

EVERLAST

POWER i-MIG 140E

MIG/GMAW WELDER



Operator's Manual for the Power i-MIG 140E MIG Welder General Use and Setup Guide

everlastwelders.com

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1-877-755-9353
329 Littlefield Ave. South San Francisco, CA 94080 USA

Specifications and Accessories subject to change without notice.

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Dear Customer,

THANKS! You had a choice, and you bought an Everlast Product. We appreciate you as a customer and hope that you will enjoy years of use from your welder.

Please go directly to the Everlast website to register your unit and receive your warranty information. Your unit registration is important should any information such as product updates or recalls be issued. It is also important so that we may track your satisfaction with Everlast products and services. If you are unable to register by website, contact Everlast directly through the sales department at the main customer service number in your country. Your unit will be registered and warranty will be issued and in full effect. Keep all information regarding your purchase. **In the event of a problem you must contact technical support before your welder can be a candidate for warranty service and returned. An over-the-phone review/diagnosis must be performed BEFORE a RMA is issued or before the unit can be sent in for service.**

Please read the warranty statement published online and other important information found on the Everlast website of the division located in or nearest to your country. Print it for your records and become familiar of its terms and conditions. Guns, accessories and torches are covered under a separate, shorter warranty. Please be sure you visit the website and are familiar with all the warranty terms before you call for service.

Everlast offers full technical support, in several different forms. We have online support available through email, and a welding support forum designed for customers and noncustomer interaction. Technical advisors are active on the forum daily. We also divide our support into two divisions: technical and welding performance. Should you have an issue or question concerning your unit, please contact performance/technical support available through the main company headquarters available in your country. This support is free to all Everlast customers. For best service call the appropriate support line and follow up with an email, particularly if off hours, or you cannot reach a live person. In the event you do not reach a live person, leave a message and your call will normally be returned within 24 hours, except for weekends and holidays. Also for quick answers to your basic questions, join the company owned forum available through the website. You'll find knowledgeable staff available to answer your questions. You also may find a topic that already addresses your question at <http://www.everlastgenerators.com/forums/>. Should you need to call or write, always know your model name, purchase date and welder manufacturing inspection date. This will assure the quick and accurate customer service. **REMEMBER: Be as specific and informed as possible. Technical and performance advisors rely upon you to carefully describe the conditions and circumstances of your problem or question. Take notes of any issues as best you can. You may be asked many questions by the advisors to clarify problems or issues that may seem very basic. However, diagnosis procedures MUST be followed to begin the warranty process. Advisors can't assume anything, even with experienced users, and must cover all aspects to properly diagnose the problem. Depending upon your issue, it is advisable to have basic tools handy such as screwdrivers, wrenches, pliers, and even an inexpensive test meter with volt/ohm functions before you call.**

Let us know how we may be of service to you should you have any questions.

Sincerely,

Everlast Customer Service

Serial number: _____
Model number: _____
Date of Purchase: _____

EVERLAST

Contact Information

Everlast US:

Everlast consumer satisfaction email: sales@everlastwelders.com

Everlast Website: everlastwelders.com

Everlast Technical Support: support@everlastwelders.com

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

Main toll free number: 1-877-755 WELD (9353) 9am—5pm PST M-F
11am-4pm PST Sat.

FAX: 1-650-588-8817

Everlast Canada:

Everlast consumer satisfaction email: sales@everlastwelders.ca

Everlast Website: everlastwelders.ca

Everlast Technical Support: sales@everlastwelders.ca

Telephone: 905-630-8246 9am-4:30pm EST M-F
10am-1pm EST Sat.

FAX: 1-905-639-2817

Everlast Australia:

Sydney: 5A Karloo Parade Newport NSW 2106

(02) 9999 2949

Port Macquarie: 2B Pandorea Place Port Macquarie

(02) 6584 2037

After hours support: 0410 661 334

Everlast Technical Support: support@pickproducts.com

OTHER (Please record here for your records):

SAFETY PRECAUTIONS

Everlast is dedicated to providing you with the best possible equipment and service to meet the demanding jobs that you have. We want to go beyond delivering a satisfactory product to you. That is the reason we offer technical support to assist you with your needs should an occasion occur. With proper use and care your product should deliver years of trouble free service.



Safe operation and proper maintenance is your responsibility.

We have compiled this operator's manual, to instruct you in basic safety, operation and maintenance of your Everlast product to give you the best possible experience. Much of welding and cutting is based upon experience and common sense. As thorough as this welding manual may be, it is no substitute for either. Exercise extreme caution and care in all activities related to welding or cutting. Your safety, health and even life depends upon it. While accidents are never planned, preventing an accident requires careful planning.

Please carefully read this manual before you operate your Everlast unit. This manual is not only for the use of the machine, but to assist in obtaining the best performance out of your unit. Do not operate the unit until you have read this manual and you are thoroughly familiar with the safe operation of the unit. If you feel you need more information please contact Everlast Support.

The warranty does not cover improper use, maintenance or consumables. **Do not attempt to alter or defeat any piece or part of your unit, particularly any safety device.** Keep all shields and covers in place during unit operation should an unlikely failure of internal components result in the possible presence of sparks and explosions. If a failure occurs, discontinue further use until malfunctioning parts or accessories have been repaired or replaced by qualified personnel.



Note on High Frequency electromagnetic disturbances:

Certain welding and cutting processes generate High Frequency (HF) waves. These waves may disturb sensitive electronic equipment such as televisions, radios, computers, cell phones, and related equipment. High Frequency may also interfere with fluorescent lights. Consult with an electrician if disturbance is noted. Sometimes, improper wire routing or poor shielding may be the cause.



HF can interfere with pacemakers. See EMF warnings in following safety section for further information. Always consult your physician before entering an area known to have welding or cutting equipment if you have a pacemaker.

SAFETY PRECAUTIONS



These safety precautions are for protection of safety and health. Failure to follow these guidelines may result in serious injury or death. Be careful to read and follow all cautions and warnings. Protect yourself and others.



Welding and cutting processes produce high levels of ultraviolet (UV) radiation that can cause severe skin burn and damage. There are other potential hazards involved with welding such as severe burns and respiratory related illnesses. Therefore observe the following to minimize potential accidents and injury:



Use appropriate safety glasses with wrap around shields while in the work area, even under welding helmets to protect your eyes from flying sparks and debris. When chipping slag or grinding, goggles and face shields may be required.



When welding or cutting, always use an approved shielding device, with the correct shade of filter installed. Always use a welding helmet in good condition. Discard any broken or cracked filters or helmets. Using broken or cracked filters or helmets can cause severe eye injury and burn. Filter shades of no less than shade 5 for cutting and no less than shade 9 for welding are highly recommended. Shades greater than 9 may be required for high amperage welds. Keep filter lenses clean and clear for maximum visibility. It is also advisable to consult with your eye doctor should you wear contacts for corrective vision before you wear them while welding.



Do not allow personnel to watch or observe the welding or cutting operation unless fully protected by a filter screen, protective curtains or equivalent protective equipment. If no protection is available, exclude them from the work area. Even brief exposure to the rays from the welding arc can damage unprotected eyes.



Always wear hearing protection because welding and cutting can be extremely noisy. Ear protection is necessary to prevent hearing loss. Even prolonged low levels of noise has been known to create long term hearing damage. Hearing protection also further protects against hot sparks and debris from entering the ear canal and doing harm.



Always wear personal protective clothing. Flame proof clothing is required at all times. Sparks and hot metal can lodge in pockets, hems and cuffs. Make sure loose clothing is tucked in neatly. Leather aprons and jackets are recommended. Suitable welding jackets and coats may be purchased made from fire proof material from welding supply stores. Discard any burned or frayed clothing. Keep clothing away from oil, grease and flammable liquids.



Leather boots or steel toed leather boots with rubber bottoms are required for adequate foot protection. Canvas, polyester and other man made materials often found in shoes will either burn or melt. Rubber or other non conductive soles are necessary to help protect from electrical shock.



Flame proof and insulated gauntlet gloves are required whether welding or cutting or handling metal. Simple work gloves for the garden or chore work are not sufficient. Gauntlet type welding gloves are available from your local welding supply companies. Never attempt to weld with out gloves. Welding with out gloves can result in serious burns and electrical shock. If your hand or body parts comes into contact with the arc of a plasma cutter or welder, instant and serious burns will occur. **Proper hand protection is required at all times when working with welding or cutting machines!**

SAFETY PRECAUTIONS



WARNING! Persons with pacemakers should not weld, cut or be in the welding area until they consult with their physician. Some pacemakers are sensitive to EMF radiation and could severely malfunction while welding or while being in the vicinity of someone welding. *Serious injury or death may occur!*



Welding and plasma cutting processes generate electro-magnetic fields and radiation. While the effects of EMF radiation are not known, it is suspected that there may be some harm from long term exposure to electromagnetic fields. Therefore, certain precautions should be taken to minimize exposure:

- Lay welding leads and lines neatly away from the body.
- Never coil cables around the body.
- Secure cables with tape if necessary to keep from the body.
- Keep all cables and leads on the same side the body.
- Never stand between cables or leads.
- Keep as far away from the power source (welder) as possible while welding.
- Never stand between the ground clamp and the torch.
- Keep the ground clamp grounded as close to the weld or cut as possible.



Welding and cutting processes pose certain inhalation risks. Be sure to follow any guidelines from your chosen consumable and electrode suppliers regarding possible need for respiratory equipment while welding or cutting. Always weld with adequate ventilation. Never weld in closed rooms or confined spaces. Fumes and gases released while welding or cutting may be poisonous. Take precautions at all times. Any burning of the eyes, nose or throat are signs that you need to increase ventilation.

- Stop immediately and relocate work if necessary until adequate ventilation is obtained.
- Stop work completely and seek medical help if irritation and discomfort persists.



WARNING! Do not weld on galvanized steel, stainless steel, beryllium, titanium, copper, cadmium, lead or zinc without proper respiratory equipment and or ventilation.



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



WARNING! Do not weld or cut around Chlorinated solvents or degreasing areas. Release of Phosgene gas can be deadly. Consider all chemicals to have potential deadly results if welded on or near metal containing residual amounts of chemicals.



Keep all cylinders upright and chained to a wall or appropriate holding pen. Certain regulations regarding high pressure cylinders can be obtained from OSHA or local regulatory agency. Consult also with your welding supply company in your area for further recommendations. The regulatory changes are frequent so keep informed.



All cylinders have a potential explosion hazard. When not in use, keep capped and closed. Store chained so that overturn is not likely. Transporting cylinders incorrectly can lead to an explosion. Do not attempt to adapt regulators to fit cylinders. Do not use faulty regulators. Do not allow cylinders to come into contact with work piece or work. Do not weld or strike arcs on cylinders. Keep cylinders away from direct heat, flame and sparks.

SAFETY PRECAUTIONS



WARNING! Electrical shock can kill. Make sure all electrical equipment is properly grounded. Do not use frayed, cut or otherwise damaged cables and leads. Do not stand, lean or rest on ground clamp. Do not stand in water or damp areas while welding or cutting. Keep work surface dry. Do not use welder or plasma cutter in the rain or in extremely humid conditions. Use dry rubber soled shoes and dry gloves when welding or cutting to insulate against electrical shock. Turn machine on or off only with gloved hand. Keep all parts of the body insulated from work, and work tables. Keep away from direct contact with skin against work. If tight or close quarters necessitates standing or resting on work piece, insulate with dry boards and rubber mats designed to insulate the body from direct contact.



All work cables, leads, and hoses pose trip hazards. Be aware of their location and make sure all personnel in area are advised of their location. Taping or securing cables with appropriate restraints can help reduce trips and falls.



WARNING! Fire and explosions are real risks while welding or cutting. Always keep fire extinguishers close by and additionally a water hose or bucket of sand. Periodically check work area for smoldering embers or smoke. It is a good idea to have someone help watch for possible fires while you are welding. Sparks and hot metal may travel a long distance. They may go into cracks in walls and floors and start a fire that would not be immediately visible. Here are some things you can do to reduce the possibility of fire or explosion:

- Keep all combustible materials including rags and spare clothing away from area.
- Keep all flammable fuels and liquids stored separately from work area.
- Visually inspect work area when job is completed for the slightest traces of smoke or embers.
- If welding or cutting outside, make sure you are in a cleared off area, free from dry tender and debris that might start a forest or grass fire.
- Do not weld on tanks, drums or barrels that are closed, pressurized or anything that held flammable liquid or material.



Metal is hot after welding or cutting! Always use gloves and or tongs when handling hot pieces of metal. Remember to place hot metal on fire-proof surfaces after handling. Serious burns and injury can result if material is improperly handled.



WARNING! Faulty or poorly maintained equipment can cause injury or death. Proper maintenance is your responsibility. Make sure all equipment is properly maintained and serviced by qualified personnel. Do not abuse or misuse equipment.

Keep all covers in place. A faulty machine may shoot sparks or may have exploding parts. Touching uncovered parts inside machine can cause discharge of high amounts of electricity. **Do not allow employees to operate poorly serviced equipment.** Always check condition of equipment thoroughly before start up. Disconnect unit from power source before any service attempt is made and for long term storage or electrical storms.



Further information can be obtained from The American Welding Society (AWS) that relates directly to safe welding and plasma cutting. Additionally, your local welding supply company may have additional pamphlets available concerning their products. Do not operate machinery until you are comfortable with proper operation and are able to assume inherent risks of cutting or welding.

Overview of Parameters and Features

Power i-MIG 140E



Power i-MIG 140E	Specification
Construction Type	IGBT Inverter
Dimensions	17.5"L x 13.5"H x 8.5"W
Weight (Unit Only)	25 lbs.
Input Voltage/Phase/Hertz	115Volt (110-120V) 1 Phase/ 50/60Hz
Maximum Input Amps (I1MAX)	38.6V
Rated Input Amps (I1EFF)	19.5A
Duty Cycle at Rated Output	25% @ 140A/21V; 60% @ 90A/18.4V; 100% @ 70A/17.5V
Output Range (Amps/Volts):	25-140A/ 15.3-21V
Maximum Wire Speed	360 Inches Per Minute (IPM)
MIG Gun Type/Length	15 Series (Trafimet/Binzel Compatible)/6ft (2m)*
MIG Gun Connection	Euro Quick Connect
Regulator Type	Floating ball
Roll Size/Capacity	4" to 8" Diameter/ 1-12lbs
Wire Diameter (standard drive roll)	Solid Wire: .023"-.035" (.6-.9mm) **
OCV:	60V
Fan:	Continuous
Insulation:	F
Water Ingress Protection Standard	IP21S

* 2015 models feature 10 ft (3m) torches. **Recommend .023"-.030" for best results.

NOTE: Environment, Maintenance and Safety.

Keep welder at least 10-12 inches away from all objects for proper cooling. Do not exceed 40° C in environment or duty cycle will be reduced. Regularly inspect and clean the welder and circuitry on a quarterly basis with dry compressed air. Remove the covers only after the unit has been turned off and unplugged for 30 minutes to discharge the capacitors to reduce the possibility of electrocution. **Do not grind or throw sparks near to the welder to prevent damage to the panel face and internal components. Damage of this nature is not covered by the warranty.**

1.1 General Description, Purpose and Features.

The Power i-MIG 140E is a durable MIG (GMAW) welder designed for light repair and fabrication where 240V service is limited or not practical. The unit operates on 110/120V single phase input and comes equipped with a standard 120V NEMA 15-5P plug for convenient use in almost any standard 120V outlet. The Power i-MIG 140E's IGBT inverter design is rated for 25% duty cycle at 140 amps. It is designed to consume less power, provide better arc stability and offer better duty cycle over transformer welders in the 120V input class. There are no tapped settings which prevent fine adjustment of either voltage or wire speed. Both amps (wire speed) and voltage are infinitely adjustable within their ranges.

1.2 Basic Design and Construction. The Power i-MIG 140E features an advanced IGBT inverter design, with plug and play circuits and controls for maximum serviceability and lifespan. The unit has a full time high speed fan which maintains temperature levels providing increased duty cycle and performance. A heavy duty wire feeder mechanism features cast aluminum and steel construction for long life. The unit will accommodate 4" (1-2lb) and 8" (10-12lb) rolls of wire and features rapid tool-free, wire spool installation. Gun connection is quick with the tool-free design of the Euro quick connect fitting. The Work clamp is equally easy to install, and features a 25 series DINSE style connector. For transport or storage both MIG gun and work clamp can be disconnected in less than 15 seconds. The standard drive rolls included with the unit are designed for use with .023"-.035" solid wire. The smaller groove (.6mm) should be used with .023-.027" wire. The larger groove (.8mm) should be used with .030 and .035 wire. For general purpose use, Everlast recommends that .030" ER70S-6 wire be used for most general purpose welding. This diameter wire and class is designed to work well with the amp output range that the Power i-MIG 140E delivers. Special applications like aluminum may be welded with the optional spool gun. It is possible to weld aluminum with the main feeder and gun, but a special gun liner must be purchased and a harder wire such as 5356 should be used to prevent "bird's nesting" of the wire. Stainless can easily be welded with either the spool gun or the standard gun. Using a spool gun may be a more practical choice if welding smaller projects with stainless or aluminum since both stainless and aluminum wires are expensive. **Either coated (copper or other coatings) or uncoated steel wire may be used for welding steel as long as it remains rust-free and clean.**

NOTE: For flux core use, special drive rolls with a serrated design may be purchased from Everlast.

1.3 Installation. The design of the Power i-MIG 140E is compact and able to travel almost anywhere 120V service is available. For maximum output capability, a 30 amp circuit breaker is needed, with a minimum of a 20 amp slow trip circuit breaker recommended. If operating on a 15 amp circuit near the maximum amp/volt settings of the welder the circuit breaker may trip. If this happens, reduce the settings on the welder.

Care and common sense should be taken to make sure that the welder offers the safest and best performance. Please note the following items regarding safe operation:

- 1) Do not use the welder in damp or wet areas. Perspiration and other forms of water in contact with the body can increase the risk of electrocution.
- 2) Do not use the welder in extremely corrosive environments. To maintain optimum power transfer, check main connections, clamps and cables frequently to ensure that components are not corroded. Excessive dirt, corrosion and oxidation can result in an unstable arc and excessive heat build-up.
- 3) Do not kink or tightly coil the MIG gun or the wire may not feed properly. Coiling tightly may even damage the liner or cable if the cable becomes kinked. Always use the MIG gun with the cable running as straight as possible. Gentle, natural curves are acceptable. Do not stand on or roll objects over the welder cables. Pay close attention if the welder is on a rolling cart so that the cables are not accidentally rolled over when moving it around.
- 4) Do not pull, hold, or suspend the welder by the gun or cables. Pick up the welder from the handle only.
- 5) Due to the light weight and compact size, strap or tie the welder down (over the top) to prevent accidental overturning while in use on a table or cart.

1.4 Duty Cycle. Duty Cycle is expressed as the percentage of time out of 10 minutes at the rated amps/volts that the welder can weld without an interruption or break. After this the welder should be allowed to rest the remainder of the 10 minutes. If the duty cycle light is triggered, the welder will stop welding. If this happens, allow the welder to continue to idle and cool for 15 minutes. After giving the unit time to cool, cycle the power switch off and back on to reset the welder and resume welding. Lowering the welder output will increase the duty cycle duty cycle. This welder has a rating of 25% @ 140 amps. Lowering the amperage to 90 amps increases the duty

cycle to 60%. Lowering it further to 70 amps increases duty cycle to 100%. Keep in mind a 100% duty cycle rating is not a continuous, infinite rating. It is rated 100% only out of a consecutive 10 minute period of time. Certain factors like ambient temperature, humidity, particle/dust buildup inside of the welder, poor quality power input etc, all can affect duty cycle. The duty cycle interrupt cycle is governed by a temperature sensor rather than a timer. This is a more effective and practical way of determining duty cycle limit. Intermittent welding and many practices involved in fabrication and repair makes it hard to track usage so a temperature limit is the best way to protect the welder if it is overworked. Intentionally and consistently reaching the duty cycle limit so the welding is regularly interrupted rapidly ages components and may cause premature failure of the welder. The duty cycle interrupt feature is not a fail safe against abuse and any heat related damage. **Never turn the unit off until it has time to cool.**

NOTE: If you are welding and the unit begins to feed wire only without an arc when the trigger is pressed, check the status of the duty-cycle light or the overcurrent light. When either an overcurrent or duty cycle event has occurred, the unit will keep feeding wire but not produce an arc when the trigger is held down.

1.5 **Overcurrent.** The unit is also equipped with an overcurrent limiter. This feature detects when there is either an over/under voltage or excessive amp draw. If the overcurrent light is triggered, the unit will also interrupt welding. When this is experienced, first power the unit off. Then check to make sure the unit is plugged into an appropriately rated outlet and that it is being used with a correct sized extension cord rated for a minimum of 20 amps. Do not use with undersized extension cords or overheating, fire or damage may result. Check outlet voltage for a minimum of 110V and not more than 125V. Cycle the power switch off and back on to reset the unit. If the Overcurrent light does not clear, then it is likely the power supply is poor or the unit has developed an internal fault. Contact Everlast if the overcurrent cannot be cleared or reoccurs repeatedly as the unit may have sustained internal damage.

NOTE: When using large diameter welding wire (.035" or greater) at or near the maximum output of the machine, the welder may occasionally experience an overcurrent. This can happen if the wire is not trimmed to an appropriate length and the gun is touched held too far away when starting the arc. Remedy all other causes first before assuming this is the

issue. This may also occur if the contact tip is touched to the metal when starting the arc. It can occur if the gun nozzle has excess slag bridging inside of the nozzle to the contact tip and the nozzle is subsequently touched to the metal when starting the arc. This creates a dead short and can trigger an overcurrent.

1.6 General operation and setup.

- 1) **Wire Tension.** Always check wire tension before use. Use no more wire tension than is necessary. (See page 15 for adjustment.)
- 2) **Work Clamp.** MIG welders require good work clamp (ground) contact. Routinely inspect work clamp and cable and make sure they are in good condition and that the cables are held tight in the connectors and are free of corrosion. **Always grind a small clean spot where the work clamp is to be attached. Always connect the work clamp directly to the metal being welded if possible. Hard starting or "machine gunning" at the start of the weld may be a result of a poor ground.**
- 3) **MIG gun use and maintenance.** Before use make sure that collar on the Euro quick connect has been fully tightened by hand. Do not use tools. Grip the gun firmly when starting the arc to prevent push-off and spattering/popping at the start of the weld. Trim the wire to 1/2" or less and hold the gun just as close to the metal to start the weld. Use nozzle dip or a anti spatter spray to help keep the MIG gun nozzle from becoming plugged with slag. Regularly check and clean the nozzle. Nozzle dip and anti spatter can be bought at almost any welding supply store. It is an economical way to prevent harmful accumulation of slag in and on the nozzle and can be used in the weld area to prevent spatter from sticking to the work-piece. Do not apply too much to the nozzle or directly to the weld area or porosity may occur. Only apply when the protective qualities begin to dissipate. Nozzle dip and anti spatter also provide some lubricity to the contact tip and increases the lifespan and ease of feeding. Make sure to change contact tip size when changing the wire size. **Using too large of a contact tip can cause erratic arc behavior. Using too small of a contact tip can cause jamming.** When welding with aluminum, use a special aluminum contact tip or at least one size larger regular contact tip to accommodate the wire as it expands due to the heat. Over time, the gun liner may become gradually fouled with dirt, metal filings from the coating and other possible contaminants. To

prevent this, regularly remove the wire from the cable, and blow dry compressed air down the gun neck with the contact tip removed. If necessary remove the liner and replace it if becomes worn and irregular or difficult feeding or gas flow is observed. **NOTE: (Binzel/Trafimet 15 series) When removing the shielding gas nozzle, twist the nozzle like a screw to install or remove as it grips the nozzle tightly. There is a special retaining spring under the nozzle that acts as a thread. This feature allows you to position the nozzle in order to vary the depth of the contact tip for different welding applications.**

- 4) **Shielding gas selection and use.** For MIG operation, selection of the proper shielding gas is important. **Remember, each shielding gas mixture and filler metal thickness will require a different setting of voltage and amps.** A 75/25 (75% Argon/25%CO₂) mixture is recommended for general purpose steel welding. This yields the best results in most circumstances. To reduce spatter further, other blends of Ar/CO₂ with higher percentages of Argon (a true inert gas) may be used. The puddle may be difficult to control and cold lap may occur if the mix is over 85% Argon, especially if used in out of position welds. Generally, when there is a higher percentage of Argon present in the mix, the cost of the mix will be greater. Though less desirable, 100% CO₂ may also be used. Greater penetration with a narrower bead profile can be achieved with 100% CO₂. However, extra spatter, smoke and oxidation will be noticed. CO₂ is not a true inert gas so it can impart a dull gray, and even flaky appearance to the weld as it interacts with the molten metal. If 100% CO₂ is used, regularly check to ensure the regulator is not freezing up. CO₂ offers a cheaper option but losses in transfer efficiency (amount of metal actually deposited versus total amount consumed) and extra time spent for cleaning spatter may negate initial cost savings. For Stainless, a commercial Tri-mix of gas is generally used for short circuit transfer. This is usually a proprietary % blend of Argon, Helium, and CO₂. Consult with your local welding supply store. For aluminum, 100% Argon must be used.
- 5) **Regulator and shielding gas flow adjustment.** **NOTE: Regulators may be supplied in LPM or CFH. Please note which has been provided before starting to weld for future reference.** The regulator should always be mounted nearly vertical if not with a slight upturn (for safety) so that the ball may float free. **Always stand to the opposite side of the regulator and slowly open the regulator with the front and top of the regulator facing away from you.** Gas flow requirements vary in MIG greatly and a lot depends upon the environment. More gas will be required in open/drafty areas. To avoid wasting shielding gas, perform some preliminary test welds. To adjust, decrease gas flow until the weld begins to bubble and exhibit porosity. Gradually increase the gas flow until the bubbles disappear completely. Crack the adjustment on the regulator an small additional amount to ensure full gas coverage. This process will reduce waste and help ensure you are not introducing oxygen into the weld. As the pressure drops within the cylinder readjustment may be necessary.
- 6) **MIG polarity.** When using solid MIG wire, the polarity should always be electrode positive. This means the torch should always be connected to the positive (+) terminal when welding with solid wire. To check this, open the cover, and inspect the heavy power cable that runs from the front end of the wire feeder to the bolted terminals on the center divider wall that are marked either with a positive (+) sign or a negative (-) sign. The cable should be screwed down to the terminal marked with the (+) sign for solid wire. For flux core, most (but not all) manufacturers of flux core wire specify the use of negative (-) polarity. Consult the manufacturer's recommendations regarding flux core or dual shield wire polarity before installation. If negative polarity is required, swap the feeder cable to the negative terminal. Always make sure the terminal screw is fully tightened. Do not over tighten the terminal or it may strip out the terminal threads. **If, after switching between solid and flux core wire, an erratic arc is noticed, double check the polarity. This is a commonly overlooked part of the changeover procedure.**
- 7) **Volt and Amp adjustment.** The welder features infinite adjustment of voltage and wire feed speed within each range. Wire speed adjustment is directly related to amp output and the terms are generally used interchangeably. As wire speed increases so does amperage and vice versa. In many welding charts and calculators, you may find actual amperage settings rather than a wire speed setting. Amperage output also depends upon the diameter of the wire as well. Both volts and amps are calibrated in numbers ranging from 1-10 with infinite adjustment possibility between each number. These are relative numbers and are used only as a reference when repeating the same or similar set-

up. If helpful for setting up the unit, the numbers 1-10 can be thought of as representing 10%-100% of full output for either voltage or wire speed. For each wire diameter, most users will find 3 to 5 settings that will fit their welding style and applications but often the ability to fine tune these settings for specific applications will be needed. **At first, some experimentation will be necessary.** The following method of setting up wire speed and voltage is commonly used by professionals in the industry to setup almost any type MIG. When setting up welding parameters, set the wire speed halfway then begin to lower the voltage until it begins to cold feed into the metal (also referred to as stubbing). Note the point where it begins to do so. Next, raise the voltage until the puddle becomes hot and the arc seems violent and irregular. Note that point as well. Lower the voltage to a point midway between the two extremes where the arc seems to even out. After the voltage is set, gradually adjust the wire feed/amps until the sound of the arc is crisp. Listen to the arc. A steady sizzle, or whine should be present. The weld puddle should be wetting out neatly on the edges of the weld. This sound has often been referred to as a “frying” sound. The sound should be regular, and the arc should be visually stable without significant popping and snapping. The wire should be disappearing easily into the puddle without the arc stopping. If the wire speed is too high, violent popping with bits of flying wire may be noticed. If it is too low the arc will appear to melt the wire before it reaches the puddle and may melt irregularly, even burning back into the tip. **Volts are responsible for how flat and wet the puddle appears.** If too much voltage is used, the weld will appear wide and flat with the edges of the weld possibly exhibiting undercut. This will create weakness in the weld. If too little is used, the weld will appear rope like and may even sit on top of the metal with irregular fusion. **Ampage/Wire speed is responsible for penetration.** If it is set too high for the thickness of metal being used, burn through can occur, especially on thin gauge material. If welding thin materials such as used in exhaust systems or body work, make sure the wire speed is adjusted to reduce penetration before attempting a voltage change. **General figures for both wire speed and amps can be easily determined.** To determine wire speed, simply press the trigger (without welding) and hold it for 15 seconds. Measure the length of the wire that is run from the torch in 15 seconds and multiply by 4.

This figure is your wire speed in inches per minute (IPM). To roughly determine amps, which are sometimes used by manufacturers for recommended settings, use the following formulas for the following wire thicknesses:

.023”: $IPM/3.5 = Amps$

.030”: $IPM/2 = Amps$

.035”: $IPM/1.6 = Amps$

The actual constant given in this formula represents “inches per amp”. This formula is only a guide and is only accurate in lower ranges as the function is not truly linear. But it usually will be within the overall range specified by the manufacturer. For each manufacturer, the filler wire diameter amp range may differ somewhat, though a general range can be established.

1.7 Spool Gun. The spool gun is an optional, but useful tool to have for welding small and medium projects aluminum projects that are 3/32” and over in thickness. The spool gun connects directly in place of the regular MIG gun. The Spool gun picks up the gas and power at the Euro connection with a separate control connection for the trigger on the spool gun. Once the spool gun panel switch is flipped, the trigger will control on and off operation of the gun. Wire speed and voltage are still controlled at the panel however. **NOTE: Some guns Everlast sells may have a separate control mounted on the spool gun handle for wire speed, but is inoperative and is not used with this unit.** When welding aluminum, the unit should be welded in the spray arc mode. Typically spool guns are good for welding 3/32” and thicker aluminum. Spray arc mode is a mode where the voltage is increased to near maximum voltage for this unit, and wire speed is adjusted so that the wire melts in a steady stream of consistently sized droplets before the wire contacts the metal. A slight hiss will be present if done correctly. There is a threshold for spray arc, and it requires higher voltage and increased wire speed to force it into this mode. This is a quieter mode than regular short circuit with quick wet in and fast forward travel. It’s recommended that .030” wire be used to achieve the best results. .023” wire may be used as well, but the unit may not achieve true spray arc mode as it requires more wire speed than the wire feeder can generate. In general, the smaller the wire, the more wire speed is required for spray arc. Larger diameter wire may cause overcurrents and may not feed well through the gun. More information about spray arc welding with MIG can be found in a variety of educational welding resources online. Read over materials available and watch demonstration videos for more information.

SECTION 2**SETUP GUIDE AND COMPONENT IDENTIFICATION****General Reference Information for Operation and Parameters**Table 1 **GENERAL POLARITY RECOMMENDATIONS***

*Consult manufacturer directions of filler material. There are exceptions.

PROCESS	TORCH POLARITY	WORK POLARITY
MIG (GMAW)	+	-
FLUX CORE (FCAW)	-	+

Table 2 **GAS SELECTION GUIDE**

PROCESS	GAS
MIG (GMAW) STEEL	80/20 Ar/CO2 or 75/25 Ar/CO2
MIG (GMAW) STAINLESS	Tri-Mix (Ar/He/CO2)
MIG (GMAW) ALUMINUM	100% Argon

Table 3 **MIG (GMAW) CURRENT/WIRE/THICKNESS GENERAL SUGGESTIONS**

WIRE DIAMETER	WELDING AMPS (A)	PLATE THICKNESS	GAS FLOW RATE
.023" (0.6)	25-120	.040"-.125"	15-20 CFH/ 7-10 lpm
.030" (0.8)	35-200	.040"-.187"	20-25 CFH/ 10-14 lpm
.035" (0.9)	45-250	.063"-.250"	20-30 CFH/ 10-16 lpm

NOTES AND FAVORITE SETTINGS:

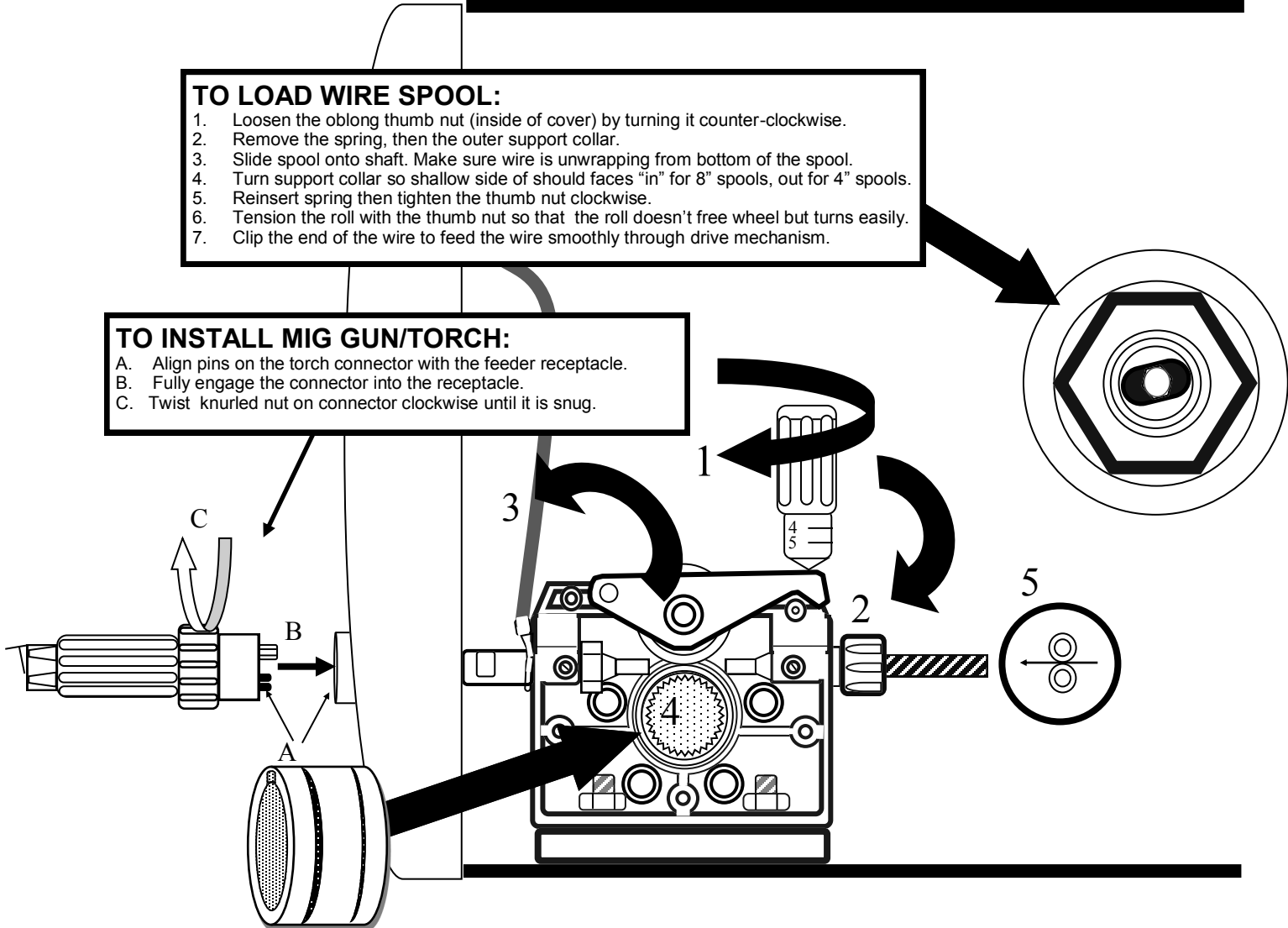
INSTALLATION OF FILLER WIRE AND MACHINE SETUP

TO LOAD WIRE SPOOL:

1. Loosen the oblong thumb nut (inside of cover) by turning it counter-clockwise.
2. Remove the spring, then the outer support collar.
3. Slide spool onto shaft. Make sure wire is unwrapping from bottom of the spool.
4. Turn support collar so shallow side of should faces "in" for 8" spools, out for 4" spools.
5. Reinsert spring then tighten the thumb nut clockwise.
6. Tension the roll with the thumb nut so that the roll doesn't free wheel but turns easily.
7. Clip the end of the wire to feed the wire smoothly through drive mechanism.

TO INSTALL MIG GUN/TORCH:

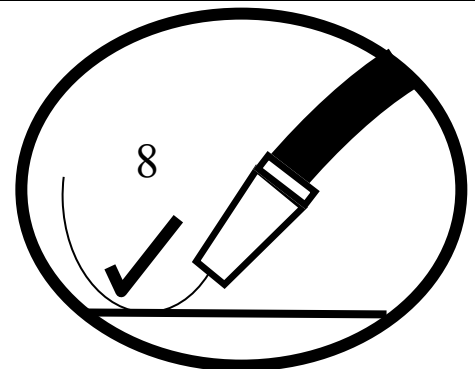
- A. Align pins on the torch connector with the feeder receptacle.
- B. Fully engage the connector into the receptacle.
- C. Twist knurled nut on connector clockwise until it is snug.



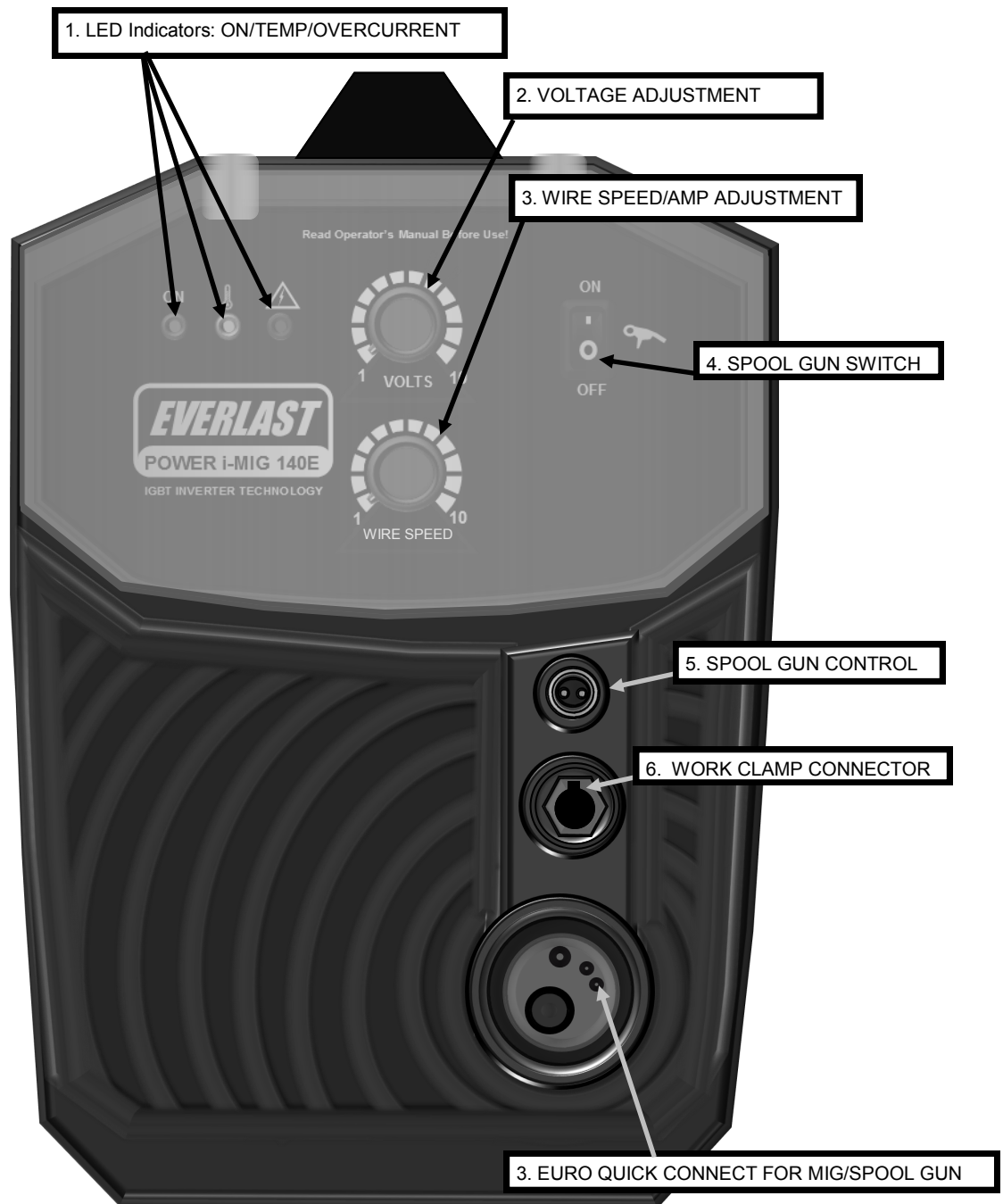
TO THREAD WIRE INTO FEEDER:

1. Loosen top idler tensioner, rotating counter-clockwise
2. Flip tensioner down, releasing top drive roll.
3. Raise top drive idler roller.
4. Inspect the drive roll to make sure that the groove size matches the wire diameter. Reversal of the lower roller may be necessary. To reverse the roller, remove the thumb screw securing the drive roll. Pull the drive roll off, and flip the drive roll over. Reassemble and tighten roller. If a flux core roller is needed contact Everlast.
5. Thread straightened wire into coiled sheath and over grooves in lower drive roll. Thread through until it threads into the gun section 3"-4". Lower the upper drive roll onto lower drive roll, keeping the wire securely fixed in the groove of the feed roller. Make sure the wire has been engaged in the correct groove.
6. Raise tensioner back into place. Tighten slightly so wire will feed. Notice markings on tensioner for future reference.
7. Hold torch straight out as possible. Press the gun trigger to feed wire until the wire exits the end of the torch. Remove contact tip if necessary to feed out wire.
8. Adjust tensioner clockwise until drive rolls will not slip when the wire comes into contact with a hard surface (a block of wood) and the wire will curl up on end. Remember to keep wire away from metal that is attached to the work clamp to prevent the wire from accidentally arcing.

Bottom Drive Roll (Standard)
 .6mm=.023"-.025" .8mm=.030"-.035"



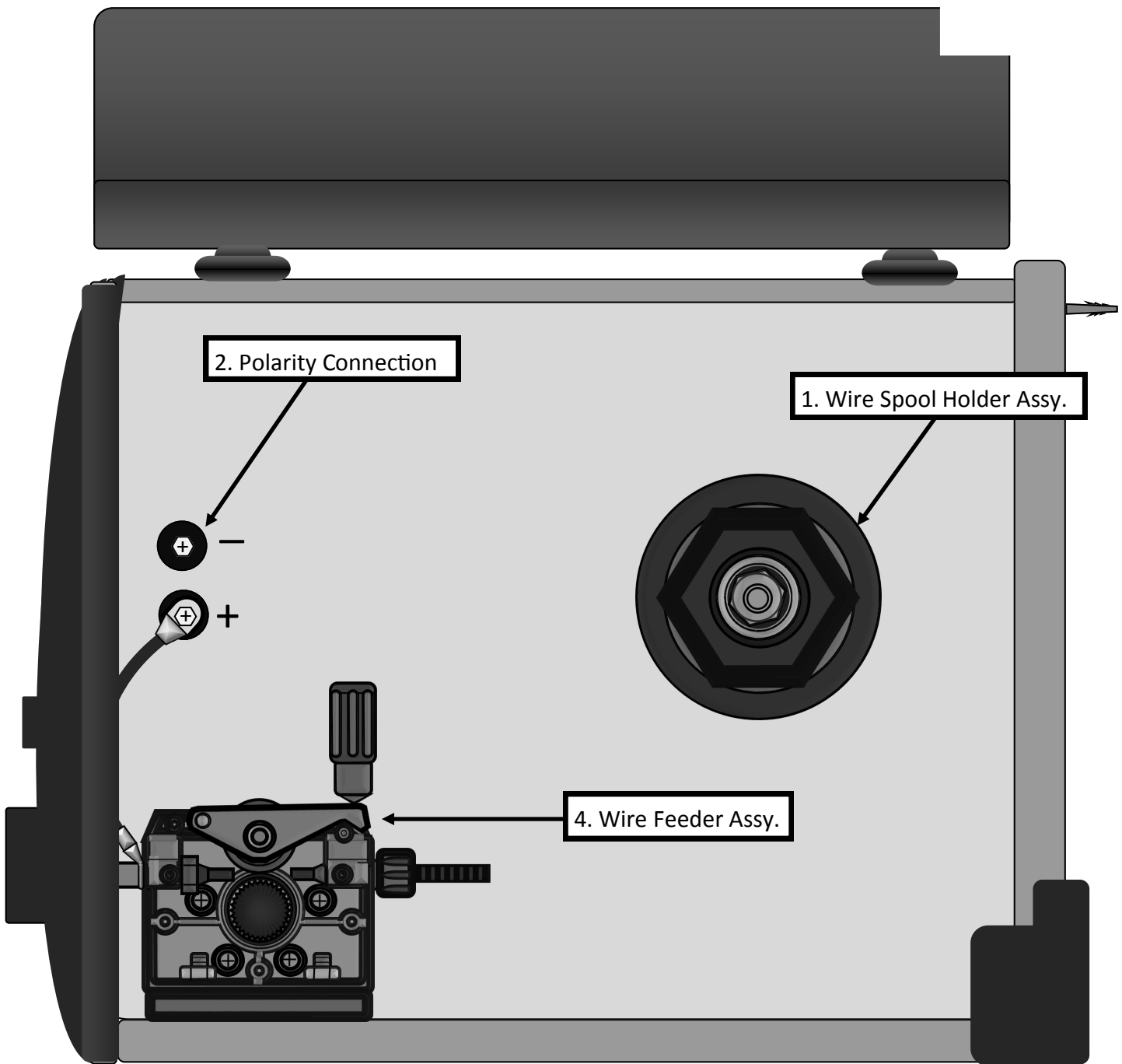
FRONT VIEW



Front Panel:

1. **LED Indicators.** The LED'S indicate the existing status of the machine. The On indicator is lit any-time the machine is turned on . The amber color light will be lit when the duty cycle has been exceeded. When it is lit, welding will be interrupted. (The wire will continue to feed but will not arc when the trigger is pressed.) If the duty cycle is exceeded, allow the unit to cool for 15 minutes before resetting the machine by powering it off and back on. Do no turn the welder off until the unit has sufficiently cooled. If the red over-current light is lit, welding will also be interrupted. If this light comes on, an overcurrent/ overvoltage or under voltage has occurred. Check wiring such as extension cords and circuit breakers for sufficient current carrying capacity. Also check to see if slag has bridged the space between the contact tip and the shielding gas nozzle or if the wire stick out is too long. Occasionally this may occur when using larger wire (.035") at or near maximum settings with a long stick out of the wire. Once the cause has been remedied, turn the power off and back on to reset the welder. If the light does not clear after remedying the cause, contact Everlast technical support for further diagnosis.
2. **Voltage Selector.** The voltage selector increases and decreases the voltage incrementally throughout the range. Increasing the voltage helps improve wet in and puddle fluidity. Too little voltage results in a ropey, narrow weld with poor fusion. Too much voltage results in an erratic, violent arc and undercutting.
3. **Wire Speed/Amp Selector.** The wire speed selector controls amperage throughout the range by varying the speed of the wire. The relationship between wire feed speed and amps is a direct one. Increasing one, increases the other. Actual amp output at the same given wire speed will vary with different diameter wires.
4. **Spool Gun Switch.** This switch changes the units output to the spool gun. The spool gun connects to the main Euro connection, and wire speed/ voltage control is retained on the panel.
5. **Spool Gun Connector.** The spool gun control wire is connected directly to this 2 pin connector. This provides On/Off control of spool gun feeding. It does not provide welding power.
6. **Work Clamp Connector.** This is where the work clamp connects to the welder. This is a DINSE 25 style connector. The work clamp cable can be lengthened by removing the rubber cover. Firmly grip the cover and slide it back. Under the connector is a set screw that retains the cable. If arc starting becomes irregular or difficult, check to ensure the work clamp and cable are in good repair that the cable is tight in the connector.
7. **Euro Connector.** The Euro connector provides rapid and secure connection of the MIG gun without having to use tools. Use only hand pressure to tighten the connector. Do not over-tighten the plastic retainer collar. Both the MIG gun and optional spool gun connect to this point. Both the spool gun and MIG gun cannot be connected at the same time.

SIDE VIEW



Side Panel:

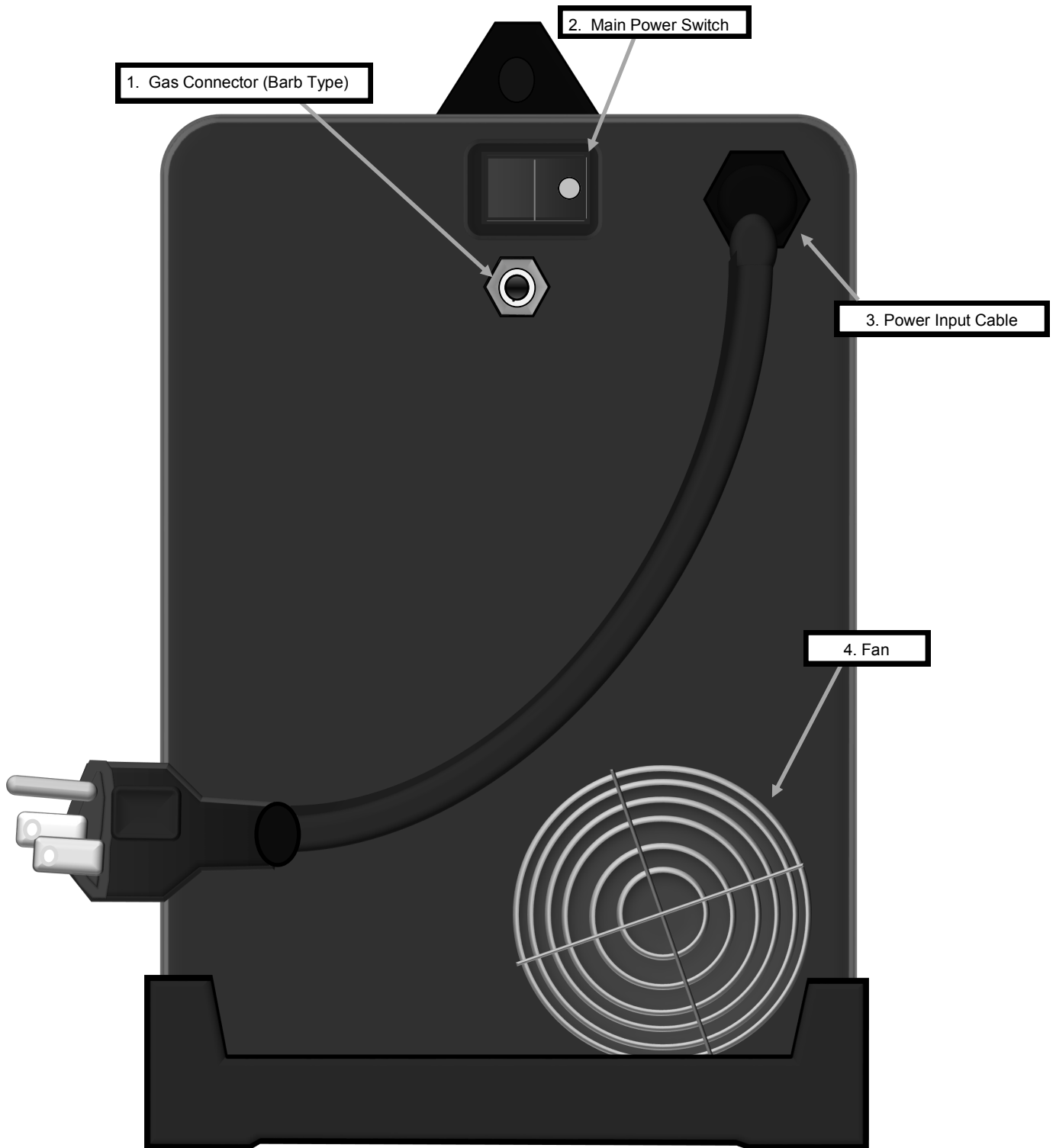
1. **Wire Spool Carrier Assembly.** The wire spool holder is designed to accommodate 4" and 8" wire spools. To install the wire, remove the thumb nut and the pressure spring from the outer collar and remove the collar. Note that the outer collar has two possible ways to be installed. The hub on the outer collar has a shallow and a deep side. The deep side should be facing out when installing 8" rolls. When installing 4" rolls, the shallow side should be turned out. When installing 4" rolls, the outer collar will serve to sandwich the smaller spool on the steel shaft preventing side to side movement. When installing an 8" roll, the wire collar will serve as the carrier for the larger diameter roll. When the outer hub is correctly inserted into the 8" roll, the retaining lip on the collar will be snug against the roll when the spring and thumb nut are installed. If there is a gap between the retaining lip on the collar and the wire roll, then it is installed correctly. Flip the collar over. Tension the wire roll with the thumb screw and spring so that it does not continue to spool wire when quickly turned. It should turn easily, but continue to de-spool the wire more than a 1/4 turn when spun quickly by hand. NOTE: Make sure the wire roll is installed with the wire rolling off the bottom of the spool and the spool is rotating clockwise. Feeding problems will be encountered if the wire is fed off the top of the roll.
2. **Polarity.** Note the "+" and "-" symbols located on the inside of the unit above the wire feed mechanism. To change the polarity of the MIG torch, simply loosen the screws and remove the cable and install it on the other terminal. ***Standard polarity for MIG is (+) positive (DCEP) with the work clamp serving as the (-) negative output terminal. (Also known as reverse polarity). For flux core use see the wire manufacturer's direction for polarity recommendation.***
3. **Wire Feed Assembly.** Note the numbers on the side of the tensioner. These numbers are a reference point to help properly tension the wire so that the drive roller will not slip. Do not over-tension the wire because it can create a condition known as birds nesting, where the wire will tangle around the feeder or jam in the gun. It may not slip if wire burns back into tip, stuck fast in weld or other resistance is met. This will continue to wrap the wire around the drive mechanism or jam wire inside the gun liner until trigger is released. Considerable effort is usually needed to clear a bird's

nest condition. Too little tension will result in wire slippage and fast wear on the drive components. Test the tension of the wire and inspect for proper feeding before beginning a weld. Occasional cleaning of the feeder mechanism is necessary to prevent wear and damage to the feeder and to the MIG gun liner. Regularly monitor any metal flaking and dirt build up that may occur around the feeder. Clean it away gently with compressed air as necessary. Use proper safety attire while doing this, i.e. glasses, gloves etc. to prevent injury. Do not use cleaners or solvents. Felt wire lubricators may be bought and used to keep feeding cleanly while using steel or stainless wire. You may purchase additional drive rolls from Everlast for flux core use.

NOTE: If erratic feeding is experienced, check wire feed tensioner, spool tension (rolling resistance) and for correct size groove. Also make sure the wire is riding in the groove and not on the shoulder of the lower drive roll.

NOTE: The unit may continue to run for up to 5 seconds after it is shut off while the capacitors discharge. This is normal and not a defect.

REAR VIEW/BACK PANEL



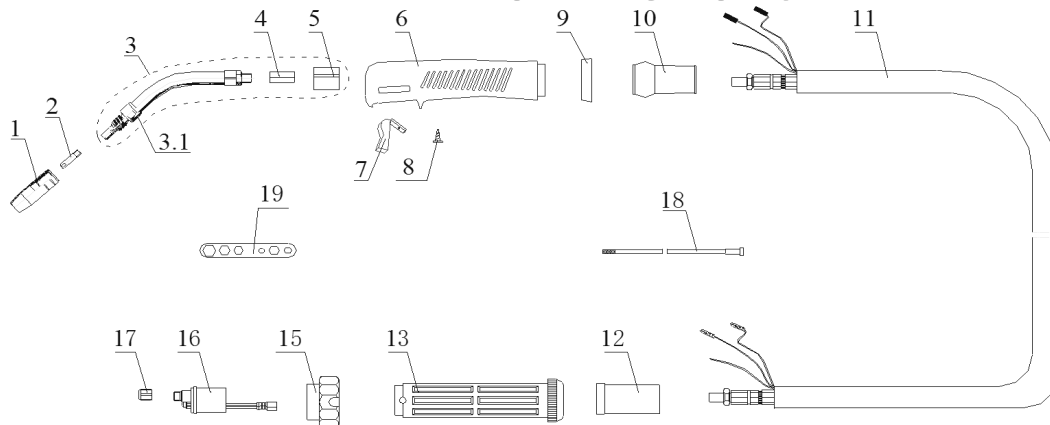
Rear Panel:

1. **Gas Supply.** Connect the Gas regulator hose to this point via the brass barb fitting. The hose barb connection must be tight to prevent gas leakage. Install an extra clamp if needed to prevent gas from escaping. Test for leaks with soapy water. Do not leave gas valve open on cylinder when not attended or in use.
2. **Power Switch.** Turns unit on or off.
3. **Power Input Cable.** The unit operates on 120V input power. This is a standard NEMA 5-15P plug used in North America.
4. **Fan.** The welder fan is designed to run continuously while the unit is switched on. It may continue to run for up to 5 seconds after the welder has been switched off while the capacitors discharge. This is normal and not an issue. Keep at least 18" away from obstructions to allow proper cooling. Do not allow grinder dust or sparks to enter the fan. Periodically inspect fan for metal dust build up. Metal particles can build up on the fan over time and can unbalance the fan and damage it.

SECTION 2

SETUP GUIDE AND COMPONENT IDENTIFICATION

EXPANDED VIEW OF MIG TORCH



NO.	PARTS	QTY
1	Diffuser D.12 14-15AK	1
2	Contact Tip 0.8/M6*25	1
3	15AK Goose gun neck assy.	1
4	Adapter for goose neck	1
5	Plastic adapter	1
6	MIG gun handle	1
7	Torch switch 21.8mm	1
8	Screw D.3*10	3
9	Handle locking ring	1
10	Articulating joint 15AK	1
11	Coaxial cable assy /16mmq/3m	1
12	Cable thimble 12-16-25 MMQ	1
13	CO ₂ Euro-rear connector handle	1
14	Retaining Screw M4*6 UNI 6107	1
15	Knurled locking nut	1
16	Euro-main connector	1
17	Securing nut for gas input	1
18	Insulating feed pipe 0.6-0.8 3m, Blue	1
19	Contact Tip Wrench	1

NOTE: Some components may appear slightly different as design/supplier changes are made from time to time. At time of publication, the standard torch provided with this unit is the Trafimet Ergo Plus 15.

TO INSTALL MIG GUN/TORCH:
 A. Align pins on with the feeder receptacle.
 B. Fully engage the connector into the receptacle.
 C. Twist knurled nut (#15) on connector until the nut is snug.
DO NOT OVERTIGHTEN! USE HAND PRESSURE ONLY.

NOTE: Over time, pressure on the drive rolls causes metal fragments from the filler wire’s surface to find its way to the gun cable liner. If the wire guide is not cleaned, it can gradually clog up and causes wire feed malfunctions. If feeding difficulty is observed, clean the liner in the following manner:

- 1) Remove the welding gun’s gas nozzle, contact tip and contact tip’s adapter.
- 2) With an air nozzle below compressed air through the wire guide. Wear eye protection!
- 3) Blow out the wire feed mechanism and reel housing with dry compressed air.
- 4) Reassemble components. Tighten the contact tip and contact tip’s adapter to spanner tightness.

The MIG torch liner may eventually become worn and will need to be replaced. When welding aluminum, a Teflon liner must be used, necessitating a liner change. A spool gun is the preferred method to weld Al. To change the liner:

- 1) Remove the securing nut of the liner (#17) which exposes the end of the wire guide.
- 2) Straighten the gun cable and withdraw the liner from the gun.
- 3) Carefully push a new wire guide in to the gun. Make sure that the wire guide travels all the way to the contact tip.
- 4) Make sure the O-ring at the machine-end of the gun is installed
- 5) Tighten the wire guide in place.
- 6) Cut the liner 2mm from the mounting nut and file the sharp edge of the liner.
- 7) Reattach the gun and tighten all parts.
- 8) Re-thread wire.

SECTION 3

TROUBLE SHOOTING

NO.	Trouble		Possible Cause	Solution
1	Unit is switched on, but the power light isn't on		Switch damaged	Replace
			Circuit breaker tripped or unit unplugged	Reset breaker, plug in unit.
2	After welding machine is overheating and the fan does not work		Fan damaged or jammed	Check fan shroud housing and wire protective guard for damage
			Fan power connector is loose	Check for dislodged connector
3	When torch switch is pressed, no gas glows		No gas in the gas cylinder/ Regulator or cylinder valved closed	Replace/Refill cylinder / Open valve
			Gas line leaks	Check line with soapy water
			Gas solenoid valve damaged	Check and clean/replace
			Torch switch damaged	Repair or Replace
			Control circuit damaged	Inspect the circuit
4	Wire-feeder does not work	Wire reel does not turn	Motor damaged	Check and Replace
			Wire feed selector turned to minimum setting, knob is loose or selector is damaged.	Check setting/Check knob/Replace potentiometer.
			Control circuit damaged	Check the board
	Wire reel turns or tries to turn intermittently	The tensioner is loose or wire slips on rollers	Increase tension	
		The drive roller does not fit the diameter of weld wire	Change roller or wire size to match	
		Wire Spool is damaged	Change out wire spool	
		Gun liner is jammed	Repair or change it, clear wire from liner/ clean liner with compressed air	
		Contact Tip is jammed because of slag or burn back	Clean or replace. If with Aluminum, increase tip size to next size.	
	5	No arc, or no output voltage		Work clamp not connected or cable is loose or Wire feeder power cable is loose or not connected
Control circuit damaged				Check the circuit
6	Welding stops, and warning light is on		Self-protection has engaged	Check over-voltage, over-current, over-temperature, lower-voltage and over-temperature. Allow unit to cool if overheated. Check power plug for problems
7	Welding Voltage/Current is uncontrollable		Potentiometer damaged	Repair or Replace it
			The control circuit damaged	Check the circuit

GENERAL NOTES:

1. While welding aluminum with the Spool gun or MIG gun you must use 100% argon. You cannot use a mix as you would with steel or stainless.
2. While welding aluminum with the Spool gun or MIG gun you must use the next size up tip or a special oversize tip for the wire because the heat will cause the aluminum wire to swell and it will either drag or seize in the tip.
3. While welding aluminum with the MIG process, best results are achieved by using a dedicated stainless steel brush to remove the oxide layer and acetone or aluminum cleaner before welding. Even though aluminum may appear shiny and clean, it still has an oxide layer, and a thin layer of oil left over from the manufacturing process. Some soot will appear in most MIG welds but if a lot is noticed, you have either contaminated metal, or insufficient gas flow. You can also induce turbulence by having too much of a torch angle. Start with a 90 degree angle and then lean the gun slightly (about 15 degrees) to the "push" position.
4. Welding aluminum is not a short circuit process. It is a spray transfer process. Spray transfer is a process that can be used to weld many metals, but in Aluminum it must be used to weld correctly. In spray transfer, the wire does not short out against the weld material. Instead a steady "spray" of droplets of molten metal pinches off before the wire can contact the material. It is a much quieter process. If you are not familiar with the spray transfer process, please research it before you try it. If you incorrectly adjust the welder while welding aluminum in the MIG process, you will burn up contact tips almost instantly.
5. If you are trying to weld Aluminum with .025 wire or smaller, you may not achieve adequate results because of the higher wire feed speeds needed. Try stepping up to the next wire size and wire feed speed rate requirements will drop.
6. If using with a generator, use with only a generator rated or certified for clean power output. This a rating given by the manufacturer of the generator if the total harmonic distortion is 10% or less (usually 5% or less). A generator that does not produce clean power can cause erratic operation and damage to the welder's electronics. Ideally a generator capable of generating 3500 watts or more should be used.
7. MIG burn back is a common condition where the wire may burn back and fuse with the contact tip while welding or after the trigger is released. If the burn back is slight, allow the tip to cool slightly and remove the tip from the gun feeding extra wire as necessary to get the tip fully removed. Usually, with a little twisting effort the wire can be removed from the tip. However, at times the tip may need to be discarded if the burn back has been severe. If burn back is experienced, it is usually a result of too low of wire speed or too short of a stick out while welding. Increase wire speed to help prevent additional events of burn back.
8. Replace the contact tip when the orifice is noticeably enlarged or becomes egg shaped. A worn out contact tip can cause issues with arc stability. Always make sure you are using the correct size tip for the application.