

# S SIMDER SD-4050PRO

IGBT INVERTER DIGITAL 10-IN-1 MULTI PROCESS MIG  
WELDER&CUTTER

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OPERATOR'S MANUAL

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**SIMDER**

®

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# SAFETY

## THANK YOU FOR SELECTING A QUALITY PRODUCT BY SSIMDER Welding Equipment Inc.

### PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

### SAFETY DEPENDS ON YOU

SIMDER arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.

#### **WARNING**

This statement appears where the information must be followed exactly to avoid serious personal injury or loss of life.

#### **CAUTION**

This statement appears where the information must be followed to avoid minor personal injury or damage to this equipment.

### KEEP YOUR HEAD OUT OF THE FUMES.

**DON'T** get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.

**READ** and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

**USE ENOUGH VENTILATION** or exhaust at the arc, or both, to



keep the fumes and gases from your breathing zone and the general area.

**IN A LARGE ROOM OR OUTDOORS**, natural ventilation may be adequate if you keep your head out of the fumes (See below).

**USE NATURAL DRAFTS** or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.

### WEAR CORRECT EYE, EAR & BODY PROTECTION



**PROTECT** your eyes and face with welding helmet properly fitted and with proper grade of filter plate (See ANSI Z49.1).

**PROTECT** your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

**PROTECT** others from splatter, flash, and glare with protective screens or barriers.

**IN SOME AREAS**, protection from noise may be

appropriate.

**BE SURE** protective equipment is in good condition.

Also, wear safety glasses in work area

**AT ALL TIMES.**



### SPECIAL SITUATIONS

**DO NOT WELD OR CUT** containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned. This is extremely dangerous.

**DO NOT WELD OR CUT** painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

Additional precautionary measures.

**PROTECT** compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.

**BE SURE** cylinders are never grounded or part of an electrical circuit.

**REMOVE** all potential fire hazards from welding area.

**ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.**



# SAFETY



## WARNINGS



### CALIFORNIA PROPOSITION 65 WARNINGS



**WARNING:** Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects, or other

reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an exposed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

**For more information go to**

**[www.P65warnings.ca.gov/diesel](http://www.P65warnings.ca.gov/diesel)**

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



**WARNING: Cancer and Reproductive Harm**  
**[www.P65warnings.ca.gov](http://www.P65warnings.ca.gov)**

**ARC 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.**

Read and understand the following safety highlights. For additional safety information, it is strongly recommended you download free PDF of Standard ANSI Z49.1 from the American Welding Society.

<https://www.aws.org/library/doclib/AWS-Z49-2021.pdf>

**BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.**



### FOR ENGINE POWERED EQUIPMENT.

1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.

1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.

1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not



start engine until fumes have been eliminated.

1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.



1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.

1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



### ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS



2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

2.d.1. Route the electrode and work cables together - Secure them with tape when possible.

2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and workcables. If the electrode cable is on your right side, the work cable should also be on your right side.

2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.

2.d.5. Do not work next to welding power source.

# SAFETY



## ELECTRIC SHOCK CAN KILL.



- 3.a. 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 wet clothing. Wear dry, hole-free gloves to insulate hands.
- 3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:**
- Semiautomatic DC Constant Voltage (Wire) Welder.
  - DC Manual (Stick) Welder.
  - AC Welder with Reduced Voltage Control.
- 3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".
- 3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- 3.e. Ground the work or metal to be welded to a good electrical (earth) ground.
- 3.f. Maintain the electrode stringer, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- 3.g. Never dip the electrode in water for cooling.
- 3.h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- 3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
- 3.j. Also see It ems 6.c. and 8.



## ARC RAYS CAN BURN.



- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- 4.c. 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.



## FUMES AND GASES CAN BE DANGEROUS.



- 5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding hardfacing (see instructions on container or SDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also be required. Additional precautions are also required when welding on galvanized steel.**
- 5.b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.
- 5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- 5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- 5.e. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the Safety Data Sheet (SDS) and follow your employer's safety practices. SDS forms are available from your welding distributor or from the manufacturer.
- 5.f. Also see item 1.b.

# SAFETY



## WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION.



- 6.a. Remove fire hazards from the welding 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 welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.
- 6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.
- 6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- 6.d. 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". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).
- 6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- 6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- 6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- 6.h. Also see item 1.c.
- 6.i. Read and follow NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 022690-9101.
- 6.j. Do not use a welding power source for pipe thawing.



## CYLINDER MAY EXPLODE IF DAMAGED.

- 7.a. 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.
- 7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- 7.c. 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.
- 7.d. Never allow the electrode, electrode stringer or any other electrically "hot" parts to touch a cylinder.
- 7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- 7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- 7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association, 14501 George Carter Way Chantilly, VA 20151.



## FOR ELECTRICALLY POWERED EQUIPMENT.



- 8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- 8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- 8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

## GENERAL DESCRIPTION

### GENERAL FUNCTIONAL DESCRIPTION

The Simder SD-4050Pro is an inverter welder based on IGBT inverter technology. This makes the machine lightweight and allows for multiple advanced functions. Before we move on to a detailed explanation of how to set up the welder, let's explain some of its features and their purpose.

Pulse MIG offers top quality, consistent welding with fairly low spatter compared to conventional MIG welders. Pulse MIG can help you take on all kinds of welding jobs from small parts to large automotive and motorcycle pieces, photo frames, high-power integrated circuit packages.

Synergic MIG welding automatically adjusts the voltage and wire feeding speed based on the amperage or the metal thickness selection. This makes the MIG welding process easier for beginners so that they don't have to manually adjust the wire feed speed and the voltage settings.

High frequency Start TIG Welding allows the operator to position the tungsten electrode near the job, and simply press the torch trigger to start the arc. The non-touch ignition allows you to position your torch accurately on every joint, even when it comes to awkward angles such as 90 degree joints or round pipe welding.

If the welder ever gets overheated, it will activate its self-protection mechanism by shutting down in order to cool down, prolonging its life span. However, thanks to the advanced IGBT technology, the SD-4050Pro has a 60% duty cycle at 180 A output when welding, and a 60% duty cycle at 40A when plasma cutting, giving you 6 out of 10 minutes intervals of working time.

This welder outputs DC current. So, it can weld mild steel and stainless steel.

Like any arc welding machine, the SD-4050Pro requires you to correctly set up the polarities to initiate the arc in a closed electric circuit. This means that to run any of its five processes, you must connect the work clamp to the metal and use the MIG/TIG/Stick/Plasma torch to close the circuit. It also requires a shielding gas for MIG and TIG processes and pressurized air for the plasma cutting process. So let's get started with an explanation of each.

### RECOMMENDED PROCESSES

SD-4050Pro is designed for SMAW, GTAW ( HF TIG ), GMAW, FCAW and Plasma cutting.

WELD MODE	PROCESS	COMMON MATERIALS	COMMON ELECTRODES
GTAW	HF TIG	STEEL	
SMAW	STICK	STEEL	6011, 7018
GMAW	MIG/MAG	STAINLESS, STEEL	ER70S-6 ER308L
FCAW	FLUX CORE	STEEL	E71T-GS
PLASMA CUTTING	CUT	STEEL, Stainless Steel Aluminum	
PULSE MIG	PULSE ALUMINUM	ALUMINUM	

# SPECIFICATION

## TECHNICAL SPECIFICATIONS: SD-4050PRO

### INPUT-SINGLE PHASE ONLY

Standard Voltage/Frequency	Input Current
220V±10% 50/60Hz	I <sub>1 max</sub> =29A, I <sub>1 left</sub> =22.4A
110V±10% 50/60Hz	I <sub>1 max</sub> =45A, I <sub>1 left</sub> =34.8A

### RATED OUTPUT – DC ONLY

Voltage	Mode	Duty Cycle	Current	Volts at Rated Current
220V	GMAW	60%	200A	24V
		100%	154A	21.7V
	SMAW	60%	180A	28V
		100%	154A	26.1V
	GTAW	60%	200A	18V
		100%	154A	16.1V
	Plasma Cutting	60%	50A	100V
		100%	40A	96V
110V	GMAW	60%	155A	22V
		100%	123A	20.1V
	SMAW	60%	140A	25.6V
		100%	123A	24.9V
	GTAW	60%	155A	16.4V
		100%	123A	14.9V
	Plasma Cutting	60%	37A	95V
		100%	32A	93V

### OUTPUT RANGE

Voltage	Mode	Open Circuit Voltage	Welding Current Range	Welding Voltage Range
220V	GMAW	62V	30A~200A	16V~24V
	SMAW		25A~180A	21V~27.2V
	GTAW		15A~200A	10.6V~18V
	Plasma Cutting	290V	25A~50A	90V~100V
110V	GMAW	62V	30A~155A	16V~22V
	SMAW		25A~140A	21V~25.6V
	GTAW		15A~155A	10.6V~16.4V
	Plasma Cutting	290V	25 A~37A	90V~95V

### OTHER PARAMETERS

Machine	Power Factor	Efficiency	Protection Class	Insulation Class
	0.93	≥80%	IP21S	F

### TEMPERATURE RANGE

Operating Temperature Range	-10°C~+40°C(14°F~104°F)
Storage Temperature Range	-25°C~+55°C(-13°F~131°F)

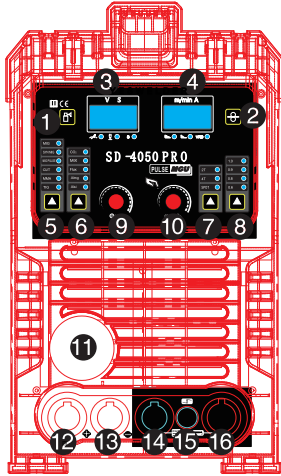


# OVERVIEW OF MACHINE

## CASE FRONT CONTROLS

(See Figure 2)

FIGURE 2

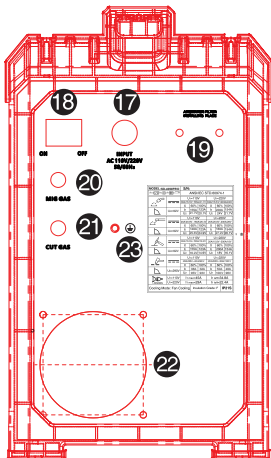


1. Check gas: to make sure gas connect
2. wire feeding: when install welding wires, press this button to feed wire quickly.
3. voltage display
4. Wire feeding speed(m/min)/Current(A)
5. Main Function selection (MIG/SYN MIG/MIG PULSE/CUT/MMA/TIG)
6. Welding materials selection(CO<sub>2</sub>/MIX gas/Flux wire/Al mg/Al si)
7. Auxiliary function selection
8. Wire diameter selection
9. Trim voltage
10. Current adjustment and Auxiliary function selection
11. MIG GUN Connection (EURO Connect)- Permits attachment of a MIG welding gun. Ensure the gun is fully seated into the brass receptacle.
12. Work clamp receptacle for Flux MIG/MMA/TIG
13. Work clamp receptacle for gas MIG and electrode holder receptacle for MMA
14. Work clamp receptacle for plasma cutting
15. Two pin Trigger receptacle for plasma cutting torch and TIG torch
16. plasma cutting torch and TIG torch connection

## CASE BACK CONTROLS

(See Figure 3)

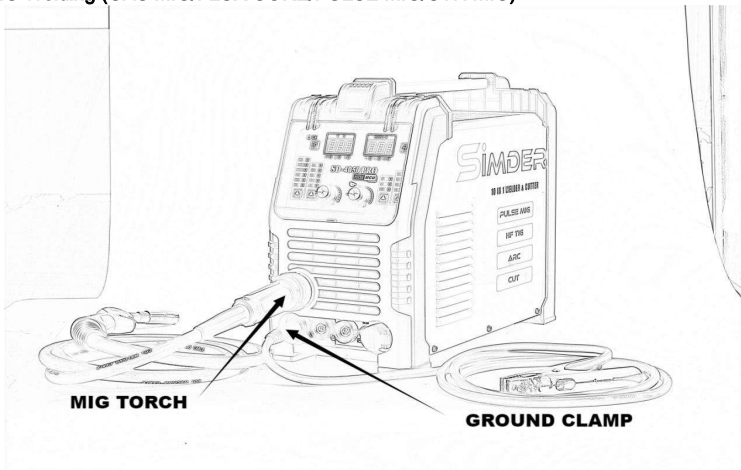
FIGURE 3



17. Input power cable
18. Power switch
19. Air filter regulator-install the air filter&regulator for plasma cutting
20. MIG gas connection
21. CUT gas connection
22. Cooling fan-when the machine is switched ON,the fan runs continuously
23. Protective Ground

# INSTALLATION

## 1.MIG Welding (GAS MIG/FLUX CORE/PULSE MIG/SYN MIG)

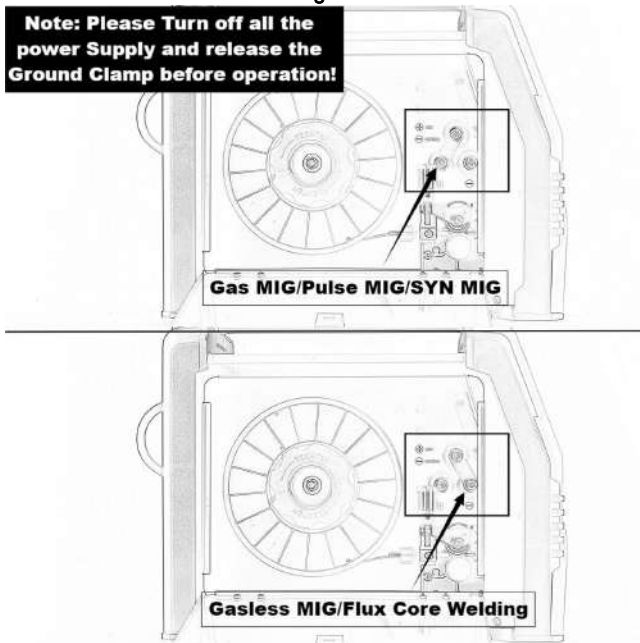


When GAS MIG/Pulse MIG/SYN MIG Welding, **Change the Polarity output to Positive (see Figure 4 below)**. Connect the MIG Torch to **"Terminal11"** (See in Page 7 Figure 2 ) and connect the Ground Clamp to **"Terminal 13"**.

When Flux Core Welding(Gasless), **Change the Polarity output to Negative (see Figure 4 below)**. Then Connect the MIG Torch to **"Terminal11"** (See in Page 7 Figure 2 ) and connect the Ground Clamp to **"Terminal 12"**.

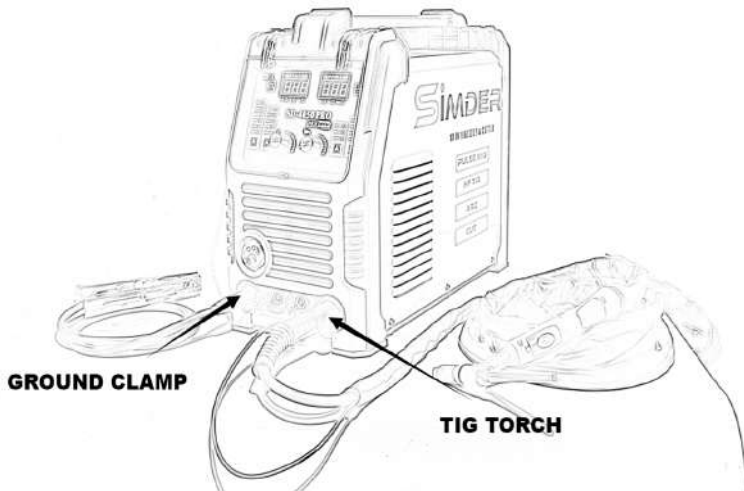
\*Always **TURN OFF** All the Power and Disconnect the Ground Clamp before Changing Polarity.

Figure 4



# INSTALLATION

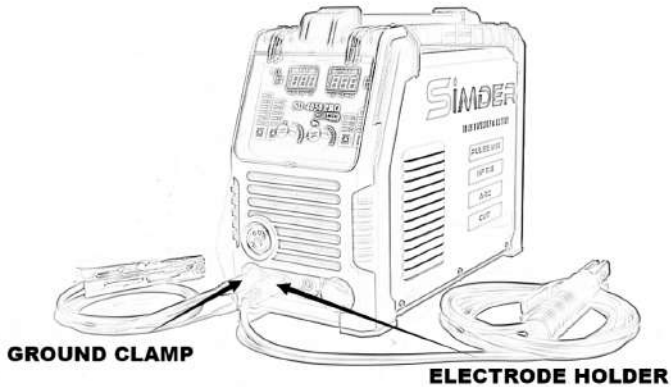
## 2.HF TIG Welding



Connect the TIG Torch to **"Terminal16"** (See in Page 7 Figure 2 ) and the two-core control switch to **"Terminal15"**, then connect the Ground Clamp to **"Terminal12"**.

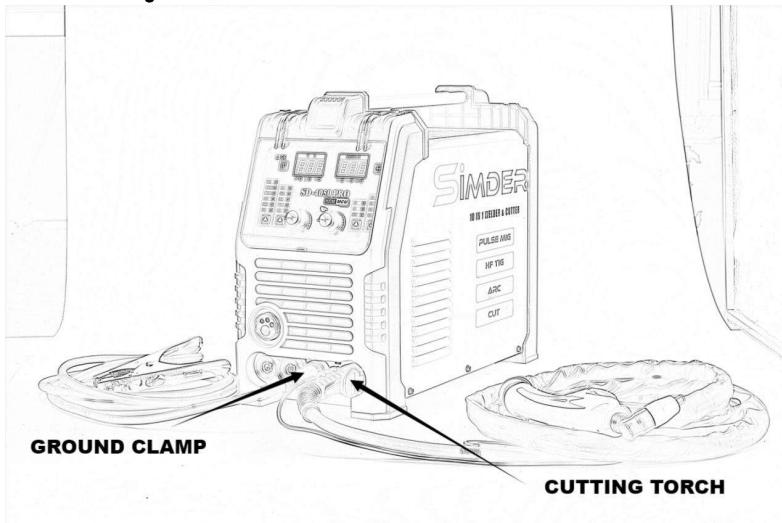
# INSTALLATION

## 3.MMA Welding



Connect the Electrode Holder to **"Terminal13"** (See in Page 7 Figure 2 ) and the Ground Clamp to **"Terminal12"**.

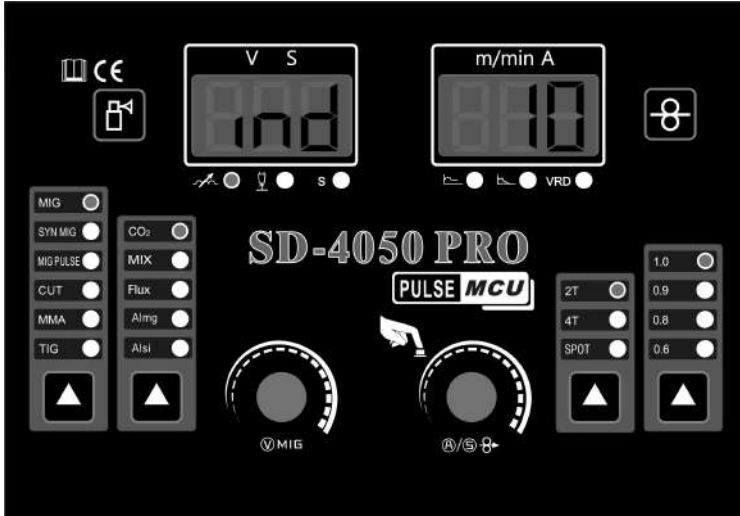
## 4.Plasma Cutting



Connect the CuttingTorch to **"Terminal16"**(See in Page 7 Figure2 ) and the two-core control switch to **"Terminal15"**, then connect the Ground Clamp to **"Terminal14"**.

# OPERATION

## 1.INDUCTANCE ADJUSTMENT



Available on MIG Welding Mode, Press the Current Button, when the Voltage Display shows "IND", Rotate the Current Button to you preferred figure, Adjustable Figure Range "0 to 10".

## 2. BURN BACK CONTROL



Available on MIG Welding Mode, Press the Current Button, when the Voltage Display shows "66E", Rotate the Current Button to you preferred figure. Adjustable Figure Range "0 to 10".

# OPERATION

## 3. SPOT TIMER SETTING



Available on MIG Welding Mode, Choose "SPOT" MODE, Press the Current Button, when the Voltage Display shows "SPT" , Rotate the Current Button to you preferred Spot Time, from "0 to 3 seconds".

## 4. PRE FLOW OF SHIELDING GAS TIME SETTING



Available on TIG/CUT Mode, Press the Current Button, when the Voltage Display shows "PrG" , Rotate the Current Button to you preferred PRG time, from 0.2second to 3 seconds.

# OPERATION

## 5. POST FLOW OF SHIELDING GAS TIME SETTING



Available on TIG/CUT Mode, Press the Current Button, when the Voltage Display shows "PoG", Rotate the Current Button to you preferred POG time, from 1second to 5 seconds.

## 6. HOT START SETTING



Available only on MMA Welding Mode, Press the Current Button, when the Voltage Display shows "HS", Rotate the Current Button to you preferred figure. Adjustable Figure Range "0 to 10".

# OPERATION

## 7. ARC FORCE SETTING



Available only on MMA Welding Mode, Press the Current Button, when the Voltage Display shows "AFC" , Rotate the Current Button to you preferred figure.Adjustable Figure Range "0 to 10".

## 8. VRD SETTING



Available only on MMA Welding Mode, Press the Current Button, when the Voltage Display shows "Vrd" , Rotate the Current Button to turn on/off the VRD function.



# MAINTENANCE

## GENERAL MAINTENANCE

This welder has been engineered to need minimal service providing that a few very simple steps are taken to properly maintain it.

1. Keep the cabinet cover closed at all times unless the wire needs to be changed or the drive pressure needs adjusting.
2. Keep all consumables (contact tips, nozzles, and liner) clean and replace when necessary.
3. Replace INPUT POWER CABLE, ground cable, work clamp, or gun assembly when damaged or worn.
4. Avoid directing grinding particles towards the welder. These conductive particles can build up inside the machine and cause severe damage.
5. Periodically clean dust, dirt, grease, etc. from your welder. Every six months or as necessary, remove the side panels from the welder and use compressed air to blow out any dust and dirt that may have accumulated inside the welder.



**WARNING: DISCONNECT FROM POWER SOURCE WHEN CARRYING OUT THIS OPERATION.**

7. The wire feed drive roller will eventually wear during normal use. With the correct pressure, the idler roller must feed the wire without slipping. If the grooves in the wire feed drive roller are worn deep enough that the idler roller and the wire feed drive roller make contact when the wire is in place between them, the wire feed drive roller must be replaced.
8. Check all cables periodically. They must be in good condition and not cracked.



**WARNING: ELECTRIC SHOCK CAN KILL!** Be aware that the ON/OFF SWITCH, when OFF, does not remove power from all internal circuitry in the welder. To reduce the risk of electric shock, always unplug the welder from its AC power source and wait several minutes for electrical energy to discharge before removing side panels.

## CONSUMABLE MAINTENANCE

**IT IS VERY IMPORTANT TO MAINTAIN THE CONSUMABLES TO AVOID THE NEED FOR PREMATURE REPLACEMENT OF THE GUN ASSEMBLY.**

### **MAINTAINING THE CONTACT TIP:**

The purpose of the CONTACT TIP is to transfer welding current to the welding wire while allowing the wire to pass through it smoothly.

Always use a contact tip stamped with the same diameter as the wire it will be used with.

1. If the wire burns back into the tip, remove the tip from the gun and clean the hole running through it with an oxygen-acetylene torch tip cleaner or tip drill. If the burned-back wire cannot be removed, the tip will have to be replaced.
2. With extended use over time, this hole will become worn. Increased wear on the hole causes increased resistance in the transfer of welding current from the contact tip to the wire. This will result in less stable arc characteristics and difficult arc starting.

### **CAUTION: KEEP THE NOZZLE CLEAN!**

During the welding process, spatter and slag will build up inside the nozzle and must be cleaned out periodically. Failure to clean and/or replace the nozzle in a timely fashion will cause damage to the front end of the gun assembly, which is not replaceable. The results of the inaction may require the replacement of the entire gun assembly.

Failure to keep the nozzle adequately cleaned can result in the following problems:

A shorted nozzle results when spatter buildup bridges across the insulation in the nozzle allowing welding current to flow through it as well as the contact tip. When shorted, a nozzle will steal welding current from the wire whenever it contacts the grounded workpiece. This causes erratic welds and reduced penetration. In addition, a shorted nozzle overheats the end of the gun which can damage the front-end of the gun.

### **TESTING FOR A SHORTED NOZZLE**

Arcing between the nozzle and the workpiece always means the nozzle is shorted, but this can be hard to detect through the lens of a welding helmet. The following testing method is another way to tell if a nozzle is shorted.

With the welder unplugged from the AC power source, touch the probes of an ohmmeter or continuity tester to the end of the contact tip and the outside of the nozzle. If there is any continuity at all, the nozzle is shorted. Clean or replace as needed.

# TROUBLESHOOTING

**OBSERVE ALL SAFETY GUIDELINES DETAILED THROUGHOUT THIS MANUAL**

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
E2	Overheat.	1. Thermal protector engaged.--Allow welder to cool at least 10 minutes with machine ON. The LED should turn off after the machine has cooled. 2. Insufficient air flow--Check for obstructions blocking air flow and ensure that there are 12 inches of clearance between any obstacles and the vents on all sides of the machine.
E1	Over Current.	Check the input connection.
Frequent circuit breaker Trips.	Machine is drawing too much amperage due to use of larger size electrode.	Use a smaller electrode.
	Machine is not the only piece of electrical equipment on the circuit.	Make sure the welder is on a dedicated circuit or is the only thing plugged into a circuit.
	Circuit breaker is incorrect/insufficient for use with this machine.	Verify that the circuit breaker for the circuit is a 35A breaker for 110V and 30A for 220V. If it is not, have a qualified electrician install the proper breakers.
All LEDs OFF, No output power, Fan not operating.	No input power.	Connect machine to proper input power source.
		Verify that circuit breaker has not been tripped in your main power panel. Reset if needed.
		Wire loose connection.
	POWER SWITCH is OFF.	Ensure POWER SWITCH(rear) is on the ON position.

# TROUBLESHOOTING

## MIG WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
No arc or wire feed. Fan operates normally (can be heard).	Gun trigger is not being pulled or is not making contact.	Pull the trigger while in contact with the workpiece. The machine does not arc unless the trigger is pulled. Depress the trigger ALL THE WAY until the trigger stops moving into the gun.
	Exceeded duty cycle; thermal protector engaged.	Allow welder to cool at least 10 minutes with machine ON (observe and maintain proper duty cycle). OVERHEAT INDICATOR should turn off after the machine has cooled.
	Insufficient air flow causing machine to overheat before reaching duty cycle.	Check for obstructions blocking air flow and ensure that there are 12 inches of clearance between any obstacles and the vents on all sides of the machine.
No arc or wire feed. Fan does NOT operate (cannot be heard).	No voltage or incorrect voltage supplied to welder.	Make sure the machine is plugged in. Check the status of your INPUT VOLTAGE INDICATOR LED. It should be illuminated. Check the voltage of your outlet. If it is 10% more or less than optimal, call a qualified electrician.
	ON/OFF SWITCH is in the OFF position.	Turn the ON/OFF SWITCH to the ON position.
	Circuit breaker has been tripped.	Make sure the circuit breaker has been reset.
Feed motor operates but wire will not feed.	Insufficient feed drive roller pressure.	Adjust drive roller pressure.
	Burr on end of wire.	Re-cut wire so it is square with no burr.
	Liner blocked or damaged.	Clear with compressed air or replace liner.
	Despooler tension too high.	Adjust despooler tension.
Wire feeds but no arc.	Bad ground or loose ground connection.	Check connection of the ground cable to the work clamp. Tighten cable connection to work clamp if needed. Ensure that the connection between the work clamp and workpiece is good and is on clean, bare (not painted or rusted) metal.
	Trigger not pulled while wire is in contact with workpiece.	Pull the trigger while in contact with the workpiece. The machine does not arc unless the trigger is pulled.
Poor quality welds.	Insufficient gas at weld area.	Check that the gas is not being blown away by drafts and, if so, move to a more sheltered weld area. If not, check gas cylinder contents, gauge, regulator setting, and operation of gas valve.
	Rusty, painted, oily or greasy workpiece	Ensure workpiece is clean and dry.
	Poor ground connection or torch/electrode connection.	Check work clamp/workpiece connection and all connections to the machine.
	Incorrect settings.	Check welding parameters and polarity.

# TROUBLESHOOTING

## MIG WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Arc works but not feeding wire.	No pressure on the drive roller; insufficient or excessive pressure on the drive roller.	Adjust the drive pressure.
	Wire spool is empty.	Check if wire is in place and replace if necessary.
Wire is "bird-nesting" at the drive roller or jamming.	Too much pressure on drive roller.	Adjust the drive pressure.
	Contact tip is clogged or damaged.	Replace contact tip.
	Worn guides or drive roll alignment.	Replace parts.
Low output or non-penetrating weld.	Weld parameters too low.	Adjust welding parameters.
	Wrong type or size wire.	Use .030" (0.8mm) - .035" (0.9mm) wire.
	Poor ground connection or gun connection.	Reposition clamp and check cable to clamp connection. Check connection of ground cable, gun, and Wire Polarity Drive Lead.
	Wrong size or worn contact tip	Use .030" (0.8mm) or 0.035" (0.9mm) contact tip with the corresponding wire. Replace contact tip if worn.
	Input power too low.	Have a qualified electrician verify the voltage at your outlet. If the voltage is appropriate, verify that the circuit wiring is sufficient for the circuit breaker size.
	Stick out too long.	Decrease stick out (the amount the wire extends past the contact tip).
Work clamp, ground cable, and/or welding cable get hot.	Bad ground or loose ground connection.	Check the connection of the work clamp and gun to the machine. Check the connection of the MIG Gun Connection. Check connection of the ground cable to the work clamp. Tighten cable connection to work clamp if needed. Ensure the connection between the work clamp and workpiece is good and on clean, bare (not painted or rusted) metal. Make sure cable is not damaged.
Gun nozzle arcs to work surface.	Spatter or Slag build-up inside nozzle or nozzle is clogged.	Clean or replace nozzle as needed.
Wire burns back to contact tip.	Wire feed speed is set too low for voltage setting being used.	Increase wire feed speed (turn left knob clockwise).
	Stick-out too short.	Increase stick-out (the amount the wire extends past the contact tip).
	Wrong size contact tip.	Use correct size contact tip.
	Contact tip is clogged or damaged.	Replace contact tip.

# TROUBLESHOOTING

## TIG WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Poor starting.	Poor work clamp connection.	Check and secure work connection.
	Start current is too low.	Increase Start current.
Black area along weld bead.	Oily or organic contamination on work	Clean work piece.
	Tungsten electrode may be contaminated.	Grind to clean electrode.
	Leaks in gas line or torch connection.	Check connection.
	Gas tank is near empty.	Replace the gas tank.
Unstable Arc.	Contaminated base metal.	Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.
	Tungsten is contaminated.	Remove 25/64" of contaminated tungsten and re-grind the tungsten.
	Arc length too long.	Lower torch so that the tungsten is off of the work piece 5/64"-13/64"(2-5mm).
Arc wanders.	Tungsten incorrect or in poor condition.	Check that correct type of tungsten is being used. Remove tungsten 3/4" from the weld end and re-sharpen the tungsten.
	Insufficient gas shielding.	Check and set the gas flow between 20-30cfh flow rate.
	Contaminated gas or leaks in gas line, torch, or connections.	Check gas line & connections.
	Poorly prepared tungsten.	Grind marks should run lengthwise with tungsten, not circular. Use proper grinding method and wheel.
	Contaminated base metal.	Remove contaminating materials like paint, grease, oil, and dirt, including mill scale from base metal.
	Contaminated/Incorrect filler.	Check the filler wire and remove all grease, oil, or moisture from filler metal.

# TROUBLESHOOTING

## TIG WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Lift TIG does not initiate an arc.	No gas, incorrect gas flow.	Check the gas is connected and cylinder valve open, check hoses, gas valve and torch are not restricted. Set the gas flow between 20-30 cfh flow rate.
	Poor work clamp connection.	Check & secure work clamp.
	Contaminated Tungsten.	Grind to clean Tungsten.
	Loose connection.	Check all connectors and tighten.
	Earth clamp not connected to work.	Connect the work clamp directly to the work piece wherever possible.
Tungsten burning away quickly.	Incorrect Gas/Inadequate gas flow.	Check the gas cylinder contains pure Argon gas and is connected and the torch gas valve is open. Set the gas flow between 20-30cfh flow rate.
	Back cap not fitted correctly.	Make sure the torch back cap is fitted so that the o-ring is inside the torch body.
	Incorrect tungsten being used.	Check and change the tungsten type if necessary.
Contaminated tungsten.	Touching tungsten into the weld pool.	Keep tungsten from contacting weld puddle. Raise the torch so that the tungsten is off of the work piece 1/8-1/4.
	Touching the filler wire to the tungsten.	Keep the filler wire from touching the tungsten during welding, feed the filler wire into the leading edge of the weld pool in front of the tungsten.
	Tungsten melting into the weld pool.	Check that correct type of tungsten is being used. Too much current for the tungsten size so reduce the amps or change to a larger tungsten.

# TROUBLESHOOTING

## STICK WELDING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Poor starting.	Poor work clamp connection.	Check and secure work connection
Stick electrode "blasts off" when arc is struck.	Current may be set too high for electrode size.	Adjust current.
Electrode "stick" in weld puddle.	Current may be set too low for electrode size.	Adjust current.
Porosity – small cavities or holes resulting from gas pockets in weld metal.	Arc length too long.	Reduce arc length.
	Damp electrode.	Use dry electrode.
	Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, slag, and dirt from work surface before welding.
Excessive Spatter – scattering of molten metal particles that cool to solid form near weld bead.	Amperage too high for electrode.	Decrease amperage or select larger electrode.
	Arc length too long or voltage too high.	Reduce arc length or voltage.
Incomplete Fusion – failure of weld metal to fuse completely with base metal or a preceding weld bead.	Insufficient heat input.	Increase amperage. Select larger electrode and increase amperage.
	Improper welding technique.	Place stringer bead in proper location at joint during welding.
		Adjust work angle or widen groove to access bottom during welding.
		Momentarily hold arc on groove side walls when using weaving technique.
		Keep arc on leading edge of weld puddle.
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, slag, and dirt from work surface before welding.	
Lack Of Penetration – shallow fusion between weld metal and base metal.	Improper joint preparation.	Material too thick. Joint preparation and design must provide access to bottom of groove.
	Improper weld technique.	Keep arc on leading edge of weld puddle.
	Insufficient heat input.	Increase amperage. Select larger electrode and increase amperage.
		Reduce travel speed.
Burn Through – weld metal melting completely through base metal resulting in holes where no metal remains.	Excessive heat input.	Select lower amperage. Use smaller electrode.
		Increase or maintain steady travel speed.

# TROUBLESHOOTING

## CUTTING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
The arc does not transfer to the workpiece.	Insufficient work clamp contact with the workpiece.	Clean the area where the work clamp attaches to the workpiece to ensure a good metal to metal connection.  Inspect the work clamp and its lead for damage, repair or replace as necessary.
	Improper cutting technique.	1. Brace the cutting hand to steady cutting hand, provides freedom of movement in all directions and helps maintain a constant 1/16" to 1/8" standoff. 2. Place the torch close and start cut from the edge of the metal with a roll 45-to-90 degree roll in case the sparks blow up into the torch.
	Plasma torch may not be in contact with the workpiece.	Be sure to physically drag the cutting nozzle on the workpiece as you cut.
Poor cut quality.	Improper use of Plasma torch.	Review operating instructions.
	Plasma torch parts are worn out.	Examine the consumables for wear and replace worn parts with new Simder consumable parts.
	Moisture or oil in air supply.	Excessive humidity or oil from the compressor may be contaminating the air supply. Install a moisture filter in the air supply line prior to machine.
Insufficient cut penetration.	Cutting speed too fast.	Decrease your torch travel speed.
	Plasma torch is too tilted.	Ensure that Plasma torch head is perpendicular to the workpiece.
	Workpiece is too thick.	Choose thinner workpiece material within the operational limits of the plasma cutting machine.
	Cutting current too low.	Turn current setting up.
		Ensure plasma cutting machine has proper input power.
		If used, eliminate or reduce length of extension cord.
	Plasma torch parts are worn out.	Examine the consumables for wear and replace worn parts with new Simder consumable parts.
Non-genuine manufacturer's parts.	Use only genuine Simder consumables for optimum performance.	
Insufficient air flow or pressure.	Check for obstructions blocking air flow and ensure that there are 12 inches of clearance between any obstacles and the vents on all sides of the machine.	



# TROUBLESHOOTING

## CUTTING ISSUES

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Excessive dross.	Cutting speed too slow (bottom dross).	Increase your torch travel speed.
	Cutting speed too fast (top dross).	Decrease your torch travel speed.
	Cutting current too low.	Ensure plasma cutting machine has proper input power.
		If used, eliminate or reduce length of extension cord.
	Plasma torch parts are worn out.	Examine the consumables for wear and replace worn parts with new Simder consumable parts.
Non-genuine manufacturer's parts.	Use only genuine Simder consumables for optimum performance.	
Excessive wear of the cutting nozzle or electrode.	Air pressure too low.	Inspect air compressor, air lines, and filters for proper operation.
		Inspect consumables for obstructions and proper installation.
	Exceeding plasma cutting machine capability (material too thick).	Choose thinner workpiece material within the operational limits of the plasma cutting machine.
	Moisture or oil in air supply.	Excessive humidity or oil from the compressor may be contaminating the air supply. Install a moisture filter in the air supply line prior to machine.
	Improperly assembled or loose Plasma torch consumables	Check Plasma torch consumables for proper installation.
	Damaged Plasma torch consumable.	Check plasma torch consumables for damage and replace if damaged.
Non-genuine manufacturer's parts.	Use only genuine Simder consumables for optimum performance.	
Tilted cut edge angle (not perpendicular).	Plasma torch position not correct.	Ensure that plasma torch head is perpendicular to the workpiece.
	Workpiece thickness is near the capacity of the machine.	Cut thinner material. 15/32" thick material cuts will not have a clean cut edge.
	Asymmetric wear of cutting nozzle hole or wrong assemblage of the plasma torch parts.	Check plasma torch consumables for wear and proper installation.
Examine the consumables for wear and replace worn parts with new Simder consumable parts.		

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