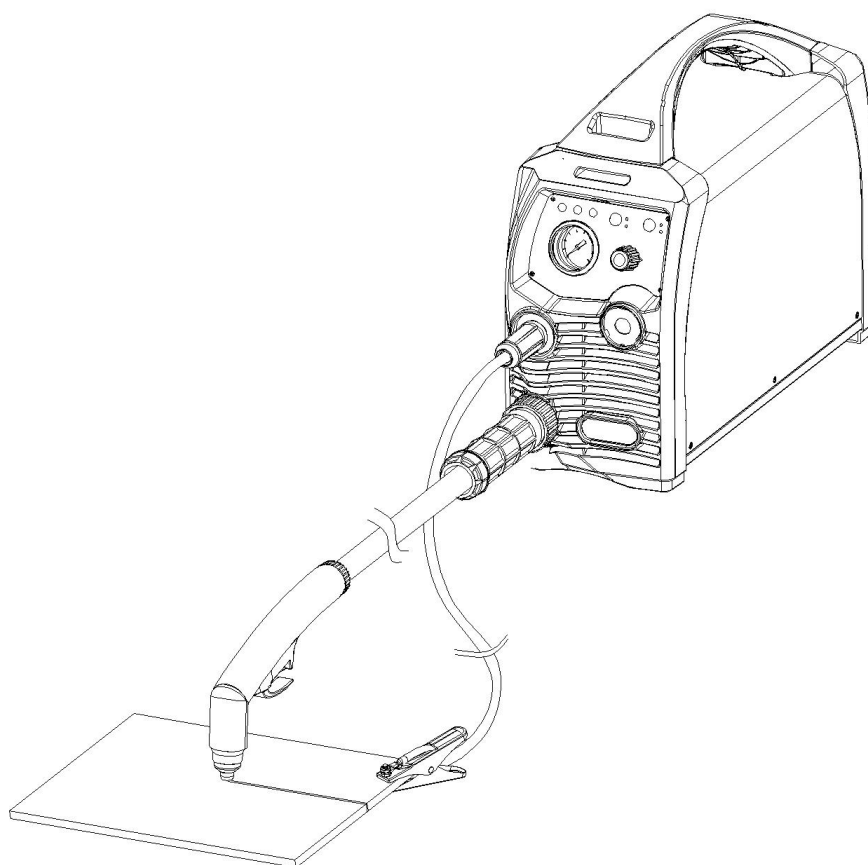


Jasic Single PCB Machine Maintenance Manual

---CUT45 (L206)



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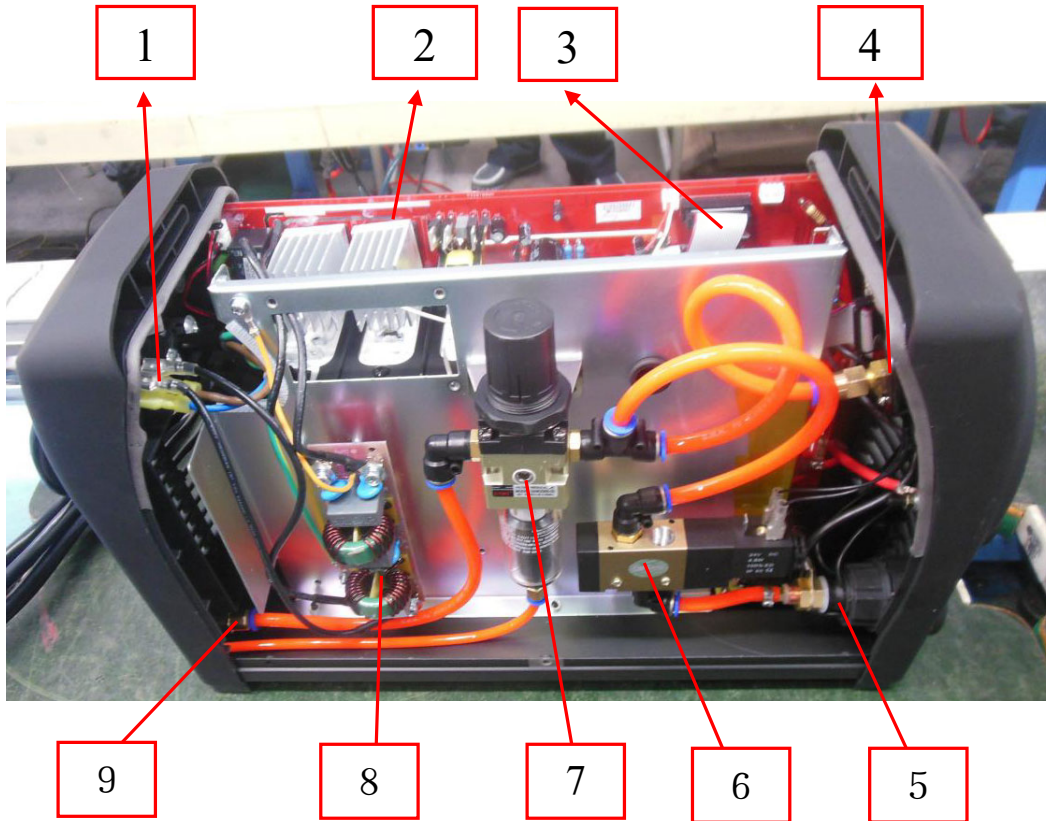
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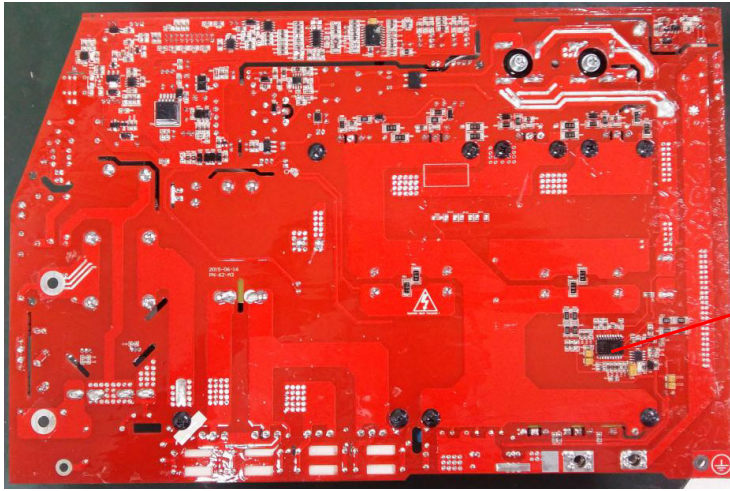
Attention :

1. This manual can be used by maintaining personnel who has no professional conditioning and debugging equipments, but instead only simple tools, such as multimeter.
2. Since welding machines are connected with high voltage electric supply, maintaining operator has to pay attention to safety and avoid electric shock.
3. Do not connect power supply with malfunctioned welding machine. Operator should firstly open the machine enclosure to remove all dust inside; then please check whether there is any burnt or exploded part inside.
4. Please take photos of the machine internal parts before maintenance is carried out so that to avoid forgetting or misconnecting some components or wires.
5. Jasic components of the original machine components models are recommended. Please do not use different component models in one machine.(such as IGBT, diode, electrolytic capacitor, etc.)

1. Machine Internal Structure and Components Description



1. Power switch: easily-worn part
2. Rectification bridge: easily-worn part, which might be caused by failed electrolysis capacitor or failed IGBT.
Please check if the silicon bridge is failed if electrolysis capacitor or is failed.
3. Flat cable: not easily-worn part
4. Gas-pressure meter: not easily-worn part
5. Plasma center connector: not easily-worn part
6. Solenoid valve: not easily-worn part
7. Air filter: not easily-worn part
8. PMC board: not easily-worn part
9. Air inlet: not easily-worn part
10. PFC control chip: not easily-worn part
11. Drive transformer: not easily-worn part



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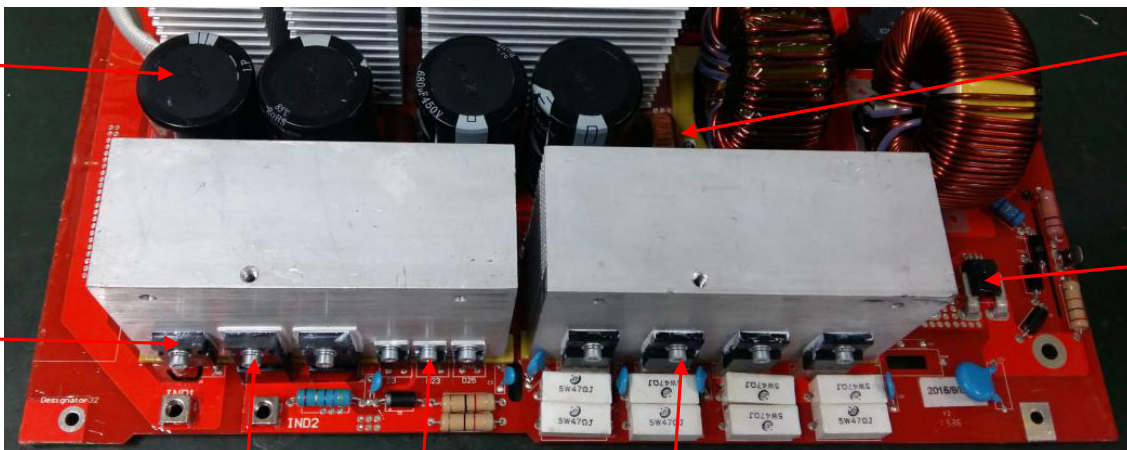


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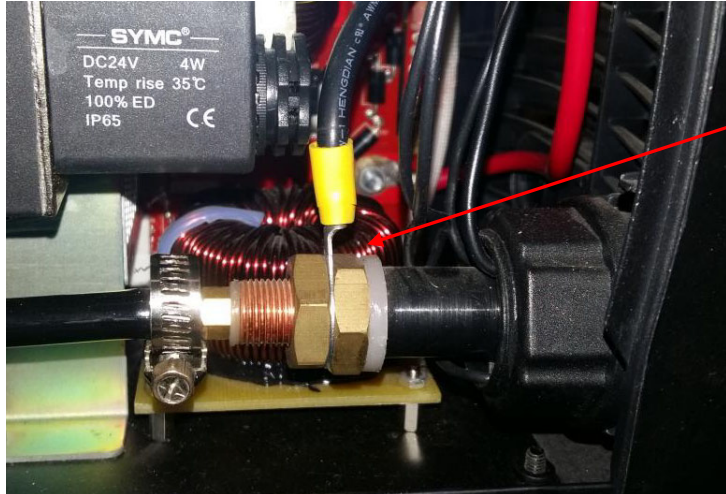
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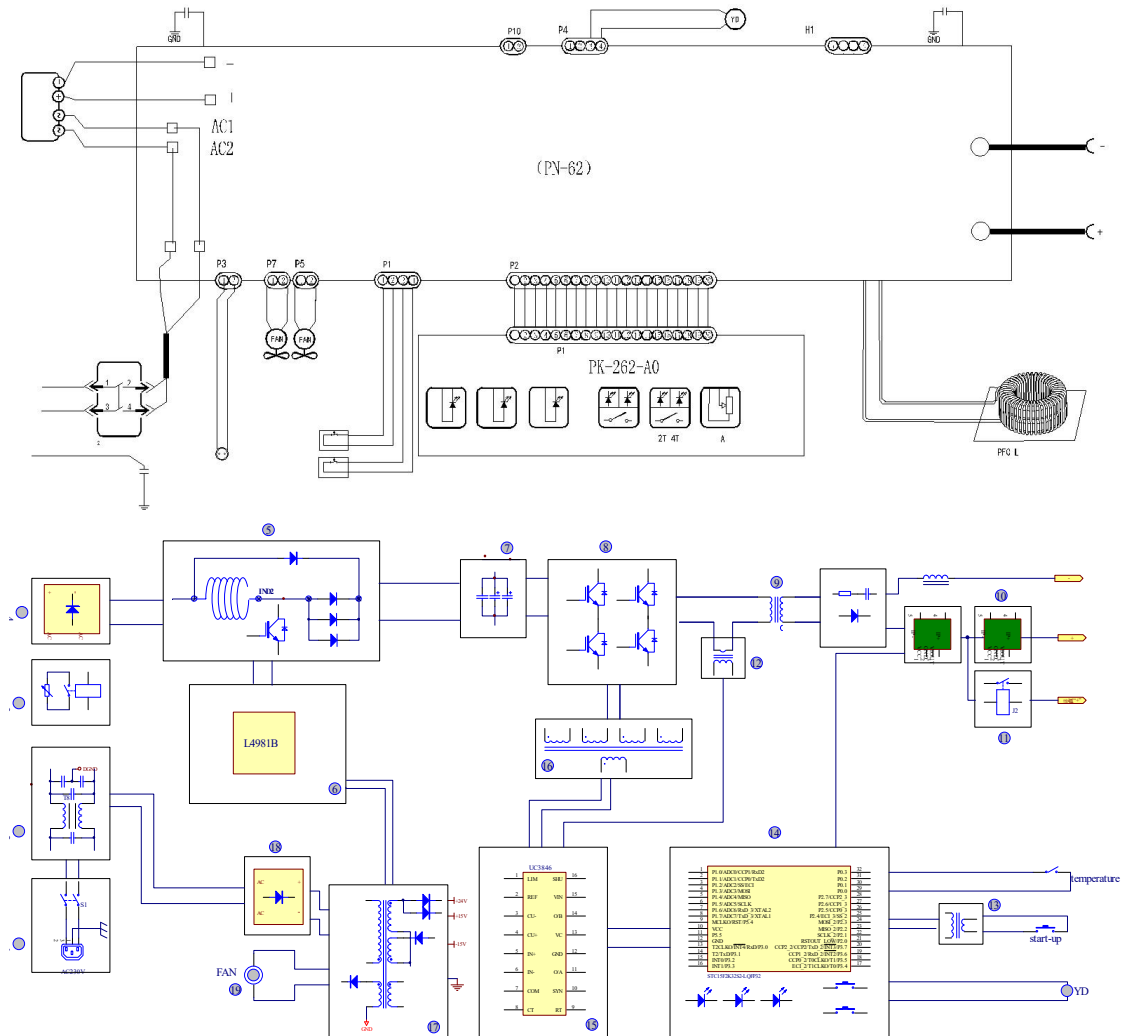
12. Switching mode power supply transformer: might get burnt or cannot close.
13. Pilot arc relay: there might be two kinds of malfunctions
 - a. Short circuit. The normally open contact of the relay is closed. There might be dual arc during cutting and nozzle might be burnt.
 - b. Open circuit. The normally close contact of the relay is closed and no pilot arc when pull the torch trigger.
14. Main transformer: not easily worn part
15. Output reactor: not easily worn part
16. Current transformer: not easily worn part
17. Hall sensor: not easily worn part
18. Output rectifier diode: not easily worn part
19. PFC output rectifier diode: not easily worn part
20. PFC IGBT: not easily worn part
21. PFC fly-wheel diode
22. Electrolytic capacitor: not easily worn part
23. IGBT: not easily worn part
24. Relay: not easily worn part
25. PFC inductance: not easily worn part



2. Easily-worn Components Model List

Item	Name	Model	Jasic part no.
1	Power switch	20A\250VAC	10047746
2	Electrolytic capacitor	470UF\400V	10005801
3	Relay	DC24V\30A	10006474
4	Silicon bridge	GBPC3510(35A/1000V)	10037345
5	Auxiliary power supply chip	UC3845(SO-8)	10006698
6	Fan	DC24V (4900±10)	10041446
7	Inverter IGBT	FGH40N60	10007251
	PFC IGBT	FGH60N60	10029693
8	Rectifier diode	FMD-4204S	10006256
9	Solenoid valve	3V210-08 DC24V	10048389
10	Plasma center connector		10004644
11	Reducing valve	SAW2000-02 (auto water drain)	10048390
1 2	Self-recovery fuse	WH60-065	10006399
1 3	Integrated circuit	TC4420EOA	10033181
1 4	Integrated circuit	L4981BD	10033180
1 5			
1 6			

3. Schematic Block Diagram



1. Power switch
2. EMC circuit; some machine models have no EMC circuit.
3. Snubber circuit
4. Silicon bridge
5. PFC main circuit
6. PFC control circuit
7. Filter capacitor
8. Inverter
9. Main transformer
10. Hall sensor
11. Current transformer

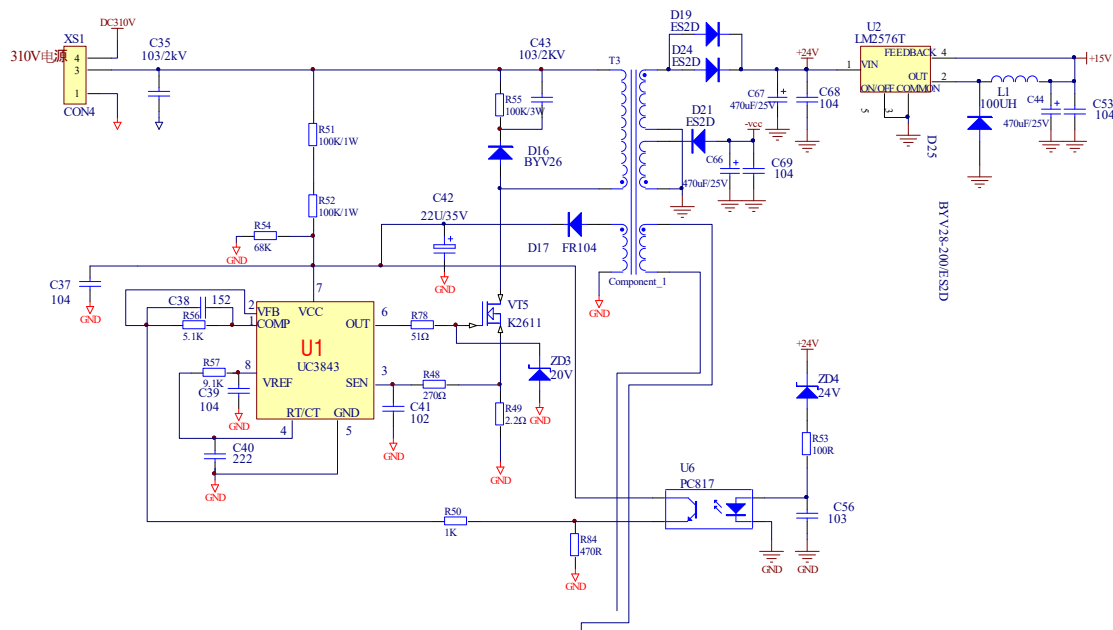
12. Isolation transformer
13. Output Hall feedback
14. Control board (with LEDs & keys)
15. PWM control segment
16. IGBT drive
17. Power switch segment
18. Switching power supply rectification segment
19. Fan

4. Malfunctions and Troubleshooting

1) After turning on the power switch, power indicator is not lighting up and fan doesn't work, no response when pull torch trigger.

Troubleshooting:


- (1). check whether the power cable is damaged or is under poor connection.
- (2). check whether the power switch is failed or not
- (3). if the above solution couldn't solve the problem, please check the auxiliary power source. See auxiliary power supply schematic diagram and PCB circuit as shown in below.



For common failure of this machine's auxiliary power source, please check MOS K2611 first; then use a multimeter to check its surrounding components. If the PCB copper sheet is burnt, fix it and make sure it's in good condition; then power on the machine; apply some glue or insulating paint after the repairing job.

2) Normal machine reaction when turn on the power switch with



power indicator lighting up (green), but the  over-heating indicator is also lighting up(yellow)

Over-heat indicator is lighting up: machine is under over-heating.

Troubleshooting



(1) If this phenomenon happens during working, please stop welding operation for at least 5 minutes and also observing if the cooling fan is still working normally.

(2) Thermal switch is failed.

If there is still an over-heat protection after stopping the machine and the internal temperature is cooling down, please check if the thermal switch is still working and the circuit is still under normal condition.

3).Tripping out or burnt fuse

Tripping when turn on the machine

(1). Silicon bridge is failed.

(2). Electrolytic capacitor is failed and is having an obvious bulge or

exploding part.

Working (cutting) tripping

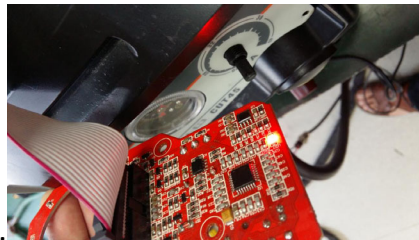
(1) Check fuse capacity. When under normal cutting operation, output is DC132V45A and input is AC230V 28A; if there is prolonged arc, current could reach 55A. If the fuse capacity is too small, there will be tripping of fuse burnt. If the power cable is too long or too small, it will lead to part of the voltage being consumed on cable, which could increase loop current. If the capacity is too small, there will be tripping or burnt fuse.

4) Normal reaction when power on the machine, except for no pilot arc when pull the torch trigger.


Troubleshooting:

Gas valve is working and there is gas.

(1) Check if it's under "gas detection" mode; if yes, need to switch it to cutting mode.

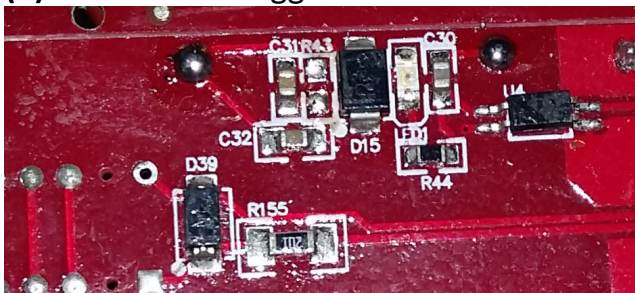


(2) Check LED7 on control board, if LED7 is lighting up, it means it's under Non-HF program control; if LED7 is

flickering, it means it's under HF program control. please press "" for continuous 5 seconds to enter non-HF control and machine can go back to normal operation.

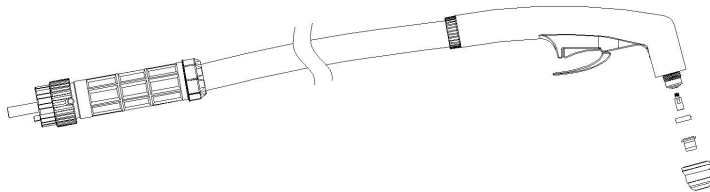
5). No gas

(1). Check torch trigger circuit.



As it's shown in above picture, if main board LED1 is lighting up when pull the torch trigger, it means torch trigger circuit is normal and need to check U4 optocouple; if main board LED1 is not lighting up when pull the torch trigger, please checking the torch trigger circuit carefully.

(2) Please check if torch is installed correctly and it's under good connection.



(3). Check the changes of panel's indicators: if the torch protection indicator



is lighting up, it means torch is abnormal.

- a. Check torch's electrodes and nozzle.
- b. Check pilot arc relay.

Remark:

Premises of non HF arc start pilot arc — — — (1) short circuit of torch's electrodes and nozzles and pilot arc relay is working. (2) send out signal and there is machine output (3) then the air valve is working and there is compressed air (0.45MPa) (4) good connection with torch; electrode and nozzles are under good condition.

6). Unadjustable output current; there might be either min current or max current

For this malfunction, please check current regulation potentiometer

carefully.

7). Easy arc interruption during cutting

(1). Check network voltage; if the input voltage is too low, there might be insufficient input power which could cause easy arc interruption; when under this circumstances, please adjust a lower cutting current, which at the same time will lead to lower cutting speed and thinner cutting ability. If machine is too far from power source and cable is too long and too small, there will be easy arc interruption. .

(2) For thin plates cutting, if the cutting speed is too slow, there will be easy arc interruption; therefore, operator should to increase cutting speed or decrease the cutting current.

Attention: use slow-blow fuse at the suitable size and power cutout switch protection circuit.

Model	Input voltage	Phase	Rated output	Input current at 6 kw output	Input current during arc stretch	Recommended slow-blow fuse size
CSA/CE	200-240V AC(optimum cutting)	Single phase single p	45A,132V (normal cutting)	28A-35A	50A-55A	60A
Caution: Protect the circuit with appropriately sized time-delay (slow-blow) fuses and a line-disconnect switch.						

* If there is need for long arc application, please use larger current fuse.

7). Poor cutting performance and lots of cutting slag



(1) Check the air pressure under gas detection mode. When machine is not working, it will show air source's pressure(normally under 0.6-0.8MPa);when under gas detection mode or pull the torch trigger, it will show the working air pressure (normally between 0.45-0.5MPa) ; check output current; if cutting current is too small, the quality can be affected; cutting speed need to be neither too quick nor slow; observing the arc

during cutting; if there is full penetration, operator can speed up; if lag line angle is becoming bigger, operator need to slow down the cutting speed.

(2) The cutting quality can also be affected when machine being connected with a generator, for the power capacity might be insufficient.

Generator Connection		
Generator Rated Driving Power(KW)	System Output(A)	Performance (prolonged arc)
8	45	Completely
6	45	Limited
6	30	Safe

(3) The plates are too thick and are beyond machine's quality cutting ability

Cutting:

Recommended:12 mm 500 mm/min

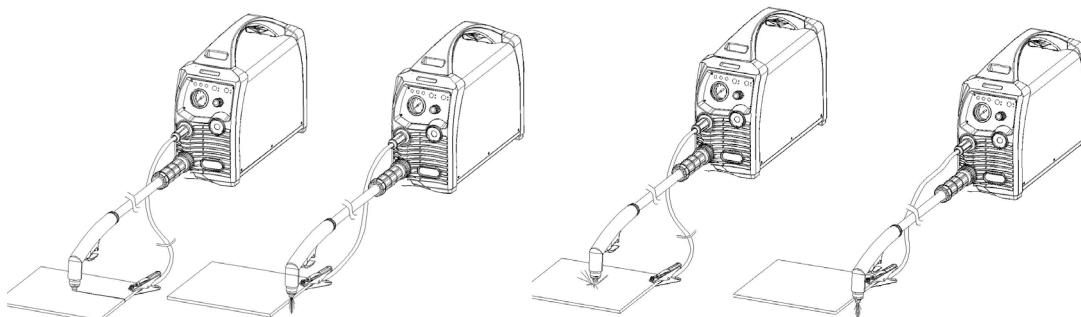
Max:19 mm 250 mm/min

Cut off :25 mm 125 mm/min

Hole boring :9.5 mm*

8). heavily worn electrode and nozzle

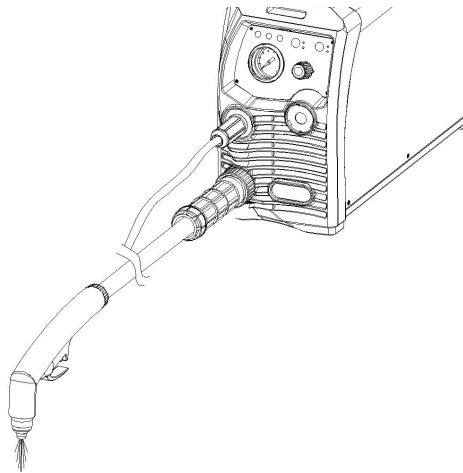
(1) Wrong arc ignition method: please ignite arc from the side areas instead of the middle area. The previous method could easy damage the nozzle.



a. Correct

b) incorrect

(2) There is only pilot arc and no cutting: if there is too much time for pilot arc and no cutting, the nozzle could be easily worn.



(3) Low air pressure: the standard torch is air cooling type. The compressed air can cool off the torch and compress arc. If the air pressure is too small, electrode and nozzle can easily be worn.

(4) Please try to avoid the nozzle contacting workpiece as possible as you can during cutting and try to keep 2-5mm distance. The contact with workpiece will speed up the worn-out of electrode and nozzle.

9) Pilot arc is normal but difficult arc ignition

(1) check if earth clamp is under good connection

(2) Check the input voltage. If the voltage is too low, there might be such phenomenon (lower than 165v)

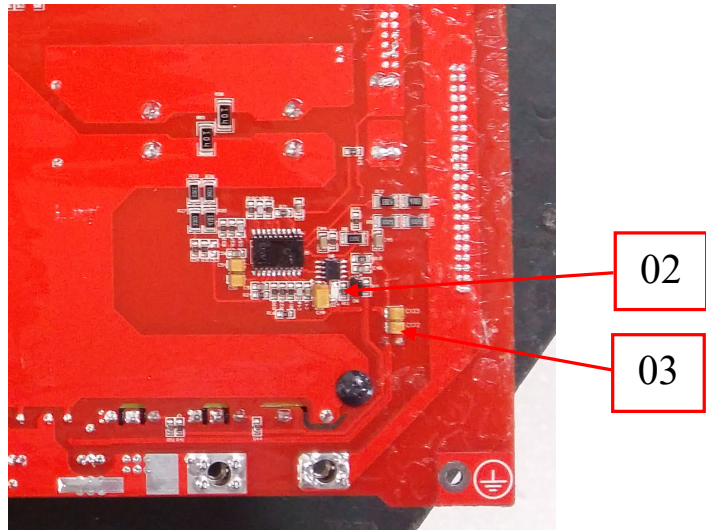
(3) Check electrode and nozzle. If they are heavily worn, it would be hard for arc ignition

(4) Check output fast recovery diode. If it's failed, it would be hard for arc ignition (for detailed checking, please refer to MMA welding's maintaining manual.

10) Pilot arc is normal but cutting ability is decreasing; prolonged arc ability is decreasing and hard arc start.

(1) Check input voltage; if voltage input is too low, there could be such phenomenon.

(2) Check PFC circuit.



((01: Power on the machine and observing 02LED. There will be slight light when under no load; normal lighting when on load.

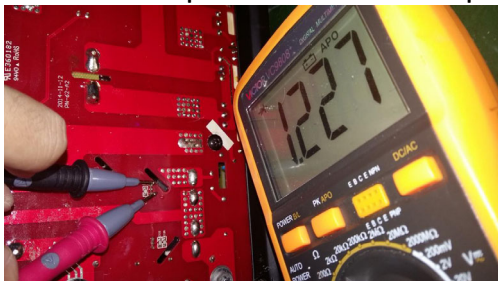
((02: if LED is not lighting up, use a multimeter to check 03 capacitor's two ends voltage. The normal result is +15V; if there is +15V, please contact Jasic service team and consult them for other solutions. If there is no +15V, please check switching power supply.

((03: if LED is lighting up, please contact Jasic service team and consult them for other solutions.

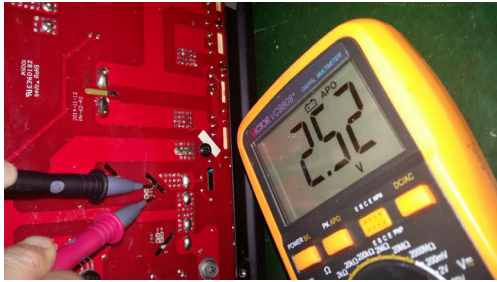
11). Pilot arc is normal, with min cutting current. After several seconds, arc is interrupted and it stops cutting.

(1) Check if the earth clamp is under good connection.

(2) Check Hall sensor. Machine cannot detect and switch to main arc current, so it will keep small current output.



(Multimeter-diode testing and the value tested is 1.227)



(Test with power on and the output tested is 2.52V)

If the results are not as described in above pictures, it means Hall sensor is failed.