

WELDING AND CUTTING TOTAL SOLUTION

2019VERSION

# OWNER'S MANUAL

EXTREME 120 III / 140 III / 160 III



## **WARNING:**

Read carefully and understand all **ASSEMBLY AND OPERATION INSTRUCTIONS** before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.

## **General Safety Information**

### **1.1 Your Welding Environment**

- Keep the environment you will be welding in free from flammable materials.
- Always keep a fire extinguisher accessible to your welding environment.
- Always have a qualified person install and operate this equipment.
- Make sure the area is clean, dry and ventilated. Do not operate the welder in humid, wet or poorly ventilated areas.
- Always have your welder maintained by a qualified technician in accordance with local, state and national codes.
- Always be aware of your work environment. Be sure to keep other people, especially children, away from you while welding.
- Keep harmful arc rays shielded from the view of others.
- Mount the welder on a secure bench or cart that will keep the welder secure and prevent it from tipping over or falling.

### **1.2 Your Welder's Condition**

- Check ground cable, power cord and welding cable to be sure the insulation is not damaged. Always replace or repair damaged components before using the welder.
- Check all components to ensure they are clean and in good operating condition before use.

### **1.3 Use of Your Welder**

#### **⚠ CAUTION**

Do not operate the welder if the output cable, electrode, MIG gun, wire or wire feed system is wet. Do not immerse them in water. These components and the welder must be completely dry before attempting to use them.

- Follow the instructions in this manual.
- Keep welder in the off position when not in use.
- Connect ground lead as close to the area being welded as possible to ensure a good ground.
- Do not allow any body part to come in contact with the welding wire if you are in contact with the material being welded, ground or electrode from another welder.
- Do not weld if you are in an awkward position. Always have a secure stance while welding to prevent accidents. Wear a safety harness if working above ground.
- Do not drape cables over or around your body.
- Wear a full coverage helmet with appropriate shade (see ANSI Z87.1 safety standard) and safety glasses while welding.
- Wear proper gloves and protective clothing to prevent your skin from being exposed to hot metals, UV and IR rays.
- Do not overuse or overheat your welder. Allow proper cooling time between duty cycles.
- Keep hands and fingers away from moving parts and stay away from the drive rolls.
- Do not point MIG gun at any body part of yourself or anyone else.

## Operating Instructions and Parts Manual

-Always use this welder in the rated duty cycle to prevent excessive heat and failure.

### 1.4 Specific Areas of Danger, Caution or Warning



#### Electrical Shock

##### **⚠ WARNING**

Electric arc welders can produce a shock that can cause injury or death. Touching electrically live parts can cause fatal shocks and severe burns. While welding, all metal components connected to the wire are electrically hot. Poor ground connections are a hazard, so secure the ground lead before welding.

- Wear dry protective apparel: coat, shirt, gloves and insulated footwear.
- Insulate yourself from the work piece. Avoid contacting the work piece or ground.
- Do not attempt to repair or maintain the welder while the power is on.
- Inspect all cables and cords for any exposed wire and replace immediately if found.
- Use only recommended replacement cables and cords.
- Always attach ground clamp to the work piece or work table as close to the weld area as possible.
- Do not touch the welding wire and the ground or grounded work piece at the same time.
- Do not use a welder to thaw frozen pipes.



#### Fumes and Gases

##### **⚠ WARNING**

- Fumes emitted from the welding process displace clean air and can result in injury or death.
- Do not breathe in fumes emitted by the welding process. Make sure your breathing air is clean and safe.
- Work only in a well-ventilated area or use a ventilation device to remove welding fumes from the environment where you will be working.
- Do not weld on coated materials (galvanized, cadmium plated or containing zinc, mercury or barium). They will emit harmful fumes that are dangerous to breathe. If necessary use a ventilator, respirator with air supply or remove the coating from the material in the weld area.
- The fumes emitted from some metals when heated are extremely toxic. Refer to the material safety data sheet for the manufacturer's instructions.
- Do not weld near materials that will emit toxic fumes when heated. Vapors from cleaners, sprays and degreasers can be highly toxic when heated.

#### UV and IR Arc Rays



##### **⚠ DANGER**

The welding arc produces ultraviolet (UV) and infrared (IR) rays that can cause injury to your eyes and skin. Do not look at the welding arc without proper eye protection.

## Operating Instructions and Parts Manual

- Always use a helmet that covers your full face from the neck to top of head and to the back of each ear.
- Use a lens that meets ANSI standards and safety glasses. For welders under 160 Amps output, use a shade 10 lens; for above 160 Amps, use a shade 12. Refer to the ANSI standard Z87.1 for more information.
- Cover all bare skin areas exposed to the arc with protective clothing and shoes. Flame-retardant cloth or leather shirts, coats, pants or coveralls are available for protection.
- Use screens or other barriers to protect other people from the arc rays emitted from your welding.
- Warn people in your welding area when you are going to strike an arc so they can protect themselves.

### Fire Hazards



#### **▲ WARNING**

Do not weld on containers or pipes that contain or have had flammable, gaseous or liquid combustibles in them. Welding creates sparks and heat that can ignite flammable and explosive materials.

- Do not operate any electric arc welder in areas where flammable or explosive materials are present.
- Remove all flammable materials within 35 feet of the welding arc. If removal is not possible, tightly cover them with fireproof covers.
- Take precautions to ensure that flying sparks do not cause fires or explosions in hidden areas, cracks or areas you cannot see.
- Keep a fire extinguisher close in the case of fire.
- Wear garments that are oil-free with no pockets or cuffs that will collect sparks.
- Do not have on your person any items that are combustible, such as lighters or matches.
- Keep work lead connected as close to the weld area as possible to prevent any unknown, unintended paths of electrical current from causing electrical shock and fire hazards.
- To prevent any unintended arcs, cut wire back to ¼" stick out after welding.

### Hot Materials



#### **▲ CAUTION**

Welded materials are hot and can cause severe burns if handled improperly.

- Do not touch welded materials with bare hands.
- Do not touch MIG gun nozzle after welding until it has had time to cool down.

### Sparks/Flying Debris



#### **▲ CAUTION**

Welding creates hot sparks that can cause injury. Chipping slag off welds creates flying debris.

## Operating Instructions and Parts Manual

-Wear protective apparel at all times: ANSI-approved safety glasses or shield, welder's hat and ear plugs to keep sparks out of ears and hair.

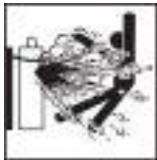


### **Electromagnetic Field**

#### **▲ CAUTION**

-Electromagnetic fields can interfere with various electrical and electronic devices such as pacemakers.

- Consult your doctor before using any electric arc welder or cutting device
- Keep people with pacemakers away from your welding area when welding.
- Do not wrap cable around your body while welding.
- Wrap MIG gun and ground cable together whenever possible.
- Keep MIG gun and ground cables on the same side of your body.



### **Shielding Gas Cylinders Can Explode**

#### **▲ WARNING**

High pressure cylinders can explode if damaged, so treat them carefully.

- Never expose cylinders to high heat, sparks, open flames, mechanical shocks or arcs.
- Do not touch cylinder with MIG gun.
- Do not weld on the cylinder
- Always secure cylinder upright to a cart or stationary object.
- Keep cylinders away from welding or electrical circuits.
- Use the proper regulators, gas hose and fittings for the specific application.
- Do not look into the valve when opening it.
- Use protective cylinder cap whenever possible

## **1.5 Proper Care, Maintenance and Repair**

### **▲ DANGER**

- Always have power disconnected when working on internal components.
- Do not touch or handle PC board without being properly grounded with a wrist strap. Put PC board in static proof bag to move or ship.
- Do not put hands or fingers near moving parts such as drive rolls of fan

## Operating Instructions and Parts Manual

**Description**

The EXTREME series is a DC inverter MMA welder . This unit uses 1~Phase 230V.50/60HZ AC power. A 30mp time delay fuse or circuit breaker is recommended. The EXTREME series is ideal for Do-It-Yourself projects or for light maintenance. Stick weld carbon steel, stainless steel .

**Unpacking**

**1.1 Remove cartons, bags or Styrofoam containing the welder and accessories.**

**1.2 Check the contents with the packing list below.**

ITEM	QTY.
DC Inverter Arc Welder	1 unit
Welding cable with electrode holder	1pc
Grounding cable with earth clamp	1pc
Operator's Manual	1set

**1.3 After unpacking unit, inspect carefully for any damage that may have occurred during transit. Check for loose, missing, or damaged parts. Shipping damage claim must be filed with carrier.**

## Operating Instructions and Parts Manual

## Specifications and Dimension

Description	Specification		
	EXTREME 120 <sub>III</sub>	EXTREME 140 <sub>III</sub>	EXTREME 160 <sub>III</sub>
Model	EXTREME 120 <sub>III</sub>	EXTREME 140 <sub>III</sub>	EXTREME 160 <sub>III</sub>
Input power	230V(220~240) 40)	230V(220~240) 40)	230V(220~240) 40)
Frequency HZ	50/60	50/60	50/60
Rated input current	22	25	30
Rated input capacitance	5.06	5.75	6.9
No-load voltage V	68	68	68
Rated working voltage V	24.8	25.6	26.4
MMA welding current A	20~120	20~140	20~160
Rated duty cycle %	15	20	20
Welding current (10min) A	15@120	20@140	20@160
10min/100% A	47	63	71
Efficiency $\eta$	85%	85%	85%

Operating Instructions and Parts Manual

Power factor Cos $\phi$	0.65	0.65	0.65
Insulation class	H	H	H
Enclosure protection IP	21S	21S	21S
Cooling type	Fan cooled	Fan cooled	Fan cooled
Dimension cm LxWxH	31.5 × 10.2 × 17.6	31.5 × 10.2 × 17.6	31.5 × 10.2 × 17.6
Weight kg	3	3	3

**Know your Welder**





## Operating Instructions and Parts Manual

### **POWER INDICATOR**

When the machine is turned on, the power indicator will be on.

### **ALARM INDICATOR**

When the thermal indicator is on, it shows the machine is overloaded and the internal temperature is too high. Weld output will turn off automatically but the fan will still be working. When the internal temperature is decreased, the overload light will turn off and the machine will be ready to weld.

### **WELDING CURRENT**

Welding Current is on the front panel of machine. It is an infinite current output adjustment.

### **WELDING CABLE**

The welding cable are attached to electrode to complete the circuit, allowing the flow of current needed to weld.

### **GROUNDING CABLE**

The ground cable/clamp are attached to the work piece to complete the circuit, allowing the flow of current needed to weld.

### **POWER SWITCH**

In the "oFF" position no power is being supplied.

In the "ON" position power is supplied to the main transformer and control circuit.

### **POWER CORD**

The power cord connects the welder to the 230 volt power supply. 16 amp receptacle to supply power to the welder.

## **Installation**

### **1. Power requirement**

AC single phase 230V, 50/60HZ fused with a 30amp time delayed fuse or circuit breaker is required.

- High voltage danger from power source! Consult a qualified electrician for proper installation of receptacle. This welder must be grounded while in use to protect the operator from electrical shock.
- Do not remove grounding prong or alter the plug in any way. Do not use any adapters between the welder's power cord and the power source receptacle. Make sure the POWER switch is OFF when connecting your welder's power cord to a properly grounded 230Vac, 50Hz, single phase, 30 amp power source.

### **2. Extension cord**

During normal use an extension cord is not necessary. It is strongly recommended that an extension cord should not be used because of the voltage drop they produce. This drop in voltage can affect the performance of the welder. If you need to use an extension cord it must be a #12 gauge cord at the smallest.

-Do not use an extension cord over 7.8m in length.

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Operating Instructions and Parts Manual

### 3. Setting up the work piece

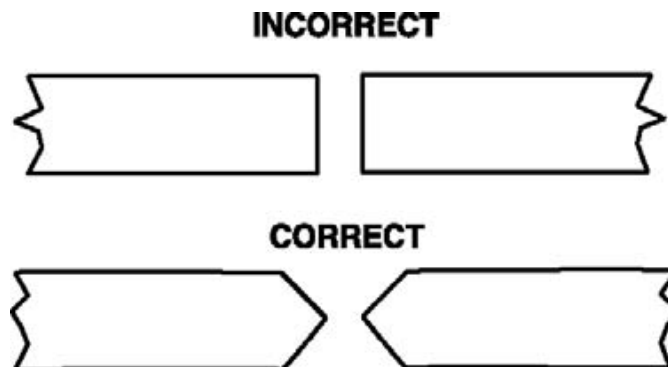
#### 3.1 Welding positions

There are two basic positions, for welding: Flat and Horizontal. Flat welding is generally easier, faster, and allows for better penetration. If possible, the work piece should be positioned so that the bead will run on a flat surface.

#### 3.2 Preparing the Joint

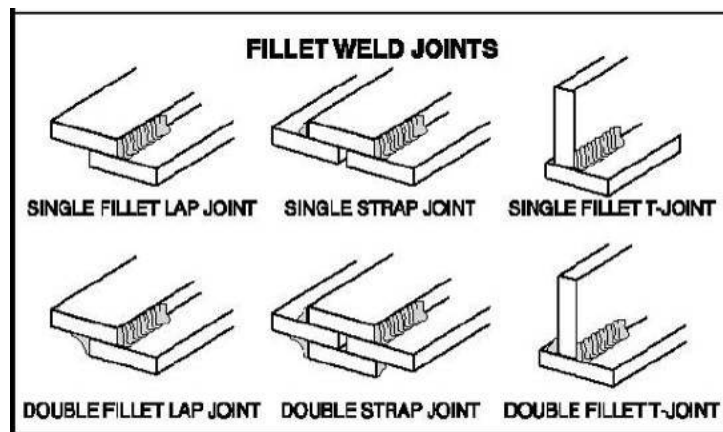
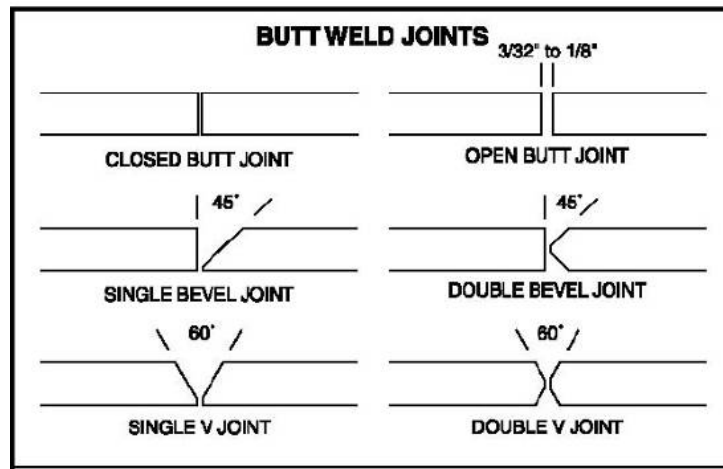
Before welding, the surface of work piece needs to be free of dirt, rust, scale, oil or paint. Or it will create brittle and porous weld. If the base metal pieces to be joined are thick or heavy, it may be necessary to bevel the edges with a metal grinder. The correct bevel should be around 60 degrees.

See following picture:



Based on different welding position, there are different welding joint, see following images for more information

## Operating Instructions and Parts Manual

**4. Ground clamp connection**

Clear any dirt, rust, scale, oil or paint on the ground clamp. Make certain you have a good solid ground connection. A poor connection at the ground clamp will waste power and heat. Make sure the ground clamp touches the metal.

**5. Electrode**

The welding electrode is a rod coated with a layer of flux. When welding, electrical current flows between the electrode (rod) and the grounded metal work piece. The intense heat of the arc between the rod and the grounded metal melts the electrode and the flux. The most popular electrodes are:

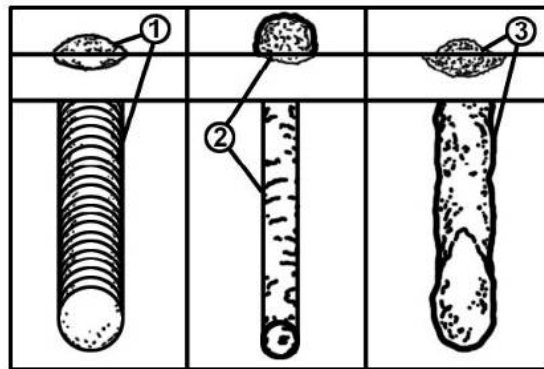
- E6011 60,000 PSI tensile strength deep penetrating applications.
- E6013 60,000 PSI tensile strength used for poor fit up applications
- E7014 70,000 PSI tensile strength used for high deposition and fast travel speeds with light penetration
- E7018 70,000 PSI tensile strength, Used for out of position and tacking.

**6. Selecting the proper electrode**

There is no golden rule that determine the exact rod or heat setting

## Operating Instructions and Parts Manual

required for every situation. The type and thickness of metal and the position of the work piece determine the electrode type and the amount of heat needed in the welding process. Heavier and thicker metals required more amperage. It is best to practice your welds on scrap metal which matches the metal you intend to work with to determine correct heat setting and electrode choice. See following some helpful trouble shooting tips to determine if you are using a correct electrode

**1. When proper rod is used**

- a. The bead will lay smoothly over the work without ragged edges
- b. The base metal puddle will be as deep as the bead that rises above it
- c. The welding operation will make a crackling sound similar to the sound of eggs frying.

**2. When a rod too small is used**

- a. The bead will be high and irregular
- b. The arc will be difficult to maintain

**3. When the rod is too large is used**

- a. The arc will burn through light metals
- b. The bead will undercut the work
- c. The bead will be flat and porous
- d. Rod may be freeze or stick to work piece

**Note:** Rate of travel over the work also affects the weld. To ensure proper penetration and enough deposit of rod, the arc must be moved slowly and evenly along the weld seam.

## Operation

### 1. Setting the amperage control

The welder has an infinite output current control. It is capable of welding with  $\phi$  1.6 mm and  $\phi$  2.0 mm and  $\phi$  2.5 mm electrodes.

There is no golden rule that determines the exact amperage required for every situation. It is best to practice your welds on scrap metal which matches the metals you intend to work with to determine correct setting for your job. The electrode type and the thickness of the work piece metal determine the amount of heat needed in the welding process. Heavier and thicker metals require more voltage (amperage), whereas lighter and thinner metals require less voltage (amperage).

### 2. Welding techniques

The best way to teach yourself how to weld is with short periods of practice at regular intervals. All practice welds should be done on scrap metal that can be discarded. Do not attempt to make any repairs on valuable equipment until you have satisfied yourself that your practice welds are of good appearance and free of slag or gas inclusions.

#### 2.1 Holding the electrode

The best way to grip the electrode holder is the way that feels most comfortable to you. To position the electrode to the work piece when striking the initial arc it may be necessary to hold the electrode perpendicular to the work piece. Once the arc is started the angle of the electrode in relation to the work piece should be between 10 and 30 degrees. This will allow for good penetration, with minimal spatter.

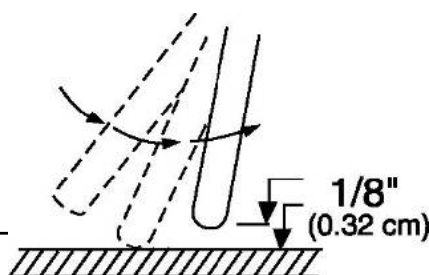
#### 2.2 Striking the arc

### **▲ WARNING**

EXPOSURE TO A WELDING ARC IS EXTREMELY HARMFUL TO THE EYES AND SKIN.

- Never strike an arc or begin welding until you have adequate protection.
- Wear flameproof welding gloves, heavy long-sleeved shirt, cuffless trousers, high-topped shoes and a welding helmet or shield.

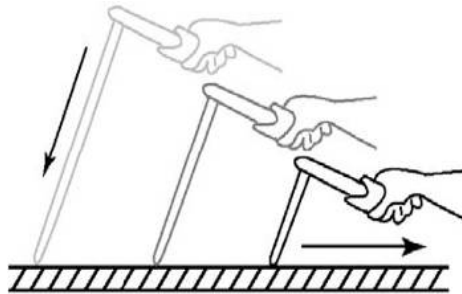
Scratch the work piece with the end of electrode to start arc and then raise it quickly about 1/8 inch gap between the rod and the work piece. See following picture



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## Operating Instructions and Parts Manual

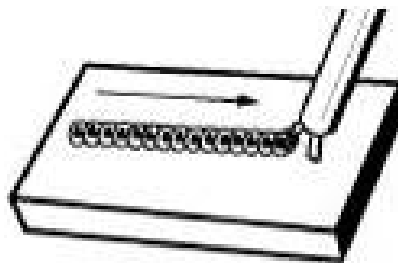
It is important that the gap be maintained during the welding process and it should be neither too wide or too narrow. If too narrow, the rod will stick to the work piece. If too wide, the arc will be extinguished. It needs much practice to maintain the gap. Beginners may usually get sticking or arc extinguishing. When the rod sticks to the work piece, gently rock it back and forth to make them separate. If not, the circuit is short connection, and it will overload the welder. A good arc is accompanied by a crisp, cracking sound. The sound is similar to that made by eggs frying. To lay a weld bead, only 2 movements are required; downward and in the direction the weld is to be laid, as in following figure:



### 2.3 Types of weld bead

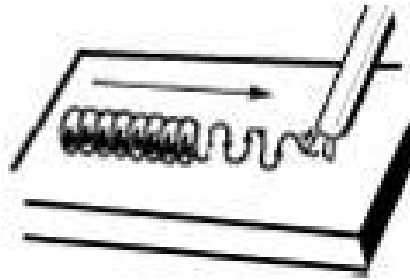
The following paragraphs discuss the most commonly used arc welding beads.

The stringer bead Formed by traveling with the electrode in a straight line while keeping it centered over the weld joint.



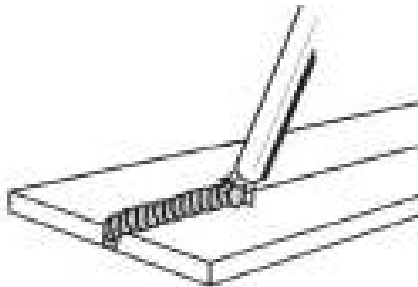
The weave bead Used when you want to deposit metal over a wider space than would be possible with a stringer bead. It is made by weaving from side to side while moving with the electrode. It is best to hesitate momentarily at each side before weaving back the other way to improve penetration.

## Operating Instructions and Parts Manual



### 2.4 Welding position

Flat position is the easiest of the welding positions and is most commonly used. It is best if you can weld in the flat position if at all possible as good results are easier to achieve.



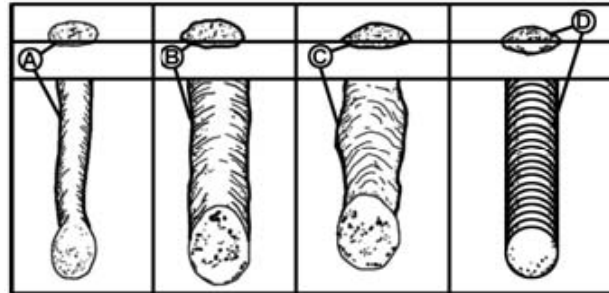
The horizontal position is performed very much the same as the flat weld except that the angle is different such that the electrode, and therefore the arc force, is directed more toward the metal above the weld joint. This more direct angle helps prevent the weld puddle from running downward while still allowing slow enough travel speed to achieve good penetration. A good starting point for your electrode angle is about 30 degrees DOWN from being perpendicular to the work piece.



### 2.5 Judge a good weld bead

Operating Instructions and Parts Manual

When the trick of establishing and holding an arc has been learned, the next step is learning how to run a good bead. The first attempts in practice will probably fall short of acceptable weld beads. Too long of an arc will be held or the travel speed will vary from slow to fast (see following)



- A. Weld speed is too fast.
- B. Weld speed is too slow.
- C. Arc is too long.
- D. Ideal weld.

A solid weld bead requires that the electrode be moved slowly and steadily along the weld seam. Moving the electrode rapidly or erratically will prevent proper fusion or create a lumpy, uneven bead. To prevent ELECTRIC SHOCK, do not perform any welding while standing, kneeling, or lying directly on the grounded work.

2.6 Finish the bead

As the coating on the outside of the electrode burns off, it forms an envelope of protective gasses around the weld. This prevents air from reaching the molten metal and creating an undesirable chemical reaction. The burning coating, however, forms slag. The slag formation appears as an accumulation of dirty metal scale on the finished weld. Slag should be removed by striking the weld with a chipping hammer.

**Trouble shooting Chart**

NO	Breakdown	Analysis	Solutions
	Yellow Indicator is on	Voltage is too high ( $\geq 15\%$ )	Switch off power source; Check the main supply; Restart welder when power recovers to normal state.
		Voltage is too low ( $\leq 15\%$ )	



Operating Instructions and Parts Manual

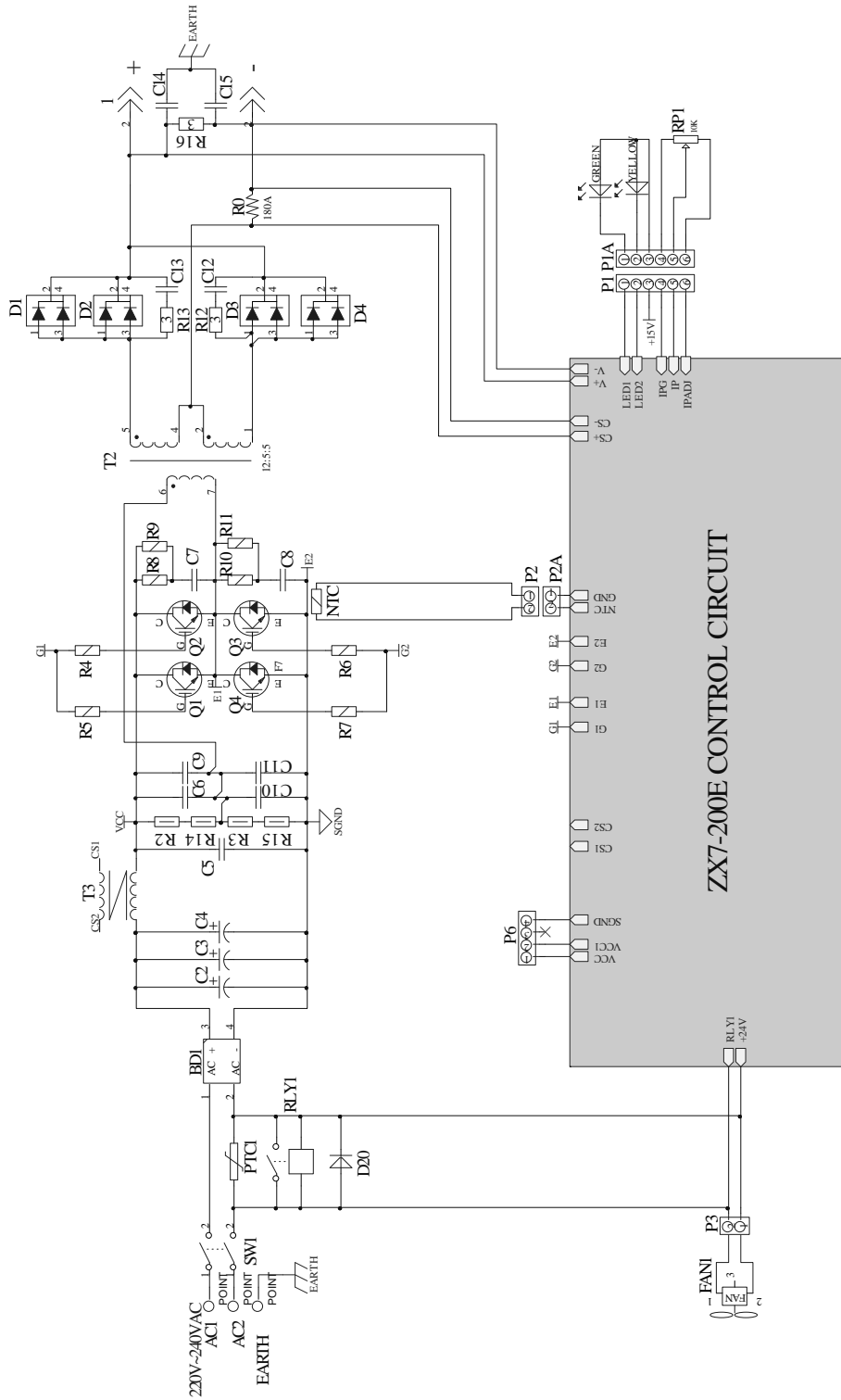
1		Bad power ventilation lead to over-heat protection	Improve the ventilation condition.
		Circumstance temperature is too high.	It will automatically recover when the temperature low down.
		Using over the rated duty-cycle.	It will automatically recover when the temperature low down.
2	Cooling Fan not working or turning very slowly	Switch broken	Replace the switch
		Fan broken	Replace or repair the fan
		Wire broken or falling off	Check the connection
3	Arc is not stable and splash is large	Too large contact tip makes the current unsteady	Change the proper contact tip or roller
		Too thin power cable makes the power astaticism	Change the power cable
		Too low input voltage	Enhance the input voltage
		Wire feeding resistance is too large	Clean or replace the liner and the torch cable had better in the line direction.
	arc can't be	Earth cable break	Connect earth cable

Operating Instructions and Parts Manual

4	pilot	Work piece has much greasy dirty or rusty stain	Clean greasy dirty or rusty stain
5	Others		Please connect with our company

Operating Instructions and Parts Manual

Main Circuit chart



### **Service, Maintenance, Transportation and Storage**

The welder needs regular maintenance as following: Periodically clean dust, dirt, grease, etc. from your welder. Every six months, or as necessary, remove the cover panel from the welder and air-blow any dust and dirt that may have accumulated inside the welder. Replace power cord, ground cable, ground clamp, or electrode assembly when damaged or worn.

Store in a clean dry facility free from corrosive gas, excess dust and high humidity. Temperature range from 10°F to 120°F and the relative humidity not more than 90%. When transporting or storing the welder after using, it is recommended to repack the product as it was received for protection. (Cleaning is required before storage and you must seal the plastic bag in the box for storage).