

OWNER`S MANUAL

MODEL: TIG 200/250/320ACDC
(POWER v-MOS CONTROLLED, INVERTER POWER SUPPLY)



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SAFETY WARNING



In the process of welding, there could be possibilities of injury, so please take protection into consideration during operation. For more details please read the Operator Safety Guide, which complies with the preventive requirements of the manufacturer.

Electric shock——Can kill !

- Set the earth fitting according to applying standard.
- Do not touch the bare electric parts and electrode with uncovered skin, wet gloves or clothes.
- Make sure you are insulated from the ground and the work piece.
- Think safety first.

Gases and fumes——May be a health hazard !

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

Arc rays——Harmful to your eyes and will 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 bystanders.

Fire

- Welding spark may cause fire, make sure there is no flammable material or liquids around the welding area.

Noise——Excessive noises will be harmful to your hearing.

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

Malfunction——Use qualified technician to repair machine.

- If faulty during installation and operation, please follow this manual instruction on fault finding.
- If you fail to fully understand the manual, or fail to solve the problem with the instructions, you should contact the suppliers or the service center for professional help.



WARNING!

Earth leakage-circuit breaker should be used with this machine!!!

About the machine

The inverter welding machine is a rectifier using the most advanced inverter technology.

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

AC/DC series welding machine are the AC/DC two-way inverters, which is the latest development by our company. 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.

AC/DC series machine uses our company's exclusive HF inverter technology. Compared with traditional transformer machines, it is compact, light and is power-saving. What's more, it uses double inverter technology, has characteristics of pure square wave output, good arc force, wide cleaning range and continuous arc with low currents, which guarantee excellent welding result.

AC/DC series can also use a remote pedal current adjustment device (except TIG200AC/DC). With that the welder can free he's hands to adjust current by foot while he is welding. The current can be controlled at the start of the weld. And then controlled as the material gets hot less current is needed and at the end of the weld the current can be slowly decreased to leave a smooth flat finish. With the help of a pedal it can improve welding efficiency, reduce welding difficulty and guarantee welding quality.

TIG welding is a full fusion process.

Thank you for purchasing our product. We are dedicated to produce the best products and offer the best service.



WARNING!

This machine is mainly used in the welding industry. It will produce Electric & Magnetic fields, so the operator should insure proper protection/screening is used.

Parameters

parameter \ model	TIG200ACDC	TIG250ACDC	TIG315ACDC
Power voltage	1phase AC220±15%	1phase AC220±15%	3phase AC380±15%
Frequency (Hz)	50/60	50/60	50/60
Rated input current (A)	30	TIG: 25A	TIG: 14.7A
		ARC: 35A	ARC: 21.2A
Output current (A)	10-200	10-250	10-315
Open voltage (V)	56	56	56
Rated working voltage (V)	18	TIG: 20	TIG: 22.6
		ARC: 30	ARC: 32.6
Duty cycle (%)	60	60	60
Pre flow gas (S)	0.1-1.0	0.1-1.0	0.1-1.0
Post flow gas (S)	0.1-8.0	0.1-8.0	0.1-8.0
Torch model	SR17	SR26	SR18 W/C
Remote control	No	Yes	Yes
Arc ignition mode	Untouched HF oscillating	Untouched HF oscillating	Untouched HF oscillating
Efficiency (%)	80	80	80
Power factor	0.73	0.73	0.73
Class of insulation	F	F	F
IP code	IP21	IP21	IP21
Weight (kg)	19	36	37
Overall dimension (mm)	630×300×560	780×300×610	780×300×610
Max welding thickness (mm)	10	12	12

FRONT PANEL FUNCTION AND INSTRUCTION

1. Selector switch

- AC/DC selector switch: When the switch is in “AC” position, it is in AC arc welding mode, which is used for aluminum materials. When the switch is in “DC” position, it is in DC arc welding mode, which is used for stainless steel, iron, copper and other metals.
- Remote/Panel selector switch: When the switch is in “OFF” position, the current is adjusted at the front panel; when it is at “ON” position, the current is controlled by a remote pedal.
- MMA/TIG selector switch: When the switch is in “MMA” position, it is in Manual Metal Arc mode, when the switch is in “TIG” position, it is in Tungsten Inert Gas mode and has to be triggered to start welding

2. Adjustment knob

- Pre-flow knob: To have clean welding start argon should flow before the current. This knob is for adjusting the time between argon gas and HF arc.
- Current adjustment knob: This knob is for current. When the remote switch is in the “OFF” position, use this knob to control welding amperage.
- Clearance Effect knob: During AC TIG welding, current jumps between positive and negative continuously. When the current moves from tungsten to work piece, it is positive current, at this moment tungsten heats slightly and lots of heat is concentrated, which is good for welding. When current jumps from work piece to tungsten, it is negative current. At this moment, it can clean oxidation at the surface of work piece, which Improves welding result. But the tungsten may burn out because of the heat; the knob is for adjusting time ratio of positive and negative current. When at “O” position, the ratio is 50% to 50%; at “5” position, ratio is 80%, and at “-5” position, ratio is 20%; Turning clockwise, positive current gets short and negative current gets long. When turned anti-clockwise, it is opposite.
Notice: Clockwise the arc width is broad good for filling. Anti-clockwise arc width is narrow good for joining.
- Down Slop knob: When finishing welding and the arc stops, in order to make a smooth finish, the current should be reduced gradually until stop. This knob is for adjusting current descending time.
Notice: When “remote control” is used turn anti-clockwise to “O”. (Not available on TIG 200 ACDC)
- Post-flow knob: The work piece will be oxidized and hot after welding, so keep argon flowing over weld for ± 3 seconds to cool and to cool the tungsten tip to a silver color to avoid brittleness. The knob is for adjusting post-flow time, up to 10 seconds.

3. Indicator lights

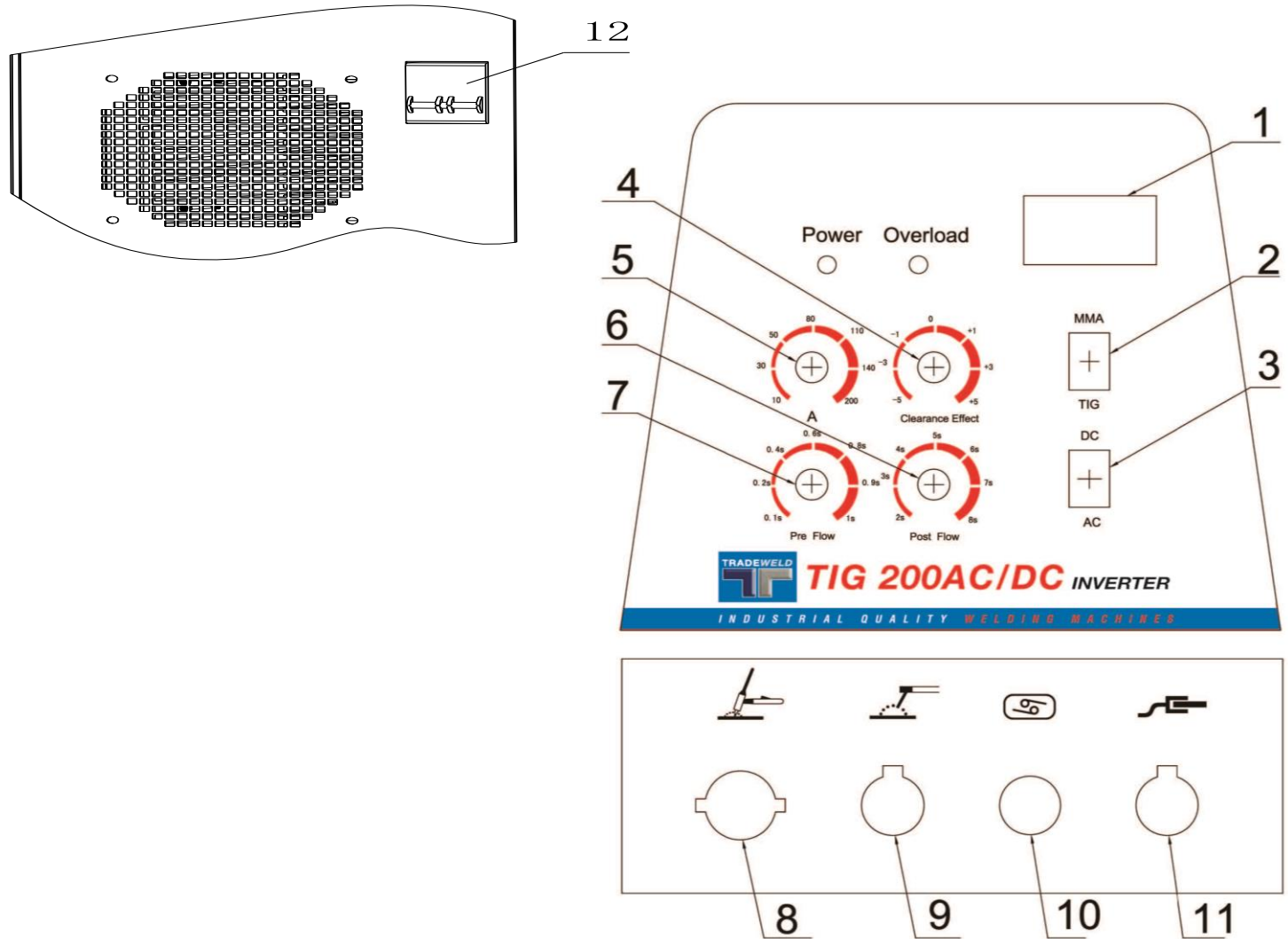
- Overload light: When machine works for a continuous, long time and at high current, in order to prevent components from burning out, the over heat protection function is set. When the light is on, machine will stop working, don't turn off the machine. After 2-3 minutes it will resume.
- QC Abnormal light: The indicator is lit when there is anything faulty inside the machine. When it is on, turn off the power switch and restart the machine after the light is off. If it occurs again, please have it checked by professionals or manufacturer.

4. Display

- Amperage display: The current displayed is for reference only the actual output from the machine can be $\pm 10\%$ of current shown.

Front panel diagram ACDC 200

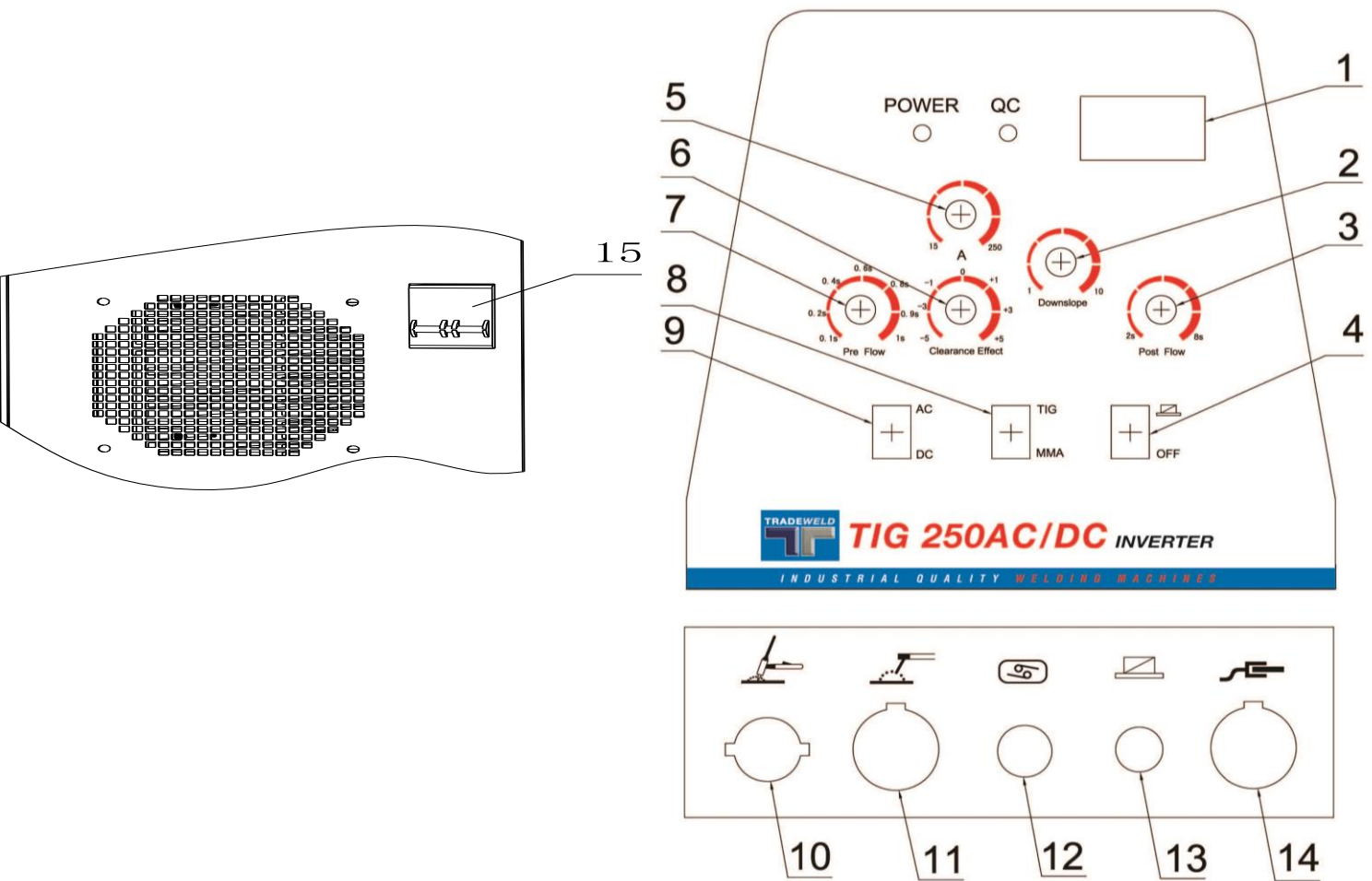
Figure for TIG200AC/DC panel1



1. Current meter	2. ARC/TIG change-over switch
3. AC/DC change-over switch	4. Cleaning width adjustment knob
5. Current adjusting knob	6. Pre-flow time adjustment
7. Post flow time adjustment	8. TIG torch interface
9. Manual welding dinse connector	10. TIG welding torch switch
11. Earth clamp dinse connector	12. Power switch

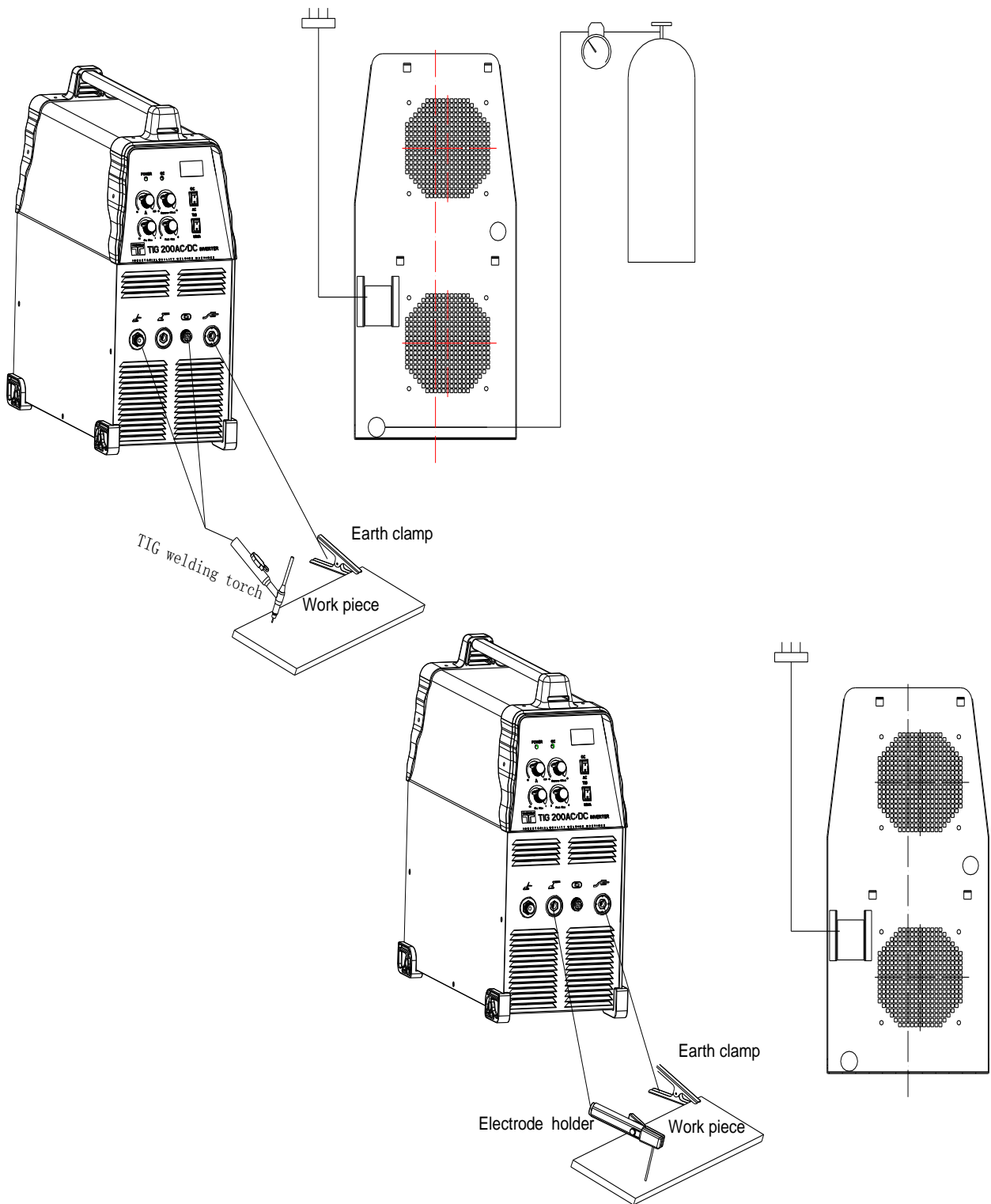
Front panel diagram ACDC 250 / 320

Figure for TIG250AC/DC (315AC/DC) panel



1. Current meter	2. Down slope time adjustment
3. Post flow time adjustment	4. Panel/Remote change-over switch
5. Current adjusting knob	6. Cleaning width adjustment
7. Pre-flow time adjustment	8. ARC/TIG change-over switch
9. AC/DC change-over switch	10. TIG welding torch interface
11. Arc welding dinse connector	12. TIG welding torch switch
13. Remote control socket	14. Earth clamp dinse connector
15. Power switch	

TIG AC / DC Installation diagram :



WARNING!

During welding, DO NOT pullout or insert any plugs or cables, It can lead to life-threatening danger and cause damage to the machine.

INSTALLATION

The welding machine is equipped with power voltage regulator. When power voltage moves between $\pm 10\%$ of rated voltage, it will still work normally.

When using a long cable, in order to minimize the loss of voltage a bigger section cable is suggested. If the cable is too long it will affect the performance of the machine, so stated length is recommended.

1. Make sure the fan intake of the machine is not covered or blocked to prevent the malfunction of the cooling system.
2. Use earth cable that the section is no less than 6mm^2 to connect the housing and earth, the method is from the connection in the back of the machine to the earth set, or make sure the earth end of power switch reaches the earth. Both ways can be used for safer earthing of the machine and to disperse static electricity.
3. Connect the electrode holder or TIG torch according to the sketch. Fit the electrode holder jack plug into the negative dinse “--” polarity and fasten it clockwise. When using TIG torch: Fit the gas and power cable nut to the left connector on the front panel, and fasten clockwise. Connect the trigger connector plug to the front panel.
4. Fit the earth clamp jack plug into the positive dinse “+” polarity at the front panel; fasten it clockwise, and the earth clamp on to the work piece.
5. Connect the Plug into the 220V supply. Insure power voltage supplied can meet the machines demands.
6. When the remote pedal switch is used to control the current, Connect the 2-core mic plug and 3-core mic plug of the remote pedal switch with the 2-pin mic socket and 3-pin mic socket.



WARNING!

Secure Compressed gas bottle to wall or trolley to prevent falling over!



WARNING!

**Before connecting welding cables make sure the power is off.
The correct way is to connect the welding cables to the machine first, and make sure they are firmly tightened and then connect the power plug to the power source.**

OPERATION AND SETUP

TIG WELDING SETUP

1. Connect cables as per Installation and Diagram and the Flow meter and gas pipe.
2. Turn on the power switch at the back panel, digital current meter is on, fan begins to rotate.
3. Select AC for aluminum welding and DC for other metals.
4. Open the valve of the argon gas cylinder and adjust the flow rate to 10 – 15 LPM Liters per minute.
5. Press the switch of the torch, the solenoid gas valve inside the machine clicks and HF can be heard, at the same time argon gas is flowing from the TIG torch. NOTES: When switching machine on trigger the torch for several seconds to disperse air out the pipes and let the argon gas flow through. After welding argon gas will still flow out for several seconds in order to protect the welding spot and to cool the tungsten down.
6. Adjust welding current and make sure the welding current is adequate for the thickness of the material.
7. The welding tungsten is held 2 to 4mm away from the material, press the torch trigger an arc will jump from the tungsten to the work piece striking an arc the HF sound will stop in DC mode.

MMA ARC WELDING

1. Connect cables as per Installation and Diagram.
2. Turn on the power switch at the back panel, digital current meter is on, fan begins to rotate.
3. Make sure the mode switch on front panel is on MMA and DC position.
4. Adjust welding current and make sure the welding current is adequate for the thickness of the material.
5. Strike an arc by touching the electrode to the work piece.

TIG welding technics tips (suggestion)

- For DC Sharpen tungsten point length to 1.5 times the thick ness of the tungsten.
- Make sure grinding marks are strait towards the tip point.
- Weld in the same direction the gas is flowing. (Leaves smoke marks if pulling)
- Dip the filler rode in front of the pool (in front of direction you are moving)
Technic: create pool move back 2-3mm dip filler then move forward pull filler away go over same area and continue pool and same technic steps.
- Practice on same material you are going to weld on.
- If tungsten burns away too fast – lower the amperage or use thicker tungsten.

1.6mm tungsten	2.4mm tungsten	3.2mm tungsten
10 to120 Amps	100 to 180 Amps	150 to 320 Amps



1、 Environment

- 1) The machine can perform in environments where conditions are dry to a humidity level of max 60%.
- 2) Ambient temperature of -10 to 40 degrees centigrade.
- 3) Avoid welding in direct sunshine, in rain or wet areas.
- 4) Do not use the machine in environments where the air is polluted with conductive dust or corrosive or flammable gasses.
- 5) Avoid gas welding in strong winds.

2、 Safety specs

The welding machine has a protection circuit for over voltage, over current and overheating. When voltage, output current and temperature of the machine has exceeded its limits the welding machine will stop working automatically to protect the machine, users must pay attention to the following.

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

The welding machine is a high voltage machine, when being operated it generates high currents, and natural wind will not meet the machines cooling demands. So there is a fan inside to cool down the machine. Make sure the air intake is not blocked or covered that there is a 0.3 meter space from welding machine to objects around the machine. 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 understand the duty cycle of the machine.

Duty cycle is out of 10 minutes i.e.:

60% @ 200A means 6 minutes welding 4 min cooling

100% @ 155A means 10min welding 1min cooling etc...

Make sure welding current doesn't exceed max duty cycle current.

Over-load current will damage and burn up machine.

3) **Over or under voltage !**

Power voltage can be found in diagram of main technical data. Automatic voltage compensation circuit will assure that welding current is kept in correct parameters. If power input voltage exceeds or drops below suggested voltage input parameters it will damage components of the machine. The operator should understand the situation and take preventive measures.

3) **Over heating !**

If the welding machine over heats the duty cycle has been reached or the ambient temperature is high the welding machine will stop working for protection. Because the machine is overheated the temperature light will be "ON" (red light). In this situation don't switch off or unplug, let the fan cool the machine. When the indicator light goes off the machine can weld again.

QUESTIONS

The following can cause problems with welding: Fittings, welding materials, environmental factors, power supply, welding technician and gas contamination. User must try to improve welding conditions.

1. Black welding spot

The cause of black welding spots is from oxygen (air) contaminating the weld. To prevent this check the following:

- 1) Make sure the valve of argon cylinder is opened and has enough pressure. The argon cylinder must be refilled if pressure is below 0.5Mpa.
- 2) Check if the flow meter is opened and has enough flow .operator can choose different flow rates according to welding current in order to save gas .But too little gas flow may cause black welding spot because not enough shielding gas is covering the welding spot. We suggest that flow of argon must be kept minimum 10L/min.
- 3) Check if torch or gas hose is not blocked, damaged, pinched, melted or has any holes.
- 4) The welding material might be contaminated with oil, chemicals or dirt.
- 5) Strong wind will lower the welding quality.

2. No Arcing-striking

- 1) Make sure the earth cable is clamped to the work piece.
- 2) Check each connection point of earth cable.(pull to make sure tight connection)
- 3) Electrode holder tightened on machine.
- 4) Selector switch set on MMA/TIG, Remote/panel.
- 5) Make sure you are using Thoriated tungsten for DC welding (red tip) and Zirconiated tungsten for AC welding (white tip).
- 6) Grind the end of the tungsten electrode to a taper point. If tungsten is not sharp it will make it difficult to strike an arc and cause an unstable arc.

3. Output current cannot reach rated current

If the supplied voltage is different from the rated it will lead to unconformity of the output current and the adjusted current. When Supplied voltage is lower than the rated, the max output current will be lower than the rated

4. Current is not stabilized when machine is being operated.

This can be caused by the following:

- 1) Supply voltage is not stable.
- 2) There is harmful interference from supply voltage or other equipment.
- 3) Bad earth connection.

Hot/bad connections or points on earth cable or torch can cause welding current to drop or be unstable.

5. When on MMA welding mode, too much spatter.

NB: Electrode quality, type, age, moisture can also cause excess splatter!!

- 1) Current is too high and electrode diameter is too thin.
- 2) Output terminal polarity connections are wrong, the opposite polarity will be used with the normal technics, which means that the stick should be connected with the negative polarity of power source, and earth clamp will be connected with the positive polarity. So please change the polarity. If this is the connection you are using and have too much splatter try reversing polarity.



DO NOT ATTEMPT TO REPAIR MACHINE IF STILL UNDER WARRANTY

Notes: only attempt to repair this machine if you have knowledge and understanding of electronic components and the dangers of electricity and components holding a charge of high voltage electricity. Before maintenance contact us for authorization is suggested.

MAINTENANCE



WARNING!

**Before maintenance and checking, power must be turned off,
Before opening the cover disconnect the machine from electricity!**

WELDING TORCH

Position	Checking keys	Remarks
Ceramic	1. If distorted or damaged 2. Splatter built up.	Replace. Can cause porosity/marks.
Collet body	1. Hole worn out. 2. Body discolored or burnt.	Replace -amperage too high, not enough gas cooling.
Collet	1. Check not twisted. 2. Check the clamping hole is not worn out.	Replace –Tungsten will slip out and cause torch to get hot quickly.
Back Cap	1. Damaged or distorted.	Replace – can damage torch head and lose gas.
Tungsten	1. Sharpened correctly, not damaged. 2. Good quality correct size.	Blunt can cause arc to be unsteady. Poor or cracked/ damaged will burn away quickly.

CABLES

Position	Checking keys	Remarks
Torch cable	1. If torch cable coiled or kinked. 2. If the adaptor is connector tight	1.Cause weak gas flow 2. Gets hot and burn gas hose.
Earth cable	1. Wearing-out of the cable insulated material. 2.Cable jack plug connector exposed (insulation damage) or loose 3. Earth clamp not damaged or burnt, lug tightened	Loose or bad connections get very hot causing a drop in welding amperage
Input cable	1. Check if cable between the plug and the machine is not damaged 2. Plug is in good condition	Replace damaged plugs with correct amperage plug.

DAILY CHECKING

1. Remove dust with dry, clean compressed air regularly, if the welding machine is operated in an area where the air is polluted with smoke and dust, the machine needs to be cleaned regularly, remove dust monthly.
2. Compressed air must not be more than 5 bars in order to prevent damage to small components inside the machine.
3. Check inside the welding machine regularly and make sure the welding output terminals are connected tightly and connectors are not damaged. If burnt, loose or damaged please tighten or replace if necessary.
4. Avoid water and steam entering into the machine, if the machine dose get wet please dry inside machine then check insulation of machine.
5. If the machine will not be operated for a long period it should be put into a box or covered and stored in a cool dry area.

TROUBLESHOOTING AND FAULT FINDING



WARNING!

Blind experiment and careless repair may lead to more problems to the machine. This will make formal diagnostic and repair more difficult. When the machine is open there may be exposed connections containing life-threatening voltages. Any direct or indirect touch will cause electric shock, and severe electric shock will lead to death.

TIG200AC/DC、TIG250AC/DC 、TIG315AC/DC

Faults	Resolvable Methods
Display is not on ,fan does not work and no welding output	<ol style="list-style-type: none"> 1. Power switch is faulty. 2. Check if electricity supply is working. 3. Check if input cable and plug is not damaged.
Display is on ,fan does not work or revolves several circles no welding output	<ol style="list-style-type: none"> 1. Electricity power is not stable or input cable is too thin causing machine to go into protection mode. Switch off machine wait 2-3 minutes then switch on. 2. Cable is loosed from switch to power board – tighten- reconnect. 3. Main circuit 24V relay of power board is not on or is damaged .Check 24V power source and relay .If relay is damaged replace it with same model.
All normal HF sound cannot be heard and cannot strike an arc.	<ol style="list-style-type: none"> 1. Check if control cable, switch or plug of torch is not broken. 2. There is a green LED indicator in auxiliary power of MOS board, if it isn't on, auxiliary power is faulty. Find fault and repair or replace.
All normal Sound of HF can be heard, but there is no welding output.	<ol style="list-style-type: none"> 1. Check if torch power cable is broken. 2. Check if earth clamp cable is broken or not connected to welding piece. 3. Output terminal of electrode or torch connector is loosed or burnt off. 4. Make sure earth clamp is connected to positive connection.
All normal Sound of HF cannot be heard, and arc welding mode works.	<ol style="list-style-type: none"> 1. Primary cable of H.F. transformer is not connected to power board firmly. 2. TIG / MMA Switch is damaged, replace it. 4. Check if HF control board components are damage, replace it.
Abnormal indicator is lit and there is no welding output.	<ol style="list-style-type: none"> 1. Mosphets are damaged 2. Rectifier of quick recovery is damaged 3. Control board is malfunctioning. The feedback circuit faulty. 4. Machine might be in overheat protection mode, wait for 2-3 minutes
Output current is not stabilized or it has no potentiometer control.	<ol style="list-style-type: none"> 1. 1K potentiometer is damage, replace it. 2. Remote on selected or remote pedal faulty. 3. Check all plug connections. 4. Bad connections cause heat – heat causes los to amperage output.
When welding aluminum, cannot break oxidized film	<ol style="list-style-type: none"> 1. AC is selected amperage too low. 2. Cleaning width too low 3. AC controller of inverter MOSFET damaged.
Electrode splatter is too much and arc striking is difficult.	Swop electrode and earth cable polarity.

If the machine fails to work after maintenance and checks, please contact your local distributor or our after-sale service center.