



**DC INVERTER TIG
WELDING MACHINE WS-200**

INSTRUCTION MANUAL

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CONTENTS

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

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

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

The development of welding equipment benefits from the appearance of the inverter power supply theory and components. Inverter arc welding power source utilizes high-power component MOSFET to transfer 50/60Hz frequency up to 100 KHz, 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.

Welding power source can offer stronger, more concentrated and more stable arc. When stick and workpiece 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.

TIG welding machine is easy for arc initiation and has the functions of arc initiation current, arc stop current, welding current, basic value current, current ascending time, current descending time, gas delay time, continuous adjustment. What's more, pulse frequency and pulse duty can also be adjusted independently. It has the characteristics of automatic control of arc initiation, arc stop and stable arc, which make the best result for shape and inner quality of the welding surface. Its exclusive design is specially suitable for bicycle industry.

The machine can be for multi-use, and can weld stainless steel, carbon steel, copper and other color metal, and also can use for traditional electric welding. Its transfer efficiency is above 85%.

Thanks for purchasing our products and looking forward to your precious advice, we will try our best to perfect our 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

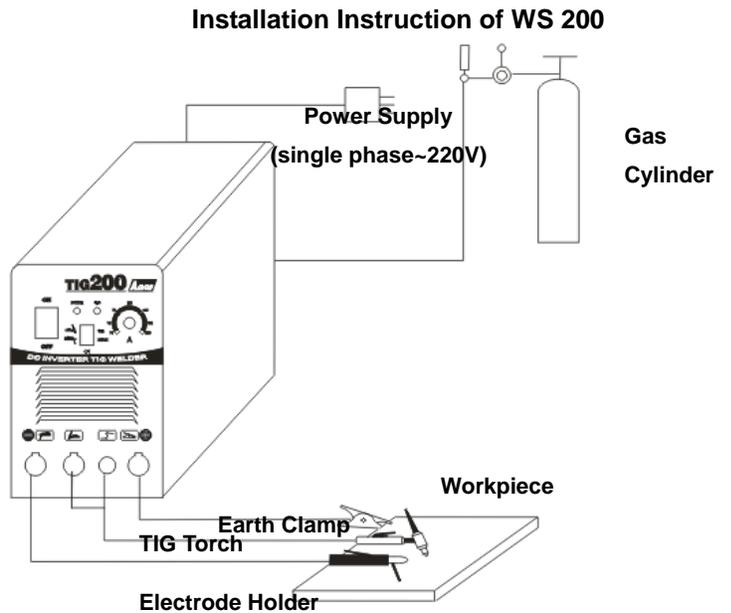
Parameters \ Model	WS 200
Power voltage(V)	single phase AC220V±15%
Frequency (Hz)	50/60
Rated input current (A)	30.8
Output current. (A)	10 ~ 200
Rated working volt. (V)	18
No-load volt. (V)	56
Force adjustment (A)	—
Duty cycle (%)	60
No-load loss (W)	40
Arcing way	HF
Efficiency (%)	80
Power factor	0.73
Insulation grade	F
Housing protection grade	IP21
Weight (Kg)	9
Dimensions (mm)	395×153×301

INSTALLATION INSTRUCTION

The machine 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 we suggest you to use configured length.

1. Make sure intake of the machine 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 used hoop or other things to fasten, lest argon leaks out and air gets in.
3. Use inducting cable whose section is not less than 6 mm^2 to connect the housing to the ground. The way is from the ground-connecting screw at the back to the earth device.
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 pulse arc 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. Put the fastening plug of the cable to fastening socket of “+” polarity at the front panel, fasten it clockwise, and the earth clamp at the other terminal clamps the work piece.
6. According to input voltage grade, connect power cable with power supply box of relevant voltage grade. Make sure so mistake and make sure the voltage difference among permission range. After the above job, installation is finished and welding is available.

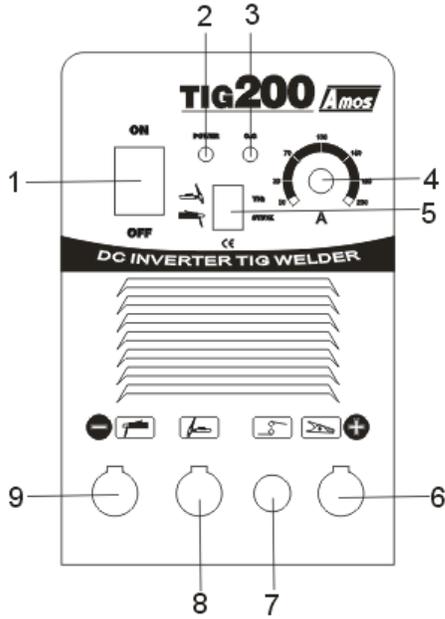


WARNING !

Before connecting operation please make sure all the power is turned off. The right order is to connect the welding cable and ground cable to the machine first, and make sure they are firmly connected and then put the power plug to the power source.

PANEL FUNCTION INSTRUCTION

Front Panel



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

OPERATION INSTRUCTION

TIG Welding Description

1. Turn on the power switch of front panel, digital current meter is normal, fan begins to run.
2. Turn on argon switch, and adjust gas pressure to rated value.(refer to flow table).
3. Press switch of torch, electromagnetic valve is started. You will hear the sound of electricity-releasing HF sparkle and at the same time, argon gets out the torch. NOTES: If the first time welding, you should press switch for a few seconds before welding, until all the air in the gas passage is removed, and then start to weld. When you stop welding, argon will still flow out for a few seconds, Which is designed to guarantee that weld spot is protected before cooling down. So when the electric arc stops, keep the welding position for a while and then move the torch.
4. Choose the “pulse alter switch” according to the need. When the switch is on the down position, there is no pulse, while between down and up position, there is middle frequency pulse (200Hz), while on the up position, there is low frequency pulse 2Hz).
5. Adjust the switch of the Current Down Slope Adjustment according to the request of the work piece and welding.
6. Set suitable welding current according to the thickness of work piece and process demand.
7. 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.

Sticking Description

1. Turn on the power switch on the front panel, and the fan begins to work.
2. Make sure function switch of front panel is on “down” position that is sticking. When welding jaw nips welding rod, it begins to work.
3. According to work piece’s thickness, position, craftwork state, choose suitable welding current.



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.

NOTES OR PREVENTIVE MEASURES

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. Do not let water enter the gas
- 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

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

1) The working area is adequately ventilated !

Our welding machine is powerful machine, when it is being operated, it generated by high currents, and natural wind can't be satisfied with 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 is 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 keeps in allowable range. If power voltage is exceeding allowable range limited, it is damaged to 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 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 3L/min.
3. Check if torch is in block.
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. 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. 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.

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 inner-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 they enter into machine, please dry inner-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
Power indicator is not lit, fan does not work and no welding output	<ol style="list-style-type: none"> 1. Power switch is out of work. 2. Check if electrify wire net (which is connected to input cable) is in work. 3. Check if input cable is out of circuit.
Power indicator is lit ,fan does not work or revolve several circles ,no welding output.	<ol style="list-style-type: none"> 1. Maybe connect wrong to 380V power cause machine is in protection circuit, connect to 220V power and operate machine again. 2. 220V power is not stable,(input cable is too slender)or input cable is connected to electrify wire net cause machine is in protection circuit .Add the section of cable and tighten input connector firmly .Turn off machine 2-3 minutes then turn on it again. 3. Cable is loosed from switch to power panel, tighten them again. 4. Turn on and turn off power switch constantly in short time cause machine is in protection circuit Turn off machine 2-3 minutes then turn on it again. 5. Main circuit 24V relay of power panel is not close or has damaged. Check 24V power source and relay. If relay has damaged replace it with same model.
Fan is working, indicator is not lit and sound of HF arc-striking can not be heard, wiping welding can not strike arc.	<ol style="list-style-type: none"> 1. Positive and negative electrodes of VH-07 insert component voltage should be about DC308v from power panel to MOS board. 2. There is a green indicator in auxiliary power of MOS board, if it is not on, auxiliary power is out of work. Check fault spot and connect with seller. 3. Check if connector is poor contact. 4. Check control circuit and find out reasons or connect with seller. 5. Check if control cable of torch is broken.
Abnormal indicator is not on, sound of HF arc-striking can be heard, but there is no welding output.	<ol style="list-style-type: none"> 1. Check if torch cable is broken. 2. Check if grounding cable is broken or not connected to welding piece. 3. Output terminal of positive electrode or torch electrify is loosed from inner-machine.
Abnormal indicator is not lit, sound of HF arc-striking can not be heard, wiping welding can strike arc.	<ol style="list-style-type: none"> 1. Primary cable of arc-striking transformer is not connected to power panel firmly, tighten it again. 2. Arc-striking tip is oxidized or too far, give a good polish to it or change it is about 1 mm between arc-striking tip. 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 but there is no welding output.</p>	<ol style="list-style-type: none"> 1. Maybe it is overheated protection, please close machine first, then turn on the machine again after abnormal indicator is out. 2. Maybe it is overheated protection, wait for 2-3 minutes (argon-arc welding does not has overheated protection function.) 3. Maybe inverter circuit is in fault, please pull up the supply power plug of main transformer which is on MOS board (VH-07 insert which is near the fan) then open the machine again. 4. If abnormal indicator is still lit ,close machine and pull up supply power plug of HF arc-striking power source (which is near the VN-07 insert of fan),then open machine: 5. If abnormal indicator is still lit, some of MOSFET of MOS board is damaged, find out and replace it with same model. 6. If abnormal indicator is not lit, rise transformer of HF arc-striking circuit is damaged, replace it. 7. If abnormal indicator is not lit. 8. Maybe transformer of middle board is damage, measure inductance value and Q value of main transformer by inductance bridge ($L=0.9-1.6mH$ $Q>35$). If value is too low, please replace it. 9. Maybe secondary rectifier tube of transformer is damaged, find out faults and replace rectifier tube with same model. 10.Maybe feedback circuit is broken.
<p>Output current is not stabilizing or out of potentiometer control and sometime is high, sometime is low.</p>	<ol style="list-style-type: none"> 1. 1K potentiometer is damage, replace it. 2. All kinds of connectors are poor contact, specially inserts etc. please check it.
<p>Sticking spatter is much and caustic electrode of is difficult .</p>	<p>Electrode is connected wrong, exchange grounding cable and handle cable.</p>

SPARE PART LIST OF WS-200

DESCRIPTION	PART CODE
TOP PCB	PCB-WS200T
MIDDLE PCB	PCB-WS200M
BOTTOM PCB	PCB-WS200B
ON/OFF SWITCH	PSW003
POTENTIOMETER FOR CURRENT SETTING (1K)	POT003
KNOB FOR POT003	KNOB003
OUT PUT CONNECTOR CABLE SIDE	FASTPLUG001-CM
OUT PUT CONNECTOR MACHINE SIDE	FASTPLUG001
FAN	FAN006
SOLENOID VALVE	SV101
CAPACITOR	CAP-ELE-01
OUT PUT FAST DIODE	FAST DIODE-02
MAIN TRANSFORMER	MTRAX-MOS-01
MOSFET	MOSFET-01
O/P TERMINAL FOR TORCH	OUT-TER-CPG-TRH
INPUT BRIDGE MODULE	IBDG005