

OWNER'S MANUAL

TIG 200/250P AC/DC

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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 welding machine is a rectifier adopting the most advanced inverter technology.

The development of inverter gas-shielded welding equipment profits from the development of the inverter power supply theory and components. Inverter gas-shielded welding 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.

TIG 200/250PAC/DC series machine are the AC/DC and MMA three-way machines, which are developed by our company newly. Its biggest characteristics is that DC function can be used to weld stainless steel, alloyed steel, carbon steel, copper and other color metals and AC function can be used to weld aluminum and aluminum alloy materials, such as welding of scooters, bicycles.

TIG 200/250PAC/DC series machine adopts our company's exclusive HF inverter technology. Compared with traditional machine, it is compact in volume, light in weight, effective in transfer, power-saving; compared with imported machine, it is low in price, strong in power net adaptability. What's more, it adopts twice inverter technology, has characteristics of pure square wave output, good arc force, wide cleaning range and continuous arc with small current, which guarantee excellent welding result.



WARNING!

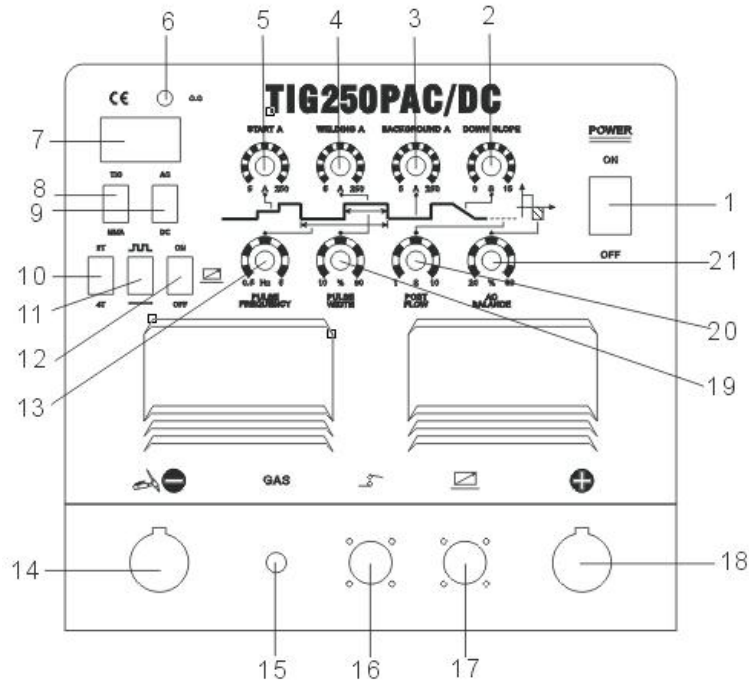
The machine is mainly used in industry. It will produce radio wave, so the worker should make fully preparation for protection.

TECHNICAL PARAMETERS TABLE

Model Parameters	TIG 200PAC/DC	TIG 250PAC/DC
Power voltage	1ph AC220V±15%	1ph AC220V±15%
Frequency (Hz)	50/60	50/60
Rated input current (A)	TIG: 32.5	TIG: 38.9
	MMA: 43.5	MMA: 58.3
Output current (A)	10-200	5-250
No-load voltage (V)	44	56
Rated output voltage (V)	TIG: 18	TIG: 20
	MMA: 28	MMA: 30
AC duty cycle (%)	20-80	20-80
Pulse duty cycle (%)	10-90	10-90
Post-flow time (S)	0-10	0-10
Pulse frequency (Hz)	0.5-5.0	0.5-5.0
Basic value current (A)	5-200	5-250
Arc initiation current (A)	5-200	5-250
Attenuation time (S)	0-15	0-15
Remote control	yes	yes
Arc initiation way	HF	HF
Frequency (%)	80	80
Duty cycle (%)	60	60
Power factor	0.73	0.73
Insulation grade	F	F
Protection grade	IP21	IP21
Weight (kg)	20	20
Dimensions (mm)	498×328×302	498×328×302
Max. thickness (mm)	10	10

PANEL FUNCTION INSTRUCTION

TIG 200/250PAC/DC PANEL INSTRUCTION:



1	Power switch	12	Remote control switch
2	Down slope adjustment	13	Pulse frequency adjustment
3	Back ground current adjustment	14	Negative output terminal
4	Welding current adjustment	15	Gas connector
5	ARC start current adjustment	16	Torch switch socket
6	Abnormal indicator	17	Remoter control
7	Current meter	18	Positive output terminal
8	TIG/MMA switch	19	Pulse switch adjustment
9	AC/DC switch	20	Post flow adjustment
10	2T/4T switch	21	AC balance adjustment
11	Pulse frequency switch		

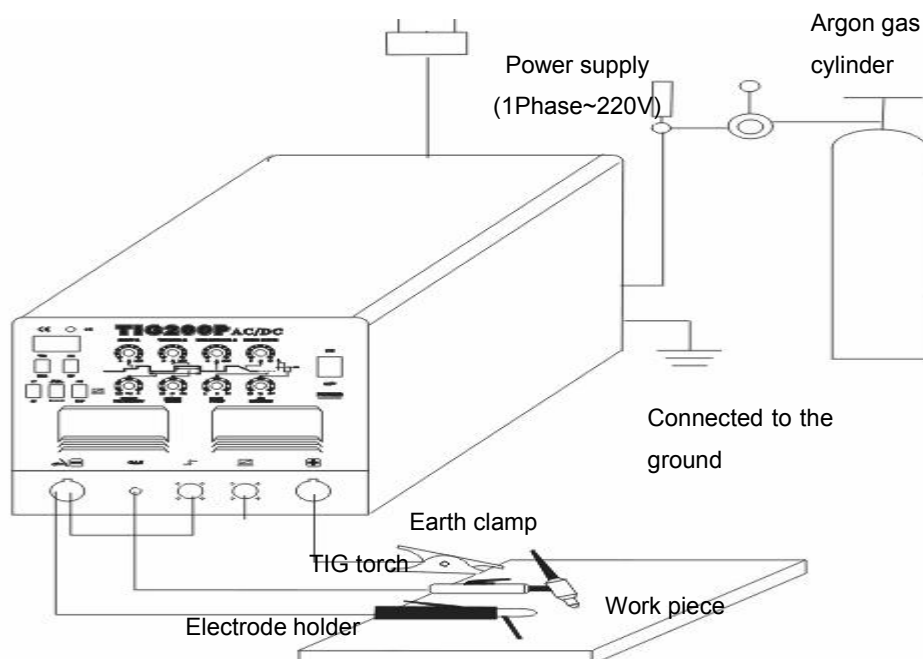
INSTALLATION INSTRUCTION

Equipment is equipped with power voltage compensation equipment. When power voltage fluctuates between $\pm 15\%$ of rated voltage, it still can work normally.

When use long cable, in order to prevent voltage from going down, bigger section cable is suggested. If cable is too long, it may affect the performance of the power system. So cables of configured length are suggested.

1. Make sure intake of the machine is not blocked or covered, lest cooling system could not work.
2. Make good connection of shielded gas source. Gas supply passage includes cylinder, argon decompress flow meter and pipe. Connecting part of pipe should use hoop or other things to fasten, lest argon leaks out and air gets in.
3. Put the fasten plug of the cable to fasten socket of “+” terminal at the front panel, fasten it clockwise, and the earth clamp at the other terminal clamps the work piece.
4. Correctly connect the arc torch or holder according to the sketch. When use MMA welding: 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. When use TIG welding: Put the gas-electricity plug of the welding gun to the joint at the front panel, and fasten clockwise. Put the air switch on the gun to the relevant joint at the front panel, and fasten the screw.
5. When use pedal control, connect its two-core air plug and three-core air plug with the relevant air socket at the panel.
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 range. After the above job, installation is finished and welding is available.

TIG200P AC/DC INSTALLATION:



OPERATION INSTRUCTION

(一) DC TIG WELIDNG

1. Turn on power switch, fan begins to wheel.
2. Open argon switch, and adjust gas flow to rated standard.(refer to flow table)
3. Put the welding switch to “upper position” is TIG WELDING.
4. When put the switch to “DC” position, it is DC arc welding which can be for stainless steel, iron, copper and other metals.
5. Set handwork/pedal switch according to needs. Put the switch to “OFF” position, current is adjusted by panel knob. Put the switch to “ON” position, current is adjusted by pedal.
6. According to requirement to choose “Pulse choosing switch”, “Down position” is no pulse. “Upper position” is low frequency (0.5—2Hz), and adjust the “Pulse adjustment knob” to suitable pulse frequency.
7. According to requirement to adjust the duty cycle to suitable position. (When no pulse, value is 1)
8. According to requirement to adjust arc initiation current and attenuation time.
9. According to thickness, set suitable welding current and basic value current (When pulse switch is down position, no basic value current).
10. Press torch switch and electromagnetic valve starts, you will hear the sound of electricity-releasing HF sparkle and at the same time, argon gets out the torch.
11. Keep 2-4mm space between tungsten pole and work piece, press torch control switch, between electrode and work piece HF electricity is released; After arc initiation, HF sparkle disappears soon and can start to work.
12. When finish welding, adjust the post-flow knob to suitable place in order to protect welding surface.
13. When TIG welding, for long welding and spot welding, you can choose the 2T/4T switch, when 2T,arc initiation and down slope adjusting function can not work, only welding current works.
14. When 4T, press the torch switch is arc initiation current, releasing the switch is welding current, pressing again is down slope time adjusting, releasing again is off working.

(二) AC TIG WELDING

1. When put the switch to “AC” position, it is AC arc welding, which can be for aluminum materials.
2. Pulse duty knob: During AC arc welding, current transfers between up side and down side continuously. When current goes from tungsten stick to work piece, it is positive current time. At this moment, stick heats slightly and quantity of heat is concentrated, which is good for welding. When current goes from work piece to stick, it is down side current. At this moment, it can clean oxide at the surface of work force, which improve welding result. But the stick may be burnt out because of over heat; the knob is for adjusting time ratio of positive and reversed current. When at “O” position, the ratio is 50% to 50%; at “5” position, ratio is 80%, and at “-5” position, ratio is 20%; Turn towards clockwise, up side current gets short, down side current gets long. When turn counter-clockwise, it is opposite.
3. Operating as the 10-12 step above.

Notice:

- 1) Big current should use small pulse duty; Above 200A, use pulse duty below 30%. At small current, use big pulse duty; below 100A, use pulse duty above 50%.
- 2) When at AC TIG welding, the smallest current is not easy for arc initiation, please set the current to 20A.

(三) MMA welding

1. Put the welding switch to “ Down position”, at this time, “Pulse choosing switch”, “2T/4T switch”, “AC/DC switch” are out of work, only welding current knob can use.
2. Set the welding current according to the work piece thickness.

Attached: Relative value for electrode and current

Electrode(mm)	2.5	3.2
Current (A)	70-100	100-140



Warning:

It is forbidden to pull out or put in the cable or connector during the process of welding, which will threat life safety and damage the machine.

MAINTENANCE

**WARNING:**

Before maintenance and checking, power must be turned off, and before opening the housing, make sure the power plug is pulled off.

1. Remove dust by dry and clean compressed air regularly, if welding machine is operated in environment where is polluted with smokes and pollution 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 inner-machine.
3. Check internal 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 inner-machine then check insulation of machine.
5. If welding machine will not be operated 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.



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



1. Environment

- 1) The machine can perform 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.
- 4) Do not use the machine in environment where condition is polluted with conductive dust on the air or corrosiveness gas on the air.
- 5) Avoid gas welding in the environment of strong airflow.

2. Safety norms

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

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

The welding machine is powerful machine, when it is being operated, it generated by high currents, and natural wind will not satisfy machine cool demands. So there is a fan in inter-machine to cool down machine. Make sure the intake is not in block or covered, it is 0.3 meter 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). Keep welding current do 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 keep in allowable rangement. If power voltage is exceeding allowable rangement limited, it is damaged to components of machine. The operator should understand the situation and take preventive measures.

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

5) If welding time is exceeded duty cycle limited, welding machine will stop working for protection. Because 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, in order to let the fan cool the machine. When the indicator light is off, and the temperature goes down to the standard range, 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 below 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 5L/min.
3. Check if torch is in block.
4. If gas passage 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. 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. Output current not to 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.

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

It has something with factors as following:

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

E. stick is burnt out:

Pulse duty is too high, which lead to over heat of stick.

F. When welding aluminum, can not break oxidized film:

1. Wrong welding value
2. Pulse duty too low
3. Twice inverter MOSFET broken.

TROUBLESHOOTING AND FAULT FINDING

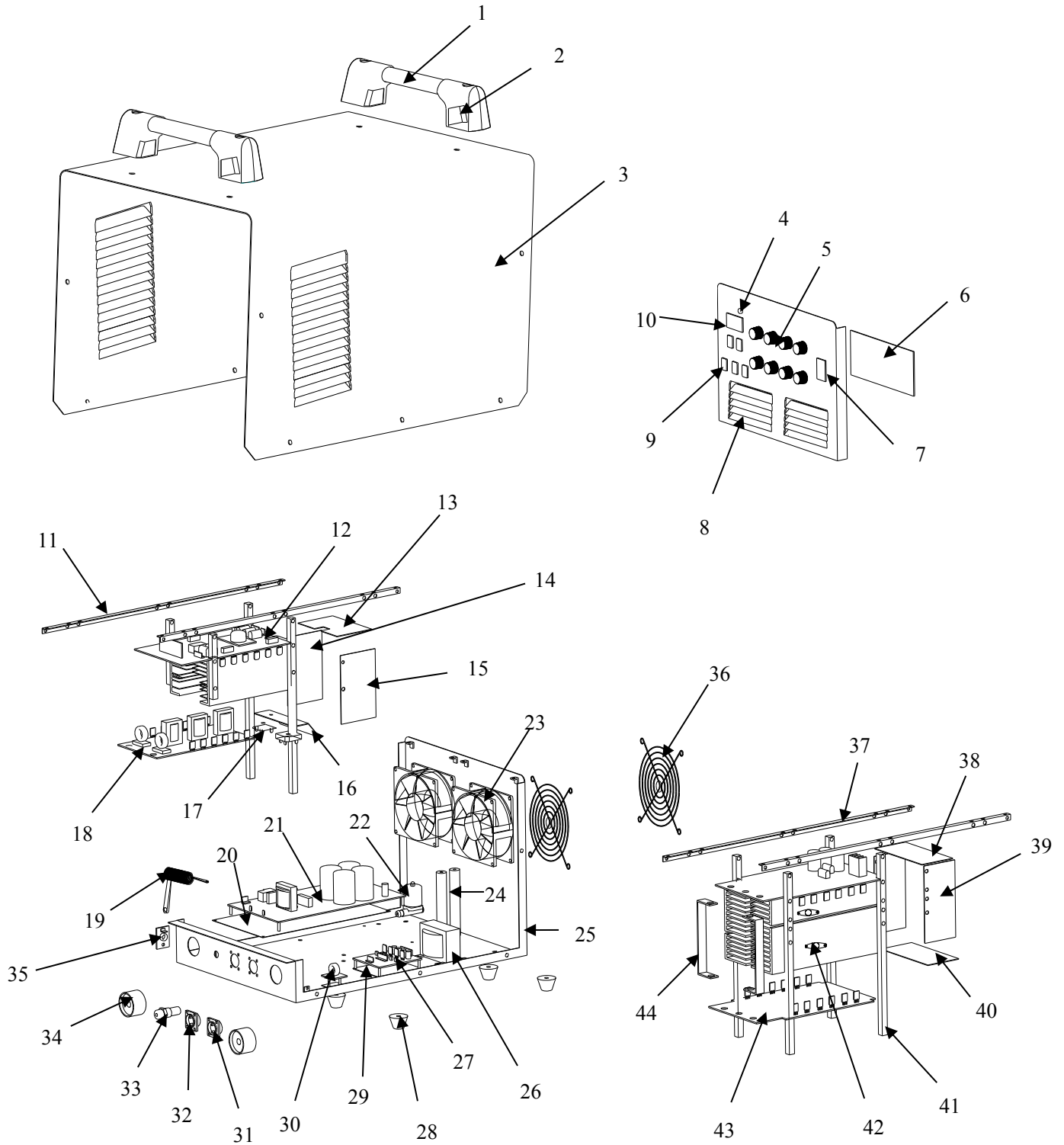
TIG 200/250PAC/DC fault symptom and solutions.

Faults symptom	Solutions
Power indicator is not lit, fan does not work and no welding output	<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.
Power indicator is lit, fan does not work or revolve several circles and stopped, no welding output	<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. Cable that connects switch and power board is loosed, tighten it again. 4. Turn on and off power switch continuously would start overload voltage protection circuit. Turn off machine for 2-3 min and restart it. 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.
Fan is working, abnormal indicator is not lit, sound of HF arc striking cannot be heard, wiping arc welding can not strike arc.	<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. <ol style="list-style-type: none"> a) If circuit is broken and silicon bridge is poor contact. b) If some of four high electrolytic (about 470UF/450V) of power panel capacitor is leaking. 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.
Abnormal indicator is not lit, sound of HF arc-striking can be heard, no welding output	<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 lit, sound of HF arc-striking can not be heard, wiping 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. Switch (sticking/argon-arc welding) is damaged, replace it. 4. Some of HF arc-striking circuit components is damage, find out and replace it.
<p>Abnormal indicator is lit, no welding 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 VH-07), then restart machine: <ol style="list-style-type: none"> a) If abnormal indicator is still on, some fieldistors on MOS board are damaged, find out and replace them 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 volume and Q value of main transformer by inductance bridge ($L=0.9-1.6mH$ $Q>35$). If value is too low, please replace it. b) Maybe secondary rectifier tube of transformer is damaged, find out faults and replace rectifier tube with same model. 4. Maybe feedback circuit is open.
<p>When welding aluminum, can not break oxidized film</p>	<ol style="list-style-type: none"> 1. Wrong welding value. 2. Pulse duty too low. 3. Twice inverter MOSFET broken.
<p>Stick is burnt out</p>	<p>Pulse duty is too high, reduce it.</p>

WELDING EXPLOSION DIAGRAM

TIG200PACDA:



MACHINE COMPONENT LIST

TIG200PACDA:

NO.	NAME	23	Fan
1	Handle bar	24	Is glaze resistance
2	Handle seat	25	Machine bottom
3	Machine cover	26	Power frequency transformer
4	Abnormal light	27	Secondary inverter drive plate
5	knob	28	Rubber feet
6	Pulse plate	29	Insulation board
7	Power switch	30	EMC plate
8	Front panel	31	Three core aviation socket
9	Type switch	32	Two core aviation socket
10	Digital display table	33	Gas electric one socket
11	beam	34	Fifty quick socket
12	Secondary inverter board	35	Gun switch board
13	On wind deflector	36	Fan net
14	Descend front-panel	37	beam
15	Side wind deflector	38	On wind deflector
16	Down wind deflector	39	Side wind deflector
17	Silicon bridge	40	Down wind deflector
18	Rectifier output board	41	Vertical beam
19	Run-on device	42	Temperature switch
20	Insulation board	43	Secondary inverter board
21	Power panel	44	fittings
22	Electromagnetic valve		

