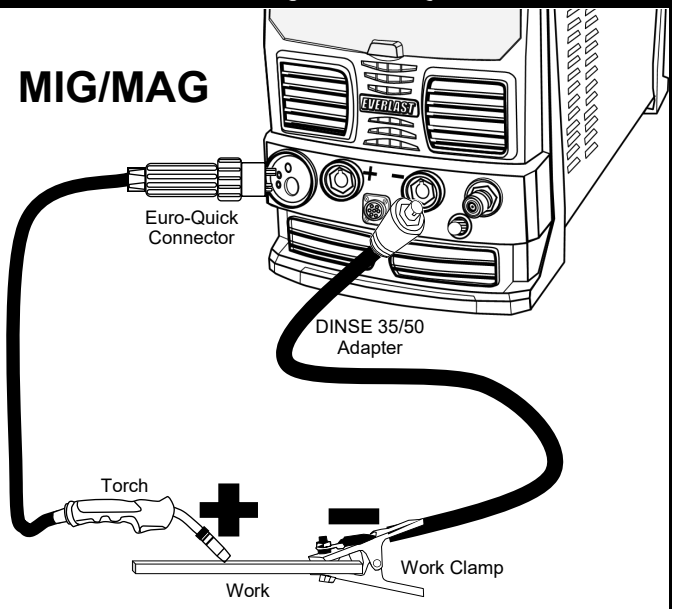
Setup Guide

Getting Started

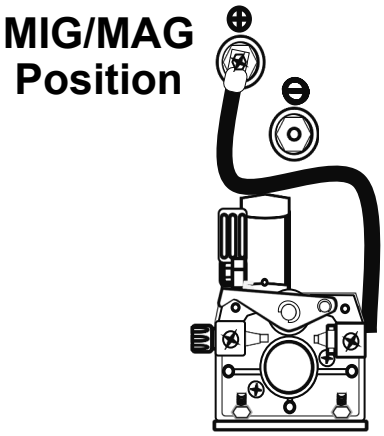
SELECT THE CORRECT MIG AND FLUX-CORED POLARITY.

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.

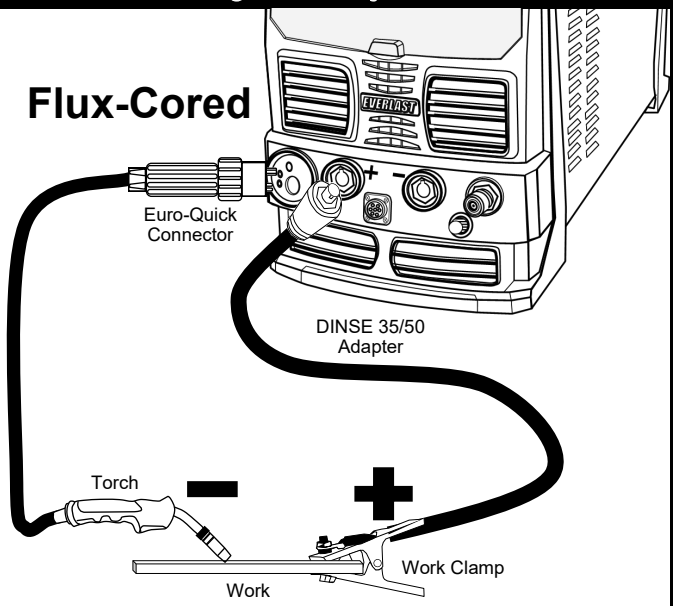
How Do I Change Polarity For MIG?



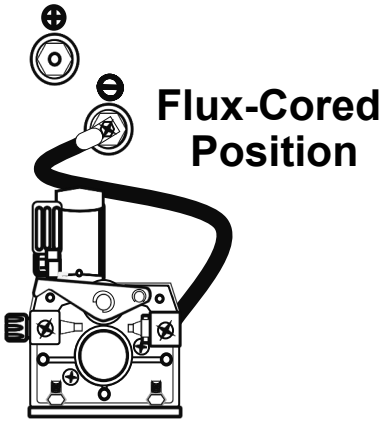
The MIG gun must also be correct in polarity. Drop open the cover on the left side of the MIG to access the wire spool and feeder. Just above the feeder, the are two terminal lugs. The upper terminal is positive, and the lower is negative polarity. If there are no positive (+) or negative (-) symbols, 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.



How Do I Change Polarity For 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, the 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.



NOTICE:

This unit is not designed for or intended to be used in gas shielded Flux-Cored operation (FCAW-G). The Flux-cored operation that this machine supports is a gasless process (FCAW). The PowerSet and manual function is only programmed for the processes listed on the front panel. Voltage readings will exceed the voltage selected on panel.

Setup Guide

Getting Started

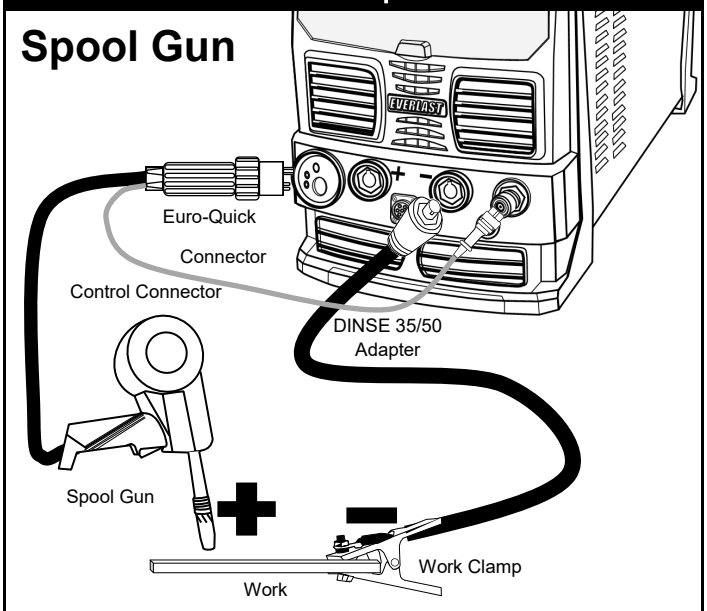
INSTALLING THE OPTIONAL SPOOL GUN.

A spool gun is usually reserved for Aluminum, though can also feed other types of metal wire. The picture below shows the proper configuration for solid wires, including Aluminum. The Spool Gun is connected directly to the unit in place of the standard MIG gun. Make sure that the torch setting on the unit's display is switched from STANDARD (Std.) to SPOOL to work correctly. Keep in mind that the spool gun controls the wire feed speed on this model of the welder. The knob or wheel on the spool gun controls the wire speed instead of the panel.

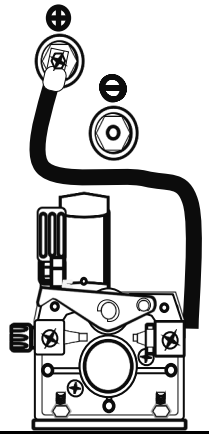
USING THE OPTIONAL GAS VALVE TIG TORCH.

Because this welder is a simple Live-Lift DC Lift TIG unit, it does not have a provision for remote control of Amperage like a foot pedal or other remote. It also does not use an internal gas solenoid valve to control the gas flow to the TIG torch. This is a rudimentary setup often called a "TIG-Rig" setup that is used in field production work such as pipe welding. The torch itself has a gas valve that can be manually opened or closed. The TIG shielding gas (100% Argon) connects directly to the gas cylinder and does not run through the unit.

Where Do I Install The Spool/Push Pull Gun?

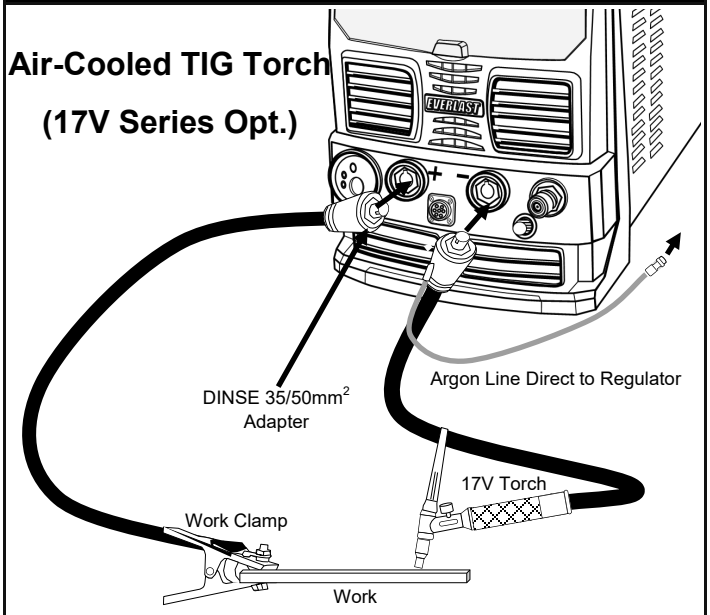


Spool/Push-Pull Gun Polarity



NOTICE: Spool guns and push-pull guns connect the same and use the same connections and polarity.

Where Do I Connect The TIG Torch?



WARNING! This unit features a Live Lift Start. This means the torch is always energized. Exercise extreme caution when laying the torch down. Accidental arc striking, burns or shock may occur if the torch is not handled properly. Keep the torch tungsten away from anything metal that is connected to the welder or the part being welded.

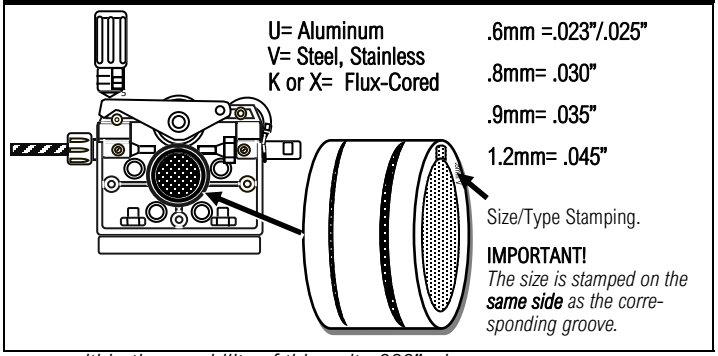
Setup Guide

Getting Started

CHECK AND CHANGE YOUR DRIVE ROLL.

The unit comes equipped with .030" and .035" drive rolls. Use the correct groove for the wire you are using. See below to see how to read and interpret the drive roll sizes and type.

Drive Roll Sizes and Location Information



ages 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 or poor operation may result from exceeding the physical limits of the wire to exhibit a stable arc. 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.

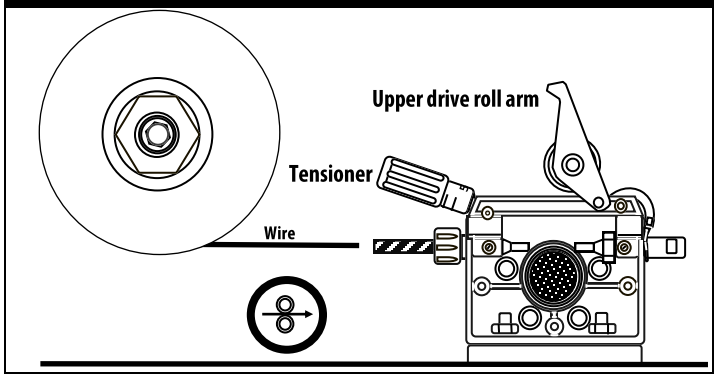
The top drive roll is actually an idler roll used to hold tension and keep the wire in the groove and is not changeable. Only the bottom drive roll needs to be changed. The bottom drive roll has two small grooves that are sized for .030" (.8mm) and .035" (.9mm) solid wire. Additional sizes and types 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.

INSTALL THE WIRE AND FEEDING WIRE INTO 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 a Spool of 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 job 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.

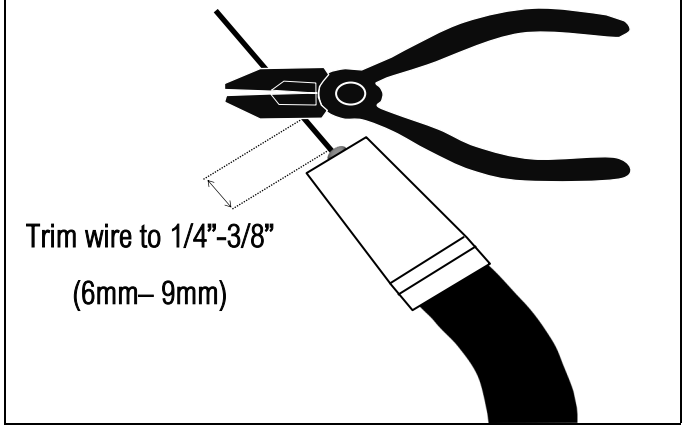
Setup Guide

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

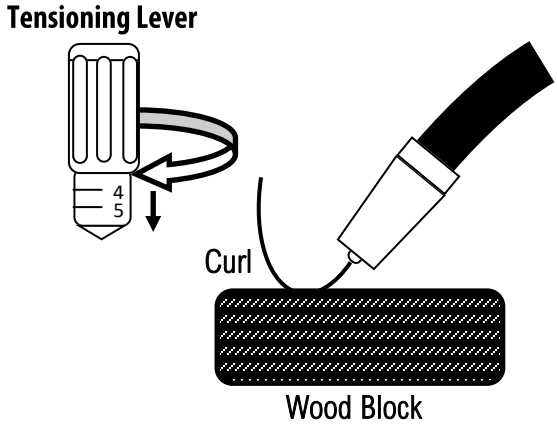


PROPERLY TENSION THE WIRE FEEDER.

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

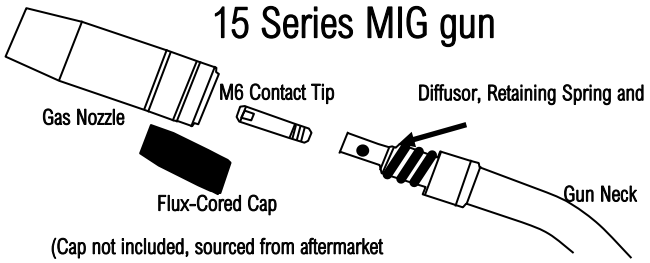


GUN SELECTION AND DISASSEMBLY.

The supplied MIG gun is the 24 series MIG gun to match the maximum output and duty cycle of the unit. However, the 15 series is a wise purchase consideration, for welding below 180 Amps or so.

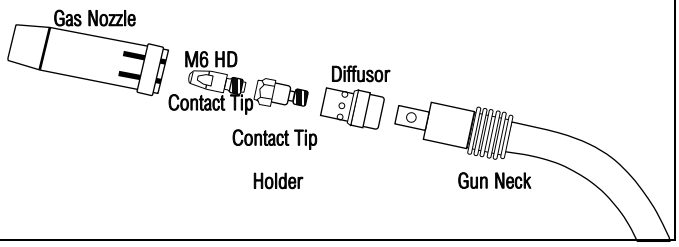
How Do I Disassemble the MIG Gun?

15 Series MIG gun



Always remove and install the 15 series gas nozzle by twisting clockwise.

24 Series MIG gun



Setup Guide

Getting Started

SELECTING A PROPER MIG WIRE SIZE AND TYPE.

As previously covered, this unit has been equipped with a 2 roll MIG wire feeder. While the welder's programming and design offers more than these two sizes and metals, this unit has shipped with a V groove drive roll that accommodates the two most common sizes of solid steel wires for this class of welder: .030 and .035" (.8 and .9). Smaller or larger drive rolls can be purchased as optional items.

To cover the entire range of wire sizes and metal types that the unit supports, the purchase of additional drive rolls, guns and or gun liners will be required. This unit provides a wide range of voltage and wire feed speed. That does not necessarily mean that the smallest wire can be forced to weld the thickest materials or that the largest gun and wire supplied is best for welding the thinnest metals with the thinnest wires. The following general recommendations are intended to help guide the user through the thought process of wire type and size selection. However, user knowledge and skill will ultimately determine what wire size choice is best to use and the appropriate settings to use.

For Steel/Stainless Wire (V groove):

040" (1.0mm) is the largest wire size recommended for this machine and is the largest size for steel allowed. This is because the maximum wire speed of this unit will not support the amperage output of the machine with larger wires. Even with .035", the wire speed will exceed the Amp output capability of this machine. The reason it is recommended is that the he short circuit limit of .035" wire is a little under 200A before it enters globular/ spray transfer mode. Keep in mind that .023-.025" (.6mm) wire is used for lighter gauge material but only offers about a 7 Amp advantage on the low end of settings over .030". It will also reach a useful service limit of about 90A. Feeding and results will become erratic at higher settings. .030" wire can service up to about 150A in short circuit transfer before it begins to enter globular transfer range.

Even though .023" Stainless wire is supported, it may not be available in all markets and will experience feeding difficulty in the standard gun. In this case the spool gun is the best option. Also even with .030" stainless wire there may also some difficulty feeding wire, especially with smaller 2 lb. rolls when used in the main feeder.

For Aluminum Wire (U groove drive roll required with polymer liner installed or use spool/push pull gun):

Even though smaller drive rolls exist, to achieve best results, .035" wire should be the smallest wire used with this unit (not to be used with 4043 due to the softness of the wire) in the main gun, although the wire speed will be nearly maxed out for most applications. .035" aluminum wire also provides a very narrow range of welding of 1/8" to 3/16".

For better results, .040" or .045" is recommended is used since it can weld a broader range of material from 1/8 to 1/4" and can also be used with 4043 wire. The optional spool and push pull guns are also equipped with either a .040" (1.0) or .045"/.047" /3/64" drive rolls, but smaller sized drive rolls are available as an option. Overall, MIG welding aluminum is not a delicate process and is typically recommended for use on 1/8" materials and thicker, though some success can be achieved in skilled hands down to 14 gauge with .030" wires used in a spool gun.

For Gasless Flux-Cored (Zippered, or serrated drive roll):

This unit is designed to support only gasless flux-cored use and should not be used with Dual-Shield, which is typically reserved for structural use and use din over 200A heavy applications for long periods of time. In general, no smaller than .035" flux-cored wire should be used. In general .045" wire is considered the best. Flux-Cored wire in general is a heavier penetrating wire and is not meant for light gauge work. Typically Flux-Cored wire is used on 14 gauge and heavier materials. Since the nature of Flux-Cored wire carries less amperage per inch of wire delivered to the weld puddle, a larger wire may be used to deliver lower amperage. However, even though available, smaller flux cored wires than recommended above suffer from weakness and the column strength of the wire is low and cannot feed longer distances. If considering using this unit for flux-cored use, to save money on shielding gas,

NOTICE: Although the maximum selectable size offered in the welder's programming for solid steel wires is .040" (1.0mm), for the US and North American market, it is recommended to use .035" (.9mm) as the maximum wire size for this unit for use solid steel wires. This is because .035" (.9mm) is the largest size commonly available for up to 200A welding range. Although technically available in North America, .040" (1.0mm) wire is more common in other regions of the world. For welding with Aluminum and gasless flux-cored wires larger size selections are available.

GUN AND LINER SELECTION.

This welder uses a common Euro Style Connection for the MIG gun. This allows any Everlast gun or any after market gun with the same connection to be connected to this unit. To match the 215A maximum output of this welder at the 35% duty cycle specified, this unit is equipped with a 24 series gun (some regions or versions may use the 15 series gun). This gun is a larger gun suitable for welding up to 250A. This gun is a medium sized gun suitable for all types of commercial fabrication and maintenance. However, if lighter work is required, such as welding body panels, the smaller 15 series gun is recommended as an optional purchase. It is smaller and is a good choice for welding up to 180A for longer periods of time and up to 200A for brief periods of time.

Because of the range of output of this welder, no single gun is ideal for every situation. Additionally each gun can be equipped with different sized liners to match the wire size used. The liners, both steel liners and polymer liners for aluminum, are color coded for wire diameter sizes:

Blue Liner: .023"-.035" (.6-.9mm)
Red Liner: .040"-.045/ .047/ 3/64" (1.0-1.2mm)
Yellow Liner: .045"-.062"/ 1/16" (1.2mm– 1.6mm)
NOTICE: Push-Pull Guns typically use special graphene type black/gra

Setup Guide

Getting Started

liners are sized for .045" and larger for Aluminum use.

It is also important to check and change the contact tips as well to match the wire diameter. In the case of Aluminum, order one size larger regular tips, or order special Aluminum tips that are slightly oversized. These tips will use the standard size, but typically are followed by an "A" to designate these are designed for use with Aluminum.

INSTALLING / REPLACING THE MIG LINER.

The liner of the gun is critical to proper wire feeding and welding performance. A liner is responsible for securely carrying the wire into the gun head from the machine connection. An undersized liner may be difficult to load or feed without bird nesting in the cabinet. An over sized liner will cause spatter and irregular behavior. While burn-back control can eliminate some of this excess wire , the best solution is to use the correct sized liner for the wire.

A steel liner should only be used with steel or stainless wire. If steel wire is used with a polymer liner, the liner will wear extremely fast. A polymer PTFE type liner or graphene type liner (or other similar smooth plastic type liner) should be used with Aluminum or soft natured wires. Liners designed for Steel use and Aluminum use look different but install the same way. Each must be cut to fit because they are always slightly longer than needed. This is done to custom fit liners in guns that may have stretched from use over time.

Liners do wear and are sometimes kinked from rolling or wrapping the gun cable too tight during storage or bending the gun in too tight of a radius at the base of the handle. More commonly, it can be caused running over or stepping on the gun cable. This will necessitate liner replacement. Also with an oversized liner, the wire may appear to jump or feed out extra wire after wire feeding is terminated. It can even cause bird nesting in the liner, making wire removal almost impossible. In this case, the liner will almost always need to be replaced due to the damage it causes as the wire is removed.

If a liner needs to be removed and it is difficult to remove this is almost always an indication of a damaged liner. Sometimes a damaged liner may also cause damage to the gun head or outer conduit when it is removed. If so, the whole gun may need to be replaced if the damage is severe enough. Usually this is not the case and a worn liner or a damaged liner can be replaced fairly quickly.

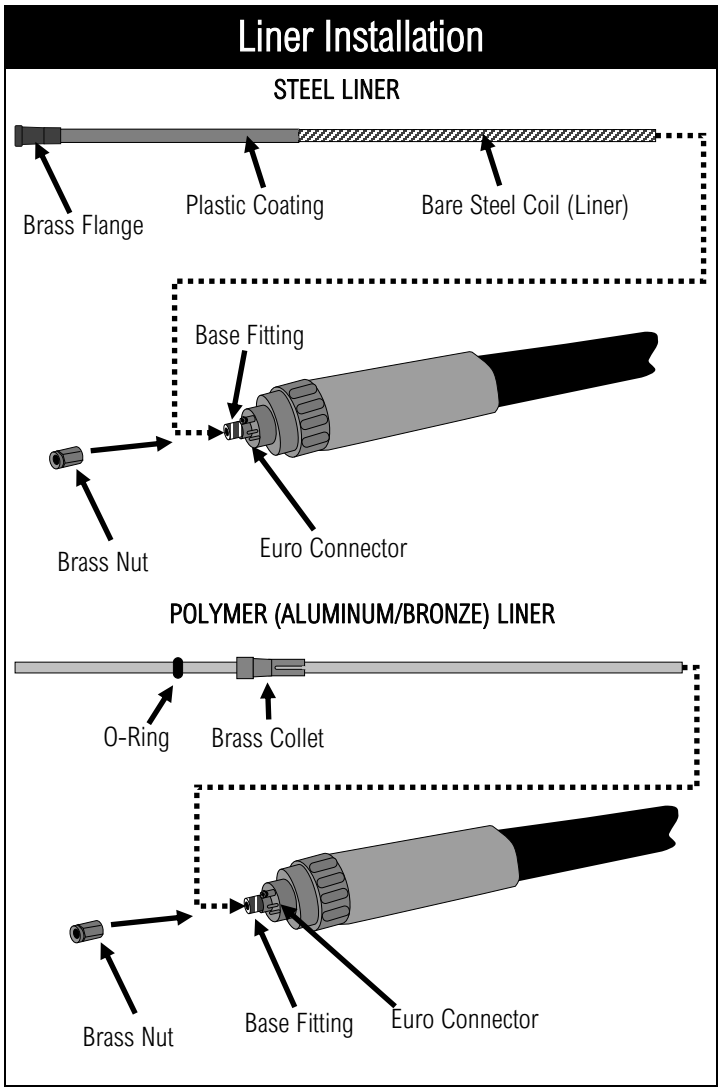
A damaged liner should be checked and replaced as soon as any damage is suspected.

A steel liner is a tightly coiled hardened wire similar to a lawn mower or automobile choke cable. The bottom half of the liner will be plasticized and color coded. The top part of the liner will typically be bare steel. The bottom of the liner will have a brass flange crimped to the liner.

The Aluminum liner will be smooth and will be composed of three pieces, the liner tube, brass collet and o-ring.

Both liners are installed from the rear of the gun and not from the top of the gun. See the information below.

IMPORTANT! Read these instructions carefully before attempting to remove the old liner or before trimming the new one. It is better to have to retrim a new liner than to cut too much off.



Steel Liner Removal and Installation.

1. Remove the brass nut from the base fitting on Euro Connector. Hold the base fitting while using a wrench to do this. Do not allow the base fitting to unscrew. If the fitting unscrews, it must be reinstalled before proceeding.
2. Grab the brass flange of the liner that was originally held in place by the brass nut. Pull on the flange to remove the old liner completely. Once removed, set aside. (If the liner is stuck, carefully work it back and forth, and twist slightly to remove. The liner can break or stretch if the liner is badly damaged inside the outer cable conduit.

Getting Started

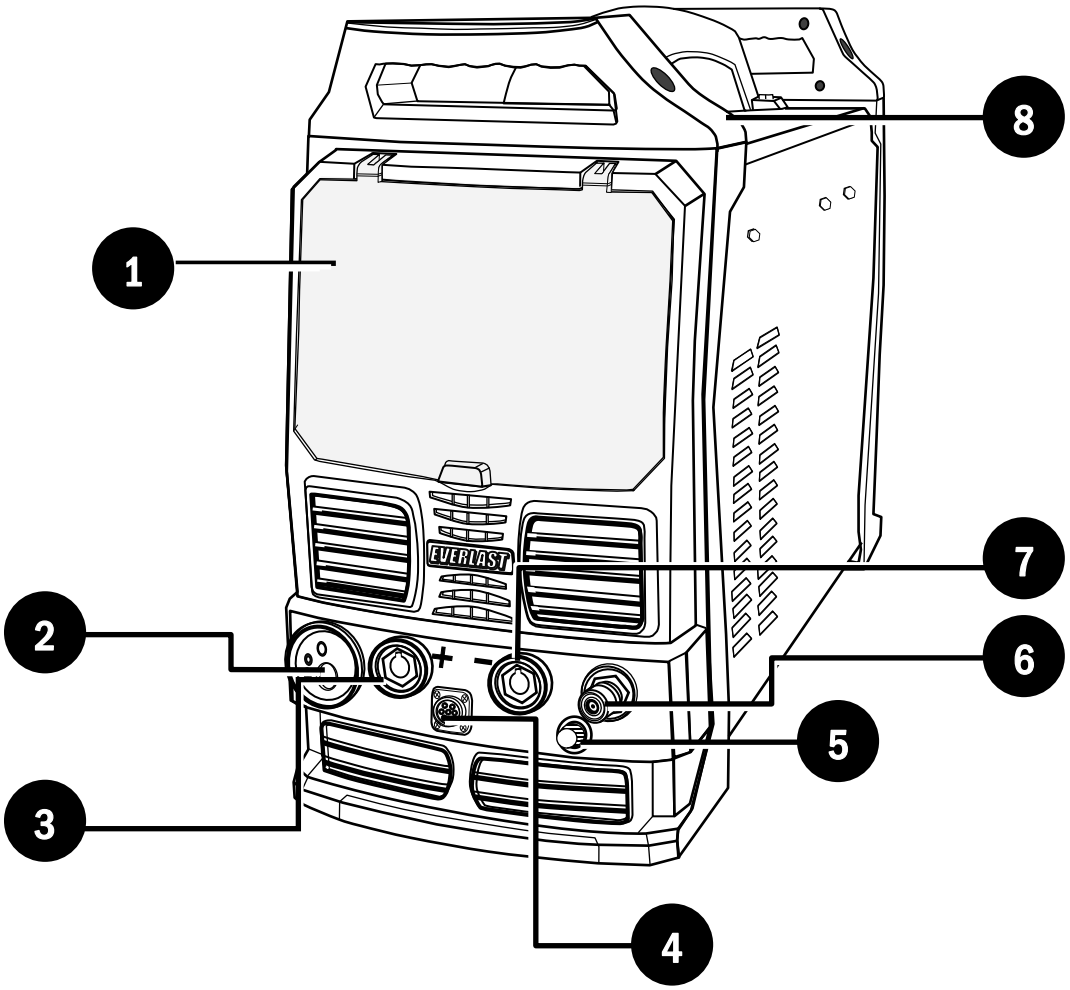
3. Make sure the gun and gun cable is held straight. Install the new liner as far as it will go. (Do not cut the liner yet.) Make sure the liner isinserted into the base of contact tip holder. Typically the liner will be visible with the contact tip holder installed. If the liner is not visible, remove the contact tip hold to check for visibility (some guns the contact tip hold is part of the gun neck and cannot be removed). If the liner is still not visible and/or does not appear to be inserted into the end of the contact tip holder manipulate the liner gently until it is visible and in position to mate with the contact tip holder once it is re -inserted. It may be necessary to move the gun handle around gently until the liner slides home.
4. With the liner inserted fully home, measure and record the distance from the top of the threaded base fitting to the flange (measure to the base fitting side of the flange). This is the amount that will need to be cut off. Double check that the liner is still seating and that the gun is held perfectly straight. **IMPORTANT: Do not cut the liner on the flange side. This is only for measuring the amount needing to be cut off the other end (Gun side of the liner).**
5. Remove the new liner.
6. From the gun end of the liner (the end that contacts the contact tip), measure and mark the length to be removed. Mark it with a metal marking pen or small file. Carefully cut the steel liner to length with pair of lineman's pliers or a similar sharp cutting tool. Make a clean flat cut. A small cut off wheel may also be used if a suitable cutter cannot be found. Carefully dress the end of the liner and chamber end with a small file removing any burrs. Do not use dull cutters or the liner may collapse.
7. Reinsert the new liner and test fit. The brass flange should fit flush against the base fitting and it should fit fully home in the contact tip.
8. Reinstall the brass nut to hold the liner in place.
9. Reassemble the gun if it has not already been reassembled.

Polymer (Aluminum) Liner Removal and Installation.

1. Remove the brass nut from the base fitting on Euro Connector. Hold the base fitting while using a wrench to do this. Do not allow the base fitting to unscrew. If the fitting unscrews, it must be reinstalled before proceeding.
2. Grab the brass flange of the liner that was originally held in place by the brass nut. Pull on the flange to remove the old liner completely. Once removed, set aside. (If the liner is stuck, carefully work it back and forth, and twist slightly to remove. The liner can break or stretch if the liner is badly damaged inside the outer cable conduit.
3. Make sure the gun and gun cable is held straight. Install the new liner as far as it will go. (Do not cut the liner yet.) Make sure the liner isinserted into the base of contact tip holder. Typically the liner will be visible with the contact tip holder installed. If the liner is not visible, remove the contact tip hold to check for visibility (some guns the contact tip hold is part of the gun neck and cannot be removed). If the liner is still not visible and/or does not appear to be inserted into the end of the contact tip holder manipulate the liner gently until it is visible and in position to mate with the contact tip holder once it is re -inserted. It may be necessary to move the gun handle around gently until the liner slides home.
4. Once the liner is fully inserted, install the collet over the liner and slide the collet down the liner until it is fully seated into the base fitting. (Depending upon the manufacturer, the collet may be more like a ferrule)
5. Slide the O-ring down until it contacts the collet.
6. Slide the brass retaining nut down over the liner and screw the nut down until the collet slightly compresses the liner and holds it in place.
7. Trim excess liner flush with the end of the brass nut.

Component Identification and Explanation

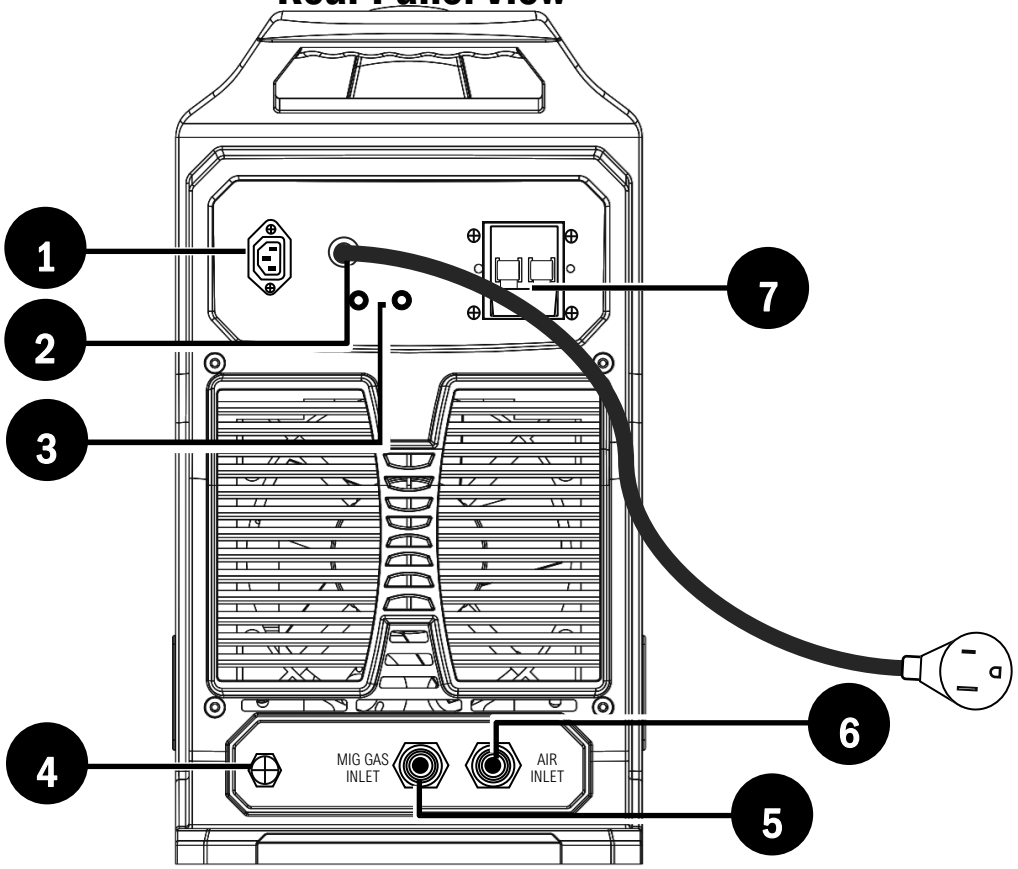
Front Panel View



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

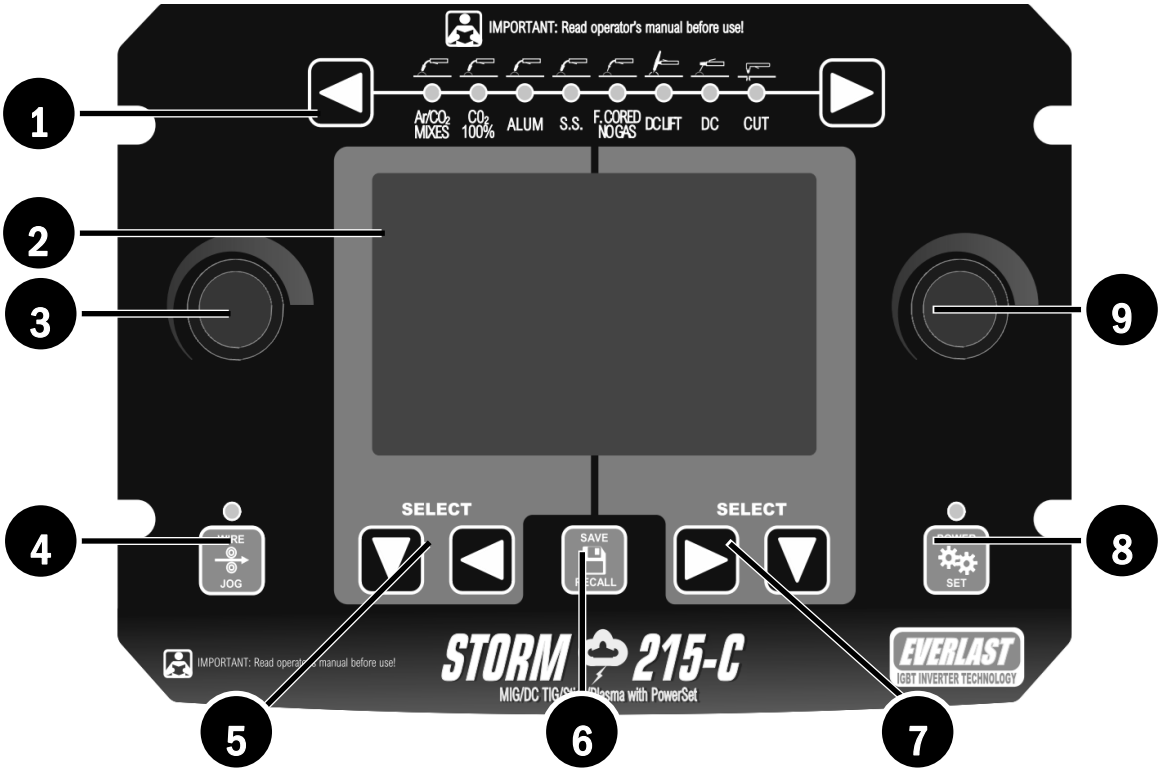
Rear Panel View



#	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 infoWhen operating on 120V, the white wire (internally) becomes the neutral, and the green still serves as the ground. *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.**
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 *may* 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 Identification	Function/Component Note
1.	Welding Process Selector	Press left or right arrow key connected to the process selector LEDs to navigate back and forth to select the desired weld process. The LED will light to indicate which weld process has been selected. See Quick Setup Section.
2.	4.3" 720HD TFT Color Display	This display is designed to be clear and bright. It will provide long life if proper care is taken. Keep the flip down cover in place when welding and when not in use. Remove temporary, original protective film on the screen surface upon delivery. Use cut-to-fit screen protectors as a replacement for future use. Do not use harsh cleaners. Use only screen type cleaners sprayed onto a damp, lint free rag to clean. Remove dust with short bursts of dry compressed air. Notice: The operation of the screen is divided into left half and right half sides. The left and right half are divided by a green line running down the middle of the screen on all adjustable pages of the menu. The left and right half are also highlighted further by the black extended line in the middle of the green surrounded area of the screen that groups right and left side controls.
3.	Left Adjustment Knob	This control knob controls all the parameter values found on left-half side of the LCD screen. It is used to increase and decrease the value. *Helpful Hint: Press in and turn to increase the parameter value in larger increments to save time.*
4.	Wire Jog	The wire jog function is designed to feed wire without pressing the trigger. This speeds up wire delivery when changing the wire spools or loading the gun with wire. The gas does not flow when using the wire jog to prevent waste.
5.	Left-Half Side Navigation Keys	The left side down and left arrow keys are used to navigate and select the left side parameters for adjustment.
6.	Program Save Key	Use this key to both access the program save menu, lock/unlock a program recall a program. See Quick Setup Section. A short press will bring up the recall menu. A long 3 second press will bring up the save menu.
7.	Right-Half Side Navigation Keys	The right side down and right arrow keys are used to navigate and select the right side parameters for adjustment.
8.	PowerSet Key	The PowerSet key is used to activate the synergic programming of any welding mode. The LED will light to both confirm and remind the user that the PowerSet Mode is activated. Also used to lock or unlock a program in the save mode
9.	Right Adjustment Knob	This control knob controls all the parameter values found on the right side of the LCD screen. It is used to increase and decrease the value. It is also used to select and navigate the pop up on-screen keyboard when naming the program or selecting a program in the recall mode.

Component Identification and Explanation

Starting-up the Welder

WHAT TO EXPECT ON START UP.

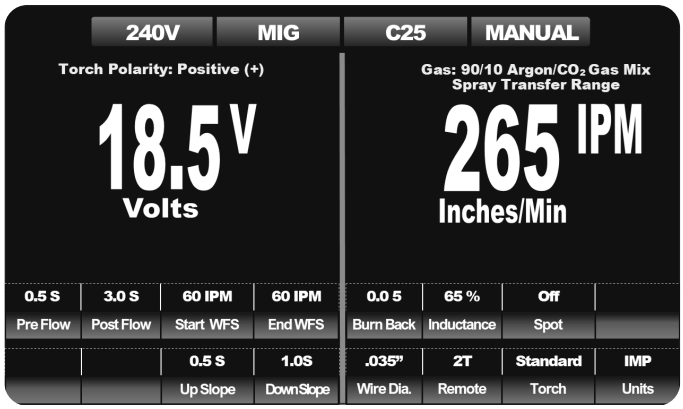
Before the first start and use of the machine, check all your connections. Make sure all fittings are tight and that your gas cylinder valve is fully open. Put on proper safety equipment (PPE) and fire resistant clothing. Make sure all accessories are uncoiled and properly connected. Inspect the accessories and ensure that they are in good working order.

WARNING! *Accidental arc flashes and burns could be possible if the foot pedal or torch switch is depressed at the time of start up. Uncoiling accessories and dismounting them from the cart is important to prevent accidental triggering, arc flashing, welder damage and possible injury.*

When the welder is switched on at the rear of the unit and the start-up process begins, the welder will greet you with the start-up screen while it is booting up. All LED lights on the front panel will light up on the front to allow you to inspect their functionality. The boot-up will take up to 5 or 6 seconds as the machine re-adjusts for the voltage input and recalls the last settings used. *The boot up screen will look similar to this:*

During the boot-up process you may hear a series of slight clicks, thuds, or thumps as the machine switches relays and solenoids. This is normal. IIt is important to note that similar thuds or clicks that are heard on start up can also be heard as the machine swaps processes or when certain functions are selected. This is normal and should not be of concern.

When fully booted up, the screen arrangement should look similar to this, depending upon the actual process and functions selected:



It is recommended that all functions be checked for proper operation every few months so that any malfunction can be noted and reported before it is needed. If any malfunction of the control screen or the welder is observed, contact Everlast Tech Support.

TAKE CARE OF THE LCD SCREEN.

The screen is a high resolution TFT color LCD screen. It is important to take care of it. Keep the cover shut when welding or when not in use. *Additionally, cut-to-fit screen protectors can be used with the screen (and it is recommended to do so) to offer a second layer of protection and keep the screen in like new conditions. These are customer-supplied and available at local stores that sell electronic items such as computers or mobile phones.* These should be periodically removed and replaced. Lightly clean the screen only when needed with standard screen cleaning solution and lint free cloth designed for cleaning screens or lenses. Do not use harsh detergents or alcohol. The front protective cover is plastic and may get scratched if it is wiped dry. If heavy dust has accumulated, use dry compressed air to blow off the screen. Do not try to dry wipe with dirty rags, sleeves or gloves or the screen may become scratched or unreadable.

Functions vs. Parameters vs. Status

This manual makes frequent use of the words "mode", "settings" "functions", "parameters", "values" and "status". In some cases it may seem that some words are interchangeable. And in a number of cases, there may be indeed some limited interchangeability in the terms since a function may also double (when turned on) as an adjustable parameter or could indicate a mode. To clear up the confusion between the terms, here is a brief explanation of Settings, Functions, Parameters, Values and Status and the general intended use of these words in this manual.

A **mode** can refer to the selection of a particular function, or a welding process. The welder has several different processes. Each process can also be considered a mode. For example, you may select "DC TIG Mode" to weld. But you can also select the Spool Gun mode from the torch function on the screen. The term mode is broadly used.

Settings is a broad term inclusive of both functions and parameters. When the term settings is used it is meant to refer to both generally and can also refer to status or value.

Functions are features and modes of the machine. Functions will dictate the way the welder behaves and what parameters are offered for adjustment to the user. A function can indicate a mode of operation, such as 2T torch switch operation as opposed to Foot Pedal operation. A function will typically be associated with words like On or OFF, or even indicate a gun type or mode.

A **parameter** is an adjustable feature of the machine. Pre-Flow, Post-Flow, Up-Slope, Down-Slope, Welding Amps, Pulse Time On, etc. are all examples of parameters. A parameter is defined by its **value**. The value can be expressed in Seconds, Amps, Wire Feed Speed, or Percent. Values are expressed in numbers. Each parameter has a range of values.

Status indicates the *condition* of a function (On, Off, etc.). It can also indicate the static operating condition or welding mode of the welder on the

Component Identification and Explanation

GENERAL INFORMATION ON SETUP AND USE.

Selecting the Process.

At the top of the panel (1) use the process selector buttons to select the desired welding or cutting process. Use either the right or left arrow directional (◄ ►) buttons to advance to the next process. Pressing the left or right arrow button too quickly multiple times in succession may cause the LED to appear to skip a process. Advance through the processes at a moderate, deliberate pace. If desired welding process is accidentally passed or skipped over, instead of cycling back through all the processes, use the opposite directional arrow button to scroll back to the desired process rather than scrolling all the way through again.

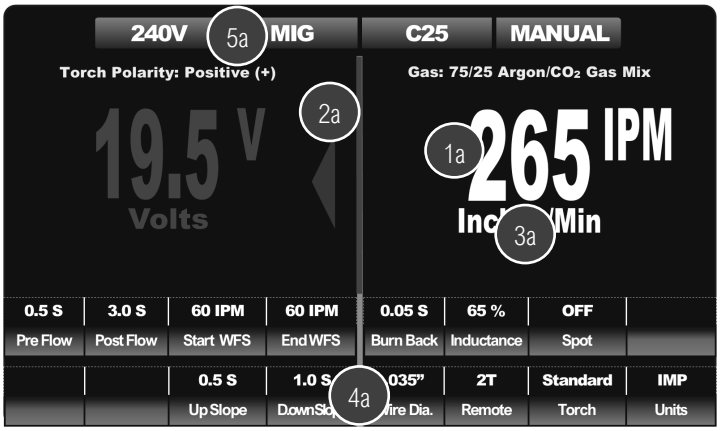
Navigating the On-Screen Menu.

The LCD screen is divided visually into a right and left half (2) by a vertical green bar on screen and black line above and below the screen. The left half side is controlled by the left side panel controls. The right half is controlled by the right side panel controls. The left side left (3) left pointing and down pointing arrows (◄ ▼) are used to navigate the left half of the screen and the right side (4) right pointing and down pointing arrows (► ▼) are used to navigate the right half of the screen. The left and right control knobs (5,6) are used to increase or decrease the selected parameter value of that side or to change the status of a function of the related side. The menu is also divided horizontally into 2 functional areas. 1) The top tier, or main display/default parameter display area, and the two lower tiered rows of parameters and functions.

There are two types of information located on-screen in the two lower tiered rows (7,8) of the on-screen menu: Parameters and Functions. *Functions are menu items that may change in status, such as ON/OFF, or Gun Selection. Parameters are menu items that change in value throughout a range such as pre-flow time or inductance percent.* Some selectable items on the menu screen serve both as functions and parameters. For example, the Spot weld function can be set to "OFF". That indicates the status of the function. But when selected and the control knob is rotated, and the status is changed to "ON", the function automatically changes to represent the parameter value and displays the seconds.

Understanding the Anatomy of the Menu Screen.

Quick Steps to Setting-Up the Welder.



1. The main display in the upper area serves to display the status, or value of a function or parameter. (1a)

- After startup, while welding or when the unit is not in the adjustment mode, Voltage is displayed on the left side of the menu screen and the Wire Feed Speed (IPM or M/M) or Amps on the right side of the menu screen. These are the default parameters displayed unless the unit is in adjustment mode and other parameters or functions are selected for adjustment. These default parameters can be adjusted simply by turning the relevant side control knob. The display will turn red to indicate adjustment

- After adjustment is finished and no further adjustment or changes are made, the unit will re-enter the default mode within approximately 5 seconds and display the Voltage and Wire Feed Speed/Amps.

2. Entering adjustment mode allows the user to make changes to all functions statuses and parameter values.

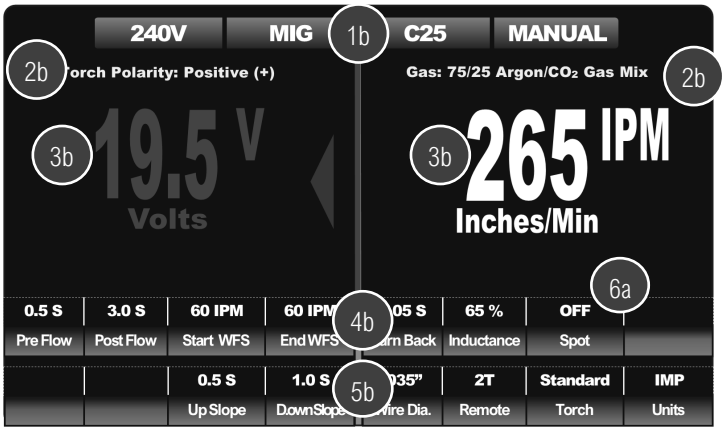
- To enter the adjustment mode, press once on the down arrow key (▼) on either the right or left side, depending upon which side the desired function or parameter is located on. This will turn the main display on that side red in color, the middle vertical line will turn red and either a left or right red arrow (◄ or ►)will appear to indicate which side is ready for adjustment. (2a) *Alternatively, to enter the adjustment mode, a slight turn of the control knob will enter the welder into the adjustment mode unless the default displayed is non adjustable and displayed in green (TIG/Stick modes).*

- Continue to use the down arrow key (▼) to navigate vertically down to the desired row.

- In TIG and Stick modes, a single press on the down arrow on the left side will automatically navigate to the first lower row.

- Use the left or right arrow button (◄ or ►) to navigate over to the desired parameter or function to highlight for adjustment.

Component Identification and Explanation



- The middle red line will extend to the row and over to the desired parameter and the selected parameter will be highlighted in red.

3. The control knobs are used to increase or decrease a selected parameter value, or make a status change in a selected function.

- Use the control knob on the side closest to the desired function or parameter to make changes to status or value.
- When making large changes in value to a parameter, press in on the control knob while continuing to turn it to make larger increment changes in value. This will speed up the adjustment process.
- The middle red line will extend to the row and over to the desired parameter and the selected parameter will be highlighted in red.
- The control knobs are used to increase or decrease a selected parameter value, or make a status change in a selected function.
- Use the control knob on the side closest to the desired function or parameter to make changes to status or value.

When making large changes in value to a parameter, press in on the control knob while continuing to turn it to make larger increment changes in value. This will speed up the adjustment process

Detailed Menu Information and What to Expect During Adjustment

The menu screen utilizes a combination of symbols, words, numbers, colors and graphical indicators to assist the user in making adjustments. It is designed to create a fluid, intuitive and easy to understand interface for the user.

The menu is divided into several basic areas and conveys useful information to the user.

1. Top Information Bar. (1B) This area conveys information to the user about basic process selection, operating mode, and input voltage.
2. Torch Polarity and Gas Selection Information (2b). This row is in yellow lettering for contrast. This is area is designed to serve as a important reminder to the user to check and confirm both gas type and torch/gun polarity. The gas selection information may change in Steel MIG mode (C25) depending upon the settings of the unit. At higher volts and wire speed settings the gas recommendation may change from 75/25 Ar/CO_2 (C25) to 90/10 Ar/CO_2 (C10).
3. The main display area, or top tiered row (3b). This area on both left and right sides of the machine will display default Volt and Wire Feed Speed/ Amp settings unless the adjustment mode is entered into. During active welding, it will also display the actual measured Volt and Amp output of the machine. During adjustment, the display will reflect the chosen parameters and values of the parameters. During adjustment, the main display area values and parameters will change color to red. Approximately 5 seconds after adjustments are completed the main display area will revert to the default setting and colors.
4. The lower parameter rows/tiers. (4b and 5b) This area displays all the information related to adjustable parameters and selectable functions of the unit. *In the PowerSet mode, only one line may be displayed due to the simplified input design.*

When a parameter or a function is selected, the screen will display the value or status of the function in two places:

1) At the top of the screen in the main display area.

2) Just above the selected parameter in the lower rows

The value-based parameters are also accompanied at the top of screen by the parameter's unit of measure in an abbreviated exponent form such as V, S, or % to as a reminder of the value being adjusted. Underneath the parameter value or function status, the actual name of the selected function or parameter appears. This redundant arrangement makes the display easier to read during adjustment and helps to eliminate bottle necks in navigation.

After adjusting is completed, the machine will default back to the main adjustment value (Volts, Amps or Inches per Minute) after approximately 5 seconds if no further input is made. The purpose of displaying the value or status of the lower tiered rows and the upper default value is to provide an at-a-glance view of all parameters simultaneously on the single screen at any time during operation. This eliminates the need for pop up menus and bottle necks in setup while promoting operator awareness of settings.

The screen makes use of colors to indicate condition, mode and status and serves to aid the user in general in interpreting the on screen information.

1. Green:

- The green color (4b, 5b) of the two lower rows/tiers of boxes indicates normal operation or that the unit is ready for use. The two lower tiered rows of boxes are normally green, unless the parameter of the box has been selected for adjustment by the user. Green is used to indicate a set function status or relay a parameter value to the user.
- Green is used at the top information bar to communicate basic status information. It is used to confirm the mode and basic operating information. *If the Voltage box in the information bar turns yellow, this indicates the unit is operating on 120V. This is to serve as a reminder that output is limited in 120V and some settings may not have a full range of adjustment or selection.*
- When the large numbers turn green in the top, main display area, this indicates the value cannot be adjusted. However, it is communicating

an important measured value, such as TIG or Stick welding Voltage and OCV.

2. Gray:

- Gray, blank areas in the lower rows of boxes are non-selectable areas. These emptied boxes can be ignored and no function is assigned to them in the current menu configuration or process.
- In some cases a gray area will become an adjustable area if certain functions like Spot weld is selected for use. If so, the area(s) will turn from gray to green and will display additional parameters related to the function. When the items are green and the blank areas filled by additional parameter information, they are then adjustable. The grayed-out areas help eliminate confusion over what needs to be adjusted. Some gray areas have no func tion and may only be a place holder and will not change status or offer adjustment. Due to the nature of each process, some areas will have more gray areas than others. In a couple of instances where a function is selected that limits the ability of other necessary functions, and the restricted function remains active, the area will remain green, but will not be adjustable.

3. Red.

- Red indicates the machine has entered the adjustment mode. The numbers/words at top of the screen, the middle vertical line, middle line extension and any parameter box on a row that turns red indicates that the machine is in adjustment mode.
- If a parameter box is highlighted in red, the main display area will display of the chosen function status or parameter value.

4. White.

- White letters or numbers in the main display area indicates that the unit is displaying the default setting and is not being adjusted.
- In any wire feed process, when both upper numbers are in white the unit is displaying welding volts (left side) and welding wire speed feed rate (right side).
- When the main display area is white this indicates the unit is not in adjustment mode and is ready to weld.
- In TIG and Stick modes, only the right Amp box will be displayed in white. The other box will be in green to indicate a non adjustable voltage value. When the white appears in only the Amp box, and the other side is in green, the unit has exited the adjustment mode.

5. Yellow.

- Yellow is used to convey important basic information.
- Yellow can also be used to alert the user to a change in status or warn of an unwise setting (PowerSet mode).
- In manual mode for steel the colors of the numbers may change when a wire begins to reach its short circuit limit and transitions to globular transfer and into axial spray transfer. The on screen recommendations for shielding gas will also change from 75/25 to 90/10. The information just above the main display area reminds the user to observe the indicated polarity and the gas type to use. In some instances, with smaller diameter wires such as .023" or .030" wire, the gas recommendation may not change at higher settings if not typically used for spray. This is important to note because, even if the unit allows the setting, the arc performance may be poor as the unit begins to transfer into the globular or spray transfer range of the wire. Spray arc welding is not normally used with wires smaller than .035". If erratic arcs are observed or the wire begins to burn back to the tip, lower the voltage until the arc smooths. If necessary, reduce the wire speed to prevent excess wire buildup. Typically, .030" wire is not used above 1/8" thick steel.
- The voltage input reading found in top information bar will change to yellow when the unit is operating on 120V input power.

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Why Are Some Settings Limited or Blank?

There are two basic reasons some settings are limited in adjustment or completely blank. The first reason 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 or poor performance. In PowerSet mode this is obvious by the limit on selecting electrode /wire or thickness sizes. The second reason is that a function is not active due to another setting or parameter that has been selected or a parameter been set to "OFF." When functions such as spot weld are set to "ON," the unit will add additional settings and allow adjustment of those functions or parameters.

Component Identification and Explanation

USING THE PROGRAM MENUS AND MEMORY FUNCTION.

The memory function on this machine allows the user to save and name up to 30 different programs. (There are 30 programs but only 10 programs per page.) Not only can the programs be saved, they can also be locked to prevent unwanted or accidental tampering for WPS work requirements. The process to save and recall the memory is relatively simple. However, there are some differences in the way the machine is controlled from the main menu screens. There are no longer any left or right division of control in this mode. Only the right side control knob and Save/Recall Program button will be used for navigation and selecting. The PowerSet button is used for selecting or deselecting the lock function. Most programs will say "Empty" until they are filled by a program. But if there are some form of program stored, these were stored during factory testing and not intended to be functional settings. These programs can be saved over, after being unlocked. Any recalled program can be fine tuned or adjusted, but the new settings or changes made to the machine will not be kept.

NOTICE: There are no useful pre-stored programs on this machine.

IMPORTANT: It is advised not to use any programs designed for 240V input with 120V input. However, if saving in 120V mode and 240V mode is expected, be sure to include the voltage in the program name .

Navigating and Using the Recall Screen.

The program function consists of two screens: the recall screen and the save screen. Both look alike except at the top information bar location, the words "Recall" or "Save" are used. Be sure to notice which word is at the top so that the unit is in the correct screen to perform the action desired. The recall screen is used to "recall" or bring up a desired program for use.

The recall mode does not allow any saving or any permanent modification of the programming. A recalled program will allow adjustments to be made, but the base program cannot be modified unless it is unlocked in the save mode and completely resaved or saved over. Recall mode will always be a safe mode to use for any user since programming cannot be saved over in this mode.

1. To recall any program, quickly press and release the save program button (1). This may be done from any process, even if the desired process is not selected at the top of the selector. (The selected program will override the process selector and display the saved program and process.)
2. The Recall menu screen will appear and will be confirmed by the green "Recall" bar (2) at the top of the screen.
3. Navigate to the desired program by rotating the left side adjustment knob (3a). A green bar will highlight the line chosen.
4. Press the right side adjustment knob (3) to select and enter and open the program. The screen will display the program and settings like a normal screen, but it will not allow it to be overwritten. The programming will allow the user to make adjustments, but these will not be permanent to the program.

NOTICE: If the recall mode is not being actively used, and no choice has been selected/entered by pressing the right adjustment knob, the machine will return back to the previous setting. It will not recall (bring up on screen) the program, even if it has been highlighted.

Navigating and Using the Save Screen.

The Recall and Save screen are similar but the Save screen allows programs to be stored and features the lock/unlock ( ) function which will allow a new program to be saved in the old memory slot.

1. To save, complete all normal setup for the process desiring to be saved. Make sure all settings are correct before proceeding to step 2.
2. To access the save menu screen, press and hold the save/recall button (1) for at least three seconds before releasing.
3. When the button is released the Save screen will appear and the green "Save" bar at the top of the screen will confirm the selection.
4. Navigate to the desired line by rotating the left side adjustment knob (3a). Each line will highlight green as the adjustment knob is rotated.
5. Each line will have either a lock symbol or unlock symbol ( )

Component Identification and Explanation

located on each line on the right side (4). This indicates whether or not the selected line is available for a new program to be saved. If the unlock symbol is displayed, this line will allow a new program to be saved. If a locked symbol is displayed, this line must be unlocked before saving. To unlock a line, quickly press and release the PowerSet button (5). The symbol will change to the unlocked status. **WARNING! If a line is purposefully unlocked, or left unlocked after saving a new program, this program will be subject to permanent change or over-writing without an extra layer of protection.** If available, always save in an "Empty" space. If a new program must be saved over an old one, make sure that it has no value or future use or write down the settings so that the values can be re-entered in the future.

6. Press the left side adjustment knob (3a) to select the line and access the 'QWERTY" popup key pad (6). Rotate the adjustment knob (3a) to highlight a letter or a command (save or cancel). Press the adjustment knob (3) to enter the letter or number desired. Continue until the program name is complete or until the maximum character limit has been reached. *The maximum number of letters, numbers and other characters that can be entered to name a program is a total of 15 in any combination. The keypad will not hold more than a 15 total character program and will block more from being entered once the maximum is reached. To eliminate future confusion over which programs are which, be sure that program names are carefully chosen to be distinctive without exceeding the character limit.*

7. Once the program has been entered, rotate the adjustment knob (3)to save selection or press cancel to exit the screen. *If cancel is selected the program will not be saved on that line and the name or status of the line will not be changed.*

8. After selecting "save" on the popup key pad, the program screen will reappear with the newly named program. As an extra layer of security, and to prevent unwanted or otherwise accidentally tampering with the program, press the PowerSet button (5) to lock the program as soon as the program returns from the keypad menu screen. *It is always a good idea to keep all programs locked for program integrity.*

9. If no further input is made (i.e. locking or selecting another line) after saving the program, the menu will default back to the welding mode after approximately 5 seconds. Instead of waiting for the 5 seconds to expire, quickly press and release the "Save/Recall" button (1) once all programming is complete and saved. This will quickly exit and return to the menu normal welding/adjustment mode.

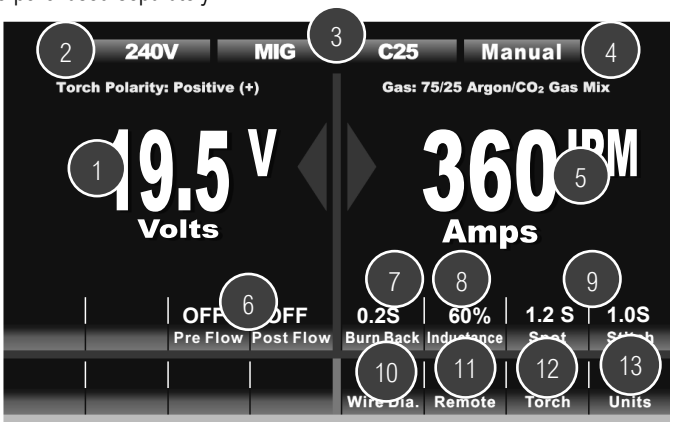
Component Identification and Explanation

USING THE MANUAL MENUS

Each process menu operates in the basic same way. Navigation is similar between all the functions. See the below menus and notes about navigation of each of the following menus.

MIG/Flux-Cored Manual Menu:

The MIG manual menu is essentially the same between all MIG process selections, whether selecting C25, C100, Aluminum, or Stainless Steel. Flux-Cored welding is similar to MIG except it is used for welding steel only without gas using a special hollow wire with a flux center that provides shielding while welding. However, the menu does not remind you that a different drive roll is required and a different gun is used for Flux-Cored welding. This gun is not supplied with the welder and will need to be purchased separately.



1. **Main Left Display, Default Voltage Display.** Adjust the voltage with left adjustment knob. To adjust other parameters or functions, enter the adjustment mode with left down arrow key to navigate to the desired parameter to highlight and enable adjustment. When a parameter or function is selected for adjustment, the numbers will turn from white to red. Voltage 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 setting and exit adjustment mode.

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 input, then the power supply to the welder is likely faulty. **With 120V output, the bar will turn yellow to remind that the welding output is limited. NOTE**: Maximum output of the machine is governed by the input voltage. Some selections may not be possible on reduced input power.

3. **Process and Gas Reminders.** When viewed together, both 3 and 3a reminds the user which process has been selected. In one of the MIG process modes MIG will always display with 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 mode, many functions may not be available for adjustment and will be preset. (See the MIG PowerSet section).

5. **Main Right Display, Default Wire Feed Speed Display.** Adjust the wire feed speed (WFS) with right adjustment knob. This display can indicate the wire feed speed in either Inches Per Minute (IPM) or in Meters Per Minute) M/Min. This is the default setting of the right side. Other parameters and functions will be represented in the display when in adjustment mode. When the Wire Feed Speed or other parameter is selected for adjustment the display will turn red in color. After 5 seconds of no input or adjustment of any parameter or function, the selected setting will default back to the Wire Speed setting and return to white. *While actively welding, the display function will change to read actual measured amperage output.*

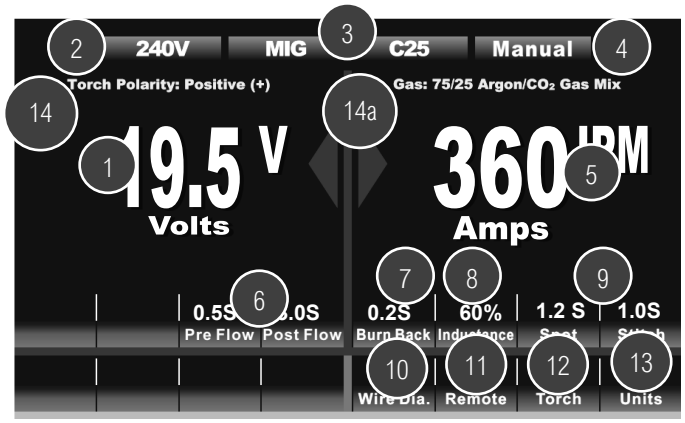
6. **Pre-Flow/Post Flow Timers.** Pre and Post Flow provide automatic shielding gas flow time before and after the weld. This is important to reducing contamination in the weld. The arc start and wire feed will be delayed slightly by the pre-flow time but this helps improve weld quality by providing a gas envelope around the weld. Post flow helps cool the torch and provides shielding around the weld after the arc is terminated. This helps prevent oxidation of the weld. **NOTICE: In gasless Flux-Cored mode, Pre and Post Flow will be unavailable and the space will be blank**.

7. **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

8. **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-Cored 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. NOTICE: The units will ship with the last settings used in performance testing. Often Inductance will be set to 0% after testing the range of function. If the unit is used with 0% Inductance, bad arc quality will result.

Component Identification and Explanation

9. **Spot and Stitch Timers.** *The Spot timer must be turned on for the*



Stitch function to appear. (Some models may only have spot function). When Spot is turned off as shown in the picture above, the Stitch function is no longer selectable. The Spot function is a timer that sets a defined "Arc on" time. The timer allows the arc to stay energized for the period set. After the time has expired the arc will automatically stop, if the trigger is still held down. While it can be used with 4T, the spot function is best used in 2T mode, especially for relatively short tack welds. **NOTE:** Keep in mind that If the spot timer is turned on accidently, 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. Stitch is defined as "Arc-off" time. This function is dependent upon the use of the Spot weld function. While the Spot function may be used independently with the Stitch timer set to "0.0", the use of the Stitch is predicated on the use of the Spot Timer. Using the spot timer together with the stitch timer creates an endless "On and Off" cycle of the arc for as long as the trigger is held. The Spot Timer sets an "arc-off" interval between a series of spot welds as the trigger is continued to be held down. This is useful for tacking up long seams on thin sheet metal such as body panels. It helps to provide regular spacing between the weld as long as the forward travel speed provided by the user remains fairly consistent. **IMPORTANT: If the spot is accidentally engaged, the user will experience a short cycle of the arc. This typically happens with new or inexperienced users or after another user has made adjustments. If the arc suddenly dies after the arc is started or starts/stops starts, check and make sure the Spot timer is set to "OFF".**

10. **Wire Dimeter.** The input of the wire diameter helps to put limits around output for the wire and make suggestions in gas selection when the wire approaches the short-circuit limits and begins to transition to globular/spray transfer.

11. **Remote/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. See more detailed 2T/4T Remote information and explanation found later in this manual.

12. **Torch Type**. Select between the main MIG gun or Spool Gun function.

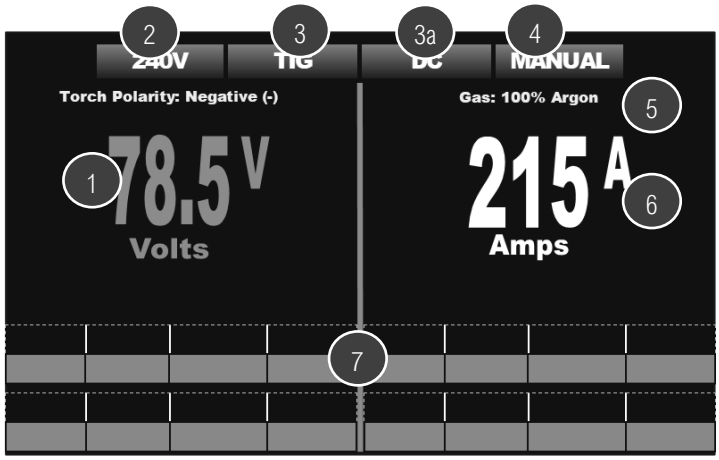
13. **Units.** Everlast recognizes that there is a need to provide different units of measures to different industries and regions of the world. This unit is equipped to read in Standard Imperial (US or English) units such as inches per minute or decimal inch equivalents. The unit is also equipped to read in Metric (SI) units such as Meters/ Minute and millimeters. Choose between MET (Metric) or IMP (Imperial) on the screen to convert all relevant measurements to the desired or required units.

14. **Reminder/ Information Areas.** This instructs the user which torch polarity (14) to select and which gas to use (14a). Both the Torch polarity and gas recommendations are subject to change according to the process used and the actual output of the machine. If improper operation is observed, check this area and the information it is displaying and confirm the polarity and gas mix being used. These are here to remind the user to change gas or which gas to use and which polarity to select and use. The polarity and recommended gas cannot be changed in the programming. It is to used only as a guide. **The welder cannot sense which gas is being used.** A different gas may be used than suggested, but programming may not function as well, especially in PowerSet mode. In the mixed gases mode, which is used for steel, recommendations may change as settings increase from the standard 75/25 to 90/10. The changeover is not an exact science as either gas may be used in some circumstances, but generally the gas for the settings selected will be the best gas to use. When wire speed and voltage cross the boundary between short circuit and globular transfer and on into a full spray setting, arc performance will suffer in the transitional areas. In the smaller wires, 75/25 will be recommended regardless of setting since most wires are not used for spray arc welding. Using 75/25 at too high of a setting for a selected wire diameter will eventually result in excess spatter. While 90/10 or similar gas mixes may be used for lower amperage welding with smooth results, the arc may become too soft to weld out of position well. *Due to the maximum 200A Amperage limitation and programming version of the particular unit, 90/10 may not appear as a suggested gas.* **For areas where 75/25 is not commonly available, use 80/20 instead or a similar Ar/CO_2 gas mix. No significant issues will occur except PowerSet may need additional fine tuning to operate correctly.**

Component Identification and Explanation

DC TIG Manual Menu:

The DC TIG Function is a basic lift arc function on this unit. The tungsten remains live while the function is selected. To stike the arc, the tungsten is simply touched to the metal quickly and lifted up. This type of TIG function means the menu has few adjustable parameters or functions and there are basically no controls other than the amperage on the welder panel. It does not support foot pedal or other remote control of the Amperage. Most items are gray or non existent, indicating there is no adjustment available. Voltage is not adjustable and only reflects actual output at the arc, or the OCV when not welding. The unit is DC only and is not meant to weld Aluminum. However, it can be used to perform basic maintenance and fabrication on pipe and structural metals. It can be also be used on most types of weldable stainless. The disadvantage of this type start is that it can contaminate the metal with tungsten if it is not performed correctly. And also, because it is DC current, it is not suitable for aluminum or magnesium welding. On this unit, the TIG torch is optional. It must be a gas valve (V designation) torch that manually controls gas flow via a valve on the torch neck. The recommended torch is the Everlast/Nova 17V series.



1. Main Left Display, Default Voltage Display. The voltage displayed in the Main display in TIG mode is a measured reading of output. It is not adjustable because in a Constant Current (CC) mode such as TIG or Stick, voltage is a function of arc length. The voltage will always be displayed in green color to remind the user that the voltage is non adjustable on the panel. The left control knob will not be able to be used to change voltage. While adjusting other parameters on the left side, the function of the screen will change and the window will display the selected parameter and value. It will also turn red indicate that it is in the adjustment mode.

2. Voltage Input Confirmation. This confirms which voltage the machine is being supplied. This also serves as a diagnostic tool. If the machine reads 120V, while operating on 240V, then the power supply to the welder is likely faulty. As demonstrated above, during when 120V input is supplied, the voltage bar will turn yellow to remind the user that the welding output is limited. NOTE: Maximum output of the machine is governed by the input voltage. Some selections may not be possible and some ranges will be reduced on 120V input power.

3. Process Reminders. When viewed together, both 3 and 3a reminds the user which process has been selected. For TIG, there is no touchless HF or HV Start. It is lift start only.

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 mode, many functions may not be available for adjustment and will be preset. (See the TIG PowerSet section).

5. Reminder/Information Area. The area in yellow is designed to inform or remind the user to check or change polarity and to confirm which shielding gas (5a) should be used. For TIG, this area will remain unchanged. Torch polarity in TIG mode will always be negative (-). The recommended shielding gas will always be 100% Argon.

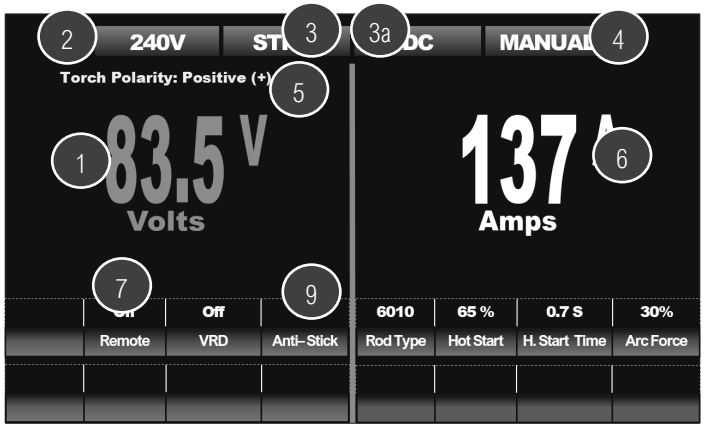
6. Main Right Display, Default Amp Display. Adjust with right adjustment knob. By default this display area indicates the Amperage. In adjustment mode, the function or parameter selected will display and the display numbers/letters will turn red to indicate adjustment mode. *While actively welding, the display function will change to read actual measured amperage output.*

7. Lower Area. *Lower area will remain blank. There are no adjustable functions or items located here. Some versions may display a remote function in this area. If present, this allows for remote control of amperage with a slider or foot pedal after arc is started.*

Component Identification and Explanation

DC Stick Manual Menu:

The stick manual menu is simplest menu of all the manual menus. However, there are a few functions that the user should know. Ignoring these setting and not providing a setting for them, may make arc starting difficult or may make maintaining a satisfactory arc impossible.



1. Main Left Display, Default Voltage Display. The voltage displayed in the Main display in Stick mode is a measured reading of output. It is not adjustable. The voltage will always be displayed in green color to remind the user that the voltage is non adjustable. The left control knob will not be able to adjust voltage. While adjusting other parameters, the voltage will change function and will display the selected parameter. It will also turn red to indicate it has entered the adjustment mode.

2. Voltage Input Confirmation. This confirms which voltage the machine is being supplied. This also serves as a diagnostic tool. If the machine reads 120V, while operating on 240V, then the power supply to the welder is likely faulty. As demonstrated above, during when 120V input is supplied, the voltage bar will turn yellow to remind the user that the welding output is limited. NOTICE: Maximum output of the machine is governed by the input voltage. Some selections may not be possible and some ranges will be reduced on 120V input power. Notably, Amp output will be limited and may not always provide a satisfactory result with electrodes over 3/32. In some cases, depending upon the type of rod selected, 3/32" size rods may not perform as well either.

3. Process Reminders. When viewed together, both 3 and 3a reminds the user which process has been selected. For Stick, DC will also be highlighted on this machine to remind the user that this unit is DC, and not AC mode. (This welder supplies DC output only for Stick.)

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 mode, some functions may not be available for adjustment and will be preset. (See the Stick PowerSet section).

5. Reminder/Information Area. The area in yellow is designed to inform or remind the user to check or change polarity and to confirm which shielding gas (5a) should be used. For Stick, this area will remain unchanged. Torch polarity in Stick mode will always be positive (+). Some rods may allow use on electrode negative, but those are typically not considered standard types or preferred polarity in most cases.

6. Main Right Display, Default Amp Display. Adjust with Right adjustment knob. By default this display area indicates the Amperage. In adjustment mode, the function or parameter selected will display and the display numbers/letters will turn red to indicate adjustment mode. After 5 seconds of no input or adjustment of any parameter or function, the selected setting will default back to the amperage reading and return to the default white color. *While actively welding, the display function will change to read actual measured amperage output.*

7. Remote. The remote function allows the stick function to be used with an adjustable remote to control amperage at the electrode holder.

8. Voltage Reduction Device (VRD). The VRD acts as a safety device by lowering the OCV while the unit is not welding to below 24V. This feature may be required in some high risk locations where electrical shock or electrocution is a major concern. But, this feature is known to make starting an arc more difficult. A "double tap" method performed quickly often helps to reliably start the arc.

9. Anti-Stick. The anti-stick helps prevent the rod from sticking fast in the weld puddle by reducing the output when it is shorted accidentally while welding. This makes the stuck rod easier to remove. It will not actually prevent the rod from wanting to stick, but it will help prevent it from sticking fast in the weld and flaming up. Using both VRD and anti-stick together can compound welding issues, especially when a poor work connection is suspected or when it is likely the arc will want to wander or snuff suddenly.

10. Rod Type. This feature helps improve overall rod performance and provides a base for the machine to fine tune parameters.

11. Hot Start. This is a rush of amperage over the set amount that is provided to help improve the starting of the rod. NOTICE: Hot Start may be limited and seem to be muted due to the amount of amperage available left over to operate the hot start. The closer to the maximum amperage the machine is set, the impact of the hot start will be softened. Typically iron powder and titania fluxed rods require less than cellulose. For iron powder/titania fluxed rods, a setting of 40-50% arc force is typical. For cellulose a higher setting of 70-90% may be required. Low-Hydrogen rods that are not properly stored in a hot box or used within 4 to 8 hours after opening from a sealed metal can are considered "wet" and may require higher settings similar to cellulose to successfully strike the arc. But fresh low-hydrogen rods or rods stored properly in rod ovens will use the lower hot start settings.

12. Hot Start Time. This is the duration of the Hot Start. This keeps the hot start active and helps heat up the puddle.

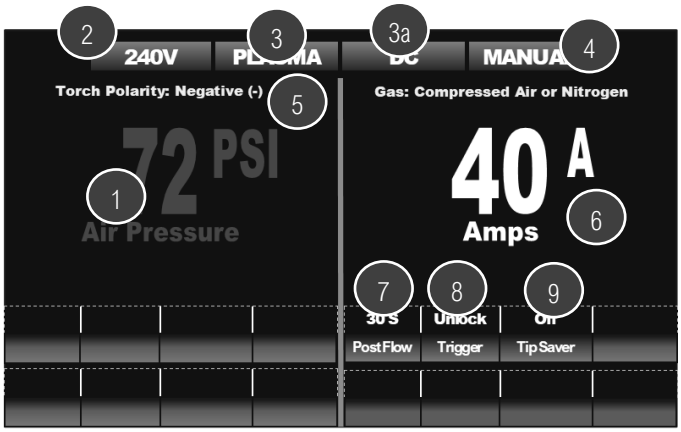
13. Arc Force. As the rod is held closer, the arc voltage will drop and the total wattage will fall. In some cases this may cause the rod to stick in the puddle. The Arc Force offsets this by supplying additional amperage (over the amount set) to help maintain welding wattage. This allows the user to use a tight arc, to prevent impurities from entering the

weld. The Arc Force will be triggered when welding voltage falls below approximately 20V. Adding Arc Force will improve the feel and wet in of the puddle. Typically rods with iron powder and titania based flux require less arc force than cellulose types. For iron powder/titania fluxed rods, 20 to 40% arc force is typical. For cellulose type rods, a 60-85% setting may be required. Low-Hydrogen rods that are not properly stored in a hot box or used within 4 to 8 hours are considered "wet" and may require higher settings to keep the rod burning properly. But fresh rods or rods stored in rod ovens will use the lower settings.

Component Identification and Explanation

PLASMA MANUAL MENU

The Plasma Cutting manual menu is very simple. Plasma is a basic process that requires minimal input from the user to operate correctly. However, there are a few inputs that must be controlled by the user such as air pressure, amperage, and torch orifice size. Not all items are located on the panel. See torch parts page for consumable sizes.



1. Main Left Display, Air Pressure Display. This is the regulated air pressure that is set by the user with the regulator installed on the rear of the unit. This number will change as the regulator is adjusted up or down. There will be a small discrepancy between the set pressure and the cutting pressure. If the air pressure is set too high, or too low the machine will stop cutting. Output will terminate to protect the torch and the unit. When this happens it will be accompanied by an error code. Always try to achieve a cutting pressure of 65 to 72 PSI. To achieve this, you may be required to set a static pressure several pounds higher than the desired cutting pressure. If the pressure drops below 50 PSI, the output will cease to prevent inadequate cooling to the plasma cutter.
2. Voltage Input Confirmation. Voltage Input Confirmation. This confirms the voltage being supplied to the machine. The correct Voltage is 120V or 240V. If 220, 230, or 208V is supplied at the outlet, the Voltage will still display 240V unless the voltage is too high or low. When operating on 120V, the display box will turn yellow and reflect 120V. When operating on 120V, output will be limited.
3. Process Reminders. When viewed together, both 3 and 3a reminds the user which process has been selected. Plasma is always DC.
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 mode, many functions may not be available for adjustment and will be preset.
5. Reminder/Information Area. The area in yellow is designed to inform or remind the user to check or change polarity and to confirm which shielding gas should be used. For Plasma, this area will remain unchanged. Torch polarity in Plasma mode will always be negative (-). The recommended cutting gas is compressed air or Nitrogen, if compressed air is unavailable (Nitrogen will require a special, high flow regulator not supplied by Everlast).
6. Main Right Display, Default Amp Display. Adjust with right adjustment knob. By default, this display area indicates the Amperage. In adjustment mode, the function or parameter selected will display and the display numbers/letters will turn red to indicate adjustment mode. After 5 seconds of no input or adjustment of any parameter or function, the selected setting will default back to the amperage reading and return to the default white color. *While actively cutting, the display function will change to read actual measured amperage output.*
7. Post Flow Timer. This feature sets the time that the gas flows after the plasma cut has terminated. This helps to cook the torch.
8. Remote/Torch Trigger Lock Function. In TIG or MIG the equivalent would be 2T or 4T. However, in Plasma it refers to “Lock” or “Unlock” because Up and Down Slope are eliminated.
9. Tip Saver Function. The tip saver function controls the behavior of the pilot arc. When TIP saver is on, the Pilot arc won’t reignite unless the trigger is released and re-pressed. The Pilot arc will also terminate after approximately 3 seconds after the trigger is pulled if the cutting arc is not established. This helps minimize the use of the Pilot arc and conserve consumable life. It is used on long, steady cuts on solid metal. When the TIP Saver is set to off, the pilot arc ignites automatically. This is used for normal cutting chores that involve uneven surfaces, heavily oxidized/painted metals, and expanded grating where the cutting arc continuity may be lost.

NOTICE: There are multiple sizes of cutting tips. The orifice size of the cutting tip should match the Amperage being used. Use the torch parts page to find the amperage range to match each tip orifice size. Using the wrong size for the Amperage selected can shorten consumable life or lead to unstable arc or excess bevel.

Component Identification and Explanation

Using the PowerSet Menus.

The PowerSet function is a synergic function designed to provide the user with a simplified set up process. It provides the user with a recommended setting while simultaneously allowing a workable range of settings based off of industry accepted norms. It can be used as a general guide for set-up and eliminates the need for complicated charts and user guides.

To use the PowerSet menu properly, the user must input basic operating parameters, such as wire type (selected by the process), wire diameter and material thickness to provide useable results. These are all the same type settings you'd have to reference in a user setup chart. Although the settings provided to the user are based off of industry accepted "norms," the provided settings may not work for every user in every application. The programming is designed to provide a target, or recommended setting, but the unit also provides a range of adjustment both higher and lower than the recommended setting to allow fine tuning to accommodate differences of joint design, user welding style and weld position. Although the range of adjustment is fairly generous, there are limits set by the machine's programming to attempt to keep the unit from going too far off track. The programming will block further adjustment after the limits of the range are reached. The PowerSet is also equipped with visual graphical aids to help the user see and visualize the settings. The settings will have a tapered graphic is also color coded to indicate a normal range of a setting and guide the user further in fine tuning. As the setting is fine-tuned, away from the recommended settings and toward the setting limits, the graphic will eventually change from green to yellow, and finally to red to indicate the general "safeness" of a permitted adjustment.

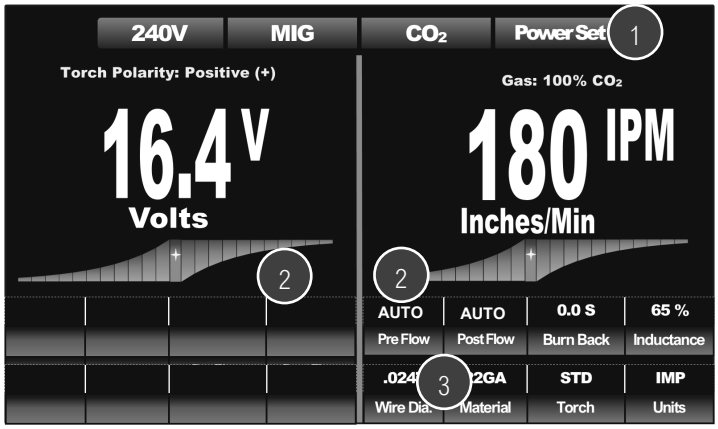
Keep in mind that synergic settings cannot take into account every variable and allows the user independent control to manually correct the provided settings to accommodate differences in welding environment, user experience and skill. Also, weld position, joint fit-up, and cleanliness all are "hidden variables" that can make a difference in the accuracy and effectiveness of the PowerSet settings. There is no perfect synergic system for every eventuality. The settings provided are given based off of in-position welding, good fit-up/joint design and assumes at least an intermediate level of understanding and skill of the operator. The PowerSet function has been tested for acceptable function under industry recommended operating conditions and parameters.

It should also be noted that welds greater than 3/16" with the unit are generally performed in multiple passes for best results for short circuit welding. The unit does offer higher settings and may recommend a gas change as the wire speed and voltage enter the Globular and Spray transfer range to perform single pass welds (MIG C25 process selection). If the user is not informed on the differences between the types of MIG wire transfers and does not understand the requirements and expectations and limits of different forms of wire transfer and observe the recommendations given, the unit may not perform satisfactorily.

NOTICE: To prevent completely unworkable mismatches in wire, tungsten or electrode capability, selection choices of inputs or parameter adjustments may be limited or completely blocked, even if further adjustment is represented graphically on the screen (such as metal thickness if MIG wire diameter is too small). This is intended to remind the user that there are physical limits to choices of wire, tungsten or electrode (welding rod) can support. Even with these limits, it does not always mean that performance will be perfect or desirable. Near or at the physical limits of wire or electrodes (or input voltage), spatter may increase and weld performance or arc stability will decrease. **The limitation of adjustment with some settings or combination of user inputs is not a malfunction of the unit.**

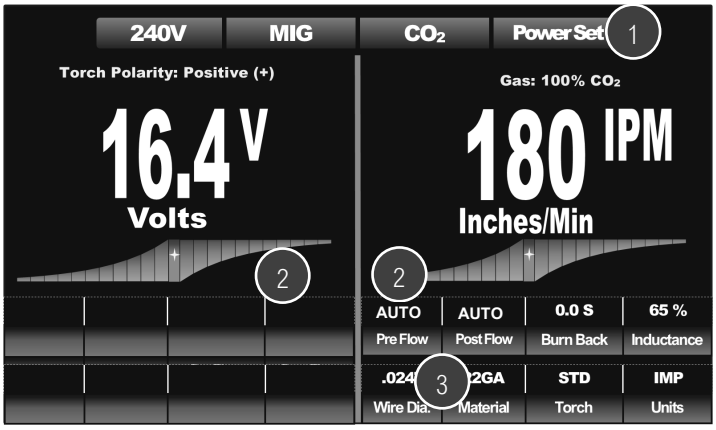
All PowerSet Menus.

In comparison to the Manual Menus, the PowerSet Menus are simplified in regards to the amount of controls and functions needed for proper adjustment. The menu is reduced to more basic functions, but still allows all critical adjustments to be made. The rest are preset by the factory or all together eliminated. The basic layout, operational information provided on screen and method of navigation/adjustment are mostly unchanged from the manual mode, so the information will not be repeated, unless there is a difference in function or process of setup.



1. When the PowerSet mode button is activated on the right lower side of the panel, this box will change from Manual to PowerSet to confirm that the PowerSet mode has been selected.
2. The adjustment range graphic is designed to aid the user a visually by indicating how the adjustment is affecting the setting. Depending upon the parameter being adjusted, the graphic may change in appearance. For Volts, Amps and Wire Feed Speed, the graphic appears as shown above in the picture. As the user makes progresses further away from the recommended adjustment, the graphic will also change color, turning from green to yellow and finally to red. The red and yellow areas indicate that the adjustment is not recommended and serves as a general warning that performance may not be optimal, even if it is allowed. For other adjustable parameters or input functions the graphics will change in appearance to better illustrate the.

Component Identification and Explanation



1. When the PowerSet mode button is activated on the right lower side of the panel, this box will change from Manual to PowerSet to confirm that the PowerSet mode has been selected.

2. The adjustment range graphic is designed to aid the user a visually by indicating how the adjustment is affecting the setting. Depending upon the parameter being adjusted, the graphic may change in appearance. For Volts, Amps and Wire Feed Speed, the graphic appears as shown above in the picture. As the user makes progresses further away from the recommended adjustment, the graphic will also change color, turning from green to yellow and finally to red. The red and yellow areas indicate that the adjustment is not recommended and serves as a general warning that performance may not be optimal, even if it is allowed. For other adjustable parameters or input functions the graphics will change in appearance to better illustrate the. **Input functions such as Wire Diameter or Material thickness have no target or recommended value and simply relay the chosen input value in the form of a graphic as a visual aid.** Other basic parameters such as torch or pre/post flow have no recommendation so there is no adjustment graphic for those. For specific parameters, such as inductance, the graphic indicates the recommended preset and allows the user to make adjustments, but indicates settings that may not be ideal as the graphic slopes up or down, away from the center setting. Other types of graphic representations are:

- Material Thickness: 

- MIG Inductance or Stick Arc Force: 
- Diameter (wire, tungsten or electrode): 

3. PowerSet requires user defined input parameters.

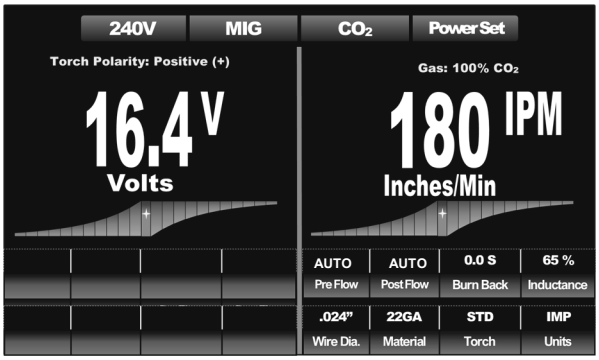
- For MIG, the required input parameters, after selecting the correct process (for wire feed processes, the correct wire and gas type are assumed by the selection of the wire process) are the input of the wire diameter and material thickness.

- For TIG, the required user input parameters are Tungsten Diameter, and Material Thickness.

- For Stick, the required user input parameters are Rod type (Electrode Selection, Rod Diameter and Material Thickness.

MIG,TIG and Stick process specific PowerSet information.

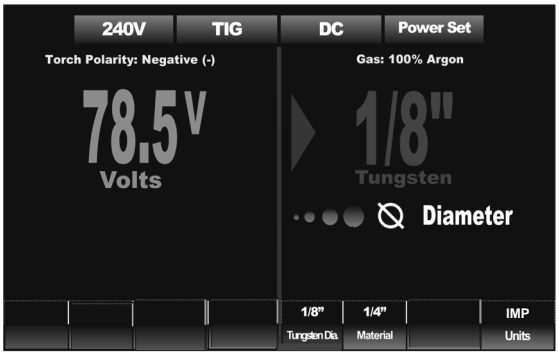
MIG/Flux-Cored:



The range of inductance is limited to the range that will produce the most acceptable results. The center target setting for inductance will vary based off the wire feed process selection. This range will not always be symmetrical from the center target. The maximum wire diameter and material thickness selection will be limited while operating on 120V input.

DC TIG:

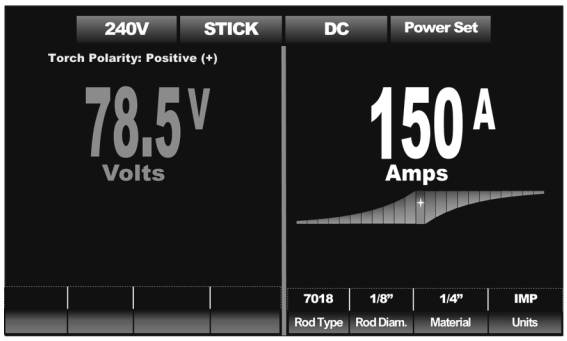
The TIG PowerSet version of DC Pulse is greatly simplified. Pulse is limited to only the Pulse Frequency (Hz) adjustment. The other parameters of Pulse Time On and Pulse Amps have been optimized for general purpose use and have been preset to simplify setup. Users may find that changes in pulse frequency may require adjustment to the recommended Amp settings to maintain the desired wet-in effects. Tungsten Diameter and Material Thickness selection will be limited while operating on 120V input.



DC Stick:

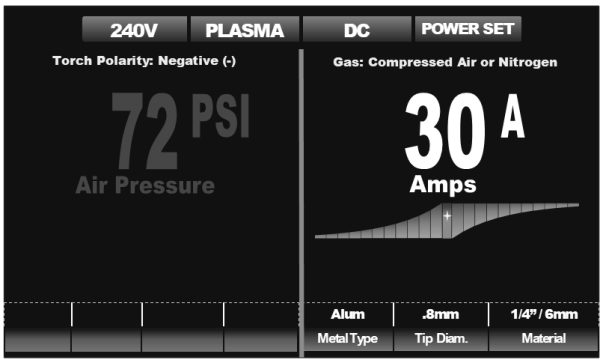
Stick performance relies upon the proper selection of the rod type/class to work well. However not all possible welding rods are listed in the PowerSet menu. If a rod is not listed, pick the selection with properties nearest the rod type listed in the selection menu. This method may not work in every case. For any cellulose rod not listed, pick E6010. For E7014 use either 6013 or 7018 and use the one that provides best results. VRD func-

tion and ANTI-Stick functions are not available in this mode.



Plasma Cutting:

The PowerSet Plasma cutting mode is also simple. The basic inputs of plate thickness, metal type, cutting tip nozzle diameter and air pressure are required. The air pressure is adjusted at the regulator on the rear of the machine instead of on the panel. The pressure will display on the front and change in value as the regulator is adjusted. If too little or too much air pressure is used, the unit will create an 06 Error code.



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 x Amps = Inches per minute (IPM)

.025": 3.1 x Amps = Inches per minute (IPM)

.030": 2 x Amps = Inches per minute (IPM)

.035": 1.6 x Amps = Inches per minute (IPM)

.045": 1 x Amps = Inches per Minute (IPM)

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

.023": IPM ÷ 3.5 = Amps

.025": IPM ÷ 3.1 = Amps

.030": IPM ÷ 2 = Amps

.035": IPM ÷ 1.6 = Amps

.045": IPM ÷ 1 = 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 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

EXPLANATION OF MIG FUNCTIONS AND TERMS

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 contaminates 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 manage 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, contaminates 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 contaminates 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 contaminates and gas pockets have the time to float out to the surface. It's far better to make 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 contaminates 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

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

if the metal deposited is the correct thickness is that it can slow the forward progress down. If weaving is too wide, one side of the puddle will cool and oxidize before the torch is brought back across to that side. This is a point where porosity can be introduced.

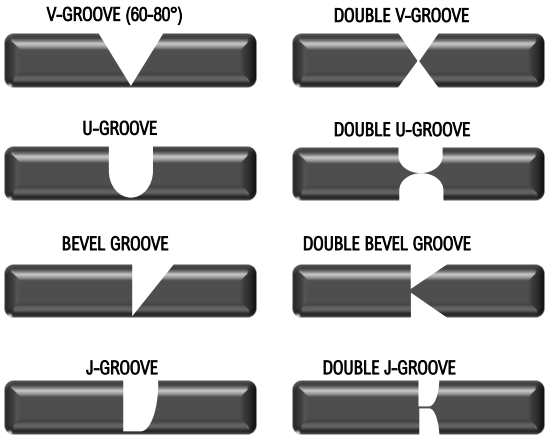
What Are the Different Kinds of Welds?

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.

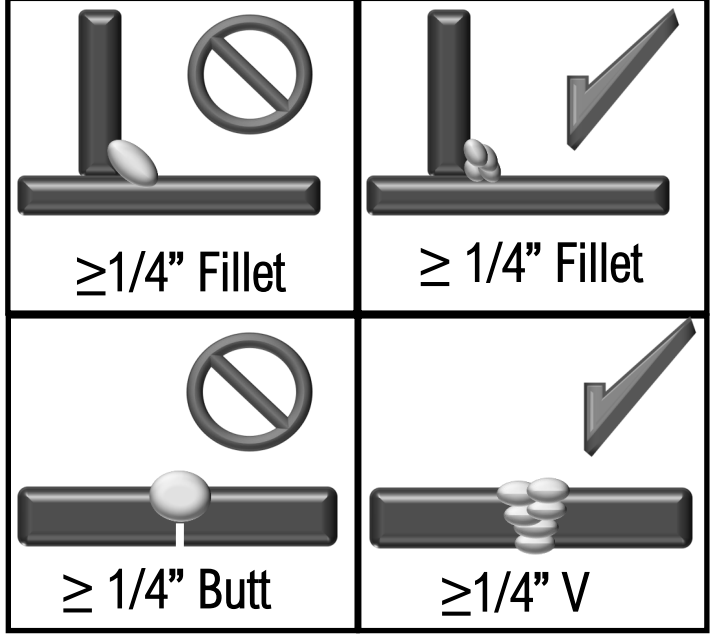
When Do I Use Multi-Pass Welds?

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.

Joint Preparation



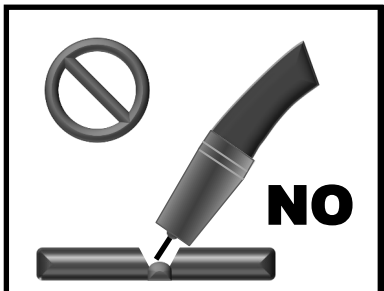
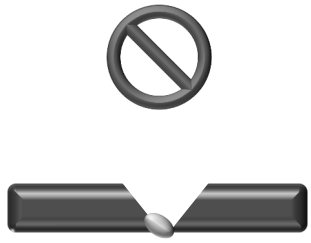
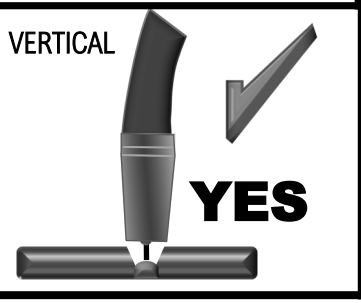
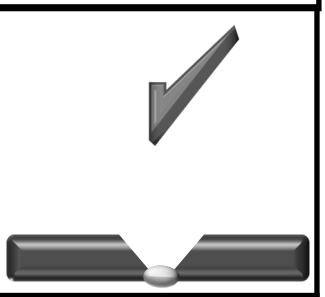
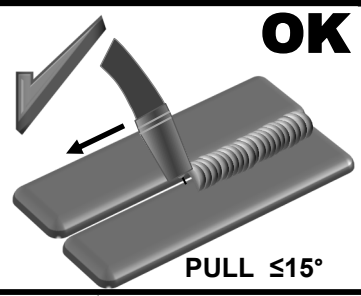
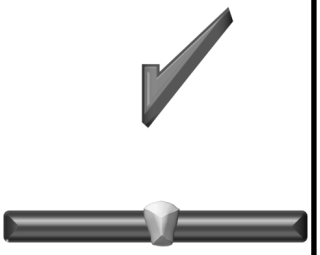
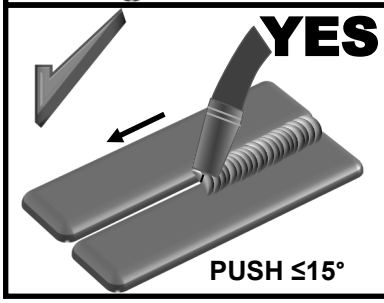
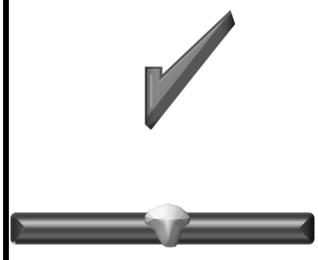
Weld Pass Examples



Component Identification and Explanation

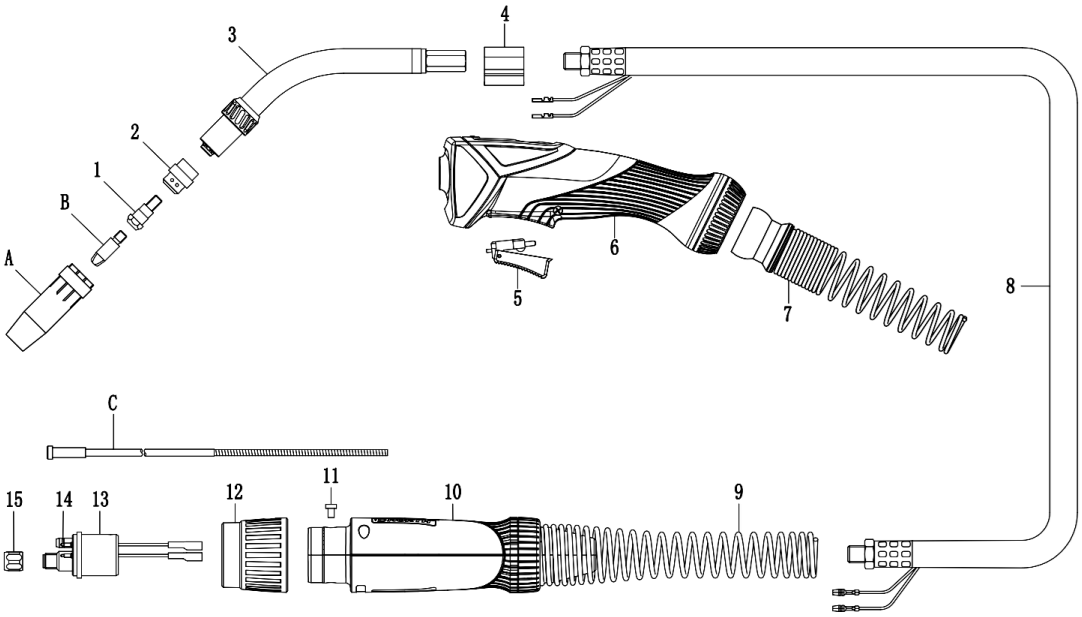
EXPLANATION OF MIG FUNCTIONS AND TERMS

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.*

	**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.	
	**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.	
	**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.	
	**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.	

Component Identification and Explanation

NORTH 24 SERIES (MB24KD STYLE) MIG TORCH PARTS BREAKDOWN



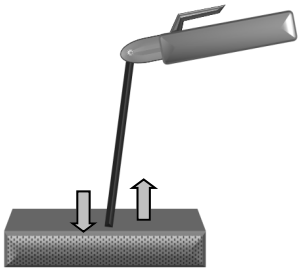
North SN 24 Series MIG Gun (MB24KD Style)		
Item	Part Number	Description
A	200300	Gas Cone/Nozzle 12.5mm
B	EB2206	Contact Tip .6mm M6x8x26 (.023" Heavy Style)
	EB2208	Contact Tip .8mm M6x8x28 (.030" Heavy Style)
	EB2209	Contact Tip .9mm M6x8x28 (.035" Heavy Style)
	EB2212	Contact Tip 1.2mm M6x8x28 (.045" Heavy Style)
C	302530	Red Liner .9 to 1.2 mm (.035"-.045") Opt. Blue liner for .6 and .8mm (.023"-.030") Steel. Optional polymer liner for Aluminum
1	EC2001	Contact Tip Holder
2	ED2001	Ceramic Diffusor
3	300624	Gun Neck 45°
4	305500	Plastic Receiver Body
5	EJ0001B	Trigger
6	NH0102HGG	Gun Handle
7	NS0101	Gun End Strain Relief Spring
8	EL2530	Cable Assembly 3m (9.5 ft
9	8M8500	Connector Spring Relief
10	NH0202HGG	Connector Body
11	Q210406B	Screw M4x6
12	NH020203	Connector Flaring Nut
13	EU1001A	Brass Power and Gas Connector Plate
14	Q504010	O-Ring 4mm x 1mm
15	EU1011	Liner Retaining Nut M10x1

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.



Tapping

Scratch/Match

HELPFUL HINT:

Pay particular attention to the Arc Force setting as it affects the aggressiveness of the arc and the amp response. To get started, 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.

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.

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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.

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 75 PSI while actively cutting. For best results, set your gas while it is flowing. **Do not set above 75 PSI.** Do not lower the air pressure in an attempt to improve cut at lower Amps with oversize 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

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 drug 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 anywhere 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 for 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 malfunction. Occasional wild or random starts with poor arc may be present.

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.

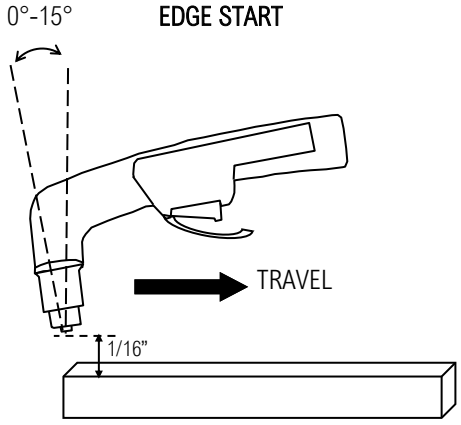
Component Identification and Explanation

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.

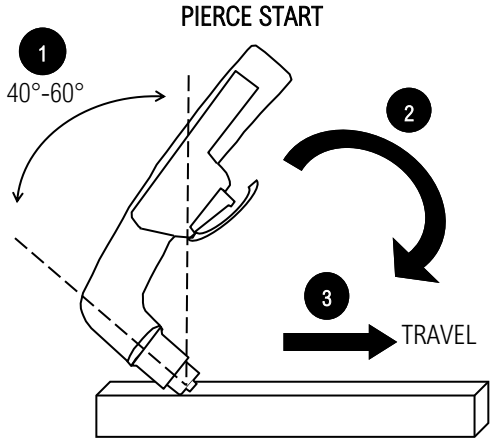
1) Line up the hole on the tip of the electrode on the edge of the cut. Hold torch perpendicular to the cut initially, about 1/16" off the metal. Slide the yellow safety lock and squeeze the trigger. Wait for arc to start.
2) Once the arc starts, wait for the arc to penetrate all the way through the 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 telltale 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 it 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:

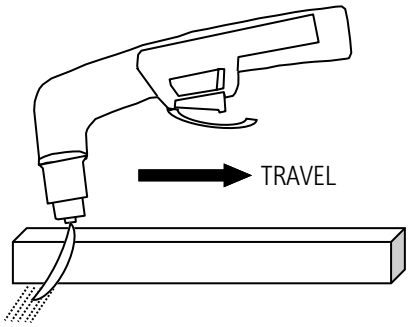
When lowering amps to cut thinner material, you must change to smaller orifice nozzle. Nozzles are offered in different sizes which are made for different amp levels. **See the torch parts page for amp range and size of consumables.** Everlast offers OEM size and configuration of consumables originally 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.*

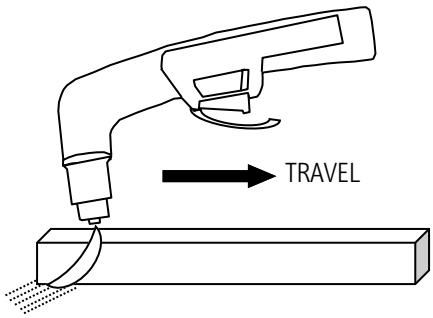
What should the torch flame look like?

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.

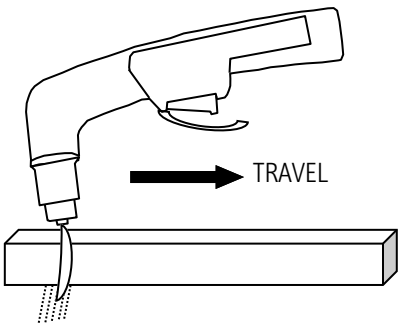
FLAME AT CORRECT TRAVEL SPEED



FLAME AT FAST TRAVEL SPEED



FLAME AT SLOW TRAVEL SPEED



Component Identification and Explanation

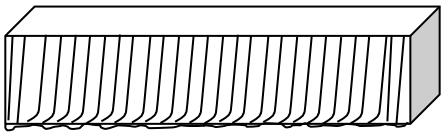
Explanation of Plasma Cutting Functions and Terms

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

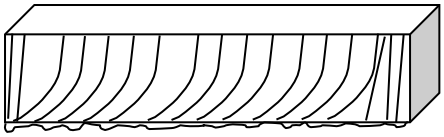
RESULTS OF CUT AT SLOW SPEED

VERTICAL CUT LINES

SIGNIFICANT SOFT, POROUS DROSS

RESULTS OF CUT AT FAST SPEED

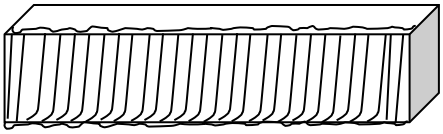
ROUGH, DISTINCT CUT LINES SPACED FAR APART



NOTICEABLE SMALL, HARD DROSS

RESULTS OF TOO MUCH STANDOFF OR WORN CONSUMABLES

TOP DROSS, SLIGHT BEVELING AT TOP



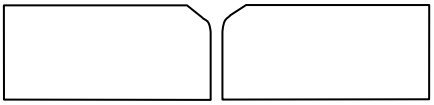
What other problems am I like to encounter?

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)

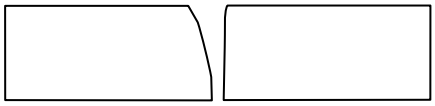
MELTED TOP EDGE



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

(END VIEW)

SEVERLY ANGLED CUT AT TOP



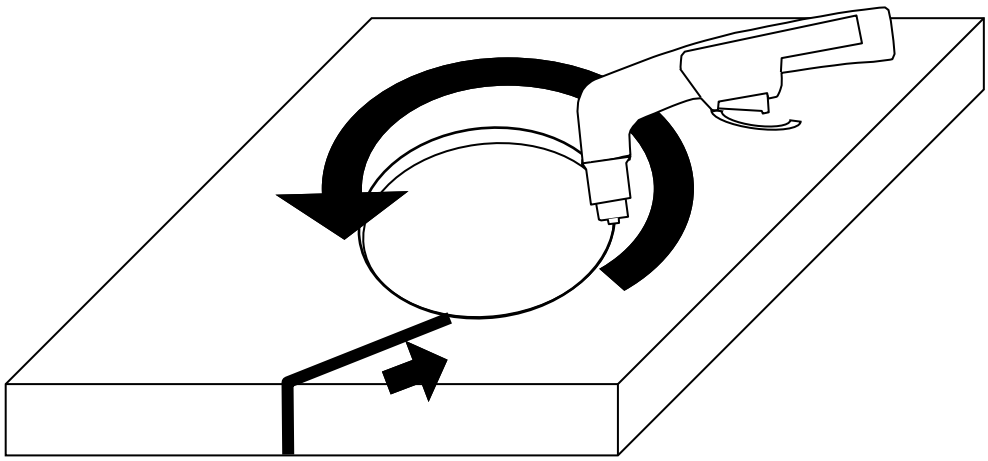
Component Identification and Explanation

Explanation of Plasma Cutting Functions and Terms

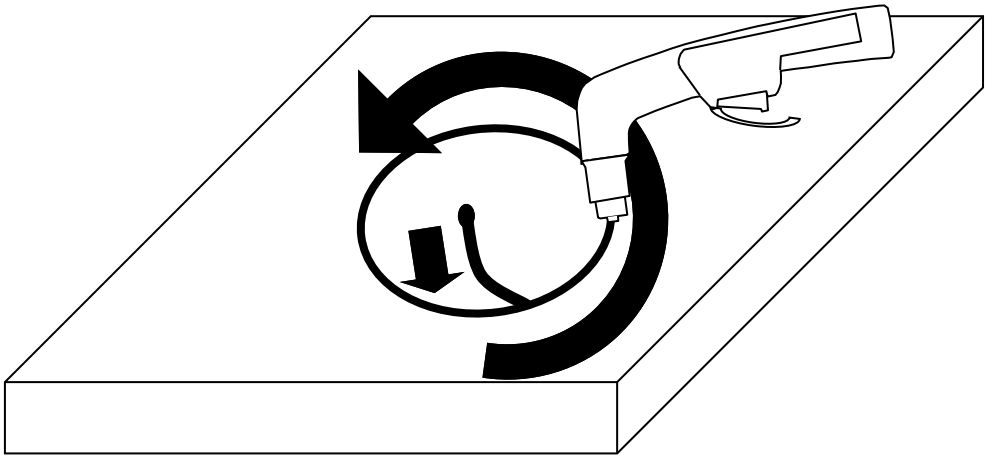
How Do I Use a Lead-in?

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

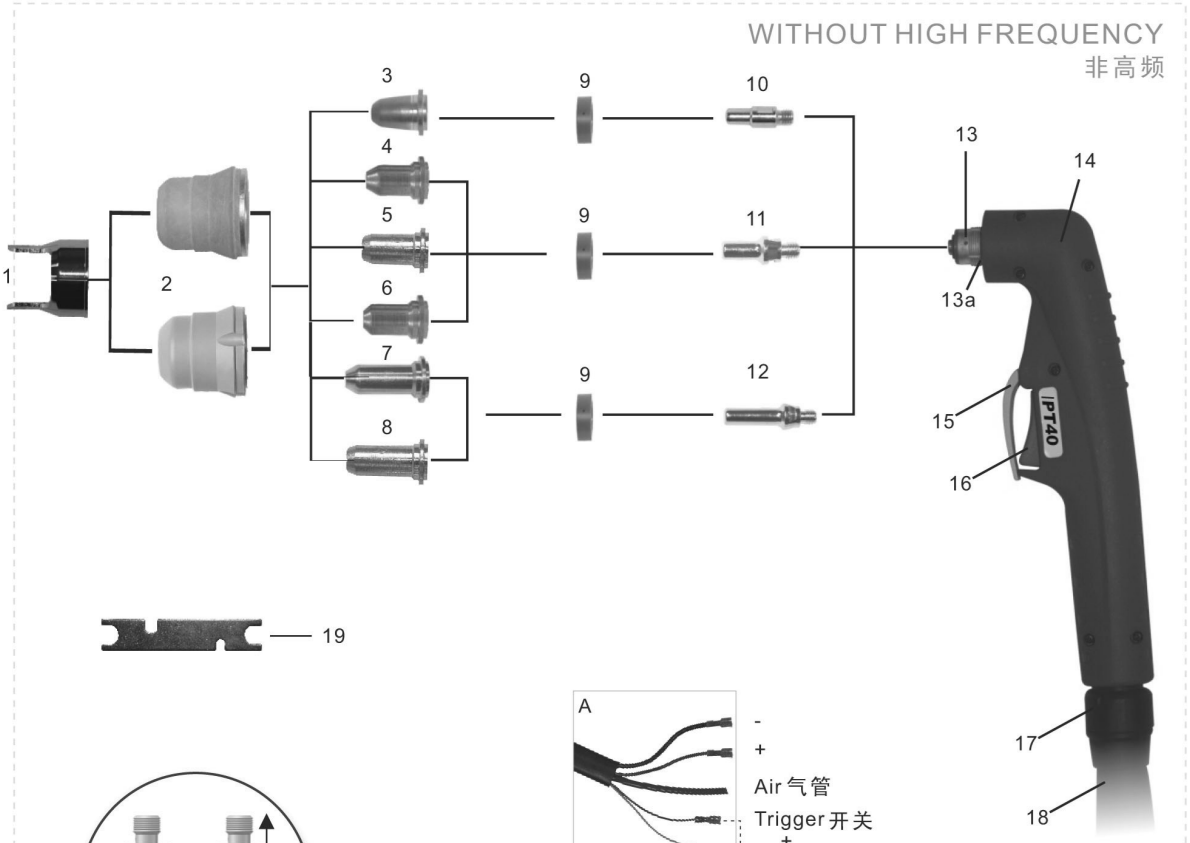


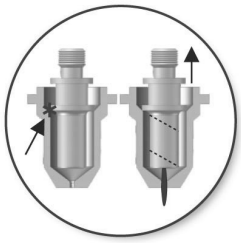
What is Kerf?

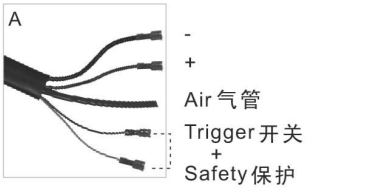
When you make a cut, a certain amount of material is removed from the cut. This is known as the kerf. In plasma cutting, knowing the width of the kerf is important to making accurate cuts. A typical kerf width from a plasma cutter will range from .045" to .090". The actual width of the kerf is affected 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 sputtering. 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 to 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.

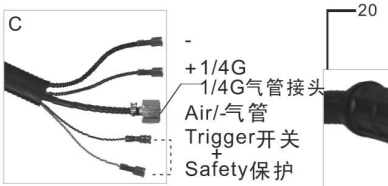
Component Identification and Explanation

iPT 40 Innotec Plasma Torch



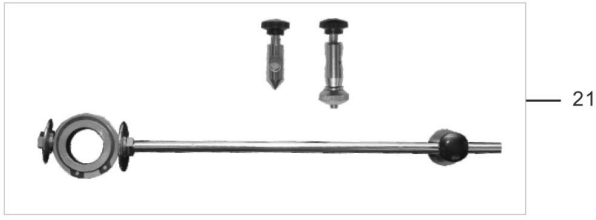






For the correct operation please use:
3-Ways Solenoid Valve,
inside orefic 2.3-2.7mm

Technical Data	技术参数
Current 额定电流	40Amp
Duty Cycle 占载率	60%
Gas 气体	Air/N_2 空气/氮气
Gas Pressure 气压	4.5–5.0 Bar
Gas Flow 气流量	100 LPM
Ignition 引弧方式	Without HF 非高频
Post Flow 气体延时	35 sec. recommended 推荐35秒
Standard Length 标准长度	6M



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 IPT25-40
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 15xΦ18mm;O型圈 Φ 15xΦ18mm
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 45 to 50PSI.
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.	Check.
		Service Breaker/ Input Line Damaged	Replace.
2.	After welding machine is overheating and the fan does not work.	Fan damaged.	Replace.
		Fan connector plus is loose	Check. Reinstall.
4.	Intermittent, wandering arc.	Work Clamp not connected directly to part being welded.	Reconnect.
		Work Clamp worn/damaged	Replace.
		Torch height too high.	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.	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.
		For Flux Core, a certain amount of spatter, haxe and smoke is common.	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.	Reduce Settings, use smaller wire
		Fan not running.	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.	Possible missing swirl ring. Pilot Arc wire is disconnected.
	Pilot arc will not transfer and amps read approximately 25-27 amps while switch is held. (Arc barely cuts or only "scratches" the surface of the metal or cut is extremely slow on thin materials.)	Check work clamp connection. Make sure rust is removed from work clamp contact area. Faulty Clamp. Arc continuity is not being sensed. If these steps do not correct the issue, contact Everlast.
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.