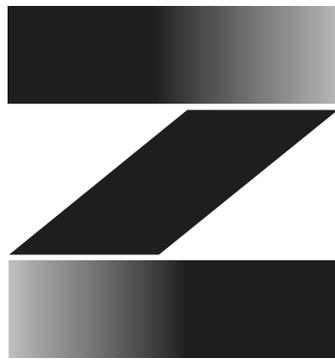


I-COMBO

OWNER'S MANUAL



ZIKA

WELD · DONE

CONTENTS

1.Contents.....	1
2.Safety warning	2
3.Machine description	3
4.Technical parameters table	4
5. Panel function instruction.....	5
6. Installation instruction.....	6
7.Operation instruction.....	9
8. Notes or preventive measures	10
9.Questions to be run into during welding	11
10.Maintenance	12
11.Notes before checking.....	12
12.Troubleshooting and fault finding.....	13

SAFETY WARNING



On the process of welding or cutting, there will be possibility of injury, so please take protection into consideration during operation. For more details please review the Operator Safety Guide, which complies with the preventive requirements of the manufacturer.

Electric shock—May lead to death !!

- Set the earth fitting according to applying standard.
- Forbidden to touch the bare electric parts and electrode with uncovered skin, wet gloves or clothes.
- Make sure you are insulated from the ground and the workshop.
- Make sure you are in safe position.

Gases and fumes—May be harmful to health!

- Keep your head out of the gases and fumes.
- When arc welding, ventilators or air extractors should be used to avoid breathing gases.

Arc rays—Harmful to your eyes, burn your skin.

- Wear suitable protective mask, light filter and protective garment to protect eyes and body.
- Prepare suitable protective mask or curtain to protect looker-on.

Fire

- Welding spark may cause fire, make sure there is no tinder stuff around the welding area.

Noise—Excessive noises will be harmful to hearing.

- Use ear protector or others means to protect ear.
- Warn looker-on that noise is harmful to hearing.

Malfunction—When trouble happens, contact with authorized professionals.

- If trouble happens during installation and operation, please follow this manual instruction to check up.
- If you fail to fully understand the manual, or fail to solve the problem with the instruction, you should contact the suppliers or the service center for professional help.



WARNING!

Creepage-protecting switch should be added when using the machine!!!

MACHINE DESCRIPTION

The I-COMBO have arc welding, sticking and plasma cutting three processes which adopts the most advanced inverter technology.

The development of inverter arc welding equipment benefits from the appearance of the inverter power supply theory and components. Inverter arc welding/cutting power source utilizes high-power component MOSFET to transfer 50/60Hz frequency up to 100KHz, then reduce the voltage and commutate, and output high-power voltage via PWM technology. Because of the great reduce of the main transformer's weight and volume; the efficiency increases by 30%. The appearance of inverter welding equipment is considered to be a revolution for welding industry.

The welding power source can offer stronger, more concentrated and more stable arc. When stick and work piece get short, its response will be quicker. It means that it is easier to design into welding machine with different dynamic characteristics, and it even can be adjusted for specialty to make arc softer or harder.

As sticking and arc welding, outer characteristic of welding machine is constant current .Welding current will not be changed with arc length and current is stable very much .As plasma cutting, after arc has pressed forcedly by air which is flowing rapidly, temperature is rise to 10000-15000℃ and it is up to high coinable situation then strong plasma arc has been formed. Cutting metal rapidly with plasma arc, heat is concentrated and energy is used effectively and smooth cutting section can be got.

The I-COMBO can be used in welding and cutting of mild steel, stainless steel, alloy steel, copper and other color metal .It has lightness, high efficiency, energy-saving, stabilizing and reliable.

Thanks for purchasing our products and looking forward to your precious advice. We will be dedicated to provide our best products and service.



WARNING!

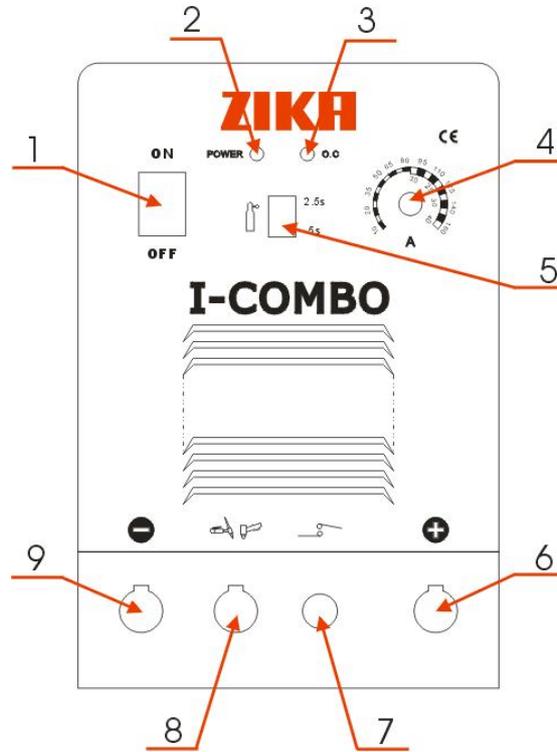
The machine is mainly used in industry. It will produce radio wave, so the worker should make fully preparation for protection.

TECHNICAL PARAMETERS TABLE

Model	I-COMBO		
Input voltage	AC220V±15%, 50/60Hz		
Input power capacity	6KVA		
No-load loss	40W		
Duty cycle	60%		
Power factor	0.73		
Efficiency	80%		
Insulation grade	F		
Protection	IP21		
Weight (Kg)	14		
Dimension (mm)	456x204x360		
	TIG-welding	Sticking	Plasma Cutting
Input current (A)	26.4A	34A	31A
Rated output current (A)	160A	160A	40A
Current adjustment range (A)	10-160	10-160	15-40
No-load voltage	62V	62V	260V
Work voltage	16.4V	26.4V	96V
Inter-diameter of burner	-	-	Ø1.0
Air compress	-	-	0.4Mpa
Gas flow	2-5L/min	-	80L/min
Thickness	-	-	1-8mm
Arc polite model	HF oscillate	Touch	HF oscillate

PANEL FUNCTION INSTRUCTION

Front Panel Instruction of I-COMBO:



1	ON / OFF switch
2	Power indicator led
3	Abnormal indicator led
4	Welding current adjustment
5	Gas delay switch
6	Positive output terminal
7	Torch switch socket
8	Gas-electricity system output terminal
9	Negative output terminal

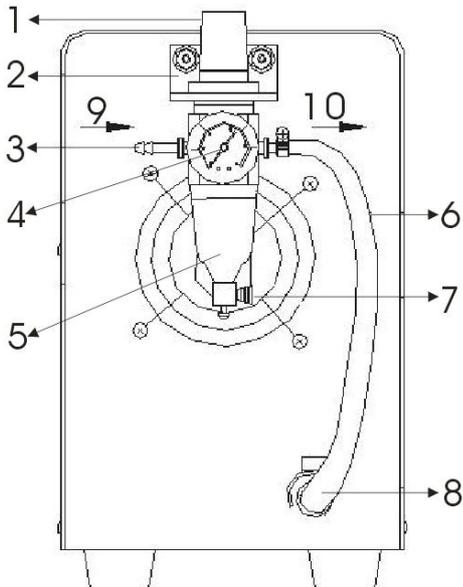
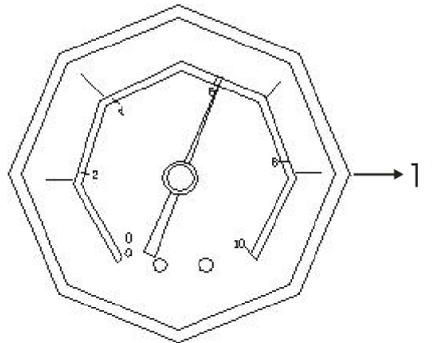
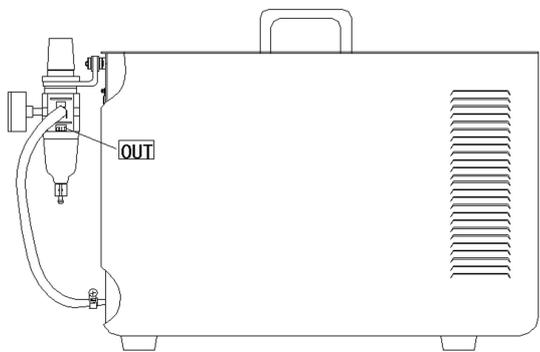
The panel picture above is for reference only. If any difference with the real machine, please follow with the real machine.

INSTALLATION INSTRUCTION

Air regulator installation and operation

1. Firmly tight and seal the copper air hole at IN and OUT terminal. By high pressure rubber tube firmly.
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 to rated value (meter inside shows Kgf/cm^2), and then put down the knob (+ means increasing pressure, - means decreasing pressure).
6. Scale of the meter is as follow. The value in the picture is 6kg.
7. If the water in the gas filtering bottle is too much, please turn on the water valve to let the water go out.

Regulator installation



1	Pressure adjustment knob
2	Connecting shelf
3	Copper air mouth
4	Pressure meter
5	Air filtering bottle
6	Air pipe
7	Drain knob
8	Electromagnetic air-in
9	Air in
10	Air out
11	Pressure meter face

INSTALLATION INSTRUCTION

The plasma cutter is equipped with power voltage compensation device. When the power voltage fluctuates between $\pm 15\%$ of rated voltage, it still can work normally.

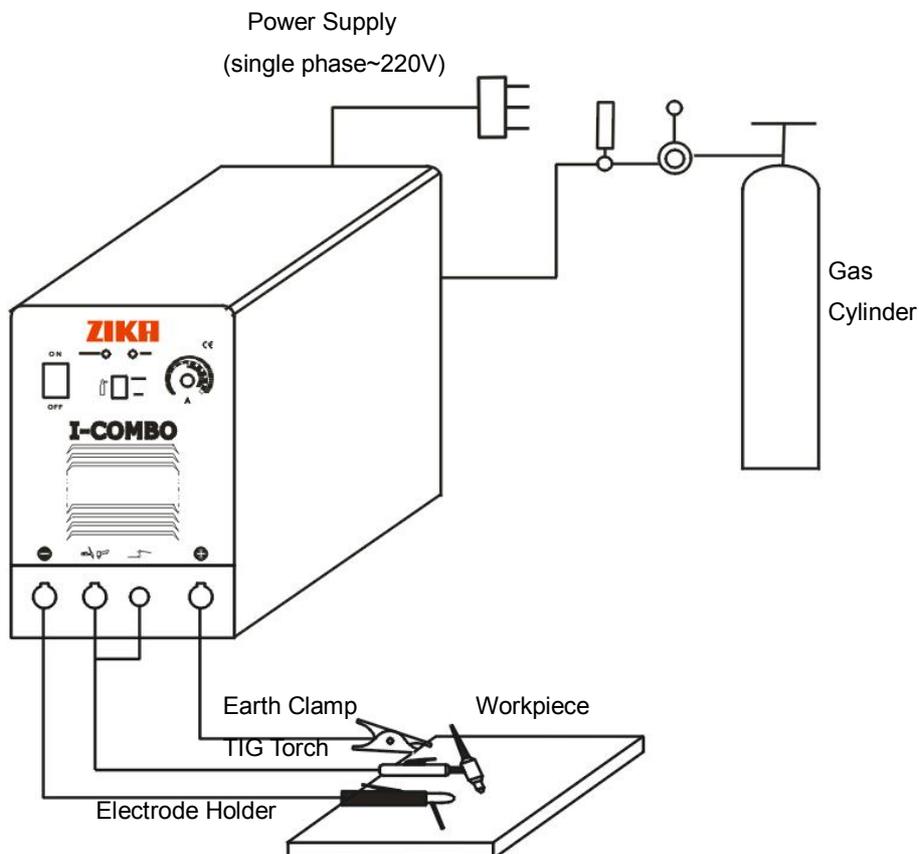
When the machine is used with long cables, in order to prevent voltage from going down, bigger section cable is suggested. If the cable is too long, it may have great influence on the arc-striking or other performance of cutting system, e.g. the HF arc-striking performance get weak or the system work abnormally. So cables of configured length are suggested.

1. Make sure the intake of the machine is not blocked or covered to avoid malfunction of cooling system.
2. Ground the cables with section area no less than 6mm^2 to the housing, the way is connecting screw in the back of the power source to ground device, or make sure ground terminal of power socket is firmly connected. Both ways can be used for absolute safety.
3. When use MMA (ARC) function.
 - 1) Make sure the cable, holder and fastening plug have been connected with the ground. Put the fastening plug into the fastening socket at the “-” terminal and fasten it clockwise.
 - 2) Put the fastening plug of the cable to fastening socket of “+” terminal at the front panel, fasten it clockwise, and the earth clamp at the other terminal clamps the work piece.
 - 3) Please pay attention to the connecting terminal, DC welding machine has two connecting ways: positive connection and negative connection. Positive connection: holder connects with “-” terminal, while work piece with the “+” terminal. Negative connection: work piece with the “-” terminal, holder with the “+” terminal. Choose suitable way according to working situation. If unsuitable choice is made, it will cause unstable arc, more spatters and conglutination. If such problems occur, please change the polarity of the fastening plug.
4. When use TIG function.
 - 1) Connect well the protecting gas source. Gas supply passage includes cylinder, argon meter and gas pipe. The joint part of the pipe should be tighten by hoop or other things in order to prevent leakage and air from coming in.
 - 2) Install the air-electricity system plug to the socket in the panel and fix it clockwise. Air plug of the cutting torch and arc-keeping cable should be connected to relevant socket, and fix the screw.
 - 3) Put cable plug to the socket on the panel and fix it clockwise. On the other hand, clamp the work piece with earth clamp.

INSTALLATION INSTRUCTION

5. When use CUTTING function.
 - 1) Use pressure-resisting air pipe to connect the air intake and compressed air source, and use hoop and other way to tighten the joint. Air source should supply suitable pressure, flow and be dry. If your air source does not meet the above requirements, you should consider using sole compressor of the right power and air-decompressing filter, in order to supply suitable pressure and eliminate the impurity and moisture in the air.
 - 2) Install the air-electricity system plug to the socket in the panel and fix it clockwise tightly. Air plug of the cutting torch and arc-keeping cable should be connected to relevant socket, and fix the screw.
 - 3) Put the fastening plug of the cable to fastening socket of “+” terminal at the front panel, fasten it clockwise, and the earth clamp at the other terminal clamps the work piece.
 - 4) Scale prints of given potentiometer on the panel indicate current adjusting range from 15 to 30.
6. According to input voltage grade, connect power cable with power supply box of relevant voltage grade. Make sure there is no mistake and the voltage of power supply does not exceed permission rang .Connect the cable as the picture shows. You can start cutting.

Installation Instruction of I-COMBO:



OPERATION INSTRUCTION

1. TIG welding function

- 1) Turn on the power switch at the back panel, digital current meter is normal, fan begins to wheel.
- 2) Open the valve of argon cylinder, adjust the volume of flow meter and make it is adequate to welding.
- 3) Press switch of torch, electromagnetic valve is started. Sound of HF arc striking can be heard, at the same time argon is flowing from torch burner. NOTES: When welding is first operated, user must press switch of torch several seconds and begin to weld until all of air is be drained out. When welding is over, argon will still flow out in several seconds in order to protect welding spot before cooled down .So torch must be kept welding place some time before arc has been extinguished.
- 4) Set suitable welding current and make sure welding current is adequate to thickness of work piece and process demand.
- 5) It is 1-4 mm from welding tungsten electrode to work piece, press control knob of torch ,burn and strike arc, sound of HF arc-striking will be diminished .The welding machine can be operated now.

2. MMA (ARC) function

- 1) Open power switch of front panel, fan begins to work.
- 2) Make sure function switch of front panel is on “down” position that is sticking. Impulse changeover switch and knob of current down-slope time will not work.
- 3) Make sure welding current is adequate to thickness of work piece.

3. Cutting function

- 1) Open the power switch of front panel, make the power switch is in “on” position .At this time indicator of power switch is on .Screen will show the current value.
- 2) Adjust the gas pressure and make it is adequate to machine, open the valve of pressed air.
- 3) Press the control knob of torch, electromagnetic valve is starting, sound of HFarc-striking can be heard and burner of torch should flow out gas (Burner of arc-supporting cutter should spurt fire).
- 4) It is 1mm from copper tip to work piece (it is further if it is arc-supporting cutter), press knob of torch and burn and strike arc, sparks of HF arc-striking will diminished immediately .User can begin to cut.
- 5) Keep the trip of the cutting torch contact the material; put the button of the cutting torch to make arc. And the high frequency will disappear after the electronic sound. And then cutting machine can begin to cut. After the initiation, take note that the nozzle should be kept about 1 mm away from the material, which do help to the nozzle.



WARNING: If input voltage is normal, ARC-striking is difficult, please turn the air pressure down to suitable position. If the nozzle gets burned seriously, please turn the air pressure up to suitable position.



1. Environment

- 1) The machine can be performed in environment where conditions are dry with a dampness level of max 90%.
- 2) Ambient temperature is between -10 to 40 degrees centigrade.
- 3) Avoid welding in sunshine or drippings. Do not let water enter the machine.
- 4) Avoid welding in dust area or the environment with corrosive gas.
- 5) Avoid gas welding in the environment with strong airflow.

2. Safety norms

The cutting machine has been installed protection circuit of over voltage, over current and over heat. When voltage, output current and temperature of machine are exceeding the rated standard, welding machine will stop working automatically. Because that will be damaging to the welding machine, users must pay attention to the following notice.

1) **The working area is adequately ventilated !**

The cutting machine is powerful machine, when it is being operated, it is generated by high currents, and natural wind cannot satisfy with machine cool demands. So there is a fan inside the machine for its cooling demands. Make sure the intake is not in blocked or covered, There should be 0.3 meter distance from welding machine to objects of environment. User should make sure the working area is adequately ventilated. It is important for the performance and the longevity of the machine.

2) **Do not over load !**

The operator should remember to watch the max duty current (Response to the selected duty cycle). Welding current should not exceed max duty cycle current. Over-load current will damage and burn up machine.

3) **No over voltage !**

Power voltage can be found in diagram of main technical data. Automatic compensation circuit of voltage will assure that welding current is in allowable range. If power voltage is exceeding allowable range limits, it can damage the components of machine. The operator should understand this situation and take preventive measures.

4) There is a grounding screw behind welding machine, with a grounding marker on it, Before operation, welding crust must be grounded reliable with cable which section is over 6 square millimeter, in order to prevent from static electricity, and accidents because of electricity leaking.

5) If welding time is exceeding duty cycle limited, welding machine will stop working for protection. The machine is overheated temperature, control switch is on "ON" position and the indicator light is red. In this situation, you don't have to pull the plug, let the fan cool the machine. When the indicator light is off, and the temperature goes down to the standard range, so it can weld again.

QUESTIONS TO BE RUN INTO DURING WELDING

Fittings, welding materials, environment factor, supply powers maybe have something to do with welding. User must try to improve welding environment.

A. Black welding spot:

——Welding spot is not prevented from oxidizing .User may check as following:

1. Make sure the valve of argon cylinder is opened and its pressure is enough. Argon cylinder must be filled up to enough pressure again if pressure of cylinder is be low 0.5Mpa.
2. Check if the flow meter is opened and has enough flow .User can choose different flow according to welding current in order to save gas .But too small flow maybe cause black welding spot because preventive gas is too short to cover welding spot .We suggest that flow of argon must be kept min 3L/min.
3. Check if torch is in blocked.
4. If gas circuit is not air-tight or gas is not pure can lower welding quality.
5. If air is flowing powerfully in welding environment, that can lower welding quality.

B. When welding, Arc-striking is difficult and easy to pause:

1. Make sure quality of tungsten electrode is high.
2. Grind end of the tungsten electrode to taper .If tungsten electrode is not grinded, that will be difficult to strike arc and cause unstable arc.

C. When cutting, Arc-striking is difficult and easy to pause:

1. Make sure the electrode, nozzle are of good quality, the discharge ability of poor electrode, nozzle perhaps may not be able to meet the requirements.
2. When the cutting current is too small and the airflow is too large, the arc would break because of powerful cooling effect.
3. Lower electric wire net voltage or longer input wire may lead to circuitry over voltage.

D. Output current cannot reach rated value:

When power voltage departs from the rated value, it will make the output current not matched with rated value;
When voltage is lower than rated value, the max output may lower than rated value.

E. Current is not stabilizing when machine is being operated:

1. Electric wire net voltage has been changed.
2. There is harmful interference from electric wire net or other equipment.

F. When use MMA welding ,too much spatter:

1. Maybe current is too big and stick's diameter is too small;
2. Output terminal polarity connection is wrong, it should apply the opposite polarity at the normal technique, which means that the stick should be connected with the negative polarity of power source, and work piece should be connected with the positive polarity. So please change the polarity.

G. The electrode or nozzle get burned quickly:

1. Maybe current is too heavy while welding rod diameter is too small.
2. Air pressure is over low can't be able to meet the flux of demand, the cooling effect gets weak, the electrode of nozzle is overheated.

MAINTENANCE



WARNING:

Power must be turned off for all checking and maintenance, before opening the housing, make sure the power plug is disconnected..

1. Remove dust by dry and clean compressed air regularly, if welding machine is operated in environment where is polluted with smokes and polluted air, the machine need remove dust every month.
2. Pressure of compressed air must be inside the reasonable arrangement in order to prevent damaging to small components of inter-machine.
3. Check inter circuit of welding machine regularly and make sure the cable circuit is connected correctly and connectors are connected tightly (especially insert connector and components). If scale and loose are found, please give a good polish to them, then connect them again tightly.
4. Avoid water and steam enter into inner-machine, if them enter into machine, please dry inter-machine then check insulation of machine.
5. If welding machine will not be operated for long time, it must be put into packing box and stored in dry environment.

NOTES BEFORE CHECKING



WARNING!

Blind experiment and careless repair may lead to more problems and make formal check and repair more difficult. When the machine is electrified, the bared parts contain life-threatening voltage. Any direct and indirect touch will cause electric shock, and severe electric shock will lead to death.



WARNING!

Connected welding machine to dynamotor directly will damage machine. The heavy voltage pulse which is produced by dynamotor will burn out machine when machine connected to dynamotor, only can use asynchronous dynamotor whose frequency and voltage both are steady. Because of connecting welding machine to dynamotor directly lead to damage and malfunction, which is not in guarantee.



NOTICE: In the period of guarantee maintenance, if user makes wrong check and repair for malfunction of welding/cutting machines without our permission, the free maintenance guarantee offered will be invalid

TROUBLESHOOTING AND FAULT FINDING



Notes: The following operations must be performed by qualified electricians with valid certifications. Before maintenance, please contact with us for professional suggestion.

Fault symptom	Remedy
<p>Power indicator is not lit, fan is not working and no welding output.</p>	<ol style="list-style-type: none"> 1. Power switch is damaged. 2. Make sure the electric wire net connecting to input cable is working alright 3. Make sure if input cable has broken circuit.
<p>Indicator of power switch is lit, fan is not working or revolves several circles and stopped, no welding output.</p>	<ol style="list-style-type: none"> 1. Input cable is possibly connected to 380V power, which causes over voltage protection circuit is starting. Connect input cable to 220V power, then restart the machine. 2. Erratic 220V power supply (input cable is too thin and long) or input cable is connected to electricity network would start overload voltage protection circuit. Increase section of input cable or tighten input contact. Turn off machine for 2-3 min and restart it. 3. Turn on and off power switch continuously would start overload voltage protection circuit. Turn off machine for 2-3 min and restart it. 4. Cable that connects switch and power board is loosed, tighten it again. 5. 24V relay of main return circuit on power board is not closed or damaged, check 24V power and relay. Replace it with same model series if it's damaged.
<p>Fan is working, abnormal indicator is not lit, sound of HF arc striking cannot be heard, wiping arc welding can not strike arc.</p>	<ol style="list-style-type: none"> 1. Measure voltage of positive and negative electrode from power board to VH-07 insert of MOS board by multimeter, which should reads DC 308V. 2. There is a green indicator for auxiliary power on MOS board, if it's not lit, auxiliary power is out of work, check fault spot and contact with dealer. 3. Check if all kinds of connect and insert cable is poor contact. 4. Check if there is some problem in control circuit, contact with dealer. 5. Check if control cable of torch is broken.

<p>Abnormal indicator is not lit, sound of HF arc striking can be heard, no welding and cutting output.</p>	<ol style="list-style-type: none"> 1. Cable of torch is broken. 2. Grounding cable is broken or not connected to work piece. 3. There is relaxation between output terminal of positive electrode, gas-electricity system output terminal and inner machine.
<p>Abnormal indicator is not on, sound of HF arc striking cannot be heard, wiping arc welding can strike arc.</p>	<ol style="list-style-type: none"> 1. Primary cable of arc-striking transformer is poor contact with power board, tighten it again. 2. Arc-striking tip is oxidized or distance is too far, get rid of film oxide of burner or adjust the distance between burners to be 1mm. 3. Converting switch of MMA/TIG/Cutting is damaged, replace it. 4. Some HF arc striking components is damaged, check and replace it.
<p>Abnormal indicator is lit, no output.</p>	<ol style="list-style-type: none"> 1. Overload current protection may start, please turn off machine first, then restart it after abnormal indicator is off. 2. Overheat protection may start, it will become normal in 2-3 min. 3. Inverter circuit may go wrong, please disconnect the power supply plug of the main transformer on MOS board (close to insert of fan VH-07) then restart the machine. <ol style="list-style-type: none"> 1) If abnormal indicator is still on, turn off machine and disconnect power supply plug of HF arc-striking power source (close to insert of fan VN-03t), then restart machine: <ol style="list-style-type: none"> a) If abnormal indicator is still on, some MOSFET on MOS board is damaged, find out and replace it with same model. b) If abnormal indicator is off, up-slope transformer of HF arc-striking circuit is damaged, replace it. 2) If abnormal indicator is off: <ol style="list-style-type: none"> a) Maybe transformer on middle board is damage, measure primary inductance value and Q value of main transformer by inductance bridge. b) Maybe second rectifier tube of transformer is damaged, find out and replace it with same model. 4. Maybe feedback circuit is short.
<p>Erratic welding output current or out of control of potentiometer.</p>	<ol style="list-style-type: none"> 1. 1K potentiometer is damaged, replace it. 2. All kinds of connectors are poor contact, check them.

If the machine still works abnormal after checking, adjusting and basic maintaining according to above suggestions, please contact with dealer or our serving center.