

TIG 200PAC/DC GDM
WELDING MACHINE




USER MANUAL

Preface

This manual includes hardware description and operation introduction of the equipment. For your and other people's safety, please read the manual carefully.

Pay attention

Pay attention to the words after the signs below.

Sign	Description
 DANGER	The words after this sign means there is great potential danger, which may cause major accident, damage or even death, if it is not followed.
 WARNING	The words after this sign means there is some potential danger, which may cause hurt or property lose, if it is not followed.
 ATTENTION	The words after this sign means there is potential risk, which may cause equipment fault or break, if it is not followed.

Version

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The contents of this manual are updated irregularly for updating of product. The manual is only used as operation guide, except for other promises. No warranties of any kind, either express or implied are made in relation to the description, information or suggestion or any other contents of the manual.

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1 Safety Warning

The safety notes listed in this manual is to ensure correct use of the machine and to keep you and other people from being hurt.

The design and manufacture of welding machine considers safety. Please refer to the safety warning listed in the manual to avoid accidents.

Different damage would be caused by wrong operation of the equipment as follows. Please read the user manual carefully to reduce such damage.

Sign	Description
	<ul style="list-style-type: none"> ◇ Any contact of electric parts may cause fatal electric shock or burnt.
	<ul style="list-style-type: none"> ◇ Gas and fumes are harmful to health. ◇ Operation in narrow space may cause choke.
	<ul style="list-style-type: none"> ◇ Spark and hot workpiece after welding may cause fire. ◇ Bad connected cable may cause fire. ◇ Incompletion connection of workpiece side circuit may cause fire. ◇ Never weld on the case of tinder stuff, or it may cause explode. ◇ Never weld airtight containers such as slot, pipe etc., or it may break.
	<ul style="list-style-type: none"> ◇ Arc ray may cause eye inflammation or skin burnt. ◇ Spark and residue will burn your eyes and skin.
	<ul style="list-style-type: none"> ◇ Toppling over of the gas cylinder will cause body hurt. ◇ Wrong use of the gas cylinder will lead to high-pressure gas eruption and cause human hurt.
	<ul style="list-style-type: none"> ◇ Never let fingers, hair, clothes or etc. near the moving parts such as the fan.
	<ul style="list-style-type: none"> ◇ The wire shoot out of the torch may stab eyes, face and other naked parts.
	<ul style="list-style-type: none"> ◇ The machine is portable, never lift it by any equipment.



Please follow the rules below to avoid heavy accidents.

- Never use the equipment to do other things but welding.
- Follow related regulations for the construction of the input-driven power source, choice of place, usage of high-pressure gas, storage, configuration, safe-keeping of workpiece after welding and disposal of waste, etc.
- Nonessentials do not enter the welding area.
- People using heart pacemaker is not allowed to get close to the welding machine or area without doctor's permission. The magnetism created by energizing the welding machine can have a bad effect to the pacemaker.
- Install, operation, check and maintain the equipment by profession personnel.
- Understanding the contents of the user manual for safety.




Please follow the rules below to avoid electric shock

- Keep away from any electric parts.
- Earth the machine and workpiece by professional personnel.
- Cut off the power before installation or checking, and restart 5 minutes later. The capacitance is chargeable device. Please ensure it has no voltage before start again even if the power source is cut off.
- Do not use wire with inadequate section surface or damage insulation sleeve or even exposed conductor.
- Do ensure well isolation of wire connection.
- Never use the device when the enclosure is removed.
- Never use broken or wet insulation gloves.
- Use firenet when work at high position.
- Check and maintain regularly, don't use it until the broken parts are fixed well.
- Turn off the power when not in used.
- Follow the national or local related standard and regulations when using the AC welding machine at narrow or high position.




Please follow the below notes to avoid fire and explode, etc.

- No combustible in welding area.
- Keep off combustible when welding.
- Keep hot workpiece after welding away from flammable gas.
- Do move away the combustible around when weld the dooryard, ground and wall,.
- The wire connection of base metal should be as close to the welding place as possible.
- Never weld those facilities with gas pipe or airtight slot.
- Put fire extinguisher around the welding area to prevent fire.

 **WARNING** The gas and fumes are harmful to health, please wear protective device according to regulations.

- Wear exhaust equipment and breathe preventive facilities to prevent gas poisoning or choke.
- Use suggested part exhaust equipment and breathe preventive facilities to prevent hurt or poisoning by gas and other powder, please.
- To prevent oxygen-deficiency, air out the gas-filled room which is full of CO₂ and argon on the bottom, when operating on trunks, boilers, cabins, etc.
- Please accept the supervisor's inspection when operating in narrow space. Air the room and wear breathe preventive facilities.
- Never operate in degrease, washing or spray space.
- Using breathe preventive facilities when weld shielded steel for it will cause poisonous dust and gas.

 **WARNING** The arc, spark, residue and noise are harmful to health, please wear protective appliance.

- Eye protection against arc is recommended when welding or supervise welding.
- Please wear preventive spectacles.
- Welder's gloves, welder's goggles, long sleeve clothes, leather apron, and other standard protection equipments must be worn for welding operation.
- A screen to protect other people against the arc must be set in the welding place.

 **WARNING** Please follow the notes below to avoid gas cylinder toppling over or broken.

- Use the gas cylinder correctly.
- Use the equipped or recommended gaseous regulator.
- Read the manual of gaseous regulator carefully before using it, and pay attention to the safety notes.
- Fix the gas cylinder with appropriate holder and other relative parts.
- Never put the cylinder under high temperature or sunshine environment.
- Keep your face away from the gas cylinder exit when opening it.
- Put on the gas shield when it is not used.
- Never put the torch on the gas cylinder. The electrode can not meet the gas cylinder.

**WARNING**

Any touch of the switch part will cause injury, please note the following.

- Never use the machine when the enclosure is off.
- Install, operate, check and maintain the machine by professional person.
- Keep your fingers, hair, clothes etc. away from the switch parts such as the fan.

**WARNING**

The wire end may deal damage, please note the following.

- Never look into the electric conduction hole when checking the wire feeding is normal or not, or the shooting wire may stab your eyes and face.
- Keep your eyes, face or other naked parts away from the end of torch when feeding the wire manually or pressing the switch.

**ATTENTION**

For better work efficiency and power source maintenance, please note the following.

- Precautions against toppling over.
- Never use the welding equipment for pipe thawing.

**ATTENTION**

Electromagnetic interference needing attention.

- It may need extra preventive measures when the equipment is used in particular location.
- Before the installation, please estimate the potential electromagnetism problems of the environment as follows.
 - a) Upper and lower parts of the welding equipments and other nearby power cable, control cable, signal cable and phone cable.
 - b) Wireless electric as well as TV radiation and reception equipment.
 - c) Computer and other control equipments.
 - d) Safety-recognition equipment etc. Such as supervise of industrial equipments.
 - e) Health of people around. Such as personnel using the heart pacemaker or audiphone.
 - f) Equipments for adjustment and measurement.
 - g) Anti-disturb capability of other used equipments .Users should ensure these equipments and the environment are compatible, which may need extra preventive measures.
 - h) Practical state of the welding and other activities.
- Users should observe the following dos and don'ts to decrease radiation interference.
 - a) Connect the welding equipments to the power supply lines.
 - b) Maintain the welding equipments regularly.
 - c) The cable should be short enough to be close to each other and the ground.
 - d) Ensure the safety of all the welding metal parts and other parts nearby.
 - e) The workpiece should be well earth.
 - f) Shield or protect the other cable and equipments to decrease the effects of disturbances.
The welding equipments can be complete shielded in some special conditions.
- Users are responsible for interference due to welding.

2 Product

2.1 General

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. The principle is to commutate the power frequency of 50Hz/60Hz into direct current, and then utilize the high-power single tube IGBT to invert it into high frequency (15K/16K), then reduce the voltage and commutate, and output high-power D.C power supply via Pulse Width Modulation (PWM). Since the switch power inversion technology is adopted, the weight and volume of the welding machine is brought down greatly with a conversion efficiency increase of more than 30%. Characteristic: stable wire feed rate, little splatter, portable, energy-saving, low electromagnetic noise.

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 especially 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.

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



The machine is mainly used in industrial fields. It will cause radio interference if used indoors. Please take through precaution measures.

2.2 Technical Data

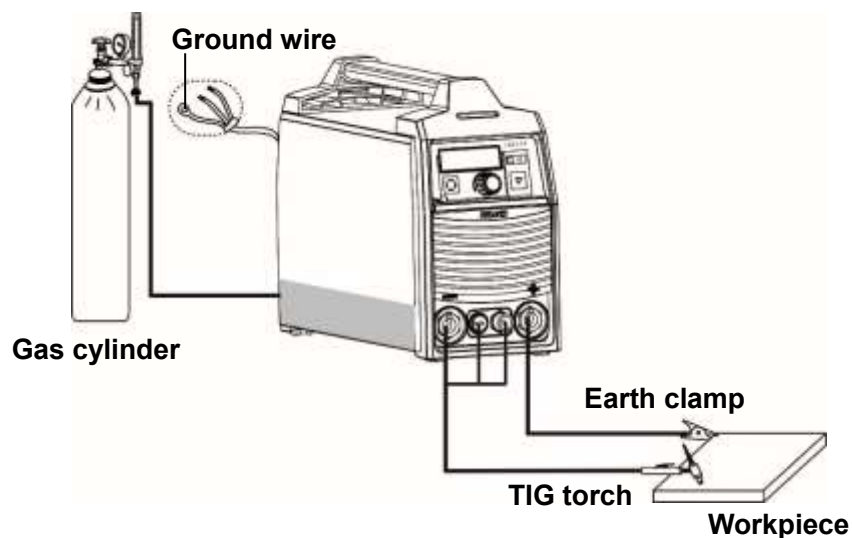
Parameters \ Model	TIG 200PAC/DC GDM
Power voltage(V)	single phase AC230V±15%
Frequency (Hz)	50/60
Rated input current (A)	25.3 (TIG/DC) 30 (TIG/AC) 36.5(MMA)
Output current. (A)	15~160 (TIG/DC) 20~180 (TIG/AC) 20~160 (MMA)
Rated working volt. (V)	16.4 (TIG/DC) 17.2 (TIG/AC) 26.4 (MMA)
No-load volt. (V)	U ₀ =58 (TIG/MMA) U _r =19 (MMA)
Duty cycle (%)	25 (TIG) 25 (MMA)
Arcing way	HF
Efficiency (%)	80
Power factor	0.72
Insulation grade	F
Housing protection grade	IP21S
Weight (Kg)	6.25
Dimensions (L*W*H mm)	315*135*250

3 Installation

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 form 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.

Installation diagram (TIG)



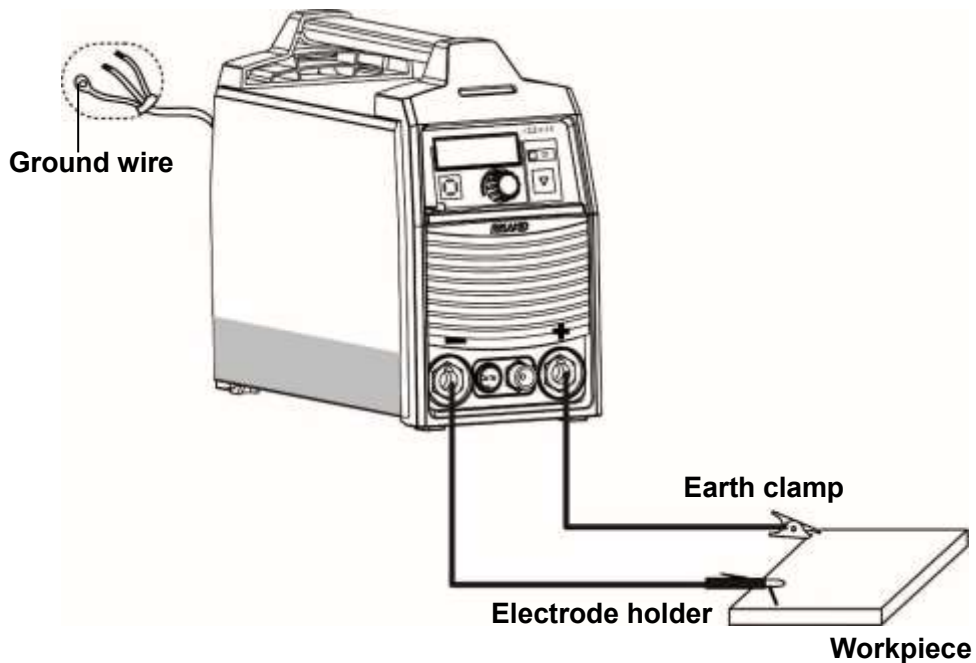
NOTE: This series of machine are compatible with gas-electric integrated TIG torch and foot control (optional).

Installation steps (TIG)

- 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.
- Connect the fast plug of the TIG torch to the socket of “-” terminal on the front panel, and fasten it clockwise.
- Connect the torch switch of the TIG torch to the joint on the front panel, and fasten the screw.
When the foot control is selected, Connect the electrical lead of the foot control to the joint (5 pin) on the front panel, and fasten the screw. The torch switch of the TIG torch should now hang free.
- Connect the gas connector of the TIG torch to the joint on the front panel.

- Connect the fast plug of the earth clamp to the socket of “+” terminal on the front panel, and fasten it clockwise.
- Clamp the earth clamp onto the workpiece.
- When the power supply is connected, the welding operation can be carried out.

Installation diagram (MMA)



Installation steps (MMA)









- Connect the fast plug of the electrode holder to the socket of “-” terminal on the front panel, and fasten it clockwise.
- Connect the fast plug of the earth clamp to the socket of “+” terminal on the front panel, and fasten it clockwise.
- Clamp the earth clamp onto the workpiece.
- When the power supply is connected, the welding operation can be carried out.














NOTE: the ground wire in the power cable must be grounded

4 Operation

4.1 Front Panel Layout

See the table below for details.

Icon	Name	Description	
	Adjustment knob	Rotate the knob to set welding current, pre gas time, start current, up-slop time, and so on.	
	Remote indicator	The indicator lights up when the parameters are set by the digital TIG torch or the foot control is connected.	
	Welding mode button	Used to switch the STICK and TIG mode The TIG mode include TIG (AC) and TIG (DC)	
	Menu button	<p>MMA mode</p> <p>Long press (3s): Open/close the VRD function.</p> <p>Short press: switch the hot start current, hot start time, arc force current, and so on..</p> <p>TIG mode</p> <p>Long press (3s): switch the 2T, 4T and spot mode</p> <p>Short press: switch the pre/post gas time, up-slop time/down-slop time, start current, stop current, pulse frequency, and so on.</p>	
MMA	VRD	VRD function	Under the MMA mode, Open/close the VRD function by long press the “menu button”.
		Electrode type	Please select the type of electrode according to the actual situation. E6013: acid electrode E6010: cellulose electrode E7018: basic electrode
		Electrode diameter	Value range: Φ 1.6mm- Φ 4.0mm
		Hot start current	Value range: -20% - 20%
		Hot start time	Value range: 0 – 1s

Icon	Name	Description
	Arc force current	Value range: -20% - 20%
TIG		Suitable for TIG(AC) mode. Value range: 50Hz – 100Hz
		Suitable for TIG(AC), TIG(DC) and spot mode. Value range: 0.1s – 9.9s
		Suitable for TIG(AC), TIG(DC) and spot mode. Value range: 10% - 100%
		Suitable for TIG(AC), TIG(DC) and spot mode. Value range: 0 – 9.9s
		Suitable for TIG(AC), TIG(DC) and spot mode. Value range: 0 – 9.9s
		Suitable for TIG(AC), TIG(DC) and spot mode. Value range: 10% - 100%
		Suitable for TIG(AC), TIG(DC) and spot mode. Value range: 0.1s – 9.9s
		Suitable for TIG(AC) mode. Value range: 20% - 70%
		Suitable for TIG(AC), TIG(DC) and spot mode. AC: 0 – 5Hz DC: 0 – 200Hz
		Suitable for TIG(AC), TIG(DC) and spot mode. Value range: 10% - 50%
		Suitable for TIG(AC), TIG(DC) and spot mode. Value range: 1% - 99%
		Suitable for spot mode. Value range: 0.1s - 9.9s

4.2 Operation Instruction

NOTE: If welding for the first time, before operating, please press the switch for a few seconds until all the air in the gas tube is removed. Then, welding could be started.




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.

Starting up

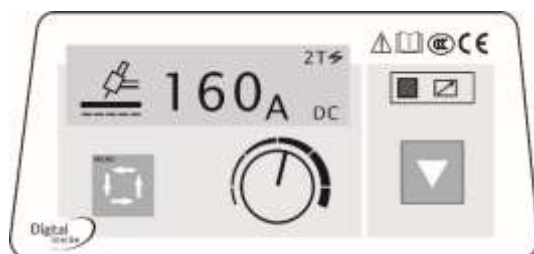
Switch on the machine through the **Power Switch**, the panel will display the previous settings that were saved in the last shutdown.

Operation instruction under TIG mode

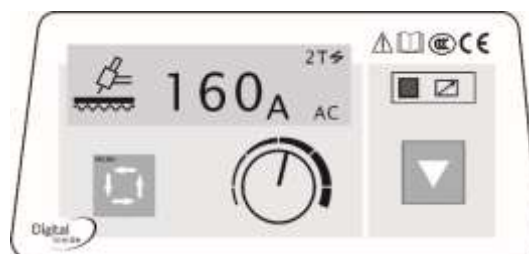
- **Set welding mode**

Press the **Welding Mode Button**  on the front panel to choose the welding mode.

In the absence of pulses, the TIG mode includes TIG/DC (without pulse) and TIG/AC (without pulse).

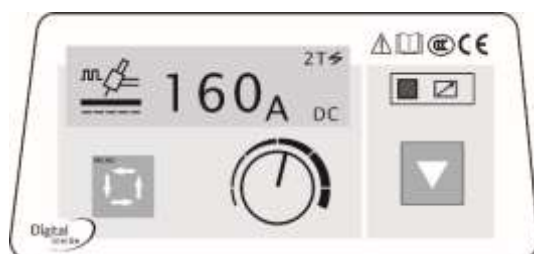


TIG/DC (without pulse)

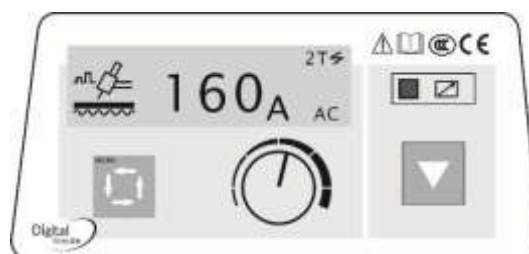


TIG/AC (without pulse)

In the case of a pulse, The TIG mode includes TIG/DC (with pulse) and TIG/AC (with pulse).




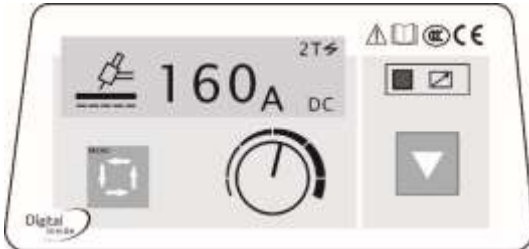
TIG/DC (with pulse)



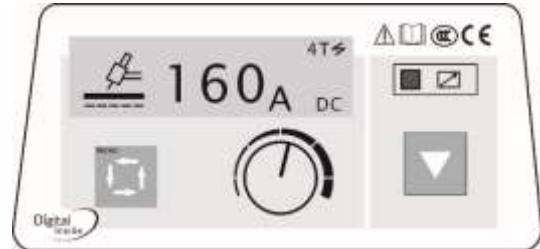
TIG/AC (with pulse)

- **Choose 2T / 4T / Spot mode**

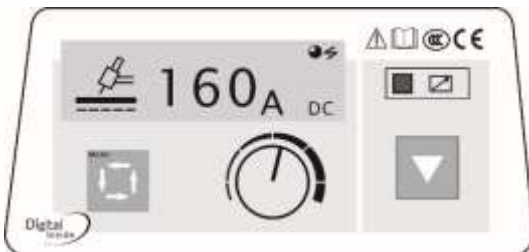
Press the **Menu Button**  for 3 seconds, and then release to choose the modes of 2T, 4T and spot.



2T mode




4T mode

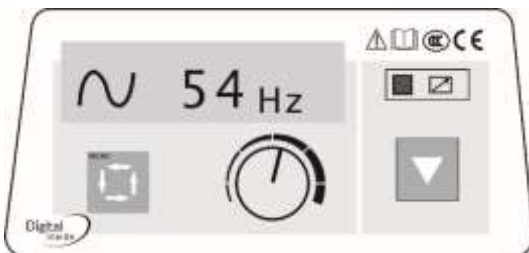


Spot mode

- **Adjusting parameters**

Under the TIG mode, select the 2T, 4T or Spot mode first by press the **Menu Button**  for 3s.

Select the parameters to be set by pressing the **Menu Button**, and then adjusting the parameter value by the **Adjustment Knob**.



Adjusting parameters (AC frequency)

Note: When the digital TIG torch is connected, the remote indicator will light up by pressing the torch switch for 10s, and the current could be adjusted by the knob on the TIG torch.

The configured parameter value will be automatically saved.

- **Start to welding**


The machine has the ways of HF to start arc.

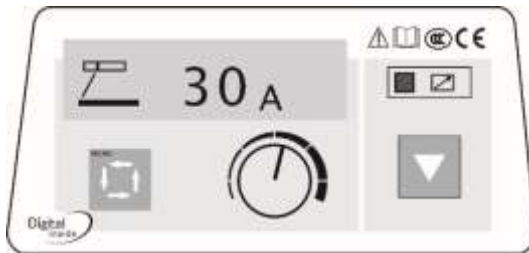
HF: Keep 2-4mm space between tungsten pole and work piece, press torch switch, the machine start to work after the pre gas time.

When stop welding and the electric arc stick out, keep the welding position for a while so that the weld spot could be protected before cooling down for delaying argon.

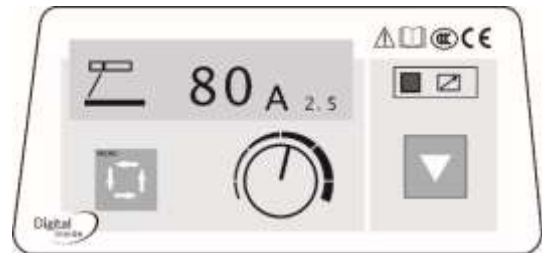
Operation instruction under MMA mode

- **Set welding mode**

Press the **Welding Mode Button**  on the front panel to choose the welding mode.



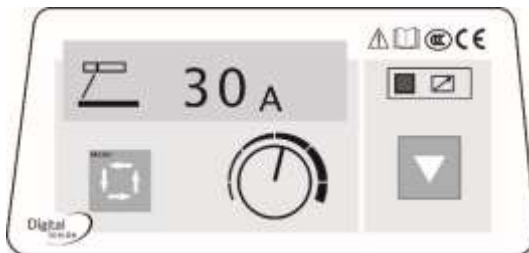
MMA mode (Electrode not configured)



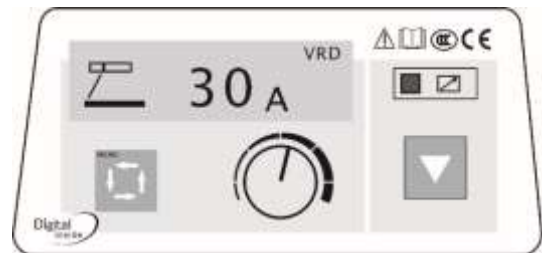
MMA mode (Electrode configured)

- **Set VRD function**

Under the MMA mode, press the **Menu Button**  for 3 seconds, and then release to open or turn off the VRD function.



MMA mode (without VRD)



MMA mode (with VRD)

- **Adjusting parameters**

Under the MMA mode, select the parameters to be set by pressing the **Menu Button**, and then adjusting the parameter value by the **Adjustment Knob**.



Adjusting parameters (Electrode type)

Note: The configured parameter value will be automatically saved.

4.3 Welding Environment and Safety

● Environment

- a) The machine can perform in environment where conditions are dry with a dampness level of max 90%.
- b) Ambient temperature is between -10 to 40 degrees centigrade.
- c) Avoid welding in sunshine or drippings. Do not let water enter the gas
- d) Avoid welding in dust area or the environment with corrosive gas.
- e) Avoid gas welding in the environment with strong airflow.

● 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.

a) **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.

b) **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.

c) **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.

If welding time is exceeded duty cycle limited, welding machine will stop working for protection. The 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.

4.4 Welding Problems and Resolution

Fittings, welding materials, environment factor, supply powers maybe have something to do with welding. User must try to improve welding environment.

- **Black welding spot.**

Welding spot is not prevented from oxidizing .User may check as following:

- a) 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 .
- b) 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.
- c) Check if torch is in block.
- d) If gas passage is not air-tight or gas is not pure can lower welding quality.
- e) If air is flowing powerfully in welding environment, that can lower welding quality.

- **Arc-striking is difficult and easy to pause.**

- a) Make sure quality of tungsten electrode is high.
- b) 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.

- **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.

- **Current is not stabilizing when machine is being operated.**

It has something with factors as following.

- a) Electric wire net voltage has been changed.
- b) There is harmful interference from electric wire net or other equipment.

- **When use MMA welding, too much spatter**

- a) Maybe current is too big and stick's diameter is too small.
- b) 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.

5 Daily Maintenance and Checking

- **Daily maintenance**

- a) Remove dust regularly with dry compressed air. If the welding machine is used in surroundings with heavy smoke and polluted air, it is necessary to remove dust at least one time one month.
- b) The pressure of compressed air shall fall to required level to prevent damage to small components in the machine.
- c) Examine inside electric joints and ensure perfect contact (Especially plugs and sockets). Fasten the losing joints. In case of oxidation, remove oxide film with sand paper and connect again.
- d) Prevent water from entering into the machine and prevent the machine from getting moist. If any, blow and dry. Measure the insulation with megohmmeter to make sure it is qualified to use.
- e) If the welding machine is not used for a long time, pack the machine in original package and store in dry surroundings.



The power shall be cut off completely before all maintenance, repairing works. Make sure to pull out power plug before opening the case.

- **Notes before checking**



Aimless test and unprofessional repairing may make the problems worse and cause more defaults. When the power is on, the bare components may be dangerous with high voltage. Any direct or indirect touch may cause electric shock, even death.



Within the warranty period, if the users handle unprofessionally of the malfunctions by themselves without permission of manufactory, the free repair guaranteed by the distributors may not be effective.

6 Trouble Shooting and Fault Finding

Notes: The following operations must be performed by qualified electricians with valid certifications. Before maintenance, you are suggested to contact local distributor to verify qualification.

Faults symptom	Reasons	Solutions
Panel no display No welding current output	<ul style="list-style-type: none"> ➤ Not connected to the power supply 	<ul style="list-style-type: none"> ➤ Make sure the input power supply is normal. ➤ Make sure the power switch is closed.
The display of the panel is normal No welding current output	<ul style="list-style-type: none"> ➤ The input voltage is wrong. ➤ The input voltage is not stable ➤ The input cable connected to the power grid or the voltage protection circuit started. ➤ The wires between power switch and power supply board are loose. 	<ul style="list-style-type: none"> ➤ Adjust the voltage to the correct value. ➤ Close the machine, and then open it in 5~10 minutes. ➤ Re tighten the wires between power switch and power supply board.
Fan is not working It has abnormal indication	<ul style="list-style-type: none"> ➤ The fan is broken. ➤ The internal element fault 	<ul style="list-style-type: none"> ➤ Replace the fan ➤ If not solve the problem, please contact the dealer or contact our company.
Press the TIG torch switch, it has no gas output, but has current output	<ul style="list-style-type: none"> ➤ The air valve is broken. ➤ The gas way is block. ➤ The internal element fault 	<ul style="list-style-type: none"> ➤ Check the gas way. ➤ If not solve the problem, please contact the dealer or contact our company.
Press the TIG torch switch, it has no gas and current output	<ul style="list-style-type: none"> ➤ The torch switch is broken or bad connection. ➤ The internal element fault 	<ul style="list-style-type: none"> ➤ Check the torch switch. ➤ Please contact the dealer or contact our company.
Fan is working No abnormal indication No welding current output	<ul style="list-style-type: none"> ➤ The control circuit is broken. 	<ul style="list-style-type: none"> ➤ If not solve the problem, please contact the dealer or contact our company.
Fan is working It has abnormal indication No welding current output	<ul style="list-style-type: none"> ➤ Overheat protection. ➤ The circuit of auxiliary power supply is broken. 	<ul style="list-style-type: none"> ➤ The machine will automatically return to normal in 5~10 minutes. ➤ If not solve the problem, please contact the dealer or contact our company.
The text in the panel is incorrectly displayed Parameter values can not be adjusted correctly	<ul style="list-style-type: none"> ➤ The cable is bad connection. 	<ul style="list-style-type: none"> ➤ Check the cable.

