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**LOTOS TIG140**

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**TIG/Stick Welder**



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## **Save this Manual**

You will need the manual for safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram. Keep your invoice with this manual. Write the invoice number and date of purchase on the inside of the manual. Keep the manual and invoice in a safe and dry place for future use.

## **Operation Manual**

Carefully read the operation manual prior to using, installing and maintaining the electric welding machine for the purpose of preventing damages such as fire, electric shock and etc. from occurring. Please keep the manual for future reference.



# SAFETY WARNINGS AND PRECAUTIONS

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**PLEASE READ AND UNDERSTAND THE FOLLOWING SAFETY HIGHLIGHTS. BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS. ARC AND TIG WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.**

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WHEN USING THE WELDER, ALL BASIC SAFETY PRECAUTIONS SHOULD ALWAYS BE FOLLOWED TO REDUCE THE RISK OF PERSONAL INJURY AND DAMAGE TO EQUIPMENT.

DRY WORKING PLACE. DO NOT WELD IN PLACES WITH HIGH HUMIDITY.

FOR THE POWER EXTENSION CORD, PLEASE MAKE SURE THE WIRE GAUGE IS MORE THAN 11 GAUGE AT 220VAC AND 13 GAUGE AT 110VAC. USING A NON-METALLIC CHAIR PLACED ON A RUBBER MAT WHILE WELDING IS RECOMMENDED. USE 20 AMPS CIRCUIT BREAKER FOR 110VAC AND 30 AMPS CIRCUIT BREAKER FOR 220VAC. DO NOT USE TRIPLE PHASE, INSTEAD USE SINGLE PHASE POWER.

## **READ ALL INSTRUCTIONS BEFORE USING THIS WELDER.**

**Keep work area clean.** Cluttered areas invite injuries.

**Observe work area conditions.** Do not use machines or power tools in damp or wet locations. Do not expose to rain. Keep work area well-lighted. Do not use electrically powered tools in the presence of flammable gases or liquids.

**Keep children away.** Children must never be allowed in the work area. Do not let them handle machines, tools or extension cords.

**Store idle equipment.** When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep them out of the reach of children.

**Do not force tool.** It will do the job better and safer at the rate for which it was intended. Do not use inappropriate attachments in an attempt to exceed the tool capacity.

**Use the right tools for the job.** Do not attempt to force a small tool or attachment to do the work of a larger industrial tool. There are certain applications for which this welder was designed. Do not modify this welder and do not use this welder for any other purposes for which it was not intended.

**Dress properly.** Do not wear loose clothing or jewelry as they can be caught in moving parts. Protective, flame retardant, electrically non-conductive clothing and non-skid footwear are recommended when working. Wear restrictive hair covering to contain long hair.

**Use eye and ear protection.** Always wear ANSI approved, arc shaded, impact safety face shield (welding helmet). Always use a full-face shield when welding. Always wear ANSI approved eyewear under face shield and while in the workplace. Wear a NIOSH approved dust mask or respirator when working around metal, chemical dusts, fumes and mists.

**Do not over reach.** Keep proper footing and balance at all times. Do not reach over or across running machines

**Maintain tools with care.** Keep tools sharp and clean for better and safer performance. Follow instructions for lubricating and changing accessories. Inspect tool cords periodically and, if damaged, have them repaired by an authorized technician. The handles must be kept clean, dry, and free from oil and grease at all times.

**Disconnect power.** Unplug machine when not in use.

**Remove adjusting keys and wrenches.** Check that keys and adjustment wrenches are removed from the welder and work area before plugging in.

**Avoid starting unintentionally.** Be sure the switch is in the off position when not in use and before plugging in. Do not carry any tool with your finger on the trigger, whether it is plugged in or not.

**Stay alert.** Watch what you are doing. Use common sense. Do not operate any tool when tired.

**Check for damaged parts.** Before using any tool, any part that appears damaged should be carefully checked to determine that it would operate properly and perform its intended function. Check for alignment and binding of moving parts; any broken parts or mounting fixtures; and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the tool if any switch does not turn on and off properly.

**Guard against electric shocks.** Prevent body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerator enclosures.

**Replacement parts and accessories.** When servicing, use only identical replacement parts. Use of any other parts will void warranty. Only use accessories intended for use with this welder. Approved accessories are available from [www.uwelding.com](http://www.uwelding.com).

**Do not operate tool if under the influence of alcohol or drugs.** Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not operate the welder.

**Maintenance.** For your safety, service and maintenance should be performed regularly by a qualified technician.

**Use proper-sized and type of extension cord.** If an extension cord is required, it must be the proper size and type to supply the correct current to the welder without heating up. Otherwise, the extension cord could melt and catch fire, or cause electrical damage to the welder. This welder requires use of an extension cord of 20 amps minimum capability up to 30 feet, with a wire size rated at 12 AWG. Longer extension cords require larger size wire. If you are using the welder outdoors, use an extension cord rated for outdoor use, signified by "WA" on the jacket. Performance of this welder may vary depending on condition in local line voltage. Extension cord usage may also affect welder performance.

## **WARNING**

The warnings, cautions and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may 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.

### **ARC WELDER SAFETY WARNINGS AND PRECAUTIONS**

**Warning:** This product, when used for welding and similar applications, produces chemicals to cause cancer and birth defects (or other reproductive harm).

## ❖ **ELECTROMAGNETIC FIELDS may be dangerous**



- The EMF field that is generated during arc welding may interfere with various electrical and electronic devices such as cardiac pacemakers.
- Anyone using such devices should consult with their physician prior to performing any electric welding operations.
- Exposure to EMF fields while welding may have other health effects, which are not known.

## ❖ **ELECTRIC SHOCK can be fatal**



- Read all precautions described in this manual to reduce the possibility of electric shock.
- Improper use of an electric welder can lead to electric shock, injury, and death!
  - The power switch should be in the OFF (“0”) position when installing the work cable and gun and while plugging in the power cord.
- The machine must be securely grounded. Ground the work metal to be welded to a good electrical (earth) ground. Always attach the ground clamp to the piece to be welded and as close to the weld area as possible. This will give the least resistance and best weld.
- Maintain the welding torch, work clamp, power cable and welding machine in good, safe operating condition. Replace damaged insulation.
- Always wear dry, protective clothing and leather welding gloves and insulated footwear. You have to wear the welding gloves and auto-darkening welding helmet to protect your hands and eyes from the harmful arc. Please check [www.uwelding.com](http://www.uwelding.com) for proper tig welding helmet.
- Always operate the welder in a clean, dry, well-ventilated area. Do not operate the welder in humid, wet, rainy or poorly ventilated areas.
- Do NOT touch the torch head when the button is depressed. It will cause a serious shock and burn.
- The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or clothing.
- Due to high frequency, keep all cell phone, cameras, and other electronic devices at least 7 feet away from the machine and torch.



### ❖ **ARC RAYS can be dangerous**



- Use a shield with the proper filter (a minimum of #11) to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding.
- Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

### ❖ **HOT METAL will burn**



- Electric welding operations cause sparks and heats metal to temperatures that will cause severe burns!
- Use protective gloves and clothing when performing any welding operations.
- Always wear long pants, long-sleeved shirts and leather welding gloves.
- Make sure that all persons in the welding area are protected from heat, sparks and ultraviolet rays.
- Use additional face shields and flame-resistant barriers as needed.
- Never touch a work piece until it has completely cooled.

### ❖ **FUMES AND WELDING GASES can be dangerous**



- Do not breathe fumes that are produced by the welding operation. These fumes are dangerous
- Shielding gases used for welding can displace air and cause injury or death.
- Always work in a properly ventilated area.
- ❖ Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. MSDS forms are available from your welding distributor or from the manufacturer.

### ❖ **WELDING SPARKS can cause a fire or an explosion**



- Remove fire hazards from the cutting area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from cutting can easily go through small cracks and openings to adjacent areas. Avoid cutting near hydraulic lines. Have a fire extinguisher readily available. Do not operate the electric arc welder in areas where flammable or explosive vapors are present.
- Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations.
- Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned".
- Always keep a fire extinguisher nearby while welding.
- Use welding blankets to protect painted surfaces, dashboards, engines, etc.
- Please make sure there are no combustible items around your welding area

### ❖ **CYLINDER may explode if damaged**



- Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.
- Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- Cylinders should be located:
  - Away from areas where they may be struck or subjected to physical damage.
  - A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- Never allow any electrically “hot” parts to touch a cylinder.
- Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

### ❖ **ELECTRICALLY POWERED EQUIPMENT can be dangerous**



- Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- Install equipment in accordance with the local codes and the manufacturer’s recommendations.
- Ground the equipment in accordance with the manufacturer’s recommendations.

### ❖ **MOVING PARTS can cause injury**



- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.

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Please read this Operation Manual carefully and thoroughly before attempting to operate this machine. Keep this manual handy for quick reference. Pay close attention to the safety instructions provided for your own protection.  
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# SPECIFICATIONS

## ❖ GENERAL DESCRIPTION

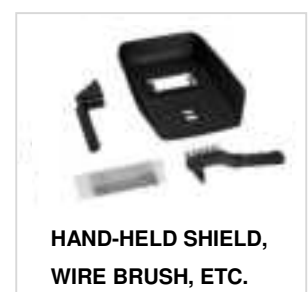
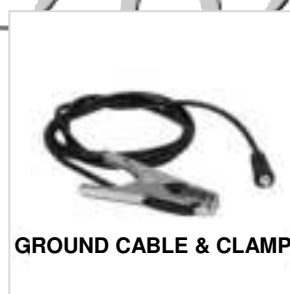
The LOTOS TIG140 is a compact inverter welder that provides DC stick and DC TIG welding capability. It is a welding machine incorporating IGBT and features performance and high efficiency. The welder is ideal for welding tasks where portability and performance are required. All ferrous metal, copper and stainless steel material can be omni-bearing welded in all positions. With 120V/240V capabilities, the unit can be operated almost anywhere a power outlet is found, and can be used with small clean powered generators.

- ✓ 140-amp DC IGBT TIG/Stick(MMA) Welder
- ✓ Automatic dual-voltage/dual-frequency (110/220-volt 50-60Hz)
- ✓ Analog controlled IGBT inverter
- ✓ Suitable for welding stainless steel, mild steel, and other metal materials

## ❖ WHAT'S INCLUDED



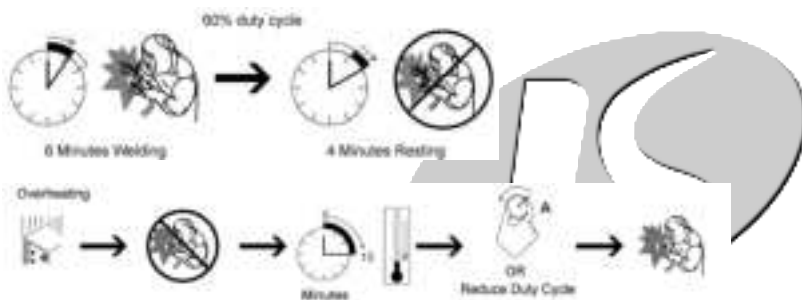
- Power Supply
- TIG Torch
- Stick Electrode with Cable (5ft)
- Ground Clamp with Cable (5ft)
- Pigtail Adapter Type 2
- TIG Accessories
- Carrying Case
- Hand-Held Shield, Wire Brush, Etc.



## ❖ POWER SUPPLY RATINGS

TIG140		
General Specification	Output Power	DC
	Input Voltages	110/220V, 1-PH, 50-60Hz
	Input Current	30.7A @110V, 25.5A @220V
	Output Current	TIG: 10 – 80A 20.4-23.2 V (110V) DC 10 – 140A 20.4-25.6 V (220V) DC
	Duty cycle <sup>1</sup> @ 104°F (40°C)	35% @ 80A (110V) 60% @ 65A (110V) 100% @ 50A (110 V)  35% @ 140A (220V) 60% @ 100A (220V) 100% @ 85A (220V)
	Dimensions with handle	20" (508mm) L 12.5" (318mm) W 13.5" (343mm) H
	Weight w/ 8'11" (2.7 m) torch	≈10lbs (4.5kg)
	Gas Supply	Clean, dry, oil-free argon
	Recommended gas inlet flow rate / pressure	3.6scfm @65psi
	Input power cable length	5' (1.8m)
Material <sup>2</sup>	Mild Steel	Welding Capacity: ¼" (6mm)
	Stainless Steel	
	Aluminum	
	Other Metals	
Warranty	New Unit	1-Year Warranty
	Refurbished Unit	60-Day Warranty

<sup>1</sup> Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.



<sup>2</sup> Production weld thickness are the results of Lotos' laboratory testing. Production speeds are approximately 80% of maximum. For optimum weld quality, welding speeds may vary based on different welding applications.

## ❖ WHAT YOU NEED TO OPERATE THIS MACHINE?

### **Operating Condition:**

- Voltage of power source: single phase, AC 110V or 240 V $\pm$ 10% Frequency: 50/60Hz
  - Reliable grounding protection
- Remember: Machine must be grounded to work properly and safely!

### **Work Environment:**

- Relative humidity:  $\leq$  90% (Average monthly temperature  $\leq$  68° F)
- Ambient temperature: 14° – 104° F
- A clean and well-ventilated working place
- Avoid rain water. Operating in the rain is not allowed.
- The welding site should have no harmful gas, chemicals, molds, flammable materials, explosive and corrosive pieces near its proximity.

Note: The machine should not receive any shocks and or vibrations.

### **Other Equipment:**

- Heavy Duty Welding Gloves
- An Auto-Darkening Welding Mask to provide eye protection
- A compressed gas cylinder containing pure Argon
- Stainless steel wire welding brushes for each material to be welded
- A stone grinding wheel or a Tungsten Sharpener to sharpen the Tungsten Electrode

### **Before welding, the operator should read the operating instructions:**

- Check the machine appearance for deformation and damage.
- For the safety of the equipment the operator must make an appropriate earth according to the power supply system.
- The welding operation should be carried out in a dry and well ventilated area.
- Check the machine output connection.
- The machine should not be moved or the cover opened when the power is on and during the welding operation.
- The machine should be maintained, operated and managed by a qualified person.
- Confirm the power source is single phase and 110V or 240V  $\pm$  10% and distribution board current is 5KVA.
- DO NOT connect with 380V power.

## ❖ MACHINE REAR



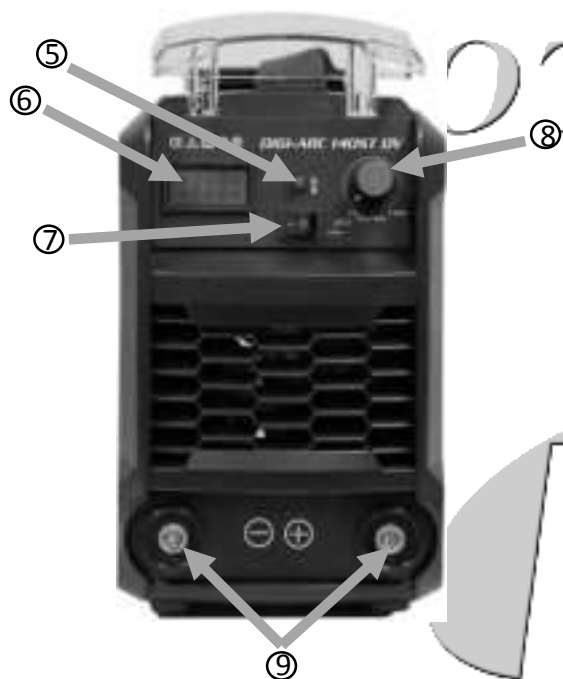
The unit is connected to the supply even if the Power Switch is on the “OFF” position, and therefore there are electrically live parts inside the power source. Carefully follow the instructions given in this manual.

### REAR COMPONENTS

1	Power Cord
2	Cooling Fan
3	Power Switch
4	Bonded Ground/Safety Earthing Column

## ❖ FRONT CONTROL PANEL

Overheat protection indicator (OC light): This is to protect the machine if it overheats. If the light is on, please stop the machine for 4 to 10 minutes before turning it on again.



### FRONT CONTROL PANEL

5	Overcurrent/Duty Cycle Indicator Light
6	Digital Amp Meter Display
7	Lift Start TIG/Stick Switch
8	Amp/Current Control Dial
9	Torch and Work Clamp Connectors
TIG Mode: Torch Negative (-), Work Positive (+)	
Stick Mode: Torch Positive (+), Work Negative (-)	

# INSTALLATION



**PLEASE READ ENTIRE INSTALLATION SECTION BEFORE STARTING INSTALLATION. BE SURE THAT ONLY QUALIFIED PERSONNEL SHOULD PERFORM THIS INSTALLATION.**

## ❖ BEFORE INSTALLATION

### WARNING

#### **ELECTRIC SHOCK can be fatal**

- ♦ Turn the input power OFF and unplug the machine from the receptacle before working on this equipment. Allow machine to sit for 5 minutes minimum to allow the power capacitors to discharge before working inside this equipment.
- ♦ Insulate yourself from the work and ground.
- ♦ Always wear dry insulating gloves.



### ➤ **SELECT SUITABLE LOCATION**

The Inverter will operate in harsh environments. Even so, it is important that simple preventative measures are followed in order to assure long life and reliable operation.

- The machine must be located where there is free circulation of clean air such that air movement in the back and out the front will not be restricted.
- Dirt and dust that can be drawn into the machine should be kept to a minimum. Failure to observe these precautions can result in excessive operating temperatures and nuisance shutdown.

### ➤ **ENVIRONMENTAL AREA**

Keep the machine dry. Do not place it on wet ground or in puddles. Avoid rainwater. Operating in rain is not allowed.

## ❖ SETUP INSTRUCTIONS

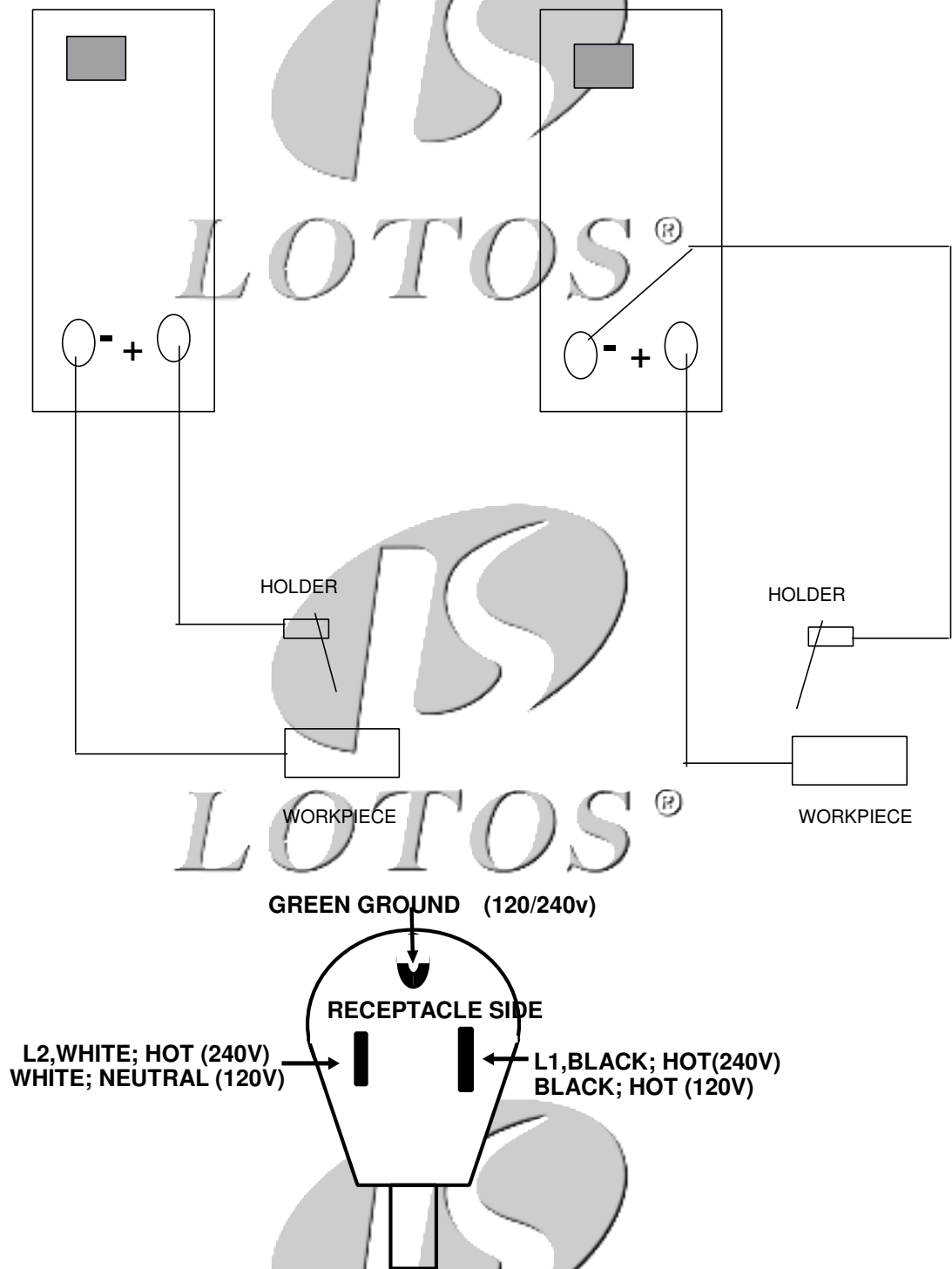
### WARNING

#### **ELECTRIC SHOCK can be fatal**

- ♦ Have a qualified electrician install and service this equipment.
- ♦ Turn the input power OFF and unplug the machine from the receptacle before working on this equipment.
- ♦ Allow machine to sit for 5 minutes minimum to allow the power capacitors to discharge before working inside this equipment.
- ♦ Do not touch electrically hot parts.
- ♦ Machine must be plugged into a receptacle that is grounded according to the National Electrical Code and local codes.
- ♦ Do not remove or defeat the purpose of the power cord ground pin.



➤ **INSTALLATION DIAGRAMS**



**IMPORTANT:** While using 120V power, be sure to maintain polarity and use the white wire as the common/neutral, the black as the hot, and the green as the ground or it may malfunction.

# OPERATION



PLEASE READ AND UNDERSTAND THIS ENTIRE SECTION BEFORE OPERATING YOUR MACHINE. ONLY QUALIFIED PERSONNEL SHOULD OPERATE THIS EQUIPMENT. OBSERVE ALL SAFETY INFORMATION THROUGHOUT THIS MANUAL.

## ❖ WELDING OPERATIONS

### ⚠ WARNING

#### **ELECTRIC SHOCK can be fatal**

- ♦ Have an electrician install and service this equipment.
- ♦ Turn the input power off at the fuse box, disconnect or unplug supply lines and allow machine to sit for five minutes minimum to allow the power capacitors to discharge before working inside this equipment.
- ♦ Do not touch electrically hot parts. Turn the input power OFF and unplug the machine from the receptacle before working on this equipment.



#### **FUMES AND GASES can be dangerous**

- ♦ Keep your head out of fumes.
- ♦ Use ventilation or exhaust to remove fumes from breathing zone.



#### **WELDING SPARKS can cause fires or explosions**

- ♦ Keep flammable material away.
- ♦ Do not weld, cut or gouge on containers that have held combustibles.



#### **ARC RAYS can burn**

- ♦ Wear eye, ear and body protection.



## ➤ WELDING STEPS

### HAND WELDING WITH ELECTRODE (MMA)

- 1) Set TIG/Stick switch into the “Stick position”
- 2) Select empiric formula:  $I = 40 \cdot d$ , d is diameter of the electrode.
- 3) Note positive and negative connection during welding.

### DC ARGON ARC WELDING (LIFT TIG)

- 1) Set TIG/Stick switch into the “TIG position”.
- 2) Connect gas inlet pipe of the welding torch to argon bottle.
- 3) Test gas: open the argon bottle switch and switch on the flow meter, select suitable argon flow.
- 4) Adjust the amp current control dial for suitable settings according to thickness of the material to be welded.
- 5) When welding operation is finished, turn off the argon bottle switch and cut off the welder’s power input.



# TROUBLESHOOTING



**PLEASE READ AND UNDERSTAND THIS ENTIRE SECTION. SERVICE AND REPAIR SHOULD ONLY BE PERFORMED BY TRAINED PERSONNEL FOR YOUR SAFE, PLEASE OBSERVE ALL SAFETY INFORMATION THROUGHOUT THIS MANUAL.**

## **WARNING**

**ELECTRIC SHOCK can be fatal**

- ♦ Service and Repair should only be performed by a Trained Personnel. Have a qualified electrician install and service this equipment.



## ❖ **HOW TO USE THE TROUBLESHOOTING GUIDE**

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

### **Step 1. LOCATE PROBLEM (SYMPTOM).**

Look under the column labeled “PROBLEM (SYMPTOMS)”. This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

### **Step 2. POSSIBLE CAUSE.**

The second column labeled “POSSIBLE CAUSE” lists the obvious external possibilities that may contribute to the machine symptom.

### **Step 3. RECOMMENDED ACTION**

This column provides a course of action for the Possible Cause.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact your dealer.



TROUBLESHOOTING WELDING	
PROBLEMS	RECOMMENDED ACTION
Machine will not turn on	<ul style="list-style-type: none"> <li>Check cords and wiring in the plug. Check circuit breaker.</li> </ul>
Machine runs, but will not weld in either mode. Red LED is on.	<ul style="list-style-type: none"> <li>Check for sound work clamp connection. Make sure work/Torch cable is securely fastened to DINSE connector. Reset main power switch if overcurrent light is on after cool down period. Contact Technical Support.</li> </ul>
Arc has difficulty establishing, welding rod sticking	<ul style="list-style-type: none"> <li>Wet welding rods. Too low of amperage. Too high of amperage. Use fresh rods. Adjust amps. Wrong polarity</li> </ul>
Welding rod is rapidly consumed.	<ul style="list-style-type: none"> <li>Too small of welding rod. Too high of amperage setting. Wrong polarity.</li> </ul>
Discolored weld color. Too much spatter. Additional TIG symptom: Tungsten is discolored	<ul style="list-style-type: none"> <li>Stick: Too long of arc length. Too high of amps. TIG: Same as above/ Low flow rate of shielding gas. Too short of post flow period. Wrong TIG cup size.</li> </ul>
Weld quality is poor, unstable arc. Weld is dirty/oxidized.	<ul style="list-style-type: none"> <li>Clean paint/rust from weld. Make sure work clamp has good contact. Too low of amps/Too large of tungsten. Incorrect wiring of welder. Tungsten (TIG) is poorly ground/contaminated</li> </ul>
LED illuminates yellow/green or red. Machine runs, but no weld power.	<ul style="list-style-type: none"> <li>Duty cycle exceeded. Allow machine to cool. Reset main power switch after full cool down period. Make sure fan is not blocked. Overcurrent (red). Check circuits<sup>®</sup> for over/under voltage. Dirty power from generator. Internal fault</li> </ul>
Slight whine or squeal to arc or to welder while turned on.	<ul style="list-style-type: none"> <li>This is normal and the sounds may vary.</li> </ul>
Circuit breaker trips. Internal Fuse blown.	<ul style="list-style-type: none"> <li>Wiring fault. Too small of a wire or circuit breaker.</li> </ul>



## OTHER ACCESSORIES

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The following accessories and consumables can be purchased on [www.uwelding.com](http://www.uwelding.com), or call 408-739-2329 to order.

### ACCESSORIES



**TT132**



**DTE10**



**AAR10**



**HELMET**



AND MORE...  
ON  
[www.uwelding.com](http://www.uwelding.com)

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