



STRIKE-ARC

USER MANUAL

DC INVERTER PLASMA CUTTER



MODELS: SACUT40

PLEASE READ THE USER MANUAL BEFORE USE.



INTRODUCTION

The Air Plasma Cutter can be used for a wide range of cutting applications: stainless steel, alloy steel, copper, aluminum, and all other color metal materials. You will need a suitable Compressor to operate the CUT40 Air Plasma Cutter. Clean dry air supply is required: **350KPA/3.5 BAR - 550KPA /5.5BAR**, to the machine. Air pressure must be regulated lower or higher depending on cutting requirements and adjustment the required amperage. Note - Lower air & amps for thinner material/ increasing for thicker materials.

We all know the first three states of matter, which are solid, liquid and gas. The fourth state of matter is plasma. When arc is transferred to the gas it elevates the temperature of the gas to the fourth state of matter. Plasma is a high energy electrically charged mixture of ions and electrons.

The gas could be of any of the following: air, nitrogen, argon, oxygen etc.

Through the restricted opening (nozzle) the gas passes through causes it to squeeze by at a high speed. This high-speed gas cuts through the molten metal.

The gas is also directed around the perimeter of the cutting area to shield the cut. Plasma cutting can be used on any conductive metals such as mild steel, aluminum and stainless are some examples. The plasma cutter will cut mild steel much faster than alloys. It doesn't rely on oxidizing the element it is cutting, which makes it a unique cutting tool.

WARNING!

Protect yourself and others from injury - read and follow these precautions.

Only suitably qualified persons should maintain and repair this unit.

During operation, keep everybody, especially children and pets, away.

CUTTING can cause fire or explosion resulting from hot metal and sparks from the cutting arc.

* The flying sparks, hot metal, hot work piece, and hot equipment can cause fires and burns.

Ensure the area is safe before doing any cutting.

* Remove all flammables within 12m of the cutting arc. If this is not possible, tightly cover them with approved covers. Do not cut where flying sparks can strike flammable material.

* Protect yourself and others from flying sparks and hot metal.

* Be aware that sparks and hot metals from cutting can easily go through small cracks and openings to adjacent areas.

* Be alert for fire and keep a fire extinguisher and trained operator nearby.

* Be aware that cutting on a ceiling, floor, bulkhead, or partition can cause fire on the backside side.

* Do not cut on closed containers such as tanks, drums, or piping.

* Connect work cable to the work as close to the cutting area as practical allowing maximum current to the cut and eliminating electric shock in the path.

* Never cut containers with potentially flammable or combustible materials inside.



They must be emptied and properly cleaned first. Blow out with clean air as fumes can ignite

- * Do not cut in areas containing explosive dust or vapors.
- * Do not cut pressurized containers of any kind.
- * Wear oil-free clothing and protective gear such as leather gloves, heavy shirt, cuff less pants, high tight shoes, and a cap.
- * Touching live electrical parts can cause fatal shocks or severe burns. The torch and work circuit are electrically live whenever the output is on.

The input power circuit and machines internal circuits are also live when power is on. Plasma arc cutting requires higher voltages than welding to start and maintain the arc (200 to 400 volts dc are common), but also uses torches designed with safety interlock systems which turn off the machine when the shield cup is loosened or if tip touches electrode inside the nozzle. Incorrectly installed or improperly grounded equipment is a hazard.

ELECTRIC SHOCK CAN KILL

- * Never touch live electrical parts.
- * Always wear dry, hole-free insulating gloves and body protection.
- * Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- * Do not touch torch parts if in contact with the work or ground.
- * Disconnect the power before checking, cleaning, or changing torch parts.
- * Disconnect input power before installing or servicing this equipment.
- * Properly install and ground this equipment according to its Owner's Manual and statutory regulations and requirements.
- * Check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet – always verify the supply ground.
- * Frequently inspect input power cord for damage – replace cord immediately if damaged – exposed wiring can kill.
- * Turn off all equipment when not in use.
- * Inspect and replace any worn or damaged torch cable leads.
- * Do not wrap torch cable around your body.
- * Use only well-maintained equipment. Repair or replace damaged parts at once.
- * Keep all panels and covers securely in place.
- * Do not bypass or try to defeat the safety interlock systems.
- * Use only a torch specified in Owner's Manual.
- * Keep away from torch tip and pilot arc when trigger is pressed.
- * Clamp work cable with good metal-to-metal contact to work piece (not the piece that will fall away) or worktable as near the cut as practical.
- * Insulate work clamp when not connected to workpiece to prevent contact with any metal object.



After disconnecting the power supply, there is still **SIGNIFICANT DC VOLTAGE** in the inverter power sources.

If you must open the unit for any reason, Turn Off unit, disconnect input power, and check input Voltage. Capacitors store electricity, ensure that they are near zero (0) volts before touching any parts. Check capacitors according to instructions in Maintenance Section of Owner's Manual or Technical Manual before touching any parts.

CAUTION:

On inverter power sources, failed parts can explode or cause other parts to explode when power is applied. Always wear a face shield and long sleeves when servicing inverters.

EXPLODING PARTS:

Sparks and hot metal blow out from the cutting arc. Chipping and grinding cause flying metal that can injure you and others.

FLYING SPARKS:

Wear approved face shield or safety goggles with side shields. Wear proper body protection to protect skin to protect from flying sparks.

Wear flame-resistant ear plugs or earmuffs to prevent sparks from entering ears.

Arc rays from the cutting process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin.

ARC RAYS:

Wear face protection (helmet or shield) with a proper shade of filter lenses to protect your face and eyes when cutting or watching.

Wear approved safety glasses with side shields under your helmet or face shield.

Use protective screens or barriers to protect others from flash, glare and sparks.

Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and protective footwear.

EXCESSIVE NOISE:

Use approved ear plugs or earmuffs if noise level is excessive.

TECHNICAL DETAILS

Plasma Defined

Plasma cutters work by sending a pressurized gas, such as air, through a small channel. In the center of this channel, you'll find a negatively charged electrode. The electrode is at the center, and the nozzle is just below it. The swirl ring causes the plasma to turn rapidly as it passes. When you apply power to the negative electrode, and you touch the tip of the nozzle to the grounded work piece, the connection creates a circuit. A powerful spark is generated between the electrode and the metal. As the inert gas passes through the channel, the spark heats the gas until it reaches the fourth state of matter (plasma). This reaction creates a stream of directed plasma, approximately 16,600°C or more and moving at 6,000 per m per second that reduces metal to vapor and molten slag.

The plasma itself conducts electrical current. The cycle of creating the arc is



continuous as long as power is supplied to the electrode and the plasma stays in contact with the metal that is being cut. The cutter nozzle has a second set of channels. These channels release a constant flow of shielding gas around the cutting area. The pressure of this gas flow effectively controls the radius of the plasma beam.

NOTE! This machine is designed to use only compressed air, referred to as the “gas”.

Voltage Regulation

The Automatic Voltage Compensation circuit prevents voltage loads from exceeding the maximum in accordance with the main technical data sheet to prevent against shorting the life of the machine.

Thermal Protection

The thermal protection circuits will engage if unit exceeds its maximum duty cycle. This will cause the machine to stop working. The indicator will be lit on the front of the machine. The fan will continue to run until unit cools down (if the fans stop checking your circuit breaker). When it reaches an acceptable temperature, it will operate again.

Duty Cycle

Duty cycle is the percentage of on time (measured in minutes) in a 10-minute period in which the machine can be operated continually, in an environment of a specified temperature.

Exceeding duty cycle ratings will cause the thermal overload protection circuit to become energized and shut down output until the unit cools to normal operating temperature. Continual exceeding of duty cycle ratings can cause damage to the machine.

TECHNICAL DATA

DATA	CUT-40
	single phase 220V
Rated input power (KVA)	7
Rated input current (A)	34
No-load voltage (v)	280
Output current range(A)	20-40
Rated output voltage (v)	96
Duty cycle	60%
Burner inner diameter (mm)	1.0
Pressure of air compressor PSI (kg)	70 psi (4-5)
Cutting Thickness (mm)	1-10
Dimensions(mm)	350X142X255



STRIKE-ARC

INSTALLATION

Unpacking

Unpack all items and verify that all items have been received according to the packing list enclosed.

Operating Environment

Make sure working area is well ventilated. The unit is cooled by an flow fan which provides airflow through the back panel over the electronics and out the machine cover vents. Provide at least 150mm in the rear and 150mm on each side for air circulation. If unit is operated without sufficient cooling the duty cycle will be greatly reduced.

Input Power Cord Connection

Every machine includes a primary power cord capable of handling the input voltage and current for this unit. If the unit is connected to power that exceeds the required voltage, or is of the incorrect phase, serious damage will be incurred.

This machine may operate on 220V to 240V volts single phase power. Proper input voltage can be determined by observing the labels next to the power cord strain relief and will be labeled 220V-240V Circuit Breaker must be at least 40Amp.

The power supply is a molded 15 Amp 3 Pin South African plug; Do not remove this plug or attempt "other" unsafe connection. This could/will result in electric shock and possible death.

If using an extension cord, make sure that it meets or exceeds the following recommendations: Minimum 30Amp rating and not exceeding 10M in length.

Long extension cords result in voltage drop and increase amperage that could be hazardous and could cause damage to the machine.

CONNECTIONS

Torch Connection

Connect the Torch to the Cutter by screwing the airline fitting at the end of the torch to the front of the machine: attach the secondary connector to the face of the machine.

Secure by tightening with wrench slightly. DO NOT OVER TIGHTEN!

Earth Clamp Connection

Connect earth clamp to face of the machine (+).

Air Connection

Connect the air supply to the regulator located on the back of the unit. Using the supplied host clamps; connect the air hose to the back of the machine

Ensure the Water Trap is properly secured and serviced regularly: this is NOT an Air Dryer.

Air Dryers can be purchased as an optional extra and installed on the air supply (Compressor).

TORCH ASSEMBLY/MAINTENANCE

Torch Assembly Procedure:

Position the torch with the shield cup facing upward and unscrew and remove the shield cup from the torch head assembly.



Unscrew the electrode.

Install the new electrode, and tip. Replace worn parts, where necessary. Install and hand tighten the shield cup until it is seated on the torch head. If resistance is felt when installing the cup, check the threads and parts before proceeding.

OPERATION

Process

Turn the Power Switch to the ON position.

Position yourself to where you can read the air pressure. Press the torch switch (air will flow from the torch, adjust the air regulator to read approximately 350KPA to 550KPA (3.5 BAR to 5.5 BAR) and release torch switch.

Note: The generally accepted air pressure range is 350KPA to 550KPA (3.5 BAR to 5.5 BAR). You may experiment as desired, but be careful not to lower the pressure too much as you may damage the torch/ mainly the torch electrode etc.

Secure earth clamp to work piece. Connect clamp to main part of your work piece, and not the part being removed (the part that might fall to the floor).

Cutting

Drag Cutting

Position torch tip slightly above work piece, press torch switch and lower torch tip toward work piece until contact is made and a cutting arc is established. After the cutting arc is established, move the torch in the desired direction keeping the torch tip slightly angled, maintaining contact with the work piece.

This methodology is called Drag-Cutting. Avoid moving too fast as would be indicated by sparks radiating from the top side of work piece. Move the torch just fast enough to maintain sparks concentration at the underside of the work piece and making sure the material is completely cut through before moving on. Adjust drag speed as desired/required.

Stand-off Cutting

In some cases, it may be beneficial to cut with the torch tip raised above the work-piece approximately 2mm to 3mm to reduce material blow-back into the tip and to maximize penetration of thick material cuts. An example of "stand-off cutting" would be used when penetration cutting, or gouging operation is being performed. You can also use "stand-off" technique when cutting sheet metal to reduce the chance of splatter-back tip damage.

Piercing

For piercing, position the tip approximately 3mm above the work piece. Angle the torch slightly to direct sparks away from the torch tip and operator. Initiate the pilot arc and lower the tip of the torch until the main cutting arc transfers, sparks start.

Start the pierce off the cutting line on the scrap piece or template and then continue the cut onto the cutting line.

Hold the torch perpendicular to the work piece after the pierce is complete and continue cutting as desired.

Clean spatter and scale from the shield cup and the tip as soon as possible.

Quality Cuts

Dross (slag) is the excess material that spatters and builds up on the underside of



the workpiece as you cut.

Dross occurs when the operating procedure and technique is less than optimal. It will require practice and experience to obtain cuts without dross. Although less than optimal cuts will contain dross, it is relatively easy to remove by breaking it off using pliers or chipping off with a chisel or scraping or grinding the finished cut as needed and is generally only a minor inconvenience.

A combination of factors contributes to the build-up of dross. They include material type, material thickness, amperage used for the cut, speed of the torch across the workpiece, condition of the torch tip, input line voltage, air pressure, etc. Generally, there is an inversely proportional relationship between output current and speed of cut. Do not use more output current than is necessary and adjust speed of cut toward minimizing dross build up on underside of cut. Experiment with adjusting current and speed to minimize dross. For more specific issues regarding quality of cuts and general operation, go to the Troubleshooting section of this manual.

MAINTENANCE

Pre-Operational check

Each time you use the plasma cutter; check the Torch, Tip/Nozzle, Electrode and Shield Cup.

Inspect Torch for any wearing, cracks, or exposed wires. Replace or repair before use.

A worn Torch Tip/Nozzle contributes to reduced speed, voltage drop and crooked cuts.

A worn Tip/Nozzle is indicated by an elongated or oversized orifice.

The face of the electrode should not be recessed more than 3mm. Replace if worn beyond this point.

If the Shield Cup does not go on easily, check the threads. Test the fan to see that is working.

Weekly Checks

Blow or vacuum any dust and dirt from of the entire machine. Check your air and moisture filter/separator/ drain water.



TROUBLESHOOTING

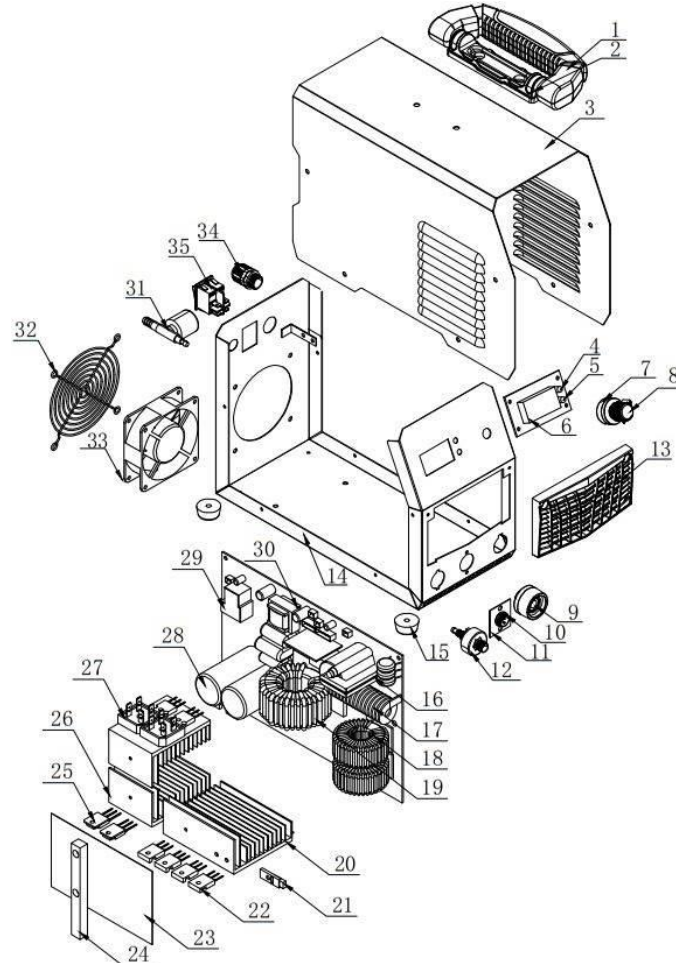
PROBLEM	CAUSE	SOLUTION
Power Switch Off	Power Switch Off	Turn Power Switch to the On Position
	Air supply is compromised	Another indication of this is a greener flame. Check air supply.
	Work piece Ground Clamp not attached	Attach to work piece or to steel table with work piece securely clamped to table.
Sparks are shooting upward Instead of down through the Material.	Plasma Torch is not piercing the material.	Increase current.
	Torch may too far away from stock	Decrease the distance of your torch to stock
	Material may not be grounded properly	Check connections for proper ground.
	Travel speed too fast	Reduce speed
Beginning of cut not completely pierced	Possible connection problem	Check all connections
Dross build-up on parts of cuts	Tool/Material building up heat	Allow material to cool then continue cut.
	Cutting speed too slow or Current too high.	Increase speed and/or reduce current until dross is reduced to minimum.
	Worn torch parts	Inspect and repair or replace worn parts.
Arc stops while cutting	Cutting speed too slow	Increase speed until problem solved
	Torch is too high, away from material	Lower torch to recommended height



Arc stops while cutting	Worn torch parts	Inspect and repair or replace worn parts
	Work piece ground cable disconnected	Connect Work piece Ground Clamp to work- piece or steel table.
Insufficient penetration	Cutting speed too fast	Slow travel speed
	Torch tilted too much	Adjust tilt.
	Metal too thick	Several passes may be necessary
	Worn torch parts	Inspect and repair or replace worn parts
Consumables wear quickly	Exceeding unit capability	Material too thick, increase angle to prevent blow back into torch tip.
	Excessive Pilot arc time	Do not pilot for more than 5 seconds. You can also start with torch in contact with metal or within 3mm of metal
	Improperly assembled torch	See section titled "Torch Assembly"
	Inadequate air supply, pressure too low.	Check air filter, increase air pressure.
	Faulty air compressor	Check air compressor operation and make sure input air pressure is at least 400KPA/4.8BAR



PARTS LISTING

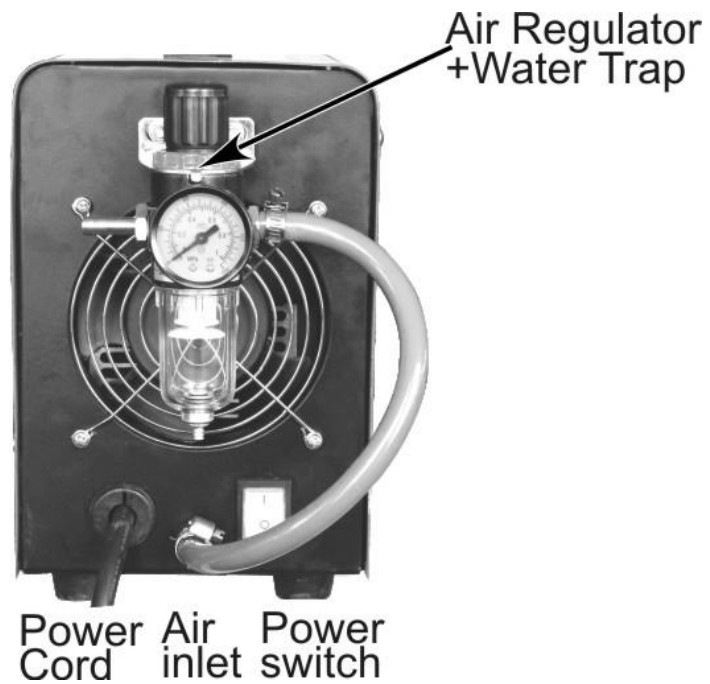


No.	PART	QTY	No.	PART	QTY
1.	HANDLE	1	19.	MAIN TRANSFORMER	1
2.	HANDLE SEAT	1	20.	RADIATOR 1	1
3.	METAL COVER	1	21.	THERMOSTAT	1
4.	LED	1	22.	RECTIFIER TRANSITOR	4
5.	LED	1	23.	BAKELITE	1
6.	DIGITAL DISPLAY	1	24.	UPRIGHT	1
7.	POTENTIALMETER	1	25.	IGBT	4
8.	POTENTIALMETER KNOB	1	26.	RADIATOR 2	2
9.	FAST CONNECTOR	1	27.	RECTIFIER BRIDGE	2
10.	AVIATION SOCKET	1	28.	CAPACITOR	2
11.	BRACKET	1	29.	RERLAY	4
12.	P&E INTEGRATED CONNECTOR	1	30.	DRIVE TRANSFORMER	1
13.	PLASTIC FRONT PANEL	1	31.	SOLENOID VALVE	1
14.	METAL BOTTOM BOARD	1	32.	FAN COVER	1
15.	RUBBER FEET	4	33.	FAN	1
16.	HIGH PRESSURE PAGAGE	1	34.	POWER CABLE FASTENER	1
17.	COUPLING TRANSFORMEFR	1	35.	SWITCH	1
18.	TRANSFORMER	2			



PANEL INSTRUCTION

Model: SACUT40



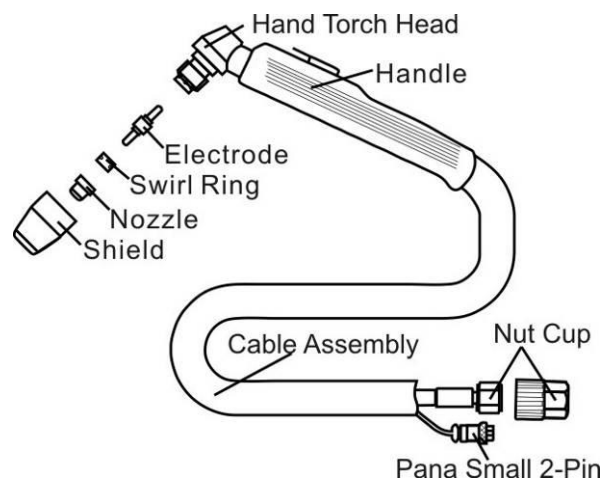
1. POWER INDICATOR LIGHT
2. CURRENT METER
3. OVER-LOAD (HEAT) INDICATOR LIGHT
4. CURRENT ADJUSTER
5. TORCH AVIATION SOCKET OUTLET
6. NEGATIVE OUTPUT (TORCH)
7. POSITIVE OUTLET (EARTH CLAMP)



Torch



Earth clamp





NAMEPLATE SYMBOL AND GRAPHIC MEANING

NO.	Symbol	Meanings
1		Single phase static frequency changer-transformer-rectifier
2		Static External Characteristics is dropping characteristic
3		Welding Power source symbol of Fit welding operation
4		II Category Protection Symbol
5		Manual arc welding with coated electrode
6		Single phase power source/ three phase power source
7		DC (direct current)
8	$\cos\phi$	Power Factor
9	IEC60974-1	Confirmed Welding power source files quote
10	~50/60Hz	AC power, rated frequency 50HZ/60HZ
11	$U_0(V)$	No load voltage unit: V
12	X	Symbol for load continuance rate
13	$I_2(A)$	Rated welding current unit: A
14	$U_2(V)$	Rated load voltage unit: V
15	...%.....100%	Duty cycle
16	$I_1 (A)$	Rated Input current unit: A
17	$U_1(V)$	Rated Input voltage unit: V
18	I CL.H	Insulation Class
19	IP21S	Protection Degree
20	COOLING AF	Fan cooling



After-sales Service

This machine is covered by the manufacturer's warranty for a period on 12 months from date of purchase against faulty material and or poor workmanship. Misuse/abuse and tampering of the machine will not be covered by the warranty. Contact your dealer for repair/warranty claims.

Packing List

Name	NO.
Main Body	1
Cutting Torch	1
Pressure Reducing Valve	1
Ground Wire	1
Manual	1

Strike-Arc products are exclusively manufactured for and distributed by Agrinet(Pty)
Ltd.

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Made in PRC