OPERATING INSTRUCTIONS

Welding Machine



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WARNINGS

Read and understand this entire Manual and your employer's safety practices before installing, operating ,or servicing the equipment. While The operating instructions provide an introduction to the safe use of the products.
•Read the operating instructions for all system components!
•Observe accident prevention regulations!
•Observe all local regulations!
•Confirm with a signature where appropriate.

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WARNING

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR. DO NOT LOSE THESE INSTRUCTIONS. READ OPERATING/INSTRUCTION MANUAL BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

Welding products and welding processes can cause serious injury or death, or damage to other equipment or property, if the operator does not strictly observe all safety rules and take precautionary actions.

Safe practices have developed from past experience in the use of welding and cutting. These practices must be learned through study and training before using this equipment. Some of these practices apply to equipment connected to power lines; other practices apply to engine driven equipment. Anyone not having extensive training in welding and cutting practices should not attempt to weld.

Safe practices are outlined in the European Standard EN60974-1 entitled: Safety in welding and allied processes Part 2: Electrical HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, ANDREPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

1.1 Arc Welding Damage



WARNING **ELECTRIC SHOCK can kill.**

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semi-automatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect input power or stop engine before installing or servicing this equipment. Lock input power disconnect switch open, or remove line fuses so power cannot be turned on accidentally.
5. Properly install and ground this equipment according to its Owner's Manual.



WARNING **ARC RAYS can burn eyes and skin, NOISE can damage hearing.**

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

1. Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching;
2. Wear approved safety glasses. Side shields recommended;
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc;
4. Wear protective clothing made from durable, flame-resistant material(wool and leather) and foot protection;
5. Use approved ear plugs or ear muffs if noise level is high;
6. Never wear contact lenses while welding.



WARNING **FUMES AND GASES can be hazardous to your health.**

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
5. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
6. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air- supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

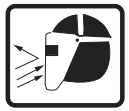


WARNING **WELDING can cause fire or explosion.**

Sparks and spatter fly off from the welding arc. The fly sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables far away from the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.

6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from travelling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.



WARNING **FLYING SPARKS and HOT METAL can cause injury.**

Chipping and grinding cause flying metal. As welds cool, they can throw off slag.

1. Wear approved face shield or safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.



WARNING **CYLINDERS can explode if damaged.**

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep protective cap in place over valve except when cylinder is in use or connected for use.
8. Read and follow instructions on compressed gas cylinders, associated equipment.



WARNING **ENGINE FUEL can cause fire or explosion.**

Engine fuel is highly flammable.

1. Stop engine before checking or adding fuel.
2. Do not add fuel while smoking or if unit is near any sparks or open flames.
3. Allow engine to cool before fuelling. If possible,check and add fuel to cold engine before beginning job.
4. Do not overfill tank — allow room for fuel to expand.
5. Do not spill fuel. If fuelling is spilled, clean up before starting engine.



WARNING **MOVING PARTS can cause injury.**

Moving parts, such as fans, rotors, and belts can cut fingers and hands and catch loose clothing.

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.
3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (-) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Reinstall panels or guards and close doors when servicing is finished and before starting engine.



WARNING **SPARKS can cause battery gases to explode; BATTERY ACID can burn eyes and skin.**

Batteries contain acid and generate explosive gases.

1. Always wear a face shield when working on a battery.
2. Stop engine before disconnecting or connecting battery cables.
3. Do not allow tools to cause sparks when working on a battery.
4. Do not use welder to charge batteries or jump start vehicles.
5. Observe correct polarity (+ and –) on batteries.



WARNING STEAM AND PRESSURIZED HOT COOLANT can burn face, eyes, and skin.

The coolant in the radiator can be very hot and under pressure.

1. Do not remove radiator cap when engine is hot. Allow engine to cool.
2. Wear gloves and put a rag over cap area when removing cap.
3. Allow pressure to escape before completely removing cap.

NOTE

1.2 Effects Of Low Frequency Electric and Magnetic Fields

Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). The discuss on the effect of EMF is ongoing all the world. Up to now, no material evidences show that EMF may have effects on health. However, the research on damage of EMF is still ongoing. Before any conslusion, we should minimize exposure to EMF as few as possible.

To reduce magnetic fields in the workplace, use the following procedures.

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cable around the body.
4. Keep welding Power Source and cables as far away from body as practical.
5. The people with heart-pacemaker should be away from the welding area.

1.3 Symbol Chart

Note that only some of these symbols will appear on your model.

	ON	1 ~	Single Phase		Wire Feed Function
	OFF	3 ~	Three Phase		Wire Feed Towards Workpiece With Output Voltage OFF.
	Dangerous Voltage		Three Phase Static Frequency Converter-Transformer-Rectifier		Welding Gun
	Increase/Decrease		Remote		Purging Of Gas
	Circuit Breaker	X	Duty Cycle		Continuous Weld Mode
	AC Auxiliary Power	%	Percentage		Spot Weld Mode
	Fuse		Panel/Local	t	Spot Time
A	Amperage		Shielded Metal Arc Welding (SMAW)	t1	Preflow Time
V	Voltage		Gas Metal Arc Welding (GMAW)	t2	Postflow Time
Hz	Hertz (cycles/sec)		Gas Tungsten Arc Welding (GTAW)		2 Step Trigger Operation Press to initiate wirefeed and welding, release to stop.
f	Frequency		Air Carbon Arc Cutting (CAC-A)		4 Step Trigger Operation Press and hold for preflow, release to start arc. Press to stop arc, and hold for preflow.
—	Negative		Constant Current	t	Burnback Time
+	Positive		Constant Voltage Or Constant Potential	IPM	Inches Per Minute
⎓	Direct Current (DC)		High Temperature	MPM	Meters Per Minute
	Protective Earth (Ground)		Fault Indication	S	See Note
	Line		Arc Force		See Note
	Line Connection		Touch Start (GTAW)		Pulse Welding
	Auxiliary Power		Variable Inductance		
115V 15A	Receptacle Rating-Auxiliary Power	V	Voltage Input		

2.1 Brief Introduction

Paris500 plasma cutting machines adopts the latest pulse width modulation (PWM) technology and insulated gate bipolar transistor (IGBT) power module, which can change work frequency to medium frequency so as to replace the traditional hulking work frequency transformer with the cabinet medium frequency transformer. Thus, its characterized with portable, small size, light weight, low consumption and etc.

Paris500 plasma cutting machines Characteristics:

- ◆**IGBT technology**
- ◆**With EMI filter to minimize the pollution of the electrified net**
- ◆**High mains voltage tolerance ± 15%to maintain stable work.**
- ◆**MCU control system, responds immediately to any changes.**
- ◆**Excellent cutting capability.**
- ◆**Pilot arc controller, can cut grid workpiece**
- ◆**Intelligent protection: over-current, over-heat, when the mentioned problems occoured, the alarm lamp on the front panel will be on and the output current will be cut off. It can self-protect and prolong the using life.**

2.2 Specifications

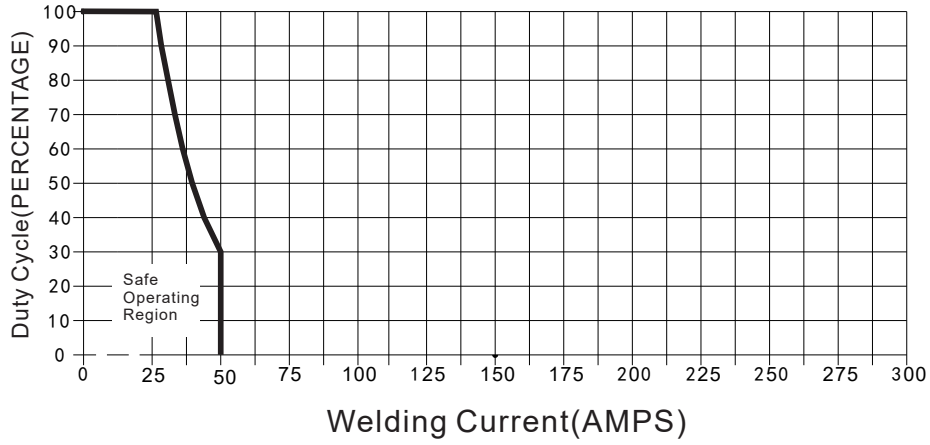
Description	SIWM DIGITAL Paris500
Weight	7.1 kg
Power Source Dimensions	H320mmxW/160mmxD380mm
Cooling	Fan Cooled
Welder Type	Inverter Power Source
European Standards	EN 60974-1 / IEC 60974-1
Number of Phases	1
Nominal Supply Voltage	230V +/- 15%
Nominal Supply Frequency	50/60Hz
Welding Current Range	20 - 50A
Effective Input Current	18.6A
Maximum Input Current	37.2A
Single Phase Generator Requirement	9.9kVA
Welding Output, 40ºC, 10 min.	50A @ 30%, 100V / 27.4A @ 100%, 91V
Open circuit voltage	240V DC
Protection Class	IP23
Quality Cutting Thickness (500mm/min)	8mm (Steel cutting capability / Thickness to scale.)
Maximum Cutting Capacity	12mm (Steel cutting capability / Thickness to scale.)

NOTE

Due to variations that can occur in manufactured products, claimed performance, voltages, ratings, all capacities, measurements, dimensions and weights quoted are approximate only. Achievable capacities and ratings in use and operation will depend upon correct installation, use, applications,maintenance and service

2.3 Duty Cycle

The rated duty cycle of a Welding Power Source is a statement of the time it may be operated at its rated welding current output without exceeding the temperature limits of the insulation of the component parts. To explain the 10 minute duty cycle period the following example is used. Suppose a Welding Power Source is designed to operate at a 30% duty cycle, 50 amperes at 100 volts. This means that it has been designed and built to provide the rated amperage (50A) for 4 minutes, i.e. arc welding time, out of every 10 minute period (30% of 10 minutes is 4 minutes). During the other 6 minutes of the 10 minute period the Welding Power Source must idle and be allowed to cool.



2.4 Packaged Items

- ◆Plasma Torch 4m PT-31
- ◆300A earth clamp with 2.5m cable
- ◆3m Power cable
- ◆3.5m Gas Hose 8x13.5
- ◆Operating Manual

3.1 Layout For The Panel

Front



Behind



WARNING **DO NOT TOUCH the electrode wire while it is being fed through the system. The electrode wire will be at welding voltage potential.**

1. Digital Display

The digital meter is used to display the pre-set (preview) amperage for cutting and the actual cutting current.

2. Power Indicator

The green power indicator will be illuminated when the welder is turned ON and indicates the presence of power.

3. Thermal Overload Indicator Light

This welding power source is protected by a self resetting thermostat. The indicator will illuminate if the duty cycle of the power source has been exceeded. Should the thermal overload indicator illuminate the output of the power source will be disabled. Once the power source cools down this light will go OFF and the over temperature condition will automatically reset. Note that the mains power switch should remain in the on position such that the fan continues to operate thus allowing the unit to cool sufficiently. Do not switch the unit off should a thermal overload condition be present.

4.Cutting current adjustment

Clockwise rotate to enlarge the current, and anti-clockwise rotate to reduce the current.

5. Positive Welding Output Terminal

The positive cutting terminal is used to connect the cutting output of the power source to the appropriate welding accessory such as earth clamp. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

6. Plasma Torch Connector

Plasma torch insert in to connect with the machine. It's necessary to be sure that the plug is correctly and tightly connected to maintain the electricity and gas supply.

7. Plasma torch control Switch

Remote control Switch receptacle is used to connect a plasma torch trigger switch: To make connections, align keyway, insert plug, and rotate threaded collar fully clockwise. The socket information is included in the event the supplied cable is not suitable and it is necessary to wire a plug or cable to interface with the receptacle.

8. Power switch

before using the machine. Pull the switch to the closure state of "AN" to operate the machine, and pull the switch to "AUS" after use. Turn off the power input, and the machine will stop operating.

9. Gas input port

The gas port is connected with the gas valve output port. After connection, check whether there is gas leakage. (As shown in the picture of section 3.2: Gas valve assembly)

10. Program downloading port

Change the program downloading connection port, and use the plastic cover to prevent the dust from polluting and oxidizing the port after use.

CAUTION **Loose welding terminal connections can cause overheating and result in the male plug being fused in the bayonet terminal.**

3.2 Installation Instructions

In order for the unit to function correctly, it must be installed properly. Follow the procedure given below for correct installation:

1. Read the safety rules given in this manual carefully.
2. Check on receiving the unit that there are no defective parts or parts damaged during transportation.
3. Attach air regulator as show in picture Air Regulator Installation only for Paris500.
4. Set your unit up in an area which is adequately ventilated and make sure that the air vents are not obstructed.
5. Connect the power supply cable to a socket located as near as possible to the work area, so that the unit can be switched off quickly in case of emergency.
6. Your machine has a 16 amp plug fitted, before use check that the green/yellow earth is connected to the earth pin socket of fitted plug.
7. Make sure that the mains supply switch and any fuses have a value which ± 15% the maximum current absorbed by the unit. All fuses should be the slow-blow type.
8. Any extensions of power supply cable should have the same cross-section as the power supply cable. The extension leads, however, should only be used when absolutely necessary. It is important to note that any extension of mains cables or torch cables will possibly affect the cutting performance of this cutting equipment, due to the fact that the resistance of the cable will reduce voltage input, which is determined by the length of the cable. The supplied length of main cables and torch cables is recommended.
9. Fasten the earth clamp to the piece to be cut, If the surface of the piece to be cut is painted, rusty or covered with insulating material, clean the surface so that satisfactory contact between the piece and the earth clamp can be obtained.
10. Make sure that the torch has been assembled with the correct components and that the cutting tip is suitable for the cutting current.

11. Connect air to regulator and adjust regulator to deliver 5-6 bar 90ltr/min
12. Switch the unit on using the main switch located on the back side.
13. press the cutting torch to achieve a pilot from the copper tip, when this pilot is up to the work piece , cutting operation begins.

CAUTION

Do not point the torch jet at foreign bodies.

CAUTION

Avoid unnecessary lighting of the pilot arc toprevent excessive consumption of the electrodeand nozzle.

CAUTION

During cutting the speed of the torch movement should be in accordance with the thickness of the piece to be cut. Excessive speed causes a return of incandescent towards the torch which shortens the life of the parts of the torch most subject to wear and tear. The metal fouling on the nozzle should be removed as soon as possible.



Air regulator installation and operation

1. Firmly tight and seal the copper air hole at IN and OUT terminal by high pressure rubber tube .
2. Tight and seal the meter with meter face rubber tube.
3. Fix the connecting shelf with screw as the regulator position.
4. Get down the plastic screw and fix the regulator on the shelf.
5. Turn on the air valve, turn up the pressure adjusting knob, turn the pressure volume (meter inside shows kg), and then put down the knob.(+ means increasing pressure, -- means decreasing pressure.)
6. Scale of the meter is as follow. The volume in the picture is 6 kg.
7. If the water in thegas filtering bottle is too much, please turn on the water valve to let the water go out.



4.1 Troubleshooting

◆Before arc welding machines are dispatched from the factory, they have already been debugged accurately. So forbid anyone who is not authorized by us to do any change to the equipment!

◆Maintenance course must be operated carefully. If any wire becomes flexible or is misplaced, it maybe potential danger to user!

◆Only professional maintenance personal who is authorized by us could overhaul the machine!

◆Guarantee to shut off the arc welding machine's power before turn on the outline of the equipment!

◆If there is any problem and has no the authorized professional maintenance personal, please contact local agent or the branch company!

If there are some simple troubles of welding machine, you can consult the following overhauling chart:

Nr.	Troubles	Reasons	Solution
1	Turn on the power source, power indicator is lit, fan and air control valve are not working	Fan is broken and the control board broken	Change fan and control board
		There is something in the fan and the control board broken	Clean it and change the control board
		The start capacitor of fan damaged and the control board broken	Change capacitor and control board
		The input lines not corretly connected	Connect correctly
2	Turn on the power source, fan is working, power indicator is not lit	The power light damaged or connection is not good	Change the power light
		The power board is broken	Change it
		Display panel is broken	Change it
3	Turn on the power source, fan is not working, power indicator is not lit	The power cable connected not good	Connect correctly
		The power cable is broken	Repair or change it
		Power on switch is damaged	Change it
		The light of the power indicator is broken and the problems mentioned in Nr. 2	Change the light of the power indicator or refer to the solution in Nr. 2
		The power board is broken	Change it
4	Turn on the power source, Torch/Gas indicator is on	The shield cup is unfitted installation	Install and screw properly
		The tip or electrode is unfitted installation	Install and screw properly
		Gas pressure too low	Adjust the gas pressure to 65psi/ 4.5 bar,the barometer indicate up to 0.4Mpa or 60psi.
		Cutting torch is broken or mistake	Check and change
5	The over-heat alarm is on after a few minutes cutting	The input or output of the air flow around the machine is blocked	Correct the condition
		Fan blocked	Check and correct it
		Over-heat appear	let meachine cool down 5 minutes and make sure the duty cycle is not exceeded
		Input voltage is not correct	Choose the proper voltage
		Faulty components in the machine	Consult the dealer or manufacturer to repair

Nr.	Troubles	Reasons	Solution
6	When torch is pressed the torch failed to ignite the arc	Torch parts broken	Inspect torch parts and replace if necessary
		Gas pressure too low or too high	Adjust it to proper rate
		Faulty components in the machine	Consult the dealer or manufacturer to repair
		Input voltage is not correct	Choose the proper voltage
7	When torch is pressed the torch is difficult to ignite	The gas distributor is uninstalled	Install it
		Torch parts are worn	Check and change the torch parts
		Machine is in trouble	Consult the dealer or manufacturer to repair
		Gas pressure too low or too high	Adjust it to proper rate
		Input voltage is not correct	Choose the proper voltage
8	After triggering the torch ,the pilot arc cannot change to the cutting pilot	The connection between cutting torch and machine is not correct o r the connection is poor	Check the torch leads are properly connect to the machine
		Earth clamp not correctly connect to the work piece	Make sure the earth clamp has a proper connection to a clean and dry area of the workpiece
		The cutting torch is broken	Change or repair it
9	Arc shuts off during operation and it will not restart when torch is triggered	Power supply is overheated	let meachine cool down 5 minutes and make sure the duty cycle is not exceeded
		Gas pressure too low , the torch/gas indicator is on when torch switch is pressed	Check and adjust the gas setting at least 65psi/4.5 bar
		Torch consumbles are worn	Check and replace
		Faulty components in the machine	Consult the dealer or manufacturer to repair
10	The power indicator is on ,fan is working but no gas flow , gas indicator is on	Gas pipe not connected or pressure is too low	Check the gas connection, adjust the proper setting
		Faulty components in the machine	Consult the dealer or manufacturer to repair
		Air regulator is broken	Change it
11	low cutting output	Incorrect setting of cutting current	Check and adjust the cutting current
		Faulty components in the machine	Consult the dealer or manufacturer to repair
12	Torch can cut but the quality is poor	Cutting current is too low	Increase the cutting current
		The movement of torch is too fast	Reduce cutting speed
		Excessive oil or moisture in torch	Do not directly start to cut before cleaning the torch
		lack of air pressure	Check the air pressure and air flow

5.1 Maintenance

In order to guarantee that arc welding machine works high-efficiently and in safety,it must be maintained regularly.Let customers understand the maintenance methods and means of arc welding machine more, enable customers to carry on simple examination and safeguarding by oneself,try one's best to reduce the fault rate and repair times of arc welding machine, so as to lengthen service life of arc welding machine.Maintenance items in detail are in the following table.

◆**Warning:For safety while maintaining the machine,please shut off the supply power and wait for 5minutes,until capacity voltage already drop to safe voltage 36V!**

Date	Maintenance item
Daily examination	Observe that whether panel knob and switch in the front and at the back of arc welding machine are flexible ane put correctly in place.If the knob has not been put correctly in place, please correct, If you can't correct or fix the knob, please replace immediately If the switch is not flexible or it can't be put correctly in place, please replace immediately; Please get in touch with maintenance service department if there are no accessories After turn-on power, watch/listen to that whether the arc welding machine has shaking, whistle calling or peculiar smell. If there is one of the above problems, find out the reason to get rid of, if you can't find out the reason, Please contact local this area agent or the branch company Observe that whether the display value of LED is intact. If the display number is not intact, please replace the damaged LED. If it still doesn't work, please maintain or replace the display PCB Observe that whether the min/max value on LED accords with the set value.If there is any difference and it has affected the normal welding craft, please adjust it Check up that Whether fan is damaged and is normal to rotate or control . If the fan is damaged,please change immediately.If the fan does not rotate after the arc welding machine is overheated, observe that whether there is something blocked in the blade,if it is blocked,please get rid of; If the fan does not rotate after getting rid of the above problems, you can poke the blade by the rotation direction of fan.If the fan rotates normally, the start capacity should be replaced; If not, change the fan Observe that whether the fast connector is loose or overheated. If the arc welding machine has the above problems,it should be fastened or changed Observe that Whether the current output cable is damaged. If it is damaged, it should be wrapped up, insulated or changed Using the dry compressed air to clear the inside of arc welding machine. Especially forclearing up the dusts on radiator, main voltage transformer, inductance, IGBT module, the fast recover diode and PCB, etc
Monthly examination	Check up the bolt in arc welding machine,if it is loose,please screw down it.If it is skid, please replace.If it is rusty,please erase rust on bolt to ensure it works well
Quarter-yearly examination	Whether the actual current accords with the displaying value.If they does not accord, they should be regulated.The actual current value can be measured by the adjusted plier-type ampere meter
Yearly examination	Measure the insulating impedance among the main circuit,PCB and case, if it below 1MΩ,insulation is thought to be damaged and need to change, and need to change or strengthen insulation