

# ***EVERLAST***

## **POWER MTS 400**

**CC/CV MULTI-PROCESS WELDER  
GMAW/FCAW/GTAW/SMAW/ACAC**



***Operator's Manual for the Power MTS 400***

***Safety, Setup and General Use Guide***

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**Dear Customer,**

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

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

**Please review the current online warranty statement and information found on the website of the Everlast division located in or nearest to your country. Print it for your records and become familiar of its terms and conditions.**

Everlast offers full technical support, in several different forms. We have online support available through email, and a welding support forum designed for customers and noncustomer interaction. Technical advisors are active on the forum daily. We also divide our support into two divisions: technical and welding performance. Should you have an issue or question concerning your unit, please contact performance/technical support available through the main company headquarters available in your country. For best service call the appropriate support line and follow up with an email, particularly if off hours, or you cannot reach a live person. In the event you do not reach a live person, particularly during heavy call volume times, holidays, and off hours, leave a message and your call will normally be returned within 24 hours. Also for quick answers to your basic questions, join the company owned forum available through the website. You'll find knowledgeable, helpful people and staff available to answer your questions, and perhaps find a topic that already addresses your question at <http://www.everlastgenerators.com/forums/>.

Should you need to call or write, always know your model name, purchase date and welder manufacturing inspection date. This will assure the quick and accurate customer service. **REMEMBER: Be as specific and informed as possible. Technical and performance advisors rely upon you to carefully describe the conditions and circumstances of your problem or question. Take notes of any issues as best you can. You may be asked many questions by the advisors to clarify problems or issues that may seem very basic. However, diagnosis procedures MUST be followed to begin the warranty process. Advisors can't assume anything, even with experienced users, and must cover all aspects to properly diagnose the problem. Depending upon your issue, it is advisable to have basic tools handy such as screwdrivers, wrenches, pliers, and even an inexpensive test meter with volt/ohm functions before you call.**

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

Sincerely,

Everlast Customer Service

Serial number: \_\_\_\_\_  
Model number: \_\_\_\_\_  
Date of Purchase \_\_\_\_\_



#### Contact Information

##### Everlast US:

Everlast consumer satisfaction email: [sales@everlastwelders.com](mailto:sales@everlastwelders.com)

Everlast Website: [everlastwelders.com](http://everlastwelders.com)

Everlast Technical Support: [support@everlastwelders.com](mailto: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](mailto:sales@everlastwelders.ca)

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## SAFETY PRECAUTIONS

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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.

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## SAFETY PRECAUTIONS

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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.



<div><b>EVERLAST</b> INVERTER TECHNOLOGY</div>					
MODEL		PowerMTS 400		No.	
1(3)~				STANDARD: EN/IEC60974.1	
		60A/17V~250A/26.5V(1~220V) 60A/17V~400A/34V(3~460V)			
		1~220V		3~460V	
		X	100%	60%	100%
		I <sub>2</sub>	250A	400A	310A
U <sub>0</sub> = 90V		U <sub>2</sub>	26.5V	34V	29.5V
		30A/21.2V~250A/30V(1~220V) 30A/21.2V~400A/36V(3~460V)			
		1~220V		3~460V	
		X	100%	60%	100%
		I <sub>2</sub>	250A	400A	310A
U <sub>0</sub> = 16V		U <sub>2</sub>	30V	36V	32.4V
 1(3)~60Hz		U <sub>i</sub> =220V/460V		I <sub>1max</sub> =55A/23A	
		I <sub>1eff</sub> =55A/18A			
PROTECTION DEGREE:IP21S			INSULATION DEGREE:H/B		

U<sub>0</sub> = Open Circuit Voltage

U<sub>1</sub> = Input Voltage

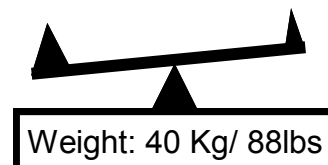
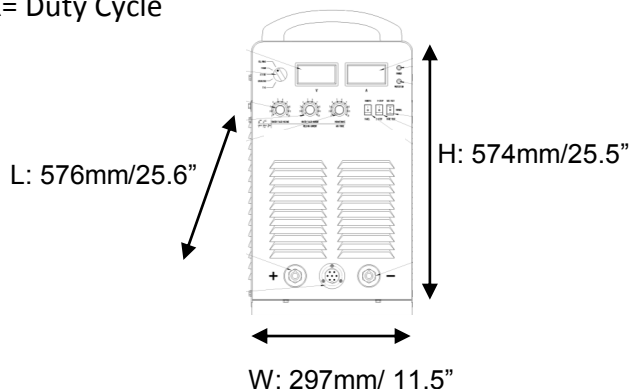
U<sub>2</sub> = Output Voltage

I<sub>1max</sub> = Inrush Current ( Maximum Amp Demand)

I<sub>1eff</sub> = Operating Current ( Amperage use after start)

I<sub>2</sub> = Output Amps

X= Duty Cycle



**1.1 General Description, Purpose and Features.** The PowerMTS, is a CV/CC power source capable of 5 different welding processes at a 60% duty cycle at the full rated power while connected to 460V 3 phase. Operation in 220V 1 phase is limited to 250 amps, but is rated at 100% duty cycle at the full 250 amps. Each process can be independently selected. The following processes are included on the PowerMTS series.

- 1) GMAW (MIG) with a standard, independent feeder with a 4 roll heavy duty drive system included. Includes advanced crater fill amps and volt control in 4T, and inductance control for higher quality welds.
- 2) FCAW (Flux Core) with a special setting on the machine that includes improved operation and arc stability with flux cored welding wires.
- 3) GTAW (TIG) offers simple DC scratch start operation includes a standard gas valve torch. (17V compatible). **Note:** Unit is DC scratch start only. No HF or LIFT start.
- 4) SMAW (Stick) offers excellent hot start performance on difficult cellulose rods such as ER 6010 and ER 6011 to prevent sticking. Arc force control increase performance, and improves out of position welding characteristics. Smooth spatter free welds are easily obtained on ER 7018, 309L, and many specialty rods.
- 5) ACAC (Carbon Arc) Allows the customer up to 400 amps of cutting and gouging power with a dedicated setting that provides improved performance over regular SMAW settings. Arc force control should be turned up to maximum to increase gouging performance.

**1.2 Basic Design and Construction.** The PowerMTS series utilizes soft switching IGBT inverter technology. The unit can operate on either 220/240V 1 phase power or on 460/480 V 3 phase power, allowing the welder to be used in many places and circumstances. For those not familiar with inverter design, the basic principle is as follows (see following diagram): Input power is rectified by the rectifier, then inverted to high frequency AC, then stepped down by the high frequency transformer, rectified again and filtered by the high frequency rectifier, which outputs directly to stable DC power suitable for welding. The basic design and construction of the inverter

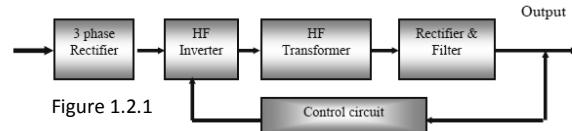
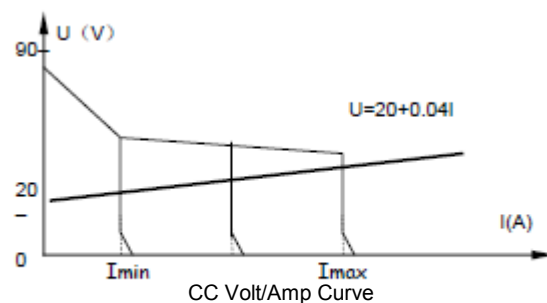
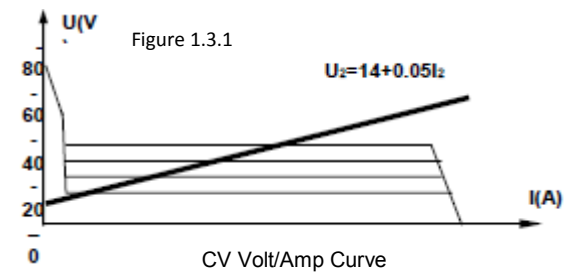


Figure 1.2.1

reduces size, weight, and power consumption, while increasing arc stability.

**1.3 Volt/Amp Curve.** The function of the CC/CV PowerMTS offers improved volt amp curves for more control and quicker response over what can be offered by many transformer based welders.



**1.4 Installation.** The basic construction of the PowerMTS is rugged and durable, ideal for many locations and use. Critical components are protected by coatings and heavy potting to make the welder environmentally resistant. However, some 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 extreme corrosive environments. To maintain optimum power transfer, check main connections, clamps and cables frequently to ensure that components are not corroded. Excessive corrosion and oxidation can result in an unstable arc and heat build-up.

- 3) Do not restrict air flow or movement of air around the welder. Allow a buffer distance of 1-2 ft from all sides if possible. Less is permissible in banks of welders, but keep them spaced 6 inches from the sides and 12 inches from the rear of the unit.
- 4) Do not mount in areas that are prone to severe shock or vibration.
- 5) Do not direct dust or dirt intentionally toward the machine, particularly in grinding and welding operations.



**1.5 Duty Cycle.** The duty cycle for this welder has been determined for operation on both 220/240 V 1phase and 460/480 V 3 phase operation. For 220/240V operation, the duty cycle is set at 250A at 100%. For operation in 460/480V 3 phase, the duty cycle is 60% at 400 A. The duty cycle is based off a 10 minute duty cycle rating. This means that the unit is capable of being operated at the stated amps for 6 out of every 10 minutes without a break for cooling down the unit. The unit is equipped with overcurrent/overheat interrupt and warning should the duty cycle be exceeded.

**If welding is interrupted and the duty cycle warning light is on, allow unit to cool while fan is on. Light should go out automatically and welding will resume. If the unit shuts down completely, the breaker function of the main switch has tripped from excess heat/current flow. Allow 10-15 minutes of cooling before resetting the breaker switch and turning the machine on.**

#### 1.6 Key Features.

- 1) Inverter design makes the unit extremely portable and ideal for use in shipyards, mills, factories, assembly lines and general repair and fabrication.
- 2) The detached wire feeder will operate up to 175 ft away from the main unit, increasing usefulness while operating in difficult areas.
- 3) DC, Multi-Process design features individually selectable, settings for GMAW (MIG), SMAW (Stick), GTAW (TIG), FCAW (Flux Core), and ACAG (Air Carbon Arc) which are optimized for best performance.
- 4) Smooth starts and stops while welding

MIG or Flux core with the use of down slope and crater fill functions while in 4T mode improve weld quality.

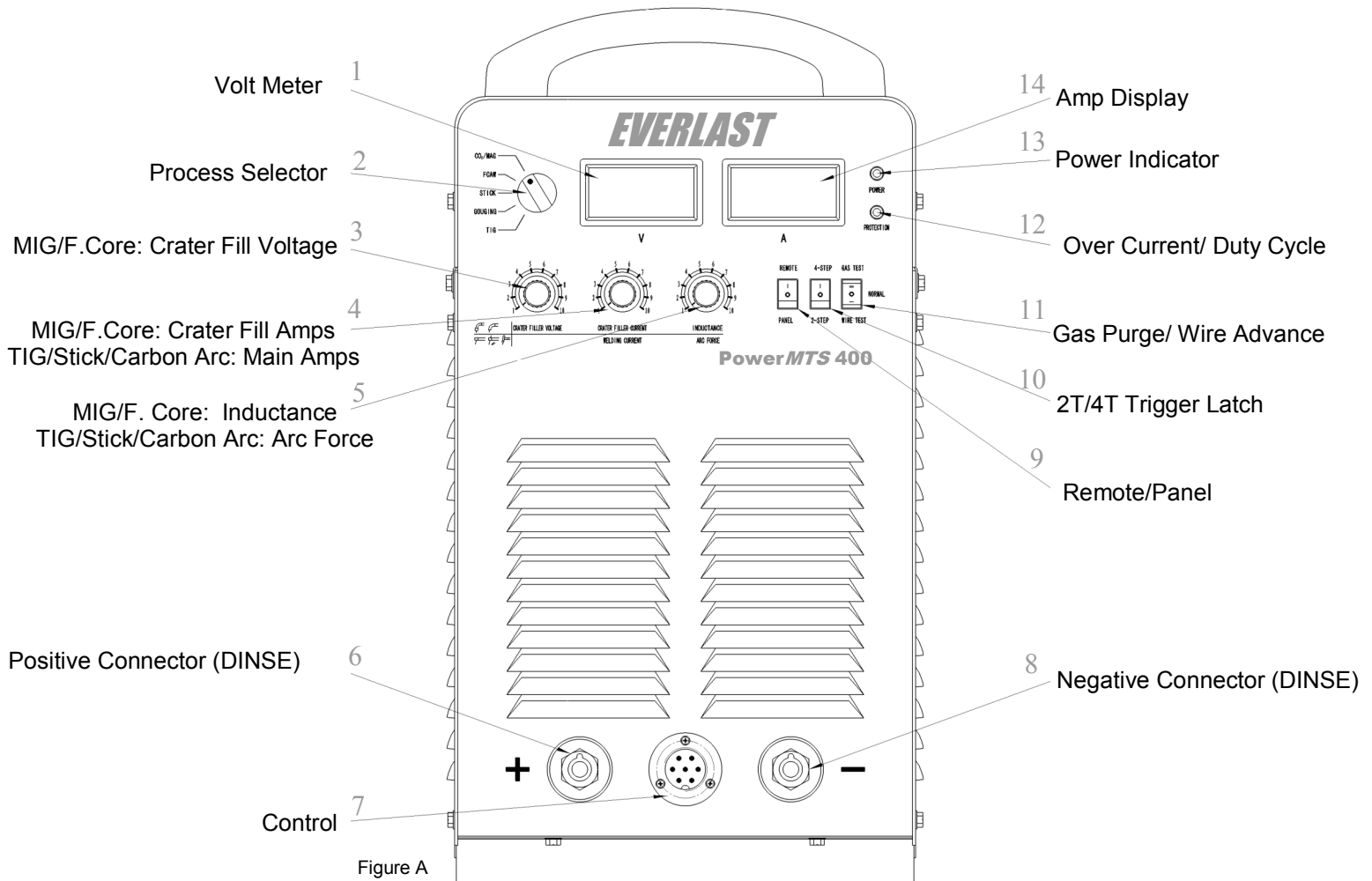
- 5) Hot Start improves starting and reduces porosity at the beginning of the weld.
- 6) Inductance/ adjustable arc force control helps to control the arc in MIG/Flux Core Settings, reducing spatter and improving out of position puddle control by altering the pinch point timing of the wire. The basic function of arc force while in stick mode, compensates for the decrease of volts while welding a short or tight arc by automatically “boosting” amps to maintain the arc and prevent sticking. The arc force improves cellulose based rod performance as well. (6010/6011)

**1.7 The unit should be stored in a dry place for long term storage.** Humid/wet conditions can contribute to the eventual decay of the circuitry in the machine. For safety reasons, do not use this machine directly in the rain or with soaked clothing or damp protective gear. The service rating for this unit is IP21S, sufficient for dripping water protection, but is not recommended for wet environment use.

**1.8 Use the handles provided to lift the welder.** Do not suspend the unit in the air or pass fork truck tongs through handle to lift or move. Lift safely, using an extra person to transport if necessary.

**1.9 Make sure that the units cooling fan and exhaust vents are kept free of obstruction.** Before every operation, inspect unit for unexpected obstructions such as insect and rodent nests. A regular cleaning of the machine with low pressure air and a small plastic bristle brush will be necessary to ensure long life. Depending upon the amount of use and work environment, once every 3 months or after every 250 hours of use the unit should be inspected for cleanliness. On these occasions only, unplug the welder and remove cover to access the interior to service. Concentrate the air pressure on the aluminum heat sinks and vents. If the welder is used near a grinding operation, a buildup of metallic dust and debris on the fan blades may make them loose cooling efficiency and cause imbalance.

**MAIN WELDER/POWER SOURCE FRONT VIEW**



1. **Volt Meter.** Displays active voltage while welding and displays preset voltage while the welder is idle.
2. **Process Selector.** Selects appropriate process. Do not change process while in welding. Do not attempt to over rotate knob past the last selection available, clockwise or counter clockwise, or damage will occur.
3. **Crater Fill Volts.** Sets a voltage level for properly filling the weld crater at the termination of the weld while in 4T MIG/Flux Core mode. The additional touch of the torch switch activates the crater fill. This is separate and functions independently of the welding volts that are preset on the wire feeder. For highest quality welds, use 4T mode and utilize the crater filling functions. The crater fill volts should be set lower than the voltage set on the wire feeder to take full advantage of this feature.
4. **Crater Fill Amps/ Main Amps.** Similar in function to the Fill Volts in MIG/Flux Core, except it changes amps/wire feed speed while filling the crater to help prevent weld defects and cracks at the end of the weld. Ideally this should be a lower value than what is preset on the wire feeder. This feature functions for MIG/Flux core ONLY in 4T. For the TIG/ STICK/Carbon Arc functions, this controls the **main welding amps**, to preset the amps for welding/cutting/gouging operations normally as would be found in any other welder.
5. **Inductance/Arc Force Control.** In MIG/Flux Core mode, the inductance of the machine is changed, affecting the current rise time after the arc is “shorted” to the metal, and pinches off. This effectively controls the actual pinch point of the wire. In practical terms this is useful for managing out of position welds, penetration, and spatter. In Stick mode, this feature similarly affects weld quality. However, it does so by compensating for voltage loss by increasing amps, if the arc is held too short or tries to stick to the metal. This helps to maintain arc stability and improve weld quality. Too much arc force can cause over melting and burn through. Follow the guides in the next section for approximating the amount of arc force needed. Each user will eventually find their own balance where the inductance arc force works best for them in each position.
6. **Positive Female Connector.** Designed to interchange with standard welding couplers with the DINSE designation of the same size. Standard size provided is 35mm2 x 75 mm2. Follow manufacturer directions for filler material to determine best and correct polarity for the process you are using. However, MIG will generally be positive, so the wire feeder should be plugged in here. Stick will generally be positive as well. The electrode holder for stick welding should be plugged into this port for most rods. Flux core and dual shield wire have different specifications for polarity, though many true flux core wires are generally negative polarity. For TIG, ALWAYS plug the work clamp into the positive terminal. For Carbon Arc, again follow the manufacturer’s recommendation. If unclear, consult the distributor of the electrodes/wire to help determine the proper polarity.
7. **Control.** Plug the double ended control wire from the wire feeder directly into this port. Pay attention to the orientation of the plugs so that they match properly before trying to force the parts to mate.
8. **Negative Female Connector.** Designed to interchange with standard welding couplers with the DINSE designation of the same size. Standard size provided is 35mm2x75mm2. The TIG torch should always be plugged into this side. For the balance of processes, the work clamp will usually be plugged into this side.
9. **Panel/Remote.** For Stick welding, this allows a separate, optional remote controller to be employed to control the amps and arc force. When in Panel mode, normal control is achieved through the AMP and Arc Force controls on the panel. For MIG and other process this is not functional.
10. **2T/4T.** Commonly referred to as a trigger latch. Simple “press and hold” operation of the MIG gun/torch is achieved by selecting 2T. 4T requires four “steps” to completely cycle the

torch on or off. To turn the torch on. First, press and hold the torch trigger to start the arc. Once started, release the trigger. To stop welding, press and hold the trigger again. This will activate the crater fill cycle that is pre-set on the panel through the use of the crater fill volt/amp control knobs. To terminate the arc and finish the weld, release the trigger fully.

11. **Gas Purge/ Weld/Wire Feed.** To setup the wire feeder, this feature is helpful for independently separating control of the gas and wire advance when change out of the gas bottle is necessary or when rolls of wire must be changed. Make sure the switch is returned to the "weld" position before attempting to weld or malfunction will occur.
12. **Duty Cycle/Overheat Indicator.** If welding is interrupted, check this indicator to determine if the unit is over heated. Allow unit to cool and reset for at least 10 minutes. When the light goes out, welding may resume. If the machine does not automatically reset, manually cycle the power switch to reset the welder. If the light remains on after sufficient cooling time, contact Everlast Support.
13. **Power Indicator.** This light should remain on while the switch is on.
14. **Amp Display.** The display displays pre-set amps while adjusting either the panel display, the wire feeder or the optional remote controller. The function of the display will change to read actual amps output while welding.

**MAIN WELDER/POWER SOURCE REAR VIEW**

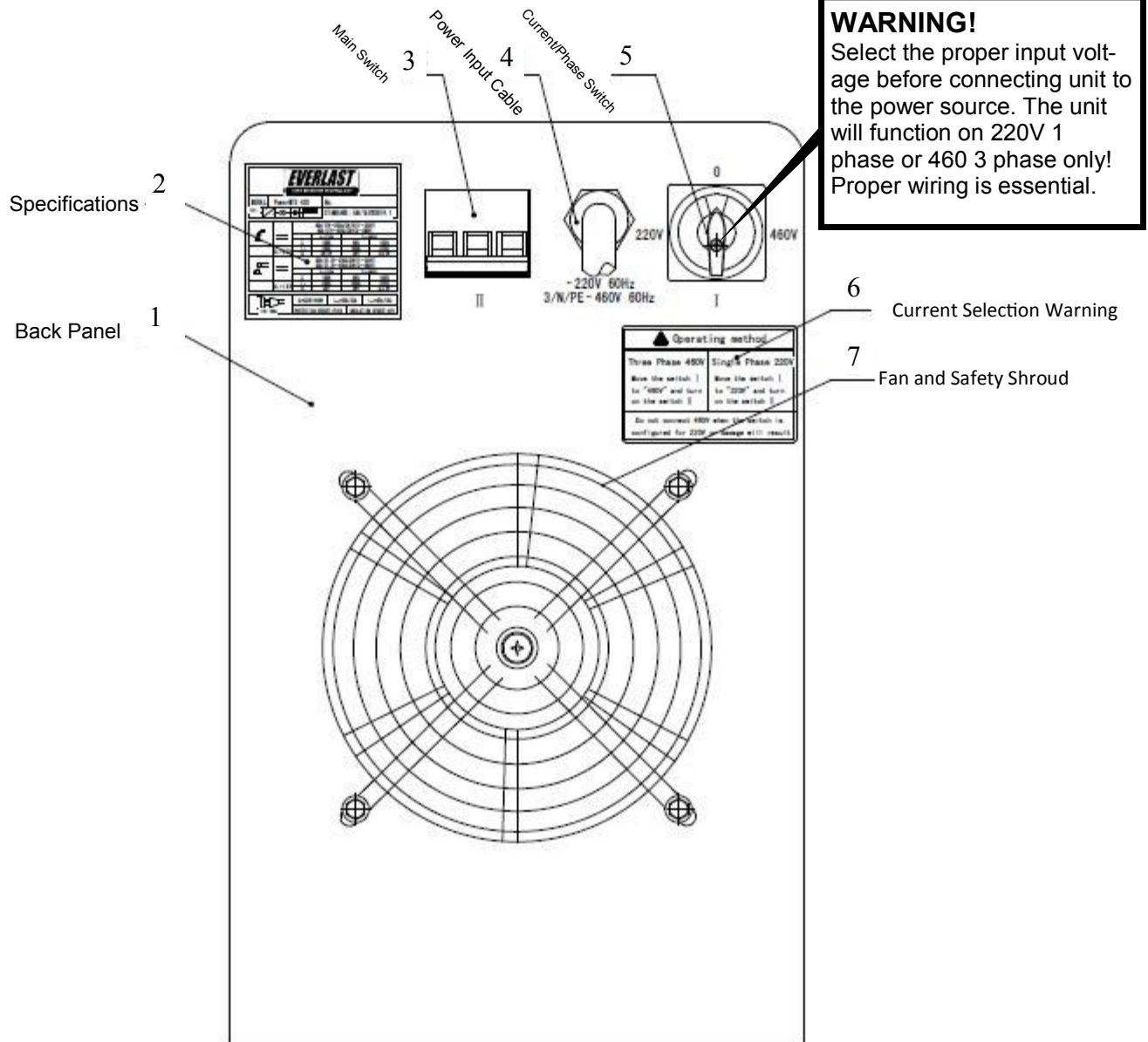


Figure B

**CONSULT A LICENSED ELECTRICIAN FOR PROPER WIRING AND LOCAL CODES.**

Yellow/Green Stripe: Ground, 240 1ph/ 460 3 phase

Solid Yellow: L1, 240 1 ph/ 460 3 phase

Solid Green: L2, 240 1 ph/ 460 3 phase

Solid Red: L3, 460 3 phase use only!

**Power Input Wiring**

**DO NOT USE RED WIRE FOR 240 V 1 PHASE!**  
Tape wire back against the cable for 240 use.

1. **Back Panel.** Make sure the back panel area is free from obstruction.
2. **Specifications.** All official and important specifications are found on this sticker. These specifications override any other stated specifications as they are updated between manual publications.
3. **Main Power Switch.** Cycling the switch turns the unit either on or off. Switch should snap into position. If fault is found with the switch contact Everlast Support.
4. **Main Input Cable.** Inspect the cable periodically to ensure that there is no damage from cuts, cracking, or burns. Replace the cable immediately should any problems be found. This is a 4 wire cable, with three wires devoted to power supply, one for grounding the unit. Follow the instructions found on the previous page for proper wiring identification and hook up.
5. **Current/Phase Selector.** Correctly select either 220V 1 phase or 460 3 phase before connecting to the power supply and powering up the welder. Do not turn switch while welding, turned on, or plugged in. **Damage may result if the correct power input is not selected!**
6. **Warning Sticker.** Details issues with selecting improper phase/current.
7. **Fan Shroud.** Do not obstruct the flow of air around the rear of the welder. Make sure that the shroud does not become damaged. Inspect fan and shroud frequently for buildup of dust, dirt, or metal through visual inspection.



**WIRE FEEDER FRONT VIEW**

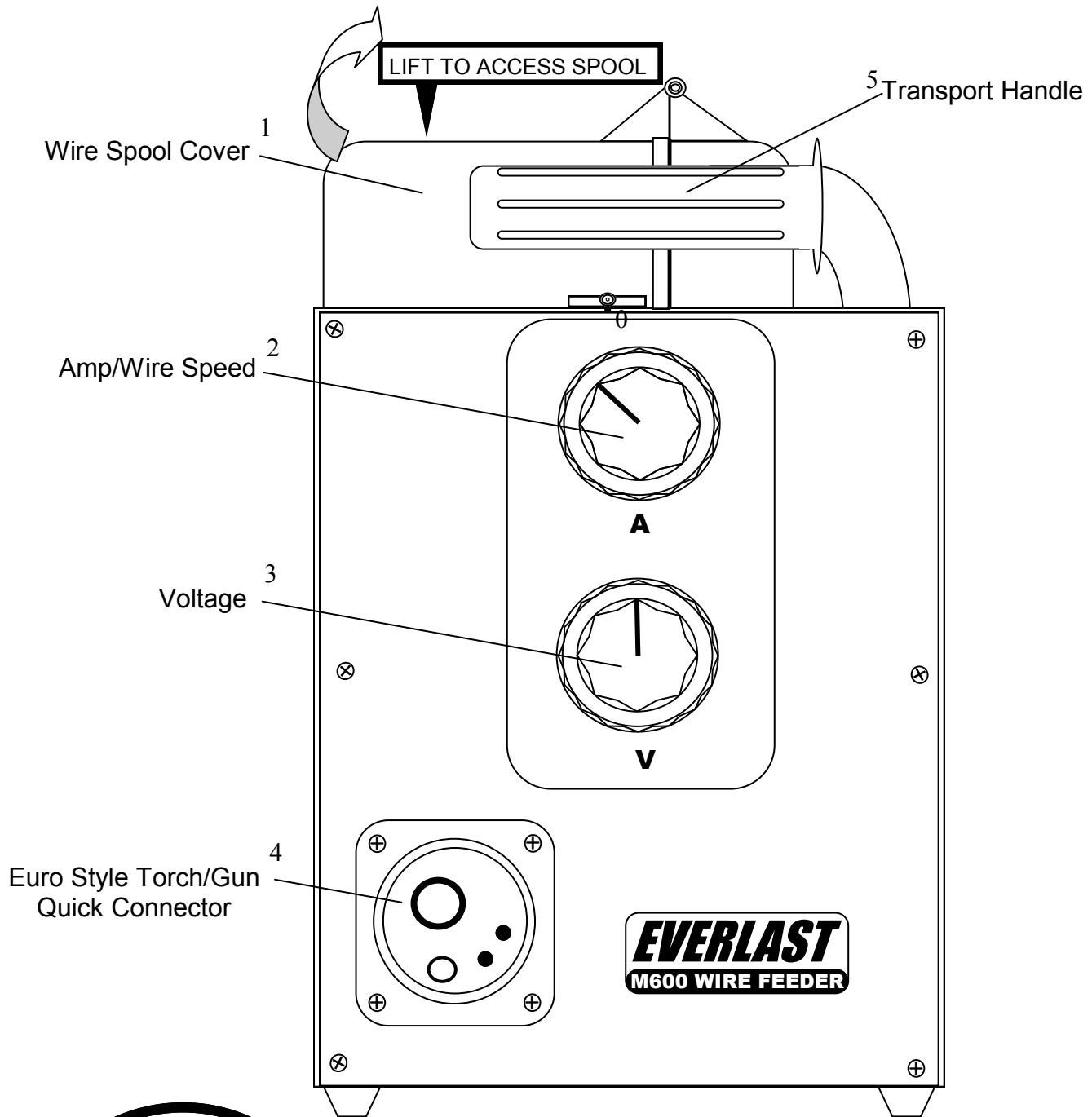
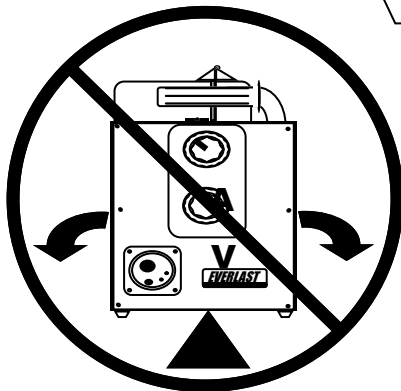


Figure C



Keep feeder stable and level!  
Place on flat, level surface.

1. **Wire Spool Cover.** Protects the wire spool from moisture and dirt. Keep in place and lowered while in operation and storage to protect the wire from deterioration and excess dirt and rust formation. This will increase liner life of the MIG gun/torch and decrease wear on drive components.
2. **Amp/Wire Speed.** Adjusts wire speed and amps while in MIG and Flux Core mode. Incremental adjustment will reflect in the main panel on the welder as knob is rotated. Keep in mind that the measurement will be displayed in actual amps, not a measurement of distance/time. Due to the nature of wire feed welding, amps and wire feed speed are related. An increase in one, will result in the direct increase of the other. 4T operation will result in the main welding amps being adjusted on the wire feeder itself. Fill amps are adjusted on the panel, independent of the adjustment on the wire feeder as the knob is rotated while using the 4T mode.
3. **Voltage.** Adjusts voltage while in MIG/Flux Core Mode. Incremental adjustment of the volts will be reflected in the main volt display on the welder. While welding in 4T mode with MIG or Flux Core, fill volts are adjusted independently on the main welder.
4. **MIG GUN/Torch connection.** The standard Euro style connection of the MIG gun/torch allows for the easiest connection in the industry and for after-market use of other brands of MIG guns equipped with the Euro connector. To couple simply line up the pins, and insert. Twist the knurled collar to lock in place. Do not over tighten the collar. **Hand tighten only!**
5. **Lift/Transport Handle.** Use the transport handle only for carrying the unit by hand. If the wire feeder is to be suspended, attach chains or cables to the corners of the main platform of the wire feeder for proper support. Do not use the handle to suspend the unit by attaching chains,ropes or cables to it.

**CONNECTION OVERVIEW**

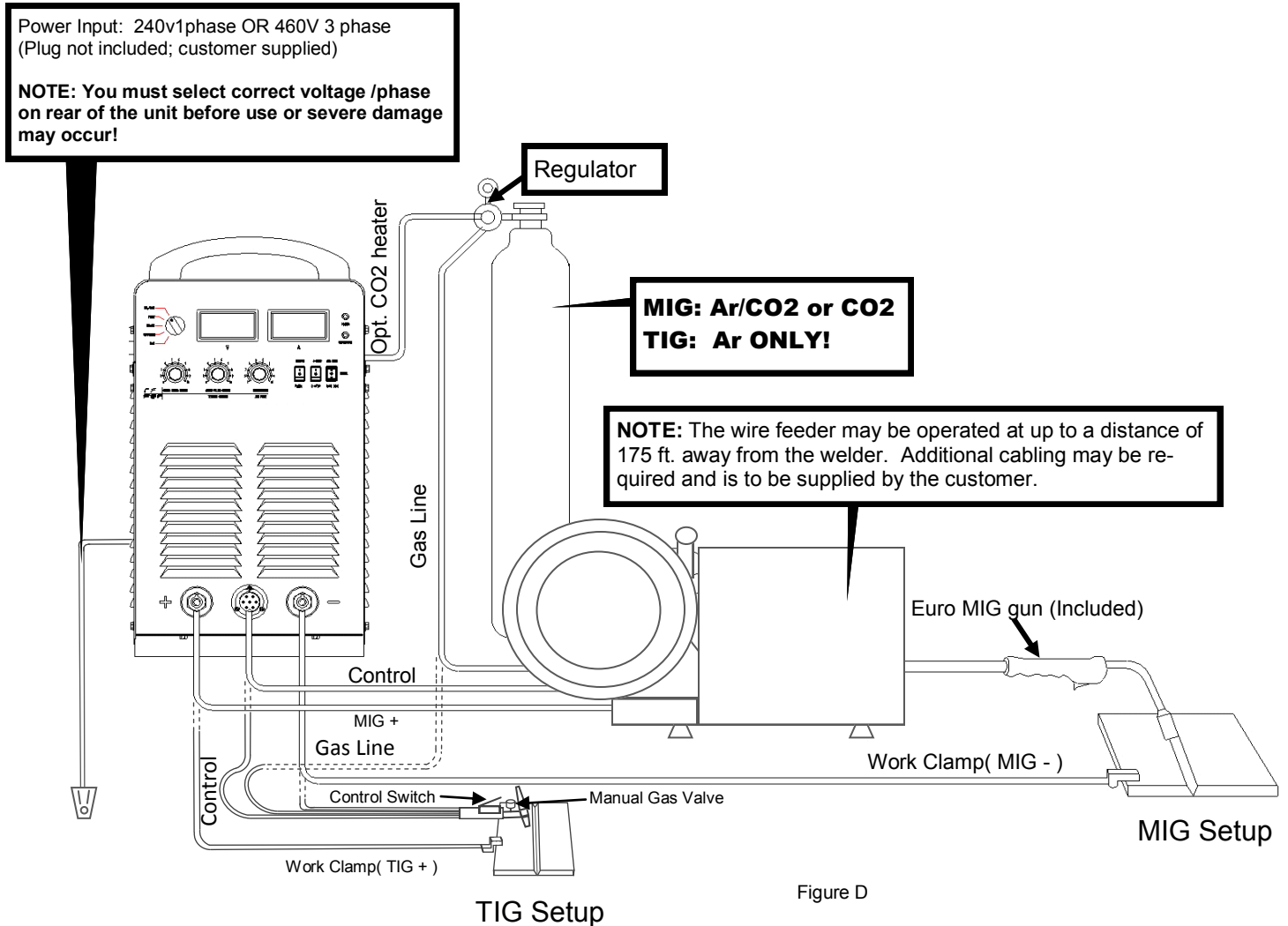


Table 1

**GENERAL POLARITY RECOMMENDATIONS\***

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

PROCESS	TORCH POLARITY	WORK POLARITY
MIG (GMAW)	+	-
FLUX CORE (FCAW)	-	+
TIG (GTAW)	-	+
STICK (SMAW)	+	-
CARBON ARC (CAC-A)	-	+

## SECTION 2

## SETUP GUIDE AND COMPONENT IDENTIFICATION

### WIRE FEEDER LOADING, USE AND SETUP

Figure E

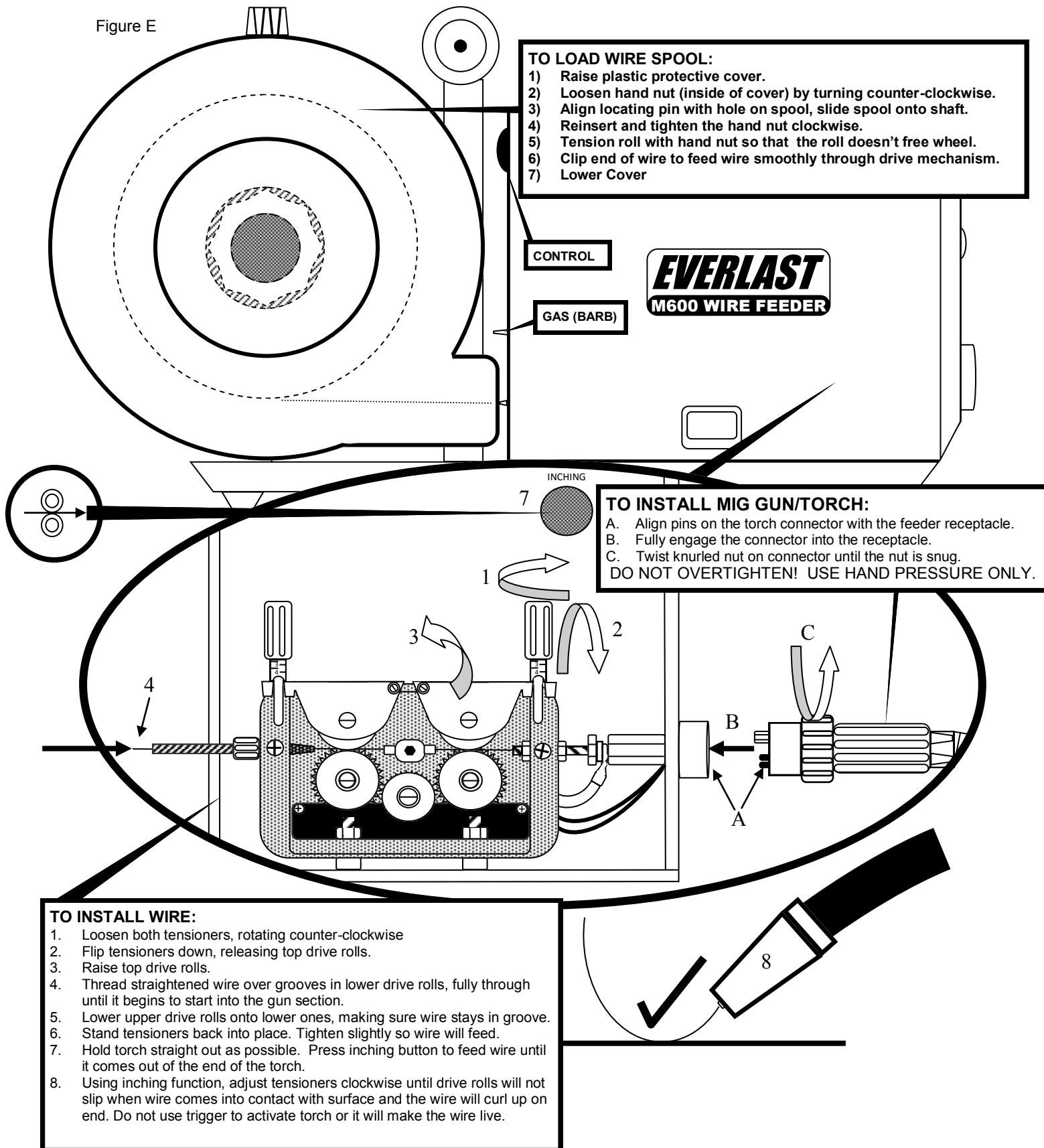


TABLE 2. SUGGESTED MIG (GMAW) PARAMETERS

WELDING AMPS	WELDING VOLTS	WIRE DIAMETER
60-80	17-18	1.0 mm/.040"
80-130	18-21	1.0-1.2 mm/.040"- .045"
130-200	20-24	1.0-1.2 mm/.040"- .045"
200-250	24-27	1.0-1.2 mm/.040"- .045"
250-350	26-32	1.2-1.6 mm/.045"- .065"
350+	31+	1.6 mm/.065"

TABLE 3. SUGGESTED STICK (SMAW [MMA]) PARAMETERS

METAL THICKNESS	ELECTRODE SIZE	WELDING AMPS
< 1 mm/.040"	1.5 mm/ 1/16"	20-40
2 mm/.080"	2 mm/3/32"	40-50
3 mm/ 1/8 "	3.2 mm/1/8"	90-110
4-5 mm/ 3/16"	3.2-4 mm/ 1/8"-3/16"	90-130
6-12 mm/ 1/4"-1/2"	4-5 mm/ 3/16"-5/32"	160-250
≥13 mm/ 1/2"	5-6 mm/ 5/32"-1/4"	250-400

NOTE: Arc force adjustment should be between 1-7 if the length of the welding cable attached to the electrode holder is less than 40 M/ 125 ft. Where voltage drop is a concern over long lengths, (for cables over 125 ft) increase arc force adjustment to 7-10 to compensate.

TABLE 4. SUGGESTED TIG (GTAW) PARAMETERS

METAL THICKNESS	WELDING AMPS	TUNGSTEN DIA.	Ar FLOW RATE
1-3 mm/.040"-1/8"	40-80	1-2 mm/.040"-3/32"	4-6 lpm/ 8-12 CFH
3-6 mm/ 1/8"-3/16"	80-200	2-3 mm/ 3/32"-1/8"	7-10 lpm/ 14-25 CFH
6-9 mm/ 3/16"-3/8"	200-400	3-6 mm/ 1/8"-1/4"	10+ lpm/ 20+ CFH

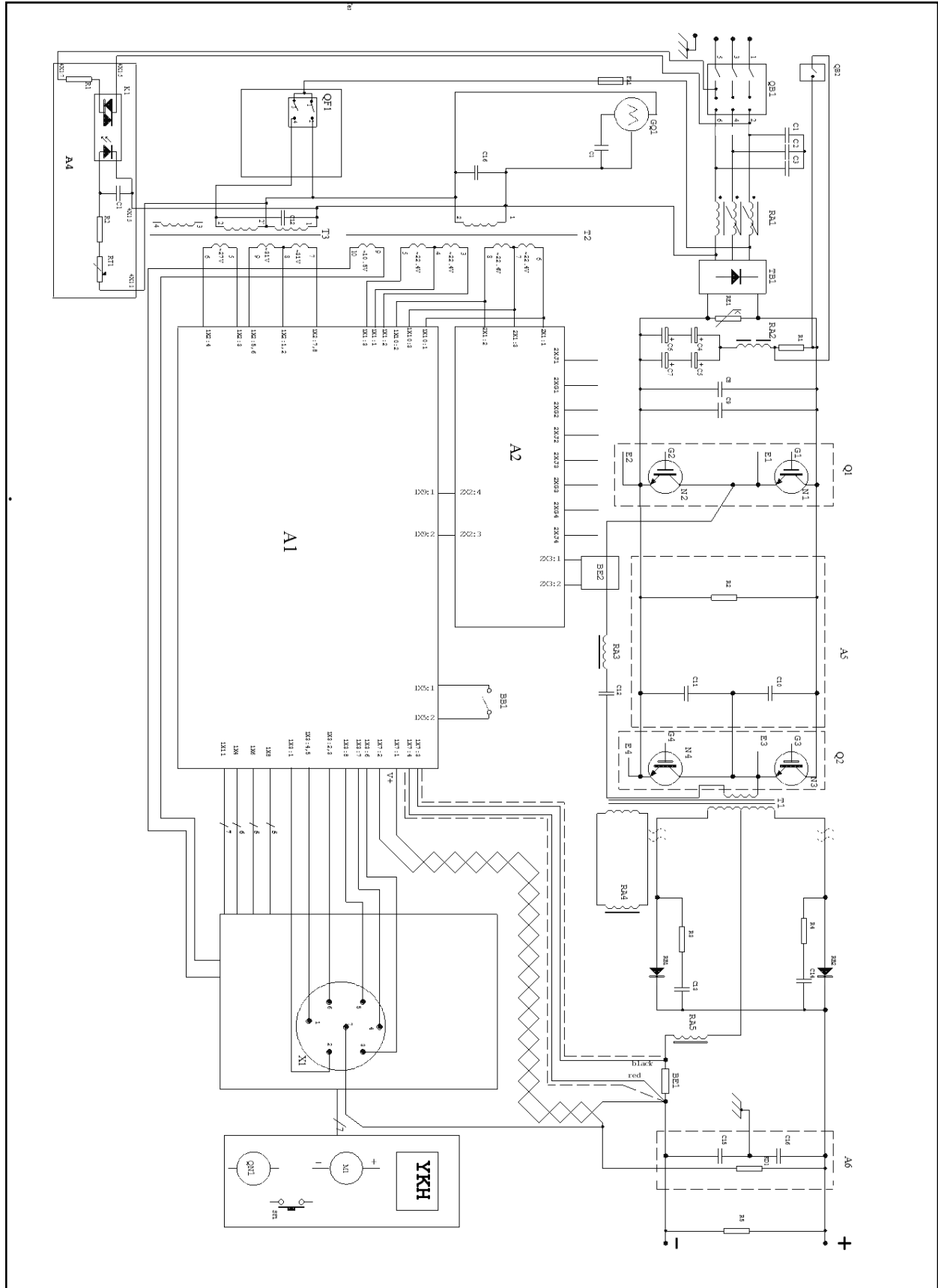
TABLE 6

No.	Trouble	Possible Cause	Remedy
01	Indicator lamp does not come on when machine is switched ON.	(1) Phase/Wiring incorrect (2) Main unit switch is damaged	(1) Check power supply (2) Change Breaker Switch
02	Circuit breaker (Main Switch) trips immediately after the machine is switched ON.	(1) Circuit breaker is damaged. (2) IGBT module is damaged (3) Rectifier bridge is damaged (4) Varistor is damaged (5) Main control board is damaged	(1) Replace (2) Replace (3) Replace (4) Replace (5) Replace
03	Circuit breaker(Main Switch) trips while welding	(1) Duty cycle exceeded/ excessive heat buildup in switch	(1) Reduce amperage, or stay within duty cycle limits
04	Main welding current will not adjust	(1) Wire feeder control cable damaged/ not hooked up.(MIG/Flux Core) (2) Control board is damaged (3) Power wire connected to the rectifier is	(1) Replace control cable or controller/ Install (2) Replace control board (3) Reconnect the broken wire
05	Unstable arc welding, excess spatter	(1) Incorrect welding parameters (2) Contact tip is worn out severely(MIG) (3) Check arc force/Inductance settings	(1) Fine tune parameters (2) Replace (3) Reduce or change setting.
06	When MIG torch trigger is pressed, wire feeds normally but gas flow is not present	(1) Control board is damaged (2) Gas solenoid is damaged /dirty/stuck	(1) Replace (2) Replace/Clean
07	Voltage will not adjust and no open circuit voltage is shown in the display	(1) MIG Torch trigger is damaged (2) Wire control cable is broken/not hooked up (3) Control board is damaged	(1) Replace torch (2) Repair control cable (3) Replace

# APPENDIX A: MAIN COMPONENT LIST

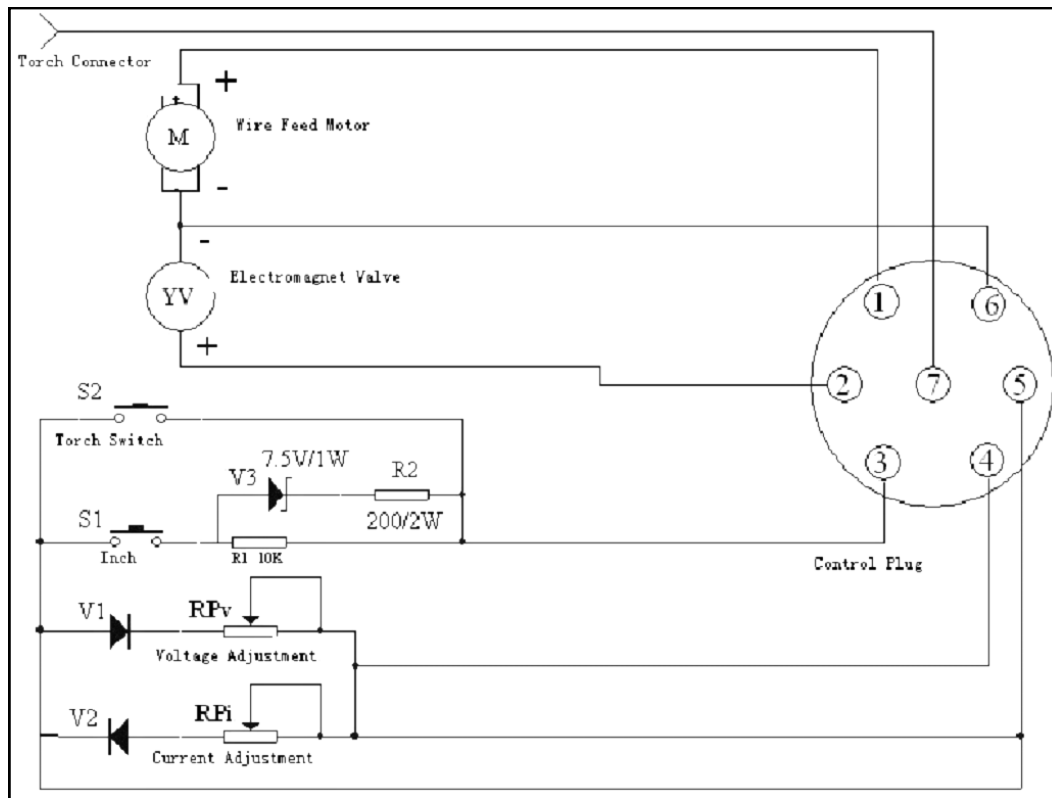
No.	Item	Specification
1	Circuit Breaker	DZ47-60(40A/3P)
2	3-phase rectifier module	MDS100A/1600V (small)
3	Polypropylene capacitor	MFD-DA01-1250VDC-40 $\mu$ F $\pm$ 5%
4	IGBT module	SKM75GB128D
5	Polypropylene capacitor	MFD-DA01 4 $\mu$ F/500VAC $\pm$ 5%
6	Main transformer	MTS 400M .3.1.0
7	Fast recovery diode module	DKR200AB60
8	Transformer for ZKB/QDB	ARC400.3.1-1
9	Transformer for ZKB/QDB	MTS400M (ZA) .4.1-1
10	Fuse	2A(6 $\times$ 30mm)
11	Fan	200FZY7 (specify voltage)
12	Thermal Switch	JUC-079F/70 $\pm$ 5 $^{\circ}$ C-1D-A
13	IGBT protection board	ZX7-400 III.5.1.0
14	Drive board	NBC-500 II.7.0
15	Main control board	MTS400M.6.0
16	Varistor	MYL1-625/5(1000V/5KA)
17	Current ex-change inductor	ZX7-400S-C.5.1.0
18	Socket	CX0031: TRAK-BE 35-70 mm <sup>2</sup>

# APPENDIX B: MAIN UNIT SCHEMATIC





# APPENDIX C: WIRE FEEDER SCHEMATIC



**NOTES:**