WELDING AND CUTTING TOTAL SOLUTION

OWNER'S MANUAL

POWER STICK WIII SERIES

⚠ 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.

CATALOGUE

GENERAL SAFETY RULES

 **WARNING: Read and understand all instructions.** Failure to follow all instructions listed below may result in serious injury.

 **CAUTION: Do not allow persons to operate or assemble this POWER STICK 251WⅢ until they have read this manual and have developed a thorough understanding of how the POWER STICK 251WⅢ works.**

 **WARNING: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions or situations that could occur.** It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

SAVE THESE INSTRUCTIONS

IMPORTANT SAFETY CONSIDERATIONS

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, torch, 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 torch at any body part of yourself or anyone else.
-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.

-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.

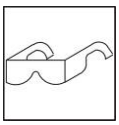
Hot Materials

⚠ 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.

-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

POWER STICK WⅢ USE AND CARE

- **Do not modify the POWER STICK WⅢ in any way.** Unauthorized modification may impair the function and/or safety and could affect the life of the equipment. There are specific applications for which the **POWER STICK WⅢ** was designed.
- **Always check of damaged or worn out parts before using the POWER STICK WⅢ.** Broken parts will affect the **POWER STICK WⅢ** operation. Replace or repair damaged or worn parts immediately.
- **Store idle POWER STICK WⅢ .** When **POWER STICK WⅢ** is not in use, store it in a secure place out of the reach of children. Inspect it for good working condition prior to storage and before re-use.

TECHNICAL SPECIFICATIONS

Main Technical Data	ITEMUINT	POWER STICK 160WⅢ			POWER STICK 180WⅢ		
Rated Input Voltage V	V	220	230	240	220	230	240
Electrical Source Frequency Hz	Hz	50/60	50/60	50/60	50/60	50/60	50/60
Rated Input Current A	A	31	30	29	35	33	24
Rated Input Capacity KVA	KVA	6.6	6.6	6.6	7.7	7.59	7.68
Open circuit Voltage V	V	77	80	83	77	80	83
Rated Working Voltage V	V	26.4			30		
Current Regulation Range A	A	30-160			30-180		
Rated Duty Cycle %	%	40			40		
Welding Current 10min/60% A	A	130			147		
10min/100% A	A	101			114		
Efficiency	η	80%					
Power Factor	Cosφ	0.73					
Insulation Grade		F					
Case Protection Grade		IP21S					
Cooling Type		Gas cooling					
Case Size （L×W×H）	mm	395*154*299			395*154*299		
Weight	kg	6.7			6.7		

Main Technical Data	ITEMUINT	POWER STICK 200WⅢ			POWER STICK 251WⅢ		
Rated Input Voltage V	V	220	230	240	220	230	240
Electrical Source Frequency Hz	Hz	50/60	50/60	50/60	50/60	50/60	50/60
Rated Input Current A	A	38	37	35	50	48	47
Rated Input Capacity KVA	KVA	8.36	8.51	8.4	11	11.04	10.34
Open circuit Voltage V	V	77	80	83	77	80	83
Rated Working Voltage V	V	28			30		
Current Regulation Range A	A	30-200			30-250		
Rated Duty Cycle %	%	20			30		
Welding Current 10min/60% A	A	115			177		
10min/100% A	A	89			137		
Efficiency	η	80%					
Power Factor	Cosφ	0.73					
Insulation Grade		F					
Case Protection Grade		IP21S					
Cooling Type		Gas cooling					
Case Size （L×W×H）	mm	395*154*299			459*200*338		
Weight	kg	6.7			12		

INSTALLATION

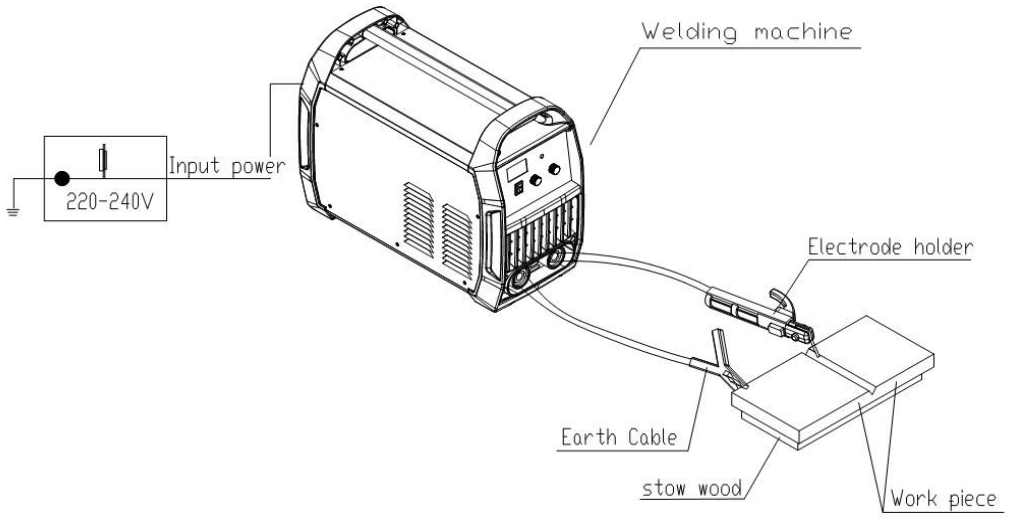
1. POWER REQUIREMENT - AC single phase 220-240V, 60 HZ with a 50 amp circuit breaker is required. DO NOT OPERATE THIS UNIT if the ACTUAL power source voltage is less than 220 volts AC or greater than 240 volts AC.

⚠WARNING

- **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 220-240 VAC, 60 HZ, Single Phase, 50 Amp input power supply.**

Welder's Placement

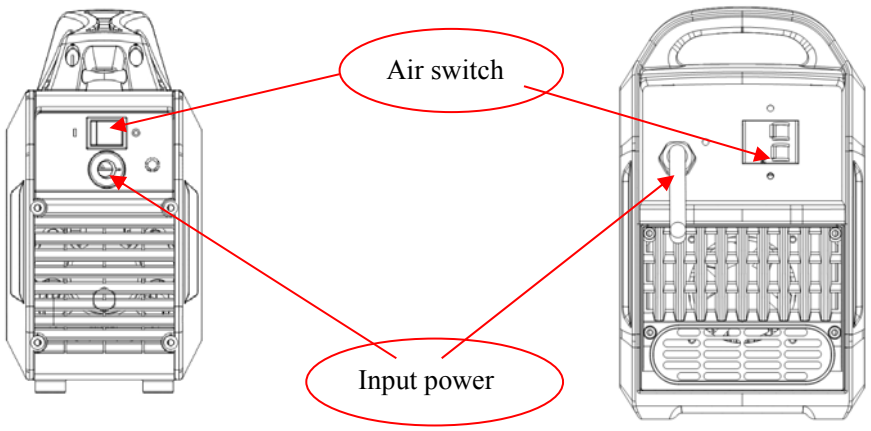
* The dust, acid and erosible dirt in the air at the job site can not exceed the amount required by the norm.
* The welder must be installed in the place where it can not be exposed to sun and rain. Also it must be stored in less humid place with the temperature range at -10~40°C.
* There should be 50 cm space about for the welding machine to have good ventilation.
* Apparatus to exclude wind and smoke should be equipped if the inside aeration is not sound.



Connection between Welder and Power Source (See the Input Connection Sketch)

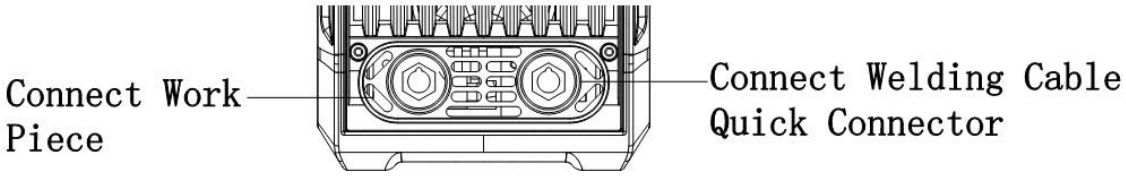
★Normally power source is 220-240VAC.50/60HZ

Notice: Power network earth connection is not power network connection zero.



Connection between Welder and Electrode Holder (See Output Connection Sketch)

Insert the quick connector of the welding cable on the electrode holder into current output "+" electrode adaptor on the second half of the front panel and then screw down clockwise.



Output Connection Skectch

Connection between Welder and Work Piece (See Output Connection Sketch)

Insert the quick connector of earth cable with earth clamp into current output '-' electrode adaptor on the second half of the front panel and then screw down clockwise. The earth clamp is connected with work piece.

Notice: Do not use steel plate or the materials alike which are ill conductor to connect between welder and work piece.

2. EXTENSION CORD - We do not recommend an extension cord 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, we recommend you check with a qualified electrician and your local electrical codes for your specific area. Do not use an extension cord over 25 ft. in length.

3. INSTALLATION OF OPTIONAL TIG TORCH

3.1 Remove the ground cable and the electrode holder from the weld output connections. Install the ground cable to the Positive (+) weld output connection.
3.2 Secure the ground clamp to the work piece
3.3 Connect a regulator to a bottle of ARGON gas. Then connect the gas connection from the TIG torch to the regulator.
3.4 Connect the TIG torch weld cable to the Negative (-) weld output connection.

3.5 Set desired amperage on the amperage control knob on the front panel of the welder.
3.6 Turn on the input power switch on the welder.

⚠ CAUTION

Be aware that the TIG torch will be electrically HOT when the Input Power Switch on the welder is turned on.

3.7 Turn on the regulator on the bottle of shielding gas and adjust the regulator to approximately 20 CFH. Then open the shielding gas valve on the torch to start the flow of shielding gas.

⚠WARNING

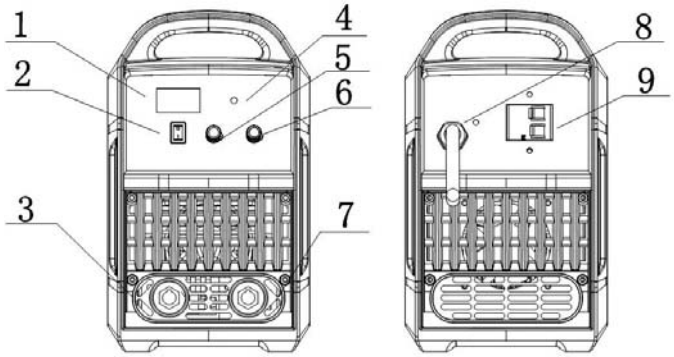
EXPOSURE TO A WELDING ARC IS EXTREMELY HARMFUL TO THE EYES AND SKIN! Prolonged exposure to the welding arc can cause blindness and burns. Never strike an arc or begin welding until you are adequately protected. Wear flame-proof welding gloves, a heavy long sleeved shirt, trousers without cuffs, high topped shoes, and an ANSI approved welding helmet.

3.8 Touch the tungsten that is installed in the TIG torch, to the work piece and quickly pull away approximately 1/4" to create an arc.

OPERATION

⚠WARNING

High voltage danger from power source! Consult a qualified electrician for proper installation of receptacle at the power source. This welder must be grounded while in use to protect the operator from electrical shock. If you are not sure if your outlet is properly grounded, have it checked by a qualified electrician. Do not cut off the grounding prong or alter the plug in any way and do not use any adapter between the welder's power cord and the power source receptacle. Make sure the POWER switch is OFF then connect your welder's power cord to a properly grounded 240 VAC, 60 HZ, single phase, 50 amp power source.



1.Current display	2.MMA/Lifttig switch	3. Current Output "-" Electrode Quick Connector Socket	4 .Alarm Indicator
5.ARC force	6.Welding Current Adjustment Knob	7.Current Output "+" Electrode Quick Connector Socket	8. Power Input Wire
9. Air switch			

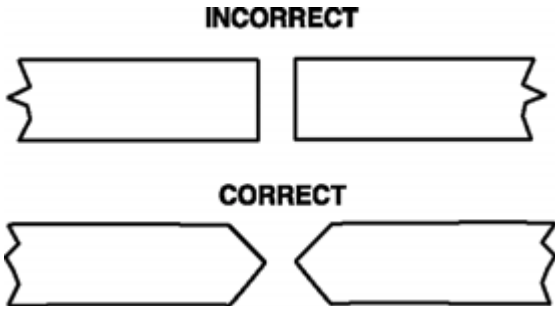
4. SETTING UP THE WORK PIECE

4.1 Welding positions

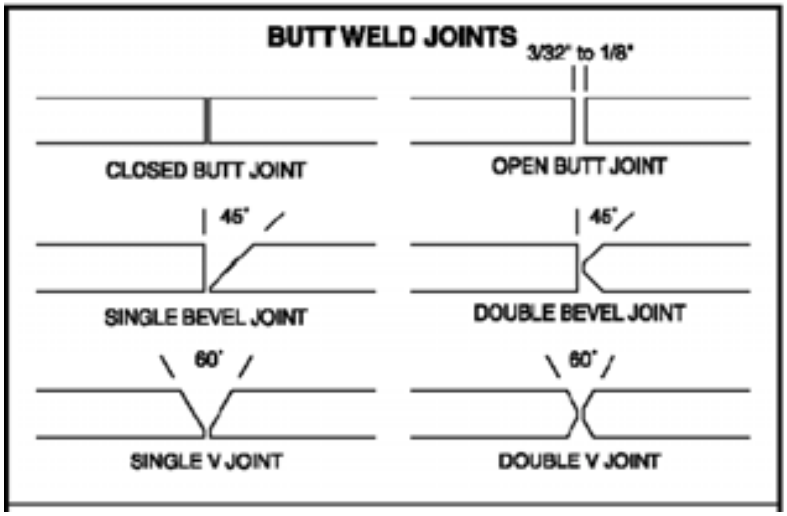
There are two basic positions, for welding: Flat and Horizontal. Flat welding is generally easier, faster, and allows for better penetration. If possible, the work piece should be positioned so that the bead will run on a flat surface.

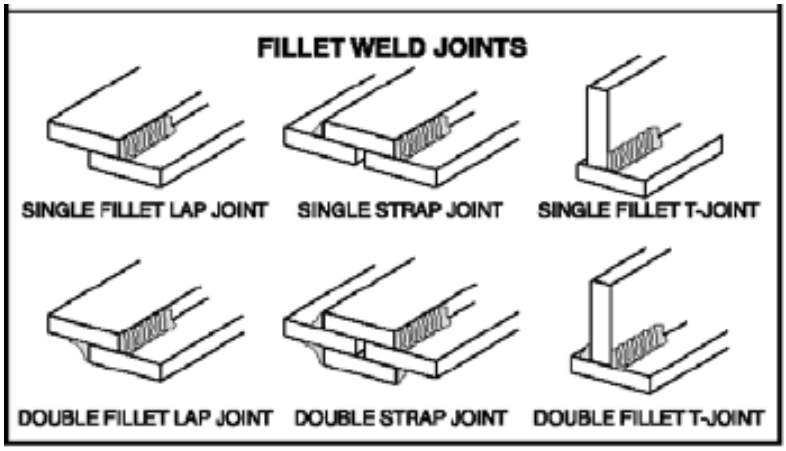
4.2 Preparing the Joint

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 welds. 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 degree. See following picture:



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





5. GROUND CLAMP CONNECTION

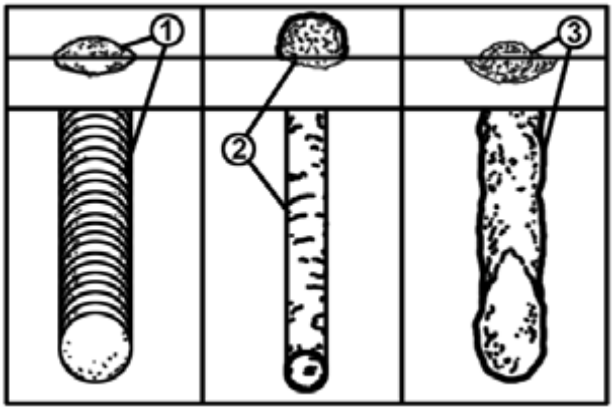
Clear any dirt, rust, scale, oil or paint on the ground clamp. Make certain you have a good solid ground connection. A poor connection at the ground clamp will waste power and heat. Make sure the ground clamp touches the metal.

6. 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. For best performance on this unit, we suggest the use of 6013 electrodes.

7. SELECTING THE PROPER ELECTRODE

There is no golden rule that determine the exact rod or heat setting 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 the following helpful trouble shooting tips to determine if you are using a correct electrode.



7.1. When proper rod is used:
7.1.a. The bead will lay smoothly over the work without ragged edges
7.1.b. The base metal puddle will be as deep as the bead that rises above it
7.1.c. The welding operation will make a crackling sound similar to the sound of eggs frying
7.2. When a rod too small is used;
7.2. a. The bead will be high and irregular
7.2. b. The arc will be difficult to maintain
7.3. When the rod is too large
7.3. a. The arc will burn through light metals
7.3. b. The bead will undercut the work
7.3. c. The bead will be flat and porous
7.3. 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.

8. SETTING THE AMPERAGE CONTROL

The welder has an infinite current control. It is capable of welding with electrodes up to 3/32” diameter. 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). Consult the welding electrode packaging for recommended welding amperage range.

9. 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.

9.1 Holding the electrode

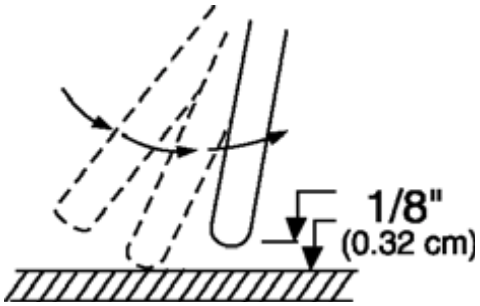
The best way to grip the electrode holder is the way that feels most comfortable to you. Position the Electrode to the work piece when striking the initial arc it may be necessary to hold the electrode perpendicular to the work piece. Once the arc is started the angle of the electrode in relation to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

9.2 Striking the arc

⚠WARNING

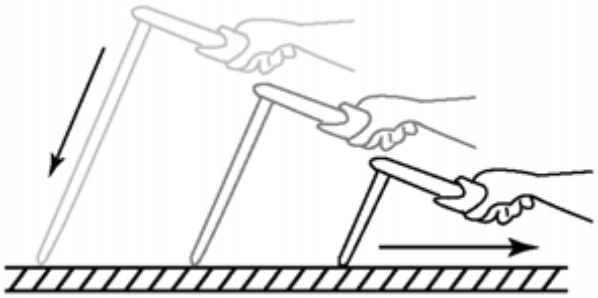
EXPOSURE TO A WELDING ARC IS EXTREMELY HARMFUL TO THE EYES AND SKIN! Prolonged exposure to the welding arc can cause blindness and burns. Never strike an arc or begin welding until you are adequately protected. Wear flame-proof welding gloves, a heavy long sleeved shirt, trousers without cuffs, high topped shoes, and an ANSI approved welding helmet.

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



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. The beginners may usually get sticker or arc extinguishing. When the rod is stuck to the work piece, gently rock it back and forth to make them separate. If not, a short circuit will occur and it will break 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;

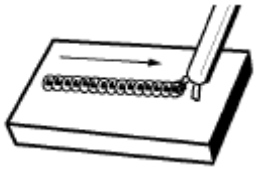
downward (as the electrode is consumed) and in the direction the weld is to be laid, as in following figure:



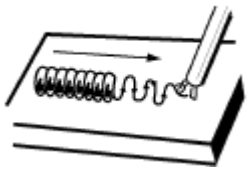
9.3 Types of weld bead

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 the electrode centered over the weld joint.



Stringer Bead



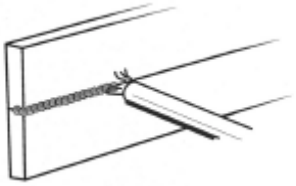
Weave Bead

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.

8.4 Welding position

Flat position It is 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.

Flat Position

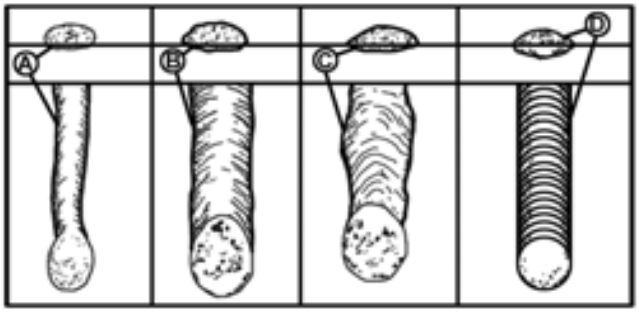


Horizontal Position

The horizontal position it 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.

9.5 Judge the good weld bead

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.

⚠WARNING

ELECTRIC SHOCK CAN KILL! To prevent ELECTRIC SHOCK, do not perform any welding while standing, kneeling, or lying directly on the grounded work piece.

9.6 Finish the bead

As the coating on the outside of the electrode burns off, it forms an envelope of protective gases 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 using a chipping hammer.

⚠WARNING

PEENING THE SLAG FROM A WELD JOINT CUASES SMALL CHIPS OF METAL TO FLY THROUGH THE AIR! Metallic chips flying through the air can cause eye injury or injury to other parts of the head, hands or exposed portions of the body. Wear goggles or safety glasses with side shields and protect the hands and other exposed parts of the body with protective garments, or if possible, work with a shield between the body and the work piece.

The intense heat produced at the arc sets up strains in the metal joined by welding. Peening the weld not only removes the scale left behind in the welding but relieves the internal strains developed by the heating and cooling process.

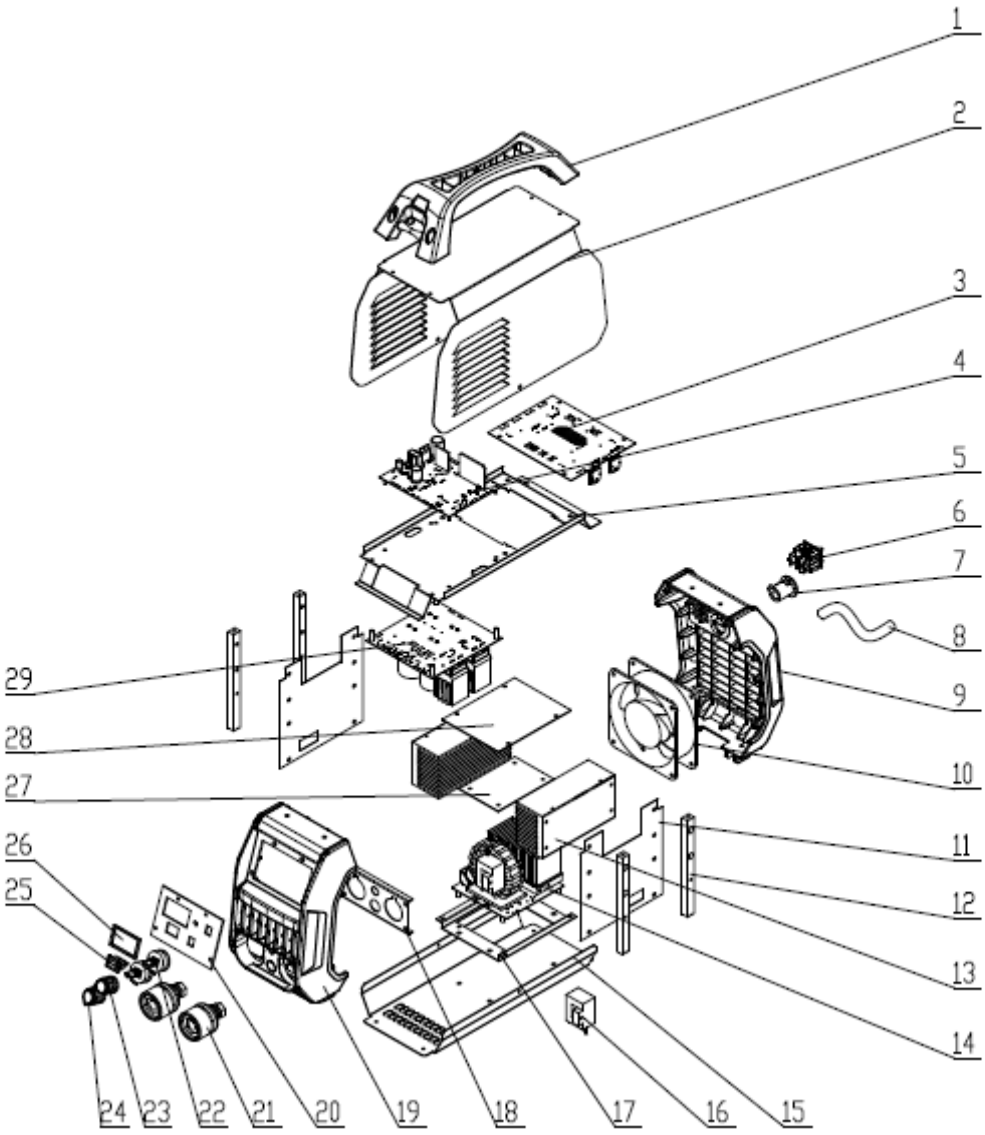
MAINTENANCE

- **Maintain your POWER STICK WⅢ.** It is recommended that the general condition of **POWER STICK WⅢ** be examined before it is used. Keep **POWER STICK WⅢ** in good repair by adopting a program of conscientious repair and maintenance. Have necessary repairs made by qualified service personnel.
- 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.

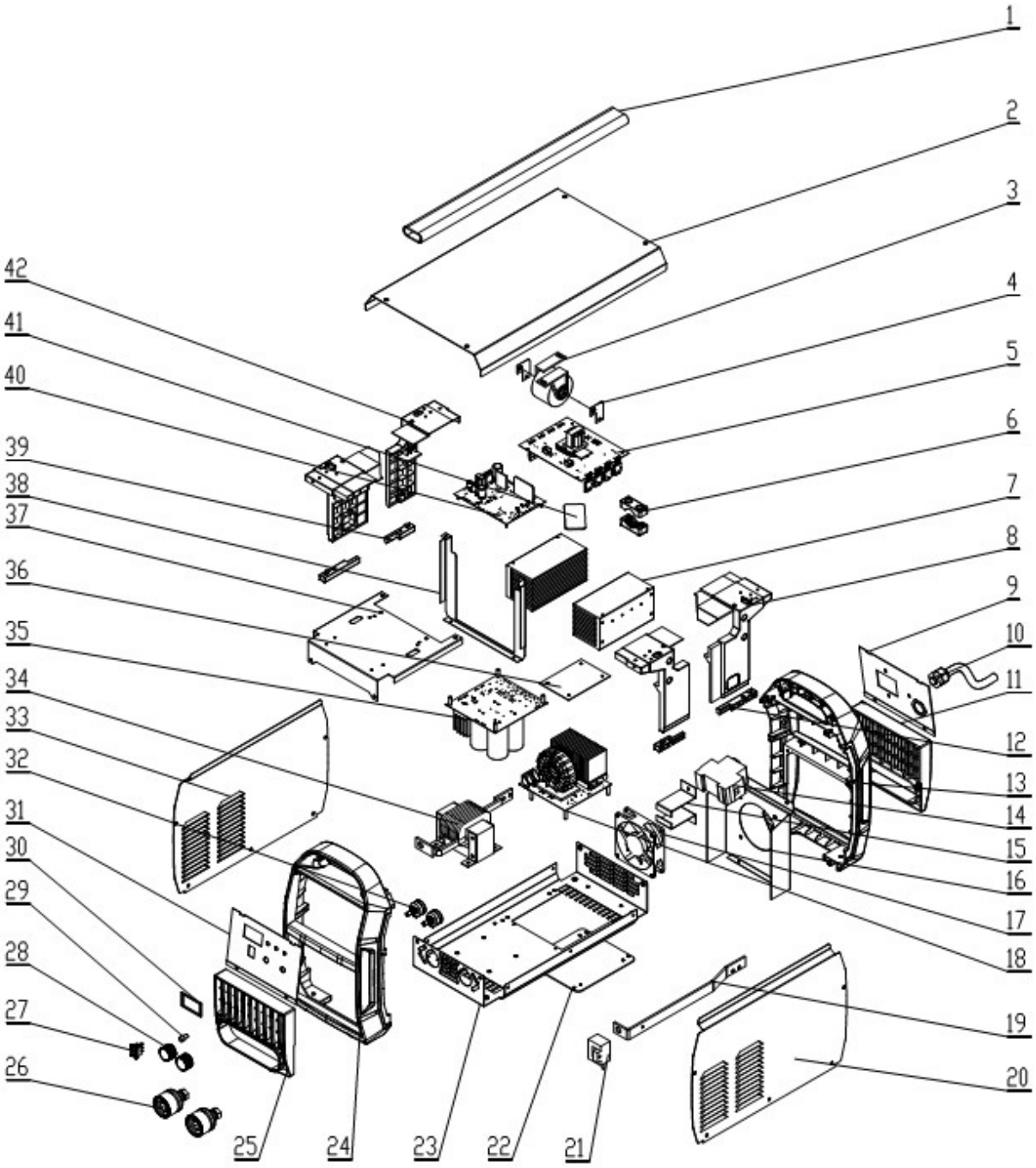
TROUBLESHOOTING

No.	Breakdown	Analysis	Solutions
1	Yellow Indicator is on	Bad power ventilation lead to over-heat protection	Improve the ventilation condition.
		Circumstance temmperature 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	The adjustment knob on the front panel didn't work	Potentiometer broken (current regulation)	Replace the potentiometer.
3	Cooling Fan not working or turning very slowly	Scarcity of phase	Recover the phase
		Switch broken	Replace the switch
		Fan broken	Replace or repair the fan
		Wire broken or falling off	Check the connection
4	No no-load voltage	Welder getting overheated	See No. 1
		Switch broken	Replace the switch
5	Electrode Holder and Cable getting hot;"+" "-" polar sockets becoming hot	Electrode Holder's capacity is too small;	Replace it with a bigger capacity one
		Cable is of small size	Replace it with another one in conformity with the requirement
		Replace it with another one in conformity with the requirement	Remove the oxide skin and tighten it
		Bigger resistance between the electrode holder and the cable	
6	Power source tripping	Resume power over a long period of time (more than two days)	Not failure. Trip caused by the main power filter's capacity charging. Switch on the main power source.
		In the process of welding	Contact us
7	Others		Contact us

DIAGRAM & PARTS LIST

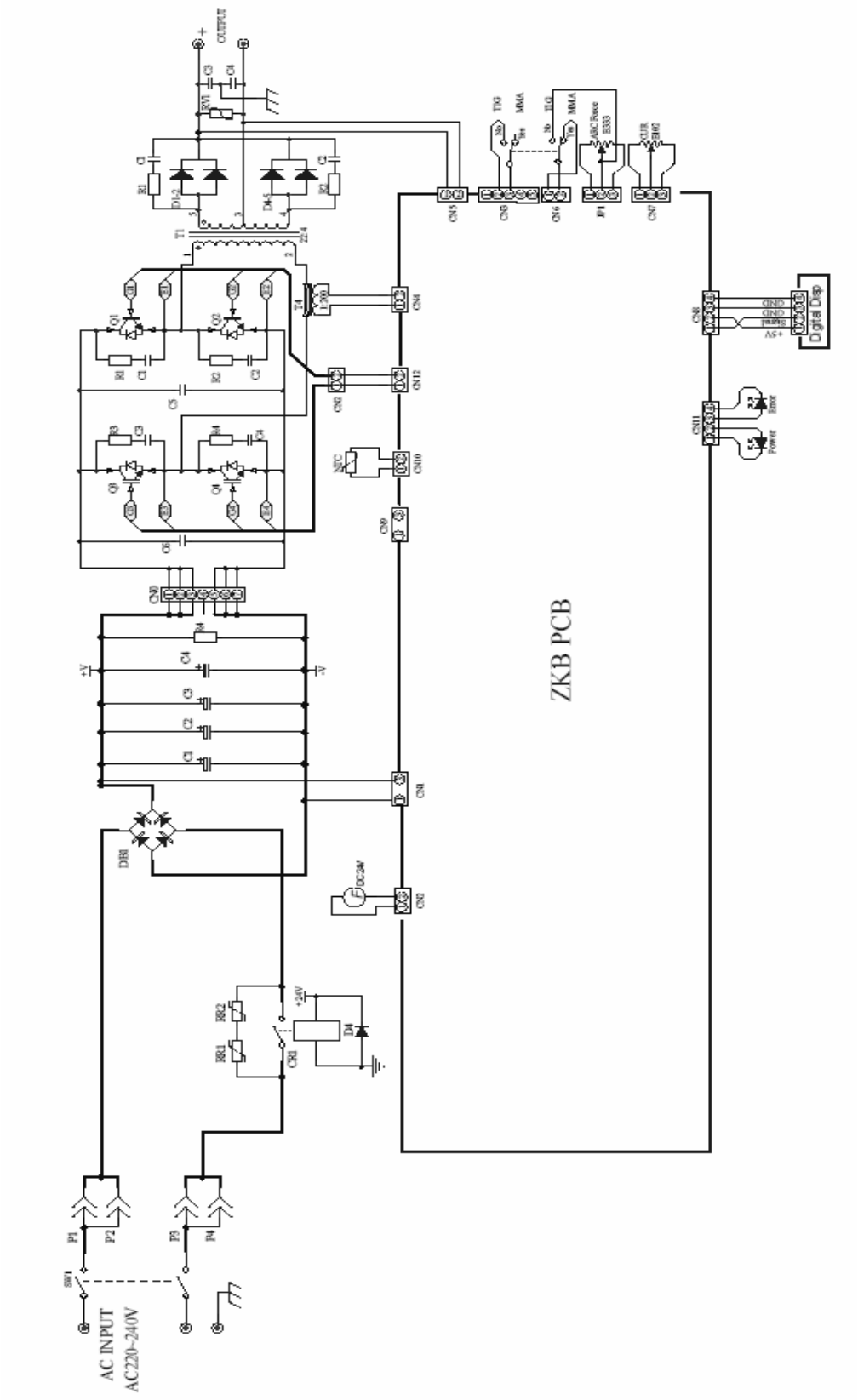


No.	ERP CODE	DESCRIPTION	SPECIFICATION	UNIT	Qty
6	20070800135	Switch	POWER STICK **200WⅢ**	PC	1
8	11100180072	Power Cord	POWER STICK **200WⅢ**	PC	1
10	11110150119	Fan	POWER STICK **200WⅢ**	PC	1
21	20070570185	Quick connector	POWER STICK **200WⅢ**	PC	2
23	20070110068	Potentiometer Knob	POWER STICK **200WⅢ**	PC	2



No.	ERP CODE	DESCRIPTION	SPECIFICATION	UNIT	Qty
10	11110180166	Power Cord	POWER STICK **251WⅢ**	PC	1
14	20070800027	Switch	POWER STICK **251WⅢ**	PC	1
17	11110180162	Fan	POWER STICK **251WⅢ**	PC	1
26	20070570185	Quick connector	POWER STICK **251WⅢ**	PC	2
28	20070110068	Potentiometer Knob	POWER STICK **251WⅢ**	PC	2

The Circuit Chart



The chart is for reference, if there is update of chart, manufacuturer will not notify.