

OWNER'S MANUAL

MCT-520DPL PRO



MULTIFUNCTION WELDING&CUTTING MACHINE

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1. BRIEF INSTRUCTION

1.1 MCT series welding machine is the latest multi-purpose machine developed by our company. It is suitable for all kinds of metal cutting machines, argon arc welding and manual arc welding. Its biggest feature is that it can cut stainless steel, alloy steel, carbon steel, and other non-ferrous metals with cutting function, or it can weld stainless steel and carbon steel products with DC function. For example: for the welding of scooters, bicycles and other products.

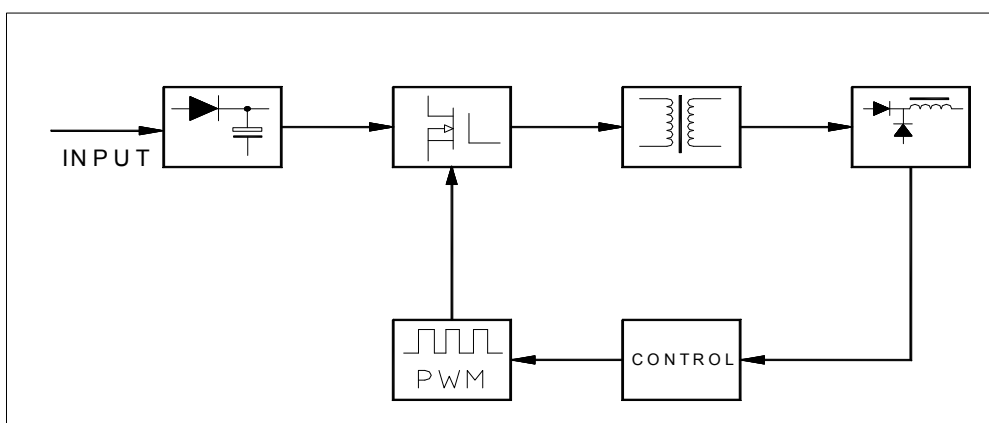
1.2 MCT series welding machine is also based on our company's unique high-frequency inverter technology, compared with the traditional machine, small size, light weight, high conversion efficiency, energy saving; Compared with imported machine, cheaper, more adaptable to power grid. To highlight the use of two inverter technology, the pure square wave output, so that the arc stiffness is good, heat concentration, reverse cleaning ability, wide cleaning range, small current is not easy to break the arc, etc., to ensure the excellent welder Welding characteristics.

1.3 The welding machine is also equipped with a foot pedal current regulating device, so that the welder can free the hand to adjust the current with the foot; thus, the current can be quickly heated when the welding is initial and the wire is added, and the current is reduced at the end of the welding. Welding pattern formation; the use of the pedal helps to improve welding efficiency, reduce welding difficulty and ensure welding quality.

The inverter power supply firstly rectifies the 50 / 60Hz AC to DC, then converts the high-power switching device (IGBT) into high-frequency voltage through pulse width modulation (PWM), and then reduces the voltage to rectify, and then outputs the high-power DC power. The volume and weight of welding machine are greatly reduced by taking inverter technology, and the efficiency is increased by more than 35%. The features of this series of welding machines are: high efficiency, energy saving, light weight, no electromagnetic noise, good dynamic characteristics, stable arc and easy control of molten pool. It has high no-load voltage and good ability compensation, which is widely used. It can weld stainless steel, alloy steel, carbon steel, copper and other non-ferrous metals. The machine has four functions: MIG, TIG, CUT, MMA, very flexible and convenient for all welding workers.

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

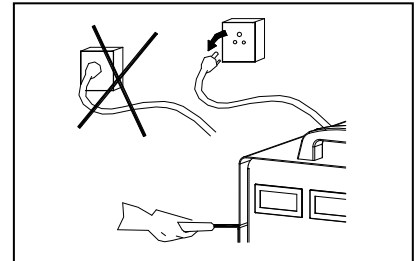
Block Diagram



2. SAFETY WARNING

Welding and cutting is dangerous to the operator, people in or near the working area, and the surrounding, if the machine is not correctly operated. Therefore, the performance of welding/cutting must only be under the strict and comprehensive observance of all relevant safety regulations. Please read and understand this instruction manual carefully before the installation and operation.

- The switching of function modes is possibly damaging to the machine, while the welding operation is performed.
- Do not disconnect the electrode-holder cable with the machine, before the performance of welding.
- A safety switch is necessary to prevent the machine from electric leakage.
- Welding tools should be of high quality.
- Operators should be qualified.



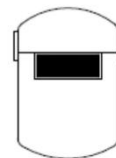
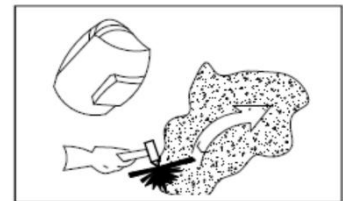
ELECTRIC SHOCK: IT COULD BE FATAL!

- Connect the earth cable according to standard regulation.
- Avoid all contact with live electrical parts of the welding circuit, electrodes and wires with bare hands. It is necessary for the operator to wear dry welding gloves while he performs the welding task.
- The operator should keep the working piece insulating from himself/herself.



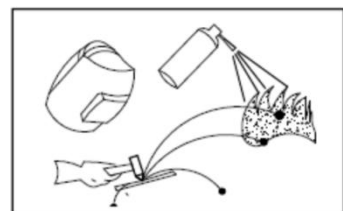
SMOKE AND GAS GENERATED WHILE WELDING OR CUTTING: HARMFUL TO PEOPLE'S HEALTH.

- Avoid breathing the smoke and gas generated while welding or cutting.
- Keep the working area well ventilated.



FIRE HAZARD

- The welding splash may cause fire, thus remove flammable material away from the working place.
- Have a fire extinguisher nearby and have a trained person ready to use it.



Noise: possibly harmful to peoples' hearing.

- Noise is generated while welding/cutting, wear approved ear protection if noise level is high.

Machine fault:

- Consult this instruction manual.
- Contact your local dealer or supplier for further advice.



WARNING !

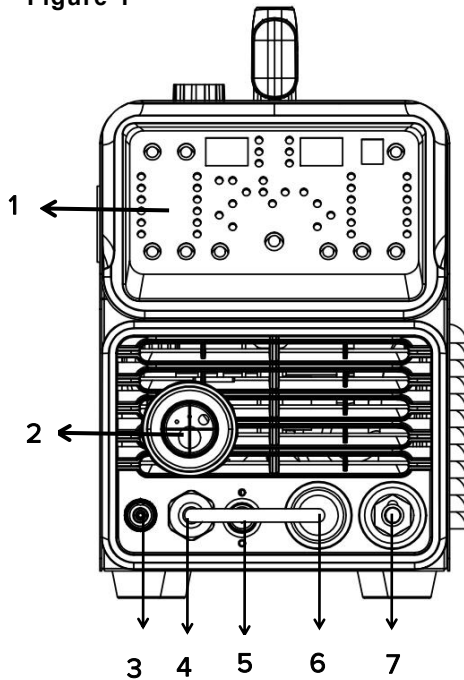
Electric leakage protecting switch should be added when using the machine!!!

3. TECHNICAL PARAMETERS TABLE

Parameters \ Model	M CT-520DPL PRO			
Mode	CUT	TIG	MMA	MIG
Input voltage (V)	AC220±15%			
Frequency (Hz)	50/60			
Rate input current (A)	40	26	40	34
Current Range (A)	20-50	10-200	10-200	50-200
No-load voltage (V)	310	64	64	64
Rate output voltage(V)	100	18	28	24
Remote control	/	/	/	/
Ignition way	HF	HF	TOUCH	TOUCH
Efficiency (%)	77	77	77	77
Duty Cycle (%)	30	30	30	30
Power factor	0.73	0.73	0.73	0.73
Insulation Class	H	H	H	H
Housing Protection Class	IP21S	IP21S	IP21S	IP21S
Weight (kg)	14.3			
Dimensions (mm)	490X215X325			

4. Structure of welder

Figure 1



1. Control panel

Refer panel schematic for details

2. MIG Torch 'Euro Style' Connection Socket

3. TIG/CUT Torch Connection Socket

4. Polarconversion line

5. Aero socket -For spool gun function

6. Positive (+) Welding Output Terminal

7. Negative (-) Welding Output Terminal

8. MIG gas

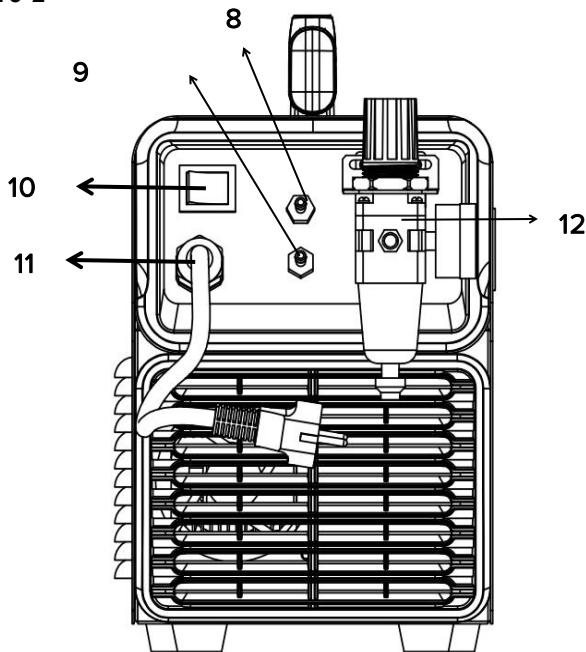
9. TIG/CUT gas

10. Power source switch

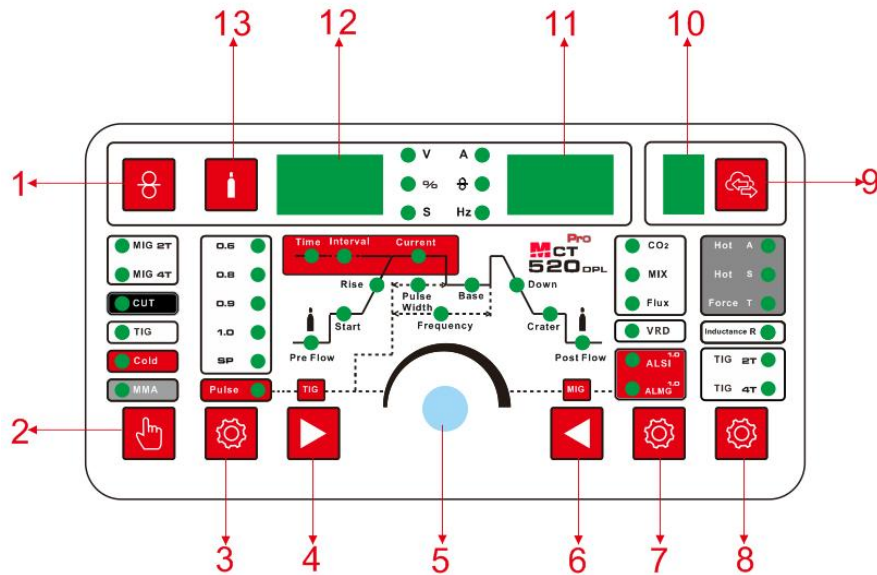
11. Power source input

12. reducing valve

Figure 2



M CT-520DPL PRO panel description:



1	Wire Check Button
2	Welding model selection: MIG 2T/MIG 4T, Plasma CUT, HF TIG, SPOT, MMA
3	MIG Synergic/MIG Manual/TIG PULSE Selection: Press to select MIG Synergic mode (wire diameter) or MIG Manual mode or DC Pulse TIG
4	TIG Parameter Selection Button: Press to select different TIG parameters (move right)
5	Parameter Adjust Knob: Adjust to increase or decrease various parameters
6	TIG Parameter Selection Button: Press to select different TIG parameters (move left)
7	Function Selection Button: Press to select CO2 / mixed gas / gasless in MIG mode, or VRD in MMA mode, or 2T/4T trigger in TIG mode
8	Function Selection Button: Press to select Hot-start / Hot-start time / Arc-force in MMA mode, or Inductance in MIG mode, or 2T/4T trigger in CUT mode
9	Job Storage Button: Press to call the saved job (total 10 groups of jobs). Parameters of one job will be saved after 5 seconds without adjustment
10	Digital Display for Job Number
11	Digital Display for Current, Wire Feeding Speed, Hertz
12	Digital Display for Voltage, Pulse Width, Pulse Time
13	Gas Check Button

5. INSTALLATION INSTRUCTION

The machine 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.

5.1 Make sure intake of the machine is not blocked or covered to avoid malfunction of cooling system.

5.2 Connect the protective gas source. The gas supply passage shall include a gas cylinder, an argon gas pressure reducing flowmeter and a gas pipe. The connecting portion of the gas pipe shall be fastened with a hose clamp or other articles to prevent argon gas leakage and air ingress.

5.3 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.

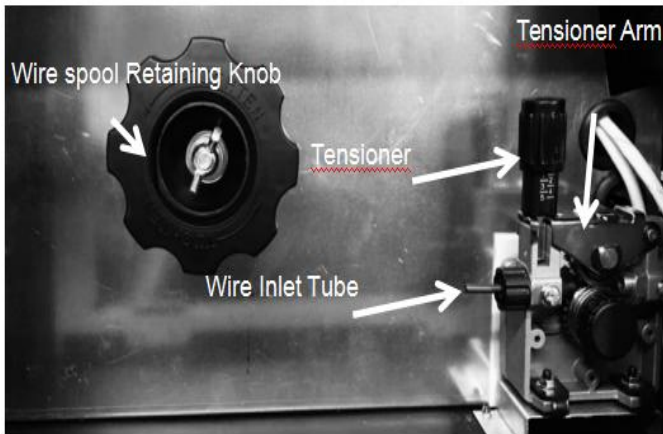
5.4 According to the input voltage level of the welding machine, connect the power line to the distribution box of the corresponding voltage level. Do not connect the wrong voltage. Also ensure that the error of the power supply voltage is within the allowable range.

5.5 Welding Set Up & Operation

NOTE:

Please connect the power line of the welder to the input voltage consistent with the parameters on the machine nameplate.

5.5.1 Welding wire reel installation

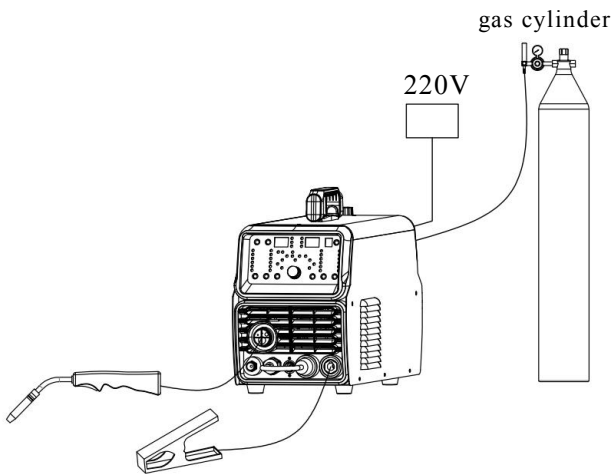


- Loose the wire spool retaining knob, install the wire reel on the holder of wire feeding machine, the hole of wire reel should align with fixed pin on the holder.
- Loose tensioner arm, choose different wire feeding groove according to the wire dimension. (Note: aluminum welding chooses U-shape groove, other welding wire choose the V-shape groove)
- Loose the nut of wire pressing roller, thread the welding wire from the spool through the wire input guide tube, through the roller groove and into the outlet guide tube. Note: adjust the tensioner and impact the wire, to make sure the wire will not slide. Avoid the wire deformation due to the oversize pressure.
- Release the wire by rotating the wire reel anticlockwise. In order to avoid wire loose, the new wire reel will fix the top of wire on the edge of wire reel. Please cut off this top of wire.
- choose different wire feeding groove position according to the wire diameter.
- Press the "Wire Check" button on the panel, let the wire out of the nozzle.


Warning! - Before changing the feed roller or wire spool, ensure that the mains power is switched off


Warning! - The use of excessive feed tension will cause rapid and premature wear of the drive roller, the support bearing and the drive motor.

5.5.2MIG Welding Installation



- Connect the MIG Torch Euro Connector to the torch socket on the front of the welder . Secure by firmly hand tightening the threaded collar on the MIG Torch Euro Connector clockwise.
- Check that the correct gas shielded wire, matching drive roller and welding tip are fitted.
- Connect Polar conversion line to the positive (+) welding output terminal .
- Connect Earth Lead Quick Connector to the negative (-) output welding terminal .
- Connect Earth Clamp to the work piece. Contact with work-piece must be strong contact with clean, bare metal, with no corrosion, paint or scale at the contact point.
- Connect gas cylinder to the MIG gas inlet.Turn on the gas valve and adjust to the desired flow. Connect to AC 220V input voltage,Turn on the power switch to start the machine.

By pressing function selection button on front panel  To select 2T or 4T working mode.

By pressing setting button  (3)to select wire diameter;By pressing setting button (7)to select gas type;By pressing setting button (7)to select Aluminum welding,ALSI/ALM.Note,When having aluminum welding, MIG torch should change to use the graphite guide wire tube,and wire feeder should change to use U-shaped roller.

By pressing setting button (8)to adjust inductance.

By pressing “Gas Check”  button to check gas.

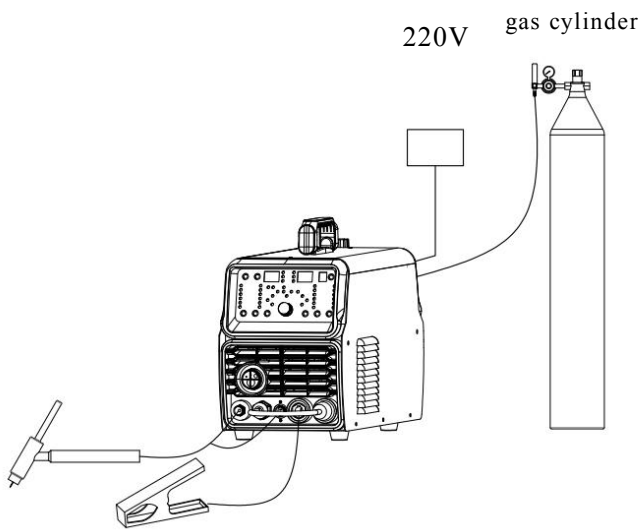
After finish the installation and setting, press the MIG torch switch to start welding working

By rotating the knob to adjust welding voltage.The larger the Welding voltage, the longer the arc, the shallower the melting depth and the wider the melting width.

By pressing the encoder to switch and adjust the wire feeding speed. The larger the current is, the faster the wire feeding speed will be. In this case, the gas flow can be adjusted appropriately.


Note: For details,please refer to Page6, the “Panel description”.

5.5.3 TIG Welding Installation



- Connect Lift TIG torch Quick Connector to the negative (-) output welding terminal.
- Connect Earth Lead Quick Connector to the positive (+) welding output terminal.
- Connect the air hose of Lift tig torch with the Argon meter connector. See picture below.
- Connect gas cylinder to the TIG gas inlet. Turn on the gas valve and adjust to the desired flow. Connect to AC 220V input voltage, Turn on the power switch to start the machine.

By pressing function selection button on front panel , to select TIG working mode.

By pressing setting button  (3) to turn ON or OFF pulse; By pressing setting button (8) to select 2T or 4T working mode.

Under Pulse node, by pressing button   to select and adjust the welding parameter.

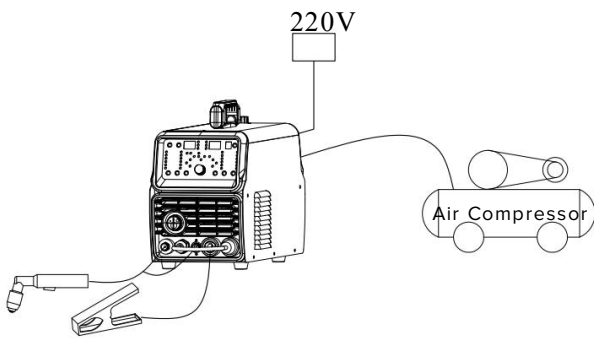
By pressing "Gas Check"  button to check gas.

When select "Cold" function, by pressing button   to select and adjust the welding parameter.

Note: Cold welding suitable for thin plate welding.


Note: For details, please refer to Page 6, the "Panel description".

5.5.4 Cutting Installation



- Connect cutting torch to the machine connector, tighten the nut and connect the torch switch to the switch control socket, tighten the nut.
- Connect polar conversion line to the negative (-)
- Connect Earth Lead Quick Connector to the positive (+) output welding terminal. ◦
- After install reducing valve, connect Air compressor to the CUT gas inlet. Connect to AC 220V input voltage, Turn on the power switch to start the machine.

By pressing function selection button on front panel , to select CUT working mode.

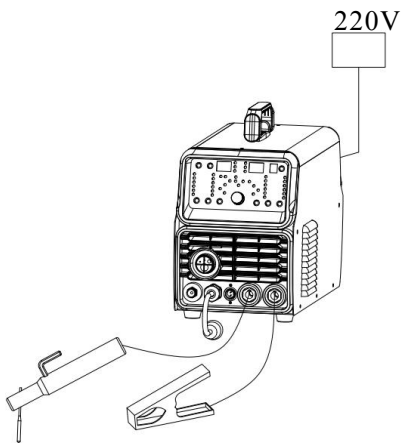
By pressing “Gas Check”  button to check gas. If the gas is normal, press the cutting torch switch to start cutting work.

By pressing setting button  (6) to adjust Post-Flow time.

By rotating the knob to adjust cutting current. The cutting thickness increases with the increase of current.

Note: For details, please refer to Page 6, the “Panel description”.


5.5.5 MMA welding Installation



- Connect Electrode holder Quick Connector to the positive (+) welding output terminal
- Connect Earth Lead Quick Connector to the negative (-) output welding terminal See picture below.
- Connect to AC 220V input voltage, Turn on the power switch to start the machine.

By pressing function selection button on front panel , to select MMA working mode.

By rotating the knob to adjust welding current to start MMA welding.

By pressing setting button  (7), select to turn ON or OFF VRD function. The VRD function is the Voltage Reduce Device, when turn it on, No-load voltage will drop to 15V. By pressing setting button (8), to select and adjust Hot Start current/Hot Start time and Arc force current, which make the arc to start easier and with better welding result.

Note: For details, please refer to Page6, the “Panel description”.

WARNING !



It is strictly forbidden to insert or remove any cable or connector in use during the welding process. This operation will endanger personal safety and cause serious damage to the equipment.

6. PRECAUTIONS

6.1 Surroundings

6.1.1 The welding operation should be carried out in a relatively dry environment, and the air humidity should generally not exceed 90%.

6.1.2 The ambient temperature should be between -10C and 40C.

6.1.3 Avoid welding in daylight or rain, and do not allow water or rain to seep into the welder.

6.1.4 Avoid welding work in dusty areas or in corrosive atmospheres. Avoid gas-shielded welding operations in environments with strong air flow.

6.2 Safety

6.2.1 Overvoltage, overcurrent and overheat protection circuits have been installed in our welding machine. When the grid voltage, output current and internal temperature exceed the set standard, the welder will automatically stop working; but excessive use (such as voltage over High) will still cause damage to the welder, so you still need to pay attention to the following matters.

6.2.2 Ensure good ventilation.

Our welding machine is a small welding machine. When operating, there is a large working current, and natural ventilation can not meet the cooling requirements of the welding machine. Therefore, a fan is installed to effectively cool the welding machine to make it work smoothly.

The user should confirm that the ventilation is not covered or blocked, and the distance between the welder and the surrounding objects should be no less than 0.3 meters. The user should always pay attention to maintain good ventilation, which is better for the welder and guarantees a longer service life. very important.

6.2.3 No current overload

The user should remember to observe the maximum allowable load current (relatively selectable load continuation rate) and keep the welding current not exceeding the maximum allowable load current. Current overload will significantly shorten the life of the welder and may even burn the welder.

6.2.4 No too high voltage

The power supply voltage is listed in the “Main Performance Parameters” table. Under normal circumstances, the voltage automatic compensation circuit in the welder will ensure that the welding current is kept within the allowable range. If the power supply voltage exceeds the allowable value, the welder will be damaged and the user should fully understand the situation and take appropriate precautions.

6.2.5 A grounding screw is attached to the rear of each welder and marked with a grounding mark. Before use, use a cable with a section larger than 6mm² to reliably ground the welder's casing to discharge static electricity or prevent accidents due to electric leakage.

6.2.6 If the welder exceeds the standard load continuation rate during operation, the welder may suddenly enter the protection state and stop working. This means that the welder exceeds the standard load continuation rate. Excessive heat energy triggers the temperature control switch, causing the welder to stop working while being in front. The the digital display shows -E2. In this

case, you do not have to unplug the power supply so that the cooling fan can continue to work to cool the welder. When the digital display shows -E2 goes out, the temperature drops to the standard range and the welding can be restarted.

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

7. TROUBLESHOOTING AND FAULT FINDING

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

7.1 Remove dust by dry and clean compressed air regularly, if welding machine is operating in environment where is polluted with smokes and pollution air, the machine need removing dust everyday.

7.2 Pressure of compressed air must be inside the reasonable arrangement in order to prevent damaging to small components of inter-machine.

7.3 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.

7.4 Avoid water and steam enter into inter-machine, if they enter into machine, please dry inter-machine then check insulation of machine.

7.5 If welding machine will not be operated long time, it must be put into packing box and store in dry environment.

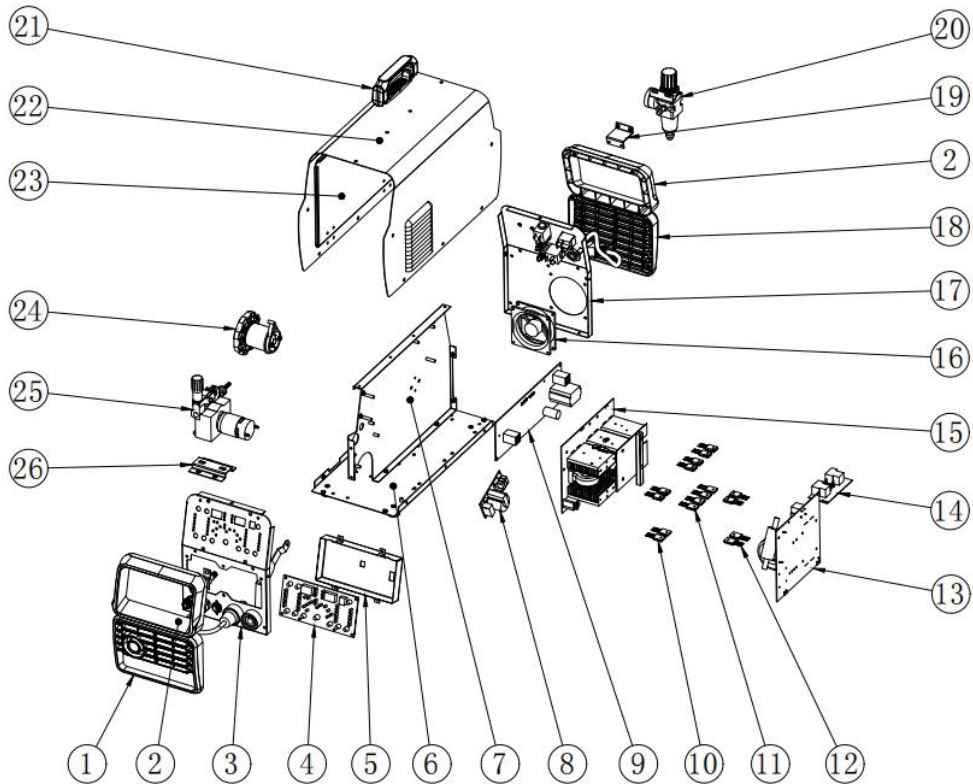
Fault symptom	Remedy
The power indicator does not light, the fan does not turn, no welding output	<ol style="list-style-type: none"> 1. The power switch is broken. 2. Confirm that the power grid connected to the input cable has power. 3. Check if the input cable has a break.
The power switch indicator is on, the fan does not turn or rotates for a few times to stop, no welding output	<ol style="list-style-type: none"> 1. It is possible to input the wrong connection on the 380V power supply, causing the overvoltage protection circuit to start, and then reconnect it to the AC110V\220V power supply and restart it. 2.AC110V\ 220V power is unstable (the input line is too long) or the input line is connected to the power grid, causing the overvoltage protection circuit to start, increasing the wire diameter of the grid input line or fastening the input line node. This phenomenon is in shutdown 2 - After 3 minutes, the new boot will return to normal. 3. Continuously open and close the power switch in a short time, causing the overvoltage protection circuit to start. Wait for 2-3 minutes and then restart it. 4. The wires between the switch and the power board are loose and retightened. 5. The main circuit 24V relay on the power supply board is not connected or damaged, check the 24V power supply and relay.
The fan turns, the abnormal indicator light is not bright, there is no high-frequency discharge "sa sa sa" sound, and the "arc welding" can not start the arc.	<ol style="list-style-type: none"> 1. The voltage of the positive and negative poles of the VH-07 plug-in of the multimeter to the MOS board should be about DC308V. 2. The auxiliary power supply on the MOS board has a green indicator light. If the light is not on, the auxiliary power supply is not working. Look for the fault point or contact the dealer. 3. Check the poor connection of various patch cords in the machine. 4. Control circuit problems, find the cause or contact the dealer. 5. The control line on the welding torch is broken.
The abnormal indicator light is not lit, there is a high-frequency discharge "sa sa sa" sound, no welding output.	<ol style="list-style-type: none"> 1. The welding gun cable is broken. 2. The ground wire is broken or not connected to the welded workpiece. 3. The positive output terminal or the welding torch gas output terminal is loose from the connection inside the machine.
Abnormal indicator light does not light, no high frequency discharge "sa sa sa" sound, "LIFT TIG welding" can start arc.	<ol style="list-style-type: none"> 1. The primary line of the arcing transformer has poor contact with the power board and is retightened. 2. The discharge nozzle is oxidized or the distance is remote. The surface oxide film of the discharge nozzle is treated or the distance of the discharge nozzle is adjusted to 1 mm. 3. The individual components of the high-frequency arc-ignition circuit are damaged, and the replacement is found.

<p>Abnormal indicator light is on, no output</p>	<ol style="list-style-type: none"> 1. It may be overcurrent protection. Please turn off the machine. When the abnormal indicator light is off and then restarted, it can be restored. 2. may be overheat protection, do not need to shut down for 2-3 minutes, the machine can naturally return to normal. 3. It may be that the inverter circuit is faulty. Please unplug the power supply plug of the main transformer on the MOS board (near the fan VH-07 plug-in) and restart it: <ol style="list-style-type: none"> (1) If the abnormality indicator is still on, turn off the power plug of the high-frequency pilot arc power supply (near the fan VH-03 plug-in) and turn it back on: <ol style="list-style-type: none"> a. If the abnormal indicator is still on, the individual FETs on the MOS board are damaged. b. If the abnormal indicator is not lit, the step-up transformer in the high-frequency arc-rising circuit on the power supply board is broken and replaced. (2) If the abnormal indicator does not light: <ol style="list-style-type: none"> a. It may be damaged in the middle plate transformer. The primary inductance and Q value of the main transformer can be measured by the bridge. b. It may be that the transformer secondary rectifier is individually broken down, and the same type of rectifier is found and replaced. 4. It may be that the feedback circuit is open.
<p>Can not break the oxide film when welding aluminum</p>	<ol style="list-style-type: none"> 1. The welding gear selection is incorrect; 2. The duty cycle adjustment is too small; 3. The secondary inverter has field tube damage.
<p>Tungsten needle burnt seriously</p>	<p>The duty cycle is adjusted too much to reduce the duty cycle.</p>

Fault symptom	Exclude
<p>The fan does not rotate, the digital meter has no display, and there is no welding output.</p>	<ol style="list-style-type: none"> 1. Confirm that the air switch is intact or closed. 2. Confirm that the power grid connected to the output cable has power. 3. The thermistor (four) on the power supply board is damaged (this is usually caused by DC24V relay failure or poor contact contact). 4. The power board (base board) is faulty and there is no DC537V voltage output. 5. The auxiliary power supply on the control panel has failed.
<p>The fan turns, the abnormal indicator light is not bright, there is no high-frequency discharge "sa sa sa" sound, and the "LIFT TIG welding" can not start the arc.</p>	<ol style="list-style-type: none"> 1. Check all kinds of patch cords in the machine for poor contact. 2. Control circuit problems, find the cause or contact the dealer. 3. The control line on the welding torch is broken.
<p>Abnormal indicator light is off, there is high frequency discharge "sa sa sa" sound, no welding output</p>	<ol style="list-style-type: none"> 1. The welding gun cable is broken. 2. The ground wire is broken or not connected to the welded workpiece. 3. The positive output terminal or the torch gas output terminal is loose from the connection inside the machine.
<p>Abnormal indicator light is not lit, no high-frequency discharge "sa sa sa" sound, arc welding can start arc</p>	<ol style="list-style-type: none"> 1. The primary line of the arcing transformer is in poor contact with the arcing plate and is retightened. 2. The discharge nozzle is oxidized or the distance is remote. The surface of the discharge nozzle is treated with an oxide film or the distance of the discharge nozzle is about 1 mm. 3. Hand soldering argon welding conversion switch is damaged and replaced. 4. The individual components of the high-frequency arc-trigger circuit are damaged, and the replacement is found.
<p>Abnormal indicator light is on, no output</p>	<ol style="list-style-type: none"> 1. It may be overcurrent protection. Please turn off the machine. When the abnormal indicator light is off and then restarted, it can be restored. 2. may be overheat protection, do not need to shut down for 2-3 minutes, the machine can naturally return to normal. 3. It may be that the inverter circuit is faulty. Please unplug the power supply plug of the main transformer on the MOS board (near the fan VH-07 plug-in) and restart it: <ol style="list-style-type: none"> (1) If the abnormality indicator is still on, turn off the power plug of the high-frequency pilot arc power supply (near the fan VH-03 plug-in) and turn it back on: <ol style="list-style-type: none"> a. If the abnormal indicator is still on, the individual FETs on the MOS board are damaged. b. If the abnormal indicator is not lit, the step-up transformer in the high-frequency arc-rising circuit on the power supply board is broken

	<p>and replaced.</p> <p>(2) If the abnormal indicator does not light:</p> <p>a. It may be damaged in the middle plate transformer. The primary inductance and Q value of the main transformer can be measured by the bridge.</p> <p>b. It may be that the transformer secondary rectifier is individually broken down, and the same type of rectifier is found and replaced.</p> <p>4. It may be that the feedback circuit is open.</p>
Tungsten needle burnt seriously	The duty cycle is adjusted too much to reduce the duty cycle.
Can not break the oxide film when welding aluminum	<ol style="list-style-type: none"> 1. The welding gear selection is incorrect; 2. The duty cycle adjustment is too small; 3. The secondary inverter has field tube damage.

8. EXPLOSIVE VIEW



NO.	name	Consumables	NO.	name	Consumables
1	Front plastic panel(down)		14	Double pressure plate	Yes
2	Front/ rear plastic panel(up)		15	Main board	Yes
3	Front metal panel		16	Fan	Yes
4	PCB Control panel	Yes	17	Rear Metal Panel	
5	Panel cover		18	Plastic Rear Panel Down	
6	Metal Bottom Plate		19	relief valve support	
7	Median Septum		20	Reducing valve	
8	High frequency board	Yes	21	Handle	
9	Control board	Yes	22	Machine Cover	
10	Rectifier Bridge	Yes	23	Side panel	
11	IGBT	Yes	24	Wire spool	
12	Fast recovery Diode	Yes	25	Wire feeder	
13	Rectifier board	Yes	26	Wire feeder support	